ADDENDUM NO. 5

April 20, 2023

North Central High School Additions and Renovations – Phase 3
1801 East 86th Street
Indianapolis, IN 46240

TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and the Drawings dated March 22, 2023, by Schmidt Associates. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages ADD 5-1 through ADD 5-2, Pre-Award Schedule, Specification Section 00 31 00 Revised Indiana Bid Form, and attached Schmidt Associates Addendum No. 5.3 dated April 19, 2023, consisting of 14 Addendum Pages and 566 Addendum Drawings.

A. GENERAL INFORMATION

Pre-Award Meeting schedule is attached herein. Pre-Award Meetings will be conducted virtually on date and times noted.

B. SPECIFICATION SECTION 00 00 10 - TITLE PAGE

Bid Opening Teams Link:

Microsoft Teams meeting
Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 280 006 365 696
Passcode: yyskD9
Download Teams | Join on the web
Or call in (audio only)
+1 317-762-3960,,381096793# United States, Indianapolis
Phone Conference ID: 381 096 793#

C. SPECIFICATION SECTION 00 31 00 INDIANA BID FORM

Updated Bid Form attached herein.

D. SPECIFICATION SECTION 01 12 00 MULTIPLE CONTRACT SUMMARY

3.03 Bid Categories

B. BID CATEGORY NO. 2 – GENERAL TRADES

Add the following clarifications:

16. Provide grouting of column base plates.
17. Provide stainless steel skate deterrents for concrete seat walls.

Q. BID CATEGORY NO. 17 – PLUMBING

Add the following specification section:

Section	22 67 19	Reverse Osmosis System Equipment

R. BID CATEGORY NO. 18 – HVAC

Add the following specification section:

Section	23 34 33	Air Curtains

CONTRACTOR'S BID FOR PUBLIC WORKS FORM NO. 96

Format (Revised 2013)
(Amended for MSDWT)

North Central High School Additions & Renovations Phase 3

MSD of Washington Township
(Marion County)

PART I

(To be completed for all bids. Please type or print)

Date (month, day, year):_____

BIDDER (Firm) _____

Address _____ P.O. Box _____

City/State/Zip_____

Telephone Number: _____ Email Address: _____

Person to contact regarding this Bid_____

Pursuant to notices given, the undersigned offers to furnish labor and/or materials necessary to complete the public works project of:

_____
Insert Category No. (s) and Name(s)

Of public works project, ***North Central High School Additions & Renovations***, in accordance with Plans and Specifications prepared by ***Schmidt Associates, 415 Massachusetts Avenue, Indianapolis, IN 46204***, as follows:

BASE BID

For the sum of _____
(Sum in words)

_____DOLLARS ($_____)
(Sum in figures)

The undersigned acknowledges receipt of the following Addenda:
Receipt of Addenda No. (s) _____

PROPOSAL TIME

Bidder agrees that this Bid shall remain in force for a period of sixty (60) consecutive calendar days from the due date, and Bids may be accepted or rejected during this period. Bids not accepted within said sixty (60) consecutive calendar days shall be deemed rejected.

Attended pre-bid conference YES _____ NO_____

Has visited the jobsite YES _____ NO_____

The Bidder has reviewed the Guideline Schedule in Section 01 32 00 and the intent Of the schedule can be met. YES _____ NO_____

Bidder has included their Written Drug Testing Plan that covers all employees of the bidder who will perform work on the public work project and meets or exceeds the requirements set in IC 4-13-18-5 or IC 4-13-18-6. YES _____ NO_____

The Skillman Corporation's diversity initiative is to create a program to encourage, assist and measure the active participation of Minority- Owned, Women-Owned, Veteran – Owned and Disabled Individual-Owned Businesses. The Program is to ensure that MWVDBEs are provided full and equal opportunity to participate in all Skillman Corporation's Projects.

Bidder has included:
DBE: YES _____% NO _____
MBE: YES _____% NO _____
WBE: YES _____% NO _____
VBE: YES _____% NO _____

The undersigned further agrees to furnish a bond or certified check with this Bid for an amount specified in the Notice to Bidders. If Alternate Bids apply, submit a proposal for each in accordance with the Plans and Specifications.

If additional units of material included in the contract are needed, the cost of units must be the same as that shown in the original contract if accepted by the governmental unit. If the bid is to be awarded on a unit bases, the itemization of the units shall be shown on a separate attachment.

The contractor and his subcontractors, if any, shall not discriminate against or intimidate any employee, or applicant for employment, to be employed in the performance of this contract, with respect to any matter directly or indirectly related to employment because of race, religion, color, sex, national origin or ancestry. Breach of this covenant may be regarded as a material breach of the contract.

CERTIFICATION OF USE OF UNITED STATES STEEL PRODUCTS
(if applicable)

I, the undersigned bidder or agent as a contractor on a public works project, understand my statutory obligation to use steel products made in the United States (I.C. 5-16-8-2). I hereby certify that I and all subcontractors employed by me for this project will use U.S. steel on this project if awarded. I understand that violations hereunder may result in forfeiture of contractual payments.

ALTERNATE BIDS

A blank entry or an entry of "No Bid", "N/A", or similar entry on any Alternate will cause the bid to be rejected as non-responsive only if that Alternate is selected. If no change in the bid amount is required, indicate "No Change".

****MARK "ADD" OR "DEDUCT" FOR EACH ALTERNATE****

Alternate Bid No. 1 – South Student Entry

Change the Base Bid the sum of_____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 2 – Performing Arts Canopy

Change the Base Bid the sum of_____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 3 – Fieldhouse Acoustical Wall Panels

Change the Base Bid the sum of_____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 4 – Fieldhouse Acoustical Wall Panels

Change the Base Bid the sum of_____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 5 – General Classrooms Interior Finishes

Change the Base Bid the sum of _____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 6 – Science Classrooms Interior Finishes

Change the Base Bid the sum of _____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 7 – Guardrail At Balcony Outside Of The Auditorium

Change the Base Bid the sum of _____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 8 – Performing Arts Classroom (PAC) Additional Work

Change the Base Bid the sum of _____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 9 – South Gym Acoustical Treatment

Change the Base Bid the sum of _____
(sum in words)

_____ DOLLARS ($_____) ADD / DEDUCT
(sum in figures)

Alternate Bid No. 10 – K Hall Elevator Replacement

Change the Base Bid the sum of _____

(sum in words)

_____DOLLARS ($_____) ADD DEDUCT
(sum in figures)

Alternate Bid No. 11 – Brick Manufacturer

Change the Base Bid the sum of_____
(sum in words)

_____DOLLARS ($_____) ADD DEDUCT
(sum in figures)

Alternate Bid No. 12 – Main Gym Railing

Change the Base Bid the sum of_____
(sum in words)

_____DOLLARS ($_____) ADD DEDUCT
(sum in figures)

Alternate Bid No. 13 – Penthouse and Tunnel Door Replacement

Change the Base Bid the sum of_____
(sum in words)

_____DOLLARS ($_____) ADD DEDUCT
(sum in figures)

Alternate Bid No. 14 – Telescoping Stands

Change the Base Bid the sum of_____
(sum in words)

_____DOLLARS ($_____) ADD DEDUCT
(sum in figures)

PART II

(For projects of $150,000 or more – IC 36-1-12-4)

These statements to be submitted under oath by each bidder with and as a part of his bid. (Attach additional pages for each section as needed.)

SECTION I EXPERIENCE QUESTIONNAIRE

1. What public works projects has your organization completed for the period of one (1) year prior to the date of the current bid?

Contract Amount	Class of Work	Completion Date	Name and Address of Owner

2. What public works projects are now in process of construction by your organization?

Contract Amount	Class of Work	Completion Date	Name and Address of Owner

3. Have you ever failed to complete any work awarded to you?_____If so, where and why?

_____

_____

_____

4. List references from private firms for which you have performed work.

_____

_____

_____

SECTION II PLAN AND EQUIPMENT QUESTIONNAIRE

1. Explain your plan or layout for performing proposed Work. (Examples could include a narrative of when you could begin, complete the project, number of workers, etc. and any other information which you believe would enable the governmental unit to consider your bid.)

2. Please list the names and addresses of all subcontractors (i.e. persons or firms outside your own firm who have performed part of the work) that you have used on public works projects during the past five (5) years along with a brief description of the work done by each subcontractor.

3. If you intend to sublet any portion of the work, state the name and addresses of each subcontractor, equipment to be used by the subcontractor, and whether you will required a bond. However, if you are unable to currently provide a listing, please understand a listing must be provided prior to contract approval. Until the completion of the proposed project, you are under a continuing obligation to immediately notify the governmental unit in the event that you subsequently determine that you will use a subcontractor on the proposed project.

4. What equipment do you have available to use for the proposed Project? Any equipment used by subcontractors may also be required to be listed by the governmental unit.

5. Have you into contracts or received offers for all materials which substantiate the prices used in preparing your proposal? If not, please explain the rationale used which corroborate the process listed.

SECTION III CONTRACTOR'S FINANCIAL STATEMENT

Attachment of Bidder's financial statement is mandatory. Any Bid submitted without said financial statement as required by statute shall thereby be rendered invalid. The financial statement provided hereunder to the governing body awarding the Contract must be specific enough in detail so that said governing body can make a proper determination of the Bidder's capability for completing the Project if awarded.

SECTION IV CONTRACTOR NON-COLLUSION AFFIDAVIT

The undersigned Bidder or agent, being duly sworn on oath, says that he has not, nor has any other member, representative, or agent of the firm, company, corporation or partnership represented by him, entered into any combination, collusion or agreement with any person relative to the price to be bid by anyone at such letting nor to prevent any person from bidding nor to induce anyone to refrain from bidding, and that this Bid is made without reference to any other bid and without any agreement, understanding or combination with any other person in reference to such bidding.

He further says that no person or persons, firms, or corporations has, have, or will receive directly or indirectly, any rebate, fee, gift, commission, or thing of value on account of such contract.

SECTION V OATH AND AFFIRMATION

I HEREBY AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE FACTS AND INFORMATION CONTAINED IN THE FOREGOING BID FOR PUBLIC WORKS ARE TRUE AND CORRECT

Dated at _____this _____ day of _____, 20

_____
(Name of Organization)

By
_____

_____
(Title of Person Signing)

ACKNOWLEDGEMENT

STATE OF _____)
) SS:
COUNTY OF _____)

Before me, a Notary Public, personally appeared the above-named
_____

Swore that the statements contained in the foregoing document are true and correct.

Subscribed and sworn to before me this _____ day of _____,
_____
(Title)

_____
Notary Public

My Commission Expires: _____

County of Residence: _____

END OF SECTION 00 31 00

PRE-AWARD MEETING SCHEDULE



- Bid Category No. 1 – May 8, 2023 @ 9:00AM
- Bid Category No. 2 – May 8, 2023 @ 10:00AM
- Bid Category No. 3 – May 8, 2023 @ 11:00AM
- Bid Category No. 4 – May 8, 2023 @ 1:00PM
- Bid Category No. 5 – May 8, 2023 @ 2:00PM
- Bid Category No. 6 – May 8, 2023 @ 3:00PM
- Bid Category No. 7 – May 9, 2023 @ 9:00AM
- Bid Category No. 8 – May 9, 2023 @ 10:00AM
- Bid Category No. 9 – May 9, 2023 @ 11:00AM
- Bid Category No. 10 – May 9, 2023 @ 1:00PM
- Bid Category No. 11 – May 9, 2023 @ 2:00PM
- Bid Category No. 12 – May 9, 2023 @ 3:00PM
- Bid Category No. 13 – May 10, 2023 @ 9:00AM
- Bid Category No. 14 – May 10, 2023 @ 10:00AM
- Bid Category No. 15 – May 10, 2023 @ 11:00AM
- Bid Category No. 16 – May 10, 2023 @ 1:00PM
- Bid Category No. 17 – May 11, 2023 @ 9:00AM
- Bid Category No. 18 – May 11, 2023 @ 10:00AM
- Bid Category No. 19 – May 11, 2023 @ 11:00AM

ADDENDUM NO. 5.3
APRIL 19, 2023

PREPARED BY SCHMIDT ASSOCIATES FOR:
NORTH CENTRAL HIGH SCHOOL RENOVATION
WASHINGTON TOWNSHIP, M.S.D. OF

This Addendum consists of 14 Addendum page(s) and 566 attachment pages totaling 580 pages.

Acknowledge receipt of this Addendum by inserting its number on the Bid Form. Failure to do so may subject the Bid to disqualification. This Addendum is part of the Contract Documents.

Bidder is encouraged to verify with reprographer of record all Addenda issued (do not rely exclusively on third party plan room services).

PART 1 - CHANGES TO PRIOR ADDENDA (NOT APPLICABLE)

PART 2 - CHANGES TO THE PROJECT MANUAL

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

2.1 DIVISION 08 – OPENINGS

A. **Section 083473 "SOUND CONTROL DOOR AND WINDOW ASSEMBLIES"**

1. ADD Subparagraph 2.2 D. as follows:
   "D. Noise Barriers, LLC"

B. **Section 088000 "GLAZING"**

1. DELETE AND REPLACE Subparagraph 3.9 D. 4. with the following:
   "4. Tint Color: Dark Gray or Dark Bronze to match existing – V.I.F."

2. DELETE AND REPLACE Subparagraph 3.9. H. 5. with the following:
   "5. Tint Color: Dark Gray or Dark Bronze to match existing – V.I.F."

2.2 DIVISION 09 – FINISHES

A. **Section 092900 "GYPSUM BOARD"**

1. DELETE AND REPLACE paragraph 2.3 D. 1. with the following:
   "1. Basis-of-design product: Subject to compliance with requirements provide Gold

Bond XP Hi-Abuse Gypsum Board by National Gypsum Company or comparable product by one of the following manufacturers:

a. CertainTeed Corporation.

b. Georgia-Pacific Building Products

c. USG Corporation"

2. DELETE AND REPLACE paragraph 2.3 D. 4. with the following:
"4. Indentation: ASTM C 1629 meets or exceeds Classification Level 1."

3. DELETE AND REPLACE paragraph 2.3 D. 5. with the following:
"5. Soft Body Impact Resistance: ASTM C 1629 meets or exceeds Classification Level 2."

4. ADD Subparagraph 2.3 D. 8. a. as follows:
"a. Corridor walls with 102600 – Impact Wall Covering are not required to have Abuse-Resistant Gypsum Board."

B. **Section 095113 "ACOUSTICAL PANEL CEILINGS'**

1. DELETE AND REPLACE Subparagraphs 2.7 A. 1., 2., and 3 with the following:

"1. Optima, 3161, Armstrong World Industries, Inc.

2. Symphony F, 1358-IOF-1, CertainTeed Corp. (The)

3. Halcyon 97262, USG Interiors Inc."

2. DELETE AND REPLACE Paragraph 2.10 as follows:

"2.10 Lay-in Gypsum Ceiling Panels (AP-25)

A. Products:

1. Sheetrock Brand, 3260, Lay-in Gypsum Ceiling, USG Interiors Inc.

2. Equal by Armstrong, CertainTeed, National Gypsum, or Georgia-Pacific

B. Color: White

C. CAC: Not less than 35.

D. Edge Detail: Square

E. Thickness: ½"

F. Size: As indicated on Drawings

G. Suspension System: Provide suspension system that complies with requirements in Part 2 "Non-Fire-Resistance-Rated, Direct-Hung Suspension Systems", Article for wide-face, capped, double-web, steel suspension system."

C. **Section 096623 "RESINOUS MATRIX TERRAZZO FLOORING"**

1. ADD Subparagraph 2.1, A., 4. as follows:

"4. Victory Surfaces"

D. **Section 098413 "FIXED SOUND-ABSORPTIVE PANELS"**

1. ADD subparagraph 2.3 D. 9. as follows:
"9. Equal: Kinetics High Impact Hardside (note: must be tackable)"

2.3 DIVISION 10 – SPECIALTIES

A. **Section 102123 "CUBICLE CURTAINS AND TRACK"**

1. DELETE AND REPLACE Subparagraph 2.2,A., 10. as follows:

"10. Construction Specialties C/S Group"

B. **Section 102123 "CUBICLE CURTAINS AND TRACK"**

1. DELETE AND REPLACE Subparagraph 2.1,A., 3. as follows:

"3. Construction Specialties C/S Group"

2.4 DIVISION 11 – EQUIPMENT

A. **Section 116623 "GYMNASIUM EQUIPMENT"**

1. DELETE Paragraph 2.3 and associated subparagraphs in its entirety.

2.5 DIVISION 12 – FURNISHINGS

A. **Section 120080.99 "EQUIPMENT"**

1. Add Sub Paragraph 2.1, A., 2. As Follows:

"2. Uline, Wide Span Storage Racks"

B. **Section 123553 "LABORATORY CASEWORK"**

1. Add Sub Paragraph 2.3, C., 5. As Follows:

"5. Lee Company Inc."

C. **Section 126600 "TELESCOPING STANDS"**

1. DELETE AND REPLACE Subparagraph 2.4 A. 3. with the following:
   "3. Number of Tiers: 11"

2. DELETE AND REPLACE Subparagraph 2.4 A. 8. with the following:
   "8. Overall Unit Height: 12'-1" V.I.F."

3. DELETE AND REPLACE Subparagraph 2.4 B. 3. with the following:
   "3. Number of Tiers: 11"

4. DELETE AND REPLACE Subparagraph 2.4 B. 8. with the following:
   "8. Overall Unit Height: 12'-1" V.I.F."

2.6 DIVISION 22 – PLUMBING

A. **Section 226719 "REVERSE OSMOSIS SYSTEM EQUIPMENT"**

1. ADD Document in its entirety.

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

A. Section 230900.99 "**DIRECT DIGITAL CONTROL SYSTEMS**"

1. DELETE AND REPLACE Article 4.1 per the attached.

"ARTICLE 4.1 INCLUDES 2 PAGES OF 8.5X11 ADDENDUM 5.3 DESCRIPTIONS WITH SHEET REFERENCES AND 466 PAGES OF 11X17 TEMPERATURE CONTROL SERVICES (TCS) DRAWINGS DATED 04/20/2023 UNDER TCS JOB NUMBER J-2304001 THAT INCLUDES UPDATED INSTALLATION STANDARDS, RISER DIAGRAMS, AND TEMPERATURE CONTROL SCHEMATICS INCLUDING POINTS AND WIRING DIAGRAM DETAILS THAT SHALL BE INSTALLED BY THE CONTROLS INSTALLATION CONTRACTOR (CIC) AS PERFORMED BY THE MECHANICAL, TECHNOLOGY, AND ELECTRICAL CONTRACTORS AND INDICATED ON THE M-701.3 TO M731.3 DRAWINGS."

B. **Section 233433 "AIR CURTAINS"**

1. ADD Section in its entirety.

C. **Section 238239.16 "PROPELLER UNIT HEATERS"**

1. ADD Subparagraph 2.1,A,12 as follows:

   "12. VTS Group"

PART 3 - CHANGES TO THE DRAWINGS

Modifications described herein shall be incorporated in the Drawings. All other Work shall remain un-changed.

3.1 DRAWING SHEETS: ADDITIONS, DELETIONS AND REPLACEMENTS

DRAWING NO.	INDICATE ACTION: ADD (A), DELETE (D), DELETE & REPLACE (R),
C-SERIES DRAWINGS	
CL103.3	DELETE AND REPLACE
CL504.3	ADD
CG103.3	DELETE AND REPLACE
CU101.3	DELETE AND REPLACE
S-SERIES DRAWINGS	
S-017.3	ADD
S-501.3	DELETE AND REPLACE
A-SERIES DRAWINGS	
A-003.3	DELETE AND REPLACE
AF1E2.3	DELETE AND REPLACE
AF1Q1.3	DELETE AND REPLACE
AF1Q2.3	DELETE AND REPLACE
AF1R1.3	DELETE AND REPLACE
AF1T1.3	DELETE AND REPLACE
AC1E2.3	DELETE AND REPLACE
A-405.3	DELETE AND REPLACE
A-415.3	DELETE AND REPLACE
A-510.3	DELETE AND REPLACE
A-511.3	DELETE AND REPLACE
I-SERIES DRAWINGS	
IN1H2.3	DELETE AND REPLACE
IN1K2.3	DELETE AND REPLACE
IN1K1.3	DELETE AND REPLACE
IN1C2.3	DELETE AND REPLACE
M-SERIES DRAWINGS	
MH1E2.3	DELETE AND REPLACE
MP1A1.3	DELETE AND REPLACE
MP1C1.3	DELETE AND REPLACE
MP1D1.3	DELETE AND REPLACE
MP1F1.3	DELETE AND REPLACE
MP1H1.3	DELETE AND REPLACE
MP1J1.3	DELETE AND REPLACE
MP1J2.3	DELETE AND REPLACE
MP1Q1.3	DELETE AND REPLACE
MP1S1.3	DELETE AND REPLACE
MR101.3	DELETE AND REPLACE
M-602.3	DELETE AND REPLACE
M-603.3	DELETE AND REPLACE
M-604.3	DELETE AND REPLACE
M-607.3	DELETE AND REPLACE
M-727.3	DELETE AND REPLACE
M-729.3	DELETE AND REPLACE
P-SERIES DRAWINGS	

PF1A0.3	DELETE AND REPLACE
PF1B0.3	DELETE AND REPLACE
PF1B1.3	DELETE AND REPLACE
PF1D1.3	DELETE AND REPLACE
PF1E1.3	DELETE AND REPLACE
PF1F0.3	DELETE AND REPLACE
PF1F1.3	DELETE AND REPLACE
PF1H0.3	DELETE AND REPLACE
PF1H1.3	DELETE AND REPLACE
PF1N1.3	DELETE AND REPLACE
PF1P1.3	DELETE AND REPLACE
PF1Q0.3	DELETE AND REPLACE
PF1Q1.3	DELETE AND REPLACE
PF1R1.3	DELETE AND REPLACE
PF1S1.3	DELETE AND REPLACE
PF1AA1.3	DELETE AND REPLACE
PR102.3	DELETE AND REPLACE
P-501.3	DELETE AND REPLACE
P-602.3	DELETE AND REPLACE
E-SERIES DRAWINGS	
ES101.3	DELETE AND REPLACE
ED1J2.3	DELETE AND REPLACE
ED1N2.3	DELETE AND REPLACE
ED1S2.3	DELETE AND REPLACE
ED100.3	DELETE AND REPLACE
ED101.3	DELETE AND REPLACE
ED102.3	DELETE AND REPLACE
EL1E2.3	DELETE AND REPLACE
EP1BC1.3	DELETE AND REPLACE
EP1D1.3	DELETE AND REPLACE
EP1D2.3	DELETE AND REPLACE
EP1E1.3	DELETE AND REPLACE
EP1E2.3	DELETE AND REPLACE
EP1H1.3	DELETE AND REPLACE
EP1Q2.3	DELETE AND REPLACE
EP1R1.3	DELETE AND REPLACE
EP105.3	DELETE AND REPLACE
EF1J2.3	DELETE AND REPLACE
EF1K2.3	DELETE AND REPLACE
EF1L2.3	DELETE AND REPLACE
EF1N2.3	DELETE AND REPLACE
EF1S2.3	DELETE AND REPLACE
EF1T2.3	DELETE AND REPLACE
EF1AA2.3	DELETE AND REPLACE
EF100.3	DELETE AND REPLACE
EF101.3	DELETE AND REPLACE
E-623.3	DELETE AND REPLACE
E-635.3	DELETE AND REPLACE

E-639.3 DELETE AND REPLACE

3.2 G-SERIES DRAWINGS

A. **Sheet Numbers G-101.3 and G-102.3**

1. ADD the following note to the CODE SUMMARY in the “FIRE BARRIER:” description cell: “Provide 078413 – Penetration Firestopping at all new and existing Fire Barriers where applicable.”

3.3 S-SERIES DRAWINGS

A. **Drawing Number SF1L1.3**

1. ADD Note in its entirety.

   “SOG04P with T/Slab +0’-0””

B. **Drawing Number SF1K1.3**

1. MODIFY Note “1” in its entirety.

   “FLOWABLE FILL 2000PSI MIN BELOW SLAB FOR INFILL. FLOWABLE FILL WILL FILL THE SPACE BETWEEN THE EXISTING TOP OF SLAB AND BOTTOM OF NEW SLAB. DEPTH OF VOID IS APPROXIMATELY 1'-0" PER EXISTING DRAWINGS. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.”

C. **Drawing Number S-513.3**

1. MODIFY Note in its entirety.
   “115 PCF LIGHTWEIGHT PRECAST OR CIP BENCH”

3.4 A-SERIES DRAWINGS

A. **Sheet A-001.3**

1. ADD General Plan Note N. as follows:
   “N. Provide Abuse-resistant GWB in classrooms and sensory rooms on new stud walls to 4’-0” A.F.F.”

B. **Sheet Number AD1A2.3**

1. DELETE Demolition Floor Plan Note 3 indicated with the following text:
   “CLASSROOM FINISH ALT.”

C. **Sheet Number AD1B2.3**

1. DELETE Demolition Floor Plan Note 3 indicated with the following text:
   “CLASSROOM FINISH ALT.”

D. **Sheet Number AD1D2.3**

1. DELETE Demolition Floor Plan Note 3 indicated with the following text: "CLASSROOM FINISH ALT."

E. **Sheet Number AD1H2.3**

1. DELETE Demolition Floor Plan Note 46 from the following rooms: "M206"
2. ADD Demolition Floor Plan Note 36 to the following rooms: "M206"

F. **Sheet Number AD1N1.3**

1. DELETE Demolition Floor Plan Note 46 from the following rooms: "H120"

G. **Sheet Number AD1N2.3**

1. DELETE Demolition Floor Plan Note 3 indicated with the following text: "CLASSROOM FINISH ALT."
2. DELETE Demolition Floor Plan Note 46 from the following rooms: "H240"

H. **Sheet Number AD1P2.3**

1. DELETE Demolition Floor Plan Note 3 indicated with the following text: "CLASSROOM FINISH ALT."

I. **AC Series Sheets**

1. DELETE and REPLACE Reflected Ceiling Plan Note #33 with the following "33. 095113 - 4" VERTICAL ALUMINUM TRIM."
2. ADD the following to the Reflected Ceiling Plan Notes: "57. 095113 - 6" HORIZONTAL ALUMINUM TRIM."

J. **Sheet Number AC1A2.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms: "D2C1."

K. **Sheet Number AC1B2.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms: "C000, B2C0, J000"

L. **Sheet Number AC1C1.3**

1. DELETE and REPLACE all instances of Reflected Ceiling Plan Note #33 with Reflected Ceiling Plan Note #57.

M. **Sheet Number AC1C2.3**

1. ADD Reflected Ceiling Plan Note 30 to the following rooms:
   "C211, C213, D216, D218, K208, K210."

N. **Sheet Number AC1D1.3**

1. ADD Reflected Ceiling Plan Note 30 to the following rooms:

   "A106, A110, A112, A112A, A114"

O. **Sheet Number AC1D2.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:
   "A2C0, B2C0, J000"

P. **Sheet Number AC1H1.3**

1. ADD Reflected Ceiling Plan Note 30 to the following rooms:

   "L105, L107, M103, M105, M106, M107, M108, M109, M111"

Q. **Sheet Number AC1H2.3**

1. ADD Reflected Ceiling Plan Note 30 to the following rooms:

   "L207, L211, M205, M206, M207, M209, M210, M211, M213"

R. **Sheet Number AC1J2.3**

1. ADD Reflected Ceiling Plan Note 30 to the following rooms:

   "D219, D221"

S. **Sheet Number AC1K1.3**

1. ADD Reflected Ceiling Plan Note 30 to the following rooms:

   "L115, L115A, L117"

T. **Sheet Number AC1N1.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:

   "H120"

U. **Sheet Number AC1N2.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:

   "H240"

V. **Sheet Number AC1P2.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:

   "H000, H616A, H608A"

W. **Sheet Number AC1Q1.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:
   "H000, H240,"
2. ADD Reflected Ceiling Plan Note 51 to the following rooms:

   "N115, N118, N120, N120A, N120B, N121, N122, N122A, N122B, N124, N125, N125A, N126"

X. **Sheet Number AC1Q2.3**

1. DELETE Reflected Ceiling Plan Note 51 from the following rooms:
   "N230"
2. DELETE Reflected Ceiling Plan Note 30 from the following rooms:
   "N2C0"

Y. **Sheet Number AC1R1.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:
   "N1C1."
2. ADD Reflected Ceiling Plan Note 51 to the following rooms:

   "N111, N111A, N112, N113, N116."

Z. **Sheet Number AC1R2.3**

1. DELETE Reflected Ceiling Plan Note 30 from the following rooms:
   "N2C0"

AA. **A-200 Series Sheets**

1. DELETE and REPLACE Elevation Note #34 with the following:
   "088000 - TYPE 1 GRAPHIC FILM ADHERED TO FACE OF STRUCTURED POLYCARBONATE PANEL"
2. DELETE and REPLACE Elevation Note #8 with the following:
   "092713 - GFRC PILASTER- REF A-500 SERIES DWGS FOR PROFILE AND DETAILS"

BB. **Sheet Numbers A-421.3 to A-429.3**

1. DELETE AND REPLACE the depth for AP-25 In the Acoustical Panel Schedule from "5/8"" to "1/2"".

CC. **Sheet Number A-512.3**

1. DELETE and REPLACE Detail Note "03 49 00 – GFRC COLUMN" with the following:
   "09 27 00 – GFRC COLUMN"

DD. **Sheet Number A-515.3**

1. DELETE and REPLACE Detail Note "03 49 00 – GFRC COLUMN" with the following:
   "09 27 00 – GFRC COLUMN"

3.5 TSERIES DRAWINGS

A. **Drawing Number**

1. **Sheet TD102.3** - **FIRST FLOOR OVERALL DEMOLITION PLAN**
   a. Replace Sheet Note #3 with “EXISTING IDF 24 LOCATION”.
   b. Replace Sheet Note #4 with “EXISTING IDF 25 LOCATION”.
2. **Sheet TF102.3 - FIRST FLOOR OVERALL DISTRIBUTION PLAN**
   a. Replace Sheet Note #2 with “IDF 24 (G114D) LOCATION.”
   b. Replace Sheet Note #3 with “IDF 25 (G111L) LOCATION.”
3. **Sheet TD1M1.3 - FIRST FLOOR DEMOLITION PLAN - UNIT M**
   a. Added one (1) existing security camera to remain in place and be recabled with category 6A.
4. **Sheet TD1M2.3 - SECOND FLOOR DEMOLITION PLAN - UNIT M**
   a. Added one (1) existing security camera to be uninstalled and placed in inventory for re-installation.
5. **Sheet TF2K2.3 - SECOND FLOOR TELECOM PLAN - UNIT K**
   a. Added one (1) new dual sensor security camera in stairwell.
6. **Sheet TF2M1.3 - FIRST FLOOR TELECOM PLAN - UNIT M**
   a. Added one (1) new dual sensor security camera in corridor.
   b. Added one (1) new multi-sensor security camera in corridor.
   c. Added one (1) reinstalled existing multi-sensor security camera in corridor.
7. **Sheet TF2M2.3 - SECOND FLOOR TELECOM PLAN - UNIT M**
   a. Added one (1) new dual sensor security camera in corridor.
   b. Added three (3) new dual sensor security cameras in stairwells.
   c. Added one (1) new multi-sensor security camera in corridor.
8. **Sheet TF2S1.3 - FIRST FLOOR TELECOM PLAN - UNIT S**
   a. Deleted two (2) new single sensor security cameras.
   b. Added one (1) new dual sensor security camera in corridor.
9. **Sheet TF2T1.3 - FIRST FLOOR TELECOM PLAN - UNIT T**
   a. Added one (1) new multi-sensor security camera in corridor.
10. **Sheet TF2T2.3 - SECOND FLOOR TELECOM PLAN - UNIT T**
    a. Added one (1) new dual sensor security camera in stairwell.
11. **Sheet TF2V1.3 - FIRST FLOOR TELECOM PLAN - UNIT V**
    a. Deleted one (1) new exterior multi-sensor security camera.
    b. Added two (2) reinstalled existing exterior single sensor security cameras.
12. **Sheet TF2B2.3 - SECOND FLOOR TELECOM PLAN - UNIT B**

a. Added one (1) new dual sensor security camera in stairwell.

13. Sheet T301.3 - TECHNOLOGY DIAGRAMS

a. Updated Detail #1 NEW TELECOM RISER CABLING DIAGRAM IDF numbers as follows:
   i. "IDF 9 (G114D)" changed to "IDF 24 (G114D)"
   ii. "IDF 9 (G111L)" changed to "IDF 25 (G111L)"

14. Sheet T302.3 - TECHNOLOGY DIAGRAMS

a. Updated Detail #2 GROUND RISER DETAIL IDF numbers as follows:
   i. "IDF 9 (G114D)" changed to "IDF 24 (G114D)"
   ii. "IDF 9 (G111L)" changed to "IDF 25 (G111L)"

15. Sheet T303.3 - TECHNOLOGY DIAGRAMS

a. Updated Detail #1 TELECOM RISER DISTRIBUTION DIAGRAM IDF numbers as follows:
   i. "IDF 9 (G114D)" changed to "IDF 24 (G114D)"
   ii. "IDF 9 (G111L)" changed to "IDF 25 (G111L)"

16. Sheet T313.3 - AV DIAGRAMS

a. Updated Detail #1 PAGING DIAGRAM IDF numbers as follows:
   i. "IDF 9 (G114D)" changed to "IDF 24 (G114D)"
   ii. "IDF 9 (G111L)" changed to "IDF 25 (G111L)"

17. Sheet T336.3 - ENLARGED TR LAYOUTS / ELEVATIONS

a. Updated Details #1 and #2 to reflect updated position of existing in-row cooling units and existing paging system racks.

18. Sheet T338.3 - ENLARGED TR LAYOUTS / ELEVATIONS

a. Replace Detail #1 IDF number with "IDF 24 (G114D)"
b. Replace Detail #2 IDF number with "IDF 24 (G114D)"
c. Replace Detail #3 IDF number with "IDF 24 (G114D)"
d. Replace Detail #4 IDF number with "IDF 24 (G114D)"
e. Replace Detail #5 IDF number with "IDF 25 (G111L)".
f. Replace Detail #6 IDF number with "IDF 25 (G111L)".

19. Sheet T320.3 – SECURITY DIAGRAMS

a. Updated Detail #5 – Intrusion Detection System Functional Diagram to show location of Fire Alarm Panel within room Fire D117D.

20. Sheet T502.3 - TELECOM SCHEDULES

a. Removed duplicate IDF 12 (N110) Telecom Schedule.
b. Added previously missing IDF 13 (C200) Telecom Schedule containing 143 data drops. Schedule is below for reference:

IDF 13 (C200) TELECOM SCHEDULE				
ROOM NUMBER	TELECOM ROOM	TOTAL DATA	LABEL	COMMENTS
B203	C200	1	13-A-01	WIRELESS ACCESS POINT - CEILING MOUNTED
B203	C200	1	13-A-02	CLOCK LOCATION - SURFACE MOUNTED
B203	C200	1	13-A-03	WALL PHONE LOCATION - SURFACE MOUNTED
B203	C200	1	13-A-04	DATA VOICE LOCATION - SURFACE MOUNTED
B205	C200	1	13-A-05	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
B205	C200	1	13-A-06	CLOCK LOCATION - SURFACE MOUNTED
B205	C200	1	13-A-07	WALL PHONE LOCATION - SURFACE MOUNTED
B205	C200	1	13-A-08	DATA VOICE LOCATION - SURFACE MOUNTED
B207	C200	1	13-A-09	WIRELESS ACCESS POINT - CEILING MOUNTED
B207	C200	1	13-A-10	CLOCK LOCATION - SURFACE MOUNTED
B207	C200	1	13-A-11	WALL PHONE LOCATION - SURFACE MOUNTED
B207	C200	1	13-A-12	DATA VOICE LOCATION - SURFACE MOUNTED
B209	C200	1	13-A-13	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
B209	C200	1	13-A-14	CLOCK LOCATION - SURFACE MOUNTED
B209	C200	1	13-A-15	WALL PHONE LOCATION - SURFACE MOUNTED
B209	C200	1	13-A-16	DATA VOICE LOCATION - SURFACE MOUNTED
C000	C200	1	13-A-17	DUAL SIDED CLOCK LOCATION
C000	C200	1	13-A-18	DUAL SIDED CLOCK LOCATION
C000	C200	1	13-A-19	SECURITY CAMERA - RECABLED EXISTING DUAL SENSOR
C201	C200	1	13-A-21	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
C201	C200	1	13-A-22	CLOCK LOCATION - SURFACE MOUNTED
C206	C200	1	13-A-24	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
C206	C200	1	13-A-25	CLOCK LOCATION - SURFACE MOUNTED
C206	C200	1	13-A-26	WALL PHONE LOCATION - SURFACE MOUNTED
C206	C200	1	13-A-27	DATA VOICE LOCATION - SURFACE MOUNTED
C207	C200	1	13-A-28	WALL PHONE LOCATION - FLUSH MOUNTED
C207	C200	1	13-A-29	WIRELESS ACCESS POINT - CEILING MOUNTED
C207	C200	1	13-A-30	CLOCK LOCATION - SURFACE MOUNTED
C207	C200	1	13-A-31	DATA VOICE LOCATION - FLUSH MOUNTED
C208	C200	1	13-A-32	WIRELESS ACCESS POINT - CEILING MOUNTED
C208	C200	1	13-A-33	CLOCK LOCATION - SURFACE MOUNTED
C208	C200	1	13-A-34	WALL PHONE LOCATION - SURFACE MOUNTED
C208	C200	1	13-A-35	DATA VOICE LOCATION - SURFACE MOUNTED
C209	C200	1	13-A-36	WALL PHONE LOCATION - FLUSH MOUNTED
C209	C200	1	13-A-37	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
C209	C200	1	13-A-38	CLOCK LOCATION - SURFACE MOUNTED
C209	C200	1	13-A-39	DATA VOICE LOCATION - FLUSH MOUNTED
C210	C200	1	13-A-40	WIRELESS ACCESS POINT - CEILING MOUNTED
C210	C200	1	13-A-41	CLOCK LOCATION - SURFACE MOUNTED
C210	C200	1	13-A-42	WALL PHONE LOCATION - SURFACE MOUNTED
C210	C200	1	13-A-43	DATA VOICE LOCATION - SURFACE MOUNTED
C211	C200	1	13-A-44	WIRELESS ACCESS POINT - CEILING MOUNTED
C211	C200	1	13-A-45	CLOCK LOCATION - SURFACE MOUNTED
C211	C200	1	13-A-46	WALL PHONE LOCATION - SURFACE MOUNTED
C211	C200	1	13-A-47	DATA VOICE LOCATION - SURFACE MOUNTED
C212	C200	1	13-A-48	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
C212	C200	1	13-B-01	CLOCK LOCATION - SURFACE MOUNTED
C212	C200	1	13-B-02	WALL PHONE LOCATION - SURFACE MOUNTED
C212	C200	1	13-B-03	DATA VOICE LOCATION - SURFACE MOUNTED
C213	C200	1	13-B-04	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
C213	C200	1	13-B-05	CLOCK LOCATION - SURFACE MOUNTED
C213	C200	2	13-B-06/07	DATA VOICE LOCATION - SURFACE MOUNTED
C213	C200	1	13-B-08	MONITOR LOCATION - SURFACE MOUNTED
J214	C200	1	13-B-09	CLOCK LOCATION - SURFACE MOUNTED
J214	C200	1	13-B-10	WALL PHONE LOCATION - SURFACE MOUNTED
J214	C200	1	13-B-11	DATA VOICE LOCATION - SURFACE MOUNTED
J216	C200	1	13-B-12	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
D210	C200	1	13-B-13	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
D210	C200	1	13-B-14	CLOCK LOCATION - SURFACE MOUNTED
D210	C200	1	13-B-15	WALL PHONE LOCATION - FLUSH MOUNTED
D210	C200	1	13-B-16	DATA VOICE LOCATION - FLUSH MOUNTED
D212	C200	1	13-B-19	WIRELESS ACCESS POINT - CEILING MOUNTED
D212	C200	1	13-B-20	CLOCK LOCATION - SURFACE MOUNTED
D214	C200	1	13-B-21	DATA VOICE LOCATION - SURFACE MOUNTED
D214	C200	1	13-B-22	WALL PHONE LOCATION - SURFACE MOUNTED
D214	C200	1	13-B-23	WIRELESS ACCESS POINT - CEILING MOUNTED
D214	C200	1	13-B-24	CLOCK LOCATION - SURFACE MOUNTED
J000	C200	1	13-B-25	DUAL SIDED CLOCK LOCATION
J000	C200	1	13-B-26	SECURITY CAMERA - NEW SINGLE SENSOR
J205	C200	1	13-B-27	WALL PHONE LOCATION - SURFACE MOUNTED
J205	C200	1	13-B-28	WIRELESS ACCESS POINT - CEILING MOUNTED
J205	C200	1	13-B-29	CLOCK LOCATION - SURFACE MOUNTED
J205	C200	1	13-B-30	DATA VOICE LOCATION - SURFACE MOUNTED
J206	C200	1	13-B-31	WALL PHONE LOCATION - SURFACE MOUNTED
J206	C200	1	13-B-32	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
J206	C200	1	13-B-33	CLOCK LOCATION - SURFACE MOUNTED
J206	C200	1	13-B-34	DATA VOICE LOCATION - SURFACE MOUNTED
J207	C200	1	13-B-35	WIRELESS ACCESS POINT - CEILING MOUNTED
J207	C200	1	13-B-36	CLOCK LOCATION - SURFACE MOUNTED
J207	C200	1	13-B-37	WALL PHONE LOCATION - SURFACE MOUNTED
J207	C200	1	13-B-38	DATA VOICE LOCATION - SURFACE MOUNTED
J208	C200	1	13-B-39	WIRELESS ACCESS POINT - CEILING MOUNTED - RELOCATED EXISTING
J208	C200	1	13-B-40	CLOCK LOCATION - SURFACE MOUNTED
J208	C200	1	13-B-41	WALL PHONE LOCATION - FLUSH MOUNTED
J208	C200	1	13-B-42	DATA VOICE LOCATION - FLUSH MOUNTED
J209	C200	1	13-B-43	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
J209	C200	1	13-B-44	CLOCK LOCATION - SURFACE MOUNTED
J209	C200	1	13-B-45	WALL PHONE LOCATION - SURFACE MOUNTED
J209	C200	1	13-B-46	DATA VOICE LOCATION - SURFACE MOUNTED
J211	C200	1	13-B-47	WIRELESS ACCESS POINT - CEILING MOUNTED
J211	C200	1	13-B-48	CLOCK LOCATION - SURFACE MOUNTED
J211	C200	1	13-C-01	DATA VOICE LOCATION - SURFACE MOUNTED
J211	C200	1	13-C-02	WALL PHONE LOCATION - SURFACE MOUNTED
J214	C200	1	13-C-03	WIRELESS ACCESS POINT - CEILING MOUNTED
J216	C200	1	13-C-08	CLOCK LOCATION - SURFACE MOUNTED
J216	C200	1	13-C-09	WALL PHONE LOCATION - SURFACE MOUNTED
J216	C200	1	13-C-10	DATA VOICE LOCATION - SURFACE MOUNTED
J217	C200	1	13-C-11	WIRELESS ACCESS POINT - CEILING MOUNTED
J210	C200	1	13-C-12	WALL PHONE LOCATION - FLUSH MOUNTED
J210	C200	1	13-C-13	DATA VOICE LOCATION - FLUSH MOUNTED
J217	C200	1	13-C-14	CLOCK LOCATION - SURFACE MOUNTED
J218	C200	1	13-C-15	WIRELESS ACCESS POINT - CEILING MOUNTED
J218	C200	1	13-C-16	CLOCK LOCATION - SURFACE MOUNTED
J218	C200	1	13-C-17	WALL PHONE LOCATION - SURFACE MOUNTED
J218	C200	1	13-C-18	DATA VOICE LOCATION - SURFACE MOUNTED
K200	C200	1	13-C-19	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
K200	C200	2	13-C-20/21	DATA VOICE LOCATION - SURFACE MOUNTED
D212	C200	1	13-C-22	WALL PHONE LOCATION - FLUSH MOUNTED
K200	C200	2	13-C-22/23	DATA VOICE LOCATION - SURFACE MOUNTED
D212	C200	1	13-C-23	DATA VOICE LOCATION - FLUSH MOUNTED
K200	C200	2	13-C-24/25	DATA VOICE LOCATION - SURFACE MOUNTED
K200	C200	2	13-C-26/27	DATA VOICE LOCATION - SURFACE MOUNTED
K200	C200	2	13-C-28/29	DATA VOICE LOCATION - SURFACE MOUNTED
K200	C200	2	13-C-30/31	DATA VOICE LOCATION - SURFACE MOUNTED
K200	C200	1	13-C-32	CLOCK LOCATION - SURFACE MOUNTED
K202	C200	1	13-C-33	WIRELESS ACCESS POINT - CEILING MOUNTED
K202	C200	1	13-C-34	CLOCK LOCATION - SURFACE MOUNTED
K202	C200	1	13-C-35	WALL PHONE LOCATION - SURFACE MOUNTED
K202	C200	1	13-C-36	DATA VOICE LOCATION - SURFACE MOUNTED
K204	C200	1	13-C-37	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
K204	C200	1	13-C-38	CLOCK LOCATION - SURFACE MOUNTED
K204	C200	1	13-C-39	WALL PHONE LOCATION - SURFACE MOUNTED
K204	C200	1	13-C-40	DATA VOICE LOCATION - SURFACE MOUNTED
K206	C200	1	13-C-41	WIRELESS ACCESS POINT - CEILING MOUNTED
K206	C200	1	13-C-42	CLOCK LOCATION - SURFACE MOUNTED
K206	C200	1	13-C-43	WALL PHONE LOCATION - SURFACE MOUNTED
K206	C200	1	13-C-44	DATA VOICE LOCATION - SURFACE MOUNTED
K208	C200	1	13-C-45	CLOCK LOCATION - SURFACE MOUNTED
K208	C200	2	13-C-46/47	DATA VOICE LOCATION - SURFACE MOUNTED
K208	C200	1	13-C-48	MONITOR LOCATION - SURFACE MOUNTED
K210	C200	1	13-D-01	WALL PHONE LOCATION - SURFACE MOUNTED
K210	C200	1	13-D-02	WIRELESS ACCESS POINT - CEILING MOUNTED - EXISTING
K210	C200	1	13-D-03	CLOCK LOCATION - SURFACE MOUNTED
K210	C200	1	13-D-04	DATA VOICE LOCATION - SURFACE MOUNTED
A000	C200	1	13-D-05	SECURITY CAMERA - REINSTALLED EXISTING DUAL SENSOR
Grand total		143		

12. Sheet T503.3 - TELECOM SCHEDULES

a. Updated “IDF 9 (G114D) TELECOM SCHEDULE” to be “IDF 24 (G114D) TELECOM SCHEDULE” and changed Device Labels within schedule to replace “09” with “24”.

b. Updated “IDF 9 (G111L) TELECOM SCHEDULE” to be “IDF 25 (G111L) TELECOM SCHEDULE” and changed Device Labels within schedule to replace “09” with “25”.

13. Sheet T506.3 - ACCESS CONTROL SCHEDULES

a. Updated “IDF 9 (G114D) ACCESS CONTROL SCHEDULE” to be “IDF 24 (G114D) ACCESS CONTROL SCHEDULE”

b. Updated “IDF 9 (G111L) ACCESS CONTROL SCHEDULE” to be “IDF 25 (G111L) ACCESS CONTROL SCHEDULE”

END OF ADDENDUM 5

SECTION 226719 – REVERSE OSMOSIS SYSTEM EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide complete packaged reverse osmosis (RO) water treatment system producing high purity water by removal of dissolved minerals, bacteria, particles and organic impurities. Designed for continuous automatic operation.

1.2 RELATED WORK

A. Section 220500, Common Work Results for Plumbing

B. Section 260500, Requirements for Electrical Installation.

1.3 SUBMITTALS

A. Submittals shall be submitted for review, and include:
   1. Catalog cuts, complete description and specifications of all equipment and accessories.
   2. Accessories including filters, product storage tank, pressure gauges and test kit.
   3. Performance data including normal and maximum flow and pressure drop. Certification that required performance shall be achieved.
   4. Piping.

B. Complete detailed layout, setting, arrangement, and installation drawings. Show all parts of the apparatus including relative positions, dimensions, and sizes and general arrangement of connecting piping.

1.4 QUALITY ASSURANCE

A. Manufacturer shall have been engaged in the manufacture of RO systems as a primary product for at least 10 years. The 10-year requirement supersedes any conflicting requirement in other parts of the project specification.

PART 2 - PRODUCTS

2.1 RO SYSTEM

A. Packaged automatic RO system designed for project conditions. Equipment arranged on the frame to allow easy access for operation, maintenance and repair. Unit shall include dechlorinator tank and controller, RO membrane, pressure vessels, and pre-filtration system.

B. Performance Requirement:

1. Membrane reject ratio: 60 percent minimum. TDS of product is 10 percent maximum of input TDS.
2. Capture rate: 55 percent minimum. Maximum amount of water to drain is 25 percent of input.

C. Automatic Valves:

1. Automatic Inlet Shut Off Valve.

2.2 DECHLORINATOR

A. Water pre-treatment:

1. Dechlorinators; Components, features, and functions shall include:
2. Granular, activated-carbon filter, 12 x 40 mesh, coconut based, compliant with ANSI B604
3. Electronic control valve(s) with integrated bypass valve (1” models)
4. One resin tank
5. Support gravel
6. One set of internal distribution
7. Drain line flow control based on the size of the resin tank
8. Solid-state microprocessor with front panel display
9. Micro-switch kit

B. Skid mounting: Water pretreatment shall include the following:

1. Frame: Frame shall be steel, primed and finished with powder-coat epoxy paint. Frame shall be equipped for and support loads imposed during rigging and operation. Frame shall house resin tanks, support piping, and electrical box.
2. System Components: System shall be placed on the frame and secured with straps.
3. Piping: The resin tanks on the skid shall be plumbed at the manufacturer allowing for one connection, made in the field, for inlet, outlet, and drain.
4. Electrical: Frame shall have a mounted electrical box for one point of connection to the power supply. The internal wiring shall be done by the manufacturer.
5. Support Legs: Frame shall come with thread able feet to allow for field leveling.

2.3 PRE-FILTER

A. Single multi-media filter sized for the RO machine inlet flow rate. Filter designed for suspended solids removal down to 10 microns.

2.4 REVERSE OSMOSIS SYSTEM

A. Frame: Frame shall be steel, primed and finished with powder-coat epoxy paint. Frame shall be equipped for and support loads imposed during rigging and operation. Frame shall house RO pump and system control components described below.

B. RO system sizing: RO system shall be rated for flow at 50°F inlet water temperature.

C. RO Membrane Sliding Rack: RO system shall have sliding rack(s) for easy membrane removal

D. RO components: RO water treatment system components shall be prewired and sized to full load capacity. Components, features, and functions shall include:

E. Multistage pump with all-stainless-steel body and acetyl wetted parts

F. Totally-enclosed fan-cooled (TEFC) high-efficiency motor

G. RO membrane(s): Extra low energy thin-film composite (TFC), high-efficiency, high-flow filtering membrane(s)

H. RO Pressure Vessel(s): Stainless steel with clamp style (U-pin not acceptable)

I. Feed water temperature gauge

J. Automatic inlet feed solenoid valve, brass construction

K. Permeate flow meter, panel mounted

L. Concentrate flow meter, panel mounted

M. Recycle flow meter, panel mounted

N. Concentrate to drain control valve

O. Stainless steel pump throttling valve

P. Recycle control valve

Q. Low pressure pump protection

R. Pressure transmitter for filter inlet, filter outlet, tank pressure; 316L SS material

S. Liquid filled pressure gauges for filter in/out and system pressures, panel mounted, SS construction
   1. Product TDS displayed on controller

T. System on-off with remote pressure kit

U. Microprocessor controller with LED keypad display

V. Water supply solenoid valve, brass body

W. Water inlet low-pressure detection

X. Stainless-steel pressure transmitter

Y. Stainless-steel pressure gauges for RO water pressure, water tank pressure, and water inlet pressure

Z. Tank-mounted pressure safety valve

AA. Brass body pressure regulator

BB. 5-micron filtering unit with purge and cut-off valve

CC. Automatic membrane fast flush on startup capability

DD. Automatic membrane flush based on inactivity capability

EE. Pressurized RO holding tank or atmospheric storage tank with level sensor

2.5 RO WATER STORAGE TANK

A. Refer to Plumbing Equipment Schedule for capacity.

B. FRP pressurized storage tank: Manufacturer shall provide FRP storage tank with rubber bladder. The tank shall have one water connection and an air Schrader valve to fill the bladder side with compressed air.

C. Carbon steel pressurized storage tank: Manufacturer shall provide painted carbon steel storage tank with rubber bladder. The tank shall have one water connection and an air Schrader valve to fill the bladder side with compressed air.

D. Atmospheric storage tank: Manufacturer shall provide a low density polyethylene storage tank. The tank shall have the following features:

1. The tank shall have a connection for inlet, vent/overflow, outlet/drain, level sensor, and lid.
2. The tank shall be mounted to a steel, primed and finished with powder-coat epoxy paint. Frame shall be equipped for and support loads imposed during rigging and operation. Frame shall house forwarding pump, tank and accessories.
3. The system shall include a transfer forwarding pump with the following capabilities:

    a. Dry run protection
    b. Over voltage and under voltage protection
    c. Built in pressure sensor and smart control for pressure setpoint

4. The system shall include an ultraviolet disinfection module with a dosage rate of 30 mJ/cm2 at 3.5 GPM.
5. The tank shall come equipped with a float style level switch.
6. System shall be pre-plumbed and pre-wired to ease installation. The connection points that will need to be connected to include: inlet (RO permeate), outlet, drain, overflow, and one power drop. The plumbing shall be schedule 80 PVC.

2.6 WATER RECLAIM SYSTEM:

A. Atmospheric storage tank: Manufacturer shall provide a low density polyethylene storage tank. The tank shall have the following features:

1. The tank shall have a connection for inlet, vent/overflow, outlet/drain, level sensor, and lid.

B. The tank shall be mounted to a steel, primed and finished with powder-coat epoxy paint. Frame shall be equipped for and support loads imposed during rigging and operation. Frame shall house forwarding pump, tank and accessories.

C. The system shall include a transfer forwarding pump with the following capabilities:

1. Dry run protection
2. Over voltage and under voltage protection
3. Built in pressure sensor and smart control for pressure setpoint

D. The system shall include an ultraviolet disinfection module with a dosage rate of 30 mJ/cm2 at 3.5 GPM.

E. The tank shall come equipped with a float style level switch.

F. System shall be pre-plumbed and pre-wired to ease installation. The connection points that will need to be connected to include: inlet (humidifier drain pan captured water), outlet (sent to the inlet of the RO system for reprocessing), drain, overflow, and one power drop. The plumbing shall be schedule 80 PVC.

G. The system shall include a microprocessor controller that receives the level switch and activates the use of 2 solenoid valves provided. This controller will utilize the reclaim water when present instead of fresh makeup water to supply the RO station.

H. The two solenoid valves will be made of {insert material} and be actuated with 24 VAC from the controller. These valves will be supplied loose for field installation.

I. Condensate pumps shall be supplied loose according to the schedule. The features of each pump shall include:

1. Dual voltage motor, 1/2HP, 230V/115V, single phase
2. Performance of 40 gpm @36’ TDH
3. Dimensions of 12” L x 12” W x 19” H
4. Inlet size of 1.5” NPT, female
5. Outlet size of 1” NPT, female

2.7 CONTROLLER

A. Interoperable with any BACnet®, Lontalk®, and Modbus® network

B. USB port on the control board for software updates, data backups, and data restoration

C. Up-time optimizer function to keep ROs operating through conditions such as fill, drain, or run-time faults, as long as safety conditions are met, minimizing production down-time

D. Real-time clock to allow time-stamped alarm/message tracking, and scheduled events

E. Factory commissioning of control board, including system configuration as-ordered

F. Keypad/display operable within a temperature range of 32 to 158 F (0 to 70 C), and that provides backlighting for viewing in low light

G. Alarms, unit configuration, and usage timer values shall remain in nonvolatile memory indefinitely during a power outage.

H. The capability to monitor, control, and/or adjust the following parameters:

1. System alarms and system messages, current and previous
2. Adjustable water flush duration and frequency
3. Programmable outputs for remote signaling of alarms and/or messages
4. System diagnostics that include:

    a. Test outputs function to verify component operation
    b. Test RO function, by simulating demand to validate performance
    c. Data collection of TDS, inlet pressure, post filter pressure, storage tank pressure, water pump hours, alarms, and service messages for viewing from the keypad/display or Web interface

5. Password-protected system parameters
6. Keypad/display or Web interface displays in English languages
7. Numerical units displayed in inch-pound or SI units

PART 3 - EXECUTION

3.1 GENERAL

A. Install RO system in compliance with manufacturer’s written installation instructions.

3.2 LABELING AND IDENTIFICATION

A. Label and identify equipment.

END OF SECTION 226719

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North Central H.S., Phase 3 Bid Package, Addendum 5.3 – BAS Print Revision Index:

18 April, 2023

1. UPDATE SYSTEM CONTROL PANEL LOCATION AND ADDRESS INFORMATION BLOCKS:
    a. RISER-05 THROUGH RISER-20

2. UPDATE BILL OF MATERIAL REFERENCES TO INDICATE BOM WILL BE PROVIDED IN A FUTURE REVISION.
    a. RISER-05 THROUGH RISER-20
    b. NCHS-XX (AS REQUIRED, MULTIPLE LOCATIONS)

3. UPDATE NOTE 3 ON RISER DIAGRAMS TO CHANGE “VFD” TO “VAV”.
    a. RISER-05 THROUGH RISER-20

4. UPDATE RISER TABLES.
    a. RISER-05, AHU-A2, REMOVE EF-A12 VFD.

5. RENAME AREA AA1 TO AREA AA.
    a. RISER-19

6. REMOVE REFERENCES TO INTAKE HOODS, INCLUDING DAMPER OUTPUT AND BUILDING STATIC PRESSURE MONITORING.
    a. NCHS-100, 101, 105, 106, 139, 141, 146, 147, 149, 150, 154, 155, 166, 170, 179, 180, 195, 196, 201, 202, 204, 205, 210, 211, 226, 227, 232, 233, 251, 252, 257, 258
    b. SCH-27, 28, 40

7. UPDATE POWER METER FIELD DEVICE HEADERS.
    a. NCHS-140, 169, 434, 461, 499

8. BUILDING PRESSURIZATION CONTROLS UPDATE.
    a. NCHS-139, 141, 146, 147, 182, 185, 192, 193, 195, 196, 201, 202, 213, 215, 220, 221, 235, 236, 240, 241, 251, 252, 257, 258, 269, 270, 275, 276, 277, 278, 282, 283, 285, 286, 291, 292, 294, 295, 300, 301, 303, 304, 308, 309, 318, 319, 324, 325, 358, 359, 363, 364, 373, 374, 378, 379, 393, 394, 399, 400, 411, 412, 420, 421, 423, 425, 430, 431, 433, 435, 440, 441, 461, 462, 467, 468

9. REMOVE 3-WAY VALVE REFERENCE FOR CONVECTOR CONTROL VALVES.
    a. NCHS-167

10. UPDATE CABINET UNIT HEATER SYMBOL TO INCLUDE HOT WATER VALVE.
    a. NCHS-168, 214

11. UPDATE PROPELLER UNIT HEATER SYMBOL TO INCLUDE HOT WATER VALVE.

a. NCHS-168, 195, 213, 260, 285, 318, 326, 358, 383, 424, 433, 500

12. REMOVE REFERENCES TO BASEMENT LEAK DETECTION.
    a. NCHS-226, 227, 235, 236, 243, 244, 251, 252, 260, 261, 269, 270, 277, 278, 285, 286, 294, 295, 303, 304

13. UPDATE EXHAUST FAN SYMBOL TO SHOW A FAN DISCONNECT -VS.- A VFD. NO CHANGES TO POINT TABLES OR COUNTS REQUIRED.
    a. NCHS-260, 294, 310, 348, 373, 381, 382, 393, 410, 411, 423, 433

14. REVISE NOTES ASSOCIATED WITH VAV POWER PANEL SCHEDULE.
    a. NCHS-492

15. ADD FUME HOOD SCHEDULE.
    a. NCHS-497

16. FINALIZE VAV DETAIL SHEETS TO SHOW FINAL WIRING TERMINATIONS AND POINT TABLES.
    a. NCHS-474 THROUGH NCHS-480

17. ADD SCHEDULE NAME TO RADIANT PANEL SCHEDULE.
    a. SCH-34

18. ADD VALVE CONFIGURATION COLUMN TO HYDRONIC PROPELLER UNIT HEATER SCHEDULE.
    a. SCH-41

MSD Washington Township
North Central High School - Phase 3

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
TITLE-03	Title Page - Phase 3 (1 of 4)	3	New	Design Review DR.0
TITLE-04	Title Page - Phase 3 (2 of 4)	3	New	Design Review DR.0
TITLE-05	Title Page - Phase 3 (3 of 4)	3	New	Design Review DR.0
TITLE-06	Title Page - Phase 3 (4 of 4)	3	New	Design Review DR.0
GEN-01	Installation Standards - Legend	All	New	Design Review DR.0
GEN-02	Installation Standards - Electrical	All	New	Design Review DR.0
GEN-03	Installation Standards - Network	All	New	Design Review DR.0
GEN-04	Installation Standards - Mechanical	All	New	Design Review DR.0
RISER-05	BAS Ethernet & RS-485 Network Risers, Phase 3, Areas A & B	3	New	Design Review DR.0
RISER-06	BAS Ethernet & RS-485 Network Risers, Phase 3, Area C	3	New	Design Review DR.0
RISER-07	BAS Ethernet & RS-485 Network Risers, Phase 3, Area D	3	New	Design Review DR.0
RISER-08	BAS Ethernet & RS-485 Network Risers, Phase 3, Area E	3	New	Design Review DR.0
RISER-09	BAS Ethernet & RS-485 Network Risers, Phase 3, Areas F & G	3	New	Design Review DR.0
RISER-10	BAS Ethernet & RS-485 Network Risers, Phase 3, Area H	3	New	Design Review DR.0
RISER-11	BAS Ethernet & RS-485 Network Risers, Phase 3, Area J	3	New	Design Review DR.0
RISER-12	BAS Ethernet & RS-485 Network Risers, Phase 3, Area K	3	New	Design Review DR.0
RISER-13	BAS Ethernet & RS-485 Network Risers, Phase 3, Area M	3	New	Design Review DR.0
RISER-14	BAS Ethernet & RS-485 Network Risers, Phase 3, Area N	3	New	Design Review DR.0
RISER-15	BAS Ethernet & RS-485 Network Risers, Phase 3, Area P	3	New	Design Review DR.0
RISER-16	BAS Ethernet & RS-485 Network Risers, Phase 3, Area Q	3	New	Design Review DR.0
RISER-17	BAS Ethernet & RS-485 Network Risers, Phase 3, Area R	3	New	Design Review DR.0
RISER-18	BAS Ethernet & RS-485 Network Risers, Phase 3, Areas S & T	3	New	Design Review DR.0
RISER-19	BAS Ethernet & RS-485 Network Risers, Phase 3, Area AA1	3	New	Design Review DR.0
RISER-20	BAS Ethernet & RS-485 Network Risers, Phase 3, Area Natatorium	3	New	Design Review DR.0
NCHS-99	AHU-A2 Field Devices	3	New	Design Review DR.0
NCHS-100	Area A Exhaust & Relief Field Devices	3	New	Design Review DR.0
NCHS-101	AHU-A2 & Area A Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-102	AHU-A2 Sequences of Operation	3	New	Design Review DR.0
NCHS-103	AHU-A2 System 15 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-104	AHU-A2 System 15 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-105	AHU-A2 System 15 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-106	AHU-A2 System 15 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-107	AHU-C1 Field Devices	3	New	Design Review DR.0
NCHS-108	Area C Exhaust Field Devices	3	New	Design Review DR.0
NCHS-109	AHU-C1 & Area C Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-110	AHU-C1 Sequences of Operation	3	New	Design Review DR.0
NCHS-111	AHU-C1 System 16 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-112	AHU-C1 System 16 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-113	AHU-C1 System 16 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-114	AHU-C1 System 16 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-115	AHU-C2 Field Devices	3	New	Design Review DR.0
NCHS-116	Area C Exhaust Field Devices	3	New	Design Review DR.0
NCHS-117	AHU-C2 & Area C Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-118	AHU-C2 Sequences of Operation	3	New	Design Review DR.0
NCHS-119	AHU-C2 System 17 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-120	AHU-C2 System 17 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-121	AHU-C2 System 17 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-122	AHU-C2 System 17 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-123	AHU-C3 Field Devices	3	New	Design Review DR.0
NCHS-124	AHU-C3 Point Tables	3	New	Design Review DR.0
NCHS-125	AHU-C3 Sequences of Operation	3	New	Design Review DR.0
NCHS-126	AHU-C3 System 18 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-127	AHU-C3 System 18 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-128	AHU-C3 System 18 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-129	AHU-C3 System 18 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-130	AHU-C5 Field Devices	3	New	Design Review DR.0
NCHS-131	AHU-C5 Exhaust, Relief, & Temp Monitoring Field Devices	3	New	Design Review DR.0
NCHS-132	AHU-C5 & Area C Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-133	AHU-C5 Sequences of Operation	3	New	Design Review DR.0

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-134	AHU-C5 System 19 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-135	AHU-C5 System 19 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-136	AHU-C5 System 19 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-137	AHU-C5 System 19 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-138	AHU-J1 Field Devices	3	New	Design Review DR.0
NCHS-139	Area J Exhaust & Relief Field Devices	3	New	Design Review DR.0
NCHS-140	Area J Lighting & Phase Loss Monitoring Field Devices	3	New	Design Review DR.0
NCHS-141	AHU-J1 & Area J Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-142	AHU-J1 Sequences of Operation	3	New	Design Review DR.0
NCHS-143	AHU-J1 System 20 Panel - I/O Wiring (1 of 3)	3	New	Design Review DR.0
NCHS-144	AHU-J1 System 20 Panel - I/O Wiring (2 of 3)	3	New	Design Review DR.0
NCHS-145	AHU-J1 System 20 Panel - I/O Wiring (3 of 3)	3	New	Design Review DR.0
NCHS-146	AHU-J1 System 20 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-147	AHU-J1 System 20 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-148	AHU-J2 Field Devices	3	New	Design Review DR.0
NCHS-149	Area J Relief Field Devices	3	New	Design Review DR.0
NCHS-150	AHU-J2 & Area J Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-151	AHU-J2 Sequences of Operation	3	New	Design Review DR.0
NCHS-152	AHU-J2 System 21 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-153	AHU-J2 System 21 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-154	AHU-J2 System 21 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-155	AHU-J2 System 21 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-156	AHU-J3 & Relief Field Devices	3	New	Design Review DR.0
NCHS-157	AHU-J3 Touchscreen, Photocell, & Area J Relief Field Devices	3	New	Design Review DR.0
NCHS-158	AHU-J3 & Area J Misc Devices Point Tables	3	New	Design Review DR.0
NCHS-159	AHU-J3 Sequences of Operation	3	New	Design Review DR.0
NCHS-160	AHU-J3 System 22 Panel - I/O Wiring (1 of 2)	3	New	Design Review DR.0
NCHS-161	AHU-J3 System 22 Panel - I/O Wiring (2 of 2)	3	New	Design Review DR.0
NCHS-162	AHU-J3 System 22 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-163	AHU-J3 System 22 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-164	AHU-K6 Field Devices	3	New	Design Review DR.0
NCHS-165	Area K Exhaust Field Devices (1 of 2)	3	New	Design Review DR.0
NCHS-166	Area K Exhaust, Relief, & Temp Monitoring Field Devices (2 of 2)	3	New	Design Review DR.0
NCHS-167	Area K Radiant Panel & Convector Field Devices	3	New	Design Review DR.0
NCHS-168	Area K Cabinet & Propeller Unit Heater Field Devices	3	New	Design Review DR.0
NCHS-169	Area K Lighting & Phase Loss Monitoring Field Devices	3	New	Design Review DR.0
NCHS-170	AHU-K6 & Area K Misc Field Devices Point Tables	3	New	Design Review DR.0
NCHS-171	AHU-K6 Sequences of Operation	3	New	Design Review DR.0
NCHS-172	AHU-K6 System 23 Panel - I/O Wiring (1 of 5)	3	New	Design Review DR.0
NCHS-173	AHU-K6 System 23 Panel - I/O Wiring (2 of 5)	3	New	Design Review DR.0
NCHS-174	AHU-K6 System 23 Panel - I/O Wiring (3 of 5)	3	New	Design Review DR.0
NCHS-175	AHU-K6 System 23 Panel - I/O Wiring (4 of 5)	3	New	Design Review DR.0
NCHS-176	AHU-K6 System 23 Panel - I/O Wiring (5 of 5)	3	New	Design Review DR.0
NCHS-177	AHU-K6 System 23 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-178	AHU-K6 System 23 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-179	AHU-K6 Companion Panel - Power Wiring	3	New	Design Review DR.0
NCHS-180	AHU-K6 Companion Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-181	AHU-M1 Field Devices	3	New	Design Review DR.0
NCHS-182	Area M Exhaust, Relief, & Radiant Panel Field Devices (1 of 3)	3	New	Design Review DR.0
NCHS-183	Area M Radiant Panel Field Devices (2 of 3)	3	New	Design Review DR.0
NCHS-184	Area M Radiant Panel Field Devices (3 of 3)	3	New	Design Review DR.0
NCHS-185	AHU-M1 & Area M Misc Field Devices Point Tables	3	New	Design Review DR.0
NCHS-186	AHU-M1 Sequences of Operation	3	New	Design Review DR.0
NCHS-187	AHU-M1 System 24 Panel - I/O Wiring (1 of 3)	3	New	Design Review DR.0
NCHS-188	AHU-M1 System 24 Panel - I/O Wiring (2 of 3)	3	New	Design Review DR.0
NCHS-189	AHU-M1 System 24 Panel - I/O Wiring (3 of 3)	3	New	Design Review DR.0
NCHS-190	AHU-M1 System 24 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-191	AHU-M1 System 24 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-192	AHU-M1 Companion Panel - Power Wiring	3	New	Design Review DR.0

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
TITLE-03
JOB NUMBER:
J-2304001

MSD Washington Township
North Central High School - Phase 3

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-193	AHU-M1 Companion Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-194	AHU-M2 Field Devices	3	New	Design Review DR.0
NCHS-195	Area M Relief & Propeller Unit Heater Field Devices	3	New	Design Review DR.0
NCHS-196	AHU-M2 & Area M Misc Field Devices Point Tables	3	New	Design Review DR.0
NCHS-197	AHU-M2 Sequences of Operation	3	New	Design Review DR.0
NCHS-198	AHU-M2 System 25 Panel - I/O Wiring (1 of 3)	3	New	Design Review DR.0
NCHS-199	AHU-M2 System 25 Panel - I/O Wiring (2 of 3)	3	New	Design Review DR.0
NCHS-200	AHU-M2 System 25 Panel - I/O Wiring (3 of 3)	3	New	Design Review DR.0
NCHS-201	AHU-M2 System 25 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-202	AHU-M2 System 25 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-203	AHU-AA1 Field Devices	3	New	Design Review DR.0
NCHS-204	Area AA Exhaust, Relief, & Propeller Unit Heater Field Devices	3	New	Design Review DR.0
NCHS-205	AHU-AA1 & Area AA Misc Field Devices Point Tables	3	New	Design Review DR.0
NCHS-206	AHU-AA1 Sequences of Operation	3	New	Design Review DR.0
NCHS-207	AHU-AA1 System 26 Panel - I/O Wiring (1 of 3)	3	New	Design Review DR.0
NCHS-208	AHU-AA1 System 26 Panel - I/O Wiring (2 of 3)	3	New	Design Review DR.0
NCHS-209	AHU-AA1 System 26 Panel - I/O Wiring (2 of 3)	3	New	Design Review DR.0
NCHS-210	AHU-AA1 System 26 Panel - Power & Network Wiring	3	New	Design Review DR.0
NCHS-211	AHU-AA1 System 26 Panel - Dimensions & BOM	3	New	Design Review DR.0
NCHS-212	AHU-A1 Field Devices	3	Existing	Design Review DR.0
NCHS-213	Area A1 Exhaust, Prop Unit Heater, & IDF Temp Monitoring Field Devices	3	Existing	Design Review DR.0
NCHS-214	Area A1 Cabinet Unit Heater Field Devices	3	Existing	Design Review DR.0
NCHS-215	AHU-A1 & Area 1 Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-216	AHU-A1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-217	AHU-A1 System 27 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-218	AHU-A1 System 27 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-219	AHU-A1 System 27 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-220	AHU-A1 System 27 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-221	AHU-A1 System 27 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-222	[PAGE NUMBER NOT USED]	3	Existing	Design Review DR.0
NCHS-223	[PAGE NUMBER NOT USED]	3	Existing	Design Review DR.0
NCHS-224	AHU-B1 Field Devices	3	Existing	Design Review DR.0
NCHS-225	Area B Exhaust Field Devices	3	Existing	Design Review DR.0
NCHS-226	Area B Relief & Leak Detection Field Devices	3	Existing	Design Review DR.0
NCHS-227	AHU-B1 & Area B Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-228	AHU-B1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-229	AHU-B1 System 28 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-230	AHU-B1 System 28 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-231	AHU-B1 System 28 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-232	AHU-B1 System 28 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-233	AHU-B1 System 28 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-234	AHU-C4 Field Devices	3	Existing	Design Review DR.0
NCHS-235	Area C Relief Air & Leak Detection Field Devices	3	Existing	Design Review DR.0
NCHS-236	AHU-C4 & Area C Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-237	AHU-C4 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-238	AHU-C4 System 29 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-239	AHU-C4 System 29 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-240	AHU-C4 System 29 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-241	AHU-C4 System 29 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-242	AHU-D1 Field Devices	3	Existing	Design Review DR.0
NCHS-243	Area D Exhaust, Relief, & Leak Detection Field Devices	3	Existing	Design Review DR.0
NCHS-244	AHU-D1 & Area D Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-245	AHU-D1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-246	AHU-D1 System 30 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-247	AHU-D1 System 30 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-248	AHU-D1 System 30 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-249	AHU-D1 System 30 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-250	AHU-D2 Field Devices	3	Existing	Design Review DR.0
NCHS-251	Area D Relief Air & Leak Detection Field Devices	3	Existing	Design Review DR.0

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-252	AHU-D2 & Area D Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-253	AHU-D2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-254	AHU-D2 System 31 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-255	AHU-D2 System 31 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-256	AHU-D2 System 31 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-257	AHU-D2 System 31 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-258	AHU-D2 System 31 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-259	AHU-E1 Field Devices	3	Existing	Design Review DR.0
NCHS-260	Area E Exhaust Air & Temp Monitoring Field Devices	3	Existing	Design Review DR.0
NCHS-261	AHU-E1 & Area E Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-262	AHU-E1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-263	AHU-E1 System 32 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-264	AHU-E1 System 32 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-265	AHU-E1 System 32 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-266	AHU-E1 System 32 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-267	AHU-E1 System 32 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-268	AHU-E2 Field Devices	3	Existing	Design Review DR.0
NCHS-269	AHU-E2 Relief Air & Temp Monitoring Field Devices	3	Existing	Design Review DR.0
NCHS-270	AHU-E2 Point Tables	3	Existing	Design Review DR.0
NCHS-271	AHU-E2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-272	AHU-E2 System 33 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-273	AHU-E2 System 33 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-274	AHU-E2 System 33 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-275	AHU-E2 System 33 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-276	AHU-E2 System 33 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-277	AHU-E3 Field Devices	3	Existing	Design Review DR.0
NCHS-278	AHU-E3 Point Tables	3	Existing	Design Review DR.0
NCHS-279	AHU-E3 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-280	AHU-E3 System 34 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-281	AHU-E3 System 34 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-282	AHU-E3 System 34 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-283	AHU-E3 System 34 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-284	AHU-F1 Field Devices	3	Existing	Design Review DR.0
NCHS-285	Area F Relief Air, Lighting, & Temp Monitoring Field Devices	3	Existing	Design Review DR.0
NCHS-286	AHU-F1 & Area F Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-287	AHU-F1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-288	AHU-F1 System 35 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-289	AHU-F1 System 35 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-290	AHU-F1 System 35 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-291	AHU-F1 System 35 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-292	AHU-F1 System 35 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-293	AHU-H1 Field Devices	3	Existing	Design Review DR.0
NCHS-294	Area H Exhaust, Relief, & Leak Detection Field Devices	3	Existing	Design Review DR.0
NCHS-295	AHU-H1 & Area H Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-296	AHU-H1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-297	AHU-H1 System 36 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-298	AHU-H1 System 36 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-299	AHU-H1 System 36 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-300	AHU-H1 System 36 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-301	AHU-H1 System 36 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-302	AHU-H2 Field Devices	3	Existing	Design Review DR.0
NCHS-303	Area H Relief & Leak Detection Field Devices	3	Existing	Design Review DR.0
NCHS-304	AHU-H2 & Area H Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-305	AHU-H2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-306	AHU-H2 System 37 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-307	AHU-H2 System 37 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-308	AHU-H2 System 37 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-309	AHU-H2 System 37 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-310	AHU-K1 & Area K Exhaust Field Devices	3	Existing	Design Review DR.0

Delta Controls

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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
TITLE-04
JOB NUMBER:
J-2304001

MSD Washington Township
North Central High School - Phase 3

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-311	AHU-K1 & Area K Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-312	AHU-K1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-313	AHU-K1 System 38 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-314	AHU-K1 System 38 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-315	AHU-K1 System 38 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-316	AHU-K1 System 38 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-317	AHU-K2 Field Devices	3	Existing	Design Review DR.0
NCHS-318	Area K Relief & PUH Field Devices	3	Existing	Design Review DR.0
NCHS-319	AHU-K2 & Area K Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-320	AHU-K2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-321	AHU-K2 System 39 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-322	AHU-K2 System 39 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-323	AHU-K2 System 39 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-324	AHU-K2 System 39 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-325	AHU-K2 System 39 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-326	AHU-K3 & PUH Field Devices	3	Existing	Design Review DR.0
NCHS-327	AHU-K3 & Area K Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-328	AHU-K3 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-329	AHU-K3 System 40 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-330	AHU-K3 System 40 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-331	AHU-K3 System 40 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-332	AHU-K3 System 40 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-333	AHU-K4 Field Devices	3	Existing	Design Review DR.0
NCHS-334	AHU-K4 Point Tables	3	Existing	Design Review DR.0
NCHS-335	AHU-K4 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-336	AHU-K4 System 41 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-337	AHU-K4 System 41 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-338	AHU-K4 System 41 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-339	AHU-K4 System 41 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-340	AHU-K5 Field Devices	3	Existing	Design Review DR.0
NCHS-341	AHU-K5 Point Tables	3	Existing	Design Review DR.0
NCHS-342	AHU-K5 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-343	AHU-K5 System 42 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-344	AHU-K5 System 42 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-345	AHU-K5 System 42 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-346	AHU-K5 System 42 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-347	AHU-N1 Field Devices	3	Existing	Design Review DR.0
NCHS-348	AHU-N1 Exhaust & Lighting Field Devices	3	Existing	Design Review DR.0
NCHS-349	Area N East Building EOL Pressure Control & Lighting Field Devices	3	Existing	Design Review DR.0
NCHS-350	AHU-N1 & Area N Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-351	AHU-N1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-352	AHU-N1 System 43 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-353	AHU-N1 System 43 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-354	AHU-N1 System 43 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-355	AHU-N1 System 43 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-356	AHU-N1 System 43 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-357	AHU-N2 Field Devices	3	Existing	Design Review DR.0
NCHS-358	Area N Relief & PUH Field Devices	3	Existing	Design Review DR.0
NCHS-359	AHU-N2 & Area N Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-360	AHU-N2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-361	AHU-N2 System 44 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-362	AHU-N2 System 44 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-363	AHU-N2 System 44 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-364	AHU-N2 System 44 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-365	AHU-P1 & Area P Lighting Field Devices	3	Existing	Design Review DR.0
NCHS-366	AHU-P1 & Area A Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-367	AHU-P1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-368	AHU-P1 System 45 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-369	AHU-P1 System 45 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-370	AHU-P1 System 45 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-371	AHU-P1 System 45 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-372	AHU-P2 Field Devices	3	Existing	Design Review DR.0
NCHS-373	Area P Exhaust & Relief Field Devices	3	Existing	Design Review DR.0
NCHS-374	AHU-P2 & Area P Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-375	AHU-P2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-376	AHU-P2 System 46 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-377	AHU-P2 System 46 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-378	AHU-P2 System 46 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-379	AHU-P2 System 46 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-380	AHU-Q1 Field Devices	3	Existing	Design Review DR.0
NCHS-381	Area Q Exhaust Field Devices (1 of 2)	3	Existing	Design Review DR.0
NCHS-382	Area Q Exhaust Fans & Lighting Field Devices (2 of 2)	3	Existing	Design Review DR.0
NCHS-383	Area Q West Building EOL Pressure Control & PUH Field Devices	3	Existing	Design Review DR.0
NCHS-384	AHU-Q1 & Area Q Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-385	AHU-Q1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-386	AHU-Q1 System 47 Panel - I/O Wiring (1 of 4)	3	Existing	Design Review DR.0
NCHS-387	AHU-Q1 System 47 Panel - I/O Wiring (2 of 4)	3	Existing	Design Review DR.0
NCHS-388	AHU-Q1 System 47 Panel - I/O Wiring (3 of 4)	3	Existing	Design Review DR.0
NCHS-389	AHU-Q1 System 47 Panel - I/O Wiring (4 of 4)	3	Existing	Design Review DR.0
NCHS-390	AHU-Q1 System 47 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-391	AHU-Q1 System 47 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-392	AHU-Q2 Field Devices	3	Existing	Design Review DR.0
NCHS-393	Area Q Exhaust & Relief Field Devices	3	Existing	Design Review DR.0
NCHS-394	AHU-Q2 & Area Q Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-395	AHU-Q2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-396	AHU-Q2 System 48 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-397	AHU-Q2 System 48 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-398	AHU-Q2 System 48 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-399	AHU-Q2 System 48 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-400	AHU-Q2 System 48 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-401	AHU-R1 Field Devices	3	Existing	Design Review DR.0
NCHS-402	Area R Lighting Field Devices	3	Existing	Design Review DR.0
NCHS-403	AHU-R1 & Area R Lighting Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-404	AHU-R1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-405	AHU-R1 System 49 Panel - I/O Wiring (1 of 2)	3	Existing	Design Review DR.0
NCHS-406	AHU-R1 System 49 Panel - I/O Wiring (2 of 2)	3	Existing	Design Review DR.0
NCHS-407	AHU-R1 System 49 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-408	AHU-R1 System 49 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-409	AHU-R2 Field Devices	3	Existing	Design Review DR.0
NCHS-410	AHU-R2 Exhaust Field Devices (1 of 2)	3	Existing	Design Review DR.0
NCHS-411	AHU-R2 Exhaust & Relief Field Devices (2 of 2)	3	Existing	Design Review DR.0
NCHS-412	AHU-R2 & Area R Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-413	AHU-R2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-414	AHU-R2 System 50 Panel - I/O Wiring (1 of 4)	3	Existing	Design Review DR.0
NCHS-415	AHU-R2 System 50 Panel - I/O Wiring (2 of 4)	3	Existing	Design Review DR.0
NCHS-416	AHU-R2 System 50 Panel - I/O Wiring (3 of 4)	3	Existing	Design Review DR.0
NCHS-417	AHU-R2 System 50 Panel - I/O Wiring (4 of 4)	3	Existing	Design Review DR.0
NCHS-418	AHU-R2 System 50 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-419	AHU-R2 System 50 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-420	AHU-R2 Companion Panel - Power Wiring	3	Existing	Design Review DR.0
NCHS-421	AHU-R2 Companion Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-422	AHU-S1 Field Devices	3	Existing	Design Review DR.0
NCHS-423	Area S Exhaust & Relief Field Devices	3	Existing	Design Review DR.0
NCHS-424	Area S Lighting & PUH Field Devices	3	Existing	Design Review DR.0
NCHS-425	AHU-S1 & Area S Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-426	AHU-S1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-427	AHU-S1 System 51 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-428	AHU-S1 System 51 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0

Delta Controls

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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
TITLE-05
JOB NUMBER:
J-2304001

MSD Washington Township
North Central High School - Phase 3

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-429	AHU-S1 System 51 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-430	AHU-S1 System 51 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-431	AHU-S1 System 51 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-432	AHU-T1 Field Devices	3	Existing	Design Review DR.0
NCHS-433	Area T Exhaust, Relief, & PUH Field Devices	3	Existing	Design Review DR.0
NCHS-434	Area T JELCC EOL Pressure Control & Phase Loss Monitoring Field Devices	3	Existing	Design Review DR.0
NCHS-435	AHU-T1 & Area T Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-436	AHU-T1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-437	AHU-T1 System 52 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-438	AHU-T1 System 52 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-439	AHU-T1 System 52 Panel - I/O Wiring (3 of 3)	3	Existing	Design Review DR.0
NCHS-440	AHU-T1 System 52 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-441	AHU-T1 System 52 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-442	NAT AHU-1 Field Devices	3	Existing	Design Review DR.0
NCHS-443	NAT-AHU-1 Misc Field Devices	3	Existing	Design Review DR.0
NCHS-444	NAT-AHU-1 & Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-445	NAT-AHU-1 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-446	NAT-AHU-1 System 53 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-447	NAT-AHU-1 System 53 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-448	NAT-AHU-1 System 53 Panel - I/O Wiring (2 of 3)			
NCHS-449	NAT-AHU-1 System 53 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-450	NAT-AHU-1 System 53 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-451	NAT AHU-2 Field Devices	3	Existing	Design Review DR.0
NCHS-452	NAT-AHU-2 Misc Field Devices	3	Existing	Design Review DR.0
NCHS-453	NAT-AHU-2 Point Tables	3	Existing	Design Review DR.0
NCHS-454	NAT-AHU-2 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-455	NAT-AHU-2 System 54 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-456	NAT-AHU-2 System 54 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-457	NAT-AHU-2 System 54 Panel - I/O Wiring (3 of 3)			
NCHS-458	NAT-AHU-2 System 54 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-459	NAT-AHU-2 System 54 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-460	NAT AHU-3 Field Devices	3	Existing	Design Review DR.0
NCHS-461	Area Natatorium Phase Loss Monitoring Field Devices			
NCHS-462	NAT-AHU-3 & Natatorium Misc Field Devices Point Tables	3	Existing	Design Review DR.0
NCHS-463	NAT-AHU-3 Sequences of Operation	3	Existing	Design Review DR.0
NCHS-464	NAT-AHU-3 System 55 Panel - I/O Wiring (1 of 3)	3	Existing	Design Review DR.0
NCHS-465	NAT-AHU-3 System 55 Panel - I/O Wiring (2 of 3)	3	Existing	Design Review DR.0
NCHS-466	NAT-AHU-3 System 55 Panel - I/O Wiring (3 of 3)			
NCHS-467	NAT-AHU-3 System 55 Panel - Power & Network Wiring	3	Existing	Design Review DR.0
NCHS-468	NAT-AHU-3 System 55 Panel - Dimensions & BOM	3	Existing	Design Review DR.0
NCHS-469	Fan Coil Unit (FCU) Field Devices	3	New	Design Review DR.0
NCHS-470	FCU Point Tables & Sequence of Operation	3	New	Design Review DR.0
NCHS-471	FCU - I/O Wiring	3	New	Design Review DR.0
NCHS-472	FCU - Power & Network Wiring	3	New	Design Review DR.0
NCHS-473	FCU - Dimensions & BOM	3	New	Design Review DR.0
NCHS-474	VAV Detail 'A' Field Devices & Controls	3	New	Design Review DR.0
NCHS-475	VAV Detail 'B' Field Devices & Controls	3	New	Design Review DR.0
NCHS-476	VAV Detail 'C' Field Devices & Controls	3	New	Design Review DR.0
NCHS-477	VAV Detail 'D' Field Devices & Controls	3	Existing	Design Review DR.0
NCHS-478	VAV Detail 'E' Field Devices & Controls	3	Existing	Design Review DR.0
NCHS-479	VAV Detail 'F' Field Devices & Controls	3	Existing	Design Review DR.0
NCHS-480	VAV Detail 'G' Field Devices & Controls	3	Existing	Design Review DR.0
NCHS-481	VAV Schedule (1 of 10)	3	New	Design Review DR.0
NCHS-482	VAV Schedule (2 of 10)	3	New	Design Review DR.0
NCHS-483	VAV Schedule (3 of 10)	3	New	Design Review DR.0
NCHS-484	VAV Schedule (4 of 10)	3	New	Design Review DR.0
NCHS-485	VAV Schedule (5 of 10)	3	New	Design Review DR.0
NCHS-486	VAV Schedule (6 of 10)	3	New	Design Review DR.0
NCHS-487	VAV Schedule (7 of 10)	3	New	Design Review DR.0

Drawing Number:	Title:	Phase	New / Revised Work	Current Revision:
NCHS-488	VAV Schedule (8 of 10)	3	New	Design Review DR.0
NCHS-489	VAV Schedule (9 of 10)	3	New	Design Review DR.0
NCHS-490	VAV Schedule (10 of 10)	3	New	Design Review DR.0
NCHS-491	VAV Sequences of Operation	3	New	Design Review DR.0
NCHS-492	VAV Power Panel Schedule	3	New	Design Review DR.0
NCHS-493	EF - Standalone with Toggle Switch Controls	3	New	Design Review DR.0
NCHS-494	EF - Standalone with Thermostat Controls (1 of 3)	3	New	Design Review DR.0
NCHS-495	EF - Standalone with Thermostat Controls (2 of 3)	3	New	Design Review DR.0
NCHS-496	EF - Standalone with Thermostat Controls (3 of 3)	3	New	Design Review DR.0
NCHS-497	Standalone Lab Hood Controls - Areas Q & R	3	New	Design Review DR.0
NCHS-498	HVLS Fans & Space Humidifiers Field Devices & Controls	3	New	Design Review DR.0
NCHS-499	Phase Loss Monitoring - Transportation Bldg Field Devices	3	New	Design Review DR.0
NCHS-500	AHU-G1 PUH Field Devices	3	New	Design Review DR.0
NCHS-501	AHU-G4 Panel Device Adds Under Phase 3 Project	3	New	Design Review DR.0
NCHS-502	Misc Requirements & Sequences of Operation for Phase 3 Equipment	3	New	Design Review DR.0
SCH-11	Valve Schedule - Phase 3 (1 of 16)	3	New	Design Review DR.0
SCH-12	Valve Schedule - Phase 3 (2 of 16)	3	New	Design Review DR.0
SCH-13	Valve Schedule - Phase 3 (3 of 16)	3	New	Design Review DR.0
SCH-14	Valve Schedule - Phase 3 (4 of 16)	3	New	Design Review DR.0
SCH-15	Valve Schedule - Phase 3 (5 of 16)	3	New	Design Review DR.0
SCH-16	Valve Schedule - Phase 3 (6 of 16)	3	New	Design Review DR.0
SCH-17	Valve Schedule - Phase 3 (7 of 16)	3	New	Design Review DR.0
SCH-18	Valve Schedule - Phase 3 (8 of 16)	3	New	Design Review DR.0
SCH-19	Valve Schedule - Phase 3 (9 of 16)	3	New	Design Review DR.0
SCH-20	Valve Schedule - Phase 3 (10 of 16)	3	New	Design Review DR.0
SCH-21	Valve Schedule - Phase 3 (11 of 16)	3	New	Design Review DR.0
SCH-22	Valve Schedule - Phase 3 (12 of 16)	3	New	Design Review DR.0
SCH-23	Valve Schedule - Phase 3 (13 of 16)	3	New	Design Review DR.0
SCH-24	Valve Schedule - Phase 3 (14 of 16)	3	New	Design Review DR.0
SCH-25	Valve Schedule - Phase 3 (15 of 16)	3	New	Design Review DR.0
SCH-26	Valve Schedule - Phase 3 (16 of 16)	3	New	Design Review DR.0
SCH-27	Damper Schedule - Phase 3 (1 of 5)	3	New	Design Review DR.0
SCH-28	Damper Schedule - Phase 3 (2 of 5)	3	New	Design Review DR.0
SCH-29	Damper Schedule - Phase 3 (3 of 5)	3	New	Design Review DR.0
SCH-30	Damper Schedule - Phase 3 (4 of 5)	3	New	Design Review DR.0
SCH-31	Damper Schedule - Phase 3 (5 of 5)	3	New	Design Review DR.0
SCH-32	Air Handling Unit Schedule - Phase 3 (New and Existing)	3	New	Design Review DR.0
SCH-33	Convector, Pump, & Split System Schedules - Phase 3	3	New	Design Review DR.0
SCH-34	VFD & Radiant Panel Schedules - Phase 3	3	New	Design Review DR.0
SCH-35	Air Flow Measuring Station Schedule - Phase 3	3	New	Design Review DR.0
SCH-36	Exhaust Fan Schedule - Phase 3 (1 of 4)	3	New	Design Review DR.0
SCH-37	Exhaust Fan Schedule - Phase 3 (2 of 4)	3	New	Design Review DR.0
SCH-38	Exhaust Fan Schedule - Phase 3 (3 of 4)	3	New	Design Review DR.0
SCH-39	Exhaust Fan Schedule - Phase 3 (4 of 4)	3	New	Design Review DR.0
SCH-40	Intake & Relief Hood Schedule - Phase 3	3	New	Design Review DR.0
SCH-41	Cabinet Unit Heater & Propeller Unit Heater Schedules - Phase 3	3	New	Design Review DR.0
SCH-42	Consolidated Bill of Material	3	New	Design Review DR.0
SCH-43	Label List	3	New	Design Review DR.0
INST-01	Installation Standards - Inputs (1 of 3)	All	New	Design Review DR.0
INST-02	Installation Standards - Inputs (2 of 3)	All	New	Design Review DR.0
INST-03	Installation Standards - Inputs (3 of 3)	All	New	Design Review DR.0
INST-04	Installation Standards - Outputs (1 of 3)	All	New	Design Review DR.0
INST-05	Installation Standards - Outputs (2 of 3)	All	New	Design Review DR.0
INST-06	Installation Standards - Outputs (3 of 3)	All	New	Design Review DR.0
INST-07	Installation Standards - Typical Third-Party Connections	All	New	Design Review DR.0

Delta Controls

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UPDATES	
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04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
TITLE-06
JOB NUMBER:
J-2304001

TAG	TAG DESCRIPTION
AC	DX COOLING-ONLY UNIT
ACF	ACTIVATED CARBON FILTER SYSTEM
ACK	ACKNOWLEDGE
ACP	AIR COMPRESSOR
ACU	AIR COOLED CONDENSING UNIT
ACU	AIR CONDITIONING SYSTEM
AF	AIR FILTER
AFS	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
ALM	ALARM
AO	ANALOG OUTPUT
AVG	AVERAGE(ING)
BAS	BUILDING AUTOMATION SYSTEM
BC	BOILER CONTROLLER
BI	BINARY (DIGITAL) INPUT
BLR	BOILER
BO	BINARY (DIGITAL) OUTPUT
BYP	BYPASS
BZR	BUZZER
CBL	CABLE
CB	CIRCUIT BREAKER
CC	COOLING COIL
CCDAT	COOLING COIL DISCHARGE AIR TEMPERATURE
CF	CARTRIDGE FILTER SYSTEM
CH	CHILLER
CHW	CHILL WATER
CHWR	CHILL WATER RETURN TEMPERATURE
CHWS	CHILL WATER SUPPLY TEMPERATURE
CI	CHLORINE
CND	CONDENSING UNIT
CO	CARBON MONOXIDE SENSOR
CO2	CARBON DIOXIDE SENSOR
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
C1A	CONTROLLER - DAC-1600 APPLICATION
C2E	CONTROLLER - DSC-1212E SYSTEM
C3A	CONTROLLER - DAC-633 APPLICATION
C3S	CONTROLLER - DSC-633 SYSTEM
C4A	CONTROLLER - DAC-1146 APPLICATION
C4F	CONTROLLER - DFM-440 FIELD MODULE
C4S	CONTROLLER - DSC-1146 SYSTEM
C4X	CONTROLLER - eBX-04 EXPANDER BACKPLANE
C6A	CONTROLLER - DAC-606 APPLICATION
C6E	CONTROLLER - DSC-1616E SYSTEM
C7E	CONTROLLER - eTCH-7E TOUCH SCREEN
C8U	CONTROLLER - eBM-800 UI MODULE
C8X	CONTROLLER - eBX-08 EXPANDER BACKPLANE
CCU	CONTROLLER - COPPERCUBE ARCHIVER
CDF	CONTROLLER - DFC-304R3-240 FCU
CDV	CONTROLLER - DVC-V322A-B VAV
CDX	CONTROLLER - DMUX-8-J MULTIPLEXER
CDZ	CONTROLLER - DZNR-768 REPEATER
CEB	CONTROLLER - eBMGR-2
CEC	CONTROLLER - EBCON-2 SYSTEM
CET	CONTROLLER - eBMGR-TCH-2
CFP	CONTROLLER - DMF-400P PWM FIELD MODULE
CFU	CONTROLLER - DFM-400 FIELD MODULE
CJA	CONTROLLER - JACE 8000 NETWORK ENGINE
CMA	CONTROLLER - eBM-440-M AO MODULE
CMD	CONTROLLER - eBM-D400R4 DO MODULE
CMH	CONTROLLER - eBM-D400R4-H DO MODULE

TAG	TAG DESCRIPTION
CMI	CONTROLLER - eBM-440-I MODULE
CZF	CONTROLLER - eZFCP-424r4-24 FCU
CZV	CONTROLLER - enteliZONE VAV
CS	CURRENT SENSOR
CT	CURRENT TRANSDUCER
CTR	COOLING TOWER
CTS	CHEMICAL TREATMENT SYSTEM
CTW	CITY WATER (RAW)
CW	CONDENSER WATER
CWF	CONDENSER WATER FILTER
CWR	CONDENSER WATER RETURN TEMPERATURE
CWS	CONDENSER WATER SUPPLY TEMPERATURE
CWV	CHILL WATER VALVE
DAH	DISCHARGE AIR HUMIDITY
DAT	DISCHARGE AIR TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEM	DEMAND
DET	DETECTION
DI	DIGITAL (BINARY) INPUT
DO	DIGITAL (BINARY) OUTPUT
DP	DEW POINT TRANSMITTER
DPA	DIFFERENTIAL PRESSURE TRANSDUCER - AIRFLOW
DPB	DIFFERENTIAL PRESSRUE BLDG TRANSDUCER
DPD	DIFFERENTIAL PRESSURE DUCT TRANSDUCER
DPF	DIFFERENTIAL PRESSURE FILTER
DPR	DAMPER
DPS	DIFFERENTIAL PRESSURE SWITCH
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
DPW	DIFFERENTIAL PRESSURE WATER TRANSDUCER
DR	DIN RAIL
DRA	DIN RAIL ADAPTER
DWH	DOMESTIC WATER HEATER
DWM	DOMESTIC WATER METER
DWP	DOMESTIC WATER PRESSURE
DWR	DISHWASHER
EAD	EXHAUST AIR DAMPER
EBO	EQUIPMENT BY OTHERS
ELE	ELEVATOR
ENA	ENABLE
ENC	ENCLOSURE
EOA	EMERGENCY OUTSIDE AIR
EOL	END OF LINE RESISTOR
EPM	ELECTRICAL POWER MONITORING
ES	END SWITCH
ESC	ELECTRONIC SPEED CONTROL
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
ETS	ETHERNET SWITCH
EWH	ELECTRIC WATER HEATER
FA	FIRE ALARM SYSTEM POINT
FAA	FIRE ALARM ANNUNCIATION
FACP	FIRE ALARM CONTROL PANEL
FAS	FIRE ALARM SYSTEM
FB	FUSE BLOCK
FBK	FEEDBACK
FBD	FACE AND BYPASS DAMPER
FBP	FACE AND BYPASS
FC	FIBER CONVERTER, (TO ETHERNET)
FCU	FAN COIL UNIT
FDT	FUEL DAY TANK
FE	FRONT END

TAG	TAG DESCRIPTION
FLT	FILTER DIFFERENTIAL PRESSURE
FM	FLOW METER
FP	FIRE PUMP
FR	FIELD RELAY
FS	FLOW SWITCH
FSC	FCU FAN SPEED CONTROL SWITCH
FT	FAULT
FWC	FIRE WATER CHEMICAL TREATMENT SYSTEM
FWC	FIRE WTR CORR CHEM TREAT INJECT SYSTEM
G	GAUGE
GD	GAS DETECTOR
GEN	GENERATOR
GFS	GAS FLOW SWITCH
GM	GAS METER
H2S	HYDROGEN SENSOR
HC	HEATING COIL
HL	HIGH LIMIT, DUCT PRESSURE
HR	HEAT RECOVERY
HRC	HEAT RECOVERY COIL
HRU	HEAT RECOVERY UNIT
HS	HUMIDISTAT
HTD	HUMIDITY / TEMPERATURE SENSOR - DUCT
HTR	HUMIDITY / TEMPERATURE SENSOR - ROOM
HTS	HEAT SENSOR
HU	HUMIDIFIER
HUM	HUMIDITY SENSOR
HW	HOT WATER
HWR	HOT WATER RETURN TEMPERATURE
HWS	HOT WATER SUPPLY TEMPERATURE
HWV	HOT WATER VALVE
IL	INTERLOCK
ION	IONIZATION UNIT
ISO	ISOLATION
JA	JACE (CONTROLLER, ACCESSORIES, EXP. PACKS)
KWM	KILOWATT METER
LAN	LOCAL ACCESS NETWORK
LBL	LABEL
LC	LIGHTING CONTACTOR
LD	LEAK DETECTOR
LFH	LAB FUME HOOD
LL	LOW LIMIT TEMPERATURE SWITCH
LLS	LIQUID LEVEL SWITCH
LLT	LIQUID LEVEL TRANSMITTER
LN*	LINKNET NETWORK POINT
LRB	LIGHTING RELAY BRACKET
LS(S)	LOAD SHEDDING (SIGNAL)
LT	LIGHT
LVL	LEVEL
LWC	LOW WATER CUT-OFF
M	ACTUATOR
MAD	MIXED AIR DAMPER
MAG	MAGNEHELIC PRESSURE GAUGE
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MB	MOUNTING BRACKET
MF	MULTIMEDIA FILTER SYSTEM
MIN	MINIMUM
MS	MOTOR STARTER
MTR	METER
N*	NETWORK (SOFTWARE) POINT NUMBER
OA	OUTSIDE AIR

TAG	TAG DESCRIPTION
OAD	OUTSIDE AIR DAMPER
OAH	OUTSIDE AIR HUMIDITY
OAT	OUTSIDE AIR TEMPERATURE
OATH	OUTSIDE AIR TEMPERATURE / HUMIDITY
OBS	OBSOLETE
OCC	OCCUPANCY
OS	OCCUPANCY SENSOR
PAN	PANDUIT / WIRE MOLD
PB(C)	PANEL BUILD (COMPONENT)
PF	PANEL FUSE
Ph	POTENTIAL HYDROGEN
PHV	PRE-HEAT VALVE
PLG	PANEL LIGHT - GREEN
PLR	PANEL LIGHT - RED
PLY	PANEL LIGHT - YELLOW
PM	POWER MONITOR
PMP	PUMP
PNL	PANEL
PLM	PHASE LOSS MONITOR
PP	PRESSURE PICKUP, SPACE - LOW PROFILE
PpH	POTABLE WATER POTENTIAL HYDROGEN (Ph) LEVEL
PR	RELAY, PANEL, TRACK MOUNT
PS	POWER SUPPLY
PRES	PRESSURE
PRN	PRINTER
PSR	PHOTOCELL RELAY
PT	PNEUMATIC TUBING - POLY
PTS	PNEUMATIC PRESSURE PICKUP - STATIC PRESSURE
PTT	PNEUMATIC PRESSURE PICKUP - TOTAL PRESSURE
PTV	PNEUMATIC PRESSURE PICKUPS - STATIC & TOTAL
PWC	POTABLE WATER CHLORINATION SYSTEM
PWM	PULSE WIDTH MODULATION
PWT	POTABLE WATER TANK
R	PANEL RELAY
RA	RETURN AIR
RAD	RETURN AIR DAMPER
RAH	RETURN AIR HUMIDITY
RAT	RETURN AIR TEMPERATURE
RB	RELAY, PANEL, ICE CUBE, SOCKET BASE
RBP	CITY RAW WATER BOOSTER PUMP
RD	RADON DETECTOR
REL(D)	RELIEF (DAMPER)
RM	REFRIGERANT MONITOR
RPC	RAW WATER BOOSTER PUMP CONTROLLER
RTS	ROTARY TIMER SWITCH
RTU	ROOFTOP UNIT
RWB	RAW WATER BAG FILTER SYSTEM
RWP	RAW WATER TREATMENT SYSTEM PUMP PKG
RWPC	RAW WATER PUMP CONTROL SYSTEM
RWR	RAW WATER RECIRCULATION & CHLORINATION SYS
RWT	RAW WATER TANK
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SCR	SILICONE-CONTROLLED RECTIFIER (REHEAT TYP.)
SD	SMOKE DETECTOR
SEF	SMOKE EXHAUST FAN
SEP	SEWAGE EJECTION PUMP
SF	SUPPLY FAN
SGD	SURGE DAMPER - AIR
SI + []	SAFETY INTERLOCK + Source (i.e. Term L6 & L7)
SMP	SUMP PUMP

TAG	TAG DESCRIPTION
SP	SWITCH PLATE
SPD	SPEED SIGNAL (VFD INPUT SPEED FROM BAS)
SPS	SPRAY WATER SYSTEM
SR	SAFETY RELAY
SS	START / STOP
SSG	SPACE SENSOR GUARD
SSP	SECURITY SYSTEM PANEL
ST	SPACE TEMPERATURE
STAT	STATUS
STPT	SETPOINT
SW	SWITCH - ELECTRIC
TB	TERMINAL BLOCK
TBP	TRIPLEX DOMESTIC WATER BOOSTER PUMP PKG
TH	THERMOSTAT, ROOM TEMPERATURE
TL	TOWER LIGHT (ALARM INDICATION)
TS	TEMPERATURE SENSOR
TW	THERMOWELL, TEMPERATURE
TX	TRANSFORMER
V	VALVE / ACTUATOR COMBINATION
VAV	VARIABLE AIR VOLUME BOX
VFD	VARIABLE FREQUENCY DRIVE
VFDR	VARIABLE FREQUENCY DRIVE, RETURN FAN
VFDS	VARIABLE FREQUENCY DRIVE, SUPPLY FAN
WA	WATER ALARM
WD	WATER DETECTOR
WLP	WATER LEVEL TRANSDUCER, PRESSURE TYPE
WLU	WATER LEVEL TRANSDUCER, ULTRASONIC
WM	WATER METER
WP	WATER PRESSURE
WSHP	WATER SOURCE HEAT PUMP
WTR	WATER
WWT	WASTE WATER TREATMENT
XFMR	TRANSFORMER

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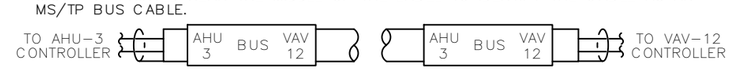
CONTRACT NO:

SHEET
GEN-01
JOB NUMBER:
J-2304001

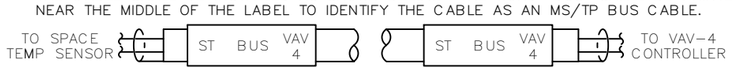
INSTALLATION STANDARDS – LEGEND

MS/TP BUS CABLE LABELING

1. THE LABELING SHOWN BELOW SHALL BE PROVIDED ON ALL MS/TP BUS CABLES RUNNING FROM ONE CONTROL PANEL TO ANOTHER, OR FROM A CONTROLLER TO A SPACE TEMPERATURE SENSOR. MS/TP BUS CABLES CONNECTING CONTROLLERS WITHIN A SINGLE CONTROL PANEL SHALL NOT BE LABELED.
   - ON CABLES RUNNING BETWEEN CONTROL PANELS: EACH LABEL SHALL INDICATE THE NAMES OF THE CONTROLLERS CONNECTED AT EACH END OF THE CABLE. THE NAME PRINTED ON THE LEFT SIDE OF THE LABEL SHALL BE THE NAME OF THE CONTROLLER CONNECTED TO THE LEFT END OF THE CABLE & VICE-VERSA (SEE EXAMPLE BELOW). THE WORD "BUS" SHALL BE PRINTED NEAR THE MIDDLE OF THE LABEL TO IDENTIFY THE CABLE AS AN MS/TP BUS CABLE.



   - ON CABLES RUNNING TO SPACE TEMPERATURE SENSORS: EACH LABEL SHALL INDICATE THE NAME OF THE CONTROLLER ON THE RIGHT SIDE AND THE LETTERS "ST" ON THE LEFT SIDE. THE CABLE SHALL BE INSTALLED AS SHOWN BELOW. THE WORD "BUS" SHALL BE PRINTED NEAR THE MIDDLE OF THE LABEL TO IDENTIFY THE CABLE AS AN MS/TP BUS CABLE.



2. EACH LABEL SHALL BE MADE OF TRANSPARENT VINYL FILM BACKED WITH AN ACRYLIC, PRESSURE-SENSITIVE ADHESIVE. THE LABEL MATERIAL SHALL BE OIL & SOLVENT RESISTANT WITH GOOD CONFORMABILITY & FLEXIBILITY. THE MEANS OF PRINTING ON THE LABEL SHALL RESULT IN A CLEARLY LEGIBLE, PERMANENT MARKING. LABELS SHALL REMAIN INTACT & CLEARLY LEGIBLE WHEN SUBJECTED TO ULTRAVIOLET LIGHT, EXTREME HUMIDITY & SURFACE TEMPERATURES FROM -40° F TO 150° F (-40° C TO 66° C).
3. EACH CABLE SHALL BE IDENTIFIED WITH (2) LABELS. A LABEL SHALL BE LOCATED WITHIN 18" OF EACH END OF THE CABLE & SHALL BE VISIBLE WITHIN THE CONTROL ENCLOSURE. THE SAME NOTATION THAT APPEARS ON THE LABEL SHALL BE MARKED ON THE COVER OF EACH JUNCTION BOX THAT THE CABLE PASSES THROUGH.

WIRING TERMINATION LEGEND - PANEL

[#] = VDC TERMINATION AT CONTROL PANEL

[L##] = VAC TERMINATION AT CONTROL PANEL

1## = 120-460VAC INTRA-PANEL TERMINATION

2##, 4## = 24VAC INTRA-PANEL TERMINATION

3##, 5## = 24VDC INTRA-PANEL TERMINATION

WIRING TERMINATION LEGEND - BACNet ID

XX ## (NOTE: LEADING ZEROS NOT USED)

INSTANCE NUMBER: FROM PANEL I/O = PHYSICAL CONNECTION NUMBER
N* INSTANCE NUMBER INDICATES A NETWORK (SOFTWARE) POINT

I/O TYPE: AI=ANALOG INPUT, BI=BINARY INPUT, MI=MULTISTATE INPUT
AO=ANALOG OUTPUT, BO=BINARY OUTPUT

DEVICE BASIC ADDRESS FROM SWITCH
DEVICE BACNET ADDRESS = DEVICE SWITCH ADDRESS * DEVICE TYPE FACTOR

DEVICE TYPE: = AREA (FACTOR = 10000)
= SYSTEM (FACTOR = 100)
= SUBLAN (FACTOR = 1)
= LINKNET DEVICE (BACNET ADDRESS USES HOSTPANEL_ID)

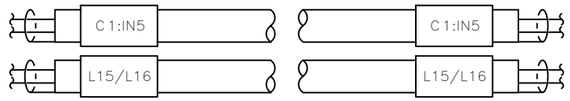
EXAMPLES:
AREA DEVICE # 3, BINARY INPUT NUMBER 4: [BACNET ADDRESS = 30000.BI4]
LINKNET DEVICE # 2, BINARY INPUT NUMBER 3: [BACNET ADDRESS = HOSTPANEL_ID.BI203]

INPUT / OUTPUT WIRING STANDARDS

1. ALL I/O CABLE SHALL MEET THE FOLLOWING SPECIFICATIONS:
   - STRANDED 18 GAUGE, TWISTED/SHIELDED-PAIR COPPER WIRE WITH 300 VOLT INSULATION
2. PLENUM-RATED CABLE SHALL BE USED WHERE REQUIRED BY LOCAL OR NATIONAL CODES.
3. I/O WIRING SHALL NOT BE RUN IN THE SAME CONDUIT AS A.C. POWER WIRING THAT CARRIES MORE THAN 24 VOLTS.
4. WITHIN ANY CONTROL PANEL:
   - I/O WIRING SHALL NOT CROSS OVER A.C. POWER WIRING THAT CARRIES MORE THAN 24 VOLTS.
   - I/O WIRING SHALL NOT BE RUN IN THE SAME CABLE GROUP AS A.C. POWER WIRING THAT CARRIES MORE THAN 24 VOLTS.
5. ONLY SHIELDED 24 VAC POWER WIRING SHALL BE ALLOWED TO CROSS OVER, RUN IN THE SAME CONDUIT, OR RUN IN THE SAME CABLE GROUP AS I/O WIRING.
6. WHERE UNAVOIDABLE, I/O WIRING MAY BE LOCATED NO CLOSER THAN 6" AND SHOULD BE LOCATED AS FAR APART AS POSSIBLE FROM POWER WIRING CARRYING MORE THAN 24 VOLTS. AVOID RUNNING PARALLEL TO POWER WIRING ANY FURTHER THAN NECESSARY, CROSS POWER WIRING AT 90 DEGREE ANGLES ONLY IF REQUIRED.
7. SHIELDS ON INPUT AND OUTPUT WIRING TO BE GROUNDED AT PANEL (OR CONTROLLER) LOCATION ONLY. THEY SHOULD BE TIED TO A TRUE EARTH GROUND.
8. STRIP ONLY ENOUGH CABLE BACK TO ALLOW TERMINATION OF SHIELD AND WIRE.

INPUT / OUTPUT CABLE LABELING

1. THE LABELING SHOWN BELOW SHALL BE PROVIDED ON ALL I/O WIRING TO & FROM CONTROLLERS AND FIELD DEVICES. I/O WIRING CONTAINED WITHIN A CONTROL PANEL SHALL NOT BE LABELED. EACH LABEL SHALL INDICATE THE I/O WIRING TERMINATION AS SHOWN ON THE TEMPERATURE CONTROL DRAWINGS (SEE EXAMPLES BELOW).



2. EACH LABEL SHALL BE MADE OF TRANSPARENT VINYL FILM BACKED WITH AN ACRYLIC, PRESSURE-SENSITIVE ADHESIVE. THE LABEL MATERIAL SHALL BE OIL & SOLVENT RESISTANT WITH GOOD CONFORMABILITY & FLEXIBILITY. THE MEANS OF PRINTING ON THE LABEL SHALL RESULT IN A CLEARLY LEGIBLE, PERMANENT MARKING. LABELS SHALL REMAIN INTACT & CLEARLY LEGIBLE WHEN SUBJECTED TO ULTRAVIOLET LIGHT, EXTREME HUMIDITY & SURFACE TEMPERATURES FROM -40° F TO 150° F (-40° C TO 66° C).
3. EACH CABLE SHALL BE IDENTIFIED WITH (2) LABELS. A LABEL SHALL BE LOCATED WITHIN 18" OF EACH END OF THE CABLE & SHALL BE VISIBLE AT THE CONTROL PANEL OR FIELD DEVICE. THE SAME NOTATION THAT APPEARS ON THE LABEL SHALL BE MARKED ON THE COVER OF EACH JUNCTION BOX THAT THE CABLE PASSES THROUGH.

GENERAL ELECTRICAL STANDARDS

1. ALL CURRENT SENSING DEVICES SHALL HAVE THE POWER WIRE LOOPED THROUGH THE SENSOR MULTIPLE TIMES, IF NECESSARY, TO PROVIDE AN AMPERAGE THAT IS WELL WITHIN THE RANGE OF THE SENSOR (REFER TO MANUFACTURER'S LITERATURE FOR AMPERAGE RANGE).
2. ALL FIELD WIRING TO TERMINAL STRIPS IN CONTROL PANELS SHALL BE TERMINATED AT THE OUTERMOST TERMINALS. INNER TERMINALS OF TERMINAL STRIPS ARE RESERVED FOR INTERNAL WIRING TERMINATIONS.
3. 120 VAC POWER WIRING SHALL ENTER ANY CONTROL PANEL AT THE UPPER RIGHT CORNER UNLESS OTHERWISE INDICATED.
4. 240 VAC POWER WIRING SHALL ENTER ANY CONTROL PANEL AT THE LOWER LEFT CORNER UNLESS OTHERWISE INDICATED.
5. THE GROUND WIRE CONNECTED TO ANY CONTROL PANEL MUST BE A CONTINUOUS CONDUCTOR BACK TO THE GROUND CONNECTION AT THE BREAKER PANEL. GROUNDING TO BUILDING STEEL IS NOT ACCEPTABLE.
6. ALL JUMPER & DIP SWITCH CONFIGURATIONS SHOWN ON THE TEMPERATURE CONTROL DRAWINGS SHALL BE SET BY THE INSTALLER. IF NO SPECIFIC CONFIGURATION IS SHOWN FOR A DEVICE, NO CHANGE SHALL BE MADE TO THE DEFAULT SETTINGS.
7. ALL FIELD WIRING THAT DIFFERS FROM THE WIRING SHOWN ON THE TEMPERATURE CONTROL DRAWINGS SHALL BE NOTED ON THE DRAWINGS (BY THE INSTALLER) WITH RED INK OR PENCIL. THE COMPLETE SET OF NOTED DRAWINGS SHALL BE PROVIDED TO THE PROJECT MANAGER UPON COMPLETION OF THE PROJECT OR SOONER UPON REQUEST.

ELECTRICAL NOTES

- ALL CONTROL DEVICES & WIRING SHALL BE INSTALLED IN ACCORDANCE WITH: MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND INSTALLATION STANDARDS PROVIDED ON THE "INSTALLATION STANDARDS" SHEET.
- THESE DRAWINGS PROVIDE SCHEMATIC REPRESENTATIONS OF EQUIPMENT & FIELD DEVICES BASED ON THE BID PROPOSAL. ACTUAL INSTALLATION OF ALL CONTROL DEVICES IS SUBJECT TO FIELD VERIFICATION. ANY CHANGES THAT MAY RESULT IN A DEVIATION FROM THE GENERAL INTENT OF THE CONTROL SYSTEM DESIGN SHALL BE APPROVED BY THE DESIGNER PRIOR TO INSTALLATION.
- FIELD VERIFICATION OF WIRING TERMINATIONS REQUIRED.

- GROUND CIRCUIT MUST BE A CONTINUOUS PATH BACK TO THE BREAKER PANEL.
- ELECTRICAL NOTE: CONTROLLER GROUND CONNECTION MUST BE A COMPLETE PATH BACK TO BREAKER PANEL.

- REMOVE SHUNT JUMPER IF SHIELD IS GROUNDED DIRECTLY AT ANY OTHER POINT OR SHUNT IS INSTALLED AT OTHER END OF NETWORK.
- ADP-45-MSTP-TB-Y AND ADP-45-MSTP-Y BOARDS MAY BE FLUSH MOUNTED ONTO METAL PANELBOARDS WITHOUT AN INSULATOR BETWEEN THE TWO.
- FIELD DEVICES SHOULD ONLY BE GROUNDED IN THE CONTROL PANEL. DO NOT GROUND I/O WIRING IN BOTH THE FIELD AND THE PANEL.
- THESE DRAWINGS PROVIDE SCHEMATIC REPRESENTATIONS OF EQUIPMENT & FIELD DEVICES BASED ON THE CHILDREN'S EDUCATION ADDITION PROPOSAL. ACTUAL INSTALLATION OF ALL CONTROL DEVICES IS SUBJECT TO FIELD VERIFICATION. ANY CHANGES THAT MAY RESULT IN A DEVIATION FROM THE GENERAL INTENT OF THE CONTROL SYSTEM DESIGN SHALL BE APPROVED BY THE DESIGNER PRIOR TO INSTALLATION.
- SEE FIELD DEVICE TERMINATION DETAIL SHEET(S) FOR POINT WIRING REQUIREMENTS.

FROM BAPI:

- BAPI recommends using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs. All wiring must comply with the National Electric Code (NEC) and local codes.
Do NOT run this device's wiring in the same conduit as AC power wiring of NEC class 1, NEC class 2, NEC class 3 or with wiring used to supply highly inductive loads such as motors, contactors and relays. BAPI's tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your BAPI representative.

Cable Requirements:

	Cable Type	Equal to	Max Cable Length	Wiring Precautions
RS-485 Network	22-24 AWG twisted pair, shielded, jacketed communication cable	Belden 9841, 82841	4000 ft (1220 m)	- Braided or Aluminum foil shield, Impedence 100-200 Ω, Capacitance 17 pF/ft or less. - Use for BACnet MS/TP, LINKNet, V2 Subnet, MODBUS-RTU
Ethernet	10/100 Base T, Cat5e, Cat6		no limit (w/ switches)	Follow IEEE 802.3 standards
Fiber Optic	Grade 3 (62.5/125μ) / Grade 4 (50/125µ), min 2 fiber, Multimode, SC connector	Belden FDxM006P0	1000 ft (550 m) for Gigabit Ethernet	Suggest 4 or more fibers for redundancy in case of damage
10k Ω / Dry Contact Input	2 conductor 18 AWG	Belden 8461NH	3900 ft (1200 m)	Ground only at controller input GND terminal
	2 conductor 22 AWG	Belden 88442	1500 ft (450 m)	Ground only at controller input GND terminal
5 V Input	2 conductor 22 AWG shielded	Belden 83552	100 ft (30 m)	Keep Cable Short Use dedicated shielded cable
	2 conductor 20 AWG shielded	Belden 83602	330 ft (100m) w 20 kΩ load resistor	
	3 conductor 20 AWG shielded	Belden 8772		

Cable Requirements:

	Cable Type	Equal to	Max Cable Length	Wiring Precautions
10 V Input	3 conductor 18 AWG unshielded	Belden 88870	330 ft (100 m)	
4-20 mA Input	2 conductor 18 AWG unshielded	Belden 8461NH	3300 ft (1000 m)	
	4 conductor 18 AWG unshielded	Belden 88489		
Digital Input	2 conductor 18 AWG	Belden 8461NH	3900 ft (1200 m)	
	2 conductor 22 AWG	Belden 88442	1500 ft (450 m)	
RTD Input	2 conductor 18 AWG	Belden 8461NH	No practical limit	Ground only at controller input GND terminal
	2 conductor 22 AWG	Belden 88442		
Analog 0-10 VDC Output	2 conductor 18 AWG unshielded	Belden 8461NH	330 ft (100 m)	
Analog 4-20 mA Output	2 conductor 18 AWG unshielded	Belden 8461NH	Depends upon impedence	ft = 1000 (500 - end dev imp) / 12.8 m = 1000 (500 - end dev imp) / 42
Binary Triac Output	2 conductor 18 AWG unshielded	Belden 8461NH	330 ft (100 m)	min turn-on current = 25 mA
Binary SS Relay Output	2 conductor 18 AWG unshielded	Belden 8461NH	330 ft (100 m)	No min turn-on current, Max External Voltages: 28 VAC, 28 VDC
Binary Relay Output	2 conductor 18 AWG unshielded	Belden 8461NH	330 ft (100 m)	Max External Voltages: 28 VAC, 28 VDC

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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
GEN-02
JOB NUMBER:
J-2304001

BACNET MS/TP (RS-485) BUS STANDARDS

1. THE MS/TP BUS SHIELD MUST BE KEPT SEPARATE FROM OTHER SHIELDS & MUST NOT BE GROUNDED. THE MS/TP BUS SHIELD SHALL BE PROTECTED FROM CONTACTING ANY SURFACE OTHER THAN THE TERMINATION BLOCK.
2. SPLICES IN MS/TP BUS WIRING ARE NOT ACCEPTABLE. MS/TP BUS WIRING SHALL BE TERMINATED ONLY AT A CONTROLLER, REPEATER, OR TRM-768: RS-485 LAN TERMINATOR.
3. THE BLACK WIRE IN AN MS/TP BUS CABLE SHALL ALWAYS BE CONNECTED TO THE (-) BUS TERMINAL ON THE DEVICE AT EACH END OF THE CABLE.
4. ALL 2-CONDUCTOR MS/TP BUS CABLE SHALL MEET THE FOLLOWING SPECIFICATIONS:
   - 22-24 GAUGE, SINGLE TWISTED-PAIR, TINNED, SHIELDED COPPER WIRE WITH GREEN JACKET
   - NOMINAL IMPEDANCE = 100-120 OHMS BETWEEN CONDUCTORS
   - CAPACITANCE < OR = TO 17 pF/FT BETWEEN GROUNDED CONDUCTOR & NEXT CONDUCTOR
   - ACCEPTABLE CABLE = BELDEN 9841, 82841 OR WINDY CITY WIRE 42002-S. (PLENUM-RATED)

   APPROVAL OF EQUIVALENT CABLE IS REQUIRED PRIOR TO INSTALLATION
5. PLENUM-RATED CABLE SHALL BE USED WHERE REQUIRED BY LOCAL OR NATIONAL CODES.
6. MS/TP BUS WIRING SHALL NOT BE RUN IN THE SAME CONDUIT AS A.C. POWER WIRING THAT CARRIES MORE THAN 24 VOLTS.
7. WITHIN ANY CONTROL PANEL:
   - MS/TP BUS WIRING SHALL NOT CROSS OVER A.C. POWER WIRING THAT CARRIES MORE THAN 24 VOLTS.
   - MS/TP BUS WIRING SHALL NOT BE RUN IN THE SAME CABLE GROUP AS A.C. POWER WIRING THAT CARRIES MORE THAN 24 VOLTS.
8. ONLY SHIELDED 24 VAC POWER WIRING SHALL BE ALLOWED TO CROSS OVER, RUN IN THE SAME CONDUIT, OR RUN IN THE SAME CABLE GROUP AS MS/TP BUS WIRING.

BACNET MS/TP (RS-485) BUS NOTES

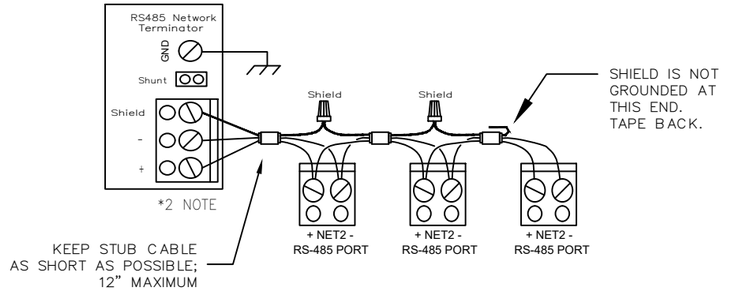
- EACH SEGMENT OF THE DZNT COMMUNICATION BUS CAN HAVE UP TO 50 DEVICES AND 2,000' TOTAL CAT5 CABLE LENGTH (COMBINED DISTANCE BETWEEN TERMINATION BOARDS AND FROM TERMINATION BOARD TO DZNT-TO-VAV (THE WALL MOUNTED DEVICE)) TO A MAXIMUM OF 99 DEVICES TOTAL.
- TOTAL NETWORK LENGTH IS DETERMINED BY SUM OF CABLE LENGTHS BETWEEN TERMINATION BOARDS, PLUS THE SUM OF THE DROP CABLES BETWEEN TERMINATION BOARD AND THERMOSTAT.
- IF ONLY 1 SEGMENT IS REQUIRED, AN ADP45-MSTP-TB-Y MAY BE USED INSTEAD OF AN ADP45-MSTP-Y.
- THERE IS NO HARD LIMIT TO THE NUMBER OF BRANCHES CREATED BY ADP45-MSTP-Y CONNECTORS, PROVIDED TOTAL OF ALL BRANCHES IS WITHIN THE LENGTH AND DEVICE LIMIT FOR THE SEGMENT. DAISY CHAIN STRUCTURE IS MAINTAINED DUE TO THE DESIGN OF THE CABLING SYSTEM.
- AFTER SPLITTING A NETWORK INTO TWO (2) BRANCHES, DO NOT RECOMBINE TO A SINGLE BRANCH AT THE OPPOSITE END OR NETWORK PROBLEMS WILL OCCUR.
- LOOPBACK TERMINATION, ADP45-MSTP-ENDLOOP, MUST BE USED AT THE END OF EACH NETWORK BRANCH OR SEGMENT. NETWORK WILL CONTINUE TO FUNCTION IF ON LOOPBACK OR DEVICE IS REMOVED FROM THE NETWORK BUT DEVICES WILL DROP OFF THE NETWORK BETWEEN ANY TWO (2) REMOVED DZNT-TO-VAV OR ADP45-MSTP-LOOP.
- 12" LENGTH OF NETWORK CABLE ATTACHED TO THE ADP45-MSTP-TB-Y IS MAXIMUM ALLOWED. TERMINATE GROUND LEAD TO GND ON THE CONTROLLER TO MAINTAIN NETWORK INTEGRITY.
- CABLING IS DESIGNED TO USE STANDARD STRAIGHT-THROUGH UNSHIELDED TWISTED PAIR (UTP) CAT3 OR HIGHER CABLES (CAT5, CAT5e, CAT6) TO CONNECT BOXES TO BOXES, AND INDIVIDUAL BOXES TO THEIR THERMOSTATS.
- CABLING IS DESIGNED TO MAINTAIN THE REQUIRED DAISY-CHAIN CONFIGURATION EVEN WITH THE USE OF NETWORK Y's.

- DO NOT EXCEED (64) NODES ON A NETWORK SEGMENT. THERE IS A MAXIMUM OF 99 NOTES ALLOWED ON A SINGLE MS/TP NETWORK. ANY MORE THAN (64) NODES ON A NETWORK REQUIRES THE USE OF A REPEATER!
- DO NOT EXCEED 4,000 FEET (1,220 m) TOTAL LENGTH ON ANY SINGLE TWISTED PAIR RS-485 NETWORK SEGMENT.
- DO NOT EXCEED 2,000 FEET (610 m) TOTAL LENGTH ON ANY SINGLE CAT5 RS-485 NETWORK SEGMENT.
- DO NOT EXCEED (3) NODES ON A SINGLE LINKNET SEGMENT.
- DO NOT EXCEED 100 FEET (30 m) TOTAL LENGTH ON ANY SINGLE LINKNET NETWORK.
- SHIELD FOR MS/TP BUS MUST BE KEPT SEPARATE FROM OTHER SHIELDS AND FROM GROUND TERMINATIONS.
- MS/TP BUS SHIELD MUST BE TIED THROUGH EACH NODE TO MAKE A CONTINUOUS SHIELD THAT RUNS THE ENTIRE LENGTH OF THE RS-485 SEGMENT. DO NOT CONNECT THE SHIELD TO GROUND AT THE NODE.
- PROTECT FROM CONTACT WITH ANY SURFACE OTHER THAN THE TRM-768 TERMINAL BOARD OR DNZR-768 REPEATER.
- COMMUNICATION WIRING MUST NOT BE SPLICED. ALL TERMINATIONS MUST OCCUR AT CONTROLLERS UNLESS SPECIFICALLY NOTED OTHERWISE.
- BLACK COMMUNICATION WIRE SHALL ALWAYS BE CONNECTED TO (-) TERMINAL AT ALL CONTROLLERS.
- REFER TO "INSTALLATION STANDARDS" SHEET FOR ACCEPTABLE CABLE SPECIFICATIONS AND WIRING PRACTICES.
- ALL DEVICES CONNECTED TO THE MS/TP NETWORK MUST BE PROPERLY GROUNDED.
- ALL DEVICES ON THE NETWORK MUST RUN AT THE SAME BAUD RATE.

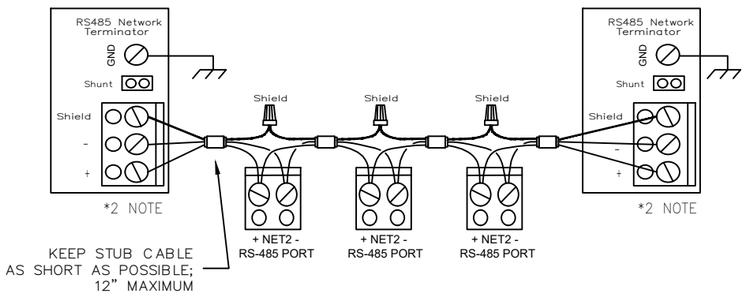
- THE LAYOUTS REPRESENTED ARE EXAMPLES OF HOW THE NETWORK MAY BE CONFIGURED. THERE IS NO REQUIREMENT TO FOLLOW THESE PROPOSED LAYOUTS, OTHER THAN MAINTAINING THE GROUPING UNDER EACH SYSTEM CONTROLLER.
- EACH APPLICATION CONTROLLER ON A GIVEN MS/TP BUS (UNDER EACH SYSTEM CONTROLLER) MUST HAVE UNIQUE ADDRESSING SET VIA THE DIP SWITCHES.

BACNET MS/TP (RS-485) BUS TERMINATIONS

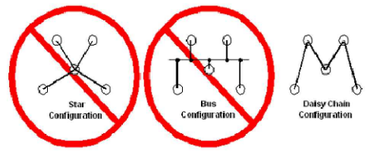
MS/TP TERMINATIONS USING ONE TRM-768 AND BUILT-IN TERMINATION



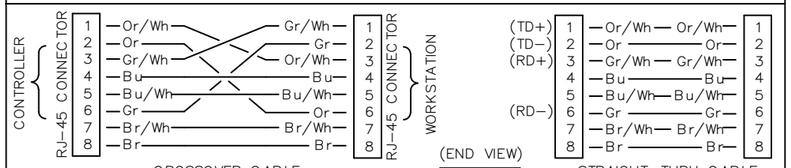
MS/TP TERMINATIONS USING TWO TRM-768s



ONLY A DAISY-CHAIN RS-485 MS/TP TOPOLOGY IS ALLOWED!



ETHERNET CABLE CONNECTIONS



- THE CONNECTIONS SHOWN ARE FOR CAT-6A OR BETTER TWISTED-PAIR CABLE.

ETHERNET CABLE STANDARDS

1. ALL ETHERNET CABLE SHALL MEET THE FOLLOWING SPECIFICATIONS:
   - 10/100/1000-BASE-T: 23 AWG, (4) TWISTED-PAIR, SOLID COPPER WIRE (CAT-6A EQUIV.)
     MAX. SEGMENT LENGTH = 330 FT (100 m)
     MAX. NETWORK LENGTH = 2,000 FT (610 m)
2. PLENUM-RATED CABLE SHALL BE USED WHERE REQUIRED BY LOCAL OR NATIONAL CODES.

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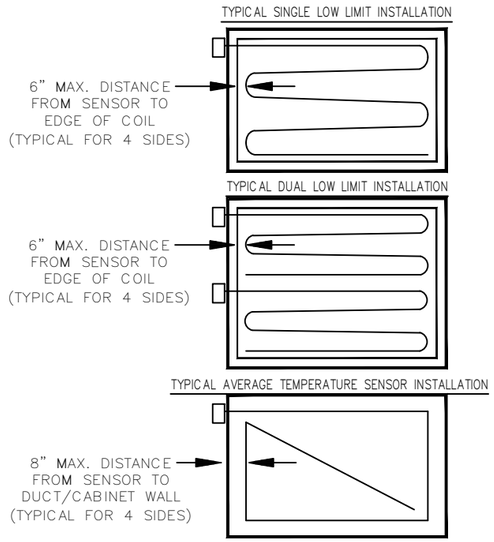
CONTRACT NO:

SHEET
GEN-03
JOB NUMBER:
J-2304001

GENERAL MECHANICAL STANDARDS

1. VALVE PORT DETAILS SHOWN ON THE TEMPERATURE CONTROL DRAWINGS DO NOT NECESSARILY INDICATE THE ACTUAL VALVE CONFIGURATION. REFER TO MANUFACTURER'S LITERATURE FOR ACTUAL VALVE PORT CONFIGURATION.
2. ALL LIQUID PRESSURE SENSORS SHALL BE INSTALLED ON VERTICAL PIPING OR BELOW THE CENTERLINE OF HORIZONTAL PIPING TO PREVENT AIR ENTRAPMENT AT THE SENSOR.

DUCT / COIL TEMPERATURE SENSOR INSTALLATION



- ALL SENSORS SHALL BE PROTECTED FROM DAMAGE AT THE POINT OF ENTRY INTO THE DUCT/CABINET. EACH SENSOR SHALL BE PROTECTED BY A RUBBER GROMMET, BUSHING, PLASTIC TUBING OR ELECTRICAL TAPE AT THE POINT OF ENTRY.
- ALL SENSORS SHALL BE SECURELY ANCHORED ALONG THE FULL LENGTH TO PREVENT DAMAGE CAUSED BY VIBRATION.

PNEUMATIC TERMINATION LEGEND

- ◇ # = PNEUMATIC SIGNAL TERMINATION AT CONTROL PANEL
- △ # = INTRA-PANEL PNEUMATIC SIGNAL TERMINATION
- (S ##) = SUPPLY AIR TERMINATION AT CONTROL PANEL (## = PSI)
- △ S ## = INTRA-PANEL SUPPLY AIR TERMINATION (## = PSI)

RED-LINE REQUIREMENTS

ALL SUBCONTRACTORS ARE REQUIRED TO SUBMIT DETAILED RED-LINE MODIFICATIONS TO THESE PRINTS FOR INCLUSION IN THE AS-BUILT SET. RED-LINES MUST INCLUDE BUT ARE NOT NECESSARILY LIMITED TO:

1. ACCURATE EQUIPMENT LOCATIONS INDICATED ON FLOOR PLANS, INCLUDING ROOF MOUNTED EQUIPMENT RELATIVE TO THE UPPERMOST FLOOR IF NO ROOF PLAN IS PROVIDED.
2. SENSOR LOCATIONS INDICATED ON FLOOR PLANS.
3. EXACT MS/TP AND ETHERNET BUS WIRING CONFIGURATION SHOWN ON FLOOR PLANS (WHEN PROVIDED) AS WELL AS IN TABLE FORMAT.
4. ALL WIRING AND EQUIPMENT CHANGES MADE ON ANY PORTION OF THE JOB.
5. FOR JOBS WITH NO FLOOR PLANS, ALL EQUIPMENT (INCLUDING SENSORS) WILL BE NOTED WITH ROOM NAME AND NUMBER.
6. ALL BACKUP BATTERY TABS ARE TO BE PULLED AT TIME OF CONTROLLER INSTALLATION.
7. ALL CONTROLLER SERIAL NUMBERS ARE TO BE RECORDED BY INSTALLING CONTRACTOR AT TIME OF INSTALLATION. THIS INFORMATION IS TO BE PASSED TO TEMPERATURE CONTROL SERVICES, LLC., AS THE JOB PROGRESSES.

MECHANICAL NOTES

- NOT ALL PANELS MAY CONTAIN THE TRM-768 END-OF-LINE TERMINATION BOARD. SEE CONTROLLER WIRING AND/OR SCHEDULE SHEETS FOR DETAILS.
- VAV CONTROLLERS MAY OPERATE IN A STAND-ALONE CONFIGURATION. HOWEVER, THIS PROJECT CALLS FOR BUS COMMUNICATION BETWEEN CONTROLLERS.
- FOR CLARITY, NOT ALL FACTORY PROVIDED ELECTRICAL WIRING AND COMPONENTS WHICH INTERFACE WITH THIRD-PARTY CONTROLLERS ARE SHOWN. FIELD VERIFICATION OF INSTALLED COMPONENTS AND WIRING CONNECTIONS REQUIRED!
- ZONE PRESSURE SENSOR LOCATED IN CONTROL PANEL.

*- DX UNITS WILL BE CONTROLLED BY FACTORY-PROVIDED ZONE SENSOR, WIRED TO FACTORY SUPPLIED CONTROLLERS. WIRING TO BE INSTALLED BY OTHERS.

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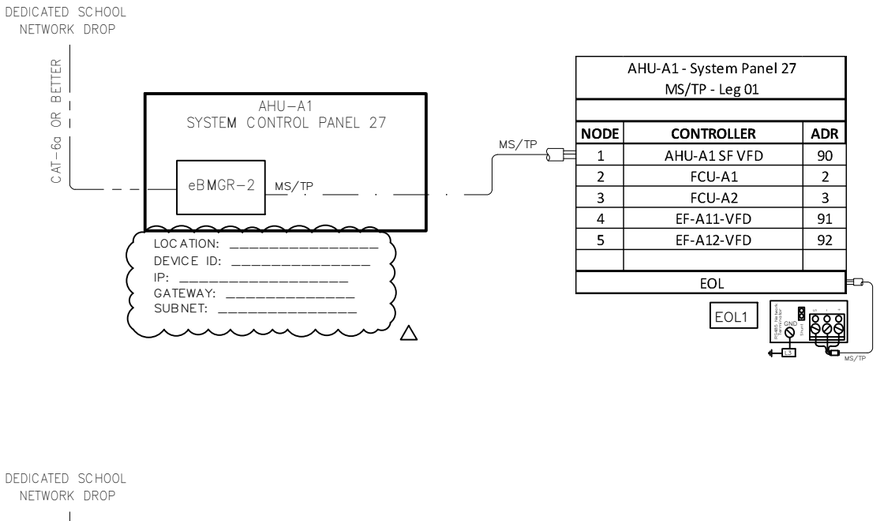
CONTRACT NO:

SHEET
GEN-04
JOB NUMBER:
J-2304001

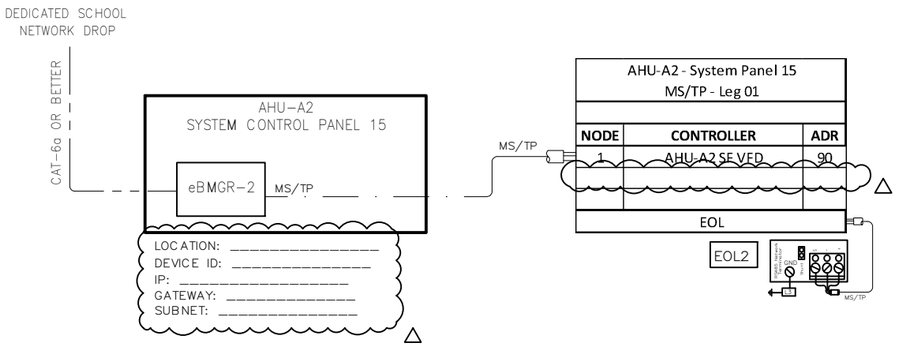
ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA A

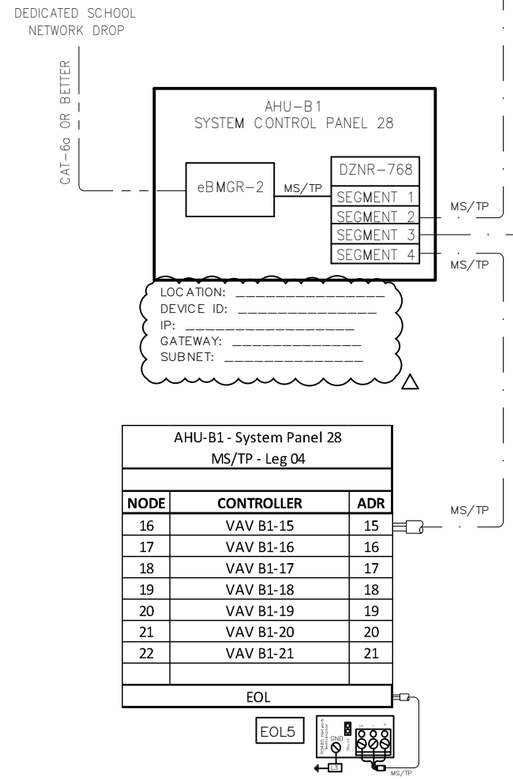


AHU-A1 - System Panel 27 MS/TP - Leg 01		
NODE	**CONTROLLER**	**ADR**
1	AHU-A1 SF VFD	90
2	FCU-A1	2
3	FCU-A2	3
4	EF-A11-VFD	91
5	EF-A12-VFD	92
EOL		

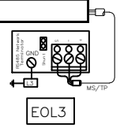


AHU-A2 - System Panel 15 MS/TP - Leg 01		
NODE	**CONTROLLER**	**ADR**
1	AHU-A2 SF VFD	90
EOL		

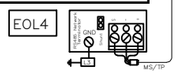
AREA B



AHU-B1 - System Panel 28 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-B1 SF VFD	90
2	VAV B1-01	1
3	VAV B1-02	2
4	VAV B1-03	3
5	VAV B1-04	4
6	VAV B1-05	5
7	VAV B1-06	6
8	VAV B1-07	7
EOL		



AHU-B1 - System Panel 28 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
9	VAV B1-08	8
10	VAV B1-09	9
11	VAV B1-10	10
12	VAV B1-11	11
13	VAV B1-12	12
14	VAV B1-13	13
15	VAV B1-14	14
EOL		

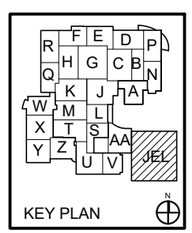


AHU-B1 - System Panel 28 MS/TP - Leg 04		
NODE	**CONTROLLER**	**ADR**
16	VAV B1-15	15
17	VAV B1-16	16
18	VAV B1-17	17
19	VAV B1-18	18
20	VAV B1-19	19
21	VAV B1-20	20
22	VAV B1-21	21
EOL		

BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

NOTES:
1. ALL SYSTEM CONTROL PANELS WILL HAVE A DEDICATED ETHERNET NETWORK DROP FROM THE SCHOOL'S NETWORK. INSTALL CAT 6a OR BETTER CABLE FROM PANEL TO DESIGNATED DROP.
2. REFER TO ELECTRICAL AND TECHNOLOGY DESIGN DRAWINGS FOR LOCATIONS OF ALL EXISTING OR NEW SYSTEM CONTROL ENCLOSURES. UPDATE RISERS WITH CONFIRMED INSTALLATION LOCATIONS FOR INCLUSION IN AS-BUILT PRINTS.
3. ALL VAV POWER PANELS SHALL BE LOCATED ADJACENT TO THEIR RESPECTIVE AIR HANDLER'S SYSTEM CONTROL PANEL. SEE VAV POWER PANELS SHEET FOR FURTHER DETAILS.



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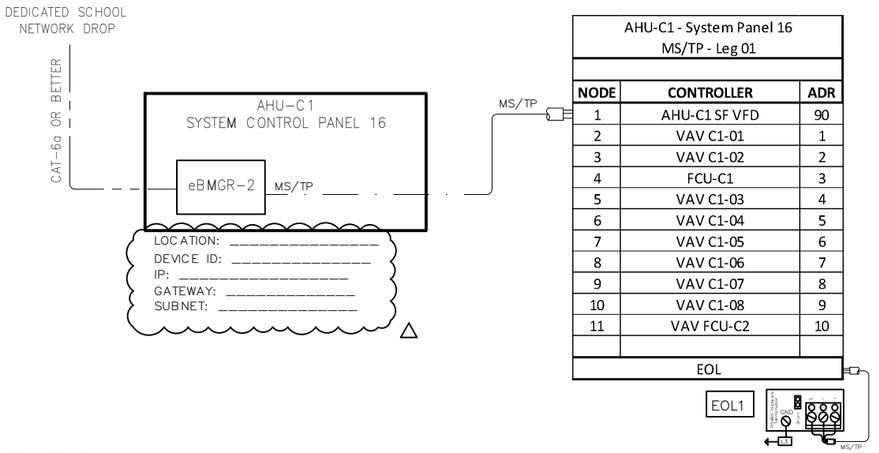
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JOB NUMBER:
J-2304001

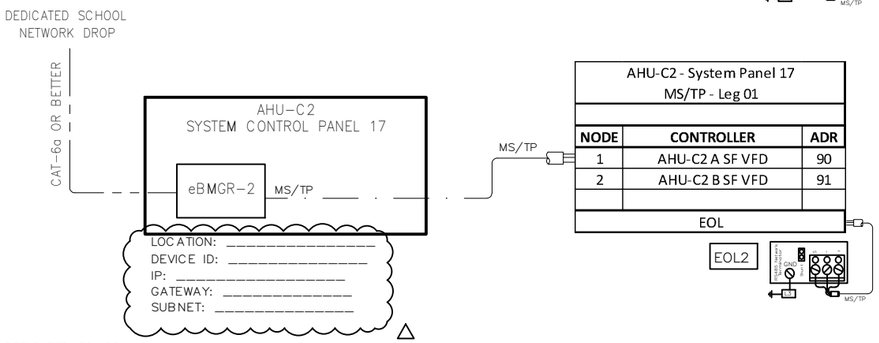
ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

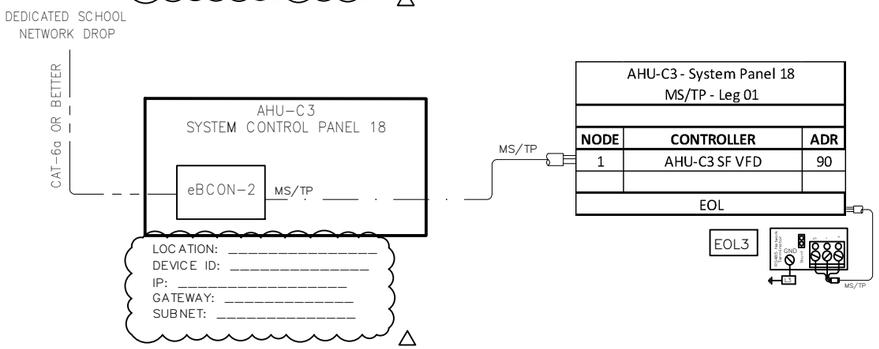
AREA C



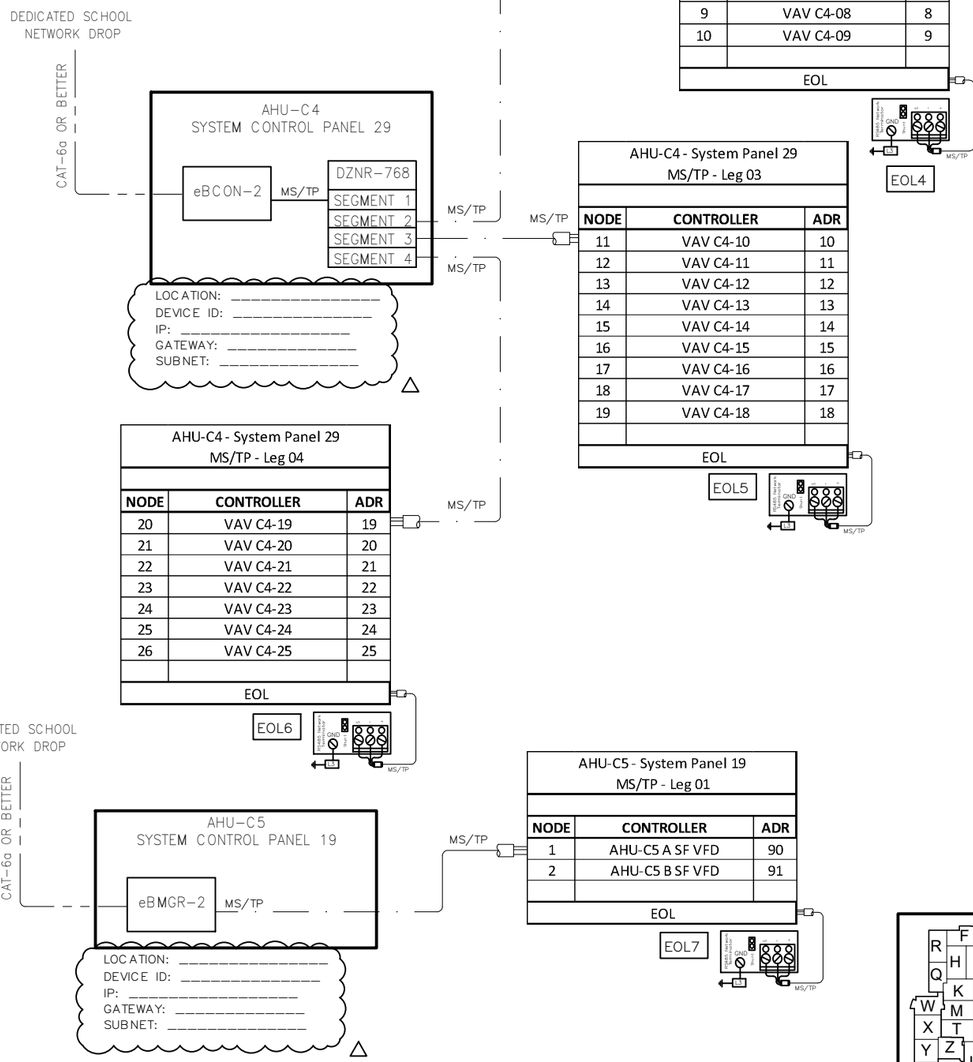
AHU-C1 - System Panel 16 MS/TP - Leg 01		
NODE	**CONTROLLER**	**ADR**
1	AHU-C1 SF VFD	90
2	VAV C1-01	1
3	VAV C1-02	2
4	FCU-C1	3
5	VAV C1-03	4
6	VAV C1-04	5
7	VAV C1-05	6
8	VAV C1-06	7
9	VAV C1-07	8
10	VAV C1-08	9
11	VAV FCU-C2	10
EOL		



AHU-C2 - System Panel 17 MS/TP - Leg 01		
NODE	**CONTROLLER**	**ADR**
1	AHU-C2 A SF VFD	90
2	AHU-C2 B SF VFD	91
EOL		



AHU-C3 - System Panel 18 MS/TP - Leg 01		
NODE	**CONTROLLER**	**ADR**
1	AHU-C3 SF VFD	90
EOL		



AHU-C4 - System Panel 29 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-C4 SF VFD	90
2	VAV C4-01	1
3	VAV C4-02	2
4	VAV C4-03	3
5	VAV C4-04	4
6	VAV C4-05	5
7	VAV C4-06	6
8	VAV C4-07	7
9	VAV C4-08	8
10	VAV C4-09	9
EOL		

AHU-C4 - System Panel 29 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
11	VAV C4-10	10
12	VAV C4-11	11
13	VAV C4-12	12
14	VAV C4-13	13
15	VAV C4-14	14
16	VAV C4-15	15
17	VAV C4-16	16
18	VAV C4-17	17
19	VAV C4-18	18
EOL		

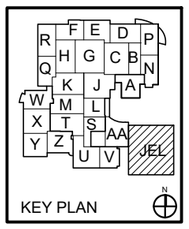
AHU-C4 - System Panel 29 MS/TP - Leg 04		
NODE	**CONTROLLER**	**ADR**
20	VAV C4-19	19
21	VAV C4-20	20
22	VAV C4-21	21
23	VAV C4-22	22
24	VAV C4-23	23
25	VAV C4-24	24
26	VAV C4-25	25
EOL		

AHU-C5 - System Panel 19 MS/TP - Leg 01		
NODE	**CONTROLLER**	**ADR**
1	AHU-C5 A SF VFD	90
2	AHU-C5 B SF VFD	91
EOL		

BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

NOTES:
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2. REFER TO ELECTRICAL AND TECHNOLOGY DESIGN DRAWINGS FOR LOCATIONS OF ALL EXISTING OR NEW SYSTEM CONTROL ENCLOSURES. UPDATE RISERS WITH CONFIRMED INSTALLATION LOCATIONS FOR INCLUSION IN AS-BUILT PRINTS.
3. ALL VAV POWER PANELS SHALL BE LOCATED ADJACENT TO THEIR RESPECTIVE AIR HANDLER'S SYSTEM CONTROL PANEL. SEE VAV POWER PANELS SHEET FOR FURTHER DETAILS.



Delta Controls
Temperature Control Services
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LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

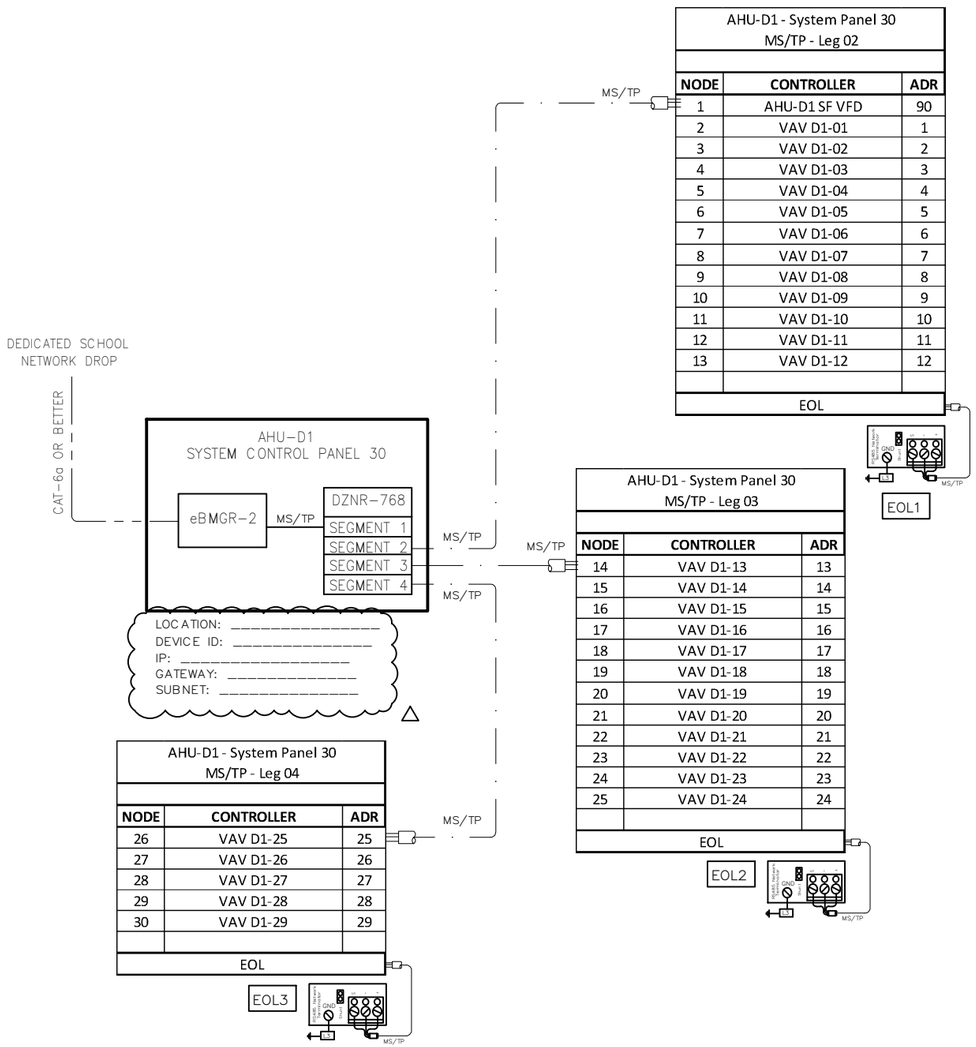
CONTRACT NO:

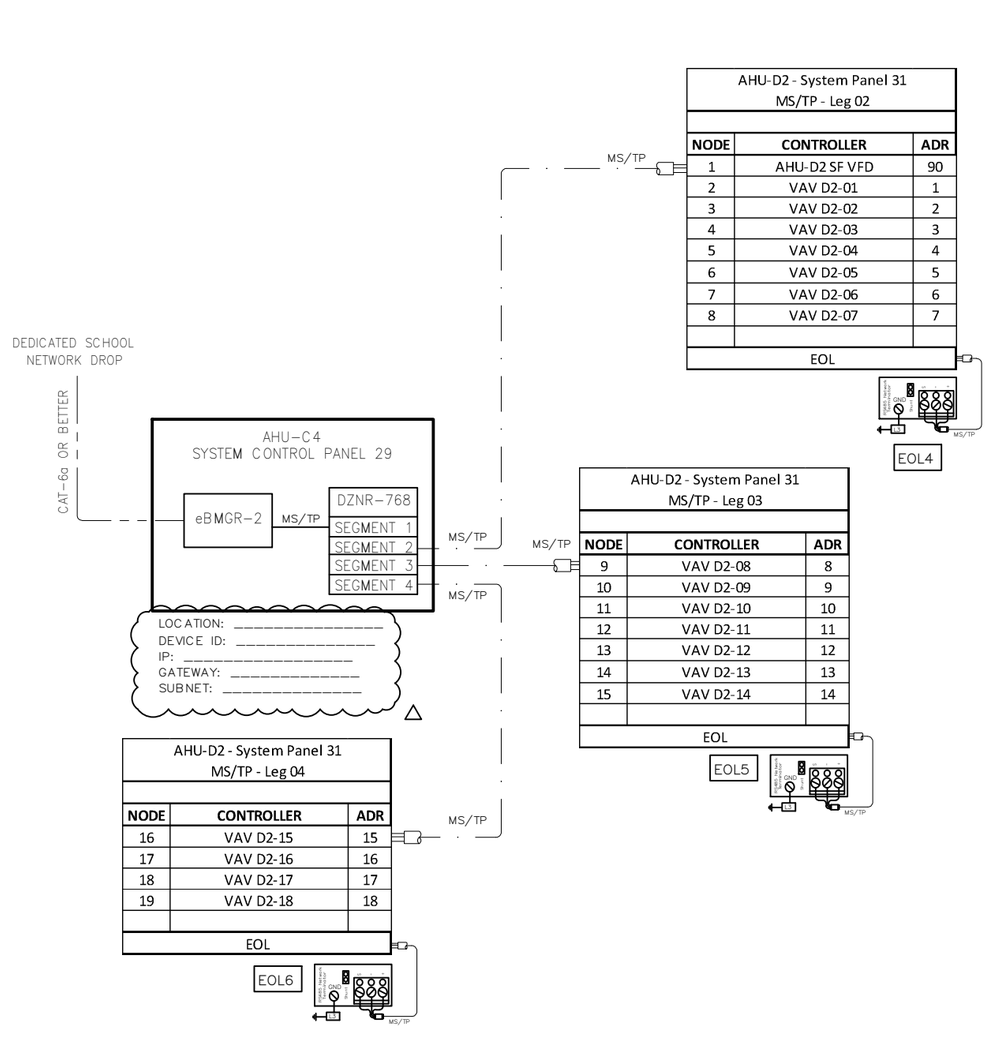
SHEET
RISER-06
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA D

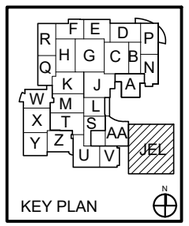




BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

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REVISIONS	
DATE	REMARKS

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DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
RISER-07
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA E

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-E1
SYSTEM CONTROL PANEL 32

eBMGR-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

MS/TP

AHU-E1 - System Panel 32 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-E1 SF VFD	90
2	VAV E1-01	1
3	VAV E1-02	2
4	VAV E1-03	3
5	VAV E1-04	4
6	VAV E1-05	5
7	VAV E1-06	6
EOL		

EOL1

AHU-E1 - System Panel 32 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
8	VAV E1-07	7
9	VAV E1-08	8
10	VAV E1-09	9
11	VAV E1-10	10
12	VAV E1-11	11
13	VAV E1-12	12
14	VAV E1-13	13
EOL		

EOL2

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-E2
SYSTEM CONTROL PANEL 33

eBMGR-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

MS/TP

AHU-E2 - System Panel 33 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-E2 SF VFD	90
2	VAV E2-01	1
3	VAV E2-02	2
4	VAV E2-03	3
5	VAV E2-04	4
6	VAV E2-05	5
7	VAV E2-06	6
8	VAV E2-07	7
9	VAV E2-08	8
10	VAV E2-09	9
EOL		

EOL3

AHU-E2 - System Panel 33 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
11	VAV E2-10	10
12	VAV E2-11	11
13	VAV E2-12	12
14	VAV E2-13	13
15	VAV E2-14	14
16	VAV E2-15	15
17	VAV E2-16	16
18	VAV E2-17	17
19	VAV E2-18	18
EOL		

EOL4

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-E3
SYSTEM CONTROL PANEL 34

eBCON-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

MS/TP

AHU-E3 - System Panel 34 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-E3 SF VFD	90
2	VAV E3-01	1
3	VAV E3-02	2
4	VAV E3-03	3
5	VAV E3-04	4
6	VAV E3-05	5
EOL		

EOL6

AHU-E2 - System Panel 33 MS/TP - Leg 04		
NODE	**CONTROLLER**	**ADR**
20	VAV E2-19	19
21	VAV E2-20	20
22	VAV E2-21	21
23	VAV E2-22	22
24	VAV E2-23	23
25	VAV E2-24	24
EOL		

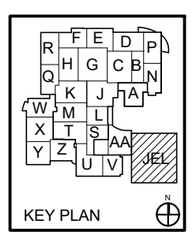
EOL5

AHU-E3 - System Panel 34 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
7	VAV E3-06	6
8	VAV E3-07	7
9	VAV E3-08	8
10	VAV E3-09	9
11	VAV E3-10	10
EOL		

EOL7

BILL OF MATERIALS

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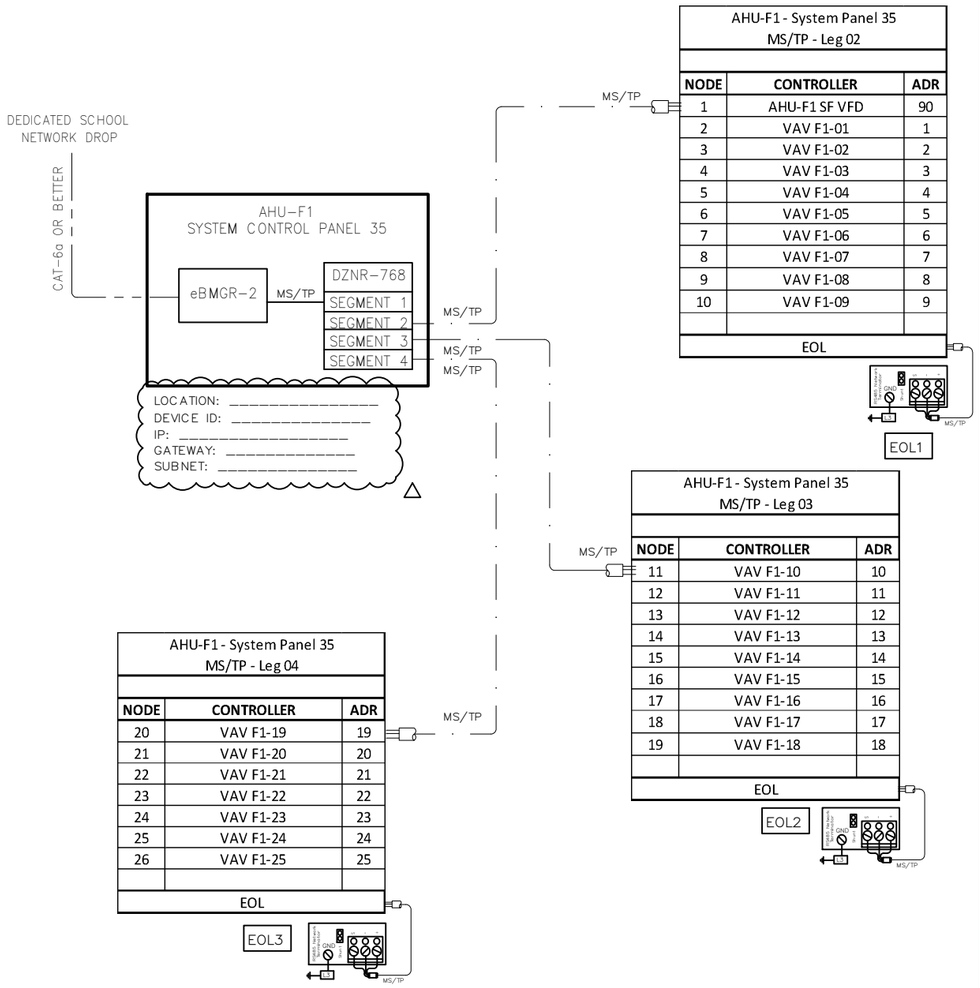
CONTRACT NO:

SHEET
RISER-08
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA F

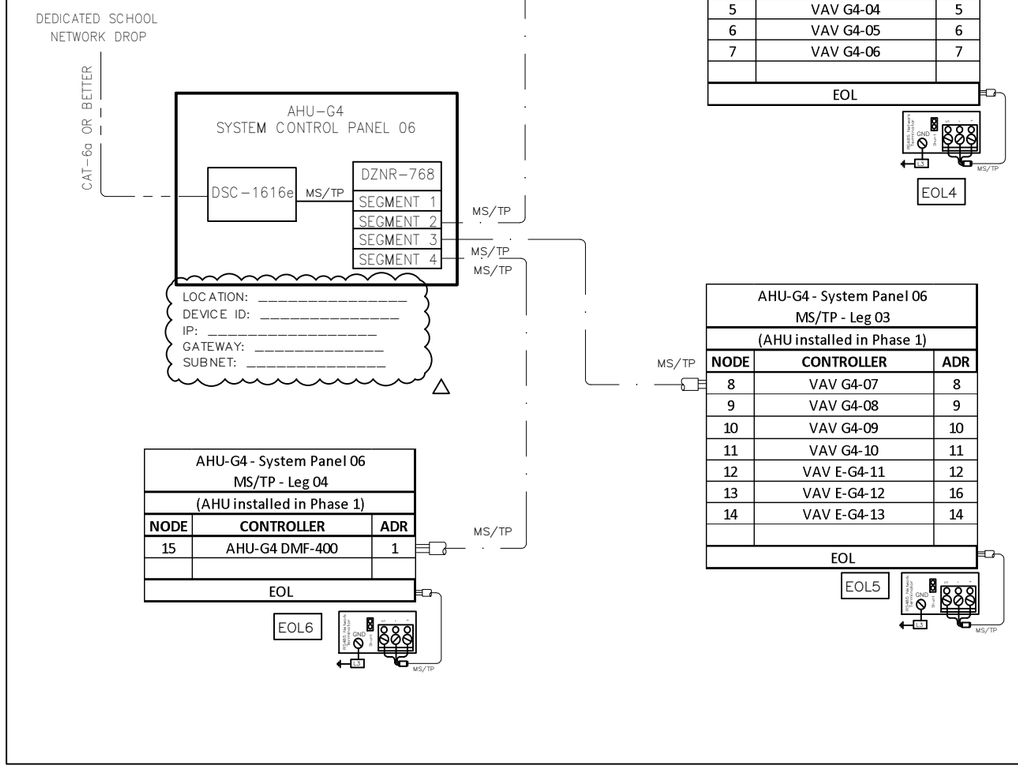


AHU-F1 - System Panel 35 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-F1 SF VFD	90
2	VAV F1-01	1
3	VAV F1-02	2
4	VAV F1-03	3
5	VAV F1-04	4
6	VAV F1-05	5
7	VAV F1-06	6
8	VAV F1-07	7
9	VAV F1-08	8
10	VAV F1-09	9
EOL		

AHU-F1 - System Panel 35 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
11	VAV F1-10	10
12	VAV F1-11	11
13	VAV F1-12	12
14	VAV F1-13	13
15	VAV F1-14	14
16	VAV F1-15	15
17	VAV F1-16	16
18	VAV F1-17	17
19	VAV F1-18	18
EOL		

AHU-F1 - System Panel 35 MS/TP - Leg 04		
NODE	**CONTROLLER**	**ADR**
20	VAV F1-19	19
21	VAV F1-20	20
22	VAV F1-21	21
23	VAV F1-22	22
24	VAV F1-23	23
25	VAV F1-24	24
26	VAV F1-25	25
EOL		

AREA G*



AHU-G4 - System Panel 06 MS/TP - Leg 02 (AHU installed in Phase 1)		
NODE	**CONTROLLER**	**ADR**
1	AHU-G4 SF VFD	90
2	VAV G4-01	2
3	VAV G4-02	3
4	VAV G4-03	4
5	VAV G4-04	5
6	VAV G4-05	6
7	VAV G4-06	7
EOL		

AHU-G4 - System Panel 06 MS/TP - Leg 03 (AHU installed in Phase 1)		
NODE	**CONTROLLER**	**ADR**
8	VAV G4-07	8
9	VAV G4-08	9
10	VAV G4-09	10
11	VAV G4-10	11
12	VAV E-G4-11	12
13	VAV E-G4-12	16
14	VAV E-G4-13	14
EOL		

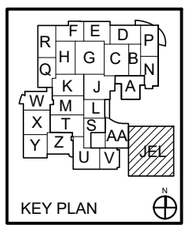
AHU-G4 - System Panel 06 MS/TP - Leg 04 (AHU installed in Phase 1)		
NODE	**CONTROLLER**	**ADR**
15	AHU-G4 DMF-400	1
EOL		

* AHU-G4 PANEL INSTALLED IN PHASE 2, NEW EQUIPMENT AND MS/TP SUB NETWORK BEING ADDED IN PHASE 3. SEE AHU-G4 PANEL DEVICE ADDS UNDER PHASE 3 PROJECT SHEET FOR ADDITIONAL DETAILS.

BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

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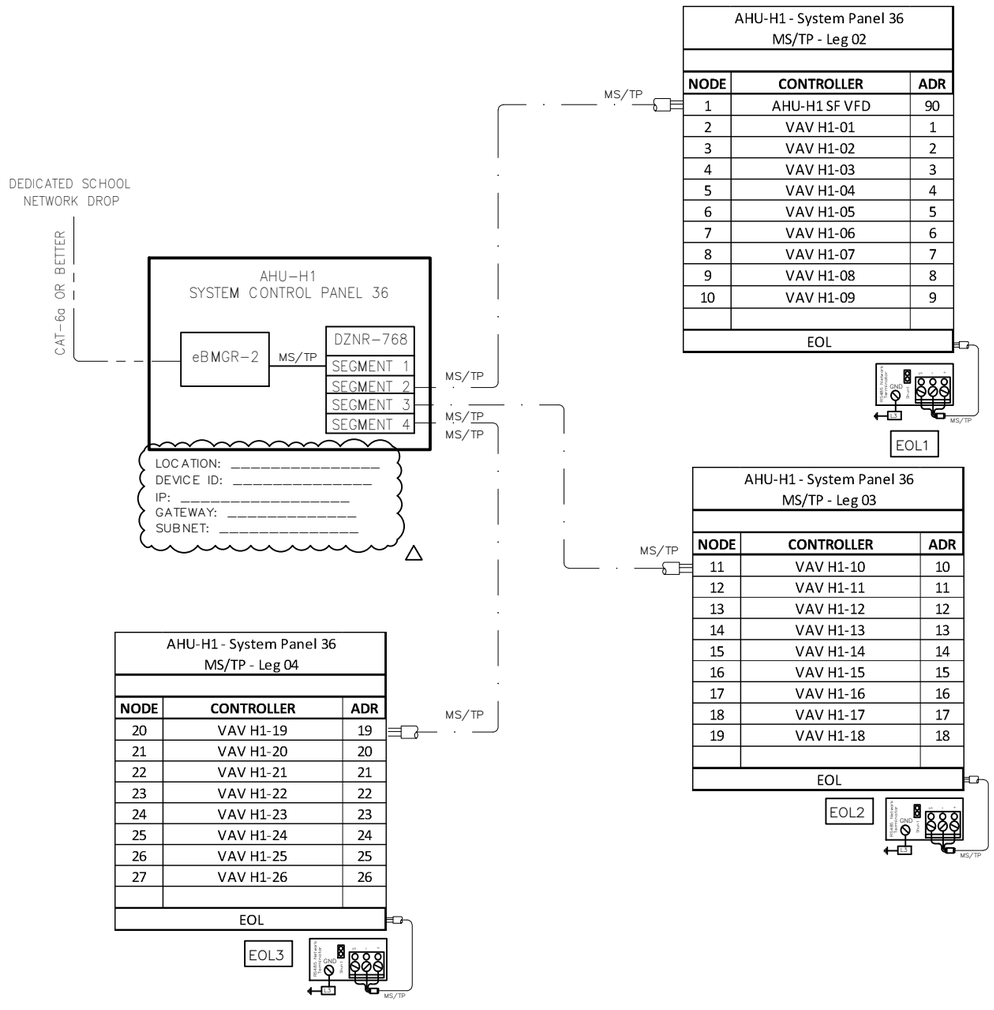
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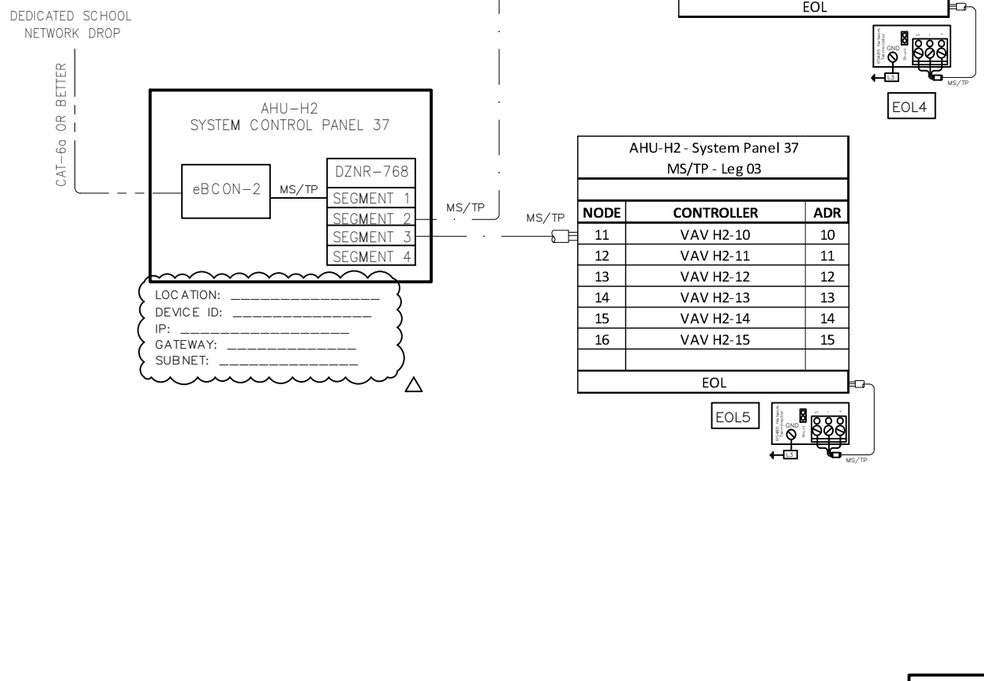
SHEET
RISER-09
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA H

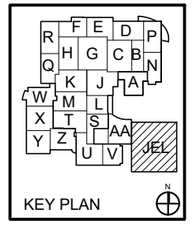




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CONTRACT NO:

SHEET
RISER-10
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA J

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-J2
SYSTEM CONTROL PANEL 21

eBCON-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

AHU-J2 - System Panel 21
MS/TP - Leg 02

NODE	CONTROLLER	ADR
1	AHU-J2 SF VFD	90
2	VAV-J2-01	1
3	VAV-J2-03	2
4	FCU-G1	3
5	VAV-J2-02	4
EOL		

EOL1

AHU-J2 - System Panel 21
MS/TP - Leg 03

NODE	CONTROLLER	ADR
6	VAV J2-04	5
7	VAV J2-05	6
8	VAV J2-06	7
9	VAV J2-07	8
10	VAV J2-08	9
11	VAV J2-09	10
12	VAV J2-10	11
13	VAV J2-11	12
14	VAV J2-12	13
15	VAV J2-13	14
16	VAV J2-14	15
EOL		

EOL2

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-J3
SYSTEM CONTROL PANEL 22

eBCON-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

AHU-J3 - System Panel 22
MS/TP - Leg 02

NODE	CONTROLLER	ADR
1	AHU-J3 SF VFD	90
2	VAV J3-01	1
3	VAV J3-02	2
4	VAV J3-15	15
5	VAV J3-16	16
6	VAV J3-03	3
7	VAV J3-04	4
8	VAV J3-05	5
9	VAV J3-06	6
EOL		

EOL6

AHU-J3 TOUCHSCREEN
SYSTEM CTRL 56

LOCATED IN AHU-J3
(CONDITIONED CONTROL ENCLOSURE
ON UNIT FOR LOCAL BAS ACCESS)

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-J1
SYSTEM CONTROL PANEL 20

eBMGR-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

AHU-J1 - System Panel 20
MS/TP - Leg 02

NODE	CONTROLLER	ADR
1	AHU-J1 SF VFD	90
2	VAV J1-01	1
3	VAV J1-02	2
4	VAV J1-03	3
5	VAV J1-04	4
6	VAV J1-05	5
7	VAV J1-06	6
8	VAV J1-07	7
9	VAV J1-08	8
10	VAV J1-09	9
11	VAV J1-10	10
EOL		

EOL3

AHU-J1 - System Panel 20
MS/TP - Leg 03

NODE	CONTROLLER	ADR
12	VAV J1-11	11
13	VAV J1-12	12
14	VAV J1-13	13
15	VAV J1-14	14
16	VAV J1-15	15
17	VAV J1-16	16
18	VAV J1-17	17
19	VAV J1-18	18
20	VAV J1-19	19
21	VAV J1-20	20
EOL		

EOL4

AHU-J1 - System Panel 20
MS/TP - Leg 04

NODE	CONTROLLER	ADR
22	Pwr Mtr Elec Rm MDPA Left	80
23	Pwr Mtr Elec Rm MDPA Rt	81
24	Pwr Mtr Elec Rm MDPB Left A	82
23	Pwr Mtr Elec Rm MDPB Left B	83
24	Pwr Mtr Elec Rm MDPB Rt A	84
25	Pwr Mtr Elec Rm MDBP Rt B	85
26	Pwr Mtr Cent Plant MDPC	86
EOL		

EOL5

AHU-J3 - System Panel 22
MS/TP - Leg 03

NODE	CONTROLLER	ADR
10	VAV J3-07	7
11	VAV J3-08	8
12	VAV J3-09	9
13	VAV J3-10	10
14	VAV J3-11	11
15	VAV J3-12	12
16	VAV J3-13	13
17	VAV J3-14	14
EOL		

EOL7

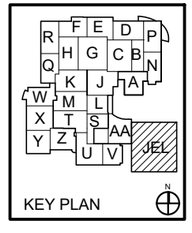
BILL OF MATERIALS

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3. ALL VAV POWER PANELS SHALL BE LOCATED ADJACENT TO THEIR RESPECTIVE AIR HANDLER'S SYSTEM CONTROL PANEL. SEE VAV POWER PANELS SHEET FOR FURTHER DETAILS.

△

KEY PLAN



ETHERNET & RS-485 NETWORK RISER (PHASE 3) AREA J

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

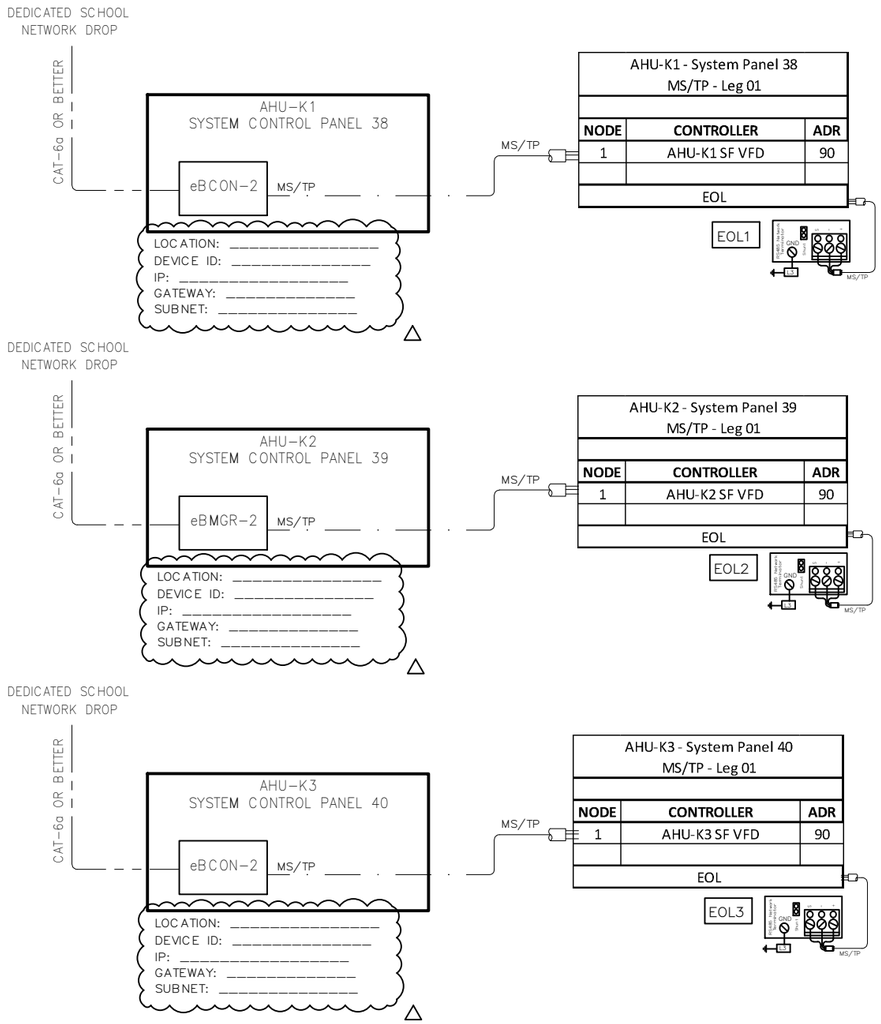
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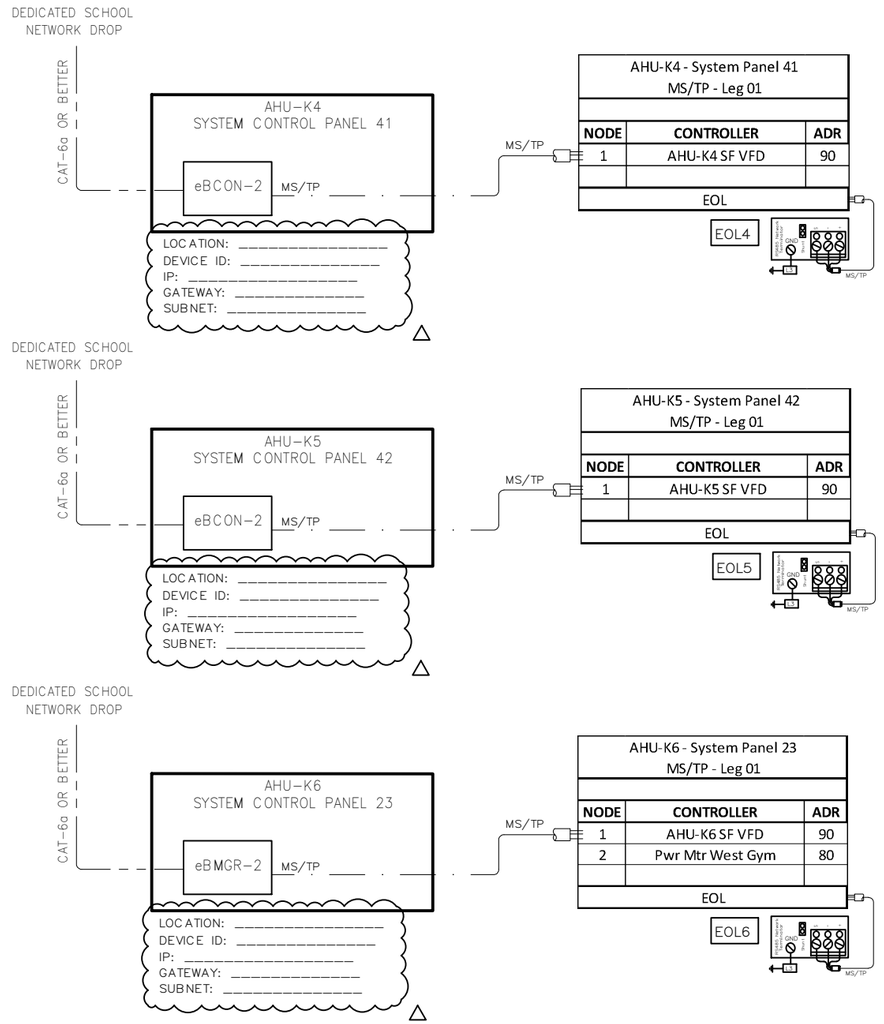
SHEET
RISER-11
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

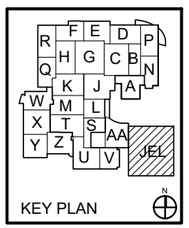
AREA K





BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION.



NOTES:
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Delta Controls
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PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

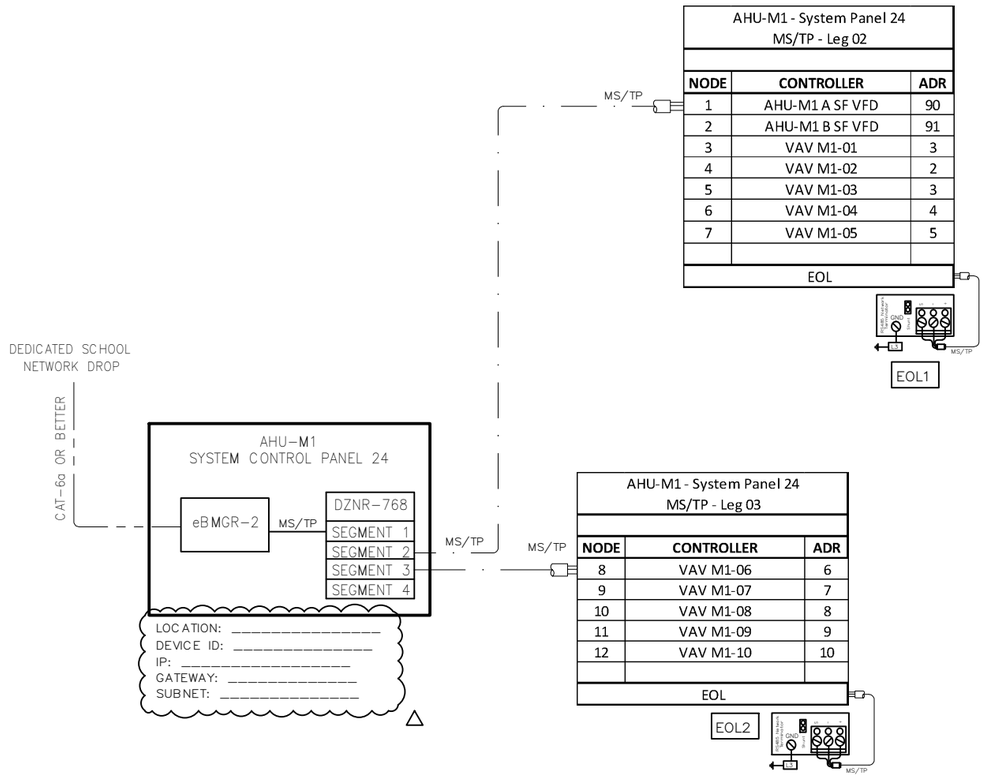
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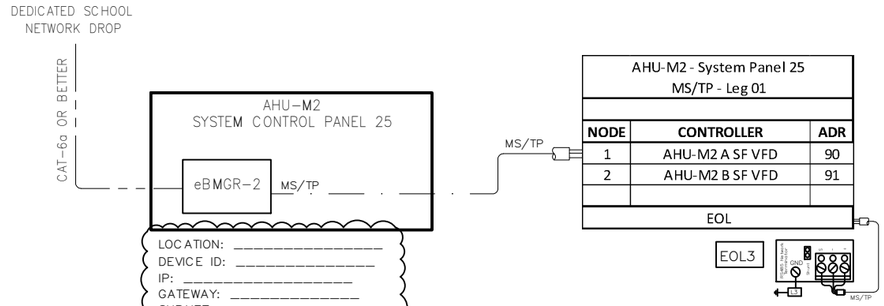
SHEET
RISER-12
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA M

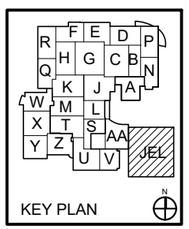




BILL OF MATERIALS

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

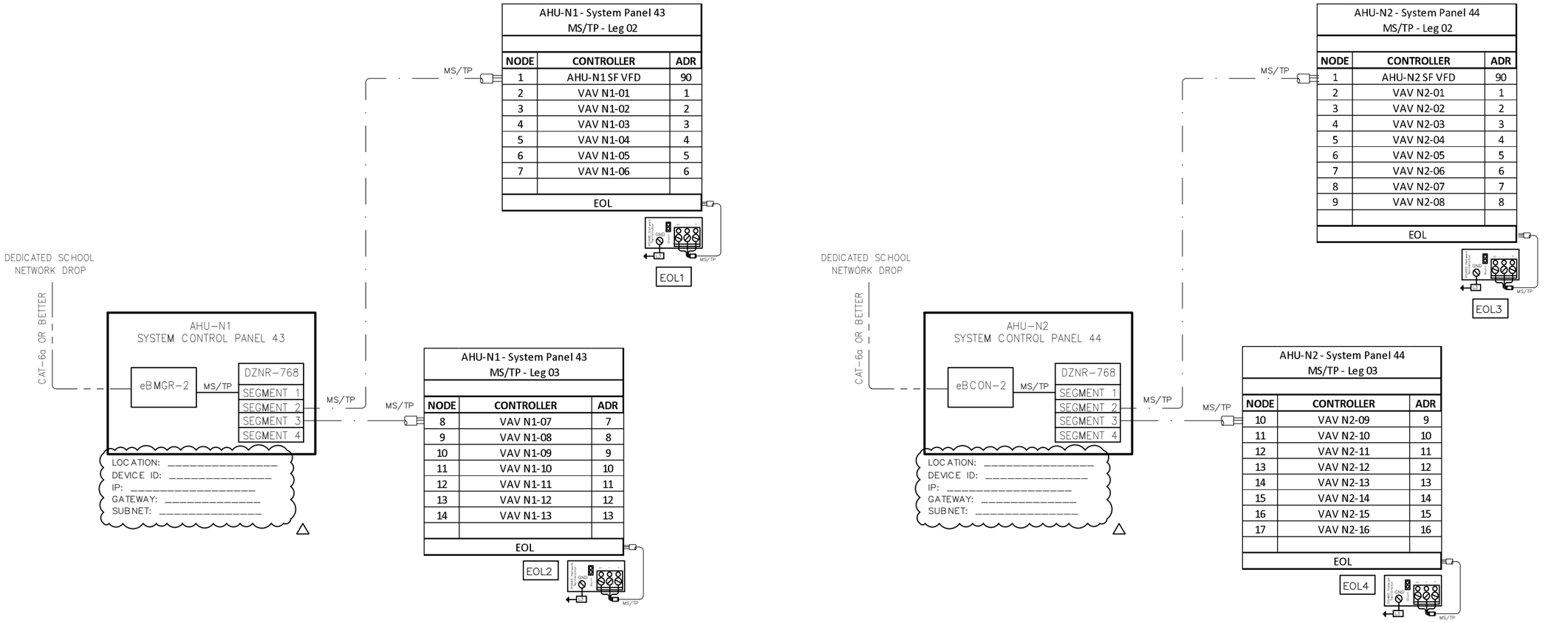
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
RISER-13
JOB NUMBER:
J-2304001

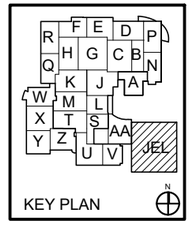
AREA N



BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

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ETHERNET & RS-485 NETWORK RISER (PHASE 3) AREA N

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
RISER-14
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA P

AHU-P1 - System Panel 45
MS/TP - Leg 02

NODE	CONTROLLER	ADR
1	AHU-P1 SF VFD	90
2	VAV P1-01	1
3	VAV P1-02	2
4	VAV P1-03	3
5	VAV P1-04	4
6	VAV P1-05	5
7	VAV P1-06	6
8	VAV P1-07	7
9	VAV P1-08	8
10	VAV P1-09	9
11	VAV P1-10	10
12	VAV P1-11	11
13	VAV P1-12	12
EOL		

MS/TP

EOL1

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-P1
SYSTEM CONTROL PANEL 45

eBCON-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

AHU-P1 - System Panel 45
MS/TP - Leg 03

NODE	CONTROLLER	ADR
14	VAV P1-13	13
15	VAV P1-14	14
16	VAV P1-15	15
17	VAV P1-16	16
18	VAV P1-17	17
19	VAV P1-18	18
20	VAV P1-19	19
21	VAV P1-20	20
22	VAV P1-21	21
23	VAV P1-22	22
24	VAV P1-23	23
25	VAV P1-24	24
EOL		

MS/TP

EOL2

AHU-P1 - System Panel 45
MS/TP - Leg 04

NODE	CONTROLLER	ADR
26	VAV P1-25	25
27	VAV P1-26	26
28	VAV P1-27	27
29	VAV P1-28	28
30	VAV P1-29	29
31	VAV P1-30	30
32	VAV P1-31	31
33	VAV P1-32	32
34	VAV P1-33	33
35	VAV P1-34	34
36	VAV P1-35	35
EOL		

MS/TP

EOL3

AHU-P2 - System Panel 46
MS/TP - Leg 02

NODE	CONTROLLER	ADR
1	AHU-P2 SF VFD	90
2	VAV P2-01	1
3	VAV P2-02	2
4	VAV P2-03	3
5	VAV P2-04	4
6	VAV P2-05	5
7	VAV P2-06	6
8	VAV P2-07	7
9	VAV P2-08	8
10	VAV P2-09	9
EOL		

MS/TP

EOL4

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-P2
SYSTEM CONTROL PANEL 46

eBMGR-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

AHU-P2 - System Panel 46
MS/TP - Leg 03

NODE	CONTROLLER	ADR
11	VAV P2-10	10
12	VAV P2-11	11
13	VAV P2-12	12
14	VAV P2-13	13
15	VAV P2-14	14
16	VAV P2-15	15
17	VAV P2-16	16
18	VAV P2-17	17
19	VAV P2-18	18
EOL		

MS/TP

EOL5

AHU-P2 - System Panel 46
MS/TP - Leg 04

NODE	CONTROLLER	ADR
20	VAV P2-19	19
21	VAV P2-20	20
22	VAV P2-21	21
23	VAV P2-22	22
24	VAV P2-23	23
25	VAV P2-24	24
26	VAV P2-25	25
EOL		

MS/TP

EOL6

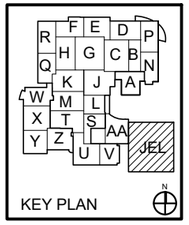
BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

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△

KEY PLAN



Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
RISER-15
JOB NUMBER:
J-2304001

ETHERNET & RS-485 NETWORK RISERS - PHASE 3
(SEE INSTALLATION STANDARDS - ELECTRICAL FOR CABLE REQUIREMENTS)

AREA Q

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-Q1
SYSTEM CONTROL PANEL 47

eBMGR-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

MS/TP

AHU-Q1 - System Panel 47 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-Q1 SF VFD	90
2	VAV Q1-01	1
3	VAV Q1-02	2
4	VAV Q1-03	3
5	VAV Q1-04	4
6	VAV Q1-05	5
7	VAV Q1-06	6
8	VAV Q1-07	7
9	VAV Q1-08	8
EOL		

EOL1

MS/TP

AHU-Q1 - System Panel 47 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
10	VAV Q1-09	9
11	VAV Q1-10	10
12	VAV Q1-11	11
13	VAV Q1-12	12
14	VAV Q1-13	13
15	VAV Q1-14	14
16	VAV Q1-15	15
EOL		

EOL2

MS/TP

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-Q2
SYSTEM CONTROL PANEL 48

eBMGR-2 — MS/TP — DZNR-768
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

MS/TP

AHU-Q2 - System Panel 48 MS/TP - Leg 02		
NODE	**CONTROLLER**	**ADR**
1	AHU-Q2 SF VFD	90
2	VAV Q2-01	1
3	VAV Q2-02	2
4	VAV Q2-03	3
5	VAV Q2-04	4
6	VAV Q2-05	5
7	VAV Q2-06	6
8	VAV Q2-07	7
9	VAV Q2-08	8
EOL		

EOL3

MS/TP

AHU-Q2 - System Panel 48 MS/TP - Leg 03		
NODE	**CONTROLLER**	**ADR**
10	VAV Q2-09	9
11	VAV Q2-10	10
12	VAV Q2-11	11
13	VAV Q2-12	12
14	VAV Q2-13	13
15	VAV Q2-14	14
16	VAV Q2-15	15
17	VAV Q2-16	16
18	VAV Q2-17	17
EOL		

EOL4

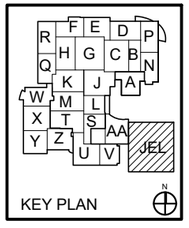
MS/TP

BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

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KEY PLAN



ETHERNET & RS-485 NETWORK RISER (PHASE 3) AREA Q

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

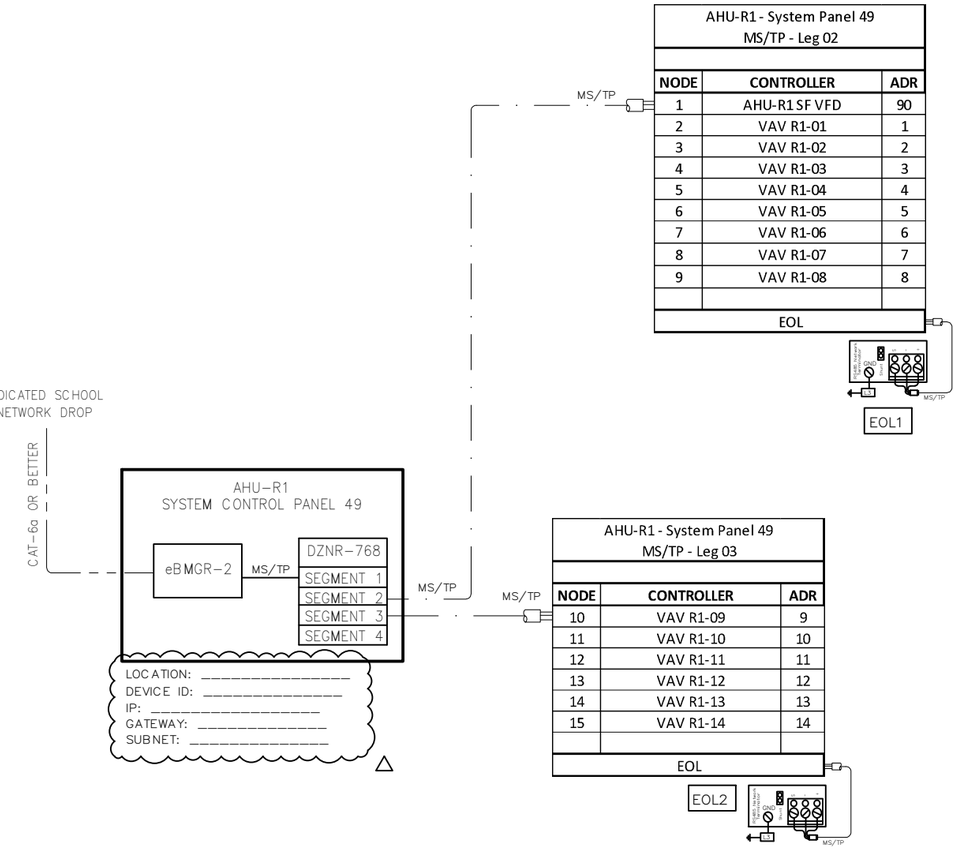
REVISIONS	
DATE	REMARKS

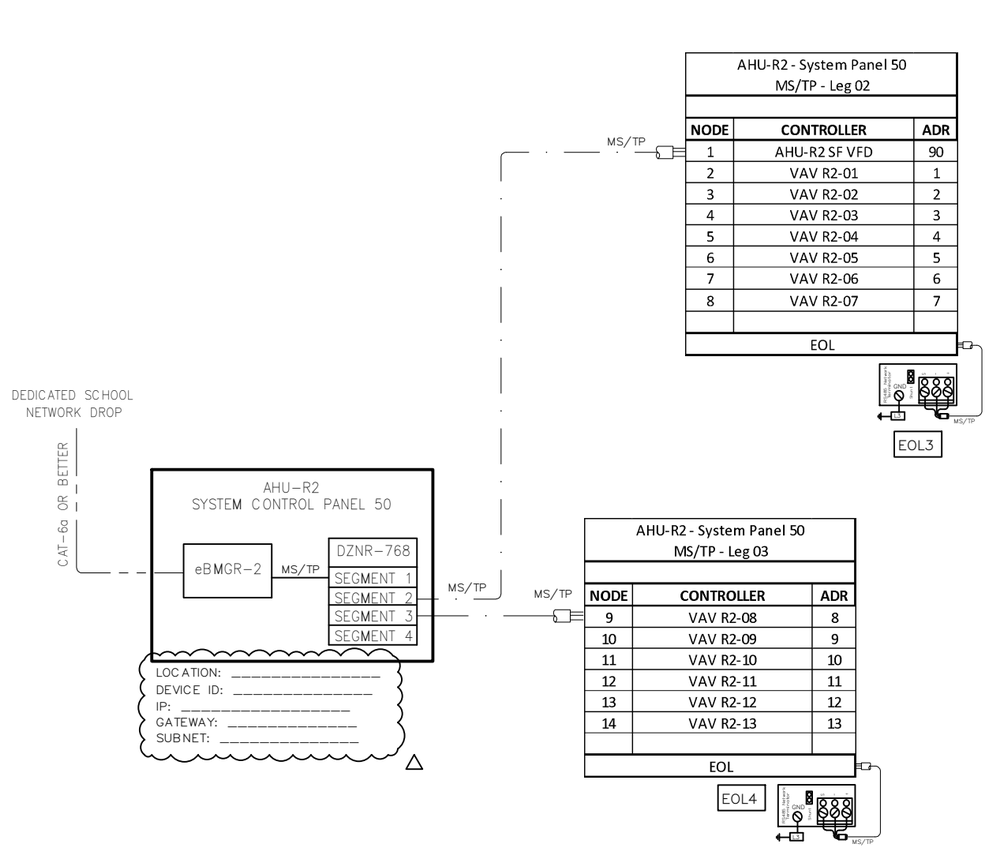
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
RISER-16
JOB NUMBER:
J-2304001

AREA R

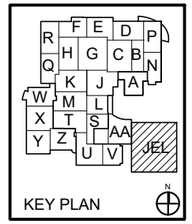




BILL OF MATERIALS

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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

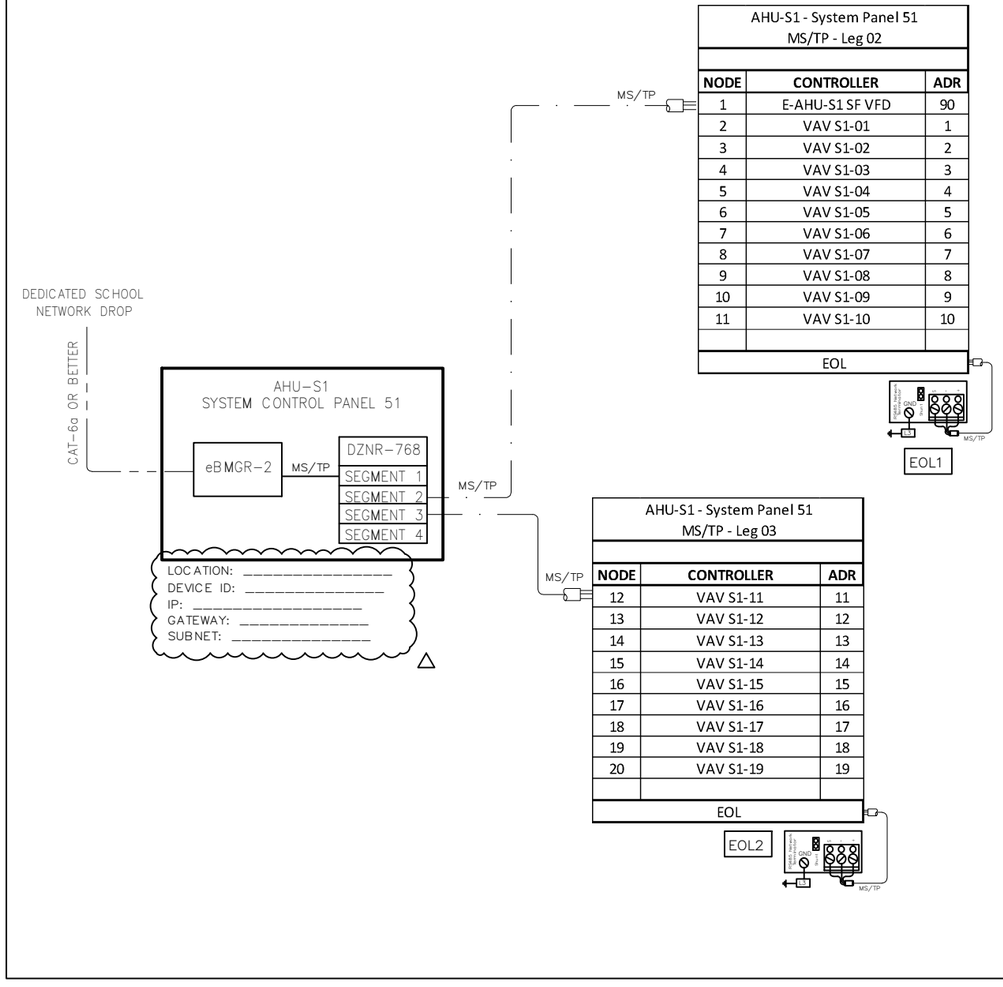
CONTRACT NO:

SHEET
RISER-17
JOB NUMBER:
J-2304001

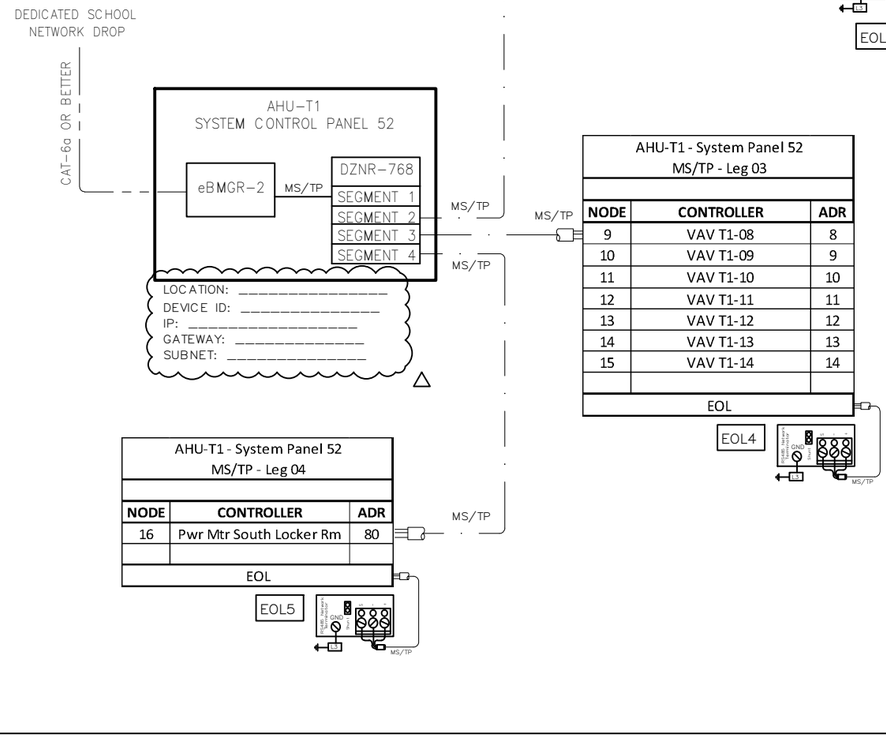
ETHERNET & RS–485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA S



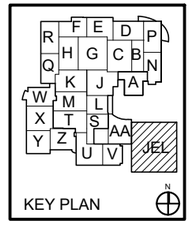
AREA T



BILL OF MATERIALS

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KEY PLAN

ETHERNET & RS–485 NETWORK RISER (PHASE 3) AREAS S & T

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
RISER–18
JOB NUMBER:
J–2304001

ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA AA △

DEDICATED SCHOOL NETWORK DROP

CAT-6a OR BETTER

AHU-AA1
SYSTEM CONTROL PANEL 26

eB MGR-2 — MS/TP — DZNR-768
- SEGMENT 1
- SEGMENT 2
- SEGMENT 3
- SEGMENT 4

MS/TP

LOCATION: _____
DEVICE ID: _____
IP: _____
GATEWAY: _____
SUBNET: _____

△

MS/TP

AHU-AA1 - System Panel 26
MS/TP - Leg 02

NODE	CONTROLLER	ADR
1	AHU-AA1 A SF VFD	90
2	AHU-AA1 B SF VFD	91
3	VAV AA1-27	1
4	VAV AA1-28	2
5	VAV AA1-29	3
6	VAV AA1-17	4
7	VAV AA1-8	5
8	VAV AA1-7	6
9	VAV AA1-9	7
10	VAV AA1-10	8
11	VAV AA1-11	9
12	VAV AA1-12	10
13	VAV AA1-13	11
14	VAV AA1-15	12
15	VAV AA1-14	13
16	VAV AA1-16	14
17	VAV AA1-18	15
18	VAV AA1-19	16
19	VAV AA1-20	17
20	VAV AA1-21	18
21	VAV AA1-22	19
22	VAV AA1-23	20
23	VAV AA1-24	21
24	VAV AA1-25	22
25	VAV AA1-26	23
EOL		

EOL1

MS/TP

AHU-AA1 - System Panel 26
MS/TP - Leg 03

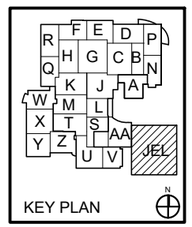
NODE	CONTROLLER	ADR
26	VAV AA1-2	24
27	VAV AA1-6	25
28	VAV AA1-1	26
29	H-AA3-B	80
30	H-AA3-D	81
31	H-AA2-B	82
32	H-AA2-D	83
33	VAV AA1-3	27
34	VAV AA1-4	28
35	VAV AA1-5	29
36	H-AA1-B	84
37	H-AA1-D	85
38	HVLS CF-1	86
39	HVLS CF-2	87
40	HVLS CF-3	88
EOL		

EOL2

BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

NOTES:
1. ALL SYSTEM CONTROL PANELS WILL HAVE A DEDICATED ETHERNET NETWORK DROP FROM THE SCHOOL'S NETWORK. INSTALL CAT 6a OR BETTER CABLE FROM PANEL TO DESIGNATED DROP.
2. REFER TO ELECTRICAL AND TECHNOLOGY DESIGN DRAWINGS FOR LOCATIONS OF ALL EXISTING OR NEW SYSTEM CONTROL ENCLOSURES. UPDATE RISERS WITH CONFIRMED INSTALLATION LOCATIONS FOR INCLUSION IN AS-BUILT PRINTS.
3. ALL VAV POWER PANELS SHALL BE LOCATED ADJACENT TO THEIR RESPECTIVE AIR HANDLER'S SYSTEM CONTROL PANEL. SEE VAV POWER PANELS SHEET FOR FURTHER DETAILS.



Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
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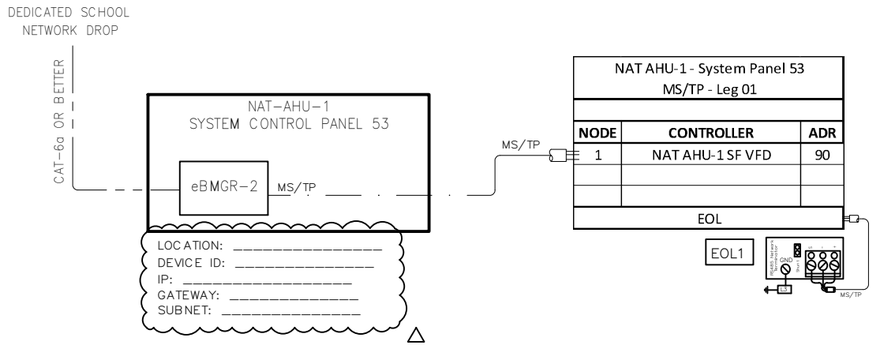
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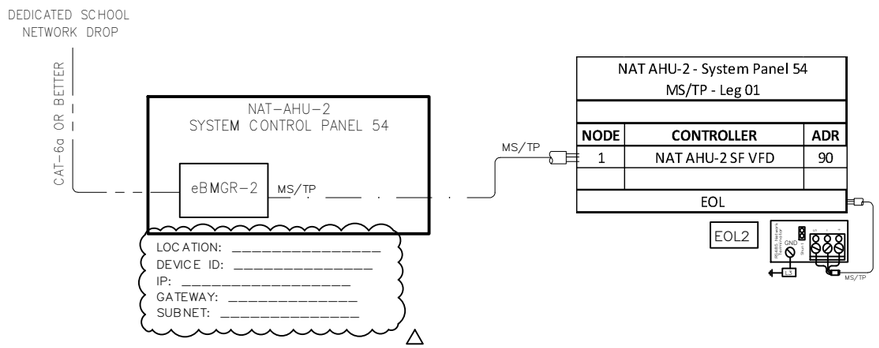
SHEET
RISER-19
JOB NUMBER:
J-2304001

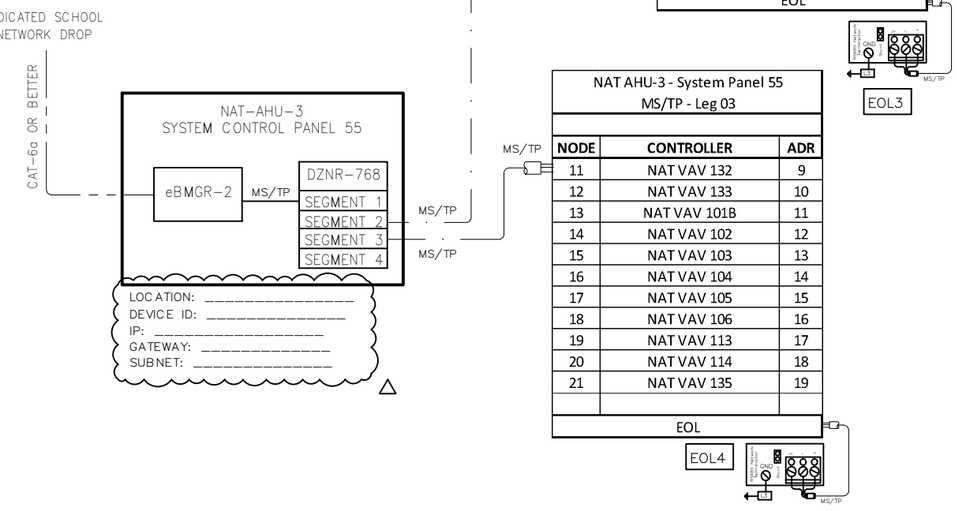
ETHERNET & RS-485 NETWORK RISERS – PHASE 3

(SEE INSTALLATION STANDARDS – ELECTRICAL FOR CABLE REQUIREMENTS)

AREA NATATORIUM



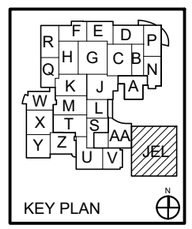




BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

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△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

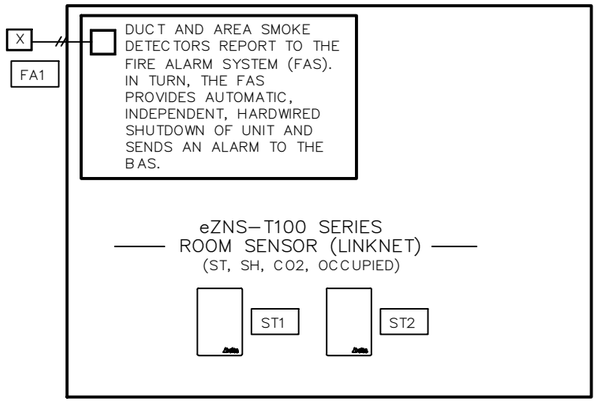
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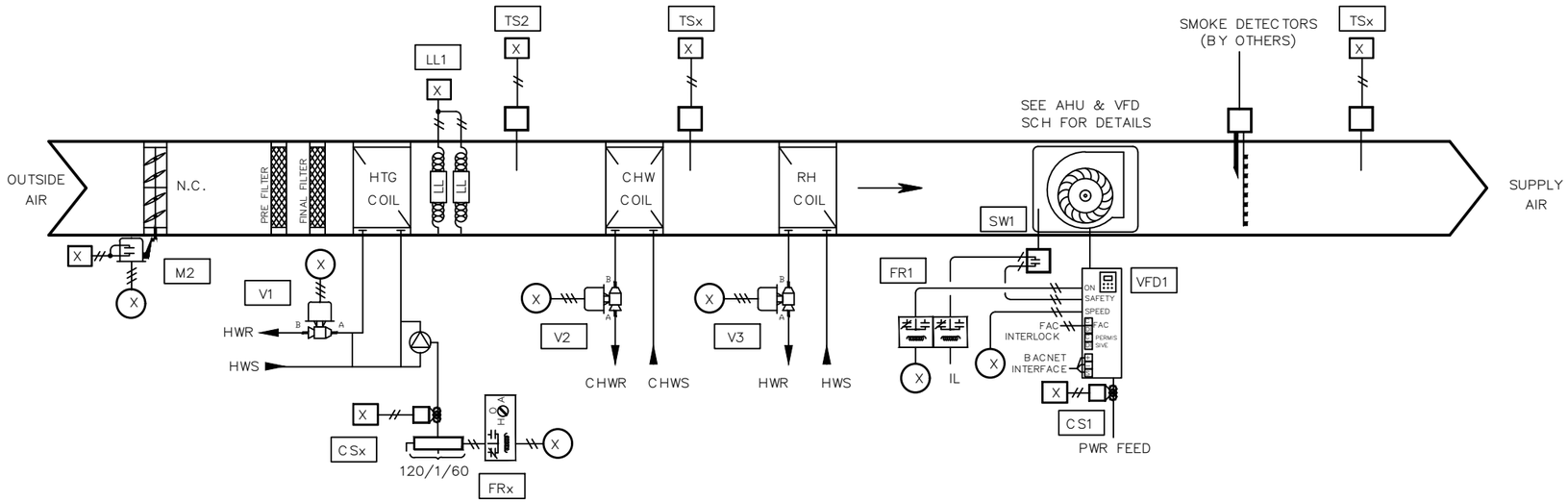
SHEET
RISER-20
JOB NUMBER:
J-2304001

AHU–A2 FIELD DEVICES



BILL OF MATERIAL (PNEUMATIC INSTALLATION MATERIAL USED THROUGHOUT PROJECT)

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
PN1	T-101	499329	T-101 1/4IN OD POLY TUBING 250FT SPOOL	82	Kele	Field
PN2	B-263	499650	B-263 ¼" x ¼" Coupling (50 Pack)	8	Kele	Field
PN3	B-376	499651	B-376 ¼" x1/4" x1/4" Barb Tees (100 Pack)	3	Kele	Field
PN4	B-391	499652	B-391 5/32" and ¼" Plug (50 Pack)	1	Kele	Field
PN5	C-133	499703	C-133 1/4X1/8 MPT COMP FTG PKG50	4	Kele	Field



BILL OF MATERIAL

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NETWORK POINTS

N1 THROUGH Nx

AHU–A2 FIELD DEVICES

Delta Controls

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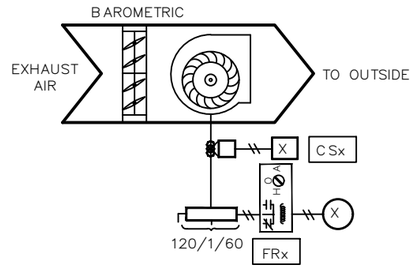
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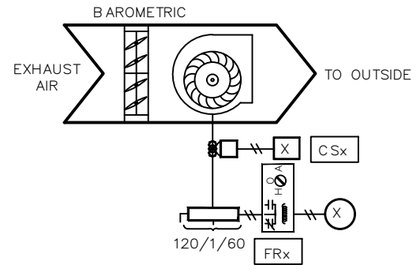
CONTRACT NO:

SHEET
NCHS–99
JOB NUMBER:
J–2304001

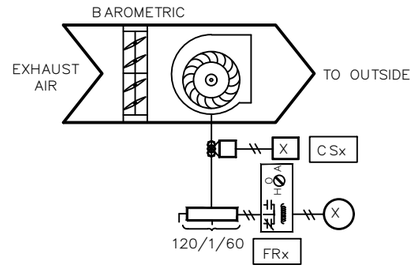
EXHAUST FAN – BAS CONTROLLED
EF–A1



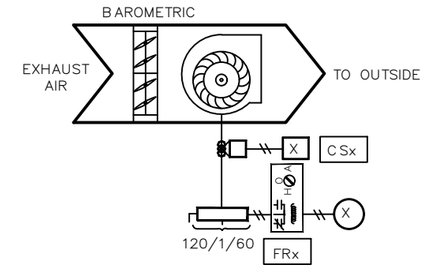
EXHAUST FAN – BAS CONTROLLED
EF–A2



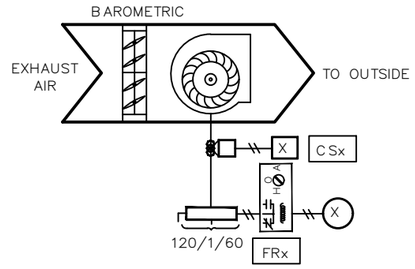
EXHAUST FAN – BAS CONTROLLED
EF–A3



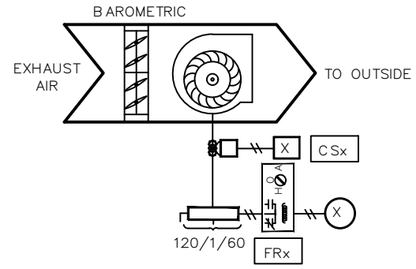
EXHAUST FAN – BAS CONTROLLED
EF–A4



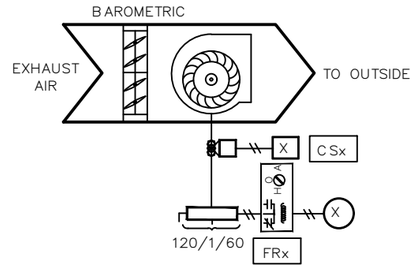
EXHAUST FAN – BAS CONTROLLED
EF–A5



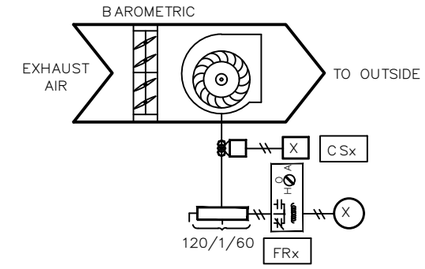
EXHAUST FAN – BAS CONTROLLED
EF–A6



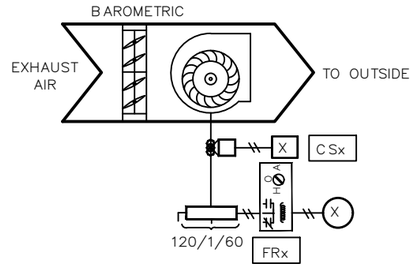
EXHAUST FAN – BAS CONTROLLED
EF–A7



EXHAUST FAN – BAS CONTROLLED
EF–A8



EXHAUST FAN – BAS CONTROLLED
EF–A9



△

NETWORK POINTS
N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AREA A MISC FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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REVISIONS	
DATE	REMARKS

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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–100
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

Point Name	Point Description	Hardware Points				
		AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
PHT	Preheat Discharge Air Temp	X				
EF-A1 STAT	Exhaust Fan A1 Status		X			
EF-A2 STAT	Exhaust Fan A2 Status		X			
EF-A3 STAT	Exhaust Fan A3 Status		X			
EF-A4 STAT	Exhaust Fan A4 Status		X			
EF-A5 STAT	Exhaust Fan A5 Status		X			
EF-A6 STAT	Exhaust Fan A6 Status		X			
EF-A7 STAT	Exhaust Fan A7 Status		X			
EF-A8 STAT	Exhaust Fan A8 Status		X			
EF-A9 STAT	Exhaust Fan A9 Status		X			
LL	Low Limit (Freezestat)		X			
OAD ES	Outside Air Damper Status		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
SF VFD	Supply Fan VFD Speed			X		
EF-A1 SS	Exhaust Fan A1 Start / Stop				X	
EF-A2 SS	Exhaust Fan A2 Start / Stop				X	
EF-A3 SS	Exhaust Fan A3 Start / Stop				X	
EF-A4 SS	Exhaust Fan A4 Start / Stop				X	
EF-A5 SS	Exhaust Fan A5 Start / Stop				X	
EF-A6 SS	Exhaust Fan A6 Start / Stop				X	
EF-A7 SS	Exhaust Fan A7 Start / Stop				X	
EF-A8 SS	Exhaust Fan A8 Start / Stop				X	
EF-A9 SS	Exhaust Fan A9 Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
ST2	Space Temp					X
SH3	Space Humidity					X
S CO22	Space CO2					X
OCC2	Occupied Flag					X
	POINT TOTALS:	**3**	**14**	**5**	**11**	**8**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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SHEET
NCHS-101
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-A2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE, OCCUPANCY SENSOR AUX CONTACT (OCC-S), OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFAn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATING THE PREHEAT VALVE AS NECESSARY. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
CHILLED WATER VALVE SHALL CLOSE
AREA EXHAUST FAN SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

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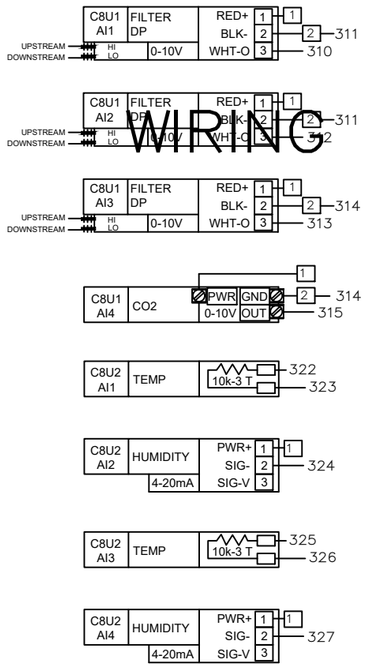
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DATE	REMARKS

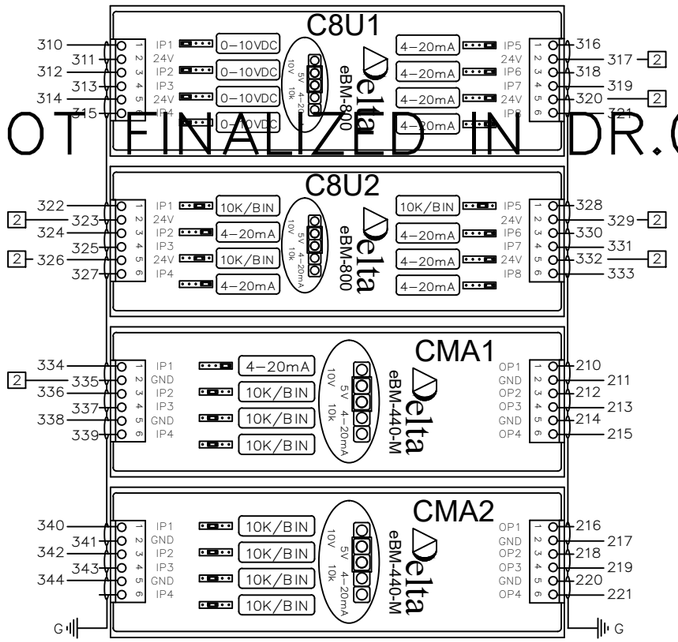
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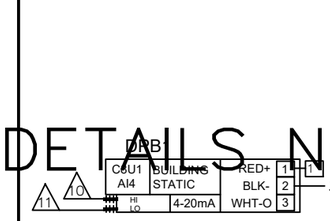
CONTRACT NO:

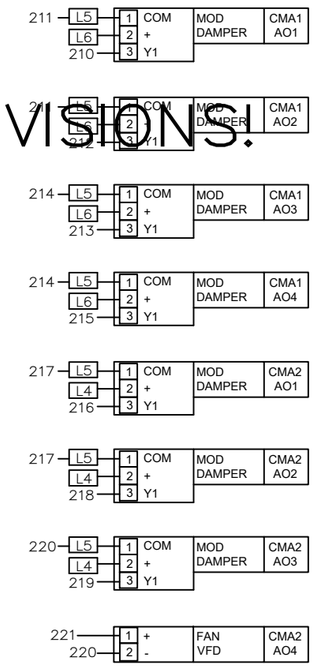
SHEET
NCHS-102
JOB NUMBER:
J-2304001

SYSTEM 15 CONTROL PANEL









WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU–2 SYSTEM 15 PANEL – I/O WIRING (1 OF 2)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
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DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

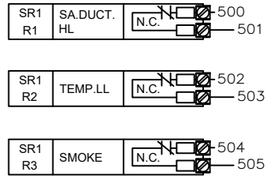
SHEET
NCHS–103
JOB NUMBER:
J–2304001

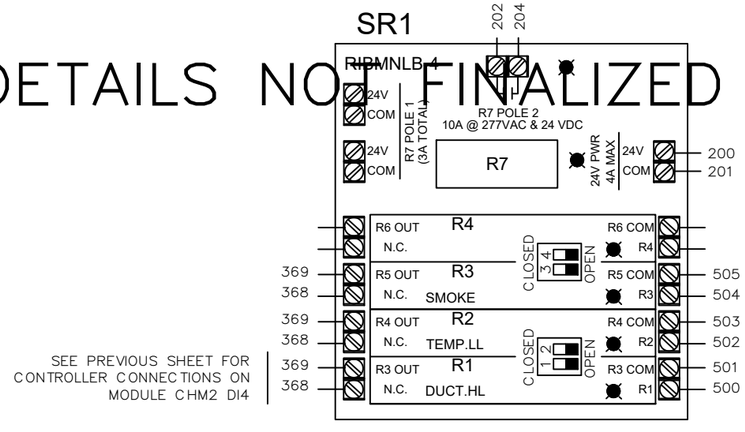
SYSTEM 15 CONTROL PANEL

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU-2 SYSTEM 15 PANEL – I/O WIRING (2 OF 2)

Delta Controls
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SHEET
NCHS-104
JOB NUMBER:
J-2304001

SYSTEM 15 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

300
301
L3
ETS1
V1-
V1+
ETHERNET SWITCH
1
3
5
2
4
CAT5e

eZNS-T100 SERIES
ROOM SENSOR
POWER & NETWORK
WIRING

EOL 4

GND

ST1
NET
PWR

ST2
NET
PWR

24 VAC

LINKNET (RS-485)

SR1
RIBMNLB-4
202
204
200
201
24V
COM
R7 POLE 2
10A @ 277VAC & 24 VDC
R7
R4 OUT
N.C.
R4
R4 COM
R4
R3 OUT
N.C.
R3
R3 COM
R3
R2 OUT
N.C.
R2
R2 COM
R2
R1 OUT
N.C.
R1
R1 COM
R1
CLOSED
OPEN
DIP SW

201
200
CEB1
PWR
GND
24~
USB2
USB1
(NOT USED)
NET1
RS-485
NET2
RS-485
SHD
LAN 1
LAN 2
eBMGR-2
eBX
eBUS Address
eBUS

C8X1
PWR
GND
24~
eBM-800
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN

EOL3

MS/TP

LINKNET (RS-485)

TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

TX1
24V CB
Power
100
L2
L3
H
C
G
120 VAC
LAPTOP PWR
75VA
24VAC
200
201
202
203
CONTROLLER PWR
FIELD DEV POWER

24 VDC PWR
PWR
SUPPLY
+V
-V
GND
L
N
300
301
101
L3
L2
PS1

1.0A
5.0A
101
100
G
PANEL
GND LUG
TB1
L1
L2
L3
H
N
120 VAC

TB2
202
203
204
205
L4
L5
L6
L7
24 VAC TO FIELD

TB3
300
301
1
2
24 VDC TO FIELD

△

AHU-2 SYSTEM 15 PANEL – POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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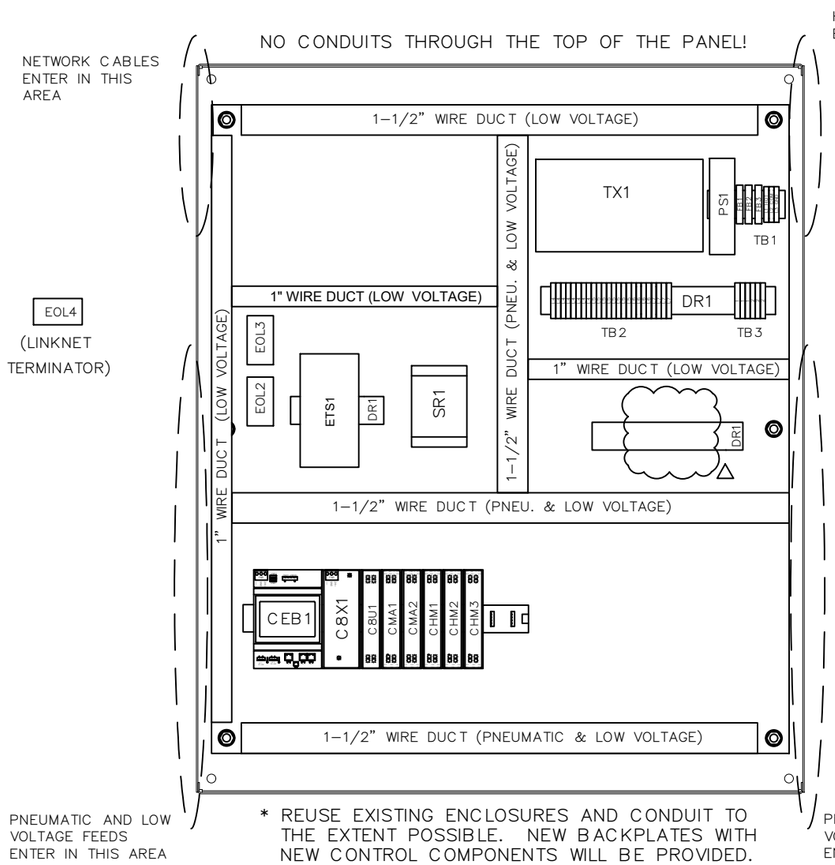
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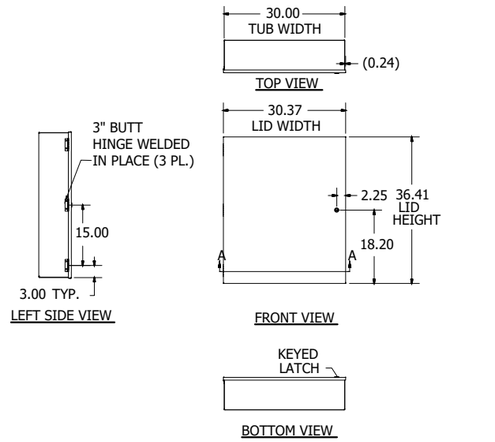
SYSTEM CONTROL PANEL 15 LAYOUT

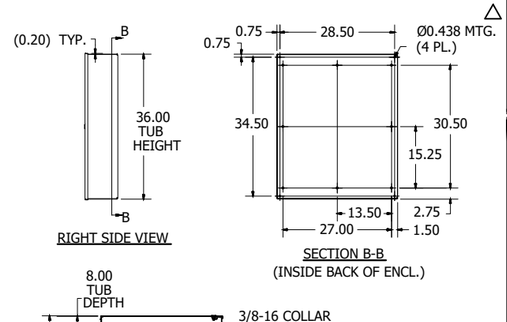


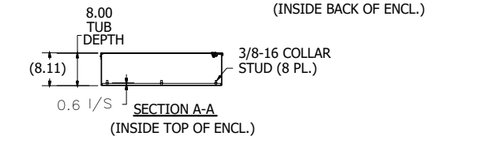
* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

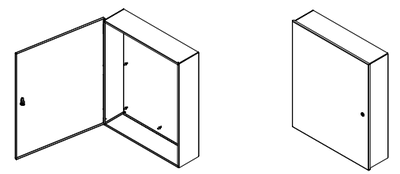
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

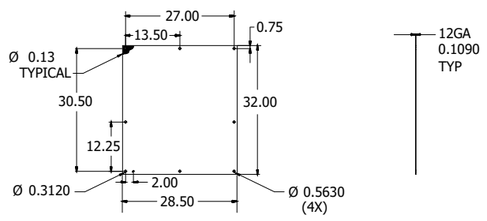








PANEL DIMENSIONS



BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
C8U1	eBM-800	375606	eBM-800 enteliBUS Module (8 UIs)	1	Delta Controls	Panel
C8X1	eBX-08	311602	eBX-08 enteliBUS Expander Backplane (8 slot)	1	Delta Controls	Panel
CBL1	eBB-CABLE	272600	eBB-CABLE Cable Kit for enteliBUS (CAN)	1	Delta Controls	Panel
CEB1	eBMGR-2	301604	eBMGR-2 enteliBUS System Controller w/Ethern	1	Delta Controls	Panel
CMA1-2	eBM-440-M	375601	eBM-440-M enteliBUS Module (4 UIs,4 AOs with	2	Delta Controls	Panel
CMH1-3	eBM-D400R4-H	375609	eBM-D400R4-H enteliBUS Module (4 BIs 4 Relay	3	Delta Controls	Panel
DR1	DIN-3F	499991	DIN-3F - STEEL DIN RAIL - 1 METER	1	Kele	Panel
EBP1	36 x 30 Perf Plate	N1P3036PP	Perf Backplate for 36"x30" Enc	1	Hubbell W.	Panel
ENC1	36 x 30 Enc (ETR)	N/A	36"x30"x8.63" Enc (ETR)	1	ETR	Panel
EOL2-4	TRM768	151924	TRM768 Network Terminator (MS/TP)	3	Delta Controls	Panel
EPC1	630128	630128	3' CAT 5e Patch Cable, Blue	2	Belkin	Panel
ETS1	DVS-005I00	507500	DVS-005I00 Unmanaged Industrial 5-Port Ethern	1	Delta Electronic	Panel
FB1	M4/8SF	499975	M4/8SF - 8MM K-235 FUSEHOLDER	4	Kele	Panel
FBE1	FEM8S	499803	FEM8S END PLATE FOR M4/8SF GRAY	2	Kele	Panel
PAN1	Wire Duct 1.5 x 3	TY15X3WPW6C	1.5"x3"x6.5' Wire Duct, White	1	Kele	Panel

BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
PAN2	Wire Duct 1 x 1.5	TY1X15WPW6C	1"x1.5"x6.5' Wire Duct, White	1	Kele	Panel
PB1	M4/6	499994	M4/6 - 6MM (.238IN) TERMINAL BLOCK	32	Kele	Panel
PB2	M4/6.P	499974	M4/6.P -GROUNDING LUG GREEN YELLOW	1	Kele	Panel
PB3	BAM4	499352	BAM4 END STOP GRAY FOR M4/6	9	Kele	Panel
PB4	FEM6	499921	FEM6 - END PLATE FOR M4/6	3	Kele	Panel
PB5	SCF6	499333	SCF6 CIRCUIT SEPARATOR	2	Kele	Panel
PB6	BJS6-10	499313	BJS6-10 JUMPER BAR 10 POLES PER BAR	4	Kele	Panel
PB7	EV6	499726	EV6 JUMPER BAR SUB-ASY PKG20	40	Kele	Panel
PF1	K235-1	499340	K235-1 FUSE 5X20MM FAST 1 AMP 250V PKG5	1	Kele	Panel
PF2	K235-5	499341	K235-5 FUSE 5X20MM FAST 5 AMP 125V PKG5	1	Kele	Panel
PLK1	Keyed Lock	N1C14TKL	Cylinder Lock Kit	1	Hubbell W.	Panel
PNL1	PNL-eBM	PNL-eBM	TCS Panel Build - eBMGR Style	1	TCS	Panel
PS1	DRP024V060W1AA	506000	DRP024V060W1AA - Line Voltage DC Power Supp	1	Delta Electronic	Panel
SR1	RIBMNLB-4	403386	RIBMNLB-4 2.75" Track Mount AHU Fan Safety Al	1	Functional Devi	Panel
TRM1	eBB-TERM	272601	eBB-TERM Network Terminator for enteliBUS (C	1	Delta Controls	Panel
TX1	PSH75A75A	403205	PSH75A75A Enclosed Dual 75VA, Multi-tap 480/2	1	Functional Devi	Panel

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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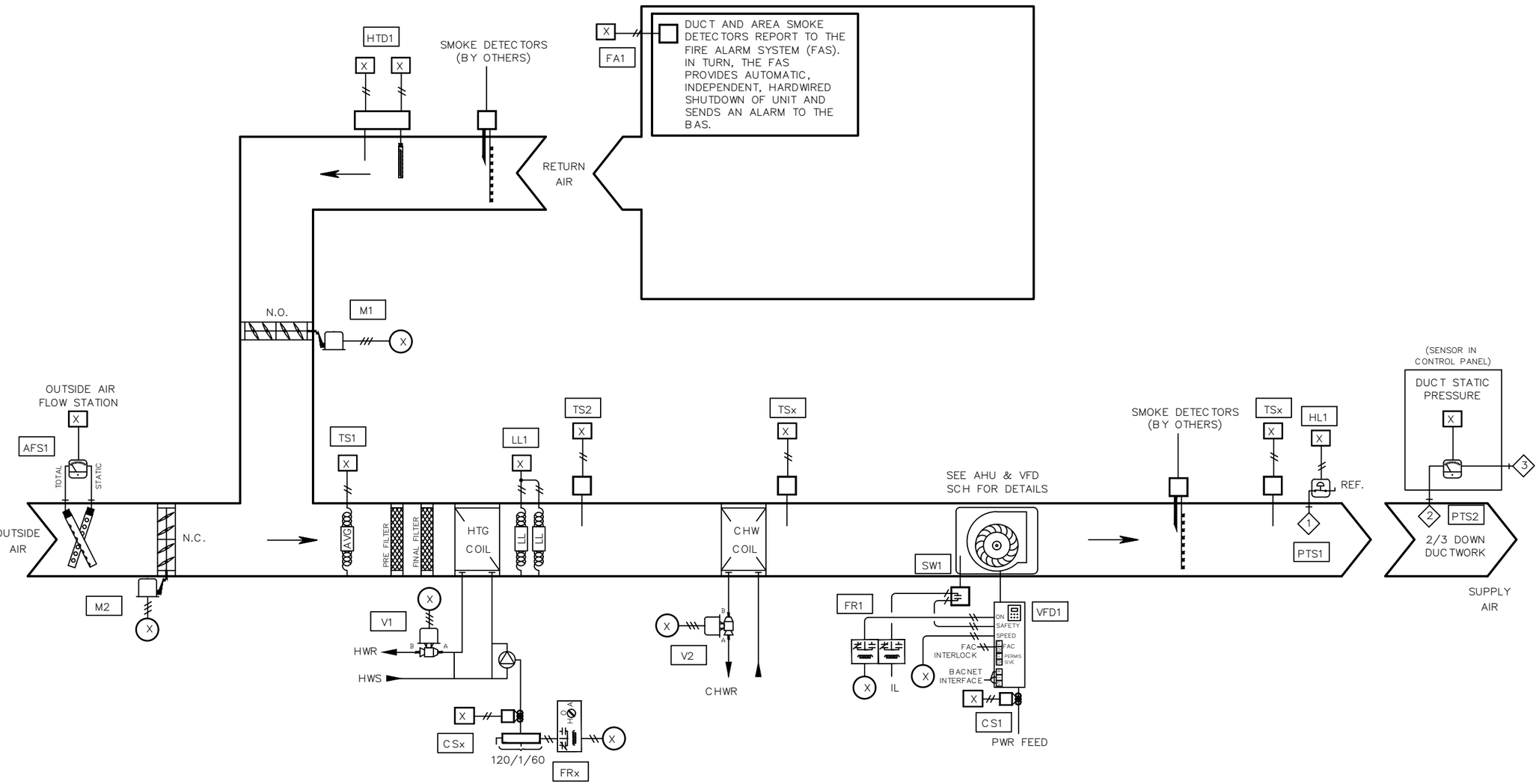
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SHEET
NCHS–106
JOB NUMBER:
J–2304001

AHU–A2 SYSTEM 15 PANEL – DIMENSIONS & BOM

AHU–C1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU–C1 FIELD DEVICES

Delta CONTROLS

Temperature Control Services

4240 W 50 S
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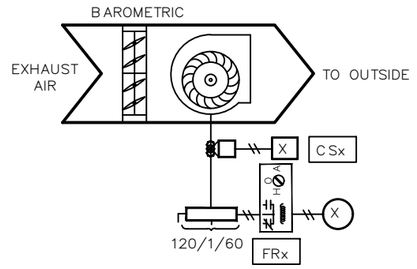
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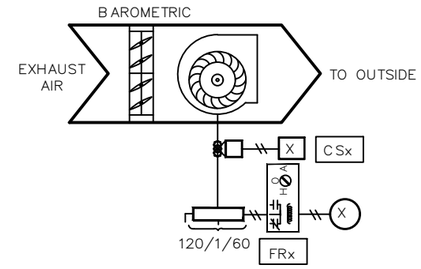
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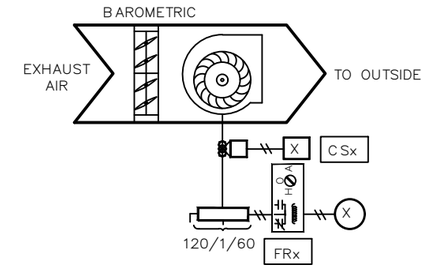
EXHAUST FAN – BAS CONTROLLED
EF–C1



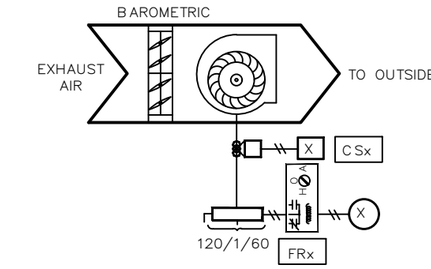
EXHAUST FAN – BAS CONTROLLED
EF–C2



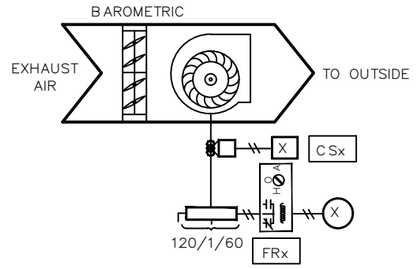
EXHAUST FAN – BAS CONTROLLED
EF–C3



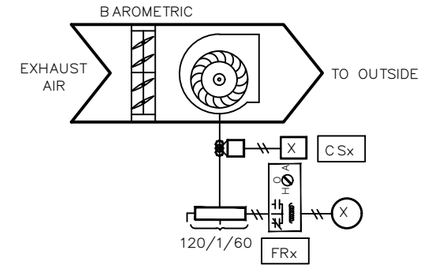
EXHAUST FAN – BAS CONTROLLED
EF–C4



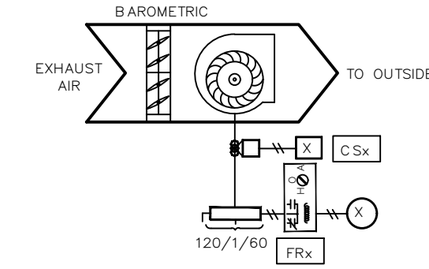
EXHAUST FAN – BAS CONTROLLED
EF–C5



EXHAUST FAN – BAS CONTROLLED
EF–C7



EXHAUST FAN – BAS CONTROLLED
EF–C8



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA C MISC FIELD DEVICES

Delta Controls

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INPUT / OUTPUT POINT TABLE

Point Name	Point Description	Hardware Points				
		AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
EF-C1 STAT	Exhaust Fan C1 Status		X			
EF-C2 STAT	Exhaust Fan C2 Status		X			
EF-C3 STAT	Exhaust Fan C3 Status		X			
EF-C4 STAT	Exhaust Fan C4 Status		X			
EF-C5 STAT	Exhaust Fan C5 Status		X			
EF-C7 STAT	Exhaust Fan C7 Status		X			
EF-C8 STAT	Exhaust Fan C8 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-C1 SS	Exhaust Fan C1 Start / Stop				X	
EF-C2 SS	Exhaust Fan C2 Start / Stop				X	
EF-C3 SS	Exhaust Fan C3 Start / Stop				X	
EF-C4 SS	Exhaust Fan C4 Start / Stop				X	
EF-C5 SS	Exhaust Fan C5 Start / Stop				X	
EF-C7 SS	Exhaust Fan C7 Start / Stop				X	
EF-C8 SS	Exhaust Fan C8 Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**7**	**12**	**5**	**9**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-C1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFCn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE OUTSIDE AIR DAMPER (OA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

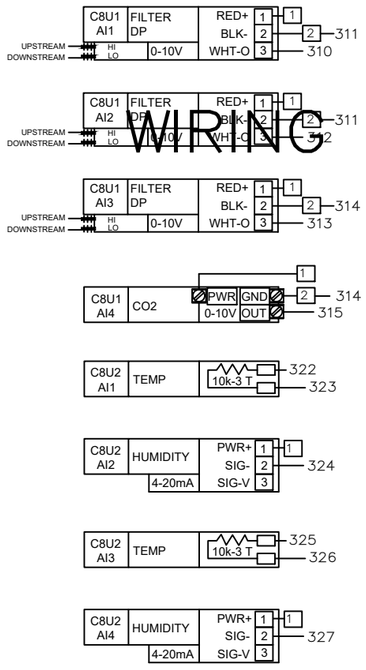
REVISIONS	
DATE	REMARKS

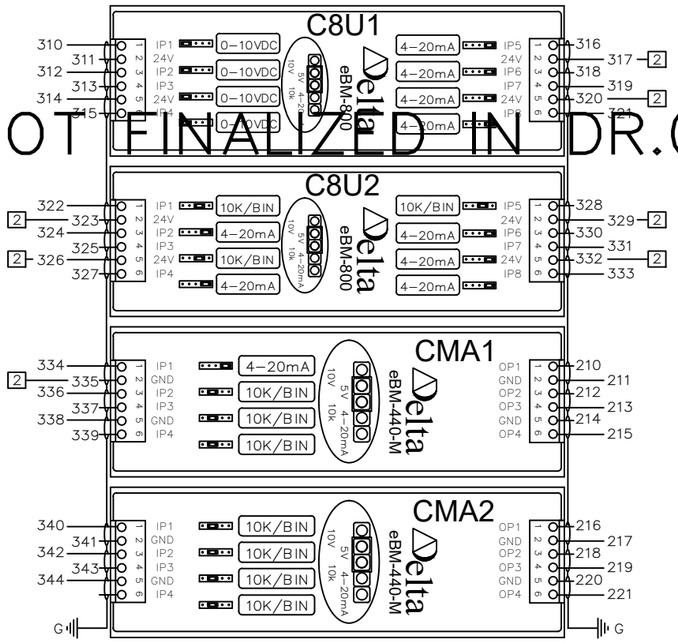
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

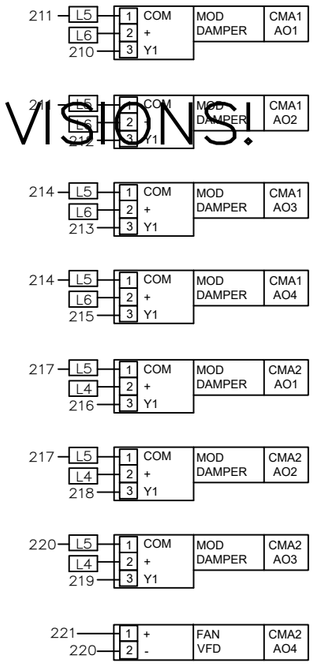
CONTRACT NO:

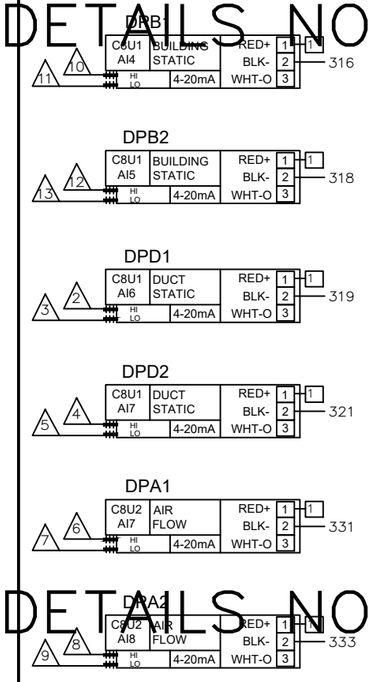
SHEET
NCHS–110
JOB NUMBER:
J–2304001

SYSTEM 16 CONTROL PANEL









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-C1 SYSTEM 16 PANEL – I/O WIRING (1 OF 2)

Delta Controls
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
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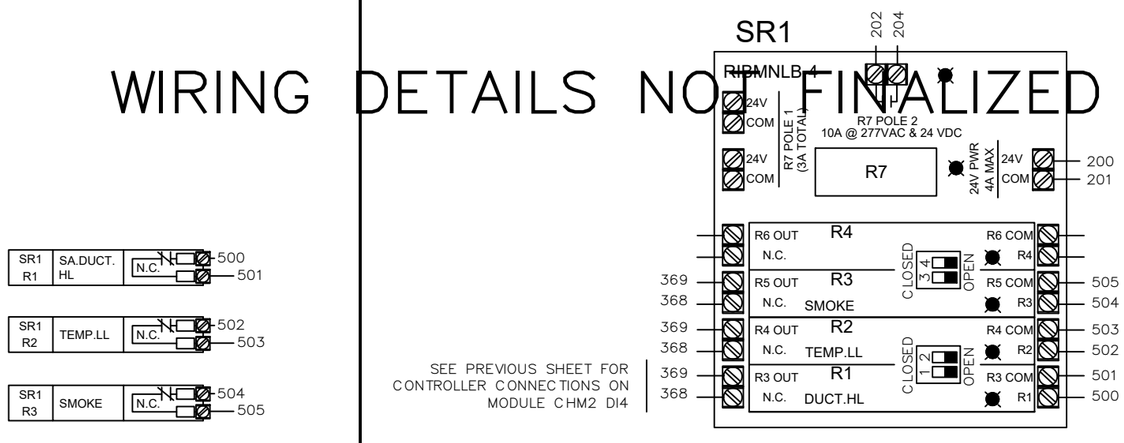
CONTRACT NO:

SHEET
NCHS–111
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls

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NCHS-112
JOB NUMBER:
J-2304001

SYSTEM 16 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

ETS1

300
301
L3
V1-
V1+
ETHERNET SWITCH
1
3
5
2
4
CAT5e

SR1
RIBMNLB-4
202
204
200
201
24V COM
POWER 24 VAC 4A MAX
R7
R7 POLE 2 10A @ 277VAC & 24 VDC
R7 POLE 1 (N.O. ONLY)
R4 OUT N.C.
R4 R4 COM R4
R3 OUT N.C.
R3 R3 COM R3
R2 OUT N.C.
R2 R2 COM R2
R1 OUT N.C.
R1 R1 COM R1
CLOSED
OPEN
LOW
HIGH

TX1
24V CB
Power
100
L2
L3
H
C
G
75VA
24VAC
120 VAC LAPTOP PWR
200
201
202
203
CONTROLLER PWR
FIELD DEV POWER

24 VDC PWR
PWR SUPPLY
+V
-V
GND
L
N
300
301
101
L3
L2
PS1

1.0A
5.0A
101
100
G
PANEL GND LUG
TB1
L1
L2
L3
H
N
120 VAC

TB2
202
203
204
205
L4
L5
L6
L7
24 VAC TO FIELD

TB3
300
301
1
2
24 VDC TO FIELD

DPD1
1
Power + GND / 4-20mA out - Voltage out 0
HIGH
LOW
2
3
PNEUMATIC

CEB1
C8X1
201
200
PWR
GND
24V~
USB2
USB1
(NOT USED)
NET1 RS-485
NET2 RS-485
LAN 1
LAN 2
eBMGR-2
eBX
eBUS Address
eBUS
IP7 24Vs IP8
IP5 24Vs IP6
eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H
eBM-D400R4-H
eBM-D400R4-H
OP1 GND V1 OP2
OP3 COM V2 OP4
OPPHAO 1
OPPHAO 2
OPPHAO 3
OPPHAO 4
I/O SHIELD DRAIN
L3
TO PANEL GND LUG
MS/TP

SEE RISER DIAGRAMS FOR LOCATION

AHU-C1 SYSTEM 16 PANEL – POWER & NETWORK WIRING

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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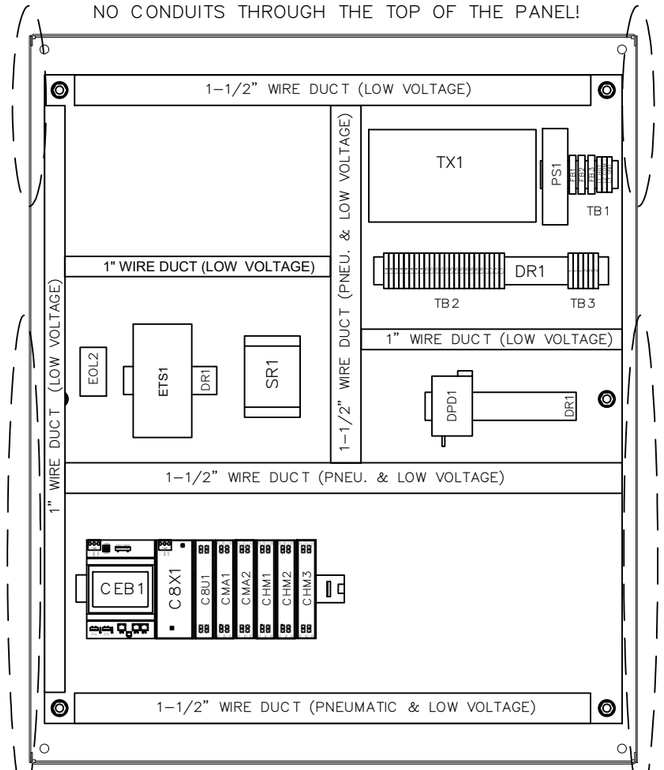
CONTRACT NO:

SHEET
NCHS-113
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 16 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

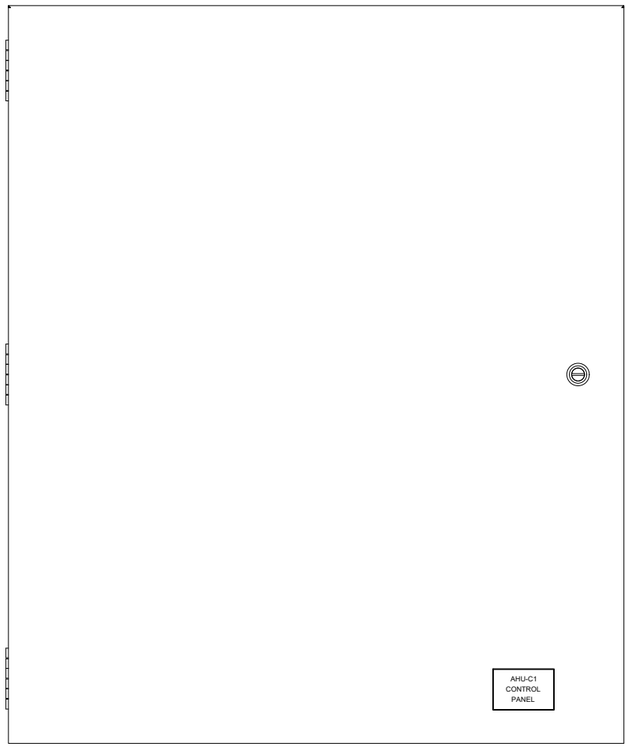


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

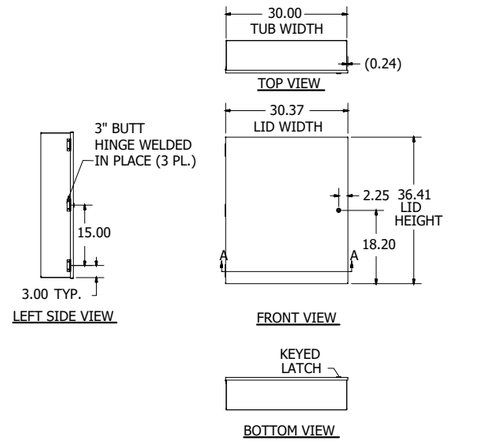
WILL BE PROVIDED IN A FUTURE REVISION. △

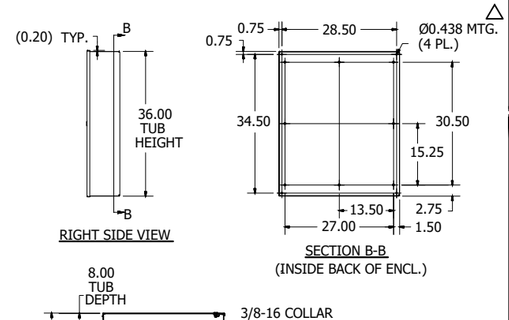
BILL OF MATERIALS

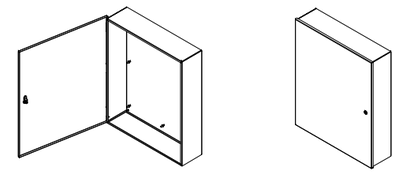
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

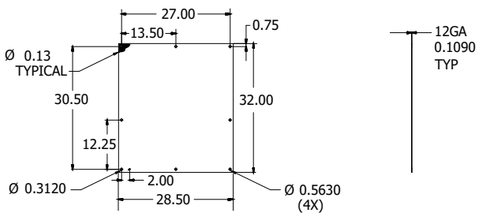
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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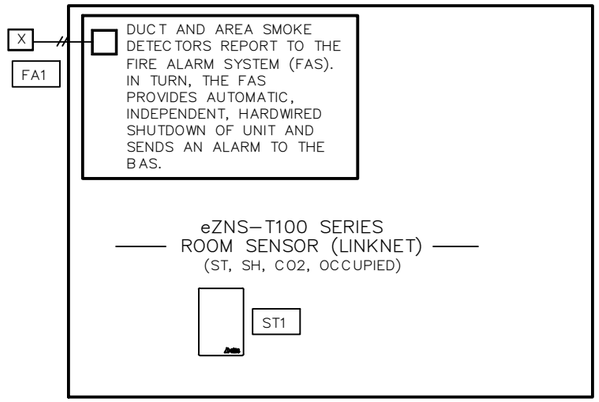
REVISIONS	
DATE	REMARKS

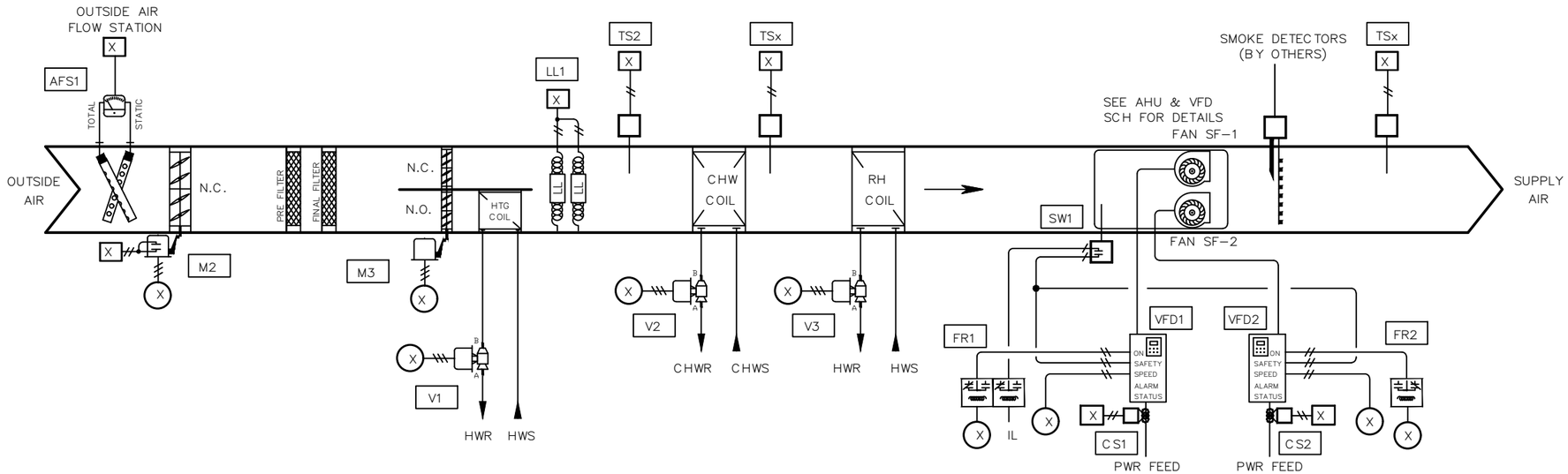
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CONTRACT NO:

SHEET
NCHS-114
JOB NUMBER:
J-2304001

AHU-C2 FIELD DEVICES





BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU-C2 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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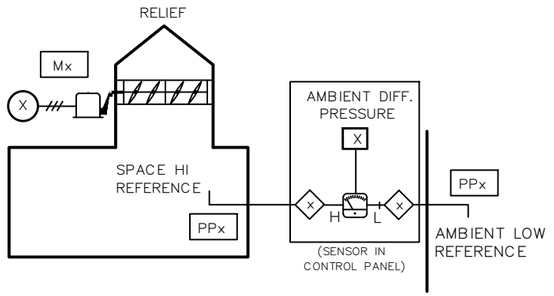
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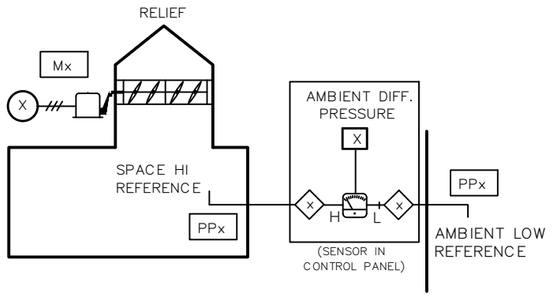
CONTRACT NO:

SHEET
NCHS-115
JOB NUMBER:
J-2304001

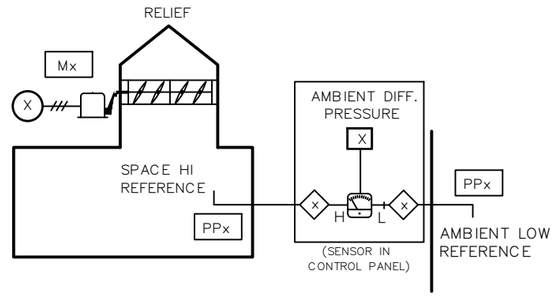
BUILDING PRESSURE CONTROL
E–RH–C1



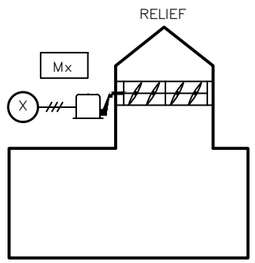
BUILDING PRESSURE CONTROL
RH–C2



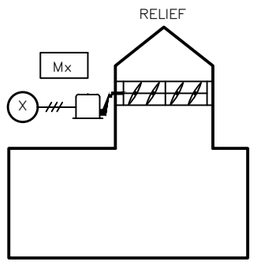
BUILDING PRESSURE CONTROL
E–RH–C3



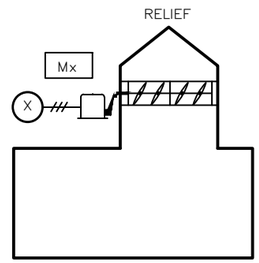
BUILDING PRESSURE CONTROL
E–RH–C4



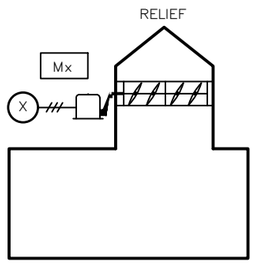
BUILDING PRESSURE CONTROL
E–RH–C5



BUILDING PRESSURE CONTROL
RH–C6



BUILDING PRESSURE CONTROL
RH–C7



NOTE:
THERE WILL BE THREE (3) BUILDING PRESSURE SENSOR INPUTS FOR CONTROL OF THESE SEVEN (7) RELIEF DAMPERS. SPECIFIC CONTROL CORRELATIONS SHALL BE DETERMINED DURING TIME OF INSTALLATION AND STARTUP.

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA C MISC FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS–116
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

Point Name	Point Description	Hardware Points				
		AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPB2	Building Static Pressure 2	X				
DPB3	Building Static Pressure 3	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
LL	Low Limit (Freezestat)		X			
OAD ES	OAD Damper Status		X			
SF 1 STAT	Supply Fan 1 Status		X			
SF 2 STAT	Supply Fan 2 Status		X			
CWV	Chill Water Valve			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
E-RH-C1 DPR	Relief Air Damper			X		
RH-C2 DPR	Relief Air Damper			X		
E-RH-C3 DPR	Relief Air Damper			X		
E-RH-C4 DPR	Relief Air Damper			X		
E-RH-C5 DPR	Relief Air Damper			X		
RH-C6 DPR	Relief Air Damper			X		
RH-C7 DPR	Relief Air Damper			X		
SF 1 VFD	Supply Fan 1 VFD Speed			X		
SF 2 VFD	Supply Fan 2 VFD Speed			X		
SF 1 SS	Supply Fan 1 Start / Stop				X	
SF 2 SS	Supply Fan 2 Start / Stop				X	
ST	Space Temp					X
SH	Space Humidity					X
S CO2	Space CO2					X
OCC	Occupied Flag					X
	POINT TOTALS:	**7**	**4**	**14**	**2**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-117
JOB NUMBER:
J-2304001

OUTDOOR AIR HANDLING UNIT AHU-C2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF1-C, SF2-C) WILL BE STARTED ACCORDING TO THE KITCHEN HOOD OPERATION OR AS MANUALLY SELECTED BY THE OPERATOR, OR BY OCCUPANCY SENSOR (OCC-S). MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF1-S, SF2-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

RELIEF DAMPER CONTROL: AS SPACE PRESSURE (ZN-SP) INCREASES, THE RELIEF DAMPER (RLFn-DPR) SHALL BE MODULATED TO MAINTAIN A SETPOINT OF +0.03" W.C. (ADJ) IN THE SERVING LINE AND CAFETERIA AS COMPARED TO THE KITCHEN. ALL DAMPERS SHALL BE FULLY CLOSED WHEN THE ASSOCIATED AHUs ARE NOT RUNNING. PNEUMATIC SENSING TUBE, TERMINATION DEVICES, AND PRESSURE TRANSDUCER FIELD INSTALLED BY CIC.

TCC SHALL GENERATE AN ALARM IF ANY HOOD IS OPERATING AND MAKEUP AIR HANDLING UNIT IS NOT. IF ANY HOOD IS IN OPERATION, VARIABLE FREQUENCY DRIVES SHALL MODULATE IN ORDER TO DELIVER THE QUANTITY OF OUTSIDE AIR EQUAL TO THE TOTAL HOOD AIRFLOW OF EXHAUST FANS C1, C2, AND C3. IF NOT HOOD EXHAUST FANS ARE RUNNING, THE VARIABLE FREQUENCY DRIVE SPEED SHALL MODULATE TO MAINTAIN THE COOLING DEMAND OF THE SPACE.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT COIL CONTROL, FACE AND BYPASS DAMPER, AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

FACE AND BYPASS DAMPER CONTROL: ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 38F (ADJ), THE HEATING COIL (PH-VLV) SHALL BE FULLY OPEN AND PREHEAT TEMPERATURE SHALL BE MAINTAINED BY MODULATING THE FACE AND BYPASS DAMPERS. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 38F (ADJ), THE FACE AND BYPASS DAMPERS SHALL BE FULLY OPEN TO THE COIL AND THE HEATING COIL SHALL MODULATE TO MAINTAIN DISCHARGE TEMPERATURE.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ) WITH THE FACE AND BYPASS DAMPER CLOSED TO THE COIL.

