ADDENDUM NO. 7

June 9, 2022

Greenfield Central High School Auditorium Renovation and Addition – Bid Package No. 2
810 N. Broadway
Greenfield, IN 46140

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 May 20, 2022, by Lancer+Beebe LLC. 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 Page ADD 7-1 through Add 7-2 and attached Lancer+Beebe LLC. Addendum No. 7, dated June 9, 2022, consisting of 5 pages, RFI Log consisting of 4 pages, and Drawing Sheets: LS001, S101L, S201, S401, S410, S411, A402, A511, A515, A720, A721L, A722L, M101L, M102L, M201L, M301L, M401, M501, M502, M503, M602, M603, and M604.

A. SECTION 00 31 00 BID FORM

1. Reissued entire section to include Alternate No. 7 – Natatorium Lighting and Alternate No. 8 – Natatorium Painting.

B. SECTION 01 23 00 ALTERNATES

1. Reissued entire section to include Alternate No. 7 – Natatorium Lighting and Alternate No. 8 – Natatorium Painting.

C. **SPECIFICATION SECTION 01 12 00 MULTIPLE CONTRACT SUMMARY**

1. Paragraph 3.03A Bid Categories

D. Bid Category No. 1 – General Trades

1. Delete the following specification section:
   Section 11 61 13 Theatre Acoustic Shell (By Owner)

2. Add the following clarifications:
   38. Site work demolition will require multiple mobilizations; maintain as much of the existing parking lot pavement as possible during site utilities and Natatorium foundation installation as possible; remove the existing pavement areas after discussion with and at the specific direction of the Site Manager.
   39. Remove and replace existing ACT and drywall bulkheads as required for the installation of the new CHWS/CHWR and HWS/HWR piping as indicated on the Mechanical Drawings.

CONTRACTOR'S BID FOR PUBLIC WORKS FORM NO. 96

Format (Revised 2013)
(Amended for GCCSC)

Greenfield Central High School Auditorium Renovation and Addition – Bid Package No. 2

(Greenfield Central Community School Corporation)
(Hancock 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, ***Greenfield Central High School Auditorium Renovation and Addition- Bid Package No. 2***, in accordance with Plans and Specifications prepared by ***Lancer+Beebe, LLC, 220 N. College Avenue, Indianapolis, IN 46202***, 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. 1A – Ground Floor Epoxy Terrazzo

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

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

Alternate Bid No. 1B – Level 2 Epoxy Terrazzo

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

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

Alternate Bid No. 2A – AHU Manufacturer (Carrier)

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

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

Alternate Bid No. 2B – AHU Manufacturer (Daikin)

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

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

Alternate Bid No. 3A – Temperature Control Manufacturer (Alerton)

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

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

Alternate Bid No. 3B – Temperature Control Manufacturer (ALC)

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

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

Alternate Bid No. 4 – AHU-1 Heat Pipe

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

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

Alternate Bid No. 5 – Theatre Rigging

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

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

Alternate Bid No. 6 – SR1 Linear Fixtures

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

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

Alternate Bid No. 7 – Natatorium Light Fixtures

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

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

Alternate Bid No. 8 – Natatorium Painting

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

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 PURPOSE

A. The Bids for the Alternates described herein are required in order for the Owner to obtain information necessary for the proper consideration of the Project in its entirety.

1.03 ALTERNATES

A. Definitions: Alternates are defined as alternate products, materials, equipment, installations or systems for the Work, which may, at Owner's option and under terms established by Instructions to Bidders, be selected and recorded in the Owner-Contractor Agreement to either supplement or displace corresponding basic requirements of Contract Documents. Alternates may or may not substantially change scope and general character of the Work; and must not be confused with "allowances", "unit prices", "change orders", "substitutions", and other similar provisions.

1.04 SCHEDULE OF ALTERNATES

A. ALTERNATE NO. 1: EPOXY TERRAZZO FLOORING

1. Base Bid: Luxury Vinyl Tile

2. Alternate 1A: State cost to delete LVT and provide materials, labor, and equipment to install the Epoxy Terrazzo Flooring at Room Nos. L102, L104, L118 and B146 as indicated on A720 and A721L. Include precast terrazzo wraparound treads from L102 down to L104.

3. Alternate 1B: State cost to delete LVT and provide materials, labor, and equipment to install the Epoxy Terrazzo Flooring at Room Nos. L201 and L202 as indicated on A720 and A722L. Include precast terrazzo stair treads from L202 down to L102.

B. ALTERNATE NO. 2: AHU MANUFACTURER

1. Base Bid: Trane

2. Alternate 2A: State cost to provide AHU Equipment as manufactured by Carrier.

3. Alternate 2B: State cost to provide AHU Equipment as manufactured by Daikin.

C. ALTERNATE NO. 3: TEMPERATURE CONTROL MANUFACTURER

1. Base Bid: Trane

2. Alternate 3A: State cost to provide Temperature Controls as manufactured by Alerton.

3. Alternate 3B: State cost to provide Temperature Controls as manufactured by ALC.

D. ALTERNATE NO. 4: AHU-1 HEAT PIPE

1. Base Bid: No Heat Pipe at AHU-1

2. Alternate: State cost to provide materials, labor, and equipment to install the heat pipe at AHU-1.

E. ALTERNATE NO. 5: THEATRE RIGGING

1. Base Bid: (23) manual counterweight linesets and (8) fixed speed, motorized linesets.

2. Alternate: State cost to provide materials, labor, and equipment to upgrade (3) manual linesets to variable speed, motorized operation for a total of (20) manual and (11) motorized linesets.

F. ALTERNATE NO. 6: SR1 LINEAR FIXTURES

1. Base Bid: No Work

2. Alternate: State cost to provide materials, labor, and equipment to install the SR1 linear light fixtures, wiring and controls as indicated in the AL series drawings.

G. ALTERNATE NO. 7: NATATORIUM LIGHT FIXTURES

1. Base Bid: New H3 Fixtures per Key Note 1 on Sheet E201K-A.

2. Alternate: State cost to provide materials, labor, and equipment to remove and dispose of the existing Natatorium light fixtures and install new H3 fixtures per Key Note 2 on Sheet E201K-A.

H. ALTERNATE NO. 8: NATATORIUM PAINTING

1. Base Bid: Paint walls indicated by Key Note 6 on Sheet A721L.

2. Alternate: State cost to provide materials, labor, and equipment to paint the existing Natatorium walls per Key Note 23 on Sheet A721L.

PART 2 - PRODUCTS, PART 3 - EXECUTION (Not Used)

END OF SECTION 01 23 00

LANCER + BEEBE, LLC
Project # 21107

ADDENDUM NO. SEVEN

PROJECT: GREENFIELD CENTRAL – AUDITORIUM RENOVATION AND ADDITION

PROJECT NUMBER: 21107

DATE OF ADDENDUM: JUNE 9, 2022

THIS ADDENDUM FORMS A PART OF THE CONTRACT DOCUMENTS AND IS ISSUED IN ACCORDANCE WITH THE INSTRUCTIONS TO BIDDERS. ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY SIGNING THE ADDENDUM ACKNOWLEDGMENT SECTION OF THE BID FORM.

Q+A LOG: PLEASE REVIEW THE ATTACHED QUESTION AND ANSWER LOG.

SPECIFICATIONS:

1. SPEC SECTION: 07 42 14 FORMED METAL WALL PANELS

   CHANGE: ADD NEXGEN DESIGN SYSTEM MOSAIC FORMED PANELS AS A PRE-APPROVED EQUAL
2. SPEC SECTION: 07 46 16 WOODGRAIN ALUMINUM SOFFITS AND CEILINGS

   CHANGE: ADD KNOTWOOD AS A PRE-APPROVED EQUAL
3. SPEC SECTION: 08 81 17 FIRE RATED GLASS

   CHANGE: ADD SUPER CLEAR 45-HS-LI AS A PRE-APPROVED EQUAL

LANCER + BEEBE, LLC
Project # 21107

DRAWINGS:

1. S101L – Foundation Plan – Unit L
    - Added section for elevator pit footing
2. S201 – Enlarged Auditorium Foundation Plan
    - Adjusted orchestra pit and sloping slab approaching pit
3. S401 – Typical Foundation Sections
    - Adjusted detail 3
4. S410 – Foundation Sections
    - Adjusted detail 14
    - Added detail 20
5. S411 – Foundation Sections
    - Adjusted details 5 & 6

ARCHITECTURE:

1. LS001
    - TP-4 [DELETED]
    - TP-5 ADDED
    - REVISED PATH OF TRAVEL SCHEDULE
2. A402
    - REVISED DETAIL 2/A402
3. A511
    - REVISED DETAIL 7/A511
4. A515
    - REVISED DETAIL 1/A515
    - REVISED DETAIL 2/A515
    - REVISED DETAIL 7/A515
5. A720
    - RB-3 ADDED
    - CON-1 REVISED
    - CON-2 REVISED
6. A721L
    - FINISH PLAN NOTE 23 ADDED
7. A722L
    - REVISED L202 FINISH TAG

ATTACHMENTS: Q+A LOG.PDF | BID PACKAGE #1 ADDENDUMS https://lancerbeebe.egnyte.com/fl/OGOWJAmcJi | DRAWINGS: LS001, S101L, S201, S401, S410, S411, A402, A511, A515, A720, A721L, A722L

END OF ADDENDUM NO. SEVEN

Greenfield Central High School Auditorium Renovation & Addition

Greenfield Central High School
Greenfield, Indiana

ADDENDUM NO. 7

HEAPY PROJECT NO. 2021-07128

June 9, 2022

SPECIFICATIONS

ITEM NO. 1 23 33 00 – AIR DUCT ACCESSORIES

A. Paragraph 2.4.C:

1) Add Pottorff as an approved manufacturer.

ITEM NO. 2 23 34 00 – HVAC FANS

A. Paragraph 2.3.B:

1) Add Skyblade as an approved manufacturer.

ITEM NO. 3 23 51 17 – BREECHINGS, CHIMNEYS, AND STACKS

A. Paragraph 2.4:

1) Add Duravent as an approved manufacturer.

ITEM NO. 4 23 73 00 – MODULAR AIR HANDLING UNITS

A. Paragraph 2.6.Q:

1) Add the following to paragraph Q: "VFD shall be manufactured by ABB and factory installed and wired by the air handler manufacturer."

ITEM NO. 5 23 82 16 – DUCT HEATING COILS

A. Paragraph 2.2:

1) Add Greenheck as an approved manufacturer.

ITEM NO. 6 26 41 00 – FACILITY LIGHTNING PROTECTION SYSTEM

A. Paragraph 2.1

1) Add Robbins Lightning, Inc, Maryville, Missouri as an approved manufacturer / provider.

3850 Priority Way South Dr. Ste 204
Indianapolis, IN 46240
(317) 571-8795 www.heapy.com

DRAWINGS

ITEM NO. 1 M101L - MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L

A. Add return air balancing dampers.

B. Modify plan note 16.

C. Add tags.

ITEM NO. 2 M102L - MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L

A. Modify plan note 1.

B. Add tags.

ITEM NO. 3 M201L - MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L

A. Modify tag.

ITEM NO. 4 M301L - MECHANICAL ROOF PLAN - UNIT L

A. Modify plan note 3.

ITEM NO. 5 M401 - ENLARGED MECHANICAL PLANS

A. Modify flow arrows.

ITEM NO. 6 M501 - MECHANICAL DETAILS

A. Edit details 8, 9, 11, and13.

ITEM NO. 7 M502 - MECHANICAL DETAILS

A. Edit details 2, 3, 6, and.

B. Add details 12 and 13.

ITEM NO. 8 M503 - MECHANICAL DETAILS

A. Modify AHU elevations.

ITEM NO. 9 M602 - ATC DIAGRAMS

A. Edit AHU-1 ATC diamgram.

ITEM NO. 10 M603 - ATC DIAGRAMS

A. Edit AHU-1 ATC diamgram.

ITEM NO. 11 M604 - ATC DIAGRAMS

A. Edit AHU-1 ATC diamgram.

ATTACHMENTS

ITEM NO. 1 M101L - MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L

ITEM NO. 2 M102L - MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L

ITEM NO. 3 M201L - MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L

ITEM NO. 4 M301L - MECHANICAL ROOF PLAN - UNIT L

ITEM NO. 5 M401 - ENLARGED MECHANICAL PLANS

ITEM NO. 6 M501 - MECHANICAL DETAILS

ITEM NO. 7 M502 - MECHANICAL DETAILS

ITEM NO. 8 M503 - MECHANICAL DETAILS

ITEM NO. 9 M602 - ATC DIAGRAMS

ITEM NO. 10 M603 - ATC DIAGRAMS

ITEM NO. 11 M604 - ATC DIAGRAMS

Greenfield Auditorium RFI Log

RFI Contact(s):
RFI Due Date/Time:
Bid Date/Time:

Published:06/10/2022

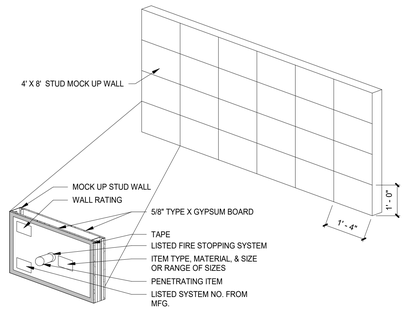
RFI LOG

No.	DATE SUBMITTED	RESPONSIBLE PARTY	QUESTION	DATE RECEIVED	FROM	RESPONSE
1	4/28/2022	L+B	Please note Item 2.4, A., in specification 034100. Is the precast mix on all panels to be all structural gray concrete? All exterior panels appear to be covered with thin brick. For thin brick clad panels, it is recommended to acid etch/rinse the precast panels to clean the thin brick and to etch between the thin brick pieces for consistency. Do you want the brick clad precast panels to be acid etched/rinsed or the leave the finished surface with the cast thin brick unfinished?	4/28/2022	CORESLAB	Structural gray concrete is acceptable. Acid etched/rinsed is desired on the exterior.
2	4/28/2022	L+B	Please note Item 2.13, A. in specification 034100. The interior precast panel faces, are they to have a smooth as cast from the form finish? And, can the precast panel (all) back finishes be a two-pass hard hand steel trowel?	4/28/2022	CORESLAB	Precast panel back finishes can be a two-pass hand steel trowel.
3	4/28/2022	L+B	Please not Item 2.14, B., 3.(thin brick type 3), per the Exterior Elevation Notes on sheets A201, 202, and 203, Glen Gery Brick noted should be Pearl River, Wire Cut, not Brazilwood, Wire cut. Please confirm? Please be advised that thin brick lead times are not controlled by the precaster and could affect the project schedule if the thin brick material is not available/received at the precast plant in time to meet the casting schedule	4/28/2022	CORESLAB	See revised specification issued in Addendum No. 5.
4	4/28/2022	TSC	Are electrical boxes and conduits going to need to be cast into the precast panels? If so, please confirm that the electrical hardware will be furnished by others to the precast plant prior to casting by Others. Also, can we be given an estimated quantity of electrical hardware that will need to be cast in?	4/28/2022	CORESLAB	Yes, these items will be furnished by the Electrical/Low Voltage Contractor to the Bid Category No. 2 Contractor. Please refer to the bid documents to determine quantities and locations.
5	4/28/2022	TSC	Please confirm the steel ledge angels shown, attached to steel embed cast in precast embed plates, are to be furnished and installed by Others. (Ex. details 7, 9, 10 – S610). And the precaster in those similar details is to furnish and cast in the flat embed plates only cast into the precast panel backs?	4/28/2022	Geiger & Peters	All connection steel shapes, attched to precast embed plates, required for the proper support of the structural steel system shall be provided by Bid Category No. 4 Contractor..
6	4/28/2022	L+B	Please reference specification 034100, page 7, Item 2.13, B. Can you confirm the size of all thin brick to be cast into the precast panels for the project is to be modular size, 2-1/4” x 7-5/8”?	4/28/2022	CORESLAB	See revised specification issued in Addendum No. 2.
7	5/13/2022	L+B	07 53 23 - The EPDM spec states the system is ballasted but also indicates the insulation is to be mechanically fastened. I assume this is a mistake and the insulation is to be loose laid. (fastening would defeat the cost advantage of ballast)	5/3/2022	Foster Contracting	Ballasted roof scope is limited to the Natatorium seating expansion (Unit K).

8	5/13/2022	L+B	07 53 23 - The EPDM spec lists Manville and Firestone as approved membrane manufacturers. I would assume Firestone and Manville would also be acceptable for the PVC membrane? I would think the school would prefer one manufacturer warranty.	5/3/2022	Foster Contracting	Yes - These manf. are acceptable. Manfacturers products must meet or exceed product performance and warranty listed in the specificaitons.
9	5/13/2022	L+B	07 54 19 - The PVC spec lists water based adhesive. Is solvent based adhesive also acceptable?	5/3/2022	Foster Contracting	Acceptable adhesives are per the manufactuer installation instructions/requirements.
10	5/13/2022	L+B	07 54 19 - The PVC spec lists light gray as the specified color for the membrane. This may / will significantly lengthen the lead time. I would advise proceeding with white membrane.	5/3/2022	Foster Contracting	Manufactuers standard white or grey is acceptable.
11	5/13/2022	L+B	Drawing A003 - Is R1c the only roof system that is the ballasted EPDM? I cannot tell which membrane goes where	5/3/2022	Foster Contracting	R1c is the only roof system that is ballasted. Roof types are labeled throughout the documents.
12	5/13/2022	TSC	What is the material for the wall rail (Note #46) and segmented handrail (note #49 and #59) on A112L? Are we responsible for these?" Reason I ask is because we are not responsible for the Decorative Rail which is commonly aluminum or stainless. This would lead me to believe that the rails in question would be aluminum or stainless to match the deco rail and the deco rail vendor would be responsible for these.	5/10/2022	Almet, Inc.	Items mentioned here should be considered by the decorative metal contractor.
13	5/13/2022	L+B/TSC	Who is responsible for stair nosings? I see where they are supposed to go, but its not listed as to who is responsible for them.	5/10/2022	Almet, Inc.	AT THIS TIME WE DO NOT ANTICIPATE CAST IN NOSINGS.
14	5/13/2022	L+B	Where is detail 4/A517 cut? Its showing "Front of House" but I do not see where its cut. Also, it shows chain-link fencing along the "catwalk except as noted". This is the only detail that shows where it is noted. Is fencing needed all around the catwalk?Who is responsible for it? If we are, what is the spec for it? It's not listed anywhere.	5/10/2022	Almet, Inc.	See revised sheet A112L for sections.
15	5/13/2022	L+B	What is the spec or basis of design for the "Perforated Metal Riser"? Only thing listed is that I am to provide 14 GA if not stated elsewhere	5/10/2022	Almet, Inc.	Stairs in this project DO NOT have "Perforated Metal Risers"
16	5/13/2022	L+B	Would 8' precast panels be acceptable? We can improve our delivery date with 8' panels.	5/10/2022	FABCON	Design team does not recommend switching to an 8' panel as this will force redesign of exterior, interior structural, and MEP elements.
17	5/13/2022	TSC	Elevator Questions - Who is responsible for the elevator accessories 1. Elevator sill angles 2. Elevator sump pit grating We do plan on including the elevator hoist beam. This is common. The reason why we ask is that I see from the drawings that the elevator pit ladder is being supplied by the elevator MFG. (5/A402) Otherwise, we would add these with our bid.	5/10/2022	Almet, Inc.	1. Support angles for elevator sills by Elevator Subcontractor. 2. Elevator sump pit cover/grate by Bid Category No. 4 Contractor. 3. Hoist beams by Bid Category No. 4 Contractor. 4. Elevator pit ladders by Elevator Subcontractor.
18	5/13/2022	L+B/TSC	Is the Box Boom guardrail at detail 1 & 2/A517 the guardrail noted #61 on A112L? There are 6 total of different lengths. If its not Note #61, am I responsible for detail 1 & 2/A517 If so, how is it attached to the structure?	5/12/2022	Almet, Inc.	Bid Category No. 4 Contractor shall provide Box Boom and guard rail pipe assemblies. See revised plan notes on A112L in Addendum No. 5. Please refer to A303 for axon views of the areas in question.
19	5/16/2022	TSC	Who is building and maintaining the roadways for crane and truck access?	5/12/2022	High Concrete	Bid Category No. 1 General Trades

20	5/16/2022	TSC	Who is responsible for cleaning the footings from the mud and debris tracked by other trades prior to panel erection?	5/12/2022	High Concrete	Bid Category No. 1 General Trades
21	5/16/2022	TSC	Will there be any underground utilities our trucks/cranes should be aware of? The site changes drastically during construction and our team cannot be responsible for that.	5/12/2022	High Concrete	Refer to the Site Utilities drawing C400 within the Civil documents; contractor is to assume that the new structures will be in place and that road plates will be required to protect same. Bid Category No. 2 Contractor shall protect these utilty structures as required during precast erection work.
22	5/16/2022	TSC	How long do we anticipate the braces being left on for until the steel is erected? 1 month additional is included, but sometimes it carries into the 2nd month	5/12/2022	High Concrete	Include two (2) months of bracing.
23	5/16/2022	TSC	Will there be requirements for flagmen and/or barricades, road closures	5/12/2022	High Concrete	Flagmen and barricades, as required to safely erect your work, are to be included. We do not anticipate requiring any road closures.
24	5/16/2022	L+B	Spec Section 34100 - 2.8A and 2.8B Insulated Flat Wall Panel Accessories indicates ship-lap edges and glass-fiber vinylester connectors for insulation and wythe connectors, which would indicate a Thermomass System. Will other systems be allowed if they meet the required structural design? Square edges and carbon-fiber wythe connectors have been used in similar school projects with equal to or better than designed capacities.	5/12/2022	High Concrete	We do not require 'ship lap' edges. It is not necessary and will not affect to any great degree the thermal performance of the panels. Butt edges for foam board will be allowed. The connectors are HK, non-metal and non-conductive and should be allowed; other non-conductive connectors like c-grid should also be acceptable.
25		L+B	Please confirm the external insulation and what type for the exposed duct in the auditorium from AHU-1 on M101L? The schedule on M702 says all the other exposed ducts call for dual wall insulated duct. Sec 230713 2.3 calls out fiberglass board insulation for exposed ductwork, board is for rectangular duct, but all the exposed duct is round.	6/8/2022	Lehman's	
26	6/9/2022	L+B	142400 - Elevators 1.1.3A1. This has all items listed, please confirm that there shall not be any seismic for this project. 2.1.4A1 and 1.5A – please confirm that the warranty/service for the elevator is one year and that the building listing, if any, is not applicable if different. I did not see a time listed. 3.2.9 A5e. please confirm that stainless steel can be provided, this ceiling is not available in powdercoat. 4.3.3 A. There is no time listed, and we take this to be the requirement IF elected by the GC. Please confirm that no Temporary use is to be included in the bid.	6/8/2022	TKE	1. Confirmed. 2. Confirmed. 3. Stainless steel is acceptable. 4. Confirmed
27		L+B	Is the expanded bleacher area, adjacent to the auditorium addition, outside of the new FP systems scope of work? There is not a fire protection system within the existing swimming pool area.	6/9/2022	Integrity	
28		L+B	Drawing 5/TP101 shows the stage right side of some platforms open to the pit, and thus visible to the audience. Would it be preferable to have these open sides covered with skirting, or open with black painted frames and legs?	6/9/2022	Wenger	

29		L+B	A121 Note 48 indicates a portable ADA ramp straight on with pit opening to seating area. 7/A314 appears to show this ADA ramp, but it does not reach the height of the seating area. Can it please be confirmed that the ADA ramp is to be per 5/TP101 & 6/TP101, and can A121 and 7/A314 please be revised to not include the straight on short ADA ramp?	6/9/2022	Wenger	
30		L+B	Drawing TP101 does not show a detail of the guard rails/hand rails on the platforms shown in 5/TP101. Are guard rails that restrict a sphere with a diameter larger than 4" to pass required? Are manufacturers standard guard rails acceptable?	6/9/2022	Wenger	
31		L+B	5/TP101 does not appear to show 5' diameter of clearance for a wheel chair to turn with the necessary overhanging ramp hand rails. Does the specified design meet the minimum clearance space required by the AHJ? If not, can a revised drawing please be provided?	6/9/2022	Wenger	
32		L+B	11 61 23 Theatre Portable Platforms - •2.2 E. specifies aluminum frames and leg assemblies that are not visible to the audience do not require black finish. 3.1 C. specifies all metal fabricated items shall be given at least one coat of primer and one coat of finish paint. Color: black. Can 2.2 E. please be confirmed that mill aluminum finish frames and legs are approved provided they are not visible to the audience? Can 3.1 C. please be removed?	6/9/2022	Wenger	



2 FIRESTOPPING PENETRATION MOCKUP PANEL

SCALE: 1/2" = 1'-0"

BUILDING CODE SUMMARY

APPLICABLE CODES:
2014 INDIANA BUILDING CODE*
2014 INDIANA FIRE CODE
2009 INDIANA ELECTRICAL CODE
2014 INDIANA MECHANICAL CODE
2012 INDIANA PLUMBING CODE
2010 INDIANA ENERGY CONSERVATION CODE
ICC/ANSI A-117.1 STANDARD, 2009 EDITION
GENERAL ADMINISTRATIVE RULES (GAR)
*CODE REFERENCED UNLESS NOTED OTHERWISE

APPLICABILITY OF CODES:
ALTERATIONS ARE PERMITTED TO AN EXISTING BUILDING WITHOUT REQUIRING THE ENTIRE EXISTING BUILDING OR PORTIONS OF THE EXISTING BUILDING UNAFFECTED BY THE PROPOSED SCOPE OF RENOVATION TO BE BROUGHT INTO COMPLIANCE WITH CURRENT CODES. [RULE 4, SECTION 12, GAR]

SCOPE OF PROJECT:
THE PROJECT INVOLVES A RENOVATION AND AUDITORIUM ADDITION TO THE EXISTING HIGH SCHOOL.

OCCUPANCY CLASSIFICATIONS:
ASSEMBLY AREAS ASSOCIATED WITH AN E OCCUPANCY
- E OCCUPANCY [303.1.3]

OFFICES - B OCCUPANCY [304.1]

STORAGE - S-1 OCCUPANCY [311.2]

ASSEMBLY SPACES ACCESSORY TO AN E OCCUPANCY ARE NOT CONSIDERED SEPARATE OCCUPANCIES. [TABLE 302.3.3, FOOTNOTE E]

CONSTRUCTION TYPE:

TYPE IIB (NONCOMBUSTIBLE, UNPROTECTED) CONSTRUCTION EXISTING AND PROPOSED. ANY CONSTRUCTION TYPE PERMITTED BASED UPON COMPLYING WITH SECTION 507.4 FOR UNLIMITED AREA 2-STORY BUILDINGS OF GROUP B, E, F, M, OR S OCCUPANCY. [507.4]

ALLOWABLE AREA:

UNLIMITED AREA BASED UPON BEING SPRINKLERED THROUGHOUT AND HAVING AT LEAST 60 FEET OF OPEN SPACE ON ALL SIDES OF THE BUILDING MEASURED TO PROPERTY LINES OR THE OPPOSITE SIDE OF A PUBLIC WAY. [507.4]

ALLOWABLE HEIGHT:

2-STORIES AND 60 FEET BASED UPON COMPLYING WITH SECTION 507.4 [507.4]

BUILDING ELEMENTS - FIRE-RESISTIVE REQUIREMENTS:
STRUCTURAL FRAME, INTERIOR WALLS, FLOOR ASSEMBLIES, AND ROOF ASSEMBLIES ARE PERMITTED TO BE OF ANY CONSTRUCTION TYPE. [507.4]

OCCUPANCY SEPARATIONS:
OCCUPANCY SEPARATIONS NOT REQUIRED, BUILDING COMPLIES AS NON-SEPARATED MIXED USES. [508.3]

INCIDENTAL USE SEPARATIONS:
THE FOLLOWING ROOMS ARE REQUIRED TO BE PROVIDED WITH A NONRATED SEPARATION CONSISTING OF WALLS TERMINATING AT THE DECK, WITH SELF-CLOSING DOORS:
-FURNACE ROOMS WITH EQUIPMENT OVER 400,000 BTU/HOUR INPUT
-BOILER ROOMS WITH EQUIPMENT OVER 15 PSI AND 10 HP [TABLE 509]

ELECTRICAL TRANSFORMER ROOMS REQUIRED TO BE SEPARATED WITH 1-HOUR CONSTRUCTION IF CONTAINING OIL-INSULATED TRANSFORMERS OVER 75KVA, OR DRYTYPE TRANSFORMERS OVER 112.5KVA; AND THE TRANSFORMERS ARE LESS THAN A CLASS 155 INSULATION SYSTEM RATING. [450.42, 450.21(B), IEC]

SEPARATION OF DRESSING AND APPURTENANT ROOMS:
THE STAGE MUST BE SEPARATED FROM DRESSING ROOMS, STORAGE ROOMS, SCENE DOCKS, PROPERTY ROOMS AND OTHER ROOMS APPURTENANT TO THE STAGE MUST BE SEPARATED BY 1-HOUR FIRE BARRIERS. DRESSING ROOMS, STORAGE ROOMS AND OTHER ROOMS APPURTENANT TO THE STAGE MUST BE SEPARATED FROM EACH OTHER BY A 1-HOUR FIRE BARRIER. OPENINGS IN 1-HOUR FIRE BARRIERS MUST BE 45MINUTE RATED AND AUTOMATIC OR SELF CLOSING. [410.5, TABLE 716.5]

FLOOR OPENINGS & SHAFT ENCLOSURES:
A 2-STORY FLOOR OPENING IS PERMITTED. [712.1.8]

EXIT STAIRS ARE REQUIRED TO BE ENCLOSED WITH 1-HOUR FIRE BARRIERS. FIRE BARRIERS MUST BE CONTINUOUS FROM THE FOUNDATION TO THE UNDERSIDE OF THE FLOOR SHEATHING, SLAB, DECK, OR ROOF ABOVE. OPENINGS IN MUST BE 60-MINUTE RATED, OPENINGS MUST BE SELF OR AUTOMATIC CLOSING. [713.4, TABLE 716.5, 716.5.9]

DUCTS THAT CONNECT NOT MORE THAN TWO STORIES ARE NOT REQUIRED TO BE ENCLOSED IN A SHAFT WHEN THE ANNULAR SPACE AROUND THE DUCT IS PROTECTED WITH AN APPROVED NONCOMBUSTIBLE MATERIAL THAT RESISTS THE FREE PASSAGE OF FLAME AND THE PRODUCTS OF COMBUSTION. [717.6.3, EXC 2]

SPRINKLER PROTECTION CAN BE OMITTED FROM ELEVATOR SHAFTS WHERE ENCLOSED WITH 2-HOUR CONSTRUCTION. IF SPRINKLERED THE ELEVATOR SHAFT MUST BE ENCLOSED WITH 1-HOUR RATED CONSTRUCTION. [903.3.1.1.1, 713.4]

FIRE AND SMOKE DAMPERS:
FIRE DAMPERS REQUIRED FOR DUCT PENETRATIONS OF RATED SHAFTS AND 2-HOUR FIRE BARRIERS. FIRE DAMPERS NOT REQUIRED FOR PENETRATIONS OF 1-HOUR FIRE BARRIERS BY DUCTED HVAC SYSTEMS WHERE DUCTS ARE CONSTRUCTED OF SHEET STEEL NOT LESS THAN NO. 26 GAGE THICKNESS AND ARE CONTINUOUS FROM THE AIR-HANDLING APPLIANCE OR EQUIPMENT TO THE AIR OUTLET AND INLET TERMINALS. SMOKE DAMPERS NOT REQUIRED. [717.5]

OCCUPANT LOAD FACTORS:
UNCONCENTRATED ASSEMBLY USE: 15 SQ. FT./OCC.
ROW SEATING - BLEACHERS: 18 IN./OCC.
STAGE: 15 SQ. FT./OCC.
OFFICE: 100 SQ. FT./OCC.
STORAGE/MECHANICAL: 300 SQ. FT/OCC. [TABLE 1004.1.2]

CORRIDORS:
CORRIDORS ARE PERMITTED TO BE NON-RATED BASED UPON SPRINKLER PROTECTION THROUGHOUT. [TABLE 1018.1]

CORRIDORS HAVING A CAPACITY OF 100 OR MORE MUST BE A MINIMUM 72 INCHES IN CLEAR AND UNOBSTRUCTED WIDTH. A MINIMUM OF 44 INCHES IS PERMITTED WHERE SERVING AN OCCUPANT LOAD LESS THAN 100 AND A MINIMUM OF 36 INCHES IS PERMITTED WHERE SERVING AN OCCUPANT LOAD LESS THAN 50. [TABLE 1018.2]

DEAD END CORRIDORS MUST NOT EXCEED 50 FEET [1018.4]

DOORS:
DOOR WIDTH MUST BE A MINIMUM OF 32 INCHES CLEAR AND 48 INCHES MAXIMUM. [1008.1.1]

EGRESS DOORS MUST SWING IN THE DIRECTION OF EGRESS WHEN SERVING 50 OR MORE OCCUPANTS. EGRESS DOORS ARE REQUIRED TO BE SIDE-HINGED SWINGING TYPE, EXCEPT FOR OFFICE AND STORAGE AREAS WITH AN OCCUPANT LOAD OF LESS THAN 10. MANUALLY OPERATED HORIZONTAL SLIDING DOORS PERMITTED FROM ROOMS WITH AN OCCUPANT LOAD THAT DOES NOT EXCEED 10. [1008.1.2]

PANIC HARDWARE:
PANIC HARDWARE IS REQUIRED FOR DOORS THAT LATCH IN E OCCUPANCIES WHERE THE ROOM OR AREA HAS AN OCCUPANT LOAD OF 50 OR MORE. EGRESS DOORS SERVING ELECTRICAL ROOMS WITH EQUIPMENT RATED 1,200 AMPERES OR MORE AND OVER 6 FEET WIDE THAT CONTAIN OVER-CURRENT DEVICES, SWITCHING DEVICES, OR CONTROL DEVICES MUST SWING IN THE DIRECTION OF EGRESS AND HAVE PANIC HARDWARE. [1008.1.10]

EXIT STAIRS:
STAIRWAYS MUST NOT BE LESS THAN 44 INCHES IN CLEAR AND UNOBSTRUCTED WIDTH WHERE SERVING 50 OR MORE OCCUPANTS. [1009.4]

A HEADROOM OF AT LEAST 6'8" MUST BE PROVIDED. [1009.5]

THE TREAD DEPTH MUST BE A MINIMUM OF 11" AND THE RISER HEIGHT MUST BE A MINIMUM OF 4" AND A MAXIMUM OF 7". [1009.7.2]

GUARDS:
MEANS OF EGRESS THAT ARE GREATER THAN 30 INCHES ABOVE THE FLOOR BELOW MUST BE PROVIDED WITH GUARDS. GUARDS ARE REQUIRED TO BE NOT LESS THAN 42 INCHES HIGH. GUARDS MUST HAVE INTERMEDIATE RAILS SUCH THAT A SPHERE 4 INCHES IN DIAMETER CAN NOT PASS THROUGH ANY OPENING UP TO A HEIGHT OF 34 INCHES. [1013.2]

HANDRAILS:
RAMPS WITH A RISE GREATER THAN 6 INCHES AND STAIRS ARE REQUIRED TO HAVE HANDRAILS ON BOTH SIDES AND THE HANDRAILS MUST PROVIDED WITHIN 30 INCHES OF REACH ON THE STAIR. THE HANDRAILS MUST BE AT LEAST 34 INCHES IN HEIGHT AND NOT GREATER THAN 38 INCHES. [1009.15, 1012]

COMMON PATH OF TRAVEL IN ASSEMBLY OCCUPANCIES - AUDITORIUM:
A COMMON PATH OF TRAVEL OF 30 FEET IS PERMITTED FROM ANY POINT WHERE SERVING ANY NUMBER OF OCCUPANTS. A COMMON PATH OF TRAVEL OF 75 FEET IS PERMITTED FROM ANY POINT WHERE SERVING NOT MORE THAN 50 OCCUPANTS. [1028.8]

WHERE ONE OF THE TWO PATHS OF TRAVEL IS ACROSS THE AISLE THROUGH A ROW OF SEATS TO ANOTHER AISLE, THERE MUST BE NOT MORE THAN 24 SEATS BETWEEN THE TWO AISLES, AND THE MINIMUM CLEAR WIDTH BETWEEN ROWS FOR THE ROW BETWEEN THE TWO AISLES MUST BE 12 INCHES PLUS 0.6 INCH FOR EACH ADDITIONAL SEAT ABOVE SEVEN IN THE ROW BETWEEN AISLES. [1028.8.1]

EGRESS WIDTH FOR ASSEMBLY SEATING:
MINIMUM REQUIRED EGRESS WITH FOR STAIRS IS 0.3 INCHES PER OCCUPANT. WHERE EGRESS REQUIRES STAIR DESCENT, AT LEAST 0.075 INCH OF ADDITIONAL WIDTH FOR EACH OCCUPANT MUST BE PROVIDED ON THOSE PORTIONS OF STAIR WIDTH HAVING NO HANDRAIL WITHIN A HORIZONTAL DISTANCE OF 30 INCHES. 0.22 INCHES PER OCCUPANT MUST BE PROVIDED FOR RAMPED MEANS OF EGRESS WHERE SLOPES ARE STEEPER THAN ONE UNIT VERTICAL IN 12 UNITS HORIZONTAL. 0.2 INCHES PER OCCUPANT FOR LEVEL AREAS IN ASSEMBLY AREAS WHICH CONTAIN SEATS, TABLES, AND DISPLAYS. [1028.6.1]

AISLE ACCESSWAYS SERVING SEATING IN ROWS - AUDITORIUM:
AISLE ACCESSWAYS BETWEEN ROWS OF SEATING WITH 14 OR FEWER SEATS MUST HAVE A MINIMUM CLEAR WIDTH OF 12 INCHES. ROWS OF SEATING WITH AISLES ON EACH SIDE CANNOT EXCEED 100 SEATS PER ROW AND MUST INCREASE THE MINIMUM CLEAR WIDTH BY 0.3 INCHES FOR EVERY SEAT OVER A TOTAL OF 14. THE AISLE ACCESSWAY IS NOT REQUIRED TO EXCEED 22 INCHES IN WIDTH. ROWS OF SEATING WITH AN AISLE AT ONLY ONE END CANNOT HAVE A PATH OF TRAVEL WHICH EXCEEDS 30 FOOT IN LENGTH FROM ANY SEAT TO THE AISLE. THE MINIMUM CLEAR WIDTH, FOR ROWS OF SEATING WITH ONLY ONE AISLE AT THE END, MUST BE INCREASED BY 0.6 INCHES FOR EVERY SEAT OVER A TOTAL OF 7. [1028.10.2]

MINIMUM WIDTH OF AISLES - AUDITORIUM:
48 INCHES FOR STAIR AISLES WITH SEATING ON EACH SIDE OR 36 INCHES IF THE AISLE SERVES 50 OR FEWER SEATS. 36 INCHES FOR STAIR AISLES HAVING SEATING ON ONLY ONE SIDE. 23INCHES BETWEEN A HANDRAIL AND SEATING. 42 INCHES FOR LEVEL OR RAMPED AISLES HAVING SEATING ON EACH SIDE OR 36 INCHES IF THE AISLE SERVES 50 OR FEWER SEATS. 36 INCHES FOR LEVEL OR RAMPED AISLES HAVING SEATING ON ONLY ONE SIDE. 23 INCHES BETWEEN A HANDRAIL OR GUARDRAIL AND SEATING WHEN THE AISLE SERVES FIVE ROWS OR FEWER ON ONE SIDE. [1028.9.1]

AISLE STAIR TREADS - AUDITORIUM:
AISLE STAIR TREADS MUST HAVE NO VARIATION IN THE DEPTH OF ADJACENT TREADS THAT EXCEEDS 3/16 INCHES. TREADS MUST BE AT LEAST 11 INCHES IN DEPTH, AND ALL TREADS MUST EXTEND THE FULL WIDTH OF THE AISLE. [1028.11.1]

THE AISLES ARE A COMBINATION OF TREADS AND LANDINGS. STAIR TREADS ARE PROVIDED BETWEEN LANDINGS WHERE THE RISER IS GREATER THAN 9 INCHES BETWEEN LANDINGS. SECTION 1009.8, STAIRWAY LANDINGS, HAS AN EXCEPTION FOR COMPLING WITH THE REQUIREMENT FOR LANDINGS WHEN AISLE STAIRS COMPLY WITH SECTION 1028. SECTION 1028 DOES NOT REGULATE LANDINGS, THEREFORE THE LANDINGS DO NOT NEED TO MEET ANY SPECIFIC REQUIREMENTS.

