ADDENDUM NO. 9

June 17, 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 9-1 and attached Lancer+Beebe LLC Addendum No. 9, dated June 17, 2022, consisting of 9 pages, RFI Log consisting of 6 pages, Specification Sections 07 21 19- Spray Foam, 21 13 12 - Fire Suppression Piping and Drawing Sheets: G000, LS000, LS001, LS002, A002, AD201, A111L, A121, A131L, A314, A502, A516, E202L, E301L, E302L, E303L, E401L, E402L, E501, E601, E701, FS101L, FS102L, P100L, P501, P701, M101L, M102L, M201L, M202L, M301L, M401, M502, M601, M602, M603, M604, M605, M701, M702, MD101L, T101L, and T102L.

A. SPECIFICATION SECTION 01 12 00 MULTIPLE CONTRACT SUMMARY

1. Paragraph 3.03A Bid Categories

D. Bid Category No. 1 – General Trades

1. Add the following specification section:
   Section 07 21 19 Spray Foam

K. Bid Category No. 11 – Fire Suppression

1. Add the following specification section:
   Section 21 13 12 Fire Suppression Piping

LANCER + BEEBE, LLC
Project # 21107

ADDENDUM NO. NINE

PROJECT: GREENFIELD CENTRAL – AUDITORIUM RENOVATION AND ADDITION

PROJECT NUMBER: 21107

DATE OF ADDENDUM: JUNE 17, 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: 12 61 00 FIXED SEATING

   CHANGE: IN PARAGRAPH 2.2.D REMOVE "AND AN INTEGRAL RING DESIGNED TO HOLD A 5-1/4" SCREEN-PRINTED LOGO PLATE"

   DELETE PARAGRAPH 2.2.L IN ITS ENTIRETY

   IN PARAGRAPH 2.2.O CHANGE PERCENTAGES THE FLOWING WAY: FOR COMPLEATE SEAT AND BACK ASSEMBLIES CHANGE TO 1%; FOR SEAT AND BACK FABRIC COVERS KEEP 5%; FOR ARMRESTS CHANGE TO 2%

2. SPEC SECTION 12 61 00 FIXED SEATING

   CHANGE: ADD HUSSEY SEATING CO. TRADITIONAL QUATTRO FIXED AUDIENCE SEATING AS AN APPROVED EQUAL

3. SPEC SECTION: 00 01 10 INDEX

   CHANGE: ADD SPEC SECTION 07 21 19 SPRAY FOAM

4. SPEC SECTION: 07 21 19 SPRAY FOAM

   CHANGE: ISSUE SPECIFICATION IN ITS ENTIRETY

5. SPEC SECTION: 08 80 00 GLAZING

   CHANGE: ADD PARAGRAPH 2.7 SECURITY GLASS:

   A. SINGLE PANE: 5/16 INCH THICK OVERALL LAMINATED GLASS. 1/8 INCH THICK ANNEALED LAMINATED X .060 PVB INTERLAYER X 1/8 INCH THICK ANNEALED GLASS.

   B. INSULATING SECURITY GLASS: UNITS INCLUDE 5/16 INCH THICK OVERALL LAMINATED GLASS. 1/8 INCH THICK ANNEALED LAMINATED X .060 PVB INTERLAYER X 1/8 INCH THICK ANNEALED GLASS; 1/4 INCH TEMPERED PANE.

LANCER + BEEBE, LLC
Project # 21107

DRAWINGS:

ARCHITECTURE:

1. G000
   - ADDED LS000 TO SHEET INDEX
2. LS000
   - ADDED SHEET IN ITS ENTIRETY
3. LS001
   - REVISED TRAVEL PATHS
   - REVISED PATH OF TRAVEL SCHEDULE
   - ADDED FIRE EXTINGUISHER PLACEMENTS
4. LS002
   - REVISED TRAVEL PATHS
   - REVISED PATH OF TRAVEL SCHEDULE
   - ADDED FIRE EXTINGUISHER PLACEMENTS
5. A002
   - REVISED APC-D TYPICAL DETAIL
6. AD201
   - REVISED VIEW REFERENCES
7. A111L
   - ADDED PLAN NOTE 74
   - ADDED GENERAL NOTE 10
8. A121
   - REVISED TEMPORARY RAMP GRAPHICS
   - REVISED PLAN NOTE 48
9. A131L
   - REVISED CEILING SCHEDULE
10. A314
    - REVISED DETAIL 7/A314 GRAPHICS
11. A502
    - REVISED DETAIL 2/A502
12. A516
    - REVISED DETAIL 1/A516
    - REVISED DETAIL 4/A516

ATTACHMENTS: Q+A LOG.PDF | BID PACKAGE #1 ADDENDUMS https://lancerbeebe.egnyte.com/fl/OGOWJAmcJi | SPECIFICATIONS: 07 21 19 | DRAWINGS: G000, LS000, LS001, LS002, A002, AD201, A111L, A121, A131L, A314, A502, A516
END OF ADDENDUM NO. NINE

Greenfield Central High School Auditorium Renovation & Addition

Greenfield Central High School
Greenfield, Indiana

ADDENDUM NO. 9

HEAPY PROJECT NO. 2021-07128

June 17, 2022

SPECIFICATIONS

ITEM NO. 1 26 24 16 - PANELBOARDS

1. Revise Paragraph 2.6 to read as follows:

2.6 The electrical equipment manufacturer shall perform a short circuit analysis and protective device time-current coordination analysis of the upstream and downstream immediate electrical power distribution system devices.

A. The protective device analysis shall include:

4. Time current characteristic curve drawings on log-log paper which illustrate:
   a. Suggested settings of the adjustable overcurrent protective devices supplied.
   b. The key or limiting overcurrent device characteristics, load characteristics, and protection requirements affecting the settings or ratings of the overcurrent protective devices supplied.
   c. The degree of service continuity and system protection achieved with the overcurrent protective devices supplied.
5. A tabulation of the suggested settings for the adjustable overcurrent protective devices supplied.
6. An analysis of the results in which any inadequacies shall be called to the attention of the (engineer) and recommendations made for improvement.

B. The short-circuit analysis shall include:

1. A calculation of the maximum RMS symmetrical three-phase short-circuit current available at significant locations in the electrical system. The results shall represent the highest short-circuit currents to which the equipment might be subjected under the reported system conditions. Appropriate motor short-circuit contribution shall be included in the calculations.
2. An evaluation of the adequacy of the short-circuit ratings of the electrical equipment supplied by that manufacture.
3. Electronic copies of the short-circuit analysis shall be submitted for approval. This submittal shall include:
   a. A computer printout of input of input data, a computer printout of calculated results and an explanation of how to interpret the printouts.
   b. A one-line diagram identifying all bus locations and the maximum available short-circuit current at each bus.
   c. A bus-to-bus listing of the maximum available short-circuit current expressed in RMS symmetrical amperes and the X and R ration of that fault current.
   d. A table of equipment short-circuit ratings versus calculated short-circuit current values.

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e. An analysis of the results in which any inadequacies shall be called to the attention of the (engineer) and recommendations made for improvement.

C. Arc-Flash analysis shall include: In addition to the short circuit and over-current coordination studies, include arc flash evaluation studies using the NFPA 70E or IEEE 1584 Standard to comply with NEC paragraph 110.16. Provide in report form the results of the calculations and install labels/marking on each medium voltage switchgear, unit substations, switchboards, panelboards, industrial control panels and motor control centers that are likely to require examination, adjustment, servicing or maintenance while energized.

1. Emergency side distribution overcurrent protection shall be fully coordinated including use of manufacturer's selectivity tables and charts. Circuit breaker models shown on plans are selectively coordinated, manufacturers of equal selectively coordinated equipment shall be supplied at no additional charge.

D. Copies of the analysis shall be submitted with the electrical equipment shop drawings.

E. The primary switchboard manufacturer shall coordinate relay settings of the high voltage switchgear breakers and fuses, and secondary circuit breakers setting with the Power Company relaying including instantaneous and ground fault protection.

F. The desired settings shall be calibrated and set in the field by an authorized representative of the switchboard manufacturer.

G. Post a durable copy of the "as-left" relay settings and fuse ratings in a convenient location within each switchboard assembly. Deliver four additional copies of the settings and fuse ratings to the Engineer

ITEM NO.2 26 09 23 - LIGHTING CONTROL DEVICES

1. Add Douglas Lighting Controls as an equal manufacturer to the following paragraph sections: 2.2.J, 2.3.E, 2.4.A.3, 2.8H, and 2.9.

ITEM NO.3 28 31 00 – EXTENSION OF EXISTING FIRE DETECTION AND ALARM SYSTEM

1. Revise paragraph 2.1 to read as follows:

2.1 The existing fire alarm system is a Siemens XLS based fire alarm system. All products shall be by the manufacturer or certified by the manufacturer as compliant with the system.

A. The existing system throughout the high school is horn/strobe based.

B. A transponder and any other hardware/equipment shall be provided for voice annunciation/evacuation as required for a complete and fully functional voice system in this addition.

ITEM NO.4 21 13 12 – FIRE SUPPRESSION PIPING

1. Add section in it's entirety.

ITEM NO.5 23 05 19 – GAUGES FOR HVAC PIPING

1. Remove paragraph 3.6 in its entirety.

ITEM NO.6 23 07 13 – DUCT INSULATION

1. Delete paragraph 3.3.F in its entirety.

ITEM NO.7 23 09 23 – BUILDING AUTOMATION SYSTEM FOR HVAC

1. Modify paragraph 1.3.A to read as follows: "A. Trane, Alerton, Automated Logic – Local Indiana Factory Branch Office."

ITEM NO.8 23 31 13 – HVAC DUCTWORK

1. Add paragraph 2.14 in its entirety: "2.14 Aluminum ductwork shall be constructed of sheet aluminum, 3003 alloy H14 temper, ASTM B209/B209M, of increased thickness and reinforcement consistent with SMACNA standards, but minimum 22 gauge. Longitudinal seams on horizontal ductwork shall not be located along the bottom of the duct. Joints and seams shall be sealed with aluminum silicone based sealant."

ITEM NO.9 23 37 00 – AIR OUTLETS AND INLETS

1. Add the following to paragraph 2.1: "Global IFS for S70 and S90 displacement diffusers."

ITEM NO.10 23 52 20 – HOT WATER HIGH EFFICIENCY CONDENSING BOILERS

1. Paragraph 2.3.C: Change relief valve setting from "75 psig" to "match existing boilers".

2. Add paragraph 2.8.E in its entirety: "E. Include new and existing boilers."

ITEM NO.11 23 73 00 – MODULAR AIR HANDLING UNITS

1. Delete paragraph 3.7 in its entirety.

<u>DRAWINGS</u>

ITEM NO.1 E202L LIGHTING PLAN – SECOND FLOOR – UNIT L
- A. Revise size and layout of fixtures M1, M2, M3, M4, M5, and M6.

ITEM NO. 2 E301L POWER PLAN – FIRST FLOOR – UNIT L
- A. Add unit heater UH-4.
- B. Added TCP panel in L138.
- C. Changed transformer from 300kVA to 500kVA.

ITEM NO. 3 E302L POWER PLAN – SECOND FLOOR – UNIT L
- A. Add unit heater UH-5.
- B. Added TCP panels in L214.

ITEM NO. 4 E303L POWER PLAN – ROOF – UNIT L
- A. Clarrified circuit wire size for MSACCUs.

ITEM NO. 5 E401L FIRE ALARM PLAN – FIRST FLOOR – UNIT L
- A. Add smoke detector in elevator lobby for elevator recall.
- B. Change all notification devices to speaker strobe notification devices.

ITEM NO. 6 E402L FIRE ALARM PLAN – SECOND FLOOR – UNIT L
Add smoke detector in elevator lobby for elevator recall
A. Change all notification devices to speak strobe notification devices.

ITEM NO. 7 E501 ELECTRICAL SCHEDULES
A. Revise manufactures and other acceptable manufactures in the LUMINAIRES schedule.
B. Add UH-4 and UH-5 to MOTORS, STARTERS, AND DISCONNECTS schedule.

ITEM NO. 8 E601 ELECTRICAL SINGLE-LINE DIAGRAM
A. Changed 300kVA transformer to 500kVA and corresponding panel L1DP and feeders.

ITEM NO. 9 E701 PANEL SCHEDULES
A. Updated panel schedules as indicated.

ITEM NO. 10 FS101L FIRE SUPPRESSION FLOOR PLAN – FIRST FLOOR – UNIT L
A. Replace sheet in it's entirety.

ITEM NO. 11 FS102L FIRE SUPPRESSION FLOOR PLAN – SECOND FLOOR – UNIT L
A. Replace sheet in it's entirety.

ITEM NO. 12 P100L PLUMBING FLOOR PLAN – FOUNDATION – UNIT L
A. Replace sheet in it's entirety.

ITEM NO. 13 P501 PLUMBING SCHEDULES
A. Replace sheet in it's entirety.

ITEM NO. 14 P701 SANITARY RISER DIAGRAM - OVERALL
A. Replace sheet in it's entirety.

ITEM NO. 15 M101L - MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L
A. Modify plan note 7.
B. Add unit heater 4.
C. Add TCP in L138.

ITEM NO. 16 M102L - MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L
A. Add temperature control panels in L214.
B. Add unit heater 5
C. Modify stage ductwork.

ITEM NO. 17 M201L - MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L
A. Add UH-4 and piping.
B. Add TCP in L138.

ITEM NO. 18 M202L - MECHANICAL PIPING PLAN - SECOND FLOOR - UNIT L
A. Add temperature control panels in L214.
B. Add UH-4 and piping.

ITEM NO. 19 M301L - MECHANICAL ROOF PLAN - UNIT L
A. Add section view.
B. Add note 4.

ITEM NO. 20 M401 - ENLARGED MECHANICAL PLANS
A. Modify piping.
B. Add pad to SHWP-1,2

ITEM NO. 21 M502 - MECHANICAL DETAILS
- A. Modify underfloor duct back fill detail.
- B. Modify base mounted pump detail.

ITEM NO. 22 M601 - ATC LEGEND
- A. Modify sequence of operations.

ITEM NO. 23 M602 - ATC DIAGRAMS
- A. Modify ATC diagam and sequence of operations.

ITEM NO. 24 M603 - ATC DIAGRAMS
- A. Modify sequence of operations.

ITEM NO. 25 M604 - ATC DIAGRAMS
- A. Modify sequence of operations.

ITEM NO. 26 M605 - ATC DIAGRAMS
- A. Add duct reheat coil diagram.
- B. Modify radiant floor diagram.
- C. Modify air terminal unit diagram.

ITEM NO. 27 M701 - MECHANICAL SCHEDULES
- A. Modify schedules. Refer to drawing.

ITEM NO. 28 M702 - MECHANICAL SCHEDULES
- A. Modify schedules. Refer to drawing.

ITEM NO. 29 MD101L - MECHANICAL DEMOLITION PLANS
- A. Demo piping as shown on drawings.

ITEM NO. 30 T101L TECHNOLOGY FLOOR PLAN - FIRST FLOOR - UNIT L
- A. Revise ceiling speaker layout in areas indicated.
- B. Added data for BMS as indicated.

ITEM NO. 31 T102L - TECHNOLOGY FLOOR PLAN - SECOND FLOOR - UNIT L
- A. Revise ceiling speaker layout in areas indicated.
- B. Added data for BMS as indicated.

ATTACHMENTS

1. E202L LIGHTING PLAN – SECOND FLOOR – UNIT L
2. E301L POWER PLAN – FIRST FLOOR – UNIT L
3. E302L POWER PLAN – SECOND FLOOR – UNIT L
4. E303L POWER PLAN – ROOF – UNIT L
5. E401L FIRE ALARM PLAN – FIRST FLOOR – UNIT L
6. E402L FIRE ALARM PLAN – SECOND FLOOR – UNIT L
7. E501 ELECTRICAL SCHEDULES
8. E601 ELECTRICAL SINGLE-LINE DIAGRAM
9. E701 PANEL SCHEDULES
10. SPEC: 21 13 12 – FIRE SUPPRESSION PIPING
11. FS101L FIRE SUPPRESSION FLOOR PLAN – FIRST FLOOR – UNIT L
12. FS102L FIRE SUPPRESSION FLOOR PLAN – SECOND FLOOR – UNIT L
13. P100L PLUMBING FLOOR PLAN – FOUNDATION – UNIT L
14. P501 PLUMBING SCHEDULES

15.	P701	SANITARY RISER DIAGRAM – OVERALL
16.	M101L	MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L
17.	M102L	MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L
18.	M201L	M201L - MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L
19.	M202L	MECHANICAL PIPING PLAN - SECOND FLOOR - UNIT L
20.	M301L	MECHANICAL ROOF PLAN - UNIT L
21.	M401	ENLARGED MECHANICAL PLANS
22.	M502	MECHANICAL DETAILS
23.	M601	ATC LEGEND
24.	M602	ATC DIAGRAMS
25.	M603	ATC DIAGRAMS
26.	M604	ATC DIAGRAMS
27.	M605	ATC DIAGRAMS
28.	M701	MECHANICAL SCHEDULES
29.	M702	MECHANICAL SCHEDULES
30.	MD101L	MECHANICAL DEMOLITION PLANS
31.	T101L	TECHNOLOGY FLOOR PLAN - FIRST FLOOR - UNIT L
32.	T102L	TECHNOLOGY FLOOR PLAN - SECOND FLOOR - UNIT L

Greenfield Auditorium RFI Log

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

Published:06/17/2022

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	6/14/2022	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	Exposed round duct in Storage rooms L138, L140, and L140A may be externally insulated with blanket insulation with a paintalble jacket.
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	6/14/2022	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	Provide Sprinkler system over the pool expansion
28	6/14/2022	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	Exposed platform frames and legs at the ADA ramp and landing do not need to be black nor covered with skirting.

29	6/14/2022	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	ADA Ramp is per 5/TP101&6/TP101. Architectural graphics to be updated in addendum #9.
30	6/14/2022	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	The 4" sphere rule should only apply to guard rails located +2'-6" or more from the level below which is not applicable to the ADA landing. Manufacturer standard products are acceptable.
31	6/14/2022	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	Assume that a 5'-0" diameter wheelchair turning space will be required.
32	6/14/2022	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	Black finish is not required for any platform frames. However, all guard rails or handrails must have a black finish.
33		L+B	P1.4/L100 – Should this be P1.3 Reinforced concrete? I do not see any thing noted for P1.4 in the material legend	6/10/2022	Ripberger	
34	6/17/2022	L+B/TSC	Spec section 098410 – Acoustical Panels and Diffusers . Please confirm BC-7 is only for Acoustical Panels AP-1, AP-2, AP-3 & AP-4 called out on the Interior Finish Legend page A720	6/10/2022	General Interiors	Bid Category No. 7 - Drywall is responsible for all Acoustical Panels. The reference to "diffusers" is because these panels diffuse sound; they do not distribute air.
35	6/17/2022	TSC	Are site furnishings in the general trades bid package?	6/10/2022	Ripberger	Yes, See Addendum No. 8
36	6/17/2022	L+B	Elevations 2&3/AD201 reference 1/A951. Sheet A951 could not be located in the plans or addenda. Please advise.	6/13/2022	Ripberger	Sheet A951 is NOT in the set. View references on sheet AD201 will reference 1/AD101A in addendum #9.
37	6/17/2022	L+B	Acoustical Ceiling tile is very vague on the RCP's. Could the architect confirm these are what they are looking for below. APC-A – Optima #3250 APC-B – it says Optima but in comments it says vinyl faced tile – optima is not vinyl faced – is the architect looking for a Armstrong kitchen zone #673 APC-D – Optima 12" x 48" is only available with 9/16" grid the number on tile is #3290 – Do you want to switch grid from 15/16" to 9/16" APC-E techzone optima #3281 blizzard white	6/14/2022	General Interiors	APC-A - Yes - Optima #3250. APC-B - Use Clean Room VL #868. APC-D -Yes - Optima #3290 with 9/16" grid. APC-E - Yes - Techzone Optima #3281 blizzard white
38	6/17/2022	L+B	26 09 61 – 2.2 – A: Do you consider Lyntec RPCR (Panasonic relay) panels equal to ETC Echo? 26 09 61 – 2.11 & 2.12: Do you consider Interactive's CueServer 2 architectural control platform equal to ETC Paradigm?	6/15/2022	Wenger	We will accept both the Lyntec relay panels and CueServer2 architectural controls within Section 26 09 61.

39	6/17/2022	L+B	The S70 diffusers in the floor that come off the blue duct do not have a damper. There is a cable operated damper in each leg coming off the main trunk. So for all that underground duct, we will only have five points available for balancing. Seems like a potential problem down the road.	6/15/2022	Lehmans	The low velocities and resulting low pressure drops in each branch should minimize the flow discrepancies between individual outlets on a common branch.
40	6/17/2022	L+B	Specification 26 24 16 Panelboards are requiring a short circuit and coordination study. That being said it was only mentioned and none stated anywhere? Can you advise if needed, if so then can you please issue the specifcations?	6/15/2022	R&M Electric	26 24 16 paragraph 2.6 will be revised in Addendum #9.
41	6/17/2022	L+B	Existing Panelboard DPH indicates two (2) 20A breakers are being added. Please advise the manufacturer of Panelboard DPH.	6/15/2022	R&M Electric	DPH is an Eaton Pow-R-Line PRL3a panelboard, 480V -3Ø-3W..
42	6/17/2022	TSC	Please confirm that the LED light strips, DMX drivers, and controllers noted in specification section 09 26 16-2.3-F will be provided and installed by others. Bid Category 7 (Drywall) is to provide and install the Fry Reglet LED-CDRM-200 reveal only.	6/15/2022	Gibson-Lewis	Bid Category No. 7 - Drywall is responsible for all drywall work indicated. Bid Category No. 13 is responsible for all light fixtures, drivers, controllers, etc. Bid Category Nos. 7 and 13 are mutually responsible for the complete coordination of this integral work.
43	6/17/2022	TSC	Please confirm the following with regards to plywood and rigid insulation: Exterior wall type E6 Rigid insulation is by BC 3 – Masonry Exterior wall type E5 - Plywood is by BC 7 – Drywall Exterior wall type E4 - Rigid insulation is by BC 1 – General Trades, Plywood is by BC 1 – General Trades Exterior wall type E3 - Rigid insulation is by BC 1 – General Trades, Plywood is by BC 1 – General Trades Exterior wall type E1 Rigid insulation is by BC 3 – Masonry	6/15/2022	Gibson-Lewis	Exterior Wall E6 Rigid insulation is by BC 3 – Masonry Exterior Wall E5 - Plywood is by BC 7 – Drywall Exterior Wall E4 - Rigid insulation is by BC 3 – Masonry, Plywood is by BC 1 – General Trades Exterior Wall E3 - Rigid insulation is by BC 3 – Masonry, Plywood is by BC 1 – General Trades Exterior Wall E1 Rigid insulation is by BC 3 – Masonry
44	6/17/2022	L+B/TSC	Some of the CFMF parapet details show a SPF insulation infill. This insulation does not appear to be in the specification or the bid package descriptions. Please confirm that all spray foam (SPF) insulation if by BC 1 General Trades. Or, please confirm that BC 7 Drywall may use fiberglass R19 batt insulation in lieu of spray foam insulation.	6/16/2022	Gibson-Lewis	Bid Category No. 1 - General Trades shall provide all spray foam insulation; fiberglass insulation at this condition is not allowed.
45	6/17/2022	L+B	IG 2 calls for security glazing. There is nothing in the glazing specification. Please advise.	6/16/2022	Hoosier Glass	See Addednum #9.
46	6/17/2022	L+B	For the glass wall panel system, it is very unclear. On A753, is it the entire 29’ 6” x 32’3” wall minus the television? In section 3 on A314 it appears it might only be the section in the middle of the wall. Details 1 on A516 and 4 on A516 this glass wall does not show up. Please clarify.	6/16/2022	Hoosier Glass	The coverage of the glass is for the entire 29'-6" x 32'-3" area minus the recesses for the TVs. Details 1 and 4 on A516 to be updated in Addendum #9.

47	6/17/2022	L+B	The bathroom walls are typically wall type A6. The partition schedule notes that insulation is only included in these walls if there is a modifier calling it to be insulative. No such naming convention is found in the legend. Please confirm that no A6 wall types are to receive insulation.	6/16/2022	Gibson-Lewis	All Restroom walls to receive Sound Batt insulation. See addendum #9.
48	6/17/2022	L+B	The Specification is calling for the Hollaender "VUE" system, however the drawings show a 3-line Hollaeander interna-rail system with glass infill panels. Please confirm what you would like us to include.	6/17/2022	Spohn Associates	The "VUE" system is preferred

SECTION 07 21 19
CLOSED CELL, MEDIUM DENSITY SPRAY POLYURETHANE FOAM AIR BARRIER

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes the following:

1. Closed cell, medium density spray polyurethane foam air barrier located where indicated on the drawings.

1.2 PERFORMANCE REQUIREMENTS

A. Material Performance: Provide air barrier materials which have an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.004 cfm/ft^2 @ 1.57 psf), [0.02 liters per square meter per second under a pressure differential of 75 Pa (0.02 L/(s·m^2) @ 75 Pa)] when tested in accordance with ASTM E2178 (unmodified).

B. The water vapor permeance Desiccant method, (Procedure A) and Water method (Procedure B) shall be determined in accordance with ASTM E96 and shall be declared by the material manufacturer.

C. Assembly Performance: Provide a continuous air barrier in the form of an assembly that has an air leakage not to exceed 0.04 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.04 cfm/ft^2 @ 1.57 psf) [0.2 liters per square meter per second under a pressure differential of 75 Pa (0.2 L/(s·m^2) @ 75 Pa)] when tested in accordance with ASTM E2357. The assembly shall accommodate movements of building materials by providing expansion and control joints as required. Expansion / control joints, changes in substrate and perimeter conditions shall have appropriate accessory materials at such locations.

1. The air barrier assembly shall be capable of withstanding combined design wind, fan and stack pressures, both positive and negative on the envelope without damage or displacement, and shall transfer the load to the structure.
2. Closed cell, medium density spray polyurethane foam air barriers shall not displace adjacent materials in the assembly under full load.
3. The air barrier assembly shall be joined in an airtight and flexible manner to the air barrier materials of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations, creep, and anticipated seismic movement.

D. Connections to Adjacent Materials: Provide connections to prevent air leakage at the following locations:

1. Foundation and walls, including penetrations, ties and anchors.
2. Walls, windows, curtain walls, storefronts, louvers and doors.
3. Different assemblies and fixed openings within those assemblies.
4. Wall and roof connections.
5. Floors over unconditioned space.
6. Walls, floor and roof across construction, control and expansion joints.
7. Walls, floors and roof to utility, pipe and duct penetrations.
8. Seismic and expansion joints.
9. All other potential air leakage pathways in the building envelope.

1.3 REFERENCES

A. American Society for Testing and Materials International (ASTM)

1. ASTM C 518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
2. ASTM C 1338: Standard Test method for Determining Fungi Resistance of Insulation Materials and Facings
3. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials
4. ASTM E 96: Standard Test Methods for Water Vapor Transmission of Materials
5. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
6. ASTM E 2178: Standard Test Method for Air Permeance of Building Materials
7. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non Load-Bearing Wall Assemblies Containing Combustible Components

1.4 SUBMITTALS

A. Product Data for type of insulation product specified.

B. Product test reports performed by a qualified third-party testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, and other properties, based on comprehensive testing of current products.

C. Evaluation Report: Evidence of compliance of foam-plastic insulations with International Building Code (IBC), International Residential Code (IRC), International Energy Conservation Code (IECC).

D. Manufacturer’s certificate certifying insulation provided meets or exceeds specified requirements.

E. Installer’s certificate showing the Icynene installation certification.

F. Sample warranty

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Product produced in an ISO 9001 registered factory.

B. Single Source Responsibility: Single source product from one manufacturer.

C. Installer Qualifications: Engage an Icynene Licensed Contractor (installer) who has been trained and certified by Icynene.

D. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84

2. Rated Wall Assembly Testing: ASTM E119 and NFPA 285

E. Toxicity/Hazardous Materials
1. Provide products that are "Low-emitting".
2. Provide products that contain no PBDE's .
3. Provide products that contain no urea-formaldehyde.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturers written instructions for handling and protection prior to and during installation.

B. Store both components in a temperature controlled area between 60 and 85 degrees F. Do not allow product to freeze.

C. Use only those components that are supplied by the Manufacturer.

1.7 PROJECT CONDITIONS

A. Temperature: Install closed cell, medium density spray polyurethane foam within range of ambient and substrate temperature, and moisture content recommended by the primary material manufacturer. Do not apply air barrier to a damp or wet substrate.

B. Field Conditions: Do not install air barrier materials in snow, rain, fog, or mist. Do not install air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the material manufacturer.

C. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.

1.8 WARRANTY

A. Material Warranty: Provide primary material manufacturer's standard product warranty, for a minimum three (3) years from date of Substantial Completion.

PRODUCTS

1.9 AIR BARRIER MATERIALS

A. Medium Density Closed Cell Spray Polyurethane Foam Air Barrier: Subject to compliance with requirements, provide one of the following:

1. Material: Proseal (MD-C-200v3) by Icynene Inc. www.icynene.com
2. BASF Walltite

A. AIR BARRIER MATERIAL PROPERTIES:

i. Air permeance for this material has been tested and reported as being 0.00016 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.00016 cfm/ft^2 @ 1.57 psf), [0.0008 liters per square meter per second under a pressure differential of 75 Pa (0.0008 L/(s·m^2) @ 75 Pa)] at 2.05" (52 mm) when tested in accordance with ASTM E2178 (unmodified).

ii. The water vapor permeance for this material has been tested and reported as being 50.6 nanograms of water vapor passing through each square meter of area per second for each Pascal of vapor pressure differential (50.6 ng/(Pa·s·m^2) [0.884 US perms] at 1.5 inches (39 mm) when tested in accordance with ASTM E96 (desiccant method - unmodified).

iii. Water vapor permeance for this material has been tested and reported as being 2748 nanograms of water vapor passing through each square meter of area per second for each Pascal of vapor pressure differential (2748 ng/(Pa·s·m^2) [48.09 US perms] at 2.0 inches (50 mm) when tested in accordance with ASTM E96 (water method - unmodified).

B. AIR BARRIER ACCESSORY MATERIALS:

A. Membrane at Transitions in Substrate and Connections to Adjacent Elements: One of the following as acceptable to the Spray Polyurethane Foam Air Barrier Manufacturer:

1. Carlisle Coatings and Waterproofing.
2. Grace Construction Products.
3. Henry.
4. Prosoco
6. W. R. Meadows, Inc.

B. Transition Membrane between Air Barrier Membrane and Roofing and Other Adjacent Materials: Comply with both air barrier manufacturer's recommendations and material manufacturer's recommendations.

C. Counter-flashing for Masonry Through-Wall Flashing: One of the following and as acceptable to the Spray Polyurethane Foam Air Barrier Material Manufacturer:

1. Carlisle Coatings and Waterproofing.

2. Grace Construction Products.
3. Henry.
4. W. R. Meadows, Inc.

PART 2 - EXECUTION

PREPARATION

A. The Air Barrier Contractor shall ensure the substrate is clean, dust-free, dry and prepared in accordance with the air barrier material manufacturer's written instructions. The General Contractor shall be notified if this is not the case.

1. Ensure that penetrating work by other trades is in place and complete.
2. Prepare surfaces by brushing, scrubbing, scraping, grinding or compressed air to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion of the closed cell, medium density spray polyurethane foam.
3. Wipe down metal surfaces to remove release agents or other non-compatible coatings using clean sponges or with a material chemically compatible with the primary air material.