Delta Controls
Temperature Control Services
4240 W 50 S
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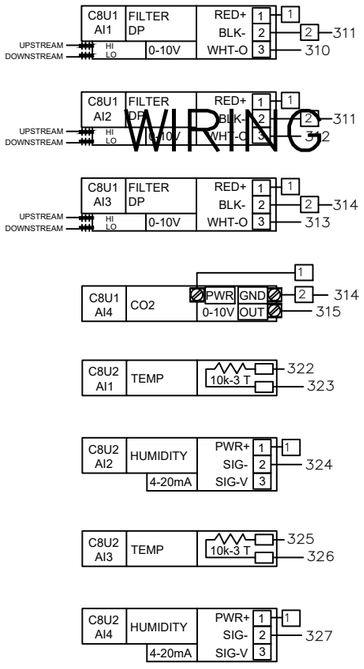
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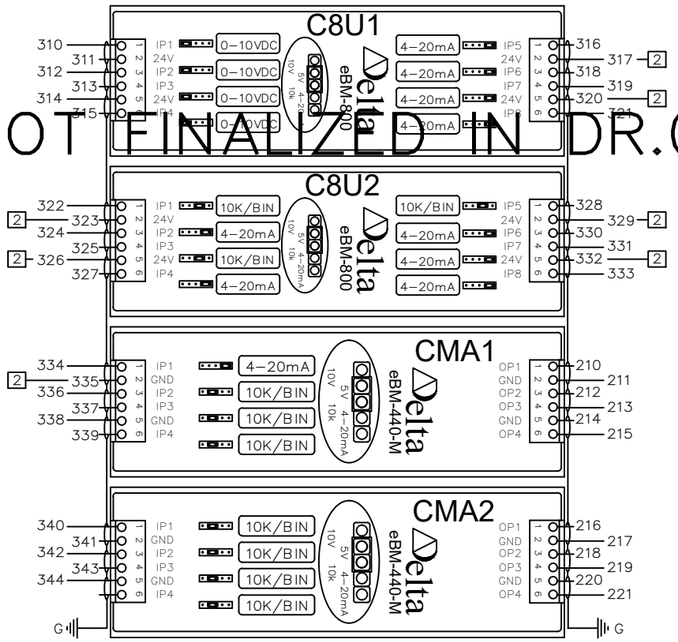
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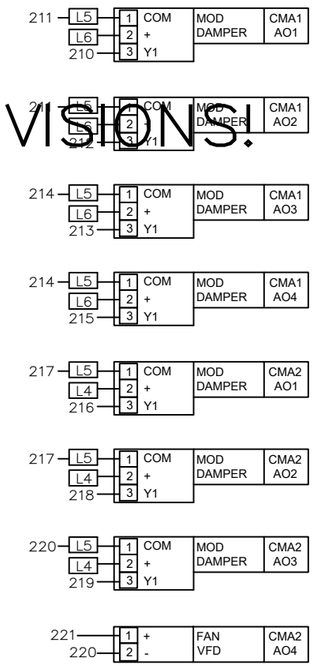
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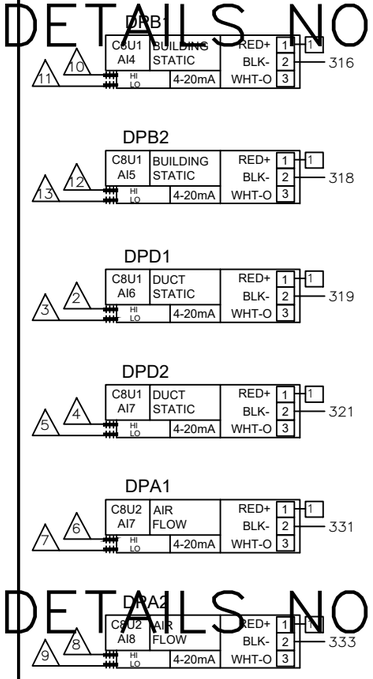
SHEET
NCHS-118
JOB NUMBER:
J-2304001

SYSTEM 17 CONTROL PANEL









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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Temperature Control Services
4240 W 50 S
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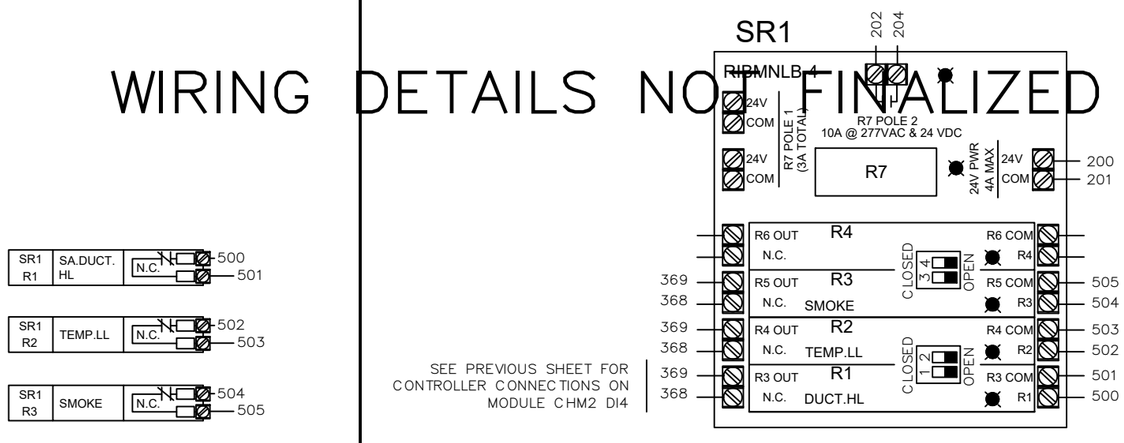
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NCHS–119
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls
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SHEET
NCHS-120
JOB NUMBER:
J-2304001

SYSTEM 17 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

SND

ETS1

ETHERNET SWITCH

V1-
V1+
300
301
L3

CAT5e

SR1

RIBMNLB-4

R7 POLE 3 10A @ 277VAC & 24 VDC
R7 POLE 1 (NO/NC) 4A MAX
R4 R3 R2 R1
R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.
CLOSED
OPEN
200
201
202
204

TRANSFORMER

102 L2
206 207

TX1

24V CB
Power
120 VAC LAPTOP PWR
75VA
24VAC
100 L2 L3 H C G
200 201 CONTROLLER PWR
202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY
+V −V GND L N
300 301 101
L3 L2
PS1

TB1

102 4.0A
101 1.0A
100 5.0A
G
PANEL GND LUG
L1 L2 L3
H N 120 VAC

TB2

202 L4 L4 L4
203 L5 L5 L5
204 L6 L6 L6
205 L7 L7 L7
206 L8 L8 L8
207 L9 L9 L9
24 VAC TO FIELD

TB3

300 1 1 1
301 2 2 2
24 VDC TO FIELD

DPB1 DPB2 DPB3

1
Power + GND / 4-20mA out - Voltage out 0
HIGH LOW
4 5 6 7 8 9
PNEUMATIC

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1
NET
PWR
24 VAC
LINKNET (RS-485)

201 200
CEB1
PWR
GND 24+
USB2
USB1
(NOT USED)
NET1 RS-485
NET2 RS-485
LED 2
LED 1
eBMGR-2
MS/TP
LINKNET (RS-485)

201 200
C8X1
PWR
eBX
eBUS Address
eBUS
eBM-800
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN
L3
TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

AHU-C2 SYSTEM 17 PANEL – POWER & NETWORK WIRING

Temperature Control Services
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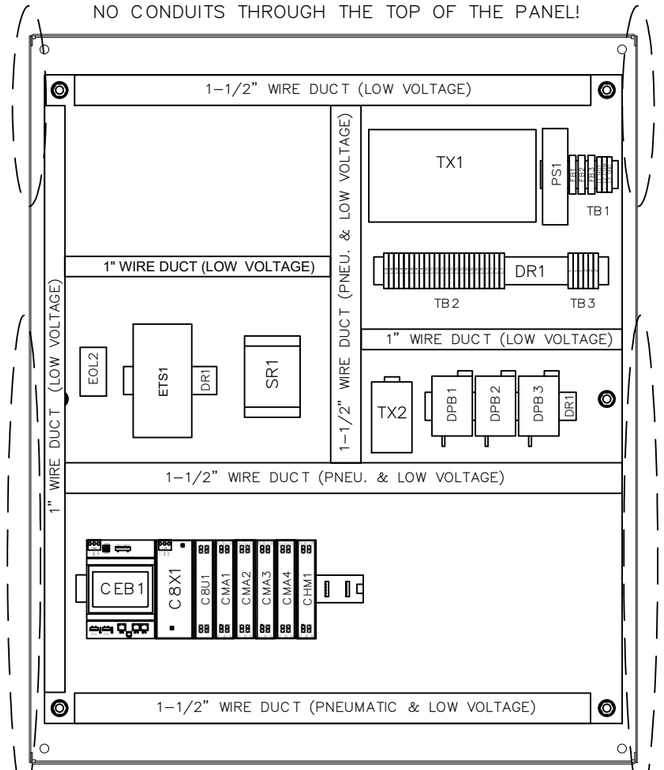
CONTRACT NO:

SHEET
NCHS-121
JOB NUMBER:
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SYSTEM CONTROL PANEL 17 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

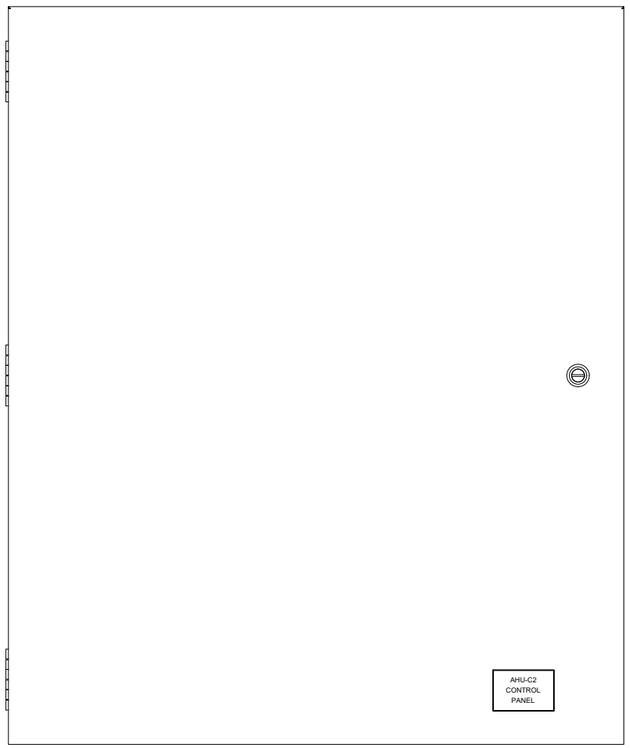


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

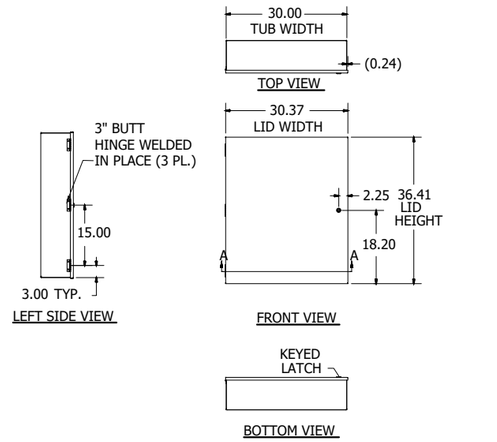
WILL BE PROVIDED IN A FUTURE REVISION. △

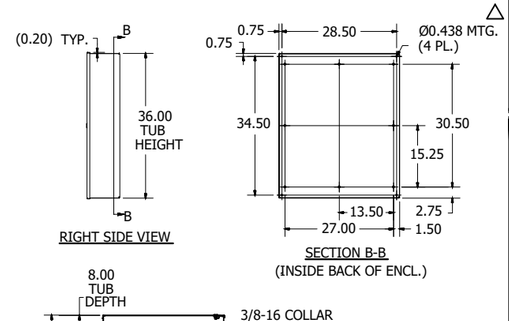
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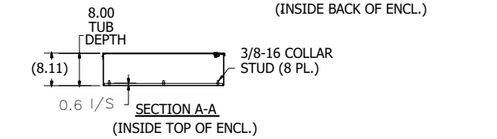
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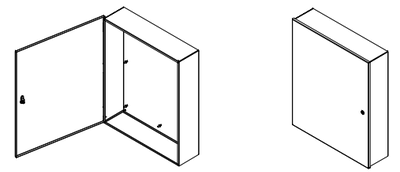
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

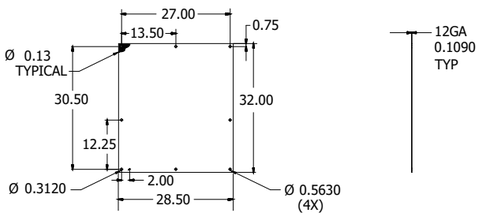








PANEL DIMENSIONS



Delta CONTROLS

Temperature Control Services

4240 W 50 S
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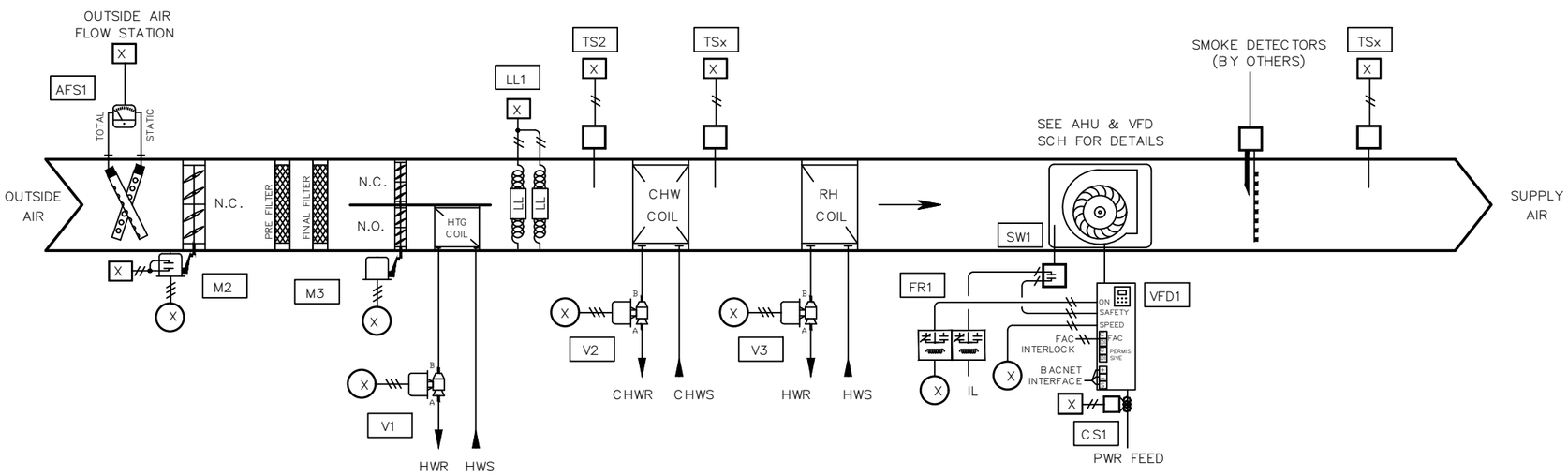
AHU-C3 FIELD DEVICES

X — FA1

DUCT AND AREA SMOKE DETECTORS REPORT TO THE FIRE ALARM SYSTEM (FAS). IN TURN, THE FAS PROVIDES AUTOMATIC, INDEPENDENT, HARDWIRED SHUTDOWN OF UNIT AND SENDS AN ALARM TO THE BAS.

eZNS-T100 SERIES
ROOM SENSOR (LINKNET)
(ST, SH, CO2, OCCUPIED)

ST1



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU-C3 FIELD DEVICES

Delta Controls

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INPUT / OUTPUT POINT TABLE

Point Name	Point Description	Hardware Points				
		AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
LL	Low Limit (Freezestat)		X			
OAD ES	OAD Damper Status		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
ST	Space Temp					X
SH	Space Humidity					X
S CO2	Space CO2					X
OCC	Occupied Flag					X
	POINT TOTALS:	**4**	**3**	**6**	**1**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-C3 POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
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OUTDOOR AIR HANDLING UNIT AHU-C3 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE, OCCUPANCY SENSOR AUX CONTACT (OCC-S), OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT, FACE AND BYPASS DAMPER, AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

FACE AND BYPASS DAMPER CONTROL: ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 38F (ADJ), THE HEATING COIL (PH-VLV) SHALL BE FULLY OPEN AND PREHEAT TEMPERATURE SHALL BE MAINTAINED BY MODULATING THE FACE AND BYPASS DAMPERS. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 38F (ADJ), THE FACE AND BYPASS DAMPERS SHALL BE FULLY OPEN TO THE COIL AND THE HEATING COIL SHALL MODULATE TO MAINTAIN DISCHARGE TEMPERATURE.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ) WITH THE FACE AND BYPASS DAMPER CLOSED TO THE COIL.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

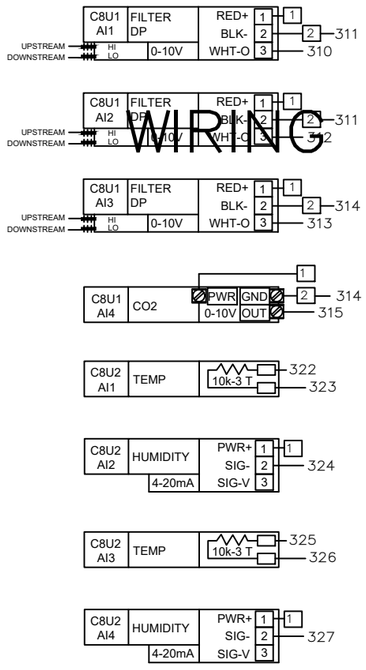
REVISIONS	
DATE	REMARKS

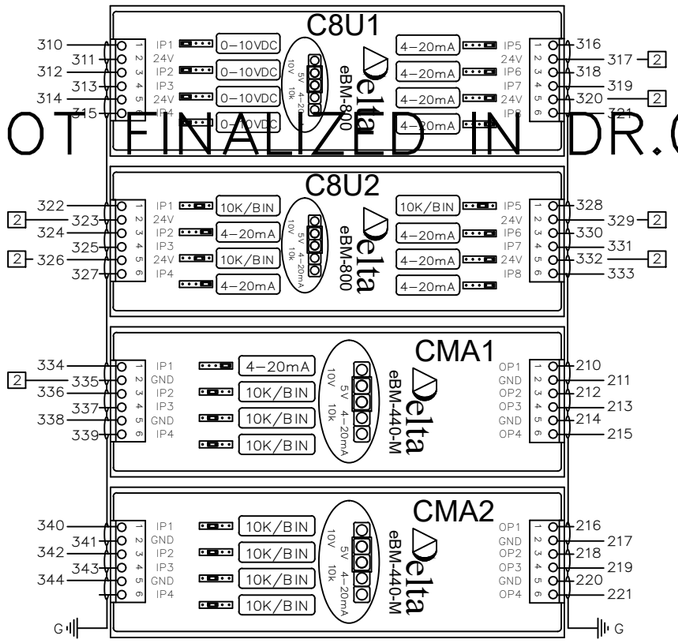
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

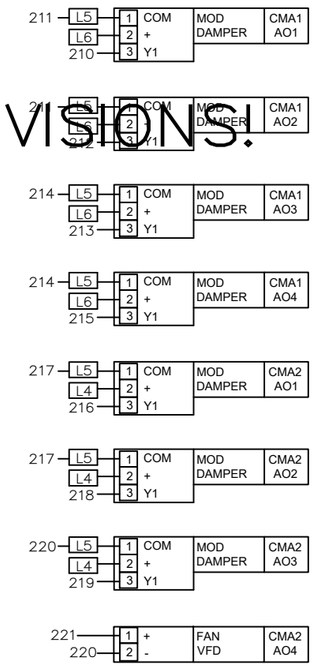
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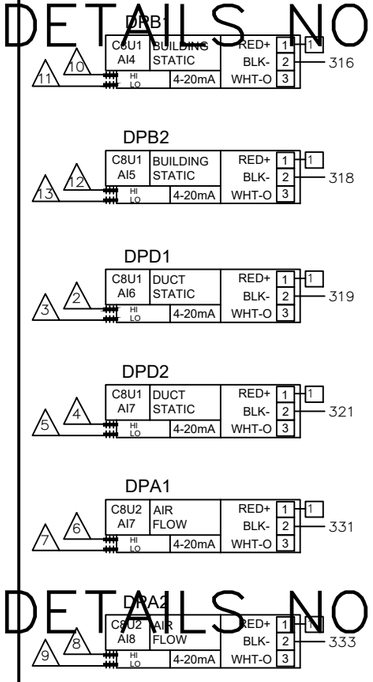
SHEET
NCHS-125
JOB NUMBER:
J-2304001

SYSTEM 18 CONTROL PANEL









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta Controls
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
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REVISIONS	
DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT NO:

SHEET
NCHS–126
JOB NUMBER:
J–2304001

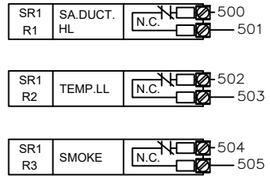
AHU–C3 SYSTEM 18 PANEL – I/O WIRING (1 OF 2)

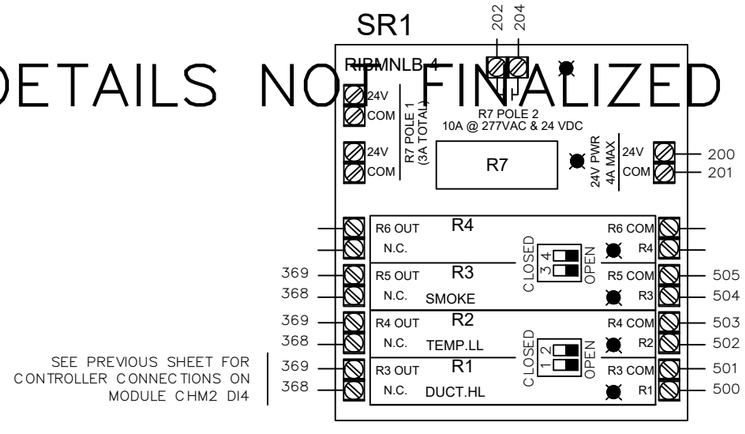
SYSTEM 18 CONTROL PANEL

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU–C3 SYSTEM 18 PANEL – I/O WIRING (2 OF 2)

Delta Controls
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NCHS–127
JOB NUMBER:
J–2304001

SYSTEM 18 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

CAT-6a

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL2

SNS

ETS1

300
301
L3
V1-
V1+
ETHERNET SWITCH
1
3
5
2
4
CAT5e

SR1
RIBMNLB-4
202
204
200
201
24V COM
R7 POLE 2 10A @ 277VAC & 24 VDC
R7 POLE 1 16A @ 277VAC
R7
R4 OUT N.C.
R4 COM
R4 NO
R3 OUT N.C.
R3 COM
R3 NO
R2 OUT N.C.
R2 COM
R2 NO
R1 OUT N.C.
R1 COM
R1 NO
CLOSED
OPEN

TX1
24V CB
24V CB
Power
Power
100
H
C
G
L2
L3
75VA
24VAC
24VAC
120 VAC LAPTOP PWR
200
201
202
203
CONTROLLER PWR
FIELD DEV POWER

24 VDC PWR
PWR SUPPLY
+V
-V
GND
L
N
300
301
101
L2
L3
PS1

1.0A
5.0A
101
100
G
PANEL GND LUG
TB1
L1
L2
L3
H
N
120 VAC

TB2
202
203
204
205
L4
L5
L6
L7
24 VAC TO FIELD

TB3
300
301
1
2
24 VDC TO FIELD

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1
NET
PWR
24 VAC
LINKNET (RS-485)

201
200
CEB1
PWR
GND
24~
USB2
USB1
(NOT USED)
NET1 RS-485
NET2 RS-485
LAN 1
LAN 2
eBMGR-2
C8X1
eBX
eBUS Address
eBUS
eBM-440-M
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN
L3
TO PANEL GND LUG
MS/TP
LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

AHU-C3 SYSTEM 18 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
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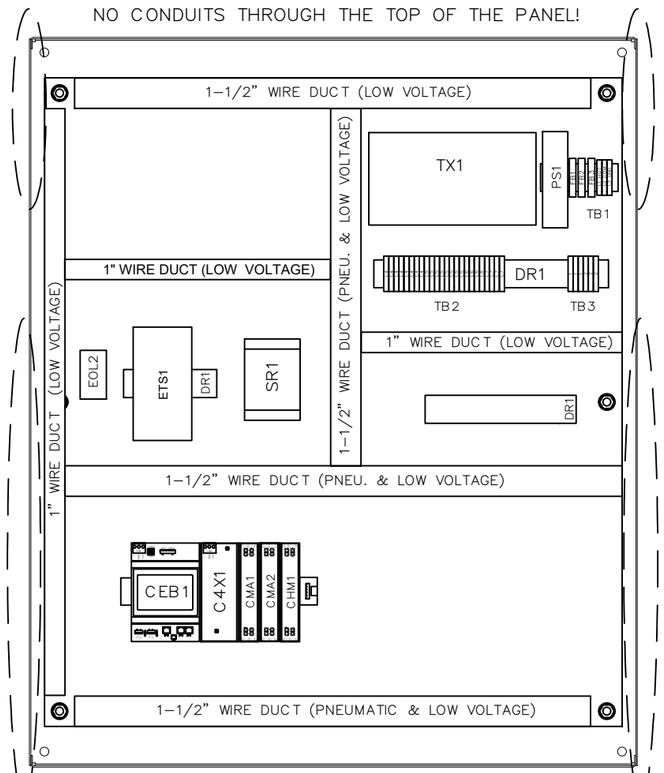
CONTRACT NO:

SHEET
NCHS-128
JOB NUMBER:
J-2304001

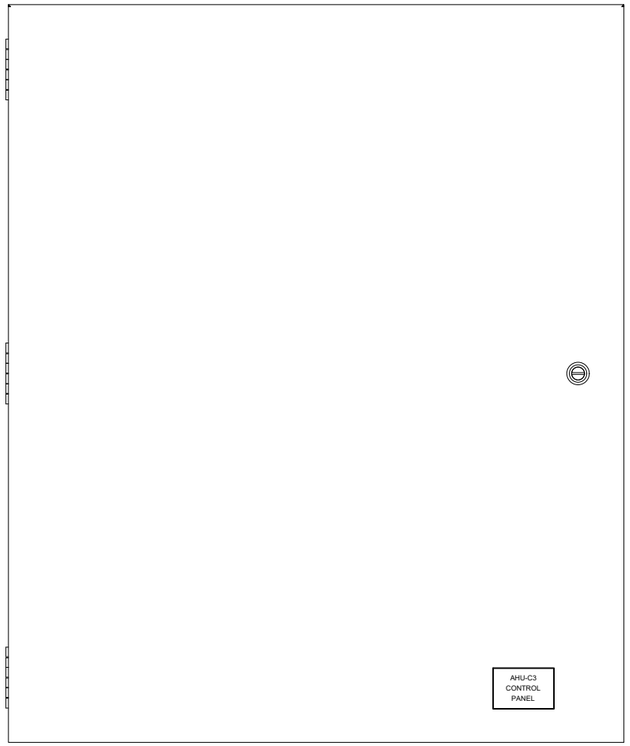
SYSTEM CONTROL PANEL 18 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

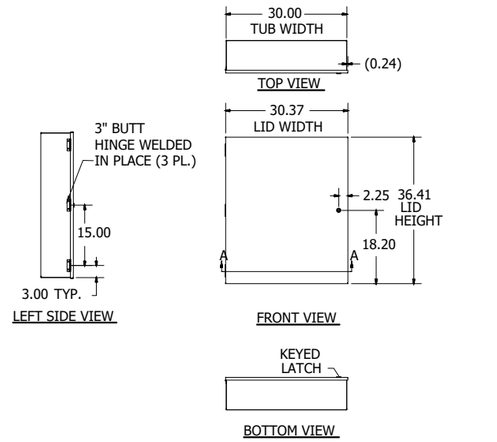
WILL BE PROVIDED IN A FUTURE REVISION. △

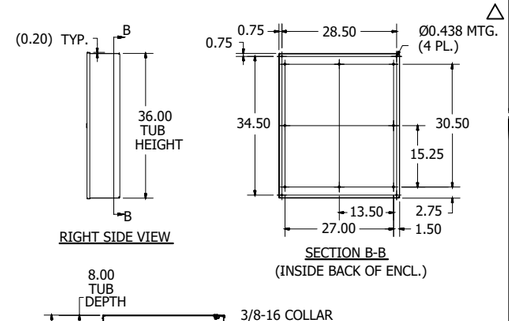
BILL OF MATERIALS

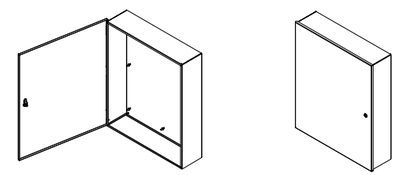
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

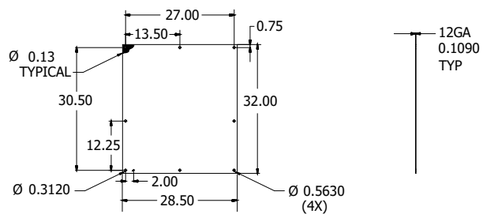
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



AHU-C3 SYSTEM 18 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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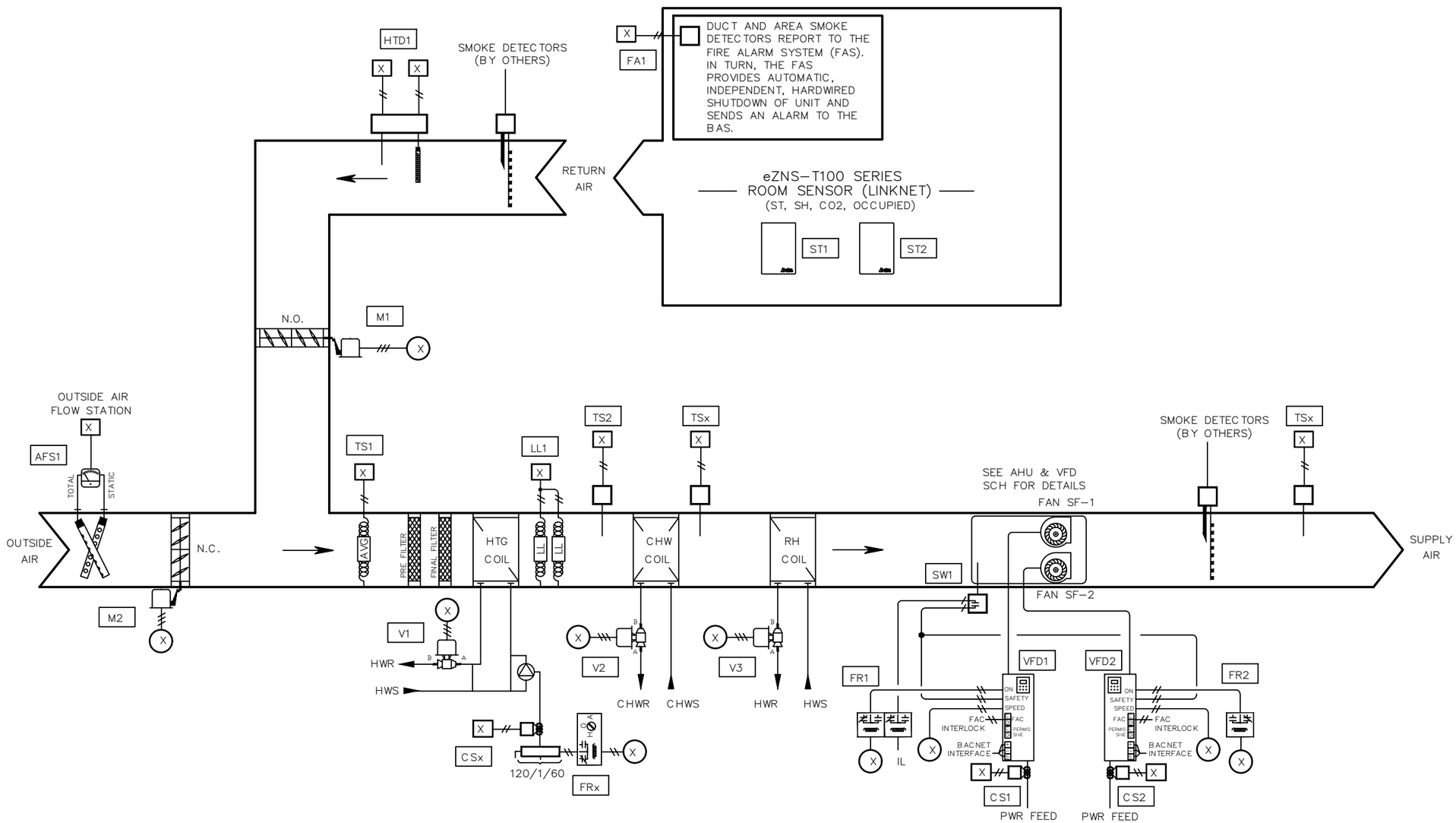
REVISIONS	
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CONTRACT NO:

SHEET
NCHS–129
JOB NUMBER:
J–2304001

AHU-C5 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AHU-C5 FIELD DEVICES

Delta Controls

Temperature Control Services
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LEBANON, INDIANA 46052
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△

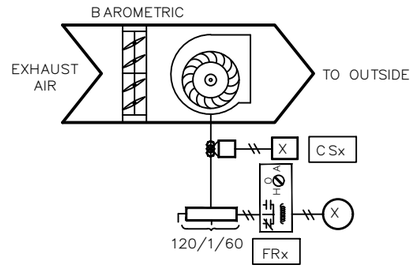
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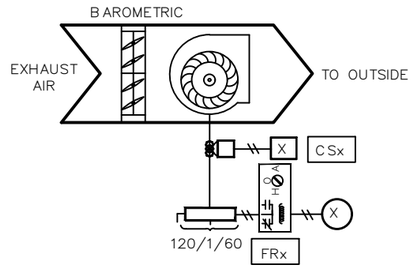
CONTRACT NO:

SHEET
NCHS-130
JOB NUMBER:
J-2304001

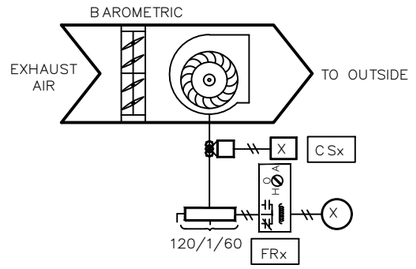
EXHAUST FAN – BAS CONTROLLED
EF–P1



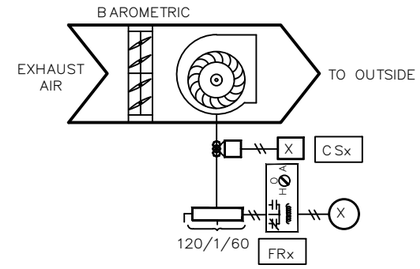
EXHAUST FAN – BAS CONTROLLED
EF–P2



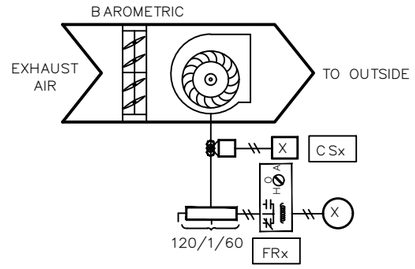
EXHAUST FAN – BAS CONTROLLED
EF–P3



EXHAUST FAN – BAS CONTROLLED
EF–P4



EXHAUST FAN – BAS CONTROLLED
EF–P5



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA C MISC FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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CONTRACT NO:

SHEET
NCHS–131
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

Point Name	Point Description	Hardware Points				
		AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
EF-P1 STAT	Exhaust Fan P1 Status		X			
EF-P2 STAT	Exhaust Fan P2 Status		X			
EF-P3 STAT	Exhaust Fan P3 Status		X			
EF-P4 STAT	Exhaust Fan P4 Status		X			
EF-P5 STAT	Exhaust Fan P5 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF 1 STAT	Supply Fan 1 Status		X			
SF 2 STAT	Supply Fan 2 Status		X			
CWV	Chill Water Valve			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF 1 VFD	Supply Fan 1 VFD Speed			X		
SF 2 VFD	Supply Fan 2 VFD Speed			X		
EF-P1 SS	Exhaust Fan P1 Start / Stop				X	
EF-P2 SS	Exhaust Fan P2 Start / Stop				X	
EF-P3 SS	Exhaust Fan P3 Start / Stop				X	
EF-P4 SS	Exhaust Fan P4 Start / Stop				X	
EF-P5 SS	Exhaust Fan P5 Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF 1 SS	Supply Fan 1 Start / Stop				X	
SF 2 SS	Supply Fan 2 Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
ST2	Space Temp					X
SH3	Space Humidity					X
S CO22	Space CO2					X
OCC2	Occupied Flag					X
	POINT TOTALS:	**6**	**11**	**7**	**8**	**8**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-C5 & AREA C MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS-132
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-C5 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF1-C, SF2-C) WILL BE STARTED ACCORDING TO THE SCHEDULE. OCCUPANCY SENSOR AUX CONTACT (OCC-S), OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF1-S, SF2-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFCn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN AVERAGE OF THE TWO ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN SPACE HUMIDITY FALLS BELOW 55 % RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

WHEN ECONOMIZER IS DISABLED, OUTSIDE AIR DAMPER SHALL BE CONTROLLED TO PROVIDE AT LEAST THE SCHEDULED MINIMUM OUTSIDE AIRFLOW AS MEASURED BY THE OUTSIDE AIRFLOW MEASURING STATION (OA-CFM) AT ALL TIMES.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZN-CO2, ZN2-CO2) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

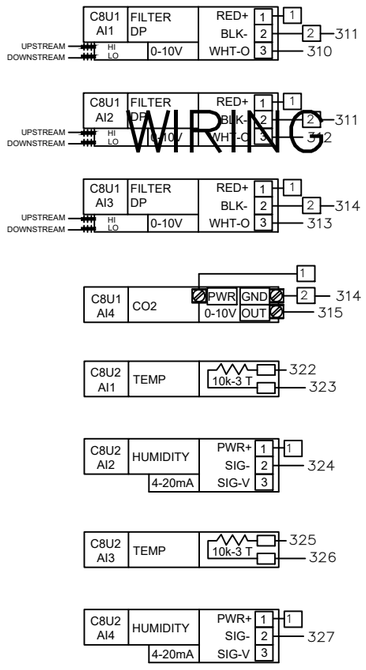
REVISIONS	
DATE	REMARKS

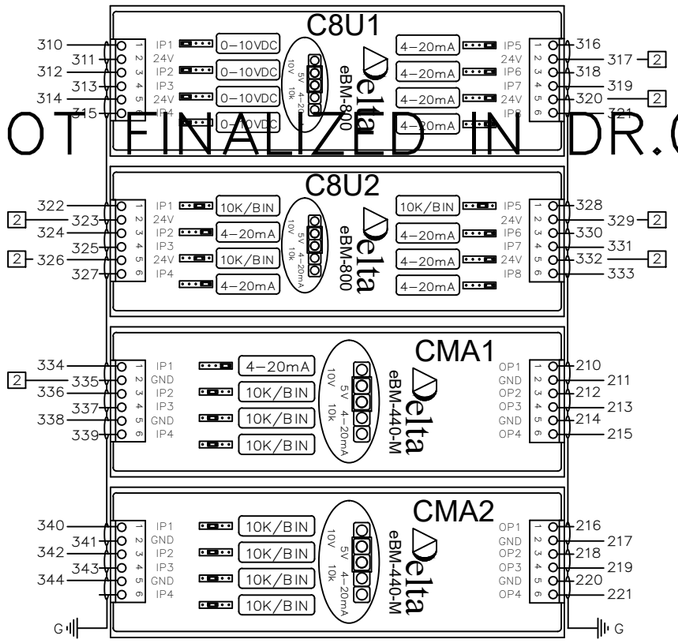
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

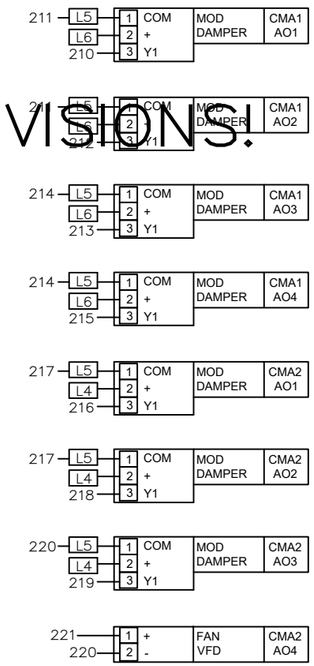
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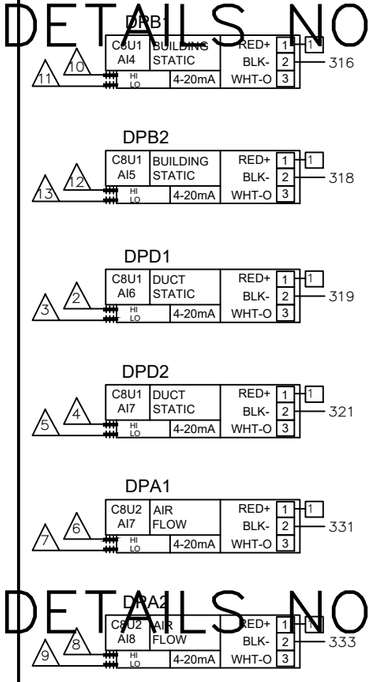
SHEET
NCHS-133
JOB NUMBER:
J-2304001

SYSTEM 19 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-C5 SYSTEM 19 PANEL – I/O WIRING (1 OF 2)

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

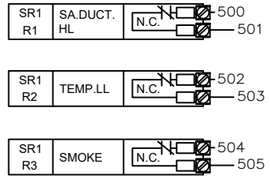
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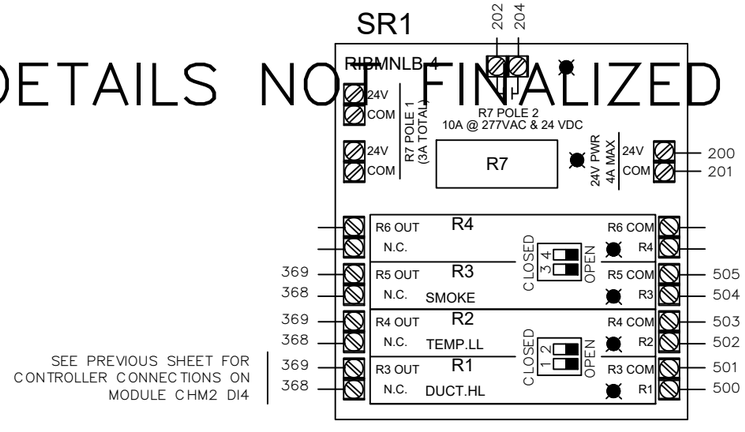
SHEET
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JOB NUMBER:
J–2304001

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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls

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SYSTEM 19 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

ETS1

ETHERNET SWITCH

CAT5e

eZNS-T100 SERIES
ROOM SENSOR
POWER & NETWORK
WIRING

SR1
RIBMNLB-4

TX1
24V CB
Power
120 VAC LAPTOP PWR
CONTROLLER PWR
FIELD DEV POWER

24 VDC PWR
PWR SUPPLY
PS1

TB1
1.0A
5.0A
PANEL GND LUG
120 VAC

TB2
24 VAC TO FIELD

TB3
24 VDC TO FIELD

EOL 4
ST1
ST2
NET
PWR
24 VAC
LINKNET (RS-485)

CEB1
C8X1
eBMGR-2
eBX
eBUS Address
eBUS
eBM-800
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN
TO PANEL GND LUG

EOL3
MS/TP
LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

AHU-C5 SYSTEM 19 PANEL – POWER & NETWORK WIRING

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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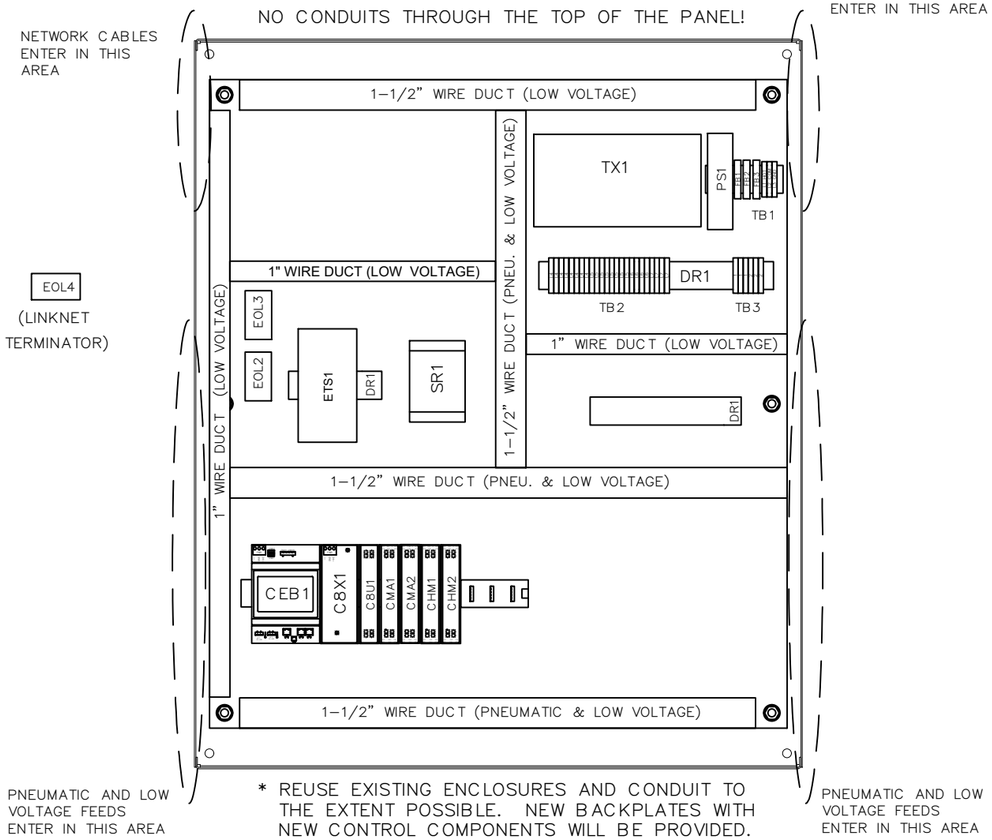
SHEET
NCHS-136
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 19 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

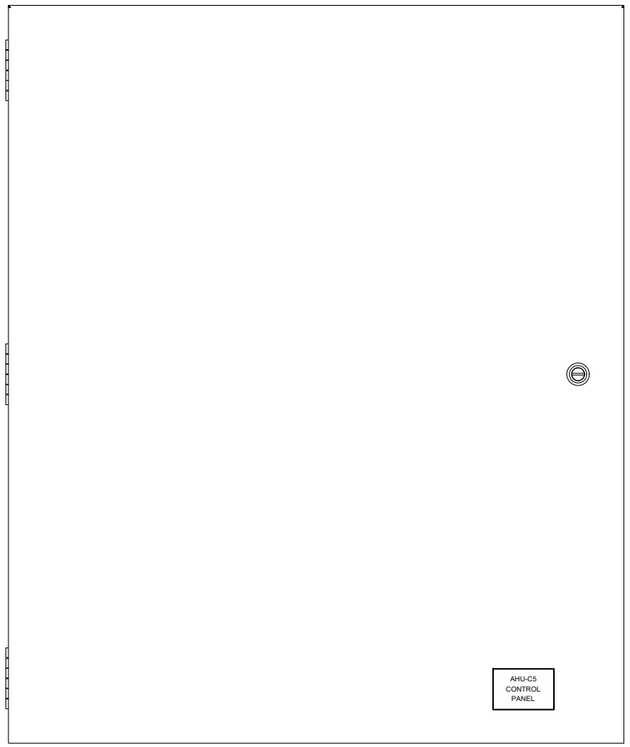


EOL4
(LINKNET TERMINATOR)

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

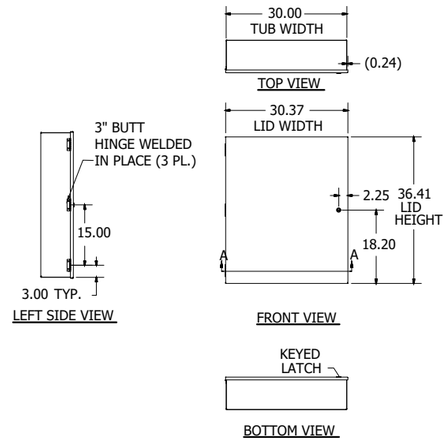
WILL BE PROVIDED IN A FUTURE REVISION. △

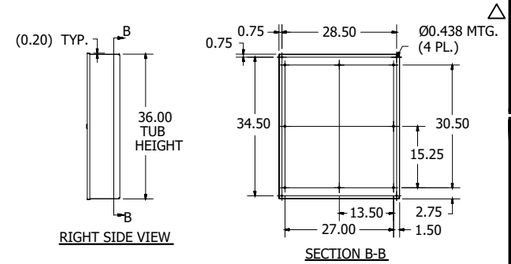
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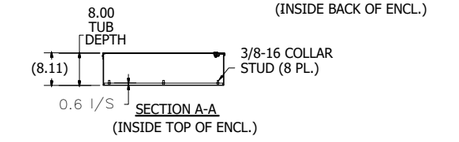
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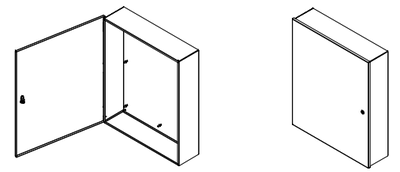
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

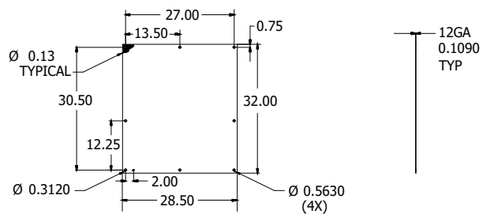








PANEL DIMENSIONS



AHU-C5 SYSTEM 19 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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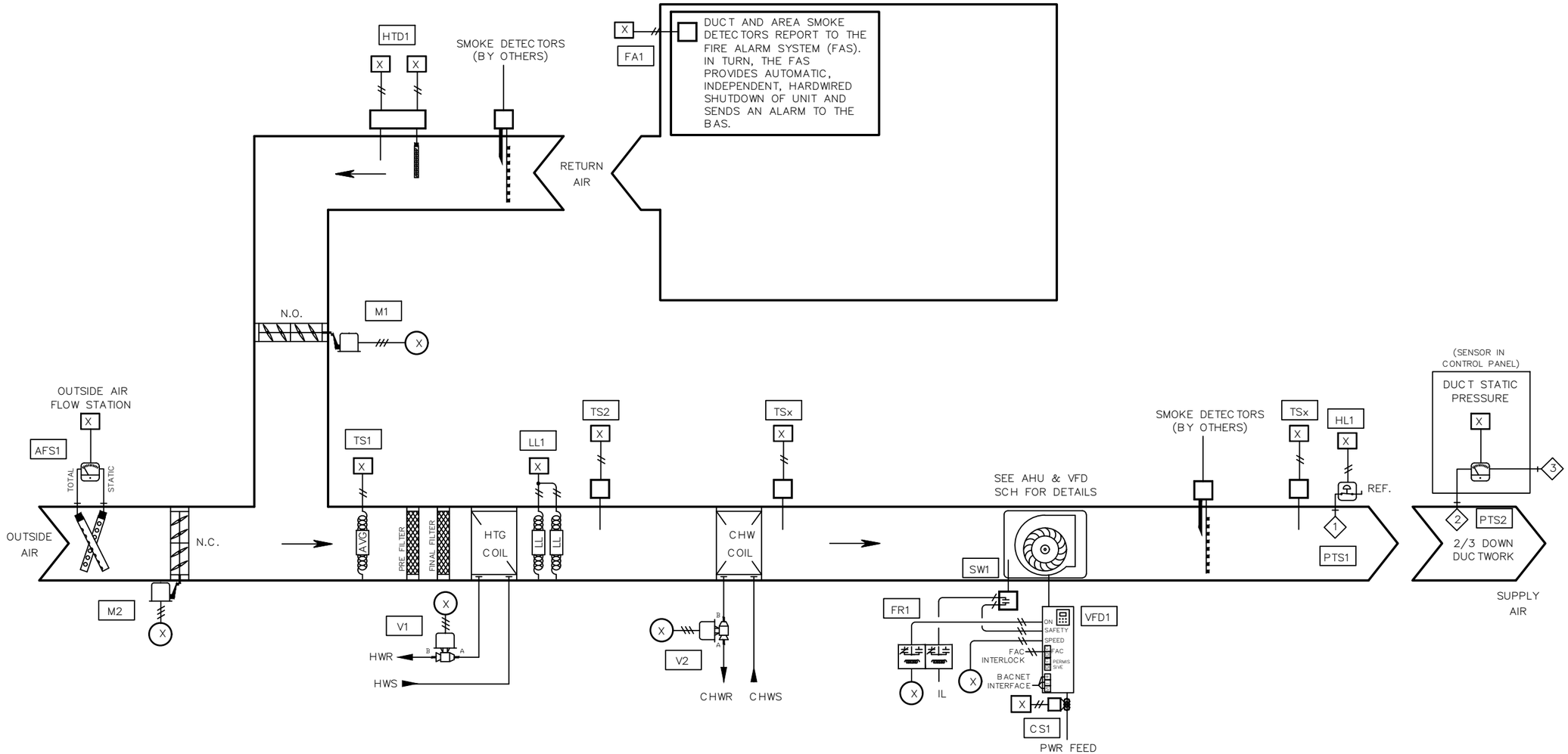
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J-2304001

AHU–J1 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AHU–J1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
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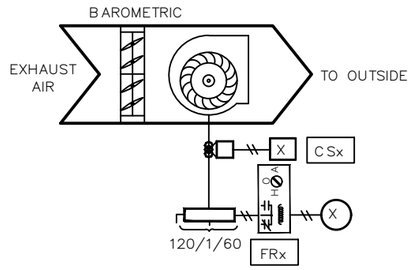
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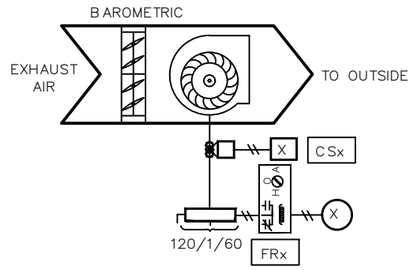
CONTRACT NO:

SHEET
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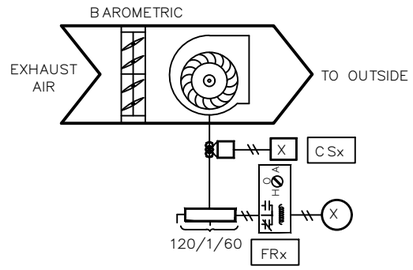
EXHAUST FAN – BAS CONTROLLED
EF–J1



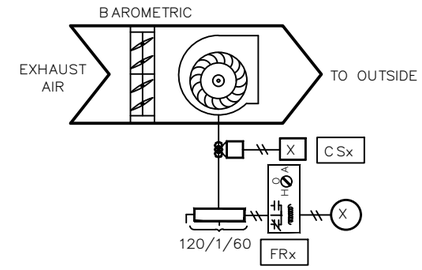
EXHAUST FAN – BAS CONTROLLED
EF–J2



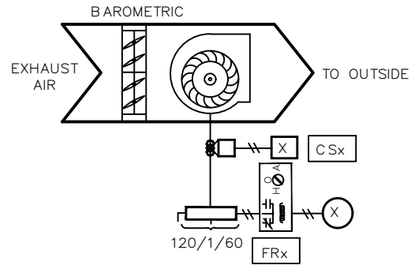
EXHAUST FAN – BAS CONTROLLED
EF–J3



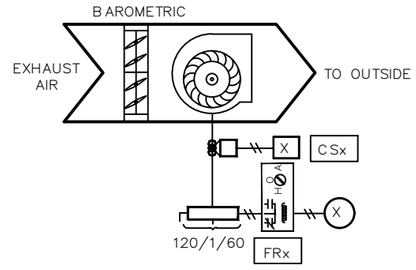
EXHAUST FAN – BAS CONTROLLED
EF–J4



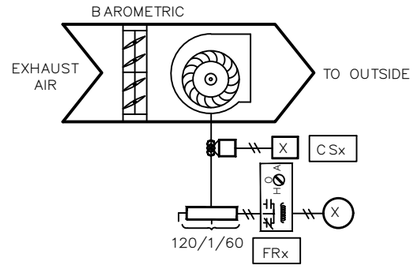
EXHAUST FAN – BAS CONTROLLED
EF–J5



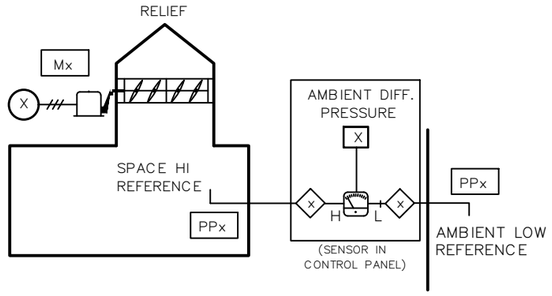
EXHAUST FAN – BAS CONTROLLED
EF–J6



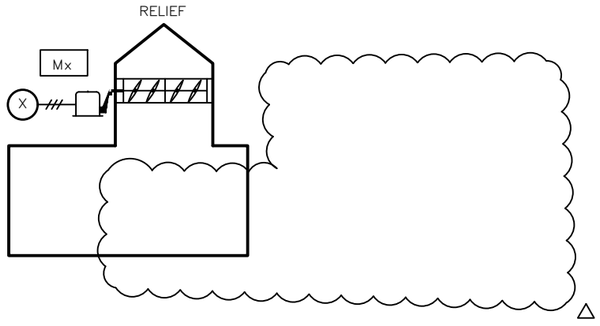
EXHAUST FAN – BAS CONTROLLED
EF–J7



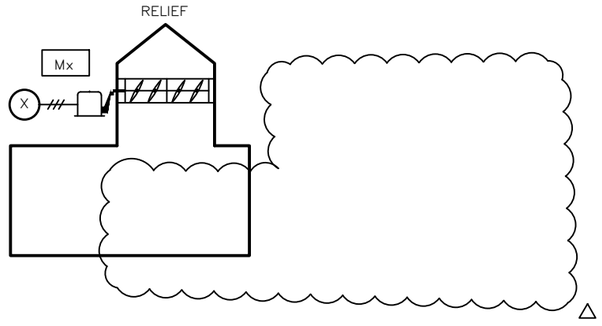
BUILDING PRESSURE CONTROL
E–RH–L1



BUILDING PRESSURE CONTROL
RH–J2



BUILDING PRESSURE CONTROL
RH–L2



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA J EXHAUST AND RELIEF FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

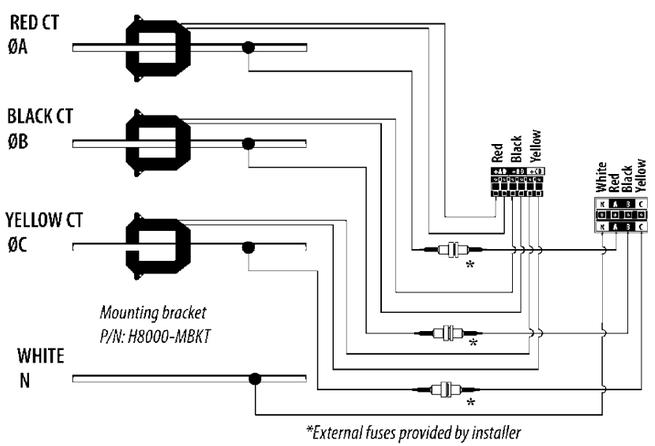
CONTRACT NO:

SHEET
NCHS–139
JOB NUMBER:
J–2304001

POWER METER HIGH VOLTAGE WIRING DETAIL

(FOR REFERENCE ONLY, EXISTING WIRING, NOT INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR SEVEN (7) METERS IN THIS AREA)

TYPICAL 208/480VAC, 4-WIRE, 3Ø INSTALLATION

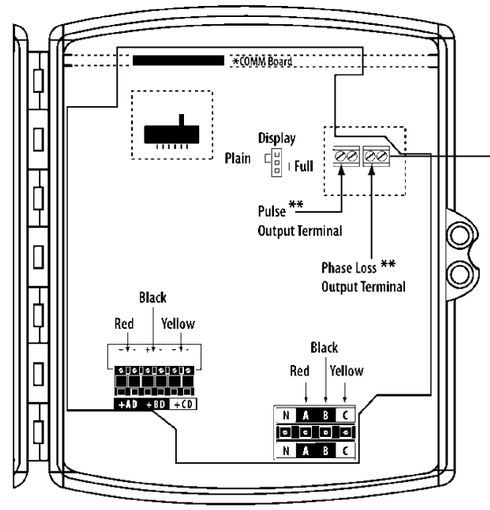


*External fuses provided by installer

(* PREVIOUS BAS DESIGN INDICATES VERIS AH04 TRIPLE FUSE KITS WERE INSTALLED)

POWER METER LOW VOLTAGE WIRING DETAIL

(BACNET MS/TP COMMUNICATION AND PHASE LOSS MONITORING INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR SEVEN (7) METERS IN THIS AREA)



*COMM Board is Optional
**H8160 Series only

PHASE LOSS OUTPUT
(ONE CONNECTION PER METER)

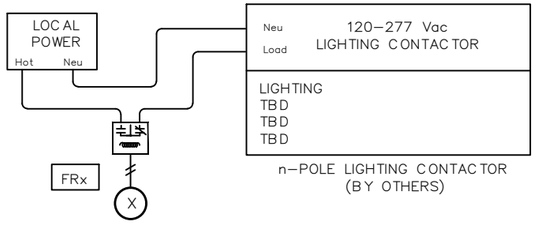
X	PL MTR3	(ELEC SWITCHGEAR RM)
X	PL MTR2	(ELEC SWITCHGEAR RM)
X	PL MTR1A	(ELEC SWITCHGEAR RM)
X	PL MTR1B	(ELEC SWITCHGEAR RM)
X	PL MTR4A	(ELEC SWITCHGEAR RM)
X	PL MTR4B	(ELEC SWITCHGEAR RM)
X	PL MTR MDPC	(CENT. PLANT)

COMMUNICATION
CARD
(IF INSTALLED)

+
–
S

BACNET
INTERFACE
(ONE CONNECTION PER METER)

LIGHTING CONTACTOR CONTROLS
RJ–1 – ROOM D147C



n–POLE LIGHTING CONTACTOR
(BY OTHERS)

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS
N1 THROUGH Nx

AREA J LIGHTING AND PHASE LOSS MONITORING FIELD DEVICES

Temperature Control Services
4240 W 50 S
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NCHS–140
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB 1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
EF-J1 STAT	Exhaust Fan J1 Status		X			
EF-J2 STAT	Exhaust Fan J2 Status		X			
EF-J3 STAT	Exhaust Fan J3 Status		X			
EF-J4 STAT	Exhaust Fan J4 Status		X			
EF-J5 STAT	Exhaust Fan J5 Status		X			
EF-J6 STAT	Exhaust Fan J6 Status		X			
EF-J7 STAT	Exhaust Fan J7 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PL MTR3	Phase Loss Elec Rm MDPA Left		X			
PL MTR2	Phase Loss Elec Rm MDPA Rt		X			
PL MTR1A	Phase Loss Elec Rm MDPB Left A		X			
PL MTR1B	Phase Loss Elec Rm MDPB Left B		X			
PL MTR4A	Phase Loss Elec Rm MDPB Rt A		X			
PL MTR4B	Phase Loss Elec Rm MDBP Rt B		X			
PL MTR MDPC	Phase Loss Cent Plant MDPC		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-L1	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-J2	Relief Air Damper			X		
RH-L2	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-J1 SS	Exhaust Fan J1 Start / Stop				X	
EF-J2 SS	Exhaust Fan J2 Start / Stop				X	
EF-J3 SS	Exhaust Fan J3 Start / Stop				X	
EF-J4 SS	Exhaust Fan J4 Start / Stop				X	
EF-J5 SS	Exhaust Fan J5 Start / Stop				X	
EF-J6 SS	Exhaust Fan J6 Start / Stop				X	
EF-J7 SS	Exhaust Fan J7 Start / Stop				X	
LTG 1	Lighting Contactor - Rm D147C RJ-1				X	
SF SS	Supply Fan Start / Stop					
	POINT TOTALS:	**8**	**18**	**8**	**8**	**0**

△ △

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
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LEBANON, INDIANA 46052
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SHEET
NCHS-141
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-J1 AND AHU-J2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFJn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

ELECTRICAL UTILITY POWER MONITORING:

TCC SHALL MONITOR FOR PHASE LOSS ON EXISTING TO REMAIN POWER METERS. TCC SHALL GENERATE AN ALARM UPON PHASE LOSS FOR MANUAL DECISION TO SHUTDOWN CHILLERS, AIR HANDLING UNITS, AND BOILERS.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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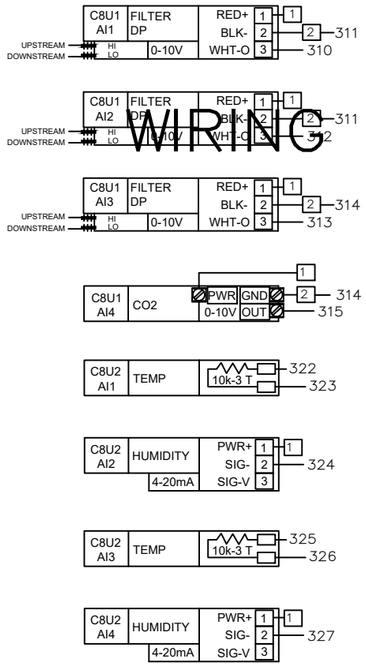
REVISIONS	
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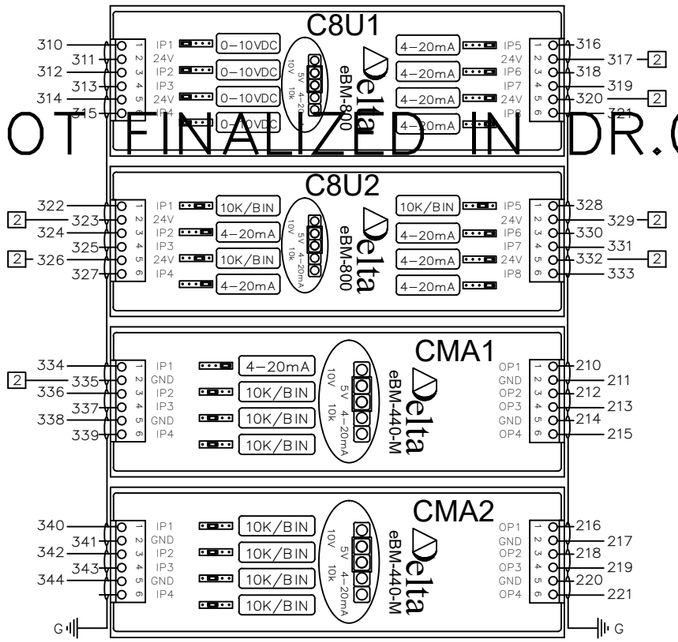
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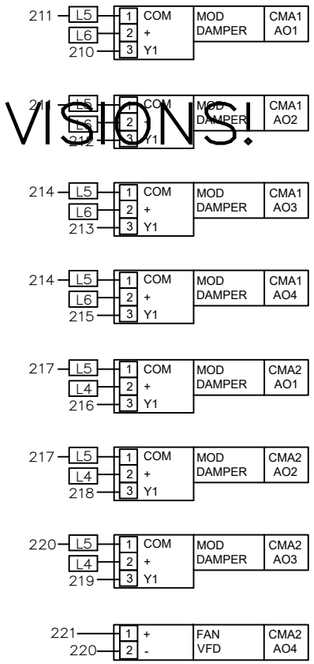
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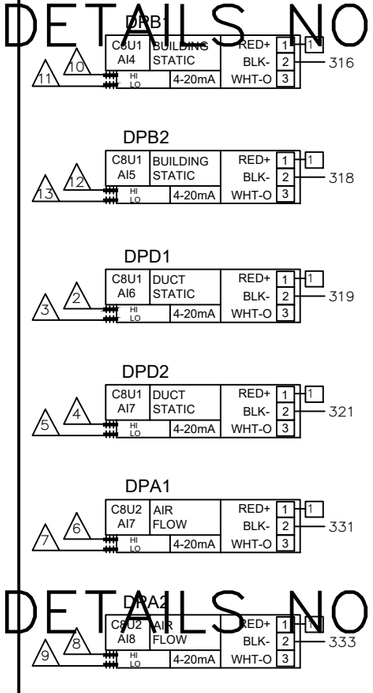
SHEET
NCHS–142
JOB NUMBER:
J–2304001

SYSTEM 20 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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AHU-J1 SYSTEM 20 PANEL – I/O WIRING (1 OF 3)

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CMA3 DI1 | DX STATUS | N.O. | 346 — 347

CMA3 DI2 | PURGE ENABLE | N.O. | 348 — 347

CMH2 DI1 | FAN STATUS | N.O. | 358 — 359

CMH1 DI1 | FAN STATUS | N.O. | 360 — 359

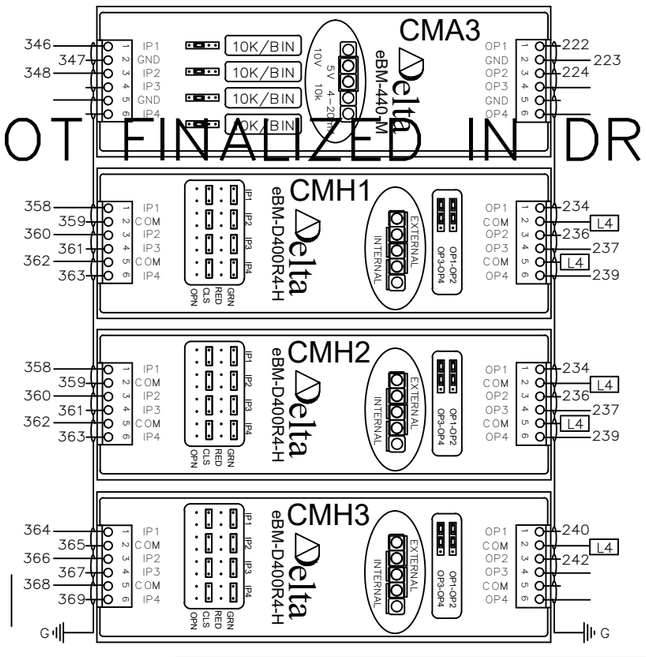
CMH1 DI3 | SMOKE ALARM | N.O. | 361 — 362

CMH1 DI4 | SMOKE ALARM | N.O. | 363 — 362

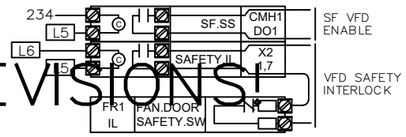
CMH2 DI1 | FAS.INPUT | N.C. | 364 — 365

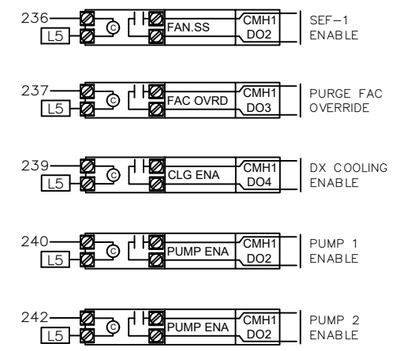
CMH2 DI2 | PUMP STATUS | N.O. | 366 — 365

CMH2 DI3 | PUMP STATUS | N.O. | 367 — 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1





	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			

CMA3 eBM-440-M — eBM-440-M I/O MODULE — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			
OUTPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			

CMA4 eBM-440-M — eBM-440-M I/O MODULE — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001

CMH1 eBM-D400R-H — eBM-D400R4-H I/O MOD — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001
	CMH2	3	10100.1803			
	CMH2	4	10100.1804			

CMH2 eBM-D400R-H — eBM-D400R4-H I/O MOD — CMH2 eBM-D400R-H

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
	ISSUED FOR CONST
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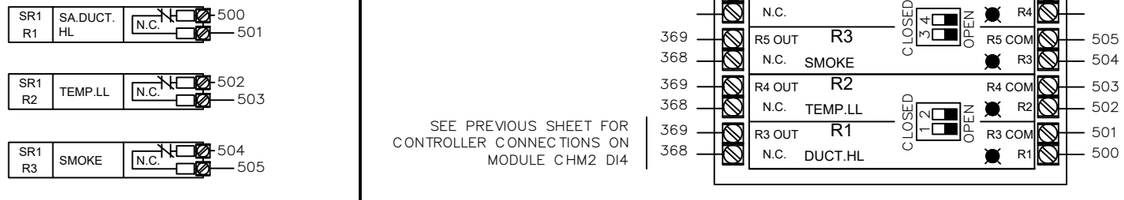
CONTRACT NO:

SHEET
NCHS–144
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls

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SYSTEM 20 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET LEG 02

TO SYSTEM 01 SUBNET LEG 03

TO SYSTEM 01 SUBNET LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB Power

24V CB Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

75VA 24VAC 24VAC

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L2 L3

PS1

102 4.0A

101 1.0A

100 5.0A

G PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

206 L8 L8 L8

207 L9 L9 L9

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

ETS1

300 301 L3

V1- V1+

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

202 204

200 201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 5A @ 30VDC

24V COM POWER 44 MAX

R7

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

DPD1 DPB1

Power + GND / 4-20mA out - Voltage out O

HIGH LOW

1 2 3 4 5

PNEUMATIC PNEUMATIC

CEB1 C8X1

201 200 PWR 24~ GND

USB2 USB1 (NOT USED)

NET1 RS-485 NET2 RS-485

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

AHU-J1 SYSTEM 20 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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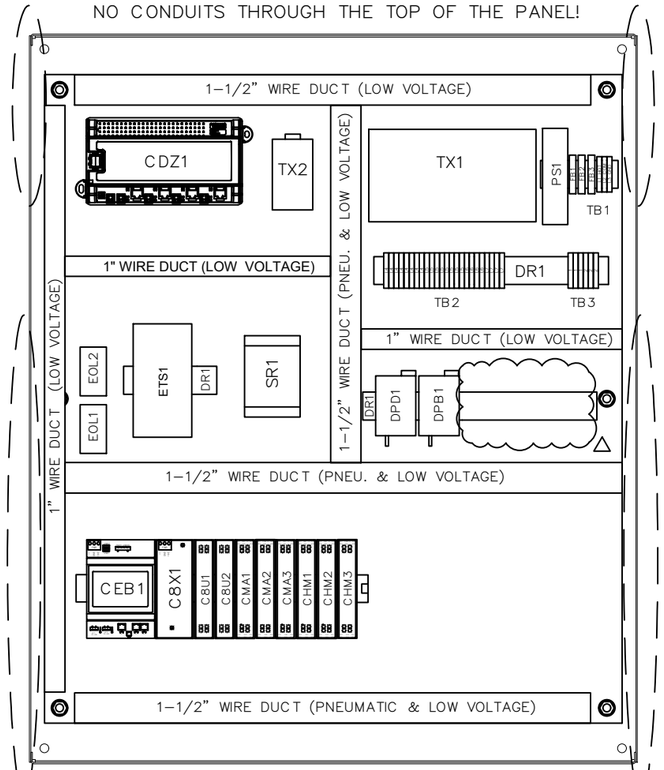
CONTRACT NO:

SHEET
NCHS-146
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 20 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

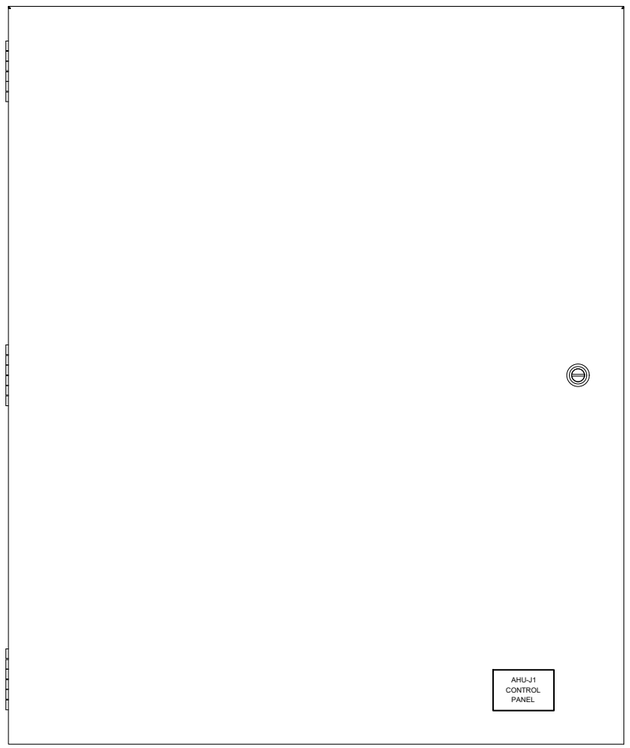


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



BILL OF MATERIALS

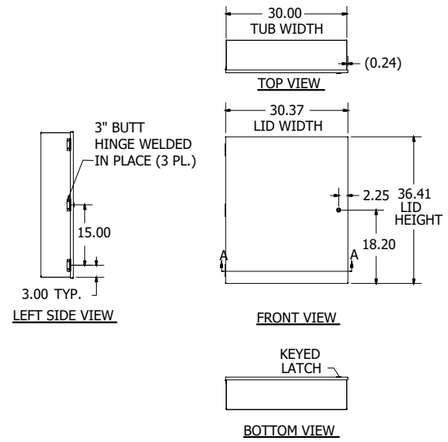
WILL BE PROVIDED IN A FUTURE REVISION. △

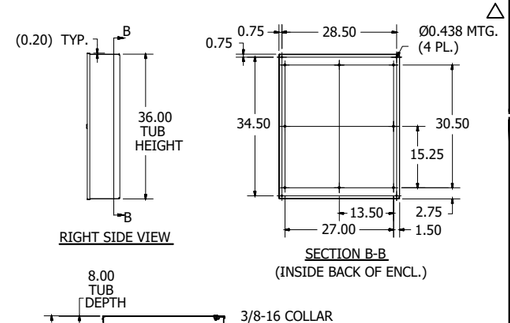
BILL OF MATERIALS

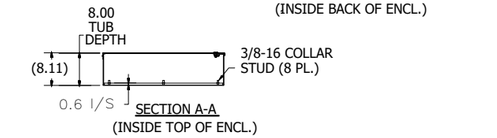
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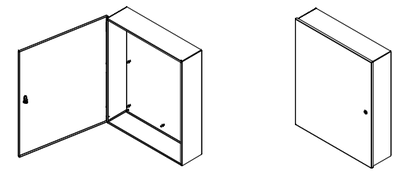
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

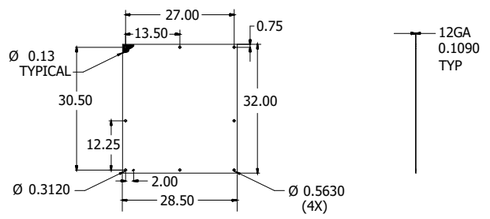








PANEL DIMENSIONS



AHU–J1 SYSTEM 20 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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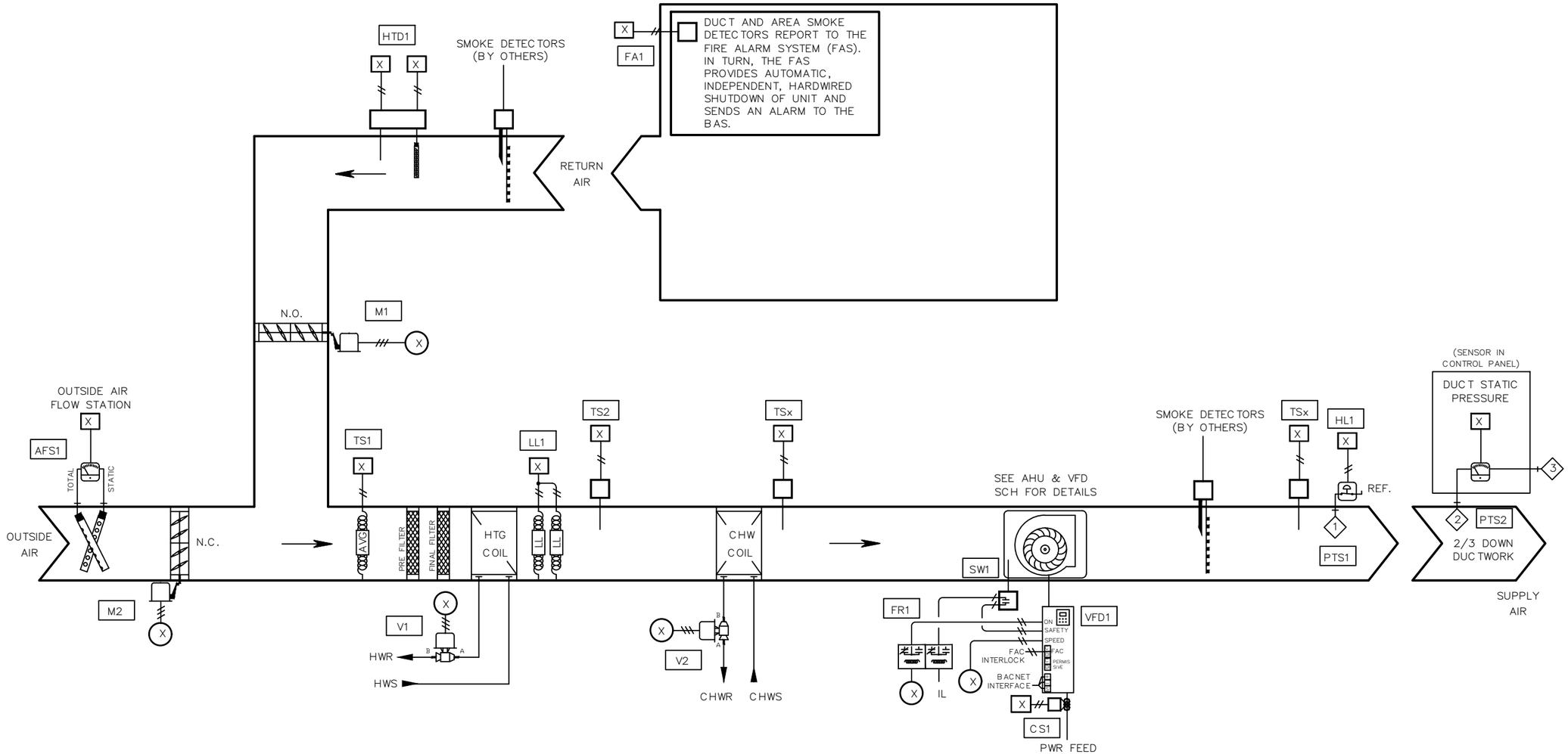
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CONTRACT NO:

SHEET
NCHS–147
JOB NUMBER:
J–2304001

AHU–J2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU–J2 FIELD DEVICES

Delta Controls

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4240 W 50 S
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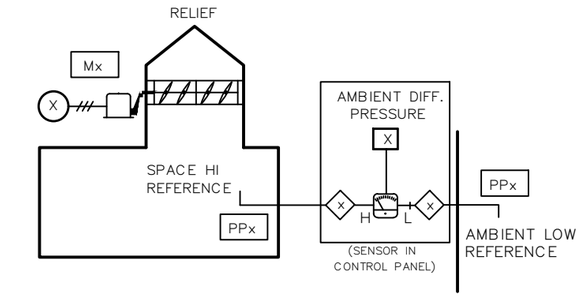
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NCHS–148
JOB NUMBER:
J–2304001

BUILDING PRESSURE CONTROL
E–RH–J3



△

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA J RELIEF FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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NCHS–149
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB 1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-J3 DPR	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**4**	**6**	**1**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-J2 & AREA J MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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CONTRACT NO:

SHEET
NCHS-150
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-J1 AND AHU-J2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFJn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

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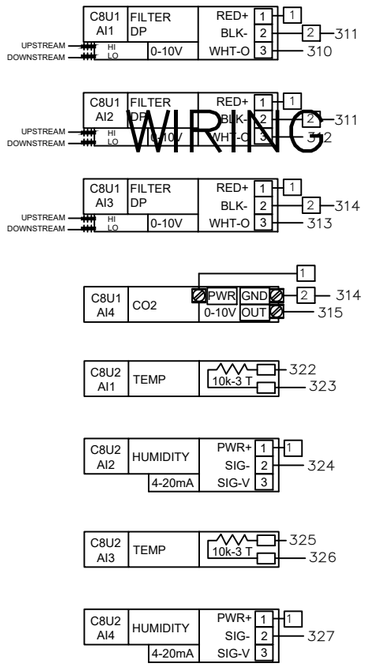
REVISIONS	
DATE	REMARKS

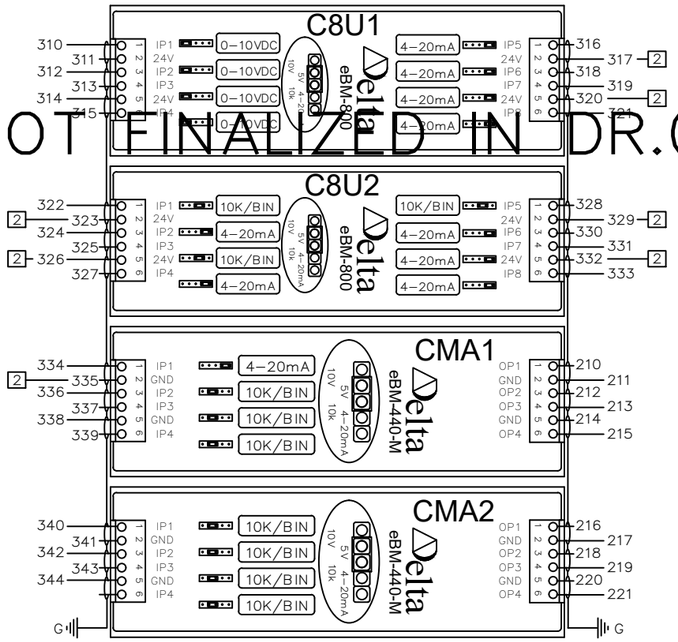
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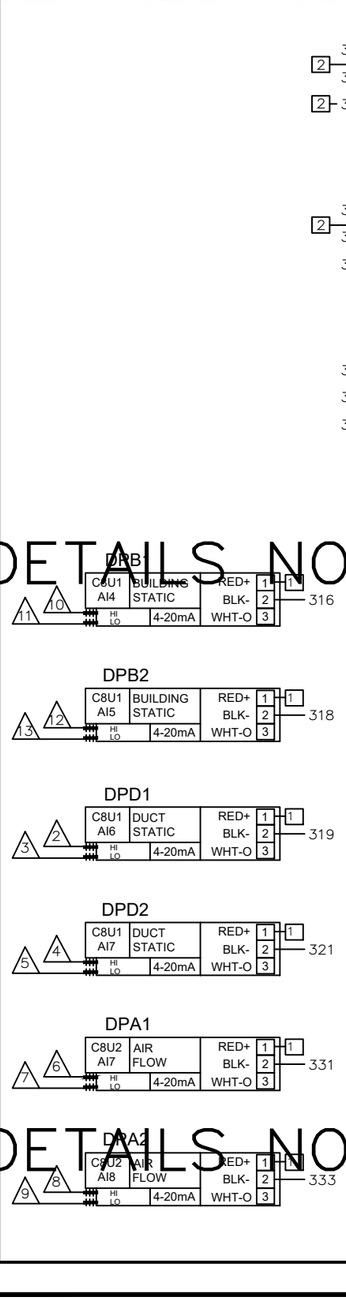
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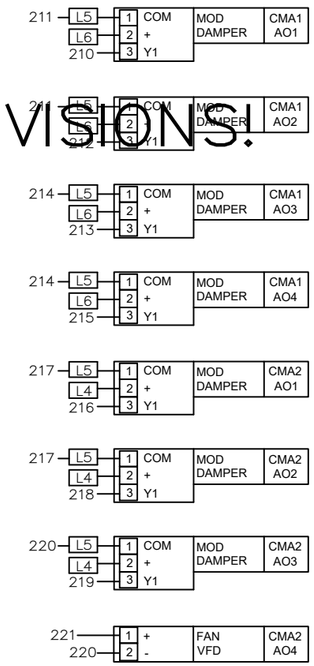
SHEET
NCHS-151
JOB NUMBER:
J-2304001

SYSTEM 21 CONTROL PANEL









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-J2 SYSTEM 21 PANEL – I/O WIRING (1 OF 2)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
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CONTRACT NO:

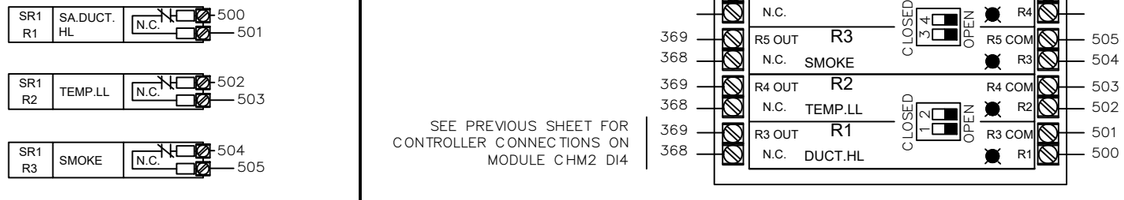
SHEET
NCHS–152
JOB NUMBER:
J–2304001

SYSTEM 21 CONTROL PANEL

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU-J2 SYSTEM 21 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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NCHS-153
JOB NUMBER:
J-2304001

SYSTEM 21 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

L3

200
201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

300
301

V1-
V1+

ETHERNET SWITCH

1 3 5 4 2

CAT5e

SR1

RIBMNLB-4

202
204

200
201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 10A @ 277VAC

R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.

R4 COM R4
R3 COM R3
R2 COM R2
R1 COM R1

CLOSED

201
200

CEC1

PWR

Delta
eBCON-2

eBUS
NET2

NET2 RS-485 [+] [-] SHD

LAN 1

eBM-440-M
eBM-440-M
eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

TX1

24V CB
24V CB
Power
Power

100
L2
L3

H
C
G

120 VAC LAPTOP PWR

75VA
24VAC
24VAC
24VAC
24VAC
75VA

200
201
CONTROLLER PWR

202
203
FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V
-V
GND
L
N

300
301
101
L2
L3

PS1

1.0A
101
5.0A
100
G

PANEL GND LUG

TB1

L1 L2 L3

H N
120 VAC

TB2

202 L4 L4 L4
203 L5 L5 L5
204 L6 L6 L6
205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1
301 2 2 2

24 VDC TO FIELD

DPD1

DPB1

Power +
GND / 4-20mA out -
Voltage out 0

HIGH
LOW

PNEUMATIC

2
3
4
5

SEE RISER DIAGRAMS FOR LOCATION

AHU-J2 SYSTEM 21 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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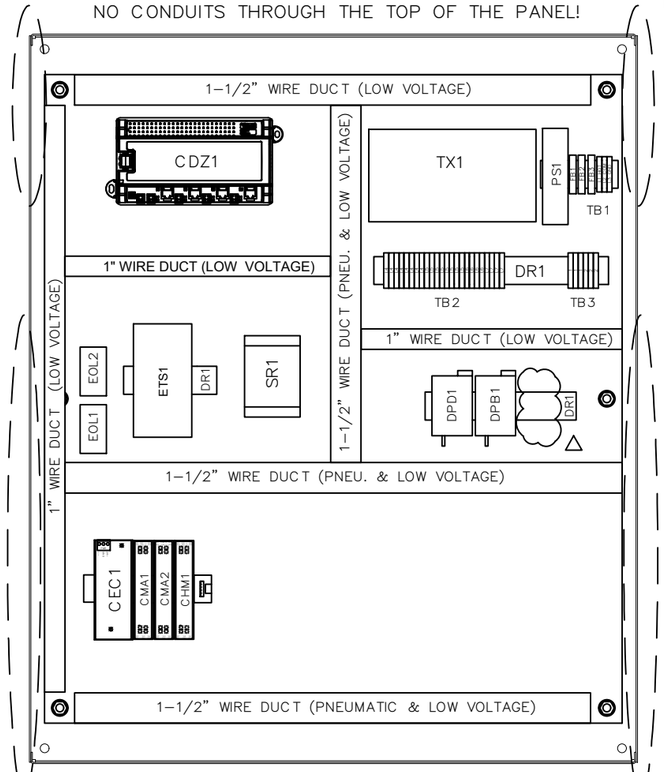
CONTRACT NO:

SHEET
NCHS-154
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 21 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

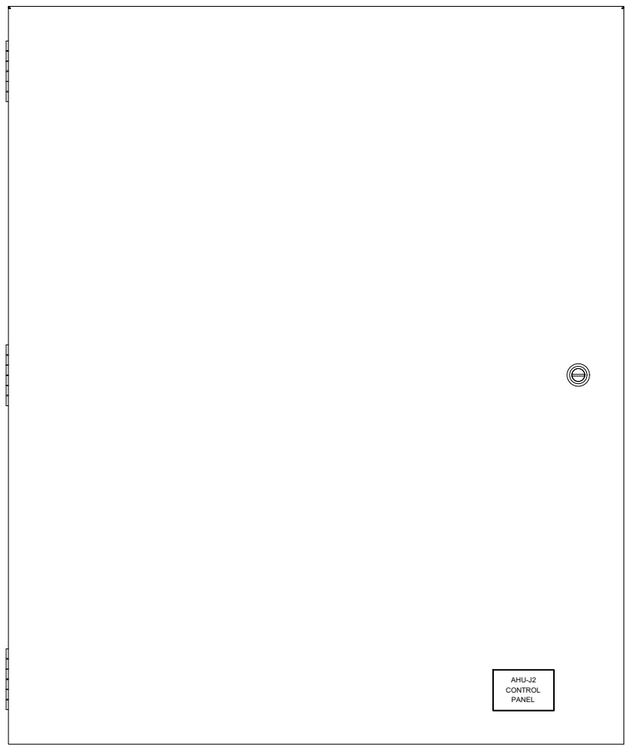


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

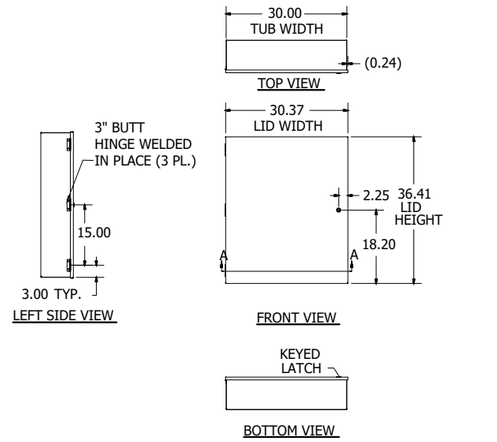
WILL BE PROVIDED IN A FUTURE REVISION. △

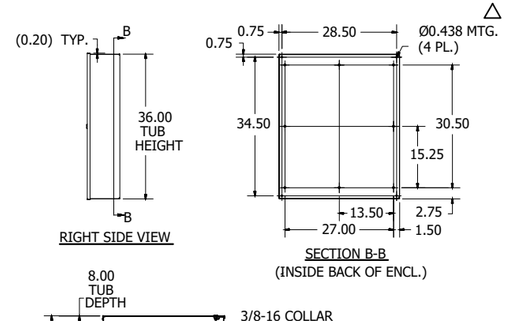
BILL OF MATERIALS

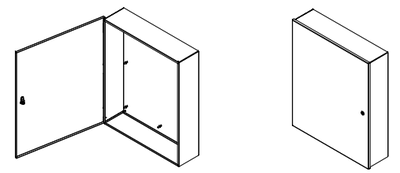
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

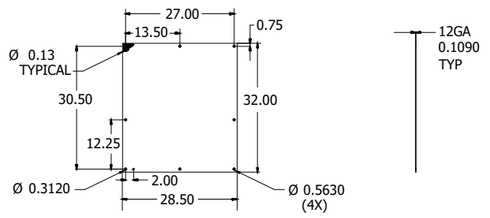
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



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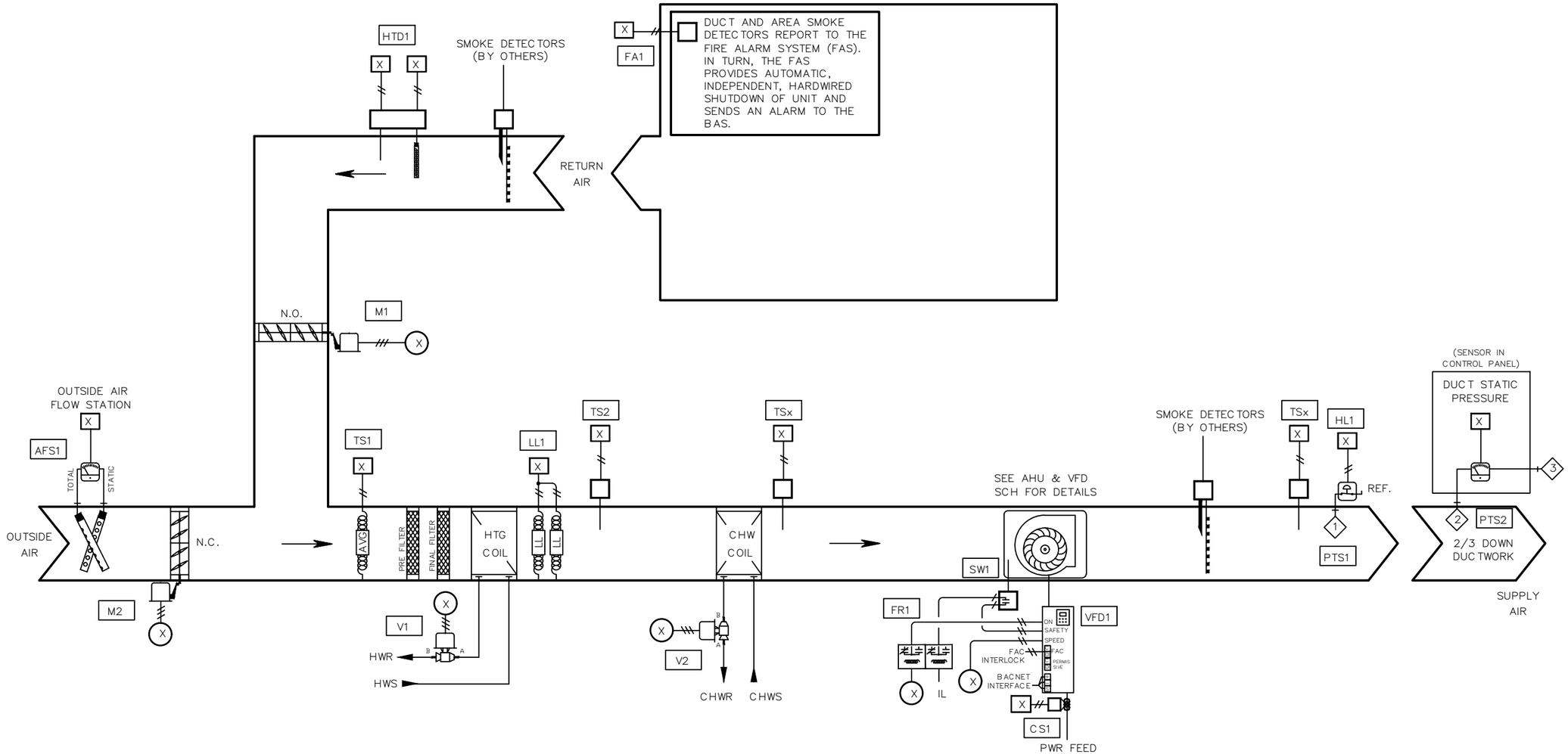
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SHEET
NCHS-155
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J-2304001

AHU-J3 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AHU-J3 FIELD DEVICES

Delta Controls

Temperature Control Services
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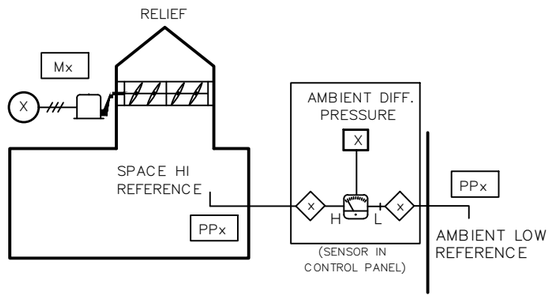
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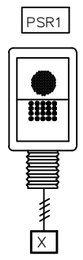
SHEET
NCHS-156
JOB NUMBER:
J-2304001

BUILDING PRESSURE CONTROL
E–RH–J1

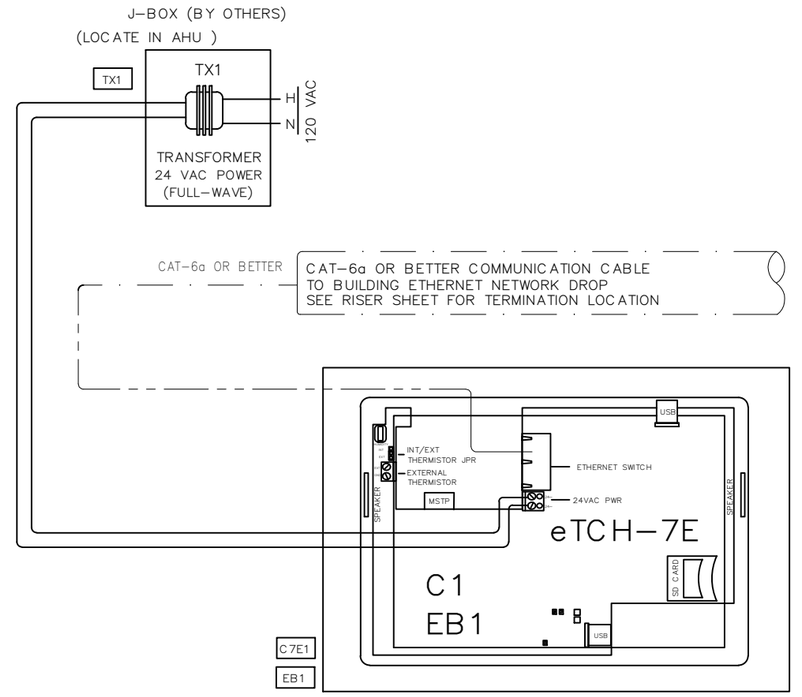


LIGHTING CONTACTOR CONTROLS

PHOTOCELL



TOUCHSCREEN LOCAL INTERFACE – AT AHU–J3
(LOCATE IN LOW–VOLTAGE CONTROLS ENCLOSURE AT THE UNIT.)



SEE RISER DIAGRAMS FOR TOUCHSCREEN CONTROLLER LOCATION

NETWORK POINTS
N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AHU–J3 TOUCHSCREEN & AREA J RELIEF FIELD DEVICES

Delta Controls
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SHEET
NCHS–157
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB 1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PSR	Photocell		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-J1 DPR	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**6**	**1**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-J3 SEQUENCE OF OPERATION

TCC SHALL PROVIDE NEW TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER. CIC IS RESPONSIBLE FOR INSTALLATION OF PANEL AND WIRING. DIVISION 26 CONTRACTOR TO BRING POWER TO THE PANEL ON A DEDICATED CIRCUIT.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5” WITH A MINIMUM OF .5”. BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1” IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1” IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

LOCAL CONTROLLER DISPLAY:

TCC SHALL PROVIDE AND CIC SHALL INSTALL NEW LOCAL CONTROLLER DISPLAY AT THE AIR HANDLING UNIT TO SUPPORT LOCAL OPERATION AS CONTROL ENCLOSURE WILL BE LOCATED REMOTELY BELOW THE ROOF.

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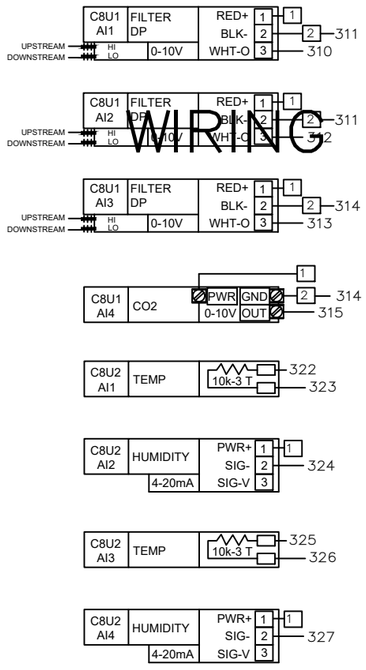
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DATE	REMARKS

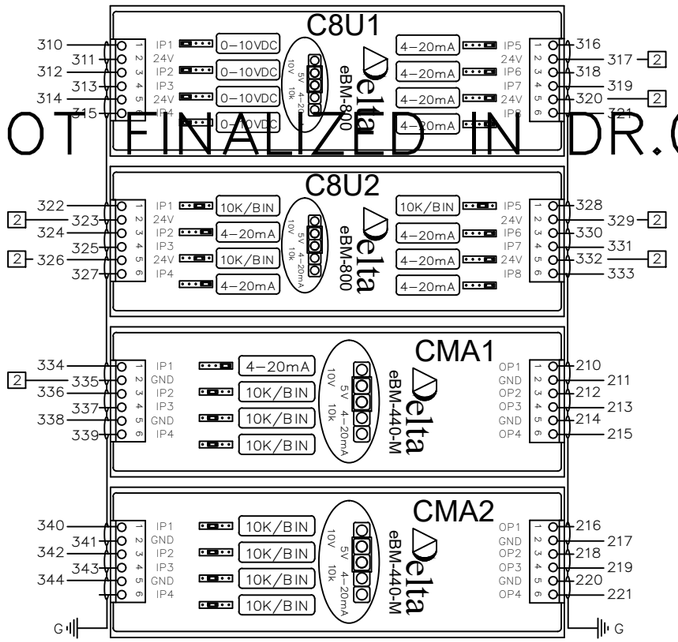
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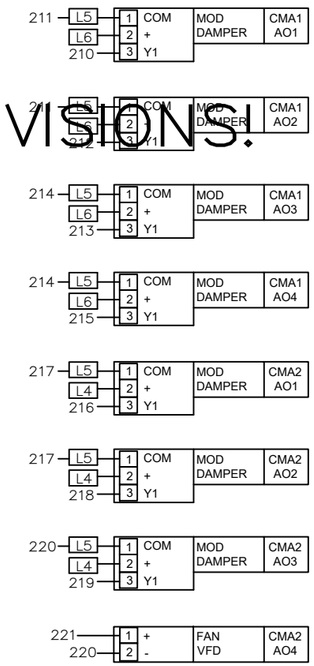
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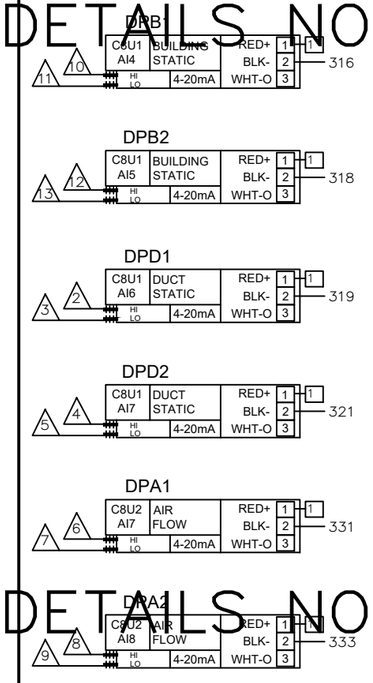
SHEET
NCHS–159
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

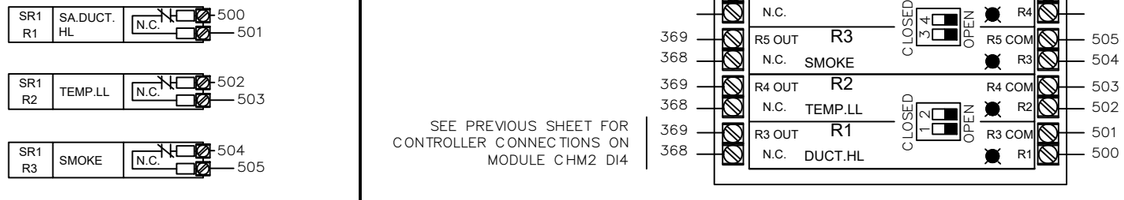
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-160
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls
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SHEET
NCHS-161
JOB NUMBER:
J-2304001

SYSTEM 22 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

L3

200
201

TO SYSTEM 01 SUBNET LEG 02

TO SYSTEM 01 SUBNET LEG 03

TO SYSTEM 01 SUBNET LEG 04

CAT-6a

ETS1

300
301
L3
V1-
V1+

ETHERNET SWITCH

1 2 3 4 5

CAT5e

CAT-6a

eTCH NETWORK DISPLAY

eTCH-7E

SR1

RIBMNLB-4

202
204

200
201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 10A @ 277VAC

R7

R4 OUT N.C.
R4 COM
R4

R3 OUT N.C.
R3 COM
R3

R2 OUT N.C.
R2 COM
R2

R1 OUT N.C.
R1 COM
R1

CLOSED
OPEN

TX1

24V CB
Power
120 VAC LAPTOP PWR
75VA
24VAC
24VAC

100
L2
L3
H
C
G

200
201
CONTROLLER PWR

202
203
FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V
-V
GND
L
N

300
301
101
L2
L3

PS1

1.0A
5.0A
101
100
G

PANEL GND LUG

TB1

L1
L2
L3
H
N
120 VAC

TB2

202
203
204
205

L4
L5
L6
L7

24 VAC TO FIELD

TB3

300
301

1
2

24 VDC TO FIELD

DPD1

DPB1

Power + / GND / 4-20mA out - / Voltage out 0

HIGH
LOW

PNEUMATIC

2
3
4
5

1

CEC1

201
200

PWR
24~ GND

Delta
eBCON-2

eBUS
NET2

NET2 RS-485
[+] [-] SHD

LAN

eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H

OP1 OP2 OP3 OP4

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

AHU-J3 SYSTEM 22 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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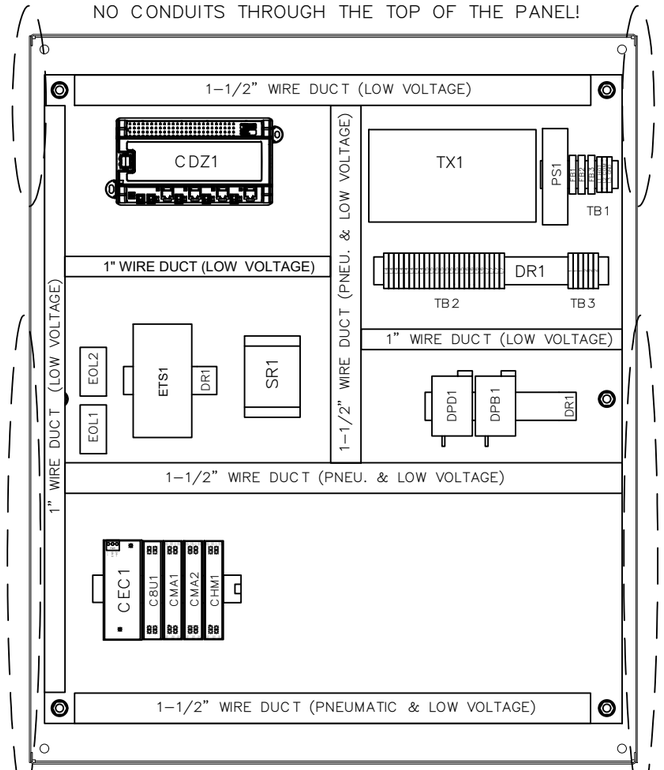
CONTRACT NO:

SHEET
NCHS-162
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 22 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

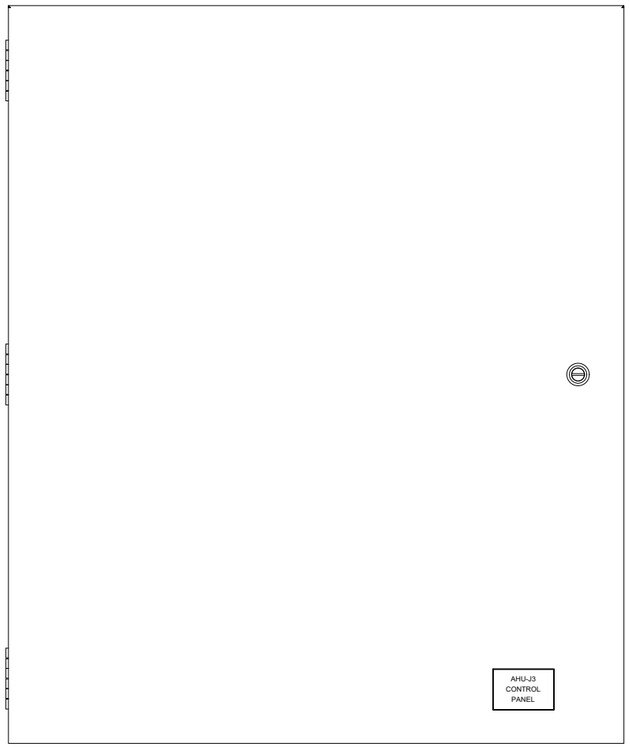


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

*NEW ENCLOSURE PROVIDED FOR THIS AHU.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



BILL OF MATERIALS

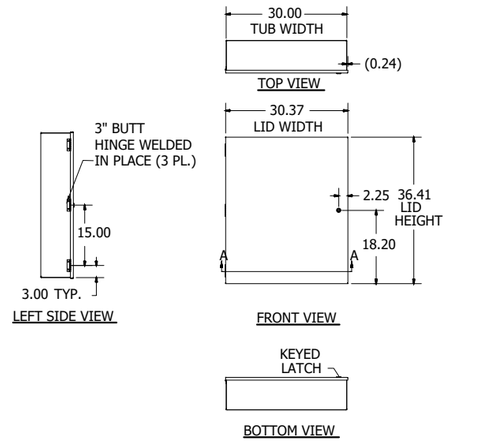
WILL BE PROVIDED IN A FUTURE REVISION. △

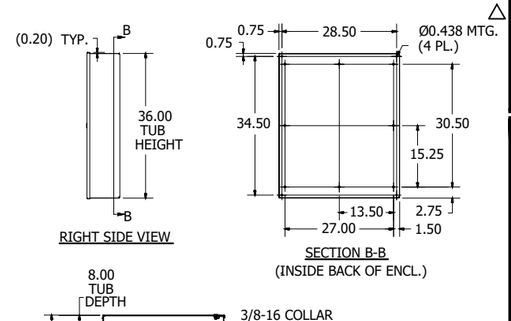
BILL OF MATERIALS

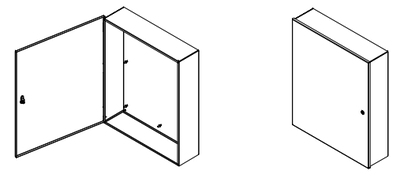
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

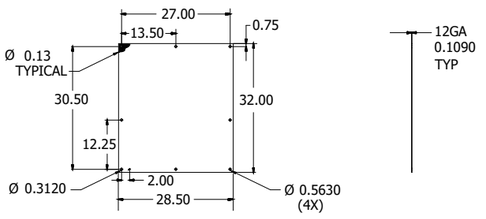
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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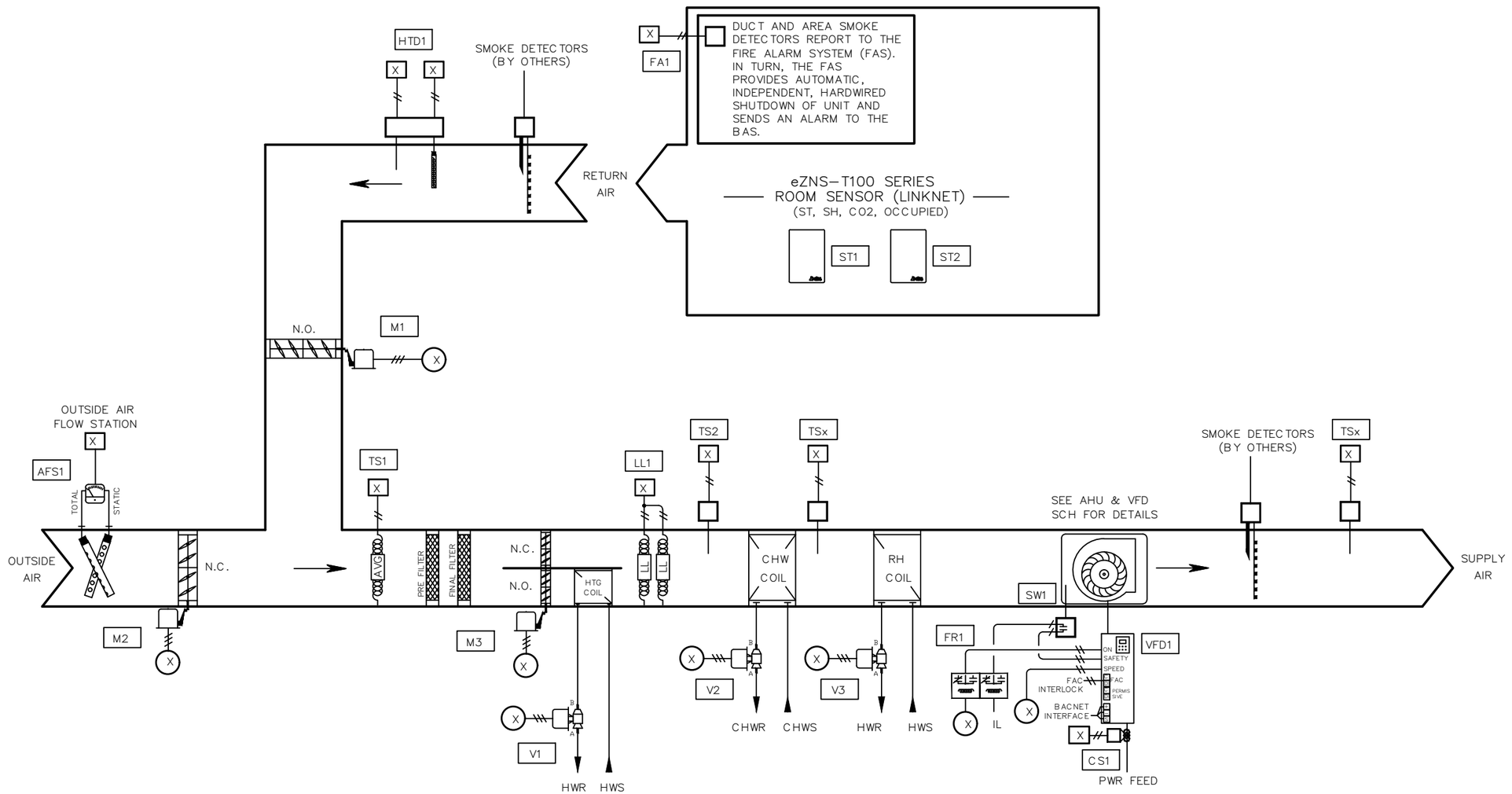
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–163
JOB NUMBER:
J–2304001

AHU-K6 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU-K6 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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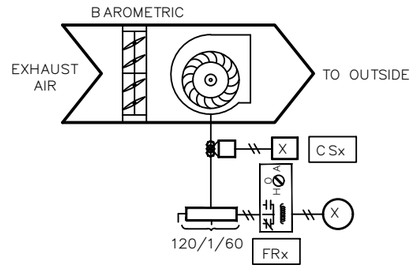
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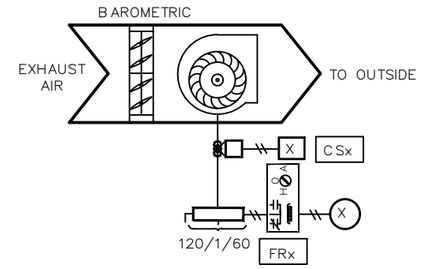
CONTRACT NO:

SHEET
NCHS-164
JOB NUMBER:
J-2304001

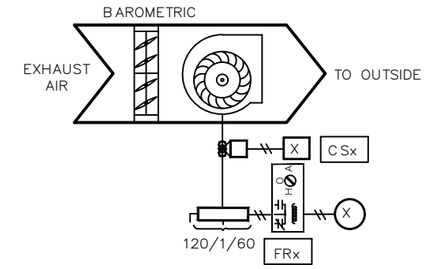
EXHAUST FAN – BAS CONTROLLED
EF–K2



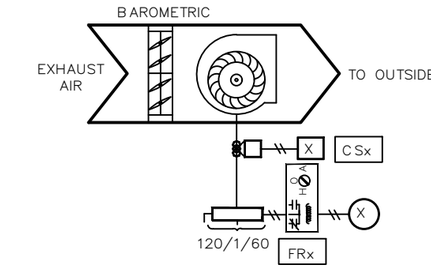
EXHAUST FAN – BAS CONTROLLED
EF–K3



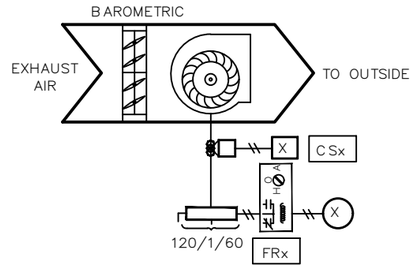
EXHAUST FAN – BAS CONTROLLED
EF–K6



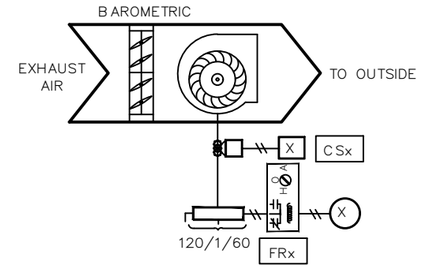
EXHAUST FAN – BAS CONTROLLED
E–EF–M1



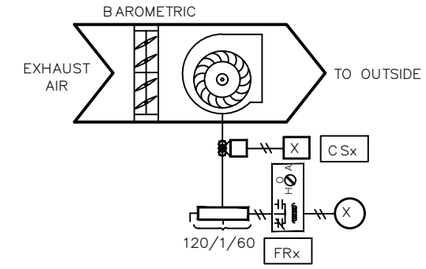
EXHAUST FAN – BAS CONTROLLED
EF–M2



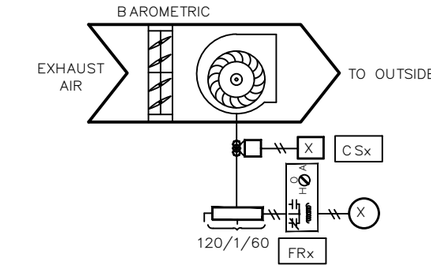
EXHAUST FAN – BAS CONTROLLED
EF–M4



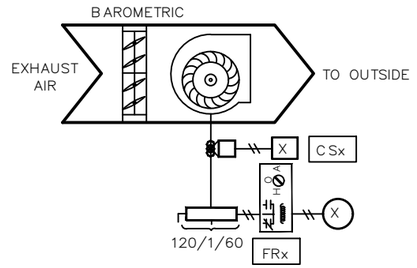
EXHAUST FAN – BAS CONTROLLED
EF–M5



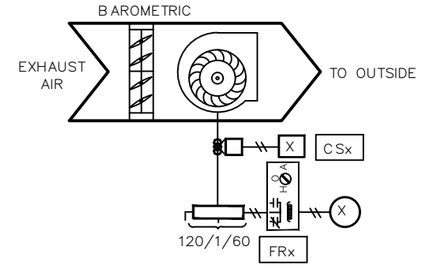
EXHAUST FAN – BAS CONTROLLED
EF–M6



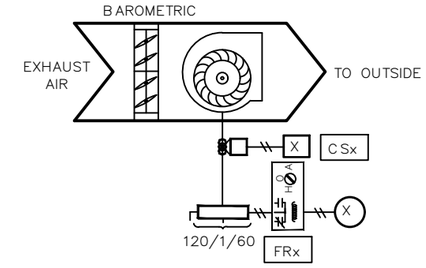
EXHAUST FAN – BAS CONTROLLED
EF–M8



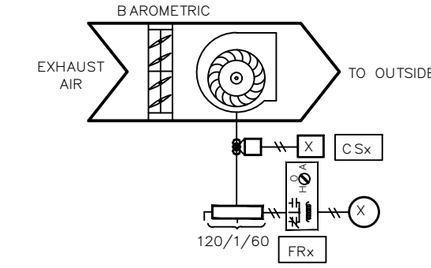
EXHAUST FAN – BAS CONTROLLED
EF–M9



EXHAUST FAN – BAS CONTROLLED
EF–M10



EXHAUST FAN – BAS CONTROLLED
EF–M11



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS
N1 THROUGH Nx

AREA K EXHAUST FIELD DEVICES (1 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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	AS–BUILT

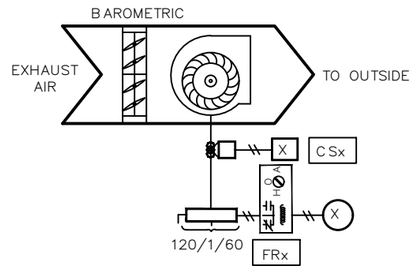
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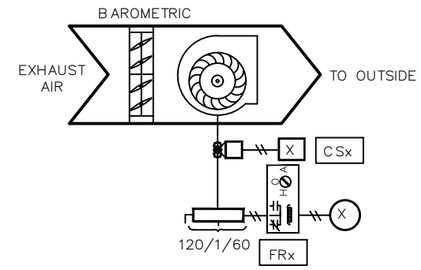
CONTRACT NO:

SHEET
NCHS–165
JOB NUMBER:
J–2304001

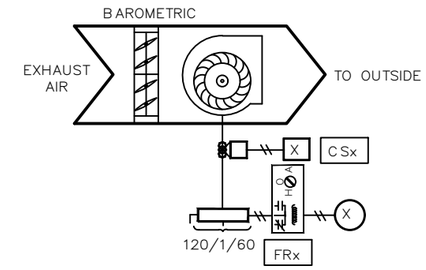
EXHAUST FAN – BAS CONTROLLED
EF–M12



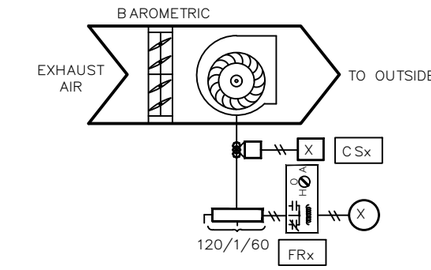
EXHAUST FAN – BAS CONTROLLED
EF–M13



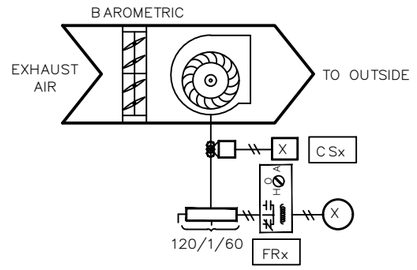
EXHAUST FAN – BAS CONTROLLED
EF–M14



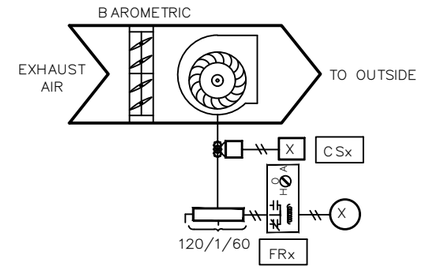
EXHAUST FAN – BAS CONTROLLED
EF–M15



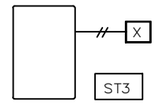
EXHAUST FAN – BAS CONTROLLED
EF–M16



EXHAUST FAN – BAS CONTROLLED
EF–M17



IDF / MDF / ELEC ROOM
SPACE TEMPERATURE
RM (TBD)



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

△

AREA K EXHAUST, RELIEF, & IDF MONITORING FIELD DEVICES (2 OF 2)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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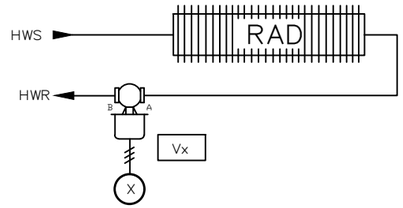
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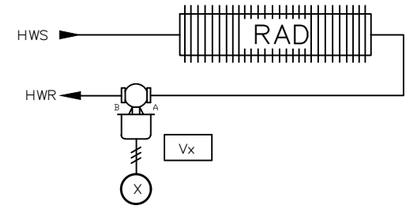
CONTRACT NO:

SHEET
NCHS–166
JOB NUMBER:
J–2304001

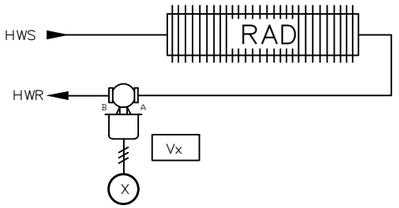
RADIANT CEILING PANEL
RCP–K1



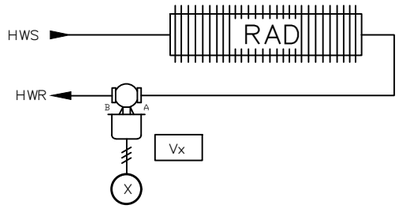
RADIANT CEILING PANEL
RCP–K2



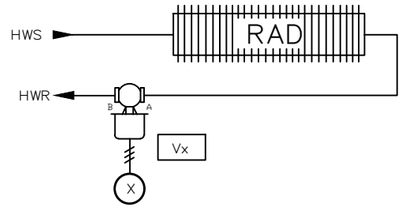
RADIANT CEILING PANEL
RCP–K3



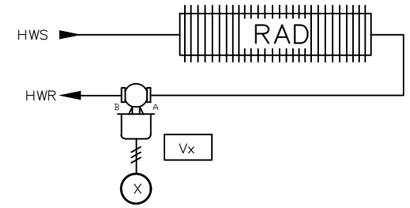
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RCP–K4



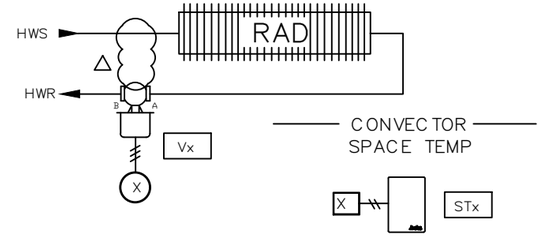
RADIANT CEILING PANEL
RCP–K5



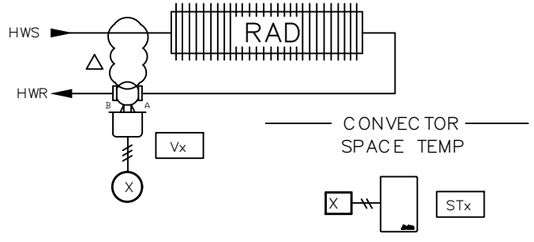
RADIANT CEILING PANEL
RCP–K6



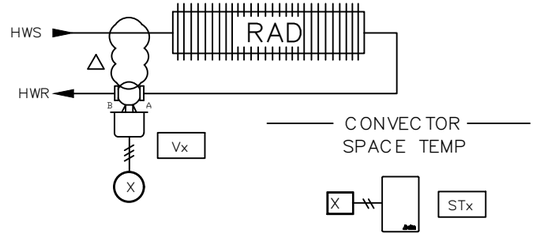
CONVECTOR
E–CV–M5



CONVECTOR
E–CV–M6



CONVECTOR
E–CV–M7



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA K RADIANT PANEL & CONVECTOR FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	△ ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

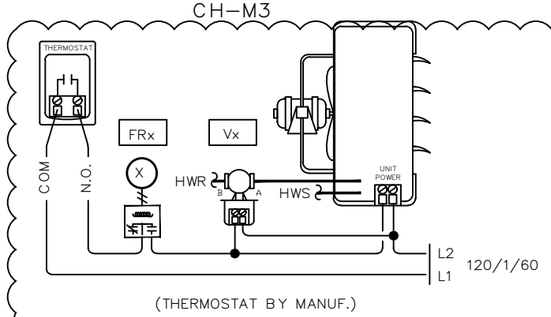
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

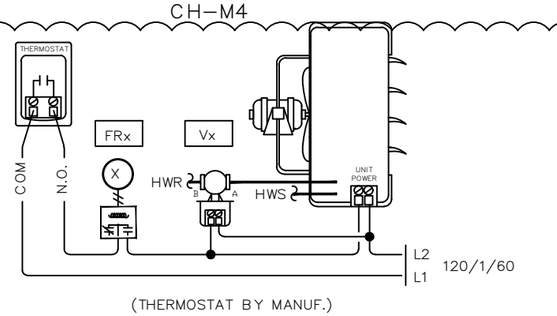
SHEET
NCHS–167
JOB NUMBER:
J–2304001

CABINET UNIT HEATER CH–M3



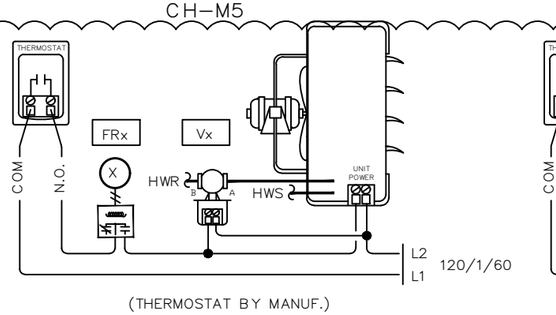
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER CH–M4



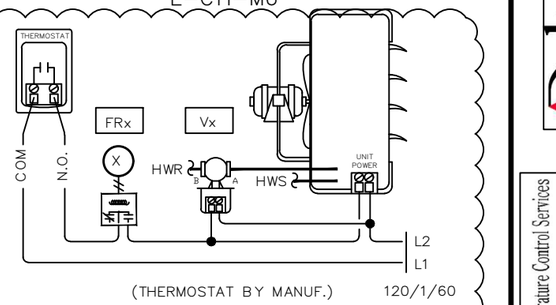
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CABINET UNIT HEATER CH–M5



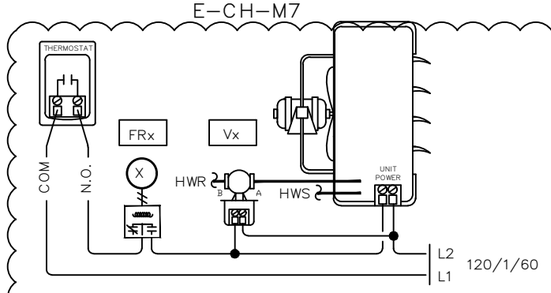
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CABINET UNIT HEATER E–CH–M6



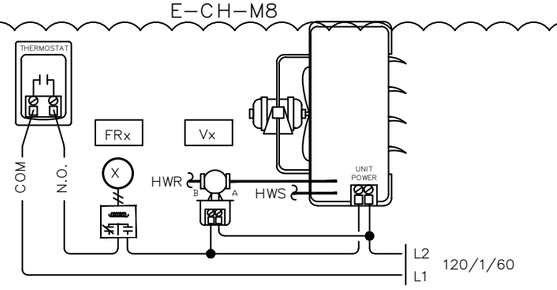
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER E–CH–M7



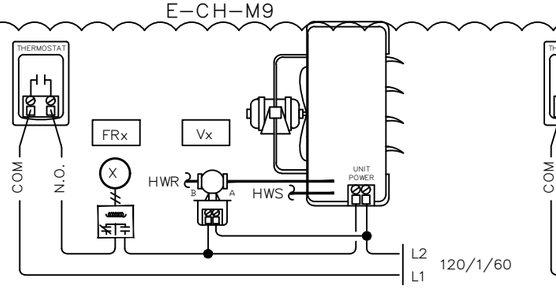
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER E–CH–M8



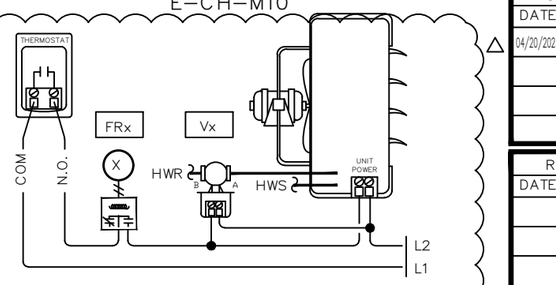
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER E–CH–M9



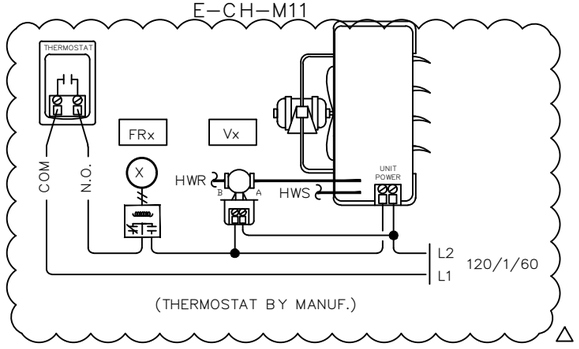
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER E–CH–M10



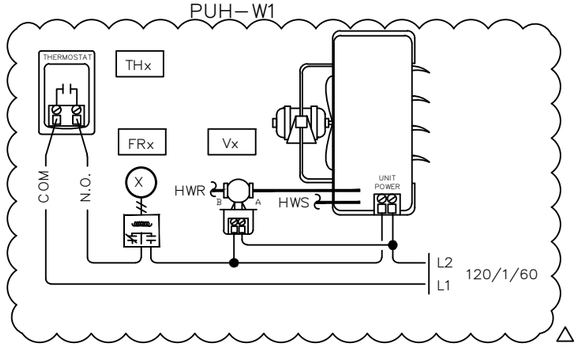
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER E–CH–M11



(THERMOSTAT BY MANUF.)

PROPELLER UNIT HEATER PUH–W1



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA K CABINET & PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

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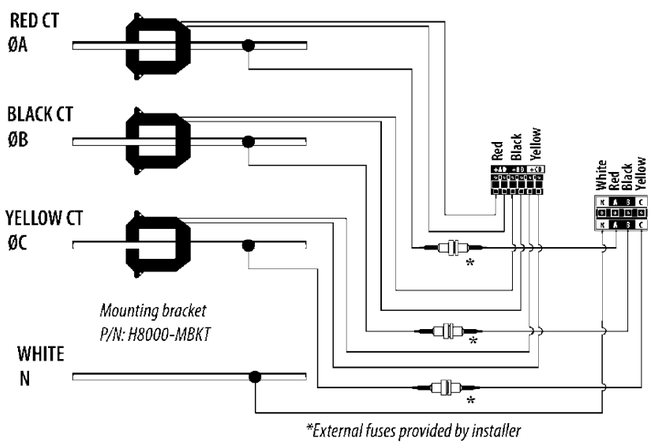
CONTRACT NO:

SHEET
NCHS–168
JOB NUMBER:
J–2304001

POWER METER HIGH VOLTAGE WIRING DETAIL

(FOR REFERENCE ONLY, EXISTING WIRING, NOT INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)

TYPICAL 208/480VAC, 4-WIRE, 3Ø INSTALLATION

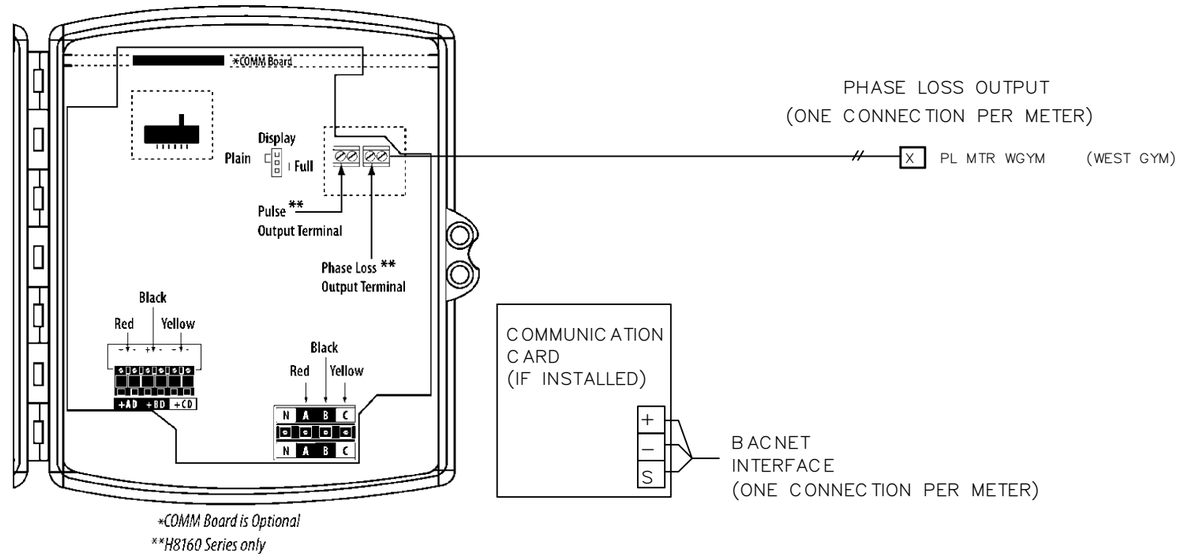


*External fuses provided by installer

(* PREVIOUS BAS DESIGN INDICATES VERIS AH04 TRIPLE FUSE KITS WERE INSTALLED)

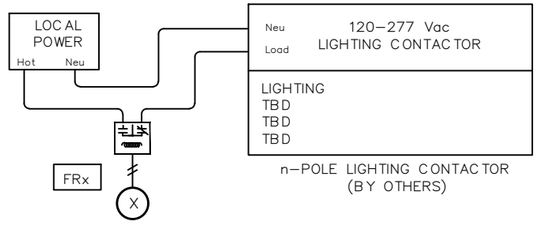
POWER METER LOW VOLTAGE WIRING DETAIL

(BACNET MS/TP COMMUNICATION AND PHASE LOSS MONITORING INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)



*COMM Board is Optional
**H8160 Series only

LIGHTING CONTACTOR CONTROLS
RT–1 – WEST LIGHTS



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS
N1 THROUGH Nx

AREA K LIGHTING AND PHASE LOSS MONITORING FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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CONTRACT WITH: MSD Washington Township
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CONTRACT NO:

SHEET
NCHS–169
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
E-CV-M5 ST	Convector M5 Space Temp	X				
E-CV-M6 ST	Convector M6 Space Temp	X				
E-CV-M7 ST	Convector M7 Space Temp	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
ST3	IDF Space Temp	X				
E-EF-M1 STAT	Exhaust Fan M1 Status		X			
EF-K2 STAT	Exhaust Fan K2 Status		X			
EF-K3 STAT	Exhaust Fan K3 Status		X			
EF-K6 STAT	Exhaust Fan K6 Status		X			
EF-M10 STAT	Exhaust Fan M10 Status		X			
EF-M11 STAT	Exhaust Fan M11 Status		X			
EF-M12 STAT	Exhaust Fan M12 Status		X			
EF-M13 STAT	Exhaust Fan M13 Status		X			
EF-M14 STAT	Exhaust Fan M14 Status		X			
EF-M15 STAT	Exhaust Fan M15 Status		X			
EF-M16 STAT	Exhaust Fan M16 Status		X			
EF-M17 STAT	Exhaust Fan M17 Status		X			
EF-M2 STAT	Exhaust Fan M2 Status		X			
EF-M4 STAT	Exhaust Fan M4 Status		X			
EF-M5 STAT	Exhaust Fan M5 Status		X			
EF-M6 STAT	Exhaust Fan M6 Status		X			
EF-M8 STAT	Exhaust Fan M8 Status		X			
EF-M9 STAT	Exhaust Fan M9 Status		X			
LL	Low Limit (Freezestat)		X			
PL MTR WGYM	Phase Loss Elec Meter West Gym		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CH-M3 EN	CUH M3 Enable				X	
CH-M4 EN	CUH M4 Enable				X	
CH-M5 EN	CUH M5 Enable				X	
E-CH-M6 EN	CUH M6 Enable				X	
E-CH-M7 EN	CUH M7 Enable				X	
E-CH-M8 EN	CUH M8 Enable				X	
E-CH-M9 EN	CUH M9 Enable				X	
E-CH-M10 EN	CUH M10 Enable				X	
E-CH-M11 EN	CUH M11 Enable				X	
E-CV-M5 HWV	Convector M5 Hot Water Valve				X	
E-CV-M6 HWV	Convector M6 Hot Water Valve				X	
E-CV-M7 HWV	Convector M7 Hot Water Valve				X	
E-EF-M1 SS	Exhaust Fan M1 Start / Stop				X	
EF-K2 SS	Exhaust Fan K2 Start / Stop				X	
EF-K3 SS	Exhaust Fan K3 Start / Stop				X	
EF-K6 SS	Exhaust Fan K6 Start / Stop				X	
EF-M10 SS	Exhaust Fan M10 Start / Stop				X	
EF-M11 SS	Exhaust Fan M11 Start / Stop				X	
EF-M12 SS	Exhaust Fan M12 Start / Stop				X	
EF-M13 SS	Exhaust Fan M13 Start / Stop				X	
EF-M14 SS	Exhaust Fan M14 Start / Stop				X	
EF-M15 SS	Exhaust Fan M15 Start / Stop				X	
EF-M16 SS	Exhaust Fan M16 Start / Stop				X	
EF-M17 SS	Exhaust Fan M17 Start / Stop				X	
EF-M2 SS	Exhaust Fan M2 Start / Stop				X	
EF-M4 SS	Exhaust Fan M4 Start / Stop				X	
EF-M5 SS	Exhaust Fan M5 Start / Stop				X	
EF-M6 SS	Exhaust Fan M6 Start / Stop				X	
EF-M8 SS	Exhaust Fan M8 Start / Stop				X	
EF-M9 SS	Exhaust Fan M9 Start / Stop				X	
LTG 1	Lighting Contactor - West Lights RT-1				X	
PUH-W1 EN	PUH W1 Enable				X	
RCP-K1 HWV	Radiant Panel K1 Hot Water Valve				X	
RCP-K2 HWV	Radiant Panel K2 Hot Water Valve				X	
RCP-K3 HWV	Radiant Panel K3 Hot Water Valve				X	
RCP-K4 HWV	Radiant Panel K4 Hot Water Valve				X	
RCP-K5 HWV	Radiant Panel K5 Hot Water Valve				X	
RCP-K6 HWV	Radiant Panel K6 Hot Water Valve				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
ST2	Space Temp					X
SH3	Space Humidity					X
S CO22	Space CO2					X
OCC2	Occupied Flag					X
	POINT TOTALS:	**12**	**22**	**9**	**39**	**8**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-K6 & AREA K MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES

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04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-170
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-K6 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE. OCCUPANCY SENSOR AUX CONTACT (OCC-S), OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL START AND RAMP TO BALANCER DETERMINED SPEED TO DELIVER THE SCHEDULED SUPPLY CFM.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFK1-C, EFK2-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO SUPPLY FAN OPERATION OF AHU-K6.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY. THE TWO SPACE TEMPERATURE SENSORS SHALL BE AVERAGED TO CONTROL THE AIR HANDLING UNIT. THE TWO SPACE HUMIDITY SENSORS SHALL UTILIZE THE MAXIMUM TO CONTROL HUMIDITY.

FACE AND BYPASS DAMPER CONTROL: ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 38F (ADJ), THE HEATING COIL (PH-VLV) SHALL BE FULLY OPEN AND DISCHARGE TEMPERATURE SHALL BE MAINTAINED BY MODULATING THE FACE AND BYPASS DAMPERS. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 38F (ADJ), THE FACE AND BYPASS DAMPERS SHALL BE FULLY OPEN TO THE COIL AND THE HEATING COIL SHALL MODULATE TO MAINTAIN DISCHARGE TEMPERATURE.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. WHEN SPACE HUMIDITY FALLS BELOW 55 % RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL BE OPENED TO THE MINIMUM POSITION TO DELIVER THE SCHEDULED OUTSIDE AIRFLOW.

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT AND REHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ) WITH THE FACE AND BYPASS DAMPER CLOSED TO THE COIL.

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

ELECTRICAL UTILITY POWER MONITORING:

TCC SHALL MONITOR FOR PHASE LOSS ON EXISTING TO REMAIN POWER METERS. TCC SHALL GENERATE AN ALARM UPON PHASE LOSS FOR MANUAL DECISION TO SHUTDOWN CHILLERS, AIR HANDLING UNITS, AND BOILERS.

RADIANT CEILING PANELS:

WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 50 F (ADJ), HOT WATER VALVES FOR RADIANT HEATING ARE TO REMAIN CLOSED. BELOW 45 F (ADJ) OUTSIDE AIR TEMPERATURE, THE RADIANT HEATING VALVES ARE TO OPEN AS A FIRST STAGE OF HEATING FOR THE SPACES INDICATED IN THE MECHANICAL DRAWINGS.

CONVECTOR HEATING:

WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 50 F (ADJ), THE HOT WATER VALVE SHALL REMAIN CLOSED. BELOW 45 F (ADJ) OUTSIDE AIR TEMPERATURE, THE RADIANT HEATING VALVES SHALL CYCLE OPEN AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT SETPOINT OF 68F (ADJ).

CABINET UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

IDF/MDF AND ELECTRICAL HVAC SPLIT SYSTEM MONITORING:

INSTALL AND WIRE BAS FLAT PLATE SPACE TEMPERATURE SENSORS FOR MONITOR OF IDF/MDF SPACES AND ALARM CONDITIONS. ALL STAND-ALONE HVAC SYSTEMS WILL HAVE BAS SPACE TEMPERATURE MONITORING IN ADDITION TO THE CONTROLS FROM THE MANUFACTURER. AN ALARM WILL BE GENERATED IF THE SPACE RISES ABOVE 81F (ADJ) OR DROPS BELOW 59F (ADJ). THESE SPACES ALSO REQUIRE A SEPARATE THERMOSTAT FOR LOCAL EQUIPMENT CONTROL.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

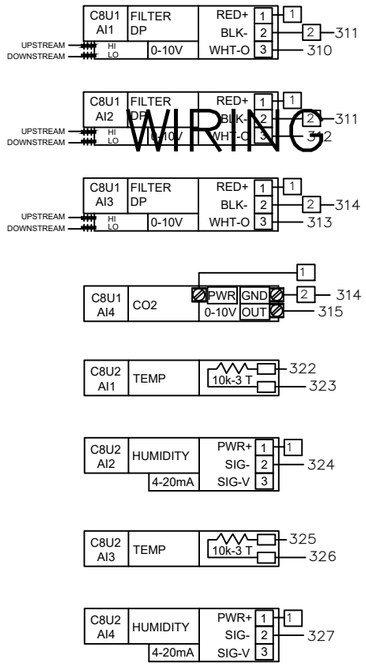
REVISIONS	
DATE	REMARKS

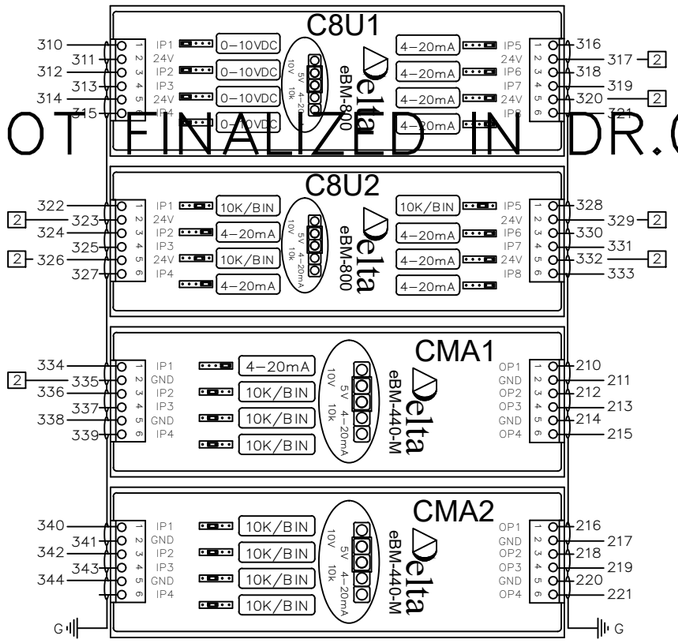
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

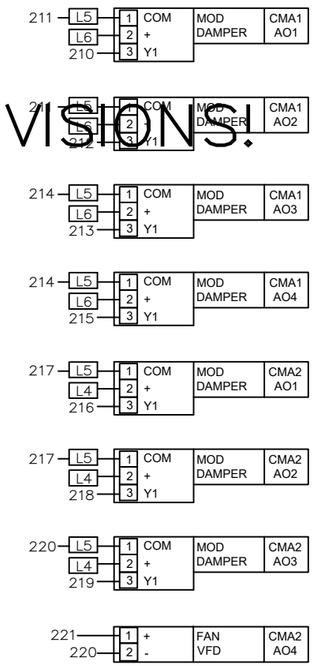
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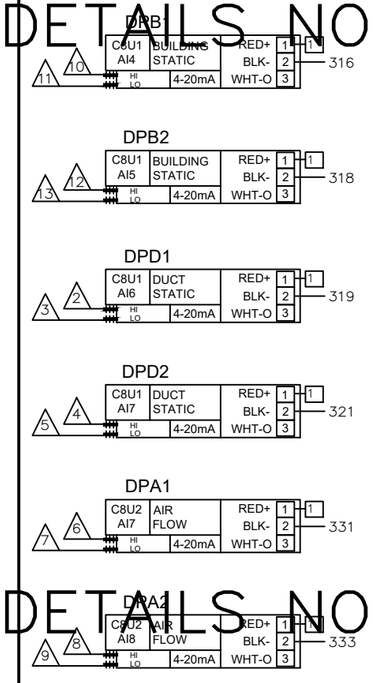
SHEET
NCHS–171
JOB NUMBER:
J–2304001

SYSTEM 23 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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	ISSUED FOR CONST
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REVISIONS	
DATE	REMARKS

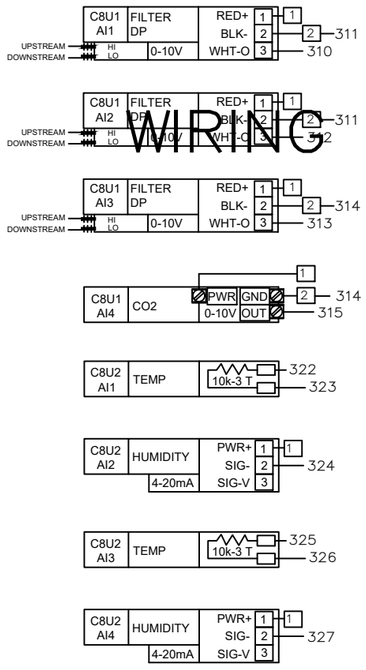
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

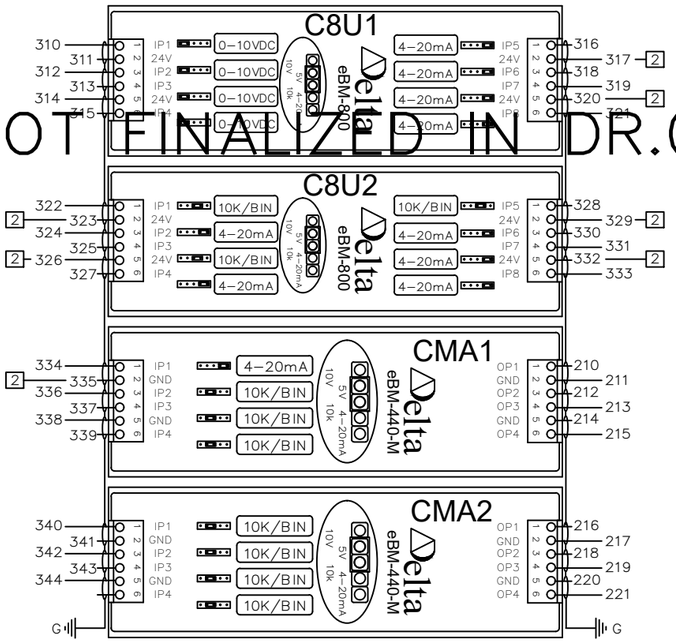
CONTRACT NO:

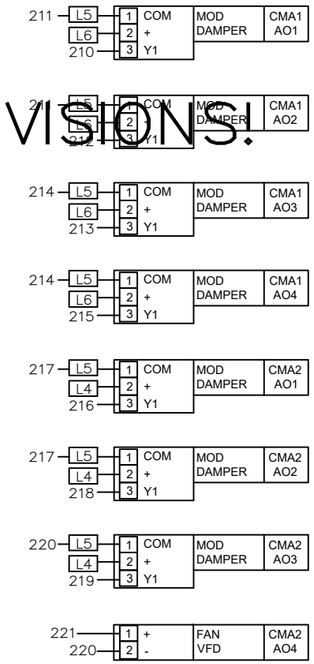
SHEET
NCHS-172
JOB NUMBER:
J-2304001

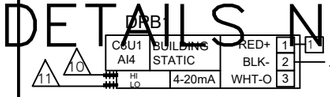
AHU-K6 SYSTEM 23 PANEL – I/O WIRING (1 OF 5)

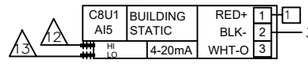
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

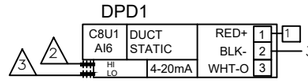


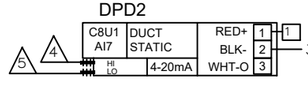


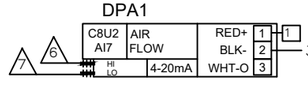


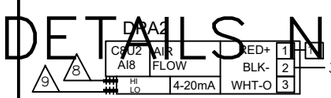












	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	eBM-800 I/O MODULE
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	

C8U1 eBM-800 — C8U1 eBM-800

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	eBM-800 I/O MODULE
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	

C8U2 eBM-800 — C8U2 eBM-800

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	eBM-440-M I/O MODULE
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	
OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	eBM-440-M I/O MODULE
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	

CMA1 eBM-440-M — CMA1 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	eBM-440-M I/O MODULE
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	
	CMA2	4	10100.1404				
OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	eBM-440-M I/O MODULE
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	

CMA2 eBM-440-M — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-K6 SYSTEM 23 PANEL – I/O WIRING (2 OF 5)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

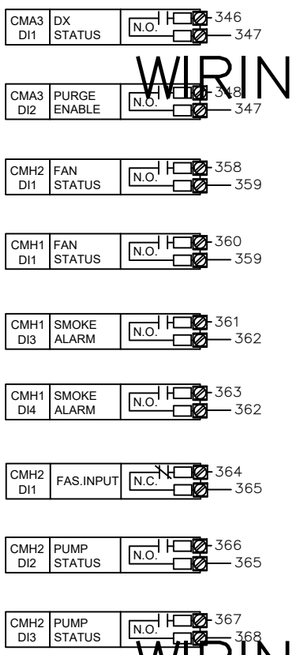
REVISIONS	
DATE	REMARKS

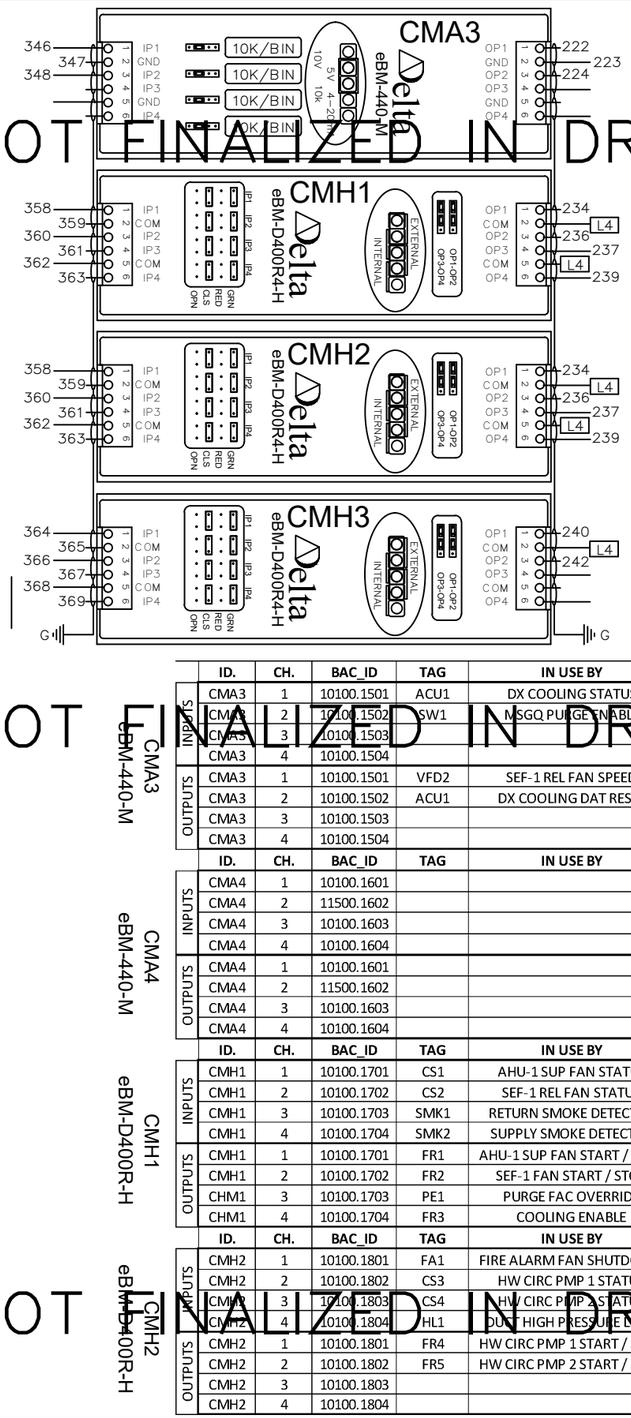
JOB TITLE: North Central High School
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ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

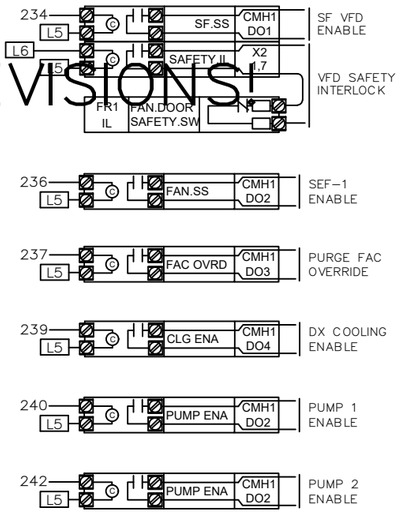
SHEET
NCHS–173
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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AHU–K6 SYSTEM 23 PANEL – I/O WIRING (3 OF 5)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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CONTRACT NO:

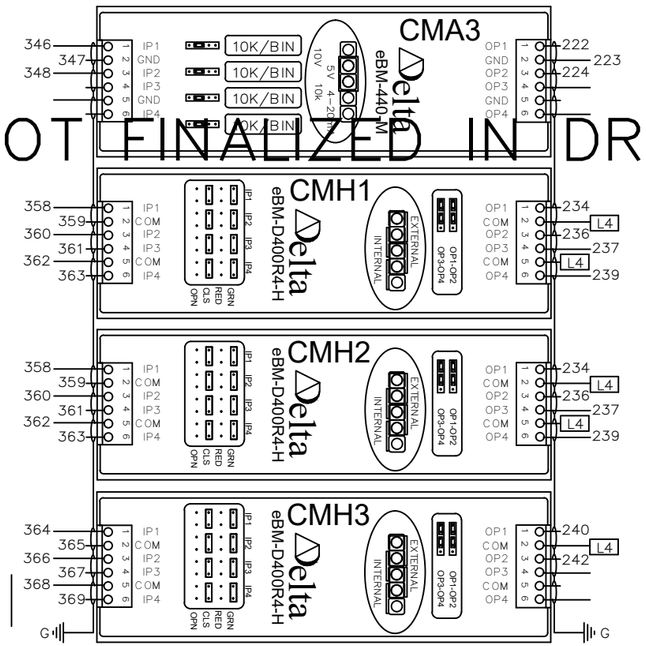
SHEET
NCHS–174
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

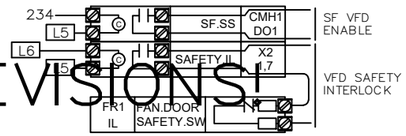
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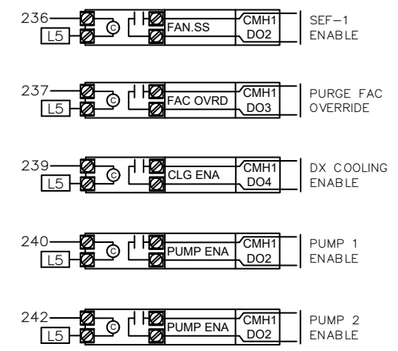
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CMA3 DI1	DX STATUS	N.O.	346 / 347
CMA3 DI2	PURGE ENABLE	N.O.	348 / 347
CMH2 DI1	FAN STATUS	N.O.	358 / 359
CMH1 DI1	FAN STATUS	N.O.	360 / 359
CMH1 DI3	SMOKE ALARM	N.O.	361 / 362
CMH1 DI4	SMOKE ALARM	N.O.	363 / 362
CMH2 DI1	FAS.INPUT	N.C.	364 / 365
CMH2 DI2	PUMP STATUS	N.O.	366 / 365
CMH2 DI3	PUMP STATUS	N.O.	367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1





	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			

CMA3 eBM-440-M — eBM-440-M I/O MODULE — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			
OUTPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			

CMA4 eBM-440-M — eBM-440-M I/O MODULE — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001

CMH1 eBM-D400R-H — eBM-D400R4-H I/O MOD — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001
	CMH2	3	10100.1803			
	CMH2	4	10100.1804			

CMH2 eBM-D400R-H — eBM-D400R4-H I/O MOD — CMH2 eBM-D400R-H

AHU–K6 SYSTEM 23 PANEL – I/O WIRING (4 OF 5)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

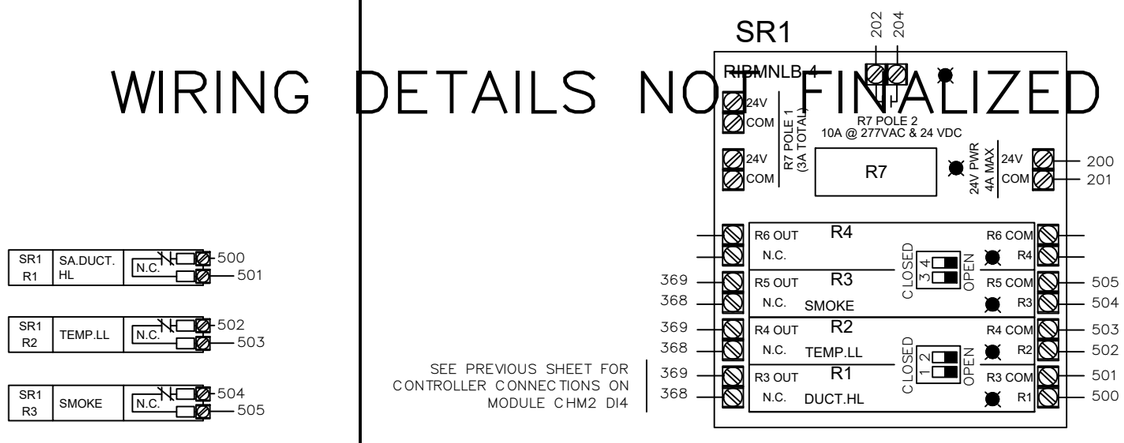
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–175
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
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	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
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CONTRACT NO:

SHEET
NCHS-176
JOB NUMBER:
J-2304001

SYSTEM 23 CONTROL PANEL

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

300
301
L3
ETS1
V1+
V1-
ETHERNET SWITCH
1
3
5
2
4
CAT5e

SR1
RIBMNLB-4
202
204
200
201
24V
COM
R7 POLE 2
10A @ 277VAC & 24 VDC
R7
R4 OUT
N.C.
R4
R4 COM
R3 OUT
N.C.
R3
R3 COM
R2 OUT
N.C.
R2
R2 COM
R1 OUT
N.C.
R1
R1 COM
CLOSED
OPEN
JP1
JP2
JP3
JP4

201
200
C8X2
PWR
GND
24~
eBX
eBUS Address
eBUS
eNET BUS
eBM-D400R4-H
I/O SHIELD DRAIN
L3
TO PANEL GND LUG

eZNS-T100 SERIES
ROOM SENSOR
POWER & NETWORK
WIRING

EOL 4
GND
ST1
NET
PWR
ST2
NET
PWR
24 VAC

201
200
CEB1
PWR
GND
24~
USB2
USB1
(NOT USED)
eBMGR-2
NET1
RS-485
NET2
RS-485
LINK 1
LINK 2
LINK 3
LINKNET (RS-485)

201
200
C8X1
eBX
eBUS Address
eBUS
eBM-800
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN
eNET BUS
L3
TO PANEL GND LUG

MS/TP
LINKNET (RS-485)
EOL3
GND

SEE RISER DIAGRAMS FOR LOCATION

AHU-K6 SYSTEM 23 PANEL – POWER & NETWORK WIRING

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

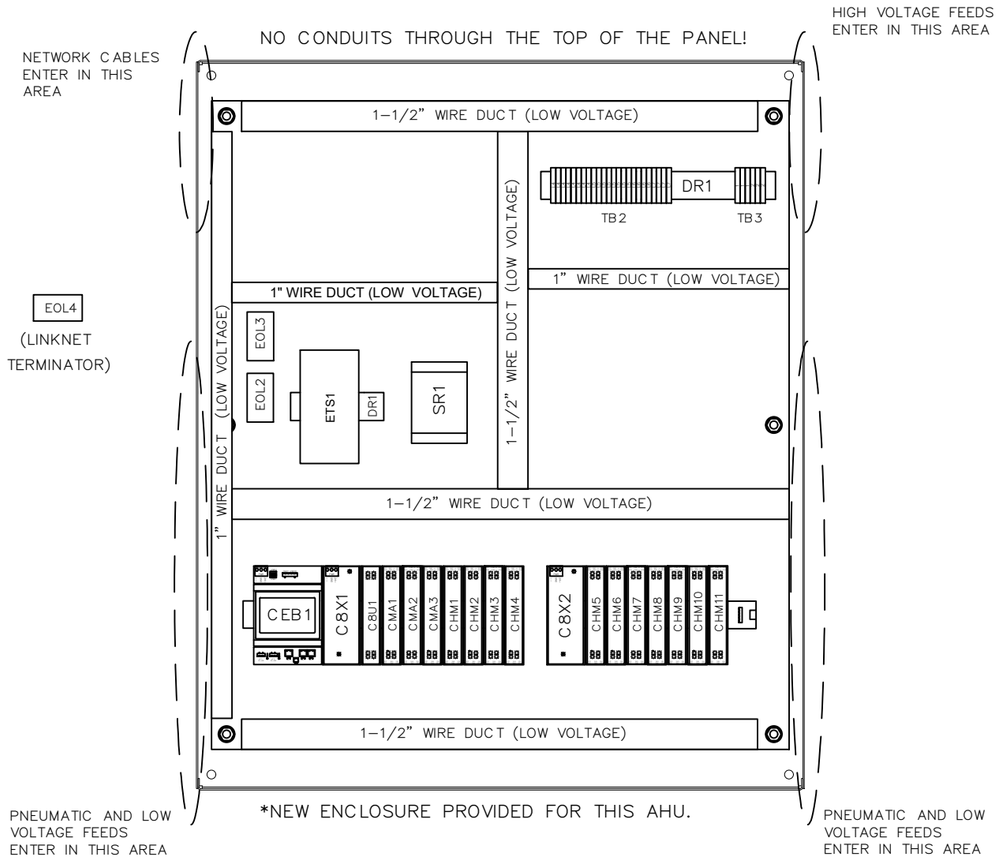
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-177
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 23 LAYOUT



BILL OF MATERIALS

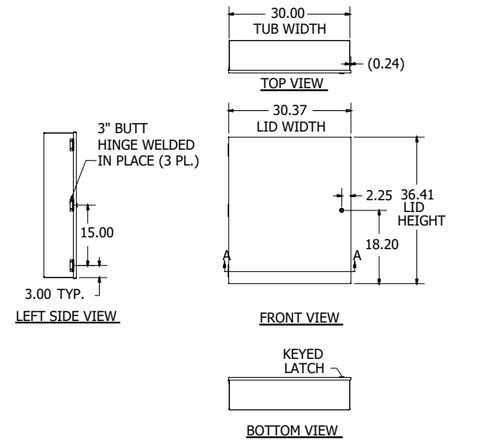
WILL BE PROVIDED IN A FUTURE REVISION. △

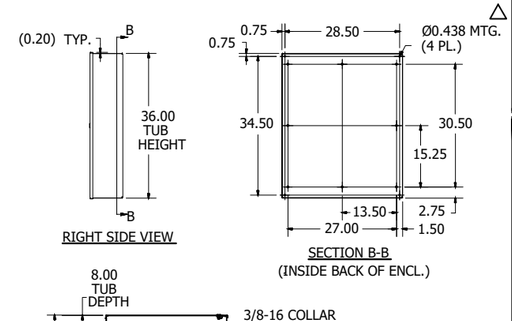
BILL OF MATERIALS

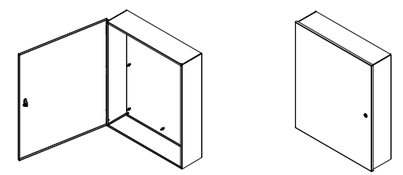
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

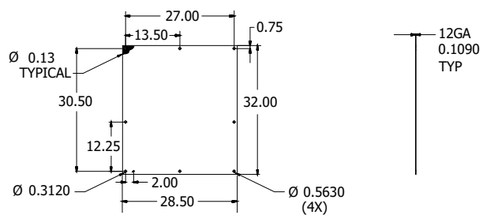
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



AHU–K6 SYSTEM 23 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

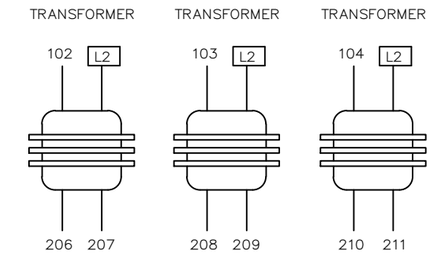
REVISIONS	
DATE	REMARKS

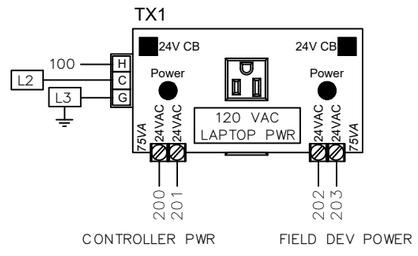
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

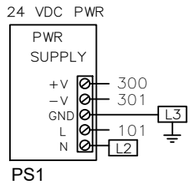
CONTRACT NO:

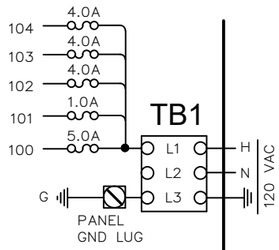
SHEET
NCHS–178
JOB NUMBER:
J–2304001

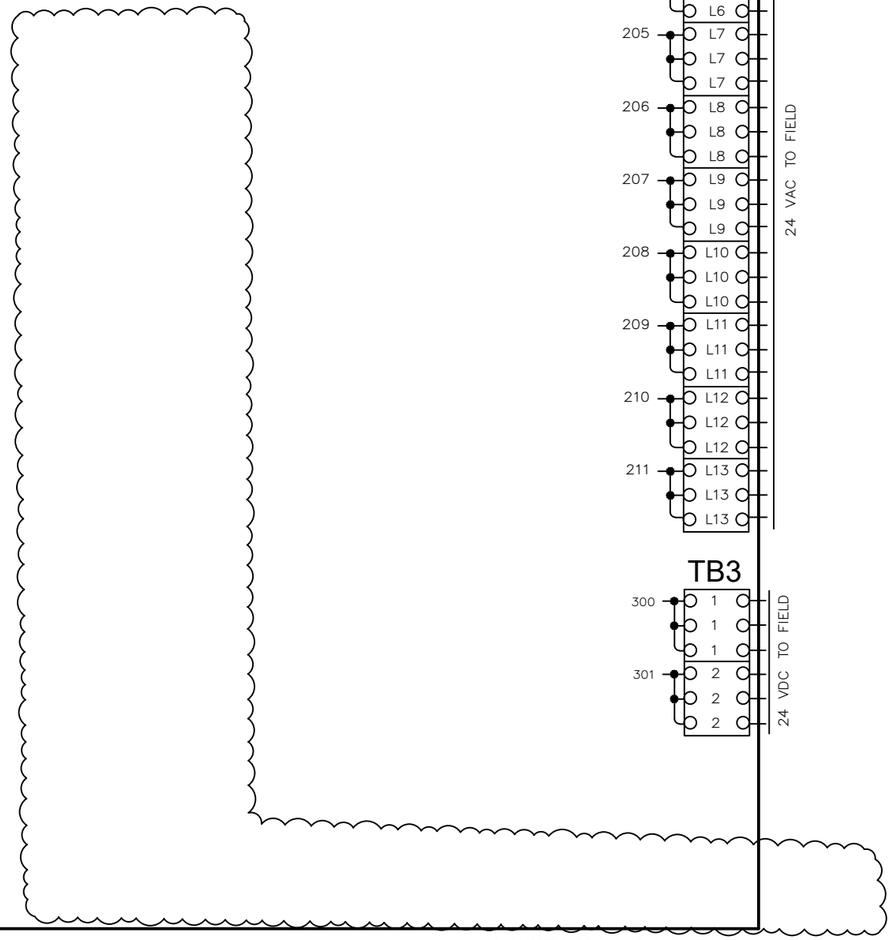
PANEL _____
CIRCUIT _____











△

SEE RISER DIAGRAMS FOR LOCATION

AHU–K6 SYSTEM 23 COMPANION PANEL – POWER WIRING & PNEUMATIC CONNECTIONS

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

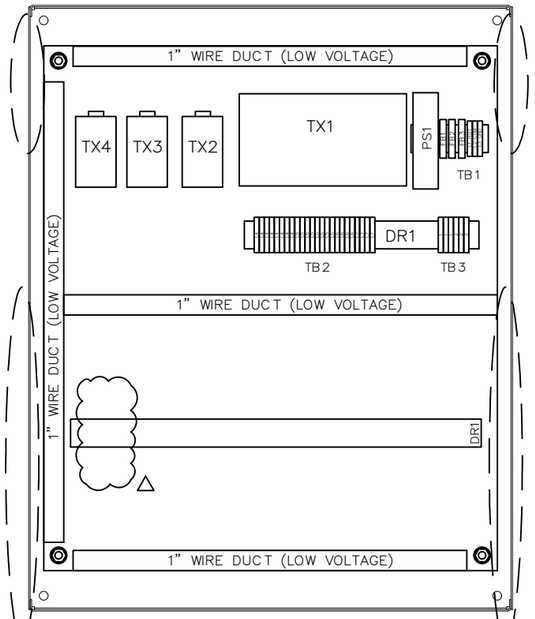
CONTRACT NO:

SHEET
NCHS–179
JOB NUMBER:
J–2304001

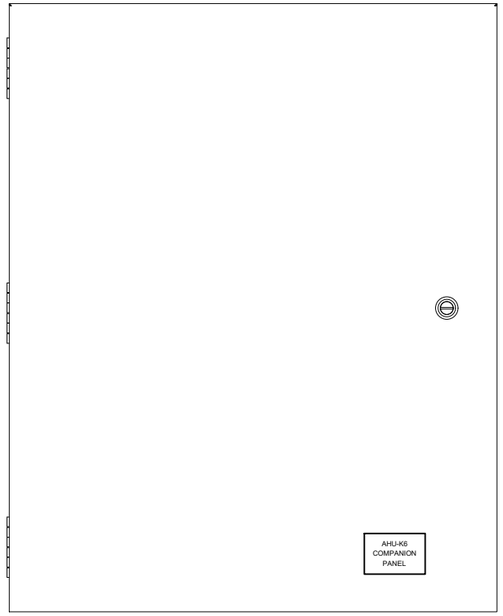
SYSTEM 23 COMPANION PANEL LAYOUT

NO CONDUITS THROUGH THE TOP OF THE PANEL!

NETWORK CABLES ENTER IN THIS AREA



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



*NEW ENCLOSURE PROVIDED

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

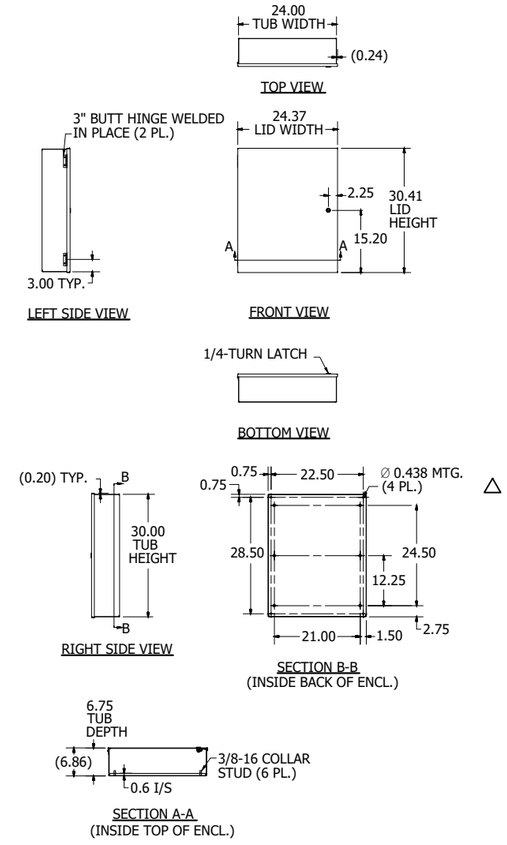
BILL OF MATERIALS

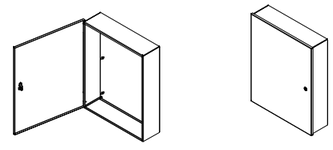
WILL BE PROVIDED IN A FUTURE REVISION. △

BILL OF MATERIALS

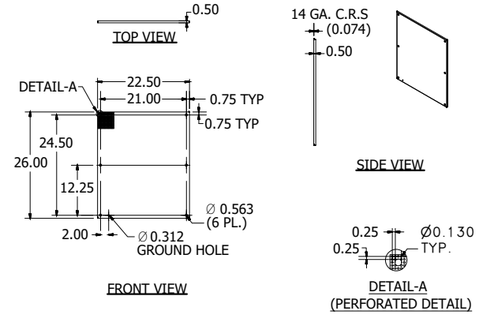
WILL BE PROVIDED IN A FUTURE REVISION. △

24" (W) x 30" (H) ENCLOSURE DIMENSIONS





PANEL DIMENSIONS



AHU-K6 SYSTEM 23 COMPANION PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

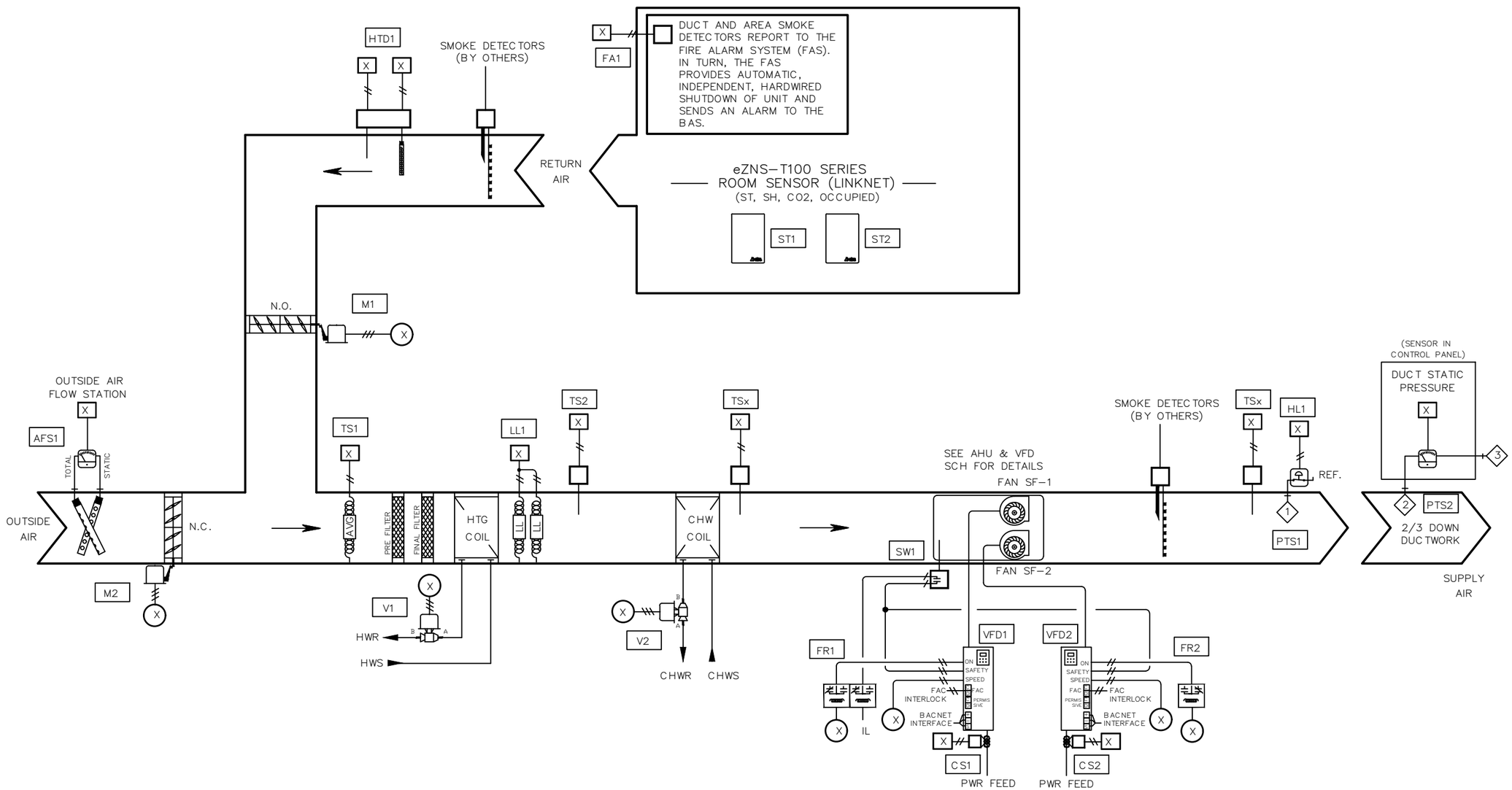
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-180
JOB NUMBER:
J-2304001

AHU–M1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU–M1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

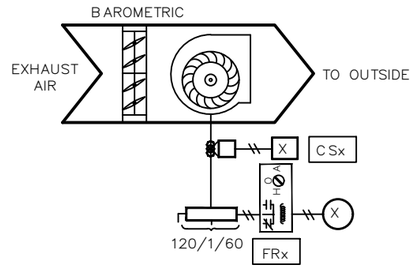
REVISIONS	
DATE	REMARKS

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DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

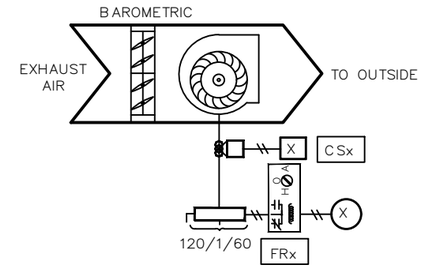
CONTRACT NO:

SHEET
NCHS–181
JOB NUMBER:
J–2304001

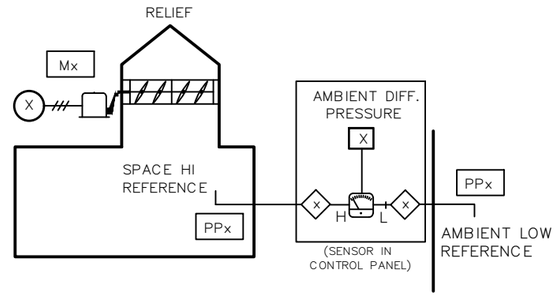
EXHAUST FAN – BAS CONTROLLED
EF–L1



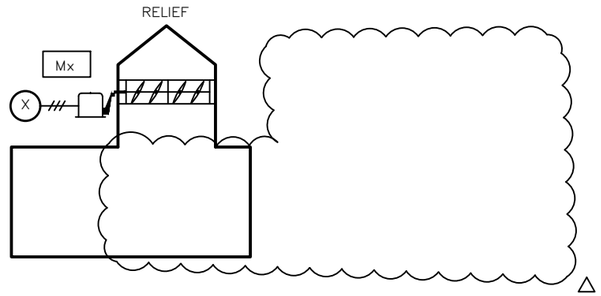
EXHAUST FAN – BAS CONTROLLED
EF–L2



BUILDING PRESSURE CONTROL
E–RH–M1

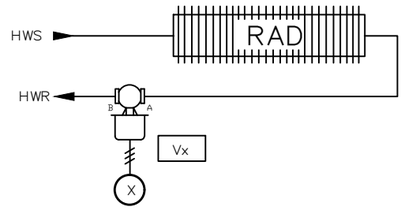


BUILDING PRESSURE CONTROL
E–RH–M2

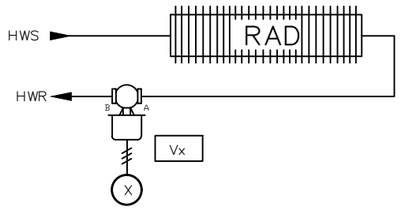


△

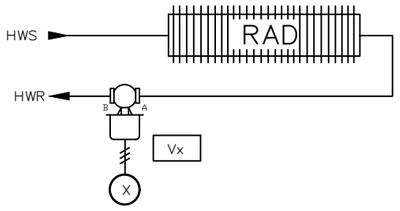
RADIANT CEILING PANEL
RCP–M1



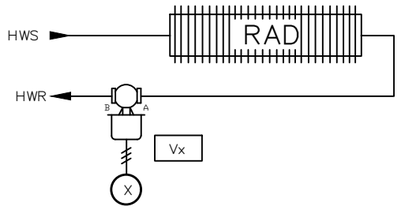
RADIANT CEILING PANEL
RCP–M2



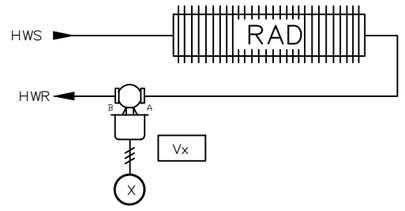
RADIANT CEILING PANEL
RCP–M3



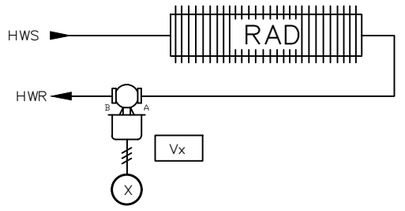
RADIANT CEILING PANEL
RCP–M4



RADIANT CEILING PANEL
RCP–M5



RADIANT CEILING PANEL
RCP–M6



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA M EXHAUST, RELIEF, & RADIANT PANEL FIELD DEVICES (1 OF 3)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

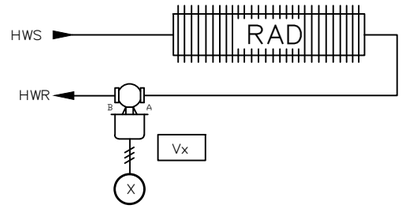
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

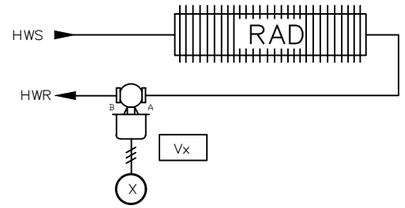
CONTRACT NO:

SHEET
NCHS–182
JOB NUMBER:
J–2304001

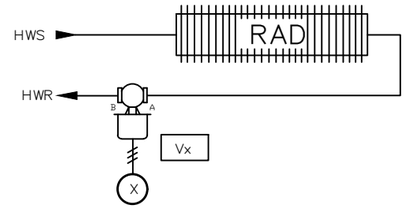
RADIANT CEILING PANEL
RCP–M7



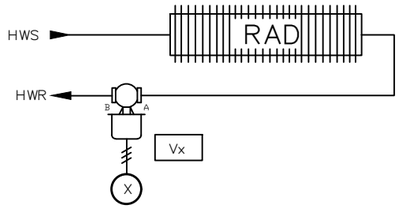
RADIANT CEILING PANEL
RCP–M8



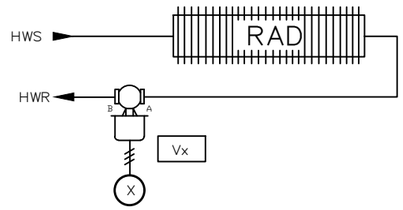
RADIANT CEILING PANEL
RCP–M9



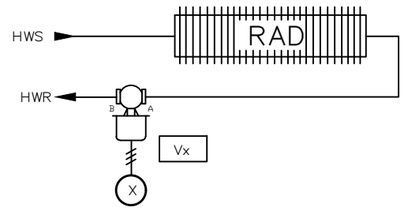
RADIANT CEILING PANEL
RCP–M10



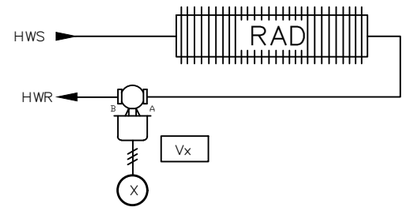
RADIANT CEILING PANEL
RCP–M11



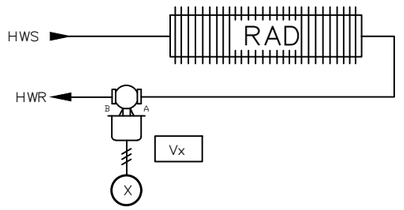
RADIANT CEILING PANEL
RCP–M12



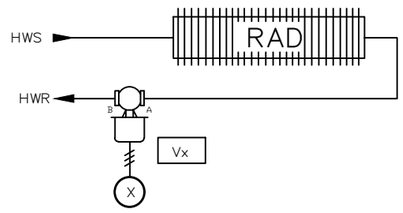
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RCP–M13



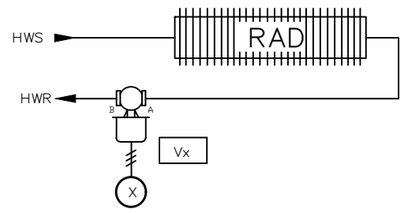
RADIANT CEILING PANEL
RCP–M14



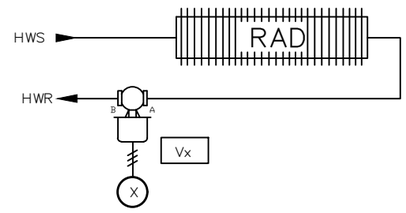
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RCP–M15



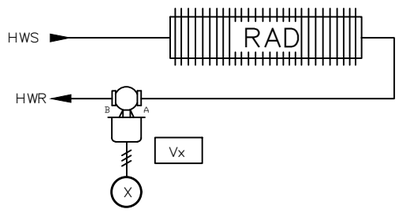
RADIANT CEILING PANEL
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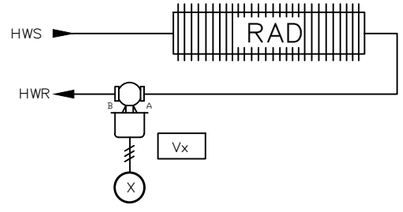
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RCP–M17



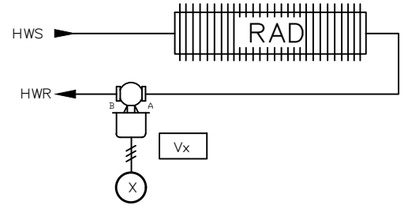
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RCP–M18



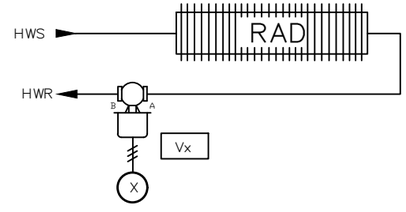
RADIANT CEILING PANEL
RCP–M19



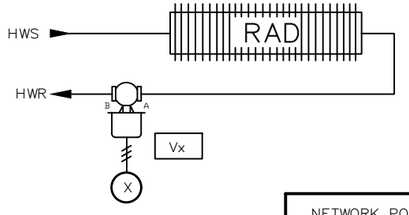
RADIANT CEILING PANEL
RCP–M20



RADIANT CEILING PANEL
RCP–M21



RADIANT CEILING PANEL
RCP–M22



NETWORK POINTS
N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AREA M RADIANT PANEL FIELD DEVICES (2 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

△

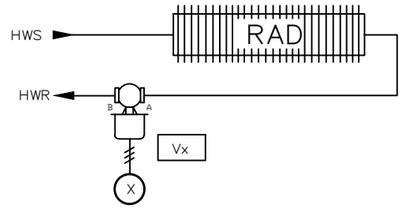
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

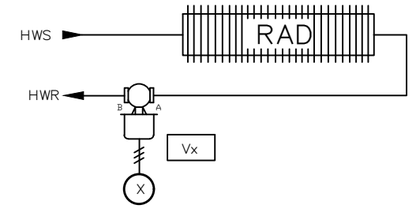
CONTRACT NO:

SHEET
NCHS–183
JOB NUMBER:
J–2304001

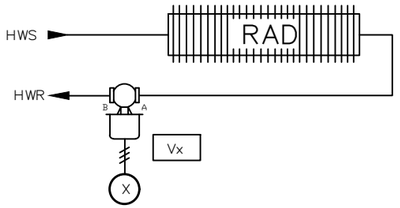
RADIANT CEILING PANEL
RCP–M23



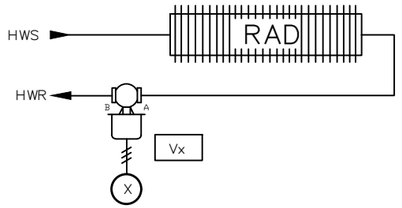
RADIANT CEILING PANEL
RCP–M24



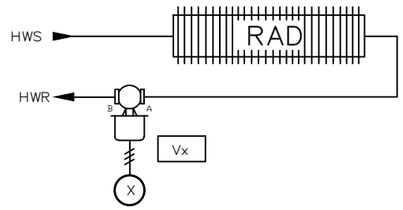
RADIANT CEILING PANEL
RCP–M25



RADIANT CEILING PANEL
RCP–M26



RADIANT CEILING PANEL
RCP–M27



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA M RADIANT PANEL FIELD DEVICES (3 OF 3)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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CONTRACT NO:

SHEET
NCHS–184
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
EF-L1 STAT	Exhaust Fan L1 Status		X			
EF-L2 STAT	Exhaust Fan L2 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF 1 STAT	Supply Fan 1 Status		X			
SF 2 STAT	Supply Fan 2 Status		X			
CWV	Chill Water Valve			X		
E-RH-M1 DPR	Relief Air Damper			X		
E-RH-M2 DPR	Relief Air Damper			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF 1 VFD	Supply Fan 1 VFD Speed			X		
SF 2 VFD	Supply Fan 2 VFD Speed			X		

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
EF-L1 SS	Exhaust Fan L1 Start / Stop				X	
EF-L2 SS	Exhaust Fan L2 Start / Stop				X	
RCP-M1 HWV	Radiant Panel M1 Hot Water Valve				X	
RCP-M10 HWV	Radiant Panel M10 Hot Water Valve				X	
RCP-M11 HWV	Radiant Panel M11 Hot Water Valve				X	
RCP-M12 HWV	Radiant Panel M12 Hot Water Valve				X	
RCP-M13 HWV	Radiant Panel M13 Hot Water Valve				X	
RCP-M14 HWV	Radiant Panel M14 Hot Water Valve				X	
RCP-M15 HWV	Radiant Panel M15 Hot Water Valve				X	
RCP-M16 HWV	Radiant Panel M16 Hot Water Valve				X	
RCP-M17 HWV	Radiant Panel M17 Hot Water Valve				X	
RCP-M18 HWV	Radiant Panel M18 Hot Water Valve				X	
RCP-M19 HWV	Radiant Panel M19 Hot Water Valve				X	
RCP-M2 HWV	Radiant Panel M2 Hot Water Valve				X	
RCP-M20 HWV	Radiant Panel M20 Hot Water Valve				X	
RCP-M21 HWV	Radiant Panel M21 Hot Water Valve				X	
RCP-M22 HWV	Radiant Panel M22 Hot Water Valve				X	
RCP-M23 HWV	Radiant Panel M23 Hot Water Valve				X	
RCP-M24 HWV	Radiant Panel M24 Hot Water Valve				X	
RCP-M25 HWV	Radiant Panel M25 Hot Water Valve				X	
RCP-M26 HWV	Radiant Panel M26 Hot Water Valve				X	
RCP-M27 HWV	Radiant Panel M27 Hot Water Valve				X	
RCP-M3 HWV	Radiant Panel M3 Hot Water Valve				X	
RCP-M4 HWV	Radiant Panel M4 Hot Water Valve				X	
RCP-M5 HWV	Radiant Panel M5 Hot Water Valve				X	
RCP-M6 HWV	Radiant Panel M6 Hot Water Valve				X	
RCP-M7 HWV	Radiant Panel M7 Hot Water Valve				X	
RCP-M8 HWV	Radiant Panel M8 Hot Water Valve				X	
RCP-M9 HWV	Radiant Panel M9 Hot Water Valve				X	
SF 1 SS	Supply Fan 1 Start / Stop				X	
SF 2 SS	Supply Fan 2 Start / Stop				X	
	POINT TOTALS:	**9**	**7**	**10**	**31**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-M1 & AREA M MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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REVISIONS	
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CONTRACT NO:

SHEET
NCHS-185
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-M1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF1-C, SF2-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF1-S, SF2-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFMn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

FACE AND BYPASS DAMPER CONTROL: ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 38F (ADJ), THE HEATING COIL (PH-VLV) SHALL BE FULLY OPEN AND DISCHARGE TEMPERATURE SHALL BE MAINTAINED BY MODULATING THE FACE AND BYPASS DAMPERS. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 38F (ADJ), THE FACE AND BYPASS DAMPERS SHALL BE FULLY OPEN TO THE COIL AND THE HEATING COIL SHALL MODULATE TO MAINTAIN DISCHARGE TEMPERATURE.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

RADIANT CEILING PANELS:

WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 50 F (ADJ), HOT WATER VALVES FOR RADIANT HEATING ARE TO REMAIN CLOSED. BELOW 45 F (ADJ) OUTSIDE AIR TEMPERATURE, THE RADIANT HEATING VALVES ARE TO OPEN AS A FIRST STAGE OF HEATING FOR THE SPACES INDICATED IN THE MECHANICAL DRAWINGS.

Delta Controls
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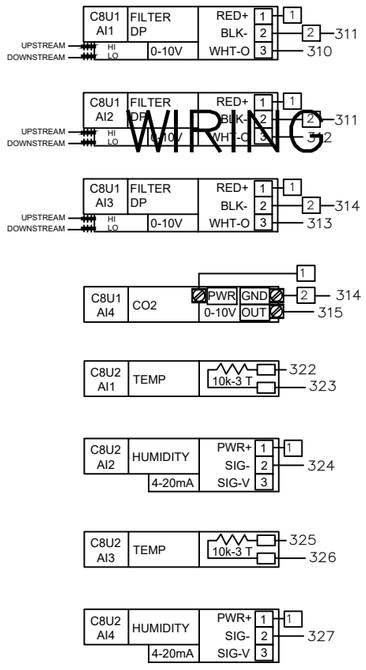
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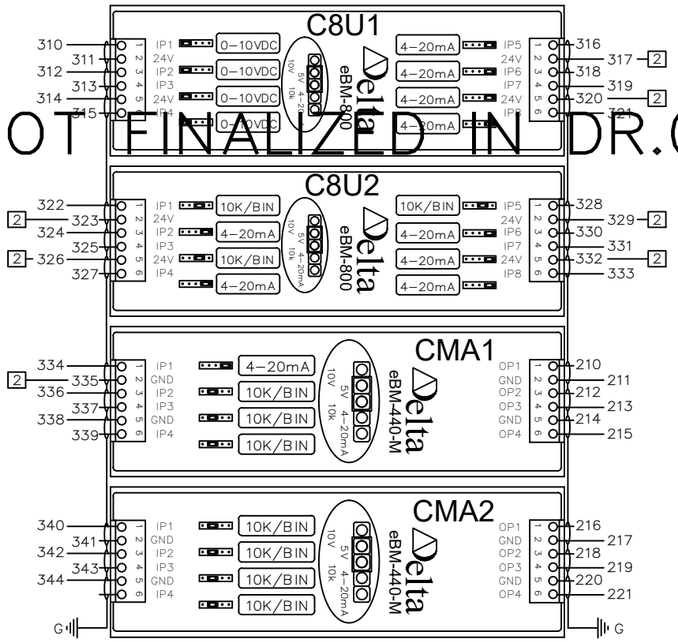
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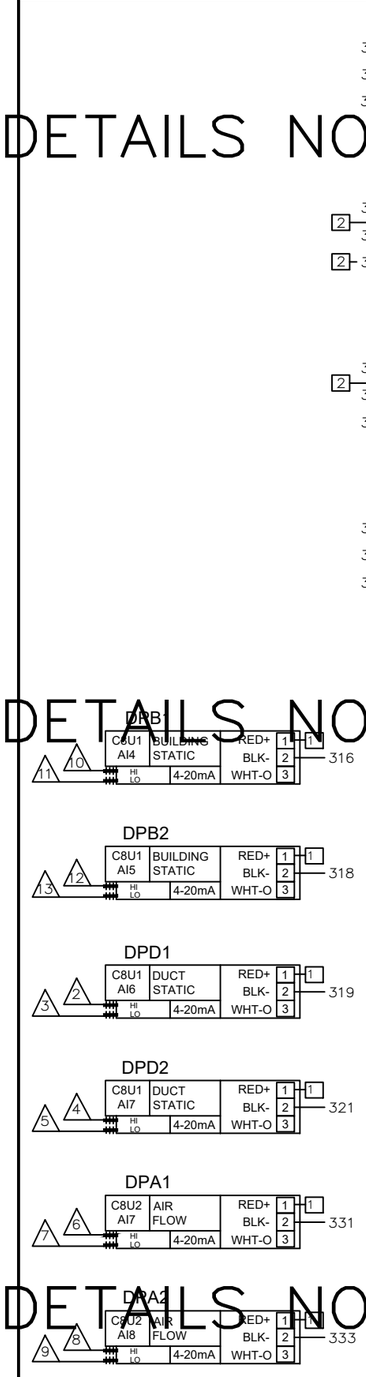
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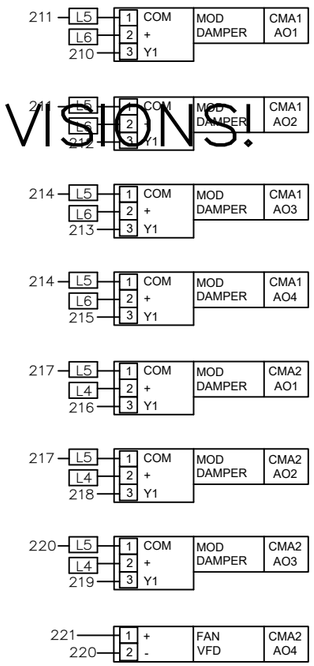
SHEET
NCHS-186
JOB NUMBER:
J-2304001

SYSTEM 24 CONTROL PANEL









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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REVISIONS	
DATE	REMARKS

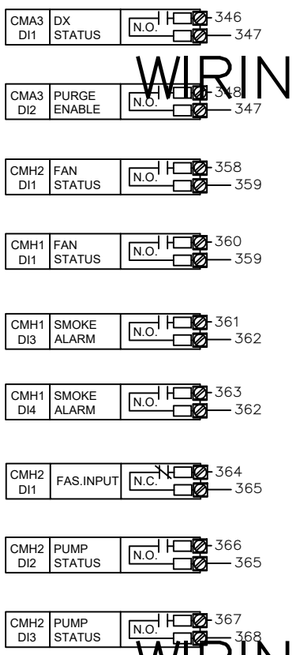
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

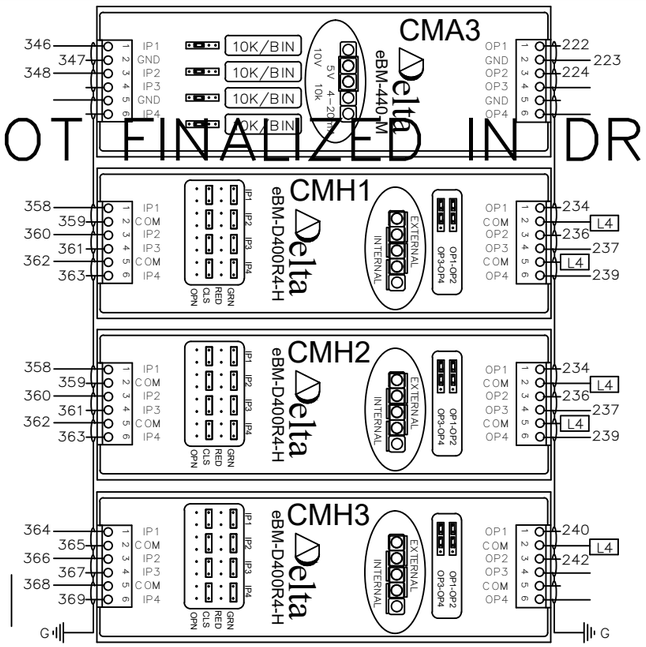
CONTRACT NO:

SHEET
NCHS–187
JOB NUMBER:
J–2304001

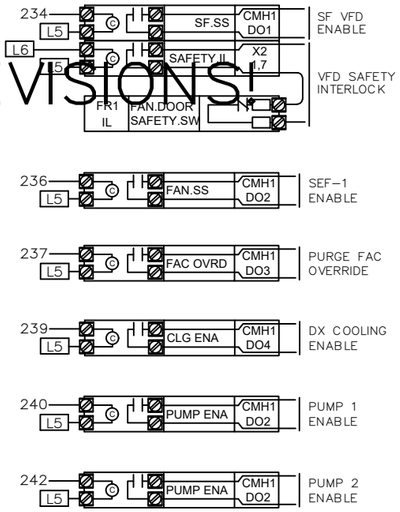
AHU–M1 SYSTEM 24 PANEL – I/O WIRING (1 OF 3)

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

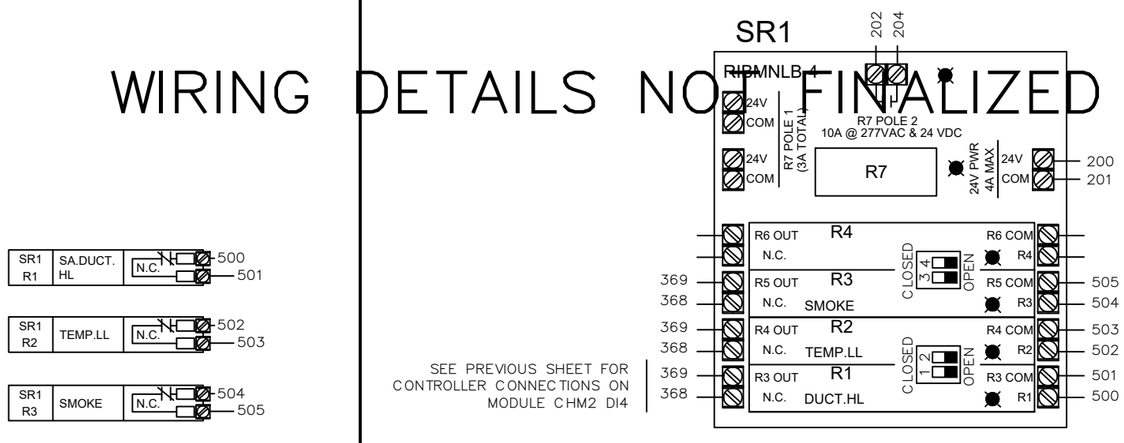
JOB TITLE: North Central High School
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–188
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU–M1 SYSTEM 24 PANEL – I/O WIRING (3 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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JOB NUMBER:
J–2304001

SYSTEM 24 CONTROL PANEL

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

CAT-6a

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1

MS/TP SEGMENT 2

MS/TP SEGMENT 3

MS/TP SEGMENT 4

POWER 24~ GND

GND

L3

200

201

TO SYSTEM 01 SUBNET LEG 02

TO SYSTEM 01 SUBNET LEG 03

TO SYSTEM 01 SUBNET LEG 04

300

301

ETS1

V1-

V1+

ETHERNET SWITCH

CAT5e

SR1

RIBMNLB-4

202

204

R7 POLE 2 10A @ 277VAC & 24 VDC

R7

R4

R3

R2

R1

CLOSED

OPEN

CEB1

C8X1

USB2

USB1

(NOT USED)

PWR

eBMGR-2

eBX

eBUS Address

eBUS

eBM-440-M

eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

eNET BUS

C8X2

SEE RISER DIAGRAMS FOR LOCATION

AHU-M1 SYSTEM 24 PANEL – POWER & NETWORK WIRING

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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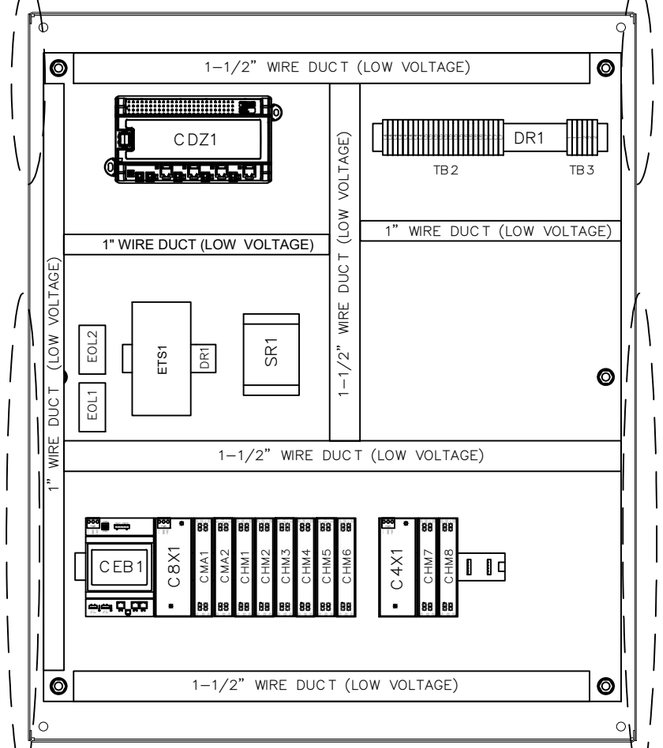
CONTRACT NO:

SHEET
NCHS-190
JOB NUMBER:
J-2304001

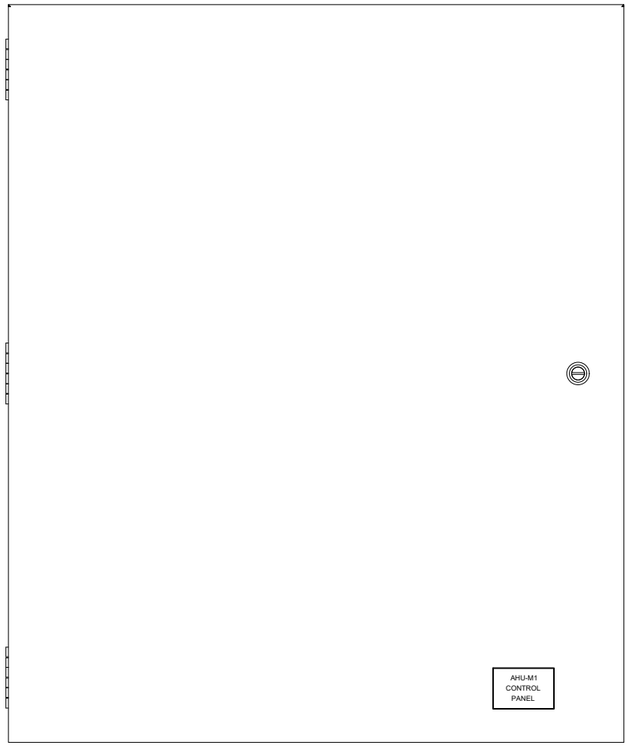
SYSTEM CONTROL PANEL 24 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

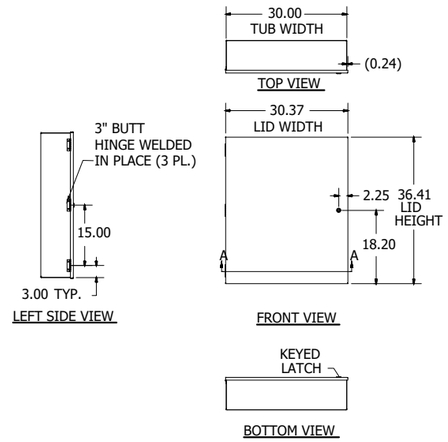
WILL BE PROVIDED IN A FUTURE REVISION. △

BILL OF MATERIALS

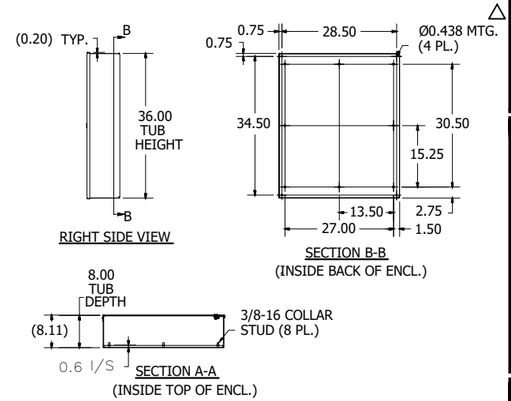
WILL BE PROVIDED IN A FUTURE REVISION. △

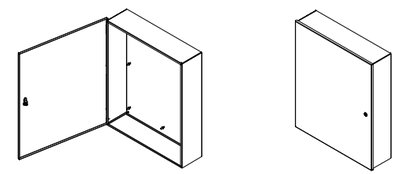
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

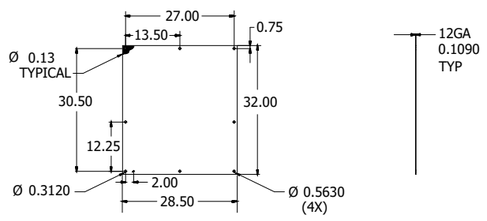


△





PANEL DIMENSIONS



AHU-M1 SYSTEM 24 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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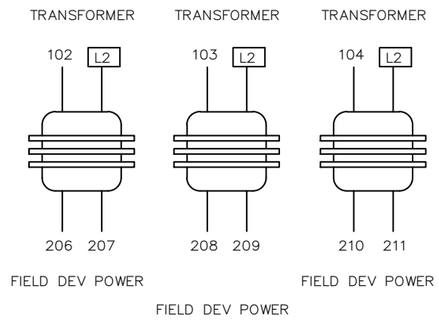
JOB TITLE: North Central High School
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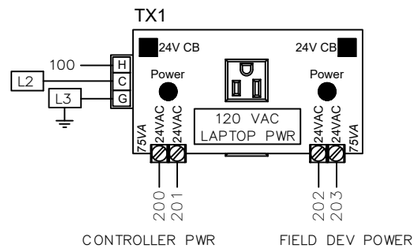
CONTRACT NO:

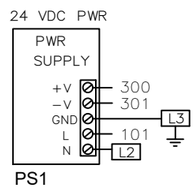
SHEET
NCHS–191
JOB NUMBER:
J–2304001

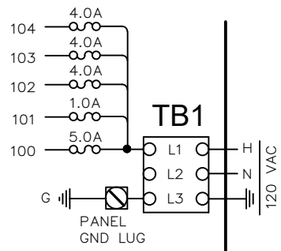
SYSTEM 24 COMPANION PANEL

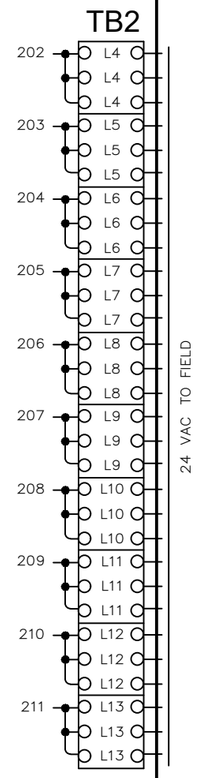
PANEL _____
CIRCUIT _____

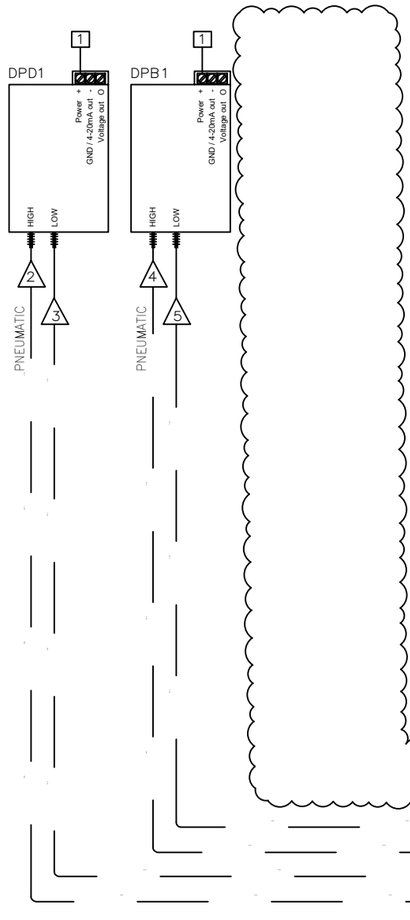


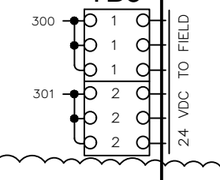


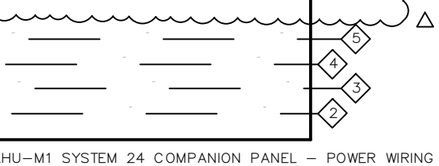












SEE RISER DIAGRAMS FOR LOCATION

AHU–M1 SYSTEM 24 COMPANION PANEL – POWER WIRING & PNEUMATIC CONNECTIONS

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
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REVISIONS	
DATE	REMARKS

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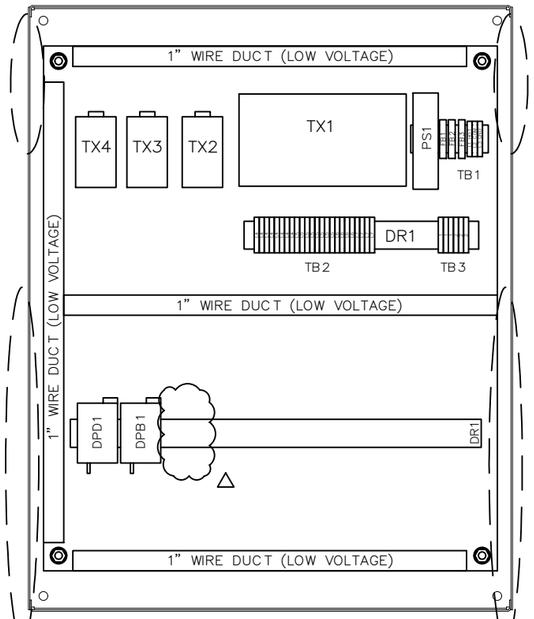
CONTRACT NO:

SHEET
NCHS–192
JOB NUMBER:
J–2304001

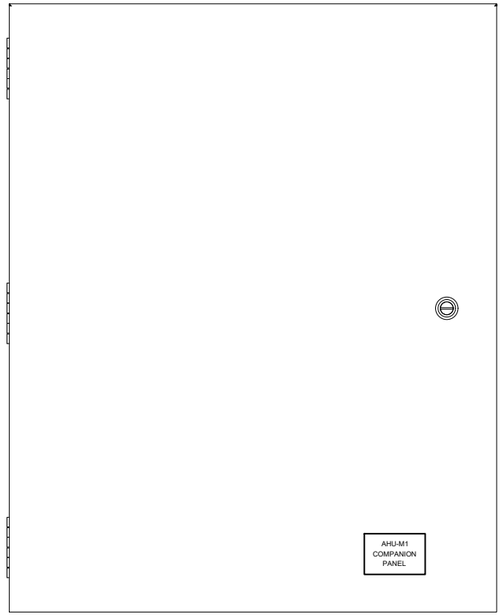
SYSTEM 24 COMPANION PANEL LAYOUT

NO CONDUITS THROUGH THE TOP OF THE PANEL!

NETWORK CABLES ENTER IN THIS AREA



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



*NEW ENCLOSURE PROVIDED

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

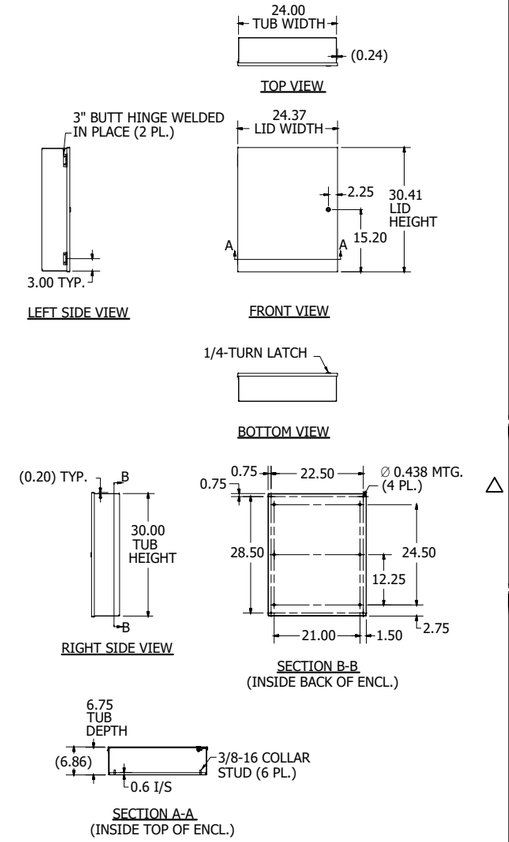
BILL OF MATERIALS

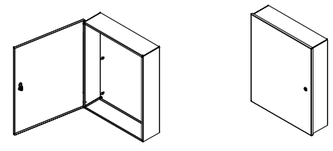
WILL BE PROVIDED IN A FUTURE REVISION. △

BILL OF MATERIALS

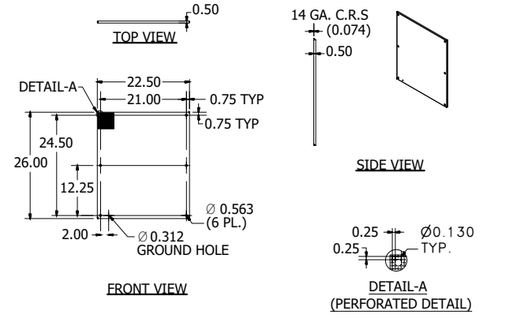
WILL BE PROVIDED IN A FUTURE REVISION. △

24" (W) x 30" (H) ENCLOSURE DIMENSIONS





PANEL DIMENSIONS



AHU-M1 SYSTEM 24 COMPANION PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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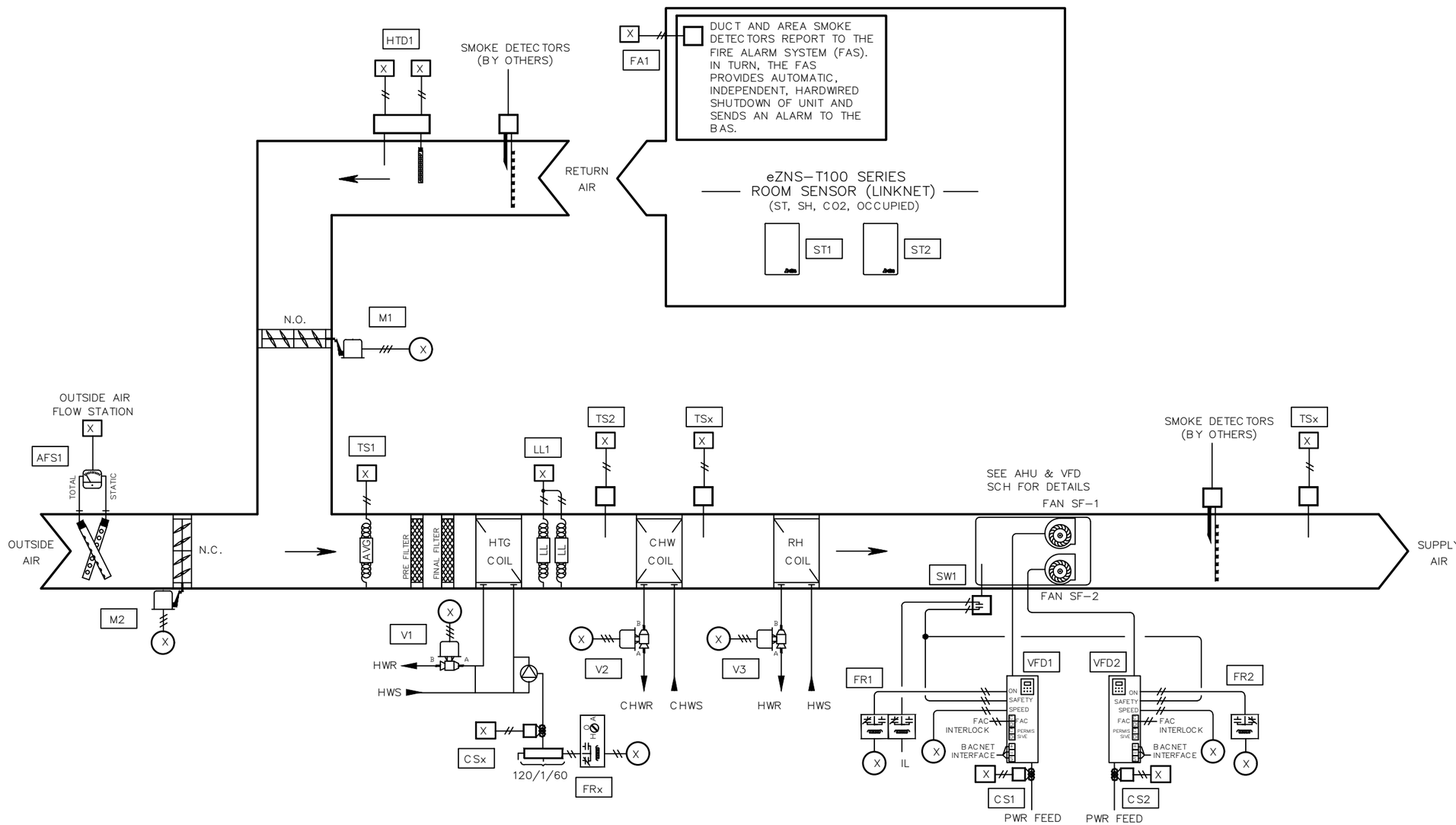
REVISIONS	
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CONTRACT NO:

SHEET
NCHS–193
JOB NUMBER:
J–2304001

AHU–M2 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AHU–M2 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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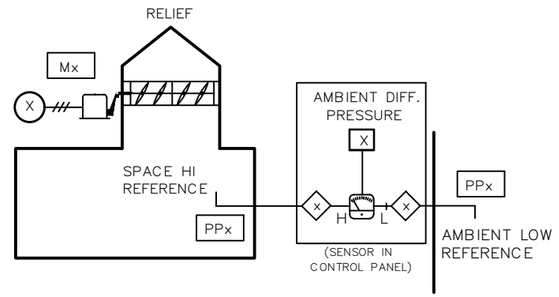
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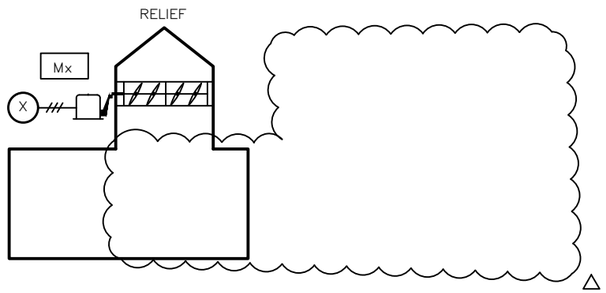
CONTRACT NO:

SHEET
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J–2304001

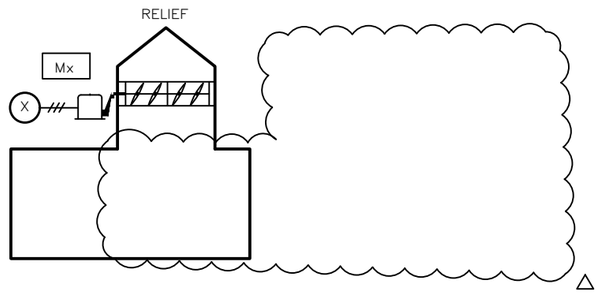
BUILDING PRESSURE CONTROL
E–RH–T3



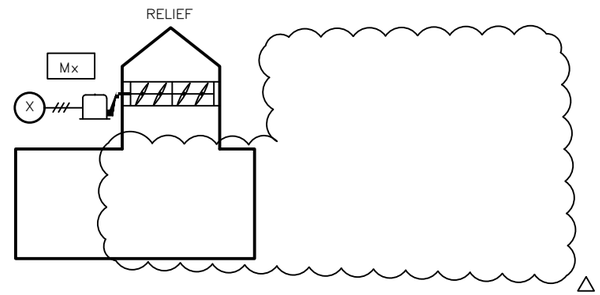
BUILDING PRESSURE CONTROL
E–RH–T4



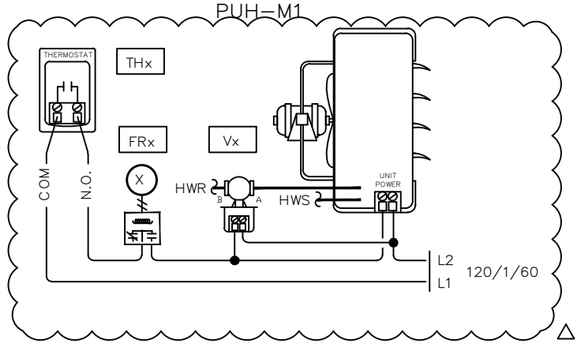
BUILDING PRESSURE CONTROL
E–RH–T5



BUILDING PRESSURE CONTROL
E–RH–T6



PROPELLER UNIT HEATER
PUH–M1



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NOTE:
THERE WILL BE ONE (1) BUILDING PRESSURE SENSOR INPUT FOR CONTROL OF THESE FOUR (4) RELIEF DAMPERS. SPECIFIC CONTROL CORRELATIONS SHALL BE DETERMINED DURING TIME OF INSTALLATION AND STARTUP.

NETWORK POINTS

N1 THROUGH Nx

AREA M RELIEF & PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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CONTRACT NO:

SHEET
NCHS–195
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF 1 STAT	Supply Fan 1 Status		X			
SF 2 STAT	Supply Fan 2 Status		X			
CWV	Chill Water Valve			X		
E-RH-T3 DPR	Relief Air Damper			X		
E-RH-T4 DPR	Relief Air Damper			X		
E-RH-T5 DPR	Relief Air Damper			X		
E-RH-T6 DPR	Relief Air Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF 1 VFD	Supply Fan 1 VFD Speed			X		
SF 2 VFD	Supply Fan 2 VFD Speed			X		
PUH-M1 EN	PUH M1 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF 1 SS	Supply Fan 1 Start / Stop				X	
SF 2 SS	Supply Fan 2 Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
ST2	Space Temp					X
SH3	Space Humidity					X
S CO22	Space CO2					X
OCC2	Occupied Flag					X
	POINT TOTALS:	**7**	**5**	**11**	**4**	**8**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-M2 & AREA M MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
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CONTRACT NO:

SHEET
NCHS-196
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-M2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF1-C, SF2-C) WILL BE STARTED ACCORDING TO THE SCHEDULE. OCCUPANCY SENSOR AUX CONTACT (OCC-S), OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF1-S, SF2-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY. THE OUTSIDE AIRFLOW MEASURING STATION (OA-CFM) SHALL ENSURE THE OUTSIDE AIR DAMPER (OA-DPR) PROVIDES A MINIMUM SCHEDULED AIRFLOW SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN SPACE HUMIDITY FALLS BELOW 55 % RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZN-CO2 FROM MAIN GYM SENSORS) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

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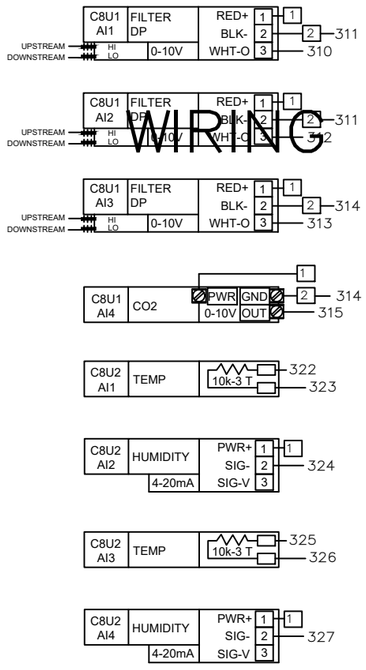
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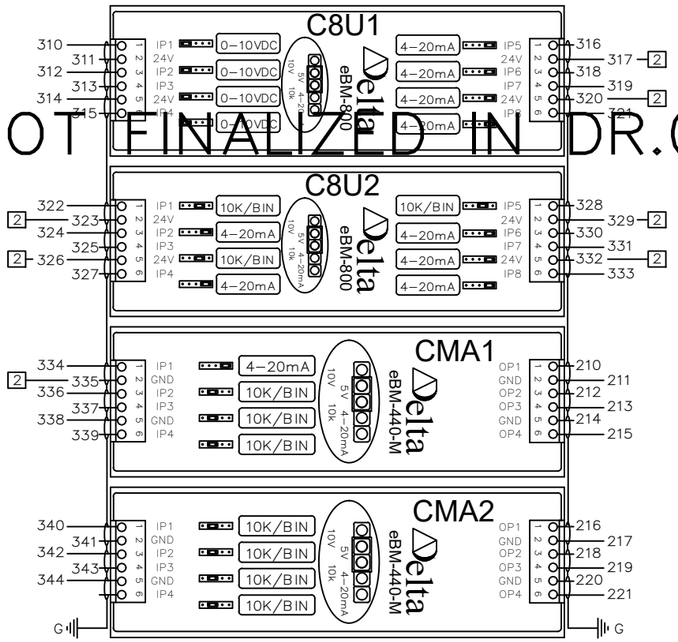
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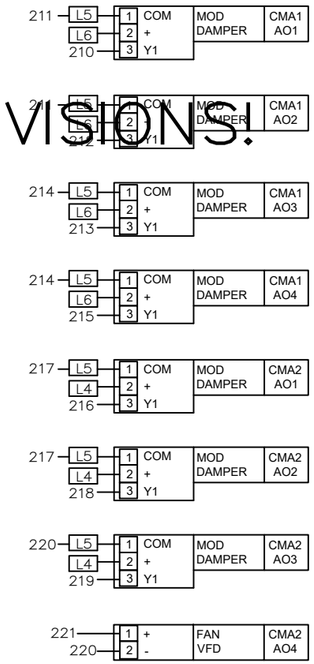
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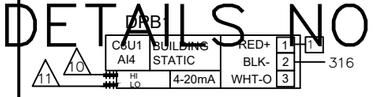
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NCHS-197
JOB NUMBER:
J-2304001

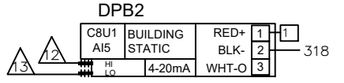
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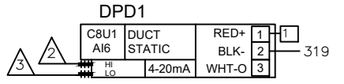


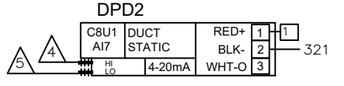


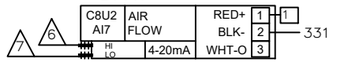


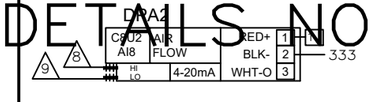












	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — eBM-440-M I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — eBM-440-M I/O MODULE

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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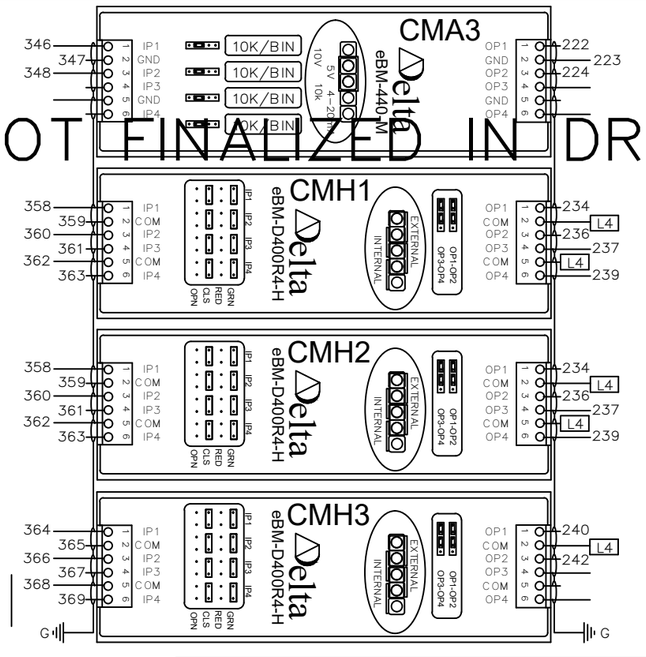
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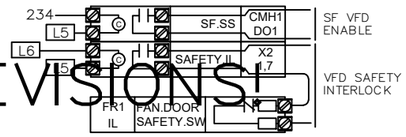
AHU-M2 SYSTEM 25 PANEL – I/O WIRING (1 OF 3)

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CMA3 DI1	DX STATUS	N.O.	346 / 347
CMA3 DI2	PURGE ENABLE	N.O.	348 / 347
CMH2 DI1	FAN STATUS	N.O.	358 / 359
CMH1 DI1	FAN STATUS	N.O.	360 / 359
CMH1 DI3	SMOKE ALARM	N.O.	361 / 362
CMH1 DI4	SMOKE ALARM	N.O.	363 / 362
CMH2 DI1	FAS.INPUT	N.C.	364 / 365
CMH2 DI2	PUMP STATUS	N.O.	366 / 365
CMH2 DI3	PUMP STATUS	N.O.	367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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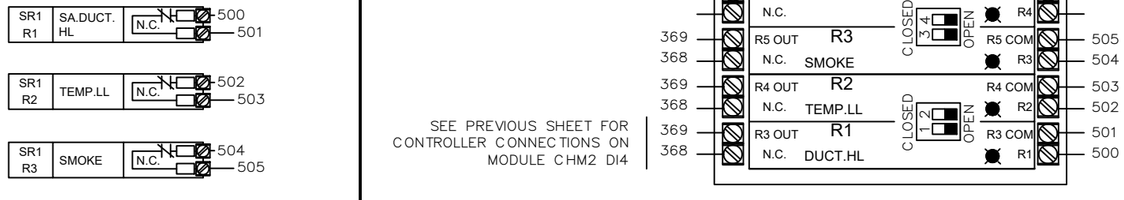
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CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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NCHS-200
JOB NUMBER:
J-2304001

SYSTEM 25 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

300 301 L3

ETS1

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

EOL 4

GND

ST1

NET PWR

ST2

NET PWR

24 VAC

LINKNET (RS-485)

SR1

RIBMNLB-4

202 204

200 201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 10A @ 277VAC & 24 VDC

24V COM

POWER 24 MAX

R7

R4 OUT N.C. R4 COM N.O.

R3 OUT N.C. R3 COM N.O.

R2 OUT N.C. R2 COM N.O.

R1 OUT N.C. R1 COM N.O.

CLOSED OPEN

TRANSFORMER

102 L2

206 207

TX1

100 H C G L2 L3

24V CB

Power

5VA 24VAC 24VAC

240 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L3 L2

PS1

102 4.0A

101 1.0A

100 5.0A

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

206 L8 L8 L8

207 L9 L9 L9

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPB1

1

Power + GND / 4-20mA out - 0-10vdc out - 0

HIGH LOW

4 5

PNEUMATIC

CEB1

201 200

PWR GND 24~

USB2 USB1 (NOT USED)

eBMGR-2

C8X1

eBX

eBUS Address

eBUS

NET1 RS-485 NET2 RS-485

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

L3

MS/TP

LINKNET (RS-485)

EOL3

GND

SEE RISER DIAGRAMS FOR LOCATION

AHU-M2 SYSTEM 25 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

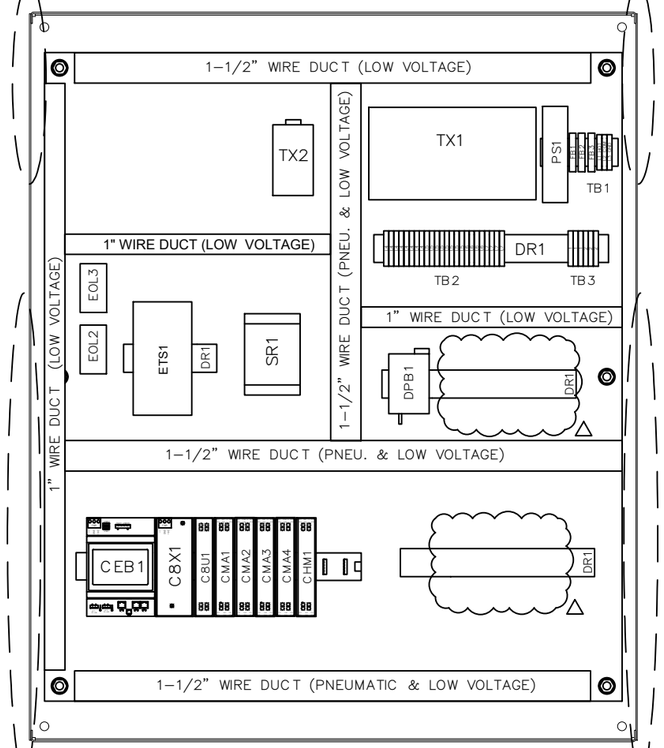
SHEET
NCHS-201
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 25 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

EOL4
(LINKNET TERMINATOR)

NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

AHU-M2 CONTROL PANEL

BILL OF MATERIALS

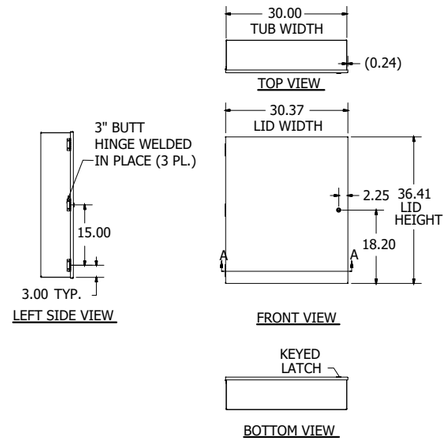
WILL BE PROVIDED IN A FUTURE REVISION. △

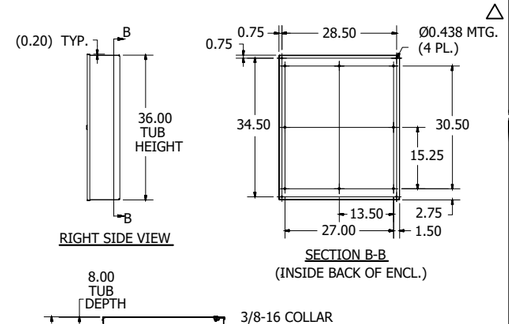
BILL OF MATERIALS

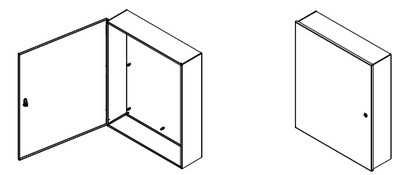
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

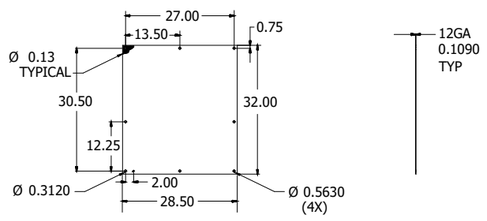
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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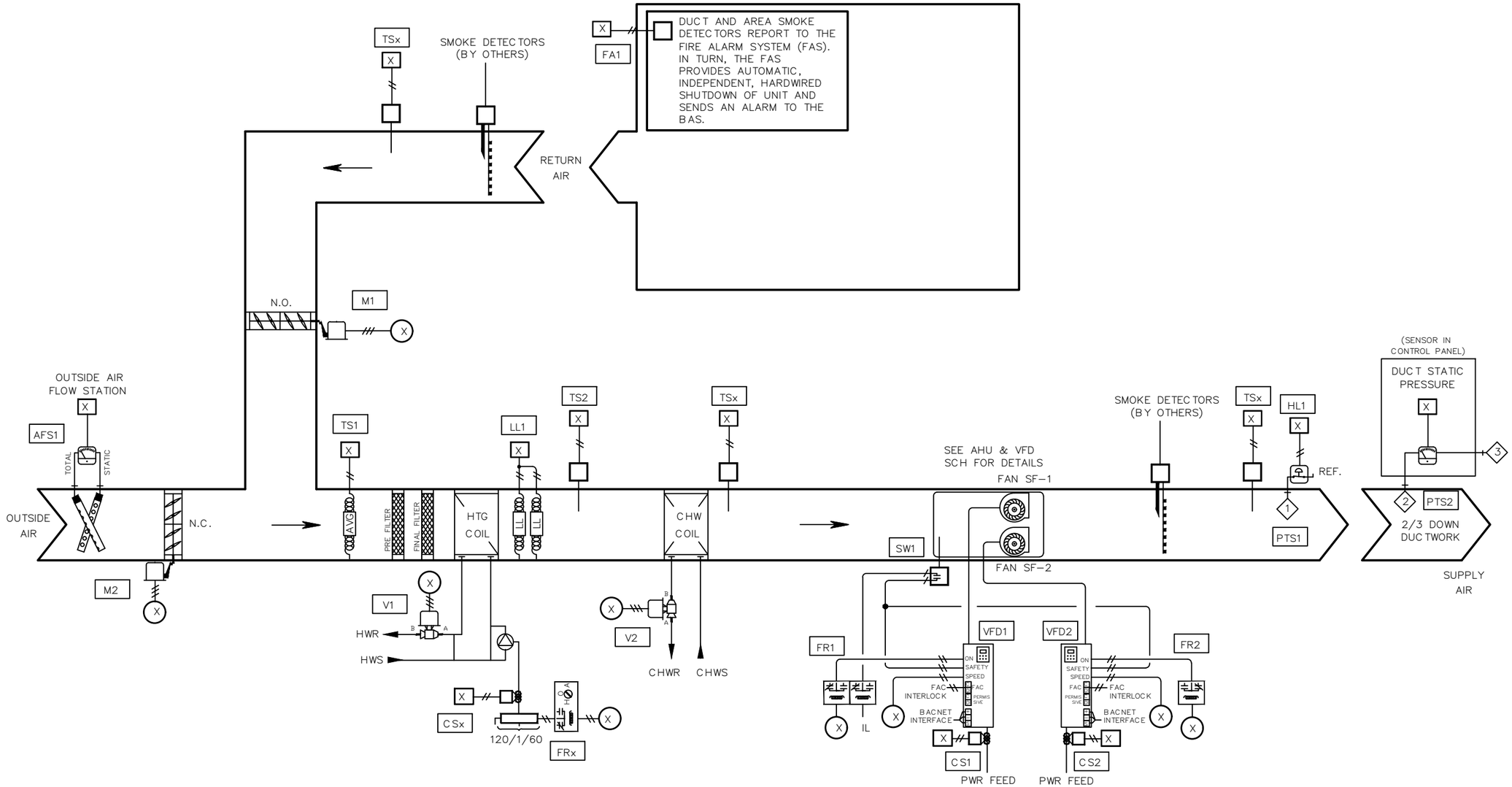
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SHEET
NCHS-202
JOB NUMBER:
J-2304001

AHU–AA1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU–AA1 FIELD DEVICES

Delta Controls

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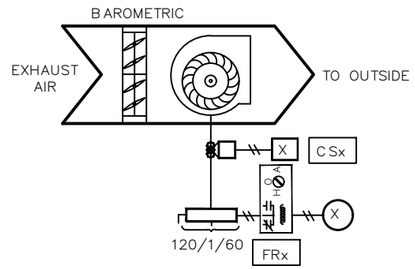
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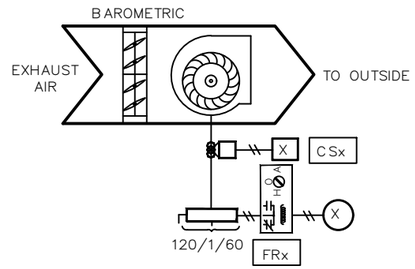
CONTRACT NO:

SHEET
NCHS–203
JOB NUMBER:
J–2304001

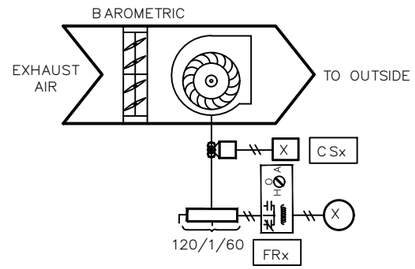
EXHAUST FAN – BAS CONTROLLED
EF–AA1



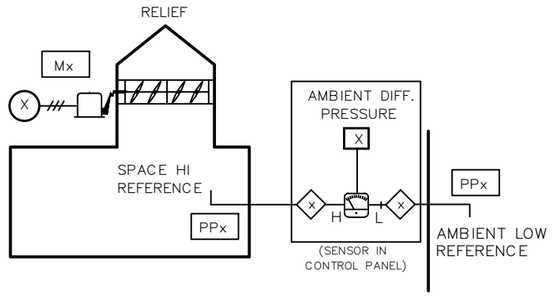
EXHAUST FAN – BAS CONTROLLED
EF–AA2



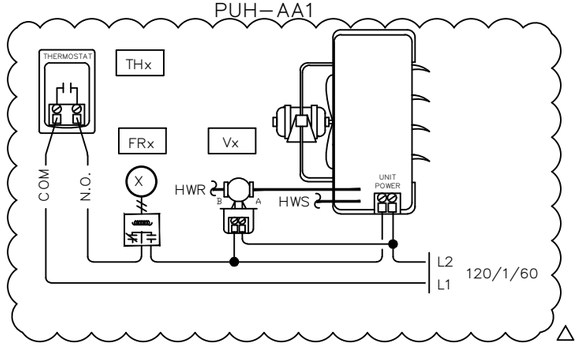
EXHAUST FAN – BAS CONTROLLED
EF–AA3



BUILDING PRESSURE CONTROL
RH–AA1



PROPELLER UNIT HEATER
PUH–AA1



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA AA EXHAUST, RELIEF, & PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

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SHEET
NCHS–204
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
EF-AA1 STAT	Exhaust Fan AA1 Status		X			
EF-AA2 STAT	Exhaust Fan AA2 Status		X			
EF-AA3 STAT	Exhaust Fan AA3 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF 1 STAT	Supply Fan 1 Status		X			
SF 2 STAT	Supply Fan 2 Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-AA1 DPR	Relief Air Damper			X		
SF 1 VFD	Supply Fan 1 VFD Speed			X		
SF 2 VFD	Supply Fan 2 VFD Speed			X		
EF-AA1 SS	Exhaust Fan AA1 Start / Stop				X	
EF-AA2 SS	Exhaust Fan AA2 Start / Stop				X	
EF-AA3 SS	Exhaust Fan AA3 Start / Stop				X	
PUH-AA1 EN	PUH AA1 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF 1 SS	Supply Fan 1 Start / Stop				X	
SF 2 SS	Supply Fan 2 Start / Stop				X	
	POINT TOTALS:	**8**	**9**	**7**	**7**	**0**

SOFTWARE AND NETWORK (NON–PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU–AA1 & AREA AA MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
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NCHS–205
JOB NUMBER:
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VAV AIR HANDLING UNIT AHU-AA1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF1-C, SF2-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF1-S, SF2-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFAAn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

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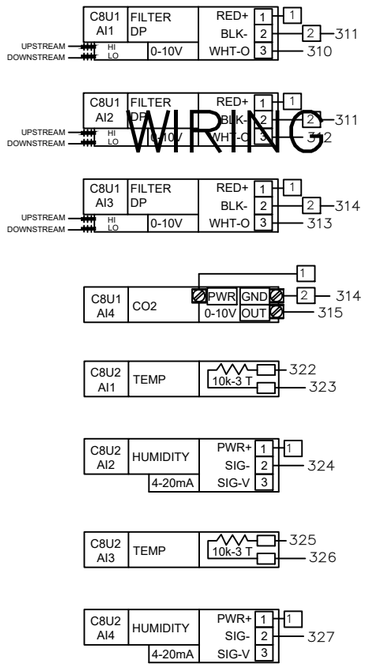
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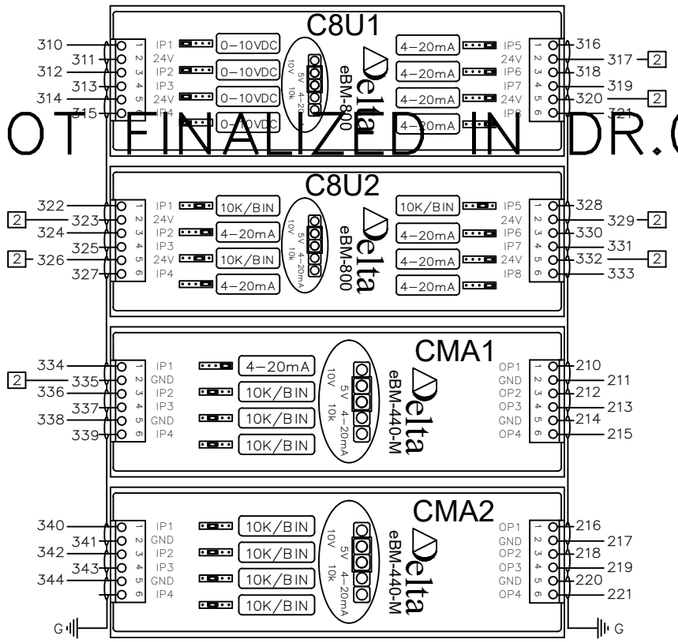
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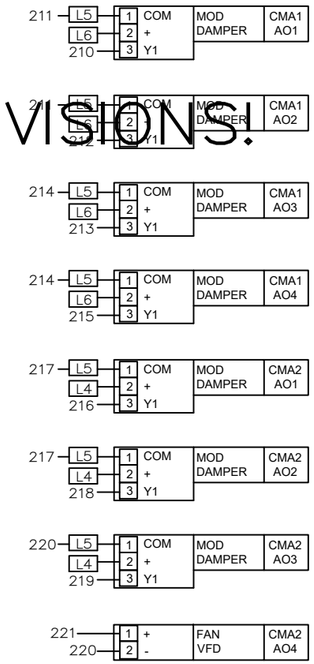
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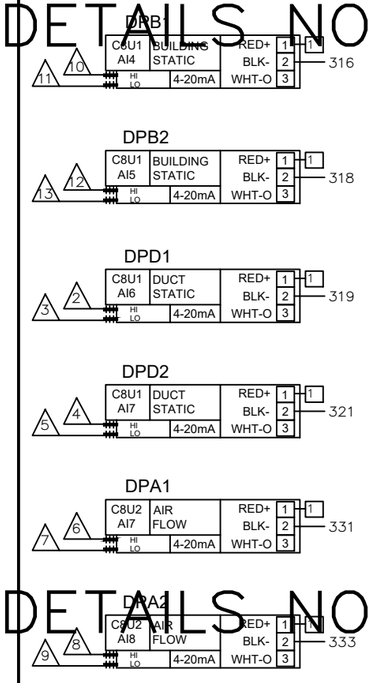
SHEET
NCHS-206
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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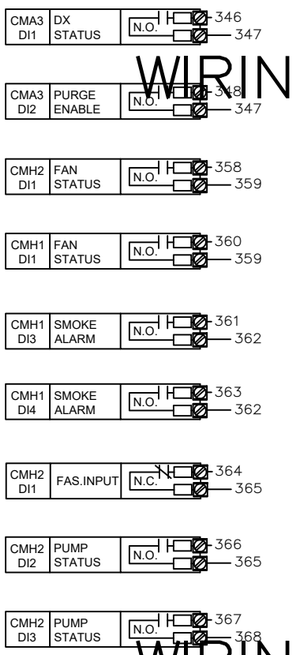
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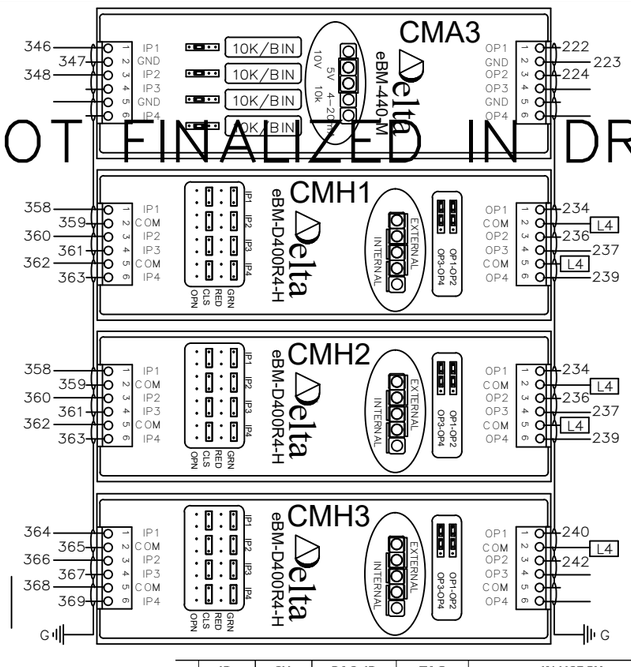
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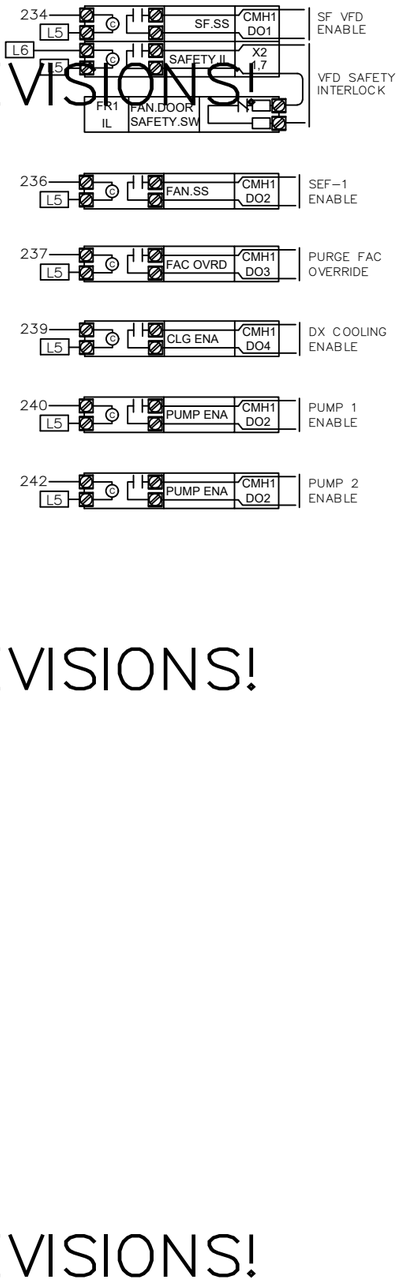
SHEET
NCHS-207
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

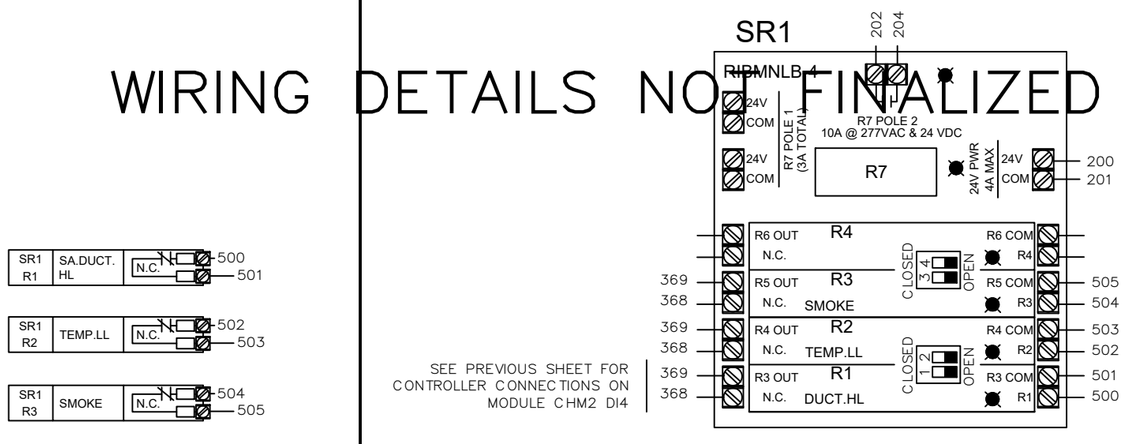
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–208
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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REVISIONS	
DATE	REMARKS

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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-209
JOB NUMBER:
J-2304001

SYSTEM 26 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

301 300 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

24V COM POWER 4A MAX

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 10A @ 277VAC (NOT USED)

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED OPEN

TX1

24V CB Power

100 L2 L3

H C G

120 VAC LAPTOP PWR

75VA 24VAC 24VAC

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L2 L3

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1 DPB1

1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3 4 5

CEB1 C8X1

201 200

PWR GND 24~

USB2 USB1 (NOT USED)

eBMGR-2

eBX

eBUS Address

eBUS

NET1 RS-485 NET2 RS-485 LAN 1 LAN 2 LAN

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

AHU-AA1 SYSTEM 26 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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REVISIONS	
DATE	REMARKS

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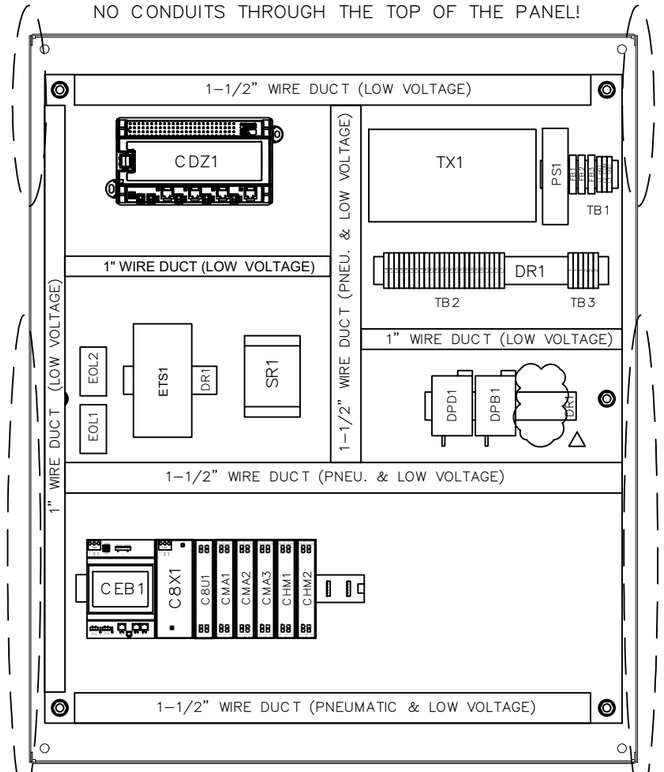
CONTRACT NO:

SHEET
NCHS-210
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 26 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

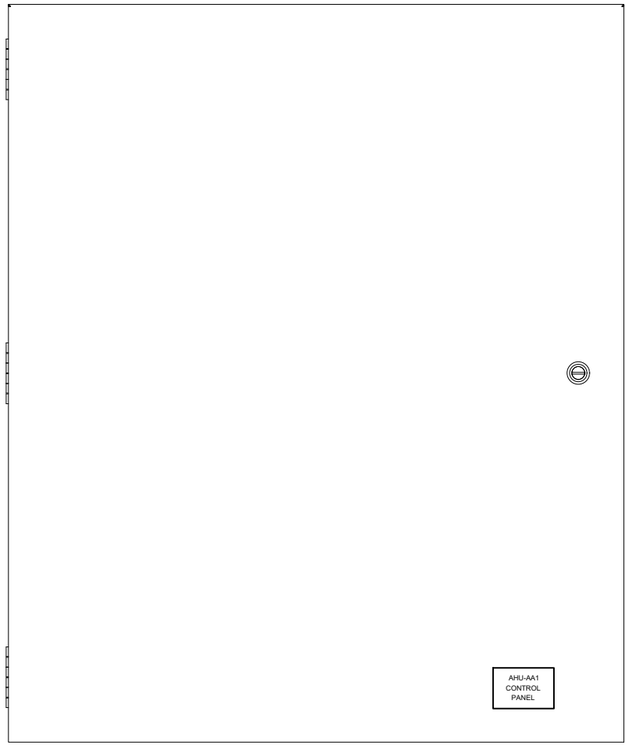
NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

*NEW ENCLOSURE PROVIDED FOR THIS AHU.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

BILL OF MATERIALS

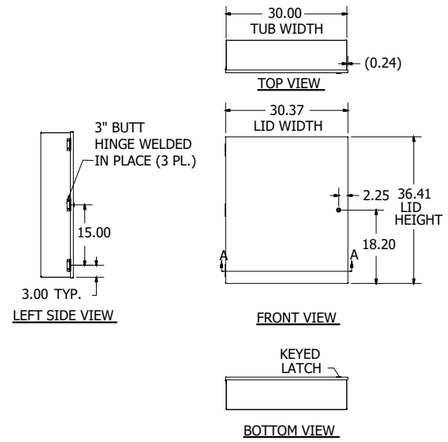
WILL BE PROVIDED IN A FUTURE REVISION. △

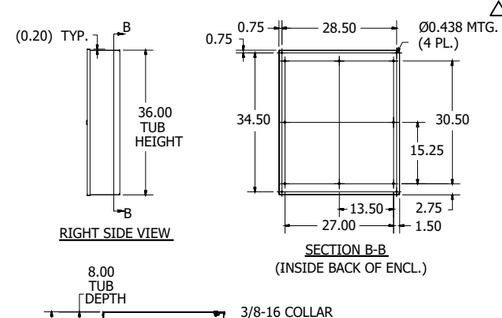
BILL OF MATERIALS

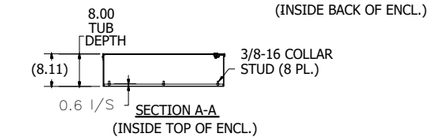
WILL BE PROVIDED IN A FUTURE REVISION. △

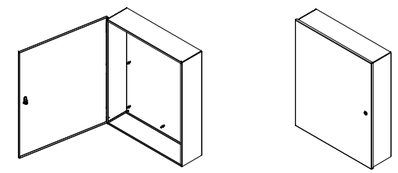
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

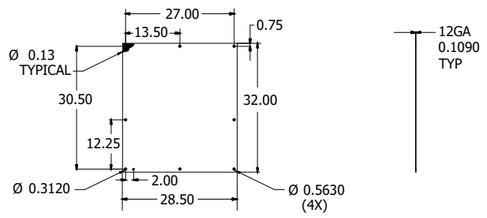








PANEL DIMENSIONS



AHU–AA1 SYSTEM 26 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

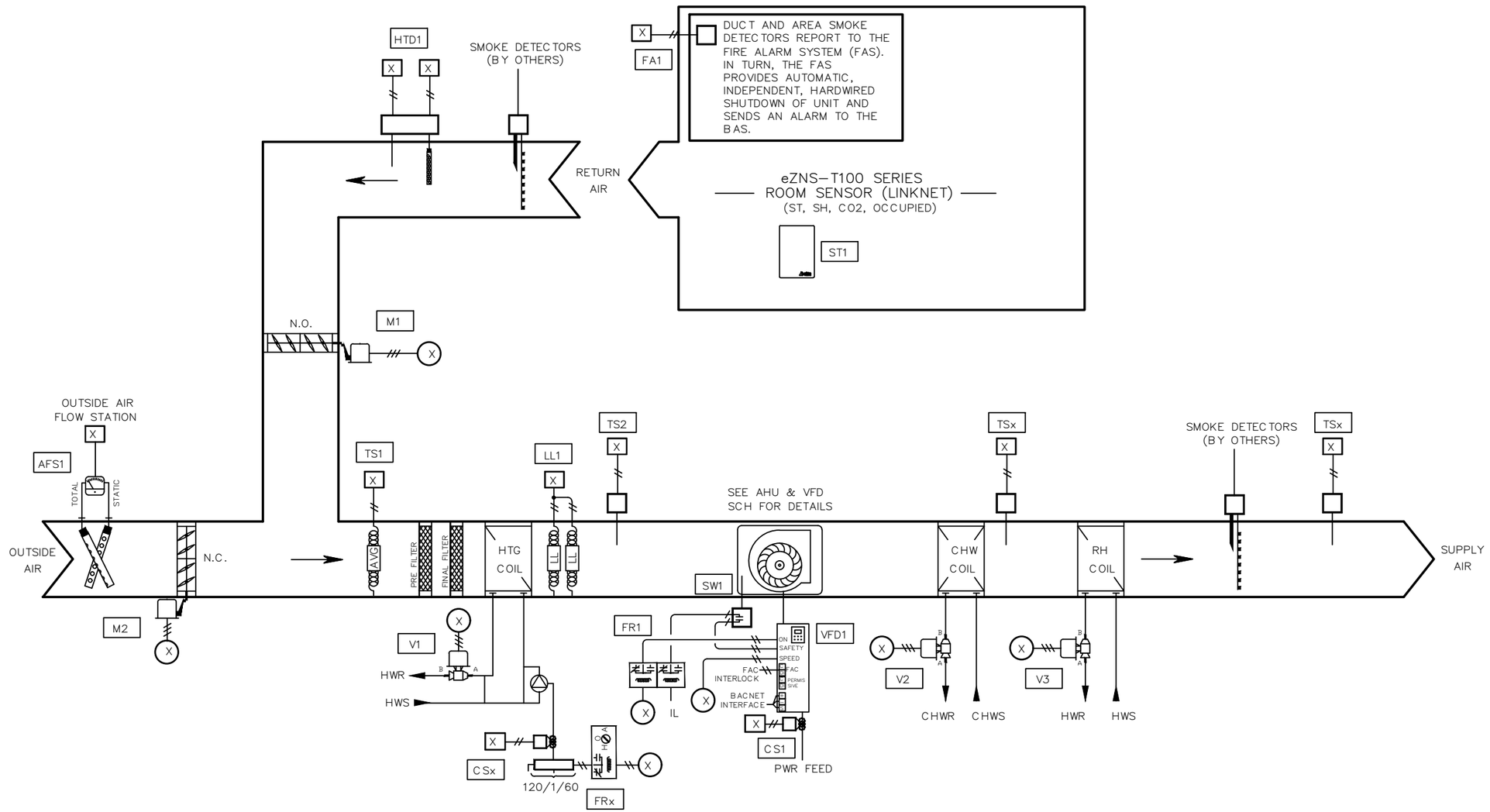
REVISIONS	
DATE	REMARKS

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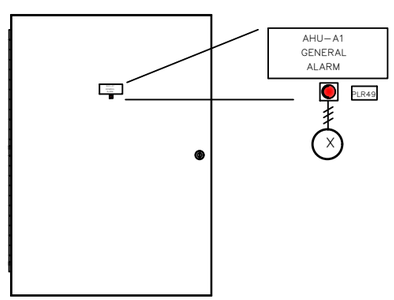
SHEET
NCHS–211
JOB NUMBER:
J–2304001

E–AHU–A1 FIELD DEVICES



E–AHU–A1 GENERAL ALARM LIGHT

(REUSE EXISTING LIGHT IN ENCLOSURE DOOR)



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

AHU–A1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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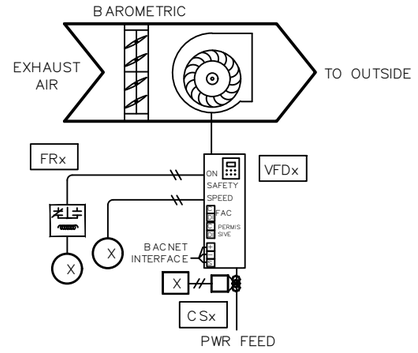
REVISIONS	
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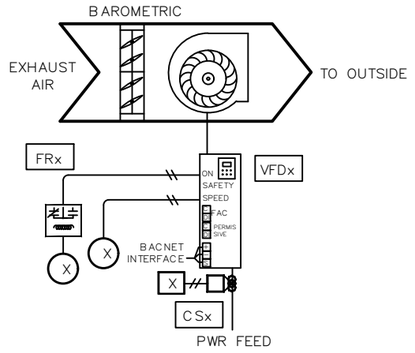
CONTRACT NO:

SHEET
NCHS–212
JOB NUMBER:
J–2304001

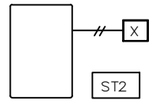
EXHAUST FAN – BAS CONTROLLED
EF–A11



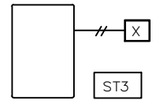
EXHAUST FAN – BAS CONTROLLED
EF–A12



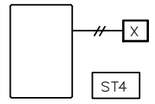
IDF / MDF / ELEC ROOM SPACE TEMPERATURE
RM (TBD)



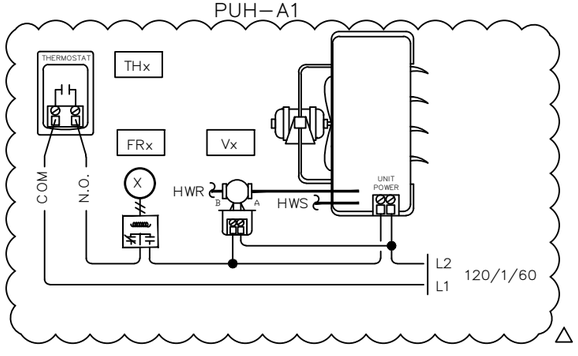
IDF / MDF / ELEC ROOM SPACE TEMPERATURE
RM (TBD)



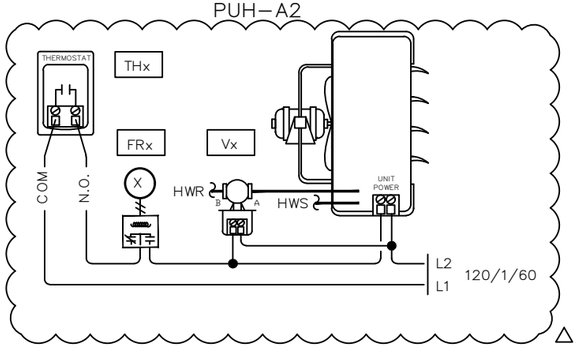
IDF / MDF / ELEC ROOM SPACE TEMPERATURE
RM (TBD)



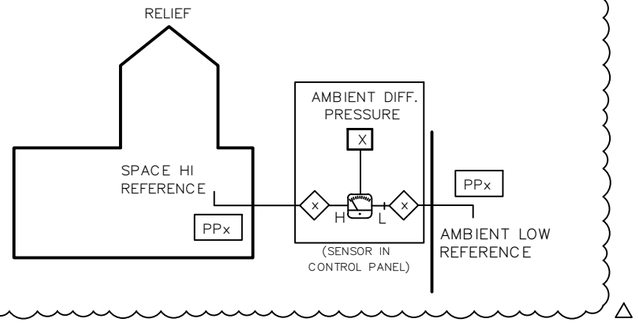
PROPELLER UNIT HEATER
PUH–A1



PROPELLER UNIT HEATER
PUH–A2



BUILDING PRESSURE MONITORING



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA A EXHAUST, IDF MONITORING, & PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

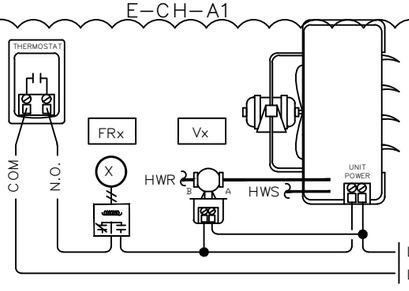
REVISIONS	
DATE	REMARKS

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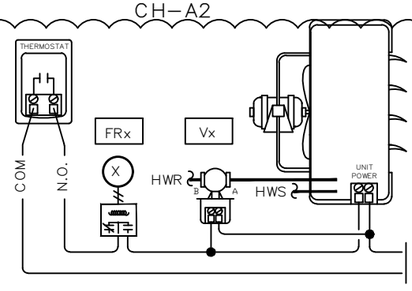
SHEET
NCHS–213
JOB NUMBER:
J–2304001

CABINET UNIT HEATER
E-CH-A1



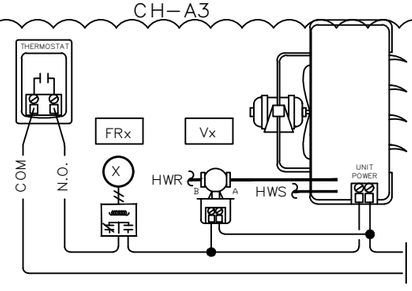
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER
CH-A2



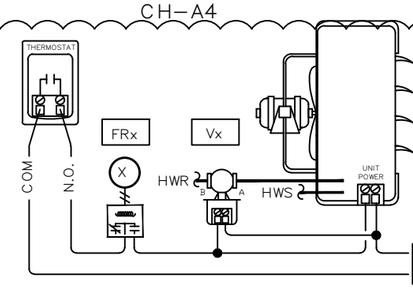
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER
CH-A3



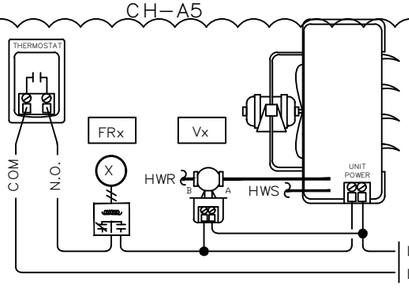
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER
CH-A4



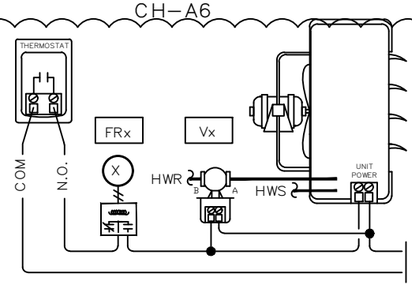
(THERMOSTAT BY MANUF.) 120/1/60

CABINET UNIT HEATER
CH-A5



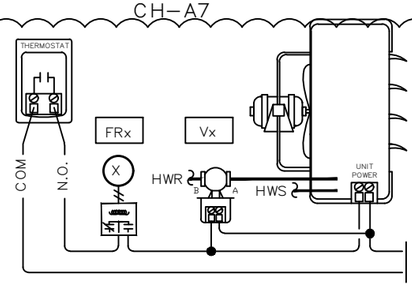
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CABINET UNIT HEATER
CH-A6



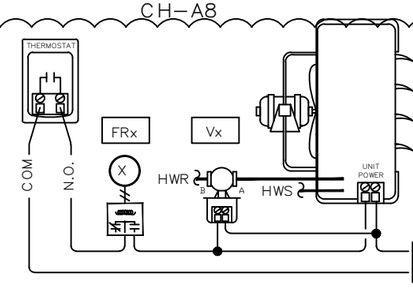
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER
CH-A7



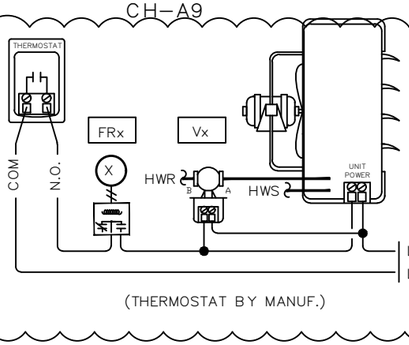
(THERMOSTAT BY MANUF.)

CABINET UNIT HEATER
CH-A8



(THERMOSTAT BY MANUF.) 120/1/60

CABINET UNIT HEATER
CH-A9



(THERMOSTAT BY MANUF.)

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA A CABINET UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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DATE	REMARKS

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CONTRACT NO:

SHEET
NCHS-214
JOB NUMBER:
J-2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure	X				
MAT	Mixed Air Temperature	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
ST2	Space Temp	X				
ST3	Space Temp	X				
ST4	Space Temp	X				
EF-A11 STAT	Exhaust Fan A11 Status		X			
EF-A12 STAT	Exhaust Fan A12 Status		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
EF-A11 VFD	Exhaust Fan A11 VFD Speed			X		
EF-A12 VFD	Exhaust Fan A12 VFD Speed			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
ALARM LT	AHU-A1 General Alarm (in pnl face)				X	
E-CH-A1 EN	CUH A1 Enable				X	
EF-A11 SS	Exhaust Fan A11 Start / Stop				X	
EF-A12 SS	Exhaust Fan A12 Start / Stop				X	
CH-A2 EN	CUH A2 Enable				X	
CH-A3 EN	CUH A3 Enable				X	
CH-A4 EN	CUH A4 Enable				X	
CH-A5 EN	CUH A5 Enable				X	
CH-A6 EN	CUH A6 Enable				X	
CH-A7 EN	CUH A7 Enable				X	
CH-A8 EN	CUH A8 Enable				X	
CH-A9 EN	CUH A9 Enable				X	
PUH-A1 EN	PUH A1 Enable				X	
PUH-A2 EN	PUH A2 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**10**	**6**	**8**	**16**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-A1 & AREA A MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-215
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-A1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE. OCCUPANCY SENSOR AUX CONTACT (OCC-S), OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), EF-A11 AND EF-A12 FANS SHALL START AND MODULATE IN UNISON TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE FANS SHALL STOP WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

DEHUMIDIFICATION MODE: WHEN SPACE HUMIDITY RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN SPACE HUMIDITY FALLS BELOW 55 % RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZNn-CO2) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

CABINET UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

IDF/MDF AND ELECTRICAL HVAC SPLIT SYSTEM MONITORING:

INSTALL AND WIRE BAS FLAT PLATE SPACE TEMPERATURE SENSORS FOR MONITOR OF IDF/MDF SPACES AND ALARM CONDITIONS. ALL STAND-ALONE HVAC SYSTEMS WILL HAVE BAS SPACE TEMPERATURE MONITORING IN ADDITION TO THE CONTROLS FROM THE MANUFACTURER. AN ALARM WILL BE GENERATED IF THE SPACE RISES ABOVE 81F (ADJ) OR DROPS BELOW 59F (ADJ). THESE SPACES ALSO REQUIRE A SEPARATE THERMOSTAT FOR LOCAL EQUIPMENT CONTROL.

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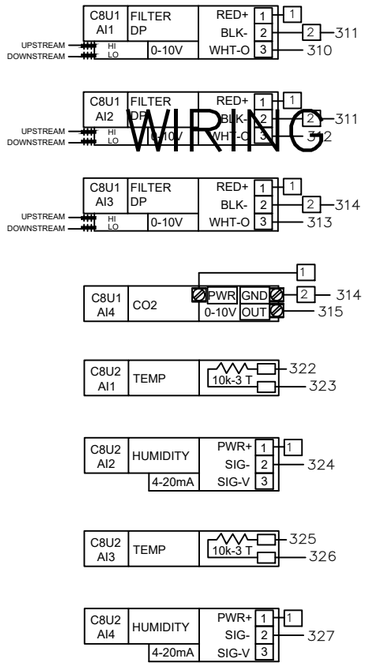
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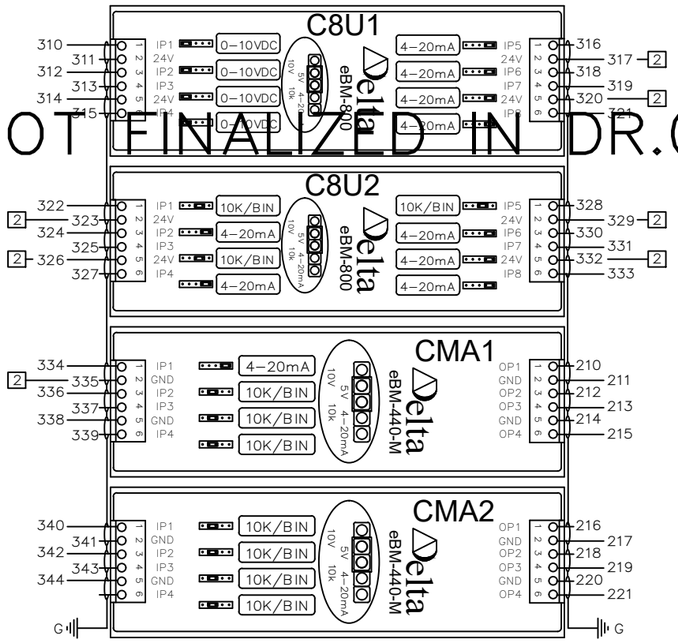
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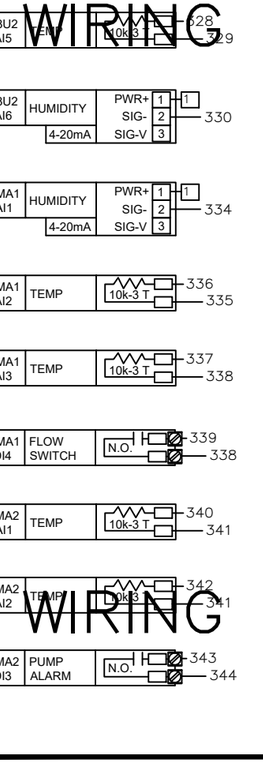
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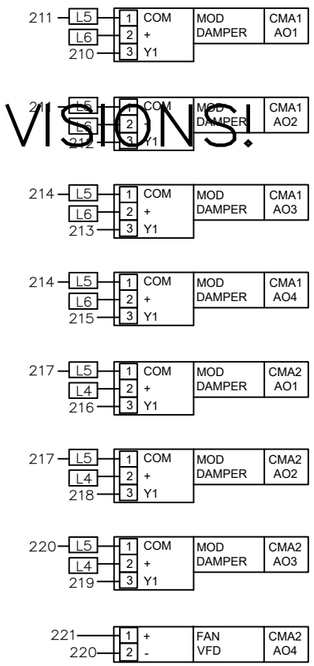
SHEET
NCHS-216
JOB NUMBER:
J-2304001

SYSTEM 27 CONTROL PANEL









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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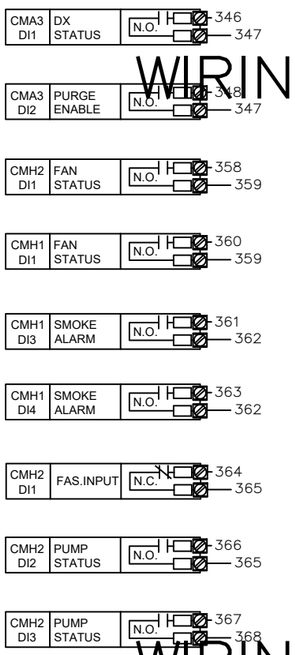
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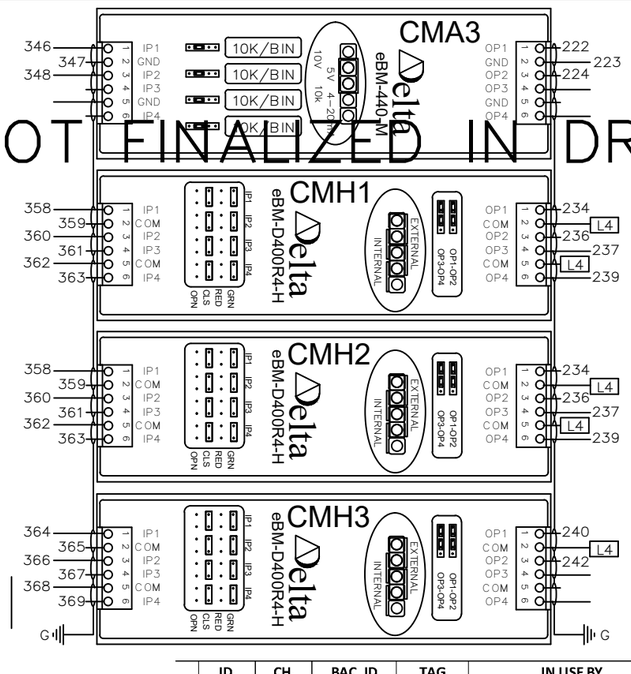
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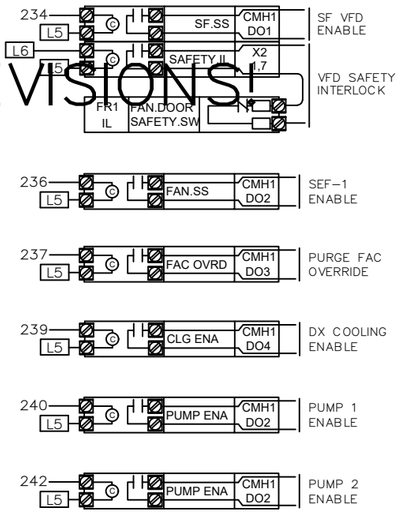
SHEET
NCHS–217
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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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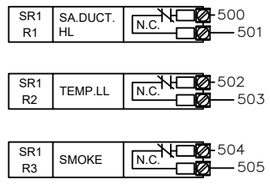
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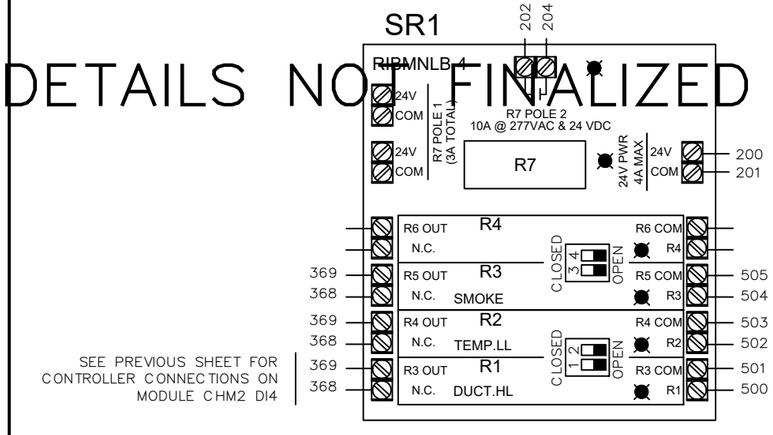
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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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SYSTEM 27 CONTROL PANEL

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

300 301 L3

ETS1

V1- V1+

ETHERNET SWITCH

1 3 5 4 2

CAT5e

TRANSFORMER 102 L2 206 207

TRANSFORMER 103 L2 208 209

TX1

24V CB Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 L3 101 L2

PS1

103 4.0A

102 4.0A

101 1.0A

100 5.0A

G

TB1

L1 L2 L3

H N 120 VAC

PANEL GND LUG

TB2

202	L4 L4 L4
203	L5 L5 L5
204	L6 L6 L6
205	L7 L7 L7
206	L8 L8 L8
207	L9 L9 L9
208	L10 L10 L10
209	L11 L11 L11

24 VAC TO FIELD

SR1

RIBMNLB-4

202 204

200 201 24V COM

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 10A @ 277VAC

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED OPEN

DPB1

1

Power GND / 4-20mA out Voltage out

HIGH LOW

4 5

PNEUMATIC

TB3

300	1 1 1
301	2 2 2

24 VDC TO FIELD

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1

NET PWR

24 VAC

LINKNET (RS-485)

201 200

CEB1

PWR GND 24~

USB2 USB1

(NOT USED)

eBMGR-2

NET1 RS-485 + - SHD

NET2 RS-485 + - SHD

LAN 1 LAN 2 LAN 3

MS/TP

LINKNET (RS-485)

201 200

C8X1

PWR GND 24~

eBX

eBUS Address

eBUS

P7 24Vac P8 24Vac IP2

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-A1 SYSTEM 27 PANEL - POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

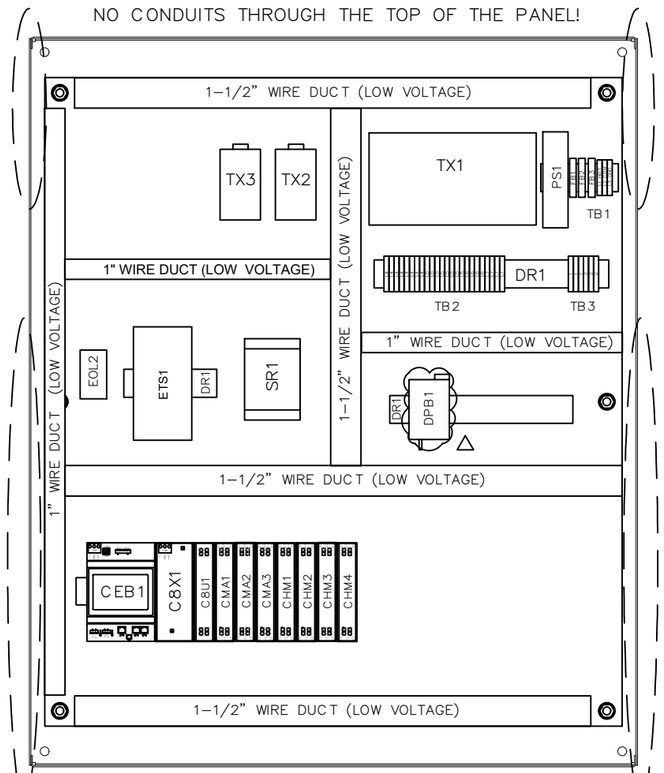
CONTRACT NO:

SHEET
NCHS-220
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 27 LAYOUT

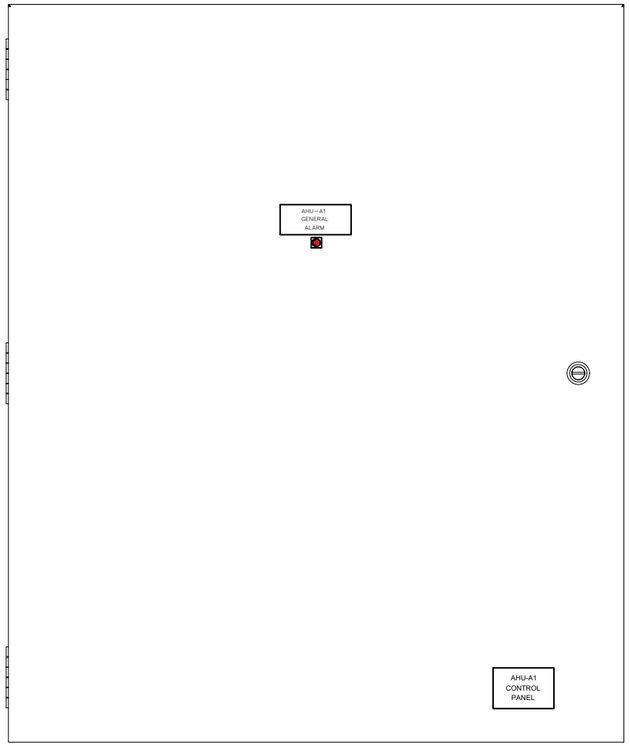
NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

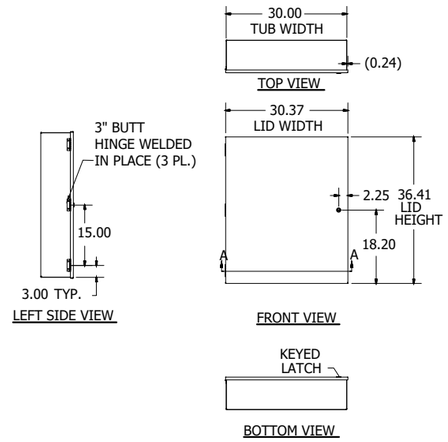
WILL BE PROVIDED IN A FUTURE REVISION. △

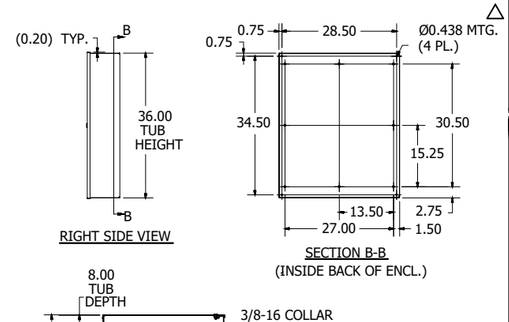
BILL OF MATERIALS

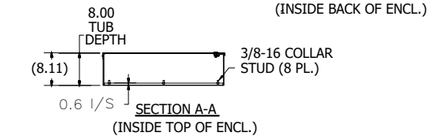
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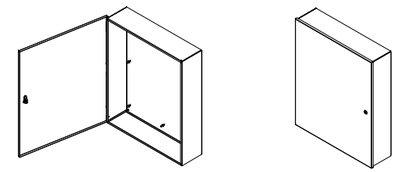
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

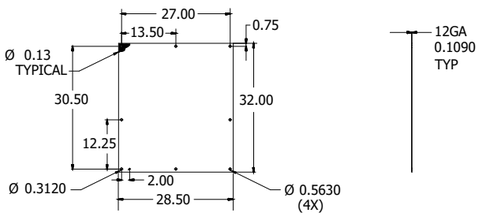








PANEL DIMENSIONS



E–AHU–A1 SYSTEM 27 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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	AS–BUILT

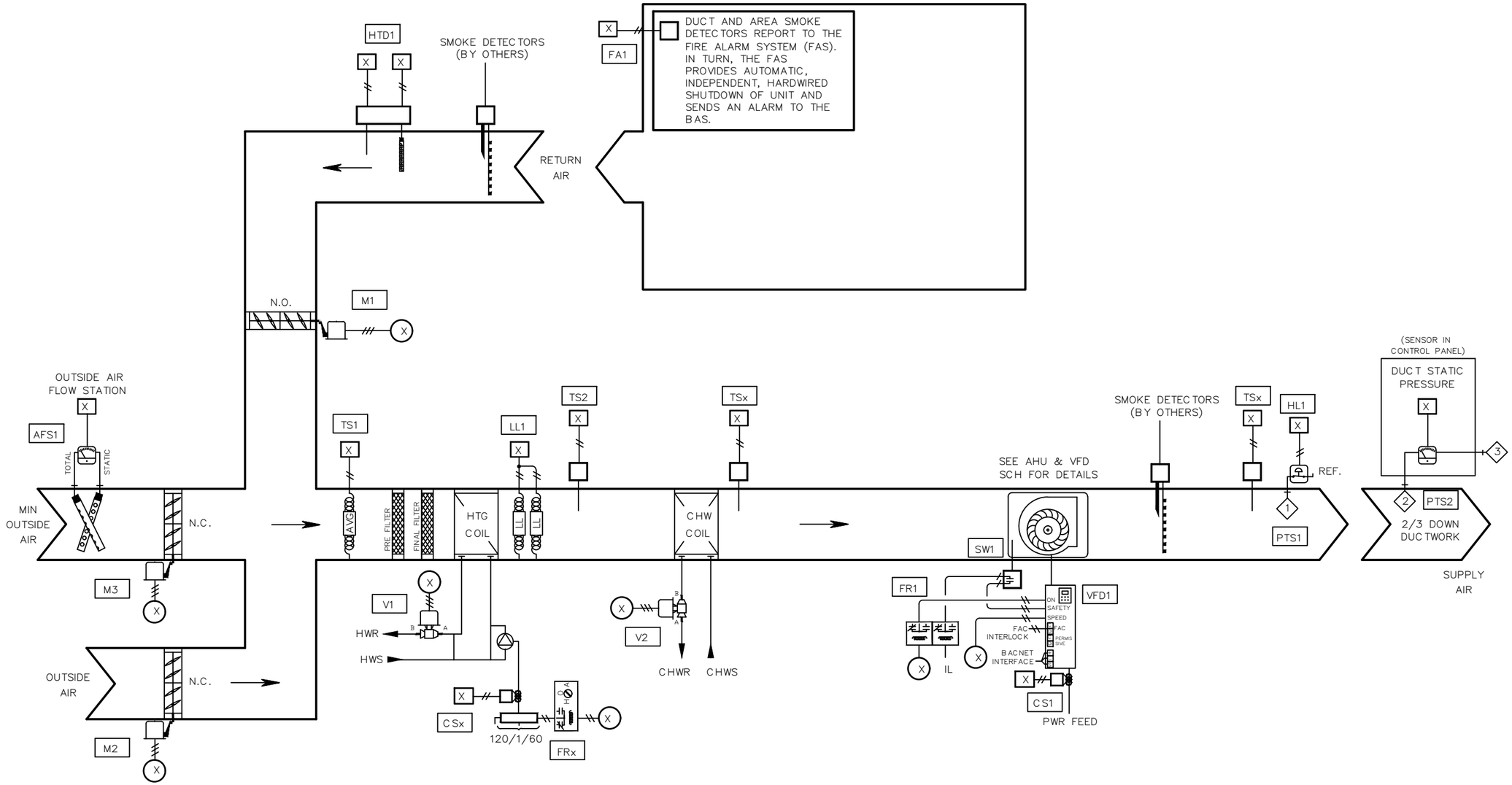
REVISIONS	
DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–221
JOB NUMBER:
J–2304001

E-AHU-B1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E-AHU-B1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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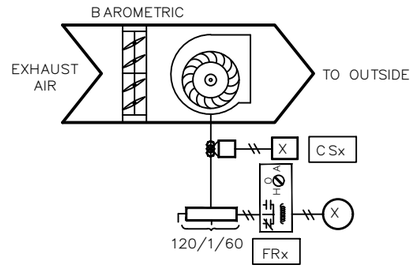
REVISIONS	
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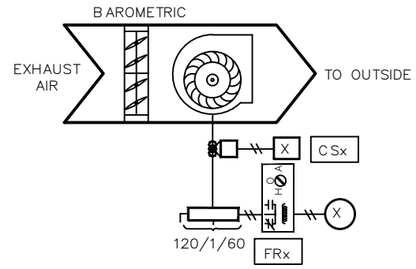
CONTRACT NO:

SHEET
NCHS-224
JOB NUMBER:
J-2304001

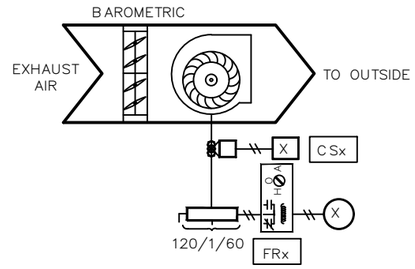
EXHAUST FAN – BAS CONTROLLED
EF–B1



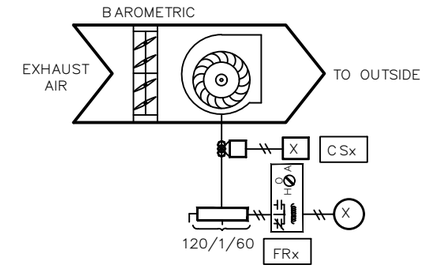
EXHAUST FAN – BAS CONTROLLED
EF–B2



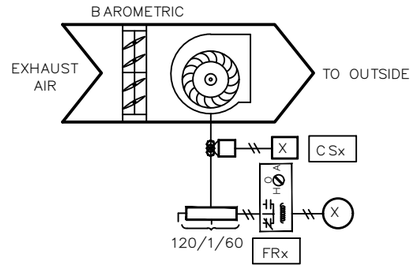
EXHAUST FAN – BAS CONTROLLED
EF–B3



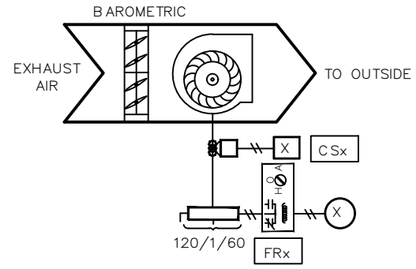
EXHAUST FAN – BAS CONTROLLED
EF–B4



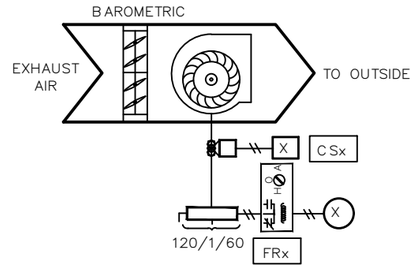
EXHAUST FAN – BAS CONTROLLED
EF–B5



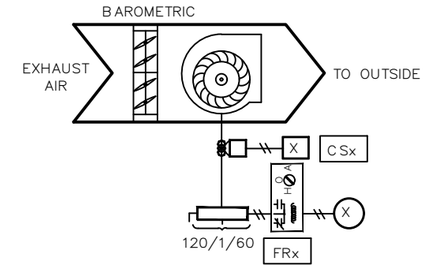
EXHAUST FAN – BAS CONTROLLED
EF–B6



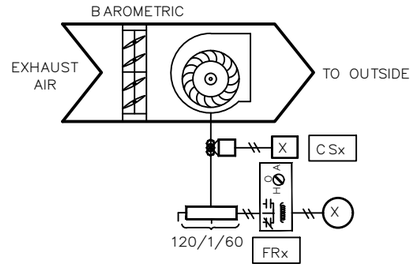
EXHAUST FAN – BAS CONTROLLED
EF–B9



EXHAUST FAN – BAS CONTROLLED
EF–B10



EXHAUST FAN – BAS CONTROLLED
EF–P9



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA B EXHAUST FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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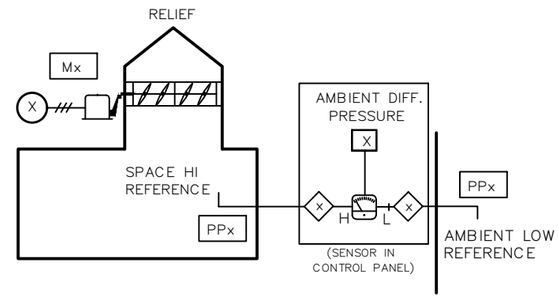
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DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–225
JOB NUMBER:
J–2304001

BUILDING PRESSURE CONTROL
E–RH–B1



△

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA B RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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△

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CONTRACT NO:

SHEET
NCHS–226
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-B1 STAT	Exhaust Fan B1 Status		X			
EF-B10 STAT	Exhaust Fan B10 Status		X			
EF-B2 STAT	Exhaust Fan B2 Status		X			
EF-B3 STAT	Exhaust Fan B3 Status		X			
EF-B4 STAT	Exhaust Fan B4 Status		X			
EF-B5 STAT	Exhaust Fan B5 Status		X			
EF-B6 STAT	Exhaust Fan B6 Status		X			
EF-B9 STAT	Exhaust Fan B9 Status		X			
EF-P9 STAT	Exhaust Fan P9 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-B1 DPR	Relief Air Damper			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-B1 SS	Exhaust Fan B1 Fan Start / Stop				X	
EF-B10 SS	Exhaust Fan B10 Fan Start / Stop				X	
EF-B2 SS	Exhaust Fan B2 Fan Start / Stop				X	
EF-B3 SS	Exhaust Fan B3 Fan Start / Stop				X	
EF-B4 SS	Exhaust Fan B4 Fan Start / Stop				X	
EF-B5 SS	Exhaust Fan B5 Fan Start / Stop				X	
EF-B6 SS	Exhaust Fan B6 Fan Start / Stop				X	
EF-B9 SS	Exhaust Fan B9 Fan Start / Stop				X	
EF-P9 SS	Exhaust Fan P9 Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**9**	**14**	**7**	**11**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-B1 & AREA B MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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SHEET
NCHS-227
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-B1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFBn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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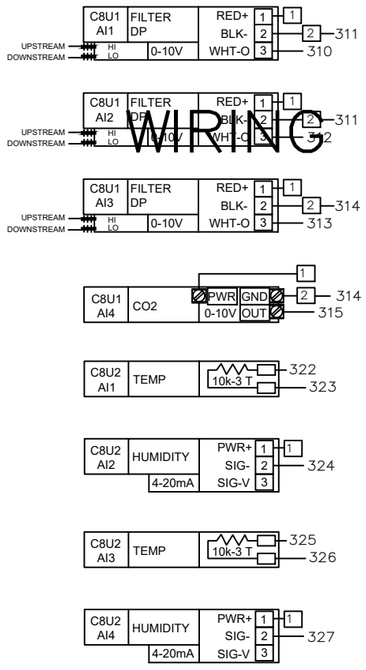
REVISIONS	
DATE	REMARKS

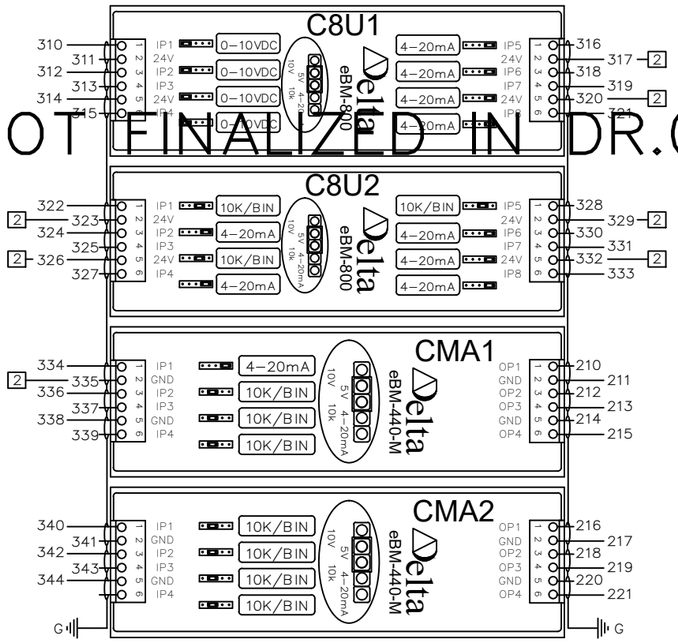
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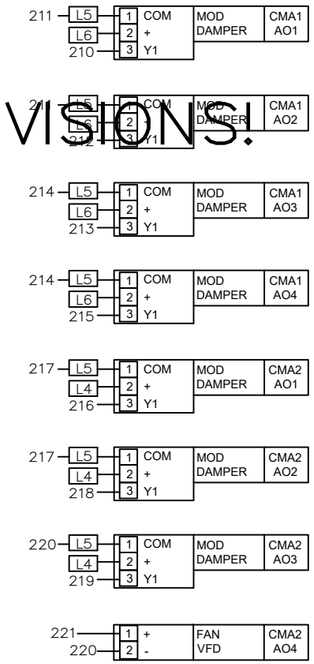
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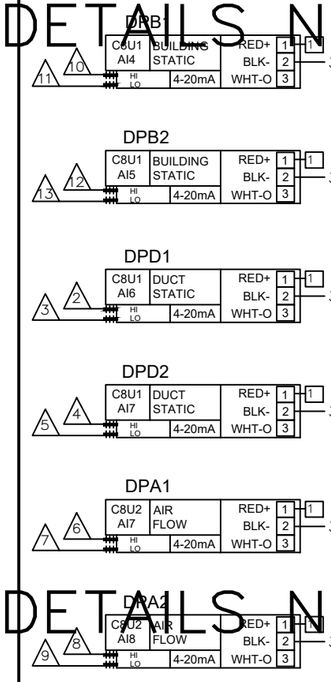
SHEET
NCHS-228
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	INPUTS
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	INPUTS
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	INPUTS
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	INPUTS
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	INPUTS
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	INPUTS
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	INPUTS
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	INPUTS

C8U1 eBM-800 — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	INPUTS
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	INPUTS
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	INPUTS
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	INPUTS
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	INPUTS
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	INPUTS
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	INPUTS
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	INPUTS

C8U2 eBM-800 — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	INPUTS
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	INPUTS
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	INPUTS
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	INPUTS
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	OUTPUTS
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	OUTPUTS
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	OUTPUTS
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	OUTPUTS

CMA1 eBM-440-M — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	INPUTS
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	INPUTS
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	INPUTS
CMA2	4	10100.1404				INPUTS
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	OUTPUTS
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	OUTPUTS
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	OUTPUTS
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	OUTPUTS

CMA2 eBM-440-M — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

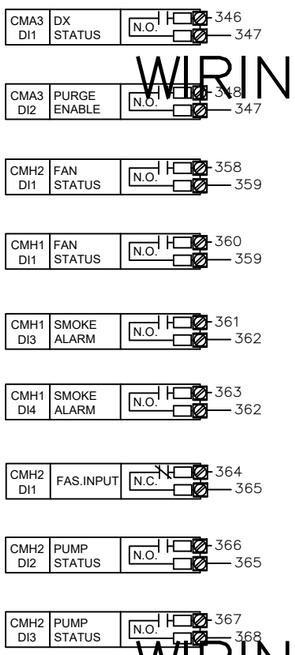
REVISIONS	
DATE	REMARKS

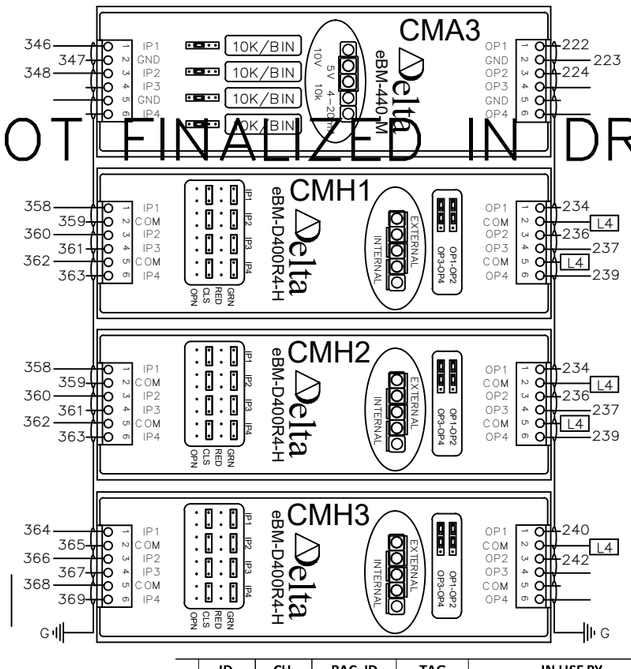
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

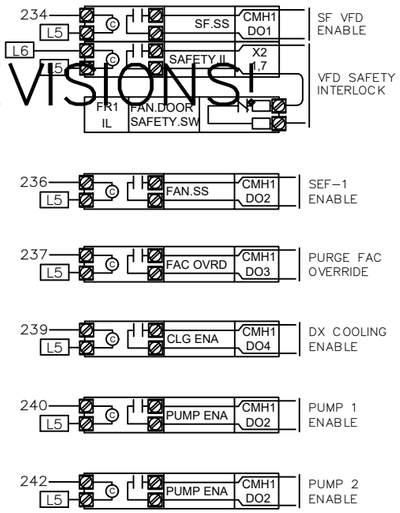
SHEET
NCHS-229
JOB NUMBER:
J-2304001

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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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Delta Controls
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4240 W 50 S
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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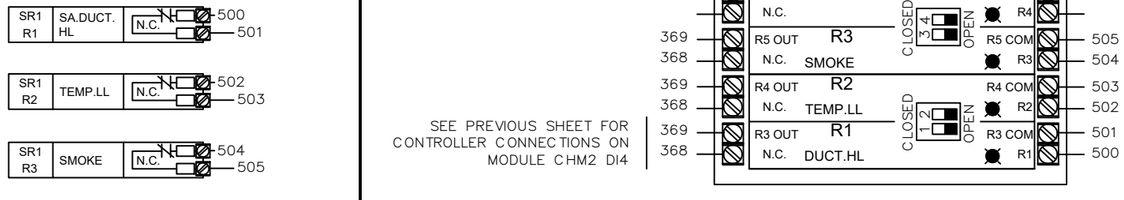
JOB TITLE: North Central High School
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ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–230
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

E-AHU-B1 SYSTEM 28 PANEL – I/O WIRING (3 OF 3)

Delta Controls
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SHEET
NCHS-231
JOB NUMBER:
J-2304001

SYSTEM 28 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB Power

24V CB Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

75VA 24VAC 24VAC

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L3 L2

PS1

102 4.0A

101 1.0A

100 5.0A

G PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

206 L8 L8 L8

207 L9 L9 L9

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

ETS1

301 300 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201 24V COM

R7 POLE 2 10A @ 277VAC & 24 VDC

R7

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

DPD1

DPB1

Power + − GND / 4-20mA out Voltage out

HIGH LOW

PNEUMATIC

2 3 4 5

CEB1

C8X1

201 200

PWR — GND 24~

USB2 USB1

(NOT USED)

NET1 RS-485 NET2 RS-485 + − SHD

LAN 1 LAN 2 LAN 3

Delta eBMGR-2

Delta eBX

eBUS Address

eBUS

eBM-800 eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

OP1 OP2 OP3 OP4 HAO

I/O SHIELD DRAIN

MS/TP

TO PANEL GND LUG L3

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-B1 SYSTEM 28 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
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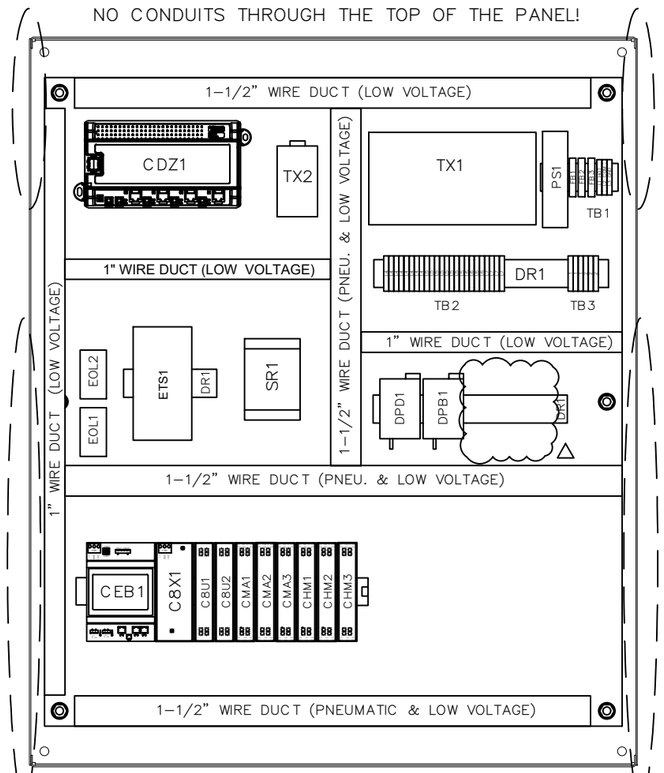
CONTRACT NO:

SHEET
NCHS-232
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 28 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

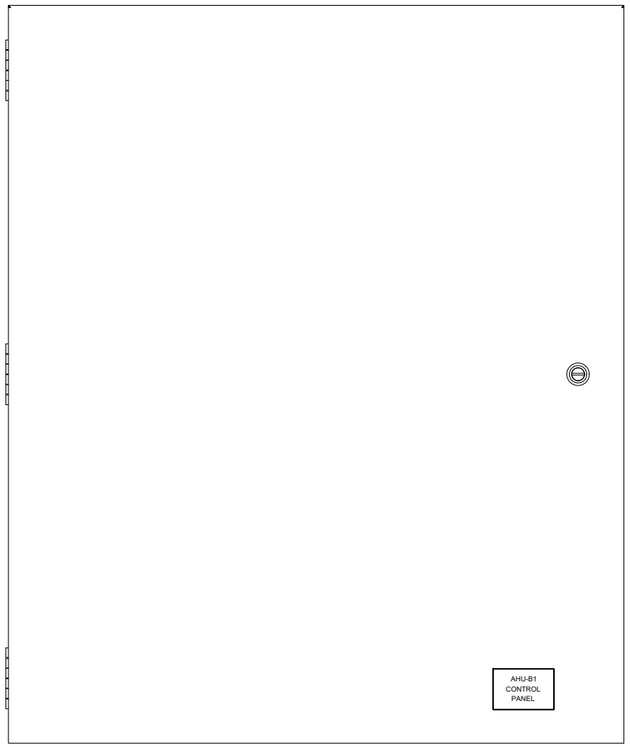


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

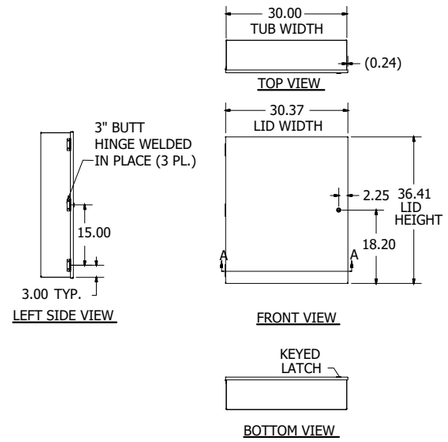
WILL BE PROVIDED IN A FUTURE REVISION. △

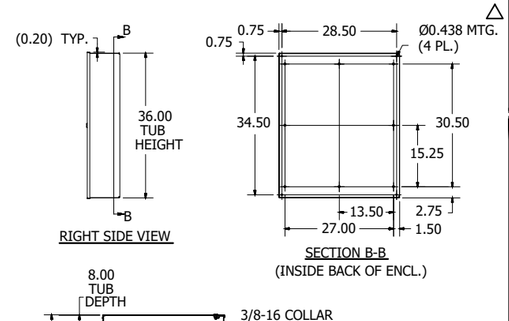
BILL OF MATERIALS

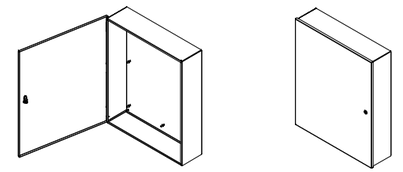
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

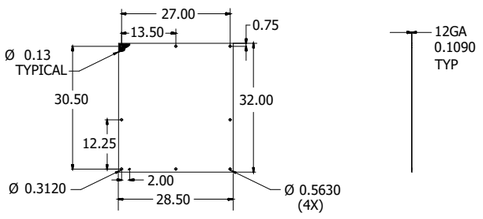
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



E–AHU–B1 SYSTEM 28 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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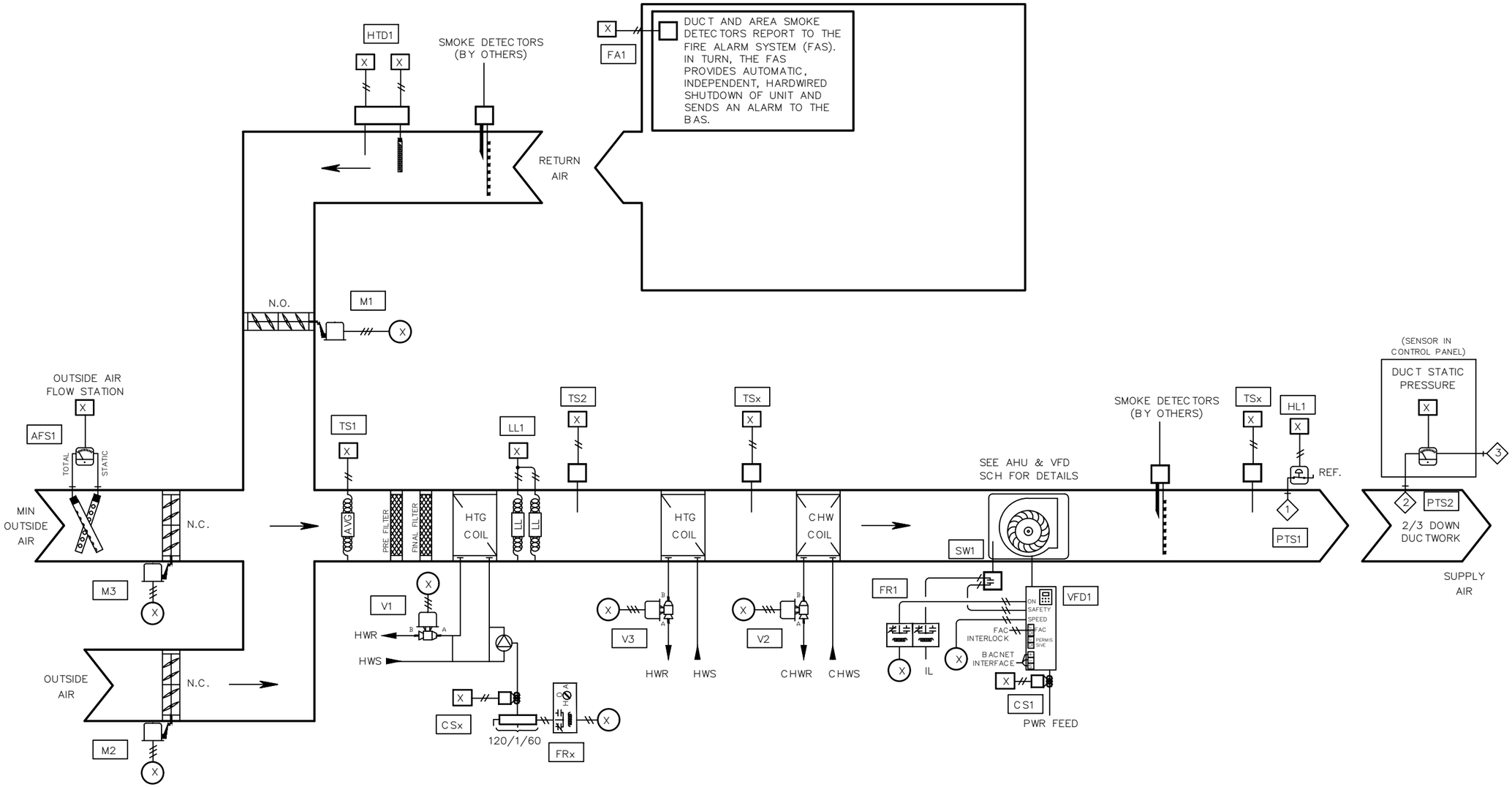
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J–2304001

E-AHU-C4 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

E-AHU-C4 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
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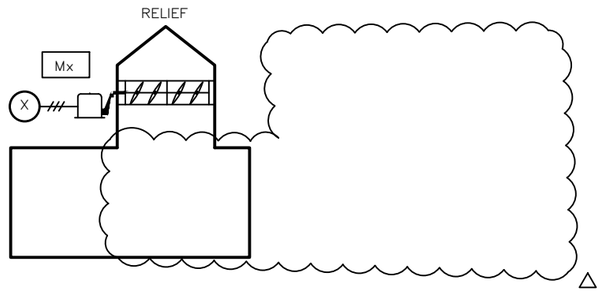
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NCHS-234
JOB NUMBER:
J-2304001

BUILDING PRESSURE CONTROL
RH–C2



△

△

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA C RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services

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CONTRACT NO:

SHEET
NCHS–235
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
HCDAT	Heating Coil Discharge Air Temp	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
HWV	Hot Water Valve			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-C2 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**8**	**2**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

AHU-C4 & AREA C MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
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REVISIONS	
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CONTRACT NO:

SHEET
NCHS-236
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-C4 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), HEATING VALVE (HC-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
PREHEAT AND HEATING VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

Delta Controls
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PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

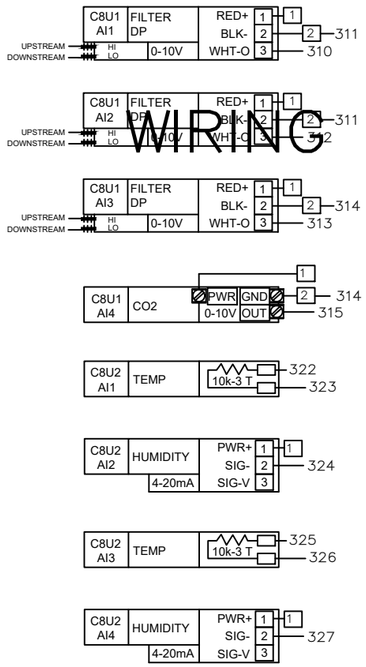
REVISIONS	
DATE	REMARKS

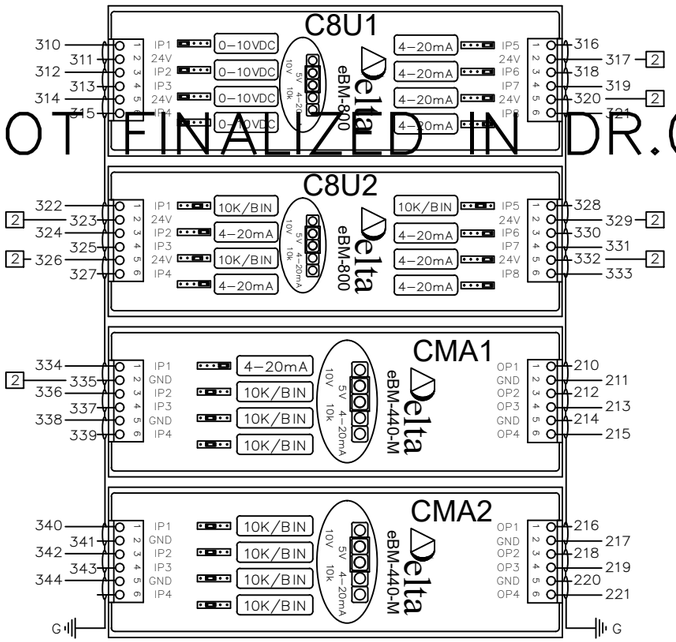
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CONTRACT WITH: MSD Washington Township
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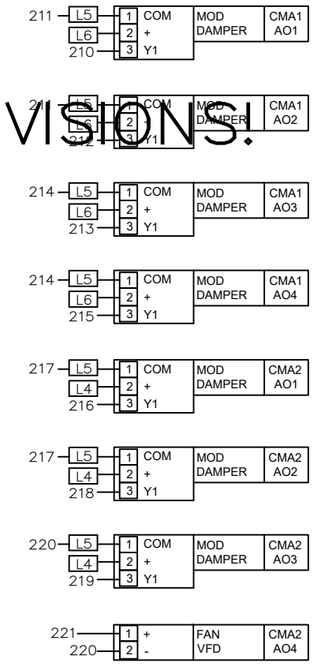
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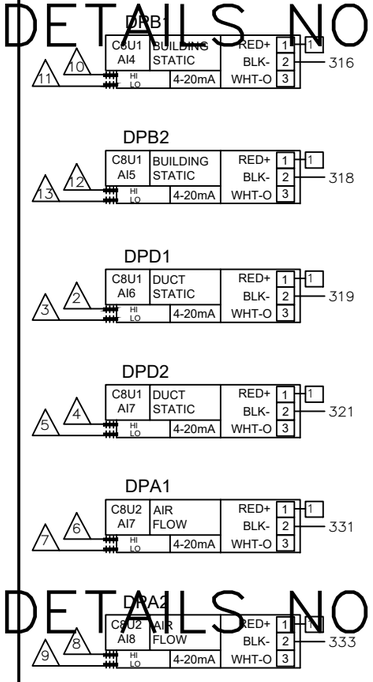
SHEET
NCHS-237
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET		
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	INPUTS	eBM-800 I/O MODULE
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO		
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO		
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510		
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201		
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201		
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200		
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200		

C8U1 eBM-800 / C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET		
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	INPUTS	eBM-800 I/O MODULE
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101		
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101		
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101		
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101		
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101		
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201		
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201		

C8U2 eBM-800 / C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET		
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	INPUTS	eBM-440-M I/O MODULE
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001		
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002		
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301		
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	OUTPUTS	
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206		
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206		
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206		

CMA1 eBM-440-M / CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET		
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	INPUTS	eBM-440-M I/O MODULE
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003		
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO		
CMA2	4	10100.1404					
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	OUTPUTS	
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208		
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208		
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO		

CMA2 eBM-440-M / CMA2 eBM-440-M

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UPDATES	
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04/20/2023	ADD 5.3
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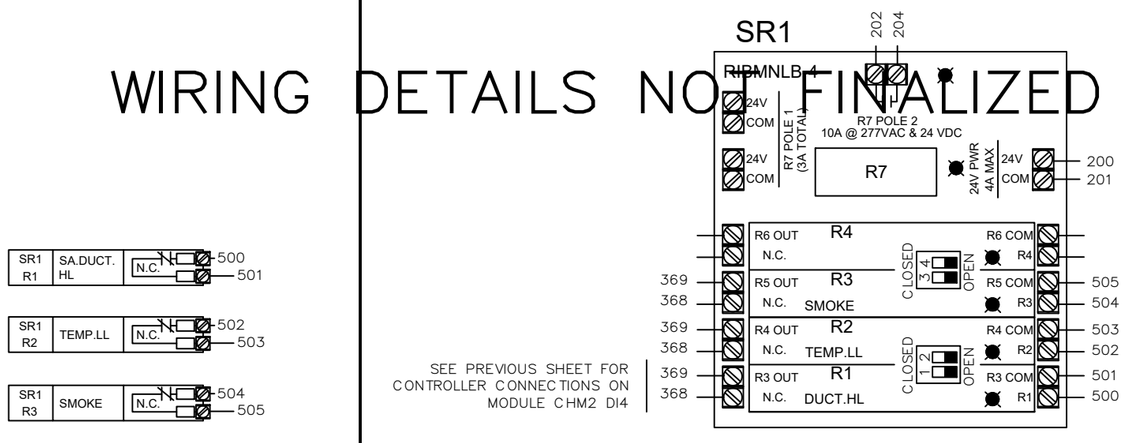
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-C4 SYSTEM 29 PANEL – I/O WIRING (2 OF 2)

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SYSTEM 29 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

L3

200
201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

CAT-6a

ETS1

301
300

V1-
V1+

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

202
204

200
201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7

R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.