AISLE STAIR RISERS - AUDITORIUM:
AISLE STAIR RISER HEIGHTS CANNOT BE LESS THAN 4 INCHES, HEIGHTS CANNOT EXCEED 8 INCHES, AND MUST BE UNIFORM. CONSTRUCTION- CAUSED NONUNIFORMITIES CANNOT EXCEED 3/16 INCHES BETWEEN ADJACENT RISERS. RISER HEIGHTS NOT EXCEEDING 9 INCHES IS PERMITTED WHERE THEY ARE NECESSITATED BY THE SLOPE OF THE ADJACENT SEATING AREAS TO MAINTAIN SIGHTLINES. [1028.11.2]

AISLE HANDRAILS - AUDITORIUM:
STAIRS MUST BE PROVIDED WITH HANDRAILS AT ONE SIDE OR ALONG THE CENTERLINE. WHERE SEATING EXISTS ON BOTH SIDES OF THE AISLE, THE HANDRAIL MUST BE NONCONTINUOUS WITH GAPS OR BREAKS AT INTERVALS NOT EXCEEDING 5 ROWS. THE GAPS OR BREAKS MUST HAVE A MINIMUM CLEAR WIDTH OF 22 INCHES AND A MAXIMUM CLEAR WIDTH OF 36 INCHES. THE ENDS OF THE HANDRAILS MUST BE ROUNDED AND WHERE A HANDRAIL IS PROVIDED IN THE MIDDLE OF THE AISLE, AN INTERMEDIATE HANDRAIL MUST BE PROVIDED 12 INCHES BELOW THE MAIN HANDRAIL. [1028.13]

AISLE MARKING - AUDITORIUM:
A CONTRASTING MARKING STRIPE MUST BE PROVIDED ON EACH TREAD AT THE NOSING OR LEADING EDGE. THE STRIPES MUST BE AT LEAST 1INCH WIDE BUT NO GREATER THAN 2 INCHES. [1028.11.3]

SEAT STABILITY - AUDITORIUM:
IN PLACES OF ASSEMBLY OR PORTIONS THEREOF WITH RAMPED OR TIERED FLOORS FOR SEATING, AND WHERE THE SEATS INCLUDE MORE THAN 200 PERMANENT, PORTABLE OR FOLDING CHAIRS IN ANY COMBINATION ON EACH INDIVIDUAL RAMPED OR TIERED AREA, ALL SEATS ON THE RAMPED OR TIERED AREA SHALL BE FASTENED TOGETHER IN GROUPS OF NOT FEWER THAN THREE OR ALL SEATS SHALL BE FASTENED TO THE FLOOR. [1028.12, EXC. 3]

EXIT TRAVEL DISTANCE:
EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE A MAXIMUM OF 250 FEET FOR E AND S-1 OCCUPANCIES AND 300 FEET FOR B OCCUPANCIES. [TABLE 1016.2]

NUMBER OF EXITS:
2 EXITS REQUIRED PER FLOOR FOR AN OCCUPANT LOAD OF 1-500
3 EXITS REQUIRED PER FLOOR FOR AN OCCUPANT LOAD OF 501-1,000
4 EXITS REQUIRED FOR AN OCCUPANT LOAD OVER 1,000 [1021.2]
AN EXIT CAPACITY OF 0.15 IN/OCCUPANT MUST BE PROVIDED FOR HORIZONTAL TRAVEL SUCH AS DOORS, RAMPS, ETC. AND 0.2 IN/OCCUPANCY MUST BE PROVIDED FOR STAIRS. [1005.3.2]

MEANS OF EGRESS:
TWO MEANS OF EGRESS MUST BE PROVIDED FROM ANY SPACE WHERE THE OCCUPANT LOAD EXCEEDS 49 FOR B AND E OCCUPANCIES AND 29 FOR S OCCUPANCIES OR WHERE THE COMMON PATH OF TRAVEL IS EXCEEDED. [TABLE 1015.1]

MEANS OF EGRESS - TECHNICAL PRODUCTION AREAS:
THE MAXIMUM EXIT ACCESS TRAVEL DISTANCE MUST NOT EXCEED 400 FEET. [410.6.3.2]

THE PATH OF EGRESS MUST BE AT LEAST 22 INCHES. [410.6.3.5]

COMMON PATH OF TRAVEL:
THE COMMON PATH OF TRAVEL IS PERMITTED TO BE A MAXIMUM OF 100 FEET FOR B AND S-1 OCCUPANCIES AND 75 FEET FOR E OCCUPANCIES. [TABLE 1014.3]

EXIT ACCESS DOORWAY ARRANGEMENT:
WHERE TWO EXITS ARE REQUIRED FROM A ROOM OR AREA, DOORS MUST BE PLACED A DISTANCE APART EQUAL TO NOT LESS THAN 1/3 OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE ROOM OR AREA SERVED BY THE EXITS. [1015.2.1]

OCCUPANT LOAD POSTING:
A OCCUPANCIES WITH AN OCCUPANT LOAD OF 50 OR MORE MUST HAVE THE OCCUPANT LOAD OF THE ROOM OR SPACE POSTED IN A CONSPICUOUS PLACE, NEAR A MAIN EXIT OR EXIT ACCESS DOORWAY FROM THE ROOM OR SPACE. [1004.3]

EMERGENCY AND EGRESS LIGHTING:
EXIT SIGNS REQUIRED TO INDICATE THE DIRECTION OF EGRESS TRAVEL FOR ROOMS AND AREAS THAT REQUIRE MORE THAN ONE EXIT ACCESS. [1011.1]

EMERGENCY LIGHTING IS REQUIRED AT EXTERIOR LANDINGS IN BUILDINGS THAT REQUIRE MORE THAN ONE EXIT, IN CORRIDORS, AND REQUIRED IN ROOMS AND SPACES THAT REQUIRE TWO OR MORE MEANS OF EGRESS. [1006.3]

AUTOMATIC SPRINKLERS:
SPRINKLERS ARE REQUIRED THROUGHOUT ALL E OCCUPANCIES WITH A FIRE AREA GREATER THAN 12,000 SQUARE FEET AND TO PERMIT THE BUILDING TO BE UNLIMITED IN AREA. [903.2.3, 507.4]

STANDPIPES:
CLASS III WET STANDPIPE REQUIRED ON EACH SIDE OF STAGES WITH A 1½ INCH HOSE CONNECTION. THE 1½ INCH HOSE CONNECTIONS MUST BE EQUIPPED WITH SUFFICIENT LENGTHS OF 1½ INCH HOSE TO PROVIDE FIRE PROTECTION FOR THE STATE AREA. PROPER CAP AND CHAIN MUST BE PROVIDED FOR THE HOSE CONNECTION VALVE ASSEMBLY. [410.8, 905.3.4]

FIRE ALARM SYSTEM:
FIRE ALARM SYSTEM REQUIRED THROUGHOUT - MANUAL PULL STATIONS ARE NOT REQUIRED BASED UPON AUTOMATIC SPRINKLER INITIATION OF THE SYSTEM [907.2.3, EXC. 3]

STAGE VENTILATION:
STAGE VENTILATION MUST BE PROVIDED BY ROOF VENTS IN ACCORDANCE WITH SECTION 410.3.7.1 OR SMOKE CONTROL IN ACCORDANCE WITH SECTION 410.3.7.2. [410.3.7]

SMOKE DETECTORS:
SMOKE DETECTORS ARE REQUIRED FOR HVAC SHUTDOWN FOR SYSTEMS DELIVERING IN EXCESS OF 2,000 CFM. [606 IMC]

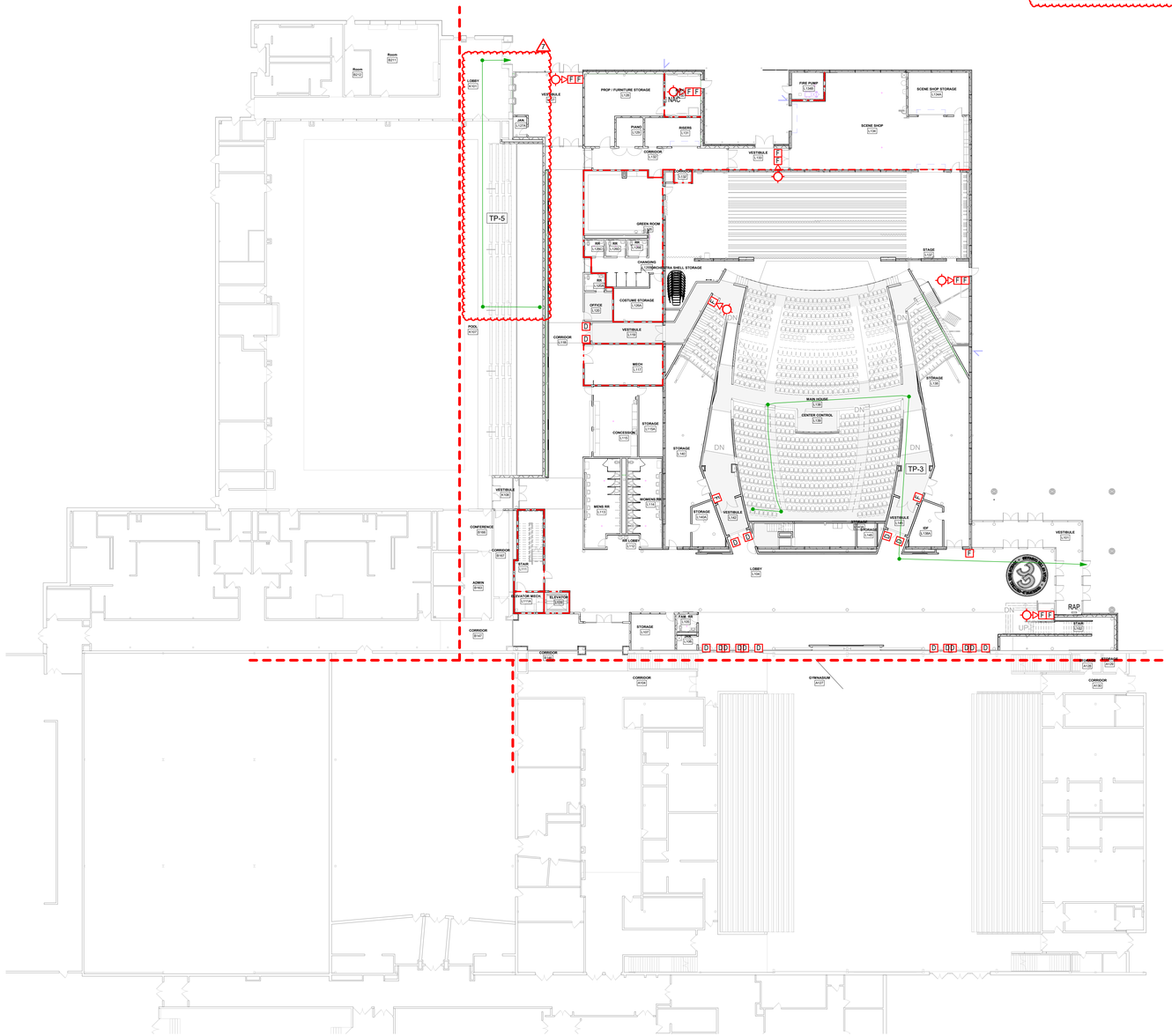
SMOKE DETECTORS ARE REQUIRED FOR PHASE I ELEVATOR RECALL. [3003.2]

INTERIOR FINISHES:
CLASS B FINISHES ARE PERMITTED THROUGHOUT. CLASS C FINISHES ARE PERMITTED IN CORRIDORS, ROOMS, AND ENCLOSED SPACES. [TABLE 803.9]

PATH OF TRAVEL

MARK	LENGTH
TP-1	191' - 2 9/16"
TP-2	80' - 7 1/2"
TP-3	248' - 2"
TP-5	131' - 0 11/16"

TP - TRAVEL PATH



1 LIFE SAFETY PLAN - FIRST FLOOR

SCALE: 3/64" = 1'-0" REF. 3 / A142

PLOT DATE/TIME: 5/9/2022 3:54:19 PM

LANCER + BEEBE, LLC
ARCHITECTURE | PLANNING | INTERIORS
220 N. COLLEGE AVE
INDIANAPOLIS, IN 46202

GREENFIELD CENTRAL HIGH SCHOOL
AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
GREENFIELD, IN 46140

MARK RANDALL BEEBE
REGISTERED
07001164
STATE OF INDIANA
ARCHITECT

REVISIONS:

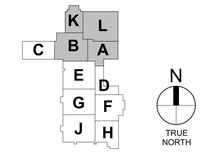
#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

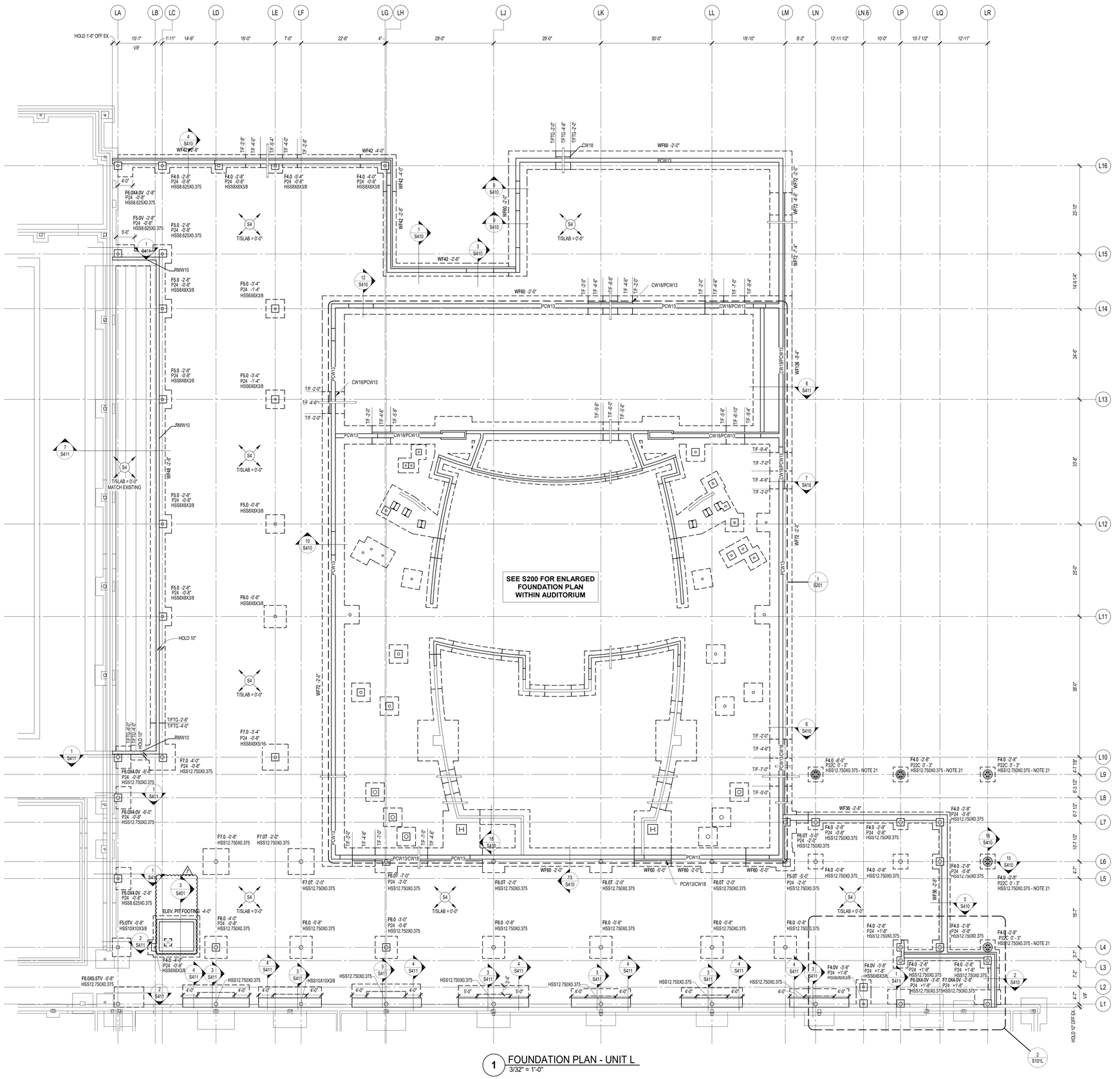
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BM/TF

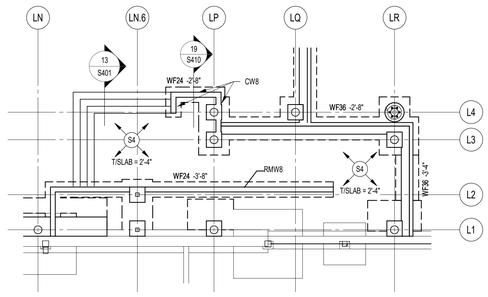
LIFE SAFETY PLAN - FIRST FLOOR

LS001





1 FOUNDATION PLAN - UNIT L
3/32" = 1'-0"



2 ENLARGED FOUNDATION PLAN - UNIT L
1/8" = 1'-0"

FOUNDATION PLAN NOTES

1. REF. S001 & S002 FOR STRUCTURAL NOTES, DESIGN DATA & SCHEDULES.
2. ALL CONTRACTORS ARE REQUIRED TO COORDINATE THEIR WORK WITH ALL DISCIPLINES TO AVOID CONFLICTS. THE MECHANICAL, ELECTRICAL, AND PLUMBING ASPECTS ARE NOT IN THE SCOPE OF THESE DRAWINGS. THEREFORE, ALL REQUIRED MATERIALS AND WORK MAY NOT BE INDICATED.
3. COORDINATE EXACT SIZE & LOCATION OF ALL MECHANICAL OPENINGS IN FOUNDATION WALLS WITH THE MECHANICAL, ELECTRICAL & PLUMBING CONTRACTORS.
4. ALL ELEVATIONS ARE REFERENCED FROM THE FIRST FLOOR FINISH FLOOR ELEVATION 0'-0" (U.S.G.S. 893.10). REF. CIVIL DWGS.
5. REF. ARCH. DRAWINGS FOR ALL DIMENSIONS NOT SHOWN. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES.
6. REF. S400 & S401 FOR TYPICAL FOUNDATION DETAILS.
7. NOTE: PERIMETER WALL AND COLUMN FOOTINGS SHALL BE LOWERED AND/OR SLEEVED TO PASS BELOW PLUMBING LINES (I.E. SANITARY & STORM SEWERS, WATER LINES, ETC.) SHOWN ON THE PLUMBING DRAWINGS. PROVIDE FOOTING STEPS AS REQUIRED PER THE TYPICAL DETAILS ON S400.
8. ALL SLAB RECESSES SHALL BE LOCATED PER THE ARCHITECTURAL DRAWINGS. COORDINATE DEPTHS OF ALL SLAB RECESSES WITH THE ARCHITECTURAL DRAWINGS AND/OR THE FLOORING SUPPLIER.
9. COORDINATE REINFORCING DOWELS FOR CMU VERTICAL REINFORCING WITH REINF. NOTED ON PLANS & SECTIONS.
10. GROUT ALL CORES OF CMU BELOW FINISH FLOOR SOLID.
11. COLUMN FOOTINGS, TRENCH FOOTINGS AND WALL FOOTINGS SHALL BEAR ON APPROVED SOIL. UNDERCUT AS REQ'D TO SUITABLE BEARING MATERIAL AS DETERMINED BY THE GEOTECHNICAL TESTING AGENCY. REF. TYPICAL FOOTING UNDERCUT DETAIL ON S400. UNDERCUTTING TO SUITABLE BRG. MATERIAL IS NOT REQUIRED FOR GRADE BEAMS. REFERENCE ELEVATIONS IN PARENTHESES (-XX'-X") FOR APPROXIMATE ELEVATION TO SUITABLE BEARING STRATA TO BE USE FOR BIDDING PURPOSES.
12. COLUMN FOOTINGS SUPPORTING MORE THAN ONE COLUMN SHALL BE CENTERED AT THE MIDPOINT BETWEEN THE COLUMNS, UNLESS NOTED OTHERWISE ON PLAN.
13. NOT USED
14. PROVIDE CONTINUOUS 4" H. x W. VARIES CONCRETE CURB ON ACOUSTIC ISOLATION SLABS IN MECHANICAL ROOMS. CURBS TO SURROUND ALL PENETRATIONS THRU SLAB INCLUDING COLUMNS, PIPES, SUMP PITS, ETC.
15. ALL EX. CONSTRUCTION SHOWN IN PLAN AND/OR SECTION WAS DERIVED FROM EXISTING DRAWINGS AND MUST BE FIELD VERIFIED. IF ANY DISCREPANCIES ARE DISCOVERED BETWEEN INFO. SHOWN ON THE DRAWINGS AND ACTUAL CONDITIONS IMMEDIATELY CONTACT ARCHITECT/ENGINEER FOR DIRECTION BEFORE PROCEEDING WITH THE WORK.
16. PROVIDE THICKENED SLAB UNDER ALL INTERIOR CMU WALLS WITHOUT FOOTINGS. SEE S401 FOR THICKENED SLAB DETAIL. LAYOUT THICKENED SLABS FROM DIMENSIONS ON THE ARCHITECT FLOOR PLANS.
17. PROVIDE CONTROL/CONTRACTION JOINTS IN SLABS ON GRADE (REF. THE TYPICAL DETAILS ON SHEET S401). ALL JOINTS IN SLABS TO RECEIVE THIN OR THICK-SET TERRAZZO, CERAMIC OR PORCELAIN TILE, VINYL-COMPOSITION TILE (VCT) OR VINYL SHEET GOODS, EPOXY OR SIMILAR THIN-FILM FINISH FLOORING SHALL BE CAREFULLY COORDINATED WITH THE FLOORING CONTRACTOR. THE CONTRACTOR SHALL SUBMIT SLAB JOINT LAYOUT TO ARCHITECT/ENGINEER FOR REVIEW PRIOR TO PLACING SLABS.
18. WHERE PIERS OCCUR WITHIN A LARGER ARCH. PILASTER OR COLUMN ENCLOSURE (FOR EG. PCKs WITHIN 40" SQUARE CANOPY PILASTERS) PROVIDE PIER REINF. CAGE CENTERED ON THE GRID INTERSECTION. FORM OVERALL PIER TO PROFILE OF THE ARCHITECTURAL PILASTER OR COLUMN ENCLOSURE. LAYOUT PILASTERS FROM DIMENSIONS ON THE ARCHITECTURAL PLANS & DETAILS.
19. FOR ARCHITECTURAL PILASTERS NOT SUPPORTING STEEL COLUMNS, CONSTRUCT AS FULLY-GROUTED MASONRY PIERS OR CAST-IN-PLACE CONCRETE PIERS REINF'D W/ #5 VERTICAL REINFORCING AT 12" O.C. ALL FACES, AT CONTRACTOR'S OPTION.
20. NOT USED
21. PROVIDE CASTCONNEX ART-12.75 + UPC-8.625 / ART-324 + UPC-219 AT TOP AND BOTTOM OF COLUMN.
22. PLAN LEGEND:

F.F.	DENOTES FINISH FLOOR
T/'X'	DENOTES TOP OF FTG., GRADE BEAM, SLAB, PIER, ETC.
B/'X'	DENOTES BOTTOM OF FTG., GRADE BEAM, ETC.
C.J.	DENOTES SLAB ON GRADE CONTROL/CONTRACTION JOINT
WF30 -20'-0"	DENOTES WALL FOOTING MARK & TOP OF FOOTING ELEVATION (SEE WALL FOOTING SCHEDULE)
PC24x24	DENOTES PRECAST CONCRETE COLUMN SIZE, IN INCHES.
N/A	NOT USED
CW16	DENOTES C.I.P. CONCRETE WALL MARK (SEE SCHEDULE)
PCW13	DENOTES PRECAST CONCRETE WALL MARK AND NOMINAL THICKNESS
S4	DENOTES 4" CONC. SLAB-ON-GRADE w/ FIBERFORCE 300 @ 1.5 LB/C.Y. (OR APPROVED EQUAL) & E5 SYSTEM BY SPECIFICATION PRODUCTS, INC. CONSISTING OF: E5 INTERNAL CURE ADMIXTURE @ 4 OZ/CWT & E5 CATALYST SPRAYED ON BETWEEN 800-1,000 SF/GAL OVER 15-MIL CLASS A VAPOR BARRIER OVER 6" COMPACTED GRANULAR FILL (INDOT No. 53)
S5	DENOTES 5" CONC. SLAB-ON-GRADE w/ FIBERFORCE 300 @ 1.5 LB/C.Y. (OR APPROVED EQUAL) & E5 SYSTEM BY SPECIFICATION PRODUCTS, INC. CONSISTING OF: E5 INTERNAL CURE ADMIXTURE @ 4 OZ/CWT & E5 CATALYST SPRAYED ON BETWEEN 800-1,000 SF/GAL OVER 15-MIL CLASS A VAPOR BARRIER OVER 6" COMPACTED GRANULAR FILL (INDOT No. 53)
	DENOTES UTILITY PIPE/CONDUIT TO RUN THROUGH FOUNDATION WALL. NOT ALL MAY BE SHOWN ON THIS DRAWING.
T/F -2'-0" T/F -4'-0" T/F -5'-0"	DENOTES W/ALL FOOTING WITH STEPS, REF. TYP. DETAIL ON S400 FOOTING STEPS SHOWN ON PLAN REQUIRE COORDINATION BETWEEN TRADES AND MAY REQUIRE ADJUSTMENT.
F5.0 -4'-8" P24 -0'-8"	DENOTES COLUMN FOOTING MARK & TOP OF FTG. ELEVATION (SEE FTG. SCHED.) DENOTES PIER MARK & TOP OF PIER ELEVATION (SEE PIER SCHED.)
DENOTES COLUMN SIZE (REF. FRAMING PLANS FOR STUB COL'S NOT ON FDNS)	COLUMN FOOTING, CONCRETE PIER, STEEL COLUMN

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810 N BROADWAY ST.
GREENFIELD, IN 46140

SCOTT A. CLORE, INC. REGISTERED PE10606154 STATE OF INDIANA PROFESSIONAL ENGINEER

REVISIONS:			
#	Date	Desc.	
7	06.09.22	BID PKG. #2 ADD #7	

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	DJL

FOUNDATION PLAN - UNIT L

S101L

K L C B A E D G F J H

N TRUE NORTH

PLOT DATE/TIME:6/9/2022 8:06:44 AM

⚠ FOUNDATION PLAN NOTES - CONTINUED

1. PLAN LEGEND:

S5R — DENOTES 5" CONC. SLAB-ON-GRADE w/ SPECIFICATION PRODUCTS ES X STEEL FIBERS @ 20 LB/C.Y. (OR APPROVED EQUAL) &
ES SYSTEM BY SPECIFICATION PRODUCTS, INC. CONSISTING OF:
ES INTERNAL CURE ADMIXTURE @ 4 OZ/CWT &
ES CATALYST SPRAYED ON BETWEEN 800-1,000 SF/GAL
OVER 15-MIL CLASS A VAPOR BARRIER
OVER 6" COMPACTED GRANULAR FILL (INDOT No. 53)

S8R — DENOTES 8" CONC. SLAB-ON-GRADE w/ SPECIFICATION PRODUCTS ES X STEEL FIBERS @ 20 LB/C.Y. (OR APPROVED EQUAL) &
ES SYSTEM BY SPECIFICATION PRODUCTS, INC. CONSISTING OF:
ES INTERNAL CURE ADMIXTURE @ 4 OZ/CWT &
ES CATALYST SPRAYED ON BETWEEN 800-1,000 SF/GAL
OVER 15-MIL CLASS A VAPOR BARRIER
OVER 6" COMPACTED GRANULAR FILL (INDOT No. 53)

FOUNDATION PLAN NOTES

1. REF. S001 & S002 FOR STRUCTURAL NOTES, DESIGN DATA & SCHEDULES.
2. ALL CONTRACTORS ARE REQUIRED TO COORDINATE THEIR WORK WITH ALL DISCIPLINES TO AVOID CONFLICTS. THE MECHANICAL, ELECTRICAL AND PLUMBING ASPECTS ARE NOT IN THE SCOPE OF THESE DRAWINGS. THEREFORE, ALL REQUIRED MATERIALS AND WORK MAY NOT BE INDICATED.
3. COORDINATE EXACT SIZE & LOCATION OF ALL MECHANICAL OPENINGS IN FOUNDATION WALLS WITH THE MECHANICAL, ELECTRICAL & PLUMBING CONTRACTORS.
4. ALL ELEVATIONS ARE REFERENCED FROM THE FIRST FLOOR FINISH FLOOR ELEVATION 0'-0" (U.S.G.S. 893.10). REF. CIVIL DWGS.
5. REF. ARCH. DRAWINGS FOR ALL DIMENSIONS NOT SHOWN. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES.
6. REF. S400 & S401 FOR TYPICAL FOUNDATION DETAILS.
7. NOTE: PERIMETER WALL AND COLUMN FOOTINGS SHALL BE LOWERED AND/OR SLEEVED TO PASS BELOW PLUMBING LINES (I.E. SANITARY & STORM SEWERS, WATER LINES, ETC.) SHOWN ON THE PLUMBING DRAWINGS. PROVIDE FOOTING STEPS AS REQUIRED PER THE TYPICAL DETAILS ON S400.
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12. COLUMN FOOTINGS SUPPORTING MORE THAN ONE COLUMN SHALL BE CENTERED AT THE MIDPOINT BETWEEN THE COLUMNS, UNLESS NOTED OTHERWISE ON PLAN.
13. NOT USED
14. PROVIDE CONTINUOUS 4" H. x W. VARIES CONCRETE CURB ON ACOUSTIC ISOLATION SLABS IN MECHANICAL ROOMS. CURBS TO SURROUND ALL PENETRATIONS THRU SLAB INCLUDING COLUMNS, PIPES, SUMP PITS, ETC.
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16. PROVIDE THICKENED SLAB UNDER ALL INTERIOR CMU WALLS WITHOUT FOOTINGS. SEE S401 FOR THICKENED SLAB DETAIL. LAYOUT THICKENED SLABS FROM DIMENSIONS ON THE ARCHITECT FLOOR PLANS.
17. PROVIDE CONTROL/CONTRACTION JOINTS IN SLABS ON GRADE (REF. THE TYPICAL DETAILS ON SHEET S401). ALL JOINTS IN SLABS TO RECEIVE THIN OR THICK-SET TERRAZZO, CERAMIC OR PORCELAIN TILE, VINYL-COMPOSITION TILE (VCT) OR VINYL SHEET GOODS, EPOXY OR SIMILAR THIN-FILM FINISH FLOORING SHALL BE CAREFULLY COORDINATED WITH THE FLOORING CONTRACTOR. THE CONTRACTOR SHALL SUBMIT SLAB JOINT LAYOUT TO ARCHITECT/ENGINEER FOR REVIEW PRIOR TO PLACING SLABS.
18. WHERE PIERS OCCUR WITHIN A LARGER ARCH. PILASTER OR COLUMN ENCLOSURE (FOR EG. POA's WITH 40" SQUARE CANOPY PILASTERS) PROVIDE PIER REINF. CAGE CENTERED ON THE GRID INTERSECTION. FORM OVERALL PIER TO PROFILE OF THE ARCHITECTURAL PILASTER OR COLUMN ENCLOSURE. LAYOUT PILASTERS FROM DIMENSIONS ON THE ARCHITECTURAL PLANS & DETAILS.
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20. NOT USED
21. PROVIDE CASTCONNEX ART-12.75 + UPC-8.625 / ART-324 + UPC-219 AT TOP AND BOTTOM OF COLUMN.
22. PLAN LEGEND:

F.F.	DENOTES FINISH FLOOR
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PC24x24	DENOTES PRECAST CONCRETE COLUMN SIZE, IN INCHES.
N/A	NOT USED
CW16	DENOTES C.I.P. CONCRETE WALL MARK (SEE SCHEDULE)
PCW13	DENOTES PRECAST CONCRETE WALL MARK AND NOMINAL THICKNESS
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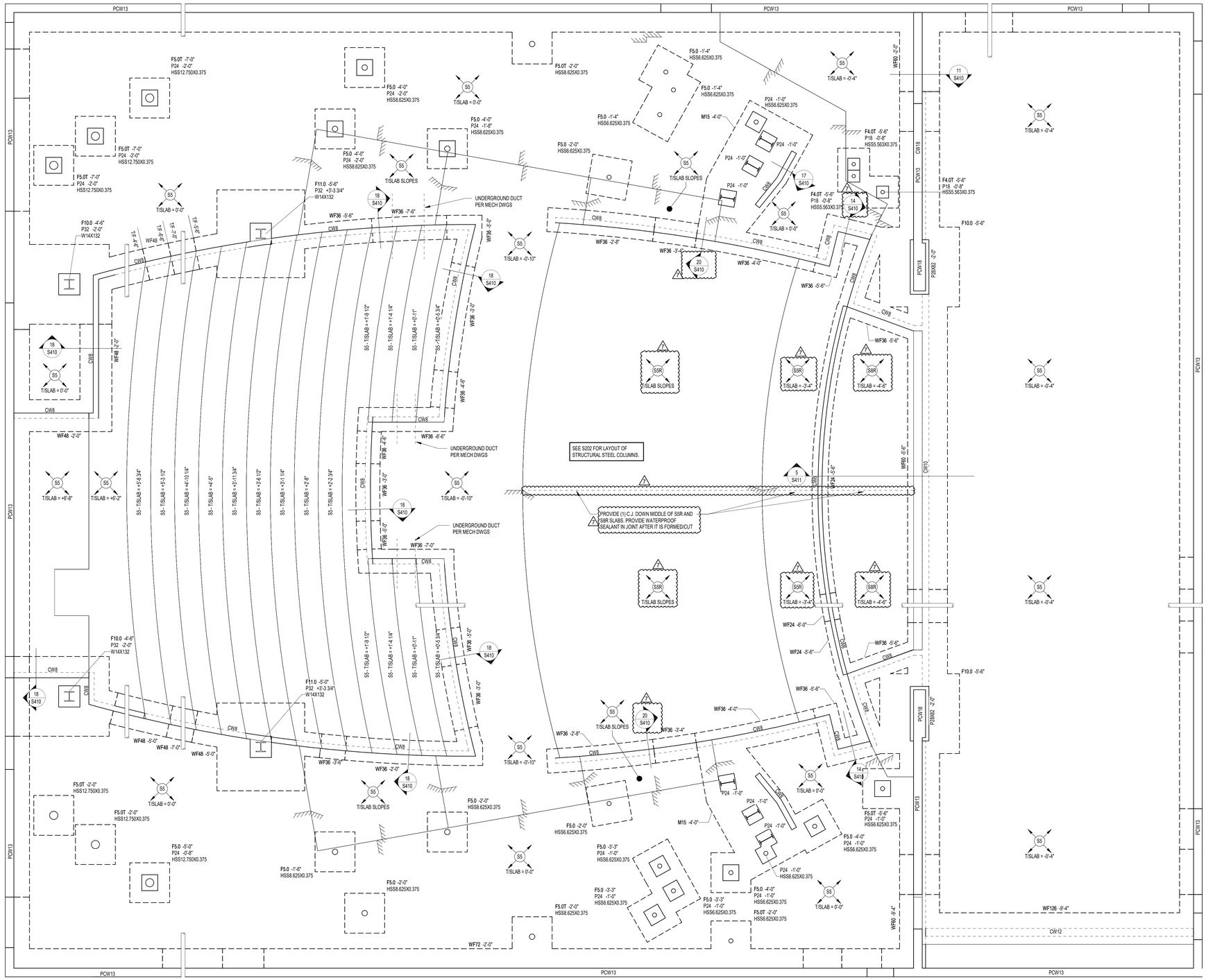
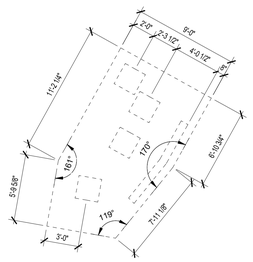
	DENOTES UTILITY PIPE/CONDUIT TO RUN THROUGH FOUNDATION WALL. NOT ALL MAY BE SHOWN ON THIS DRAWING.
TF -2'-8" TF -4'-0" TF -5'-3"	DENOTES WALL FOOTING WITH STEPS, REF. TYP. DETAIL ON S400 FOOTING STEPS SHOWN ON PLAN REQUIRE COORDINATION BETWEEN TRADES AND MAY REQUIRE ADJUSTMENT.
DENOTES COLUMN SIZE (REF. FRAMING PLANS FOR STUB COL'S NOT ON FDNS)	F5.0 -4'-6" P24 -0'-8" — DENOTES COLUMN FOOTING MARK & TOP OF FTG. ELEVATION (SEE FTG. SCHED.); DENOTES PIER MARK & TOP OF PIER ELEVATION (SEE PIER SCHED.)
	COLUMN FOOTING
	CONCRETE PIER
	STEEL COLUMN



1 ENLARGED AUDITORIUM FOUNDATION PLAN
3/16" = 1'-0"



2 M15 DIMENSION PLAN
3/16" = 1'-0"

LANCER + BEEBE, LLC
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220 N. COLLEGE AVE
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GREENFIELD, IN 46140

SCOTT A. CLOSE — REGISTERED — PE10606154 — STATE OF INDIANA — PROFESSIONAL ENGINEER

REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD #7

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: DJL

ENLARGED AUDITORIUM FOUNDATION PLAN

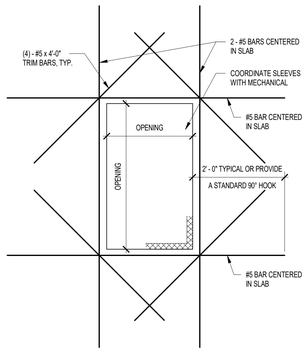
S201

K L C B A E D G F J H

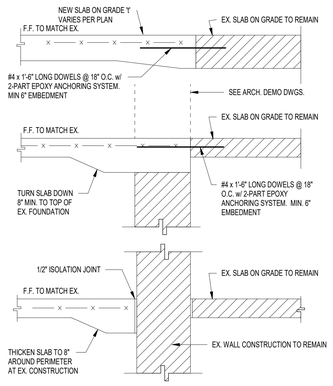
TRUE NORTH

PLOT DATE/TIME:6/6/2022 3:53:25 PM

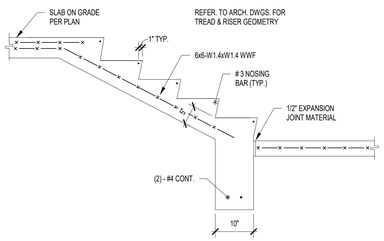
NOTES:
1. IF BARS CANNOT BE PLACED AS DETAILED, REPLACE THE 2'-0" EXTENSION WITH 6" AND A STANDARD HOOK.
2. COORDINATE FINAL LOCATION OF MECHANICAL PENETRATIONS WITH MECHANICAL CONTRACTOR BEFORE INSTALLATION OF THE REINFORCING.
3. THIS DETAIL APPLIES TO ALL OPENINGS IN SLABS ON GRADE UNLESS OTHERWISE NOTED ON THE PLANS.



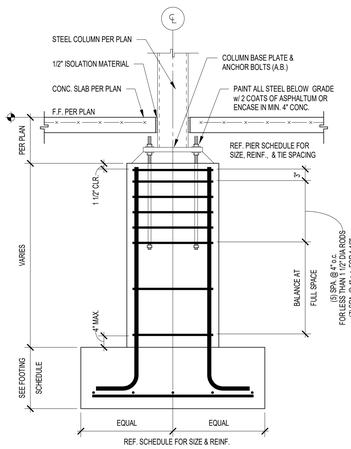
15 SLAB ON GRADE MECH. OPENING
3/4" = 1'-0"



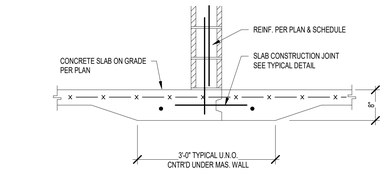
14 NEW-TO-EXISTING SLAB DETAIL
3/4" = 1'-0"

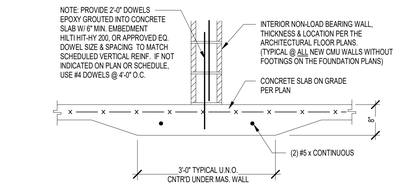


13 TYPICAL CONCRETE STAIR DETAIL
3/4" = 1'-0"

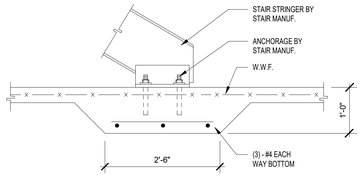


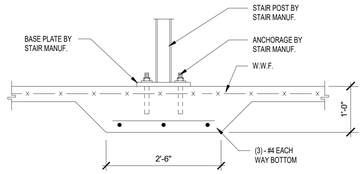
12 TYPICAL CONCRETE PIER REINFORCING
3/4" = 1'-0"



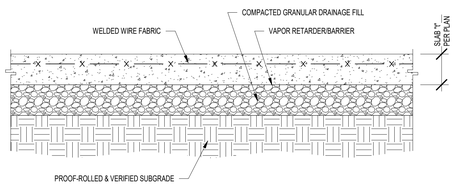


11 THICKENED SLAB DETAILS
3/4" = 1'-0"



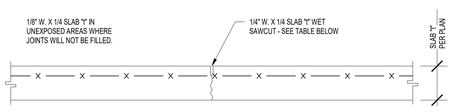


10 THICKENED SLAB AT STAIR POSTS
3/4" = 1'-0"



1. LOCATE WELDED WIRE FABRIC IN UPPER THIRD OF SLAB. SUPPORT ON BOLSTERS, CHAIRS, OR CONCRETE BRICKS.
2. LAP WELDED WIRE FABRIC A MIN. OF ONE FULL MESH SPACING.
3. THE USE OF NYLON OR POLYPROPYLENE FIBER IN LIEU OF WELDED WIRE FABRIC AS A SECONDARY REINFORCEMENT IS PERMISSIBLE, UNLESS OTHERWISE NOTED. NOTE: FIBER MAY NOT BE SUBSTITUTED FOR W.W.F. IN SUPPORTED SLABS.
4. SEE PLAN, NOTES, AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS SUCH AS FINISH, JOINTING, CURING, ETC.

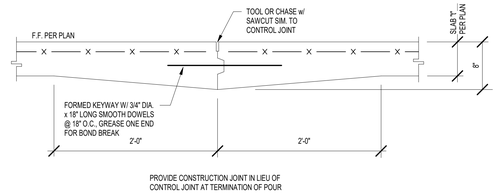
9 SLAB ON GRADE CONSTRUCTION
1" = 1'-0"



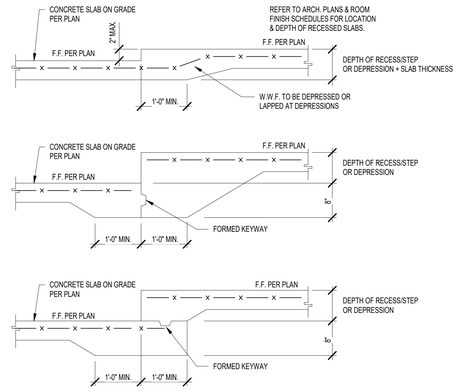
CONTROL JOINTS SHALL BE SAWN NOT LATER THAN THE FOLLOWING TABLE, OR 16 HOURS AFTER FINAL TROWELING (WHICHEVER IS LESS). WHERE TEMP EQUALS THE AMBIENT TEMPERATURE IN DEGREES FAHRENHEIT AT THEN TIME OF FINAL TROWELING. SAWCUTTING SHALL BE SUSPENDED ONLY IF THE LARGE AGGREGATE IS DISLODGED OR LOOSENED. ALTERNATE: USE PRE-FORMED JOINT FORMER.