B. Prime substrate for installation of sheet membrane transition strips if required by material manufacturer and as follows:

1. Prime masonry, concrete substrates with primers.
2. Prime glass-fiber surfaced gypsum sheathing with an adequate number (if applicable) of coats to achieve required bond, with adequate drying time between coats.
3. Prime wood, metal, structural steel, sheet metal, and painted substrates with primer.
4. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air barrier and protrusions.

C. Protection from Closed Cell, Medium Density Spray Polyurethane Foam:

1. Mask and cover adjacent areas and materials that aren’t being sprayed to protect from over-spray.
2. Ensure any required foam stop or back up material are in place and complete to prevent over spray and achieve complete seal.
3. Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes are removed from the spray location to exterior of the building. Provide for make-up air.
4. Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.
5. Clean substrates and cavities of loose materials capable of interfering with insulation placement.

D. APPLICATION Transition Strip Installation: Install air barrier accessories and closed cell, medium density spray polyurethane foam to provide continuity throughout the building envelope. Install materials in accordance with manufacturer's instructions and the following:

1. Apply primer for transition membrane at rate recommended by material manufacturer. Allow primer to dry completely before membrane application. Apply as many coats as necessary for proper adhesion.
2. Position subsequent sheets of membrane applied above so that it overlaps the membrane sheet below by a minimum of 2.0 inches (50 mm), unless greater overlap is recommended by material manufacturer. Roll into place with roller ensuring all transition membranes are free of fish-mouths, wrinkles, delaminations, bubbles and voids.
3. Overlap horizontally adjacent pieces of membrane a minimum of 2.0 inches (50 mm), unless greater overlap is recommended by material manufacturer. Roll all areas of membrane including seams with roller.
4. Seal around all penetrations with termination mastic, extruded silicone sealant, membrane counter-flashing or other procedure in accordance with material Manufacturer’s recommendations.
5. Connect air barrier in exterior wall assembly continuously to the air barrier of the roof, to concrete below-grade structures, to windows, curtain wall, storefront, louvers, exterior doors and other intersection conditions and perform sealing of penetrations, using accessory materials and in accordance with the manufacturer’s recommendations.
6. To bridge gaps >1/8” (3 mm) in wall construction at changes in substrate plane or changes in adjoining materials, provide transition membranes or other material recommended by spray polyurethane foam material manufacturer.
7. Provide transition membrane, sealant, mastic, membrane counter-flashing or other material recommended by spray polyurethane foam manufacturer at 90 degree inside or outside corners. Follow spray polyurethane foam manufacturer’s instructions for instructions on how to treat interlocked CMU or structurally-attached 90 degree cast-in place concrete corners.
8. Provide mechanically fastened non-corrosive metal sheet to span gaps greater than 1.0 inch (25 mm) in substrate plane and to make a smooth transition from one plane to the other. Membrane shall be continuously supported by substrate.
9. At through-wall flashings, provide an additional 6.0 inch (150mm) wide strip of manufacturer’s recommended membrane counter-flashing to seal top of through-wall flashing to membrane. Seal exposed top edge of strip with bead of mastic or as recommended by manufacturer.
10. At deflection and control joints, provide backup for the membrane to accommodate anticipated movement.
11. At expansion and seismic joints provide transition to the joint assemblies.
12. Apply a bead or trowel coat of mastic along membrane seams at reverse lapped seams, rough cuts, and as recommended by the manufacturer when membrane will be exposed to the elements.
13. At end of each working day, seal top edge of self-adhered membrane to substrate with termination mastic if exposed.
14. Do not allow materials to come in contact with chemically incompatible materials.
15. Do not expose membrane to sunlight longer than as recommended by the manufacturer.

16. Ensure that membranes at terminations have a pull adhesive of 16 psi or greater.
17. Inspect installation prior to enclosing assembly and repair damaged areas with closed cell, medium density spray polyurethane foam as recommended by manufacturer.

E. Installation of Spray Polyurethane Foam: Install materials in accordance with manufacturer's instructions and the following:

1. The Installer(s) and those within the work area shall use proper personal protective equipment (PPE) during the installation of material in accordance with US Government regulation 29 CFR 1910.134.
2. The Installer(s) shall follow all OSHA requirements when working on a job-site.
3. Warning signs shall be displayed on each job site in the spray area warning of health and safety hazards for those personnel who do not comply with the personal protective equipment as required by Federal law.
4. Equipment used to spray polyurethane foam shall comply with the manufacturer’s instructions for the specific type of application and type of material being sprayed. Each proportioner unit shall supply only one spray gun.
5. Apply only when surfaces and environmental conditions are within limits instructed by the material manufacturer.
6. Apply in consecutive passes as required by material manufacturer to thickness as indicated on drawings. Passes shall be not less than ½ inch and not greater than 3 inches on the first pass or greater than the maximum thickness required by the SPF manufacturer. An additional pass of 2.0 inches shall only be done after the first pass has had time to cool down. Install within material manufacturer’s tolerances, but not more than minus ¼ inch plus 1/2 inch.
7. Do not install closed cell, medium density spray polyurethane foam within 3.0 inches (75 mm) of heat emitting devices such as light fixtures and chimneys.
8. Finished surface of foam insulation to be free of voids and embedded foreign objects.
9. Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed by other sections.
10. Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.
11. Clean and restore surfaces soiled or damaged by work of the section. Consult with section of work soiled before cleaning to ensure methods used will not damage the work.
12. Complete connections to other air barrier components and repair any gaps, holes or other damage using material in a manner approved by primary air barrier material manufacturer.

F. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

2.2 REPAIRS

A. Any repairs must be effected by an Icynene Licensed Contractor.

2.3 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse.

END OF SECTION 07 21 19

21 13 12

FIRE SUPPRESSION PIPING

PART 1 - GENERAL

1.1 Piping, valves and devices for the fire suppression system shall be provided as shown on the drawings, as specified and as required for a complete system.

1.2 Piping and associated devices and materials shall conform to provisions of Section 21 05 07 Piping Materials and Methods for Fire Suppression, Section 21 05 29 Hangers and Supports for Fire Suppression Piping and as specified in this and other Fire Suppression sections.

1.3 Pipe, fittings and joints shall conform to specifications and standards references of NFPA 13 Standard for the Installation of Sprinkler Systems and NFPA 14 Standard for the Installation of Standpipe and Hose Systems.

1.4 Fire suppression system materials and components shall be UL listed and / or FM Global approved for fire suppression service. Piping, fittings, valves and system components shall be rated at not less than 175 psi or greater so that system pressures do not exceed working pressure ratings.

1.5 Welding in place will be permitted only if written approval is obtained from the authority having jurisdiction. Welders and welding procedures in both the shop and in the field shall conform to AWS B2.1, Specification for Qualification of Welding Procedures and Welders for Piping and Tubing. Welding of galvanized piping is prohibited.

PART 2 - PRODUCTS

2.1 Pipe, fittings and joining methods shall be:

A. TYPE F1 - Wet Pipe System
Pipe - Schedule 40 black steel, ASTM A53, Type E or F, or ASTM A135. Fittings and joints - malleable or cast iron screwed type or flanged.

2.2 Grooved-end coupling specialty fittings and accessories such as ANSI class flange adaptors, reducing couplings and combination outlet-couplings that utilize grooved-end joining with torsion nuts and bolts shall be permitted. Other couplings and accessories, such as boltless couplings, and hole-cut mechanical – t outlets, strapless outlets and similar fittings using pipe-surface seals shall not be permitted unless specifically approved by the Engineer.

2.3 Valves on the interior piping of the fire suppression systems shall be UL listed or/and FM approved for fire suppression application. Valves shall be manufactured by Nibco, whose catalog numbers are listed below, or equal by Kennedy, Hammond, Watts, Apollo Valves; Aalberts - IPS.

A. Butterfly Valves.

Type A4. 2 inches and larger.
Nibco LD3510-8, 250 psi w.w.p.(dead-end service), ductile or cast iron tapped lug body, nickel plated ductile iron disc, molded in EPDM seat, 416 S.S. stem, worm-gear operator with handwheel and indicator. Valves with integral supervisory switches are acceptable if supervisory mechanism is UL listed.

B. Ball Valves.

Type B7. 2 inches and smaller.

Nibco KT-505-W-8, 300 psi w.w.p. two-piece bronze body, screwed ends, chrome plated brass ball, bronze stem, full port, TFE seat and seal. Gear box operator with handwheel and indicator. Valves with integral supervisory switches are acceptable if supervisory mechanism is UL listed.

Type B8. 1" and smaller, for trim and drain use only.
Nibco KT-580-70-UL, 300 psi w.w.p., two-piece bronze body, screwed ends, chrome plated brass ball, bronze stem, full port, TFE seat and seal, handle.

Type B9. 1.25" to 2", for trim and drain use only.
Nibco KT-580-70-UL, 300 psi w.w.p., two piece bronze body, screwed ends, chrome plated brass base, bronze stem, standard port, TFE seat and seal, handle.

C. Check Valves.

Type C10. 2 inches and smaller.
Nibco KT-403-W, 200 psi w.w.p., swing check, bronze body, threaded bonnet, Buna-N faced disc.

Type C11. 2.50 inches and larger.
Nibco F-908-W, 175 psi w.w.p., swing check, cast iron body and bonnet, bronze mounted, renewable seat and disc, flanged ends, rubber faced disc, drilled and tapped ball drip boss with plug.

Type C12. 2.50 inches and larger.
Nibco KW-900-W, 250 psi w.w.p., ductile iron body, wafer style, bronze disc, molded Buna-N resilient seat, stainless steel spring and pins.

2.4 Double Check Detector Assembly

A. Double check detector assembly shall be designed for low-hazard cross-connections and shall consist of:

1. Two independent spring loaded check valves.
2. Shutoff valves, one upstream and one downstream. Resilient seated O.S.&Y. gate type.
3. Ball type test cocks.
4. By-pass detector water meter, check valve, isolation valves and by-pass piping, 0.75 inches size. (Verify meter requirements with water purveyor.)

B. Units shall have coated cast iron or stainless steel bodies and flanged ends.

C. All components of the assembly shall be constructed of corrosion resistant materials or waterways shall be coated with FDA approved epoxy or other corrosion protection. The assembly shall conform to ASSE Standard 1048 and AWWA Standard C-510.

D. Double check detector assembly shall be Watts Series 709 DCDA or equal by Apollo Valves; Aalberts - IPS, Wilkins, AMES or FEBCO. Assemblies shall be UL and FM approved with UL and FM approved shutoff valves upstream and downstream.

2.5 Valves where designated as supervised type shall be suitable for mounting of an electrical supervisory switch to monitor the valve position, open or closed.

2.6 Unions, flanges, pipe sleeves and firestopping shall be as described in Section 21 05 07 Piping Materials and Methods for Fire Suppression and Section 21 05 05 Firestopping.

2.7 Pipe hangers and supports shall be UL listed or FM approved and shall be as described in Section 21 05 29 Hangers and Supports for Fire Suppression Piping.

2.8 Supervisory attachments shall be UL listed and approved for fire alarm signaling use. Devices shall contain one Form “C” signal contact having 120 VAC, 7.5 amps minimum rating and shall be compatible with the type valve on which it is to be installed.

PART 3 - EXECUTION

3.1 Installation of piping, valves, hangers, sleeves and other components shall conform to FM Global, NFPA 13 for sprinkler systems, NFPA 14 for standpipe and hose systems, Section 21 05 07 Piping Materials and Methods for Fire Suppression, and Section 21 05 29 Hangers and Supports for Fire Suppression Piping.

3.2 Supervisory switches for valves shall be furnished and installed. Make all final adjustments.

3.3 Grooved-end joint type couplings shall be installed in strict conformance with manufacturer’s recommendations, including torquing of coupling bolts to recommended levels.

3.4 Backflow preventer(s) shall be located and installed in accordance with the manufacturer’s recommendations and Water Department’s requirements. Clearances and elevations shall afford easy access for testing and servicing. Devices shall be tested at the time of being put into service. Submit test data in O & M manuals.

END OF SECTION

GREENFIELD-CENTRAL COMMUNITY SCHOOL CORPORATION
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Greenfield, IN 46140
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OWNER

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ARCHITECT

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CIVIL ENGINEER

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STRUCTURAL ENGINEER

HEAPY ENGINEERING
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www.heapy.com
MECH, ELEC, PLUMB, TECH ENGINEER

SCHULER SHOOK
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Minneapolis, MN 55414
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www.schulershook.com
THEATRE CONSULTANT

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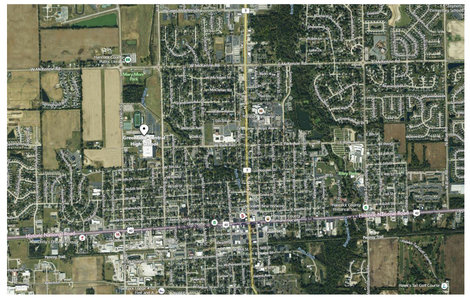
www.skillman.com
CONSTRUCTION MANAGER

GREENFIELD CENTRAL HIGH SCHOOL AUDITORIUM RENOVATION & ADDITION

BID PACKAGE #2 - 100%
CONSTRUCTION DOCUMENTS
05.20.2022

GREENFIELD CENTRAL HIGH SCHOOL

GREENFIELD CENTRAL HIGH SCHOOL



PROJECT LOCATION: 810 N BROADWAY ST.
GREENFIELD, IN 46140

BOARD OF SCHOOL TRUSTEES

PRESIDENT:	DAN BROWN
1ST VICE PRESIDENT:	KATHY DOWLING
2ND VICE PRESIDENT:	HILLARY CLOSE
SECRETARY:	JOHN RIHM
ASST. SECRETARY:	BECKY TAYLOR
SUPERINTENDENT:	DR. HAROLD OLIN
BUSINESS MANAGER:	NATHANIEL DAY
DIRECTOR OF FACILITIES:	BRIAN SKILES
PRINCIPAL:	JASON CARY
ASSISTANT PRINCIPAL:	SUSANNA COLEMAN

OWNER DIRECTORY

SHEET INDEX

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.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY:

COVER SHEET AND INDEX

G000

PLOT DATE/TIME: 6/17/2022 11:20:14 AM

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:
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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/MECHANCIAL: 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]

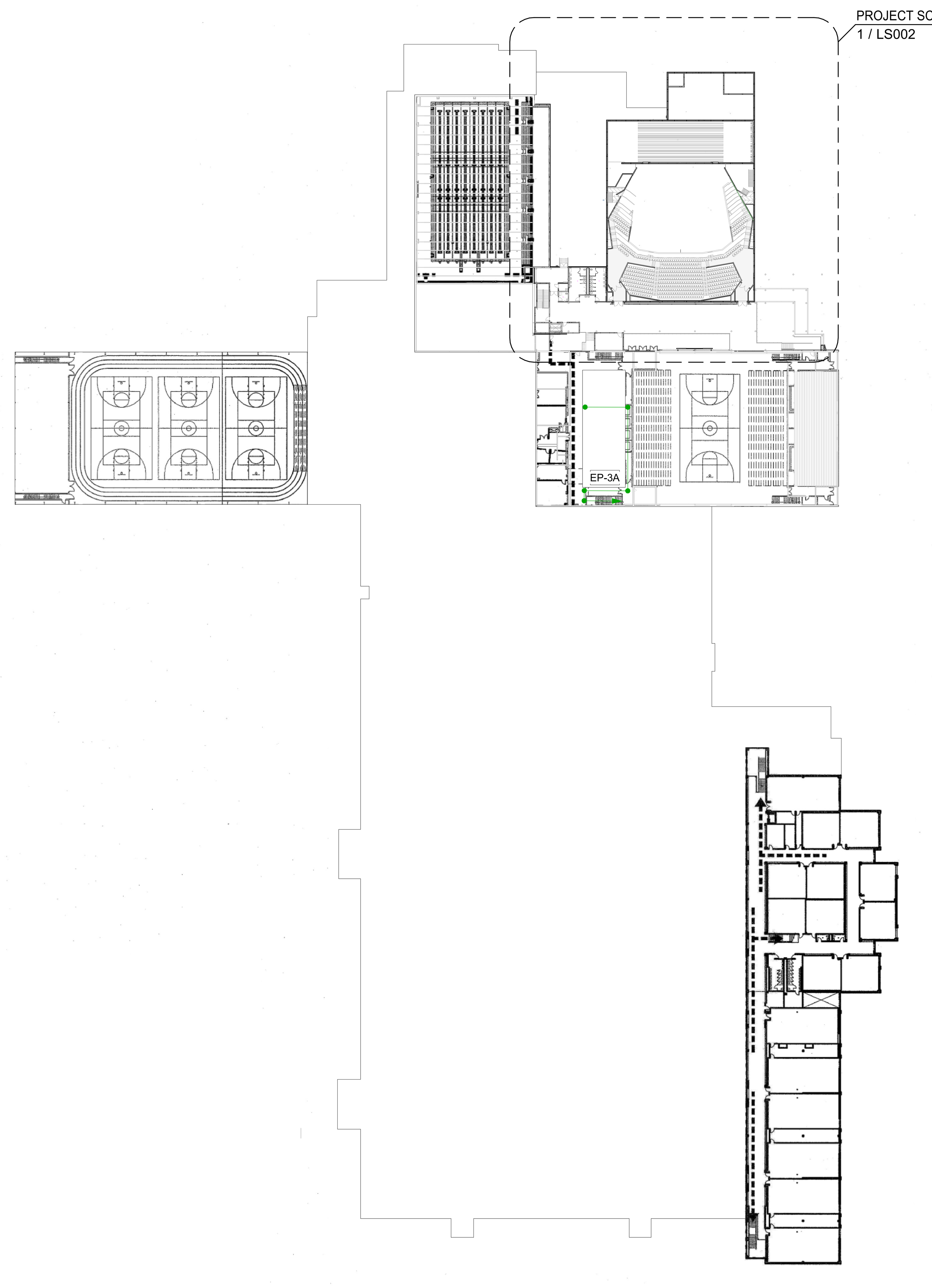
FIRE EXTINGUISHER SYMBOL LEGEND

FE WALL-MOUNTED FIRE EXTINGUISHER
FEC SEMI-RECESSED FIRE EXTINGUISHER CABINET
FHC FIRE HOSE CABINET AND CONNECTION

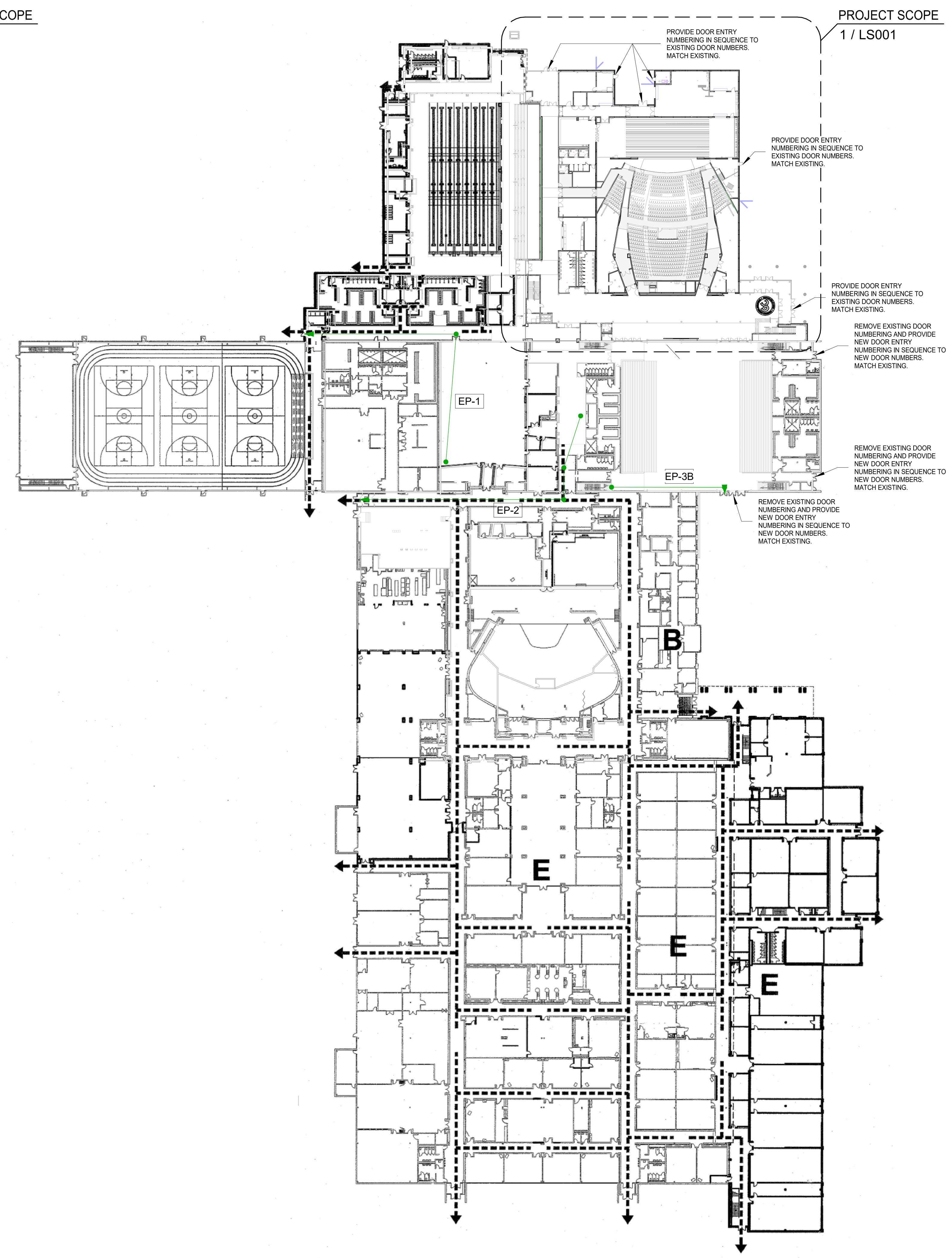
PATH OF TRAVEL

MARK	LENGTH
EP-1	237' - 3 1/8"
EP-2	246' - 1 1/16"
EP-3A	179' - 0 11/16"
EP-3B	101' - 7 1/8"
TP-1A	183' - 3 3/8"
TP-1B	44' - 2 1/8"
TP-3	248' - 2"
TP-5	131' - 0 11/16"

EP - EXISTING TRAVEL PATH
TP - TRAVEL PATH



2 LIFE SAFETY PLAN - SECOND FLOOR - OVERALL
SCALE: 1/64" = 1'-0"



1 LIFE SAFETY PLAN - FIRST FLOOR - OVERALL
SCALE: 1/64" = 1'-0"

LANCER + BEEBE, LLC
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AUDITORIUM RENOVATION & ADDITION
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MARK RANDALL BEEBE REGISTERED 0700164 STATE OF INDIANA ARCHITECT

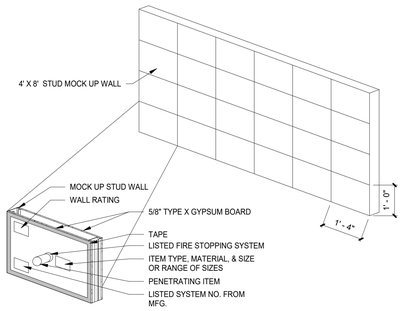
REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BM

LIFE SAFETY PLAN - OVERALLS

LS000



2 FIRESTOPPING PENETRATION MOCKUP PANEL

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

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2014 INDIANA MECHANICAL CODE
2012 INDIANA PLUMBING CODE
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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]

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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]

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

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-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]

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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]

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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]

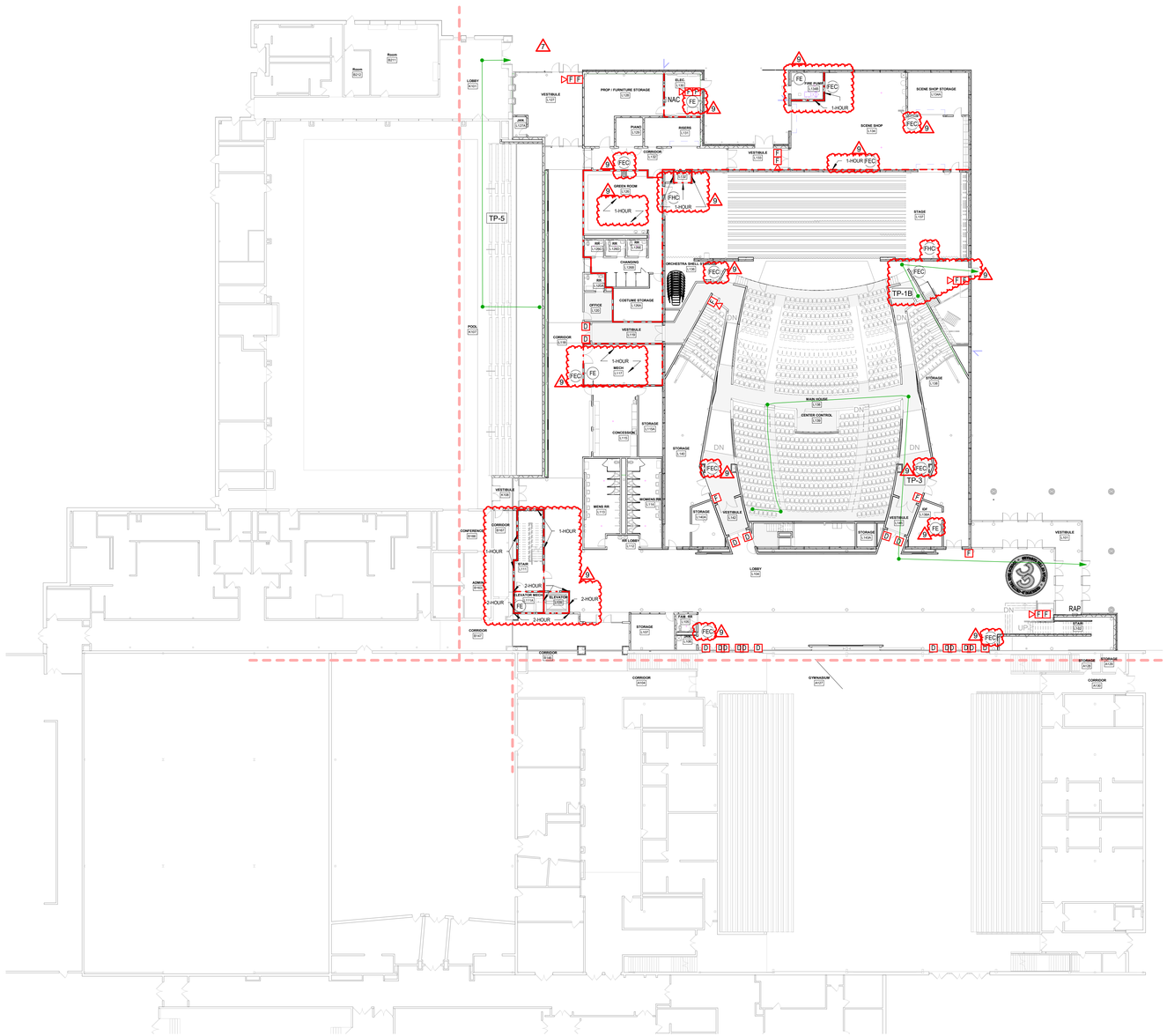
FIRE EXTINGUISHER SYMBOL LEGEND

- (FE) WALL-MOUNTED FIRE EXTINGUISHER
- (FEC) SEMI-RECESSED FIRE EXTINGUISHER CABINET
- (FHC) FIRE HOSE CABINET AND CONNECTION

PATH OF TRAVEL

MARK	LENGTH
EP-1	237' - 3 1/8"
EP-2	246' - 1 11/16"
EP-3A	179' - 0 11/16"
EP-3B	101' - 7 1/8"
TP-1A	183' - 3 3/8"
TP-1B	44' - 2 1/8"
TP-3	248' - 2"
TP-5	131' - 0 11/16"

EP - EXISTING TRAVEL PATH
TP - TRAVEL PATH



1 LIFE SAFETY PLAN - FIRST FLOOR

SCALE: 3/64" = 1'-0"

PLOT DATE/TIME:6/17/2022 1:17:24 AM

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
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

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

LIFE SAFETY PLAN - FIRST FLOOR

LS001

K L
C B A
E D
G F
J H

N
TRUE NORTH

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]

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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]

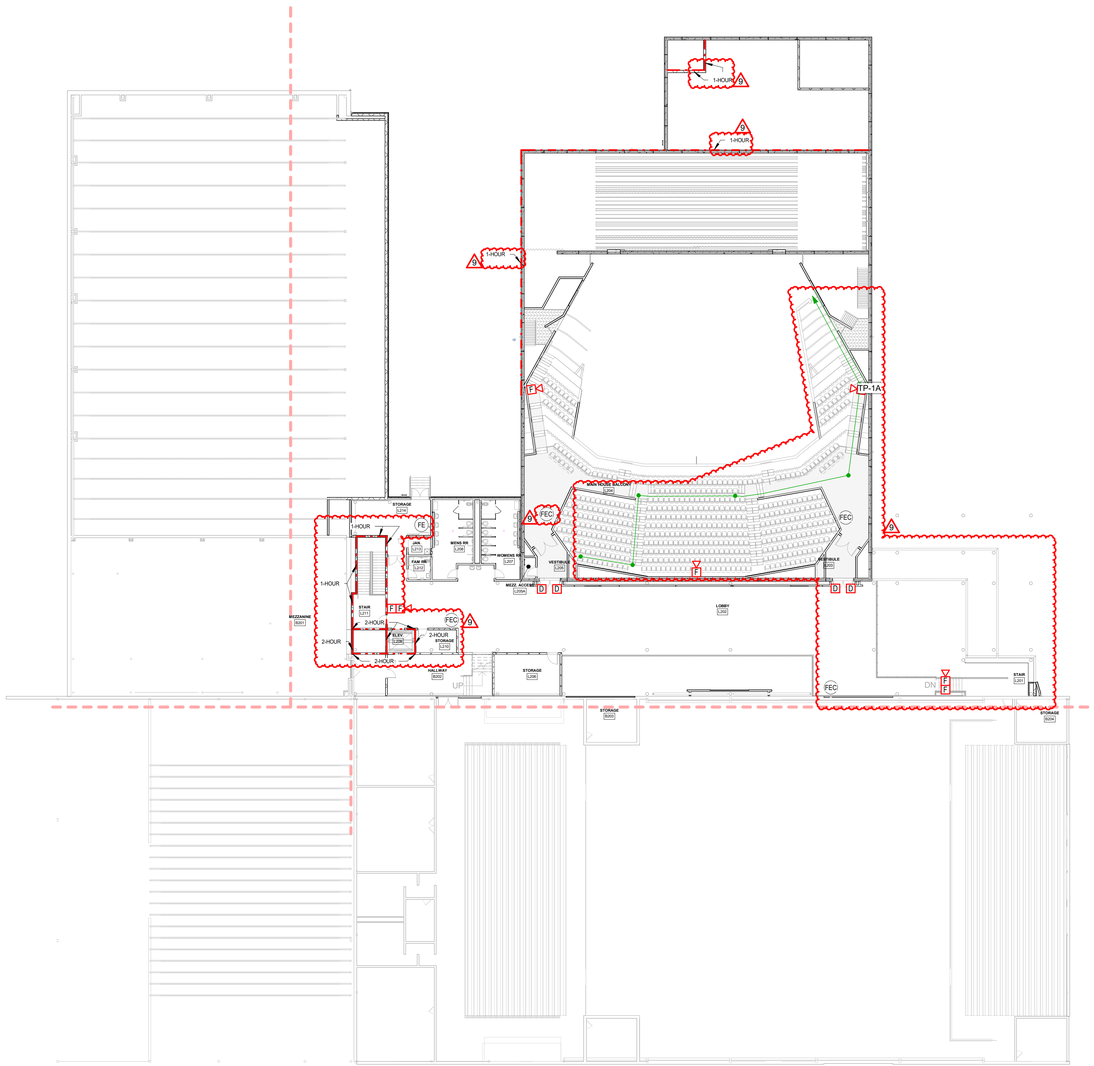
FIRE EXTINGUISHER SYMBOL LEGEND

- (FE) WALL-MOUNTED FIRE EXTINGUISHER
- (FEC) SEMI-RECESSED FIRE EXTINGUISHER CABINET
- (FHC) FIRE HOSE CABINET AND CONNECTION