R4 COM R4
R3 COM R3
R2 COM R2
R1 COM R1

CLOSED

CEC1

201
200

PWR

Delta
eBCON-2

eBUS
NET2

NET2 RS-485 [+] [-] SHD

LAN 1

eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

TX1

24V CB
24V CB
Power
Power

100
L2
L3
H
C
G

120 VAC LAPTOP PWR

75VA
24VAC
24VAC
24VAC
24VAC
75VA

200
201
CONTROLLER PWR

202
203
FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V
-V
GND
L
N

300
301
101
L2
L3

PS1

1.0A
101
5.0A
100
G

PANEL GND LUG

TB1

L1 L2 L3 H N

120 VAC

TB2

202 L4 L4 L4
203 L5 L5 L5
204 L6 L6 L6
205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1
301 2 2 2

24 VDC TO FIELD

DPD1

Power + - O
GND / 4-20mA out
Voltage out

HIGH
LOW

PNEUMATIC

1
2
3

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-C4 SYSTEM 29 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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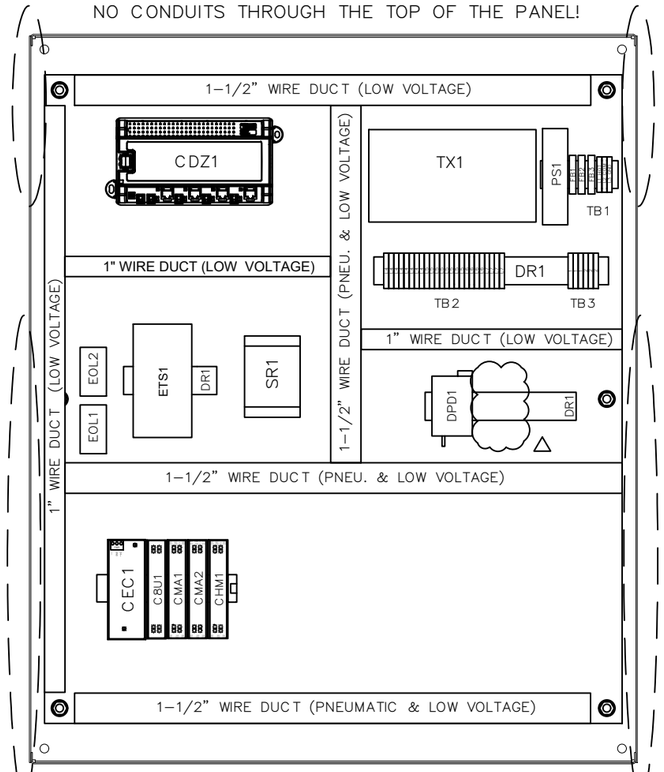
CONTRACT NO:

SHEET
NCHS-240
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J-2304001

SYSTEM CONTROL PANEL 29 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

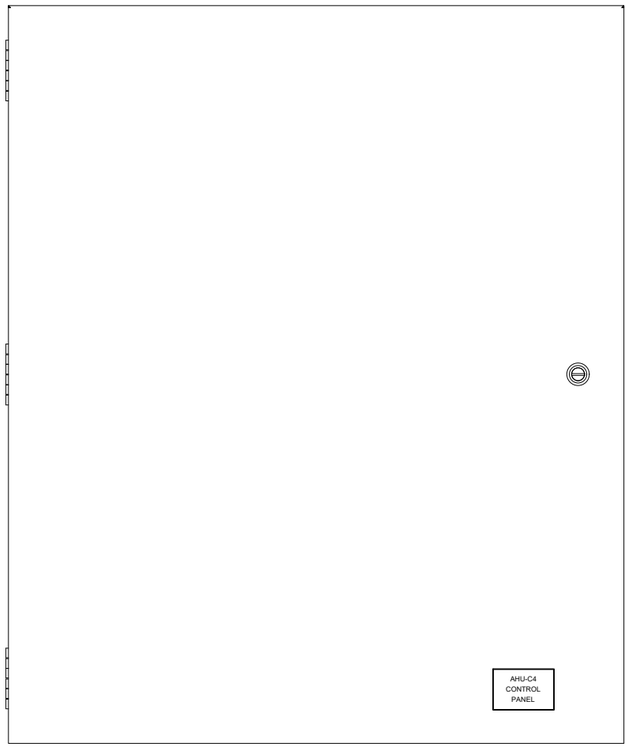
NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

BILL OF MATERIALS

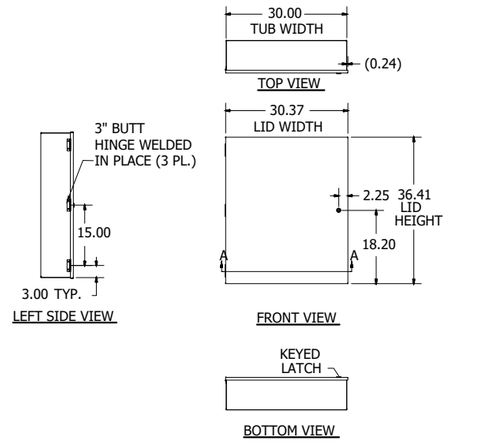
WILL BE PROVIDED IN A FUTURE REVISION. △

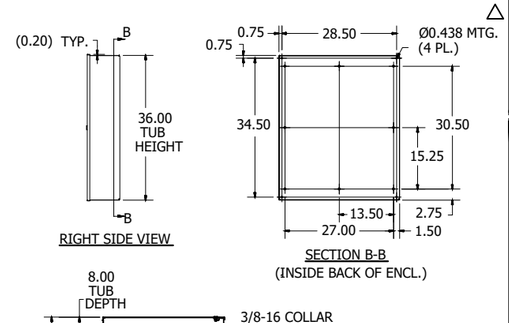
BILL OF MATERIALS

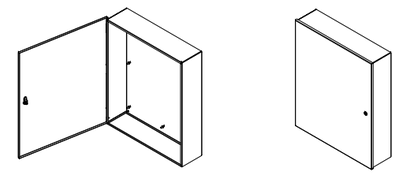
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

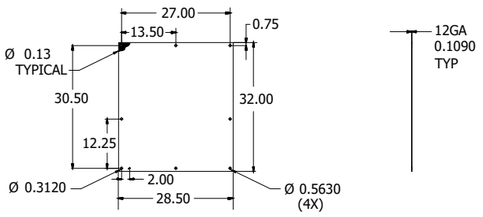
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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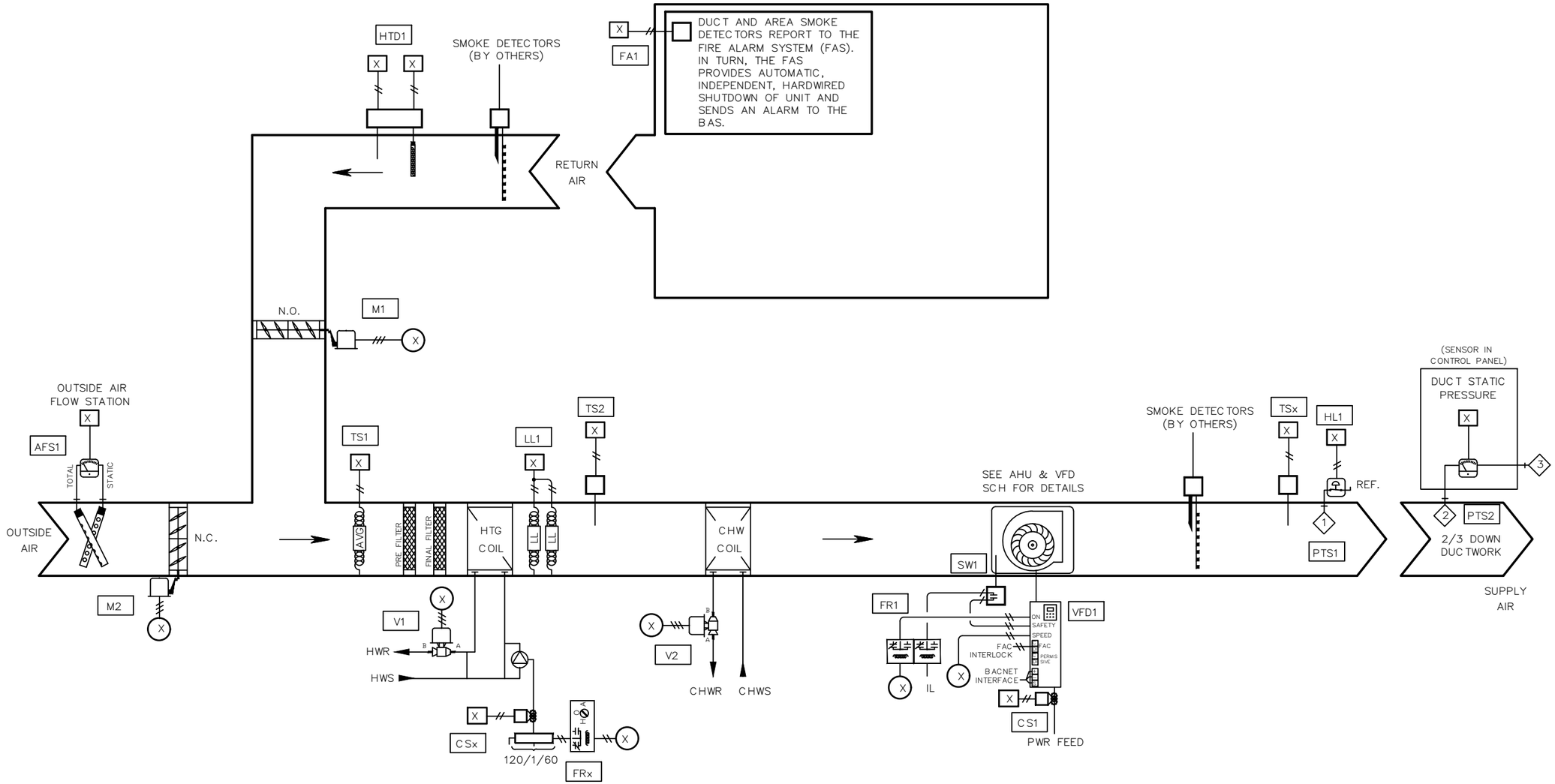
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E–AHU–D1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–D1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
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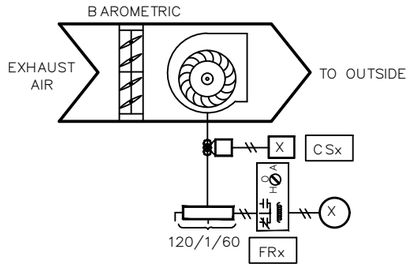
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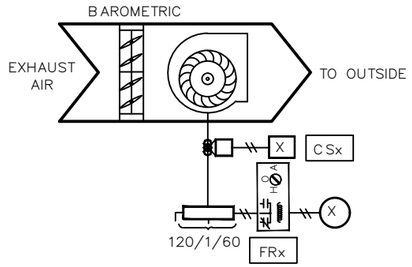
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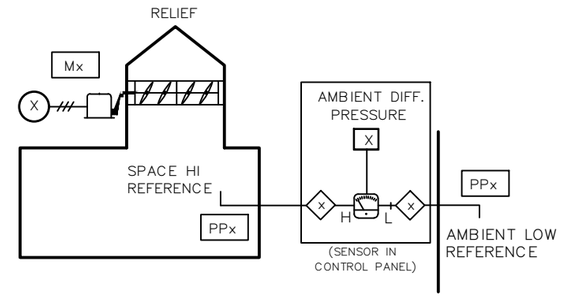
EXHAUST FAN – BAS CONTROLLED
EF–D1



EXHAUST FAN – BAS CONTROLLED
EF–D2



BUILDING PRESSURE CONTROL
RH–D3



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA D EXHAUST, RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

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4240 W 50 S
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-D1 STAT	Exhaust Fan D1 Status		X			
EF-D2 STAT	Exhaust Fan D2 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
RH-D3 DPR	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-D1 SS	Exhaust Fan D1 Fan Start / Stop				X	
EF-D2 SS	Exhaust Fan D2 Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**7**	**6**	**4**	**0**

△

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-D1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFDn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

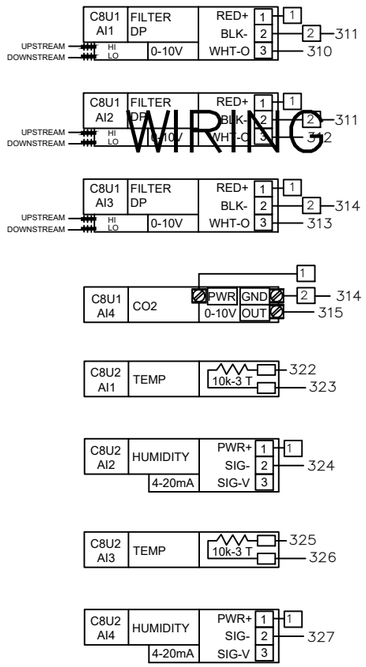
REVISIONS	
DATE	REMARKS

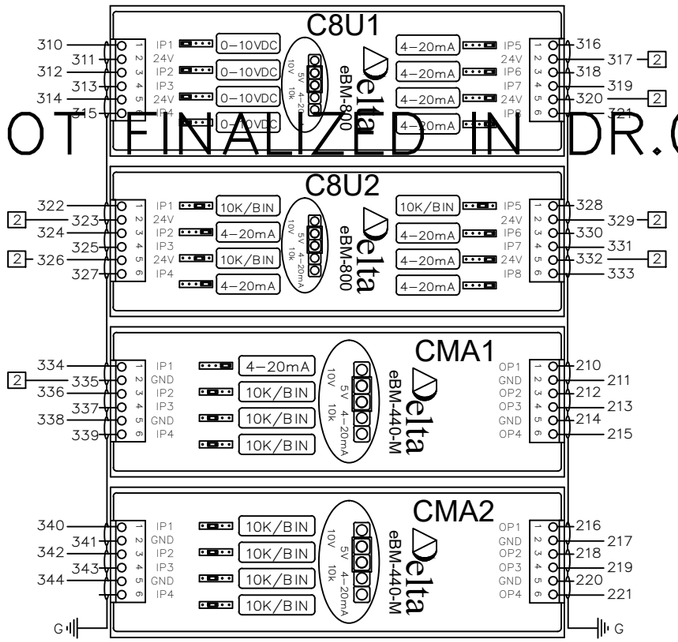
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

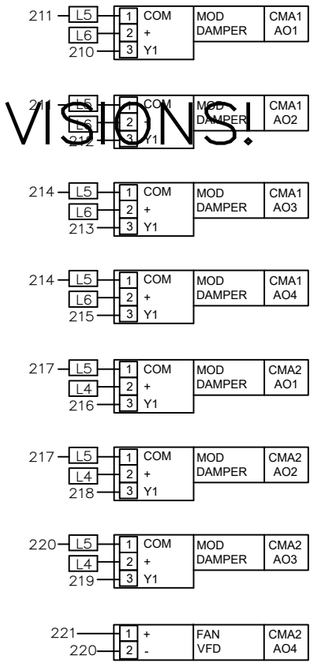
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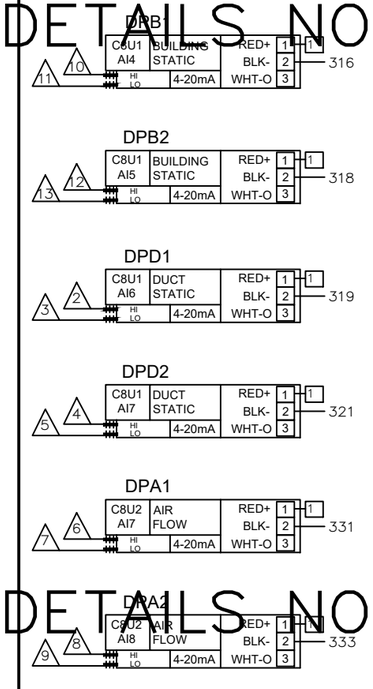
SHEET
NCHS-245
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	INPUTS
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	INPUTS
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	INPUTS
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	INPUTS
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	INPUTS
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	INPUTS
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	INPUTS
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	INPUTS

C8U1 eBM-800 — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	INPUTS
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	INPUTS
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	INPUTS
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	INPUTS
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	INPUTS
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	INPUTS
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	INPUTS
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	INPUTS

C8U2 eBM-800 — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	INPUTS
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	INPUTS
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	INPUTS
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	INPUTS
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	OUTPUTS
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	OUTPUTS
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	OUTPUTS
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	OUTPUTS

CMA1 eBM-440-M — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	INPUTS
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	INPUTS
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	INPUTS
CMA2	4	10100.1404				INPUTS
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	OUTPUTS
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	OUTPUTS
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	OUTPUTS
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	OUTPUTS

CMA2 eBM-440-M — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

E-AHU-D1 SYSTEM 30 PANEL – I/O WIRING (1 OF 2)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

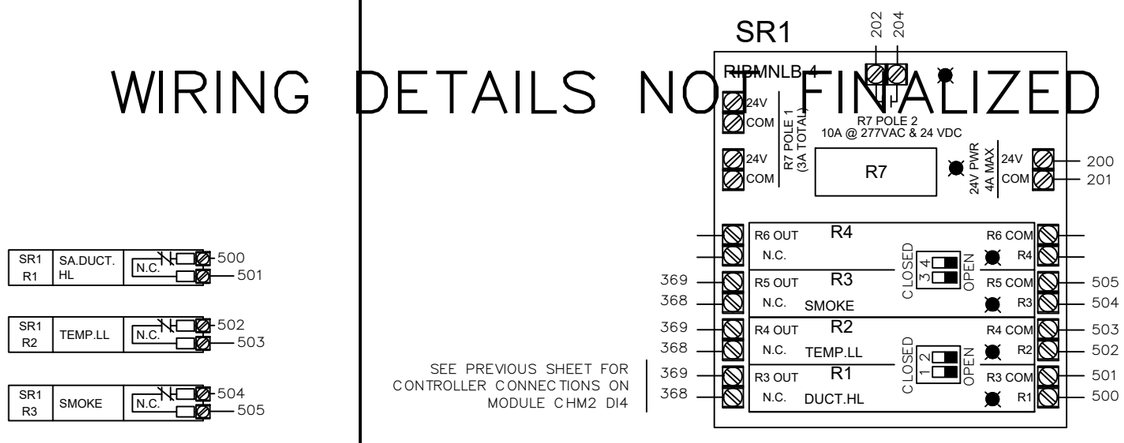
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-246
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

E-AHU-D1 SYSTEM 30 PANEL - I/O WIRING (2 OF 2)

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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J-2304001

SYSTEM 30 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C
MS/TP SEG2 Err Tx Rx C
MS/TP SEG3 Err Tx Rx C
MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02
TO SYSTEM 01 SUBNET, LEG 03
TO SYSTEM 01 SUBNET, LEG 04

ETS1

V1- V1+ 300 301 L3

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

200 201 202 204

24V COM

R7 POLE 2 10A @ 277VAC & 24 VDC
R7 POLE 1 10A @ 277VAC

R7 R4 R3 R2 R1

R4 OUT N.C. R4 COM R4
R3 OUT N.C. R3 COM R3
R2 OUT N.C. R2 COM R2
R1 OUT N.C. R1 COM R1

CLOSED OPEN

TX1

24V CB 24V CB

Power Power

100 L2 L3 H C G

120 VAC LAPTOP PWR

75VA 24VAC 24VAC 24VAC 24VAC 75VA

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L3 L2

PS1

101 1.0A
100 5.0A
G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4
203 L5 L5 L5
204 L6 L6 L6
205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1
301 2 2 2

24 VDC TO FIELD

DPD1 DPB1

1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

2 3 4 5

PNEUMATIC

CEB1 C8X1

201 200

PWR GND 24~

USB2 USB1 (NOT USED)

NET1 RS-485 NET2 RS-485 LAN 1 LAN 2 LAN 3

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 eBM-800 eBM-440-M eBM-440-M eBM-D400R4-H

OPD1 OPD2 OPD3 OPD4 HAO

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-D1 SYSTEM 30 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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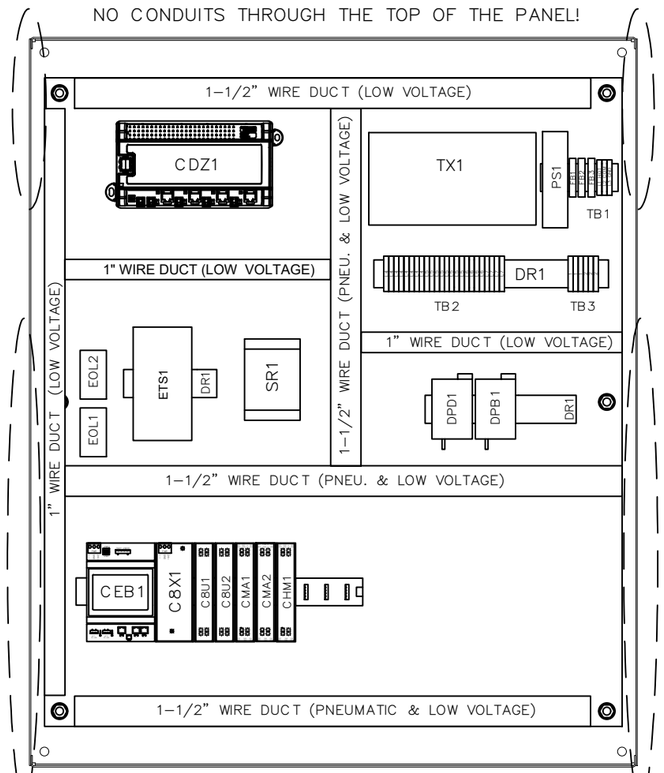
CONTRACT NO:

SHEET
NCHS-248
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 30 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

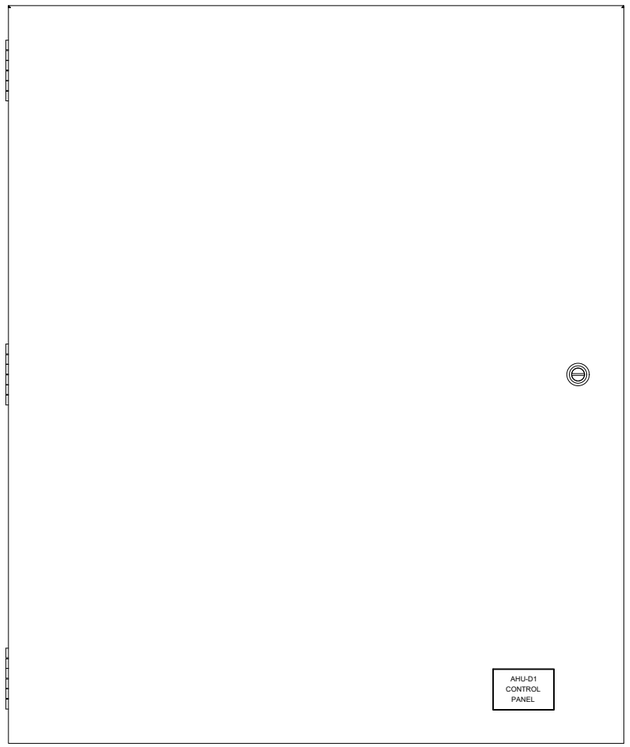


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

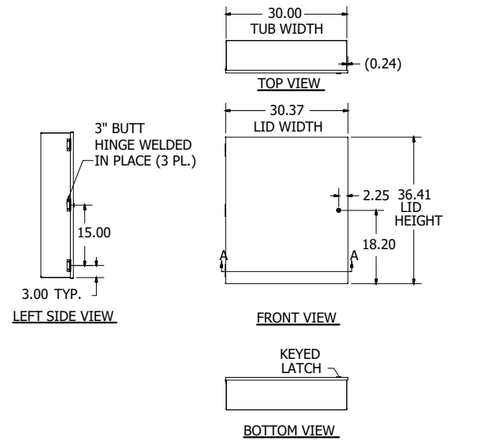
WILL BE PROVIDED IN A FUTURE REVISION. △

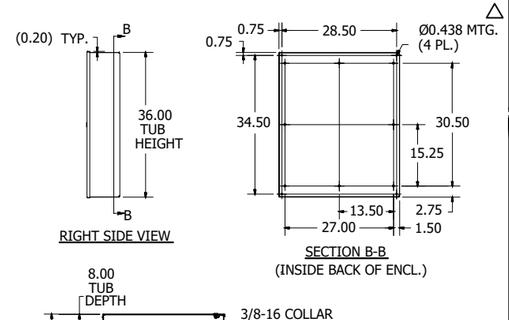
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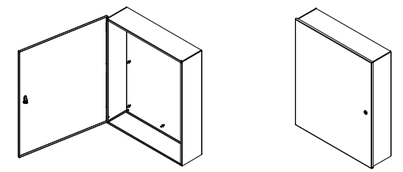
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

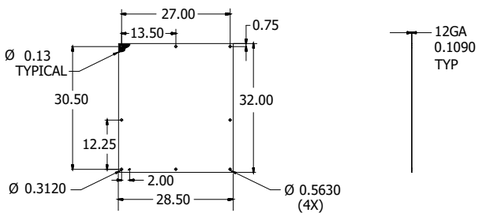
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



E–AHU–D1 SYSTEM 30 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

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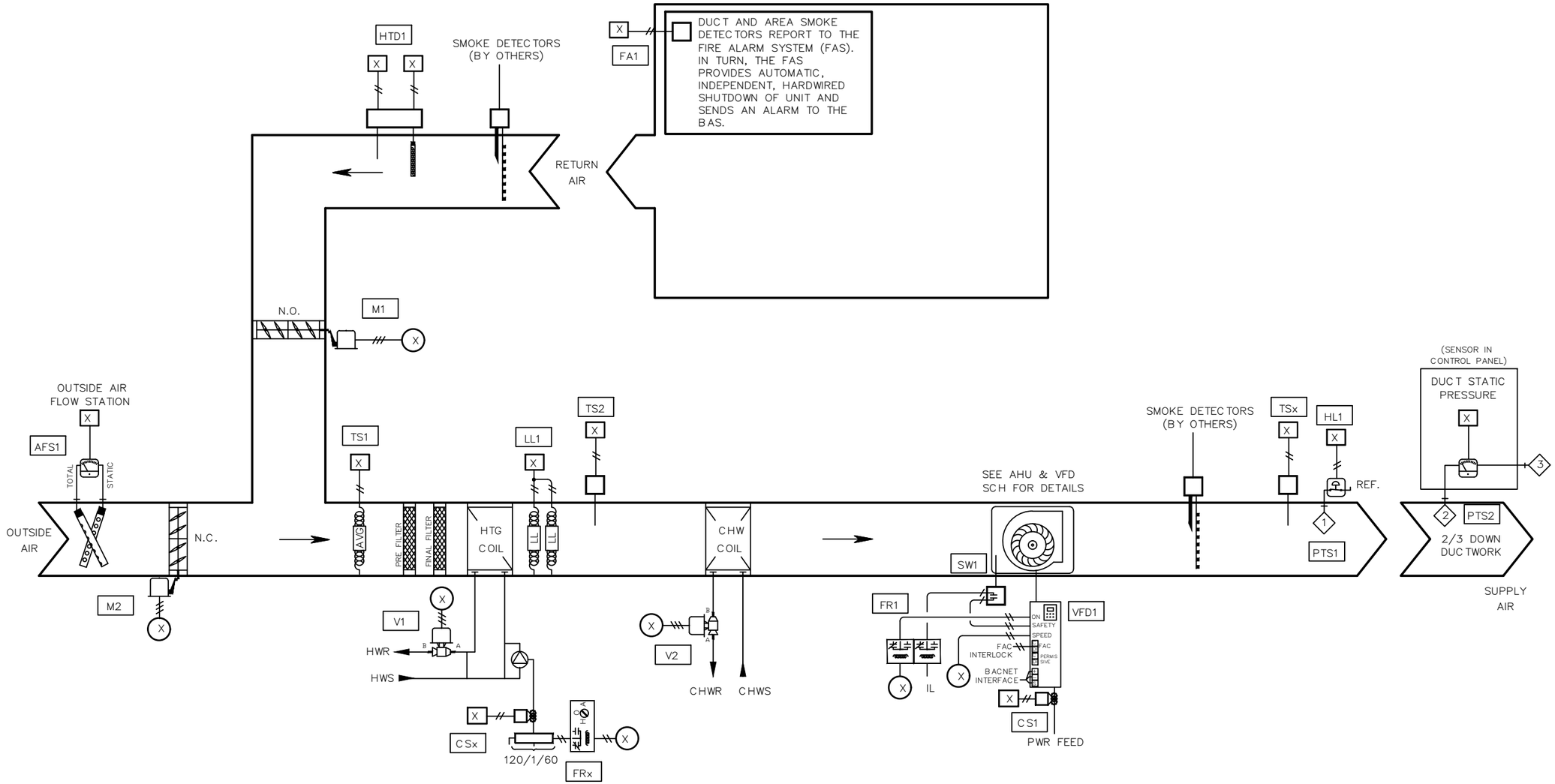
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DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–249
JOB NUMBER:
J–2304001

E–AHU–D2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–D2 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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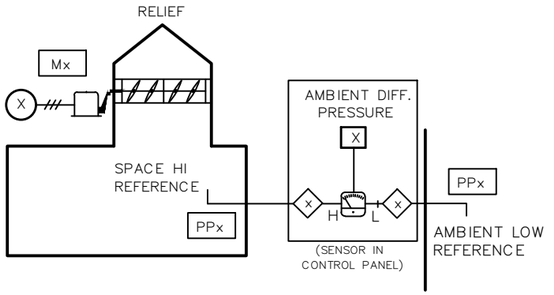
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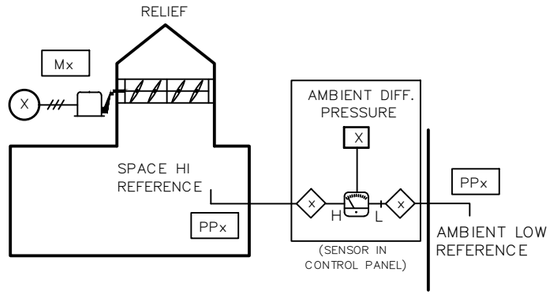
CONTRACT NO:

SHEET
NCHS–250
JOB NUMBER:
J–2304001

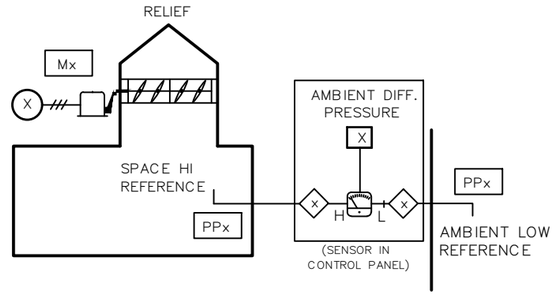
BUILDING PRESSURE CONTROL
E–IH–D1



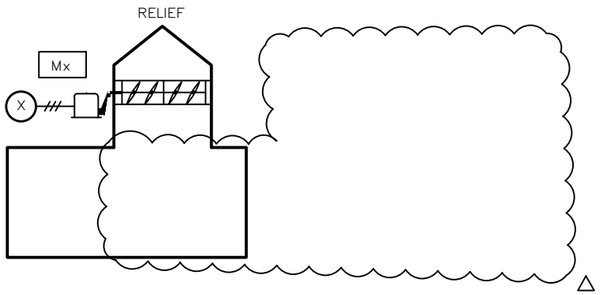
BUILDING PRESSURE CONTROL
E–IH–D2



BUILDING PRESSURE CONTROL
RH–D1



BUILDING PRESSURE CONTROL
RH–D2



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA D RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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CONTRACT NO:

SHEET
NCHS–251
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-D1 DPR	Relief Air Damper			X		
RH-D2 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**7**	**2**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-D2 & AREA D MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
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E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-252
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-D2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:

SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ

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04/20/2023	ADD 5.3
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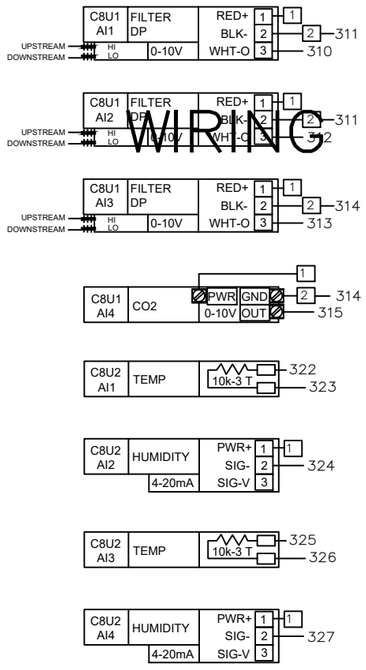
REVISIONS	
DATE	REMARKS

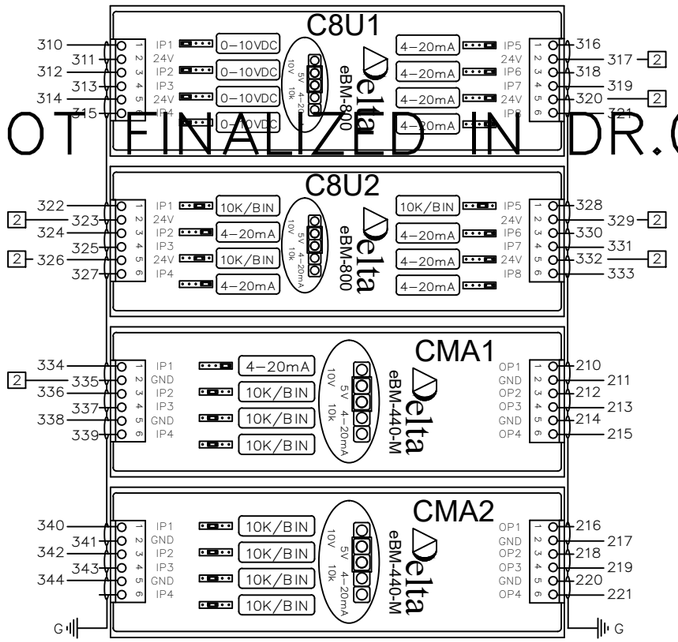
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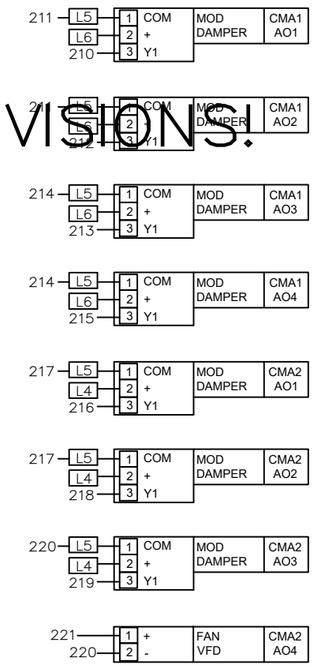
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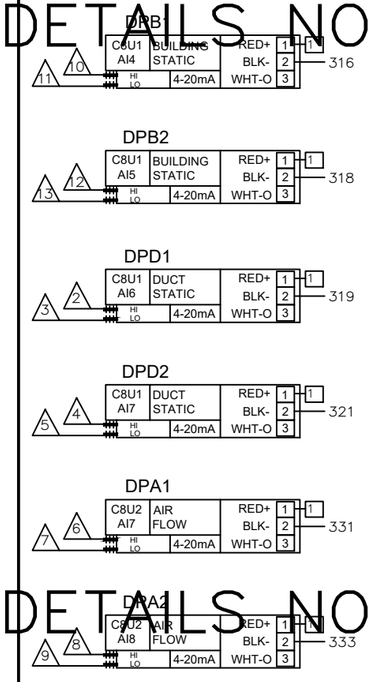
SHEET
NCHS-253
JOB NUMBER:
J-2304001

SYSTEM 31 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — eBM-440-M I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — eBM-440-M I/O MODULE

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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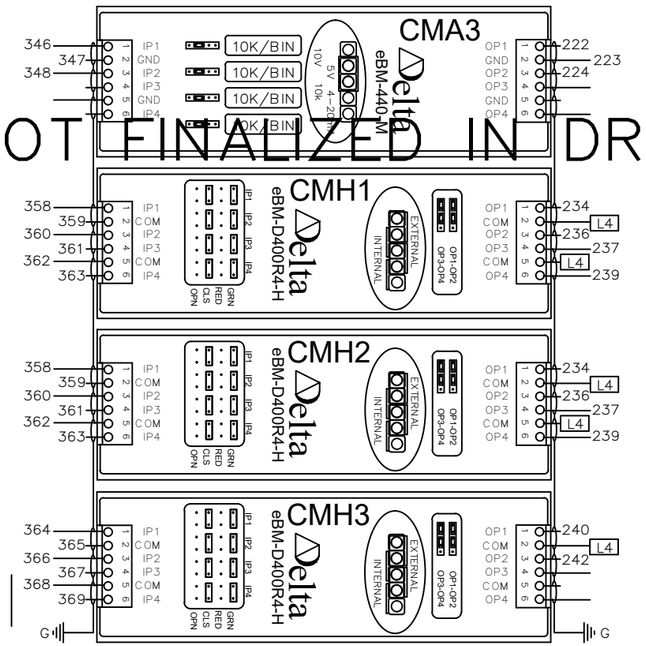
CONTRACT NO:

SHEET
NCHS–254
JOB NUMBER:
J–2304001

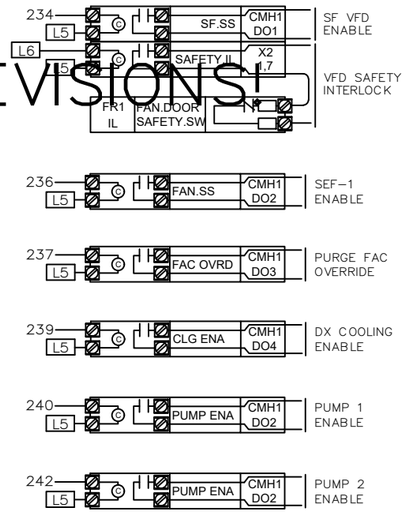
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

SYSTEM 31 CONTROL PANEL

CMA3 DI1	DX STATUS	N.O.	346 / 347
CMA3 DI2	PURGE ENABLE	N.O.	348 / 347
CMH2 DI1	FAN STATUS	N.O.	358 / 359
CMH1 DI1	FAN STATUS	N.O.	360 / 359
CMH1 DI3	SMOKE ALARM	N.O.	361 / 362
CMH1 DI4	SMOKE ALARM	N.O.	363 / 362
CMH2 DI1	FAS.INPUT	N.C.	364 / 365
CMH2 DI2	PUMP STATUS	N.O.	366 / 365
CMH2 DI3	PUMP STATUS	N.O.	367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			

eBM-440-M I/O MODULE — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			
OUTPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			

eBM-440-M I/O MODULE — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001

eBM-D400R4-H I/O MOD — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001
	CMH2	3	10100.1803			
	CMH2	4	10100.1804			

eBM-D400R4-H I/O MOD — CMH2 eBM-D400R-H

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E–AHU–D2 SYSTEM 31 PANEL – I/O WIRING (2 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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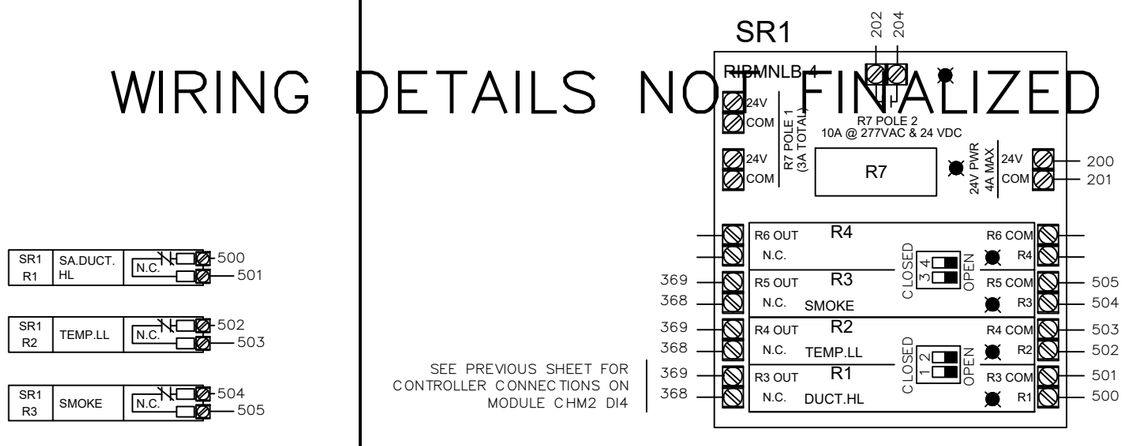
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NCHS–255
JOB NUMBER:
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1
DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1
DFM-400P

Delta Controls
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SHEET
NCHS-256
JOB NUMBER:
J-2304001

SYSTEM 31 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB | 24V CB

Power | Power

240 VAC LAPTOP PWR

CONTROLLER PWR

FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101

PS1

4.0A 1.0A 5.0A

TB1

L1 L2 L3 H N 120 VAC

PANEL GND LUG

TB2

24 VAC TO FIELD

TB3

24 VDC TO FIELD

ETS1

ETHERNET SWITCH

CAT5e

SR1

RIBMNLB-4

DPD1

DPB1

HIGH LOW

PNEUMATIC

CEB1

C8X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 | eBM-440-M | eBM-440-M | eBM-440-M | eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-D2 SYSTEM 31 PANEL – POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
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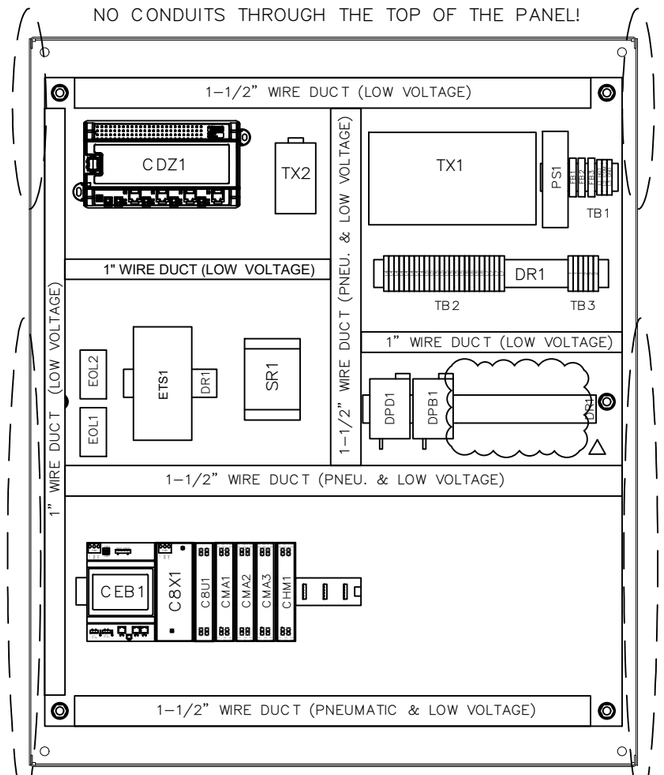
CONTRACT NO:

SHEET
NCHS-257
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 31 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

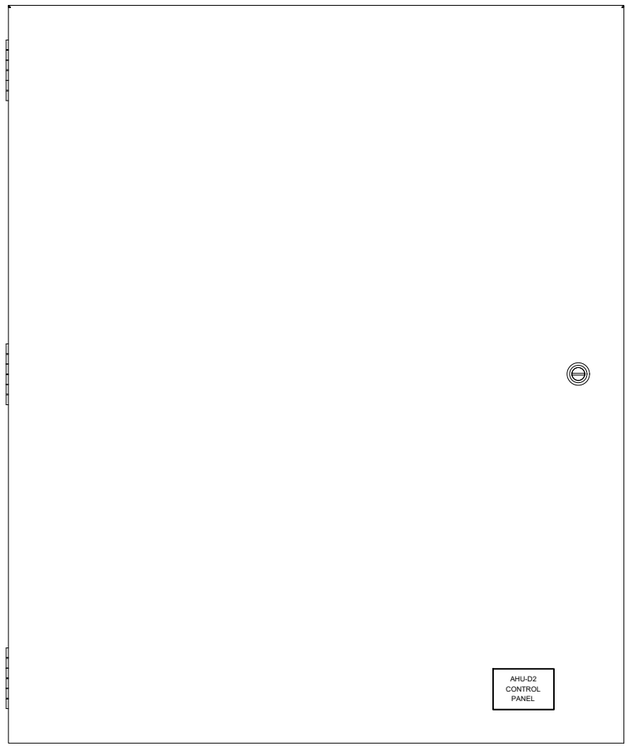


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

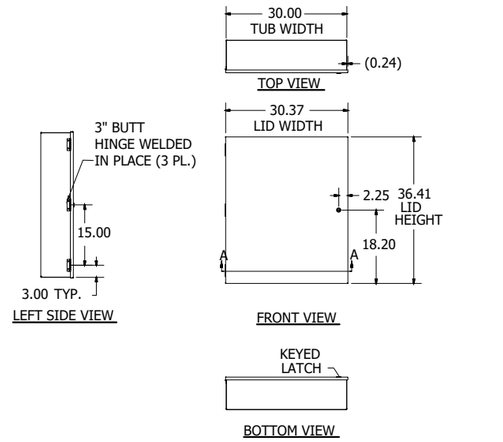
WILL BE PROVIDED IN A FUTURE REVISION. △

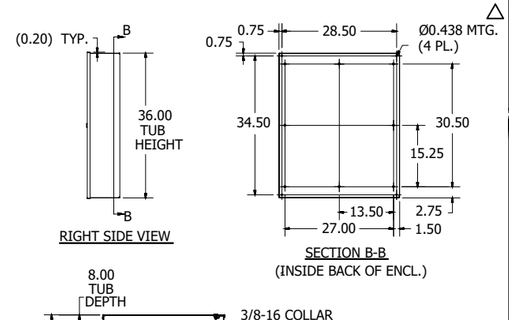
BILL OF MATERIALS

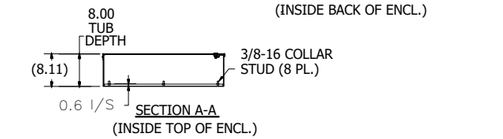
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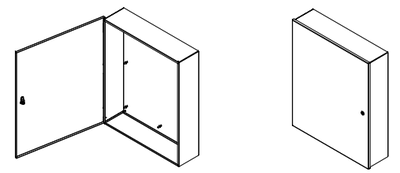
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

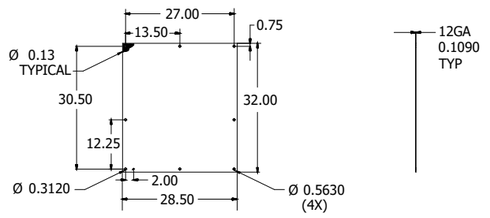








PANEL DIMENSIONS



Delta CONTROLS

Temperature Control Services

4240 W 50 S
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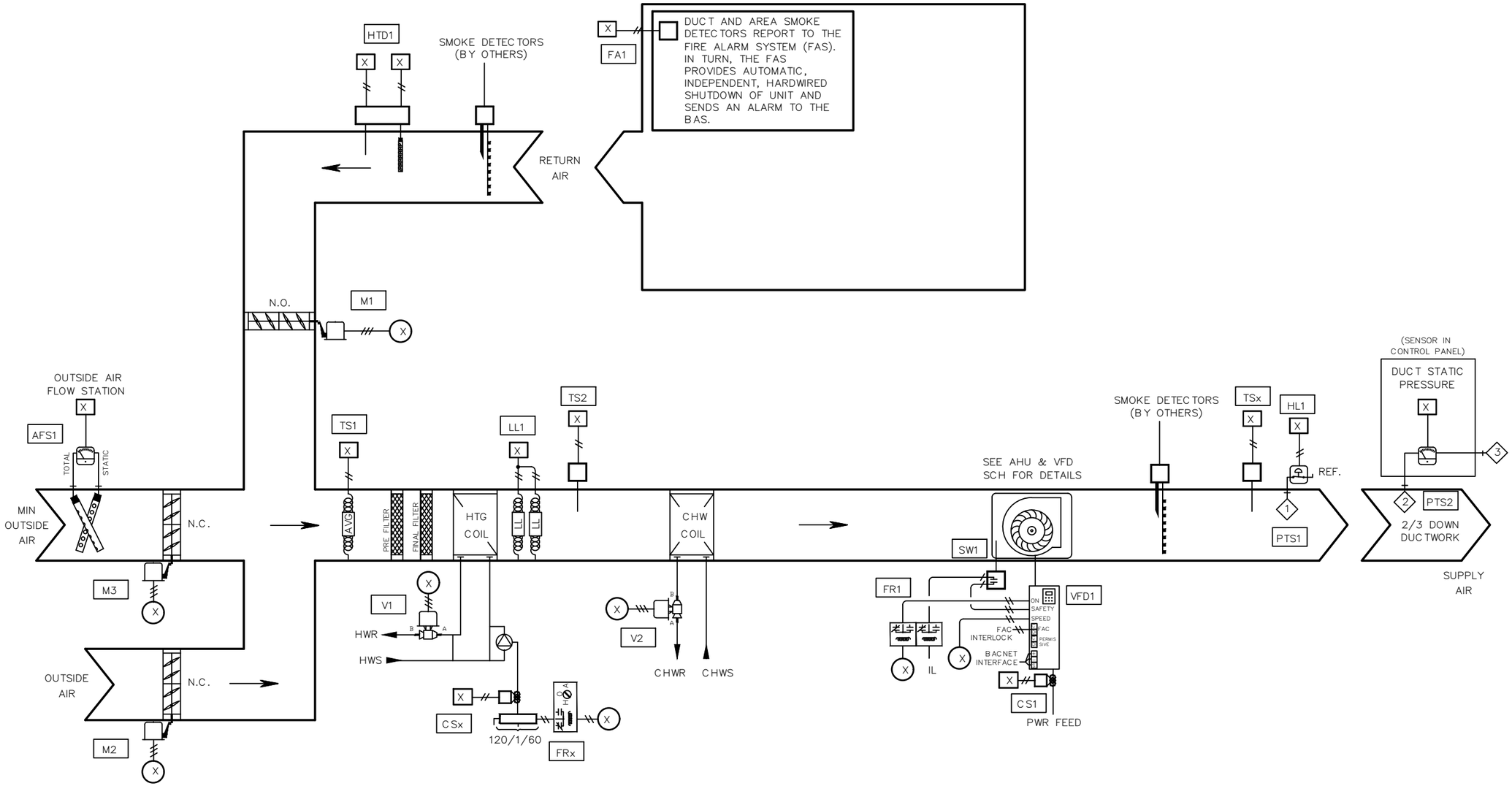
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-258
JOB NUMBER:
J-2304001

E-AHU-E1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E-AHU-E1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
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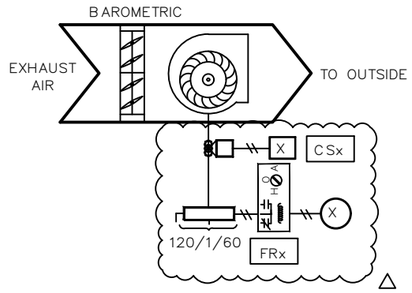
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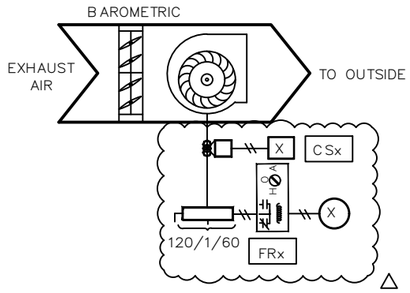
CONTRACT NO:

SHEET
NCHS-259
JOB NUMBER:
J-2304001

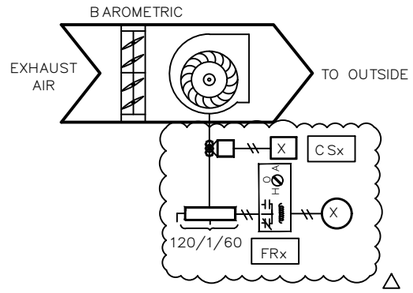
EXHAUST FAN – BAS CONTROLLED
EF–E1



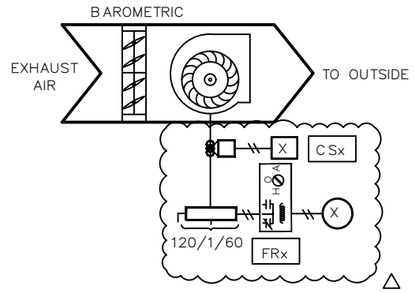
EXHAUST FAN – BAS CONTROLLED
EF–E2



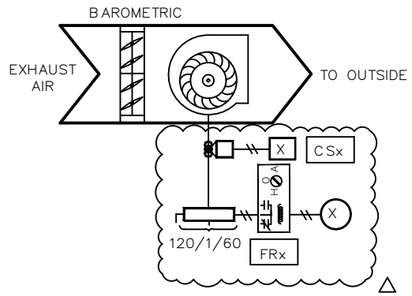
EXHAUST FAN – BAS CONTROLLED
EF–F1



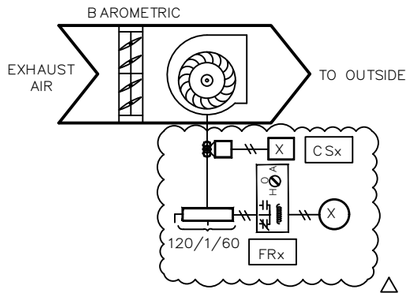
EXHAUST FAN – BAS CONTROLLED
EF–F3



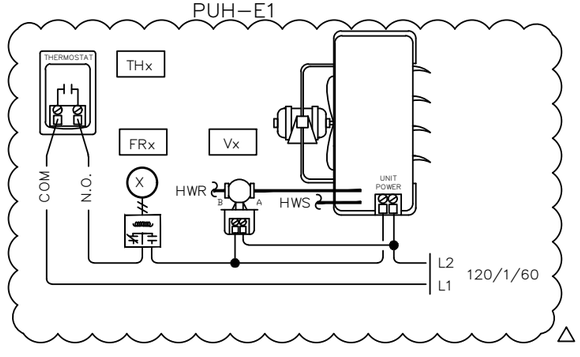
EXHAUST FAN – BAS CONTROLLED
EF–F4



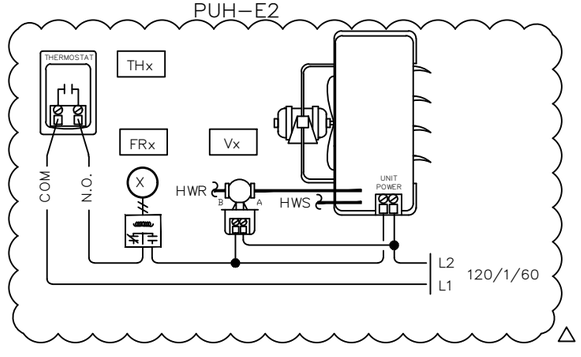
EXHAUST FAN – BAS CONTROLLED
EF–F6



PROPELLER UNIT HEATER
PUH–E1



PROPELLER UNIT HEATER
PUH–E2



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA E EXHAUST, PROPELLER UNIT HEATERS, & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
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NCHS–260
JOB NUMBER:
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-E1 STAT	Exhaust Fan E1 Status		X			
EF-E2 STAT	Exhaust Fan E2 Status		X			
EF-F1 STAT	Exhaust Fan F1 Status		X			
EF-F3 STAT	Exhaust Fan F3 Status		X			
EF-F4 STAT	Exhaust Fan F4 Status		X			
EF-F6 STAT	Exhaust Fan F6 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-E1 SS	Exhaust Fan E1 Fan Start / Stop				X	
EF-E2 SS	Exhaust Fan E2 Fan Start / Stop				X	
EF-F1 SS	Exhaust Fan F1 Fan Start / Stop				X	
EF-F3 SS	Exhaust Fan F3 Fan Start / Stop				X	
EF-F4 SS	Exhaust Fan F4 Fan Start / Stop				X	
EF-F6 SS	Exhaust Fan F6 Fan Start / Stop				X	
PUH-E1 EN	PUH E1 Enable				X	
PUH-E2 EN	PUH E2 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**7**	**11**	**6**	**10**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-E1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

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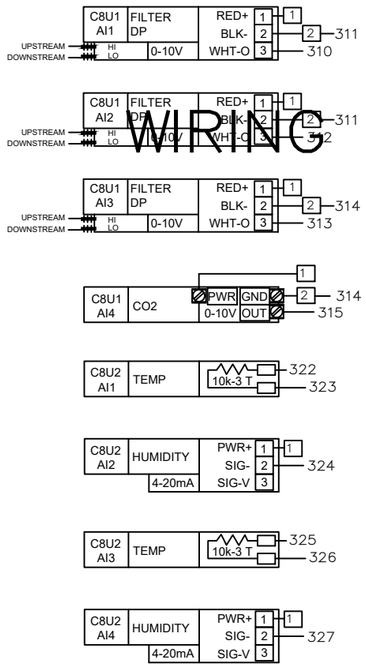
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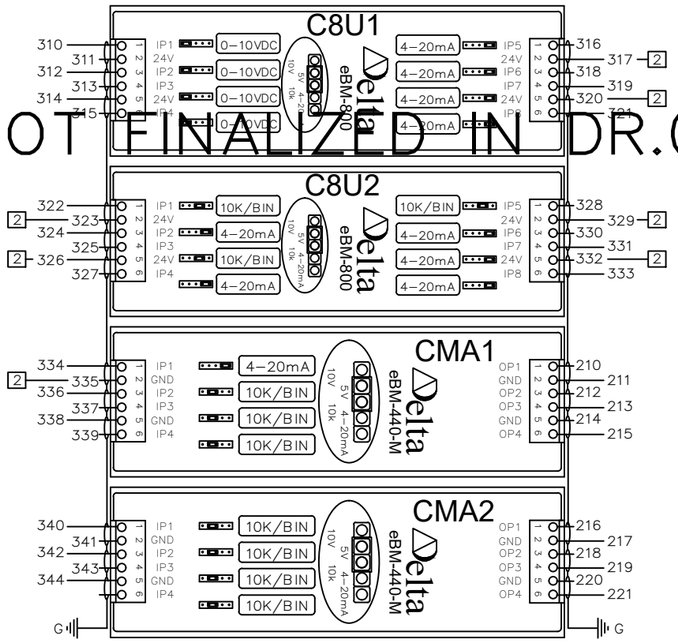
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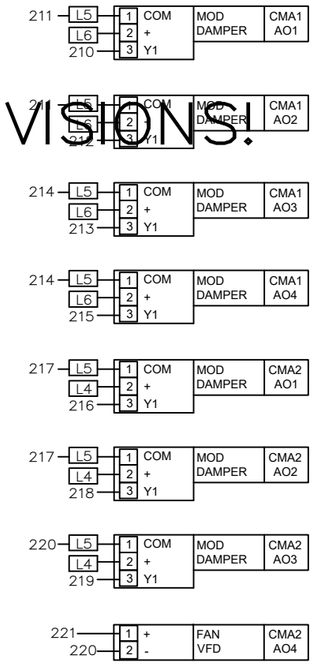
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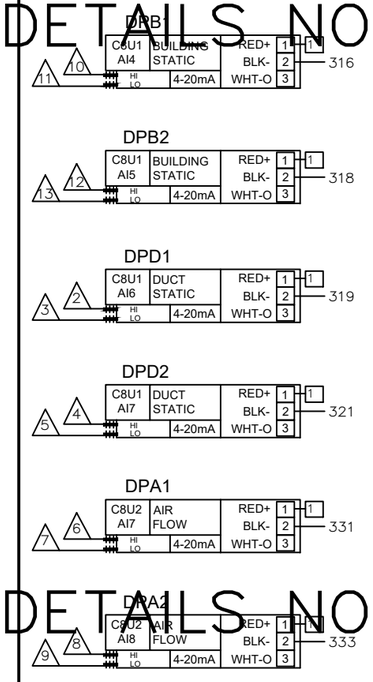
SHEET
NCHS-262
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J-2304001

SYSTEM 32 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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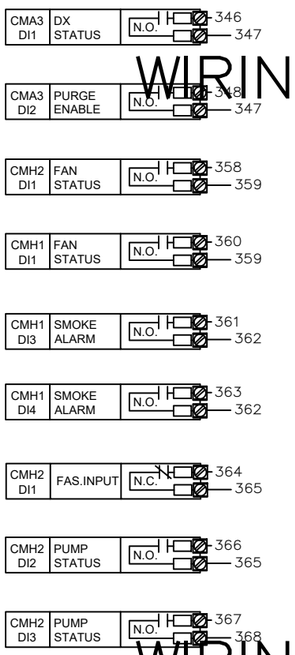
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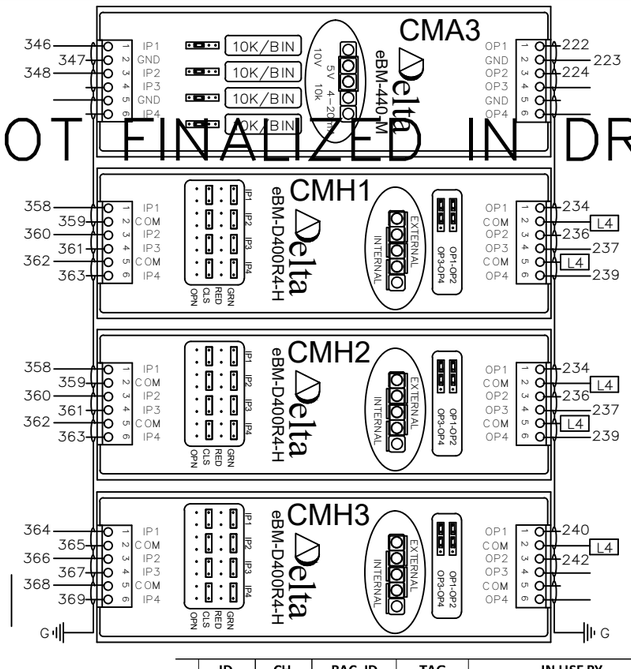
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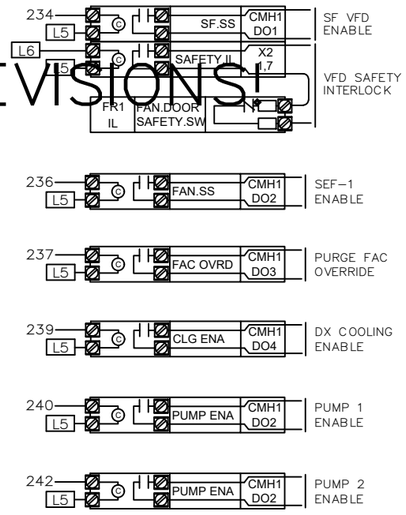
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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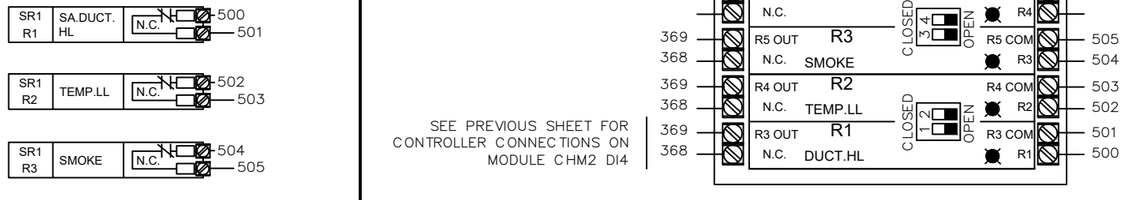
CONTRACT NO:

SHEET
NCHS–264
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

E-AHU-E1 SYSTEM 32 PANEL – I/O WIRING (3 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-265
JOB NUMBER:
J-2304001

SYSTEM 32 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

300 301 L3

ETS1

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

24V COM

R7 POLE C 10A @ 277VAC & 24 VDC

R7 POLE A 1 HP @ 120VAC

POWER 44 MAX

R7

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED LOOP

TX1

24V CB 24V CB

Power Power

100 L2 L3 H C G

75VA 24VAC 24VAC 120 VAC LAPTOP PWR 24VAC 24VAC 75VA

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 L3 101 L2

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3

3 2

201 200 CEB1

PWR GND 24~ USB2 USB1 (NOT USED)

201 200 C8X1

PWR GND 24~

eBMGR-2

eBX

eBUS Address

eBUS

P7 24Vs P8 P5 24Vs P6

eBM-800 eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

OP1 GND I/O OP2 OP3 COM I/O OP4

OP1 HAO

OP2 HAO

OP3 HAO

OP4 HAO

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-E1 SYSTEM 32 PANEL - POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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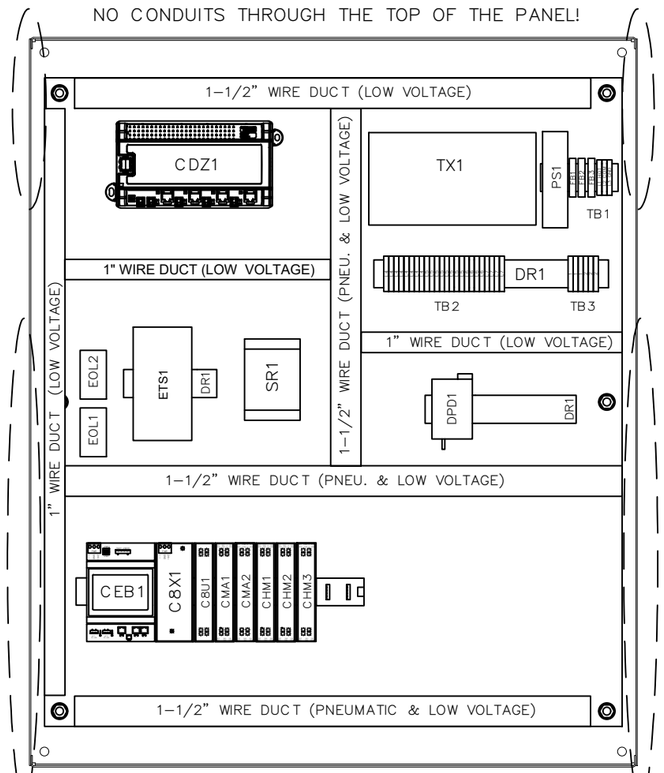
CONTRACT NO:

SHEET
NCHS-266
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 32 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

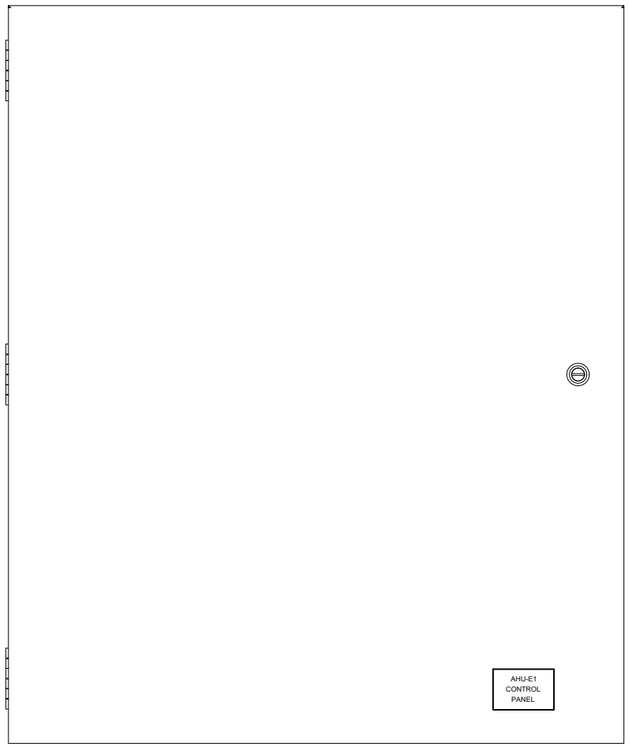


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



BILL OF MATERIALS

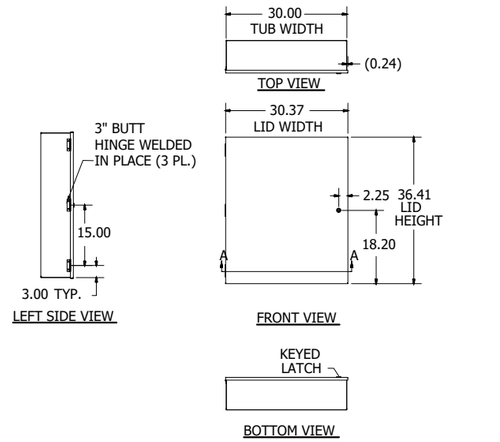
WILL BE PROVIDED IN A FUTURE REVISION. △

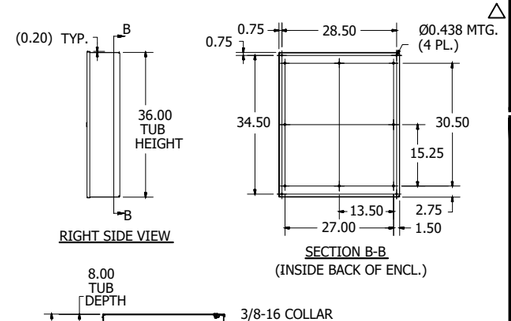
BILL OF MATERIALS

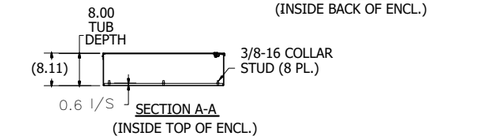
WILL BE PROVIDED IN A FUTURE REVISION. △

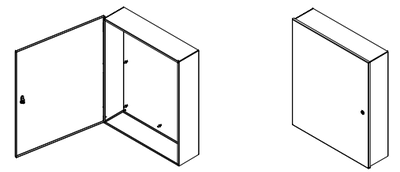
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

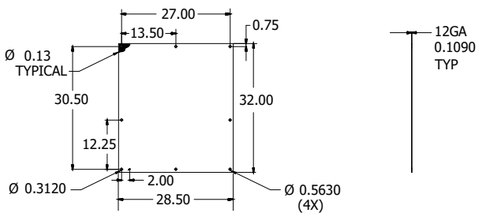








PANEL DIMENSIONS



E-AHU-E1 SYSTEM 32 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
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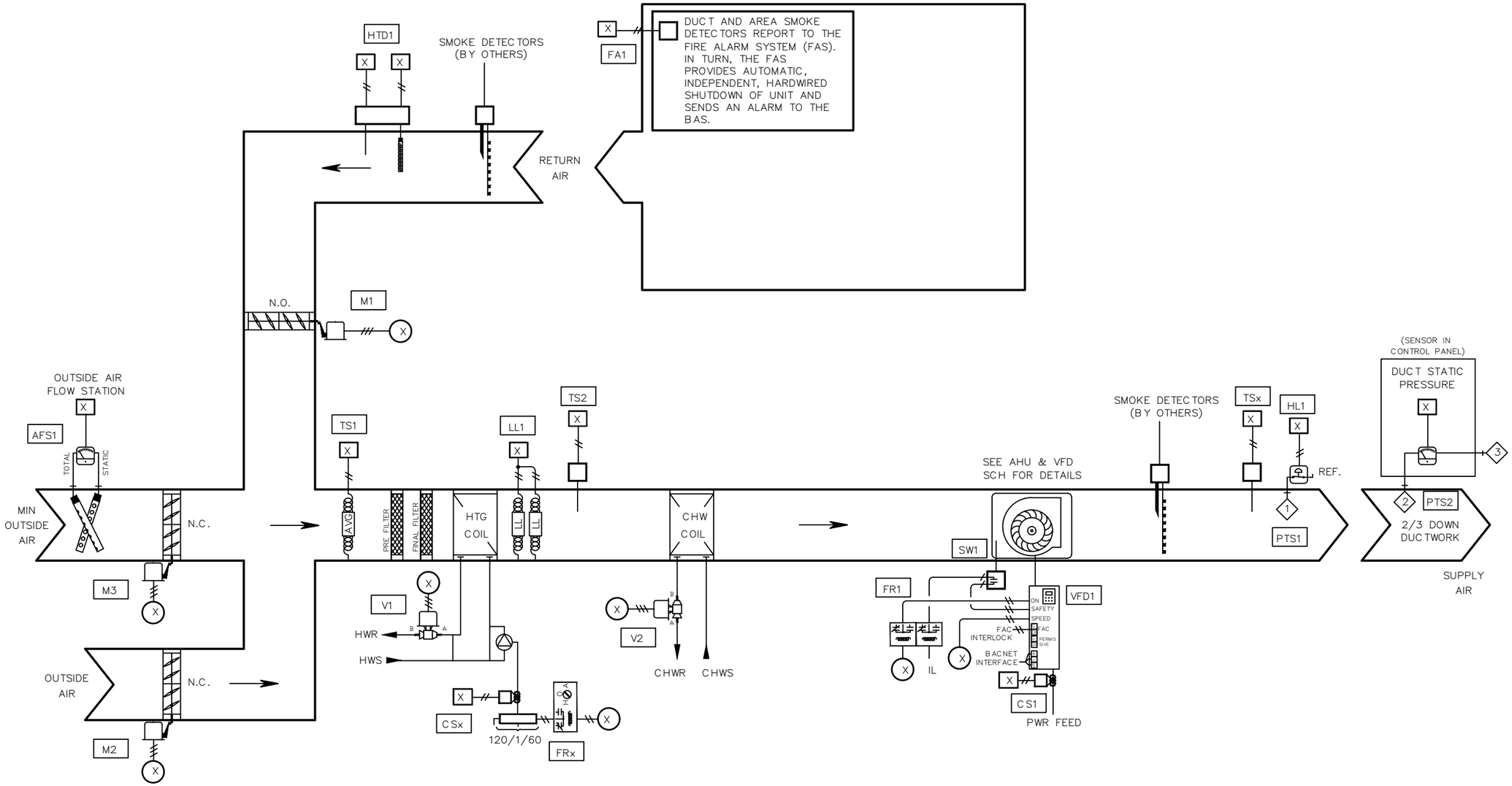
REVISIONS	
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SHEET
NCHS-267
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J-2304001

E-AHU-E2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E-AHU-E2 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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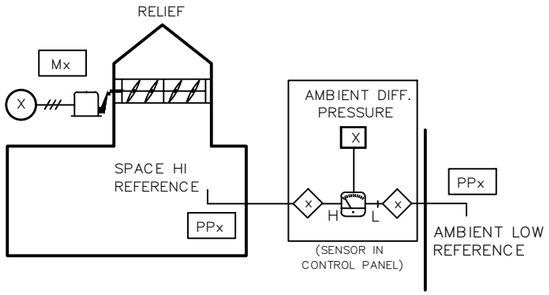
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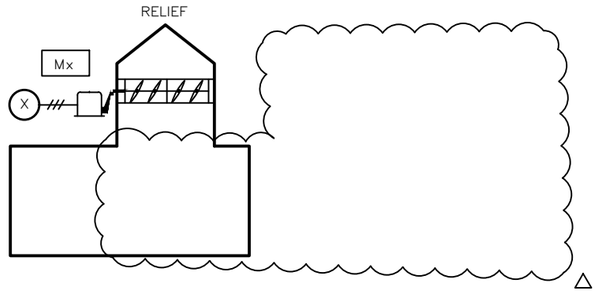
CONTRACT NO:

SHEET
NCHS-268
JOB NUMBER:
J-2304001

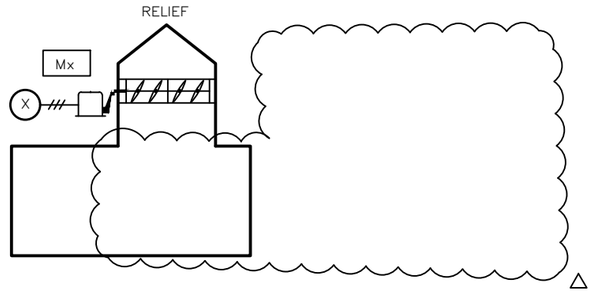
BUILDING PRESSURE CONTROL
E–RH–E1



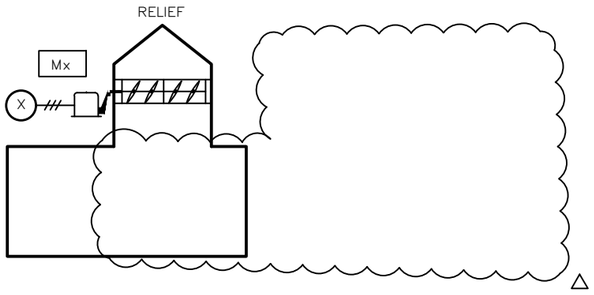
BUILDING PRESSURE CONTROL
E–RH–E2



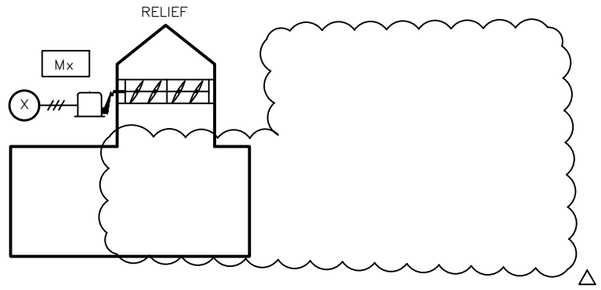
BUILDING PRESSURE CONTROL
E–RH–E3

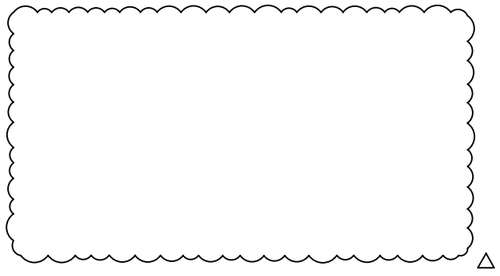


BUILDING PRESSURE CONTROL
E–RH–E4



BUILDING PRESSURE CONTROL
E–RH–E5





BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA E RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–269
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPR1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-E1 DPR	Relief Air Damper			X		
E-RH-E2 DPR	Relief Air Damper			X		
E-RH-E3 DPR	Relief Air Damper			X		
E-RH-E4 DPR	Relief Air Damper			X		
E-RH-E5 DPR	Relief Air Damper			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**11**	**2**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
Temperature Control Services
4240 W 50 S
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NCHS-270
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VAV AIR HANDLING UNIT AHU-E2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (MINIMUM OF ZN-SP AND ZN-SP FROM E-AHU-E3) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFEn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

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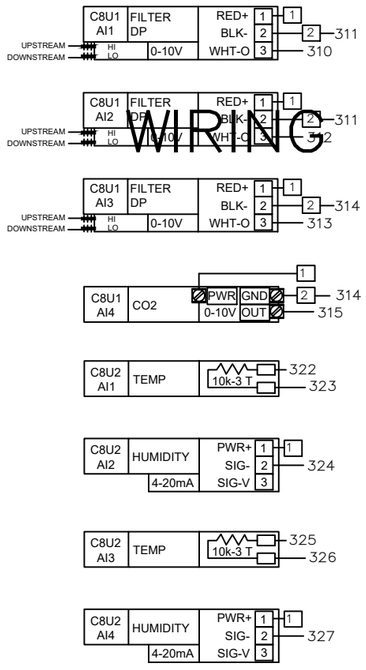
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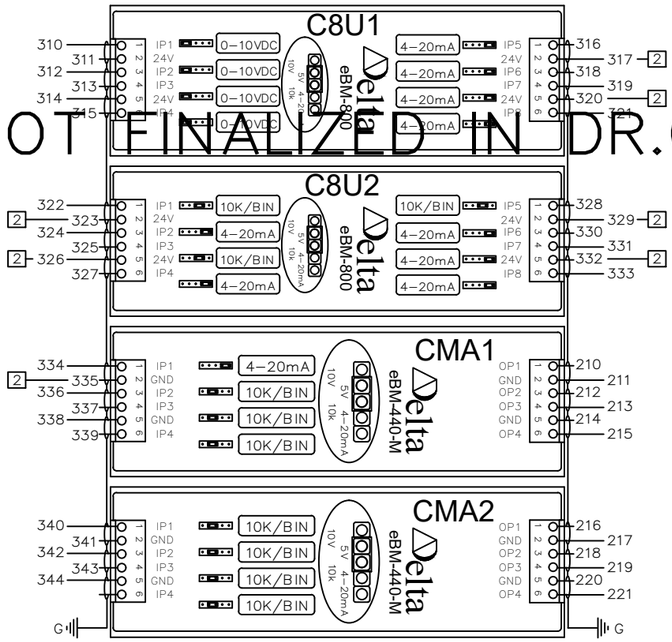
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JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

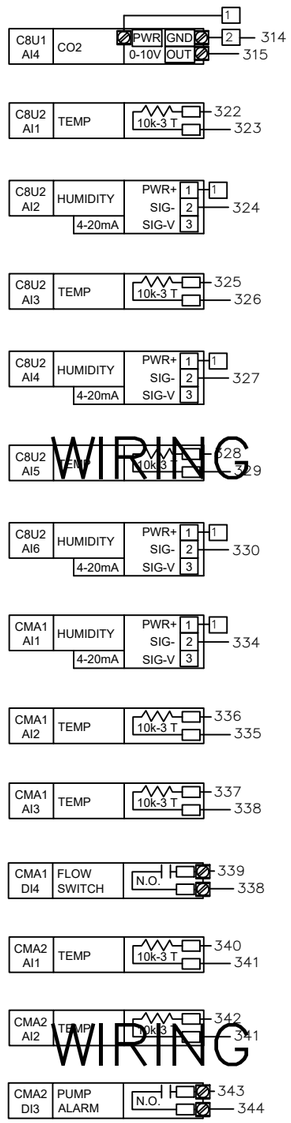
C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

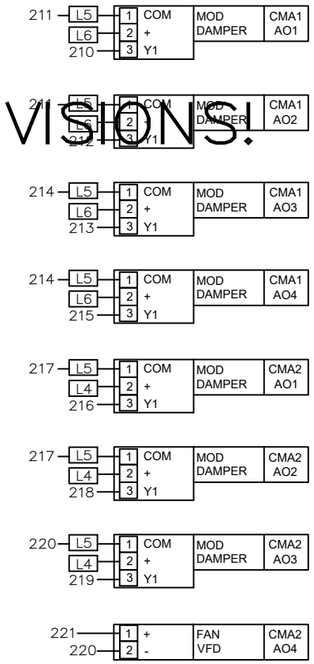
ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M





Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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04/20/2023	ADD 5.3
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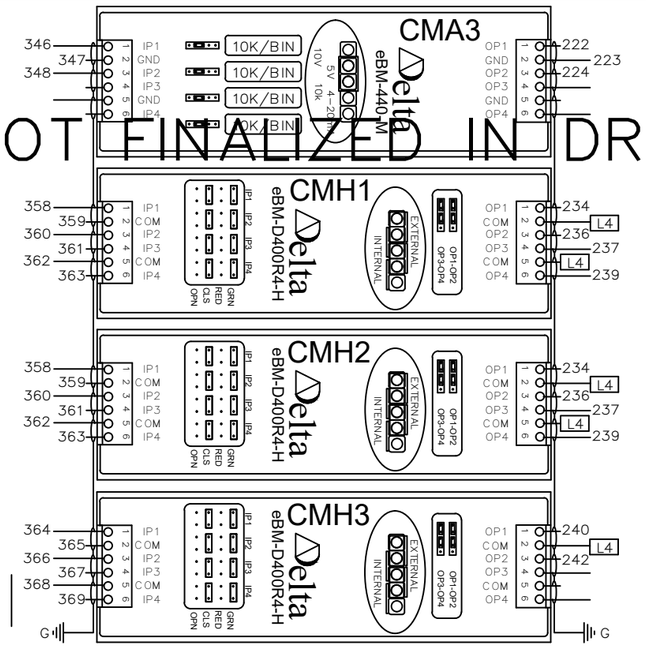
SHEET
NCHS–272
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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CMA3 DI1	DX STATUS	N.O.	346 / 347
CMA3 DI2	PURGE ENABLE	N.O.	348 / 347
CMH2 DI1	FAN STATUS	N.O.	358 / 359
CMH1 DI1	FAN STATUS	N.O.	360 / 359
CMH1 DI3	SMOKE ALARM	N.O.	361 / 362
CMH1 DI4	SMOKE ALARM	N.O.	363 / 362
CMH2 DI1	FAS.INPUT	N.C.	364 / 365
CMH2 DI2	PUMP STATUS	N.O.	366 / 365
CMH2 DI3	PUMP STATUS	N.O.	367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			

eBM-440-M I/O MODULE — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			
OUTPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			

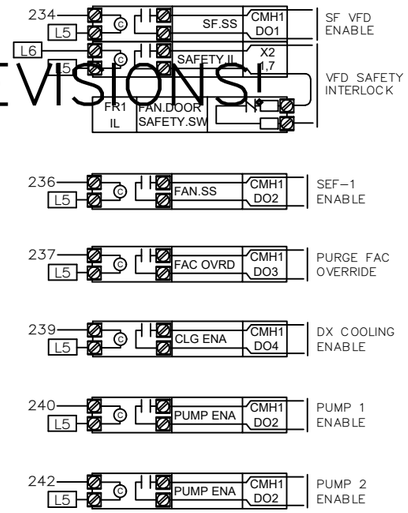
eBM-440-M I/O MODULE — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001

eBM-D400R4-H I/O MOD — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001
	CMH2	3	10100.1803			
	CMH2	4	10100.1804			

eBM-D400R4-H I/O MOD — CMH2 eBM-D400R-H



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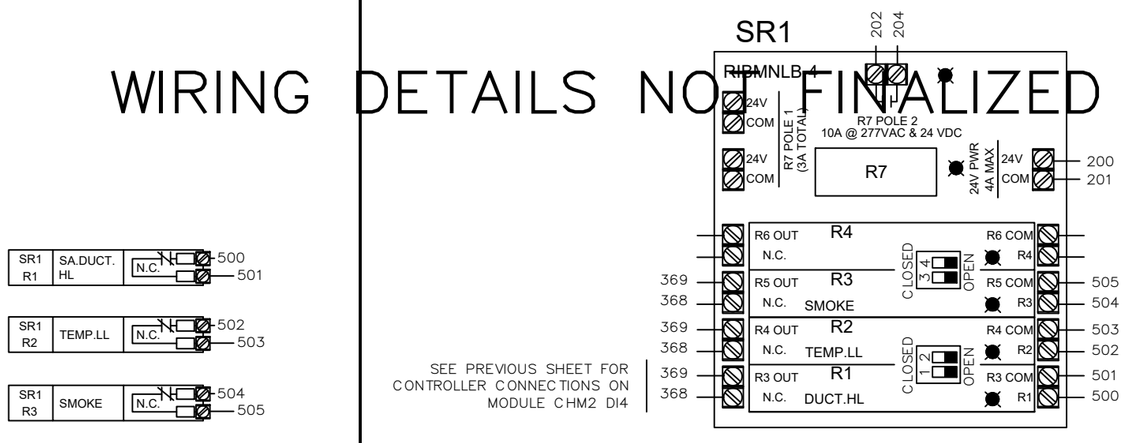
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CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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SYSTEM 33 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB | 24V CB

Power | Power

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101

PS1

4.0A 1.0A 5.0A

102 101 100 G

TB1

L1 L2 L3 H N 120 VAC

PANEL GND LUG

TB2

202 203 204 205 206 207

L4 L5 L6 L7 L8 L9

24 VAC TO FIELD

TB3

300 301

1 1 1 2 2 2

24 VDC TO FIELD

CAT-6a

ETS1

301 300 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 16A @ 277VAC

R4 OUT N.C. R4 COM

R3 OUT N.C. R3 COM

R2 OUT N.C. R2 COM

R1 OUT N.C. R1 COM

CLOSED OPEN

DPD1 DPB1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

2 4 PNEUMATIC

3 5 PNEUMATIC

CEB1 C8X1

201 200

PWR GND 24~

USB 2 USB 1

(NOT USED)

eBMGR-2

eBX

eBUS Address

eBUS

NET1 RS-485 NET2 RS-485

LAN 1 LAN 2 LAN 3

MS/TP

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG L3

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-E2 SYSTEM 33 PANEL – POWER & NETWORK WIRING

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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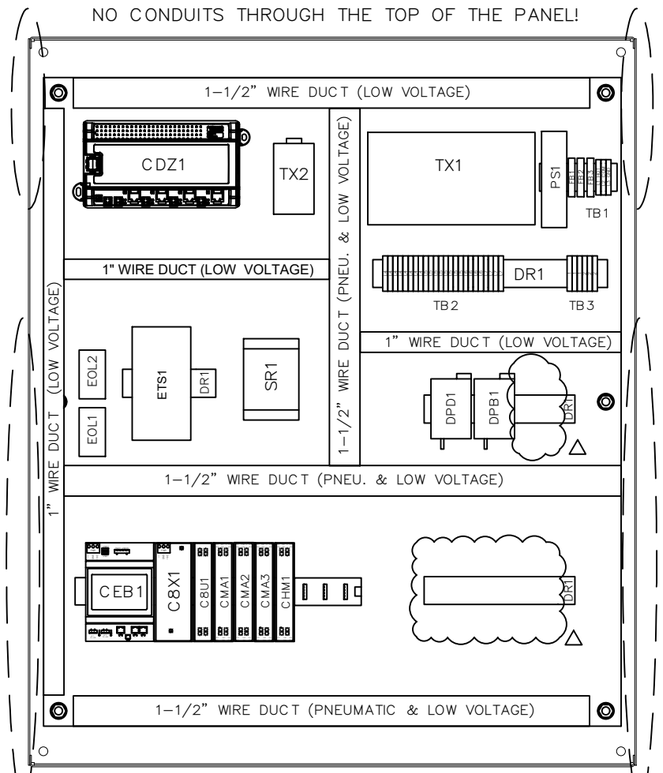
CONTRACT NO:

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SYSTEM CONTROL PANEL 33 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

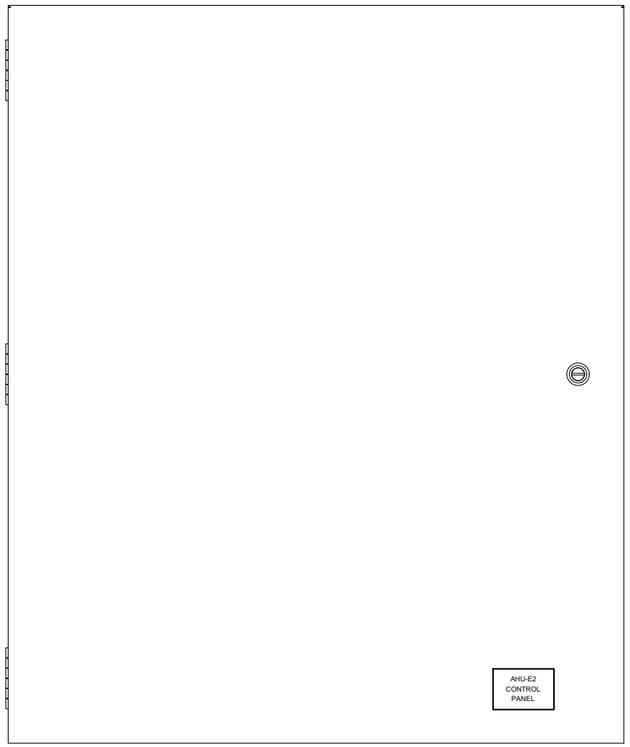


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

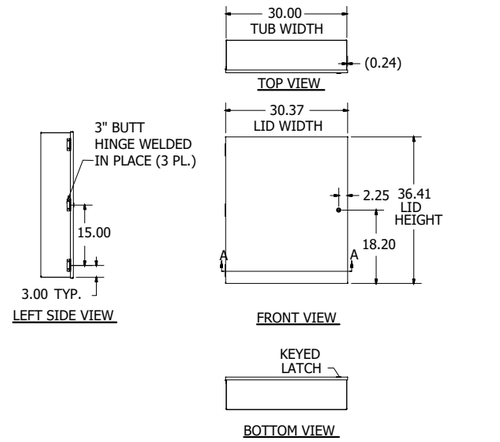
WILL BE PROVIDED IN A FUTURE REVISION. △

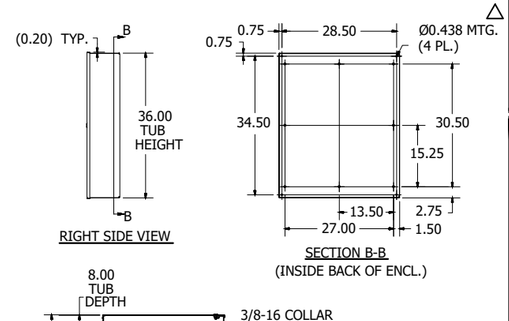
BILL OF MATERIALS

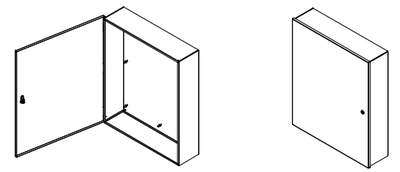
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

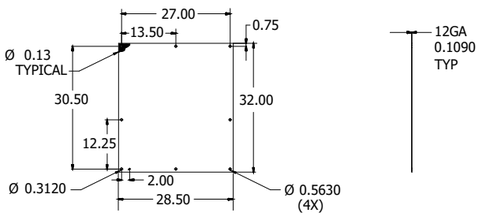
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



E-AHU-E2 SYSTEM 33 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
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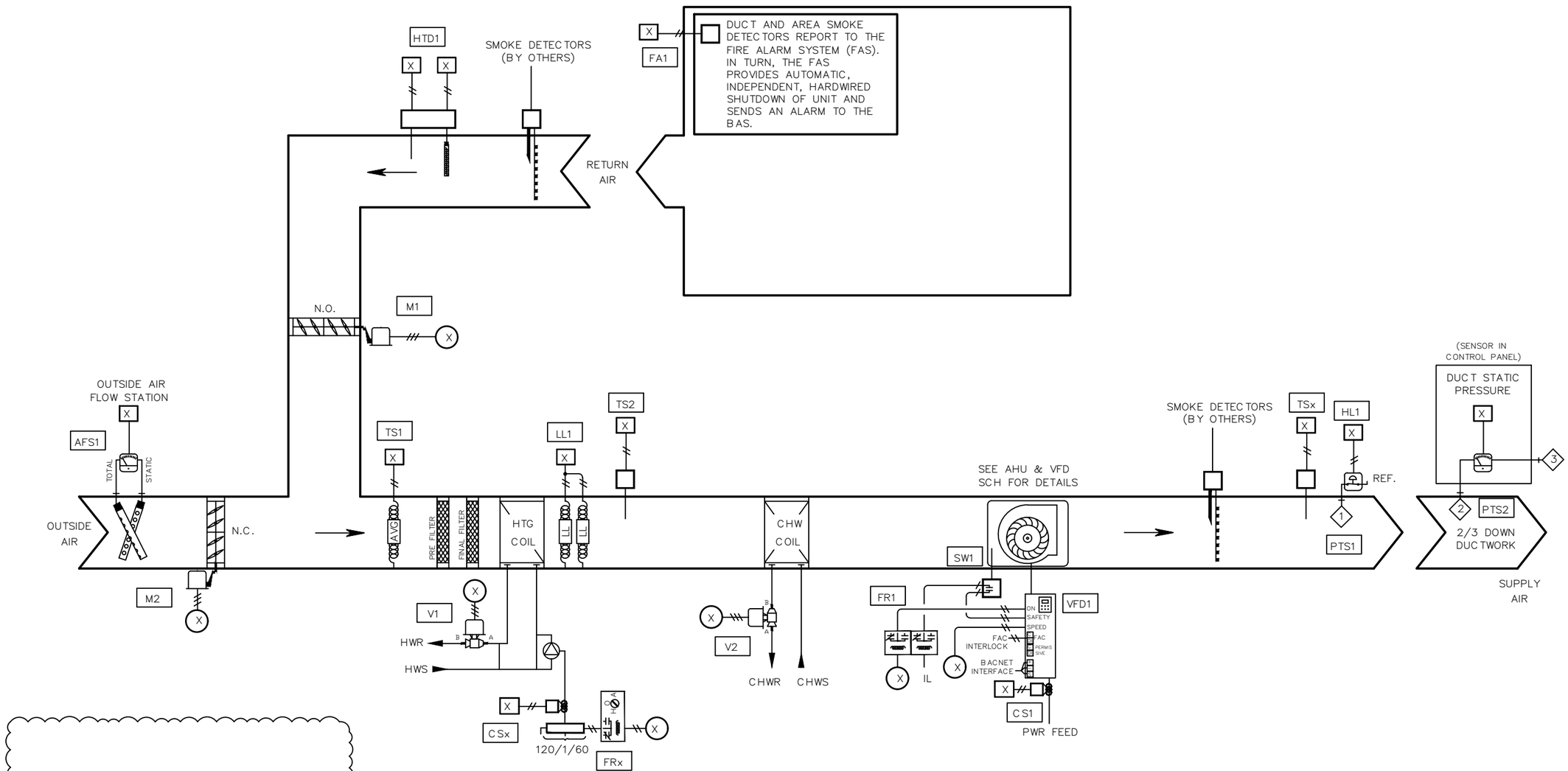
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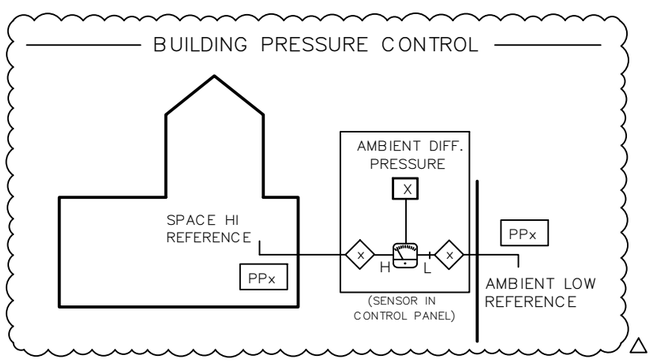
E-AHU-E3 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

BUILDING PRESSURE CONTROL



NETWORK POINTS

N1 THROUGH Nx

E-AHU-E3 FIELD DEVICES

Delta Controls

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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-E3 POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
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VAV AIR HANDLING UNIT AHU-E3 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFEn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

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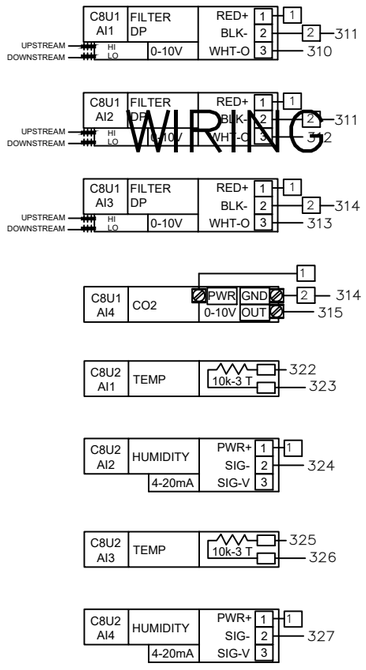
REVISIONS	
DATE	REMARKS

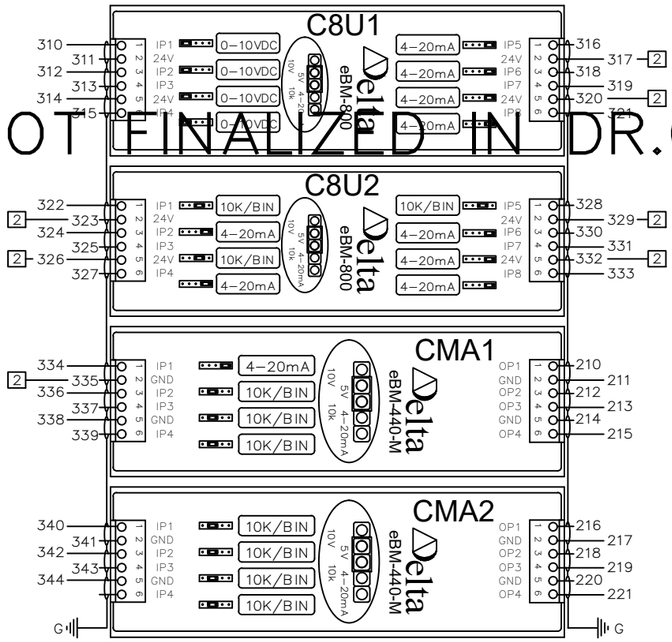
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

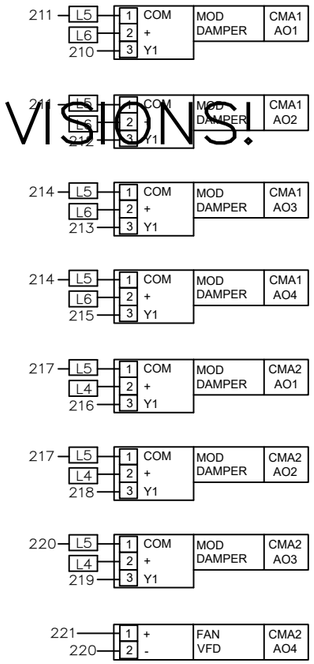
CONTRACT NO:

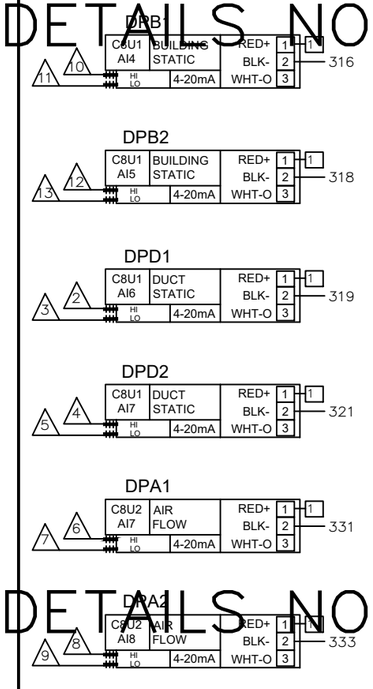
SHEET
NCHS–279
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

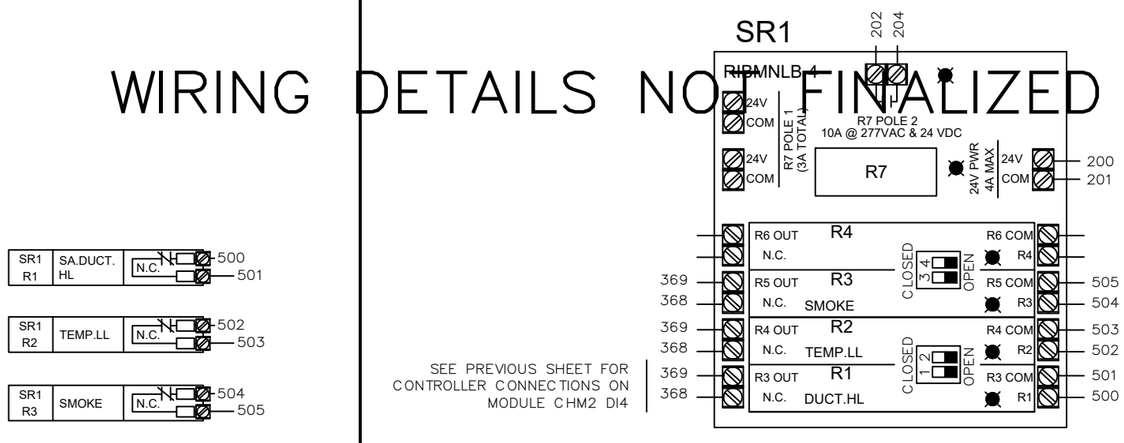
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DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-280
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU-E3 SYSTEM 34 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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NCHS-281
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SYSTEM 34 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TX1

100 L2 L3 H C G

24V CB Power 75VA 24VAC 24VAC

120 VAC LAPTOP PWR

24V CB Power 75VA 24VAC 24VAC

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L2 L3

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

SR1

RIBMNLB-4

202 204

200 201 24V COM

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 10A @ 277VAC

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

ETS1

300 301 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

DPD1

DPB1

1 1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3 4 5

CEC1

201 200

PWR

— GND 24~

Delta eBCON-2

eBUS

NET2

NET2 RS-485 [+] [-] SHD

LAN 1

eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-E3 SYSTEM 34 PANEL – POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
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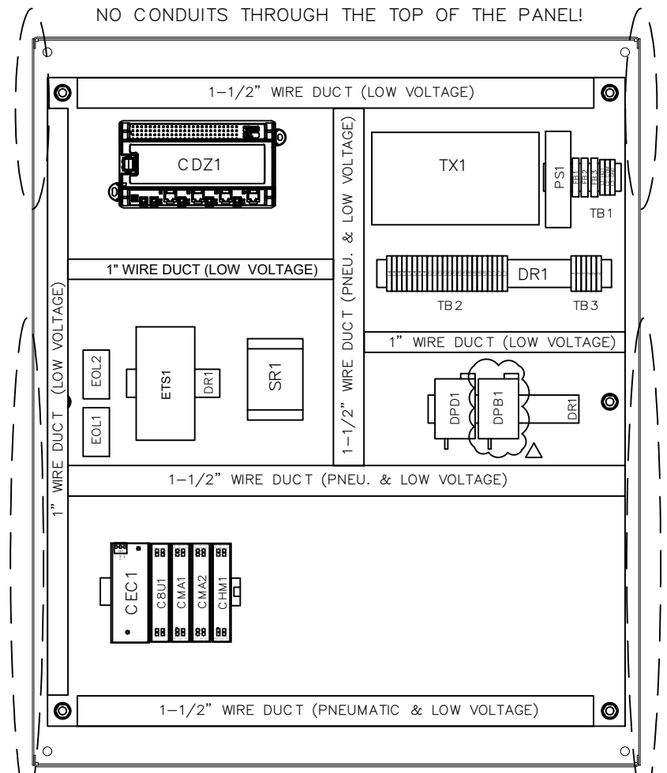
CONTRACT NO:

SHEET
NCHS-282
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 34 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

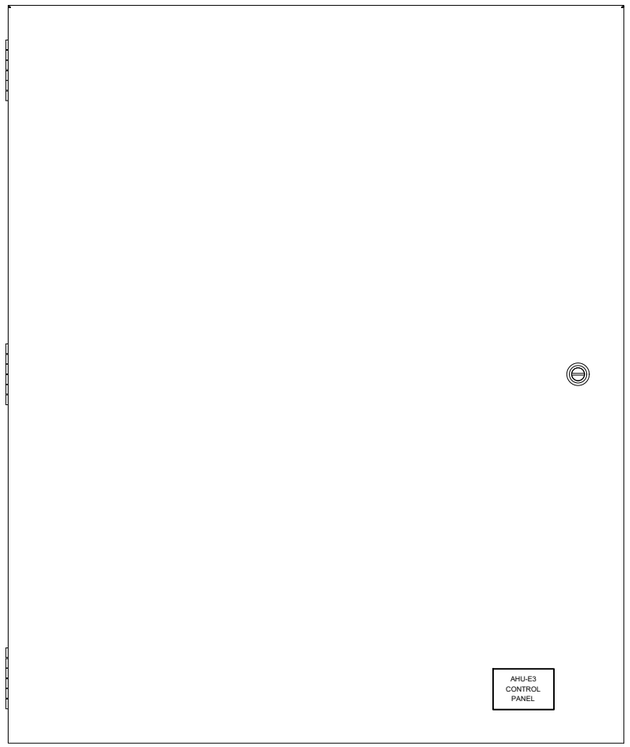


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

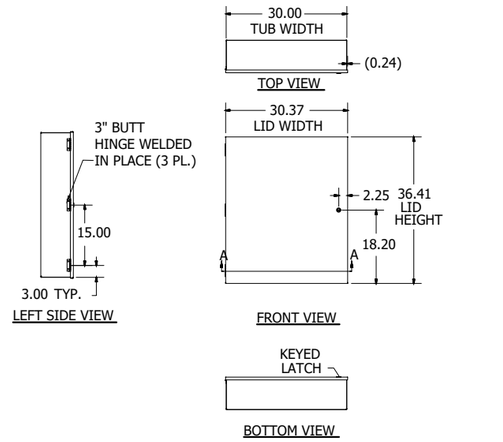
WILL BE PROVIDED IN A FUTURE REVISION. △

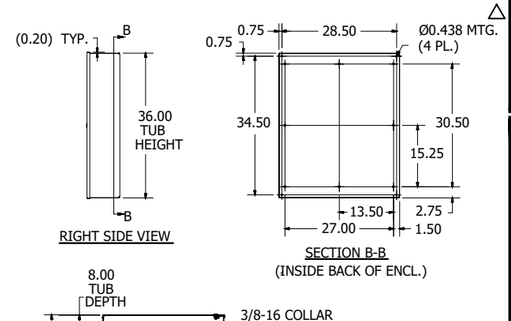
BILL OF MATERIALS

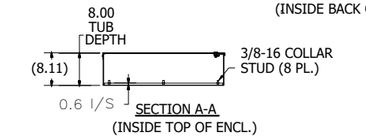
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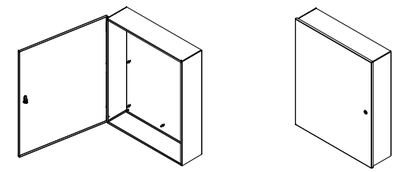
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

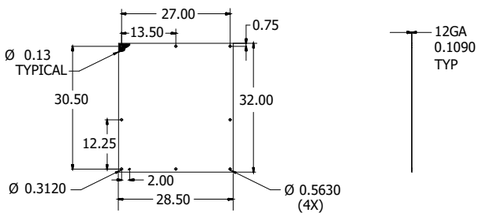








PANEL DIMENSIONS



E-AHU-E3 SYSTEM 34 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

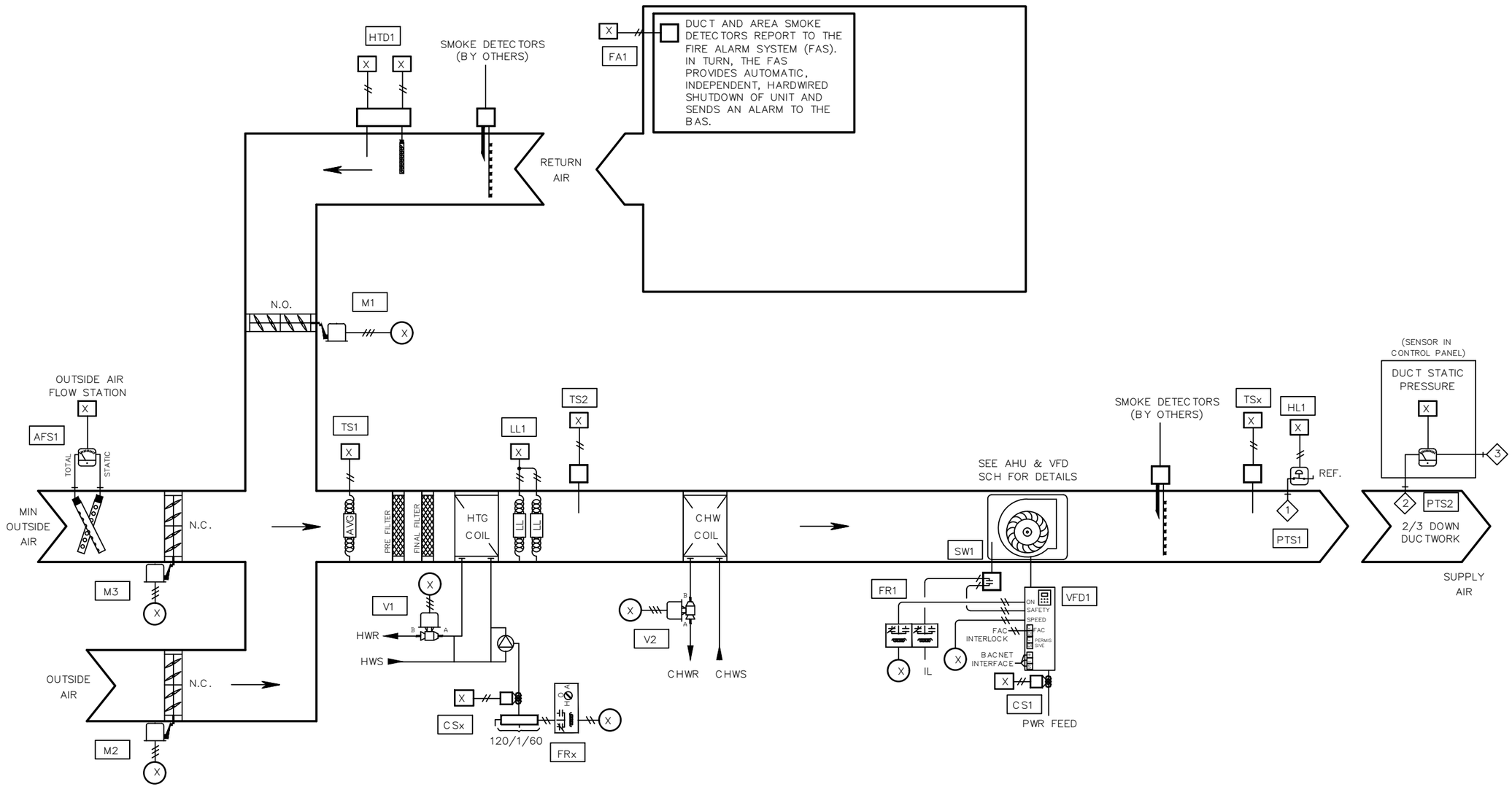
REVISIONS	
DATE	REMARKS

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DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-283
JOB NUMBER:
J-2304001

E–AHU–F1 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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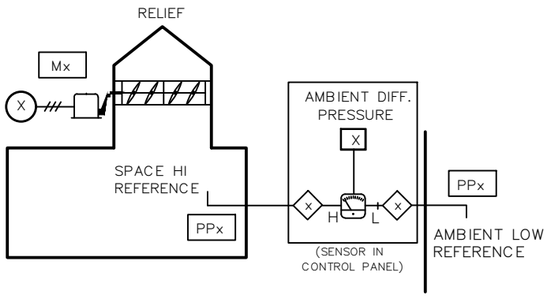
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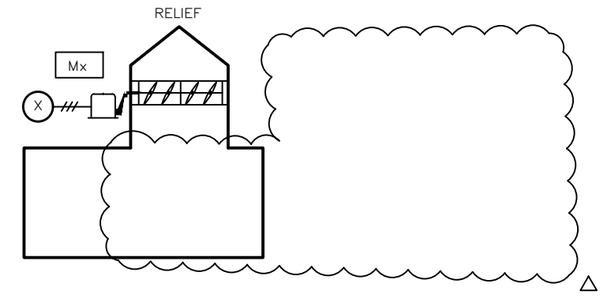
CONTRACT NO:

SHEET
NCHS–284
JOB NUMBER:
J–2304001

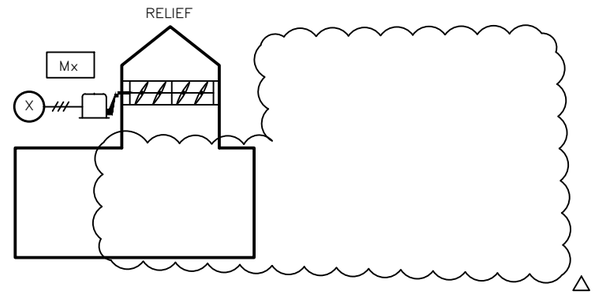
BUILDING PRESSURE CONTROL
E–RH–F1



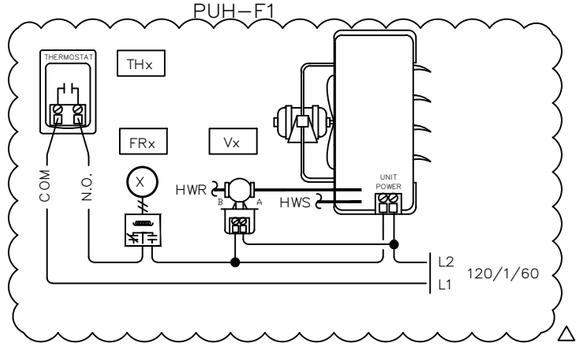
BUILDING PRESSURE CONTROL
E–RH–F2



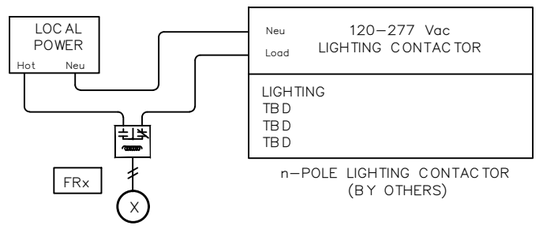
BUILDING PRESSURE CONTROL
E–RH–F3



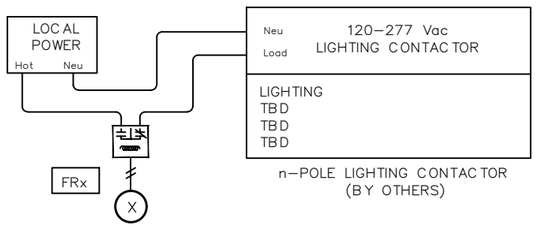
PROPELLER UNIT HEATER
PUH–F1



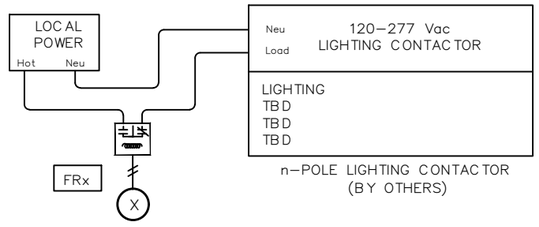
LIGHTING CONTACTOR CONTROLS
RF–1 – NORTH SECURITY



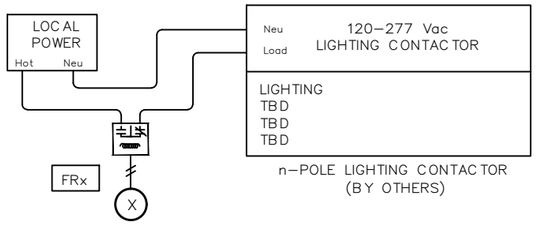
LIGHTING CONTACTOR CONTROLS
RF–2 – NORTH PARKING / SECURITY



LIGHTING CONTACTOR CONTROLS
RF–3 – NORTH PARKING



LIGHTING CONTACTOR CONTROLS
RF–4 – NORTH WALK



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA F EXHAUST, RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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CONTRACT NO:

SHEET
NCHS–285
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-F1 DPR	Relief Air Damper			X		
E-RH-F2 DPR	Relief Air Damper			X		
E-RH-F3 DPR	Relief Air Damper			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
LTG 1	Lighting Contactor - North Sec RF-1				X	
LTG 2	Lighting Contactor - N Pkg Sec RF-2				X	
LTG 3	Lighting Contactor - North Pkg RF-3				X	
LTG 4	Lighting Contactor - North Walk RF-4				X	
PUH-F1 EN	PUH F1 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**7**	**5**	**9**	**7**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
Temperature Control Services
4240 W 50 S
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CONTRACT NO:

SHEET
NCHS-286
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-F1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFFn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

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04/20/2023	ADD 5.3
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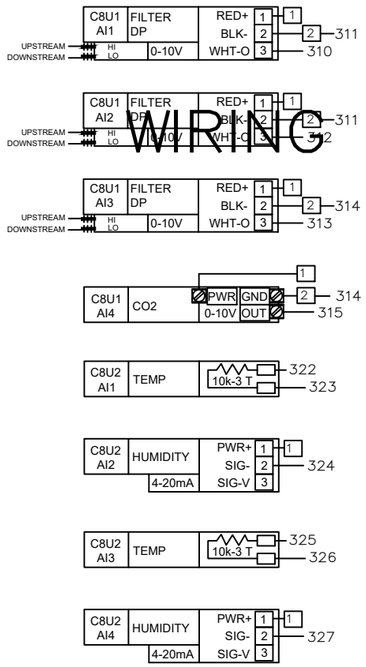
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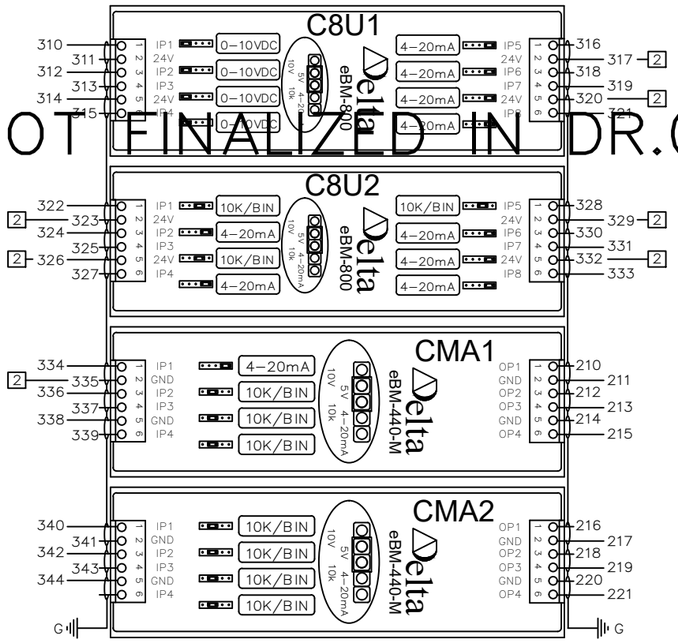
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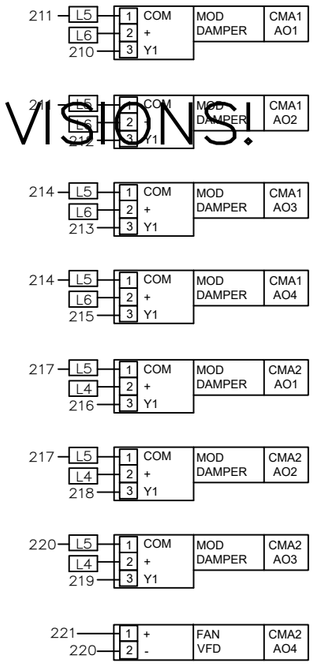
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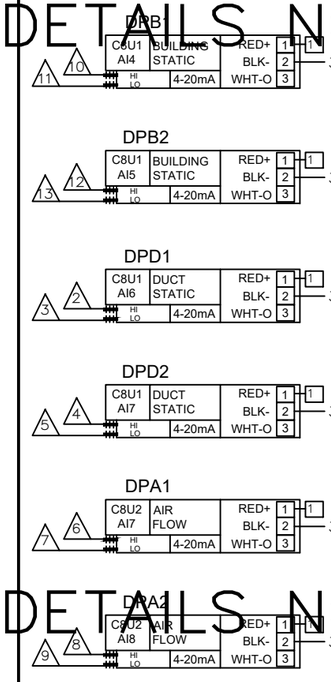
SHEET
NCHS-287
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

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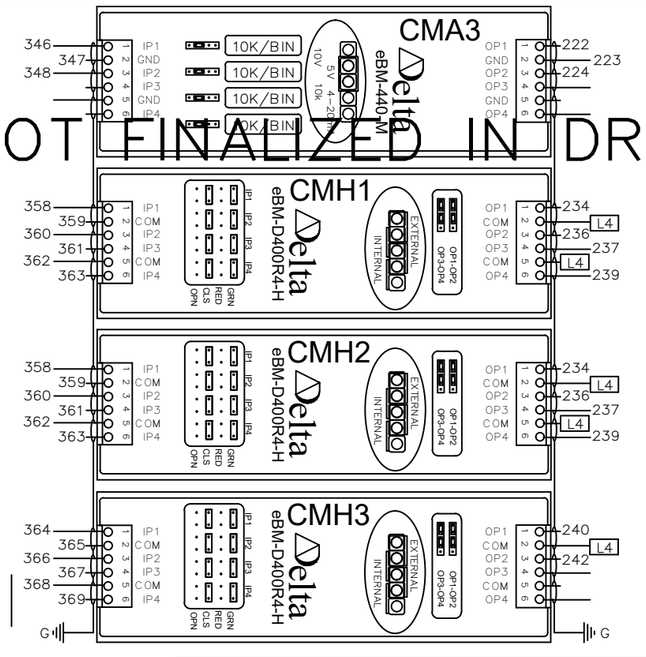
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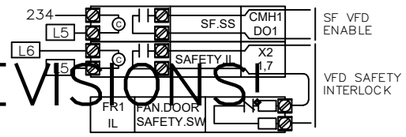
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CMA3 DI1	DX STATUS	N.O.	346 / 347
CMA3 DI2	PURGE ENABLE	N.O.	348 / 347
CMH2 DI1	FAN STATUS	N.O.	358 / 359
CMH1 DI1	FAN STATUS	N.O.	360 / 359
CMH1 DI3	SMOKE ALARM	N.O.	361 / 362
CMH1 DI4	SMOKE ALARM	N.O.	363 / 362
CMH2 DI1	FAS.INPUT	N.C.	364 / 365
CMH2 DI2	PUMP STATUS	N.O.	366 / 365
CMH2 DI3	PUMP STATUS	N.O.	367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



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CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO
	CMA3	3	10100.1503			
	CMA3	4	10100.1504			

eBM-440-M I/O MODULE — CMA3 eBM-440-M

CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			
OUTPUTS	CMA4	1	10100.1601			
	CMA4	2	11500.1602			
	CMA4	3	10100.1603			
	CMA4	4	10100.1604			

eBM-440-M I/O MODULE — CMA4 eBM-440-M

CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001

eBM-D400R4-H I/O MOD — CMH1 eBM-D400R-H

CMH2 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001
	CMH2	3	10100.1803			
	CMH2	4	10100.1804			

eBM-D400R4-H I/O MOD — CMH2 eBM-D400R-H

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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
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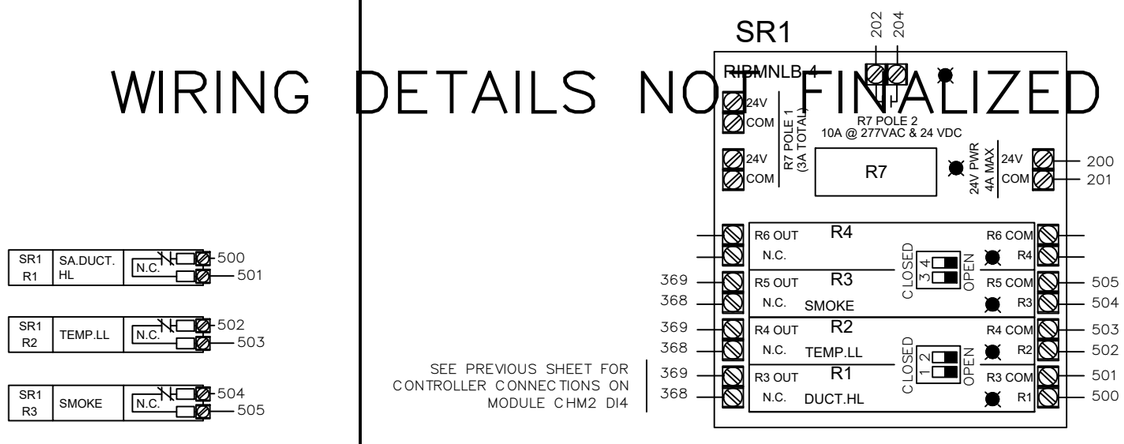
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SYSTEM 35 CONTROL PANEL

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

E-AHU-F1 SYSTEM 35 PANEL – I/O WIRING (3 OF 3)

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SYSTEM 35 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB Power

24V CB Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L2 L3

PS1

4.0A 102

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

206 L8 L8 L8

207 L9 L9 L9

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

ETS1

300 301 L3

V1- V1+

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

202 204

200 201 24V COM

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 16A @ 277VAC

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED HIGH LOW

DPD1

DPB1

1 Power + - GND / 4-20mA out Voltage out

HIGH LOW

2 3 4 5

PNEUMATIC

CEB1

C8X1

201 200 PWR GND 24~

USB2 USB1

(NOT USED)

Delta eBMGR-2

Delta eBX

eBUS Address

eBUS

NET1 RS-485 NET2 RS-485

LED 1 LED 2 LED 3

P7 24Vs IP5 24Vs IP6 IP8

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H

OP1 OP2 OP3 OP4 HAO

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-F1 SYSTEM 35 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

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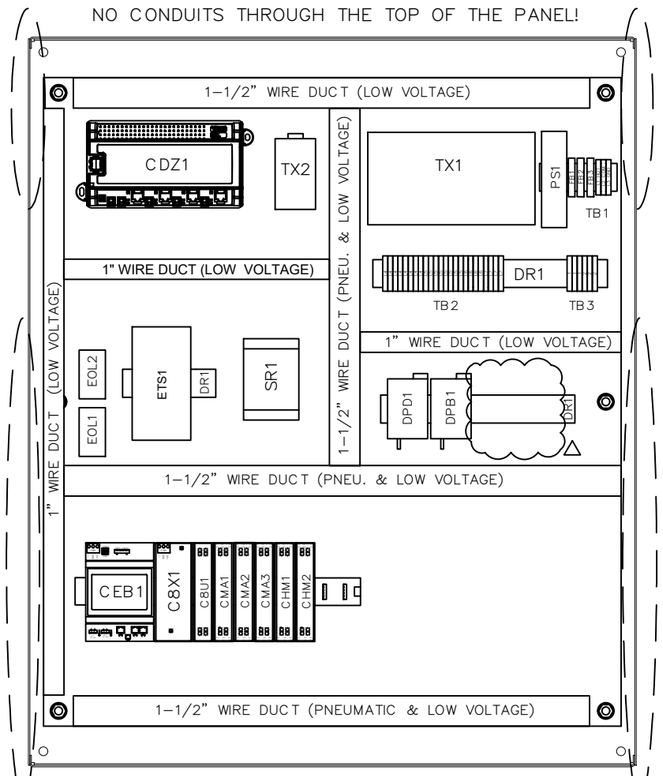
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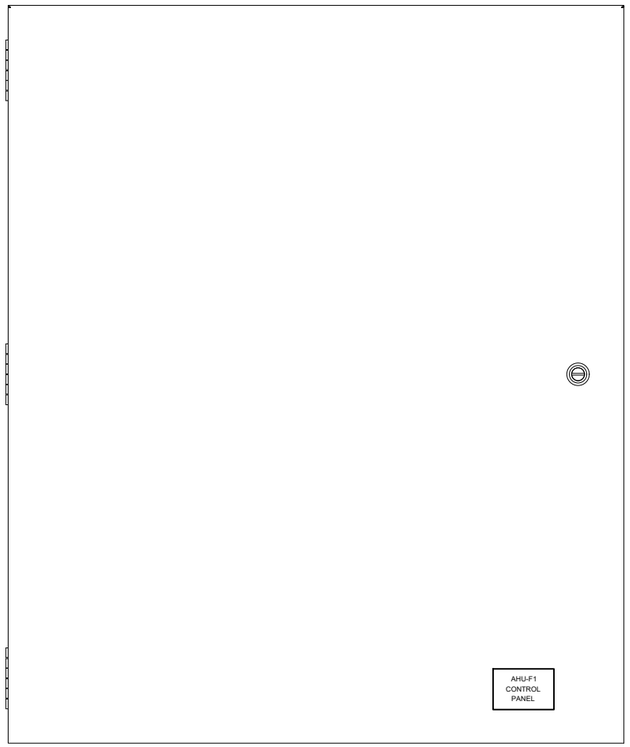
SYSTEM CONTROL PANEL 35 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

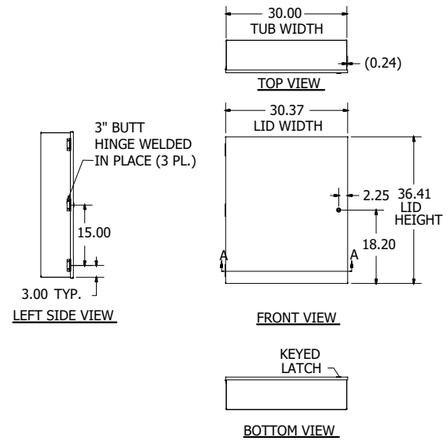
WILL BE PROVIDED IN A FUTURE REVISION. △

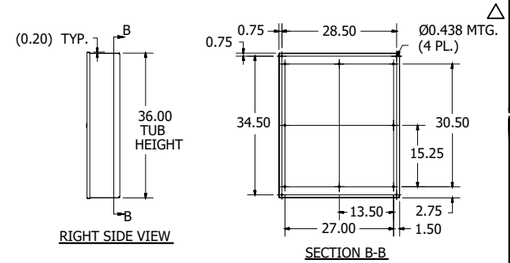
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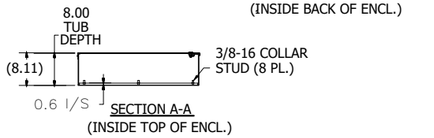
WILL BE PROVIDED IN A FUTURE REVISION. △

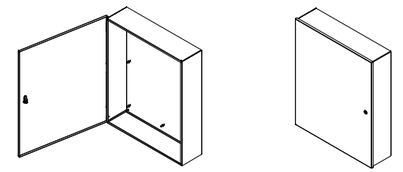
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

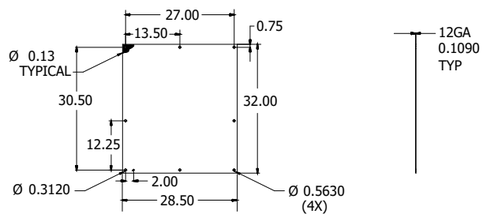








PANEL DIMENSIONS



E-AHU-F1 SYSTEM 35 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

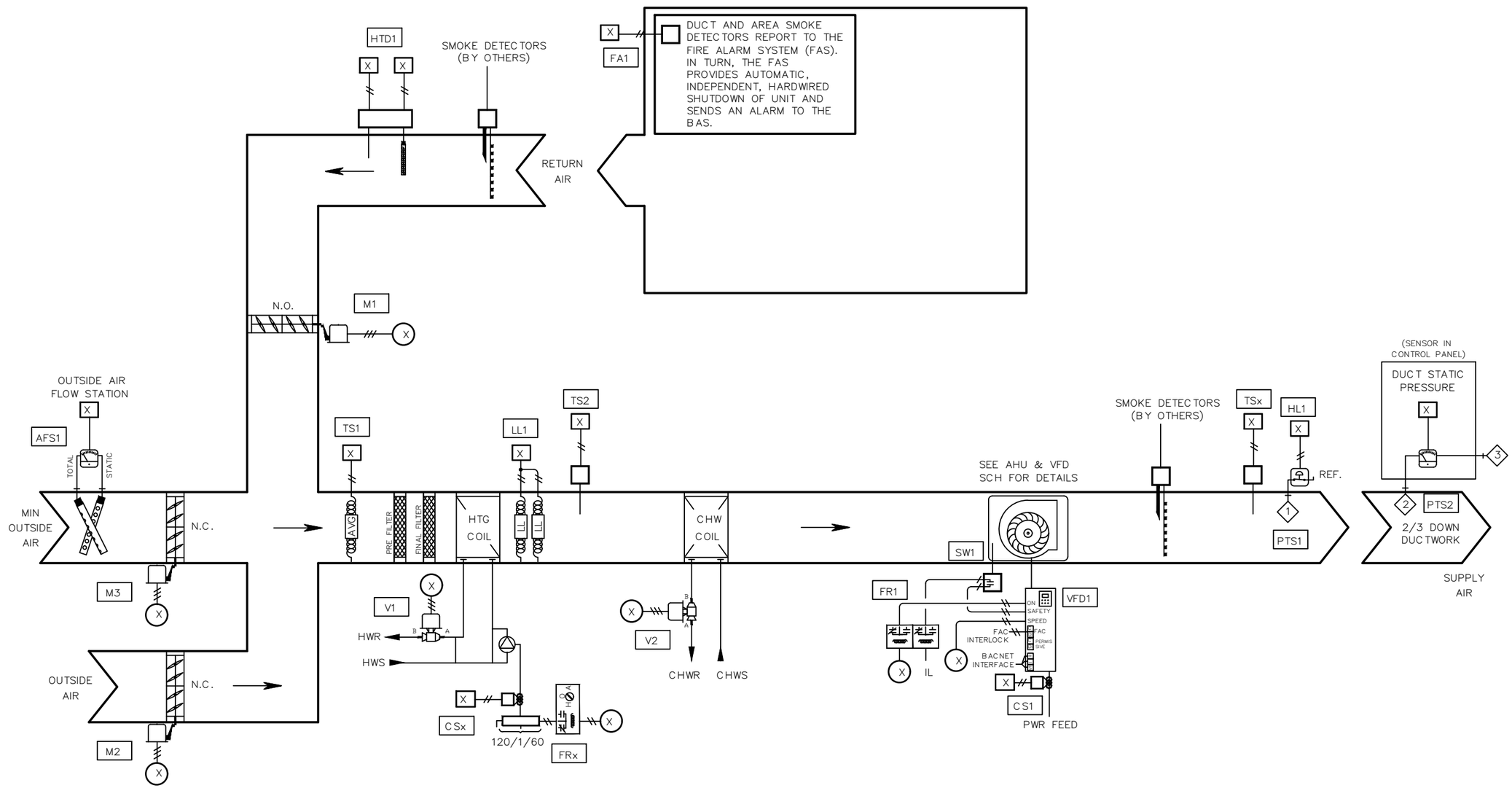
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-292
JOB NUMBER:
J-2304001

E–AHU–H1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–H1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
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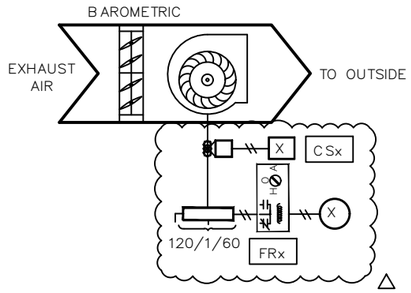
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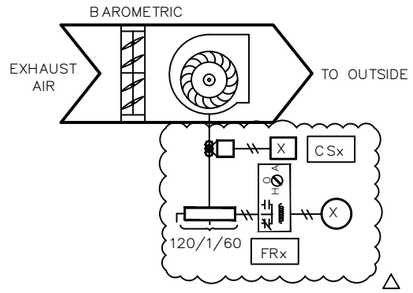
CONTRACT NO:

SHEET
NCHS–293
JOB NUMBER:
J–2304001

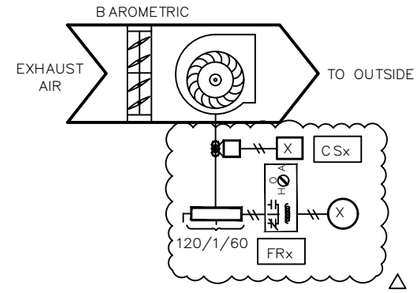
EXHAUST FAN – BAS CONTROLLED
EF–H1



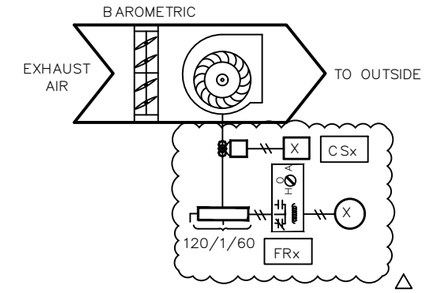
EXHAUST FAN – BAS CONTROLLED
EF–H2



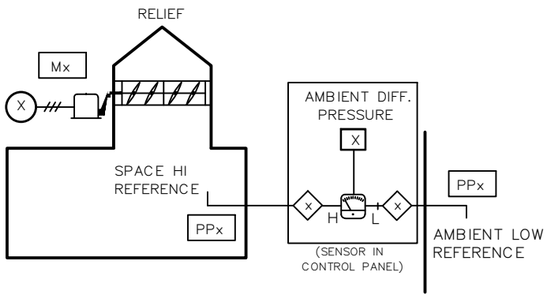
EXHAUST FAN – BAS CONTROLLED
EF–H4



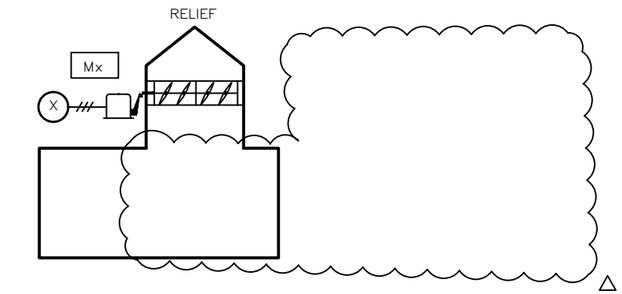
EXHAUST FAN – BAS CONTROLLED
EF–H5



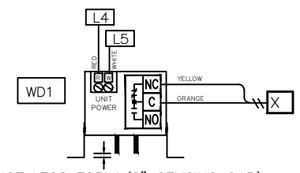
BUILDING PRESSURE CONTROL
RH–H1



BUILDING PRESSURE CONTROL
RH–H4



BASEMENT LEAK DETECTION



(ADJUST LEGS FOR 1/8" SENSING GAP)

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA H EXHAUST, RELIEF, & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services
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LEBANON, INDIANA 46052
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SHEET
NCHS–294
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-H1 STAT	Exhaust Fan H1 Status		X			
EF-H2 STAT	Exhaust Fan H2 Status		X			
EF-H4 STAT	Exhaust Fan H4 Status		X			
EF-H5 STAT	Exhaust Fan H5 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-H1 DPR	Relief Air Damper			X		
RH-H4 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-H1 SS	Exhaust Fan H1 Fan Start / Stop				X	
EF-H2 SS	Exhaust Fan H2 Fan Start / Stop				X	
EF-H4 SS	Exhaust Fan H4 Fan Start / Stop				X	
EF-H5 SS	Exhaust Fan H5 Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**9**	**8**	**6**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-H1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFHn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
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4240 W 50 S
LEBANON, INDIANA 46052
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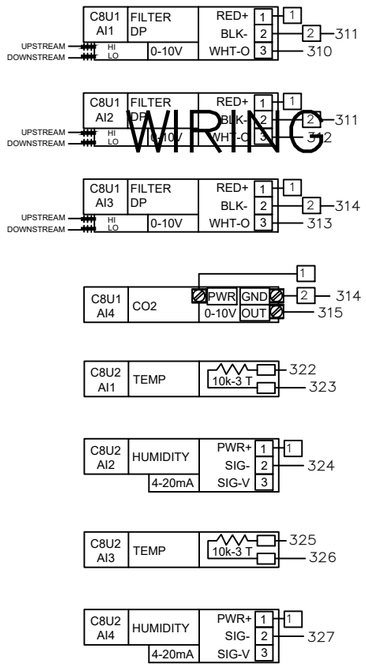
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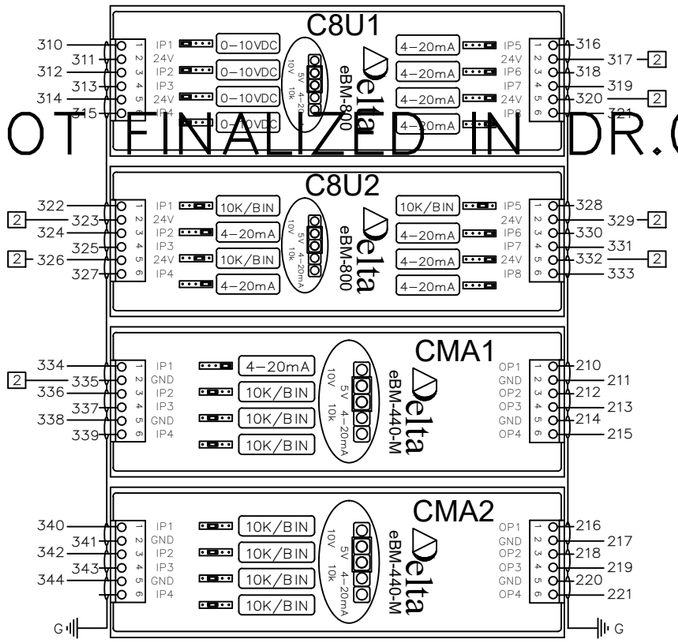
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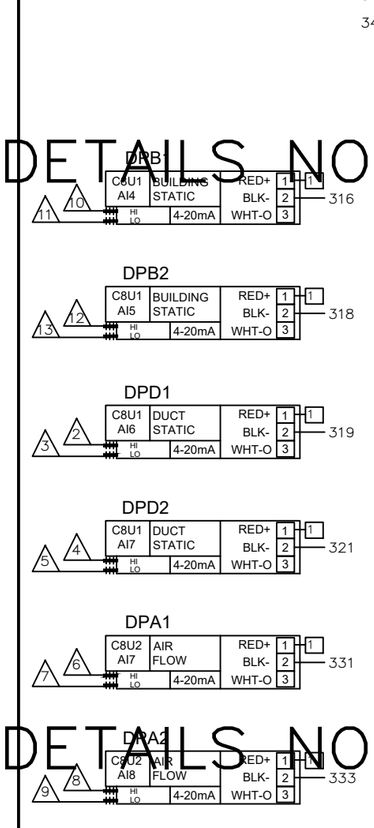
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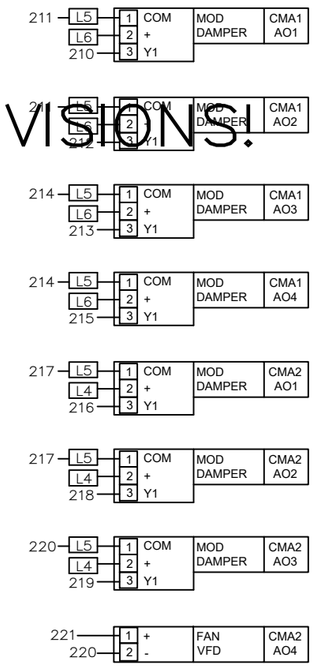
SHEET
NCHS-296
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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CMA3 DI1 DX STATUS — N.O. — 346 / 347

CMA3 DI2 PURGE ENABLE — N.O. — 348 / 347

CMH2 DI1 FAN STATUS — N.O. — 358 / 359

CMH1 DI1 FAN STATUS — N.O. — 360 / 359

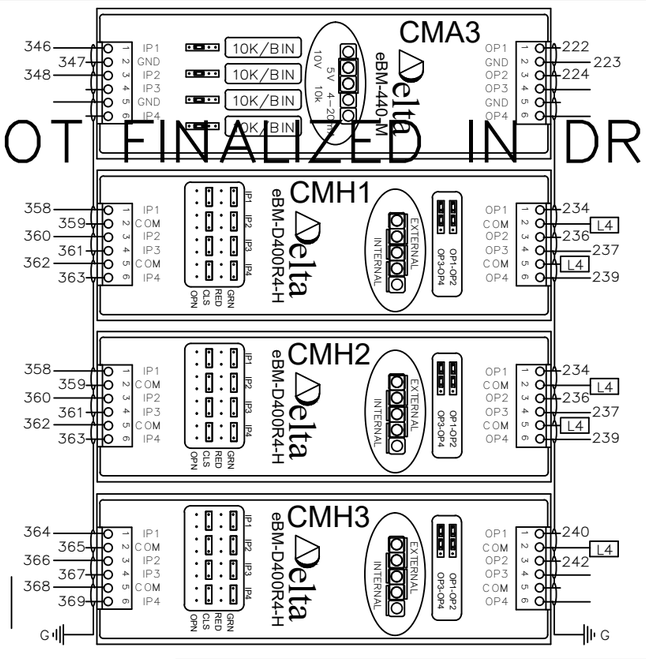
CMH1 DI3 SMOKE ALARM — N.O. — 361 / 362

CMH1 DI4 SMOKE ALARM — N.O. — 363 / 362

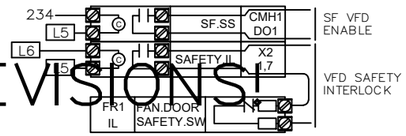
CMH2 DI1 FAS.INPUT — N.C. — 364 / 365

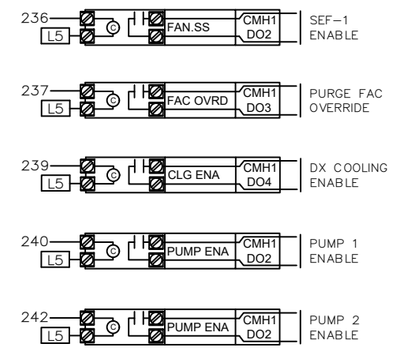
CMH2 DI2 PUMP STATUS — N.O. — 366 / 365

CMH2 DI3 PUMP STATUS — N.O. — 367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1





	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

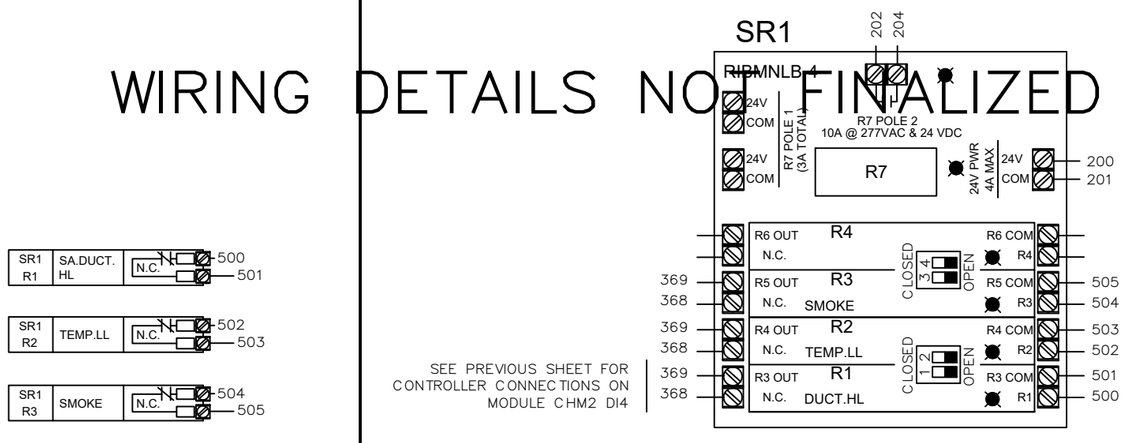
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

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SHEET
NCHS–298
JOB NUMBER:
J–2304001

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1
DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1
DFM-400P

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SYSTEM 36 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

V1- V1+ 300 301 L3

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

200 201 202 204

24V COM POWER 4A MAX

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 (NORMALLY OPEN)

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

TX1

24V CB Power

100 L2 L3 H C G

120 VAC LAPTOP PWR

75VA 24VAC 24VAC

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L2 L3

PS1

1.0A 5.0A 101 100 G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 203 204 205

L4 L5 L6 L7

24 VAC TO FIELD

TB3

300 301

1 2

24 VDC TO FIELD

DPD1 DPB1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

1 2 3 4 5

CEB1 C8X1

201 200

PWR GND 24~

USB2 USB1 (NOT USED)

NET1 RS-485 NET2 RS-485 LAN 1 LAN 2

eBMGR-2

eBX

eBUS Address

eBUS

MS/TP

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H

OP1 OP2 OP3 OP4 HAO

I/O SHIELD DRAIN

L3 TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-H1 SYSTEM 36 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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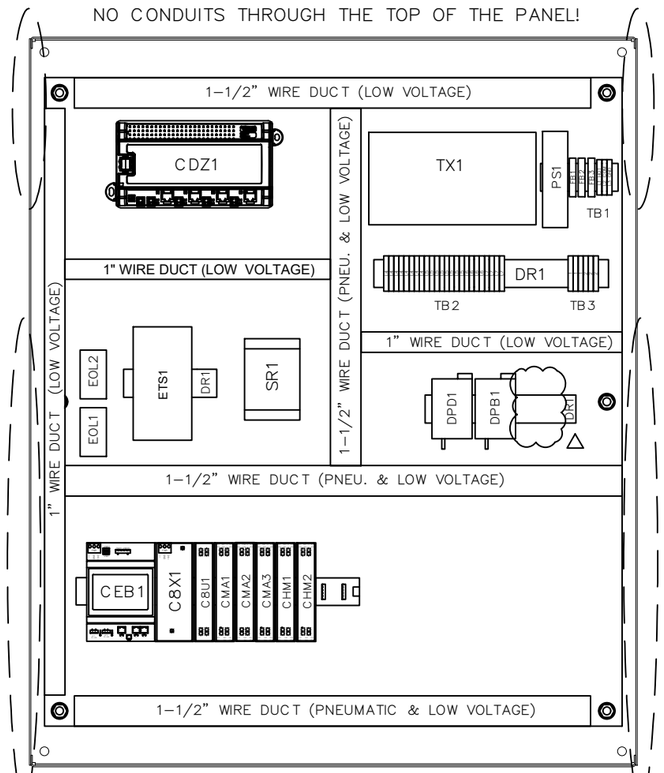
CONTRACT NO:

SHEET
NCHS-300
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 36 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

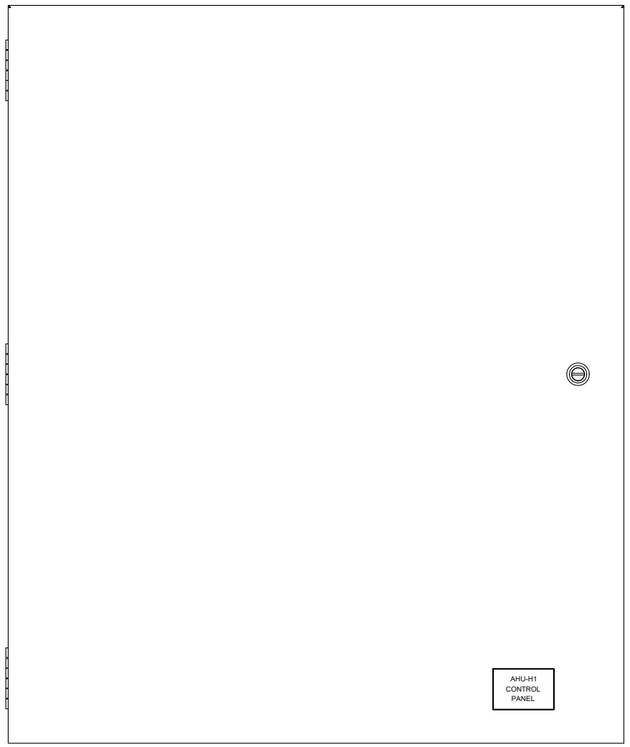


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

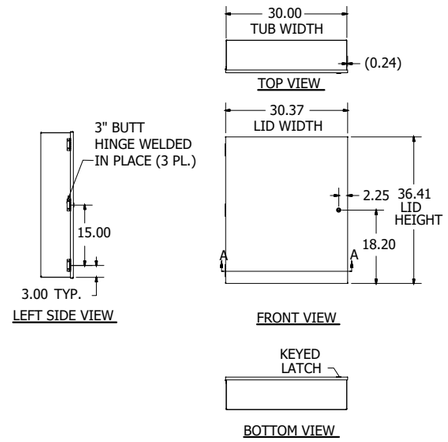
WILL BE PROVIDED IN A FUTURE REVISION. △

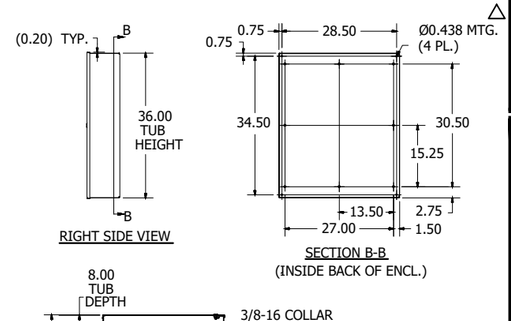
BILL OF MATERIALS

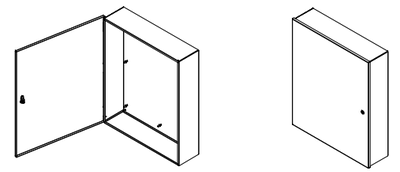
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

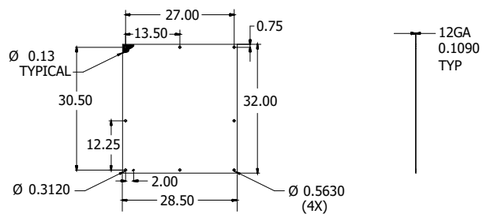
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



E–AHU–H1 SYSTEM 36 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
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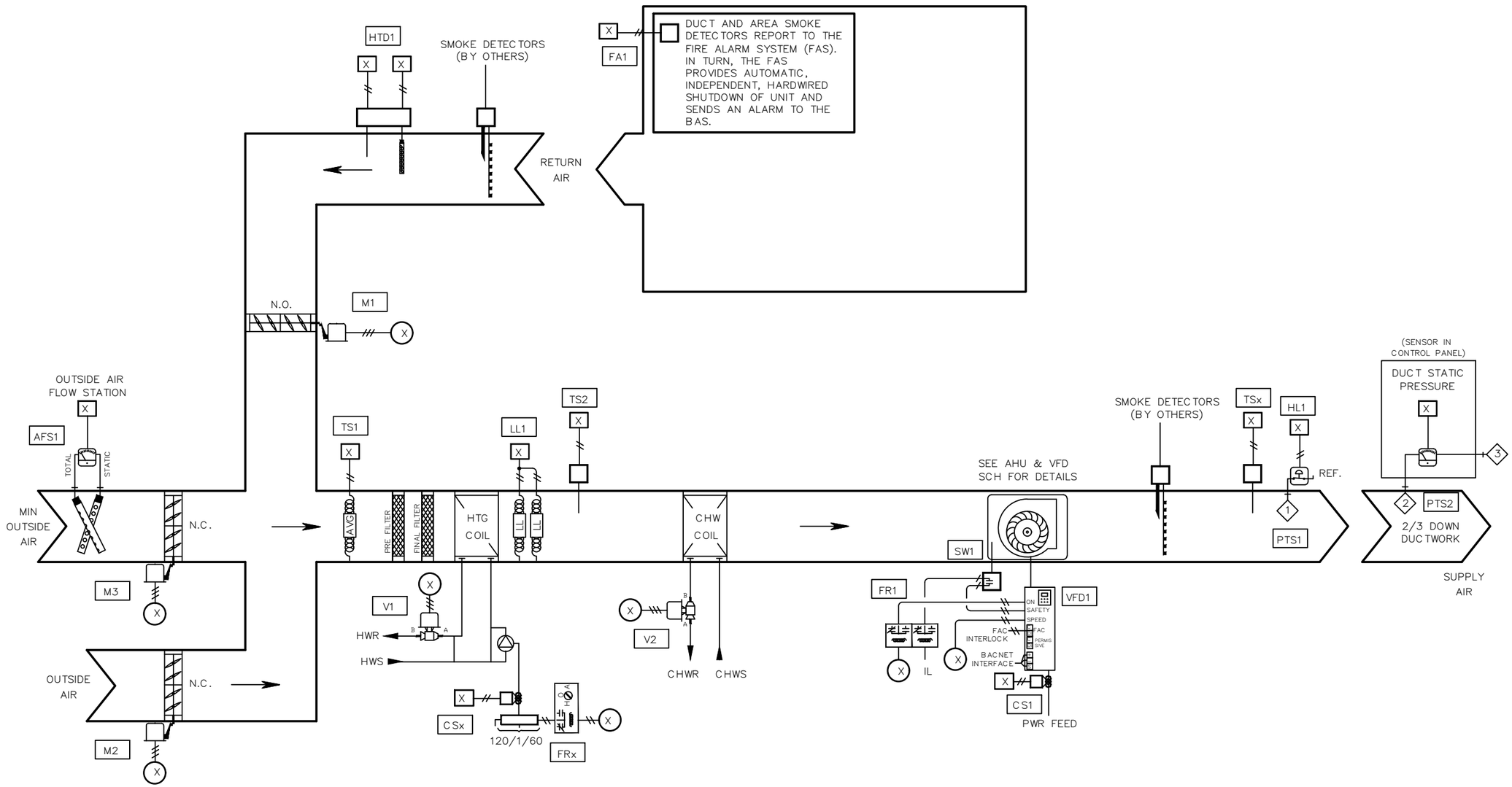
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NCHS–301
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J–2304001

E–AHU–H2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–H2 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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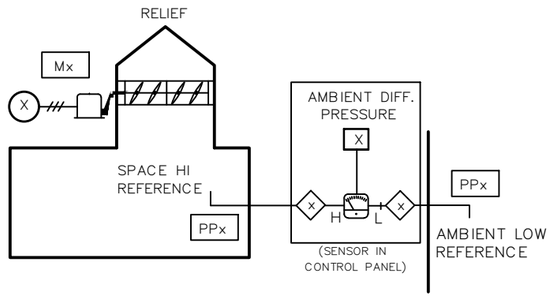
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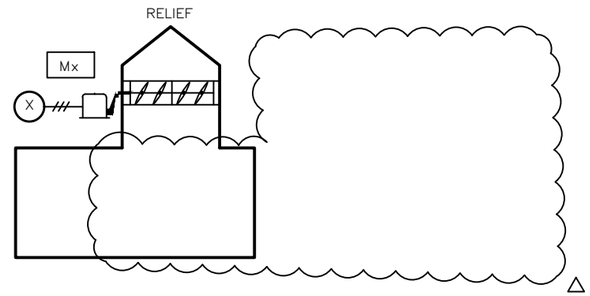
CONTRACT NO:

SHEET
NCHS–302
JOB NUMBER:
J–2304001

BUILDING PRESSURE CONTROL
RH–H2

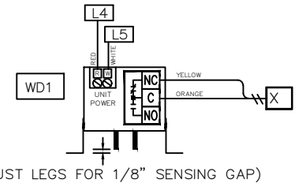


BUILDING PRESSURE CONTROL
RH–H3



△

BASEMENT LEAK DETECTION



(ADJUST LEGS FOR 1/8" SENSING GAP)

△

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA H RELIEF & LEAK DETECTION FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS–303
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-H2 DPR	Relief Air Damper			X		
RH-H3 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**8**	**2**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-H2 & AREA H MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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CONTRACT NO:

SHEET
NCHS-304
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-H2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

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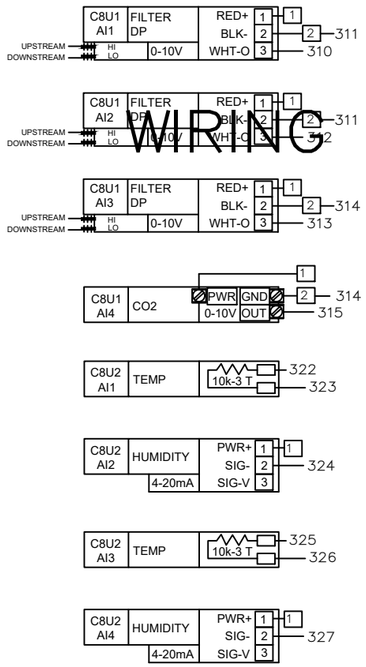
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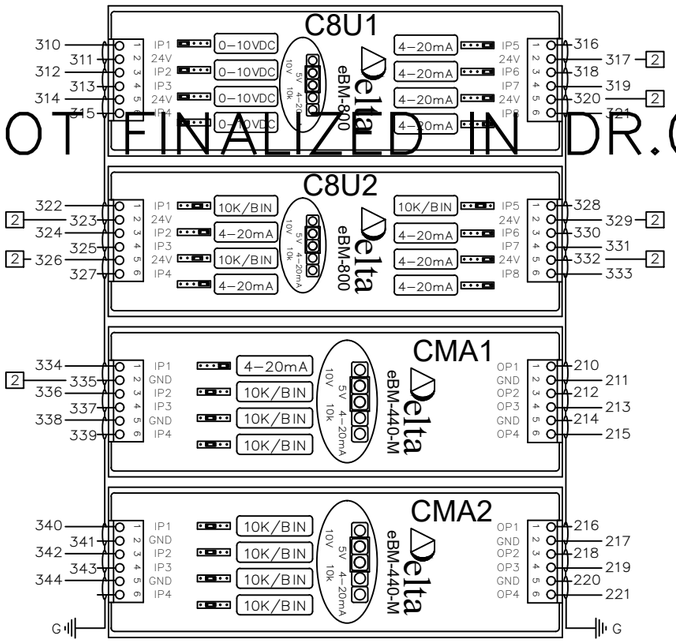
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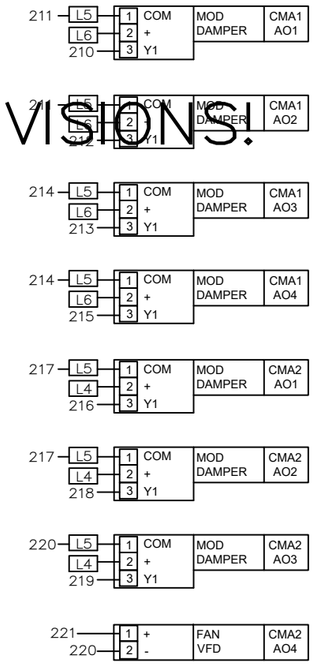
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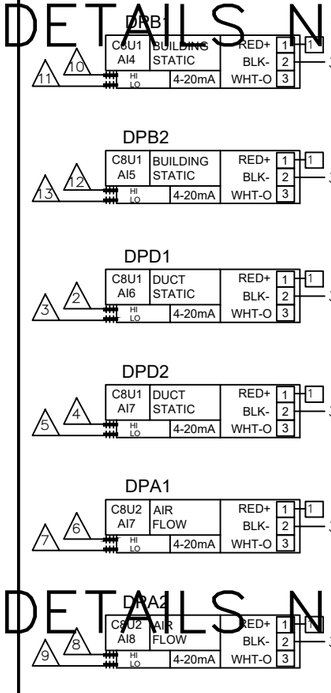
SHEET
NCHS-305
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

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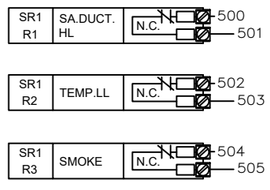
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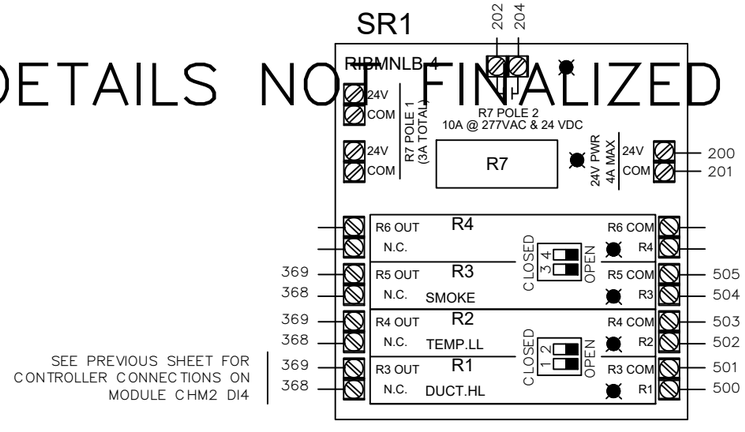
CONTRACT NO:

SHEET
NCHS-306
JOB NUMBER:
J-2304001

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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU–H2 SYSTEM 37 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
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SYSTEM 37 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

L3

200
201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

301
300

V1-
V1+

ETHERNET SWITCH

1 3 5 4 2

CAT5e

SR1

RIBMNLB-4

202
204

200
201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED

TX1

24V CB

Power

100

L2

L3

H C G

120 VAC LAPTOP PWR

75VA

24VAC

200
201

CONTROLLER PWR

202
203

FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300
301
101

L3
L2

PS1

1.0A
5.0A

101
100
G

PANEL GND LUG

TB1

L1 L2 L3

H N

120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1

DPB1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3 4 5

CEC1

201
200

PWR

24~ GND ⏚

Delta eBCON-2

eBUS

NET2

NET2 RS-485 [+] [-] SHD

LAN 1

eBM-440-M

eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-H2 SYSTEM 37 PANEL – POWER & NETWORK WIRING

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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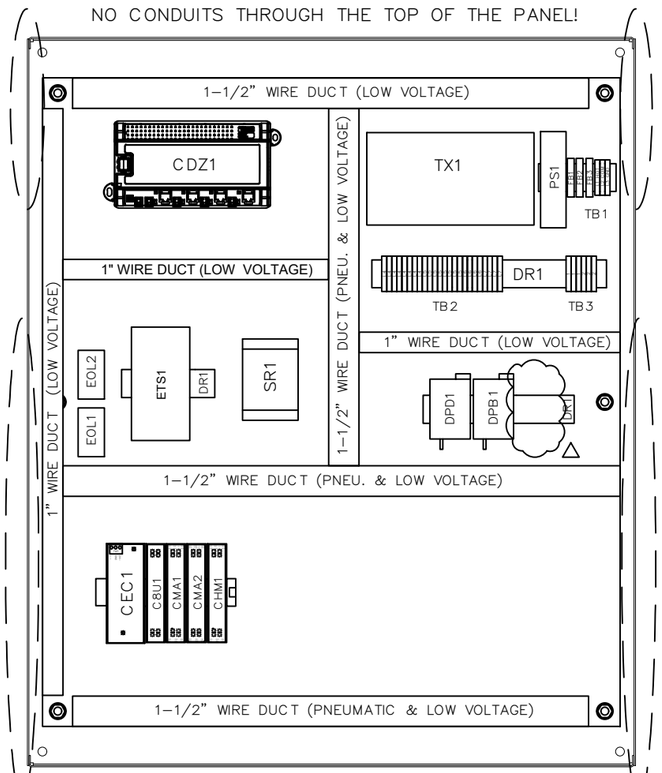
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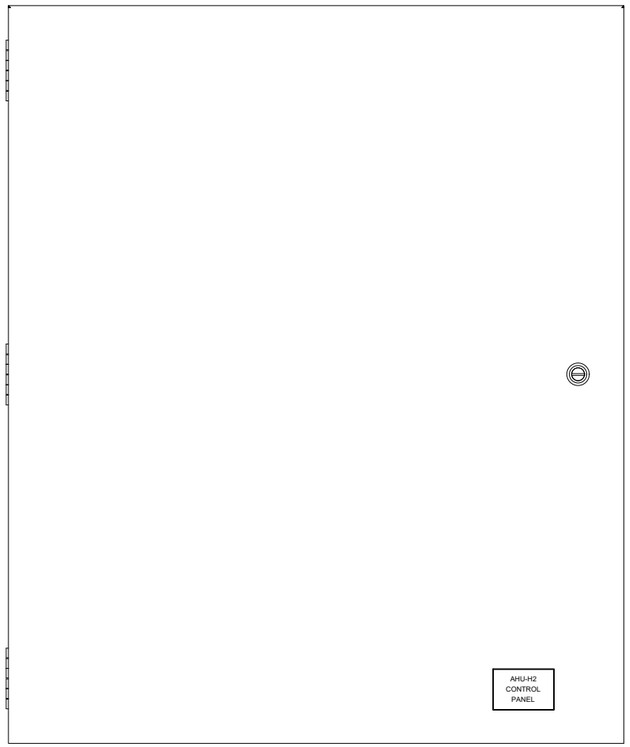
SYSTEM CONTROL PANEL 37 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

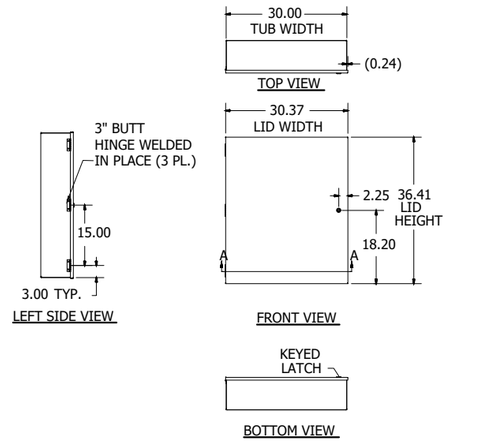
WILL BE PROVIDED IN A FUTURE REVISION. △

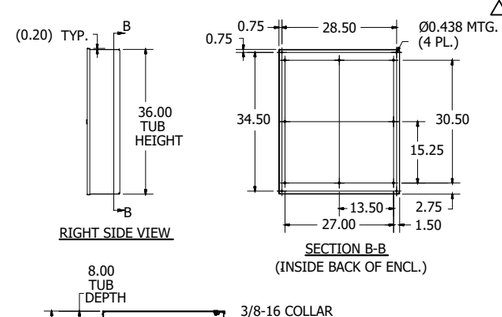
BILL OF MATERIALS

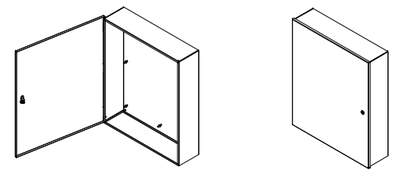
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

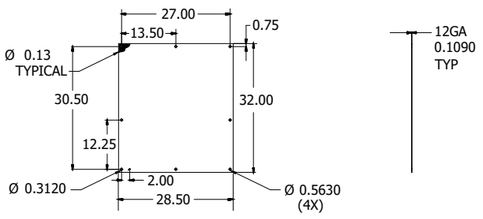
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



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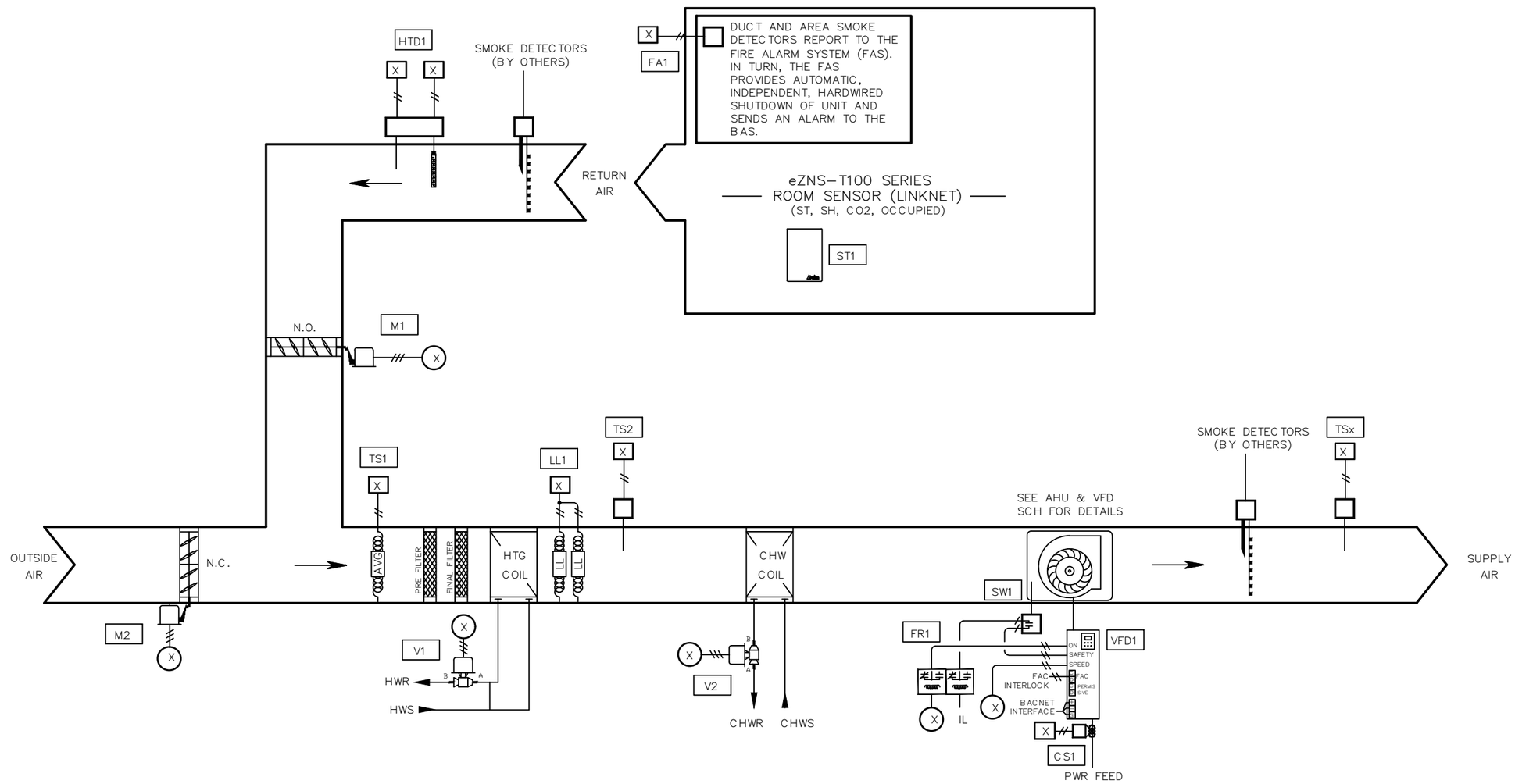
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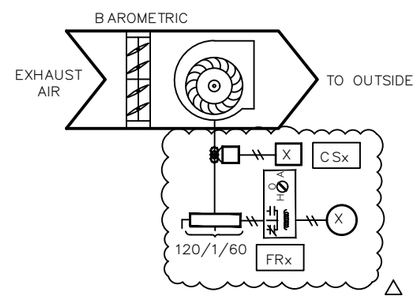
CONTRACT NO:

SHEET
NCHS-309
JOB NUMBER:
J-2304001

E–AHU–K1 FIELD DEVICES



EXHAUST FAN – BAS CONTROLLED
EF–K1



NETWORK POINTS
N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

E–AHU–K1 & AREA K EXHAUST FIELD DEVICES

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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
MAT	Mixed Air Temperature	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
EF-K1 STAT	Exhaust Fan K1 Status		X			
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-K1 SS	Exhaust Fan K1 Fan Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**4**	**4**	**5**	**2**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-K1 & AREA K MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
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NCHS-311
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AIR HANDLING UNIT AHU-K1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

AHU-K1 SERVES THE EAST UPPER GYM

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZNn-CO2 FROM MAIN GYM SENSORS) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

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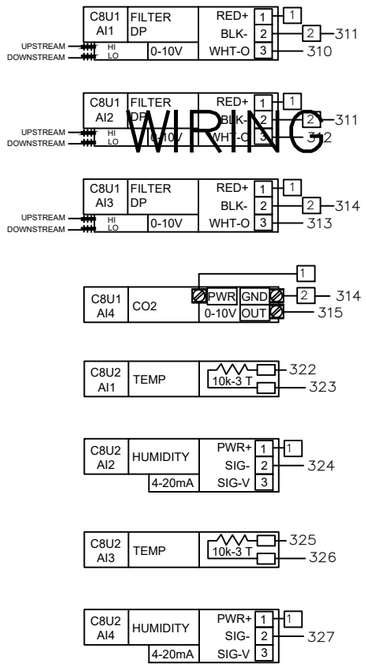
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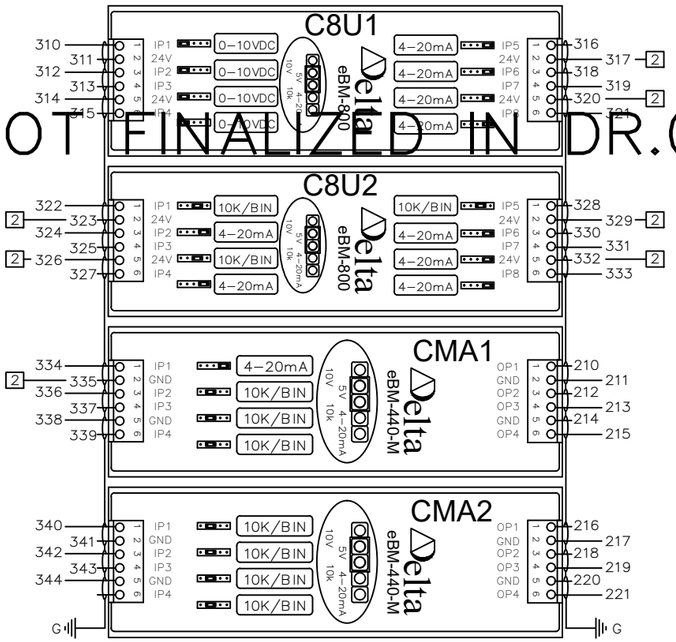
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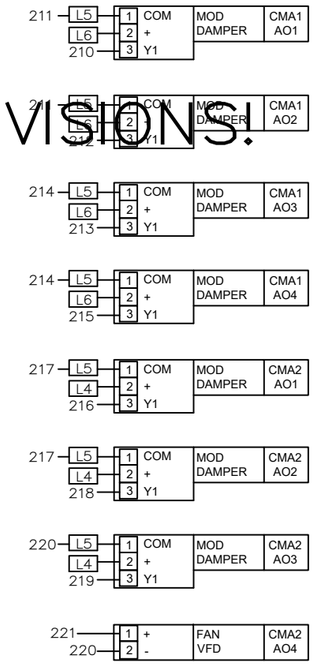
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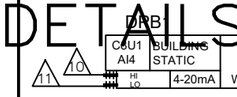
SHEET
NCHS-312
JOB NUMBER:
J-2304001

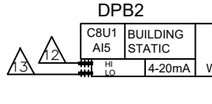
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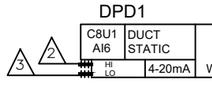


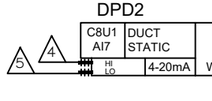


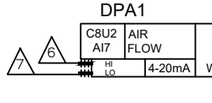


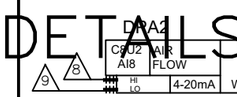












	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	eBM-800 I/O MODULE
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	

C8U1 eBM-800 — C8U1 eBM-800

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	eBM-800 I/O MODULE
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	

C8U2 eBM-800 — C8U2 eBM-800

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	eBM-440-M I/O MODULE
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	
OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	eBM-440-M I/O MODULE
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	

CMA1 eBM-440-M — CMA1 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	eBM-440-M I/O MODULE
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	
	CMA2	4	10100.1404				
OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	eBM-440-M I/O MODULE
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	

CMA2 eBM-440-M — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

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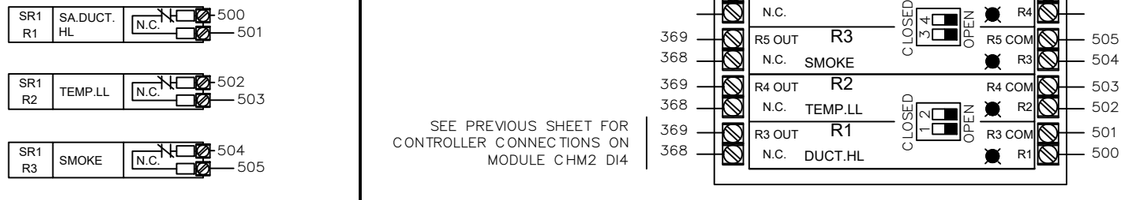
CONTRACT NO:

SHEET
NCHS-313
JOB NUMBER:
J-2304001

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU-K1 SYSTEM 38 PANEL – I/O WIRING (2 OF 2)

Delta Controls
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4240 W 50 S
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SYSTEM 38 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

ETS1

ETHERNET SWITCH

CAT5e

SR1

RIBMNLB-4

TX1

24V CB

Power

120 VAC LAPTOP PWR

CONTROLLER PWR

FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

PS1

TB1

1.0A

5.0A

PANEL GND LUG

120 VAC

TB2

24 VAC TO FIELD

TB3

24 VDC TO FIELD

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1

NET

PWR

24 VAC

LINKNET (RS-485)

CEB1

C4X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800

eBM-440-M

eBM-440-M

eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-K1 SYSTEM 38 PANEL – POWER & NETWORK WIRING

Temperature Control Services
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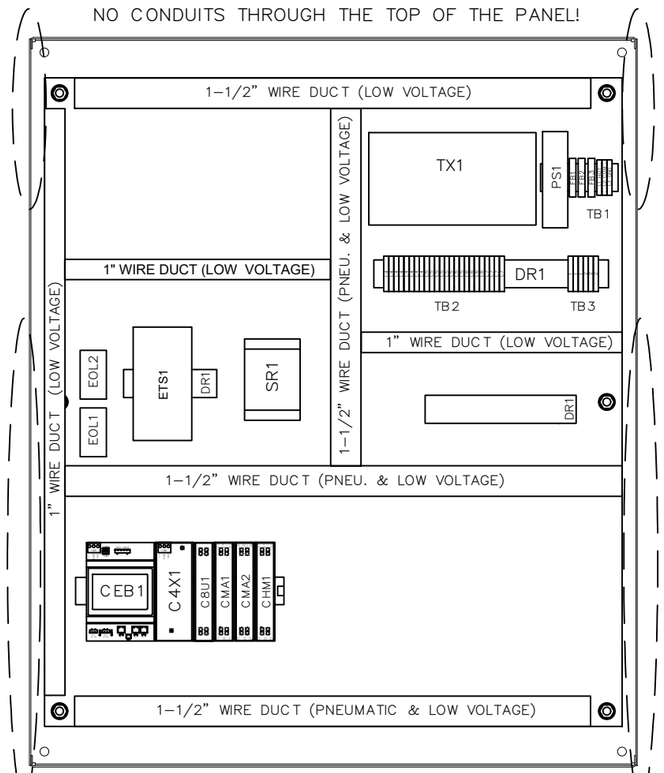
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SYSTEM CONTROL PANEL 38 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

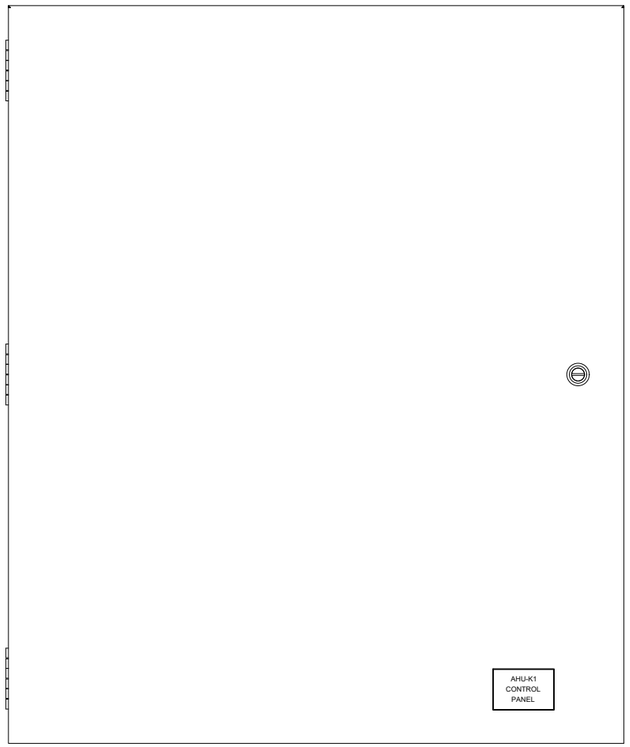
NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

BILL OF MATERIALS

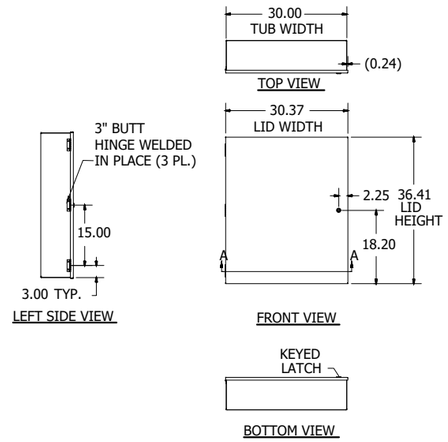
WILL BE PROVIDED IN A FUTURE REVISION. △

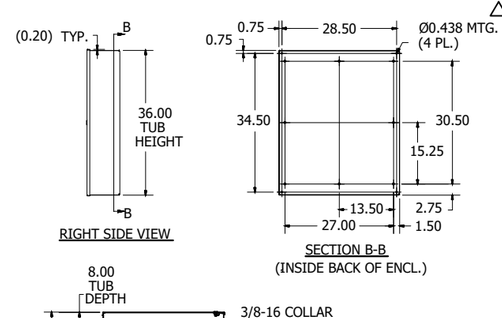
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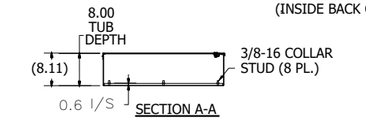
WILL BE PROVIDED IN A FUTURE REVISION. △

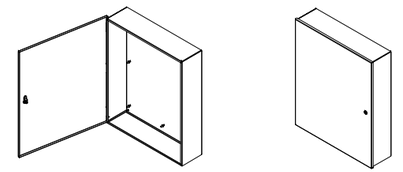
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

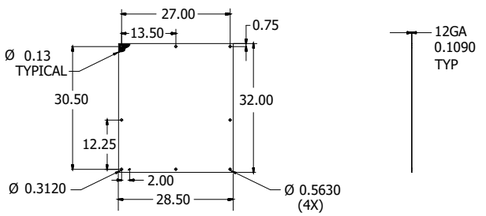








PANEL DIMENSIONS



E-AHU-K1 SYSTEM 38 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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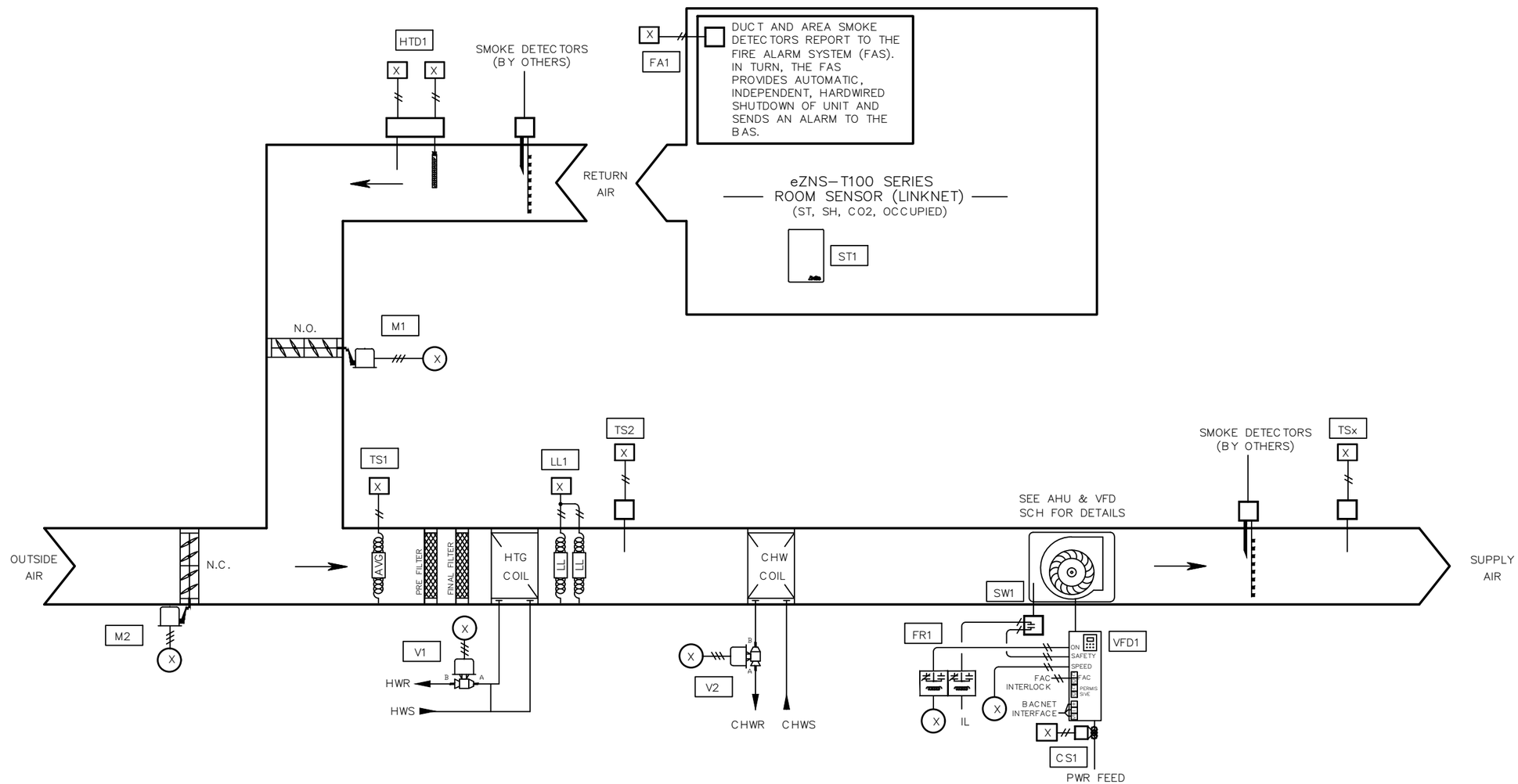
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E–AHU–K2 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

E–AHU–K2 FIELD DEVICES

Delta Controls

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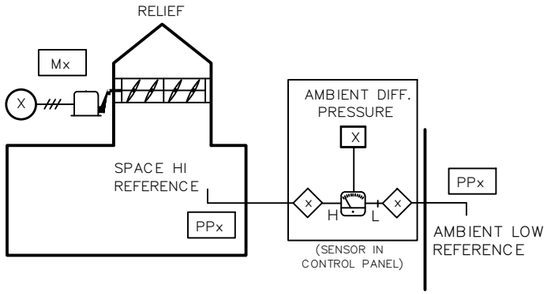
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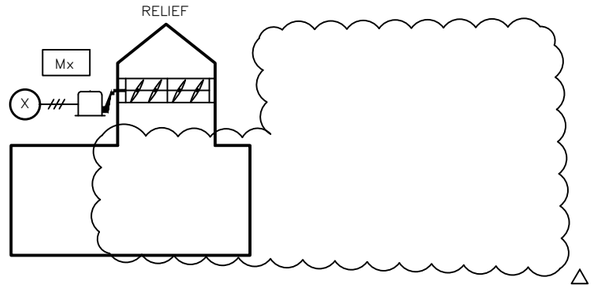
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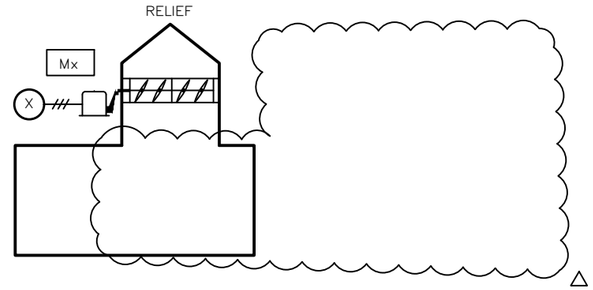
BUILDING PRESSURE CONTROL E-RH-K1



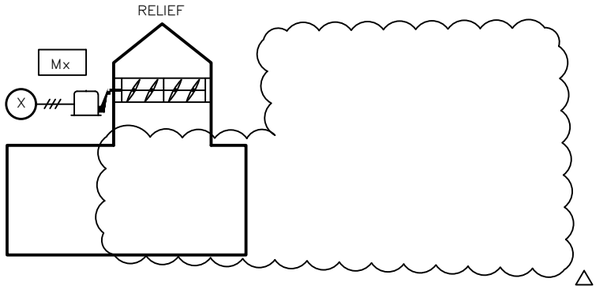
BUILDING PRESSURE CONTROL E-RH-K2



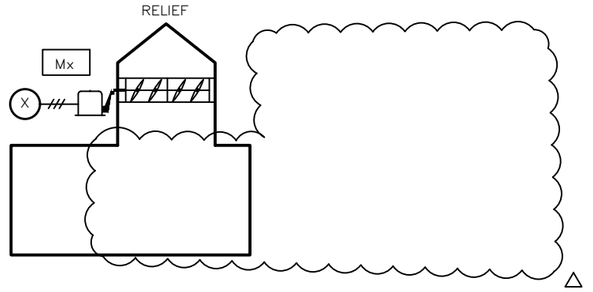
BUILDING PRESSURE CONTROL E-RH-K3



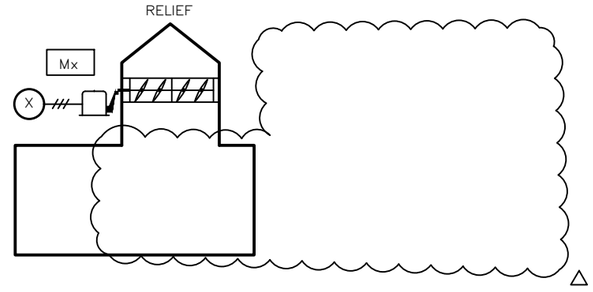
BUILDING PRESSURE CONTROL E-RH-K4



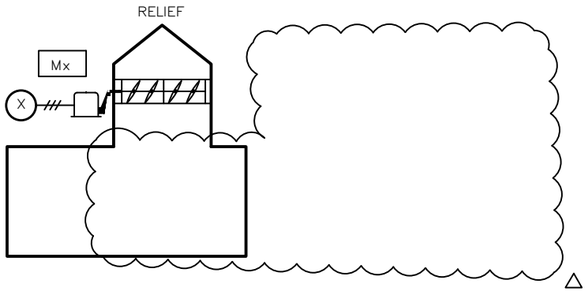
BUILDING PRESSURE CONTROL E-RH-K5



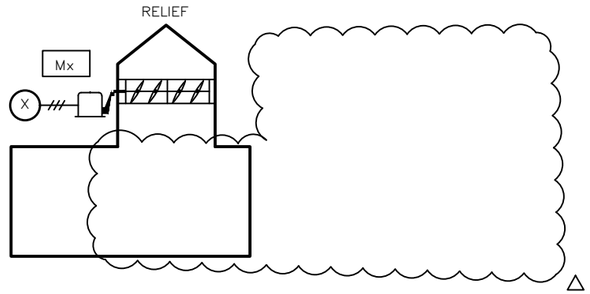
BUILDING PRESSURE CONTROL E-RH-K6



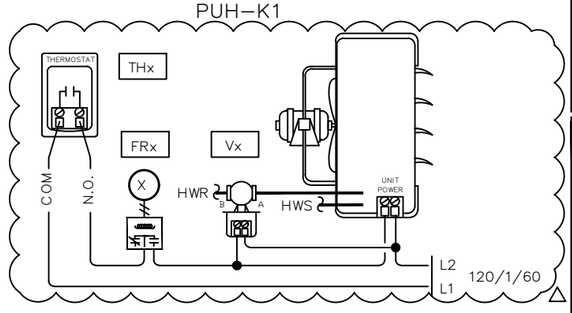
BUILDING PRESSURE CONTROL E-RH-K7



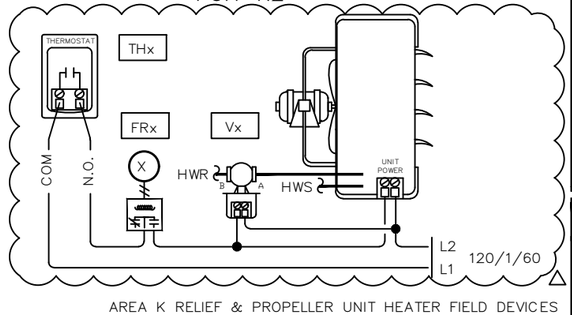
BUILDING PRESSURE CONTROL E-RH-K8



PROPELLER UNIT HEATER PUH-K1



PROPELLER UNIT HEATER PUH-K2



AREA K RELIEF & PROPELLER UNIT HEATER FIELD DEVICES

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
MAT	Mixed Air Temperature	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-K1 DPR	Relief Air Damper			X		
E-RH-K2 DPR	Relief Air Damper			X		
E-RH-K3 DPR	Relief Air Damper			X		
E-RH-K4 DPR	Relief Air Damper			X		
E-RH-K5 DPR	Relief Air Damper			X		
E-RH-K6 DPR	Relief Air Damper			X		
E-RH-K7 DPR	Relief Air Damper			X		
E-RH-K8 DPR	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
PUH-K1 EN	PUH K1 Enable				X	
PUH-K2 EN	PUH K2 Enable				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**6**	**3**	**13**	**3**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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AIR HANDLING UNIT AHU-K2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

LEAD ROTATION: AHU-K2 (EAST), AHU-K3 (CENTER), AND AHU-K4 (WEST) SERVE THE MAIN GYM AND SHALL ROTATE LEAD WEEKLY. DURING OCCUPANCY, ONLY THE LEAD AIR HANDLING UNITS SHALL OPERATE UNLESS ADDITIONAL CAPACITY IS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT SETPOINT. ALL THREE AIR HANDLING UNITS SHALL BE ALLOWED TO OPERATE IF SPACE TEMPERATURE DEVIATES MORE THAN 1F (ADJ) FROM SETPOINT. LAG AIR HANDLING UNITS SHALL OPERATE ONLY WHEN REQUIRED AND TURN OFF OTHERWISE.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE, IF IN LEAD, OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFKn-C, EXCEPT EF-K1 AND EF-K2 SERVING AHU-K6) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: WHEN ANY GYM AIR HANDLING UNIT (AHU-K1 TO AHU-K5) AND UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD DAMPERS (E-RH-K1 TO E-RH-K8) SHALL START AND MODULATE IN SEQUENCE, ONE AFTER ANOTHER, TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPERS SHALL CLOSE WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZN-CO2 FROM MAIN GYM SENSOR) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE (WHEN ALL GYM AIR HANDLING UNITS (AHU-K1 TO AHU-K5) ARE NOT OPERATIONAL)
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

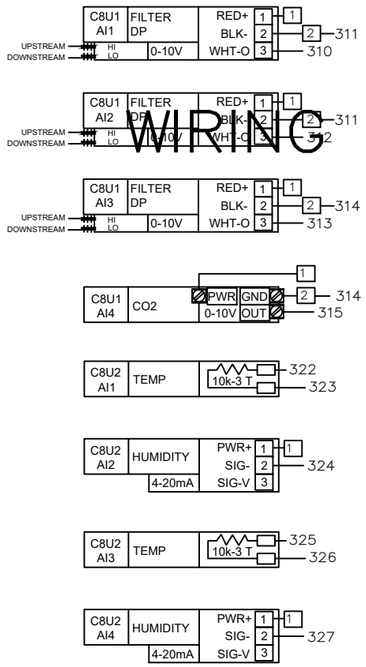
REVISIONS	
DATE	REMARKS

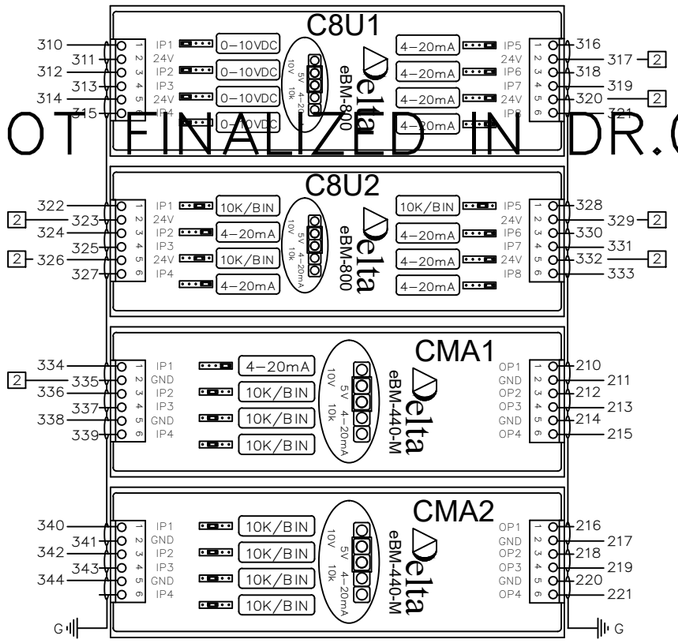
JOB TITLE: North Central High School
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ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

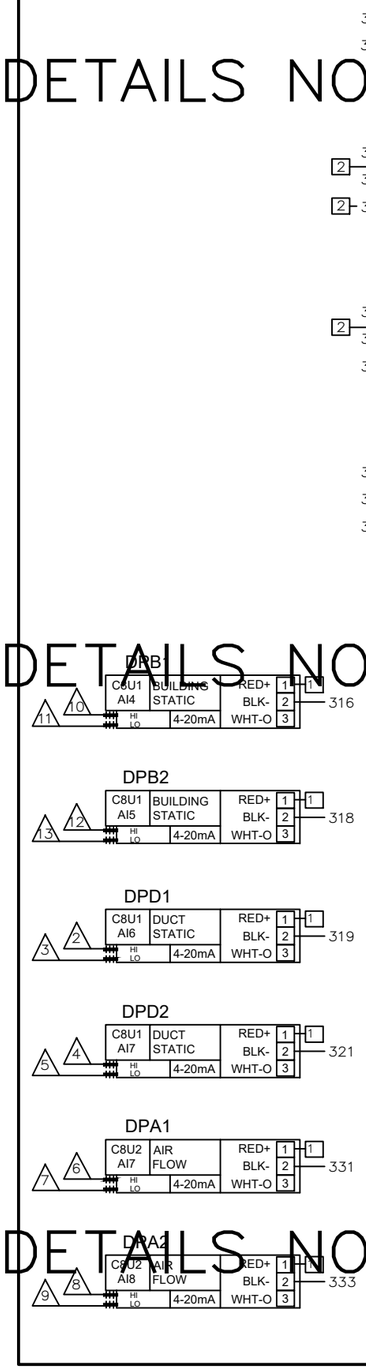
CONTRACT NO:

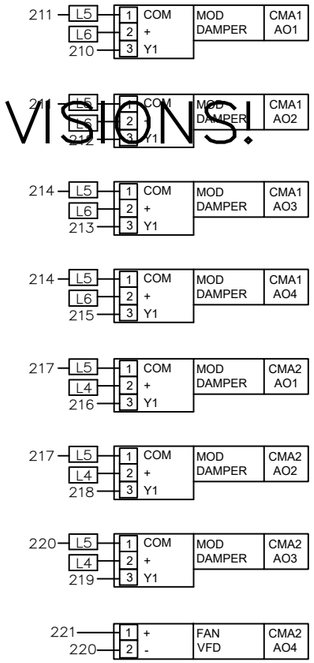
SHEET
NCHS-320
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

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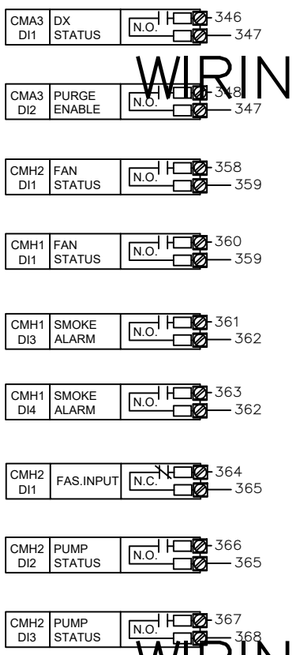
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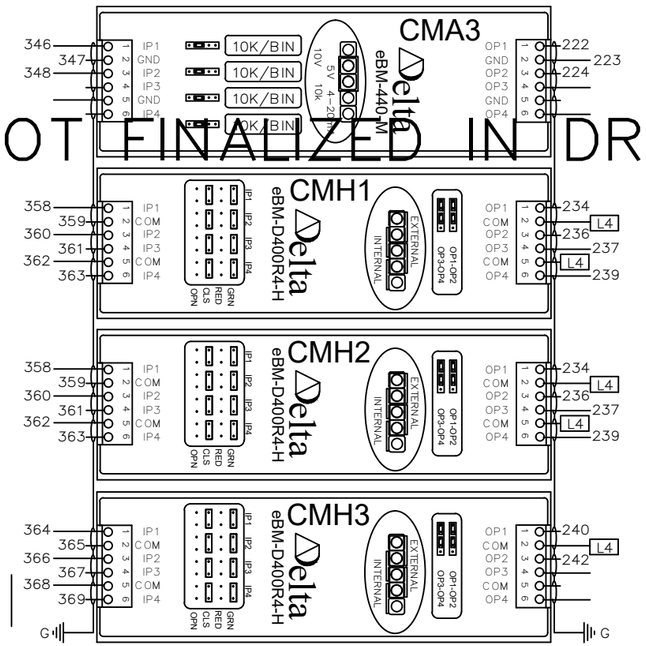
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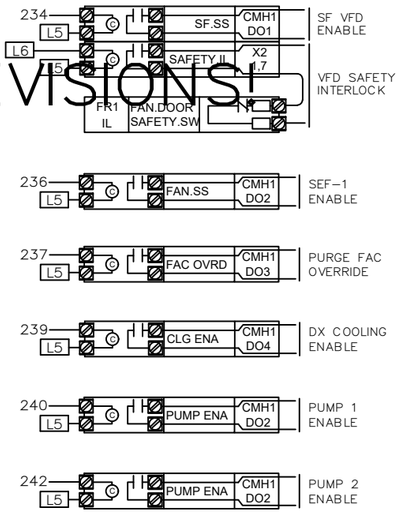
SHEET
NCHS-321
JOB NUMBER:
J-2304001

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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
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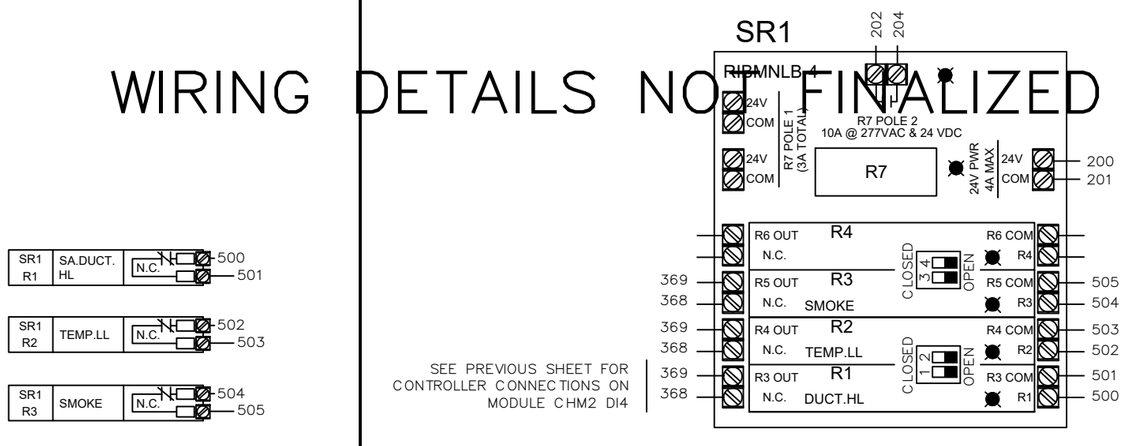
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–322
JOB NUMBER:
J–2304001

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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SHEET
NCHS-323
JOB NUMBER:
J-2304001

SYSTEM 39 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

ETS1

300
301
L3
V1-
V1+
ETHERNET SWITCH
1
3
5
2
4

CAT5e

SR1
RIBMNLB-4
202
204
200
201
24V COM
R7 POLE 2 10A @ 277VAC & 24 VDC
R7
R4 OUT N.C.
R4 COM
R3 OUT N.C.
R3 COM
R2 OUT N.C.
R2 COM
R1 OUT N.C.
R1 COM
R4
R3
R2
R1
CLOSED
LOW

TRANSFORMER
102
L2
206
207

TX1
24V CB
Power
100
H
C
G
L2
L3
5VA
24VAC
120 VAC LAPTOP PWR
200
201
202
203
CONTROLLER PWR
FIELD DEV POWER

24 VDC PWR
PWR SUPPLY
+V
-V
GND
L
N
300
301
101
L3
L2
PS1

TB1
4.0A
1.0A
5.0A
102
101
100
L1
L2
L3
H
N
G
120 VAC
PANEL GND LUG

TB2
202
203
204
205
206
207
L4
L5
L6
L7
L8
L9
24 VAC TO FIELD

TB3
300
301
1
2
24 VDC TO FIELD

DPB1
1
Power +
GND / 4-20mA out
Voltage out
HIGH
LOW
4
5
PNEUMATIC

eZNS-T100 SERIES
ROOM SENSOR
POWER & NETWORK
WIRING

ST1
NET
PWR
24 VAC
LINKNET (RS-485)

201
200
CEB1
PWR
GND
24~
USB2
USB1
(NOT USED)
NET1 RS-485
NET2 RS-485
MS/TP
LINKNET (RS-485)

C8X1
eBMGR-2
eBX
eBUS Address
eBUS
eBM-800
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN
L3
TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-K2 SYSTEM 39 PANEL - POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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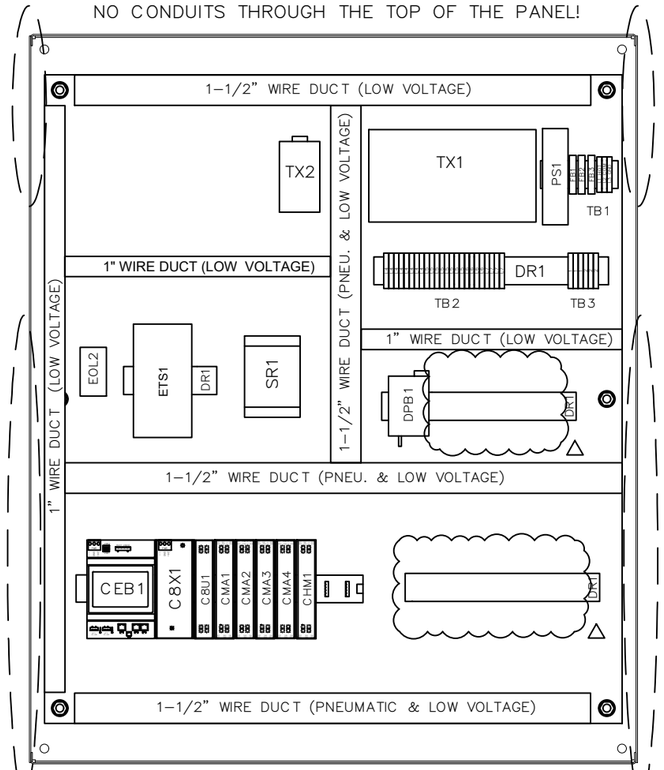
CONTRACT NO:

SHEET
NCHS-324
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J-2304001

SYSTEM CONTROL PANEL 39 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

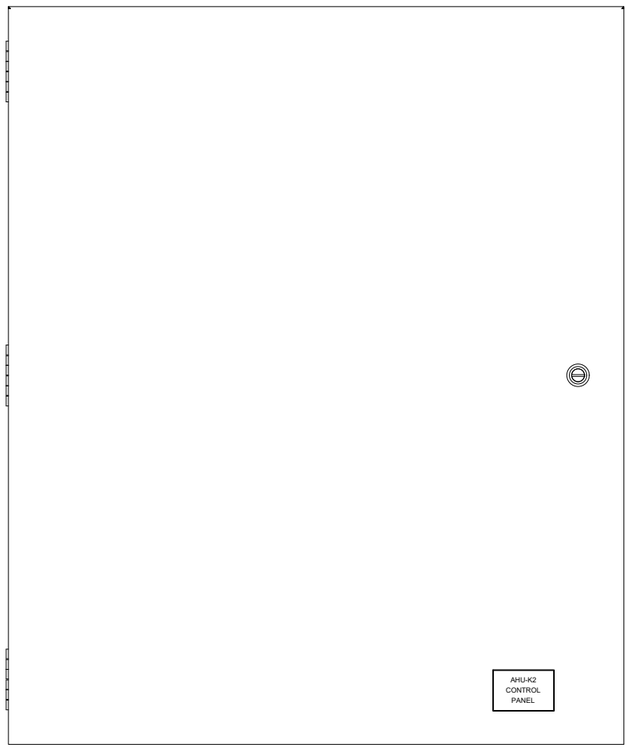


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



BILL OF MATERIALS

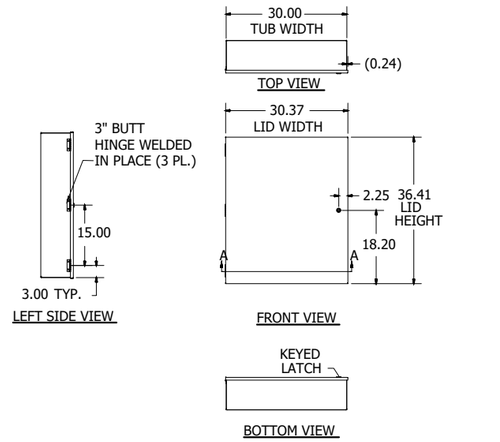
WILL BE PROVIDED IN A FUTURE REVISION. △

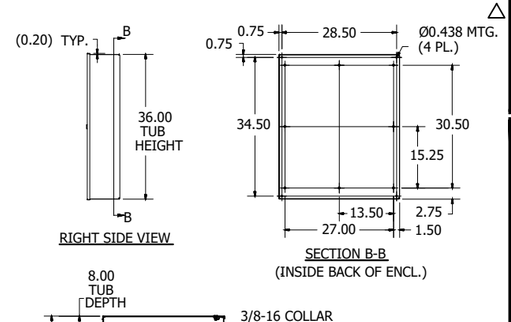
BILL OF MATERIALS

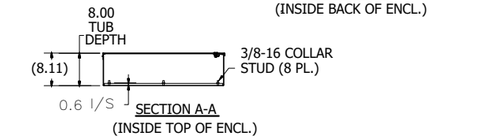
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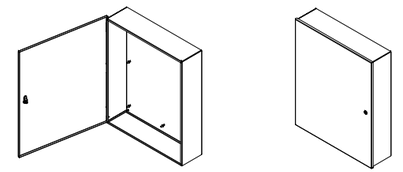
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

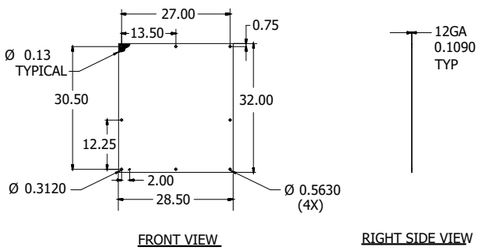








PANEL DIMENSIONS



E–AHU–K2 SYSTEM 39 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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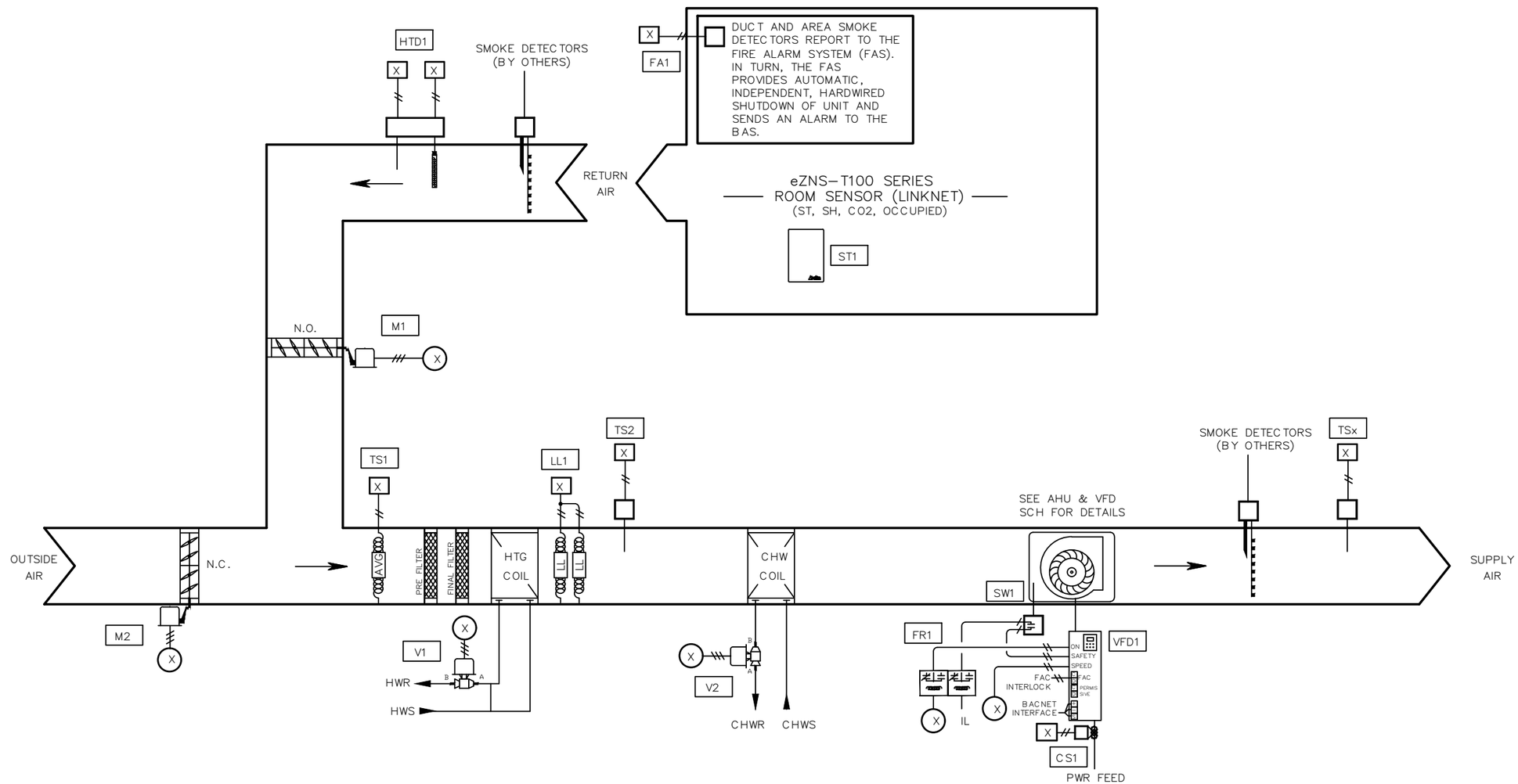
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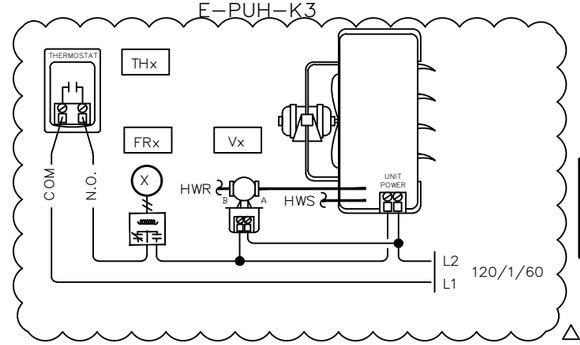
CONTRACT NO:

SHEET
NCHS–325
JOB NUMBER:
J–2304001

E–AHU–K3 FIELD DEVICES



PROPELLER UNIT HEATER
E–PUH–K3



NETWORK POINTS
N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

E–AHU–K3 & AREA K PUH FIELD DEVICES

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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
MAT	Mixed Air Temperature	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
E-PUH-K3 EN	PUH K3 Enable				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**4**	**3**	**5**	**2**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-K3 & AREA K MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
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JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-327
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-K3 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

LEAD ROTATION: AHU-K2 (EAST), AHU-K3 (CENTER), AND AHU-K4 (WEST) SERVE THE MAIN GYM AND SHALL ROTATE LEAD WEEKLY. DURING OCCUPANCY, ONLY THE LEAD AIR HANDLING UNITS SHALL OPERATE UNLESS ADDITIONAL CAPACITY IS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT SETPOINT. ALL THREE AIR HANDLING UNITS SHALL BE ALLOWED TO OPERATE IF SPACE TEMPERATURE DEVIATES MORE THAN 1F (ADJ) FROM SETPOINT. LAG AIR HANDLING UNITS SHALL OPERATE ONLY WHEN REQUIRED AND TURN OFF OTHERWISE.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE, IF IN LEAD, OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZN-CO2 FROM MAIN GYM SENSOR) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE (WHEN ALL GYM AIR HANDLING UNITS (AHU-K1 TO AHU-K5) ARE NOT OPERATIONAL)
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

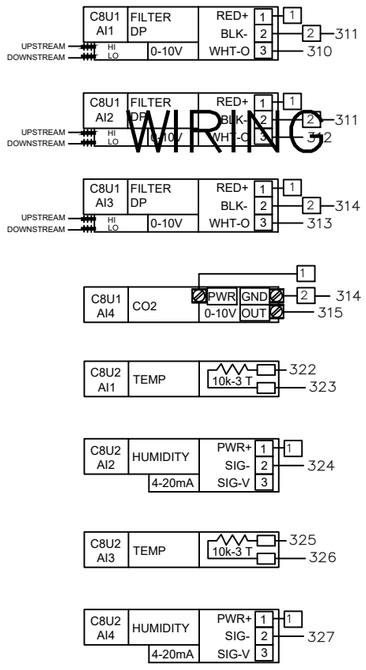
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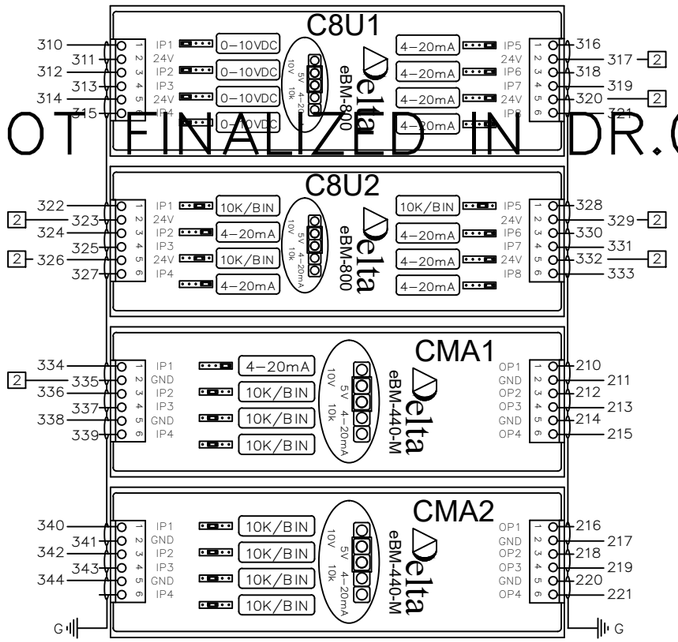
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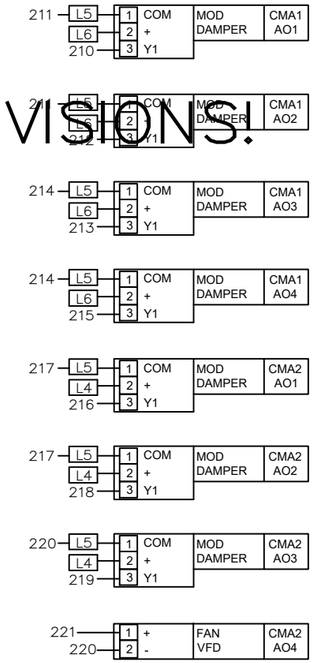
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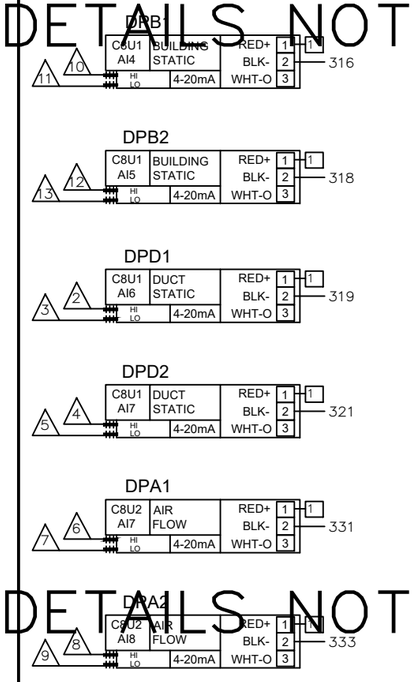
SHEET
NCHS-328
JOB NUMBER:
J-2304001

SYSTEM 40 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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Delta Controls
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UPDATES	
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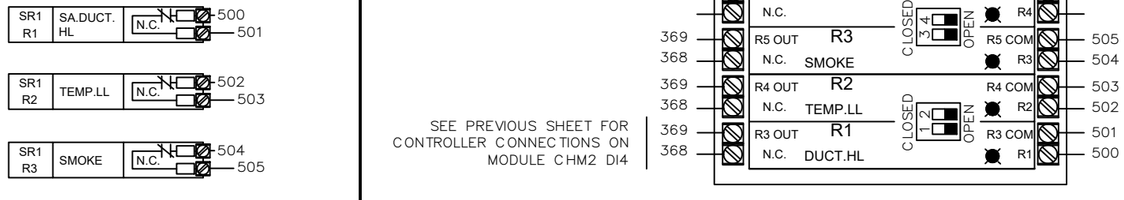
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INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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SYSTEM 40 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

GND

300
301
L3
ETS1
V1-
V1+
ETHERNET SWITCH
1
3
5
4
2
CAT5e

SR1
RIBMNLB-4
202
204
200
201
24V COM
R7 POLE 2 10A @ 277VAC & 24 VDC
R7
R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.
R4 COM
R3 COM
R2 COM
R1 COM
CLOSED
OPEN

TX1
24V CB
Power
100
L2
L3
H
C
G
75VA
24VAC
120 VAC LAPTOP PWR
200
201
202
203
CONTROLLER PWR
FIELD DEV POWER

24 VDC PWR
PWR SUPPLY
+V
-V
GND
L
N
300
301
101
L3
L2
PS1

1.0A
5.0A
101
100
G
PANEL GND LUG
TB1
L1
L2
L3
H
N
120 VAC

TB2
202
203
204
205
L4
L5
L6
L7
24 VAC TO FIELD

TB3
300
301
1
2
24 VDC TO FIELD

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1
NET
PWR
24 VAC
LINKNET (RS-485)

201
200
CEB1
PWR
GND
24~
USB2
USB1
(NOT USED)
NET1 RS-485
NET2 RS-485
LAN 1
LAN 2

eBMGR-2

C4X1
eBX
eBUS Address
eBUS

eBM-440-M
eBM-440-M
eBM-D400R4-H
OP1
OP2
OP3
OP4
HAO

I/O SHIELD DRAIN
L3
TO PANEL GND LUG

MS/TP
LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-K3 SYSTEM 40 PANEL - POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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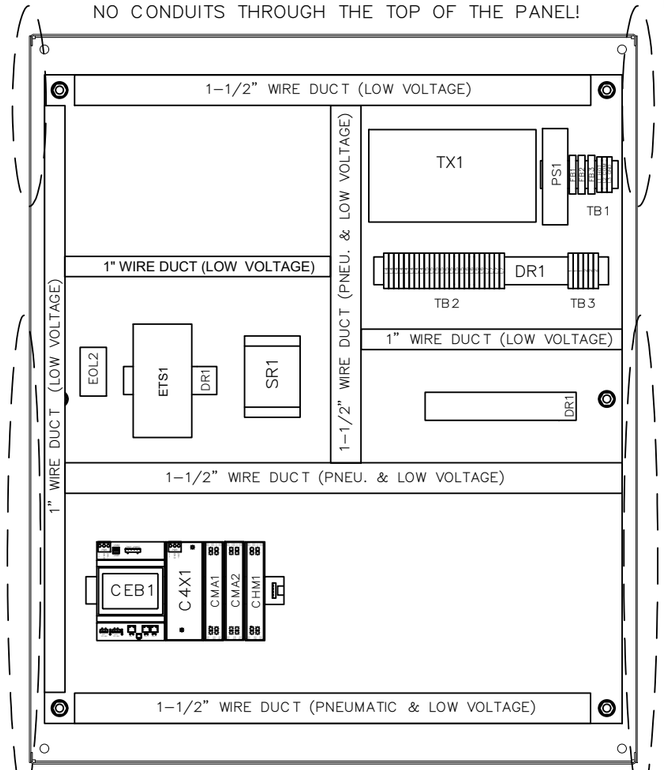
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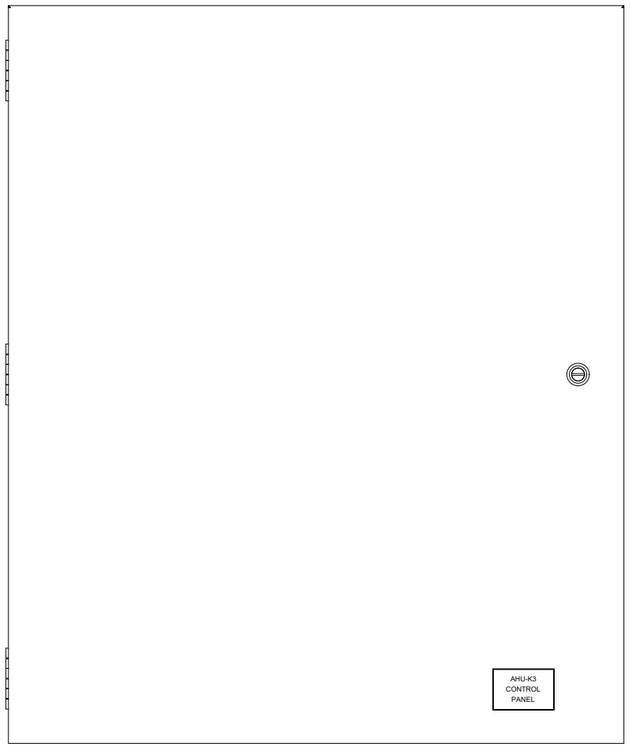
SYSTEM CONTROL PANEL 40 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

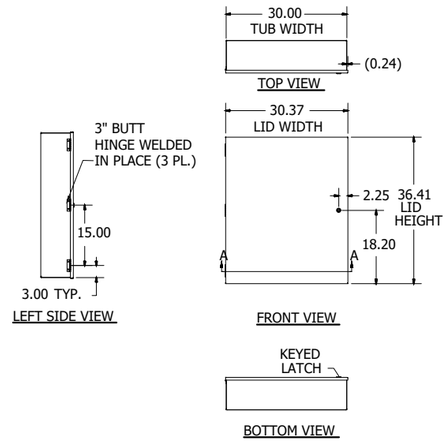
WILL BE PROVIDED IN A FUTURE REVISION. △

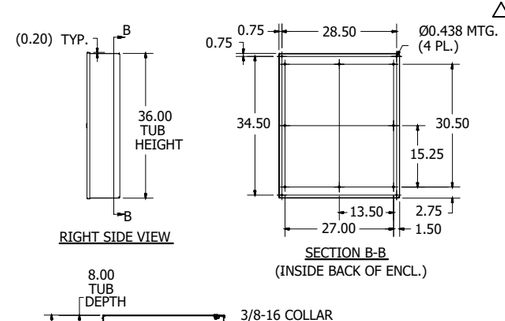
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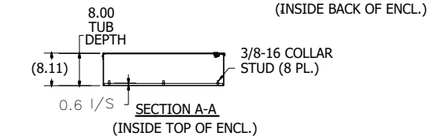
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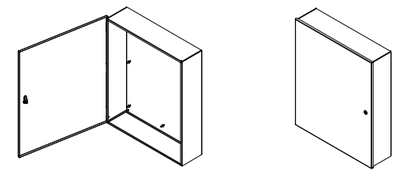
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

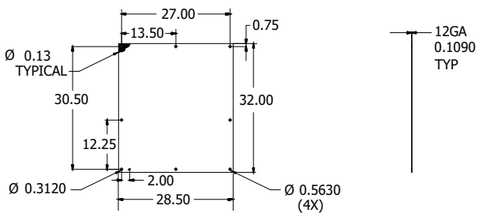








PANEL DIMENSIONS



E–AHU–K3 SYSTEM 40 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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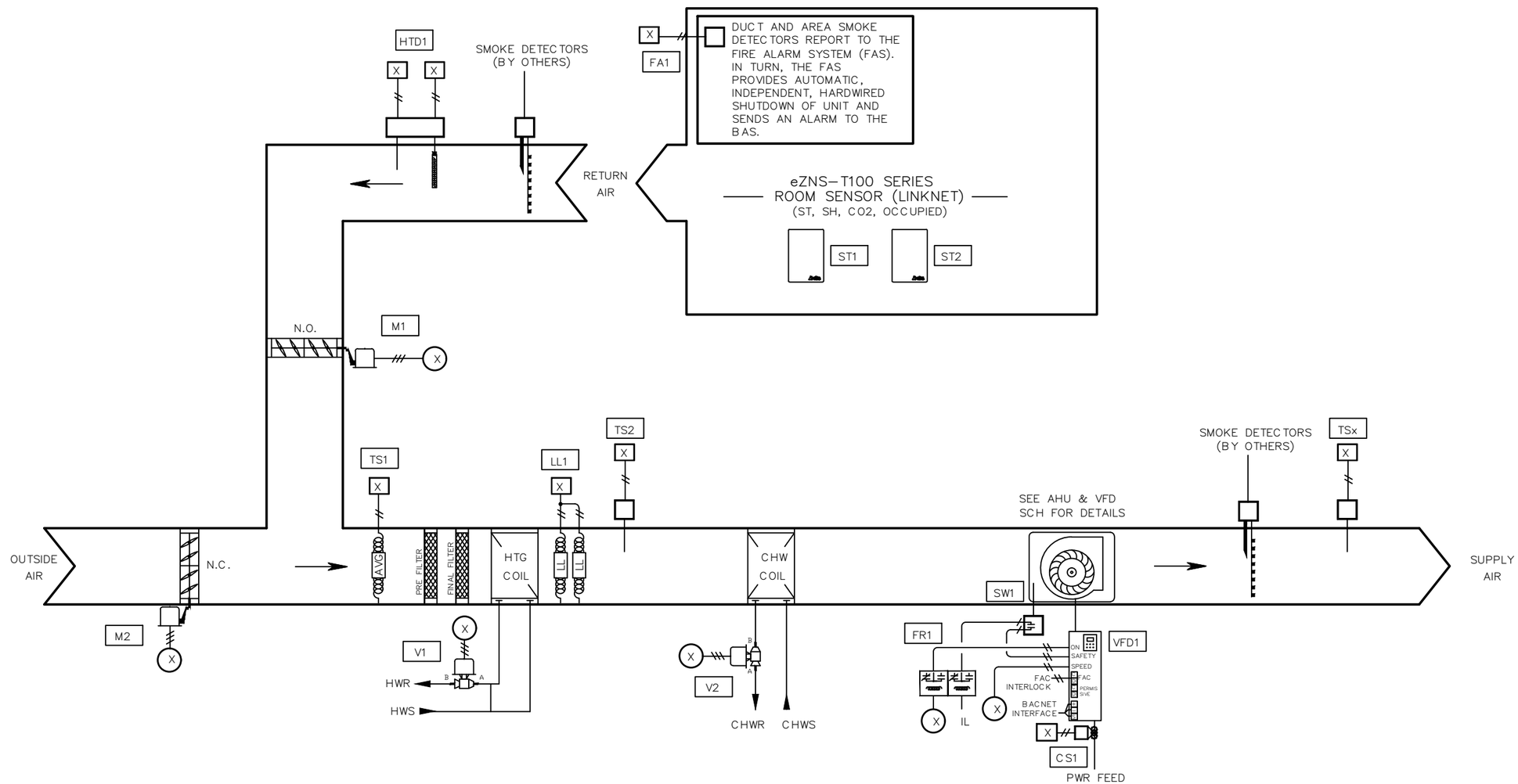
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E–AHU–K4 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–K4 FIELD DEVICES

Delta Controls

Temperature Control Services
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SHEET
NCHS–333
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
MAT	Mixed Air Temperature	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
ST2	Space Temp					X
SH3	Space Humidity					X
S CO22	Space CO2					X
OCC2	Occupied Flag					X
	POINT TOTALS:	**4**	**3**	**5**	**1**	**8**

SOFTWARE AND NETWORK (NON–PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E–AHU–K4 POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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AIR HANDLING UNIT AHU-K4 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

LEAD ROTATION: AHU-K2 (EAST), AHU-K3 (CENTER), AND AHU-K4 (WEST) SERVE THE MAIN GYM AND SHALL ROTATE LEAD WEEKLY. DURING OCCUPANCY, ONLY THE LEAD AIR HANDLING UNITS SHALL OPERATE UNLESS ADDITIONAL CAPACITY IS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT SETPOINT. ALL THREE AIR HANDLING UNITS SHALL BE ALLOWED TO OPERATE IF SPACE TEMPERATURE DEVIATES MORE THAN 1F (ADJ) FROM SETPOINT. LAG AIR HANDLING UNITS SHALL OPERATE ONLY WHEN REQUIRED AND TURN OFF OTHERWISE.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE, IF IN LEAD, OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZN-CO2 FROM MAIN GYM SENSOR) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE (WHEN ALL GYM AIR HANDLING UNITS (AHU-K1 TO AHU-K5) ARE NOT OPERATIONAL)
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

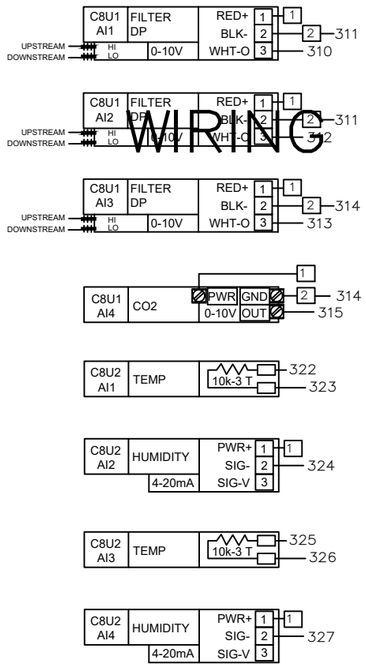
REVISIONS	
DATE	REMARKS

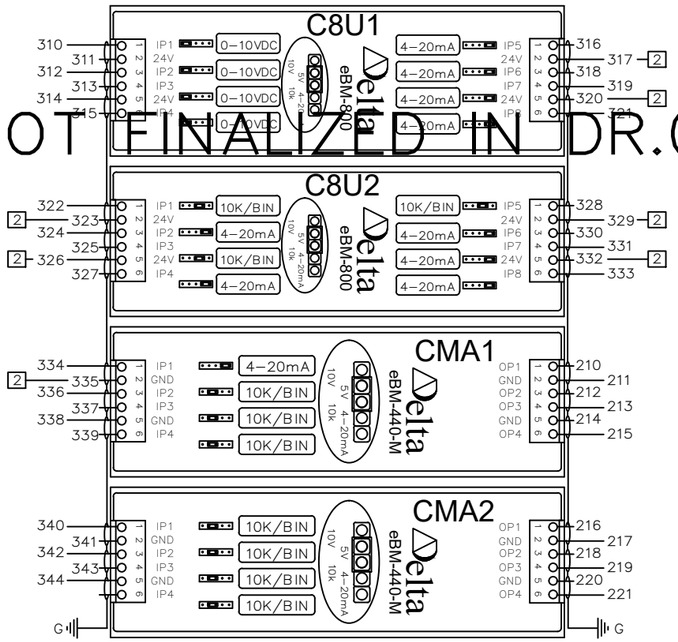
JOB TITLE: North Central High School
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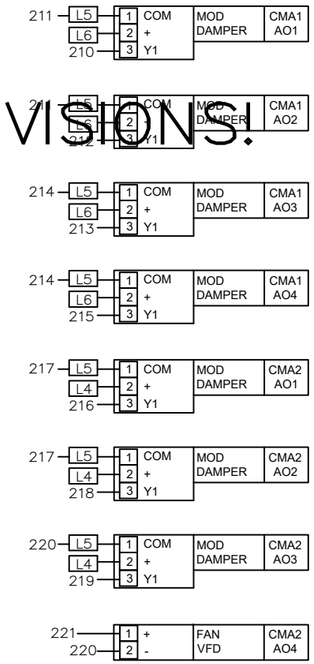
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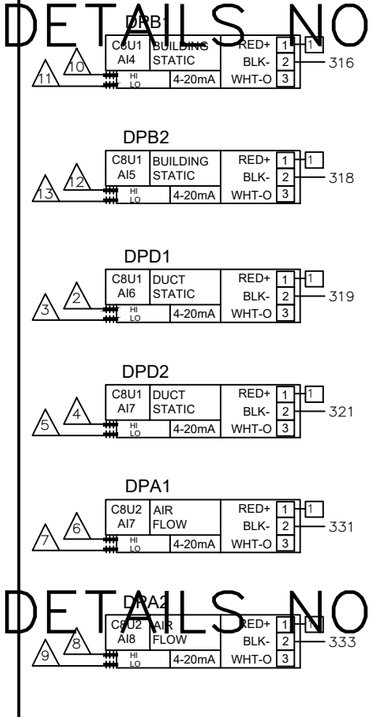
SHEET
NCHS-335
JOB NUMBER:
J-2304001

SYSTEM 41 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 eBM-800 I/O MODULE INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 eBM-800 I/O MODULE INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M eBM-440-M I/O MODULE INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M eBM-440-M I/O MODULE INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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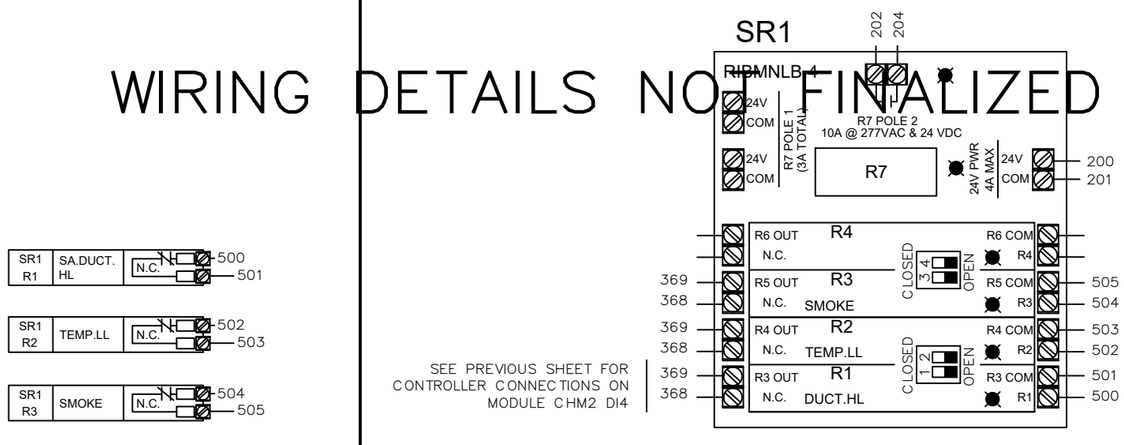
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CONTRACT NO:

SHEET
NCHS-336
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU-K4 SYSTEM 41 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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CONTRACT NO:

SHEET
NCHS-337
JOB NUMBER:
J-2304001

SYSTEM 41 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

ETS1

ETHERNET SWITCH

CAT5e

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

SR1

RIBMNLB-4

TX1

24V CB

Power

120 VAC LAPTOP PWR

CONTROLLER PWR

FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

PS1

TB1

PANEL GND LUG

120 VAC

TB2

24 VAC TO FIELD

TB3

24 VDC TO FIELD

EOL 4

ST1

ST2

NET

PWR

24 VAC

LINKNET (RS-485)

CEB1

C4X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800

eBM-440-M

eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

EOL3

MS/TP

LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-K4 SYSTEM 41 PANEL - POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
4240 W 50 S
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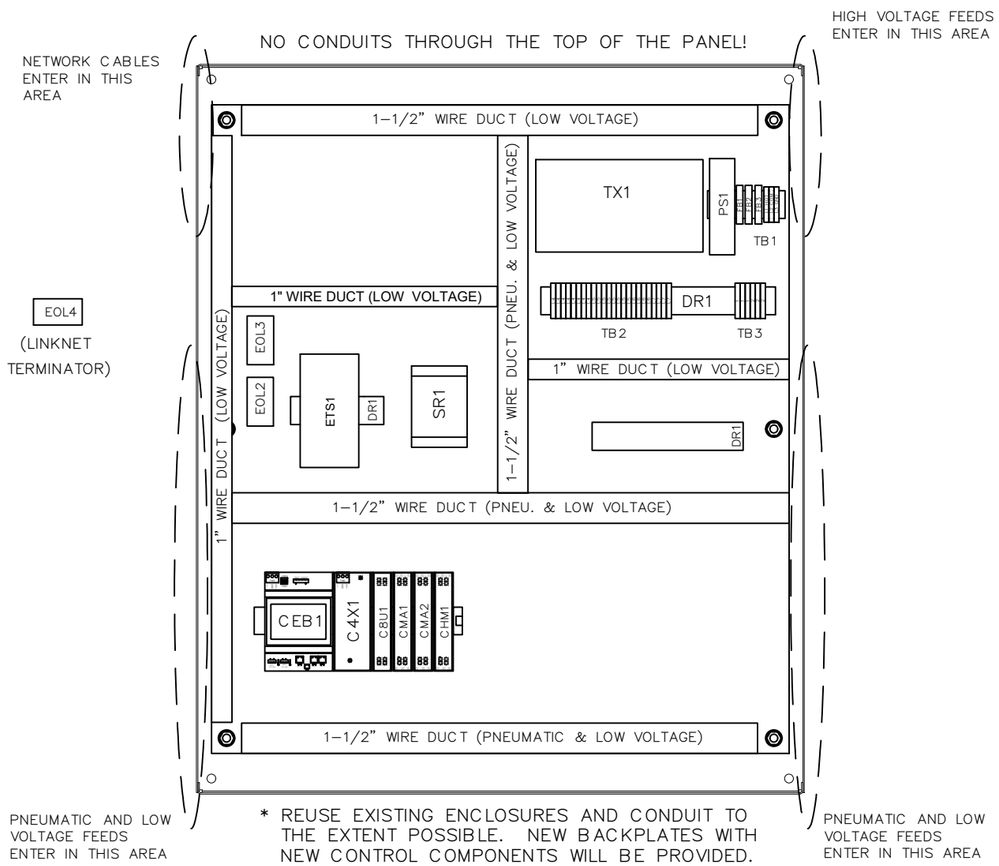
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CONTRACT NO:

SHEET
NCHS-338
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 41 LAYOUT



* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

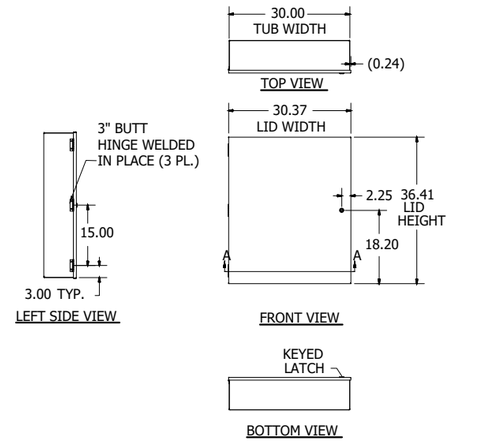
WILL BE PROVIDED IN A FUTURE REVISION. △

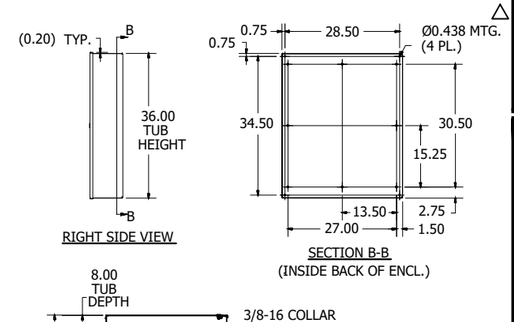
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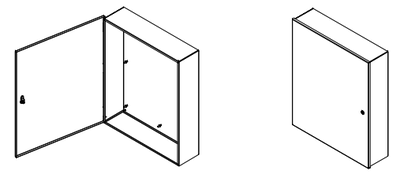
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

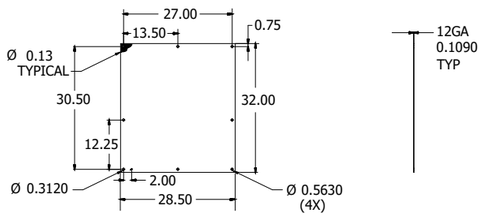
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



E-AHU-K4 SYSTEM 41 PANEL – DIMENSIONS & BOM

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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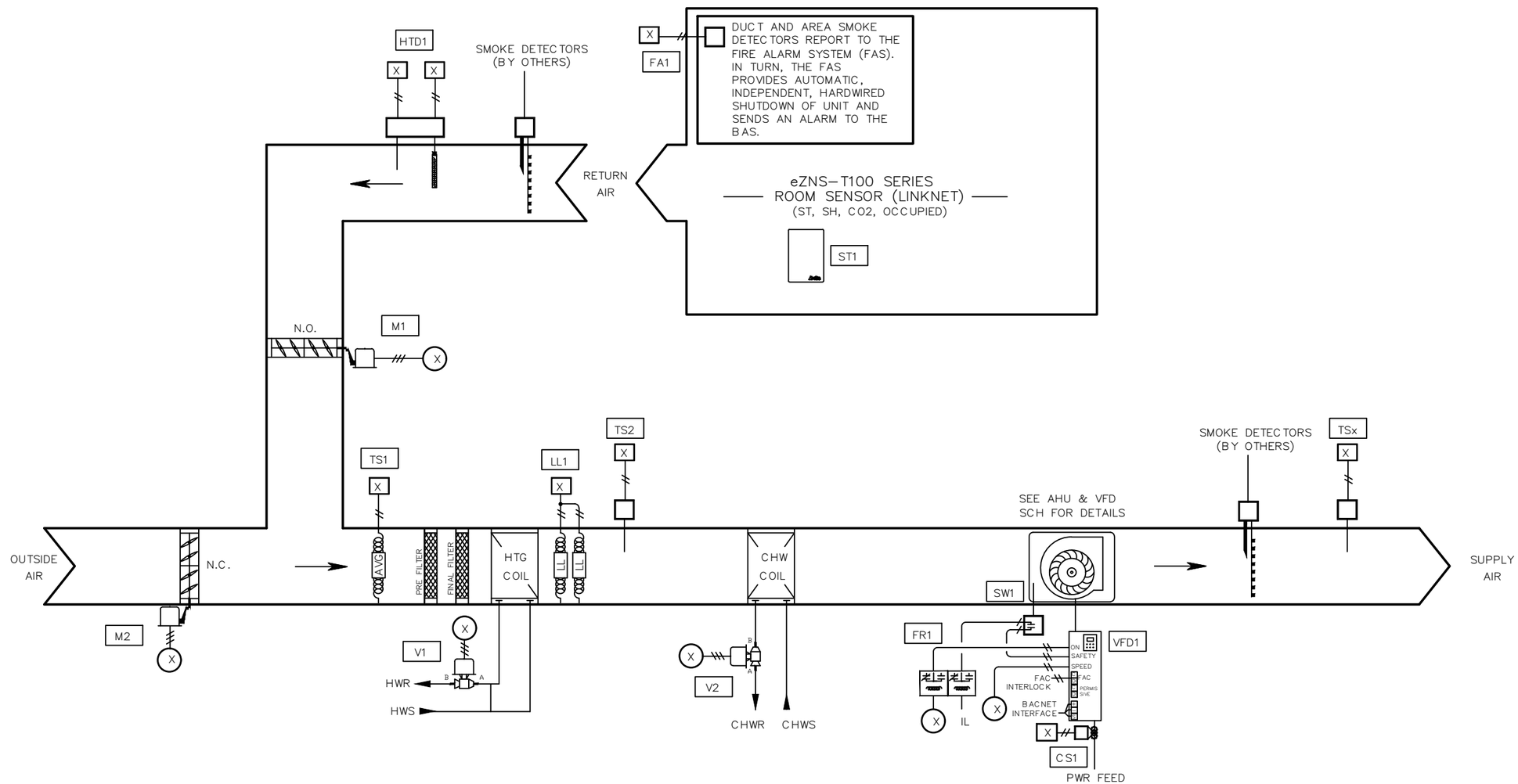
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SHEET
NCHS-339
JOB NUMBER:
J-2304001

E–AHU–K5 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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CONTRACT NO:

SHEET
NCHS–340
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
MAT	Mixed Air Temperature	X				
PHT	Preheat Discharge Air Temp	X				
RAT	Return Air Temperature	X				
LL	Low Limit (Freezestat)		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**4**	**3**	**5**	**1**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-K5 POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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SHEET
NCHS-341
JOB NUMBER:
J-2304001

AIR HANDLING UNIT AHU-K5 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

AHU-K5 SERVES THE WEST UPPER GYM

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR AS MANUALLY SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN SPEED SHALL BE MODULATED FROM MINIMUM SPEED OF 25% TO MAXIMUM SPEED OF 100 %. THE MAXIMUM SPEED SHALL BE DETERMINED BY THE BALANCER TO ACHIEVE THE SCHEDULED AIRFLOW REQUIRED. MINIMUM AND MAXIMUM FAN SPEEDS TO BE ADJUSTABLE.

OCCUPIED MODE: DISCHARGE AIR SETPOINT SHALL BE RESET FROM 55 F TO 95 F TO MAINTAIN ROOM TEMPERATURE AT SETPOINT OF 72 F (ADJ). PREHEAT AND COOLING COIL CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR SETPOINT. ON A CALL FOR ADDITIONAL COOLING THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. ON A CALL FOR ADDITIONAL HEATING, THE SUPPLY FAN SHALL MODULATE FROM MINIMUM SPEED TO MAXIMUM SPEED TO SATISFY ROOM TEMPERATURE. THE PREHEAT AIR TEMPERATURE SENSOR (PH-T) SHALL BE UTILIZED IN LOGIC TO MAINTAIN A MINIMUM PREHEAT AIR TEMPERATURE OF 50F AT ALL TIMES BY MODULATE THE PREHEAT VALVE AS NECESSARY.

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE ZONE AIR ENTHALPY (ZN-T, ZN-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

ZONE CARBON DIOXIDE CONTROL: WHEN THE MAXIMUM ZONE CARBON DIOXIDE LEVEL (ZNn-CO2 FROM MAIN GYM SENSORS) EXCEEDS THE SETPOINT OF 1000PPM (ADJ), THE MIXED AIR DAMPERS SHALL MODULATE FROM MINIMUM POSITION TO BRING IN ADDITIONAL OUTSIDE AIR SUBJECT TO A MIXED AIR TEMPERATURE (MA-T) LOW LIMIT AND HIGH LIMIT EQUAL TO ENTERING AIR TEMPERATURES NOTED ON THE MECHANICAL SCHEDULE. LOW LIMIT SHALL BE EQUAL TO THE ENTERING AIR TEMPERATURE FOR THE PREHEAT COIL AND THE HIGH LIMIT SHALL BE THE ENTERING AIR TEMPERATURE FOR THE COOLING COIL.

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FANS TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
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-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

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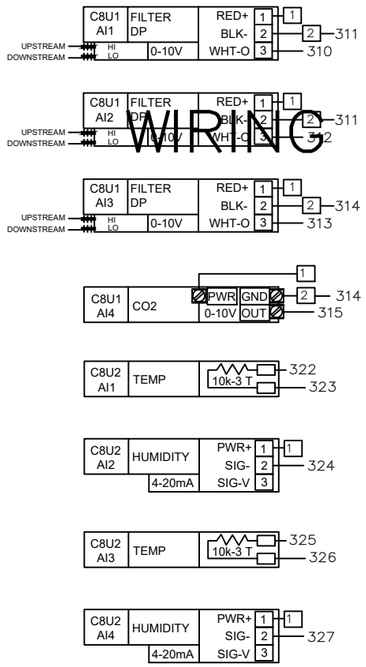
REVISIONS	
DATE	REMARKS

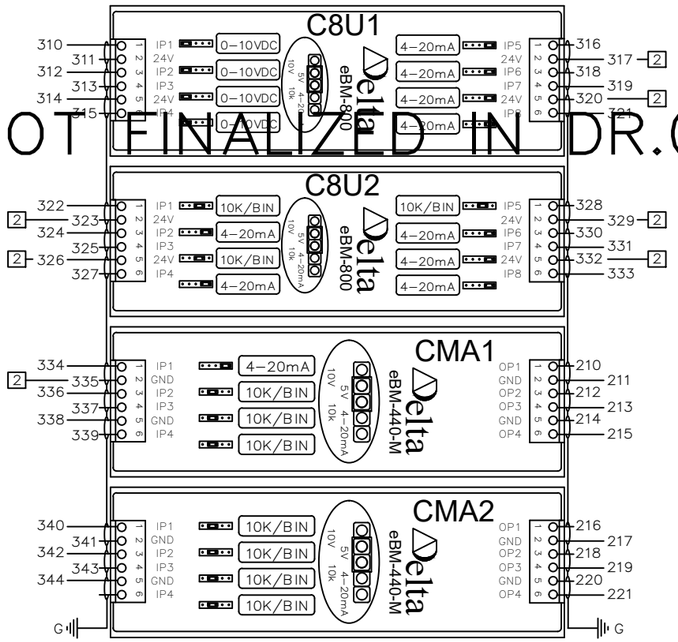
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

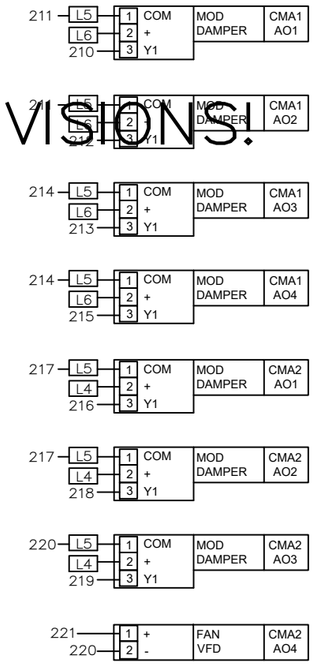
CONTRACT NO:

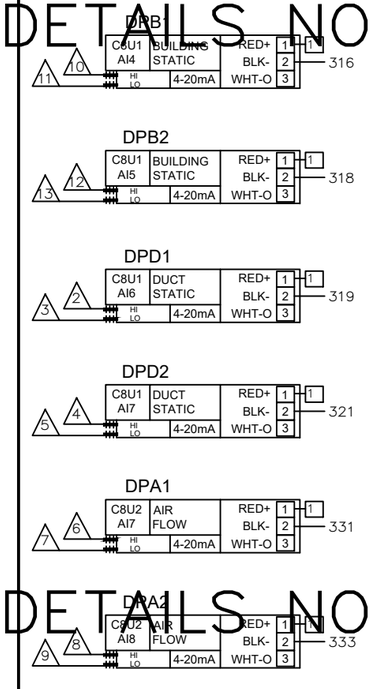
SHEET
NCHS-342
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

E-AHU-K5 SYSTEM 42 PANEL – I/O WIRING (1 OF 2)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

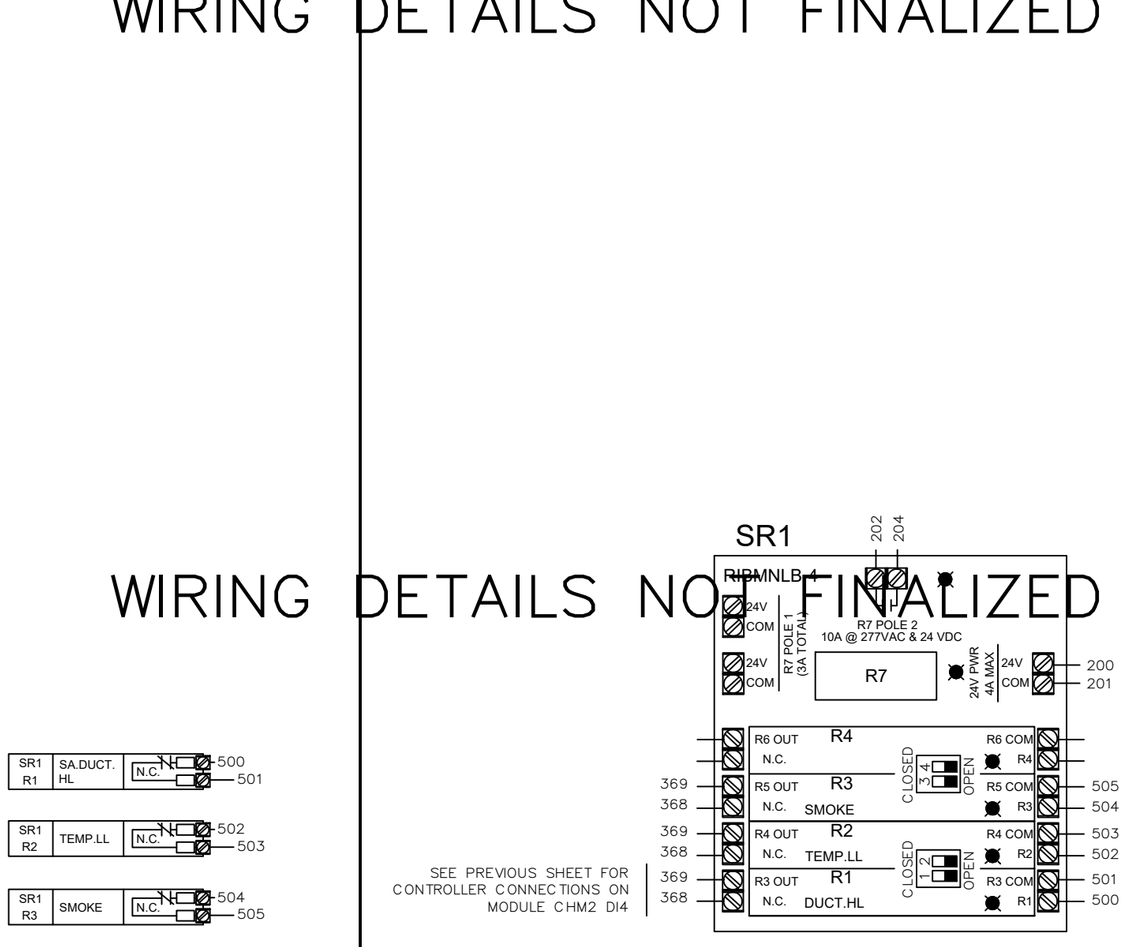
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT WITH: MSD Washington Township
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SHEET
NCHS-343
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-K5 SYSTEM 42 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

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SHEET
NCHS-344
JOB NUMBER:
J-2304001

SYSTEM 42 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

SNS

ETS1

300
301
L3
V1-
V1+
ETHERNET SWITCH
1
3
5
2
4
CAT5e

SR1
RIBMNLB-4
202
204
200
201
24V COM
R7 POLE 2 10A @ 277VAC & 24 VDC
R7
R4 OUT N.C.
R4 COM
R3 OUT N.C.
R3 COM
R2 OUT N.C.
R2 COM
R1 OUT N.C.
R1 COM
CLOSED
OPEN
LOCAL

TX1
24V CB
24V CB
Power
Power
100
L2
L3
H
C
G
75VA
24VAC
24VAC
120 VAC LAPTOP PWR
200
201
CONTROLLER PWR
202
203
FIELD DEV POWER

24 VDC PWR
PWR SUPPLY
+V
-V
GND
L
N
300
301
101
L3
L2
PS1

101
1.0A
100
5.0A
G
PANEL GND LUG
TB1
L1
L2
L3
H
N
120 VAC

TB2
202
203
204
205
L4
L5
L6
L7
24 VAC TO FIELD

TB3
300
301
1
2
24 VDC TO FIELD

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1
NET
PWR
24 VAC
LINKNET (RS-485)

201
200
CEB1
PWR
GND
24~
USB2
USB1
(NOT USED)
NET1 RS-485
NET2 RS-485
LAN 1
LAN 2
LAN 3
eBMGR-2
MS/TP
LINKNET (RS-485)

201
200
C4X1
PWR
eBX
eBUS Address
eBUS
P7 24Vs P8
P5 24Vs P6
eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H
I/O SHIELD DRAIN
L3
TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-K5 SYSTEM 42 PANEL - POWER & NETWORK WIRING

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
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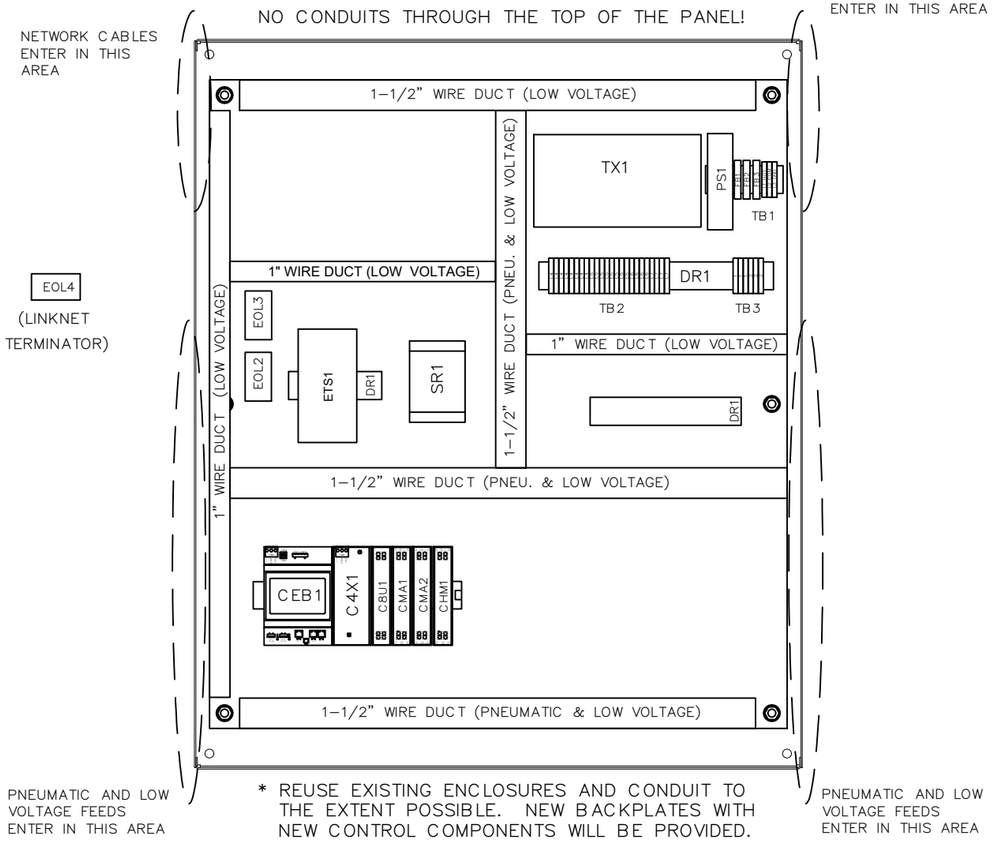
SHEET
NCHS-345
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 42 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

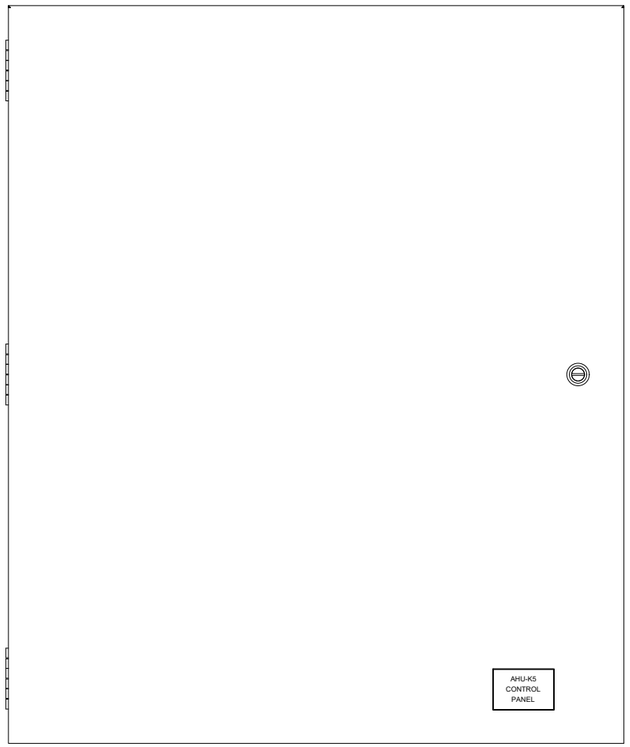


EOL4
(LINKNET TERMINATOR)

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

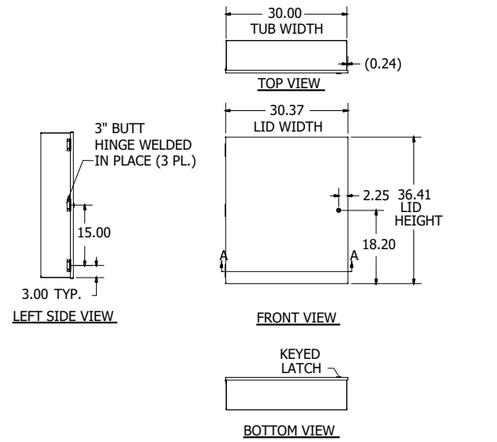
WILL BE PROVIDED IN A FUTURE REVISION. △

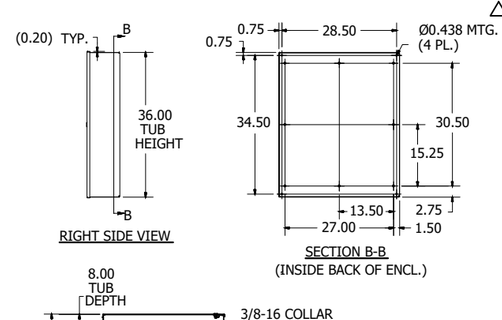
BILL OF MATERIALS

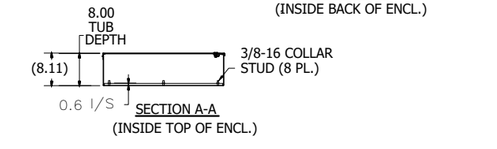
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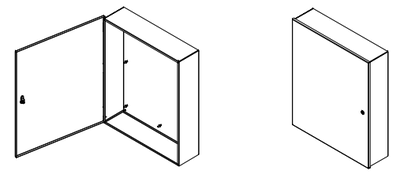
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

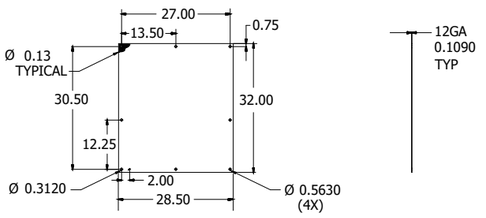








PANEL DIMENSIONS



E–AHU–K5 SYSTEM 42 PANEL – DIMENSIONS & BOM

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

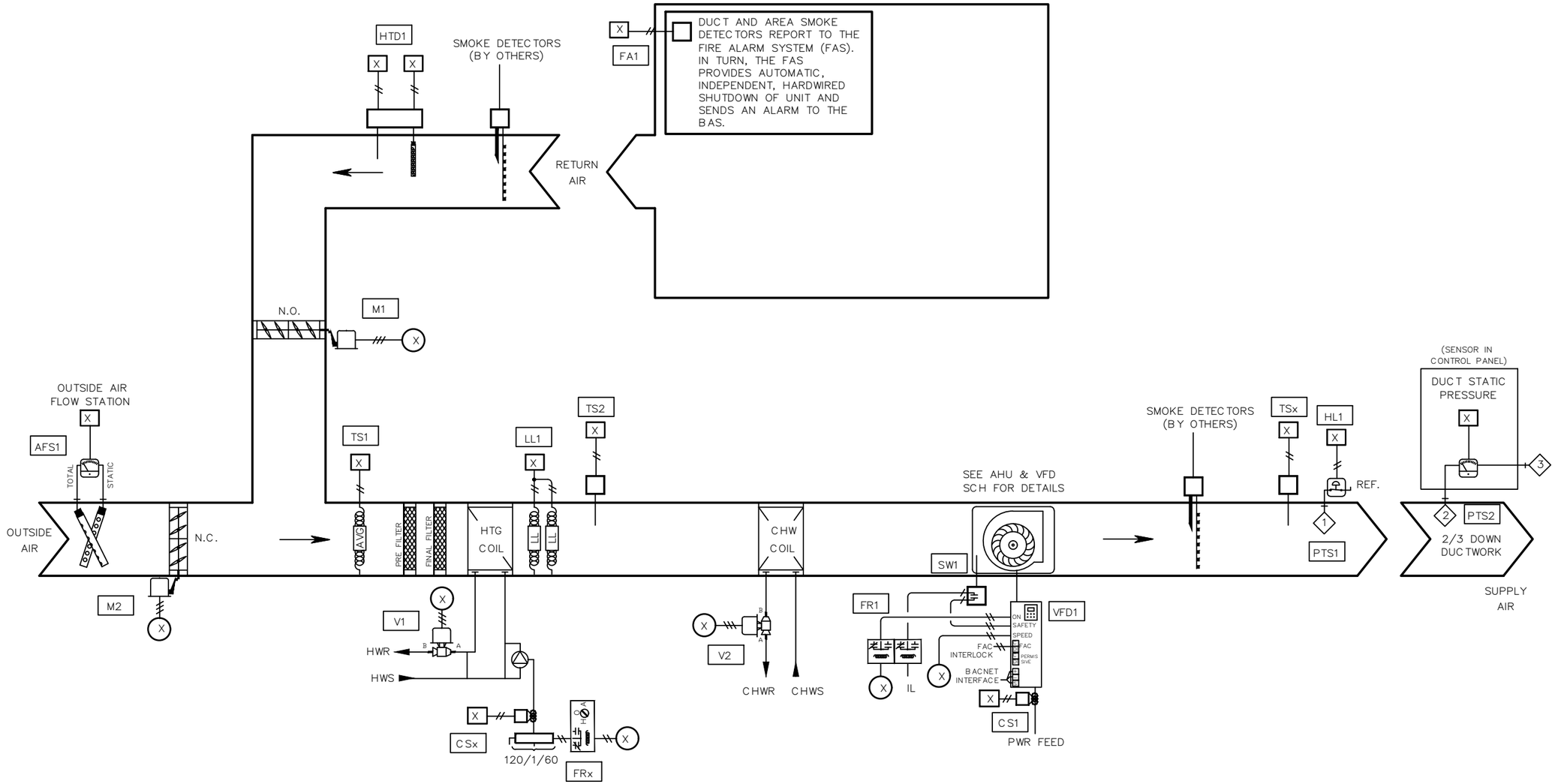
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–346
JOB NUMBER:
J–2304001

E–AHU–N1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–N1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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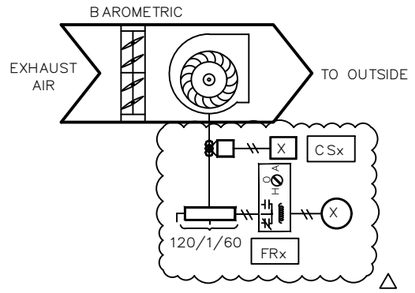
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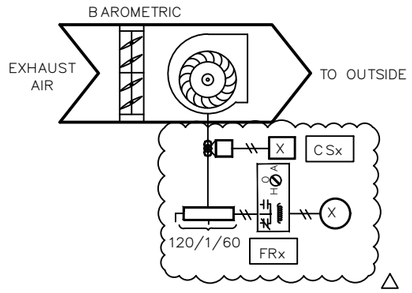
CONTRACT NO:

SHEET
NCHS–347
JOB NUMBER:
J–2304001

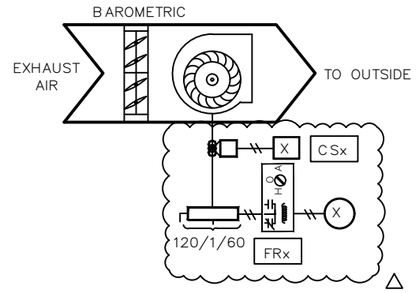
EXHAUST FAN – BAS CONTROLLED
EF–N1



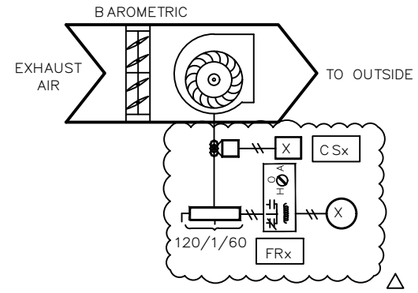
EXHAUST FAN – BAS CONTROLLED
EF–N2



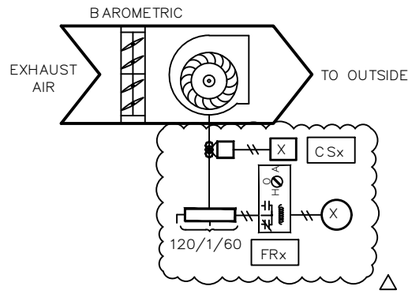
EXHAUST FAN – BAS CONTROLLED
EF–N3



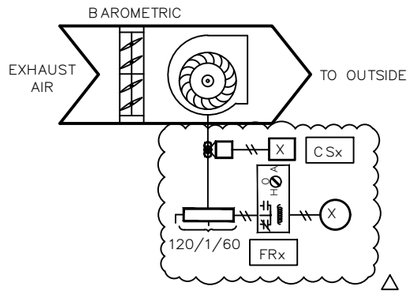
EXHAUST FAN – BAS CONTROLLED
EF–N6



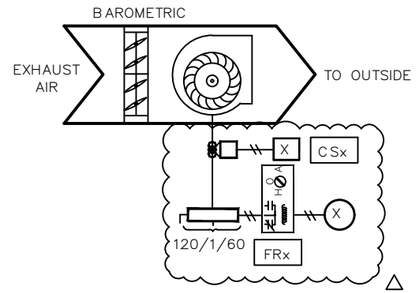
EXHAUST FAN – BAS CONTROLLED
EF–N10



EXHAUST FAN – BAS CONTROLLED
EF–N12



EXHAUST FAN – BAS CONTROLLED
EF–N14



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA N EXHAUST FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
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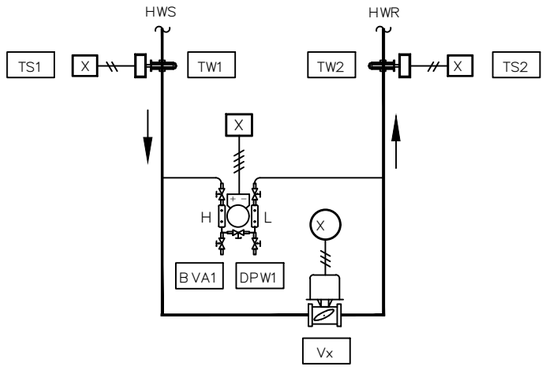
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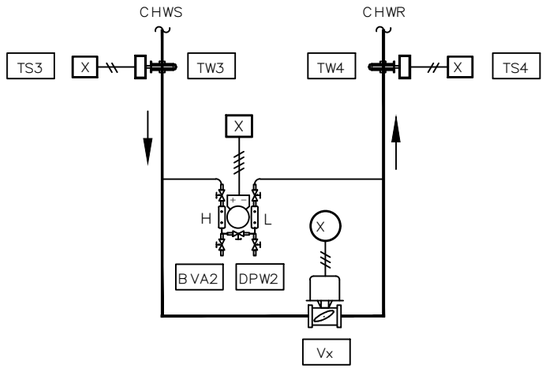
END OF LOOP CONTROLS – HOT WATER (PENTHOUSE 'N' EAST BUILDING)

(CONFIRMATION OF EXISTING DEVICE LOCATIONS REQUIRED)
(PREVIOUS DESIGN INDICATES CTRLS. ARE LOCATED AT AHU–N1)



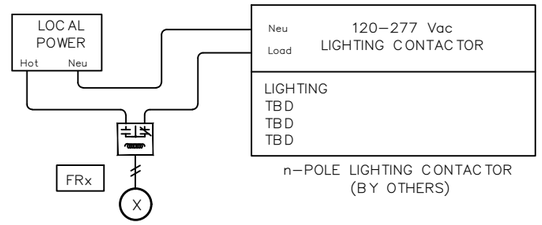
END OF LOOP CONTROLS – CHILL WATER (PENTHOUSE 'N' EAST BUILDING)

(CONFIRMATION OF EXISTING DEVICE LOCATIONS REQUIRED)
(PREVIOUS DESIGN INDICATES CTRLS. ARE LOCATED AT AHU–N1)

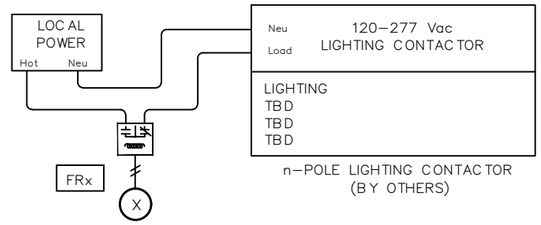


BILL OF MATERIAL

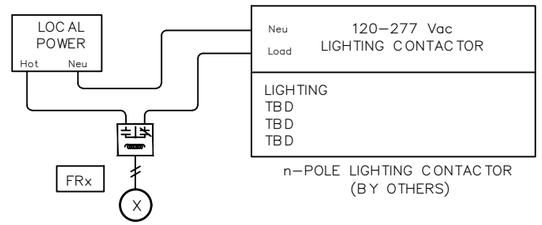
LIGHTING CONTACTOR CONTROLS
RN–1 – SECURITY LIGHTS EAST BUILDING



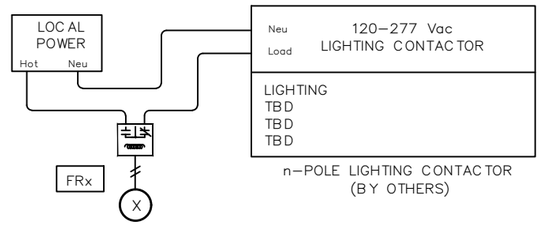
LIGHTING CONTACTOR CONTROLS
RN–2 – LIGHTS EAST BUILDING



LIGHTING CONTACTOR CONTROLS
RN–3 – SECURITY LIGHTS EAST LOT



LIGHTING CONTACTOR CONTROLS
RN–4 – LIGHTS EAST LOT



NETWORK POINTS
N1 THROUGH Nx

AREA N EAST BUILDING END OF LOOP PRESSURE CONTROL & LIGHTING FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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CONTRACT NO:

SHEET
NCHS–349
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CHWR EAST EOL	Chill Water Return Temp	X				
CHWS EAST EOL	Chill Water Supply Temp	X				
CW DP EAST EOL	End of Loop Diff Pressure - East Bldg	X				
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
HW DP EAST EOL	End of Loop Diff Pressure - East Bldg	X				
HWR EAST EOL	Hot Water Return Temp	X				
HWS EAST EOL	Hot Water Supply Temp	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-N1 STAT	Exhaust Fan N1 Status		X			
EF-N10 STAT	Exhaust Fan N10 Status		X			
EF-N12 STAT	Exhaust Fan N12 Status		X			
EF-N14 STAT	Exhaust Fan N14 Status		X			
EF-N2 STAT	Exhaust Fan N2 Status		X			
EF-N3 STAT	Exhaust Fan N3 Status		X			
EF-N6 STAT	Exhaust Fan N6 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CW BYP VLV	EOL Bypass Valve - East Bldg			X		
CWV	Chill Water Valve			X		
HW BYP VLV	EOL Bypass Valve - East Bldg			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-N1 SS	Exhaust Fan N1 Fan Start / Stop				X	
EF-N10 SS	Exhaust Fan N10 Fan Start / Stop				X	
EF-N12 SS	Exhaust Fan N12 Fan Start / Stop				X	
EF-N14 SS	Exhaust Fan N14 Fan Start / Stop				X	
EF-N2 SS	Exhaust Fan N2 Fan Start / Stop				X	
EF-N3 SS	Exhaust Fan N3 Fan Start / Stop				X	
EF-N6 SS	Exhaust Fan N6 Fan Start / Stop				X	
LTG 1	Lighting Contactor - Sec Lts E Bldg RN-1				X	
LTG 2	Lighting Contactor - Lights E Bldg RN-2				X	
LTG 3	Lighting Contactor - Sec Lts E Lot RN-3				X	
LTG 4	Lighting Contactor - Lights E Lot RN-4				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**13**	**12**	**7**	**13**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
Temperature Control Services
4240 W 50 S
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-350
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-N1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

END OF LOOP CONTROLS (FROM PREVIOUS BAS CONTROL SEQUENCES):

THE TEMPERATURE OF THE SUPPLY WATER TO THE EQUIPMENT ROOM WILL BE USED TO POSITION THE END OF LOOP TEMPERATURE VALVE TO MAINTAIN THE CHILLED WATER SUPPLY AT 48 DEG. F AND THE HEATING WATER SUPPLY AT 145 DEG. F. THE PRESSURE TRANSMITTER WILL BE USED IN THE RESET OF THE PUMP VOLUME CONTROL SUCH THAT THE PUMP WILL MAINTAIN THE PROPER PRESSURE AT THE END OF THE MAIN.