TEMP. F°	TIME, HOURS
< 40°	16
50°	14
60°	8 1/2
70°	5 1/2
80°	4
90°	3

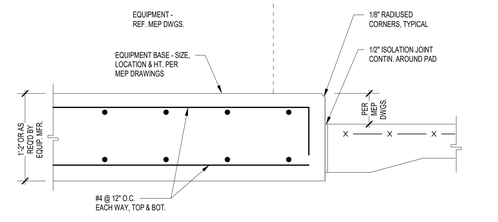
8 SLAB CONTROL/CONTRACTION JOINT
1" = 1'-0"



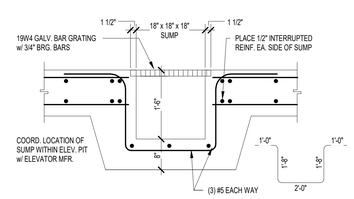
7 SLAB CONSTRUCTION JOINT
1" = 1'-0"



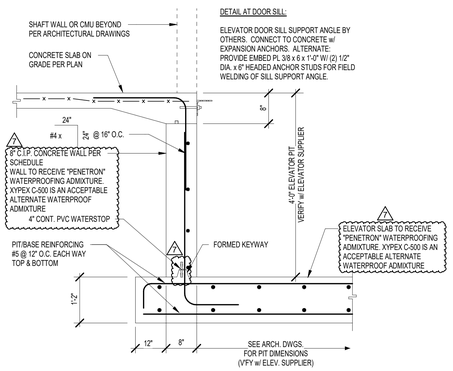
6 RECESSED SLAB DETAIL
3/4" = 1'-0"



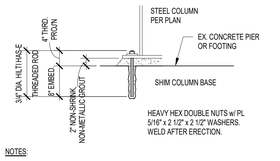
5 MECHANICAL EQUIPMENT PAD
1" = 1'-0"



4 ELEVATOR SUMP PIT DETAIL
3/4" = 1'-0"

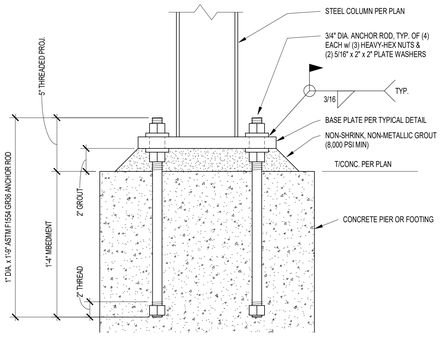


3 ELEVATOR PIT DETAIL - C.I.P.
3/4" = 1'-0"

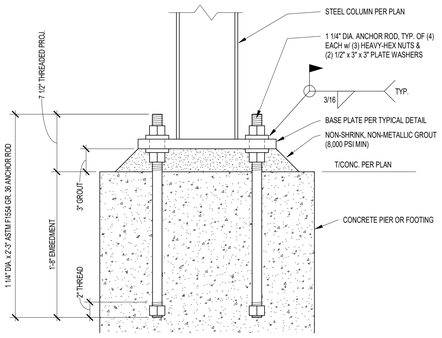


NOTES:
1. DRILL & GROUT THREADED ANCHOR RODS SOLIDLY INTO EX. CONCRETE USING HILTI HIT-HY 200, OR APPROVED 2-PART EPOXY ANCHORING SYSTEM.
2. WHERE COLUMNS ARE TO BE INSTALLED BETWEEN TWO FIXED ELEVATIONS, SUCH AS BETWEEN THE BOTTOM OF AN EXISTING BEAM AND THE TOP OF AN EXISTING FOUNDATION, THE ANCHORS MAY BE INSTALLED AFTER THE COLUMN IS TEMPORARILY SET IN PLACE. IT IS THE RESPONSIBILITY OF THE STEEL ERECTOR TO ADEQUATELY BRACE THE COLUMN UNTIL THE ANCHOR BOLTS CAN BE INSTALLED AND TIGHTENED.
3. THIS DETAIL SHALL BE USED ONLY FOR CONNECTION OF COLUMNS TO EXISTING FOUNDATIONS AND NOT FOR NEW COLUMNS SUPPORTED ON NEW FOUNDATIONS.

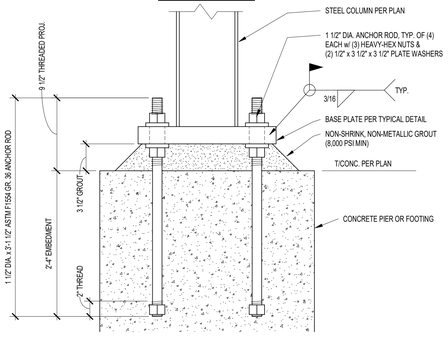
2 3/4" DIA. ANCHOR BOLTS TO EX. FOUNDATIONS
3/4" = 1'-0"



3/4" DIAMETER



1 1/4" DIAMETER



1 1/2" DIAMETER

NOTES:
1. LOCATION OF ANCHOR BOLTS MUST NOT VARY MORE THAN 1/8" CENTER-TO-CENTER OF ANY TWO BOLTS WITHIN AN ANCHOR BOLT GROUP.
2. HOLD MAX. DEVIATION OF 1/4", CENTER-TO-CENTER OF ADJACENT ANCHOR BOLT GROUPS.
3. HOLD ELEVATION OF THE TOP OF THE ANCHOR BOLTS TO +/- 1/2 INCH.
4. HOLD MAXIMUM DEVIATION OF 1/4" FROM THE CENTER OF ANY ANCHOR BOLT GROUP TO THE ESTABLISHED COLUMN LINE THROUGH THAT GROUP.
5. REFER TO THE AISC CODE OF STANDARD PRACTICE FOR ADDITIONAL INFORMATION.

1 ANCHOR ROD DETAILS
1 1/2" = 1'-0"

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PROJECT:	#21107
DATE:	05.20.2022
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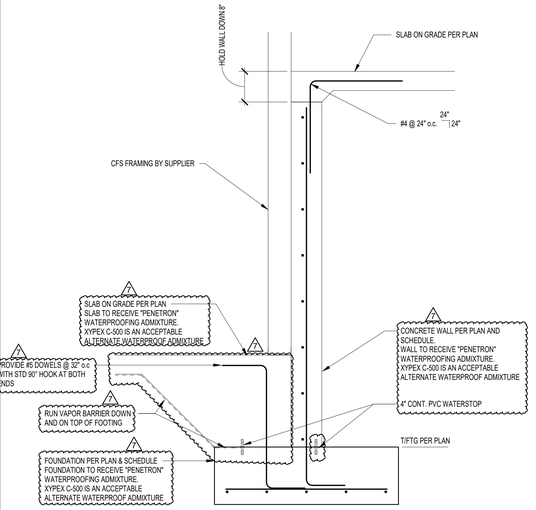
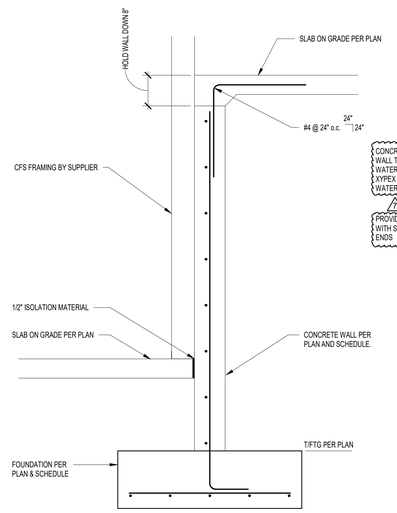
TYPICAL FOUNDATION DETAILS

S401

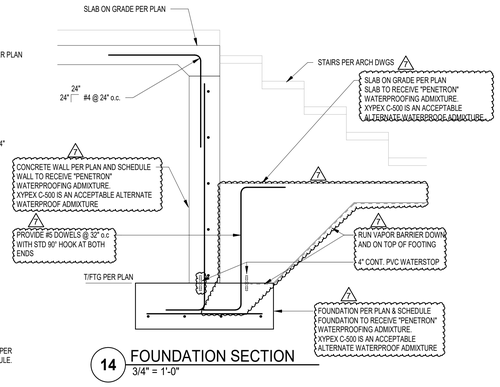
PLOT DATE/TIME:6/6/2022 3:53:26 PM



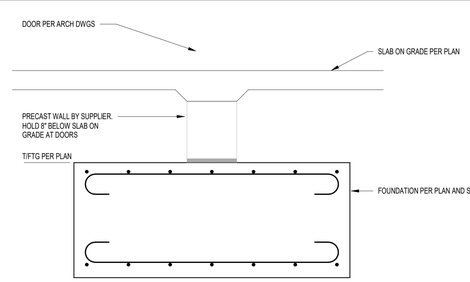
20 FOUNDATION SECTION
3/4" = 1'-0"



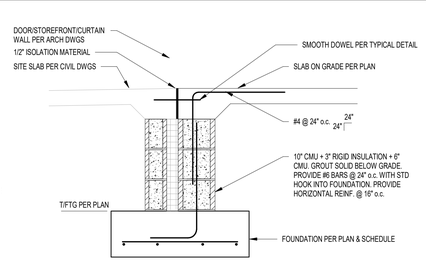
18 FOUNDATION SECTION
3/4" = 1'-0"



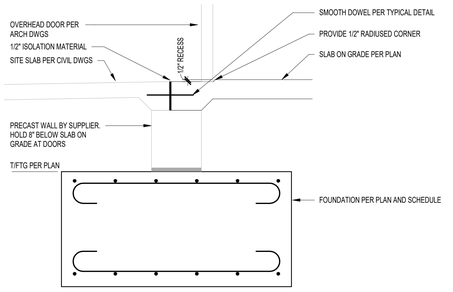
14 FOUNDATION SECTION
3/4" = 1'-0"



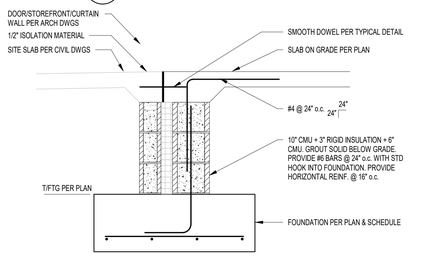
10 FOUNDATION SECTION
3/4" = 1'-0"



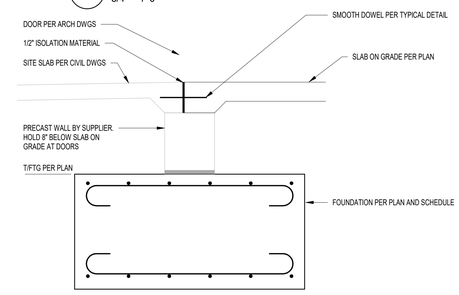
5 FOUNDATION SECTION
3/4" = 1'-0"



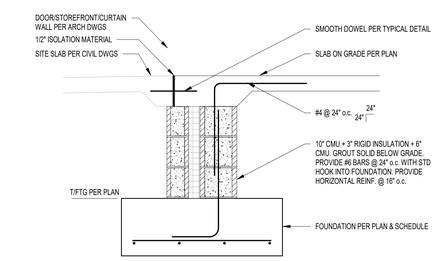
9 FOUNDATION SECTION
3/4" = 1'-0"



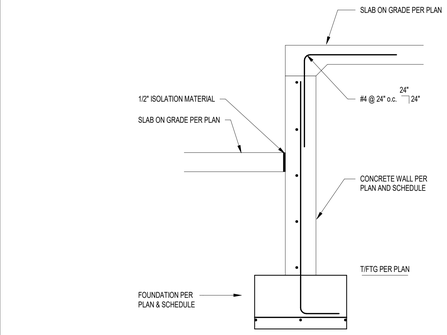
4 FOUNDATION SECTION
3/4" = 1'-0"



8 FOUNDATION SECTION
3/4" = 1'-0"



3 FOUNDATION SECTION
3/4" = 1'-0"



19 FOUNDATION SECTION
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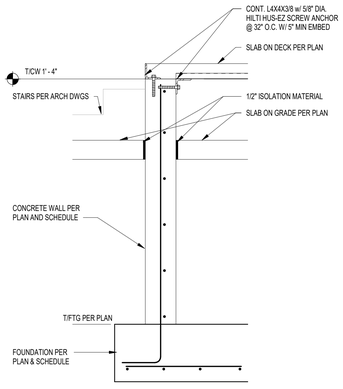
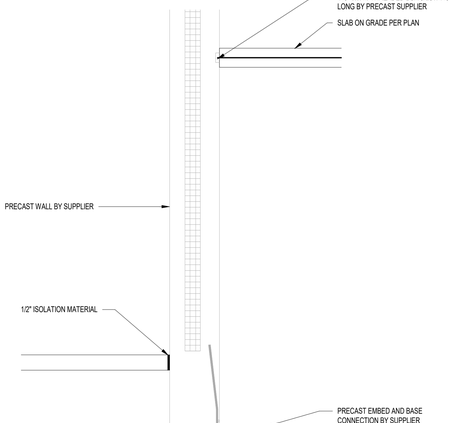
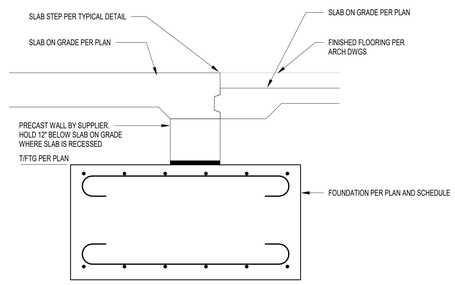


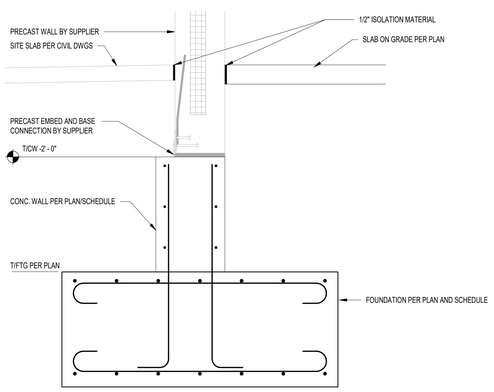
17 FOUNDATION SECTION
3/4" = 1'-0"



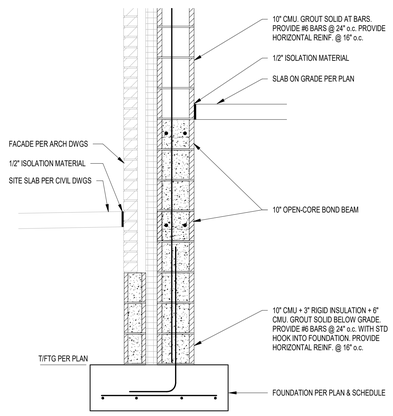
13 FOUNDATION SECTION
3/4" = 1'-0"



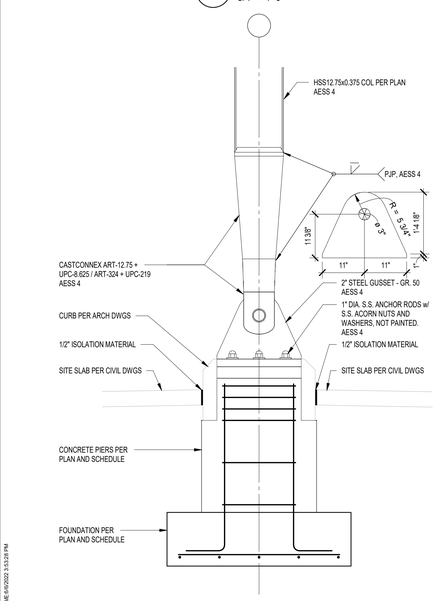
12 FOUNDATION SECTION
3/4" = 1'-0"



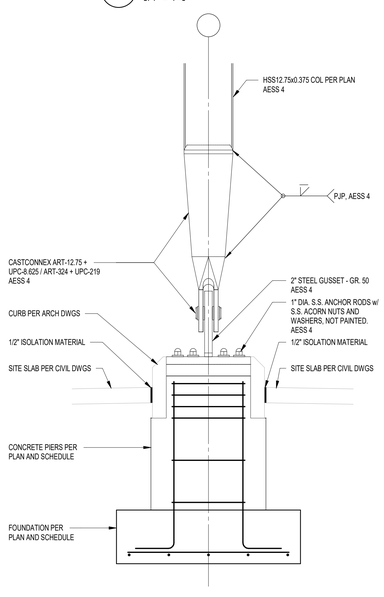
7 FOUNDATION SECTION
3/4" = 1'-0"



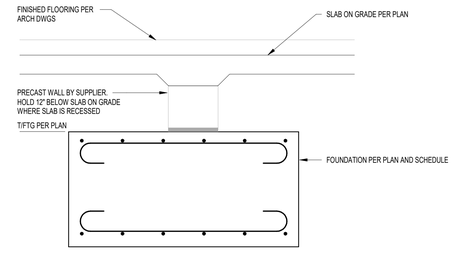
2 FOUNDATION SECTION
3/4" = 1'-0"



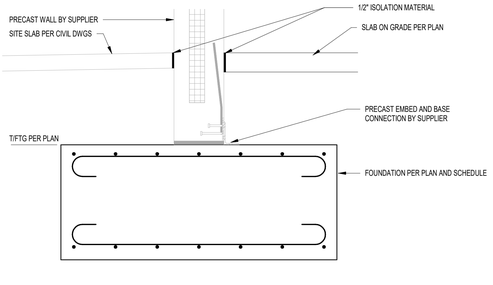
16 FOUNDATION SECTION
3/4" = 1'-0"



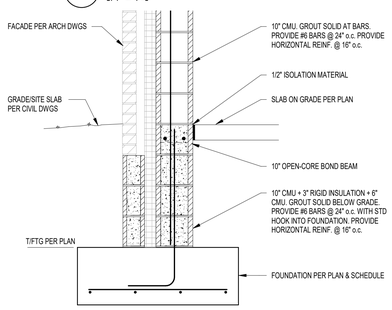
15 FOUNDATION SECTION
3/4" = 1'-0"



11 FOUNDATION SECTION
3/4" = 1'-0"



6 FOUNDATION SECTION
3/4" = 1'-0"



1 FOUNDATION SECTION
3/4" = 1'-0"

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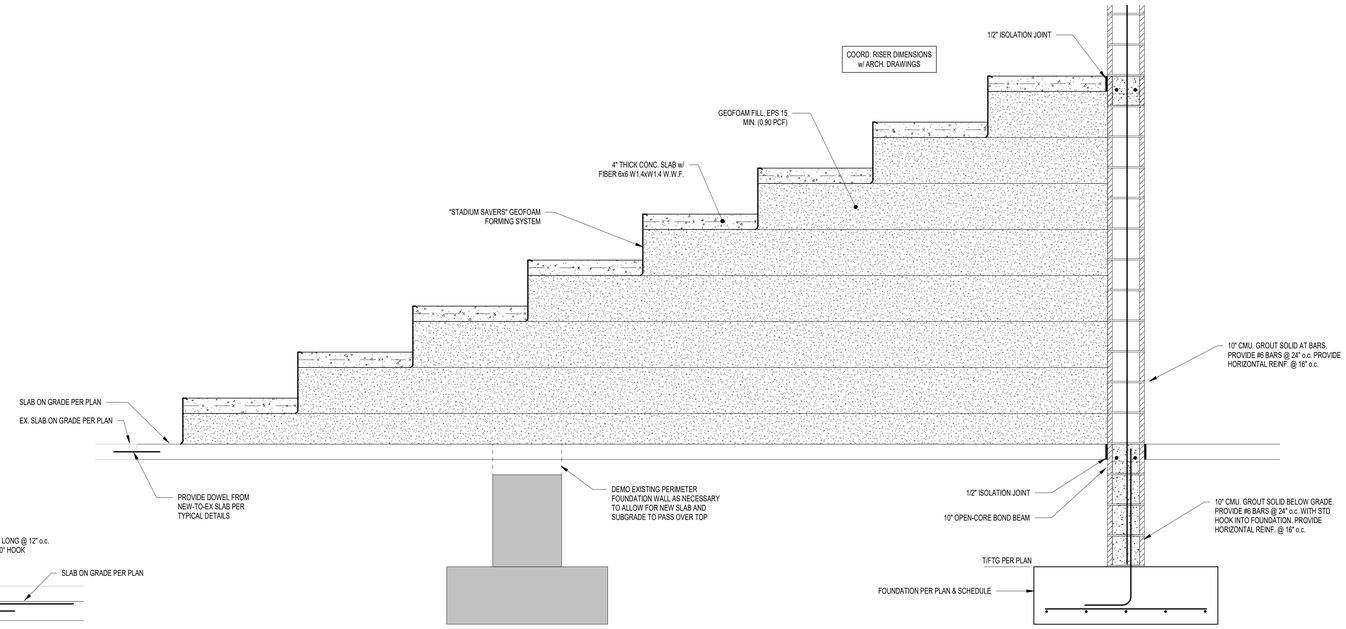
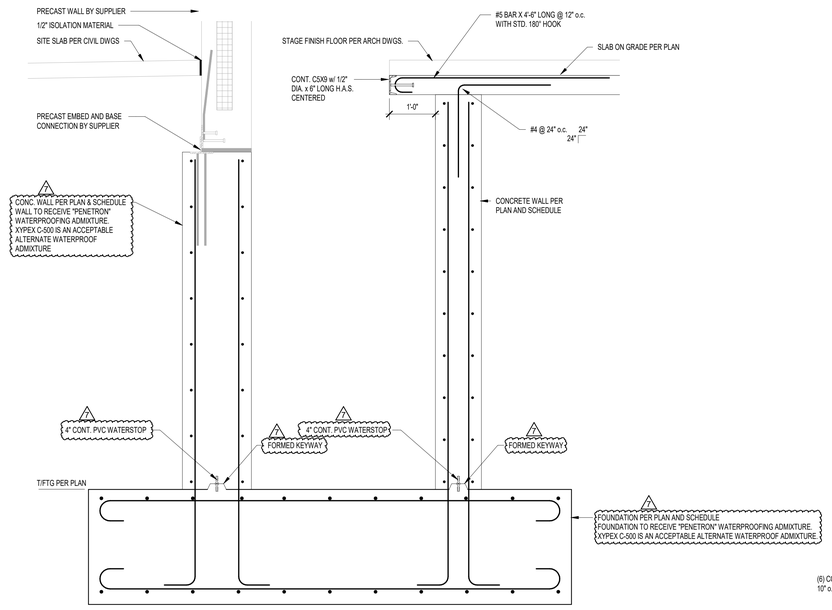
FOUNDATION SECTIONS

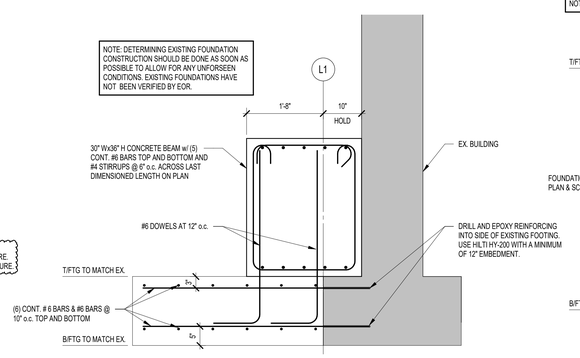
S410



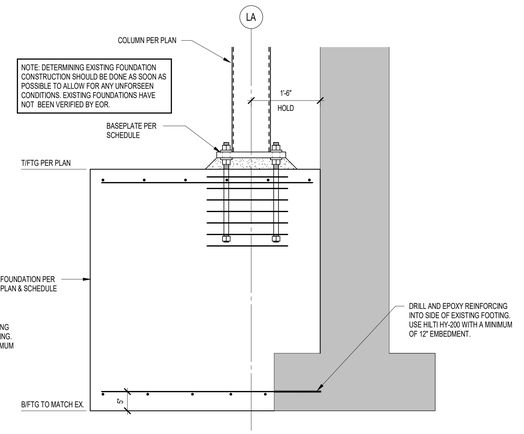
7 FOUNDATION SECTION
3/4" = 1'-0"



6 FOUNDATION SECTION
3/4" = 1'-0"



4 FOUNDATION SECTION
3/4" = 1'-0"



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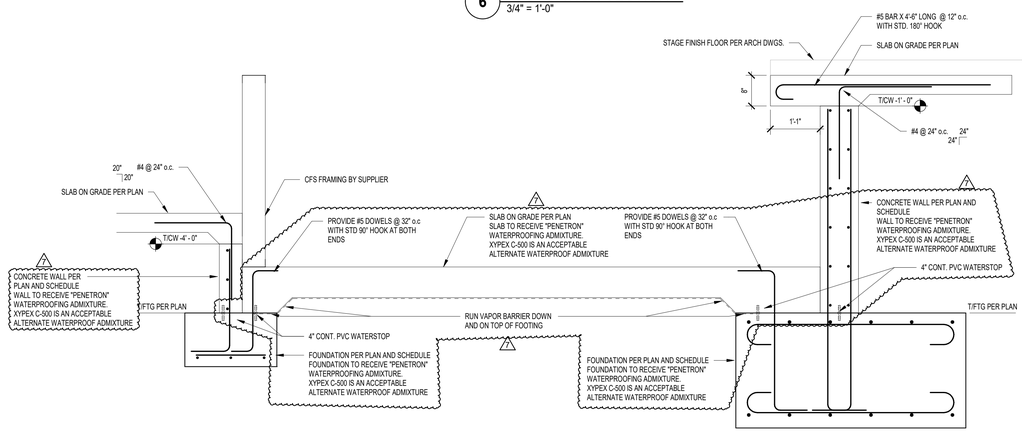
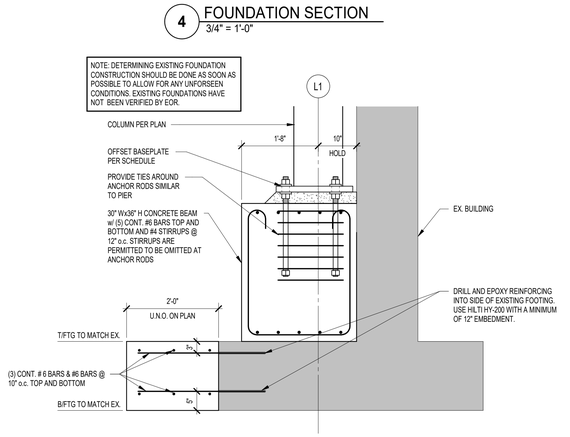


5 FOUNDATION SECTION
3/4" = 1'-0"



3 FOUNDATION SECTION
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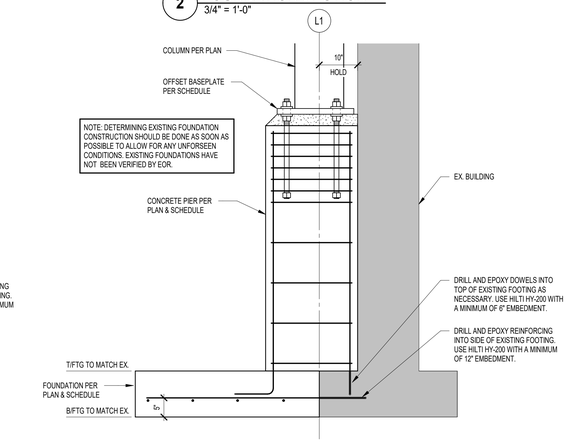

1 FOUNDATION SECTION
3/4" = 1'-0"

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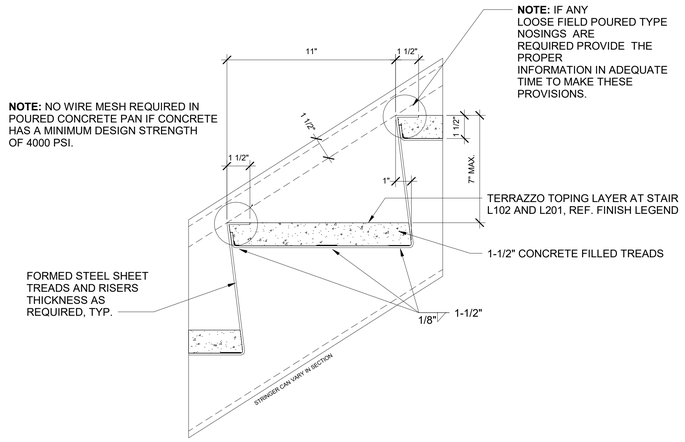
FOUNDATION SECTIONS

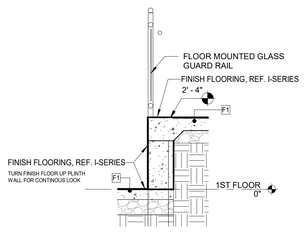
S411

PLOT DATE/TIME: 6/6/2022 3:53:29 PM



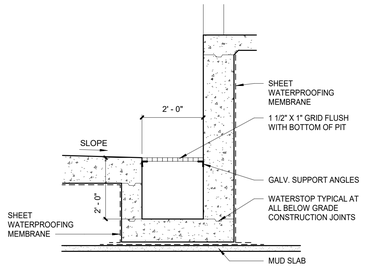
10 TYPICAL CONCRETE FILLED METAL PAN TREAD/RISER

SCALE: 3" = 1'-0" REF. 1 / A401



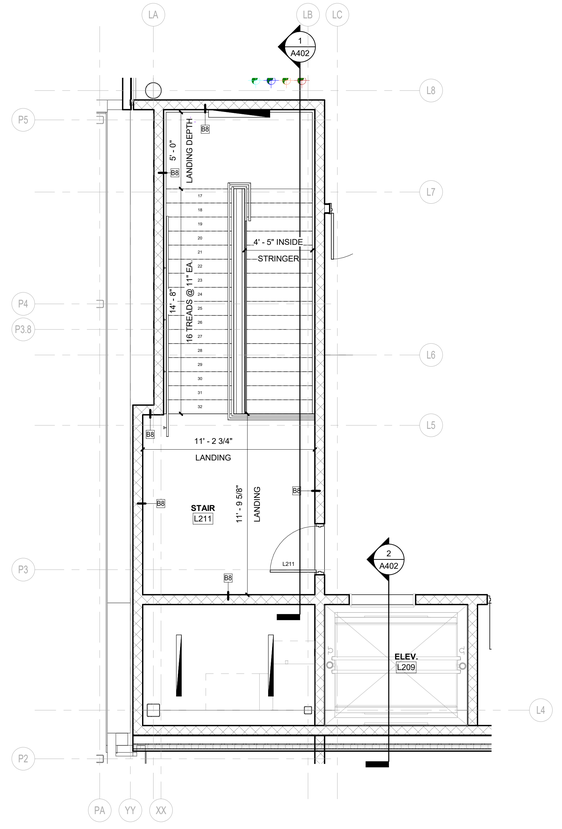
9 STAIR SECTION - PLINTH DETAIL

SCALE: 1/2" = 1'-0" REF. 5 / A401



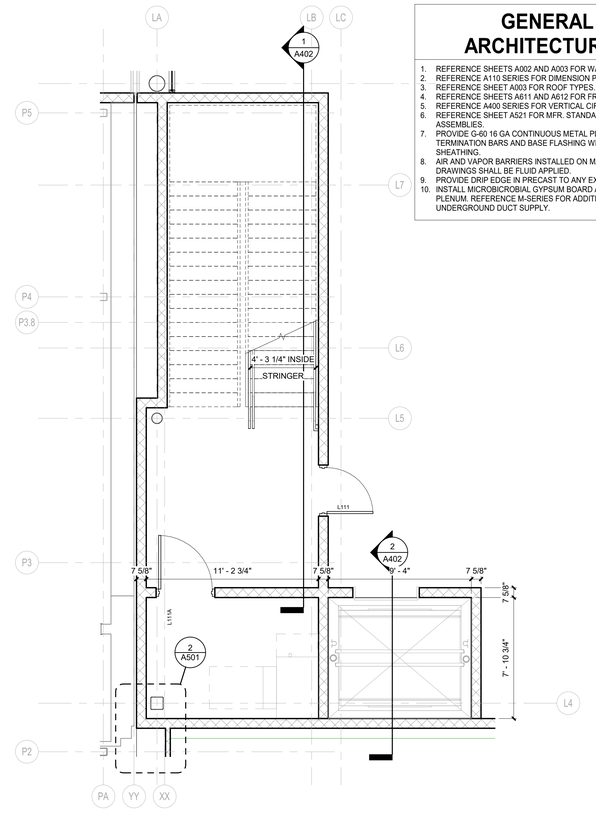
8 ELEVATOR PIT SECTION AT SUMP

SCALE: 1/2" = 1'-0"



7 ENLARGED FLOOR PLAN

SCALE: 1/4" = 1'-0" REF. 1 / A112L

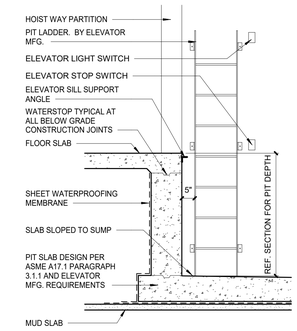


6 ENLARGED FLOOR PLAN

SCALE: 1/4" = 1'-0" REF. 1 / A101L

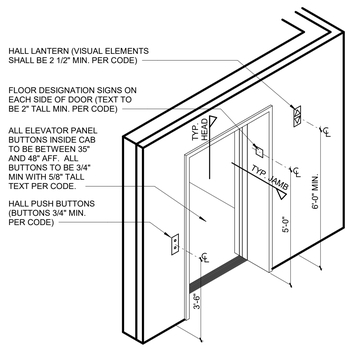
GENERAL NOTES - ARCHITECTURAL DETAILS

1. REFERENCE SHEETS A002 AND A003 FOR WALL TYPES INDICATED BY WALL TYPE TAGS.
2. REFERENCE A110 SERIES FOR DIMENSION PLANS.
3. REFERENCE SHEET A003 FOR ROOF TYPES.
4. REFERENCE SHEETS A611 AND A612 FOR FRAMING AND GLAZING TYPES.
5. REFERENCE A400 SERIES FOR VERTICAL CIRCULATION DETAILS.
6. REFERENCE SHEET A521 FOR MFR. STANDARD DETAILS FOR EXPANSION JOINT ASSEMBLIES.
7. PROVIDE G-60 16 GA CONTINUOUS METAL PLATE BEHIND TRANSITION STRIPS, TERMINATION BARS AND BASE FLASHING WHEN ANCHORING THROUGH GYPSUM SHEATHING.
8. AIR AND VAPOR BARRIERS INSTALLED ON MASONRY WALLS WHERE INDICATED ON DRAWINGS SHALL BE FLUID APPLIED.
9. PROVIDE DRIP EDGE IN PRECAST TO ANY EXTERIOR DOOR OPENINGS.
10. INSTALL MICROBICROBIAL GYPSUM BOARD AT ALL WALLS BEING USED AS AN AIR PLENUM. REFERENCE M-SERIES FOR ADDITIONAL DETAILS AND LOCATIONS OF UNDERGROUND DUCT SUPPLY.



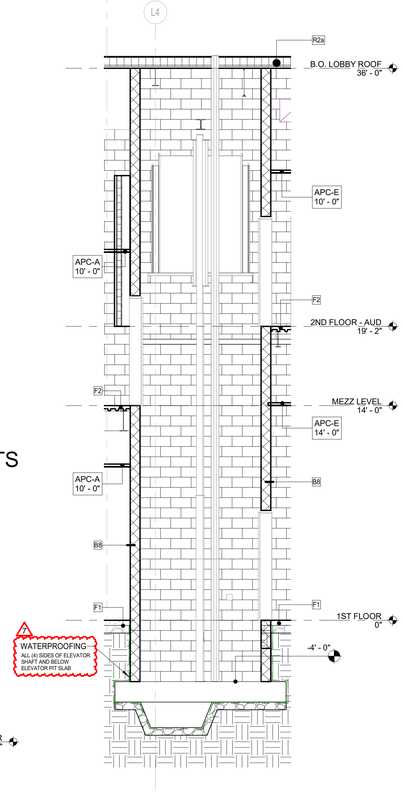
5 ELEVATOR PIT SECTION

SCALE: 1/2" = 1'-0"



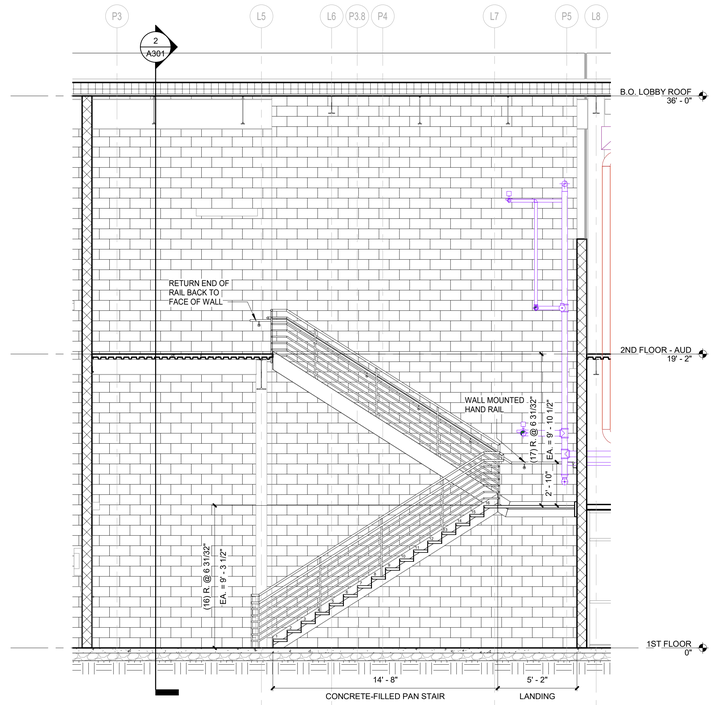
4 ENTRY AND MOUNTING HEIGHTS

SCALE: 3/8" = 1'-0"



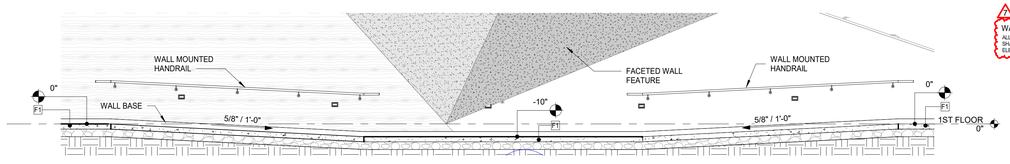
2 ELEVATOR SECTION

SCALE: 1/4" = 1'-0" REF. 6 / A402



1 STAIR SECTION

SCALE: 1/4" = 1'-0" REF. 2 / A202



3 RAMP SECTION

SCALE: 1/4" = 1'-0" REF. 1 / A111L

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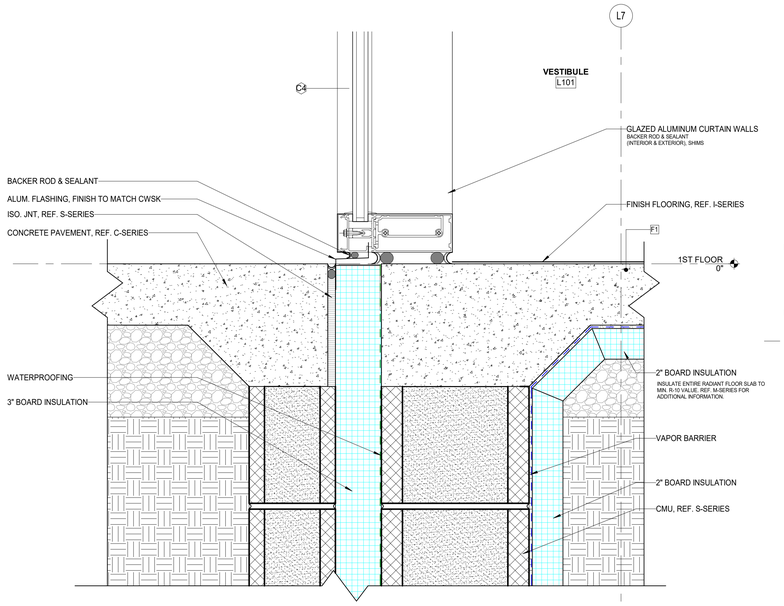
VERTICAL CIRCULATION

A402

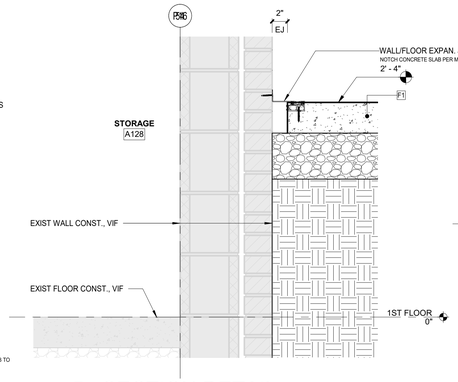
PLOT DATE/TIME:6/9/2022 3:03:34 PM

GENERAL NOTES - ARCHITECTURAL DETAILS

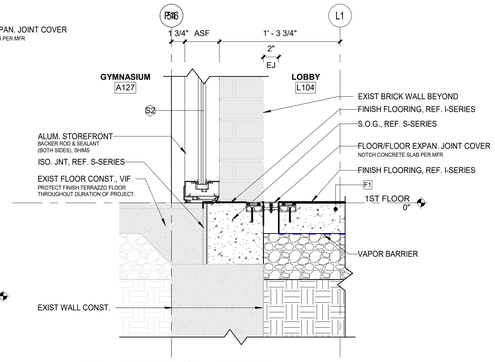
1. REFERENCE SHEETS A002 AND A003 FOR WALL TYPES INDICATED BY WALL TYPE TAGS.
2. REFERENCE A110 SERIES FOR DIMENSION PLANS.
3. REFERENCE SHEET A003 FOR ROOF TYPES.
4. REFERENCE SHEETS A611 AND A612 FOR FRAMING AND GLAZING TYPES.
5. REFERENCE A400 SERIES FOR VERTICAL CIRCULATION DETAILS.
6. REFERENCE SHEET A521 FOR MFR. STANDARD DETAILS FOR EXPANSION JOINT ASSEMBLIES.
7. PROVIDE G-60 16 GA CONTINUOUS METAL PLATE BEHIND TRANSITION STRIPS, TERMINATION BARS AND BASE FLASHING WHEN ANCHORING THROUGH GYPSUM SHEATHING.
8. AIR AND VAPOR BARRIERS INSTALLED ON MASONRY WALLS WHERE INDICATED ON DRAWINGS SHALL BE FLUID APPLIED.
9. PROVIDE DRIP EDGE IN PRECAST TO ANY EXTERIOR DOOR OPENINGS.
10. INSTALL MICROBICROBIAL GYPSUM BOARD AT ALL WALLS BEING USED AS AN AIR PLENUM. REFERENCE M-SERIES FOR ADDITIONAL DETAILS AND LOCATIONS OF UNDERGROUND DUCT SUPPLY.