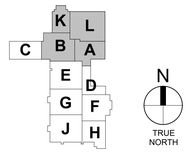
PATH OF TRAVEL

MARK	LENGTH
EP-1	237' - 3 1/8"
EP-2	246' - 1 1/16"
EP-3A	179' - 0 11/16"
EP-3B	101' - 7 1/8"
TP-1A	183' - 3 3/8"
TP-1B	44' - 2 1/8"
TP-3	248' - 2"
TP-5	131' - 0 11/16"

EP - EXISTING TRAVEL PATH
TP - TRAVEL PATH



1 LIFE SAFETY PLAN - SECOND FLOOR
SCALE: 3/64" = 1'-0"



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#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

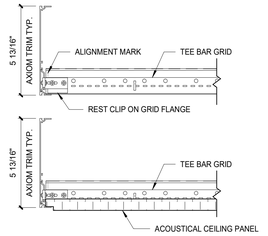
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

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

LIFE SAFETY PLAN - SECOND FLOOR

LS002

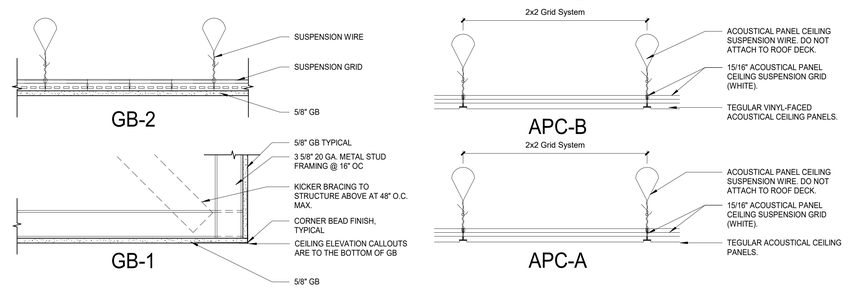
PLOT DATE/TIME:6/17/2022 11:20:50 AM



**APPLICABLE AT ALL CEILING CLOUD PERIMETERS

2 AXIOM TRIM TYP.

SCALE: 3" = 1'-0"



1 CEILING TYPES

WALL TYPE NOTES

1. WHERE INSULATION IS PRESENT WITHIN STUD CAVITY, AT INTERIOR WALLS, AND GYPSUM BOARD IS NOT PRESENT, PROVIDE "CHICKEN WIRE" OR HARDWARE CLOTH TO SECURE INSULATION WITHIN THE STUD CAVITY.
2. SEE FLOOR PLANS FOR INTERIOR WALL TYPES.
3. SEE EXTERIOR ELEVATIONS, WALL SECTIONS AND DETAILS FOR EXTERIOR WALL TYPES.
4. ALL GYPSUM BOARD (GB) IS 5/8" TYPE 'X' UNLESS NOTED OTHERWISE.
5. HOLD BOTTOM EDGE OF GYPSUM BOARD A MINIMUM OF 1/2" ABOVE THE SLAB/SUBFLOOR. REPLACE ALL GYPSUM BOARD EXPOSED TO WATER.
6. IN A ROOM THAT DOES NOT HAVE A CEILING SYSTEM, THE GYPSUM BOARD SHALL EXTEND TO THE DECK ABOVE ON THE SIDE OF THE WALL WHERE THE CEILING IS NOT PRESENT AND PROVIDE ELASTOMERIC SEALANT AT JOINT.
7. AT ALL WALLS SCHEDULED TO RECEIVE CERAMIC TILE, CONTRACTOR SHALL SUBSTITUTE GLASS MAT INTERIOR GYPSUM WALLBOARD FOR THE STANDARD GYPSUM BOARD IDENTIFIED IN THE WALL TYPES. REFER TO FINISH LEGEND AND FINISH PLANS FOR LOCATIONS OF CERAMIC TILE.
8. SEE WALL SECTIONS ON A300 SERIES SHEETS FOR EXTERIOR WALL CONSTRUCTION.
9. PROVIDE AN INSTALL 4'-0" WIDE MOLD AND MOISTURE RESISTANT GYPSUM BOARD CENTERED BEHIND ALL PLUMBING FIXTURES AT WALLS NOT SCHEDULED TO RECEIVE CERAMIC TILE.
10. PROVIDE MOLD AND MOISTURE RESISTANT GYPSUM BOARD ON WALLS OF MECHANICAL ROOMS, ELECTRICAL CLOSETS, TOILET ROOMS, AND JANITOR ROOMS.
11. PROVIDE MOLD AND MOISTURE RESISTANT GYPSUM BOARD ON ALL WALLS INTERSECTING EXTERIOR WALLS FOR THE FIRST 4'-0" OF THE WALL ADJACENT TO THE EXTERIOR WALL.
12. ANY PATCHING AND REPAIRING TO EXTERIOR WALL GYPSUM BOARD TO BE DONE WITH MOLD AND MOISTURE RESISTANT GYPSUM BOARD.
13. ALL PENETRATIONS OCCURRING ON INSULATIVE WALL TYPES TO BE SEALED ON BOTH SIDES OF WALLS.

INTERIOR WALL NAMING CONVENTION

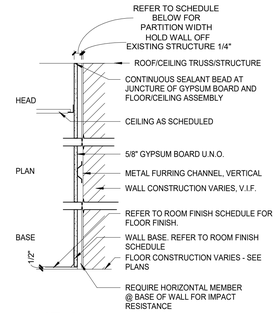
A 4 .1 A

WALL CORE MATERIAL
A - NON-STRUCTURAL METAL STUDS
B - CONCRETE MASONRY UNITS
D - SHAFT WALL (CH STUDS)
F - FURRING WALL
W - WOOD STUDS

THICKNESS OF WALL CORE
NOMINAL DIMENSION OF WALL CORE

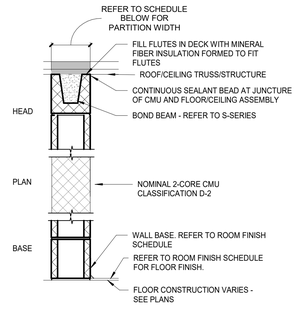
WALL CHARACTERISTIC MODIFIER (OPTIONAL)
REF. SHEET A002 FOR ADDITIONAL INFORMATION

WALL TYPE MODIFIER (OPTIONAL)
.1 - ONE SIDED GYP. WALLBOARD
.2 - WALL STOPS 6" MIN. ABOVE CEIILING
.3 - BOTH LINE ITEMS .1 AND .2
.4 - DOUBLE LAYER OF GYP. BOTH SIDES
.5 - "PONY" WALL, REF. PLANS FOR HEIGHT
.6 - (1) DOUBLE LAYER OF GYP AND (1) SINGLE LAYER GYP.
.7 - ONE SIDED DOUBLE LAYER OF GYP.



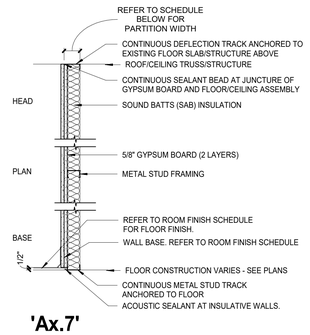
'Fx'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
F1	1 1/2"	7/8"				



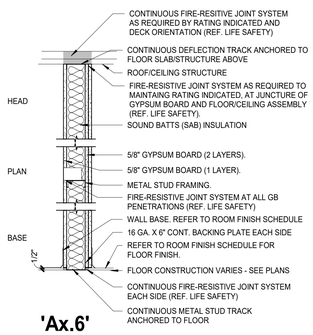
'Bx'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
B4	3 5/8"	3 5/8"				
B6	5 5/8"	5 5/8"				
B8	7 5/8"	7 5/8"		ULC-U905		
B10		9 5/8"				



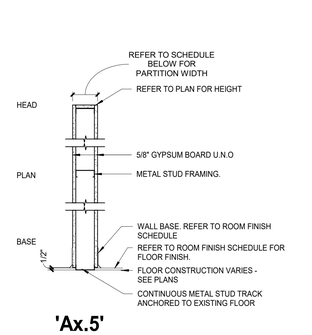
'Ax.7'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
A6.7	7 1/4"	6"				



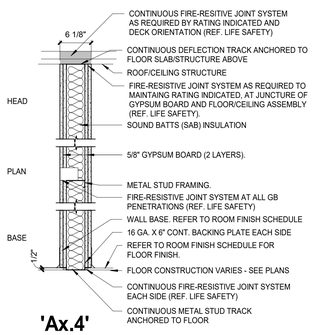
'Ax.6'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
A6.6	7 7/8"	6"			52	



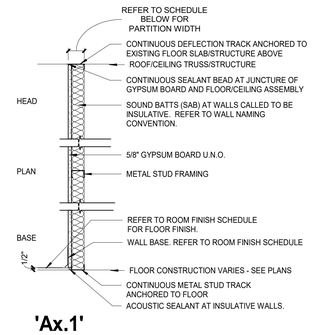
'Ax.5'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
A6.5	7 1/4"	6"				



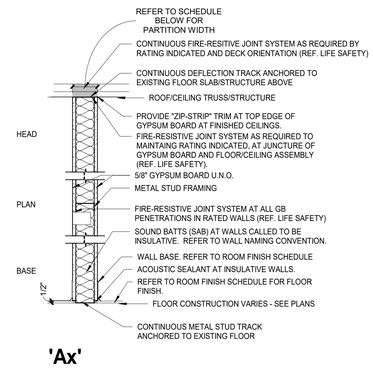
'Ax.4'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
A6.4	8 1/2"	6"			55	



'Ax.1'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
A4.1	4 1/4"	3 5/8"				
A6.1	6 5/8"	6"				



'Ax'

WALL	WIDTH PART	WIDTH CORE	FIRE RATING	UL LISTING	STC	STC TEST
A4	4 7/8"	3 5/8"				
A6	7 1/4"	6"				

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REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

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

INTERIOR TYPES

A002

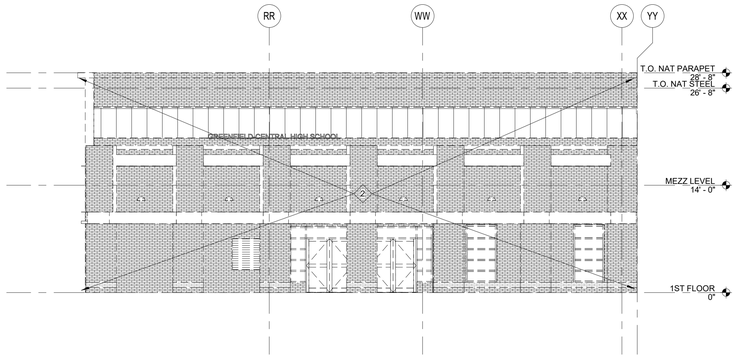
PLOT DATE/TIME:6/17/2022 11:19:14 AM

GENERAL NOTES - DEMO PLANS

1. COORDINATE DEMOLITION WORK WITH NEW CONSTRUCTION WORK
2. PATCH, CLEAN, AND PREP SURFACES FOR NEW CONSTRUCTION WORK
3. MODIFY EXISTING CEILINGS AS NEEDED TO ACCOMMODATE NEW CONSTRUCTION WORK
4. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF ANY DEMOLISHED DOORS, LIGHTING FIXTURES, SIGNAGE, ETC.
5. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION ON SCOPE OF STRUCTURAL DEMOLITION.
6. REFER TO MEP DRAWINGS FOR ADDITIONAL INFORMATION ON SCOPE OF MEP DEMOLITION.
7. REFER TO SITE AND CIVIL DRAWINGS FOR ADDITIONAL INFORMATION ON SITE DEMOLITION.

DEMOLITION PLAN NOTES

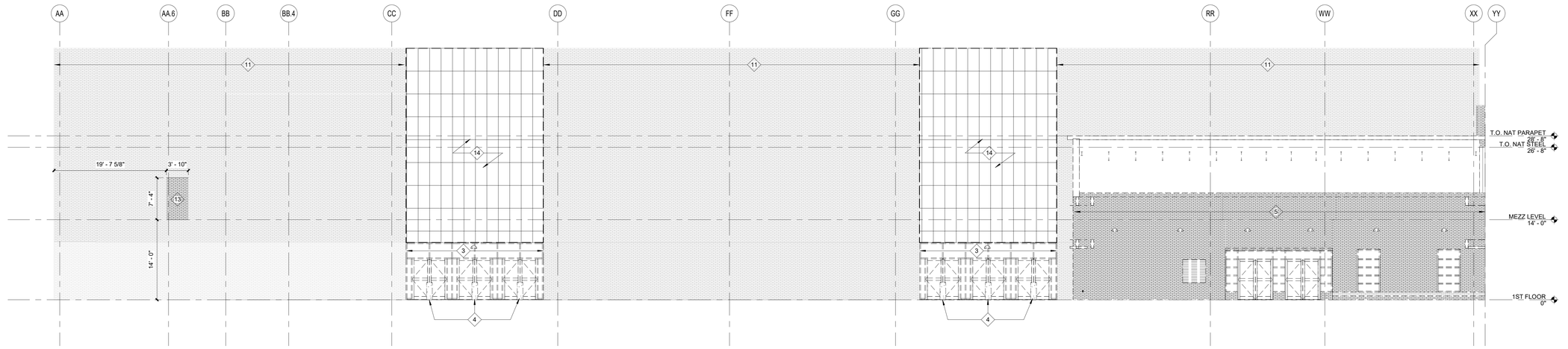
1. NO ARCHITECTURAL DEMO WORK THIS AREA. PROTECT THROUGHOUT DURATION OF PROJECT.
2. DEMO ALL EXISTING WALLS, FLOORS, DOORS, WINDOWS, CEILINGS THIS AREA COMPLETE. FOUNDATION DEMOLITION MAY NEED TO OCCUR HERE TO PLACE NEW FOUNDATIONS. PLEASE REF. S-SERIES FOR ADDITIONAL INFORMATION.
3. DEMO EXISTING STOREFRONT COMPLETE. EXISTING HEADERS/STEEL TO REMAIN FOR NEW CONSTRUCTION.
4. DEMO EXISTING BOLLARD COMPLETE. REF. C-SERIES FOR ADDITIONAL INFORMATION.
5. DEMO EXISTING WALL COMPLETE.
6. DEMO EXISTING COLUMN. REF. S-SERIES FOR ADDITIONAL INFORMATION.
7. DEMO EXISTING LIGHT POLE, REF. C AND E-SERIES FOR ADDITIONAL INFORMATION
8. DEMO MEP ASSOCIATED ITEMS COMPLETE, REF. MEP SERIES FOR ADDITIONAL INFORMATION.
9. DEMO EXISTING FINISH FLOOR AND WALL BASE COMPLETE THIS AREA. PROTECT EXISTING TO REMAIN FINISHES THROUGHOUT DURATION OF PROJECT.
10. EXISTING COLUMN TO REMAIN. PROTECT THROUGHOUT DURATION OF PROJECT. REF. S-SERIES FOR ADDITIONAL INFORMATION.
11. EXISTING WALL TO REMAIN. PROTECT THROUGHOUT DURATION OF PROJECT.
12. DEMO EXISTING CEILING AND ALL ASSOCIATED MEP ITEMS COMPLETE. REF. MEP SERIES FOR ADDITIONAL INFORMATION
13. DEMOLITION OF EXISTING WALL CONSTRUCTION FOR FUTURE DOOR COMPLETE.COORDINATE WITH NEW CONSTRUCTION PLAN(S) FOR ADDITIONAL INFORMATION.
14. DEMOLITION OF EXISTING EIFS ABOVE STOREFRONT COMPLETE. WALL STRUCTURE TO REMAIN.
15. DEMOLITION OF EXISTING WALL CONSTRUCTION FOR FUTURE STOREFRONT COMPLETE. COORDINATE WITH NEW CONSTRUCTION PLAN(S) FOR ADDITIONAL INFORMATION.
16. DEMOLITION OF EXISTING BLEACHERS COMPLETE.
17. DEMO EXISTING TILE FLOOR AND BASE FROM WALL TO EXISTING FLOOR DRAIN (VIF DRAIN LOCATION). CLEAN AND PREP AREA FOR NEW FLOOR TILE AND BASE



4 EXT_DEMO ELEVATION_NORTH CANOPY
SCALE: 1/8" = 1'-0" REF. 1 / AD101A 9

3 DEMOLITION SECTION
SCALE: 3/8" = 1'-0" REF. 1 / AD101A 9

2 EXT_DEMO ELEVATION_WEST
SCALE: 1/8" = 1'-0" REF. 1 / AD101A 9



1 EXT_DEMO ELEVATION_NORTH
SCALE: 1/8" = 1'-0" REF. 1 / AD101A 9

PLOT DATE/TIME:6/17/2022 11:28:07 AM

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.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	BM

DEMOLITION ELEVATIONS AND SECTIONS

AD201

GENERAL NOTES - FLOOR PLAN

1. REFERENCE SHEET A002 FOR INTERIOR WALL TYPES INDICATED BY WALL TYPE TAGS.
2. REFERENCE SHEET A003 FOR EXTERIOR WALL TYPES INDICATED BY WALL TYPE TAGS.
3. REFERENCE SHEETS A611 AND A612 FOR CURTAINWALL AND STOREFRONT TYPES INDICATED BY WALL TYPE TAGS.
4. REFERENCE SHEET A720 SERIES "INTERIOR FINISH LEGEND" AND INTERIOR FINISH PLANS FOR FINISHES SUCH AS FLOORING, PAINT OR COVERINGS APPLIED TO WALL AND FLOOR CONSTRUCTION.
5. PROVIDE FULL HEIGHT CORNER GUARDS AT ALL OUTSIDE CORNERS WITH GYPSUM BOARD FINISH. FLOOR TO CEILING HEIGHT
6. PROVIDE BULL-NOSE FINISH ON ALL OUTSIDE CORNERS OF CMU WALLS
7. PROVIDE SOLID SURFACE WINDOW SILLS @ ALL STOREFRONT GLAZING SILLS ABOVE FINISHED FLOOR HEIGHT. WINDOW SILL TO EXTEND 1" PAST FINISHED WALL SURFACE, TYP. UNLESS OTHERWISE NOTED
8. REFERENCE A121 FOR ENLARGED PLANS
9. VF ALL DIMENSIONS FOR CURTAINWALL/STOREFRONTS AND CASEWORK
10. ALL RESTROOM WALLS TO BE INSULATED WITH SOUND BATT (SAB) INSULATION.

FLOOR PLAN NOTES

1. PAPER TOWEL DISPENSER AND/OR WITH WASTE RECEPTACLE - REFER TO RESPONSIBILTY MATRIX
2. DRINKING FOUNTAIN - REF. P-SERIES
3. ELECTRIC HAND DRYER - REFER TO RESPONSIBILTY MATRIX
4. SOAP DISPENSER - REFER TO RESPONSIBILITY MATRIX
5. BABY CHANGING STATION - REFER TO RESPONSIBILITY MATRIX
6. 24"x36" WALL MOUNTED MIRROR - REFER TO RESPONSIBILITY MATRIX
7. LAVATORY SINK. - REF. P-SERIES
8. GREENROOM VANITY MIRROR - REFER TO RESPONSIBILITY MATRIX
9. TOILET PLUMBING FIXTURE - REF. P-SERIES
10. ADA BUTTON. ATTACH TO BOLLARD. PROVIDE ASSOICATED ITEMS AND SYSTEMS. REF. E-SERIES
11. SPLIT ADA BUTTON ATTACHED TO COLUMN. PROVIDE ASSOICATED ITEMS AND SYSTEMS. REF. E-SERIES
12. TOILET PARTITION - REF. SPECS
13. TALL MIRROR - REFER TO RESPONSIBILITY MATRIX
14. WATER BOTTLE FILLER - REF. P-SERIES
15. HAND WASHING SINK - REF. P-SERIES
16. WALL MOUNTED TV - REFER TO RESPONSIBILITY MATRIX
17. ADA COMPLIANT GRAB BARS - REFER TO RESPONSIBILITY MATRIX
18. LINED SANITARY NAPKIN DISPOSAL - REFER TO RESPONSIBILITY MATRIX
19. BEVERAGE COOLER. - REFER TO RESPONSIBILITY MATRIX
20. TOILET PAPER DISPENSER - REFER TO RESPONSIBILITY MATRIX
21. STAINLESS STEEL OPEN SHELVING - REFER TO RESPONSIBILITY MATRIX
22. URINAL PARTITION - REF. SPECS
23. ADA BUTTON ATTACH TO STOREFRONT. PROVIDE ASSOICATED ITEMS AND SYSTEMS. REF. E-SERIES
24. SEALANT JOINT AT MATERIAL TRANSITION
25. BOLLARD. REF. C-SERIES
26. BASTEEL EXTERIOR GRADE FENCING, REF. SPECIFICATIONS FOR ADDITIONAL INFORMATION. COLOR TO BE CHOSEN BY ARCHITECT.
27. WATER BIB. REF. P-SERIES FOR ADDITIONAL INFORMATION.
28. DOMESTIC WATER HEATER. REF. P-SERIES FOR ADDITIONAL INFORMATION.
29. ELECTRICAL PANEL - REF. E-SERIES
30. FIRE PUMP - REF. _-SERIES
31. TRANSFORMER - REF. E-SERIES
32. CONCESSION SINK - REF. P-SERIES
34. AUDITORIUM FEATURE WALL. REF. INTERIOR ELEVATIONS FOR MORE INFORMATION
36. FLOOR DRAIN - REF. P-SERIES
37. MOP SINK - REF. P-SERIES
38. SERVICE SINK - REF. P-SERIES
39. HALL OF FAME TV - REFER TO RESPONSIBILITY MATRIX
40. ORCHESTRA SHELL - REFER TO RESPONSIBILITY MATRIX
41. WHEELCHAIR LIFT - REFER TO RESPONSIBILITY MATRIX
42. ELECTRICAL EQUIPTMENT - REF. E-SERIES
43. HUMIDITY SENSOR - REF. M-SERIES
44. HALF DEPTH ORCHESTRA PIT REFER TO DETAILS FOR ADDITIONAL INFORMATION
45. DOWNSTAGE MASKING CURTAIN - REF. T-SERIES. COLOR TO BE SELECTED BY ARCHITECT
46. CONTINUOUS WALL-MOUNTED HANDRAIL TO MEET ALL APPLICABLE CODES. REFER TO SPECIFICATIONS.
47. CAST IN PLACE CONCRETE STEP DOWN (7"H x 11"D) MATCH ADJACENT DOOR WIDTH. COORDINATE WITH PORTABLE ADA MANUFACTURED RAMP
48. PORTABLE ADA RAMP FOR HALF DEPTH PIT. REFER TO TP-SERIES FOR REQUIREMENTS AND ADDITIONAL INFORMATION FOR THE TEMPORARY RAMP.
49. SEGMENTED HANDRAIL FROM TOP TO BOTTOM OF AISLE TO MEET ALL APPLICABLE CODES. PROVIDE CORROSION RESISTENT MATERIALS AND COATINGS AT NATATORIUM SEATING. REFER TO SPECIFICATIONS
50. DEDICATION PLAQUE REFER TO SPECIFICATIONS
51. THEATRE EQUIPTMENT - REF. TL-SERIES
52. CHANGING ROOM PARTITIONS. INSTALL COAT HOOK ON BACK OF DOOR TYP. ADA CHANGING COAT HOOK TO BE INSTALLED ADJACENT TO DOOR. REFER TO ELEVATION FOR MORE INFORMATION
53. EXTENDED FRAMLESS GLASS GUARDRAIL REQUIRED AT BASE OF BALCONY AISLES ONLY. REFER TO DETAILS FOR ADDITIONAL INFORMATION
54. GYM FEATURE WALL. REF. A753 INTERIOR ELEVATIONS FOR MORE INFORMATION
56. CORRIDOR FEATURE WALL. REF. A753 INTERIOR ELEVATIONS FOR MORE INFORMATION
57. METAL PAN STAIR FILLED WITH CONCRETE, REF. A500 SERIES FOR DETAILS
58. MECHANICAL EQUIPTMENT - REF. M-SERIES
59. GUARDRAIL WITH INTEGRATED HANDRAIL. REFER TO ELEVATIONS/SECTIONS FOR ADDITIONAL INFORMATION. REFER TO SPECIFICATIONS
60. 12'-0" LIGHTING FIXTURE (PIPE) ASSEMBLY. REFER TO DETAILS FOR ADDITIONAL INFORMATION
61. GUARDRAIL. SEE SPECIFICATIONS. REFER TO S-SERIES FOR DESIGN CRITERIA
62. PLYWOOD ON BAR GRADING. REF. R-SERIES FOR ADDITIONAL INFORMATION
64. 24"x60" MIRROR TO BE HUNG 1'-0" A.F.F.- REFER TO RESPONSIBILITY MATRIX
65. LOOSE BENCHES - REFER TO RESPONSIBILITY MATRIX
66. SHIPS LADDER WITH HAND RAILS - PAINT FINISH TO MATCH ADJACENT SURFACES. CAGE STARTING 7'-0" AFF.
67. LOCKABLE GATE (REFER TO DOOR HARDWARE) AND CHAIN LINK FENCE. EXTEND FENCE AND GATE TO THE BOTTOM OF THE INTERMEDIATE CATWALK FLOOR AND/OR ROOF DECK ABOVE. PROVIDE COMPLIANT CHAINLINK CEILING COVER WHEN NECESSARY (ILO EXTENDING TO DECK).
68. RIGGING PIT. REFER TO TR-SERIES, S-SERIES FOR DETAILS
69. SAFTEY CAGE VERTICAL LADDER - PAINT TO MATCH ADJACENT SURFACES. CAGE STARTING AT 7'-0" AFF. EXTERIOR LADDERS TO BE GALVANIZED.
70. ADA BUTTON ATTACHED TO COLUMN. PROVIDE ASSOICATED ITEMS AND SYSTEMS. REF. E-SERIES
71. WALL MOUNTED PAPER TOWEL DISPENSER - REFER TO RESPONSIBILITY MATRIX
72. RUBBER GLOVE DISPENSER - REFER TO RESPONSIBILITY MATRIX
73. CHAIN LINK FENCE ON THIS SIDE OF CATWALK. REFER TO DETAIL 4/A517. ALL OTHER LOCATIONS TO RECEIVE A GUARDRAIL MN.
74. FIRE HOSE CABINET AND CONNECTION. REF. P-SERIES FOR ADDITIONAL INFORMATION.