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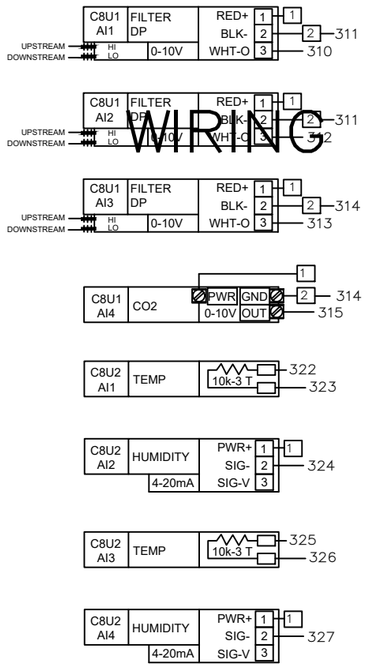
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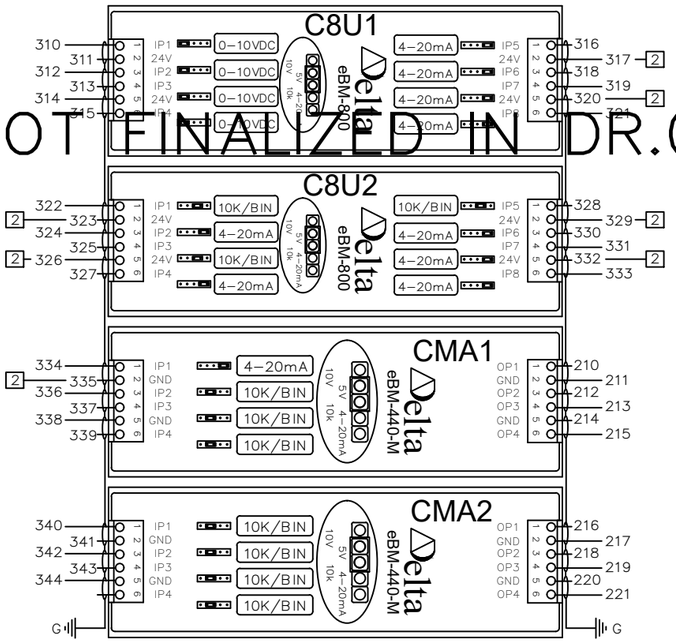
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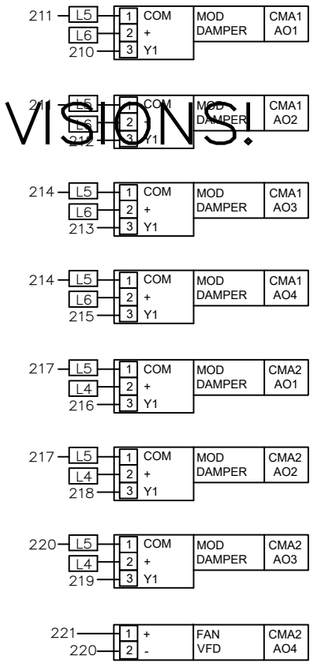
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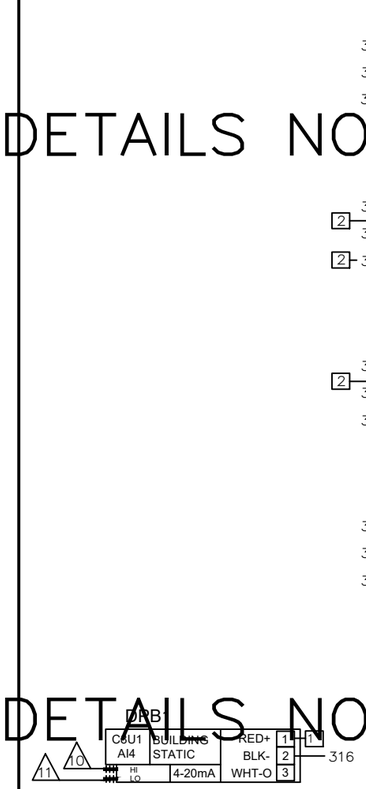
SHEET
NCHS-351
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	INPUTS
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	INPUTS
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	INPUTS
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	INPUTS
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	INPUTS
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	INPUTS
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	INPUTS
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	INPUTS

C8U1 eBM-800 — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	INPUTS
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	INPUTS
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	INPUTS
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	INPUTS
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	INPUTS
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	INPUTS
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	INPUTS
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	INPUTS

C8U2 eBM-800 — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	INPUTS
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	INPUTS
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	INPUTS
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	INPUTS
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	OUTPUTS
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	OUTPUTS
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	OUTPUTS
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	OUTPUTS

CMA1 eBM-440-M — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	INPUTS
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	INPUTS
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	INPUTS
CMA2	4	10100.1404				INPUTS
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	OUTPUTS
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	OUTPUTS
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	OUTPUTS
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	OUTPUTS

CMA2 eBM-440-M — eBM-440-M I/O MODULE — CMA2 eBM-440-M

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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E-AHU-N1 SYSTEM 43 PANEL – I/O WIRING (1 OF 3)

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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

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DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-352
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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CMA3 DI1 | DX STATUS | N.O. | 346 — 347

CMA3 DI2 | PURGE ENABLE | N.O. | 348 — 347

CMH2 DI1 | FAN STATUS | N.O. | 358 — 359

CMH1 DI1 | FAN STATUS | N.O. | 360 — 359

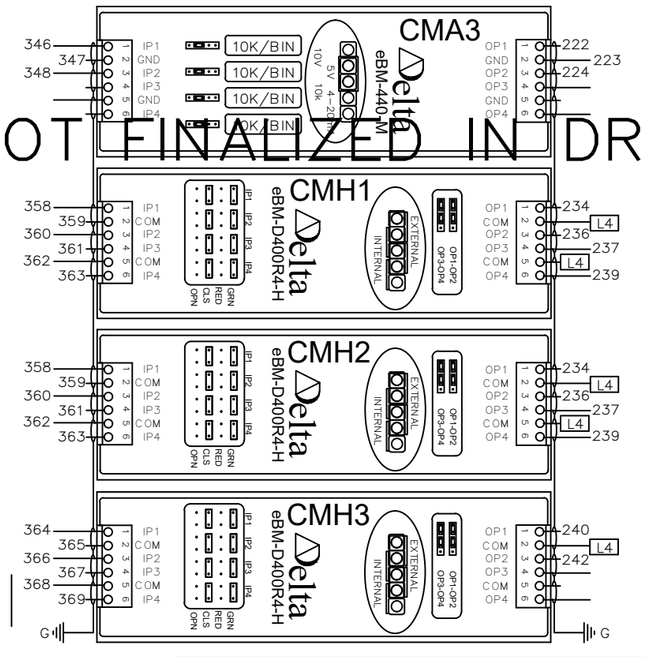
CMH1 DI3 | SMOKE ALARM | N.O. | 361 — 362

CMH1 DI4 | SMOKE ALARM | N.O. | 363 — 362

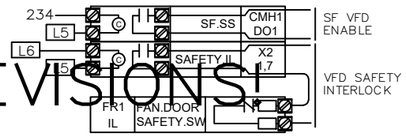
CMH2 DI1 | FAS.INPUT | N.C. | 364 — 365

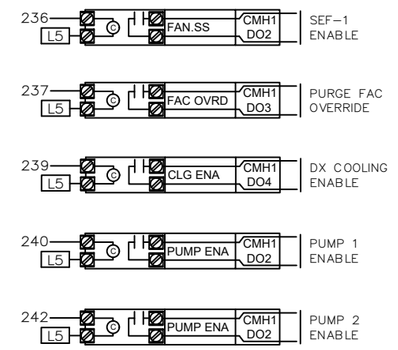
CMH2 DI2 | PUMP STATUS | N.O. | 366 — 365

CMH2 DI3 | PUMP STATUS | N.O. | 367 — 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1





	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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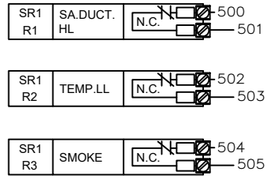
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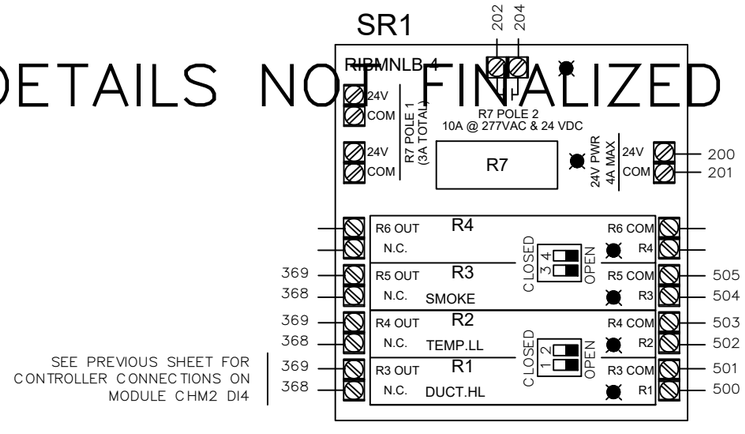
SHEET
NCHS–353
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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CONTRACT NO:

SHEET
NCHS-354
JOB NUMBER:
J-2304001

SYSTEM 43 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

GND

L3

200
201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TX1

24V CB | 24V CB

Power | Power

100
L2
L3
H
C
G

75VA
24VAC
24VAC

120 VAC LAPTOP PWR

200
201
CONTROLLER PWR

202
203
FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V
-V
GND
L
N

300
301
101
L2
L3

PS1

1.0A
101
5.0A
100
G

TB1

L1
L2
L3
H
N
120 VAC

PANEL GND LUG

TB2

202 L4 L4 L4
203 L5 L5 L5
204 L6 L6 L6
205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1
301 2 2 2

24 VDC TO FIELD

DPD1

1

Power +
GND / 4-20mA out -
Voltage out 0

HIGH
LOW

2
3

PNEUMATIC

300
301
L3

ETS1

V1-
V1+

ETHERNET SWITCH

1
3
5
2
4

CAT5e

SR1

RIBMNLB-4

202
204

200
201

24V
COM

R7 POLE C
10A @ 277VAC & 24 VDC

R7 POLE A / B
5A @ 30VDC

R7

R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.

R4 COM R4
R3 COM R3
R2 COM R2
R1 COM R1

CLOSED
OPEN

201
200

CEB1

PWR
GND
24~

USB2
USB1

(NOT USED)

NET1 RS-485
NET2 RS-485

LAN 1
LAN 2

MS/TP

C8X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H
eBM-D400R4-H
eBM-D400R4-H
eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-N1 SYSTEM 43 PANEL - POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

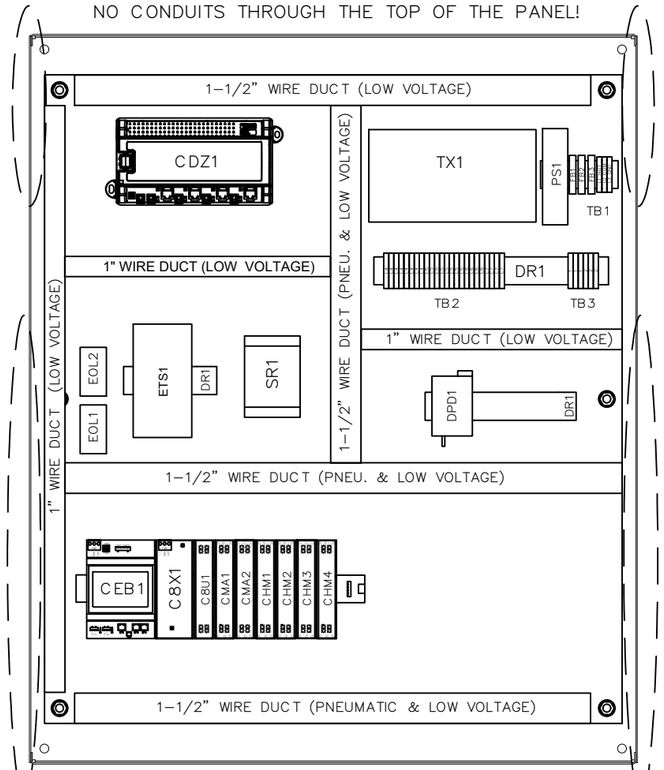
CONTRACT NO:

SHEET
NCHS-355
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 43 LAYOUT

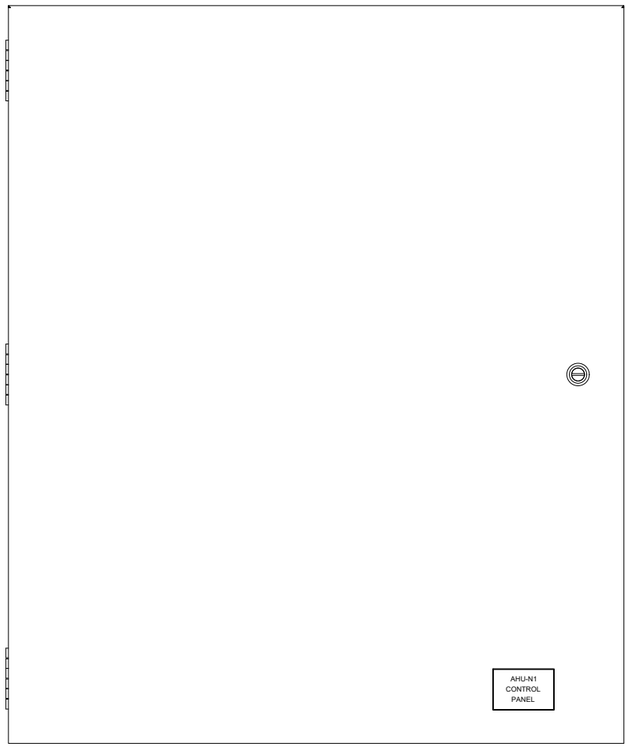
NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

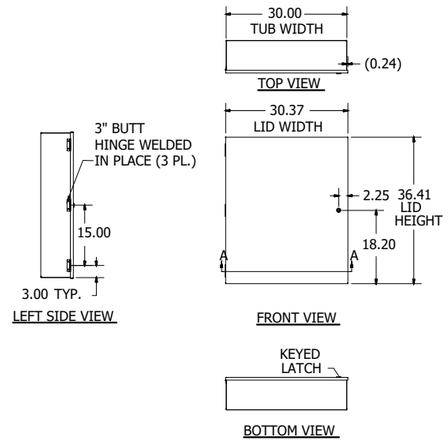
WILL BE PROVIDED IN A FUTURE REVISION. △

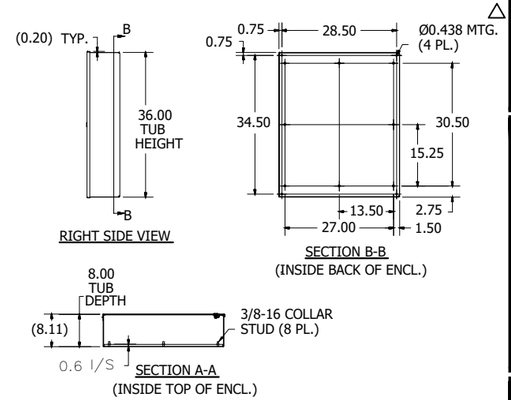
BILL OF MATERIALS

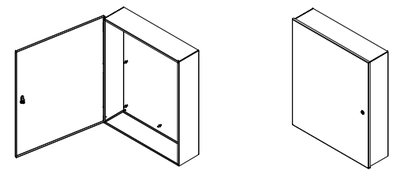
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

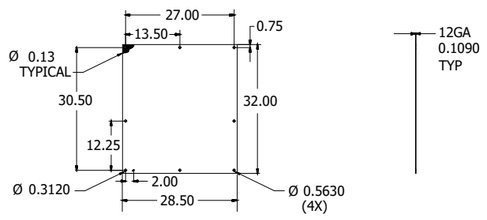
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



Delta CONTROLS
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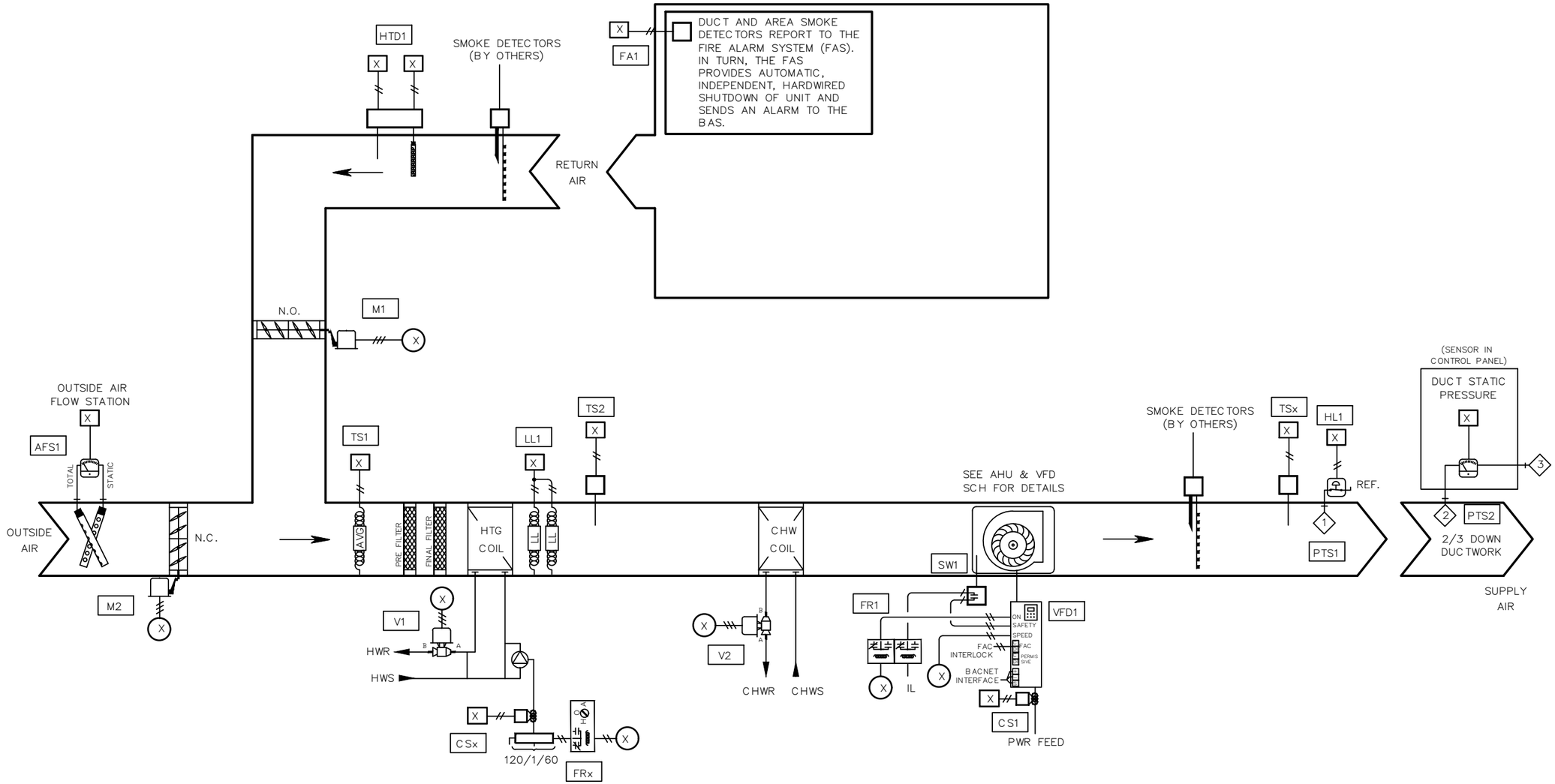
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NCHS-356
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J-2304001

E–AHU–N2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–N2 FIELD DEVICES

Delta Controls

Temperature Control Services
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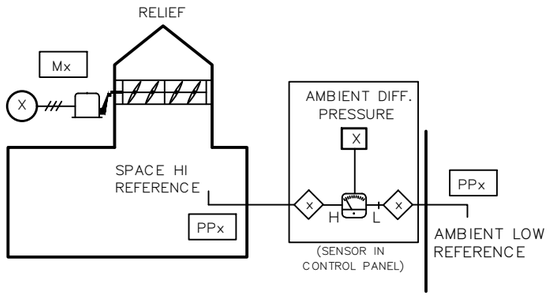
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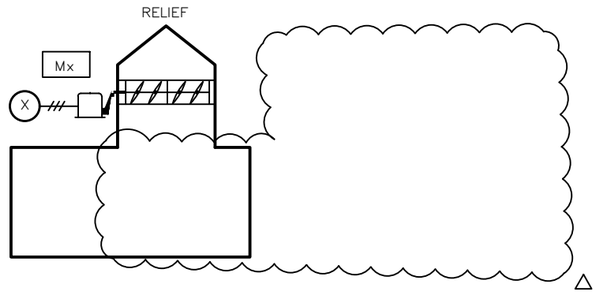
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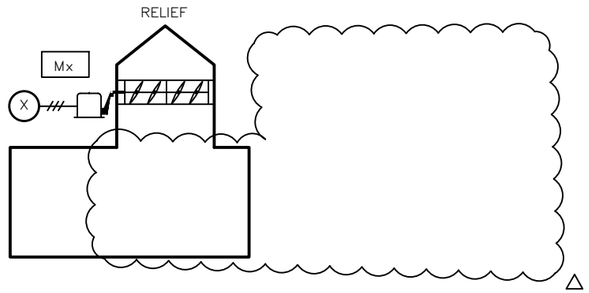
BUILDING PRESSURE CONTROL
E–RH–N1



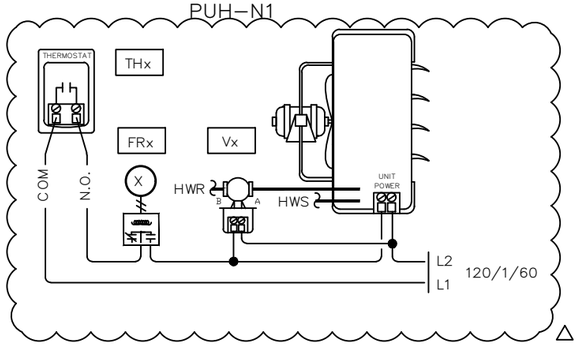
BUILDING PRESSURE CONTROL
E–RH–N2



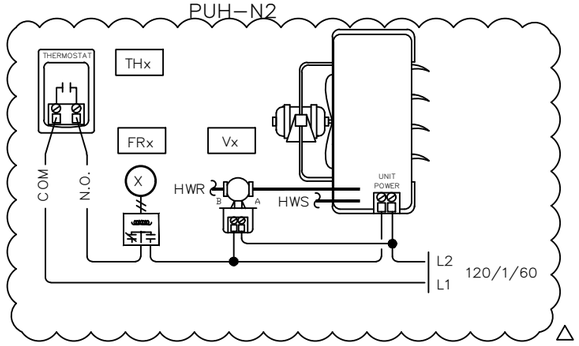
BUILDING PRESSURE CONTROL
RH–N3



PROPELLER UNIT HEATER
PUH–N1



PROPELLER UNIT HEATER
PUH–N2



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA N RELIEF & PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services

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CONTRACT NO:

SHEET
NCHS–358
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-N1 DPR	Relief Air Damper			X		
E-RH-N2 DPR	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-N3 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
PUH-N1 EN	PUH N1 Enable				X	
PUH-N2 EN	PUH N2 Enable				X	
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**8**	**4**	**0**

△

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
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SHEET
NCHS-359
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-N2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFNn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

Delta Controls
Temperature Control Services
4240 W 50 S
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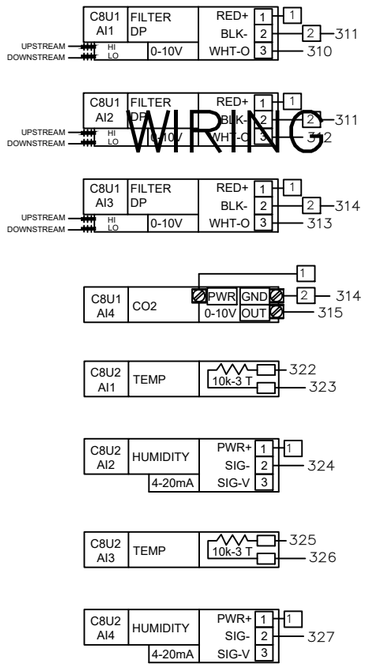
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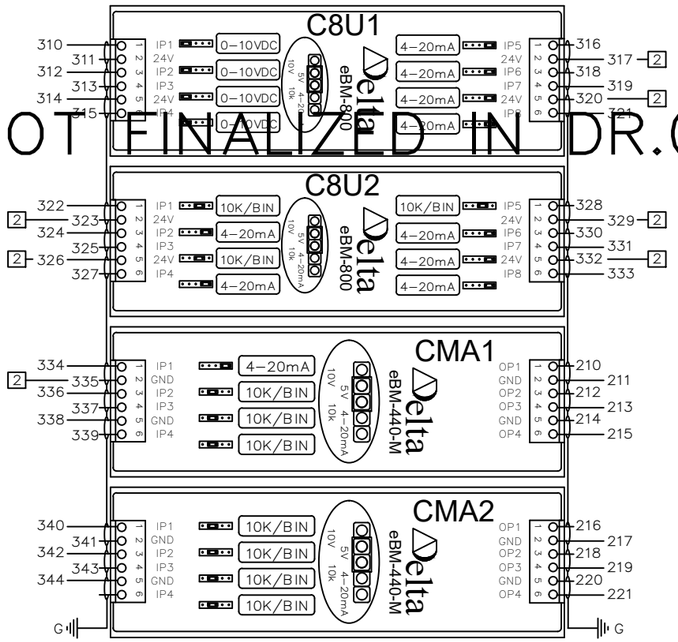
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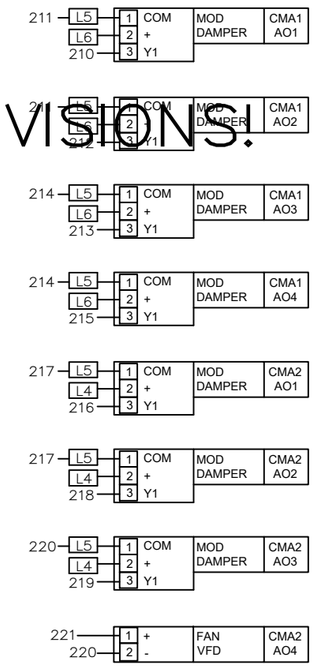
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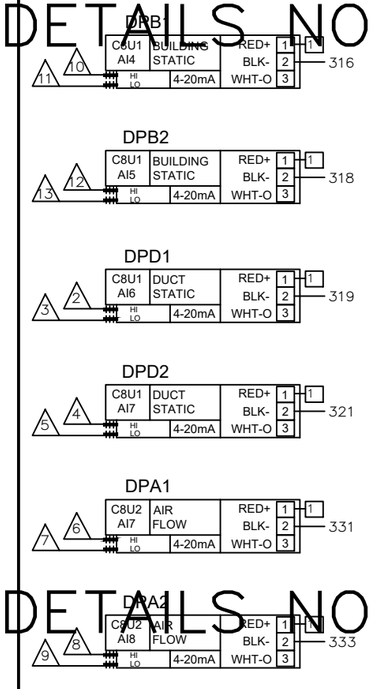
SHEET
NCHS-360
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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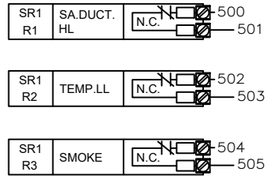
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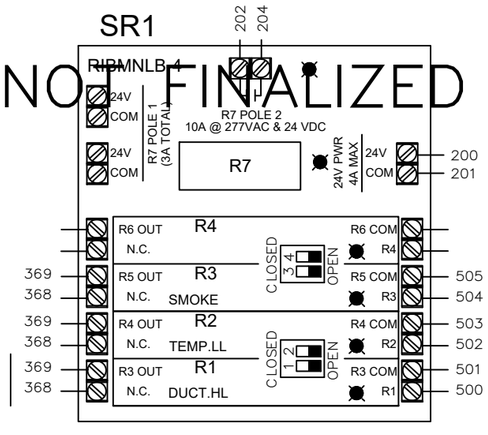
SHEET
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4



INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU–N2 SYSTEM 44 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–362
JOB NUMBER:
J–2304001

SYSTEM 44 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

GND

L3

200
201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

CAT-6a

300
301

ETS1

V1-
V1+

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

202
204

200
201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7

R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.

R4 COM
R3 COM
R2 COM
R1 COM

CLOSED
OPEN

TX1

24V CB
Power

100
L2
L3

H
C
G

75VA
24VAC
24VAC

120 VAC LAPTOP PWR

200
201

CONTROLLER PWR

202
203

FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V
-V
GND
L
N

300
301
101
L2
L3

PS1

1.0A
5.0A
101
100
G

TB1

L1
L2
L3
H
N

120 VAC

PANEL GND LUG

TB2

202
203
204
205

L4
L5
L6
L7

24 VAC TO FIELD

TB3

300
301

1
2

24 VDC TO FIELD

DPD1

DPB1

Power +
GND / 4-20mA out -
Voltage out 0

HIGH
LOW

PNEUMATIC

2
3
4
5

201
200

CEC1

PWR

GND
24~

Delta
eBCON-2

eBUS
NET2

NET2
RS-485
[+] [-] SHD

LAN 1

eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H

OP1 HAO
OP2 HAO
OP3 HAO
OP4 HAO

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-N2 SYSTEM 44 PANEL - POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
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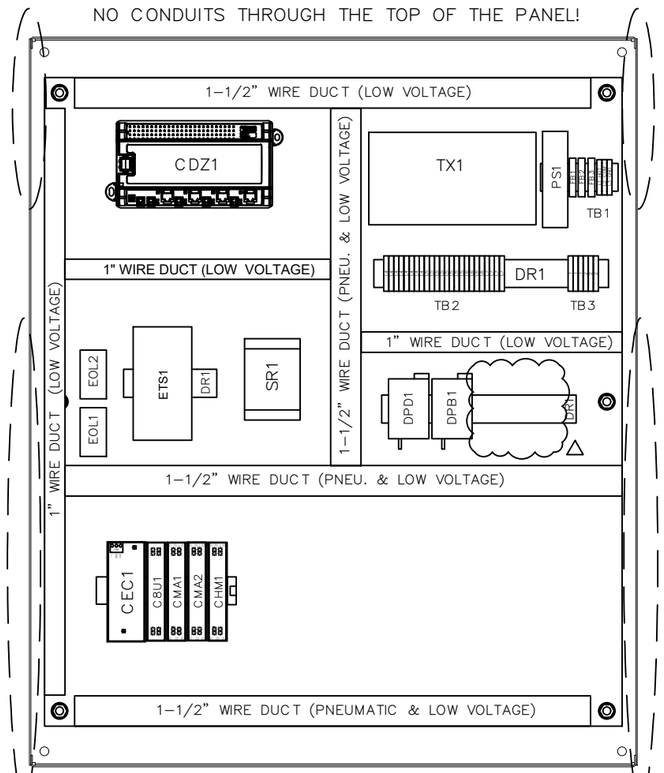
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SYSTEM CONTROL PANEL 44 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

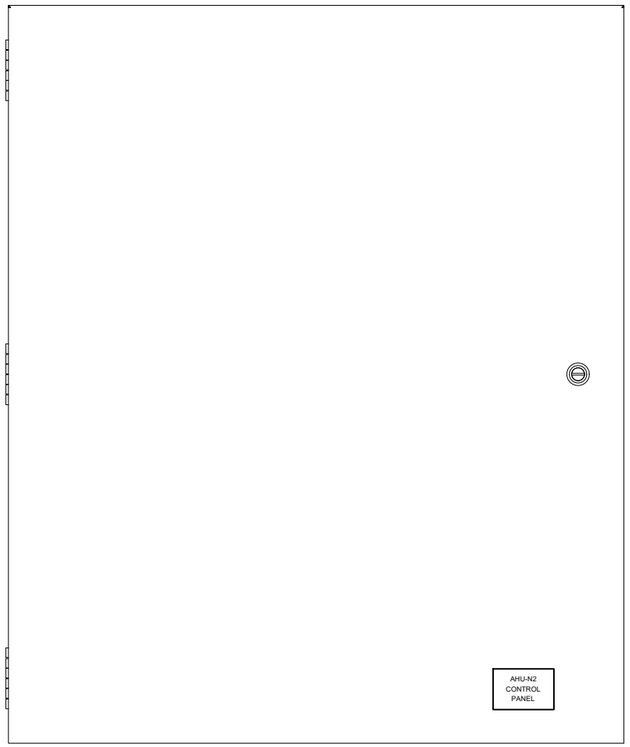
NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

BILL OF MATERIALS

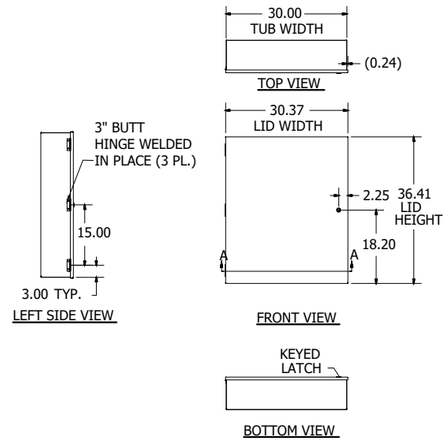
WILL BE PROVIDED IN A FUTURE REVISION. △

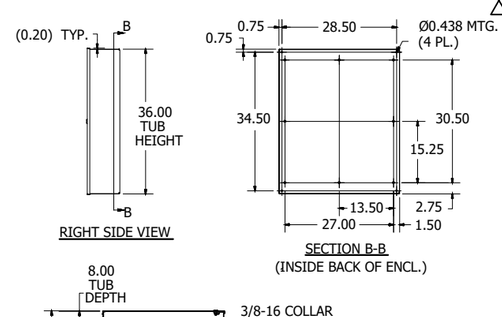
BILL OF MATERIALS

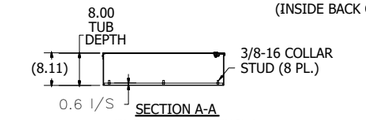
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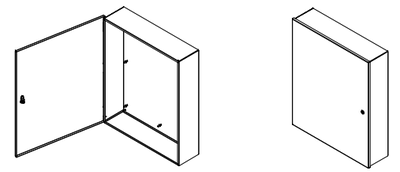
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

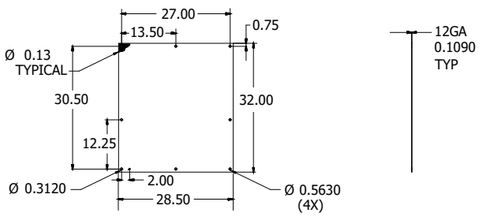








PANEL DIMENSIONS



E–AHU–N2 SYSTEM 44 PANEL – DIMENSIONS & BOM

Delta Controls

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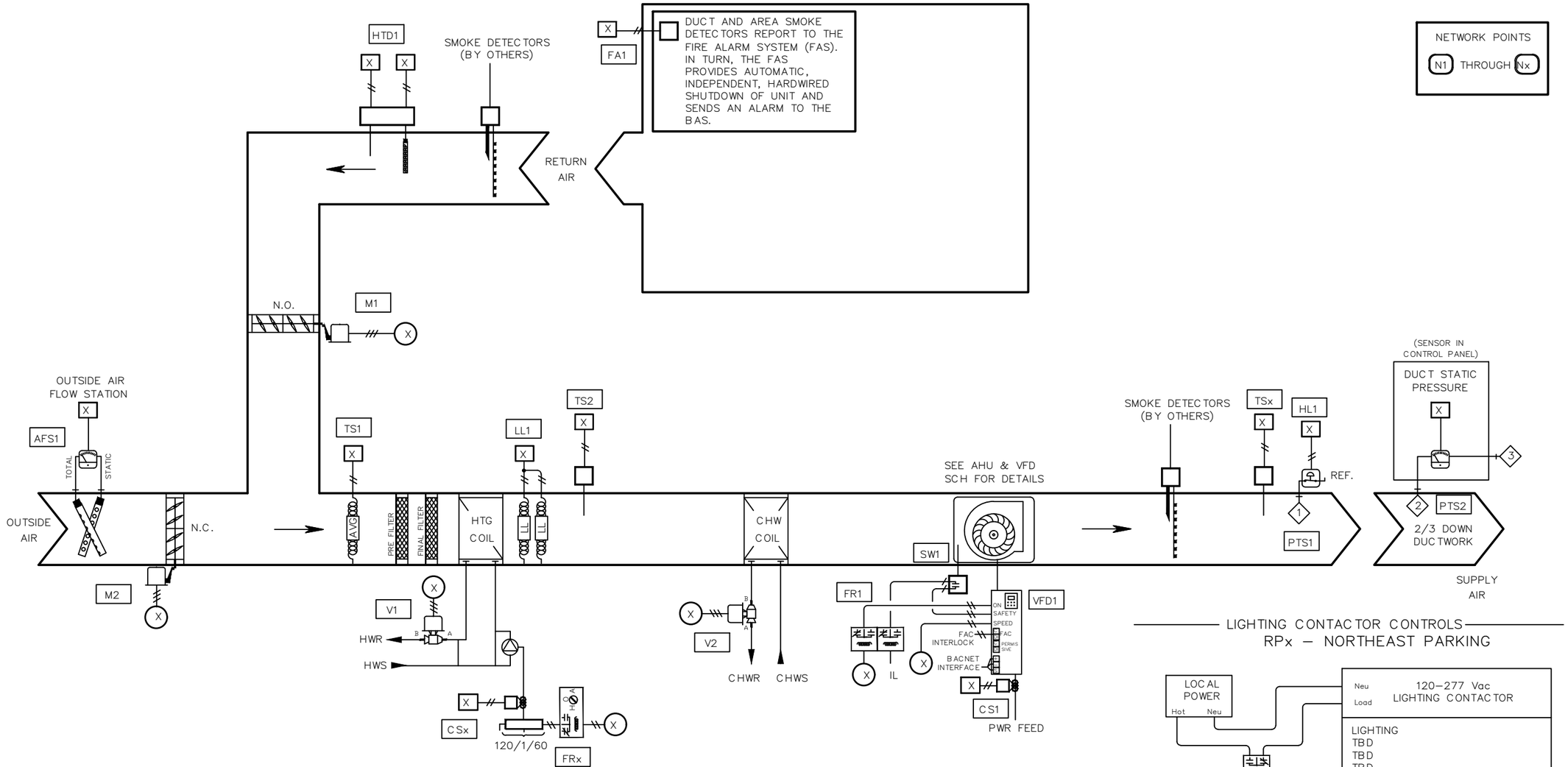
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E–AHU–P1 FIELD DEVICES

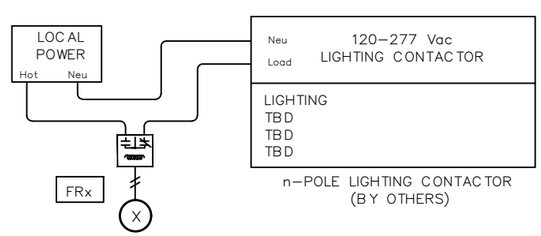


NETWORK POINTS

N1 THROUGH Nx

LIGHTING CONTACTOR CONTROLS
RPx – NORTHEAST PARKING

LIGHTING CONTACTOR CONTROLS
RPy – EXTERIOR WALL



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

E–AHU–P1 FIELD DEVICES

Delta Controls

Temperature Control Services
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NCHS–365
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
LTG 1	Lighting Contactor - NE Pkg RPx				X	
LTG 2	Lighting Contactor - Ext Wall Rpy				X	
SF SS	Supply Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
	POINT TOTALS:	**7**	**5**	**5**	**4**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-P1 & AREA P MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
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VAV AIR HANDLING UNIT AHU-P1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOODS SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

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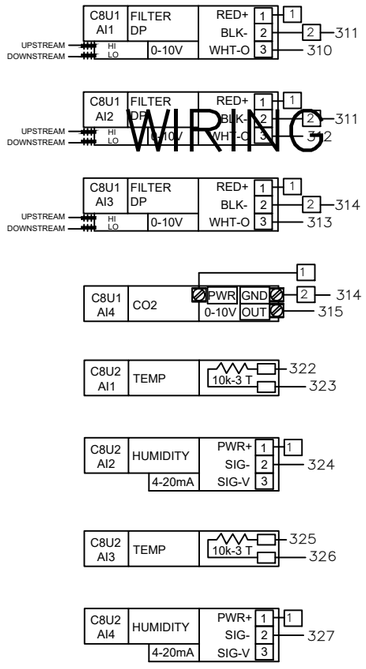
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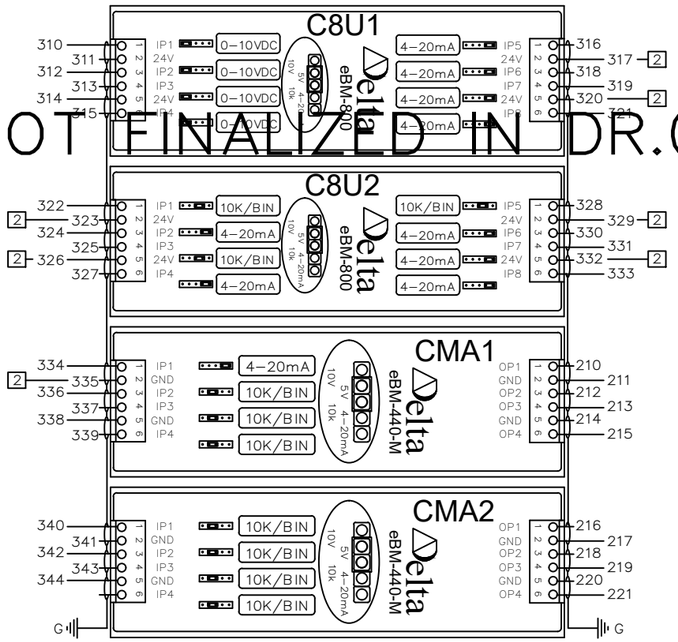
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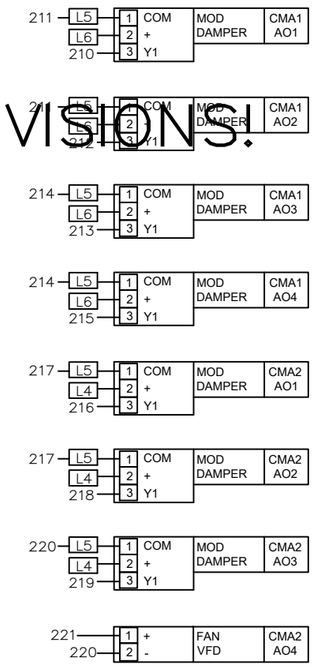
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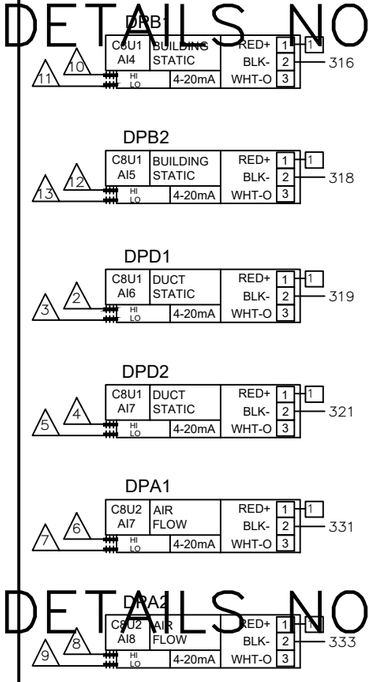
SHEET
NCHS-367
JOB NUMBER:
J-2304001

SYSTEM 45 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — eBM-440-M I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — eBM-440-M I/O MODULE

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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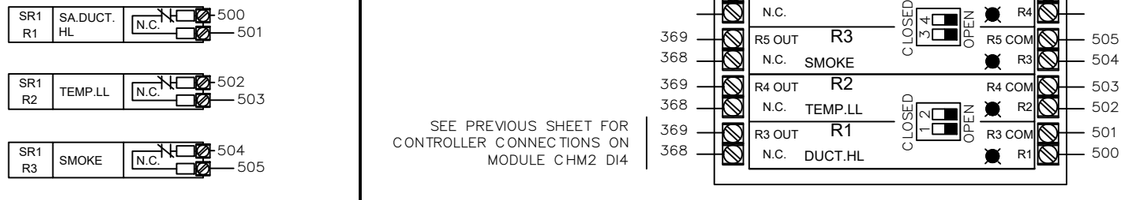
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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

INPUTS - DFM-400-P

CFP1 DFM-400P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-P1 SYSTEM 45 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-369
JOB NUMBER:
J-2304001

SYSTEM 45 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

L3

200
201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

300
301

V1-
V1+

ETHERNET SWITCH

1 3 5 4 2

CAT5e

SR1

RIBMNLB-4

202
204

200
201

R7 POLE C 10A @ 277VAC & 24 VDC

R7

R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.

R4 COM R4
R3 COM R3
R2 COM R2
R1 COM R1

CLOSED

LOOP

TX1

24V CB
24V CB

Power
Power

H C G

100
L2
L3

75VA
24VAC
24VAC

120 VAC LAPTOP PWR

200
201
CONTROLLER PWR

202
203
FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V
-V
GND
L
N

300
301
101
L2
L3

PS1

1.0A
5.0A
101
100
G

TB1

L1 L2 L3

H N
120 VAC

PANEL GND LUG

TB2

202 L4 L4 L4
203 L5 L5 L5
204 L6 L6 L6
205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1
301 2 2 2

24 VDC TO FIELD

DPD1

1

Power + GND / 4-20mA out - Voltage out 0

HIGH
LOW

2
3

PNEUMATIC

3
2

CEC1

201
200

PWR

GND
24~

Delta
eBCON-2

eBUS
NET2

NET2 RS-485
[+] [-] SHD

LAN

P7 24Vs P8 24Vs P9

eBM-800
eBM-440-M
eBM-440-M
eBM-D400R4-H

DP1 GND I/O DP2
DP3 GND I/O DP4
DP1 COM I/O DP2
DP3 COM I/O DP4

OPT 1 HAO
OPT 2 HAO
OPT 3 HAO
OPT 4 HAO

JP1 24V 24V JP2
JP3 24V 24V JP4

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-P1 SYSTEM 45 PANEL - POWER & NETWORK WIRING

Delta CONTROLS
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4240 W 50 S
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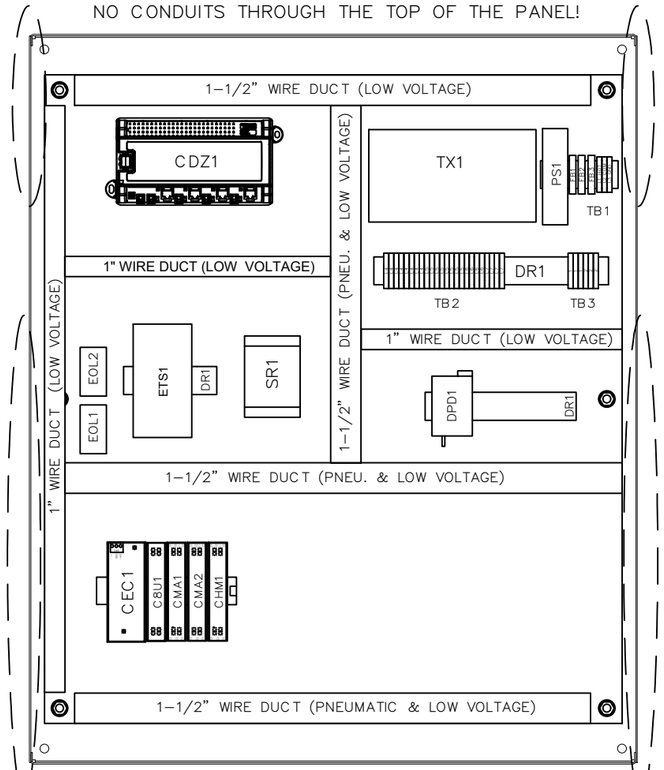
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JOB NUMBER:
J-2304001

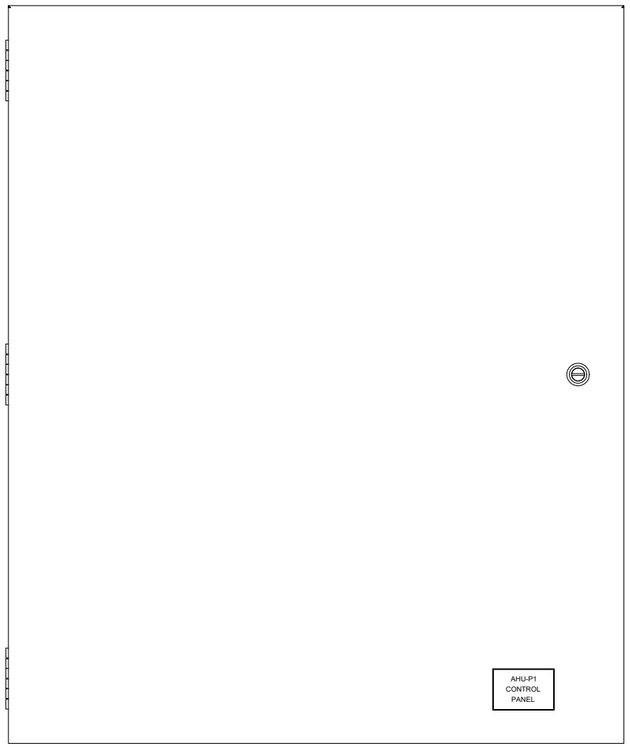
SYSTEM CONTROL PANEL 45 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

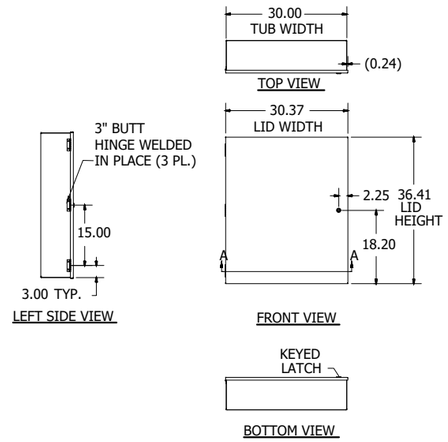
WILL BE PROVIDED IN A FUTURE REVISION. △

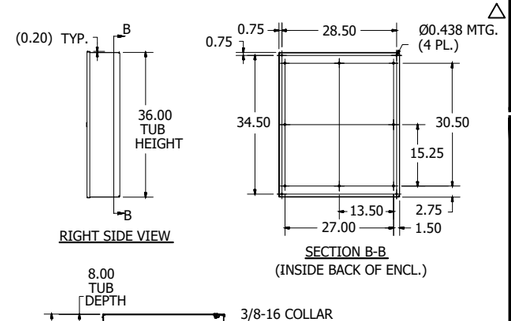
BILL OF MATERIALS

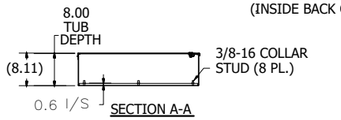
WILL BE PROVIDED IN A FUTURE REVISION. △

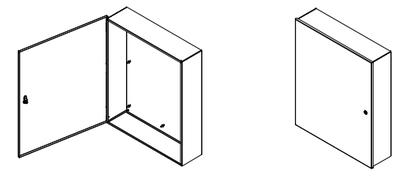
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

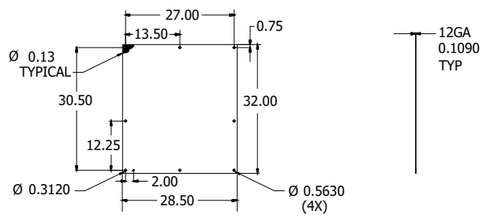








PANEL DIMENSIONS



E-AHU-P1 SYSTEM 45 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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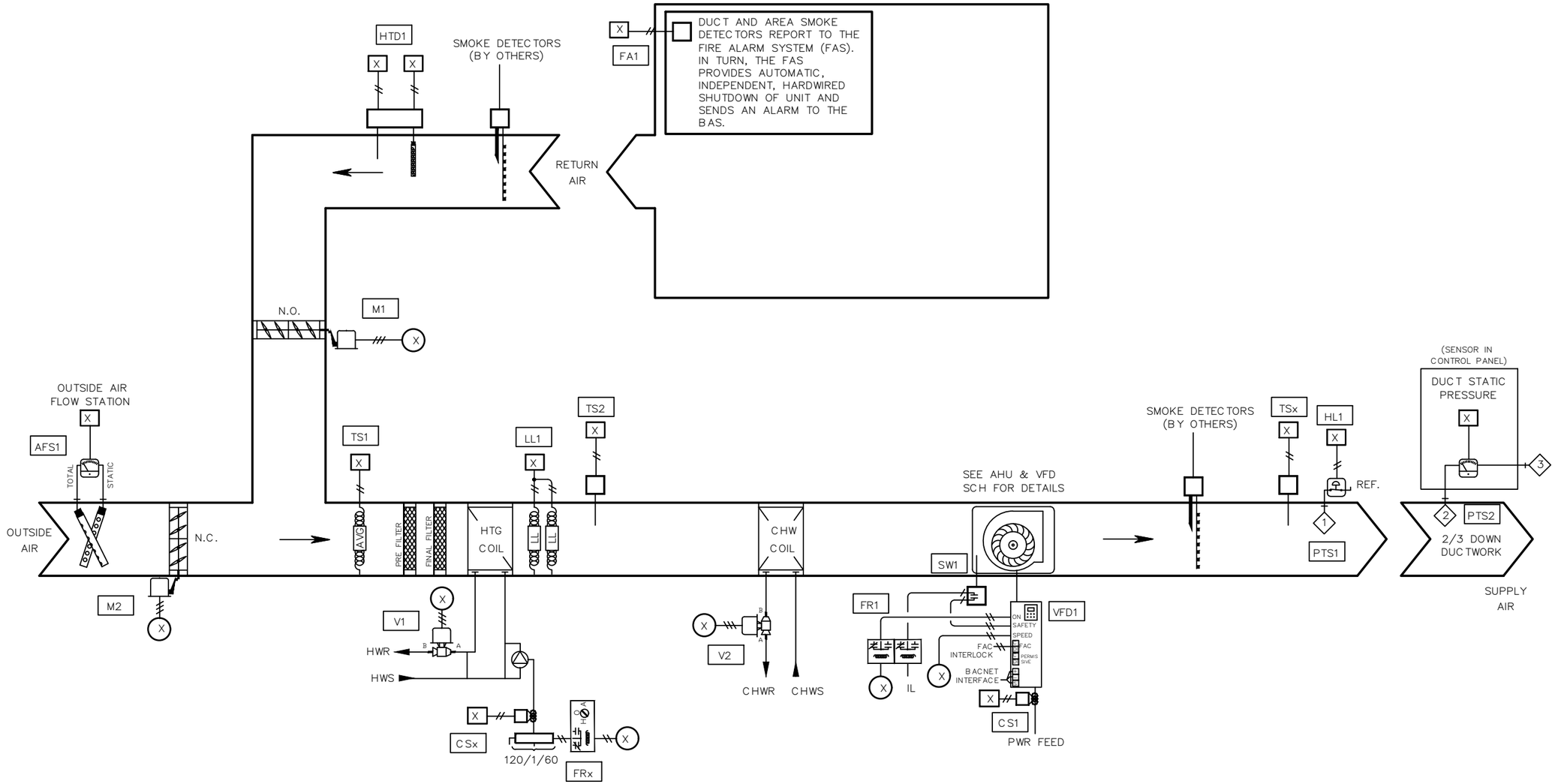
REVISIONS	
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CONTRACT NO:

SHEET
NCHS–371
JOB NUMBER:
J–2304001

E–AHU–P2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–P2 FIELD DEVICES

Delta Controls

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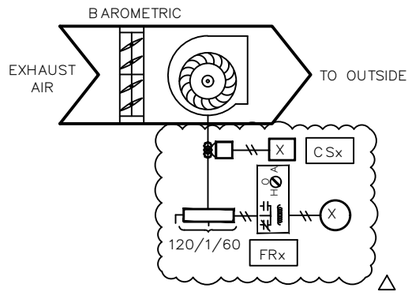
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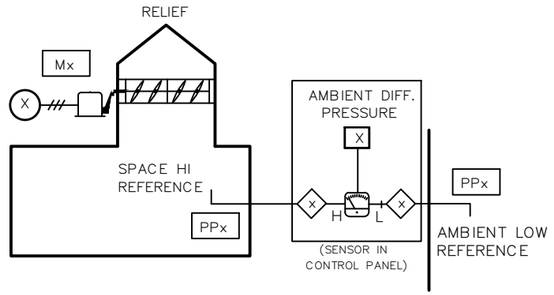
CONTRACT NO:

SHEET
NCHS–372
JOB NUMBER:
J–2304001

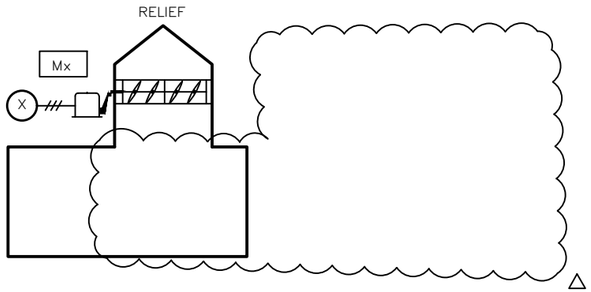
EXHAUST FAN – BAS CONTROLLED
EF–D3



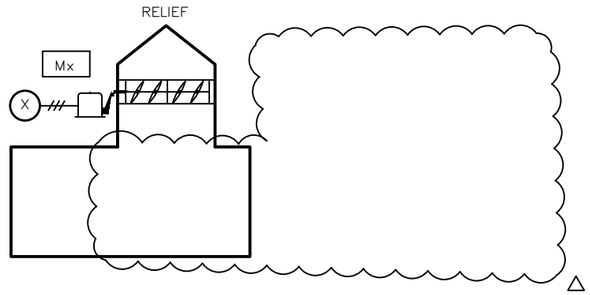
BUILDING PRESSURE CONTROL
E–RH–P1



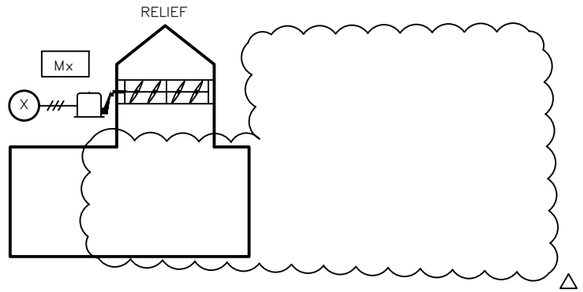
BUILDING PRESSURE CONTROL
E–RH–P2



BUILDING PRESSURE CONTROL
RH–P3



BUILDING PRESSURE CONTROL
RH–P4



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA P EXHAUST & RELIEF FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
~~DPB1~~	~~Building Static Pressure 1~~	~~X~~				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-D3 STAT	Exhaust Fan D3 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-P1 DPR	Relief Air Damper			X		
E-RH-P2 DPR	Relief Air Damper			X		
RH-P3 DPR	Relief Air Damper			X		
RH-P4 DPR	Relief Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-D3 SS	Exhaust Fan D3 Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**6**	**9**	**3**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
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VAV AIR HANDLING UNIT AHU-P2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFPn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

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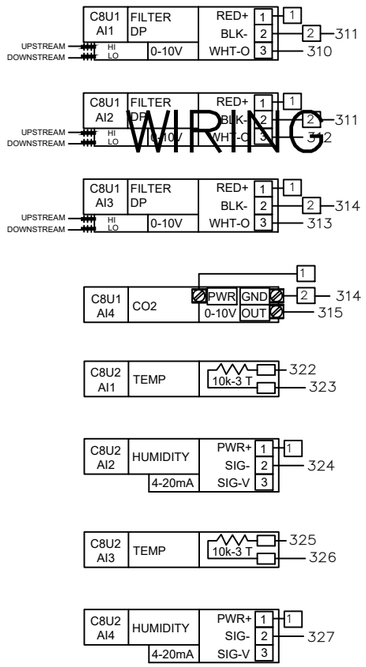
REVISIONS	
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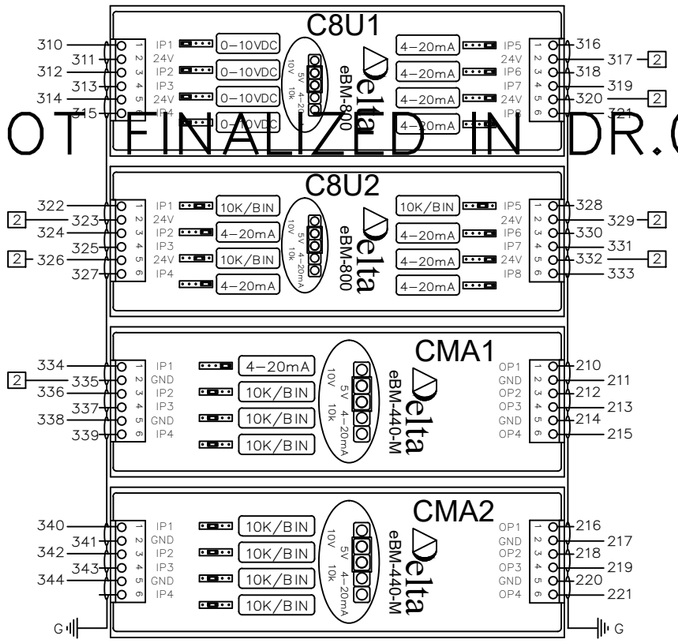
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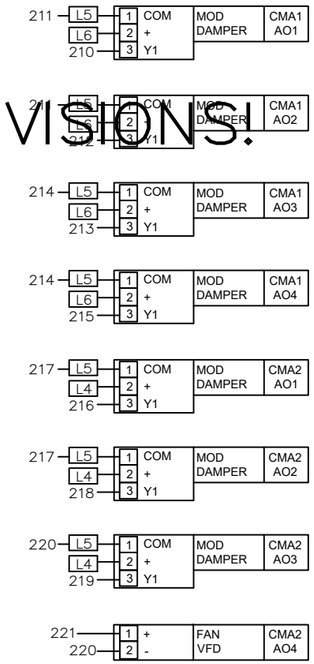
CONTRACT NO:

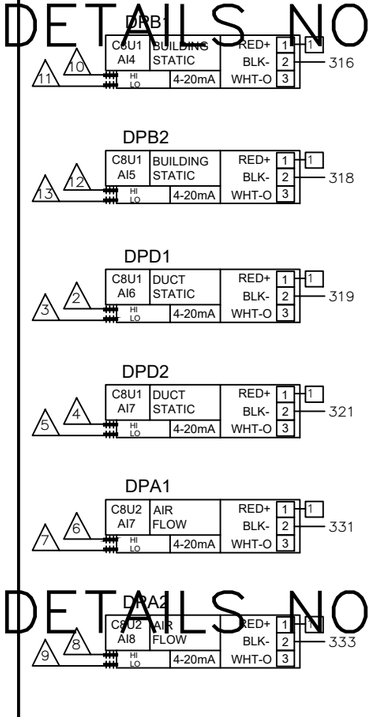
SHEET
NCHS-375
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

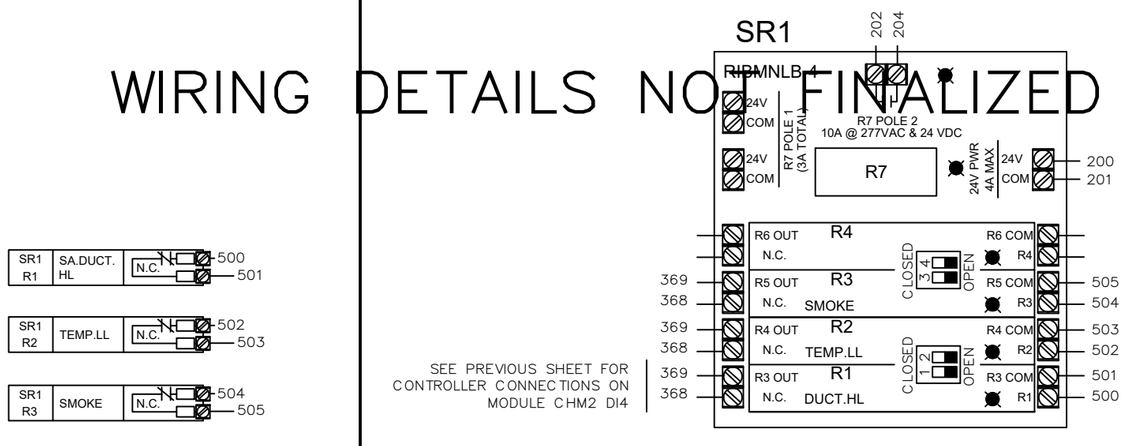
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-376
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1
DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1
DFM-400P

AHU–P2 SYSTEM 46 PANEL – I/O WIRING (2 OF 2)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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SYSTEM 46 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET LEG 02

TO SYSTEM 01 SUBNET LEG 03

TO SYSTEM 01 SUBNET LEG 04

ETS1

V1- V1+ 301 300 L3

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

24V COM POWER 4A MAX

R7 POLE 2 10A @ 277VAC & 24 VDC

R7

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

TX1

24V CB Power

24V CB Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L2 L3

PS1

101 100 G

1.0A 5.0A

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 203 204 205

L4 L4 L4 L5 L5 L5 L6 L6 L6 L7 L7 L7

24 VAC TO FIELD

TB3

300 301

1 1 1 2 2 2

24 VDC TO FIELD

DPD1 DPB1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

1 2 3 4 5

CEB1 C8X1

201 200

PWR GND 24~

USB2 USB1

(NOT USED)

eBMGR-2

eBX

eBUS Address

eBUS

NET1 RS-485 NET2 RS-485

LAN 1 LAN 2 LAN 3

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG L3

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

E-AHU-P2 SYSTEM 46 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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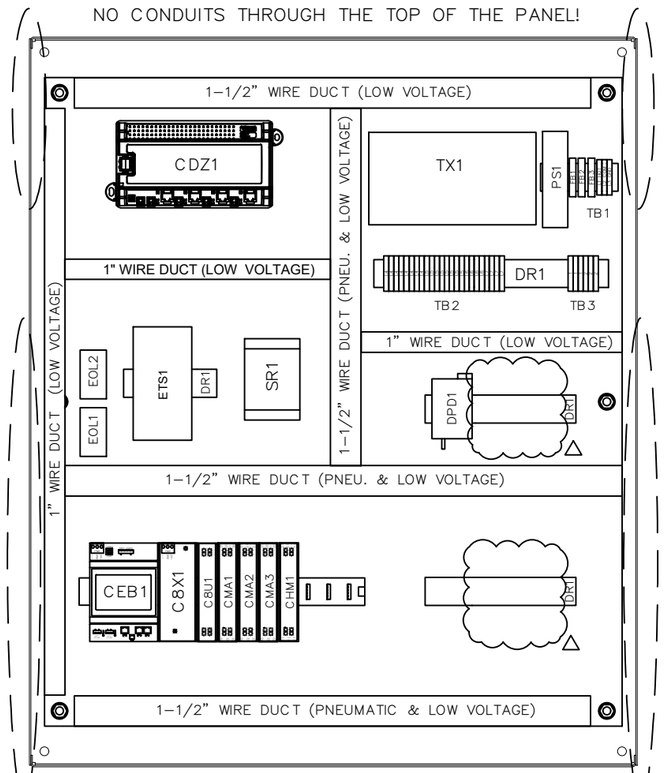
CONTRACT NO:

SHEET
NCHS-378
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 46 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

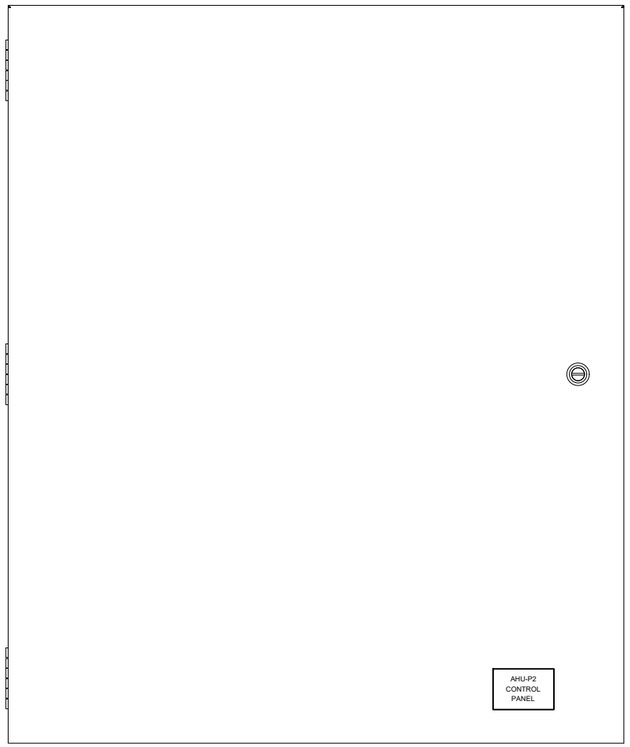


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

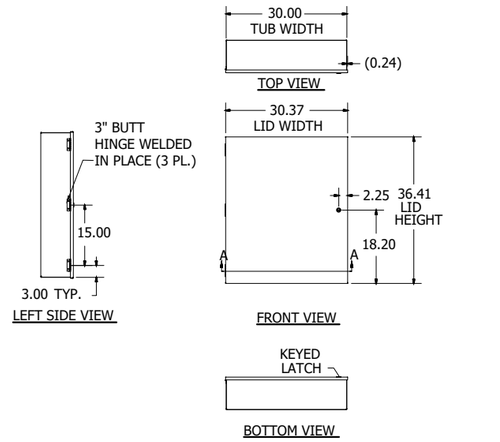
WILL BE PROVIDED IN A FUTURE REVISION. △

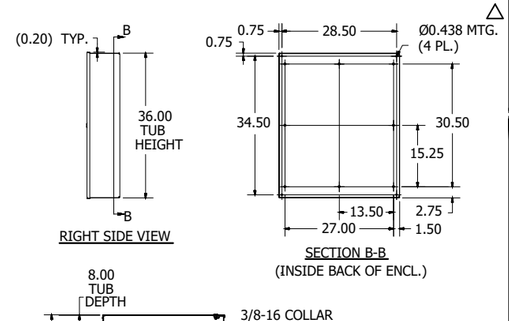
BILL OF MATERIALS

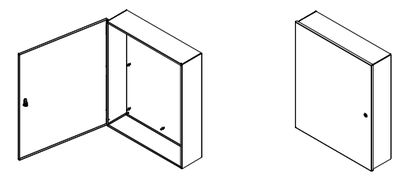
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

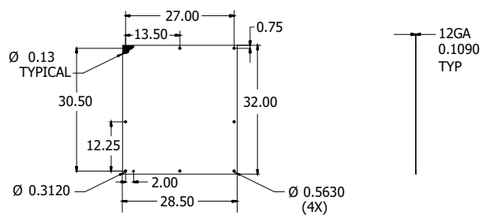
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



E–AHU–P2 SYSTEM 46 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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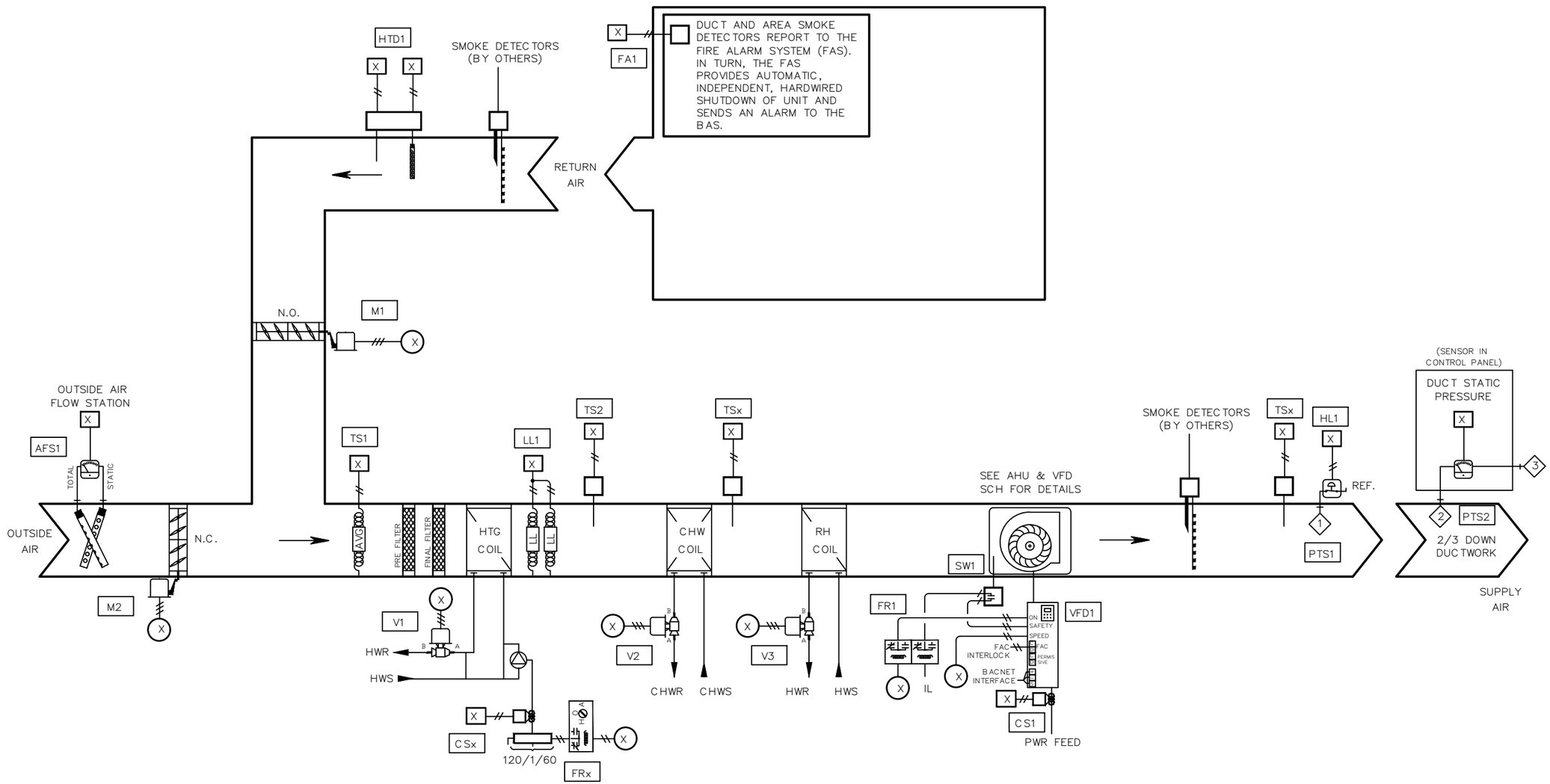
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CONTRACT NO:

SHEET
NCHS–379
JOB NUMBER:
J–2304001

E–AHU–Q1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–Q1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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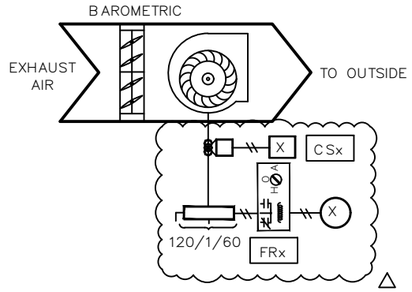
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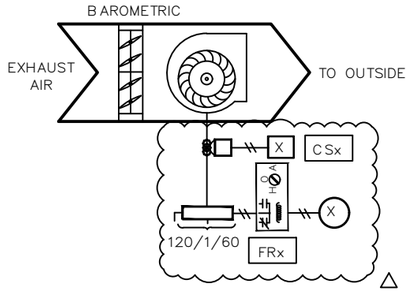
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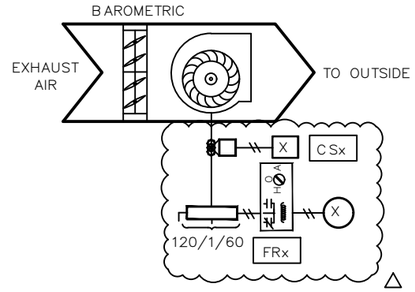
EXHAUST FAN – BAS CONTROLLED
EF–Q3



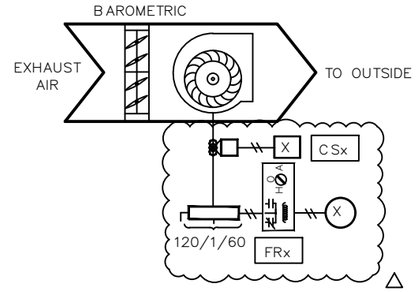
EXHAUST FAN – BAS CONTROLLED
EF–Q4



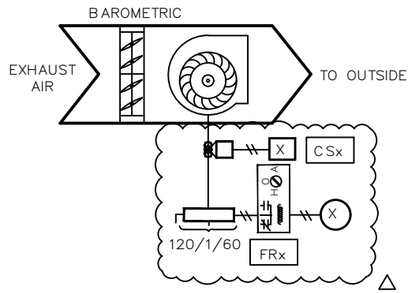
EXHAUST FAN – BAS CONTROLLED
EF–Q11



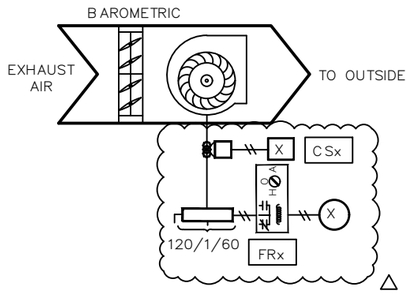
EXHAUST FAN – BAS CONTROLLED
EF–Q12



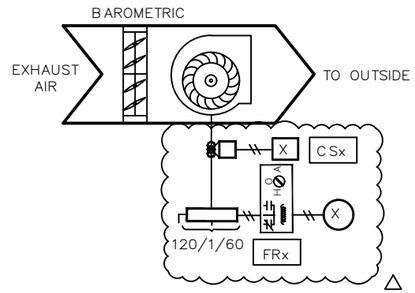
EXHAUST FAN – BAS CONTROLLED
EF–Q16



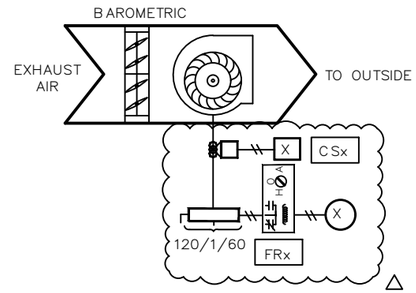
EXHAUST FAN – BAS CONTROLLED
EF–Q20



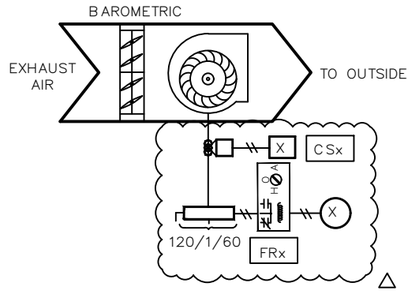
EXHAUST FAN – BAS CONTROLLED
EF–Q23



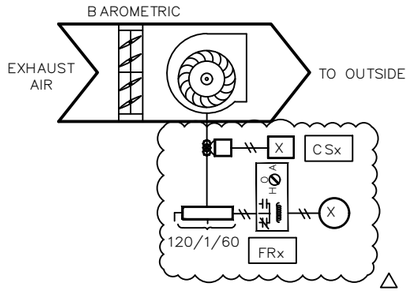
EXHAUST FAN – BAS CONTROLLED
EF–Q24



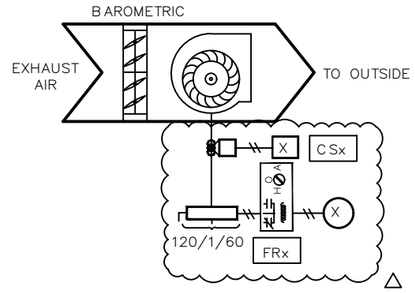
EXHAUST FAN – BAS CONTROLLED
EF–R2



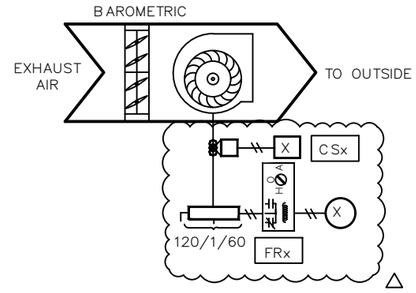
EXHAUST FAN – BAS CONTROLLED
EF–R3



EXHAUST FAN – BAS CONTROLLED
EF–R4



EXHAUST FAN – BAS CONTROLLED
EF–R5



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA Q EXHAUST FIELD DEVICES (1 OF 2)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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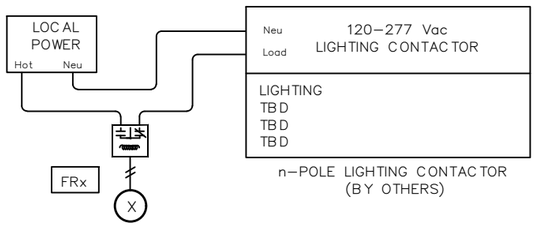
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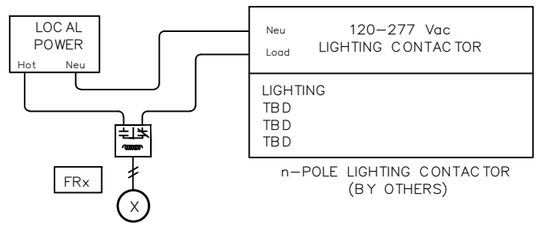
CONTRACT NO:

SHEET
NCHS–381
JOB NUMBER:
J–2304001

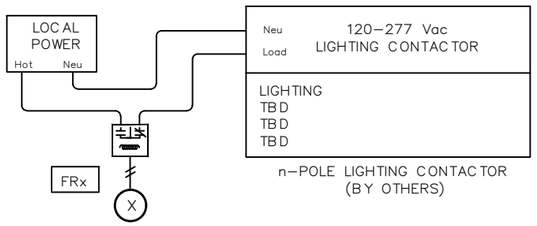
LIGHTING CONTACTOR CONTROLS
RR–3 – ZONE 4



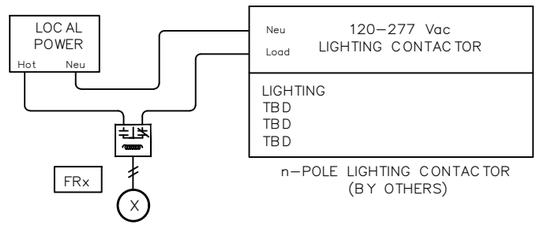
LIGHTING CONTACTOR CONTROLS
RR–4 – ZONE 8



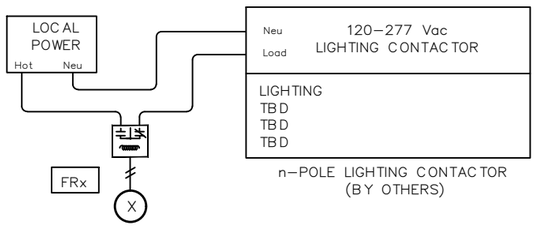
LIGHTING CONTACTOR CONTROLS
RR–5 – ZONE 12



LIGHTING CONTACTOR CONTROLS
RR–6 – ZONE 12



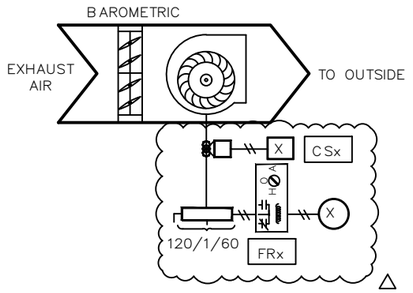
LIGHTING CONTACTOR CONTROLS
RR–7 – ZONE 12



BILL OF MATERIAL

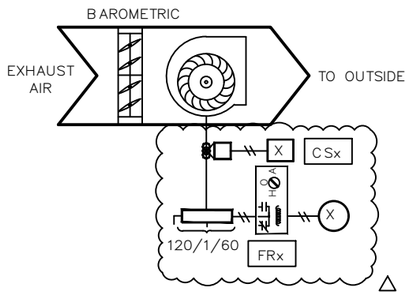
WILL BE PROVIDED IN A FUTURE REVISION. △

EXHAUST FAN – BAS CONTROLLED
EF–R13



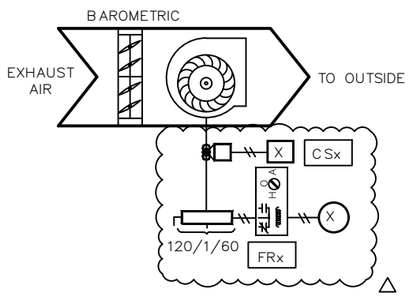
△

EXHAUST FAN – BAS CONTROLLED
EF–R16



△

EXHAUST FAN – BAS CONTROLLED
EF–R17



△

NETWORK POINTS

N1 THROUGH Nx

AREA Q EXHAUST & LIGHTING FIELD DEVICES (2 OF 2)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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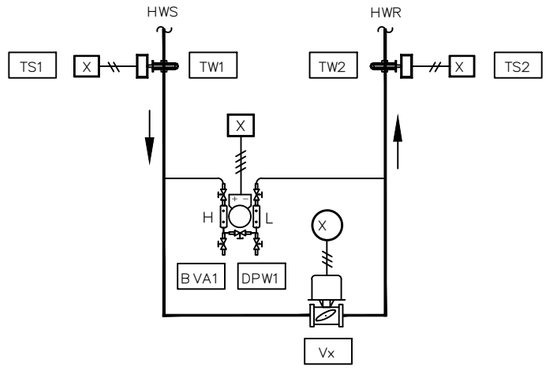
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SHEET
NCHS–382
JOB NUMBER:
J–2304001

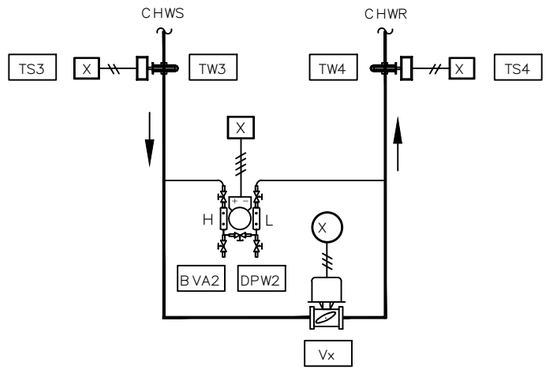
END OF LOOP CONTROLS – HOT WATER
(PENTHOUSE 'Q' WEST BUILDING)

(CONFIRMATION OF EXISTING DEVICE LOCATIONS REQUIRED)
(PREVIOUS DESIGN INDICATES CTRLS. ARE LOCATED AT AHU–Q1)



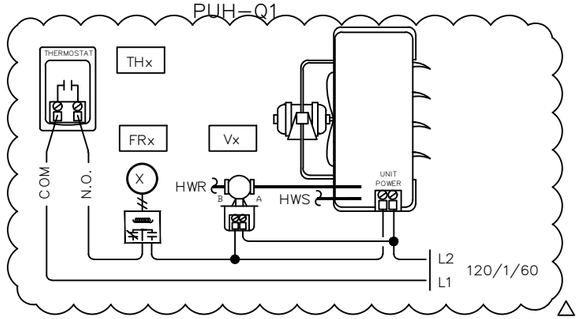
END OF LOOP CONTROLS – CHILL WATER
(PENTHOUSE 'Q' WEST BUILDING)

(CONFIRMATION OF EXISTING DEVICE LOCATIONS REQUIRED)
(PREVIOUS DESIGN INDICATES CTRLS. ARE LOCATED AT AHU–Q1)

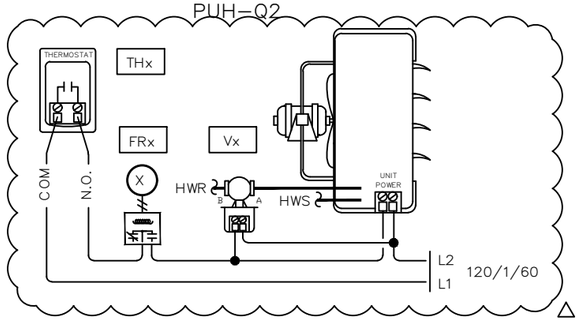


BILL OF MATERIAL

PROPELLER UNIT HEATER
PUH–Q1



PROPELLER UNIT HEATER
PUH–Q2



NETWORK POINTS
N1 THROUGH Nx

AREA Q WEST BUILDING END OF LOOP PRESSURE CONTROL & PROPELLER UNIT HEATER FIELD DEVICES

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–383
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
CHWR WEST EOL	Chill Water Return Temp	X				
CHWS WEST EOL	Chill Water Supply Temp	X				
CW DP WEST EOL	End of Loop Diff Pressure - West Bldg	X				
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
HW DP WEST EOL	End of Loop Diff Pressure - West Bldg	X				
HWR WEST EOL	Hot Water Return Temp	X				
HWS WEST EOL	Hot Water Supply Temp	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-Q11 STAT	Exhaust Fan Q11 Status		X			
EF-Q12 STAT	Exhaust Fan Q12 Status		X			
EF-Q16 STAT	Exhaust Fan Q16 Status		X			
EF-Q20 STAT	Exhaust Fan Q20 Status		X			
EF-Q23 STAT	Exhaust Fan Q23 Status		X			
EF-Q24 STAT	Exhaust Fan Q24 Status		X			
EF-Q3 STAT	Exhaust Fan Q3 Status		X			
EF-Q4 STAT	Exhaust Fan Q4 Status		X			
EF-R13 STAT	Exhaust Fan R13 Status		X			
EF-R16 STAT	Exhaust Fan R16 Status		X			
EF-R17 STAT	Exhaust Fan R17 Status		X			
EF-R2 STAT	Exhaust Fan R2 Status		X			
EF-R3 STAT	Exhaust Fan R3 Status		X			
EF-R4 STAT	Exhaust Fan R4 Status		X			
EF-R5 STAT	Exhaust Fan R5 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CW BYP VLV	EOL Bypass Valve - West Bldg			X		
CWV	Chill Water Valve			X		
HW BYP VLV	EOL Bypass Valve - West Bldg			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
EF-Q11 SS	Exhaust Fan Q11 Fan Start / Stop				X	
EF-Q12 SS	Exhaust Fan Q12 Fan Start / Stop				X	
EF-Q16 SS	Exhaust Fan Q16 Fan Start / Stop				X	
EF-Q20 SS	Exhaust Fan Q20 Fan Start / Stop				X	
EF-Q23 SS	Exhaust Fan Q23 Fan Start / Stop				X	
EF-Q24 SS	Exhaust Fan Q24 Fan Start / Stop				X	
EF-Q3 SS	Exhaust Fan Q3 Fan Start / Stop				X	
EF-Q4 SS	Exhaust Fan Q4 Fan Start / Stop				X	
EF-R13 SS	Exhaust Fan R13 Fan Start / Stop				X	
EF-R16 SS	Exhaust Fan R16 Fan Start / Stop				X	
EF-R17 SS	Exhaust Fan R17 Fan Start / Stop				X	
EF-R2 SS	Exhaust Fan R2 Fan Start / Stop				X	
EF-R3 SS	Exhaust Fan R3 Fan Start / Stop				X	
EF-R4 SS	Exhaust Fan R4 Fan Start / Stop				X	
EF-R5 SS	Exhaust Fan R5 Fan Start / Stop				X	
LTG 1	Lighting Contactor - Zone 4 RR-3				X	
LTG 2	Lighting Contactor - Zone 8 RR-4				X	
LTG 3	Lighting Contactor - Zone 12 RR-5				X	
LTG 4	Lighting Contactor - Zone 12 RR-6				X	
LTG 5	Lighting Contactor - Zone 12 RR-7				X	
PUH-Q1 EN	PUH Q1 Enable				X	
PUH-Q2 EN	PUH Q2 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**14**	**20**	**8**	**24**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-Q1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

DEHUMIDIFICATION MODE: WHEN AVERAGE SPACE HUMIDITY AS COMMUNICATED FROM TERMINAL UNITS RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN AVERAGE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

END OF LOOP CONTROLS (FROM PREVIOUS BAS CONTROL SEQUENCES):

THE TEMPERATURE OF THE SUPPLY WATER TO THE EQUIPMENT ROOM WILL BE USED TO POSITION THE END OF LOOP TEMPERATURE VALVE TO MAINTAIN THE CHILLED WATER SUPPLY AT 48 DEG. F AND THE HEATING WATER SUPPLY AT 145 DEG. F. THE PRESSURE TRANSMITTER WILL BE USED IN THE RESET OF THE PUMP VOLUME CONTROL SUCH THAT THE PUMP WILL MAINTAIN THE PROPER PRESSURE AT THE END OF THE MAIN.

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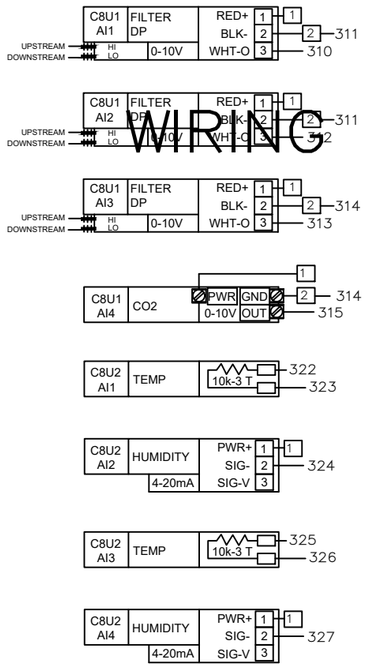
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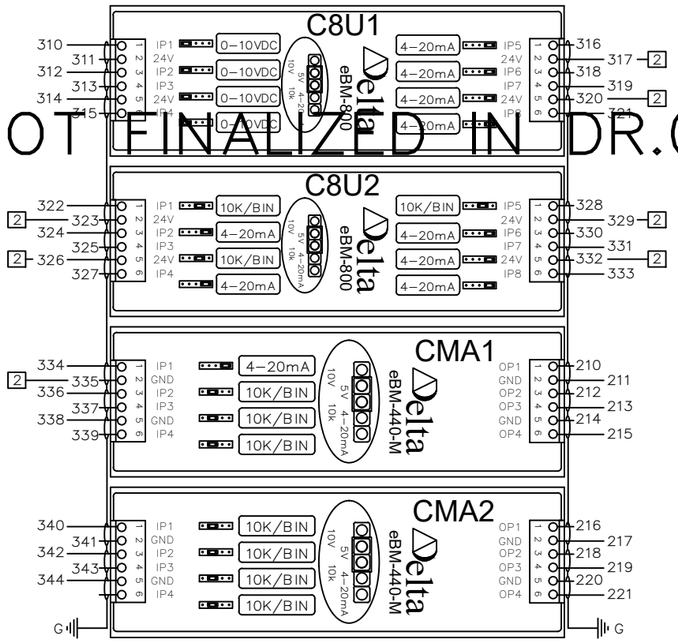
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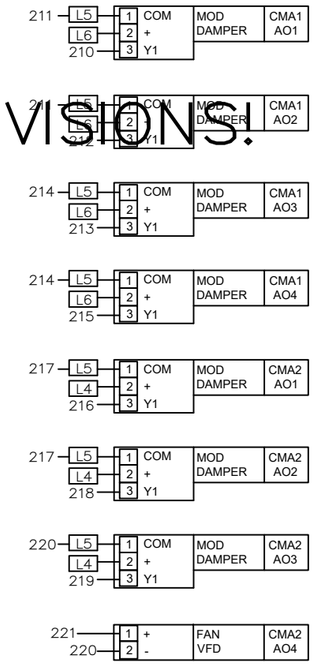
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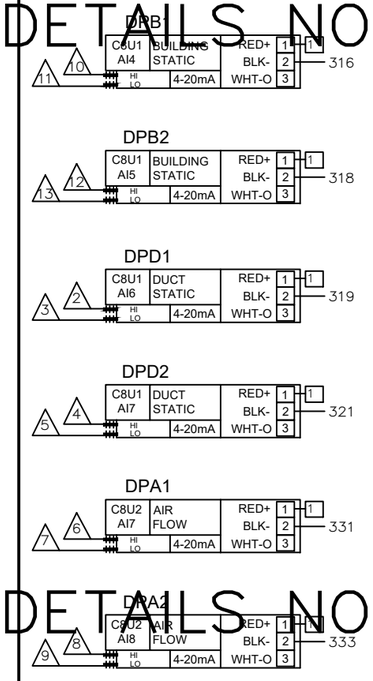
SHEET
NCHS–385
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J–2304001

SYSTEM 47 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — eBM-440-M I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — eBM-440-M I/O MODULE

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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AHU-Q1 SYSTEM 47 PANEL – I/O WIRING (1 OF 4)

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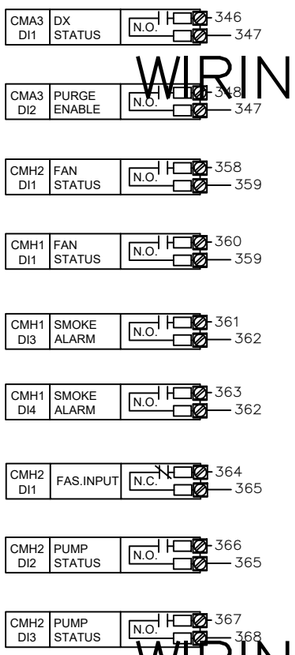
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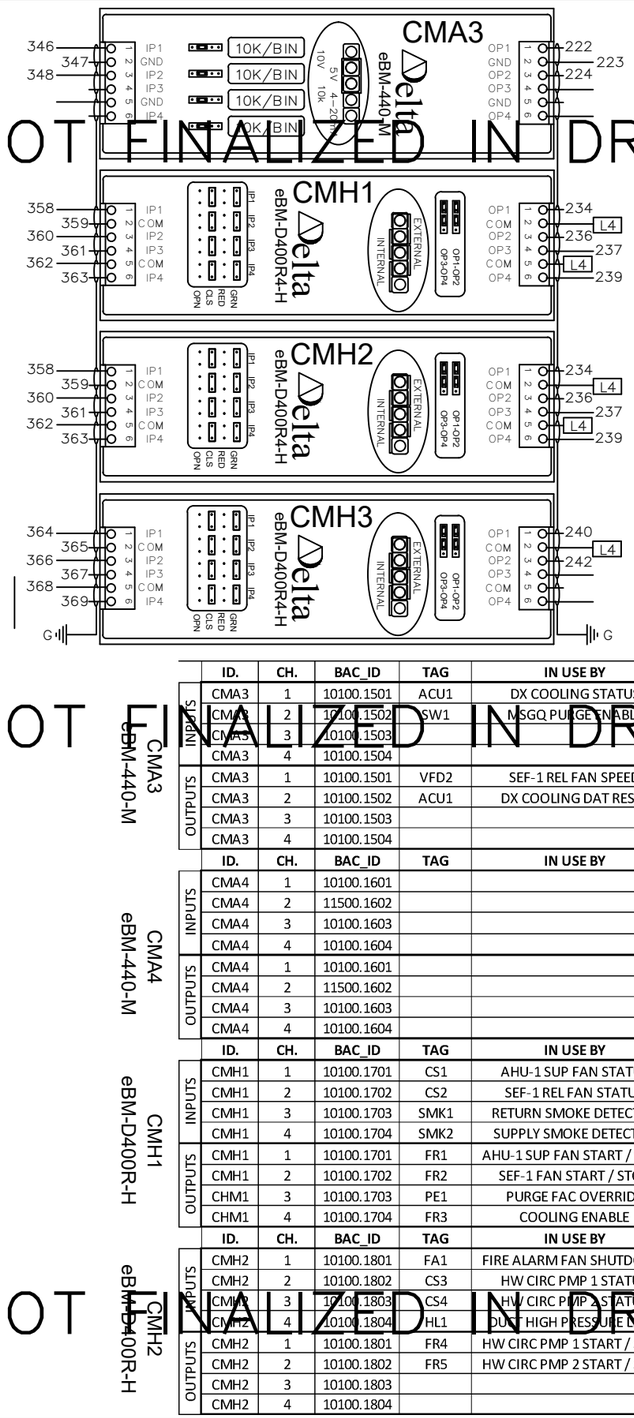
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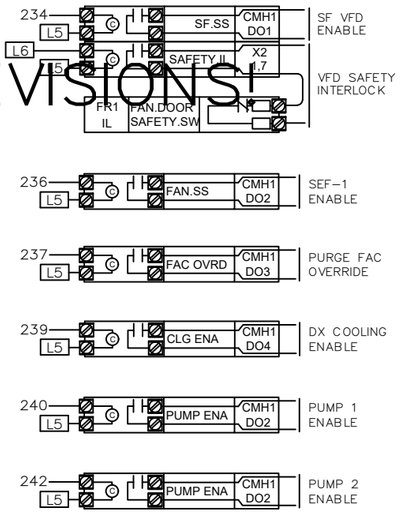
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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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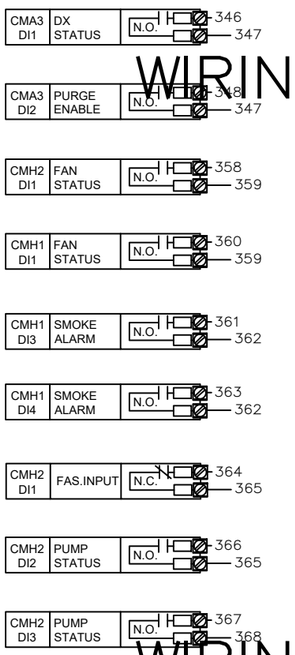
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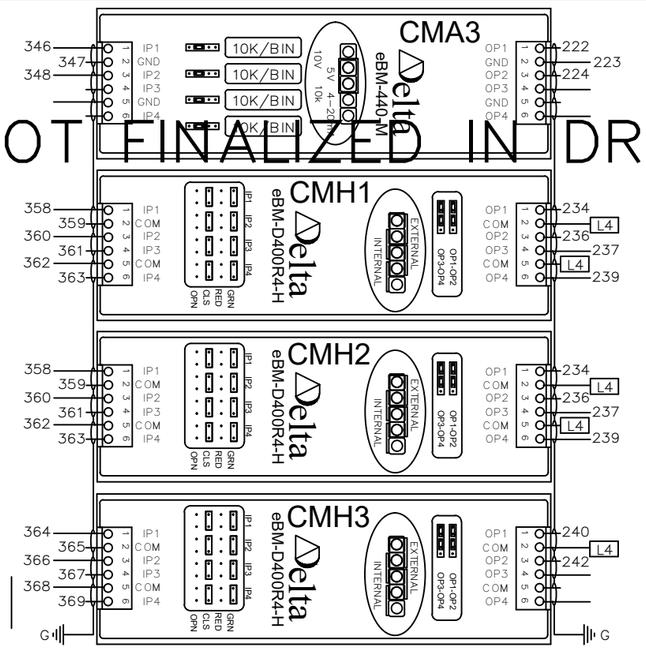
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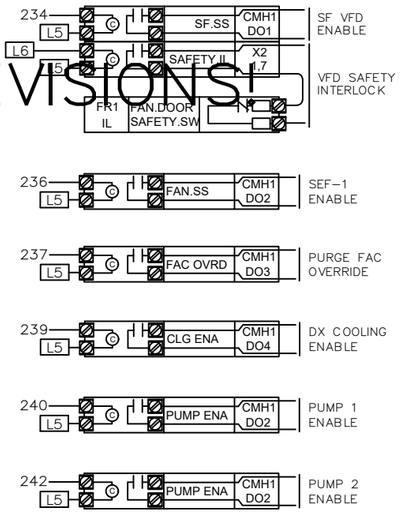
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NCHS–387
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

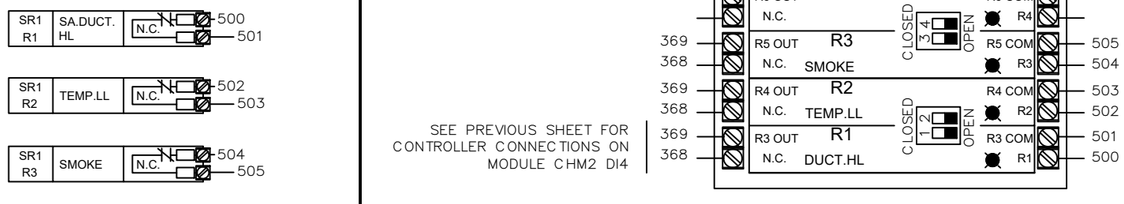
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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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SYSTEM 47 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB Power

24V CB Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L3 L2

PS1

102 4.0A

101 1.0A

100 5.0A

G PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

206 L8 L8 L8

207 L9 L9 L9

24 VAC TO FIELD

300 301 L3 ETS1

V1− V1+

ETHERNET SWITCH

1 3 5 4 2

CAT5e

SR1

RIBMNLB-4

202 204

200 201

R7 POLE C 10A @ 277VAC & 24 VDC

R7 POLE A 1 HP @ 120VAC

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED OPEN

DPD1

Power + GND / 4-20mA out − Voltage out 0

HIGH LOW

PNEUMATIC

2 3

3 2

CEB1

201 200

PWR GND 24~

USB2 USB1

(NOT USED)

NET1 RS-485 NET2 RS-485

MS/TP

C8X1

eBX

eBUS Address

eBUS

eBM-800 eBM-800 eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

eNET BUS

C4X1

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

SEE RISER DIAGRAMS FOR LOCATION

AHU-Q1 SYSTEM 47 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
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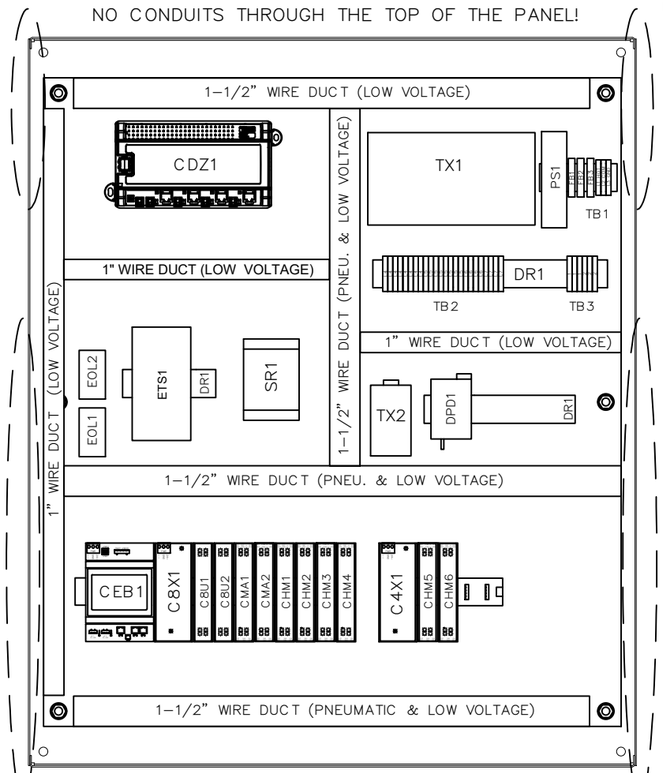
CONTRACT NO:

SHEET
NCHS-390
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J-2304001

SYSTEM CONTROL PANEL 47 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

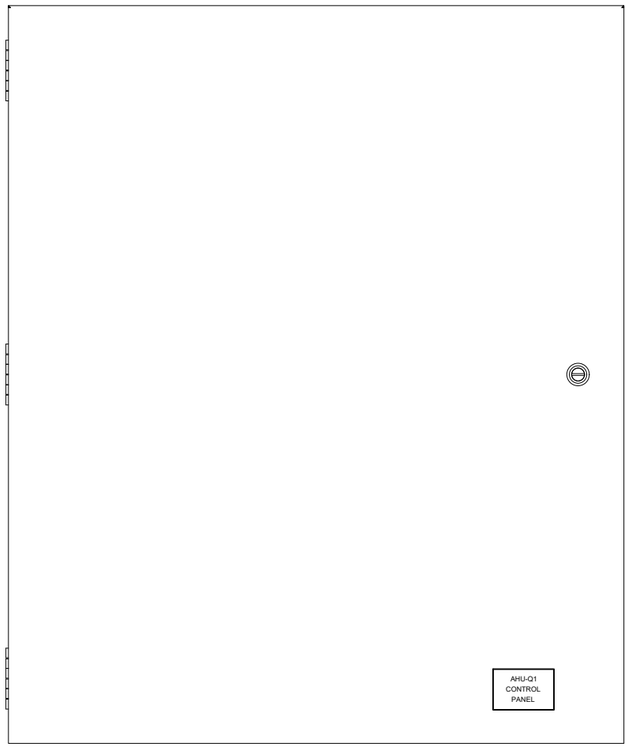


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



BILL OF MATERIALS

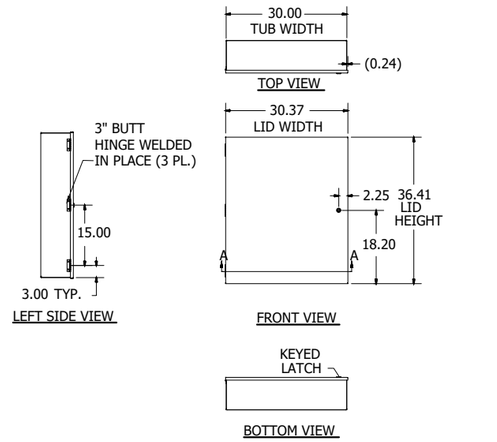
WILL BE PROVIDED IN A FUTURE REVISION. △

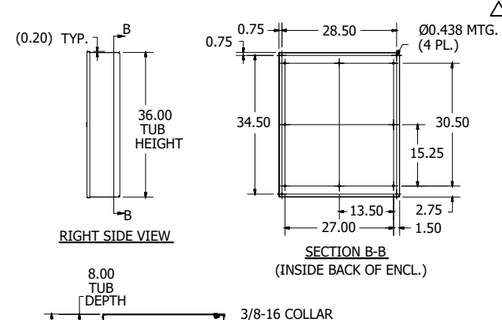
BILL OF MATERIALS

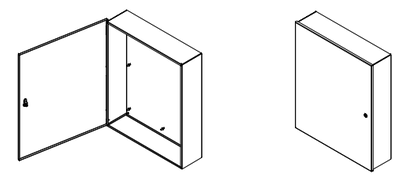
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

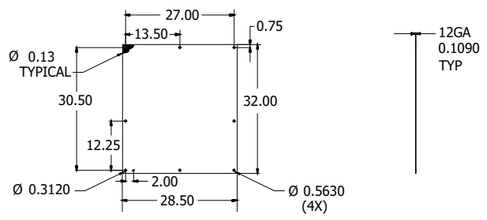
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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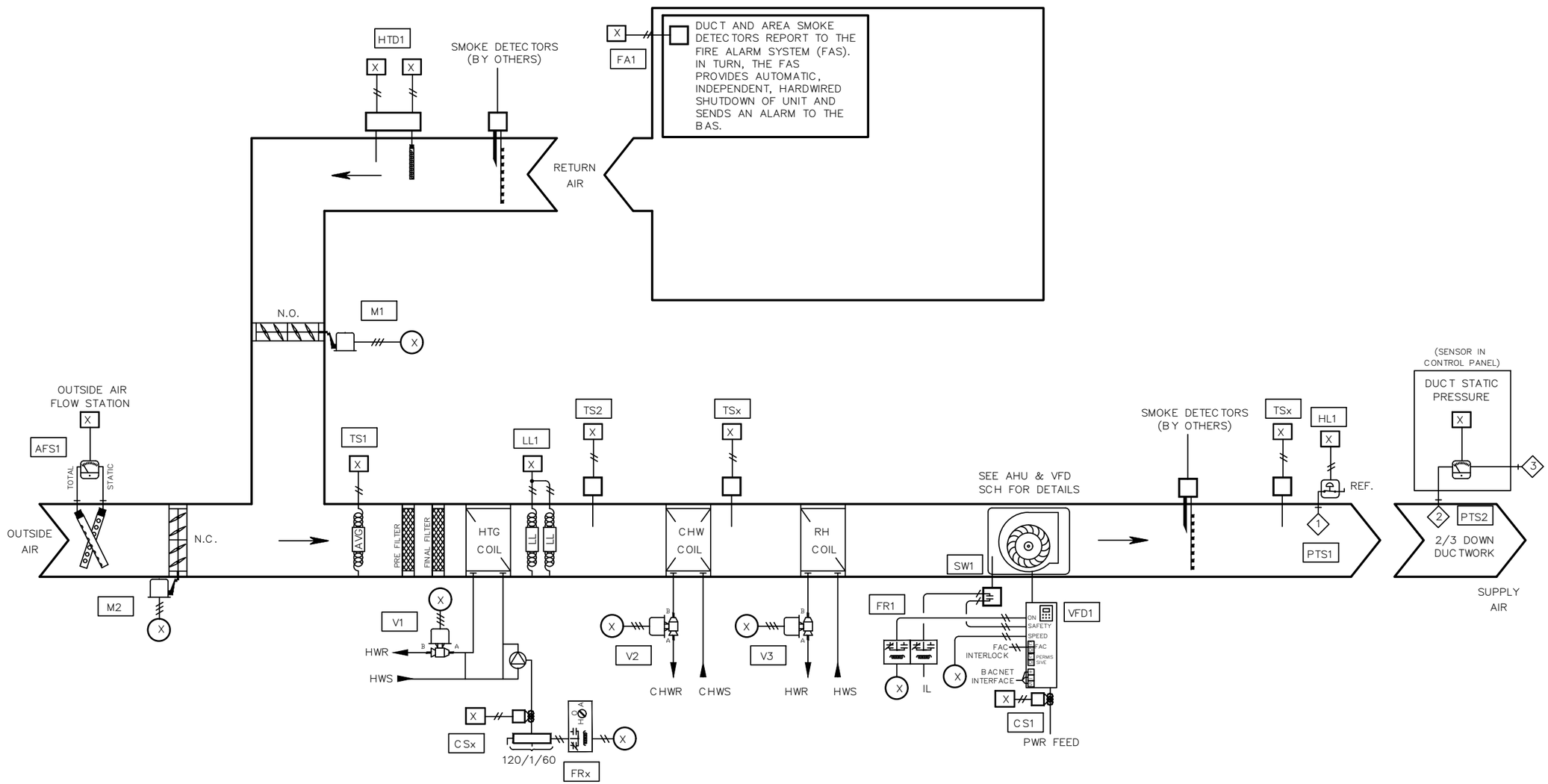
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E–AHU–Q2 FIELD DEVICES



NETWORK POINTS

N1 THROUGH Nx

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

E–AHU–Q2 FIELD DEVICES

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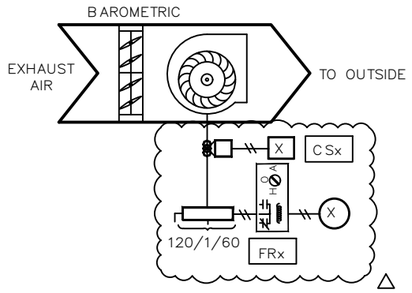
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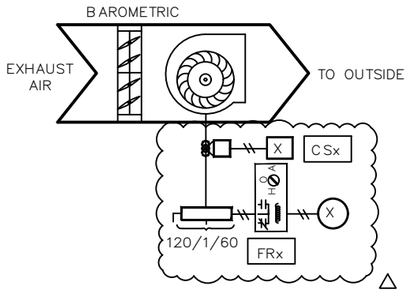
CONTRACT NO:

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NCHS–392
JOB NUMBER:
J–2304001

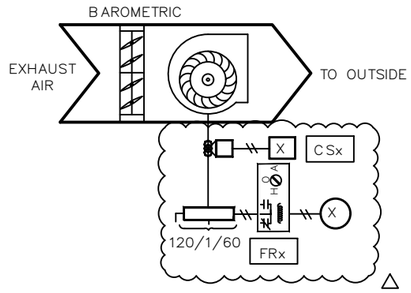
EXHAUST FAN – BAS CONTROLLED
EF–Q26



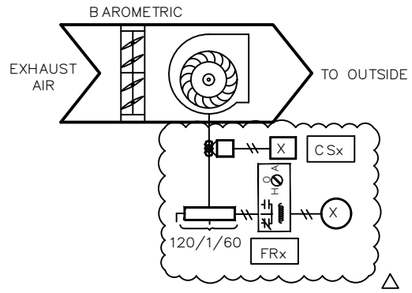
EXHAUST FAN – BAS CONTROLLED
EF–Q27



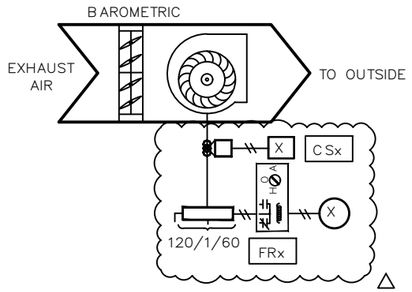
EXHAUST FAN – BAS CONTROLLED
EF–Q28



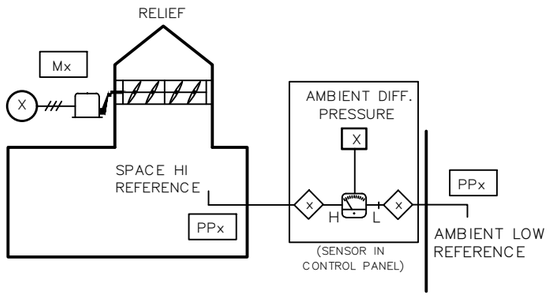
EXHAUST FAN – BAS CONTROLLED
EF–Q29



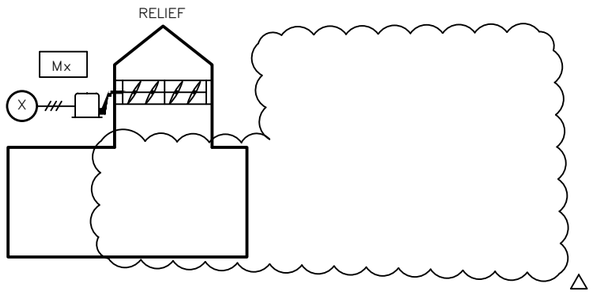
EXHAUST FAN – BAS CONTROLLED
EF–Q30



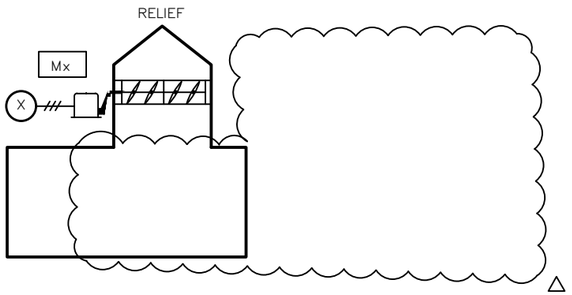
BUILDING PRESSURE CONTROL
E–RH–Q1



BUILDING PRESSURE CONTROL
E–RH–Q2



BUILDING PRESSURE CONTROL
RH–Q3



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA Q EXHAUST & RELIEF FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-Q26 STAT	Exhaust Fan Q26 Status		X			
EF-Q27 STAT	Exhaust Fan Q27 Status		X			
EF-Q28 STAT	Exhaust Fan Q28 Status		X			
EF-Q29 STAT	Exhaust Fan Q29 Status		X			
EF-Q30 STAT	Exhaust Fan Q30 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-Q1 DPR	Relief Air Damper			X		
E-RH-Q2 DPR	Relief Air Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-Q3 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-Q26 SS	Exhaust Fan Q26 Fan Start / Stop				X	
EF-Q27 SS	Exhaust Fan Q27 Fan Start / Stop				X	
EF-Q28 SS	Exhaust Fan Q28 Fan Start / Stop				X	
EF-Q29 SS	Exhaust Fan Q29 Fan Start / Stop				X	
EF-Q30 SS	Exhaust Fan Q30 Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**9**	**10**	**9**	**7**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-Q2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFQn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

DEHUMIDIFICATION MODE: WHEN AVERAGE SPACE HUMIDITY AS COMMUNICATED FROM TERMINAL UNITS RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN AVERAGE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

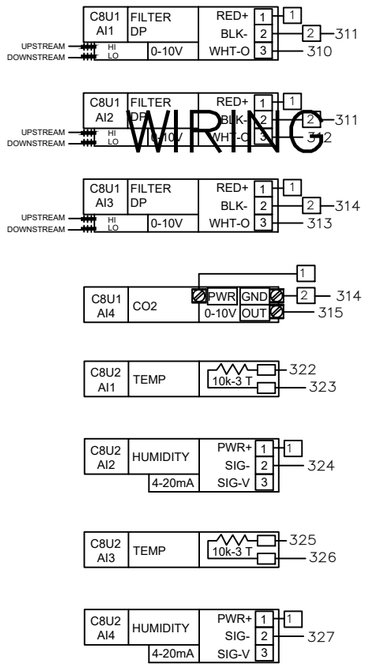
REVISIONS	
DATE	REMARKS

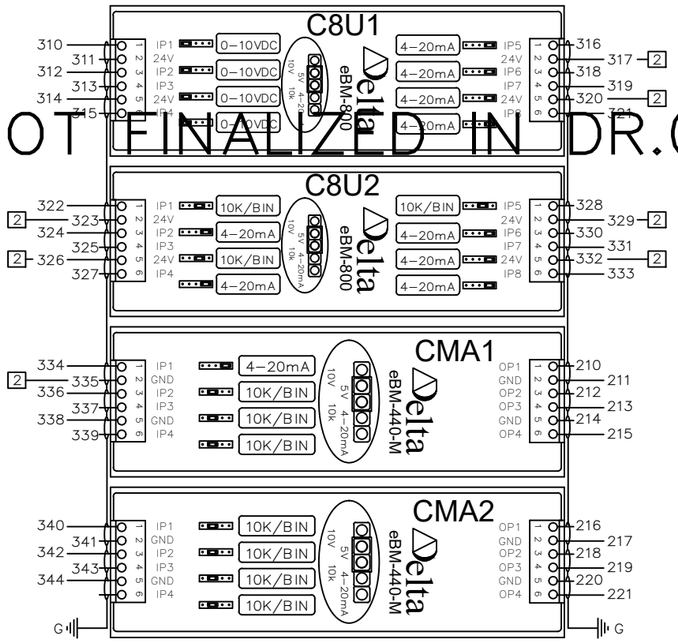
JOB TITLE: North Central High School
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ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

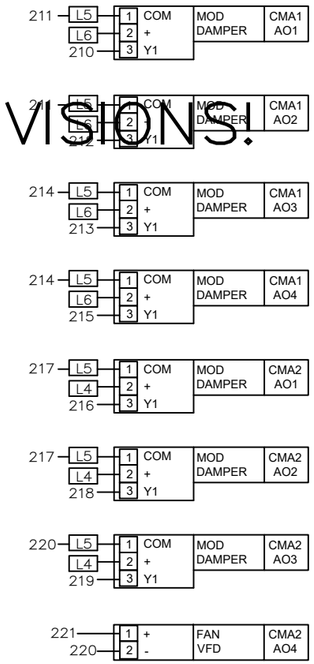
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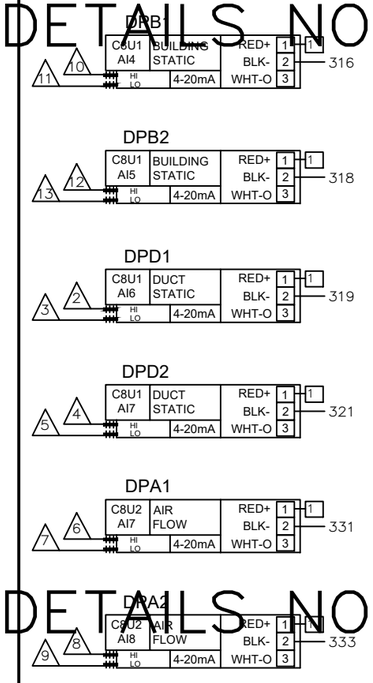
SHEET
NCHS-395
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	C8U1 eBM-800 INPUTS
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	C8U2 eBM-800 INPUTS
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	CMA1 eBM-440-M INPUTS
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	CMA1 eBM-440-M OUTPUTS
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	CMA2 eBM-440-M INPUTS
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	
CMA2	4	10100.1404				
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	CMA2 eBM-440-M OUTPUTS
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	

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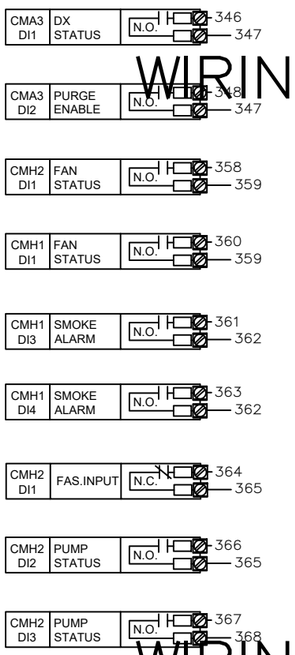
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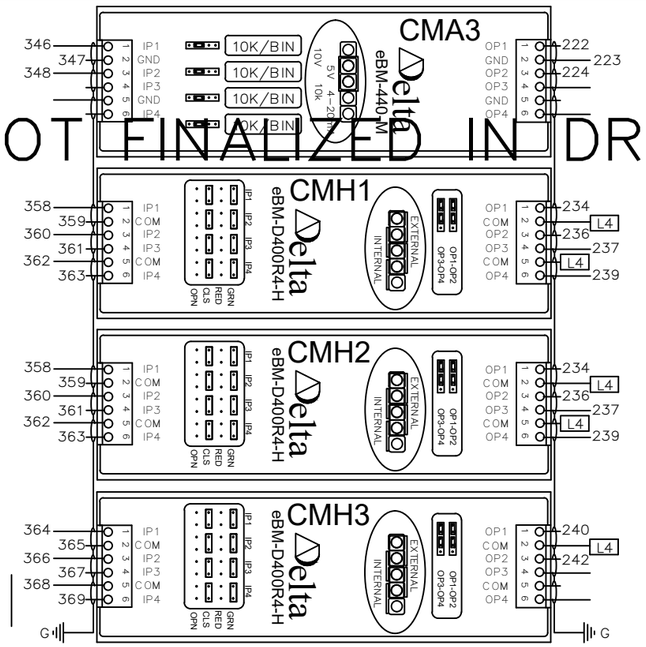
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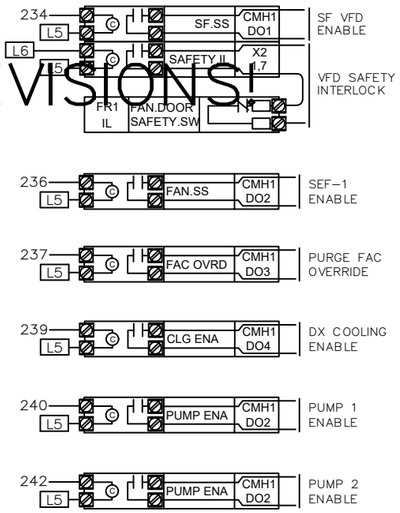
SHEET
NCHS-396
JOB NUMBER:
J-2304001

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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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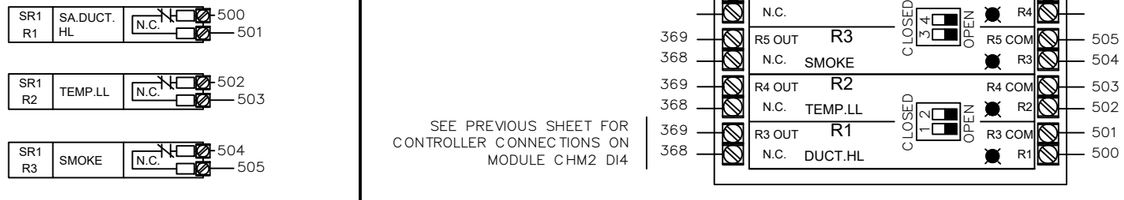
CONTRACT NO:

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NCHS–397
JOB NUMBER:
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CFP1
DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1
DFM-400P

AHU–Q2 SYSTEM 48 PANEL – I/O WIRING (3 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
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SYSTEM 48 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

CAT-6a

ETS1

V1- V1+ 300 301 L3

ETHERNET SWITCH

1 2 3 4 5

CAT5e

SR1

RIBMNLB-4

202 204

200 201

24V COM

POWER 24 VAC 44 MAX

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 (NOT USED)

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

TX1

24V CB 24V CB

Power Power

100 L2 L3 H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

24VAC 24VAC 75VA

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L2 L3

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1 DPB1

1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3 4 5

CEB1 C8X1

201 200

PWR GND 24~

USB2 USB1 (NOT USED)

eBMGR-2

eBX

eBUS Address

eBUS

NET1 RS-485 NET2 RS-485 + – SHD

ETH 1 ETH 2 LAN 1

MS/TP

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

OP1 OP2 OP3 OP4 HAO

IP1 IP2 IP3 IP4 24V

I/O SHIELD DRAIN

TO PANEL GND LUG L3

SEE RISER DIAGRAMS FOR LOCATION

AHU-Q2 SYSTEM 48 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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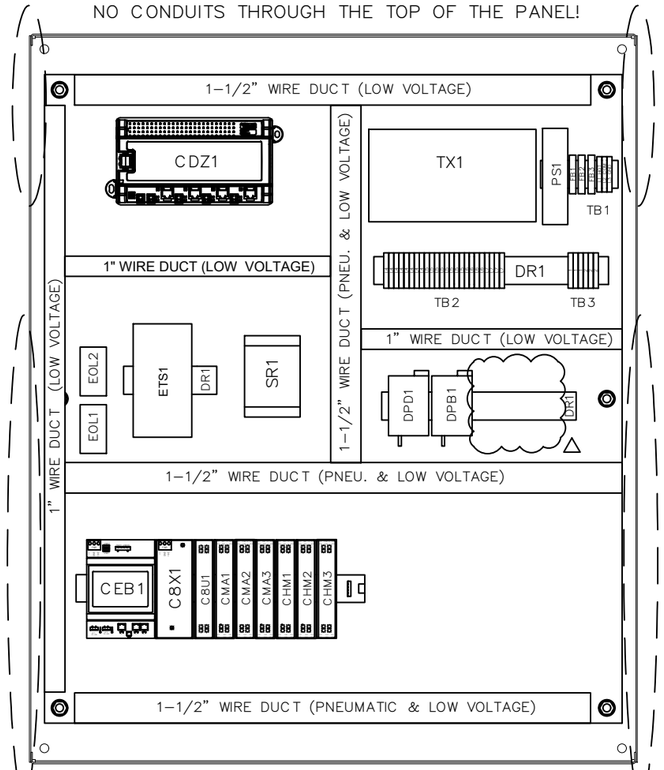
CONTRACT NO:

SHEET
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J-2304001

SYSTEM CONTROL PANEL 48 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

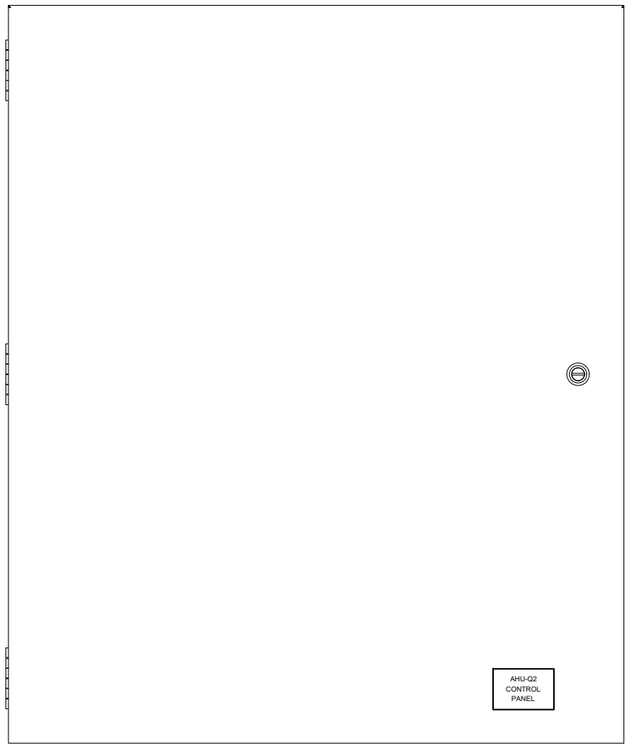


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

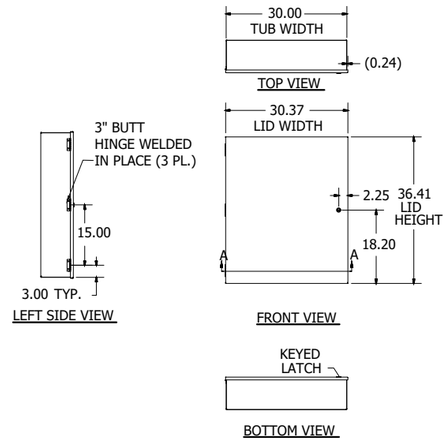
WILL BE PROVIDED IN A FUTURE REVISION. △

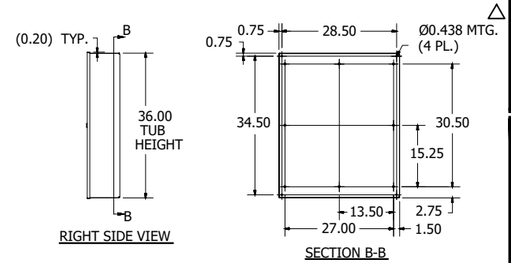
BILL OF MATERIALS

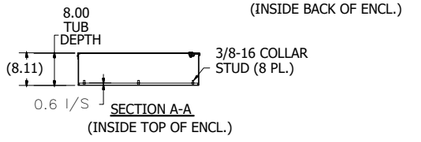
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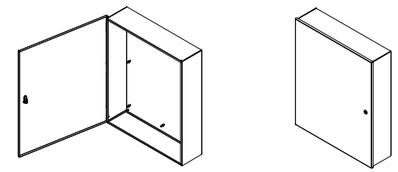
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

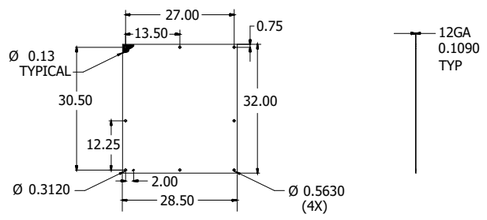








PANEL DIMENSIONS



AHU–Q2 SYSTEM 48 PANEL – DIMENSIONS & BOM

Delta CONTROLS

Temperature Control Services

4240 W 50 S
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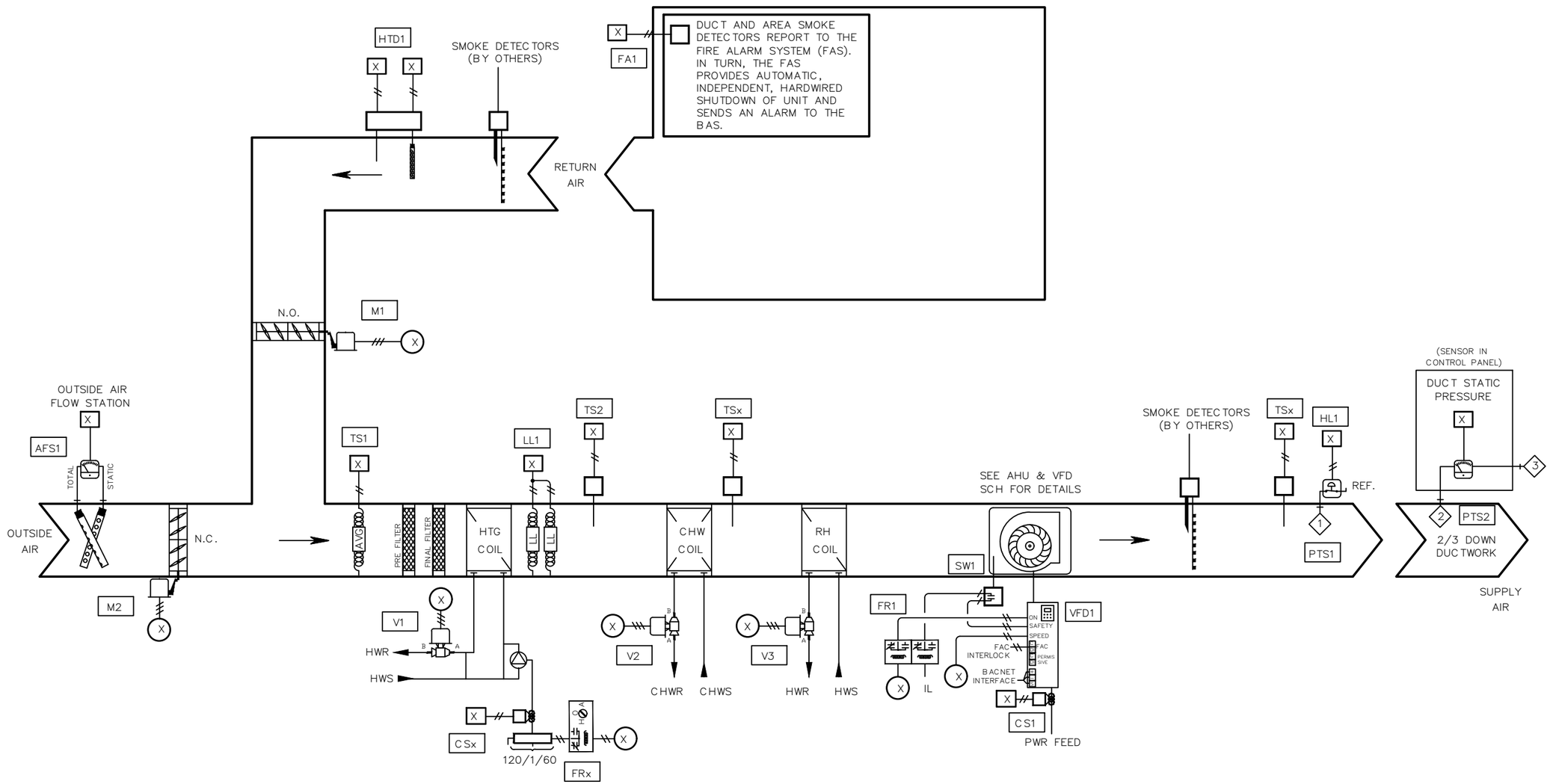
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NCHS–400
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E–AHU–R1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–R1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

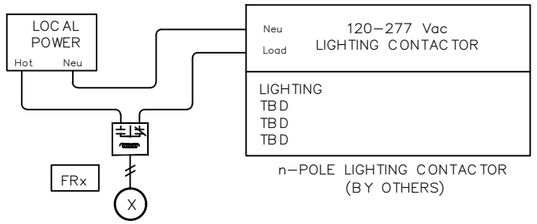
REVISIONS	
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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

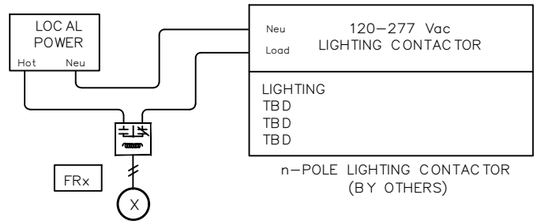
CONTRACT NO:

SHEET
NCHS–401
JOB NUMBER:
J–2304001

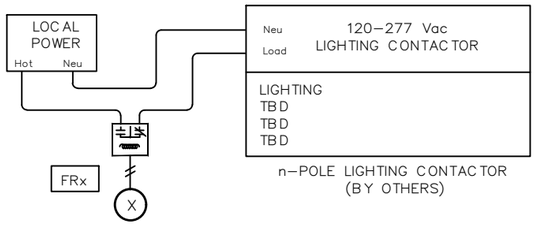
LIGHTING CONTACTOR CONTROLS
RR–1 – NORTH & WEST EXTERIOR



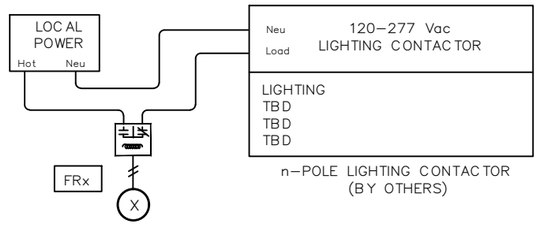
LIGHTING CONTACTOR CONTROLS
RU–1 – SOUTH PARKING



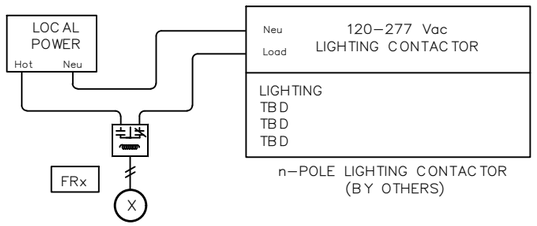
LIGHTING CONTACTOR CONTROLS
RZ–1 – SOUTH EXTERIOR AND WRESTLING



LIGHTING CONTACTOR CONTROLS
RZ–2 – WEST EXTERIOR & GYM



LIGHTING CONTACTOR CONTROLS
RZ–3 – SOUTH PARKING



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA R LIGHTING FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS–402
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
LTG 1	Lighting Contactor - N & W Ext RR-1				X	
LTG 2	Lighting Contactor - S Pkg RU-1				X	
LTG 3	Lighting Contactor - S Ext & Wrst RZ-1				X	
LTG 4	Lighting Contactor - W Ext & Gym RZ-2				X	
LTG 5	Lighting Contactor - S Pkg RZ-3				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**5**	**6**	**7**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

E-AHU-R1 & AREA R MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
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VAV AIR HANDLING UNIT AHU-R1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

DEHUMIDIFICATION MODE: WHEN AVERAGE SPACE HUMIDITY AS COMMUNICATED FROM TERMINAL UNITS RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN AVERAGE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

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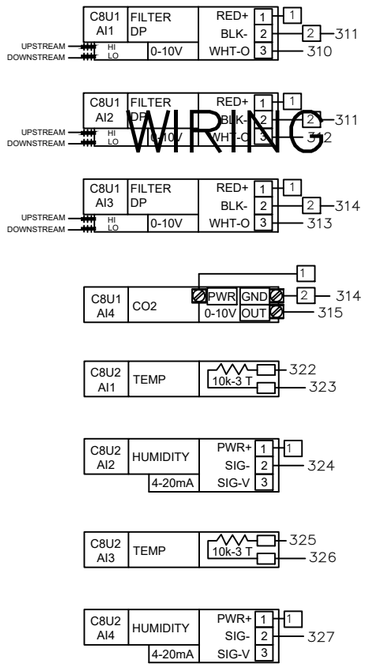
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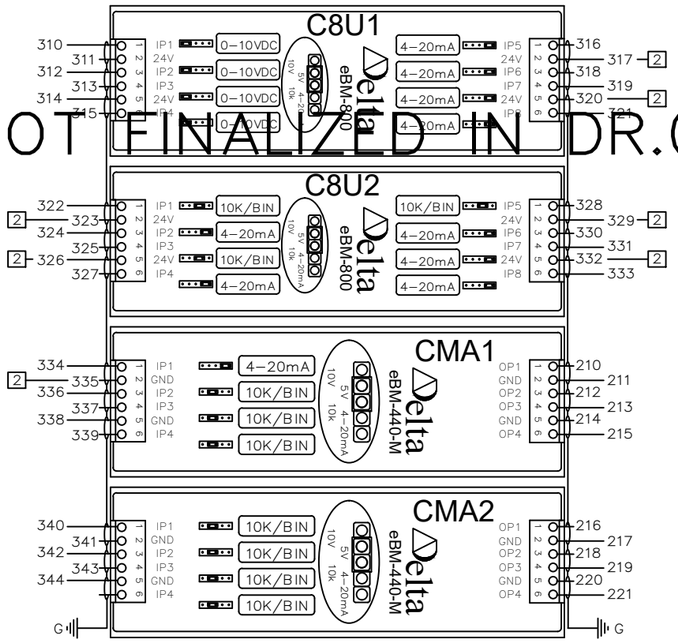
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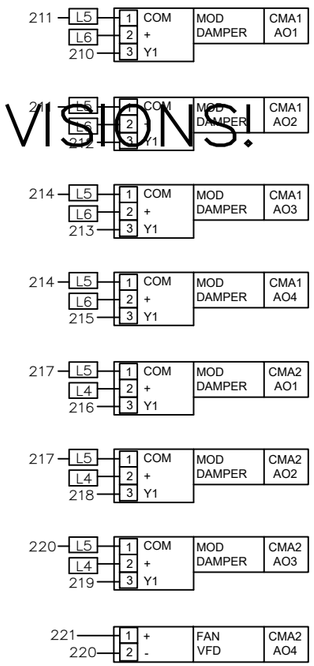
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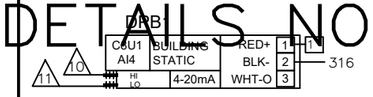
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



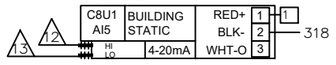




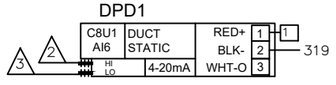
DPB



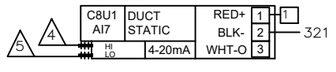
DPB2



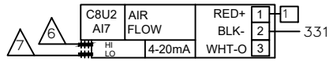
DPD1



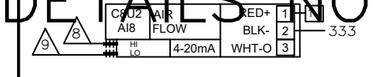
DPD2



DPA1



DPA2



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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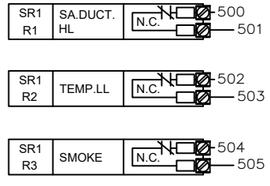
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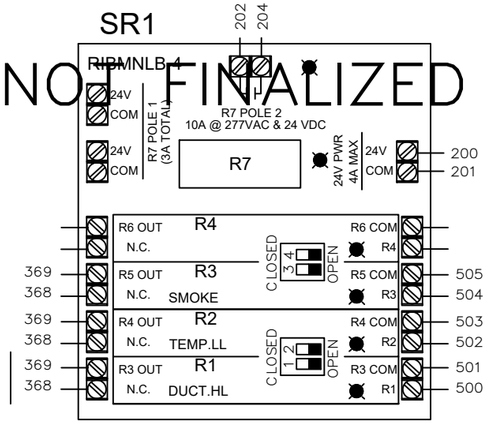
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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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NCHS-406
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J-2304001

SYSTEM 49 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

300 301 L3

V1- V1+

ETHERNET SWITCH

1 3 5 4 2

CAT5e

SR1

RIBMNLB-4

202 204

200 201

24V COM

R7 POLE C 10A @ 277VAC & 24 VDC

R7 POLE A, B 5A @ 277VAC

POWER 24 MAX

R7

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED LOOP

TX1

24V CB

Power

100 L2 L3

H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L3 L2

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3

H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3

CEB1

201 200

PWR GND 24~

USB2 USB1

(NOT USED)

NET1 RS-485 NET2 RS-485

LAN 1 LAN 2 LAN 3

C8X1

P7 24Vs P8 P5 24Vs P6

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

3 2

SEE RISER DIAGRAMS FOR LOCATION

AHU-R1 SYSTEM 49 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

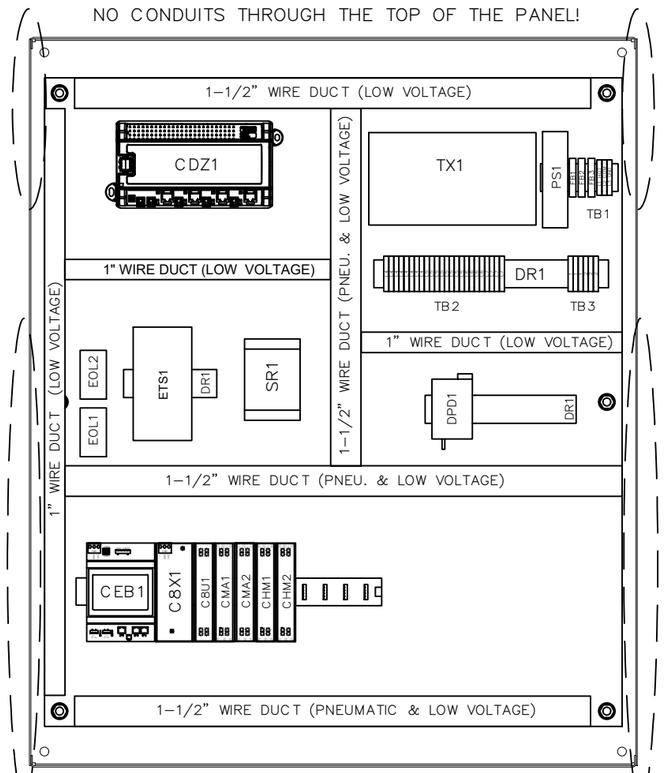
CONTRACT NO:

SHEET
NCHS-407
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 49 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

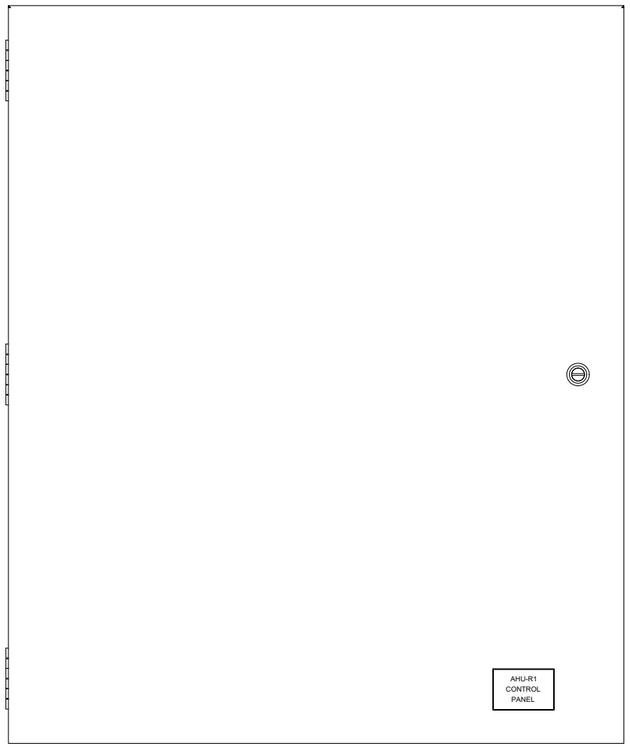
NO CONDUITS THROUGH THE TOP OF THE PANEL!



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

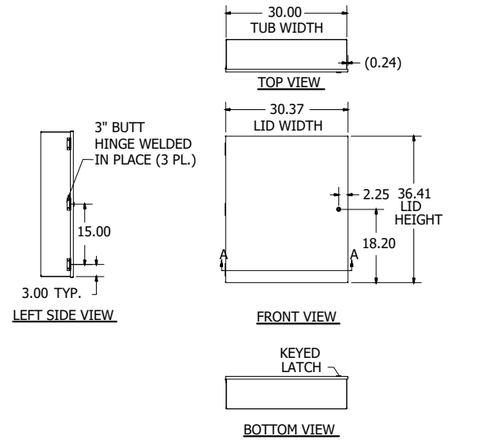
WILL BE PROVIDED IN A FUTURE REVISION. △

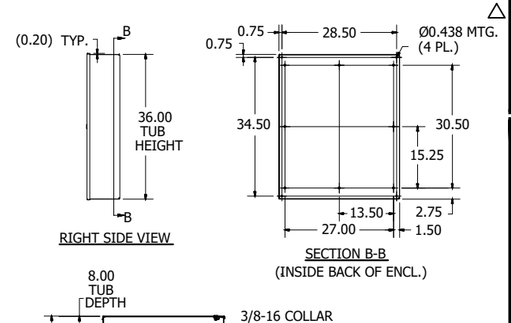
BILL OF MATERIALS

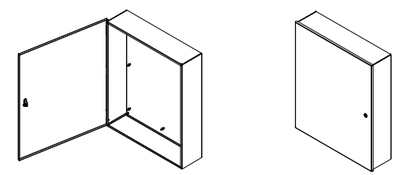
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30" (W) x 36" (H) ENCLOSURE DIMENSIONS

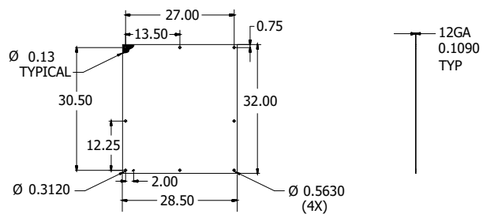
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



AHU-R1 SYSTEM 49 PANEL – DIMENSIONS & BOM

Delta Controls

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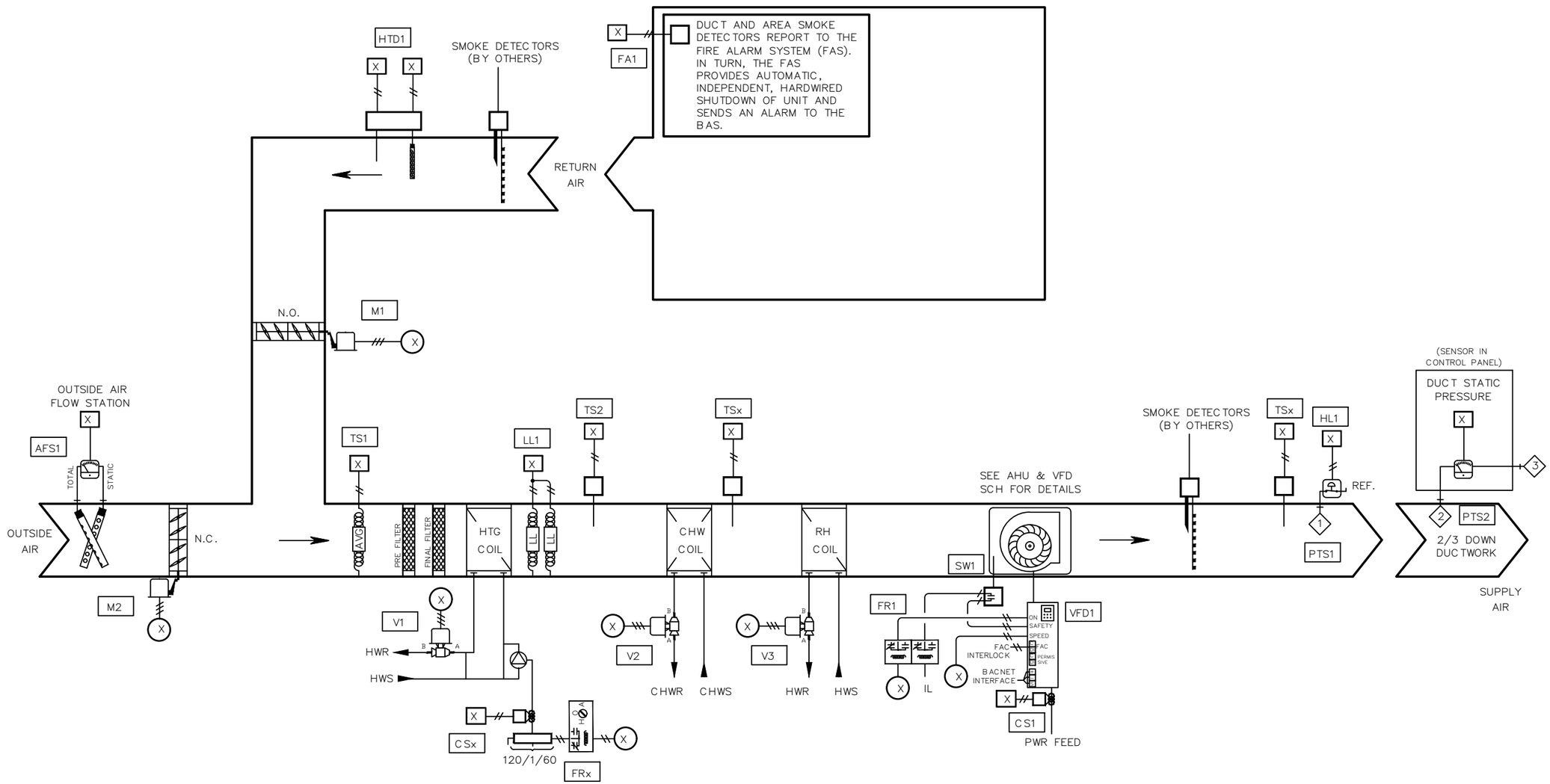
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E–AHU–R2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–R2 FIELD DEVICES

Delta Controls

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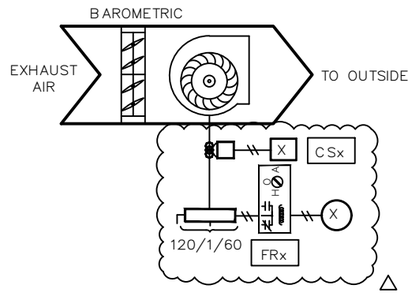
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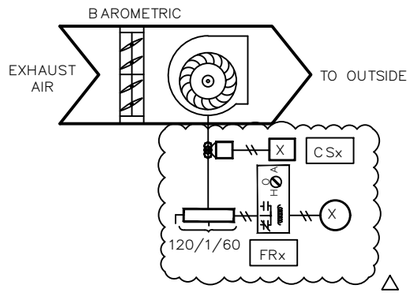
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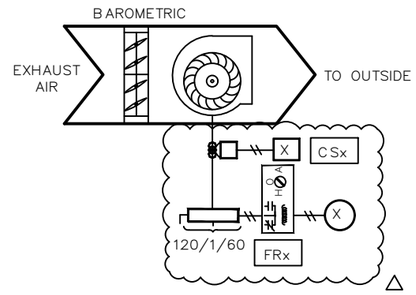
EXHAUST FAN – BAS CONTROLLED
EF–Q2



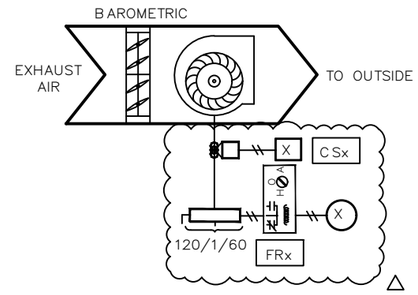
EXHAUST FAN – BAS CONTROLLED
EF–Q5



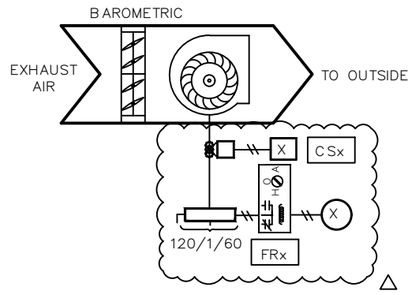
EXHAUST FAN – BAS CONTROLLED
EF–Q6



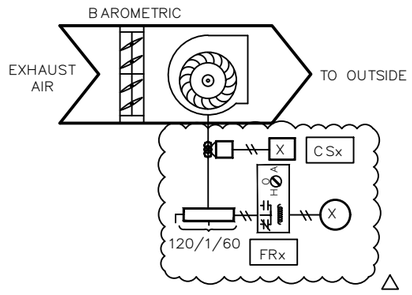
EXHAUST FAN – BAS CONTROLLED
EF–Q7



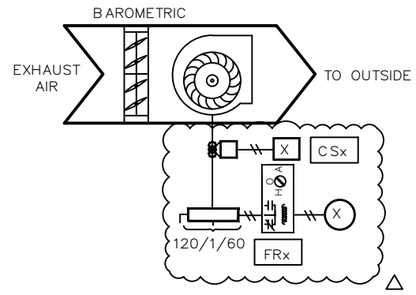
EXHAUST FAN – BAS CONTROLLED
EF–Q8



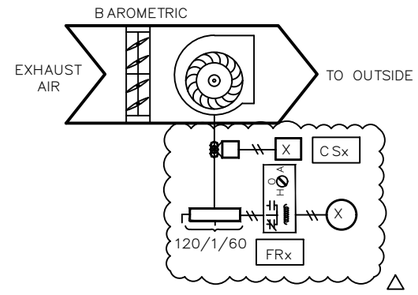
EXHAUST FAN – BAS CONTROLLED
EF–Q10



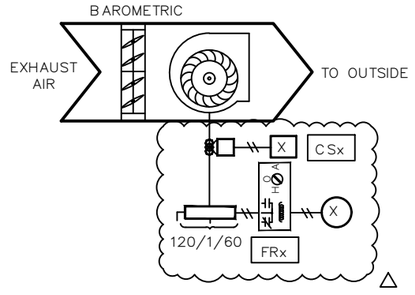
EXHAUST FAN – BAS CONTROLLED
EF–Q13



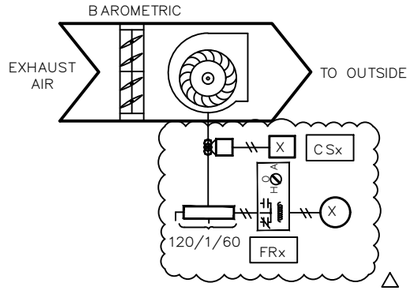
EXHAUST FAN – BAS CONTROLLED
EF–Q14



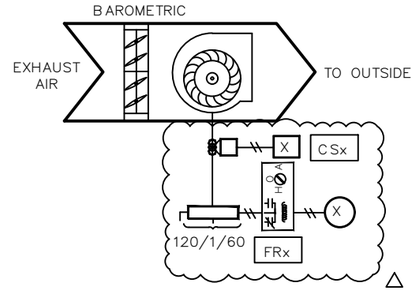
EXHAUST FAN – BAS CONTROLLED
EF–Q21



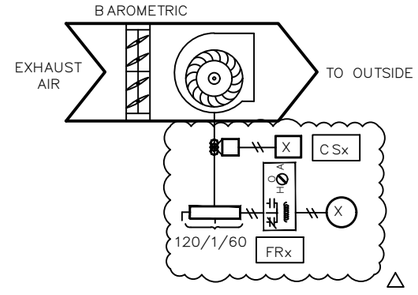
EXHAUST FAN – BAS CONTROLLED
EF–Q22



EXHAUST FAN – BAS CONTROLLED
EF–Q25



EXHAUST FAN – BAS CONTROLLED
EF–R6



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA R EXHAUST FIELD DEVICES (1 OF 2)

Delta Controls

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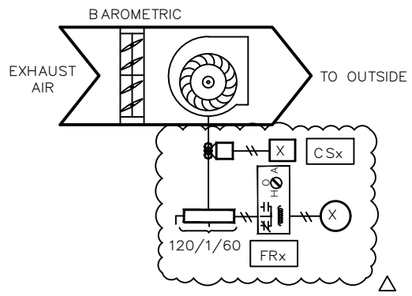
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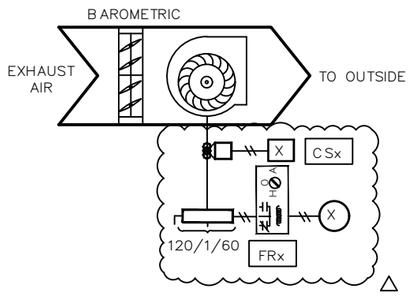
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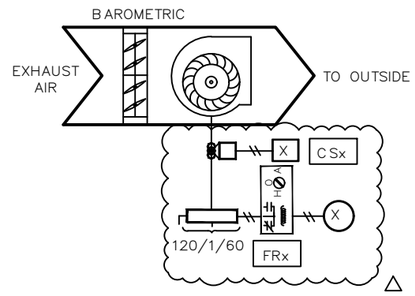
EXHAUST FAN – BAS CONTROLLED
EF–R7



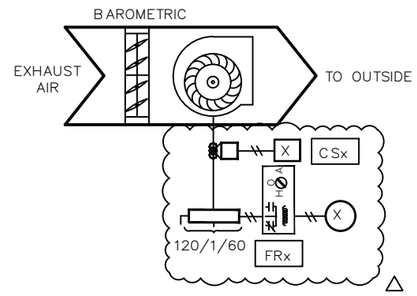
EXHAUST FAN – BAS CONTROLLED
EF–R8



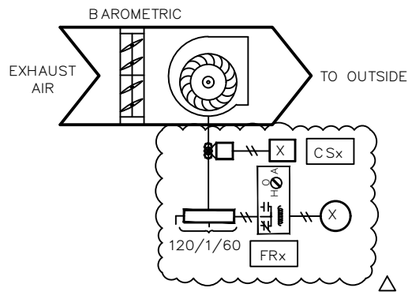
EXHAUST FAN – BAS CONTROLLED
EF–R9



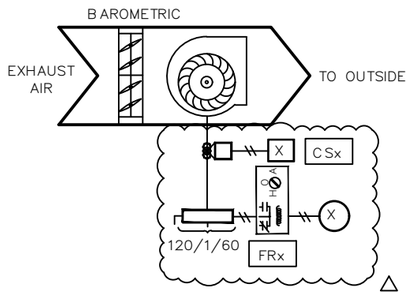
EXHAUST FAN – BAS CONTROLLED
EF–R12



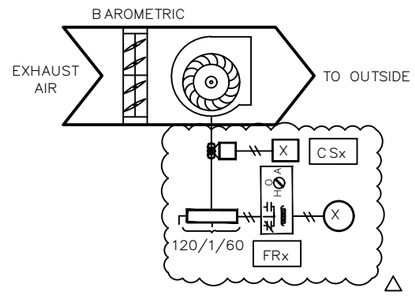
EXHAUST FAN – BAS CONTROLLED
EF–R14



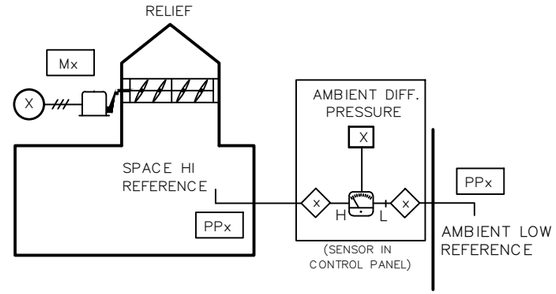
EXHAUST FAN – BAS CONTROLLED
EF–R15



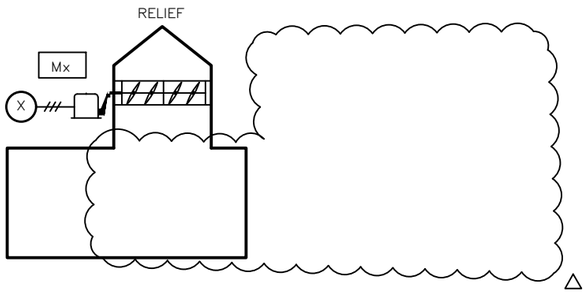
EXHAUST FAN – BAS CONTROLLED
EF–R19



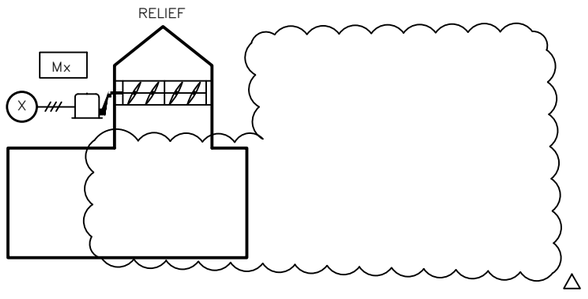
BUILDING PRESSURE CONTROL
E–RH–R2



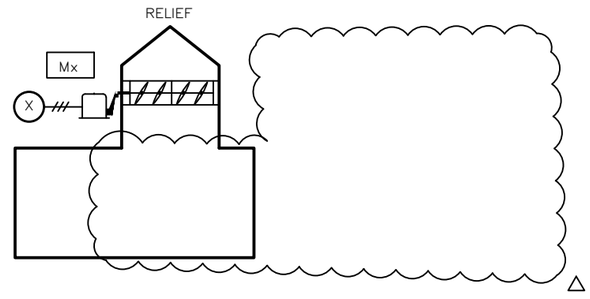
BUILDING PRESSURE CONTROL
RH–R1



BUILDING PRESSURE CONTROL
RH–R3



BUILDING PRESSURE CONTROL
RH–R4



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS

N1 THROUGH Nx

AREA R EXHAUST & RELIEF FIELD DEVICES (2 OF 2)

Delta Controls

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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-Q10 STAT	Exhaust Fan Q10 Status		X			
EF-Q13 STAT	Exhaust Fan Q13 Status		X			
EF-Q14 STAT	Exhaust Fan Q14 Status		X			
EF-Q2 STAT	Exhaust Fan Q2 Status		X			
EF-Q21 STAT	Exhaust Fan Q21 Status		X			
EF-Q22 STAT	Exhaust Fan R22 Status		X			
EF-Q25 STAT	Exhaust Fan R25 Status		X			
EF-Q5 STAT	Exhaust Fan Q5 Status		X			
EF-Q6 STAT	Exhaust Fan Q6 Status		X			
EF-Q7 STAT	Exhaust Fan Q7 Status		X			
EF-Q8 STAT	Exhaust Fan Q8 Status		X			
EF-R12 STAT	Exhaust Fan R12 Status		X			
EF-R14 STAT	Exhaust Fan R14 Status		X			
EF-R15 STAT	Exhaust Fan R15 Status		X			
EF-R19 STAT	Exhaust Fan R19 Status		X			
EF-R6 STAT	Exhaust Fan R6 Status		X			
EF-R7 STAT	Exhaust Fan R7 Status		X			
EF-R8 STAT	Exhaust Fan R8 Status		X			
EF-R9 STAT	Exhaust Fan R9 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-R2 DPR	Relief Air Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
RH-R1 DPR	Relief Air Damper			X		
RH-R3 DPR	Relief Air Damper			X		
RH-R4 DPR	Relief Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
EF-Q10 SS	Exhaust Fan Q10 Fan Start / Stop				X	
EF-Q13 SS	Exhaust Fan Q13 Fan Start / Stop				X	
EF-Q14 SS	Exhaust Fan Q14 Fan Start / Stop				X	
EF-Q2 SS	Exhaust Fan Q2 Fan Start / Stop				X	
EF-Q21 SS	Exhaust Fan Q21 Fan Start / Stop				X	
EF-Q22 SS	Exhaust Fan R22 Fan Start / Stop				X	
EF-Q25 SS	Exhaust Fan R25 Fan Start / Stop				X	
EF-Q5 SS	Exhaust Fan Q5 Fan Start / Stop				X	
EF-Q6 SS	Exhaust Fan Q6 Fan Start / Stop				X	
EF-Q7 SS	Exhaust Fan Q7 Fan Start / Stop				X	
EF-Q8 SS	Exhaust Fan Q8 Fan Start / Stop				X	
EF-R12 SS	Exhaust Fan R12 Fan Start / Stop				X	
EF-R14 SS	Exhaust Fan R14 Fan Start / Stop				X	
EF-R15 SS	Exhaust Fan R15 Fan Start / Stop				X	
EF-R19 SS	Exhaust Fan R19 Fan Start / Stop				X	
EF-R6 SS	Exhaust Fan R6 Fan Start / Stop				X	
EF-R7 SS	Exhaust Fan R7 Fan Start / Stop				X	
EF-R8 SS	Exhaust Fan R8 Fan Start / Stop				X	
EF-R9 SS	Exhaust Fan R9 Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**12**	**24**	**10**	**21**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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VAV AIR HANDLING UNIT AHU-R2 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFRn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

DEHUMIDIFICATION MODE: WHEN AVERAGE SPACE HUMIDITY AS COMMUNICATED FROM TERMINAL UNITS RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN AVERAGE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:

-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

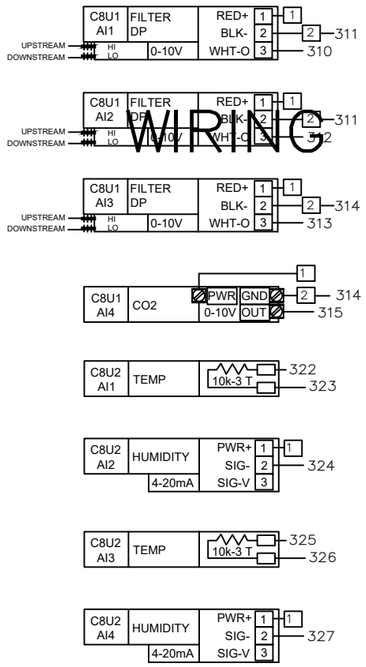
REVISIONS	
DATE	REMARKS

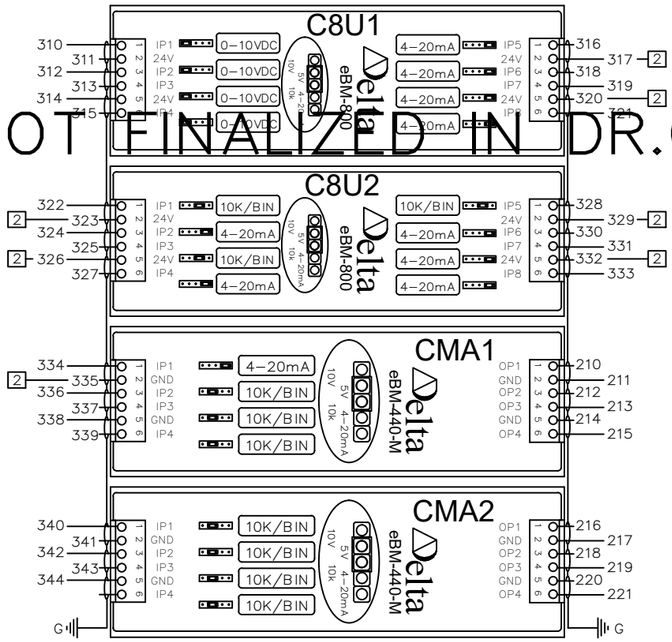
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

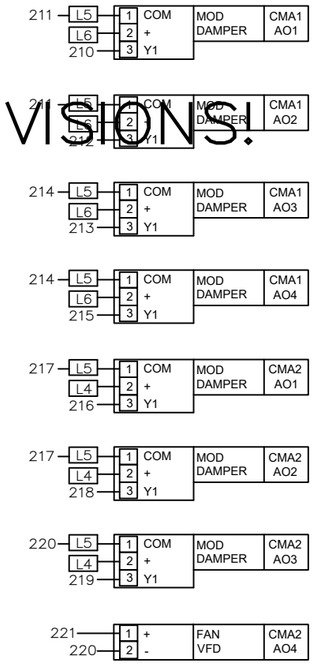
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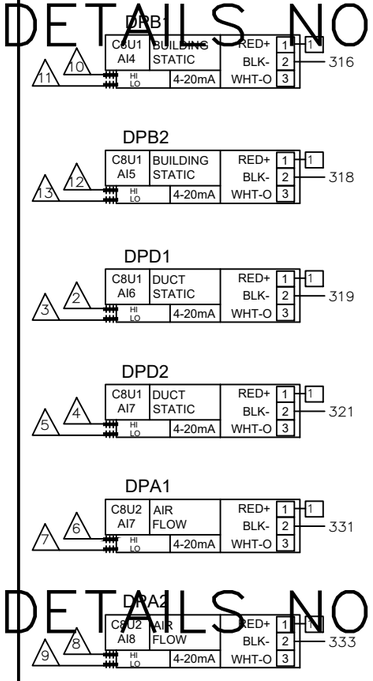
SHEET
NCHS-413
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

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AHU-R2 SYSTEM 50 PANEL – I/O WIRING (1 OF 4)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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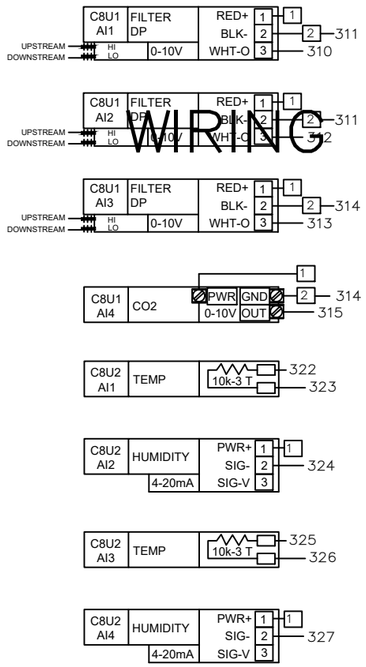
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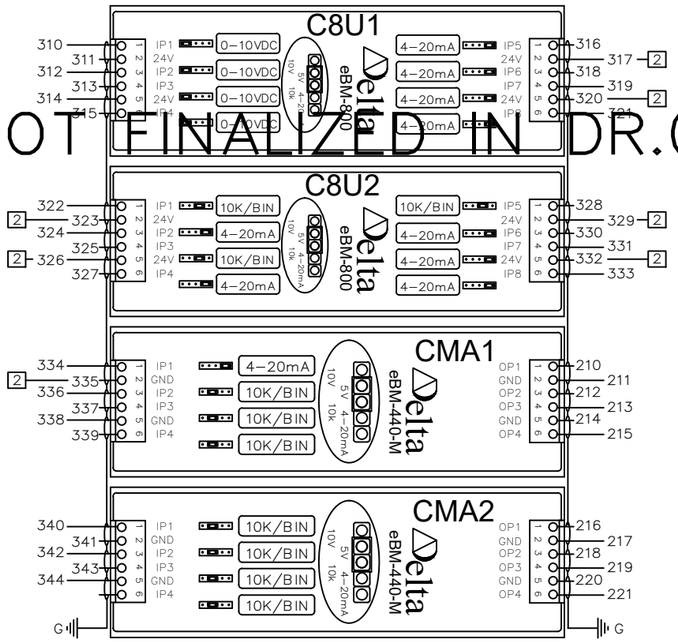
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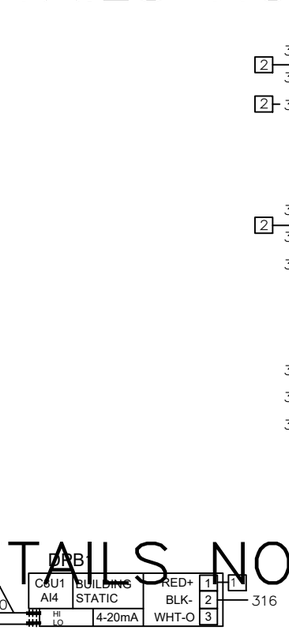
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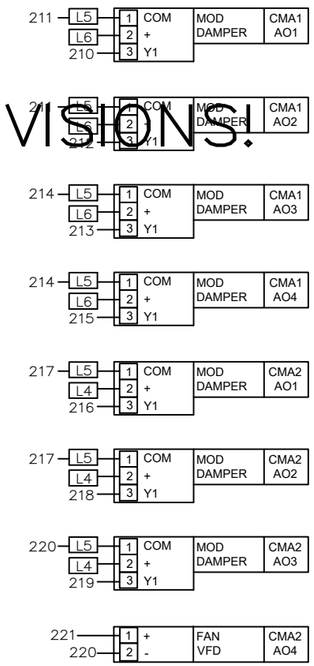
SHEET
NCHS–414
JOB NUMBER:
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

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AHU-R2 SYSTEM 50 PANEL – I/O WIRING (2 OF 4)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

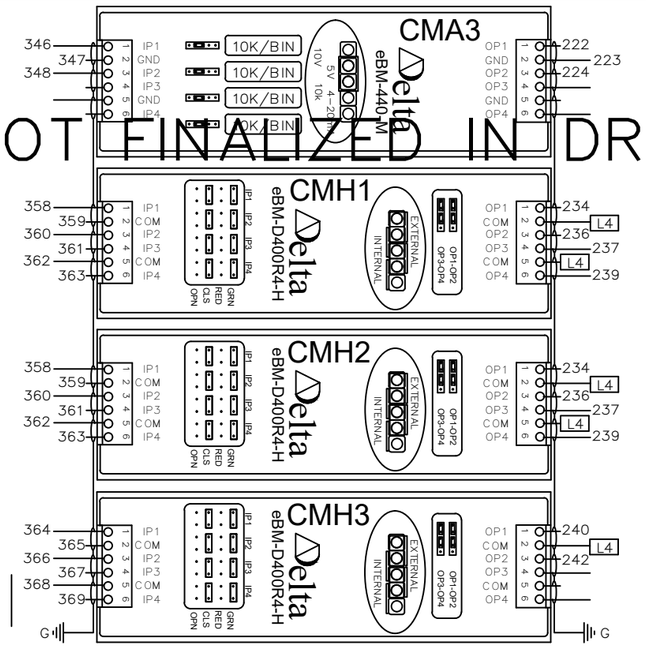
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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

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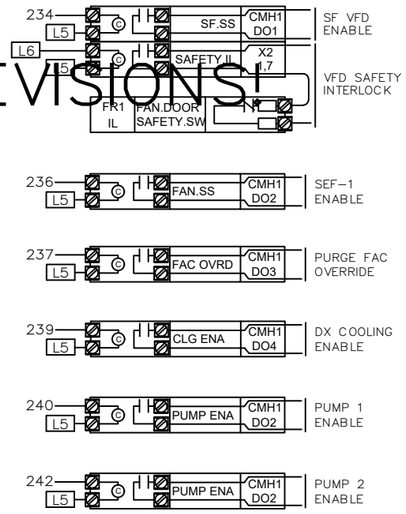
SHEET
NCHS–415
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CMA3 DI1	DX STATUS	N.O.	346 / 347
CMA3 DI2	PURGE ENABLE	N.O.	348 / 347
CMH2 DI1	FAN STATUS	N.O.	358 / 359
CMH1 DI1	FAN STATUS	N.O.	360 / 359
CMH1 DI3	SMOKE ALARM	N.O.	361 / 362
CMH1 DI4	SMOKE ALARM	N.O.	363 / 362
CMH2 DI1	FAS.INPUT	N.C.	364 / 365
CMH2 DI2	PUMP STATUS	N.O.	366 / 365
CMH2 DI3	PUMP STATUS	N.O.	367 / 368



SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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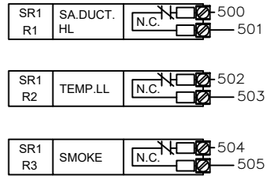
SHEET
NCHS–416
JOB NUMBER:
J–2304001

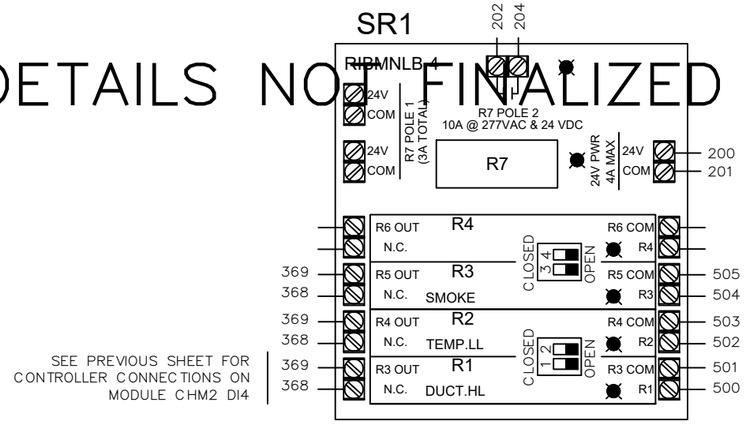
SYSTEM 50 CONTROL PANEL

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

AHU–R2 SYSTEM 50 PANEL – I/O WIRING (4 OF 4)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS–417
JOB NUMBER:
J–2304001

SYSTEM 50 CONTROL PANEL

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

GND

L3

200
201

TO SYSTEM 01 SUBNET LEG 02

TO SYSTEM 01 SUBNET LEG 03

TO SYSTEM 01 SUBNET LEG 04

300
301

ETS1

V1-
V1+

ETHERNET SWITCH

CAT5e

SR1

RIBMNLB-4

202
204

200
201

R7 POLE 2
10A @ 277VAC & 24 VDC

R7

R4 OUT N.C.
R3 OUT N.C.
R2 OUT N.C.
R1 OUT N.C.

CLOSED

CEB1

C8X1

201
200

PWR
GND
24~

USB2
USB1
(NOT USED)

eBMGR-2

eBX

eBUS Address

eBUS

NET1 RS-485
NET2 RS-485

eBM-800
eBM-800
eBM-440-M
eBM-440-M
eBM-440-M
eBM-D400R4-H
eBM-D400R4-H
eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

L3

MS/TP

eNET BUS

C4X1

201
200

eBX

eBUS Address

eBUS

eBM-D400R4-H
eBM-D400R4-H
eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

L3

SEE RISER DIAGRAMS FOR LOCATION

AHU-R2 SYSTEM 50 PANEL – POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

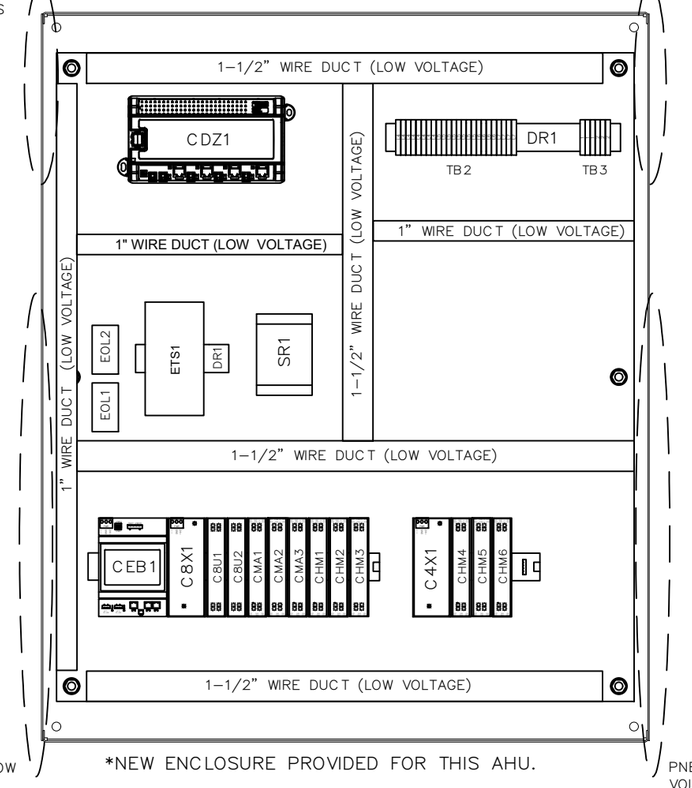
CONTRACT NO:

SHEET
NCHS-418
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 50 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

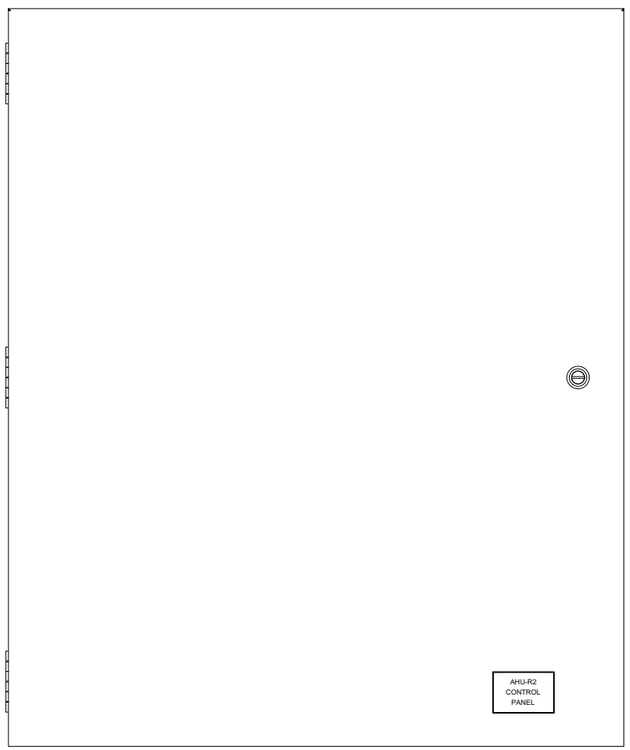
NO CONDUITS THROUGH THE TOP OF THE PANEL!



*NEW ENCLOSURE PROVIDED FOR THIS AHU.

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

BILL OF MATERIALS

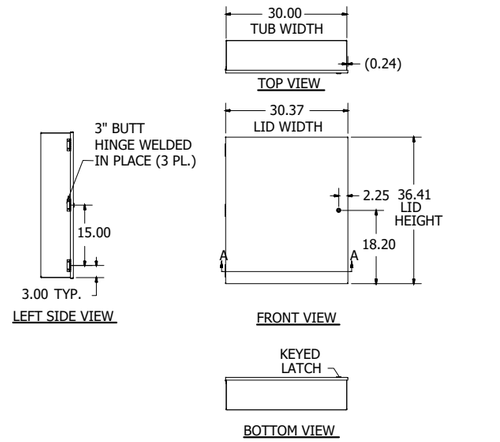
WILL BE PROVIDED IN A FUTURE REVISION. △

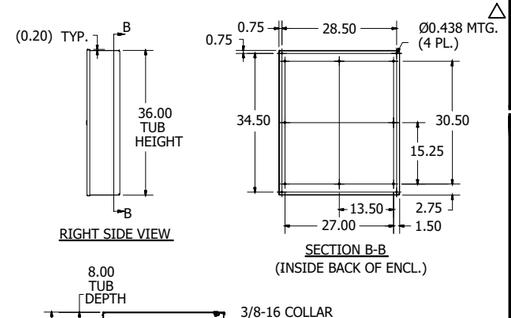
BILL OF MATERIALS

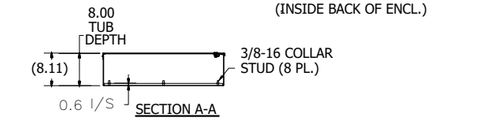
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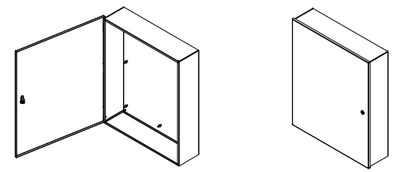
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

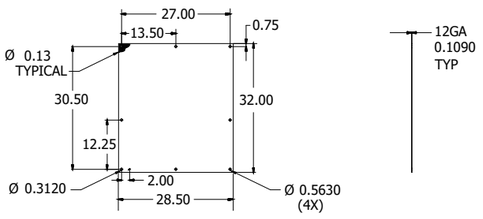








PANEL DIMENSIONS



AHU–R2 SYSTEM 50 PANEL – DIMENSIONS & BOM

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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REVISIONS	
DATE	REMARKS

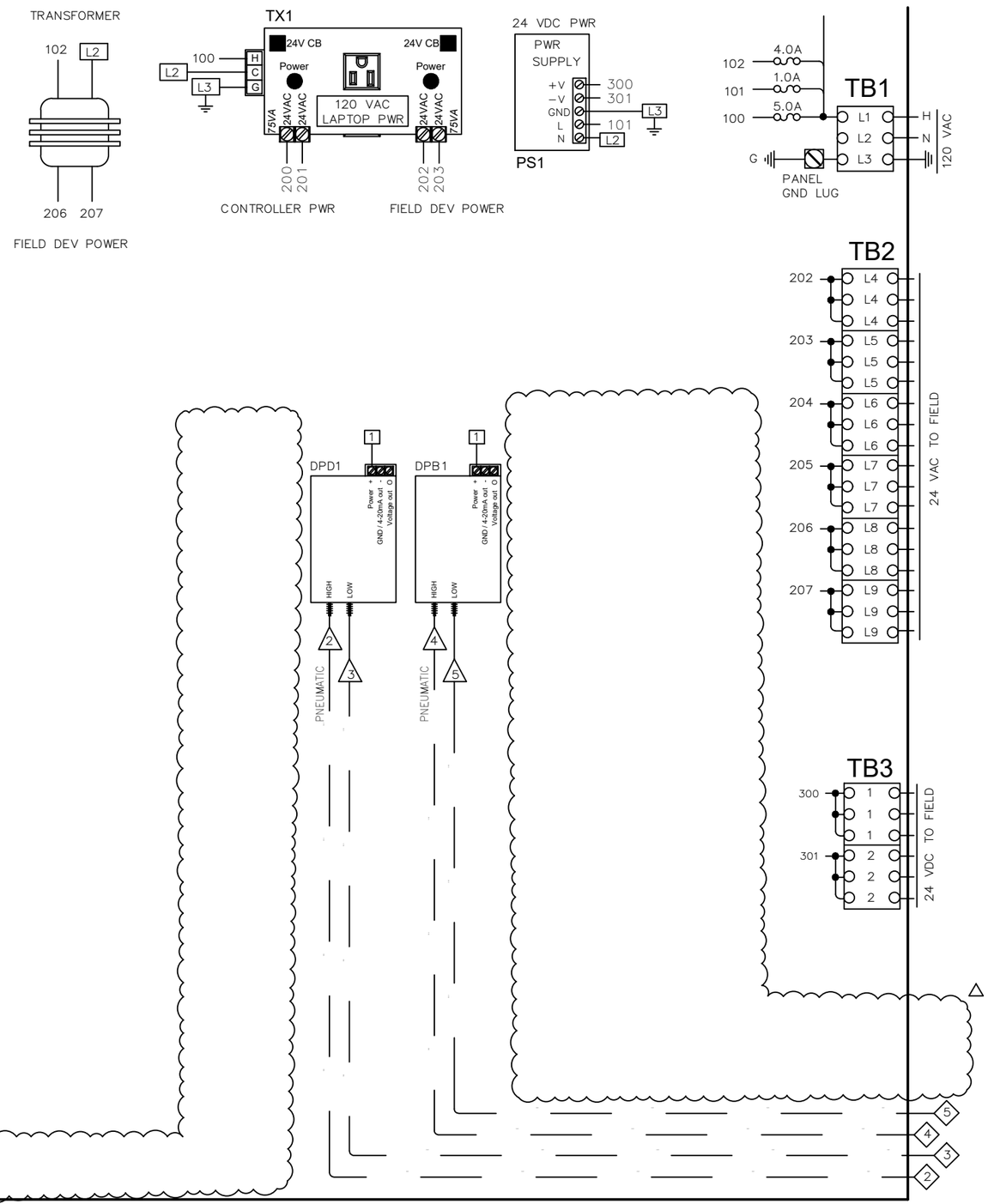
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
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DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–419
JOB NUMBER:
J–2304001

SYSTEM 50 COMPANION PANEL

PANEL _____
CIRCUIT _____



AHU–R2 SYSTEM 50 COMPANION PANEL – POWER WIRING & PNEUMATIC CONNECTIONS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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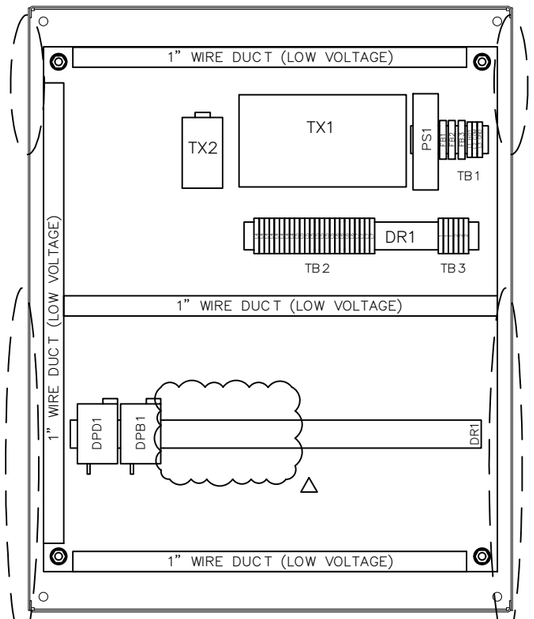
CONTRACT NO:

SHEET
NCHS–420
JOB NUMBER:
J–2304001

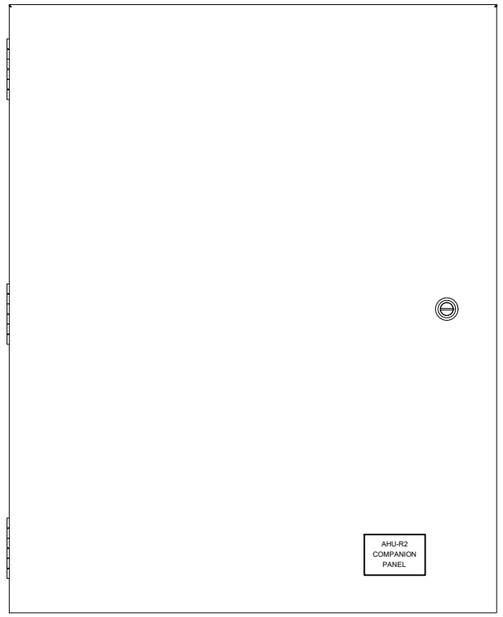
SYSTEM 50 COMPANION PANEL LAYOUT

NO CONDUITS THROUGH THE TOP OF THE PANEL!

NETWORK CABLES ENTER IN THIS AREA



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



*NEW ENCLOSURE PROVIDED

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

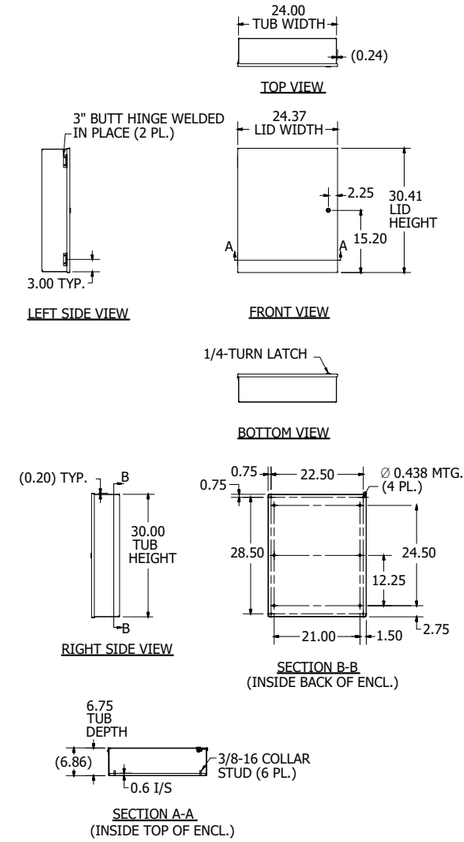
BILL OF MATERIALS

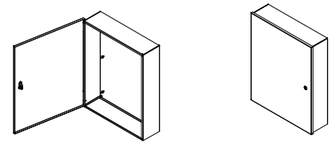
WILL BE PROVIDED IN A FUTURE REVISION. △

BILL OF MATERIALS

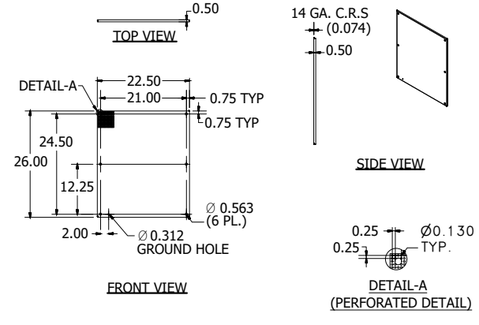
WILL BE PROVIDED IN A FUTURE REVISION. △

24" (W) x 30" (H) ENCLOSURE DIMENSIONS





PANEL DIMENSIONS



AHU-R2 SYSTEM 50 COMPANION PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3 △
	ISSUED FOR CONST
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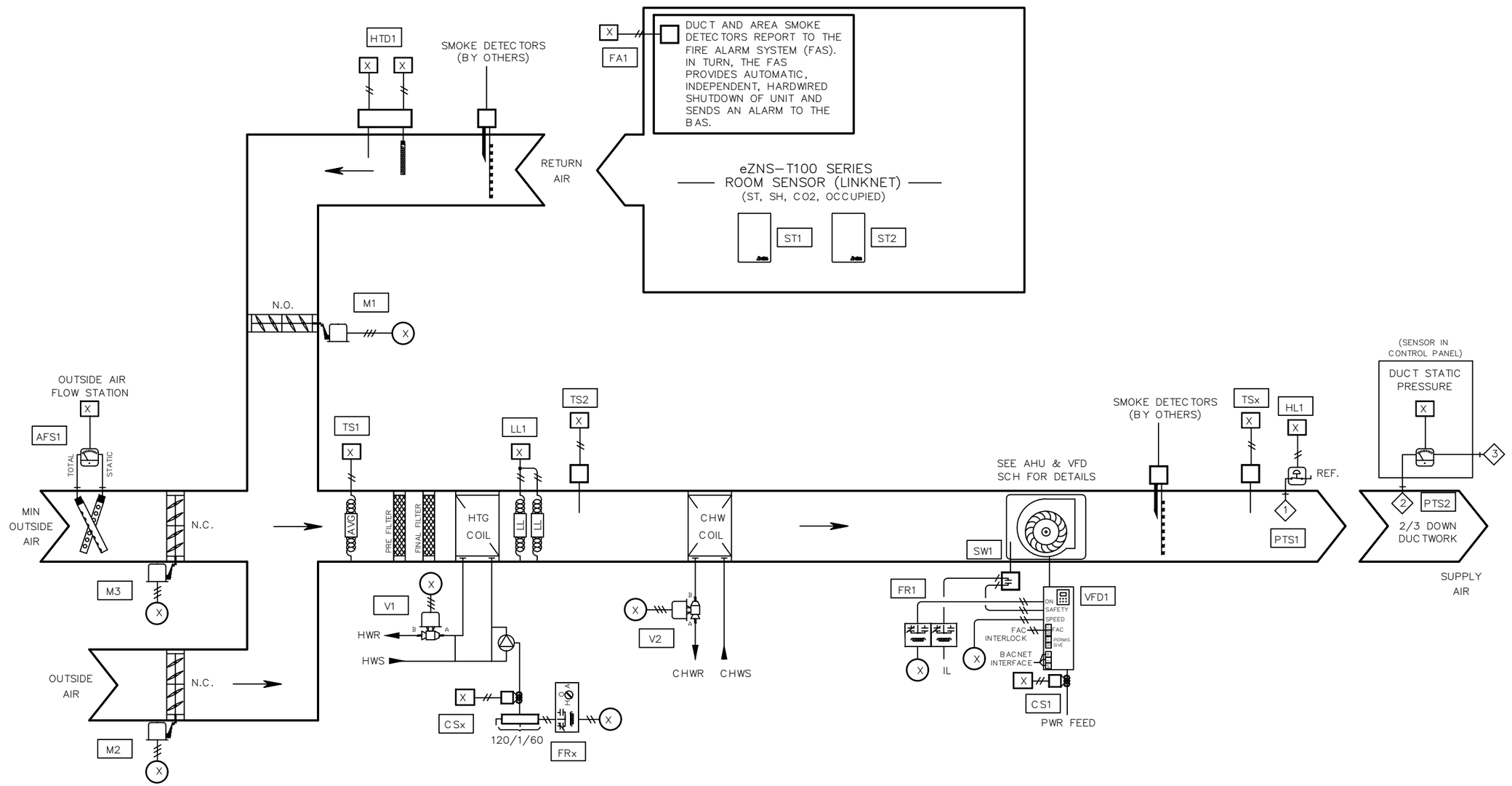
REVISIONS	
DATE	REMARKS

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CONTRACT NO:

SHEET
NCHS-421
JOB NUMBER:
J-2304001

E–AHU–S1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–S1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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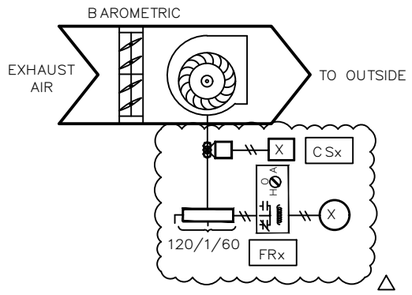
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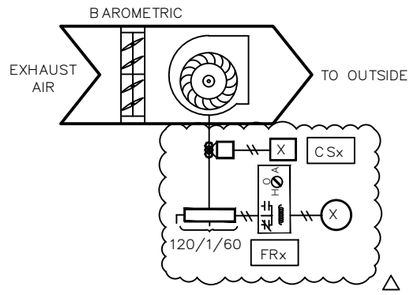
CONTRACT NO:

SHEET
NCHS–422
JOB NUMBER:
J–2304001

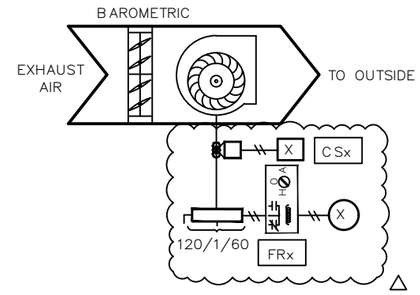
EXHAUST FAN – BAS CONTROLLED
EF–M3



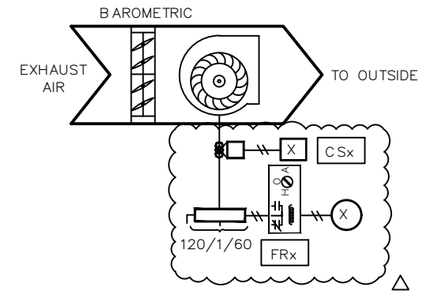
EXHAUST FAN – BAS CONTROLLED
EF–S2



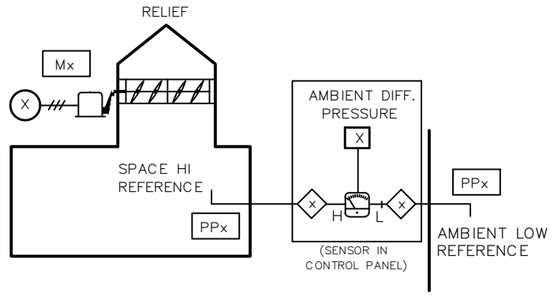
EXHAUST FAN – BAS CONTROLLED
EF–S3



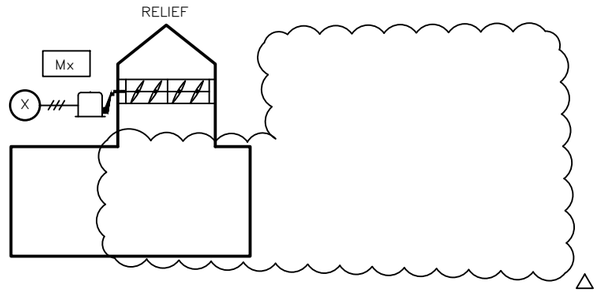
EXHAUST FAN – BAS CONTROLLED
EF–S6



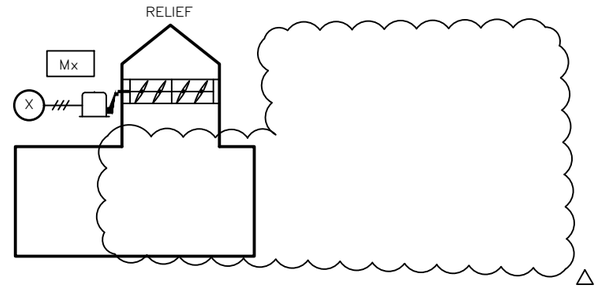
BUILDING PRESSURE CONTROL
E–RH–S1



BUILDING PRESSURE CONTROL
E–RH–S2



BUILDING PRESSURE CONTROL
E–RH–S3



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA S EXHAUST & RELIEF FIELD DEVICES

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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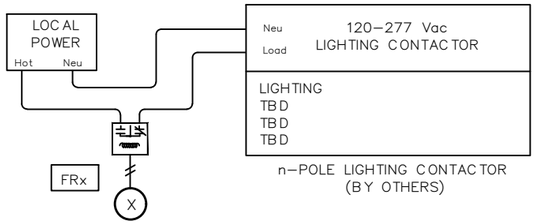
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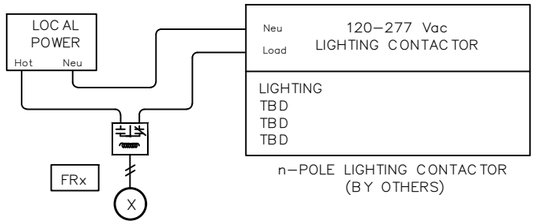
CONTRACT NO:

SHEET
NCHS–423
JOB NUMBER:
J–2304001

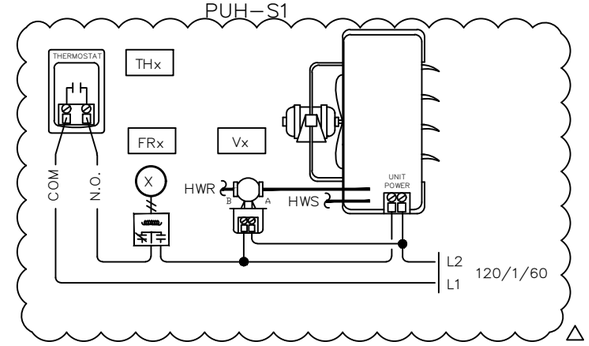
LIGHTING CONTACTOR CONTROLS
RS–4 – SOUTH BUILDING / SECURITY



LIGHTING CONTACTOR CONTROLS
RS–6 – SOUTH PARKING / SECURITY

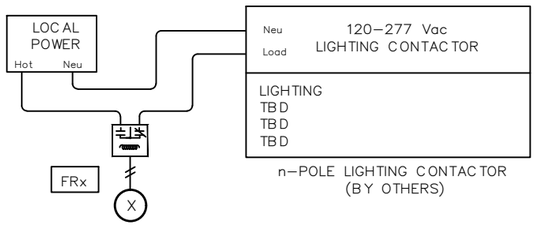


PROPELLER UNIT HEATER
PUH–S1

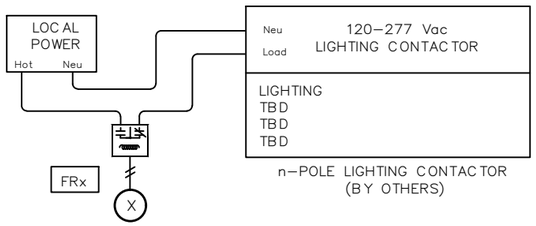


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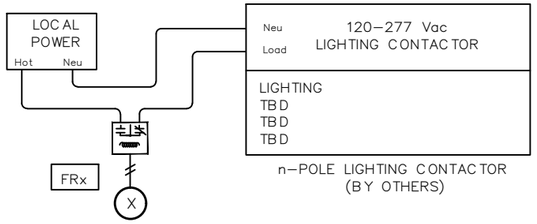
LIGHTING CONTACTOR CONTROLS
RS–5 – SOUTH BUILDING



LIGHTING CONTACTOR CONTROLS
RS–7 – SOUTH PARKING



LIGHTING CONTACTOR CONTROLS
RS–8 – SOUTH WALKWAY



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA S LIGHTING AND PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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CONTRACT NO:

SHEET
NCHS–424
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF-M3 STAT	Exhaust Fan M3 Status		X			
EF-S2 STAT	Exhaust Fan S2 Status		X			
EF-S3 STAT	Exhaust Fan S3 Status		X			
EF-S6 STAT	Exhaust Fan S6 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
E-RH-S1 DPR	Relief Air Damper			X		
E-RH-S2 DPR	Relief Air Damper			X		
E-RH-S3 DPR	Relief Air Damper			X		
MIN OAD	Minimum Outside Air Damper			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF-M3 SS	Exhaust Fan M3 Fan Start / Stop				X	
EF-S2 SS	Exhaust Fan S2 Fan Start / Stop				X	
EF-S3 SS	Exhaust Fan S3 Fan Start / Stop				X	
EF-S6 SS	Exhaust Fan S6 Fan Start / Stop				X	
LTG 1	Lighting Contactor - S Bldg Sec RS-4				X	
LTG 2	Lighting Contactor - S Pkg Sec RS-6				X	
LTG 3	Lighting Contactor - South Bldg RS-5				X	
LTG 4	Lighting Contactor - South Pkg RS-7				X	
LTG 5	Lighting Contactor - South Walk RS-8				X	
PUH-S1 EN	PUH S1 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**8**	**9**	**9**	**12**	**0**

△

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS-425
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-S1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFSn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV), AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MAXIMUM OUTSIDE AIR DAMPER (OA-DPR) SHALL CLOSE AND THE MINIMUM OUTSIDE AIR DAMPER (MOA-DPR) SHALL MODULATE TO MAINTAIN THE SCHEDULED AIRFLOW REQUIRED AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPER SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT AND HEATING VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

DDC INTERFACE TO EXTERIOR LIGHTING:

ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELLS LOCATED IN AREAS A (INSTALLED IN PHASE 1) AND AREA T (EXISTING BAS). NEW PHOTOCELL TO BE INSTALLED ON AHU-J3.

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

Delta Controls
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4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

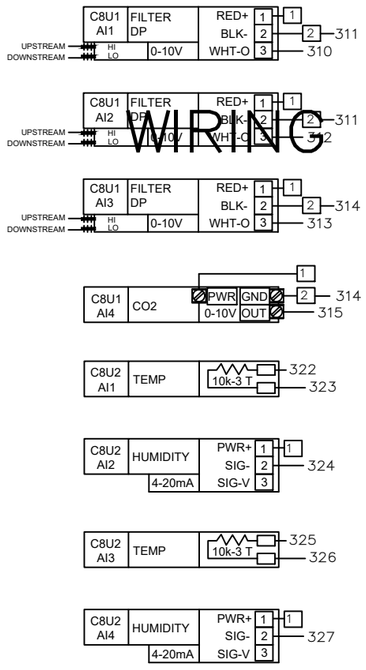
REVISIONS	
DATE	REMARKS

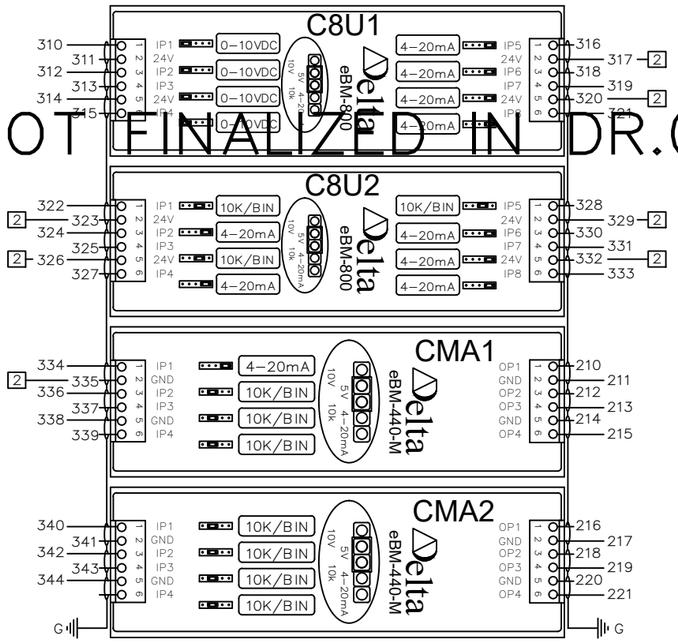
JOB TITLE: North Central High School
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DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

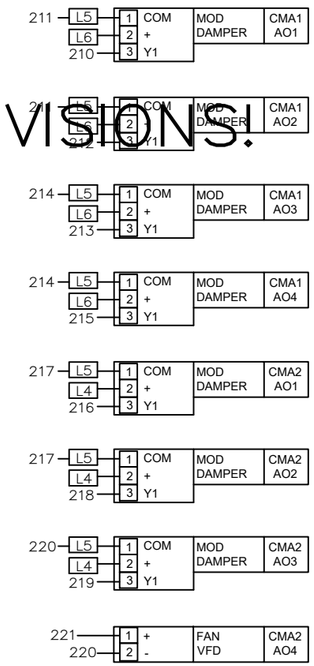
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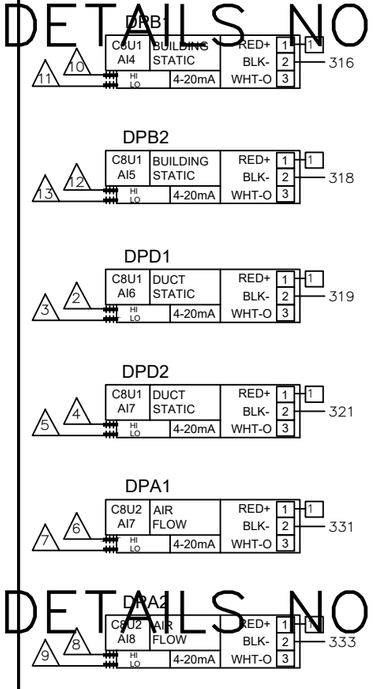
SHEET
NCHS-426
JOB NUMBER:
J-2304001

SYSTEM 51 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200
C8U2 eBM-800 INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201
CMA1 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206
CMA2 eBM-440-M INPUTS	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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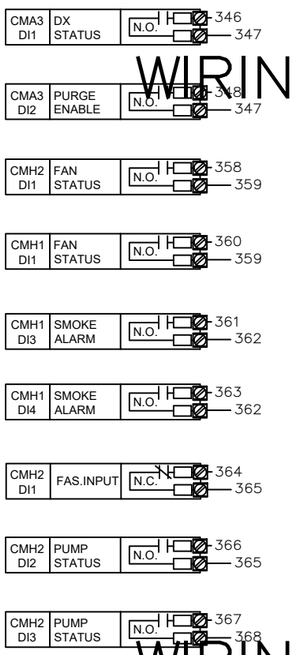
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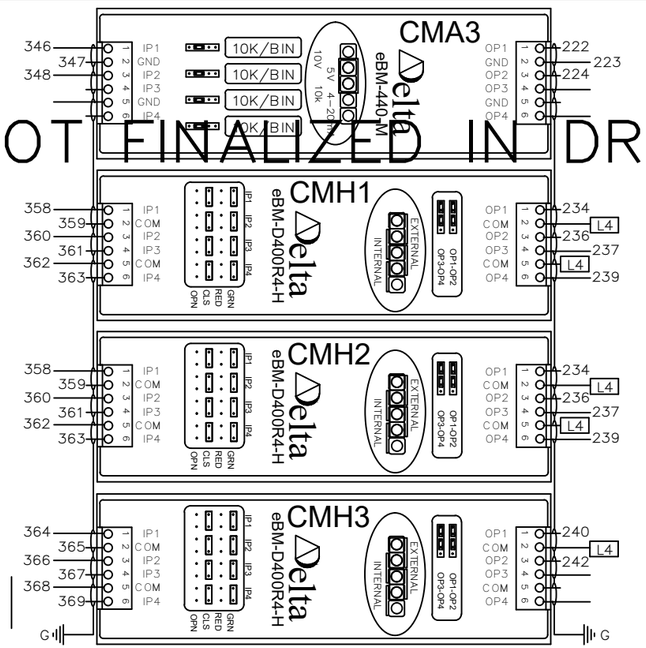
CONTRACT NO:

SHEET
NCHS-427
JOB NUMBER:
J-2304001

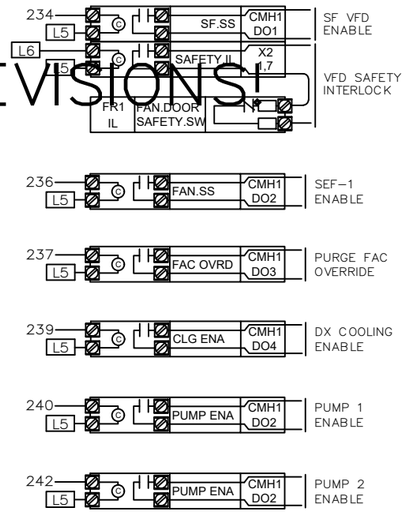
SYSTEM 51 CONTROL PANEL

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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AHU–S1 SYSTEM 51 PANEL – I/O WIRING (2 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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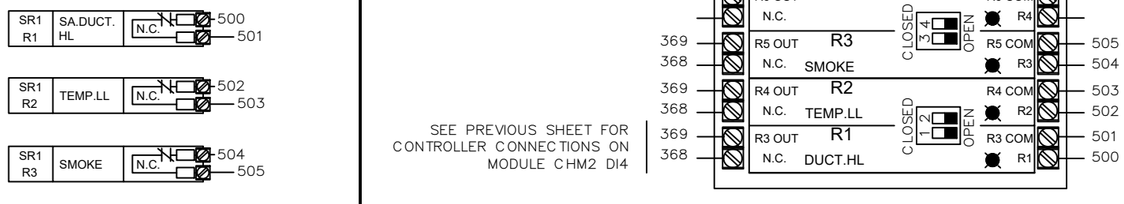
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CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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NCHS-429
JOB NUMBER:
J-2304001

SYSTEM 51 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

301 300 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 (NORMAL)

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED OPEN

TX1

24V CB 24V CB

Power Power

100 L2 L3 H C G

75VA 24VAC 24VAC 120 VAC LAPTOP PWR 24VAC 24VAC 75VA

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L2 L3

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1 DPB1

1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

PNEUMATIC

2 3 4 5

201 200

CEB1

PWR GND 24~

USB2 USB1

(NOT USED)

NET1 RS-485 NET2 RS-485

ETH 1 VAR 2 VAR 1

MS/TP

C8X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 eBM-440-M eBM-440-M eBM-440-M eBM-D400R4-H eBM-D400R4-H eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

AHU-S1 SYSTEM 51 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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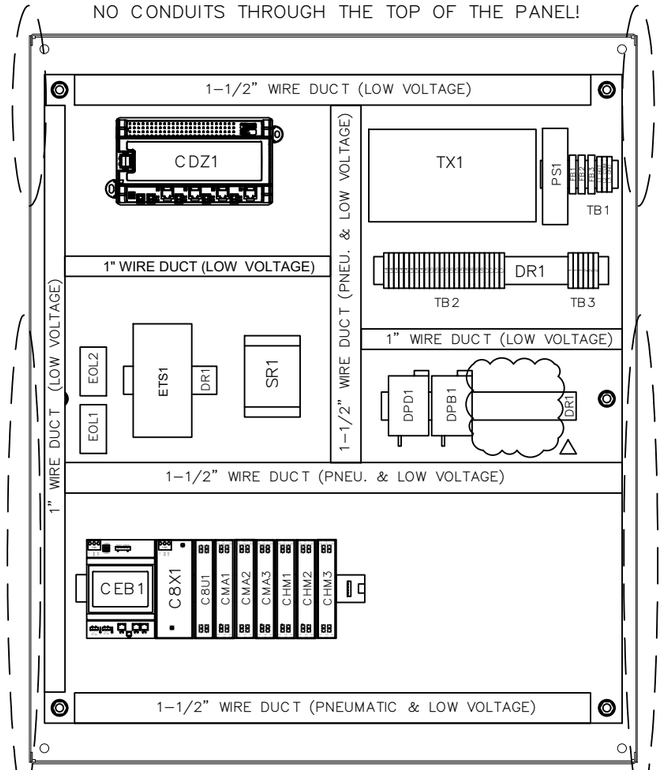
CONTRACT NO:

SHEET
NCHS-430
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 51 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

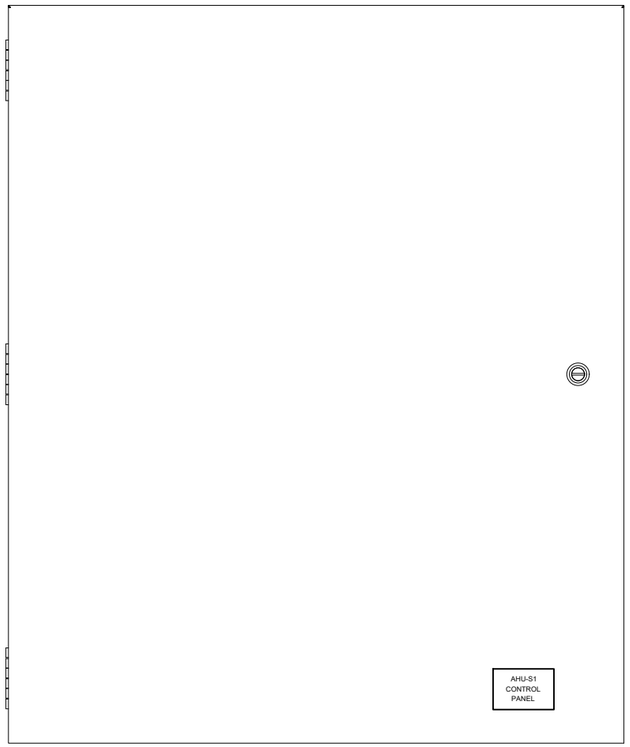


PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA



BILL OF MATERIALS

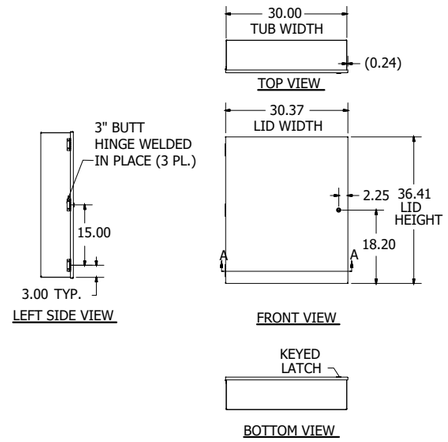
WILL BE PROVIDED IN A FUTURE REVISION. △

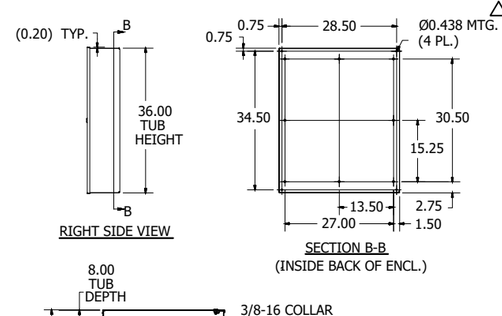
BILL OF MATERIALS

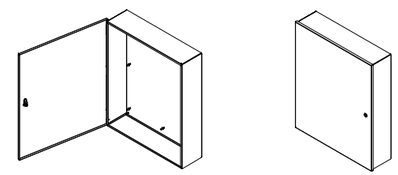
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30" (W) x 36" (H) ENCLOSURE DIMENSIONS

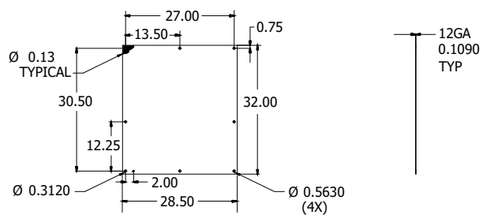
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



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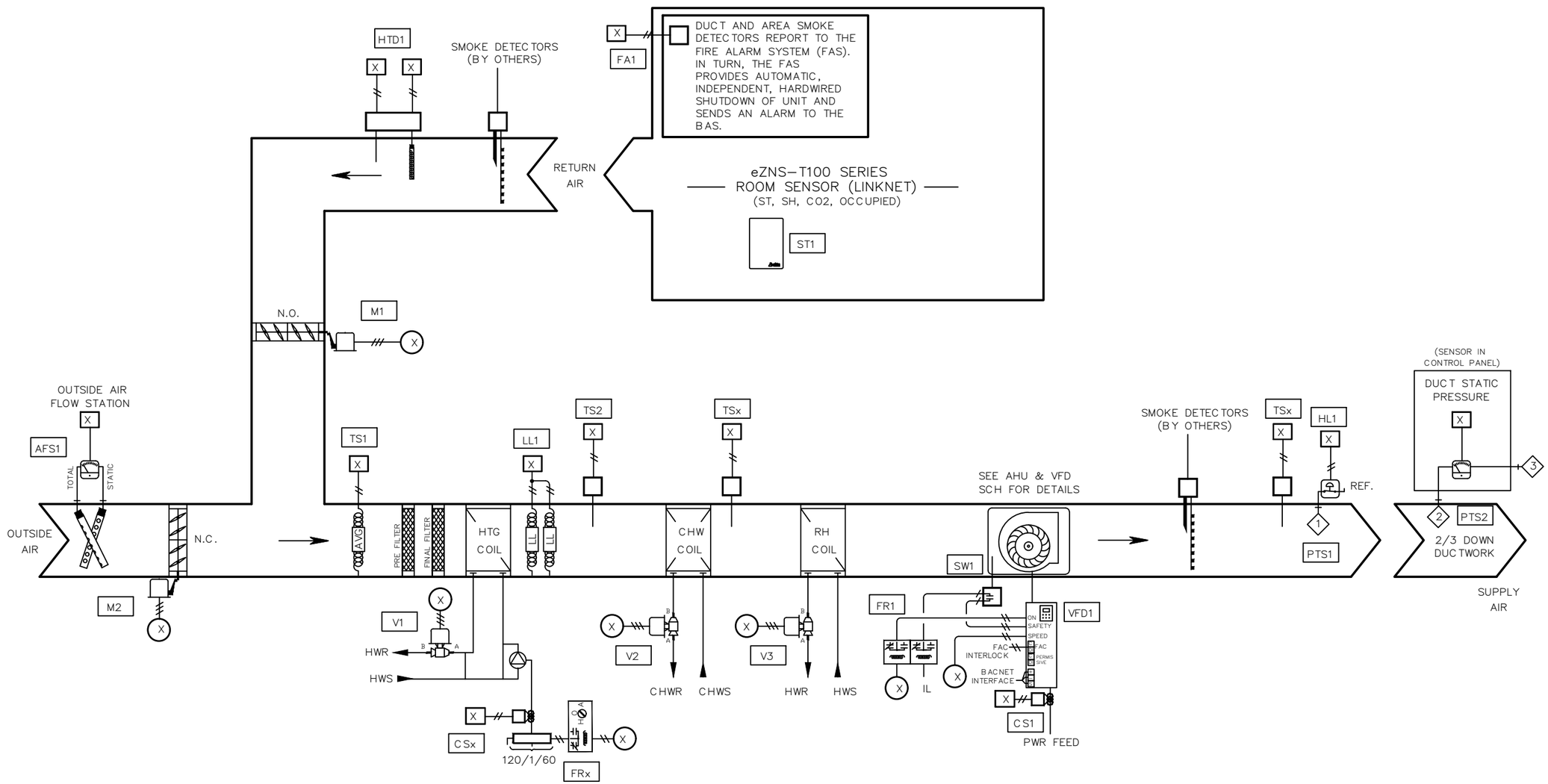
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E–AHU–T1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

E–AHU–T1 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

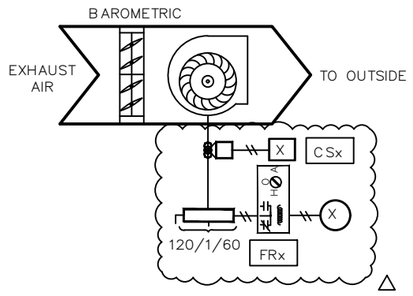
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

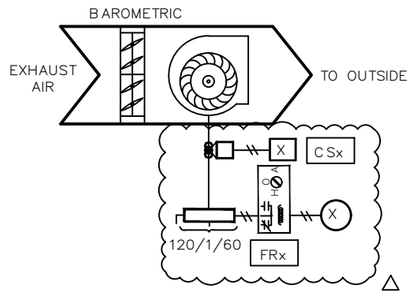
CONTRACT NO:

SHEET
NCHS–432
JOB NUMBER:
J–2304001

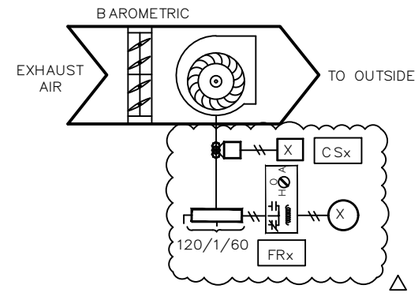
EXHAUST FAN – BAS CONTROLLED
EF–T2



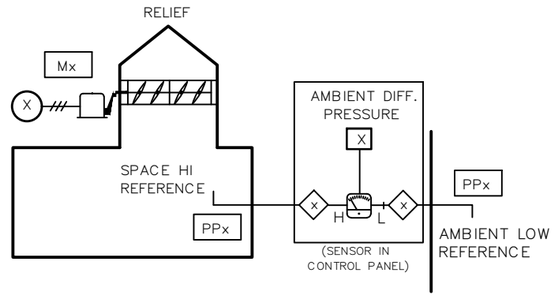
EXHAUST FAN – BAS CONTROLLED
EF–T3



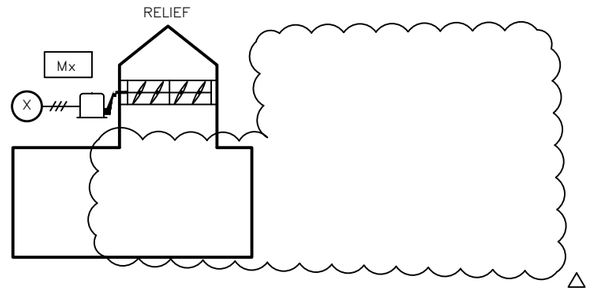
EXHAUST FAN – BAS CONTROLLED
E–EF–T4



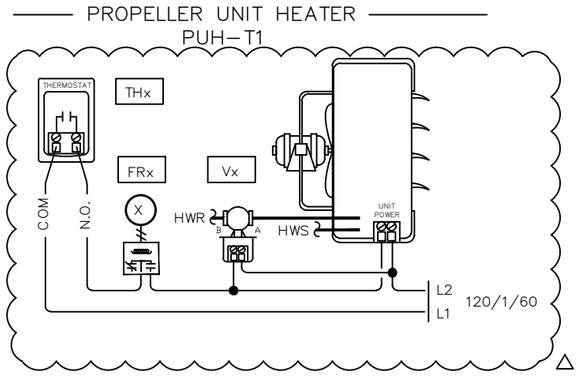
BUILDING PRESSURE CONTROL
E–RH–T1



BUILDING PRESSURE CONTROL
E–RH–T2



PROPELLER UNIT HEATER
PUH–T1



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AREA T EXHAUST, RELIEF, & PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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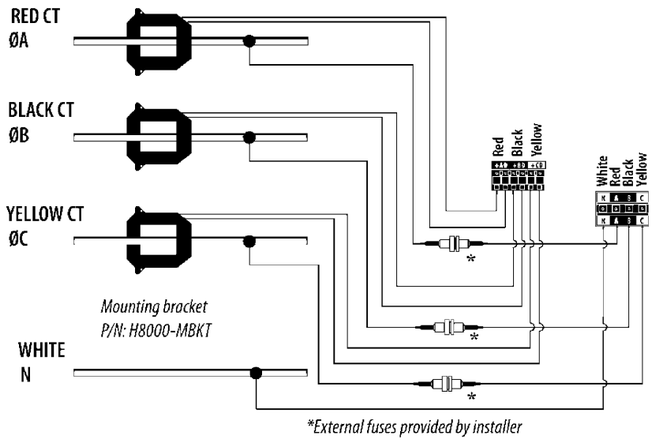
SHEET
NCHS–433
JOB NUMBER:
J–2304001

POWER METER HIGH VOLTAGE WIRING DETAIL

(FOR REFERENCE ONLY, WIRING EXISTING, NOT INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)

△

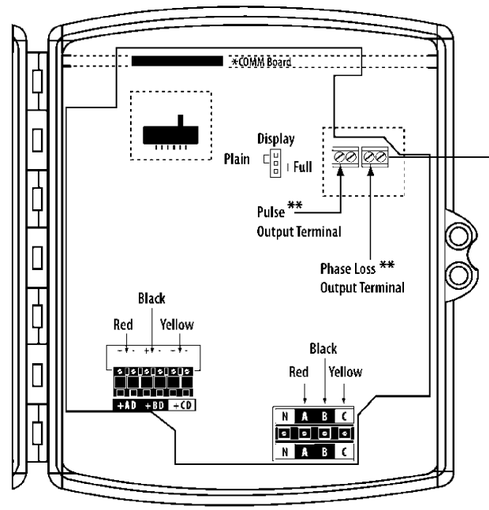
TYPICAL 208/480VAC, 4-WIRE, 3Ø INSTALLATION



(* PREVIOUS BAS DESIGN INDICATES VERIS AH04 TRIPLE FUSE KITS WERE INSTALLED)

△ POWER METER LOW VOLTAGE WIRING DETAIL

(BACNET MS/TP COMMUNICATION AND PHASE LOSS MONITORING INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)



*COMM Board is Optional
**H8160 Series only

PHASE LOSS OUTPUT
(ONE CONNECTION PER METER)

X PL MTRS (SOUTH LOCKER ROOM)

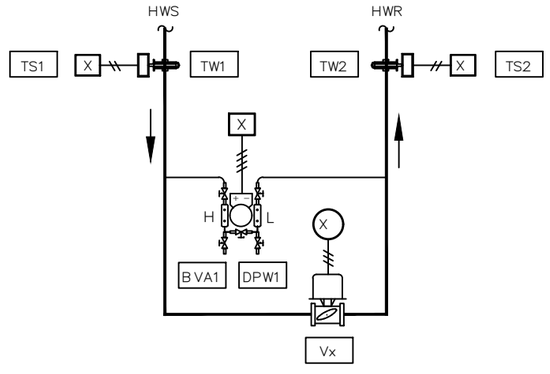
COMMUNICATION CARD
(IF INSTALLED)

+
–
S

BACNET INTERFACE
(ONE CONNECTION PER METER)

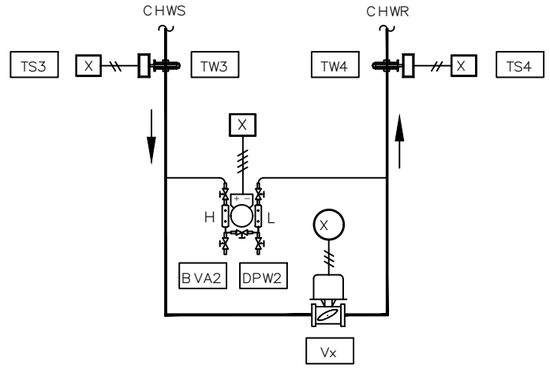
END OF LOOP CONTROLS – HOT WATER
(J. EVERETT LIGHT CAREER CENTER)

(CONFIRMATION OF EXISTING DEVICE LOCATIONS REQUIRED)
(PREVIOUS DESIGN INDICATES CTRLS. WERE LOCATED AT NOW REMOVED AHU–D4)



END OF LOOP CONTROLS – CHILL WATER
(J. EVERETT LIGHT CAREER CENTER)

(CONFIRMATION OF EXISTING DEVICE LOCATIONS REQUIRED)
(PREVIOUS DESIGN INDICATES CTRLS. WERE LOCATED AT NOW REMOVED AHU–D4)



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS
N1 THROUGH Nx

AREA T JELCC END OF LOOP PRESSURE CONTROL & PHASE LOSS MONITORING FIELD DEVICES

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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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CONTRACT NO:

SHEET
NCHS–434
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
CHWR JELCC EOL	Chill Water Return Temp	X				
CHWS JELCC EOL	Chill Water Supply Temp	X				
CW DP JELCC EOL	End of Loop Diff Pressure - JELCC	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPD1	Duct Static Pressure	X				
HW DP JELCC EOL	End of Loop Diff Pressure - JELCC	X				
HWR JELCC EOL	Hot Water Return Temp	X				
HWS JELCC EOL	Hot Water Supply Temp	X				
MAT	Mixed Air Temperature	X				
OA AFMS	Outside Airflow	X				
PHT	Preheat Discharge Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
E-EF-T4 STAT	Exhaust Fan T4 Status		X			
EF-T2 STAT	Exhaust Fan T2 Status		X			
EF-T3 STAT	Exhaust Fan T3 Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat)		X			
PL MTR S LOCKER	Phase Loss Elec Mtr S Locker Rm		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detector (device by others)		X			
SF STAT	Supply Fan Status		X			
CW BYP VLV	EOL Bypass Valve - JELCC Bldg			X		
CWV	Chill Water Valve			X		
E-RH-T1 DPR	Relief Air Damper			X		
E-RH-T2 DPR	Relief Air Damper			X		
HW BYP VLV	EOL Bypass Valve - JELCC Bldg			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RAD	Return Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
E-EF-T4 SS	Exhaust Fan T4 Fan Start / Stop				X	
EF-T2 SS	Exhaust Fan T2 Fan Start / Stop				X	
EF-T3 SS	Exhaust Fan T3 Fan Start / Stop				X	
PUH-T1 EN	PUH T1 Enable				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**15**	**9**	**10**	**6**	**4**

△

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

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CONTRACT NO:

SHEET
NCHS-435
JOB NUMBER:
J-2304001

VAV AIR HANDLING UNIT AHU-T1 SEQUENCE OF OPERATION

TCC SHALL UTILIZE EXISTING TEMPERATURE CONTROL PANEL TO HOUSE THE EQUIPMENT REQUIRED TO CONTROL THE AIR HANDLER.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE SCHEDULE OR MANUALLY AS SELECTED BY THE OPERATOR. MINIMUM RUN TIME SHALL BE 30 MINUTES (ADJ). IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

EXHAUST FAN CONTROL: THE ASSOCIATED EXHAUST FANS (EFTn-C) AS SHOWN ON M-602.3 WILL BE STARTED ACCORDING TO THE SCHEDULE AND NOTES.

BUILDING STATIC PRESSURE CONTROL: UPON A RISE IN BUILDING STATIC PRESSURE SETPOINT (ZN-SP) ABOVE SETPOINT OF +0.07" W.C. (ADJ), RELIEF HOOD(S) SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE AT A SETPOINT OF +0.05" W.C. (ADJ). THE DAMPER SHALL REMAIN CLOSED WHEN THE BUILDING STATIC PRESSURE FALLS BELOW 0.02" W.C. (ADJ).

SUPPLY DUCT STATIC PRESSURE CONTROL: THE SUPPLY FAN (SF-O) WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT. THE INITIAL SETPOINT MAXIMUM SHALL BE 1.5" WITH A MINIMUM OF .5". BOTH SETTINGS SHALL BE DETERMINED BY THE BALANCE CONTRACTOR. SENSOR SHALL BE LOCATED 2/3 OF THE WAY DOWN THE MAIN DUCT RUN.

THE SYSTEM WILL SAMPLE THE VAV BOX DAMPER POSITIONS EVERY TWO MINUTES AND THE FAN SPEED WILL BE RESET AS FOLLOWS:
THE SUPPLY FAN STATIC WILL BE INCREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST BOX DAMPER POSITION IS GREATER THAN 80% OPEN.

THE SUPPLY FAN STATIC WILL REMAIN AS IS IF THE SECOND HIGHEST DAMPER POSITION IS BETWEEN 60% AND 80% OPEN.
THE SUPPLY FAN STATIC WILL BE DECREASED IN INCREMENTS OF .1" IF THE SECOND HIGHEST DAMPER POSITION IS LESS THAT 60% OPEN.

DISCHARGE TEMPERATURE CONTROL: THE MIXED AIR DAMPERS (OA,RA-DPR), PREHEAT VALVE (PH-VLV) AND COOLING VALVE (CLG-VLV) SHALL MODULATE TO MAINTAIN THE FOLLOWING DISCHARGE AIR TEMPERATURE SCHEDULE:

OUTSIDE AIR TEMPERATURE	DISCHARGE TEMPERATURE
0F	62F
70F	55F

ECONOMIZER SWITCHOVER: WHEN THE OUTSIDE AIR ENTHALPY (OA-T, OA-H) IS BELOW THE RETURN AIR ENTHALPY (RA-T, RA-H), THE ECONOMIZER MODE SHALL BE ENABLED. WHEN ECONOMIZER MODE IS ENABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL MODULATE TO CONTROL FOR MIXED AIR TEMPERATURE AND PROVIDE THE FIRST STAGE OF COOLING IN LIEU OF CHILLED WATER. CHILLED WATER VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN ECONOMIZER MODE IS DISABLED, THE MIXED AIR DAMPER (OA-DPR, RA-DPR) SHALL RETURN TO MINIMUM POSITION TO MAINTAIN THE MINIMUM SCHEDULED OUTSIDE AIRFLOW AS MEASURED BY THE AIRFLOW MEASURING STATION (OA-CFM).

DEHUMIDIFICATION MODE: WHEN AVERAGE SPACE HUMIDITY AS COMMUNICATED FROM TERMINAL UNITS RISES ABOVE SETPOINT OF 60%RH (ADJ), THEN COOLING COIL SHALL OPEN FULLY, AND THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE FAN SPEED SHALL OPERATE AT FIXED SPEED 75% (ADJ) IN DEHUMIDIFICATION MODE. WHEN AVERAGE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE SEQUENCE SHALL RESUME NORMAL OPERATION.

PREHEAT COIL CIRCULATING PUMP: THE PREHEAT COIL CIRCULATING PUMP SHALL RUN CONSTANTLY ANYTIME THE OUTSIDE AIR TEMPERATURE IS BELOW 35F AND SHALL STOP ABOVE 40F. GENERATE AN ALARM IF STATUS DOES NOT MATCH THE COMMAND AFTER 60 SECONDS (ADJ).

MORNING WARM-UP: A MORNING WARMUP CYCLE SHALL BE IMPLEMENTED, UPON TRANSITION FROM UNOCCUPIED TO OCCUPIED MODE. FAN(S) TURN ON, OUTSIDE AIR DAMPER REMAINS CLOSED, RETURN AIR DAMPER REMAINS OPEN AND THE PREHEAT COIL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE OF 90F (ADJ). UNIT REMAINS IN THIS MODE UNTIL THE RETURN AIR TEMPERATURE (RA-T) REACHES THE MORNING WARMUP CYCLE TERMINATION SETPOINT OF 70F (ADJ). UPON REACHING THIS SETPOINT, THE AIR HANDLING UNIT ENTERS ITS NORMAL OCCUPIED MODE OF OPERATION (DISCHARGE TEMPERATURE CONTROL).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:

-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.
-IF A FIRE ALARM (RA-SD, SA-SD) SHUTDOWN CONTACT IS PROVIDED,
-IF DISCHARGE AIR HIGH LIMIT SWITCH IS IN ALARM,
-VALVES AND DAMPERS SHALL RETURN TO NORMAL POSITION VIA SPRING.

SHUTDOWN: WHEN THE UNIT IS SHUTDOWN BY A STOP COMMAND THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
CHILLED WATER VALVE SHALL CLOSE
RELIEF HOOD DAMPERS SHALL CLOSE
AREA EXHAUST FANS SHALL STOP
PREHEAT VALVE SHALL MODULATE TO MAINTAIN A PREHEAT DISCHARGE TEMPERATURE (PH-T) OF 60F (ADJ)

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

ELECTRICAL UTILITY POWER MONITORING:

TCC SHALL MONITOR FOR PHASE LOSS ON EXISTING TO REMAIN POWER METERS. TCC SHALL GENERATE AN ALARM UPON PHASE LOSS FOR MANUAL DECISION TO SHUTDOWN CHILLERS, AIR HANDLING UNITS, AND BOILERS.

PROPELLER UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

END OF LOOP CONTROLS (FROM PREVIOUS BAS CONTROL SEQUENCES):

THE TEMPERATURE OF THE SUPPLY WATER TO THE EQUIPMENT ROOM WILL BE USED TO POSITION THE END OF LOOP TEMPERATURE VALVE TO MAINTAIN THE CHILLED WATER SUPPLY AT 48 DEG. F AND THE HEATING WATER SUPPLY AT 145 DEG. F. THE PRESSURE TRANSMITTER WILL BE USED IN THE RESET OF THE PUMP VOLUME CONTROL SUCH THAT THE PUMP WILL MAINTAIN THE PROPER PRESSURE AT THE END OF THE MAIN.

Delta Controls
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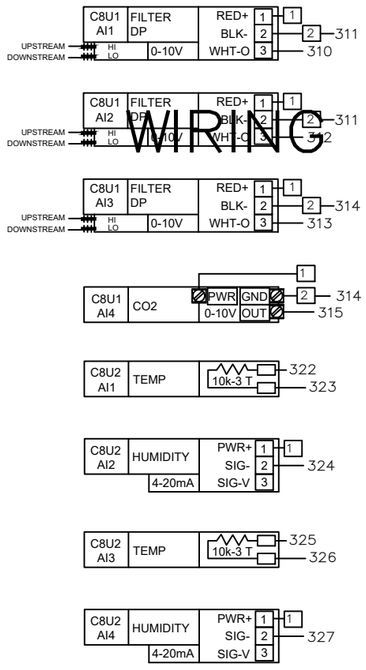
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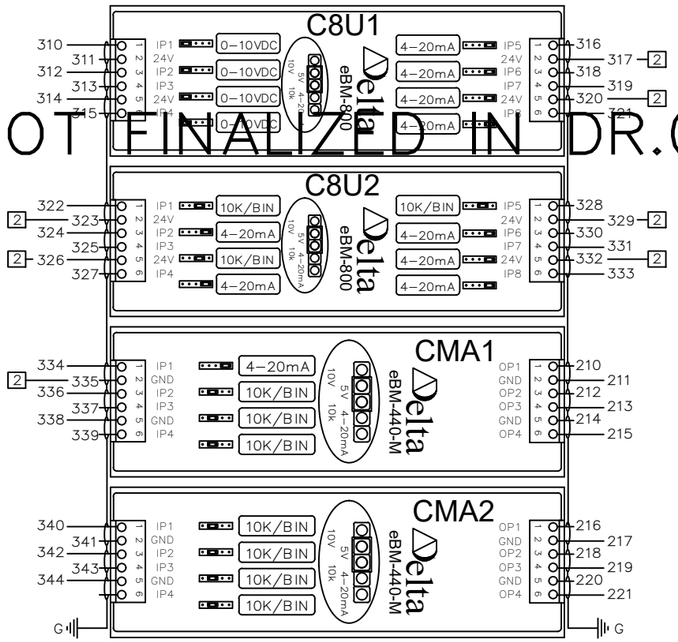
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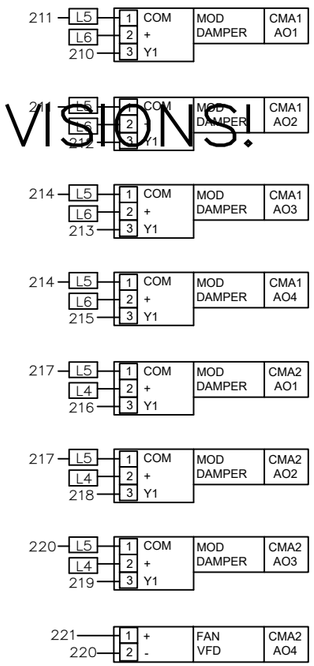
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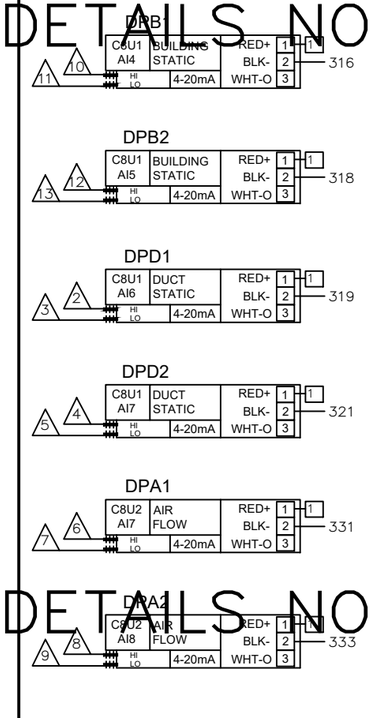
SHEET
NCHS–436
JOB NUMBER:
J–2304001

SYSTEM 52 CONTROL PANEL









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — eBM-440-M I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — eBM-440-M I/O MODULE

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!
WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

AHU-T1 SYSTEM 52 PANEL – I/O WIRING (1 OF 3)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
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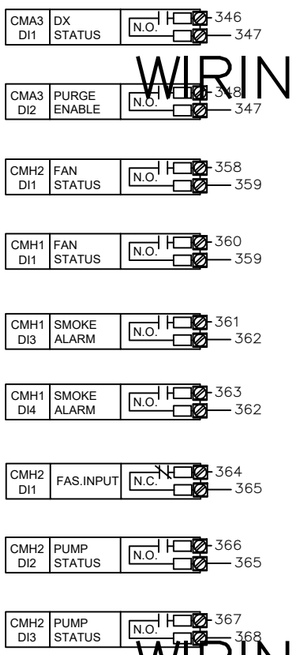
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DATE	REMARKS

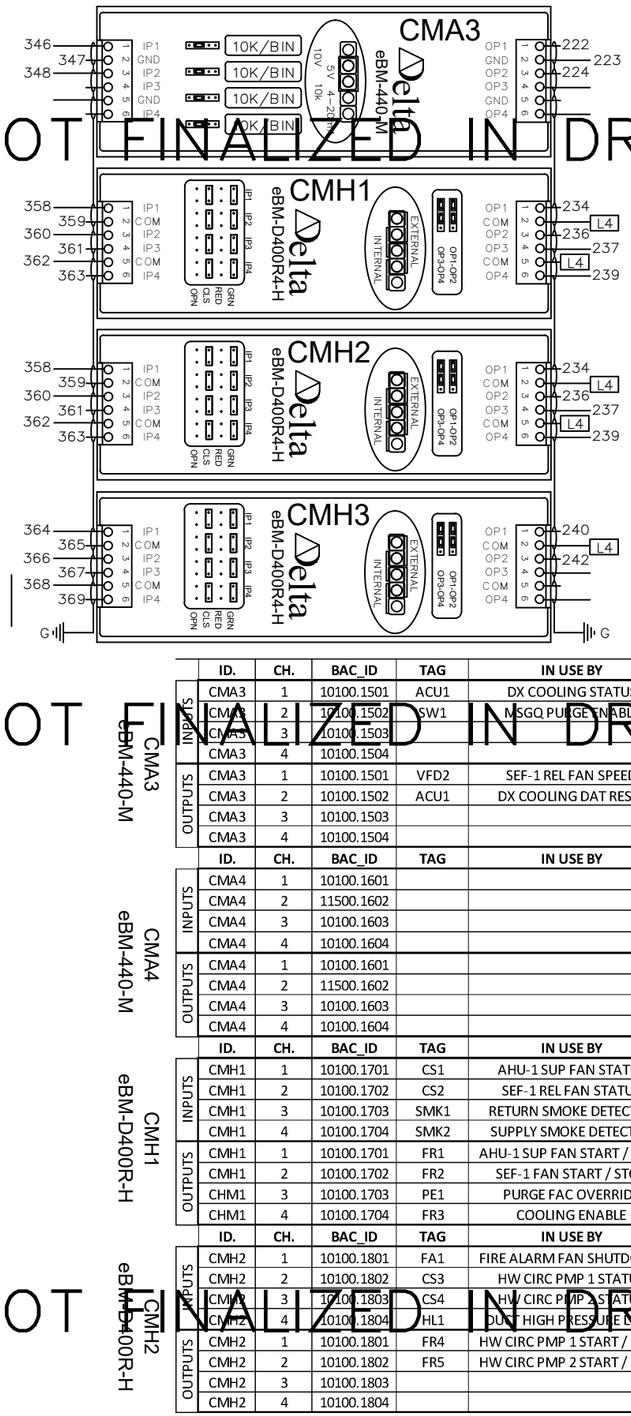
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

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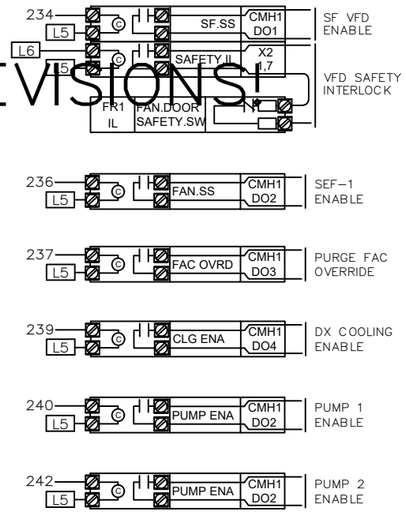
SHEET
NCHS–437
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

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DATE	REMARKS

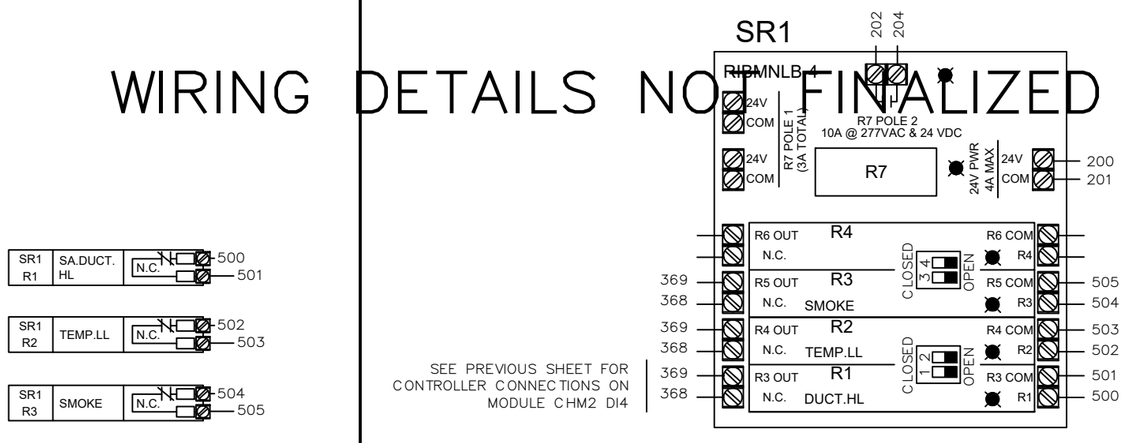
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

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SYSTEM 52 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 | MS/TP SEG2 | MS/TP SEG3 | MS/TP SEG4

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

TRANSFORMER

102 L2

206 207

TX1

24V CB | 24V CB

Power | Power

120 VAC LAPTOP PWR

100 L2 L3 H C G

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V −V GND L N

300 301 101 L3 L2

PS1

4.0A 1.0A 5.0A

102 101 100 G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

206 L8 L8 L8

207 L9 L9 L9

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

ETS1

300 301 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 (NORMALLY OPEN)

R4 R3 R2 R1

R4 OUT N.C. R4 COM R4

R3 OUT N.C. R3 COM R3

R2 OUT N.C. R2 COM R2

R1 OUT N.C. R1 COM R1

CLOSED LOOP

DPD1

DPB1

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

2 3 PNEUMATIC

4 5 PNEUMATIC

eZNS-T100 SERIES
ROOM SENSOR
POWER & NETWORK
WIRING

ST1

NET

PWR

24 VAC

LINKNET (RS-485)

201 200

CEB1

PWR

USB2

(NOT USED)

USB1

GND 24~

C8X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 | eBM-440-M | eBM-440-M | eBM-440-M | eBM-D400R4-H | eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

MS/TP

LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

AHU-T1 SYSTEM 52 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
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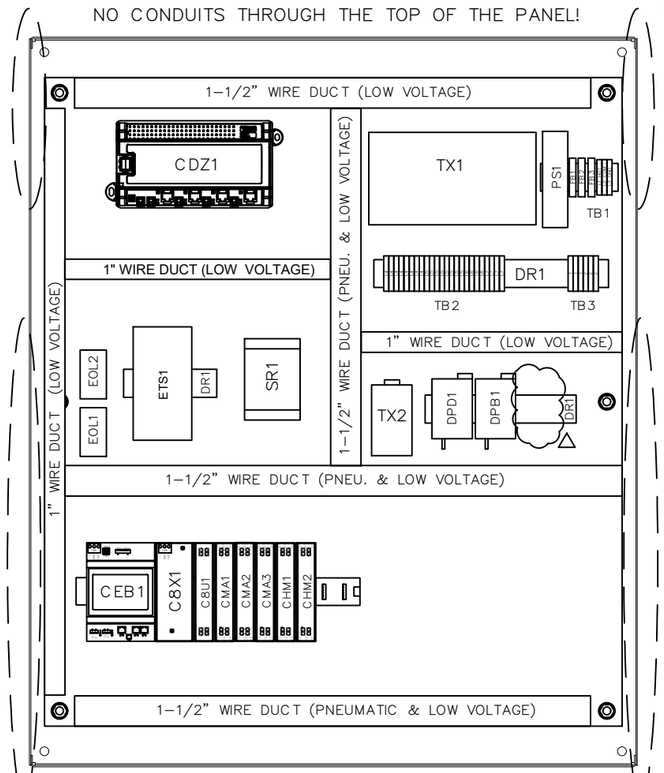
CONTRACT NO:

SHEET
NCHS-440
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 52 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

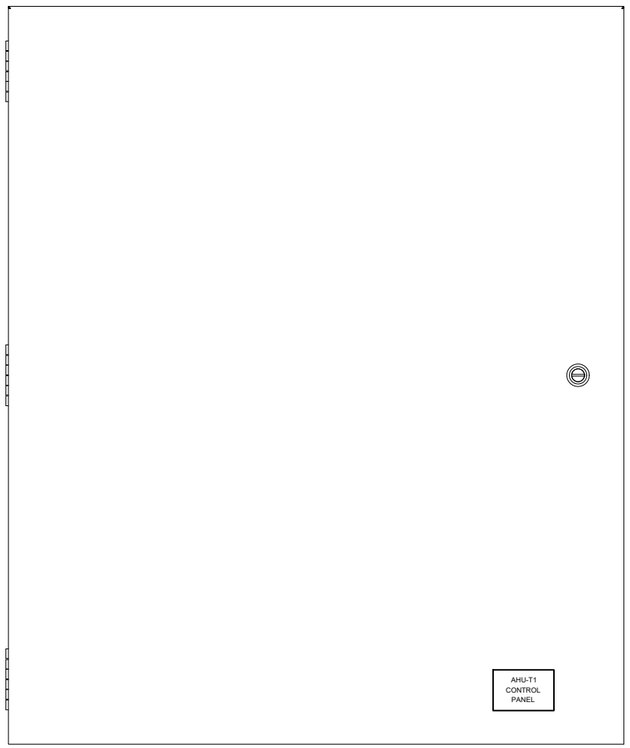


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

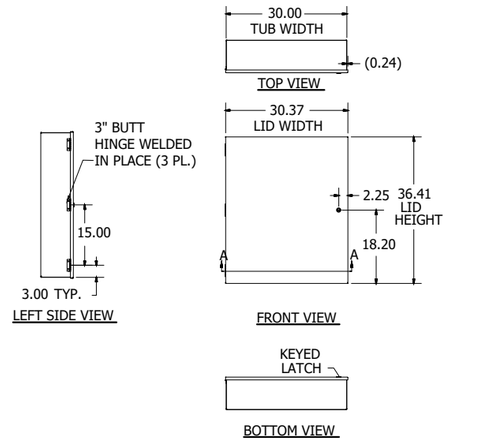
WILL BE PROVIDED IN A FUTURE REVISION. △

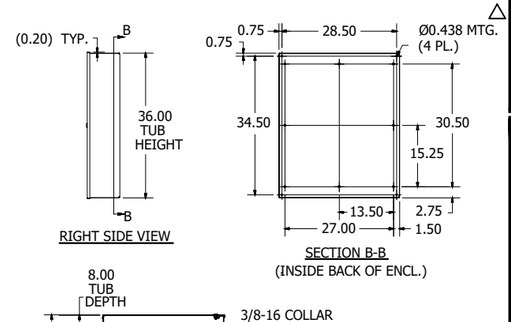
BILL OF MATERIALS

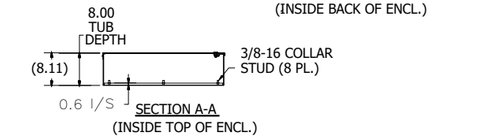
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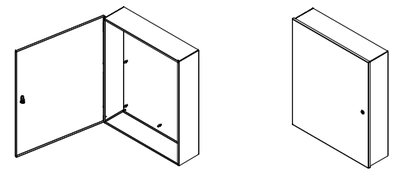
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

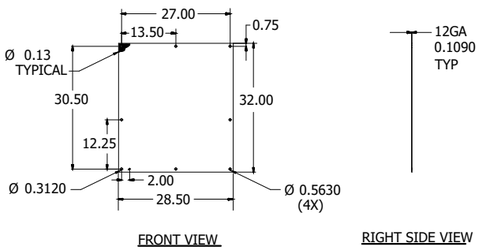








PANEL DIMENSIONS



Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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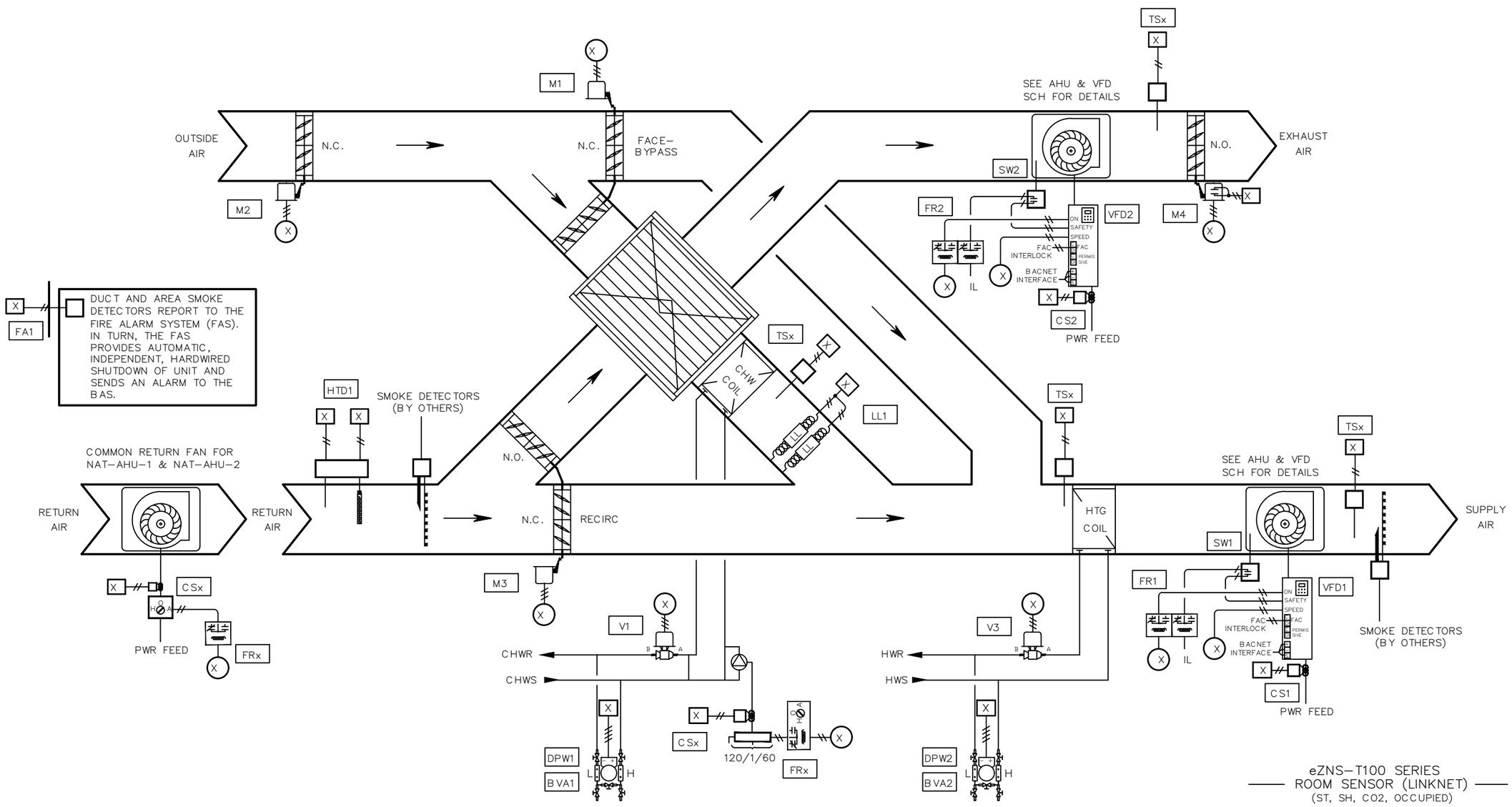
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CONTRACT NO:

SHEET
NCHS-441
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J-2304001

NAT–AHU–1 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NAT–AHU–1 FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
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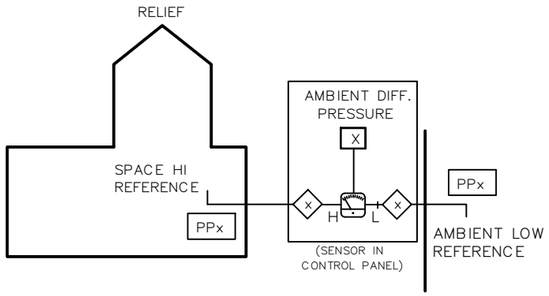
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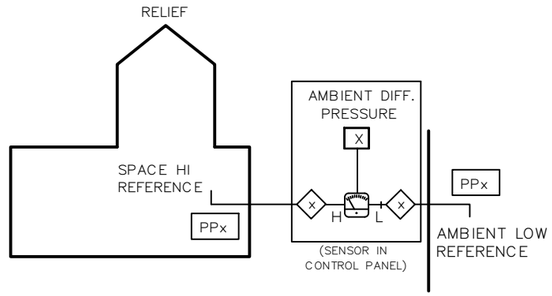
CONTRACT NO:

SHEET
NCHS–442
JOB NUMBER:
J–2304001

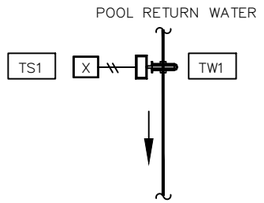
BUILDING PRESSURE MONITORING
AREA SENSOR 1



BUILDING PRESSURE MONITORING
AREA SENSOR 1



POOL RETURN WATER TEMPERATURE
(FIELD DETERMINATION OF LOCATION AND MOUNTING REQUIREMENTS REQUIRED.)



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

NAT–AHU–1 BUILDING PRESSURE AND POOL RETURN TEMPERATURE MONITORING FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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CONTRACT NO:

SHEET
NCHS–443
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
CW DP NAT-AHU-1	Chill Water Diff Pressure	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPB2	Building Static Pressure 2	X				
EAT	Exhaust Air Temp	X				
HW DP NAT-AHU-1	Hot Water Diff Pressure	X				
HXT	Heat Exchanger Air Temp	X				
POOLWTR-T	Pool Water Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EAD ES	Exhaust Air Damper Status		X			
EF STAT	Exhaust Fan Status		X			
LL	Low Limit (Freezestat) (qty 2)		X			
PUMP STAT	HW Circ Pump Status		X			
RF STAT	Return Fan Status		X			
SD	Smoke Detectors (devices by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
EAD	Exhaust Air Damper			X		
EF VFD	Exhaust Fan VFD Speed			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
RECIRC DPR	Recirculation Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF SS	Exhaust Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
RF SS	Return Fan Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**11**	**7**	**8**	**4**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

NAT-AHU-1 & MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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NATATORIUM AIR HANDLING UNIT 1 AND 2 SEQUENCE OF OPERATION

TCC PROVIDED CONTROLLER SHALL BE INSTALLED, WIRED, AND CONNECTED TO EXISTING CONTROL CIRCUIT BY THE CONTROLS INSTALLATION CONTRACTOR. AHU-1 SHALL USE THE POOL SPACE (HIGH PRESSURE) AND CORRIDOR (NEGATIVE PRESSURE) AS THE REFERENCE STATIC PRESSURE POINTS FOR THE EXHAUST FAN TO MAINTAIN A NEGATIVE SPACE PRESSURE (ZN-SP) AS NOTED BELOW. TCC SHALL PROVIDE NEW PROGRAMMING AND CONTROL DEVICES TO MAINTAIN A FIXED DIFFERENTIAL BETWEEN POOL WATER TEMPERATURE AND SPECTATOR ADJUSTABLE ZONE TEMPERATURE. MINIMUM SPECTATOR TEMPERATURE SETPOINT SHALL BE 76 F AND MAXIMUM SHALL BE 80F (ADJ). TCC SHALL PROVIDE POOL WATER TEMPERATURE SENSOR FOR INSTALLATION BY THE CIC AND USE IN LOGIC WITHIN THE BUILDING AUTOMATION SYSTEM. CLASSROOM VAV CONTROLS SHALL BE REPLACED EXACTLY AS CURRENTLY IMPLEMENTED. SEE AS-BUILT TEMPERATURE CONTROL DRAWINGS FOR ADDITIONAL DETAILS. TCC SHALL REPLACE CONTROLS, VALVE ASSEMBLY, DAMPER ACTUATORS, AND VFDS. REFERENCE OWNER PROVIDED AS-BUILT DRAWINGS FOR ADDITIONAL DETAILS AND REQUIREMENTS. TCC SHALL ENABLE/DISABLE HIGH VOLUME LOW SPEED FANS ACCORDING TO SEQUENCE OF OPERATION PROVIDED ON M-708.3 DETAIL 1A.

DDC SHALL HAVE ONE DIGITAL OUTPUT FOR LOCAL INDICATION OF AN ALARM CONDITION. (I.E. BLOWER CURRENT/DIFFERENTIAL PRESSURE SWITCH, DAMPER END SWITCHES, FREEZE STAT, FIRE STAT, SMOKE, DIRTY FILTERS…).

1. AHU-1 AND AHU-2 SUPPLY FANS SHALL BE CONVERTED FROM THE EXISTING MOTOR STARTER SOLUTION TO VARIABLE FREQUENCY DRIVES. THE LEAD AIR HANDLING UNIT SHALL OPERATE AT ALL TIMES. AHU-1 AND AHU-2 SHALL ROTATE LEAD WEEKLY AND OPERATE CONCURRENTLY
   WHEN THE LAG AIR HANDLER IS REQUIRED TO MAINTAIN REQUIRED SPACE TEMPERATURE AND HUMIDITY CONDITIONS. LAG AIR HANDLING UNIT SHALL AUTOMATICALLY TAKE OVER UPON LEAD FAILURE.
2. PROVIDE LOW LIMIT PROTECTION, NUMBER AS REQUIRED ON THE DISCHARGE OF AHU CHILLED WATER COILS TO SHUT UNIT OFF UPON SENSING FREEZE CONDITIONS. PROVIDE STRAP ON SENSOR TO OVERRIDE CONTROL VALVE UPON SENSING 39F AT THE CHILLED WATER RETURN LINE
   OF THE COOLING COIL. LOW LIMIT PROTECTION ON THE DISCHARGE OF AHU CHILLED WATER COILS SHALL SHUT UNIT OFF UPON SENSING FREEZE CONDITIONS. IMMERSION SENSOR SHALL OVERRIDE CONTROL VALVE LOGIC UPON SENSING 39F (ADJ) AT THE CHILLED RETURN LINE OF
   THE COOLING COIL.
3. DIVISION 26 CONTRACTOR SHALL PROVIDE AND MOUNT DUCT DETECTORS IN THE SUPPLY AIR (SA) AND RETURN AIR (RA) DUCTS. CIC SHALL WIRE DETECTORS TO STOP THE SUPPLY FAN (SA) AND GENERATE A BAS ALARM.
4. EITHER OF THE ABOVE SAFETIES SHALL STOP THE FAN, CLOSE THE OUTSIDE AIR DAMPER, AND OPEN THE HEATING CONTROL VALVE WHEN IN ALARM.
5. POOL WATER TEMPERATURE SENSOR SHALL BE UTILIZED TO CALCULATE SPACE TEMPERATURE VERSUS WATER TEMPERATURE DIFFERENTIAL. TCC SHALL INCLUDE SPACE AND WATER TEMPERATURE ON GRAPHIC. THE LEAD AIR HANDLING UNIT SHALL OPERATE AT ALL TIMES.
   AHU-1 AND AHU-2 SHALL ROTATE LEAD WEEKLY AND OPERATE CONCURRENTLY WHEN THE LAG AIR HANDLER IS REQUIRED TO MAINTAIN REQUIRED SPACE TEMPERATURE AND HUMIDITY CONDITIONS. LAG AIR HANDLING UNIT SHALL AUTOMATICALLY TAKE OVER UPON LEAD FAILURE.
6. OUTSIDE AIR HEAT EXCHANGER FACE AND BYPASS DAMPER: (THE OUTSIDE AIR MAXIMUM AND MINIMUM SETTINGS SHALL BE SET AT ORIGINAL START-UP VALUES.)
A. ENERGY RECOVERY MODE:
1. UNIT SHALL OPERATE IN ENERGY RECOVERY MODE WHEN THE EXHAUST AIR LEAVING THE HEAT EXCHANGER IS 38F AND ABOVE.
2. THE OUTSIDE AIR HEAT EXCHANGER FACE & BYPASS DAMPER SHALL MODULATE FULL OPEN TO FACE AND FULL CLOSED TO BYPASS TO PASS ALL OUTSIDE AIR THROUGH THE HEAT EXCHANGER.
B. WINTER DEFROST MODE:
1. UNIT SHALL OPERATE IN WINTER DEFROST MODE WHEN THE EXHAUST AIR LEAVING THE HEAT EXCHANGER IS BELOW 38F.
2. THE OUTSIDE AIR HEAT EXCHANGER FACE & BYPASS DAMPER SHALL MODULATE OPEN TO BYPASS AND CLOSED TO THE FACE, BYPASSING SOME OF THE OUTSIDE AIR TO PREVENT FROST FORMATION
   ON THE EXHAUST SIDE OF THE HEAT EXCHANGER. UNIT SHALL OPERATE IN THIS MODE UNTIL THE EXHAUST AIR LEAVING THE HEAT EXCHANGER IS ABOVE 38F.
7. COOLING
A. COOLING SHALL BE LOCKED OUT WHEN THE VALIDATED OUTSIDE AIR TEMPERATURE IS BELOW 55F.
B. THE COOLING COIL PRESSURE INDEPENDENT (PI) CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN AHU DISCHARGE AIR TEMPERATURE AT SETPOINT. THIS SIGNAL
   SHALL BE OVERRIDDEN BY LOGIC AS REQUIRED TO MAINTAIN HOT WATER COIL LEAVING TEMPERATURE MINIMUM OF 55F.
8. HEATING
A. THE HEATING COIL PRESSURE INDEPENDENT (PI) CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN AHU DISCHARGE TEMPERATURE AT SETPOINT. THIS SIGNAL
   SHALL BE OVERRIDDEN BY LOGIC AS REQUIRED TO MAINTAIN HOT WATER COIL LEAVING TEMPERATURE MINIMUM OF 55F.
9. SPACE PRESSURIZATION CONTROL
A. THE EXHAUST FAN VFD SHALL MODULATE FAN SPEED AS REQUIRED TO MAINTAIN NEGATIVE POOL SPACE PRESSURE RELATIVE TO THE ADJACENT SPACES. DIFFERENTIAL
   PRESSURE SETPOINT SHALL BE 0.04" W.C. (ADJ).
10. SPACE HUMIDITY CONTROL
A. RETURN AIR DEW POINT CONTROL: UNIT DEHUMIDIFICATION CONTROLS SHALL MAINTAIN RETURN AIR AT 86F AT 50% RH.
B. OUTSIDE AIR AND RECIRCULATION AIR DAMPERS
1. OA DAMPER AT MINIMUM POSITION, RECIRCULATION DAMPER AT MAXIMUM POSITION: THE EXHAUST FAN VFD OPERATES FAN AT MINIMUM EXHAUST SETTING.
2. OA DAMPER AT MAXIMUM POSITION, RECIRCULATION DAMPER AT MINIMUM POSITION: COOLING COIL PI VALVE MODULATES AS REQUIRED FOR COIL DISCHARGE TEMPERATURE CONTROL OR RETURN AIR DEW
   POINT CONTROL.
11. SUPPLY AIR TEMPERATURE RESET
A. THE SUPPLY AIR TEMPERATURE AT THE AHU DISCHARGE SHALL BE RESET WITHIN THE LIMITS BELOW TO MAINTAIN THE RETURN AIR TEMPERATURE AT SETPOINT OF 86F (ADJ).
1. SUPPLY AIR MINIMUM SETPOINT OF 60F (ADJ).
2. SUPPLY AIR MAXIMUM SETPOINT OF 120F (ADJ).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.

POOL WATER TEMP MONITORING:

BAS TO MONITOR POOL WATER RETURN TEMPERATURE. MAKE INFORMATION AVAILABLE ON FRONT-END GRAPHICS.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

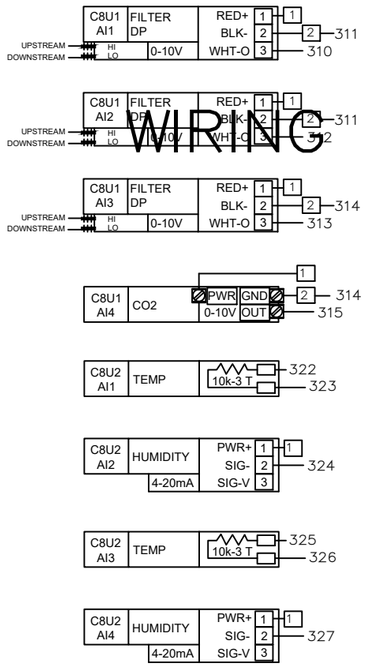
REVISIONS	
DATE	REMARKS

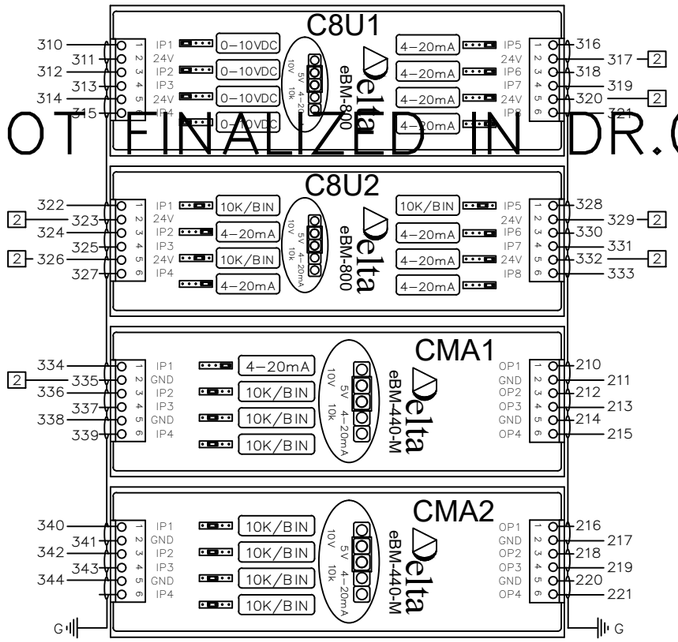
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

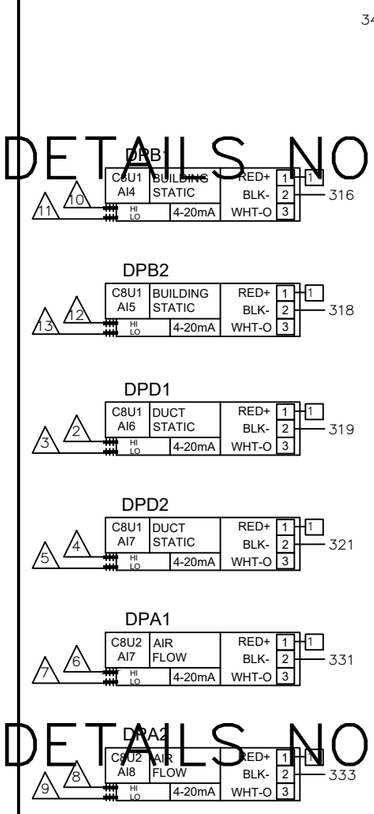
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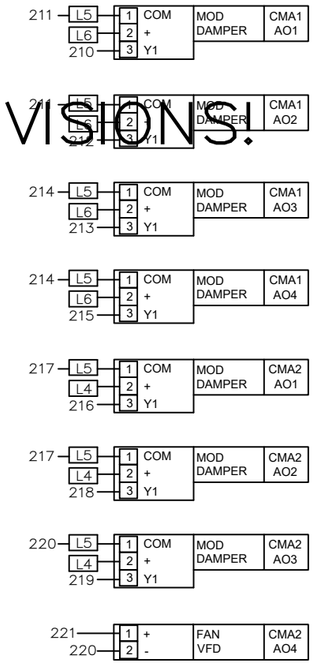
SHEET
NCHS-445
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U1 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — INPUTS — eBM-800 I/O MODULE — C8U2 eBM-800

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA1 eBM-440-M

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
CMA2	4	10100.1404			
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — INPUTS / OUTPUTS — eBM-440-M I/O MODULE — CMA2 eBM-440-M

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NAT-AHU-1 SYSTEM 53 PANEL – I/O WIRING (1 OF 3)

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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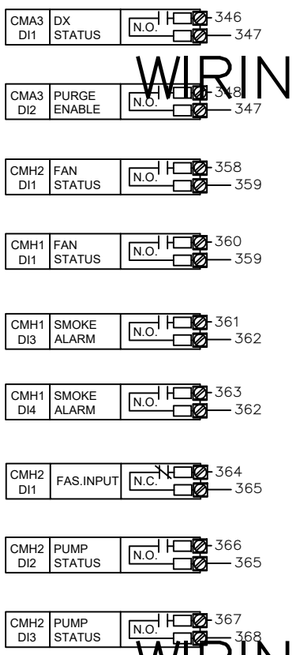
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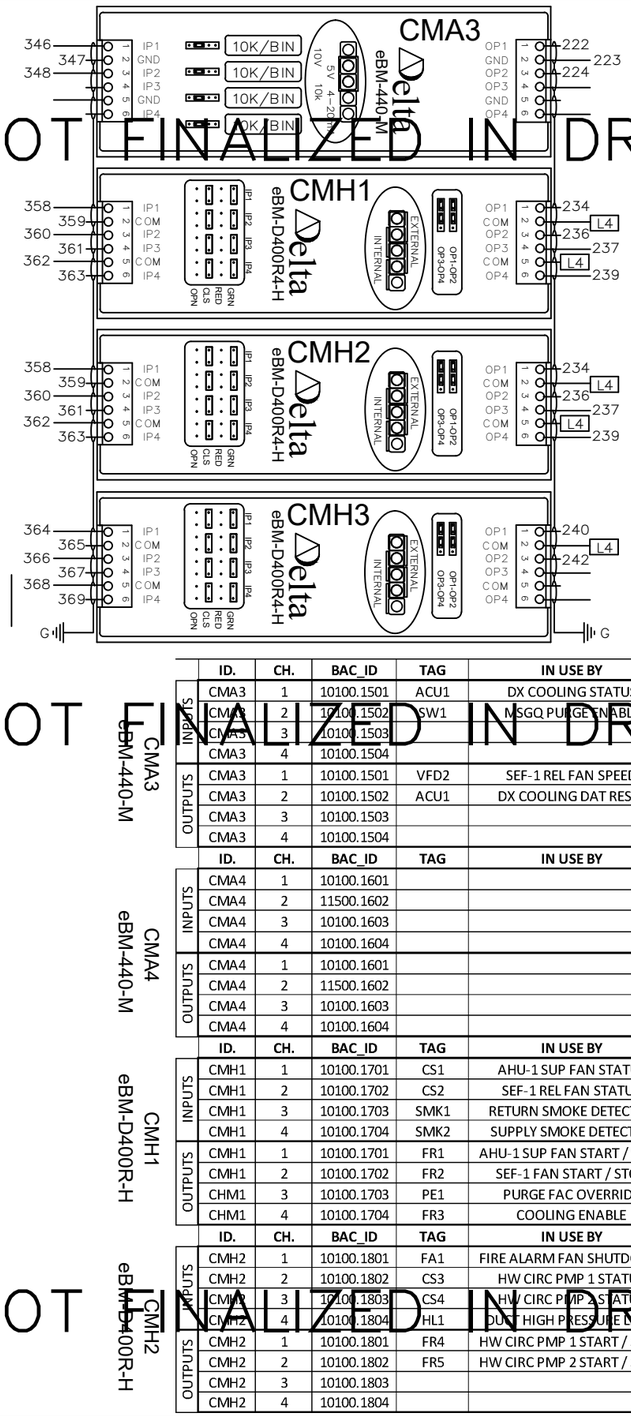
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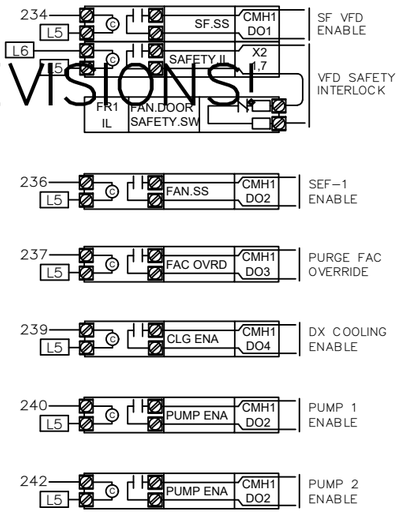
SHEET
NCHS-446
JOB NUMBER:
J-2304001

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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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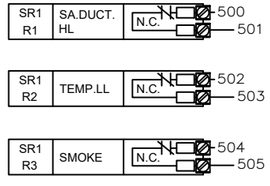
CONTRACT NO:

SHEET
NCHS–447
JOB NUMBER:
J–2304001

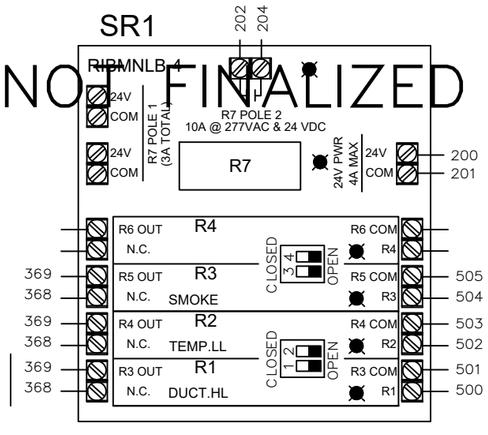
SYSTEM 53 CONTROL PANEL

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!