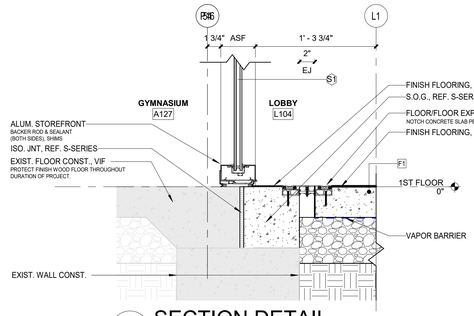
12 SECTION DETAIL
SCALE: 3" = 1'-0" REF. 1 / A312



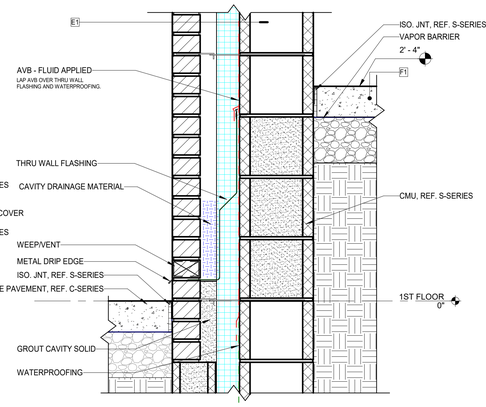
10 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 3 / A313



11 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 5 / A313

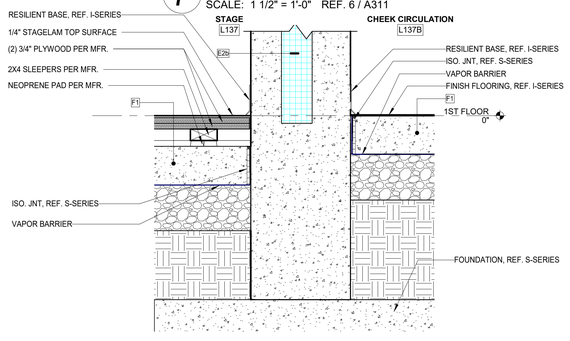


9 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 4 / A313



8 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 1 / A313

7 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 6 / A311



4 SECTION DETAIL
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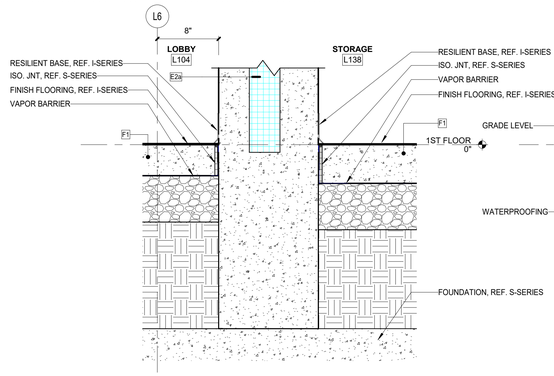
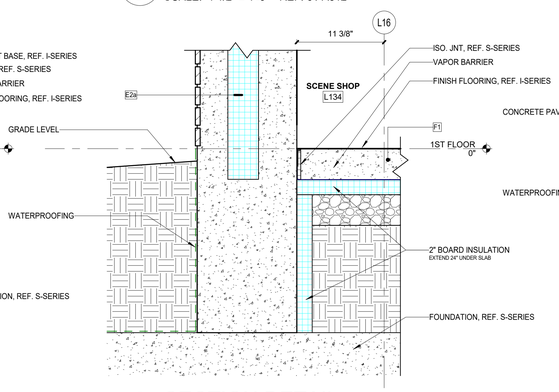
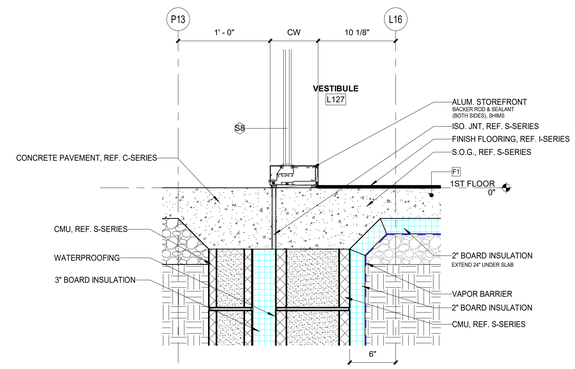


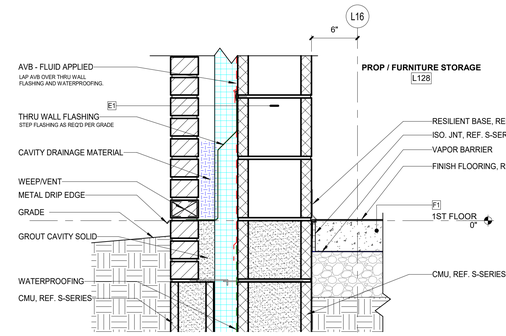
3 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 2 / A311



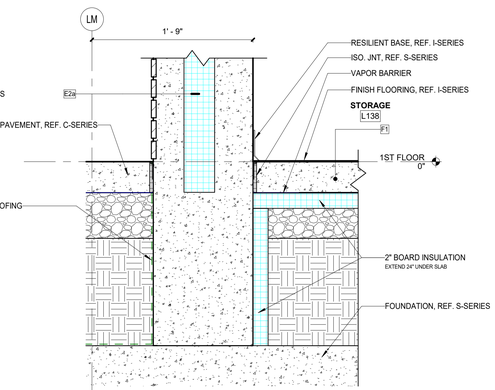
2 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 7 / A311



6 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 6 / A312



5 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 8 / A311



1 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 1 / A311

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REGISTERED
07001164
STATE OF INDIANA
ARCHITECT

REVISIONS:		
#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: KH/BM

SECTION DETAILS

A511

PLOT DATE/TIME:6/9/2022 3:59:41 PM

GENERAL NOTES - ARCHITECTURAL DETAILS

1. REFERENCE SHEETS A002 AND A003 FOR WALL TYPES INDICATED BY WALL TYPE TAGS.
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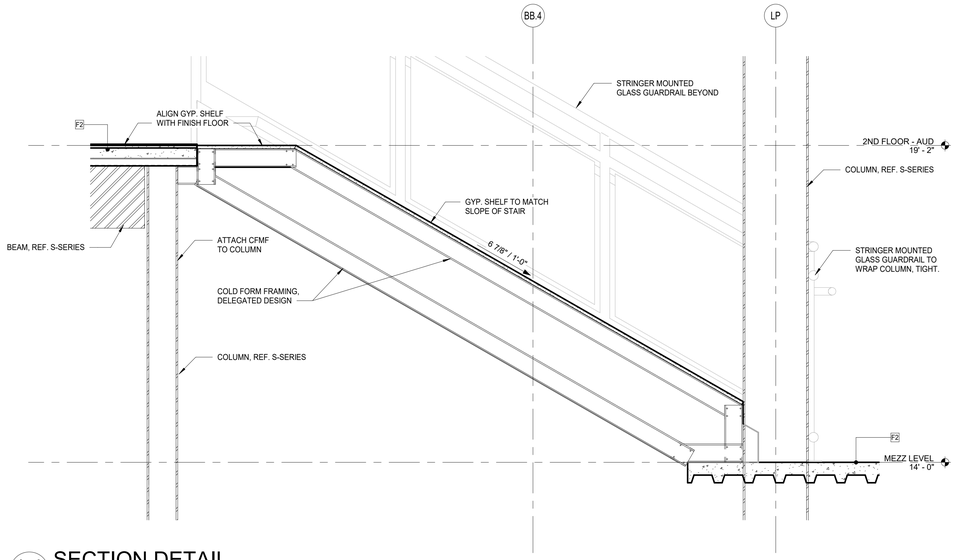
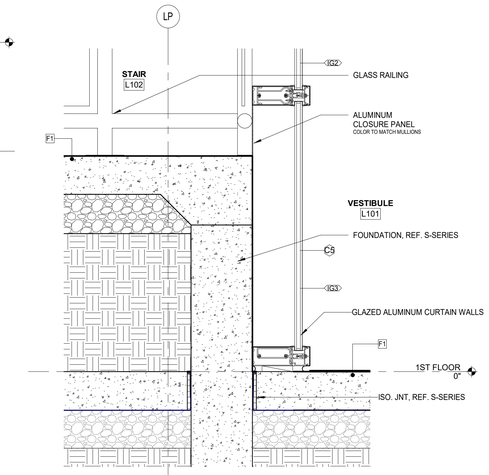
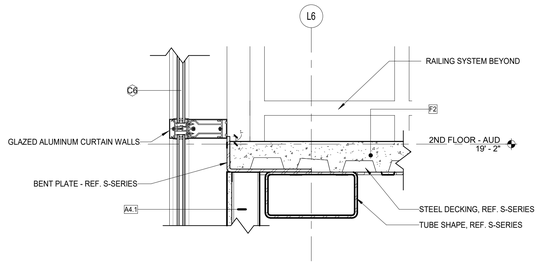


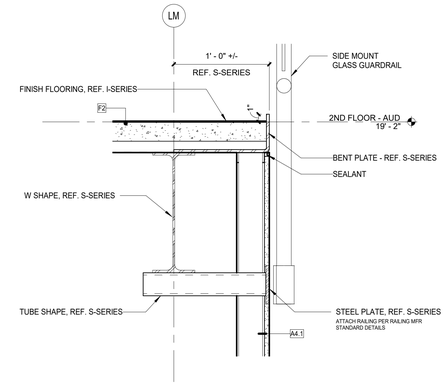
11 SECTION DETAIL
SCALE: 1" = 1'-0" REF. 3 / A313



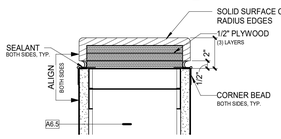
8 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 5 / A401



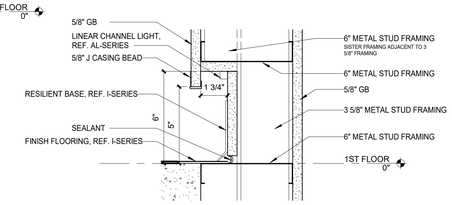
10 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 2 / A202



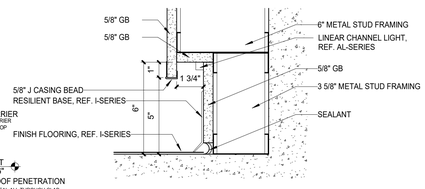
9 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 6 / A314



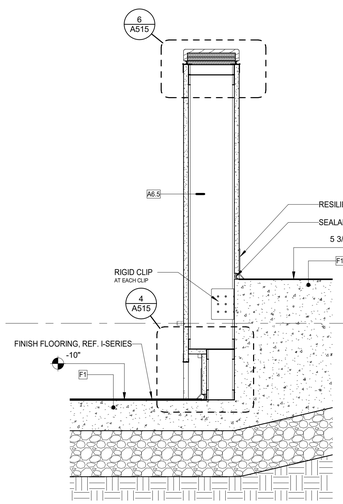
6 SOLID SURFACE WALL CAP DETAIL
SCALE: 3" = 1'-0" REF. 2 / A515



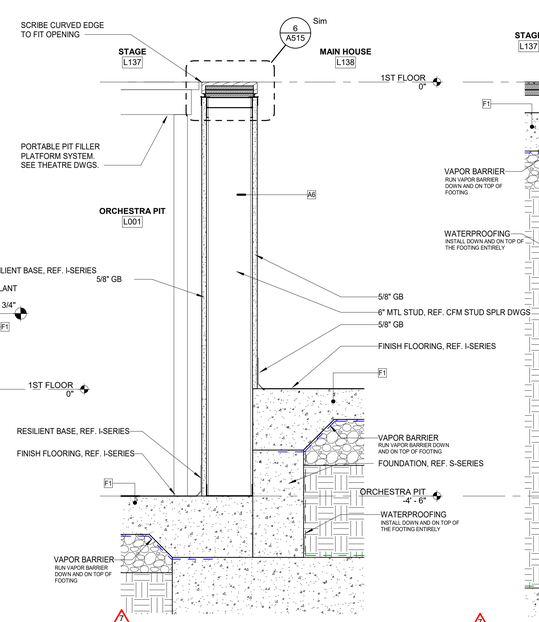
5 RECESSED TOE KICK DETAIL
SCALE: 3" = 1'-0" REF. 7 / A515



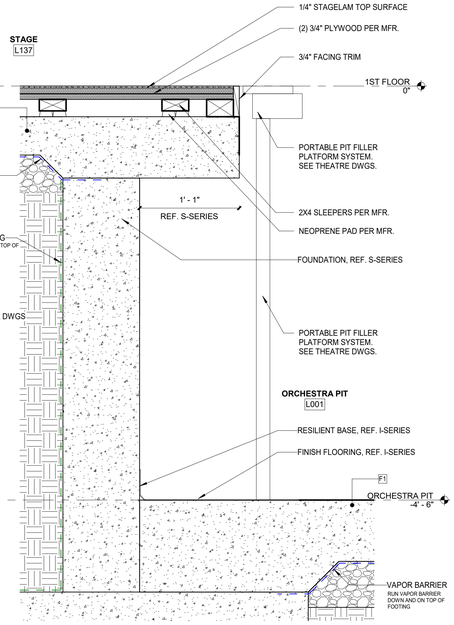
4 RECESSED TOE KICK DETAIL
SCALE: 3" = 1'-0" REF. 3 / A515



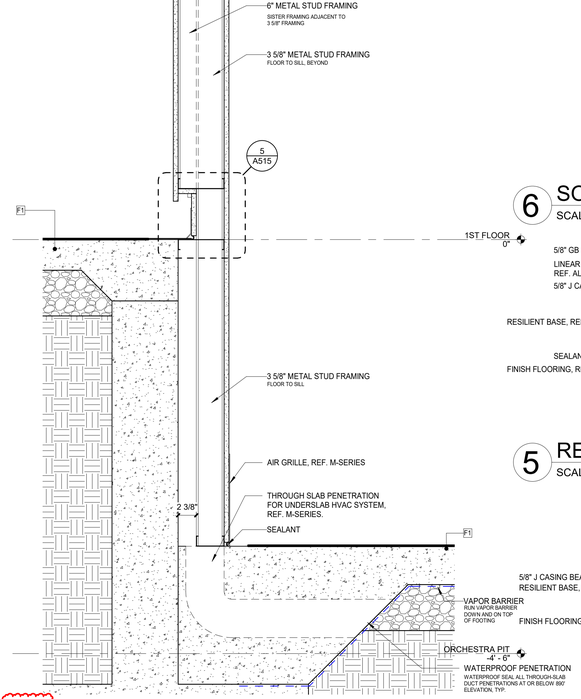
3 WALL SECTION
SCALE: 1 1/2" = 1'-0" REF. 1 / A111L



2 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 7 / A314



1 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 7 / A314



7 WALL SECTION
SCALE: 1 1/2" = 1'-0" REF. 1 / A111L

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MARK RANDALL BEEBE REGISTERED 0700164 STATE OF INDIANA ARCHITECT

REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	KH/BM

SECTION DETAILS

A515

PLOT DATE/TIME:6/9/2022 3:09:43 PM

FINISH LEGEND

NOTES

ETR EXISTING TO REMAIN

FLOOR COVERING

CARPET TILE

CPT-1: MFG: INTERFACE
TYPE: 50CM X 50CM CARPET TILE
PATTERN: ICE BREAKER
COLOR: 105771 GRANITE
INSTALL: NON-DIRECTIONAL
LOCATION: AUDITORIUM/OFFICE

WOM-1: MFG: INTERFACE
TYPE: 50CM X 50CM WALK-OFF TILE
PATTERN: SR899 STEP REPEAT
COLOR: 104940 IRON
INSTALL: QUARTER TURN
LOCATION: VESTIBULE

RESILIENT FLOOR

LVT-1: MFG: INTERFACE
TYPE: 36"X36" SOLID VINYL TILE
PATTERN: I347V ADMIX
COLOR: 00530 OYSTER
INSTALL: MONOLITHIC

LVT-2: MFG: INTERFACE
TYPE: 36"X36" SOLID VINYL TILE
PATTERN: I347V ADMIX
COLOR: 00570 SHARK'S TOOTH
INSTALL: MONOLITHIC

LVT-3: MFG: INTERFACE
TYPE: 12"X12" SOLID VINYL TILE
PATTERN: I429V ADMIX ENCORE
COLOR: 00165 ORB
INSTALL: MONOLITHIC

LVT-4: MFG: INTERFACE
TYPE: 12"X12" SOLID VINYL TILE
PATTERN: I429V ADMIX ENCORE
COLOR: 00275 GILT
INSTALL: MONOLITHIC

LVT-5: MFG: INTERFACE
TYPE: 12"X12" SOLID VINYL TILE
PATTERN: I429V ADMIX ENCORE
COLOR: 0085 GALENA
INSTALL: MONOLITHIC

RUB-1: MFG: NORA
TYPE: RUBBER SHEET FLOORING W/ INTEGRAL STAIR TREAD STRIP. TO BE CONFIRMED BY ARCHITECT
PATTERN: NORAMENT HAMMERED
COLOR: 0884 DUST GREY
INSTALL: MONOLITHIC
LOCATION: L111 STAIRS

EPX-1: MFG: SHERWIN WILLIAMS GENERAL POLYMERS
TYPE: DECORATIVE MOSAIC EPOXY
COLOR: 1/8" FLAKES, MIX TBD
INSTALL: MONOLITHIC, 4" INTEGRAL COVE BASE REF. SPECS
LOCATION: GREENROOM AND RESTROOMS

RES-1: MFG: STAGELAM
TYPE: STAGELAM REF. SPECS
COLOR: BLACK MATTE
INSTALL: MONOLITHIC
LOCATION: STAGE, ORCHESTRA SHELL

TER-1: TYPE: TBD TERRAZZO
COLOR: WHITE (MIX TBD)
INSTALL: REF. PLAN DIMENSIONS; COORDINATE FINAL DIMENSIONS W/ OWNER & BRAND STANDARDS
REMARKS: ALTERNATE FOR LVT-1 AND LVT-5

TER-2: TYPE: TBD TERRAZZO
COLOR: GRAY (MIX TBD)
INSTALL: REF. PLAN DIMENSIONS; COORDINATE FINAL DIMENSIONS W/ OWNER & BRAND STANDARDS
REMARKS: ALTERNATE FOR LVT-2

TER-3: TYPE: TBD TERRAZZO
COLOR: BLUE (MIX TBD)
INSTALL: REF. PLAN DIMENSIONS; COORDINATE FINAL DIMENSIONS W/ OWNER & BRAND STANDARDS
REMARKS: ALTERNATE FOR LVT-3

TER-4: TYPE: TBD TERRAZZO
COLOR: YELLOW (MIX TBD)
INSTALL: REF. PLAN DIMENSIONS; COORDINATE FINAL DIMENSIONS W/ OWNER & BRAND STANDARDS
REMARKS: ALTERNATE FOR LVT-4

TILE FLOOR

FT-1: MFG: DALTILE
TYPE: 12"X24" PORCELAIN FLOOR TILE
PATTERN: PORTFOLIO
COLOR: PF09 CHARCOAL
INSTALL: VERTICAL STACKED, REF. ELEVATIONS
LOCATION: RESTROOMS
REMARKS: WHEN USED TOGETHER WITH WT-1 ALIGN FLOOR WALL GROUT JOINTS

FT-2: MFG: DALTILE
TYPE: 2"x2" MOSAIC TILE
PATTERN: KEYSTONE
COLOR: D182 SUEDE GRAY
INSTALL: MONOLITHIC
LOCATION: NATATORIUM

CONCRETE

CON-1 TYPE: SEALED CONCRETE, REF. SPECS

CON-2 TYPE: SEALED CONCRETE, REF. SPECS

CON-3 TYPE: PAINTED CONCRETE, REF. SPECS

WALL BASE

RUBBER BASE

RB-1: MFG: JOHNSONITE
TYPE: 4" VINYL WALL BASE
COLOR: TA6 BEDROCK
LOCATION: STANDARD UNLESS NOTED OTHERWISE

RB-2: MFG: JOHNSONITE
TYPE: 4" VINYL WALL BASE
COLOR: TG4 BLACK MAGIC
LOCATION: STAGE TO BE USED AT ALL PT-5 LOCATIONS

RB-3: MFG: JOHNSONITE
TYPE: 4" VINYL WALL BASE
COLOR: 45 SANDALWOOD WB
LOCATION: L202 AT WALL WITH WC-1

TILE BASE

TB-1: MFG: DALTILE
TYPE: MB5A BUILD UP BASE KEYSTONES
COLOR: SUEDE GRAY D182
INSTALL: INTEGRAL BASE, REF. SPECS
LOCATION: TO BE USED WITH FT-2 (POOL)

EPOXY BASE

EB-1: MFG: SHERWIN WILLIAMS
TYPE: GENERAL POLYMERS 4" DECORATIVE MOSAIC EPOXY WALL BASE
COLOR: 1/8" FLAKES, FB-913 SHADOW
INSTALL: INTEGRAL BASE, REF. SPECS
LOCATION: GREENROOM, GREENROOM RESTROOMS

TERB-1: MFG: TBD
TYPE: 4" INTREGAL WALL BASE
COLOR: MATCH ADJACENT TERAZZO
INSTALL: INTEGRAL BASE, REF. SPECS
LOCATION: LOBBY/CORRIDOR
REMARKS: ALTERNATE AT TERRAZZO FLOOR

PAINT/WALL FINISH

PAINT

PT-1: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, EGGSHELL FINISH
COLOR: SW7070 SITE WHITE
LOCATION: STANDARD/COLUMNS

PT-1A: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, FLAT FINISH
COLOR: SW7070 SITE WHITE
LOCATION: BALCONY WATERFALL

PT-1B: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, CASHMERE PEARL FINISH
COLOR: SW7070 SITE WHITE
LOCATION: BALCONY EDGE

PT-1C: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, HIGH GLOSS FINISH
COLOR: SW7070 SITE WHITE
LOCATION: BALCONY EDGE

PT-2: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, EGGSHELL FINISH
COLOR: SW7073 NETWORK GRAY
LOCATION: ACCENT

PT-3: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, EGGSHELL FINISH
COLOR: SW7074 SOFTWARE
LOCATION: ACCENT

PT-4: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS EGGSHELL FINISH
COLOR: SW7076 CYBERSPACE
LOCATION: HM DOOR FRAMES/ACCENT/ STAIR STRINGER

PT-5: MFG: SHERWIN WILLIAMS
TYPE: REF. SPECS, EGGSHELL FINISH
COLOR: SW9993 BLACK OF NIGHT
LOCATION: AUDITORIUM, EXPOSED STRUCTURE

WALL TILE

WT-1: MFG: DALTILE
TYPE: 12"X24" PORCELAIN TILE
PATTERN: PORTFOLIO
COLOR: PF06 IRON GRAY
INSTALL: VERTICAL STACKED, REF. ELEVATIONS
REMARKS: RUN DIRECTLY TO FINISHED FLOOR. WHEN USED TOGETHER WITH FT-1 ALIGN FLOOR AND WALL GROUT JOINTS

WT-2: MFG: DALTILE
TYPE: 12"X36" GLAZED CERAMIC TILE
PATTERN: AESTHETIC - GEOMETRIC AS23
INSTALL: HORIZONTAL STACKED, REF. ELEVATIONS
REMARKS: WHEN USING AT WALL, RUN DIRECTLY TO FINISHED FLOOR

WT-3: MFG: DALTILE
TYPE: 8"X24" GLAZED CERAMIC WALL TILE
PATTERN: COLOR WHEEL - LINEAR
COLOR: 0180 CHALKBOARD
INSTALL: VERTICAL STACKED, REF. DRINKING FOUNTAIN ELEVATIONS
REMARKS: WHEN USING AT WALL, RUN DIRECTLY TO FINISHED FLOOR

WT-4: MFG: DALTILE
TYPE: 8"X24" GLAZED CERAMIC WALL TILE
PATTERN: COLOR WHEEL - LINEAR
COLOR: X714 MATTE DESSERT GRAY
INSTALL: VERTICAL STACKED, REF. DRINKING FOUNTAIN ELEVATIONS
REMARKS: WHEN USING AT WALL, RUN DIRECTLY TO FINISHED FLOOR

WALLCOVERING

WC-1: MFG: SURFACE MATERIALS
TYPE: WALLCOVERING
PATTERN: WOOD WALL 2
COLOR: PAULOWNIA WRW 1051
INSTALL: VERTICAL GRAIN
LOCATION: AUDITORIUM LOBBY WALL/AUDITORIUM

WC-4: MFG: TBD
TYPE: COUGAR CUSTOM DIGITAL WALLCOVERING,GRAPHIC TO BE DETERMINED BY ARCHITECT. REF. PLAN FOR LOCATION AND SIZES

WC-5: MFG: TBD
TYPE: GCHS CUSTOM DIGITAL WALLCOVERING,GRAPHIC TO BE DETERMINED BY ARCHITECT. REF. PLAN FOR LOCATION AND SIZES

WC-6: MFG: TBD
TYPE: TIMELINE CUSTOM DIGITAL WALLCOVERING,GRAPHIC TO BE DETERMINED BY ARCHITECT. REF. PLAN FOR LOCATION AND SIZES

PLASTIC LAMINATE/SOLID SURFACE

PLASTIC LAMINATE

PL-1: MFG: FORMICA
TYPE: PLASTIC LAMINATE
COLOR: 5883-58 PECAN WOODLINE (MATTE FINISH)
INSTALL: MONOLITHIC, VERTICAL GRAIN
LOCATION: GREENROOM/CONCESSION

PL-2: MFG: FORMICA
TYPE: PLASTIC LAMINATE
COLOR: 928-58 MOUSE (MATTE FINISH)
INSTALL: MONOLITHIC
LOCATION: SCENE SHOP

SOLID SURFACE

SS-1: MFG: CORIAN
TYPE: 1" QUARTZ
COLOR: STORM LEATHERED GRAY
INSTALL: MONOLITHIC
LOCATION: RESTROOMS

SS-2: MFG: CORIAN
TYPE: 1/2" SOLID SURFACE WALL CAP
COLOR: DEEP TITANIUM
INSTALL: MONOLITHIC
LOCATION: AUDITORIUM

SS-3: MFG: CORIAN
TYPE: 1/2" SOLID SURFACE WALL CAP
COLOR: PEARL GRAY
INSTALL: MONOLITHIC
LOCATION: AUDTORIUM, GRAND STAIR

SS-4: MFG: CORIAN
TYPE: 1/2" SOLID SURFACE
COLOR: LAVAROCK
INSTALL: MONOLITHIC
LOCATION: GREENROOM

SS-5: MFG: CORIAN
TYPE: 1/2" SOLID SURFACE
COLOR: CARBON CONCRETE
INSTALL: MONOLITHIC
LOCATION: CONCESSION/SCENE SHOP

MISCELLANEOUS

TEXTILE

TEX-1: MFG: FILZFELT
TYPE: 1/8" 100% WOOL DESIGN FELT
COLOR: 170 ASCHE
LOCATION: L118 CORRIDOR

TEX-2: MFG: FILZFELT
TYPE: 1/8" 100% WOOL DESIGN FELT
COLOR: 423 HELLGRAU
LOCATION: L118 CORRIDOR

TEX-3: MFG: KM FABRICS
TYPE: 100% IFR POLYESTER
PATTERN: CHARISMA
COLOR: 1118 NAVY
LOCATION: AUDITORIUM CURTIAN

CORNER GUARDS

CG-1: MFG: ACROVYN
TYPE: VA SERIES - FULL HEIGHT CORNER GUARD
COLOR: TO MATCH ADJACENT PAINT COLOR, DESIGNER TO APPROVE
LOCATION: PROVIDE AT ALL EXTERIOR DRYWALL CORNERS

WALL PROTECTION

WP-1: MFG: P3 TECH
TYPE: ADVANCED WALL PROTECTION
PATTERN: SHARA STONE
COLOR: MORROCAN SLATE
INSTALL: TBD - TO BE SELECTED BY ARCHITECT

AUDITORIUM SEATING

TEX-4 MFG: CULP CONTRACT
TYPE: AUDITORIUM SEATING FABRIC
PATTERN: ARCHETYPE
COLOR: ADMIRAL
BACKING: TBD, ARCHITECT TO APPROVE
LOCATION: AUDITORIUM SEATS

PL-3 MFG: NEVAMAR
TYPE: PLASTIC LAMINATE
COLOR: S6054T WROT IRON
INSTALL: MONOLITHIC
LOCATION: AISLE PANEL

RAILING

MFG: HOLLAENDAR
TYPE: GLASS
COLOR: TBD
LOCATION: GRAND STAIR

ACOUSTICAL:

AP-1: MFG: KINETICS NOISE CONTROL
TYPE: 4"x96" ACOUSTICAL DIFFUSER
PATTERN: HIGH TONES
COLOR: TO BE PAINTED PT-4
INSTALL: REF. ELEVATION FOR DIRECTION
LOCATION: AUDITORIUM BACK WALL

AP-2: MFG: AUTEX
TYPE: 1" QUIETSPACE PANEL FACE WITH VERIFACE VELOUR FINISH
COLOR: CITRUS
LOCATION: K107 POOL

AP-3 : MFG: AUTEX
TYPE: 1" QUIETSPACE PANEL FACE WITH VERIFACE VELOUR FINISH
COLOR: MYST
LOCATION: K107 POOL

AP-4 : MFG: AUTEX
TYPE: 1" QUIETSPACE PANEL FACE WITH VERIFACE VELOUR FINISH
COLOR: KOALA
LOCATION: K107 POOL

GLASS WALL

GW-1: MFG: CLARUS
TYPE: WALL2WALL WALL-MOUNTED GLASS BOARD
COLOR: CBC-824
LOCATION: MAIN LOBBY

PLOT DATE/TIME:6/9/2022 4:23:05 PM

LANCER+BEEBE, LLC
ARCHITECTURE | PLANNING | INTERIORS
220 N. COLLEGE AVE
INDIANAPOLIS, IN 46202

GREENFIELD CENTRAL HIGH SCHOOL
AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
GREENFIELD, IN 46140

MARK RANDALL BEEBE
REGISTERED
0700164
STATE OF INDIANA
ARCHITECT

REVISIONS:

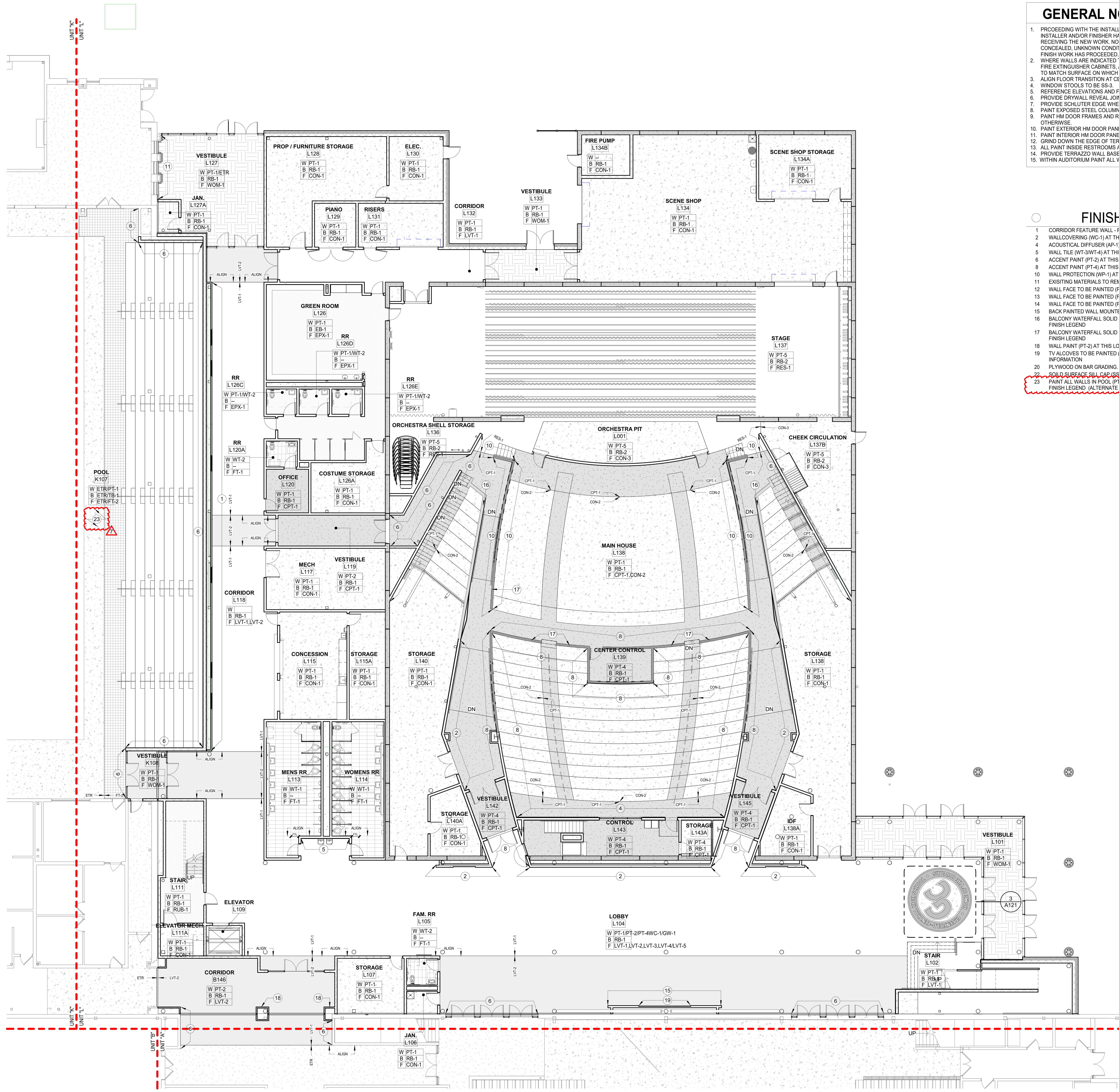
#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: MC

INTERIOR FINISH LEGEND

A720



1 INTERIOR FINISH PLAN - FIRST FLOOR - UNIT L

SCALE: 3/32" = 1'-0" REF. 3 / A142

GENERAL NOTES - FINISH PLAN

1. PRCOEEDING WITH THE INSTALLATION OF FINISHES WILL BE CONSTRUED THAT THE INSTALLER AND/OR FINISHER HAS INSPECTED AND ACCEPTED THE SUBSTRATE RECEIVING THE NEW WORK. NO CHANGE ORDER WILL BE ISSUED TO RECTIFY CONCEALED, UNKNOWN CONDITIONS OR UNSATISFACTORY SUBSTRATE ONCE THE FINISH WORK HAS PROCEEDED.
2. WHERE WALLS ARE INDICATED TO RECEIVE PAINT FINISH, PAINT ALL PRIMED GRILLES, FIRE EXTINGUISHER CABINETS, AND OTHER ITEMS EMBEDDED IN WALL CONSTRUCTION TO MATCH SURFACE ON WHICH THEY OCCUR UNLESS NOTED OTHERWISE.
3. ALIGN FLOOR TRANSITION AT CENTER OF DOORWAY, TYP.
4. WINDOW STOOLS TO BE SS-3.
5. REFERENCE ELEVATIONS AND FINISH LEGEND FOR CUSTOM GRAPHIC WALL COVERING.
6. PROVIDE DRYWALL REVEAL JOINT WHERE DRYWALL MEETS DISSIMILAR MATERIALS.
7. PROVIDE SCHLUTER EDGE WHERE TILE MEETS DISSIMILAR MATERIALS.
8. PAINT EXPOSED STEEL COLUMNS PT-1.
9. PAINT HM DOOR FRAMES AND RELATED EXPOSED LINTELS PT-4 UNLESS NOTED OTHERIWSE.
10. PAINT EXTERIOR HM DOOR PANELS PT-4 UNLESS NOTED OTHERWISE.
11. PAINT INTERIOR HM DOOR PANELS PT-2 UNLESS NOTED OTHERWISE.
12. GRIND DOWN THE EDGE OF TERRAZZO WHERE IT MEETS DISSIMILAR FLOORING.
13. ALL PAINT INSIDE RESTROOMS AND CONCESSION TO BE EPOXY BASED PAINT.
14. PROVIDE TERRAZZO WALL BASE ADJACENT TO TERRAZZO FLOOR.
15. WITHIN AUDITORIUM PAINT ALL WALL FACES ABOVE 33'-6" AFF PT-5.

FINISH PLAN NOTES

1	CORRIDOR FEATURE WALL - REF. ELEVATIONS FOR MORE DETAILS
2	WALLCOVERING (WC-1) AT THIS LOCATION - REF. FINISH LEGEND
4	ACOUSTICAL DIFFUSER (AP-1) AT THIS LOCATION - REF. FINISH LEGEND
5	WALL TILE (WT-3/WT-4) AT THIS LOCATION - REF. FINISH LEGEND
6	ACCENT PAINT (PT-2) AT THIS LOCATION - REFER TO FINISH LEGEND
8	ACCENT PAINT (PT-4) AT THIS LOCATION - REFER TO FINISH LEGEND
10	WALL PROTECTION (WP-1) AT THIS LOCATION. REF. FINISH LEGEND
11	EXISITING MATERIALS TO REMAIN. CLEAN SURFACES
12	WALL FACE TO BE PAINTED (PT-1A) - REF. FINISH LEGEND
13	WALL FACE TO BE PAINTED (PT-1B) - REF. FINISH LEGEND
14	WALL FACE TO BE PAINTED (PT-1C) - REF. FINISH LEGEND
15	BACK PAINTED WALL MOUNTED GLASS (GW-1) - REF. TO FINISH LEGEND
16	BALCONY WATERFALL SOLID SURFACE WALL CAP (SS-3) AT THIS LOCATION - REFER TO FINISH LEGEND
17	BALCONY WATERFALL SOLID SURFACE WALL CAP (SS-2) AT THIS LOCATION - REFER TO FINISH LEGEND
18	WALL PAINT (PT-2) AT THIS LOCATION - REF. FINISH LEGEND
19	TV ALCOVES TO BE PAINTED (PT-4) - REF. FINISH LEGEND AND ELEVATIONS FOR MORE INFORMATION
20	PLYWOOD ON BAR GRADING. REF. R-SERIES FOR ADDITIONAL INFORMATION
22	SOILD SURFACE SILL CAP (SS-3) AT THIS LOCATION - REFER TO FINISH LEGEND
23	PAINT ALL WALLS IN POOL (PT-1) NOT COVERED BY FINISH PLAN NOTES - REFER TO FINISH LEGEND (ALTERNATE BID)

7

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ARCHITECT

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PROJECT: #21107
DATE: 05.20.2022
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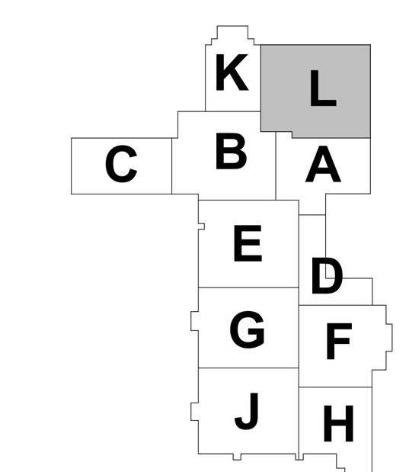
INTERIOR FINISH PLAN - FIRST FLOOR - UNIT L



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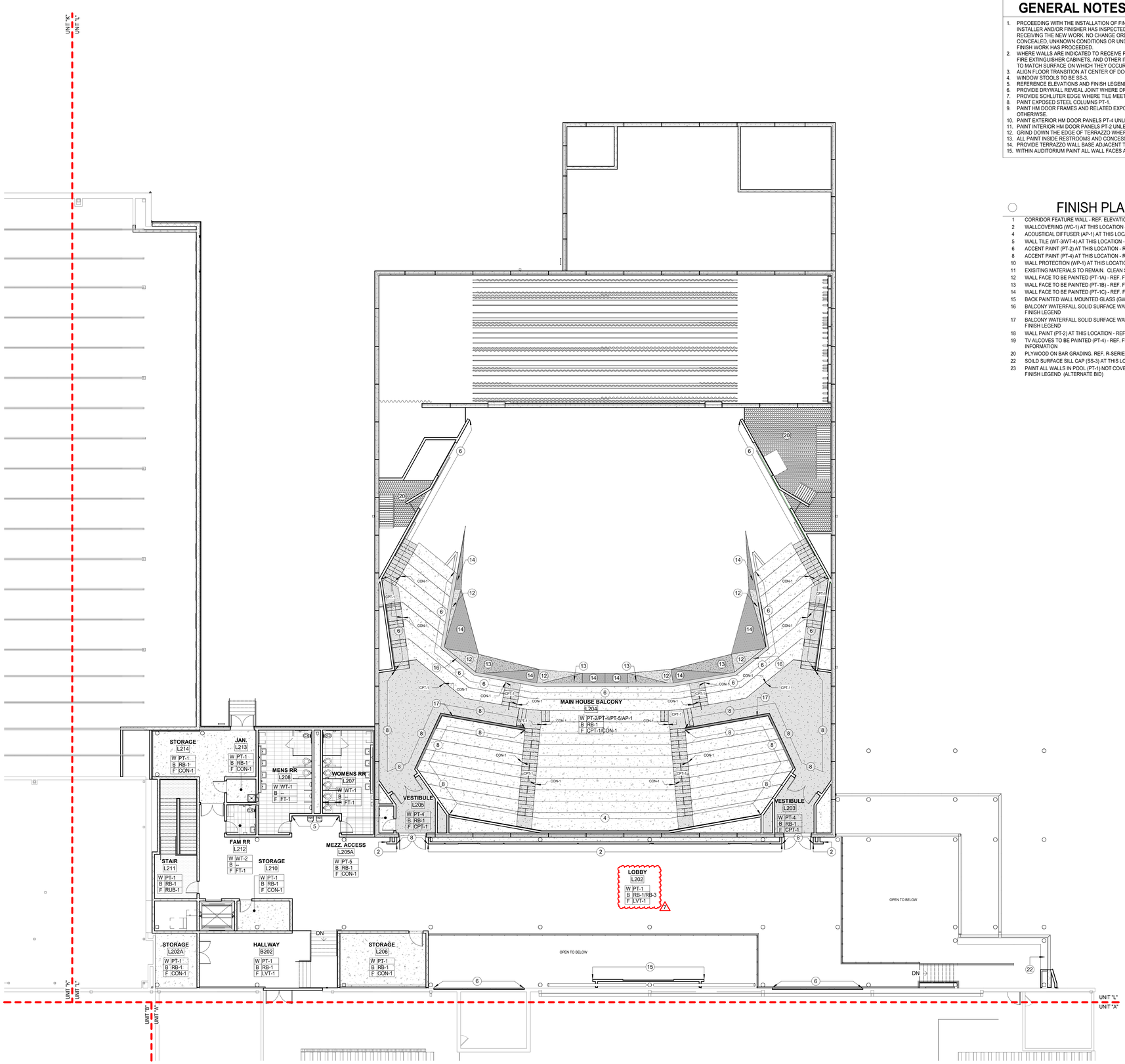
PLOT DATE/TIME:6/9/2022 3:04:01 PM