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DRAWN BY:	MC/BM

FLOOR PLAN - FIRST FLOOR - UNIT L

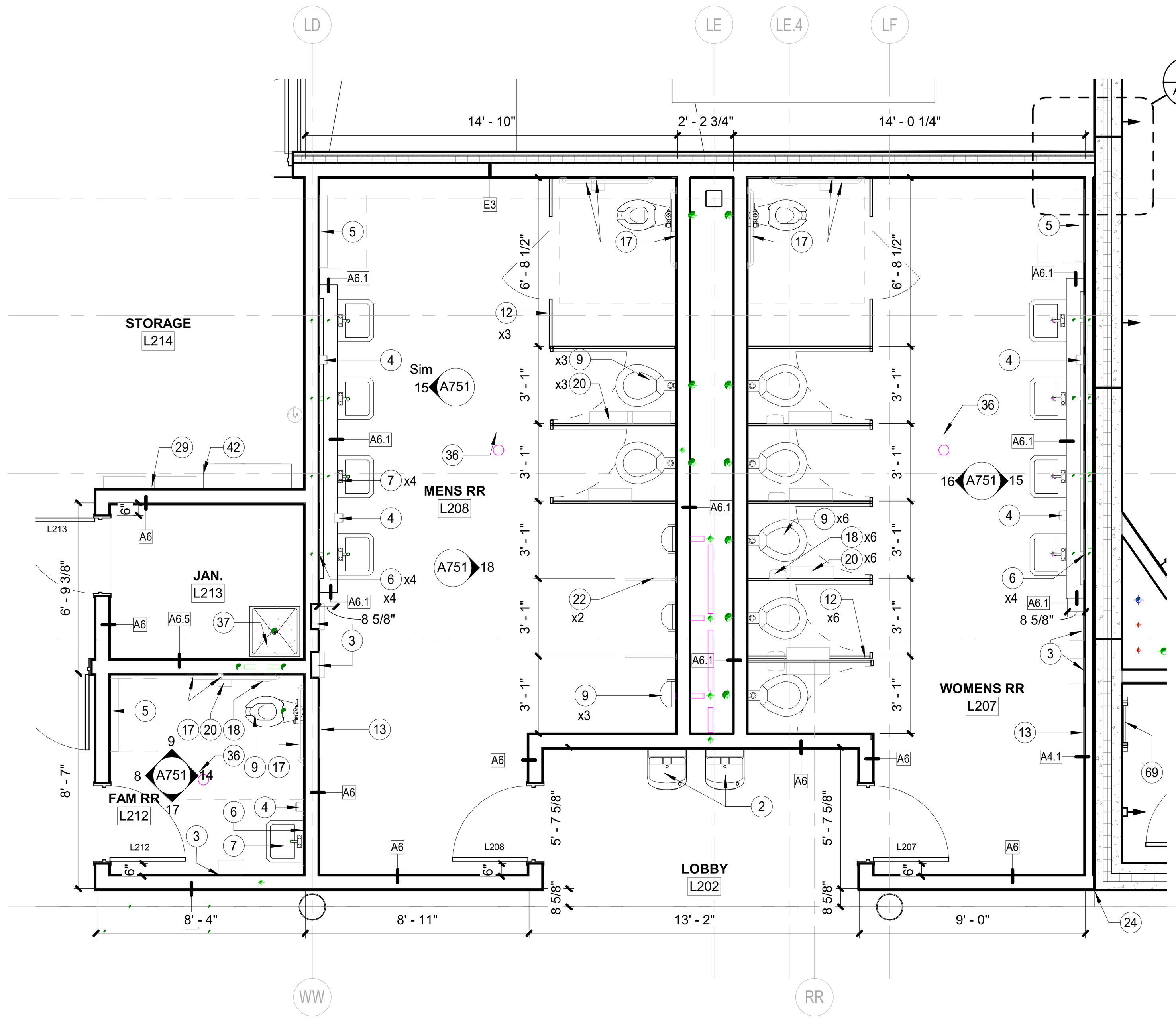
A111L

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

PLOT DATE/TIME:6/17/2022 11:19:39 AM

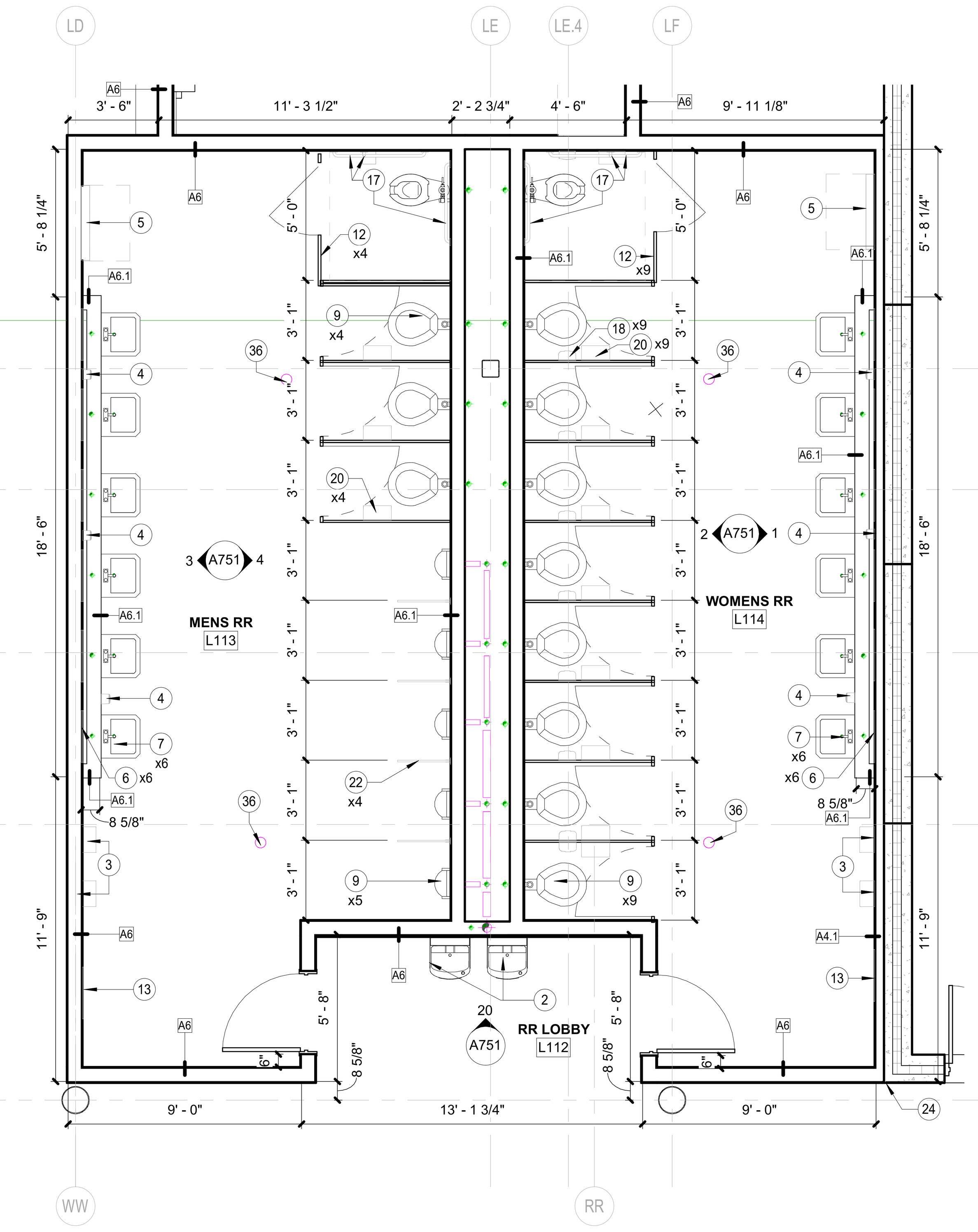
K L C B A E D G F J H

N TRUE NORTH



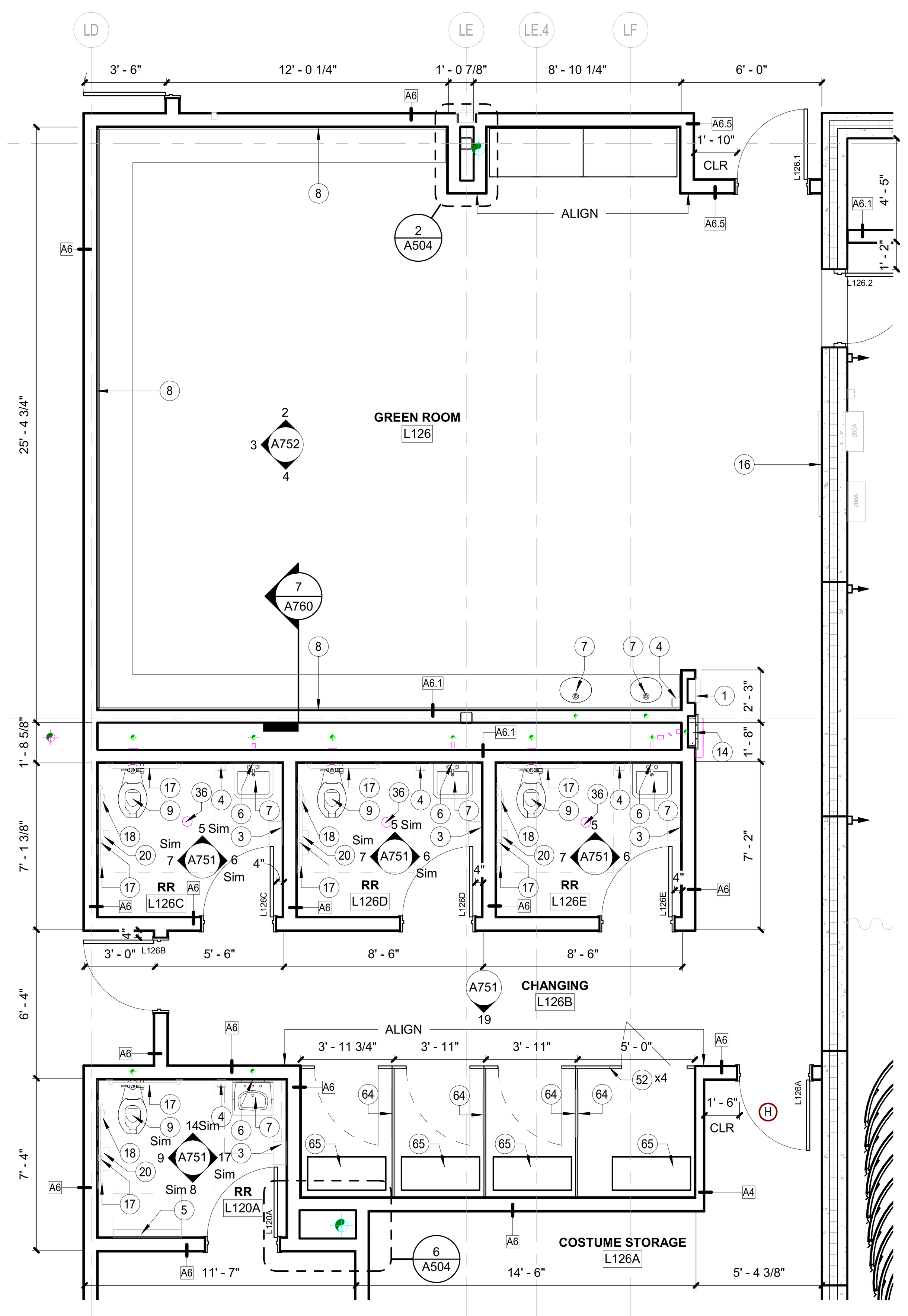
6 ENLARGED PLAN - SECOND FLOOR - 202/207/208/212

SCALE: 1/4" = 1'-0" REF. 1 / A102L



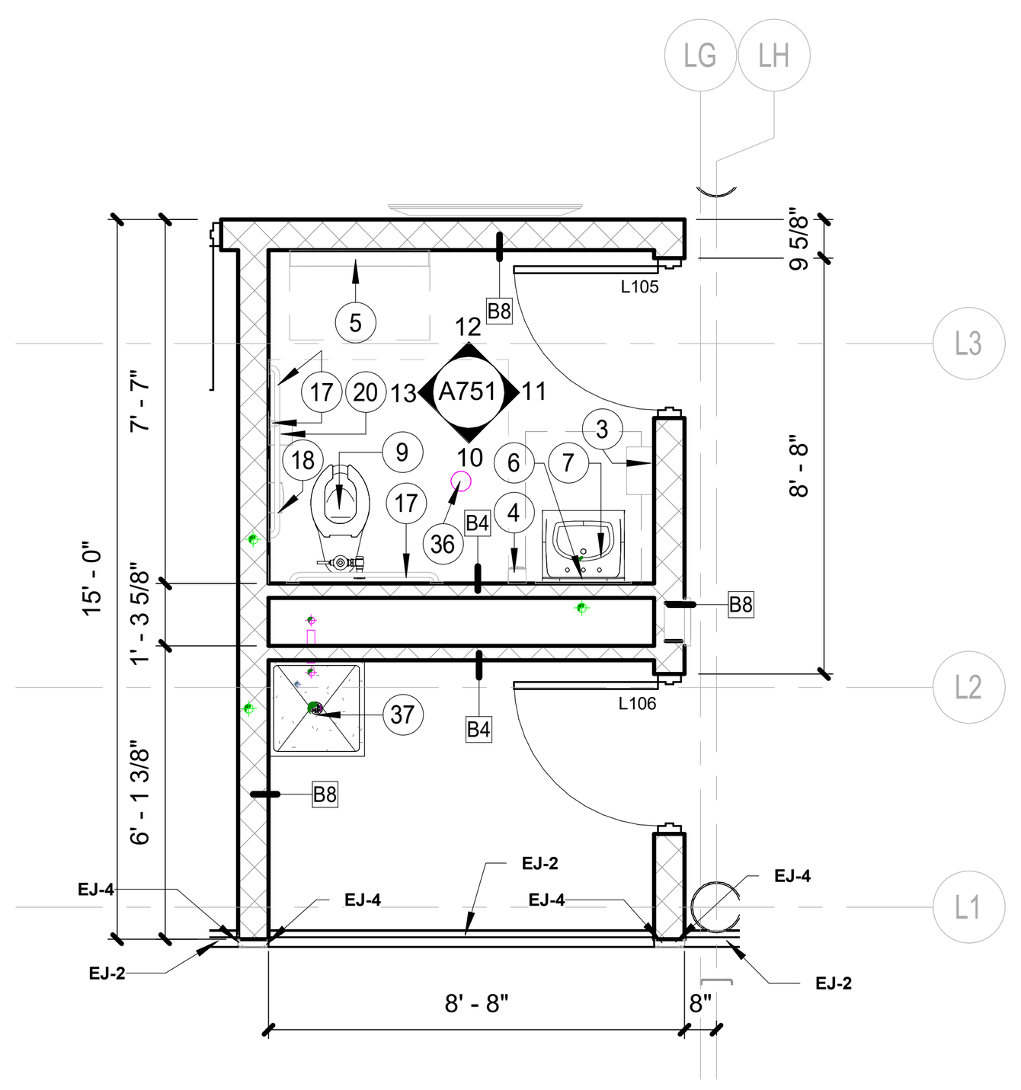
5 ENLARGED PLAN - L113/L114 RESTROOMS

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



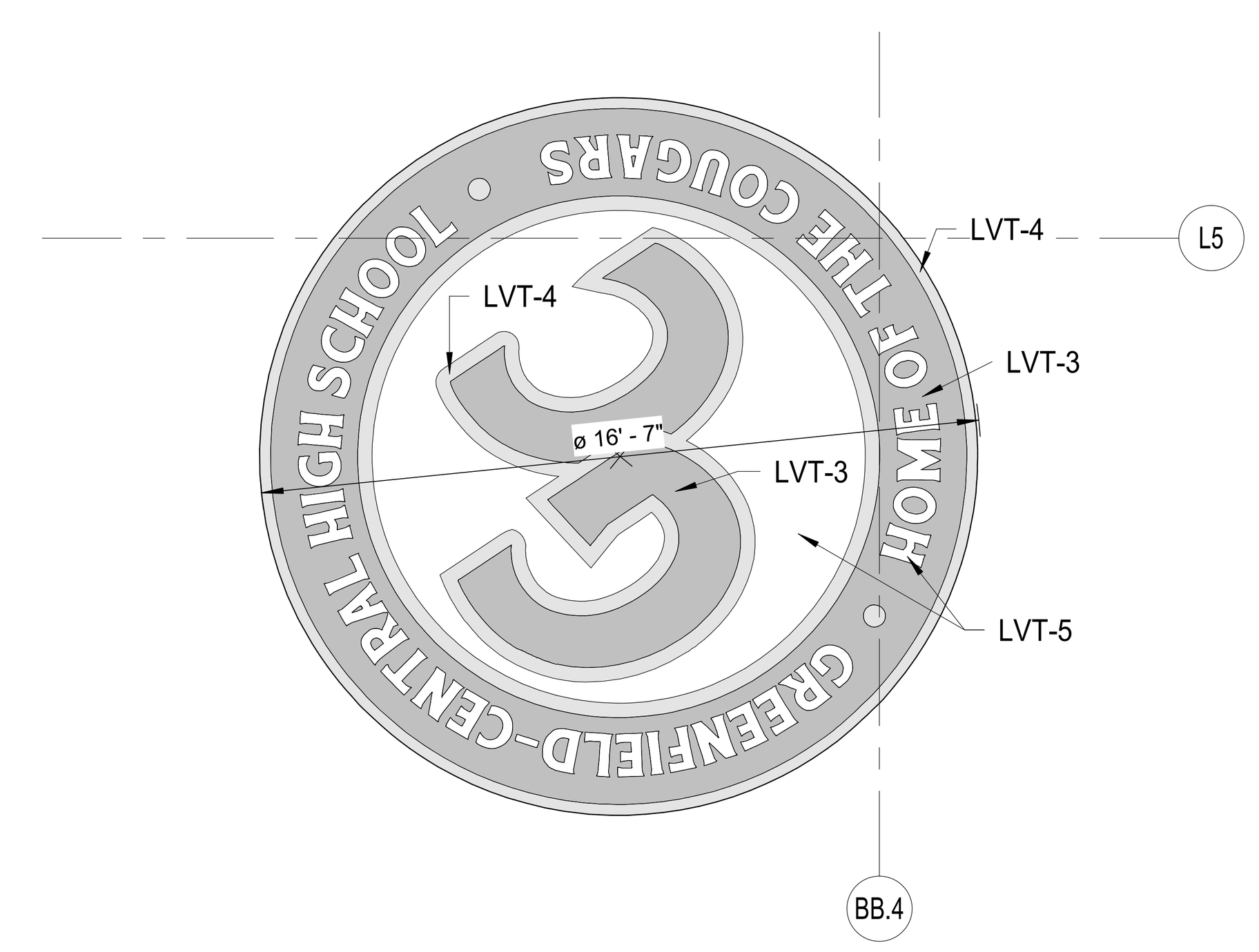
2 ENLARGED PLAN - L122A/L123/L124/L125

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



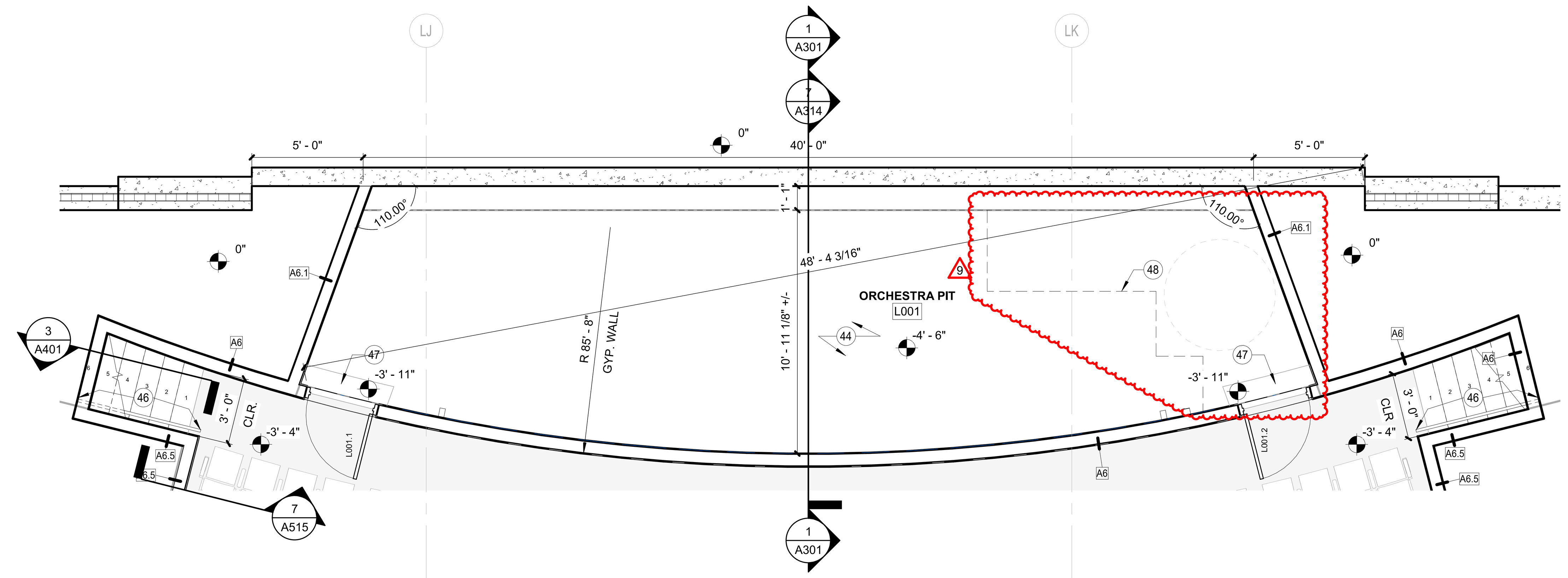
4 ENLARGED PLAN - L105/L106

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



3 ENLARGED PLAN - LOBBY LOGO

SCALE: 1/4" = 1'-0" REF. 1 / A721L



1 FLOOR PLAN - ORCHESTRA PIT

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

GENERAL NOTES - FLOOR PLAN

1. REFERENCE SHEET A002 FOR INTERIOR WALL TYPES INDICATED BY WALL TYPE TAGS.
2. REFERENCE SHEET A003 FOR EXTERIOR WALL TYPES INDICATED BY WALL TYPE TAGS.
3. REFERENCE SHEETS A611 AND A612 FOR CURTAINWALL AND STOREFRONT TYPES INDICATED BY WALL TYPE TAGS.
4. REFERENCE SHEET A720 SERIES "INTERIOR FINISH LEGEND" AND INTERIOR FINISH PLANS FOR FINISHES SUCH AS FLOORING, PAINT OR COVERINGS APPLIED TO WALL AND FLOOR CONSTRUCTION.
5. PROVIDE FULL HEIGHT CORNER GUARDS AT ALL OUTSIDE CORNERS WITH GYPSUM BOARD FINISH. FLOOR TO CEILING HEIGHT
6. PROVIDE BULL-NOSE FINISH ON ALL OUTSIDE CORNERS OF CMU WALLS
7. PROVIDE SOLID SURFACE WINDOW SILLS @ ALL STOREFRONT GLAZING SILLS ABOVE FINISHED FLOOR HEIGHT. WINDOW SILL TO EXTEND 1" PAST FINISHED WALL SURFACE, TYP. UNLESS OTHERWISE NOTED
8. REFERENCE A121 FOR ENLARGED PLANS
9. VIF ALL DIMENSIONS FOR CURTAINWALLS/STOREFRONTS AND CASEWORK
10. ALL RESTROOM WALLS TO BE INSULATED WITH SOUND BATT (SAB) INSULATION. (9)

FLOOR PLAN NOTES

1	PAPER TOWEL DISPENSER AND/OR WITH WASTE RECEPTACLE - REFER TO RESPONSIBILTY MATRIX
2	DRINKING FOUNTAIN - REF. P-SERIES
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18	LINED SANITARY NAPKIN DISPOSAL - REFER TO RESPONSIBILITY MATRIX
19	BEVERAGE COOLER. - REFER TO RESPONSIBILITY MATRIX
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56	CORRIDOR FEATURE WALL. REF. A753 INTERIOR ELEVATIONS FOR MORE INFORMATION
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58	MECHANICAL EQUIPMENT - REF. M-SERIES
59	GUARDRAIL WITH INTEGRATED HANDRAIL. REFER TO ELEVATIONS/SECTIONS FOR ADDITIONAL INFORMATION. REFER TO SPECIFICATIONS
60	12'-0" LIGHTING FIXTURE (PIPE) ASSEMBLY. REFER TO DETAILS FOR ADDITIONAL INFORMATION
61	GUARDRAIL. SEE SPECIFICATIONS. REFER TO S-SERIES FOR DESIGN CRITERIA
62	PLYWOOD ON BAR GRADING. REF. R-SERIES FOR ADDITIONAL INFORMATION
64	24"x60" MIRROR TO BE HUNG 1'-0" A.F.F.- REFER TO RESPONSIBILITY MATRIX
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73	CHAIN LINK FENCE ON THIS SIDE OF CATWALK. REFER TO DETAIL 4/A517. ALL OTHER LOCATIONS TO RECEIVE A GUARDRAIL MIN.
74	FIRE HOSE CABINET AND CONNECTION, REF. P-SERIES FOR ADDITIONAL INFORMATION.

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MARK RANDALL BEEBE · REGISTERED · 0700164 · STATE OF INDIANA · ARCHITECT

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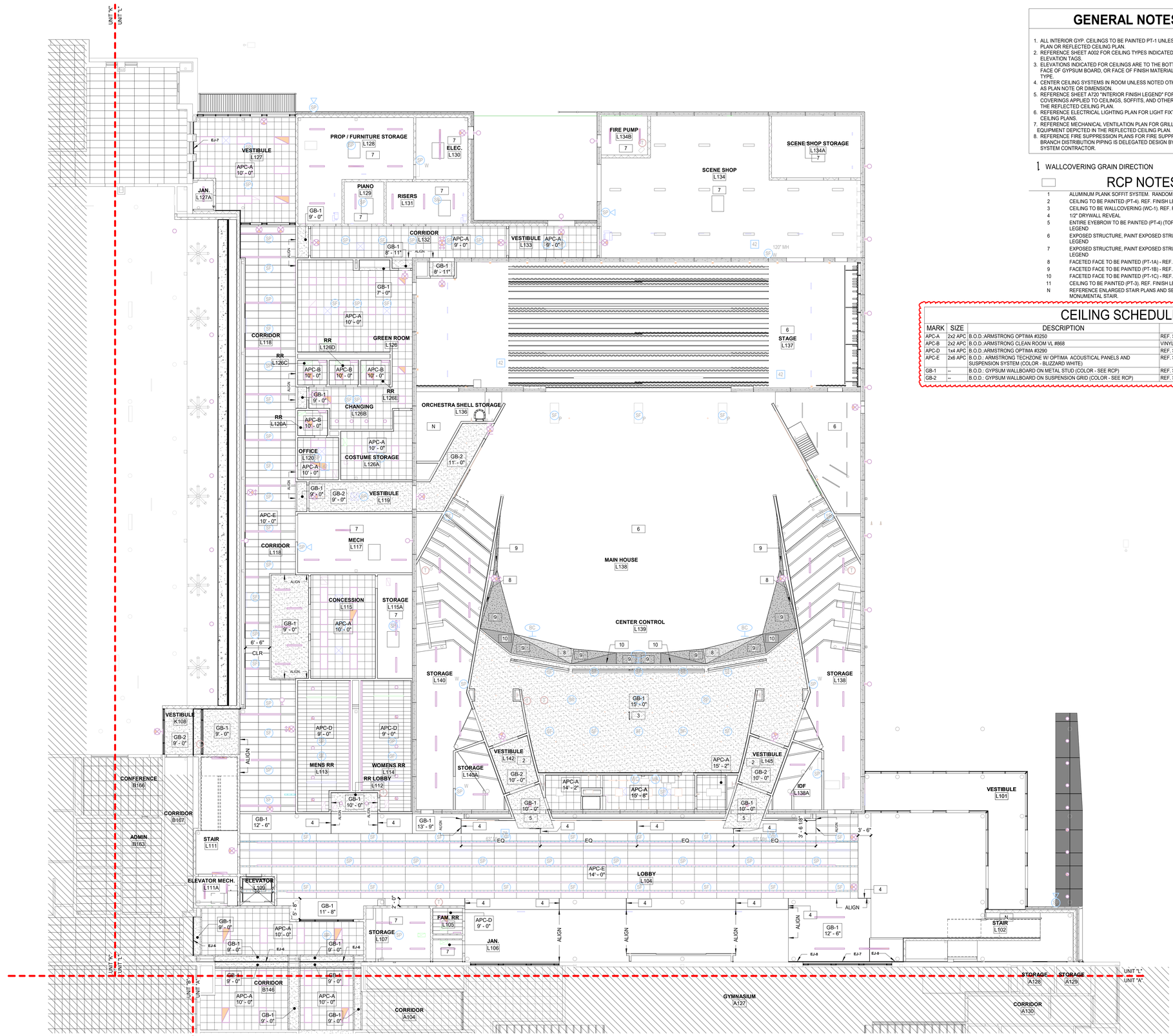
DRAWN BY: MC

ENLARGED PLANS

A121



1 REFLECTED CEILING PLAN - FIRST FLOOR - UNIT L

SCALE: 3/32" = 1'-0"

GENERAL NOTES - RCP

1. ALL INTERIOR GYP. CEILINGS TO BE PAINTED PT-1 UNLESS OTHERWISE NOTED ON FINISH PLAN OR REFLECTED CEILING PLAN.
2. REFERENCE SHEET A002 FOR CEILING TYPES INDICATED BY CEILING TYPE AND ELEVATION TAGS.
3. ELEVATIONS INDICATED FOR CEILINGS ARE TO THE BOTTOM OF THE SUSPENDED GRID, FACE OF GYPSUM BOARD, OR FACE OF FINISH MATERIAL SYSTEM INDICATED BY CEILING TYPE.
4. CENTER CEILING SYSTEMS IN ROOM UNLESS NOTED OTHERWISE BY ANNOTATION SUCH AS PLAN NOTE OR DIMENSION.
5. REFERENCE SHEET A720 "INTERIOR FINISH LEGEND" FOR FINISHES SUCH AS PAINT OR COVERINGS APPLIED TO CEILINGS, SOFFITS, AND OTHER CONSTRUCTION DEPICTED IN THE REFLECTED CEILING PLAN.
6. REFERENCE ELECTRICAL LIGHTING PLAN FOR LIGHT FIXTURES SHOWN IN REFLECTED CEILING PLANS.
7. REFERENCE MECHANICAL VENTILATION PLAN FOR GRILLES, DIFFUSERS, DUCTS, AND EQUIPMENT DEPICTED IN THE REFLECTED CEILING PLAN.
8. REFERENCE FIRE SUPPRESSION PLANS FOR FIRE SUPPRESSION SYSTEM PIPING, BRANCH DISTRIBUTION PIPING IS DELEGATED DESIGN BY THE FIRE SUPPRESSION SYSTEM CONTRACTOR.

1 WALLCOVERING GRAIN DIRECTION

RCP NOTES

1	ALUMINUM PLANK SOFFIT SYSTEM. RANDOM AND PATTERN
2	CEILING TO BE PAINTED (PT-4). REF. FINISH LEGEND
3	CEILING TO BE WALLCOVERING (WC-1). REF. FINSIH LEGEND
4	1/2" DRYWALL REVEAL
5	ENTIRE EYEBROW TO BE PAINTED (PT-4) (TOP, BOTTOM, AND SIDES). REF. FINISH LEGEND
6	EXPOSED STRUCTURE, PAINT EXPOSED STRUCTURE (PT-5). REF. FINISH LEGEND
7	EXPOSED STRUCTURE, PAINT EXPOSED STRUCTURE (PT-1). REF. FINISH LEGEND
8	FACETED FACE TO BE PAINTED (PT-1A) - REF. FINSIH LEGEND
9	FACETED FACE TO BE PAINTED (PT-1B) - REF. FINSIH LEGEND
10	FACETED FACE TO BE PAINTED (PT-1C) - REF. FINSIH LEGEND
11	CEILING TO BE PAINTED (PT-3). REF. FINISH LEGEND
N	REFERENCE ENLARGED STAIR PLANS AND SECTIONS FOR CEILING UNDER MONUMENTAL STAIR

CEILING SCHEDULE

MARK	SIZE	DESCRIPTION	COMMENTS
APC-A	2x2 APC	B.O.D.:ARMSTRONG OPTIMA #3250	REF. SHEET A002 FOR TYP. CEILING DETAILS
APC-B	2x2 APC	B.O.D.:ARMSTRONG CLEAN ROOM VL #868	VINYL FACED REF. SHEET A002 FOR TYP. CEILING DETAILS
APC-D	1x4 APC	B.O.D.:ARMSTRONG OPTIMA #3290	REF. SHEET A002 FOR TYP. CEILING DETAILS
APC-E	2x6 APC	B.O.D.: ARMSTRONG TECHZONE W/ OPTIMA ACOUSTICAL PANELS AND SUSPENSION SYSTEM (COLOR - BLIZZARD WHITE)	REF. SHEET A002 FOR TYP. CEILING DETAILS
GB-1	--	B.O.D.: GYPSUM WALLBOARD ON METAL STUD (COLOR - SEE RCP)	REF. SHEET A002 FOR TYP. CEILING DETAILS
GB-2	--	B.O.D.: GYPSUM WALLBOARD ON SUSPENSION GRID (COLOR - SEE RCP)	REF. SHEET A002 FOR TYP. CEILING DETAILS

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REFLECTED CEILING PLAN - FIRST FLOOR - UNIT L

A131L

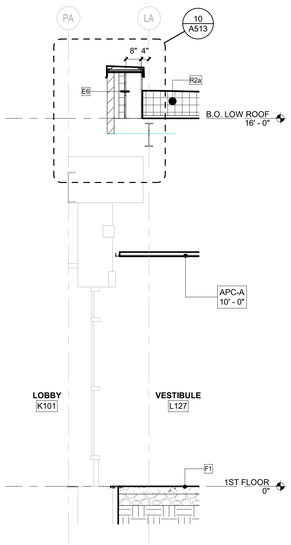
K L C B A E D G F J H

N TRUE NORTH

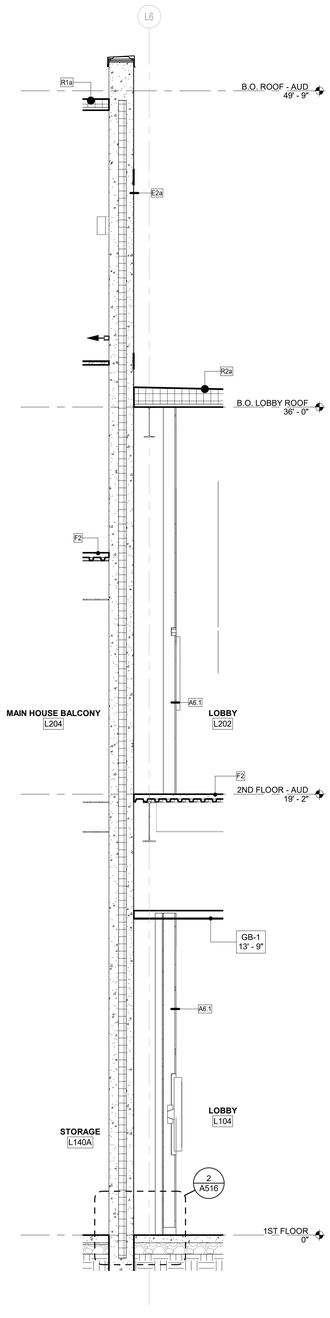
PLOT DATE/TIME:6/17/2022 11:19:50 AM

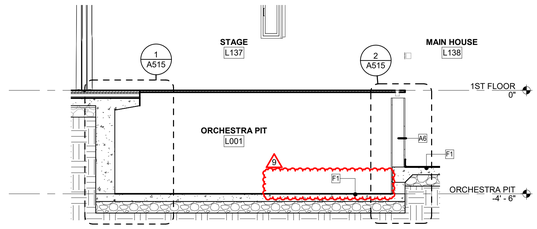
GENERAL NOTES - ARCHITECTURAL DETAILS

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.