SEE PREVIOUS SHEET FOR CONTROLLER CONNECTIONS ON MODULE CHM2 DI4



WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1 DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1 DFM-400P

NAT–AHU–1 SYSTEM 53 PANEL – I/O WIRING (3 OF 3)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–448
JOB NUMBER:
J–2304001

SYSTEM 53 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

ETS1

ETHERNET SWITCH

CAT5e

SR1 RIBMNLB-4

TX1

24V CB | 24V CB | Power | Power | 120 VAC LAPTOP PWR | 75VA | 24VAC | 24VAC

100 | L2 | L3 | H | C | G

200 | 201 CONTROLLER PWR

202 | 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V | -V | GND | L | N | 300 | 301 | 101 | L3 | L2

PS1

TB1

1.0A | 101

5.0A | 100

G | PANEL GND LUG

L1 | L2 | L3 | H | N | 120 VAC

TB2

202 | 203 | 204 | 205 | L4 | L5 | L6 | L7 | 24 VAC TO FIELD

TB3

300 | 301 | 1 | 2 | 24 VDC TO FIELD

DPB1 | DPB2

Power + | GND / 4-20mA out - | Voltage out 0

HIGH | LOW

4 | 5 PNEUMATIC

6 | 7 PNEUMATIC

7 | 6 | 5 | 4

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1 | NET | PWR

24 VAC

LINKNET (RS-485)

MS/TP

LINKNET (RS-485)

CEB1 | C8X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 | eBM-800 | eBM-440-M | eBM-440-M | eBM-D400R4-H

I/O SHIELD DRAIN

TO PANEL GND LUG

SEE RISER DIAGRAMS FOR LOCATION

NAT-AHU-1 SYSTEM 53 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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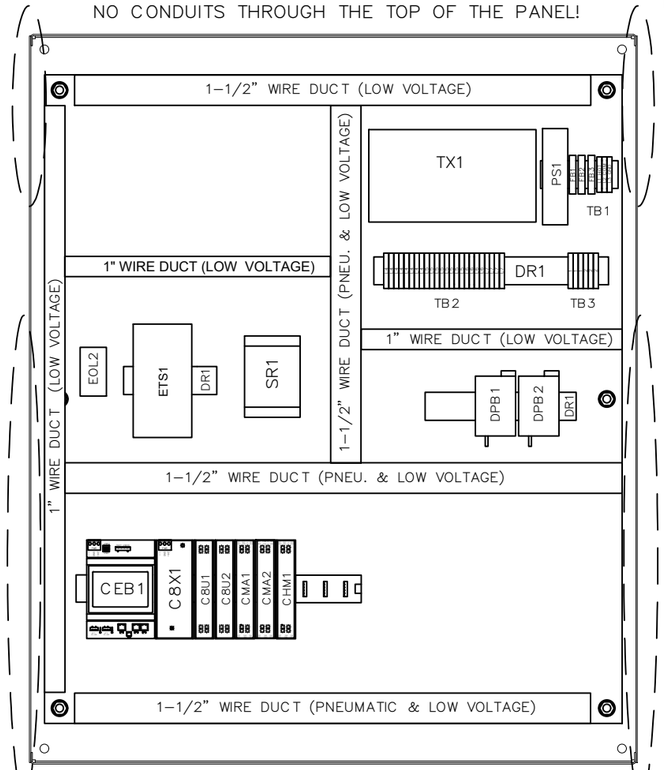
CONTRACT NO:

SHEET
NCHS-449
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 53 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

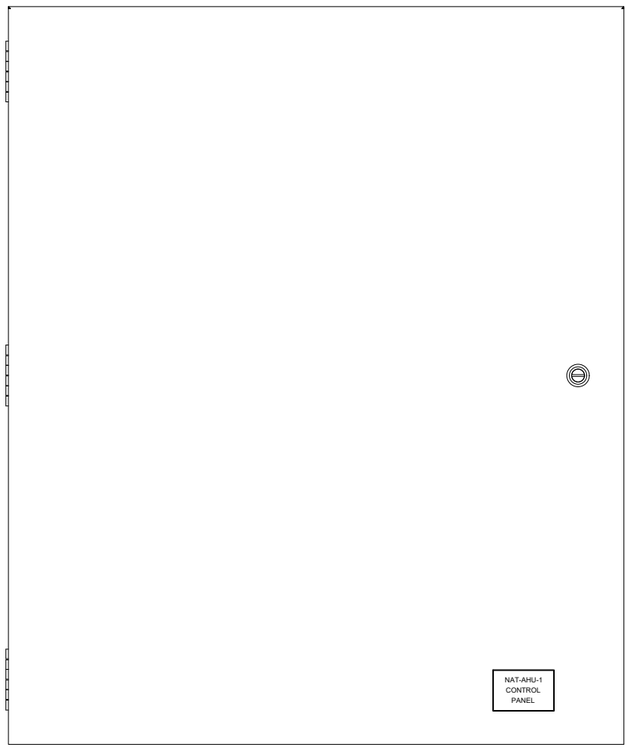


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

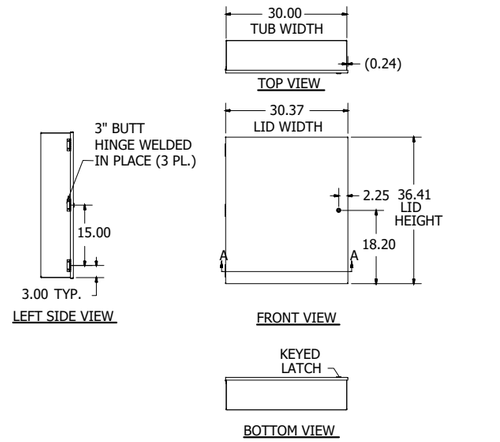
WILL BE PROVIDED IN A FUTURE REVISION. △

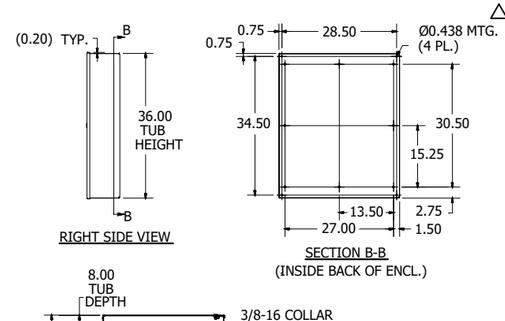
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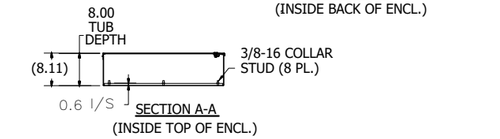
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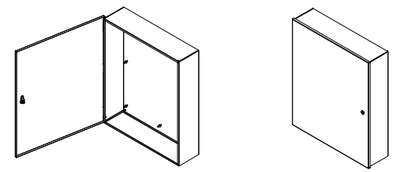
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

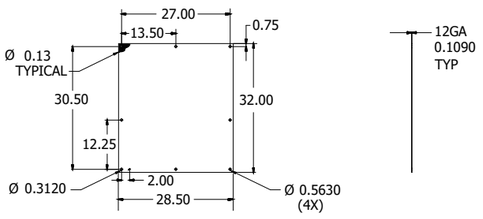








PANEL DIMENSIONS



NAT–AHU–1 SYSTEM 53 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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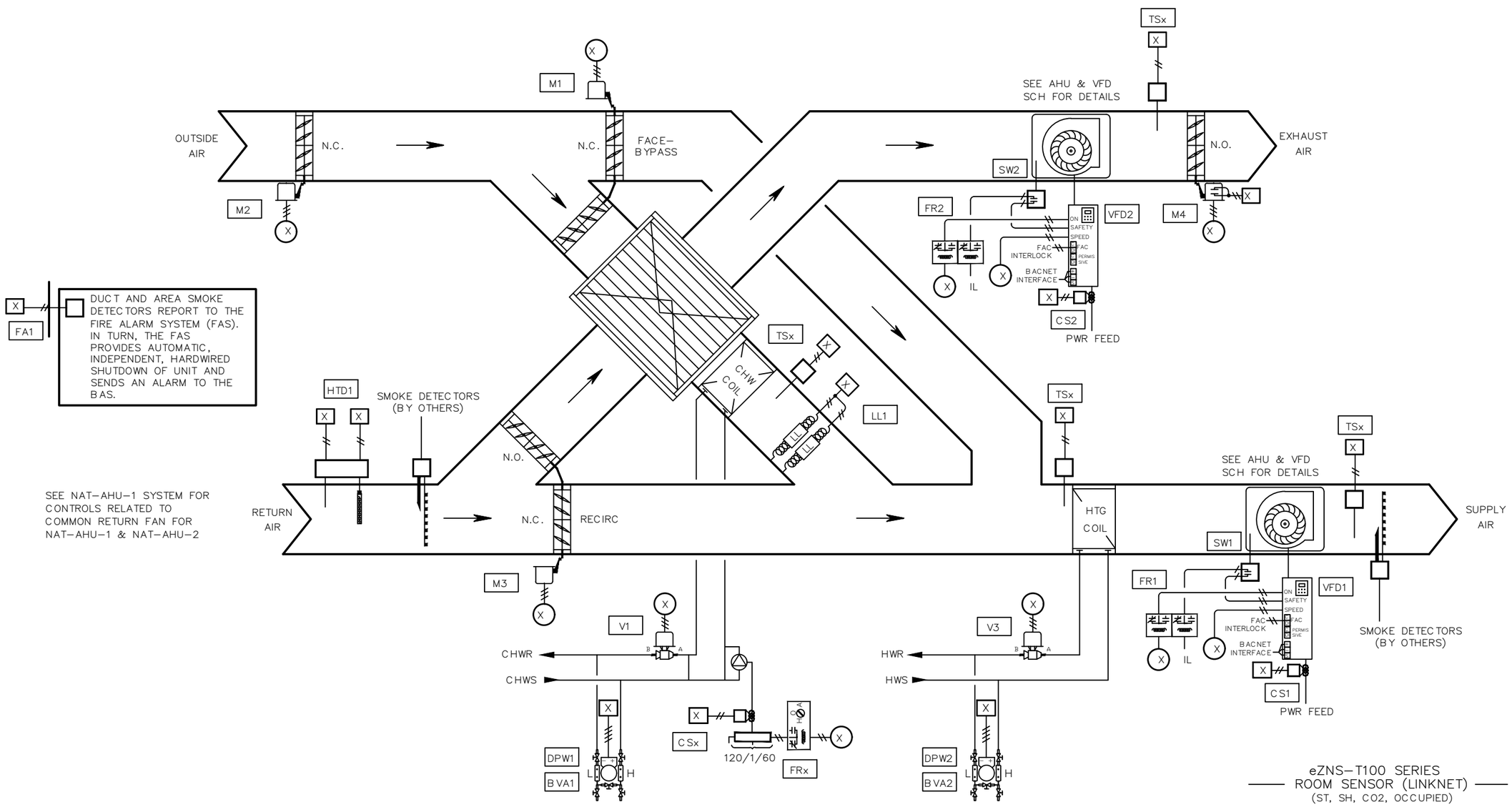
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CONTRACT NO:

SHEET
NCHS–450
JOB NUMBER:
J–2304001

NAT–AHU–2 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

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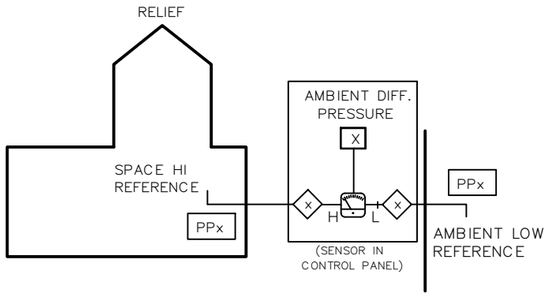
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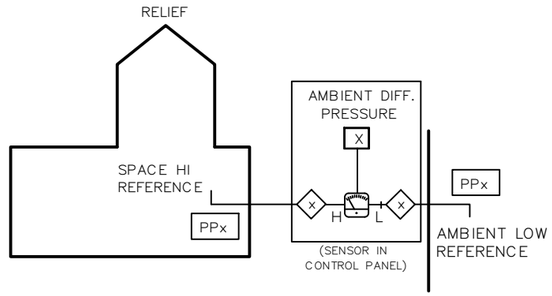
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JOB NUMBER:
J–2304001

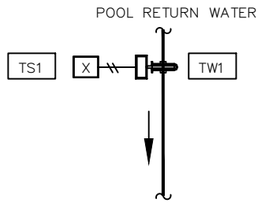
BUILDING PRESSURE MONITORING
AREA SENSOR 1



BUILDING PRESSURE MONITORING
AREA SENSOR 1



POOL RETURN WATER TEMPERATURE
(FIELD DETERMINATION OF LOCATION AND MOUNTING REQUIREMENTS REQUIRED.)



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

NAT–AHU–2 BUILDING PRESSURE AND POOL RETURN TEMPERATURE MONITORING FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–452
JOB NUMBER:
J–2304001

INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
CW DP NAT-AHU-1	Chill Water Diff Pressure	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure 1	X				
DPB2	Building Static Pressure 2	X				
EAT	Exhaust Air Temp	X				
HW DP NAT-AHU-1	Hot Water Diff Pressure	X				
HXT	Heat Exchanger Air Temp	X				
POOLWTR-T	Pool Water Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EAD ES	Exhaust Air Damper Status		X			
EF STAT	Exhaust Fan Status		X			
LL	Low Limit (Freezestat) (qty 2)		X			
PUMP STAT	HW Circ Pump Status		X			
SD	Smoke Detectors (devices by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
EAD	Exhaust Air Damper			X		
EF VFD	Exhaust Fan VFD Speed			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
RECIRC DPR	Recirculation Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF SS	Exhaust Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
ST1	Space Temp					X
SH1	Space Humidity					X
S CO21	Space CO2					X
OCC1	Occupied Flag					X
	POINT TOTALS:	**11**	**6**	**8**	**3**	**4**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

NAT-AHU-2 & MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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NATATORIUM AIR HANDLING UNIT 1 AND 2 SEQUENCE OF OPERATION

TCC PROVIDED CONTROLLER SHALL BE INSTALLED, WIRED, AND CONNECTED TO EXISTING CONTROL CIRCUIT BY THE CONTROLS INSTALLATION CONTRACTOR. AHU-1 SHALL USE THE POOL SPACE (HIGH PRESSURE) AND CORRIDOR (NEGATIVE PRESSURE) AS THE REFERENCE STATIC PRESSURE POINTS FOR THE EXHAUST FAN TO MAINTAIN A NEGATIVE SPACE PRESSURE (ZN-SP) AS NOTED BELOW. TCC SHALL PROVIDE NEW PROGRAMMING AND CONTROL DEVICES TO MAINTAIN A FIXED DIFFERENTIAL BETWEEN POOL WATER TEMPERATURE AND SPECTATOR ADJUSTABLE ZONE TEMPERATURE. MINIMUM SPECTATOR TEMPERATURE SETPOINT SHALL BE 76 F AND MAXIMUM SHALL BE 80F (ADJ). TCC SHALL PROVIDE POOL WATER TEMPERATURE SENSOR FOR INSTALLATION BY THE CIC AND USE IN LOGIC WITHIN THE BUILDING AUTOMATION SYSTEM. CLASSROOM VAV CONTROLS SHALL BE REPLACED EXACTLY AS CURRENTLY IMPLEMENTED. SEE AS-BUILT TEMPERATURE CONTROL DRAWINGS FOR ADDITIONAL DETAILS. TCC SHALL REPLACE CONTROLS, VALVE ASSEMBLY, DAMPER ACTUATORS, AND VFDS. REFERENCE OWNER PROVIDED AS-BUILT DRAWINGS FOR ADDITIONAL DETAILS AND REQUIREMENTS. TCC SHALL ENABLE/DISABLE HIGH VOLUME LOW SPEED FANS ACCORDING TO SEQUENCE OF OPERATION PROVIDED ON M-708.3 DETAIL 1A.

DDC SHALL HAVE ONE DIGITAL OUTPUT FOR LOCAL INDICATION OF AN ALARM CONDITION. (I.E. BLOWER CURRENT/DIFFERENTIAL PRESSURE SWITCH, DAMPER END SWITCHES, FREEZE STAT, FIRE STAT, SMOKE, DIRTY FILTERS…).

1. AHU-1 AND AHU-2 SUPPLY FANS SHALL BE CONVERTED FROM THE EXISTING MOTOR STARTER SOLUTION TO VARIABLE FREQUENCY DRIVES. THE LEAD AIR HANDLING UNIT SHALL OPERATE AT ALL TIMES. AHU-1 AND AHU-2 SHALL ROTATE LEAD WEEKLY AND OPERATE CONCURRENTLY
   WHEN THE LAG AIR HANDLER IS REQUIRED TO MAINTAIN REQUIRED SPACE TEMPERATURE AND HUMIDITY CONDITIONS. LAG AIR HANDLING UNIT SHALL AUTOMATICALLY TAKE OVER UPON LEAD FAILURE.
2. PROVIDE LOW LIMIT PROTECTION, NUMBER AS REQUIRED ON THE DISCHARGE OF AHU CHILLED WATER COILS TO SHUT UNIT OFF UPON SENSING FREEZE CONDITIONS. PROVIDE STRAP ON SENSOR TO OVERRIDE CONTROL VALVE UPON SENSING 39F AT THE CHILLED WATER RETURN LINE
   OF THE COOLING COIL. LOW LIMIT PROTECTION ON THE DISCHARGE OF AHU CHILLED WATER COILS SHALL SHUT UNIT OFF UPON SENSING FREEZE CONDITIONS. IMMERSION SENSOR SHALL OVERRIDE CONTROL VALVE LOGIC UPON SENSING 39F (ADJ) AT THE CHILLED RETURN LINE OF
   THE COOLING COIL.
3. DIVISION 26 CONTRACTOR SHALL PROVIDE AND MOUNT DUCT DETECTORS IN THE SUPPLY AIR (SA) AND RETURN AIR (RA) DUCTS. CIC SHALL WIRE DETECTORS TO STOP THE SUPPLY FAN (SA) AND GENERATE A BAS ALARM.
4. EITHER OF THE ABOVE SAFETIES SHALL STOP THE FAN, CLOSE THE OUTSIDE AIR DAMPER, AND OPEN THE HEATING CONTROL VALVE WHEN IN ALARM.
5. POOL WATER TEMPERATURE SENSOR SHALL BE UTILIZED TO CALCULATE SPACE TEMPERATURE VERSUS WATER TEMPERATURE DIFFERENTIAL. TCC SHALL INCLUDE SPACE AND WATER TEMPERATURE ON GRAPHIC. THE LEAD AIR HANDLING UNIT SHALL OPERATE AT ALL TIMES.
   AHU-1 AND AHU-2 SHALL ROTATE LEAD WEEKLY AND OPERATE CONCURRENTLY WHEN THE LAG AIR HANDLER IS REQUIRED TO MAINTAIN REQUIRED SPACE TEMPERATURE AND HUMIDITY CONDITIONS. LAG AIR HANDLING UNIT SHALL AUTOMATICALLY TAKE OVER UPON LEAD FAILURE.
6. OUTSIDE AIR HEAT EXCHANGER FACE AND BYPASS DAMPER: (THE OUTSIDE AIR MAXIMUM AND MINIMUM SETTINGS SHALL BE SET AT ORIGINAL START-UP VALUES.)
A. ENERGY RECOVERY MODE:
1. UNIT SHALL OPERATE IN ENERGY RECOVERY MODE WHEN THE EXHAUST AIR LEAVING THE HEAT EXCHANGER IS 38F AND ABOVE.
2. THE OUTSIDE AIR HEAT EXCHANGER FACE & BYPASS DAMPER SHALL MODULATE FULL OPEN TO FACE AND FULL CLOSED TO BYPASS TO PASS ALL OUTSIDE AIR THROUGH THE HEAT EXCHANGER.
B. WINTER DEFROST MODE:
1. UNIT SHALL OPERATE IN WINTER DEFROST MODE WHEN THE EXHAUST AIR LEAVING THE HEAT EXCHANGER IS BELOW 38F.
2. THE OUTSIDE AIR HEAT EXCHANGER FACE & BYPASS DAMPER SHALL MODULATE OPEN TO BYPASS AND CLOSED TO THE FACE, BYPASSING SOME OF THE OUTSIDE AIR TO PREVENT FROST FORMATION
   ON THE EXHAUST SIDE OF THE HEAT EXCHANGER. UNIT SHALL OPERATE IN THIS MODE UNTIL THE EXHAUST AIR LEAVING THE HEAT EXCHANGER IS ABOVE 38F.
7. COOLING
A. COOLING SHALL BE LOCKED OUT WHEN THE VALIDATED OUTSIDE AIR TEMPERATURE IS BELOW 55F.
B. THE COOLING COIL PRESSURE INDEPENDENT (PI) CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN AHU DISCHARGE AIR TEMPERATURE AT SETPOINT. THIS SIGNAL
   SHALL BE OVERRIDDEN BY LOGIC AS REQUIRED TO MAINTAIN HOT WATER COIL LEAVING TEMPERATURE MINIMUM OF 55F.
8. HEATING
A. THE HEATING COIL PRESSURE INDEPENDENT (PI) CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN AHU DISCHARGE TEMPERATURE AT SETPOINT. THIS SIGNAL
   SHALL BE OVERRIDDEN BY LOGIC AS REQUIRED TO MAINTAIN HOT WATER COIL LEAVING TEMPERATURE MINIMUM OF 55F.
9. SPACE PRESSURIZATION CONTROL
A. THE EXHAUST FAN VFD SHALL MODULATE FAN SPEED AS REQUIRED TO MAINTAIN NEGATIVE POOL SPACE PRESSURE RELATIVE TO THE ADJACENT SPACES. DIFFERENTIAL
   PRESSURE SETPOINT SHALL BE 0.04" W.C. (ADJ).
10. SPACE HUMIDITY CONTROL
A. RETURN AIR DEW POINT CONTROL: UNIT DEHUMIDIFICATION CONTROLS SHALL MAINTAIN RETURN AIR AT 86F AT 50% RH.
B. OUTSIDE AIR AND RECIRCULATION AIR DAMPERS
1. OA DAMPER AT MINIMUM POSITION, RECIRCULATION DAMPER AT MAXIMUM POSITION: THE EXHAUST FAN VFD OPERATES FAN AT MINIMUM EXHAUST SETTING.
2. OA DAMPER AT MAXIMUM POSITION, RECIRCULATION DAMPER AT MINIMUM POSITION: COOLING COIL PI VALVE MODULATES AS REQUIRED FOR COIL DISCHARGE TEMPERATURE CONTROL OR RETURN AIR DEW
   POINT CONTROL.
11. SUPPLY AIR TEMPERATURE RESET
A. THE SUPPLY AIR TEMPERATURE AT THE AHU DISCHARGE SHALL BE RESET WITHIN THE LIMITS BELOW TO MAINTAIN THE RETURN AIR TEMPERATURE AT SETPOINT OF 86F (ADJ).
1. SUPPLY AIR MINIMUM SETPOINT OF 60F (ADJ).
2. SUPPLY AIR MAXIMUM SETPOINT OF 120F (ADJ).

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.

POOL WATER TEMP MONITORING:

BAS TO MONITOR POOL WATER RETURN TEMPERATURE. MAKE INFORMATION AVAILABLE ON FRONT-END GRAPHICS.

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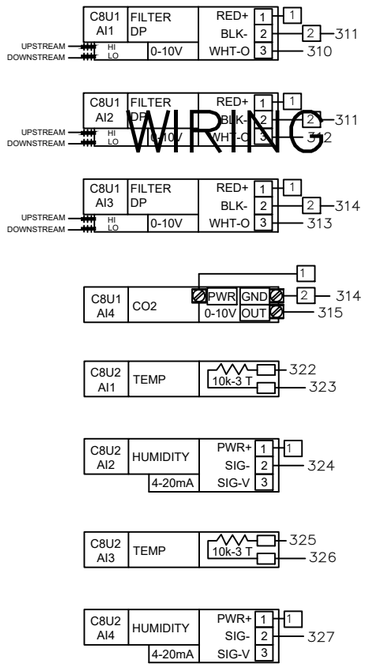
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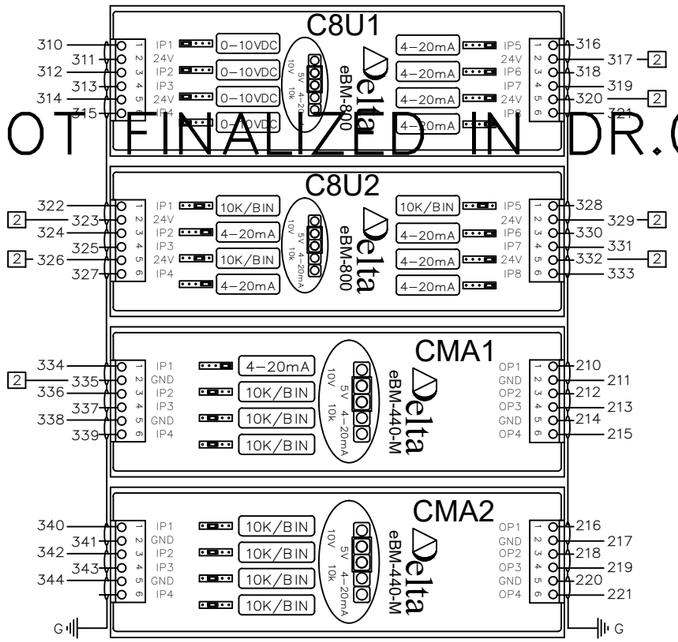
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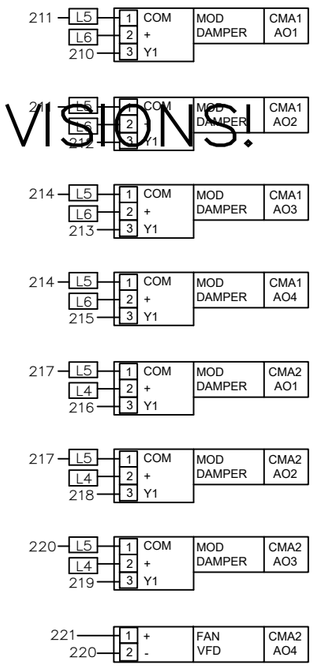
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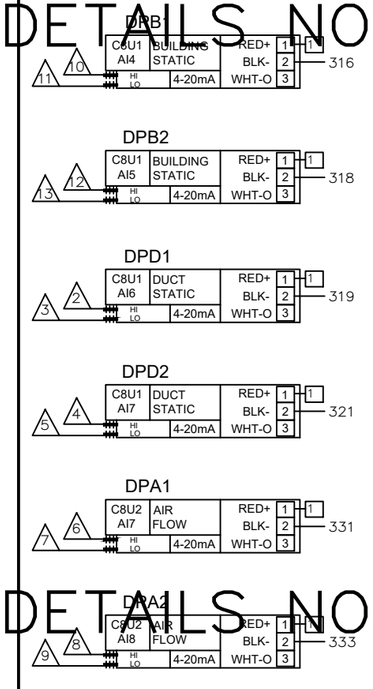
SHEET
NCHS-454
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO	C8U1 eBM-800 INPUTS
C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO	
C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO	
C8U1	4	10100.1104	CO21	CO2 SENSOR	2510	
C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201	
C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201	
C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200	
C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200	

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101	C8U2 eBM-800 INPUTS
C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101	
C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101	
C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101	
C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101	
C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101	
C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201	
C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201	

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101	CMA1 eBM-440-M INPUTS
CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001	
CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002	
CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301	
CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206	CMA1 eBM-440-M OUTPUTS
CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206	
CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206	
CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206	

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003	CMA2 eBM-440-M INPUTS
CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003	
CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO	
CMA2	4	10100.1404				
CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204	CMA2 eBM-440-M OUTPUTS
CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208	
CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208	
CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO	

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4240 W 50 S
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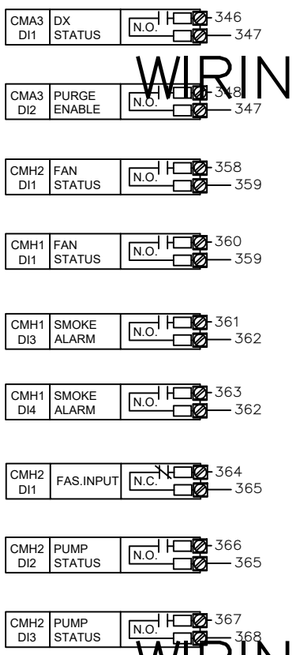
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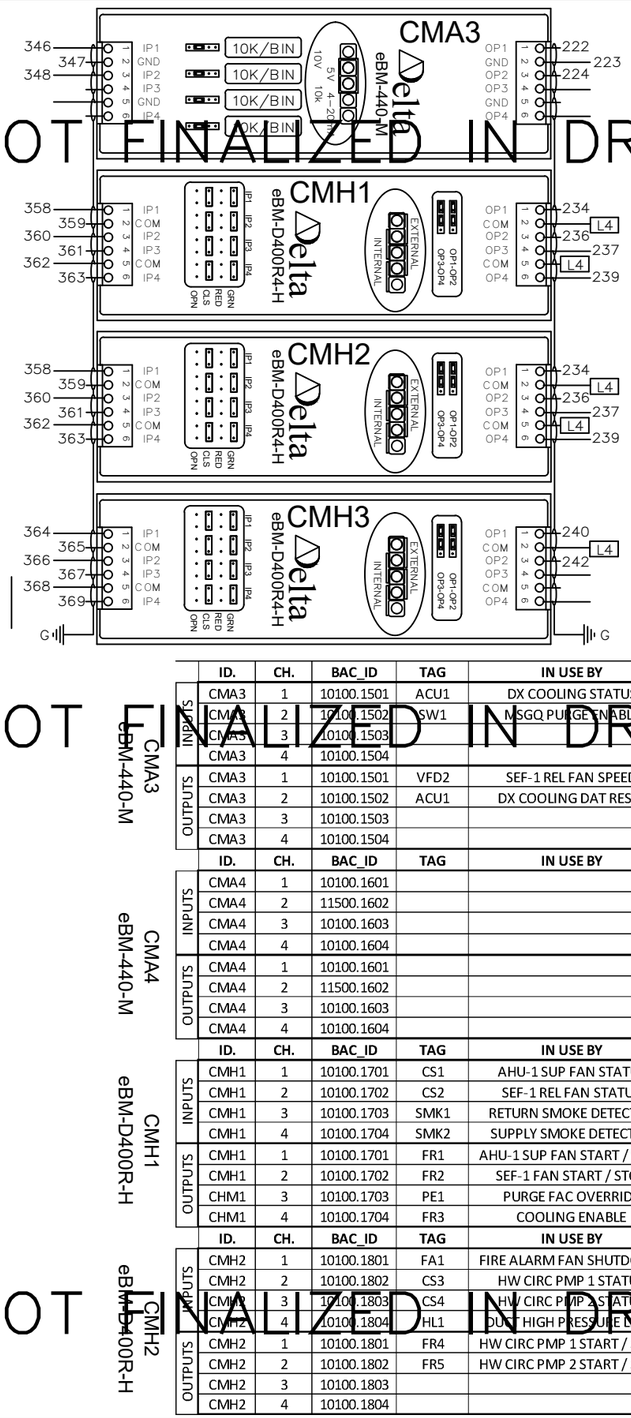
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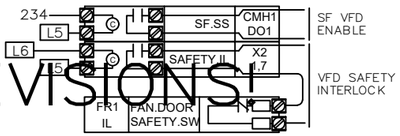
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SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	BOILER HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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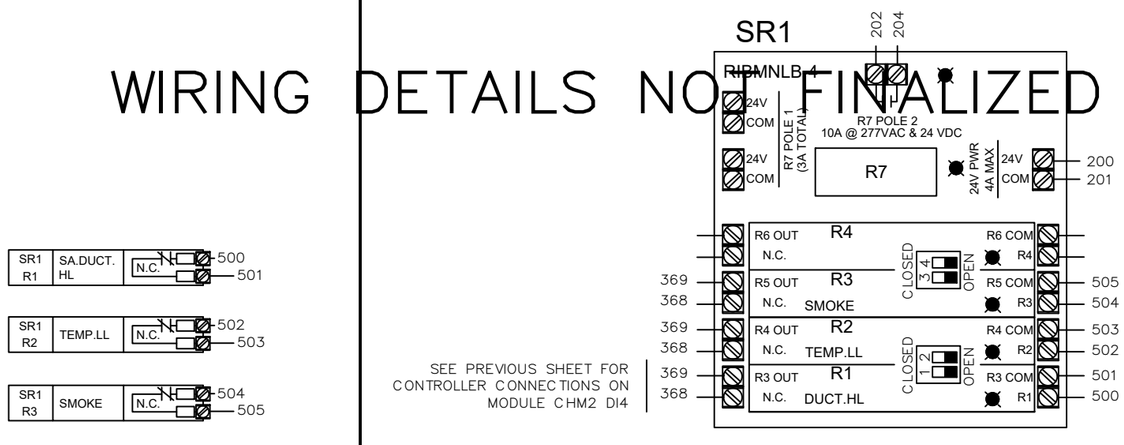
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CFP1
DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1
DFM-400P

NAT-AHU-2 SYSTEM 54 PANEL - I/O WIRING (3 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
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JOB NUMBER:
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SYSTEM 54 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL2

SND

ETS1

300 301 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

R7 POLE 3 10A @ 277VAC & 24 VDC

R7 POLE 1 (NO-COM-NC)

R4 OUT N.C.

R3 OUT N.C.

R2 OUT N.C.

R1 OUT N.C.

R4 R3 R2 R1

CLOSED LOOP

TX1

24V CB

Power

100 L2 L3

H C G

75VA 24VAC 24VAC

120 VAC LAPTOP PWR

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L3 L2

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 203 204 205

L4 L5 L6 L7

24 VAC TO FIELD

TB3

300 301

1 2

24 VDC TO FIELD

DPB1 DPB2

Power + GND / 4-20mA out - Voltage out 0

HIGH LOW

4 5 6 7

PNEUMATIC

7 6 5 4

eZNS-T100 SERIES ROOM SENSOR POWER & NETWORK WIRING

ST1

NET PWR

24 VAC

LINKNET (RS-485)

201 200

CEB1

PWR

USB2 USB1

(NOT USED)

GND 24V~

C8X1

eBMGR-2

eBX

eBUS Address

eBUS

eBM-800 eBM-800 eBM-440-M eBM-440-M eBM-D400R4-H

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

LINKNET (RS-485)

SEE RISER DIAGRAMS FOR LOCATION

NAT-AHU-2 SYSTEM 54 PANEL – POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

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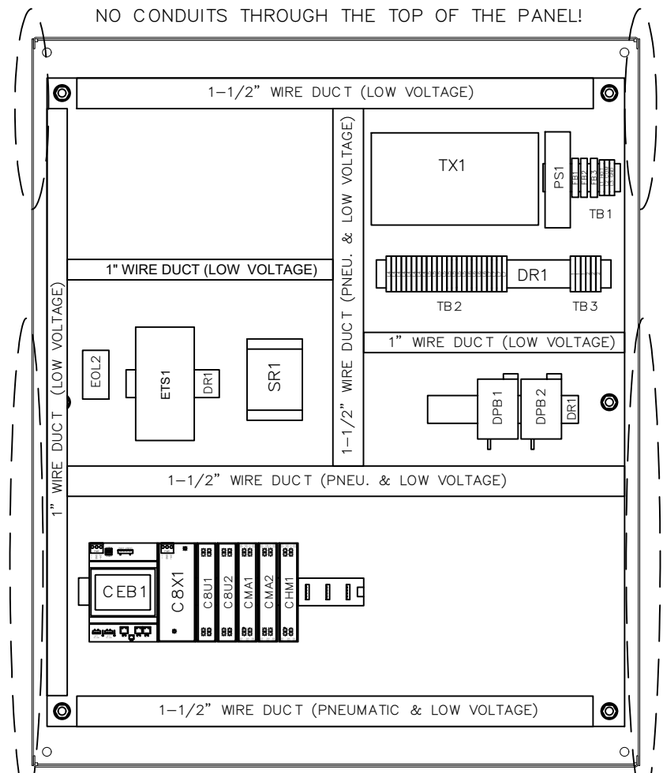
CONTRACT NO:

SHEET
NCHS-458
JOB NUMBER:
J-2304001

SYSTEM CONTROL PANEL 54 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!

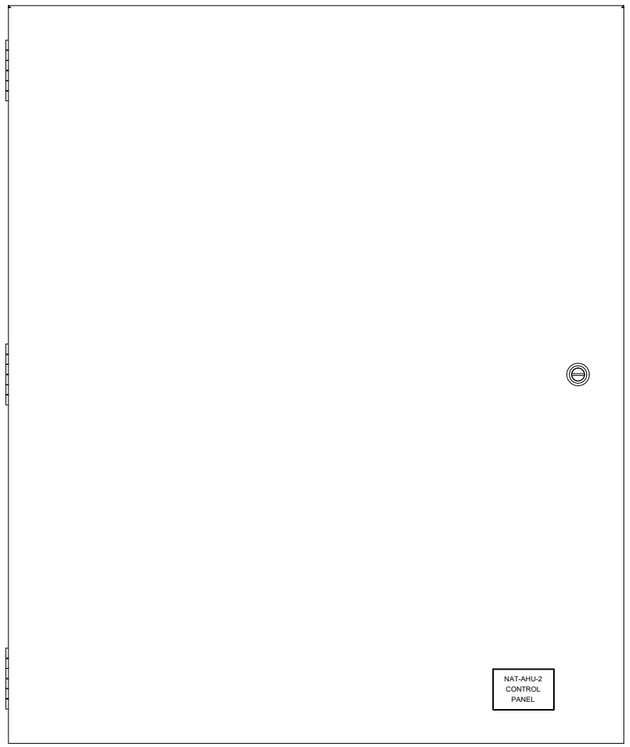


HIGH VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.



BILL OF MATERIALS

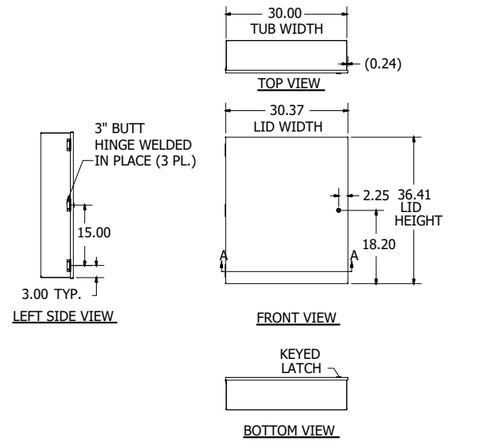
WILL BE PROVIDED IN A FUTURE REVISION. △

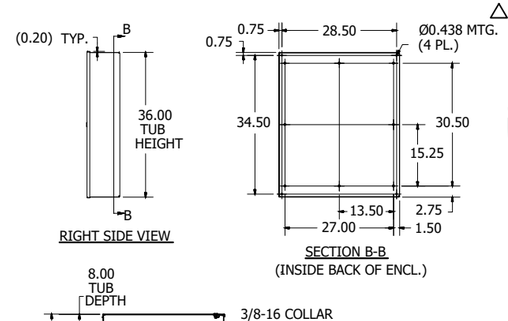
BILL OF MATERIALS

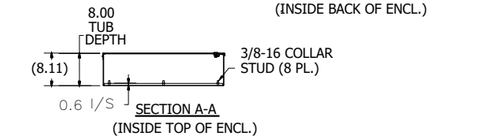
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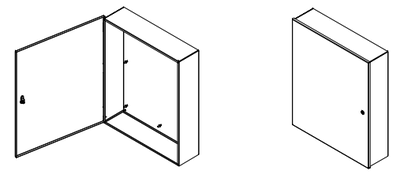
30" (W) x 36" (H) ENCLOSURE DIMENSIONS

(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)

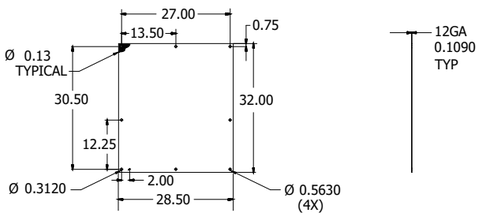








PANEL DIMENSIONS



NAT–AHU–2 SYSTEM 54 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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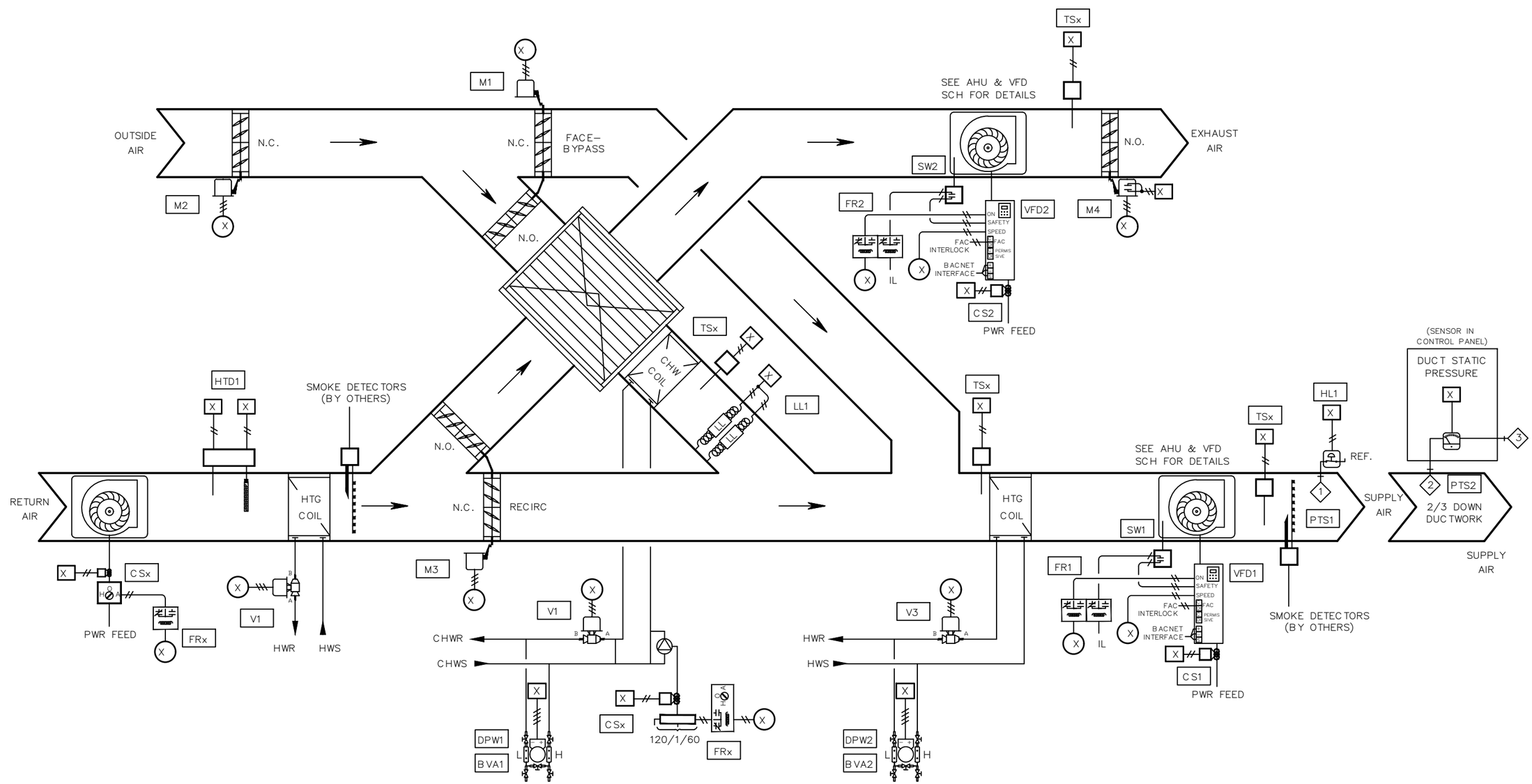
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NCHS–459
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J–2304001

NAT–AHU–3 FIELD DEVICES



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

NAT–AHU–3 FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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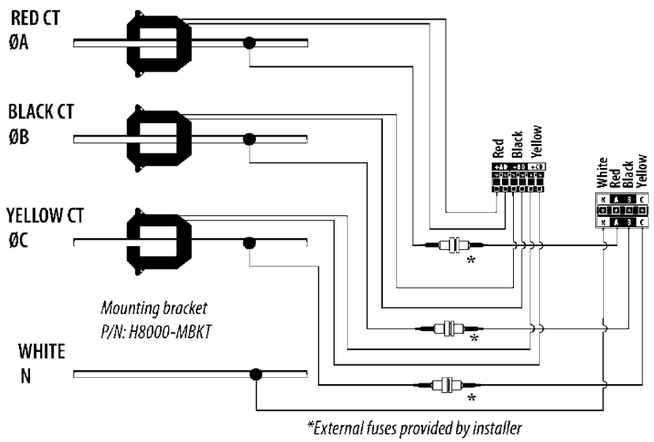
CONTRACT NO:

SHEET
NCHS–460
JOB NUMBER:
J–2304001

POWER METER HIGH VOLTAGE WIRING DETAIL

(FOR REFERENCE ONLY, WIRING EXISTING, NOT INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)

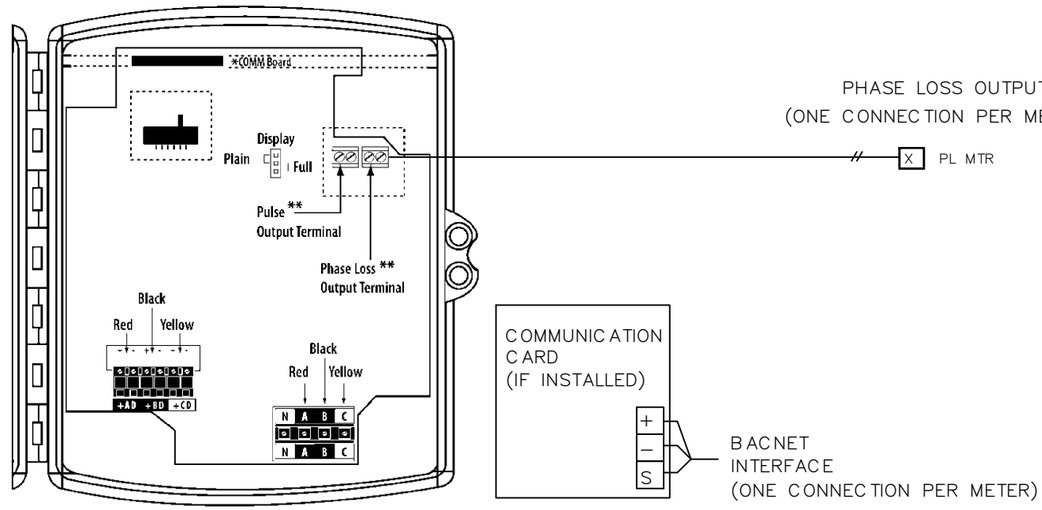
TYPICAL 208/480VAC, 4-WIRE, 3Ø INSTALLATION



(* PREVIOUS BAS DESIGN INDICATES VERIS AH04 TRIPLE FUSE KITS WERE INSTALLED)

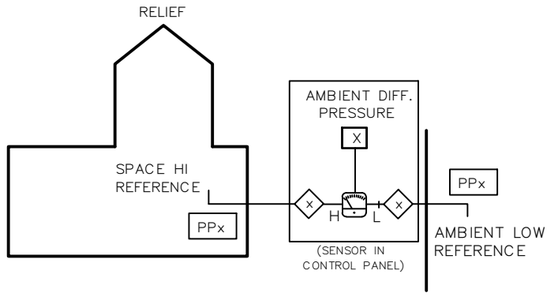
POWER METER LOW VOLTAGE WIRING DETAIL

(BACNET MS/TP COMMUNICATION AND PHASE LOSS MONITORING INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)

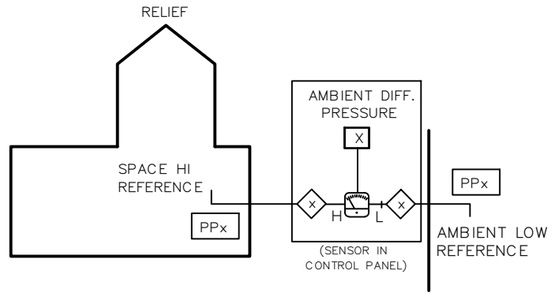


*COMM Board is Optional
**H8160 Series only

BUILDING PRESSURE MONITORING AREA SENSOR 1



BUILDING PRESSURE MONITORING AREA SENSOR 1



BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION.

NETWORK POINTS
N1 THROUGH Nx

AREA NATATORIUM PHASE LOSS MONITORING FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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SHEET
NCHS-461
JOB NUMBER:
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INPUT / OUTPUT POINT TABLE

		Hardware Points				
Point Name	Point Description	AI	BI	AO	BO	LinkNet
CCDAT	Cooling Coil Discharge Air Temp	X				
CW DP NAT-AHU-3	Chill Water Diff Pressure	X				
DAT	Discharge Air Temp	X				
DPB1	Building Static Pressure	X				
DPB2	Building Static Pressure	X				
DPD1	Duct Static Pressure	X				
EAT	Exhaust Air Temp	X				
HW DP NAT-AHU-3	Hot Water Diff Pressure	X				
HXT	Heat Exchanger Air Temp	X				
RAH	Return Air Humidity	X				
RAT	Return Air Temperature	X				
EF STAT	Exhaust Fan Status		X			
HL	High Duct Static Limit		X			
LL	Low Limit (Freezestat) (qty 2)		X			
PL MTR WGYM	Phase Loss Elec Meter West Gym		X			
PUMP STAT	HW Circ Pump Status		X			
RF STAT	Return Fan Status		X			
SD	Smoke Detectors (devices by others)		X			
SF STAT	Supply Fan Status		X			
CWV	Chill Water Valve			X		
EAD	Exhaust Air Damper			X		
EF VFD	Exhaust Fan VFD Speed			X		
FBP	Face & Bypass Damper			X		
HWV	Hot Water Valve			X		
OAD	Outside Air Damper			X		
PHV	Preheat Valve			X		
RECIRC DPR	Recirculation Air Damper			X		
SF VFD	Supply Fan VFD Speed			X		
EF SS	Exhaust Fan Start / Stop				X	
PUMP SS	HW Circ Pump Start / Stop				X	
RF SS	Return Fan Start / Stop				X	
SF SS	Supply Fan Start / Stop				X	
	POINT TOTALS:	**11**	**8**	**9**	**4**	**0**

SOFTWARE AND NETWORK (NON-PHYSICAL) POINTS
WILL BE DEFINED AND INCLUDED IN A FUTURE REVISION.

NAT-AHU-3 & MISC FIELD DEVICES POINT TABLE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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NATATORIUM AIR HANDLING UNIT 3 SEQUENCE OF OPERATION

TCC PROVIDED CONTROLLER SHALL BE INSTALLED, WIRED, AND CONNECTED TO EXISTING CONTROL CIRCUIT BY THE CONTROLS INSTALLATION CONTRACTOR. AHU-1 SHALL USE THE POOL SPACE (HIGH PRESSURE) AND CORRIDOR (NEGATIVE PRESSURE) AS THE REFERENCE STATIC PRESSURE POINTS FOR THE EXHAUST FAN TO MAINTAIN A NEGATIVE SPACE PRESSURE (ZN-SP) AS NOTED BELOW. TCC SHALL PROVIDE NEW PROGRAMMING AND CONTROL DEVICES TO MAINTAIN A FIXED DIFFERENTIAL BETWEEN POOL WATER TEMPERATURE AND SPECTATOR ADJUSTABLE ZONE TEMPERATURE. MINIMUM SPECTATOR TEMPERATURE SETPOINT SHALL BE 76 F AND MAXIMUM SHALL BE 80F (ADJ). TCC SHALL PROVIDE POOL WATER TEMPERATURE SENSOR FOR INSTALLATION BY THE CIC AND USE IN LOGIC WITHIN THE BUILDING AUTOMATION SYSTEM. CLASSROOM VAV CONTROLS SHALL BE REPLACED EXACTLY AS CURRENTLY IMPLEMENTED. SEE AS-BUILT TEMPERATURE CONTROL DRAWINGS FOR ADDITIONAL DETAILS. TCC SHALL REPLACE CONTROLS, VALVE ACTUATORS, DAMPER ACTUATORS, AND VFDS. REFERENCE OWNER PROVIDED AS-BUILT DRAWINGS FOR ADDITIONAL DETAILS AND REQUIREMENTS.

DDC SHALL HAVE ONE DIGITAL OUTPUT FOR LOCAL INDICATION OF AN ALARM CONDITION. (I.E. BLOWER CURRENT/DIFFERENTIAL PRESSURE SWITCH, DAMPER END SWITCHES, FREEZE STAT, FIRE STAT, SMOKE, DIRTY FILTERS…).

1. AIR HANDLING UNIT AHU-3 SHALL BE VARIABLE VOLUME SUPPLY AND CONSTANT AIR VOLUME EXHAUST..
2. PROVIDE LOW LIMIT PROTECTION, NUMBER AS REQUIRED ON THE DISCHARGE OF AHU CHILLED WATER COILS TO SHUT UNIT OFF UPON SENSING FREEZE CONDITIONS. PROVIDE STRAP ON SENSOR TO OVERRIDE CONTROL VALVE UPON SENSING 39F AT THE CHILLED WATER RETURN LINE
   OF THE COOLING COIL. LOW LIMIT PROTECTION ON THE DISCHARGE OF AHU CHILLED WATER COILS SHALL SHUT UNIT OFF UPON SENSING FREEZE CONDITIONS. IMMERSION SENSOR SHALL OVERRIDE CONTROL VALVE LOGIC UPON SENSING 39F (ADJ) AT THE CHILLED RETURN LINE OF
   THE COOLING COIL.
3. DIVISION 26 CONTRACTOR SHALL PROVIDE AND MOUNT DUCT DETECTORS IN THE SUPPLY AIR (SA) AND RETURN AIR (RA) DUCTS. CIC SHALL WIRE DETECTORS TO STOP THE SUPPLY FAN (SA) AND GENERATE A BAS ALARM.
4. EITHER OF THE ABOVE SAFETIES SHALL STOP THE FAN, CLOSE THE OUTSIDE AIR DAMPER, AND OPEN THE HEATING CONTROL VALVE WHEN IN ALARM.
5. FAN SHALL HAVE A DUCT STATIC PRESSURE HIGH LIMIT, LOCATED CLOSE TO THE FAN DISCHARGE TO PREVENT OVER-PRESSURIZING THE DUCT SYSTEM.
6. DAY MODE

A. SA COOLING:

1. COOLING SHALL BE LOCKED OUT WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 55F.
2. THE COOLING COIL PRESSURE INDEPENDENT CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN 55F AIR TEMPERATURE LEAVING THE COOLING COIL.

B. SA HEATING:

1. THE HEATING COIL PRESSURE INDEPENDENT CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN AHU DISCHARGE TEMPERATURE PER THE CRITICAL ZONE RESET SEQUENCE BELOW. THIS SIGNAL SHALL BE OVER-RIDDEN AS REQUIRED TO MAINTAIN HOT WATER COIL
   LEAVING WATER TEMPERATURE MINIMUM OF 55F, AS MEASURED BY THE TEMPERATURE TRANSMITTER.

C. DEFROST MODE (EA HEATING):

1. THE HEATING COIL CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN EXHAUST AIR TEMPERATURE ABOVE THE DEFROST SETPOINT OF 35F (ADJ).

D. BYPASS DAMPERS SHALL REMAIN FULLY CLOSED.

7. THE OUTSIDE AIR MAXIMUM AND MINIMUM SETTINGS SHALL BE SET PER ORIGINAL SYSTEM START-UP BY BALANCER.
8. DIRTY FILTER ALARM: EACH FILTER SECTION AT THE AIR HANDLING UNIT SHALL BE FITTED WITH A DIFFERENTIAL PRESSURE SENSOR AND TRANSMITTER WITH OUTPUTS MONITORED BY THE BUILDING AUTOMATION SYSTEM. UPON SENSING A HIGH LIMIT OF 0.5" WATER DIFFERENTIAL, THE CONTROLLER SHALL SIGNAL A DIRTY FILTER ALARM.
9. CRITICAL ZONE RESET

A. THE AHU DISCHARGE AIR TEMPERATURE SHALL BE RESET FROM 55F TO 68F (MAX), AS REQUIRED TO KEEP THE VAV TERMINAL UNIT PRIMARY AIR VALVE IN THE 100% OPEN POSITION AT THE MOST CRITICAL ZONE. THE MOST CRITICAL ZONE IS THAT ZONE WITH THE GREATEST CALL
   FOR COOLING.

B. WHEN THE CRITICAL ZONE SPACE TEMPERATURE RISES MORE THAN 2F ABOVE THE COOLING SETPOINT, THE AHU DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET DOWNWARD AS REQUIRED TO MAINTAIN THE CRITICAL ZONE SPACE TEMPERATURE AT SETPOINT.

C. CRITICAL ZONE RESET SHALL BE ALLOWED WHEN THE OUTSIDE AIR TEMPERATURE IS 50F (ADJ) AND BELOW.

10. NIGHT MODE:

A. THE OUTSIDE AIR DAMPER SHALL BE CLOSED. THE SUPPLY FAN, EXHAUST FAN, AND ENERGY WHEEL SHALL ALL BE OFF.

B. AVERAGE OF SPACE TEMPERATURES SHALL BE CALCULATED BY TCC AND SHALL START THE AHU IF THE AVERAGE TEMPERATURE FALL BELOW THE NOMINAL NIGHT SETBACK TEMPERATURE OF 60F (ADJ). THE AHU SHALL OPERATE AS DESCRIBED BELOW IN THE MORNING WARM-UP
   SECTION AND SHALL SHUT OFF WHEN THE NOMINAL OCCUPIED SETPOINT IS REACHED.

C. THE AHU SHALL OPERATE AS DESCRIBED ABOVE IN THE DAY MODE SECTION WHEN SPACE OVERRIDE BUTTONS ARE PUSHED AT THE SPACE THERMOSTATS. THE AHU SHALL RETURN TO NIGHT MODE 10 MINUTES (ADJ) AFTER SPACE OVERRIDE PERIOD ENDS.

11. MORNING WARM-UP:

A. THE SYSTEM SHALL ENTER MORNING WARM-UP MODE WHEN THE SYSTEM IS GOING FROM NIGHT UNOCCUPIED MODE TO DAY MODE AND THE OUTSIDE AIR TEMPERATURE IS BELOW 60F (ADJ).

B. THE AHU OUTSIDE AIR DAMPER SHALL REMAIN CLOSED THROUGHOUT THIS MODE OF OPERATION AND THE BYPASS DAMPER SHALL OPEN. THE EXHAUST FAN AND THE ENERGY WHEEL SHALL REMAIN OFF THROUGHOUT THIS MODE OF OPERATION.

C. THE AHU SUPPLY FAN SHALL INITIATE AND THE SUPPLY AIR HEATING COIL CONTROL VALVE SHALL FULLY OPEN.

D. THE EXHAUST AIR HEATING COIL CONTROL VALVE SHALL MODULATE AS REQUIRED TO PREVENT FROST FORMATION ON THE ENERGY WHEEL.

E. THE TERMINAL UNIT BOXES SHALL OPERATE AS DESCRIBED IN THE MORNING WARM-UP SECTION OF THE TERMINAL UNIT SEQUENCE OF OPERATION.

F. THE SYSTEM SHALL OPERATE IN THIS MODE UNTIL ALL SPACES ARE AT THE OCCUPIED TEMPERATURE SETPOINT. THE SYSTEM SHALL THEN ENTER DAY MODE OF OPERATION.

SAFETY: THE SUPPLY FAN WILL BE SHUTDOWN IF ANY OF THE FOLLOWING OCCUR:
-IF A TEMPERATURE LOW LIMIT (LT-ALM) SWITCH SENSES A TEMPERATURE BELOW 38F (ADJ). IF THREE TRIPS OCCUR WITHIN A 24-HOUR PERIOD, THE THIRD TRIP WILL RESULT IN SOFTWARE OPERATION LOCKOUT AND REQUIRE MANUAL RESET THROUGH GRAPHICS.

ELECTRICAL UTILITY POWER MONITORING:

TCC SHALL MONITOR FOR PHASE LOSS ON EXISTING TO REMAIN POWER METERS. TCC SHALL GENERATE AN ALARM UPON PHASE LOSS FOR MANUAL DECISION TO SHUTDOWN CHILLERS, AIR HANDLING UNITS, AND BOILERS.

Delta Controls
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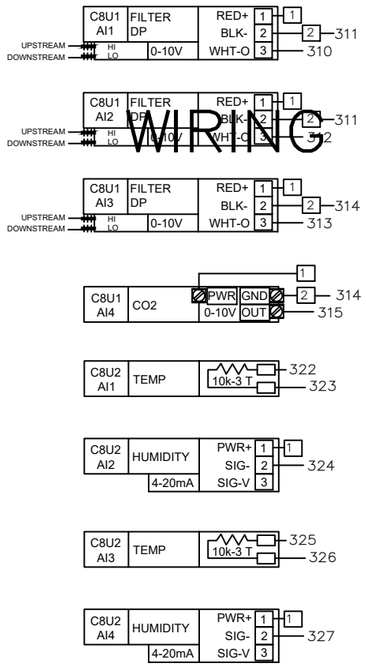
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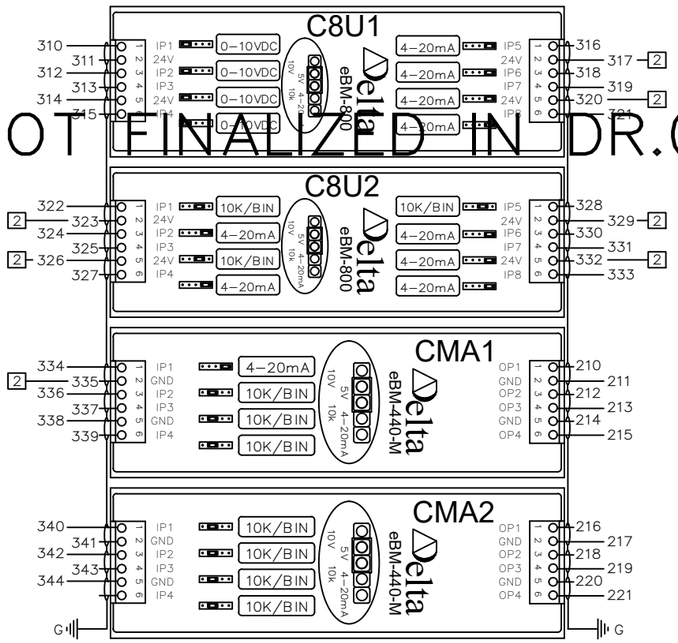
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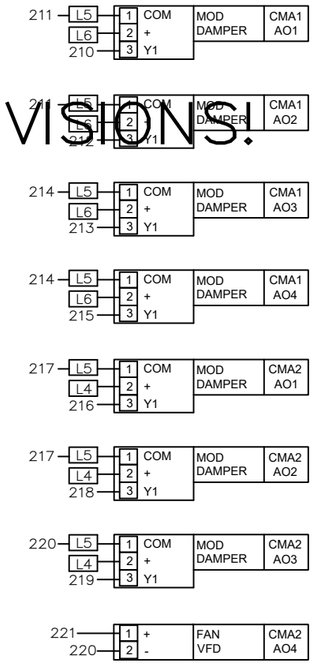
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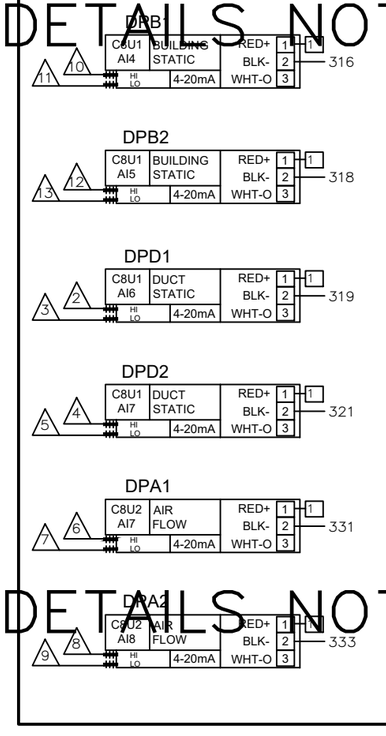
SHEET
NCHS–463
JOB NUMBER:
J–2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!









	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U1 eBM-800 INPUTS	C8U1	1	10100.1101	FLT1	FILTER DP 01	EBO
	C8U1	2	10100.1102	FLT2	FILTER DP 02	EBO
	C8U1	3	10100.1103	FLT3	FILTER DP 03	EBO
	C8U1	4	10100.1104	CO21	CO2 SENSOR	2510
	C8U1	5	10100.1105	DPB1	LEVEL 1 DP SENSOR	2201
	C8U1	6	10100.1106	DPB2	LEVEL 2 DP SENSOR	2201
	C8U1	7	10100.1107	DPD1	LVL 1 SA DUCT STATIC PRESS	2200
	C8U1	8	10100.1108	DPD2	LVL 2 SA DUCT STATIC PRESS	2200

C8U1 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
C8U2 eBM-800 INPUTS	C8U2	1	10100.1201	HTD1	OUTSIDE AIR TEMP	2101
	C8U2	2	10100.1202	HTD1	OUTSIDE AIR HUMIDITY	2101
	C8U2	3	10100.1203	HTD2	RETURN AIR TEMP	2101
	C8U2	4	10100.1204	HTD2	RETURN AIR HUMIDITY	2101
	C8U2	5	10100.1205	HTD4	DISCHARGE AIR TEMP	2101
	C8U2	6	10100.1206	HTD4	DISCHARGE AIR HUMIDITY	2101
	C8U2	7	10100.1207	DPA1	OUTSIDE AIR FLOW	2201
	C8U2	8	10100.1208	DPA2	SUPPLY AIR FLOW	2201

C8U2 eBM-800 — eBM-800 I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA1 eBM-440-M INPUTS	CMA1	1	10100.1301	HTD3	MIXED AIR HUMIDITY	2101
	CMA1	2	10100.1302	TS1	MIXED AIR TEMP	2001
	CMA1	3	10100.1303	TS2	AHU-1 COOLING COIL DAT	2002
	CMA1	4	10100.1304	FS1	DISCH AIRFLOW SWITCH	1301
CMA1 eBM-440-M OUTPUTS	CMA1	1	10100.1301	M1	OUTSIDE AIR DAMPER	4206
	CMA1	2	10100.1302	M2	RETURN AIR DAMPER	4206
	CMA1	3	10100.1303	M3	1ST FL RETURN AIR DAMPER	4206
	CMA1	4	10100.1304	M4	2ND FL RETURN AIR DAMPER	4206

CMA1 eBM-440-M — eBM-440-M I/O MODULE

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CMA2 eBM-440-M INPUTS	CMA2	1	10100.1401	TS3	LOW TEMP DHW TEMP	2003
	CMA2	2	10100.1402	TS4	HIGH TEMP DHW TEMP	2003
	CMA2	3	10100.1403	SEP1	SEWAGE EJECTOR PUMP ALM	EBO
	CMA2	4	10100.1404			
CMA2 eBM-440-M OUTPUTS	CMA2	1	10100.1401	M5	1ST FL EXH AIR DAMPER	4204
	CMA2	2	10100.1402	M6	2ND FL EXH AIR DAMPER 1	4208
	CMA2	3	10100.1403	M7	2ND FL EXH AIR DAMPER 2	4208
	CMA2	4	10100.1404	VFD1	AHU-1 SUP FAN SPEED	EBO

CMA2 eBM-440-M — eBM-440-M I/O MODULE

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

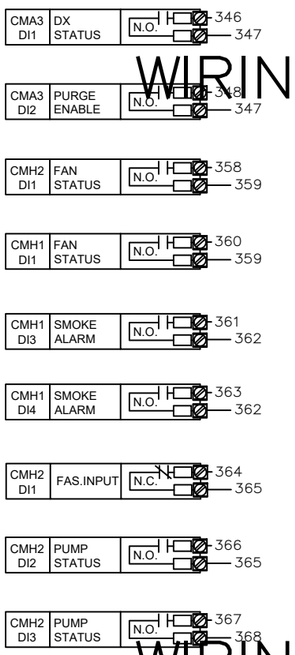
REVISIONS	
DATE	REMARKS

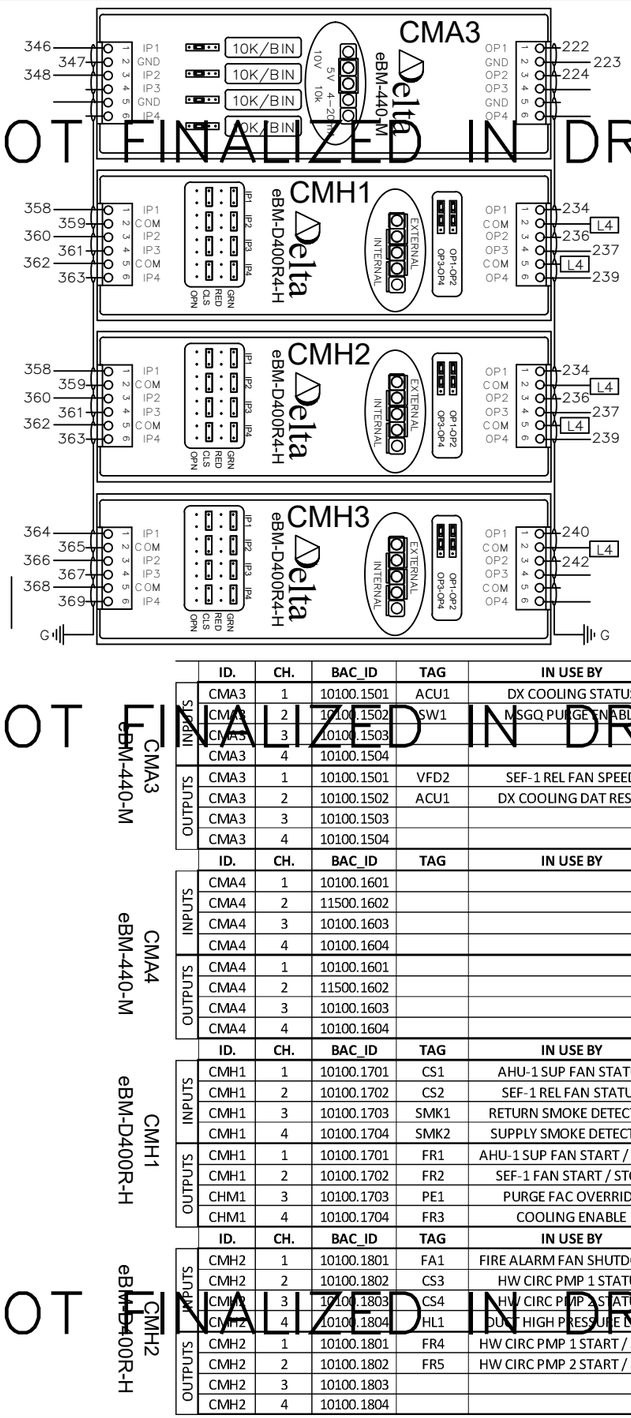
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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

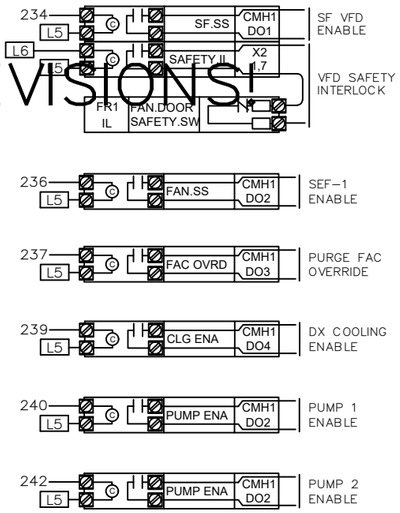
SHEET
NCHS-464
JOB NUMBER:
J-2304001

WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!





SEE FOLLOWING SHEET FOR CONTROLLER CONNECTIONS ON RELAY SR1–R1



	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA3	1	10100.1501	ACU1	DX COOLING STATUS	EBO	eBM-440-M I/O MODULE
	CMA3	2	10100.1502	SW1	MSGQ PURGE ENABLE	1806	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				
OUTPUTS	CMA3	1	10100.1501	VFD2	SEF-1 REL FAN SPEED	EBO	
	CMA3	2	10100.1502	ACU1	DX COOLING DAT RESET	EBO	
	CMA3	3	10100.1503				
	CMA3	4	10100.1504				

CMA3 eBM-440-M — CMA3 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMA4	1	10100.1601				eBM-440-M I/O MODULE
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				
OUTPUTS	CMA4	1	10100.1601				
	CMA4	2	11500.1602				
	CMA4	3	10100.1603				
	CMA4	4	10100.1604				

CMA4 eBM-440-M — CMA4 eBM-440-M

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH1	1	10100.1701	CS1	AHU-1 SUP FAN STATUS	1400	eBM-D400R4-H I/O MOD
	CMH1	2	10100.1702	CS2	SEF-1 REL FAN STATUS	1400	
	CMH1	3	10100.1703	SMK1	RETURN SMOKE DETECTOR	EBO	
	CMH1	4	10100.1704	SMK2	SUPPLY SMOKE DETECTOR	EBO	
OUTPUTS	CMH1	1	10100.1701	FR1	AHU-1 SUP FAN START / STOP	3002	
	CMH1	2	10100.1702	FR2	SEF-1 FAN START / STOP	3001	
	CHM1	3	10100.1703	PE1	PURGE FAC OVERRIDE	EBO	
	CHM1	4	10100.1704	FR3	COOLING ENABLE	3001	

CMH1 eBM-D400R-H — CMH1 eBM-D400R-H

	ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET	
INPUTS	CMH2	1	10100.1801	FA1	FIRE ALARM FAN SHUTDOWN	EBO	eBM-D400R4-H I/O MOD
	CMH2	2	10100.1802	CS3	HW CIRC PMP 1 STATUS	1400	
	CMH2	3	10100.1803	CS4	HW CIRC PMP 2 STATUS	1400	
	CMH2	4	10100.1804	HL1	OUT HIGH PRESSURE LIMIT	1200	
OUTPUTS	CMH2	1	10100.1801	FR4	HW CIRC PMP 1 START / STOP	3001	
	CMH2	2	10100.1802	FR5	HW CIRC PMP 2 START / STOP	3001	
	CMH2	3	10100.1803				
	CMH2	4	10100.1804				

CMH2 eBM-D400R-H — CMH2 eBM-D400R-H

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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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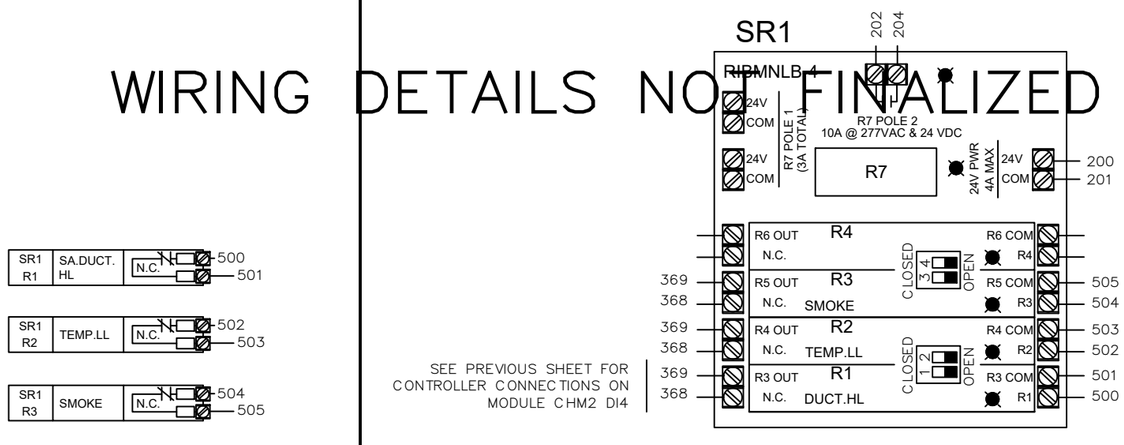
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SHEET
NCHS–465
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WIRING DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

CFP1
DFM-400P

INPUTS - DFM-400-P

ID.	CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
CFP1	1	10101.DI01	DWM1	LOW TEMP HW FLOW	EBO
CFP1	2	10101.DI02	DWM2	HIGH TEMP HW FLOW	EBO
CFP1	3	10101.DI03	DWM3	DOMESTIC WTR FLOW	EBO
CFP1	4	10101.DI04			

CFP1
DFM-400P

NAT–AHU–3 SYSTEM 55 PANEL – I/O WIRING (3 OF 3)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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SYSTEM 55 CONTROL PANEL

PANEL _____
CIRCUIT _____

CAT-6a OR BETTER COMMUNICATION CABLE TO BUILDING ETHERNET NETWORK DROP
SEE RISER SHEET FOR TERMINATION LOCATION

2-CONDUCTOR SHIELDED BACNET COMMUNICATION CABLE TO BUILDING MS/TP DEVICES
SEE RISER SHEET FOR TERMINATION LOCATION

MS/TP

CAT-6a

EOL1

EOL2

CDZ1

DZNR-768

MS/TP SEGMENT 1 | MS/TP SEGMENT 2 | MS/TP SEGMENT 3 | MS/TP SEGMENT 4

POWER 24~ GND

MS/TP SEG1 Err Tx Rx C

MS/TP SEG2 Err Tx Rx C

MS/TP SEG3 Err Tx Rx C

MS/TP SEG4 Err Tx Rx C

GND L3 200 201

TO SYSTEM 01 SUBNET, LEG 02

TO SYSTEM 01 SUBNET, LEG 03

TO SYSTEM 01 SUBNET, LEG 04

ETS1

301 300 L3

V1- V1+

ETHERNET SWITCH

1 3 5 2 4

CAT5e

SR1

RIBMNLB-4

202 204

200 201

24V COM POWER 44 MAX

R7 POLE 2 10A @ 277VAC & 24 VDC

R7 POLE 1 (NORMALLY OPEN)

R4 OUT N.C. R4 R4 COM R4

R3 OUT N.C. R3 R3 COM R3

R2 OUT N.C. R2 R2 COM R2

R1 OUT N.C. R1 R1 COM R1

CLOSED OPEN

TX1

24V CB Power

100 L2 L3

H C G

120 VAC LAPTOP PWR

5VA 24VAC 24VAC

200 201 CONTROLLER PWR

202 203 FIELD DEV POWER

24 VDC PWR

PWR SUPPLY

+V -V GND L N

300 301 101 L2 L3

PS1

1.0A 101

5.0A 100

G

PANEL GND LUG

TB1

L1 L2 L3 H N 120 VAC

TB2

202 L4 L4 L4

203 L5 L5 L5

204 L6 L6 L6

205 L7 L7 L7

24 VAC TO FIELD

TB3

300 1 1 1

301 2 2 2

24 VDC TO FIELD

DPD1 DPB1 DPB2

Power + - O

GND / 4-20mA out - Voltage out O

HIGH LOW

PNEUMATIC

1 2 3 4 5 6 7

CEB1

C8X1

201 200

PWR GND 24~

USB2 USB1 (NOT USED)

NET1 RS-485 NET2 RS-485 + - SHD

LAN 1 LAN 2 LAN

Delta eBMGR-2

Delta eBX

eBUS Address

eBUS

eBM-800 eBM-800 eBM-440-M eBM-440-M eBM-D400R4-H

OPD1 OPD2 OPD3 OPD4 HAO

I/O SHIELD DRAIN

L3

TO PANEL GND LUG

MS/TP

SEE RISER DIAGRAMS FOR LOCATION

NAT-AHU-3 SYSTEM 55 PANEL - POWER & NETWORK WIRING

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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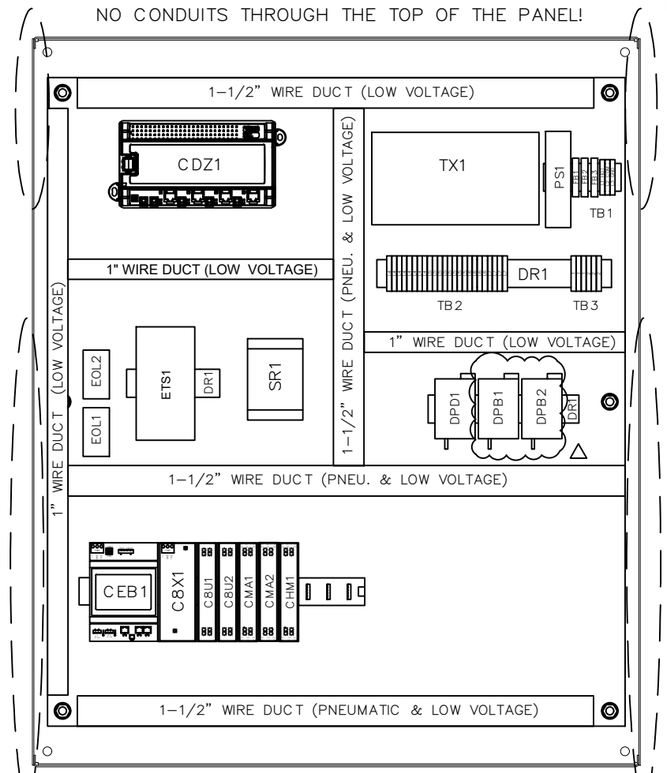
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J-2304001

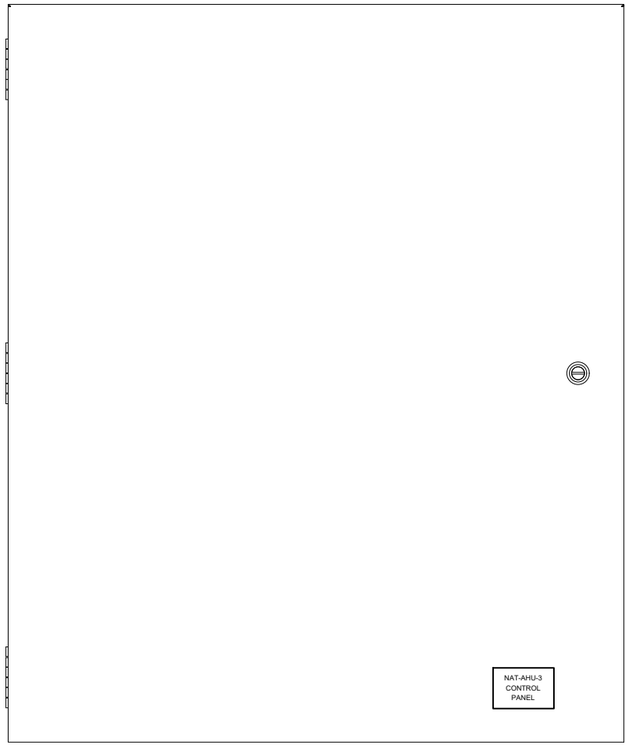
SYSTEM CONTROL PANEL 55 LAYOUT

NETWORK CABLES ENTER IN THIS AREA

NO CONDUITS THROUGH THE TOP OF THE PANEL!



HIGH VOLTAGE FEEDS ENTER IN THIS AREA



PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

PNEUMATIC AND LOW VOLTAGE FEEDS ENTER IN THIS AREA

* REUSE EXISTING ENCLOSURES AND CONDUIT TO THE EXTENT POSSIBLE. NEW BACKPLATES WITH NEW CONTROL COMPONENTS WILL BE PROVIDED.

BILL OF MATERIALS

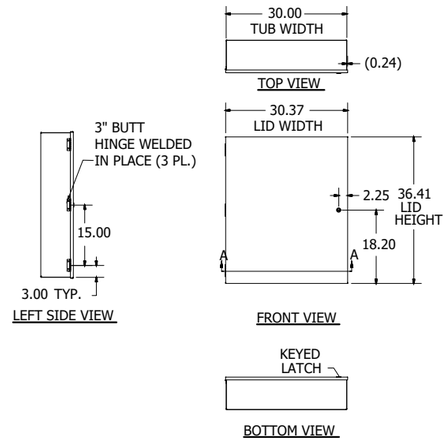
WILL BE PROVIDED IN A FUTURE REVISION. △

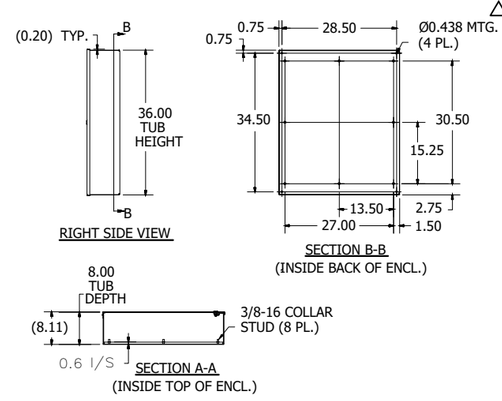
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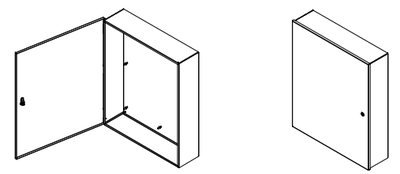
WILL BE PROVIDED IN A FUTURE REVISION. △

30" (W) x 36" (H) ENCLOSURE DIMENSIONS

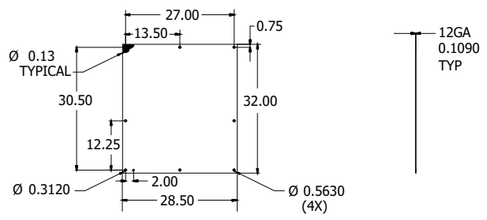
(DIMENSIONS APPROXIMATE FOR EXISTING ENCLOSURES)







PANEL DIMENSIONS



NAT–AHU–1 SYSTEM 55 PANEL – DIMENSIONS & BOM

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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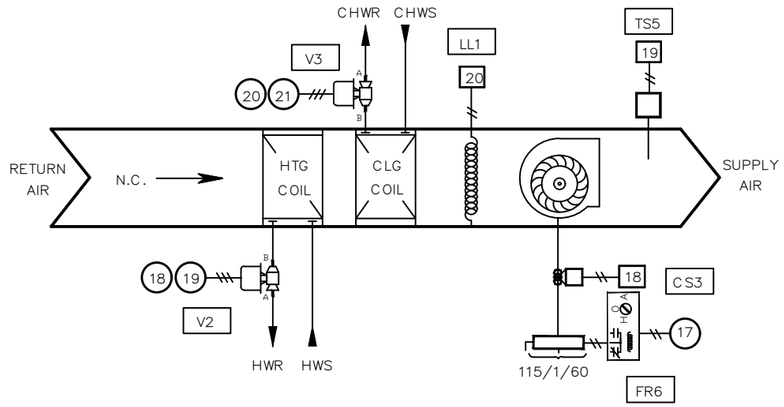
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FAN COIL UNIT FIELD DEVICES
(TYPICAL FOR 5 FCUs)



eZNS–T100 SERIES ROOM SENSOR (LINKNET)
(ST, SH, CO2, OCCUPIED)



FAN COIL UNIT SCHEDULE

IDENTITY DATA			FAN DATA				HEATING DATA			ELECTRICAL DATA					NOTES
MARK	MANUF	MODEL	CFM	SPEED	GPM	FLUID TYPE	TOTAL HEATING (BTUH)	GPM	FLUID TYPE	VOLTS (V)	PH	FREQ (HZ)	FLA (A)	MOCP (A)	
FCU-A1	TRANE	FCCB030	200	HIGH	1.3	WATER	4,840	0.5	WATER	115	1	60	2.8	15.0	
FCU-A2	TRANE	FCCB030	200	HIGH	1.3	WATER	4,840	0.5	WATER	115	1	60	2.8	15.0	
FCU-C1	TRANE	FCCB060	450	HIGH	2.8	WATER	9,900	0.7	WATER	115	1	60	3.9	15.0	
FCU-C2	TRANE	FCCB060	450	HIGH	2.8	WATER	9,900	0.7	WATER	115	1	60	3.9	15.0	
FCU-G1	TRANE	FCHB030	200	HIGH	1.3	WATER	4,840	0.5	WATER	115	1	60	2.8	15.0	

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

FAN COIL UNIT (FCU) FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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INPUTS

INPUTS - EZFCP-424R4-24

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
1	1**xx.AI01	CS1	FAN STATUS	1400
2	1**xx.DI02			
3	1**xx.AI03	TS1	CCDAT	2002
4	1**xx.AI04	TS2	DISCHARGE AIR TEMP	2008
5	1**xx.AI05	WD1	WATER DETECTOR	1804
6	1**xx.AI06			

OUTPUTS

OUTPUTS - EZFCP-424R4-24

CH.	BAC_ID	TAG	IN USE BY	DATASHEET
1	1**xx.D001	V1	HWV OPEN	3203/3222
2	1**xx.D002	V1	HWV CLOSE	3203/3222
3	1**xx.D003	V2	CWV OPEN	3222
4	1**xx.D004	V2	CWV CLOSE	3222
5	1**xx.A005			
6	1**xx.A006			
7	1**xx.D007	C1	FAN START / STOP	123
8	1**xx.D008			
9	1**xx.D009			
10	1**xx.D010			

NETWORK POINTS

LINKNET NETWORK POINTS - eZNS-T100

CH.	BAC_ID	TAG	IN USE BY	DATASHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	115
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	115
LN3	1**xx.LN3	ST1	SPACE CO2	115
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	115

NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	SUPPLY FAN ALARM
N2	1**xx.LN2	LOW DAT ALARM
N3	1**xx.LN3	HIGH DAT ALARM
N4	1**xx.LN4	ZONE HTG CALL
N5	1**xx.LN5	ZONE CLG CALL
N6	1**xx.LN6	OCCUPIED OVERRIDE
N7	1**xx.LN7	HW AVAILABLE
N8	1**xx.LN8	CW AVAILABLE
N9	1**xx.LN9	SAFETY TRIP
N10	1**xx.LN10	OCCUPIED
N11	1**xx.LN11	

DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

FAN COIL UNIT WITH REHEAT SEQUENCE OF OPERATION

TCC SHALL PROVIDE CONTROLS AND DEVICES SPECIFIED AND CIC SHALL INSTALL AND PROVIDE ALL CONTROL AND POWER WIRING.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

ZONE CONTROL: THE COOLING VALVE (CLG-VLV) AND HEATING VALVE (HTG-VLV) WILL MODULATE IN SEQUENCE TO MAINTAIN THE ZONE TEMPERATURE (ZN-T) AT SETPOINT OF 74F (ADJ) COOLING AND 70F (ADJ) HEATING.

ZONE HUMIDITY CONTROL: IF THE SPACE HUMIDITY (ZN-H) RISES ABOVE 60% RH (ADJ) AND IF CHILLED AND HOT WATER IS AVAILABLE, THE COOLING VALVE (CLG-VLV) SHALL FULLY OPEN AND HEATING VALVE (HTG-VLV) WILL MODULATE IN SEQUENCE TO MAINTAIN THE ZONE SPACE TEMPERATURE AT SETPOINT. WHEN THE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE HOT AND CHILLED WATER CONTROL VALVES SHALL RETURN TO NORMAL OPERATION.

NIGHT SETBACK/NIGHT SETUP: WHEN IN "UNOCCUPIED" MODE, THE UNIT WILL CYCLE AS NECESSARY TO MAINTAIN THE NIGHT SETBACK ZONE TEMPERATURE AT SETPOINT WITHIN 60F AND 85F(ADJ). A DIFFERENTIAL PREVENTS THE UNIT FROM CYCLING EXCESSIVELY.

SHUTDOWN:
GENERATE AN ALARM AND SHUTDOWN OPERATION OF THE UNIT IN THE EVENT OF CONDENSATE SWITCH ALARM (COND-SW).
WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS:

- SUPPLY FAN WILL BE OFF
- COOLING VALVE WILL CLOSE
- HEATING VALVE WILL MODULATE TO MAINTAIN THE DISCHARGE SENSOR AT 60F (ADJ)

POINTS LIST: THE POINTS LIST REPRESENTS THE MINIMUM POINTS TO BE PROVIDED AND DISPLAYED IN THE SYSTEM GRAPHICS. ADDITIONAL POINTS REQUIRED TO MEET THE SEQUENCE SHALL BE PROVIDED AND ALSO SHOWN.

DETAILS NOT FINALIZED IN DR.0 PRINT REVISIONS!

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Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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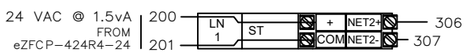
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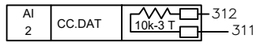
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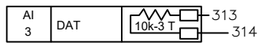
FAN COIL UNIT CONTROLS

(TYPICAL FOR 5)

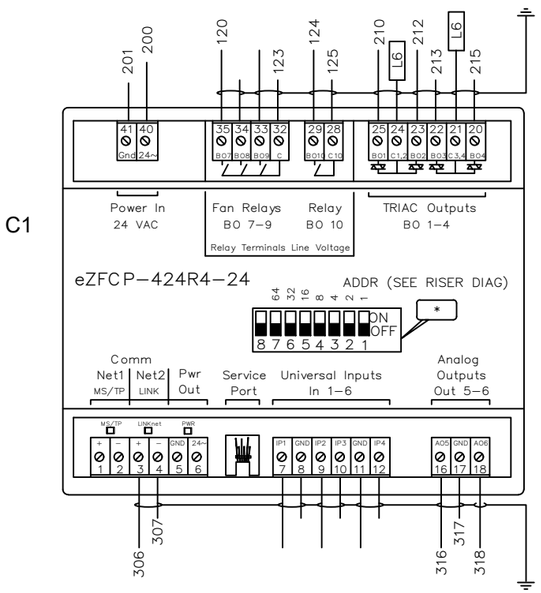




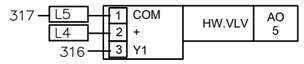




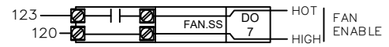
C1

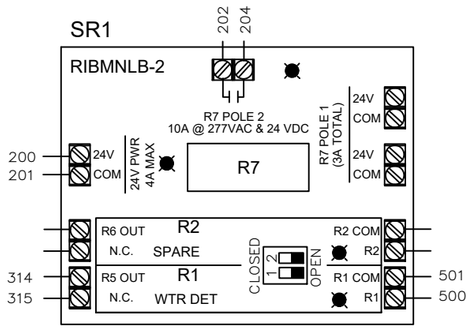


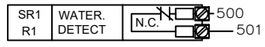
IN	NAME
1	FAN_STATUS
2	
3	CC_DAT
4	DAT
5	WTR_DETECTOR
6	
OUT	**NAME**
1	
2	
3	
4	
5	HWV
6	CWV
7	FAN_SS
8	
9	
10	











FAN COIL UNIT WITH RETURN AIR ONLY CONTROL PANEL – I/O WIRING

Delta Controls

Temperature Control Services

4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

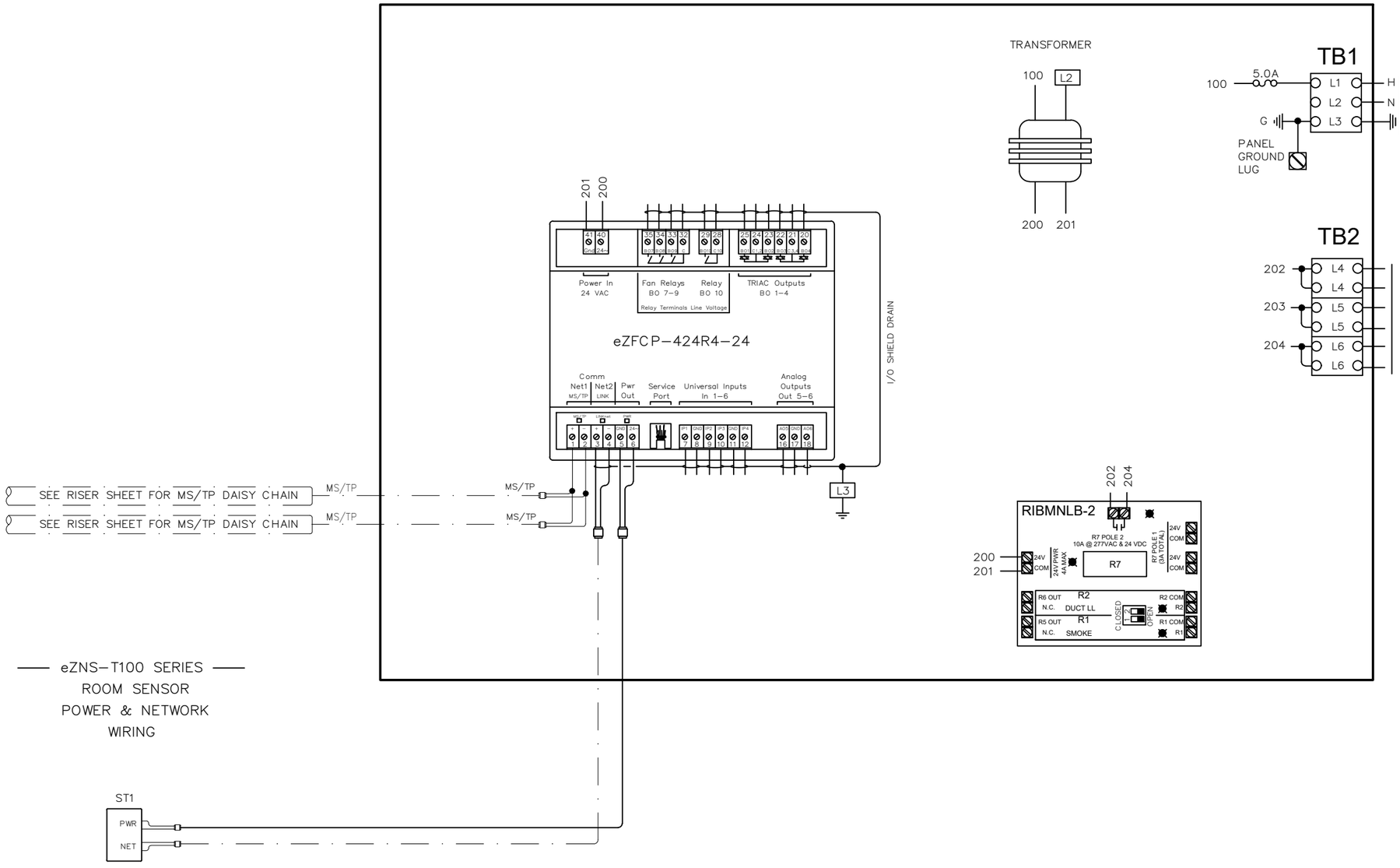
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-471
JOB NUMBER:
J-2304001

FCU W/ RETURN AIR – APPLICATION CONTROL PANEL

(TYPICAL FOR 5 PANELS)



FAN COIL UNIT, HYDRONIC WITH RETURN AIR ONLY CONTROL PANEL – POWER & NETWORK WIRING

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

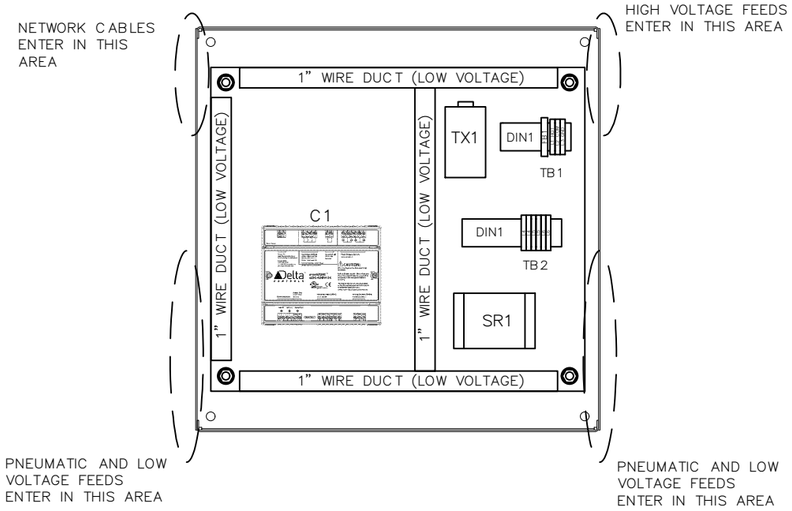
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

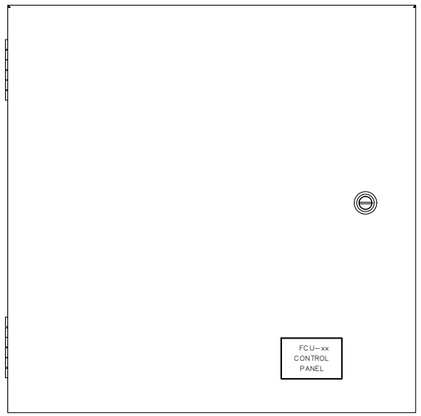
CONTRACT NO:

SHEET
NCHS–472
JOB NUMBER:
J–2304001

APPLICATION CONTROL PANEL LAYOUT
(TYPICAL FOR 5 PANELS)

NO CONDUITS THROUGH THE TOP OF THE PANEL!





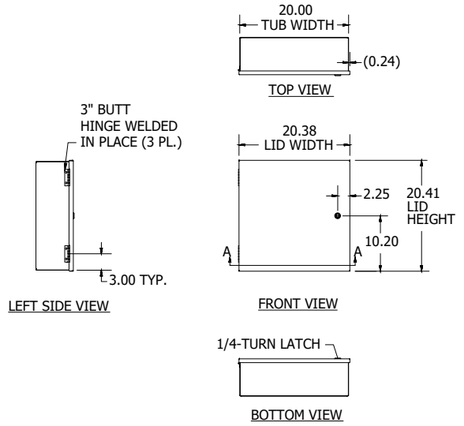
BILL OF MATERIALS

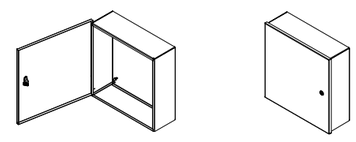
WILL BE PROVIDED IN A FUTURE REVISION. △

BILL OF MATERIALS

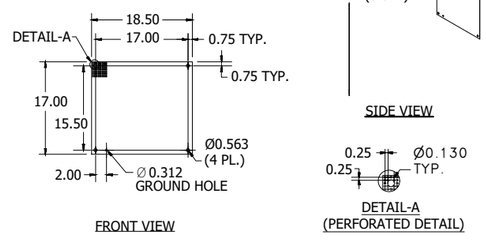
WILL BE PROVIDED IN A FUTURE REVISION. △

20" (W) x 20" (H) ENCLOSURE DIMENSIONS





PANEL DIMENSIONS



Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3 △
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-473
JOB NUMBER:
J-2304001

VARIABLE AIR VOLUME BOX DETAIL 'A' FIELD DEVICES & CONTROLS

(TYPICAL FOR 417)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 417)



NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02	ST2	IDF/MDF/ELEC ROOM TEMP	2004
3	1**xx.AI03			
4	1**xx.DI04			

OUTPUTS

OUTPUTS - eZV-440

CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002			
3	1**xx.D003			
4	1**xx.A004			

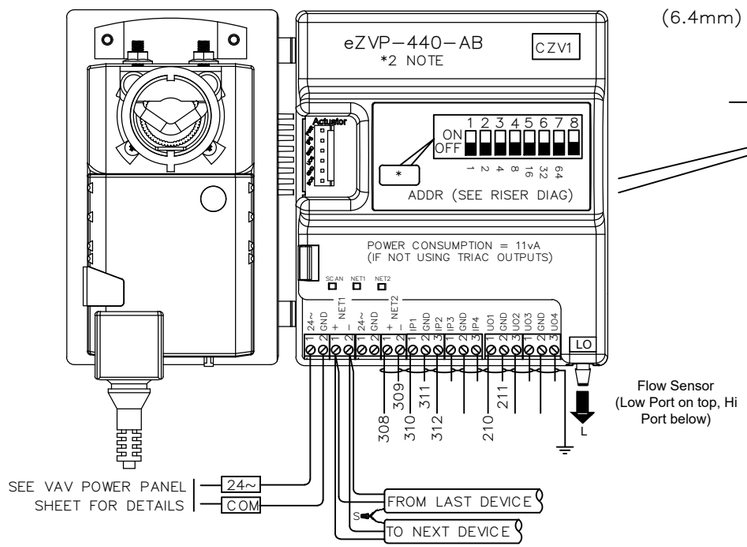
PNEUMATIC

PNEUMATIC

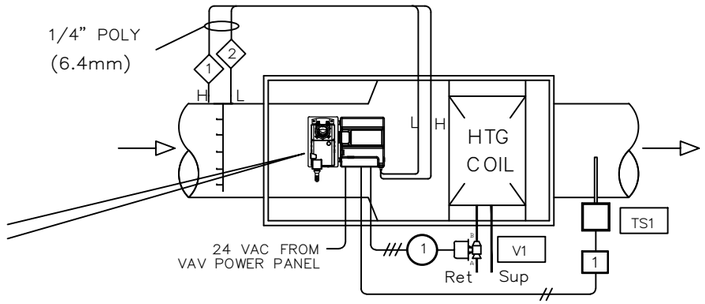
LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)

BACNet ADDRESS NOTES:
** – NUMBERS ARE DERIVED FROM THE SYSTEM CONTROLLER ADDRESS THAT THIS MS/TP DEVICE IS SUBORDINATE TO.
xx – NUMBERS ARE DERIVED FROM THE DIP SWITCH ADDRESS ON THE VAV CONTROLLER. VAV CONTROLLERS ON EACH MS/TP LEG MUST HAVE UNIQUE DIP SWITCH BACNet (MAC) ADDRESSES!

NOTES:
*1 – POINT NOT INSTALLED ON ALL CONTROLLERS. SEE VAV SCHEDULE FOR SPECIFIC REQUIREMENTS.
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.

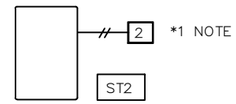


Flow Sensor (Low Port on top, Hi Port below)

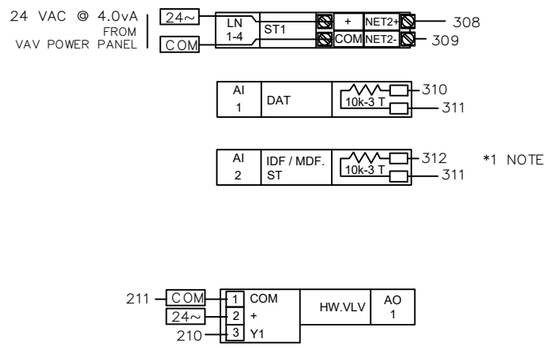


IDF / MDF / ELEC ROOM SPACE TEMPERATURE

(TYPICAL FOR 19)



*1 NOTE



BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
CZV1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	417	Delta Controls	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	417	Delta Controls	Field
ST2	BA/10K-3-SP	400006	BA/10K-3-SP Wall Plate Temp Sensor, Plain, Stainless Steel, Single Gang	19	BAPI	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	417	BAPI	Field
V1	RH Valve	See Schedule	See Valve Sch for Details	417	Belimo	Field

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–474
JOB NUMBER:
J–2304001

VARIABLE AIR VOLUME BOX DETAIL 'B' FIELD DEVICES & CONTROLS

(TYPICAL FOR 64)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 64)



NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02	ST2	IDF/MDF/ELEC ROOM TEMP	2004
3	1**xx.AI03	ST4	CONVECTOR ST	2004
4	1**xx.DI04	ST3	IDF/MDF/ELEC ROOM TEMP	2004

OUTPUTS

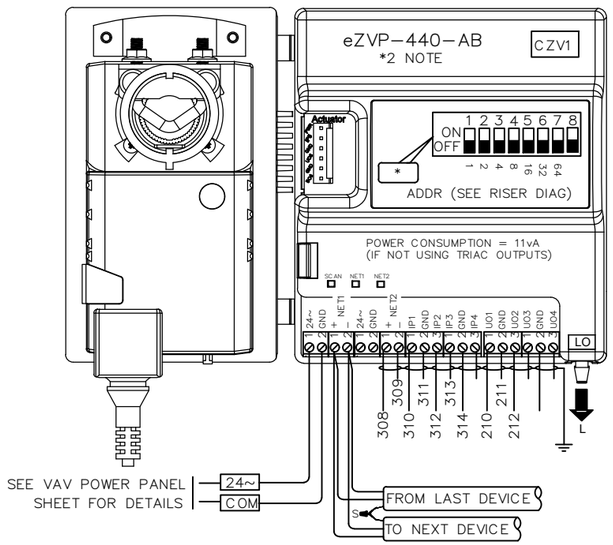
OUTPUTS - eZV-440

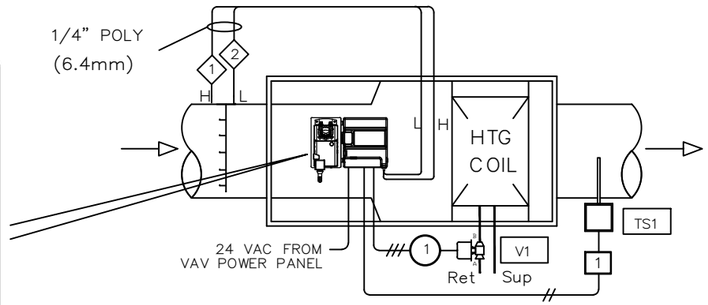
CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002	V2	CONVECTOR HWV	4305
3	1**xx.D003			
4	1**xx.A004			

PNEUMATIC

PNEUMATIC

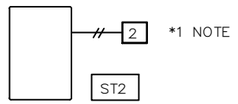
LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)



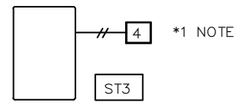


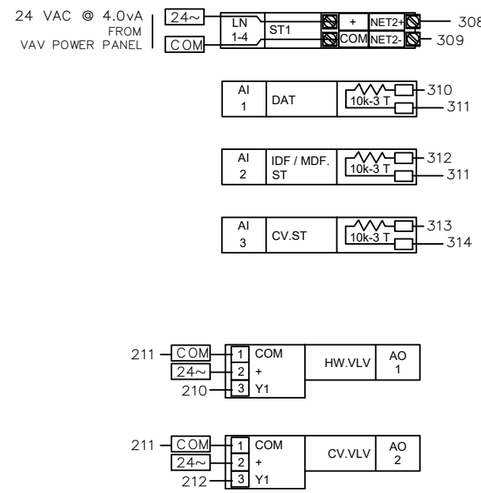
Flow Sensor (Low Port on top, Hi Port below)

IDF / MDF / ELEC ROOM SPACE TEMPERATURE (TYPICAL FOR 6)



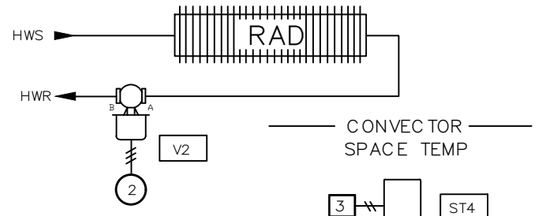
STORAGE ROOM F106 SPACE TEMPERATURE (TYPICAL FOR 1)





CONVECTOR CV–X

(TYPICAL FOR 64)



CONVECTOR SPACE TEMP

BACNet ADDRESS NOTES:
** – NUMBERS ARE DERIVED FROM THE SYSTEM CONTROLLER ADDRESS THAT THIS MS/TP DEVICE IS SUBORDINATE TO.
xx – NUMBERS ARE DERIVED FROM THE DIP SWITCH ADDRESS ON THE VAV CONTROLLER. VAV CONTROLLERS ON EACH MS/TP LEG MUST HAVE UNIQUE DIP SWITCH BACNet (MAC) ADDRESSES!

NOTES:
*1 – POINT NOT INSTALLED ON ALL CONTROLLERS. SEE VAV SCHEDULE FOR SPECIFIC REQUIREMENTS.
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.

BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
CZV1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	64	Delta Controls	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	64	Delta Controls	Field
ST2-4	BA/10K-3-SP	400006	BA/10K-3-SP Wall Plate Temp Sensor, Plain, Stainless Steel, Single Gang	71	BAPI	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	64	BAPI	Field
V1-2	RH Valve	See Schedule	See Valve Sch for Details	128	Belimo	Field

VAV DETAIL 'B' FIELD DEVICES AND CONTROLS

Delta CONTROLS

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–475
JOB NUMBER:
J–2304001

VARIABLE AIR VOLUME BOX DETAIL 'C' FIELD DEVICES & CONTROLS

(TYPICAL FOR 16)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 16)



NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02	ST2	IDF/MDF/ELEC ROOM TEMP	2004
3	1**xx.AI03			
4	1**xx.DI04			

OUTPUTS

OUTPUTS - eZV-440

CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002	FR1	CUH ENABLE	3001
3	1**xx.D003			
4	1**xx.A004			

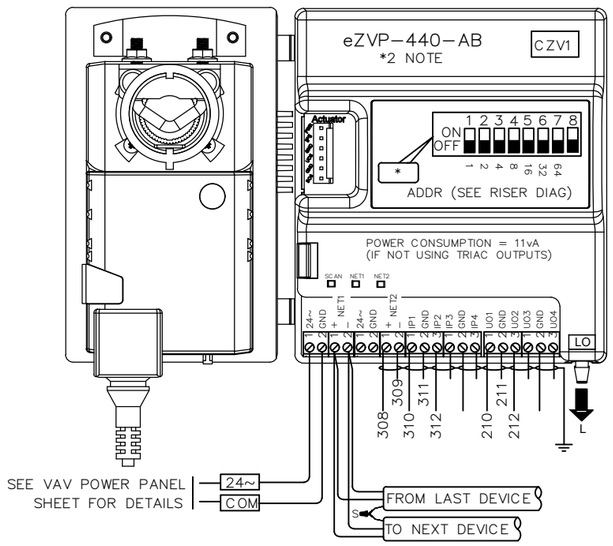
PNEUMATIC

PNEUMATIC

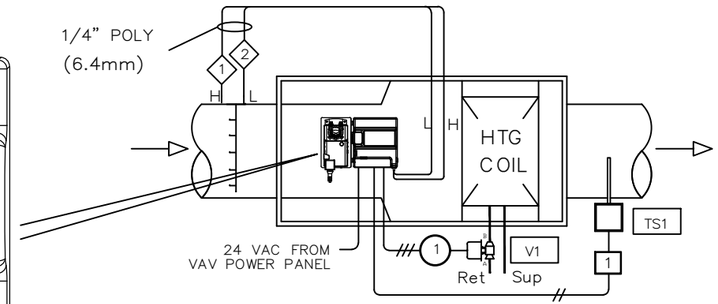
LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)

BACNet ADDRESS NOTES:
** – NUMBERS ARE DERIVED FROM THE SYSTEM CONTROLLER ADDRESS THAT THIS MS/TP DEVICE IS SUBORDINATE TO.
xx – NUMBERS ARE DERIVED FROM THE DIP SWITCH ADDRESS ON THE VAV CONTROLLER. VAV CONTROLLERS ON EACH MS/TP LEG MUST HAVE UNIQUE DIP SWITCH BACNet (MAC) ADDRESSES!

NOTES:
*1 – POINT NOT INSTALLED ON ALL CONTROLLERS. SEE VAV SCHEDULE FOR SPECIFIC REQUIREMENTS.
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.

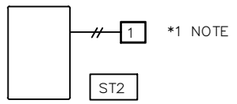


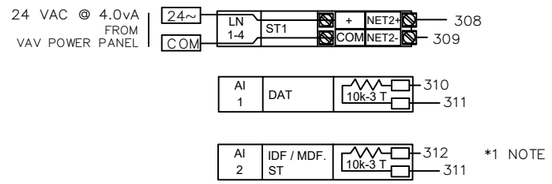
Flow Sensor
(Low Port on top, Hi Port below)

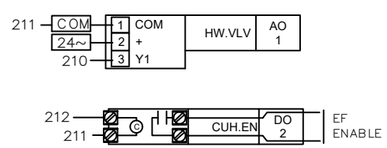


IDF / MDF / ELEC ROOM SPACE TEMPERATURE

(TYPICAL FOR 1)

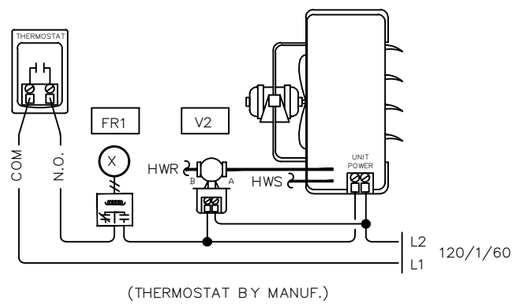






CABINET UNIT HEATER CUH–X

(TYPICAL FOR 16)



(THERMOSTAT BY MANUF.)

BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
CZV1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	16	Delta Controls	Field
FR1	RIBU1C	403455	RIBU1C Enclosed Pilot Relay 10 Amp SPDT with 10-30 Vac/dc/120 Vac Coil	16	Functional Devices	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	16	Delta Controls	Field
ST2	BA/10K-3-SP	400006	BA/10K-3-SP Wall Plate Temp Sensor, Plain, Stainless Steel, Single Gang	1	BAPI	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	16	BAPI	Field
V1	RH Valve	See Schedule	See Valve Sch for Details	16	Belimo	Field
V2	HW Valve	See Schedule	See Valve Sch for Details	16	Belimo	Field

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–476
JOB NUMBER:
J–2304001

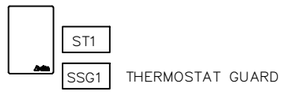
VARIABLE AIR VOLUME BOX DETAIL 'D' FIELD DEVICES & CONTROLS

(TYPICAL FOR 1)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 1)



NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02	OCC1	OCCUPANCY (ETR)	ETR
3	1**xx.AI03			
4	1**xx.DI04			

OUTPUTS

OUTPUTS - eZV-440

CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002			
3	1**xx.D003			
4	1**xx.A004			

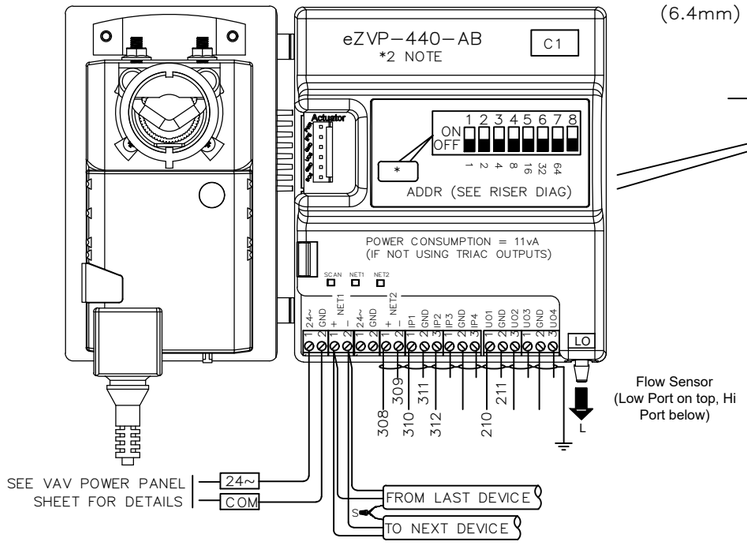
PNEUMATIC

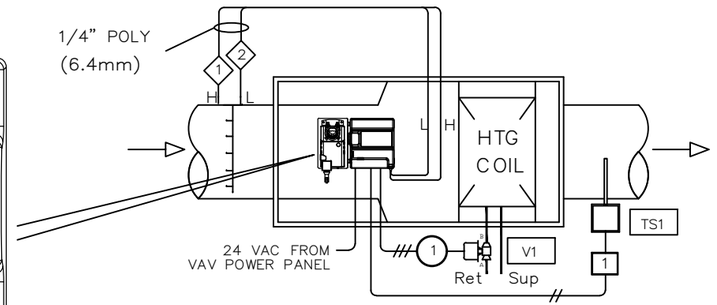
PNEUMATIC

LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)

BACNet ADDRESS NOTES:
** – NUMBERS ARE DERIVED FROM THE SYSTEM CONTROLLER ADDRESS THAT THIS MS/TP DEVICE IS SUBORDINATE TO.
xx – NUMBERS ARE DERIVED FROM THE DIP SWITCH ADDRESS ON THE VAV CONTROLLER. VAV CONTROLLERS ON EACH MS/TP LEG MUST HAVE UNIQUE DIP SWITCH BACNet (MAC) ADDRESSES!

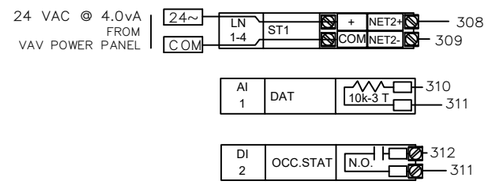
NOTES:
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.

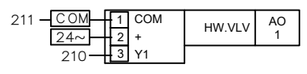




Flow Sensor
(Low Port on top, Hi Port below)







BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
C1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	1	Delta Controls	Field
OS1	Occ Sensor (ETR)	N/A	Occupancy Sensor (ETR)	1	ETR	Field
SSG1	BA/BG	400602	BA/BG Larger BAPI-Guard Thermostat Protector	1	BAPI	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	1	Delta Controls	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	1	BAPI	Field
V1	RH Valve	See Schedule	See Valve Sch for Details	1	Belimo	Field

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–477
JOB NUMBER:
J–2304001

VARIABLE AIR VOLUME BOX DETAIL 'E' FIELD DEVICES & CONTROLS

(TYPICAL FOR 9)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 9)



THERMOSTAT GUARD

NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02	CS1	EF-3-1 STAT	1400
3	1**xx.AI03			
4	1**xx.DI04			

OUTPUTS

OUTPUTS - eZV-440

CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002			
3	1**xx.D003			
4	1**xx.A004			

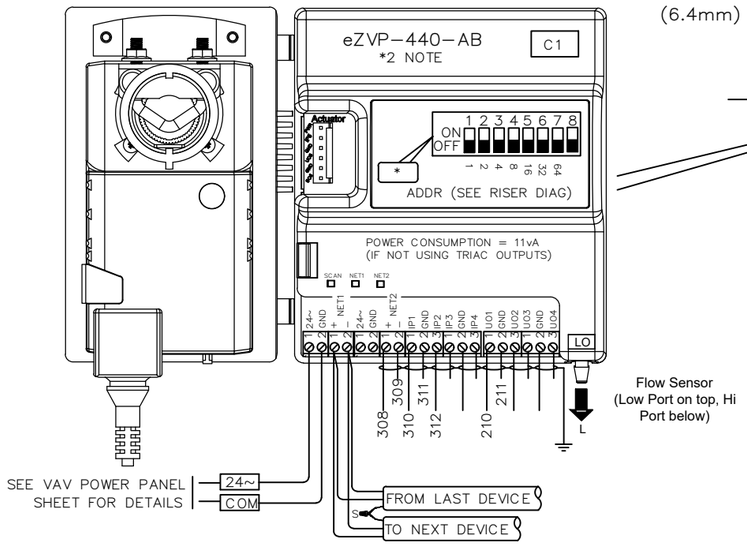
PNEUMATIC

PNEUMATIC

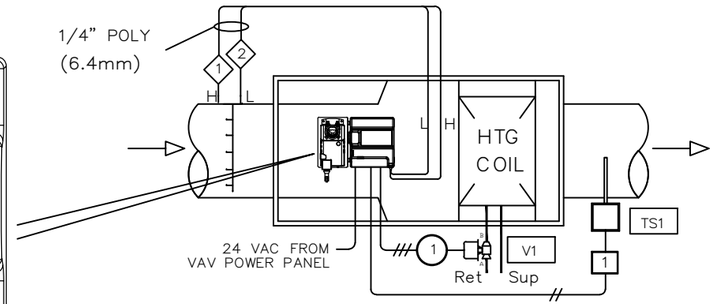
LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)

BACNet ADDRESS NOTES:
** – NUMBERS ARE DERIVED FROM THE SYSTEM CONTROLLER ADDRESS THAT THIS MS/TP DEVICE IS SUBORDINATE TO.
xx – NUMBERS ARE DERIVED FROM THE DIP SWITCH ADDRESS ON THE VAV CONTROLLER. VAV CONTROLLERS ON EACH MS/TP LEG MUST HAVE UNIQUE DIP SWITCH BACNet (MAC) ADDRESSES!

NOTES:
*1 – POINT NOT INSTALLED ON ALL CONTROLLERS. SEE VAV SCHEDULE FOR SPECIFIC REQUIREMENTS.
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.

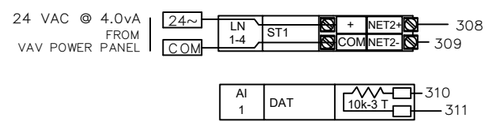


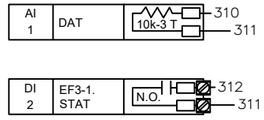
Flow Sensor (Low Port on top, Hi Port below)

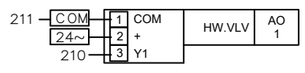


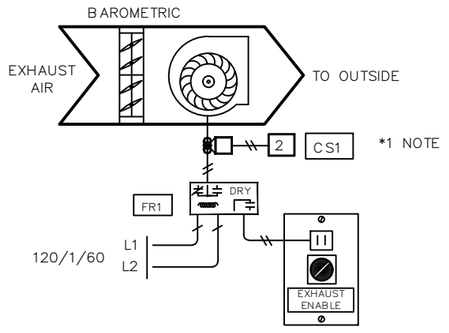
EXHAUST FAN – TOGGLE SWITCH CTRL WITH BAS MONITORING – EF 3–1

(TYPICAL FOR 1, NOT ON SCHEDULE, ETR EQUIPMENT FROM PREVIOUS SYSTEM)
(REPLACE RELAY AND CURRENT SENSOR AS SHOWN)









(DRY CONTACT SWITCH!)
(EXISTING TO REMAIN)

BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
C1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	9	Delta Controls	Field
CS1	RIBXKTA	403501	RIBXKTA Solid Core, Adjustable Current Switch, 0.50-150 Amp, Terminal	1	Functional Devices	Field
FR1	RIB21CDC	403264	RIB21CDC Enclosed Relay 10 Amp SPDT, Class 2 Dry Contact Input, 120-277 Vac Power Input	1	Functional Devices	Field
SSG1	BA/BG	400602	BA/BG Larger BAPI-Guard Thermostat Protector	9	BAPI	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	9	Delta Controls	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	9	BAPI	Field
V1	RH Valve	See Schedule	See Valve Sch for Details	9	Belimo	Field

Delta CONTROLS
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
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UPDATES	
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04/20/2023	ADD 5.3
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CONTRACT NO:

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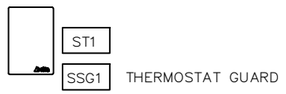
VARIABLE AIR VOLUME BOX DETAIL 'F' FIELD DEVICES & CONTROLS

(TYPICAL FOR 1)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 1)



THERMOSTAT GUARD

NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02			
3	1**xx.AI03			
4	1**xx.DI04			

OUTPUTS

OUTPUTS - eZV-440

CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002			
3	1**xx.D003			
4	1**xx.A004			

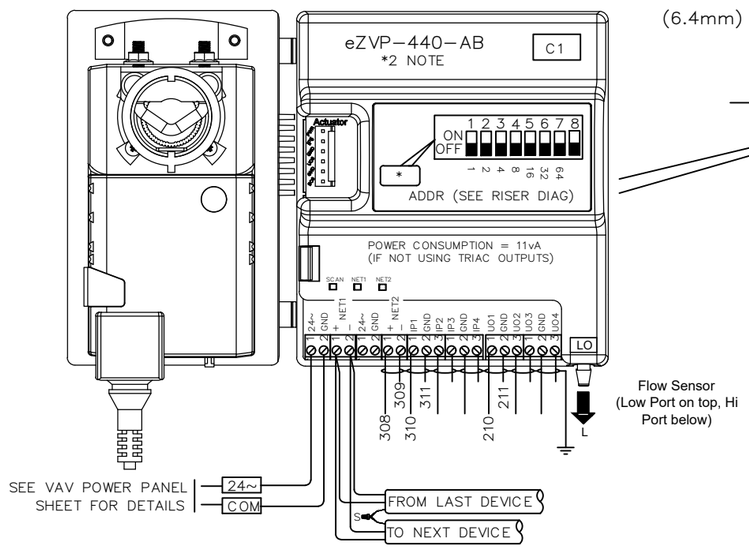
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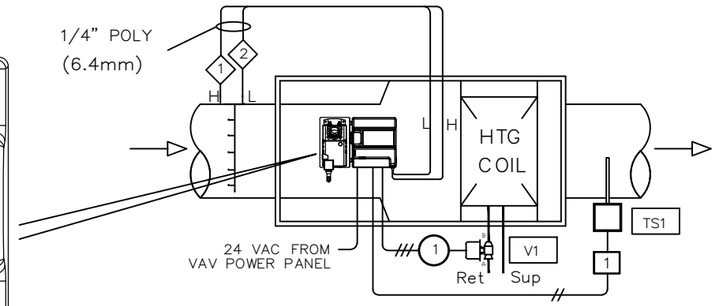
PNEUMATIC

LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)

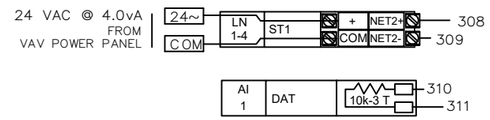
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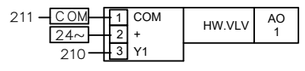
NOTES:
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.





Flow Sensor
(Low Port on top, Hi Port below)





BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
C1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	1	Delta Controls	Field
SSG1	BA/BG	400602	BA/BG Larger BAPI-Guard Thermostat Protector	1	BAPI	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	1	Delta Controls	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	1	BAPI	Field
V1	RH Valve	See Schedule	See Valve Sch for Details	1	Belimo	Field

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
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04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–479
JOB NUMBER:
J–2304001

VARIABLE AIR VOLUME BOX DETAIL 'G' FIELD DEVICES & CONTROLS

(TYPICAL FOR 8)

eZNS–T100 SERIES ROOM SENSOR (LINKNET)

(ST, SH, CO2, OCCUPIED)

(TYPICAL FOR 8)



NETWORK POINTS

NETWORK POINTS

CH.	BAC_ID	IN USE BY
N1	1**xx.LN1	AIRFLOW SETPOINT
N2	1**xx.LN2	COOLING SETPOINT
N3	1**xx.LN3	DAT HEATING SETPOINT LIMIT
N4	1**xx.LN4	HEATING SETPOINT
N5	1**xx.LN5	HEATING MODE
N6	1**xx.LN6	UNOCCUPIED HEATING STPT
N7	1**xx.LN7	UNOCCUPIED COOLING STPT
N8	1**xx.LN8	UNOCCUPIED LOW LIMIT
N9	1**xx.LN9	HIGH DAT ALARM
N10	1**xx.LN10	HIGH ZONE TEMP ALARM
N11	1**xx.LN11	LOW DAT ALARM
N12	1**xx.LN12	LOW ZONE TEMP ALARM
N13	1**xx.LN13	OCCUPIED

NETWORK POINTS

LINKNET NETWORK POINTS - DNS-24L

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
LN1	1**xx.LN1	ST1	SPACE TEMP SENSOR	132
LN2	1**xx.LN2	ST1	SPACE HUMIDITY	132
LN3	1**xx.LN3	ST1	SPACE CO2	132
LN4	1**xx.LN4	ST1	OCCUPANCY STATUS	132

INPUTS

INPUTS - eZV-440

CH.	BAC_ID	TAG	IN USE BY	DATA SHEET
AF	1**xx.AF	C1	AIRFLOW SENSOR	128
1	1**xx.AI01	TS1	DISCHARGE AIR TEMP	2002
2	1**xx.AI02			
3	1**xx.AI03			
4	1**xx.DI04			

OUTPUTS

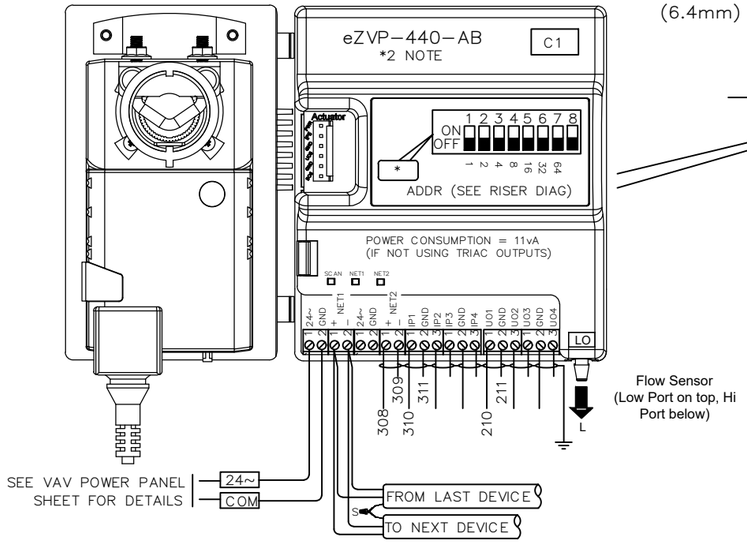
OUTPUTS - eZV-440

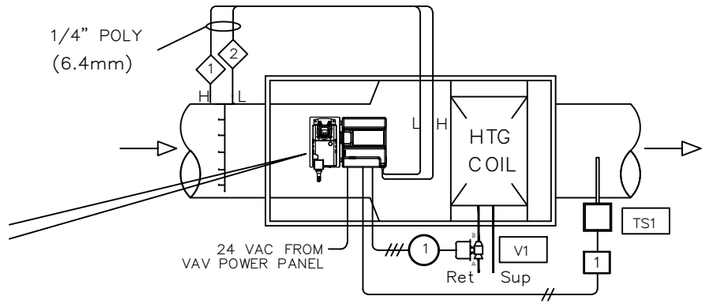
CH	BAC_ID	TAG	IN USE BY	DATA SHEET
DPR	1**xx.DPR	C1	DAMPER	128
1	1**xx.D001	V1	HOT WATER VLV	4305
2	1**xx.D002			
3	1**xx.D003			
4	1**xx.A004			

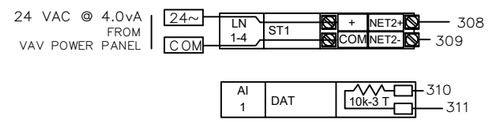
PNEUMATIC

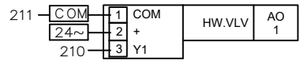
PNEUMATIC

LINE	IN USE BY
1	TOTAL PRESSURE (HI PORT)
2	STATIC PRESSURE (LO PORT)









BACNet ADDRESS NOTES:
** – NUMBERS ARE DERIVED FROM THE SYSTEM CONTROLLER ADDRESS THAT THIS MS/TP DEVICE IS SUBORDINATE TO.
xx – NUMBERS ARE DERIVED FROM THE DIP SWITCH ADDRESS ON THE VAV CONTROLLER. VAV CONTROLLERS ON EACH MS/TP LEG MUST HAVE UNIQUE DIP SWITCH BACNet (MAC) ADDRESSES!

NOTES:
*2 – CONTROLLER TO BE SHIPPED TO FACTORY FOR MOUNTING.

BILL OF MATERIALS

TAG	ITEM NAME	VENDOR P/N	DESCRIPTION	QTY	MANUF	LOC
C1	eZVP-440-AB	333010	eZVP-440-AB enteliZONE VAV Controller (Belimo, Programmable, MS/TP, DP sensor, 4UI, 4UO)	8	Delta Controls	Field
ST1	eZNS-T100CHM-ND-SC-000-WWG	337370	eZNS-T100CHM-ND-SC-000-WWG enteliZONE Network Sensor (No Display, Temp, CO2, Hum, Motion,	8	Delta Controls	Field
TS1	BA/10K-3-D-4"	400160	BA/10K-3-D-4 Duct Temp Sensor, 4 Stainless Steel Probe, Steel J-Box Enclosure	8	BAPI	Field
V1	RH Valve	See Schedule	See Valve Sch for Details	8	Belimo	Field

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–480
JOB NUMBER:
J–2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
1	B1	B1-01			TRANE	VCWF	14	1,500	975	600	2.40			E-CV-N1				B	
2	B1	B1-02			TRANE	VCWF	12	1,000	650	400	1.70			E-CV-N3				B	
3	B1	B1-03			TRANE	VCWF	8	500	325	200	1.10	IDF D108C	SS-B1	E-CV-N2				B	
4	B1	B1-04			TRANE	VCWF	8	350	230	140	0.70							A	
5	B1	B1-05			TRANE	VCWF	5	250	165	100	0.80							A	
6	B1	B1-06			TRANE	VCWF	10	800	520	320	1.20							A	
7	B1	B1-07			TRANE	VCWF	10	800	520	320	1.20							A	
8	B1	B1-08			TRANE	VCWF	12	1,050	685	420	1.80							A	
9	B1	B1-09			TRANE	VCWF	10	800	520	320	1.20							A	
10	B1	B1-10			TRANE	VCWF	12	1,050	685	420	1.80							A	
11	B1	B1-11			TRANE	VCWF	12	1,050	685	420	1.80							A	
12	B1	B1-12			TRANE	VCWF	12	1,050	685	420	1.80							A	
13	B1	B1-13			TRANE	VCWF	12	1,100	715	440	1.60							A	
14	B1	B1-14			TRANE	VCWF	12	1,070	695	430	1.60							A	
15	B1	B1-15			TRANE	VCWF	12	870	565	350	1.40							A	
16	B1	B1-16			TRANE	VCWF	12	870	565	350	1.40							A	
17	B1	B1-17			TRANE	VCWF	12	870	565	350	1.40							A	
18	B1	B1-18			TRANE	VCWF	12	950	620	380	1.60							A	
19	B1	B1-19			TRANE	VCWF	14	1,500	975	600	2.40							A	
20	B1	B1-20			TRANE	VCWF	12	870	565	350	1.40							A	
21	B1	B1-21			TRANE	VCWF	10	800	520	320	1.20							A	
22	C1	C1-01			TRANE	VCWF	12	1,000	650	400	1.70				E-CH-J3			B	
23	C1	C1-02			NOT USED						-							A	
24	C1	C1-03			TRANE	VCWF	12	1,000	650	400	1.70				E-CH-J1			B	
25	C1	C1-04	Corridor		TRANE	VCWF	10	780	505	310	1.30							A	
26	C1	C1-05			TRANE	VCWF	8	500	325	200	1.10							A	
27	C1	C1-06			TRANE	VCWF	4	100	100	100	0.10							A	
28	C1	C1-07			TRANE	VCWF	4	100	100	100	0.10							A	
29	C1	C1-08			TRANE	VCWF	10	600	390	240	0.80							A	
30	C4	C4-01			TRANE	VCWF	10	800	520	320	1.20							A	
31	C4	C4-02			TRANE	VCWF	12	1,100	715	440	1.90							A	
32	C4	C4-03			TRANE	VCWF	12	1,100	715	440	1.90							A	
33	C4	C4-04			TRANE	VCWF	12	1,100	715	440	1.90							A	
34	C4	C4-05			TRANE	VCWF	12	1,100	715	440	1.90							A	
35	C4	C4-06			TRANE	VCWF	12	1,100	715	440	1.90							A	
36	C4	C4-07			TRANE	VCWF	12	1,100	715	440	1.90							A	
37	C4	C4-08			TRANE	VCWF	10	800	520	320	1.20							A	
38	C4	C4-09			TRANE	VCWF	14	1,500	975	600	2.40							A	
39	C4	C4-10			TRANE	VCWF	12	1,100	715	440	1.90							A	
40	C4	C4-11			TRANE	VCWF	14	1,500	975	600	2.40							A	
41	C4	C4-12			TRANE	VCWF	12	1,100	715	440	1.90							A	
42	C4	C4-13			TRANE	VCWF	8	400	260	160	0.90							A	
43	C4	C4-14			TRANE	VCWF	10	550	360	220	0.80							A	
44	C4	C4-15			TRANE	VCWF	10	750	490	300	1.10							A	
45	C4	C4-16			TRANE	VCWF	10	750	490	300	1.10							A	
46	C4	C4-17			TRANE	VCWF	10	840	545	335	1.20							A	
47	C4	C4-18			TRANE	VCWF	10	1,050	685	420	1.80							A	
48	C4	C4-19			TRANE	VCWF	10	800	520	320	1.40							A	
49	C4	C4-20			TRANE	VCWF	10	800	520	320	1.20							A	
50	C4	C4-21			TRANE	VCWF	12	1,000	650	400	1.70	ELEC D577A						A	
51	C4	C4-22			TRANE	VCWF	5	250	165	100	0.40							A	
52	C4	C4-23			TRANE	VCWF	10	750	490	300	1.10	IDF C200	SS-B2					A	

*1 - USE TAMPERPROOF SPACE TEMPERATURE SENSOR.
*2 - OCCUPANCY SENSOR TIE-IN, LOCATED IN WOMEN'S RR.
*3 - HOT WATER LOOP TEMP SENSOR, LOCATED IN MEN'S RR.
*4 - CHILLED WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*5 - HOT WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*6 - USE ADJUSTABLE SPACE TEMPERATURE SENSOR.
*7 - INSTALLED UNDER PREVIOUS PHASE, NO WORK UNDER THIS PHASE.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-481
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
53	C4	C4-24			TRANE	VCWF	10	600	390	240	1.00							A	
54	C4	C4-25			TRANE	VCWF	5	250	165	100	0.50							A	
55	D1	D1-01			TRANE	VCWF	14	1,185	770	475	2.00							A	
56	D1	D1-02			TRANE	VCWF	12	1,000	650	400	1.70							A	
57	D1	D1-03			TRANE	VCWF	12	1,000	650	400	1.70							A	
58	D1	D1-04			TRANE	VCWF	5	250	165	100	0.80							A	
59	D1	D1-05			TRANE	VCWF	5	250	165	100	0.80							A	
60	D1	D1-06			TRANE	VCWF	5	250	165	100	0.80							A	
61	D1	D1-07			TRANE	VCWF	12	900	585	360	1.10							A	
62	D1	D1-08			TRANE	VCWF	8	375	245	150	0.80							A	
63	D1	D1-09			TRANE	VCWF	10	700	455	280	1.40			CV-D6				B	
64	D1	D1-10			TRANE	VCWF	10	600	390	240	0.80							A	
65	D1	D1-11			TRANE	VCWF	6	300	195	120	0.40							A	
66	D1	D1-12			TRANE	VCWF	10	550	360	220	0.80							A	
67	D1	D1-13			TRANE	VCWF	8	400	260	160	0.90							A	
68	D1	D1-14			TRANE	VCWF	8	400	260	160	0.90							A	
69	D1	D1-15			TRANE	VCWF	4	125	100	100	0.20			CV-D5				B	
70	D1	D1-16			TRANE	VCWF	6	325	210	130	0.50							A	
71	D1	D1-17			TRANE	VCWF	4	125	100	100	0.20							A	
72	D1	D1-18			TRANE	VCWF	4	100	100	100	0.10							A	
73	D1	D1-19			TRANE	VCWF	6	300	195	120	0.40							A	
74	D1	D1-20			TRANE	VCWF	10	1,050	685	420	1.70							A	
75	D1	D1-21			TRANE	VCWF	14	1,200	780	480	1.80							A	
76	D1	D1-22			TRANE	VCWF	14	1,200	780	480	1.80							A	
77	D1	D1-23			TRANE	VCWF	14	1,200	780	480	1.80							A	
78	D1	D1-24			TRANE	VCWF	14	1,200	780	480	1.80							A	
79	D1	D1-25			TRANE	VCWF	14	1,200	780	480	1.80							A	
80	D1	D1-26			TRANE	VCWF	14	1,250	815	500	2.00							A	
81	D1	D1-27			TRANE	VCWF	14	1,450	945	580	2.50							A	
82	D1	D1-28			TRANE	VCWF	4	100	100	100	0.10							A	
83	D1	D1-29			TRANE	VCWF	4	100	100	100	0.10							A	
84	D2	D2-01			TRANE	VCWF	10	550	360	220	0.80			CV-D1				B	
85	D2	D2-02			TRANE	VCWF	12	1,100	715	440	1.90	IDF A115	SS-D1					A	
86	D2	D2-03			TRANE	VCWF	10	800	520	320	1.20							A	
87	D2	D2-04			TRANE	VCWF	12	1,000	650	400	1.70							A	
88	D2	D2-05			TRANE	VCWF	16	2,000	1,300	800	3.00			CV-D7				B	
89	D2	D2-06			TRANE	VCWF	12	800	520	320	1.40			CV-D2				B	
90	D2	D2-07			TRANE	VCWF	4	100	100	100	0.10							A	
91	D2	D2-08			TRANE	VCWF	4	100	100	100	0.10			CV-D3				B	
92	D2	D2-09			TRANE	VCWF	4	150	100	100	0.30			CV-D4				B	
93	D2	D2-10			TRANE	VCWF	12	1,100	715	440	1.90			CV-D8				B	
94	D2	D2-11			TRANE	VCWF	10	800	520	320	1.20							A	
95	D2	D2-12			TRANE	VCWF	12	1,090	710	435	1.90							A	
96	D2	D2-13			TRANE	VCWF	12	1,050	685	420	1.80							A	
97	D2	D2-14			TRANE	VCWF	10	650	425	260	0.90			CV-D9				B	
98	D2	D2-15			TRANE	VCWF	12	1,050	685	420	1.80							A	
99	D2	D2-16			TRANE	VCWF	12	1,050	685	420	1.80							A	
100	D2	D2-17			TRANE	VCWF	12	800	520	320	1.40							A	
101	D2	D2-18			TRANE	VCWF	14	1,200	780	480	1.80							A	
102	E1	E1-01			TRANE	VCWF	14	1,400	910	560	2.20							A	
103	E1	E1-02			TRANE	VCWF	12	900	585	360	1.50							A	
104	E1	E1-03			TRANE	VCWF	14	1,400	910	560	2.20							A	

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*7 - INSTALLED UNDER PREVIOUS PHASE, NO WORK UNDER THIS PHASE.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS

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JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-482
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
105	E1	E1-04			TRANE	VCWF	12	900	585	360	1.50							A	
106	E1	E1-05			TRANE	VCWF	14	1,500	975	600	2.40				CH-E1			C	
107	E1	E1-06			TRANE	VCWF	10	750	490	300	1.10							A	
108	E1	E1-07			TRANE	VCWF	10	750	490	300	1.10							A	
109	E1	E1-08			TRANE	VCWF	10	750	490	300	1.10							A	
110	E1	E1-09			TRANE	VCWF	10	750	490	300	1.10							A	
111	E1	E1-10			TRANE	VCWF	10	750	490	300	1.10							A	
112	E1	E1-11			TRANE	VCWF	4	150	100	100	0.30							A	
113	E1	E1-12			TRANE	VCWF	4	100	100	100	0.10							A	
114	E1	E1-13			TRANE	VCWF	10	650	425	260	0.90							A	
115	E2	E2-01			TRANE	VCWF	12	1,000	650	400	1.70							A	
116	E2	E2-02			TRANE	VCWF	12	1,000	650	400	1.70							A	
117	E2	E2-03			TRANE	VCWF	8	500	325	200	1.10							A	
118	E2	E2-04			TRANE	VCWF	8	450	295	180	1.00							A	
119	E2	E2-05			TRANE	VCWF	6	300	195	120	0.40							A	
120	E2	E2-06			TRANE	VCWF	5	200	130	100	0.50							A	
121	E2	E2-07			TRANE	VCWF	16	1,950	1,270	780	2.80							A	
122	E2	E2-08			TRANE	VCWF	16	1,950	1,270	780	2.80							A	
123	E2	E2-09			TRANE	VCWF	14	1,200	780	480	1.90							A	
124	E2	E2-10			TRANE	VCWF	10	750	490	300	1.10							A	
125	E2	E2-11			TRANE	VCWF	10	800	520	320	1.20							A	
126	E2	E2-12			TRANE	VCWF	4	150	100	100	0.30	IDF A226K	SS-F1					A	
127	E2	E2-13			TRANE	VCWF	5	200	130	100	0.50							A	
128	E2	E2-14			TRANE	VCWF	16	1,950	1,270	780	2.80							A	
129	E2	E2-15			TRANE	VCWF	14	1,400	910	560	2.20							A	
130	E2	E2-16			TRANE	VCWF	14	1,400	910	560	2.20							A	
131	E2	E2-17			TRANE	VCWF	6	300	195	120	0.40							A	
132	E2	E2-18			TRANE	VCWF	6	300	195	120	0.40							A	
133	E2	E2-19			TRANE	VCWF	12	1,000	650	400	1.70							A	
134	E2	E2-20			TRANE	VCWF	12	1,000	650	400	1.70							A	
135	E2	E2-21			TRANE	VCWF	4	100	100	100	0.10							A	
136	E2	E2-22			NOT USED						-							A	
137	E2	E2-23			TRANE	VCWF	8	450	295	180	1.00							A	
138	E2	E2-24			TRANE	VCWF	14	1,400	910	560	2.20							A	
139	E3	E3-01			TRANE	VCWF	14	1,400	910	560	2.20							A	
140	E3	E3-02			TRANE	VCWF	10	700	455	280	1.00				CH-F1			C	
141	E3	E3-03			TRANE	VCWF	12	1,000	650	400	1.70			CV-F5				B	
142	E3	E3-04			TRANE	VCWF	12	1,000	650	400	1.70			CV-E1				B	
143	E3	E3-05			TRANE	VCWF	6	300	195	120	0.40	IDF A134	SS-E1					A	
144	E3	E3-06			TRANE	VCWF	8	400	260	160	0.90				CH-E2			C	
145	E3	E3-07			TRANE	VCWF	5	200	130	100	0.50							A	
146	E3	E3-08			TRANE	VCWF	5	225	145	90	0.50							A	
147	E3	E3-09			TRANE	VCWF	14	1,200	780	480	1.90							A	
148	E3	E3-10			TRANE	VCWF	8	500	325	200	1.10							A	
149	F1	F1-01			TRANE	VCWF	14	1,500	975	600	2.40			CV-F2				B	
150	F1	F1-02			TRANE	VCWF	4	125	100	100	0.20							A	
151	F1	F1-03			TRANE	VCWF	12	1,000	650	400	1.70			CV-F1				B	
152	F1	F1-04			TRANE	VCWF	4	150	100	100	0.30							A	
153	F1	F1-05			TRANE	VCWF	4	150	100	100	0.30	IDF A153						A	
154	F1	F1-06			TRANE	VCWF	6	325	210	130	0.50							A	
155	F1	F1-07			TRANE	VCWF	12	1,000	650	400	1.70							A	
156	F1	F1-08			TRANE	VCWF	4	60	60	60	0.10			CV-F3				B	

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*3 - HOT WATER LOOP TEMP SENSOR, LOCATED IN MEN'S RR.
*4 - CHILLED WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*5 - HOT WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*6 - USE ADJUSTABLE SPACE TEMPERATURE SENSOR.
*7 - INSTALLED UNDER PREVIOUS PHASE, NO WORK UNDER THIS PHASE.

PHASE 3 VAV SCHEDULE (3 OF 10)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-483
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
157	F1	F1-09			TRANE	VCWF	14	1,200	780	480	1.90			CV-F4				B	
158	F1	F1-10			TRANE	VCWF	8	500	325	200	1.10							A	
159	F1	F1-11			TRANE	VCWF	10	750	490	300	1.10							A	
160	F1	F1-12			TRANE	VCWF	5	250	165	100	0.80							A	
161	F1	F1-13			TRANE	VCWF	4	100	100	100	0.10							A	
162	F1	F1-14			TRANE	VCWF	4	100	100	100	0.10							A	
163	F1	F1-15			TRANE	VCWF	14	1,400	910	560	2.20							A	
164	F1	F1-16			TRANE	VCWF	14	1,400	910	560	2.20							A	
165	F1	F1-17			TRANE	VCWF	5	250	165	100	0.80							A	
166	F1	F1-18			TRANE	VCWF	10	750	490	300	1.10							A	
167	F1	F1-19			TRANE	VCWF	12	1,000	650	400	1.70			CV-F7				B	
168	F1	F1-20			TRANE	VCWF	10	750	490	300	1.10							A	
169	F1	F1-21			TRANE	VCWF	4	125	100	100	0.20			CV-F6				B	
170	F1	F1-22			TRANE	VCWF	5	160	105	100	0.40							A	
171	F1	F1-23			TRANE	VCWF	4	125	100	100	0.20							A	
172	F1	F1-24			TRANE	VCWF	10	600	390	240	0.80							A	
173	F1	F1-25			TRANE	VCWF	5	160	105	100	0.40							A	
174	G4	G4-01			TRANE	VCWF	10	600	390	240	0.80	STOR L106	SS-G1					A	
175	G4	G4-02			TRANE	VCWF	16	1,800	1,170	720	2.60							A	
176	G4	G4-03			TRANE	VCWF	16	1,800	1,170	720	2.60							A	
177	G4	G4-04			TRANE	VCWF	16	1,700	1,105	680	2.50							A	
178	G4	G4-05			TRANE	VCWF	16	1,700	1,105	680	2.50							A	
179	G4	G4-06			TRANE	VCWF	12	860	560	345	1.30							A	
180	G4	G4-07			TRANE	VCWF	16	1,700	1,105	680	2.50							A	
181	G4	G4-08			TRANE	VCWF	16	1,700	1,105	680	2.50							A	
182	G4	G4-09			TRANE	VCWF	16	1,800	1,170	720	2.60							A	
183	G4	G4-10			TRANE	VCWF	10	600	390	240	0.80							A	
184	G4	E-G4-11			-	-	8	550	360	220	0.80							A	7
185	G4	E-G4-12			-	-	5	350	230	140	0.50							A	7
186	G4	E-G4-13			-	-	8	550	360	220	0.80							A	7
187	H1	H1-01			TRANE	VCWF	12	1,100	715	440	1.90			CV-H5				B	
188	H1	H1-02			TRANE	VCWF	4	100	100	100	0.10							A	
189	H1	H1-03			TRANE	VCWF	4	100	100	100	0.10							A	
190	H1	H1-04			TRANE	VCWF	8	350	230	140	0.70			CV-H4				B	
191	H1	H1-05			TRANE	VCWF	4	100	100	100	0.10							A	
192	H1	H1-06			TRANE	VCWF	4	100	100	100	0.10							A	
193	H1	H1-07			TRANE	VCWF	4	100	100	100	0.10							A	
194	H1	H1-08			TRANE	VCWF	4	100	100	100	0.10							A	
195	H1	H1-09			TRANE	VCWF	4	150	100	100	0.30			CV-H3				B	
196	H1	H1-10			TRANE	VCWF	12	1,090	710	435	1.90							A	
197	H1	H1-11			TRANE	VCWF	10	720	470	290	1.50							A	
198	H1	H1-12			TRANE	VCWF	12	900	585	360	1.50							A	
199	H1	H1-13			TRANE	VCWF	10	720	470	290	1.20			E-CV-H1				B	
200	H1	H1-14			TRANE	VCWF	12	900	585	360	1.50			E-CV-H2				B	
201	H1	H1-15			TRANE	VCWF	12	1,125	730	450	2.00							A	
202	H1	H1-16			TRANE	VCWF	12	1,125	730	450	2.00							A	
203	H1	H1-17			TRANE	VCWF	10	850	555	340	1.30							A	
204	H1	H1-18			TRANE	VCWF	10	850	555	340	1.30							A	
205	H1	H1-19			TRANE	VCWF	10	850	555	340	1.30							A	
206	H1	H1-20			TRANE	VCWF	10	850	555	340	1.30							A	
207	H1	H1-21			TRANE	VCWF	10	850	555	340	1.30	IDF L205	SS-H1					A	
208	H1	H1-22			TRANE	VCWF	12	1,000	650	400	1.70							A	

*1 - USE TAMPERPROOF SPACE TEMPERATURE SENSOR.
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PHASE 3 VAV SCHEDULE (4 OF 10)

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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-484
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS							
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp	Control Detail	NOTES
209	H1	H1-23			TRANE	VCWF	14	1,195	775	480	2.10							A	
210	H1	H1-24			TRANE	VCWF	12	1,000	650	400	1.70			E-CV-H6				B	
211	H1	H1-25			TRANE	VCWF	12	1,135	740	455	2.00			E-CV-H7				B	
212	H1	H1-26			TRANE	VCWF	12	875	570	350	1.50							A	
213	H2	H2-01			TRANE	VCWF	14	1,500	975	600	2.40							A	
214	H2	H2-02			TRANE	VCWF	12	1,000	650	400	1.70							A	
215	H2	H2-03			TRANE	VCWF	10	800	520	320	1.20							A	
216	H2	H2-04			TRANE	VCWF	12	1,000	650	400	1.70							A	
217	H2	H2-05			TRANE	VCWF	12	1,000	650	400	1.70							A	
218	H2	H2-06			TRANE	VCWF	16	1,800	1,170	720	2.60							A	
219	H2	H2-07			TRANE	VCWF	12	1,050	685	420	1.80							A	
220	H2	H2-08			TRANE	VCWF	12	1,100	715	440	1.90							A	
221	H2	H2-09			TRANE	VCWF	10	700	455	280	1.00							A	
222	H2	H2-10			TRANE	VCWF	12	900	585	360	1.50							A	
223	H2	H2-11			TRANE	VCWF	12	900	585	360	1.50							A	
224	H2	H2-12			TRANE	VCWF	12	900	585	360	1.50							A	
225	H2	H2-13			TRANE	VCWF	10	700	455	280	1.00							A	
226	H2	H2-14			TRANE	VCWF	12	1,000	650	400	1.70							A	
227	H2	H2-15			TRANE	VCWF	10	800	520	320	1.20							A	
228	J1	J1-01			TRANE	VCWF	10	800	520	320	1.20							A	
229	J1	J1-02			TRANE	VCWF	4	100	100	100	0.10							A	
230	J1	J1-03			TRANE	VCWF	16	1,800	1,170	720	2.60							A	
231	J1	J1-04			TRANE	VCWF	10	750	490	300	1.10							A	
232	J1	J1-05			TRANE	VCWF	10	800	520	320	1.20							A	
233	J1	J1-06			TRANE	VCWF	10	800	520	320	1.20			CV-M2				B	
234	J1	J1-07			TRANE	VCWF	16	1,600	1,040	640	2.30							A	
235	J1	J1-08			TRANE	VCWF	10	800	520	320	1.20							A	
236	J1	J1-09			TRANE	VCWF	16	1,600	1,040	640	2.30							A	
237	J1	J1-10			TRANE	VCWF	8	400	260	160	1.10							A	
238	J1	J1-11			TRANE	VCWF	5	200	130	100	0.50							A	
239	J1	J1-12			TRANE	VCWF	5	200	130	100	0.50							A	
240	J1	J1-13			TRANE	VCWF	16	2,250	1465	900	2.40							A	
241	J1	J1-14			TRANE	VCWF	14	1,400	910	560	2.20							A	
242	J1	J1-15			TRANE	VCWF	14	1,500	975	600	2.40							A	
243	J1	J1-16			TRANE	VCWF	14	1,500	975	600	2.40							A	
244	J1	J1-17			TRANE	VCWF	8	400	260	160	0.60							A	
245	J1	J1-18			TRANE	VCWF	10	600	390	240	0.80							A	
246	J1	J1-19			TRANE	VCWF	8	400	260	160	0.60							A	
247	J1	J1-20			TRANE	VCWF	8	400	260	160	0.60			CV-L3				B	
248	J2	J2-01			TRANE	VCWF	16	1,800	1,170	720	2.60							A	
249	J2	J2-02			TRANE	VCWF	5	200	130	100	0.50				CH-J2			C	
250	J2	J2-03			TRANE	VCWF	16	1,750	1,140	700	2.70							A	
251	J2	J2-04			TRANE	VCWF	16	1,750	1,140	700	2.50							A	
252	J2	J2-05			TRANE	VCWF	16	1,750	1,140	700	2.50							A	
253	J2	J2-06			TRANE	VCWF	8	500	325	200	1.10							A	
254	J2	J2-07			TRANE	VCWF	12	1,100	715	440	1.90	IDF K112	SS-J1					A	
255	J2	J2-08			TRANE	VCWF	5	200	130	100	0.50			CV-J1				B	
256	J2	J2-09			TRANE	VCWF	5	200	130	100	0.50			CV-J2				B	
257	J2	J2-10			TRANE	VCWF	16	1,700	1,105	680	2.50							A	
258	J2	J2-11			TRANE	VCWF	12	1,100	715	440	1.70							A	
259	J2	J2-12			TRANE	VCWF	10	800	520	320	1.20	IDF D219A	SS-J2					A	
260	J2	J2-13			TRANE	VCWF	12	1,000	650	400	1.70							A	

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4240 W 50 S
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UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–485
JOB NUMBER:
J–2304001

IDENTITY DATA												ALTERNATE CONTROLS							
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp	Control Detail	NOTES
261	J2	J2-14			TRANE	VCWF	10	825	535	330	1.40				E-CH-K1			C	
262	J3	J3-01	L113	Classroom	TRANE	VCWF	14	1,200	780	480	3.70							A	
263	J3	J3-02			TRANE	VCWF	14	1,200	780	480	3.70							A	
264	J3	J3-03	L117	Piano Theory	TRANE	VCWF	8	540	350	215	0.80							A	
265	J3	J3-04			TRANE	VCWF	14	1,500	975	600	2.40							A	
266	J3	J3-05			TRANE	VCWF	14	1,500	975	600	2.40							A	
267	J3	J3-06			TRANE	VCWF	14	1,500	975	600	2.40							A	
268	J3	J3-07			TRANE	VCWF	5	250	165	100	0.20							A	
269	J3	J3-08			TRANE	VCWF	8	350	230	140	0.80							A	
270	J3	J3-09			TRANE	VCWF	8	350	230	140	0.20							A	
271	J3	J3-10			TRANE	VCWF	5	250	165	100	0.20							A	
272	J3	J3-11			TRANE	VCWF	10	800	520	320	1.20							A	
273	J3	J3-12			TRANE	VCWF	4	125	100	100	0.90							A	
274	J3	J3-13			TRANE	VCWF	6	300	195	120	0.40							A	
275	J3	J3-14			TRANE	VCWF	8	350	230	140	0.40							A	
276	J3	J3-15			TRANE	VCWF	4	150	100	100	0.75							A	
277	J3	J3-16			TRANE	VCWF	4	150	100	100	0.75							A	
278	M1	M1-01			TRANE	VCWF	12	1,000	650	400	1.70							A	
279	M1	M1-02			TRANE	VCWF	10	550	360	220	0.80			CV-M3				B	
280	M1	M1-03			TRANE	VCWF	10	550	360	220	0.80			CV-M4				B	
281	M1	M1-04			TRANE	VCWF	10	700	455	280	1.00			CV-M1				B	
282	M1	M1-05			TRANE	VCWF	4	125	100	100	0.20							A	
283	M1	M1-06			TRANE	VCWF	4	150	100	100	0.30							A	
284	M1	M1-07			TRANE	VCWF	8	400	260	160	0.60			CV-M8				B	
285	M1	M1-08	Unit M Mech Rm		TRANE	VCWF	24/16	4,500	2,925	1,800	7.00							A	
286	M1	M1-09	Unit M Mech Rm		TRANE	VCWF	24/16	4,400	2,860	1,760	6.00							A	
287	M1	M1-10	Unit M Mech Rm		TRANE	VCWF	24/16	4,450	2,895	1,780	6.50							A	
288	N1	N1-01			TRANE	VCWF	16	1,650	1075	660	2.40	ELEC H113						A	
289	N1	N1-02			TRANE	VCWF	16	1,900	1,235	760	3.00							A	
290	N1	N1-03			TRANE	VCWF	16	1,900	1,235	760	3.00							A	
291	N1	N1-04			TRANE	VCWF	16	1,750	1,140	700	2.70							A	
292	N1	N1-05			TRANE	VCWF	10	720	470	290	1.10							A	
293	N1	N1-06			TRANE	VCWF	16	1,900	1,235	760	3.00				CH-N1			C	
294	N1	N1-07			TRANE	VCWF	8	400	260	160	0.90							A	
295	N1	N1-08			TRANE	VCWF	4	150	100	100	0.30							A	
296	N1	N1-09			TRANE	VCWF	14	1,500	975	600	2.40							A	
297	N1	N1-10			TRANE	VCWF	10	550	550	550	1.20							A	
298	N1	N1-11	Passage D157A		TRANE	VCWF	6	300	195	120	0.40	ELEC D107A			CH-A1			C	
299	N1	N1-12			TRANE	VCWF	14	1,200	780	480	1.80	ELEC H118						A	
300	N1	N1-13			TRANE	VCWF	14	1,200	780	480	1.80				CH-N2			C	
301	N2	N2-01			TRANE	VCWF	10	800	520	320	1.20			CV-N4				B	
302	N2	N2-02			TRANE	VCWF	14	1,400	910	560	2.20							A	
303	N2	N2-03			TRANE	VCWF	6	300	195	120	0.40							A	
304	N2	N2-04			TRANE	VCWF	10	800	520	320	1.20			CV-N5				B	
305	N2	N2-05			TRANE	VCWF	10	800	520	320	1.20							A	
306	N2	N2-06			TRANE	VCWF	10	800	520	320	1.20							A	
307	N2	N2-07			TRANE	VCWF	14	1,400	910	560	2.20							A	
308	N2	N2-08			TRANE	VCWF	14	1,500	975	600	1.80							A	
309	N2	N2-09			TRANE	VCWF	14	1,400	910	560	2.20							A	
310	N2	N2-10			TRANE	VCWF	10	800	520	320	1.20							A	
311	N2	N2-11			TRANE	VCWF	10	800	520	320	1.20							A	
312	N2	N2-12			TRANE	VCWF	14	1,400	910	560	2.20							A	

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PHASE 3 VAV SCHEDULE (6 OF 10)

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ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

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SHEET
NCHS-486
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
313	N2	N2-13			TRANE	VCWF	8	500	325	200	1.10							A	
314	N2	N2-14			TRANE	VCWF	14	1,200	780	480	1.80							A	
315	N2	N2-15			TRANE	VCWF	14	1,200	780	480	1.80							A	
316	N2	N2-16			TRANE	VCWF	10	800	520	320	1.70							A	
317	P1	P1-01			TRANE	VCWF	5	250	165	100	0.50							A	
318	P1	P1-02			TRANE	VCWF	4	100	100	100	0.10	IDF B108L	SS-P1					A	
319	P1	P1-03			TRANE	VCWF	10	800	520	320	1.20							A	
320	P1	P1-04			TRANE	VCWF	8	350	230	140	0.70							A	
321	P1	P1-05			TRANE	VCWF	14	1,200	780	480	1.90							A	
322	P1	P1-06			TRANE	VCWF	10	600	390	240	0.80							A	
323	P1	P1-07			TRANE	VCWF	4	100	100	100	0.10			CV-P3				B	
324	P1	P1-08			TRANE	VCWF	5	200	130	100	0.50							A	
325	P1	P1-09			TRANE	VCWF	6	300	195	120	0.40							A	
326	P1	P1-10			TRANE	VCWF	8	350	230	140	0.70			CV-P1				B	
327	P1	P1-11			TRANE	VCWF	12	900	585	360	1.50			CV-P2				B	
328	P1	P1-12			TRANE	VCWF	4	100	100	100	0.10							A	
329	P1	P1-13			TRANE	VCWF	4	100	100	100	0.10							A	
330	P1	P1-14			TRANE	VCWF	4	100	100	100	0.10							A	
331	P1	P1-15			TRANE	VCWF	4	100	100	100	0.10							A	
332	P1	P1-16			TRANE	VCWF	12	900	585	360	1.50							A	
333	P1	P1-17			TRANE	VCWF	12	1,150	750	460	2.00							A	
334	P1	P1-18			TRANE	VCWF	4	100	100	100	0.10							A	
335	P1	P1-19			TRANE	VCWF	5	200	130	100	0.50							A	
336	P1	P1-20			NOT USED						-							A	
337	P1	P1-21			TRANE	VCWF	6	300	195	120	0.40							A	
338	P1	P1-22			TRANE	VCWF	10	600	390	240	1.00							A	
339	P1	P1-23			TRANE	VCWF	6	300	195	120	0.40							A	
340	P1	P1-24			TRANE	VCWF	4	100	100	100	0.10							A	
341	P1	P1-25			TRANE	VCWF	4	100	100	100	0.10							A	
342	P1	P1-26			TRANE	VCWF	4	100	100	100	0.10							A	
343	P1	P1-27			TRANE	VCWF	4	100	100	100	0.10			E-CV-P5				B	
344	P1	P1-28			TRANE	VCWF	12	900	585	360	1.50			CV-P4				B	
345	P1	P1-29			TRANE	VCWF	24/16	3,000	1,950	1200	3.10							A	
346	P1	P1-30			TRANE	VCWF	14	1,500	975	600	2.40							A	
347	P1	P1-31			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
348	P1	P1-32			TRANE	VCWF	12	1,000	650	400	1.70							A	
349	P1	P1-33			TRANE	VCWF	14	1,500	975	600	2.40							A	
350	P1	P1-34			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
351	P1	P1-35			TRANE	VCWF	4	100	100	100	0.10							A	
352	P2	P2-01			TRANE	VCWF	14	1,450	945	580	2.50			CV-P8				B	
353	P2	P2-02			TRANE	VCWF	8	500	325	200	1.10			CV-P6				B	
354	P2	P2-03			TRANE	VCWF	4	125	100	100	0.20			CV-P9				B	
355	P2	P2-04			TRANE	VCWF	8	350	230	140	0.70							A	
356	P2	P2-05			TRANE	VCWF	6	300	195	120	0.40							A	
357	P2	P2-06			TRANE	VCWF	8	350	230	140	0.40							A	
358	P2	P2-07			TRANE	VCWF	14	1,200	780	480	1.80							A	
359	P2	P2-08			TRANE	VCWF	6	300	195	120	0.40							A	
360	P2	P2-09			TRANE	VCWF	10	800	520	320	1.20							A	
361	P2	P2-10			TRANE	VCWF	14	1,260	820	505	2.10							A	
362	P2	P2-11			TRANE	VCWF	14	1,400	910	560	2.20							A	
363	P2	P2-12			TRANE	VCWF	6	300	195	120	0.40							A	
364	P2	P2-13			TRANE	VCWF	14	1,200	780	480	1.90							A	

*1 - USE TAMPERPROOF SPACE TEMPERATURE SENSOR.
*2 - OCCUPANCY SENSOR TIE-IN, LOCATED IN WOMEN'S RR.
*3 - HOT WATER LOOP TEMP SENSOR, LOCATED IN MEN'S RR.
*4 - CHILLED WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*5 - HOT WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*6 - USE ADJUSTABLE SPACE TEMPERATURE SENSOR.
*7 - INSTALLED UNDER PREVIOUS PHASE, NO WORK UNDER THIS PHASE.

PHASE 3 VAV SCHEDULE (7 OF 10)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-487
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
365	P2	P2-14			TRANE	VCWF	10	800	520	320	1.20							A	
366	P2	P2-15			TRANE	VCWF	10	800	520	320	1.20							A	
367	P2	P2-16			TRANE	VCWF	14	1,260	820	505	2.10	IDF H206						A	
368	P2	P2-17			TRANE	VCWF	10	800	520	320	1.20							A	
369	P2	P2-18			TRANE	VCWF	10	800	520	320	1.20							A	
370	P2	P2-19			TRANE	VCWF	14	1,260	820	505	2.10							A	
371	P2	P2-20			TRANE	VCWF	10	620	405	250	0.90							A	
372	P2	P2-21			TRANE	VCWF	10	800	520	320	1.20							A	
373	P2	P2-22			TRANE	VCWF	10	800	520	320	1.20							A	
374	P2	P2-23			TRANE	VCWF	14	1,260	820	505	2.10							A	
375	P2	P2-24			TRANE	VCWF	14	1,200	780	480	1.90							A	
376	P2	P2-25			TRANE	VCWF	5	200	130	100	0.50			CV-P7				B	
377	Q1	Q1-01			TRANE	VCWF	14	1,500	975	600	2.50							A	
378	Q1	Q1-02			TRANE	VCWF	14	1,400	910	560	2.30							A	
379	Q1	Q1-03			TRANE	VCWF	14	1,500	975	600	2.50							A	
380	Q1	Q1-04			TRANE	VCWF	14	1,500	975	600	2.40							A	
381	Q1	Q1-05			TRANE	VCWF	14	1,400	910	560	2.30							A	
382	Q1	Q1-06			TRANE	VCWF	6	180	115	100	0.50	SCI PREP N123	SS-Q1					A	
383	Q1	Q1-07			TRANE	VCWF	6	300	195	120	0.50							A	
384	Q1	Q1-08			TRANE	VCWF	14	1,500	975	600	2.50	ELEC N125B						A	
385	Q1	Q1-09			TRANE	VCWF	14	1,400	910	560	2.30							A	
386	Q1	Q1-10			TRANE	VCWF	16	2,000	1,300	800	3.00				CH-Q1			C	
387	Q1	Q1-11			TRANE	VCWF	8	500	325	200	1.10				CH-Q2			C	
388	Q1	Q1-12			TRANE	VCWF	8	550	360	220	N/A			E-CV-Q1				B	
389	Q1	Q1-13			TRANE	VCWF	14	1,400	910	560	2.20							A	
390	Q1	Q1-14			TRANE	VCWF	14	1,400	910	560	2.20							A	
391	Q1	Q1-15			TRANE	VCWF	6	300	195	120	0.40							A	
392	Q2	Q2-01			TRANE	VCWF	14	1,500	975	600	2.40							A	
393	Q2	Q2-02			TRANE	VCWF	6	300	195	120	0.50							A	
394	Q2	Q2-03			TRANE	VCWF	16	1,600	1,040	640	2.50							A	
395	Q2	Q2-04			TRANE	VCWF	14	1,500	975	600	2.40							A	
396	Q2	Q2-05			TRANE	VCWF	6	300	195	120	0.50							A	
397	Q2	Q2-06			TRANE	VCWF	14	1,500	975	600	2.40							A	
398	Q2	Q2-07			TRANE	VCWF	16	1,800	1,170	720	2.90							A	
399	Q2	Q2-08			TRANE	VCWF	14	1,500	975	600	2.40							A	
400	Q2	Q2-09			TRANE	VCWF	16	1,600	1,040	640	2.30							A	
401	Q2	Q2-10			TRANE	VCWF	14	1,500	975	600	2.40			CV-Q2				B	
402	Q2	Q2-11			TRANE	VCWF	14	1,500	975	600	2.40							A	
403	Q2	Q2-12			TRANE	VCWF	14	1,500	975	600	2.40							A	
404	Q2	Q2-13			TRANE	VCWF	10	700	455	280	2.40	ELEC N232						A	
405	Q2	Q2-14			TRANE	VCWF	14	1,500	975	600	2.40	IDF N234						A	
406	Q2	Q2-15			TRANE	VCWF	6	300	195	120	0.40							A	
407	Q2	Q2-16			TRANE	VCWF	6	300	195	120	0.40	ELEC N228C						A	
408	Q2	Q2-17			TRANE	VCWF	8	400	260	160	0.60							A	
409	R1	R1-01			TRANE	VCWF	14	1,500	975	600	2.40							A	
410	R1	R1-02			TRANE	VCWF	6	300	195	120	0.40	IDF A160						A	
411	R1	R1-03			TRANE	VCWF	6	300	195	120	0.50			E-CV-R1				B	
412	R1	R1-04			TRANE	VCWF	14	1400	910	560	1.40							A	
413	R1	R1-05			TRANE	VCWF	14	1,500	975	600	2.40							A	
414	R1	R1-06			NOT USED						-							A	
415	R1	R1-07	CORR N000	CORR A & N	TRANE	VCWF	14	1,500	975	600	2.40			E-CV-R2				B	
416	R1	R1-08			TRANE	VCWF	14	1400	910	560	1.50	IDF N110	SS-R1	E-CV-R3				B	

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*4 - CHILLED WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*5 - HOT WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*6 - USE ADJUSTABLE SPACE TEMPERATURE SENSOR.
*7 - INSTALLED UNDER PREVIOUS PHASE, NO WORK UNDER THIS PHASE.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-488
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
417	R1	R1-09			TRANE	VCWF	16	2,200	1,430	880	3.30	IDF B143A		E-CV-R4				B	
418	R1	R1-10			TRANE	VCWF	14	1,500	975	600	2.50				CH-R2			C	
419	R1	R1-11			TRANE	VCWF	12	1,000	650	400	1.60							A	
420	R1	R1-12			TRANE	VCWF	14	1,400	910	560	2.30				E-CH-R1			C	
421	R1	R1-13			TRANE	VCWF	14	1,500	975	600	2.40				CH-R3			C	
422	R1	R1-14			TRANE	VCWF	6	300	195	120	0.50							A	
423	R2	R2-01			TRANE	VCWF	14	1,400	910	560	2.20							A	
424	R2	R2-02			TRANE	VCWF	12	1,000	650	400	1.70							A	
425	R2	R2-03			TRANE	VCWF	8	350	230	140	0.70							A	
426	R2	R2-04			TRANE	VCWF	14	1,200	780	480	1.90			E-CV-R6				B	
427	R2	R2-05			TRANE	VCWF	8	500	325	200	0.70							A	
428	R2	R2-06			TRANE	VCWF	12	1,000	650	400	1.80							A	
429	R2	R2-07			TRANE	VCWF	12	1,000	650	400	1.70							A	
430	R2	R2-08			TRANE	VCWF	16	2,000	1,300	800	3.00			E-CV-R7				B	
431	R2	R2-09			TRANE	VCWF	12	1,000	650	400	1.70			E-CV-R5				B	
432	R2	R2-10			TRANE	VCWF	12	1,000	650	400	1.50							A	
433	R2	R2-11			TRANE	VCWF	16	1,600	1,040	640	2.30							A	
434	R2	R2-12			TRANE	VCWF	12	1,000	650	400	1.50							A	
435	R2	R2-13			TRANE	VCWF	16	1,800	1,170	720	2.70							A	
436	S1	S1-01			TRANE	VCWF	10	620	405	250	0.90	ELEC L122		E-CV-L2				B	
437	S1	S1-02			TRANE	VCWF	10	800	520	320	1.20							A	
438	S1	S1-03			TRANE	VCWF	10	800	520	320	1.20							A	
439	S1	S1-04			TRANE	VCWF	8	350	230	140	0.70							A	
440	S1	S1-05			TRANE	VCWF	16	1,800	1,170	720	2.80			E-CV-S1				B	
441	S1	S1-06			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
442	S1	S1-07			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
443	S1	S1-08			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
444	S1	S1-09			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
445	S1	S1-10			TRANE	VCWF	16	2,000	1,300	800	3.00							A	
446	S1	S1-11			TRANE	VCWF	14	1,485	965	595	2.50							A	
447	S1	S1-12			TRANE	VCWF	16	1,815	1,180	725	2.80							A	
448	S1	S1-13			TRANE	VCWF	16	1,650	1,075	660	2.50							A	
449	S1	S1-14			TRANE	VCWF	14	1,200	780	480	1.90							A	
450	S1	S1-15			TRANE	VCWF	12	880	570	350	1.50							A	
451	S1	S1-16			TRANE	VCWF	5	185	120	100	0.50			E-CV-S3				B	
452	S1	S1-17			TRANE	VCWF	16	1800	1,170	720	2.60			E-CV-S2				B	
453	S1	S1-18			TRANE	VCWF	5	250	165	100	0.80	ELEC G116D & STOR F106	SS-L1 (STOR F106)	E-CV-L1				B	2 ST Monitoring
454	S1	S1-19			TRANE	VCWF	6	300	195	120	0.40							A	
455	T1	E-T1-01			--	--	8	400	260	160	0.90							A	
456	T1	E-T1-02			--	--	12	900	585	360	1.50							A	
457	T1	E-T1-03			--	--	14	1,300	845	520	2.10							A	
458	T1	E-T1-04			--	--	4	125	80	50	0.20							A	
459	T1	E-T1-05			--	--	14	1500	975	600	2.40							A	
460	T1	E-T1-06			--	--	14	1500	975	600	2.40							A	
461	T1	E-T1-07			--	--	5	200	130	80	0.50							A	
462	T1	T1-08			TRANE	VCWF	10	550	360	220	0.80							A	
463	T1	T1-09			TRANE	VCWF	10	550	360	220	0.80							A	
464	T1	T1-10			TRANE	VCWF	12	1,100	715	440	1.90							A	
465	T1	T1-11			TRANE	VCWF	12	1,150	750	460	2.00							A	
466	T1	T1-12			TRANE	VCWF	12	1,150	750	460	2.00							A	
467	T1	T1-13			TRANE	VCWF	12	1,000	650	400	1.70							A	
468	T1	T1-14			TRANE	VCWF	14	1,400	910	560	2.20							A	

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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
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JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-489
JOB NUMBER:
J-2304001

IDENTITY DATA												ALTERNATE CONTROLS						Control Detail	NOTES
ITEM	AHU	MARK	ROOM	SERVICE	MANUF.	MODEL	NEW INLET DIA	NEW COOLING MAX AIRFLOW (CFM)	NEW HEATING MAX AIRFLOW (CFM)	NEW OCC MIN AIRFLOW (CFM)	NEW FLOW (GPM)	IDF / MDF / Elec Rm Temp Monitoring	IDF Associated Split A/C (no BAS ctrls)	Hydronic Convector	CUH / UH Control	Exhaust Fan	Loop Temp		
469	AA1	AA1-01			TRANE	VCWF	14	1400	910	560	0.90							A	
470	AA1	AA1-02			TRANE	VCWF	8	450	295	180	1.80							A	
471	AA1	AA1-03			TRANE	VCWF	10	600	390	240	1.10			CV-AA3				B	
472	AA1	AA1-04			TRANE	VCWF	8	400	260	160	0.80			CV-AA4				B	
473	AA1	AA1-05			TRANE	VCWF	8	450	295	180	3.00			CV-AA2				B	
474	AA1	AA1-06			TRANE	VCWF	14	1200	780	480	1.10							A	
475	AA1	AA1-07			TRANE	VCWF	8	500	325	200	1.10			CV-AA1				B	
476	AA1	AA1-08			TRANE	VCWF	5	200	130	100	2.20							A	
477	AA1	AA1-09			TRANE	VCWF	16	2250	1465	900	0.80							A	
478	AA1	AA1-10			TRANE	VCWF	16	2250	1465	900	0.90							A	
479	AA1	AA1-11			TRANE	VCWF	4	100	100	100	1.00							A	
480	AA1	AA1-12			TRANE	VCWF	4	100	100	100	4.00							A	
481	AA1	AA1-13			TRANE	VCWF	4	100	100	100	4.00							A	
482	AA1	AA1-14			TRANE	VCWF	4	100	100	100	0.10							A	
483	AA1	AA1-15			TRANE	VCWF	5	200	130	80	0.10							A	
484	AA1	AA1-16			TRANE	VCWF	8	500	325	200	0.10							A	
485	AA1	AA1-17			TRANE	VCWF	14	1300	845	520	0.10							A	
486	AA1	AA1-18			TRANE	VCWF	16	2,250	1465	900	2.10							A	
487	AA1	AA1-19			TRANE	VCWF	16	2250	1465	900	0.50							A	
488	AA1	AA1-20			TRANE	VCWF	14	1500	975	600	1.10							A	
489	AA1	AA1-21	G101E	Band	TRANE	VCWF	4	100	100	100	4.00							A	
490	AA1	AA1-22	G101E	Practice	TRANE	VCWF	4	100	100	100	4.00							A	
491	AA1	AA1-23			TRANE	VCWF	4	100	100	100	2.40							A	
492	AA1	AA1-24			TRANE	VCWF	4	100	100	100	0.10							A	
493	AA1	AA1-25			TRANE	VCWF	14	1200	780	480	0.10							A	
494	AA1	AA1-26			TRANE	VCWF	10	750	490	300	0.10							A	
495	AA1	AA1-27			TRANE	VCWF	8	500	325	200	0.10							A	
496	AA1	AA1-28			TRANE	VCWF	16	2,000	1300	800	1.80				CH-AA1			C	
497	AA1	AA1-29			TRANE	VCWF	8	500	325	200	1.10							A	
498	NAT	108	108		ETR	ETR					8.10						Y	D	1, 2, 3
499	NAT	138	138		ETR	ETR					12.20					EF 3-1		E	1
500	NAT	101A	101A		PRICE	ETR					12.20							E	1
501	NAT	112	112		PRICE	ETR					3.30							E	1
502	NAT	116	116		PRICE	ETR					12.20							E	1
503	NAT	117	117		PRICE	ETR					?							E	1
504	NAT	122	122		PRICE	ETR					5.40							E	1
505	NAT	127	127		PRICE	ETR					12.20							E	1
506	NAT	132	132		PRICE	ETR					12.20							E	1
507	NAT	133	133		PRICE	ETR					12.20							E	1
508	NAT	101B	101B		PRICE	ETR					12.20						Y	F	1, 4, 5
509	NAT	102	102		PRICE	ETR					2.70							G	6
510	NAT	103	103		PRICE	ETR					1.20							G	6
511	NAT	104	104		PRICE	ETR					1.20							G	6
512	NAT	105	105		PRICE	ETR					2.70							G	6
513	NAT	106	106		PRICE	ETR					2.70							G	6
514	NAT	113	113		PRICE	ETR					1.20							G	6
515	NAT	114	114		PRICE	ETR					12.20							G	6
516	NAT	135	135		PRICE	ETR					1.20							G	6

*1 - USE TAMPERPROOF SPACE TEMPERATURE SENSOR.
*2 - OCCUPANCY SENSOR TIE-IN, LOCATED IN WOMEN'S RR.
*3 - HOT WATER LOOP TEMP SENSOR, LOCATED IN MEN'S RR.
*4 - CHILLED WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*5 - HOT WATER LOOP TEMP SENSOR, INSTALL IN RETURN WATER PIPING.
*6 - USE ADJUSTABLE SPACE TEMPERATURE SENSOR.
*7 - INSTALLED UNDER PREVIOUS PHASE, NO WORK UNDER THIS PHASE.

PHASE 3 VAV SCHEDULE (10 OF 10)

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JOB NUMBER:
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VAV BOX WITH REHEAT SEQUENCE OF OPERATION (NEW VAVs ADDED UNDER PHASE 3)

DISCHARGE AIR TEMPERATURE SENSOR: TCC SHALL PROVIDE A SUPPLY AIR TEMPERATURE SENSOR (DA-T) FOR MONITORING PURPOSES AND TO LIMIT THE DISCHARGE AT 95F (ADJ).

OCCUPIED MODE: WHEN THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE HEATING AND COOLING SETPOINTS, THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-CFM) AND THE REHEAT VALVE (HTG-VLV) SHALL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE COOLING SETPOINT OF 72F (ADJ) PLUS THE DEAD BAND, THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM AND THE REHEAT VALVE SHALL REMAIN FULLY CLOSED. ON A DROP IN TEMPERATURE BELOW THE HEATING SETPOINT OF 70F (ADJ), THE REHEAT VALVE SHALL MODULATE OPEN AFTER LOOP SIGNAL INCREASE AND THE PRIMARY AIR DAMPER SHALL MAINTAIN MINIMUM CFM UP TO THE HEATING MAX AIRFLOW. REFERENCE DIAGRAM AND SETPOINT MATRIX FOR FURTHER DETAILS.

UNOCCUPIED (NIGHT SETBACK) MODE: WHEN IN THE UNOCCUPIED MODE, THE VAV BOX SEQUENCE SHALL BE THE SAME AS THE ABOVE OCCUPIED SEQUENCE. UNOCCUPIED HEATING SETPOINT SHALL BE 65F (ADJ) AND THE COOLING SETPOINT SHALL BE 82F (ADJ). WHEN ANY TWO VAV BOXES REACH EITHER THEIR HEATING OR COOLING SETPOINT, THE AIR HANDLING UNIT SHALL START AND RUN TO MAINTAIN THE UNOCCUPIED SETPOINT. PROVIDE DIFFERENTIAL TO PREVENT SHORT CYCLING OF AHU.

VAV BOX WITH REHEAT SEQUENCE OF OPERATION (TYPICAL FOR 19 NATATORIUM VAV BOXES AS SHOWN IN PREVIOUS BAS AS-BUILT DRAWINGS)

DISCHARGE AIR TEMPERATURE SENSOR: TCC SHALL PROVIDE A SUPPLY AIR TEMPERATURE SENSOR (DA-T) FOR MONITORING PURPOSES AND TO LIMIT THE DISCHARGE AT 95F (ADJ).

OCCUPIED MODE: WHEN THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE HEATING AND COOLING SETPOINTS, THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-CFM) AND THE REHEAT VALVE (HTG-VLV) SHALL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE COOLING SETPOINT OF 72F (ADJ) PLUS THE DEAD BAND, THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM AND THE REHEAT VALVE SHALL REMAIN FULLY CLOSED. ON A DROP IN TEMPERATURE BELOW THE HEATING SETPOINT OF 70F (ADJ), THE REHEAT VALVE SHALL MODULATE OPEN AFTER LOOP SIGNAL INCREASE AND THE PRIMARY AIR DAMPER SHALL MAINTAIN MINIMUM CFM UP TO THE HEATING MAX AIRFLOW. REFERENCE DIAGRAM AND SETPOINT MATRIX FOR FURTHER DETAILS.

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EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE EXHAUST FAN STATUS (EF-S) DOES NOT MATCH THE COMMANDED VALUE AFTER 180 SECONDS (ADJ), AN ALARM SHALL BE GENERATED. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

CONVECTOR HEATING:

WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 50 F (ADJ), THE HOT WATER VALVE SHALL REMAIN CLOSED. BELOW 45 F (ADJ) OUTSIDE AIR TEMPERATURE, THE RADIANT HEATING VALVES SHALL CYCLE OPEN AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT SETPOINT OF 68F (ADJ).

CABINET UNIT HEATER:

ZONE TEMPERATURE CONTROL: THE THERMOSTAT (ZN-T) WILL OPEN THE 2-POSITION HEATING VALVE (HTG-VLV) AND ENABLE THE CABINET HEATER FAN TO MAINTAIN THE ZONE TEMPERATURE AT 70F (ADJ). THE BUILDING AUTOMATION SYSTEM SHALL DISABLE (BAS-OVR) HEATER OPERATION WHEN THE OUTDOOR AIR TEMPERATURE (OA-T) IS ABOVE 65F (ADJ).

IDF/MDF AND ELECTRICAL HVAC SPLIT SYSTEM MONITORING:

INSTALL AND WIRE BAS FLAT PLATE SPACE TEMPERATURE SENSORS FOR MONITOR OF IDF/MDF SPACES AND ALARM CONDITIONS. ALL STAND-ALONE HVAC SYSTEMS WILL HAVE BAS SPACE TEMPERATURE MONITORING IN addition TO THE CONTROLS FROM THE MANUFACTURER. AN ALARM WILL BE GENERATED IF THE SPACE RISES ABOVE 81F (ADJ) OR DROPS BELOW 59F (ADJ). THESE SPACES ALSO REQUIRE A SEPARATE THERMOSTAT FOR LOCAL EQUIPMENT CONTROL.

MONITORING AND CONTROL POINTS FROM PREVIOUS BAS:

INCLUDES POINTS FOUND IN VAV INSTALLATION DETAILS D THROUGH G AND INCLUDES:
- OCCUPANCY SENSOR
- HOT AND CHILL WATER LOOP TEMPERATURE MONITORING
- EXHAUST FAN 3-1

DETAILS REGARDING CONTROL, MONITORING, OR ALARMING WERE NOT PROVIDED IN PREVIOUS BAS AS-BUILT DRAWINGS. DETERMINE CURRENT CONTROL STRATEGIES FROM THE EXISTING BAS PRIOR TO CHANGEOVER AND DUPLICATE THOSE STRATEGIES IN THE NEW BAS.

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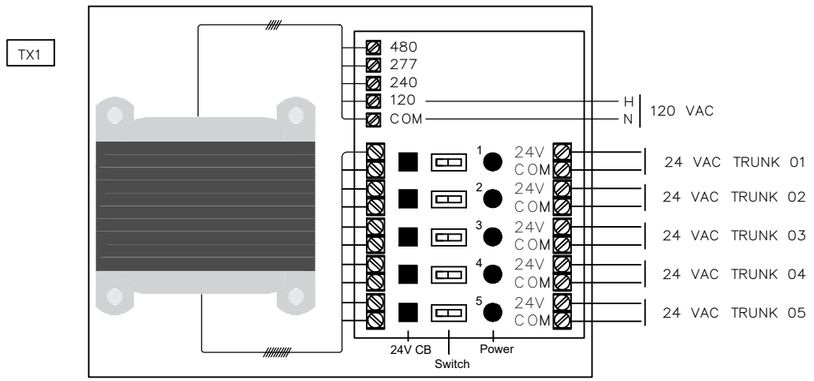
SHEET
NCHS-491
JOB NUMBER:
J-2304001

VAV POWER DISTRIBUTION DETAILS

REMOTE 500 vA TRANSFORMER PANEL

(SEE VAV POWER PANEL SCHEDULE FOR LOCATIONS & QUANTITIES)

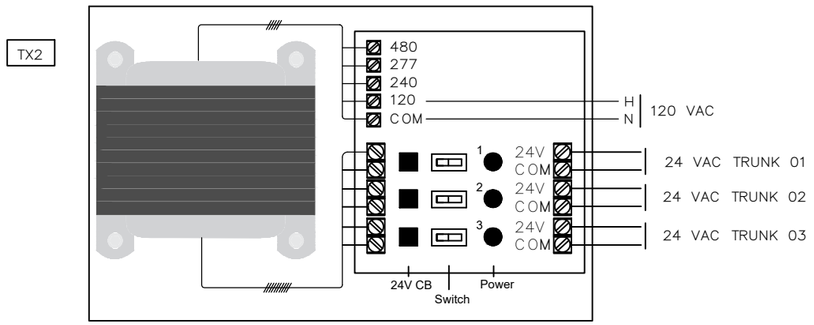
(LOCATE POWER PANELS ADJACENT TO THE SYSTEM CONTROL PANELS ON THE SCHEDULE)



REMOTE 300 vA TRANSFORMER PANEL

(SEE VAV POWER PANEL SCHEDULE FOR LOCATIONS & QUANTITIES)

(LOCATE POWER PANELS ADJACENT TO THE SYSTEM CONTROL PANELS ON THE SCHEDULE)



24 VAC Power Cable Sizing - Maximum allowable voltage drop

1. Supply voltage deviation should not exceed 2 VAC at any given terminal controller.
2. Table indicates the maximum one-way distance for power wiring based on load and wire size.
   a. These values will limit the voltage drop as indicated above.
3. To calculate the required wire size and maximum length:
   a. Determine power requirements for the controller and all connected devices including but not limited to:
      i. The controller itself with all onboard devices.
      ii. LINKNet controllers and devices
      iii. eZNS T-100 room sensors powered from the controller
      iv. Valve and damper actuators.
      v. Powered sensors.
      vi. Control relays.
4. Data for 18 AWG and greater wire in the accompanying table are from Chapter 9, Table 8 of the 2005 NEC. Resistance values based on a temperature of 75°C.
5. Data in the following table is based on the formula:
   a. Wire length (ft) = (Voltage Drop / (ohms per kFt * load in amps) * 1000) /2

Typical Power Calculations:

eZV-440	11 VA
eZFC-424R4-24	15 VA
DVC-V322A-B	15 VA
DNS-24L/LB/H24LB	1.5 VA
DNS-C24/CH24	3 VA
eZNS-T100 (ST)	2 VA (no backlight)
eZNS-T100 (ST)	4 VA (with backlight)
eZNS-T100 (ST/CO2)	6 VA (with backlight)
CQB24-SR	1 VA
LF24-SR	5 VA
TFB24-S	5 VA

		AWG (ohms / kFt)						
		22 Ga	20 Ga	18 Ga	16 Ga	14 Ga	12 Ga	10 Ga
		16.46	10.35	7.95	4.99	3.14	1.98	1.24
A	**VA**	**Max One-Way Distance to Load (ft)**						
0.11	2.5	552	878	1144	1822	2895	4591	7331
0.21	5	289	460	599	954	1517	2405	3840
0.42	10	145	230	302	481	764	1212	1935
0.83	20	73	116	151	240	382	606	968
1.25	30	49	77	101	160	255	404	645
1.67	40	36	58	75	120	191	303	484
2.08	50	29	46	60	96	153	242	387
2.5	60	24	39	50	80	127	202	323
2.92	70	21	33	43	69	109	173	276
3.33	80	18	29	38	60	96	152	242
3.75	90	16	26	34	53	85	135	215
4	96	15	24	31	50	80	126	202

24 VAC Power Trunks:

1. Typically utilizes #14 Gauge or heaver cable.
2. Typically, each leg is intended to support four (4) to five (5) VAV box controllers maximum.
3. See table for cable requirements for long runs and/or high VA requirements.

BILL OF MATERIALS

WILL BE PROVIDED IN A FUTURE REVISION. △

VAV POWER PANEL SCHEDULE

IDENTITY DATA			PANEL 1 MODEL	PANEL 2 MODEL	NOTES
ITEM	SERVICE	INSTALL ADJACENT TO:			
1	AHU-B1 VAVs	System Panel 28	PSH-500	--	1, 4
2	AHU-C1VAVs	System Panel 16	PSH-300	--	1, 4
3	AHU-C4 VAVs	System Panel 29	PSH-500	--	1, 4
4	AHU-D1 VAVs	System Panel 30	PSH-500	PSH-300	1, 3, 4
5	AHU-D2 VAVs	System Panel 31	PSH-500	--	1, 4
6	AHU-E1 VAVs	System Panel 32	PSH-300	--	1, 4
7	AHU-E2 VAVs	System Panel 33	PSH-500	--	1, 4
8	AHU-E3 VAVs	System Panel 34	PSH-300	--	1, 4
9	AHU-F1 VFDs	System Panel 35	PSH-500	--	1, 4
10	AHU-G4 VFDs	System Panel 06	PSH-300	--	1, 2, 4
11	AHU-H1 VFDs	System Panel 36	PSH-500	--	1, 4
12	AHU-H2 VFDs	System Panel 37	PSH-300	--	1, 4
13	AHU-J1 VFDs	System Panel 20	PSH-500	--	1, 4
14	AHU-J2 VFDs	System Panel 21	PSH-300	--	1, 4
15	AHU-J3 VFDs	System Panel 22	PSH-500	--	1, 4
16	AHU-M1 VFDs	System Panel 24	PSH-300	--	1, 4
18	AHU-N1 VFDs	System Panel 43	PSH-300	--	1, 4
19	AHU-N2 VFDs	System Panel 44	PSH-500	--	1, 4
20	AHU-P1 VFDs	System Panel 45	PSH-500	PSH-300	1, 3, 4
21	AHU-P2 VFDs	System Panel 46	PSH-500	--	1, 4
22	AHU-Q1 VFDs	System Panel 47	PSH-300	--	1, 4
23	AHU-Q2 VFDs	System Panel 48	PSH-500	--	1, 4
24	AHU-R1 VFDs	System Panel 49	PSH-300	--	1, 4
25	AHU-R2 VFDs	System Panel 50	PSH-300	--	1, 4
26	AHU-S1 VFDs	System Panel 51	PSH-500	--	1, 4
27	AHU-T1 VFDs	System Panel 52	PSH-300	--	1, 4
28	AHU-AA1 VFDs	System Panel 26	PSH-500	PSH-300	1, 3, 4
29	NAT-AHU-3 VFDs	System Panel 55	PSH-500	--	1, 4

*1 - SEE VAV POWER DISTRIBUTION PANEL WIRING SHEET FOR DETAILS ON HOW TO DIVIDE LOADS. △
*2 - SYSTEM PANEL INSTALLED ON PREVIOUS PHASE.
*3 - TWO VAV POWER PANELS USED FOR THIS SYSTEM.
*4 - PANEL SELECTIONS BASED ON 14 GA WIRE AND FIVE (5) VAV BOX CONTROLLERS PER SECONDARY TRANSFORMER LEG. △

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UPDATES	
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△ 04/20/2023	ADD 5.3
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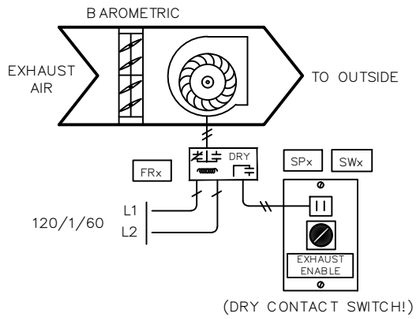
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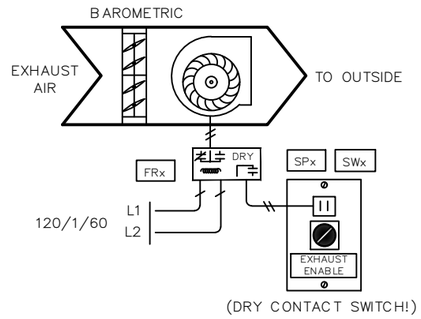
SHEET
NCHS-492
JOB NUMBER:
J-2304001

EXHAUST FAN – TOGGLE SWITCH CTRL — EF–C6



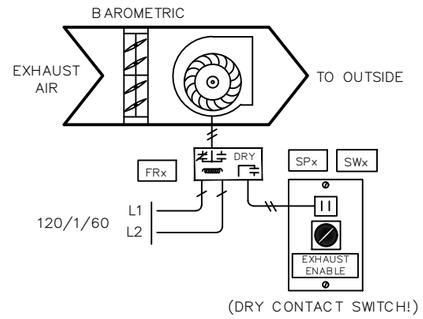
(DRY CONTACT SWITCH!)

EXHAUST FAN – TOGGLE SWITCH CTRL — EF–E5



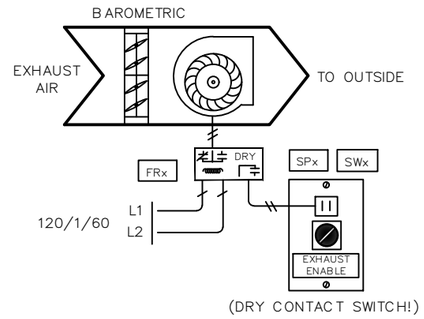
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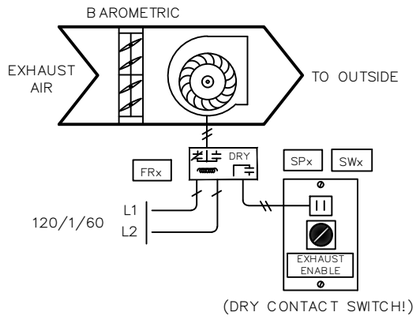
(DRY CONTACT SWITCH!)

EXHAUST FAN – TOGGLE SWITCH CTRL — EF–E7



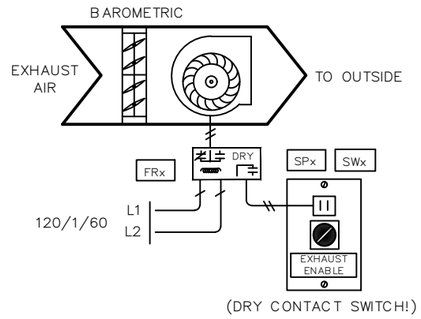
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EXHAUST FAN – TOGGLE SWITCH CTRL — EF–N7



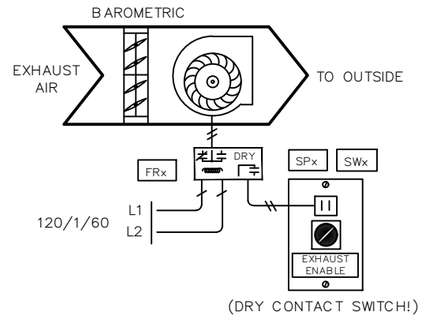
(DRY CONTACT SWITCH!)

EXHAUST FAN – TOGGLE SWITCH CTRL — EF–N8



(DRY CONTACT SWITCH!)

EXHAUST FAN – TOGGLE SWITCH CTRL — EF–P8



(DRY CONTACT SWITCH!)

BILL OF MATERIALS

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO WALL MOUNTED TOGGLE SWITCH. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

EXHAUST FANS – STANDALONE WITH TOGGLE SWITCH CONTROLS

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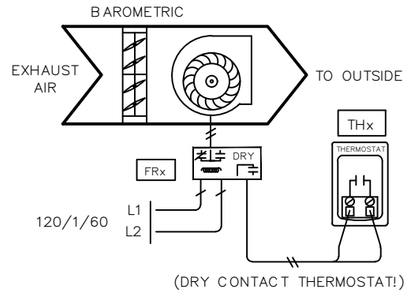
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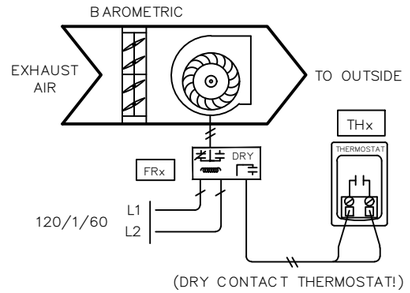
EXHAUST FAN – THERMOSTAT CTRL

EF–C9



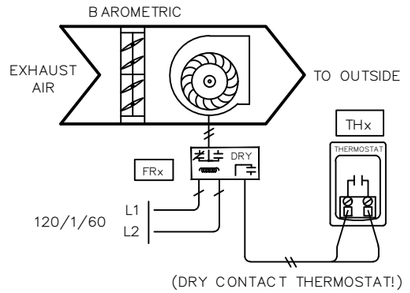
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EF–E3



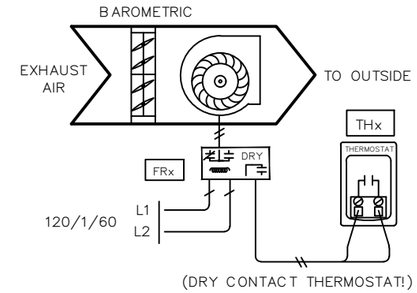
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EF–E4



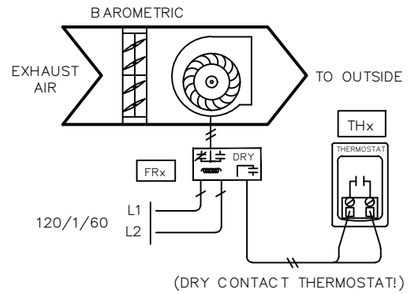
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EF–F2



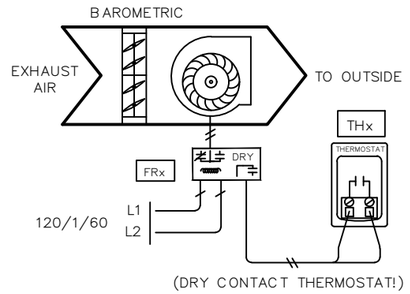
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EF–F5



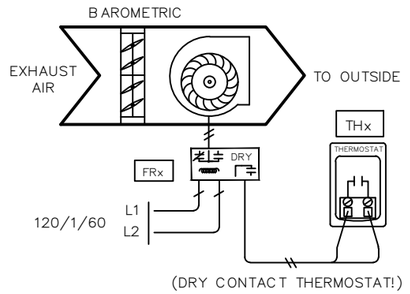
EXHAUST FAN – THERMOSTAT CTRL

EF–F7



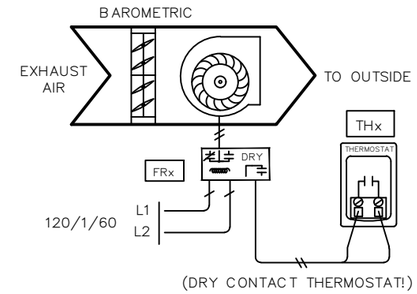
EXHAUST FAN – THERMOSTAT CTRL

EF–G5



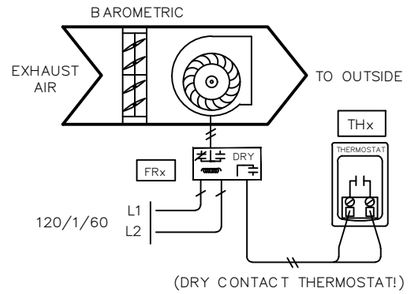
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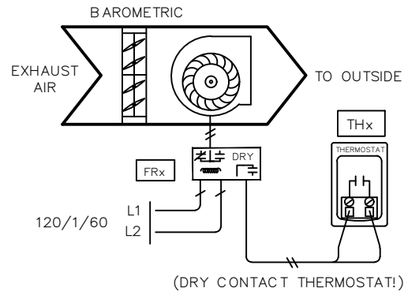
EXHAUST FAN – THERMOSTAT CTRL

EF–H3



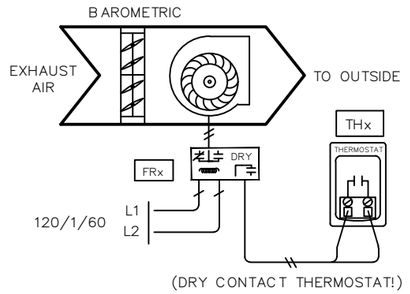
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EF–H6



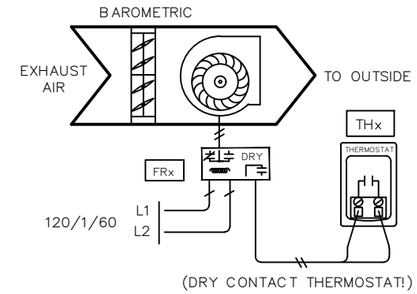
EXHAUST FAN – THERMOSTAT CTRL

EF–K7



EXHAUST FAN – THERMOSTAT CTRL

EF–K8



BILL OF MATERIALS

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO WALL MOUNTED THERMOSTAT. CONTRACTOR SHALL SET ADJUSTABLE THERMOSTAT TO CONTROL SPACE TEMPERATURE TO 75F. SEE ELECTRICAL DRAWINGS FOR DISCONNECT LOCATION INFORMATION.

EXHAUST FANS – STANDALONE WITH THERMOSTAT CONTROLS (1 OF 3)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

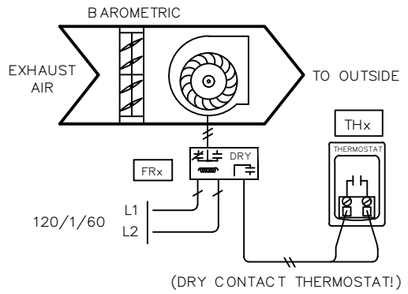
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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS–494
JOB NUMBER:
J–2304001

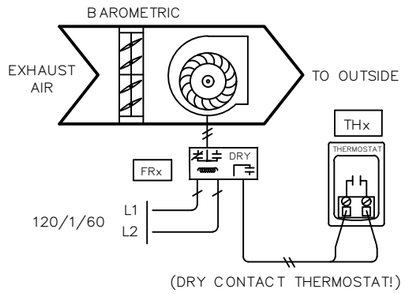
EXHAUST FAN – THERMOSTAT CTRL

EF–K9



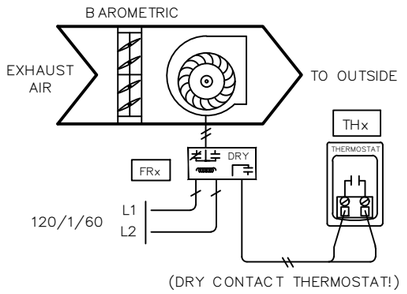
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EF–L3



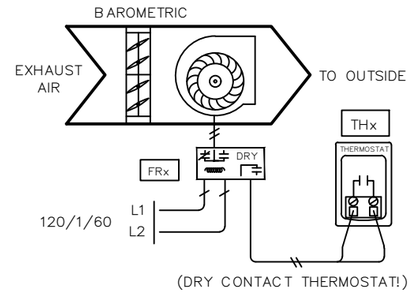
EXHAUST FAN – THERMOSTAT CTRL

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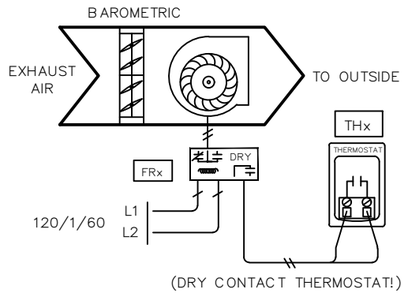
EXHAUST FAN – THERMOSTAT CTRL

EF–M18



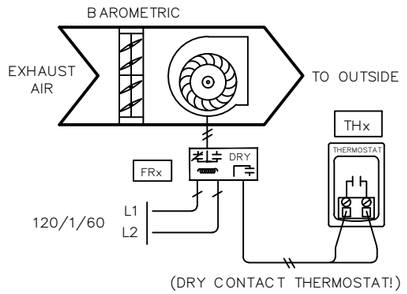
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EF–N5



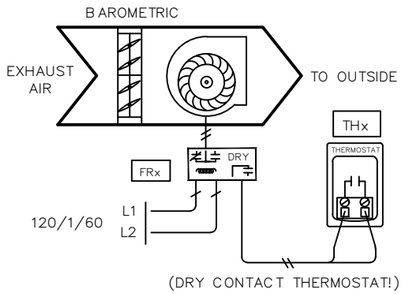
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EF–N9



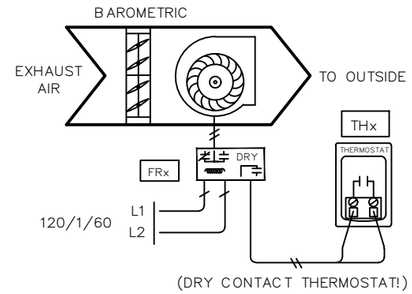
EXHAUST FAN – THERMOSTAT CTRL

EF–N11



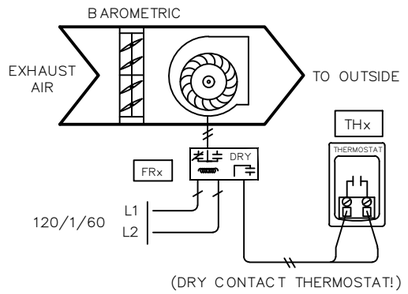
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EF–N13



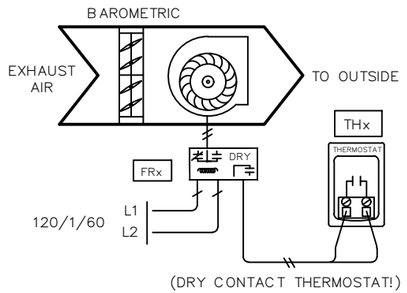
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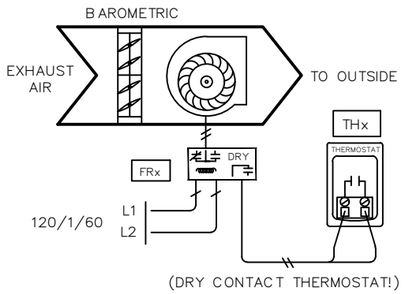
EXHAUST FAN – THERMOSTAT CTRL

EF–P7



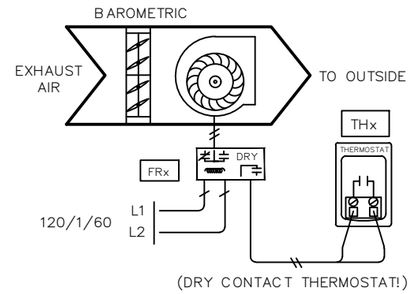
EXHAUST FAN – THERMOSTAT CTRL

EF–P8



EXHAUST FAN – THERMOSTAT CTRL

EF–Q1



BILL OF MATERIALS

EXHAUST FANS – STANDALONE WITH THERMOSTAT CONTROLS (2 OF 3)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
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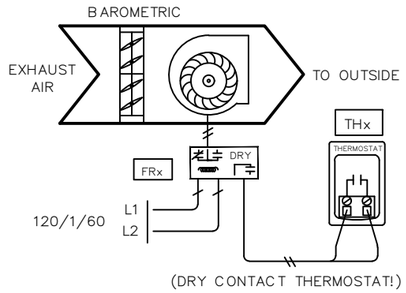
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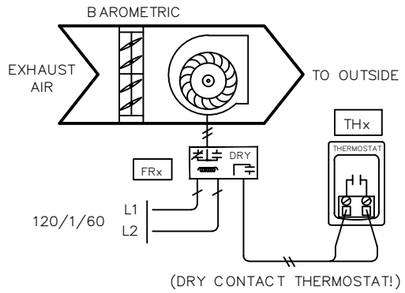
CONTRACT NO:

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JOB NUMBER:
J–2304001

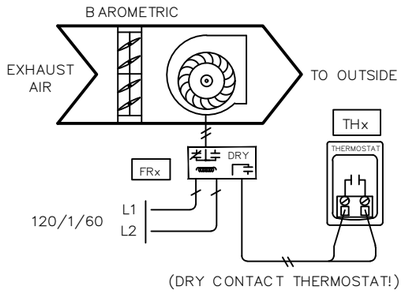
EXHAUST FAN – THERMOSTAT CTRL
EF–Q9



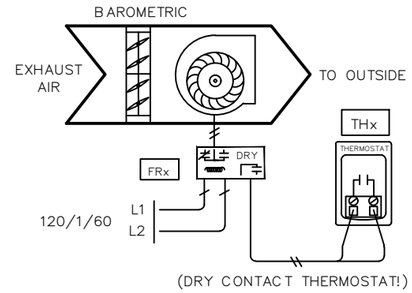
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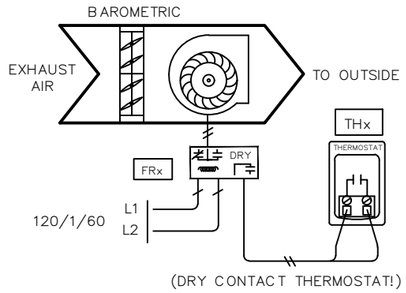
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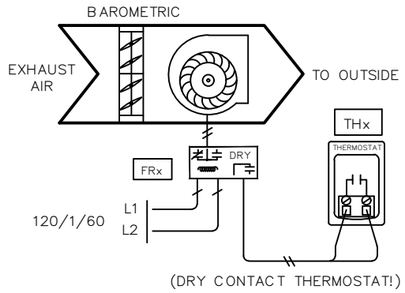
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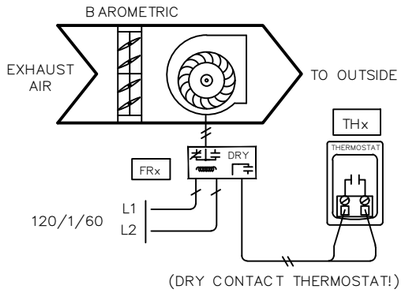
EXHAUST FAN – THERMOSTAT CTRL
EF–R1



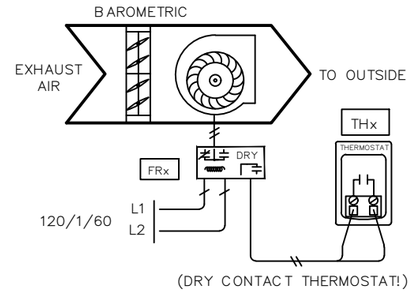
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EF–R10



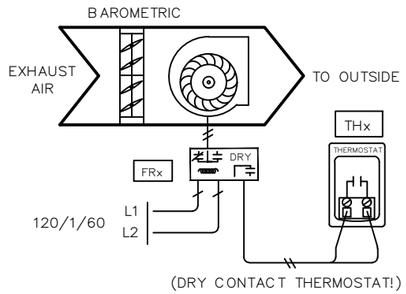
EXHAUST FAN – THERMOSTAT CTRL
EF–R11



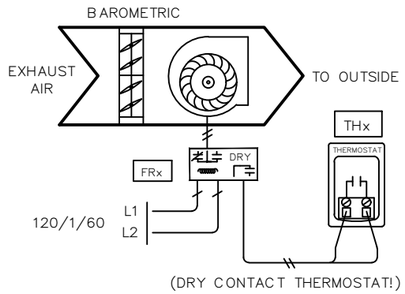
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EF–S1



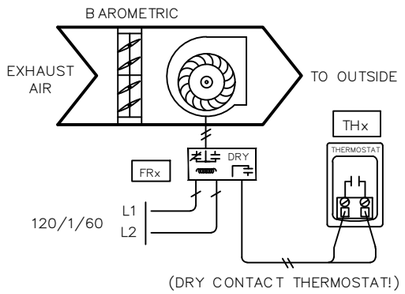
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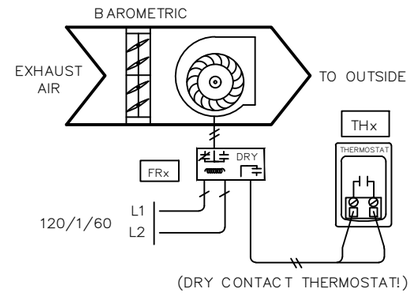
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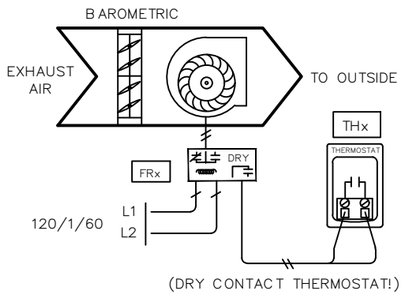
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EF–T1



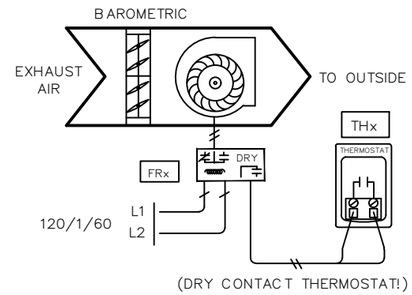
EXHAUST FAN – THERMOSTAT CTRL
EF–15



EXHAUST FAN – THERMOSTAT CTRL
EF–W1



EXHAUST FAN – THERMOSTAT CTRL
EF–AA4



BILL OF MATERIALS

EXHAUST FANS – STANDALONE WITH THERMOSTAT CONTROLS (3 OF 3)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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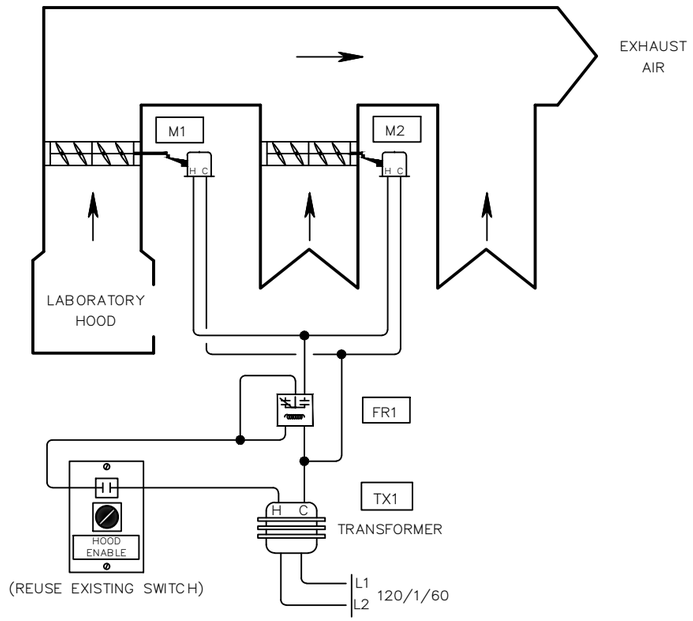
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DATE	REMARKS

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SHEET
NCHS–496
JOB NUMBER:
J–2304001

LAB HOOD EXHAUST INTERLOCK
(TYPICAL FOR 24 HOODS)



NOTES:
SEE EXHAUST FAN SCHEDULE TO DETERMINE WHICH EXHAUST FANS HAVE ASSOCIATED LAB HOOD DAMPER INTERLOCKS. DAMPER HOODS OPERATE LOCALLY AND INDEPENDENTLY OF BAS–CONTROLLED EXHAUST FANS.

SEE DAMPER SCHEDULE FOR DAMPER ACTUATOR REQUIREMENTS. △

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

SCIENCE ROOM LAB HOOD SEQUENCE OF OPERATION

LAB HOOD OPERATION: THE LAB HOOD SWITCH SHALL BE CONTROLLED MANUALLY BY THE OPERATOR. WHEN THE SWITCH IS TURNED ON, THE BAS CONTROL RELAY SHALL DRIVE THE NORMALLY CLOSED HOOD AND NORMALLY OPEN ZONE DAMPER ACTUATORS. WHEN THE OPERATOR TURNS THE HOOD SWITCH OFF, BOTH DAMPERS SHALL SPRING TO NORMAL POSITION.

LAB HOOD EXHAUST INTERLOCK SCHEDULE

IDENTITY DATA				LAB HOOD CONTROL	ASSOCIATED EXHAUST FAN	ASSOCIATED EF CONTROL	NOTES
ITEM	ROOM	SERVICE	FLOOR				
1	N101	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-R6	BAS	1, 2
2	N105	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-R9	BAS	1, 2
3	N106	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-R8	BAS	1, 2
4	N108	SCIENCE LAB	FIRST	EXISTING HOOD SWITCH	EF-R16	BAS	1, 2
5	N111	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-R12	BAS	1, 2
6	N115	SCIENCE LAB	FIRST	EXISTING HOOD SWITCH	EF-Q20	BAS	1, 2
7	N116	SCIENCE LAB	FIRST	EXISTING HOOD SWITCH	EF-R13	BAS	1, 2
8	N120	SCIENCE LAB	FIRST	EXISTING HOOD SWITCH	EF-Q24	BAS	1, 2
9	N121	SCIENCE LAB	FIRST	EXISTING HOOD SWITCH	EF-Q21	BAS	1, 2
10	N122	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-Q13	BAS	1, 2
11	N125	SCIENCE LAB	FIRST	EXISTING HOOD SWITCH	EF-Q22	BAS	1, 2
12	N126	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-Q25	BAS	1, 2
13	N127	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-Q27	BAS	1, 2
14	N129	SCIENCE CLASSROOM	FIRST	EXISTING HOOD SWITCH	EF-Q28	BAS	1, 2
15	N216	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-R19	BAS	1, 2
16	N219	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-R15	BAS	1, 2
17	N220	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-Q26	BAS	1, 2
18	N223	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-Q2	BAS	1, 2
19	N224	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-Q5	BAS	1, 2
20	N227	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-Q3	BAS	1, 2
21	N228	SCIENCE LAB	SECOND	EXISTING HOOD SWITCH	EF-Q6	BAS	1, 2
22	N229	BIOLOGY LAB	SECOND	EXISTING HOOD SWITCH	EF-Q4	BAS	1, 2
23	N231	CHEMISTRY LAB	SECOND	EXISTING HOOD SWITCH	EF-Q29	BAS	1, 2
24	N235	CHEMISTRY LAB	SECOND	EXISTING HOOD SWITCH	EF-Q11	BAS	1, 2

*1 - DAMPER HOODS OPERATE LOCALLY AND INDEPENDENTLY OF BAS-CONTROLLED EXHAUST FANS.
*2 - ASSOCIATED EXHAUST FANS IDENTIFIED FOR CONVENIENCE. THERE IS NO MECHANICAL OR ELECTRICAL TIE-IN BETWEEN THE TWO SYSTEMS.

△

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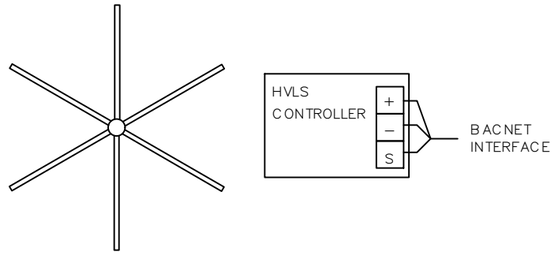
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HIGH VOLUME, LOW SPEED FANS
HVLSF–X



EXHAUST FAN SCHEDULE										
IDENTITY DATA					ELECTRICAL DATA					
MARK	MANUF	SERVICES	MODEL	HP	VOLTS (V)	PH	FREQ (HZ)	UNIT CONTROL	CONTROLLED FROM	NOTES
CF-1	GREENHECK	Unit U Level 2	DC-5	0.25	120	1	60	FACTORY BACNET CTRL	Mech K225B AHU-S1 MS/TP	Standalone Ctrls, MS/TP comm to BAS
CF-2	GREENHECK	Unit U Level 2	DC-5	0.25	120	1	60	FACTORY BACNET CTRL	Mech K225B AHU-S1 MS/TP	Standalone Ctrls, MS/TP comm to BAS
CF-3	GREENHECK	Unit V Level 2	DC-5	0.25	120	1	60	FACTORY BACNET CTRL	Mech K225B AHU-S1 MS/TP	Standalone Ctrls, MS/TP comm to BAS

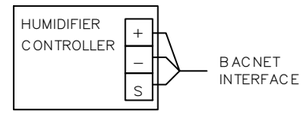
HIGH VOLUME LOW SPEED (HVLS) FANS SEQUENCE OF OPERATION

THE HVLS FANS SHALL BE FURNISHED WITH A SINGLE CONTROLLER WITH BACnet MSTP INTERFACE AND 50 FEET OF CAT-5E CONTROL CABLE FOR INTERLOCKING ALL FAN OPERATION. THE CIC CONTRACTOR SHALL INSTALL THE 50-FT OF CAT-5E CONTROL CABLE, THE CONTROLLER, AND ALSO FURNISH AND INSTALL ANY ADDITIONAL CAT-5E CABLE REQUIRED TO INTERLOCK THE OPERATION OF ALL FANS. THE CIC CONTRACTOR SHALL PROVIDE AND INSTALL A LOCKABLE PANEL TO INSTALL THE CEILING FAN CONTROLLER IN AND 24VDC/24VAC POWER (AS REQUIRED) PER MECHANICAL DRAWINGS.

OCCUPIED MODE: THE FANS (HVLSFn-C) SHALL BE COMMANDED TO RUN BASED MANUAL OPERATION AT THE LOCAL INTERFACE. THE BACnet MSTP INTERFACE SHALL NOT BE CONNECTED AT THIS TIME. A MAXIMUM SPEED OF 50 FT/MIN AT 4' A.F.F. SHALL BE MAINTAINED WHEN THE FANS ARE OPERATING. ALL FANS SHALL RUN CONCURRENTLY WHEN ENABLED AT THE SAME SPEED.

FIRE SAFETY MODE: THE FANS SHALL BE FURNISHED WITH A N.C. FIRE ALARM RELAY FOR INTERLOCK WITH THE FIRE ALARM SYSTEM. THE CIC CONTRACTOR SHALL COORDINATE WITH THE FIRE ALARM CONTRACTOR TO PROVIDE A FIRE ALARM OUTPUT FROM WHICH THE CONTROLLER CAN UTILIZE. THE CIC CONTRACTOR SHALL FURNISH AND INSTALL WIRING TO THE FIRE ALARM PANEL. THE FIRE ALARM CONTRACTOR SHALL BE RESPONSIBLE FOR TERMINATION OF THE WIRING. UPON SENSING AN ALARM, THE HVLS FAN SHALL BE HARDWIRED TO PREVENT OPERATION UNTIL THE ALARM IS CLEARED.

SPACE HUMIDIFIERS
HAA–X



ELECTRIC HUMIDIFIER SCHEDULE - 23 84 13														
IDENTITY DATA				OUTPUT (LB/H)	WATER DATA		ELECTRICAL DATA						CONTROLLED FROM	NOTES
MARK	MANUF	MODEL	SERVES		TYPE	FLOW (GPM)	CAP. (KW)	VOLTS (V)	PH	FREQ (HZ)	MCA (A)	MOCP (A)		
H-AA1	DRISTEEM	RX-63-1	ORCHESTRA	63.0	DCW	0.12	21	480	3	60	27.1	30.0	FACTORY BACNET CTRL	Standalone Ctrls, MS/TP comm to BAS
H-AA2	DRISTEEM	RX-12-1	ORCHESTRA STORAGE	12.0	DCW	<0.1	4	480	3	60	7.2	10.0	FACTORY BACNET CTRL	Standalone Ctrls, MS/TP comm to BAS
H-AA3	DRISTEEM	RX-6-1	BAND/INSTRUMENT CORRIDOR	18.0	DCW	<0.1	6	480	3	60	7.2	10.0	FACTORY BACNET CTRL	Standalone Ctrls, MS/TP comm to BAS

SPACE HUMIDIFIERS HAA-1, HAA-2, H-AA3: TCC SHALL CONNECT TO SPACE HUMIDIFIERS VIA BACNET MSTP FOR MONITORING OF THE UNITS.

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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

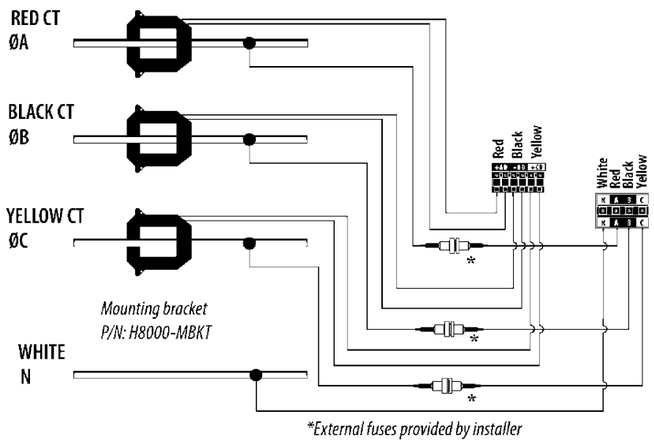
CONTRACT NO:

SHEET
NCHS–498
JOB NUMBER:
J–2304001

POWER METER HIGH VOLTAGE WIRING DETAIL

(FOR REFERENCE ONLY, WIRING EXISTING, NOT INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)

TYPICAL 208/480VAC, 4-WIRE, 3Ø INSTALLATION

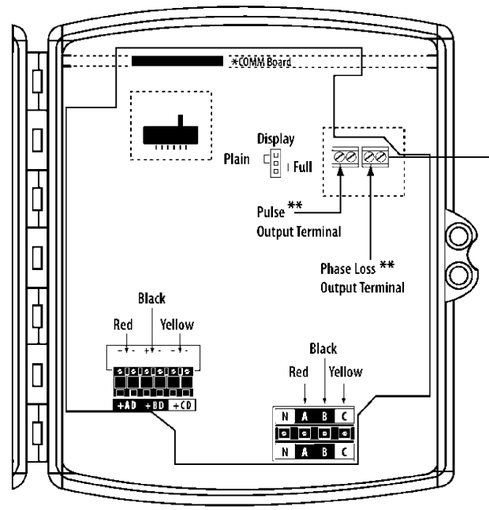


*External fuses provided by installer

(* PREVIOUS BAS DESIGN INDICATES VERIS AH04 TRIPLE FUSE KITS WERE INSTALLED)

POWER METER LOW VOLTAGE WIRING DETAIL

(BACNET MS/TP COMMUNICATION AND PHASE LOSS MONITORING INCLUDED IN PHASE 3 SCOPE)
(TYPICAL FOR ONE (1) METER IN THIS AREA)



PHASE LOSS OUTPUT
(ONE CONNECTION PER METER)

27 TR MTR (PHASE 2B TRANSPORTATION BLDG.)

COMMUNICATION CARD (IF INSTALLED)

+ – S

BACNET INTERFACE
(ONE CONNECTION PER METER)

*COMM Board is Optional
**H8160 Series only

NOTE:
METER MONITORING ADDED UNDER PHASE 3 PROJECT. CONNECTION OF METER (HARD-WIRE INPUT AND BACNET) TO THE BAS SHALL OCCUR AT SYSTEM CONTROL PANEL 01, HOT WATER PLANT, IN THE TRANSPORTATION BUILDING.

NETWORK POINTS
N1 THROUGH Nx

TRANSPORTATION BUILDING PHASE LOSS MONITORING FIELD DEVICES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

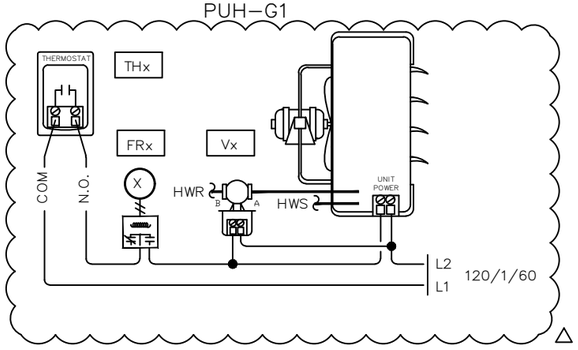
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

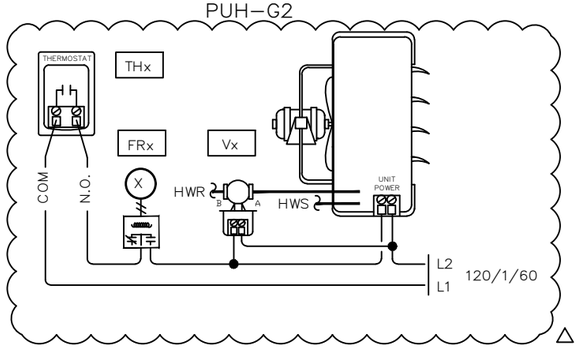
CONTRACT NO:

SHEET
NCHS-499
JOB NUMBER:
J-2304001

PROPELLER UNIT HEATER
PUH–G1



PROPELLER UNIT HEATER
PUH–G2



NOTE:
PROPELLER UNIT HEATERS ADDED UNDER PHASE 3 PROJECT. CONNECTION OF INTERLOCK TO THE BAS SHALL OCCUR AT SYSTEM CONTROL PANEL 03, AHU–G1, LOCATED IN AREA G. WIRE INTERLOCK TO OUTPUTS 8 AND 9 OF THE DSC–1212E CONTROLLER.

BILL OF MATERIAL

WILL BE PROVIDED IN A FUTURE REVISION. △

NETWORK POINTS

N1 THROUGH Nx

AHU–G1 PROPELLER UNIT HEATER FIELD DEVICES

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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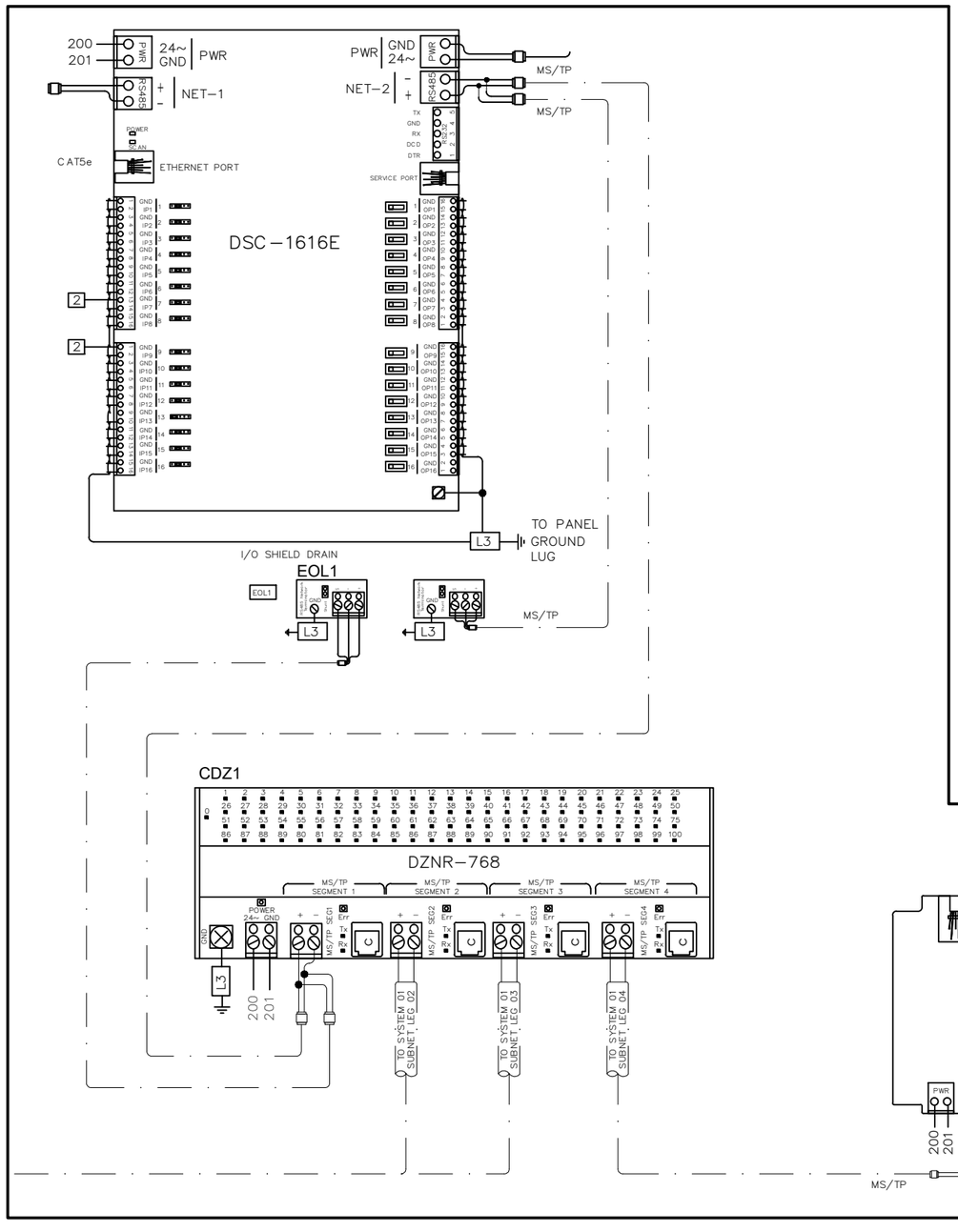
JOB TITLE: North Central High School
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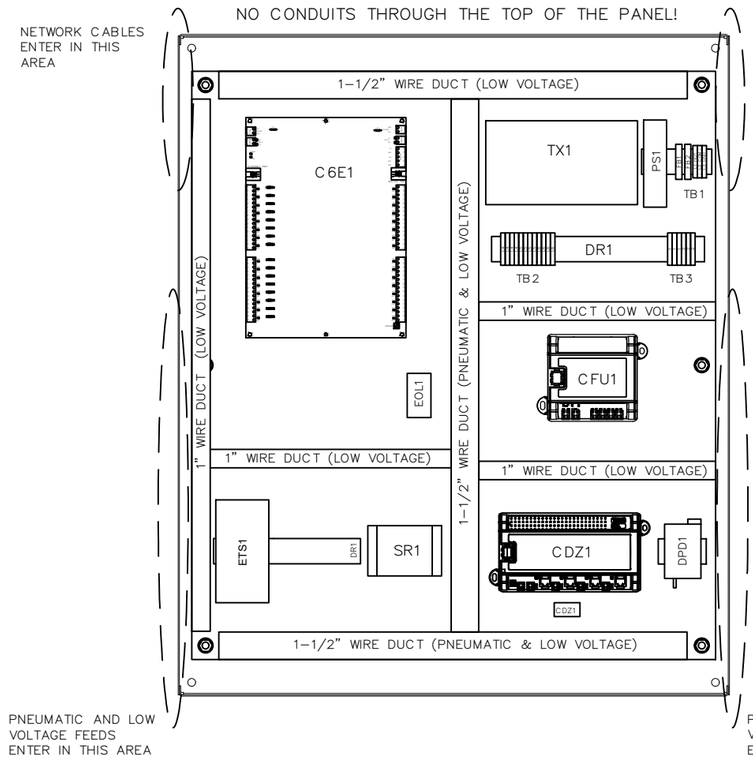
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(EXISTING) SYSTEM CONTROL PANEL 06

(COMPONENTS SHOWN FOR CLARITY. ONLY DEVICES BEING ADDED ARE ONE (1) DZNR–768 BACNET MS/TP REPEATER (ITEM CDZ1) AND ONE (1) NETWORK TERMINATOR (ITEM TRM1)





BILL OF MATERIALS

NOTE:
REWORK MS/TP CABLING AS INDICATED TO INCORPORATE DFM–400 ON DZNR–768 REPEATER, SEGMENT 4, IN LIEU OF A DIRECT CONNECTION TO NET 2 OF THE SYSTEM CONTROLLER.

AHU–G4 PANEL DEVICE ADDS UNDER PHASE 3 PROJECT

Delta Controls

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CONTROLS INSTALLATION CONTRACTOR (CIC) MISCELLANEOUS SEQUENCES AND INFORMATION:

IT IS THE INTENTION OF THIS PROJECT TO PROVIDE DELTA CONTROLS DEVICES FOR ALL NEW EQUIPMENT EXCEPT NOTED PACKAGED EQUIPMENT AND CAPABLE OF ACHIEVING THE SEQUENCE OF OPERATION UTILIZING BACnet IP AND MSTP COMMUNICATION. TEMPERATURE CONTROLS SERVICES (TCS) SHALL PROVIDE ALL REQUIRED CONTROLS EQUIPMENT PER THE DRAWINGS AND SPECIFICATIONS AND WILL FUNCTION AS THE TCC. THE MECHANICAL CONTRACTOR SHALL PERFORM THE CIC SCOPE OF WORK AS QUALIFIED OR SUBCONTRACT THE WORK AS NEEDED. TCS AS THE TCC SHALL IDENTIFY AND COMMUNICATE TO THE CONTROLS INSTALLATION CONTRACTOR (CIC) ANY INSTALLATION DISCREPANCIES OR ISSUES FOR RESOLUTION BY THE CIC. ALL COORDINATION AND COMMUNICATION WITH TCS SHALL INCLUDE BRIAN SHEPPERD - BRIAN@TCSBAS.COM

TCS SHALL PROVIDE A COMPREHENSIVE GRAPHIC PACKAGE TO INCLUDE ALL NEW EQUIPMENT CONTROLLED OR MONITORED BY THE BUILDING AUTOMATION SYSTEM AND SHALL PROVIDE EQUIPMENT POINT DATABASE, LICENSING, SCHEDULES, TRENDING, AND REPORTS.

TCS SHALL COORDINATE WITH THE CLIENT FOR: EMAIL ALARM INFORMATION, 1-YEAR TRENDING AND REPORTS, OCCUPIED AND HOLIDAY SCHEDULES, AND SPECIALTY EQUIPMENT PARAMETERS AND ALARMING.

IDF/MDF AND ELECTRICAL HVAC SPLIT SYSTEM MONITORING SS-n: TCC SHALL REFERENCE THE MECHANICAL SCHEDULE AND CIC SHALL INSTALL AND WIRE BAS FLAT PLATE SPACE TEMPERATURE SENSORS FOR MONITOR OF IDF/MDF SPACES AND ALARM CONDITIONS. ALL STAND-ALONE HVAC SYSTEMS WILL HAVE BAS SPACE TEMPERATURE MONITORING IN ADDITION TO THE CONTROLS FROM THE MANUFACTURER. AN ALARM WILL BE GENERATED IF THE SPACE RISES ABOVE 81F (ADJ) OR DROPS BELOW 59F (ADJ). THESE SPACES ALSO REQUIRE A SEPARATE THERMOSTAT FOR LOCAL EQUIPMENT CONTROL THAT CIC WILL ENSURE IS CONFIGURED AND OPERATING PROPERLY. SEE MECHANICAL PLANS FOR ADDITIONAL REQUIREMENTS.

CONTROL PANELS: TCC SHALL PROVIDE AND CIC SHALL INSTALL TEMPERATURE CONTROL PANEL BACKPLATES THAT ARE HOFFMAN STYLE FOR ALL AIR HANDLING UNITS EXCEPT AHU-AA1, AHU-J3, AND AHU-K6. THE TECHNOLOGY CONTRACTOR WILL PROVIDE ETHERNET DROPS FOR ALL PANELS THAT DO NOT ALREADY HAVE BUILDING NETWORK CONNECTIVITY AND THE DIVISION 26 CONTRACTOR SHALL PROVIDE 120 VAC CIRCUITS FOR ALL NEW PANELS DEDICATED TO PANEL AND VAV POWER. CIC IS RESPONSIBLE TO DEMOLISH EXISTING CONTROL PANEL CONTENTS BY REMOVING THE BACKPLATE AND ALL CONTENTS FROM THE EXISTING TO REMAIN PANELS WITH THE EXCEPTION TO FIELD CONTROL WIRING AND CONDUIT. CIC IS RESPONSIBLE TO INSTALL THE REPLACEMENT BACKPLATE WITH NEW CONTROLS PRE-MOUNTED AND PROVIDED BY TCC AND TERMINATE PER TCC DRAWINGS. ADDITIONAL CABLING SHALL ALSO BE INSTALLED BY THE CIC IN CONDUIT WITHIN MECHANICAL ROOMS. CLEARLY LABEL PANELS AS TO THE EQUIPMENT CONTROLLED AND INCLUDE A COPY OF THE CONTROL DRAWINGS IN A PROTECTIVE COVER AFFIXED ON THE INSIDE PANEL DOOR. SEPARATE CIRCUIT PROVIDED BY DIVISION 26 FOR VAV POWER PANELS.

BUILDING NETWORK ETHERNET INTERFACE: ONE (1) DATA DROP SHALL BE PROVIDED BY THE TELECOMMUNICATIONS CONTRACTOR FOR USE BY TCC IN EACH MECHANICAL ROOM TO EACH TEMPERATURE CONTROL PANEL. SEE TELECOMMUNICATIONS DRAWINGS.

ELECTRICAL UTILITY POWER MONITORING: TCC SHALL MONITOR FOR PHASE LOSS ON EXISTING TO REMAIN POWER METERS. TCC SHALL GENERATE AN ALARM UPON PHASE LOSS FOR MANUAL DECISION TO SHUTDOWN CHILLERS, AIR HANDLING UNITS, AND BOILERS. EXISTING TO REMAIN EQUIPMENT INCLUDE:

1. CENTRAL PLANT MDPC - GE POWERLOGIX
2. MAIN ELECTRICAL ROOM MDPA-LEFT - HAWKEYE 8100
3. MAIN ELECTRICAL ROOM MDPA-RIGHT - HAWKEYE 8100
4. MAIN ELECTRICAL ROOM MDPB-LEFT A - HAWKEYE 8100
5. MAIN ELECTRICAL ROOM MDPB-LEFT B - HAWKEYE 8100
6. MAIN ELECTRICAL ROOM MDPB-RIGHT A - HAWKEYE 8100
7. MAIN ELECTRICAL ROOM MDPB-RIGHT A - HAWKEYE 8100
8. NATATORIUM - FIELD DETERMINED
9. WEST GYM - FIELD DETERMINED
10. SOUTH LOCKER ROOM - FIELD DETERMINED
11. TRANSPORTATION BUILDING - FIELD DETERMINED

EXISTING TO REMAIN HVAC EQUIPMENT: TCC SHALL PROVIDE AND CIC SHALL INSTALL REPLACEMENT CONTROLS FOR THE EQUIPMENT SHOWN ON THE OWNER PROVIDED AS-BUILT DRAWINGS SHOWN ON M-701.3 TO M-731.3. CIC SHALL REFERENCE TCC (TEMPERATURE CONTROL SERVICES) DRAWINGS ISSUED BY ADDENDUM FOR DETAILED REQUIREMENTS.

BUILDING ANNUNCIATOR PANEL: UPON BRINGING AN AIR HANDLING UNIT ONLINE TCS SHALL BE RESPONSIBLE TO COMMUNICATE CRITICAL ALARMS TO THE EXISTING TO REMAIN ANNUNICATOR PANEL CONTROLLER.

SPACE HUMIDIFIERS HAA-1, HAA-2, H-AA3: TCC SHALL CONNECT TO SPACE HUMIDIFIERS VIA BACNET MSTP FOR MONITORING OF THE UNITS.

Delta Controls
Temperature Control Services
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
NCHS-502
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																		Ordering Data				
																			2 WAY	3 WAY													
																			2VDC FAIL		2VDC FAIL											
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn. Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
1	1	3	RCP-K1 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
2	1	3	RCP-K2 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
3	1	3	RCP-K3 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
4	1	3	RCP-K4 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
5	1	3	RCP-K5 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
6	1	3	RCP-K6 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
7	1	3	RCP-M1 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
8	1	3	RCP-M2 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
9	1	3	RCP-M3 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
10	1	3	RCP-M4 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
11	1	3	RCP-M5 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
12	1	3	RCP-M6 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
13	1	3	RCP-M7 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
14	1	3	RCP-M8 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
15	1	3	RCP-M9 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
16	1	3	RCP-M10 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
17	1	3	RCP-M11 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
18	1	3	RCP-M12 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
19	1	3	RCP-M13 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
20	1	3	RCP-M14 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
21	1	3	RCP-M15 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
22	1	3	RCP-M16 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
23	1	3	RCP-M17 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
24	1	3	RCP-M18 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
25	1	3	RCP-M19 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
26	1	3	RCP-M20 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
27	1	3	RCP-M21 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
28	1	3	RCP-M22 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
29	1	3	RCP-M23 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
30	1	3	RCP-M24 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
31	1	3	RCP-M25 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
32	1	3	RCP-M26 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
33	1	3	RCP-M27 HWV	0.19	4.00	0.10		200.0	0.50		0.00	X			X		X			X		X								--		
34	1	3	FCU-A1 CWV	1.30	4.00	0.65		200.0	0.50		0.00	X			X					X	X		X						TFRB24-SR	--		
35	1	3	FCU-A1 HWV	0.50	4.00	0.25		200.0	0.50		0.00	X			X					X	X			X					TFRB24-SR	--		
36	1	3	FCU-A2 CWV	1.30	4.00	0.65		200.0	0.50		0.00	X			X					X	X		X						TFRB24-SR	--		
37	1	3	FCU-A2 HWV	0.50	4.00	0.25		200.0	0.50		0.00	X			X					X	X			X					TFRB24-SR	--		
38	1	3	FCU-C1 CWV	2.80	4.00	1.40		200.0	0.50		0.00	X			X					X	X		X						TFRB24-SR	--		
39	1	3	FCU-C1 HWV	0.70	4.00	0.35		200.0	0.50		0.00	X			X					X	X			X					TFRB24-SR	--		
40	1	3	FCU-C2 CWV	2.80	4.00	1.40		200.0	0.50		0.00	X			X					X	X		X						TFRB24-SR	--		
41	1	3	FCU-C2 HWV	0.70	4.00	0.35		200.0	0.50		0.00	X			X					X	X			X					TFRB24-SR	--		
42	1	3	FCU-G1 CWV	1.30	4.00	0.65		200.0	0.50		0.00	X			X					X	X		X						TFRB24-SR	--		
43	1	3	FCU-G1 HWV	0.50	4.00	0.25		200.0	0.50		0.00	X			X					X	X			X					TFRB24-SR	--		
44	1	3	VAV B1-01 HWV	2.40	4.00	1.20		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			
45	1	3	VAV B1-02 HWV	1.70	4.00	0.85		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			
46	1	3	VAV B1-03 HWV	1.10	4.00	0.55		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			
47	1	3	VAV B1-04 HWV	0.70	4.00	0.35		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			
48	1	3	VAV B1-05 HWV	0.80	4.00	0.40		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			
49	1	3	VAV B1-06 HWV	1.20	4.00	0.60		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			
50	1	3	VAV B1-07 HWV	1.20	4.00	0.60		75.0	0.50		0.00	X			X					X			X						CQB24-SR-R			

Delta Controls

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LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-11
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																				Ordering Data				
																				2 WAY		3 WAY												
																				2VDC FAIL		2VDC FAIL												
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn. Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
51	1	3	VAV B1-08 HWV	1.80	4.00	0.90		75.0	0.50		0.00	X			X				X			X								CQB24-SR-R			
52	1	3	VAV B1-09 HWV	1.20	4.00	0.60		75.0	0.50		0.00	X			X				X			X								CQB24-SR-R			
53	1	3	VAV B1-10 HWV	1.80	4.00	0.90		75.0	0.50		0.00	X			X				X			X								CQB24-SR-R			
54	1	3	VAV B1-11 HWV	1.80	4.00	0.90		75.0	0.50		0.00	X			X				X			X								CQB24-SR-R			
55	1	3	VAV B1-12 HWV	1.80	4.00	0.90		75.0	0.50		0.00	X			X				X			X								CQB24-SR-R			
56	1	3	VAV B1-13 HWV	1.60	4.00	0.80		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
57	1	3	VAV B1-14 HWV	1.60	4.00	0.80		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
58	1	3	VAV B1-15 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
59	1	3	VAV B1-16 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
60	1	3	VAV B1-17 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
61	1	3	VAV B1-18 HWV	1.60	4.00	0.80		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
62	1	3	VAV B1-19 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
63	1	3	VAV B1-20 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
64	1	3	VAV B1-21 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
65	1	3	VAV C1-01 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
66	1	3	VAV C1-03 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
67	1	3	VAV C1-04 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
68	1	3	VAV C1-05 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
69	1	3	VAV C1-06 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
70	1	3	VAV C1-07 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
71	1	3	VAV C1-08 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
72	1	3	VAV C4-01 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
73	1	3	VAV C4-02 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
74	1	3	VAV C4-03 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
75	1	3	VAV C4-04 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
76	1	3	VAV C4-05 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
77	1	3	VAV C4-06 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
78	1	3	VAV C4-07 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
79	1	3	VAV C4-08 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
80	1	3	VAV C4-09 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
81	1	3	VAV C4-10 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
82	1	3	VAV C4-11 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
83	1	3	VAV C4-12 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
84	1	3	VAV C4-13 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
85	1	3	VAV C4-14 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
86	1	3	VAV C4-15 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
87	1	3	VAV C4-16 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
88	1	3	VAV C4-17 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
89	1	3	VAV C4-18 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
90	1	3	VAV C4-19 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
91	1	3	VAV C4-20 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
92	1	3	VAV C4-21 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
93	1	3	VAV C4-22 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
94	1	3	VAV C4-23 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
95	1	3	VAV C4-24 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
96	1	3	VAV C4-25 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
97	1	3	VAV D1-01 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
98	1	3	VAV D1-02 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
99	1	3	VAV D1-03 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X			X								CQB24-SR-R			
100	1	3	VAV D1-04 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X			X								CQB24-SR-R			

PHASE 3 VALVE SCHEDULE (2 OF 16)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-12
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																				Ordering Data				
																			2 WAY		3 WAY														
																			2VDC FAIL		2VDC FAIL													
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn .	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
101	1	3	VAV D1-05 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
102	1	3	VAV D1-06 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
103	1	3	VAV D1-07 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
104	1	3	VAV D1-08 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
105	1	3	VAV D1-09 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
106	1	3	VAV D1-10 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
107	1	3	VAV D1-11 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
108	1	3	VAV D1-12 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
109	1	3	VAV D1-13 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
110	1	3	VAV D1-14 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
111	1	3	VAV D1-15 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
112	1	3	VAV D1-16 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
113	1	3	VAV D1-17 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
114	1	3	VAV D1-18 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
115	1	3	VAV D1-19 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
116	1	3	VAV D1-20 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
117	1	3	VAV D1-21 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
118	1	3	VAV D1-22 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
119	1	3	VAV D1-23 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
120	1	3	VAV D1-24 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
121	1	3	VAV D1-25 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
122	1	3	VAV D1-26 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
123	1	3	VAV D1-27 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
124	1	3	VAV D1-28 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
125	1	3	VAV D1-29 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
126	1	3	VAV D2-01 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
127	1	3	VAV D2-02 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
128	1	3	VAV D2-03 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
129	1	3	VAV D2-04 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
130	1	3	VAV D2-05 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
131	1	3	VAV D2-06 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
132	1	3	VAV D2-07 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
133	1	3	VAV D2-08 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
134	1	3	VAV D2-09 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
135	1	3	VAV D2-10 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
136	1	3	VAV D2-11 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
137	1	3	VAV D2-12 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
138	1	3	VAV D2-13 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
139	1	3	VAV D2-14 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
140	1	3	VAV D2-15 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
141	1	3	VAV D2-16 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
142	1	3	VAV D2-17 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
143	1	3	VAV D2-18 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
144	1	3	VAV E1-01 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
145	1	3	VAV E1-02 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
146	1	3	VAV E1-03 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
147	1	3	VAV E1-04 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
148	1	3	VAV E1-05 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
149	1	3	VAV E1-06 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
150	1	3	VAV E1-07 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

PHASE 3 VALVE SCHEDULE (3 OF 16)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-13
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																						Ordering Data				
																				2 WAY		3 WAY														
																				2VDC FAIL		2VDC FAIL														
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
151	1	3	VAV E1-08 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
152	1	3	VAV E1-09 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
153	1	3	VAV E1-10 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
154	1	3	VAV E1-11 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
155	1	3	VAV E1-12 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
156	1	3	VAV E1-13 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
157	1	3	VAV E2-01 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
158	1	3	VAV E2-02 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
159	1	3	VAV E2-03 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
160	1	3	VAV E2-04 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
161	1	3	VAV E2-05 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
162	1	3	VAV E2-06 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
163	1	3	VAV E2-07 HWV	2.80	4.00	1.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
164	1	3	VAV E2-08 HWV	2.80	4.00	1.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
165	1	3	VAV E2-09 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
166	1	3	VAV E2-10 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
167	1	3	VAV E2-11 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
168	1	3	VAV E2-12 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
169	1	3	VAV E2-13 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
170	1	3	VAV E2-14 HWV	2.80	4.00	1.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
171	1	3	VAV E2-15 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
172	1	3	VAV E2-16 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
173	1	3	VAV E2-17 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
174	1	3	VAV E2-18 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
175	1	3	VAV E2-19 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
176	1	3	VAV E2-20 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
177	1	3	VAV E2-21 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
178	1	3	VAV E2-23 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
179	1	3	VAV E2-24 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
180	1	3	VAV E3-01 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
181	1	3	VAV E3-02 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
182	1	3	VAV E3-03 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
183	1	3	VAV E3-04 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
184	1	3	VAV E3-05 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
185	1	3	VAV E3-06 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
186	1	3	VAV E3-07 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
187	1	3	VAV E3-08 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
188	1	3	VAV E3-09 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
189	1	3	VAV E3-10 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
190	1	3	VAV F1-01 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
191	1	3	VAV F1-02 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
192	1	3	VAV F1-03 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
193	1	3	VAV F1-04 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
194	1	3	VAV F1-05 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
195	1	3	VAV F1-06 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
196	1	3	VAV F1-07 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
197	1	3	VAV F1-08 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
198	1	3	VAV F1-09 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
199	1	3	VAV F1-10 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
200	1	3	VAV F1-11 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

PHASE 3 VALVE SCHEDULE (4 OF 16)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-14
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																					Ordering Data				
																				2 WAY		3 WAY														
																				2VDC FAIL		2VDC FAIL													
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn .	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
201	1	3	VAV F1-12 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
202	1	3	VAV F1-13 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
203	1	3	VAV F1-14 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
204	1	3	VAV F1-15 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
205	1	3	VAV F1-16 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
206	1	3	VAV F1-17 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
207	1	3	VAV F1-18 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
208	1	3	VAV F1-19 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
209	1	3	VAV F1-20 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
210	1	3	VAV F1-21 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
211	1	3	VAV F1-22 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
212	1	3	VAV F1-23 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
213	1	3	VAV F1-24 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
214	1	3	VAV F1-25 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
215	1	3	VAV G4-01 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
216	1	3	VAV G4-02 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
217	1	3	VAV G4-03 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
218	1	3	VAV G4-04 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
219	1	3	VAV G4-05 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
220	1	3	VAV G4-06 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
221	1	3	VAV G4-07 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
222	1	3	VAV G4-08 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
223	1	3	VAV G4-09 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
224	1	3	VAV G4-10 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
225	1	3	VAV E-G4-11 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
226	1	3	VAV E-G4-12 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
227	1	3	VAV E-G4-13 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
228	1	3	VAV H1-01 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
229	1	3	VAV H1-02 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
230	1	3	VAV H1-03 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
231	1	3	VAV H1-04 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
232	1	3	VAV H1-05 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
233	1	3	VAV H1-06 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
234	1	3	VAV H1-07 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
235	1	3	VAV H1-08 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
236	1	3	VAV H1-09 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
237	1	3	VAV H1-10 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
238	1	3	VAV H1-11 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
239	1	3	VAV H1-12 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
240	1	3	VAV H1-13 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
241	1	3	VAV H1-14 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
242	1	3	VAV H1-15 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
243	1	3	VAV H1-16 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
244	1	3	VAV H1-17 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
245	1	3	VAV H1-18 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
246	1	3	VAV H1-19 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
247	1	3	VAV H1-20 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
248	1	3	VAV H1-21 HWV	1.30	4.00	0.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
249	1	3	VAV H1-22 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
250	1	3	VAV H1-23 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

PHASE 3 VALVE SCHEDULE (5 OF 16)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-15
JOB NUMBER:
J-2304001

	From Project Specifications								Valve Type and Actuator Specifications																				Ordering Data				
																				2 WAY		3 WAY										
																				2VDC FAIL		2VDC FAIL										
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn .	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
251	1	3	VAV H1-24 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
252	1	3	VAV H1-25 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
253	1	3	VAV H1-26 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
254	1	3	VAV H2-01 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
255	1	3	VAV H2-02 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
256	1	3	VAV H2-03 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
257	1	3	VAV H2-04 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
258	1	3	VAV H2-05 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
259	1	3	VAV H2-06 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
260	1	3	VAV H2-07 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
261	1	3	VAV H2-08 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
262	1	3	VAV H2-09 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
263	1	3	VAV H2-10 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
264	1	3	VAV H2-11 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
265	1	3	VAV H2-12 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
266	1	3	VAV H2-13 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
267	1	3	VAV H2-14 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
268	1	3	VAV H2-15 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
269	1	3	VAV J1-01 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
270	1	3	VAV J1-02 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
271	1	3	VAV J1-03 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
272	1	3	VAV J1-04 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
273	1	3	VAV J1-05 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
274	1	3	VAV J1-06 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
275	1	3	VAV J1-07 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
276	1	3	VAV J1-08 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
277	1	3	VAV J1-09 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
278	1	3	VAV J1-10 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
279	1	3	VAV J1-11 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
280	1	3	VAV J1-12 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
281	1	3	VAV J1-13 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
282	1	3	VAV J1-14 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
283	1	3	VAV J1-15 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
284	1	3	VAV J1-16 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
285	1	3	VAV J1-17 HWV	0.60	4.00	0.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
286	1	3	VAV J1-18 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
287	1	3	VAV J1-19 HWV	0.60	4.00	0.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
288	1	3	VAV J1-20 HWV	0.60	4.00	0.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
289	1	3	VAV J2-01 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
290	1	3	VAV J2-02 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
291	1	3	VAV J2-03 HWV	2.70	4.00	1.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
292	1	3	VAV J2-04 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
293	1	3	VAV J2-05 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
294	1	3	VAV J2-06 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
295	1	3	VAV J2-07 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
296	1	3	VAV J2-08 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
297	1	3	VAV J2-09 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
298	1	3	VAV J2-10 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
299	1	3	VAV J2-11 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
300	1	3	VAV J2-12 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

PHASE 3 VALVE SCHEDULE (6 OF 16)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-16
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																				Ordering Data				
																			2 WAY		3 WAY														
																			2VDC FAIL		2VDC FAIL														
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn .	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
301	1	3	VAV J2-13 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
302	1	3	VAV J2-14 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
303	1	3	VAV J3-01 HWV	3.70	4.00	1.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
304	1	3	VAV J3-02 HWV	3.70	4.00	1.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
305	1	3	VAV J3-03 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
306	1	3	VAV J3-04 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
307	1	3	VAV J3-05 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
308	1	3	VAV J3-06 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
309	1	3	VAV J3-07 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
310	1	3	VAV J3-08 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
311	1	3	VAV J3-09 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
312	1	3	VAV J3-10 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
313	1	3	VAV J3-11 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
314	1	3	VAV J3-12 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
315	1	3	VAV J3-13 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
316	1	3	VAV J3-14 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
317	1	3	VAV J3-15 HWV	0.75	4.00	0.38		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
318	1	3	VAV J3-16 HWV	0.75	4.00	0.38		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
319	1	3	VAV M1-01 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
320	1	3	VAV M1-02 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
321	1	3	VAV M1-03 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
322	1	3	VAV M1-04 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
323	1	3	VAV M1-05 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
324	1	3	VAV M1-06 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
325	1	3	VAV M1-07 HWV	0.60	4.00	0.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
326	1	3	VAV M1-08 HWV	7.00	4.00	3.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
327	1	3	VAV M1-09 HWV	6.00	4.00	3.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
328	1	3	VAV M1-10 HWV	6.50	4.00	3.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
329	1	3	VAV N1-01 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
330	1	3	VAV N1-02 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
331	1	3	VAV N1-03 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
332	1	3	VAV N1-04 HWV	2.70	4.00	1.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
333	1	3	VAV N1-05 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
334	1	3	VAV N1-06 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
335	1	3	VAV N1-07 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
336	1	3	VAV N1-08 HWV	0.30	4.00	0.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
337	1	3	VAV N1-09 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
338	1	3	VAV N1-10 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
339	1	3	VAV N1-11 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
340	1	3	VAV N1-12 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
341	1	3	VAV N1-13 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
342	1	3	VAV N2-01 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
343	1	3	VAV N2-02 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
344	1	3	VAV N2-03 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
345	1	3	VAV N2-04 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
346	1	3	VAV N2-05 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
347	1	3	VAV N2-06 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
348	1	3	VAV N2-07 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
349	1	3	VAV N2-08 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
350	1	3	VAV N2-09 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-17
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																				Ordering Data				
																					2 WAY		3 WAY												
																					2VDC FAIL		2VDC FAIL												
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
351	1	3	VAV N2-10 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
352	1	3	VAV N2-11 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
353	1	3	VAV N2-12 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
354	1	3	VAV N2-13 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
355	1	3	VAV N2-14 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
356	1	3	VAV N2-15 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
357	1	3	VAV N2-16 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
358	1	3	VAV P1-01 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
359	1	3	VAV P1-02 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
360	1	3	VAV P1-03 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
361	1	3	VAV P1-04 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
362	1	3	VAV P1-05 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
363	1	3	VAV P1-06 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
364	1	3	VAV P1-07 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
365	1	3	VAV P1-08 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
366	1	3	VAV P1-09 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
367	1	3	VAV P1-10 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
368	1	3	VAV P1-11 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
369	1	3	VAV P1-12 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
370	1	3	VAV P1-13 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
371	1	3	VAV P1-14 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
372	1	3	VAV P1-15 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
373	1	3	VAV P1-16 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
374	1	3	VAV P1-17 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
375	1	3	VAV P1-18 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
376	1	3	VAV P1-19 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
377	1	3	VAV P1-21 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
378	1	3	VAV P1-22 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
379	1	3	VAV P1-23 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
380	1	3	VAV P1-24 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
381	1	3	VAV P1-25 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
382	1	3	VAV P1-26 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
383	1	3	VAV P1-27 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
384	1	3	VAV P1-28 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
385	1	3	VAV P1-29 HWV	3.10	4.00	1.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
386	1	3	VAV P1-30 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
387	1	3	VAV P1-31 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
388	1	3	VAV P1-32 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
389	1	3	VAV P1-33 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
390	1	3	VAV P1-34 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
391	1	3	VAV P1-35 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
392	1	3	VAV P2-01 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
393	1	3	VAV P2-02 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
394	1	3	VAV P2-03 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
395	1	3	VAV P2-04 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
396	1	3	VAV P2-05 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
397	1	3	VAV P2-06 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
398	1	3	VAV P2-07 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
399	1	3	VAV P2-08 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
400	1	3	VAV P2-09 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-18
JOB NUMBER:
J-2304001

	From Project Specifications			Valve Type and Actuator Specifications																								Ordering Data				
																			2 WAY		3 WAY												
																			2VDC FAIL		2VDC FAIL												
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn. Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
401	1	3	VAV P2-10 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
402	1	3	VAV P2-11 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
403	1	3	VAV P2-12 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
404	1	3	VAV P2-13 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
405	1	3	VAV P2-14 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
406	1	3	VAV P2-15 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
407	1	3	VAV P2-16 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
408	1	3	VAV P2-17 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
409	1	3	VAV P2-18 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
410	1	3	VAV P2-19 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
411	1	3	VAV P2-20 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
412	1	3	VAV P2-21 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
413	1	3	VAV P2-22 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
414	1	3	VAV P2-23 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
415	1	3	VAV P2-24 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
416	1	3	VAV P2-25 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
417	1	3	VAV Q1-01 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
418	1	3	VAV Q1-02 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
419	1	3	VAV Q1-03 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
420	1	3	VAV Q1-04 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
421	1	3	VAV Q1-05 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
422	1	3	VAV Q1-06 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
423	1	3	VAV Q1-07 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
424	1	3	VAV Q1-08 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
425	1	3	VAV Q1-09 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
426	1	3	VAV Q1-10 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
427	1	3	VAV Q1-11 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
428	1	3	VAV Q1-13 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
429	1	3	VAV Q1-14 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
430	1	3	VAV Q1-15 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
431	1	3	VAV Q2-01 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
432	1	3	VAV Q2-02 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
433	1	3	VAV Q2-03 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
434	1	3	VAV Q2-04 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
435	1	3	VAV Q2-05 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
436	1	3	VAV Q2-06 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
437	1	3	VAV Q2-07 HWV	2.90	4.00	1.45		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
438	1	3	VAV Q2-08 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
439	1	3	VAV Q2-09 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
440	1	3	VAV Q2-10 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
441	1	3	VAV Q2-11 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
442	1	3	VAV Q2-12 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
443	1	3	VAV Q2-13 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
444	1	3	VAV Q2-14 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
445	1	3	VAV Q2-15 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
446	1	3	VAV Q2-16 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
447	1	3	VAV Q2-17 HWV	0.60	4.00	0.30		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
448	1	3	VAV R1-01 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
449	1	3	VAV R1-02 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X			X							CQB24-SR-R			
450	1	3	VAV R1-03 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X			X							CQB24-SR-R			

Delta Controls

Temperature Control Services
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UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-19
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																								Ordering Data				
																						2 WAY				3 WAY														
																						2VDC FAIL				2VDC FAIL													
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
451	1	3	VAV R1-04 HWV	1.40	4.00	0.70		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
452	1	3	VAV R1-05 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
453	1	3	VAV R1-07 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
454	1	3	VAV R1-08 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
455	1	3	VAV R1-09 HWV	3.30	4.00	1.65		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
456	1	3	VAV R1-10 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
457	1	3	VAV R1-11 HWV	1.60	4.00	0.80		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
458	1	3	VAV R1-12 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
459	1	3	VAV R1-13 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
460	1	3	VAV R1-14 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
461	1	3	VAV R2-01 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
462	1	3	VAV R2-02 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
463	1	3	VAV R2-03 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
464	1	3	VAV R2-04 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
465	1	3	VAV R2-05 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
466	1	3	VAV R2-06 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
467	1	3	VAV R2-07 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
468	1	3	VAV R2-08 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
469	1	3	VAV R2-09 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
470	1	3	VAV R2-10 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
471	1	3	VAV R2-11 HWV	2.30	4.00	1.15		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
472	1	3	VAV R2-12 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
473	1	3	VAV R2-13 HWV	2.70	4.00	1.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
474	1	3	VAV S1-01 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
475	1	3	VAV S1-02 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
476	1	3	VAV S1-03 HWV	1.20	4.00	0.60		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
477	1	3	VAV S1-04 HWV	0.70	4.00	0.35		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
478	1	3	VAV S1-05 HWV	2.80	4.00	1.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
479	1	3	VAV S1-06 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
480	1	3	VAV S1-07 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
481	1	3	VAV S1-08 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
482	1	3	VAV S1-09 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
483	1	3	VAV S1-10 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
484	1	3	VAV S1-11 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
485	1	3	VAV S1-12 HWV	2.80	4.00	1.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
486	1	3	VAV S1-13 HWV	2.50	4.00	1.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
487	1	3	VAV S1-14 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
488	1	3	VAV S1-15 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
489	1	3	VAV S1-16 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
490	1	3	VAV S1-17 HWV	2.60	4.00	1.30		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
491	1	3	VAV S1-18 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
492	1	3	VAV S1-19 HWV	0.40	4.00	0.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
493	1	3	VAV E-T1-01 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
494	1	3	VAV E-T1-02 HWV	1.50	4.00	0.75		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
495	1	3	VAV E-T1-03 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
496	1	3	VAV E-T1-04 HWV	0.20	4.00	0.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
497	1	3	VAV E-T1-05 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
498	1	3	VAV E-T1-06 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
499	1	3	VAV E-T1-07 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
500	1	3	VAV T1-08 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			

Delta Controls
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UPDATES	
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04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-20
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																						Ordering Data				
																				2 WAY		3 WAY															
																				2VDC FAIL		2VDC FAIL													
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
501	1	3	VAV T1-09 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
502	1	3	VAV T1-10 HWV	1.90	4.00	0.95		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
503	1	3	VAV T1-11 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
504	1	3	VAV T1-12 HWV	2.00	4.00	1.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
505	1	3	VAV T1-13 HWV	1.70	4.00	0.85		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
506	1	3	VAV T1-14 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
507	1	3	VAV AA1-01 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
508	1	3	VAV AA1-02 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
509	1	3	VAV AA1-03 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
510	1	3	VAV AA1-04 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
511	1	3	VAV AA1-05 HWV	3.00	4.00	1.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
512	1	3	VAV AA1-06 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
513	1	3	VAV AA1-07 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
514	1	3	VAV AA1-08 HWV	2.20	4.00	1.10		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
515	1	3	VAV AA1-09 HWV	0.80	4.00	0.40		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
516	1	3	VAV AA1-10 HWV	0.90	4.00	0.45		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
517	1	3	VAV AA1-11 HWV	1.00	4.00	0.50		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
518	1	3	VAV AA1-12 HWV	4.00	4.00	2.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
519	1	3	VAV AA1-13 HWV	4.00	4.00	2.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
520	1	3	VAV AA1-14 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
521	1	3	VAV AA1-15 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
522	1	3	VAV AA1-16 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
523	1	3	VAV AA1-17 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
524	1	3	VAV AA1-18 HWV	2.10	4.00	1.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
525	1	3	VAV AA1-19 HWV	0.50	4.00	0.25		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
526	1	3	VAV AA1-20 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
527	1	3	VAV AA1-21 HWV	4.00	4.00	2.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
528	1	3	VAV AA1-22 HWV	4.00	4.00	2.00		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
529	1	3	VAV AA1-23 HWV	2.40	4.00	1.20		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
530	1	3	VAV AA1-24 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
531	1	3	VAV AA1-25 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
532	1	3	VAV AA1-26 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
533	1	3	VAV AA1-27 HWV	0.10	4.00	0.05		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
534	1	3	VAV AA1-28 HWV	1.80	4.00	0.90		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
535	1	3	VAV AA1-29 HWV	1.10	4.00	0.55		75.0	0.5		0	X			X				X				X								CQB24-SR-R			
536	1	3	CUH E-CH-A1 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X											
537	1	3	CUH CH-A2 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
538	1	3	CUH CH-A3 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X											
539	1	3	CUH CH-A4 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
540	1	3	CUH CH-A5 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
541	1	3	CUH CH-A6 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
542	1	3	CUH CH-A7 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X											
543	1	3	CUH CH-A8 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
544	1	3	CUH CH-A9 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
545	1	3	CUH CH-E1 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
546	1	3	CUH CH-E2 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X											
547	1	3	CUH CH-F1 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X											
548	1	3	CUH E-CH-J1 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X											
549	1	3	CUH CH-J2 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X											
550	1	3	CUH E-CH-J3 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X											

PHASE 3 VALVE SCHEDULE (11 OF 16)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-21
JOB NUMBER:
J-2304001

	From Project Specifications								Valve Type and Actuator Specifications																				Ordering Data				
																				2 WAY	3 WAY											
																				2VDC FAIL	2VDC FAIL											
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
551	1	3	CUH E-CH-K1 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
552	1	3	CUH E-CH-M1 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X										
553	1	3	CUH E-CH-M2 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X										
554	1	3	CUH CH-M3 HWV	1.30	4.00	0.65		200.0	0.5			X				X	X			X			X										
555	1	3	CUH CH-M4 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X										
556	1	3	CUH CH-M5 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X										
557	1	3	CUH E-CH-M6 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
558	1	3	CUH E-CH-M7 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
559	1	3	CUH E-CH-M8 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
560	1	3	CUH E-CH-M9 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
561	1	3	CUH E-CH-M10 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
562	1	3	CUH E-CH-M11 HWV	2.00	4.00	1.00		200.0	0.5			X				X	X			X			X										
563	1	3	CUH CH-N1 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X										
564	1	3	CUH CH-N2 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X										
565	1	3	CUH CH-Q1 HWV	2.50	4.00	1.25		200.0	0.5			X				X	X			X			X										
566	1	3	CUH CH-Q2 HWV	2.50	4.00	1.25		200.0	0.5		0	X				X	X			X			X										
567	1	3	CUH E-CH-R1 HWV	2.00	4.00	1.00		200.0	0.5		0	X				X	X			X			X										
568	1	3	CUH CH-R2 HWV	2.50	4.00	1.25		200.0	0.5		0	X				X	X			X			X										
569	1	3	CUH CH-R3 HWV	2.50	4.00	1.25		200.0	0.5		0	X				X	X			X			X										
570	1	3	CUH CH-AA1 HWV	2.50	4.00	1.25		200.0	0.5		0	X				X	X			X			X										
571	1	3	CV-D1 HWV	0.30	4.00	0.15		200.0	0.5		0	X			X																		
572	1	3	CV-D2 HWV	0.30	4.00	0.15		200.0	0.5			X			X																		
573	1	3	CV-D3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
574	1	3	CV-D4 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
575	1	3	CV-D5 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
576	1	3	CV-D6 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
577	1	3	CV-D7 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
578	1	3	CV-D8 HWV	0.30	4.00	0.15		200.0	0.5			X			X																		
579	1	3	CV-D9 HWV	0.30	4.00	0.15		200.0	0.5			X			X																		
580	1	3	CV-E1 HWV	0.50	4.00	0.25		200.0	0.5			X			X																		
581	1	3	CV-F1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
582	1	3	CV-F2 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
583	1	3	CV-F3 HWV	0.50	4.00	0.25		200.0	0.5			X			X																		
584	1	3	CV-F4 HWV	0.50	4.00	0.25		200.0	0.5			X			X																		
585	1	3	CV-F5 HWV	0.50	4.00	0.25		200.0	0.5			X			X																		
586	1	3	CV-F6 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
587	1	3	CV-F7 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
588	1	3	E-CV-H1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
589	1	3	E-CV-H2 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
590	1	3	CV-H3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
591	1	3	CV-H4 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
592	1	3	CV-H5 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
593	1	3	E-CV-H6 HWV	0.70	4.00	0.35		200.0	0.5			X			X																		
594	1	3	E-CV-H7 HWV	0.70	4.00	0.35		200.0	0.5			X			X																		
595	1	3	CV-J1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
596	1	3	CV-J2 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
597	1	3	E-CV-L1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
598	1	3	E-CV-L2 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
599	1	3	CV-L3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		
600	1	3	CV-M1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																		

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-22
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																						Ordering Data				
																				2 WAY 2VDC FAIL		3 WAY 2VDC FAIL															
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
601	1	3	CV-M2 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
602	1	3	CV-M3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
603	1	3	CV-M4 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
604	1	3	E-CV-M5 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
605	1	3	E-CV-M6 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
606	1	3	E-CV-M7 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
607	1	3	CV-M8 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
608	1	3	CV-M9 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
609	1	3	E-CV-N1 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
610	1	3	CV-N2 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
611	1	3	E-CV-N3 HWV	0.30	4.00	0.15		200.0	0.5			X			X																			
612	1	3	CV-N4 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
613	1	3	CV-N5 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
614	1	3	CV-P1 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
615	1	3	CV-P2 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
616	1	3	CV-P3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
617	1	3	CV-P4 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
618	1	3	E-CV-P5 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
619	1	3	CV-P6 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
620	1	3	CV-P7 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
621	1	3	CV-P8 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
622	1	3	CV-P9 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
623	1	3	CV-Q1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
624	1	3	CV-Q2 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
625	1	3	E-CV-R1 HWV	0.30	4.00	0.15		200.0	0.5			X			X																			
626	1	3	E-CV-R2 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
627	1	3	E-CV-R3 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
628	1	3	E-CV-R4 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
629	1	3	E-CV-R5 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
630	1	3	E-CV-R6 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
631	1	3	E-CV-R7 HWV	0.70	4.00	0.35		200.0	0.5			X			X																			
632	1	3	E-CV-S1 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
633	1	3	E-CV-S2 HWV	0.30	4.00	0.15		200.0	0.5			X			X																			
634	1	3	E-CV-S3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
635	1	3	CV-AA1 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
636	1	3	CV-AA2 HWV	0.50	4.00	0.25		200.0	0.5			X			X																			
637	1	3	CV-AA3 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
638	1	3	CV-AA4 HWV	0.20	4.00	0.10		200.0	0.5			X			X																			
639	1	3	AHU-A2 PHV	30.00	4.00	15.00		200.0				X			X					X	X		X		X									
640	1	3	AHU-A2 CWV	73.00	4.00	36.50		200.0				X			X					X	X			X		X								
641	1	3	AHU-A2 RHV	13.00	4.00	6.50		200.0				X			X					X	X		X		X									
642	1	3	AHU-C1 PHV	6.00	4.00	3.00		200.0				X			X					X	X		X		X									
643	1	3	AHU-C1 CWV	22.00	4.00	11.00		200.0				X			X					X	X			X		X								
644	1	3	AHU-C2 PHV	51.00	4.00	25.50		200.0				X			X					X	X		X		X									
645	1	3	AHU-C2 CWV	167.00	4.00	83.50		200.0				X			X					X	X			X		X								
646	1	3	AHU-C2 RHV	35.00	4.00	17.50		200.0				X			X					X	X		X		X									
647	1	3	AHU-C3 PHV	28.00	4.00	14.00		200.0				X			X					X	X		X		X									
648	1	3	AHU-C3 CWV	122.00	4.00	61.00		200.0				X			X					X	X			X		X								
649	1	3	AHU-C3 RHV	25.00	4.00	12.50		200.0				X			X					X	X		X		X									
650	1	3	AHU-C5 PHV	45.00	4.00	22.50		200.0				X			X					X	X		X		X									

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-23
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																			Ordering Data				
																				2 WAY		3 WAY											
																				2VDC FAIL		2VDC FAIL										
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
651	1	3	AHU-C5 CWV	178.00	4.00	89.00		200.0				X			X				X	X			X		X								
652	1	3	AHU-J1 PHV	21.00	4.00	10.50		200.0				X			X				X	X		X		X									
653	1	3	AHU-J1 CWV	98.00	4.00	49.00		200.0				X			X				X	X			X		X								
654	1	3	AHU-J2 PHV	16.00	4.00	8.00		200.0				X			X				X	X		X		X									
655	1	3	AHU-J2 CWV	74.00	4.00	37.00		200.0				X			X				X	X			X		X								
656	1	3	AHU-J3 PHV	42.00	4.00	21.00		200.0				X			X				X	X		X		X									
657	1	3	AHU-J3 CWV	73.00	4.00	36.50		200.0				X			X				X	X			X		X								
658	1	3	AHU-K6 PHV	18.00	4.00	9.00		200.0				X			X				X	X		X		X									
659	1	3	AHU-K6 CWV	23.00	4.00	11.50		200.0				X			X				X	X			X		X								
660	1	3	AHU-K6 RHV	10.00	4.00	5.00		200.0				X			X				X	X		X		X									
661	1	3	AHU-M1 PHV	34.00	4.00	17.00		200.0				X			X				X	X		X		X									
662	1	3	AHU-M1 CWV	107.00	4.00	53.50		200.0				X			X				X	X			X		X								
663	1	3	AHU-M2 PHV	40.00	4.00	20.00		200.0			0	X			X				X	X		X		X									
664	1	3	AHU-M2 CWV	208.00	4.00	104.00		200.0			0	X			X				X	X			X		X								
665	1	3	AHU-M2 RHV	72.00	4.00	36.00		200.0			0	X			X				X	X		X		X									
666	1	3	AHU-AA1 PHV	25.00	4.00	12.50		200.0				X			X				X	X							X		X				
667	1	3	AHU-AA1 CWV	117.00	4.00	58.50		200.0				X			X				X	X						X		X					
668	1	3	E-AHU-A1 PHV	62.00	4.00	31.00	3.0	200.0				X			X				X	X		X		X									
669	1	3	E-AHU-A1 CWV	182.00	4.00	91.00	4.0	200.0				X			X				X	X			X		X								
670	1	3	E-AHU-A1 HWV	72.00	4.00	36.00	3.0	200.0				X			X				X	X		X		X									
671	1	3	E-AHU-B1 HWV	33.00	4.00	16.50	2.0	200.0				X			X				X	X		X		X									
672	1	3	E-AHU-B1 CWV	199.00	4.00	99.50	4.0	200.0				X			X				X	X			X		X								
673	1	3	E-AHU-C4 PHV	50.00	4.00	25.00	2.5	200.0				X			X				X	X		X		X									
674	1	3	E-AHU-C4 CWV	497.00	4.00	248.50	4.0	200.0				X			X				X	X			X		X								
675	1	3	E-AHU-C4 HWV	40.00	4.00	20.00	2.0	200.0				X			X				X	X		X		X									
676	1	3	E-AHU-D1 HWV	25.00	4.00	12.50	?	200.0				X			X				X	X		X		X									
677	1	3	E-AHU-D1 CWV	150.00	4.00	75.00	?	200.0				X			X				X	X			X		X								
678	1	3	E-AHU-D2 HWV	19.00	4.00	9.50	?	200.0				X			X				X	X		X		X									
679	1	3	E-AHU-D2 CWV	125.00	4.00	62.50	?	200.0				X			X				X	X			X		X								
680	1	3	E-AHU-E1 HWV	13.00	4.00	6.50	1.3	200.0				X			X				X	X		X		X									
681	1	3	E-AHU-E1 CWV	95.00	4.00	47.50	3.0	200.0				X			X				X	X			X		X								
682	1	3	E-AHU-E2 HWV	19.00	4.00	9.50	1.3	200.0				X			X				X	X		X		X									
683	1	3	E-AHU-E2 CWV	139.00	4.00	69.50	4.0	200.0				X			X				X	X			X		X								
684	1	3	E-AHU-E3 HWV	6.00	4.00	3.00	1.3	200.0				X			X				X	X		X		X									
685	1	3	E-AHU-E3 CWV	64.00	4.00	32.00	3.0	200.0				X			X				X	X			X		X								
686	1	3	E-AHU-F1 HWV	14.00	4.00	7.00	1.5	200.0				X			X				X	X		X		X									
687	1	3	E-AHU-F1 CWV	153.00	4.00	76.50	4.0	200.0				X			X				X	X			X		X								
688	1	3	E-AHU-H1 HWV	26.00	4.00	13.00	?	200.0				X			X				X	X		X		X									
689	1	3	E-AHU-H1 CWV	171.00	4.00	85.50	?	200.0				X			X				X	X			X		X								
690	1	3	E-AHU-H2 HWV	18.00	4.00	9.00	?	200.0				X			X				X	X		X		X									
691	1	3	E-AHU-H2 CWV	121.00	4.00	60.50	?	200.0				X			X				X	X			X		X								
692	1	3	E-AHU-K1 HWV	43.00	4.00	21.50	?	200.0				X			X				X	X		X		X									
693	1	3	E-AHU-K1 CWV	89.00	4.00	44.50	?	200.0				X			X				X	X			X		X								
694	1	3	E-AHU-K2 HWV	43.00	4.00	21.50	?	200.0				X			X				X	X		X		X									
695	1	3	E-AHU-K2 CWV	89.00	4.00	44.50	?	200.0				X			X				X	X			X		X								
696	1	3	E-AHU-K3 HWV	43.00	4.00	21.50	?	200.0				X			X				X	X		X		X									
697	1	3	E-AHU-K3 CWV	89.00	4.00	44.50	?	200.0				X			X				X	X			X		X								
698	1	3	E-AHU-K4 HWV	43.00	4.00	21.50	?	200.0				X			X				X	X		X		X									
699	1	3	E-AHU-K4 CWV	89.00	4.00	44.50	?	200.0				X			X				X	X			X		X								
700	1	3	E-AHU-K5 HWV	43.00	4.00	21.50	?	200.0				X			X				X	X		X		X									

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04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH–24
JOB NUMBER:
J–2304001

	From Project Specifications										Valve Type and Actuator Specifications																				Ordering Data				
																				2 WAY				3 WAY											
																				2VDC FAIL				2VDC FAIL											
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
701	1	3	E-AHU-K5 CWV	89.00	4.00	44.50	?	200.0				X			X				X	X			X		X									
702	1	3	E-AHU-N1 HWV	25.00	4.00	12.50	2.0	200.0				X			X				X	X								X		X				
703	1	3	E-AHU-N1 CWV	114.00	4.00	57.00	3.0	200.0				X			X				X	X						X		X						
704	1	3	E-AHU-N2 HWV	35.00	4.00	17.50	2.0	200.0				X			X				X	X		X		X										
705	1	3	E-AHU-N2 CWV	160.00	4.00	80.00	3.0	200.0				X			X				X	X			X		X									
706	1	3	E-AHU-P1 HWV	37.00	4.00	18.50	2.5	200.0				X			X				X	X		X		X										
707	1	3	E-AHU-P1 CWV	171.50	4.00	85.75	4.0	200.0				X			X				X	X			X		X									
708	1	3	E-AHU-P2 HWV	45.00	4.00	22.50	2.5	200.0				X			X				X	X		X		X										
709	1	3	E-AHU-P2 CWV	214.00	4.00	107.00	4.0	200.0				X			X				X	X			X		X									
710	1	3	E-AHU-Q1 PHV	50.00	4.00	25.00	2.5	200.0				X			X				X	X								X		X				
711	1	3	E-AHU-Q1 CWV	232.00	4.00	116.00	4.0	200.0				X			X				X	X						X		X						
712	1	3	E-AHU-Q1 HWV	19.00	4.00	9.50	2.0	200.0				X			X				X	X								X		X				
713	1	3	E-AHU-Q2 PHV	57.00	4.00	28.50	2.5	200.0				X			X				X	X		X		X										
714	1	3	E-AHU-Q2 CWV	255.00	4.00	127.50	4.0	200.0				X			X				X	X			X		X									
715	1	3	E-AHU-Q2 HWV	22.00	4.00	11.00	2.0	200.0				X			X				X	X		X		X										
716	1	3	E-AHU-R1 PHV	50.00	4.00	25.00	2.5	200.0				X			X				X	X		X		X										
717	1	3	E-AHU-R1 CWV	232.00	4.00	116.00	4.0	200.0				X			X				X	X			X		X									
718	1	3	E-AHU-R1 HWV	19.00	4.00	9.50	2.0	200.0				X			X				X	X		X		X										
719	1	3	E-AHU-R2 PHV	47.00	4.00	23.50	2.5	200.0				X			X				X	X		X		X										
720	1	3	E-AHU-R2CWV	219.00	4.00	109.50	4.0	200.0				X			X				X	X			X		X									
721	1	3	E-AHU-R2 HWV	18.00	4.00	9.00	2.0	200.0				X			X				X	X		X		X										
722	1	3	E-AHU-S1 HWV	56.80	4.00	28.40	?	200.0				X			X				X	X		X		X										
723	1	3	E-AHU-S1 CWV	154.00	4.00	77.00	?	200.0				X			X				X	X			X		X									
724	1	3	E-AHU-T1 PHV	40.00	4.00	20.00	2.5	200.0				X			X				X	X								X		X				
725	1	3	E-AHU-T1 CWV	179.00	4.00	89.50	4.0	200.0				X			X				X	X						X		X						
726	1	3	E-AHU-T1 HWV	11.00	4.00	5.50	1.3	200.0				X			X				X	X								X		X				
727	1	3	PUH-A1 HWV	4.40	4.00	2.20		200.0				X				X	X			X			X		X									
728	1	3	PUH-A2 HWV	6.10	4.00	3.05		200.0				X				X	X			X			X		X									
729	1	3	PUH-E1 HWV	1.80	4.00	0.90		200.0				X				X	X			X			X		X									
730	1	3	PUH-E2 HWV	1.80	4.00	0.90		200.0				X				X	X			X			X		X									
731	1	3	PUH-F1 HWV	1.80	4.00	0.90		200.0				X				X	X			X			X		X									
732	1	3	E-PUH-G1 HWV	3.50	4.00	1.75		200.0				X				X	X			X			X		X									
733	1	3	E-PUH-G2 HWV	3.50	4.00	1.75		200.0				X				X	X			X			X		X									
734	1	3	PUH-K1 HWV	4.40	4.00	2.20		200.0				X				X	X			X			X		X									
735	1	3	PUH-K2 HWV	4.40	4.00	2.20		200.0				X				X	X			X			X		X									
736	1	3	E-PUH-K3 HWV	2.00	4.00	1.00		200.0				X				X	X			X			X		X									
737	1	3	PUH-M1 HWV	3.50	4.00	1.75		200.0				X				X	X			X			X		X									
738	1	3	PUH-N1 HWV	5.30	4.00	2.65		200.0				X				X	X			X			X		X									
739	1	3	PUH-N2 HWV	5.30	4.00	2.65		200.0				X				X	X			X			X		X									
740	1	3	PUH-Q1 HWV	6.10	4.00	3.05		200.0				X				X	X			X			X		X									
741	1	3	PUH-Q2 HWV	6.10	4.00	3.05		200.0				X				X	X			X			X		X									
742	1	3	PUH-S1 HWV	1.80	4.00	0.90		200.0				X				X	X			X			X		X									
743	1	3	PUH-T1 HWV	3.50	4.00	1.75		200.0				X				X	X			X			X		X									
744	1	3	PUH-W1 HWV	3.50	4.00	1.75		200.0				X				X	X			X			X		X									
745	1	3	PUH-AA1 HWV	3.50	4.00	1.75		200.0				X				X	X			X			X		X									
746	1	3	NAT VAV 101A	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X								B218B	TR24-3-T + NO			New Actuator Only
747	1	3	NAT VAV 101B	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X								B218B	TR24-3-T + NO			New Actuator Only
748	1	3	NAT VAV 102	2.70	4.00	1.35	0.8	75.0			200	X			X			X					X								B211B	TR24-3-T + NO			New Actuator Only
749	1	3	NAT VAV 103	1.20	4.00	0.60	0.8	75.0			200	X			X			X					X								B209B	TR24-3-T + NO			New Actuator Only
750	1	3	NAT VAV 104	1.20	4.00	0.60	0.8	75.0			200	X			X			X					X								B209B	TR24-3-T + NO			New Actuator Only

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04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-25
JOB NUMBER:
J-2304001

	From Project Specifications										Valve Type and Actuator Specifications																		Ordering Data				
																				2 WAY		3 WAY											
																				2VDC FAIL		2VDC FAIL										
Reference	Quantity	Building / Phase	Valve Tag	Flow (GPM)	TargetPressure Drop (PSI)	Target Cv Rating	Pipe Size (in.)	Required Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	Actual Pressure drop (PSI)	Ball	Globe	Butterfly	24 VAC	120 VAC	On-Off	Tri-State	Modulating	Spring Rtn.	Switches	OPEN	CLOSED	OPEN	CLOSED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	Valve #	Actuator #	Clip Position	Data Sheet	Notes
751	1	3	NAT VAV 105	2.70	4.00	1.35	0.8	75.0			200	X			X			X					X						B211B	TR24-3-T + NO			New Actuator Only
752	1	3	NAT VAV 106	2.70	4.00	1.35	0.8	75.0			200	X			X			X					X						B211B	TR24-3-T + NO			New Actuator Only
753	1	3	NAT VAV 108	8.10	4.00	4.05	1.0	75.0			200	X			X			X					X						B213B	TR24-3-T + NO			New Actuator Only
754	1	3	NAT VAV 112	3.30	4.00	1.65	1.0	75.0			200	X			X			X					X						B211B	TR24-3-T + NO			New Actuator Only
755	1	3	NAT VAV 113	1.20	4.00	0.60	0.8	75.0			200	X			X			X					X						B209B	TR24-3-T + NO			New Actuator Only
756	1	3	NAT VAV 114	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
757	1	3	NAT VAV 116	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
758	1	3	NAT VAV 117 (118)	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
759	1	3	NAT VAV 122	5.40	4.00	2.70	1.0	75.0			200	X			X			X					X						B213B	TR24-3-T + NO			New Actuator Only
760	1	3	NAT VAV 127	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
761	1	3	NAT VAV 132	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
762	1	3	NAT VAV 133	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
763	1	3	NAT VAV 135	1.20	4.00	0.60	0.8	75.0			200	X			X			X					X						B209B	TR24-3-T + NO			New Actuator Only
764	1	3	NAT VAV 138	12.20	4.00	6.10	1.5	75.0			200	X			X			X					X						B218B	TR24-3-T + NO			New Actuator Only
765	1	3	NAT AHU-1 CWV	152.00	4.00	76.00	4.0	200.0	3.0		150				X				X	X			X		X				HDP-200-05-L	GMB24-MFTX1 US + NC/FC P-10001			New Actuator Only
766	1	3	NAT AHU-1 HWV	109.00	4.00	54.50	3.0	200.0	3.0		150				X				X	X		X		X					HDP-160-05-L	GMB24-MFTX1 US + NO/FO P-10001			New Actuator Only
767	1	3	NAT AHU-2 CWV	152.00	4.00	76.00	4.0	200.0	3.0		150				X				X	X			X		X				HDP-200-05-L	GMB24-MFTX1 US + NC/FC P-10001			New Actuator Only
768	1	3	NAT AHU-2 HWV	109.00	4.00	54.50	3.0	200.0	3.0		150				X				X	X		X		X					HDP-160-05-L	GMB24-MFTX1 US + NO/FO P-10001			New Actuator Only
769	1	3	NAT AHU-3 CWV	166.00	4.00	83.00	4.0	200.0	4.0		150				X				X	X			X		X				EDP-210-05-L	SY3-24P-150 + NC/FC P-10001			New Actuator Only
770	1	3	NAT AHU-3 HWSV	58.00	4.00	29.00	2.5	200.0	2.0		150				X				X	X		X		X					HDP-125-05-L	AF24-MFT + NO/FO P-10001			New Actuator Only
771	1	3	NAT AHU-3 HWRV	71.00	4.00	35.50	2.5	200.0	2.0		150				X				X	X		X		X					HDP-125-05-L	AF24-MFT + NO/FO P-10001			New Actuator Only
772	1	3	NAT V-1 PHWS		4.00	0.00	10.0		10.0		50			X	X				X				X		X				F7250HSU	SY4-24 SR CONFIG X13			New Actuator Only
773	1	3	RHC-1 HWV	2.00	4.00	1.00	0.8	200.0			200	X			X				X				X						B210B	LR24-SR-2.0			New Actuator Only
774	1	3	RHC-2 HWV	4.00	4.00	2.00	0.8	200.0			200	X			X				X								X		B312B	LR24-SR-2.0			New Actuator Only
775	1	3	RHC-1 HWV	6.00	4.00	3.00	1.0	200.0			200	X			X				X								X		B312B	LR24-SR-2.0			New Actuator Only
776	1	3	RHC-2 HWV	1.50	4.00	0.75	0.8	200.0			200	X			X				X			X							B209B	LR24-SR-2.0			New Actuator Only
777	1	3	RHC-1 HWV	2.00	4.00	1.00	0.8	200.0			200	X			X				X			X							B210B	LR24-SR-2.0			New Actuator Only
778	1	3	CC-1 CHWV	38.00	4.00	19.00	2.0	200.0			200	X			X				X			X							B230B	LR24-SR-2.0			New Actuator Only
779	1	3	E BLDG EOL CW BYP		4.00	0.00						X			X				X														No Size Information Found
780	1	3	E BLDG EOL HW BYP		4.00	0.00						X			X				X														No Size Information Found
781	1	3	W BLDG EOL CW BYP		4.00	0.00						X			X				X														No Size Information Found
782	1	3	W BLDG EOL HW BYP		4.00	0.00						X			X				X														No Size Information Found
783	1	3	JELCC EOL CW BYP		4.00	0.00						X			X				X														No Size Information Found
784	1	3	JELCC EOL HW BYP		4.00	0.00						X			X				X														No Size Information Found

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES

DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS

DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-26
JOB NUMBER:
J-2304001

CONTROL DAMPERS

Item#	Qty	SIZE A - Width or D - Diameter	SIZE B - Height	DAMPER Model Number	DAMPER OPTONS Frame (std = no flanges) Std,FF,RF,DF, or T-flange	DAMPER OPTONS Blade Action = P=Parallel or O=Opposed	DAMPER OPTONS Linkage Std = Concealed Exp = Exposed	DAMPER OPTONS Blade Seals Standard = Y	DAMPER OPTONS Jamb Seals Standard = Y	DAMPER OPTONS Bearings Std=Y or TB=Vertical Blades	DAMPER OPTONS Extended Shaft = EXT Jackshafting = JS	DAMPER OPTONS SP100 End Switch	DAMPER OPTONS Switch Location = IN or OUT	DAMPER OPTONS Side Plate (Optional - Used for Ext Mnt Act & SP100 only)	SLEEVE Sleeve Length	SLEEVE Gage (20 ga Std for SD's)	SLEEVE Enclosure C,CR,CO	SLEEVE Material Galv (Std),SS,AL	ACTUATOR Pneumatic = P Electric = 120V, 24V, MOD	ACTUATOR Actuator Model	ACTUATOR External Mount	ACTUATOR Internal Mount	ACTUATOR Qty of Act per damper	ACTUATOR Fail Position Std is Closed = C Open = O	TAGGING Tag	NSTALLATIO Data Sheet	NOTES Notes
1																											
2																											
3	1	48	DIA	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-B1		New Act Only
4																											
5																											
6	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-C1		New Act Only
7	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-C2		New Actuator + Damper
8	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-C3		New Act Only
9	1	190"	22"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-C4		New Act Only
10	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-C5		New Act Only
11	1	56"	40"		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-C6		New Actuator + Damper
12	1	56"	40"		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-C7		New Actuator + Damper
13																											
14																											
15	1	60"	36"		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-D1		New Actuator + Damper
16	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-D2		New Actuator + Damper
17	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-D3		New Actuator + Damper
18	1	44"	24"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-E1		New Act Only
19	1	44"	24"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-E2		New Act Only
20	1	56"	28"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-E3		New Act Only
21	1	56"	28"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-E4		New Act Only
22	1	56"	28"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-E5		New Act Only
23	1	44"	28"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-F1		New Act Only
24	1	44"	28"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-F2		New Act Only
25	1	44"	28"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-F3		New Act Only
26	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-H1		New Actuator + Damper
27	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-H2		New Actuator + Damper
28	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-H3		New Actuator + Damper
29	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-H4		New Actuator + Damper
30																											
31																											
32	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	25 Mod		O		1	C	E-RH-J1		New Act Only
33	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-J2		New Actuator + Damper
34	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-J3		New Act Only
35	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K1		New Act Only
36	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K2		New Act Only
37	1	48"	48"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K3		New Act Only
38	1	48"	48"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K4		New Act Only
39	1	48"	48"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K5		New Act Only
40	1	48"	48"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K6		New Act Only
41	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K7		New Act Only
42	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-K8		New Act Only
43	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-L1		New Actuator + Damper
44	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-L2		New Actuator + Damper
45																											
46																											
47	1	24"	24"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-M1		New Act Only
48	1	24"	24"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-M2		New Act Only
49	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-N1		New Act Only
50	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-N2		New Act Only

Delta Controls

Temperature Control Services
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LEBANON, INDIANA 46052
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UPDATES	
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04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-27
JOB NUMBER:
J-2304001

CONTROL DAMPERS

		SIZE		DAMPER	DAMPER OPTONS										SLEEVE				ACTUATOR						TAGGING	INSTALLATION	NOTES
Item#	Qty	A - Width or D - Diameter	B - Height	Model Number	Frame (std = no flanges) Std,FF,RF,DF, or T-flange	* Blade Action = P=Parallel or O=Opposed	Linkage Std = Concealed Exp = Exposed	Blade Seals Standard = Y	Jamb Seals Standard = Y	Bearings Std=Y or TB=Vertical Blades	Extended Shaft = EXT Jackshafting = JS	SP100 End Switch	Switch Location = IN or OUT	Side Plate (Optional - Used for Ext Mnt Act & SP100 only)	Sleeve Length	Gage (20 ga Std for SD's)	Enclosure C,CR,CO	Material Galv (Std), SS,AL	* Pneumatic = P Electric = 120V, 24V, MOD	Actuator Model	External Mount	Internal Mount	Qty of Act per damper	Fail Position Std is Closed = C Open = O	Tag	Data Sheet	Notes
51	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-N3		New Actuator + Damper
52	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-P1		New Act Only
53	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-P2		New Act Only
54	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-P3		New Actuator + Damper
55	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-P4		New Actuator + Damper
56	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-Q1		New Act Only
57	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-Q2		New Act Only
58	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-Q3		New Actuator + Damper
59	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-R1		New Actuator + Damper
60	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-R2		New Act Only
61	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-R3		New Actuator + Damper
62	1	42"	DIA		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-R4		New Actuator + Damper
63																											
64	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-S1		New Act Only
65	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-S2		New Act Only
66	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-S3		New Act Only
67	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-T1		New Act Only
68	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-T2		New Act Only
69	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-T3		New Act Only
70	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-T4		New Act Only
71	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-T5		New Act Only
72	1	36"	36"	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	E-RH-T6		New Act Only
73																											
74																											
75	1	30"	30"		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-AA1		New Actuator + Damper
76	1	36"	32"		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-AA2		New Actuator + Damper
77	1	48"	36"		STD	P	STD	Y	Y	STD				Y				STD	24 Mod		O		1	C	RH-AA3		New Actuator + Damper
78																											
79	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q2 HOOD ISO DPR 1		New Act Only
80	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q2 HOOD ISO DPR 2		New Act Only
81	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q3 HOOD ISO DPR 1		New Act Only
82	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q3 HOOD ISO DPR 2		New Act Only
83	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q4 HOOD ISO DPR 1		New Act Only
84	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q4 HOOD ISO DPR 2		New Act Only
85	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q5 HOOD ISO DPR 1		New Act Only
86	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q5 HOOD ISO DPR 2		New Act Only
87	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q6 HOOD ISO DPR 1		New Act Only
88	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q6 HOOD ISO DPR 2		New Act Only
89	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q11 HOOD ISO DPR 1		New Act Only
90	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q11 HOOD ISO DPR 2		New Act Only
91	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q13 HOOD ISO DPR 1		New Act Only
92	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q13 HOOD ISO DPR 2		New Act Only
93	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q20 HOOD ISO DPR 1		New Act Only
94	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q20 HOOD ISO DPR 2		New Act Only
95	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q21 HOOD ISO DPR 1		New Act Only
96	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q21 HOOD ISO DPR 2		New Act Only
97	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q22 HOOD ISO DPR 1		New Act Only
98	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q22 HOOD ISO DPR 2		New Act Only
99	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q24 HOOD ISO DPR 1		New Act Only
100	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q24 HOOD ISO DPR 2		New Act Only

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JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-28
JOB NUMBER:
J-2304001

CONTROL DAMPERS

		SIZE		DAMPER	DAMPER OPTONS										SLEEVE				ACTUATOR						TAGGING	INSTALLATIO	NOTES
Item#	Qty	A - Width or D - Diameter	B - Height	Model Number	Frame (std = no flanges) Std,FF,RF,DF,or T-flange	* Blade Action = P=Parallel or O=Opposed	Linkage Std = Concealed Exp = Exposed	Blade Seals Standard = Y	Jamb Seals Standard = Y	Bearings Std=Y or TB=Vertical Blades	Extended Shaft = EXT Jackshafting = JS	SP100 End Switch	Switch Location = IN or OUT	Side Plate (Optional - Used for Ext Mnt Act & SP100 only)	Sleeve Length	Gage (20 ga Std for SD's)	Enclosure C,CR,CO	Material Galv (Std),SS,AL	* Pneumatic = P Electric = 120V, 24V, MOD	Actuator Model	External Mount	Internal Mount	Qty of Act per damper	Fail Position Std is Closed = C Open = O	Tag	Data Sheet	Notes
101	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q25 HOOD ISO DPR 1		New Act Only
102	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q25 HOOD ISO DPR 2		New Act Only
103	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q26 HOOD ISO DPR 1		New Act Only
104	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q26 HOOD ISO DPR 2		New Act Only
105	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q27 HOOD ISO DPR 1		New Act Only
106	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q27 HOOD ISO DPR 2		New Act Only
107	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q28 HOOD ISO DPR 1		New Act Only
108	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q28 HOOD ISO DPR 2		New Act Only
109	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q29 HOOD ISO DPR 1		New Act Only
110	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-Q29 HOOD ISO DPR 2		New Act Only
111	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R6 HOOD ISO DPR 1		New Act Only
112	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R6 HOOD ISO DPR 2		New Act Only
113	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R8 HOOD ISO DPR 1		New Act Only
114	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R8 HOOD ISO DPR 2		New Act Only
115	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R9 HOOD ISO DPR 1		New Act Only
116	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R9 HOOD ISO DPR 2		New Act Only
117	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R12 HOOD ISO DPR 1		New Act Only
118	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R12 HOOD ISO DPR 2		New Act Only
119	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R13 HOOD ISO DPR 1		New Act Only
120	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R13 HOOD ISO DPR 2		New Act Only
121	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R15 HOOD ISO DPR 1		New Act Only
122	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R15 HOOD ISO DPR 2		New Act Only
123	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R16 HOOD ISO DPR 1		New Act Only
124	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R16 HOOD ISO DPR 2		New Act Only
125	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R19 HOOD ISO DPR 1		New Act Only
126	1	?	?	ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC	TFB24	O		1		EF-R19 HOOD ISO DPR 2		New Act Only
127	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-A2 OAD		New Act w/ End Sw + Damper
128	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-AA1 OAD		New Actuator + Damper
129	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-AA1 RAD		New Actuator + Damper
130	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C1 OAD		New Actuator + Damper
131	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C1 RAD		New Actuator + Damper
132	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-J1 OAD		New Actuator + Damper
133	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-J1 RAD		New Actuator + Damper
134	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-J2 OAD		New Actuator + Damper
135	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-J2 RAD		New Actuator + Damper
136	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-J3 OAD		New Actuator + Damper
137	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-J3 RAD		New Actuator + Damper
138	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C3 OAD		New Act w/ End Sw + Damper
139	1			EBO	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C3 FBD		New Act Only
140	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C2 OAD		New Act w/ End Sw + Damper
141	1			EBO	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C2 FBD		New Act Only
142	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C5 OAD		New Actuator + Damper
143	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C5 RAD		New Actuator + Damper
144	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C5 ISO		New Act w/ End Sw Only
145	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K6 OAD		New Actuator + Damper
146	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K6 RAD		New Actuator + Damper
147	1			EBO	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K6 FBD		New Act Only
148	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-M1 OAD		New Actuator + Damper
149	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-M1 RAD		New Actuator + Damper
150	1			EBO	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-M1 FBD		New Act Only

PHASE 3 DAMPER SCHEDULE (3 OF 5)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-29
JOB NUMBER:
J-2304001

CONTROL DAMPERS

		SIZE		DAMPER	DAMPER OPTONS										SLEEVE				ACTUATOR						TAGGING	INSTALLATIO	NOTES
Item#	Qty	A - Width or D - Diameter	B - Height	Model Number	Frame (std = no flanges) Std,FF,RF, DF, or T-flange	* Blade Action = P=Parallel or O=Opposed	LinKage Std = Concealed Exp = Exposed	Blade Seals Standard = Y	Jamb Seals Standard = Y	Bearings Std=Y or TB=Vertical Blades	Extended Shaft = EXT Jackshafting = JS	SP100 End Switch	Switch Location = IN or OUT	Side Plate (Optional - Used for Ext Mnt Act & SP100 only)	Sleeve Length	Gage (20 ga Std for SD's)	Enclosure C,CR,CO	Material Galv (Std),SS,AL	* Pneumatic = P Electric = 120V, 24V, MOD	Actuator Model	External Mount	Internal Mount	Qty of Act per damper	Fail Position Std is Closed = C Open = O	Tag	Data Sheet	Notes
151	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-M2 OAD		New Actuator + Damper
152	1			NEW	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-M2 RAD		New Actuator + Damper
153	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C4 OAD		New Act Only
154	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C4 MIN OAD		New Act Only
155	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-C4 RAD		New Act Only
156	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-A1 OAD		New Act Only
157	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-A1 MIN OAD		New Act Only
158	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-A1 RAD		New Act Only
159	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-B1 OAD		New Act Only
160	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-B1 MIN OAD		New Act Only
161	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-B1 RAD		New Act Only
162	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-D1 OAD		New Act Only
163	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-D1 RAD		New Act Only
164	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-D2 OAD		New Act Only
165	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-D2 RAD		New Act Only
166	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E1 OAD		New Act Only
167	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E1 MIN OAD		New Act Only
168	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E1 RAD		New Act Only
169	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E2 OAD		New Act Only
170	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E2 MIN OAD		New Act Only
171	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E2 RAD		New Act Only
172	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E3 OAD		New Act Only
173	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-E3 RAD		New Act Only
174	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-F1 OAD		New Act Only
175	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-F1 MIN OAD		New Act Only
176	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-F1 RAD		New Act Only
177	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-H1 OAD		New Act Only
178	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-H1 MIN OAD		New Act Only
179	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-H1 RAD		New Act Only
180	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-H2 OAD		New Act Only
181	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-H2 MIN OAD		New Act Only
182	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-H2 RAD		New Act Only
183	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K1 OAD		New Act Only
184	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K1 RAD		New Act Only
185	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K2 OAD		New Act Only
186	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K2 RAD		New Act Only
187	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K3 OAD		New Act Only
188	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K3 RAD		New Act Only
189	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K4 OAD		New Act Only
190	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K4 RAD		New Act Only
191	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC		O		1		AHU-K4 OA INTAKE		New Act Only
192	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K5 OAD		New Act Only
193	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-K5 RAD		New Act Only
194	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-N1 OAD		New Act Only
195	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-N1 RAD		New Act Only
196	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-N2 OAD		New Act Only
197	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-N2 RAD		New Act Only
198	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-P1 OAD		New Act Only
199	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-P1 RAD		New Act Only
200	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-P2 OAD		New Act Only

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-30
JOB NUMBER:
J-2304001

CONTROL DAMPERS

		SIZE		DAMPER	DAMPER OPTONS										SLEEVE				ACTUATOR						TAGGING	INSTALLATIO	NOTES
Item#	Qty	A - Width or D - Diameter	B - Height	Model Number	Frame (std = no flanges) Std,FF, RF, DF, or T-flange	* Blade Action = P=Parallel or O=Opposed	Linkage Std = Concealed Exp = Exposed	Blade Seals Standard = Y	Jamb Seals Standard = Y	Bearings Std=Y or TB=Vertical Blades	Extended Shaft = EXT Jackshafting = JS	SP100 End Switch	Switch Location = IN or OUT	Side Plate (Optional - Used for Ext Mnt Act & SP100 only)	Sleeve Length	Gage (20 ga Std for SD's)	Enclosure C,CR,CO	Material Galv (Std),SS,AL	* Pneumatic = P Electric = 120V, 24V, MOD	Actuator Model	External Mount	Internal Mount	Qty of Act per damper	Fail Position Std is Closed = C Open = O	Tag	Data Sheet	Notes
201	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-P2 RAD		New Act Only
202	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-Q1 OAD		New Act Only
203	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-Q1 RAD		New Act Only
204	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-Q2 OAD		New Act Only
205	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-Q2 RAD		New Act Only
206	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-R1 OAD		New Act Only
207	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-R1 RAD		New Act Only
208	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-R2 OAD		New Act Only
209	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-R2 RAD		New Act Only
210	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-S1 OAD		New Act Only
211	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-S1 MIN OAD		New Act Only
212	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-S1 RAD		New Act Only
213	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-T1 OAD		New Act Only
214	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		AHU-T1 RAD		New Act Only
215	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC		O		1		NAT AHU-1 EAD		New Act w/ End Sw Only
216	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-1 RECIRC DPR		New Act Only
217	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-1 FBD		New Act Only
218	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-1 OAD		New Act Only
219	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC		O		1		NAT AHU-2 EAD		New Act w/ End Sw Only
220	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-2 RECIRC DPR		New Act Only
221	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-2 FBD		New Act Only
222	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-2 OAD		New Act Only
223	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 VAC		O		1		NAT AHU-3 EAD		New Act w/ End Sw Only
224	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-3 FBD		New Act Only
225	1			ETR	STD	P	STD	Y	Y	STD				Y				STD	24 MOD		O		1		NAT AHU-3 MAD		New Act Only

PHASE 3 DAMPER SCHEDULE (5 OF 5)

Delta Controls

Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-31
JOB NUMBER:
J-2304001

AHU SCHEDULE

IDENTITY DATA					SUPPLY FAN DATA					SUPPLY FAN ELECTRICAL																
MARK	MANUF	MODEL	LOCATION	AREA SERVED	AIRFLOW (CFM)	RPM	MOTOR			VOLTS (V)	PH	FREQ (HZ)	FLA (A)	PREHEAT COIL DATA			COOLING COIL DATA			REHEAT COIL DATA			MIN OA (%)	NOTES
							QTY	HP EACH	BHP EACH					AIRFLOW (CFM)	FLOW (GPM)	VALVE	AIRFLOW (CFM)	FLOW (GPM)	VALVE	AIRFLOW (CFM)	FLOW (GPM)	VALVE		
AHU-A2	TRANE	CSAA012	2ND FLOOR MECH ROOM	WEIGHT ROOM LOCKERS	6,000	1,843	1	7.5	5.7	460	3	60	9.8	6,000	30	2P	6,000	73	2	6,000	13	2	100	
AHU-C1	TRANE	CSAA008	TUNNEL MECH ROOM	CAFETERIA SUPPORT	3,600	2,110	1	5.0	3.2	460	3	60	6.7	2,340	6	2P	3,600	22	2	-	-	-	30	
AHU-C2	TRANE	CSAA035	TUNNEL MECH ROOM	KITCHEN MAKEUP AIR	13,700	1,982	2	7.5	6.7	460	3	60	9.8	13,700	51	2P	13,700	167	2	13,700	35	2	100	
AHU-C3	TRANE	CSAA025	TUNNEL MECH ROOM	SERVING LINE	10,000	1,586	1	10.0	8.7	460	3	60	12.5	6,500	28	2P	10,000	122	2	10,000	25	2	100	
AHU-C5	TRANE	CSAA050	TUNNEL MECH ROOM	CAFETERIA	24,750	1,408	2	15.0	11.0	460	3	60	21.0	25,000	45	2P	25,000	178	2	-	-	-	40	
AHU-J1	TRANE	CSAA030	PENTHOUSE NEAR CENTRAL PLANT	PERFORMING ARTS	15,500	1,421	1	15.0	13.2	460	3	60	21.0	10,075	21	2	15,000	98	2	-	-	-	30	
AHU-J2	TRANE	CSAA025	PENTHOUSE NEAR CENTRAL PLANT	PERFORMING ARTS	12,200	1,720	1	15.0	10.6	460	3	60	18.5	7,930	16	2	12,200	74	2	-	-	-	25	
AHU-J3	MARCRAFT	CUSTOM	ROOFTOP	STUDENT SERVICES	9,000	1,775	1	10.0	8.2	460	3	60	14.0	9,000	42	2P	9,000	73	2	-	-	-	50	
AHU-K6	TRANE	CSAA008	2ND FLOOR MECH ROOM	LOCKER ROOMS	3,100	2,372	1	5.0	3.2	460	3	60	6.7	3,200	18	2P	3,200	23	2	3,200	10	2	50	
AHU-M1	TRANE	CSAA035	PENTHOUSE	LOCKER ROOMS	15,000	1,710	2	7.5	6.9	460	3	60	9.4	12,000	34	2	15,000	107	2	-	-	-	50	
AHU-M2	TRANE	CSAA050	PENTHOUSE	SOUTH GYM	25,000	1,458	2	15.0	12.1	460	3	60	21.0	25,000	40	2P	25,000	208	2	25,000	72	2	25	
AHU-AA1	TRANE	CSAA040	PENTHOUSE	PERFORMING ARTS ADDITION	19,000	1,861	2	10.0	8.5	460	3	60	12.5	11,500	25	2P	19,000	117	2	-	-	-	40	

1 - Preheat Coil is integral face / bypass
* Valve nomenclature: 2 = Two Way, 3 = Three Way, 2P = Two Way Pumped, 3P = Three Way Pumped.