GENERAL NOTES - FINISH PLAN

1. PROCEEDING WITH THE INSTALLATION OF FINISHES WILL BE CONSTRUED THAT THE INSTALLER AND/OR FINISHER HAS INSPECTED AND ACCEPTED THE SUBSTRATE RECEIVING THE NEW WORK. NO CHANGE ORDER WILL BE ISSUED TO RECTIFY CONCEALED, UNKNOWN CONDITIONS OR UNSATISFACTORY SUBSTRATE ONCE THE FINISH WORK HAS PROCEEDED.
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7. PROVIDE SCHLUTER EDGE WHERE TILE MEETS DISSIMILAR MATERIALS.
8. PAINT EXPOSED STEEL COLUMNS PT-1.
9. PAINT HM DOOR FRAMES AND RELATED EXPOSED LINTELS PT-4 UNLESS NOTED OTHERWISE.
10. PAINT EXTERIOR HM DOOR PANELS PT-4 UNLESS NOTED OTHERWISE.
11. PAINT INTERIOR HM DOOR PANELS PT-2 UNLESS NOTED OTHERWISE.
12. GRIND DOWN THE EDGE OF TERRAZZO WHERE IT MEETS DISSIMILAR FLOORING.
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14. PROVIDE TERRAZZO WALL BASE ADJACENT TO TERRAZZO FLOOR.
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FINISH PLAN NOTES

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19	TV ALCOVES TO BE PAINTED (PT-4) - REF. FINISH LEGEND AND ELEVATIONS FOR MORE INFORMATION
20	PLYWOOD ON BAR GRADING. REF. R-SERIES FOR ADDITIONAL INFORMATION
22	SOLID SURFACE SILL CAP (SS-3) AT THIS LOCATION - REFER TO FINISH LEGEND
23	PAINT ALL WALLS IN POOL (PT-1) NOT COVERED BY FINISH PLAN NOTES - REFER TO FINISH LEGEND (ALTERNATE BID)

1 INTERIOR FINISH PLAN - SECOND FLOOR - UNIT L
SCALE: 3/32" = 1'-0" REF. 1 / A201

PLOT DATE/TIME:6/9/2022 3:54:48 PM

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810 N BROADWAY ST.
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MARK RANDALL BEEBE REGISTERED 07001164 STATE OF INDIANA ARCHITECT

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#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	MC

INTERIOR FINISH PLAN - SECOND FLOOR - UNIT L

A722L

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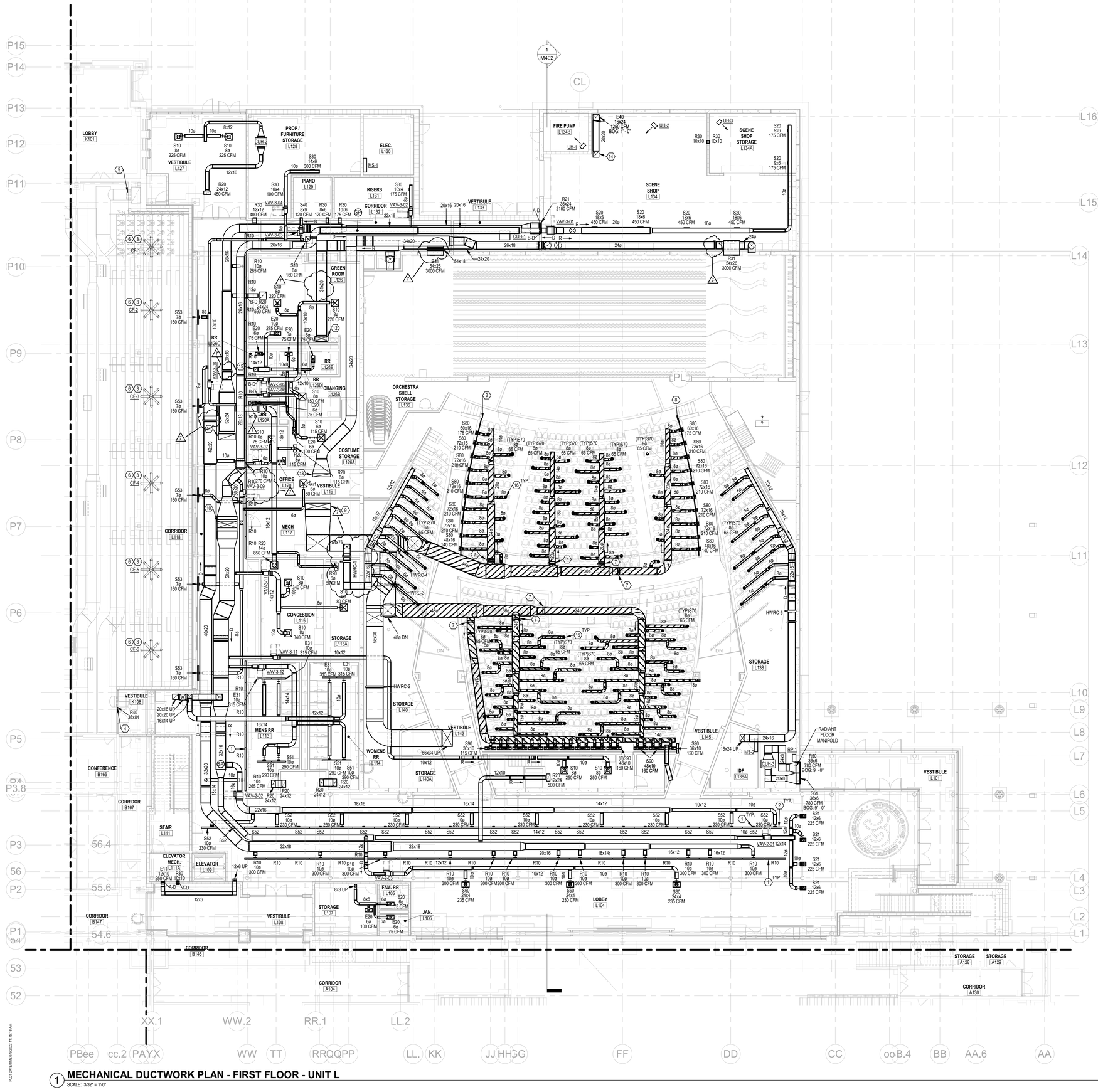

PLAN NOTES

1. DIFFUSER TO APPEAR CONTINUOUS. BLANK OFF UNUSED SECTIONS.
2. DIFFUSER SLOTS TO HAVE OPPOSED THROW. BALANCING CONTRACTOR TO BALANCE DIFFUSER TO ENSURE COMPLETE COVERAGE OF THE SPACE.
3. BOTTOM OF FAN SHALL BE FULLY ABOVE EXISTING SUPPLY DIFFUSERS. MAINTAIN ALL REQUIRED CLEARANCES AND SPACING PER MANUFACTURER.
4. REPLACE UPPER GRILLE WITH 36" X 84" GRILLE EXTENDING OPENING DOWN AS REQUIRED. GRILLE TO MATCH EXISTING APPEARANCE. BALANCE GRILLE TO MATCH TOTAL OF TWO EXISTING GRILLES.
5. HVLS FAN CONTROLLER. COORDINATE WITH DIV-26. CONFIRM LOCATION WITH OWNER.
6. FAN TO SHUT DOWN UPON ACTIVATION OF FIRE ALARM OR SPRINKLER SYSTEM.
7. CABLE OPERATED BALANCE DAMPER
8. SIDE WALL DISPLACEMENT DIFFUSER AT 0'-0" A.F.F. DIFFUSER TO APPEAR CONTINUOUS AND FOLLOW THE CURVE OF THE WALL. VERIFY SECTION LENGTHS AS REQUIRED. TRIM DIFFUSERS AND BEND A RETURN AS REQUIRED TO MAINTAIN CONTINUOUS APPEARANCE AT CHANGES IN FLOOR SLOPE.
9. 84" X 20" SUPPLY DUCTWORK UP TO AHU-1 ON ROOF. TRANSITION AS REQUIRED.
10. 66" X 22" SUPPLY DUCTWORK UP TO AHU-2 ON ROOF. TRANSITION AS REQUIRED.
11. 56" X 20" RETURN DUCTWORK UP TO AHU-2 ON ROOF. TRANSITION AS REQUIRED.
12. 44" X 16" SUPPLY DUCTWORK UP TO AHU-3 ON ROOF. TRANSITION AS REQUIRED.
13. 60" X 10" RETURN DUCTWORK UP TO AHU-3 ON ROOF. TRANSITION AS REQUIRED.
14. 24" X 24" EXHAUST UP TO EXISTING ROOF TRANSITION AS REQUIRED.
15. 14" x 14" EXHAUST UP TO EF-2 ON ROOF. TRANSITION AS REQUIRED.
16. UNDERGROUND DUCTWORK SHALL TRANSITION TO STAINLESS STEEL AT THE FLOOR SLAB. SEAL TRANSITION WATER TIGHT. TRANSITION AS REQUIRED FOR CONNECTION TO ROUND FLOOR DISPLACEMENT DIFFUSER.

1 **MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L**
SCALE: 3/32" = 1'-0"

PLOT DATE/TIME:6/9/2022 11:19:18 AM

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HEAPY
PROJECT NO. 2021-07128

GREENFIELD CENTRAL HIGH SCHOOL
AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
GREENFIELD, IN 46140

EHREN E. LOHRMANN
REGISTERED
No. PE10911293
STATE OF INDIANA
PROFESSIONAL ENGINEER

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7	06.09.22	BID PKG. #2 ADD. #7

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PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	BMW

MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L

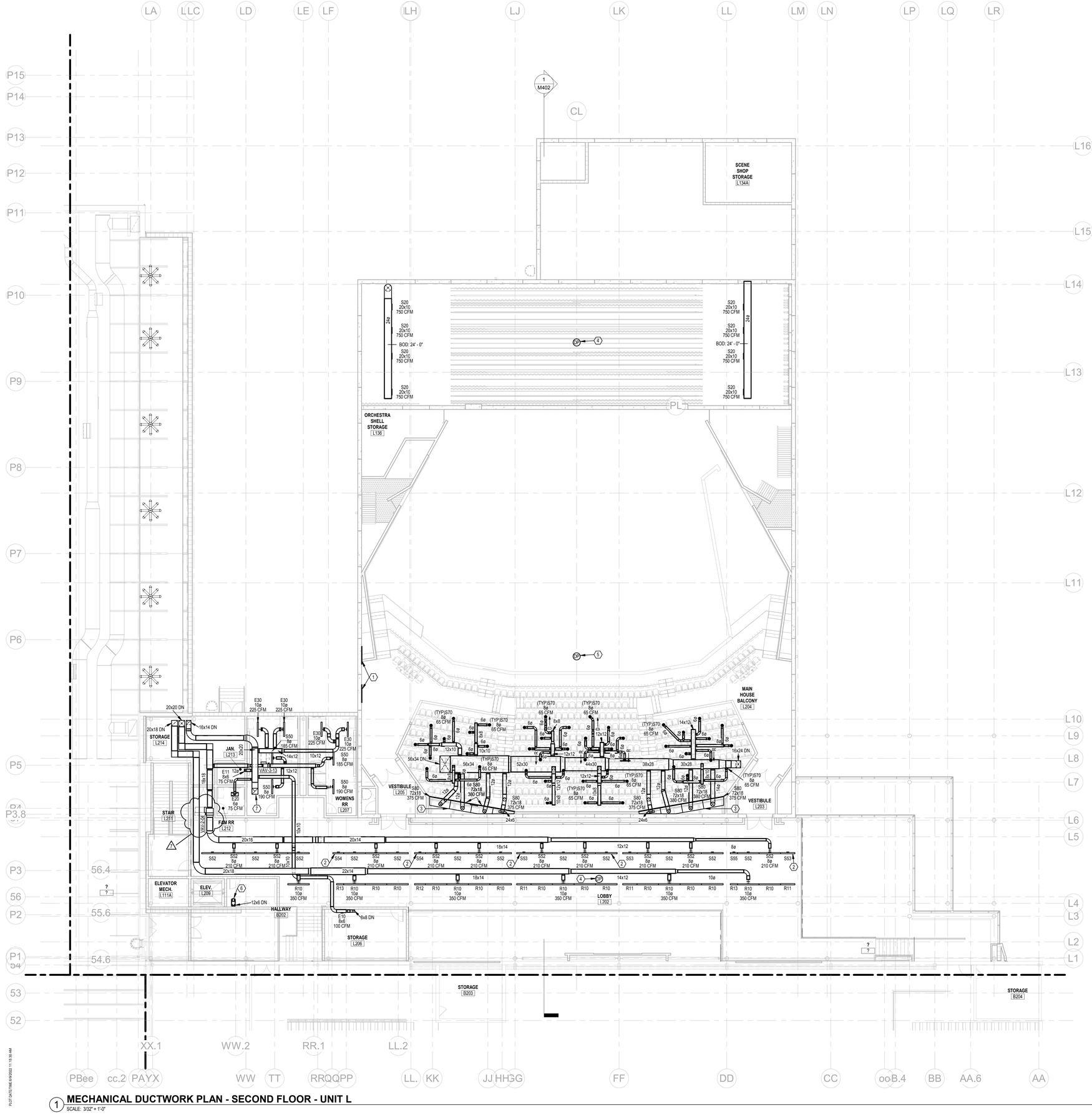
M101L

K L C B A E D G F J H

N TRUE NORTH

PLAN NOTES

1. COVER RETURN AIR OPENING WITH 1/2" MESH HARDWARE CLOTH. REFER TO ROOF PLAN FOR CONTINUATION.
2. DIFFUSER NT EDGE OF A CLOUD TO BE FIELD CUT TO LENGTH AS REQUIRED. TOUCH UP PAINT TO MATCH DIFFUSER COLOR.
3. SHEET METAL PLENUM.
4. BUILDING DIFFERENTIAL PRESSURE SENSOR ABOVE CEILING.
5. BUILDING DIFFERENTIAL PRESSURE SENSOR ABOVE CATWALK.
6. 8" X 8" EXHAUST UP TO EF-3 ON ROOF. TRANSITION AS REQUIRED.
7. 20" X 20" EXHAUST UP TO EF-1 ON ROOF. TRANSITION AS REQUIRED.



1 **MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L**
SCALE: 3/32" = 1'-0"

PLOT DATE/TIME:6/9/2022 11:15:30 AM

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AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
GREENFIELD, IN 46140

EMREN E. LOHRMANN
REGISTERED
No. PE10911293
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PROFESSIONAL ENGINEER
6/9/2022

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BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

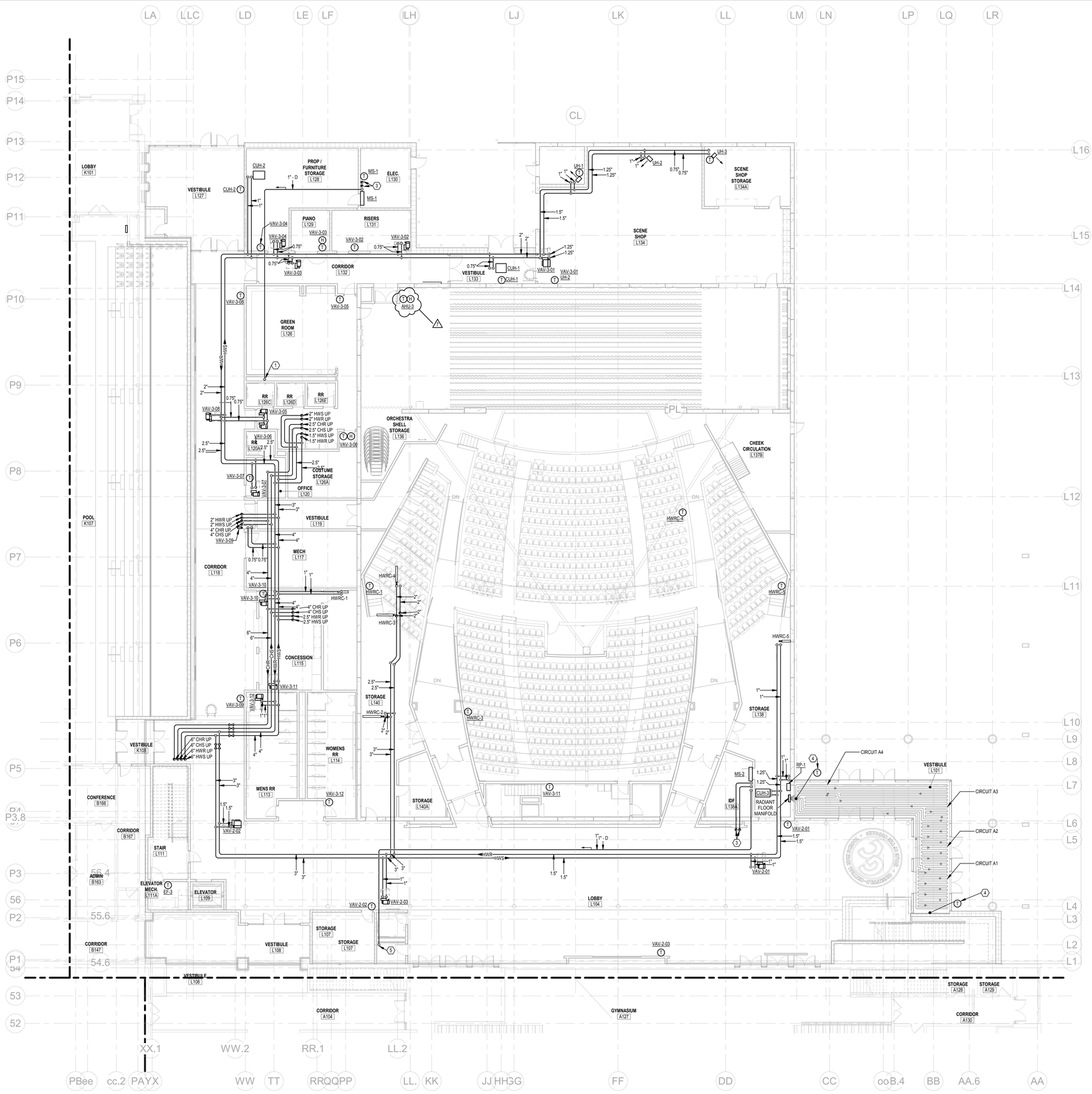
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L

M102L

K L C B A E D G F J H

N TRUE NORTH



PLAN NOTES

1. CONDENSATE DRAIN DOWN IN CHASE. CONNECT TO SANITARY WITH AIR GAP FITTING.
2. CONDENSATE DRAIN DOWN TO MOP BASIN.
3. REFRIGERANT PIPING UP TO SECOND FLOOR. PIPE SIZING AND SPECIALTIES BY MANUFACTURER.
4. AVERAGE THERMOSTATS IN VESTIBULE TO CONTROL RADIANT FLOOR AND CUH-3.
5. CONDENSATE DRAIN DOWN TO MOP BASIN.

1 **MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L**
SCALE: 3/32" = 1'-0"

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PROFESSIONAL ENGINEER

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PROJECT:	#21107
DATE:	05.20.2022
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MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L

M201L

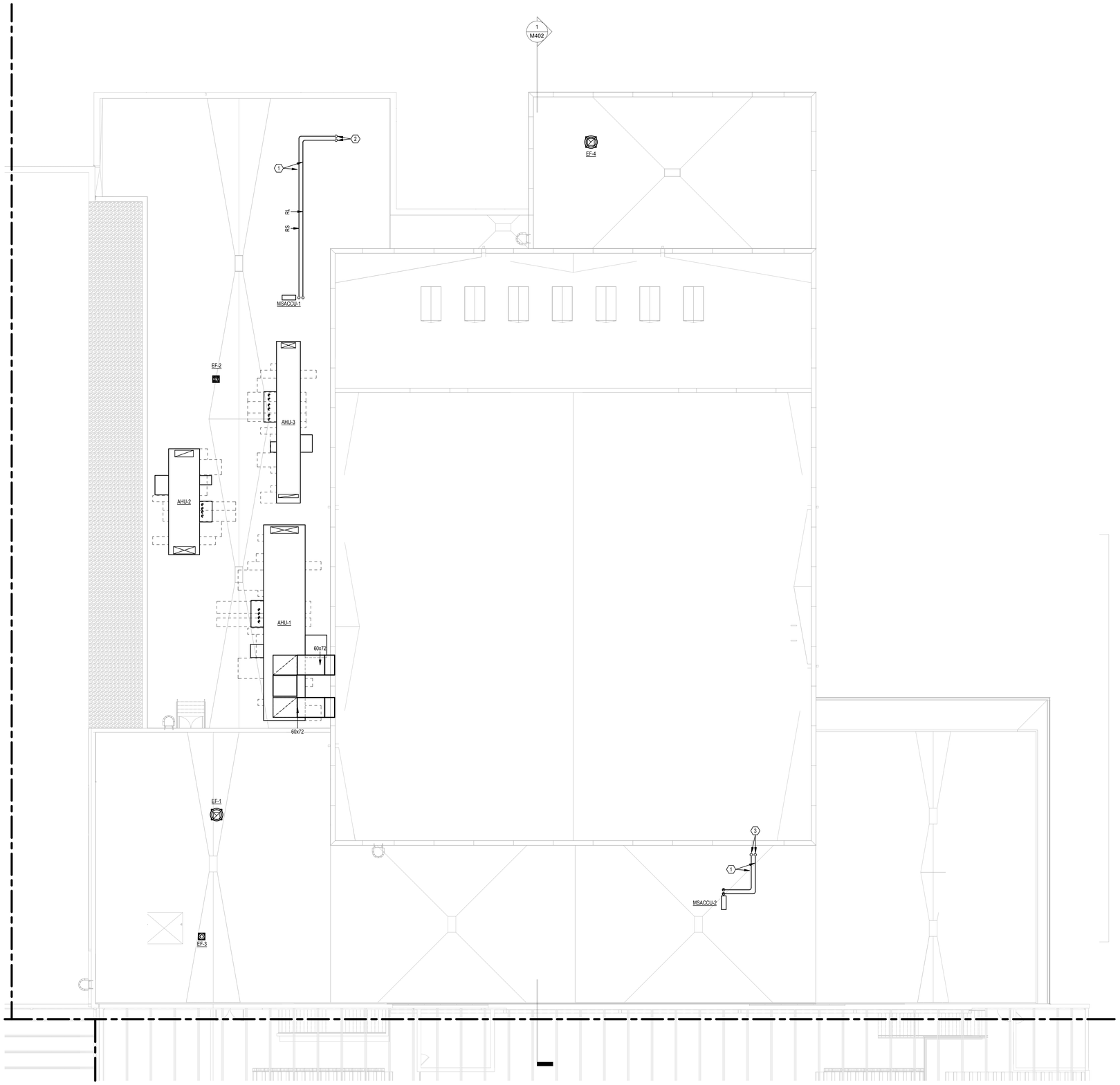
K L C B A E D G F J H

N TRUE NORTH

PLOT DATE/TIME:6/9/2022 11:15:36 AM

PLAN NOTES

1. REFRIGERANT PIPE SIZING AND SPECIALTIES BY MANUFACTURER.
2. REFRIGERANT PIPE DOWN TO MS-1.
3. REFRIGERANT PIPE DOWN TO MS-2.



1 **MECHANICAL ROOF PLAN - UNIT L**
SCALE: 3/32" = 1'-0"

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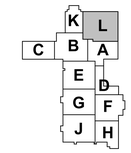
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

MECHANICAL ROOF PLAN - UNIT L

M301L



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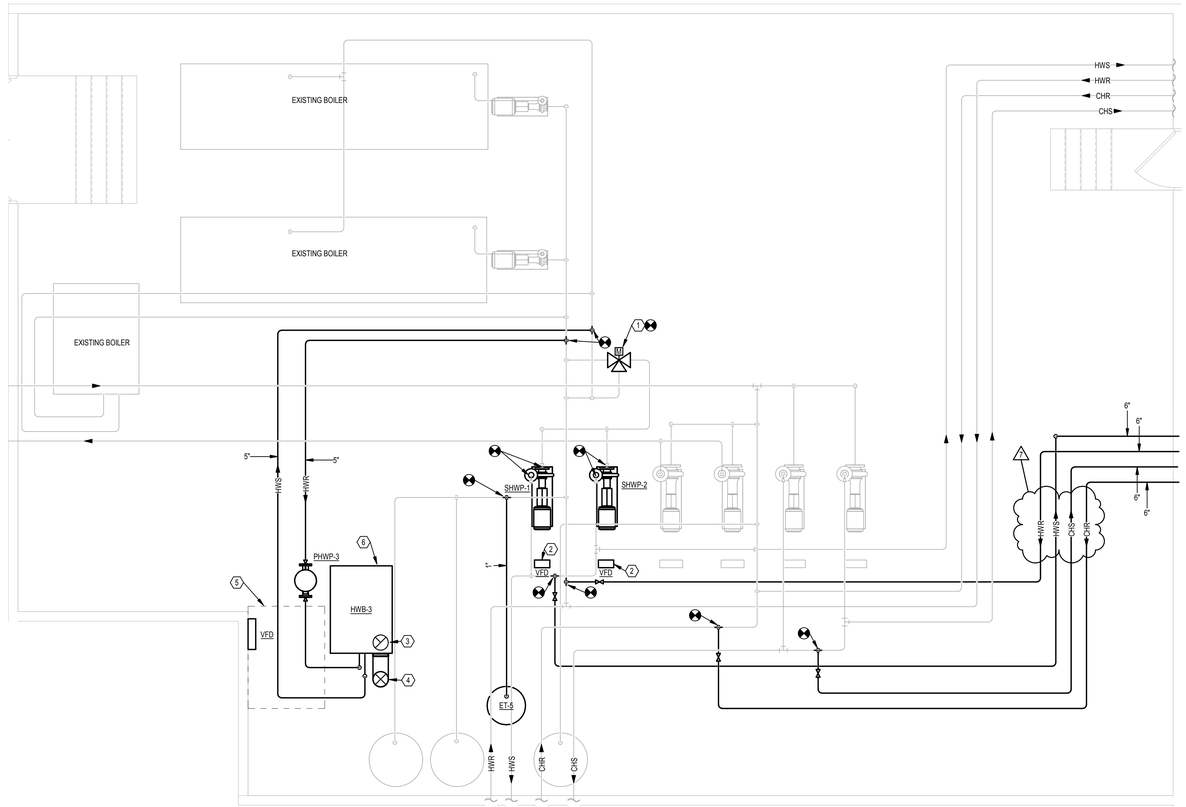
PLOT DATE/TIME:6/9/2022, 11:15:37 AM

PLAN NOTES

1. NEW 8" 3-WAY CONTROL VALVE, 1,500 GPM.
2. NEW VFDS MOUNTED ON EXISTING UNISTRUT.
3. FLUE GAS OUTLET UP THROUGH ROOF. SIZE ROUTING AND TERMINATION PER MANUFACTURERS RECOMMENDATION.
4. COMBUSTION AIR INTAKE UP THROUGH ROOF. SIZE, ROUTING, AND TERMINATION PER MANUFACTURERS RECOMMENDATION.
5. MAINTAIN MINIMUM WORKING CLEARANCE OF 48" FROM FACE OF ELECTRICAL PANEL.
6. BOILER TO BE MOUNTED ON EXISTING HOUSE KEEPING PAD. EXTEND PAD AS REQUIRED.



1 **ENLARGED MECHANICAL ROOM PLAN**
SCALE: 1/4" = 1'-0"

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INDIANAPOLIS, IN
46202

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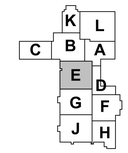
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

ENLARGED MECHANICAL PLANS

M401



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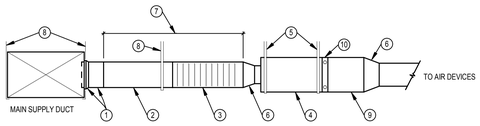
TRUE NORTH

PLOT DATE/TIME:9/9/2022 11:15:40 AM

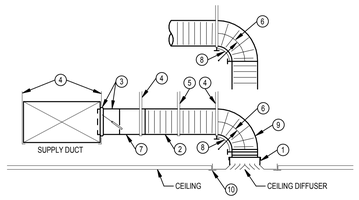


NOTES

1. CONICAL SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE. INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN SUPPLY DUCT WITH INTERNAL INSULATION.
2. ROUND SHEET METAL BRANCH DUCT, SAME SIZE AS AIR TERMINAL UNIT INLET SIZE UNLESS NOTED OTHERWISE.
3. INSULATED FLEXIBLE DUCT. MAXIMUM LENGTH OF 3 FT. MINIMUM LENGTH OF 4 IN. STRETCH FLEXIBLE DUCT TO 90% OF FULLY EXTENDED LENGTH.
4. AIR TERMINAL UNIT.
5. MINIMUM FOUR HANGER RODS FOR UNIT (CORNER POINTS); ATTACH TO STRUCTURE.
6. TRANSITION WHEN REQUIRED.
7. MINIMUM STRAIGHT LENGTH OF DUCT SHALL BE TERMINAL UNIT MANUFACTURER'S REQUIRED LENGTH, BUT AT LEAST 3 TIMES UNIT INLET DIAMETER.
8. DUCT HANGER. ATTACH TO STRUCTURE.
9. DUCT SHALL BE FULL SIZE OF UNIT OUTLET UNLESS NOTED OTHERWISE ON FLOOR PLANS.
10. REHEAT COIL WHEN SPECIFIED. REFER TO COIL DETAIL.

1 AIR TERMINAL UNIT DUCT CONNECTION

SCALE: NONE

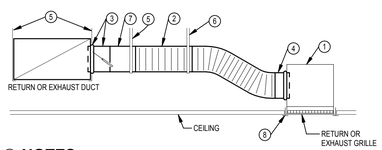


NOTES

1. SQUARE-TO-ROUND ADAPTER IF DIFFUSER NECK IS SQUARE. CONNECT ADAPTOR TO DIFFUSER. SEAL TO AIR DEVICE, SEAL CLASS A. INSULATE ADAPTOR AND EXPOSED BACKSIDE SURFACES OF AIR DEVICE.
2. INSULATED FLEXIBLE DUCT SAME DIAMETER AS BRANCH DUCT (7), 3 FT. MAXIMUM TOTAL LENGTH PER AIR DEVICE. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
3. SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE WITH MANUAL DAMPER. DAMPER SHAFT IN HORIZONTAL INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION, AND EXTENDED DAMPER SHAFT AND HANDLE WITH STAND-OFF TO ACCOMMODATE EXTERNAL INSULATION.
4. DUCT STRAP HANGER. ATTACH TO STRUCTURE.
5. STRAP HANGER REQUIRED IF LENGTH OF FLEXIBLE DUCT IS LONGER THAN 2 FT.
6. MINIMUM CENTERLINE RADIUS EQUAL TO DUCT DIAMETER.
7. ROUND SHEET METAL BRANCH DUCT, SAME SIZE AS DIFFUSER INLET UNLESS NOTED OTHERWISE.
8. FLEXIBLE DUCT ELBOW SUPPORT, INSTALLED WITH NYLON BANDING PER MANUFACTURER'S INSTRUCTIONS.
9. A RADIUS'D SHEET METAL ELBOW MAY BE USED IN LIEU OF A FLEXIBLE ELBOW SUPPORT WHEN CONNECTED DIRECTLY TO AIR DEVICE.
10. CEILING T-BAR SUPPORT (FOR LAY-IN APPLICATIONS). COORDINATE AND VERIFY T-BAR TYPE FOR COMPATIBILITY WITH DIFFUSER.

2 CEILING DIFFUSER DUCT CONNECTION

SCALE: NONE



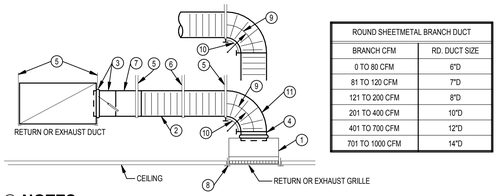
ROUND SHEETMETAL BRANCH DUCT	
BRANCH CFM	RD. DUCT SIZE
0 TO 80 CFM	6"D
81 TO 120 CFM	7"D
121 TO 200 CFM	8"D
201 TO 400 CFM	10"D
401 TO 700 CFM	12"D
701 TO 1000 CFM	14"D

NOTES

1. SHEET METAL PLENUM. FULL SIZE OF GRILLE NECK, MINIMUM 4" TALLER THAN DUCT RUNOUT SIZE. WITH SAME INTERNAL OR EXTERNAL INSULATION AS RETURN OR EXHAUST DUCT, CONNECT TO GRILLE. SEAL PLENUM AND CONNECTION TO GRILLE, SEAL CLASS A.
2. FLEXIBLE DUCT, SAME DIAMETER AS BRANCH DUCT (7), 3 FT. MAXIMUM TOTAL LENGTH PER AIR DEVICE. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
3. SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE WITH MANUAL DAMPER. DAMPER SHAFT IN HORIZONTAL, INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION. EXTENDED DAMPER SHAFT AND HANDLE WITH STAND-OFF REQUIRED FOR EXTERNALLY INSULATED DUCTWORK.
4. SPIN-IN TAP FITTING SIMILAR TO (3) EXCEPT NO DAMPER.
5. DUCT STRAP HANGER. ATTACH TO STRUCTURE.
6. STRAP HANGER REQUIRED IF LENGTH OF FLEXIBLE DUCT IS LONGER THAN 2 FT.
7. ROUND SHEET METAL BRANCH DUCT, SIZE AS INDICATED IN ADJACENT SCHEDULE UNLESS NOTED OTHERWISE ON PLANS.
8. CEILING T-BAR SUPPORT (FOR LAY-IN APPLICATIONS). COORDINATE AND VERIFY T-BAR TYPE FOR COMPATIBILITY WITH GRILLE.

3 RETURN/EXHAUST GRILLE DUCT CONNECTION

SCALE: NONE



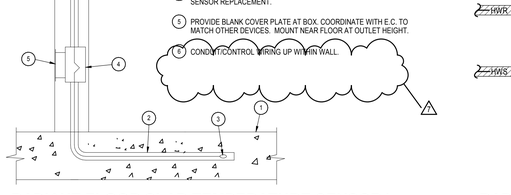
ROUND SHEETMETAL BRANCH DUCT	
BRANCH CFM	RD. DUCT SIZE
0 TO 80 CFM	6"D
81 TO 120 CFM	7"D
121 TO 200 CFM	8"D
201 TO 400 CFM	10"D
401 TO 700 CFM	12"D
701 TO 1000 CFM	14"D

NOTES

1. SHEET METAL PLENUM, FULL SIZE OF GRILLE NECK, MINIMUM 6" TALL WITH SAME INTERNAL OR EXTERNAL INSULATION AS RETURN OR EXHAUST DUCT. CONNECT TO GRILLE. SEAL PLENUM AND CONNECTION TO GRILLE, SEAL CLASS A.
2. FLEXIBLE DUCT, SAME DIAMETER AS BRANCH DUCT (7), 3 FT. MAXIMUM TOTAL LENGTH PER AIR DEVICE. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
3. SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE WITH MANUAL DAMPER. DAMPER SHAFT IN HORIZONTAL, INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION. EXTENDED DAMPER SHAFT AND HANDLE WITH STAND-OFF REQUIRED FOR EXTERNALLY INSULATED DUCTWORK.
4. SPIN-IN TAP FITTING SIMILAR TO (3) EXCEPT NO DAMPER.
5. DUCT STRAP HANGER. ATTACH TO STRUCTURE.
6. STRAP HANGER REQUIRED IF LENGTH OF FLEXIBLE DUCT IS LONGER THAN 2 FT.
7. ROUND SHEET METAL BRANCH DUCT, SIZE AS INDICATED IN ADJACENT SCHEDULE UNLESS NOTED OTHERWISE ON PLANS.
8. CEILING T-BAR SUPPORT (FOR LAY-IN APPLICATIONS). COORDINATE AND VERIFY T-BAR TYPE FOR COMPATIBILITY WITH GRILLE.
9. MINIMUM CENTERLINE RADIUS EQUAL TO DUCT DIAMETER.
10. FLEXIBLE DUCT ELBOW SUPPORT, INSTALLED WITH NYLON BANDING PER MANUFACTURER'S INSTRUCTIONS.
11. A RADIUS'D SHEET METAL ELBOW MAY BE USED IN LIEU OF A FLEXIBLE ELBOW SUPPORT WHEN CONNECTED DIRECTLY TO AIR DEVICE.

4 RETURN/EXHAUST GRILLE DUCT CONNECTION

SCALE: NONE



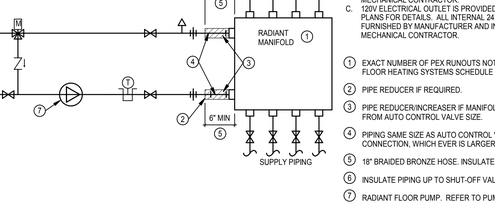
AIR SPLIT DUCT TAKE-OFF PLAN VIEW

BRANCH DUCT TAKE-OFF PLAN VIEW

THE BRANCH DUCT TAKE-OFF MAY BE USED FOR UP TO 15% OF THE MAIN DUCT CFM, AND UP TO 40% WHEN THE MAIN DUCT VELOCITY IS 1000 FPM OR LESS. THE AIR SPLIT DUCT TAKE-OFF SHALL BE USED IN ALL OTHER CASES

5 SUPPLY DUCTWORK BRANCH TAKE-OFFS

SCALE: NONE



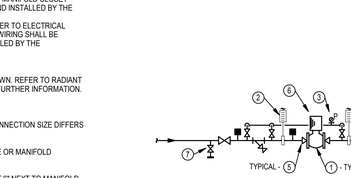
TYPICAL DUCTWORK TRANSITION WITH EQUIPMENT MOUNTED IN DUCT PLAN OR SIDE VIEW

TYPICAL DUCTWORK TRANSITION PLAN OR SIDE VIEW

NOTE:
A. UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.
B. TRANSITION ANGLES IN AND OUT OF FANS SHALL BE 50% OF THOSE SHOWN ABOVE.

6 DUCTWORK TRANSITIONS

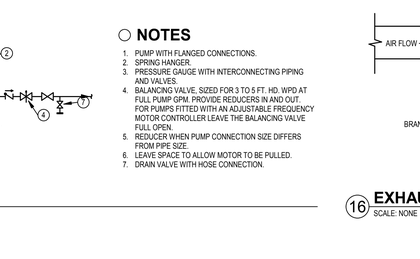
SCALE: NONE



AIR DEVICE SIZE	DUCT SIZE
12x12	12x10
24x12	12x12
24x24	24x12

7 RETURN AIR SOUND BOOT

SCALE: NONE



NOTES

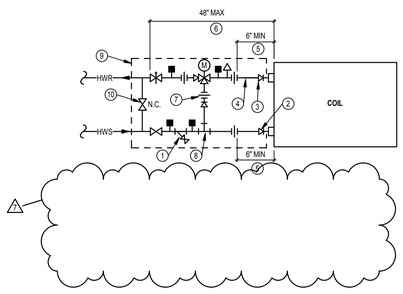
1. LOCATE STRAINER WITH BLOW-DOWN VALVE AND HOSE CONNECTION AT LOW POINT OF COIL PIPING.
2. PIPE REDUCER IF REQUIRED.
3. PIPE REDUCER/INCREASER IF COIL CONNECTION SIZE DIFFERS FROM AUTO CONTROL VALVE SIZE.
4. PIPING SAME SIZE AS AUTO CONTROL VALVE OR COIL CONNECTION, WHICH EVER IS LARGER.
5. 6" MINIMUM LENGTH INCLUDES ANY REQUIRED ELBOWS AND OFFSETS. PIPING INSULATION FROM COIL TO UNION SHALL INCLUDE SEALED VAPOR BARRIER.
6. MAXIMUM DISTANCE FROM SUPPLY AND RETURN SHUT-OFF VALVES TO COIL IS 48".
7. FACTORY ASSEMBLED PIPING PACKAGE (OPTIONAL).
8. LINE SIZE START-UP/FLUSHING BYPASS.

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE.
B. REFER TO AIR TERMINAL UNIT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE. VERIFY VALVE PORTING AND CONNECT PIPING TO PROPER PORTS, PER MANUFACTURER'S RECOMMENDATIONS.
C. REFER TO SPECIFICATIONS FOR DEVICES NOT TO BE INSULATED. INSULATED DEVICES SHALL INCLUDE EXTENDED NECKS, SHAFTS, ETC... SO THEY ARE ACCESSIBLE ABOVE THE INSULATION.

8 AIR TERMINAL UNIT / DUCT REHEAT COIL

SCALE: NONE



NOTES

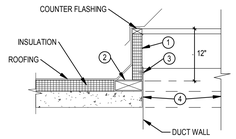
1. LOCATE STRAINER WITH BLOW-DOWN VALVE AND HOSE CONNECTION AT LOW POINT OF COIL PIPING.
2. PIPE REDUCER IF REQUIRED.
3. PIPE REDUCER/INCREASER IF COIL CONNECTION SIZE DIFFERS FROM AUTO CONTROL VALVE SIZE.
4. PIPING SAME SIZE AS AUTO CONTROL VALVE OR COIL CONNECTION, WHICH EVER IS LARGER.
5. 6" MINIMUM LENGTH INCLUDES ANY REQUIRED ELBOWS AND OFFSETS. PIPING INSULATION FROM COIL TO UNION SHALL INCLUDE SEALED VAPOR BARRIER.
6. MAXIMUM DISTANCE FROM SUPPLY AND RETURN SHUT-OFF VALVES TO COIL IS 48".
7. FACTORY ASSEMBLED PIPING PACKAGE (OPTIONAL).
8. LINE SIZE START-UP/FLUSHING BYPASS.

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE.
B. REFER TO AIR TERMINAL UNIT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE.
C. REFER TO SPECIFICATIONS FOR DEVICES NOT TO BE INSULATED. INSULATED DEVICES SHALL INCLUDE EXTENDED NECKS, SHAFTS, ETC... SO THEY ARE ACCESSIBLE ABOVE THE INSULATION.