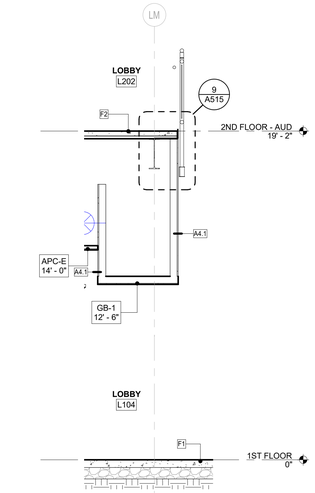


8 WALL SECTION
SCALE: 3/8" = 1'-0" REF. 1 / A111L

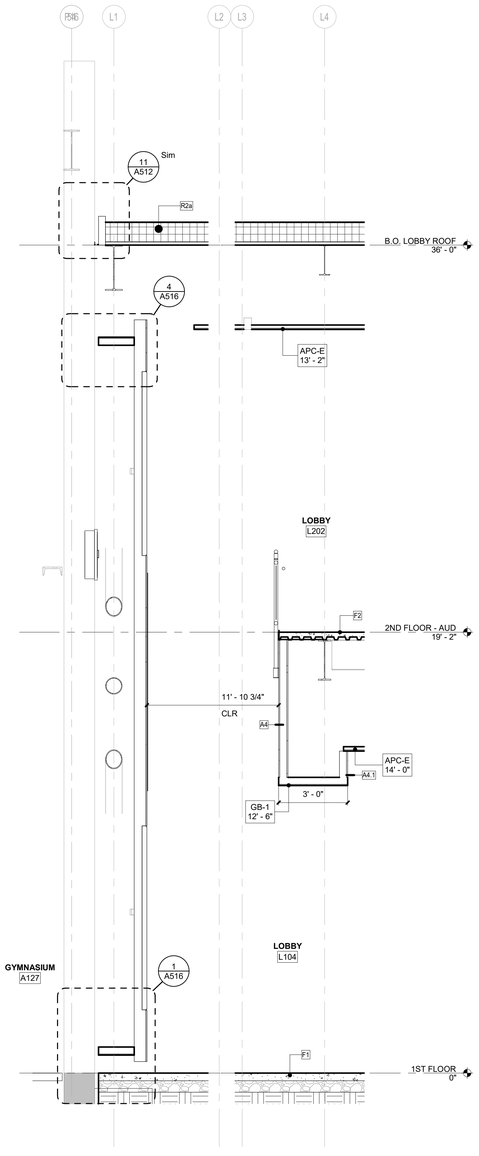




7 WALL SECTION
SCALE: 3/8" = 1'-0" REF. 1 / A121



6 WALL SECTION
SCALE: 3/8" = 1'-0" REF. 1 / A111L



3 WALL SECTION
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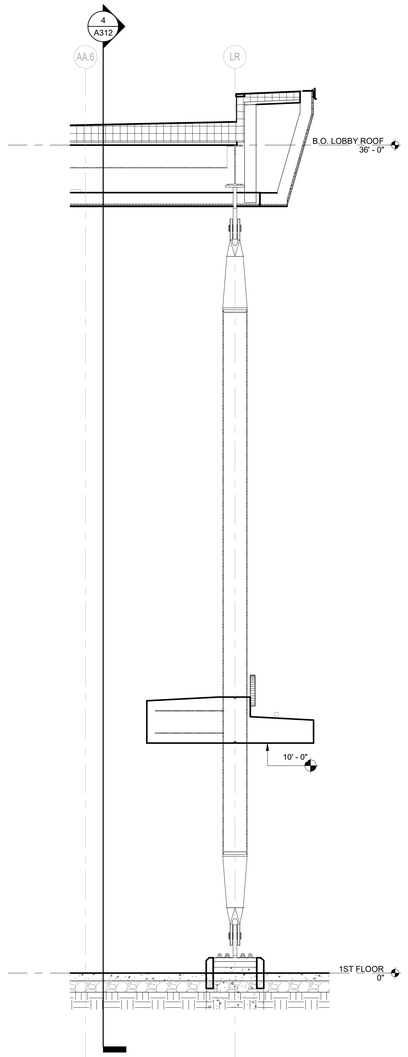

2 WALL SECTION
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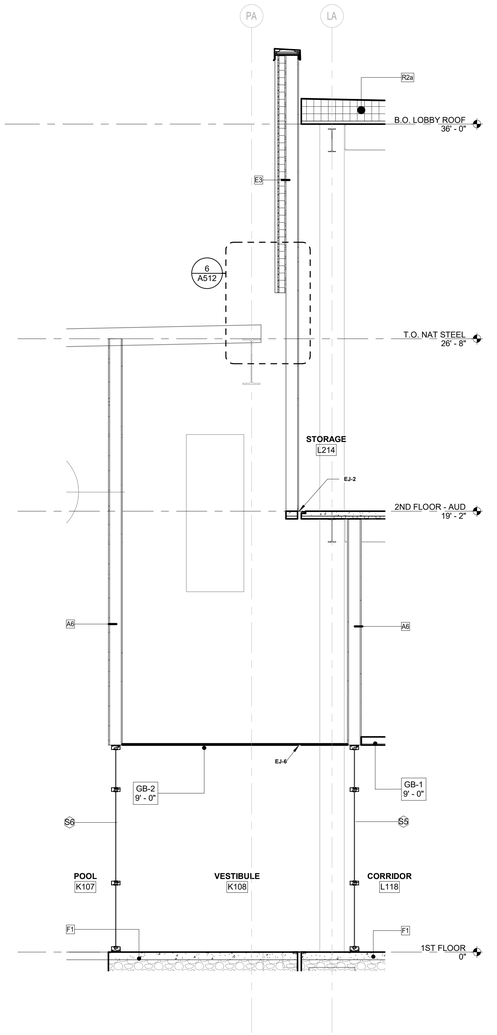
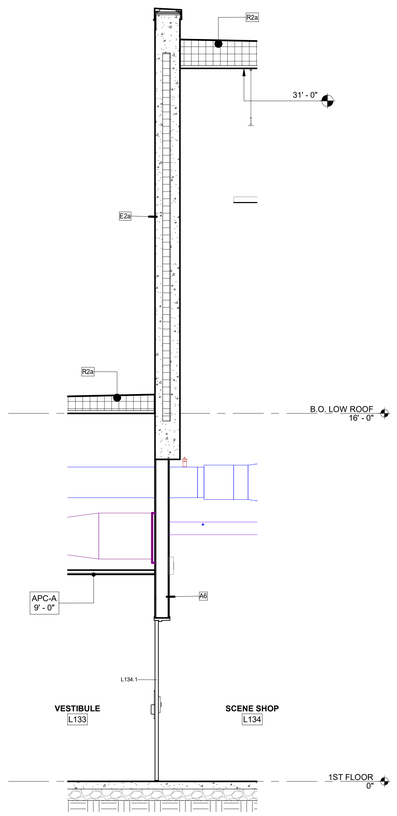


1 WALL SECTION
SCALE: 3/8" = 1'-0" REF. 1 / A111L



5 WALL SECTION
SCALE: 3/8" = 1'-0" REF. 1 / A111L

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REGISTERED
07001164
STATE OF INDIANA
ARCHITECT

REVISIONS:

#	Date	Desc.
0	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

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

WALL SECTIONS

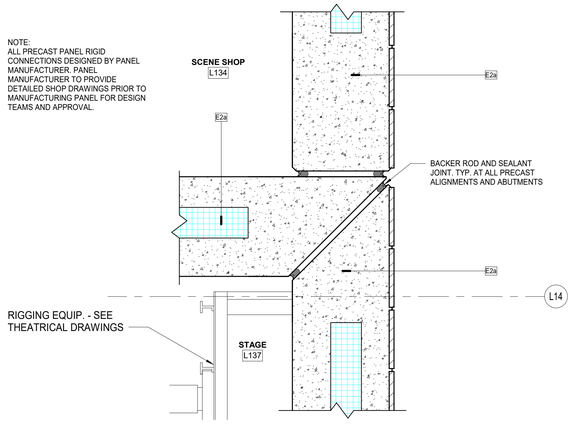
A314

PLOT DATE/TIME:6/17/2022 11:19:55 AM

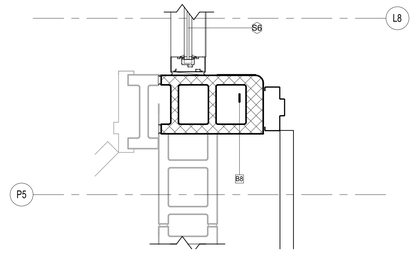
GENERAL NOTES - ARCHITECTURAL DETAILS

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.

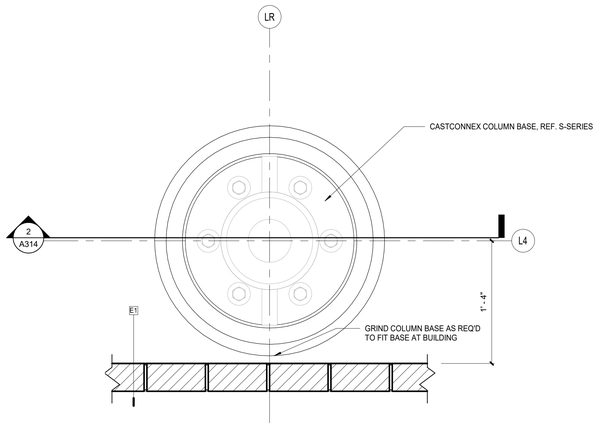
NOTE:
ALL PRECAST PANEL RIGID CONNECTIONS DESIGNED BY PANEL MANUFACTURER. PANEL MANUFACTURER TO PROVIDE DETAILED SHOP DRAWINGS PRIOR TO MANUFACTURING PANEL FOR DESIGN TEAMS AND APPROVAL.



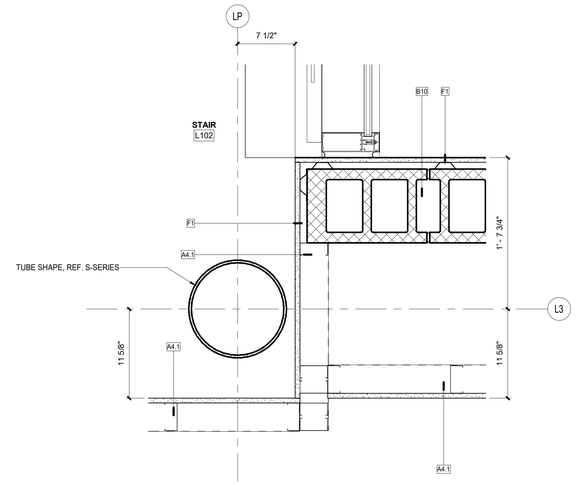
8 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 1 / A111L



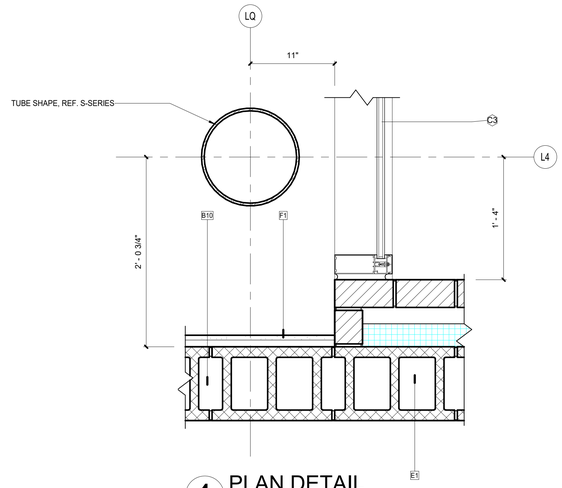
7 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 1 / A111L



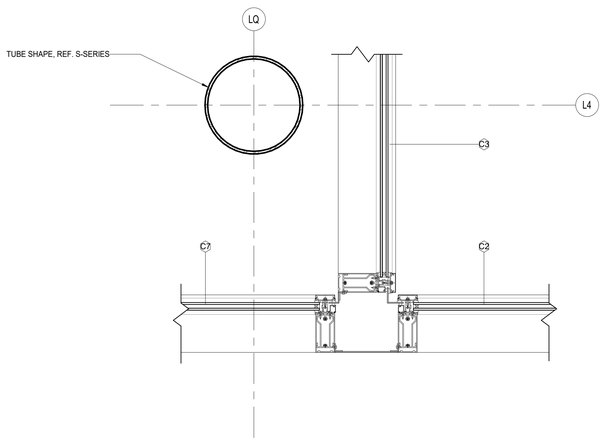
6 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 5 / A401



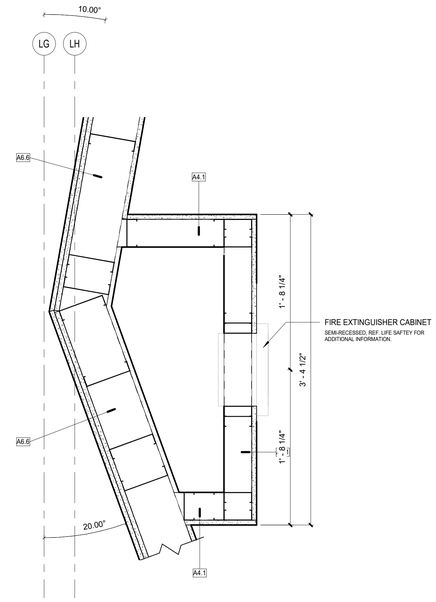
5 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 5 / A401



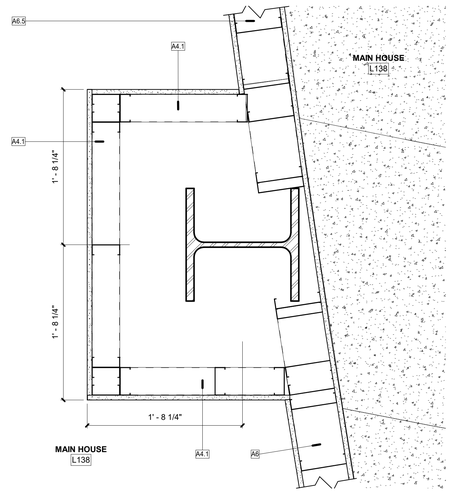
4 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 5 / A401



3 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 6 / A401



2 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 1 / A111L



1 PLAN DETAIL
SCALE: 1 1/2" = 1'-0" REF. 1 / A111L

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MARK RANDALL BEEBE
REGISTERED
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STATE OF INDIANA
ARCHITECT

REVISIONS:

#	Date	Desc.
0	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

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

PLAN DETAILS

A502

PLOT DATE/TIME: 6/17/2022 11:19:58 AM

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.
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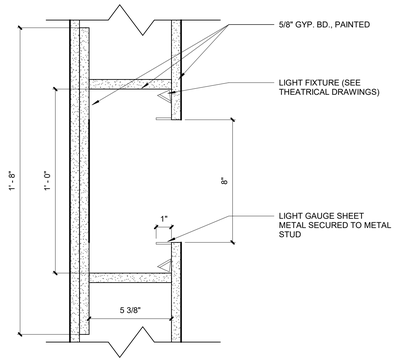
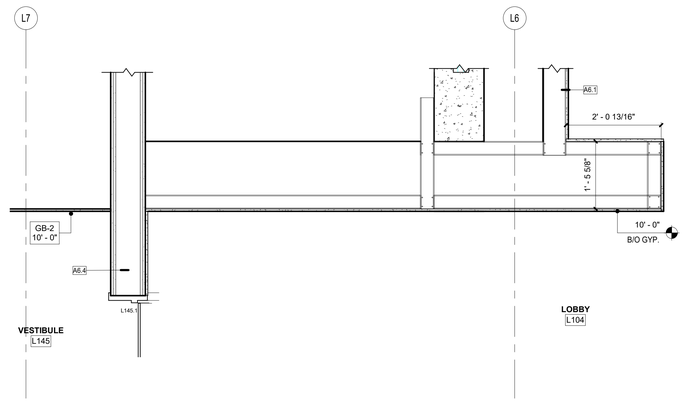
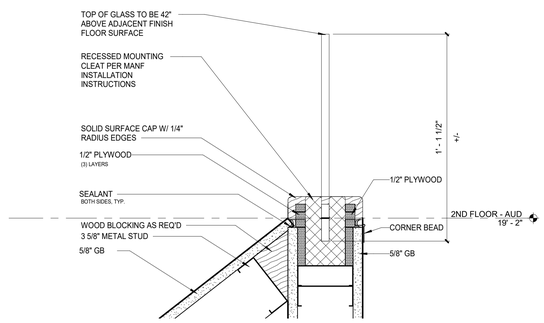


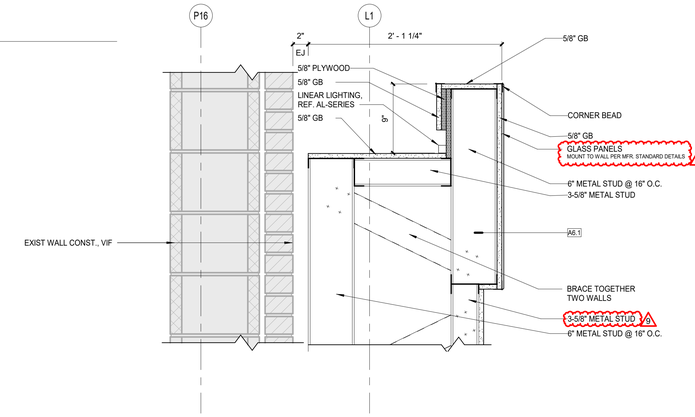
8 SECTION DETAIL
SCALE: 3" = 1'-0" REF. 5 / A403



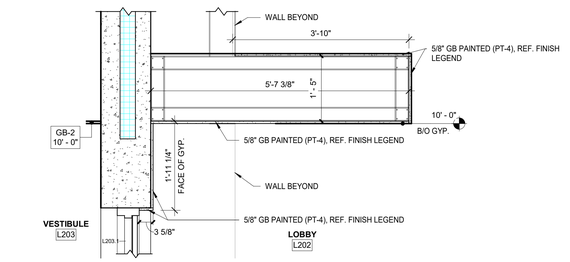
7 SECTION DETAIL
SCALE: 3/4" = 1'-0" REF. 1 / A754



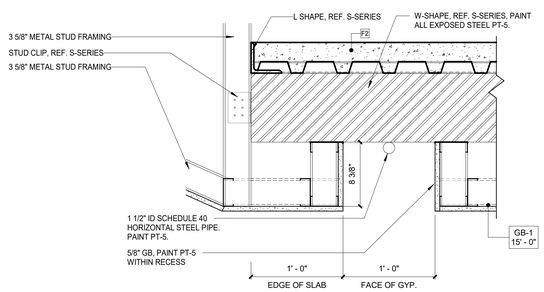
5 SECTION DETAIL
SCALE: 3" = 1'-0" REF. 1 / A403



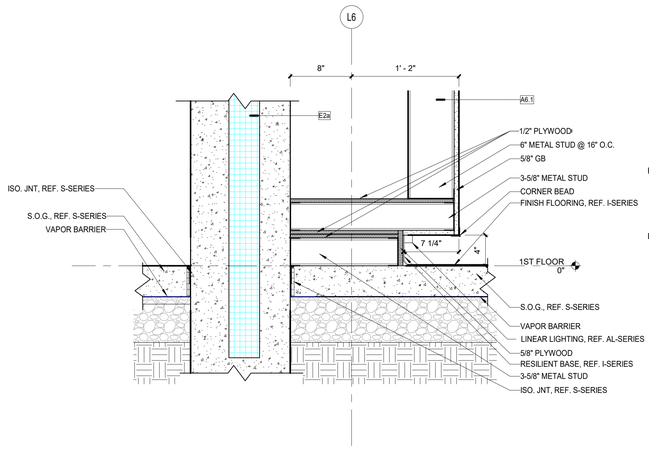
4 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 3 / A314



6 SECTION DETAIL
SCALE: 3/4" = 1'-0" REF. 2 / A754



3 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 4 / A304



2 SECTION DETAIL
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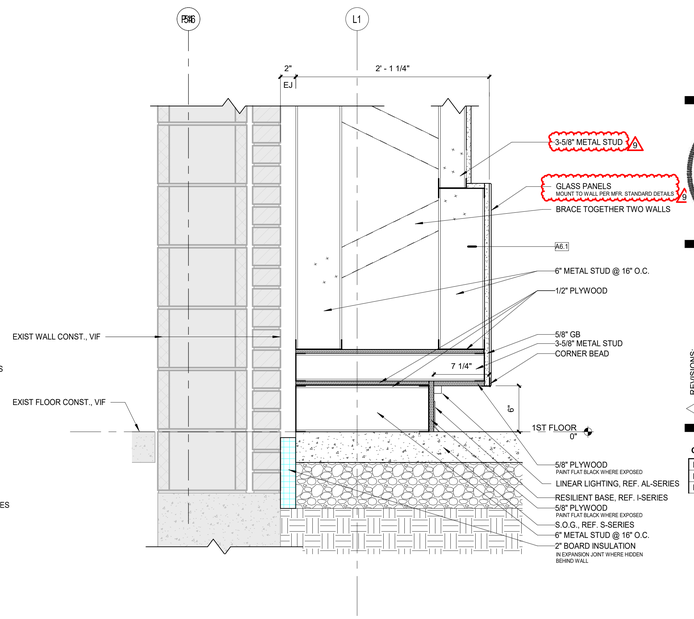

1 SECTION DETAIL
SCALE: 1 1/2" = 1'-0" REF. 3 / A314

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MARK RANDALL BEEBE
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ARCHITECT

REVISIONS:		
#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

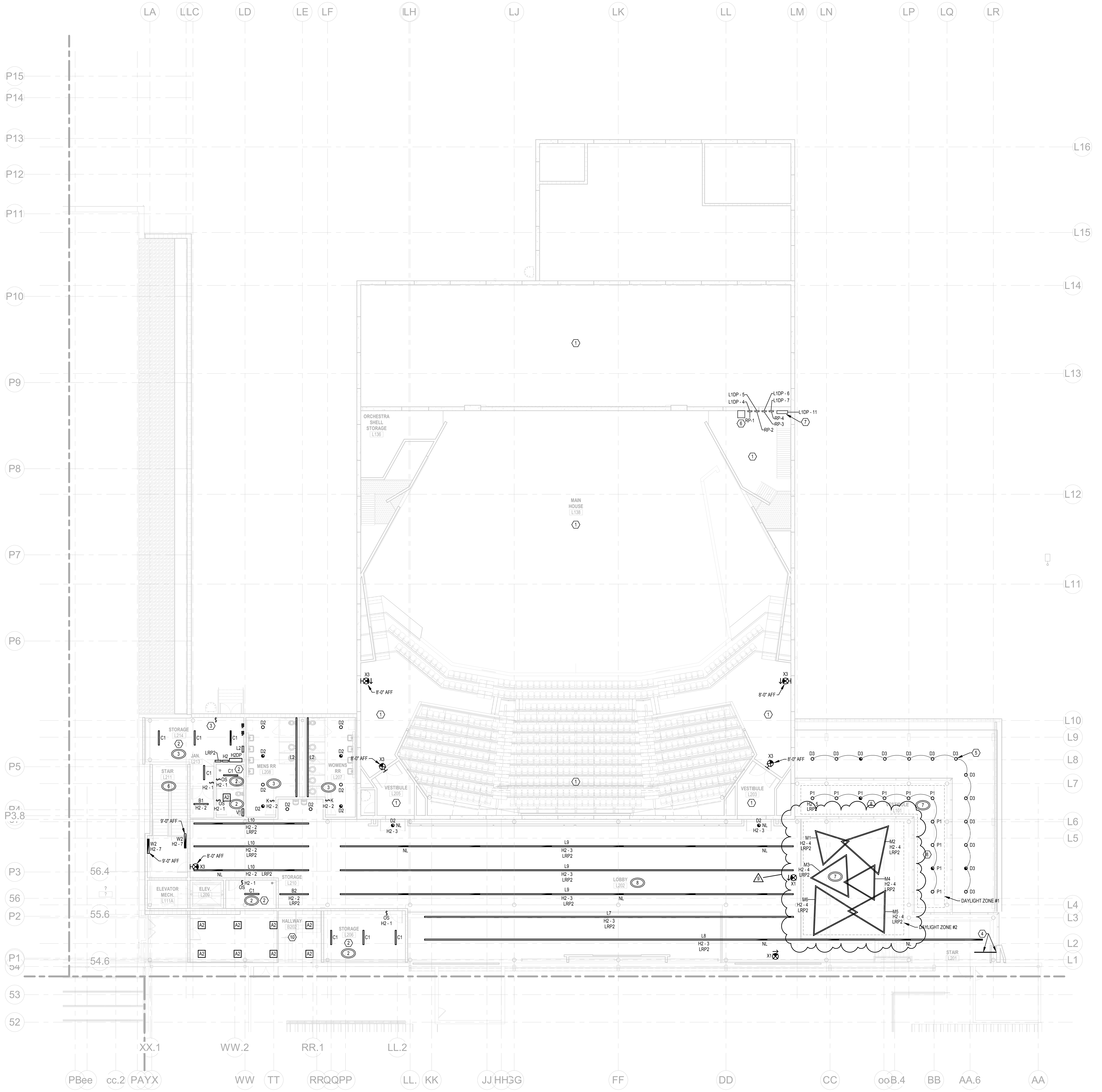
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

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

SECTION DETAILS

A516

PLOT DATE/TIME:6/17/2022 1:11:20:00 AM



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

GENERAL NOTES

A REFER TO ARCHITECTURAL ELEVATIONS AND CASEWORK DRAWINGS FOR DEVICE MOUNTING HEIGHTS PRIOR TO ROUGH-IN. REFER TO ARCHITECTURAL PLANS FOR LUMINAIRE LOCATIONS.

B ALL LUMINAIRES AND LIGHTING CONTROL DEVICES IN AN ENCLOSED SPACE/ROOM ARE CIRCUITED TO THE SAME CIRCUIT. THE CIRCUIT NUMBER IS INDICATED NEAR THE LIGHTING CONTROL DEVICE.

C ALL "EXIT" SIGNS ARE TO BE CIRCUITED TO THE LIGHTING CIRCUIT IN THE SPACE/ROOM AHEAD OF ANY LIGHTING CONTROL DEVICES, UNLESS NOTED OTHERWISE.

D COORDINATE OCCUPANCY SENSOR AIMING AND PLACEMENT WITH MANUFACTURER OR SUPPLIER PRIOR TO INSTALLATION.

E OCCUPANCY SENSOR MANUFACTURERS' COVERAGE PATTERNS VARY, THUS MANUFACTURER SHALL SUBMIT 1/8-INCH SCALE FLOOR PLANS SHOWING PROPOSED LAYOUT WITH DEVICES CLEARLY IDENTIFIED DURING THE SHOP DRAWING REVIEW PHASE. SHOP DRAWINGS MISSING INFORMATION WILL BE REJECTED. REQUEST AUTOCAD FLOOR PLANS IN A DVANCE OF SHOP DRAWING SUBMITTAL TO ENSURE ON TIME DELIVERY.

F IN ROOMS WITH EXPOSED CEILINGS CONTRACTORS SHALL COORDINATE LIGHTING LAYOUT WITH DUCTWORK AND PIPING ROUTING PRIOR TO INSTALLATION BEGINING. PROVIDE ALL NECESSARY SUPPORTS FOR LIGHTS OR PORTIONS OF LIGHTS THAT MAY BE LOCATED BELOW DUCTWORK.

PLAN NOTES

1 REFER TO THEATRICAL LIGHTING DRAWINGS FOR LIGHT FIXTURES AND CONTROLS IN THIS ROOM.

2 SUSPEND FIXTURES 10'-0" CLEAR AFF.

3 SWTICH FOR W1 LIGHT FIXTURES SHOWN ON LIGHTING ROOF PLAN.

4 CONDUIT FOR EXTERIOR LIGHTING MOUNTED IN CANOPY ABOVE. ROUTE FROM ABOVE SECOND FLOOR ACCESSIBLE CEILING AND DROP DOWN IN CHASE TO HORIZONTAL RUN TO CANOPY. REFER TO FIRST FLOOR LIGHTING PLAN FOR CONTINUATION OF CONDUIT.

5 D3 FIXTURES ARE COLOR CHANGING FIXTURES WITH DMX CONTROL THROUGH THE THEATRICAL LIGHTING CONTROL SYSTEM. REFER TO AL AND TL DRAWINGS AND SCHEDULES.

6 LIGHTING CONTROL INTERFACE RACK FOR THEATRICAL LIGHTS. REFER TO POWER PLANS FOR POWER REQUIREMENTS.

7 EMERGENCY LIGHTING TRANSFER UNIT, REFER TO AL AND TL DRAWINGS. CIRCUIT SHOWN IS ROUTED THROUGH LIGHTING INVERTER. REFER TO SINGLE LINE DRAWINGS.

8 SUSPEND FIXTURES 29'-0" CLEAR AFF.

10 CONNECT TO EXISTING LIGHTING CIRCUIT AND CONTROLS THAT SERVED REMOVED LIGHT FIXTURES IN THIS AREA.

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HEAPY
PROJECT NO. 2021-07128

GREENFIELD CENTRAL HIGH SCHOOL
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KEITH A SCHEID
REGISTERED
No. PE60610071
STATE OF INDIANA
PROFESSIONAL ENGINEER
5-20-22

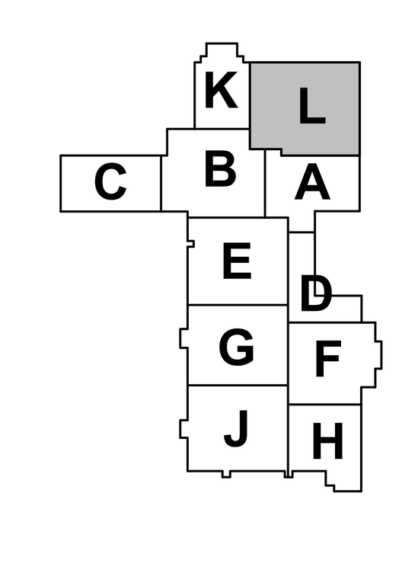
REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

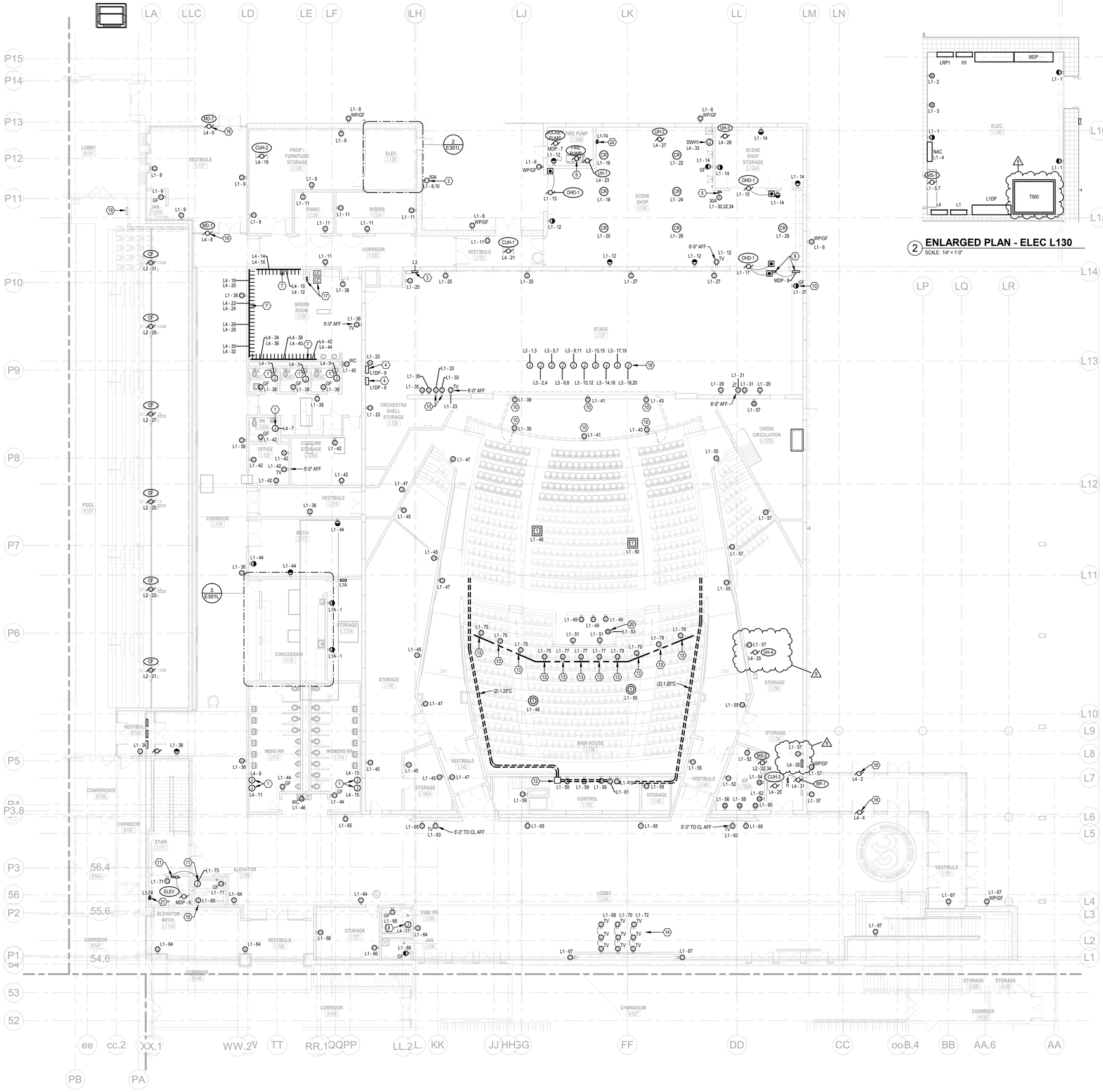
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: MAR

LIGHTING PLAN - SECOND FLOOR - UNIT L



TRUE NORTH

E202L



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

2 **ENLARGED PLAN - ELEC L130**
SCALE: 1/4" = 1'-0"

GENERAL NOTES

A REFER TO ARCHITECTURAL ELEVATIONS AND CASEWORK DRAWINGS FOR DEVICE MOUNTING HEIGHTS PRIOR TO ROUGH-IN.