EXISTING AIR HANDLING UNIT SCHEDULE

MARK	EXISTING TRANE MODEL #	LOCATION	AREA SERVED	CONFIGURATION	MOTOR HP	REPLACE MOTOR?	AIRFLOW (CFM)	NEW AIRFLOW (CFM)	PREHEAT COIL NEW FLOW (GPM)	PREHEAT COIL NEW VALVE	HEATING COIL NEW FLOW (GPM)	HEATING COIL NEW VALVE	COOLING COIL NEW FLOW (GPM)	COOLING COIL NEW VALVE	EXISTING MIN. OCC. AIRFLOW (%)	NEW MIN. OCC. AIRFLOW (%)	NOTES
E-AHU-A1	MCCA035	2ND FLOOR MECH ROOM	WEIGHT ROOM	VAV PHC-CC-2HC	20	YES	13,700	13,700	62.0	2P	72.0	2	182.0	2	100%	50%	
E-AHU-B1	MCCA040	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	40	NO	21,400	17,000	-	-	33.0	2P	199.0	2	35%	35%	
E-AHU-C4	MCCA040	TUNNEL MECH ROOM	CLASSROOMS	VAV 2HC-CC	40	YES	23,100	20,000	50.0	2P	40.0	2	497.0	2	35%	35%	
E-AHU-D1	MCCA035	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	25	YES	16,200	16,200	-	-	25.0	2P	150.0	2	35%	35%	
E-AHU-D2	MCCA030	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	25	YES	14,000	14,000	-	-	19.0	2P	125.0	2	30%	30%	
E-AHU-E1	MCCA025	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	20	YES	11,510	9,500	-	-	13.0	2P	95.0	2	25%	30%	
E-AHU-E2	MCCA035	TUNNEL MECH ROOM	LIBRARY	VAV HC-CC	25	NO	16,960	17,000	-	-	19.0	2P	139.0	2	25%	30%	
E-AHU-E3	MCCA017	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	15	YES	8,360	6,000	-	-	6.0	2P	64.0	2	20%	30%	
E-AHU-F1	MCCA035	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	30	YES	18,180	13,000	-	-	14.0	2P	153.0	2	20%	35%	
E-AHU-G1	MCCA040	2ND FLOOR MECH ROOM	AUDITORIUM	CONSTANT HC-CC	20	NO	19,000	19,000	-	-	63.0	2P	179.0	2	40%	40%	1
E-AHU-G2	MCCA040	2ND FLOOR MECH ROOM	AUDITORIUM	CONSTANT HC-CC	20	NO	20,900	20,900	-	-	65.0	2P	188.0	2	40%	40%	1
E-AHU-G3	MCCA030	2ND FLOOR MECH ROOM	STUDENT COMMONS	CONSTANT HC-CC	15	NO	15,000	15,000	-	-	42.0	2P	113.0	2	40%	40%	1
E-AHU-G4	MCCA030	2ND FLOOR MECH ROOM	LECTURE 1ST & 2ND	VAV HC-CC	25	NO	14,625	14,625	-	-	16.0	2P	123.0	2	40%	40%	1
E-AHU-G5	MCCA021	2ND FLOOR MECH ROOM	WEST STAGE	VAV HC-CC	15	NO	10,400	10,400	-	-	22.0	2P	77.0	2	40%	40%	1
E-AHU-G6	MCCA030	SCENE SHOP MEZZANINE	EAST STAGE	VAV HC-CC	15	NO	13,300	13,300	-	-	28.0	2P	99.0	2	40%	40%	1
E-AHU-H1	MCCA040	TUNNEL MECH ROOM	CLASSRM & HEALTH CTR	VAV HC-CC	30	YES	19,400	16,000	-	-	26.0	2P	171.0	2	30%	30%	
E-AHU-H2	MCCA030	TUNNEL MECH ROOM	CLASSROOMS	VAV HC-CC	25	YES	13,500	13,500	-	-	18.0	2P	121.0	2	30%	30%	
E-AHU-K1	MCCA030	PENTHOUSE	MAIN GYM	VAV HC-CC	15	YES	15,000	15,000	-	-	43.0	2	89.0	2	25%	25%	
E-AHU-K2	MCCA030	PENTHOUSE	MAIN GYM	VAV HC-CC	15	YES	15,000	15,000	-	-	43.0	2	89.0	2	25%	25%	
E-AHU-K3	MCCA030	PENTHOUSE	MAIN GYM	VAV HC-CC	15	YES	15,000	15,000	-	-	43.0	2	89.0	2	25%	25%	
E-AHU-K4	MCCA030	PENTHOUSE	MAIN GYM	VAV HC-CC	15	YES	15,000	15,000	-	-	43.0	2	89.0	2	25%	25%	
E-AHU-K5	MCCA030	PENTHOUSE	MAIN GYM	VAV HC-CC	15	YES	15,000	15,000	-	-	43.0	2	89.0	2	25%	25%	
E-AHU-N1	MCCA025	PENTHOUSE	ART	VAV HC-CC	20	YES	12,300	13,000	-	-	25.0	3P	114.0	3	40%	40%	
E-AHU-N2	MCCA035	PENTHOUSE	CLASSROOMS	VAV HC-CC	30	YES	17,200	13,500	-	-	35.0	2P	160.0	2	40%	40%	
E-AHU-P1	MCCA040	PENTHOUSE	ADMINISTRATION	VAV HC-CC	30	YES	18,500	18,200	-	-	37.0	2P	171.5	2	40%	40%	
E-AHU-P2	MCCA050	PENTHOUSE	CLASSROOMS	VAV HC-CC	40	YES	22,800	17,200	-	-	45.0	2P	214.0	2	40%	40%	
E-AHU-Q1	MCCA035	PENTHOUSE	CLASSROOMS	VAV PHC-CC-HC	30	NO	17,400	15,000	50.0	2P	19.0	3	232.0	3	85%	35%	
E-AHU-Q2	MCCA040	PENTHOUSE	SCIENCE LABS	VAV PHC-CC-HC	30	YES	19,800	17,500	57.0	2P	22.0	2	255.0	2	85%	85%	
E-AHU-R1	MCCA035	PENTHOUSE	CLASSROOMS	VAV PHC-CC-HC	30	YES	17,400	14,000	50.0	2P	19.0	2	232.0	2	85%	35%	
E-AHU-R2	MCCA035	PENTHOUSE	CLASSROOMS	VAV PHC-CC-HC	30	YES	16,500	13,500	47.0	2P	18.0	2	219.0	2	85%	35%	
E-AHU-S1	MCCA040	2ND FLOOR MECH ROOM	PERF. ARTS CLASS	VAV HC-CC	30	NO	20,000	20,000	-	-	56.8	2P	154.0	2	30%	30%	
E-AHU-T1	MCCA025	PENTHOUSE	ROTC	VAV PHC-HC-CC	20	NO	13,020	12,000	40.0	2P	11.0	3	179.0	3	30%	30%	
NAT AHU-1	ETR	NATATORIUM	NATATORIUM	VAV ERU	25	NO	33,600	?	-	-	109.0	2	152.0	2	SEE SOO	SEE SOO	2
NAT AHU-2	ETR	NATATORIUM	NATATORIUM	VAV ERU	25	NO	33,600	?	-	-	109.0	2	152.0	2	SEE SOO	SEE SOO	2
NAT AHU-3	ETR	NATATORIUM	NATATORIUM	VAV ERU	40	NO	25,000	?	71.0	2	58.0	2	166.0	2	SEE SOO	SEE SOO	2

1 - Information only, AHUs installed in Phase 2. No Phase 3 scope for these units.
2 - Nadatorium AHUs will be provided with new VFDs and all BAS controls.
* Valve nomenclature: 2 = Two Way, 3 = Three Way, 2P = Two Way Pumped, 3P = Three Way Pumped.

PHASE 3 NEW AND EXISTING AHU SCHEDULES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-32
JOB NUMBER:
J-2304001

HYDRONIC CONVECTOR SCHEDULE

IDENTITY DATA				TYPE	HEATING DATA		CONTROLLED FROM	NOTES
MARK	MANUF	MODEL	ENCLOSURE MODEL		CAPACITY (BTUH)	FLOW (GPM)		
CV-D1	TRANE	SW	38"L / 26" H / 6" D	SURFACE	2,500	0.3	VAV D2-01	NEW
CV-D2	TRANE	SW	38"L / 26" H / 6" D	SURFACE	2,500	0.3	VAV D2-06	NEW
CV-D3	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV D2-08	NEW
CV-D4	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV D2-09	NEW
CV-D5	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV D1-15	NEW
CV-D6	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV D1-09	NEW
CV-D7	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV D2-05	NEW
CV-D8	TRANE	SW	44"L / 24" H / 4" D	SURFACE	2,900	0.3	VAV D2-10	NEW
CV-D9	TRANE	SW	44"L / 24" H / 4" D	SURFACE	2,900	0.3	VAV D2-14	NEW
CV-E1	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV E3-04	NEW
CV-F1	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV F1-03	NEW
CV-F2	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV F1-01	NEW
CV-F3	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV F1-08	NEW
CV-F4	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV F1-09	NEW
CV-F5	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV E3-03	NEW
CV-F6	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV F1-21	NEW
CV-F7	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV F1-19	NEW
E-CV-H1	EXIST	-	-	RECESSED	2,100	0.2	VAV H1-13	ETR
E-CV-H2	EXIST	-	-	RECESSED	2,100	0.2	VAV H1-14	ETR
CV-H3	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	0.2	VAV H1-09	NEW
CV-H4	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	0.2	VAV H1-04	NEW
CV-H5	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	0.2	VAV H1-01	NEW
E-CV-H6	EXIST	-	-	SURFACE	6,900	0.7	VAV H1-24	ETR
E-CV-H7	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV H1-25	ETR
CV-J1	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV J2-08	NEW
CV-J2	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV J2-09	NEW
E-CV-L1	EXIST	-	-	RECESSED	2,100	0.2	VAV S1-18	ETR
E-CV-L2	EXIST	-	-	RECESSED	2,100	0.2	VAV S1-01	ETR
CV-L3	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV J1-20	NEW
CV-M1	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	0.2	VAV M1-04	NEW
CV-M2	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	0.2	VAV J1-06	NEW
CV-M3	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV M1-02	NEW
CV-M4	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV M1-03	NEW
E-CV-M5	EXIST	T6	-	RECESSED	2,100	0.2	AHU-K6	ETR
E-CV-M6	EXIST	T4	-	RECESSED	2,100	0.2	AHU-K6	ETR
E-CV-M7	EXIST	T3	-	RECESSED	2,100	0.2	AHU-K6	ETR
CV-M8	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV M1-07	NEW
E-CV-N1	EXIST	N2	-	SEMI-RECESSED	6,900	0.7	VAV B1-01	ETR
CV-N2	TRANE	SG	44"L / 26" H / 6" D	SEMI-RECESSED	4,600	0.5	VAV B1-03	NEW
E-CV-N3	EXIST	N5	-	RECESSED	3,100	0.3	VAV B1-02	ETR
CV-N4	TRANE	SG	44"L / 26" H / 6" D	SEMI-RECESSED	4,600	0.5	VAV N2-01	NEW
CV-N5	TRANE	SG	44"L / 26" H / 6" D	SEMI-RECESSED	4,600	0.5	VAV N2-04	NEW
CV-P1	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV P1-10	NEW
CV-P2	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV P1-11	NEW
CV-P3	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV P1-07	NEW
CV-P4	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV P1-28	NEW
E-CV-P5	EXIST	-	-	SURFACE	6,900	0.7	VAV P1-27	ETR
CV-P6	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV P2-02	NEW
CV-P7	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV P2-25	NEW
CV-P8	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV P2-01	NEW
CV-P9	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV P2-03	NEW
E-CV-Q1	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV Q1-12	ETR
CV-Q2	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	0.2	VAV Q2-10	NEW
E-CV-R1	EXIST	-	-	RECESSED	3,100	0.3	VAV R1-03	ETR
E-CV-R2	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV-R1-07	ETR
E-CV-R3	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV-R1-08	ETR
E-CV-R4	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV-R1-09	ETR
E-CV-R5	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV R2-09	ETR
E-CV-R6	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV R2-04	ETR
E-CV-R7	EXIST	-	-	SEMI-RECESSED	6,900	0.7	VAV R2-08	ETR
E-CV-S1	EXIST	-	-	RECESSED	2,100	0.2	VAV S1-05	ETR
E-CV-S2	EXIST	-	-	RECESSED	3,100	0.3	VAV S1-17	ETR
E-CV-S3	EXIST	-	-	RECESSED	2,100	0.2	VAV S1-16	ETR
CV-AA1	TRANE	SG	44"L / 26" H / 6" D	SURFACE	4,600	0.5	VAV AA1-07	NEW
CV-AA2	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	0.5	VAV AA1-05	NEW
CV-AA3	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	0.2	VAV AA1-03	NEW
CV-AA4	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	0.2	VAV AA1-04	NEW

PUMP SCHEDULE

IDENTITY DATA				TYPE	FLUID DATA		MOTOR DATA		ELECTRICAL DATA			CONTROLLED FROM	NOTES
MARK	MANUF	MODEL	SYSTEM SERVED		FLUID TYPE	FLOW (GPM)	HP	SPEED (RPM)	VOLTS (V)	PH	FREQ (HZ)		
IP-A1	GRUNDFOS	UPS 50-80/2 F	HHW	INLINE CIRCULATOR	WATER	75	0.75	3,500	460	3	60	E-AHU-A1	
IP-A2	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	55	0.75	3,500	460	3	60	AHU-A2	
IP-B1	GRUNDFOS	UPS 50-80/2 F	HHW	INLINE CIRCULATOR	WATER	32	0.75	3,500	460	3	60	E-AHU-B1	
IP-C1	GRUNDFOS	UPS 32-80 F F	HHW	INLINE CIRCULATOR	WATER	5	0.50	3,500	460	3	60	AHU-C1	
IP-C2	GRUNDFOS	UPS 50-80/2 F	HHW	INLINE CIRCULATOR	WATER	75	0.75	3,500	460	3	60	AHU-C2	
IP-C3	GRUNDFOS	UPS 50-80/2 F	HHW	INLINE CIRCULATOR	WATER	65	0.75	3,500	460	3	60	AHU-C3	
IP-C4	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	50	0.75	3,500	460	3	60	E-AHU-C4	
IP-C5	GRUNDFOS	UPS 50-160 F	HHW	INLINE CIRCULATOR	WATER	150	3.00	3,500	460	3	60	AHU-C5	
IP-D1	GRUNDFOS	UPS 32-80 F	HHW	INLINE CIRCULATOR	WATER	25	0.50	3,500	460	3	60	E-AHU-D1	
E-IP-D2	EXISTING		HHW	INLINE CIRCULATOR	WATER	18	0.75	-	460	3	60	E-AHU-D2	
IP-E1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	13	0.75	3,500	460	3	60	E-AHU-E1	
IP-E2	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	19	0.75	3,500	460	3	60	E-AHU-E2	
IP-E3	GRUNDFOS	UPS 32-80 F	HHW	INLINE CIRCULATOR	WATER	10	0.50	3,500	460	3	60	E-AHU-E3	
IP-F1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	14	0.75	3,500	460	3	60	E-AHU-F1	
IP-H1	GRUNDFOS	UPS 32-80 F	HHW	INLINE CIRCULATOR	WATER	25	0.50	3,500	460	3	60	E-AHU-H1	
IP-H2	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	18	0.75	3,500	460	3	60	E-AHU-H2	
IP-J3	GRUNDFOS	UPS 32-160F	HHW	INLINE CIRCULATOR	WATER	40	0.75	3,500	460	3	60	AHU-J3	
IP-K6	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	20	0.75	3,500	460	3	60	AHU-K6	
IP-M1	GRUNDFOS	UPS 50-80/2 F	HHW	INLINE CIRCULATOR	WATER	34	0.75	3,500	460	3	60	AHU-M1	
IP-M2	GRUNDFOS	UPS 75-69 F	HHW	INLINE CIRCULATOR	WATER	130	1.50	3,500	460	3	60	AHU-M2	
E-IP-N1	EXISTING		HHW	INLINE CIRCULATOR	WATER	25	0.75	-	460	3	60	E-AHU-N1	
IP-N2	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	35	0.75	3,500	460	3	60	E-AHU-N2	
IP-P1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	37	0.75	3,500	460	3	60	E-AHU-P1	
E-IP-P2	EXISTING		HHW	INLINE CIRCULATOR	WATER	48	1.00	-	460	3	60	E-AHU-P2	
IP-Q1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	50	0.75	3,500	460	3	60	E-AHU-Q1	
E-IP-Q2	EXISTING		HHW	INLINE CIRCULATOR	WATER	57	1.00	-	460	3	60	E-AHU-Q2	
IP-R1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	50	0.75	3,500	460	3	60	E-AHU-R1	
IP-R2	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	47	0.75	3,500	460	3	60	E-AHU-R2	
IP-S1	GRUNDFOS	UPS 32-160 F	HHW	INLINE CIRCULATOR	WATER	57	0.75	3,500	460	3	60	E-AHU-S1	
IP-T1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	50	0.75	3,500	460	3	60	E-AHU-T1	
IP-AA1	GRUNDFOS	UPS 40-80/2 F	HHW	INLINE CIRCULATOR	WATER	50	0.50	3,500	460	3	60	AHU-AA1	

SPLIT SYSTEM SCHEDULE

IDENTITY DATA			CONTROL DATA			
MARK	MANUF	MODEL	LOCATION	SERVES	SPACE TEMP MONITORED FROM	NOTES
SS-B1	DAIKIN	FTKB09	D108C	IDF	VAV B1-03	
SS-B2	DAIKIN	FTKB09	C200	IDF	VAV C4-23	
SS-D1	DAIKIN	FTKB09	A115	IDF	VAV D2-02	
SS-E1	DAIKIN	FTKB09	A134	IDF	VAV E3-05	
SS-F1	DAIKIN	FTKB09	A226K	IDF	VAV E2-12	
SS-G1	DAIKIN	FTKB09	L106	AREA G STORAGE	VAV G4-01	Ph 1a, confirm complete
SS-H1	DAIKIN	FTKB09	L205	IDF	VAV H1-21	
SS-J1	DAIKIN	FTKB09	K112	IDF	VAV J2-07	
SS-J2	DAIKIN	FTKB09	D219A	IDF	VAV J2-12	
SS-L1	DAIKIN	FTKB09	F106	STORAGE	VAV S1-18	
SS-P1	DAIKIN	FTKB09	B108L	IDF	VAV P1-02	
SS-R1	DAIKIN	FTKB09	N110	IDF	VAV R1-08	
SS-Q1	DAIKIN	FTKB09	N123	SCIENCE PREP	VAV Q1-06	

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UPDATES	
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04/20/2023	ADD 5.3
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REVISIONS	
DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-33
JOB NUMBER:
J-2304001

VARIABLE FREQUENCY DRIVE (VFD) SCHEDULE

ITEM	DESIGNATION (FROM MECH. PLANS)	QUANTITY	UNIT LOCATION	UNIT SERVES	HP	VOLTAGE / PHASE	HZ	DISCONNECT	BYPASS	BACNET MS/TP	MODEL NUMBER	NOTES
1	AHU-A2	1	2ND FLOOR MECH ROOM	WEIGHT ROOM LOCKERS	7.5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
2	AHU-C1	1	TUNNEL MECH ROOM	CAFETERIA SUPPORT	5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
3	AHU-C2A	1	TUNNEL MECH ROOM	KITCHEN MAKEUP AIR	7.5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
4	AHU-C2B	1	TUNNEL MECH ROOM	KITCHEN MAKEUP AIR	7.5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
5	AHU-C3	1	TUNNEL MECH ROOM	SERVING LINE	10	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
6	AHU-C5A	1	TUNNEL MECH ROOM	CAFETERIA	15	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
7	AHU-C5B	1	TUNNEL MECH ROOM	CAFETERIA	15	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
8	AHU-J1	1	PENTHOUSE NEAR CENTRAL PLANT	PERFORMING ARTS	15	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
9	AHU-J2	1	PENTHOUSE NEAR CENTRAL PLANT	PERFORMING ARTS	15	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
10	AHU-J3	1	ROOFTOP	STUDENT SERVICES	10	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
11	AHU-K6	1	2ND FLOOR MECH ROOM	LOCKER ROOMS	5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	3
12	AHU-M1A	1	PENTHOUSE	LOCKER ROOMS	7.5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
13	AHU-M1B	1	PENTHOUSE	LOCKER ROOMS	7.5	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
14	AHU-M2A	1	PENTHOUSE	SOUTH GYM	15	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
15	AHU-M2B	1	PENTHOUSE	SOUTH GYM	15	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
16	AHU-AA1A	1	PENTHOUSE	PERFORMING ARTS ADDITION	10	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
17	AHU-AA1B	1	PENTHOUSE	PERFORMING ARTS ADDITION	10	460/3	60.0	Yes	Yes	Y	ABB ACH-580	1, 3
18	E-AHU-A1	1	2ND FLOOR MECH ROOM	WEIGHT ROOM	20	?	60.0	Yes	Yes	Y	ABB ACH-580	3
19	E-AHU-B1	1	TUNNEL MECH ROOM	CLASSROOMS	40	?	60.0	Yes	Yes	Y	ABB ACH-580	3
20	E-AHU-C4	1	TUNNEL MECH ROOM	CLASSROOMS	40	?	60.0	Yes	Yes	Y	ABB ACH-580	3
21	E-AHU-D1	1	TUNNEL MECH ROOM	CLASSROOMS	25	?	60.0	Yes	Yes	Y	ABB ACH-580	3
22	E-AHU-D2	1	TUNNEL MECH ROOM	CLASSROOMS	25	?	60.0	Yes	Yes	Y	ABB ACH-580	3
23	E-AHU-E1	1	TUNNEL MECH ROOM	CLASSROOMS	20	?	60.0	Yes	Yes	Y	ABB ACH-580	3
24	E-AHU-E2	1	TUNNEL MECH ROOM	LIBRARY	25	?	60.0	Yes	Yes	Y	ABB ACH-580	3
25	E-AHU-E3	1	TUNNEL MECH ROOM	CLASSROOMS	15	?	60.0	Yes	Yes	Y	ABB ACH-580	3
26	E-AHU-F1	1	TUNNEL MECH ROOM	CLASSROOMS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
27	E-AHU-H1	1	TUNNEL MECH ROOM	CLASSROOM & HEALTH CTR	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
28	E-AHU-H2	1	TUNNEL MECH ROOM	CLASSROOMS	25	?	60.0	Yes	Yes	Y	ABB ACH-580	3
29	E-AHU-K1	1	PENTHOUSE	MAIN GYM	15	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
30	E-AHU-K2	1	PENTHOUSE	MAIN GYM	15	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
31	E-AHU-K3	1	PENTHOUSE	MAIN GYM	15	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
32	E-AHU-K4	1	PENTHOUSE	MAIN GYM	15	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
33	E-AHU-K5	1	PENTHOUSE	MAIN GYM	15	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
34	E-AHU-N1	1	PENTHOUSE	ART	20	?	60.0	Yes	Yes	Y	ABB ACH-580	3
35	E-AHU-N2	1	PENTHOUSE	CLASSROOMS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
36	E-AHU-P1	1	PENTHOUSE	ADMINISTRATION	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
37	E-AHU-P2	1	PENTHOUSE	CLASSROOMS	40	?	60.0	Yes	Yes	Y	ABB ACH-580	3
38	E-AHU-Q1	1	PENTHOUSE	CLASSROOMS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
39	E-AHU-Q2	1	PENTHOUSE	SCIENCE LABS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
40	E-AHU-R1	1	PENTHOUSE	CLASSROOMS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
41	E-AHU-R2	1	PENTHOUSE	CLASSROOMS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
42	E-AHU-S1	1	2ND FLOOR MECH ROOM	PERF. ARTS CLASS	30	?	60.0	Yes	Yes	Y	ABB ACH-580	3
43	E-AHU-T1	1	PENTHOUSE	ROTC	20	?	60.0	Yes	Yes	Y	ABB ACH-580	3
44	NAT AHU-1	1	NATATORIUM	NATATORIUM	25	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
45	NAT AHU-2	1	NATATORIUM	NATATORIUM	25	?	60.0	Yes	Yes	Y	ABB ACH-580	2, 3
46	NAT AHU-3	1	NATATORIUM	NATATORIUM	40	?	60.0	Yes	Yes	Y	ABB ACH-580	3
47	EF-A11	1	E-AHU-A1 RELIEF	AREA A	40	208/3	60.0	Yes	Yes	Y	ABB ACH-580	4
48	EF-A12	1	E-AHU-A1 RELIEF	AREA A	40	208/3	60.0	Yes	Yes	Y	ABB ACH-580	4

*1 - Dual supply fans. Per the AE, each fan is to have individual VFDs.
*2 - Existing AHUs do not have VFDs, they are being added under Phase 3.
*3 - All new VFDs include BACNet MS/TP communication. Each drive should be connected to the MS/TP sub-net of the associated AHU's System Controller
*4 - New VFD includes BACNet MS/TP communication. Connect drive to the AHU-A2 MS/TP sub-net.

RADIANT PANEL SCHEDULE

IDENTITY DATA			HEATING DATA			CONTROL	
MARK	MANUF	MODEL	BTUH/LF	TOTAL CAP. (BTUH)	FLOW (GPM)	CONTROLLED FROM	NOTES
RCP-K1	ZEHNDER	LINEAR	362	2,896	0.19	AHU-K6	
RCP-K2	ZEHNDER	LINEAR	362	2,896	0.19	AHU-K6	
RCP-K3	ZEHNDER	LINEAR	362	2,896	0.19	AHU-K6	
RCP-K4	ZEHNDER	LINEAR	362	2,896	0.19	AHU-K6	
RCP-K5	ZEHNDER	LINEAR	362	2,896	0.19	AHU-K6	
RCP-K6	ZEHNDER	LINEAR	362	2,896	0.19	AHU-K6	
RCP-M1	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M2	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M3	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M4	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M5	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M6	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M7	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M8	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M9	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M10	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M11	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M12	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M13	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M14	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M15	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M16	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M17	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M18	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M19	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M20	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M21	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M22	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M23	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M24	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M25	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M26	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	
RCP-M27	ZEHNDER	LINEAR	362	2,896	0.19	AHU-M1	

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REVISIONS	
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JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-34
JOB NUMBER:
J-2304001

Air Flow Station (AFMS) Schedule													
AFMS Designation	Qty	Serves	Width (in.)	Height (in.)	Area (Sq. Ft.)	Airflow Max (CFM)	Airflow Min (CFM)	Fan Diameter (in.)	Manuf	Model Number	# Probes	Cable Length (ft)	Notes
AFMS AHU-C1 OA	1	CAFETERIA SUPPORT			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-C2 OA	1	KITCHEN MAKEUP AIR			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-C3 OA	1	SERVING LINE			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-C5 OA	1	CAFETERIA			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-J1 OA	1	PERFORMING ARTS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-J2 OA	1	PERFORMING ARTS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-J3 OA	1	STUDENT SERVICES			0.00			--	Ebtron	GTC116-P + Transmitter		50	1
AFMS AHU-K6 OA	1	LOCKER ROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-M1 OA	1	LOCKER ROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-M2 OA	1	SOUTH GYM			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS AHU-AA1 OA	1	PERFORMING ARTS ADDITION			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-B1 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-C4 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-D1 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-D2 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-E1 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-E2 OA	1	LIBRARY			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-E3 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-F1 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-H1 OA	1	CLASSROOM & HEALTH CTR			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-H2 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-N1 OA	1	ART			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-N2 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-P1 OA	1	ADMINISTRATION			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-P2 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-Q1 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-Q2 OA	1	SCIENCE LABS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-R1 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-R2 OA	1	CLASSROOMS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-S1 OA	1	PERF. ARTS CLASS			0.00			--	Ebtron	GTC116-P + Transmitter		50	2
AFMS E-AHU-T1 OA	1	ROTC			0.00			--	Ebtron	GTC116-P + Transmitter		50	2

NOTES:
1 - AFMS are to be located on intake of RTUs - no OA ductwork.
2 - AFMS are to be located in OA ductwork.

PHASE 3 AIR FLOW MEASURING STATION SCHEDULE

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CONTRACT NO:

SHEET
SCH-35
JOB NUMBER:
J-2304001

EXHAUST FAN SCHEDULE

IDENTITY DATA				FAN DATA			ELECTRICAL DATA			UNIT CONTROL	CONTROLLED FROM	LAB HOOD INTERFACE	NOTES
ITEM	MARK	MANUF	SERVICES	FAN TYPE	DRIVE TYPE	AIRFLOW (CFM)	VOLTS (V)	PH	FREQ (HZ)				
1	EF-A1	GREENHECK	RECEIVING	DOWNBLAST CENTRIFUGAL	DIRECT	1,200	115	1	60	BAS	AHU-A2		4
2	EF-A2	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2,870	115	1	60	BAS	AHU-A2		4
3	EF-A3	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	800	115	1	60	BAS	AHU-A2		4
4	EF-A4	GREENHECK	SHOWERS	DOWNBLAST CENTRIFUGAL	DIRECT	480	115	1	60	BAS	AHU-A2		4
5	EF-A5	GREENHECK	LAUNDRY	DOWNBLAST CENTRIFUGAL	DIRECT	430	115	1	60	BAS	AHU-A2		4
6	EF-A6	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	520	115	1	60	BAS	AHU-A2		4
7	EF-A7	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2,840	115	1	60	BAS	AHU-A2		4
8	EF-A8	GREENHECK	SHOWERS	DOWNBLAST CENTRIFUGAL	DIRECT	480	115	1	60	BAS	AHU-A2		4
9	EF-A9	GREENHECK	RECEIVING	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	115	1	60	BAS	AHU-A2		4
10	EF-A10	TJERLUND	DRYER	ROOF	DIRECT	900	120	1	60	FACTORY CTRLS	N/A		5
11	EF-A11	GREENHECK	E-AHU-A1 RELIEF	DOWNBLAST CENTRIFUGAL	DIRECT	6,850	208	3	60	PRESSURE CTRL	AHU-A1		1, 4
12	EF-A12	GREENHECK	E-AHU-A1 RELIEF	UTILITY SET	DIRECT	6,850	208	3	60	PRESSURE CTRL	AHU-A1		1, 4
13	EF-B1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1,080	115	1	60	BAS	AHU-B1		4
14	EF-B2	GREENHECK	DARK ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	BAS	AHU-B1		4
15	EF-B3	GREENHECK	CUST STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	650	115	1	60	BAS	AHU-B1		4
16	EF-B4	GREENHECK	CAFÉ STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	925	115	1	60	BAS	AHU-B1		4
17	EF-B5	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	300	115	1	60	BAS	AHU-B1		4
18	EF-B6	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	160	115	1	60	BAS	AHU-B1		4
19	EF-B7	NOT USED		-	-	-	-	-	-	-	-		
20	EF-B8	NOT USED		-	-	-	-	-	-	-	-		
21	EF-B9	S&P	DISH HOOD (76)			1,750					AHU-B1		4
22	EF-B10	GREENHECK	CUST	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	BAS	AHU-B1		4
23	EF-B11	TJERLUND	DRYER	INLINE	DIRECT	160	120	1	60	PRESSURE CTRL	N/A		5
24	EF-C1	S&P	KITCHEN HOOD (27)			2,000					AHU-C1		4
25	EF-C2	S&P	KITCHEN HOOD (40)			4,400					AHU-G1 (or C1?)		4
26	EF-C3	S&P	KITCHEN HOOD (51)			9,080					AHU-C1		4
27	EF-C4	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	BAS	AHU-C1		4
28	EF-C5	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	115	1	60	BAS	AHU-C1		4
29	EF-C6	GREENHECK	WORKSHOP	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	TOGGLE	STANDALONE		2
30	EF-C7	GREENHECK	DRY STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	800	115	1	60	BAS	AHU-C1		4
31	EF-C8	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	115	1	60	BAS	AHU-C1		4
32	EF-C9	GREENHECK	ELECTRICAL	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	THERMOSTAT	STANDALONE		3
33	EF-D1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	3,370	115	1	60	BAS	AHU-D1		4
34	EF-D2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	750	115	1	60	BAS	AHU-D1		4
35	EF-D3	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	500	115	1	60	BAS	AHU-P2		4
36	EF-E1	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	115	1	60	BAS	AHU-E1		4
37	EF-E2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	500	115	1	60	BAS	AHU-E1		4
38	EF-E3	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	700	115	1	60	THERMOSTAT	STANDALONE		3
39	EF-E4	GREENHECK	ELEV MACHINE ROOM	SIDEWALL	DIRECT	800	115	1	60	THERMOSTAT	STANDALONE		3
40	EF-E5	GREENHECK	WORKROOM	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	TOGGLE	STANDALONE		2
41	EF-E6	GREENHECK	WORKROOM	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	TOGGLE	STANDALONE		2
42	EF-E7	GREENHECK	WORKROOM	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	TOGGLE	STANDALONE		2
43	EF-F1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	BAS	AHU-E1		4
44	EF-F2	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	THERMOSTAT	STANDALONE		3
45	EF-F3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	1,050	115	1	60	BAS	AHU-E1		4
46	EF-F4	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	550	115	1	60	BAS	AHU-E1		4
47	EF-F5	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	125	115	1	60	THERMOSTAT	STANDALONE		3
48	EF-F6	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	125	115	1	60	BAS	AHU-E1		4
49	EF-F7	GREENHECK	IDF ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	150	115	1	60	THERMOSTAT	STANDALONE		3
50	EF-G1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	500	115	1	60	BAS	AHU-G5		4, 8

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*3 - CONTROL VIA A LINE VOLTAGE THERMOSTAT. NO BAS INTERFACE.
*4 - CONTROL VIA BAS.
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Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
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REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-36
JOB NUMBER:
J-2304001

EXHAUST FAN SCHEDULE

IDENTITY DATA				FAN DATA			ELECTRICAL DATA						
ITEM	MARK	MANUF	SERVICES	FAN TYPE	DRIVE TYPE	AIRFLOW (CFM)	VOLTS (V)	PH	FREQ (HZ)	UNIT CONTROL	CONTROLLED FROM	LAB HOOD INTERFACE	NOTES
51	EF-G2	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	700	115	1	60	BAS	AHU-G2		4, 8
52	EF-G3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	525	115	1	60	BAS	AHU-G5		4, 8
53	EF-G4	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	BAS	AHU-G2		4, 8
54	EF-G5	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	THERMOSTAT	STANDALONE		3
55	EF-G6	GREENHECK	CUST	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	BAS	AHU-G2		4, 8
56	EF-G7	GREENHECK	SPOTLIGHT	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	THERMOSTAT	STANDALONE		3
57	EF-G8	GREENHECK	SCENE SHOP	DOWNBLAST CENTRIFUGAL	DIRECT	1,080	115	1	60	BAS	AHU-G2		4, 8
58	EF-H1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	550	115	1	60	BAS	AHU-H1		4
59	EF-H2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	475	115	1	60	BAS	AHU-H1		4
60	EF-H3	GREENHECK	CONCESSION	DOWNBLAST CENTRIFUGAL	DIRECT	300	115	1	60	THERMOSTAT	STANDALONE		3
61	EF-H4	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1,790	115	1	60	BAS	AHU-H1		4
62	EF-H5	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	2,180	115	1	60	BAS	AHU-H1		4
63	EF-H6	GREENHECK	CONCESSION	DOWNBLAST CENTRIFUGAL	DIRECT	300	115	1	60	THERMOSTAT	STANDALONE		3
64	EF-H7	TJERLUND	DRYER	INLINE	DIRECT	160	120	1	60	PRESSURE CTRL	N/A		4
65	EF-H8	NOT USED		-	-	-	-	-	-	-	-		
66	EF-J1	GREENHECK	ELEC + CUST OFFICE	DOWNBLAST CENTRIFUGAL	DIRECT	625	115	1	60	BAS	AHU-J1		4
67	EF-J2	GREENHECK	SCENE STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	800	115	1	60	BAS	AHU-J1		4
68	EF-J3	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	325	115	1	60	BAS	AHU-J1		4
69	EF-J4	GREENHECK	DRESSING ROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	BAS	AHU-J1 (or G1?)		4
70	EF-J5	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	115	1	60	BAS	AHU-J1		4
71	EF-J6	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	1,100	115	1	60	BAS	AHU-J1		4
72	EF-J7	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	BAS	AHU-J1		4
74	EF-J9	TJERLUND	DRYER	INLINE	DIRECT	160	120	1	60	PRESSURE CTRL	N/A		5
75	EF-J10	TJERLUND	DRYER	INLINE	DIRECT	160	120	1	60	PRESSURE CTRL	N/A		5
76	EF-K1	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2,650	115	1	60	BAS	AHU-K1		4
77	EF-K2	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	1,100	115	1	60	BAS	AHU-K6		4
78	EF-K3	GREENHECK	GYM STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	360	115	1	60	BAS	AHU-K6		4
79	EF-K4	NOT USED		-	-	-	-	-	-	-	-		
80	EF-K5	NOT USED		-	-	-	-	-	-	-	-		
81	EF-K6	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	BAS	AHU-K6		4
82	EF-K7	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	160	115	1	60	THERMOSTAT	STANDALONE		3
83	EF-K8	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	3,000	115	1	60	THERMOSTAT	STANDALONE		3
84	EF-K9	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	THERMOSTAT	STANDALONE		3
85	EF-L1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1,720	115	1	60	BAS	AHU-M1		4
86	EF-L2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	BAS	AHU-M1		4
87	EF-L3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	THERMOSTAT	STANDALONE		3
88	E-EF-M1	SEE PH. 2	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	800	115	1	60	BAS	AHU-K6		4
89	EF-M2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	575	120	1	60	BAS	AHU-K6		4
90	EF-M3	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2,400	115	1	60	BAS	AHU-S1		4
91	EF-M4	GREENHECK	RR/SHOWER	DOWNBLAST CENTRIFUGAL	DIRECT	650	115	1	60	BAS	AHU-K6		4
92	EF-M5	GREENHECK	RR/SHOWER	DOWNBLAST CENTRIFUGAL	DIRECT	1,275	115	1	60	BAS	AHU-K6		4
93	EF-M6	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	3,700	115	1	60	BAS	AHU-K6 (or S1?)		4
94	EF-M7	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	430	115	1	60	THERMOSTAT	STANDALONE		3
95	EF-M8	GREENHECK	LOCKER RR	DOWNBLAST CENTRIFUGAL	DIRECT	900	115	1	60	BAS	AHU-K6		4
96	EF-M9	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	1,350	115	1	60	BAS	AHU-K6		4
97	EF-M10	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2,300	115	1	60	BAS	AHU-K6		4
98	EF-M11	GREENHECK	LOCKER ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	1,800	115	1	60	BAS	AHU-K6		4
99	EF-M12	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	900	115	1	60	BAS	AHU-K6		4
100	EF-M13	GREENHECK	RR/SHOWER	DOWNBLAST CENTRIFUGAL	DIRECT	900	115	1	60	BAS	AHU-K6		4

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PHASE 3 EXHAUST FAN SCHEDULE (2 OF 4)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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REVISIONS	
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JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-37
JOB NUMBER:
J-2304001

EXHAUST FAN SCHEDULE

IDENTITY DATA				FAN DATA			ELECTRICAL DATA						
ITEM	MARK	MANUF	SERVICES	FAN TYPE	DRIVE TYPE	AIRFLOW (CFM)	VOLTS (V)	PH	FREQ (HZ)	UNIT CONTROL	CONTROLLED FROM	LAB HOOD INTERFACE	NOTES
101	EF-M14	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	500	115	1	60	BAS	AHU-K6		4
102	EF-M15	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	120	115	1	60	BAS	AHU-K6		4
103	EF-M16	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	310	115	1	60	BAS	AHU-K6		4
104	EF-M17	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	BAS	AHU-K6		4
105	EF-M18	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	1600	115	1	60	THERMOSTAT	STANDALONE		3
106	EF-N1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	3200	115	1	60	BAS	AHU-N1		4
107	EF-N2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	BAS	AHU-N1		4
108	EF-N3	GREENHECK	ART	DOWNBLAST CENTRIFUGAL	DIRECT	750	115	1	60	BAS	AHU-N1		4
109	EF-N4	NOT USED		-	-	-	-	-	-	-	-		
110	EF-N5	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	750	115	1	60	THERMOSTAT	STANDALONE		3
111	EF-N6	GREENHECK	CERAMICS	DOWNBLAST CENTRIFUGAL	DIRECT	2550	115	1	60	BAS	AHU-N1		4
112	EF-N7	GREENHECK	PAINT SPRAY BOOTH	UPBLAST CENTRIFUGAL	DIRECT	775	115	1	60	TOGGLE	STANDALONE		2
113	EF-N8	GREENHECK	KILN HOOD	UPBLAST CENTRIFUGAL	DIRECT	1500	115	1	60	TOGGLE	STANDALONE		2
114	EF-N9	GREENHECK	ELEV MACHINE	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	THERMOSTAT	STANDALONE		3
115	EF-N10	GREENHECK	STORAGE/ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	440	115	1	60	BAS	AHU-N1		4
116	EF-N11	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	160	115	1	60	THERMOSTAT	STANDALONE		3
117	EF-N12	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	300	115	1	60	BAS	AHU-N1		4
118	EF-N13	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	8000	208	3	60	THERMOSTAT	STANDALONE		3, 7
119	EF-N14	GREENHECK	SOLDERING HOOD	DOWNBLAST CENTRIFUGAL	DIRECT	1200	115	1	60	BAS	AHU-N1		4
120	EF-N15	GREENHECK	IDF ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	THERMOSTAT	STANDALONE		3
121	EF-P1	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	800	115	1	60	BAS	AHU-C5		4
122	EF-P2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	300	115	1	60	BAS	AHU-C5		4
123	EF-P3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	BAS	AHU-C5		4
124	EF-P4	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	BAS	AHU-C5		4
125	EF-P5	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	BAS	AHU-C5		4
126	EF-P6	GREENHECK	WORKROOM	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	TOGGLE	STANDALONE		2
127	EF-P7	GREENHECK	IDF / ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	THERMOSTAT	STANDALONE		3
128	EF-P8	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	THERMOSTAT	STANDALONE		2
129	EF-P9	GREENHECK	PAINTING CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	BAS	AHU-B1		3
130	EF-Q1	GREENHECK	ELEV MACHINE	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	THERMOSTAT	STANDALONE		3
131	EF-Q2	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
132	EF-Q3	GREENHECK	CHEMISTRY LAB	DOWNBLAST CENTRIFUGAL	DIRECT	1500	115	1	60	BAS	AHU-Q1	Y	4, 6
133	EF-Q4	GREENHECK	CHEMISTRY LAB	DOWNBLAST CENTRIFUGAL	DIRECT	2500	115	1	60	BAS	AHU-Q1	Y	4, 6
134	EF-Q5	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
135	EF-Q6	GREENHECK	ZOOLOGY LAB	DOWNBLAST CENTRIFUGAL	DIRECT	1500	115	1	60	BAS	AHU-R2	Y	4, 6
136	EF-Q7	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	650	115	1	60	BAS	AHU-R2		4
137	EF-Q8	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	500	115	1	60	BAS	AHU-R2		4
138	EF-Q9	GREENHECK	GREENHOUSE	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	THERMOSTAT	STANDALONE		3
139	EF-Q10	GREENHECK	LAB PREP	DOWNBLAST CENTRIFUGAL	DIRECT	300	115	1	60	BAS	AHU-R2		4
140	EF-Q11	GREENHECK	CHEMISTRY LAB	DOWNBLAST CENTRIFUGAL	DIRECT	2350	115	1	60	BAS	AHU-Q1	Y	4, 6
141	EF-Q12	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	375	115	1	60	BAS	AHU-Q1		4
142	EF-Q13	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
143	EF-Q14	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	175	115	1	60	BAS	AHU-R2		4
144	EF-Q15	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	8000	208	3	60	THERMOSTAT	STANDALONE		3, 7
145	EF-Q16	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	660	115	1	60	BAS	AHU-Q1		4
146	EF-Q17	TJERLUND	DRYER	INLINE	DIRECT	160	120	1	60	PRESSURE CTRL	N/A		5
147	EF-Q18	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	760	115	1	60	THERMOSTAT	STANDALONE		3
148	EF-Q19	GREENHECK	IDF ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	THERMOSTAT	STANDALONE		3
149	EF-Q20	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q1 (or R2?)	Y	4, 6
150	EF-Q21	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6

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PHASE 3 EXHAUST FAN SCHEDULE (3 OF 4)

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CONTRACT NO:

SHEET
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EXHAUST FAN SCHEDULE

IDENTITY DATA				FAN DATA			ELECTRICAL DATA			UNIT CONTROL	CONTROLLED FROM	LAB HOOD INTERFACE	NOTES
ITEM	MARK	MANUF	SERVICES	FAN TYPE	DRIVE TYPE	AIRFLOW (CFM)	VOLTS (V)	PH	FREQ (HZ)				
151	EF-Q22	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
152	EF-Q23	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	380	115	1	60	BAS	AHU-Q1		4
153	EF-Q24	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q1	Y	4, 6
154	EF-Q25	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
155	EF-Q26	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q2	Y	4, 6
156	EF-Q27	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q2	Y	4, 6
157	EF-Q28	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q2	Y	4, 6
158	EF-Q29	GREENHECK	SCIENCE LAB	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q2	Y	4, 6
159	EF-Q30	GREENHECK	LAB PREP	DOWNBLAST CENTRIFUGAL	DIRECT	700	115	1	60	BAS	AHU-Q2		4
160	EF-R1	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	1000	115	1	60	THERMOSTAT	STANDALONE		3
161	EF-R2	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1000	115	1	60	BAS	AHU-Q1		4
162	EF-R3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	580	115	1	60	BAS	AHU-Q1		4
163	EF-R4	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	340	115	1	60	BAS	AHU-Q1		4
164	EF-R5	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1000	115	1	60	BAS	AHU-Q1		4
165	EF-R6	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
166	EF-R7	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	1200	115	1	60	BAS	AHU-R2		4
167	EF-R8	GREENHECK	SCIENCE LAB	DOWNBLAST CENTRIFUGAL	DIRECT	150	115	1	60	BAS	AHU-R2	Y	4, 6
168	EF-R9	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
169	EF-R10	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	150	115	1	60	THERMOSTAT	STANDALONE		3
170	EF-R11	GREENHECK	IDF	DOWNBLAST CENTRIFUGAL	DIRECT	220	115	1	60	THERMOSTAT	STANDALONE		3
171	EF-R12	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2	Y	4, 6
172	EF-R13	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q1	Y	4, 6
173	EF-R14	GREENHECK	SCIENCE CLASS	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-R2		4
174	EF-R15	GREENHECK	CHEMISTRY LAB	DOWNBLAST CENTRIFUGAL	DIRECT	1500	115	1	60	BAS	AHU-R2	Y	4, 6
175	EF-R16	GREENHECK	SCIENCE LAB	DOWNBLAST CENTRIFUGAL	DIRECT	1250	115	1	60	BAS	AHU-Q1	Y	4, 6
176	EF-R17	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	250	115	1	60	BAS	AHU-Q1		4
177	EF-R18	NOT USED		-	-	-	-	-	-	-	-		
178	EF-R19	GREENHECK	SCIENCE LAB	DOWNBLAST CENTRIFUGAL	DIRECT	1500	115	1	60	BAS	AHU-R2	Y	4, 6
179	EF-S1	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	1200	115	1	60	THERMOSTAT	STANDALONE		3
180	EF-S2	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	410	115	1	60	BAS	AHU-S1		4
181	EF-S3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	190	115	1	60	BAS	AHU-S1		4
182	EF-S4	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2600	115	1	60	THERMOSTAT	STANDALONE		3
183	EF-S5	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	600	115	1	60	THERMOSTAT	STANDALONE		4
184	EF-S6	GREENHECK	STORAGE/MECH	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	BAS	AHU-S1		4
185	EF-T1	GREENHECK	ELEC	DOWNBLAST CENTRIFUGAL	DIRECT	280	115	1	60	THERMOSTAT	STANDALONE		3
186	EF-T2	GREENHECK	DANCE	DOWNBLAST CENTRIFUGAL	DIRECT	2400	115	1	60	BAS	AHU-T1		4
187	EF-T3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	650	115	1	60	BAS	AHU-T1		4
188	E-EF-T4	SEE PH. 2	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	100	115	1	60	BAS	AHU-T1		4
189	EF-15	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2600	115	1	60	THERMOSTAT	STANDALONE		3
190	EF-W1	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	THERMOSTAT	STANDALONE		3
191	EF-AA1	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	400	115	1	60	BAS	AHU-AA1		4
192	EF-AA2	GREENHECK	RESTROOMS	DOWNBLAST CENTRIFUGAL	DIRECT	1050	115	1	60	BAS	AHU-AA1		4
193	EF-AA3	GREENHECK	STORAGE	DOWNBLAST CENTRIFUGAL	DIRECT	200	115	1	60	BAS	AHU-AA1		4
194	EF-AA4	GREENHECK	MECH ROOM	DOWNBLAST CENTRIFUGAL	DIRECT	2600	115	1	60	THERMOSTAT	STANDALONE		3

*1 - FAN EQUIPPED WITH A VFD FOR BALANCING.
*2 - CONTROL VIA A TOGGLE SWITCH, NO BAS INTERFACE.
*3 - CONTROL VIA A LINE VOLTAGE THERMOSTAT. NO BAS INTERFACE.
*4 - CONTROL VIA BAS.
*5 - FAN PROVIDED WITH FACTORY PRESSURE AND/OR TEMPERATURE CONTROLS. NO BAS INTERFACE.
*6 - LAB HOOD INTERFACE FANS WILL INCLUDE (1) FIELD RELAY, (1) TRANSFORMER, AND (2) ISOLATION DAMPER ACUTATORS PER SYSTEM.
FANS ARE BAS CONTROLLED. ISOLATION DAMPERS ARE MANUALLY CONTROLLED FROM THE HOOD-MOUNTED SWITCH.
PREVIOUS BAS DESIGN INDICATES 28 LAB HOODS, ONLY 24 HOODS IDENTIFIED ON CURRENT DESIGN.
*7 - THREE PHASE FANS ASSUME DIRECT CONTROL WITHOUT A MAGNETIC STARTER. CONTROL VIA FIELD MOUNT DRY CONTACT INPUT RELAY WHICH IN TURN CONTROLS A 3-PHASE FIELD RELAY.
*8 - SHOWN FOR REFERENCE ONLY. FANS INSTALLED UNDER PREVIOUS PHASE. NO SCOPE IN PHASE 3 PROJECT.

PHASE 3 EXHAUST FAN SCHEDULE (4 OF 4)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-39
JOB NUMBER:
J-2304001

INTAKE / RELIEF HOOD SCHEDULE

ITEM	IDENTITY DATA MARK	TYPE	MANUF	MODEL	HOOD DATA AIRFLOW (CFM)	THROAT DATA VELOCITY (FPM)	DIMENSIONS L	W	DIA	CONTROLLED FROM	NOTES
1											
2											
3	E-RH-B1	HOOD	EXISTING	EXISTING	10,000	780	-	-	48"	AHU-B1	1
4											
5											
6	E-RH-C1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-C2	1
7	RH-C2	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-C2	2
8	E-RH-C3	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-C2	1
9	E-RH-C4	PENTHOUSE	EXISTING	EXISTING	15,000	800	190"	22"	-	AHU-C2	1
10	E-RH-C5	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-C2	1
11	RH-C6	PENTHOUSE	GREENHECK	WRH	12,500	800	56"	40"	-	AHU-C2	2
12	RH-C7	PENTHOUSE	GREENHECK	WRH	12,500	800	56"	40"	-	AHU-C2	2
13											
14											
15	RH-D1	PENTHOUSE	WRH	WRH	10,000	667	60"	36"	-	AHU-D2	2
16	RH-D2	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-D2	2
17	RH-D3	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-D1	2
18	E-RH-E1	PENTHOUSE	EXISTING	EXISTING	5,500	750	44"	24"	-	AHU-E2	1
19	E-RH-E2	PENTHOUSE	EXISTING	EXISTING	5,500	750	44"	24"	-	AHU-E2	1
20	E-RH-E3	PENTHOUSE	EXISTING	EXISTING	8,000	735	56"	28"	-	AHU-E2	1
21	E-RH-E4	PENTHOUSE	EXISTING	EXISTING	8,000	735	56"	28"	-	AHU-E2	1
22	E-RH-E5	PENTHOUSE	EXISTING	EXISTING	8,000	735	56"	28"	-	AHU-E2	1
23	E-RH-F1	PENTHOUSE	EXISTING	EXISTING	6,500	760	44"	28"	-	AHU-F1	1
24	E-RH-F2	PENTHOUSE	EXISTING	EXISTING	6,500	760	44"	28"	-	AHU-F1	1
25	E-RH-F3	PENTHOUSE	EXISTING	EXISTING	6,500	760	44"	28"	-	AHU-F1	1
26	RH-H1	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-H1	2
27	RH-H2	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-H2	2
28	RH-H3	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-H2	2
29	RH-H4	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-H1	2
30											
31											
32	E-RH-J1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-J3	1
33	RH-J2	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-J1	2
34	E-RH-J3	EXISTING	EXISTING	EXISTING	7000	800	36"	36"	-	AHU-J2	1
35	E-RH-K1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-K2	1, 4
36	E-RH-K2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-K2	1, 4
37	E-RH-K3	HOOD	EXISTING	EXISTING	12,000	750	48"	48"	-	AHU-K2	1, 4
38	E-RH-K4	HOOD	EXISTING	EXISTING	12,000	750	48"	48"	-	AHU-K2	1, 4
39	E-RH-K5	HOOD	EXISTING	EXISTING	12,000	750	48"	48"	-	AHU-K2	1, 4
40	E-RH-K6	HOOD	EXISTING	EXISTING	12,000	750	48"	48"	-	AHU-K2	1, 4
41	E-RH-K7	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-K2	1, 4
42	E-RH-K8	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-K2	1, 4
43	E-RH-L1	HOOD	GREENHECK	GRSR-42	7,000	768	36"	36"	-	AHU-J1	2
44	RH-L2	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-J1	2
45											
46											
47	E-RH-M1	HOOD	EXISTING	EXISTING	3,000	925	24"	24"	-	AHU-M1	1
48	E-RH-M2	HOOD	EXISTING	EXISTING	3,000	925	24"	24"	-	AHU-M1	1
49	E-RH-N1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-N2	1
50	E-RH-N2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-N2	1

INTAKE / RELIEF HOOD SCHEDULE

ITEM	IDENTITY DATA MARK	TYPE	MANUF	MODEL	HOOD DATA AIRFLOW (CFM)	THROAT DATA VELOCITY (FPM)	DIMENSIONS L	W	DIA	CONTROLLED FROM	NOTES
51	RH-N3	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-N2	2
52	E-RH-P1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-P2	1
53	E-RH-P2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-P2	1
54	RH-P3	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-P2	2
55	RH-P4	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-P2	2
56	E-RH-Q1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-Q2	1
57	E-RH-Q2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-Q2	1
58	RH-Q3	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-Q2	2
59	RH-R1	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-R2	2
60	E-RH-R2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-R2	1
61	RH-R3	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-R2	2
62	RH-R4	HOOD	GREENHECK	GRSR-42	7,500	768	-	-	42"	AHU-R2	2
63											
64	E-RH-S1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-S1	1
65	E-RH-S2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-S1	1
66	E-RH-S3	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-S1	1
67	E-RH-T1	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-T1	1
68	E-RH-T2	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-T1	1
69	E-RH-T3	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-M2	1
70	E-RH-T4	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-M2	1
71	E-RH-T5	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-M2	1
72	E-RH-T6	HOOD	EXISTING	EXISTING	7,000	800	36"	36"	-	AHU-M2	1
73											
74											
75	RH-AA1	PENTHOUSE	GREENHECK	WIH	19,000	774	68"	52"	-	AHU-AA1	2
78											

*1 - NEW ACTUATOR ONLY
*2 - NEW DAMPER & ACTUATOR
*3 - NO ACTUATOR REQUIRED PER MEP SCHEDULE
*4 - EXISTING DAMPERS HAVE PNEUMATIC ACTUATORS, NO EXISTING WIRING INFRASTRUCTURE

PHASE 3 INTAKE & RELIEF HOOD SCHEDULE

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ___ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-40
JOB NUMBER:
J-2304001

HYDRONIC PROP UNIT HEATER SCHEDULE

IDENTITY DATA				HEATING DATA	VALVE	FAN DATA					ELECTRICAL DATA				CONTROLLED FROM	NOTES
MARK	MANUF	MODEL	LOCATION	FLOW (GPM)		AIRFLOW (CFM)	FAN TYPE	DRIVE	HP	RPM	VOLTS (V)	PH	FREQ (HZ)	FLA (A)		
PUH-A1	TRANE	UHS-060	Unit A Mech Rm	4.4	2 WAY	900	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-A1	1, 2
PUH-A2	TRANE	UHS-084	Loading Dock D115A	6.1	2 WAY	1,400	PROP	DIRECT	0.1	1,000	115	1	60	2.8	AHU-A1	1, 2
PUH-E1	TRANE	UHS-024	Unit E Mech Rm	1.8	2 WAY	450	PROP	DIRECT	16 W	1,550	115	1	60	1.0	AHU-E1	1, 2
PUH-E2	TRANE	UHS-024	Unit E Mech Rm	1.8	2 WAY	450	PROP	DIRECT	16 W	1,550	115	1	60	1.0	AHU-E1	1, 2
PUH-F1	TRANE	UHS-024	Unit F Mech Rm	1.8	2 WAY	450	PROP	DIRECT	16 W	1,550	115	1	60	1.0	AHU-F1	1, 2
E-PUH-G1	EXISTING		Unit G Mech Rm	3.5	2 WAY	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-G1	1, 2, 3
E-PUH-G2	EXISTING		Unit G Mech Rm	3.5	2 WAY	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-G1	1, 2, 3
PUH-K1	TRANE	UHS-060	Unit K Mech Rm	4.4	2 WAY	900	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-K1	1, 2
PUH-K2	TRANE	UHS-060	Unit K Mech Rm	4.4	2 WAY	900	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-K1	1, 2
E-PUH-K3	EXISTING			2.0	2 WAY	425	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-K3	1, 2, 3
PUH-M1	TRANE	UHS-048	Unit M Mech Rm	3.5	2 WAY	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-M1	1, 2
PUH-N1	TRANE	UHS-072	Unit N/P Mech Rm	5.3	2 WAY	1,100	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-N2	1, 2
PUH-N2	TRANE	UHS-072	Unit N/P Mech Rm	5.3	2 WAY	1,100	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-N2	1, 2
PUH-Q1	TRANE	UHS-084	Unit Q/R Mech Rm	6.1	2 WAY	1,400	PROP	DIRECT	0.1	1,000	115	1	60	2.8	AHU-Q1	1, 2
PUH-Q2	TRANE	UHS-084	Unit Q/R Mech Rm	6.1	2 WAY	1,400	PROP	DIRECT	0.1	1,000	115	1	60	2.8	AHU-Q1	1, 2
PUH-S1	TRANE	UHS-024	Unit S Mech Rm	1.8	2 WAY	450	PROP	DIRECT	0.1	1,000	115	1	60	1.0	AHU-S1	1, 2
PUH-T1	TRANE	UHS-048	Unit T Mech Rm	3.5	2 WAY	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-T1	1, 2
PUH-W1	TRANE	UHS-048	Unit K6 Mech Rm	3.5	2 WAY	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-K6	1, 2
PUH-AA1	TRANE	UHS-048	Unit AA Mech Rm	3.5	2 WAY	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	AHU-AA1	1, 2

△

1 - Use line voltage valve actuators (120 VAC). BAS will only enable system via field relay.
2 - Thermostat control. Thermostat by Manuf.
3 - Confirm which existing AHU is the closest and relocat control to that location.
4 - Similar control strategy for Cabinet Unit Heaters.

HYDRONIC CABINET UNIT HEATER SCHEDULE

IDENTITY DATA				HEATING DATA		VALVE	FAN DATA				ELECTRICAL DATA				CONTROLLED FROM	NOTES
MARK	MANUF	MODEL	ENCLOSURE MODEL	CAPACITY (BTUH)	FLOW (GPM)		AIRFLOW (CFM)	W	RPM	SPEEDS	VOLTS (V)	PH	FREQ (HZ)	FLA (A)		
E-CH-A1	EXIST	-	HORIZ. CABINET	34,700	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-A1	1, 2
CH-A2	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-A1	1, 2
CH-A3	TRANE	FFD 030	HORIZ. CABINET	19,200	1.3	2 WAY	280	70.00	780	3	115	1	60	0.7	AHU-A1	1, 2
CH-A4	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-A1	1, 2
CH-A5	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-A1	1, 2
CH-A6	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-A1	1, 2
CH-A7	TRANE	FFD 030	HORIZ. CABINET	19,200	1.3	2 WAY	280	70.00	780	3	115	1	60	0.7	AHU-A1	1, 2
CH-A8	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-A1	1, 2
CH-A9	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-A1	1, 2
CH-E1	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV E1-05	1, 2
CH-E2	TRANE	FFD 030	HORIZ. CABINET	19,200	1.3	2 WAY	280	70.00	780	3	115	1	60	0.7	VAV E1-06	1, 2
CH-F1	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV E3-02	1, 2
E-CH-J1	EXIST	-	HORIZ. CABINET	34,700	2.0	2 WAY	-	-	-	-	115	1	60	-	VAV C1-03	1, 2
CH-J2	TRANE	FFD 030	HORIZ. CABINET	19,200	1.3	2 WAY	280	70.00	780	3	115	1	60	0.7	VAV J2-02	1, 2
E-CH-J3	EXIST	-	HORIZ. CABINET	34,700	2.0	2 WAY	-	-	-	-	115	1	60	-	VAV C1-01	1, 2
E-CH-K1	EXIST	-	HORIZ. CABINET	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	VAV J2-14	1, 2
E-CH-M1	EXIST - SEE PHASE 2			7,080	1.3	2 WAY	-	-	-	3	115	1	60	-	AHU-W1	1, 2
E-CH-M2	EXIST - SEE PHASE 2			7,080	1.3	2 WAY	-	-	-	3	115	1	60	-	AHU-W1	1, 2
CH-M3	TRANE	FFD 030	HORIZ. CABINET	19,200	1.3	2 WAY	280	70.00	780	3	115	1	60	0.7	AHU-K6	1, 2
CH-M4	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-K6	1, 2
CH-M5	TRANE	FFD 060	HORIZ. CABINET	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	AHU-K6	1, 2
E-CH-M6	EXIST	-	HORIZ. CABINET	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-K6	1, 2
E-CH-M7	EXIST	-	HORIZ. CABINET	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-K6	1, 2
E-CH-M8	EXIST	-	HORIZ. CABINET	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-K6	1, 2
E-CH-M9	EXIST	-	HORIZ. CABINET	34,700	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-K6	1, 2
E-CH-M10	EXIST	-	HORIZ. CABINET	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-K6	1, 2
E-CH-M11	EXIST	-	HORIZ. CABINET	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	AHU-K6	1, 2
CH-N1	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV N1-06	1, 2
CH-N2	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV N1-13	1, 2
CH-Q1	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV Q1-10	1, 2
CH-Q2	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV Q1-11	1, 2
E-CH-R1	EXIST	-	VERTICAL RECESSED	19,500	2.0	2 WAY	-	-	-	-	115	1	60	-	VAV R1-12	1, 2
CH-R2	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV R1-10	1, 2
CH-R3	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV R1-13	1, 2
CH-AA1	TRANE	FFH 060	VERTICAL RECESSED	37,400	2.5	2 WAY	544	110.00	780	3	115	1	60	1.2	VAV AA3-11	1, 2

1 - Use line voltage valve actuators (120 VAC). BAS will only enable system via field relay.
2 - Thermostat control. Thermostat by Manuf.
3 - Similar control strategy for Propeller Unit Heaters.

PHASE 3 CABINET UNIT HEATER AND PROPELLER UNIT HEATER SCHEDULES

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
△ 04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS-BUILT

REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-41
JOB NUMBER:
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CONSOLIDATED BILL OF MATERIAL WILL BE PROVIDED IN A FUTURE REVISION.

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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REVISIONS	
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-42
JOB NUMBER:
J-2304001

LABEL LIST WILL BE PROVIDED IN A FUTURE REVISION.

Delta Controls

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4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
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04/20/2023	ADD 5.3
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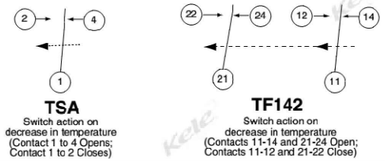
REVISIONS	
DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
SCH-43
JOB NUMBER:
J-2304001

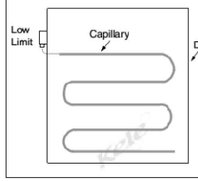
WIRING



TSA
Switch action on decrease in temperature (Contact 1 to 4 Opens; Contact 1 to 2 Closes)

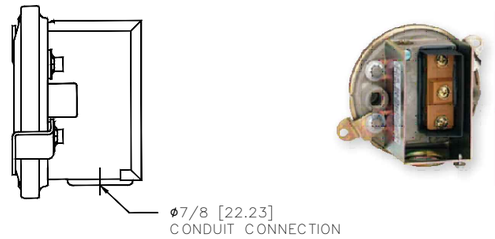
TF142
Switch action on decrease in temperature (Contacts 11-14 and 21-24 Open; Contacts 11-12 and 21-22 Close)

INSTALLATION

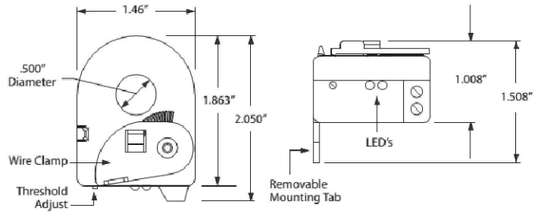


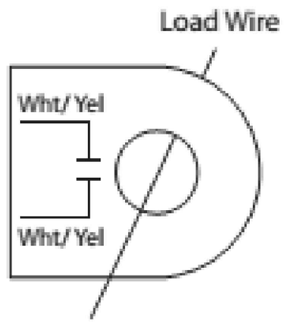
Install capillary element in a horizontal serpentine pattern across the duct on the downstream side of the coil so it is exposed to areas where low temperatures will occur. Do not kink or apply excessive force to the capillary element.

1000 TEMPERATURE, LOW LIMIT

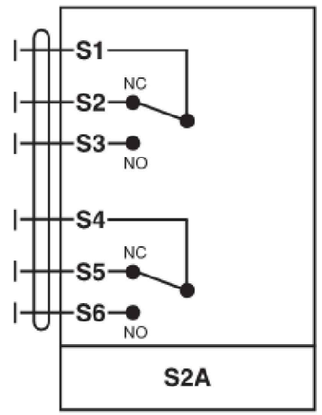


1200 PRESSURE, DUCT HIGH LIMIT



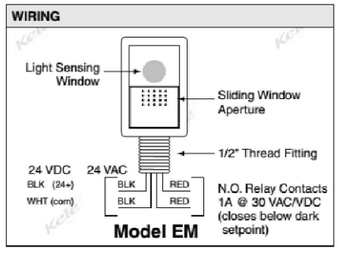


1400 CURRENT SWITCH, RIBXK SERIES

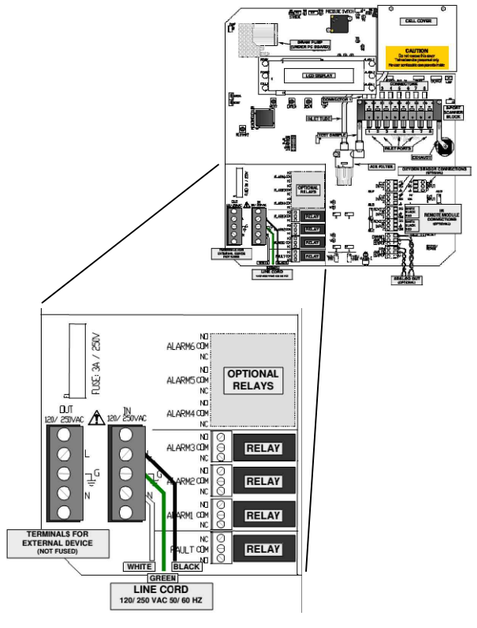


1801 AUXILIARY END SWITCH, BELIMO S2A

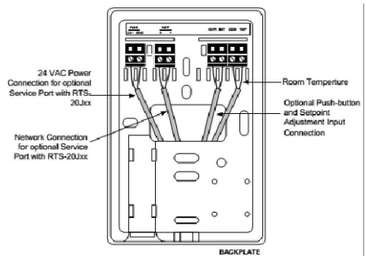
WIRING

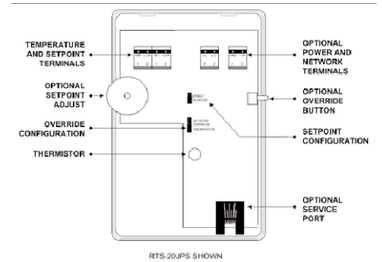


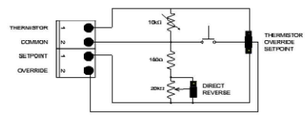
1900 PHOTOCELL, OUTDOOR, EM SERIES



1901 REFRIGERANT MONITOR, HALOGUARD







2000 TEMPERATURE, WALL MT, DELTA RTS-20

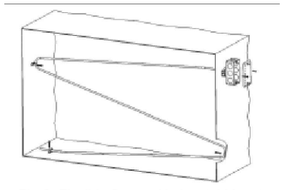


Fig 8: Flexible Sensor Horizontal Mount (Best for Vertical Stratification)

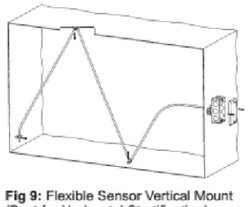


Fig 9: Flexible Sensor Vertical Mount (Best for Horizontal Stratification)

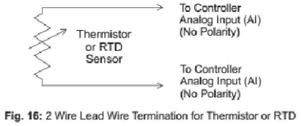


Fig. 16: 2 Wire Lead Wire Termination for Thermistor or RTD

2001 TEMPERATURE, DUCT AVERAGING

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

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DATE	REMARKS

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ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

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INST-01
JOB NUMBER:
J-2304001

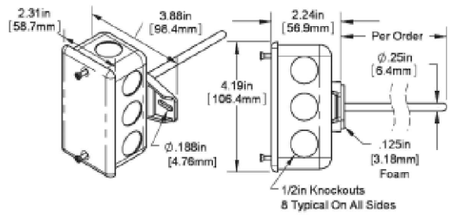


Fig 2: Duct Unit with J-Box (Standard)

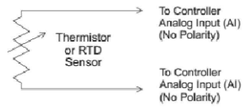


Fig. 16: 2 Wire Lead Wire Termination for Thermistor or RTD

2002 TEMPERATURE, DUCT PROBE

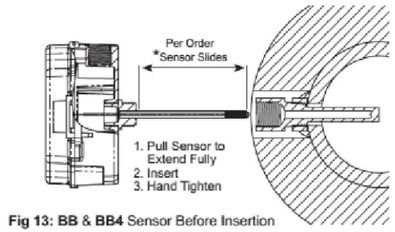


Fig 13: BB & BB4 Sensor Before Insertion

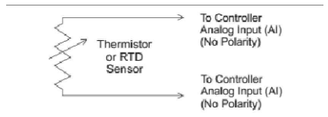


Fig. 16: 2 Wire Lead Wire Termination for Thermistor or RTD

2003 TEMPERATURE, IMMERSION

Table 3: Temperature Sensor Lead Wire Colors			
Thermistors		**Platinum RTDs - 2 Wire**	
1.8KΩ	Orange/Red	100Ω	Red/Red
2.2KΩ	Brown/White	1KΩ	Orange/Orange
3KΩ	Yellow/Black	**Nickel RTD**	
3.25KΩ	Brown/Green	1KΩ	Green/Green
3.3KΩ	Yellow/Brown	**Silicon RTD**	
10K-2Ω	Yellow/Yellow	2KΩ	Brown/Blue
10K-3Ω	Yellow/Red	**Platinum RTDs - 3 Wire**	
10K-3(11K)Ω	Yellow/Blue	100Ω	Red/Red/Black*
20KΩ	White/White	1KΩ	Orange/Orange/Black*
47KΩ	Yellow/Orange	*In the 3-Wire RTD sensors listed above, the two wires of similar color are connected together.	
50KΩ	White/Blue		
100KΩ	Yellow/White		

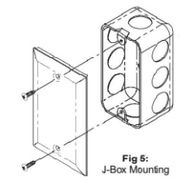


Fig 5:
J-Box Mounting

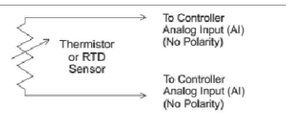


Fig. 16: 2 Wire Lead Wire Termination for Thermistor or RTD

2004 TEMPERATURE, WALL PLATE

Table 1: Humidity Transmitter with 0 to 10VDC Output		
Wire Color	**Purpose**	**Note**
Green	Humidity Output	0 to 10VDC, To Analog Input of Controller
Black	GND (Common)	Ground for Power and Humidity Output
Red	Power	15 to 35VDC or 15 to 27VAC

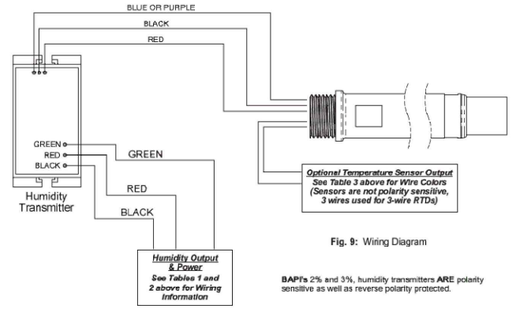


Fig. 9: Wiring Diagram

BAPI's 2% and 3%, humidity transmitters **ARE** polarity sensitive as well as reverse polarity protected.

2100 HUMIDITY / TEMPERATURE, OUTSIDE AIR

Table 1: Humidity Transmitter with 0 to 10VDC Output		
Wire Color	**Purpose**	**Note**
Green	Humidity Output	0 to 10VDC, To Analog Input of Controller
Black	GND (Common)	Ground for Power and Humidity Output
Red	Power	15 to 35VDC or 15 to 27VAC

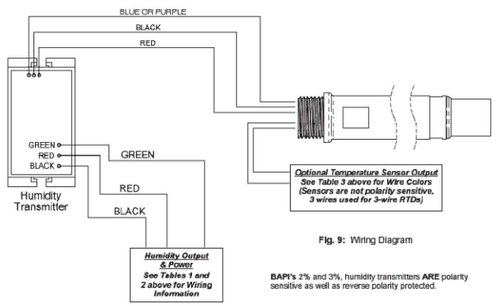


Fig. 9: Wiring Diagram

BAPI's 2% and 3%, humidity transmitters **ARE** polarity sensitive as well as reverse polarity protected.

2101 HUMIDITY / TEMPERATURE, DUCT

Table 1: EZ Pressure Sensor Termination	
Output Signal	**Power Terminal**
4 to 20 mA	7 to 40 VDC
0 to 5 VDC	7 to 40 VDC or 18 to 28 VAC
0 to 10 VDC	13 to 40 VDC or 18 to 28 VAC

Gnd/4-20mA Terminal	Voltage Output Terminal
4 to 20 mA Signal To Controller Analog Input	Not Used
To Controller Ground	0 to 5 VDC Signal To Controller Analog Input
To Controller Ground	0 to 10 VDC Signal To Controller Analog Inpu

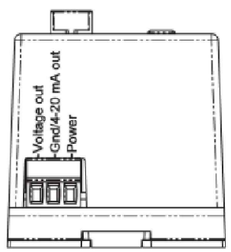
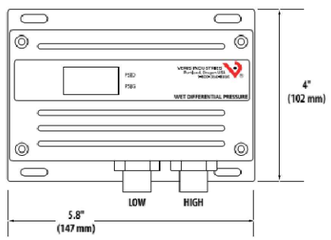
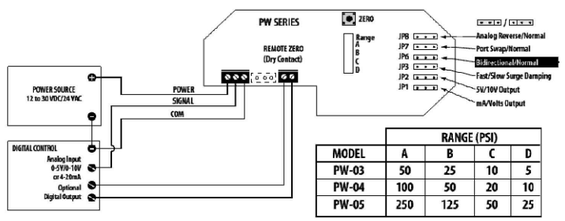


Fig. 7: Wiring terminations

2200 PRESSURE, ZPS DP STD RANGE
2201 PRESSURE, ZPS DP LOW RANGE





	RANGE (PSI)			
MODEL	**A**	**B**	**C**	**D**
PW-03	50	25	10	5
PW-04	100	50	20	10
PW-05	250	125	50	25

2202 PRESSURE, VERIS WET DP

Electrical connections to the Series 605 Transmitter are made to the two-screw terminal strip on the rear of the case. Polarity is indicated by + and – signs stamped on side. The schematic diagram of the Series 605 transmitter is illustrated in Figure B.

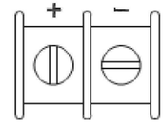


Figure A

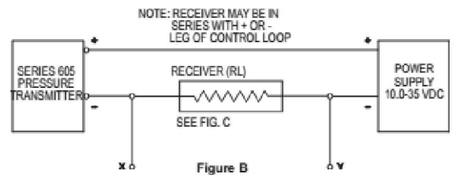


Figure B

2203 PRESSURE, DUCT DP, DWYER 605 SERIES

Delta Controls
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4240 W 50 S
LEBANON, INDIANA 46052
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E-MAIL: NATHAN@TCSBAS.COM

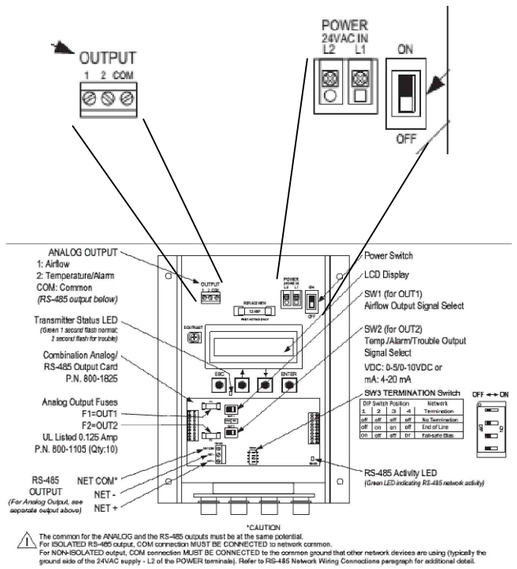
UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
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REVISIONS	
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JOB NUMBER:
J–2304001



2300 FLOW, AFMS, EBTRON GOLD

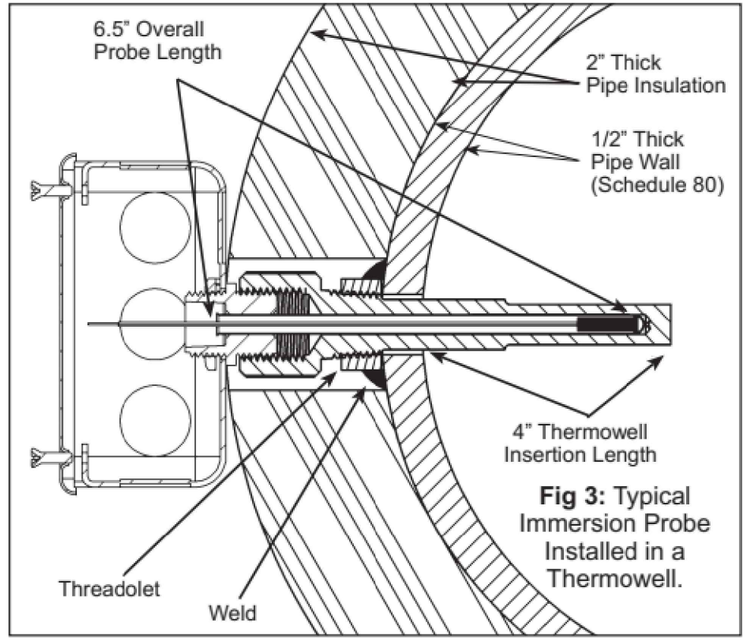


Fig 3: Typical Immersion Probe Installed in a Thermowell.

907 BAPI IMMERSION TEMPERATURE THERMOWELL

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

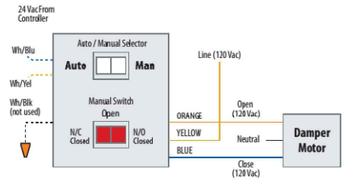
UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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	AS-BUILT

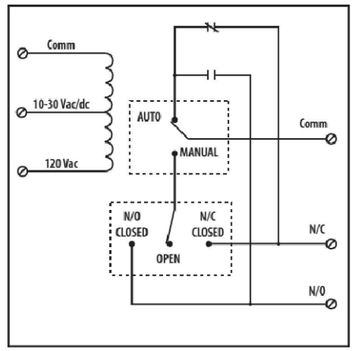
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DATE	REMARKS

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LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
INST-03
JOB NUMBER:
J-2304001



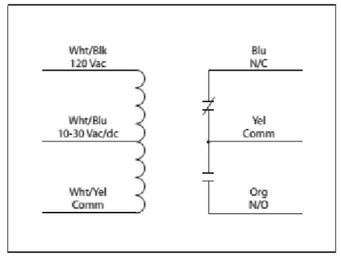


3000 RELAY, RIB PANEL–MOUNT MU1SC

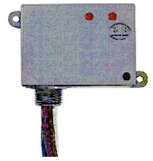


Coil Voltage Input:
10-30 Vac/dc ; 120 Vac ; 50-60 Hz (RIBU1C)
10-30 Vac/dc ; 208-277 Vac ; 50-60 Hz (RIBH1C)
Drop Out = 2.1 Vac / 2.8 Vdc
Pull In = 9 Vac / 10 Vdc

Contact Ratings:
10 Amp Resistive @ 277 Vac
10 Amp Resistive @ 28 Vdc
480 VA Pilot Duty @ 240-277 Vac
480 VA Ballast @ 277 Vac
Not rated for Electronic Ballast
600 Watt Tungsten @ 120 Vac (N/O)
240 Watt Tungsten @ 120 Vac (N/C)
1/3 HP @ 120-240 Vac (N/O)
1/6 HP @ 120-240 Vac (N/C)
1/4 HP @ 277 Vac (N/O)
1/8 HP @ 277 Vac (N/C)

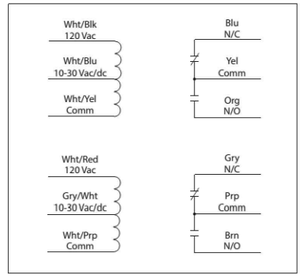


3001 RELAY, RIB FIELD–MOUNT RIBU1C

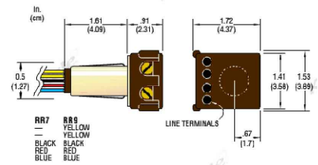


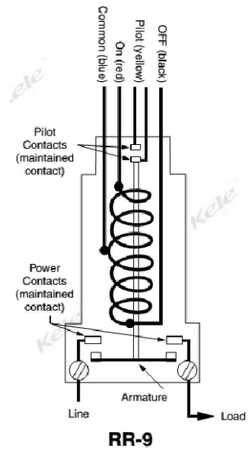
Coil Voltage Input:
10-30 Vac/dc ; 120 Vac ; 50-60 Hz (RIBU1C)
10-30 Vac/dc ; 208-277 Vac ; 50-60 Hz (RIBH1C)
Drop Out = 2.1 Vac / 2.8 Vdc
Pull In = 9 Vac / 10 Vdc

Contact Ratings:
10 Amp Resistive @ 277 Vac
10 Amp Resistive @ 28 Vdc
480 VA Pilot Duty @ 240-277 Vac
480 VA Ballast @ 277 Vac
Not rated for Electronic Ballast
600 Watt Tungsten @ 120 Vac (N/O)
240 Watt Tungsten @ 120 Vac (N/C)
1/3 HP @ 120-240 Vac (N/O)
1/6 HP @ 120-240 Vac (N/C)
1/4 HP @ 277 Vac (N/O)
1/8 HP @ 277 Vac (N/C)



3002 RELAY, RIB FIELD–MOUNT RIBU2C

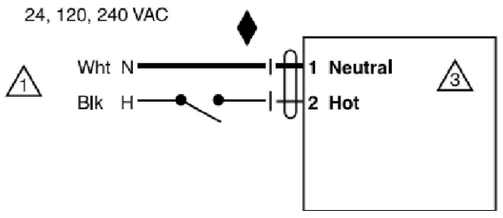




RR-9

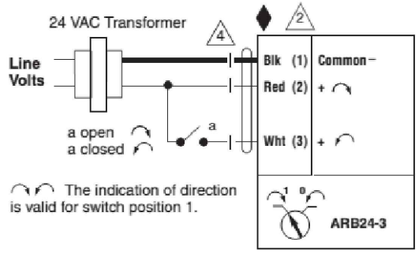
3100 RELAY, LIGHTING, LATCHING RR–9

1. Provide overload protection and disconnect as required.
2. ***CAUTION** Equipment Damage!*
   Actuators may be connected in parallel.
   Power consumption and input impedance must be observed.
3. No ground connection is required.



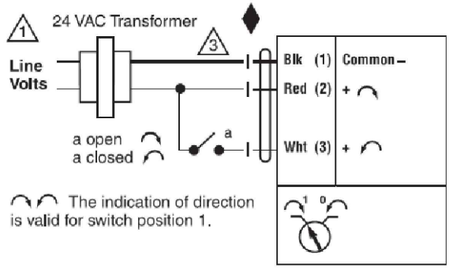
3200 BELIMO NFBUP–R ACT (ON–OFF)

2. ***CAUTION** Equipment damage!*
   Actuators may be connected in parallel.
   Power consumption and input impedance must be observed.
   For end position indication, interlock control, etc.,
4. Actuators may also be powered by 24 VDC.



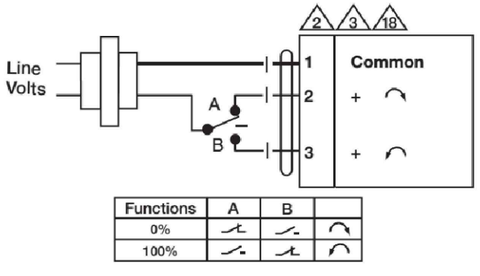
3201 BELIMO ARX24–3 ACT (ON–OFF, TS)

1. Provide overload protection and disconnect as required.
3. Actuators may also be powered by 24 VDC.



3202 BELIMO GRX24–3 ACT (ON–OFF, TS)

2. Actuators may be connected in parallel. Power consumption and input impedance must be observed.
3. Actuators may also be powered by 24 VDC.
18. Actuators with plenum rated cable do not have numbers on wires; use color codes instead.



Functions	A	B	
0%			
100%			

3203 BELIMO CQB24–3 ACT (TS)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

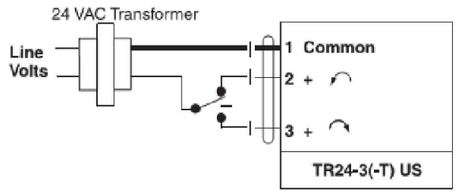
REVISIONS	
DATE	REMARKS

JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

SHEET
INST–04
JOB NUMBER:
J–2304001

NOTE: TR24-3(-T) US cannot be wired in parallel with themselves or any other actuator.



3204 BELIMO TR24–3 ACT (ON–OFF, TS)

◆ Meets cULus requirements without the need of an electrical ground connection.

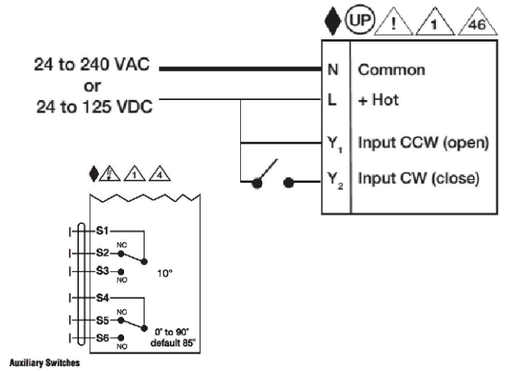
UP Universal Power Supply (UP) models can be supplied with 24 VAC up to 240 VAC, or 24 VDC up to 125 VDC.

⚠ Disconnect power.

1 Provide overload protection and disconnect as required.

4 Two built-in auxiliary switches (2x SPDT), for end position indication, interlock control, fan startup, etc.

46 Actuators may be controlled in parallel. Current draw and input impedance must be observed.

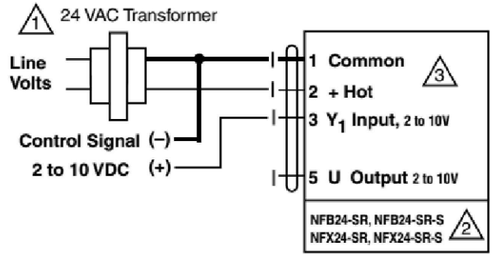


3205 BELIMO PRBUP–3–T ACT (ON–OFF, TS)

1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.

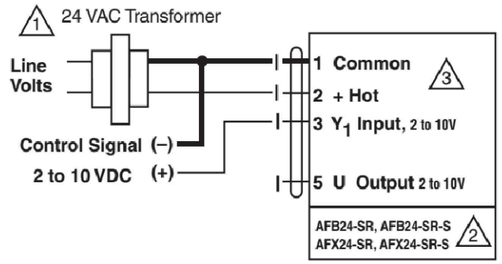


4200 BELIMO NFB24–SR ACT (2–10 VDC)

1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.

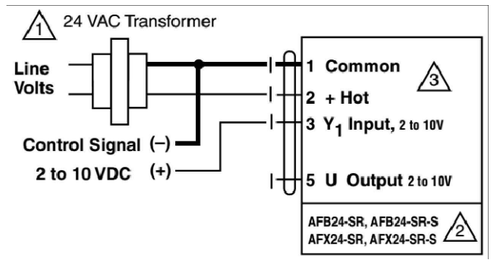


4201 BELIMO AFRB24–SR ACT (2–10 VDC)

1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.

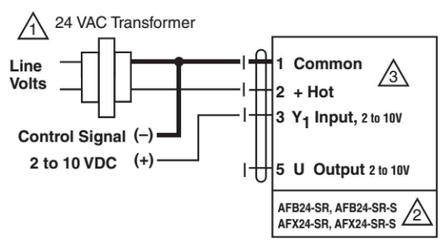


4202 BELIMO AFB24–SR ACT (2–10 VDC)

1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.



4203 BELIMO AFRB24–SR ACT (2–10 VDC)
BELIMO AFRX24–SR ACT (2–10 VDC)

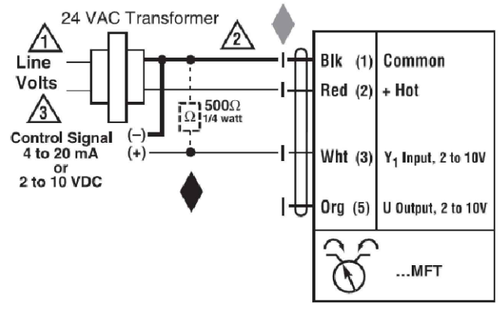
1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.

◆ Meets UL requirements without the need of an electrical ground connection.

◆ The ZG-R01 500 Ω resistor may be used.



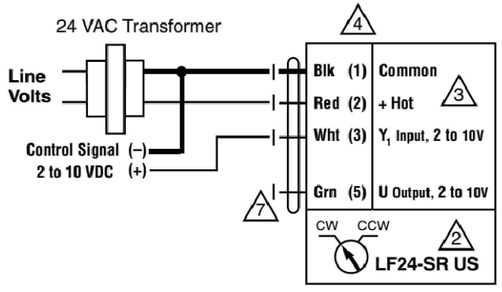
4204 BELIMO GKRX24–MFT ACT (2–10 VDC)

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.

4 Actuators with plenum rated cable do not have numbers on wires; use color codes instead.

7 The LF24-SR-S US wire 5 is white.



4205 BELIMO LF24–SR ACT (2–10 VDC)

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
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04/20/2023	ADD 5.3
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	AS–BUILT

REVISIONS	
DATE	REMARKS

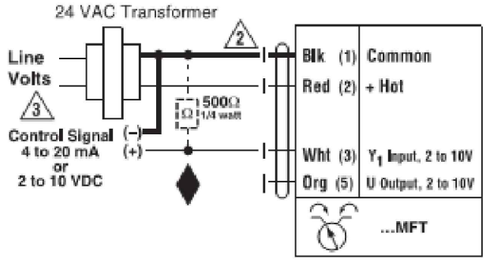
JOB TITLE: North Central High School
LOCATION: MSD Washington Township, Indianapolis, IN
ENGINEER: Temperature Control Services, LLC
CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

CONTRACT NO:

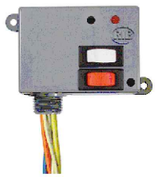
SHEET
INST–05
JOB NUMBER:
J–2304001

2 **CAUTION** *Equipment damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

3 Actuators may also be powered by 24 VDC.

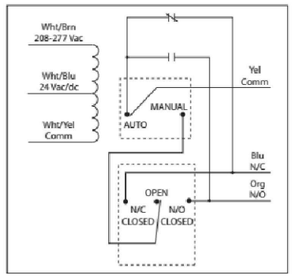


4206 BELIMO ARB24–MFT ACT (2–10 VDC)



Coil Voltage Input:
24 Vac/dc ; 120 Vac ; 50-60 Hz (RIB2401SBC)
24 Vac/dc ; 208-277 Vac ; 50-60 Hz (RIB2402SBC)
Drop Out = 2.1 Vac / 3.8 Vdc
Pull In = 18 Vac / 22 Vdc

Contact Ratings:
20 Amp Resistive @ 277 Vac
20 Amp Ballast @ 277 Vac (N/O)
10 Amp Ballast @ 277 Vac (N/C)
Not rated for Electronic Ballast
10 Amp Tungsten @ 120 Vac (N/O)
770 VA Pilot Duty @ 120 Vac
1,110 VA Pilot Duty @ 277 Vac
2 HP @ 277 Vac
1 HP @ 120 Vac



3104 RELAY, RIB FIELD–MOUNT RIB2401SBC

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

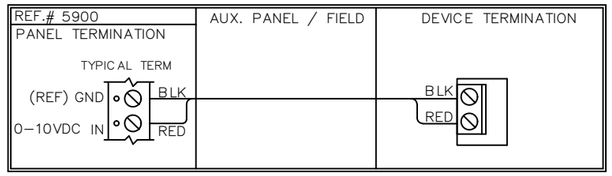
UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
	ISSUED FOR CONST
	AS–BUILT

REVISIONS	
DATE	REMARKS

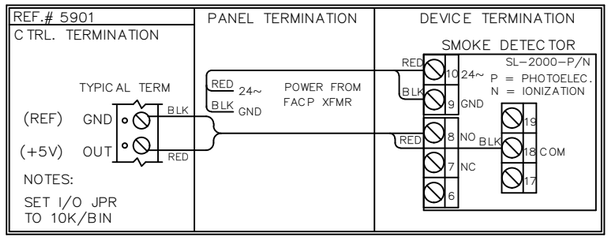
JOB TITLE: North Central High School
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DATE: 4/12/2023 CHK. BY: ____ DRAWN BY: BSS

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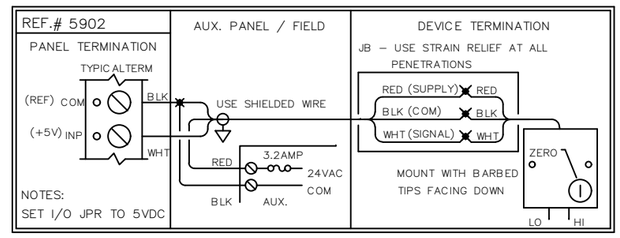
SHEET
INST–06
JOB NUMBER:
J–2304001



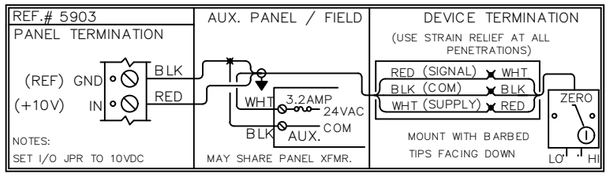
5900 DRY CONTACT INPUT (TO BAS)



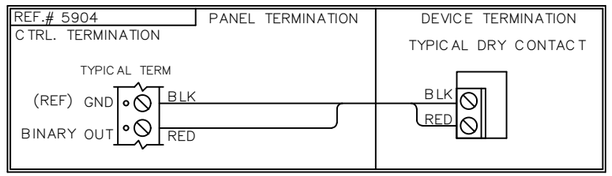
5901 SMOKE DETECTOR INPUT



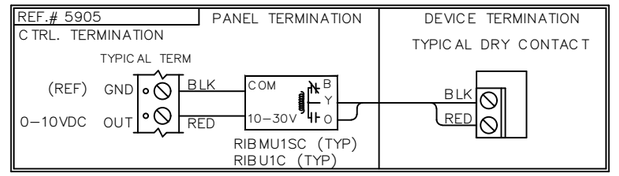
5902 0–5 VDC TRANSDUCER INPUT (TO BAS)



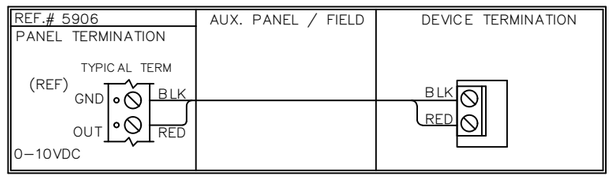
5903 0–10 VDC TRANSDUCER INPUT (TO BAS)



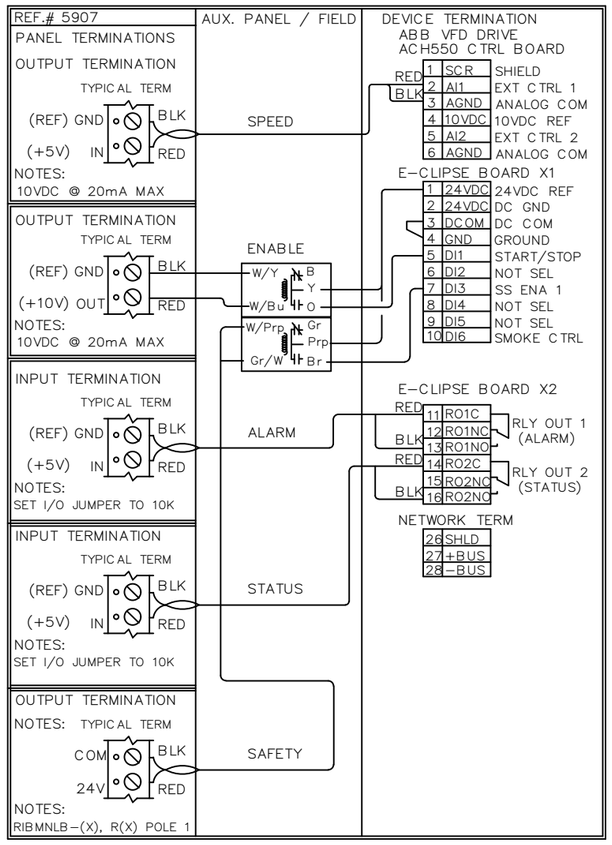
5904 PUMP / FAN ENABLE / DRY CONTACT (W/ BINARY OUT)



5905 PUMP / FAN ENABLE / DRY CONTACT (W/2–10VDC OUT)



5906 ANALOG OUTPUT (LEVEL / SPEED, ETC.)



5907 VFD CONNECTIONS, ABB ACH–550 DRIVE

NOTE:
– THE DETAILS ON THIS PAGE ARE PROVIDED AS GENERAL REPRESENTATIONS OF TYPICAL APPLICATIONS ONLY!
– WHENEVER POSSIBLE, ALWAYS FOLLOW THE ACTUAL MANUFACTURER'S INSTALLATION DETAILS.
– ACTUAL TERMINATIONS MAY DIFFER SUBSTANTIALLY FROM THESE DETAILS – USE WITH CAUTION!

INSTALLATION STANDARDS – TYPICAL THIRD–PARTY CONNECTIONS

Delta Controls
Temperature Control Services
4240 W 50 S
LEBANON, INDIANA 46052
PHONE: 765.481.8510
E-MAIL: NATHAN@TCSBAS.COM

UPDATES	
DATE	REMARKS
04/20/2023	ADD 5.3
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DATE	REMARKS

JOB TITLE: North Central High School
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CONTRACT WITH: MSD Washington Township
DATE: 4/12/2023 CHK. BY:____ DRAWN BY: BSS

CONTRACT NO:

SHEET
INST–07
JOB NUMBER:
J–2304001

SECTION 233433 - AIR CURTAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections include, but are not limited to, the following:

1. 230553 Identification for HVAC Equipment

1.2 SUMMARY

A. Section includes air curtains electric heat.

1.3 ACTION SUBMITTALS

A. Product Data with Shop Drawings and Delegated-Design Submittal:

1. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties, and accessories.
2. Shop Drawings: For air curtains. Include plans, elevations, sections, details, and attachments to other work.

a. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
b. Wiring Diagrams: For power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air curtains to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish one set of (T.A.) filters, for air curtains equipped with them.
2. Furnish one set of fan belts for each unit that requires them.

1.6 QUALITY ASSURANCE

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. Comply with AMCA 220, "Laboratory Methods of Testing Air Curtains for Aerodynamic Performance Ratings," for airflow, outlet velocity, and power consumption.

C. Comply with ARI 410, "Forced-Circulation Air-Cooling and Air-Heating Coils," for components, construction, and rating.

1. Certify coils according to ARI 410.

D. Comply with NSF 37, "Air Curtains for Entranceways in Food and Food Service Establishments."

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of air curtains that fail in materials or workmanship within specified warranty period.

1. Warranty Period Minimum: 24 months.

PART 2 - PRODUCTS

2.1 AIR-CURTAIN UNIT .

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berner International.
2. King Company; a company of Mestek, Inc.
3. Loren Cook Company.
4. Mars Air Products; Dynaforce Division.
5. Mars Air Products; Mars Air Door Division.
6. Powered Aire, Inc.
7. VTS Group.

B. Housing:

1. Materials: Heavy-gage, aluminum construction.

a. Finish: White powder coated aluminum cover.

C. Mounting Brackets: Steel, for mounting.

D. Fans:

1. Centrifugal, forward curved, double width, double inlet.
2. Galvanized steel.
3. Statically and dynamically balanced.
4. Direct drive.

E. Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
2. Multispeed.
3. Resiliently mounted.
4. Continuous duty.
5. Totally enclosed, fan cooled.
6. Integral thermal-overload protection.
7. Bearings: Permanently sealed, lifetime, prelubricated, ball bearings.
8. Disconnect toggle switch.

F. Electric-Resistance Coils:

1. Coil Assembly: Comply with UL 1995.
2. Frame: Galvanized-steel frame.
3. Heating Elements: Open-coil resistance wire of 80 percent nickel and 20 percent chromium, supported and insulated by floating ceramic bushings recessed into casing openings, fastened to supporting brackets, and mounted in galvanized-steel frame.
4. Overtemperature Protection: Disk-type, automatically reset, thermal-cutout, safety device; serviceable through terminal box without removing heater from duct or unit.

    a. Secondary Protection: Load-carrying, manually reset or manually replaceable, thermal cutouts; factory wired in series with each heater stage.

5. Control Panel: Unit mounted with disconnecting means and overcurrent protection. Include the following controls:

    a. Magnetic contactor.
    b. Mercury contactor.
    c. Toggle switches; one per step.
    d. Time-delay relay.
    e. Pilot lights; one per step.
    f. Airflow-proving switch.

G. Filters:

1. Disposable Panel Filters: Factory-fabricated, viscous-coated, flat-panel-type, disposable air filters with glass-fiber media sprayed with nonflammable adhesive in cardboard frame.
2. Mounting Frames: Welded, galvanized steel with gaskets and fasteners and suitable for bolting together into built-up filter banks.

H. Controls:

1. Built-in Thermostat: Line voltage, factory installed and wired to the junction box on air curtain.
2. Automatic Door Switch: Combination roller-plunger type installed in door area to activate air curtain when door opens and to deactivate air curtain when door closes.
3. Start-Stop, Push-Button Switch: Manually activates and deactivates air curtain.
4. Three-Speed Switch: Manually activates, deactivates, and controls air-curtain fan speed.
5. Time-Delay Relay: Factory installed and adjustable to allow air curtain to operate from 0.5 seconds to 10 hours.
6. Motor-Control Panel: Complete with motor starter, 115-V ac transformer with primary and secondary fuses, terminal strip, and NEMA 250, Type 1 Type 12 enclosure with door-mounted hands-off-auto switch.
7. Coordinate with TCC on Air Curtain control voltage, with TCC provided Hydronic control valve.

2.2 SOURCE QUALITY CONTROL

A. Source Quality Control: Test to 300 psig and to 200 psig underwater.

B. Testing: Test and inspect steam coils according to ASHRAE 33.

C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install air curtains with clearance for equipment service and maintenance.

B. Equipment Installation: Install air curtains. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."

C. Comply with requirements for hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

3.3 CONNECTIONS

A. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. After installing air curtains completely, perform visual and mechanical check of individual components.
2. After electrical circuitry has been energized, start unit to confirm motor rotation and unit operation. Certify compliance with test parameters.
3. Inspect for water leaks.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Air-curtain unit will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 ADJUSTING

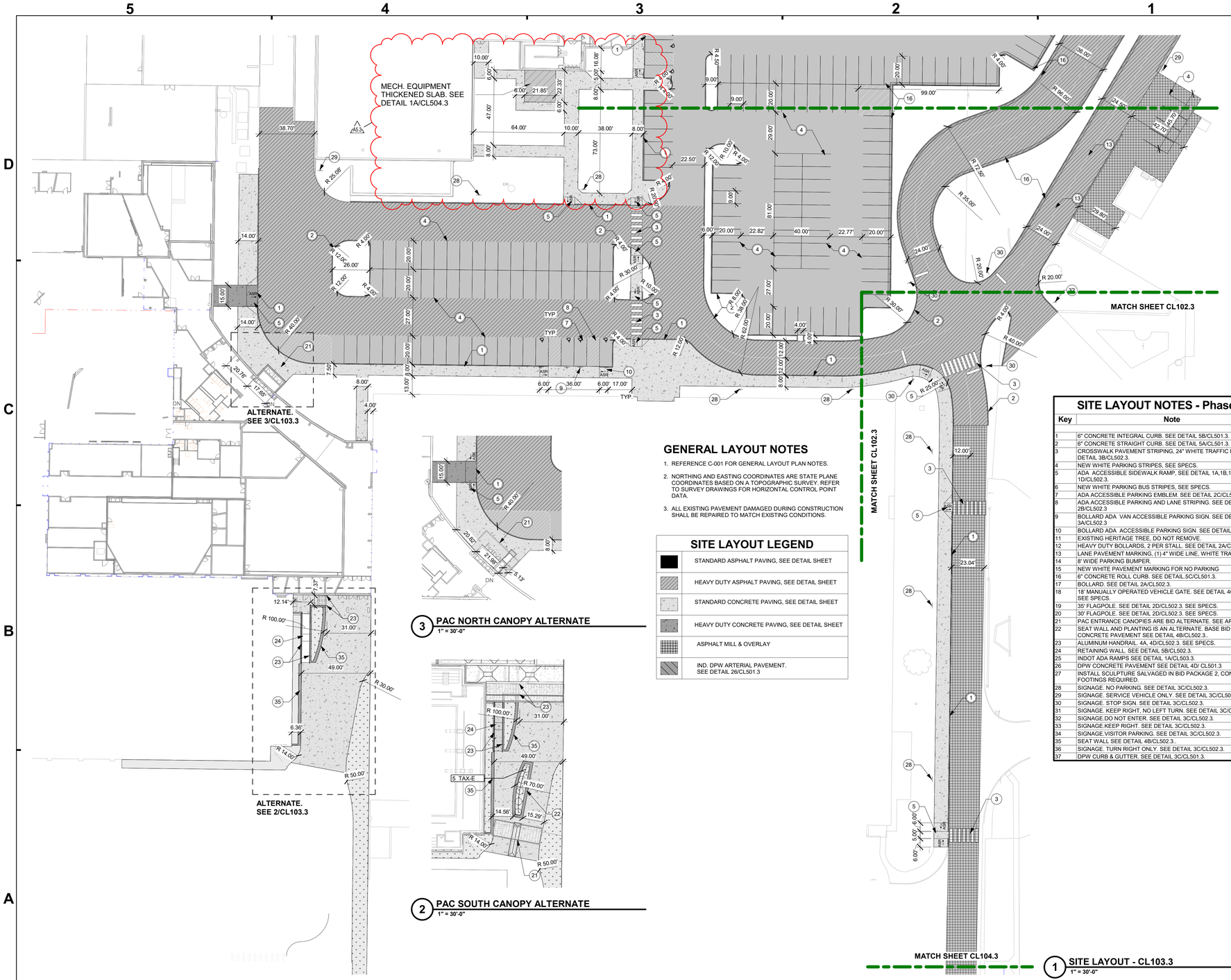
A. Adjust motor and fan speed to achieve specified airflow.

B. Adjust discharge louver and dampers to regulate airflow.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain air curtains.

END OF SECTION



3 PAC NORTH CANOPY ALTERNATE
1" = 30'-0"

2 PAC SOUTH CANOPY ALTERNATE
1" = 30'-0"

GENERAL LAYOUT NOTES

1. REFERENCE C-001 FOR GENERAL LAYOUT PLAN NOTES.
2. NORTHING AND EASTING COORDINATES ARE STATE PLANE COORDINATES BASED ON A TOPOGRAPHIC SURVEY. REFER TO SURVEY DRAWINGS FOR HORIZONTAL CONTROL POINT DATA.
3. ALL EXISTING PAVEMENT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO MATCH EXISTING CONDITIONS.

SITE LAYOUT LEGEND

	STANDARD ASPHALT PAVING, SEE DETAIL SHEET
	HEAVY DUTY ASPHALT PAVING, SEE DETAIL SHEET
	STANDARD CONCRETE PAVING, SEE DETAIL SHEET
	HEAVY DUTY CONCRETE PAVING, SEE DETAIL SHEET
	ASPHALT MILL & OVERLAY
	IND. DPW ARTERIAL PAVEMENT. SEE DETAIL 26/CL501.3

SITE LAYOUT NOTES - Phase 3

Key	Note
1	6" CONCRETE INTEGRAL CURB. SEE DETAIL 5B/CL501.3.
2	6" CONCRETE STRAIGHT CURB. SEE DETAIL 5A/CL501.3.
3	CROSSWALK PAVEMENT STRIPING, 24" WHITE TRAFFIC PAINT. SEE DETAIL 3B/CL502.3.
4	NEW WHITE PARKING STRIPES, SEE SPECS.
5	ADA ACCESSIBLE SIDEWALK RAMP, SEE DETAIL 1A,1B,1C, 1D/CL502.3.
6	NEW WHITE PARKING BUS STRIPES, SEE SPECS.
7	ADA ACCESSIBLE PARKING EMBLEM. SEE DETAIL 2C/CL502.3
8	ADA ACCESSIBLE PARKING AND LANE STRIPING. SEE DETAIL 2B/CL502.3
9	BOLLARD ADA VAN ACCESSIBLE PARKING SIGN. SEE DETAIL 3A/CL502.3
10	BOLLARD ADA ACCESSIBLE PARKING SIGN. SEE DETAIL 3A/CL502.3
11	EXISTING HERITAGE TREE, DO NOT REMOVE.
12	HEAVY DUTY BOLLARDS, 2 PER STALL. SEE DETAIL 2A/CL502.3.
13	LANE PAVEMENT MARKING, (1) 4" WIDE LINE, WHITE TRAFFIC PAINT.
14	8' WIDE PARKING BUMPER.
15	NEW WHITE PAVEMENT MARKING FOR NO PARKING
16	6" CONCRETE ROLL CURB. SEE DETAIL 5C/CL501.3.
17	BOLLARD. SEE DETAIL 2A/CL502.3.
18	18' MANUALLY OPERATED VEHICLE GATE. SEE DETAIL 4C/CL503.3. SEE SPECS.
19	35' FLAGPOLE. SEE DETAIL 2D/CL502.3. SEE SPECS.
20	30' FLAGPOLE. SEE DETAIL 2D/CL502.3. SEE SPECS.
21	PAC ENTRANCE CANOPIES ARE BID ALTERNATE. SEE ARCH PLANS.
22	SEAT WALL AND PLANTING IS AN ALTERNATE. BASE BID IS CONCRETE PAVEMENT SEE DETAIL 4B/CL502.3.
23	ALUMINUM HANDRAIL. 4A, 4D/CL502.3. SEE SPECS.
24	RETAINING WALL. SEE DETAIL 5B/CL502.3.
25	INDOT ADA RAMPS SEE DETAIL 1A/CL503.3.
26	DPW CONCRETE PAVEMENT SEE DETAIL 4D/ CL501.3
27	INSTALL SCULPTURE SALVAGED IN BID PACKAGE 2, CONC. FOOTINGS REQUIRED.
28	SIGNAGE. NO PARKING. SEE DETAIL 3C/CL502.3.
29	SIGNAGE. SERVICE VEHICLE ONLY. SEE DETAIL 3C/CL502.3.
30	SIGNAGE. STOP SIGN. SEE DETAIL 3C/CL502.3.
31	SIGNAGE. KEEP RIGHT, NO LEFT TURN. SEE DETAIL 3C/CL502.3.
32	SIGNAGE.DO NOT ENTER. SEE DETAIL 3C/CL502.3.
33	SIGNAGE.KEEP RIGHT. SEE DETAIL 3C/CL502.3.
34	SIGNAGE.VISITOR PARKING. SEE DETAIL 3C/CL502.3.
35	SEAT WALL SEE DETAIL 4B/CL502.3..
36	SIGNAGE. TURN RIGHT ONLY. SEE DETAIL 3C/CL502.3.
37	DPW CURB & GUTTER. SEE DETAIL 3C/CL501.3.

1 SITE LAYOUT - CL103.3
1" = 30'-0"

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Project No.	2019-067.NCH
Project Date	03.03.2023
Bid Set	03
Produced	AJ,KL

KYLE E. MILLER REGISTERED NO. 19900465 STATE OF INDIANA PROFESSIONAL ENGINEER

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 E 86th St
Indianapolis, IN 46240

M.S.D. of Washington Township

North Central High School Renovations - Additions Phase 3

SITE LAYOUT PLAN

CL103.3

1A Mechanical Equipment Thickened Slab
Scale: 1" = 1'-0"

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Project No. 2019-067.NCH
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1801 East 86th Street
Indianapolis, IN 46240

KEY PLAN

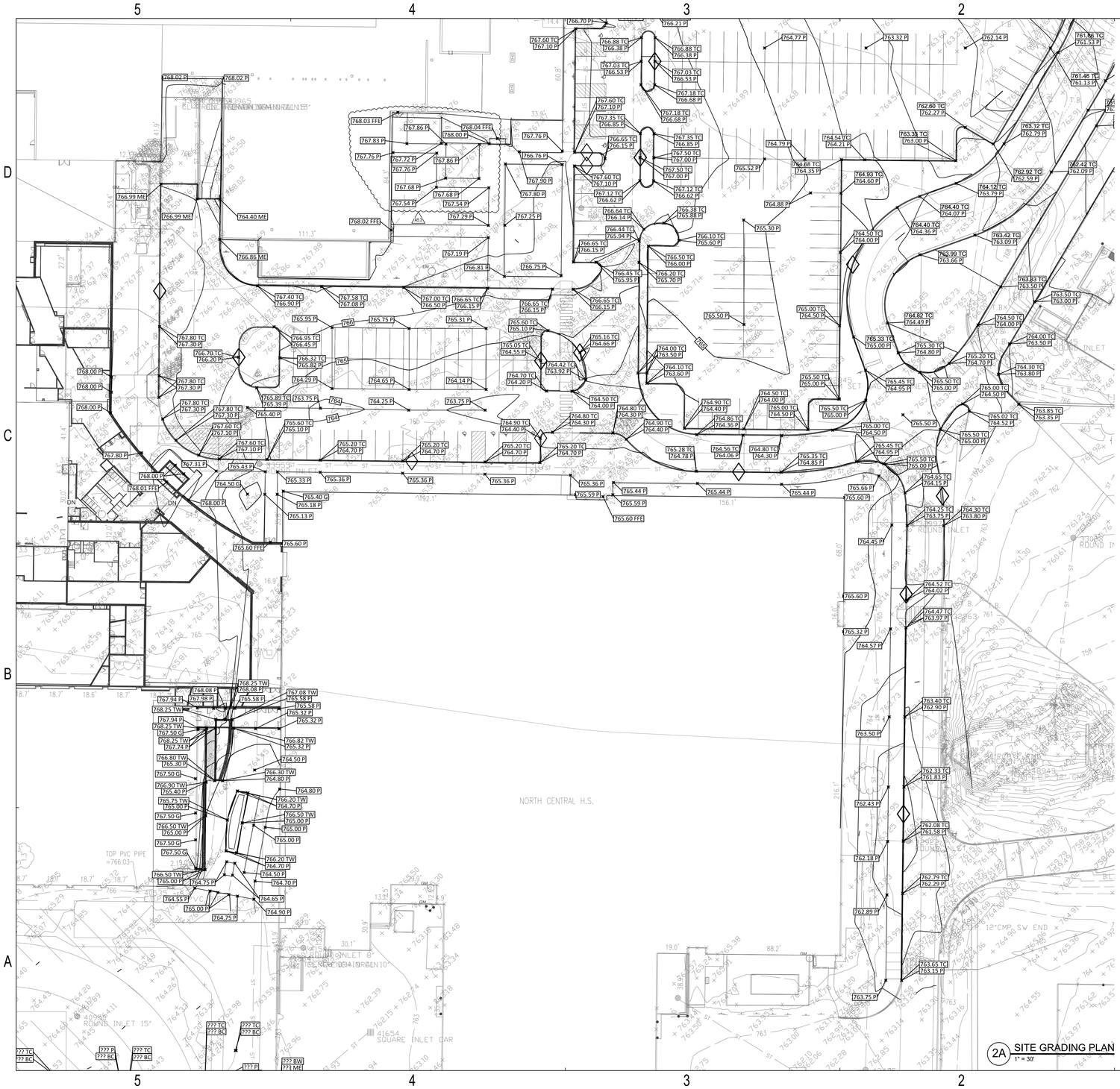
MSD of Washington Township

North Central High School Renovations - Additions Phase 3

SITE DETAILS

CL504.3

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Project No. 2019-067.NCH
Project Date 03.03.2023
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A5.3	ADDENDUM 5.3	04.20.2023

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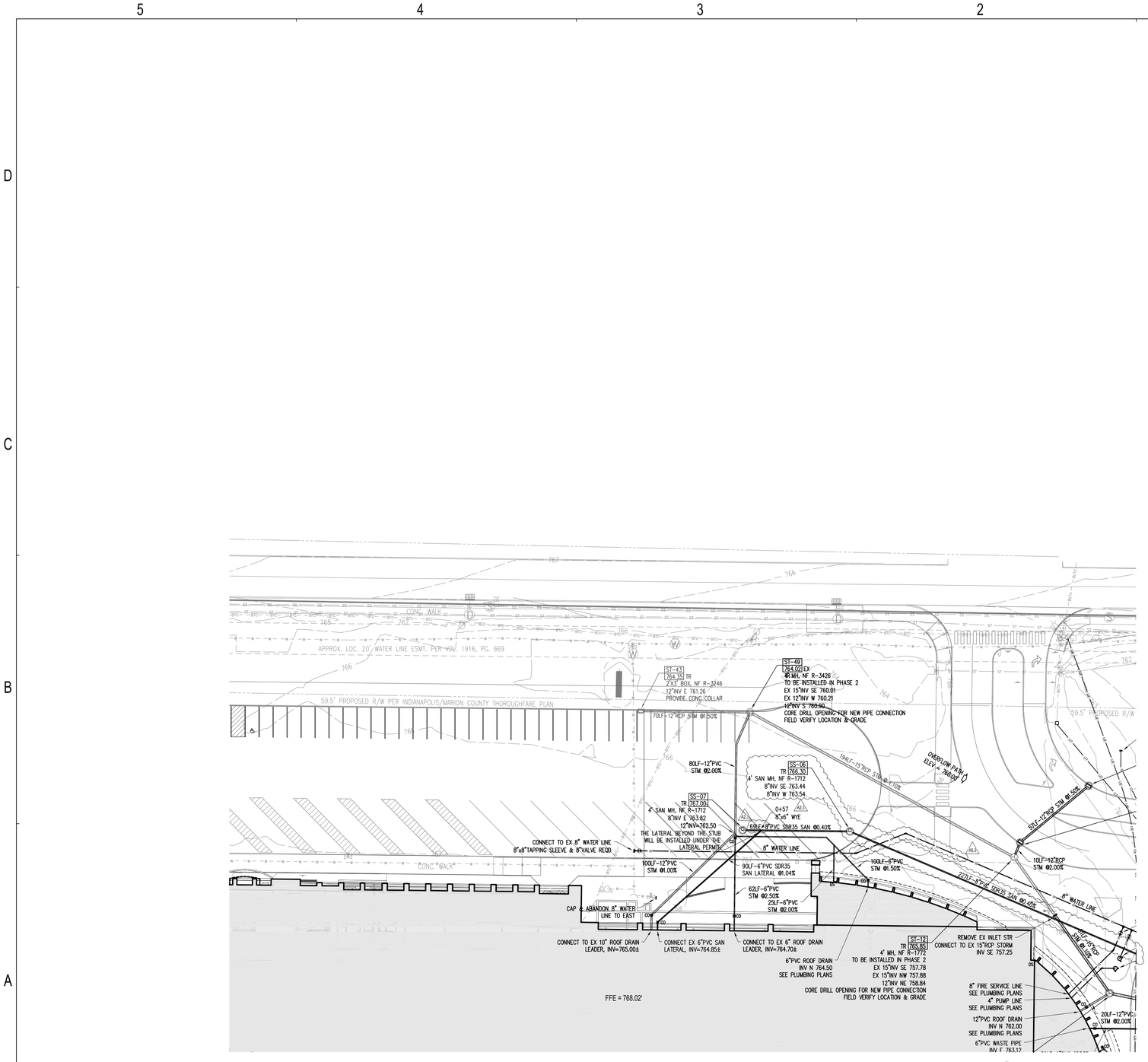
MSD of Washington Township

North Central High School
Renovations - Additions
Phase 3

GRADING PLAN

CG103.3

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2A SITE UTILITY PLAN
1" = 30'

UTILITY LEGEND

W — W	PROPOSED WATER LINE
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	EXISTING SANITARY SEWER
	PROPOSED STORM SEWER/DRAIN
	EXISTING STORM SEWER/DRAIN
DS	DOWNSPOUT
CO	CLEAN OUT
WV	WATER VALVE
PIV	POST INDICATOR VALVE
INV	PIPE INVERT
ALT	BID ALTERNATE
TYP	TYPICAL OF MULTIPLE LOCATIONS

ST-01 | 713.00 | TR
MH 4A
INV W 709.79
PROPOSED STORM MANHOLE
SEE DETAIL 1A/CU501.3

ST-02 | 713.00 | TR
MH 4A
INV W 709.79
PROPOSED STORM MANHOLE/INLET
SEE DETAIL 1A/CU501.3

ST-03 | 713.00 | TR
2x2 BOX
INV N 710.00
PROPOSED CATCH BASIN
SEE DETAIL 1C/CU501.3

SS-2 | 729.25 | TR
MH 4A
INV S 721.00
PROPOSED SANITARY MANHOLE
SEE DETAIL 1A/CU505.3

GENERAL UTILITY NOTES

1. ALL SANITARY SEWER IMPROVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITIZENS ENERGY GROUP SANITARY SEWER TECHNICAL SPECIFICATIONS AND DETAILS.
2. ALL GRAVITY SANITARY SEWERS, SANITARY FORCE MAINS, FITTINGS, AND ACCESSORIES TO BE INSTALLED IN ACCORDANCE WITH ASTM D-2321, LATEST REVISION.
3. WHERE A NEW SANITARY SEWER IS CONNECTED TO AN EXISTING MANHOLE, THAT MANHOLE SHALL BE REHABILITATED TO CURRENT DESIGN STANDARDS OF CITY OR UTILITY HAVING JURISDICTION. THIS REQUIREMENT SHALL INCLUDE REHABILITATING FLOW CHANNEL/BENCHWALLS, SEALING CRACKS, CHIMNEY SEAL INSTALLATION, AS WELL AS OTHER MEASURES TO REDUCE THE AMOUNT OF INFILTRATION AND INFLOW TO REQUIRED LEVELS.
4. ALL SANITARY LATERALS AND FORCE MAINS REQUIRE THE INSTALLATION OF A TRACER WIRE ON TOP OF THE PIPE FROM THE SEWER MAIN TO THE CLEAN OUT.
5. AN EXTERIOR CLEANOUT IS REQUIRED ON ALL SANITARY LATERALS WITHIN 18 INCHES TO 60 INCHES OF THE BUILDING EXTERIOR WALL.
6. ALL LIDS, CASTINGS, GRATES, BOXES, AND HATCHES ASSOCIATED WITH EXISTING UTILITY STRUCTURES THAT ARE NOT INDICATED FOR MODIFICATION SHALL BE MAINTAINED AND PROTECTED DURING CONSTRUCTION.
7. COMPACTED GRANULAR BACKFILL IS REQUIRED FOR ALL UTILITY TRENCHES LOCATED UNDER PAVED AREAS. SEE SPECIFICATIONS.
8. ALL WATER SYSTEM AND FIRE PROTECTION SYSTEM IMPROVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITIZENS ENERGY GROUP TECHNICAL SPECIFICATION AND DETAILS.
9. A MINIMUM OF 54" OF COVER SHALL BE PROVIDED OVER ALL EXTERIOR WATER PIPE, VALVES, AND FITTINGS. AT SOME PLACES WHERE WATER PIPE CROSSING OTHER UTILITY PIPES, A MINIMUM OF 60" OF COVER SHALL BE MAINTAIN.
10. PIPE LENGTHS INDICATED ON THE DRAWINGS ARE FOR HYDRAULIC CALCULATION PURPOSES ONLY. CONTRACTOR IS RESPONSIBLE FOR FURNISHING THE AMOUNT OF PIPE MATERIALS NECESSARY FOR A COMPLETE INSTALLATION.
11. ALL STORM INLET CASTINGS SHALL BE PERMANENTLY STAMPED WITH NOTATION "DUMP NO WASTE, DRAINS TO RIVER".
12. ALL STORM SEWERS, STRUCTURES, AND LATERALS WITHIN THE SUBJECT SITE SHALL BE PRIVATELY OWNED AND MAINTAINED.
13. NO SUBSTITUTION OF BMP HYDRODYNAMIC SEPARATOR STRUCTURE OR MANUFACTURER IS PERMITTED.
14. INSTALL 18"W x 18"L x 4"T CONCRETE COLLAR AROUND ALL CLEANOUTS, FIRE HYDRANTS, VALVE BOXES, INDICATOR POSTS, AND YARD HYDRANTS THAT ARE LOCATED IN YARD AREAS. COLLAR TO BE SET 1" ABOVE ADJACENT GROUND GRADES.
15. WHERE PROPOSED UNDERGROUND UTILITIES ARE IN CONFLICT WITH EXISTING UNDERGROUND UTILITIES, THE CONTRACTOR IS RESPONSIBLE FOR RELOCATING THE EXISTING UTILITIES AROUND THE PROPOSED WORK.
16. WHERE CONNECTIONS ARE MADE TO EXISTING MANHOLES OR INLET STRUCTURES, THOSE STRUCTURES SHALL BE REHABILITATED OR REPLACED TO THOSE MINIMUM STANDARDS OUTLINED IN CHAPTERS 400 AND 500 OF THE CITY OF INDIANAPOLIS STORMWATER SPECIFICATIONS MANUAL, LATEST EDITION. THE REHABILITATION SHALL INCLUDE THE INSTALLATION OF BENCHWALLS, AS WELL AS PRESCRIBED MEASURES TO ELIMINATE THE POTENTIAL FOR MIGRATION OF BACKFILL MATERIALS INTO THE STORMWATER SYSTEM.
17. ALL PROPOSED STORM SEWER AND DRAINAGE APPURTENANCES SHALL BE IN CONFORMANCE WITH CHAPTERS 400 AND 500 OF THE CITY OF INDIANAPOLIS STORMWATER SPECIFICATIONS MANUAL, LATEST EDITION. DISCREPANCIES BETWEEN THE PLANS AND THE MANUAL SHALL NOT ALLEVIATE THE CONTRACTOR FROM ADHERING TO THE REQUIREMENTS AS SET FORTH IN THE MANUAL.
18. THE FOLLOWING REQUIREMENTS SHALL BE MET FOR THE INSTALLATION OF THE AQUA-SWIRL WQU'S:
    - 18.1. A 6" THICK BASE OF OF CLASS 1 MATERIAL, AS DEFINED BY ASTM D2321, COMPACTED TO 95% PROCTOR DENSITY SHALL BE PROVIDED.
    - 18.2. BACKFILL SHALL BE CLASS 1 MATERIAL, COMPACTED TO 90% PROCTOR DENSITY, EXTENDING A MINIMUM OF 1.5 FEET BEYOUD THE OUTSIDE OF THE UNIT FOR THE FULL HEIGHT.
    - 18.3. PIPE CONNECTIONS SHALL BE MADE WITH FLEXIBLE CONNECTORS AND A SHEER GUARD.
    - 18.4. SAFETY BOLLARDS SHALL BE INSTALLED AROUND THE UNIT(S) IN NON-TRAFFIC AREAS.
19. NO STORMWATER SHALL BE ROUTED THROUGH THE DETENTION FACILITY UNTIL THE BMP IS INSTALLED AND FULLY FUNCTIONAL AND ALL CONSTRUCTION EROSION CONTROL FOR DISTURBED AREAS ARE INSTALLED TO ENSURE NO SEDIMENT BUILDUP IN THE UNDERGROUND DETENTION STORAGE FACILITY. THE EROSION CONTROL METHODS AND BMP'S MUST BE INSPECTED AFTER EACH RAIN EVENT AND REPAIRED OR CLEANED WHERE NECESSARY.

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Project No. 2019-067.NCH
Project Date 03.03.2023
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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240

KEY PLAN

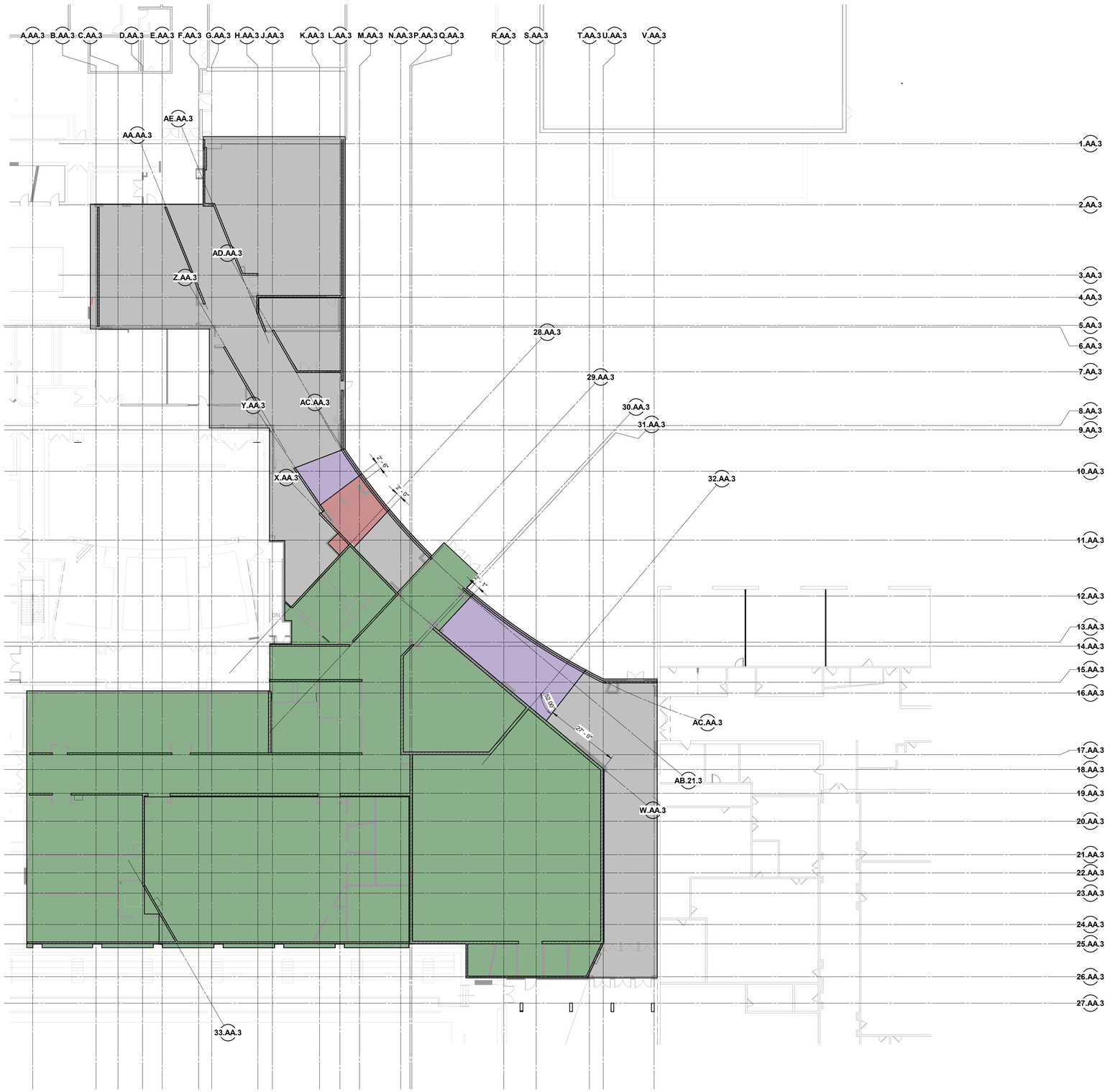
MSD of Washington Township

North Central High School
Renovations - Additions
Phase 3

SITE UTILITY PLAN

CU101.3

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PERFORMING ARTS SLAB BREAK PLAN

SCALE: 1/16" = 1'-0"

SLAB BREAK PLAN NOTES:
HATCHES SHOWN INDICATE PROPOSED SLAB BREAKS TO ACCOMMODATE DIFFERENTIAL LEVELING TO MATCH EXISTING SLAB ELEVATIONS

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Project No. 2019-067.NCH
Project Date 04/07/23
Bid Set 03
Produced DJS CDL

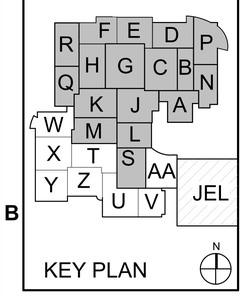
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04/07/23

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.10.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SLAB BREAKS PLAN

S-017.3

S-017.3_SLAB BREAK PLAN
2019-067.NCH_A E3.21 Washington Township, North Central High School Renovation_
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CONCRETE MIX SCHEDULE

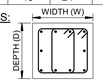
CONCRETE USAGE	28-DAY COMPRESSIVE STRENGTH (PSI)	MAX CEMENT REPLACEMENT (NOTE 3)	MAXIMUM W/CM RATIO	AIR CONTENT (PERCENT)	MAX AGGREGATE SIZE (INCHES)	NOTES
FOOTINGS	4,000	20%	0.55	0-3	1.5	
PILE CAPS, MAT FOUNDATIONS	4,000	20%	0.50	0-3	1.5	
GRADE BEAMS, PIERS, FOUNDATION WALS	4,000	20%	0.50	0-3	1	
EXTERIOR RETG WALLS, STOOPS AND PADS	4,000	20%	0.45	6 ± 1	1	
BASEMENT WALLS	4,000	20%	0.50	0-3	1	
SLABS ON GRADE (6 INCHES OR LESS)	4,000	20%	0.48	0-3	1	
SLABS ON METAL DECK	4,000	20%	0.48	0-3	1	4.0 LBS/CYD MACRO-FIBER
FREEZER SLABS	4,000	20%	0.45	6 ± 1	1	

NOTES:
1. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. ALL CONCRETE IS NORMAL WEIGHT AND CEMENT IS ASTM C150 TYPE 1, UNO. DO NOT USE LIGHTWEIGHT CONCRETE UNLESS SPECIFICALLY INDICATED.
3. ACCEPTABLE CEMENT REPLACEMENT MATERIAL, WHERE PERMITTED, SHALL BE FLY ASH, ASTM C618 TYCE C OR F, UNO.
4. TARGET SLUMP SHALL BE DETERMINED BY THE CONTRACTOR AS NEEDED FOR PROPER PLACEMENT.
5. WHERE NOTED, BLENDED AGGREGATE WITH ZONE 2 COARSENESS PER ACI 302 IS MANDATORY.
6. COORDINATE OF LOCATIONS OF ALL POLISHED CONCRETE SLABS (WHEN USED) AND REVIEW THE CONCRETE MIX REQUIREMENTS WITH THE POLISHED CONCRETE CONTRACTOR PRIOR TO SUBMITTAL OF CONCRETE MIXES. IF THE POLISHED CONCRETE CONTRACTOR REQUESTS TO DEVIATE FROM THE REQUIREMENTS OF THIS SCHEDULE, CONTACT THE STRUCTURAL ENGINEER TO REVIEW THE REQUESTS PRIOR TO SUBMISSION OF THE POLISHED CONCRETE MIX(ES).

GRADE BEAM SCHEDULE

MARK	SIZE		LONGITUDINAL REINFORCEMENT		TYPE	TIES	STIRRUPS	SKIN REINFORCEMENT EA. SIDE	REMARKS
	WIDTH	DEPTH	TOP	BTM					
GB20	20"	16"	(5) #7	(5) #7	A	#3 @ 0'-6"	N/A	(1) #5	
GB24	24"	30"	(5) #7	(4) #7	A	#3 @ 0'-10"	N/A	(1) #5	
GB28	28"	24"	(5) #5	(5) #6	A	#4 @ 0'-10"	N/A	(1) #5	
GB48	48"	24"	(8) #6	(9) #6	A	#4 @ 0'-10"	N/A	(1) #5	

TYPES:



NOTES: TYPE A

1. FOLLOW ACI REQ. SPACING
2. REINFORCEMENT SHALL HAVE EQ/ SPACING UNO

NON-COATED REINFORCING BAR DEVELOPMENT AND SPLICE LENGTHS

f'c = 3000 PSI

BAR SIZE	Ld	Ldt	Lt	Ltt
#3	17	23	23	29
#4	22	29	29	38
#5	28	37	37	48
#6	33	43	43	56
#7	48	63	63	82
#8	55	72	72	93
#9	62	81	81	105
#10	69	90	90	117
#11	76	99	99	129

f'c = 4000 PSI

BAR SIZE	Ld	Ldt	Lt	Ltt
#3	15	20	20	26
#4	19	25	25	33
#5	24	32	32	41
#6	29	38	38	50
#7	42	55	55	71
#8	48	63	63	82
#9	54	71	71	92
#10	60	78	78	102
#11	66	86	86	112

f'c = 5000 PSI

BAR SIZE	Ld	Ldt	Lt	Ltt
#3	13	17	17	22
#4	17	23	23	29
#5	22	29	29	38
#6	26	34	34	44
#7	38	50	50	65
#8	43	56	56	73
#9	48	63	63	82
#10	54	71	71	92
#11	59	77	77	100

ALL CONCRETE STRENGTHS

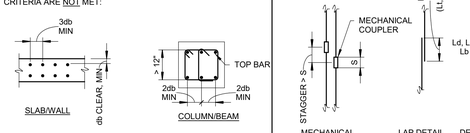
BAR SIZE	Lb	Lc	Lcs
#3	9	12	12
#4	11	13	12
#5	14	16	15
#6	17	19	17
#7	20	22	20
#8	22	25	23
#9	25	29	26
#10	28	32	29
#11	31	35	31

DEVELOPMENT LENGTH HOOKS

Bar Size	f'c (Normal Weight Concrete), psi			Hook Length	
	2500	3000	4000	90 deg.	180 deg.
#3	9"	9"	6"	6"	3"
#4	12"	11"	10"	6"	3"
#5	15"	14"	12"	8"	3"
#6	18"	17"	15"	9"	3"
#7	21"	20"	17"	11"	4"
#8	24"	22"	19"	12"	4"
#9	28"	25"	22"	14"	5"
#10	31"	28"	25"	16"	6"
#11	34"	31"	27"	17"	6"

NOTES:
1. db = NOMINAL BAR DIAMETER
   Ld = TENSION DEVELOPMENT LENGTH
   Ldt = DEVELOPMENT LENGTH OF TOP BARS IN TENSION
   Lt = TENSION LAP SPLICE STRENGTH
   Ltt = TENSION LAP SPLICE LENGTH OF TOP BARS
   Lb = COMPRESSION DEVELOPMENT LENGTH
   Lc = TIED COLUMN LAP SPLICE IN COMPRESSION
   Lcs = SPIRAL COLUMN LAP SPLICE IN COMPRESSION
2. REBAR DEVELOPMENT/SPLICE LENGTHS ARE BASED ON ACI 318. REINFORCEMENT YIELD STRENGTH, Fy = 60 KSI.
3. "TOP BARS" = HORIZONTAL BEAM, MAT, OR SLAB REINFORCING WITH MORE THAN 12" CAST BELOW.
4. ALL SPLICES SHALL BE TENSION SPLICES, UNO.
5. LARGER DIAMETER SPLICE LENGTH GOVERN AT BAR SIZE TRANSITIONS.
6. FOR LIGHTWEIGHT CONCRETE MULTIPLY TABLE VALUES BY 1.33, UNO

TABLE VALUES SHALL BE MULTIPLIED BY 1.5 IF THE FOLLOWING CRITERIA ARE NOT MET:



TYPICAL REINFORCING BAR DEVELOPMENT/SPLICE DETAILS

CONCRETE WALL SCHEDULE

Mark	Width	Horiz Reinf			Vert Reinf		Dowel Reinf		Reinf Location	Cover	Horz. Reinf. Location	Phase Created
		Size	Spa	Location	Size	Spa	Size	Spa				
CW8	8"	#5	1' - 0"	Center	#5	1' - 0"	#5	1' - 0"	Center	3"	IN	Phase 3
CW10	10"	#5	1' - 0"	Center	#5	1' - 0"	#5	1' - 0"	Center	3"	IN	Phase 3
CW12	1' - 0"	#5	1' - 0"	Center	#5	1' - 0"	#5	1' - 0"	Center	3"	IN	Phase 3
CW18	1' - 6"	#5	1' - 0"	Ea Face	#5	1' - 0"	#5	1' - 0"	Ea Face	3"	IN	Phase 3
CW20	1' - 8"	#5	1' - 0"	Ea Face	#5	1' - 0"	#5	1' - 0"	Ea Face	3"	IN	Phase 3
CW24	2' - 0"	#5	1' - 0"	Ea Face	#5	1' - 0"	#5	1' - 0"	Ea Face	3"	IN	Phase 3

Concrete Wall Schedule Notes:
1. Provide concrete cover to closest bar as indicated.
2. Provide wheel spacers or CRSI Typ. Bar Bend T5 at 36" each way to assure adequate concrete cover.
3. See sections for all bars not included in schedule.
4. Horizontal Bar Location: In = Horiz. bars inside of vertical bars, Out = Horiz. Bars outside of vert. bars.

COLUMN FOOTING SCHEDULE

Mark	Ftg Dimensions			Bottom Reinforcing						Remarks	Phase Created
				Short Direction			Long Direction				
	Width	Length	Thickness	No	Size	Length	No	Size	Length		
F2.0	2' - 0"	2' - 0"	1' - 6"	3	#7	1' - 6"	3	#7	1' - 6"		Phase 3
F2.5	2' - 6"	2' - 6"	1' - 6"	3	#7	2' - 0"	3	#7	2' - 0"		Phase 3
F3.0A	3' - 0"	3' - 0"	1' - 6"	3	#6	2' - 6"	3	#6	2' - 6"		Phase 3
F3.0C	3' - 0"	3' - 0"	1' - 0"	3	#5	2' - 6"	3	#5	2' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F3.0D	3' - 0"	3' - 0"	1' - 6"	3	#5	2' - 6"	3	#5	2' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F3.5	3' - 6"	3' - 6"	1' - 6"	3	#5	3' - 0"	3	#5	3' - 0"		Phase 3
F4.0A	4' - 0"	4' - 0"	1' - 2"	4	#5	3' - 6"	4	#5	3' - 6"		Phase 3
F4.0B	4' - 0"	4' - 0"	1' - 6"	4	#7	3' - 6"	4	#7	3' - 6"		Phase 3
F4.0C	4' - 0"	4' - 0"	1' - 0"	3	#5	3' - 6"	3	#5	3' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F4.5B	4' - 6"	4' - 6"	1' - 6"	3	#5	4' - 0"	3	#5	4' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F5.0A	5' - 0"	5' - 0"	1' - 6"	5	#7	4' - 6"	5	#7	4' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F5.0B	5' - 0"	5' - 0"	1' - 4"	5	#7	4' - 6"	5	#7	4' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F5.0C	3' - 0"	5' - 0"	1' - 0"	5	#5	2' - 6"	3	#5	4' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F5.0D	3' - 0"	5' - 0"	1' - 6"	5	#6	2' - 6"	3	#6	4' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F5.0E	4' - 6"	5' - 0"	1' - 6"	5	#6	4' - 0"	5	#6	4' - 6"		Phase 3
F5.6	3' - 0"	5' - 6"	1' - 6"	5	#5	2' - 6"	3	#5	5' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F6.0A	6' - 0"	6' - 0"	2' - 0"	7	#5	5' - 6"	7	#5	5' - 6"		Phase 3
F6.0B	6' - 0"	6' - 0"	1' - 6"	7	#5	5' - 6"	7	#5	5' - 6"		Phase 3
F6.0C	6' - 0"	4' - 0"	1' - 2"	7	#5	5' - 6"	7	#5	3' - 6"		Phase 3
F6.0D	4' - 6"	6' - 0"	1' - 6"	6	#6	4' - 0"	5	#6	5' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F6.0E	3' - 0"	6' - 0"	1' - 0"	6	#5	2' - 6"	3	#5	5' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F6.5	6' - 6"	6' - 6"	1' - 6"	5	#7	6' - 0"	5	#7	6' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F6x12	6' - 0"	12' - 0"	1' - 6"	12	#7	5' - 6"	6	#7	11' - 6"		Phase 3
F7.0A	7' - 0"	7' - 0"	1' - 6"	8	#5	6' - 6"	8	#5	6' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F7.0B	5' - 0"	7' - 0"	1' - 6"	7	#6	4' - 6"	5	#6	6' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F7.5	4' - 6"	7' - 6"	1' - 6"	7	#6	4' - 0"	5	#6	7' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F7.5C	3' - 6"	7' - 6"	1' - 6"	6	#7	3' - 0"	4	#7	7' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F7.5D	7' - 6"	7' - 6"	2' - 0"	8	#6	7' - 0"	8	#6	7' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F7.6	7' - 6"	7' - 6"	2' - 0"	8	#6	7' - 0"	8	#6	7' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F8.0B	4' - 0"	8' - 0"	1' - 0"	8	#5	3' - 6"	4	#5	7' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F8.0D	5' - 0"	8' - 0"	1' - 6"	7	#6	4' - 6"	5	#6	7' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F8.5A	8' - 6"	8' - 6"	2' - 0"	9	#5	8' - 0"	9	#5	8' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F10.0A	4' - 0"	10' - 0"	1' - 6"	8	#7	3' - 6"	4	#7	9' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F10.0B	6' - 0"	10' - 0"	2' - 0"	8	#8	5' - 6"	5	#8	9' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F10.0C	5' - 0"	10' - 0"	1' - 0"	9	#5	4' - 6"	5	#5	9' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F10.0D	5' - 6"	10' - 0"	1' - 6"	10	#6	4' - 6"	5	#6	9' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3
F14x28	14' - 0"	28' - 4"	3' - 0"	28	#9	13' - 6"	14	#9	27' - 10"	TYP. TOP AND BOTTOM REINF	Phase 3
F14x34	14' - 0"	34' - 0"	3' - 0"	34	#9	13' - 6"	14	#9	33' - 6"	TYP. TOP AND BOTTOM REINF	Phase 3

ALTERNATE COLUMN FOOTING SCHEDULE

Mark	Ftg Dimensions			Bottom Reinforcing						Remarks	Phase Created
				Short Direction			Long Direction				
	Width	Length	Thickness	No	Size	Length	No	Size	Length		
F14x24	14' - 0"	24' - 6"	3' - 0"	24	#9	13' - 6"	14	#9	24' - 0"	TYP. TOP AND BOTTOM REINF	Phase 3
F14x29	14' - 0"	29' - 4"	3' - 0"	29	#9	13' - 6"	14	#9	28' - 10"	TYP. TOP AND BOTTOM REINF	Phase 3

Column Footing Schedule Notes:
1. Reinforcing clearance at bottom and sides of footings = 3"
2. Use concrete brick of CRSI Class 3, CHCP wire bar supports @ 36".

A5.3

DRILLED CAISSON (DC) SCHEDULE

MARK	DIAMETER	CAISSON DEPTH	LONGITUDINAL REINF	TIES
DC24	24"	NOTE 3	(8) #8	#4 @ 12" OC
DC30	30"	NOTE 3	(12) #9	#4 @ 12" OC

NOTES:
1. SEE GEOTECHNICAL REPORT FOR INFORMATION RELATED TO GENERAL EXISTING SOIL PROFILE AND APPARENT BEDROCK ELEVATIONS.
2. A GEOTECHNICAL ENGINEER SHALL BE PRESENT AT THE TIME OF DRILLING TO INDICATE AT WHAT ELEVATION COMPETENT BEDROCK IS ACHIEVED FOR EACH CAISSON.
3. INSTALL CAISSON TO DEPTH INDICATED BY GEOTECHNICAL ENGINEER. DEPTH TO BE A MINIMUM OF 20 FEET BELOW FINISHED GRADE. DEPTH TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE AT TIME OF DRILLING AND MAY BE DEEPER DEPENDING ON IN PLACE CONDITIONS.

WALL FOOTING SCHEDULE

Mark	Dimensions		Bottom Reinf				Remarks	Phase Created
			Longitudinal Reinf		Transverse Reinf			
	Width	Thickness	No	Size	Size	Spa		
WF18	1' - 6"	1' - 0"	3	#5	NA	0"		Phase 3
WF20	1' - 8"	1' - 0"	3	#5	NA	0"		Phase 3
WF24	2' - 0"	1' - 0"	4	#5	NA	0"		Phase 3
WF30	2' - 6"	1' - 0"	3	#5	NA	0"		Phase 3
WF36A	3' - 0"	1' - 0"	4	#5	#5	1' - 0"		Phase 3
WF36B	3' - 0"	1' - 6"	4	#5	#5	1' - 0"		Phase 3
WF42	3' - 6"	1' - 0"	5	#5	NA	0"		Phase 3
WF48	4' - 0"	1' - 0"	5	#5	NA	0"		Phase 3
WF54A	4' - 6"	1' - 0"	5	#5	NA	0"		Phase 3
WF54B	4' - 6"	1' - 6"	4	#8	NA	0"	TOP AND BOTTOM REINF	Phase 3
WF60	5' - 0"	1' - 6"	5	#7	NA	0"		Phase 3

Wall Footing Schedule Notes:
1. Reinforcing clearance at bottom and sides of footings = 3".
2. Use concrete brick of CRSI Class 3, CHCP wire bar supports @ 36".

CONCRETE PIER SCHEDULE

Type Mark	Size	Vert Reinf		Ties		Remarks	Phase Created
		No	Size	Size	Spa		
PR16S	16" x 16"	4	#8	#3	1' - 0"	BP3	Phase 3
PR18S	18" x 18"	12	#5	#4	10"		Phase 3
PR22S	22" x 16"	4	#8	#3	1' - 0"		Phase 3
PR24AS	24" x 16"	4	#8	#3	1' - 0"		Phase 3
PR24BS	24" x 18"	4	#8	#3	1' - 0"		Phase 3
PR24S	24" x 24"	4	#8	#3	1' - 0"	BP3	Phase 3

Pier Schedule Notes:
1. Provide 2 inch concrete cover over ties.
2. Space first tie 2" from top of footing, last tie 2" from top of pier.
3. Provide (3) ties in top of pier, spacing = 2 1/2" on center.
4. Provide CRSI typical bar bend T5 for all ties.
5. Provide CRSI typical bar bend T9 additional ties for all piers with more than four vertical bars.
6. Provide 90° Hook for all ties per CRSI detailing standards.

SLAB ON GRADE SCHEDULE

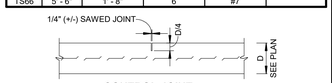
Mark	Thickness	Reinforcing	Control Jt Depth	Reinf Clearance	Control Jt Spa	Vapor Retarder	Sub-Base Depth	Remarks	Phase Created
SOG04P	4"	6x6-W1.4xW1.4 WWF	1"	1 1/2"	10' - 0"	Plastic	6"		Phase 3
SOG08P	8"	6x6-W2.9xW2.9 WWF	2"	2 1/2"	20' - 0"	Plastic	6"		Phase 3

Slab on Grade Schedule Notes:
1. Reinforcing clearance from the top of slab

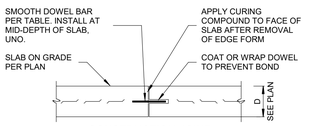
THICKENED SLAB FOOTING SCHEDULE

Mark	Dimensions		Footing Reinforcing			Remarks
	Width	Thickness	No	Size		
TS20	1' - 8"	1' - 0"	3	#5		
TS24	2' - 0"	1' - 0"	3	#6		
TS30	2' - 6"	1' - 0"	3	#6		
TS36	3' - 0"	1' - 0"	4	#6		
TS42	3' - 6"	1' - 0"	4	#6		
TS48	4' - 0"	1' - 0"	4	#6		
TS66	5' - 6"	1' - 8"	6	#7		





CONTROL JOINT



CONSTRUCTION JOINT

DOWEL SIZE AND SPACING

SLAB DEPTH (in)	DOWEL BAR DIAMETER (in)	TOTAL BAR LENGTH (in)	BAR SPACING (CTL - CTL) (in)
4	3/4	16	24
5-6	3/4	16	12
7-8	1	18	12
9-11	1-1/4	18	12

NOTE:
IF NO CONSTRUCTION OR CONTROL JOINT PLAN IS PROVIDED, CONTRACTOR TO PROVIDE PLAN FOR ENGINEERING APPROVAL AS PART OF SUBMITTAL.

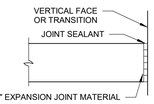
SLAB ON GRADE FLATNESS/LEVELNESS SCHEDULE

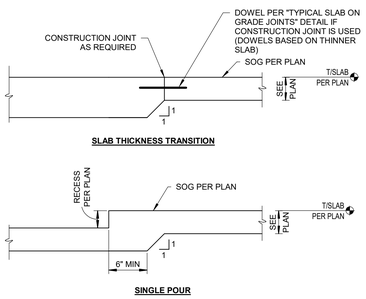
CLASSIFICATION	OVERALL FF	OVERALL FL	MIN LOCAL FF	MIN LOCAL FL
CONVENTIONAL	20	15	15	10
MODERATELY FLAT	25	20	20	15
FLAT	35	25	25	15
VERY FLAT	45	35	30	25
SUPER FLAT	60	40	40	25

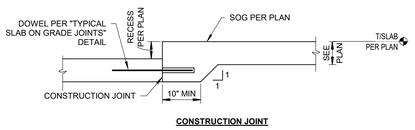
FLOOR TYPE/LOCATION	REQUIRED SLAB
EXPOSED WAREHOUSE, MANUFACTURING AREAS, UNO	FLAT
EXPOSED UTILITY/MECHANICAL AREAS, UNO	MODERATELY FLAT
FLOORS WITH CARPET, VCT FINISH, UNO	MODERATELY FLAT
FLOORS WITH POLISHED CONCRETE FINISH	FLAT
TILE UP TO 16" LONG DIMENSION, ≥ 1/4" GROUT JOINTS	FLAT
TILE UP TO 16" LONG DIMENSION, 3/16" GROUT JOINTS	VERY FLAT
TILE UP TO 16" LONG DIMENSION, 1/8" GROUT JOINTS	SUPER FLAT
TILE > 16" TO < 36" LONG DIMENSION, ≥ 1/4" GROUT JOINTS	VERY FLAT
TILE > 16" TO < 36" LONG DIMENSION, < 1/4" GROUT JOINTS	SUPER FLAT
TILE > 36" LONG DIMENSION	SUPER FLAT

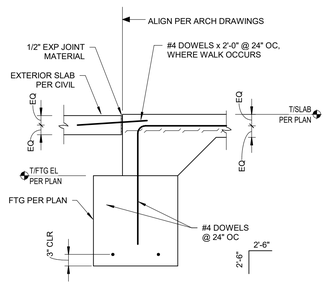
NOTES:
1. GENERAL CONTRACTOR SHALL REVIEW ALL FLOOR FINISH REQUIREMENTS FOR THE PROJECT AND PROVIDE CONCRETE SLAB SURFACE FINISHES IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFIED FLOOR FINISH MATERIALS. WHERE TOLERANCES FOR THE FLOOR FINISH MATERIALS DIFFER FROM THIS SCHEDULE, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
2. GENERAL CONTRACTOR SHALL COORDINATE WITH THE FINISH FLOORING SUPPLIER TO PROVIDE ALL NECESSARY REPAIR, GRINDING, AND/OR LEVELING OF THE CONCRETE SLAB TO ACCOMODATE ALL FLOOR FINISHES PRIOR TO INSTALLATION OF FINISH MATERIALS WITH NO ADDITIONAL COST TO THE PROJECT.

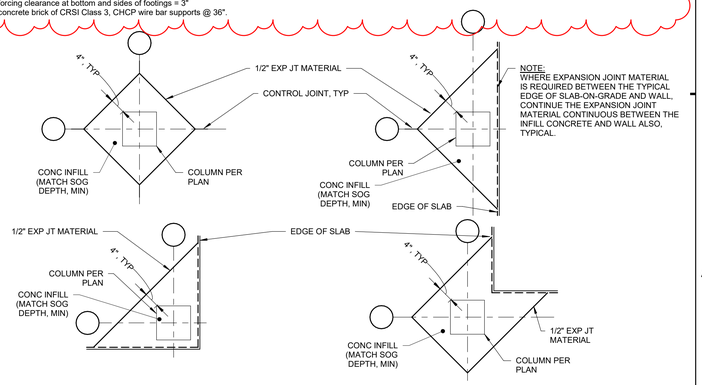












4 S-501.3 **TYPICAL SLAB ON GRADE JOINTS** SCALE: 3/4" = 1'-0"

3 S-501.3 **TYPICAL NEW TO EXISTING SLAB** SCALE: 3/4" = 1'-0"

2 S-501.3 **TYPICAL SOG ISOLATION JOINT** SCALE: 1 1/2" = 1'-0"

6 S-501.3 **TYPICAL SLAB ON GRADE STEP DETAILS** SCALE: 3/4" = 1'-0"

5 S-501.3 **TYPICAL AT EXTERIOR SLAB** SCALE: 3/4" = 1'-0"

1 S-501.3 **TYPICAL CONCRETE COLUMN ISOLATION JOINT DETAIL** SCALE: 3/4" = 1'-0"

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Project Date 03.03.2023
Bid Set 03
Produced DJS MS

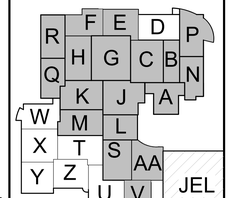


03.03.2023

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.10.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

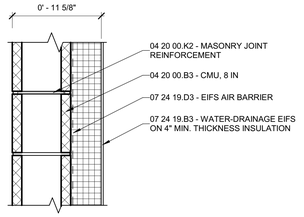
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

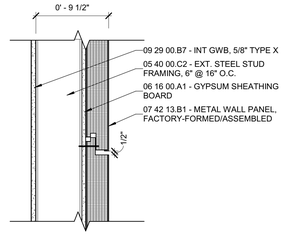
FOUNDATION SCHEDULES, SECTIONS, & DETAILS

S-501.3

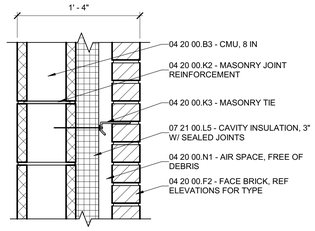
S-501.3_FOUNDATION SCHEDULES, SECTIONS, & DETAILS
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_
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© SCHMIDT ASSOCIATES



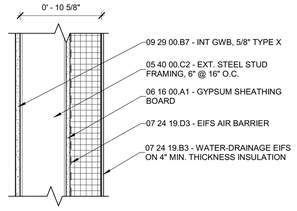
3E EM8E WALL TYPE
1 1/2" = 1'-0"



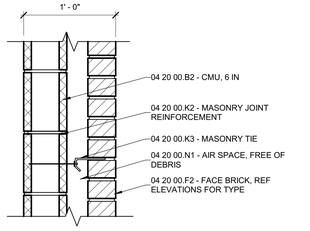
2E ES6Mi WALL TYPE
1 1/2" = 1'-0"



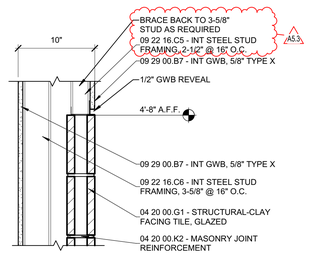
3D EM8B WALL TYPE
1 1/2" = 1'-0"



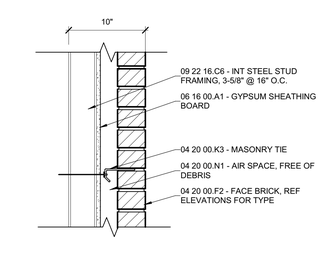
2D ES6E WALL TYPE
1 1/2" = 1'-0"



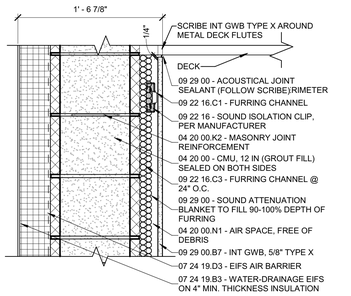
3C CM6B WALL TYPE
1 1/2" = 1'-0"



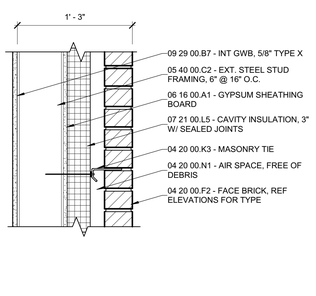
2C S4-T WALL TYPE
1 1/2" = 1'-0"



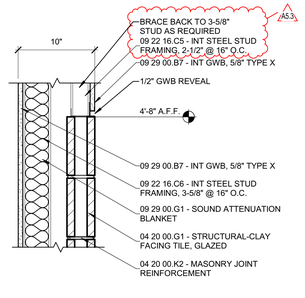
1C CS4B WALL TYPE
1 1/2" = 1'-0"



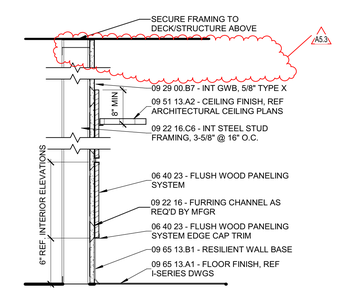
4B EM12EW1 WALL TYPE
1 1/2" = 1'-0"



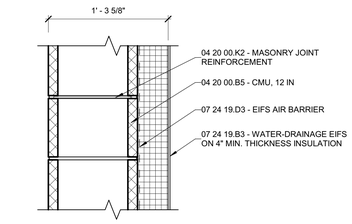
3B ES6B WALL TYPE
1 1/2" = 1'-0"



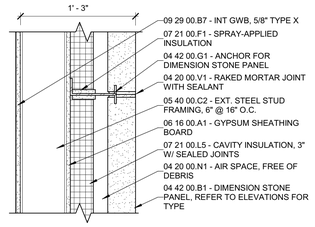
2B S4iT WALL TYPE
1 1/2" = 1'-0"



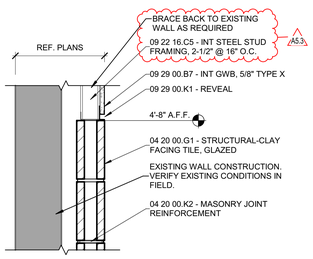
1B S4-DW' WALL TYPE
1 1/2" = 1'-0"



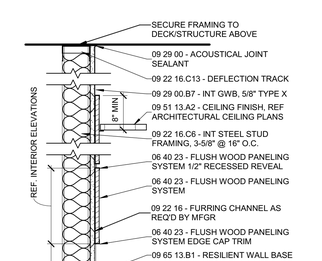
4A EM12E WALL TYPE
1 1/2" = 1'-0"



3A ES6S WALL TYPE
1 1/2" = 1'-0"



2A M4-T WALL TYPE
1 1/2" = 1'-0"



1A S4iDW' WALL TYPE
1 1/2" = 1'-0"

WALL TYPE LEGEND

READING LEFT TO RIGHT, WALL TYPES ARE DE-CODED AS FOLLOWS:

LOCATION
- E EXTERIOR WALL
- INTERIOR WALL - NO DESIGNATION
- C COMPOSITE WALL (EXTERIOR AND/OR INTERIOR)

WALL BACKUP MATERIAL
- C CONCRETE (03 30 00)
- M CONCRETE MASONY UNIT (04 20 00)
- S METAL STUD - EXTERIOR (05 40 00)
- S METAL STUD - INTERIOR (09 22 16)

WALL BACKUP NOMINAL DEPTH
- 1 1 INCHES
- 2 2 INCHES
- 4 4 INCHES
- 6 6 INCHES
- 8 8 INCHES
- 12 12 INCHES

ACOUSTICAL INSULATION
- \- NON-INSULATED
- i SOUND ATTENUATION BLANKETS (09 29 00)

WALL FINISH OPTIONS
- ' WALL FINISH ON ONE SIDE OF BACKUP ONLY
- C WALL FINISH TO MIN. 8 INCHES ABOVE FINISHED CEILING
- D WALL FINISHES TO DECK ABOVE

WALL FINISH MATERIAL
- B FACE BRICK VENEER (04 20 00)
  GYPSUM BOARD (09 29 00) - NO DESIGNATION, TYPICAL
- M METAL PANEL (07 42 16)
- S STONE VENEER (04 42 00)

WALL FINISH LAYERS
- 1 LAYER(S) WALL FINISH - NO DESIGNATION, TYPICAL
- 2 2 LAYER(S) WALL FINISH

WALL TYPE NOTES:

A. FIRE-RESISTIVE-RATED CONSTRUCTION: REFERENCE LIFE SAFETY PLANS FOR REQUIREMENTS RELATING TO FIRE-RATED CONSTRUCTION.
B. STC RATED CONSTRUCTION: PROVIDE ACOUSTICAL SEALANT (07 92 00) AT PERIMETER AND PENETRATIONS OF ALL NON-FIRE-RATED PARTITIONS INDICATED WITH AN STC RATING.
C. EXTERIOR WALLS: PENETRATIONS AND/OR COMPROMISES TO THE WEATHER-RESISTIVE BARRIER (AIR/VAPOR BARRIER) SHALL BE SEALED WITH SPRAY-POLYURETHANE FOAM (07 21 00).
D. SHAFTWALL ASSEMBLIES: SW1-D & SW1D ARE GYPSUM BOARD SHAFT WALL ASSEMBLIES (09 21 16.23).

SCHMIDT
ASSOCIATES
415 Massachusetts Avenue
Indianapolis, IN 46204
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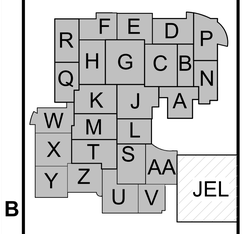
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced SLS DJK

SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
ARCHITECT

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

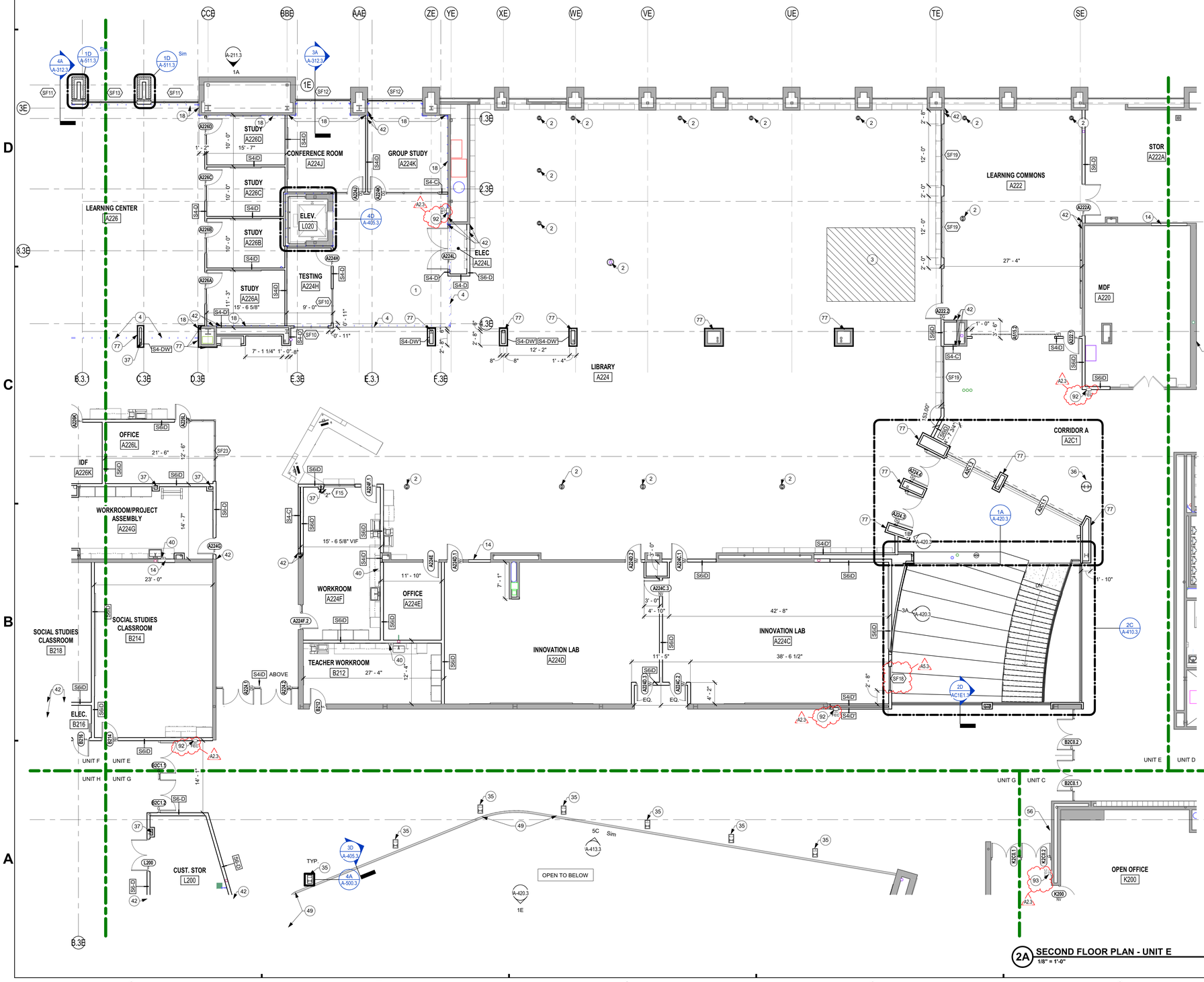
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

WALL TYPES

A-003.3

A-003_3_WALL TYPES
2019-067.NCH_S1S_D.rvt (Washington Township, North Central High School Renovation_...
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Mar 03, 2023 2:57:27 PM



FLOOR PLAN NOTES

Refer to sheet A-001.3 for general plan notes that apply to all plan work.

#	Note
1	NEW FLOOR SLAB - REF S-SERIES DWGS
2	057500 - METAL COLUMN COVER, 16" DIAMETER.
3	FLOOR INFILL - REFER TO S-SERIES DWGS
4	079500 - INTERIOR FLOOR-TO-FLOOR EXPANSION JOINT SYSTEM.
5	102219 - FOLDING PANEL PARTITION
6	111316 - NEW LOADING DOCK SEALS ON EXISTING OPENING.
7	EXISTING TRASH COMPACTOR TO REMAIN
8	CUT EXISTING FLOOR SLAB FOR NEW MECHANICAL CHASE, REF S-SERIES DWGS
9	WASHER AND DRYER, OWNER PROVIDED
10	114000 - FOOD SERVICE EQUIPMENT- REF Q-SERIES DWGS
11	033000 - TOPPING SLAB INFILL OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
12	088300 - WALL MIRRORS 6'-0" TALL, 3'-3" WIDE MAX. EQUALLY SPACE JOINTS. MOUNT 1'-0" A.F.F.
13	122200 - WALL MOUNTED TRACK CURTAINS. LENGTH TO CONCEAL MIRRORS. MOUNT TRACK AT 10'-0" A.F.F.
14	INFILL OPENING WITH WALL TO MATCH SURROUNDING/ADJACENT WALL CONSTRUCTION. VERIFY EXISTING WALL CONDITIONS/CONSTRUCTION AND DIMENSIONS IN THE FIELD. ALIGN THE FACE OF THE NEW INFILL WALL WITH THE ADJACENT EXISTING WALL FACE. TOOTH NEW MASONRY INTO EXISTING CONSTRUCTION WHERE APPLICABLE
15	088300 - 48" X 54" MIRROR MOUNTED AT 2'-6" A.F.F.
16	088300 - 24" H CONTINUOUS MIRROR MOUNTED 4" ABOVE COUNTERTOP. 40" MAX TO BOTTOM OF REFLECTIVE SURFACE
17	BASE BID: INFILL EXISTING OPENING TO MATCH ADJACENT RAILING. MODIFY GUARDRAIL AS REQUIRED TO CREATE SEAMLESS TRANSITION.
18	079500 - INTERIOR FLOOR-TO-WALL EXPANSION JOINT SYSTEM. EXTEND LENGTH OF WALL.
19	116623 - GYMNASIUM ATHLETIC WALL PADS
20	079500 - INTERIOR WALL-TO-WALL EXPANSION JOINT SYSTEM. EXTEND FROM FLOOR TO CEILING.
21	NEW OPENING IN EXISTING WALL. REF DEMO PLANS AND INTERIOR ELEVATIONS
22	120890.99 - INDUSTRIAL SHELVING UNITS, 72"W X 24"D X 96" H EACH
23	120890.99 - INDUSTRIAL SHELVING UNITS, 48"W X 24"D X 96" H EACH
24	055300 - FLOOR GRATING OVER RECESS IN SLAB. REF SECTION DETAIL
25	102213 - WIRE MESH PARTITION AND GATE - FLOOR TO DECK ABOVE
26	042000 - 56" TALL 8" CMU WALL WITH DOUBLE BULLNOSE SOLID CMU CAP. CONFIRM LOCATION OF WALL WITH FOOD SERVICE EQUIPMENT LAYOUT.
27	033000 - 4" CONCRETE FLOOR SLAB - COORDINATE DEPTH WITH FOODSERVICE EQUIPMENT REQUIREMENTS
28	033000 - 4" CONCRETE SLAB, REF S SERIES DWGS
29	033000 - TOPPING SLAB OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
30	079500 - EXTERIOR WALL TO WALL EXPANSON JOINT COVER
31	079500 - INTERIOR WALL TO WALL CORNER EXPANSION JOINT COVER
32	077100 - METAL DOWNSPOUT, REF ROOF PLAN FOR SIZE. COORD WITH C-SERIES DWGS FOR BOOT CONNECTION.
33	033000 - 4" CONCRETE FLOOR SLAB. REF S-SERIES DWGS
34	033000 - RECESSED 4" CONCRETE SLAB. COORDINATE DEPTH WITH FOOD SERVICE EQUIPMENT REQUIREMENTS
35	092713 - GFRC TAPERED PIER - REF TYPICAL DETAILS, A-500 SERIES DWGS
36	057500 - METAL COLUMN COVER, 24" DIAMETER.
37	NEW ENCLOSURE AROUND EXISTING COLUMN USING WALL TYPE S4-C', MAINTAIN 1" MIN. CLEAR AROUND COLUMN. DO NOT ATTACH TO COLUMN.
38	084113 - BRAKE METAL CLOSURE TRIM FROM WALL TO MULLION.
39	105113 - LOCKER TRIM
40	PAPER TOWEL AND SOAP DISPENSERS - OWNER FURNISHED, CONTRACTOR INSTALLED. COORD LOCATION IN FIELD.
41	BASE BID: NEW GATE OPENINGS IN EXISTING RAILING. REF DETAILS. MAIN GYM RAILING ALTERNATE: NEW GUARDRAIL TYPE A WITH OPERABLE GATES.
42	ALIGN FACE OF WALLS
43	LINE OF CANOPY ABOVE
44	CENTER NEW WALL CONSTRUCTION ON COLUMN CENTERLINE
45	092713 - GFRC COLUMN WRAP - REF TYPICAL DETAILS, A-500 SERIES DWGS
46	077100 - 2X2 DOWNSPOUT TO SPLASH BLOCK AT GRADE.
47	K HALL ELEVATOR ALTERNATE: 142400 - NEW ELEVATOR IN EXISTING ELEVATOR SHAFT, REF ENLARGED PLANS AND SECTIONS. V.I.F.
48	064023 - SOLID SURFACE OVER EXISTING PLANTER, REF ENLARGED PLANS AND DETAILS.
49	BALCONY RAILING ALTERNATE: 057300 - GLASS RETROFIT GUARDRAIL ATTACHED TO EXISTING ALUMINUM RAILING, REF TYP DETAILS
50	057300 - STAINLESS STEEL HANDRAIL - REF ENLARGED PLANS AND DETAILS
51	ALIGN RAIL WITH CENTERLINE OF EXISTING AUDITORIUM DOORS.
52	RELOCATED EXISTING FUME HOOD, REF M-SERIES DWGS
53	ALIGN NEW OPENING WITH OPENING ACROSS THE HALL
54	102123 - CUBICLE CURTAIN AND TRACK
55	033000 - COMPOSITE FLOOR INFILL. REF S-SERIES DWGS
56	055000 - CUSTOM FIRE ALARM PULL COVER, REF TYPICAL DETAILS, A-500 DWGS.
57	083323 - OVERHEAD COILING SERVICE DOOR. REF DOOR SCHEDULE AND DETAILS
58	126600 - TELESCOPING STANDS, BANK A
59	126600 - MEDIA PLATFORM
60	096468.99 - REFINISH GYM WOOD FLOORING. REF I-SERIES DWGS FOR FLOOR PATTERNS, ETC.
61	057300 - RAILING TYPE A, REF RAIL TYPES SHEET AND DETAILS
62	126600 - TELESCOPING STANDS, BANK B
63	126600 - TELESCOPING STANDS, BANK C
64	126600 - TELESCOPING STANDS, BANK D
65	NOT USED
66	SHOWER TRENCH DRAIN, REF DETAIL IN A-400 SERIES DWGS. COORD WITH P-SERIES DWGS
67	126600 - TELESCOPING STANDS, BANK E
68	NOT USED
69	SOUTH CANOPY ALTERNATE: CANOPY AND LIGHT WALL CONSTRUCTED AS SHOWN.
70	EAST PERFORMING ARTS ENTRANCE ALTERNATE: REF SHEET A324.3 FOR ALTERNATE
71	NOT USED
72	REMOVE EXISTING STORAGE BENCH AS REQUIRED FOR NEW DOOR. DEMO TO EXISTING SEAM LOCATION. PATCH AND REPAIR WALL SURFACE TO REMAIN. CAP END OF BENCH AND FINISH TO MATCH EXISTING.
73	PAC ADDITIONAL WORK ALTERNATE: 126124 - NEW AUDIENCE SEATING AS SHOWN, REF TS-SERIES DWGS
74	BASE BID: CONSTRUCT STAGE ACCESS AND STAIR AS SHOWN, MODIFY EXISTING AUDIENCE SEATING AS REQUIRED FOR NEW CONSTRUCTION. REF A-400 SERIES DWGS.
75	REF SHEET AF1S2 FOR CLERESTORY PLAN OF THIS ROOM
76	09 30 00 - REPLACE DAMAGED FLOOR/WALL TILES IN SHADED AREA WITH TILES AND PATTERN TO MATCH EXISTING. PROVIDE "X" SQUARE FEET ("X" INDICATED ON DEMO PLANS) OF TILE REPLACEMENT AT LOCATIONS INDICATED. CONFIRM TILE TYPE AND PATTERN IN THE FIELD. CONFIRM FINAL EXTENTS AT EACH AREA OF CRACKED TILE WITH ARCHITECT IN THE FIELD.
77	064023 - WOOD PANELING AND WAINSCOT, ALL SIDES OF COLUMN WRAP
78	CENTER PIER ON FACE OF WALL
79	DISPLAY WALL - REF I-SERIES DWGS
80	EXISTING RAIL TO REMAIN
81	EXTERIOR COLUMN WRAP PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
82	EXTERIOR DECORATIVE PILASTER. REF A-500 SERIES DWGS FOR ELEVATION
83	033000 - CONCRETE TOPPING FLOOR SLAB TO BRING FINISH FLOOR ELEVATION TO MATCH EXISTING, REF I-SERIES DWGS FOR FINISH TYPE.
84	WALL IS CONCENTRIC TO EXTERIOR WALL; REF AF2D1.3 FOR GRADUATED DIMENSIONS OF EXTERIOR CURVE.
85	PAC ADDITIONAL WORK ALTERNATE: NEW COUNTERTOP AND WALL CAP, REF A-322.3
86	034100 - PRECAST CONCRETE EXTERIOR COLUMN, REF PILASTER PROFILES
87	087100 - AUTOMATIC DOOR OPENER PADDLE
88	RELOCATED WOODEN CREST (FROM AUDITORIUM ENTRANCE). FIELD VERIFY MOUNING LOCATION AND PROVISIONS WITH ARCHITECT/CM IN FIELD
89	RELOCATED DARK ROOM SINK. REF P-SERIES DRAWINGS
90	087100 - AUTOMATIC DOOR OPENER PADDLE ON BOLLARD
91	083436 - DARKROOM DOOR
92	104413 - SEMI-RECESSED FIRE EXTINGUISHER CABINET (FEC)
93	EXISTING FIRE EXTINGUISHER CABINET (FEC) TO REMAIN

SCHMIDT ASSOCIATES
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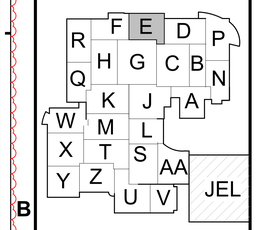
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced SLS MM

SARAH KATHLEEN HEMPSTEAD REGISTERED No. AR10400134 STATE OF INDIANA ARCHITECT

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

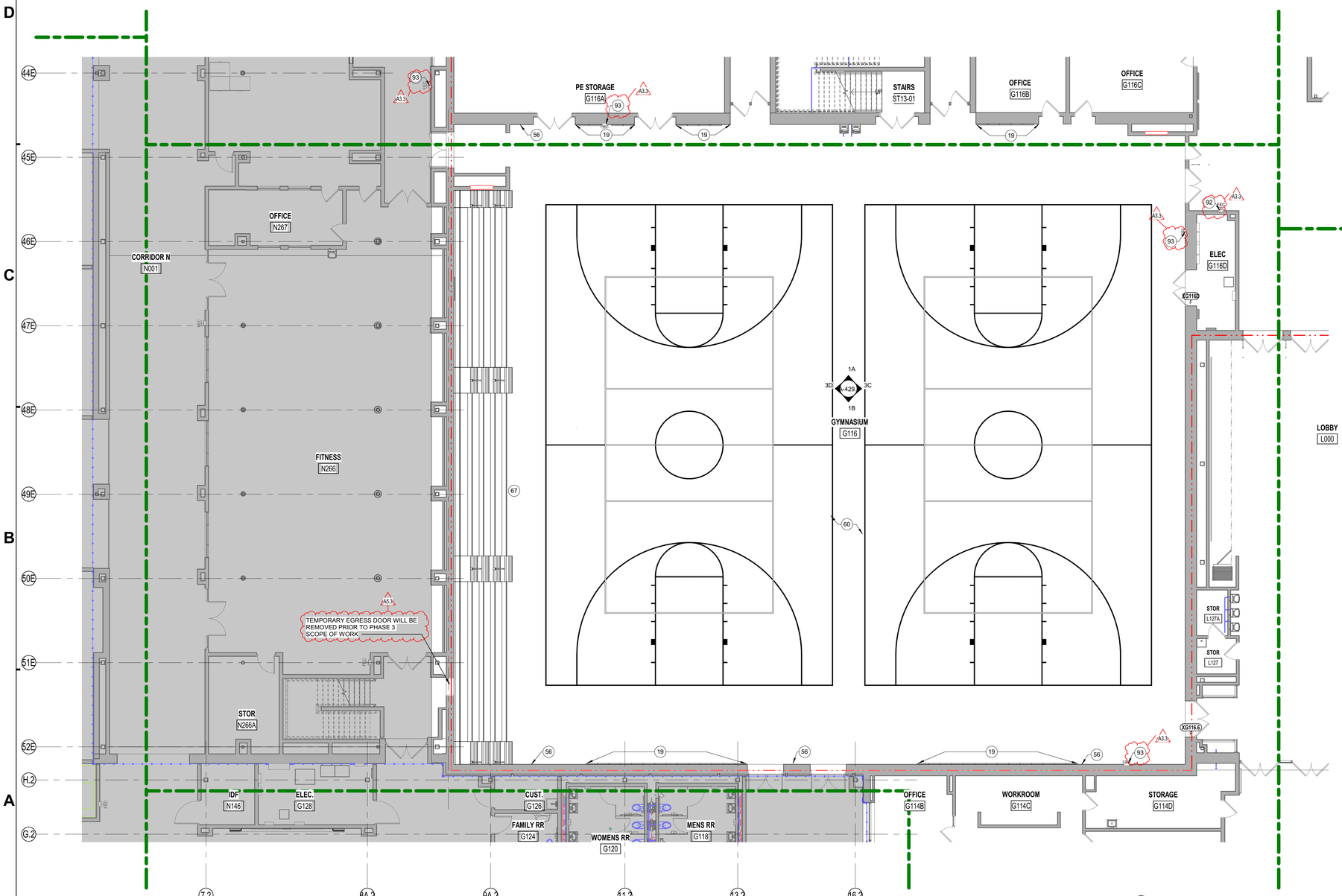
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR PLAN - UNIT E

AF1E2.3

AF1E2.3, 3/22/2023 11:23:55 AM, mhall
2019-067.NCH_MLS D of Washington Township, North Central High School Renovation_
C:\Users\mhall\Documents\2019-067.NCH_Section D_3_MHall_mhall.rvt
C:\Users\mhall\Documents\2019-067.NCH_Section D_3_SLS_mmiller.rvt



2A **FIRST FLOOR PLAN - UNIT T**
1/8" = 1'-0"

FLOOR PLAN NOTES

Refer to sheet A-001.3 for general plan notes that apply to all plan work.

#	Note
1	NEW FLOOR SLAB - REF S-SERIES DWGS
2	057500 - METAL COLUMN COVER, 16" DIAMETER.
3	FLOOR INFILL - REFER TO S-SERIES DWGS
4	079500 - INTERIOR FLOOR-TO-FLOOR EXPANSION JOINT SYSTEM.
5	102219 - FOLDING PANEL PARTITION
6	111316 - NEW LOADING DOCK SEALS ON EXISTING OPENING.
7	EXISTING TRASH COMPACTOR TO REMAIN
8	CUT EXISTING FLOOR SLAB FOR NEW MECHANICAL CHASE
9	WASHER AND DRYER, OWNER PROVIDED
10	114000 - FOOD SERVICE EQUIPMENT- REF Q-SERIES DWGS
11	033000 - TOPPING SLAB INFILL OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
12	088300 - WALL MIRRORS 6'-0" TALL, 3'-3" WIDE MAX. EQUALLY SPACE JOINTS. MOUNT 1'-0" A.F.F.
13	122200 - WALL MOUNTED TRACK CURTAINS. LENGTH TO CONCEAL MIRRORS. MOUNT TRACK AT 10'-0" A.F.F.
14	INFILL OPENING WITH WALL TO MATCH SURROUNDING/ADJACENT WALL CONSTRUCTION. VERIFY EXISTING WALL CONDITIONS/CONSTRUCTION AND DIMENSIONS IN THE FIELD. ALIGN THE FACE OF THE NEW INFILL WALL WITH THE ADJACENT EXISTING WALL FACE. TOOTH NEW MASONRY INTO EXISTING CONSTRUCTION WHERE APPLICABLE
15	088300 - 48" X 54" MIRROR MOUNTED AT 2'-6" A.F.F.
16	088300 - 24" H CONTINUOUS MIRROR MOUNTED 4" ABOVE COUNTERTOP. 40" MAX TO BOTTOM OF REFLECTIVE SURFACE
17	BASE BID: INFILL EXISTING OPENING TO MATCH ADJACENT RAILING. MODIFY GUARDRAIL AS REQUIRED TO CREATE SEAMLESS TRANSITION.
18	079500 - INTERIOR FLOOR-TO-WALL EXPANSION JOINT SYSTEM. EXTEND LENGTH OF WALL.
19	116623 - GYMNASIUM ATHLETIC WALL PADS
20	079500 - INTERIOR WALL-TO-WALL EXPANSION JOINT SYSTEM. EXTEND FROM FLOOR TO CEILING.
21	NEW OPENING IN EXISTING WALL. REF DEMO PLANS AND INTERIOR ELEVATIONS
22	120890.99 - INDUSTRIAL SHELVING UNITS, 72"W X 24"D X 96" H EACH
23	120890.99 - INDUSTRIAL SHELVING UNITS, 48"W X 24"D X 96" H EACH
24	056300 - FLOOR GRATING OVER RECESS IN SLAB. REF SECTION DETAIL
25	102213 - WIRE MESH PARTITION AND GATE - FLOOR TO DECK ABOVE
26	042000 - 56" TALL 8" CMU WALL WITH DOUBLE BULLNOSE SOLID CMU CAP. CONFIRM LOCATION OF WALL WITH FOOD SERVICE EQUIPMENT LAYOUT.
27	033000 - 4" CONCRETE FLOOR SLAB - COORDINATE DEPTH WITH FOODSERVICE EQUIPMENT REQUIREMENTS
28	033000 - 4" CONCRETE SLAB, REF S SERIES DWGS
29	033000 - TOPPING SLAB OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
30	079500 - EXTERIOR WALL TO WALL EXPANSON JOINT COVER
31	079500 - INTERIOR WALL TO WALL CORNER EXPANSION JOINT COVER
32	077100 - METAL DOWNSPOUT, REF ROOF PLAN FOR SIZE. COORD WITH C-SERIES DWGS FOR BOOT CONNECTION.
33	033000 - 4" CONCRETE FLOOR SLAB. REF S-SERIES DWGS
34	033000 - RECESSED 4" CONCRETE SLAB. COORDINATE DEPTH WITH FOOD SERVICE EQUIPMENT REQUIREMENTS
35	092713 - GFRC TAPERED PIER - REF TYPICAL DETAILS, A-500 SERIES DWGS
36	057500 - METAL COLUMN COVER, 24" DIAMETER.
37	NEW ENCLOSURE AROUND EXISTING COLUMN USING WALL TYPE S4-C'. MAINTAIN 1" MIN. CLEAR AROUND COLUMN. DO NOT ATTACH TO COLUMN.
38	084113 - BRAKE METAL CLOSURE TRIM FROM WALL TO MULLION.
39	105113 - LOCKER TRIM
40	PAPER TOWEL AND SOAP DISPENSERS - OWNER FURNISHED, CONTRACTOR INSTALLED. COORD LOCATION IN FIELD.
41	BASE BID: NEW GATE OPENINGS IN EXISTING RAILING. REF DETAILS ON SHEET AF1K2.3. MAIN GYM RAILING ALTERNATE: NEW GUARDRAIL TYPE A WITH OPERABLE GATES ALIGNED WITH AISLES IN TELESCOPING STANDS
42	ALIGN FACE OF WALLS
43	LINE OF CANOPY ABOVE
44	CENTER NEW WALL CONSTRUCTION ON COLUMN CENTERLINE
45	092713 - GFRC COLUMN WRAP - REF TYPICAL DETAILS, A-500 SERIES DWGS
46	077100 - 2X2 DOWNSPOUT TO SPLASH BLOCK AT GRADE.
47	K HALL ELEVATOR ALTERNATE: 142400 - NEW ELEVATOR IN EXISTING ELEVATOR SHAFT. REF ENLARGED PLANS AND SECTIONS. V.I.F.
48	064023 - SOLID SURFACE OVER EXISTING PLANTER, REF ENLARGED PLANS AND DETAILS.
49	BALCONY RAILING ALTERNATE: 057300 - GLASS GUARDRAIL ATTACHED TO EXISTING ALUMINUM RAILING, REF TYP DETAILS
50	057300 - STAINLESS STEEL HANDRAIL - REF ENLARGED PLANS AND DETAILS
51	ALIGN RAIL WITH CENTERLINE OF EXISTING AUDITORIUM DOORS.
52	RELOCATED EXISTING FUME HOOD, REF M-SERIES DWGS
53	ALIGN NEW OPENING WITH OPENING ACROSS THE HALL
54	102123 - CUBICLE CURTAIN AND TRACK
55	033000 - COMPOSITE FLOOR INFILL. REF S-SERIES DWGS
56	055000 - CUSTOM FIRE ALARM PULL COVER, REF TYPICAL DETAILS, A-500 DWGS.
57	083323 - OVERHEAD COILING SERVICE DOOR. REF DOOR SCHEDULE AND DETAILS
58	126600 - TELESCOPING STANDS, BANK A
59	126600 - MEDIA PLATFORM
60	096468.99 - REFINISH GYM WOOD FLOORING. REF I-SERIES DWGS FOR FLOOR PATTERNS, ETC.
61	057300 - RAILING TYPE A. REF RAIL TYPES SHEET AND DETAILS
62	126600 - TELESCOPING STANDS, BANK B
63	126600 - TELESCOPING STANDS, BANK C
64	126600 - TELESCOPING STANDS, BANK D
65	NOT USED
66	SHOWER TRENCH DRAIN, REF DETAIL IN A-400 SERIES DWGS. COORD WITH P-SERIES DWGS
67	126600 - TELESCOPING STANDS, BANK E
68	NOT USED
69	SOUTH CANOPY ALTERNATE: CANOPY AND LIGHT WALL CONSTRUCTED AS SHOWN.
70	EAST PERFORMING ARTS ENTRANCE ALTERNATE: REF SHEET A324.3 FOR ALTERNATE
71	NOT USED
72	REMOVE EXISTING STORAGE BENCH AS REQUIRED FOR NEW DOOR. DEMO TO EXISTING SEAM LOCATION. PATCH AND REPAIR WALL SURFACE TO REMAIN. CAP END OF BENCH AND FINISH TO MATCH EXISTING.
73	PAC ADDITIONAL WORK ALTERNATE: 126124 - NEW AUDIENCE SEATING AS SHOWN, REF TS-SEERIES DWGS
74	BASE BID: CONSTRUCT STAGE ACCESS AND STAIR AS SHOWN, MODIFY EXISTING AUDIENCE SEATING AS REQUIRED FOR NEW CONSTRUCTION. REF A-400 SERIES DWGS.
75	REF SHEET AF1S2 FOR CLERESTORY PLAN OF THIS ROOM
76	09 30 00 - REPLACE DAMAGED FLOOR/WALL TILES IN SHADED AREA WITH TILES AND PATTERN TO MATCH EXISTING. PROVIDE "X" SQUARE FEET ("X" INDICATED ON DEMO PLANS) OF TILE REPLACEMENT AT LOCATIONS INDICATED. CONFIRM TILE TYPE AND PATTERN IN THE FIELD. CONFIRM FINAL EXTENTS AT EACH AREA OF CRACKED TILE WITH ARCHITECT IN THE FIELD.
77	064023 - WOOD PANELING AND WAINSCOT, ALL SIDES OF COLUMN WRAP
78	CENTER PIER ON FACE OF WALL
79	DISPLAY WALL - REF I-SERIES DWGS
80	EXISTING RAIL TO REMIAN
81	EXTERIOR COLUMN WRAP PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
82	EXTERIOR DECORATIVE PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
83	033000 - CONCRETE TOPPING FLOOR SLAB TO BRING FINISH FLOOR ELEVATION TO MATCH EXISTING, REF I-SERIES DWGS FOR FINISH TYPE.
84	WALL IS CONCENTRIC TO EXTERIOR WALL; REF AF2D1.3 FOR GRADUATED DIMENSIONS OF EXTERIOR CURVE
85	PAC ADDITIONAL WORK ALTERNATE: NEW COUNTERTOP AND WALL CAP, REF 5A/A-322.3
86	034100 - PRECAST CONCRETE EXTERIOR COLUMN, REF PILASTER PROFILES
87	087100 - AUTOMATIC DOOR OPENER PADDLE
88	RELOCATED WOODEN CREST (FROM AUDITORIUM ENTRANCE). FIELD VERIFY MOUNING LOCATION AND PROVISIONS WITH ARCHITECT/CM IN FIELD
89	RELOCATED DARK ROOM SINK. REF P-SERIES DRAWINGS
90	087100 - AUTOMATIC DOOR OPENER PADDLE ON BOLLARD
91	083436 - DARKROOM DOOR
92	104413 - SEMI-RECESSED FIRE EXTINGUISHER CABINET (FEC)
93	EXISTING FIRE EXTINGUISHER CABINET (FEC) TO REMAIN

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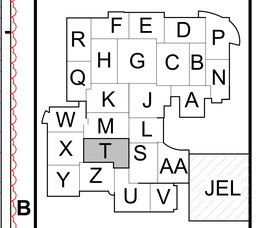
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced SLS MM

SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
ARCHITECT

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

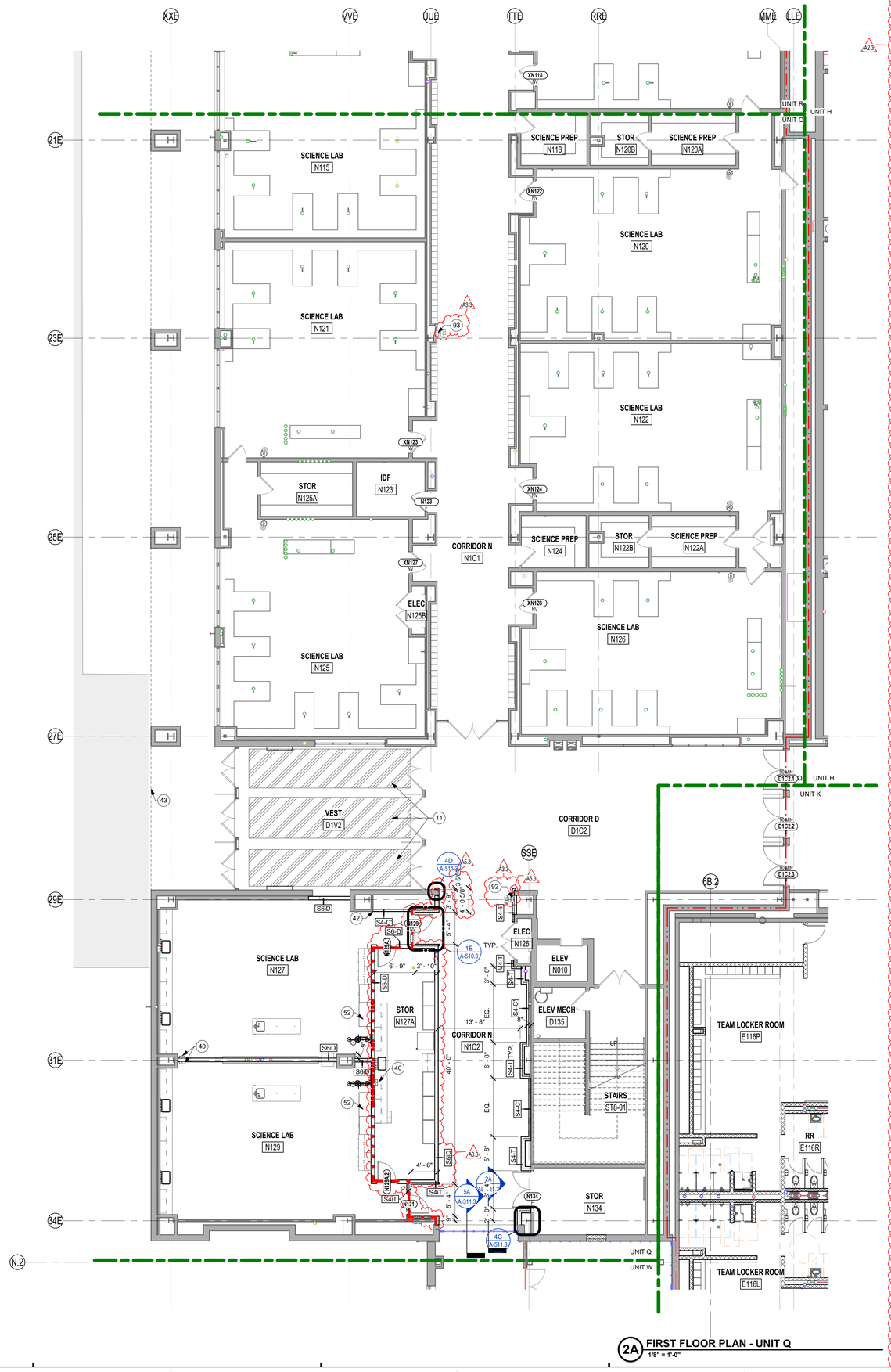
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FIRST FLOOR PLAN - UNIT T

AF1T1.3

AF1T1.1_FIRST FLOOR PLAN - UNIT T
2019-067.NCH_M.S.D. of Washington Township_North Central High School Renovation_
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2A FIRST FLOOR PLAN - UNIT Q
1/8" = 1'-0"

FLOOR PLAN NOTES

Refer to sheet A-001.3 for general plan notes that apply to all plan work.

#	Note
1	NEW FLOOR SLAB - REF S-SERIES DWGS
2	057500 - METAL COLUMN COVER, 16" DIAMETER.
3	FLOOR INFILL - REFER TO S-SERIES DWGS
4	079500 - INTERIOR FLOOR-TO-FLOOR EXPANSION JOINT SYSTEM.
5	102219 - FOLDING PANEL PARTITION
6	111316 - NEW LOADING DOCK SEALS ON EXISTING OPENING.
7	EXISTING TRASH COMPACTOR TO REMAIN
8	CUT EXISTING FLOOR SLAB FOR NEW MECHANICAL CHASE, REF S-SERIES DWGS
9	WASHER AND DRYER, OWNER PROVIDED
10	114000 - FOOD SERVICE EQUIPMENT- REF Q-SERIES DWGS
11	033000 - TOPPING SLAB INFILL OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
12	088300 - WALL MIRRORS 6'-0" TALL, 3'-3" WIDE MAX. EQUALLY SPACE JOINTS. MOUNT 1'-0" A.F.F.
13	122200 - WALL MOUNTED TRACK CURTAINS. LENGTH TO CONCEAL MIRRORS. MOUNT TRACK AT 10'-0" A.F.F.
14	INFILL OPENING WITH WALL TO MATCH SURROUNDING/ADJACENT WALL CONSTRUCTION. VERIFY EXISTING WALL CONDITIONS/CONSTRUCTION AND DIMENSIONS IN THE FIELD. ALIGN THE FACE OF THE NEW INFILL WALL WITH THE ADJACENT EXISTING WALL FACE. TOOTH NEW MASONRY INTO EXISTING CONSTRUCTION WHERE APPLICABLE
15	088300 - 48" X 54" MIRROR MOUNTED AT 2'-6" A.F.F.
16	088300 - 24" H CONTINUOUS MIRROR MOUNTED 4" ABOVE COUNTERTOP. 40" MAX TO BOTTOM OF REFLECTIVE SURFACE
17	BASE BID: INFILL EXISTING OPENING TO MATCH ADJACENT RAILING. MODIFY GUARDRAIL AS REQUIRED TO CREATE SEAMLESS TRANSITION.
18	079500 - INTERIOR FLOOR-TO-WALL EXPANSION JOINT SYSTEM. EXTEND LENGTH OF WALL.
19	116623 - GYMNASIUM ATHLETIC WALL PADS
20	079500 - INTERIOR WALL-TO-WALL EXPANSION JOINT SYSTEM. EXTEND FROM FLOOR TO CEILING.
21	NEW OPENING IN EXISTING WALL. REF DEMO PLANS AND INTERIOR ELEVATIONS
22	120890.99 - INDUSTRIAL SHELVING UNITS, 72"W X 24"D X 96" H EACH
23	120890.99 - INDUSTRIAL SHELVING UNITS, 48"W X 24"D X 96" H EACH
24	055300 - FLOOR GRATING OVER RECESS IN SLAB. REF SECTION DETAIL
25	102213 - WIRE MESH PARTITION AND GATE - FLOOR TO DECK ABOVE
26	042000 - 56" TALL 8" CMU WALL WITH DOUBLE BULLNOSE SOLID CMU CAP. CONFIRM LOCATION OF WALL WITH FOOD SERVICE EQUIPMENT LAYOUT.
27	033000 - 4" CONCRETE FLOOR SLAB - COORDINATE DEPTH WITH FOODSERVICE EQUIPMENT REQUIREMENTS
28	033000 - 4" CONCRETE SLAB, REF S SERIES DWGS
29	033000 - TOPPING SLAB OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
30	079500 - EXTERIOR WALL TO WALL EXPANSON JOINT COVER
31	079500 - INTERIOR WALL TO WALL CORNER EXPANSION JOINT COVER
32	077100 - METAL DOWNSPOUT, REF ROOF PLAN FOR SIZE. COORD WITH C-SERIES DWGS FOR BOOT CONNECTION.
33	033000 - 4" CONCRETE FLOOR SLAB. REF S-SERIES DWGS
34	033000 - RECESSED 4" CONCRETE SLAB. COORDINATE DEPTH WITH FOOD SERVICE EQUIPMENT REQUIREMENTS
35	092713 - GFRC TAPERED PIER - REF TYPICAL DETAILS, A-500 SERIES DWGS
36	057500 - METAL COLUMN COVER, 24" DIAMETER.
37	NEW ENCLOSURE AROUND EXISTING COLUMN USING WALL TYPE S4-C', MAINTAIN 1" MIN. CLEAR AROUND COLUMN. DO NOT ATTACH TO COLUMN.
38	084113 - BRAKE METAL CLOSURE TRIM FROM WALL TO MULLION.
39	105113 - LOCKER TRIM
40	PAPER TOWEL AND SOAP DISPENSERS - OWNER FURNISHED, CONTRACTOR INSTALLED. COORD LOCATION IN FIELD.
41	BASE BID: NEW GATE OPENINGS IN EXISTING RAILING. REF DETAILS. MAIN GYM RAILING ALTERNATE: NEW GUARDRAIL TYPE A WITH OPERABLE GATES.
42	ALIGN FACE OF WALLS
43	LINE OF CANOPY ABOVE
44	CENTER NEW WALL CONSTRUCTION ON COLUMN CENTERLINE
45	092713 - GFRC COLUMN WRAP - REF TYPICAL DETAILS, A-500 SERIES DWGS
46	077100 - 2X2 DOWNSPOUT TO SPLASH BLOCK AT GRADE.
47	K HALL ELEVATOR ALTERNATE: 142400 - NEW ELEVATOR IN EXISTING ELEVATOR SHAFT, REF ENLARGED PLANS AND SECTIONS. V.I.F.
48	064023 - SOLID SURFACE OVER EXISTING PLANTER, REF ENLARGED PLANS AND DETAILS.
49	BALCONY RAILING ALTERNATE: 057300 - GLASS RETROFIT GUARDRAIL ATTACHED TO EXISTING ALUMINUM RAILING, REF TYP DETAILS
50	057300 - STAINLESS STEEL HANDRAIL - REF ENLARGED PLANS AND DETAILS
51	ALIGN RAIL WITH CENTERLINE OF EXISTING AUDITORIUM DOORS.
52	RELOCATED EXISTING FUME HOOD, REF M-SERIES DWGS
53	ALIGN NEW OPENING WITH OPENING ACROSS THE HALL
54	102123 - CUBICLE CURTAIN AND TRACK
55	033000 - COMPOSITE FLOOR INFILL. REF S-SERIES DWGS
56	055000 - CUSTOM FIRE ALARM PULL COVER, REF TYPICAL DETAILS, A-500 DWGS.
57	083323 - OVERHEAD COILING SERVICE DOOR. REF DOOR SCHEDULE AND DETAILS
58	126600 - TELESCOPING STANDS, BANK A
59	126600 - MEDIA PLATFORM
60	096468.99 - REFINISH GYM WOOD FLOORING. REF I-SERIES DWGS FOR FLOOR PATTERNS, ETC.
61	057300 - RAILING TYPE A, REF RAIL TYPES SHEET AND DETAILS
62	126600 - TELESCOPING STANDS, BANK B
63	126600 - TELESCOPING STANDS, BANK C
64	126600 - TELESCOPING STANDS, BANK D
65	NOT USED
66	SHOWER TRENCH DRAIN, REF DETAIL IN A-400 SERIES DWGS. COORD WITH P-SERIES DWGS
67	126600 - TELESCOPING STANDS, BANK E
68	NOT USED
69	SOUTH CANOPY ALTERNATE: CANOPY AND LIGHT WALL CONSTRUCTED AS SHOWN.
70	EAST PERFORMING ARTS ENTRANCE ALTERNATE: REF SHEET A324.3 FOR ALTERNATE
71	NOT USED
72	REMOVE EXISTING STORAGE BENCH AS REQUIRED FOR NEW DOOR. DEMO TO EXISTING SEAM LOCATION. PATCH AND REPAIR WALL SURFACE TO REMAIN. CAP END OF BENCH AND FINISH TO MATCH EXISTING.
73	PAC ADDITIONAL WORK ALTERNATE: 126124 - NEW AUDIENCE SEATING AS SHOWN, REF TS-SERIES DWGS
74	BASE BID: CONSTRUCT STAGE ACCESS AND STAIR AS SHOWN, MODIFY EXISTING AUDIENCE SEATING AS REQUIRED FOR NEW CONSTRUCTION. REF A-400 SERIES DWGS.
75	REF SHEET AF1S2 FOR CLERESTORY PLAN OF THIS ROOM
76	09 30 00 - REPLACE DAMAGED FLOOR/WALL TILES IN SHADED AREA WITH TILES AND PATTERN TO MATCH EXISTING. PROVIDE "X" SQUARE FEET ("X" INDICATED ON DEMO PLANS) OF TILE REPLACEMENT AT LOCATIONS INDICATED. CONFIRM TILE TYPE AND PATTERN IN THE FIELD. CONFIRM FINAL EXTENTS AT EACH AREA OF CRACKED TILE WITH ARCHITECT IN THE FIELD.
77	064023 - WOOD PANELING AND WAINSCOT, ALL SIDES OF COLUMN WRAP
78	CENTER PIER ON FACE OF WALL
79	DISPLAY WALL - REF I-SERIES DWGS
80	EXISTING RAIL TO REMAIN
81	EXTERIOR COLUMN WRAP PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
82	EXTERIOR DECORATIVE PILASTER. REF A-500 SERIES DWGS FOR ELEVATION
83	033000 - CONCRETE TOPPING FLOOR SLAB TO BRING FINISH FLOOR ELEVATION TO MATCH EXISTING, REF I-SERIES DWGS FOR FINISH TYPE.
84	WALL IS CONCENTRIC TO EXTERIOR WALL; REF AF2D1.3 FOR GRADUATED DIMENSIONS OF EXTERIOR CURVE.
85	PAC ADDITIONAL WORK ALTERNATE: NEW COUNTERTOP AND WALL CAP, REF A-322.3
86	034100 - PRECAST CONCRETE EXTERIOR COLUMN, REF PILASTER PROFILES
87	087100 - AUTOMATIC DOOR OPENER PADDLE
88	RELOCATED WOODEN CREST (FROM AUDITORIUM ENTRANCE). FIELD VERIFY MOUNING LOCATION AND PROVISIONS WITH ARCHITECT/CM IN FIELD
89	RELOCATED DARK ROOM SINK. REF P-SERIES DRAWINGS
90	087100 - AUTOMATIC DOOR OPENER PADDLE ON BOLLARD
91	083436 - DARKROOM DOOR
92	104413 - SEMI-RECESSED FIRE EXTINGUISHER CABINET (FEC)
93	EXISTING FIRE EXTINGUISHER CABINET (FEC) TO REMAIN

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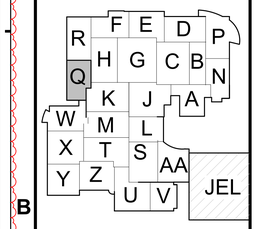
SARAH KATHLEEN HEMPSTEAD REGISTERED No. AR10400134 STATE OF INDIANA ARCHITECT

Sarah K Hempstead

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KEY PLAN

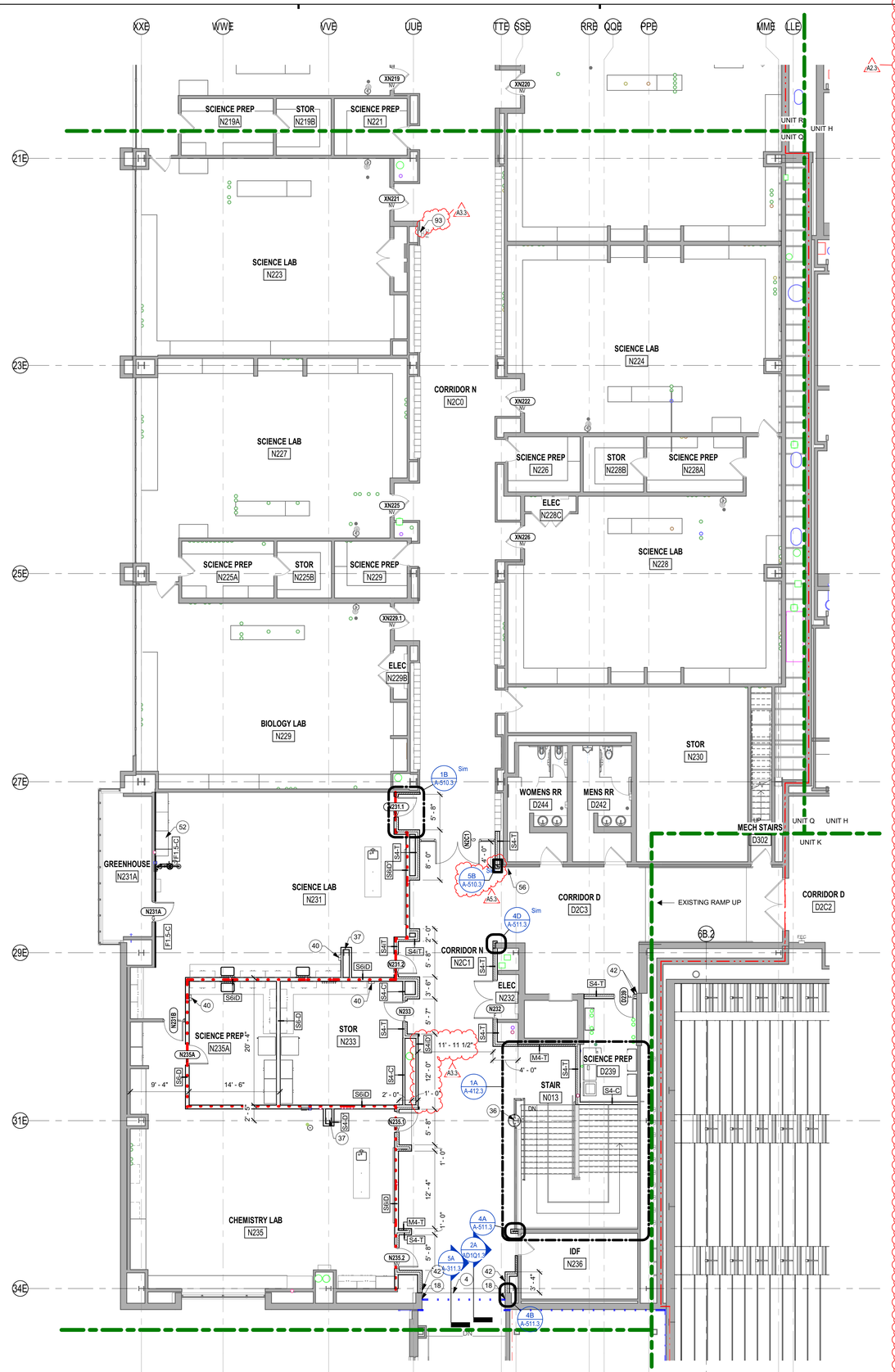
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FIRST FLOOR PLAN - UNIT Q

AF1Q1.3

AF1Q1_1 FIRST FLOOR PLAN - UNIT Q
2019-067.NCH_N.S.S of Washington Township North Central High School Renovation_
File Path: C:\Revit Local Files\2019-067.NCH_Sarah K_20220324-SLS.rvt
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2A SECOND FLOOR PLAN - UNIT Q
1/8" = 1'-0"

FLOOR PLAN NOTES

Refer to sheet A-001.3 for general plan notes that apply to all plan work.

#	Note
1	NEW FLOOR SLAB - REF S-SERIES DWGS
2	057500 - METAL COLUMN COVER, 16" DIAMETER.
3	FLOOR INFILL - REFER TO S-SERIES DWGS
4	079500 - INTERIOR FLOOR-TO-FLOOR EXPANSION JOINT SYSTEM.
5	102219 - FOLDING PANEL PARTITION
6	111316 - NEW LOADING DOCK SEALS ON EXISTING OPENING.
7	EXISTING TRASH COMPACTOR TO REMAIN
8	CUT EXISTING FLOOR SLAB FOR NEW MECHANICAL CHASE, REF S-SERIES DWGS
9	WASHER AND DRYER, OWNER PROVIDED
10	114000 - FOOD SERVICE EQUIPMENT- REF Q-SERIES DWGS
11	033000 - TOPPING SLAB INFILL OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL
12	088300 - WALL MIRRORS 6'-0" TALL, 3'-3" WIDE MAX. EQUALLY SPACE JOINTS. MOUNT 1'-0" A.F.F.
13	122200 - WALL MOUNTED TRACK CURTAINS. LENGTH TO CONCEAL MIRRORS. MOUNT TRACK AT 10'-0" A.F.F.
14	INFILL OPENING WITH WALL TO MATCH SURROUNDING/ADJACENT WALL CONSTRUCTION. VERIFY EXISTING WALL CONDITIONS/CONSTRUCTION AND DIMENSIONS IN THE FIELD. ALIGN THE FACE OF THE NEW INFILL WALL WITH THE ADJACENT EXISTING WALL FACE. TOOTH NEW MASONRY INTO EXISTING CONSTRUCTION WHERE APPLICABLE
15	088300 - 48" X 54" MIRROR MOUNTED AT 2'-6" A.F.F.
16	088300 - 24" H CONTINUOUS MIRROR MOUNTED 4" ABOVE COUNTERTOP. 40" MAX TO BOTTOM OF REFLECTIVE SURFACE
17	BASE BID: INFILL EXISTING OPENING TO MATCH ADJACENT RAILING. MODIFY GUARDRAIL AS REQUIRED TO CREATE SEAMLESS TRANSITION.
18	079500 - INTERIOR FLOOR-TO-WALL EXPANSION JOINT SYSTEM. EXTEND LENGTH OF WALL.
19	116623 - GYMNASIUM ATHLETIC WALL PADS
20	079500 - INTERIOR WALL-TO-WALL EXPANSION JOINT SYSTEM. EXTEND FROM FLOOR TO CEILING.
21	NEW OPENING IN EXISTING WALL. REF DEMO PLANS AND INTERIOR ELEVATIONS
22	120890.99 - INDUSTRIAL SHELVING UNITS, 72"W X 24"D X 96" H EACH
23	120890.99 - INDUSTRIAL SHELVING UNITS, 48"W X 24"D X 96" H EACH
24	055300 - FLOOR GRATING OVER RECESS IN SLAB. REF SECTION DETAIL
25	102213 - WIRE MESH PARTITION AND GATE - FLOOR TO DECK ABOVE
26	042000 - 56" TALL 8" CMU WALL WITH DOUBLE BULLNOSE SOLID CMU CAP. CONFIRM LOCATION OF WALL WITH FOOD SERVICE EQUIPMENT LAYOUT.
27	033000 - 4" CONCRETE FLOOR SLAB - COORDINATE DEPTH WITH FOODSERVICE EQUIPMENT REQUIREMENTS
28	033000 - 4" CONCRETE SLAB, REF S SERIES DWGS
29	033000 - TOPPING SLAB OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL
30	079500 - EXTERIOR WALL TO WALL EXPANSON JOINT COVER
31	079500 - INTERIOR WALL TO WALL CORNER EXPANSION JOINT COVER
32	077100 - METAL DOWNSPOUT, REF ROOF PLAN FOR SIZE. COORD WITH C-SERIES DWGS FOR BOOT CONNECTION.
33	033000 - 4" CONCRETE FLOOR SLAB. REF S-SERIES DWGS
34	033000 - RECESSED 4" CONCRETE SLAB. COORDINATE DEPTH WITH FOOD SERVICE EQUIPMENT REQUIREMENTS
35	092713 - GFRC TAPERED PIER - REF TYPICAL DETAILS, A-500 SERIES DWGS
36	057500 - METAL COLUMN COVER, 24" DIAMETER.
37	NEW ENCLOSURE AROUND EXISTING COLUMN USING WALL TYPE S4-C', MAINTAIN 1" MIN. CLEAR AROUND COLUMN. DO NOT ATTACH TO COLUMN.
38	084113 - BRAKE METAL CLOSURE TRIM FROM WALL TO MULLION.
39	105113 - LOCKER TRIM
40	PAPER TOWEL AND SOAP DISPENSERS - OWNER FURNISHED, CONTRACTOR INSTALLED. COORD LOCATION IN FIELD.
41	BASE BID: NEW GATE OPENINGS IN EXISTING RAILING. REF DETAILS. MAIN GYM RAILING ALTERNATE: NEW GUARDRAIL TYPE A WITH OPERABLE GATES.
42	ALIGN FACE OF WALLS
43	LINE OF CANOPY ABOVE
44	CENTER NEW WALL CONSTRUCTION ON COLUMN CENTERLINE
45	092713 - GFRC COLUMN WRAP - REF TYPICAL DETAILS, A-500 SERIES DWGS
46	077100 - 2X2 DOWNSPOUT TO SPLASH BLOCK AT GRADE.
47	K HALL ELEVATOR ALTERNATE: 142400 - NEW ELEVATOR IN EXISTING ELEVATOR SHAFT, REF ENLARGED PLANS AND SECTIONS. V.I.F.
48	064023 - SOLID SURFACE OVER EXISTING PLANTER, REF ENLARGED PLANS AND DETAILS.
49	BALCONY RAILING ALTERNATE: 057300 - GLASS RETROFIT GUARDRAIL ATTACHED TO EXISTING ALUMINUM RAILING, REF TYP DETAILS
50	057300 - STAINLESS STEEL HANDRAIL - REF ENLARGED PLANS AND DETAILS
51	ALIGN RAIL WITH CENTERLINE OF EXISTING AUDITORIUM DOORS.
52	RELOCATED EXISTING FUME HOOD, REF M-SERIES DWGS
53	ALIGN NEW OPENING WITH OPENING ACROSS THE HALL
54	102123 - CUBICLE CURTAIN AND TRACK
55	033000 - COMPOSITE FLOOR INFILL. REF S-SERIES DWGS
56	055000 - CUSTOM FIRE ALARM PULL COVER, REF TYPICAL DETAILS, A-500 DWGS.
57	083323 - OVERHEAD COILING SERVICE DOOR. REF DOOR SCHEDULE AND DETAILS
58	126600 - TELESCOPING STANDS, BANK A
59	126600 - MEDIA PLATFORM
60	096468.99 - REFINISH GYM WOOD FLOORING. REF I-SERIES DWGS FOR FLOOR PATTERNS, ETC.
61	057300 - RAILING TYPE A, REF RAIL TYPES SHEET AND DETAILS
62	126600 - TELESCOPING STANDS, BANK B
63	126600 - TELESCOPING STANDS, BANK C
64	126600 - TELESCOPING STANDS, BANK D
65	NOT USED
66	SHOWER TRENCH DRAIN, REF DETAIL IN A-400 SERIES DWGS. COORD WITH P-SERIES DWGS
67	126600 - TELESCOPING STANDS, BANK E
68	NOT USED
69	SOUTH CANOPY ALTERNATE: CANOPY AND LIGHT WALL CONSTRUCTED AS SHOWN.
70	EAST PERFORMING ARTS ENTRANCE ALTERNATE: REF SHEET A324.3 FOR ALTERNATE
71	NOT USED
72	REMOVE EXISTING STORAGE BENCH AS REQUIRED FOR NEW DOOR. DEMO TO EXISTING SEAM LOCATION. PATCH AND REPAIR WALL SURFACE TO REMAIN. CAP END OF BENCH AND FINISH TO MATCH EXISTING.
73	PAC ADDITIONAL WORK ALTERNATE: 126124 - NEW AUDIENCE SEATING AS SHOWN, REF TS-SEERIES DWGS
74	BASE BID: CONSTRUCT STAGE ACCESS AND STAIR AS SHOWN, MODIFY EXISTING AUDIENCE SEATING AS REQUIRED FOR NEW CONSTRUCTION. REF A-400 SERIES DWGS.
75	REF SHEET AF1S2 FOR CLERESTORY PLAN OF THIS ROOM
76	09 30 00 - REPLACE DAMAGED FLOOR/WALL TILES IN SHADED AREA WITH TILES AND PATTERN TO MATCH EXISTING. PROVIDE "X" SQUARE FEET ("X" INDICATED ON DEMO PLANS) OF TILE REPLACEMENT AT LOCATIONS INDICATED. CONFIRM TILE TYPE AND PATTERN IN THE FIELD. CONFIRM FINAL EXTENTS AT EACH AREA OF CRACKED TILE WITH ARCHITECT IN THE FIELD.
77	064023 - WOOD PANELING AND WAINSCOT, ALL SIDES OF COLUMN WRAP
78	CENTER PIER ON FACE OF WALL
79	DISPLAY WALL - REF I-SERIES DWGS
80	EXISTING RAIL TO REMAIN
81	EXTERIOR COLUMN WRAP PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
82	EXTERIOR DECORATIVE PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
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85	PAC ADDITIONAL WORK ALTERNATE: NEW COUNTERTOP AND WALL CAP, REF A-322.3
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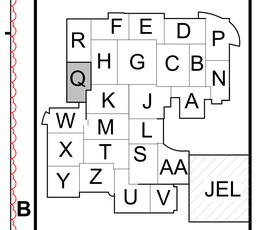
Project No. 2019-067.NCH
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SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
ARCHITECT

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1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN N

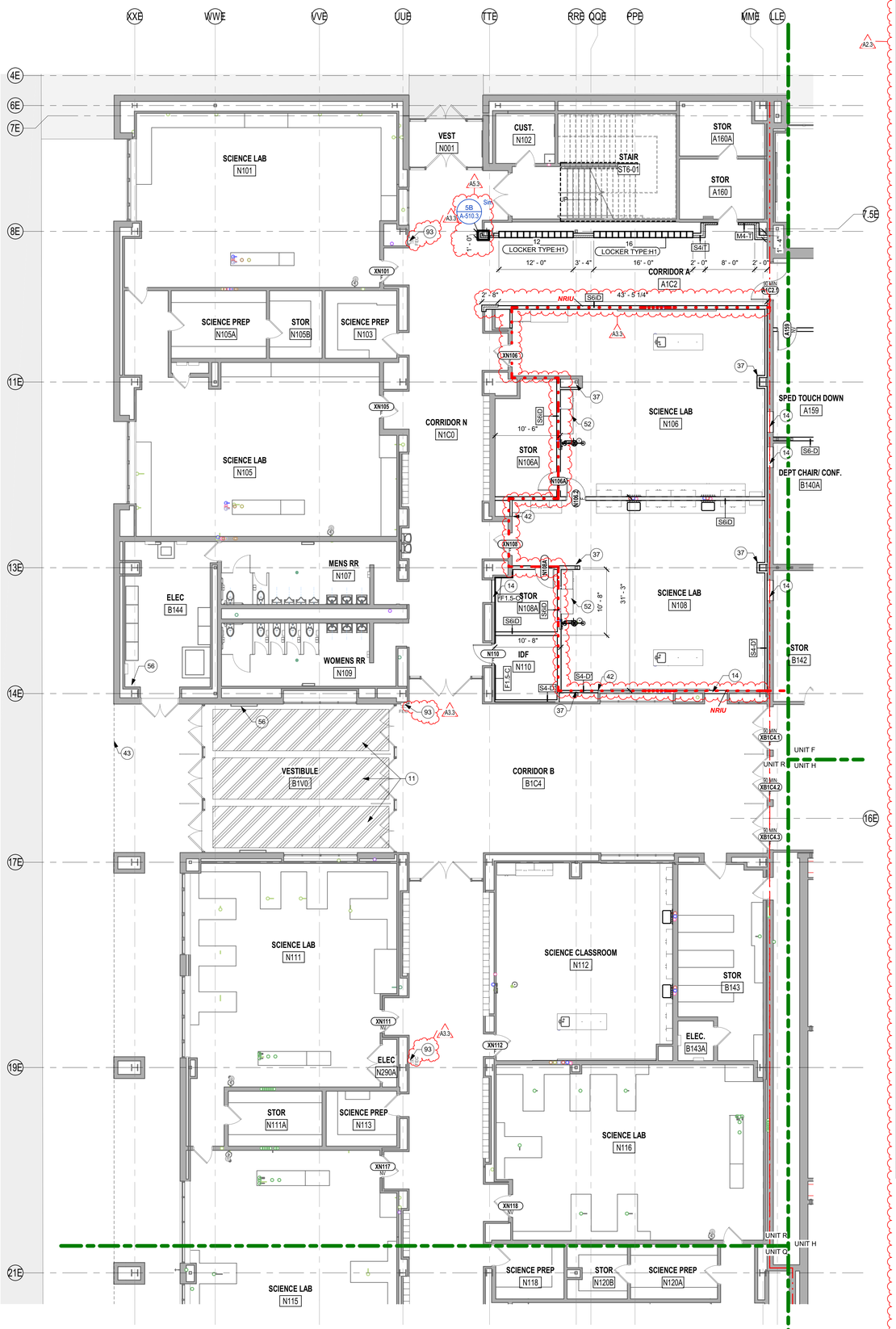
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR PLAN - UNIT Q

AF1Q2.3

AF1Q2_ 20220401-CLOUD PLAN_UNIT Q
2019-067.NCH_A2.3 of Washington Township_North Central High School Renovation_
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Tuesday, April 05, 2022 2:48:47 PM



2A **FIRST FLOOR PLAN - UNIT R**
1/8" = 1'-0"

FLOOR PLAN NOTES

Refer to sheet A-001.3 for general plan notes that apply to all plan work.

#	Note
1	NEW FLOOR SLAB - REF S-SERIES DWGS
2	057500 - METAL COLUMN COVER, 16" DIAMETER.
3	FLOOR INFILL - REFER TO S-SERIES DWGS
4	079500 - INTERIOR FLOOR-TO-FLOOR EXPANSION JOINT SYSTEM.
5	102219 - FOLDING PANEL PARTITION
6	111316 - NEW LOADING DOCK SEALS ON EXISTING OPENING.
7	EXISTING TRASH COMPACTOR TO REMAIN
8	CUT EXISTING FLOOR SLAB FOR NEW MECHANICAL CHASE, REF S-SERIES DWGS
9	WASHER AND DRYER, OWNER PROVIDED
10	114000 - FOOD SERVICE EQUIPMENT- REF Q-SERIES DWGS
11	033000 - TOPPING SLAB INFILL OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
12	088300 - WALL MIRRORS 6'-0" TALL, 3'-3" WIDE MAX. EQUALLY SPACE JOINTS. MOUNT 1'-0" A.F.F.
13	122200 - WALL MOUNTED TRACK CURTAINS. LENGTH TO CONCEAL MIRRORS. MOUNT TRACK AT 10'-0" A.F.F.
14	INFILL OPENING WITH WALL TO MATCH SURROUNDING/ADJACENT WALL CONSTRUCTION. VERIFY EXISTING WALL CONDITIONS/CONSTRUCTION AND DIMENSIONS IN THE FIELD. ALIGN THE FACE OF THE NEW INFILL WALL WITH THE ADJACENT EXISTING WALL FACE. TOOTH NEW MASONRY INTO EXISTING CONSTRUCTION WHERE APPLICABLE
15	088300 - 48" X 54" MIRROR MOUNTED AT 2'-6" A.F.F.
16	088300 - 24" H CONTINUOUS MIRROR MOUNTED 4" ABOVE COUNTERTOP. 40" MAX TO BOTTOM OF REFLECTIVE SURFACE
17	BASE BID: INFILL EXISTING OPENING TO MATCH ADJACENT RAILING. MODIFY GUARDRAIL AS REQUIRED TO CREATE SEAMLESS TRANSITION.
18	079500 - INTERIOR FLOOR-TO-WALL EXPANSION JOINT SYSTEM. EXTEND LENGTH OF WALL.
19	116623 - GYMNASIUM ATHLETIC WALL PADS
20	079500 - INTERIOR WALL-TO-WALL EXPANSION JOINT SYSTEM. EXTEND FROM FLOOR TO CEILING.
21	NEW OPENING IN EXISTING WALL. REF DEMO PLANS AND INTERIOR ELEVATIONS
22	120890.99 - INDUSTRIAL SHELVING UNITS, 72"W X 24"D X 96" H EACH
23	120890.99 - INDUSTRIAL SHELVING UNITS, 48"W X 24"D X 96" H EACH
24	055300 - FLOOR GRATING OVER RECESS IN SLAB. REF SECTION DETAIL
25	102213 - WIRE MESH PARTITION AND GATE - FLOOR TO DECK ABOVE
26	042000 - 56" TALL 8" CMU WALL WITH DOUBLE BULLNOSE SOLID CMU CAP. CONFIRM LOCATION OF WALL WITH FOOD SERVICE EQUIPMENT LAYOUT.
27	033000 - 4" CONCRETE FLOOR SLAB - COORDINATE DEPTH WITH FOODSERVICE EQUIPMENT REQUIREMENTS
28	033000 - 4" CONCRETE SLAB, REF S SERIES DWGS
29	033000 - TOPPING SLAB OF RECESSED FLOOR MAT AREA. PREP AREA TO RECEIVE NEW FLOOR MATERIAL.
30	079500 - EXTERIOR WALL TO WALL EXPANSON JOINT COVER
31	079500 - INTERIOR WALL TO WALL CORNER EXPANSION JOINT COVER
32	077100 - METAL DOWNSPOUT, REF ROOF PLAN FOR SIZE. COORD WITH C-SERIES DWGS FOR BOOT CONNECTION.
33	033000 - 4" CONCRETE FLOOR SLAB. REF S-SERIES DWGS
34	033000 - RECESSED 4" CONCRETE SLAB. COORDINATE DEPTH WITH FOOD SERVICE EQUIPMENT REQUIREMENTS
35	092713 - GFRC TAPERED PIER - REF TYPICAL DETAILS, A-500 SERIES DWGS
36	057500 - METAL COLUMN COVER, 24" DIAMETER.
37	NEW ENCLOSURE AROUND EXISTING COLUMN USING WALL TYPE S4-C', MAINTAIN 1" MIN. CLEAR AROUND COLUMN. DO NOT ATTACH TO COLUMN.
38	084113 - BRAKE METAL CLOSURE TRIM FROM WALL TO MULLION.
39	105113 - LOCKER TRIM
40	PAPER TOWEL AND SOAP DISPENSERS - OWNER FURNISHED, CONTRACTOR INSTALLED. COORD LOCATION IN FIELD.
41	BASE BID: NEW GATE OPENINGS IN EXISTING RAILING. REF DETAILS. MAIN GYM RAILING ALTERNATE: NEW GUARDRAIL TYPE A WITH OPERABLE GATES.
42	ALIGN FACE OF WALLS
43	LINE OF CANOPY ABOVE
44	CENTER NEW WALL CONSTRUCTION ON COLUMN CENTERLINE
45	092713 - GFRC COLUMN WRAP - REF TYPICAL DETAILS, A-500 SERIES DWGS
46	077100 - 2X2 DOWNSPOUT TO SPLASH BLOCK AT GRADE.
47	K HALL ELEVATOR ALTERNATE: 142400 - NEW ELEVATOR IN EXISTING ELEVATOR SHAFT, REF ENLARGED PLANS AND SECTIONS. V.I.F.
48	064023 - SOLID SURFACE OVER EXISTING PLANTER, REF ENLARGED PLANS AND DETAILS.
49	BALCONY RAILING ALTERNATE: 057300 - GLASS RETROFIT GUARDRAIL ATTACHED TO EXISTING ALUMINUM RAILING, REF TYP DETAILS
50	057300 - STAINLESS STEEL HANDRAIL - REF ENLARGED PLANS AND DETAILS
51	ALIGN RAIL WITH CENTERLINE OF EXISTING AUDITORIUM DOORS.
52	RELOCATED EXISTING FUME HOOD, REF M-SERIES DWGS
53	ALIGN NEW OPENING WITH OPENING ACROSS THE HALL
54	102123 - CUBICLE CURTAIN AND TRACK
55	033000 - COMPOSITE FLOOR INFILL. REF S-SERIES DWGS
56	055000 - CUSTOM FIRE ALARM PULL COVER, REF TYPICAL DETAILS, A-500 DWGS.
57	083323 - OVERHEAD COILING SERVICE DOOR. REF DOOR SCHEDULE AND DETAILS
58	126600 - TELESCOPING STANDS, BANK A
59	126600 - MEDIA PLATFORM
60	096468.99 - REFINISH GYM WOOD FLOORING. REF I-SERIES DWGS FOR FLOOR PATTERNS, ETC.
61	057300 - RAILING TYPE A, REF RAIL TYPES SHEET AND DETAILS
62	126600 - TELESCOPING STANDS, BANK B
63	126600 - TELESCOPING STANDS, BANK C
64	126600 - TELESCOPING STANDS, BANK D
65	NOT USED
66	SHOWER TRENCH DRAIN. REF DETAIL IN A-400 SERIES DWGS. COORD WITH P-SERIES DWGS
67	126600 - TELESCOPING STANDS, BANK E
68	NOT USED
69	SOUTH CANOPY ALTERNATE: CANOPY AND LIGHT WALL CONSTRUCTED AS SHOWN.
70	EAST PERFORMING ARTS ENTRANCE ALTERNATE: REF SHEET A324.3 FOR ALTERNATE
71	NOT USED
72	REMOVE EXISTING STORAGE BENCH AS REQUIRED FOR NEW DOOR. DEMO TO EXISTING SEAM LOCATION. PATCH AND REPAIR WALL SURFACE TO REMAIN. CAP END OF BENCH AND FINISH TO MATCH EXISTING.
73	PAC ADDITIONAL WORK ALTERNATE: 126124 - NEW AUDIENCE SEATING AS SHOWN, REF TS-SEERIES DWGS
74	BASE BID: CONSTRUCT STAGE ACCESS AND STAIR AS SHOWN. MODIFY EXISTING AUDIENCE SEATING AS REQUIRED FOR NEW CONSTRUCTION. REF A-400 SERIES DWGS.
75	REF SHEET AF1S2 FOR CLERESTORY PLAN OF THIS ROOM
76	09 30 00 - REPLACE DAMAGED FLOOR/WALL TILES IN SHADED AREA WITH TILES AND PATTERN TO MATCH EXISTING. PROVIDE "X" SQUARE FEET ("X" INDICATED ON DEMO PLANS) OF TILE REPLACEMENT AT LOCATIONS INDICATED. CONFIRM TILE TYPE AND PATTERN IN THE FIELD. CONFIRM FINAL EXTENTS AT EACH AREA OF CRACKED TILE WITH ARCHITECT IN THE FIELD.
77	064023 - WOOD PANELING AND WAINSCOT, ALL SIDES OF COLUMN WRAP
78	CENTER PIER ON FACE OF WALL
79	DISPLAY WALL - REF I-SERIES DWGS
80	EXISTING RAIL TO REMAIN
81	EXTERIOR COLUMN WRAP PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
82	EXTERIOR DECORATIVE PILASTER- REF A-500 SERIES DWGS FOR ELEVATION
83	033000 - CONCRETE TOPPING FLOOR SLAB TO BRING FINISH FLOOR ELEVATION TO MATCH EXISTING, REF I-SERIES DWGS FOR FINISH TYPE.
84	WALL IS CONCENTRIC TO EXTERIOR WALL; REF AF2D1.3 FOR GRADUATED DIMENSIONS OF EXTERIOR CURVE.
85	PAC ADDITIONAL WORK ALTERNATE: NEW COUNTERTOP AND WALL CAP, REF A-322.3
86	034100 - PRECAST CONCRETE EXTERIOR COLUMN, REF PILASTER PROFILES
87	087100 - AUTOMATIC DOOR OPENER PADDLE
88	RELOCATED WOODEN CREST (FROM AUDITORIUM ENTRANCE), FIELD VERIFY MOUNING LOCATION AND PROVISIONS WITH ARCHITECT/OM IN FIELD
89	RELOCATED DARK ROOM SINK. REF P-SERIES DRAWINGS
90	087100 - AUTOMATIC DOOR OPENER PADDLE ON BOLLARD
91	083436 - DARKROOM DOOR
92	104413 - SEMI-RECESSED FIRE EXTINGUISHER CABINET (FEC)
93	EXISTING FIRE EXTINGUISHER CABINET (FEC) TO REMAIN

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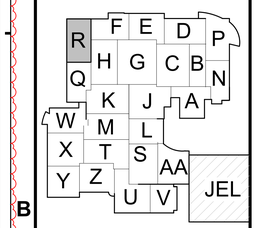
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced SLS MM

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

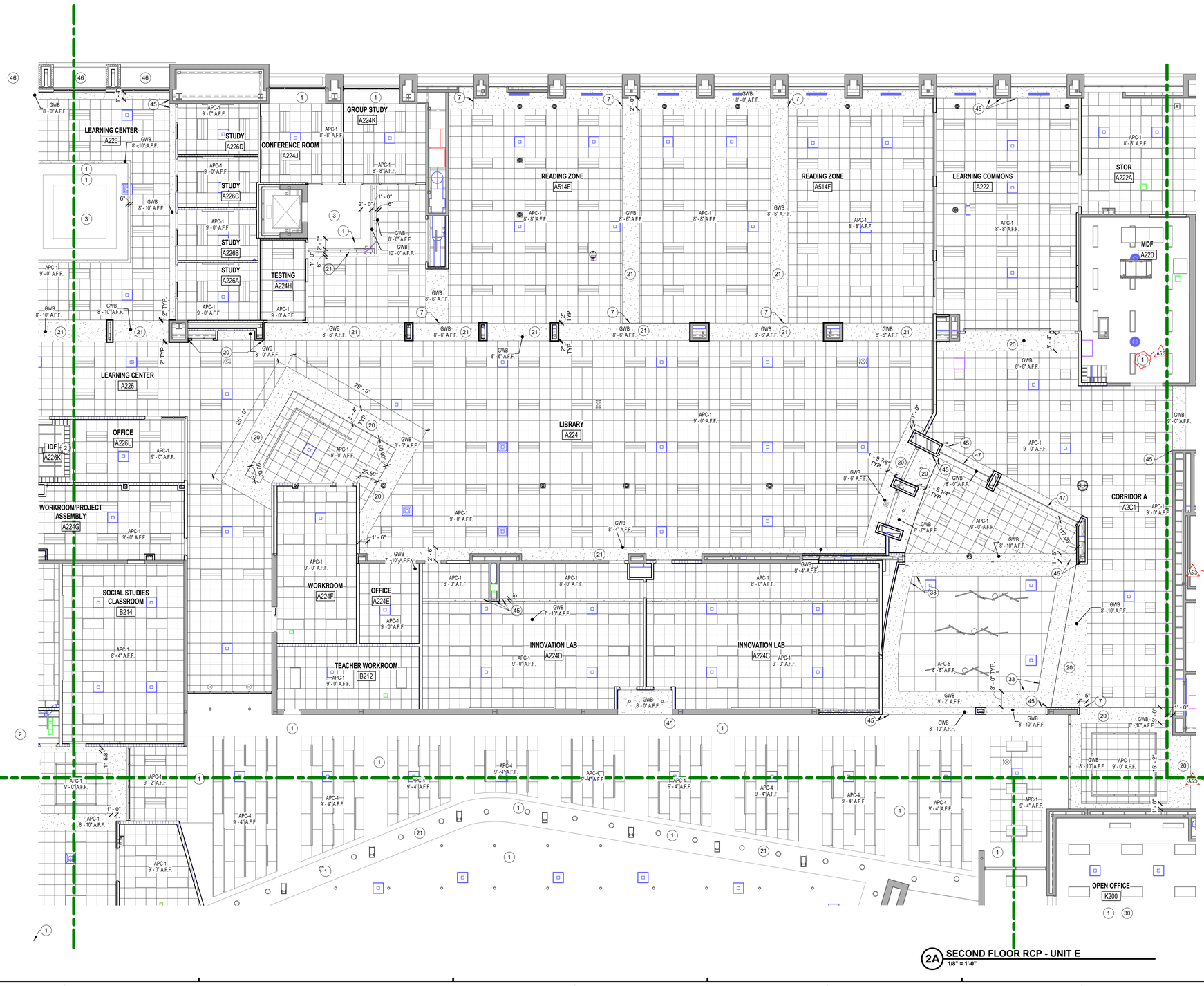
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North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLAN - UNIT R

AF1R1.3

AF1R1.3 - FIRST FLOOR PLAN - UNIT R
2019-067.NCH_3.8.5 of Washington Township North Central High School Renovatio...
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2A SECOND FLOOR RCP - UNIT E
1/8" = 1'-0"

General Reflected Ceiling Plan Notes

A. All ceilings are at 9'-0" AFF, unless noted otherwise.

B. All bulkheads are at 8'-10" AFF, unless noted otherwise.

C. All grids are centered in rooms, unless noted otherwise.

D. All exposed ductwork, piping etc. shall be painted. Refer to I-series drawings for finish.

E. Locate sprinkler heads in center of ceiling panel - where applicable.

F. All new & existing bulkheads to have exposed faces painted P-10 unless specifically noted otherwise. Bulkheads that are flush with walls provide color to match adjacent wall color.

REFLECTED CEILING PLAN LEGEND

APC-1	2' X 2' Acoustical Panel Ceiling (09 51 13)	Light Fixture (Reference E-Series Dwgs)	
APC-2	2' X 2' Washable Acoustical Panel Ceiling (09 51 13)	Return Air (Reference M-Series Dwgs)	
APC-3	2' X 2' Humidity Resistant Acoustical Panel Ceiling (09 51 13)	Supply Air (Reference M-Series Dwgs)	
APC-4	2' X 6' Acoustical Panel Ceiling (09 51 13)	Exit Light (Reference E-Series Dwgs)	
APC-5	Seamless Acoustical Ceiling (09 51 13)	Recessed Light Fixture Suspended Fixture in Areas with Exposed Ceilings (Reference E-Series Dwgs)	
GWB	5/8" GWB on Grid Suspension System (09 22 16)	SOUND SYSTEM SPEAKER (REFERENCE E-SERIES/T-SERIES DWGS)	S
DEFS	Direct-Applied Finish system on 5/8" Gypsum Sheathing on Grid Suspension System (07 24 13.99)	Walls to Deck	

REFLECTED CEILING PLAN NOTES

#	NOTE
1	EXISTING CEILING TO REMAIN
2	099000 - NO CEILING. PAINT EXPOSED STRUCTURE, DUCTWORK, PIPING, CONDUIT, ETC. WHITE.
3	OPEN TO EXISTING SKYLIGHT TO REMAIN
4	EXISTING EXTERIOR SOFFIT TO REMAIN
5	OPEN TO ABOVE
6	MODIFY EXISTING CEILING AS REQUIRED FOR NEW CHASE CONSTRUCTION
7	GWB CONTROL JOINT
8	EXISTING CEILING TO REMAIN. REMOVE CEILING AS REQUIRED FOR MECHANICAL WORK. PATCH AND REPAIR EXISTING CEILING
9	098300.99 - NO CEILING. APPLY 1.5" OF K-13 PRODUCT (BLACK) TO UNDERSIDE OF EXPOSED DECK AND TOP CHORD OF EXPOSED JOISTS
10	EXISTING CEILING GRID TO REMAIN. REPLACE TILES WITH ACP-1
11	092216 - EXTEND EXISTING BULKHEAD TO NEAREST ADJ. WALL.
12	REFER TO 1ST FLOOR PLAN FOR CEILING IN THIS AREA.
13	122200 - CEILING MOUNTED TRACK CURTAINS.
14	083113 - CEILING ACCESS PANEL. COORD LOCATION IN FIELD WITH AIR CURTAINS
15	1 HR RATED CEILING CONST.
16	PAINT EXPOSED DECK AND STRUCTURE WHITE
17	114000 - KITCHEN HOOD LOCATION. COORD WITH Q-SERIES DWGS
18	107317.99 - PREENGINEERED CANOPY SYSTEM
19	099123 .99 - ALL SIDES OF BULKHEAD TO BE PAINTED P-4 (SCHOOL RED ACCENT).
20	099123 .99 - ALL SIDES OF BULKHEAD TO BE PAINTED P-5 (NEUTRAL RED ACCENT).
21	099123 .99 - ALL SIDES OF BULKHEAD TO BE PAINTED P-10
22	PROJECTION SCREEN - REFER TO T-SERIES DWGS.
23	074213.23 - METAL COMPOSITE PANEL - COLOR A.
24	072419 - EIFS SOFFIT.
25	074219 - CONTROL JOINT.
26	079500 - SOFFIT EXPANSION JOINT COVER.
27	077100 - GUTTER.
28	101400 - DIMENSIONAL LETTERS "ART GALLERY"
29	095113 - MODIFY EXISTING CEILING GRID AS REQUIRED TO ACCOMMODATE NEW BULKHEAD CONSTRUCTION.
30	CLASSROOM INTERIORS FINISHES ALTERNATIVE - PROVIDE NEW APC-1 CEILING IN ROOM AT SAME ELEVATION AND CONFIGURATION AS EXISTING.
31	083323 - OVERHEAD COILING COUNTER DOOR.
32	095113 - SEAMLESS ACOUSTICAL CEILING SYSTEM.
33	095113 - 4" VERTICAL ALUMINUM TRIM
34	095113 - MODIFY WIDTH OF EXISTING BULKHEAD TO DIMENSION INDICATED.
35	092900 - NEW BULKHEAD TO ALIGN WITH EXISTING BULKHEAD. VERIFY ELEVATION.
36	PHASE 1 AREA - NO WORK IN THIS AREA IN THIS PHASE.
37	102123 - CUBICLE CURTAIN AND TRACK.
38	079500 - CEILING TO WALL EXPANSION JOINT COVER.
39	NOT USED
40	074213.23 - METAL COMPOSITE PANEL - COLOR B
41	PAINT EXPOSED DECK, DUCTWORK, CONDUIT, ETC. BLACK TO OVERLAP CEILING CLOUD EDGES BY 2'-0" MIN.
42	079500 - CEILING TO CEILING EXPANSION JOINT COVER.
43	PHASE 2 SCOPE OF WORK AREA
44	072419 - EIFS SOFFIT - REF SECTION FOR SCOPE OF WORK
45	ALIGN FACE OF BULKHEAD WITH FACE OF ADJACENT WALLS
46	074213.19 - INSULATED-CORE METAL SOFFIT PANEL TYPE B (MATCH EXISTING)
47	083326 - OVERHEAD COILING GRILLE. REF SECTION DETAILS
48	EXHAUST HOOD, REF M-SERIES DWGS
49	MATCH EXISTING ADJACENT CEILING HEIGHT, V.I.F.
50	EXTEND FACE OF BULKHEAD BEYOND FACE OF ADJACENT CMU WALL. REF RCP DETAILS
51	SCIENCE CLASSROOM INTERIORS FINISHES ALTERNATIVE - PROVIDE NEW APC-1 CEILING IN ROOM AT SAME ELEVATION AND CONFIGURATION AS EXISTING.
52	07 95 00 - EXTERIOR CEILING TO WALL EXPANSION JOINT COVER
53	SOUTH CANOPY ALTERNATE: CANOPY AND LIGHT WALL CONSTRUCTED AS SHOWN.
54	EAST PERFORMING ARTS ENTRANCE ALTERNATE: REF SHEET A319.3 FOR ALTERNATE
55	HEIGHT DIMENSION IS TAKEN FROM JEL LEVEL 1
56	EXISTING CEILING GRID TO REMAIN. REPLACE TILES WITH ACP-6
57	095113 - 6" HORIZONTAL ALUMINUM TRIM

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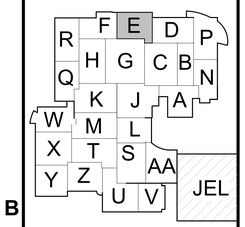
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced SLS MM

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

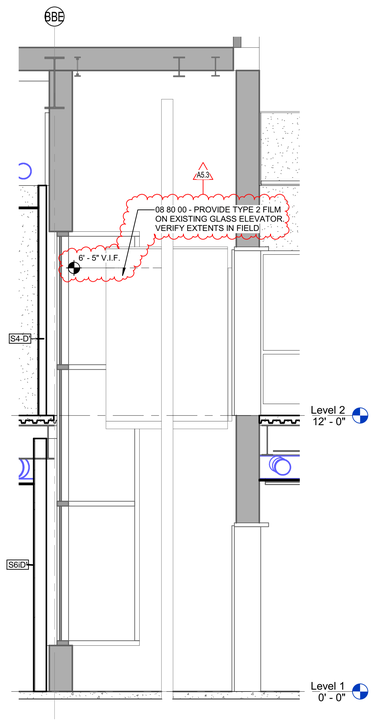
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North Central High School Renovation - Additions Phase 3

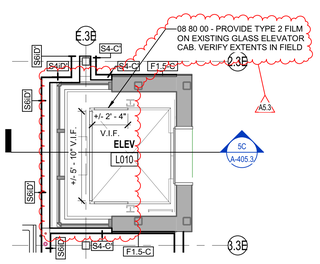
SECOND FLOOR REFLECTED CEILING PLAN - UNIT E

AC1E2.3

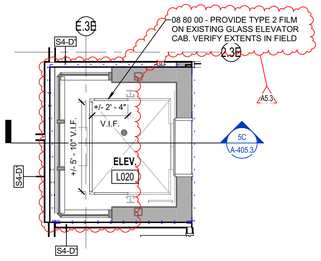
AC1E2.3 - SECOND FLOOR REFLECTED CEILING PLAN - UNIT E
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_
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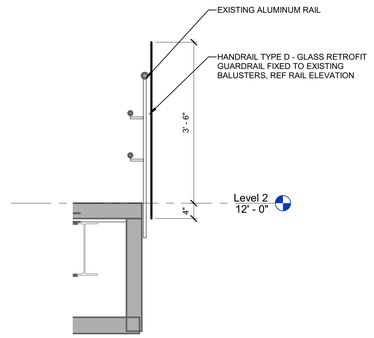
5C **UNIT E ELEVATOR**
3/8" = 1'-0"



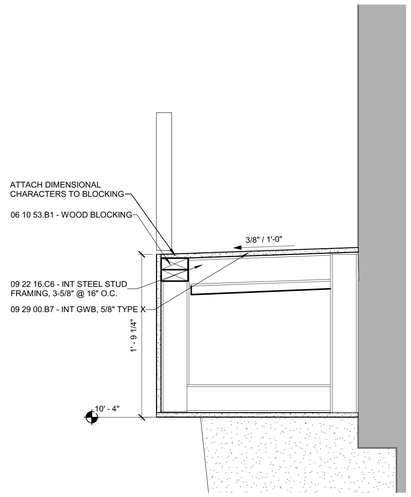
4E **UNIT E ELEVATOR - FIRST FLOOR**
1/4" = 1'-0"



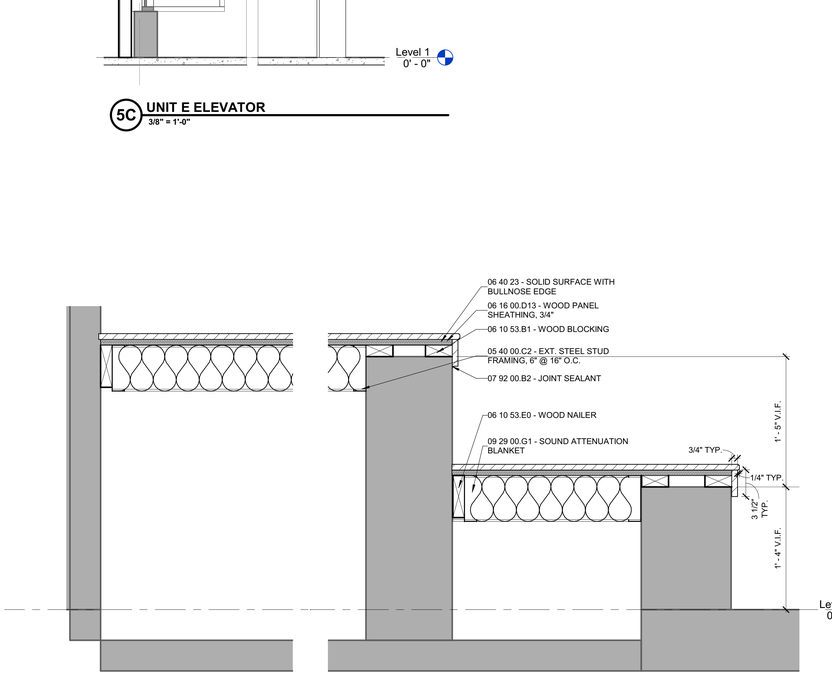
4D **UNIT E ELEVATOR - SECOND FLOOR**
1/4" = 1'-0"



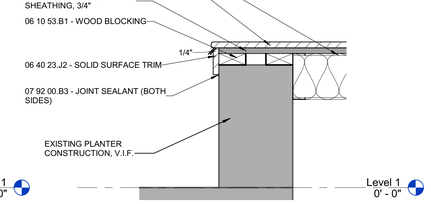
3D **SECTION DETAIL - EXISTING RAILING**
3/4" = 1'-0"



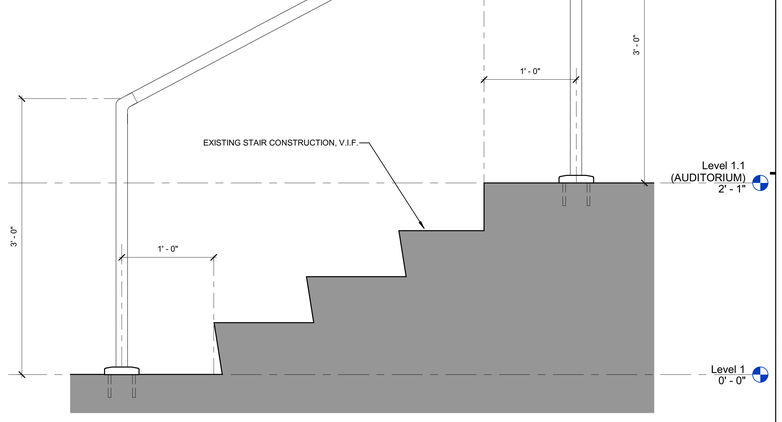
1D **SECTION DETAIL - AUDITORIUM BULKHEAD**
1 1/2" = 1'-0"



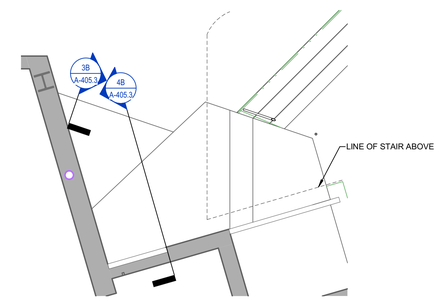
4B **SECTION DETAIL - WEST PLANTER - UPPER**
1 1/2" = 1'-0"



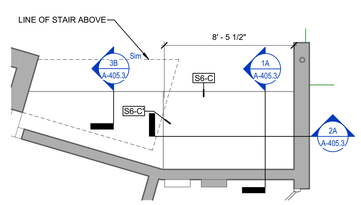
3B **SECTION DETAIL - WEST PLANTER - LOWER**
1 1/2" = 1'-0"



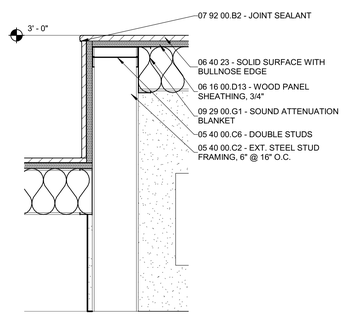
1B **SECTION DETAIL - UNIT G STAIR**
1 1/2" = 1'-0"



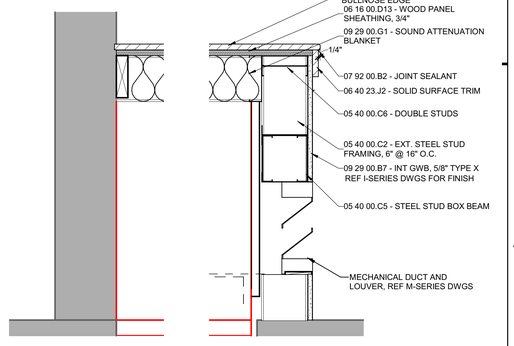
4A **ENLARGED PLAN - AUDITORIUM PLANTER WEST**
1/4" = 1'-0"



3A **ENLARGED PLAN - AUDITORIUM PLANTER EAST**
1/4" = 1'-0"



2A **SECTION DETAIL - EAST PLANTER**
1 1/2" = 1'-0"



1A **SECTION DETAIL - EAST PLANTER UPPER**
1 1/2" = 1'-0"

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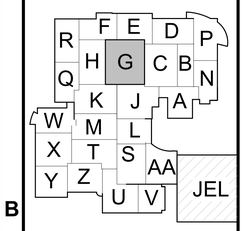
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

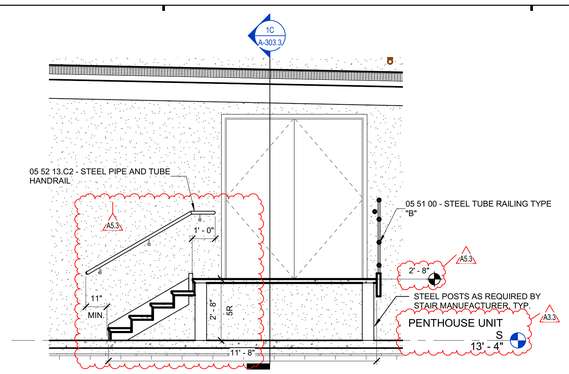
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North Central High School Renovation - Additions Phase 3

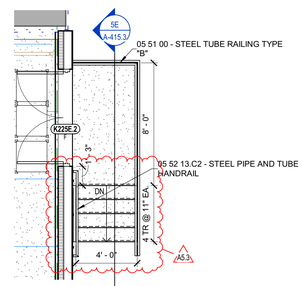
ENLARGED PLANS - UNIT G

A-405.3

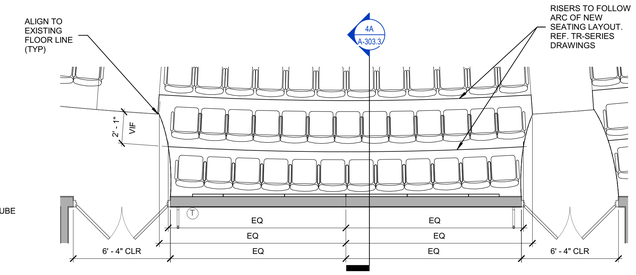
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2019-067.NCH_M.S.D. of Washington Township_North Central High School Renovation_
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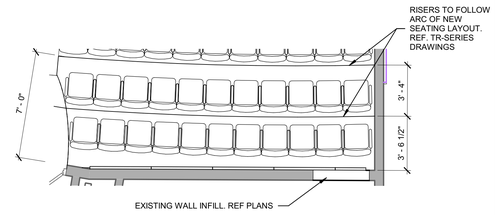
5E STAIR SECTION - UNIT AA MECHANICAL
3/8" = 1'-0"



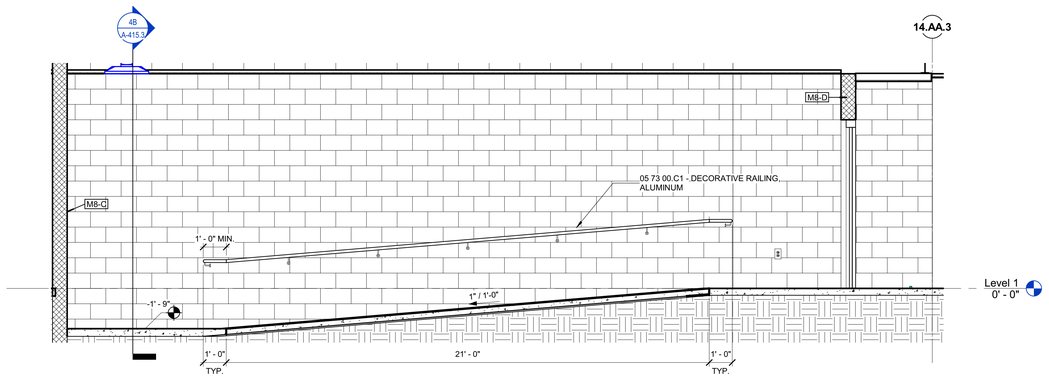
4E MECH STAIR
1/4" = 1'-0"



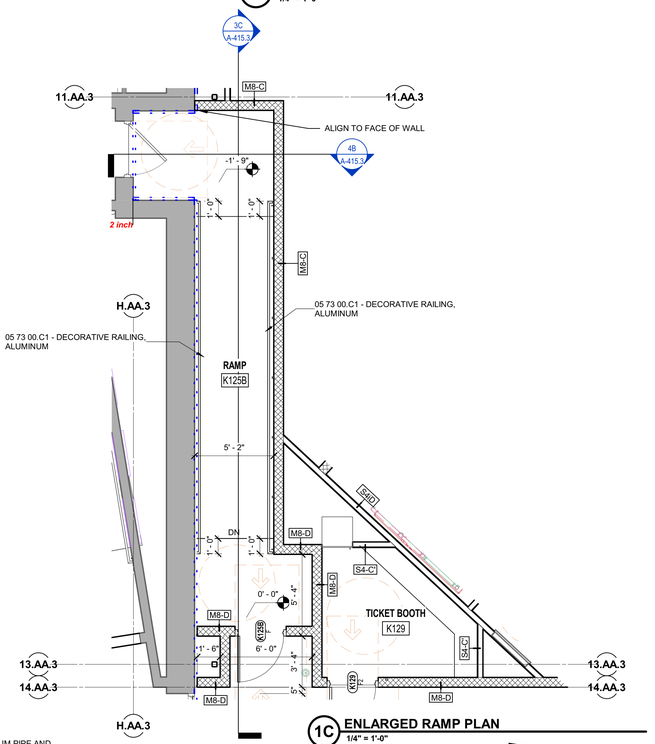
2E PAC ADDITIONAL WORK ALTERNATE: ENLARGED RISER PLAN
1/4" = 1'-0"



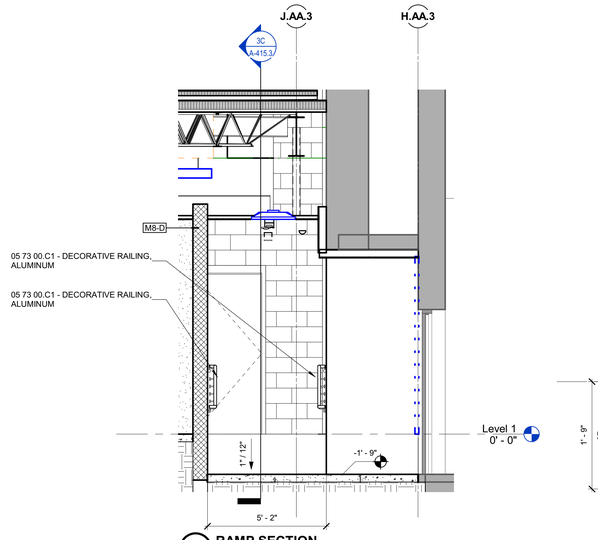
1E PAC ADDITIONAL WORK ALTERNATE: ENLARGED RISER PLAN
1/4" = 1'-0"



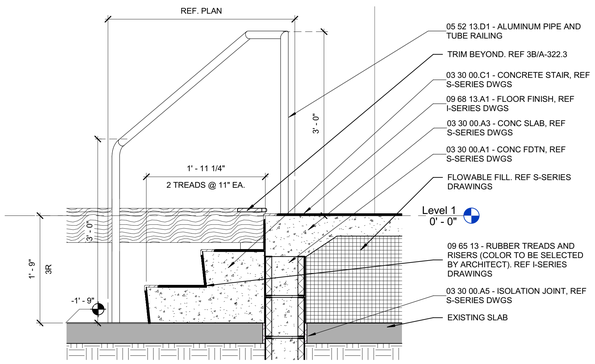
3C RAMP SECTION
3/8" = 1'-0"



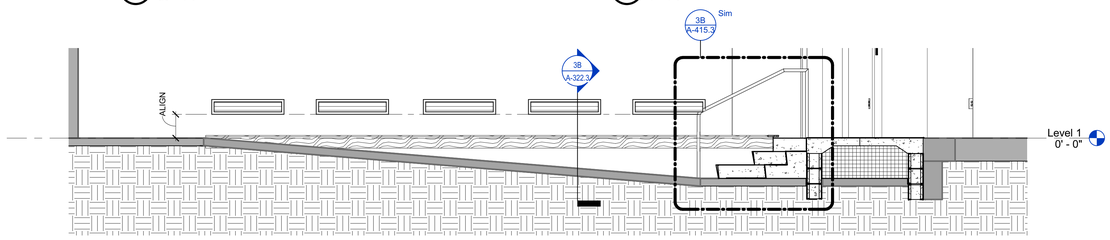
1C ENLARGED RAMP PLAN
1/4" = 1'-0"



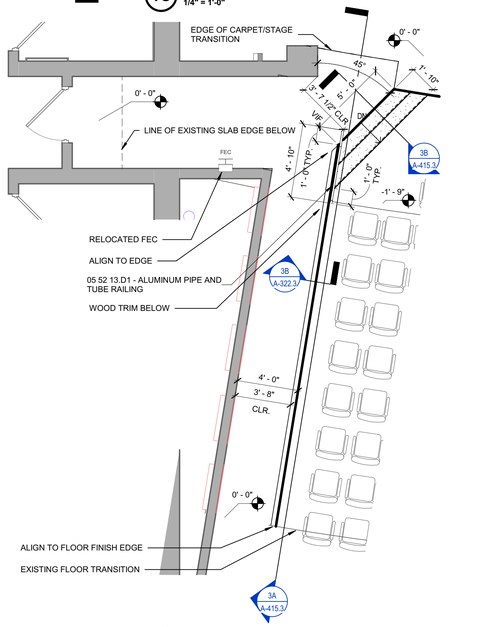
4B RAMP SECTION
3/8" = 1'-0"



3B STAGE STAIR SECTION
1" = 1'-0"



3A PAC STAGE ACCESS INFILL SECTION
3/8" = 1'-0"



1A ENLARGED PAC STAGE ACCESS AND STAGE STAIR
1/4" = 1'-0"

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Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced SLS DJK

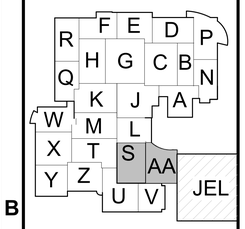
SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

Sarah K Hempstead

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

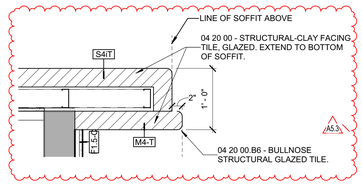
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

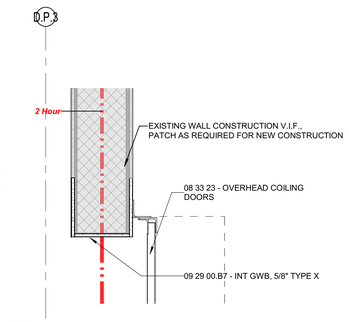
ENLARGED STAIR AND RAMP PLANS

A-415.3

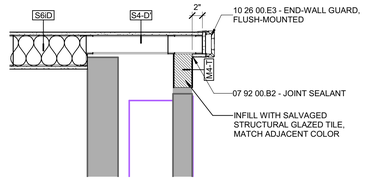
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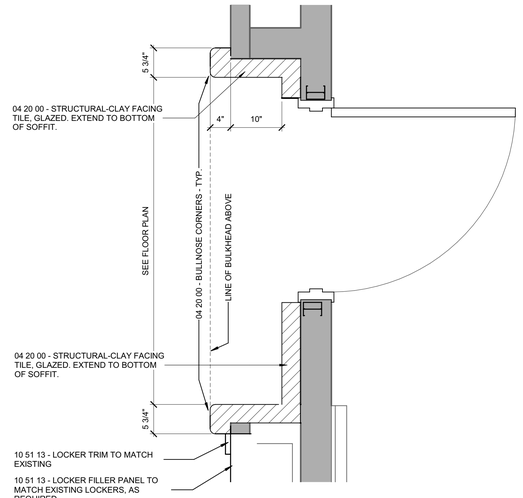
5E PLAN DETAIL
1" = 1'-0"



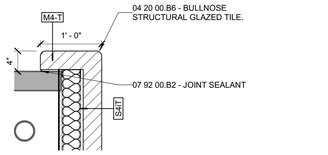
4E PLAN DETAIL - PARTITION
1" = 1'-0"



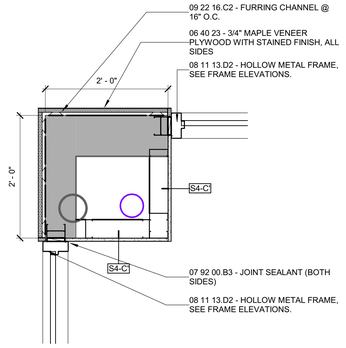
3E PLAN DETAIL
1" = 1'-0"



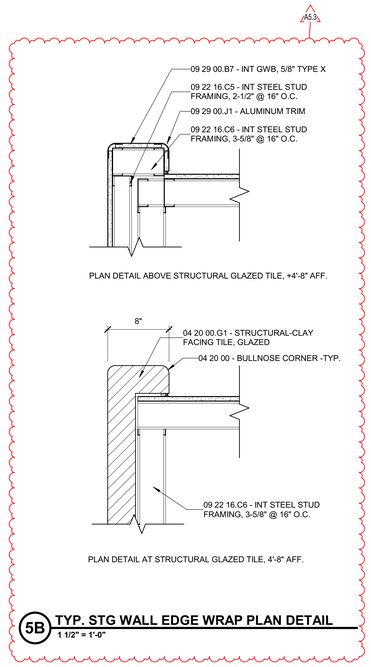
1E PLAN DETAIL - TYPICAL NEW DOOR RECESS_2
1" = 1'-0"



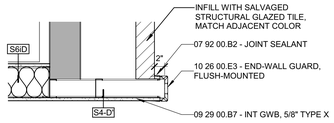
4D PLAN DETAIL - CAFETERIA & B CORRIDIR
1" = 1'-0"



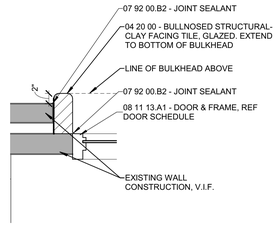
3D PLAN DETAIL
1" = 1'-0"



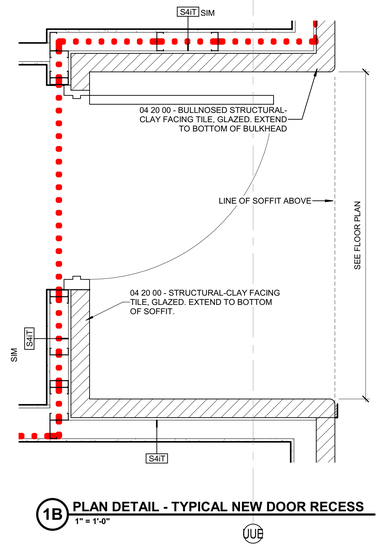
5B TYP. STG WALL EDGE WRAP PLAN DETAIL
1 1/2" = 1'-0"



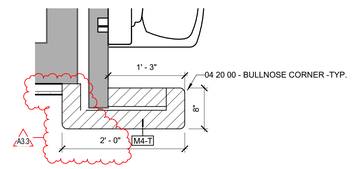
4C PLAN DETAIL
1" = 1'-0"



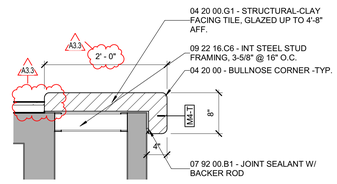
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1" = 1'-0"



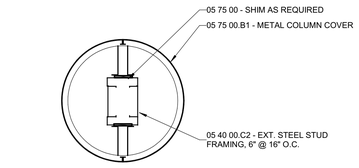
1B PLAN DETAIL - TYPICAL NEW DOOR RECESS
1" = 1'-0"



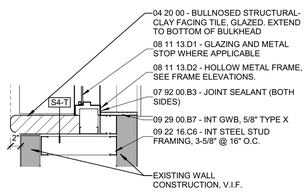
4B PLAN DETAIL
1" = 1'-0"



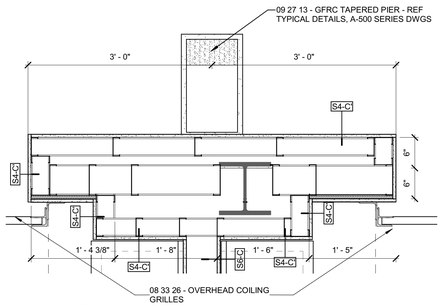
3B PLAN DETAIL
1" = 1'-0"



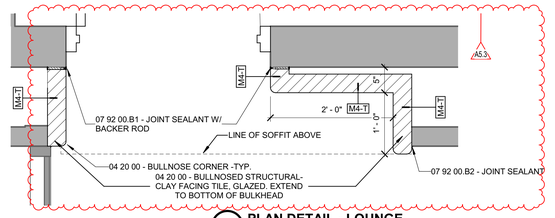
5A PLAN DETAIL
1" = 1'-0"



4A PLAN DETAIL
1" = 1'-0"



3A PLAN DETAIL - SERVING PILASTER
1" = 1'-0"



1A PLAN DETAIL - LOUNGE
1" = 1'-0"

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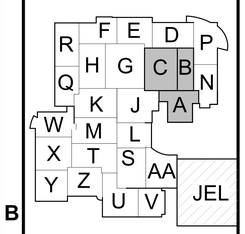
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Project Date 03.03.2023
Bid Set 03
Produced SLS HEL

SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

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1801 East 86th Street
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KEY PLAN

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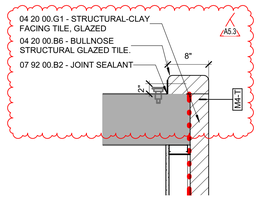
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North Central High School Renovation - Additions Phase 3

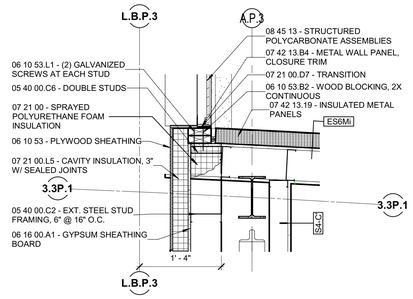
PLAN DETAILS

A-510.3

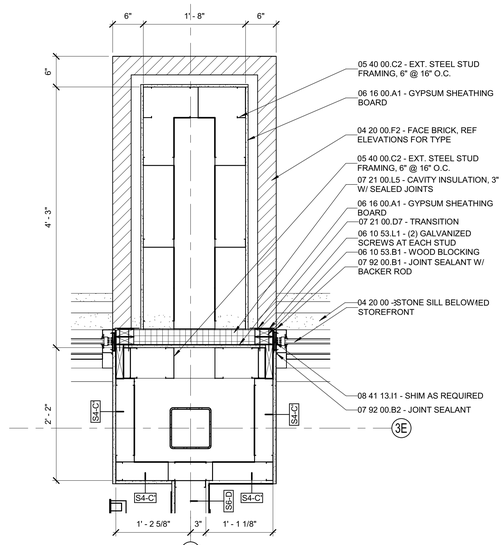
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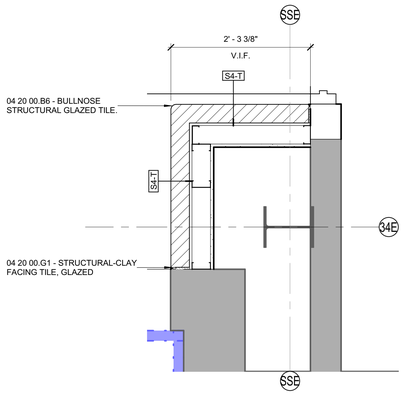
4D PLAN DETAIL
1" = 1'-0"



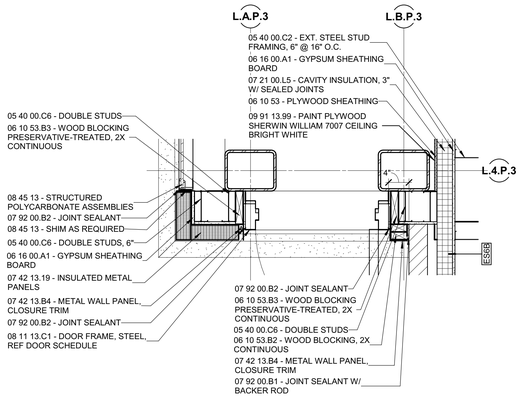
2D PLAN DETAIL
1" = 1'-0"



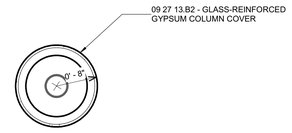
1D UNIT E PLAN DETAIL
1" = 1'-0"



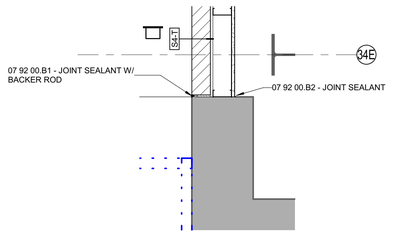
4C PLAN DETAIL
1" = 1'-0"



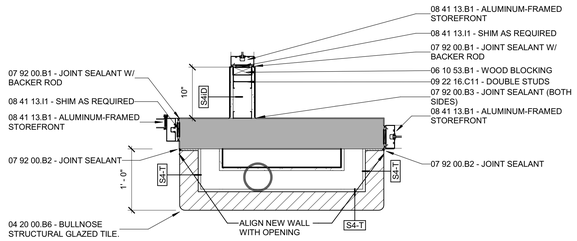
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1" = 1'-0"



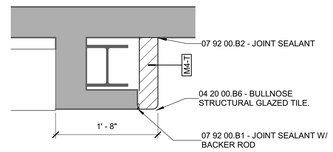
1C PLAN DETAIL - ROUND COLUMN COVER
1" = 1'-0"



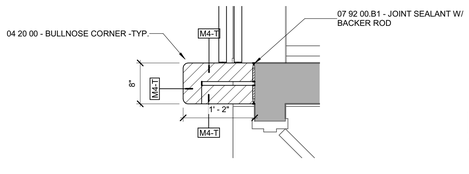
4B PLAN DETAIL
1" = 1'-0"



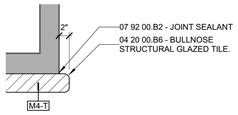
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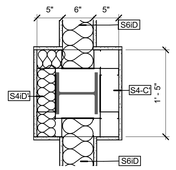
1B PLAN DETAIL
1" = 1'-0"



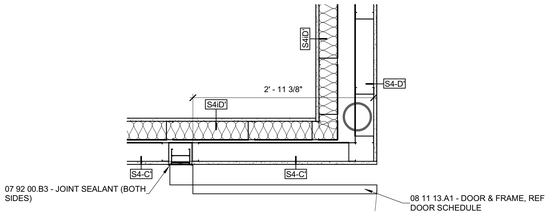
4A PLAN DETAIL
1" = 1'-0"



3A PLAN DETAIL
1" = 1'-0"



2A PLAN DETAIL
1" = 1'-0"



1A PLAN DETAIL
1" = 1'-0"

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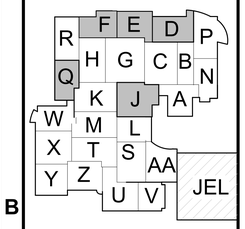
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SARAH KATHLEEN HEMPSTEAD
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NO. AR10400134
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A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

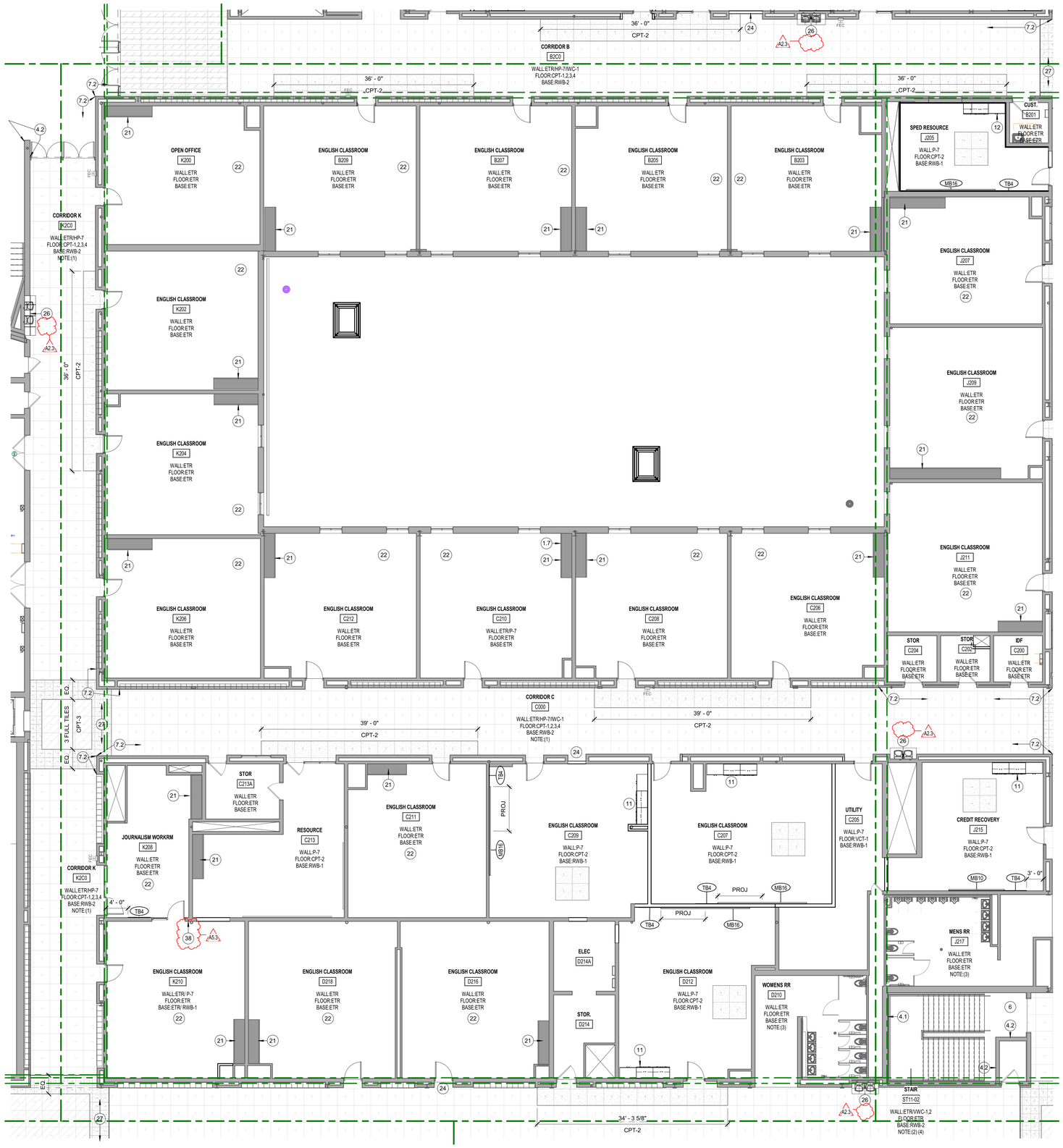
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

PLAN DETAILS

A-511.3

A-511.3_PLAN DETAILS
2019-067.NCH_A5.3 of Washington Township, North Central High School Renovation_
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4/19/2023 10:29:08 AM



2A SECOND FLOOR INTERIOR FINISH PLAN - UNIT C
1/8" = 1'-0"

INTERIOR GENERAL NOTES

REFERENCE A-001 FOR GENERAL PLAN NOTES. ALL NOTES MAY NOT APPLY TO THIS SHEET.