9 AIR TERMINAL UNIT / DUCT REHEAT COIL

SCALE: NONE

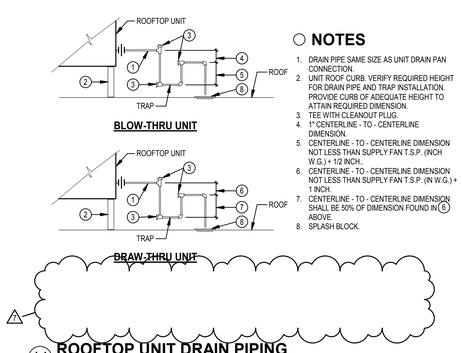


NOTES

1. 12" HIGH INSULATED STEEL CURB.
2. PROVIDE PRESSURE TREATED RIGID WOOD BLOCK FRAME SAME THICKNESS AS ROOF INSULATION. BOLT TO CONCRETE ROOF DECK.
3. SHEET METAL SCREW.
4. CONCRETE ROOF DECK OPENING. COORDINATE REQUIRED OPENING SIZE.

10 FAN MOUNTING CURB

SCALE: NONE

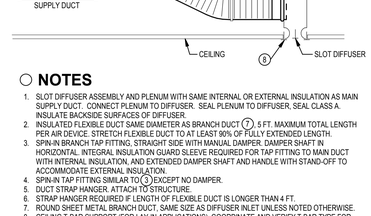


NOTES

1. DRAIN PIPE SAME SIZE AS UNIT DRAIN PAN CONNECTION.
2. UNIT ROOF CURB. VERIFY REQUIRED HEIGHT FOR DRAIN PIPE AND TRAP INSTALLATION. PROVIDE CURB OF ADEQUATE HEIGHT TO ATTAIN REQUIRED DIMENSION.
3. TEE WITH CLEANOUT PLUG.
4. 1" CENTERLINE - TO - CENTERLINE DIMENSION.
5. CENTERLINE - TO - CENTERLINE DIMENSION NOT LESS THAN SUPPLY FAN T.S.P. (INCH W.G.) + 1/2 INCH.
6. CENTERLINE - TO - CENTERLINE DIMENSION NOT LESS THAN SUPPLY FAN T.S.P. (IN W.G.) + 1 INCH.
7. CENTERLINE - TO - CENTERLINE DIMENSION SHALL BE 50% OF DIMENSION FOUND IN (6) ABOVE.
8. SPLASH BLOCK.

11 ROOFTOP UNIT DRAIN PIPING

SCALE: NONE



NOTES

1. SLOT DIFFUSER ASSEMBLY AND PLENUM WITH SAME INTERNAL OR EXTERNAL INSULATION AS MAIN SUPPLY DUCT. CONNECT PLENUM TO DIFFUSER. SEAL PLENUM TO DIFFUSER, SEAL CLASS A. INSULATE BACKSIDE SURFACES OF DIFFUSER.
2. INSULATED FLEXIBLE DUCT SAME DIAMETER AS BRANCH DUCT (7), 5 FT. MAXIMUM TOTAL LENGTH PER AIR DEVICE. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
3. SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE WITH MANUAL DAMPER. DAMPER SHAFT IN HORIZONTAL, INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION, AND EXTENDED DAMPER SHAFT AND HANDLE WITH STAND-OFF TO ACCOMMODATE EXTERNAL INSULATION.
4. SPIN-IN TAP FITTING SIMILAR TO (3) EXCEPT NO DAMPER.
5. DUCT STRAP HANGER. ATTACH TO STRUCTURE.
6. STRAP HANGER REQUIRED IF LENGTH OF FLEXIBLE DUCT IS LONGER THAN 4 FT.
7. ROUND SHEET METAL BRANCH DUCT, SAME SIZE AS DIFFUSER INLET UNLESS NOTED OTHERWISE.
8. CEILING T-BAR SUPPORT (FOR LAY-IN APPLICATIONS). COORDINATE AND VERIFY T-BAR TYPE FOR COMPATIBILITY WITH DIFFUSER.

12 SLOT DIFFUSER DUCT CONNECTION

SCALE: NONE

13 RADIANT FLOOR SLAB TEMPERATURE SENSOR1

SCALE: NONE

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE.
B. ALL COMPONENTS SHOWN SHALL BE WITHIN MANIFOLD CLOSET AND FURNISHED BY THE MANUFACTURER AND INSTALLED BY THE MECHANICAL CONTRACTOR.
C. 120V ELECTRICAL OUTLET IS PROVIDED, REFER TO ELECTRICAL PLANS FOR DETAILS. ALL INTERNAL 24 VAC WIRING SHALL BE FURNISHED BY MANUFACTURER AND INSTALLED BY THE MECHANICAL CONTRACTOR.

1 EXACT NUMBER OF PEX RUNOUTS NOT SHOWN. REFER TO RADIANT FLOOR HEATING SYSTEMS SCHEDULE FOR FURTHER INFORMATION.
2 PIPE REDUCER IF REQUIRED.
3 PIPE REDUCER/INCREASER IF MANIFOLD CONNECTION SIZE DIFFERS FROM AUTO CONTROL VALVE SIZE.
4 PIPING SAME SIZE AS AUTO CONTROL VALVE OR MANIFOLD CONNECTION, WHICH EVER IS LARGER.
5 18" BRAIDED BRONZE HOSE. INSULATE FIRST 6" NEXT TO MANIFOLD.
6 INSULATE PIPING UP TO SHUT-OFF VALVE.
7 RADIANT FLOOR PUMP. REFER TO PUMP SCHEDULE.

14 RADIANT FLOOR PIPING1

SCALE: NONE

NOTES

1. PUMP WITH FLANGED CONNECTIONS.
2. SPRING HANGER.
3. PRESSURE GAUGE WITH INTERCONNECTING PIPING AND VALVES.
4. BALANCING VALVE, SIZED FOR 3 TO 5 FT. HD. WPD AT FULL PUMP GPM. PROVIDE REDUCERS IN AND OUT. FOR PUMPS FITTED WITH AN ADJUSTABLE FREQUENCY MOTOR CONTROLLER LEAVE THE BALANCING VALVE FULL OPEN.
5. REDUCER WHEN PUMP CONNECTION SIZE DIFFERS FROM PIPE SIZE.
6. LEAVE SPACE TO ALLOW MOTOR TO BE PULLED.
7. DRAIN VALVE WITH HOSE CONNECTION.

15 PIPE MOUNTED PUMP

SCALE: NONE

16 EXHAUST OR RETURN BRANCH DUCTWORK

SCALE: NONE

LANCER + BEEBE, LLC
ARCHITECTURE | PLANNING | INTERIORS
220 N. COLLEGE AVE
INDIANAPOLIS, IN
46202

HEAPY
PROJECT NO. 2021-07128

GREENFIELD CENTRAL HIGH SCHOOL
AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
GREENFIELD, IN 46140

EHREN E. LOHRMANN
REGISTERED
No. PE10911293
STATE OF INDIANA
PROFESSIONAL ENGINEER

REVISIONS:	#	Date	Desc.
1	7	06.09.22	BID PKG. #2 ADD. #7

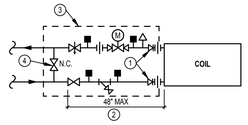
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

MECHANICAL DETAILS

M501

PLOT DATE/TIME:6/9/2022 11:18:40 AM



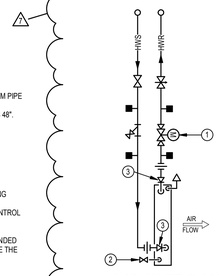
NOTES

1. PIPE REDUCER IF COIL CONNECTION SIZE DIFFERS FROM PIPE SIZE.
2. MAXIMUM DISTANCE FROM SHUT-OFF VALVE TO COIL IS 48".
3. FACTORY ASSEMBLED PIPING PACKAGE (OPTIONAL).
4. LINE SIZE START-UP/FLUSHING BYPASS.

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE.
B. REFER TO EQUIPMENT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE.
C. REFER TO SPECIFICATIONS FOR DEVICES NOT TO BE INSULATED. INSULATED DEVICES SHALL INCLUDE EXTENDED NECKS, SHAFTS, ETC. SO THEY ARE ACCESSIBLE ABOVE THE INSULATION.

4 CABINET UNIT HEATER PIPING-HEATING COIL
SCALE: NONE



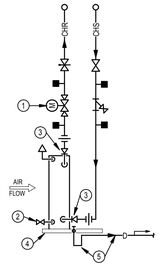
NOTES

1. AUTOMATIC TWO-PORT CONTROL VALVE. NORMALLY OPEN THRU COIL.
2. 0.5" DRAIN VALVE.
3. PIPE REDUCER IF COIL CONNECTION DIFFERS FROM PIPE SIZE.

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE.

3 A.H. UNIT 2 AND 3 HOT WATER COIL
SCALE: NONE



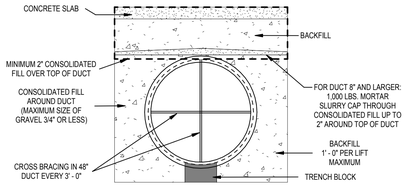
NOTES

1. AUTOMATIC TWO-PORT CONTROL VALVE. NORMALLY CLOSED THRU COIL.
2. 0.5" DRAIN VALVE.
3. PIPE REDUCER IF COIL CONNECTION DIFFERS FROM PIPE SIZE.
4. DRAIN PAN.
5. DRAIN PIPE, SAME SIZE AS PAN CONNECTION, WITH DEEP SEAL TRAP. REFER TO CONDENSATE DRAIN PIPING DETAIL.

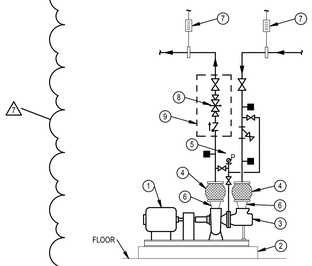
GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE.

2 A.H. UNIT 2 AND 3 CHILLED WATER COIL
SCALE: NONE



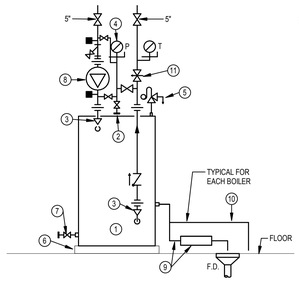
1 UNDERFLOOR DUCT BACK FILL DETAIL
SCALE: NONE



NOTES

1. BASE MOUNTED END SUCTION CENTRIFUGAL PUMP WITH FLANGED PIPE CONNECTIONS.
2. 4" CONCRETE HOUSEKEEPING PAD.
3. SUCTION DIFFUSER WITH INTEGRAL FINE MESH START-UP STRAINER AND ADJUSTABLE SUPPORT. REMOVE MESH AFTER PIPING IS CLEANED.
4. SPHERICAL FLEXIBLE PIPE CONNECTOR.
5. PRESSURE GAUGE WITH INTERCONNECTING PIPING AND VALVES.
6. PIPE REDUCER WHEN PIPE SIZE DIFFERS FROM PUMP CONNECTION SIZE.
7. SPRING HANGER. 3 SPRING HANGERS REQUIRED WITHIN 50 LF OF PUMP.
8. BALANCING VALVE, SIZED FOR 3 TO 5 FT. HD. WPD AT FULL PUMP GPM. PROVIDE REDUCERS IN AND OUT. FOR PUMPS FITTED WITH AN ADJUSTABLE FREQUENCY MOTOR CONTROLLER LEAVE THE BALANCING VALVE FULL OPEN.
9. SHUT-OFF, CHECK AND BALANCING VALVES MAY BE COMBINED INTO A SINGLE TRIPLE DUTY VALVE (OPTIONAL).

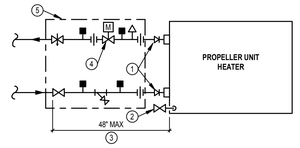
7 BASE MOUNTED PUMP - END SUCTION
SCALE: NONE



NOTES

1. BOILER, REFER TO EQUIPMENT SCHEDULE.
2. .75" DRAIN VALVE WITH HOSE THREAD FITTING.
3. REDUCER IF BOILER CONNECTION SIZE DIFFERS FROM PIPE SIZE.
4. PRESSURE GAUGE WITH INTERCONNECTING PIPING AND VALVES.
5. ONE OR MORE SAFETY RELIEF VALVES. PIPE DISCHARGE(S) TO SPILL ON FLOOR NEXT TO BOILER.
6. 4" CONCRETE HOUSEKEEPING PAD.
7. FULL SIZE DRAIN VALVE.
8. PRIMARY BOILER PUMP PHWP-3.
9. STAINLESS STEEL SECONDARY HX CONDENSATE DRAIN. PIPE TO FLOOR DRAIN THRU A NEUTRALIZING BASIN. DISCHARGE TO DRAIN PER PLUMBING CODE.
10. STAINLESS STEEL OVERFLOW DRAIN LINE TO SPILL ONTO FLOOR NEXT TO FLOOR DRAIN.
11. LINE SIZE MANUAL BALANCING VALVE. LEAVE WIDE-OPEN UNLESS REQUIRED TO BALANCE PRIMARY PUMP. VALVE MAY BE DELETED IF PRIMARY BOILER PUMP IS PROVIDED WITH AN ELECTRONICALLY COMMUTATED MOTOR WITH MANUAL SPEED ADJUSTMENT.

6 BOILER DETAIL
SCALE: NONE



NOTES

1. PIPE REDUCER IF COIL CONNECTION SIZE DIFFERS FROM PIPE SIZE.
2. 0.5" DRAIN VALVE.
3. MAXIMUM DISTANCE FROM SHUT-OFF VALVES TO COIL IS 48".
4. LINE-SIZE 2-POSITION AUTOMATIC ISOLATION VALVE FOR SEASONAL SHUT-OFF.
5. FACTORY ASSEMBLED PIPING PACKAGE (OPTIONAL).

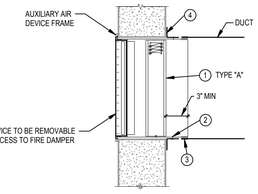
GENERAL NOTES

A. REFER TO SPECIFICATIONS FOR DEVICES NOT TO BE INSULATED. INSULATED DEVICES SHALL INCLUDE EXTENDED NECKS, SHAFTS, ETC. SO THEY ARE ACCESSIBLE ABOVE THE INSULATION.

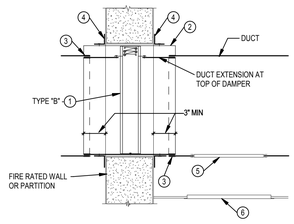
5 PROPELLER UNIT HEATER
SCALE: NONE

GENERAL NOTES

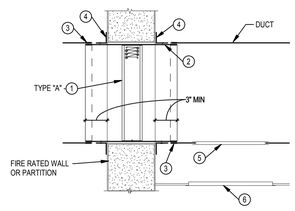
A. FIRE DAMPERS SHALL BE UL LABELED.
B. INSTALLATION OF FIRE DAMPERS AND ACCESSORIES SHALL CONFORM TO NFPA 90A, SMACNA AND MANUFACTURER'S INSTRUCTIONS.
C. DETAILS SHOW INSTALLATION OF FIRE DAMPER IN WALL. DAMPER INSTALLATION IN FLOOR SIMILAR. COORDINATE REQUIRED ACCESS LOCATIONS.
D. INSULATE RETAINING ANGLES FOR SYSTEMS REQUIRED TO BE INSULATED.



11 FIRE DAMPER AT AIR DEVICE - WALL
SCALE: NONE



10 FIRE DAMPER TYPE "B"
SCALE: NONE

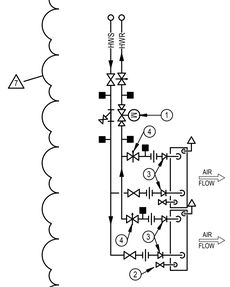


9 FIRE DAMPER TYPE "A"
SCALE: NONE

NOTES

1. FIRE DAMPER, FOLDED BLADE CURTAIN TYPE. EXCEPT AS NOTED. VERTICAL MOUNT, GRAVITY DROP; HORIZONTAL MOUNT, SPRING LOADED TO CLOSE. REFER TO SPECS FOR VELOCITY LIMITATIONS OF EACH TYPE. REFER TO DRAWINGS FOR STATIC OR DYNAMIC REQUIREMENTS.
   - TYPE "A" - BLADES STORED IN AIR STREAM. RECTANGULAR, ROUND OR OVAL DUCT CONNECTION.
   - TYPE "B" - BLADES STORED OUT OF AIR STREAM. RECTANGULAR, ROUND OR OVAL DUCT CONNECTION.
   - TYPE "C" - HIGH VELOCITY TYPE, BLADES STORED OUT OF AIR STREAM. RECTANGULAR, ROUND OR OVAL DUCT CONNECTION.
   - TYPE "D" - HIGH VELOCITY CENTER PIVOTED MULTI-BLADE. RECTANGULAR, ROUND OR OVAL DUCT CONNECTION.
   - TYPE "R" - HORIZONTAL CEILING RADIATION TYPE.
   - TYPE "AA", "BB", "CC", "DD" - SAME AS "A", "B", "C", "D", EXCEPT RATED FOR 3-HRS.
2. SHEET METAL WALL SLEEVE, SAME MATERIAL AS DUCT (EXCEPT GALVANIZED SHEET METAL FOR FIBERGLASS DUCT). SHEET METAL GAUGE PER SMACNA. USE EXTENDED HEAVY GAUGE SLEEVES WHEN INSTALLED CONDITION REQUIRES.
3. DUCT/SLEEVE CONNECTION. BREAKAWAY TYPE SHOWN. CONNECTION MAY BE RIGID TYPE IF ALLOWED BY CODE AUTHORITY.
4. RETAINING ANGLE ALL FOUR SIDES, GAUGE PER SMACNA. 1" MINIMUM OVERLAP OF WALL OPENING. LONGER LEG MAY BE REQUIRED TO ATTAIN REQUIRED OVERLAP. BOLT, SCREW OR TACK WELD TO WALL SLEEVE. SPACING OF FASTENERS PER SMACNA.
5. DUCT ACCESS PANEL OR DOOR. REFER TO SPECIFICATIONS.
6. CEILING ACCESS PANEL IF CEILING IS NOT ACCESSIBLE.

8 FIRE DAMPER NOTES
SCALE: NONE



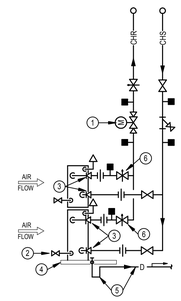
NOTES

1. AUTOMATIC TWO-PORT CONTROL VALVE. NORMALLY OPEN THRU COIL.
2. 0.5" DRAIN VALVE.
3. PIPE REDUCER IF COIL CONNECTION DIFFERS FROM PIPE SIZE.
4. LEAVE WIDE OPEN UNLESS NEEDED TO EVENLY DISTRIBUTE FLOW THRU COILS.

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE. BRANCH PIPING TO EACH COIL ONE SIZE SMALLER THAN MAIN RUN-OUT PIPING, BUT NO SMALLER THAN COIL CONNECTION SIZE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE.

13 A.H. UNIT 1 HOT WATER COILS
SCALE: NONE



NOTES

1. AUTOMATIC TWO-PORT CONTROL VALVE. NORMALLY CLOSED THRU COIL.
2. 0.5" DRAIN VALVE.
3. PIPE REDUCER IF COIL CONNECTION DIFFERS FROM PIPE SIZE.
4. DRAIN PAN.
5. DRAIN PIPE, SAME SIZE AS PAN CONNECTION, WITH DEEP SEAL TRAP. REFER TO CONDENSATE DRAIN PIPING DETAIL.
6. LEAVE WIDE OPEN UNLESS NEEDED TO EVENLY DISTRIBUTE FLOW THRU COILS.

GENERAL NOTES

A. ALL PIPING SHALL BE FULL SIZE OF MAIN RUN-OUT PIPING UNLESS NOTED OTHERWISE. BRANCH PIPING TO EACH COIL ONE SIZE SMALLER THAN MAIN RUN-OUT PIPING, BUT NO SMALLER THAN COIL CONNECTION SIZE.
B. REFER TO AIR HANDLING UNIT SCHEDULE FOR AUTOMATIC CONTROL VALVE SIZE.

12 A.H. UNIT 1 CHILLED WATER COILS
SCALE: NONE

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HEAPY
PROJECT NO. 2021-07128

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AUDITORIUM RENOVATION & ADDITION
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EHREN E. LOHRMANN
REGISTERED
No. PE10911293
STATE OF INDIANA
PROFESSIONAL ENGINEER

REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

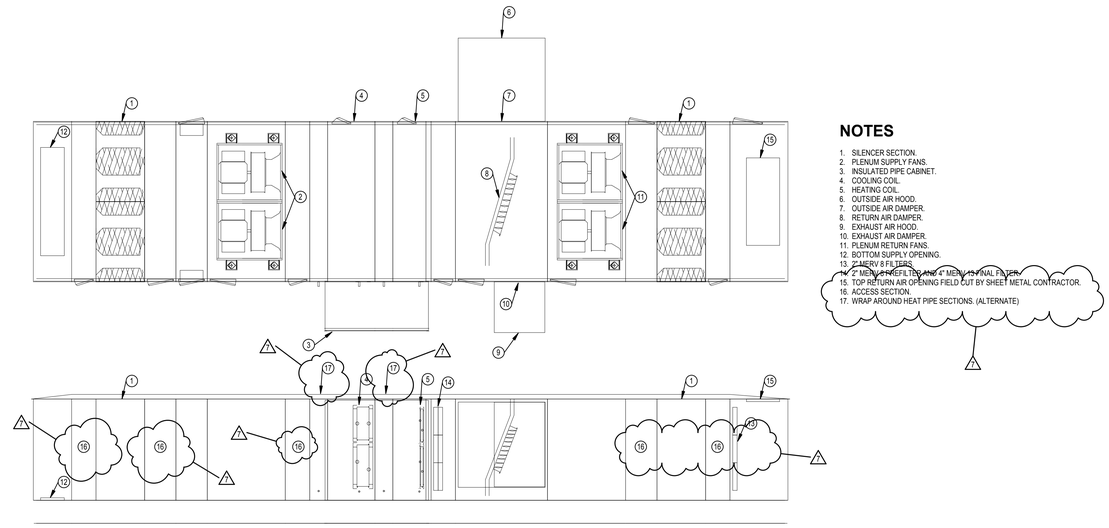
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

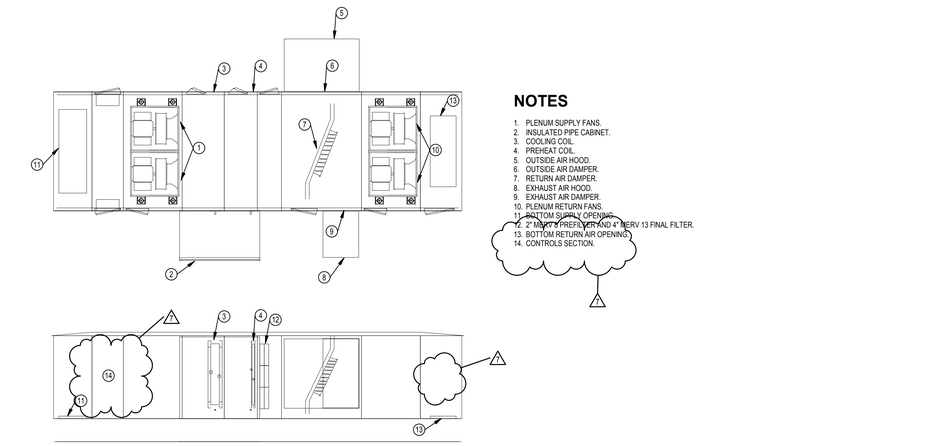
MECHANICAL DETAILS

M502

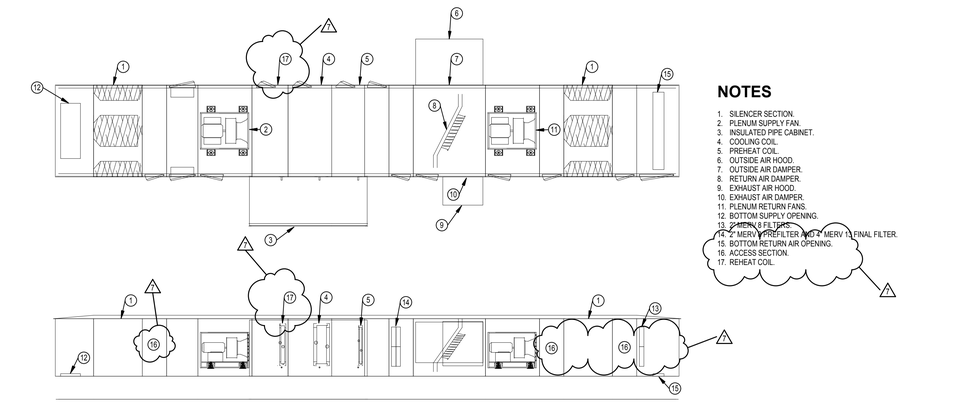
PLOT DATE/TIME:6/9/2022 11:15:41 AM



1 AHU-1 ELEVATION
SCALE: NONE



2 AHU-2 ELEVATION
SCALE: NONE



3 AHU-3 ELEVATION
SCALE: NONE

PLOT DATE/TIME:6/9/2022 11:19:42 AM

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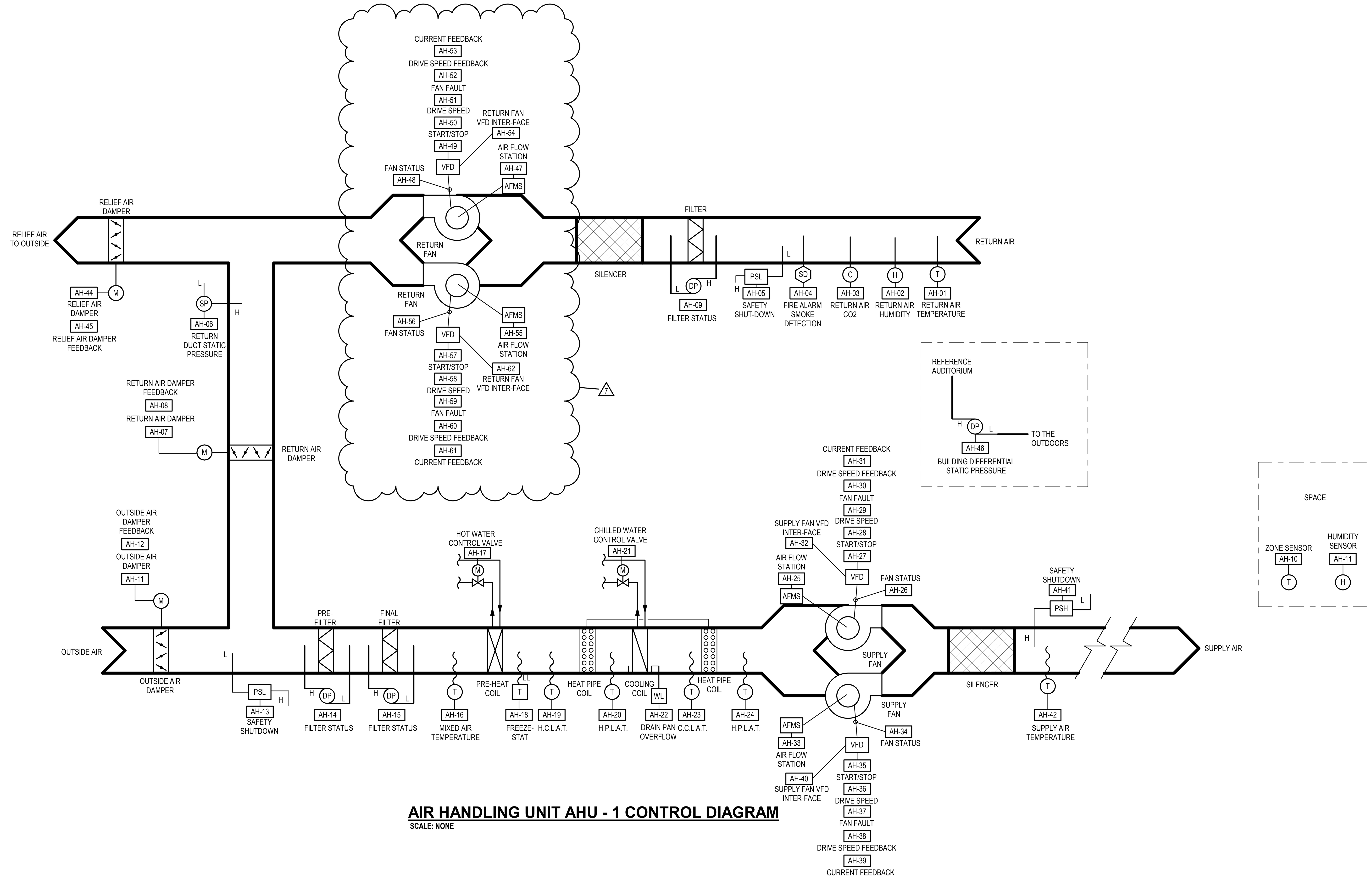
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

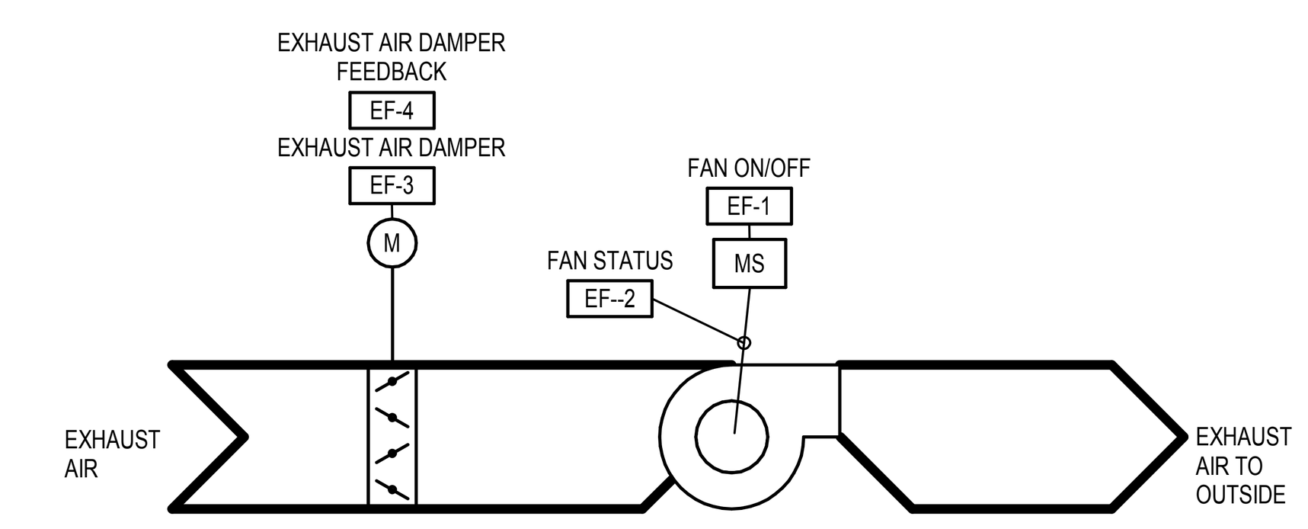
MECHANICAL DETAILS

M503



AIR HANDLING UNIT AHU - 1 CONTROL DIAGRAM

SCALE: NONE



EF-1 AND EF-2 ATC DIAGRAM

SCALE: NONE

EF-1 AND EF-2 POINTS LIST

GENERAL NOTES:
A. THE FOLLOWING LIST SHALL BE THE MINIMUM POINTS REQUIRED OF THE DIRECT DIGITAL CONTROL SYSTEM (BUILDING AUTOMATION SYSTEM). IT IS NOT THE INTENT TO SHOW ALL REQUIRED POINTS. IF OR WHEN ADDITIONAL POINTS ARE REQUIRED TO ACCOMPLISH THE SEQUENCES OF CONTROL SPECIFIED, THOSE POINTS SHALL ALSO BE PROVIDED.

NOTES:
1. CURRENT SENSOR.

POINT NO.	EF-1	EF-2	EF-3	EF-4				
POINT NAME	FAN ON/OFF	FAN STATUS	EXHAUST AIR DAMPER	EXHAUST AIR DAMPER FEEDBACK				
TYPE	BO	BI	AO	AI				
ALARM		ON FAULT		ON MISMATCH				
NOTES		1						

AIR HANDLING UNIT AHU - 1 POINTS LIST SCHEDULE

NOTES:
1. CURRENT SENSOR.
2. COORDINATE WITH VFD SUPPLIER.
3. COORDINATE SMOKE DETECTION ALARM SIGNAL FROM FIRE ALARM SYSTEM. SMOKE DETECTOR BY DIV 26/28.
4. IN ADDITION TO BEING A (BI) SAFETIES SHALL BE WIRED INTO THE FAN STARTERS/VFD(S) STARTER CIRCUIT SUCH THAT THE SAFETY SHALL FUNCTION WHETHER THE SELECTOR SWITCH IS IN THE "HAND" OR "AUTOMATIC" POSITION.
5. INCLUDE IN HEAT PIPE ALTERNATE.

POINT NO.	POINT NAME	TYPE	ALARM	NOTES
AH-01	RETURN AIR TEMPERATURE	AI	HIGH/LOW	
AH-02	RETURN AIR HUMIDITY	AI	HIGH/LOW	
AH-03	RETURN AIR CO2	AI	HIGH ALARM	
AH-04	RETURN AIR F.A. SMOKE DETECTION	BI	ON TRIP	3,4
AH-05	PRESSURE SAFETY SHUT-DOWN	BI	LOW PRESS. SYSTEM ALARM	4
AH-06	RETURN DUCT STATIC PRESSURE	AI	HIGH/LOW	
AH-07	RETURN AIR DAMPER	AO		
AH-08	RETURN AIR DAMPER FEEDBACK	AI	ON MISMATCH	
AH-09	FILTER STATUS	BI	ADJUSTABLE HIGH PRESS.	
AH-10	ZONE SENSOR	AI		
AH-11	ROOM HUMIDITY SENSOR	AI	7	
AH-12	OUTSIDE AIR DAMPER FEEDBACK	AI	ON MISMATCH	
AH-13	PRESSURE SAFETY SHUT-DOWN	BI	LOW PRESS. SYSTEM ALARM	4
AH-14	PRE-FILTER STATUS	BI	ADJUSTABLE HIGH PRESS.	
AH-15	FINAL FILTER STATUS	BI	ADJUSTABLE HIGH PRESSURE	
AH-16	MIXED AIR TEMPERATURE	AI	HIGH/LOW	
AH-17	HOT WATER COIL CONTROL VALVE	AO		
AH-18	FREEZE-STAT	BI	ON TRIP	4
AH-19	PREHEAT COIL - LEAVING AIR TEMPERATURE	AI	HIGH/LOW	
AH-20	HEAT PIPE - LEAVING AIR TEMPERATURE	AI	HIGH/LOW	5
AH-21	CHILLED WATER COIL CONTROL VALVE	AO		
AH-22	DRAIN PAN OVERFLOW	BI	ON TRIP	4
AH-23	COOLING COIL - LEAVING AIR TEMPERATURE	AI	HIGH/LOW	
AH-24	HEAT PIPE - LEAVING AIR TEMPERATURE	AI	HIGH/LOW	5
AH-25	SUPPLY FAN - AIRFLOW MEASURING STATION	AI	7	
AH-26	SUPPLY FAN - STATUS	BI	ON FAILURE	1
AH-27	SUPPLY FAN - START/STOP	BO		2
AH-28	SUPPLY FAN - DRIVE SPEED	AO		2
AH-29	SUPPLY FAN - FAULT	BI	ON TRIP	2
AH-30	SUPPLY FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-31	SUPPLY FAN - CURRENT FEEDBACK	AI		2
AH-32	SUPPLY FAN VFD INTER-FACE	INTER-FACE		2
AH-33	SUPPLY FAN - AIRFLOW MEASURING STATION	AI	7	
AH-34	SUPPLY FAN - STATUS	BI	ON FAILURE	1
AH-35	SUPPLY FAN - START/STOP	BO		2
AH-36	SUPPLY FAN - DRIVE SPEED	AO		2
AH-37	SUPPLY FAN - FAULT	BI	ON TRIP	2
AH-38	SUPPLY FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-39	SUPPLY FAN - CURRENT FEEDBACK	AI		2
AH-40	SUPPLY FAN VFD INTER-FACE	INTER-FACE		2
AH-41	PRESSURE SAFETY SHUT-DOWN	BI	HIGH PRESS. SYSTEM ALARM	4
AH-42	SUPPLY AIR - TEMPERATURE	AI	HIGH/LOW	
AH-43				
AH-44	RELIEF AIR DAMPER	AO		
AH-45	RELIEF AIR DAMPER FEEDBACK	AI	ON MISMATCH	
AH-46	BUILDING DIFFERENTIAL STATIC PRESSURE	AI	HIGH/LOW	
AH-47	RETURN FAN - AIRFLOW MEASURING STATION	AI	7	
AH-48	RETURN FAN - STATUS	BI	ON FAILURE	1
AH-49	RETURN FAN - START/STOP	BO		2
AH-50	RETURN FAN - DRIVE SPEED	AO		2
AH-51	RETURN FAN - FAULT	BI	ON TRIP	2
AH-52	RETURN FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-53	RETURN FAN - CURRENT FEEDBACK	AI		2
AH-54	RETURN FAN VFD INTER-FACE	INTER-FACE		2
AH-55	RETURN FAN - AIRFLOW MEASURING STATION	AI	7	
AH-56	RETURN FAN - STATUS	BI	ON FAILURE	1
AH-57	RETURN FAN - START/STOP	BO		2
AH-58	RETURN FAN - DRIVE SPEED	AO		2
AH-59	RETURN FAN - FAULT	BI	ON TRIP	2
AH-60	RETURN FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-61	RETURN FAN - CURRENT FEEDBACK	AI		2
AH-62	RETURN FAN VFD INTER-FACE	INTER-FACE		2

3.8 AIR HANDLING UNIT AHU-1

A. SYSTEM DESCRIPTION
1. THE AIR HANDLING SYSTEM SHALL CONSIST OF A SUPPLY FAN ARRAY WITH VFD'S AND AIRFLOW MEASURING STATIONS, RETURN FAN ARRAY WITH VFD'S AND AIRFLOW MEASURING STATIONS, MIXING BOX WITH RETURN AIR DAMPERS AND OUTSIDE AIR DAMPERS, RELIEF AIR DAMPERS, PREFILTERS, FINAL FILTERS, PREHEAT COIL, COOLING COIL, AND WRAP AROUND HEAT PIPE. REFER TO THE DRAWINGS FOR DETAILS.

B. SYSTEM ENABLE CONDITIONS:
1. REFER TO PARAGRAPH 3.1 FOR DEFINITIONS OF "OCCUPIED", "UNOCCUPIED", "MORNING WARM UP", AND "OVERRIDE" MODES.
2. THE "OCCUPIED" MODE OF OPERATION FOR THIS AIR HANDLING SYSTEM SHALL BE AS DEFINED IN PARAGRAPH 3.1. VERIFY AND COORDINATE TIME OF DAY SCHEDULING WITH OWNER. DURING THE "OCCUPIED" MODE, THE TEMPERATURE CONTROLS SHALL FUNCTION AS SPECIFIED. REFER TO BELOW FOR "UNOCCUPIED" MODE AND "OVERRIDE" MODE.
3. WHEN A ZONE THERMOSTAT OVERRIDE BUTTON IS ENERGIZED, THE AIR HANDLING SYSTEM SHALL BE ENABLED TO RUN IN THE "OCCUPIED" MODE FOR THE DURATION OF THE OVERRIDE.
4. PROVIDE START-STOP INTERLOCK BETWEEN SUPPLY AND RETURN FANS. SCHEDULE EXHAUST FANS EF-1 AND EF-2 TO RUN WHEN THE AHU IS IN THE "OCCUPIED" MODE.

C. "UNOCCUPIED" NIGHT SETBACK HEATING MODE
1. WHEN THE AIR HANDLING UNIT IS IN THE "UNOCCUPIED" MODE AND ANY ZONE TEMPERATURE FALLS 3 DEGREES BELOW THE ZONE "UNOCCUPIED" HEATING SETPOINT (REFER TO PARAGRAPH 3.3 ABOVE), THE AIR HANDLING UNIT SYSTEM SHALL CYCLE ON, EXCEPT THAT THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED AND THE INTERLOCKED EXHAUST FANS SHALL REMAIN OFF. WHEN ALL ZONE TEMPERATURES ARE AT OR ABOVE THEIR ZONE "UNOCCUPIED" HEATING SETPOINT THE AIR HANDLING SYSTEM SHALL CYCLE OFF.

D. "UNOCCUPIED" NIGHT SETUP COOL-DOWN MODE
1. WHEN THE AIR HANDLING UNIT IS IN THE "UNOCCUPIED" MODE AND ANY ZONE TEMPERATURE RISES 3 DEGREES ABOVE THE ZONE "UNOCCUPIED" COOLING SETPOINT (REFER TO PARAGRAPH 3.3 ABOVE), OR WHEN SPACE RH RISES ABOVE 60%, THE AIR HANDLING UNIT SYSTEM SHALL BE CYCLED ON FOR COOL-DOWN, EXCEPT THAT AND THE INTERLOCKED GENERAL EXHAUST FANS SHALL REMAIN OFF. PROVIDE WALL MOUNTED RH SENSOR AS SHOWN ON DRAWINGS.
2. DURING COOL-DOWN, OUTSIDE AIR SHALL BE USED FOR COOLING FIRST UNLESS THE ECONOMIZER IS LOCKED OUT. IF THE ECONOMIZER IS INACTIVE, THE ASSOCIATED RELIEF SHALL REMAIN OFF, AND OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, AND CHILLED WATER SYSTEM SHALL BE MADE AVAILABLE. WHEN ALL ZONE TEMPERATURES ARE AT OR BELOW THEIR ZONE "UNOCCUPIED" COOLING SETPOINT THE AIR HANDLING SYSTEM SHALL CYCLE OFF.