B COORDINATE ELECTRICAL REQUIREMENTS WITH OTHER TRADES' SHOP DRAWINGS FOR ELECTRICAL CONNECTIONS TO EQUIPMENT FURNISHED BY OTHER TRADES AND/OR THE OWNER.

C ALL IT / DATA ROUGH-INS ARE TO BE AT THE SAME ELEVATION AS THE ADJACENT RECEPTACLE., UNLESS OTHERWISE NOTED.

D BRANCH CIRCUIT WIRE SIZING CHART TO BE UTILIZED AS A GUIDELINE FOR VOLTAGE DROP COMPENSATION. INCREASE CONDUIT AND WIRING AS REQUIRED.

20A – 120V CIRCUITS		20A – 277V CIRCUITS	
#12 WIRE	75' MAX	#12 WIRE	175' MAX
#10 WIRE	125' MAX	#10 WIRE	300' MAX
# 8 WIRE	200' MAX	# 8 WIRE	450' MAX

E STAGGER RECEPTACLES AND OTHER RECESSED DEVICES WHEN LOCATED ON OPPOSITE SIDES OF A PARTITION / WALL TO ELIMINATE SOUND TRANSMISSION FROM ONE SPACE TO THE OTHER.

F NEW WIRE AND CONDUITS SHALL NOT BE RUN EXPOSED UNLESS APPROVED BY THE OWNER, ARHCITECT OR THE ENGINEER.

G FEEDER CONDUITS ARE TO BE HELD HIGH AND TIGHT TO THE STRUCTURE ABOVE.

H RECEPTACLES FOR WATER COOLERS / VENDING MACHINES ARE TO BE GFCI PROTECTED. IF LOCATED BEHIND THE WATER COOLER / VENDING MACHINE, RECEPTACLES MUST BE PROTECTED BY A GFCI BREAKER.

I ALL RECEPTACLES IN PUBLIC ACCESSIBLE SPACES ARE TO BE OF THE TAMPER-RESISTANT DESIGN.

J COORDINATE EXACT LOCATION OF ALL WALL MOUNTED DEVICES IN AUDITORIUM PRIOR TO ROUGH-IN.

PLAN NOTES

1 J-BOX AND 120V BRANCH CIRCUIT FOR HAND DRYERS.

2 RECEPTACLE FOR RV MOTORHOME. COORDINATE RECEPTACLE REQUIREMENTS WITH OWNER PRIOR TO INSTALLATION.

3 120/208V-3PHASE PANELBOARD FOR VIDEO WALL CIRCUITS. PROVIDE 208V, 20A-1PHASE CIRCUIT (2#12, #12G, 0.75") TO JUNCTION BOX FOR CONNECTION TO LED TV WALL ON STAGE. REFER TO PLAN NOTE 18.

4 200A/3P COMPANY SWITCH, PROVIDED BY A/V SUPPLIER.

5 480V-3PHASE, 30 AMP, INTERLOCKED WELDING DISCONNECT WITH PIN AND SLEEVE PLUG.

6 30 AMP, 3 POLE DISCONNECT AND 24"X24" JUNCTION BOX FOR MOTORIZED WINCHES. COORDINATE EXACT LOCATION OF J-BOX WITH WINCH LOCATION AND STAGE RIGGING SUPPLIER. REFER TO STAGE RIGGING DRAWINGS FOR WIRING DIAGRAMS AND CONNECTIONS. COORDINATE WIRING TO WINCHES WITH SUMP PUMP.

7 MOUNT RACEWAY AND RECEPTACLE ABOVE COUNTER BACKSPLASH AND BELOW MIRROR, APPROXIMATELY 3'-2" AFF. COORDINATE EXACT LOCATION WITH ARCHITECTURAL ELEVATIONS. PLUG STRIP TO BE 6' LONG SECTIONS WITH TWO 20 AMP CIRCUITS AND RECEPTACLES SPACED 1'-0" ON CENTER. MOUNT END TO END AND PROVIDE COUPLINGS AT JOINTS FOR CONTINUOUS RUN APPEARANCE. PLUG STRIP TO BE HUBBELL #HBL24GBA612V OR APPROVED EQUAL.

8 MOUNT IN AV BACK BOX. COORDINATE EXACT MOUNTING HEIGHT WITH TECHNOLOGY DRAWINGS.

9 REFER TO SINGLE LINE DIAGRAM FOR WIRING OF FIRE PUMP.

10 RECEPTACLE FOR SUMP PUMP LOCATED IN ORCHESTRA PIT. COORDINATE FINAL LOCATION WITH SUMP PUMP PRIOR TO ROUGH-IN.

11 120V CIRCUIT AND LOCKABLE DISCONNECT FOR ELEVATOR CAB LIGHT CIRCUIT.

12 18"x18"x18" PULL BOX IN CRAWL SPACE BELOW CONTROL ROOM FLOOR FOR CONDUIT PATHWAY TO FLOOR BOX.

13 DUPLEX RECEPTACLE MOUTNED IN PIPE RAIL RECESS UNDER BALCONY. REFER TO ARCHITECTURAL DRAWINGS FOR RECESS DETAIL. MOUNT RECEPTACLE ON REAR SIDE OF RECESS CAVITY 6" FROM BOTTOM OF OPENING. COORDINATE WITH ARCHITECT AND ENGINEER PRIOR TO ROUGH-IN

14 RECEPTACLES FOR TV WALL. COORDINATE EXACT MOUNTING HEIGHTS WITH AV BACKBOXES PRIOR TO ROUGH-IN.

15 120V BRANCH CIRCUIT AND SINGLE RECEPTACLE FOR SUMP PUMP.

16 120V BRANCH CIRCUIT CONNECTION FOR MOTORIZED DOOR OPERATOR. REFER TO TECHNOLOGY DRAWINGS FOR LOCATION OF HANDICAP OPERATORS.

17 PROVIDE SWITCH AND CONTACTOR FOR CONTROL OF PLUG MOLD RECEPTACLES MOUNTED ABOVE COUNTER. INTERLOCK WALL MOUNTED LIGHT LOCATED OUTSIDE OF GREEN ROOM DOOR TO INDICATE ON/OFF OF CONTACTOR AND CIRCUITS. REFER TO DETAIL 9/ES02.

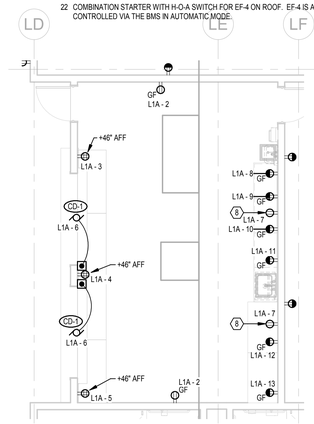
18 J-BOX FOR CONNECTION TO LED TV WALL ON STAGE. PROVIDE FLEXIBLE CONNECTION FROM J-BOX TO LED TV WALL. COORDINATE CONNECTION REQUIREMENTS WITH OWNER FURNISHED LED TV WALL.

19 CONTROL STATION FOR CEILING FANS PROVIDED WITH CEILING FANS. COORDINATE WIRING REQUIREMENTS WITH CEILING FAN PROVIDER AND INSTALL AS DIRECTED.

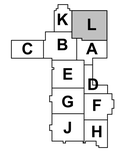
20 INSTALL POWER RECEPTACLE INSIDE A/V CABINET. COORDINATE EXACT LOCATION WITH A/V CABINET INSTALLER.

21 COMBINATION STARTER WITH H-O-A SWITCH FOR EF-3 ON ROOF. EF-3 IS AN ECM MOTOR, CONTROLLED VIA THE BMS IN AUTOMATIC MODE.

22 COMBINATION STARTER WITH H-O-A SWITCH FOR EF-4 ON ROOF. EF-4 IS AN ECM MOTOR, CONTROLLED VIA THE BMS IN AUTOMATIC MODE.



3 **ENLARGED PLAN - CONCESSIONS L115**
SCALE: 3/16" = 1'-0"



N
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LANCER + BEEBE, LLC
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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

KEITH A. SCHED
REGISTERED
No. PE60910071
STATE OF INDIANA
PROFESSIONAL ENGINEER
5-20-22

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

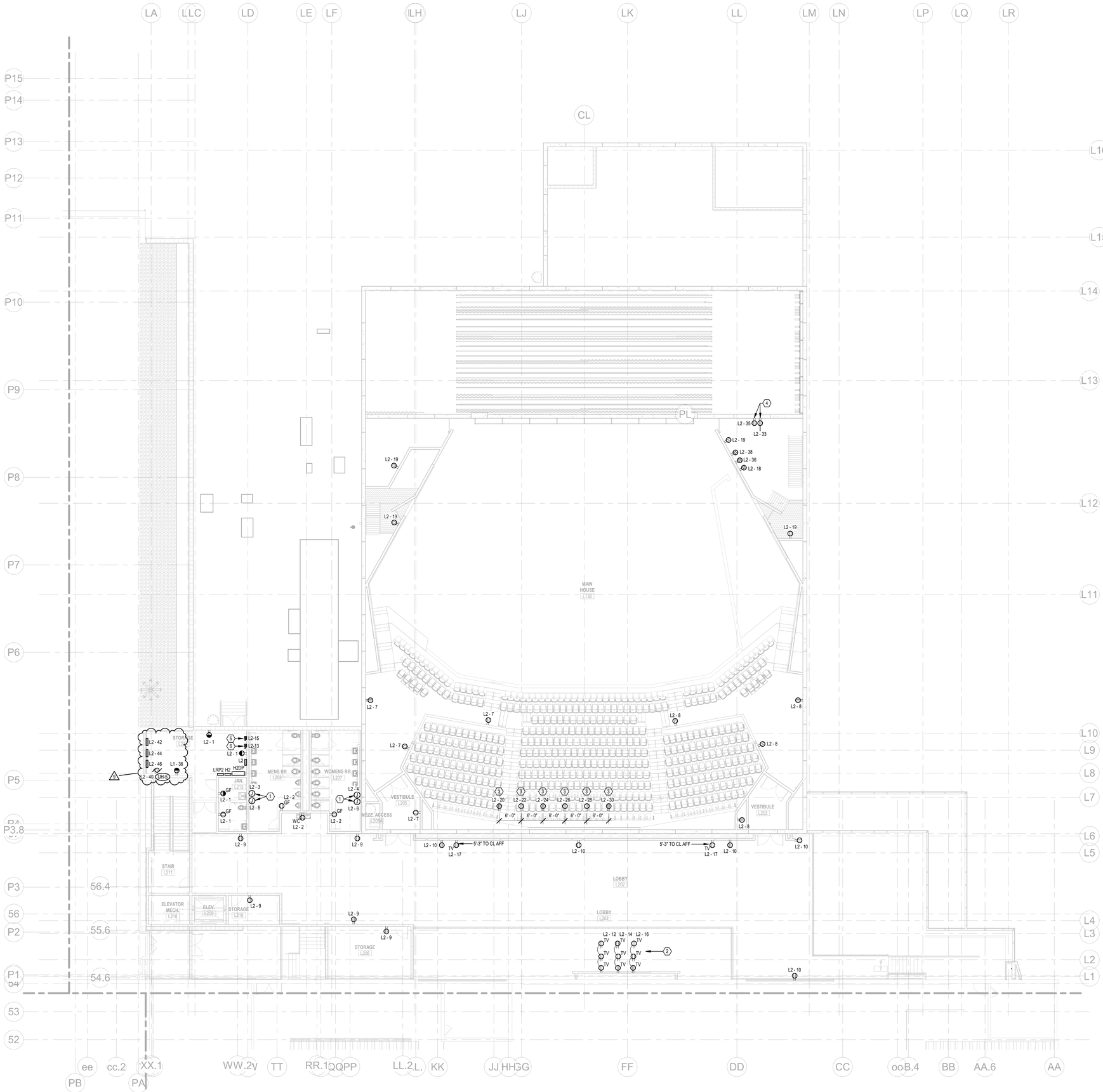
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: MAR/KAS

POWER PLAN - FIRST FLOOR - UNIT L

E301L

PLOT DATE/TIME:5/17/2022 8:51:12 AM



GENERAL NOTES

A REFER TO ARCHITECTURAL ELEVATIONS AND CASEWORK DRAWINGS FOR DEVICE MOUNTING HEIGHTS PRIOR TO ROUGH-IN.

B COORDINATE ELECTRICAL REQUIREMENTS WITH OTHER TRADES' SHOP DRAWINGS FOR ELECTRICAL CONNECTIONS TO EQUIPMENT FURNISHED BY OTHER TRADES AND/OR THE OWNER.

C ALL IT / DATA ROUGH-INS ARE TO BE AT THE SAME ELEVATION AS THE ADJACENT RECEPTACLE., UNLESS OTHERWISE NOTED.

D BRANCH CIRCUIT WIRE SIZING CHART TO BE UTILIZED AS A GUIDELINE FOR VOLTAGE DROP COMPENSATION. INCREASE CONDUIT AND WIRING AS REQUIRED.

20A – 120V CIRCUITS		20A – 277V CIRCUITS	
#12 WIRE	75' MAX	#12 WIRE	170' MAX
#10 WIRE	125' MAX	#10 WIRE	300' MAX
# 8 WIRE	200' MAX	# 8 WIRE	450' MAX

E STAGGER RECEPTACLES AND OTHER RECESSED DEVICES WHEN LOCATED ON OPPOSITE SIDES OF A PARTITION / WALL TO ELIMINATE SOUND TRANSMISSION FROM ONE SPACE TO THE OTHER.

F NEW WIRE AND CONDUITS SHALL NOT BE RUN EXPOSED UNLESS APPROVED BY THE OWNER, ARHCITECT OR THE ENGINEER.

G FEEDER CONDUITS ARE TO BE HELD HIGH AND TIGHT TO THE STRUCTURE ABOVE.

H RECEPTACLES FOR WATER COOLERS / VENDING MACHINES ARE TO BE GFCI PROTECTED. IF LOCATED BEHIND THE WATER COOLER / VENDING MACHINE, RECEPTACLES MUST BE PROTECTED BY A GFCI BREAKER.

I ALL RECEPTACLES IN PUBLIC ACCESSIBLE SPACES ARE TO BE OF THE TAMPER-RESISTANT DESIGN.

J COORDINATE EXACT LOCATION OF ALL WALL MOUNTED DEVICES IN AUDITORIUM PRIOR TO ROUGH-IN.

PLAN NOTES

1 J-BOX AND 120V BRANCH CIRCUIT FOR HAND DRYERS.

2 RECEPTACLES FOR TV WALL. COORDINATE EXACT MOUNTING HEIGHTS WITH AV BACKBOXES PRIOR TO ROUGH-IN.

3 RECEPTACLES MOUNTED TO CATWALK RAILING ABOVE. COORDINATE EXACT LOCATION WITH THEATRICAL LIGHTING SUPPLIER. MAINTAIN 6'-0" SPACING INDICATED.

4 DEDICATED 20 AMP CIRCUIT FOR RECEPTACLE AT LIGHTING CONTROL INTERFACE RACK. COORDINATE FINAL LOCATION WITH THEATER LIGHTING SUPPLIER.

5 COMBINATION STARTER FOR EF-1.

6 COMBINATION STARTER FOR EF-2.

7 120V BRANCH CIRCUIT FOR AHU LIGHTS AND RECEPTACLES. COORDINATE LOCATION WITH AHU SUPPLIER.

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

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BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	MAR

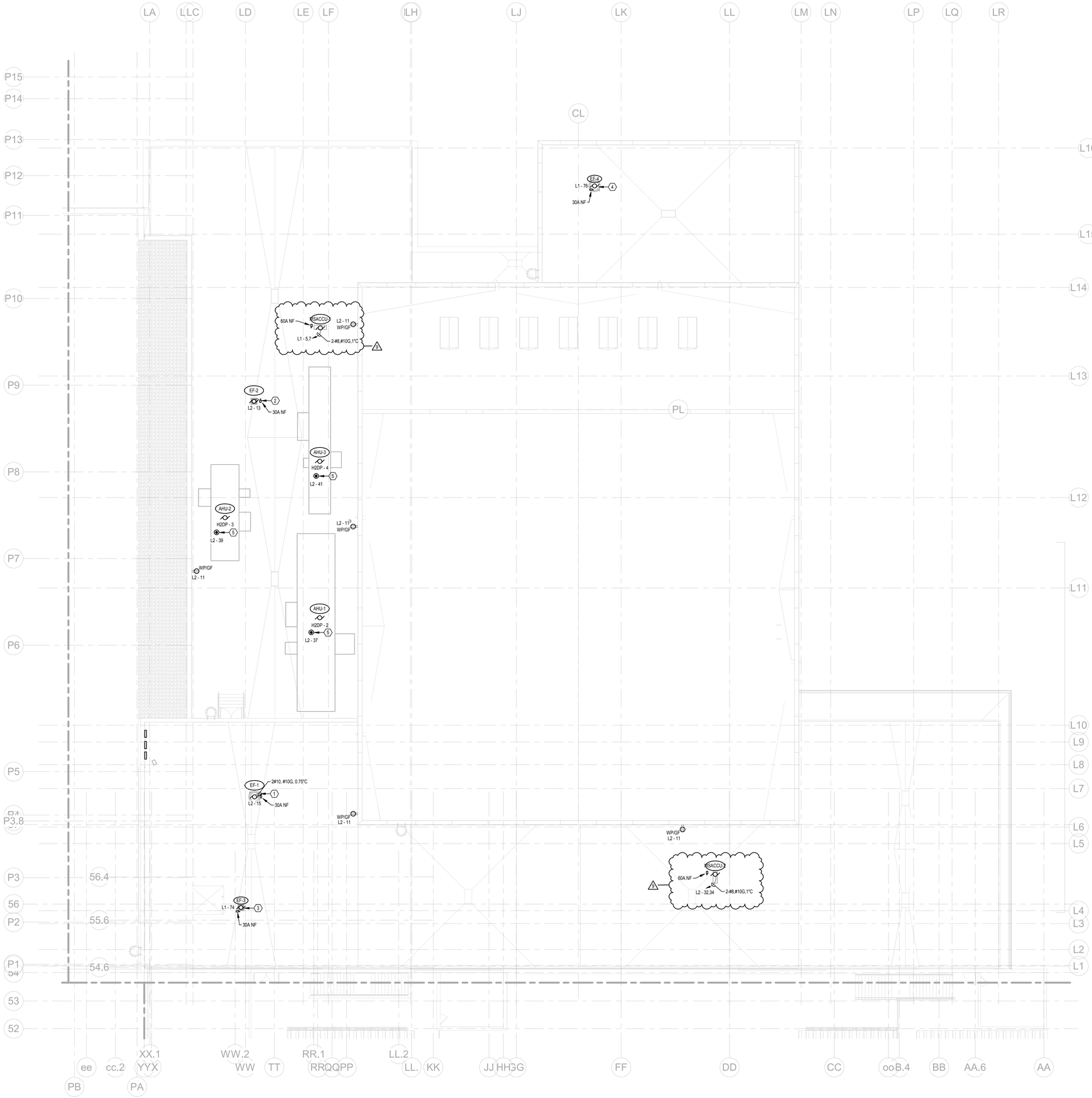
POWER PLAN - SECOND FLOOR - UNIT L

K L C B A E D G F J H

N TRUE NORTH

E302L

PLOT DATE/TIME:5/17/2022 9:41:20 AM



GENERAL NOTES

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G FEEDER CONDUITS ARE TO BE HELD HIGH AND TIGHT TO THE STRUCTURE ABOVE.

H RECEPTACLES FOR WATER COOLERS / VENDING MACHINES ARE TO BE GFCI PROTECTED. IF LOCATED BEHIND THE WATER COOLER / VENDING MACHINE, RECEPTACLES MUST BE PROTECTED BY A GFCI BREAKER.

I ALL RECEPTACLES IN PUBLIC ACCESSIBLE SPACES ARE TO BE OF THE TAMPER-RESISTANT DESIGN.

PLAN NOTES

1 COMBINATION STARTER LOCATED IN STORAGE L214.

2 COMBINATION STARTER LOCATED IN STORAGE L214.

3 COMBINATION STARTER LOCATED IN ELEVATOR EQUIPMENT ROOM.

4 COMBINATION STARTER LOCATED IN SCENE SHOP.

5 PROVIDE CONNECTION TO RECEPTACLE AND LIGHTS IN AIR HANDLING UNIT.

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

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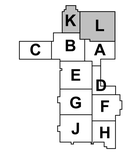
BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	MAR

POWER PLAN - ROOF - UNIT L



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TRUE NORTH

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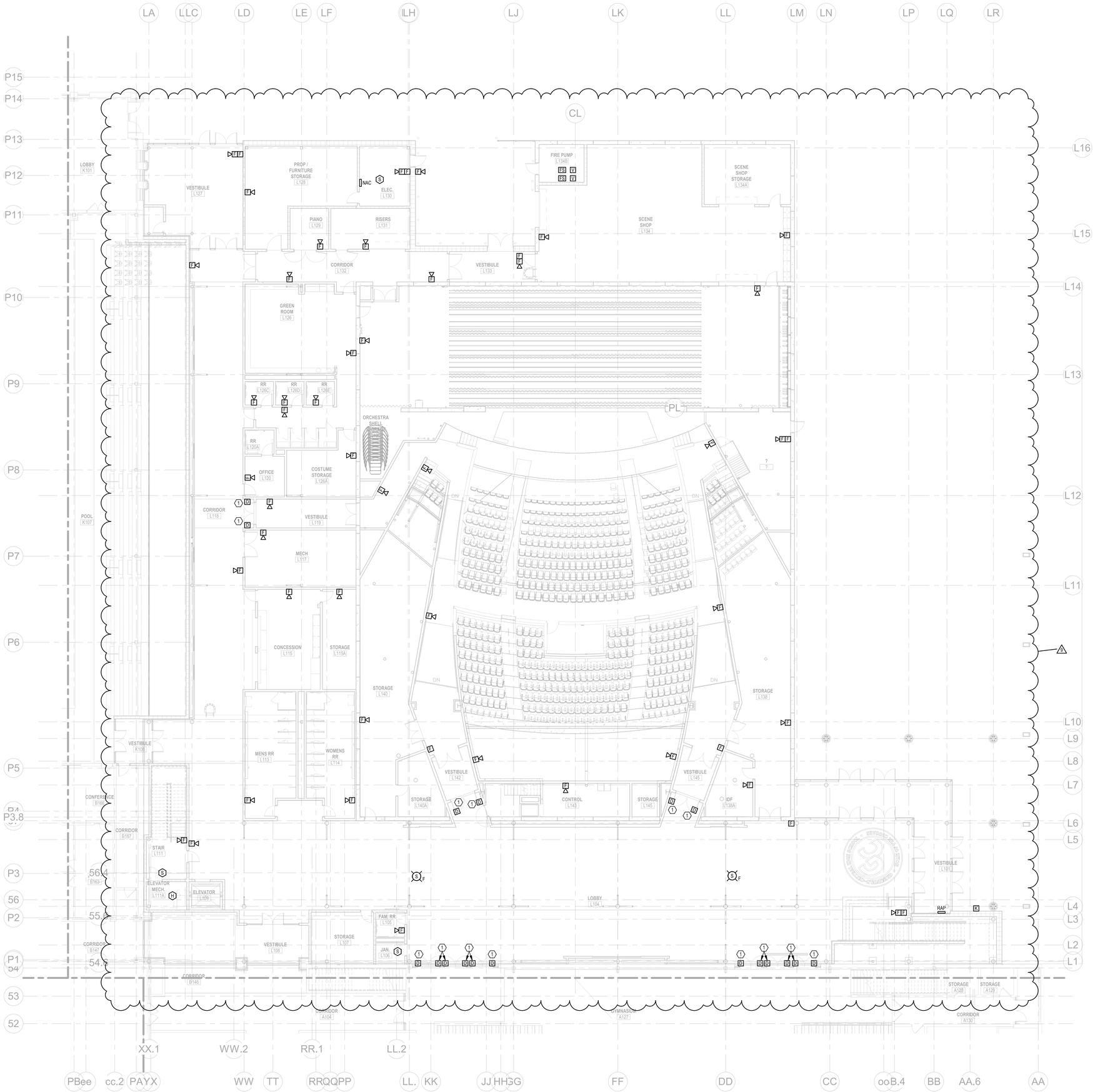
PLOT DATE/TIME:6/17/2022 3:14:25 PM



GENERAL NOTES

A COORDINATE ALL DEVICE LOCATIONS WITH ARCHITECTURAL CEILING PLANS AND ELEVATIONS PRIOR TO ROUGH-IN.

B ALL FIRE ALARM EQUIPMENT AND DEVICES TO BE INSTALLED PER NFPA 72 AND N.E.C. STANDARDS.

C MOUNT ALL SMOKE DETECTORS A MINIMUM OF 36" FROM ANY AIR DIFFUSER DEVICE.

D MOUNT ALL HMS NO MORE THAT 72" AFF, UNLESS LOCATED ABOVE ACCESSIBLE CEILINGS.

E ANY CABLE RUN OUTSIDE / UNDERGROUND, MUST BE RATED DIRECT BURIAL W/ SHIELD.

F LEAVE ALL CANDELA SETTINGS SET TO "FACP". CANDELAS WILL BE SET BY THE TECHNICIAN THRU SOFTWARE DURING COMMISSIONING.

G COORDINATE EXACT LOCATION OF ALL WALL MOUNTED DEVICES IN AUDITORIUM PRIOR TO ROUGH-IN.

PLAN NOTES

1 PROVIDE FIRE ALARM CONNECTION TO DOOR HOLD OPEN DEVICE.

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

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PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: MAR

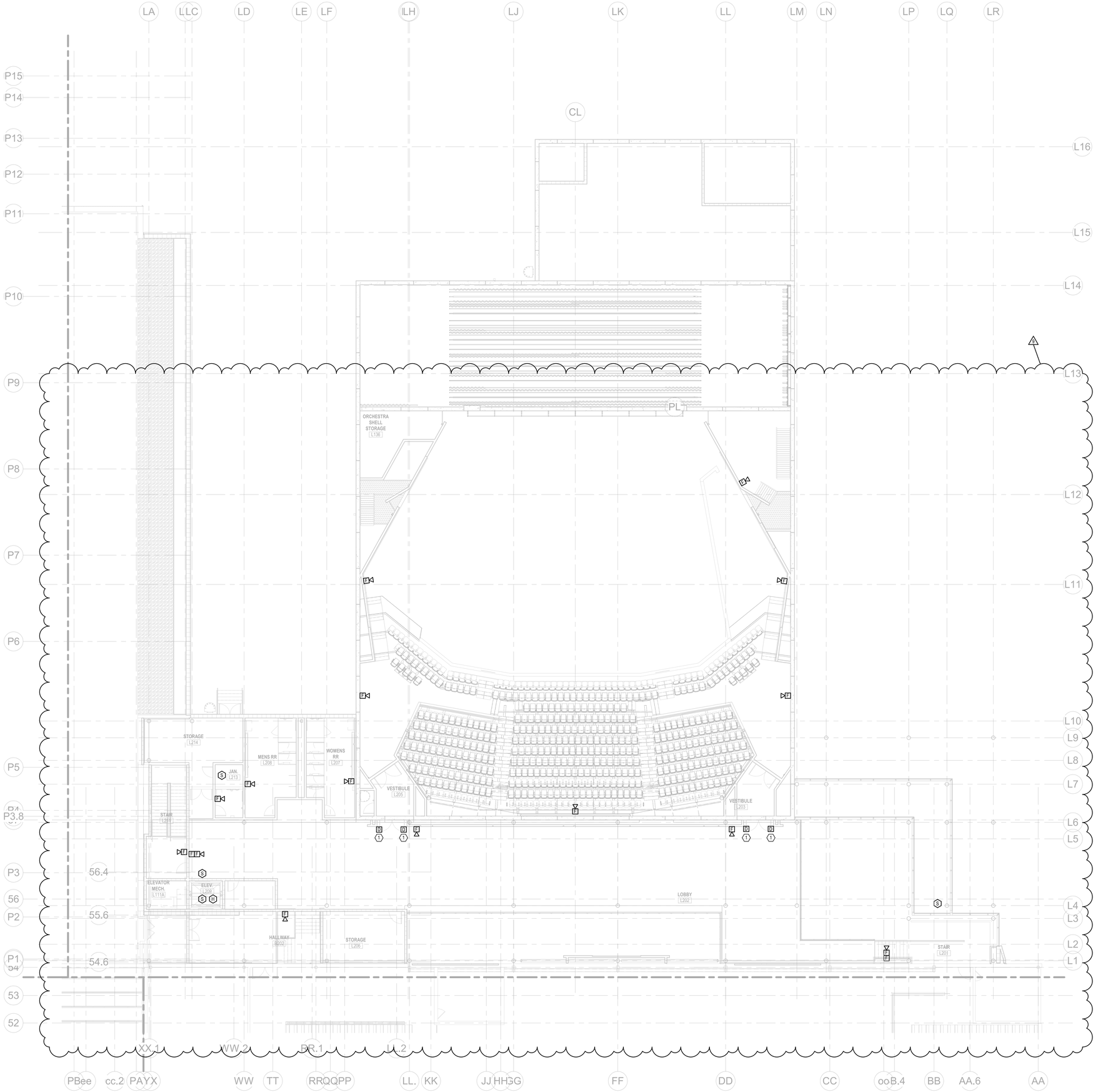
FIRE ALARM PLAN - FIRST FLOOR - UNIT L

K L
C B A
E D
G F
J H

N
TRUE NORTH

E401L

PLOT DATE/TIME:5/19/2022 5:39:15 PM



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

GENERAL NOTES

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D MOUNT ALL IAMS NO MORE THAT 72" AFF, UNLESS LOCATED ABOVE ACCESSIBLE CEILINGS.