1. FINISHES PRIOR TO START & FINAL COMPLETION OF WORK
   - Where existing finishes are to remain outside scope of work, patch & repair any area damaged or effected by renovation, to return to like new condition, matching adjacent finishes. This includes, but is not limited to doors & associated hardware, door frames, wall finishes, wall base, floor finish including floor transitions & thresholds, etc. It is the responsibility of the contractor to verify conditions in field prior to start & completion of work.
2. Interior Painting/Wallcovering
   - Existing wall conditions that were not specifically noted to be patched and repaired, but are designated to receive new finishes, are to be repaired prior to new finishes being applied. It is the Contractors responsibility to confirm conditions in field prior to start of work.
   - Walls are to be prepped removing any existing wallcovering & residue, holes patched, and surface smoothed prior to new paint or wallcovering being installed.
   - Vinyl Wall Base over gyp. - Prior to removal of existing vinyl wall base, score wall above top of base to minimize damage to drywall.
3. Reference architectural ceilings plans for ceiling heights and bulkhead color designations. Paint all bulkheads P-10 unless specifically noted otherwise. Bulkheads that are flush with walls provide color to match adjacent wall color.
4. Paint interior hollow metal door frames HP-2.
   - Where existing conditions remain, split face finish, painting only side impacted by renovation.
5. Paint general walls HP-7 or P-7 (Neutral) unless specifically noted otherwise.
   - Athletics - Gymnasiums/Locker Rooms walls to be painted HP-1or P-1, unless specifically noted otherwise.
6. Paint all exposed conduit, piping, and associated assemblies to match adjacent paint finish. Applies to all new & existing to remain in areas of renovation.
7. Visual Display Markerboards & Tackboards- All existing to remain unless room(s) indicate new visual display to be installed or otherwise noted.
8. Corridor Walls
   - All Structural Glazed Block Walls and Cove Base are existing to remain unless noted otherwise on A-series dwgs.
   - Walls not Structural Glazing shall receive impact wallcovering wainscot. This includes any portion of wall below wainscot height not specifically called out.
9. ROOM FINISH TAG NOTES
   (1) Existing glazed block walls to remain. Walls above to be patched and repaired to make ready to receive new finish.
   (2) Existing terrazzo floors to remain.
   (3) 09 30 00 - Where existing mosaic & porcelain floor tile is to remain, clean & seal grout.
   (4) Stairs - Existing mosaic wall tile to remain.
10. ROOM FINISH TAG ABBREVIATIONS

P - paint	VCT - vinyl tile	TZ - epoxy terrazzo
HP - high performance paint	LVT - luxury vinyl tile	RWB - rubber wall base
CWT - ceramic wall tile	PWT - porcelain wall tile	PFT - porcelain floor tile
VWC - type II wallcovering	MFT - mosaic floor tile	CPT carpet tile
IWC - type III wallcovering	MWT - mosaic wall tile	CPB - broadloom carpet
RSF - resinous flooring	WOC - walk-off carpet	VSF - vinyl sheet flooring
SGC - structural glazed cove	CFC - concrete floor coating	

INTERIOR FLOOR PLAN NOTES PH3

#	NOTE
1	NO NEW FINISHES. EXISTING TO REMAIN.
1.1	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-1/HP-1.
1.2	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL, INSIDE CORNER TO INSIDE CORNER TO BE P-2/HP-2.
1.3	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL, INSIDE CORNER TO INSIDE CORNER TO BE P-3/HP-3.
1.4	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-4.
1.5	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-5.
1.7	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-7/HP-7.
1.8	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-8.
2.2	09 30 00 - WALL TO RECEIVE CERAMIC WALL TILE, REFERENCE 1E/I-501.3 FOR TYPICAL ELEVATION.
2.3	09 30 00 - ALL WALLS TO RECEIVE CERAMIC WALL TILE TO BE CWT-10,11. REFERENCE SHEET 221.3 FOR RESTROOM ELEVATIONS.
2.4	09 30 00 - ALL WALLS TO RECEIVE CERAMIC WALL TILE TO BE CWT-5, BRICK INSTALL.
2.5	09 30 00 - WALL BELOW CONCRETE BENCH TO RECEIVE CERAMIC WALL TILE, TO BE CWT-11.
3.1	12 24 13 - PROVIDE MANUAL ROLLER WINDOW SHADES. VERIFY DIMENSIONS IN FIELD PRIOR TO ORDERING AND INSTALL.
3.2	12 24 13 - PROVIDE MOTORIZED ROLLER WINDOW SHADES. VERIFY DIMENSIONS IN FIELD PRIOR TO ORDERING AND INSTALL.
4.1	09 70 00 - FULL EXTENT OF WALL TO RECEIVE NEW CUSTOM VINYL WALLCOVERING (VWC-1).
4.2	09 70 00 - FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-2).
4.3	09 70 00 - FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-3).
5	12 36 61.16 - PROVIDE SOLID SURFACE WINDOW STOOL TI BE (SS-1)
6	EXISTING TERRAZZO STAIR TREADS, RISERS, & MOSIC WALL TILE ARE EXISTING TO REMAIN. NEW RESILIENT WALL BASE TO BE INSTALLED OVER MOSAIC WALL BASE.
6.1	09 66 23 - STAIR TREADS TO BE TERRAZZO
7.1	10 26 00 - PROVIDE SURFACE MOUNTED CORNER GUARDS, (CG-1). REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7.2	10 26 00 - PROVIDE IMPACT WALLCOVERING WAINSCOTT ALONG FULL EXTENT OF WALL UNLESS LEADERS INDICATED OTHERWISE. TO BE (IWC-1). PROVIDE EDGE TRIM ACCESSORIES AS REQUIRED BY MFR. PROVIDE NEW RUBBER WALL BASE, RWB-2 ALONG EXTENTS.
8	EXISTING DISPLAY CASES. NO NEW WORK.
8.1	10 11 00 - VISUAL DISPLAY SURFACES. CUSTOM DISPLAY CASES TO RECEIVE FABRIC WRAPPED TACKBOARD TO BE (UPH-X). REFER TO A-SERIES DRAWINGS.
9	EXISTING TERRAZZO FLOOR TO REMAIN. CLEAN AND BUFF PROTECTED FLOORS.
10	CONCRETE BENCHES TO BE SEALED. (CFC-1).
11	12 32 00 - TYPICAL CLASSROOM STORAGE. REFER TO ELEVATION 6C/I-207.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
12	12 32 00 - TYPICAL RESOURCE STORAGE. REFER TO ELEVATION 3B/I-205.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
13	REFERENCE SHEET I-501 FOR FLOOR PATTERNS.
14	06 40 23 - SEATED RISERS TO BE PORCELAIN TILE ON TOP AND FRONT FACE. INSTALL 1/3 RUNNING BOND LENGTHWISE. PROVIDE METAL STAIR NOSING. SEE A-SERIES DRAWINGS FOR SECTION.
15	REFERENCE 2A/I-404.3 FOR TYPICAL SCIENCE ISLAND CASEWORK ELEVATIONS.
16	09 66 23 - PATCH -IN NEW RESINIOUS MATRIX TERRAZZO FLOOR TO MATCH ADJACENT FLOOR. PROVIDE PHYSICAL SAMPLE TO VERIFY COLOR IN FIELD. COLOR MAY VARY.
17	12 35 53 - TYPICAL SCIENCE CLASSROOM STORAGE. REFER TO ELEVATION 2D/I-215.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
18	REFERENCE 2B/I-210.3 & 2C/I-210.3 FOR TYPICAL SCIENCE DEMONSTRATION ISLAND CASEWORK ELEVATIONS.
19	06 40 23 - BUILT-IN BENCH. REFER TO A-SERIES DRAWINGS FOR DETAIL.
20	NEW FLOOR FINISHES IN PHASE 3. ALL OTHER FINISH SCOPE INCLUDED IN PHASE 2.
21	ALTERNATE CLASSROOM FINISHES AND CASEWORK: PROVIDE NEW CASEWORK IN EXISTING LOCATION. SEE ELEVATION 6E/I-211.3 FOR TYPICAL.
22	ALTERNATE CLASSROOM FINISHES AND CASEWORK: PROVIDE NEW FINISHES INCLUDING/BUT NOT LIMITED TO CARPET, PAINT, WALL BASE, AND CASEWORK. REFER TO ALTERNATES DESIGNATED IN SPECIFICATION PROJECT MANUAL.
23	ALTERNATE SCIENCE CLASSROOM FINISHES : PROVIDE NEW FINISHES INCLUDING/BUT NOT LIMITED TO VCT, PAINT, AND WALL BASE. REFER TO ALTERNATES DESIGNATED IN SPECIFICATION PROJECT MANUAL.
24	10 11 00 - PROVIDE FABRIC WRAPPED TACKBOARD TO FILL RECESS ABOVE WALL BASE, IN ITS ENTIRETY. VERIFY DIMENSIONS IN FIELD.
25	12 32 00 - TYPICAL WELLNESS CASEWORK. REFER TO ELEVATION 6E/I-401.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
26	09 30 00 - PROVIDE PORCELAIN FLOOR TILE W/ METAL EDGE TRIM AT ALL EXPOSED EDGES. TO BE PT-1.
27	ALIGN ACCENT FLOOR PATTERN WITH BULKHEAD ABOVE. CPT-4
28	APPLIED WALL FINISH IS EXISTING TO REMAIN. PROTECT SURFACE(S) THROUGH RENOVATION & CONTRSTRUCTION.
29	15"D ADJUSTABLE SHELVES W/ KV BRACKETS. SEE DETAIL 2B/I-301.3 FOR ADDITIONAL INFORMATION.
30	EXISTING RELOCATED METAL STUDENT ART LOCKERS.
31	12 00 80.99 - PROVIDE UTILITY SHELVING REFER TO SPECIFICATIONS FOR ADDITONAL INFORMATON.
32	10 21 33 - PROVIDE CUBICLE CURTAIN AND TRACK.
33	CONTINUE CARPET TILE ON RAISED PLATFORM. PROVIDE RUBBER NOSING ON EXPOSED EDGES.
34	EXISTING NON-GYPSUM BOARD WALLS TO BE PAINTED. REFER TO ELEVATIONS REFERENCED FOR PAINT COLOR LOCATIONS, TYPICAL.
35	OWNER PROVIDED EQUIPMENT. N.I.C.
36	09 30 00 - PATCH AND REPAIR AREAS OF BROKEN MOSAIC FLOOR TILE. MATCH EXISTING TILE AND GROUT. VERIFY CONDITIONS AND LOCATIONS IN FIELD.
37	12 32 00 - PROVIDE PLASTIC LAMINATE COUNTERTOP W/ WIRE MANAGEMENT LINEAR CHANNEL W/ BRUSH. SIZE 2 BY 60 INCHES. BASIS OF DESIGN: MOCKETT-BREXT MODEL BRKIT, MATTE BLACK, (QTY-4). MOUNT AT 30"AFF W/ RAKKS EH-1824 SUPPORT BRACKETS SPACED MAX 42 INCHES APART. SEE DETAIL 5A/A-327.3
38	APPLY NEW FINISHES, AS INDICATED IN FINISH TAG, INSIDE CORNER TO INSIDE CORNER, OR TO EXTENTS SHOWN.
39	09 68 16 - PROVIDE NEW BROADLOOM CARPET ALONG AISLE. PATTERN DIRECTION TO RUN NORTH & SOUTH, LENGTH OF ROLL, TO BE (CPB-1). REFER TO E-SERIES DRAWINGS FOR ILLUMINATED EDGE TRIM FOR LIGHTED AISLE.
40	PROVIDE RUBBER STAIR TREAD & RISER, RAISED DISK, TO BE SELECTED BY ARCHITECT FROM MFR FULL COLOR RANGE.

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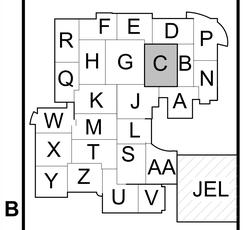
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced LGK

SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
ARCHITECT

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

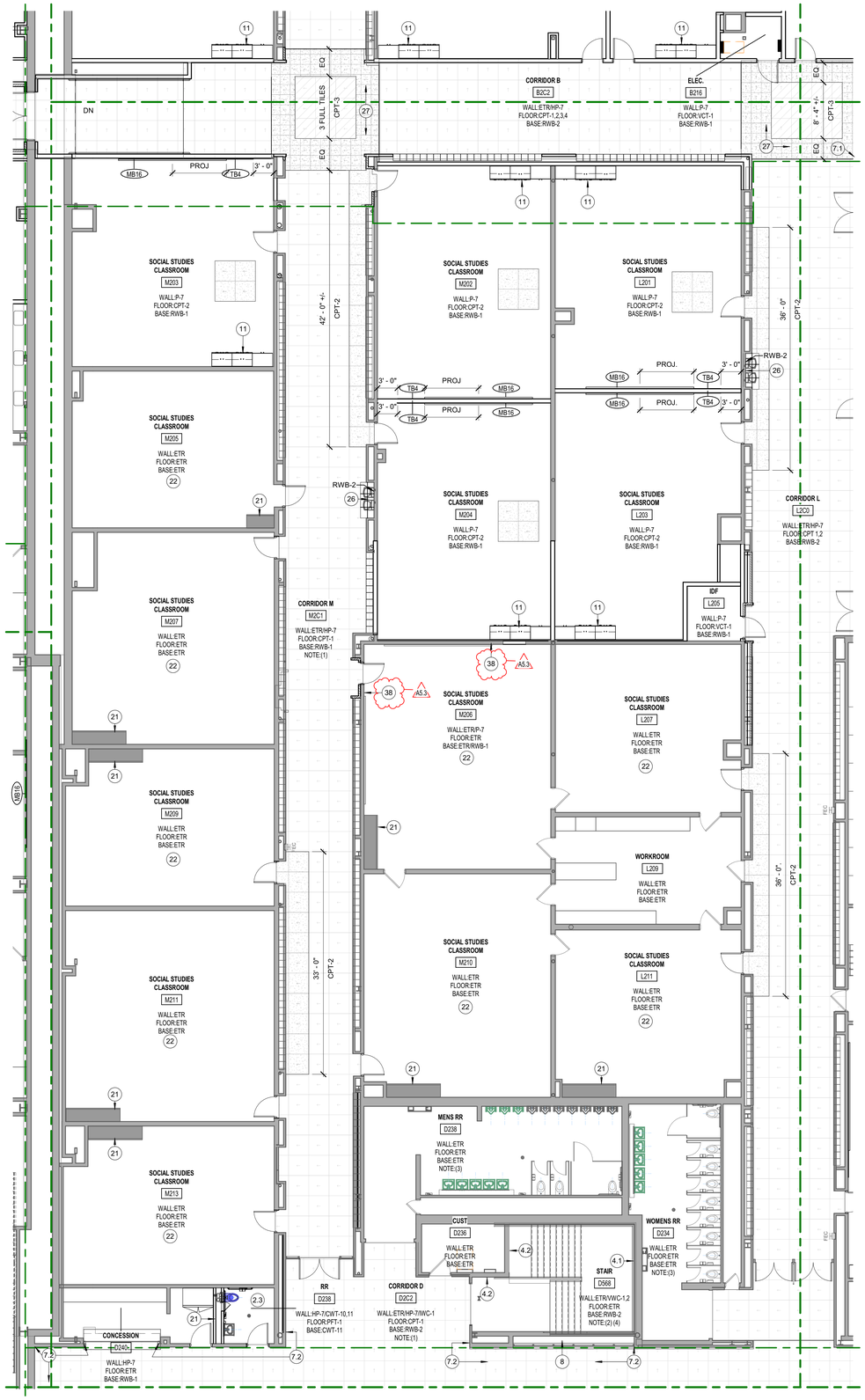
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

SECOND FLOOR
INTERIOR FINISH PLAN -
UNIT C

IN1C2.3

IN1C2.3_SECOND FLOOR INTERIOR FINISH PLAN - UNIT C
2019-067.NCH_M.S.D. of Washington Township_North Central High School Renovation_
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2A **SECOND FLOOR INTERIOR FINISH PLAN - UNIT H**
1/8" = 1'-0"

INTERIOR GENERAL NOTES

REFERENCE A-001 FOR GENERAL PLAN NOTES. ALL NOTES MAY NOT APPLY TO THIS SHEET.

1. FINISHES PRIOR TO START & FINAL COMPLETION OF WORK
   - Where existing finishes are to remain outside scope of work, patch & repair any area damaged or effected by renovation, to return to like new condition, matching adjacent finishes. This includes, but is not limited to doors & associated hardware, door frames, wall finishes, wall base, floor finish including floor transitions & thresholds, etc. It is the responsibility of the contractor to verify conditions in field prior to start & completion of work.
2. Interior Painting/Wallcovering
   - Existing wall conditions that were not specifically noted to be patched and repaired, but are designated to receive new finishes, are to be repaired prior to new finishes being applied. It is the Contrors responsibility to confirm conditions in field prior to start of work.
   - Walls are to be prepped removing any existing wallcovering & residue, holes patched, and surface smoothed prior to new paint or wallcovering being installed.
   - Vinyl Wall Base over gyp. - Prior to removal of existing vinyl wall base, score wall above top of base to minimize damage to drywall.
3. Reference architectural ceilings plans for ceiling heights and bulkhead color designations. Paint all bulkheads P-10 unless specifically noted otherwise. Bulkheads that are flush with walls provide color to match adjacent wall color.
4. Paint interior hollow metal door frames HP-2.
   - Where existing conditions remain, split face finish, painting only side impacted by renovation.
5. Paint general walls HP-7 or P-7 (Neutral) unless specifically noted otherwise.
   - Athletics - Gymnasiums/Locker Rooms walls to be painted HP-1or P-1, unless specifically noted otherwise.
6. Paint all exposed conduit, piping, and associated assemblies to match adjacent paint finish. Applies to all new & existing to remain in areas of renovation.
7. Visual Display Markerboards & Tackboards- All existing to remain unless room(s) indicate new visual display to be installed or otherwise noted.
8. Corridor Walls
   - All Structural Glazed Block Walls and Cove Base are existing to remain unless noted otherwise on A-series dwgs.
   - Walls not Structural Glazing shall receive impact wallcovering wainscot. This includes any portion of wall below wainscot height not specifically called out.
9. ROOM FINISH TAG NOTES
   (1) Existing glazed block walls to remain. Walls above to be patched and repaired to make ready to receive new finish.
   (2) Existing terrazzo floors to remain.
   (3) 09 30 00 - Where existing mosaic & porcelain floor tile is to remain, clean & seal grout.
   (4) Stairs - Existing mosaic wall tile to remain.
10. ROOM FINISH TAG ABBREVIATIONS

P - paint	VCT - vinyl tile	TZ - epoxy terrazzo
HP - high performance paint	LVT - luxury vinyl tile	RWB - rubber wall base
CWT - ceramic wall tile	PWT - porcelain wall tile	PFT - porcelain floor tile
VWC - type II wallcovering	MFT - mosaic floor tile	CPT carpet tile
IWC - type III wallcovering	MWT - mosaic wall tile	CPB - broadloom carpet
RSF - resinous flooring	WOC - walk-off carpet	VSF - vinyl sheet flooring
SGC - structural glazed cove	CFC - concrete floor coating	

INTERIOR FLOOR PLAN NOTES PH3

#	NOTE
1	NO NEW FINISHES. EXISTING TO REMAIN.
1.1	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-1/HP-1.
1.2	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL, INSIDE CORNER TO INSIDE CORNER TO BE P-2/HP-2.
1.3	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL, INSIDE CORNER TO INSIDE CORNER TO BE P-3/HP-3.
1.4	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-4.
1.5	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-5.
1.7	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-7/HP-7.
1.8	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-8.
2.2	09 30 00 - WALL TO RECEIVE CERAMIC WALL TILE, REFERENCE 1E/I-501.3 FOR TYPICAL ELEVATION.
2.3	09 30 00 - ALL WALLS TO RECEIVE CERAMIC WALL TILE TO BE CWT-10,11. REFERENCE SHEET 221.3 FOR RESTROOM ELEVATIONS.
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2.5	09 30 00 - WALL BELOW CONCRETE BENCH TO RECEIVE CERAMIC WALL TILE, TO BE CWT-11.
3.1	12 24 13 - PROVIDE MANUAL ROLLER WINDOW SHADES. VERIFY DIMENSIONS IN FIELD PRIOR TO ORDERING AND INSTALL.
3.2	12 24 13 - PROVIDE MOTORIZED ROLLER WINDOW SHADES. VERIFY DIMENSIONS IN FIELD PRIOR TO ORDERING AND INSTALL.
4.1	09 70 00 - FULL EXTENT OF WALL TO RECEIVE NEW CUSTOM VINYL WALLCOVERING (VWC-1).
4.2	09 70 00 - FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-2).
4.3	09 70 00 - FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-3).
5	12 36 61.16 - PROVIDE SOLID SURFACE WINDOW STOOL TI BE (SS-1)
6	EXISTING TERRAZZO STAIR TREADS, RISERS, & MOSIC WALL TILE ARE EXISTING TO REMAIN. NEW RESILIENT WALL BASE TO BE INSTALLED OVER MOSAIC WALL BASE.
6.1	09 66 23 - STAIR TREADS TO BE TERRAZZO
7.1	10 26 00 - PROVIDE SURFACE MOUNTED CORNER GUARDS, (CG-1). REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7.2	10 26 00 - PROVIDE IMPACT WALLCOVERING WAINSCOTT ALONG FULL EXTENT OF WALL UNLESS LEADERS INDICATED OTHERWISE. TO BE (IWC-1). PROVIDE EDGE TRIM ACCESSORIES AS REQUIRED BY MFR. PROVIDE NEW RUBBER WALL BASE, RWB-2 ALONG EXTENTS.
8	EXISTING DISPLAY CASES. NO NEW WORK.
8.1	10 11 00 - VISUAL DISPLAY SURFACES. CUSTOM DISPLAY CASES TO RECEIVE FABRIC WRAPPED TACKBOARD TO BE (UPH-X). REFER TO A-SERIES DRAWINGS.
9	EXISTING TERRAZZO FLOOR TO REMAIN. CLEAN AND BUFF PROTECTED FLOORS.
10	CONCRETE BENCHES TO BE SEALED, (CFC-1).
11	12 32 00 - TYPICAL CLASSROOM STORAGE. REFER TO ELEVATION 6C/I-207.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
12	12 32 00 - TYPICAL RESOURCE STORAGE. REFER TO ELEVATION 3B/I-205.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
13	REFERENCE SHEET I-501 FOR FLOOR PATTERNS.
14	06 40 23 - SEATED RISERS TO BE PORCELAIN TILE ON TOP AND FRONT FACE. INSTALL 1/3 RUNNING BOND LENGTHWISE. PROVIDE METAL STAIR NOSING. SEE A-SERIES DRAWINGS FOR SECTION.
15	REFERENCE 2A/I-404.3 FOR TYPICAL SCIENCE ISLAND CASEWORK ELEVATIONS.
16	09 66 23 - PATCH -IN NEW RESINIOUS MATRIX TERRAZZO FLOOR TO MATCH ADJACENT FLOOR. PROVIDE PHYSICAL SAMPLE TO VERIFY COLOR IN FIELD. COLOR MAY VARY.
17	12 35 53 - TYPICAL SCIENCE CLASSROOM STORAGE. REFER TO ELEVATION 2D/I-215.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
18	REFERENCE 2B/I-210.3 & 2C/I-210.3 FOR TYPICAL SCIENCE DEMONSTRATION ISLAND CASEWORK ELEVATIONS.
19	06 40 23 - BUILT-IN BENCH. REFER TO A-SERIES DRAWINGS FOR DETAIL.
20	NEW FLOOR FINISHES IN PHASE 3. ALL OTHER FINISH SCOPE INCLUDED IN PHASE 2.
21	ALTERNATE CLASSROOM FINISHES AND CASEWORK: PROVIDE NEW CASEWORK IN EXISTING LOCATION. SEE ELEVATION 6E/I-211.3 FOR TYPICAL.
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23	ALTERNATE SCIENCE CLASSROOM FINISHES : PROVIDE NEW FINISHES INCLUDING/BUT NOT LIMITED TO VCT, PAINT, AND WALL BASE. REFER TO ALTERNATES DESIGNATED IN SPECIFICATION PROJECT MANUAL.
24	10 11 00 - PROVIDE FABRIC WRAPPED TACKBOARD TO FILL RECESS ABOVE WALL BASE, IN ITS ENTIRETY. VERIFY DIMENSIONS IN FIELD.
25	12 32 00 - TYPICAL WELLNESS CASEWORK. REFER TO ELEVATION 6E/I-401.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
26	09 30 00 - PROVIDE PORCELAIN FLOOR TILE W/ METAL EDGE TRIM AT ALL EXPOSED EDGES. TO BE PT-1.
27	ALIGN ACCENT FLOOR PATTERN WITH BULKHEAD ABOVE. CPT-4
28	APPLIED WALL FINISH IS EXISTING TO REMAIN. PROTECT SURFACE(S) THROUGH RENOVATION & CONTRSTRUCTION.
29	15"D ADJUSTABLE SHELVES W/ KV BRACKETS. SEE DETAIL 2B/I-301.3 FOR ADDITIONAL INFORMATION.
30	EXISTING RELOCATED METAL STUDENT ART LOCKERS.
31	12 00 80 99 - PROVIDE UTILITY SHELVING REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATON.
32	10 21 33 - PROVIDE CUBICLE CURTAIN AND TRACK.
33	CONTINUE CARPET TILE ON RAISED PLATFORM. PROVIDE RUBBER NOSING ON EXPOSED EDGES.
34	EXISTING NON-GYPSUM BOARD WALLS TO BE PAINTED. REFER TO ELEVATIONS REFERENCED FOR PAINT COLOR LOCATIONS, TYPICAL.
35	OWNER PROVIDED EQUIPMENT, N.I.C.
36	09 30 00 - PATCH AND REPAIR AREAS OF BROKEN MOSAIC FLOOR TILE. MATCH EXISTING TILE AND GROUT. VERIFY CONDITIONS AND LOCATIONS IN FIELD.
37	12 32 00 - PROVIDE PLASTIC LAMINATE COUNTERTOP W/ WIRE MANAGEMENT LINEAR CHANNEL W/ BRUSH. SIZE 2 BY 60 INCHES. BASIS OF DESIGN: MOCKETT-BREKT MODEL BRKT, MATTE BLACK. (QTY-4). MOUNT AT 30"AFF W/ RAKKS EH-1824 SUPPORT BRACKETS SPACED MAX 42 INCHES APART. SEE DETAIL 5A/A-327.3
38	APPLY NEW FINISHES, AS INDICATED IN FINISH TAG, INSIDE CORNER TO INSIDE CORNER, OR TO EXTENTS SHOWN.
39	09 68 16 - PROVIDE NEW BROADLOOM CARPET ALONG AISLE. PATTERN DIRECTION TO RUN NORTH & SOUTH, LENGTH OF ROLL, TO BE (CPB-1). REFER TO E-SERIES DRAWINGS FOR ILLUMINATED EDGE TRIM FOR LIGHTED AISLE.
40	PROVIDE RUBBER STAIR TREAD & RISER, RAISED DISK, TO BE SELECTED BY ARCHITECT FROM MFR FULL COLOR RANGE.

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Project No. 2019-067.NCH
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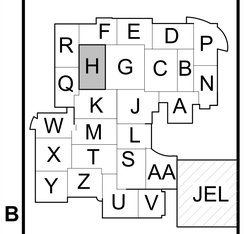
SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

Sarah K Hempstead

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

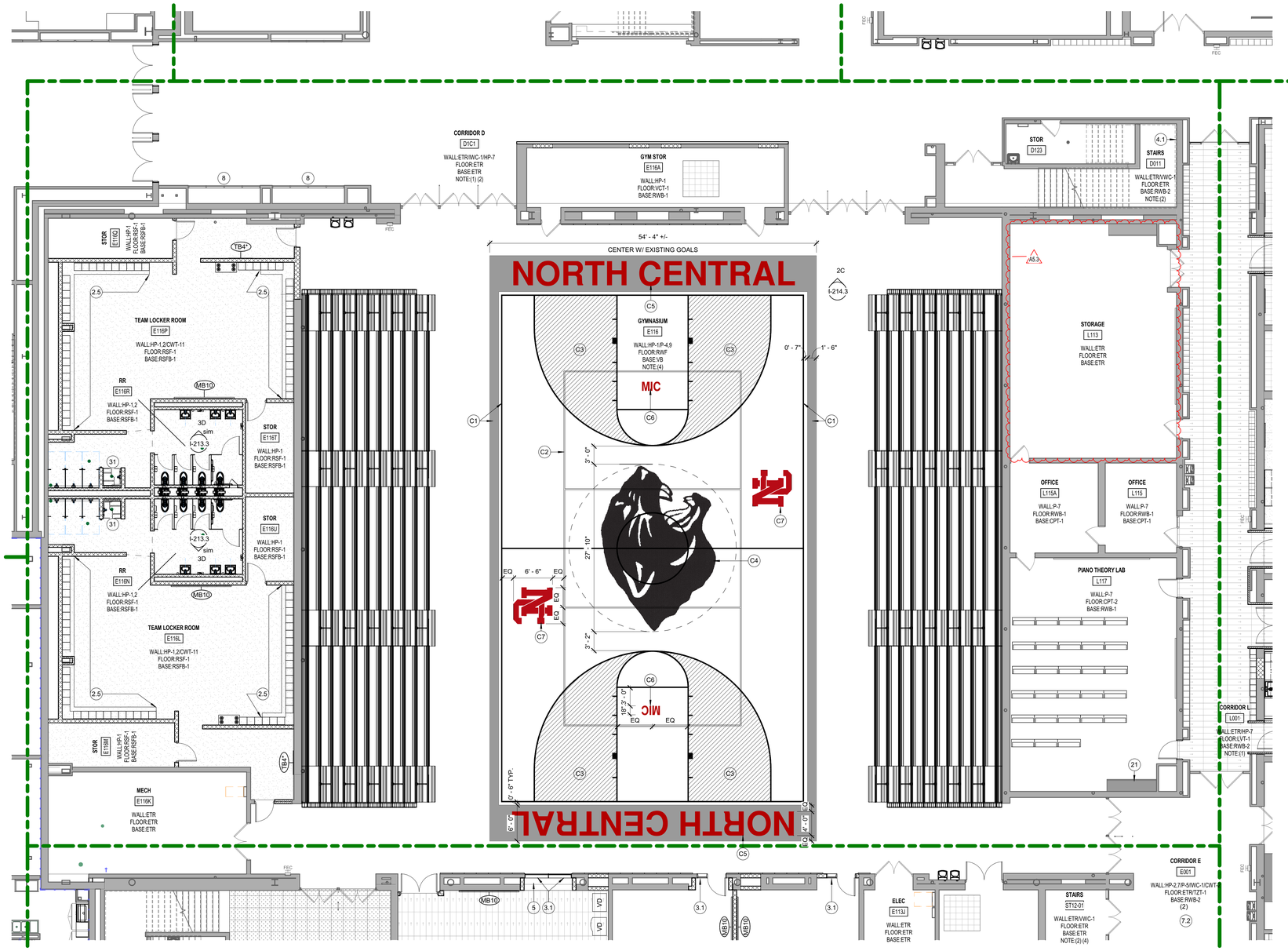
SECOND FLOOR INTERIOR FINISH PLAN - UNIT H

IN1H2.3

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Court Marking Plan Notes PH3

Key	Note
C1	COMPETITION COURT OUTSIDE BORDER LINES TO BE BLACK.
C2	VOLLEYBALL COURT LINES TO BE YELLOW, SOLID.
C3	HATCHED REGION TO BE CONTRASTING WOOD STAIN. PROVIDE MOCKUPS FOR OWNER SELECTION. COORDINATE WITH ARCHITECT.
C4	LOGO TO EXTEND BEYOND JUMP CIRCLE. OVERALL COLOR TO BE BLACK W/ RED ACCENTS. UNFILLED REGIONS TO BE TYPICAL GYM WOOD FLOOR.
C5	FONT TO BY "MYRIAD" 48 INCHES TALL RED W/ WHITE OUTLINE.
C6	FONT TO BY "MYRIAD" 18 INCHES TALL RED.
C7	NORTH CENTRAL LOGO, RED W/ WHITE OUTLINE.



2A FIRST FLOOR - INTERIOR FINISH PLAN - UNIT K
1/8" = 1'-0"

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   - Walls are to be prepped removing any existing wallcovering & residue, holes patched, and surface smoothed prior to new paint or wallcovering being installed.
   - Vinyl Wall Base over gyp. - Prior to removal of existing vinyl wall base, score wall above top of base to minimize damage to drywall.
3. Reference architectural ceilings plans for ceiling heights and bulkhead color designations. Paint all bulkheads P-10 unless specifically noted otherwise. Bulkheads that are flush with walls provide color to match adjacent wall color.
4. Paint interior hollow metal door frames HP-2.
5. • Where existing conditions remain, split face finish, painting only side impacted by renovation.
6. Paint general walls HP-7 or P-7 (Neutral) unless specifically noted otherwise.
   - Athletics - Gymnasiums/Locker Rooms walls to be painted HP-1or P-1, unless specifically noted otherwise.
7. Paint all exposed conduit, piping, and associated assemblies to match adjacent paint finish. Applies to all new & existing to remain in areas of renovation.
8. Corridor Walls
   - All Structural Glazed Block Walls and Cove Base are existing to remain unless noted otherwise on A-series dwgs.
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9. ROOM FINISH TAG NOTES
   (1) Existing glazed block walls to remain. Walls above to be patched and repaired to make ready to receive new finish.
   (2) Existing terrazzo floors to remain.
   (3) 09 30 00 - Where existing mosaic & porcelain floor tile is to remain, clean & seal grout.
   (4) Stairs - Existing mosaic wall tile to remain.

ROOM FINISH TAG ABBREVIATIONS

P - paint	VCT - vinyl tile	TZ - epoxy terrazzo
HP - high performance paint	LVT - luxury vinyl tile	RWB - rubber wall base
CWT - ceramic wall tile	PWT - porcelain wall tile	PFT - porcelain floot tile
VWC - type II wallcovering	MFT - mosaic floor tile	CPT carpet tile
IWC - type III wallcovering	MWT - mosaic wall tile	CPB - broadloom carpet
RSF - resinous flooring	WOC - walk-off carpet	VSF - vinyl sheet flooring
SGC - structural glazed cove	CFC - concrete floor coating	

Interior Plan Notes PH3

#	Note
1	PHASE ONE WORK. NO SCOPE.
1.1	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-1/HP-1.
1.2	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL, INSIDE CORNER TO INSIDE CORNER TO BE P-2/HP-2.
1.3	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL, INSIDE CORNER TO INSIDE CORNER TO BE P-3/HP-3.
1.4	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-4.
1.5	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-5.
1.6	09 91 23.99 - EXPOSED STRUCTURE AND ASSOCIATED ASSEMBLIES TO BE PAINTED P-6.
1.7	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-7/HP-7.
1.8	09 91 23.99 - PAINT FULL HEIGHT OF ENTIRE WALL/COLUMN, INSIDE CORNER TO INSIDE CORNER TO BE P-8.
2.2	09 30 00 - WALL TO RECEIVE CERAMIC WALL TILE, REFERENCE 1E/I-501.3 FOR TYPICAL ELEVATION.
2.3	09 30 00 - ALL WALLS TO RECEIVE CERAMIC WALL TILE TO BE CWT-10,11. REFERENCE SHEET 221.3 FOR RESTROOM ELEVATIONS.
2.4	09 30 00 - ALL WALLS TO RECEIVE CERAMIC WALL TILE TO BE CWT-5. BRICK INSTALL.
2.5	09 30 00 - WALL BELOW CONCRETE BENCH TO RECEIVE CERAMIC WALL TILE, TO BE CWT-11.
3.1	12 24 13 - PROVIDE MANUAL ROLLER WINDOW SHADES. VERIFY DIMENSIONS IN FIELD PRIOR TO ORDERING AND INSTALL.
3.2	12 24 13 - PROVIDE MOTORIZED ROLLER WINDOW SHADES. VERIFY DIMENSIONS IN FIELD PRIOR TO ORDERING AND INSTALL.
4.1	FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-1).
4.2	FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-2).
4.3	FULL EXTENT OF WALL TO RECEIVE NEW VINYL WALLCOVERING (VWC-3).
5	12 36 61.16 - PROVIDE SOLID SURFACE WINDOW STOOL TI BE (SS-1)
6	EXISTING TERRAZZO STAIR TREADS, RISERS, & MOSIC WALL TILE ARE EXISTING TO REMAIN. NEW VINYL WALL BASE TO BE INSTALLED OVER MOSAIC WALL BASE.
6.1	STAIR TREADS TO BE TERRAZZO
7.1	10 26 00 - PROVIDE SURFACE MOUNTED CORNER GUARDS, (CG-1). REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7.2	10 26 00 - PROVIDE IMPACT WALLCOVERING WAINSCOTT ALONG FULL EXTENT OF WALL UNLESS LEADERS INDICATED OTHERWISE. TO BE (IWC-1), PROVIDE EDGE TRIM ACCESSORIES AS REQUIRED BY MFR. PROVIDE NEW RUBBER WALL BASE, RWB-2 ALONG EXTENTS.
8	EXISTING DISPLAY CASES. NO NEW WORK.
8.1	10 11 00 - VISUAL DISPLAY SURFACES. CUSTOM DISPLAY CASES TO RECEIVE FABRIC WRAPPED TACKBOARD TO BE (UPH-X). REFER TO A-SERIES DRAWINGS.
9	EXISTING TERRAZZO FLOOR TO REMAIN. CLEAN AND BUFF PROTECTED FLOORS.
10	CONCRETE BENCHES TO BE SEALED, (CFC-1).
11	12 32 00 - TYPICAL CLASSROOM STORAGE. REFER TO ELEVATION 3B/I-205.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
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13	EXISTING CASEWORK TO REMAIN.
14	06 40 23 - SEATED RISERS TO BE WOOD ON TOP AND FRONT FACE.
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16	09 66 23 - PATCH -IN NEW RESINIOUS MATRIX TERRAZZO FLOOR TO MATCH ADJACENT FLOOR. PROVIDE PHYSICAL SAMPLE TO VERIFY COLOR IN FIELD. COLOR MAY VARY.
17	12 35 53 - TYPICAL SCIENCE CLASSROOM STORAGE. REFER TO ELEVATION 1A/I-210.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
18	REFERENCE 2B/I-210.3 & 2C/I-210.3 FOR TYPICAL SCIENCE DEMONSTRATION ISLAND CASEWORK ELEVATIONS.
19	06 40 23 - BUILT-IN BENCH TO BE WOOD ON TOP AND FRONT FACE.
20	NEW FLOOR FINISHES IN PHASE 3. ALL OTHER FINISH SCOPE INCLUDED IN PHASE 2.
21	ALTERNATE CLASSROOM FINISHES AND CASEWORK: PROVIDE NEW CASEWORK IN EXISTING LOCATION. SEE ELEVATION 6E/I-211.3 FOR TYPICAL.
22	ALTERNATE: PROVIDE NEW FINISHES INCLUDING/BUT NOT LIMITED TO CARPET, PAINT, AND WALL BASE. REFER TO ALTERNATES DESIGNATED IN SPECIFICATION PROJECT MANUAL.
23	ALIGN CPT-4 WITH BULKHEAD ABOVE.
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25	12 32 00 - TYPICAL WELLNESS CASEWORK. REFER TO ELEVATION 6E/I-401.3 FOR CLARIFICATION PROVIDE OPPOSITE HAND WHERE REQUIRED.
26	09 30 00 - PROVIDE PORCELAIN FLOOR TILE W/ METAL EDGE TRIM AT ALL EXPOSED EDGES. TO BE PFT-1.
27	ALIGN ACCENT FLOOR PATTERN WITH BULKHEAD ABOVE. CPT-4
28	APPLIED WALL FINISH IS EXISTING TO REMAIN. PROTECT SURFACE(S) THROUGH RENOVATION & CONTRSTRUCTION.
29	15"D ADJUSTABLE SHELVES W/ KV BRACKETS. SEE DETAIL 2B/I-301.3 FOR ADDITIONAL INFORMATION.
30	EXISTING RELOCATED METAL STUDENT ART LOCKERS.
31	12 00 80.99 - PROVIDE UTILITY SHELVING REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATON.
32	10 21 33 - PROVIDE CUBICLE CURTAIN AND TRACK.
33	CONTINUE CARPET TILE ON RAISED PLATFORM. PROVIDE RUBBER NOSING ON EXPOSED EDGES.
34	EXISTING NON-GYPSUM BOARD WALLS TO BE PAINTED. REFER TO ELEVATIONS REFERENCED FOR PAINT COLOR LOCATIONS, TYPICAL.
35	OWNER PROVIDED EQUIPMENT, N.I.C.
36	09 30 00 - PATCH AND REPAIR AREAS OF BROKEN MOSAIC FLOOR TILE. MATCH EXISTING TILE AND GROUT. VERIFY CONDITIONS AND LOCATIONS IN FIELD.
37	12 32 00 - PROVIDE PLASTIC LAMINATE COUNTERTOP W/ WIRE MANAGEMENT LINEAR CHANNEL W/ BRUSH. SIZE 2' BY 60 INCHES. BASIS OF DESIGN: MOCKETT-BREXT MODEL BRKIT, MATTE BLACK. (QTY:4). MOUNT AT 30"AFF W/ RAKKS EH-1824 SUPPORT BRACKETS SPACED MAX 42 INCHES APART. SEE DETAIL 5A/A-327.3
38	APPLY NEW FINISHES, AS INDICATED IN FINISH TAG, INSIDE CORNER TO INSIDE CORNER, OR TO EXTENTS SHOWN.
39	09 68 16 - PROVIDE NEW BROADLOOM CARPET ALONG AISLE. PATTERN DIRECTION TO RUN NORTH & SOUTH, LENGTH OF ROLL, TO BE (CPB-1); REFER TO E-SERIES DRAWINGS FOR ILLUMINATED EDGE TRIM FOR LIGHTED AISLE.
40	PROVIDE RUBBER STAIR TREAD & RISER, RAISED DISK, TO BE SELECTED BY ARCHITECT FROM MFR FULL COLOR RANGE.
41	BASE BID: CONSTRUCT STAGE ACCESS AND STAIR AS SHOWN, MODIFY EXISTING AUDIENCE SEATING AS REQUIRED FOR NEW CONSTRUCTION. PATCH & REPAIR AREA OF WALL AFFECTED BY CONSTRUCTION. REF A-400 SERIES DWGS.

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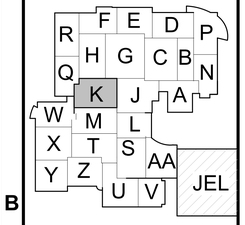
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced LGK

SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
ARCHITECT

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

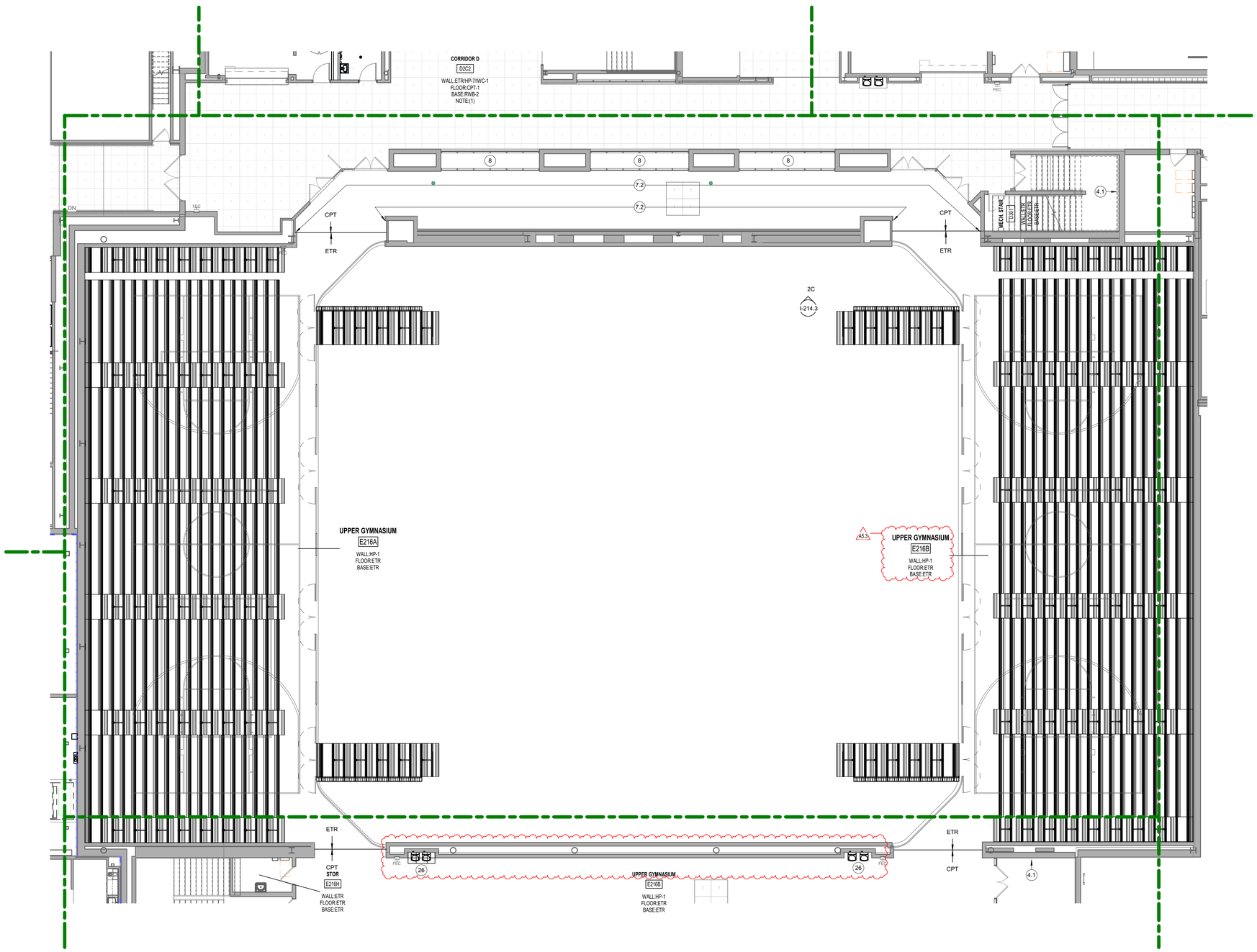
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FIRST FLOOR INTERIOR FINISH PLAN - UNIT K

IN1K1.3

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2A **SECOND FLOOR - INTERIOR FINISH PLAN - UNIT K**
1/8" = 1'-0"

INTERIOR GENERAL NOTES

REFERENCE A-001 FOR GENERAL PLAN NOTES. ALL NOTES MAY NOT APPLY TO THIS SHEET.

1. FINISHES PRIOR TO START & FINAL COMPLETION OF WORK
   - Where existing finishes are to remain outside scope of work, patch & repair any area damaged or effected by renovation, to return to like new condition, matching adjacent finishes. This includes, but is not limited to doors & associated hardware, door frames, wall finishes, wall base, floor finish including floor transitions & thresholds, etc. It is the responsibility of the contractor to verify conditions in field prior to start & completion of work.
2. Interior Painting/Wallcovering
   - Existing wall conditions that were not specifically noted to be patched and repaired, but are designated to receive new finishes, are to be repaired prior to new finishes being applied. It is the Contractors responsibility to confirm conditions in field prior to start of work.
   - Walls are to be prepped removing any existing wallcovering & residue, holes patched, and surface smoothed prior to new paint or wallcovering being installed.
   - Vinyl Wall Base over gyp. - Prior to removal of existing vinyl wall base, score wall above top of base to minimize damage to drywall.
3. Reference architectural ceilings plans for ceiling heights and bulkhead color designations. Paint all bulkheads P-10 unless specifically noted otherwise. Bulkheads that are flush with walls provide color to match adjacent wall color.
4. Paint interior hollow metal door frames HP-2.
5. • Where existing conditions remain, split face finish, painting only side impacted by renovation.
6. Paint general walls HP-7 or P-7 (Neutral) unless specifically noted otherwise.
   - Athletics - Gymnasiums/Locker Rooms walls to be painted HP-1or P-1, unless specifically noted otherwise.
7. Paint all exposed conduit, piping, and associated assemblies to match adjacent paint finish. Applies to all new & existing to remain in areas of renovation.
8. Corridor Walls
   - All Structural Glazed Block Walls and Cove Base are existing to remain unless noted otherwise on A-series dwgs.
   - Walls not Structural Glazing shall receive impact wallcovering wainscott. This includes any portion of wall below wainscott height not specifically called out.

ROOM FINISH TAG NOTES
(1) Existing glazed block walls to remain. Walls above to be patched and repaired to make ready to receive new finish.
(2) Existing terrazzo floors to remain.
9. (3) 09 30 00 - Where existing mosaic & porcelain floor tile is to remain, clean & seal grout.
(4) Stairs - Existing mosaic wall tile to remain.

ROOM FINISH TAG ABBREVIATIONS

P - paint	VCT - vinyl tile	TZ - epoxy terrazzo
HP - high performance paint	LVT - luxury vinyl tile	RWB - rubber wall base
CWT - ceramic wall tile	PWT - porcelain wall tile	PFT - porcelain floot tile
VWC - type II wallcovering	MFT - mosaic floor tile	CPT carpet tile
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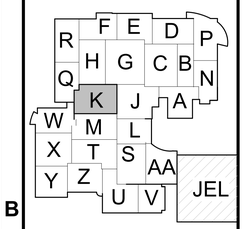
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SARAH KATHLEEN HEMPSTEAD
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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR INTERIOR FINISH PLAN - UNIT K

IN1K2.3

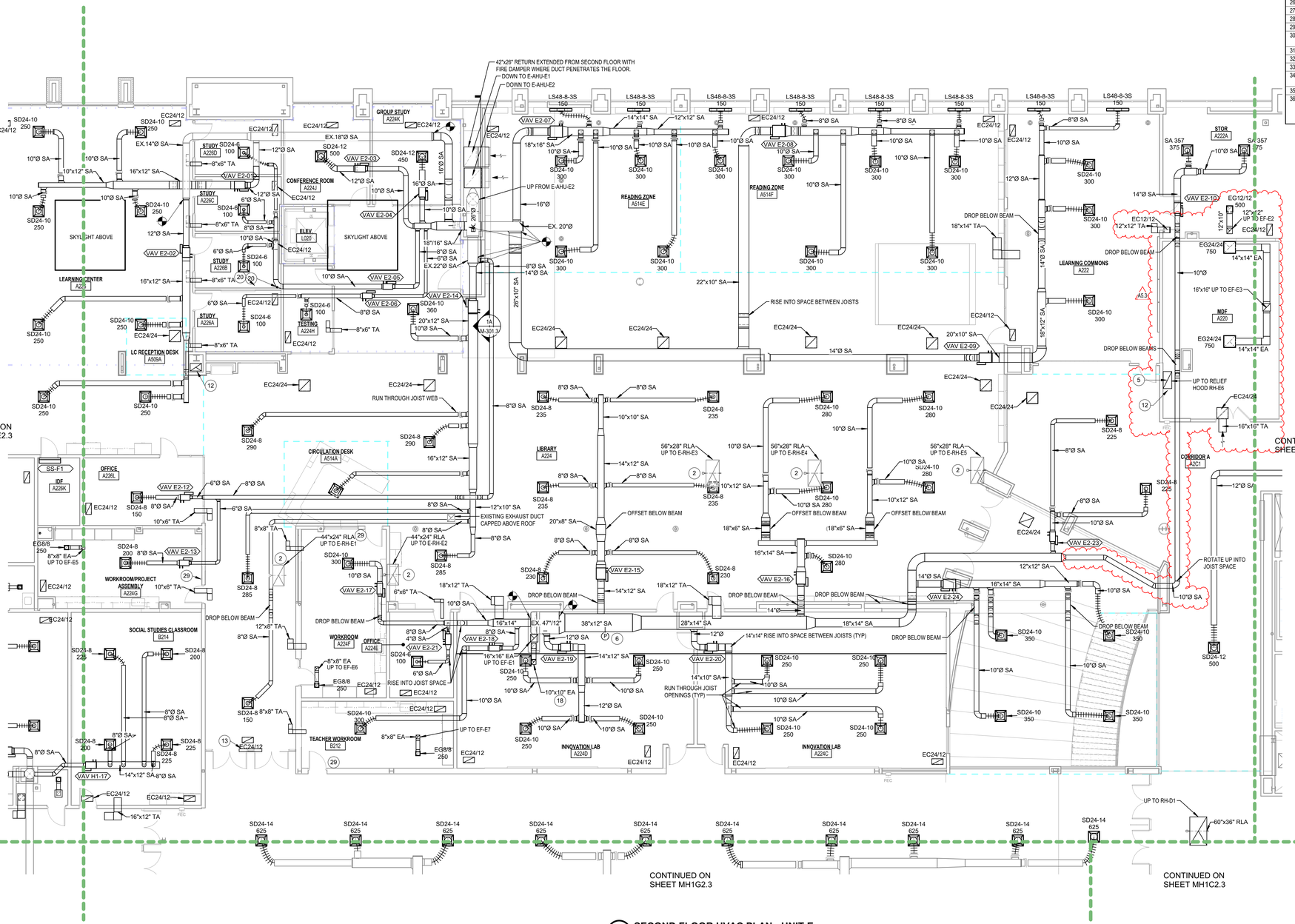
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GENERAL NOTES HVAC PLAN

1. ALL DIFFUSERS AND GRILLES SHALL BE REMOVED AND REPLACED UNLESS OTHERWISE NOTED.
2. ALL TERMINAL BOXES SHALL BE REMOVED. REPLACE WHERE APPLICABLE AS SHOWN ON PLAN.
3. ALL EXISTING EXHAUST FANS SHALL BE REMOVED. REPLACE WHERE APPLICABLE AS SHOWN ON PLANS.
4. ALL CONTROL DEVICES SHALL BE REMOVED AND REPLACED. SEE M700 SERIES DRAWINGS FOR MORE INFORMATION. TC PANELS TO REMAIN.

MECHANICAL HVAC PLAN NOTES - PH3

#	NOTE
1	REPLACE EXISTING STATIC PRESSURE SENSOR.
2	PROVIDE NEW ELECTRONIC DAMPER ACTUATOR AT EXISTING ROOF RELIEF. DAMPER SHALL BE CLEANED AND LUBRICATED TO LIKE NEW CONDITION. IF DAMPER CANNOT BE REPAIRED TO LIKE NEW, PROVIDE NEW DAMPER THAT MATCHES THE EXISTING DEVICE IN EVERY RESPECT. SEE M700 SERIES DRAWINGS FOR CONTROLS SCOPE.
3	304 STAINLESS STEEL EXHAUST DUCT.
4	ROUTE EXHAUST DUCT DOWN TO HOOD. OPPOSED BLADE MOTORIZED DAMPERS SHALL BE INTERLOCKED SO THAT WHEN THE HOOD SWITCH IS ON, THE HOOD DAMPER IS OPEN AND THE CEILING DAMPER IS CLOSED. WHEN THE HOOD SWITCH IS OFF, THE HOOD DAMPER IS CLOSED AND THE CEILING DAMPER IS OPEN.
5	PROVIDE NEW RELIEF HOOD OR LOUVERED PENTHOUSE. SEE RELIEF VENT SCHEDULE FOR MORE INFORMATION.
6	NEW STATIC PRESSURE SENSOR. SEE M700 SERIES DRAWINGS.
7	UNDERCUT DOOR 1"
8	EXISTING RETURN AIR OR OUTDOOR AIR DUCT OR CHASE DOWN TO TUNNELS / MECHANICAL ROOM.
9	EXISTING AIR TRANSFER THROUGH SECOND FLOOR SLAB AND DECK.
10	EXISTING LOW WALL RETURN GRILLE TO REMAIN.
11	KITCHEN HOOD, EXHAUST DUCT AND FANS SHOWN FOR REFERENCE. SEE KITCHEN VENDOR DRAWINGS FOR HOODS, EXHAUST DUCTS AND FANS.
12	PROVIDE NEW TRANSFER AIR PATH THROUGH SECOND FLOOR DECK.
13	PROVIDE TRANSFER OPENING IN WALL ABOVE CEILING - 48"x10" MINIMUM.
14	REMOVE LATHE/PLASTER AND/OR DRYWALL AND PROVIDE CLEAR OPENING BETWEEN ABOVE CEILING PLENUM AND RETURN AIR CHASE.
15	PROVIDE 1" CLOSED CELL INTERNALLY LINED TRANSFER AIR DUCT ABOVE CEILING.
16	PROVIDE TRANSFER OPENING IN WALL - 60"x16" MINIMUM.
17	PROVIDE 36"x18" RETURN AIR DUCT FROM MECHANICAL ROOM BELOW UP TO ABOVE CEILING.
18	EXHAUST DUCT FOR FUTURE BARISTA AREA. ROUTE 10"x8" DUCT AS SHOWN UP TO CURB AND CAP ON ROOF.
19	VENT PIPNG FOR FLAMMABLE STORAGE AND ACID STORAGE CABINETS. COORDINATE VENTING REQUIREMENTS WITH CABINET MANUFACTURER.
20	RESIDENTIAL DRYER EXHAUST DUCT UP THROUGH ROOF.
21	EXISTING ABOVE CEILING OPENING INTO RETURN/RELIEF AIR CHASE.
22	EXISTING FUME OR HEAT CAPTURE HOOD AND ASSOCIATED EXHAUST DUCTWORK TO REMAIN.
23	EXISTING COMBUSTION AIR DUCTWORK TO REMAIN. PROVIDE NEW GRILLE.
24	EXISTING TRANSFER DUCT TO REMAIN.
25	EXISTING RELIEF AIR DUCTWORK TO REMAIN.
26	CONNECT TO EXISTING MAKEUP AIR DUCT.
27	EXISTING LOUVERED DOOR TO REMAIN.
28	PROVIDE RETURN GRILLE SOUND TRAP. SEE MECHANICAL DETAILS FOR MORE INFORMATION.
29	PROVIDE SWITCH FOR EXHAUST FAN OPERATION.
30	PROVIDE ACOUSTICAL DUCT LINER IN RETURN DUCT AT AIR INLET DEVICE AND CONTINUING A MINIMUM OF TWENTY FEET DOWNSTREAM.
31	4" DRYER VENT FROM FLOOR BELOW. ROUTE DRYER VENT UP THROUGH ROOF TO GOOSENECK.
32	MOUNT DRYER BOOSTER FAN IN THE VERTICAL POSITION.
33	RESIDENTIAL DRYER EXHAUST DUCT UP THROUGH ROOF.
34	26"x8" PA CONNECTED TO EXISTING GRILLE AND ROUTED TO ABOVE CEILING, THEN BACK TO ABOVE CHOIR CEILING.
35	EXISTING FSK INSULATION SHALL BE PAINTED (TYPICAL) AS SHOWN ON ARCHITECTURAL DRAWINGS.
36	PROVIDE NEW CUSTOM 24" WIDE x 12" TALL x 4" DEEP SLOTTED FACE STAINLESS STEEL FUME COLLECTOR SIMILAR TO EXISTING RELOCATED COLLECTOR. TRANSITION STAINLESS 8" DUCT TO COLLECTOR AND ROUND ANY SHARP EDGES. BALANCE AIRFLOW TO 200 CFM EXHAUST. SEE IMAGE THIS SHEET.



1 **SECOND FLOOR HVAC PLAN - UNIT E**
1/8" = 1'-0"

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Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240

KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

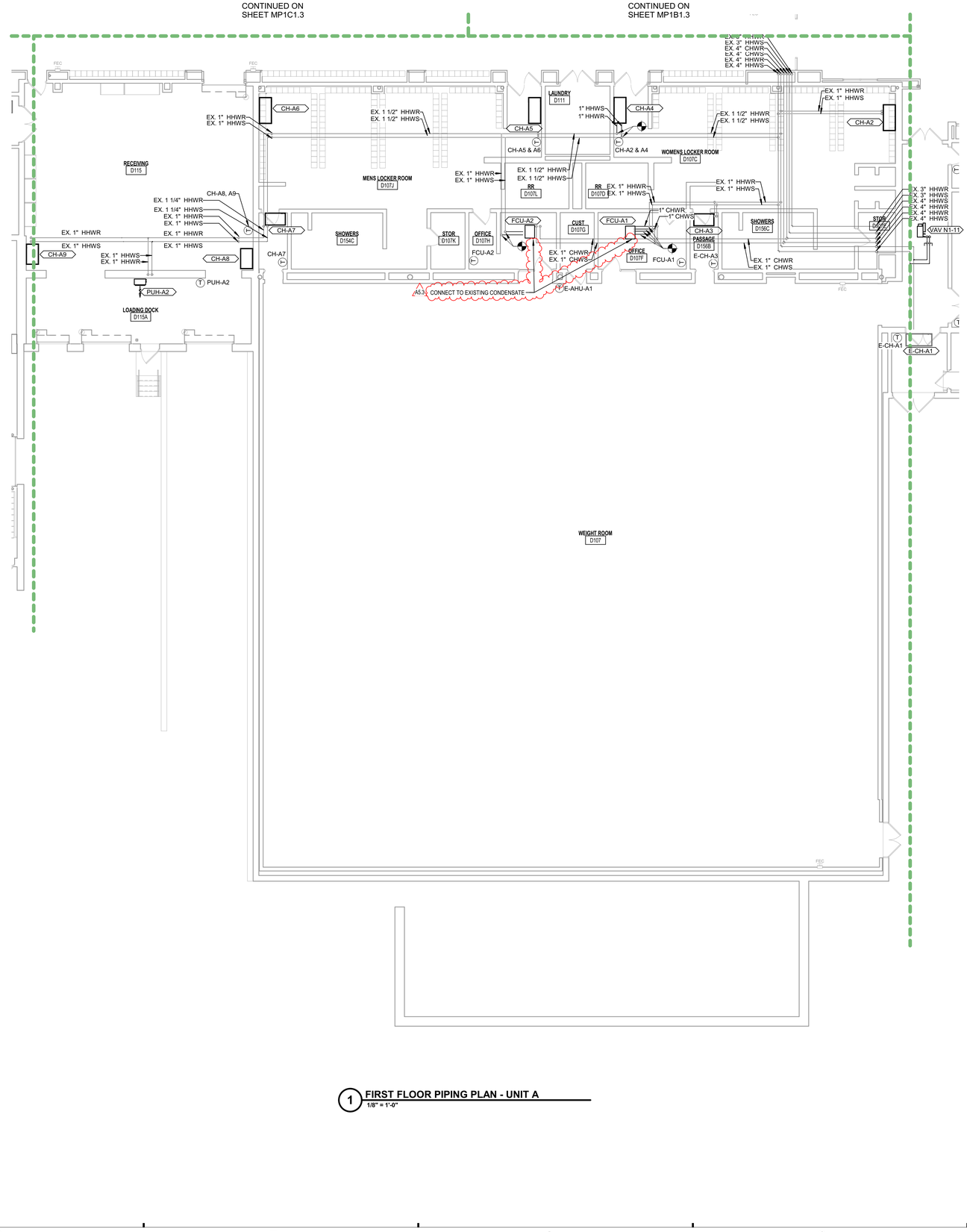
SECOND FLOOR HVAC PLAN - UNIT E

MH1E2.3

MH1E2.3 - SECOND FLOOR HVAC PLAN - UNIT E
2019-067.NCH_A2.3 S-F (Washington Township, North Central High School Renovation_
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CONTINUED ON SHEET MP1C1.3

CONTINUED ON SHEET MP1B1.3



CONTINUED ON SHEET MP1N1.3

CONTINUED ON SHEET MP1J1.3

1 **FIRST FLOOR PIPING PLAN - UNIT A**
1/8" = 1'-0"

MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID. PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
3	ONE CONTROL VALVE SERVES ALL RADIANT CEILING PANELS IN THIS ZONE.
4	TERMINATE CONDENSATE LINE AT PLUMBING FIXTURE REFER TO PLUMBING DRAWINGS FOR LOCATION OF CONNECTION. MAINTAIN SERVICEABLE AIR GAP PER MECHANICAL CODE.
5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.

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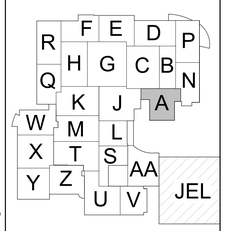
Project No. 2019-067.NCH
Project Date 03.03.2023
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A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

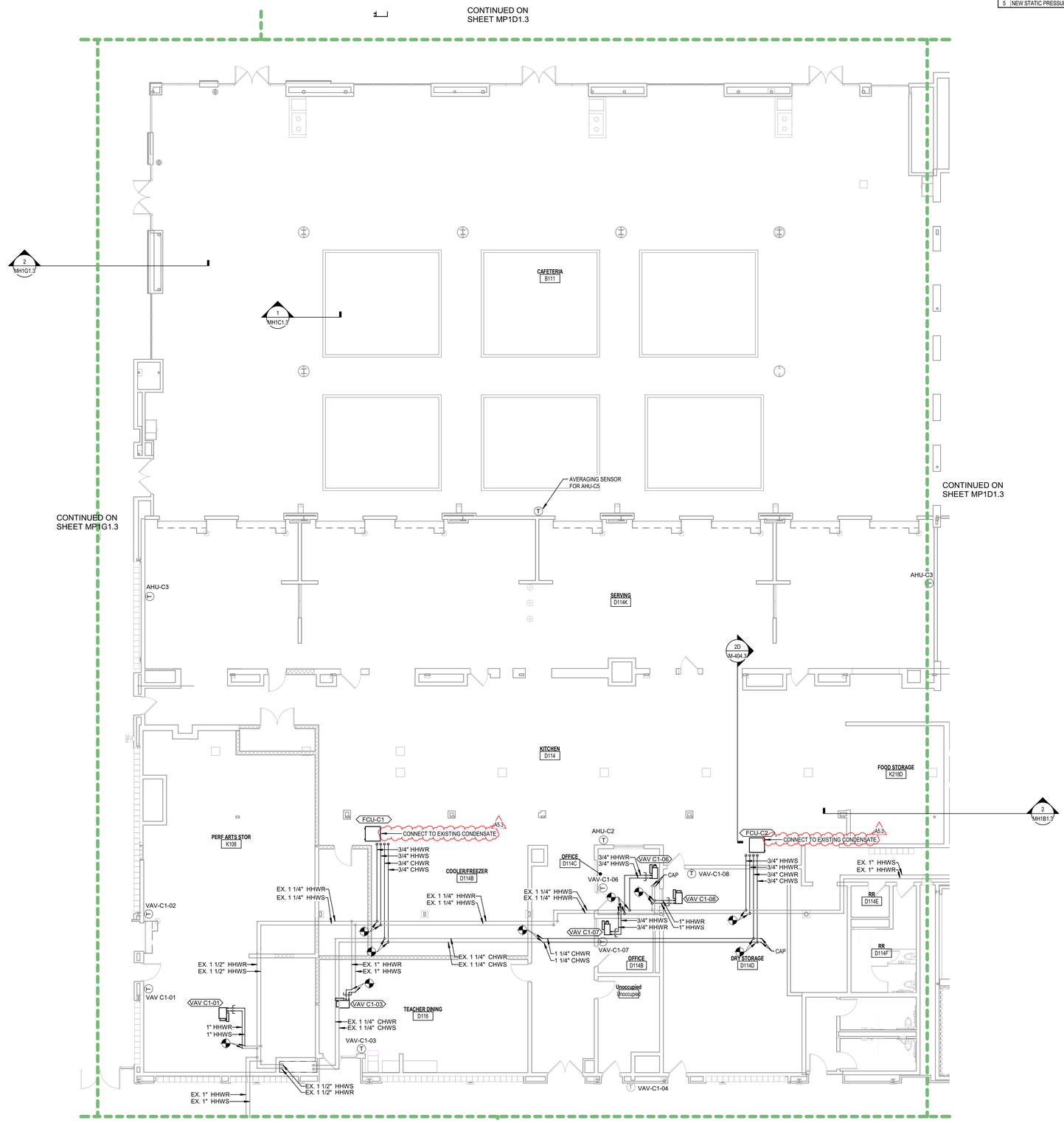
FIRST FLOOR PIPING PLAN - UNIT A

MP1A1.3

MP1A1.3 - FIRST FLOOR PIPING PLAN - UNIT A
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MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID. PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
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4	TERMINATE CONDENSATE LINE AT PLUMBING FIXTURE REFER TO PLUMBING DRAWINGS FOR LOCATION OF CONNECTION. MAINTAIN SERVICEABLE AIR GAP PER MECHANICAL CODE.
5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.



2A FIRST FLOOR PIPING PLAN - UNIT C
1/8" = 1'-0"

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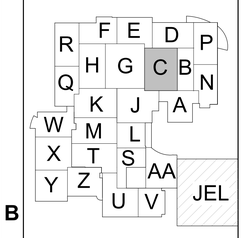
Project No. 2019-067.NCH
Project Date 03.03.2023
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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

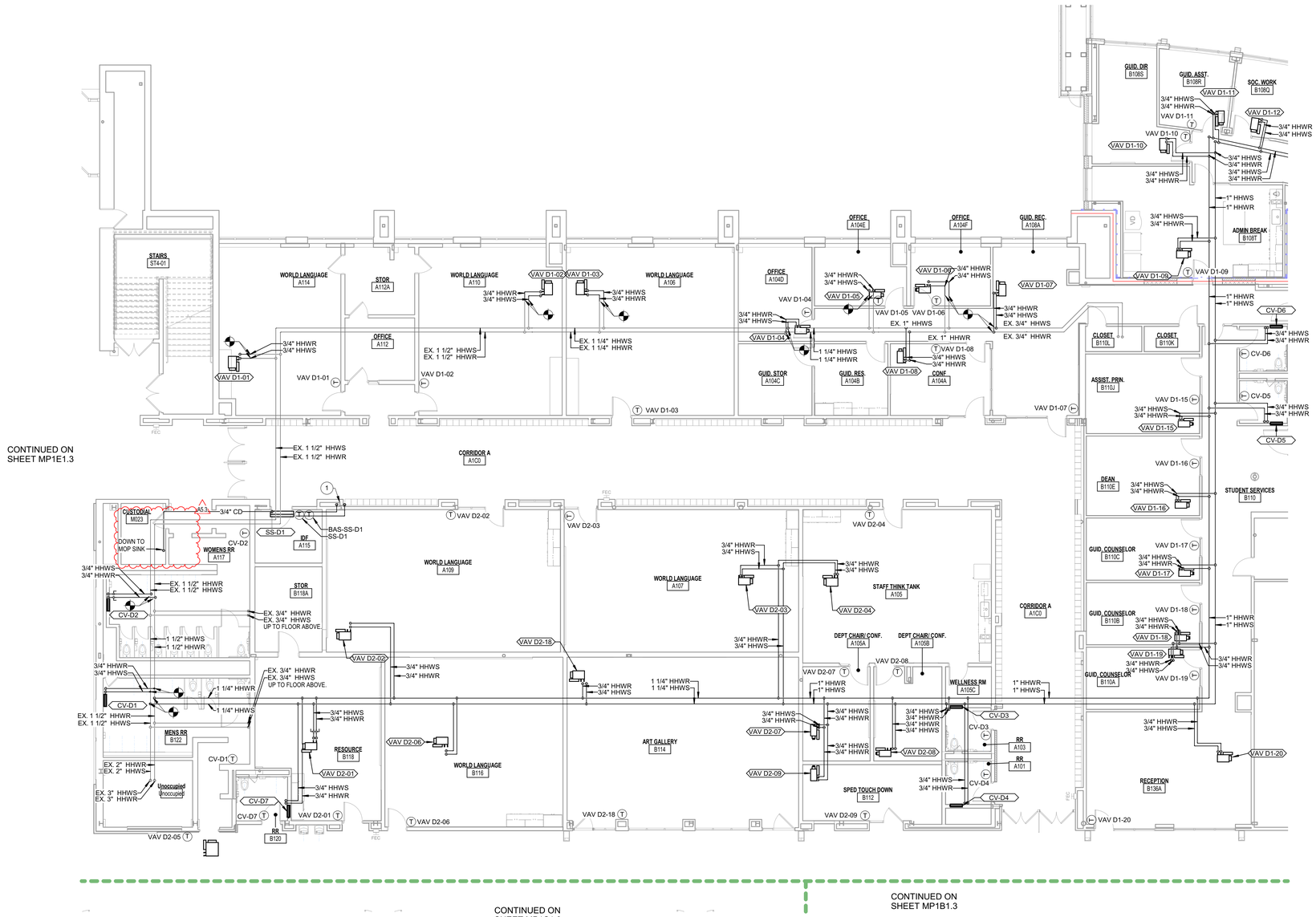
FIRST FLOOR PIPING PLAN - UNIT C

MP1C1.3

MP1C1.3 - FIRST FLOOR PIPING PLAN - UNIT C
2019-067.NCH | M.S.D. of Washington Township, North Central High School Renovation - Additions Phase 3
Plotted: 3/28/2023 7:08:07 AM EDT | North Central High School 2019-067.NCH_Master1_R_2022_Cloud.rvt

MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID, PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
3	ONE CONTROL VALVE SERVES ALL RADIANT CEILING PANELS IN THIS ZONE.
4	TERMINATE CONDENSATE LINE AT PLUMBING FIXTURE REFER TO PLUMBING DRAWINGS FOR LOCATION OF CONNECTION. MAINTAIN SERVICEABLE AIR GAP PER MECHANICAL CODE.
5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.



1 **FIRST FLOOR PIPING PLAN - UNIT D**
1/8" = 1'-0"

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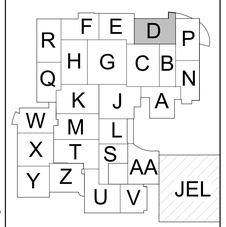
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

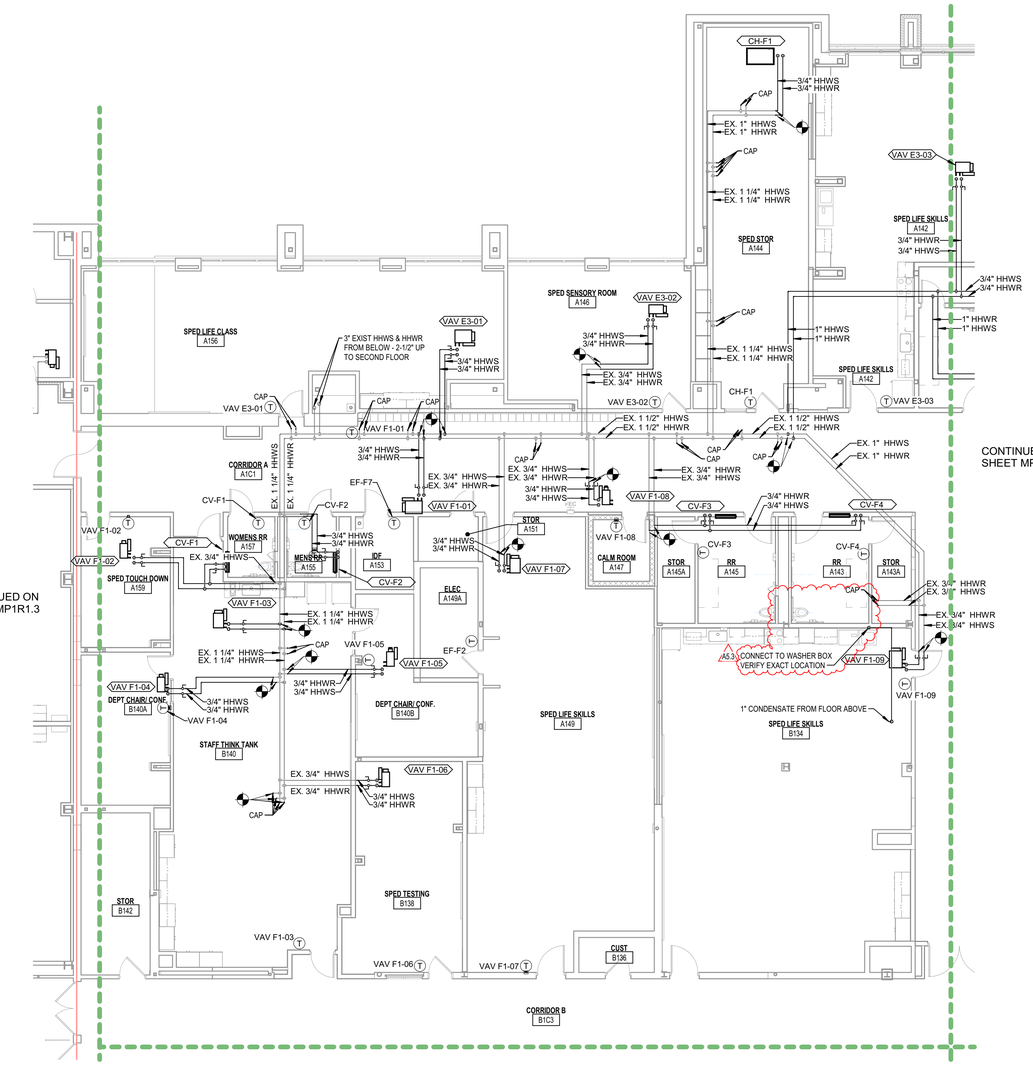
FIRST FLOOR PIPING PLAN - UNIT D

MP1D1.3

MP1D1.3 - FIRST FLOOR PIPING PLAN - UNIT D
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MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID. PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
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5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.



1 **FIRST FLOOR PIPING PLAN - UNIT F**
1/8" = 1'-0"

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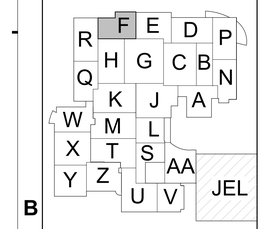
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
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SARAH KATHLEEN HEMPSTEAD
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ARCHITECT

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

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Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

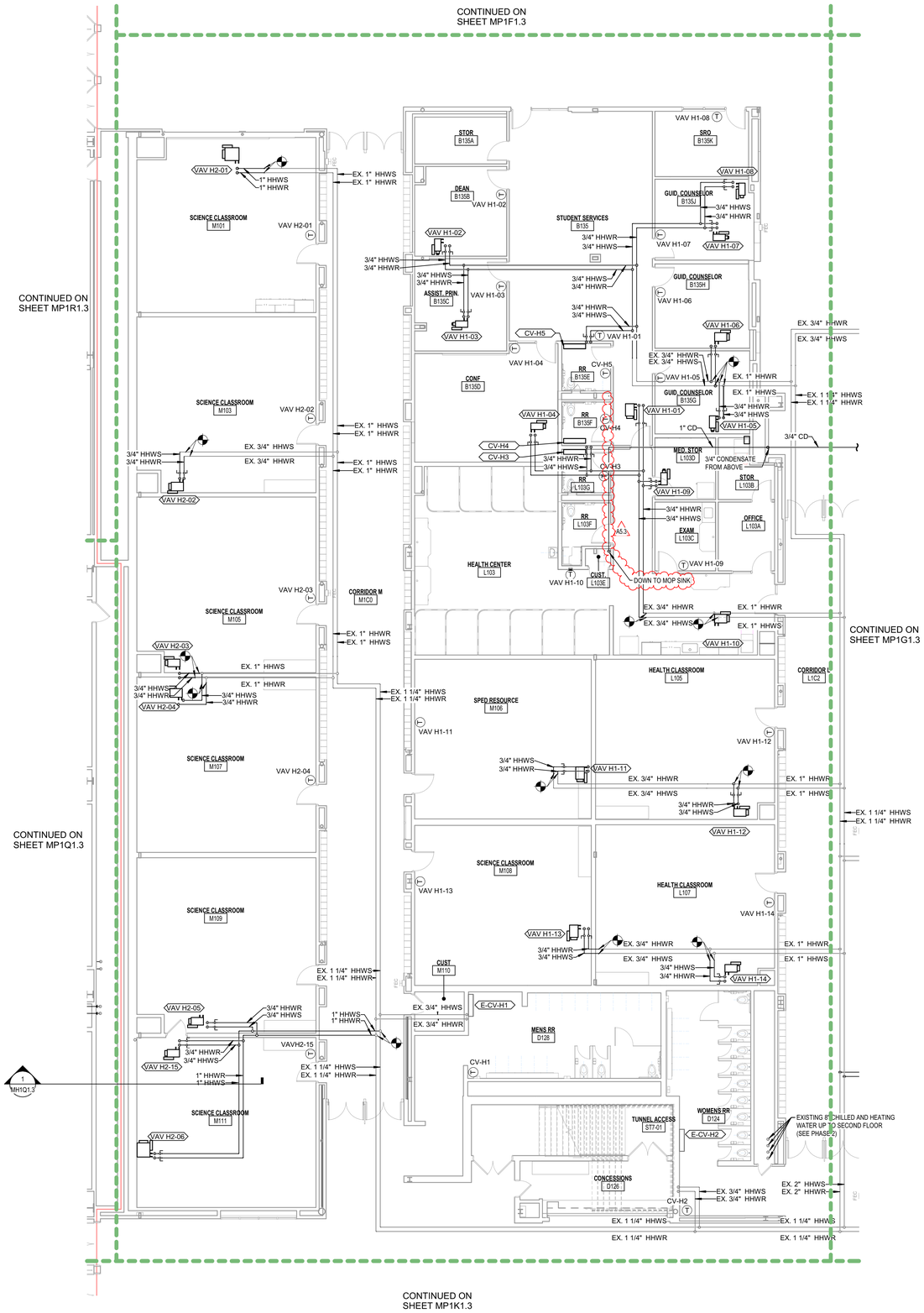
FIRST FLOOR PIPING PLAN - UNIT F

MP1F1.3

MP1F1.3_FIRST FLOOR PIPING PLAN - UNIT F
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MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID, PIPED PER TWO-WAY COIL PIPING DETAIL 3DM-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
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5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.



1 **FIRST FLOOR PIPING PLAN - UNIT H**
1/8" = 1'-0"

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Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
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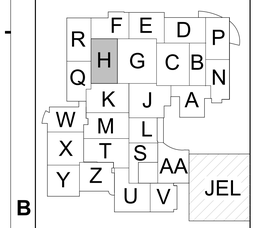
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Sarah K Hempstead

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

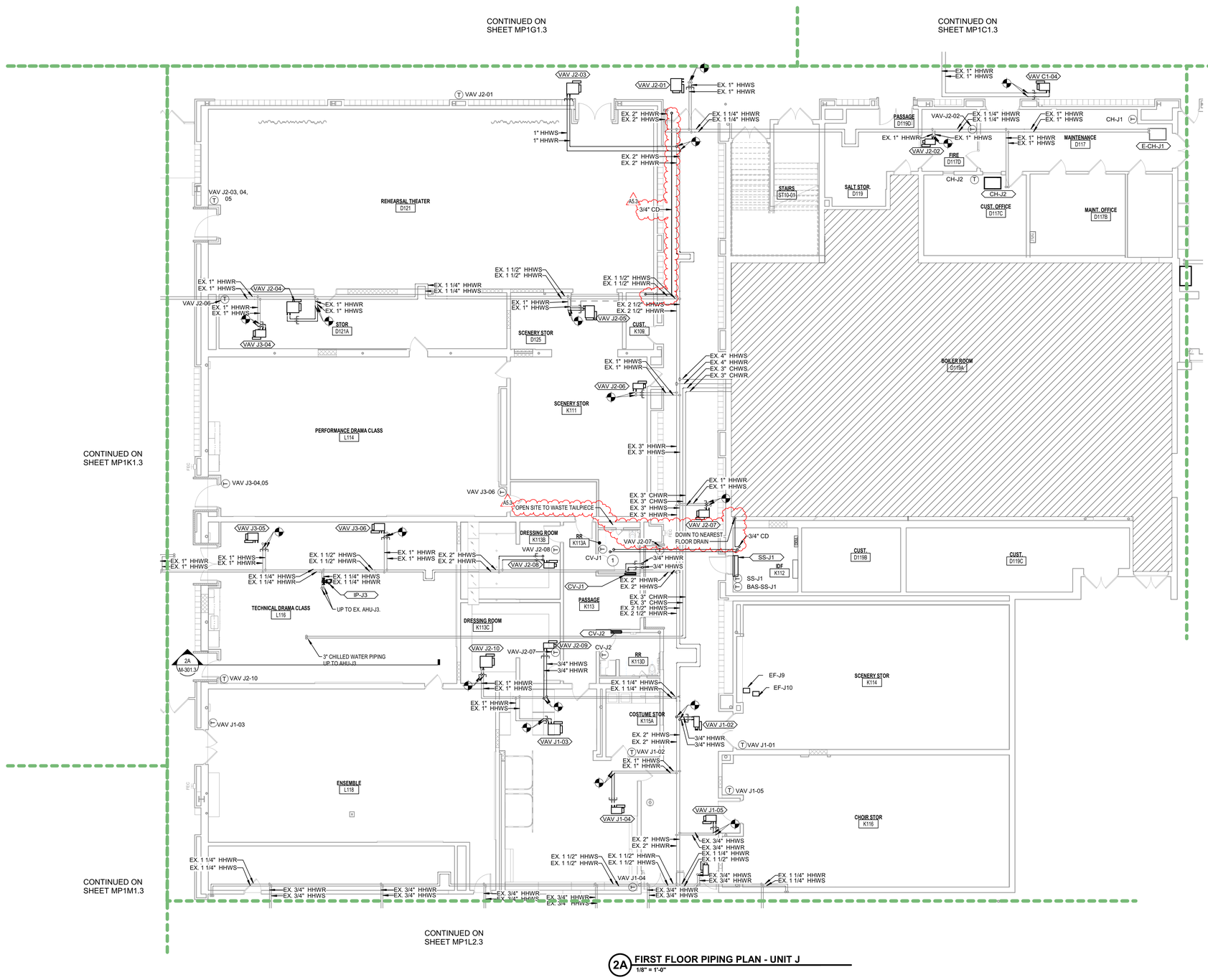
FIRST FLOOR PIPING PLAN - UNIT H

MP1H1.3

MP1H1.3_FIRST FLOOR PIPING PLAN - UNIT H
2019-067.NCH_A.E.S. of Washington Township_North Central High School Renovation_
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MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID, PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
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5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.



2A **FIRST FLOOR PIPING PLAN - UNIT J**
1/8" = 1'-0"

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Indianapolis, IN 46240

KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

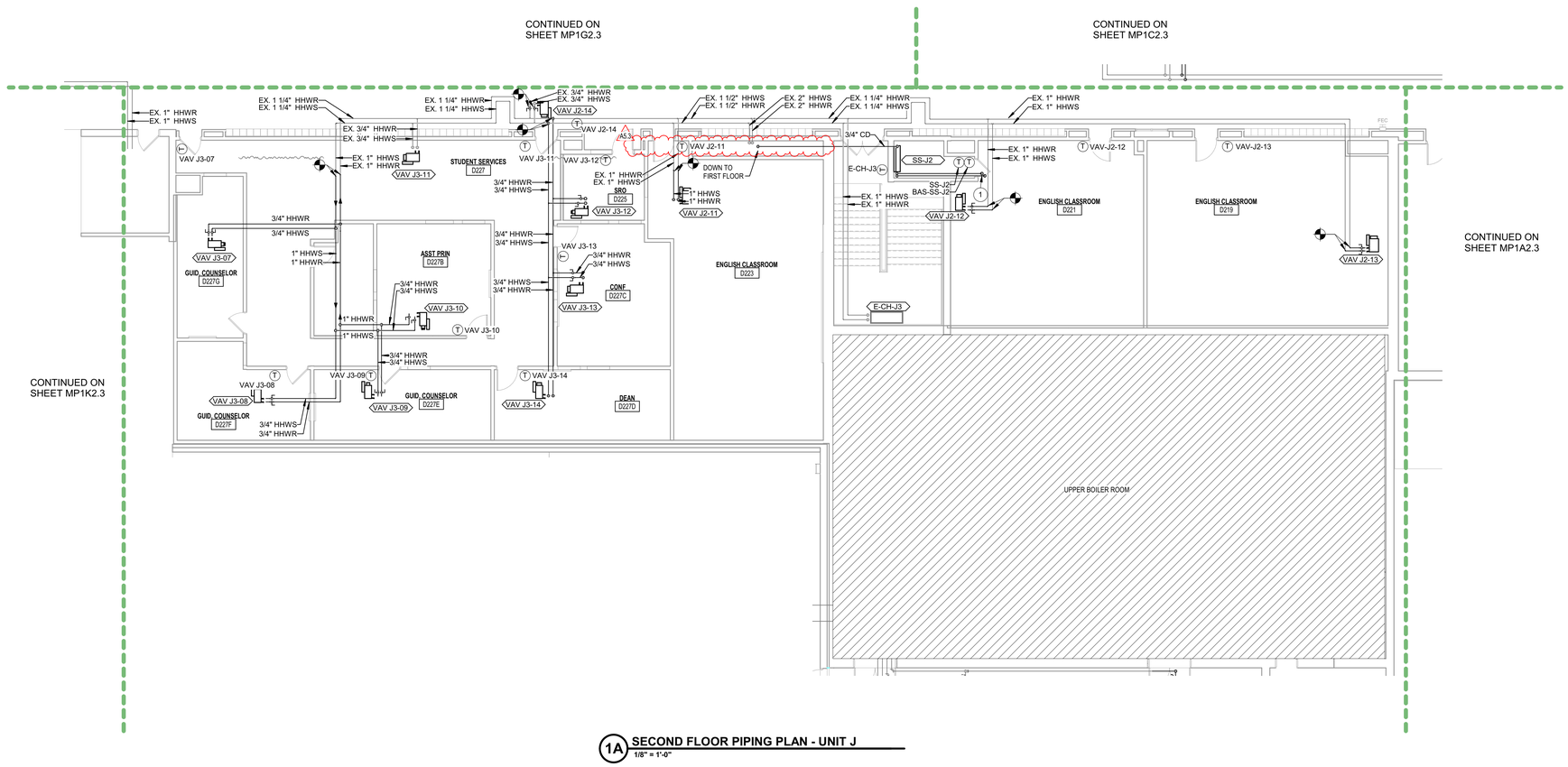
FIRST FLOOR PIPING PLAN - UNIT J

MP1J1.3

MP1J1_1_2023-03-03_PH3 PIPING PLAN_UNIT J
2019-067.NCH_N.S.D. of Washington Township_North Central High School Renovation_
Additions Phase 3.rvt 3/3/2023 2:09:37 PM

MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
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1A **SECOND FLOOR PIPING PLAN - UNIT J**
1/8" = 1'-0"

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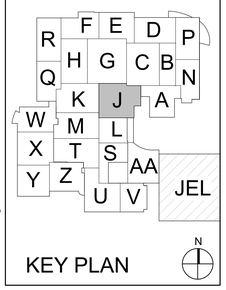
Project No. 2019-067.NCH
Project Date 03.03.2023
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A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

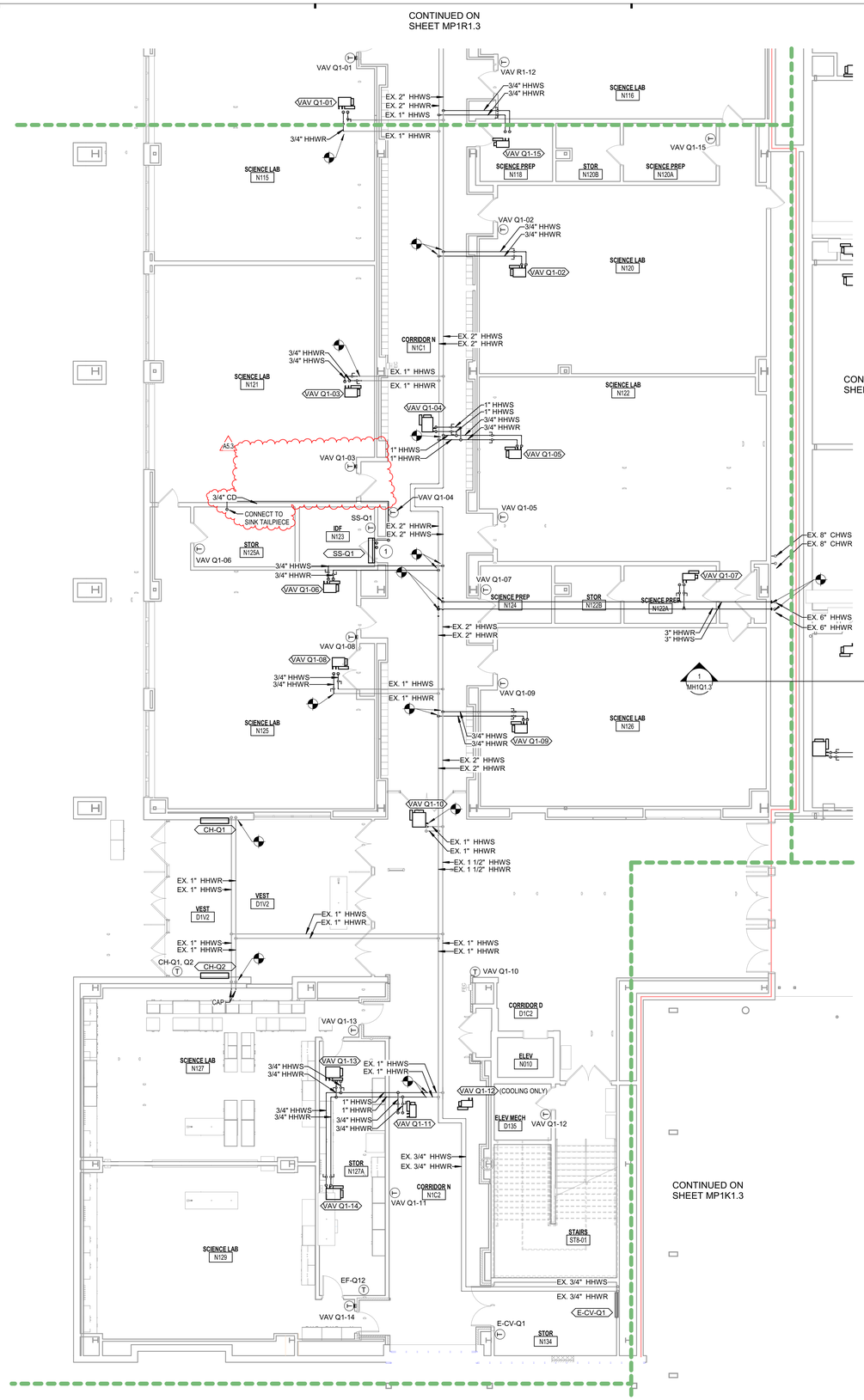
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR PIPING PLAN - UNIT J

MP1J2.3

MP1J2.3 - SECOND FLOOR PIPING PLAN - UNIT J
2019-067.NCH, M.S.D. of Washington Township, North Central High School Renovation,
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MECHANICAL PIPING PLAN NOTES (PH3)

#	NOTE
1	PROPOSED REFIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID. PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3, AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
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5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.

2A FIRST FLOOR PIPING PLAN - UNIT Q
1/8" = 1'-0"

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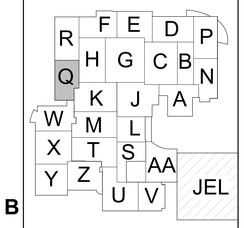
Project No. 2019-067.NCH
Project Date 03.03.2023
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A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

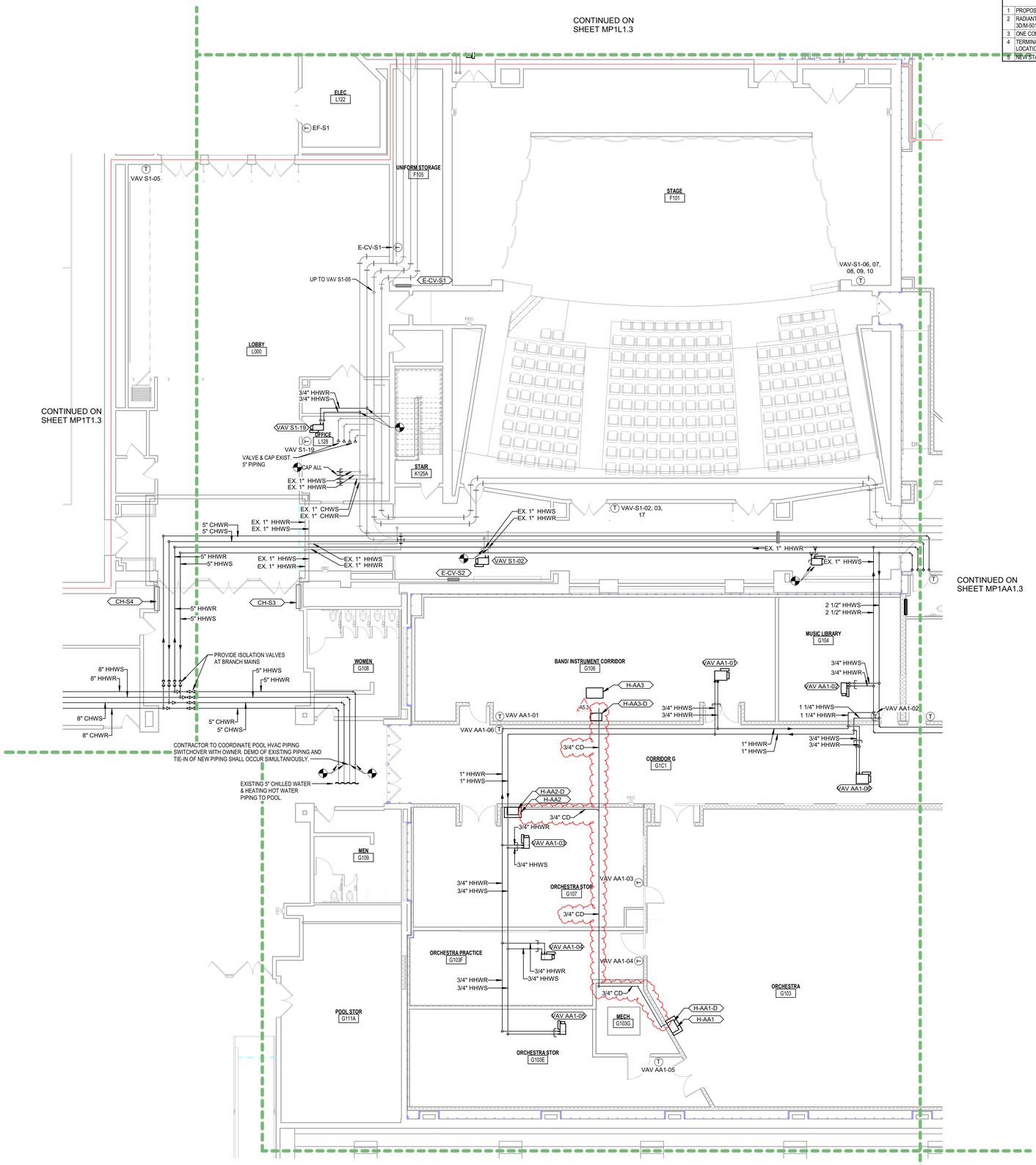
FIRST FLOOR PIPING PLAN - UNIT Q

MP1Q1.3

MP1Q1.3 - HMP FLOOR PIPING PLAN - UNIT Q
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MECHANICAL PIPING PLAN NOTES - PH3

#	NOTE
1	PROPOSED REFRIGERANT PIPING PATH.
2	RADIANT CEILING PANEL INSTALLED IN CEILING GRID, PIPED PER TWO-WAY COIL PIPING DETAIL 3D/M-501.3. AND INSULATED BY M.C. PER MANUFACTURER'S REQUIREMENTS. TYPICAL ALL RCP.
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5	NEW STATIC PRESSURE SENSOR. SEE M-700 SERIES DRAWINGS.



2A FIRST FLOOR PIPING PLAN - UNIT S
1/8" = 1'-0"

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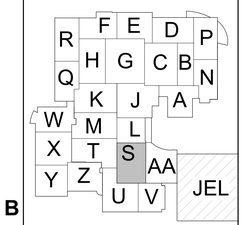
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced BNW/ PWF

SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

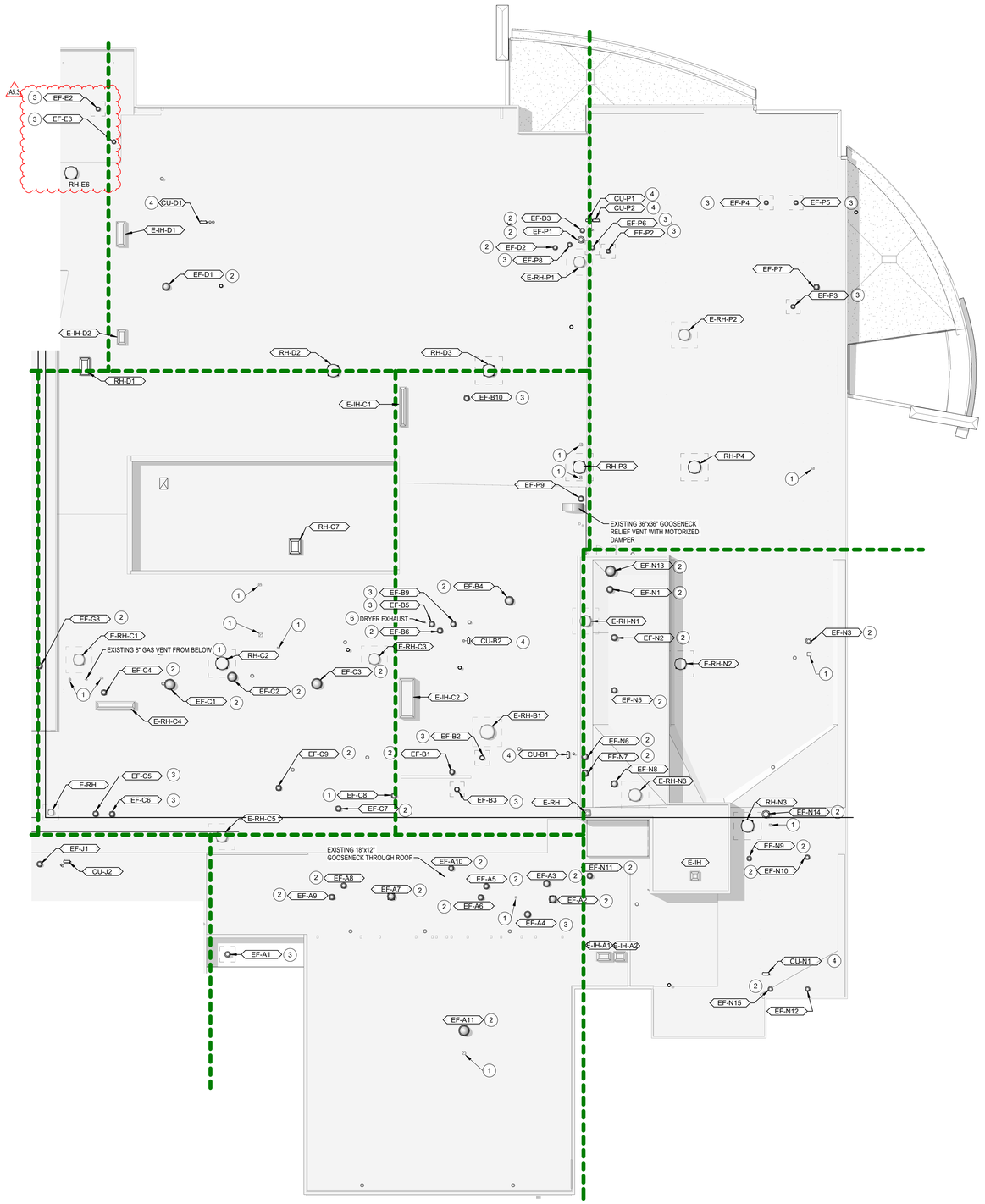
FIRST FLOOR PIPING PLAN - UNIT S

MP1S1.3

MP1S1_1_FIRST FLOOR PIPING PLAN - UNIT S
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_
Phase 3 Additions and Renovations\2019-067.NCH_North Central High School\2019-067.NCH_Central_R_2022_Cloud.rvt
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MECHANICAL ROOF PLAN NOTES (PH3)

#	NOTE
1	CAP EXISTING ROOF CURB PER DETAIL 5B/M-502.3.
2	NEW EXHAUST FAN ON EXISTING CURB PER DETAIL 1D/M-503.3. TRANSITION AS NECESSARY TO NEW FAN CONNECTION SIZE.
3	NEW EXHAUST FAN ON NEW CURB PER DETAIL 1D/M-503.3. COORDINATE WITH ROOFING CONTRACTOR FOR PENETRATION.
4	SPLIT SYSTEM AIR-COOLED CONDENSING UNIT AND REFRIGERANT PIPING PER DETAIL 5C/M-502.3. REFRIGERANT PIPING DOWN THROUGH CURB PER DETAIL 5D/M-501.3.
5	NEW LOUVERED PENTHOUSE ON NEW ROOF CURB PER DETAIL 3C/M-503.3. COORDINATE WITH ROOFING CONTRACTOR FOR ROOF PENETRATION.
6	INSTALL DRYER EXHAUST DUCT PER DETAIL 3A/M-503.3.



1 **ROOF MECHANICAL PLAN - AREA NORTHEAST**
3/64" = 1'-0"

SCHMIDT
ASSOCIATES
415 Massachusetts Avenue
Indianapolis, IN 46204
www.schmidt-arch.com

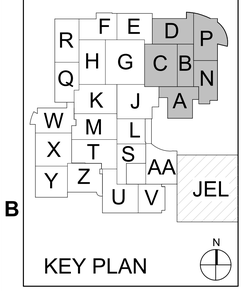
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced BNW / PWF

SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
ARCHITECT

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

ROOF MECHANICAL PLAN - NORTHEAST

MR101.3

MR101.3_ROOF MECHANICAL PLAN - NORTHEAST
2019-067.NCH_M.3.3 of Washington Township, North Central High School Renovation_
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EXHAUST FAN SCHEDULE - 23 34 23

IDENTITY DATA				WEIGHT (LBS)	FAN DATA							ELECTRICAL DATA			UNIT CONTROL	NOTES
MARK	MANUFACTURER	SERVICES	MODEL	WEIGHT (LBS)	FAN TYPE	DRIVE TYPE	AIRFLOW (CFM)	ESP (IN-WG)	RPM	HP	BHP	VOLTS (V)	PH	FREQ (HZ)	UNIT CONTROL	NOTES
EF-A1	GREENHECK	RECEIVING	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,200	0.50	1680	0.33	0.26	115	1	60	BAS	[1-3]
EF-A2	GREENHECK	LOCKER ROOM	G-160-VG	70	DOWNBLAST CENTRIFUGAL	DIRECT	2,870	0.50	1176	1.00	0.63	115	1	60	BAS	[1-2,7]
EF-A3	GREENHECK	MECH ROOM	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	800	0.50	1443	0.25	0.14	115	1	60	BAS	[1-3]
EF-A4	GREENHECK	SHOWERS	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	480	0.50	1446	0.13	0.09	115	1	60	BAS	[1-3]
EF-A5	GREENHECK	LAUNDRY	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	430	0.50	1400	0.13	0.08	115	1	60	BAS	[1-3]
EF-A6	GREENHECK	RESTROOMS	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	520	0.50	1477	0.13	0.1	115	1	60	BAS	[1-3]
EF-A7	GREENHECK	LOCKER ROOM	G-160-VG	70	DOWNBLAST CENTRIFUGAL	DIRECT	2,840	0.50	1170	1.00	0.63	115	1	60	BAS	[1-2,7]
EF-A8	GREENHECK	SHOWERS	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	480	0.50	1446	0.13	0.09	115	1	60	BAS	[1-3]
EF-A9	GREENHECK	RECEIVING	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	0.50	1725	0.25	0.21	115	1	60	BAS	[1-3]
EF-A10	TJERLUND	DRYER	RT1500	100	ROOF	DIRECT	900	0.50	-	0.50	0.4	120	1	60	PRESSURE CONTROL	[4]
EF-A11	GREENHECK	E-AHU-A1 RELIEF	G-240-VG	130	DOWNBLAST CENTRIFUGAL	DIRECT	6,850	0.50	854	2.00	1.64	208	3	60	PRESSURE CONTROL	[1-2,8]
EF-A12	GREENHECK	E-AHU-A1 RELIEF	USF-27-B4	550	UTILITY SET	DIRECT	6,850	0.75	1170	3.00	1.46	208	3	60	PRESSURE CONTROL	[1,2,8]
EF-B1	GREENHECK	RESTROOMS	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,080	0.50	1725	0.25	0.24	115	1	60	BAS	[1-3]
EF-B2	GREENHECK	DARK ROOM	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	BAS	[1-3]
EF-B3	GREENHECK	CUST STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	650	0.50	1550	0.13	0.12	115	1	60	BAS	[1-3]
EF-B4	GREENHECK	CAFÉ STORAGE	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	925	0.50	1570	0.25	0.18	115	1	60	BAS	[1-3]
EF-B5	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	300	0.50	1550	0.13	0.06	115	1	60	BAS	[1-3]
EF-B6	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	160	0.50	1465	0.05	0.04	115	1	60	BAS	[1-3]
EF-B7	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-B8	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-B9	S&P	DISH HOOD (76)	REFER TO KITCHEN EQUIP PLANS				1,750	REFER TO KITCHEN EQUIP PLANS								[6]
EF-B10	GREENHECK	CUST	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[1-3]
EF-B11	TJERLUND	DRYER	LB2	20	INLINE	DIRECT	160	0.30	-	0.07	0.05	120	1	60	PRESSURE CONTROL	[5]
EF-C1	S&P	KITCHEN HOOD (27)	REFER TO KITCHEN EQUIP PLANS				2,000	REFER TO KITCHEN EQUIP PLANS								[6]
EF-C2	S&P	KITCHEN HOOD (40)	REFER TO KITCHEN EQUIP PLANS				4,400	REFER TO KITCHEN EQUIP PLANS								[6]
EF-C3	S&P	KITCHEN HOOD (51)	REFER TO KITCHEN EQUIP PLANS				9,080	REFER TO KITCHEN EQUIP PLANS								[6]
EF-C4	GREENHECK	STORAGE	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[1-3]
EF-C5	GREENHECK	STORAGE	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	0.50	1725	0.50	0.25	115	1	60	BAS	[1-3]
EF-C6	GREENHECK	WORKSHOP	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	400	0.50	1488	0.07	0.07	115	1	60	TOGGLE	[1-3]
EF-C7	GREENHECK	DRY STORAGE	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	800	0.50	1443	0.25	0.14	115	1	60	BAS	[1-3]
EF-C8	GREENHECK	RESTROOMS	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	0.50	1725	0.50	0.25	115	1	60	BAS	[1-3]
EF-C9	GREENHECK	ELECTRICAL	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	400	0.50	1488	0.07	0.07	115	1	60	THERMOSTAT	[1-3]
EF-D1	GREENHECK	RESTROOMS	G-160-VG	80	DOWNBLAST CENTRIFUGAL	DIRECT	3,370	0.50	1320	2.00	0.88	208	3	60	BAS	[1-2,7]
EF-D2	GREENHECK	STORAGE	G-098-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	750	0.50	1725	0.25	0.18	115	1	60	BAS	[1-3]
EF-D3	GREENHECK	RESTROOMS	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	500	0.50	1550	0.05	0.04	115	1	60	BAS	[1-3]
EF-E1	GREENHECK	STORAGE	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
A5.3 ~~EF-E2~~	~~GREENHECK~~	~~STORAGE~~	~~G-080-D~~	~~17~~	~~DOWNBLAST CENTRIFUGAL~~	~~DIRECT~~	~~500~~	~~0.50~~	~~1550~~	~~0.05~~	~~0.04~~	~~115~~	~~1~~	~~60~~	~~BAS~~	~~[1-3]~~
EF-E3	GREENHECK	MDF ROOM	G-120-A	60	DOWNBLAST CENTRIFUGAL	DIRECT	1,500	0.50	1725	0.50	0.47	115	1	60	THERMOSTAT	[1-3]
EF-E4	GREENHECK	ELEV MACHINE ROOM	SE1-12-432-E	20	SIDEWALL	DIRECT	800	0.10	1050	0.05	0.03	115	1	60	THERMOSTAT	[1-3]
EF-E5	GREENHECK	WORKROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	TOGGLE	[1-3]
EF-E6	GREENHECK	WORKROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	TOGGLE	[1-3]
EF-E7	GREENHECK	WORKROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	TOGGLE	[1-3]
EF-F1	GREENHECK	RESTROOMS	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	400	0.50	1488	0.07	0.07	115	1	60	BAS	[1-3]
EF-F2	GREENHECK	ELEC	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	THERMOSTAT	[1-3]
EF-F3	GREENHECK	STORAGE	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,050	0.50	1705	0.25	0.23	115	1	60	BAS	[1-3]
EF-F4	GREENHECK	RESTROOMS	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	550	0.50	1500	0.13	0.1	115	1	60	BAS	[1-3]
EF-F5	GREENHECK	ELEC	G-097-B	46	DOWNBLAST CENTRIFUGAL	DIRECT	125	0.50	1140	0.17	0.03	115	1	60	THERMOSTAT	[1-3]
EF-F6	GREENHECK	WELLNESS ROOM	G-097-B	46	DOWNBLAST CENTRIFUGAL	DIRECT	125	0.50	1140	0.17	0.03	115	1	60	BAS	[1-3]
EF-F7	GREENHECK	IDF ROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	THERMOSTAT	[1-3]
EF-G1	GREENHECK	RESTROOMS	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	500	0.50	1550	0.05	0.04	115	1	60	BAS	[1-3]
EF-G2	GREENHECK	RESTROOMS	G-098-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	700	0.50	1725	0.25	0.18	115	1	60	BAS	[1-3]
EF-G3	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	525	0.50	1550	0.13	0.11	115	1	60	BAS	[1-3]
EF-G4	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	BAS	[1-3]
EF-G5	GREENHECK	ELEC	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	THERMOSTAT	[1-3]
EF-G6	GREENHECK	CUST	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[1-3]
EF-G7	GREENHECK	SPOTLIGHT	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	THERMOSTAT	[1-3]
EF-G8	GREENHECK	SCENE SHOP	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,080	0.50	1725	0.25	0.24	115	1	60	BAS	[1-3]
EF-H1	GREENHECK	RESTROOMS	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	550	0.50	1500	0.13	0.1	115	1	60	BAS	[1-3]
EF-H2	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	475	0.50	1550	0.07	0.07	115	1	60	BAS	[1-3]
EF-H3	GREENHECK	CONCESSION	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	300	0.50	1550	0.13	0.06	115	1	60	THERMOSTAT	[1-3]
EF-H4	GREENHECK	RESTROOMS	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,790	0.50	1725	0.50	0.41	115	1	60	BAS	[1-3]
EF-H5	GREENHECK	RESTROOMS	G-130-A	58	DOWNBLAST CENTRIFUGAL	DIRECT	2,180	0.50	1725	0.50	0.55	115	1	60	BAS	[1-3]
EF-H6	GREENHECK	CONCESSION	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	300	0.50	1550	0.13	0.06	115	1	60	THERMOSTAT	[1-3]
EF-H7	TJERLUND	DRYER	LB2	20	INLINE	DIRECT	160	0.30	-	0.07	0.05	120	1	60	PRESSURE CONTROL	[5]
EF-H8	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-J1	GREENHECK	ELEC + CUST OFFICE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	625	0.50	1550	0.17	0.12	115	1	60	BAS	[1-3]
EF-J2	GREENHECK	SCENE STORAGE	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	800	0.50	1443	0.25	0.14	115	1	60	BAS	[1-3]
EF-J3	GREENHECK	RESTROOMS	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	325	0.50	1504	0.07	0.06	115	1	60	BAS	[1-3]
EF-J4	GREENHECK	DRESSING ROOMS	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	BAS	[1-3]
EF-J5	GREENHECK	STORAGE	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	0.50	1725	0.50	0.25	115	1	60	BAS	[1-3]
EF-J6	GREENHECK	STORAGE	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,100	0.50	1725	0.25	0.24	115	1	60	BAS	[1-3]
EF-J7	GREENHECK	STORAGE	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[1-3]
EF-J9	TJERLUND	DRYER	LB2	20	INLINE	DIRECT	160	0.30	-	0.07	0.05	120	1	60	PRESSURE CONTROL	[5]
EF-J10	TJERLUND	DRYER	LB2	20	INLINE	DIRECT	160	0.30	-	0.07	0.05	120	1	60	PRESSURE CONTROL	[5]
EF-K1	GREENHECK	LOCKER ROOM	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,650	0.50	1475	1.00	0.65	115	1	60	BAS	[1-3]
EF-K2	GREENHECK	LOCKER ROOM	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,100	0.50	1725	0.25	0.24	115	1	60	BAS	[1-3]
EF-K3	GREENHECK	GYM STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	360	0.50	1501	0.07	0.06	115	1	60	BAS	[1-3]
EF-K4	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-K5	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-K6	GREENHECK	STORAGE	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[1-3]
EF-K7	GREENHECK	ELEC	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	160	0.50	1465	0.05	0.04	115	1	60	THERMOSTAT	[1-3]
EF-K8	GREENHECK	MECH ROOM	G-160-VG	80	DOWNBLAST CENTRIFUGAL	DIRECT	3,000	0.50	1212	2.00	0.69	208	3	60	THERMOSTAT	[1-2,7]
EF-K9	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	THERMOSTAT	[1-3]
EF-L1	GREENHECK	RESTROOMS	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,600	0.50	1725	0.50	0.46	115	1	60	BAS	[1-3]
EF-L2	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	BAS	[1-3]
EF-L3	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	175	0.50	1485	0.05	0.05	115	1	60	THERMOSTAT	[1-3]
E-EF-M1	EXIST - SEE PHASE 2	RESTROOMS	-	46	DOWNBLAST CENTRIFUGAL	DIRECT	800	0.5	1445	0.25	0.14	115	1	60	BAS	[9]
EF-M2	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	575	0.50	1521	0.13	0.11	120	1	60	BAS	[1-3]
EF-M3	GREENHECK	LOCKER ROOM	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,400	0.50	1475	1.00	0.65	115	1	60	BAS	[1-2,7]
EF-M4	GREENHECK	RR/SHOWER	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	650	0.50	1550	0.13	0.12	115	1	60	BAS	[1-3]
EF-M5	GREENHECK	RR/SHOWER	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,275	0.50	1366	0.50	0.23	115	1	60	BAS	[1-3]
EF-M6	GREENHECK	LOCKER ROOM	G-200-VG	103	DOWNBLAST CENTRIFUGAL	DIRECT	5,150	0.50	1195	2.00	1.68	208	3	60	BAS	[1-2,7]
EF-M7	GREENHECK	ELEC	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	430	0.50	1400	0.13	0.08	115	1	60	THERMOSTAT	[1-3]
EF-M8	GREENHECK	LOCKER RR	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	0.50	1725	0.25	0.21	115	1	60	BAS	[1-3]
EF-M9	GREENHECK	LOCKER ROOM	G-130-A	58	DOWNBLAST CENTRIFUGAL	DIRECT	2,150	0.50	1725	0.50	0.55	115	1	60	BAS	[1-3]
EF-M10	GREENHECK	LOCKER ROOM	G-160-VG	80	DOWNBLAST CENTRIFUGAL	DIRECT	3,000	0.50	1212	2.00	0.69	208	3	60	BAS	[1-2,7]
EF-M11	GREENHECK	LOCKER ROOM	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,400	0.50	1475	1.00	0.65	115	1	60	BAS	[1-3]
EF-M12	GREENHECK	STORAGE	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	900	0.50	1725	0.25	0.18	115	1	60	BAS	[1-3]
EF-M13	GREENHECK	RR/SHOWER	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	900	0.50	1725	0.25	0.18	115	1	60	BAS	[1-3]
EF-M14	GREENHECK	RESTROOMS	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	500	0.50	1550	0.05	0.04	115	1	60	BAS	[1-3]
EF-M15	GREENHECK	STORAGE	G-097-B	46	DOWNBLAST CENTRIFUGAL	DIRECT	120	0.50	1140	0.17	0.03	115	1	60	BAS	[1-3]
EF-M16	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	310	0.50	1504	0.07	0.06	115	1	60	BAS	[1-3]
EF-M17	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	BAS	[1-3]
EF-M18	GREENHECK	MECH ROOM	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,600	0.50	1725	0.50	0.46	115	1	60	THERMOSTAT	[1-3]

EXHAUST FAN SCHEDULE - 23 34 23

IDENTITY DATA				WEIGHT (LBS)	FAN DATA							ELECTRICAL DATA			UNIT CONTROL	NOTES
MARK	MANUFACTURER	SERVICES	MODEL	WEIGHT (LBS)	FAN TYPE	DRIVE TYPE	AIRFLOW (CFM)	ESP (IN-WG)	RPM	HP	BHP	VOLTS (V)	PH	FREQ (HZ)	UNIT CONTROL	NOTES
EF-N1	GREENHECK	RESTROOMS	G-160-VG	80	DOWNBLAST CENTRIFUGAL	DIRECT	3,200	0.50	1270	2.00	0.79	208	3	60	BAS	[1-2,7]
EF-N2	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	BAS	[1-3]
EF-N3	GREENHECK	ART	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,750	0.50	1725	0.50	0.45	115	1	60	BAS	[1-3]
EF-N4	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-N5	GREENHECK	ELEC	G-098-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	750	0.50	1725	0.25	0.18	115	1	60	THERMOSTAT	[1-3]
EF-N6	GREENHECK	CERAMICS	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,550	0.50	1547	1.00	0.74	115	1	60	BAS	[1-3]
EF-N7	GREENHECK	PAINT SPRAY BOOTH	CUE-099-A	48	UPBLAST CENTRIFUGAL	DIRECT	775	0.50	1443	0.25	0.14	115	1	60	TOGGLE	[1-2,7]
EF-N8	GREENHECK	KILN HOOD	CUE-120-A	64	UPBLAST CENTRIFUGAL	DIRECT	1,500	0.50	1491	0.50	0.29	115	1	60	TOGGLE	[1-3]
EF-N9	GREENHECK	ELEV MACHINE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	THERMOSTAT	[1-3]
EF-N10	GREENHECK	STORAGE/ELEC	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	440	0.50	1526	0.07	0.07	115	1	60	BAS	[1-3]
EF-N11	GREENHECK	ELEC	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	160	0.50	1465	0.05	0.04	115	1	60	THERMOSTAT	[1-3]
EF-N12	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	300	0.50	1550	0.13	0.06	115	1	60	BAS	[1-3]
EF-N13	GREENHECK	MECH ROOM	G-240-VG	149	DOWNBLAST CENTRIFUGAL	DIRECT	8,000	0.25	920	3.00	1.98	208	3	60	THERMOSTAT	[1-2,7]
EF-N14	GREENHECK	SOLDERING HOOD	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	0.75	1725	0.25	0.21	115	1	60	BAS	[1-3]
EF-N15	GREENHECK	IDF ROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	THERMOSTAT	[1-3]
EF-P1	GREENHECK	RESTROOMS	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	800	0.50	1443	0.25	0.14	115	1	60	BAS	[1-3]
EF-P2	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	300	0.50	1550	0.13	0.06	115	1	60	BAS	[1-3]
EF-P3	GREENHECK	STORAGE	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[1-3]
EF-P4	GREENHECK	RESTROOMS	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	400	0.50	1488	0.07	0.07	115	1	60	BAS	[1-3]
EF-P5	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	BAS	[1-3]
EF-P6	GREENHECK	WORKROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	TOGGLE	[1-3]
EF-P7	GREENHECK	IDF / ELEC	G-095-G	17	DOWNBLAST CENTRIFUGAL	DIRECT	275	0.50	1300	0.08	0.06	115	1	60	THERMOSTAT	[1-3]
EF-P8	GREENHECK	ELEC	G-060-D	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	THERMOSTAT	[1-3]
EF-P9	GREENHECK	PAINTING CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,200	0.50	1680	0.33	0.26	115	1	60	BAS	[1-3]
EF-Q1	GREENHECK	ELEV MACHINE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	THERMOSTAT	[1-3]
EF-Q2	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q3	GREENHECK	CHEMISTRY LAB	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,500	0.50	1725	0.50	0.47	115	1	60	BAS	[1-3]
EF-Q4	GREENHECK	CHEMISTRY LAB	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-2,7]
EF-Q5	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-2,7]
EF-Q6	GREENHECK	ZOOLOGY LAB	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,500	0.50	1725	0.50	0.47	115	1	60	BAS	[1-3]
EF-Q7	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	650	0.50	1550	0.13	0.12	115	1	60	BAS	[1-3]
EF-Q8	GREENHECK	RESTROOMS	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	500	0.50	1550	0.05	0.04	115	1	60	BAS	[1-3]
EF-Q9	GREENHECK	GREENHOUSE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	THERMOSTAT	[1-3]
EF-Q10	GREENHECK	LAB PREP	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	300	0.50	1550	0.13	0.06	115	1	60	BAS	[1-3]
EF-Q11	GREENHECK	CHEMISTRY LAB	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q12	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	375	0.50	1465	0.07	0.06	115	1	60	BAS	[1-3]
EF-Q13	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q14	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	175	0.50	1485	0.05	0.05	115	1	60	BAS	[1-3]
EF-Q15	GREENHECK	MECH ROOM	G-240-VG	149	DOWNBLAST CENTRIFUGAL	DIRECT	8,000	0.25	920	3.00	1.98	208	3	60	THERMOSTAT	[1-2,7]
EF-Q16	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	540	0.50	1550	0.13	0.12	115	1	60	BAS	[1-3]
EF-Q17	TJERLUND	DRYER	LB2	20	INLINE	DIRECT	160	0.30	-	0.07	0.05	120	1	60	PRESSURE CONTROL	[5]
EF-Q18	GREENHECK	STORAGE	G-098-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	760	0.50	1725	0.25	0.18	115	1	60	THERMOSTAT	[1-3]
EF-Q19	GREENHECK	IDF ROOM	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	THERMOSTAT	[1-3]
EF-Q20	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q21	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q22	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q23	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	380	0.50	1716	0.10	0.06	115	1	60	BAS	[1-3]
EF-Q24	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q25	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q26	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q27	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q28	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q29	GREENHECK	SCIENCE LAB	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-Q30	GREENHECK	LAB PREP	G-098-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	700	0.50	1725	0.25	0.18	115	1	60	BAS	[1-3]
EF-R1	GREENHECK	ELEC	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	0.50	1725	0.25	0.21	115	1	60	THERMOSTAT	[1-3]
EF-R2	GREENHECK	RESTROOMS	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	0.50	1725	0.25	0.21	115	1	60	BAS	[1-3]
EF-R3	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	580	0.50	1725	0.10	0.1	115	1	60	BAS	[1-3]
EF-R4	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	340	0.50	1433	0.07	0.06	115	1	60	BAS	[1-3]
EF-R5	GREENHECK	RESTROOMS	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,000	0.50	1725	0.25	0.21	115	1	60	BAS	[1-3]
EF-R6	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R7	GREENHECK	STORAGE	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,200	0.50	1680	0.33	0.26	115	1	60	BAS	[1-3]
EF-R8	GREENHECK	SCIENCE LAB	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R9	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R10	GREENHECK	ELEC	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	150	0.50	1550	0.05	0.05	115	1	60	THERMOSTAT	[1-3]
EF-R11	GREENHECK	IDF	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	THERMOSTAT	[1-3]
EF-R12	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R13	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R14	GREENHECK	SCIENCE CLASS	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R15	GREENHECK	CHEMISTRY LAB	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,500	0.50	1725	0.50	0.47	115	1	60	BAS	[1-3]
EF-R16	GREENHECK	SCIENCE LAB	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,250	0.50	1725	0.33	0.28	115	1	60	BAS	[1-3]
EF-R17	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	250	0.50	1550	0.05	0.06	115	1	60	BAS	[1-3]
EF-R18	NOT USED			-	-	-	-	-	-	-	-	-	-	-	-	-
EF-R19	GREENHECK	SCIENCE LAB	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,500	0.50	1725	0.50	0.47	115	1	60	BAS	[1-3]
EF-S1	GREENHECK	ELEC	G-100-A	48	DOWNBLAST CENTRIFUGAL	DIRECT	1,200	0.50	1680	0.33	0.26	115	1	60	THERMOSTAT	[1-3]
EF-S2	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	410	0.50	1498	0.07	0.07	115	1	60	BAS	[1-3]
EF-S3	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	190	0.50	1504	0.05	0.05	115	1	60	BAS	[1-3]
EF-S4	GREENHECK	MECH ROOM	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,600	0.50	1571	1.00	0.78	115	1	60	THERMOSTAT	[1-2,7]
EF-S5	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	600	0.50	1544	0.13	0.11	115	1	60	THERMOSTAT	[1-3]
EF-S6	GREENHECK	STORAGE/MECH	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	400	0.50	1488	0.07	0.07	115	1	60	BAS	[1-3]
EF-T1	GREENHECK	ELEC	G-095-G	20	DOWNBLAST CENTRIFUGAL	DIRECT	280	0.50	1300	0.08	0.06	115	1	60	THERMOSTAT	[1-3]
EF-T2	GREENHECK	DANCE	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,400	0.50	1475	1.00	0.65	115	1	60	BAS	[1-2,7]
EF-T3	GREENHECK	STORAGE	G-095-D	20	DOWNBLAST CENTRIFUGAL	DIRECT	650	0.50	1550	0.13	0.12	115	1	60	BAS	[1-3]
E-EF-T4	EXIST - SEE PHASE 2	STORAGE	-	12	DOWNBLAST CENTRIFUGAL	DIRECT	100	0.50	1490	0.02	0.01	115	1	60	BAS	[9]
EF-T5	GREENHECK	MECH ROOM	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,600	0.50	1571	1.00	0.78	115	1	60	THERMOSTAT	[1-2,7]
EF-W1	GREENHECK	MECH ROOM	G-120-A	57	DOWNBLAST CENTRIFUGAL	DIRECT	1,400	0.50	1725	0.50	0.25	115	1	60	THERMOSTAT	[1-3]
EF-AA1	GREENHECK	STORAGE	G-090-D	18	DOWNBLAST CENTRIFUGAL	DIRECT	400	0.50	1488	0.07	0.07	115	1	60	BAS	[1-3]
EF-AA2	GREENHECK	RESTROOMS	G-099-A	46	DOWNBLAST CENTRIFUGAL	DIRECT	1,050	0.50	1705	0.25	0.23	115	1	60	BAS	[1-3]
EF-AA3	GREENHECK	STORAGE	G-080-D	17	DOWNBLAST CENTRIFUGAL	DIRECT	200	0.50	1518	0.05	0.05	115	1	60	BAS	[1-3]
EF-AA4	GREENHECK	MECH ROOM	G-140-VG	68	DOWNBLAST CENTRIFUGAL	DIRECT	2,600	0.50	1571	1.00	0.78	115	1	60	THERMOSTAT	[1-2,7]

EXHAUST FAN SCHEDULE NOTES:

1. DISCONNECT BY MANUFACTURER.
2. SEE M-700 SERIES SHEETS FOR TEMPERATURE CONTROL INFORMATION.
3. PROVIDE FAN SPEED CONTROLLER FOR BALANCING.
4. PROVIDE PRESSURE CONTROLER LIKE TJERLUND MODEL COP2 AND DISCHARGE HOOD WITH GRAVITY DAMPER. FAN TO BE MOUNTED ON MATCHING ROOF CURB.
5. PROVIDE MATCHING PRESSURE AND TEMPERATURE SENSING CONTROL.
6. REFER TO KITCHEN EQUIPMENT PLANS FOR FAN INFORMATION.
7. ECM MOTOR.
8. PROVIDE VFD FOR BALANCING.
9. EXISTING FAN TO REMAIN.

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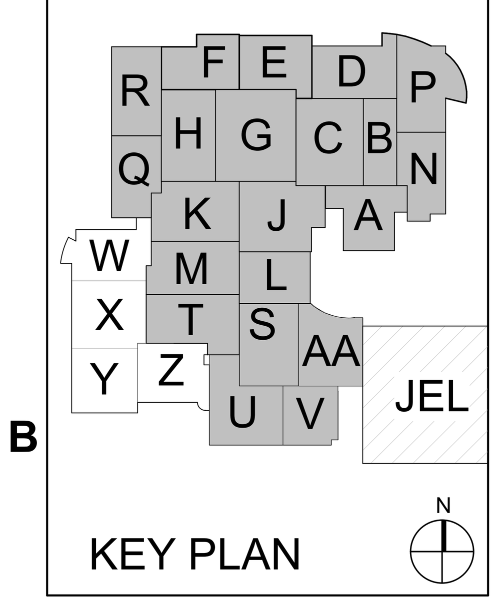
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

MECHANICAL SCHEDULES

M-602.3

4-PIPE HYDRONIC FAN COIL UNIT SCHEDULE - 23 82 19

IDENTITY DATA				DIMENSIONS			FAN DATA				COOLING DATA												HEATING DATA									ELECTRICAL DATA					
MARK	MANUFACTURER	MODEL	WEIGHT (LBS)	L	W	H	CFM	ESP (IN-WG)	W	SPEED	TOTAL (BTUH)	SENSIBLE (BTUH)	ROWS	GPM	EWT (°F)	LWT (°F)	EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	COIL WPD (FT-WG)	FLUID TYPE	TOTAL HEATING (BTUH)	ROWS	GPM	EWT (°F)	LWT (°F)	EDB (°F)	LDB (°F)	COIL WPD (FT-WG)	FLUID TYPE	VOLTS (V)	PH	FREQ (HZ)	FLA (A)	MOCP (A)	NOTES
FCU-A1	TRANE	FCCB030	81	33"	25"	10"	200	0.4	77	HIGH	7,600	5,410	4	1.3	44.0	56.0	80.0	67.0	55.0	54.6	3.1	WATER	4,840	1	0.5	160.0	140.0	68.0	90.0	0.1	WATER	115	1	60	2.8	15.0	[1-7]
FCU-A2	TRANE	FCCB030	81	33"	25"	10"	200	0.4	77	HIGH	7,600	5,410	4	1.3	44.0	56.0	80.0	67.0	55.0	54.6	3.1	WATER	4,840	1	0.5	160.0	140.0	68.0	90.0	0.1	WATER	115	1	60	2.8	15.0	[1-7]
FCU-C1	TRANE	FCCB060	139	47"	25"	10"	450	0.4	156	HIGH	16,740	12,070	4	2.8	44.0	56.0	80.0	67.0	55.0	54.8	2.8	WATER	9,900	1	0.7	160.0	130.0	68.0	88.0	0.7	WATER	115	1	60	3.9	15.0	[1-7]
FCU-C2	TRANE	FCCB060	139	47"	25"	10"	450	0.4	156	HIGH	16,740	12,070	4	2.8	44.0	56.0	80.0	67.0	55.0	54.8	2.8	WATER	9,900	1	0.7	160.0	130.0	68.0	88.0	0.7	WATER	115	1	60	3.9	15.0	[1-7]
FCU-G1	TRANE	FCHB030	78	36"	10"	30"	200	-	48	HIGH	7,600	5,410	4	1.3	44.0	56.0	80.0	67.0	55.0	54.6	3.1	WATER	4,840	1	0.5	160.0	140.0	68.0	90.0	0.1	WATER	115	1	60	2.8	15.0	[1-6,8]

HYDRONIC FAN COIL UNIT SCHEDULE NOTES:
1. DISCONNECT BY MANUFACTURER. FACTORY-INSTALLED TOGGLE DISCONNECT.
2. UNIT SELECTED FOR SCHEDULED SPEED SETTING. SCHEDULED CFM IS NOMINAL CFM. BALANCE FAN COIL UNIT TO AIRFLOW INDICATED ON PLANS.
3. COORDINATE COLOR WITH ARCHITECT.
4. HEATING COIL PROVIDED IN REHEAT POSITION.
5. 4-PIPE HEATING AND COOLING CABINET.
6. SEE M-700 SERIES SHEETS FOR TEMPERATURE CONTROL INFORMATION.
7. PROVIDE HORIZONTAL DUCTED CABINET.
8. PROVIDE VERITCAL, HIDEAWAY FULLY RECESSED CABINET.

HYDRONIC PROP UNIT HEATER SCHEDULE - 23 82 39.16

IDENTITY DATA				HEATING DATA							FAN DATA					ELECTRICAL DATA					
MARK	MANUFACTURER	MODEL	WEIGHT (LBS)	CAPACITY (BTUH)	EWT (°F)	LWT (°F)	WPD (FT-WG)	FLOW (GPM)	EAT (°F)	LAT (°F)	AIRFLOW (CFM)	FAN TYPE	DRIVE	HP	RPM	VOLTS (V)	PH	FREQ (HZ)	FLA (A)	MOCP (A)	NOTES
PUH-A1	TRANE	UHS-060	41	39,397	160	140	0.17	4.4	60	105	900	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-A2	TRANE	UHS-084	47	61,633	160	140	0.24	6.1	60	100	1,400	PROP	DIRECT	0.1	1,000	115	1	60	2.8	5.0	[1-3]
PUH-E1	TRANE	UHS-024	30	13,800	160	140	0.01	1.8	60	96	450	PROP	DIRECT	16 W	1,550	115	1	60	1.0	1.8	[1-3]
PUH-E2	TRANE	UHS-024	30	13,800	160	140	0.01	1.8	60	96	450	PROP	DIRECT	16 W	1,550	115	1	60	1.0	1.8	[1-3]
PUH-F1	TRANE	UHS-024	30	13,800	160	140	0.01	1.8	60	96	450	PROP	DIRECT	16 W	1,550	115	1	60	1.0	1.8	[1-3]
E-PUH-G1	EXISTING			34,320	160	140	-	3.5	60	103	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[4]
E-PUH-G2	EXISTING			34,320	160	140	-	3.5	60	103	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[4]
PUH-K1	TRANE	UHS-060	41	39,397	160	140	0.17	4.4	60	105	900	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-K2	TRANE	UHS-060	41	39,397	160	140	0.17	4.4	60	105	900	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
E-PUH-K3	EXISTING			19,300	160	140	-	2.0	60	103	425	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[4]
PUH-M1	TRANE	UHS-048	41	34,320	160	140	0.12	3.5	60	103	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-N1	TRANE	UHS-072	44	51,480	160	140	0.23	5.3	60	104	1,100	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-N2	TRANE	UHS-072	44	51,480	160	140	0.23	5.3	60	104	1,100	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-Q1	TRANE	UHS-084	47	61,633	160	140	0.24	6.1	60	100	1,400	PROP	DIRECT	0.1	1,000	115	1	60	2.8	5.0	[1-3]
PUH-Q2	TRANE	UHS-084	47	61,633	160	140	0.24	6.1	60	100	1,400	PROP	DIRECT	0.1	1,000	115	1	60	2.8	5.0	[1-3]
PUH-S1	TRANE	UHS-024	30	13,800	160	140	0.01	1.8	60	96	450	PROP	DIRECT	0.1	1,000	115	1	60	1.0	1.8	[1-3]
PUH-T1	TRANE	UHS-048	41	34,320	160	140	0.12	3.5	60	103	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-W1	TRANE	UHS-048	41	34,320	160	140	0.12	3.5	60	103	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]
PUH-AA1	TRANE	UHS-048	41	34,320	160	140	0.12	3.5	60	103	750	PROP	DIRECT	0.1	1,000	115	1	60	1.8	3.2	[1-3]

HYDRONIC PROP UNIT HEATER SCHEDULE NOTES:
1. DISCONNECT BY DIV 26.
2. SEE M-700 SERIES SHEETS FOR TEMPERATURE CONTROL INFORMATION.
3. PROVIDE NEW ISOLATION VALVES AND FLOW CONTROL VALVE.
4. EXISTING TO REMAIN, FOR REFERENCE ONLY

AIR CURTAIN SCHEDULE - 23 34 33

IDENTITY DATA				FAN DATA		ELECTRIC HEATING DATA	MOTOR DATA		ELECTRICAL DATA					
MARK	MANUFACTURER	MODEL	WEIGHT (LBS)	AIRFLOW (CFM)	NOZZLE WIDTH (IN)	CAPACITY (KW)	QTY.	HP EACH	VOLTS (V)	PH	FREQ (HZ)	MCA (A)	MOCP (A)	NOTES
AC-P1	BERNER	ARD12-2072E	200	3,174	6'-0"	28	2	0.5	480	3	60	28.3	40	1-6
AC-P2	BERNER	ARD12-2072E	200	3,174	6'-0"	28	2	0.5	480	3	60	28.3	40	1-6

A5.3

AIR CURTAIN SCHEDULE NOTES:
1. MANUFACTURER-INSTALLED TOGGLE DISCONNECT.
2. ELECTRICAL CONNECTION TO BE FLEXIBLE.
3. STANDARD WHITE COLOR.
4. TWO SETS OF WASHABLE FILTERS BY MANUFACTURER.
5. DOOR SWITCH MAGNETIC REED. UNIT IS INTERLOCKED WITH DOOR POSITION SWITCH. COORDINATE WITH DOOR FRAME. SEE ARCHITECTURE SHEETS.
6. UNIT SHALL BE RECESS MOUNTED IN CEILING. (A5.3)

ELECTRIC HUMIDIFIER SCHEDULE - 23 84 13

IDENTITY DATA						WATER DATA		ELECTRICAL DATA						
MARK	MANUFACTURER	MODEL	SERVES	WEIGHT (LBS)	OUTPUT (LB/H)	TYPE	FLOW (GPM)	CAP. (KW)	VOLTS (V)	PH	FREQ (HZ)	MCA (A)	MOCP (A)	NOTES
H-AA1	DRISTEEM	RX-63-1	ORCHESTRA	142	63.0	RO	0.12	21	480	3	60	27.1	30.0	[1-5]
H-AA2	DRISTEEM	RX-12-1	ORCHESTRA STORAGE	94	12.0	RO	<0.1	4	480	3	60	7.2	10.0	[1-5]
H-AA3	DRISTEEM	RX-6-1	BAND/INSTRUMENT CORRIDOR	93	18.0	RO	<0.1	6	480	3	60	7.2	10.0	[1-3,5-6]

A5.3 A5.3

HUMIDIFIER SCHEDULE NOTES:
1. DISCONNECT BY MANUFACTURER.
2. PROVIDE WITH SPACE DISTRIBUTION UNIT TO REMOVE VAPOR TRAILS.
3. UNIT SHALL HAVE UNIVERSAL WATER CAPABILITIES (I.E. DCW, SOFTENED WATER, RO, DI WATER).
4. UNIT SHALL BE WALL MOUNTED. VERIFY CLEARANCE REQUIREMENTS WITH MANUFACTURER.
5. PROVIDE WITH CONDENSATE PUMPING STATION AND CONDENSATE COOLING CAPABILITIES.
6. HUMIDIFIER UNIT SHALL BE MOUNTED ABOVE THE CEILING. VERIFY CLEARANCE REQUIREMENTS WITH MANUFACTURER. SPACE DISPERSION UNIT SHALL BE WALL MOUNTED IN SPACE. SEE PLAN. PROVIDE PIPING CONNECTIONS TO REMOTE DISPERSION UNIT AS REQUIRED. (A5.3)

DUCT SOUND ATTENUATOR SCHEDULE - 23 33 00

IDENTITY DATA					DIMENSIONS			AIRFLOW DATA			MIN INSERTION LOSSES (BY OCTAVE BAND)							
MARK	MANUFACTURER	MODEL	EQUIPMENT SERVED	DUCT SYSTEM	H	W	L	AIRFLOW (CFM)	APD (IN-WG)	FACE VELOCITY (FPM)	1	2	3	4	5	6	7	8
SA-K1	PRICE	RM48-9B	AHU-K6	RETURN	16"	30"	48"	3,100	0.05	930	4.0	7.0	11.0	18.0	14.0	11.0	8.0	6.0

SPLIT SYSTEM SCHEDULE - 23 81 26

INDOOR UNIT: IDENTITY DATA				DIMENSIONS			COOLING CAPACITY			AIRFLOW DATA				OUTDOOR UNIT: IDENTITY DATA				COOLING DATA		HEATING DATA		ENERGY DATA				ELECTRICAL DATA					
MARK	MANUFACTURER	MODEL	WEIGHT (LBS)	L	W	H	TOTAL (BTUH)	SENSIBLE (BTUH)	CAPACITY (BTUH)	MIN (CFM)	MAX (CFM)	DESIGN (CFM)	EXT. STATIC (IN-WG)	MARK	MODEL	SERVES	WEIGHT (LBS)	NOMINAL (BTUH)	AMBIENT (°F)	CAPACITY (BTUH)	AMBIENT (°F)	COP	EER	SEER	REF. TYPE	VOLTS (V)	PH	FREQ (HZ)	MCA (A)	MOCP (A)	NOTES
SS-B1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-B1	RKB09	SS-B1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-B2	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-B2	RKB09	SS-B2	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-D1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-D1	RKB09	SS-D1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-E1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-E1	RKB09	SS-E1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-F1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-F1	RKB09	SS-F1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-G1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-G1	RKB09	SS-H1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-H1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-H1	RKB09	SS-H1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-J1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-J1	RKB09	SS-J1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-J2	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-J2	RKB09	SS-J2	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-L1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-L1	RKB09	SS-P1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-P1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-P1	RKB09	SS-P1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-Q1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-Q1	RKB09	SS-P1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]
SS-R1	DAIKIN	FTKB09	20	36"	9"	12"	8,800	7,165	8,800	215	330	330	-	CU-R1	RKB09	SS-P1	53	0.75	95	-	-	-	11.0	17.0	R-410A	208	1	60	7.0	15.0	[1-4]

SPLIT SYSTEMS UNIT SCHEDULE NOTES:
1. DISCONNECT BY DIVISION 26.
2. PROVIDE WITH LOW AMBIENT CONTROLS.
3. SEE M-700 SERIES DRAWINGS FOR TEMPERATURE CONTROLS AND HIGH TEMPERATURE ALARM INFORMATION.
4. PROVIDE CONDENSATE PUMP FOR INDOOR UNIT.

CEILING FAN SCHEDULE - 23 34 39

IDENTITY DATA						ELECTRICAL DATA					
MARK	MANUFACTURER	MODEL	# OF BLADES	DIAMETER	WEIGHT (LBS)	VOLTS (V)	PH	FREQ (HZ)	MOCP (A)	HP	NOTES
CF-1	GREENHECK	DC-5	5	8'	100	120	1	60	20	1/4	1-5
CF-2	GREENHECK	DC-5	5	8'	100	120	1	60	20	1/4	1-5
CF-3	GREENHECK	DC-5	5	8'	100	120	1	60	20	1/4	1-5

CEILING FAN SCHEDULE NOTES:
1. CONTROLS: MANUFACTURER-PROVIDED CONTROLLER SHALL COMMUNICATE VIA BACNET. SEE M-700 SHEETS FOR TEMPERATURE CONTROLS INFORMATION.
2. CONTRACTOR TO COORDINATE DOWNROD LENGTH, MOUNTING BRACKET STYLE, AND GUY WIRE LENGTH TO ACHIEVE INSTALLED AIRFOIL HEIGHT AS INDICATED ON PLANS.
3. MANUFACTURER-PROVIDED TOGGLE DISCONNECT.
4. FAN CONSTRUCTION AND FINISH SHALL BE SUITABLE FOR DAMP AND CORROSIVE ENVIRONMENTS.
5. AIRFOIL COLOR SHALL BE MANUFACTURER'S STANDARD WHITE COLOR.

HYDRONIC RADIANT CEILING PANEL SCHEDULE - 23 82 36

IDENTITY DATA			HEATING DATA					PANEL			
MARK	MANUFACTURER	MODEL	BTUH/LF	TOTAL CAP. (BTUH)	EWT (°F)	LWT (°F)	FLOW (GPM)	WIDTH (IN)	LENGTH (FEET)	PASSES	NOTES
RCP-K1	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-K2	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-K3	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-K4	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-K5	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-K6	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M1	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M2	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M3	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M4	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M5	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M6	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M7	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M8	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M9	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M10	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M11	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M12	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M13	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M14	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M15	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M16	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M17	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M18	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M19	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M20	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M21	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M22	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M23	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M24	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M25	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M26	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5
RCP-M27	ZEHNDER	LINEAR	362	2,896	160	130	0.19	24"	8	4	1-5

HYDRONIC RADIANT CEILING PANEL SCHEDULE NOTES:
1. REFERENCE ARCHITECTURAL CEILING PLANS FOR CEILING TYPE.
2. SEE M-700 SERIES DRAWINGS FOR TEMPERATURE CONTROLS INFORMATION.
3. COORDINATE WITH M.C. FOR INSULATION REQUIRED FOR PROPER INSTALLATION.
4. 1/2" NOMINAL, TYPE L COPPER TUBING. ALUMINUM PANEL.
5. COLOR SELECTED BY ARCHITECT.

PUMP SCHEDULE - 23 21 23

IDENTITY DATA						FLUID DATA					MOTOR DATA			ELECTRICAL DATA			
MARK	MANUFACTURER	MODEL	SYSTEM SERVED	WEIGHT (LBS)	TYPE	FLUID TYPE	FLOW (GPM)	HEAD (FT-WG)	TEMP (°F)	EFF (%)	HP	BHP	SPEED (RPM)	VOLTS (V)	PH	FREQ (HZ)	NOTES
IP-A1	GRUNDFOS	UPS 50-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	75	20	160	48.1	0.75	-	3,500	460	3	60	[1-3]
IP-A2	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	55	20	160	46.8	0.75	-	3,500	460	3	60	[1-3]
IP-B1	GRUNDFOS	UPS 50-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	32	20	160	29.8	0.75	-	3,500	460	3	60	[1-3]
IP-C1	GRUNDFOS	UPS 32-80 F F	HHW	25	INLINE CIRCULATOR	WATER	5	20	160	6.8	0.50	-	3,500	460	3	60	[1-3]
IP-C2	GRUNDFOS	UPS 50-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	75	20	160	48.1	0.75	-	3,500	460	3	60	[1-3]
IP-C3	GRUNDFOS	UPS 50-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	65	20	160	47.1	0.75	-	3,500	460	3	60	[1-3]
IP-C4	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	50	20	160	45.3	0.75	-	3,500	460	3	60	[1-3]
IP-C5	GRUNDFOS	UPS 50-160 F	HHW	40	INLINE CIRCULATOR	WATER	150	20	160	37.4	3.00	-	3,500	460	3	60	[1-3]
IP-D1	GRUNDFOS	UPS 32-80 F	HHW	40	INLINE CIRCULATOR	WATER	25	20	160	38.9	0.50	-	3,500	460	3	60	[1-3]
E-IP-D2	EXISTING		HHW	-	INLINE CIRCULATOR	WATER	18	30	160	-	0.75	-	-	460	3	60	[3,4]
IP-E1	GRUNDFOS	UPS 40-80/2 F	HHW	25	INLINE CIRCULATOR	WATER	13	20	160	24.0	0.75	-	3,500	460	3	60	[1-3]
IP-E2	GRUNDFOS	UPS 40-80/2 F	HHW	25	INLINE CIRCULATOR	WATER	19	20	160	31.1	0.75	-	3,500	460	3	60	[1-3]
IP-E3	GRUNDFOS	UPS 32-80 F	HHW	40	INLINE CIRCULATOR	WATER	10	20	160	38.9	0.50	-	3,500	460	3	60	[1-3]
IP-F1	GRUNDFOS	UPS 40-80/2 F	HHW	25	INLINE CIRCULATOR	WATER	14	20	160	25.3	0.75	-	3,500	460	3	60	[1-3]
IP-H1	GRUNDFOS	UPS 32-80 F	HHW	40	INLINE CIRCULATOR	WATER	25	20	160	38.9	0.50	-	3,500	460	3	60	[1-3]
IP-H2	GRUNDFOS	UPS 40-80/2 F	HHW	25	INLINE CIRCULATOR	WATER	18	20	160	30.0	0.75	-	3,500	460	3	60	[1-3]
IP-J3	GRUNDFOS	UPS 32-160F	HHW	40	INLINE CIRCULATOR	WATER	40	20	160	36.6	0.75	-	3,500	460	3	60	[1-3]
IP-K6	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	20	20	160	32.0	0.75	-	3,500	460	3	60	[1-3]
IP-M1	GRUNDFOS	UPS 50-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	34	20	160	30.8	0.75	-	3,500	460	3	60	[1-3]
IP-M2	GRUNDFOS	UPS 75-69 F	HHW	54	INLINE CIRCULATOR	WATER	130	20	160	41.8	1.50	-	3,500	460	3	60	[1-3]
E-IP-N1	EXISTING		HHW	-	INLINE CIRCULATOR	WATER	25	30	160	-	0.75	-	-	460	3	60	[3,4]
IP-N2	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	35	20	160	45.7	0.75	-	3,500	460	3	60	[1-3]
IP-P1	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	37	20	160	46.4	0.75	-	3,500	460	3	60	[1-3]
E-IP-P2	EXISTING		HHW	-	INLINE CIRCULATOR	WATER	48	30	160	-	1.00	-	-	460	3	60	[3,4]
IP-Q1	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	50	20	160	32.9	0.75	-	3,500	460	3	60	[1-3]
E-IP-Q2	EXISTING		HHW	-	INLINE CIRCULATOR	WATER	57	30	160	-	1.00	-	-	460	3	60	[3,4]
IP-R1	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	50	20	160	32.9	0.75	-	3,500	460	3	60	[1-3]
IP-R2	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	47	20	160	48.6	0.75	-	3,500	460	3	60	[1-3]
IP-S1	GRUNDFOS	UPS 32-160 F	HHW	40	INLINE CIRCULATOR	WATER	57	20	160	36.6	0.75	-	3,500	460	3	60	[1-3]
IP-T1	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	50	20	160	32.9	0.75	-	3,500	460	3	60	[1-3]
IP-AA1	GRUNDFOS	UPS 40-80/2 F	HHW	40	INLINE CIRCULATOR	WATER	50	20	160	32.9	0.75	-	3,500	460	3	60	[1-3]

PUMP SCHEDULE NOTES:
1. REFER TO IN-LINE PUMP INSTALLATION DETAIL 1A/M-501.3.
2. 3-SPEED PUMP.
3. REFER TO M-700 SERIES FOR TEMPERATURE CONTROLS INFORMATION.
4. EXISTING INLINE PUMP TO REMAIN.

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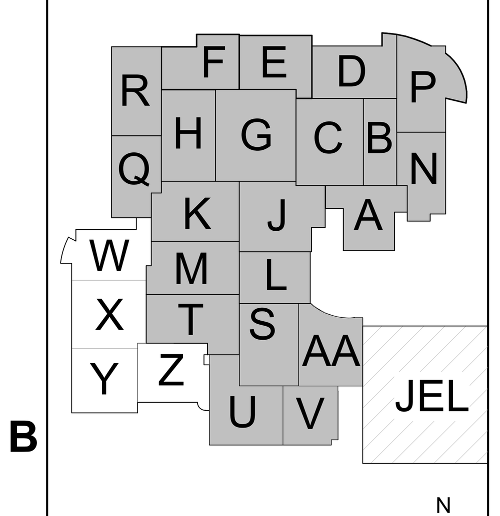
Project No. 2019-067.NCH
Project Date 03.03.2023
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Produced BNW / PWF

SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

MECHANICAL SCHEDULES

M-603.3

VAV BOX WITH HOT WATER REHEAT SCHEDULE - 23 36 00

IDENTITY DATA				AIRFLOW DATA				NOISE DATA		REHEAT COIL DATA									
MARK	MANUF.	MODEL	INLET DIAMETER	COOLING MAX AIRFLOW (CFM)	HEATING MAX AIRFLOW (CFM)	OCCUPIED MINIMUM AIRFLOW (CFM)	STATIC INLET (IN-WG)	MAX DISCH.	MAX RAD.	CAPACITY (BTUH)	EAT (°F)	LAT (°F)	APD (IN-WG)	FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (FT-WG)	ROWS	NOTES
B1-01	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.22	2.4	140	109	0.14	2	[1-6]
B1-02	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
B1-03	TRANE	VCWF	8	500	325	200	0.75	16	-	12,296	55	90	0.28	1.1	140	117	0.07	2	[1-6]
B1-04	TRANE	VCWF	8	350	230	140	0.75	-	-	8,702	55	90	0.16	0.7	140	114	0.03	2	[1-6]
B1-05	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
B1-06	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
B1-07	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
B1-08	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
B1-09	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
B1-10	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
B1-11	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
B1-12	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
B1-13	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.27	1.9	140	111	0.13	2	[1-6]
B1-14	TRANE	VCWF	12	1,070	695	430	0.75	-	-	26,295	55	90	0.26	2.0	140	113	0.24	2	[1-6]
B1-15	TRANE	VCWF	12	870	565	350	0.75	-	-	21,377	55	90	0.19	1.5	140	112	0.14	2	[1-6]
B1-16	TRANE	VCWF	12	870	565	350	0.75	-	-	21,377	55	90	0.19	1.5	140	112	0.14	2	[1-6]
B1-17	TRANE	VCWF	12	870	565	350	0.75	-	-	21,377	55	90	0.19	1.5	140	112	0.14	2	[1-6]
B1-18	TRANE	VCWF	12	950	620	380	0.75	-	-	23,458	55	90	0.2	1.7	140	112	0.2	2	[1-6]
B1-19	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.25	2.4	140	109	0.16	2	[1-6]
B1-20	TRANE	VCWF	12	870	565	350	0.75	-	-	21,377	55	90	0.19	1.5	140	112	0.14	2	[1-6]
B1-21	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
C1-01	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
C1-02		NOT USED		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1-03	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
C1-04	TRANE	VCWF	10	780	505	310	0.75	-	-	19,107	55	90	0.3	1.3	140	110	0.3	2	[1-6]
C1-05	TRANE	VCWF	8	500	325	200	0.75	16	-	12,296	55	90	0.28	1.1	140	117	0.07	2	[1-6]
C1-06	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
C1-07	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
C1-08	TRANE	VCWF	10	600	390	240	0.75	-	-	14,756	55	90	0.18	0.8	140	105	0.09	2	[1-6]
C4-01	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
C4-02	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-03	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-04	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-05	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-06	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-07	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-08	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
C4-09	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.25	2.4	140	109	0.16	2	[1-6]
C4-10	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-11	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.25	2.4	140	109	0.16	2	[1-6]
C4-12	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
C4-13	TRANE	VCWF	8	400	260	160	0.75	-	-	9,837	55	90	0.20	0.9	140	117	0.04	2	[1-6]
C4-14	TRANE	VCWF	10	550	360	220	0.75	-	-	13,621	55	90	0.16	0.8	140	105	0.07	2	[1-6]
C4-15	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
C4-16	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
C4-17	TRANE	VCWF	10	840	545	335	0.75	-	-	20,620	55	90	0.31	1.4	140	111	0.36	2	[1-6]
C4-18	TRANE	VCWF	10	1,050	685	420	0.75	-	-	25,917	55	90	0.20	1.7	140	110	0.09	2	[1-6]
C4-19	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
C4-20	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
C4-21	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
C4-22	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
C4-23	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
C4-24	TRANE	VCWF	10	600	390	240	0.75	-	-	14,756	55	90	0.18	0.8	140	105	0.09	2	[1-6]
C4-25	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
D1-01	TRANE	VCWF	14	1,185	770	475	0.75	-	-	29,133	55	90	0.17	1.9	140	110	0.18	2	[1-6]
D1-02	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
D1-03	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
D1-04	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
D1-05	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
D1-06	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
D1-07	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
D1-08	TRANE	VCWF	8	375	245	150	0.75	-	-	9,270	55	90	0.2	0.8	140	118	0.1	2	[1-6]
D1-09	TRANE	VCWF	10	700	455	280	0.75	-	-	17,215	55	90	0.23	1.0	140	106	0.12	2	[1-6]
D1-10	TRANE	VCWF	10	600	390	240	0.75	-	-	14,756	55	90	0.18	0.8	140	105	0.09	2	[1-6]
D1-11	TRANE	VCWF	6	300	195	120	0.75	15	-	7,378	55	90	0.26	0.4	140	105	0.09	2	[1-6]
D1-12	TRANE	VCWF	10	550	360	220	0.75	-	-	13,621	55	90	0.16	0.8	140	105	0.07	2	[1-6]
D1-13	TRANE	VCWF	8	400	260	160	0.75	-	-	9,837	55	90	0.20	0.9	140	117	0.04	2	[1-6]
D1-14	TRANE	VCWF	8	400	260	160	0.75	-	-	9,837	55	90	0.20	0.9	140	117	0.04	2	[1-6]
D1-15	TRANE	VCWF	4	125	100	100	0.75	20	-	3,784	55	90	0.03	0.3	140	111	0.08	1	[1-6]
D1-16	TRANE	VCWF	6	325	210	130	0.75	15	-	7,945	55	90	0.3	0.5	140	108	0.2	2	[1-6]
D1-17	TRANE	VCWF	4	125	100	100	0.75	20	-	3,784	55	90	0.03	0.3	140	111	0.08	1	[1-6]
D1-18	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
D1-19	TRANE	VCWF	6	300	195	120	0.75	15	-	7,378	55	90	0.26	0.4	140	105	0.09	2	[1-6]
D1-20	TRANE	VCWF	10	1,050	685	420	0.75	-	-	25,917	55	90	0.20	1.7	140	110	0.09	2	[1-6]
D1-21	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.28	1.8	140	107	0.16	2	[1-6]
D1-22	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.28	1.8	140	107	0.16	2	[1-6]
D1-23	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.28	1.8	140	107	0.16	2	[1-6]
D1-24	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.28	1.8	140	107	0.16	2	[1-6]
D1-25	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.28	1.8	140	107	0.16	2	[1-6]
D1-26	TRANE	VCWF	14	1,250	815	500	0.75	-	-	30,836	55	90	0.19	2.0	140	109	0.11	2	[1-6]
D1-27	TRANE	VCWF	14	1,450	945	580	0.75	-	-	35,754	55	90	0.2	2.5	140	111	0.3	2	[1-6]
D1-28	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
D1-29	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
D2-01	TRANE	VCWF	10	550	360	220	0.75	-	-	13,621	55	90	0.16	0.8	140	105	0.07	2	[1-6]
D2-02	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
D2-03	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
D2-04	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
D2-05	TRANE	VCWF	16	2,000	1,300	800	0.75	-	-	49,186	55	90	0.29	3.0	140	107	0.26	2	[1-6]
D2-06	TRANE	VCWF	12	800	520	320	0.75	-	-	19,674	55	90	0.25	1.4	140	111	0.12	2	[1-6]
D2-07	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
D2-08	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
D2-09	TRANE	VCWF	4	150	100	100	0.75	22	-	3,784	55	90	0.04	0.3	140	113	0.12	2	[1-6]
D2-10	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.23	1.9	140	111	0.11	2	[1-6]
D2-11	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
D2-12	TRANE	VCWF	12	1,090	710	435	0.75	-	-	26,863	55	90	0.23	1.9	140	111	0.11	2	[1-6]
D2-13	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
D2-14	TRANE	VCWF	10	650	425	260	0.75	-	-	16,080	55	90	0.18	0.9	140	105	0.09	2	[1-6]
D2-15	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
D2-16	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
D2-17	TRANE	VCWF	12	800	520	320	0.75	-	-	19,674	55	90	0.25	1.4	140	111	0.12	2	[1-6]
D2-18	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.28	1.8	140	107	0.16	2	[1-6]

VAV BOX WITH HOT WATER REHEAT SCHEDULE NOTES:

1. COORDINATE LOCATION OF BOX A BOVE CEILING WITH LIGHT FIXTURES, FIRE PROTECTION, HEATING AND COOLING SYSTEM PIPING, PLUMBING SYSTEMS, AND WIRE TRAYS.
2. PROVIDE WITH FACTORY MOUNTED CONTROLLERS. SEE M-700 SERIES DRAWINGS FOR TEMPERATURE CONTROLS INFORMATION.
3. INSULATED BOTTOM ACCESS DOOR UPSTREAM OF COIL WITH SNAP LATCH FASTENERS.
4. PROVIDE WITH 2-WAY VALVES.
5. COORDINATE PIPING CONNECTION SIDE WITH PLANS.
6. PROVIDE LINED WITH 1/2" MATTE INSULATION.
7. EXISTING TO REMAIN, SEE PHASE 2 DRAWINGS FOR ADDITIONAL INFORMATION.

VAV BOX WITH HOT WATER REHEAT SCHEDULE - 23 36 00

IDENTITY DATA				AIRFLOW DATA				NOISE DATA		REHEAT COIL DATA									
MARK	MANUF.	MODEL	INLET DIAMETER	COOLING MAX AIRFLOW (CFM)	HEATING MAX AIRFLOW (CFM)	OCCUPIED MINIMUM AIRFLOW (CFM)	STATIC INLET (IN-WG)	MAX DISCH.	MAX RAD.	CAPACITY (BTUH)	EAT (°F)	LAT (°F)	APD (IN-WG)	FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (FT-WG)	ROWS	NOTES
E1-01	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
E1-02	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
E1-03	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
E1-04	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
E1-05	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.25	2.4	140	109	0.16	2	[1-6]
E1-06	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
E1-07	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
E1-08	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
E1-09	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
E1-10	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
E1-11	TRANE	VCWF	4	150	100	100	0.75	22	-	3,784	55	90	0.04	0.3	140	113	0.12	2	[1-6]
E1-12	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
E1-13	TRANE	VCWF	10	650	425	260	0.75	-	-	16,080	55	90	0.21	0.9	140	106	0.10	2	[1-6]
E2-01	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
E2-02	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
E2-03	TRANE	VCWF	8	500	325	200	0.75	16	-	12,296	55	90	0.28	1.1	140	117	0.07	2	[1-6]
E2-04	TRANE	VCWF	8	450	295	180	0.75	-	-	11,161	55	90	0.24	1.0	140	117	0.06	2	[1-6]
E2-05	TRANE	VCWF	6	300	195	120	0.75	15	-	7,378	55	90	0.26	0.4	140	105	0.09	2	[1-6]
E2-06	TRANE	VCWF	5	200	130	100	0.75	19	-	4,919	55	90	0.06	0.5	140	119	0.30	1	[1-6]
E2-07	TRANE	VCWF	16	1,950	1,270	780	0.75	-	-	48,050	55	90	0.28	2.8	140	106	0.24	2	[1-6]
E2-08	TRANE	VCWF	16	1,950	1,270	780	0.75	-	-	48,050	55	90	0.28	2.8	140	106	0.24	2	[1-6]
E2-09	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.17	1.9	140	109	0.10	2	[1-6]
E2-10	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
E2-11		NOT USED		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2-12	TRANE	VCWF	4	150	100	100	0.75	22	-	3,784	55	90	0.04	0.3	140	113	0.12	2	[1-6]
E2-13	TRANE	VCWF	5	200	130	100	0.75	19	-	4,919	55	90	0.06	0.5	140	119	0.30	1	[1-6]
E2-14	TRANE	VCWF	16	1,950	1,270	780	0.75	-	-	48,050	55	90	0.28	2.8	140	106	0.24	2	[1-6]
E2-15	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
E2-16	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
E2-17	TRANE	VCWF	6	300	195	120	0.75	15	-	7,378	55	90	0.26	0.4	140	105	0.09	2	[1-6]
E2-18	TRANE	VCWF	6	300	195	120	0.75	15	-	7,378	55	90	0.26	0.4	140	105	0.09	2	[1-6]
E2-19	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
E2-20	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
E2-21	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
E2-22		NOT USED		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2-23	TRANE	VCWF	8	450	295	180	0.75	-	-	11,161	55	90	0.24	1.0	140	117	0.06	2	[1-6]
E2-24	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
E3-01	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
E3-02	TRANE	VCWF	10	700	455	280	0.75	-	-	17,215	55	90	0.23	1.0	140	106	0.12	2	[1-6]
E3-03	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
E3-04	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
E3-05	TRANE	VCWF	6	300	195	120	0.75	15	-	7,378	55	90	0.26	0.4	140	105	0.09	2	[1-6]
E3-06	TRANE	VCWF	8	400	260	160	0.75	-	-	9,837	55	90	0.20	0.9	140	117	0.04	2	[1-6]
E3-07	TRANE	VCWF	5	200	130	100	0.75	19	-	4,919	55	90	0.06	0.5	140	119	0.30	1	[1-6]
E3-08	TRANE	VCWF	5	225	145	90	0.75	19	-	5,486	55	90	0.07	1.1	140	129	1.89	1	[1-6]
E3-09	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.17	1.9	140	109	0.10	2	[1-6]
E3-10	TRANE	VCWF	8	500	325	200	0.75	16	-	12,296	55	90	0.28	1.1	140	118	0.07	2	[1-6]
F1-01	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.25	2.4	140	109	0.16	2	[1-6]
F1-02	TRANE	VCWF	4	125	100	100	0.75	20	-	3,784	55	90	0.03	0.3	140	111	0.08	1	[1-6]
F1-03	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
F1-04	TRANE	VCWF	4	150	100	100	0.75	22	-	3,784	55	90	0.04	0.3	140	113	0.12	2	[1-6]
F1-05	TRANE	VCWF	4	150	100	100	0.75	22	-	3,784	55	90	0.04	0.3	140	113	0.12	2	[1-6]
F1-06	TRANE	VCWF	6	325	210	130	0.75	15	-	7,945	55	90	0.3	0.5	140	108	0.2	2	[1-6]
F1-07	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
F1-08	TRANE	VCWF	4	60	60	60	0.75	-	-	2,270	55	90	0.02	0.1	140	106	0.04	1	[1-6]
F1-09	TRANE	VCWF	14	1,200	780	480	0.75	-	-	29,511	55	90	0.17	1.9	140	109	0.10	2	[1-6]
F1-10	TRANE	VCWF	8	500	325	200	0.75	16	-	12,296	55	90	0.28	1.1	140	117	0.07	2	[1-6]
F1-11	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
F1-12	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
F1-13	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
F1-14	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
F1-15	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
F1-16	TRANE	VCWF	14	1,400	910	560	0.75	-	-	34,430	55	90	0.22	2.2	140	109	0.14	2	[1-6]
F1-17	TRANE	VCWF	5	250	165	100	0.75	20	-	6,243	55	90	0.08	0.8	140	125	0.79	1	[1-6]
F1-18	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
F1-19	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
F1-20	TRANE	VCWF	10	750	490	300	0.75	-	-	18,539	55	90	0.26	1.1	140	107	0.14	2	[1-6]
F1-21	TRANE	VCWF	4	125	100	100	0.75	20	-	3,784	55	90	0.03	0.3	140	111	0.08	1	[1-6]
F1-22	TRANE	VCWF	5	160	105	100	0.75	16	-	3,973	55	90	0.04	0.4	140	120	0.36	1	[1-6]
F1-23	TRANE	VCWF	4	125	100	100	0.75	20	-	3,784	55	90	0.03	0.3	140	111	0.08	1	[1-6]
F1-24	TRANE	VCWF	10	600	390	240	0.75	-	-	14,756	55	90	0.18	0.8	140	105	0.09	2	[1-6]
F1-25	TRANE	VCWF	5	160	105	100	0.75	16	-	3,973	55	90	0.04	0.4	140	120	0.36	1	[1-6]
G4-01	TRANE	VCWF	10	600	390	240	0.75	-	-	14,756	55	90	0.18	0.8	140	105	0.09	2	[1-6]
G4-02	TRANE	VCWF	16	1,800	1,170	720	0.75	-	-	44,267	55	90	0.24	2.6	140	106	0.20	2	[1-6]
G4-03	TRANE	VCWF	16	1,800	1,170	720	0.75	-	-	44,267	55	90	0.24	2.6	140	106	0.20	2	[1-6]
G4-04	TRANE	VCWF	16	1,700	1,105	680	0.75	-	-	41,808	55	90	0.22	2.5	140	106	0.18	2	[1-6]
G4-05	TRANE	VCWF	16	1,700	1,105	680	0.75	-	-	41,808	55	90	0.22	2.5	140	106	0.18	2	[1-6]
G4-06	TRANE	VCWF	12	860	560	345	0.75	-	-	21,188	55	90	0.32	1.3	140	108	0.19	2	[1-6]
G4-07	TRANE	VCWF	16	1,700	1,105	680	0.75	-	-	41,808	55	90	0.22	2.5	140	106	0.18	2	[1-6]
G4-08	TRANE	VCWF	16	1,700	1,105	680	0.75	-	-	41,808	55	90	0.22	2.5	140	106	0.18	2	[1-6]
G4-09	TRANE	VCWF	16	1,800	1,170	720	0.75	-	-	44,267	55	90	0.24	2.6	140	106	0.20	2	[1-6]
G4-10	TRANE	VCWF	10	600	390	240	0.75	-	-	14,756	55	90	0.18	0.8	140	105	0.09	2	[1-6]
E-G4-11	-	-	8	550	360	220	0.75	-	-	13,621	55	90	-	0.8	140	105	-	2	[7]
E-G4-12	-	-	5	350	230	140	0.75	25	-	8,702	55	90	-	0.5	140	105	-	2	[7]
E-G4-13	-	-	8	550	360	220	0.75	-	-	13,621	55	90	-	0.8	140	105	-	2	[7]
H1-01	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.27	1.9	140	111	0.13	2	[1-6]
H1-02	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
H1-03	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
H1-04	TRANE	VCWF	8	350	230	140	0.75	-	-	8,702	55	90	0.16	0.7	140	114	0.03	2	[1-6]
H1-05	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
H1-06	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
H1-07	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
H1-08	TRANE	VCWF	4	100	100	100	0.75	17	-	3,784	55	90	0.03	0.2	140	106	0.04	1	[1-6]
H1-09	TRANE	VCWF	4	150	100	100	0.75	22	-	3,784	55	90	0.04	0.3	140	113	0.12	2	[1-6]
H1-10	TRANE	VCWF	12	1,090	710	435	0.75	-	-	26,863	55	90	0.27	1.9	140	111	0.13	2	[1-6]
H1-11	TRANE	VCWF	10	720	470	290	0.75	-	-	17,782	55	90	0.24	1.2	140	109	0.24	2	[1-6]
H1-12	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
H1-13	TRANE	VCWF	10	720	470	290	0.75	-	-	17,782	55	90	0.24	1.2	140	109	0.24	2	[1-6]
H1-14	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
H1-15	TRANE	VCWF	12	1,125	730	450	0.75	-	-	27,620	55	90	0.28	2.0	140	112	0.14	2	[1-6]
H1-16	TRANE	VCWF	12	1,125	730	450	0.75	-	-	27,620	55	90	0.28	2.0	140	112	0.14	2	[1-6]
H1-17	TRANE	VCWF	10	850	555	340	0.75	-	-	20,998	55	90	0.31	1.3	140	108	0.19	2	[1-6]
H1-18	TRANE	VCWF	10	850	555	340	0.75	-	-	20,998	55	90	0.31	1.3	140	108	0.19	2	[1-6]
H1-19	TRANE	VCWF	10	850	555	340	0.75	-	-	20,998	55	90	0.31	1.3	140	108	0.19	2	[1-6]
H1-20	TRANE	VCWF	10	850	555	340	0.75	-	-	20,998	55	90	0.31	1.3	140	108	0.19	2	[1-6]
H1-21	TRANE	VCWF	10	850	555	340	0.75	-	-	20,998	55	90	0.31	1.3	140	108	0.19	2	[1-6]
H1-22	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
H1-23	TRANE	VCWF	14	1,195	775	480	0.75	-	-	29,322	55	90	0.17	1.9	140	110	0.18	2	[1-6]
H1-24	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
H1-25	TRANE	VCWF	12	1,135	740	455	0.75	-	-	27,998	55	90	0.26	2.2	140	114	0.28	2	[1-6]
H1-26	TRANE	VCWF	12	875	570	350	0.75	-	-	21,566	55	90	0.19	1.5	140	112	0.14	2	[1-6]
H2-01	TRANE	VCWF	14	1,500	975	600	0.75	-	-	36,889	55	90	0.25	2.4	140	109	0.16	2	[1-6]
H2-02	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
H2-03	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]
H2-04	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
H2-05	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
H2-06	TRANE	VCWF	16	1,800	1,170	720	0.75	-	-	44,267	55	90	0.24	2.6	140	106	0.20	2	[1-6]
H2-07	TRANE	VCWF	12	1,050	685	420	0.75	-	-	25,917	55	90	0.25	1.8	140	111	0.12	2	[1-6]
H2-08	TRANE	VCWF	12	1,100	715	440	0.75	-	-	27,052	55	90	0.27	1.9	140	111	0.13	2	[1-6]
H2-09	TRANE	VCWF	10	700	455	280	0.75	-	-	17,215	55	90	0.23	1.0	140	106	0.12	2	[1-6]
H2-10	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
H2-11	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
H2-12	TRANE	VCWF	12	900	585	360	0.75	-	-	22,133	55	90	0.20	1.5	140	110	0.09	2	[1-6]
H2-13	TRANE	VCWF	10	700	455	280	0.75	-	-	17,215	55	90	0.23	1.0	140	106	0.12	2	[1-6]
H2-14	TRANE	VCWF	12	1,000	650	400	0.75	-	-	24,593	55	90	0.23	1.7	140	111	0.11	2	[1-6]
H2-15	TRANE	VCWF	10	800	520	320	0.75	-	-	19,674	55	90	0.28	1.2	140	107	0.16	2	[1-6]

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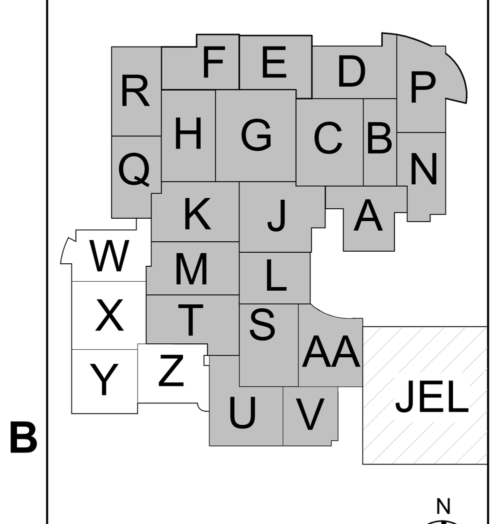
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SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

MECHANICAL SCHEDULES

M-604.3

HYDRONIC CABINET UNIT HEATER SCHEDULE - 23 82 39.13

IDENTITY DATA				HEATING DATA									FAN DATA						ELECTRICAL DATA				
MARK	MANUFACTURER	MODEL	ENCLOSURE MODEL	CAPACITY (BTUH)	EWT (°F)	LWT (°F)	WPD (FT-WG)	FLOW (GPM)	EAT (°F)	LAT (°F)	FLUID TYPE	VALVE	AIRFLOW (CFM)	FAN TYPE	DRIVE	W	RPM	SPEEDS	VOLTS (V)	PH	FREQ (HZ)	FLA (A)	NOTES
E-CH-A1	EXIST	-	HORIZ. CABINET	34,700	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
CH-A2	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-A3	TRANE	FFD 030	HORIZ. CABINET	19,200	160	140	7.5	1.3	70	100	WATER	2 WAY	280	CENTRIFUFAL	DIRECT	70.00	780	3	115	1	60	0.7	[1-3]
CH-A4	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-A5	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-A6	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-A7	TRANE	FFD 030	HORIZ. CABINET	19,200	160	140	7.5	1.3	70	100	WATER	2 WAY	280	CENTRIFUFAL	DIRECT	70.00	780	3	115	1	60	0.7	[1-3]
CH-A8	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-A9	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-E1	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-E2	TRANE	FFD 030	HORIZ. CABINET	19,200	160	140	7.5	1.3	70	100	WATER	NONE	280	CENTRIFUFAL	DIRECT	70.00	780	3	115	1	60	0.7	[1-3]
CH-F1	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,4]
E-CH-J1	EXIST	-	HORIZ. CABINET	34,700	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
CH-J2	TRANE	FFD 030	HORIZ. CABINET	19,200	160	140	7.5	1.3	70	100	WATER	2 WAY	280	CENTRIFUFAL	DIRECT	70.00	780	3	115	1	60	0.7	[1-3]
E-CH-J3	EXIST	-	HORIZ. CABINET	34,700	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-K1	EXIST	-	HORIZ. CABINET	19,500	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-M1	EXIST - SEE PHASE 2			7,080	160	140	2.0	1.3	60	106	WATER	2 WAY	-	CENTRIFUFAL	DIRECT	-	-	3	115	1	60	-	[7]
E-CH-M2	EXIST - SEE PHASE 2			7,080	160	140	2.0	1.3	60	106	WATER	2 WAY	-	CENTRIFUFAL	DIRECT	-	-	3	115	1	60	-	[7]
CH-M3	TRANE	FFD 030	HORIZ. CABINET	19,200	160	140	7.5	1.3	70	100	WATER	2 WAY	280	CENTRIFUFAL	DIRECT	70.00	780	3	115	1	60	0.7	[1-3]
CH-M4	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
CH-M5	TRANE	FFD 060	HORIZ. CABINET	37,400	160	140	7.6	2.5	70	100	WATER	2 WAY	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1-3]
E-CH-M6	EXIST	-	HORIZ. CABINET	19,500	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-M7	EXIST	-	HORIZ. CABINET	19,500	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-M8	EXIST	-	HORIZ. CABINET	19,500	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-M9	EXIST	-	HORIZ. CABINET	34,700	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-M10	EXIST	-	HORIZ. CABINET	19,500	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
E-CH-M11	EXIST	-	HORIZ. CABINET	19,500	160	140	-	2.0	70	110	WATER	2 WAY	-	-	-	-	-	-	115	1	60	-	[6]
CH-N1	TRANE	FFH 060	VERTICAL RECESSED	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]
CH-N2	TRANE	FFH 060	VERTICAL RECESSED	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]
CH-Q1	TRANE	FFH 060	VERTICAL RECESSED	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]
CH-Q2	TRANE	FFH 060	VERTICAL RECESSED	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]
E-CH-R1	EXIST	-	VERTICAL RECESSED	19,500	160	140	-	2.0	70	110	WATER	NONE	-	-	-	-	-	-	115	1	60	-	[6]
CH-R2	TRANE	FFH 060	VERTICAL RECESSED	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]
CH-R3	TRANE	FFH 060	VERTICAL RECESSED	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]
CH-AA1	TRANE	FFH 060	VERTICAL SURFACE	37,400	160	140	7.6	2.5	70	100	WATER	NONE	544	CENTRIFUFAL	DIRECT	110.00	780	3	115	1	60	1.2	[1,2,5]

HYDRONIC CABINET UNIT HEATER SCHEDULE NOTES:

1. DISCONNECT SWITCH BY MANUFACTURER. DISCONNECT SWITCH AND ALL INTERLOCK RELAYS TO BE INSTALLED WITHIN HEATER ENCLOSURE.
2. PROVIDE WITH TAMPER PROOF ACCESS DOOR AND THERMOSTAT.
3. INSTALL UNIT TIGHT TO BOTTOM OF CEILING.
4. INSTALL UNIT 12 INCHES BELOW STRUCTURE IN OPEN CEILING.
5. FULLY RECESSED CABINET. PROVIDE RECESSING FLANGE AS REQUIRED TO INFILL EXISTING CAVITY.
6. UNIT IS EXISTING TO REMAIN. PROVIDE NEW VALVES AND ACTUATORS WHERE APPLICABLE. SEE M700 SERIES DRAWINGS FOR MORE INFORMATION.
7. HEATERS REPLACED AS PART OF PHASE 2 SCOPE. EXISTING TO REMAIN.

INTAKE AND RELIEF HOOD SCHEDULE - 23 37 23

IDENTITY DATA					HOOD DATA		THROAT DATA				
								DIMENSIONS			
MARK	TYPE	MANUFACTURER	MODEL	WEIGHT (LBS)	AIRFLOW (CFM)	TSP (IN-WG)	VELOCITY (FPM)	L	W	DIA	NOTES
E-IH-A1	PENTHOUSE	EXISTING	EXISTING	EXISTING	14,000	0.03	933	60"	36"	-	[3]
E-IH-A2	PENTHOUSE	EXISTING	EXISTING	EXISTING	7,000	0.05	580	48"	36"	-	[3]
E-RH-B1	HOOD	EXISTING	EXISTING	EXISTING	10,000	0.10	780	-	-	48"	[3]
E-IH-C1	PENTHOUSE	EXISTING	EXISTING	EXISTING	25,000	0.08	780	16'	24"	-	[3]
E-IH-C2	PENTHOUSE	EXISTING	EXISTING	EXISTING	50,000	0.07	670	15'	60"	-	[3]
E-RH-C1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-C2	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-RH-C3	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-C4	PENTHOUSE	EXISTING	EXISTING	EXISTING	15,000	0.10	800	190"	22"	-	[4]
E-RH-C5	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-C6	PENTHOUSE	GREENHECK	WRH	136	12,500	0.10	800	56"	40"	-	[1,4]
RH-C7	PENTHOUSE	GREENHECK	WRH	136	12,500	0.10	800	56"	40"	-	[1,4]
E-IH-D1	PENTHOUSE	EXISTING	EXISTING	EXISTING	16,000	0.05	533	120"	36"	-	[3]
E-IH-D2	PENTHOUSE	EXISTING	EXISTING	EXISTING	14,000	0.08	775	72"	36"	-	[3]
RH-D1	PENTHOUSE	WRH	WRH	135	10,000	0.07	667	60"	36"	-	[1,4]
RH-D2	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-D3	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-RH-E1	PENTHOUSE	EXISTING	EXISTING	EXISTING	5,500	0.08	750	44"	24"	-	[3]
E-RH-E2	PENTHOUSE	EXISTING	EXISTING	EXISTING	5,500	0.08	750	44"	24"	-	[3]
E-RH-E3	PENTHOUSE	EXISTING	EXISTING	EXISTING	8,000	0.08	735	56"	28"	-	[3]
E-RH-E4	PENTHOUSE	EXISTING	EXISTING	EXISTING	8,000	0.08	735	56"	28"	-	[3]
E-RH-E5	PENTHOUSE	EXISTING	EXISTING	EXISTING	8,000	0.08	735	56"	28"	-	[3]
RH-E6	HOOD	GREENHECK	GRSR-42	122	6,500	0.08	665	-	-	42"	[2,4]
E-RH-F1	PENTHOUSE	EXISTING	EXISTING	EXISTING	6,500	0.09	760	44"	28"	-	[3]
E-RH-F2	PENTHOUSE	EXISTING	EXISTING	EXISTING	6,500	0.09	760	44"	28"	-	[3]
E-RH-F3	PENTHOUSE	EXISTING	EXISTING	EXISTING	6,500	0.09	760	44"	28"	-	[3]
RH-H1	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-H2	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-H3	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-H4	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-IH-J1	PENTHOUSE	EXISTING	EXISTING	EXISTING	15,000	0.10	800	36"	60"	-	[3]
E-IH-J2	PENTHOUSE	EXISTING	EXISTING	EXISTING	16,000	0.10	800	36"	60"	-	[3]
E-RH-J1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-J2	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-RH-J3	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-K1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-K2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-K3	HOOD	EXISTING	EXISTING	EXISTING	12,000	0.08	750	48"	48"	-	[3]
E-RH-K4	HOOD	EXISTING	EXISTING	EXISTING	12,000	0.08	750	48"	48"	-	[3]
E-RH-K5	HOOD	EXISTING	EXISTING	EXISTING	12,000	0.08	750	48"	48"	-	[3]
E-RH-K6	HOOD	EXISTING	EXISTING	EXISTING	12,000	0.08	750	48"	48"	-	[3]
E-RH-K7	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-K8	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-L1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-L2	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
IH-M1	PENTHOUSE	GREENHECK	WRH	500	15,000	0.15	400	80"	30"	-	[1]
E-IH-M2	PENTHOUSE	EXISTING	EXISTING	EXISTING	25,000	0.10	800	72	30	-	[3]
E-RH-M1	HOOD	EXISTING	EXISTING	EXISTING	3,000	0.10	925	24"	24"	-	[3]
E-RH-M2	HOOD	EXISTING	EXISTING	EXISTING	3,000	0.10	925	24"	24"	-	[3]
E-RH-N1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-N2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-N3	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-RH-P1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-P2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-P3	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-P4	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-RH-Q1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-Q2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-Q3	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-R1	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-RH-R2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
RH-R3	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
RH-R4	HOOD	GREENHECK	GRSR-42	122	7,500	0.10	768	-	-	42"	[2,4]
E-IH-S1	PENTHOUSE	EXISTING	EXISTING	EXISTING	18,500	0.15	1,100	48"	48"	-	[3]
E-RH-S1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-S2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-S3	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-T1	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-T2	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-T3	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-T4	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-T5	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
E-RH-T6	HOOD	EXISTING	EXISTING	EXISTING	7,000	0.10	800	36"	36"	-	[3]
IH-W1	PENTHOUSE	GREENHECK	WIH	55	4,000	0.10	706	34"	24"	-	[1]
IH-W2	HOOD	GREENHECK	GRSI-18	50	1,400	0.10	765	-	-	18"	[2,4]
RH-AA1	PENTHOUSE	GREENHECK	WRH	207	19,000	0.09	774	68"	52"	-	[1,4]
IH-AA1	PENTHOUSE	GREENHECK	WIH	57	2,600	0.08	416	30"	30"	-	[1]

A5.3

A5.3

A5.3

A5.3

GRAVITY VENTILATOR SCHEDULE NOTES:

1. SEE DETAIL 3C/M-503.3.
2. SEE DETAIL 1E/M-503.3.
3. EXISTING RELIEF TO REMAIN. REPLACE EXISTING DAMPER ACTUATOR. CLEAN AND LUBRICATE DAMPER TO LIKE NEW CONDITION, OR REPLACE AS REQUIRED.
4. PROVIDE WITH MOTORIZED DAMPER. SEE M700 SERIES CONTROLS DRAWINGS FOR PRESSURE SENSOR.

HYDRONIC CONVECTOR SCHEDULE - 23 82 39.13

IDENTITY DATA					HEATING DATA							
MARK	MANUFACTURER	MODEL	ENCLOSURE MODEL	TYPE	CAPACITY (BTUH)	EWT (°F)	LWT (°F)	WPD (FT-WG)	FLOW (GPM)	EAT (°F)	FLUID TYPE	NOTES
CV-D1	TRANE	SW	38"L / 26" H / 6" D	SURFACE	2,500	160	140	0.0	0.3	65	WATER	[1-2]
CV-D2	TRANE	SW	38"L / 26" H / 6" D	SURFACE	2,500	160	140	0.0	0.3	65	WATER	[1-2]
CV-D3	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-D4	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-D5	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-D6	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-D7	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-D8	TRANE	SW	44"L / 24" H / 4" D	SURFACE	2,900	160	140	0.0	0.3	65	WATER	[1-2]
CV-D9	TRANE	SW	44"L / 24" H / 4" D	SURFACE	2,900	160	140	0.0	0.3	65	WATER	[1-2]
CV-E1	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-F1	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-F2	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-F3	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-F4	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-F5	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-F6	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-F7	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-H1	EXIST	-	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
E-CV-H2	EXIST	-	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
CV-H3	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-H4	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-H5	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-H6	EXIST	-	-	SURFACE	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-H7	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
CV-J1	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-J2	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-L1	EXIST	-	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
E-CV-L2	EXIST	-	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
CV-L3	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-M1	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-M2	NOT USED			-	-	-	-	-	-	-	-	-
CV-M3	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-M4	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-M5	EXIST	T6	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
E-CV-M6	EXIST	T4	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
E-CV-M7	EXIST	T3	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
CV-M8	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-N1	EXIST	N2	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
CV-N2	TRANE	SG	44"L / 26" H / 6" D	SEMI-RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
E-CV-N3	EXIST	N5	-	RECESSED	3,100	160	140	-	0.3	65	WATER	[3]
CV-N4	TRANE	SG	44"L / 26" H / 6" D	SEMI-RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-N5	TRANE	SG	44"L / 26" H / 6" D	SEMI-RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-P1	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-P2	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-P3	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-P4	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-P5	EXIST	-	-	SURFACE	6,900	160	140	-	0.7	65	WATER	[3]
CV-P6	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-P7	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-P8	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-P9	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-Q1	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-Q2	TRANE	RG	32"L / 24" H / 4" D	RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]
E-CV-R1	EXIST	-	-	RECESSED	3,100	160	140	-	0.3	65	WATER	[3]
E-CV-R2	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-R3	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-R4	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-R5	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-R6	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-R7	EXIST	-	-	SEMI-RECESSED	6,900	160	140	-	0.7	65	WATER	[3]
E-CV-S1	EXIST	-	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
E-CV-S2	EXIST	-	-	RECESSED	3,100	160	140	-	0.3	65	WATER	[3]
E-CV-S3	EXIST	-	-	RECESSED	2,100	160	140	-	0.2	65	WATER	[3]
CV-AA1	TRANE	SG	44"L / 26" H / 6" D	SURFACE	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-AA2	TRANE	SG	44"L / 26" H / 6" D	RECESSED	4,600	160	140	0.1	0.5	65	WATER	[1-2]
CV-AA3	TRANE	RG	32"L / 24" H / 4" D	SURFACE	2,000	160	140	0.0	0.2	65	WATER	[1-2]
CV-AA4	TRANE	RG	32"L / 24" H / 4" D	SEMI-RECESSED	2,000	160	140	0.0	0.2	65	WATER	[1-2]

HYDRONIC CONVECTOR SCHEDULE NOTES:

1. PROVIDE WITH TAMPER PROOF ACCESS DOOR.
2. WALL THERMOSTAT TO BE PROVIDED BY TCC. REUSE EXISTING LOCATION WHERE APPLICABLE. SEE M700 SERIES DRAWINGS FOR MORE INFORMATION.
3. UNIT IS EXISTING TO REMAIN. PROVIDE NEW VALVES AND ACTUATORS WHERE APPLICABLE. SEE M700 SERIES DRAWINGS FOR MORE INFORMATION. CAPACITY IS TAKEN FROM ORIGINAL 92 DRAWINGS WHERE EWT=200, EAT=70.

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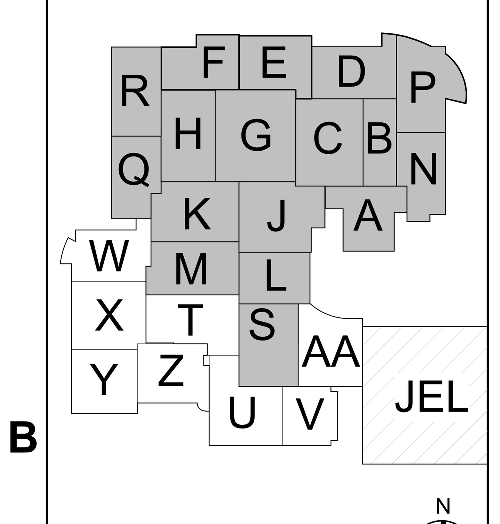
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced BNW / PWF

SARAH KATHLEEN HEMPSTEAD
REGISTERED
NO. AR10400134
STATE OF INDIANA
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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

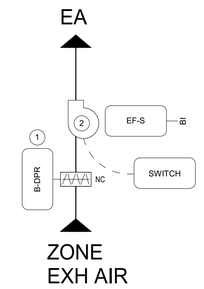
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North Central High School Renovation - Additions Phase 3

MECHANICAL SCHEDULES

M-607.3

	Hardware Points				Software Points						
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Exhaust Fan Status (EF-S)			x						x	x	x



SCHEMATIC NOTES:

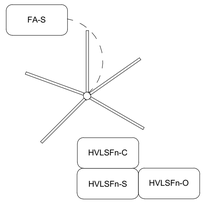
1. BACKDRAFT DAMPER REQUIRES NO TEMPERATURE CONTROLS.
2. EXISTING TO REMAIN EXHAUST FAN 3 THAT SERVES THE POOL CHEMICAL STORAGE ROOM SHALL ACT STAND-ALONE AND THE OPERATION SHALL BE MONITORED BY THE BUILDING AUTOMATION SYSTEM.

EXHAUST FAN SEQUENCE OF OPERATION:

THE EXHAUST FAN SHALL BE STARTED ACCORDING TO WALL MOUNTED TOGGLE SWITCH AND UTILIZE THE EXISTING TO REMAIN DISCONNECT. TCC SHALL PROVIDE AND CIC SHALL INSTALL A CURRENT TRANSFORMER SWITCH TO MONITOR EXHAUST FAN OPERATION AND GENERATE AN ALARM IF THE EXHAUST FAN IS NOT OPERATING.

1C TOGGLE SWITCH CONTROLLED POWERED VENTILATOR EF-3
NOT TO SCALE

A5.3



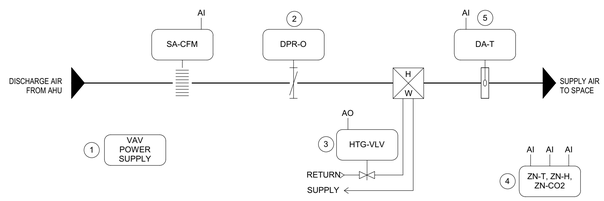
HIGH VOLUME LOW SPEED (HVLS) FANS SEQUENCE OF OPERATION

THE HVLS FANS SHALL BE FURNISHED WITH A SINGLE CONTROLLER WITH BACnet MSTP INTERFACE AND 50 FEET OF CAT-5E CONTROL CABLE FOR INTERLOCKING ALL FAN OPERATION. THE CIC CONTRACTOR SHALL INSTALL THE 50-FT OF CAT-5E CONTROL CABLE. THE CONTROLLER, AND ALSO FURNISH AND INSTALL ANY ADDITIONAL CAT-5E CABLE REQUIRED TO INTERLOCK THE OPERATION OF ALL FANS. THE CIC CONTRACTOR SHALL PROVIDE AND INSTALL A LOCKABLE PANEL TO INSTALL THE CEILING FAN CONTROLLER IN AND 24VDC/24VAC POWER (AS REQUIRED) PER MECHANICAL DRAWINGS.

OCCUPIED MODE: THE FANS (HVLSFn-C) SHALL BE COMMANDED TO RUN BASED MANUAL OPERATION AT THE LOCAL INTERFACE. THE BACnet MSTP INTERFACE SHALL NOT BE CONNECTED AT THIS TIME. A MAXIMUM SPEED OF 50 FT/MIN AT 4' A.F.F. SHALL BE MAINTAINED WHEN THE FANS ARE OPERATING. ALL FANS SHALL RUN CONCURRENTLY WHEN ENABLED AT THE SAME SPEED.

FIRE SAFETY MODE: THE FANS SHALL BE FURNISHED WITH A N.C. FIRE ALARM RELAY FOR INTERLOCK WITH THE FIRE ALARM SYSTEM. THE CIC CONTRACTOR SHALL COORDINATE WITH THE FIRE ALARM CONTRACTOR TO PROVIDE A FIRE ALARM OUTPUT FROM WHICH THE CONTROLLER CAN UTILIZE. THE CIC CONTRACTOR SHALL FURNISH AND INSTALL WIRING TO THE FIRE ALARM PANEL. THE FIRE ALARM CONTRACTOR SHALL BE RESPONSIBLE FOR TERMINATION OF THE WIRING. UPON SENSING AN ALARM, THE HVLS FAN SHALL BE HARDWIRED TO PREVENT OPERATION UNTIL THE ALARM IS CLEARED.

4A NATATORIUM HVLS FANS CF-n
NOT TO SCALE



SCHEMATIC NOTES:

1. CIC SHALL RESUSE 24 VOLT POWER TO VAV BOXES. SEE TEMPERATURE CONTROL AS-BUILT DRAWINGS.
2. VAV CONTROLLER/ACTUATOR FURNISHED BY TCC TO CIC FOR INSTALLATION AND WIRING. SEE M-731.3 FOR VAV LOCATIONS.
3. EXISTING TO REMAIN VALVES SHALL BE CONTROLLED BY THE NEW TCC CONTROLLER. CIC TO REUSE EXISTING WIRE AND TERMINATE TO NEW CONTROLLER.
4. CIC SHALL PULL NEW WIRING AND INSTALL NEW SENSOR PROVIDED BY TCC.
5. CIC SHALL INSTALL DISCHARGE TEMPERATURE SENSOR AND UTILIZE EXISTING WIRE.

VAV BOX WITH REHEAT SEQUENCE OF OPERATION (TYPICAL FOR 19 VAV BOXES AS SHOWN IN TEMPERATURE CONTROL AS-BUILT DRAWINGS)

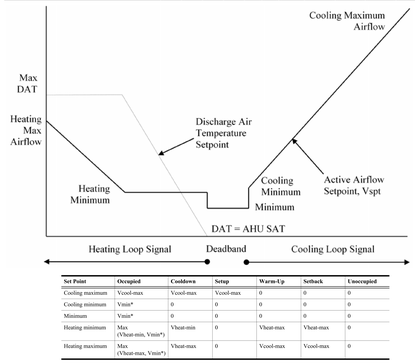
DISCHARGE AIR TEMPERATURE SENSOR: TCC SHALL PROVIDE A SUPPLY AIR TEMPERATURE SENSOR (DA-T) FOR MONITORING PURPOSES AND TO LIMIT THE DISCHARGE AT 95F (ADJ).

OCCUPIED MODE: WHEN THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE HEATING AND COOLING SETPOINTS, THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-CFM) AND THE REHEAT VALVE (HTG-VLV) SHALL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE COOLING SETPOINT OF 72F (ADJ) PLUS THE DEAD BAND, THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM AND THE REHEAT VALVE SHALL REMAIN FULLY CLOSED. ON A DROP IN TEMPERATURE BELOW THE HEATING SETPOINT OF 70F (ADJ), THE REHEAT VALVE SHALL MODULATE OPEN AFTER LOOP SIGNAL INCREASE AND THE PRIMARY AIR DAMPER SHALL MAINTAIN MINIMUM CFM UP TO THE HEATING MAX AIRFLOW. REFERENCE DIAGRAM AND SETPOINT MATRIX FOR FURTHER DETAILS.

UNOCCUPIED (NIGHT SETBACK) MODE: WHEN IN THE UNOCCUPIED MODE, THE VAV BOX SEQUENCE SHALL BE THE SAME AS THE ABOVE OCCUPIED SEQUENCE. UNOCCUPIED HEATING SETPOINT SHALL BE 65F (ADJ) AND THE COOLING SETPOINT SHALL BE 82F (ADJ). WHEN ANY TWO VAV BOXES REACH EITHER THEIR HEATING OR COOLING SETPOINT, THE AIR HANDLING UNIT SHALL START AND RUN TO MAINTAIN THE UNOCCUPIED SETPOINT. PROVIDE DIFFERENTIAL TO PREVENT SHORT CYCLING OF AHU.

1A EXISTING TO REMAIN NATATORIUM VAV BOXES (TYPICAL OF 19)
NOT TO SCALE

	Hardware Points				Software Points						
Point Name	AI	AO	BI	BO	AV	BV	Flag	Sched	Trend	Alarm	Show On Graphic
Airflow (SA-CFM)	x								x		x
Discharge Air Temp (DA-T)	x								x		x
Zone Setpoint Adjust	x										x
Zone Combo (ZN-T, ZN-H, ZN-CO2)	x								x		x
Reheating Valve (HTG-VLV)		x							x		x
Zone Damper (DPR-O)		x							x		x
Airflow Setpoint					x				x		x
Cooling Setpoint					x				x		x
DAT Heating Stpt Limit					x						
Heating Setpoint					x				x		x
Heating Mode						x			x		x
Unoccupied Heating Stpt					x						x
Unoccupied Cooling Stpt					x						x
Unoccupied Low Limit					x		x				
High Discharge Air Temp						x				x	
High Zone Temp						x				x	
Low Discharge Air Temp						x				x	
Low Zone Temp						x				x	
Local Override Allowed						x			x		x
Occupied						x		x	x		x



Set Point	Occupied	Cooldown	Setup	Warm-Up	Setback	Unoccupied
Cooling maximum	Vcool-max	Vcool-max	Vcool-max	0	0	0
Cooling minimum	Vmin*	0	0	0	0	0
Minimum	Vmin*	0	0	0	0	0
Heating minimum	Max (Vheat-min, Vmin*)	Vheat-min	0	Vheat-max	Vheat-max	0
Heating maximum	Max (Vheat-max, Vmin*)	Vheat-max	0	Vcool-max	Vcool-max	0

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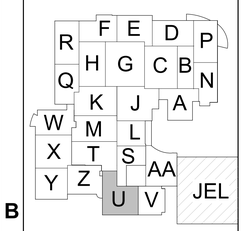
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced BNW / DLM

SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

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A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN N

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

TEMPERATURE CONTROLS SCHEMATICS

M-727.3

M-727.3_TEMPERATURE CONTROLS SCHEMATICS
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_
Date: 3/3/2023 2:27:27 PM Author: Jeff Hirsch - North Central High School\2019-067.NCH_Bidset01.04.23\M727_Drawing

CONTROLS INSTALLATION CONTRACTOR (CIC) MISCELLANEOUS SEQUENCES AND INFORMATION:

IT IS THE INTENTION OF THIS PROJECT TO PROVIDE DELTA CONTROLS DEVICES FOR ALL NEW EQUIPMENT EXCEPT NOTED PACKAGED EQUIPMENT AND CAPABLE OF ACHIEVING THE SEQUENCE OF OPERATION UTILIZING BACnet IP AND MSTP COMMUNICATION. TEMPERATURE CONTROLS SERVICES (TCS) SHALL PROVIDE ALL REQUIRED CONTROLS EQUIPMENT PER THE DRAWINGS AND SPECIFICATIONS AND WILL FUNCTION AS THE TCC. THE MECHANICAL CONTRACTOR SHALL PERFORM THE CIC SCOPE OF WORK AS QUALIFIED OR SUBCONTRACT THE WORK AS NEEDED. TCS AS THE TCC SHALL IDENTIFY AND COMMUNICATE TO THE CONTROLS INSTALLATION CONTRACTOR (CIC) ANY INSTALLATION DISCREPANCIES OR ISSUES FOR RESOLUTION BY THE CIC. ALL COORDINATION AND COMMUNICATION WITH TCS SHALL INCLUDE BRIAN SHEPPERD - BRIAN@TCSBAS.COM

TCS SHALL PROVIDE A COMPREHENSIVE GRAPHIC PACKAGE TO INCLUDE ALL NEW EQUIPMENT CONTROLLED OR MONITORED BY THE BUILDING AUTOMATION SYSTEM AND SHALL PROVIDE EQUIPMENT POINT DATABASE, LICENSING, SCHEDULES, TRENDING, AND REPORTS.

TCS SHALL COORDINATE WITH THE CLIENT FOR: EMAIL ALARM INFORMATION, 1-YEAR TRENDING AND REPORTS, OCCUPIED AND HOLIDAY SCHEDULES, AND SPECIALTY EQUIPMENT PARAMETERS AND ALARMING.

IDF/MDF AND ELECTRICAL HVAC SPLIT SYSTEM MONITORING SS-n: TCC SHALL REFERENCE THE MECHANICAL SCHEDULE AND CIC SHALL INSTALL AND WIRE BAS FLAT PLATE SPACE TEMPERATURE SENSORS FOR MONITOR OF IDF/MDF SPACES AND ALARM CONDITIONS. ALL STAND-ALONE HVAC SYSTEMS WILL HAVE BAS SPACE TEMPERATURE MONITORING IN ADDITION TO THE CONTROLS FROM THE MANUFACTURER. AN ALARM WILL BE GENERATED IF THE SPACE RISES ABOVE 81F (ADJ) OR DROPS BELOW 59F (ADJ). THESE SPACES ALSO REQUIRE A SEPARATE THERMOSTAT FOR LOCAL EQUIPMENT CONTROL THAT CIC WILL ENSURE IS CONFIGURED AND OPERATING PROPERLY. SEE MECHANICAL PLANS FOR ADDITIONAL REQUIREMENTS.

CONTROL PANELS: TCC SHALL PROVIDE AND CIC SHALL INSTALL TEMPERATURE CONTROL PANEL BACKPLATES THAT ARE HOFFMAN STYLE FOR ALL AIR HANDLING UNITS EXCEPT AHU-AA1, AHU-J3, AND AHU-K6. THE TECHNOLOGY CONTRACTOR WILL PROVIDE ETHERNET DROPS FOR ALL PANELS THAT DO NOT ALREADY HAVE BUILDING NETWORK CONNECTIVITY AND THE DIVISION 26 CONTRACTOR SHALL PROVIDE 120 VAC CIRCUITS FOR ALL NEW PANELS DEDICATED TO PANEL AND VAV POWER. CIC IS RESPONSIBLE TO DEMOLISH EXISTING CONTROL PANEL CONTENTS BY REMOVING THE BACKPLATE AND ALL CONTENTS FROM THE EXISTING TO REMAIN PANELS WITH THE EXCEPTION TO FIELD CONTROL WIRING AND CONDUIT. CIC IS RESPONSIBLE TO INSTALL THE REPLACEMENT BACKPLATE WITH NEW CONTROLS PRE-MOUNTED AND PROVIDED BY TCC AND TERMINATE PER TCC DRAWINGS. ADDITIONAL CABLING SHALL ALSO BE INSTALLED BY THE CIC IN CONDUIT WITHIN MECHANICAL ROOMS. CLEARLY LABEL PANELS AS TO THE EQUIPMENT CONTROLLED AND INCLUDE A COPY OF THE CONTROL DRAWINGS IN A PROTECTIVE COVER AFFIXED ON THE INSIDE PANEL DOOR. SEPARATE CIRCUIT PROVIDED BY DIVISION 26 FOR VAV POWER PANELS.

A5.3 **BUILDING NETWORK ETHERNET INTERFACE:** ONE (1) DATA DROP SHALL BE PROVIDED BY THE TELECOMMUNICATIONS CONTRACTOR FOR USE BY TCC IN EACH MECHANICAL ROOM TO EACH TEMPERATURE CONTROL PANEL. SEE TELECOMMUNICATIONS DRAWINGS.
ALL BAS ETHERNET CABLE SHALL BE GRAY JACKETED MEETING CAT-6A STANDARDS

ELECTRICAL UTILITY POWER MONITORING: TCC SHALL MONITOR FOR PHASE LOSS ON EXISTING TO REMAIN POWER METERS. TCC SHALL GENERATE AN ALARM UPON PHASE LOSS FOR MANUAL DECISION TO SHUTDOWN CHILLERS, AIR HANDLING UNITS, AND BOILERS. EXISTING TO REMAIN EQUIPMENT INCLUDE:

1. CENTRAL PLANT MDPC - GE POWERLOGIX
2. MAIN ELECTRICAL ROOM MDPA-LEFT - HAWKEYE 8100
3. MAIN ELECTRICAL ROOM MDPA-RIGHT - HAWKEYE 8100
4. MAIN ELECTRICAL ROOM MDPB-LEFT A - HAWKEYE 8100
5. MAIN ELECTRICAL ROOM MDPB-LEFT B - HAWKEYE 8100
6. MAIN ELECTRICAL ROOM MDPB-RIGHT A - HAWKEYE 8100
7. MAIN ELECTRICAL ROOM MDPB-RIGHT A - HAWKEYE 8100
8. NATATORIUM - FIELD DETERMINED
9. WEST GYM - FIELD DETERMINED
10. SOUTH LOCKER ROOM - FIELD DETERMINED
11. TRANSPORTATION BUILDING - FIELD DETERMINED

EXISTING TO REMAIN HVAC EQUIPMENT: TCC SHALL PROVIDE AND CIC SHALL INSTALL REPLACEMENT CONTROLS FOR THE EQUIPMENT SHOWN ON THE OWNER PROVIDED AS-BUILT DRAWINGS SHOWN ON M-701.3 TO M-731.3. CIC SHALL REFERENCE TCC (TEMPERATURE CONTROL SERVICES) DRAWINGS ISSUED BY ADDENDUM FOR DETAILED REQUIREMENTS.

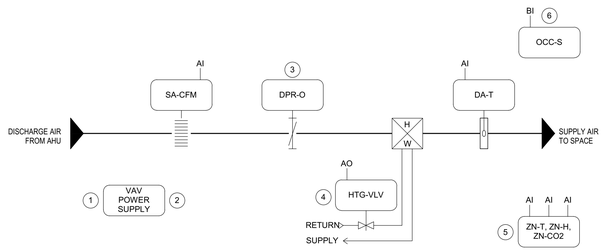
BUILDING ANNUNCIATOR PANEL: UPON BRINGING AN AIR HANDLING UNIT ONLINE TCS SHALL BE RESPONSIBLE TO COMMUNICATE CRITICAL ALARMS TO THE EXISTING TO REMAIN ANNUNICATOR PANEL CONTROLLER.

SPACE HUMIDIFIERS HAA-1, HAA-2, H-AA3: TCC SHALL CONNECT TO SPACE HUMIDIFIERS VIA BACNET MSTP FOR MONITORING OF THE UNITS.

A5.3 **TEMPERATURE CONTROL SERVICES (TCS) DRAWINGS:** PRIOR TO CONSTRUCTION, TCS WILL ISSUE A CONSTRUCTION DRAWING SET THAT INCLUDE THE FINAL WIRING DIAGRAMS CURRENTLY DISPLAYING A WATERMARK THAT READS, "WIRING DETAILS NOT FINALIZED IN DR.1 PRINT REVISIONS!" THE CONSTRUCTION SET WILL NOT CHANGE THE SCOPE OF WORK, BUT WILL PROVIDE THE DETAILS NEEDED BY THE CIC TO PROPERLY TERMINATE THE CONTROL AND POWER WIRING SHOWN IN THE TCS SCHEMATIC DIAGRAMS. REFERENCE TCS DR.1 DRAWINGS ISSUED VIA ADDENDUM FOR EQUIPMENT WIRING DIAGRAMS WITHOUT THE WATERMARK THAT REPRESENT THE FINAL WIRING DETAILS.

EXISTING TO REMAIN AIR HANDLING UNITS: ALL EXISTING TO REMAIN AIR HANDLING UNITS CURRENTLY HAVE DDC CONTROLS WITH TEMPERATURE CONTROL PANELS, CONDUIT, AND WIRING. ALL 120 VAC POWER, TUBS, CONDUIT, AND WIRE SHALL BE REUSED TO TERMINATE TO REPLACEMENT CONTROL DEVICES, CONTROLLER TERMINAL STRIP CONNECTIONS, AND POWER TERMINAL STRIP CONNECTIONS AS SHOWN IN THE TEMPERATURE CONTROL SERVICES (TCS) 11X17 DRAWINGS. TCS SHALL PROVIDE THE CIC WITH A REPLACEMENT BACKPLATE FOR THE EXISTING TO REMAIN HOFFMAN ENCLOSURES WITH ALL PANEL DEVICES PRE-MOUNTED AND WIRED TO TERMINAL STRIP CONNECTIONS. CIC SHALL INSTALL AND WIRE PER TCS WIRING DIAGRAMS INCLUDING RECONNECTION OF THE EXISTING TO REMAIN 120 VAC POWER. APPROVED CHANGE ORDER REQUESTS WILL BE REQUIRED FOR ANY POWER, WIRING, OR CONDUIT ISSUES IDENTIFIED DURING CONSTRUCTION.

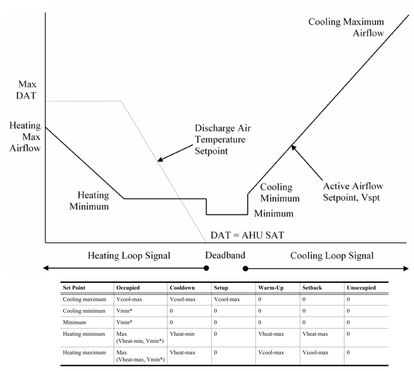
3C CIC MISCELLANEOUS SCOPE OF WORK
NOT TO SCALE



Point Name	Hardware Points AI	AO	BI	BO	Software Points AV	BV	Flag	Sched	Trend	Alarm	Show On Graphic
Airflow (SA-CFM)	x								x		x
Discharge Air Temp (DA-T)	x								x		x
Zone Setpoint Adjust	x										x
Zone Combo (ZN-T, ZN-H, ZN-CO2)	x								x		x
Reheating Valve (HTG-O)		x							x		x
Zone Damper (DPR-O)		x							x		x
Occupancy Status (OCC-S)			x						x		x
Finned Tube (FTR-O)				x					x		x
Airflow Setpoint					x				x		x
Cooling Setpoint					x				x		x
DAT Heating Stpt Limit					x						
Heating Setpoint					x				x		x
Heating Mode						x			x		x
Unoccupied Heating Stpt					x						x
Unoccupied Cooling Stpt					x						x
Unoccupied Low Limit					x		x				
High Discharge Air Temp						x				x	
High Zone Temp						x				x	
Low Discharge Air Temp						x				x	
Low Zone Temp						x				x	

SCHEMATIC NOTES:

1. 24 VOLT POWER TO VAV BOXES PROVIDED BY TCC AND INSTALLED BY CONTROLS INSTALLATION CONTRACTOR. USE POWER SUPPLY EQUAL TO FUNCTIONAL DEVICES PSH500A OR PSH300A AS APPLICABLE. 120 VOLT POWER TO POWER SUPPLIES BY DIV. 26. DIVISION 26 TO PROVIDE DEDICATED CIRCUIT FOR VAV POWER PANELS NEAR AIR HANDLING UNIT TEMPERATURE CONTROL PANELS SERVING VAV BOXES. SEE ELECTRICAL DRAWINGS.
2. TCC SHALL LOAD POWER SUPPLIES AS REQUIRED TO PROPERLY SERVE CONTROLS ON VAV BOXES. PROVIDE NUMBER REQUIRED. TCC SHALL PROVIDE FUSE PROTECTION AS REQUIRED FOR CONTROLS.
3. VAV CONTROLLER/ACTUATOR FURNISHED BY TCC TO VAV BOX MANUFACTURER FOR FACTORY INSTALLATION AND WIRING.
4. FURNISHED BY TCC, INSTALLED BY THE DIV. 23 CONTRACTOR. CIC SHALL PROVIDE AND INSTALL CONTROL AND POWER WIRING.
5. TCC SHALL PROVIDE AND CIC SHALL INSTALL AND WIRE BACK TO CONTROLLER AS SHOWN ON MECHANICAL PIPING DRAWINGS.
6. CIC SHALL INSTALL AND WIRE FROM TCC CONTROLLER TO AUX CONTACT INCLUDED WITH LIGHTING OCCUPANCY SENSOR.



Set Point	Occupied	Cooldown	Setup	Warm-Up	Setback	Unoccupied
Cooling maximum	Vcool-max	Vcool-max	Vcool-max	0	0	0
Cooling minimum	Vmin*	0	0	0	0	0
Minimum	Vmin*	0	0	0	0	0
Heating minimum	Max (Vheat-min, Vmin*)	Vheat-min	0	Vheat-max	Vheat-max	0
Heating maximum	Max (Vheat-max, Vmin*)	Vheat-max	0	Vcool-max	Vcool-max	0

VAV BOX WITH REHEAT SEQUENCE OF OPERATION

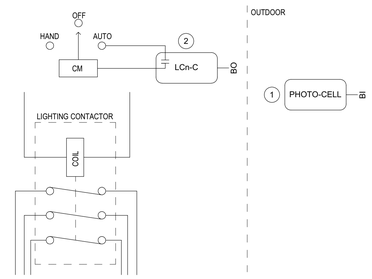
DISCHARGE AIR TEMPERATURE SENSOR: TCC SHALL PROVIDE A SUPPLY AIR TEMPERATURE SENSOR (DA-T) FOR MONITORING PURPOSES AND TO LIMIT THE DISCHARGE AT 95F (ADJ).

OCCUPIED MODE: WHEN THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE HEATING AND COOLING SETPOINTS, THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-CFM) AND THE REHEAT VALVE (HTG-VLV) SHALL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE COOLING SETPOINT OF 72F (ADJ) PLUS THE DEAD BAND, THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM AND THE REHEAT VALVE SHALL REMAIN FULLY CLOSED. ON A DROP IN TEMPERATURE BELOW THE HEATING SETPOINT OF 70F (ADJ), THE REHEAT VALVE SHALL MODULATE OPEN AFTER LOOP SIGNAL INCREASE AND THE PRIMARY AIR DAMPER SHALL MAINTAIN MINIMUM CFM UP TO THE HEATING MAX AIRFLOW. REFERENCE DIAGRAM AND SETPOINT MATRIX FOR FURTHER DETAILS.

UNOCCUPIED (NIGHT SETBACK) MODE: WHEN IN THE UNOCCUPIED MODE, THE VAV BOX SEQUENCE SHALL BE THE SAME AS THE ABOVE OCCUPIED SEQUENCE. UNOCCUPIED HEATING SETPOINT SHALL BE 65F (ADJ) AND THE COOLING SETPOINT SHALL BE 82F (ADJ). WHEN ANY TWO VAV BOXES REACH EITHER THEIR HEATING OR COOLING SETPOINT, THE AIR HANDLING UNIT SHALL START AND RUN TO MAINTAIN THE UNOCCUPIED SETPOINT. PROVIDE DIFFERENTIAL TO PREVENT SHORT CYCLING OF AHU.

3A VAV BOX WITH REHEAT VAV-n
NOT TO SCALE

Point Name	Hardware Points AI	AO	BI	BO	Software Points AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Photocell (PHOTO-CELL)			x						x		x
Lighting Contactor (LCn-C) SEE BELOW FOR QUANTITY	x								x		x



SCHEMATIC NOTES:

1. TCC SHALL PROVIDE AND CIC SHALL INSTALL ONE EXTERIOR PHOTOCELL.
2. TCC SHALL PROVIDE AND CIC SHALL INSTALL INTERPOSING RELAYS WITH CONTACTS RATED FOR CONTINUOUS DUTY AT 277 VAC TO ENERGIZE LIGHTING CONTACTOR COILS. SEE E-622.3 DETAIL 2A.

DDC INTERFACE TO EXTERIOR LIGHTING: ONE PHOTOELECTRIC CELL SENSOR SHALL CONTROL NEW AND EXISTING TO REMAIN EXTERIOR LIGHTING CONTACTORS. LIGHTING CONTACTORS CONTROLLED FROM THE PREVIOUS CONTROL SYSTEM SHALL ALSO BE CONTROLLED BY THE NEW BUILDING AUTOMATION SYSTEM. PHOTOCELL SHALL BE INSTALLED WHERE NOT INFLUENCED BY EXTERIOR LIGHTING. LIGHTING CONTACTORS PROVIDED AND INSTALLED AND WIRED TO LIGHTING CIRCUITS BY THE DIV. 26 CONTRACTOR. SEE ELECTRICAL DRAWINGS FOR COUNT AND LOCATIONS. PROVIDE SEPARATE BINARY OUTPUT FOR EACH CONTACTOR FOR INDIVIDUAL CONTROL. PROVIDE GRAPHICAL REPRESENTATIONS FOR TIME-OF-DAY SCHEDULING OF INDIVIDUAL CONTACTORS AS WELL AS PHOTOCELL CONTROL. ALL CONTACTORS SHALL BE CONTROLLED BY ONE PHOTOCELL INPUT.

EXISTING BAS LIGHTING CONTACTOR INFORMATION TO BE CONTROLLED BY THE BUILDING AUTOMATION SYSTEM AS PART OF THIS SCOPE OF WORK:

1. NORTH SECURITY LIGHTING	**AREA F**
A. NORTH SECURITY	CONTACTOR RF-1 IN B112B PANEL L12 L13
B. NORTH PARKING SECURITY	CONTACTOR RF-2 IN B112B PANEL L12 L14
C. NORTH PARKING	CONTACTOR RF-3 IN B112B PANEL L15 L16
D. NORTH WALK	CONTACTOR RF-4 IN B112B PANEL L15 L17
2. WEST EXTERIOR LIGHTING	**AREA K**
A. WEST LIGHTS	CONTACTOR RT-1 PANEL L17 L18
3. EAST EXTERIOR LIGHTING	**AREA N**
A. SECURITY LIGHTS EAST	CONTACTOR RN-1 IN H179 PANEL L14 L15
B. EAST LIGHTS	CONTACTOR RN-2 IN H179 PANEL L14 L16
C. EAST SECURITY LIGHTS	CONTACTOR RN-3 IN H179 PANEL L17 L18
D. EAST LIGHTS	CONTACTOR RN-4 IN H179 PANEL L17 L19
4. ZONE LIGHTING	**AREA Q**
A. ZONE4	CONTACTOR RR-3 IN N293A PANEL L14 L15
B. ZONE8	CONTACTOR RR-4 IN N293A PANEL L14 L16
C. ZONE12	CONTACTOR RR-5 IN N293A PANEL L17 L18
D. ZONE12	CONTACTOR RR-6 IN N293A PANEL L17 L18
E. ZONE12	CONTACTOR RR-7 IN N293A PANEL L17 L18
5. SOUTH EXTERIOR LIGHTING	**AREA S**
A. SOUTH SECURITY	CONTACTOR RS-4 IN L232 PANEL L14 L15
B. SOUTH PARKING	CONTACTOR RS-6 IN L232 PANEL L14 L16
C. SOUTH BUILDING	CONTACTOR RS-5 IN L232 PANEL L17 L18
D. SOUTH PARKING	CONTACTOR RS-7 IN L232 PANEL L17 L19
E. SOUTH WALK	CONTACTOR RS-8 IN L232 PANEL L20 L21
6. LIGHTING RELAY	**AREA J**
A. LIGHTING RELAY	CONTACTOR RJ-1 IN D147C

NOTE: FIELD VERIFICATION OF ALL ETR CONTACTOR INFORMATION REQUIRED.
NOTE: EXISTING BAS PHOTOCELL LOCATED IN AREA T

NEW LIGHTING CONTACTOR INFORMATION TO BE CONTROLLED BY THE BUILDING AUTOMATION SYSTEM AS PART OF THIS SCOPE OF WORK:

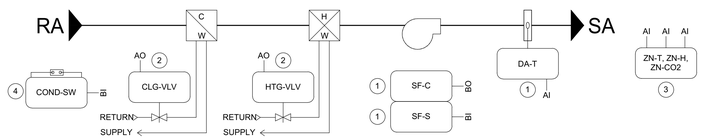
1. NORTHEAST LIGHTING	**AREA P**
A. NORTHEAST PARKING	CONTACTOR RPx PANEL 1H17- CIRCUITS 3,4,5,6,7
B. EXTERIOR WALL LIGHTING	CONTACTOR RPy PANEL 1XLSH3 CIRC. 2 & 1XLSH4 - CIRC. 5

PHASE 2B LIGHTING CONTACTOR INFORMATION TO BE CONTROLLED BY THE BUILDING AUTOMATION SYSTEM AS PART OF THIS SCOPE OF WORK:

1. NORTH & WEST EXTERIOR	**AREA R**
A. NORTH AND WEST EXT	CONTACTOR RR-1 IN P112 PANEL 1H16- CIRCUITS 17, 19, 21, 23, 25
2. SOUTH PARKING LOT	AREA U
A. SOUTH PARKING	CONTACTOR RU-1 PANEL HA - CIRCUITS 61,63,65,67,69,71
3. EXTERIOR AND PARKING LIGHTS	AREA Z
A. SOUTH EXTERIOR/WRESTLING	CONTACTOR RZ-1 PANEL 1HZ1 - CIRC. 13,16,18,20,22,24 1HLSZ1-14
B. WEST EXTERIOR/GYM	CONTACTOR RZ-2 PANEL 1HZ1 - CIRC. 15,17,19,21,23,25,27,29,31,1HLSZ1-12
C. SOUTH PARKING	CONTACTOR RZ-3 PANEL 1HZ1 - CIRC. 26,28,30,32,34,36

1D EXTERIOR LIGHTING CONTROL
NOT TO SCALE

Point Name	Hardware Points AI	AO	BI	BO	Software Points AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Outside Air Temperature (OA-T) NETWORK SHARE	x								x		x
Discharge Air Temperature (DA-T)	x								x		x
Space Temperature Humidity and CO2 (ZN-T, ZN-H, ZN-CO2)	x								x		x
Hot Water Valve (HTG-VLV)		x							x		x
Chilled Water Valve (CLG-VLV)		x							x		x
Supply Fan Status (SF-S)			x						x		x
Condensate Switch (COND-SW)			x						x	x	x
Supply Fan Start/Stop (SF-C)				x					x		x
Minimum Discharge Air Temperature					x						x
Fan Failure						x			x	x	
Low Discharge Air Temperature (<45F)						x			x	x	
High Discharge Air Temperature (>120F)						x			x	x	
Hot Water Available						x			x		x
Chilled Water Available						x			x		x
Occupied								x	x		x



SCHEMATIC NOTES:

1. TCC SHALL PROVIDE CONTROL DEVICE TO THE CIC FOR FIELD INSTALLATION AND WIRING.
2. TCC SHALL PROVIDE AND MECHANICAL CONTRACTOR SHALL INSTALL. CIC RESPONSIBLE FOR CONTROL AND POWER WIRING.
3. TCC SHALL PROVIDE AND CIC SHALL INSTALL PER MECHANICAL PIPING DRAWINGS.
4. MANUFACTURER INSTALLED DEVICE. CIC RESPONSIBLE TO WIRE TO TCC CONTROLLER PER TCC DRAWINGS.

FAN COIL UNIT WITH REHEAT SEQUENCE OF OPERATION

TCC SHALL PROVIDE CONTROLS AND DEVICES SPECIFIED AND CIC SHALL INSTALL AND PROVIDE ALL CONTROL AND POWER WIRING NOT SPECIFIED OTHERWISE.

SUPPLY FAN START/STOP: THE SUPPLY FAN (SF-C) WILL BE STARTED ACCORDING TO THE OWNER-DEFINED SCHEDULE. IF THE SUPPLY FAN STATUS (SF-S) DOES NOT MATCH THE COMMANDED VALUE, AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

ZONE CONTROL: THE COOLING VALVE (CLG-VLV) AND HEATING VALVE (HTG-VLV) WILL MODULATE IN SEQUENCE TO MAINTAIN THE ZONE TEMPERATURE (ZN-T) AT SETPOINT OF 74F (ADJ) COOLING AND 70F (ADJ) HEATING.

ZONE HUMIDITY CONTROL: IF THE SPACE HUMIDITY (ZN-H) RISES ABOVE 60% RH (ADJ) AND IF CHILLED AND HOT WATER IS AVAILABLE, THE COOLING VALVE (CLG-VLV) SHALL FULLY OPEN AND HEATING VALVE (HTG-VLV) WILL MODULATE IN SEQUENCE TO MAINTAIN THE ZONE SPACE TEMPERATURE AT SETPOINT. WHEN THE SPACE HUMIDITY FALLS BELOW 55% RH (ADJ), THE HOT AND CHILLED WATER CONTROL VALVES SHALL RETURN TO NORMAL OPERATION.

NIGHT SETBACK/NIGHT SETUP: WHEN IN "UNOCCUPIED" MODE, THE UNIT WILL CYCLE AS NECESSARY TO MAINTAIN THE NIGHT SETBACK ZONE TEMPERATURE AT SETPOINT WITHIN 60F AND 85F(ADJ). A DIFFERENTIAL PREVENTS THE UNIT FROM CYCLING EXCESSIVELY.

SHUTDOWN:
GENERATE AN ALARM AND SHUTDOWN OPERATION OF THE UNIT IN THE EVENT OF CONDENSATE SWITCH ALARM (COND-SW).
WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
COOLING VALVE WILL CLOSE
HEATING VALVE WILL MODULATE TO MAINTAIN THE DISCHARGE SENSOR AT 60F (ADJ)

POINTS LIST: THE POINTS LIST REPRESENTS THE MINIMUM POINTS TO BE PROVIDED AND DISPLAYED IN THE SYSTEM GRAPHICS. POINTS REQUIRED TO MEET THE SEQUENCE SHALL BE PROVIDED AND ALSO SHOWN.

1A FAN COIL UNITS FCU-A1, A2, C1, C2, G1
NOT TO SCALE

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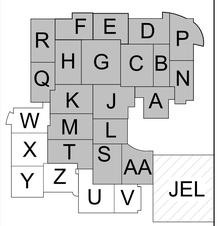
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SARAH KATHLEEN HEMPSTEAD REGISTERED NO. AR10400134 STATE OF INDIANA ARCHITECT

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN
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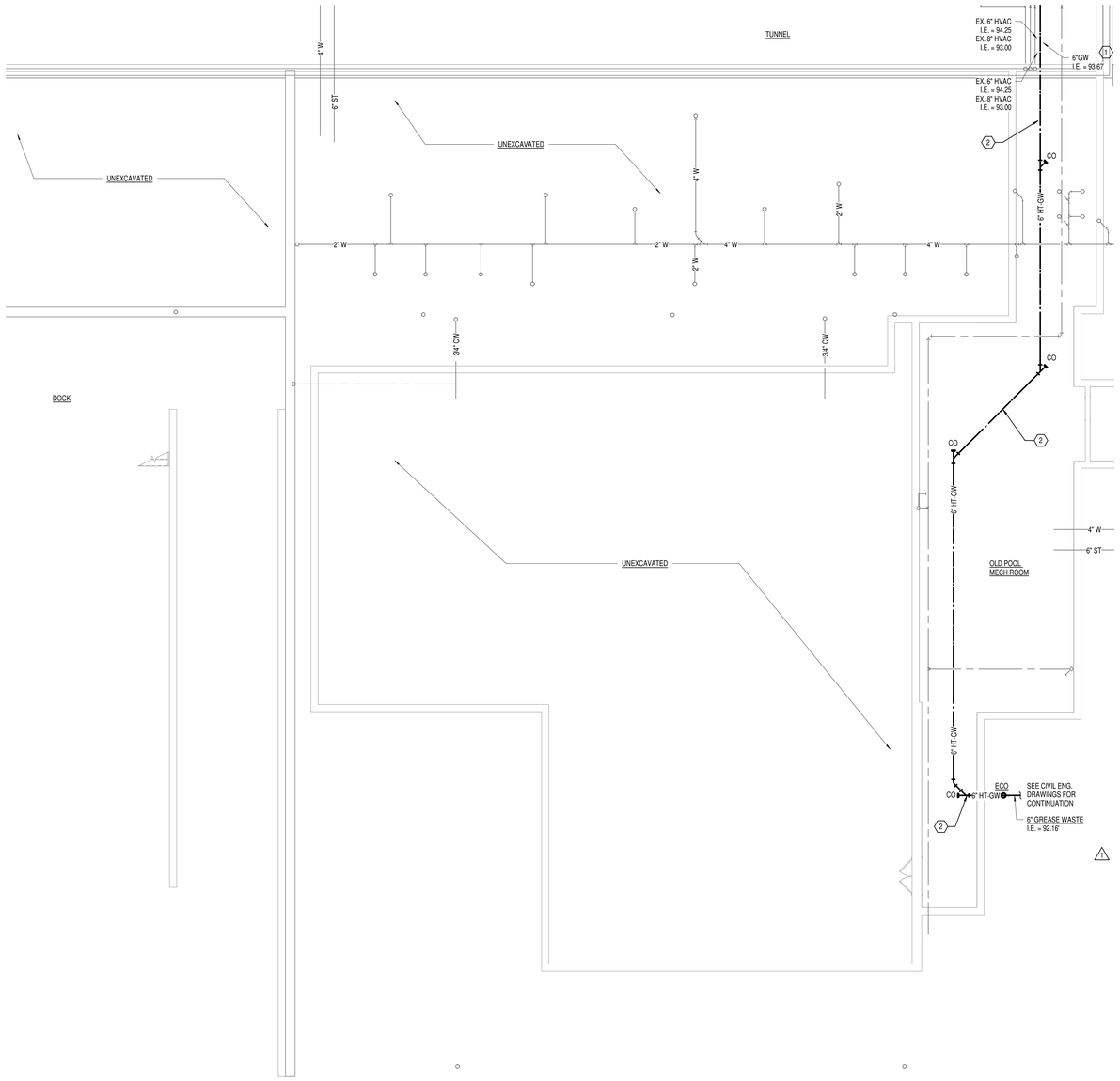
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North Central High School Renovation - Additions Phase 3

TEMPERATURE CONTROLS SCHEMATICS

M-729.3

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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 CRITICAL ELEVATION POINT OF GW PIPING; 6" GW MUST GO BETWEEN UPPER AND LOWER SETS OF HVAC WATER PIPING. SUGGEST TO BEGIN INSTALLATION OF GW PIPE AT THIS LOCATION AND WORK SLOPING IN BOTH DIRECTIONS FROM HERE TO ENSURE COORDINATION. MODIFY EXISTING PLUMBING PIPING IN THIS E/W SECTION OF THE TUNNEL AS REQUIRED TO ALLOW GW PIPING TO SLOPE PROPERLY AT 1/8" PER FOOT. IF GAS PIPING IS REQUIRED TO BE MODIFIED, COORDINATE GAS SERVICE SHUT-OFF WITH SCHOOL ADMINISTRATION AND MAINTENANCE TEAMS TO ENSURE PROPER PRECAUTIONS ARE TAKEN AND HOT WATER HEATERS/BOILERS/HVAC SYSTEMS ARE MINIMALLY IMPACTED.
2 PROVIDE HEAT TRACE CABLE AND INSULATION FOR GREASE WASTE PIPING EXPOSED IN TUNNEL AND OLD POOL MECHANICAL ROOM. HEAT TRACE TO MAINTAIN 85-105 DEG F PIPE TEMPERATURE TO KEEP GREASE WASTE FROM CONGEALING IN PIPE. THERMON FLX SELF-REGULATING HEAT TRACE CABLE OR EQUILAVENT. SEE SPECIFICATION SECTION 22 0533.

N
1 FOUNDATION PLUMBING PLAN - UNIT A
1/8" = 1'-0"

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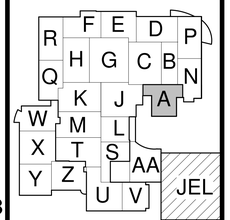
Project No. 2019-067.NCH
Project Date 03.03.2023
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A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

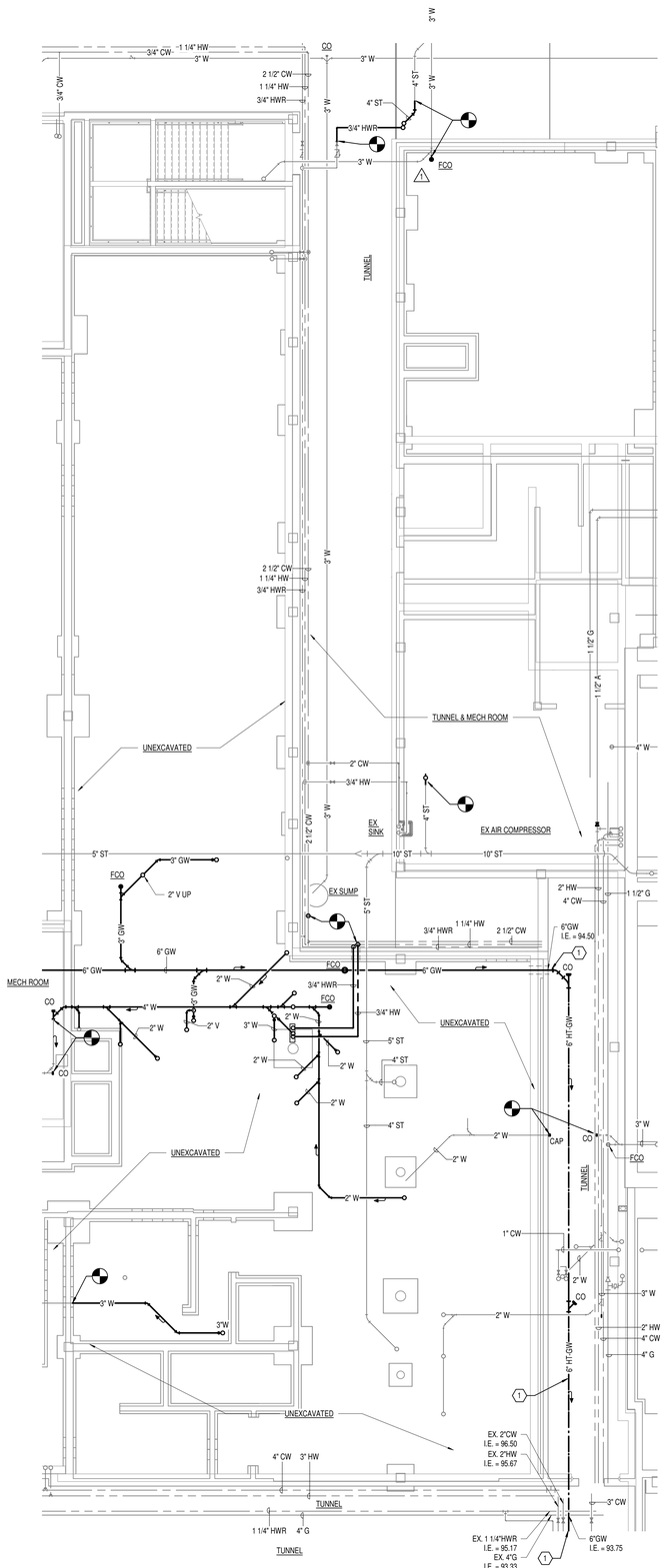
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North Central High School Renovation - Additions Phase 3

FOUNDATION PLUMBING PLAN - UNIT A

PF1A0.3

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2019-067.NCH M.S.D. of Washington Township North Central High School Renovation_
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1 FOUNDATION PLUMBING PLAN - UNIT B

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1. PROVIDE HEAT TRACE CABLE AND INSULATION FOR GREASE WASTE PIPING EXPOSED IN TUNNEL AND OLD POOL MECHANICAL ROOM. HEAT TRACE TO MAINTAIN 85-105 DEG F PIPE TEMPERATURE TO KEEP GREASE WASTE FROM CONGEALING IN PIPE. THERMON FLX SELF-REGULATING HEAT TRACE CABLE OR EQUILAVENT. SEE SPECIFICATION SECTION 22 0533.

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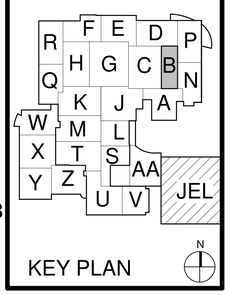
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Project Date 03.03.2023
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KBSO #20060
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A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

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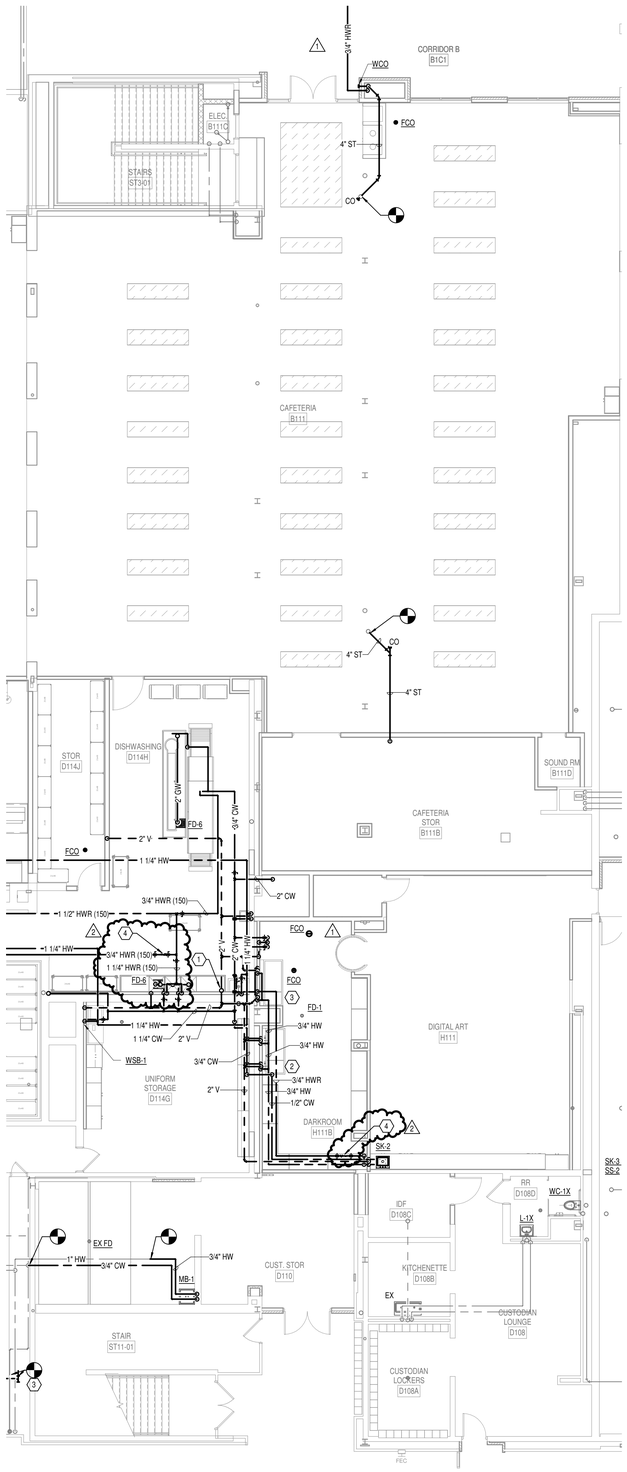
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FOUNDATION PLUMBING PLAN -UNIT B

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2019-067.NCH, M.S.D. of Washington Township, North Central High School Renovation - Additions - Phase 3
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT B

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 2" V UP, 4" VENT THRU ROOF.
2 RELOCATED DARK ROOM PHOTO PROCESSING SINK WITH ONE RELOCATED FAUCET. PROVIDE ONE NEW FAUCET, CHICAGO W4D-DB6AE1-317ABCP, 1/2" CW AND 1/2" HW TO EACH FAUCET, 2" WASTE CONNECTION.
3 NEW DARK ROOM PHOTO PROCESSING SINK, ARKAY PREMIUM STAINLESS STEEL PHOTO PROCESSING SINK SERIES SQ, MODEL ARSQ30726, 30" DEPTH, 72" LENGTH, 6" DEEP. PROVIDE TWO NEW FAUCET, CHICAGO W4D-DB6AE1-317ABCP, 1/2" CW AND 1/2" HW TO EACH FAUCET, 2" WASTE CONNECTION.
4 HWR BALANCING STATION, SEE DETAIL 1-P-601.3.

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Project No. 2019-067.NCH
Project Date 03.03.2023
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Produced KC TCC

KBSO #20060 OLUWASEUN OGUNKOMAIYA REGISTERED No. 11300632 STATE OF INDIANA PROFESSIONAL ENGINEER 3/3/2023

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A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

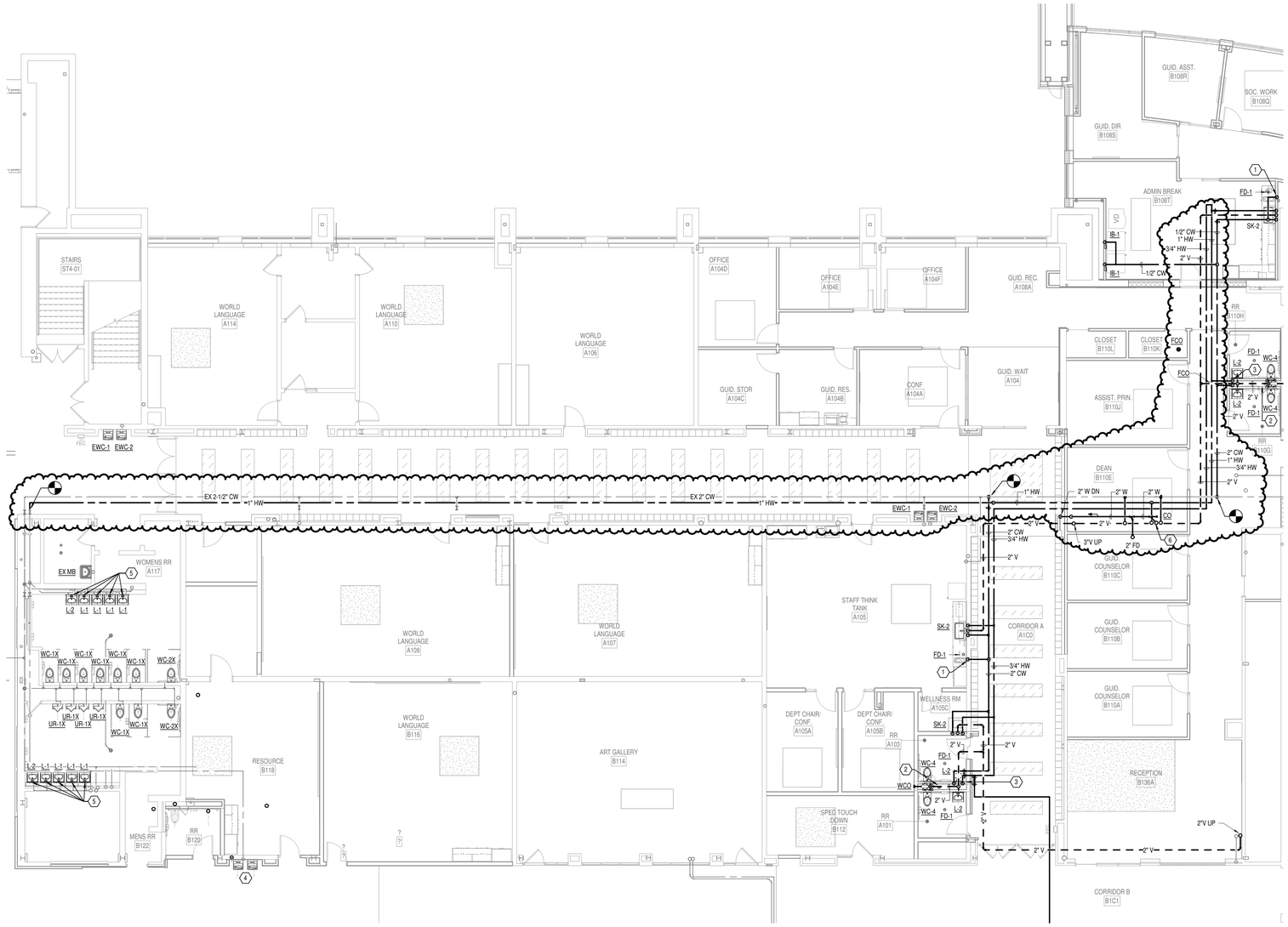
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT B

PF1B1.3

PF1B1.3 - FIRST FLOOR PLUMBING PLAN - UNIT B
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT D

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 1/2" CW DROP IN WALL FOR CONNECTION TO COFFEE MACHINE. PROVIDE IN-LINE DUAL CHECK VALVE LIKE WILKINS MODEL 700XL, PRIOR TO CONNECTION TO COFFEE MACHINE.
2 4" W DOWN.
3 1-1/2" CW AND 1/2" HW DOWN IN CHASE - ROUTE FULL SIZE HEADERS TO FIXTURES. PROVIDE WATER HAMMER ARRESTOR (WHA-B) PRIOR TO LAST FLUSH VALVE.
4 PROVIDE NEW WATER COOLERS, EWC-1 & EWC-2. RECONNECT TO EXISTING CW AND WASTE PIPING.
5 PROVIDE NEW LAVATORIES, L-1 AND L-2. RECONNECT TO EXISTING CW, HW, AND WASTE PIPING.
6 1/2" CW, 1/2" HW, AND 2' W UP.

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415 Massachusetts Avenue
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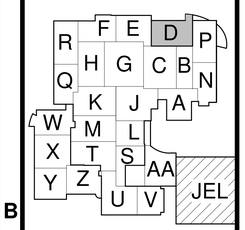
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

KBSO #20060 OLUWASEUN ODUKOMAIYA REGISTERED No. 11300632 STATE OF INDIANA PROFESSIONAL ENGINEER 3/3/2023

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN N

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT D

PF1D1.3

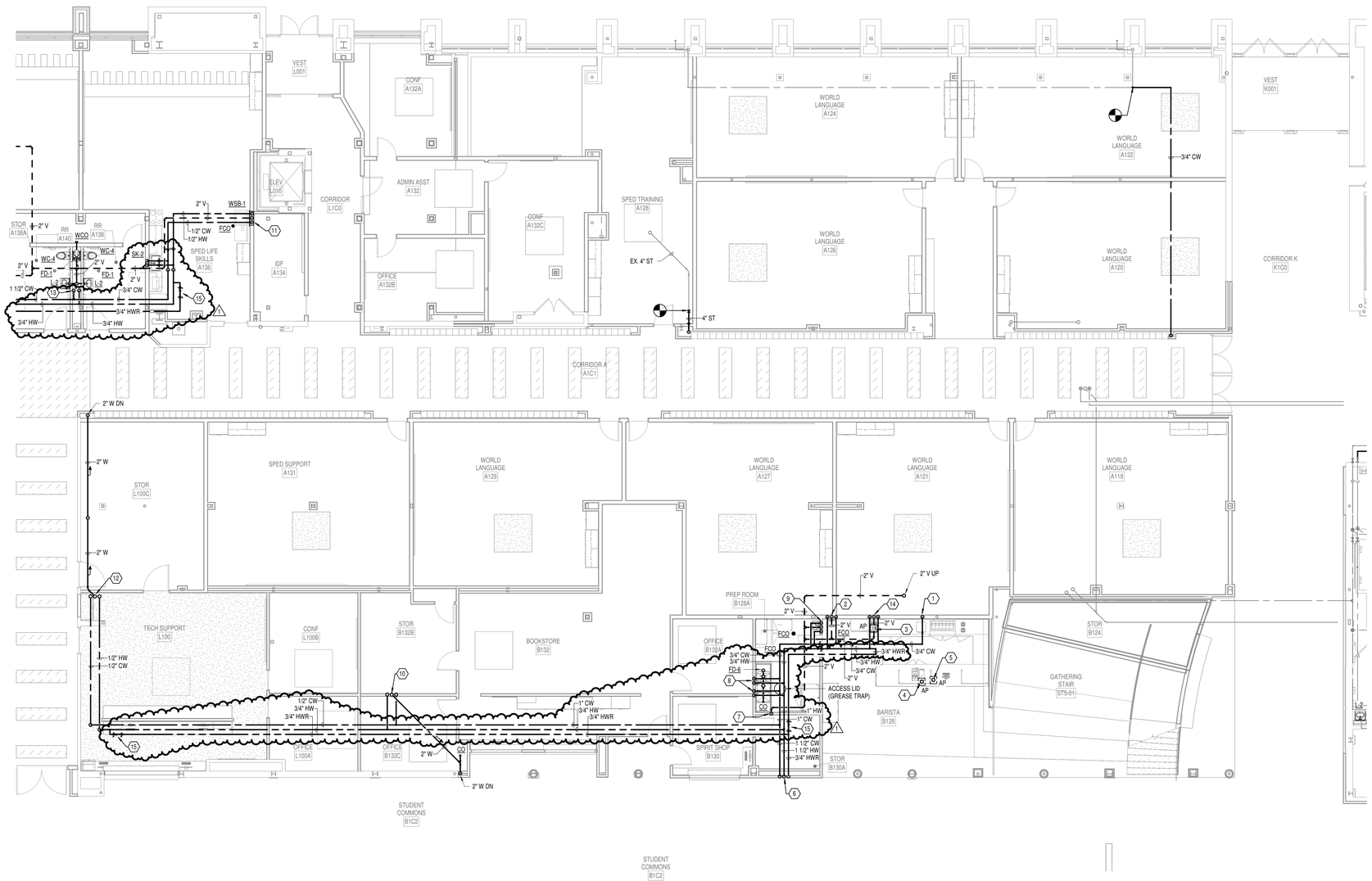
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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 3/4" CW DOWN IN WALL. CAP PIPING IN WALL FOR FUTURE CONNECTION.
2 1/2" CW AND 1/2" HW DOWN IN WALL CAP PIPING IN WALL FOR FUTURE CONNECTION TO SERVICE SINK. 2" W DOWN AND 2" VENT UP IN WALL. CAP 2" W IN WALL FOR FUTURE CONNECTION TO SERVICE SINK.
3 2" GW DOWN. CAP FOR FUTURE CONNECTION TO FLOOR SINK. PROVIDE FLOOR ACCESS PANEL.
4 2" W DOWN. CAP FOR FUTURE CONNECTION TO FLOOR DRAIN. PROVIDE FLOOR ACCESS PANEL.
5 3/4" CW FROM BELOW. CAP FOR FUTURE CONNECTION. PROVIDE FLOOR ACCESS PANEL.
6 1 1/2" CW, 1 1/2" HW AND 3/4" HWR FROM BELOW.
7 2" VENT FROM BELOW.
8 3/4" CW AND 3/4" HW DOWN IN WALL TO THREE COMPARTMENT SINK. SINK BY OTHERS.
9 1/2" CW AND 1/2" HW DOWN IN WALL TO SERVICE SINK, SINK BY OTHERS. 2" W DOWN AND 2" VENT UP IN WALL.
10 1" HW, 2" W AND 1" CW UP IN WALL ABOVE.
11 2" W DOWN IN WALL. 2" VENT UP IN WALL. 1/2" HW AND 1/2" CW DOWN TO WSB-1.
12 1/2" HW, 2" W AND 1/2" CW UP IN WALL ABOVE.
13 1/2" HW AND 1-1/2" CW DOWN IN CHASE. ROUTE FULL SIZE HEADER IN CHASE TO FIXTURES. PROVIDE WATER HAMMER ARRESTOR (WHA-B) PRIOR TO LAST FLUSH VALVE. 2" W DOWN AND 2" V UP.
14 1/2" CW AND 1/2" HW DOWN IN WALL CAP PIPING IN WALL FOR FUTURE CONNECTION. 2" W DOWN AND 2" VENT UP IN WALL. CAP 2" W IN WALL FOR FUTURE CONNECTION.
15 HWR BALANCING STATION, SEE DETAIL 14/P-501.3.



N
1 FIRST FLOOR PLUMBING PLAN - UNIT E
1/8" = 1'-0"

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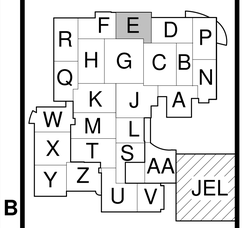
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

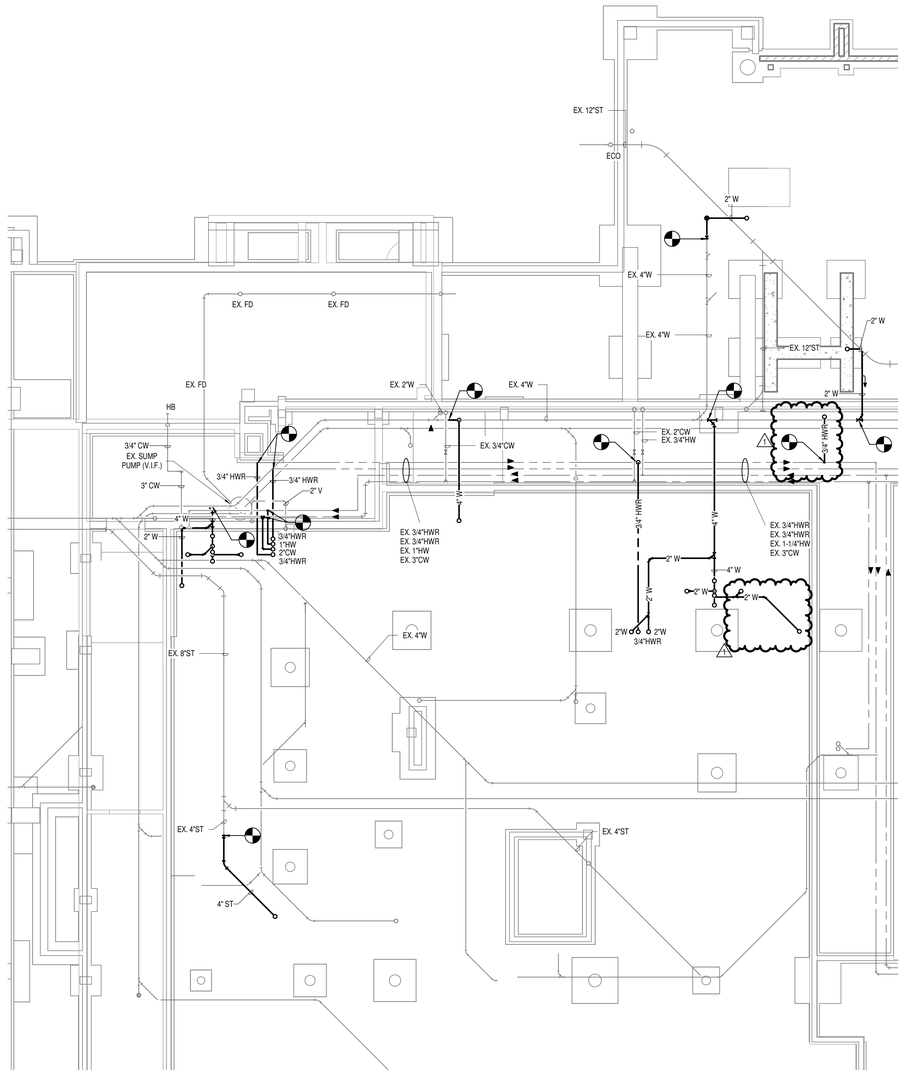
FIRST FLOOR PLUMBING PLAN - UNIT E

PF1E1.3

PF1E1.3_FIRST FLOOR PLUMBING PLAN - UNIT E
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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
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F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.



N 1 FOUNDATION PLUMBING PLAN - UNIT F
1/8" = 1'-0"

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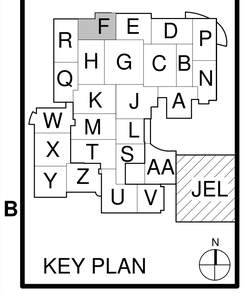
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

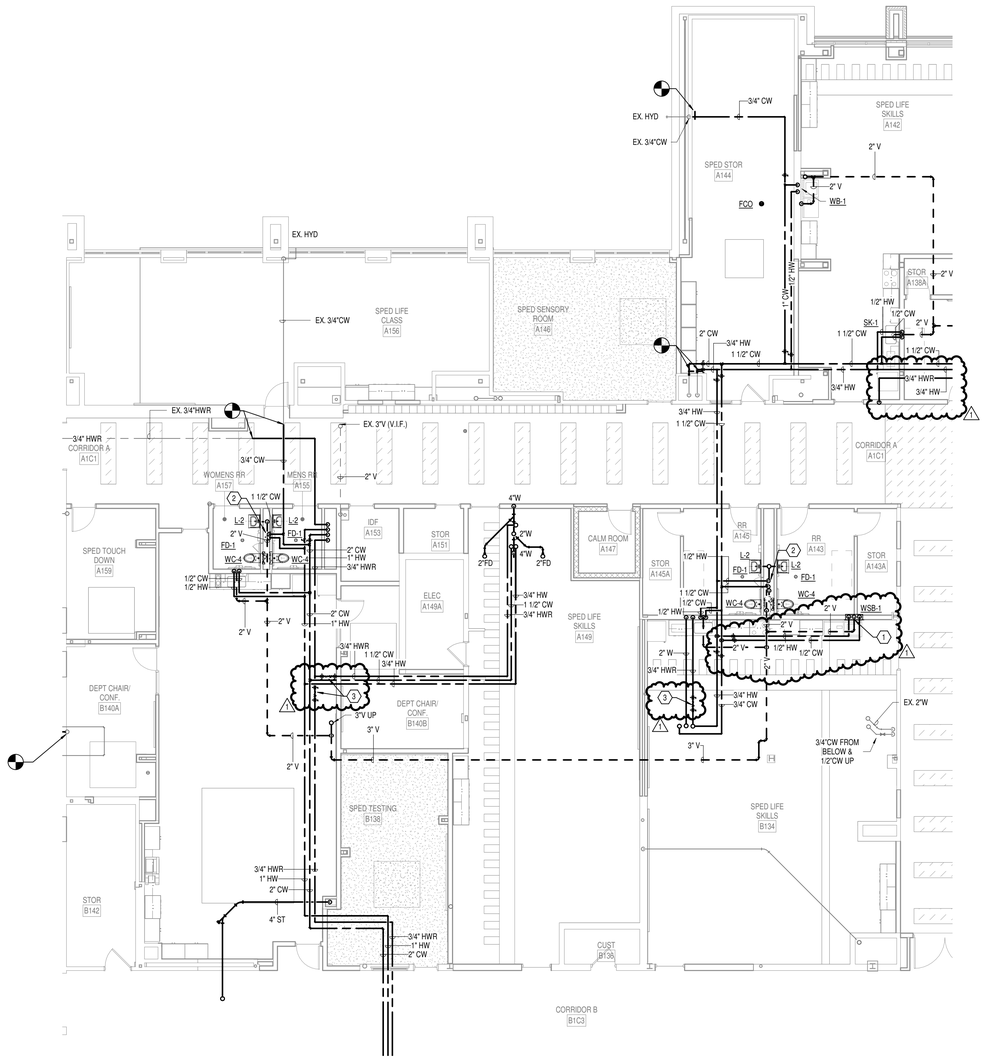
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FOUNDATION PLUMBING PLAN - UNIT F

PF1F0.3

PF1F0.3_FOUNDATION PLUMBING PLAN - UNIT F
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT F

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
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F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 2" W DOWN IN WALL. 2" VENT UP IN WALL. 1/2" HW AND 1/2" CW DOWN TO WSB-1.
2 1/2" HW AND 1-1/2" CW DOWN IN CHASE. ROUTE FULL SIZE HEADER IN CHASE TO FIXTURES. PROVIDE WATER HAMMER ARRESTOR (WHA-B) PRIOR TO LAST FLUSH VALVE. 2" W DOWN AND 2" V UP.
3 HWR BALANCING STATION, SEE DETAIL 14/P-501.3.

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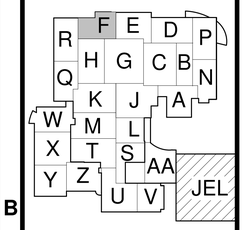
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN N

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

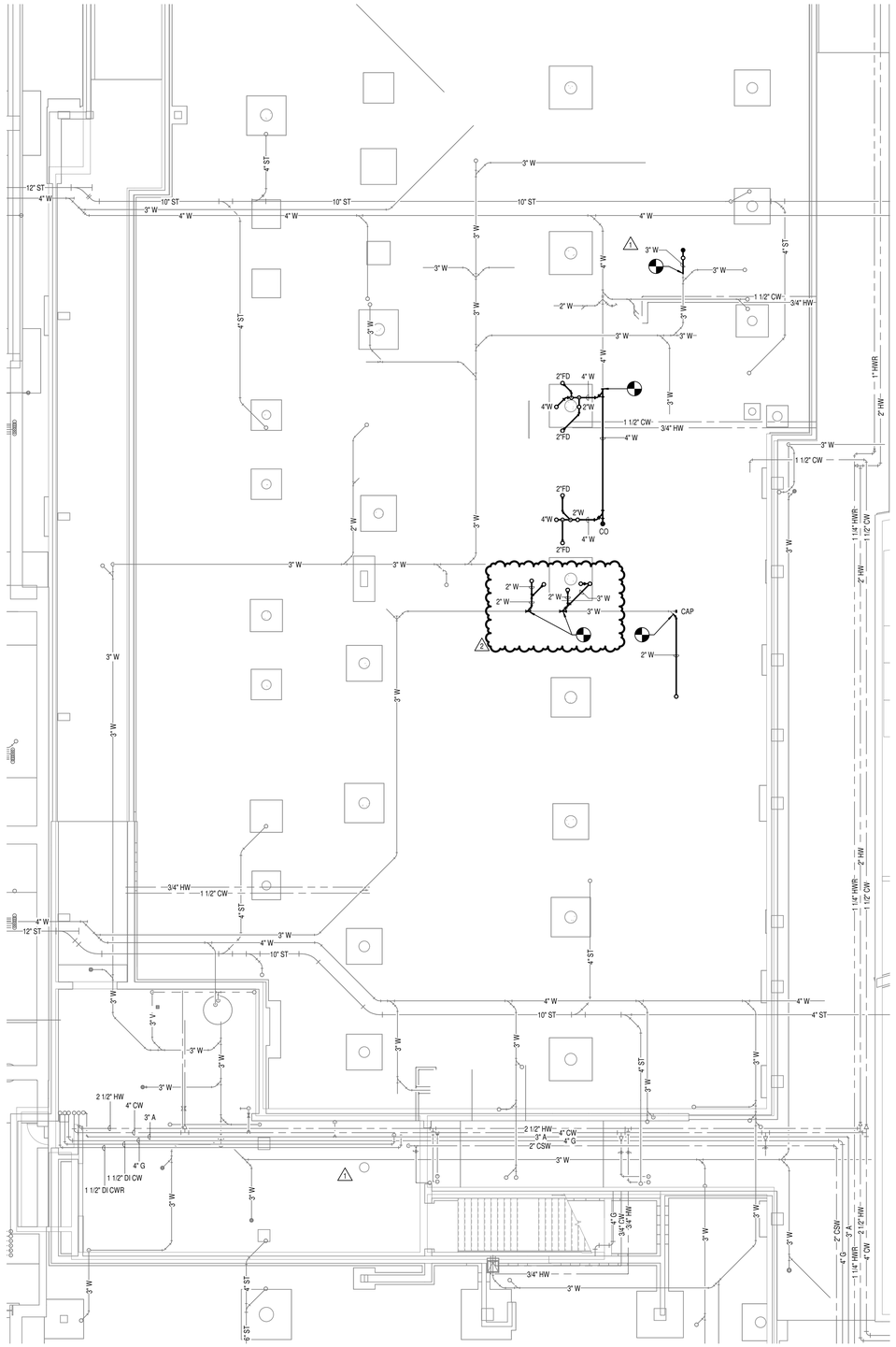
FIRST FLOOR PLUMBING PLAN - UNIT F

PF1F1.3

PF1F1.3_FIRST FLOOR PLUMBING PLAN - UNIT F
2019-067.NCH_R19 3 of Washington Township North Central High School Renovation...
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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
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F FOR ALL WATER CLOSETS AND URINALS: VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.



N

1 FOUNDATION PLUMBING PLAN - UNIT H
1/8" = 1'-0"

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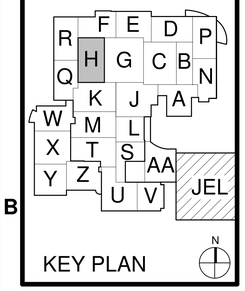
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

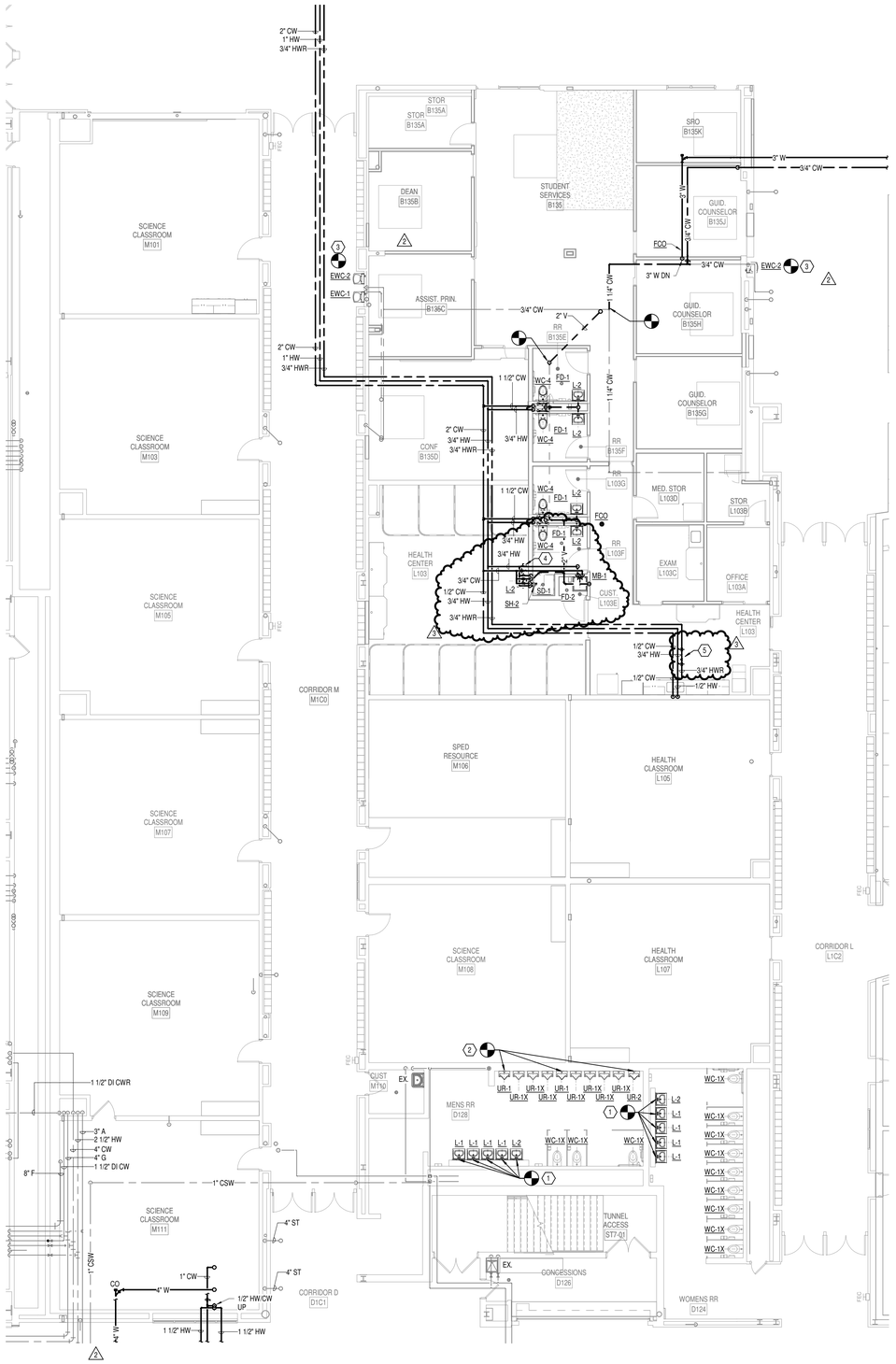
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FOUNDATION PLUMBING PLAN - UNIT H

PF1H0.3

PF1H0.3 - FOUNDATION PLUMBING PLAN - UNIT H
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT H

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
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F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 PROVIDE NEW LAVATORIES, L-1 AND L-2. RECONNECT TO EXISTING CW, HW, AND WASTE PIPING.
2 PROVIDE NEW URINALS, UR-1 AND UR-2. RECONNECT TO EXISTING CW AND WASTE PIPING.
3 PROVIDE NEW WATER COOLER(S), EWC-1 AND/OR EWC-2. RECONNECT TO EXISTING CW AND WASTE PIPING.
4 PROVIDE SHUT-OFF VALVES AND CHECK VALVES ON HW AND CW SUPPLY TO MOP BASIN.
5 HWR BALANCING STATION, SEE DETAIL 14/P-501.3.