E. ADAPTIVE OPTIMAL START
1. AN OPTIMAL START PROGRAM SHALL START THE UNIT IN ADVANCE OF THE SCHEDULED "OCCUPIED" TIME TO ENSURE PROPER SPACE TEMPERATURES AT OCCUPANCY TIME. REFER TO PARAGRAPH 3.2 ABOVE. THE CONTROL LEARNING ALGORITHM AT A MINIMUM SHALL BE A FUNCTION OF THE DIFFERENCE BETWEEN ZONE TEMPERATURES AND OCCUPIED SET POINTS AND THE AMOUNT OF TIME PRIOR TO SCHEDULED OCCUPANCY. THE ALGORITHM SHALL ADJUST START TIMES BASED ON PAST HISTORIES AND TIMES TO OBTAIN OCCUPIED SETPOINTS AT SIMILAR OUTSIDE AIR TEMPERATURES.
2. DURING AN OPTIMAL START WARM-UP CYCLE ("MORNING WARM-UP") THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, RETURN AIR DAMPERS FULL OPEN, RELIEF DAMPERS FULL CLOSED, AND ASSOCIATED GENERAL EXHAUST FANS OFF. HOT WATER SHALL BE MADE AVAILABLE. THIS MODE SHALL CONTINUE UNTIL THE EXTERIOR ZONES (ONLY) REACH THEIR "OCCUPIED" HEATING SETPOINTS. IF THE SYSTEM IS STILL IN ITS WARM-UP CYCLE 30 MINUTES AFTER THE SCHEDULED OCCUPIED START TIME, END THE WARM-UP CYCLE AND ALARM THE BAS OF THE ZONE(S) THAT DID NOT HIT THEIR OCCUPIED HEATING SET POINT. WHEN THE WARM-UP CYCLE ENDS, THE ECONOMIZER DAMPERS SHALL BE POSITIONED TO MINIMUM AND THE RESPECTIVE EXHAUST FANS SHALL BE ENABLED. ECONOMIZER DAMPER CONTROL SHALL BE DELAYED TWO MINUTES DURING START-UP TO PREVENT CABINET HEAT FROM FALSE LOADING THE SYSTEM.
3. DURING AN OPTIMAL START COOL-DOWN CYCLE, OUTSIDE AIR SHALL BE USED FOR COOLING FIRST UNLESS THE ECONOMIZER IS LOCKED OUT. IF THE ECONOMIZER IS INACTIVE, THE ASSOCIATED RELIEF AND OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, AND CHILLED WATER SYSTEM SHALL BE MADE AVAILABLE. THIS MODE SHALL CONTINUE UNTIL ALL ZONES REACH THEIR "OCCUPIED" COOLING SETPOINTS. IF THE SYSTEM IS STILL IN ITS COOL-DOWN CYCLE 30 MINUTES AFTER THE SCHEDULED OCCUPIED START TIME, END THE COOL-DOWN CYCLE AND ALARM THE BAS OF THE ZONE(S) THAT DID NOT HIT THEIR OCCUPIED COOLING SET POINT. WHEN THE COOL-DOWN CYCLE ENDS, THE ECONOMIZER DAMPERS SHALL BE POSITIONED TO MINIMUM AND THE RESPECTIVE EXHAUST FANS SHALL BE ENABLED.

F. SAFETIES
1. THE FOLLOWING SAFETIES SHALL BE PROVIDED TO STOP THE AIR HANDLING UNIT SYSTEM AND POSITION ASSOCIATED CONTROL DEVICES TO THEIR "FAIL SAFE" POSITION, I.E., OUTSIDE AND RELIEF DAMPERS CLOSED, RETURN DAMPERS OPEN, HEATING VALVES OPEN AND HUMIDIFIER VALVES CLOSED. SAFETIES SHALL BE WIRED INTO THE FAN STARTER CIRCUIT SUCH THAT THE SAFETY SHALL FUNCTION WHETHER THE STARTER SELECTOR SWITCH IS IN THE HAND ON OR AUTOMATIC POSITION, AND WHETHER OR NOT THE VFD IS IN BYPASS.
   A. LOW TEMPERATURE LIMIT CUTOUT "FREEZESTATS" –AUTO RESET TYPE WITH REMOTE MANUAL RESET. SHALL BE PROVIDED AND INSTALLED ON THE LEAVING AIR FACE OF THE FIRST COIL IN THE AIR STREAM (UNLESS OTHERWISE NOTED) AND SHALL STOP THE AIR HANDLING UNIT SYSTEM IF A TEMPERATURE BELOW 38 DEG F IS DETECTED. REFER TO DETAILED INSTALLATION REQUIREMENTS IN 23 09 25 INSTRUMENTATION AND CONTROL DEVICES FOR HVAC.
   B. UNIT SMOKE DETECTORS – UPON SENSING SMOKE OR PRODUCTS OF COMBUSTION THE AIR HANDLING SYSTEM SHALL BE DISABLED. SMOKE DETECTORS SHALL BE PROVIDED PER DIVISION 26 UNLESS OTHERWISE NOTED, INSTALLED IN THE RETURN DUCT SYSTEM AND WIRED TO THE FAN SAFETY CIRCUITS TO STOP THE AIR HANDLING UNIT SYSTEM UPON SMOKE DETECTION. REFER TO THE DRAWINGS FOR DETECTOR LOCATIONS AND COORDINATE THEIR INSTALLATION.
   C. SUPPLY DUCT HIGH STATIC PRESSURE CUTOUT - PROVIDE A MANUALLY RESET TYPE DUCT STATIC PRESSURE SWITCH, SET AT THE MAXIMUM WORKING PRESSURE OF THE DUCTWORK, TO STOP THE FAN SYSTEM (SUPPLY, RETURN, EXHAUST) ON A RISE IN DUCT STATIC ABOVE SETPOINT.
   D. RETURN DUCT HIGH NEGATIVE PRESSURE CUTOUT - PROVIDE A MANUAL RESET TYPE DUCT STATIC PRESSURE SWITCH, SET AT THE MAXIMUM NEGATIVE WORKING PRESSURE OF THE DUCTWORK, TO STOP THE FAN SYSTEM (SUPPLY, RETURN, EXHAUST) ON A FALL IN DUCT STATIC BELOW SETPOINT.
   E. MIXED AIR PLENUM HIGH NEGATIVE PRESSURE CUTOUT - PROVIDE A MANUAL RESET TYPE STATIC PRESSURE SWITCH, SET AT THE MAXIMUM NEGATIVE WORKING PRESSURE OF THE AHU, TO STOP THE AHU FAN SYSTEM ON A FALL IN DUCT STATIC BELOW SETPOINT.

G. MINIMUM OUTSIDE AIR CONTROL
1. THIS PARAGRAPH DEFINES THE OPERATION OF OUTSIDE AIR, RELIEF AIR AND RETURN AIR DAMPERS (ECONOMIZER DAMPERS) TO PROVIDE MINIMUM OUTSIDE AIR FOR VENTILATION. THE PHRASE "MINIMUM" IN THE SEQUENCES OF OPERATION SHALL INVOKE THIS PARAGRAPH.

H. DIFFERENTIAL ENTHALPY ECONOMIZER CONTROL
1. DURING "OCCUPIED" MODE OR "COOL-DOWN" MODE, OUTSIDE AIR TEMPERATURE AND HUMIDITY, AND RETURN AIR TEMPERATURE AND HUMIDITY SHALL BE MEASURED, AND THE ENTHALPY OF EACH DETERMINED. IF THE ENTHALPY OF THE OUTSIDE AIR IS LESS THAN THE ENTHALPY OF THE RETURN AIR, THE ECONOMIZER SHALL BE ENABLED. WHEN THE OUTSIDE AIR ENTHALPY IS HIGHER THAN THE RETURN AIR ENTHALPY, OR WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 75 DEG F, THE ECONOMIZER SHALL BE DISABLED.
2. WHEN THE UNIT OPERATES IN THE "OCCUPIED" MODE, THE MINIMUM OUTSIDE AIR SHALL BE PROVIDED, THE RETURN AIR DAMPERS SHALL OPEN FULL AND RELIEF AIR DAMPERS SHALL REMAIN CLOSED. THIS CONDITION IS THE NORMAL POSITION AND SHALL BE MAINTAINED DURING THE "OCCUPIED" MODE EXCEPT DURING THE "ECONOMIZER" CYCLE. DURING THE "ECONOMIZER" CYCLE, THE AMOUNT OF OUTSIDE AIR AND RELIEF AIR SHALL BE INCREASED AS REQUIRED TO MAINTAIN THE UNIT DISCHARGE AIR TEMPERATURE SETPOINT. PROVIDE A MIXED AIR SENSOR AND LOW LIMIT CONTROL SET AT 45 DEGREES F. TO PREVENT OVER-OPENING OF THE OUTSIDE AIR DAMPERS. IF THE MIXED AIR TEMPERATURE FALLS BELOW 45 DEG F FOR 10 MINUTES AND THE OUTSIDE AIR DAMPERS ARE AT MINIMUM POSITION, ECONOMIZER SHALL BE CONSIDERED "INACTIVE". ALL CONTROL SETPOINTS SHALL BE FULLY ADJUSTABLE TO MEET JOB CONDITIONS. ECONOMIZER MODE SHALL BE DELAYED TWO MINUTES DURING START-UP TO PREVENT CABINET HEAT FROM FALSE LOADING THE SYSTEM.

I. OUTSIDE AIR AUTO DAMPER CONTROL
1. WHEN THE SUPPLY AIR FAN IS OFF FOR ANY REASON OR THE UNIT IS OPERATING IN THE "UNOCCUPIED" MODE, WARM-UP MODE, OR COOL-DOWN MODE THE OUTSIDE AIR DAMPER SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED.

J. RETURN AIR AUTO DAMPER CONTROL
1. THE RETURN AIR DAMPER SHALL MODULATE INVERSELY TO THE OUTDOOR AIR DAMPER WHEN THE ECONOMIZER MODE IS ENABLED. WHEN THE ECONOMIZER MODE IS DISABLED THE RETURN AIR DAMPER SHALL BE FULLY OPEN. PROVIDE INTERLOCK SO THAT THE RETURN AIR DAMPERS AND OUTSIDE AIR DAMPERS CANNOT BE CLOSED AT THE SAME TIME, UNDER NORMAL OPERATION AND OFF OR FAILED OPERATION.

K. RELIEF AIR AUTO DAMPER CONTROL
1. THE RELIEF AIR AUTO DAMPER ON THE AIR HANDLING UNIT IN THE ECONOMIZER SECTION DOWNSTREAM OF THE RETURN FAN SHALL BE OPPOSED BLADE TYPE CONTROLLED BY BUILDING PRESSURE. PROVIDE A WALL-MOUNTED DP SENSOR-TRANSMITTER TO MODULATE THE RELIEF AIR DAMPERS TO MAINTAIN A PRESSURE OF +0.05" W.C. AT THAT LOCATION, REFERENCED TO OUTDOORS. REFER TO DRAWINGS FOR DP SENSOR LOCATION.

L. SUPPLY FAN SYSTEM CONTROL
1. THE SUPPLY FAN SYSTEM CONSISTS OF AN ARRAY OF 2 FANS AND ASSOCIATED 2 VFD'S (1 FAN PER VFD). REFER TO 23 05 14 ADJUSTABLE FREQUENCY MOTOR CONTROLLERS FOR VFD REQUIREMENTS.
2. A MANUAL "HAND-OFF-AUTO" SWITCH ON THE FACE OF EACH VFD SHALL SELECT MODE OF OPERATION. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "OFF" POSITION, THE ASSOCIATED FAN SYSTEM SHALL STOP. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "ON" POSITION AND ALL SAFETIES ARE NORMAL, THE ASSOCIATED FAN SYSTEM SHALL START AND RUN CONTINUOUSLY. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "AUTO" POSITION AND ALL SAFETIES ARE NORMAL, THE BAS SHALL START AND STOP THE ASSOCIATED FAN SYSTEM.
3. A MANUAL "MANUAL-AUTO" SWITCH (CONTROL PAD FEATURE) ON THE FACE OF EACH VFD SHALL SELECT CONTROL SIGNAL SOURCE FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN THE SUPPLY AIR STATIC PRESSURE SETPOINT.
4. SUPPLY FAN VOLUME CONTROL - THE VARIABLE SPEED DRIVE ON THE SUPPLY FANS SHALL BE MODULATED. THE FAN SPEED MINIMUM SHALL BE BALANCED TO ACHIEVE AN AIR FLOW THAT IS 50% OF THE DESIGN MAXIMUM COOLING CFM. WHEN THE SYSTEM IS OPERATING IN THE HEATING-COOLING DEAD BAND THE FAN SPEED SHALL BE AT MINIMUM. DURING THE HEATING MODE, THE FAN SHALL REMAIN AT MINIMUM SPEED UNTIL THE HEATING RESET HAS REACHED IT MAXIMUM SUPPLY AIR TEMPERATURE (90 DEGREES F. ADJUSTABLE), IF THE ROOM TEMPERATURE IS STILL BELOW SET POINT THE SUPPLY FAN SHALL RAMP UP A MAXIMUM OF 10% PER MINUTE UNTIL THE ROOM HEATING SET POINT IS SATISFIED OR 100% SPEED AS REACHED. AS THE ROOM TEMPERATURES RISES ABOVE THE HEATING SET POINT THE SEQUENCE WILL REVERSE IN ORDER. DURING THE COOLING MODE, THE SUPPLY FAN SHALL RAMP UP FROM MINIMUM TO THE DESIGN MAXIMUM CFM WHEN THE ECONOMIZER IS ACTIVE BEFORE THE COOLING VALVE OPENS. IF THE ECONOMIZER IS NOT ACTIVE THE COOLING VALVE WILL LEAD BY ENABLING THE COOLING SUPPLY AIR RESET SCHEDULE. WHEN THE COOLING SUPPLY AIR TEMPERATURE HAS REACHED ITS MINIMUM SUPPLY AIR TEMPERATURE THE FAN SPEED SHALL BE RAMPED UPWARD UNTIL THE ROOM TEMPERATURE SET POINT HAS BEEN REACHED OR 100% SPEED AS REACHED. ON A FALL OF THE ROOM TEMPERATURE THE SEQUENCE HAS REVERSE IN ORDER.

M. RETURN FAN SYSTEM CONTROL
1. THE RETURN FAN SYSTEM CONSISTS OF AN ARRAY OF 2 FANS AND ASSOCIATED 2 VFD'S (1 FAN PER VFD). REFER TO 23 05 14 ADJUSTABLE FREQUENCY MOTOR CONTROLLERS FOR VFD REQUIREMENTS.
2. A MANUAL "HAND-OFF-AUTO" SWITCH ON THE FACE OF EACH VFD SHALL SELECT MODE OF OPERATION. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "OFF" POSITION, THE ASSOCIATED FAN SYSTEM SHALL STOP. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "ON" POSITION AND ALL SAFETIES ARE NORMAL, THE ASSOCIATED FAN SYSTEM SHALL START AND RUN CONTINUOUSLY. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "AUTO" POSITION AND ALL SAFETIES ARE NORMAL, THE BAS SHALL START AND STOP THE ASSOCIATED FAN SYSTEM.
3. A MANUAL "MANUAL-AUTO" SWITCH (CONTROL PAD FEATURE) ON THE FACE OF EACH VFD SHALL SELECT CONTROL SIGNAL SOURCE FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN SETPOINT.
4. RETURN FAN SYSTEM SPEED CONTROL - THE VARIABLE SPEED DRIVES ON THE RETURN FAN SYSTEM SHALL BE MODULATED BY A PLENUM-MOUNTED STATIC PRESSURE SENSOR LOCATED IN THE RETURN FAN DISCHARGE PLENUM, AND A PROPORTIONAL PLUS INTEGRAL CONTROL SHALL PROVIDE A SIGNAL THRU THE BAS TO MODULATE THE RETURN FAN SYSTEM VFD SPEEDS TO MAINTAIN A DISCHARGE AIR PLENUM SET POINT OF +0.15" W.C. (ADJUSTABLE).

N. SUPPLY AIR TEMPERATURE SET POINT AND RESET
1. THE AIR HANDLING UNIT COMPONENTS SHALL BE SEQUENCED TO PROVIDE A SUPPLY AIR TEMPERATURE OF 70 DEG F DURING "WARM-UP" CYCLES, AND 53 DEG F DURING "COOL DOWN" CYCLES. DURING "OCCUPIED" MODE, THE SUPPLY AIR TEMPERATURE SET POINT SHALL BE 53 DEG F EXCEPT RESET AS FOLLOWS:
   A. SUPPLY AIR TEMPERATURE RESET BASED ON ZONE TEMPERATURE: POLL ALL ZONES ASSOCIATED WITH THIS AIR HANDLING UNIT EVERY 15 MINUTES AND THE ZONE FURTHEST FROM ITS COOLING SETPOINT SHALL GOVERN. AS THE WORST-CASE ZONE DEVIATION FROM ITS COOLING SETPOINT DECREASES, THE DISCHARGE AIR SHALL BE RESET UPWARDS TOWARDS AN UPPER LIMIT OF 60 DEG F. IF ALL ZONES ARE IN HEATING AND/OR IN DEAD BAND, THE SUPPLY AIR SET POINT SHALL BE RESET TO THE UPPER LIMIT OF 60 DEG F. AUTOMATICALLY DETECT THOSE ZONES THAT MAY BE EXCESSIVELY DRIVING THE RESET LOGIC AND GENERATE AN ALARM TO THE SYSTEM OPERATOR. READILY ALLOW OPERATOR REMOVAL OF ZONE(S) FROM THE RESET ALGORITHM.
   IF RETURN AIR RELATIVE HUMIDITY RISES ABOVE 58 PERCENT RH THE RESET SCHEDULE SHALL BE DEACTIVATED. AFTER 60 MINUTES, RE-ACTIVATE RESET SCHEDULE IF BUILDING RH FALLS BELOW 55 PERCENT. PROVIDE RETURN DUCT RH SENSOR FOR MONITORING AND RESET CONTROL.

O. PREHEAT COIL CONTROL
1. HOT WATER PREHEAT COIL - IF THE AHU FAN SYSTEM IS "ON" AND CHILLED WATER VALVE IS CLOSED AND ECONOMIZER IS "OFF" AND THE AHU SUPPLY AIR TEMPERATURE FALLS 2 DEGREES BELOW SETPOINT, THE HOT WATER PREHEAT COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR AT 2 DEGREES BELOW SETPOINT. WHEN THE AHU FAN SYSTEM IS "OFF" UNDER NORMAL OPERATION, A TEMPERATURE SENSOR IN THE COIL LEAVING WATER SHALL MODULATE THE HOT WATER VALVE TO MAINTAIN 70 DEG F COIL LEAVING WATER TEMPERATURE. IF THE UNIT SHUTS DOWN ON FREEZESTAT THE VALVE SHALL GO FULL OPEN TO THE COIL.

P. COOLING COIL CONTROL
1. CHILLED WATER COIL – IF THE AHU FAN SYSTEM IS "ON" AND THE ECONOMIZER IS ACTIVE AND AT 100 PERCENT (OUTSIDE AIR DAMPERS FULL OPEN) AND THE AHU SUPPLY AIR TEMPERATURE IS ABOVE SET POINT, MODULATE THE CHILLED WATER VALVE OPEN TO MAINTAIN THE SUPPLY AIR SET POINT. IF THE AHU FAN SYSTEM IS "ON" AND THE ECONOMIZER IS NOT ACTIVE AND THE AHU SUPPLY AIR TEMPERATURE IS ABOVE SET POINT, MODULATE THE CHILLED WATER VALVE OPEN TO MAINTAIN THE SUPPLY AIR SET POINT. THE CHILLED WATER VALVE SHALL BE CLOSED ANY TIME THE AHU FAN SYSTEM IS "OFF" FOR ANY REASON.

Q. ZONE HOT WATER REHEAT COILS – HOT WATER CONTROL VALVES WILL MODULATE TO MAINTAIN SPACE TEMPERATURE WITH A MINIMUM SUPPLY TEMPERATURE OF 62 DEG F (ADJUSTABLE) AND MAXIMUM SUPPLY TEMPERATURE OF 95 DEG F (ADJUSTABLE)

R. AIR FILTER MONITORING
1. THE BAS SYSTEM SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS EACH FILTER BANK. WHEN THE FILTER BANK PRESSURE DROP EXCEEDS THE MANUFACTURER'S FILTER LOAD LIMIT GENERATE AN ALARM TO THE BAS.

PLOT DATE/TIME:6/9/2022 11:15:42 AM

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PROFESSIONAL ENGINEER

REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

BID PACKAGE #2 - 100%
CONSTRUCTION DOCUMENTS

PROJECT: #21107	
DATE: 05.20.2022	
DRAWN BY: BMW	

ATC DIAGRAMS

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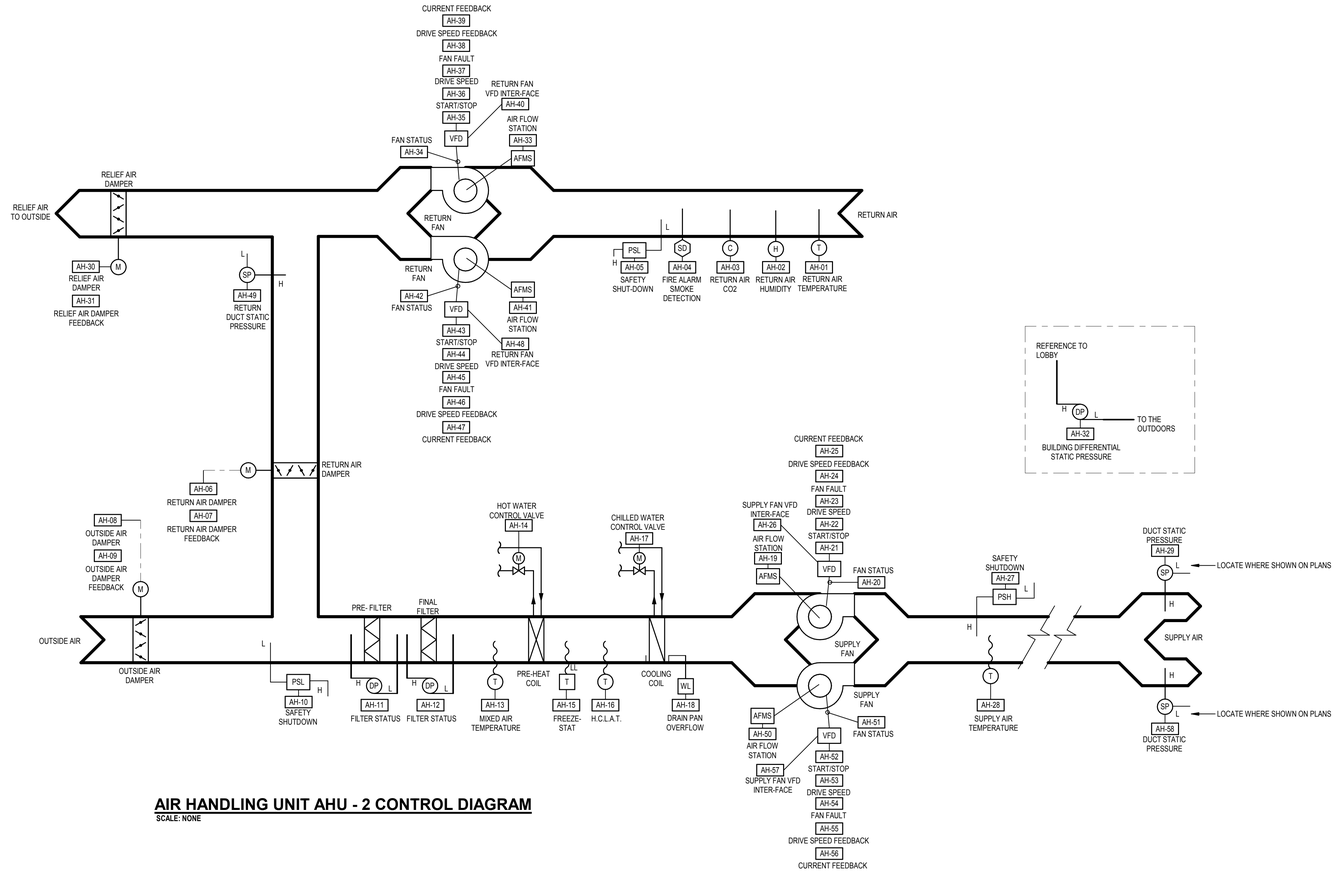

AIR HANDLING UNIT AHU - 2 CONTROL DIAGRAM

SCALE: NONE

AIR HANDLING UNIT AHU - 2 POINTS LIST SCHEDULE

NOTES:
1. CURRENT SENSOR.
2. COORDINATE WITH VFD SUPPLIER.
3. COORDINATE SMOKE DETECTION ALARM SIGNAL FROM FIRE ALARM SYSTEM. SMOKE DETECTOR BY DIV 26/28.
4. IN ADDITION TO BEING A (BI) SAFETIES SHALL BE WIRED INTO THE FAN STARTERS/VFD(S) STARTER CIRCUIT SUCH THAT THE SAFETY SHALL FUNCTION WHETHER THE SELECTOR SWITCH IS IN THE "HAND" OR "AUTOMATIC" POSITION.

POINT NO.	AH-01	AH-02	AH-03	AH-04	AH-05	AH-06	AH-07	AH-08	AH-09	AH-10	AH-11	AH-12	AH-13	AH-14	AH-15	AH-16	AH-17	AH-18	AH-19	AH-20	AH-21	AH-22	AH-23	AH-24	AH-25	AH-26	AH-27	AH-28	AH-29	AH-30	AH-31	AH-32	AH-33	AH-34	AH-35	AH-36	AH-37	AH-38	AH-39	AH-40	AH-41	AH-42	AH-43	AH-44	AH-45	AH-46	AH-47	AH-48	AH-49	AH-50	AH-51	AH-52	AH-53	AH-54	AH-55	AH-56	AH-57	AH-58
POINT NAME	RETURN AIR TEMPERATURE	RETURN AIR HUMIDITY	RETURN AIR CO2	RETURN AIR F.A. SMOKE DETECTION	PRESSURE SAFETY SHUT-DOWN	RETURN AIR DAMPER	RETURN AIR DAMPER FEEDBACK	OUTSIDE AIR DAMPER	OUTSIDE AIR DAMPER FEEDBACK	PRESSURE SAFETY SHUT-DOWN	PRE - FILTER STATUS	FINAL FILTER STATUS	MIXED AIR TEMPERATURE	HOT WATER COIL CONTROL VALVE	FREEZE-STAT	PREHEAT COIL - LEAVING AIR TEMPERATURE	CHILLED WATER COIL CONTROL VALVE	DRAIN PAN OVERFLOW	SUPPLY FAN - AIRFLOW MEASURING STATION	SUPPLY FAN - STATUS	SUPPLY FAN - START/STOP	SUPPLY FAN - DRIVE SPEED	SUPPLY FAN - FAULT	SUPPLY FAN - DRIVE SPEED FEEDBACK	SUPPLY FAN - CURRENT FEEDBACK	SUPPLY FAN VFD INTER-FACE	PRESSURE SAFETY SHUT-DOWN	SUPPLY AIR - TEMPERATURE	SUPPLY DUCT STATIC PRESSURE	RELIEF AIR DAMPER	RELIEF AIR DAMPER FEEDBACK	BUILDING DIFFERENTIAL STATIC PRESSURE	RETURN FAN - AIRFLOW MEASURING STATION	RETURN FAN - STATUS	RETURN FAN - START/STOP	RETURN FAN - DRIVE SPEED	RETURN FAN - FAULT	RETURN FAN - DRIVE SPEED FEEDBACK	RETURN FAN - CURRENT FEEDBACK	RETURN FAN VFD INTER-FACE	RETURN DUCT STATIC PRESSURE	SUPPLY FAN - AIRFLOW MEASURING STATION	SUPPLY FAN - STATUS	SUPPLY FAN - START/STOP	SUPPLY FAN - DRIVE SPEED	SUPPLY FAN - FAULT	SUPPLY FAN - DRIVE SPEED FEEDBACK	SUPPLY FAN - CURRENT FEEDBACK	SUPPLY FAN VFD INTER-FACE	SUPPLY DUCT STATIC PRESSURE
TYPE	AI	AI	AI	BI	BI	AO	AI	AO	AI	BI	BI	BI	AI	AO	BI	AI	AO	BI	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	BI	AI	AI	AO	AI	AI	INTER-FACE	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	AI
ALARM	HIGH/LOW	HIGH/LOW	HIGH/ALARM	ON TRIP	LOW PRESS. SYSTEM ALARM		ON MISMATCH		ON MISMATCH	LOW PRESS. SYSTEM ALARM	ADJUSTABLE HIGH PRESS.	ADJUSTABLE HIGH PRESSURE	HIGH/LOW		ON TRIP	HIGH/LOW		ON TRIP		ON FAILURE	ON MISMATCH			HIGH PRESS. SYSTEM ALARM	HIGH/LOW	HIGH/LOW		ON MISMATCH	HIGH/LOW			ON FAILURE					ON TRIP	ON MISMATCH			HIGH/LOW				ON FAILURE			ON TRIP	ON MISMATCH			HIGH/LOW
NOTES				3,4	4					4					4			4		1	2	2	2	2	2	2	4									1	2	2	2	2	2	2	2								1	2	2	2	2	2	2	2	

3.9 AIR HANDLING UNIT AHU-2

A. SYSTEM DESCRIPTION
1. THE AIR HANDLING SYSTEM SHALL CONSIST OF A SUPPLY FAN ARRAY WITH VFD'S AND AIRFLOW MEASURING STATIONS, RETURN FAN ARRAY WITH VFD'S AND AIRFLOW MEASURING STATIONS, MIXING BOX WITH RETURN AIR DAMPERS AND OUTSIDE AIR DAMPERS, RELIEF AIR DAMPERS, PREFILTERS, FINAL FILTERS, PREHEAT COIL, AND COOLING COIL. REFER TO THE DRAWINGS FOR DETAILS.

B. SYSTEM ENABLE CONDITIONS:
1. REFER TO PARAGRAPH 3.1 FOR DEFINITIONS OF "OCCUPIED", "UNOCCUPIED", "MORNING WARM UP", AND "OVERRIDE" MODES.
2. THE "OCCUPIED" MODE OF OPERATION FOR THIS AIR HANDLING SYSTEM SHALL BE AS DEFINED IN PARAGRAPH 3.1. VERIFY AND COORDINATE TIME OF DAY SCHEDULING WITH OWNER. DURING THE "OCCUPIED" MODE, THE TEMPERATURE CONTROLS SHALL FUNCTION AS SPECIFIED. REFER TO BELOW FOR "UNOCCUPIED" MODE AND "OVERRIDE" MODE.
3. WHEN A ZONE THERMOSTAT OVERRIDE BUTTON IS ENERGIZED, THE AIR HANDLING SYSTEM SHALL BE ENABLED TO RUN IN THE "OCCUPIED" MODE FOR THE DURATION OF THE OVERRIDE.
4. PROVIDE START-STOP INTERLOCK BETWEEN SUPPLY AND RETURN FANS. SCHEDULE EXHAUST FANS EF-1 AND EF-2 TO RUN WHEN THE AHU IS IN THE "OCCUPIED" MODE.

C. "UNOCCUPIED" NIGHT SETBACK HEATING MODE
1. WHEN COTHE AIR HANDLING UNIT IS IN THE "UNOCCUPIED" MODE AND ANY ZONE TEMPERATURE FALLS 3 DEGREES BELOW THE ZONE "UNOCCUPIED" HEATING SETPOINT (REFER TO PARAGRAPH 3.3 ABOVE), THE AIR HANDLING UNIT SYSTEM SHALL CYCLE ON, EXCEPT THAT THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED AND THE INTERLOCKED EXHAUST FANS SHALL REMAIN OFF. WHEN ALL ZONE TEMPERATURES ARE AT OR ABOVE THEIR ZONE "UNOCCUPIED" HEATING SETPOINT THE AIR HANDLING SYSTEM SHALL CYCLE OFF.

D. "UNOCCUPIED" NIGHT SETUP COOL-DOWN MODE
1. WHEN THE AIR HANDLING UNIT IS IN THE "UNOCCUPIED" MODE AND ANY ZONE TEMPERATURE RISES 3 DEGREES ABOVE THE ZONE "UNOCCUPIED" COOLING SETPOINT (REFER TO PARAGRAPH 3.3 ABOVE), OR WHEN SPACE RH RISES ABOVE 60%, THE AIR HANDLING UNIT SYSTEM SHALL BE CYCLED ON FOR COOL-DOWN, EXCEPT THAT AND THE INTERLOCKED GENERAL EXHAUST FANS SHALL REMAIN OFF. PROVIDE WALL MOUNTED RH SENSOR AS SHOWN ON DRAWINGS.
2. DURING COOL-DOWN, OUTSIDE AIR SHALL BE USED FOR COOLING FIRST UNLESS THE ECONOMIZER IS LOCKED OUT. IF THE ECONOMIZER IS INACTIVE, THE ASSOCIATED RELIEF SHALL REMAIN OFF, AND OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, AND CHILLED WATER SYSTEM SHALL BE MADE AVAILABLE. WHEN ALL ZONE TEMPERATURES ARE AT OR BELOW THEIR ZONE "UNOCCUPIED" COOLING SETPOINT THE AIR HANDLING SYSTEM SHALL CYCLE OFF.

E. ADAPTIVE OPTIMAL START
1. AN OPTIMAL START PROGRAM SHALL START THE UNIT IN ADVANCE OF THE SCHEDULED "OCCUPIED" TIME TO ENSURE PROPER SPACE TEMPERATURES AT OCCUPANCY TIME. REFER TO PARAGRAPH 3.2 ABOVE. THE CONTROL LEARNING ALGORITHM AT A MINIMUM SHALL BE A FUNCTION OF THE DIFFERENCE BETWEEN ZONE TEMPERATURES AND OCCUPIED SET POINTS AND THE AMOUNT OF TIME PRIOR TO SCHEDULED OCCUPANCY. THE ALGORITHM SHALL ADJUST START TIMES BASED ON PAST HISTORIES AND TIMES TO OBTAIN OCCUPIED SETPOINTS AT SIMILAR OUTSIDE AIR TEMPERATURES.
2. DURING AN OPTIMAL START WARM-UP CYCLE ("MORNING WARM-UP") THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, RETURN AIR DAMPERS FULL OPEN, RELIEF DAMPERS FULL CLOSED, AND ASSOCIATED GENERAL EXHAUST FANS OFF. HOT WATER SHALL BE MADE AVAILABLE. DURING WARM-UP THE VAV SHUT-OFF BOXES SHALL OPEN. THIS MODE SHALL CONTINUE UNTIL THE EXTERIOR ZONES (ONLY) REACH THEIR "OCCUPIED" HEATING SETPOINTS. IF THE SYSTEM IS STILL IN ITS WARM-UP CYCLE 30 MINUTES AFTER THE SCHEDULED OCCUPIED START TIME, END THE WARM-UP CYCLE AND ALARM THE BAS OF THE ZONE(S) THAT DID NOT HIT THEIR OCCUPIED HEATING SET POINT. WHEN THE WARM-UP CYCLE ENDS, THE ECONOMIZER DAMPERS SHALL BE POSITIONED TO MINIMUM AND THE RESPECTIVE EXHAUST FANS SHALL BE ENABLED. ECONOMIZER DAMPER CONTROL SHALL BE DELAYED TWO MINUTES DURING START-UP TO PREVENT CABINET HEAT FROM FALSE LOADING THE SYSTEM.
3. DURING AN OPTIMAL START COOL-DOWN CYCLE, OUTSIDE AIR SHALL BE USED FOR COOLING FIRST UNLESS THE ECONOMIZER IS LOCKED OUT. IF THE ECONOMIZER IS INACTIVE, THE ASSOCIATED RELIEF AND OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, AND CHILLED WATER SYSTEM SHALL BE MADE AVAILABLE. THIS MODE SHALL CONTINUE UNTIL ALL ZONES REACH THEIR "OCCUPIED" COOLING SETPOINTS. IF THE SYSTEM IS STILL IN ITS COOL-DOWN CYCLE 30 MINUTES AFTER THE SCHEDULED OCCUPIED START TIME, END THE COOL-DOWN CYCLE AND ALARM THE BAS OF THE ZONE(S) THAT DID NOT HIT THEIR OCCUPIED COOLING SET POINT. WHEN THE COOL-DOWN CYCLE ENDS, THE ECONOMIZER DAMPERS SHALL BE POSITIONED TO MINIMUM AND THE RESPECTIVE EXHAUST FANS SHALL BE ENABLED.

F. SAFETIES
1. THE FOLLOWING SAFETIES SHALL BE PROVIDED TO STOP THE AIR HANDLING UNIT CONTROL SIGNAL SOURCE OF MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN SETPOINT.
2. THE "OCCUPIED" MODE OF OPERATION FOR THIS AIR HANDLING SYSTEM SHALL BE AS DEFINED IN PARAGRAPH 3.1. VERIFY AND COORDINATE TIME OF DAY SCHEDULING WITH OWNER. DURING THE "OCCUPIED" MODE, THE TEMPERATURE CONTROLS SHALL FUNCTION AS SPECIFIED. REFER TO BELOW FOR "UNOCCUPIED" MODE AND "OVERRIDE" MODE.
3. WHEN A ZONE THERMOSTAT OVERRIDE BUTTON IS ENERGIZED, THE AIR HANDLING SYSTEM SHALL BE ENABLED TO RUN IN THE "OCCUPIED" MODE FOR THE DURATION OF THE OVERRIDE.
4. PROVIDE START-STOP INTERLOCK BETWEEN SUPPLY AND RETURN FANS. SCHEDULE EXHAUST FANS EF-1 AND EF-2 TO RUN WHEN THE AHU IS IN THE "OCCUPIED" MODE.
A. LOW TEMPERATURE LIMIT CUTOUT "FREEZESTATS" –AUTO RESET TYPE WITH REMOTE MANUAL RESET. SHALL BE PROVIDED AND INSTALLED ON THE LEAVING AIR FACE OF THE FIRST COIL IN THE AIR STREAM (UNLESS OTHERWISE NOTED) AND SHALL STOP THE AIR HANDLING UNIT SYSTEM IF A TEMPERATURE BELOW 38 DEG F IS DETECTED. REFER TO DETAILED INSTALLATION REQUIREMENTS IN 23 09 25 INSTRUMENTATION AND CONTROL DEVICES FOR HVAC.
B. UNIT SMOKE DETECTORS – UPON SENSING SMOKE OR PRODUCTS OF COMBUSTION THE AIR HANDLING SYSTEM SHALL BE DISABLED. SMOKE DETECTORS SHALL BE PROVIDED PER DIVISION 26 UNLESS OTHERWISE NOTED, INSTALLED IN THE RETURN DUCT SYSTEM AND WIRED TO THE FAN SAFETY CIRCUITS TO STOP THE AIR HANDLING UNIT SYSTEM UPON SMOKE DETECTION. REFER TO THE DRAWINGS FOR DETECTOR LOCATIONS AND COORDINATE THEIR INSTALLATION.
C. SUPPLY DUCT HIGH STATIC PRESSURE CUTOUT - PROVIDE A MANUALLY RESET TYPE DUCT STATIC PRESSURE SWITCH, SET AT THE MAXIMUM WORKING PRESSURE OF THE DUCTWORK, TO STOP THE FAN SYSTEM (SUPPLY, RETURN, EXHAUST) ON A RISE IN DUCT STATIC ABOVE SETPOINT.
D. RETURN DUCT HIGH NEGATIVE PRESSURE CUTOUT - PROVIDE A MANUAL RESET TYPE DUCT STATIC PRESSURE SWITCH, SET AT THE MAXIMUM NEGATIVE WORKING PRESSURE OF THE DUCTWORK, TO STOP THE FAN SYSTEM (SUPPLY, RETURN, EXHAUST) ON A FALL IN DUCT STATIC BELOW SETPOINT.
E. MIXED AIR PLENUM HIGH NEGATIVE PRESSURE CUTOUT - PROVIDE A MANUAL RESET TYPE STATIC PRESSURE SWITCH, SET AT THE MAXIMUM NEGATIVE WORKING PRESSURE OF THE AHU, TO STOP THE AHU FAN SYSTEM ON A FALL IN DUCT STATIC BELOW SETPOINT.

G. MINIMUM OUTSIDE AIR CONTROL
1. THIS PARAGRAPH DEFINES THE OPERATION OF OUTSIDE AIR, RELIEF AIR AND RETURN AIR DAMPERS (ECONOMIZER DAMPERS) TO PROVIDE MINIMUM OUTSIDE AIR FOR VENTILATION. THE PHRASE "MINIMUM" IN THE SEQUENCES OF OPERATION SHALL INVOKE THIS PARAGRAPH.

H. DIFFERENTIAL ENTHALPY ECONOMIZER CONTROL
1. DURING "OCCUPIED" MODE OR "COOL-DOWN" MODE, OUTSIDE AIR TEMPERATURE AND HUMIDITY, AND RETURN AIR TEMPERATURE AND HUMIDITY SHALL BE MEASURED, AND THE ENTHALPY OF EACH DETERMINED. IF THE ENTHALPY OF THE OUTSIDE AIR IS LESS THAN THE ENTHALPY OF THE RETURN AIR, THE ECONOMIZER SHALL BE ENABLED. WHEN TO STOP THE ECONOMIZER IS HIGHER THAN THE OUTSIDE AIR ENTHALPY IS HIGHER THAN THE RETURN AIR ENTHALPY, OR WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 75 DEG F, THE ECONOMIZER SHALL BE DISABLED.
2. WHEN THE UNIT OPERATES IN THE "OCCUPIED" MODE, THE MINIMUM OUTSIDE AIR SHALL BE PROVIDED, THE RETURN AIR DAMPERS SHALL OPEN FULL AND RELIEF AIR DAMPERS SHALL REMAIN CLOSED. THIS CONDITION IS THE NORMAL POSITION AND SHALL BE MAINTAINED DURING THE "OCCUPIED" MODE EXCEPT DURING THE "ECONOMIZER" CYCLE. DURING THE "ECONOMIZER" CYCLE, THE AMOUNT OF OUTSIDE AIR AND RELIEF AIR SHALL BE INCREASED AS REQUIRED TO MAINTAIN THE UNIT DISCHARGE AIR TEMPERATURE SETPOINT. PROVIDE A MIXED AIR SENSOR AND LOW LIMIT CONTROL SET AT 45 DEGREES F. TO PREVENT OVER-OPENING OF THE OUTSIDE AIR DAMPERS. IF THE MIXED AIR TEMPERATURE FALLS BELOW 45 DEG F FOR 10 MINUTES AND THE OUTSIDE AIR DAMPERS ARE AT MINIMUM POSITION, ECONOMIZER SHALL BE CONSIDERED "INACTIVE". ALL CONTROL SETPOINTS SHALL BE FULLY ADJUSTABLE TO MEET JOB CONDITIONS. ECONOMIZER MODE SHALL BE DELAYED TWO MINUTES DURING START-UP TO PREVENT CABINET HEAT FROM FALSE LOADING THE SYSTEM.