E ANY CABLE RUN OUTSIDE / UNDERGROUND, MUST BE RATED DIRECT BURIAL W/ SHIELD.

F LEAVE ALL CANDELA SETTINGS SET TO "FACP". CANDELAS WILL BE SET BY THE TECHNICIAN THRU SOFTWARE DURING COMMISSIONING.

G COORDINATE EXACT LOCATION OF ALL WALL MOUNTED DEVICES IN AUDITORIUM PRIOR TO ROUGH-IN.

PLAN NOTES

1 PROVIDE FIRE ALARM CONNECTION TO DOOR HOLD OPEN DEVICE.

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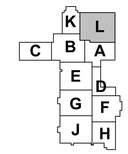
DRAWN BY:	MAR

FIRE ALARM PLAN - SECOND FLOOR - UNIT L



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TRUE NORTH

E402L

PLOT DATE/TIME:5/19/2022 5:39:19 PM

FLOOR BOX (FB) SCHEDULE

GENERAL NOTES:
A. REFER TO DRAWINGS FOR BOX DEPTH REQUIRED.
B. PROVIDE CARPET FLANGE WHERE REQURED.
C. COVER FINISH TO BE BRUSHED BRASS PLATED, UNLESS NOTED OTHERWISE.
D. PROVIDE 20A-125V DUPLEX RECEPTACLE FOR EACH POWER GANG, UNLESS NOTED OTHERWISE.
E. REFER TO DIVISION 27 FACEPLATE DETAILS.
F. REFER TO DRAWINGS FOR LOW VOLTAGE CONDUITS QUANTITY, SIZE, AND ROUTING.

NOTES:
1. RECTANGULAR COVER. VERIFY FINISH WITH ARCHITECT.
2.
3.
4.

	TYPE							QTY. OF GANGS					LOW VOLTAGE CONDUITS			
	BASIS OF DESIGN															
FLOOR BOX (FB) #	MANUFACTURER	MODEL	RECESSED CONCRETE	RECESSED WOOD	RAISED FLOOR	FIRE RATED	TYPE NOTE	POWER	VOICE/DATA	A/V	BLANK	DEVICE NOTE	VOICE/DATA	A/V	SPECIAL	CONDUIT NOTE
1	HUBBELL	SERIES "CFB"	●	-	-	-	1	2	0	0	2		-	-	-	
2	HUBBELL	SERIES "CFB"	●	-	-	-	1	1	1	1	1		●	●	-	

POKE-THRU (PT) SCHEDULE

GENERAL NOTES:
A. REFER TO DRAWINGS FOR BOX DEPTH REQUIRED.
B. PROVIDE CARPET FLANGE WHERE REQURED.
C. COVER FINISH TO BE BRUSHED BRASS PLATED, UNLESS NOTED OTHERWISE.
D. PROVIDE 20A-125V DUPLEX RECEPTACLE FOR EACH POWER GANG, UNLESS NOTED OTHERWISE.
E. REFER TO DIVISION 27 FACEPLATE DETAILS.
F. REFER TO DRAWINGS FOR LOW VOLTAGE CONDUITS QUANTITY, SIZE, AND ROUTING.
G. POKE-THRU SHALL BE UL FIRE RATED.

NOTES:
1. VERIFY COVER FINISH WITH ARCHITECT.
2.
3.
4.

	TYPE											ACTIVATION					LOW VOLTAGE CONDUITS			
	BASIS OF DESIGN																			
POKE-THRU (PT) #	MANUFACTURER	MODEL	3" CORE	4" CORE	6" CORE	8" CORE	10" CORE	FURN. FEED COVER	ACTIVE COVER	FLUSH COVER	TYPE NOTE	# OF GANGS	VOICE/DATA JACKS	A/V ACONNECTIVITY	BLANK	DEVICE NOTE	VOICE/DATA	A/V	SPECIAL	CONDUIT NOTE
1	HUBBELL	SYSTEM ONE	-	-	-	●	-	-	-	-	1	2	-	-	-		-	-	-	

MOTORS, STARTERS, DISCONNECTS & CONTROLS

NOTES:
1. INDOOR UNIT IS POWERED FROM OUTDOOR UNIT, PROVIDE LOCAL DISCONNECT AS REQUIRED.
2. DISCONNECT & VFD FURNISHED WITH EQUIPMENT.
3. VFD INSTALLED AND WIRED BY EC
4. COMBINATION STARTER W/ H-O-A SWITCH
5. BMS CONTROL IN AUTO.
6. TIMER SWITCH IN AUTO, INTEGRAL TO COMB. STARTER.
7. THERMOSTAT CONTROL IN AUTO.
8. DISCONNECT INTEGRAL TO VFD.
9. MOTOR STARTER / DISCONNECT TOGGLE SWITCH
10. CONTROLS FURNISHED WITH CEILING FAN, INSTALLED BY EC.

	MOTOR CHARACTERISTICS										STARTER												DISCONNECT MEANS												CONTROL			
												TYPE						LOCATION					TYPE							LOCATION								
MARK	HORSEPOWER (HP)	LOAD (kVA)	120V-1PH	208V-1PH	208V-3PH	240V-1PH	240V-3PH	277V-1PH	480V-1PH	480V-3PH	NEMA SIZE	MANUAL	MAGNETIC	BUILT-IN MOTOR O/L	2-SPEED	VFD	SEE NOTE	NEAR MOTOR	MOTOR CONT CENTER	EQUIP CONT PANEL	ROOM NUMBER	SEE NOTE	DISC SWITCH	MANUAL STARTER	RECEPTACLE	FEEDER SW OR BREAKER	NEMA TYPE	DISC SIZE	FUSE SIZE	NEAR MOTOR	MOTOR CONT CENTER	EQUIP CONT PANEL	PANELBOARD	SEE NOTE	INTERLOCK WITH MOTOR NO. BY E.C.	MANUAL AT STARTER	INTEGRAL WITH EQUIPMENT	SEE NOTE
AHU-1		53.21								●						●				●			●				3R					●			●			2,3
AHU-2		36.58								●						●				●			●				3R					●			●			2,3
AHU-3		15.96								●						●				●			●				3R					●			●			2,3
CD-1		0.72	●										●					●					●							●						●		9
CF		1.2	●										●					●					●							●						●		9, 10
CUH-1		0.08	●											●						●			●									●			●			
CUH-2		0.41	●											●						●			●									●			●			
CUH-3		0.7	●											●						●			●									●			●			
EF-1	1	1.92	●										●										●				3R	30A NF		●					●			4, 5
EF-2	1/6	0.53	●										●										●				3R	30A NF		●					●			4, 5
EF-3	3/4	1.68	●										●										●				3R	30A NF		●					●			4, 7
EF-4	1/15	0.12	●										●										●				3R	30A NF		●					●			4, 6
ELEV	40	43.23								●						●				●			●							●					●			
FIRE PUMP	20	22.45								●			●							●			●									●			●		●	
HWB-3		4.99								●			●					●					●									●			●			
JOCKEY PUMP	0.75	1.16								●			●							●			●									●			●		●	
MD-1		1.2	●										●					●					●							●						●		9
MS-1		0.21		●									●					●					●				1	30A NF		●								1
MS-2		0.21		●									●					●					●				1	30A NF		●								1
MSACCU-1		4.99		●									●							●			●				3R	30A NF		●								1
MSACCU-2		4.99		●									●							●			●				3R	30A NF		●								1
OHD-1		1.15	●										●							●			●							●						●		9
PHWP-3	5	6.65								●						●		●					●							●					●			5, 8
RP-1		0.15	●										●					●					●							●					●			9
SHWP-1	40	43.23								●						●		●					●							●					●			5, 8
SHWP-2	40	43.23								●						●		●					●							●					●			5, 8
UH-1		0.08	●											●						●			●									●			●			
UH-2		0.08	●											●						●			●									●			●			
UH-3		0.08	●											●						●			●									●			●			
UH-4		0.02	●											●						●			●									●			●			
UH-5		0.02	●											●						●			●									●			●			

9

LIGHTING CONTROL SEQUENCE OF OPERATIONS

NOTES:
1. OCCUPANCY SENSOR INTEGRAL WITH WALL SWITCH.
2. CEILING MOUNTED OCCUPANCY SENSOR.
3. FIXTURE ON 24/7. OCCUPIED MODE FULL OUT PUT. UNOCCUPIED MODE FIXTURE DIMS TO MIN OF 50%.
4. LIGHTING CIRCUITS ROUTED THROUGH RELAY PANEL.
5 LIGHTS TO BE CONTROLLED VIA CONTACTOR, PHOTOCELL, AND TIME CLOCK.

	OCCUPANCY SENSOR				TIME CLOCK					WALL SWITCH					DAYLIGHT SENSOR					
CONTROL NUMBER	VACANCY MODE (MANUAL ON)	OCCUPANCY MODE (AUTO ON)	SENSOR TIME OUT PERIOD (IN MINUTES)	HIGH / LOW OPERATION: OCCUPIED: 100% / VACANT: 30%	SCHEDULED ON AT	SCHEDULED OFF AT	OCCUPIED TIME START	UNOCCUPIED TIME START	AFTER HOURS OVERRIDE SWITCH (2 HOURS)	ON / OFF ONLY	DIMMER SWITCH	KEY SWITCH	SCENE SWITCH	GRAPHICAL WALL STATION	INDOOR - ON / OFF ONLY	INDOOR - DIMMING	LIGHT LEVEL MAINTAINED AT (IN FOOTCANDLES @ 2'-6" A.F.F.)	EXTERIOR PHOTOCELL - ON / OFF	SEE NOTE	DETAIL NUMBER
1										●										
2		●	15							●									1	
3		●	15							●									2	
4	●		30								●								1	
5	●		30							●									2	
6		●	15																3	
7					6:30	7:00			●							●	30		4	
8					6:30	7:00			●										4	
9					DUSK	COORDINATE W/ OWNER													5	10/E502

LUMINAIRES

NOTES:
1. PROVIDE BATTERY INVERTER FOR 90 MINUTES OF EGRESS LIGHTING.
2. COLOR AND FINISH SELECTED BY ARCHITECT.
3. LIGHT FIXTURES NEED TO BE COMPATIBLE WITH ARMSTRONG CEILING SYSTEM. REFER TO ARCHITECTURAL DRAWINGS.
4. EQUALS WILL BE CONSIDERED WHEN SUBMITTED WITH FOOTCANDLE CALCULATIONS FOR 40 FOOTCANDLES.

	LAMPS											TRIM COLOR						MOUNTING	SIZE				
	QUANTITY																						
MARK	L.E.D.	VA / LINEAR FOOT	DELIVERED LUMENS	COLOR	LOAD (VA)	FIXTURE VOLTAGE	MANUFACTURER	CATALOG NO.	DESCRIPTION	OTHER ACCEPTABLE MANUFACTURERS	DIFFUSING MEDIA	WHITE	BLACK	ALUMINUM	BRONZE	STANDARD	SEE NOTE	S-SURFACE R-RECESSED SM-STEM MTD WM-WALL MTD C-CHAIN MTD UC-UNDER CAB CS-CEIL SURFACE AC-AIRCRAFT CABLE	DIAMETER	WIDTH	LENGTH	DEPTH	SEE NOTE
A1	X		5000	3500K	49	277	COLUMBIA	SERIES "CFP"	2x4 LED EDGE LIT FLAT PANEL, 0-10V DIMMING	METALUX, LITHONIA, CREE	DIFFUSE ACRYLIC LENS	●				●		R		24"	48"	6"	1
A2	X		4200	3500K	40	277	COLUMBIA	SERIES "CFP"	2x2 LED EDGE LIT FLAT PANEL, 0-10V DIMMING	METALUX, LITHONIA, CREE	DIFFUSE ACRYLIC LENS	●				●		R		24"	24"	6"	1
B1	X		391/FT	3500K	14	277	FINELITE	SERIES "HP-4R	4" WIDE, 4' LONG, EXTRUDED ALUMINUM HOUSING	LUMENWERX, PRUDENTIAL, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	48"	6"	
B2	X		391/FT	3500K	29	277	FINELITE	SERIES "HP-4R	4" WIDE, 8' LONG, EXTRUDED ALUMINUM HOUSING	LUMENWERX, PRUDENTIAL, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	96"	6"	
B3	X		391/FT	3500K	43	277	FINELITE	SERIES "HP-4R	4" WIDE, 12' LONG, EXTRUDED ALUMINUM HOUSING	LUMENWERX, PRUDENTIAL, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	132"	6"	
B4	X		391/FT	3500K	352	277	FINELITE	SERIES "HP-4R	4" WIDE, 10'-11" LONG, EXTRUDED ALUMINUM HOUSING	LUMENWERX, PRUDENTIAL, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	130"	6"	
C1	X		5300	3500K	42	277	COLUMBIA	SERIES "LCL"	4' STRIP, ROUND LENS, 0-10V DIMMING	METALUX, LITHONIA, CREE	FROSTED PRISMATIC ACRYLIC LENS	●				●		C		4"	48"	5.5"	1
D1	X		600	3500K	8	277	PRESCOLITE	SERIES "LTR-6RD	6" DOWNLIGHT, 0-10V DIMMING, MEDIUM DISTRIBUTION	PORTFOLIO, GOTHAM, H.E. WILLIAMS	SILICONE LENS INTEGRAL TO LIGHT ENGINE					●		R	7"			8.75"	2
D2	X		1000	3500K	8	277	PRESCOLITE	SERIES "LTR-6RD	6" DOWNLIGHT, 0-10V DIMMING, EXTRA WIDE DISTRIBUTION	PORTFOLIO, GOTHAM, H.E. WILLIAMS	SILICONE LENS INTEGRAL TO LIGHT ENGINE					●		R	6"			8.75"	1, 2
D3	X		4000	RGBW	26	120	ZANIBONI	SERIES "LUNA6"	6" DIAMETER DOWNLIGHT, RGBW COLOR CHANGING, NARROW DISTRIBUTION, DMX DIMMING CONTROL, WET LABEL RATED	ALTMAN LIGHTING, GOTHAM, H.E. WILLIAMS	FROSTED ACRYLIC LENS					●		R	6"			8.75"	2
D5	X		1500	RGBW	32	120	ZANIBONI	SERIES "LUNA4"	4" DIAMETER DOWNLIGHT, RGBW COLOR CHANGING, DMX DIMMING CONTROL, MEDIUM DISTRIBUTION, WET LABEL RATED	ALTMAN LIGHTING, GOTHAM, H.E. WILLIAMS	FROSTED ACRYLIC LENS							R	7"			8.75"	2
H3	X		24000	4000K	185	277	HOLOPHANE	SERIES "PHS"	LED HIGH BAY WITH UPLIGHT, CAST ALUMINUM HOUSING	APROVED EQUAL	WIDE FROSTED GLASS	●				●		ST	12.75"			12"	4
L1	X	9	391/FT	3500K	270	277	FINELITE	SERIES "HP-4R	4" WIDE, 29'-6", WALL TO WALL, EXTRUDED ALUMINUM HOUSING, 0-10V DIMMING, SINGLE CIRCUIT	LUMENWERX, PRUDENTIAL, ARCHITECTURAL LIGHTING WORKS	FLUSH ACRYLIC LENS	●				●		R		4"		6"	
L2	X	9	391/FT	3500K	198	277	FINELITE	SERIES "HP-4R	4" WIDE, 22'-0", WALL TO WALL, EXTRUDED ALUMINUM HOUSING, 0-10V DIMMING, SINGLE CIRCUIT	LUMENWERX, PRUDENTIAL, ARCHITECTURAL LIGHTING WORKS	FLUSH ACRYLIC LENS	●				●		R		4"	264"	6"	
L3	X		391/FT	3500K	180	277	FINELITE	SERIES "HP-4R	4" WIDE, LINEAR RECESSED FIXTURE. 9' VERTICAL SECTION UP WALL, 9'-8" HORIZONTAL SECTION IN LAY-IN CEILING. EXTRUDED ALUMINUM HOUSING WITH 45 DEGREE MITERED CORNERS IN WALL TO CREATE SEAMLESS CONTINUATION FROM CEILING TO WALL. COORDINATE EXACT LENGTH OF FIXTURE PRIOR TO ORDERING.	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		R		4"	116"	6"	
L4	X		391/FT	3500K	126	277	FINELITE	SERIES "HP-4R	4" WIDE, LINEAR RECESSED FIXTURE. 9' VERTICAL SECTION UP WALL, 3'-8" HORIZONTAL SECTION IN LAY-IN CEILING. EXTRUDED ALUMINUM HOUSING WITH 45 DEGREE MITERED CORNERS IN WALL TO CREATE SEAMLESS CONTINUATION FROM CEILING TO WALL. COORDINATE EXACT LENGTH OF	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		R		4"	44"	6"	
L5	X		391/FT	3500K	624	277	FINELITE	SERIES "HP-4R	4" WIDE, 156' LONG, EXTRUDED ALUMINUM HOUSING	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	1872"	6"	
L6	X		391/FT	3500K	592	277	FINELITE	SERIES "HP-4R	4" WIDE, 148' LONG, EXTRUDED ALUMINUM HOUSING	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	1776"	6"	
L7	X		391/FT	3500K	408	277	FINELITE	SERIES "HP-4R	4" WIDE,102' LONG, EXTRUDED ALUMINUM HOUSING	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	1234"	6"	
L8	X		391/FT	3500K	624	277	FINELITE	SERIES "HP-4R	4" WIDE, 155'-6" LONG, EXTRUDED ALUMINUM HOUSING	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	1866"	6"	
L9	X		391/FT	3500K	544	277	FINELITE	SERIES "HP-4R	4" WIDE, 136'-3" LONG, EXTRUDED ALUMINUM HOUSING	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	1515"	6"	
L10	X		391/FT	3500K	128	277	FINELITE	SERIES "HP-4R	4" WIDE, 32' LONG, EXTRUDED ALUMINUM HOUSING	FOCAL POINT, PINNACLE, ARCHITECTURAL LIGHTING WORKS	DIFFUSE ACRYLIC LENS	●				●		R		4"	384"	6"	
M1	X		D=400L/FT, ID=250L/FT	3500K	53	277	AXIS LIGHTING	SERIES "STFDI"	SUSPENDED DIRECT/INDIRECT LINEAR FIXTURES WITH CAST CONNECTORS TO CREATE AN EQUILATERAL TRIANGLE SHAPE WITH 10'-0" SIDES, SINGLE CIRCUIT, 0-10V DIMMING	APPROVED EQUAL, LUMENWERX, FLUXWERX, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		AC					2
M2	X		D=400L/FT, ID=250L/FT	3500K	45	277	AXIS LIGHTING	SERIES "STFDI"	SUSPENDED DIRECT/INDIRECT LINEAR FIXTURES WITH CAST CONNECTORS TO CREATE AN EQUILATERAL TRIANGLE SHAPE WITH 14'-0" SIDES, SINGLE CIRCUIT, 0-10V DIMMING	APPROVED EQUAL, LUMENWERX, FLUXWERX, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		AC					2
M3	X		D=400L/FT, ID=250L/FT	3500K	45	277	AXIS LIGHTING	SERIES "STFDI"	SUSPENDED DIRECT/INDIRECT LINEAR FIXTURES WITH CAST CONNECTORS TO CREATE AN EQUILATERAL TRIANGLE SHAPE WITH 12'-0" SIDES, SINGLE CIRCUIT, 0-10V DIMMING	APPROVED EQUAL, LUMENWERX, FLUXWERX, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		AC					2
M4	X		D=400L/FT, ID=250L/FT	3500K	27	277	AXIS LIGHTING	SERIES "STFDI"	SUSPENDED DIRECT/INDIRECT LINEAR FIXTURES WITH CAST CONNECTORS TO CREATE AN EQUILATERAL TRIANGLE SHAPE WITH 10'-0" SIDES, SINGLE CIRCUIT, 0-10V DIMMING	APPROVED EQUAL, LUMENWERX, FLUXWERX, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		AC					2
M5	X		D=400L/FT, ID=250L/FT	3500K	45	277	AXIS LIGHTING	SERIES "STFDI"	SUSPENDED DIRECT/INDIRECT LINEAR FIXTURES WITH CAST CONNECTORS TO CREATE AN EQUILATERAL TRIANGLE SHAPE WITH 12'-0" SIDES, SINGLE CIRCUIT, 0-10V DIMMING	APPROVED EQUAL, LUMENWERX, FLUXWERX, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		AC					2
M6	X		D=400L/FT, ID=250L/FT	3500K	53	277	AXIS LIGHTING	SERIES "STFDI"	SUSPENDED DIRECT/INDIRECT LINEAR FIXTURES WITH CAST CONNECTORS TO CREATE AN EQUILATERAL TRIANGLE SHAPE WITH 14'-0" SIDES, SINGLE CIRCUIT, 0-10V DIMMING	APPROVED EQUAL, LUMENWERX, FLUXWERX, ARCHITECTURAL LIGHTING WORKS	FLUSH FROSTED ACRYLIC LENS					●		AC					2
P1	X		5000	3500K	48	277	PRESCOLITE	SERIES "LTC-6RDW"	6" ALUMINUM CYLINDER DOWNLIGHT, NARROW DISTRIBUTION, 0-10V DIMMING	PORTFOLIO, GOTHAM, H.E. WILLIAMS	SILICONE LENS INTEGRAL TO LIGHT ENGINE					●		ST	6"			18"	1, 2
S1	X			RGBW	64	120	INSIGHT	SERIES "PEX"	COLOR CHANGING SIGN LIGHT, EXTRUDED ALUMINUM HOUSING, TEMPERED GLASS LENS, DMX DIMMING/CONTROL, 30/60 DISTRIBUTION	SOLID STATE LIGHTING, LUMEN PULSE, ACCLAIM	TEMPERED GLASS							S		2"	552"	2"	
SL1	X		EXISTING	EXISTING	70	277	EXISTING	EXISTING	EXISTING POLE AND 4 EXISTING FIXTURES REINSTALLED	NA	EXISTING									12"	17.125"	6"	
V1	X		1360	3500K	16	277	SCOTT ARCHITECTURAL LIGHTING	SERIES "S3950-L16"	2' WALL MOUNTED VANITY LIGHT	VISA LIGHTING, CAMMAN, LEGION	OPAL MATTE ACRYLIC							WM		6"	24"	3"	2
V2	X		350/LAMP	2700K	84	120	ALUZ	SERIES "A6-ZEMY-STN-RG"	23' LONG, ALUMINUM EXTRUSSION,DRESSING ROOM LIGHT, LED LAMPS, 1-0" SPACING, ROUND WIRE CAGE	CELESTIAL, TIVOLI, COLE LIGHTING	FROSTED LAMP					●		WM		6"	298"	3"	2
V3	X		350/LAMP	2700K	60	120	ALUZ	SERIES "A6-ZEMY-STN-RG"	16'-6" LONG, ALUMINUM EXTRUSSION,DRESSING ROOM LIGHT, LED LAMPS, 1'-0" SPACING, ROUND WIRE CAGE	CELESTIAL, TIVOLI, COLE LIGHTING	FROSTED LAMP					●		WM		6"	179"	3"	2
W1	X		3000	3500K	28	277	HUBBELL	SERIES "TRP1"	TRAPEZOIDAL WALL PACK	LITHONIA, MCGRAW EDISON, CGF DESIGN						●		WM		12"	17.125"	6"	1, 2
W2	X		5800	3500K	50	277	COLUMBIA	SERIES "ESL"	4' LONG, WALL MOUNTED, STEEL HOUSING, WIDE DISTRIBUTION, INTEGRAL OCCUPANCY SENSOR, 0-10V DIMMING. FIXTURE TO DIM TO MINIMUM OF 50% IN UNOCCUPIED MODE.	METALUX, LITHONIA, H.E. WILLIAMS	FROSTED ACRYLIC	●				●		WM		6"	48"	6"	1
W3	X		2722 UP / 2722 DOWN	3500K	52	277	LIGMAN LIGHTING	SERIES "UMV-30051"	6" DIAMETER, WALL MOUNTED CYLINDER, UP/DOWN LIGHTING, WIDE BEAM DISTRIBUTION (40 DEGREE BEAM), WET LOCATION RATED	FC LIGHTING, LUMINIS, ARCHITECTURAL LIGHTING WORKS						●		WM	6"			10"	2
X1	X			GREEN	3	277	DUAL-LITE	SERIES "LE"	CEILING MOUNTED, SINGLE SIDED, EDGE LIT, EXIT SIGN, INJECTION MOLDED ACRYLIC FACE, EXTRUDED ALUMINUM CONSTRUCTION, SELF DIAGNOSTICS	EVENLITE, LITHONIA, MULE LIGHTING	CLEAR ACRYLIC W/ RED LETTERS			●		●		C		9"	13"	2.375"	1, 2
X2	X			GREEN	3	277	DUAL-LITE	SERIES "LE"	CEILING MOUNTED, DOUBLE SIDED, EDGE LIT, EXIT SIGN, INJECTION MOLDED ACRYLIC FACE, EXTRUDED ALUMINUM CONSTRUCTION, SELF DIAGNOSTICS	EVENLITE, LITHONIA, MULE LIGHTING	CLEAR ACRYLIC W/ RED LETTERS			●		●		C		9"	13"	2.375"	1, 2
X3	X			GREEN	3	277	DUAL-LITE	SERIES "LE"	WALL MOUNTED, SINGLE SIDED, EDGE LIT, EXIT SIGN, INJECTION MOLDED ACRYLIC FACE, EXTRUDED ALUMINUM CONSTRUCTION, SELF DIAGNOSTICS	EVENLITE, LITHONIA, MULE LIGHTING	CLEAR ACRYLIC W/ RED LETTERS			●		●		W		9"	13"	2.375"	1, 2
X4	X			GREEN	3	277	DUAL-LITE	SERIES "LE"	WALL MOUNTED, SINGLE SIDED, EDGE LIT, EXIT SIGN, INJECTION MOLDED ACRYLIC FACE, EXTRUDED ALUMINUM CONSTRUCTION, SELF DIAGNOSTICS	EVENLITE, LITHONIA, MULE LIGHTING	CLEAR ACRYLIC W/ RED LETTERS			●		●		W		9"	13"	2.375"	1, 2

9

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

HEAPY
P: 317-571-8795 www.heapy.com
PROJECT NO. 2021-07128

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

KEITH A SCHEID
REGISTERED
No. PE60910071
STATE OF INDIANA
PROFESSIONAL ENGINEER
5-20-22

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: MAR

ELECTRICAL SCHEDULES

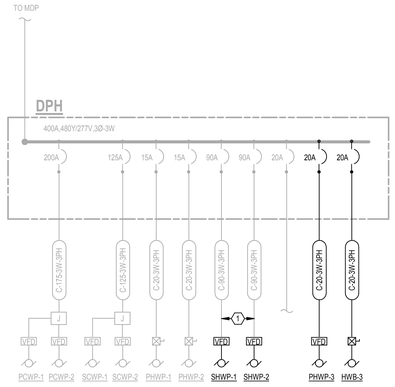
E501

FEEDER WIRE SIZES

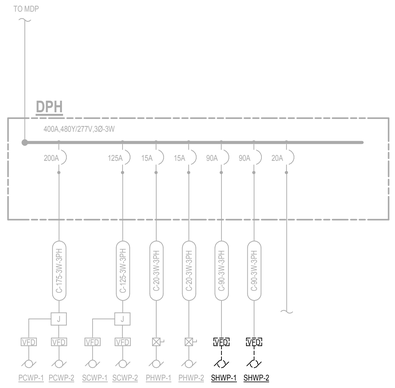
FEEDER TAG	# OF SETS	# OF CONDUCTORS	CONDUCTOR SIZE	GROUND SIZE	CONDUIT SIZE
A 200 4W 3PH	1	4	250	4	2.5"
A 400 4W 3PH	2	4	250	1	3"
A 800 3W 3PH	3	3	400	1/0	3"
A 1200 4W 3PH SE	4	4	500	-	3.5"
C 20 3W 3PH	1	3	12	12	0.75"
C 30 3W 3PH	1	3	10	10	0.75"
C 30 4W 3PH	1	4	10	10	0.75"
C 50 3W 3PH	1	3	6	10	1"
C 50 4W 3PH	1	4	6	10	1"
C 60 3W 3PH	1	3	4	10	1.25"
C 60 4W 3PH	1	4	4	10	1.25"
C 90 3W 3PH	1	3	3	8	1.5"
C 100 4W 3PH	1	4	2	8	1.5"
C 110 3W 3PH	1	3	1	6	1.5"
C 125 3W 3PH	1	3	1	6	1.5"
C 175 3W 3PH	1	3	2/0	6	2"
C 1600 4W 3PH	4	4	600	4/0	4"

PLAN NOTES

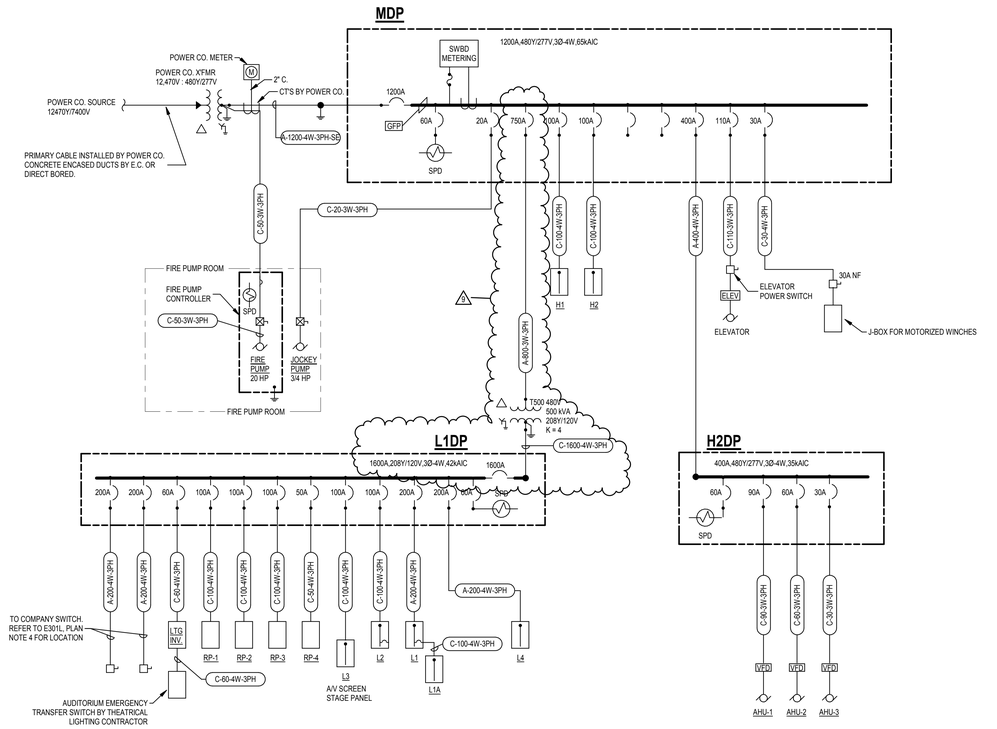
1 CONTRACTOR TO VERIFY EXISTING MOTOR CIRCUITS. IF SIZED PROPERLY PER FEEDER SCHEDULE, CONTRACTOR MAY REUSE EXISTING MOTOR CIRCUITS, OTHERWISE REPLACE WITH NEW CONDUIT AND/OR CONDUCTORS AS REQUIRED.