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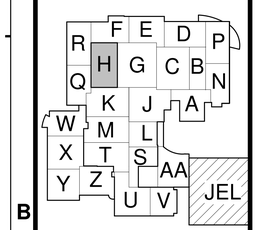
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



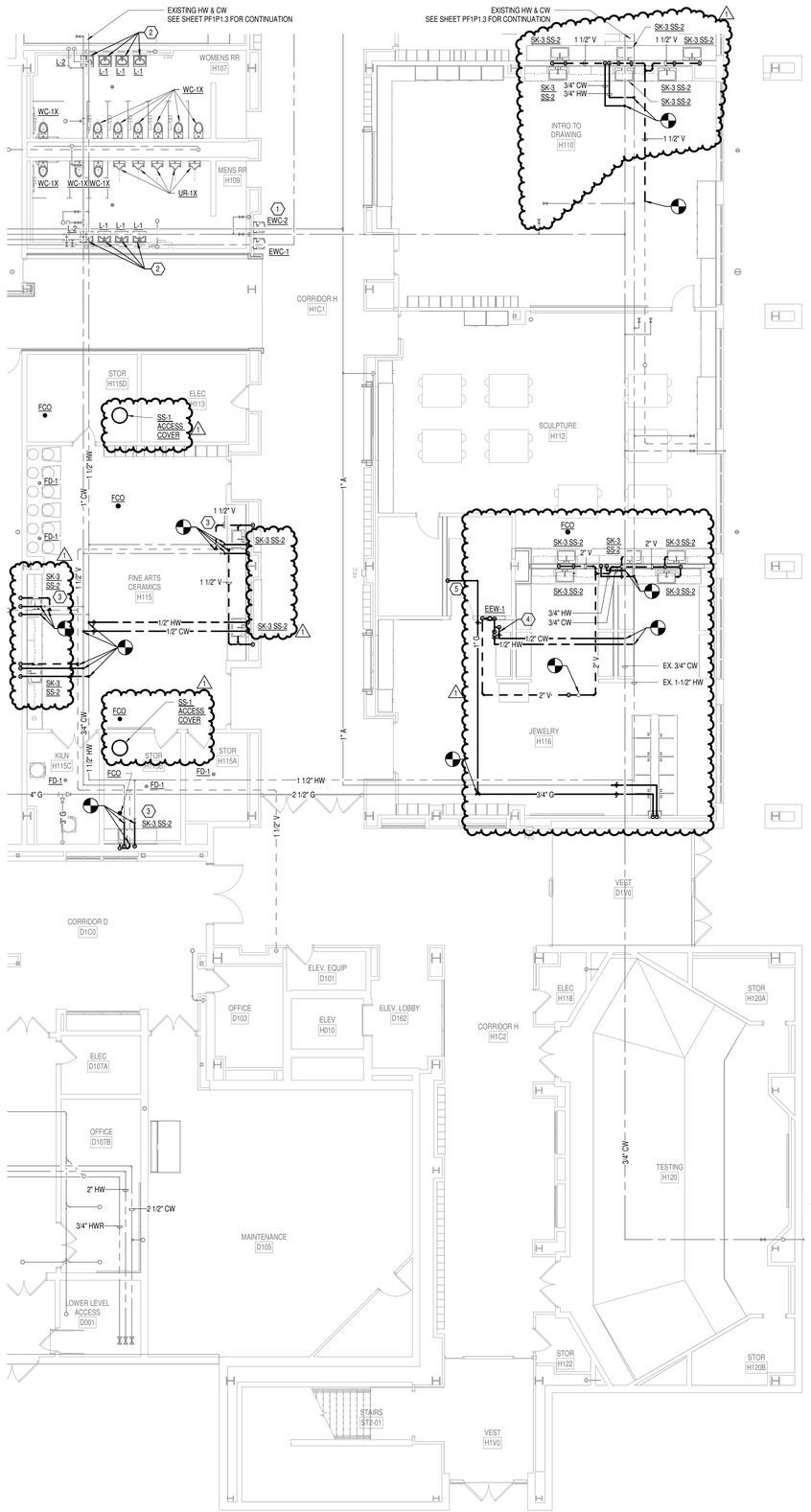
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT H

PF1H1.3

PF1H1.3 - FIRST FLOOR PLUMBING PLAN - UNIT H
2019-067.NCH, M.S.D. of Washington Township, North Central High School Renovation - Additions Phase 3
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT N

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
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SHEET KEYNOTES

1 PROVIDE NEW WATER COOLERS, EWC-1 & EWC-2. RECONNECT TO EXISTING CW AND WASTE PIPING.
2 PROVIDE NEW LAVATORIES, L-1 AND L-2. RECONNECT TO EXISTING CW, HW, AND WASTE PIPING.
3 PROVIDE NEW SINK, SK-3. RECONNECT EXISTING CW, HW, AND WASTE PIPING.
4 THERMOSTATIC MIXING VALVE PROVIDED WITH EMERGENCY SHOWER MOUNTED ABOVE CEILING. PROVIDE SHUT-OFF VALVES WITH LOCK-OPEN HANDLES OR REMOVE HANDLES AFTER INSTALLATION.
5 PROVIDE 1" NG TO ROOM. FIELD ROUTE TO FINAL CONNECTION POINT. COORDINATE WITH FINAL ROOM LAYOUT AND EQUIPMENT. PROVIDE SHUT-OFF VALVE AT ROOM ENTRY POINT AND PRESSURE REGULATORS AS REQUIRED FOR EQUIPMENT. PRESSURE REGULATORS TO BE VENT TO THE EXTERIOR OF THE BUILDING.

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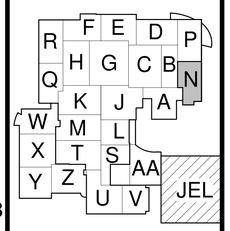
Project No. 2019-067.NCH
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Produced KC TCC

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

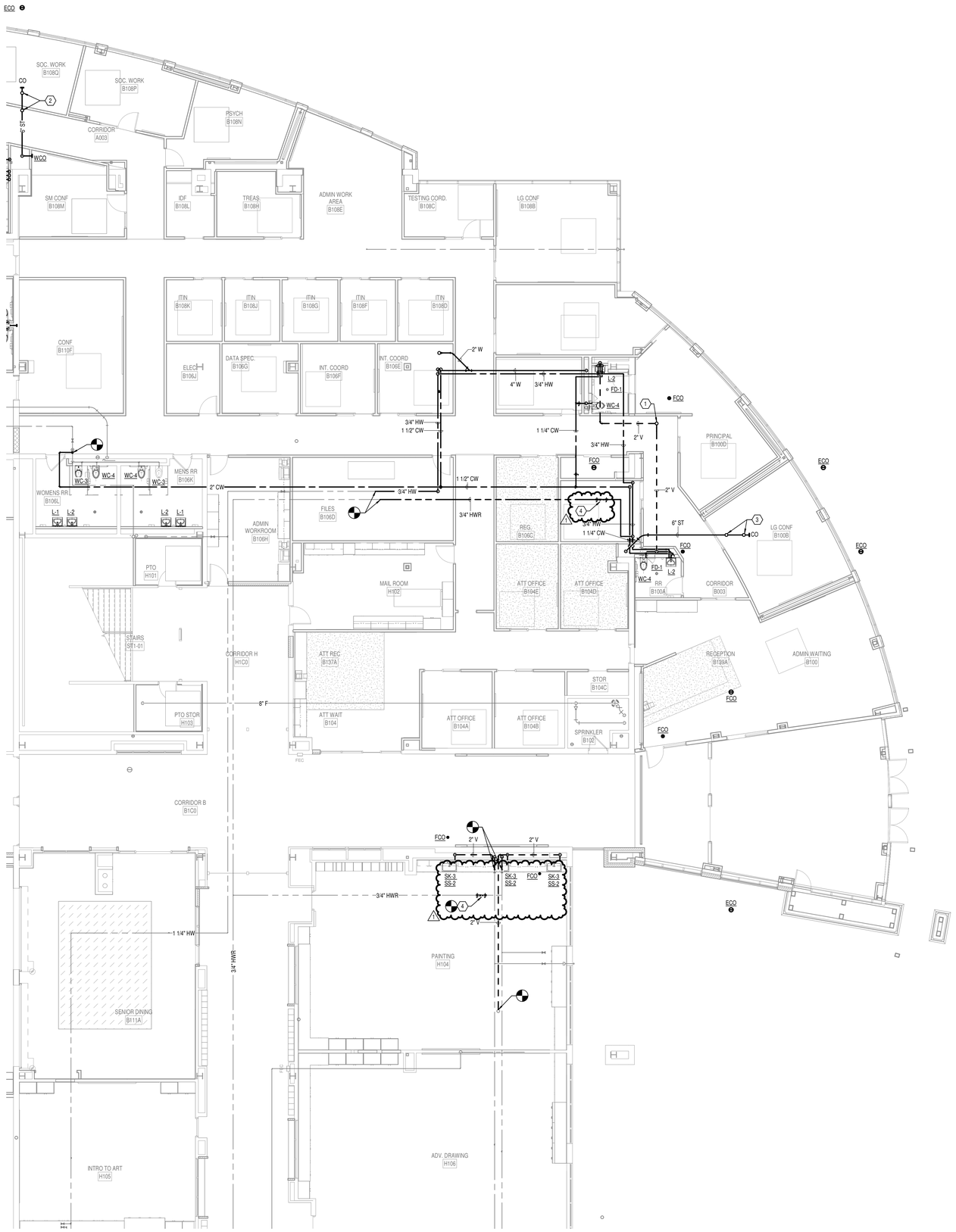
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT N

PF1N1.3

PF1N1_1 FIRST FLOOR PLUMBING PLAN - UNIT N
2019-067.NCH_M.E.S. of Washington Township, North Central High School Renovation_
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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
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SHEET KEYNOTES

1 2"V UP TO 4"VTR
2 4" ST UP TO ROOF DRAIN.
3 6" ST UP TO ROOF DRAIN.
4 HWR BALANCING STATION, SEE DETAIL 14/P-501.3.

1 FIRST FLOOR PLUMBING PLAN - UNIT P

1/8" = 1'-0"

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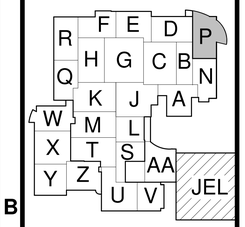
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Indianapolis, IN 46240



KEY PLAN

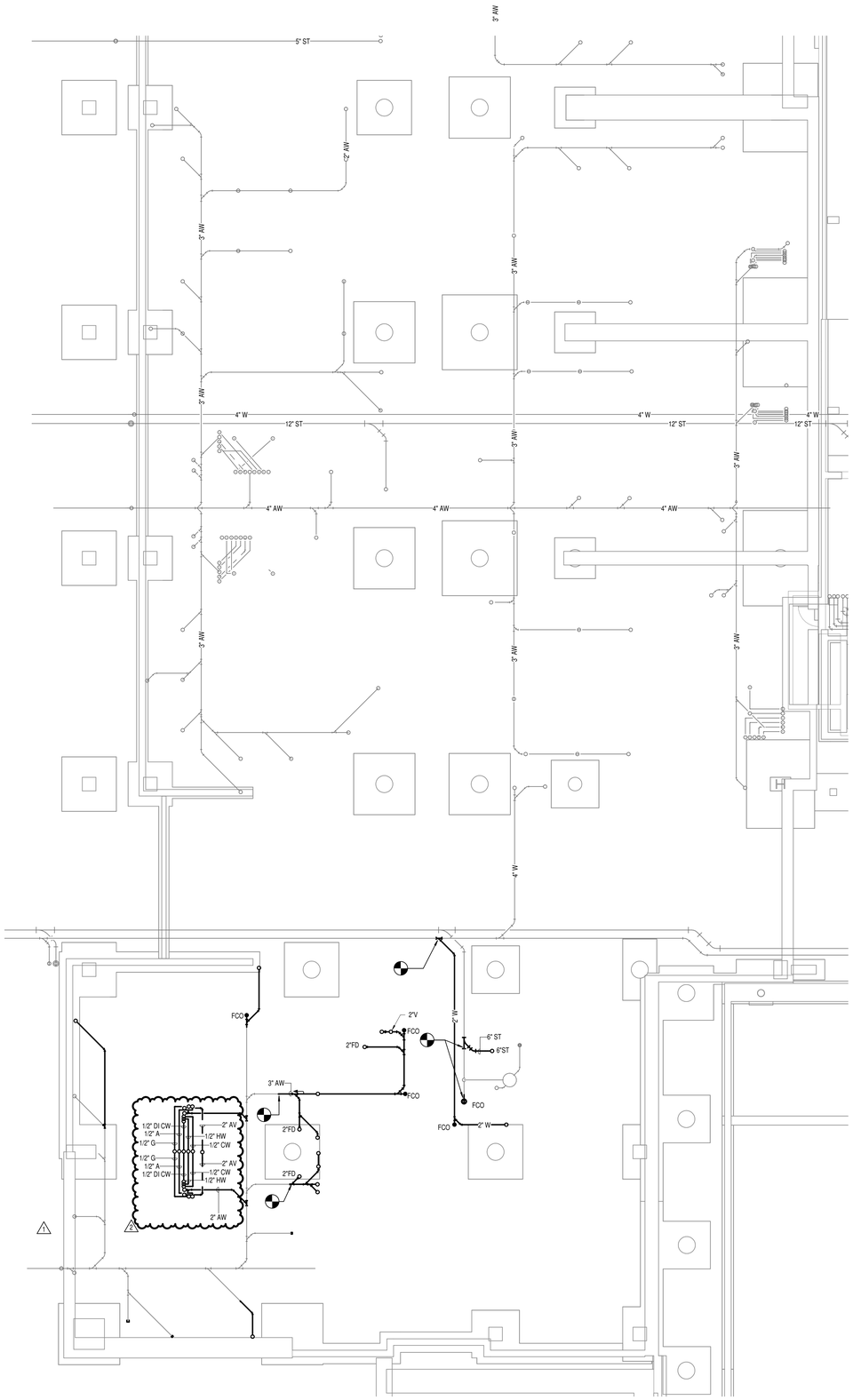
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT P

PF1P1.3

PF1P1.3_FIRST FLOOR PLUMBING PLAN - UNIT P
2019-067.NCH_R19 S-V Washington Township_North Central High School Renovation_
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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

N

1 FOUNDATION PLUMBING PLAN - UNIT Q
1/8" = 1'-0"

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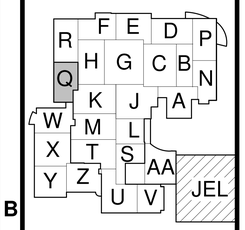
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

KBSO #20060 OLUWASEUN ODUKOMAIYA REGISTERED No. 11300632 STATE OF INDIANA PROFESSIONAL ENGINEER 3/3/2023

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FOUNDATION PLUMBING PLAN - UNIT Q

PF1Q0.3

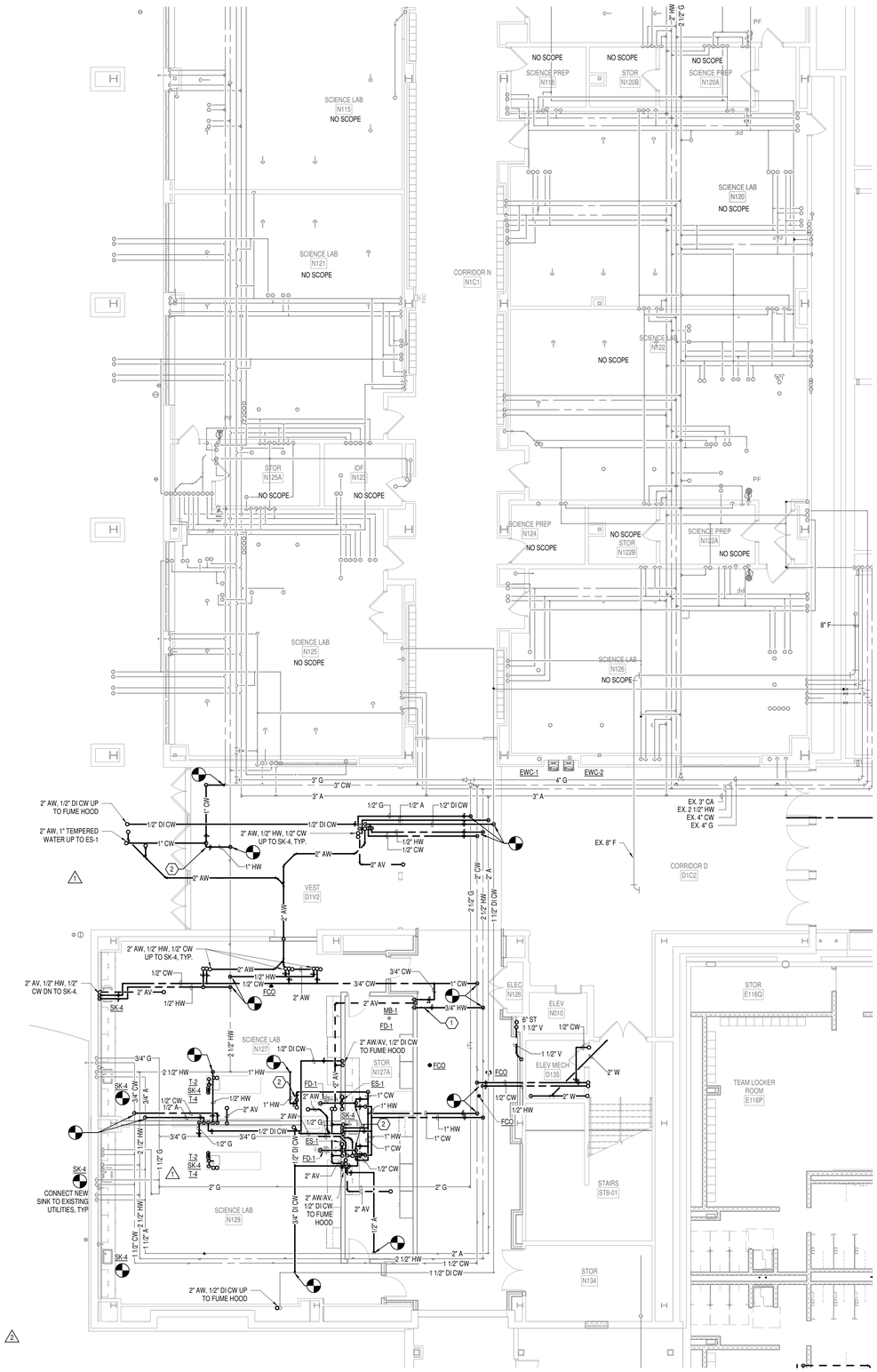
PF1Q0.3 - FOUNDATION PLUMBING PLAN - UNIT Q
2019-067.NCH M.S.D. of Washington Township North Central High School Renovation...
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GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
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C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS, VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 PROVIDE SHUT-OFF VALVES AND CHECK VALVES ON HW AND CW SUPPLY TO MOP BASIN.
2 THERMOSTATIC MIXING VALVE PROVIDED WITH EMERGENCY SHOWER MOUNTED ABOVE CEILING. PROVIDE SHUT-OFF VALVES WITH LOCK-OPEN HANDLES OR REMOVE HANDLES AFTER INSTALLATION.



N

1 FIRST FLOOR PLUMBING PLAN - UNIT Q

1/8" = 1'-0"

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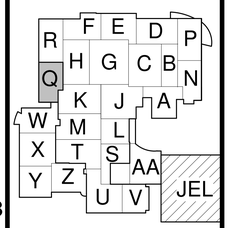
Project No. 2019-067.NCH
Project Date 03.03.2023
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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN

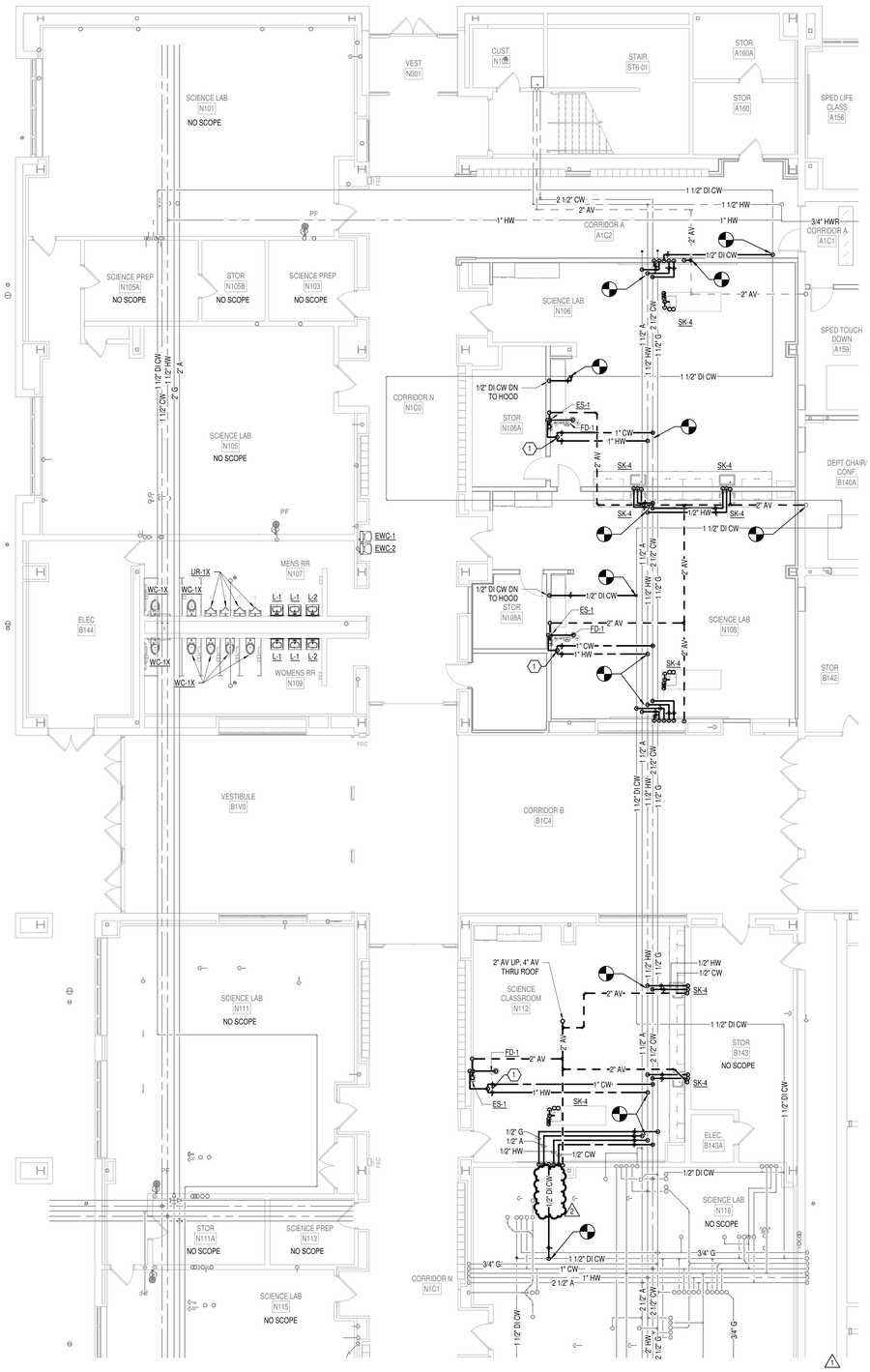
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT Q

PF1Q1.3

PF1Q1.3_FIRST_FLOOR PLUMBING PLAN - UNIT Q
2019-067.NCH_M.S.D. of Washington Township North Central High School Renovation_
Date/Time: 3/3/2023 2:04:08 PM Plotted By: JT Owens (Last Edited By: JT Owens)
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT R

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
D REFER TO ARCHITECTURAL DRAWINGS FOR INSTRUCTIONS FOR REMOVING/REPLACING WALLS, CEILINGS, ETC.
E FOR ALL ELECTRIC WATER COOLER REPLACEMENTS, VERIFY EXISTING ELECTRIC WATER COOLER HAS NOT PREVIOUSLY BEEN REPLACED BY OWNER.
F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 THERMOSTATIC MIXING VALVE PROVIDED WITH EMERGENCY SHOWER MOUNTED ABOVE CEILING. PROVIDE SHUT-OFF VALVES WITH LOCK-OPEN HANDLES OR REMOVE HANDLES AFTER INSTALLATION.

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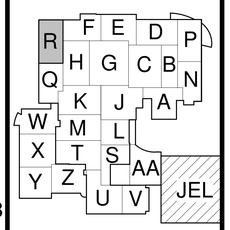
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

OLUWASUN OGUNKOMAIYA
REGISTERED
No. 11300632
STATE OF INDIANA
PROFESSIONAL ENGINEER
KBSO #20060
3/3/2023

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

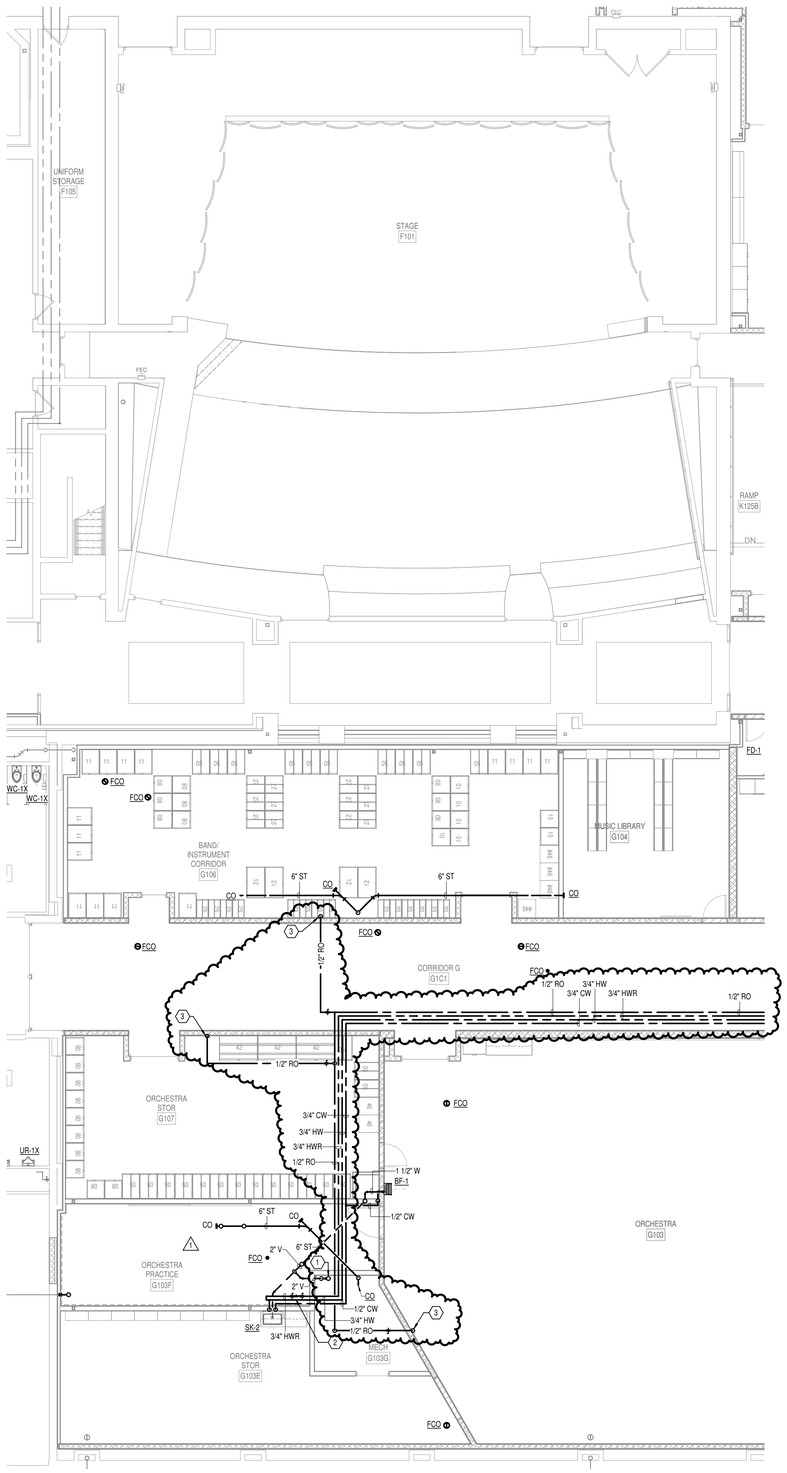
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT R

PF1R1.3

PF1R1_1_FIRST FLOOR PLUMBING PLAN - UNIT R
2019-067.NCH A1S.2 of Washington Township North Central High School Renovation_
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N

1 FIRST FLOOR PLUMBING PLAN - UNIT S

1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
B REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR INSTRUCTIONS FOR PATCHING FLOORS.
C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
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F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 2"x6" FITTING USED AS HUB DRAIN/STANDPIPE FOR MECHANCIAL HUMIDIFICATION UNIT CONDENSATE. PROVIDE P-TRAP, 2" W DN, 2" V UP. SEE DETAIL 15/P501.3.
2 HWR BALANCING STATION, SEE DETAIL 14/P501.3.
3 1/2" RO DN TO HUMIDIFICATION UNIT. VERIFY EXACT LOCATION AND CONNECTION POINT WITH MECHANICAL DRAWINGS.

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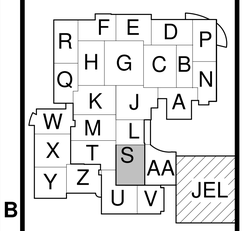
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

KBSO #20060 OLUWASEUN ODUKOMAIYA REGISTERED No. 11300632 STATE OF INDIANA PROFESSIONAL ENGINEER 3/3/2023

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#	Revision	Date
A3.3	ADDENDUM 3.3	04.06.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN N

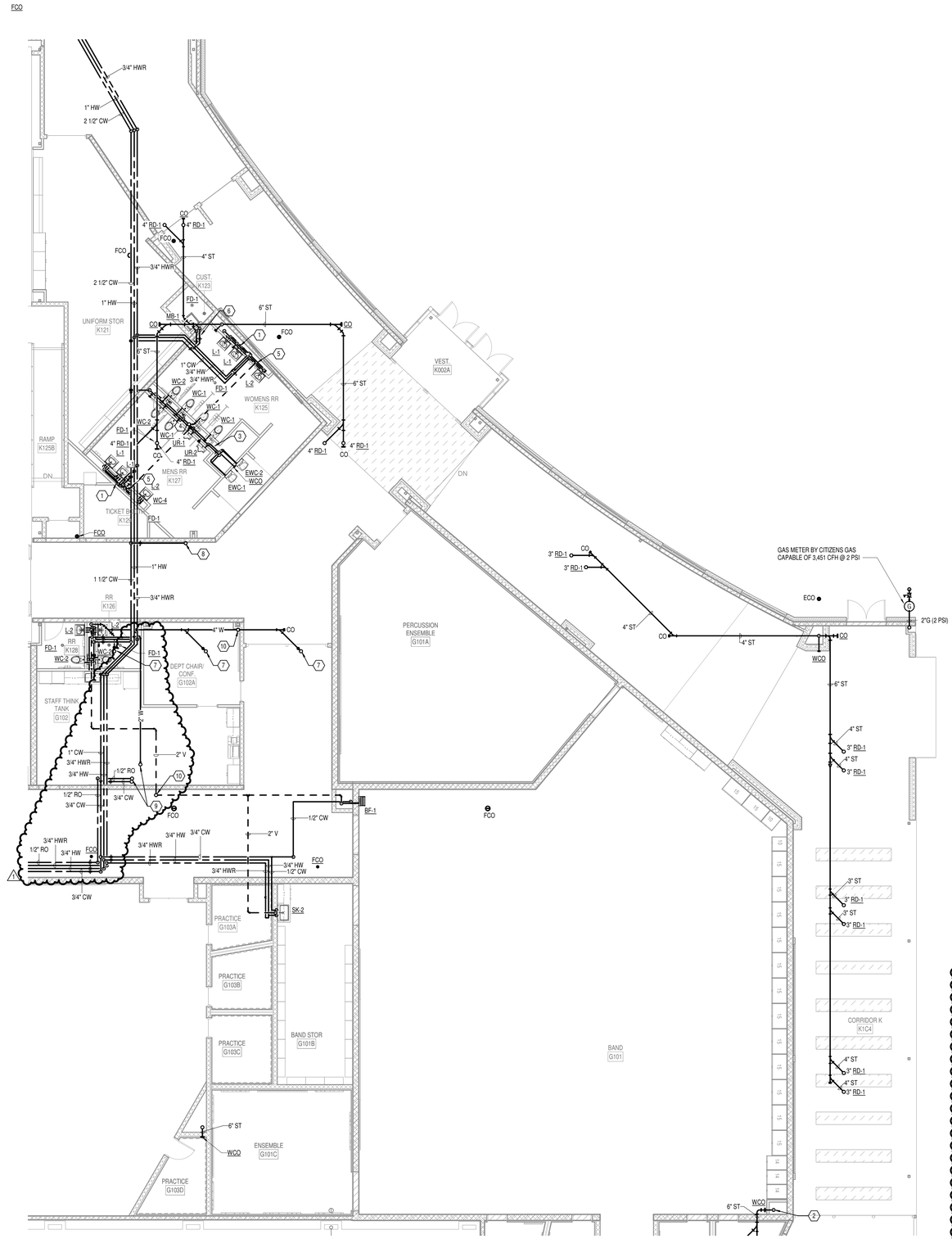
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

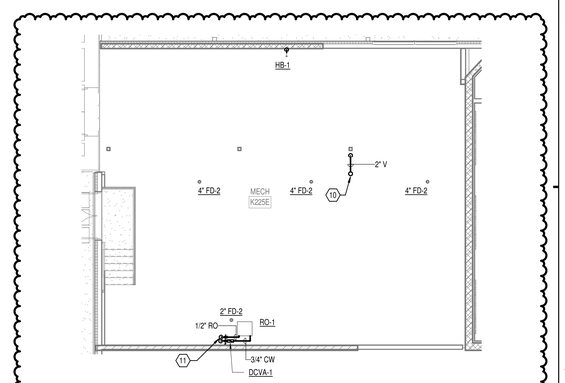
FIRST FLOOR PLUMBING PLAN - UNIT S

PF1S1.3

PF1S1_FIRST FLOOR PLUMBING PLAN - UNIT S
2019-067.NCH, M.S.D. of Washington Township, North Central High School Renovation - Additions Phase 3
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1 FIRST FLOOR PLUMBING PLAN - UNIT AA
1/8" = 1'-0"



2 SECOND FLOOR PLUMBING PLAN - UNIT AA
1/8" = 1'-0"

GENERAL NOTES

A SAWCUT AND/OR CORE DRILL FLOORS, WALLS, ETC. TO INSTALL NEW PIPE.
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C REFER TO SPECIFICATIONS FOR PIPE SLEEVE REQUIREMENTS.
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F FOR ALL WATER CLOSETS AND URINALS; VERIFY CONDITION AND OPERATION OF EXISTING FLUSH VALVE AND REPLACE AS NEEDED. REPLACE ALL WATER CLOSET SEATS.

SHEET KEYNOTES

1 1" CW AND 1" HW DOWN IN CHASE - ROUTE FULL SIZE HEADERS TO FIXUTRES.
3 1-1/2" CW DOWN IN CHASE - ROUTE FULL SIZE HEADER IN CHASE TO FIXTURES. PROVIDE WATER HAMMER ARRESTOR (WHA-B) PRIOR TO FLUSH VALVE.
4 2"V VENT RISER IN CHASE - ROUTE 4"W AND 2"V TO WATER CLOSETS, 2"W AND 2"V TO URINALS. 3" V UP WITH 4" VTR.
5 2"V VENT RISER IN CHASE - ROUTE 2"W AND 2"V TO LAVATORIES.
6 PROVIDE SHUT-OFF VALVES AND CHECK VALVES ON HW AND CW SUPPLY TO MOP BASIN.
7 4" W UP TO FD-2.
8 3/4" CW UP TO HB-1 IN MECHANICAL MEZZANINE.
5 3/4" CW UP TO RO-1 IN MEZZANINE, 1/2" RO DN FROM RO SKID IN MEZZANINE, 2" W UP TO FD-2.
10 2" V UP, 4" VENT THRU ROOF.
11 3/4" CW UP FROM BELOW, 1/2" RO DN THRU FLOOR.

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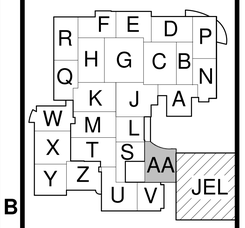
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

KBSO #20060 OLUWASUN OGUNKOMAIYA REGISTERED No. 11300632 STATE OF INDIANA PROFESSIONAL ENGINEER 3/3/2023

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

FIRST FLOOR PLUMBING PLAN - UNIT AA

PF1AA1.3

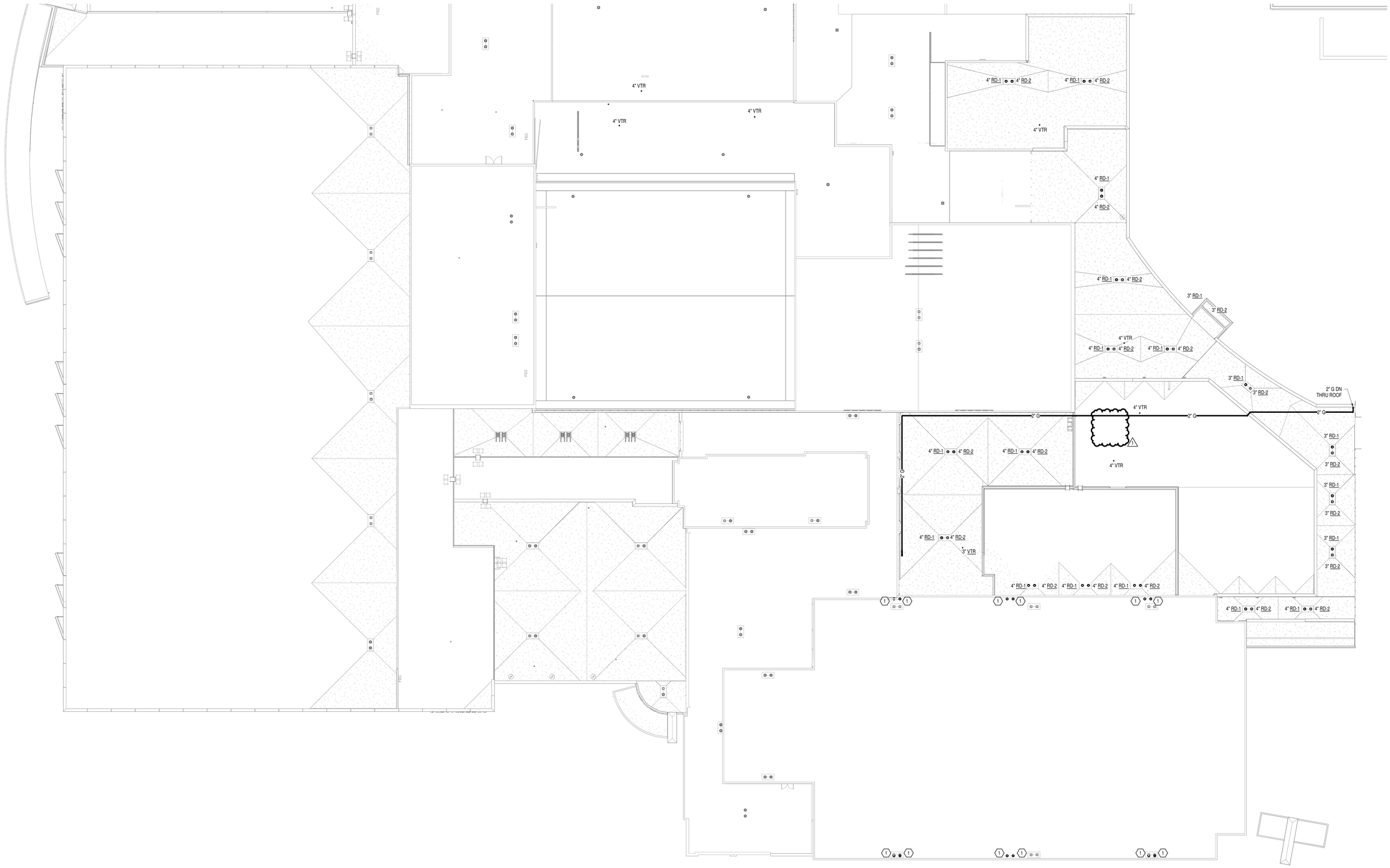
PF1AA1.3 - FIRST FLOOR PLUMBING PLAN - UNIT AA
2019-067.NCH_M.S.D. of Washington Township North Central High School Renovation_
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GENERAL NOTES

A ALL NEW AND EXISTING PLUMBING VENTS TO EXTEND A MINIMUM 18" ABOVE FINISHED ROOF. EXISTING VENTS TO BE EXTENDED IF REQUIRED.

SHEET KEYNOTES

1 COORDINATE WITH ARCHITECTURAL DRAWINGS AND DETAILS ON NEW ROOF TRENCH. DRAINS TO BE REPLACED AND SET IN BOTTOM OF TRENCH THEN RECONNECTED TO EXISTING STORM PIPING.



N

1 ROOF PLUMBING PLAN
1" = 20'-0"

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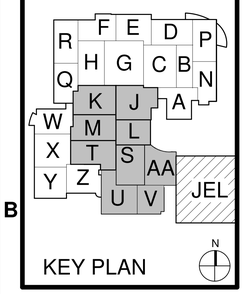
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced KC TCC

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

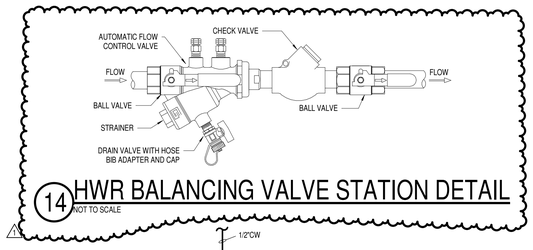
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

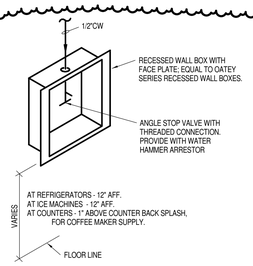
ROOF PLUMBING PLAN

PR102.3

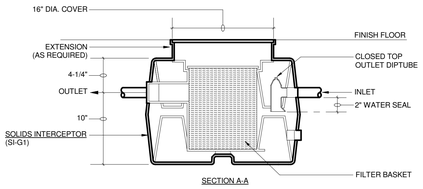
PR102.3 - ROOF PLUMBING PLAN
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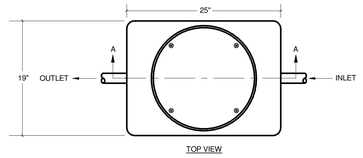
14 HWR BALANCING VALVE STATION DETAIL
NOT TO SCALE



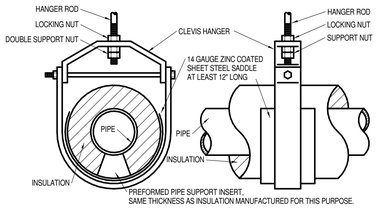
13 WATER SUPPLY BOX DETAIL
NOT TO SCALE



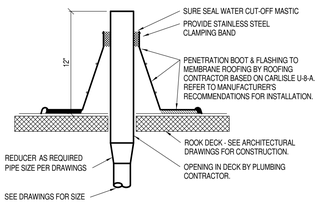
NOTE:
INSTALL SOLIDS INTERCEPTOR PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.



9 SOLIDS INTERCEPTOR DETAIL
NOT TO SCALE



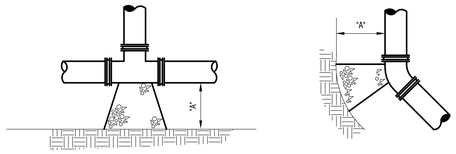
5 PIPE HANGER DETAIL
NOT TO SCALE



4 VENT THRU ROOF DETAIL
NOT TO SCALE

TEES, PLUGS & HYDRANTS		
PIPE DIA. INCHES	"A" FEET	BEARING AREA SQUARE FEET
4	2.0	1.5
6	2.0	2.9
8	2.5	4.8
10	2.5	7.1
12	3.0	10.0
16	3.0	17.1
18	3.5	21.0
20	4.0	26.0

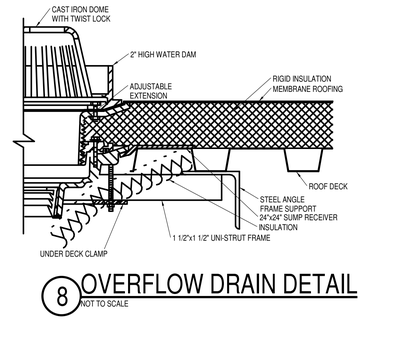
ELBOWS					
PIPE DIA. INCHES	"A" FEET	BEARING AREA (SQUARE FEET)			
		90°	45°	22-1/2°	11-1/4°
4	1.5	2.1	1.1	0.6	0.3
6	2.0	4.1	2.2	1.1	0.6
8	2.0	6.8	3.7	1.9	0.9
10	2.5	10.1	5.5	2.8	1.4
12	3.0	14.1	7.6	3.9	2.0
16	3.0	24.2	13.0	6.7	3.3
18	3.0	30.0	16.3	8.3	4.2
20	3.0	36.8	19.9	10.1	5.1



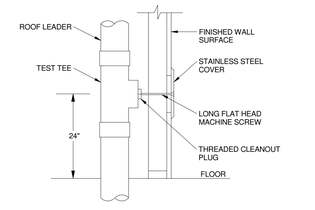
TEES, PLUGS & HYDRANTS ELBOWS

1. THRUST BLOCK SHALL BE FC'=2500 PSI @ 28 DAYS (SEE SPECIFICATIONS SECTION 03300)
2. ALL THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH.
3. BOLTS, FITTING & JOINTS SHALL BE KEPT CLEAR OF CONCRETE.
4. A BEARING CAPACITY OF 2000# PER FOOT WAS USED IN DETERMINING THE MINIMUM "BEARING AREAS" IN THE ABOVE TABLES.
5. THE CROSS SECTION OF THE THRUST BLOCKS SHALL BE SQUARE.

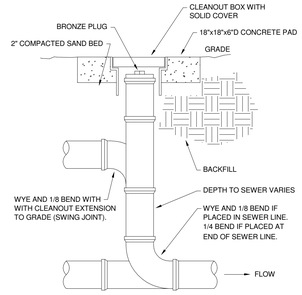
12 CONCRETE THRUST BLOCK DETAIL
NOT TO SCALE



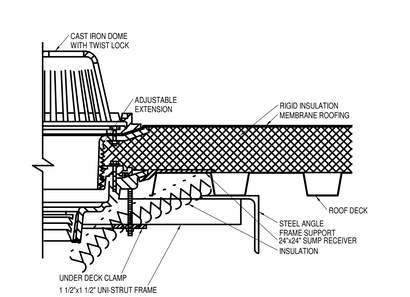
8 OVERFLOW DRAIN DETAIL
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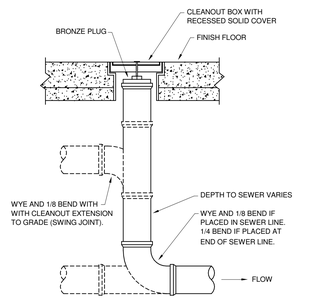
3 WALL CLEANOUT DETAIL
NOT TO SCALE



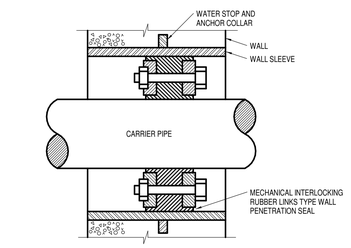
2 EXTERIOR CLEANOUT DETAIL
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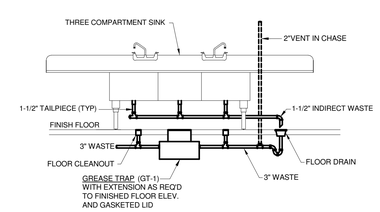
7 ROOF DRAIN DETAIL
NOT TO SCALE



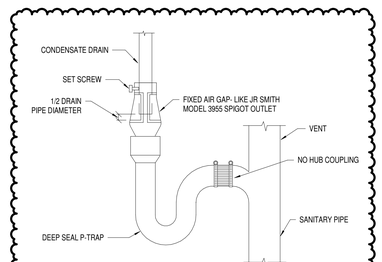
1 INTERIOR CLEANOUT DETAIL
NOT TO SCALE



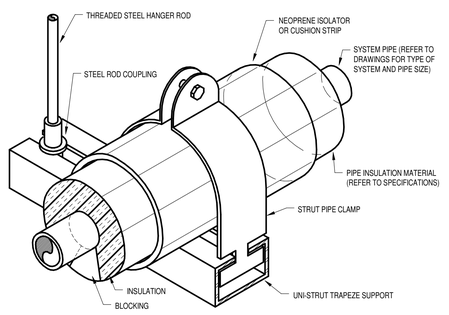
11 WALL FLOOR SLEEVE DETAIL
NOT TO SCALE



10 GREASE TRAP DETAIL
NOT TO SCALE



15 FIXED AIR GAP DETAIL
NOT TO SCALE



6 TRAPEZE DETAIL
NOT TO SCALE

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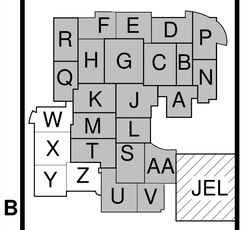
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN N

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

PLUMBING DETAILS

P-501.3

P-501.3_PLUMBING DETAILS
2019-067.NCH_M.S.D. of Washington Township North Central High School Renovation - Additions Phase 3
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DRAINAGE FITTING SCHEDULE

MARK NO.	FIXTURE DESCRIPTION	MANUFACTURER/ MODEL NUMBER
FD-1	FLOOR DRAIN: CAST IRON, FLASHING COLLAR, NO-HUB BOTTOM OUTLET. STRAINER: NICKEL BRONZE, ROUND, FLAT, ADJUSTABLE, 5" DIAMETER. TRAP SEALER: ELASTOMERIC TRAP SEAL DEVICE WITH FITTING FOR INTERNAL TAILPIECE OR PIPE INSTALLATION.	FLOOR DRAIN: WADE 1100-A TRAP SEALER: WADE 4405
FD-2	FLOOR DRAIN: CAST IRON, WITH ANCHOR FLANGE, SEEPAGE OPENINGS, CLAMPING COLLAR, NO HUB BOTTOM OUTLET. BAR GRATE: DUCTILE IRON SLOTTED GRATE.	WADE 1340
FD-3	FLOOR DRAIN: CAST IRON, FLASHING COLLAR, NO-HUB BOTTOM OUTLET. STRAINER: NICKEL BRONZE, ROUND, FLAT, ADJUSTABLE, ANTI-FLOOD RIM, 5" DIAMETER. TRAP SEALER: ELASTOMERIC TRAP SEAL DEVICE WITH FITTING FOR INTERNAL TAILPIECE OR PIPE INSTALLATION.	FLOOR DRAIN: WADE 1100-ER TRAP SEALER: WADE 4405
FD-4	FLOOR DRAIN: CAST IRON, ACID RESISTANT COATED, BOTTOM NO-HUB OUTLET. STRAINER: NICKEL BRONZE, ADJUSTABLE, ROUND, FLAT.	JAY R. SMITH 3021S
FD-5	FLOOR DRAIN: CAST-IRON, ACID RESISTANT COATED. STRAINER: NICKEL BRONZE, ROUND, FLAT, ADJUSTABLE, FUNNEL.	JAY R. SMITH 3510Y
FD-6	FLOOR DRAIN: CAST IRON, ACID RESISTANT COATING, 8" DEEP, NO HUB BOTTOM OUTLET. BAR GRATE: NICKEL BRONZE, SECURED, 1/2 GRATE.	WADE 9140-1-3NH-15
FD-7	FLOOR DRAIN: POLYPROPYLENE BODY AND ADJUSTABLE POLYPROPYLENE STRAINER.	ENFIELD LABLINE F1000 SERIES
SD-1	SHOWER DRAIN: CAST IRON, FLASHING COLLAR, NO-HUB BOTTOM OUTLET. STRAINER: CHROME PLATED BRONZE, ROUND, DOME, ADJUSTABLE, 5-5/8" DIAMETER. TRAP SEALER: ELASTOMERIC TRAP SEAL DEVICE WITH FITTING FOR INTERNAL TAILPIECE OR PIPE INSTALLATION.	FLOOR DRAIN: WADE 1100-K TRAP SEALER: WADE 4405
FCO	FLOOR CLEANOUT: CAST IRON BODY, ROUND ADJUSTABLE SECURED NICKEL BRONZE COVER, BRONZE PLUG, GASKET SEAL.	FLOOR CLEANOUT: WADE FCO 8000-1X-75-4NH
ECO	EXTERIOR CLEANOUT: CAST IRON BODY, DOUBLE FLANGED HOUSING, HEAVY DUTY SECURED SCORIATED CAST IRON COVER WITH LIFTING RING, ABS PLUG, GASKET SEAL.	EXTERIOR CLEANOUT: WADE 8401-12
WCO	WALL CLEANOUT: STAINLESS STEEL SHALLOW COVER WITH CENTER VANDAL RESISTANT SCREW.	WALL CLEANOUT: WADE WCO 8304
RD-1	ROOF DRAIN: DUCO CAST IRON BODY WITH COMBINED FLASHING CLAMP AND GRAVEL STOP, DUCO CAST IRON ADJUSTABLE SLEEVE AND TOP MOUNT REVERSIBLE DECK PLATE. DOME: CAST IRON.	ROOF DRAIN: WADE RD1 3000-42-189
RD-2	OVERFLOW DRAIN: DUCO CAST IRON BODY WITH COMBINED FLASHING CLAMP AND GRAVEL STOP, DUCO CAST IRON ADJUSTABLE SLEEVE AND TOP MOUNT REVERSIBLE DECK PLATE, 2" EXTERIOR WATER DAM. DOME: CAST IRON.	OVERFLOW DRAIN: WADE RD2 3000D-42-189
GT-1	GREASE TRAP: 25 GPM FLOW, 64.9 LBS GREASE, 1.3 GAL SOLIDS CAPACITY, 10 GAL LIQUID CAPACITY.	GREASE TRAP: SCHIER GREAT BASIN GB-1
SS-1	SOLIDS SEPARATOR: SEAMLESS MEDIUM DENSITY POLYETHYLENE 3/8" WALL TANK, REMOVABLE BASKET WITH INTERLOCKS WITH INLET, 3" PLAIN END INLET/OUTLETS, 50 GPM MAX FLOW RATE, LIQUIDS CAPACITY 38 GALLONS (HIGH OUTLET), 12 GALLONS (LOW OUTLET), 6 GALLON SOLIDS CAPACITY, 1/8" DIAMETER SCREEN PERFORATIONS, MAXIMUM TEMPERATURE 140 DEG. F CONTINUOUS.	SOLIDS SEPARATOR: STRIEM AA-M

PLUMBING FIXTURE ROUGH-IN SCHEDULE

TAG	FIXTURE DESCRIPTION	HW	CW	TRAP	W	V	AW	AV	G	A	DI	MOUNTING HEIGHT
WC-1, 3	WATER CLOSET - WALL HUNG, FLUSH VALVE	-	1"	INTEGRAL	4"	2"	-	-	-	-	-	15" A.F.F. TO RIM
WC-2, 4	WATER CLOSET - WALL HUNG, FLUSH VALVE, ADA	-	1"	INTEGRAL	4"	2"	-	-	-	-	-	17" A.F.F. TO RIM
WC-1X, 3X	EX WATER CLOSET - NEW FLUSH VALVE	-	EX	EX	EX	EX	-	-	-	-	-	EX
UR-1	URINAL	-	3/4"	INTEGRAL	2"	2"	-	-	-	-	-	24" A.F.F. TO RIM
UR-2	URINAL - ADA	-	3/4"	INTEGRAL	2"	2"	-	-	-	-	-	17" A.F.F. TO RIM
UR-1X	EX URINAL - NEW FLUSH VALVE	-	EX	EX	EX	EX	-	-	-	-	-	EX
L-1	LAVATORY	1/2"	1/2"	1-1/4"	2"	2"	-	-	-	-	-	34" A.F.F. TO RIM
L-2	LAVATORY - ADA	1/2"	1/2"	1-1/4"	2"	2"	-	-	-	-	-	34" A.F.F. TO RIM
L-1X	EX LAVATORY - NEW FAUCET / TRIM	EX	EX	1-1/4"	EX	EX	-	-	-	-	-	EX
SH-1	SHOWER	1/2"	1/2"	FD	-	-	-	-	-	-	-	58-1/4" A.F.F. TO VALVE, 72" A.F.F. TO HEAD
SH-2	SHOWER - ADA	1/2"	1/2"	FD	-	-	-	-	-	-	-	43" A.F.F. TO VALVE, 72" A.F.F. TO HEAD, 48" TO HAND HELD
SK-1	SINK - THREE COMPARTMENT SINK	(2) 3/4"	(2) 3/4"	FD	(3) 2"	-	-	-	-	-	-	-
SK-2	SINK	1/2"	1/2"	1-1/2"	2"	2"	-	-	-	-	-	SEE ARCHITECTURAL DRAWINGS
SK-3	SINK - ART, SOLIDS INTERCEPTOR	1/2"	1/2"	1-1/2"	2"	2"	-	-	-	-	-	SEE ARCHITECTURAL DRAWINGS
SK-4	SINK - SCIENCE	1/2"	1/2"	1-1/2"	-	-	2"	2"	-	-	1/2"	SEE ARCHITECTURAL DRAWINGS
SK-5	SINK - SCIENCE, ADA	1/2"	1/2"	1-1/2"	-	-	2"	2"	-	-	1/2"	SEE ARCHITECTURAL DRAWINGS
EWC-1	ELECTRIC WATER COOLER - SPORTS BOTTLE FILLER	-	1/2"	1-1/4"	2"	2"	-	-	-	-	-	42" A.F.F. TO BUBBLER
EWC-2	ELECTRIC WATER COOLER - SPORTS BOTTLE FILLER, ADA	-	1/2"	1-1/4"	2"	2"	-	-	-	-	-	32-9/16" A.F.F. TO BUBBLER
T-1	TURRET - ONE OUTLET	-	-	-	-	-	-	-	1/2"	-	-	SEE ARCHITECTURAL DRAWINGS
T-2	TURRET - TWO OUTLETS	-	-	-	-	-	-	-	1/2"	-	-	SEE ARCHITECTURAL DRAWINGS
T-3	TURRET - ONE OUTLET	-	-	-	-	-	-	-	-	1/2"	-	SEE ARCHITECTURAL DRAWINGS
T-4	TURRET - TWO OUTLETS	-	-	-	-	-	-	-	-	1/2"	-	SEE ARCHITECTURAL DRAWINGS
FH-1	FUME HOOD	-	-	1-1/2"	-	-	2"	2"	1/2"	1/2"	1/2"	SEE ARCHITECTURAL DRAWINGS
ES-1	EMERGENCY SHOWER	1"	1"	2"	2"	2"	-	-	-	-	-	1" CW/HW SUPPLY FOR THERMOSTATIC MIXING VALVE
EEW-1	EMERGENCY EYE WASH	1/2"	1/2"	2"	2"	2"	-	-	-	-	-	1/2" CW/HW SUPPLY FOR THERMOSTATIC MIXING VALVE
MB-1	MOP BASIN	3/4"	3/4"	3"	3"	2"	-	-	-	-	-	36" A.F.F. TO FAUCET
IB-1	WATER SUPPLY BOX	-	1/2"	-	-	-	-	-	-	-	-	REFER TO DETAIL
WSB-1	WASHER BOX	1/2"	1/2"	2"	2"	2"	-	-	-	-	-	42" A.F.F.
HB-1	HOSE BIBB	-	3/4"	-	-	-	-	-	-	-	-	36" A.F.F.
HYD-1	WALL HYDRANT - FREEZELESS	-	3/4"	-	-	-	-	-	-	-	-	18" ABOVE GRADE
BF-1	BOTTLE FILLER	-	1/2"	2"	2"	2"	-	-	-	-	-	32-9/16" A.F.F. TO BASIN

PLUMBING EQUIPMENT SCHEDULE

TAG	SPECIFICATION NAME	MANUFACTURER	MODEL #	UNIT WEIGHT	CAPACITY	ELECTRICAL DATA V-PH-HZ	HP	KW	GAS DATA MBH IN	MBH OUT	NOTES
DCVA-01	BACKFLOW PREVENTER (DOMESTIC)	WILKINS	350XL - 3/4"		6 PSI PRESSURE DROP AT 8 GPM FLOW	-	-	-	-	-	1
RO-1	RO WATER SKID	PUROMAX	LP-5000	130 LBS	3.95 PRODUCTION GPM, 3.95 REJECTION GPM, 7.91 TOTAL GPM, 5,000 GALLONS PER DAY, 3/4" INLET/OUTLET CONNECTIONS	120-1-60	1/2	-	-	-	2

NOTES:
1. PROVIDE AIR GAP FITTING. ROUTE DRAIN AND TERMINATE ABOVE FLOOR DRAIN.
2. PROVIDE 120 GALLON R.O. PRESSURE TANK WITH SKID, FLEXWAVE SSR0120 OR EQUIVALENT. 125 MAX PSI, 140 DEG F MAX TEMP, ANSI 61.

WATER HAMMER ARRESTOR SCHEDULE

TYPE	FIXTURE UNIT RATING	I.P.S.	J. R. SMITH NUMBER	NOTES
WHA-A	1-11	3/4"	5005	1
WHA-B	12-32	1"	5010	1
WHA-C	33-60	1"	5020	1
WHA-D	61-113	1"	5030	1
WHA-E	114-154	1"	5040	1
WHA-F	155-330	1"	5050	1

NOTES:
1. WATER HAMMER ARRESTORS SHALL BE SIZED AND INSTALLED PER THE PLUMBING DRAINAGE INSTITUTE (STANDARD PDI-WH 201) REQUIREMENTS IN ACCESSIBLE LOCATIONS ON THE COLD WATER AND HOT WATER PIPING WHERE FLUSH VALVES AND ANY OTHER QUICK CLOSING VALVES ARE USED.

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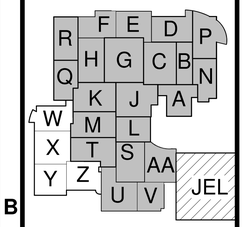
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN N

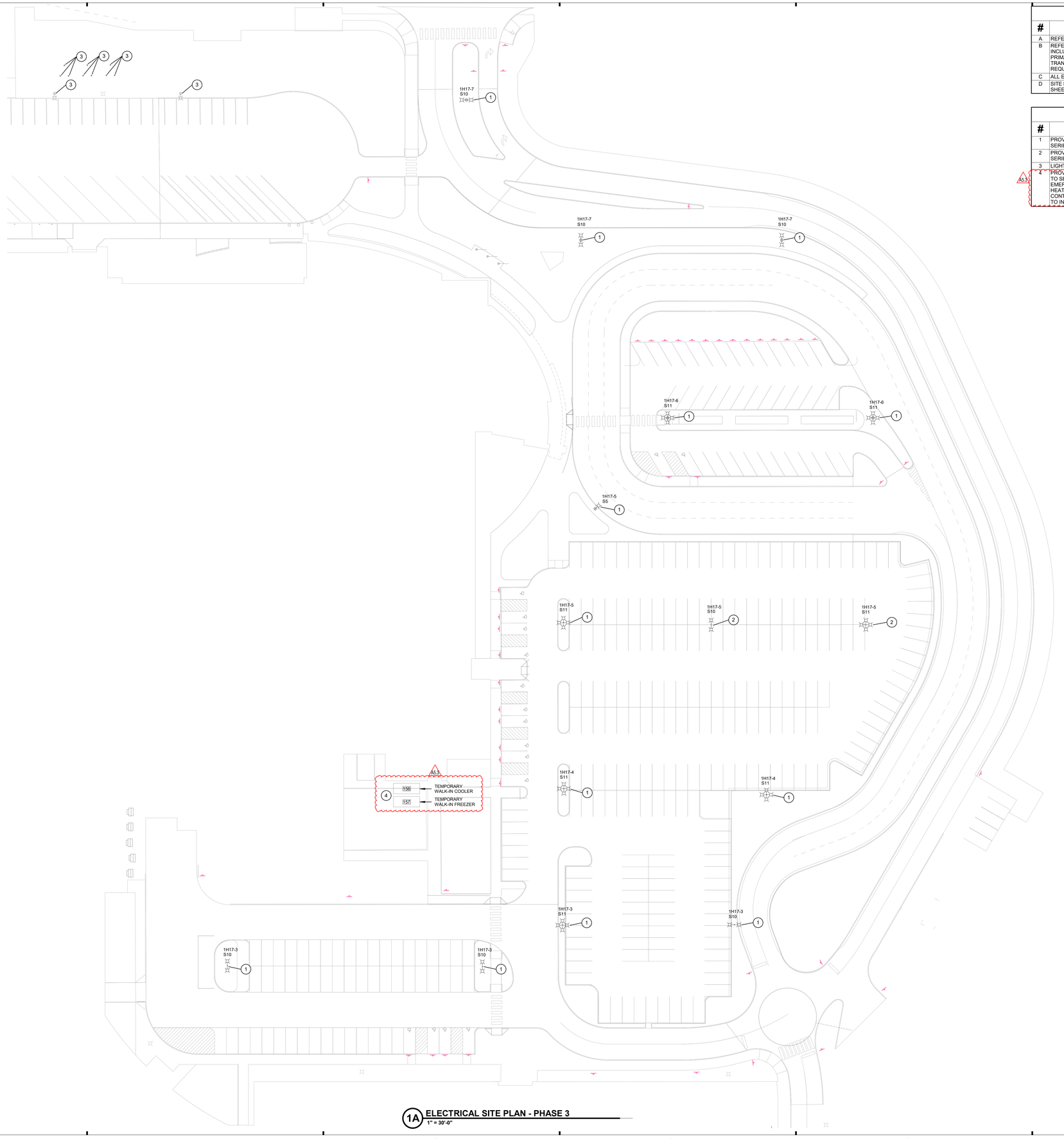
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

PLUMBING SCHEDULES

P-602.3

P-602_1_PLUMBING SCHEDULES
2019.067.NCH M.S.D. of Washington Township_North Central High School Renovation_
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1A **ELECTRICAL SITE PLAN - PHASE 3**
1" = 30'-0"

GENERAL SITE NOTES

#	NOTES
A	REFER TO SHEETS E-001.3 AND E-623.3 FOR ADDITIONAL INFORMATION.
B	REFER TO LOCAL UTILITIES GUIDE FOR DETAILS AND REQUIREMENTS. INCLUDING, BUT NOT LIMITED TO, SERVICE REQUIREMENTS FOR UNDERGROUND PRIMARY, PROTECTIVE POLES FOR PAD-MOUNTED EQUIPMENT, UTILITY TRANSFORMER CONCRETE PAD DETAIL, ETC. INCLUDE ALL UTILITY FEES REQUIRED IN BID.
C	ALL ELECTRICAL ITEMS SHOWN WITH LIGHT LINEWORK ARE EXISTING TO REMAIN.
D	SITE LIGHTING TO BE CONTROLLED VIA LIGHTING CONTROL SYSTEM. REFER TO SHEET E-622.3 FOR EXTERIOR LIGHTNG CONTROL SYSTEM SCHEMATIC.

SITE PLAN NOTES

#	NOTES
1	PROVIDE POLE BASE FOR FIXTURE 6" ABOVE FINISHED GRADE. REFER TO E-500 SERIES DRAWINGS FOR DETAIL.
2	PROVIDE POLE BASE FOR FIXTURE 42" ABOVE FINISHED GRADE. REFER TO E-500 SERIES DRAWINGS FOR DETAIL.
3	LIGHT FIXTURE PROVIDED IN PREVIOUS BID PACKAGE.
4 (A5.3)	PROVIDE 208V-3P, 100A PANELBOARD AND 30KVA 480V / 208/120V TRANSFORMER TO SERVE TEMPORARY WALK-INS. CONNECT TRANSFORMER TO 480V EMERGENCY PANEL 'XHD2'. CONNECT ALL WALK-IN CONDENSERS, DOOR HEATERS, EVAPORATORS, AND LIGHTS TO TEMPORARY PANELBOARD. CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS WITH OWNER PRIOR TO INSTALLATION.

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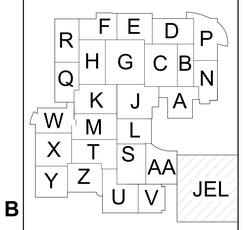
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KEY PLAN

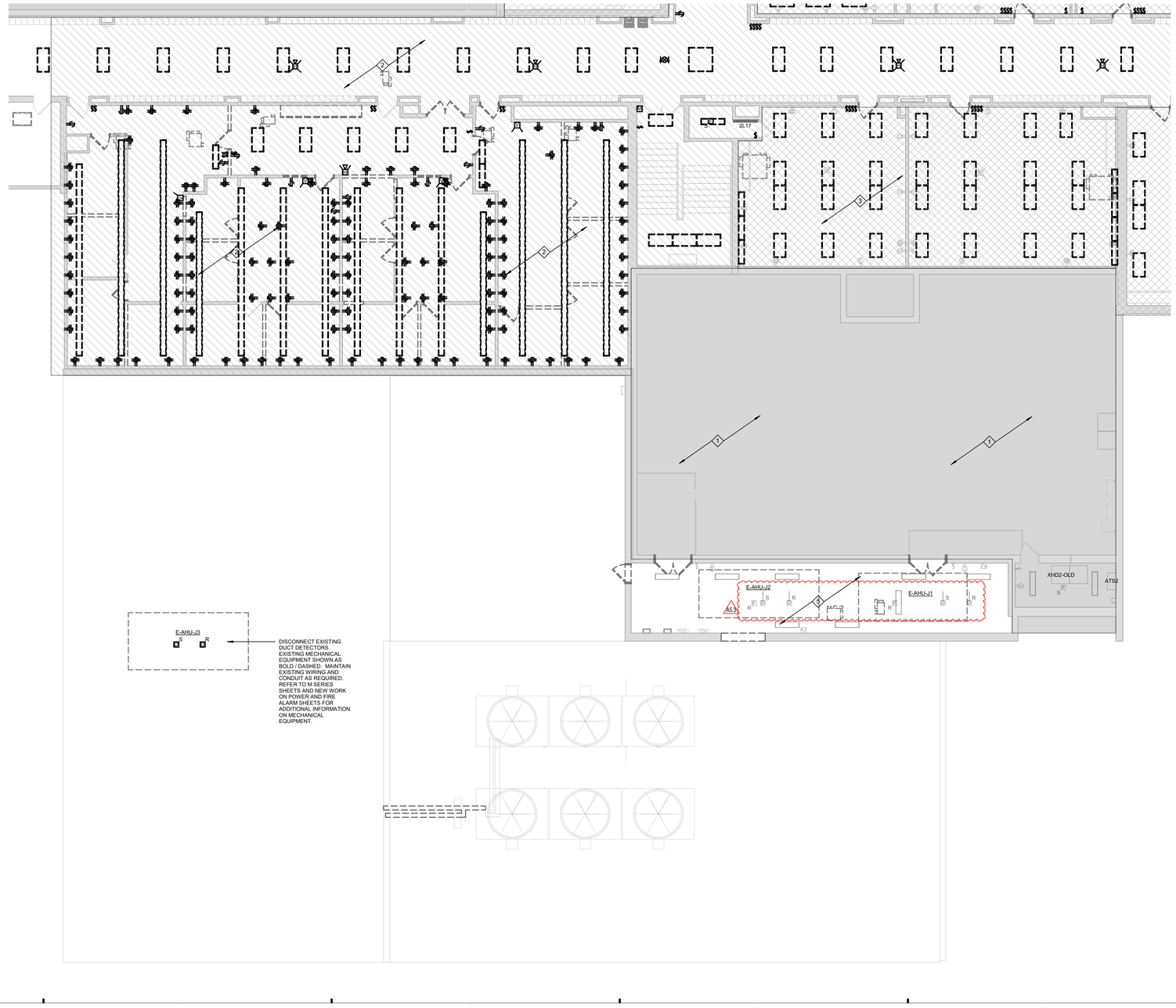
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North Central High School
Renovation - Additions
Phase 3

ELECTRICAL SITE PLAN

ES101.3

ES101.3_ELECTRICAL SITE PLAN
2019-067.NCH_M.S.D. of Washington Township North Central High School Renovation_TEST FIT#01
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GENERAL DEMOLITION NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	THIS DRAWING REPRESENTS INFORMATION OBTAINED FROM ORIGINAL CONTRACT DRAWINGS AND FIELD SURVEY. VERIFY BY ON-SITE OBSERVATION THE EXTENT OF WORK PRIOR TO SUBMISSION OF BID.
C	CONTRACT DOCUMENTS CONSIST OF BOTH PROJECT MANUAL AND DRAWINGS AND ARE MEANT TO BE COMPLEMENTARY. ANYTHING APPEARING ON EITHER MUST BE EXECUTED THE SAME AS IF SHOWN ON BOTH.
D	THOROUGHLY EXAMINE THE WORK OF OTHER CONTRACTORS AND PROPERLY INSTALL ALL WORK REQUIRED FOR THE PROJECT.
E	THE OWNER HOLDS RIGHT OF FIRST REFUSAL FOR ALL DEMOLISHED ELECTRICAL EQUIPMENT.
F	CONTRACTOR SHALL REFER TO NEW WORK ON POWER PLANS FOR EXISTING OUTLET BOXES INDICATED WITH 'X' FOR NEW DEVICES. CONTRACTOR SHALL MAINTAIN EXISTING DEVICES ROUGH-INS AND WIRING AS REQUIRED.
G	SALVAGE EXISTING FIRE ALARM DEVICES FOR RELOCATION. CONTRACTOR SHALL MAINTAIN EXISTING DEVICES ROUGH-INS AND WIRING AS REQUIRED.
H	COORDINATE AND DISCONNECT ALL ARCHITECTURAL, MECHANICAL, AND PLUMBING EQUIPMENT AS NOTED FOR REMOVAL BY OTHERS. REMOVE ALL ASSOCIATED ELECTRICAL EQUIPMENT, RACEWAYS, CONDUCTORS, ETC. SERVING THE EQUIPMENT.
I	PROVIDE ALL CUTTING AND PATCHING AS REQUIRED FOR THE REMOVAL OF EXISTING ELECTRICAL EQUIPMENT. REFER TO SPECIFICATIONS.
J	PROVIDE A BLANK COVERPLATE FOR ALL EXISTING WALL OPENINGS WHERE ELECTRICAL EQUIPMENT HAS BEEN REMOVED AND NOT REPLACED. IN AREAS RECEIVING NEW WALL TREATMENTS, PATCH THE EXISTING OPENING.
K	REFER TO A, M, AND P-SERIES DRAWINGS FOR AREAS WITH ABOVE CEILING WORK AND/OR CEILING REMOVAL. TEMPORARILY SUPPORT ALL ELECTRICAL DEVICES, FIXTURES, ETC. AS REQUIRED. RE-INSTALL ELECTRICAL ITEMS FOLLOWING THE COMPLETION OF WORK IN THE NEW OR EXISTING CEILINGS.
L	REFER TO ELECTRICAL ONE-LINE DIAGRAMS FOR ELECTRICAL EQUIPMENT TO BE DEMOLISHED.

DEMOLITION PLAN NOTES

#	NOTES
1	SOLID GRAY HATCH INDIACTES AREA COMPLETED IN AN EARLIER PHASE. AREA IS EXISTING TO REMAIN.
2	DIAGONAL HATCH INDICATES TO DISCONNECT AND REMOVE EXISTING LIGHTING FIXTURES, LIGHTING DEVICES, RECEPTACLES, PANELBOARDS, MECHANICAL EQUIPMENT AND FIRE ALARM DEVICES SHOWN AS BOLD / DASHED BACK TO SOURCE COMPLETE, UNLESS NOTED OTHERWISE. REFER TO NEW WORK ON LIGHTING, POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION.
3	CROSS HATCH INDICATES: BASE BID. DISCONNECT AND REMOVE EXISTING LIGHTING FIXTURES, LIGHTING DEVICES AND MECHANICAL EQUIPMENT SHOWN AS BOLD / DASHED BACK TO SOURCE COMPLETE, UNLESS NOTED OTHERWISE. FIRE ALARM DEVICES ARE EXISTING TO REMAIN. GENERAL CLASSROOM INTERIOR FINISHES ALTERNATE. PROVIDE ALTERNATE BID TO REPLACE RECEPTACLES AND COVERPLATES. CONTRACTOR SHALL MAINTAIN EXISTING DEVICES ROUGH-INS AND WIRING AS REQUIRED. REFER TO NEW WORK ON LIGHTING, POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION.
4	DIAGONAL HATCH INDICATES TO DISCONNECT EXISTING MECHANICAL EQUIPMENT COMPLETE BACK TO SOURCE SHOWN AS BOLD / DASHED. REFER TO M SERIES SHEETS AND NEW WORK ON ROOF POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION.
5	LIGHT FIXTURES, RECEPTACLES AND FIRE ALARM DEVICES ARE EXISTING TO REMAIN. DISCONNECT EXISTING MANUAL PULLS AND DUCT DETECTORS. DISCONNECT EXISTING MECHANICAL EQUIPMENT SHOWN AS BOLD / DASHED. MAINTAIN EXISTING WIRING AND CONDUIT AS REQUIRED. REFER TO M SERIES SHEETS AND NEW WORK ON POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION ON MECHANICAL EQUIPMENT.
6	LIGHTING FIXTURES, RECEPTACLES, AND FIRE ALARM DEVICES ARE EXISTING TO REMAIN IN HATCHED AREA.
7	K HALL ELEVATOR ALTERNATE. PROVIDE ALTERNATE BID TO DISCONNECT AND REMOVE EXISTING ELEVATOR ELECTRICAL & FIRE ALARM EQUIPMENT / DEVICES SERVING ELEVATOR BACK TO NEAREST SOURCE TO REMAIN.
8	MDF SHALL REMAIN OPERATIONAL DURING CONSTRUTCTION.

2A SECOND FLOOR DEMOLITION PLAN - UNIT J
1/8" = 1'-0"

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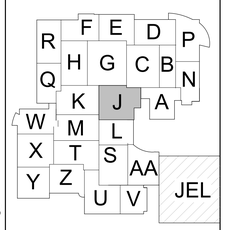
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

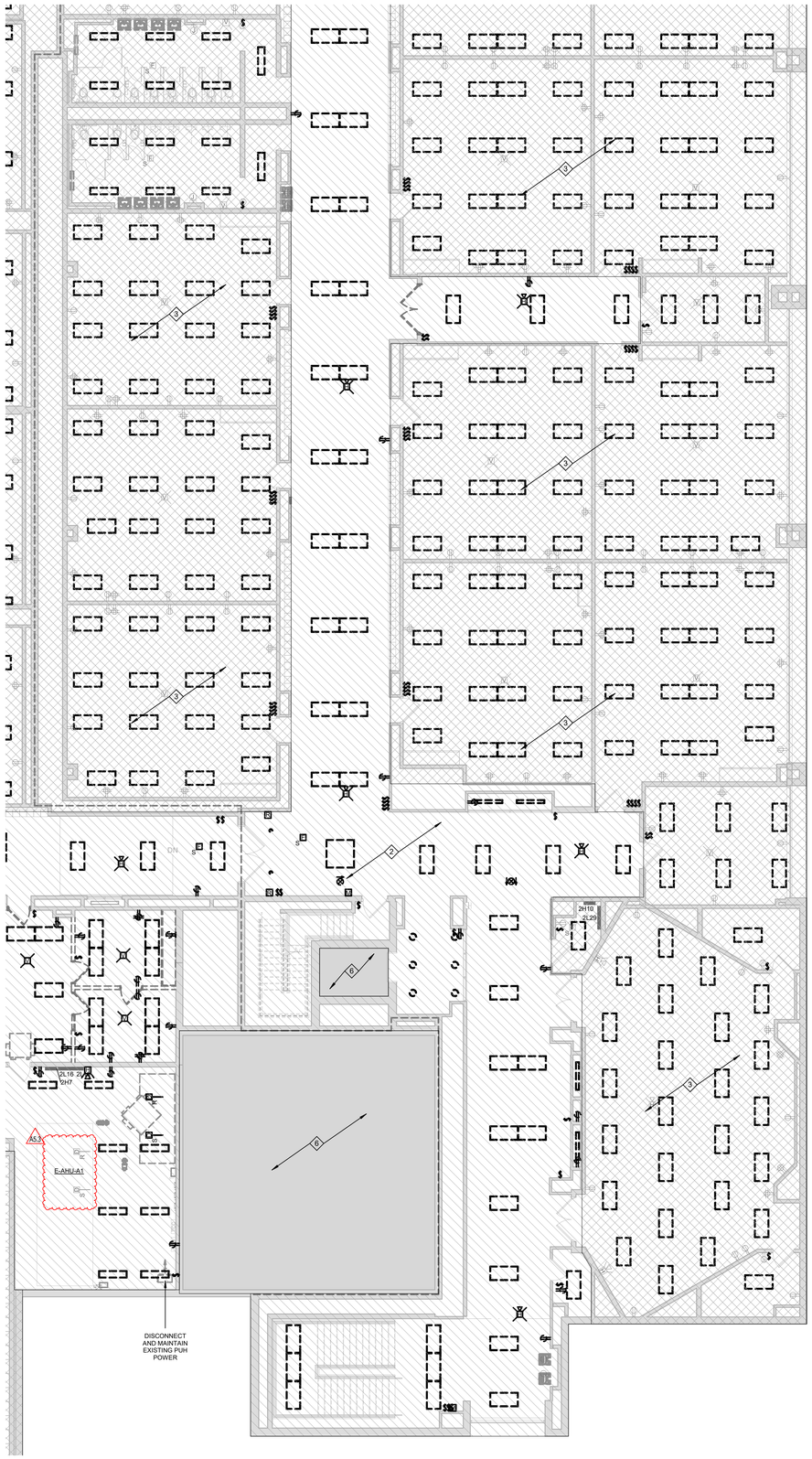
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR DEMOLITION PLAN - UNIT J

ED1J2.3

ED1J2_SECOND FLOOR DEMOLITION PLAN - UNIT J
2019-067.NCH_3-8-23 of Washington Township North Central High School Renovation_15317.rvt
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4/19/2023 10:59:58 AM



2A **SECOND FLOOR DEMOLITION PLAN - UNIT N**
1/8" = 1'-0"

GENERAL DEMOLITION NOTES

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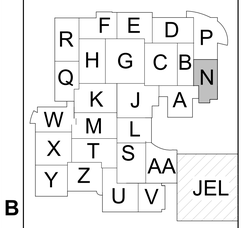
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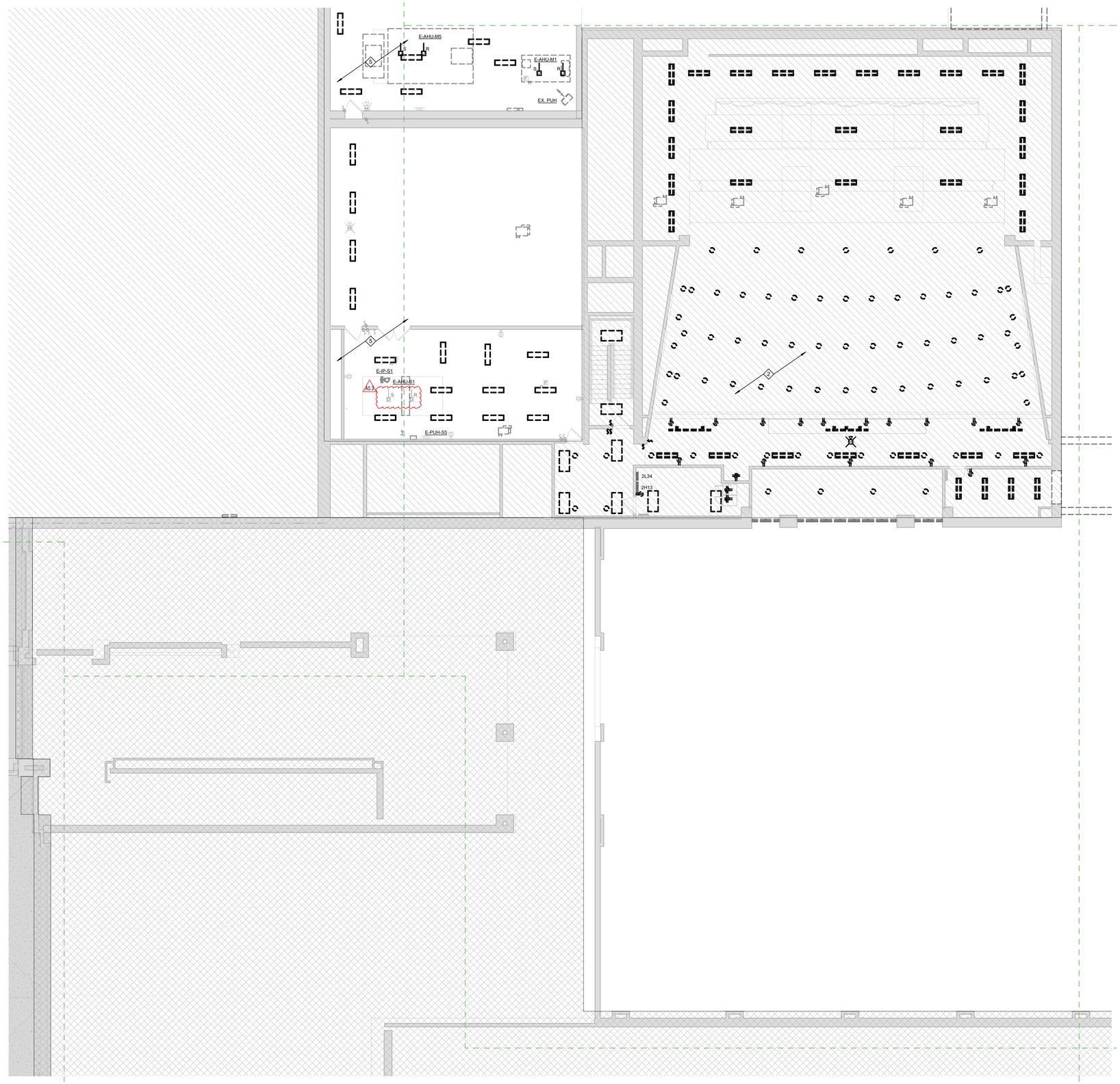
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North Central High School
Renovation - Additions
Phase 3

SECOND FLOOR DEMOLITION PLAN - UNIT N

ED1N2.3

ED1N2_SECOND FLOOR DEMOLITION PLAN - UNIT N
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2A **SECOND FLOOR DEMOLITION PLAN - UNIT S**
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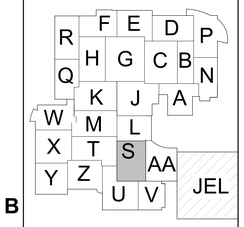
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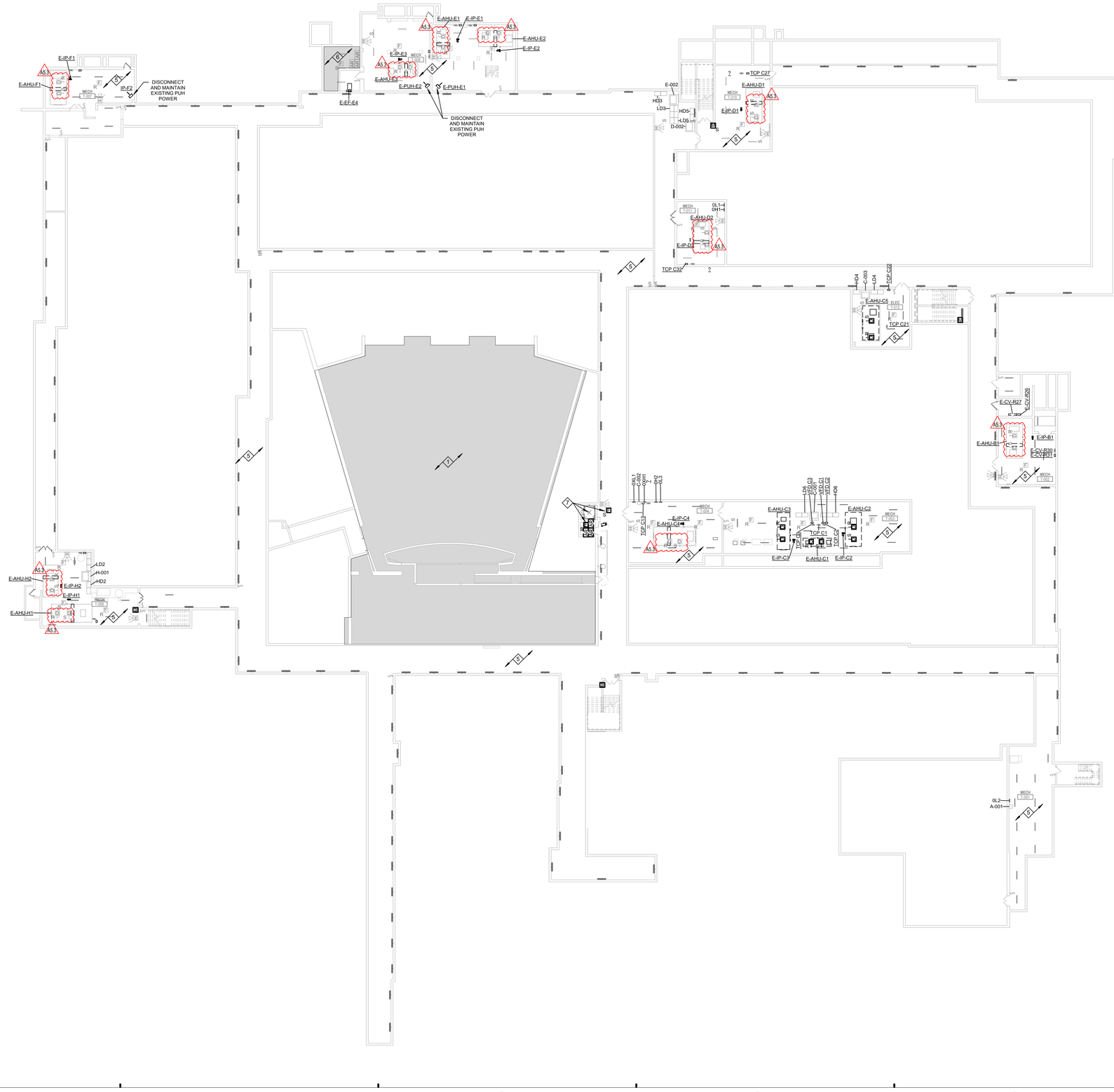
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR DEMOLITION PLAN - UNIT S

ED1S2.3

ED1S2.3_SECOND FLOOR DEMOLITION PLAN - UNIT S
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2A LOWER LEVEL PARTIAL OVERALL DEMOLITION PLAN

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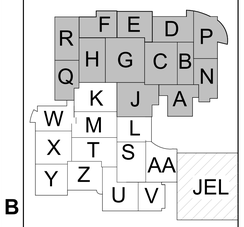
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KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

LOWER LEVEL PARTIAL OVERALL DEMOLITION PLAN

ED100.3

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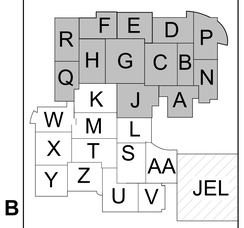
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ED101.3

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2019-067.NCH_A5.0 of Washington Township North Central High School Renovation_1503.rvtm1
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B	THIS DRAWING REPRESENTS INFORMATION OBTAINED FROM ORIGINAL CONTRACT DRAWINGS AND FIELD SURVEY. VERIFY BY ON-SITE OBSERVATION THE EXTENT OF WORK PRIOR TO SUBMISSION OF BID.
C	CONTRACT DOCUMENTS CONSIST OF BOTH PROJECT MANUAL AND DRAWINGS AND ARE MEANT TO BE COMPLEMENTARY. ANYTHING APPEARING ON EITHER MUST BE EXECUTED THE SAME AS IF SHOWN ON BOTH.
D	THOROUGHLY EXAMINE THE WORK OF OTHER CONTRACTORS AND PROPERLY INSTALL ALL WORK REQUIRED FOR THE PROJECT.
E	THE OWNER HOLDS RIGHT OF FIRST REFUSAL FOR ALL DEMOLISHED ELECTRICAL EQUIPMENT.
F	CONTRACTOR SHALL REFER TO NEW WORK ON POWER PLANS FOR EXISTING OUTLET BOXES INDICATED WITH 'X' FOR NEW DEVICES. CONTRACTOR SHALL MAINTAIN EXISTING DEVICES ROUGH-INS AND WIRING AS REQUIRED.
G	SALVAGE EXISTING FIRE ALARM DEVICES FOR RELOCATION. CONTRACTOR SHALL MAINTAIN EXISTING DEVICES ROUGH-INS AND WIRING AS REQUIRED.
H	COORDINATE AND DISCONNECT ALL ARCHITECTURAL, MECHANICAL, AND PLUMBING EQUIPMENT AS NOTED FOR REMOVAL BY OTHERS. REMOVE ALL ASSOCIATED ELECTRICAL EQUIPMENT, RACEWAYS, CONDUCTORS, ETC. SERVING THE EQUIPMENT.
I	PROVIDE ALL CUTTING AND PATCHING AS REQUIRED FOR THE REMOVAL OF EXISTING ELECTRICAL EQUIPMENT. REFER TO SPECIFICATIONS.
J	PROVIDE A BLANK COVERPLATE FOR ALL EXISTING WALL OPENINGS WHERE ELECTRICAL EQUIPMENT HAS BEEN REMOVED AND NOT REPLACED. IN AREAS RECEIVING NEW WALL TREATMENTS, PATCH THE EXISTING OPENING.
K	REFER TO A, M, AND P-SERIES DRAWINGS FOR AREAS WITH ABOVE CEILING WORK AND/OR CEILING REMOVAL. TEMPORARILY SUPPORT ALL ELECTRICAL DEVICES, FIXTURES, ETC. AS REQUIRED. RE-INSTALL ELECTRICAL ITEMS FOLLOWING THE COMPLETION OF WORK IN THE NEW OR EXISTING CEILINGS.
L	REFER TO ELECTRICAL ONE-LINE DIAGRAMS FOR ELECTRICAL EQUIPMENT TO BE DEMOLISHED.

DEMOLITION PLAN NOTES

#	NOTES
1	SOLID GRAY HATCH INDIACTES AREA COMPLETED IN AN EARLIER PHASE. AREA IS EXISTING TO REMAIN.
2	DIAGONAL HATCH INDICATES TO DISCONNECT AND REMOVE EXISTING LIGHTING FIXTURES, LIGHTING DEVICES, RECEPTACLES, PANELBOARDS, MECHANICAL EQUIPMENT AND FIRE ALARM DEVICES SHOWN AS BOLD / DASHED BACK TO SOURCE COMPLETE, UNLESS NOTED OTHERWISE. REFER TO NEW WORK ON LIGHTING, POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION.
3	CROSS HATCH INDICATES: BASE BID. DISCONNECT AND REMOVE EXISTING LIGHTING FIXTURES, LIGHTING DEVICES AND MECHANICAL EQUIPMENT SHOWN AS BOLD / DASHED BACK TO SOURCE COMPLETE, UNLESS NOTED OTHERWISE. FIRE ALARM DEVICES ARE EXISTING TO REMAIN. GENERAL CLASSROOM INTERIOR FINISHES ALTERNATE. PROVIDE ALTERNATE BID TO REPLACE RECEPTACLES AND COVERPLATES. CONTRACTOR SHALL MAINTAIN EXISTING DEVICES ROUGH-INS AND WIRING AS REQUIRED. REFER TO NEW WORK ON LIGHTING, POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION.
4	DIAGONAL HATCH INDICATES TO DISCONNECT EXISTING MECHANICAL EQUIPMENT COMPLETE BACK TO SOURCE SHOWN AS BOLD / DASHED. REFER TO M SERIES SHEETS AND NEW WORK ON ROOF POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION.
5	LIGHT FIXTURES, RECEPTACLES AND FIRE ALARM DEVICES ARE EXISTING TO REMAIN. DISCONNECT EXISTING MANUAL PULLS AND DUCT DETECTORS. DISCONNECT EXISTING MECHANICAL EQUIPMENT SHOWN AS BOLD / DASHED. MAINTAIN EXISTING WIRING AND CONDUIT AS REQUIRED. REFER TO M SERIES SHEETS AND NEW WORK ON POWER AND FIRE ALARM SHEETS FOR ADDITIONAL INFORMATION ON MECHANICAL EQUIPMENT.
6	LIGHTING FIXTURES, RECEPTACLES, AND FIRE ALARM DEVICES ARE EXISTING TO REMAIN IN HATCHED AREA.
7	K HALL ELEVATOR ALTERNATE. PROVIDE ALTERNATE BID TO DISCONNECT AND REMOVE EXISTING ELEVATOR ELECTRICAL & FIRE ALARM EQUIPMENT / DEVICES SERVING ELEVATOR BACK TO NEAREST SOURCE TO REMAIN.
8	MDF SHALL REMAIN OPERATIONAL DURING CONSTRUTCTION.

1A **ROOF & PENTHOUSE PARTIAL OVERALL DEMOLITION PLAN**
3/64" = 1'-0"

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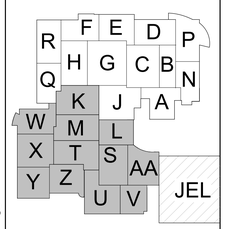
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced JAW

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

ROOF & PENTHOUSE
PARTIAL OVERALL
DEMOLITION PLAN

ED102.3

ED102.3 - ROOF & PENTHOUSE PARTIAL OVERALL DEMOLITION PLAN
2019-067.NCH_ED102.3 - M.S.D. of Washington Township, North Central High School Renovation - Additions - Phase 3
Saved: 3/2/2023 3:47:27 PM EST
Plotted: 3/2/2023 3:47:40 PM EST
Author: Jeff Wolf
Path: C:\Users\jwolf\Schmidt Associates\2019-067.NCH - North Central High School Renovation - Additions - Phase 3 - Washington Township\Revit\2019-067.NCH_Wingate_v_2022_CAcad.rvt
Scale: 3/64" = 1'-0"

GENERAL LIGHTING NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ALL 'LOWER LEVEL LIGHT FIXTURES ARE FED FROM PANELBOARD 'OXH1'.
C	NEW LIGHTING DEVICES / LIGHTING FIXTURES SHOWN TO BE INSTALLED ON EXISTING BLOCK WALLS / CEILINGS TIGHT TO STRUCTURE SHALL BE INSTALLED SURFACE MOUNTED AND IN SURFACE MOUNTED WIREMOLD PAINTED TO MATCH WALLS AND CEILINGS. WIREMOLD SHALL BE INSTALLED NEATLY AND AT RIGHT ANGLES TO STRUCTURE. WHEN POSSIBLE ROUTE VERTICAL WIREMOLD IN CORNERS THEN TO DEVICE / FIXTURE. WIREMOLD. SHALL BE INSTALLED TO MINIMIZE LENGTH. REFER TO ARCHITECTURAL FLOOR PLANS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION. CONFIRM EXACT WIREMOLD ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.

LIGHTING PLAN NOTES

#	NOTES
1	CONNECT NEW LIGHT FIXTURES TO NORMAL AND/OR EMERGENCY CIRCUITS THAT WERE MAINTAINED DURING DEMOLITION.
2	ONE-FOR-ONE LIGHT FIXTURE REPLACEMENT. CONNECT NEW LIGHT FIXTURE TO CIRCUIT THAT WAS MAINTAINED DURING DEMOLITION.
3	CONNECT NEW DEVICES TO CIRCUIT THAT WAS MAINTAINED DURING DEMOLITION.
4	CONNECT NEW LIGHT FIXTURES TO CLOSEST LIGHTING CIRCUIT IN THIS AREA.
5	MOUNT FIXTURES INDICATED BELOW PIPING. REWORK WIRE AND CONDUIT AS REQUIRED.
6	PROVIDE UL 924 AUTOMATIC LOAD CONTROL RELAY IN OUTLET BOX FLUSH-MOUNTED IN CEILING TO ZONE CONTROL EMERGENCY LIGHTING IN THIS ROOM/SPACE. CONNECT UL 924 DEVICE TO NORMAL AND EMERGENCY CIRCUITS INDICATED AT DEVICE. CONTROL FIXTURE(S) BASED ON SWITCH LEG(S) WHERE REQUIRED.
7	COORDINATE FINAL LOCATION OF FIXTURES WITH ELEVATOR INSTALLATION CONTRACTOR.
8	CONNECT FIXTURE TO EXTERIOR LIGHTING CONTROLS.
9	REFER TO SECOND FLOOR LIGHTING PLAN FOR FIXTURE LAYOUT AND CONTROLS FOR THIS ROOM/AREA.
10	REFER TO FIRST FLOOR LIGHTING PLAN FOR FIXTURE LAYOUT AND CONTROLS FOR THIS ROOM/AREA.
11	ALL LIGHTING DEVICES AND FIXTURES IN THIS AREA ARE EXISTING TO REMAIN.
12	4 SCENE LOW VOLTAGE PUSHBUTTON WALL STATION, WITH DIMMING CAPABILITIES. PROVIDE PRESET LEVELS FOR NORMAL GYM ACTIVITIES AND FOR GAMES. PROVIDE UL 924 FOR CONTROL OF EMERGENCY LIGHTING INDICATED. PROVIDE ALL COMPONENTS, ROOM CONTROLLERS, WIRING, ETC. FOR COMPLETE OPERATIONAL SYSTEM.
13	LIGHTING IN THIS AREA SHALL BE PROVIDED BY EQUIPMENT PROVIDER. REFER TO POWER PLANS FOR CIRCUIT DESIGNATION.
14	RGB LED SYSTEM TO BE PROVIDED BY LIGHTBOX MANUFACTURER. WIRING AND INSTALLATION BY E.C. TO CIRCUIT INDICATED. CONNECT FIXTURE TO EXTERIOR LIGHTING CONTROLS.
16	LOWER LEVEL LIGHT FIXTURES ARE EXISTING TO REMAIN.
17	PENTHOUSE LIGHT FIXTURES ARE EXISTING TO REMAIN.
18	SOUTH CANOPY ALTERNATE: PROVIDE ALTERNATE BID FOR CANOPY AND LIGHT BOX LIGHTING AS SHOWN.
19	EAST PERFORMANCE ARTS ENTRANCE ALTERNATE: PROVIDE ALTERNATE BID FOR CANOPY LIGHTING AS SHOWN.



2A **SECOND FLOOR LIGHTING PLAN - UNIT E**
1/8" = 1'-0"

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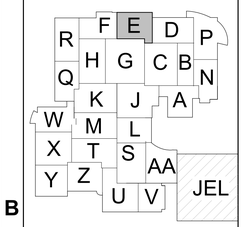
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A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN N

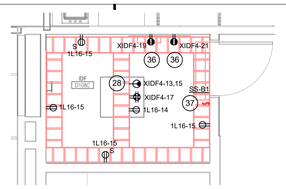
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR LIGHTING PLAN - UNIT E

EL1E2.3

EL1E2.3 - SECOND FLOOR LIGHTING PLAN - UNIT E
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1 ENLARGED FIRST FLOOR POWER PLAN - IDF 1

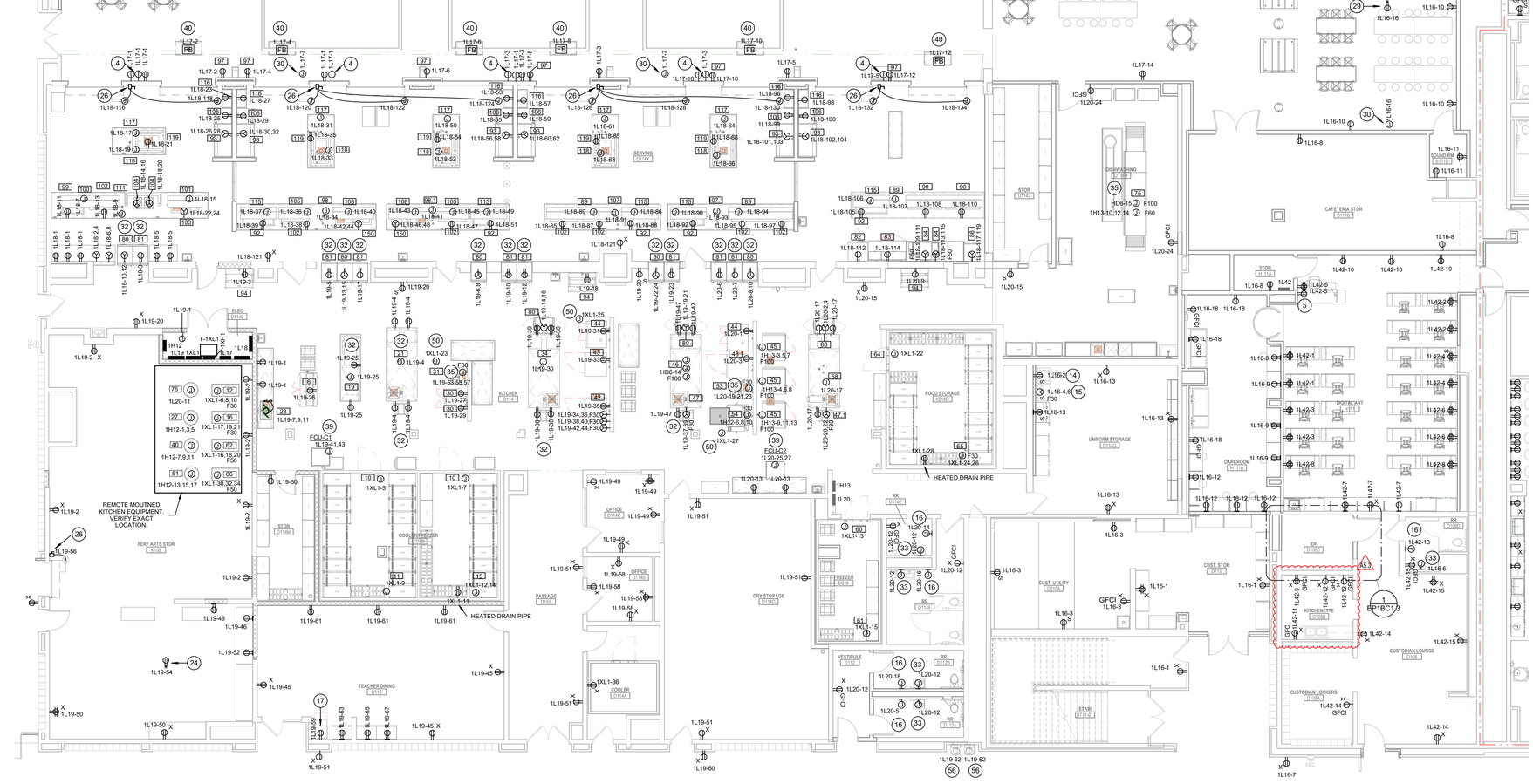
1/4" = 1'-0"

GENERAL POWER NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ALL THEATER AND PERFORMING ARTS EQUIPMENT SHALL BE PROVIDED MINIMUM #10AWG.
C	NEW ELECTRICAL DEVICES SHOWN TO BE INSTALLED ON EXISTING BLOCK WALLS / CEILINGS TIGHT TO STRUCTURE SHALL BE INSTALLED SURFACE MOUNTED AND IN SURFACE MOUNTED WIREMOLD PAINTED TO MATCH WALL AND CEILINGS. WIREMOLD SHALL BE INSTALLED NEATLY AND AT RIGHT ANGLES TO STRUCTURE. WHEN POSSIBLE ROUTE VERTICAL WIREMOLD IN CORNERS THEN TO DEVICE / FIXTURE. WIREMOLD SHALL BE INSTALLED TO MINIMIZE LENGTH. REFER TO ARCHITECTURAL FLOOR PLANS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION. CONFIRM EXACT WIREMOLD ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.

POWER PLAN NOTES

#	NOTES
1	GENERAL CLASSROOM INTERIOR FINISHES ALTERNATE. PROVIDE ALTERNATE BID TO REPLACE ALL ELECTRICAL RECEPTACLES AND COVER PLATES IN HATCHED AREA IF SHOWN OR NOT SHOWN. ELECTRICAL DEVICES SHOWN IN THE HATCHED AREA ARE BASED ON EXISTING DRAWINGS AND ALL DEVICES MAY NOT BE SHOWN. ELECTRICAL DEVICES SHALL MATCH CURRENT INSTALLATION CHARACTERISTICS.
2	PROVIDE INFRARED SCAN FOR EQUIPMENT INDICATED. CLEAN ALL DUST OFF EQUIPMENT, EXERCISE AND LUBRICATE ALL FUSIBLE SWITCHES
3	LOCATION FOR FUTURE RECEPTACLE FOR WALL-MOUNTED SHORT-THROW PROJECTOR. INSTALL CONDUCTORS IN OUTLET BOX. PROVIDE BLANK COVERPLATE. COORDINATE MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
4	RECESSED SIMPLEX RECEPTACLE EQUAL TO HUBBELL RR201CHWTR FOR MONITOR. COORDINATE EXACT LOCATION AND ELEVATION WITH T-SERIES DRAWINGS. INSTALL ADJACENT RECEPTACLE DIRECTLY BELOW (IF SHOWN).
5	INSTALL RECEPTACLE INDICATED AT +46" A.F.F. TO C.L. DIRECTLY ABOVE ADJACENT RECEPTACLE. REFER TO T-SERIES DRAWINGS FOR DATA AND POWER LAYOUT.
6	RECEPTACLE FOR REFRIGERATOR AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
7	RECEPTACLE FOR MICROWAVE. VERIFY EXACT LOCATION OF RECEPTACLE WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
8	RECEPTACLE FOR COFFEE MAKER.
9	NEMA 14-50R RECEPTACLE FOR RANGE. RECEPTACLE TO BE FLUSH MOUNTED OR OTHERWISE AS REQUIRED TO ALLOW BACK OF RANGE TO BE PLACED FLUSH AGAINST WALL BEHIND THE RANGE. INSTALL RECEPTACLE IN LOCATION AND ORIENTATION AS REQUIRED BY AND IN ACCORDANCE WITH THE SUPPLIED RANGE MANUFACTURER INSTALLATION INSTRUCTIONS.
10	2P-60A, 240V CONTACTOR FOR RANGE SHUT DOWN. ROUTE POWER FOR RANGE THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER.
11	RECEPTACLE / CIRCUIT CONNECTION TO RANGE HOOD. RANGE HOOD AND LIGHT SHALL BE SWITCHED SEPARATELY. INSTALL SO THAT THE SWITCHES ARE ACCESSIBLE. COORDINATE LOCATION WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
12	CIRCUIT CONNECTION FOR BATHROOM LIFT. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS. COORDINATE LOCATION WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKER.
13	RECEPTACLE FOR COPIER AT +36" A.F.F. TO C.L.
14	RECEPTACLE FOR WASHER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
15	NEMA 14-30 RECEPTACLE FOR DRYER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTEDY GFCI BREAKER.
16	CIRCUIT CONNECTION FOR HAND DRYER. COORDINATE MOUNTING HEIGHT WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKER.
17	RECEPTACLE FOR ICE MACHINE AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
18	RECEPTACLE / CIRCUIT CONNECTION FOR DISHWASHER.VERIFY EXACT LOCATION WITH MANUFACTURER. CIRCUIT PROTECTED BY GFCI BREAKER.
19	RECEPTACLES FOR STACKED WASHER AND DRYER. COORDINATE MOUNTING HEIGHTS WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKERS.
20	RECEPTACLE FOR VENDING MACHINE AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
21	RECEPTACLE / CIRCUIT CONNECTION FOR GOGGLE CABINET AT + 60" A.F.F. TO C.L.
22	RECEPTACLE IN CASEWORK. VERIFY EXACT LOCATION WITH CASEWORK MANUFACTURER PRIOR TO ROUGH-IN. CIRCUIT PROTECTED BY GFCI BREAKER.
23	CIRCUIT CONNECTION FOR FUME HOOD. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS.
24	RECEPTACLE FOR CORD REEL. PROVIDE 25FT WHITE REEL WITH WHITE 20A DUPLEX RECEPTACLE SIMILAR TO HUBBELL INREACH. PROVIDE PLENUM RATED ENCLOSURE SIMILAR TO HUBBELL 'HBUPRBOX' FOR MOUNTING CORD REEL ABOVE CEILING. COORDINATE LOCATION WITH A-SERIES DRAWINGS.
25	EXACT RECEPTACLE LOCATION AND COLOR OF DEVICE / COVER PLATE SHALL BE COORDINATED WITH ARCHITECT.
26	MOTOR CONTROL DEVICE TO OVERHEAD COILING DOOR. CONNECT COMPLETE TO ALL CONTROLS AND PROVIDE ALL CONTROL WIRING AS REQUIRED.
27	QUADRUPLEX RECEPTACLE FOR AV RACK. COORDINATE MOUNTING LOCATION WITH T-SERIES DRAWINGS.
28	NEMA L6-20 RECEPTACLE FOR TELECOMMUNICATIONS RACK. COORDINATE LOCATION AND MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
29	RECEPTACLE LOCATED IN FACE OF CEILING FOR FOR PROJECTOR. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
30	CIRCUIT CONNECTION FOR MOTORIZED PROJECTION SCREEN. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
31	1P-20A, 120V CONTACTOR FOR LAB GAS SHUT DOWN. ROUTE POWER FOR LAB GAS THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER.
32	REFER TO FOOD SERVICE EQUIPMENT CONTRACTOR'S DRAWINGS FOR ADDITIONAL INFORMATION ON MOUNTING LOCATION AND RECEPTACLE / CONNECTION TYPE.
33	CIRCUIT CORON LOCATED ABOVE CEILING FOR SENSOR(S) TRANSFORMER(S). PROVIDE QUANTITY OF JUNCTION BOXES REQUIRED CONNECTED TO CIRCUIT INDICATED. CONNECT COMPLETE TO CIRCUIT INDICATED. REFER TO SCHEMATIC DIAGRAMS FOR ADDITIONAL INFORMATION. COORDINATE WITH P-SERIES DRAWINGS.
34	RECEPTACLE FOR ELECTRIC WATER COOLER. COORDINATE LOCATION WITH MANUFACTURER PRIOR TO INSTALLATION. CIRCUIT PROTECTED BY GFCI BREAKER.
35	EXISTING EQUIPMENT TO BE RELOCATED. VERIFY POWER REQUIREMENTS WITH EXISTING EQUIPMENT.
36	RECEPTACLES FOR ACCESS CONTROL PANELS. COORDINATE EXACT LOCATION WITH ACCESS CONTROL CONTRACTOR.
37	PROVIDE TOGGLE DISCONNECT SWITCH FOR SPLIT SYSTEM FAN COIL UNIT. INDOOR UNIT IS POWERED BY OUTDOOR UNIT. REFER TO ROOF PLANS FOR ADDITIONAL INFORMATION ON CORRESPONDING CONDENSING UNIT.
38	PROVIDE CONTACTOR FOR DRESSING ROOM. CONTACTOR SHALL SHUT DOWN ALL ROOM RECEPTACLES AND LIGHTING ADJACENT TO MIRRORS. ROUTE POWER FOR DRESSING ROOM THRU CONTACTOR FOR CONTROL. PROVIDE PILOT LIGHT INDICATOR AND RESET SWITCH IN COVER.
39	DISCONNECT SWITCH PROVIDED BY MANUFACTURER.
40	6-GANG FLOOR BOX. ON-GRADE PAN. PROVIDE (2) DUPLEX RECEPTACLES IN 1" CONDUIT. REFER TO T-SERIES DRAWINGS FOR DEVICE AND CONDUIT REQUIREMENTS AT EACH BOX.
41	EXISTING FLOOR BOX. REPLACE EXISTING DEVICES AS REQUIRED. COORDINATE REQUIREMENTS WITH AV CONTRACTOR. DISCONNECT POWER AND RECONNECT POWER TO INTERNAL PLATE.
42	NEW FLOOR BOX. COORDINATE REQUIREMENTS WITH AV CONTRACTOR.
43	CIRCUIT CONNECTION FOR A/V CEILING ENCLOSURE. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
44	INSTALL RECEPTACLE IN BOTTOM RISER OF BLEACHERS. CONNECT TO FLEXIBLE CABLE FROM WALL OUTLET BOX. COORDINATE OPENING IN BLEACHER WITH MANUFACTURER.
45	INSTALL SCOREBOARD CONTROL OUTLET IN BOTTOM RISER OF BLEACHERS. CONNECT TO FLEXIBLE CABLE FROM WALL OUTLET BOX. COORDINATE OPENING IN BLEACHER WITH MANUFACTURER.
46	PROVIDE FLEXIBLE WIRING FROM OUTLET BOX ON WALL TO DEVICE LOCATED ON BLEACHERS.
47	12" X 12" X 6" JUNCTION BOX FOR MOTORIZED BLEACHERS. INSTALL BOX AT 5'-0" A.F.F. TO C.L. INSTALL IN LOCATION AS RECOMMENDED BY BLEACHER MANUFACTURER. CONTACTORS AND CONTROLLERS ARE PROVIDED, INSTALLED AND WIRED BY THE MANUFACTURER. INSTALL (1) 3/4"C. BETWEN JUNCTION BOX AND ADJACENT DISCONNECT SWITCH. CONNECT COMPLETE.
48	COORDINATE THEATRICAL LIGHTING ELECTRICAL EQUIPMENT AND CIRCUITING INFORMATION (120V, DMX, & LOW VOLTAGE) WITH TE- AND SKE-SERIES DRAWINGS AND SPECIFICATIONS.
49	COORDINATE A/V EQUIPMENT ELECTRICAL ROUGH-INS TA-SERIES DRAWINGS AND SPECIFICATIONS.
50	EC SHALL PROVIDE CONTACTORS AND ROUTE ALL POWER FOR EQUIPMENT LOCATED UNDER THE HOOD THRU CONTACTORS. CONTACTORS SHALL BE INTERLOCKED WITH THE HOOD FIRE SUPPRESSION SYSTEM TO SHUT DOWN ALL POWER TO EQUIPMENT WHEN FIRE SUPPRESSION SYSTEM IS ACITIVATED. CONTACTORS SHALL HAVE RESET SWITCH LOCATED IN THE COVER. LOCATE CONTACTORS IN ACCESSIBLE LOCATION AS DIRECTED BY THE OWNER. EC MAY PROVIDE SHUNT TRIP BREAKERS IN LIEU OF CONTACTOR
51	CONNECT CEILING FAN AND CONTROLLER COMPLETE. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONTROLLER FOR CEILING FAN PROVIDED BY OTHERS. VERIFY LOCATION OF CONTROLLER WITH OWNER
52	PROVIDE NEMA 3R JUNCTION BOX(ES) FOR SIGNAGE AS REQUIRED. VERIFY EXACT LOCATION(S) WITH OWNER'S SIGNAGE MANUFACTURER PRIOR TO INSTALLATION. SIGN SHALL BE CONNECTED TO THE LIGHTING CONTROL SYSTEM. PROVIDE ALL REQUIRED CONTROL WIRING AND CONNECTIONS IN CONDUIT AS REQUIRED.
53	PROVIDE RECEPTACLES IN THIS ROOM WITH ACOUSTICALLY ISOLATED METAL FURRING THAT MAINTAINS ACOUSTICAL ISOLATION BETWEEN THE BACKBOX AND DRYWALL. SEAL EACH LOCATION WITH ACOUSTICAL SEALANT TO PROVIDE RESILENT DECOUPLING BETWEEN THE TWO MATERIALS. REFER TO 'A' SERIES WALL TYPES FOR ADDITIONAL INFORMATION.
54	CIRCUIT CONNECTION FOR AUTO DOOR. PROVIDE ALL CONDUIT AND WIRING FOR CONNECTION OF PUSH PADS TO MOTOR. COORDINATE PUSH PAD LOCATIONS WITH A-SERIES DRAWINGS.
55	CIRCUIT CONNECTION FOR MAGNETIC DOOR HOLD OPENS. PROVIDE ALL CONDUIT AND WIRING.
56	DISCONNECT EXISTING AND RECONNECT NEW EQUIPMENT AS REQUIRED. MAINTAIN EXISTING ROUGH-IN AND WIRING. PROVIDE EXISTING CIRCUIT WITH NEW GFCI BREAKER.
57	PROVIDE JUNCTION BOX ABOVE CEILING FOT FUTURE FEATURE WALL.



2A FIRST FLOOR POWER PLAN - UNIT B AND C

1/8" = 1'-0"

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KEY PLAN

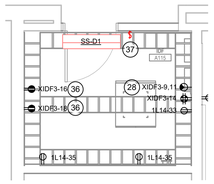
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North Central High School Renovation - Additions Phase 3

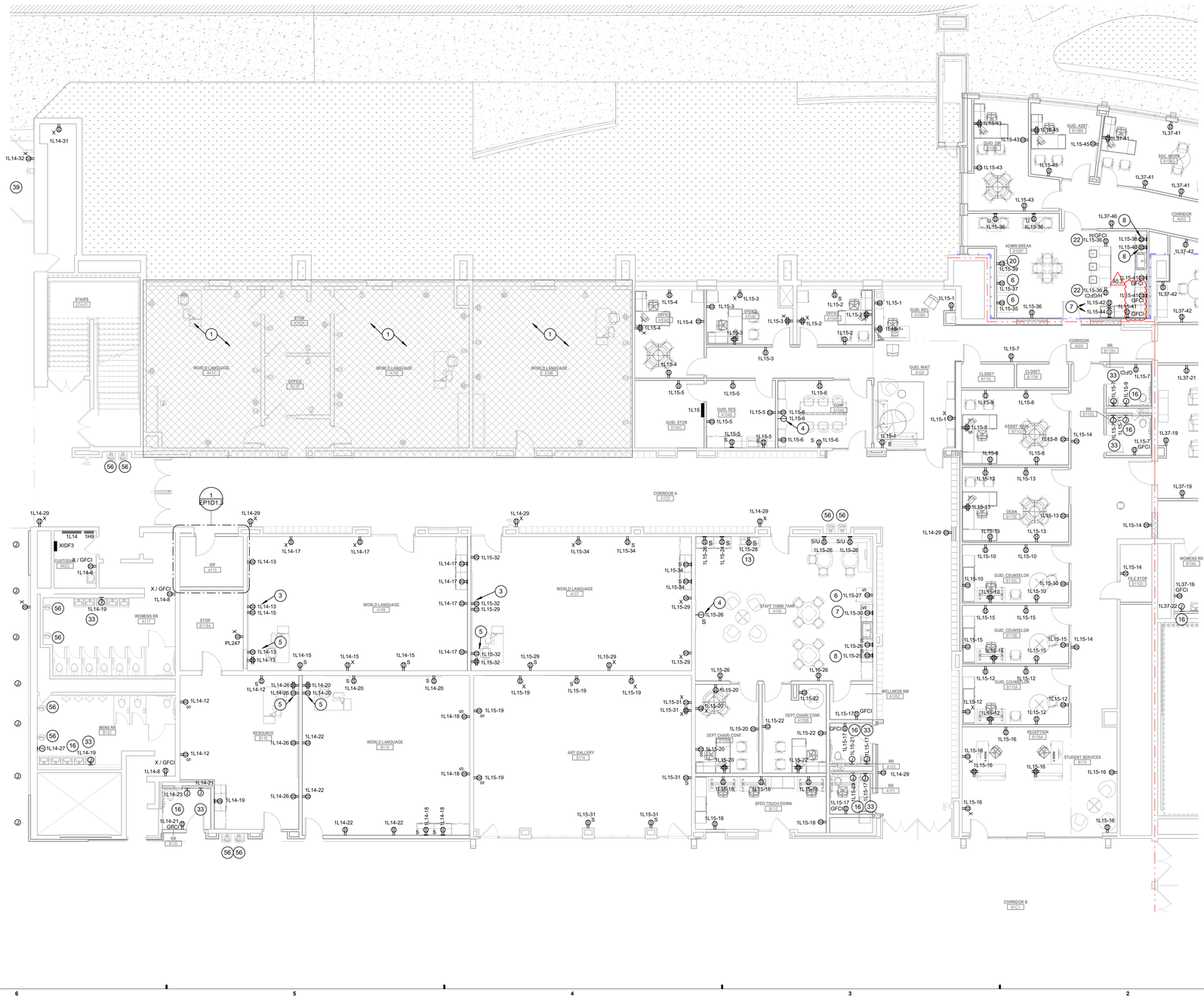
FIRST FLOOR POWER PLAN - UNIT B AND C

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EP1BC1.3 - FIRST FLOOR POWER PLAN - UNITS B AND C
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1 **ENLARGED FIRST FLOOR POWER PLAN - IDF**
1/4" = 1'-0"



2A **FIRST FLOOR POWER PLAN - UNIT D**
1/8" = 1'-0"

GENERAL POWER NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ALL THEATER AND PERFORMING ARTS EQUIPMENT SHALL BE PROVIDED MINIMUM #10AWG.
C	NEW ELECTRICAL DEVICES SHOWN TO BE INSTALLED ON EXISTING BLOCK WALLS / CEILINGS TIGHT TO STRUCTURE SHALL BE INSTALLED SURFACE MOUNTED AND IN SURFACE MOUNTED WIREMOLD PAINTED TO MATCH WALL AND CEILINGS. WIREMOLD SHALL BE INSTALLED NEATLY AND AT RIGHT ANGLES TO STRUCTURE. WHEN POSSIBLE ROUTE VERTICAL WIREMOLD IN CORNERS THEN TO DEVICE / FIXTURE. WIREMOLD SHALL BE INSTALLED TO MINIMIZE LENGTH. REFER TO ARCHITECTURAL FLOOR PLANS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION. CONFIRM EXACT WIREMOLD ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.

POWER PLAN NOTES

#	NOTES
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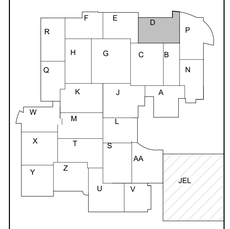
Project No.	2019-067.NCH
Project Date	03.03.2023
Bid Set	03
Produced	JAW

DAVID SAUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

FIRST FLOOR POWER PLAN - UNIT D

EP1D1.3

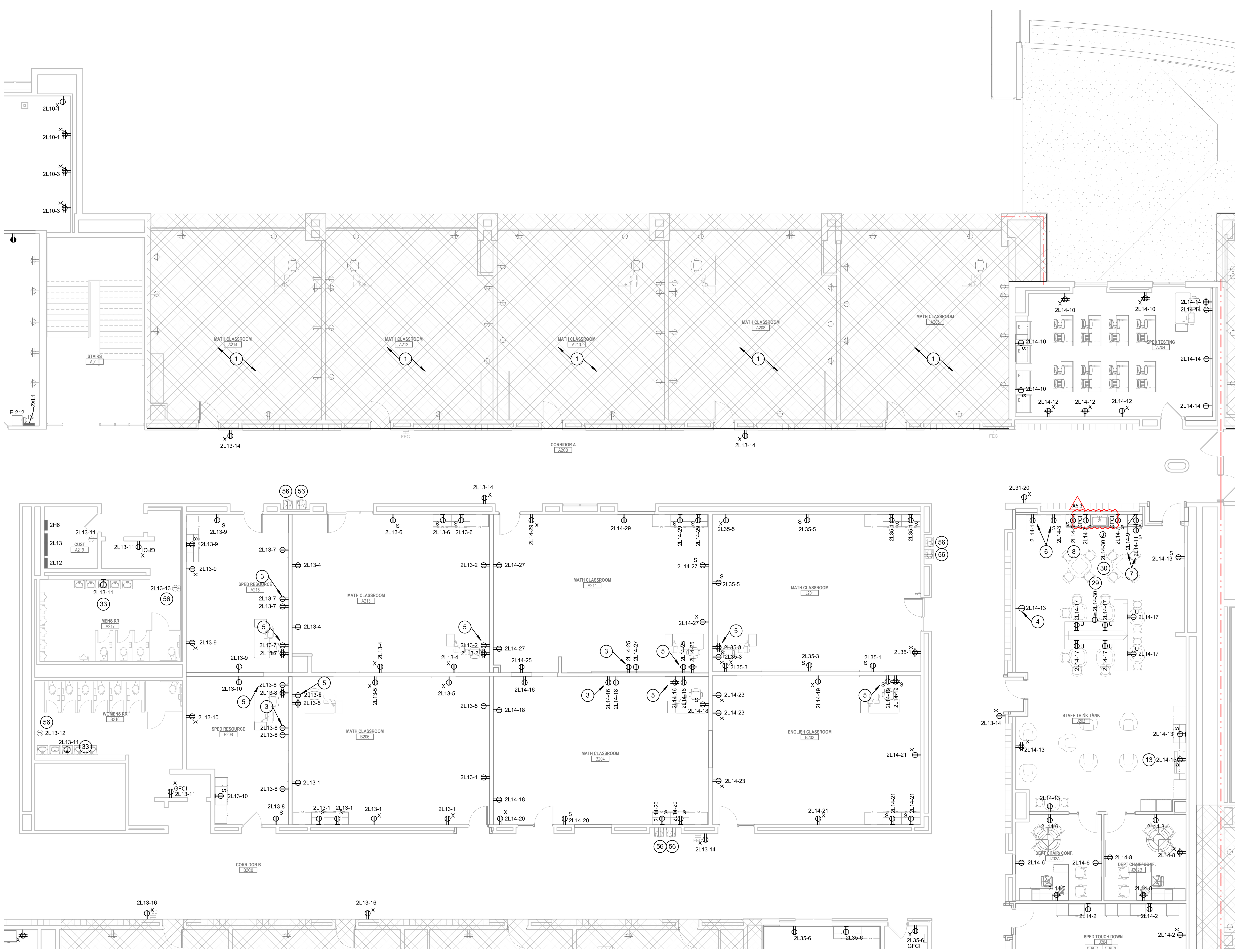
EP1D1.3 - FIRST FLOOR POWER PLAN - UNIT D
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2A SECOND FLOOR POWER PLAN - UNIT D
1/8" = 1'-0"

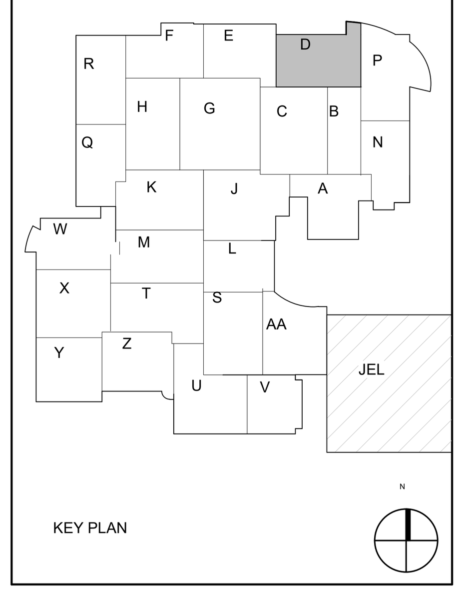
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03
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DAVID SHUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

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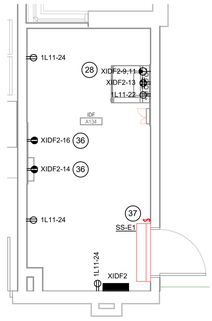
KEY PLAN

M.S.D. of Washington Township

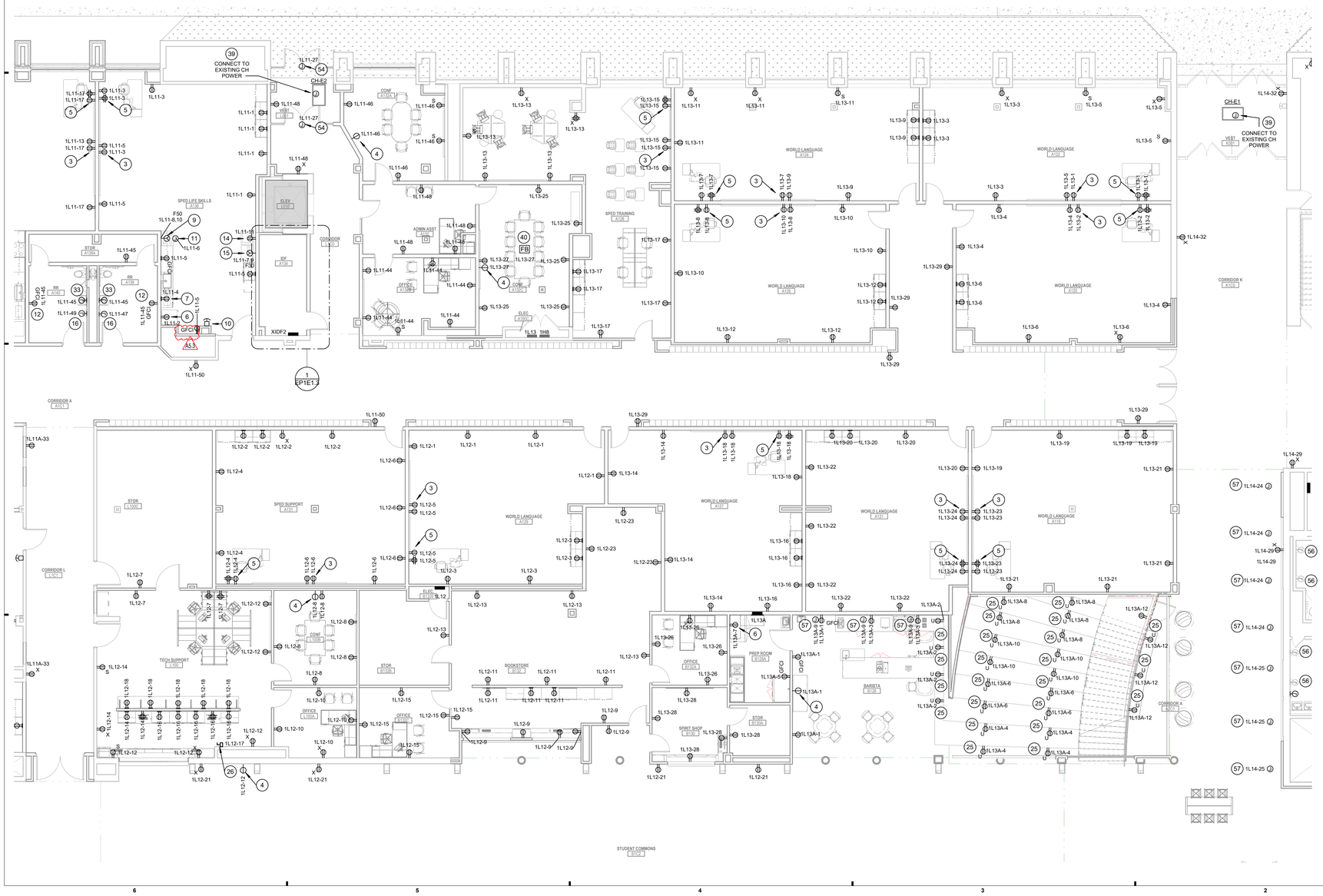
North Central High School Renovation - Additions Phase 3

SECOND FLOOR POWER PLAN - UNIT D

EP1D2.3



1 ENLARGED FIRST FLOOR POWER PLAN - IDF 3
1/4" = 1'-0"



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1	GENERAL CLASSROOM INTERIOR FINISHES ALTERNATE. PROVIDE ALTERNATE BID TO REPLACE ALL ELECTRICAL RECEPTACLES AND COVER PLATES IN HATCHED AREA IF SHOWN OR NOT SHOWN. ELECTRICAL DEVICES SHOWN IN THE HATCHED AREA ARE BASED ON EXISTING DRAWINGS AND ALL DEVICES MAY NOT BE SHOWN. ELECTRICAL DEVICES SHALL MATCH CURRENT INSTALLATION CHARACTERISTICS.
2	PROVIDE INFRARED SCAN FOR EQUIPMENT INDICATED. CLEAN ALL DUST OFF EQUIPMENT, EXERCISE AND LUBRICATE ALL FUSIBLE SWITCHES.
3	LOCATION FOR FUTURE RECEPTACLE FOR WALL-MOUNTED SHORT-THROW PROJECTOR. INSTALL CONDUCTORS IN OUTLET BOX. PROVIDE BLANK COVERPLATE. COORDINATE MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
4	RECESSED SIMPLEX RECEPTACLE EQUAL TO HUBBELL RR201CHWTR FOR MONITOR. COORDINATE EXACT LOCATION AND ELEVATION WITH T-SERIES DRAWINGS. INSTALL ADJACENT RECEPTACLE DIRECTLY BELOW (IF SHOWN).
5	INSTALL RECEPTACLE INDICATED AT +46" A.F.F. TO C.L. DIRECTLY ABOVE ADJACENT RECEPTACLE. REFER TO T-SERIES DRAWINGS FOR DATA AND POWER LAYOUT.
6	RECEPTACLE FOR REFRIGERATOR AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
7	RECEPTACLE FOR MICROWAVE. VERIFY EXACT LOCATION OF RECEPTACLE WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
8	RECEPTACLE FOR COFFEE MAKER.
9	NEMA 14-50R RECEPTACLE FOR RANGE. RECEPTACLE TO BE FLUSH MOUNTED OR OTHERWISE AS REQUIRED TO ALLOW BACK OF RANGE TO BE PLACED FLUSH AGAINST WALL BEHIND THE RANGE. INSTALL RECEPTACLE IN LOCATION AND ORIENTATION AS REQUIRED BY AND IN ACCORDANCE WITH THE SUPPLIED RANGE MANUFACTURER INSTALLATION INSTRUCTIONS.
10	2P-60A, 240V CONTACTOR FOR RANGE SHUT DOWN. ROUTE POWER FOR RANGE THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER.
11	RECEPTACLE / CIRCUIT CONNECTION TO RANGE HOOD. RANGE HOOD AND LIGHT SHALL BE SWITCHED SEPARATELY. INSTALL SO THAT THE SWITCHES ARE ACCESSIBLE. COORDINATE LOCATION WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
12	CIRCUIT CONNECTION FOR BATHROOM LIFT. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS. COORDINATE LOCATION WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKER.
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14	RECEPTACLE FOR WASHER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
15	NEMA 14-30 RECEPTACLE FOR DRYER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTEDY GFCI BREAKER.
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18	RECEPTACLE / CIRCUIT CONNECTION FOR DISHWASHER.VERIFY EXACT LOCATION WITH MANUFACTURER. CIRCUIT PROTECTED BY GFCI BREAKER.
19	RECEPTACLES FOR STACKED WASHER AND DRYER. COORDINATE MOUNTING HEIGHTS WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKERS.
20	RECEPTACLE FOR VENDING MACHINE AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
21	RECEPTACLE / CIRCUIT CONNECTION FOR GOGGLE CABINET AT + 60" A.F.F. TO C.L.
22	RECEPTACLE IN CASEWORK. VERIFY EXACT LOCATION WITH CASEWORK MANUFACTURER PRIOR TO ROUGH-IN. CIRCUIT PROTECTED BY GFCI BREAKER.
23	CIRCUIT CONNECTION FOR FUME HOOD. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS.
24	RECEPTACLE FOR CORD REEL. PROVIDE 25FT WHITE REEL WITH WHITE 20A DUPLEX RECEPTACLE SIMILAR TO HUBBELL INREACH. PROVIDE PLENUM RATED ENCLOSURE SIMILAR TO HUBBELL 'HBLIPRBOX' FOR MOUNTING CORD REEL ABOVE CEILING. COORDINATE LOCATION WITH A-SERIES DRAWINGS.
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51	CONNECT CEILING FAN AND CONTROLLER COMPLETE. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONTROLLER FOR CEILING FAN PROVIDED BY OTHERS. VERIFY LOCATION OF CONTROLLER WITH OWNER
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57	PROVIDE JUNCTION BOX ABOVE CEILING FOT FUTURE FEATURE WALL.

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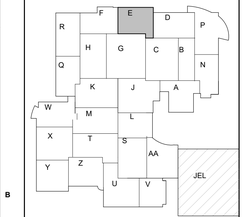
Project No. 2019-067.NCH
Project Date 03.03.2023
Set 03
Protocol JAW

DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

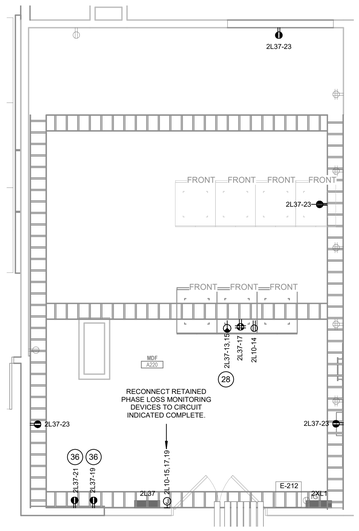
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

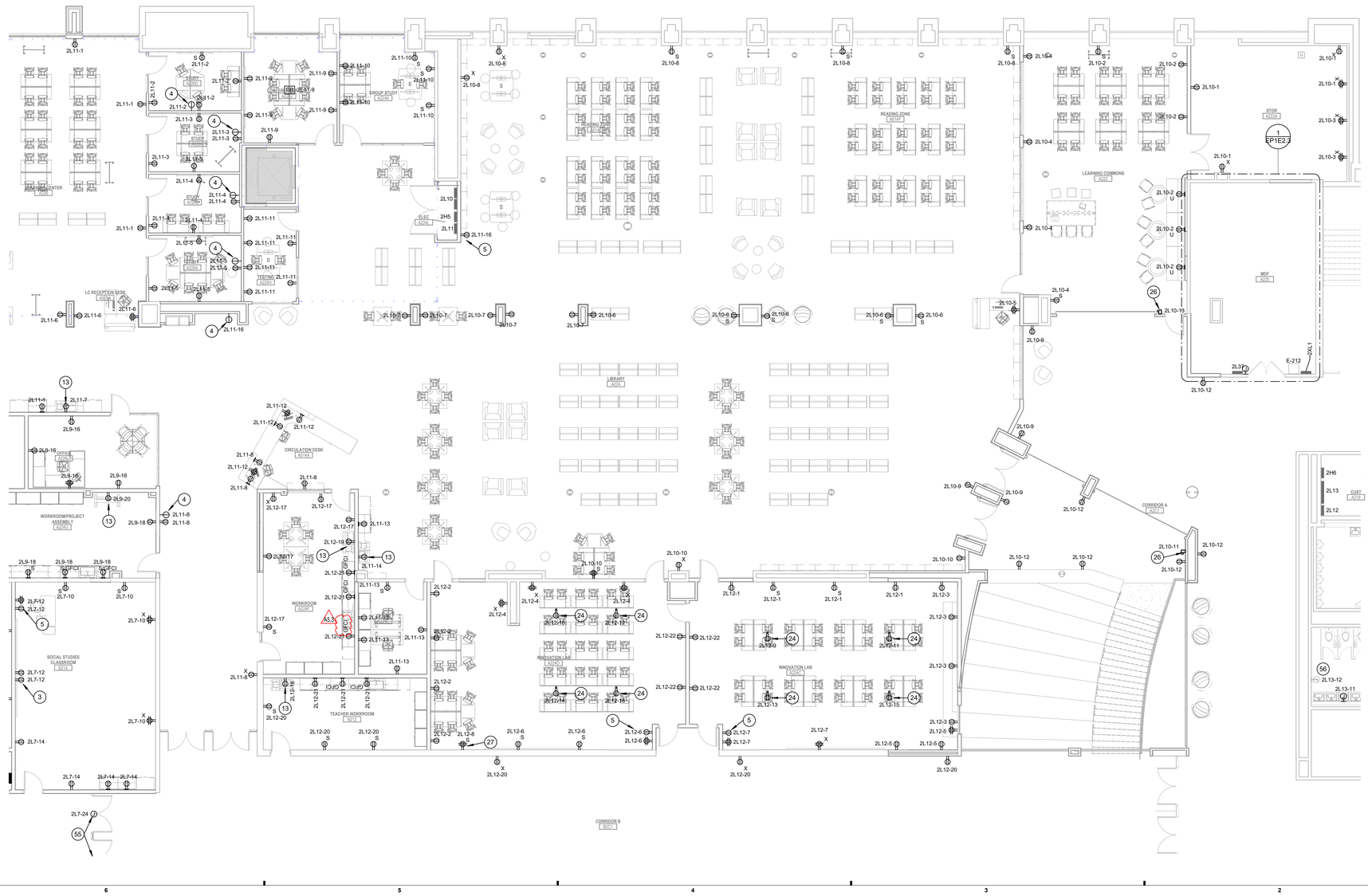
FIRST FLOOR POWER PLAN - UNIT E

EP1E1.3

EP1E1.3_FIRST FLOOR POWER PLAN_UNIT E
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4/18/2023 11:11:09 PM



1 ENLARGED SECOND FLOOR POWER PLAN - MDF/IDF 23
1/4" = 1'-0"



2A SECOND FLOOR POWER PLAN - UNIT E
1/8" = 1'-0"

GENERAL POWER NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ALL THEATER AND PERFORMING ARTS EQUIPMENT SHALL BE PROVIDED MINIMUM #10AWG.
C	NEW ELECTRICAL DEVICES SHOWN TO BE INSTALLED ON EXISTING BLOCK WALLS / CEILINGS TIGHT TO STRUCTURE SHALL BE INSTALLED SURFACE MOUNTED AND IN SURFACE MOUNTED WIREMOLD PAINTED TO MATCH WALL AND CEILINGS. WIREMOLD SHALL BE INSTALLED NEATLY AND AT RIGHT ANGLES TO STRUCTURE. WHEN POSSIBLE ROUTE VERTICAL WIREMOLD IN CORNERS THEN TO DEVICE / FIXTURE. WIREMOLD SHALL BE INSTALLED TO MINIMIZE LENGTH. REFER TO ARCHITECTURAL FLOOR PLANS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION. CONFIRM EXACT WIREMOLD ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.

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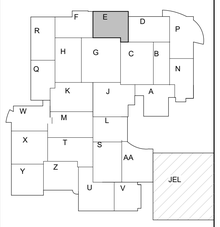
Project No.	2019-067.NCH
Project Date	03.03.2023
Bid Set	03
Produced	JAW

DAVID SAUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

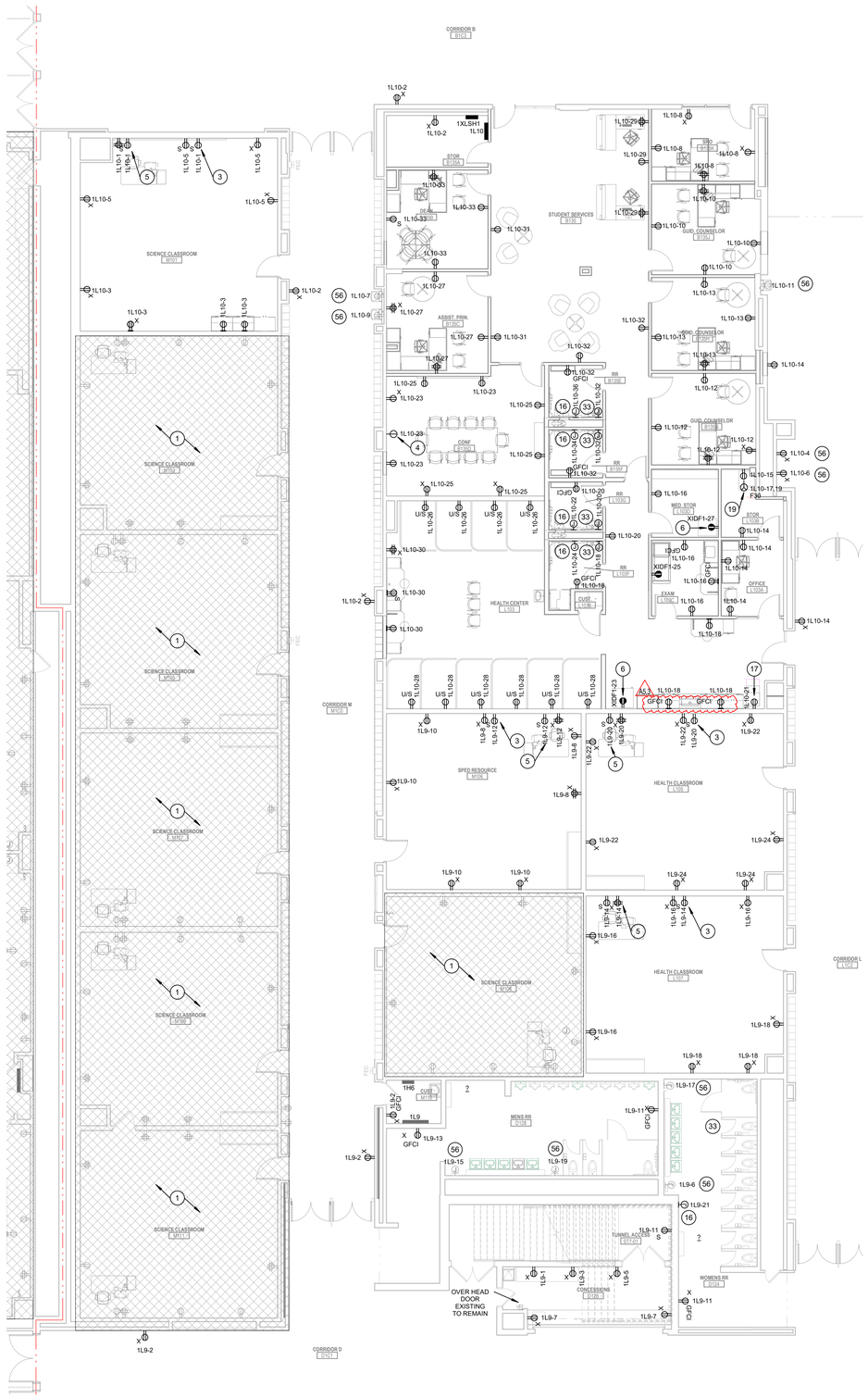
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR POWER PLAN - UNIT E

EP1E2.3

EP1E2.3_SECOND FLOOR POWER PLAN - UNIT E
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_1001 West
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GENERAL POWER NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ALL THEATER AND PERFORMING ARTS EQUIPMENT SHALL BE PROVIDED MINIMUM #10AWG.
C	NEW ELECTRICAL DEVICES SHOWN TO BE INSTALLED ON EXISTING BLOCK WALLS / CEILINGS TIGHT TO STRUCTURE SHALL BE INSTALLED SURFACE MOUNTED AND IN SURFACE MOUNTED WIREMOLD PAINTED TO MATCH WALL AND CEILINGS. WIREMOLD SHALL BE INSTALLED NEATLY AND AT RIGHT ANGLES TO STRUCTURE. WHEN POSSIBLE ROUTE VERTICAL WIREMOLD IN CORNERS THEN TO DEVICE / FIXTURE. WIREMOLD SHALL BE INSTALLED TO MINIMZE LENGTH. REFER TO ARCHITECTURAL FLOOR PLANS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION. CONFIRM EXACT WIREMOLD ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.

POWER PLAN NOTES

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1	GENERAL CLASSROOM INTERIOR FINISHES ALTERNATE. PROVIDE ALTERNATE BID TO REPLACE ALL ELECTRICAL RECEPTACLES AND COVER PLATES IN HATCHED AREA IF SHOWN OR NOT SHOWN. ELECTRICAL DEVICES SHOWN IN THE HATCHED AREA ARE BASED ON EXISTING DRAWINGS AND ALL DEVICES MAY NOT BE SHOWN. ELECTRICAL DEVICES SHALL MATCH CURRENT INSTALLATION CHARACTERISTICS.
2	PROVIDE INFRARED SCAN FOR EQUIPMENT INDICATED. CLEAN ALL DUST OFF EQUIPMENT, EXERCISE AND LUBRICATE ALL FUSIBLE SWITCHES.
3	LOCATION FOR FUTURE RECEPTACLE FOR WALL-MOUNTED SHORT-THROW PROJECTOR. INSTALL CONDUCTORS IN OUTLET BOX. PROVIDE BLANK COVERPLATE. COORDINATE MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
4	RECESSED SIMPLEX RECEPTACLE EQUAL TO HUBBELL RR201CHWTR FOR MONITOR. COORDINATE EXACT LOCATION AND ELEVATION WITH T-SERIES DRAWINGS. INSTALL ADJACENT RECEPTACLE DIRECTLY BELOW (IF SHOWN).
5	INSTALL RECEPTACLE INDICATED AT +46" A.F.F. TO C.L. DIRECTLY ABOVE ADJACENT RECEPTACLE. REFER TO T-SERIES DRAWINGS FOR DATA AND POWER LAYOUT.
6	RECEPTACLE FOR REFRIGERATOR AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
7	RECEPTACLE FOR MICROWAVE.VERIFY EXACT LOCATION OF RECEPTACLE WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
8	RECEPTACLE FOR COFFEE MAKER.
9	NEMA 14-50R RECEPTACLE FOR RANGE. RECEPTACLE TO BE FLUSH MOUNTED OR OTHERWISE AS REQUIRED TO ALLOW BACK OF RANGE TO BE PLACED FLUSH AGAINST WALL BEHIND THE RANGE. INSTALL RECEPTACLE IN LOCATION AND ORIENTATION AS REQUIRED BY AND IN ACCORDANCE WITH THE SUPPLIED RANGE MANUFACTURER INSTALLATION INSTRUCTIONS.
10	2P-60A, 240V CONTACTOR FOR RANGE SHUT DOWN. ROUTE POWER FOR RANGE THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER.
11	RECEPTACLE / CIRCUIT CONNECTION TO RANGE HOOD. RANGE HOOD AND LIGHT SHALL BE SWITCHED SEPARATELY. INSTALL SO THAT THE SWITCHES ARE ACCESSIBLE. COORDINATE LOCATION WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
12	CIRCUIT CONNECTION FOR BATHROOM LIFT. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS. COORDINATE LOCATION WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKER.
13	RECEPTACLE FOR COPIER AT +36" A.F.F. TO C.L.
14	RECEPTACLE FOR WASHER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
15	NEMA 14-30 RECEPTACLE FOR DRYER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTEDY GFCI BREAKER.
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19	RECEPTACLES FOR STACKED WASHER AND DRYER. COORDINATE MOUNTING HEIGHTS WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKERS.
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21	RECEPTACLE / CIRCUIT CONNECTION FOR GOGGLE CABINET AT + 60" A.F.F. TO C.L.
22	RECEPTACLE IN CASEWORK. VERIFY EXACT LOCATION WITH CASEWORK MANUFACTURER PRIOR TO ROUGH-IN. CIRCUIT PROTECTED BY GFCI BREAKER.
23	CIRCUIT CONNECTION FOR FUME HOOD. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS.
24	RECEPTACLE FOR CORD REEL. PROVIDE 25FT WHITE REEL WITH WHITE 20A DUPLEX RECEPTACLE SIMILAR TO HUBBELL INREACH. PROVIDE PLENUM RATED ENCLOSURE SIMILAR TO HUBBELL 'HBLIPRBOX' FOR MOUNTING CORD REEL ABOVE CEILING. COORDINATE LOCATION WITH A-SERIES DRAWINGS.
25	EXACT RECEPTACLE LOCATION AND COLOR OF DEVICE / COVER PLATE SHALL BE COORDINATED WITH ARCHITECT.
26	MOTOR CONTROL DEVICE TO OVERHEAD COILING DOOR. CONNECT COMPLETE TO ALL CONTROLS AND PROVIDE ALL CONTROL WIRING AS REQUIRED.
27	QUADRUPLEX RECEPTACLE FOR AV RACK. COORDINATE MOUNTING LOCATION WITH T-SERIES DRAWINGS.
28	NEMA L6-20 RECEPTACLE FOR TELECOMMUNICATIONS RACK. COORDINATE LOCATION AND MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
29	RECEPTACLE LOCATED IN FACE OF CEILING FOR FOR PROJECTOR. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
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33	CIRCUIT CONNECTION LOCATED ABOVE CEILING FOR SENSOR(S) TRANSFORMER(S). PROVIDE QUANTITY OF JUNCTION BOXES REQUIRED CONNECTED TO CIRCUIT INDICATED. CONNECT COMPLETE TO CIRCUIT INDICATED. REFER TO SCHEMATIC DIAGRAMS FOR ADDITIONAL INFORMATION. COORDINATE WITH P-SERIES DRAWINGS.
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38	PROVIDE CONTACTOR FOR DRESSING ROOM. CONTACTOR SHALL SHUT DOWN ALL ROOM RECEPTACLES AND LIGHTING ADJACENT TO MIRRORS. ROUTE POWER FOR DRESSING ROOM THRU CONTACTOR FOR CONTROL. PROVIDE PILOT LIGHT INDICATOR AND RESET SWITCH IN COVER.
39	DISCONNECT SWITCH PROVIDED BY MANUFACTURER.
40	6-GANG FLOOR BOX. ON-GRADE PAN. PROVIDE (2) DUPLEX RECEPTACLES IN 1" CONDUIT. REFER TO T-SERIES DRAWINGS FOR DEVICE AND CONDUIT REQUIREMENTS AT EACH BOX.
41	EXISTING FLOOR BOX. REPLACE EXISTING DEVICES AS REQUIRED. COORDINATE REQUIREMENTS WITH AV CONTRACTOR. DISCONNECT POWER AND RECONNECT POWER TO INTERNAL PLATE.
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45	INSTALL SCOREBOARD CONTROL OUTLET IN BOTTOM RISER OF BLEACHERS. CONNECT TO FLEXIBLE CABLE FROM WALL OUTLET BOX. COORDINATE OPENING IN BLEACHER WITH MANUFACTURER.
46	PROVIDE FLEXIBLE WIRING FROM OUTLET BOX ON WALL TO DEVICE LOCATED ON BLEACHERS.
47	12" X 12" X 6" JUNCTION BOX FOR MOTORIZED BLEACHERS. INSTALL BOX AT 5'-0" A.F.F. TO C.L. INSTALL IN LOCATION AS RECOMMENDED BY BLEACHER MANUFACTURER. CONTACTORS AND CONTROLLERS ARE PROVIDED, INSTALLED AND WIRED BY THE MANUFACTURER. INSTALL (1) 3/4"C. BETWEN JUNCTION BOX AND ADJACENT DISCONNECT SWITCH. CONNECT COMPLETE.
48	COORDINATE THEATRICAL LIGHTING ELECTRICAL EQUIPMENT AND CIRCUITING INFORMATION (120V, DMX, & LOW VOLTAGE) WITH TE- AND SKE-SERIES DRAWINGS AND SPECIFICATIONS.
49	COORDINATE A/V EQUIPMENT ELECTRICAL ROUGH-INS TA-SERIES DRAWINGS AND SPECIFICATIONS.
50	EC SHALL PROVIDE CONTACTORS AND ROUTE ALL POWER FOR EQUIPMENT LOCATED UNDER THE HOOD THRU CONTACTORS. CONTACTORS SHALL BE INTERLOCKED WITH THE HOOD FIRE SUPPRESSION SYSTEM TO SHUT DOWN ALL POWER TO EQUIPMENT WHEN FIRE SUPPRESSION SYSTEM IS ACITIVATED. CONTACTORS SHALL HAVE RESET SWITCH LOCATED IN THE COVER. LOCATE CONTACTORS IN ACCESSIBLE LOCATION AS DIRECTED BY THE OWNER. EC MAY PROVIDE SHUNT TRIP BREAKERS IN LIEU OF CONTACTOR
51	CONNECT CEILING FAN AND CONTROLLER COMPLETE. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONTROLLER FOR CEILING FAN PROVIDED BY OTHERS. VERIFY LOCATION OF CONTROLLER WITH OWNER
52	PROVIDE NEMA 3R JUNCTION BOX(ES) FOR SIGNAGE AS REQUIRED. VERIFY EXACT LOCATION(S) WITH OWNER'S SIGNAGE MANUFACTURER PRIOR TO INSTALLATION. SIGN SHALL BE CONNECTED TO THE LIGHTING CONTROL SYSTEM. PROVIDE ALL REQUIRED CONTROL WIRING AND CONNECTIONS IN CONDUIT AS REQUIRED.
53	PROVIDE RECEPTACLES IN THIS ROOM WITH ACOUSTICALLY ISOLATED METAL FURRING THAT MAINTAINS ACOUSTICAL ISOLATION BETWEEN THE BACKBOX AND DRYWALL. SEAL EACH LOCATION WITH ACOUSTICAL SEALANT TO PROVIDE RESILENT DECOUPLING BETWEEN THE TWO MATERIALS. REFER TO 'A' SERIES WALL TYPES FOR ADDITIONAL INFORMATION.
54	CIRCUIT CONNECTION FOR AUTO DOOR. PROVIDE ALL CONDUIT AND WIRING FOR CONNECTION OF PUSH PADS TO MOTOR. COORDINATE PUSH PAD LOCATIONS WITH A-SERIES DRAWINGS.
55	CIRCUIT CONNECTION FOR MAGNETIC DOOR HOLD OPENS. PROVIDE ALL CONDUIT AND WIRING.
56	DISCONNECT EXISTING AND RECONNECT NEW EQUIPMENT AS REQUIRED. MAINTAIN EXISTING ROUGH-IN AND WIRING. PROVIDE EXISTING CIRCUIT WITH NEW GFCI BREAKER.
57	PROVIDE JUNCTION BOX ABOVE CEILING FOT FUTURE FEATURE WALL.

2A **FIRST FLOOR POWER PLAN - UNIT H**
1/8" = 1'-0"

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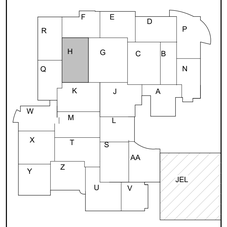
Project No: 2019-067.NCH
Project Date: 03.03.2023
Set Set: 03
Produced: JAW

DAVID SAUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

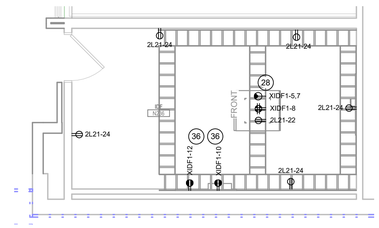
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

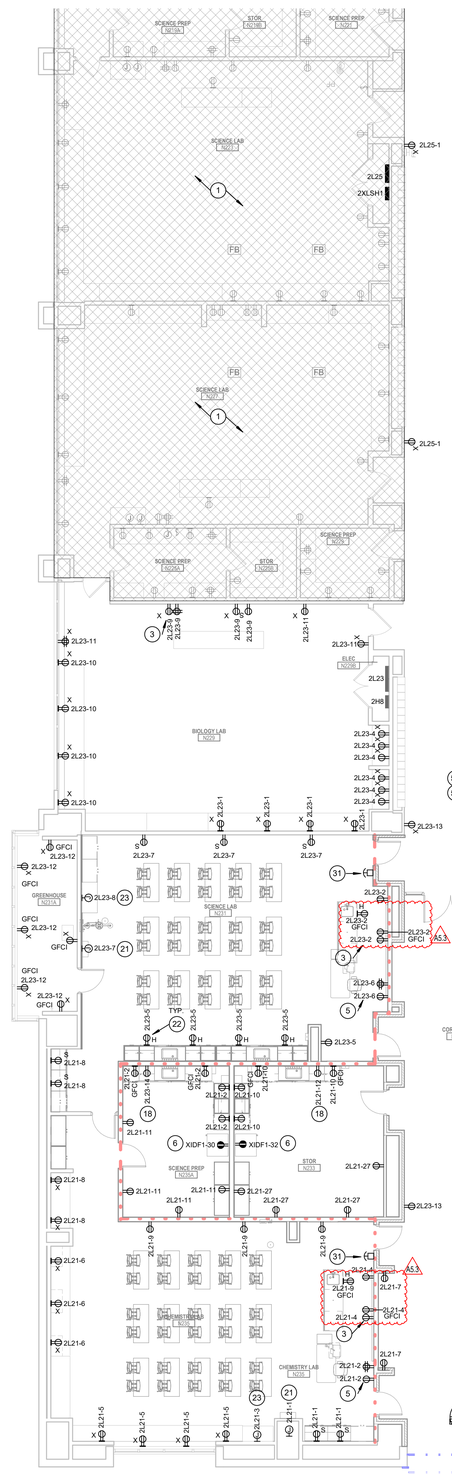
FIRST FLOOR POWER PLAN - UNIT H

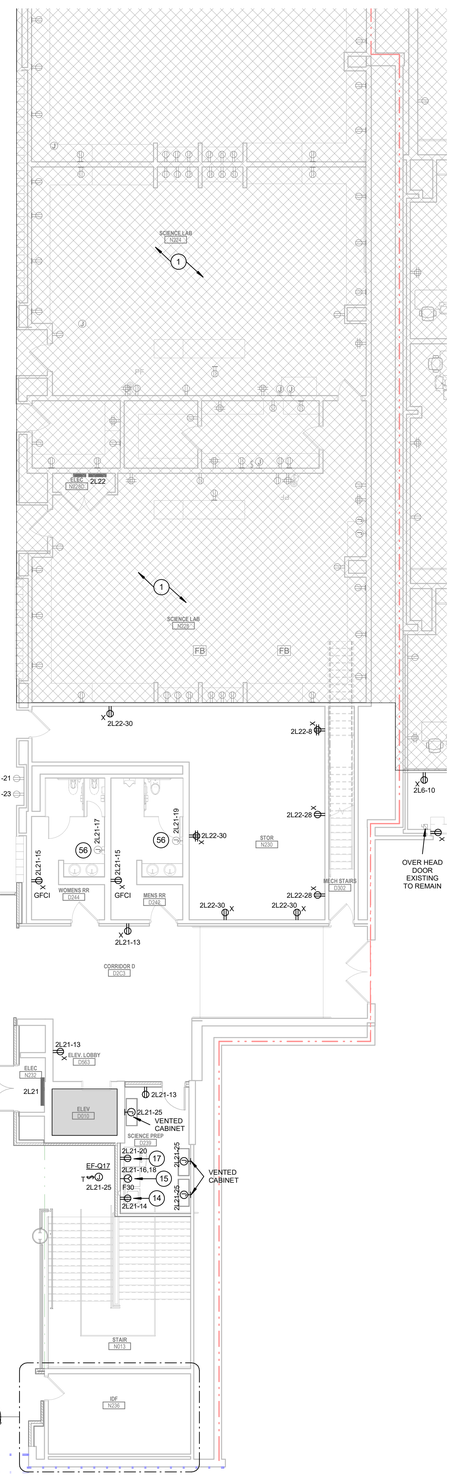
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EP1H1.3_FIRST FLOOR POWER PLAN - UNIT H
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1 **ENLARGED SECOND FLOOR POWER PLAN - IDF 21**
1/4" = 1'-0"





2A **SECOND FLOOR POWER PLAN - UNIT Q**
1/8" = 1'-0"

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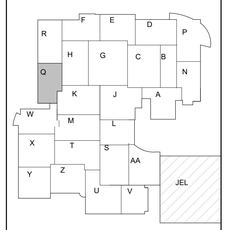
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced JAW

DAVID SHUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

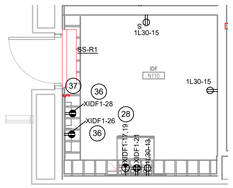
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR POWER PLAN - UNIT Q

EP1Q2.3

EP1Q2.3 - SECOND FLOOR POWER PLAN - UNIT Q
2019-067.NCH A13.3 of Washington Township, North Central High School Renovation_1_2022_Closed.rvt
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1 ENLARGED FIRST FLOOR POWER PLAN - IDF 12
1/4" = 1'-0"



2A FIRST FLOOR POWER PLAN - UNIT R
1/8" = 1'-0"

GENERAL POWER NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ALL THEATER AND PERFORMING ARTS EQUIPMENT SHALL BE PROVIDED MINIMUM #10AWG.
C	NEW ELECTRICAL DEVICES SHOWN TO BE INSTALLED ON EXISTING BLOCK WALLS / CEILINGS TIGHT TO STRUCTURE SHALL BE INSTALLED SURFACE MOUNTED AND IN SURFACE MOUNTED WIREMOLD PAINTED TO MATCH WALL AND CEILINGS. WIREMOLD SHALL BE INSTALLED NEATLY AND AT RIGHT ANGLES TO STRUCTURE. WHEN POSSIBLE ROUTE VERTICAL WIREMOLD IN CORNERS THEN TO DEVICE / FIXTURE. WIREMOLD SHALL BE INSTALLED TO MINIMIZE LENGTH. REFER TO ARCHITECTURAL FLOOR PLANS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION. CONFIRM EXACT WIREMOLD ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.

POWER PLAN NOTES

#	NOTES
1	GENERAL CLASSROOM INTERIOR FINISHES ALTERNATE. PROVIDE ALTERNATE BID TO REPLACE ALL ELECTRICAL RECEPTACLES AND COVER PLATES IN HATCHED AREA IF SHOWN OR NOT SHOWN. ELECTRICAL DEVICES SHOWN IN THE HATCHED AREA ARE BASED ON EXISTING DRAWINGS AND ALL DEVICES MAY NOT BE SHOWN. ELECTRICAL DEVICES SHALL MATCH CURRENT INSTALLATION CHARACTERISTICS.
2	PROVIDE INFRARED SCAN FOR EQUIPMENT INDICATED. CLEAN ALL DUST OFF EQUIPMENT, EXERCISE AND LUBRICATE ALL FUSIBLE SWITCHES.
3	LOCATION FOR FUTURE RECEPTACLE FOR WALL-MOUNTED SHORT-THROW PROJECTOR. INSTALL CONDUCTORS IN OUTLET BOX. PROVIDE BLANK COVERPLATE. COORDINATE MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
4	RECESSED SIMPLEX RECEPTACLE EQUAL TO HUBBELL RR201CHWTR FOR MONITOR. COORDINATE EXACT LOCATION AND ELEVATION WITH T-SERIES DRAWINGS. INSTALL ADJACENT RECEPTACLE DIRECTLY BELOW (IF SHOWN).
5	INSTALL RECEPTACLE INDICATED AT +48" A.F.F. TO C.L. DIRECTLY ABOVE ADJACENT RECEPTACLE. REFER TO T-SERIES DRAWINGS FOR DATA AND POWER LAYOUT.
6	RECEPTACLE FOR REFRIGERATOR AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
7	RECEPTACLE FOR MICROWAVE. VERIFY EXACT LOCATION OF RECEPTACLE WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
8	RECEPTACLE FOR COFFEE MAKER.
9	NEMA 14-50R RECEPTACLE FOR RANGE. RECEPTACLE TO BE FLUSH MOUNTED OR OTHERWISE AS REQUIRED TO ALLOW BACK OF RANGE TO BE PLACED FLUSH AGAINST WALL BEHIND THE RANGE. INSTALL RECEPTACLE IN LOCATION AND ORIENTATION AS REQUIRED BY AND IN ACCORDANCE WITH THE SUPPLIED RANGE MANUFACTURER INSTALLATION INSTRUCTIONS.
10	2P-60A, 240V CONTACTOR FOR RANGE SHUT DOWN. ROUTE POWER FOR RANGE THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER.
11	RECEPTACLE / CIRCUIT CONNECTION TO RANGE HOOD. RANGE HOOD AND LIGHT SHALL BE SWITCHED SEPARATELY. INSTALL SO THAT THE SWITCHES ARE ACCESSIBLE. COORDINATE LOCATION WITH CASEWORK MANUFACTURER PRIOR TO INSTALLATION.
12	CIRCUIT CONNECTION FOR BATHROOM LIFT. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS. COORDINATE LOCATION WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKER.
13	RECEPTACLE FOR COPIER AT +36" A.F.F. TO C.L.
14	RECEPTACLE FOR WASHER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
15	NEMA 14-30 RECEPTACLE FOR DRYER AT +46" A.F.F. TO C.L. CIRCUIT PROTECTEDY GFCI BREAKER.
16	CIRCUIT CONNECTION FOR HAND DRYER. COORDINATE MOUNTING HEIGHT WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKER.
17	RECEPTACLE FOR ICE MACHINE AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
18	RECEPTACLE / CIRCUIT CONNECTION FOR DISHWASHER VERIFY EXACT LOCATION WITH MANUFACTURER. CIRCUIT PROTECTED BY GFCI BREAKER.
19	RECEPTACLES FOR STACKED WASHER AND DRYER. COORDINATE MOUNTING HEIGHTS WITH A-SERIES DRAWINGS. CIRCUIT PROTECTED BY GFCI BREAKERS.
20	RECEPTACLE FOR VENDING MACHINE AT +46" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
21	RECEPTACLE / CIRCUIT CONNECTION FOR GOGGLE CABINET AT + 60" A.F.F. TO C.L.
22	RECEPTACLE IN CASEWORK. VERIFY EXACT LOCATION WITH CASEWORK MANUFACTURER PRIOR TO ROUGH-IN. CIRCUIT PROTECTED BY GFCI BREAKER.
23	CIRCUIT CONNECTION FOR FUME HOOD. CONNECT COMPLETE PER MANUFACTURER'S REQUIREMENTS.
24	RECEPTACLE FOR CORD REEL. PROVIDE 25FT WHITE REEL WITH WHITE 20A DUPLEX RECEPTACLE SIMILAR TO HUBBELL INREACH. PROVIDE PLENUM RATED ENCLOSURE SIMILAR TO HUBBELL 'HBLIPRBOX' FOR MOUNTING CORD REEL ABOVE CEILING. COORDINATE LOCATION WITH A-SERIES DRAWINGS.
25	EXACT RECEPTACLE LOCATION AND COLOR OF DEVICE / COVER PLATE SHALL BE COORDINATED WITH ARCHITECT.
26	MOTOR CONTROL DEVICE TO OVERHEAD COILING DOOR. CONNECT COMPLETE TO ALL CONTROLS AND PROVIDE ALL CONTROL WIRING AS REQUIRED.
27	QUADRUPLEX RECEPTACLE FOR AV RACK. COORDINATE MOUNTING LOCATION WITH T-SERIES DRAWINGS.
28	NEMA L6-20 RECEPTACLE FOR TELECOMMUNICATIONS RACK. COORDINATE LOCATION AND MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
29	RECEPTACLE LOCATED IN FACE OF CEILING FOR FOR PROJECTOR. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
30	CIRCUIT CONNECTION FOR MOTORIZED PROJECTION SCREEN. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
31	1P-20A, 120V CONTACTOR FOR LAB GAS SHUT DOWN. ROUTE POWER FOR LAB GAS THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER.
32	REFER TO FOOD SERVICE EQUIPMENT CONTRACTOR'S DRAWINGS FOR ADDITIONAL INFORMATION ON MOUNTING LOCATION AND RECEPTACLE / CONNECTION TYPE.
33	CIRCUIT CONNECTION LOCATED ABOVE CEILING FOR SENSOR(S) TRANSFORMER(S). PROVIDE QUANTITY OF JUNCTION BOXES REQUIRED CONNECTED TO CIRCUIT INDICATED. CONNECT COMPLETE TO CIRCUIT INDICATED. REFER TO SCHEMATIC DIAGRAMS FOR ADDITIONAL INFORMATION. COORDINATE WITH P-SERIES DRAWINGS.
34	RECEPTACLE FOR ELECTRIC WATER COOLER. COORDINATE LOCATION WITH MANUFACTURER PRIOR TO INSTALLATION. CIRCUIT PROTECTED BY GFCI BREAKER.
35	EXISTING EQUIPMENT TO BE RELOCATED. VERIFY POWER REQUIREMENTS WITH EXISTING EQUIPMENT.
36	RECEPTACLES FOR ACCESS CONTROL PANELS. COORDINATE EXACT LOCATION WITH ACCESS CONTROL CONTRACTOR.
37	PROVIDE TOGGLE DISCONNECT SWITCH FOR SPLIT SYSTEM FAN COIL UNIT. INDOOR UNIT IS POWERED BY OUTDOOR UNIT. REFER TO ROOF PLANS FOR ADDITIONAL INFORMATION ON CORRESPONDING CONDENSING UNIT.
38	PROVIDE CONTACTOR FOR DRESSING ROOM. CONTACTOR SHALL SHUT DOWN ALL ROOM RECEPTACLES AND LIGHTING ADJACENT TO MIRRORS. ROUTE POWER FOR DRESSING ROOM THRU CONTACTOR FOR CONTROL. PROVIDE PILOT LIGHT INDICATOR AND RESET SWITCH IN COVER.
39	DISCONNECT SWITCH PROVIDED BY MANUFACTURER.
40	6-GANG FLOOR BOX, ON-GRADE PAN. PROVIDE (2) DUPLEX RECEPTACLES IN 1" CONDUIT. REFER TO T-SERIES DRAWINGS FOR DEVICE AND CONDUIT REQUIREMENTS AT EACH BOX.
41	EXISTING FLOOR BOX. REPLACE EXISTING DEVICES AS REQUIRED. COORDINATE REQUIREMENTS WITH AV CONTRACTOR. DISCONNECT POWER AND RECONNECT POWER TO INTERNAL PLATE.
42	NEW FLOOR BOX. COORDINATE REQUIREMENTS WITH A/V CONTRACTOR.
43	CIRCUIT CONNECTION FOR A/V CEILING ENCLOSURE. COORDINATE LOCATION WITH T-SERIES DRAWINGS.
44	INSTALL RECEPTACLE IN BOTTOM RISER OF BLEACHERS. CONNECT TO FLEXIBLE CABLE FROM WALL OUTLET BOX. COORDINATE OPENING IN BLEACHER WITH MANUFACTURER.
45	INSTALL SCOREBOARD CONTROL OUTLET IN BOTTOM RISER OF BLEACHERS. CONNECT TO FLEXIBLE CABLE FROM WALL OUTLET BOX. COORDINATE OPENING IN BLEACHER WITH MANUFACTURER.
46	PROVIDE FLEXIBLE WIRING FROM OUTLET BOX ON WALL TO DEVICE LOCATED ON BLEACHERS.
47	12" X 12" X 6" JUNCTION BOX FOR MOTORIZED BLEACHERS. INSTALL BOX AT 5'-0" A.F.F. TO C.L. INSTALL IN LOCATION AS RECOMMENDED BY BLEACHER MANUFACTURER. CONTACTORS AND CONTROLLERS ARE PROVIDED, INSTALLED AND WIRED BY THE MANUFACTURER. INSTALL (1) 3/4"C. BETWEEN JUNCTION BOX AND ADJACENT DISCONNECT SWITCH. CONNECT COMPLETE.
48	COORDINATE THEATRICAL LIGHTING ELECTRICAL EQUIPMENT AND CIRCUITING INFORMATION (120V, DMX, & LOW VOLTAGE) WITH TE- AND SKE-SERIES DRAWINGS AND SPECIFICATIONS.
49	COORDINATE A/V EQUIPMENT ELECTRICAL ROUGH-INS TA-SERIES DRAWINGS AND SPECIFICATIONS.
50	EC SHALL PROVIDE CONTACTORS AND ROUTE ALL POWER FOR EQUIPMENT LOCATED UNDER THE HOOD THRU CONTACTORS. CONTACTORS SHALL BE INTERLOCKED WITH THE HOOD FIRE SUPPRESSION SYSTEM TO SHUT DOWN ALL POWER TO EQUIPMENT WHEN FIRE SUPPRESSION SYSTEM IS ACITIVATED. CONTACTORS SHALL HAVE RESET SWITCH LOCATED IN THE COVER. LOCATE CONTACTORS IN ACCESSIBLE LOCATION AS DIRECTED BY THE OWNER. EC MAY PROVIDE SHUNT TRIP BREAKERS IN LIEU OF CONTACTOR
51	CONNECT CEILING FAN AND CONTROLLER COMPLETE. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONTROLLER FOR CEILING FAN PROVIDED BY OTHERS. VERIFY LOCATION OF CONTROLLER WITH OWNER
52	PROVIDE NEMA 3R JUNCTION BOX(ES) FOR SIGNAGE AS REQUIRED. VERIFY EXACT LOCATION(S) WITH OWNER'S SIGNAGE MANUFACTURER PRIOR TO INSTALLATION. SIGN SHALL BE CONNECTED TO THE LIGHTING CONTROL SYSTEM. PROVIDE ALL REQUIRED CONTROL WIRING AND CONNECTIONS IN CONDUIT AS REQUIRED.
53	PROVIDE RECEPTACLES IN THIS ROOM WITH ACOUSTICALLY ISOLATED METAL FURRING THAT MAINTAINS ACOUSTICAL ISOLATION BETWEEN THE BACKBOX AND DRYWALL. SEAL EACH LOCATION WITH ACOUSTICAL SEALANT TO PROVIDE RESILENT DECOUPLING BETWEEN THE TWO MATERIALS. REFER TO 'A' SERIES WALL TYPES FOR ADDITIONAL INFORMATION.
54	CIRCUIT CONNECTION FOR AUTO DOOR. PROVIDE ALL CONDUIT AND WIRING FOR CONNECTION OF PUSH PADS TO MOTOR. COORDINATE PUSH PAD LOCATIONS WITH A-SERIES DRAWINGS.
55	CIRCUIT CONNECTION FOR MAGNETIC DOOR HOLD OPENS. PROVIDE ALL CONDUIT AND WIRING.
56	DISCONNECT EXISTING AND RECONNECT NEW EQUIPMENT AS REQUIRED. MAINTAIN EXISTING ROUGH-IN AND WIRING. PROVIDE EXISTING CIRCUIT WITH NEW GFCI BREAKER.
57	PROVIDE JUNCTION BOX ABOVE CEILING FOT FUTURE FEATURE WALL.

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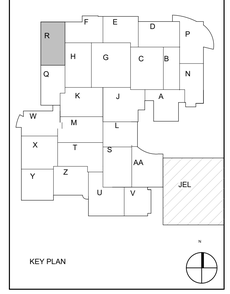
Project No.	2019-067.NCH
Project Date	03.03.2023
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Produced	JAW

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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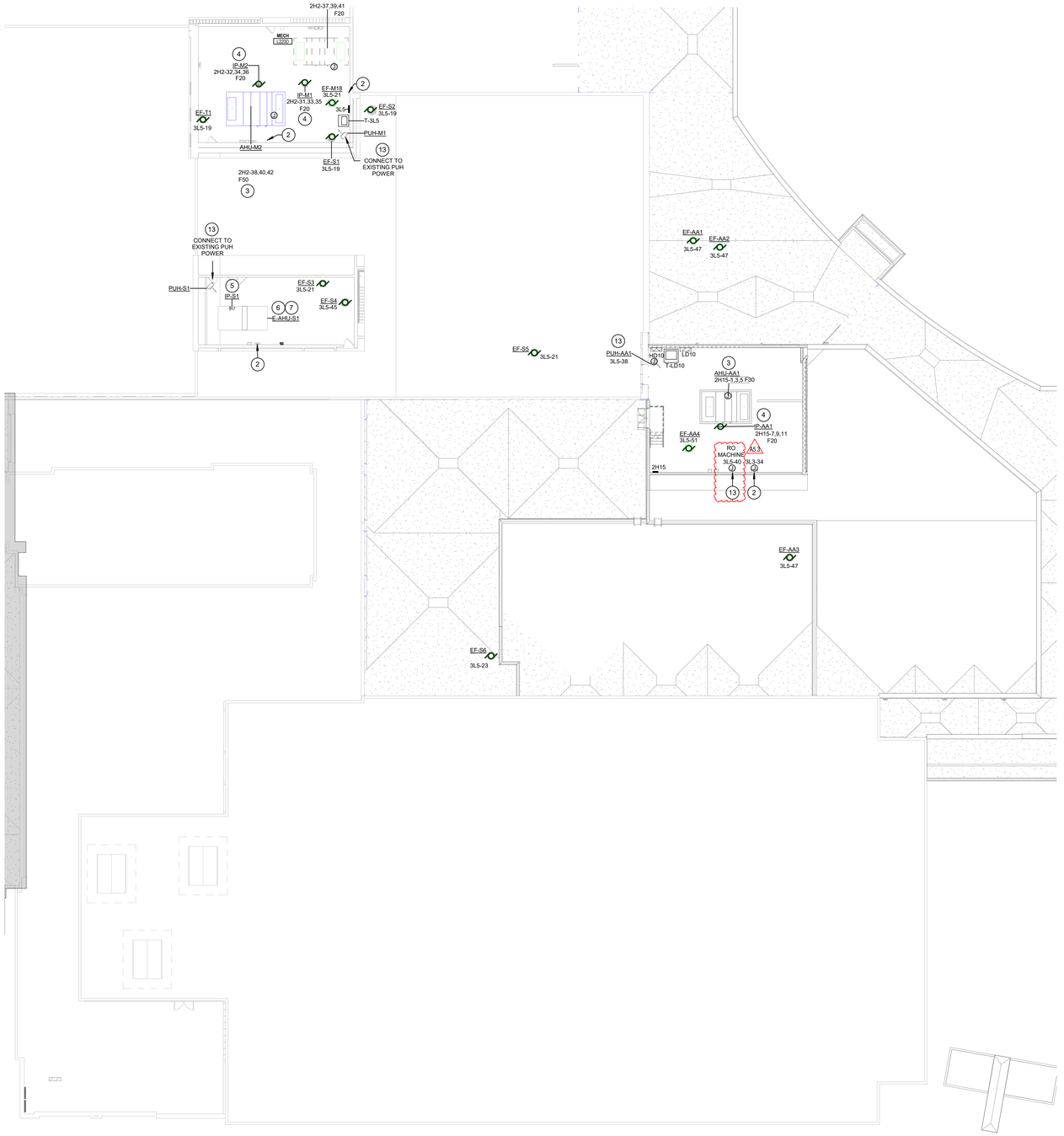
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North Central High School Renovation - Additions Phase 3

FIRST FLOOR POWER PLAN - UNIT R

EP1R1.3

EP1R1.3 - FIRST FLOOR POWER PLAN - UNIT R
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LOWER LEVEL & ROOF GENERAL NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	DIV 26 TO PROVIDE 120V-1P, 20A EXHAUST FAN MOTOR STARTER DISCONNECT FOR EXHAUST FANS. DIV 23 PROVIDES CONTROL RELAY AND CURRENT TRANSFORMER SWITCH. VERIFY EXACT LOCATION PRIOR TO INSTALLATION. REFER TO SHEET M SERIES SHEETS FOR ADDITIONAL INFORMATION.

LOWER LEVEL & ROOF PLAN NOTES

#	NOTES
1	PROVIDE INFRARED SCAN FOR EQUIPMENT INDICATED. CLEAN ALL DUST OFF EQUIPMENT, EXERCISE AND LUBRICATE ALL FUSIBLE SWITCHES.
2	CONNECT NEW AIR HANDLING UNIT BUILDING AUTOMATION CONTROLLER TO CIRCUIT SERVING EXISTING BUILDING AUTOMATION CONTROLLER COMPLETE. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
3	CONNECT AIR HANDLING UNIT AND ASSOCIATED VARIABLE FREQUENCY DRIVE COMPLETE TO CIRCUIT INDICATED. VARIABLE FREQUENCY DRIVE PROVIDED BY DIV 23 AND INSTALLED BY DIV 26. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
4	CONNECT NEW CIRCULATION PUMP COMPLETE TO CIRCUIT INDICATED. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
5	CONNECT NEW CIRCULATION PUMP TO EXISTING CIRCUIT MAINTAINED DURING DEMOLITION. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
6	DISCONNECT EXISTING AIR HANDLING UNIT MOTOR CONTROL AND CONNECT NEW VARIABLE FREQUENCY DRIVE TO EXISTING CIRCUIT MAINTAINED DURING DEMOLITION. VARIABLE FREQUENCY DRIVE PROVIDED BY DIV 23 AND INSTALLED BY DIV 26. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
7	DISCONNECT EXISTING AIR HANDLING UNIT MOTOR AND CONNECT NEW MOTOR COMPLETE. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
8	PROVIDE 208V-1P, 30A, NEMA 3R, FUSIBLE DISCONNECT SWITCH FUSED PER UNIT MANUFACTURERS RECOMMENDATIONS. PROVIDE ADDITIONAL SUPPORT STRUCTURE AS REQUIRED.
9	REFER TO FIRST FLOOR KITCHEN PLANS FOR ADDITIONAL INFORMATION.
10	K HALL ELEVATOR ALTERNATE. PROVIDE ALTERNATE BID FOR 480V-3P, 60A FUSIBLE DISCONNECT. PROVIDE 480V-3P, 60A CONTACTOR FOR ELEVATOR SHUT DOWN PRIOR TO SPRINKLER SYSTEM RELEASE. INTERLOCK CONTACTOR WITH FIRE ALARM SYSTEM AS REQUIRED. ROUTE POWER FOR ELEVATOR THRU CONTACTOR FOR CONTROL. PROVIDE RESET SWITCH IN COVER. PROVIDE 2P-30A, 208V, FUSIBLE DISCONNECT FOR ELEVATOR LIGHTING AND CONTROL. PROVIDE CONNECTIONS TO ELEVATOR EQUIPMENT AS REQUIRED. COORDINATE ALL EQUIPMENT LOCATIONS WITH ELEVATOR SUPPLIER. FUSES PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
11	DISCONNECT SWITCH PROVIDED BY MANUFACTURER.
12	PROVIDE NEMA SIZE 1, FVNR MOTOR CONTROLLER. PROVIDE CONTROL POWER TRANSFORMER, H-O-A SWITCH, ON PILOT LIGHT, 2 NO, 2 NC AUX CONTACT SWITCHES, SOLID STATE OVERLOADS.
13	PROVIDE 120V-1P, 20A TOGGLE SWITCH DISCONNECT SWITCH.
14	CONNECT EXHAUST FAN TO VARIABLE FREQUENCY DRIVE COMPLETE TO CIRCUIT INDICATED. VARIABLE FREQUENCY DRIVE PROVIDED BY DIV 23 AND INSTALLED BY DIV 26. REFER TO M SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

2A **ROOF POWER PLAN - S, U, V, AA, BB**
1/16" = 1'-0"

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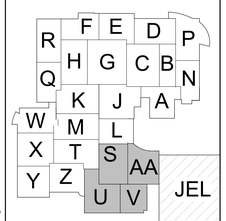
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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

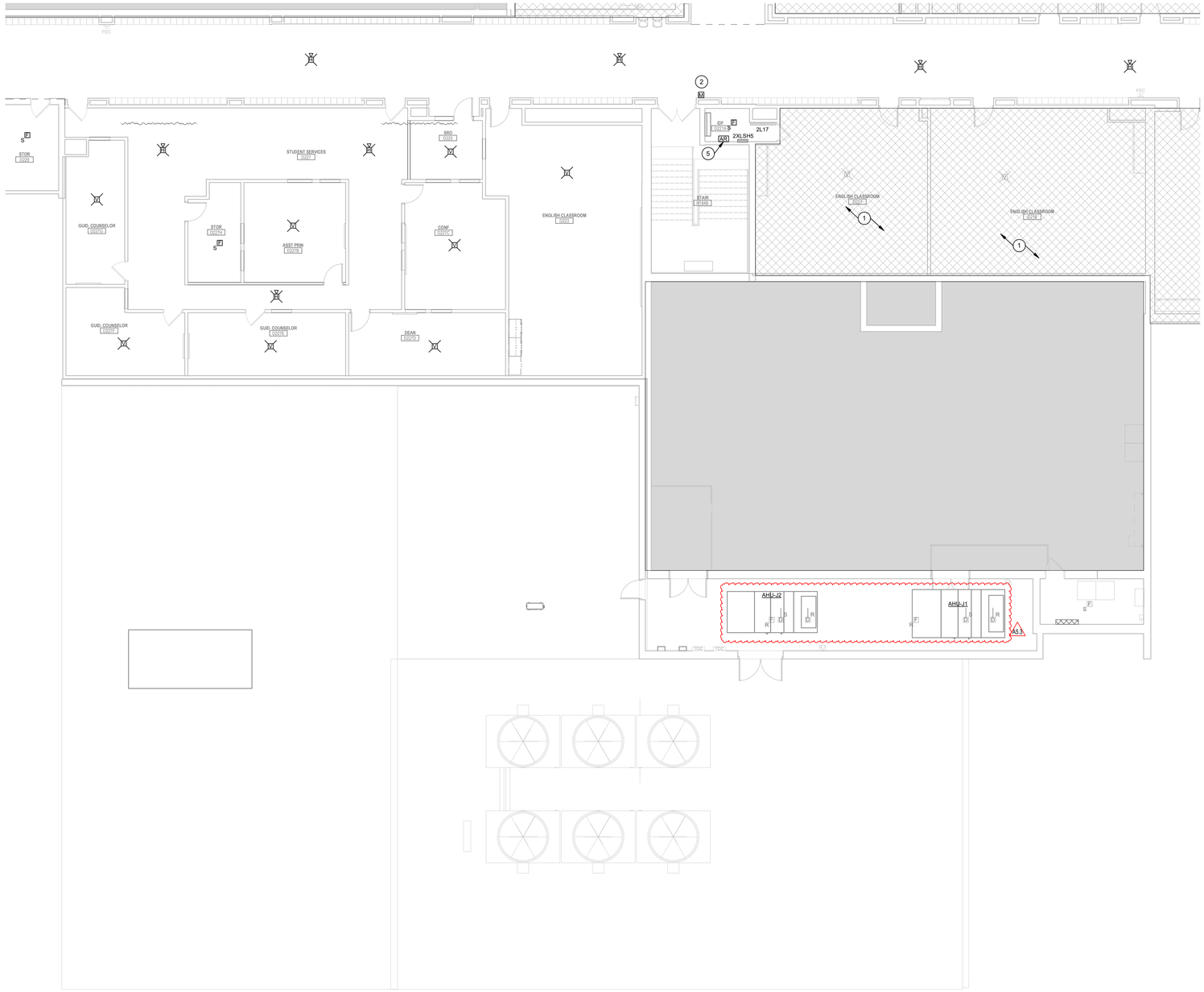
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

ROOF POWER PLAN - UNIT S, U, V, AA

EP105.3

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GENERAL FIRE ALARM NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ELEVATOR FIRE ALARM DEVICES ARE EXISTING TO REMAIN. CONTRACTOR SHALL PROVIDE WHAT IS REQUIRED FOR ELEVATOR RECALL.
C	TAMPER AND FLOW FIRE ALARM DEVICES ARE EXISTING TO REMAIN.
D	DOOR HOLD OPEN FIRE ALARM DEVICES ARE EXISTING TO REMAIN.
E	PROVIDE MODIFICATION TO EXISTING FIRE ALARM SYSTEM INCLUDING BUT NOT LIMITED TO PROGRAMMING, NAC PANELS AND POWER TO NAC PANELS. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL INFORMATION.
F	MOST NEW DEVICES SHOWN THROUGHOUT THE FIRE ALARM PLANS ARE RELOCATED. IT IS THE CONTRACTORS RESPONSIBILITY TO COUNT SALVAGED DEVICES FROM DEMOLITION AND COMPARE TO NEW DEVICES SHOWN ON NEW WORK PLANS FOR ACTUAL COUNT OF DEVICES TO BE PURCHASED.
G	TURN OVER ALL UNUSED FIRE ALARM DEVICES TO OWNER.

FIRE ALARM PLAN NOTES

#	NOTES
1	CONTRACTOR SHALL MAINTAIN ALL EXISTING FIRE ALARM DEVICES IN HATCHED AREA IF SHOWN OR NOT SHOWN. FIRE ALARM DEVICES SHOWN IN THE HATCHED AREA ARE BASED ON EXISTING DRAWINGS AND ALL DEVICES MAY NOT BE SHOWN.
2	EXISTING FIRE ALARM MANUAL PULL SHALL BE LOWERED TO BE ADA COMPLIANT. PROVIDE ROUGH-IN AND CONDUIT AS REQUIRED. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
3	TOUCH SCREEN REMOTE ANNUNCIATOR.
4	PROVIDE FIRE ALARM ADDRESSABLE RELAY / MONITOR MODULE FOR CONNECTION TO KITCHEN EXHAUST HOOD FIRE SUPPRESSION SYSTEM.
5	FIRE ALARM ADDRESSABLE RELAYS FOR CONNECTION TO ACCESS CONTROL PANEL/INTRUSION PANEL AND PA SYSTEM. COORDINATE ALL REQUIRMENTS.
6	FIRE ALARM ADDRESSABLE RELAY. INTERLOCK FAN WITH FIRE ALARM SYSTEM TO SHUT OFF FAN WHEN SYSTEM IS IN ALARM.
7	FIRE ALARM ADDRESSABLE RELAYS FOR CONNECTION TO THEATHER POWER SENSING AND EMERGENCY TRIGGER DEVICE. COORDINATE WITH TE- AND SKE-SERIES DRAWINGS AND SPECIFICATIONS.
8	FIRE ALARM DUCT MOUNTED SMOKE DETECTOR INSTALLED IN SUPPLY AND RETURN DUCTWORK INSIDE THE BUILDING IN LOCATION AS REQUIRED BY MANUFACTURER. PROVIDE SERIES CONNECTIONS TO EACH DUCT DETECTOR TO SHUT DOWN UNIT WHEN IN ALARM. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONNECT TO EXISTING FIRE ALARM SYSTEM AS REQUIRED.
9	PROVIDE FIRE ALARM DEVICES IN THIS ROOM WITH ACOUSTICALLY ISOLATED METAL FURRING THAT MAINTAINS ACOUSTICAL ISOLATION BETWEEN THE BACKBOX AND DRYWALL. SEAL EACH LOCATION WITH ACOUSTICAL SEALANT TO PROVIDE RESILIENT DECOUPLING BETWEEN THE TWO MATERIALS. REFER TO 'A' SERIES WALL TYPES FOR ADDITIONAL INFORMATION.

2A **SECOND FLOOR FIRE ALARM PLAN - UNIT J**
1/8" = 1'-0"

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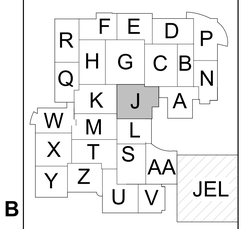
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A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT J

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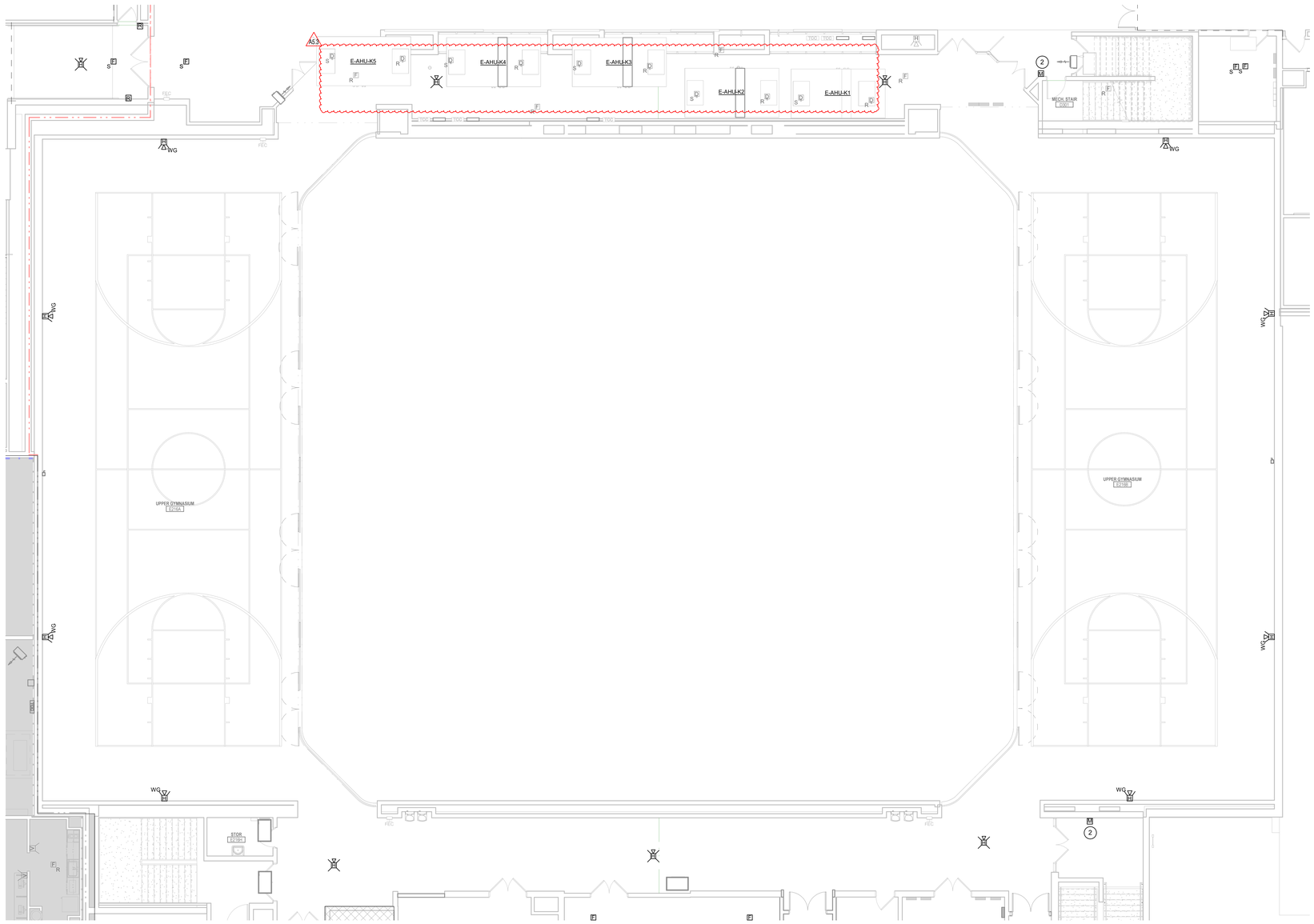
GENERAL FIRE ALARM NOTES

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C	TAMPER AND FLOW FIRE ALARM DEVICES ARE EXISTING TO REMAIN.
D	DOOR HOLD OPEN FIRE ALARM DEVICES ARE EXISTING TO REMAIN.
E	PROVIDE MODIFICATION TO EXISTING FIRE ALARM SYSTEM INCLUDING BUT NOT LIMITED TO PROGRAMMING, NAC PANELS AND POWER TO NAC PANELS. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL INFORMATION.
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G	TURN OVER ALL UNUSED FIRE ALARM DEVICES TO OWNER.

FIRE ALARM PLAN NOTES

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3	TOUCH SCREEN REMOTE ANNUNCIATOR.
4	PROVIDE FIRE ALARM ADDRESSABLE RELAY / MONITOR MODULE FOR CONNECTION TO KITCHEN EXHAUST HOOD FIRE SUPPRESSION SYSTEM.
5	FIRE ALARM ADDRESSABLE RELAYS FOR CONNECTION TO ACCESS CONTROL PANEL/INTRUSION PANEL AND PA SYSTEM. COORDINATE ALL REQUIRMENTS.
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8	FIRE ALARM DUCT MOUNTED SMOKE DETECTOR INSTALLED IN SUPPLY AND RETURN DUCTWORK INSIDE THE BUILDING IN LOCATION AS REQUIRED BY MANUFACTURER. PROVIDE SERIES CONNECTIONS TO EACH DUCT DETECTOR TO SHUT DOWN UNIT WHEN IN ALARM. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONNECT TO EXISTING FIRE ALARM SYSTEM AS REQUIRED.
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A5.3



2A SECOND FLOOR FIRE ALARM PLAN - UNIT K
1/8" = 1'-0"

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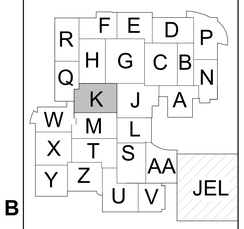
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced JAW

DAVID SAUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT K

EF1K2.3

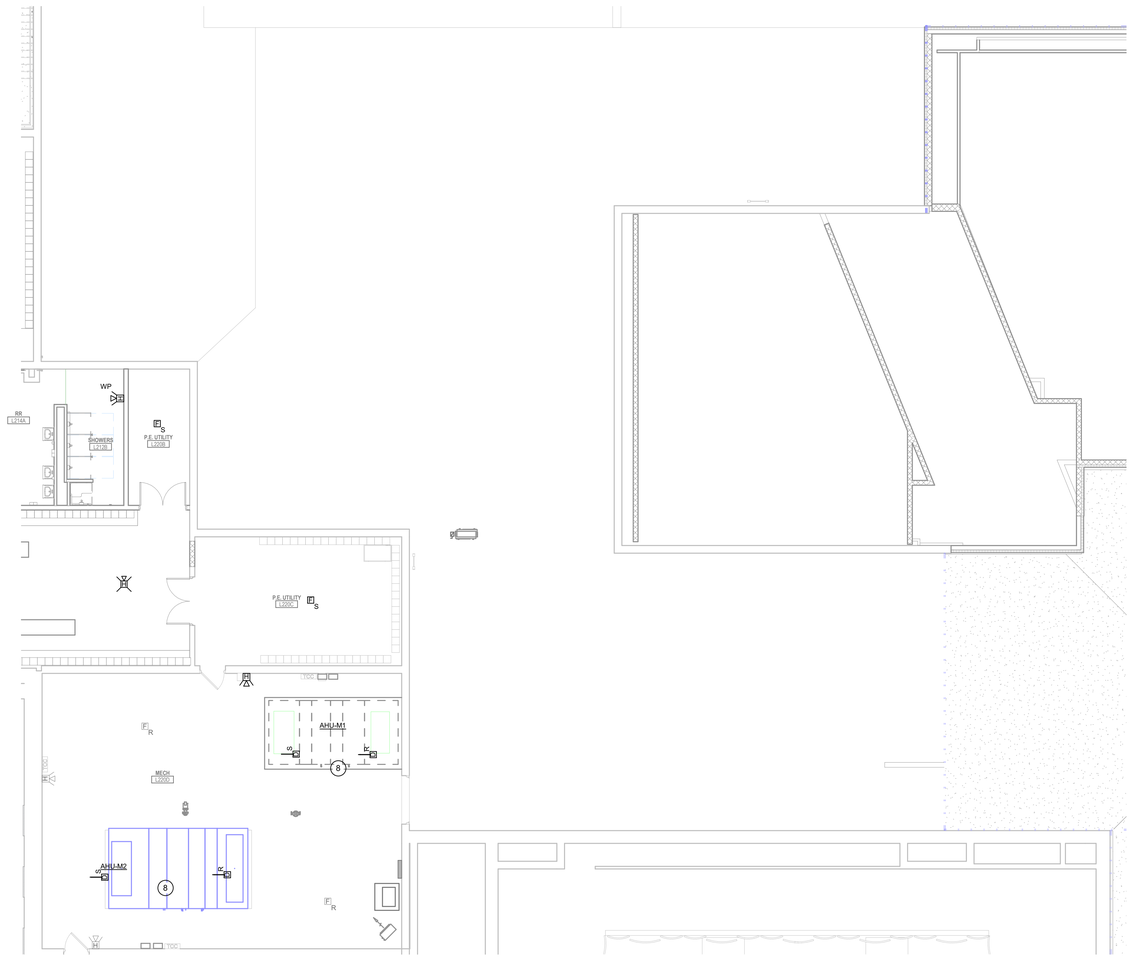
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GENERAL FIRE ALARM NOTES

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2A **SECOND FLOOR FIRE ALARM PLAN - UNIT L**
1/8" = 1'-0"

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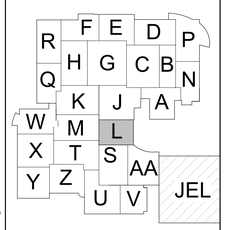
Project No. 2019-067.NCH
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Bid Set 03
Produced JAW

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN N

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT L

EF1L2.3

EF1L2_SECOND FLOOR FIRE ALARM PLAN - UNIT L
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GENERAL FIRE ALARM NOTES

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2A SECOND FLOOR FIRE ALARM PLAN - UNIT N
1/8" = 1'-0"

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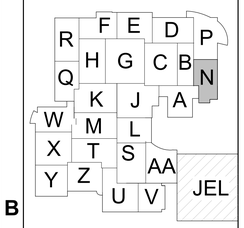
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced JAW

DAVID SAUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

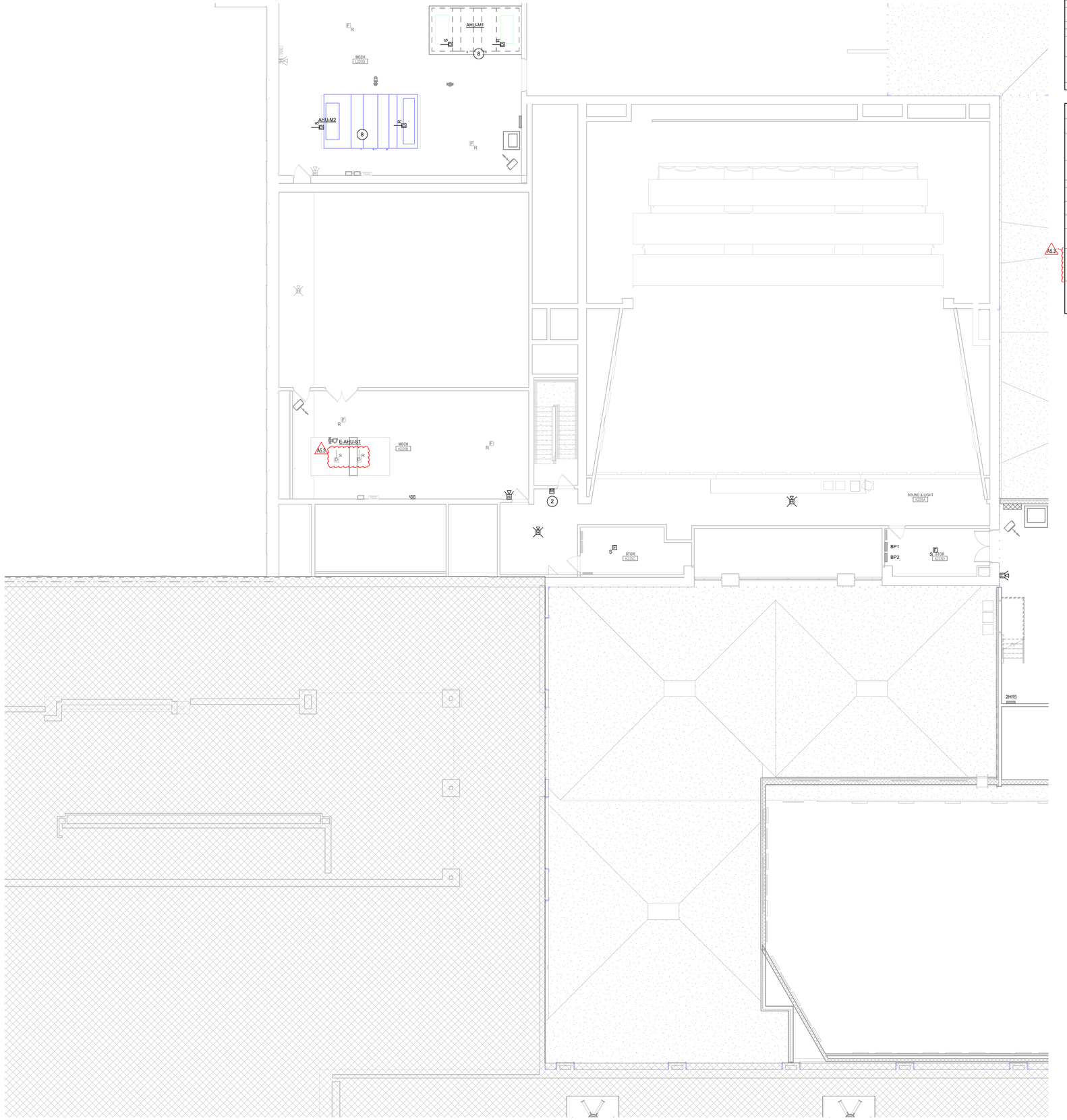
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT N

EF1N2.3

EF1N2_SECOND FLOOR FIRE ALARM PLAN_UNIT N
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_SD1Y.rvt
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2A **SECOND FLOOR FIRE ALARM PLAN - UNIT S**
1/8" = 1'-0"

GENERAL FIRE ALARM NOTES

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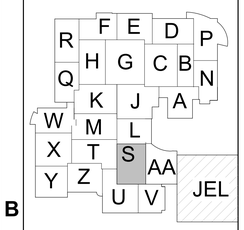
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT S

EF1S2.3

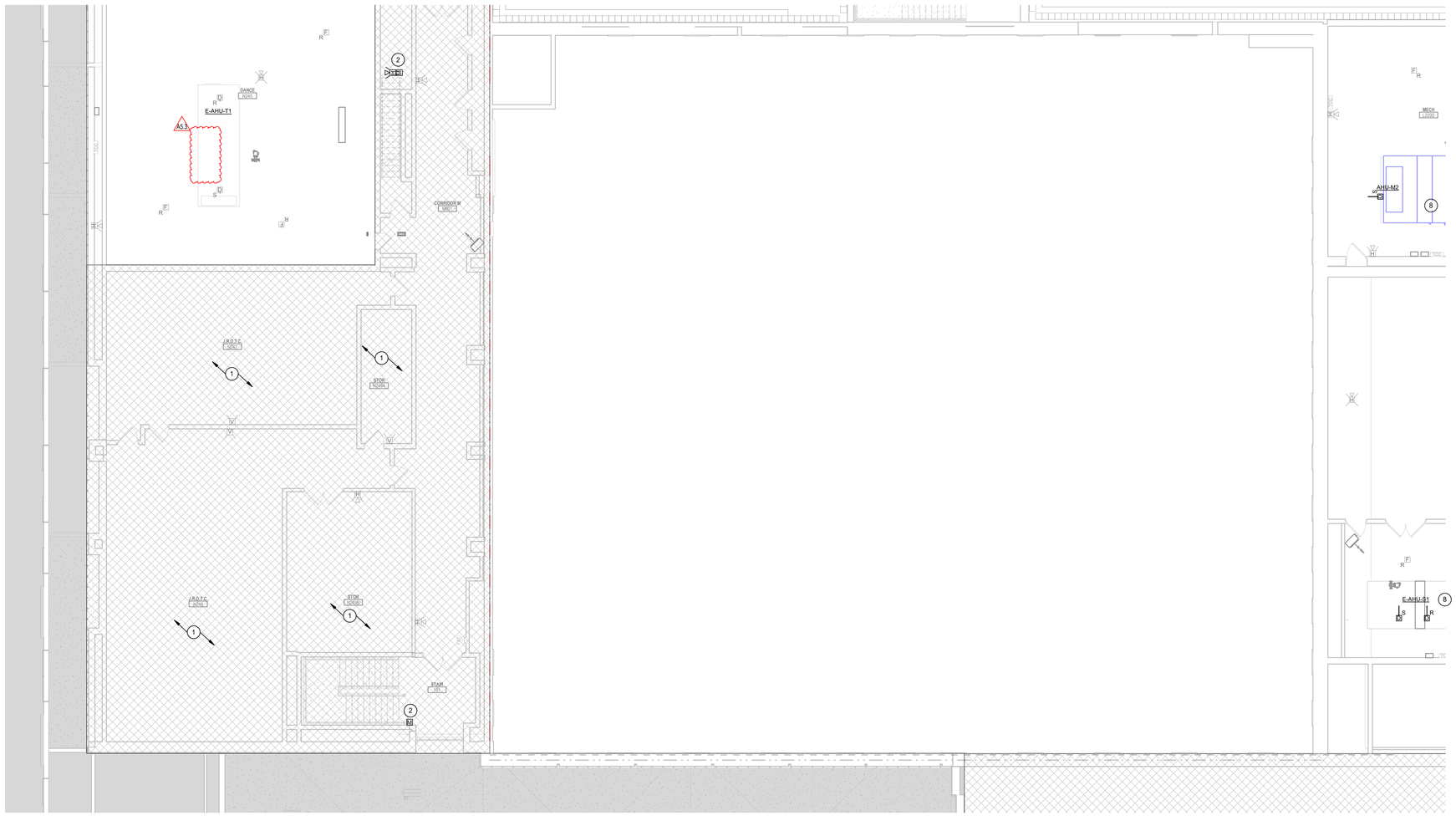
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GENERAL FIRE ALARM NOTES

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1/8" = 1'-0"

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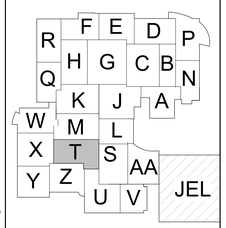
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A5.3	ADDENDUM 5.3	04.20.2023

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KEY PLAN N

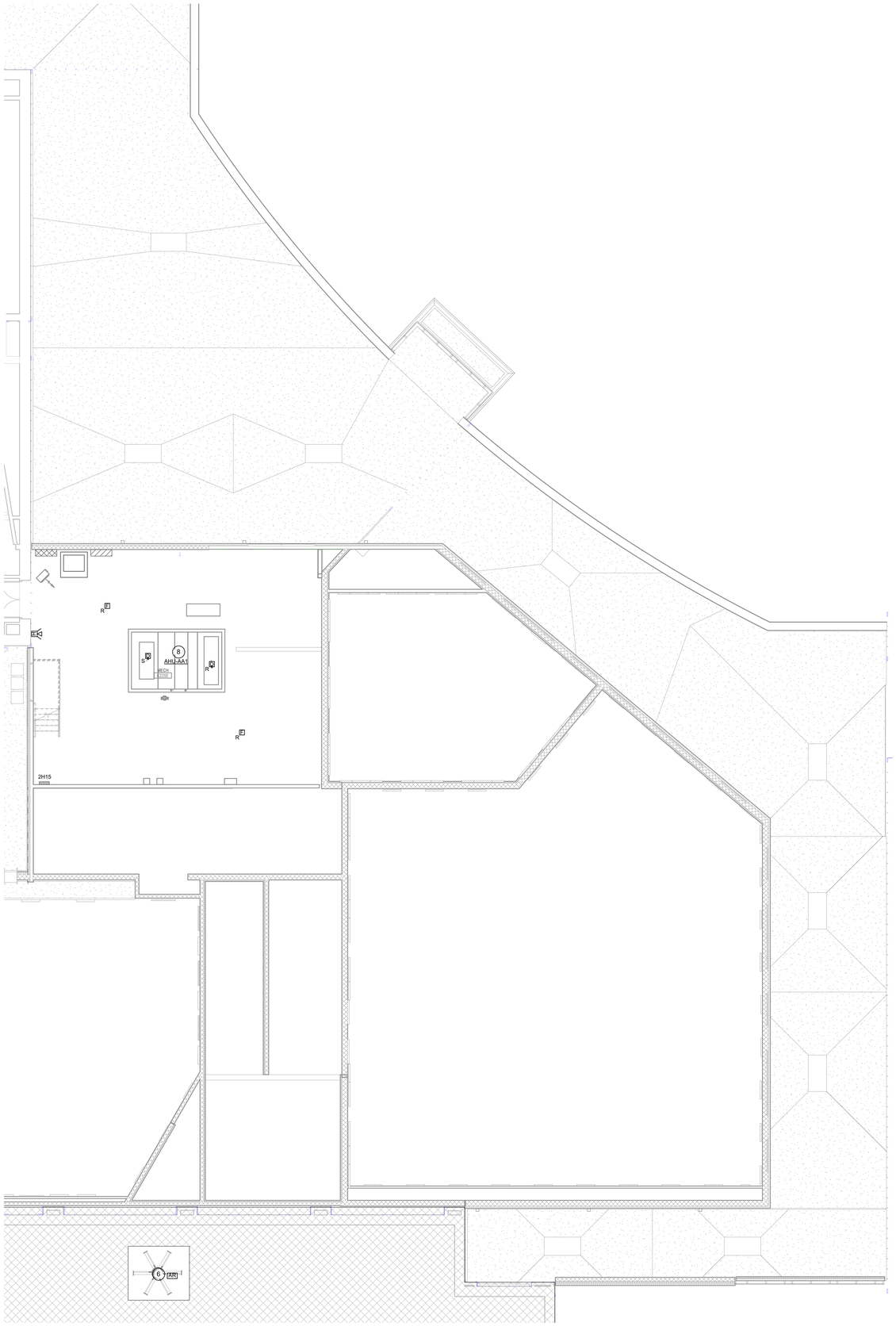
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT T

EF1T2.3

EF1T2_SECOND FLOOR FIRE ALARM PLAN - UNIT T
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1 **SECOND FLOOR FIRE ALARM PLAN - UNIT AA**
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GENERAL FIRE ALARM NOTES

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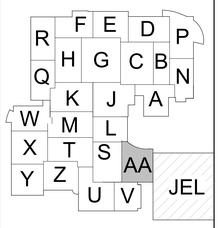
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced JAW

DAVID SAUCK
REGISTERED
No.
19700101
STATE OF
INDIANA
PROFESSIONAL ENGINEER

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#	Revision	Date
A2.3	ADDENDUM 2.3	03.22.2023
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

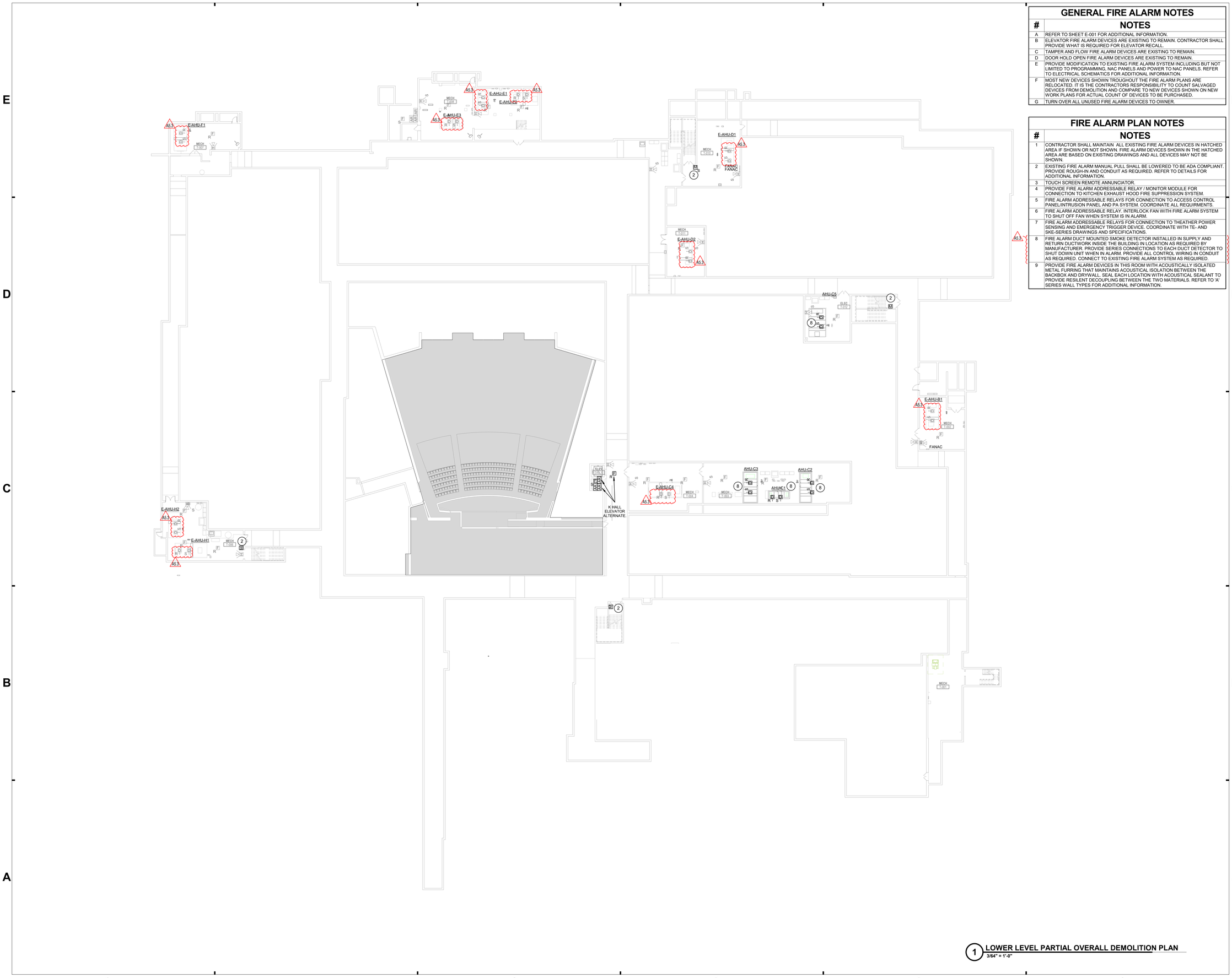
M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

SECOND FLOOR FIRE ALARM PLAN - UNIT AA

EF1AA2.3

EF1AA2_SECOND FLOOR FIRE ALARM PLAN - UNIT AA
2019-067.NCH_M.S.D. of Washington Township, North Central High School Renovation_SD\Project
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1 **LOWER LEVEL PARTIAL OVERALL DEMOLITION PLAN**
3/64" = 1'-0"

GENERAL FIRE ALARM NOTES

#	NOTES
A	REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
B	ELEVATOR FIRE ALARM DEVICES ARE EXISTING TO REMAIN. CONTRACTOR SHALL PROVIDE WHAT IS REQUIRED FOR ELEVATOR RECALL.
C	TAMPER AND FLOW FIRE ALARM DEVICES ARE EXISTING TO REMAIN.
D	DOOR HOLD OPEN FIRE ALARM DEVICES ARE EXISTING TO REMAIN.
E	PROVIDE MODIFICATION TO EXISTING FIRE ALARM SYSTEM INCLUDING BUT NOT LIMITED TO PROGRAMMING, NAC PANELS AND POWER TO NAC PANELS. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL INFORMATION.
F	MOST NEW DEVICES SHOWN TROUGHOUT THE FIRE ALARM PLANS ARE RELOCATED. IT IS THE CONTRACTORS RESPONSIBILITY TO COUNT SALVAGED DEVICES FROM DEMOLITION AND COMPARE TO NEW DEVICES SHOWN ON NEW WORK PLANS FOR ACTUAL COUNT OF DEVICES TO BE PURCHASED.
G	TURN OVER ALL UNUSED FIRE ALARM DEVICES TO OWNER.

FIRE ALARM PLAN NOTES

#	NOTES
1	CONTRACTOR SHALL MAINTAIN ALL EXISTING FIRE ALARM DEVICES IN HATCHED AREA IF SHOWN OR NOT SHOWN. FIRE ALARM DEVICES SHOWN IN THE HATCHED AREA ARE BASED ON EXISTING DRAWINGS AND ALL DEVICES MAY NOT BE SHOWN.
2	EXISTING FIRE ALARM MANUAL PULL SHALL BE LOWERED TO BE ADA COMPLIANT. PROVIDE ROUGH-IN AND CONDUIT AS REQUIRED. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
3	TOUCH SCREEN REMOTE ANNUNCIATOR.
4	PROVIDE FIRE ALARM ADDRESSABLE RELAY / MONITOR MODULE FOR CONNECTION TO KITCHEN EXHAUST HOOD FIRE SUPPRESSION SYSTEM.
5	FIRE ALARM ADDRESSABLE RELAYS FOR CONNECTION TO ACCESS CONTROL PANELINTRUSION PANEL AND PA SYSTEM. COORDINATE ALL REQUIRMENTS.
6	FIRE ALARM ADDRESSABLE RELAY. INTERLOCK FAN WITH FIRE ALARM SYSTEM TO SHUT OFF FAN WHEN SYSTEM IS IN ALARM.
7	FIRE ALARM ADDRESSABLE RELAYS FOR CONNECTION TO THEATHER POWER SENSING AND EMERGENCY TRIGGER DEVICE. COORDINATE WITH TE- AND SKE-SERIES DRAWINGS AND SPECIFICATIONS.
8	FIRE ALARM DUCT MOUNTED SMOKE DETECTOR INSTALLED IN SUPPLY AND RETURN DUCTWORK INSIDE THE BUILDING IN LOCATION AS REQUIRED BY MANUFACTURER. PROVIDE SERIES CONNECTIONS TO EACH DUCT DETECTOR TO SHUT DOWN UNIT WHEN IN ALARM. PROVIDE ALL CONTROL WIRING IN CONDUIT AS REQUIRED. CONNECT TO EXISTING FIRE ALARM SYSTEM AS REQUIRED.
9	PROVIDE FIRE ALARM DEVICES IN THIS ROOM WITH ACOUSTICALLY ISOLATED METAL FURRING THAT MAINTAINS ACOUSTICAL ISOLATION BETWEEN THE BACKBOX AND DRYWALL. SEAL EACH LOCATION WITH ACOUSTICAL SEALANT TO PROVIDE RESILENT DECOUPLING BETWEEN THE TWO MATERIALS. REFER TO 'A' SERIES WALL TYPES FOR ADDITIONAL INFORMATION.

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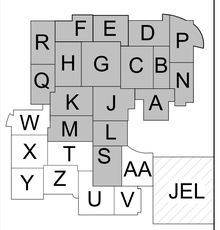
Project No. 2019-067.NCH
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DAVID SAUCK
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A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN

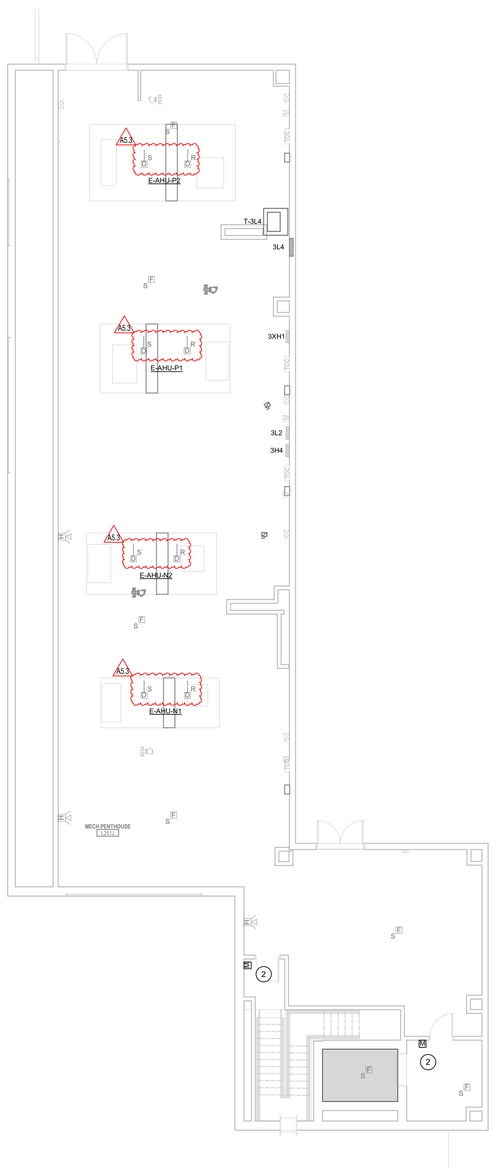
M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

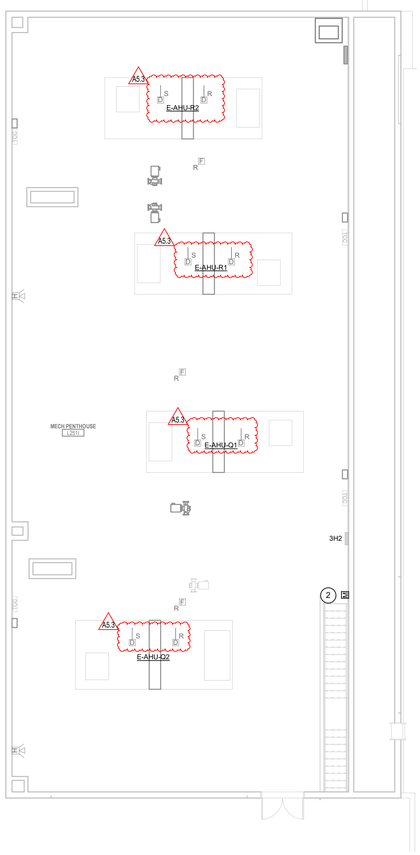
LOWER LEVEL PARTIAL OVERALL FIRE ALARM PLAN

EF100.3

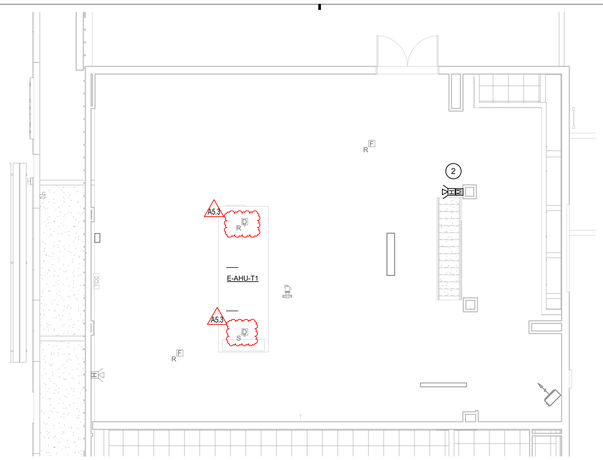
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2019-067.NCH_M.S.D. of Washington Township_North Central High School Renovation_SD1\Work\
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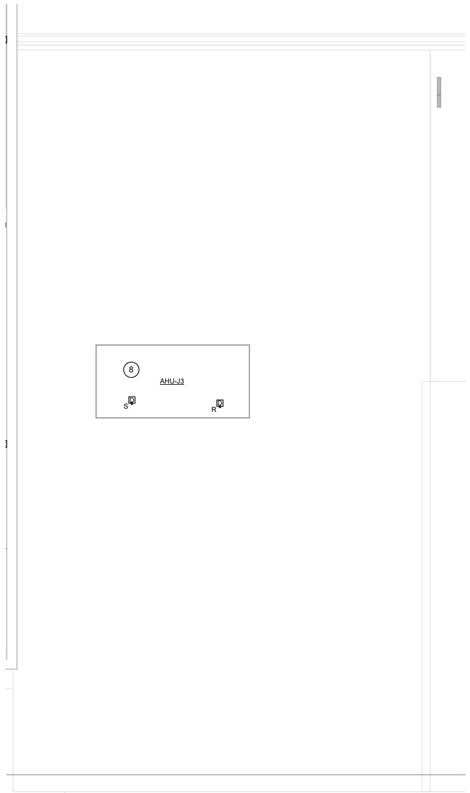
1 PENTHOUSE FIRE ALARM PLAN - UNIT N
1/8" = 1'-0"



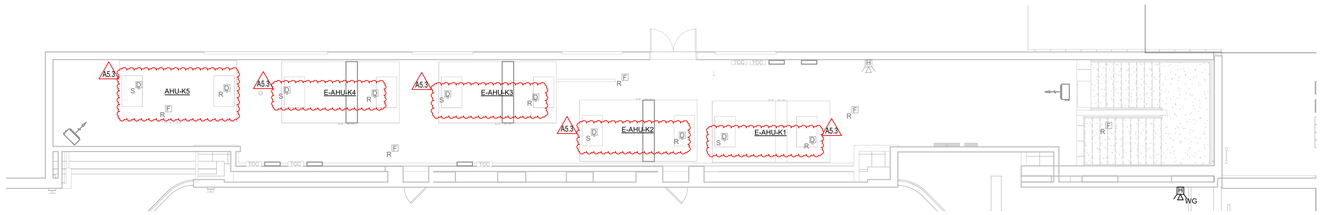
2 PENTHOUSE FIRE ALARM PLAN - UNIT Q
1/8" = 1'-0"



4 PENTHOUSE FIRE ALARM PLAN - UNIT T
1/8" = 1'-0"



5 ROOF FIRE ALARM PLAN - UNIT J
1/8" = 1'-0"



3 PENTHOUSE FIRE ALARM PLAN - UNIT K
1/8" = 1'-0"

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A5.3 3

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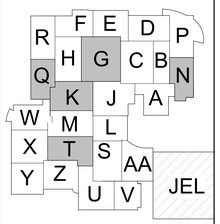
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A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
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KEY PLAN
N

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

PENTHOUSE FIRE ALARM PLANS

EF101.3

EF101.3_PENTHOUSE FIRE ALARM PLANS
2019-067.NCH_A5.3 of Washington Township_North Central High School Renovation_10.01.21.rvt
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LIGHTING FIXTURE SCHEDULE

LABEL	DESCRIPTION	VOLTAGE	SOURCE TYPE	SOURCE LUMENS	SOURCE WATTS	SOURCE CCT	MOUNTING	LENS/REFLECTOR	ACCEPTABLE MANUFACTURERS
L1	1X4 ARCHITECTURAL LED TROFFER. WHITE FLUSH ALUMINUM DOOR. 0-10V DIMMING. SUITABLE FOR DAMP LOCATION. A5.3	120/277 V	LED	3,800 LM	36 W	4000 K	RECESSED	SMOOTH FROSTED ACRYLIC LENS	METALUX 14CZ COLUMBIA RLA14 LITHONIA 2BLTBA4 A5.3
L1-D	1X4 ARCHITECTURAL LED TROFFER. WHITE FLUSH ALUMINUM DOOR. 0-10V DIMMING. PROVIDE WITH DRYWALL KIT. SUITABLE FOR DAMP LOCATION. A5.3	120/277 V	LED	3,800 LM	36 W	4000 K	RECESSED	SMOOTH FROSTED ACRYLIC LENS	METALUX 14CZ COLUMBIA RLA14 LITHONIA 2BLTBA4
L2	2X2 ARCHITECTURAL LED TROFFER. WHITE FLUSH ALUMINUM DOOR. 0-10V DIMMING. SUITABLE FOR DAMP LOCATION. A5.3	120/277 V	LED	4,000 LM	50 W	4000 K	RECESSED	SMOOTH FROSTED ACRYLIC LENS	METALUX 22CZ COLUMBIA RLA22 LITHONIA 2BLTBA2
L3	4" ROUND LED DOWNLIGHT. SELF-FLANGED TRIM. MEDIUM DISTRIBUTION (50°). 0-10V DIMMING.	120/277 V	LED	1,500 LM	16 W	4000 K	RECESSED	SEMI-SPECULAR CLEAR	PORTFOLIO LD4B PRESCOLITE LF4SL LITHONIA LDN4 A5.3
L4	2.5" WIDE RECESSED LINEAR LED. 0-10V DIMMING. REFER TO LIGHTING PLANS FOR LENGTH.	120/277 V	LED	800 LM/FT	25 W	4000 K	RECESSED	FLUSH SATIN LENS	FOCAL POINT SEEM 2 FINELITE HPX-R PRUDENTIAL LIGHTING BPR03
L5	4" WIDE LINEAR LED PENDANT. 0-10V DIMMING. REFER TO LIGHTING PLANS FOR LENGTH.	120/277 V	LED	800 LM/FT	25 W	4000 K	PENDANT	FLUSH SATIN LENS	FOCAL POINT SEEM 2 FINELITE HPX MARK LIGHTING SLOT 4 INDIRECT/DIRECT A5.3
L6	2X4 ARCHITECTURAL LED TROFFER. WHITE FLUSH ALUMINUM DOOR. 0-10V DIMMING. SUITABLE FOR DAMP LOCATION. A5.3	120/277 V	LED	4,700 LM	52 W	4000 K	RECESSED	SMOOTH FROSTED ACRYLIC LENS	METALUX 24CZ COLUMBIA RLA24 LITHONIA 2BLTBA4 A5.3
L7	2X4 ARCHITECTURAL LED TROFFER. WHITE FLUSH ALUMINUM DOOR. 0-10V DIMMING. SUITABLE FOR DAMP LOCATION. A5.3	120/277 V	LED	5,300 LM	55 W	4000 K	RECESSED	SMOOTH FROSTED ACRYLIC LENS	METALUX 24CZ COLUMBIA RLA24 LITHONIA 2BLTBA4
L8	2X4 ARCHITECTURAL LED TROFFER. WHITE FLUSH ALUMINUM DOOR. 0-10V DIMMING. SUITABLE FOR DAMP LOCATION. A5.3	120/277 V	LED	7,000 LM	80 W	4000 K	RECESSED	SMOOTH FROSTED ACRYLIC LENS	METALUX 24CZ COLUMBIA RLA24 LITHONIA 2BLTBA4
L9	4" WIDE x 4" H EXTRUDED ALUMINUM LED, PROVIDE LENGTHS AS INDICATED ON DRAWINGS. PROVIDE SEAMLESS LENS, 0-10V DIMMING.	120/277 V	LED	3,500 LM	39 W	4000 K	RECESSED	FLUSH SATIN LENS	FOCAL POINT FSM4LS FINELITE HP4 MARK LIGHTING SLOT 4 A5.3
L10	4' LENSED LED STRIP LIGHT. 0-10V DIMMING, WHITE FINISH.	120/277 V	LED	3,000 LM	27 W	4000 K	CHAIN MOUNTED TO STRUCTURE	SEMI-FROSTED CURVED LENS	METALUX SNLED COLUMBIA MPS LITHONIA CLX
L11	4' LENSED LED STRIP LIGHT. 0-10V DIMMING, WHITE FINISH.	120/277 V	LED	3,000 LM	27 W	4000 K	SURFACE MOUNTED	SEMI-FROSTED CURVED LENS	METALUX SNLED COLUMBIA MPS LITHONIA CLX
L12	4' LENSED LED STRIP LIGHT. 0-10V DIMMING, WHITE FINISH.	120/277 V	LED	5,000 LM	45 W	4000 K	CHAIN MOUNTED TO STRUCTURE	SEMI-FROSTED CURVED LENS	METALUX SNLED COLUMBIA MPS LITHONIA CLX
L13	4' LENSED LED STRIP LIGHT. 0-10V DIMMING, WHITE FINISH.	120/277 V	LED	5,000 LM	45 W	4000 K	SURFACE MOUNTED	SEMI-FROSTED CURVED LENS	METALUX SNLED COLUMBIA MPS LITHONIA CLX
L14	4' LED VAPORTIGHT FIXTURE. FIBERGLASS HOUSING. STAINLESS STEEL LATCHES. UL LISTED WET LOCATION.	120/277 V	LED	3,000 LM	24 W	4000 K	SURFACE MOUNTED	IMPACT RESISTANT, GASKETED PRISMATIC LENS	METALUX 4VT2 COLUMBIA LXEM4 LITHONIA CSVT
L15	2X4 LED FLAT PANEL. 0-10V DIMMING.	120/277 V	LED	4,000 LM	35 W	4000 K	RECESSED	WHITE FROST ACRYLIC	METALUX 24FP COLUMBIA CFP24 LITHONIA CPX-2X4 A5.3
L15-D	2X4 LED FLAT PANEL. 0-10V DIMMING. PROVIDE WITH DRYWALL KIT.	120/277 V	LED	4,000 LM	35 W	4000 K	RECESSED	WHITE FROST ACRYLIC	METALUX 24FP COLUMBIA CFP24 LITHONIA CPX-2X4 A5.3
L16	2X4 LED FLAT PANEL. 0-10V DIMMING.	120/277 V	LED	7,400 LM	59 W	4000 K	RECESSED	WHITE FROST ACRYLIC	METALUX 24FP COLUMBIA CFP24 LITHONIA CPX-2X4 A5.3
L17	2' LED VAPORTIGHT FIXTURE IN ELEVATOR SHAFTS. FIBERGLASS HOUSING. STAINLESS STEEL LATCHES. UL LISTED WET LOCATION.	120/277 V	LED	3,000 LM	26 W	4000 K	SURFACE/WALL	IMPACT RESISTANT, GASKETED PRISMATIC LENS	METALUX 2VT2 COLUMBIA LXEM2 LITHONIA DWM2
L18	4" X 4' WALL MOUNTED, LINEAR, DIRECT LED FIXTURE. FLUSH LENS. WHITE FINISH. 0-10V DIMMING. U.L. LISTED WET LOCATION.	120/277 V	LED	2,000 LM	22 W	4000 K	WALL-MOUNTED	TEMPERED CLEAR GLASS	LUMENWERX VIAWETW OCL UA1 SELUX L125
L19	TRACK LIGHTING. PROVIDE ONE LED HEAD PER 3'-0", 1500LM, MEDIUM DISTRIBUTION, 3000K, 90 CRI, SINGLE CIRCUIT WHITE TRACK, REFER TO LIGHTING PLANS FOR LENGTH.	120/277 V	LED	100 LM/FT	45 W	3000K	SURFACE		CONTECH CTL905 SERIES BRUCK LIGHTING LUMENTURE T65 A5.3
L20	2X4 LED BEHAVIORAL HEALTH FIXTURE, 0-10V DIMMING	120/277 V	LED	5,369 LM	49 W	3500 K	RECESSED	IMPACT RESISTANT POLYCARBONATE LENS	PACO LIGHTING MRGA1 NEWSTAR AURAMED HIGH ABUSE KENALL MEDMASTER MMAC24
L21	15" X 18" LED HIGHBAY. WHITE ALUMINUM HOUSING. WIDE DISTRIBUTION. 0-10V DIMMING.	120/277 V	LED	24,000 LM	215 W	4000 K	CABLE MOUNTED WITH SEPARATE SAFETY CABLE	HIGH IMPACT POLYCARBONATE LENS	METALUX VHB COLUMBIA PEL2 LITHONIA CHPB
L23	6" ROUND LED CYLINDER. DIE-CAST ALUMINUM HOUSING.	120/277 V	LED	2,566 LM	29 W	3000 K	SURFACE MOUNTED	IMPACT RESISTANT CLEAR LENS	LIGMAN LIGHTING UTA-80552-29W-AS-W40 FC LIGHTING FCC8GA LUMINIS SY810
L24	6" LED PENDANT STEM CYLINDER. BLACK FINISH. 0-10V DIMMING.	120/277 V	LED	5,500 LM	53 W	4000 K	RIGID STEM	SEMI-SPECULAR CLEAR	PORTFOLIO LER6B PRESCOLITE LITEISTRY 6" ROUND CYLINDER LITHONIA LDN6CYL A5.3
L25	2'X2" WIDE LED WALL-MOUNTED FIXTURE. DIRECT/INDIRECT DISTRIBUTION. WHITE EXTRUDED ALUMINUM HOUSING. WALL BRACKET. 0-10V DIMMING.	120/277 V	LED	375 LM/FT UP 375 LM/FT DN	15 W	4000 K	WALL-MOUNTED	FLUSH FROSTED ACRYLIC LENS (TOP & BOTTOM)	FOCAL POINT FSM1BW FINELITE HP-2 WM ID MARK LIGHTING SLOT 2 A5.3
L26	2X4 LED INDOOR SPORTS TROFFER	120/277 V	LED	31,000 LM	279 W	4000 K	RECESSED		KURTZON IS-R RCA PHL A5.3
L27	LED RETROFIT POOL HID TRUSS SYSTEM TO LED, 2 LAMPS, 0-10V DIMMING (ALTERNATE BID) COORDINATE REQUIREMENTS WITH MANUFACTURER	120/277 V	LED	38,174 LM	380 W	4000 K	SUSPENDED	ASYMMETRIC INDIRECT	INSIGHT LIGHTING D2 PROVIDE AN ALLOWANCE FOR MATERIAL ONLY, ADD LABOR REQUIRED FOR INSTALLATION.
L28	6" ROUND LED DOWNLIGHT. SELF-FLANGED TRIM. 0-10V DIMMING. U.L.LISTED WET LOCATION.	120/277V	LED	1,000 LM	12 W	4000 K	RECESSED	SEMI-SPECULAR CLEAR	PORTFOLIO LDSQ6B PRESCOLITE LF6SQSL LITHONIA LDN6 A5.3 PROVIDE AN ALLOWANCE FOR MATERIAL ONLY, ADD LABOR REQUIRED FOR INSTALLATION.
L29	6" ROUND LED RETROFIT DOWNLIGHT. SELF-FLANGED TRIM. 0-10V DIMMING.	120/277 V	LED	1,500 LM	16 W	4000 K	RECESSED IN DRYWALL	SEMI-SPECULAR CLEAR	PORTFOLIO LDRT6C PRESCOLITE LITEFRAME 2.0 6" ROUND LITHONIA LBR6 A5.3
L30	LED DARKROOM RED SAFELIGHT	120/277 V	LED	50 LM	4 W	RED LED	RECESSED IN GRID		KIRLIN LRR-08471-660 A5.3 KURTZON DKS KENALL CSEDI14-RED A5.3
L31	LED "IN USE" SIGN, DIE-CAST ALUMINUM HOUSING, BRUSED ALUMINUM, RED LETTERS, AC ONLY	120/277 V	LED	N/A	5 W	N/A	SURFACE WALL	N/A	SURE-LITES CX DUAL-LITE SE LITHONIA LE
L32	PERFORMANCE SPOT LIGHT, INTEGRATED POWER SUPPLY, HEAVY DUTY DIE-CAST ALUMINUM HOUSING	120/277 V	LED		15 W	4000 K	SURFACE	TEMPERED CLEAR GLASS	FC LIGHTING FCF1105 INSIGHT LIGHTING PROSPOT 6 ECOSENSE RISE F080 DUO A5.3
L33	SURFACE MOUNTED LED STAIRWELL LIGHT WITH INTEGRAL OCCUPANCY SENSOR SET TO 50% DURING ONOCCUPIED TIMES.	120/277 V	LED	4,000 LM	16 W	4000 K	SURFACE/WALL	SEMI-FROSTED LENS	METALUX SRL LED COLUMBIA ESCALATE LITHONIA WL4
L34	1X4 LED FLAT PANEL. 0-10V DIMMING.	120/277 V	LED	3,800 LM	36 W	4000 K	RECESSED	WHITE FROST ACRYLIC	METALUX 14FP COLUMBIA CFP14 LITHONIA CPX-1X4 A5.3
L35	2X4 LED FLAT PANEL. 0-10V DIMMING.	120/277 V	LED	5,500 LM	63 W	4000 K	RECESSED	WHITE FROST ACRYLIC	METALUX 24FP COLUMBIA CFP24 LITHONIA CPX-2X4 A5.3
L36	2X2 LED FLAT PANEL. 0-10V DIMMING.	120/277 V	LED	4,800 LM	45 W	4000 K	RECESSED	WHITE FROST ACRYLIC	METALUX 22FP COLUMBIA CFP22 LITHONIA CPX-2X2 A5.3
LD1	1.5" WIDE x 4" H DIRECT LINEAR LED PENDANT. PROVIDE LENGTHS AS INDICATED ON PLANS. COORDINATE EXACT CONFIGURATION WITH ARCHITECTURAL PLANS. COORDINATE FINISH WITH ARCHITECT	120/277 V	LED	1,100 LM	10 W	3000 K	PENDANT		LUXXBOX BLADE FLUXWERX LINE MARK LIGHTING SLOT 1 A5.3
LD2	DECORATIVE PENDANT FIXTURE, FINISH SELECTED BY ARCHITECT	120/277 V	LED		53 W	4000 K	RIGID STEM	SEMI-SPECULAR CLEAR	LIGHTART CONTOUR BEVEL BOCK LIGHTING JUG A5.3
LD3	4' LED COVE LIGHT, LOW PROFILE, STANDARD LIGHT OUTPUT	120/277 V	LED	1,000 LM	10 W	4000 K	SURFACE MOUNTED	FROSTED ACRYLIC	LUMENWERX ALCOVE LED FINELITE S11-LED-MP ECOSENSE TROV FLEX A5.3
LD4	LED DOWNLIGHT. EXTERIOR AT CANOPY	120/277 V	LED	1,500 LM	16 W	4000 K	RECESSED	SEMI-SPECULAR CLEAR	PORTFOLIO LD4B PRESCOLITE LF4SL LITHONIA LDN4 A5.3
LD5	OUTDOOR FLEXIBLE LED TAPE, FIELD CUTTABLE, STATIC WHITE/RGB, REFER TO LIGHTING PLANS FOR LENGTH.	120/277 V	LED	121 LM/FT	64 W	4000 K	SURFACE MOUNTED		BEULUX MADRID RGBW KLUS WP-K-1530-RGB+W-IP65-24V A5.3 HYDRALUX LD IP67
LD6	LED SCONCE, EXTERIOR AT CANOPY	120/277 V	LED		24 W	4000 K	SURFACE WALL	N/A	OCL NEWPORT LUMINIARE LED VISION VPF8 A5.3
LD7	LED LATTICE GRID SYSTEM FOR LIGHT BOX. COORDINATE SYSTEM IN PHASE 2. PROVIDE ALL LED'S, SUPPORTING HARDWARE, ENGINEERING FOR LAYOUT, CONTRACTOR INSTRUCTIONS, ETC. FOR A COMPLETE OPERATIONAL SYSTEM.	120/277 V	LED	3,500 LM	40 W	4000 K	SUSPENDED/ATTACHED TO STRUCTURE	N/A	COOPER LIGHTING COVID GRAZE INSIGHT LIGHTING PILOT EXTERIOR (PEX) A5.3 ECOSENSE TROV FLEX
LD8	INTERTWINED LINEARS DECORATIVE FIXTURE, CONFIGURATION AND FINISH DETERMINED BY ARCHITECT, 0-10V DIMMING	120/277 V	LED		99 W	3000 K			HALO LINEAL VIBIA SONNEMAN LABYRINTH A5.3 EUREKA EXPO
LD9	4' LINEAR LED PENDANT. DIMMABLE. 90CRI	120/277 V	LED	1,300 LM	32 W	3000 K	PENDANT		TECH LIGHTING DYNA LINEAR SUSPENSION KLUS GLAZA-LL WITH K-HE-1920-HD-24V A5.3 ECOSENSE HELIUM 1
LD10	6" LED PENDANT STEM PUCK. BLACK FINISH. 0-10V DIMMING.	120/277 V	LED	300 LM	4 W	3000 K	RIGID STEM		TECH LIGHTING GABLE PORT ALONE PENDANT DMF DCC SMALL A5.3 EUREKA TUMBLER A5.3
LD11	10" ROUND LED RETROFIT DOWNLIGHT, CLEAR DIFFUSER, WHITE FLANGE, WET LOCATION	120/277V	LED	2,000 LM	12 W	4000 K	RECESSED	SEMI-SPECULAR CLEAR	ATLANTIC LIGHTING LED10-R GREEN CREATIVE SPECFIT 9.5 A5.3 INDY LIGHTING LRT10 SERIES
S5	LED SITE FIXTURE. SINGLE-PIECE ALUMINUM HOUSING. ARM MOUNT. U.L. LISTED WET LOCATION. DARK BRONZE FINISH. ROUND, STRAIGHT, STEEL, POLE DESIGNED TO SUPPORT FIXTURE(S) IN 100 MPH WINDS WITH 1.3 GUST FACTOR. PRIMARY FUSES. FLAT LENS. SURGE PROTECTION. (1) HEAD.	277 V	LED	35,800 LM PER FIXTURE	270 W	4000 K	30' POLE, BASE BY DIVISION 26 CONTRACTOR	TYPE III DISTRIBUTION; ZERO UPLIGHT	McGRAW-EDISON GLEON LED BEACON VPS LITHONIA RSX3 A5.3
S10	LED SITE FIXTURE. SINGLE-PIECE ALUMINUM HOUSING. ARM MOUNT. U.L. LISTED WET LOCATION. DARK BRONZE FINISH. ROUND, STRAIGHT, STEEL, POLE DESIGNED TO SUPPORT FIXTURE(S) IN 100 MPH WINDS WITH 1.3 GUST FACTOR. PRIMARY FUSES. FLAT LENS. SURGE PROTECTION. (2) HEADS, 180° APART.	277 V	LED	35,800 LM PER FIXTURE	540 W	4000 K	30' POLE, BASE BY DIVISION 26 CONTRACTOR	TYPE IV DISTRIBUTION; ZERO UPLIGHT	McGRAW-EDISON GLEON LED BEACON VPS LITHONIA RSX3 A5.3
S11	LED SITE FIXTURE. SINGLE-PIECE ALUMINUM HOUSING. ARM MOUNT. U.L. LISTED WET LOCATION. DARK BRONZE FINISH. ROUND, STRAIGHT, STEEL, POLE DESIGNED TO SUPPORT FIXTURE(S) IN 100 MPH WINDS WITH 1.3 GUST FACTOR. PRIMARY FUSES. FLAT LENS. SURGE PROTECTION. (4) HEADS, 90° APART.	277 V	LED	35,800 LM PER FIXTURE	1070 W	4000 K	30' POLE, BASE BY DIVISION 26 CONTRACTOR	TYPE IV DISTRIBUTION; ZERO UPLIGHT	McGRAW-EDISON GLEON LED BEACON VPS LITHONIA RSX3 A5.3
X1	LED EXIT LIGHT, MATTE BLACK DIE-CAST ALUMINUM HOUSING, BRUSHED ALUM. SINGLE FACE. STENCIL FACE, RED LETTERS. AC ONLY	120/277 V	LED	N/A	5 W	N/A	UNIVERSAL	N/A	SURE-LITES CX DUAL-LITE SE LITHONIA LE
X2	LED EXIT LIGHT, MATTE BLACK DIE-CAST ALUMINUM HOUSING, BRUSHED ALUM. DUAL FACE. STENCIL FACE, RED LETTERS. AC ONLY.	120/277 V	LED	N/A	5 W	N/A	UNIVERSAL	N/A	SURE-LITES CX DUAL-LITE SE LITHONIA LE
X3	VANDAL PROOF LED EXIT LIGHT, DIE-CAST ALUMINUM HOUSING, BLACK FINISH. SINGLE FACE. STENCIL FACE, RED LETTERS. AC ONLY	120/277 V	LED	N/A	5 W	N/A	UNIVERSAL	VANDAL-RESISTANT POLYCARBONATE SHIELD WITH TAMPERPROOF SCREWS	SURE-LITES UX DUAL-LITE SEWL LITHONIA LV

GENERAL LIGHT FIXTURE SCHEDULE NOTES

#	NOTES
A	PROVIDE 10% SPARE DRIVERS FOR EACH FIXTURE TO BE USED AS OWNER ATTIC STOCK.
B	PROVIDE 3500 DEGREE K COLOR TEMPERATURE FOR SPECIAL NEEDS AREAS. TOWNSHIP STANDARD KELVIN TEMPERATURE FOR INTERIOR AND EXTERIOR FIXTURES IS 4000K.
C	COORDINATE LIGHT FIXTURE LAYOUTS ARCHITECTURAL REFLECTED CEILING PLAN, DIFFUSERS, DUCTWORK, PIPING AND SPRINKLER HEADS.
D	COORDINATE MOUNTING REQUIREMENTS, CEILING TYPES, AND FINAL LOCATIONS. PROVIDE APPROPRIATE MOUNTING TRIM REQUIRED FOR CEILING TYPE.
E	PROVIDE FACTORY INSTALLED DISCONNECTS FOR ALL LINEAR FIXTURES.
F	PROVIDE VIBRATION DAMPERS FOR ALL ALUMINUM & STEEL POLES 20'-0" AND ABOVE.
G	PROVIDE SELF-DIAGNOSTICS AND SELF-TESTING FOR ALL LIFE SAFETY FIXTURES (EXIT FIXTURES, WALL PACKS, INVERTERS BALLASTS, ETC.)

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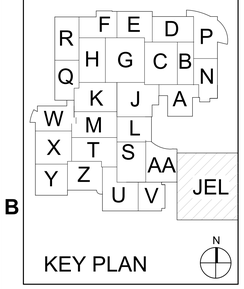
Project No. 2019-067.NCH
Project Date 03.03.2023
Bid Set 03
Produced JAW

DAVID SHUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

LIGHT FIXTURE SCHEDULE

E-623.3

E-623.3_LIGHT FIXTURE SCHEDULE
2019-067.NCH M.S.D. of Washington Township_North Central High School Renovation_10217.RVT
Plotted: 4/20/2023 7:46:07 AM by JAW - North Central High School/2019-067.NCH_Bldg/2019_R_2020_Create.rvt
Autodesk Revit 2021 (Build: 20200914_1515(x64))

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 1L18 **VOLTS:** 208Y/120 V **MAINS RATING:** 400 A
LOCATION: ELEC D118L **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD6 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
G	1	Receptacle - SERVING K223		20 A	1	5.76	1.70					2	25 A		Receptacle - SERVING K223	2	
G	3	Refrigerated Cab - SERVING K223		20 A	1			0.46	1.70			--	--	--	--	4	--
G	5	Receptacle - SERVING K223		20 A	1					3.84	1.70	2	25 A		Receptacle - SERVING K223	6	
G	7	Breath Guard - SERVING K223		25 A	1	1.92	1.70					--	--	--	--	8	--
G	9	Serving Counter - SERVING K223		25 A	1			1.92	0.75			2	20 A		Heated Cab - SERVING K223	10	
G	11	Frost Top - SERVING K223		20 A	1					0.46	0.75	--	--	--	--	12	--
G	13	Heated Shelf - SERVING K223		20 A	1	1.00	1.56					2	20 A		Pellet Heater - SERVING K223	14	
G	15	Breath Guard - SERVING K223		20 A	1			0.72	1.56			--	--	--	--	16	--
G	17	Food Counter - SERVING K223		25 A	1					1.92	1.56	2	20 A		Pellet Heater - SERVING K223	18	
G	19	Breath Guard - SERVING K223		20 A	1	0.72	1.56					--	--	--	--	20	--
G	21	Cold Well - SERVING K223		20 A	1			0.76	1.25			2	20 A		Hot/Cold Well - SERVING K223	22	
G	23	Dry Goods - SERVING K223		25 A	1					1.92	1.25	--	--	--	--	24	--
G	25	Merchandiser Freezer - SERVIN...		20 A	1	0.86	1.20					2	20 A		Refrig Merchandiser - SERVING K223	26	
G	27	Dry Goods - SERVING K223		25 A	1			1.92	1.20			--	--	--	--	28	--
G	29	Merchandiser Freezer - SERVIN...		20 A	1					0.86	1.20	2	20 A		Refrig Merchandiser - SERVING K223	30	
G	31	Food Counter - SERVING K223		25 A	1	1.92	1.20					--	--	--	--	32	--
G	33	Breath Guard - SERVING K223		20 A	1			0.72	1.92			1	25 A		Food Counter - SERVING K223	34	G
G	35	Cold Well - SERVING K223		20 A	1					0.76	1.92	1	25 A		Breath Guard - SERVING K223	36	G
G	37	Breath Guard - SERVING K223		20 A	1	0.72	1.00					1	20 A		Heated Shelf - SERVING K223	38	G
G	39	Frost Top - SERVING K223		20 A	1			0.46	0.72			1	20 A		Breath Guard - SERVING K223	40	G
G	41	Food Counter - SERVING K223		25 A	1					1.92	2.47	2	30 A		Hot / Cold Well - SERVING K223	42	G
G	43	Breath Guard - SERVING K223		20 A	1	0.72	2.47					--	--	--	--	44	--
G	45	Breath Guard - SERVING K223		25 A	1			1.92	2.47			2	30 A		Hot / Cold Well - SERVING K223	46	
G	47	Heated Shelf - SERVING K223		20 A	1					1.00	2.47	--	--	--	--	48	--
G	49	Breath Guard - SERVING K223		20 A	1	0.72	1.92					1	25 A		Food Counter - SERVING K223	50	G
G	51	Frost Top - SERVING K223		20 A	1			0.46	0.72			1	20 A		Breath Guard - SERVING K223	52	G
G	53	Dry Goods - SERVING K223		25 A	1					1.92	0.76	1	20 A		Cold Well - SERVING K223	54	G
G	55	Merchandiser Freezer - SERVIN...		20 A	1	0.86	1.20					2	20 A		Refrig Merchandiser - SERVING K223	56	
G	57	Dry Goods - SERVING K223		25 A	1			1.92	1.20			--	--	--	--	58	--
G	59	Merchandiser Freezer - SERVIN...		20 A	1					0.86	1.20	2	20 A		Refrig Merchandiser - SERVING K223	60	
G	61	Food Counter - SERVING K223		25 A	1	1.92	1.20					--	--	--	--	62	--
G	63	Breath Guard - SERVING K223		20 A	1			0.72	1.92			1	25 A		Food Counter - SERVING K223	64	G
G	65	Cold Well - SERVING K223		20 A	1					0.76	0.72	1	20 A		Breath Guard - SERVING K223	66	G
--	67	SPARE		20 A	1	0.00	0.76					1	20 A		Cold Well - SERVING K223	68	G
--	69	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	70	--
--	71	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	72	--
--	73	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	74	--
--	75	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	76	--
--	77	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	78	--
--	79	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	80	--
--	81	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	82	--
--	83	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	84	--

		A	B	C
THIS SECTION TOTAL:	TOTAL LOAD:	34.56 kVA	27.36 kVA	32.19 kVA
	TOTAL AMPS:	294 A	228 A	274 A
TOTAL LOAD CONNECTED TO FEED THROUGH LUGS:	TOTAL LOAD:	22.30 kVA	16.42 kVA	18.72 kVA
	TOTAL AMPS:	189 A	137 A	159 A
GRAND TOTAL LOADS:	TOTAL LOAD:	56.86 kVA	43.78 kVA	50.90 kVA
	TOTAL AMPS:	483 A	365 A	433 A

TOTAL CONNECTED LOAD:	151.55 kVA	95.57 kVA	TOTAL DEMAND LOAD:
TOTAL CONNECTED AMPS:	483 A	265 A	TOTAL DEMAND AMPS:

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
		Receptacle - General	52896 VA	59.45%	31448 VA
C	CONTACTOR CONTROLLED	Kitchen Equipment	98652 VA	65.00%	64124 VA
G	GFCI PROTECTED				
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
Yes	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 400A FUSES

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 1L18 **VOLTS:** 208Y/120 V **MAINS RATING:** 400 A
LOCATION: ELEC D118L **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: 1L18 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
G	85	Heated Shelf - SERVING K223		20 A	1	1.00	0.72					1	20 A		Breath Guard - SERVING K223	86	G
G	87	Heated Shelf - SERVING K223		20 A	1			1.00	0.46			1	20 A		Frost Top - SERVING K223	88	G
G	89	Breath Guard - SERVING K223		25 A	1					1.92	0.72	1	20 A		Breath Guard - SERVING K223	90	G
G	91	Sandwich Counter - SERVING...		25 A	1	1.92	0.46					1	20 A		Frost Top - SERVING K223	92	G
G	93	Sandwich Counter - SERVING...		25 A	1			1.92	1.92			1	25 A		Breath Guard - SERVING K223	94	G
G	95	Heated Shelf - SERVING K223		20 A	1					1.00	1.92	1	25 A		Dry Goods - SERVING K223	96	G
G	97	Heated Shelf - SERVING K223		20 A	1	1.00	1.92					1	20 A		Dry Goods - SERVING K223	98	G
G	99	Merchandiser Freezer - SERVIN...		20 A	1			0.86	0.86			1	20 A		Merchandiser Freezer - SERVING...	100	G
	101	Refrig Merchandiser - SERVING...		20 A	2					1.20	1.20	2	20 A		Refrig Merchandiser - SERVING K223	102	
--	103	--	--	--	--	1.20	1.20					--	--	--	--	104	--
G	105	Frost Top - SERVING K223		20 A	1			0.46	0.72			1	20 A		Breath Guard - SERVING K223	106	G
G	107	Breath Guard - SERVING K223		25 A	1					1.92	1.22	1	20 A		Heated Shelf - SERVING K223	108	G
	109	Pizza Oven - SERVING K223		50 A	2	4.16	1.22					1	20 A		Heated Shelf - SERVING K223	110	G
--	111	--	--	--	--			4.16	1.07			1	20 A		Refrigerator - SERVING K223	112	G
	113	Pizza Oven - SERVING K223		50 A	2					4.16	0.47	1	20 A		Pizza Prep Table - SERVING K223	114	G
--	115	--	--	--	--	4.16	0.75					1	20 A		Overhead Door - SERVING D118K	116	
	117	Heated Cabinet - SERVING K223		20 A	2			0.75	0.75			1	20 A		Overhead Door - SERVING D118K	118	
--	119	--	--	--	--					0.75	0.75	1	20 A		Overhead Door - SERVING D118K	120	
G	121	Receptacle - General SERVING...		20 A	1	0.36	0.75					1	20 A		Overhead Door - SERVING D118K	122	
--	123	SPARE		20 A	1			0.00	0.75			1	20 A		Overhead Door - SERVING D118K	124	
--	125	SPARE		20 A	1					0.00	0.75	1	20 A		Overhead Door - SERVING D118K	126	
--	127	SPARE		20 A	1	0.00	0.75					1	20 A		Overhead Door - SERVING D118K	128	
--	129	SPARE		20 A	1			0.00	0.75			1	20 A		Overhead Door - SERVING D118K	130	
--	131	SPARE		20 A	1					0.00	0.75	1	20 A		Overhead Door - SERVING D118K	132	
--	133	SPARE		20 A	1	0.00	0.75					1	20 A		Overhead Door - SERVING D118K	134	
--	135	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	136	--
--	137	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	138	--
--	139	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	140	--
--	141	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	142	--
--	143	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	144	--
--	145	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	146	--
--	147	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	148	--
--	149	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	150	--
--	151	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	152	--
--	153	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	154	--
--	155	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	156	--
--	157	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	158	--
--	159	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	160	--
--	161	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	162	--
--	163	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	164	--
--	165	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	166	--
--	167	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	168	--

	A	B	C
TOTAL LOAD:	22.30 kVA	16.42 kVA	18.72 kVA
TOTAL AMPS:	189 A	137 A	159 A

TOTAL CONNECTED LOAD:	57.44 kVA	38.44 kVA	TOTAL DEMAND LOAD:
TOTAL CONNECTED AMPS:	189 A	107 A	TOTAL DEMAND AMPS:

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
		Receptacle - General	26000 VA	69.23%	18000 VA
C	CONTACTOR CONTROLLED	Kitchen Equipment	31444 VA	65.00%	20439 VA
G	GFCI PROTECTED				
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
Yes	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES:

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 1L19 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: ELEC D118L **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD6 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
G	1	Receptacle - General Room K21...		20 A	1	0.54	1.08					1	20 A		Receptacle - General Room K217,...	2	G
G	3	Milk Cooler - KITCHEN K218		20 A	1			0.32	2.64			1	30 A		Island Worktable - KITCHEN K218	4	G
G	5	Refrigerated Cab - KITCHEN K218		20 A	1					0.46	0.75	2	20 A		Heated Cab - KITCHEN K218	6	
	7	Garbage Disposal - KITCHEN...		20 A	3	0.79	0.75					--	--	--	--	8	--
--	9	--	--	--	--			0.79	0.46			1	20 A		Refrigerated Cab - KITCHEN K218	10	G
--	11	--	--	--	--					0.79	0.46	1	20 A		Refrigerated Cab - KITCHEN K218	12	G
	13	Heated Cab - KITCHEN K218		20 A	2	0.75	0.75					2	20 A		Heated Cab - KITCHEN K218	14	
--	15	--	--	--	--			0.75	0.75			--	--	--	--	16	--
G	17	Refrigerated Cab - KITCHEN K218		20 A	1					0.46	0.32	1	20 A		Milk Cooler - KITCHEN K218	18	G
	19	Heated Cab - KITCHEN K218		20 A	2	0.75	0.54					1	20 A		Receptacle - KITCHEN K218	20	G
--	21	--	--	--	--			0.75	0.75			2	20 A		Heated Cab - KITCHEN K218	22	
G	23	Refrigerated Cab - KITCHEN K218		20 A	1					0.46	0.75	--	--	--	--	24	--
G	25	Island Worktable - KITCHEN K218		30 A	1	2.28	0.78					1	20 A		Prep Table - KITCHEN K218	26	G
G	27	Oven - KITCHEN K218		20 A	1			0.92								28	
G	29	Oven - KITCHEN K218		20 A	1					0.92	2.64	1	30 A		Island Worktable - KITCHEN K218	30	G
G	31	Bakery Oven - KITCHEN K218		20 A	1	1.39										32	
G	33	Combi-Oven - KITCHEN K218		20 A	1			1.80	1.70			2	30 A		Receptacle - KITCHEN K218	34	
G	35	Combi-Oven - KITCHEN K218		20 A	1					1.80	1.70	--	--	--	--	36	--
	37	Hot Water Disp - KITCHEN K218		30 A	2	2.50	1.70					2	30 A		Receptacle - KITCHEN K218	38	
--	39	--	--	--	--			2.50	1.70			--	--	--	--	40	--
	41	FC-C1		20 A	2					1.50	1.70	2	30 A		Receptacle - KITCHEN K218	42	
--	43	--	--	--	--	1.50	1.70					--	--	--	--	44	--
	45	Receptacle - TEACHER DINING...		20 A	1			0.54	0.18			1	20 A		Receptacle - General	46	
G	47	Receptacle - KITCHEN K218		20 A	1					0.54	0.18	1	20 A		Receptacle - General	48	
	49	Receptacle - OFFICE D150B		20 A	1	0.90	1.26					1	20 A		Receptacle - General	50	
	51	Receptacle - K223,		20 A	1			1.04	0.18			1	20 A		Receptacle - General	52	
	53	Tilt Kettle		30 A	3					3.60	0.18	1	20 A		Receptacle - General	54	
--	55	--	--	--	--	3.60	0.60					1	20 A		Mechanical - Motor SET...	56	
--	57	--	--	--	--			3.60	0.90			1	20 A		Receptacle - OFFICE D150A	58	
G	59	Ice Maker - TEACHER DINING...		20 A	1					1.20	0.18	1	20 A		EWC - CORRIDOR D	60	G
	61	Receptacle - General TEACHER...		20 A	1	0.54	1.00					1	20 A		Receptacle - General CORRIDOR D...	62	
	63	Receptacle - General TEACHER...		20 A	1			0.18	0.00			1	20 A		SPARE	64	--
	65	Receptacle - General TEACHER...		20 A	1					0.18	0.00	1	20 A		SPARE	66	--
	67	Receptacle - General TEACHER...		20 A	1	0.18	0.00					1	20 A		SPARE	68	--
--	69	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	70	--
--	71	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	72	--
--	73	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	74	--
--	75	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	76	--
--	77	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	78	--
--	79	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	80	--
--	81	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	82	--
--	83	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	84	--

	A	B	C
TOTAL LOAD:	25.88 kVA	22.46 kVA	20.76 kVA
TOTAL AMPS:	218 A	189 A	173 A

TOTAL CONNECTED LOAD:	69.10 kVA	45.26 kVA	TOTAL DEMAND LOAD:
TOTAL CONNECTED AMPS:	218 A	126 A	TOTAL DEMAND AMPS:

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
		Receptacle - General	32452 VA	65.41%	21226 VA
C	CONTACTOR CONTROLLED	Kitchen Equipment	36050 VA	65.00%	23432 VA
G	GFCI PROTECTED	Mechanical - Motor	600 VA	100.00%	600 VA
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 200A FUSES

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 1L20 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: KITCHEN D118 **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD6 **AIC RATING:** 22,000A

A5.3

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
G	1	Bakery Oven - KITCHEN K218		20 A	1	1.39	0.75					2	20 A		Heated Cab - KITCHEN K218	2	
G	3	Combi-Oven - KITCHEN K218		20 A	1			1.80	0.75			--	--	--	--	4	--
G	5	Hand Dryer - WOMENS RR D116		20 A	1					1.20	0.46	1	20 A		Refrigerated Cab - KITCHEN K218	6	G
G	7	Refrigerated Cab - KITCHEN K218		20 A	1	0.46	0.75					2	20 A		Heated Cab - KITCHEN K218	8	
G	9	Milk Cooler - KITCHEN K218		20 A	1			0.32	0.75			--	--	--	--	10	--
G	11	Kitchen Equipment...		20 A	1					0.00	1.26	1	20 A		Receptacle - RRs K218C, K224, D153	12	G
G	13	Receptacle - KITCHEN K218		20 A	1	3.84	1.20					1	20 A		Hand Dryer - RR K218C	14	G
G	15	Receptacle - KITCHEN K218		20 A	1			0.36	1.20			1	20 A		Hand Dryer - RR K224	16	G
G	17	Island Worktable - KITCHEN D118		20 A	1					2.46	1.20	1	20 A		Hand Dryer - WOMENS RR D153	18	G
	19	Kitchen Equipment KITCHEN...		20 A	3	3.60	2.50					2	30 A		Hot Water DIsp - KITCHEN D118	20	
--	21	--	--	--	--			3.60	2.50			--	--	--	--	22	--
--	23	--	--	--	--					3.60	0.36	1	20 A		Receptacle - D118H	24	G
	25	FC-C2		20 A	2	1.50	0.00					1	20 A		SPARE	26	--
--	27	--	--	--	--			1.50	0.00			1	20 A		SPARE	28	--
--	29	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	30	--
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	38	--
--	39	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	40	--
--	41	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	42	--

	A	B	C
TOTAL LOAD:	15.98 kVA	12.78 kVA	10.54 kVA
TOTAL AMPS:	136 A	109 A	88 A

TOTAL CONNECTED LOAD:	39.30 kVA	30.72 kVA	TOTAL DEMAND LOAD:
TOTAL CONNECTED AMPS:	136 A	85 A	TOTAL DEMAND AMPS:

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
		Receptacle - General	9252 VA	100.00%	9252 VA
C	CONTACTOR CONTROLLED	Kitchen Equipment	24528 VA	65.00%	15943 VA
G	GFCI PROTECTED	Power - Continuous	5520 VA	100.00%	5520 VA
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 200A FUSES

EXISTING BRANCH PANELBOARD SCHEDULE

DESIGNATION: 1L24 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: STOR L106B **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD3 **AIC RATING:**

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
	1	Receptacle - CURRICULUM L254		20 A	1	1.26	0.90					1	20 A		Receptacle - Space N580	2	
	3	Receptacle - TESTING L249		20 A	1			1.26	0.18			1	20 A		Receptacle - STOR L249B	4	
	5	Receptacle - TESTING L249		20 A	1					1.26	0.72	1	20 A		Receptacle - TESTING L249	6	
	7	Receptacle - CORRIDOR L-1...		20 A	1	1.26	0.54					1	20 A		Receptacle - MENS DRESSING L247	8	
	9	Receptacle - MENS DRESSING...		20 A	1			0.54	0.54			1	20 A		Receptacle - MENS DRESSING L247	10	
	11	Receptacle - MENS DRESSING...		20 A	1					0.54	0.54	1	20 A		Receptacle - MENS DRESSING L247	12	
	13	Receptacle - WOMENS...		20 A	1	0.54	0.54					1	20 A		Receptacle - WOMENS DRESSING...	14	
	15	Receptacle - WOMENS...		20 A	1			0.54	0.54			1	20 A		Receptacle - WOMENS DRESSING...	16	
	17	Receptacle - WOMENS...		20 A	1					0.54	1.20	1	20 A		Receptacle - MENS DRESSING L247	18	
	19	Receptacle - MENS DRESSING...		20 A	1	0.18	1.70					2	30 A	NEW	Receptacle - MENS DRESSING...	20	
	21	Receptacle - General		20 A	1			0.54	1.70			--	--	--	--	22	--
	23	Receptacle - General		20 A	1					0.72	0.00	1	20 A		SPARE	24	--
	25	Receptacle - General		20 A	1	0.18	1.56					1	20 A		Receptacle - STOR L106C	26	
--	27	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	28	--
--	29	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	30	--

		A	B	C
THIS SECTION TOTAL:	TOTAL LOAD:	8.66 kVA	5.84 kVA	5.52 kVA
	TOTAL AMPS:	73 A	49 A	46 A
TOTAL LOAD CONNECTED TO FEED THROUGH LUGS:	TOTAL LOAD:	0.00 kVA	0.00 kVA	0.00 kVA
	TOTAL AMPS:	0 A	0 A	0 A
GRAND TOTAL LOADS:	TOTAL LOAD:	8.66 kVA	5.84 kVA	5.52 kVA
	TOTAL AMPS:	73 A	49 A	46 A

TOTAL CONNECTED LOAD:	20.02 kVA	15.01 kVA	TOTAL DEMAND LOAD:
TOTAL CONNECTED AMPS:	73 A	42 A	TOTAL DEMAND AMPS:

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
		Receptacle - General	20020 VA	74.98%	15010 VA
C	CONTACTOR CONTROLLED				
G	GFCI PROTECTED				
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
Yes	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 150A FUSES

EXISTING BRANCH PANELBOARD SCHEDULE

DESIGNATION: 1L24 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: STOR L106B **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: 1L24 **AIC RATING:**

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	38	--
--	39	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	40	--
--	41	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	42	--
--	43	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	44	--
--	45	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	46	--
--	47	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	48	--
--	49	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	50	--
--	51	UNKNOWN		25 A	3			0.00	0.00			2	30 A		UNKNOWN	52	--
--	53	--	--	--	--					0.00	0.00	--	--	--	--	54	--
--	55	--	--	--	--	0.00	--					1	--		SPACE	56	--
--	57	SPACE		--	1			--	--			1	--		SPACE	58	--
--	59	SPACE		--	1					--	--	1	--		SPACE	60	--

	A	B	C
TOTAL LOAD:	0.00 kVA	0.00 kVA	0.00 kVA
TOTAL AMPS:	0 A	0 A	0 A

TOTAL CONNECTED LOAD:	0.00 kVA	0.00 kVA	TOTAL DEMAND LOAD:
TOTAL CONNECTED AMPS:	0 A	0 A	TOTAL DEMAND AMPS:

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED				
G	GFCI PROTECTED				
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES:

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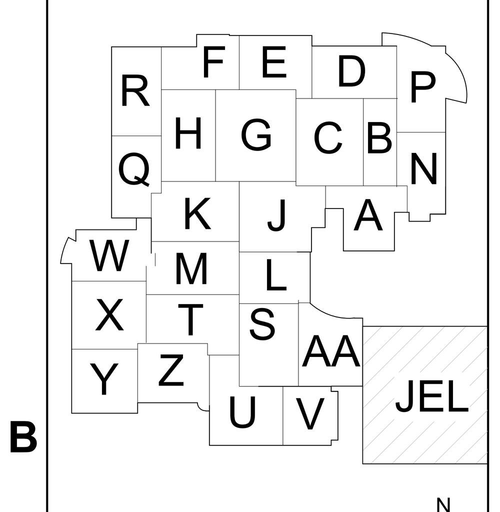
Project No. 2019-067.NCH
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Produced JAW

DAVID SHUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School Renovation - Additions Phase 3

PANEL SCHEDULES

E-635.3

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 2L10 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: ELEC A224L **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD5 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
	1	Receptacle - A515A, A515, A516		20 A	1	0.90	1.08					1	20 A		Receptacle - A515	2	
	3	Receptacle - A515A		20 A	1			0.72	0.72			1	20 A		Receptacle - A515	4	
	5	Receptacle - General LIBRARY-...		20 A	1					0.36	0.90	1	20 A		Receptacle - A514	6	
	7	Receptacle - A514		20 A	1	0.90	0.90					1	20 A		Receptacle - A514F, A514E	8	
	9	Receptacle - A514G, A514		20 A	1			0.72	0.72			1	20 A		Receptacle - A514H, A514-1	10	
	11	Overhead Door - A000		20 A	1					0.60	1.08	1	20 A		Receptacle - General	12	
	13	Overhead Door - A515		20 A	1	0.60	1.20					1	20 A		Receptacle - MDF A220	14	
	15	Phase Loss Monitoring		20 A	3			0.00	0.00			1	20 A		SPARE	16	--
--	17	--	--	--	--					0.00	0.00	1	20 A		SPARE	18	--
--	19	--	--	--	--	0.00	0.00					1	20 A		SPARE	20	--
--	21	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	22	--
--	23	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	24	--
--	25	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	26	--
--	27	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	28	--
--	29	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	30	--
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		25 A	3	0.00	0.00					1	20 A		SPARE	38	--
--	39	--	--	--	--			0.00	0.00			1	20 A		SPARE	40	--
--	41	--	--	--	--					0.00	0.00	1	20 A		SPARE	42	--
		TOTAL LOAD:				5.58 kVA		2.88 kVA		2.94 kVA							
		TOTAL AMPS:				47 A		24 A		25 A							

TOTAL CONNECTED LOAD: 11.40 kVA — 11.30 kVA **TOTAL DEMAND LOAD:**
TOTAL CONNECTED AMPS: 47 A — 31 A **TOTAL DEMAND AMPS:**

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED	Receptacle - General	10200 VA	99.02%	10100 VA
G	GFCI PROTECTED	Mechanical - Motor	1200 VA	100.00%	1200 VA
P	HANDLE LOCKING DEVICE	Power - Continuous	0 VA	0.00%	0 VA
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
Yes	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 150A FUSE

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 2L11 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: ELEC A224L **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD5 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
	1	Receptacle - A509		20 A	1	1.44	0.90					1	20 A		Receptacle - A509G	2	
	3	Receptacle - A509H		20 A	1			0.90	0.90			1	20 A		Receptacle - A509J	4	
	5	Receptacle - A509K		20 A	1					0.90	0.72	1	20 A		Receptacle - A509A	6	
	7	Copier - A509		20 A	1	1.20	1.08					1	20 A		Receptacle - A514-1, B000-5	8	
	9	Receptacle - A514C		20 A	1			1.26	0.90			1	20 A		Receptacle - A514D	10	
	11	Receptacle - A514B		20 A	1					1.08	1.08	1	20 A		Receptacle - A514A	12	
	13	Receptacle - A513		20 A	1	1.08	1.20					1	20 A		Copier - A514	14	
--	15	SPARE		20 A	1			0.00	0.36			1	20 A		Receptacle - General LIBRARY-1...	16	
--	17	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	18	--
--	19	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	20	--
--	21	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	22	--
--	23	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	24	--
--	25	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	26	--
--	27	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	28	--
--	29	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	30	--
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		20 A	3	0.00	0.00					1	20 A		SPARE	38	--
--	39	--	--	--	--			0.00	0.00			2	20 A		SPARE	40	--
--	41	--	--	--	--					0.00	0.00	--	--	--	--	42	--
		TOTAL LOAD:				6.90 kVA		4.32 kVA		3.78 kVA							
		TOTAL AMPS:				58 A		37 A		32 A							

TOTAL CONNECTED LOAD: 15.00 kVA — 12.50 kVA **TOTAL DEMAND LOAD:**
TOTAL CONNECTED AMPS: 58 A — 35 A **TOTAL DEMAND AMPS:**

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED	Receptacle - General	15000 VA	83.33%	12500 VA
G	GFCI PROTECTED				
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 150A FUSE

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 2L14 **VOLTS:** 208Y/120 V **MAINS RATING:** 100 A
LOCATION: SPED RESOURCE-1 B201 **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
G	1	Refrigerator - J632		20 A	1	1.20	0.72					1	20 A		Receptacle - J631	2	
G	3	Refrigerator - J632		20 A	1			1.20	0.72			1	20 A		Receptacle - J631	4	
G	5	Coffee Maker- J632		20 A	1					0.18	0.90	1	20 A		Receptacle - J632A	6	
	7	Receptacle - J632		20 A	1	2.40	1.08					1	20 A		Receptacle - J632B	8	
G	9	Microwave - J632		20 A	1			1.20	1.08			1	20 A		Receptacle - A527	10	
G	11	Microwave - J632		20 A	1					1.20	0.90	1	20 A		Receptacle - A527	12	
	13	Receptacle - J632		20 A	1	1.08	3.96					1	20 A		Receptacle - A527	14	
	15	Copier - J632		20 A	1			1.20	0.90			1	20 A		Receptacle - B541	16	
	17	Receptacle - J632		20 A	1					1.08	0.72	1	20 A		Receptacle - B541	18	
	19	Receptacle - B543		20 A	1	0.72	0.72					1	20 A		Receptacle - B541	20	
	21	Receptacle - B543		20 A	1			0.72	0.50			1	20 A		Electric Water Cooler	22	G
	23	Receptacle - B543		20 A	1					0.54	0.50	1	20 A		Electric Water Cooler	24	G
	25	Receptacle - A524		20 A	1	0.90	0.50					1	20 A		Electric Water Cooler	26	G
	27	Receptacle - A524		20 A	1			0.90	0.50			1	20 A		Electric Water Cooler	28	G
	29	Receptacle - A524		20 A	1					0.72	0.68	1	20 A		Projector and Screen - J202	30	
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	38	--
--	39	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	40	--
--	41	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	42	--
		TOTAL LOAD:				13.28 kVA		8.92 kVA		7.42 kVA							
		TOTAL AMPS:				113 A		76 A		62 A							

TOTAL CONNECTED LOAD: 29.62 kVA — 20.06 kVA **TOTAL DEMAND LOAD:**
TOTAL CONNECTED AMPS: 113 A — 56 A **TOTAL DEMAND AMPS:**

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED	Receptacle - General	29120 VA	67.17%	19560 VA
G	GFCI PROTECTED	Power - Continuous	500 VA	100.00%	500 VA
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: FED BY 100A FUSES

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 2L21 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: ELEC N681 **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD8 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
	1	Receptacle - N235	NEW	20 A	1	0.36	1.26					1	20 A	NEW	Receptacle - N680	2	G
	3	Hood - N235	NEW	20 A	1			0.00	0.54			1	20 A	NEW	Receptacle - N680	4	G
G	5	Ceiling Receptacle - N680	NEW	20 A	1					0.72	0.54	1	20 A	NEW	Receptacle - N680	6	G
G	7	Ceiling Receptacle - N680	NEW	20 A	1	0.36	0.72					1	20 A	NEW	Receptacle - N680	8	G
	9	Receptacle - N235	NEW	20 A	1			0.72	0.72			1	20 A		Receptacle - N680	10	
	11	Receptacle - N235A	NEW	20 A	1					0.72	1.20	1	20 A	NEW	Dishwasher - N680	12	G
	13	Receptacle - D563	NEW	20 A	1	0.54	1.20					1	20 A	NEW	Washer - D565	14	
	15	Receptacle - D564, D562	NEW	20 A	1			0.36	1.70			2	30 A	NEW	Dryer D565	16	
G	17	Hand Dryer - D562	NEW	20 A	1					1.20	1.70	--	--	--	--	18	--
G	19	Hand Dryer - D564	NEW	20 A	1	1.20	1.20					1	20 A	NEW	Ice Maker D565	20	G
G	21	Electric Water Cooler	NEW	20 A	1			0.50	1.20			1	20 A	NEW	Receptacle - IDF N228	22	
G	23	Electric Water Cooler	NEW	20 A	1					0.50	0.90	1	20 A	NEW	Receptacle - IDF N228	24	
	25	Vented Cabinets - D237	NEW	20 A	1	0.05	0.00					1	20 A		SPARE	26	--
	27	Receptacle - N680		20 A	1			0.72	0.00			1	20 A		SPARE	28	--
--	29	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	30	--
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	38	--
--	39	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	40	--
--	41	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	42	--
--	43	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	44	--
--	45	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	46	--
--	47	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	48	--
--	49	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	50	--
--	51	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	52	--
--	53	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	54	--
--	55	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	56	--
--	57	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	58	--
--	59	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	60	--
--	61	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	62	--
--	63	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	64	--
--	65	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	66	--
--	67	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	68	--
--	69	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	70	--
--	71	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	72	--
--	73	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	74	--
--	75	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	76	--
--	77	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	78	--
--	79	SPARE		20 A	3	0.00	0.00					1	20 A		SPARE	80	--
--	81	--	--	--	--			0.00	0.00			1	20 A		SPARE	82	--
--	83	--	--	--	--					0.00	0.00	1	20 A		SPARE	84	--
		TOTAL LOAD:				6.89 kVA		6.46 kVA		7.48 kVA							
		TOTAL AMPS:				58 A		54 A		63 A							

TOTAL CONNECTED LOAD: 20.83 kVA — 16.64 kVA **TOTAL DEMAND LOAD:**
TOTAL CONNECTED AMPS: 63 A — 46 A **TOTAL DEMAND AMPS:**

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED	Receptacle - General	18380 VA	77.20%	14190 VA
G	GFCI PROTECTED	Power - Continuous	2400 VA	100.00%	2400 VA
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
Yes	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 150A FUSE.

BRANCH PANELBOARD SCHEDULE

DESIGNATION: 2L19 **VOLTS:** 208Y/120 V **MAINS RATING:** 225 A
LOCATION: Room L646A **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: LD3 **AIC RATING:** 22,000A

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
	1	Receptacle - L654		20 A	1	0.90	0.54					1	20 A		Receptacle - L653	2	
	3	Receptacle - L653		20 A	1			0.72	0.54			1	20 A		Receptacle - L653	4	
	5	Receptacle - L651		20 A	1					1.44	0.54	1	20 A		Receptacle - L653	6	
	7	Receptacle - L650		20 A	1	1.62	0.54					1	20 A		Receptacle - M428	8	
	9	Receptacle - L650		20 A	1			0.72	0.18			1	20 A		Receptacle - M428	10	
	11	Receptacle - L650A		20 A	1					0.18	0.18	1	20 A		Receptacle - M428	12	
G	13	Electrica Water Cooler	NEW	20 A	1	0.50	0.18					1	20 A		Receptacle - M428	14	
G	15	Electrica Water Cooler	NEW	20 A	1			0.50	0.18			1	20 A		Receptacle - M428	16	
	17	Receptacle - General STOR-1...		20 A	1					0.90	0.18	1	20 A		Receptacle - M428	18	
--	19	SPARE		20 A	1	0.00	0.18					1	20 A		Receptacle - M428	20	
--	21	SPARE		20 A	1			0.00	0.18			1	20 A		Receptacle - M428	22	
--	23	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	24	--
--	25	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	26	--
--	27	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	28	--
--	29	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	30	--
--	31	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	32	--
--	33	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	34	--
--	35	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	36	--
--	37	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	38	--
--	39	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	40	--
--	41	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	42	--
--	43	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	44	--
--	45	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	46	--
--	47	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	48	--
--	49	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	50	--
--	51	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	52	--
--	53	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	54	--
--	55	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	56	--
--	57	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	58	--
--	59	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	60	--
--	61	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	62	--
--	63	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	64	--
--	65	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	66	--
--	67	SPARE		20 A	1	0.00	0.00					1	20 A		SPARE	68	--
--	69	SPARE		20 A	1			0.00	0.00			1	20 A		SPARE	70	--
--	71	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	72	--
--	73	SPARE		20 A	1	0.00	0.00					3	30 A		SPARE	74	--
--	75	SPARE		20 A	1			0.00	0.00			--	--	--	--	76	--
--	77	SPARE		20 A	1					0.00	0.00	--	--	--	--	78	--
--	79	SPARE		40 A	3	0.00	0.00					3	25 A		SPARE	80	--
--	81	--	--	--	--			0.00	0.00			--	--	--	--	82	--
--	83	--	--	--	--					0.00	0.00	--	--	--	--	84	--
		TOTAL LOAD:				4.46 kVA		3.02 kVA		3.42 kVA							
		TOTAL AMPS:				38 A		25 A		29 A							

TOTAL CONNECTED LOAD: 10.90 kVA — 10.45 kVA **TOTAL DEMAND LOAD:**
TOTAL CONNECTED AMPS: 38 A — 29 A **TOTAL DEMAND AMPS:**

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED	Receptacle - General	10900 VA	95.87%	10450 VA
G	GFCI PROTECTED	Power - Continuous	0 VA	0.00%	0 VA
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
Yes	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: 1. FED BY 150A FUSE

A5.3

EXISTING BRANCH PANELBOARD SCHEDULE

DESIGNATION: 2L12 **VOLTS:** 208Y/120 V **MAINS RATING:** 100 A
LOCATION: CUST A219 **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: SURFACE **WIRES:** 4
SUPPLY FROM: **AIC RATING:**

O	CKT NO.	CIRCUIT ROOM #	CIRCUIT TYPE	TRIP	P	A	A	B	B	C	C	P	TRIP	CIRCUIT TYPE	CIRCUIT ROOM #	CKT NO.	O
	1	Receptacle - B534		20 A	1	0.72	0.72					1	20 A		Receptacle - B533	2	
	3	Receptacle - B534		20 A	1			0.72	1.08			1	20 A		Receptacle - B533	4	
	5	Receptacle - B534		20 A	1					0.72	0.90	1	20 A		Receptacle - B533	6	
	7	Receptacle - B534		20 A	1	0.90	0.36					1	20 A		A/V Rack - B533	8	
	9	Ceiling Receptacle - B534		20 A	1			0.18	0.18			1	20 A		Ceiling Receptacle - B533	10	
	11	Ceiling Receptacle - B534		20 A	1					0.18	0.18	1	20 A		Ceiling Receptacle - B533	12	
	13	Ceiling Receptacle - B534		20 A	1	0.18	0.18					1	20 A		Ceiling Receptacle - B533	14	
	15	Ceiling Receptacle - B534		20 A	1			0.18	0.18			1	20 A		Ceiling Receptacle - B533	16	
	17	Receptacle - A513A		20 A	1					0.90	1.20	1	20 A		Copier - B532	18	
	19	Copier - A513A		20 A	1	1.20	1.08					1	20 A		Receptacle - B532, B000-5	20	
	21	Receptacle - A513A, B532		20 A	1			1.08	0.72			1	20 A		Receptacle - General INNOVATION...	22	
--	23	SPARE		20 A	1					0.00	0.00	1	20 A		SPARE	24	--
--	25	TVSS		30 A	3	0.00	0.00					1	20 A		SPARE	26	--
--	27	--	--	--	--			0.00	0.00			1	20 A		SPARE	28	--
--	29	--	--	--	--					0.00	0.00	1	20 A		SPARE	30	--
		TOTAL LOAD:				5.34 kVA		4.32 kVA		4.08 kVA							
		TOTAL AMPS:				45 A		36 A		34 A							

TOTAL CONNECTED LOAD: 13.74 kVA — 11.87 kVA **TOTAL DEMAND LOAD:**
TOTAL CONNECTED AMPS: 45 A — 33 A **TOTAL DEMAND AMPS:**

PANELBOARD & CIRCUIT BREAKER OPTIONS ("O" COLUMN / MCB OPTIONS ABBREVIATIONS)		LOAD CLASSIFICATION	CONNECTED LOAD (VA)	DEMAND FACTOR	ESTIMATE DEMAND (VA)
C	CONTACTOR CONTROLLED	Receptacle - General	13740 VA	86.39%	11870 VA
G	GFCI PROTECTED				
P	HANDLE LOCKING DEVICE				
S	SHUNT TRIP				
X	80% RATED MAIN CIRCUIT BREAKER WITH LSI				
Y	100% RATED MAIN CIRCUIT BREAKER WITH LSI				
Z	100% RATED MAIN CIRCUIT BREAKER WITH LSIG				
	FEED THROUGH LUGS (FTL)				
	SUB FEED LUGS (SFL)				

NOTES: FED BY 100A FUSE

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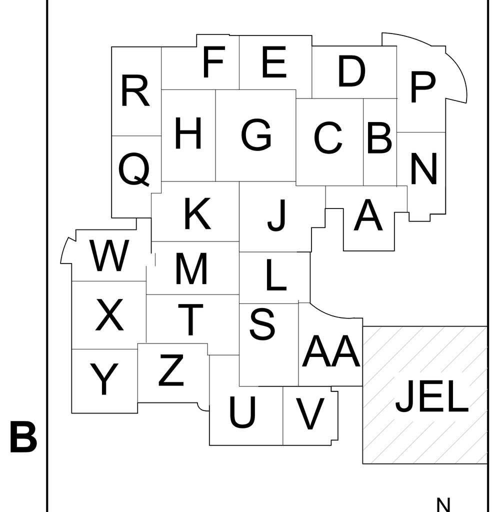
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Bid Set 03
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#	Revision	Date
A5.3	ADDENDUM 5.3	04.20.2023

1801 East 86th Street
Indianapolis, IN 46240



KEY PLAN

M.S.D. of Washington Township

North Central High School
Renovation - Additions
Phase 3

PANEL SCHEDULES

E-639.3