I. OUTSIDE AIR AUTO DAMPER CONTROL
1. WHEN THE SUPPLY AIR FAN IS OFF FOR ANY REASON OR THE UNIT IS OPERATING IN THE "UNOCCUPIED" MODE, WARM-UP MODE, OR COOL-DOWN MODE THE OUTSIDE AIR DAMPER SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED.

J. RETURN AIR AUTO DAMPER CONTROL
1. THE RETURN AIR DAMPER SHALL MODULATE INVERSELY TO THE OUTDOOR AIR DAMPER WHEN THE ECONOMIZER MODE IS ENABLED. WHEN THE ECONOMIZER MODE IS DISABLED THE RETURN AIR DAMPER SHALL BE FULLY OPEN. PROVIDE INTERLOCK SO THAT THE RETURN AIR DAMPERS AND OUTSIDE AIR DAMPERS CANNOT BE CLOSED AT THE SAME TIME, UNDER NORMAL OPERATION AND OFF OR FAILED OPERATION.

K. RELIEF AIR AUTO DAMPER CONTROL
1. THE RELIEF AIR AUTO DAMPER ON THE AIR HANDLING UNIT IN THE ECONOMIZER SECTION DOWNSTREAM OF THE RETURN FAN SHALL BE OPPOSED BLADE TYPE CONTROLLED BY BUILDING PRESSURE. PROVIDE A WALL-MOUNTED DP SENSOR-TRANSMITTER TO MODULATE THE RELIEF AIR DAMPERS TO MAINTAIN A PRESSURE OF +0.05" W.C. AT THAT LOCATION, REFERENCED TO OUTDOORS. REFER TO DRAWINGS FOR DP SENSOR LOCATION.

L. SUPPLY FAN SYSTEM CONTROL
1. THE SUPPLY FAN SYSTEM CONSISTS OF AN ARRAY OF 2 FANS AND ASSOCIATED 2 VFD'S (1 FAN PER VFD). REFER TO 23 05 14 ADJUSTABLE FREQUENCY MOTOR CONTROLLERS FOR VFD REQUIREMENTS.
2. A MANUAL "HAND-OFF-AUTO" SWITCH ON THE FACE OF EACH VFD SHALL SELECT MODE OF OPERATION. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "OFF" POSITION, THE ASSOCIATED FAN SYSTEM SHALL STOP. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "ON" POSITION AND ALL SAFETIES ARE NORMAL, THE ASSOCIATED FAN SYSTEM SHALL START AND RUN CONTINUOUSLY. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "AUTO" POSITION AND ALL SAFETIES ARE NORMAL, THE BAS SHALL START AND STOP THE ASSOCIATED FAN SYSTEM.
3. A MANUAL "MANUAL-AUTO" SWITCH (CONTROL PAD FEATURE) ON THE FACE OF EACH VFD SHALL SELECT CONTROL SIGNAL SOURCE FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN SETPOINT.
4. SUPPLY FAN SYSTEM SPEED CONTROL - THE VARIABLE SPEED DRIVES ON THE SUPPLY FAN SYSTEM SHALL BE MODULATED BY A PLENUM-MOUNTED STATIC PRESSURE SENSOR LOCATED IN THE RETURN FAN DISCHARGE PLENUM, AND A PROPORTIONAL PLUS INTEGRAL CONTROL SHALL PROVIDE A SIGNAL THRU THE BAS TO MODULATE THE RETURN FAN SYSTEM VFD SPEEDS TO MAINTAIN A DISCHARGE AIR PLENUM SET POINT OF +0.15" W.C. (ADJUSTABLE).

M. RETURN FAN SYSTEM CONTROL
1. THE RETURN FAN SYSTEM CONSISTS OF AN ARRAY OF 2 FANS AND ASSOCIATED 2 VFD'S (1 FAN PER VFD). REFER TO 23 05 14 ADJUSTABLE FREQUENCY MOTOR CONTROLLERS FOR VFD REQUIREMENTS.
2. A MANUAL "HAND-OFF-AUTO" SWITCH ON THE FACE OF EACH VFD SHALL SELECT MODE OF OPERATION. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "OFF" POSITION, THE ASSOCIATED FAN SYSTEM SHALL STOP. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "ON" POSITION AND ALL SAFETIES ARE NORMAL, THE ASSOCIATED FAN SYSTEM SHALL START AND RUN CONTINUOUSLY. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "AUTO" POSITION AND ALL SAFETIES ARE NORMAL, THE BAS SHALL START AND STOP THE ASSOCIATED FAN SYSTEM.
3. A MANUAL "MANUAL-AUTO" SWITCH (CONTROL PAD FEATURE) ON THE FACE OF EACH VFD SHALL SELECT CONTROL SIGNAL SOURCE FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN SETPOINT.
4. SUPPLY FAN SYSTEM SPEED CONTROL - THE VARIABLE SPEED DRIVES ON THE SUPPLY FAN SYSTEM SHALL BE MODULATED BY A DUCT-MOUNTED STATIC PRESSURE SENSOR LOCATED TWO-THIRDS DOWN EACH MAIN SUPPLY DUCT AS SHOWN ON THE DRAWINGS, AND A PROPORTIONAL PLUS INTEGRAL CONTROL SHALL PROVIDE A SIGNAL THRU THE BAS TO MODULATE THE VFD SPEEDS TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT (INITIALLY SET TO 1.0" W.C.).
5. SUPPLY AIR STATIC PRESSURE SETPOINT RESET
THE SUPPLY AIR STATIC PRESSURE SETPOINT SHALL BE RESET BY POLLING ALL VAV BOX DAMPER POSITIONS. IF ALL VAV BOX DAMPERS ARE BELOW 80 PERCENT OF FULL OPEN, RESET THE SUPPLY DUCT STATIC PRESSURE SETPOINT DOWNWARD 0.05" W.C. EVERY 10 MINUTES UNTIL AT LEAST ONE VAV BOX DAMPER IS 85 PERCENT OF FULL OPEN. IF ANY BOX DAMPER IS MORE THAN 90 PERCENT OF FULL OPEN, REVERSE THE SEQUENCE (RESET THE STATIC SETPOINT UPWARD 0.05" W.C. EVERY 5 MINUTES UNTIL ALL VAV BOX DAMPERS ARE LESS THAN 90 PERCENT OF FULL OPEN. LOW LIMIT OF THE SETPOINT SHALL BE 0.50" W.C. AND HIGH LIMIT SETPOINT SHALL BE 1.20" W.C. AUTOMATICALLY DETECT THOSE ZONES THAT MAY BE EXCESSIVELY DRIVING THE RESET LOGIC AND GENERATE AN ALARM TO THE SYSTEM OPERATOR. READILY ALLOW OPERATOR REMOVAL OF ZONE(S) FROM THE RESET ALGORITHM.

N. SUPPLY AIR TEMPERATURE SET POINT AND RESET
1. THE AIR HANDLING UNIT COMPONENTS SHALL BE SEQUENCED TO PROVIDE A SUPPLY AIR TEMPERATURE OF 70 DEG F DURING "WARM-UP" CYCLES, AND 53 DEG F DURING "COOL DOWN" CYCLES. DURING "OCCUPIED" MODE, THE SUPPLY AIR TEMPERATURE SET POINT SHALL BE 53 DEG F EXCEPT RESET AS FOLLOWS:
A. SUPPLY AIR TEMPERATURE RESET BASED ON ZONE TEMPERATURE. POLL ALL ZONES ASSOCIATED WITH THIS AIR HANDLING UNIT EVERY 15 MINUTES AND THE ZONE FURTHEST FROM ITS COOLING SETPOINT SHALL GOVERN. AS THE WORST-CASE ZONE DEVIATION FROM ITS COOLING SETPOINT DECREASES, THE DISCHARGE AIR SHALL BE RESET UPWARDS TOWARDS AN UPPER LIMIT OF 60 DEG F. IF ALL ZONES ARE IN HEATING AND/OR IN DEAD BAND, THE SUPPLY AIR SET POINT SHALL BE RESET TO THE UPPER LIMIT OF 60 DEG F. AUTOMATICALLY DETECT THOSE ZONES THAT MAY BE EXCESSIVELY DRIVING THE RESET LOGIC AND GENERATE AN ALARM TO THE SYSTEM OPERATOR. READILY ALLOW OPERATOR REMOVAL OF ZONE(S) FROM THE RESET ALGORITHM.
B. IF RETURN AIR RELATIVE HUMIDITY RISES ABOVE 58 PERCENT RH THE RESET SCHEDULE SHALL BE DEACTIVATED. AFTER 60 MINUTES, RE-ACTIVATE RESET SCHEDULE IF BUILDING RH FALLS BELOW 55 PERCENT. PROVIDE RETURN DUCT RH SENSOR FOR MONITORING AND RESET CONTROL.

O. PREHEAT COIL CONTROL
1. HOT WATER PREHEAT COIL - IF THE AHU FAN SYSTEM IS "ON" AND CHILLED WATER VALVE IS CLOSED AND ECONOMIZER IS "OFF" AND THE AHU SUPPLY AIR TEMPERATURE FALLS 2 DEGREES BELOW SETPOINT, THE HOT WATER PREHEAT COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR AT 2 DEGREES BELOW SETPOINT. WHEN THE AHU FAN SYSTEM IS "OFF" UNDER NORMAL OPERATION, A TEMPERATURE SENSOR IN THE COIL LEAVING WATER SHALL MODULATE THE HOT WATER VALVE TO MAINTAIN 70 DEG F COIL LEAVING WATER TEMPERATURE. IF THE UNIT SHUTS DOWN ON FREEZESTAT THE VALVE SHALL GO FULL OPEN TO THE COIL.

P. COOLING COIL CONTROL
1. CHILLED WATER COIL – IF THE AHU FAN SYSTEM IS "ON" AND THE ECONOMIZER IS ACTIVE AND AT 100 PERCENT (OUTSIDE AIR DAMPERS FULL OPEN) AND THE AHU SUPPLY AIR TEMPERATURE IS ABOVE SET POINT, MODULATE THE CHILLED WATER VALVE OPEN TO MAINTAIN THE SUPPLY AIR SET POINT. IF THE AHU FAN SYSTEM IS "ON" AND THE ECONOMIZER IS NOT ACTIVE AND THE AHU SUPPLY AIR TEMPERATURE IS ABOVE SET POINT, MODULATE THE CHILLED WATER VALVE OPEN TO MAINTAIN THE SUPPLY AIR SET POINT. THE CHILLED WATER VALVE SHALL BE CLOSED ANY TIME THE AHU FAN SYSTEM IS "OFF" FOR ANY REASON.

Q. AIR FILTER MONITORING
1. THE BAS SYSTEM SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS EACH FILTER BANK. WHEN THE FILTER BANK PRESSURE DROP EXCEEDS THE MANUFACTURER'S FILTER LOAD LIMIT GENERATE AN ALARM TO THE BAS.

PLOT DATE/TIME: 6/9/2022 11:19:42 AM

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HEAPY
PROJECT NO. 2021-07128

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AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
GREENFIELD, IN 46140

EAMON E. LOHRMANN
REGISTERED
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PROFESSIONAL ENGINEER

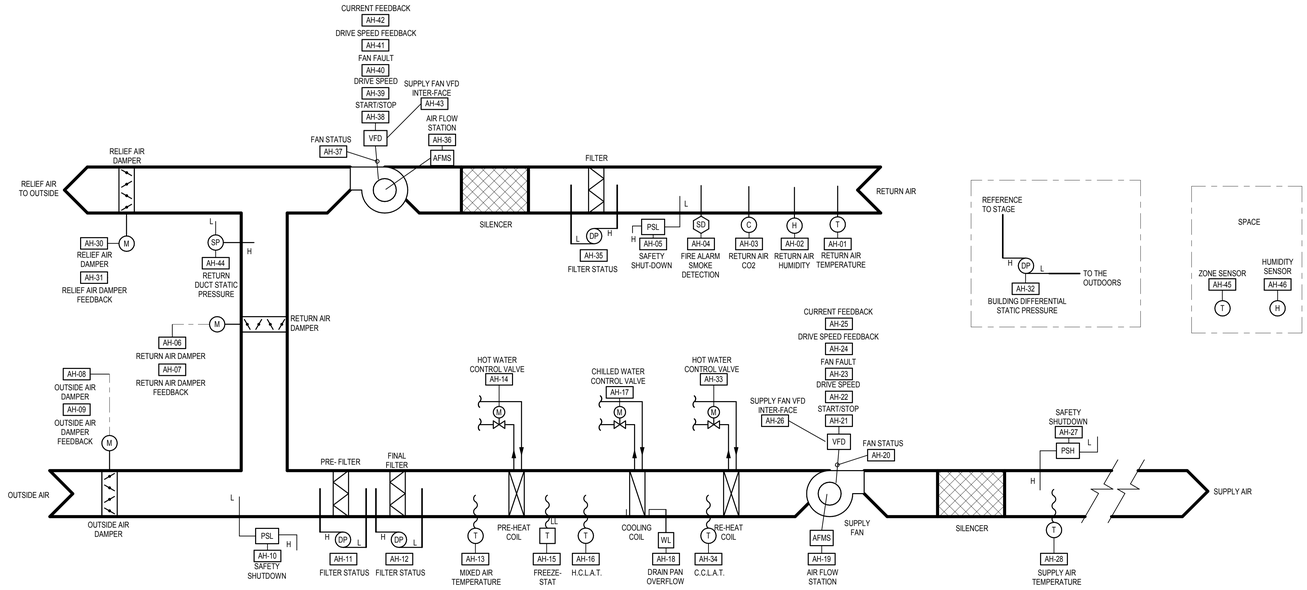
REVISIONS:			
#	Date	Desc.	
7	06.09.22	BID PKG. #2 ADD. #7	

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	BMW

ATC DIAGRAMS

M603



AIR HANDLING UNIT AHU - 3 CONTROL DIAGRAM

SCALE: NONE

AIR HANDLING UNIT AHU - 3 POINTS LIST SCHEDULE

NOTES:
1. CURRENT SENSOR.
2. COORDINATE WITH VFD SUPPLIER.
3. COORDINATE SMOKE DETECTION ALARM SIGNAL FROM FIRE ALARM SYSTEM. SMOKE DETECTOR BY DIV 26/28.
4. IN ADDITION TO BEING A (BI) SAFETIES SHALL BE WIRED INTO THE FAN STARTERS/VFD(S) STARTER CIRCUIT SUCH THAT THE SAFETY SHALL FUNCTION WHETHER THE SELECTOR SWITCH IS IN THE "HAND" OR "AUTOMATIC" POSITION.

POINT NO.	AH-01	AH-02	AH-03	AH-04	AH-05	AH-06	AH-07	AH-08	AH-09	AH-10	AH-11	AH-12	AH-13	AH-14	AH-15	AH-16	AH-17	AH-18	AH-19	AH-20	AH-21	AH-22	AH-23	AH-24	AH-25	AH-26	AH-27	AH-28	AH-29	AH-30	AH-31	AH-32	AH-33	AH-34	AH-35	AH-36	AH-37	AH-38	AH-39	AH-40	AH-41	AH-42	AH-43	AH-44	AH-45	AH-46
POINT NAME	RETURN AIR TEMPERATURE	RETURN AIR HUMIDITY	RETURN AIR CO2	RETURN FAN F. & SMOKE DETECTION	PRESSURE SAFETY SHUT-DOWN	RETURN AIR DAMPER	RETURN AIR DAMPER FEEDBACK	OUTSIDE AIR DAMPER	OUTSIDE AIR DAMPER FEEDBACK	PRESSURE SAFETY SHUT-DOWN	PRE - FILTER STATUS	FINAL FILTER STATUS	MIXED AIR TEMPERATURE	HOT WATER COIL CONTROL VALVE	FREEZE- STAT	PREHEAT COIL - LEAVING AIR TEMPERATURE	CHILLED WATER COIL CONTROL VALVE	DRAIN PAN OVERFLOW	SUPPLY FAN - AIRFLOW MEASURING STATION	SUPPLY FAN - STATUS	SUPPLY FAN - START/STOP	SUPPLY FAN - DRIVE SPEED	SUPPLY FAN - FAULT	SUPPLY FAN - DRIVE SPEED FEEDBACK	SUPPLY FAN - CURRENT FEEDBACK	SUPPLY FAN VFD INTER-FACE	PRESSURE SAFETY SHUT-DOWN	SUPPLY AIR - TEMPERATURE		RELIEF AIR DAMPER	RELIEF AIR DAMPER FEEDBACK	BUILDING DIFFERENTIAL STATIC PRESSURE	HOT WATER COIL CONTROL VALVE	COOLING COIL - LEAVING AIR TEMPERATURE	FILTER STATUS	RETURN FAN - AIRFLOW MEASURING STATION	RETURN FAN - STATUS	RETURN FAN - START/STOP	RETURN FAN - DRIVE SPEED	RETURN FAN - FAULT	RETURN FAN - DRIVE SPEED FEEDBACK	RETURN FAN - CURRENT FEEDBACK	RETURN FAN VFD INTER-FACE	RETURN DUCT STATIC PRESSURE	ZONE SENSOR	ROOM HUMIDITY SENSOR
TYPE	AI	AI	AI	BI	BI	AO	AI	AO	AI	BI	BI	BI	AI	AO	BI	AI	AO	BI	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	BI	AI		AO	AI	AI	AO	AI	BI	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	AI	AI	AI
ALARM	HIGH/LOW	HIGH/LOW	HIGH ALARM	ON TRIP	LOW PRESS SYSTEM ALARM		ON MISMATCH		ON MISMATCH	LOW PRESS SYSTEM ALARM	ADJUSTABLE HIGH PRESS	ADJUSTABLE HIGH PRESSURE	HIGH/LOW		ON TRIP	HIGH/LOW		ON TRIP	⚠1	ON FAILURE			ON TRIP	ON MISMATCH			HIGH PRESS SYSTEM ALARM	HIGH/LOW				ON MISMATCH	HIGH/LOW	⚠1	HIGH/LOW	ADJUSTABLE HIGH PRESS	⚠1	ON FAILURE				ON TRIP	ON MISMATCH			HIGH/LOW		⚠1
NOTES				3,4	4					4					4			4		1	2	2	2	2	2	2	4										1	2	2	2	2	2	2				

3.10 AIR HANDLING UNIT AHU-3

A. SYSTEM DESCRIPTION
1. THE AIR HANDLING SYSTEM SHALL CONSIST OF A SUPPLY FAN WITH VFD AND AIRFLOW MEASURING STATIONS, RETURN FAN WITH VFD AND AIRFLOW MEASURING STATIONS, MIXING BOX WITH RETURN AIR DAMPERS AND OUTSIDE AIR DAMPERS, RELIEF AIR DAMPERS, PREFILTERS, FINAL FILTERS, PREHEAT COIL, COOLING COIL, AND REHEAT COIL. REFER TO THE DRAWINGS FOR DETAILS.

B. SYSTEM ENABLE CONDITIONS:
1. REFER TO PARAGRAPH 3.1 FOR DEFINITIONS OF "OCCUPIED", "UNOCCUPIED", "MORNING WARM UP", AND "OVERRIDE" MODES.
2. THE "OCCUPIED" MODE OF OPERATION FOR THIS AIR HANDLING SYSTEM SHALL BE AS DEFINED IN PARAGRAPH 3.1. VERIFY AND COORDINATE TIME OF DAY SCHEDULING WITH OWNER. DURING THE "OCCUPIED" MODE, THE TEMPERATURE CONTROLS SHALL FUNCTION AS SPECIFIED. REFER TO BELOW FOR "UNOCCUPIED" MODE AND "OVERRIDE" MODE.
3. WHEN A ZONE THERMOSTAT OVERRIDE BUTTON IS ENERGIZED, THE AIR HANDLING SYSTEM SHALL BE ENABLED TO RUN IN THE "OCCUPIED" MODE FOR THE DURATION OF THE OVERRIDE.
4. PROVIDE START-STOP INTERLOCK BETWEEN SUPPLY AND RETURN FANS. SCHEDULE EXHAUST FANS EF-1 AND EF-2 TO RUN WHEN THE AHU IS IN THE "OCCUPIED" MODE.

C. "UNOCCUPIED" NIGHT SETBACK HEATING MODE
1. WHEN THE AIR HANDLING UNIT IS IN THE "UNOCCUPIED" MODE AND ANY ZONE TEMPERATURE FALLS 3 DEGREES BELOW THE ZONE "UNOCCUPIED" HEATING SETPOINT (REFER TO PARAGRAPH 3.3 ABOVE), THE AIR HANDLING UNIT SYSTEM SHALL CYCLE ON, EXCEPT THAT THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED AND THE INTERLOCKED EXHAUST FANS SHALL REMAIN OFF. WHEN ALL ZONE TEMPERATURES ARE AT OR ABOVE THEIR ZONE "UNOCCUPIED" HEATING SETPOINT THE AIR HANDLING SYSTEM SHALL CYCLE OFF.

D. "UNOCCUPIED" NIGHT SETUP COOL-DOWN MODE
1. WHEN THE AIR HANDLING UNIT IS IN THE "UNOCCUPIED" MODE AND ANY ZONE TEMPERATURE RISES 3 DEGREES ABOVE THE ZONE "UNOCCUPIED" COOLING SETPOINT (REFER TO PARAGRAPH 3.3 ABOVE), OR WHEN SPACE RH RISES ABOVE 60%, THE AIR HANDLING UNIT SYSTEM SHALL BE CYCLED ON FOR COOL-DOWN, EXCEPT THAT AND THE INTERLOCKED GENERAL EXHAUST FANS SHALL REMAIN OFF. PROVIDE WALL MOUNTED RH SENSOR AS SHOWN ON DRAWINGS.
2. DURING COOL-DOWN, OUTSIDE AIR SHALL BE USED FOR COOLING FIRST UNLESS THE ECONOMIZER IS LOCKED OUT. IF THE ECONOMIZER IS INACTIVE, THE ASSOCIATED RELIEF SHALL REMAIN OFF, AND OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, AND CHILLED WATER SYSTEM SHALL BE MADE AVAILABLE. WHEN ALL ZONE TEMPERATURES ARE AT OR BELOW THEIR ZONE "UNOCCUPIED" COOLING SETPOINT THE AIR HANDLING SYSTEM SHALL CYCLE OFF.

E. ADAPTIVE OPTIMAL START
1. AN OPTIMAL START PROGRAM SHALL START THE UNIT IN ADVANCE OF THE SCHEDULED "OCCUPIED" TIME TO ENSURE PROPER SPACE TEMPERATURES AT OCCUPANCY TIME. REFER TO PARAGRAPH 3.2 ABOVE. THE CONTROL LEARNING ALGORITHM AT A MINIMUM SHALL BE A FUNCTION OF THE DIFFERENCE BETWEEN ZONE TEMPERATURES AND OCCUPIED SET POINTS AND THE AMOUNT OF TIME PRIOR TO SCHEDULED OCCUPANCY. THE ALGORITHM SHALL ADJUST START TIMES BASED ON PAST HISTORIES AND TIMES TO OBTAIN OCCUPIED SETPOINTS AT SIMILAR OUTSIDE AIR TEMPERATURES.
2. DURING AN OPTIMAL START WARM-UP CYCLE ("MORNING WARM-UP") THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, RETURN AIR DAMPERS FULL OPEN, RELIEF DAMPERS FULL CLOSED, AND ASSOCIATED GENERAL EXHAUST FANS OFF. HOT WATER SHALL BE MADE AVAILABLE. THIS MODE SHALL CONTINUE UNTIL THE EXTERIOR ZONES (ONLY) REACH THEIR "OCCUPIED" HEATING SETPOINTS. IF THE SYSTEM IS STILL IN ITS WARM-UP CYCLE 30 MINUTES AFTER THE SCHEDULED OCCUPIED START TIME, END THE WARM-UP CYCLE AND ALARM THE BAS OF THE ZONE(S) THAT DID NOT HIT THEIR OCCUPIED HEATING SET POINT. WHEN THE WARM-UP CYCLE ENDS, THE ECONOMIZER DAMPERS SHALL BE POSITIONED TO MINIMUM AND THE RESPECTIVE EXHAUST FANS SHALL BE ENABLED. ECONOMIZER DAMPER CONTROL SHALL BE DELAYED TWO MINUTES DURING START-UP TO PREVENT CABINET HEAT FROM FALSE LOADING THE SYSTEM.
3. DURING AN OPTIMAL START COOL-DOWN CYCLE, OUTSIDE AIR SHALL BE USED FOR COOLING FIRST UNLESS THE ECONOMIZER IS LOCKED OUT. IF THE ECONOMIZER IS INACTIVE, THE ASSOCIATED RELIEF AND OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED, AND CHILLED WATER SYSTEM SHALL BE MADE AVAILABLE. THIS MODE SHALL CONTINUE UNTIL ALL ZONES REACH THEIR "OCCUPIED" COOLING SETPOINTS. IF THE SYSTEM IS STILL IN ITS COOL-DOWN CYCLE 30 MINUTES AFTER THE SCHEDULED OCCUPIED START TIME, END THE COOL-DOWN CYCLE AND ALARM THE BAS OF THE ZONE(S) THAT DID NOT HIT THEIR OCCUPIED COOLING SET POINT. WHEN THE COOL-DOWN CYCLE ENDS, THE ECONOMIZER DAMPERS SHALL BE POSITIONED TO MINIMUM AND THE RESPECTIVE EXHAUST FANS SHALL BE ENABLED.

F. SAFETIES
1. THE FOLLOWING SAFETIES SHALL BE PROVIDED TO STOP THE AIR HANDLING UNIT SYSTEM AND POSITION ASSOCIATED CONTROL DEVICES TO THEIR "FAIL SAFE" POSITION, I.E., OUTSIDE AND RELIEF DAMPERS CLOSED, RETURN DAMPERS OPEN, HEATING VALVES OPEN AND HUMIDIFIER VALVES CLOSED. SAFETIES SHALL BE WIRED INTO THE FAN STARTER CIRCUIT SUCH THAT THE SAFETY SHALL FUNCTION WHETHER THE STARTER SELECTOR SWITCH IS IN THE HAND ON OR AUTOMATIC POSITION, AND WHETHER OR NOT THE VFD IS IN BYPASS.
   A. LOW TEMPERATURE LIMIT CUTOUT "FREEZESTATS" –AUTO RESET TYPE WITH REMOTE MANUAL RESET. SHALL BE PROVIDED AND INSTALLED ON THE LEAVING AIR FACE OF THE FIRST COIL IN THE AIR STREAM (UNLESS OTHERWISE NOTED) AND SHALL STOP THE AIR HANDLING UNIT SYSTEM IF A TEMPERATURE BELOW 38 DEG F IS DETECTED. REFER TO DETAILED INSTALLATION REQUIREMENTS IN 23 09 25 INSTRUMENTATION AND CONTROL DEVICES FOR HVAC.
   B. UNIT SMOKE DETECTORS – UPON SENSING SMOKE OR PRODUCTS OF COMBUSTION THE AIR HANDLING SYSTEM SHALL BE DISABLED. SMOKE DETECTORS SHALL BE PROVIDED PER DIVISION 26 UNLESS OTHERWISE NOTED, INSTALLED IN THE RETURN DUCT SYSTEM AND WIRED TO THE FAN SAFETY CIRCUITS TO STOP THE AIR HANDLING UNIT SYSTEM UPON SMOKE DETECTION. REFER TO THE DRAWINGS FOR DETECTOR LOCATIONS AND COORDINATE THEIR INSTALLATION.
   C. SUPPLY DUCT HIGH STATIC PRESSURE CUTOUT - PROVIDE A MANUALLY RESET TYPE DUCT STATIC PRESSURE SWITCH, SET AT THE MAXIMUM WORKING PRESSURE OF THE DUCTWORK, TO STOP THE FAN SYSTEM (SUPPLY, RETURN, EXHAUST) ON A RISE IN DUCT STATIC ABOVE SETPOINT.
   D. RETURN DUCT HIGH NEGATIVE PRESSURE CUTOUT - PROVIDE A MANUAL RESET TYPE DUCT STATIC PRESSURE SWITCH, SET AT THE MAXIMUM NEGATIVE WORKING PRESSURE OF THE DUCTWORK, TO STOP THE FAN SYSTEM (SUPPLY, RETURN, EXHAUST) ON A FALL IN DUCT STATIC BELOW SETPOINT.
   E. MIXED AIR PLENUM HIGH NEGATIVE PRESSURE CUTOUT - PROVIDE A MANUAL RESET TYPE STATIC PRESSURE SWITCH, SET AT THE MAXIMUM NEGATIVE WORKING PRESSURE OF THE AHU, TO STOP THE AHU FAN SYSTEM ON A FALL IN DUCT STATIC BELOW SETPOINT.

G. MINIMUM OUTSIDE AIR CONTROL
1. THIS PARAGRAPH DEFINES THE OPERATION OF OUTSIDE AIR, RELIEF AIR AND RETURN AIR DAMPERS (ECONOMIZER DAMPERS) TO PROVIDE MINIMUM OUTSIDE AIR VENTILATION. THE PHRASE "MINIMUM" IN THE SEQUENCES OF OPERATION SHALL INVOKE THIS PARAGRAPH.

H. DIFFERENTIAL ENTHALPY ECONOMIZER CONTROL
1. DURING "OCCUPIED" MODE OR "COOL-DOWN" MODE, OUTSIDE AIR TEMPERATURE AND HUMIDITY AND RETURN AIR TEMPERATURE AND HUMIDITY SHALL BE MEASURED, AND THE ENTHALPY OF EACH DETERMINED. IF THE ENTHALPY OF THE OUTSIDE AIR IS LESS THAN THE ENTHALPY OF THE RETURN AIR, THE ECONOMIZER SHALL BE ENABLED. WHEN THE OUTSIDE AIR ENTHALPY IS HIGHER THAN THE RETURN AIR ENTHALPY, OR WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 75 DEG F, THE ECONOMIZER SHALL BE DISABLED.
2. WHEN THE UNIT OPERATES IN THE "OCCUPIED" MODE, THE MINIMUM OUTSIDE AIR SHALL BE PROVIDED, THE RETURN AIR DAMPERS SHALL OPEN FULL AND RELIEF AIR DAMPERS SHALL REMAIN CLOSED. THIS CONDITION IS THE NORMAL POSITION AND SHALL BE MAINTAINED DURING THE "OCCUPIED" MODE EXCEPT DURING THE "ECONOMIZER" CYCLE. DURING THE "ECONOMIZER" CYCLE, THE AMOUNT OF OUTSIDE AIR AND RELIEF AIR SHALL BE INCREASED AS REQUIRED TO MAINTAIN THE UNIT DISCHARGE AIR TEMPERATURE SETPOINT. PROVIDE A MIXED AIR SENSOR AND LOW LIMIT CONTROL SET AT 45 DEGREES F. TO PREVENT OVER-OPENING OF THE OUTSIDE AIR DAMPERS. IF THE MIXED AIR TEMPERATURE FALLS BELOW 45 DEG F FOR 10 MINUTES AND THE OUTSIDE AIR DAMPERS ARE AT MINIMUM POSITION, ECONOMIZER SHALL BE CONSIDERED "INACTIVE". ALL CONTROL SETPOINTS SHALL BE FULLY ADJUSTABLE TO MEET JOB CONDITIONS. ECONOMIZER MODE SHALL BE DELAYED TWO MINUTES DURING START-UP TO PREVENT CABINET HEAT FROM FALSE LOADING THE SYSTEM.

I. OUTSIDE AIR AUTO DAMPER CONTROL
1. WHEN THE SUPPLY AIR FAN IS OFF FOR ANY REASON OR THE UNIT IS OPERATING IN THE "UNOCCUPIED" MODE, WARM-UP MODE, OR COOL-DOWN MODE THE OUTSIDE AIR DAMPER SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED.

J. RETURN AIR AUTO DAMPER CONTROL
1. THE RETURN AIR DAMPER SHALL MODULATE INVERSELY TO THE OUTDOOR AIR DAMPER WHEN THE ECONOMIZER MODE IS ENABLED. WHEN THE ECONOMIZER MODE IS DISABLED THE RETURN AIR DAMPER SHALL BE FULLY OPEN. PROVIDE INTERLOCK SO THAT THE RETURN AIR DAMPERS AND OUTSIDE AIR DAMPERS CANNOT BE CLOSED AT THE SAME TIME, UNDER NORMAL OPERATION AND OFF ON FAILED OPERATION.

K. RELIEF AIR AUTO DAMPER CONTROL
1. THE RELIEF AIR AUTO DAMPER ON THE AIR HANDLING UNIT IN THE ECONOMIZER SECTION DOWNSTREAM OF THE RETURN FAN SHALL BE OPPOSED BLADE TYPE CONTROLLED BY BUILDING PRESSURE. PROVIDE A WALL-MOUNTED DP SENSOR-TRANSMITTER TO MODULATE THE RELIEF AIR DAMPERS TO MAINTAIN A PRESSURE OF +0.05" W.C. AT THAT LOCATION, REFERENCED TO OUTDOORS. REFER TO DRAWINGS FOR DP SENSOR LOCATION.

L. SUPPLY FAN SYSTEM CONTROL
1. THE SUPPLY FAN SYSTEM CONSISTS OF AN ARRAY OF 2 FANS AND ASSOCIATED 2 VFD'S (1 FAN PER VFD). REFER TO 23 05 14 ADJUSTABLE FREQUENCY MOTOR CONTROLLERS FOR VFD REQUIREMENTS.
2. A MANUAL "HAND-OFF-AUTO" SWITCH ON THE FACE OF EACH VFD SHALL SELECT MODE OF OPERATION. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "OFF" POSITION, THE ASSOCIATED FAN SYSTEM SHALL STOP. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "ON" POSITION AND ALL SAFETIES ARE NORMAL, THE ASSOCIATED FAN SYSTEM SHALL START AND RUN CONTINUOUSLY. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "AUTO" POSITION AND ALL SAFETIES ARE NORMAL, THE BAS SHALL START AND STOP THE ASSOCIATED FAN SYSTEM.
3. A MANUAL "MANUAL-AUTO" SWITCH (CONTROL PAD FEATURE) ON THE FACE OF EACH VFD SHALL SELECT CONTROL SIGNAL SOURCE FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN SETPOINT.
4. SUPPLY FAN VOLUME CONTROL - THE VARIABLE SPEED DRIVE ON THE SUPPLY FANS SHALL BE MODULATED. THE FAN SPEED MINIMUM SHALL BE BALANCED TO ACHIEVE AN AIR FLOW THAT IS 50% OF THE DESIGN MAXIMUM COOLING CFM. WHEN THE SYSTEM IS OPERATING IN THE HEATING-COOLING DEAD BAND THE FAN SPEED SHALL BE AT MINIMUM. DURING THE HEATING MODE, THE FAN SHALL REMAIN AT MINIMUM SPEED UNTIL THE HEATING RESET HAS REACHED IT MAXIMUM SUPPLY AIR TEMPERATURE (90 DEGREES F. ADJUSTABLE). IF THE ROOM TEMPERATURE IS STILL BELOW SET POINT THE SUPPLY FAN SHALL RAMP UP A MAXIMUM OF 10% PER MINUTE UNTIL THE ROOM HEATING SET POINT IS SATISFIED OR 100% SPEED AS REACHED. AS THE ROOM TEMPERATURES RISES ABOVE THE HEATING SET POINT THE SEQUENCE WILL REVERSE IN ORDER. DURING THE COOLING MODE, THE SUPPLY FAN SHALL RAMP UP FROM MINIMUM TO THE DESIGN MAXIMUM CFM WHEN THE ECONOMIZER IS ACTIVE BEFORE THE COOLING VALVE OPENS. IF THE ECONOMIZER IS NOT ACTIVE THE COOLING VALVE WILL LEAD BY ENABLING THE COOLING SUPPLY AIR RESET SCHEDULE. WHEN THE COOLING SUPPLY AIR TEMPERATURE HAS REACHED ITS MINIMUM SUPPLY AIR TEMPERATURE THE FAN SPEED SHALL BE RAMPED UPWARD UNTIL THE ROOM TEMPERATURE SET POINT HAS BEEN REACHED OR 100% SPEED AS REACHED. ON A FALL OF THE ROOM TEMPERATURE THE SEQUENCE HAS REVERSED IN ORDER.

M. RETURN FAN SYSTEM CONTROL
1. THE RETURN FAN SYSTEM CONSISTS OF AN ARRAY OF 2 FANS AND ASSOCIATED 2 VFD'S (1 FAN PER VFD). REFER TO 23 05 14 ADJUSTABLE FREQUENCY MOTOR CONTROLLERS FOR VFD REQUIREMENTS.
2. A MANUAL "HAND-OFF-AUTO" SWITCH ON THE FACE OF EACH VFD SHALL SELECT MODE OF OPERATION. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "OFF" POSITION, THE ASSOCIATED FAN SYSTEM SHALL STOP. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "ON" POSITION AND ALL SAFETIES ARE NORMAL, THE ASSOCIATED FAN SYSTEM SHALL START AND RUN CONTINUOUSLY. WHEN THE SELECTOR SWITCH IS INDEXED TO THE "AUTO" POSITION AND ALL SAFETIES ARE NORMAL, THE BAS SHALL START AND STOP THE ASSOCIATED FAN SYSTEM.
3. A MANUAL "MANUAL-AUTO" SWITCH (CONTROL PAD FEATURE) ON THE FACE OF EACH VFD SHALL SELECT CONTROL SIGNAL SOURCE FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "MANUAL" POSITION, THE MANUAL SPEED ADJUSTOR OF THE VFD SHALL PROVIDE THE CONTROL SIGNAL FOR MOTOR SPEED. WHEN THE MOTOR IS ENABLED AND IS INDEXED TO THE "AUTO" POSITION, THE BAS SHALL PROVIDE A PROPORTIONAL PLUS INTEGRAL CONTROL SIGNAL TO MODULATE MOTOR SPEED TO MAINTAIN SETPOINT.
4. RETURN FAN SYSTEM SPEED CONTROL - THE VARIABLE SPEED DRIVES ON THE RETURN FAN SYSTEM SHALL BE MODULATED BY A PLENUM-MOUNTED STATIC PRESSURE SENSOR LOCATED IN THE RETURN FAN DISCHARGE PLENUM, AND A PROPORTIONAL PLUS INTEGRAL CONTROL SHALL PROVIDE A SIGNAL THRU THE BAS TO MODULATE THE RETURN FAN SYSTEM VFD SPEEDS TO MAINTAIN A DISCHARGE AIR PLENUM SET POINT OF +0.15" W.C. (ADJUSTABLE).

N. SUPPLY AIR TEMPERATURE SET POINT AND RESET
1. THE AIR HANDLING UNIT COMPONENTS SHALL BE SEQUENCED TO PROVIDE A SUPPLY AIR TEMPERATURE SET POINT OF 70 DEG F DURING "WARM-UP" CYCLES, AND 53 DEG F DURING "COOL DOWN" CYCLES DURING "OCCUPIED" MODE, THE SUPPLY AIR TEMPERATURE SET POINT SHALL BE 53 DEG F EXCEPT RESET AS FOLLOWS:
   A. SUPPLY AIR TEMPERATURE RESET BASED ON ZONE TEMPERATURE: POLL ALL ZONES ASSOCIATED WITH THIS AIR HANDLING UNIT EVERY 15 MINUTES AND THE ZONE FURTHEST FROM ITS COOLING SETPOINT SHALL GOVERN. AS THE WORST-CASE ZONE DEVIATION FROM ITS COOLING SETPOINT DECREASES, THE DISCHARGE AIR SHALL BE RESET UPWARDS TOWARDS AN UPPER LIMIT OF 60 DEG F. IF ALL ZONES ARE IN HEATING AND/OR IN DEAD BAND, THE SUPPLY AIR SET POINT SHALL BE RESET TO THE UPPER LIMIT OF 60 DEG F. AUTOMATICALLY DETECT THOSE ZONES THAT MAY BE EXCESSIVELY DRIVING THE RESET LOGIC AND GENERATE AN ALARM TO THE SYSTEM OPERATOR. READILY ALLOW OPERATOR REMOVAL OF ZONE(S) FROM THE RESET ALGORITHM. IF RETURN AIR RELATIVE HUMIDITY RISES ABOVE 58 PERCENT THE RESET SCHEDULE SHALL BE DEACTIVATED. AFTER 60 MINUTES, RE-ACTIVATE RESET SCHEDULE IF BUILDING RH FALLS BELOW 55 PERCENT. PROVIDE RETURN DUCT RH SENSOR FOR MONITORING AND RESET CONTROL.

O. PREHEAT COIL CONTROL
1. HOT WATER PREHEAT COIL - IF THE AHU FAN SYSTEM IS "ON" AND CHILLED WATER VALVE IS CLOSED AND ECONOMIZER IS "OFF" AND THE AHU SUPPLY AIR TEMPERATURE FALLS 2 DEGREES BELOW SETPOINT, THE HOT WATER PREHEAT COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR AT 2 DEGREES BELOW SETPOINT. WHEN THE AHU FAN SYSTEM IS "OFF" UNDER NORMAL OPERATION, A TEMPERATURE SENSOR IN THE COIL LEAVING WATER SHALL MODULATE THE HOT WATER VALVE TO MAINTAIN 70 DEG F COIL LEAVING WATER TEMPERATURE. IF THE UNIT SHUTS DOWN ON FREEZESTAT THE VALVE SHALL GO FULL OPEN TO THE COIL.

P. COOLING COIL CONTROL
1. CHILLED WATER COIL – IF THE AHU FAN SYSTEM IS "ON" AND THE ECONOMIZER IS ACTIVE AND AT 100 PERCENT (OUTSIDE AIR DAMPERS FULL OPEN) AND THE AHU SUPPLY AIR TEMPERATURE IS ABOVE SET POINT, MODULATE THE CHILLED WATER VALVE OPEN TO MAINTAIN THE SUPPLY AIR SET POINT. IF THE AHU FAN SYSTEM IS "ON" AND THE ECONOMIZER IS NOT ACTIVE AND THE AHU SUPPLY AIR TEMPERATURE IS ABOVE SET POINT, MODULATE THE CHILLED WATER VALVE OPEN TO MAINTAIN THE SUPPLY AIR SET POINT. THE CHILLED WATER VALVE SHALL BE CLOSED ANY TIME THE AHU FAN SYSTEM IS "OFF" FOR ANY REASON.

Q. REHEAT COIL CONTROL– HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.

R. AIR FILTER MONITORING
1. THE BAS SYSTEM SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS EACH FILTER BANK. WHEN THE FILTER BANK PRESSURE DROP EXCEEDS THE MANUFACTURER'S FILTER LOAD LIMIT GENERATE AN ALARM TO THE BAS.

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HEAPY
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REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
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DRAWN BY:	BMW

ATC DIAGRAMS

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