3 **PARTIAL SINGLE-LINE DIAGRAM - NEW WORK**



2 **PARTIAL SINGLE-LINE DIAGRAM - DEMO**



1 **ELECTRICAL SINGLE-LINE - NEW WORK**

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

KEITH A SOLID REGISTERED No. PE8091 0071 STATE OF INDIANA PROFESSIONAL ENGINEER
5-20-22

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: KAS

ELECTRICAL SINGLE-LINE DIAGRAM

E601

PLOT DATE/TIME:6/17/2022 9:01:34 AM

Panel: L4

Location: ELEC. L130 **Supply From:** L1DP **Voltage:** 120/208 Wye-3PH-4W
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 22kAIC **Mains Type:** MLO **Mains Rating:** 225 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	HAND DRYER	20 A	1	1200...	1200...					1	20 A	MOTORIZED DOOR	2
3	HAND DRYER	20 A	1			1200...	1200...			1	20 A	MOTORIZED DOOR	4
5	HAND DRYER	20 A	1					1200...	1200...	1	20 A	MOTORIZED DOOR	6
7	HAND DRYER	20 A	1	1200...	1200...					1	20 A	MOTORIZED DOOR	8
9	HAND DRYER	20 A	1			1200...	540 VA			1	20 A	PLUG STRIP	10
11	HAND DRYER	20 A	1					1200...	540 VA	1	20 A	PLUG STRIP	12
13	HAND DRYER	20 A	1	1200...	540 VA					1	20 A	PLUG STRIP	14
15	HAND DRYER	20 A	1			1200...	540 VA			1	20 A	PLUG STRIP	16
17	HAND DRYER	20 A	1					1200...	540 VA	1	20 A	PLUG STRIP	18
19	CUH-2	20 A	1	408 VA	540 VA					1	20 A	PLUG STRIP	20
21	CUH-1	20 A	1			84 VA	540 VA			1	20 A	PLUG STRIP	22
23	UH-1	20 A	1					84 VA	540 VA	1	20 A	PLUG STRIP	24
25	CUH-3	20 A	1	712 VA	540 VA					1	20 A	PLUG STRIP	26
27	UH-2	20 A	1			84 VA	540 VA			1	20 A	PLUG STRIP	28
29	UH-3	20 A	1					84 VA	540 VA	1	20 A	PLUG STRIP	30
31	PUMP P-3	20 A	1	150 VA	540 VA					1	20 A	PLUG STRIP	32
33	WATER HEATER	20 A	1			1650...	540 VA			1	20 A	PLUG STRIP	34
35	TCP	20 A	1					1000...	540 VA	1	20 A	PLUG STRIP	36
37	SPARE	20 A	1	0 VA	540 VA					1	20 A	PLUG STRIP	38
39	SPARE	20 A	1			0 VA	540 VA			1	20 A	PLUG STRIP	40
41	SPARE	20 A	1					0 VA	540 VA	1	20 A	PLUG STRIP	42
43	SPARE	20 A	1	0 VA	540 VA					1	20 A	PLUG STRIP	44
45	SPARE	20 A	1			0 VA	228 VA			1	20 A	LIGHTING	46
47	SPARE	20 A	1					0 VA	--	1	--	SPACE	48
49	SPARE	20 A	1	0 VA	--					1	--	SPACE	50
51	SPARE	20 A	1			0 VA	--			1	--	SPACE	52
53	SPARE	20 A	1					0 VA	--	1	--	SPACE	54
55	SPARE	20 A	1	0 VA	--					1	--	SPACE	56
57	SPARE	20 A	1			0 VA	--			1	--	SPACE	58
59	SPARE	20 A	1					0 VA	--	1	--	SPACE	60
61	SPARE	20 A	1	0 VA	--					1	--	SPACE	62
63	SPARE	20 A	1			0 VA	--			1	--	SPACE	64
65	SPARE	20 A	1					0 VA	--	1	--	SPACE	66
67	SPARE	20 A	1	0 VA	--					1	--	SPACE	68
69	SPARE	20 A	1			0 VA	--			1	--	SPACE	70
71	SPARE	20 A	1					0 VA	--	1	--	SPACE	72
73	SPARE	20 A	1	0 VA	--					1	--	SPACE	74
75	SPARE	20 A	1			0 VA	--			1	--	SPACE	76
77	SPARE	20 A	1					0 VA	--	1	--	SPACE	78
79	SPARE	20 A	1	0 VA	--					1	--	SPACE	80
81	SPARE	20 A	1			0 VA	--			1	--	SPACE	82
83	SPARE	20 A	1					0 VA	--	1	--	SPACE	84
			Total Load:	10.51 kVA		10.09 kVA		9.21 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Lighting	228 VA	125.00%	285 VA		
Motor	6406 VA	104.68%	6706 VA	Total Conn. Load:	29804 VA
Other	1000 VA	100.00%	1000 VA	Total Est. Demand:	24076 VA
Receptacle	22170 VA	72.55%	16085 VA	Total Conn.:	83 A
				Total Est. Demand:	67 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
29.8 kVA		24.08 kVA (67 A)

9

Panel: L3

Location: STAGE L137 **Supply From:** L1DP **Voltage:** 120/208 Wye-3PH-4W
Mounting: SURFACE **Enclosure:** Type 1
A.I.C. Rating: 22kAIC **Mains Type:** MLO **Mains Rating:** 225 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	STAGE TV WALL	20 A	2	1400...	1400...					2	20 A	STAGE TV WALL	2
3	--	--	--			1400...	1400...			--	--	--	4
5	STAGE TV WALL	20 A	2					1400...	1400...	2	20 A	STAGE TV WALL	6
7	--	--	--	1400...	1400...					--	--	--	8
9	STAGE TV WALL	20 A	2			1400...	1400...			2	20 A	STAGE TV WALL	10
11	--	--	--					1400...	1400...	--	--	--	12
13	STAGE TV WALL	20 A	2	1400...	1400...					2	20 A	STAGE TV WALL	14
15	--	--	--			1400...	1400...			--	--	--	16
17	STAGE TV WALL	20 A	2					1400...	1400...	2	20 A	STAGE TV WALL	18
19	--	--	--	1400...	1400...					--	--	--	20
21	SPACE	--	1			--	--			1	--	SPACE	22
23	SPACE	--	1					--	--	1	--	SPACE	24
25	SPACE	--	1	--	--					1	--	SPACE	26
27	SPACE	--	1			--	--			1	--	SPACE	28
29	SPACE	--	1					--	--	1	--	SPACE	30
31	SPACE	--	1	--	--					1	--	SPACE	32
33	SPACE	--	1			--	--			1	--	SPACE	34
35	SPACE	--	1					--	--	1	--	SPACE	36
37	SPACE	--	1	--	--					1	--	SPACE	38
39	SPACE	--	1			--	--			1	--	SPACE	40
41	SPACE	--	1					--	--	1	--	SPACE	42
			Total Load:	11.20 kVA		8.40 kVA		8.40 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Receptacle	28000 VA	67.86%	19000 VA		
				Total Conn. Load:	28000 VA
				Total Est. Demand:	19000 VA
				Total Conn.:	78 A
				Total Est. Demand:	53 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
28 kVA		19 kVA (53 A)

PLOT DATE/TIME:6/17/2022 9:01:37 AM

Panel: L1A

Location: STORAGE L115A **Supply From:** L1 **Voltage:** 120/208 Wye-3PH-4W
Mounting: Surface **Enclosure:** Type 1
A.I.C. Rating: 22kAIC **Mains Type:** MLO **Mains Rating:** 100 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	RECEPTACLES	20 A	1	360 VA	360 VA					1	20 A	RECEPTACLES	2
3	RECEPTACLE	20 A	1			360 VA	360 VA			1	20 A	RECEPTACLE	4
5	RECEPTACLE	20 A	1					360 VA	1440...	1	20 A	COILING DOOR	6
7	RECEPTACLES	20 A	1	1000...	180 VA					1	20 A	RECEPTACLE	8
9	RECEPTACLE	20 A	1			180 VA	180 VA			1	20 A	RECEPTACLE	10
11	RECEPTACLE	20 A	1					180 VA	180 VA	1	20 A	RECEPTACLE	12
13	RECEPTACLE	20 A	1	180 VA	0 VA					1	20 A	SPARE	14
15	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	16
17	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	18
19	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	20
21	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	22
23	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	24
25	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	26
27	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	28
29	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	30
			Total Load:	2.08 kVA		1.08 kVA		2.16 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Motor	1440 VA	112.50%	1620 VA		
Receptacle	3880 VA	100.00%	3880 VA	Total Conn. Load:	5320 VA
				Total Est. Demand:	5500 VA
				Total Conn.:	15 A
				Total Est. Demand:	15 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
5.32 kVA		5.5 kVA (15 A)

Panel: L1

Location: ELEC. L130 **Supply From:** L1DP **Voltage:** 120/208 Wye-3PH-4W
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 22kAIC **Mains Type:** MLO **Mains Rating:** 225 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	RECEPTACLES	20 A	1	540 VA	360 VA					1	20 A	RECEPTACLE	2
3	RECEPTACLE	20 A	1			360 VA	1000...			1	20 A	NAC PANEL	4
5	MS-1	35 A	2					2600...	900 VA	1	20 A	RECEPTACLES	6
7	--	--	--	2600...	4160...					2	50 A	RECEPTACLE	8
9	RECEPTACLES	20 A	1			1260...	4160...			--	--	--	10
11	RECEPTACLES	20 A	1					1260...	1220...	1	20 A	RECEPTACLES	12
13	OVERHEAD DOOR	20 A	1	1152...	900 VA					1	20 A	RECEPTACLES	14
15	OVERHEAD DOOR	20 A	1			1152...	360 VA			1	20 A	CORD REEL	16
17	OVERHEAD DOOR	20 A	1					1152...	360 VA	1	20 A	CORD REEL	18
19	RECEPTACLE	20 A	1	180 VA	360 VA					1	20 A	CORD REEL	20
21	SPARE	20 A	1			0 VA	360 VA			1	20 A	CORD REEL	22
23	RECEPTACLES	20 A	1					860 VA	360 VA	1	20 A	CORD REEL	24
25	RECEPTACLES	20 A	1	540 VA	360 VA					1	20 A	CORD REEL	26
27	RECEPTACLES	20 A	1			360 VA	360 VA			1	20 A	CORD REEL	28
29	RECEPTACLES	20 A	1					360 VA	2882...	3	30 A	RECEPTACLE	30
31	RECEPTACLES	20 A	1	680 VA	2882...					--	--	--	32
33	RECEPTACLES	20 A	1			360 VA	2882...			--	--	--	34
35	RECEPTACLES	20 A	1					360 VA	1260...	1	20 A	RECEPTACLES	36
37	RECEPTACLES	20 A	1	180 VA	1400...					1	20 A	RECEPTACLES	38
39	RECEPTACLES	20 A	1			360 VA	500 VA			1	20 A	RECEPTACLES	40
41	RECEPTACLES	20 A	1					360 VA	1580...	1	20 A	RECEPTACLES	42
43	RECEPTACLES	20 A	1	360 VA	900 VA					1	20 A	RECEPTACLES	44
45	RECEPTACLES	20 A	1			1080...	500 VA			1	20 A	WATER COOLER	46
47	RECEPTACLES	20 A	1					900 VA	900 VA	1	20 A	FLOOR BOXES	48
49	RECEPTACLES	20 A	1	540 VA	900 VA					1	20 A	FLOOR BOXES	50
51	RECEPTACLES	20 A	1			360 VA	360 VA			1	20 A	RECEPTACLE	52
53	AV RACK	20 A	1					360 VA	360 VA	1	20 A	RECEPTACLE	54
55	RECEPTACLES	20 A	1	720 VA	360 VA					1	20 A	RECEPTACLE	56
57	RECEPTACLES	20 A	1			1440...	360 VA			1	20 A	RECEPTACLE	58
59	RECEPTACLES	20 A	1					900 VA	360 VA	1	20 A	RECEPTACLE	60
61	RECEPTACLES	20 A	1	180 VA	360 VA					1	20 A	RECEPTACLE	62
63	RECEPTACLES	20 A	1			1000...	900 VA			1	20 A	RECEPTACLES	64
65	RECEPTACLES	20 A	1					900 VA	720 VA	1	20 A	RECEPTACLES	66
67	RECEPTACLES	20 A	1	900 VA	1500...					1	20 A	RECEPTACLES	68
69	RECEPTACLE	20 A	1			180 VA	1500...			1	20 A	RECEPTACLES	70
71	RECEPTACLE	20 A	1					360 VA	1500...	1	20 A	RECEPTACLES	72
73	ELEV CAB LIGHTS	20 A	1	180 VA	1680...					1	20 A	EF-3	74
75	RECEPTACLES	20 A	1			2000...	120 VA			1	20 A	EF-4	76
77	RECEPTACLES	20 A	1					1500...	0 VA	1	20 A	SPARE	78
79	RECEPTACLES	20 A	1	2000...	2080...					3	100 A	L1A	80
81	SPARE	20 A	1			0 VA	1080...			--	--	--	82
83	SPARE	20 A	1					0 VA	2160...	--	--	--	84
			Total Load:	28.95 kVA		24.35 kVA		26.43 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Motor	11896 VA	110.49%	13144 VA		
Other	1000 VA	100.00%	1000 VA	Total Conn. Load:	79742 VA
Receptacle	66846 VA	57.48%	38423 VA	Total Est. Demand:	52567 VA
				Total Conn.:	221 A
				Total Est. Demand:	146 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
79.74 kVA		52.57 kVA (146 A)

Panel: L2

Location: STORAGE L214 **Supply From:** L1DP **Voltage:** 120/208 Wye-3PH-4W
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 22kAIC **Mains Type:** MLO **Mains Rating:** 225 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	RECEPTACLES	20 A	1	720 VA	860 VA					1	20 A	RECEPTACLE	2
3	HAND DRYER	20 A	1			1200...	1200...			1	20 A	HAND DRYER	4
5	HAND DRYER	20 A	1					1200...	1200...	1	20 A	HAND DRYER	6
7	RECEPTACLES	20 A	1	720 VA	720 VA					1	20 A	RECEPTACLES	8
9	RECEPTACLES	20 A	1			900 VA	900 VA			1	20 A	RECEPTACLES	10
11	RECEPTACLES	20 A	1					900 VA	1500...	1	20 A	RECEPTACLES	12
13	EF-2	20 A	1	528 VA	1500...					1	20 A	RECEPTACLES	14
15	EF-1	30 A	1			1920...	1500...			1	20 A	RECEPTACLES	16
17	RECEPTACLES	20 A	1					1000...	360 VA	1	20 A	RECEPTACLE	18
19	RECEPTACLES	20 A	1	720 VA	180 VA					1	20 A	RECEPTACLE	20
21	CEILING FAN	20 A	1			1200...	180 VA			1	20 A	RECEPTACLE	22
23	CEILING FAN	20 A	1					1200...	180 VA	1	20 A	RECEPTACLE	24
25	CEILING FAN	20 A	1	1200...	180 VA					1	20 A	RECEPTACLE	26
27	CEILING FAN	20 A	1			1200...	180 VA			1	20 A	RECEPTACLE	28
29	CEILING FAN	20 A	1					1200...	180 VA	1	20 A	RECEPTACLE	30
31	CEILING FAN	20 A	1	1200...	2600...					2	35 A	MS-2 & MSACCU-2	32
33	RECEPTACLES	20 A	1			180 VA	2600...			--	--	--	34
35	RECEPTACLES	20 A	1					180 VA	360 VA	1	20 A	RECEPTACLE	36
37	AHU-1 POWER	20 A	1	0 VA	360 VA					1	20 A	RECEPTACLE	38
39	AHU-2 POWER	20 A	1			0 VA	16 VA			1	20 A	UH-5	40
41	AHU-3 POWER	20 A	1					0 VA	1000...	1	20 A	TCP	42
43	SPARE	20 A	1	0 VA	1000...					1	20 A	TCP	44
45	SPARE	20 A	1			0 VA	1000...			1	20 A	TCP	46
47	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	48
49	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	50
51	SPACE	--	1			--	--			1	--	SPACE	52
53	SPACE	--	1					--	--	1	--	SPACE	54
55	SPACE	--	1	--	--					1	--	SPACE	56
57	SPACE	--	1			--	--			1	--	SPACE	58
59	SPACE	--	1					--	--	1	--	SPACE	60
			Total Load:	12.49 kVA		14.18 kVA		10.46 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Motor	14864 VA	108.40%	16112 VA		
Other	3000 VA	100.00%	3000 VA	Total Conn. Load:	37124 VA
Receptacle	19260 VA	75.96%	14630 VA	Total Est. Demand:	33742 VA
				Total Conn.:	103 A
				Total Est. Demand:	94 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
37.12 kVA		33.74 kVA (94 A)

9

Panel: H2

Location: STORAGE L214 **Supply From:** MDP **Voltage:** 480/277 Wye-3PH-4W
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 14kAIC **Mains Type:** MLO **Mains Rating:** 125 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	LIGHTING	20 A	1	434 VA	898 VA					1	20 A	LIGHTING	2
3	LIGHTING	20 A	1			2679...	268 VA			1	20 A	LIGHTING	4
5	LIGHTING	20 A	1					480 VA					6
7	LIGHTING	20 A	1	200 VA	0 VA					1	20 A	SPARE	8
9	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	10
11	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	12
13	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	14
15	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	16
17	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	18
19	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	20
21	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	22
23	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	24
25	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	26
27	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	28
29	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	30
31	SPACE	--	1	--	--					1	--	SPACE	32
33	SPACE	--	1			--	--			1	--	SPACE	34
35	SPACE	--	1					--	--	1	--	SPACE	36
37	SPACE	--	1	--	--					1	--	SPACE	38
39	SPACE	--	1			--	--			1	--	SPACE	40
41	SPACE	--	1					--	--	1	--	SPACE	42
			Total Load:	1.53 kVA		2.95 kVA		0.48 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Lighting	4691 VA	125.00%	5864 VA		
Other	268 VA	100.00%	268 VA	Total Conn. Load:	4959 VA
				Total Est. Demand:	6132 VA
				Total Conn.:	6 A
				Total Est. Demand:	7 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
4.96 kVA		6.13 kVA (7 A)

Panel: H1

Location: ELEC. L130 **Supply From:** MDP **Voltage:** 480/277 Wye-3PH-4W
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 18kAIC **Mains Type:** MLO **Mains Rating:** 125 A

CKT	Circuit Description	Trip	Poles	A	A	B	B	C	C	Poles	Trip	Circuit Description	CKT
1	LIGHTING	20 A	1	630 VA	1090...					1	20 A	LIGHTING	2
3	LIGHTING	20 A	1			1301...	546 VA			1	20 A	LIGHTING	4
5	LIGHTING	20 A	1					546 VA	2421...	1	20 A	LIGHTING	6
7	LIGHTING	20 A	1	1957...	434 VA					1	20 A	LIGHTING	8
9	LIGHTING	20 A	1			84 VA	434 VA			1	20 A	LIGHTING	10
11	EXTERIOR LIGHTING	20 A	1					416 VA	0 VA	1	20 A	SPARE	12
13	EXTERIOR LIGHTING	20 A	1	84 VA	0 VA					1	20 A	SPARE	14
15	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	16
17	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	18
19	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	20
21	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	22
23	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	24
25	SPARE	20 A	1	0 VA	0 VA					1	20 A	SPARE	26
27	SPARE	20 A	1			0 VA	0 VA			1	20 A	SPARE	28
29	SPARE	20 A	1					0 VA	0 VA	1	20 A	SPARE	30
31	SPACE	--	1	--	--					1	--	SPACE	32
33	SPACE	--	1			--	--			1	--	SPACE	34
35	SPACE	--	1					--	--	1	--	SPACE	36
37	SPACE	--	1	--	--					1	--	SPACE	38
39	SPACE	--	1			--	--			1	--	SPACE	40
41	SPACE	--	1					--	--	1	--	SPACE	42
			Total Load:	4.20 kVA		2.37 kVA		3.38 kVA					

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Lighting	9943 VA	125.00%	12429 VA		
				Total Conn. Load:	9943 VA
				Total Est. Demand:	12429 VA
				Total Conn.:	12 A
				Total Est. Demand:	15 A

Notes:

TOTAL CONNECTED		ESTIMATED DEMAND
9.94 kVA		12.43 kVA (15 A)

DISTRIBUTION PANEL: L1DP

9

Location: ELEC. L130 **Supply From:** T500 **Voltage:** 120/208 Wye-3PH-4W **Feeder Size:**
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 22kAIC **Mains Type:** MCB **Mains Rating:** 1600 A **Spec. Ref. #:**

CKT	CIRCUIT DESCRIPTION	APPROX. CONNECTED LOAD	FRAME SIZE	POLES	TRIP SETTING	BREAKER TYPE	NUMBER OF CONDUCTORS	WIRE SIZE	GROUND SIZE	CONDUIT SIZE	SEE NOTE
1	SPD	0.00 kVA	60 A	3	60 A	--	--	--	--	--	--
2	L1	79.74 kVA	250 A	3	200 A						1
3	L2	37.12 kVA	125 A	3	100 A						1
4	RELAY PANEL...	20.00 kVA	100 A	3	100 A						1
5	RELAY PANEL...	20.00 kVA	100 A	3	100 A						1
6	RELAY PANEL...	20.00 kVA	100 A	3	100 A						1
7	RELAY PANEL...	10.00 kVA	100 A	3	50 A						1
8	COMPANY...	57.00 kVA	400 A	3	200 A						1
9	COMPANY...	57.00 kVA	400 A	3	200 A						1
10	L4	29.80 kVA	400 A	3	20 A						1
11	EM LTG UNIT	12.00 kVA	100 A	3	70 A						1
12	L3	28.00 kVA	400 A	3	100 A						1
13	SPACE	--	--	3	--	--	--	--	--	--	--
14	SPACE	--	--	3	--	--	--	--	--	--	--
15	SPACE	--	--	3	--	--	--	--	--	--	--
16	SPACE	--	--	3	--	--	--	--	--	--	--
17	SPACE	--	--	3	--	--	--	--	--	--	--
18	SPACE	--	--	3	--	--	--	--	--	--	--
19	SPACE	--	--	3	--	--	--	--	--	--	--
20	SPACE	--	--	3	--	--	--	--	--	--	--

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Lighting	228 VA	125.00%	285 VA		
Motor	33165 VA	103.76%	34413 VA	Total Conn. Load:	370669 VA
Other	201000 VA	100.00%	201000 VA	Total Est. Demand:	308836 VA
Receptacle	136276 VA	53.67%	73138 VA	Total Conn.:	1029 A
				Total Est. Demand:	857 A

NOTES: 1 - REFER TO SINGLE-LINE DIAGRAM FOR FEEDER SIZING.

TOTAL CONNECTED		ESTIMATED DEMAND
370.67 kVA		

DISTRIBUTION PANEL: H2DP

Location: STORAGE L214 **Supply From:** MDP **Voltage:** 480/277 Wye-3PH-4W **Feeder Size:**
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 14kAIC **Mains Type:** MLO **Mains Rating:** 400 A **Spec. Ref. #:**

CKT	CIRCUIT DESCRIPTION	APPROX. CONNECTED LOAD	FRAME SIZE	POLES	TRIP SETTING	BREAKER TYPE	NUMBER OF CONDUCTORS	WIRE SIZE	GROUND SIZE	CONDUIT SIZE	SEE NOTE
1	SPD	0.00 kVA	60 A	1	60 A	--	--	--	--	--	--
2	AHU-1	53.21 kVA	125 A	3	90 A						1
3	AHU-2	36.58 kVA	125 A	3	60 A						1
4	AHU-3	15.96 kVA	125 A	3	30 A						1
5	SPACE	--	--	3	--	--	--	--	--	--	--
6	SPACE	--	--	3	--	--	--	--	--	--	--
7	SPACE	--	--	3	--	--	--	--	--	--	--
8	SPACE	--	--	3	--	--	--	--	--	--	--
9	SPACE	--	--	3	--	--	--	--	--	--	--
10	SPACE	--	--	3	--	--	--	--	--	--	--
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Motor	105752 VA	112.58%	119054 VA		
				Total Conn. Load:	105752 VA
				Total Est. Demand:	119054 VA
				Total Conn.:	127 A
				Total Est. Demand:	143 A

NOTES: 1 - REFER TO SINGLE-LINE DIAGRAM FOR FEEDER SIZING.

TOTAL CONNECTED		ESTIMATED DEMAND
105.75 kVA		

DISTRIBUTION PANEL: MDP

Location: ELEC. L130 **Supply From:** **Voltage:** 480/277 Wye-3PH-4W **Feeder Size:**
Mounting: SURFACE **Enclosure:** NEMA 1
A.I.C. Rating: 35kAIC **Mains Type:** MCB **Mains Rating:** 1200 A **Spec. Ref. #:**

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CKT	CIRCUIT DESCRIPTION	APPROX. CONNECTED LOAD	FRAME SIZE	POLES	TRIP SETTING	BREAKER TYPE	NUMBER OF CONDUCTORS	WIRE SIZE	GROUND SIZE	CONDUIT SIZE	SEE NOTE
1	SPD	0.00 kVA	60 A	3	60 A	--	--	--	--	--	--
2	H1	9.94 kVA	250 A	3	100 A						1
3	H2DP	105.75 kVA	400 A	3	400 A						1
4	T500 / L1DP	370.67 kVA	800 A	3	750 A						1
5	H2	4.96 kVA	250 A	3	100 A						1
6	ELEVATOR	43.23 kVA	250 A	3	110 A						1
7	JOCKEY PUMP	1.16 kVA	400 A	3	20 A						1
8	WINCHES	16.00 kVA	30 A	3	30 A						1
9	SPACE	--	--	3	--	--	--	--	--	--	--
10	SPACE	--	--	3	--	--	--	--	--	--	--
11	SPACE	--	--	3	--	--	--	--	--	--	--
12	SPACE	--	--	3	--	--	--	--	--	--	--
13	SPACE	--	--	3	--	--	--	--	--	--	--
14	SPACE	--	--	3	--	--	--	--	--	--	--
15	SPACE	--	--	3	--	--	--	--	--	--	--
16	SPACE	--	--	3	--	--	--	--	--	--	--
17	SPACE	--	--	3	--	--	--	--	--	--	--
18	SPACE	--	--	3	--	--	--	--	--	--	--
19	SPACE	--	--	3	--	--	--	--	--	--	--
20	SPACE	--	--	3	--	--	--	--	--	--	--

Load Classification	Connected...	Demand Factor	Estimated...	Panel Totals	
Lighting	14863 VA	125.00%	18578 VA		
Motor	183313 VA	107.26%	196615 VA	Total Conn. Load:	551720 VA
Other	217268 VA	100.00%	217268 VA	Total Est. Demand:	505600 VA
Receptacle	136276 VA	53.67%	73138 VA	Total Conn.:	664 A
				Total Est. Demand:	608 A

NOTES: 1 - REFER TO SINGLE-LINE DIAGRAM FOR FEEDER SIZING.

TOTAL CONNECTED		ESTIMATED DEMAND
551.72 kVA		

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

KEITH A SCHEID
REGISTERED
No. PE60910071
STATE OF
INDIANA
PROFESSIONAL ENGINEER
5-20-22

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

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CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
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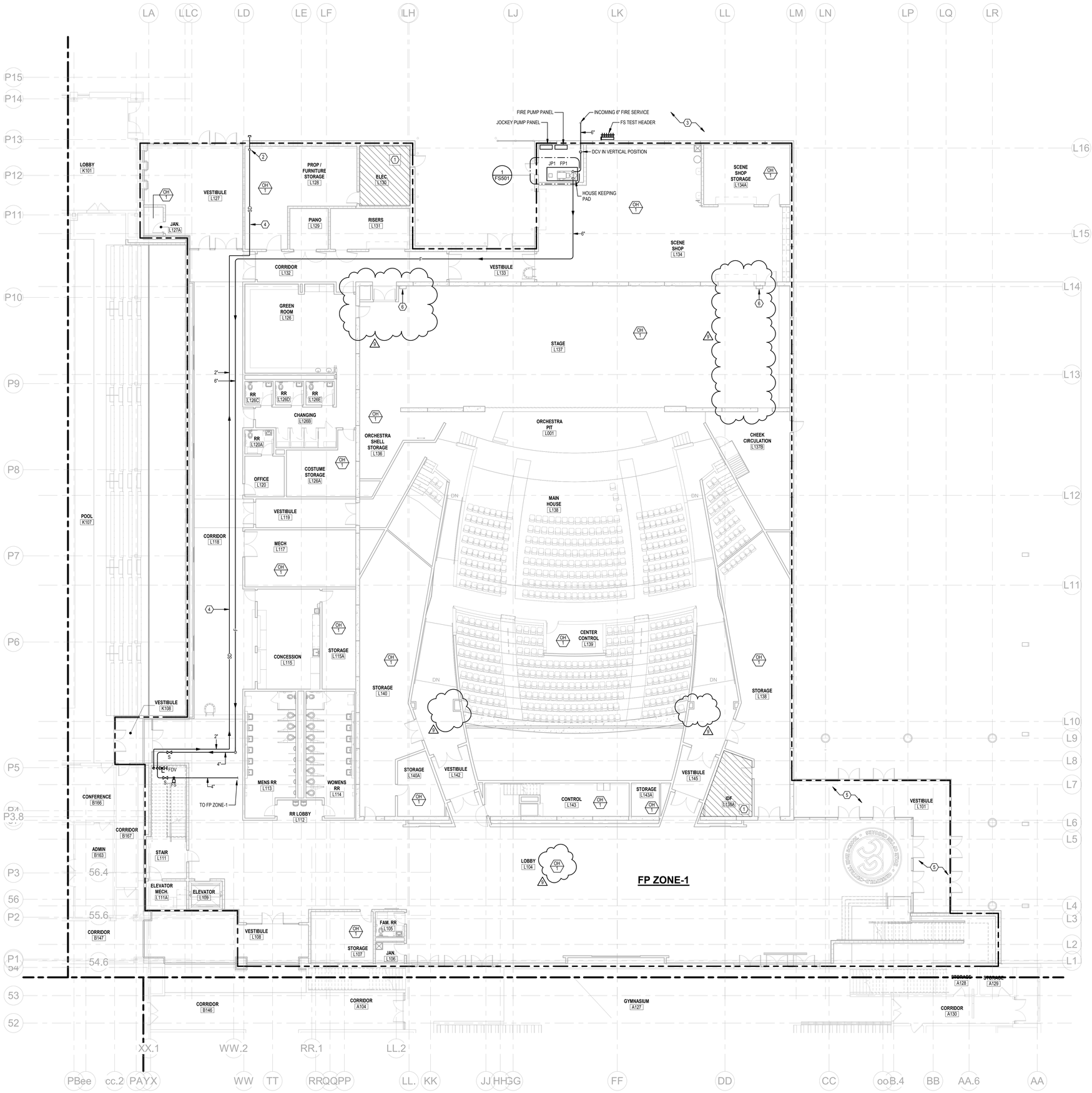
PANEL SCHEDULES

E701



PLAN NOTES

1. NO PIPING SHALL BE ROUTED THRU THIS SPACE UNLESS SERVING THIS SPACE.
2. SPRINKLER DRAIN TO DROP TO 18" AFG. PENETRATE WALL AND ELBOW DOWN. PROVIDE CONCRETE SPLASHBLOCK UNDER OUTLET. PATCH WALL AS REQUIRED.
3. REFER TO CIVIL PLANS FOR FDC AND PIV LOCATIONS.
4. PROVIDE VALVED ATTACHMENT AT ANY SPRINKLER DRAIN LINE LOCATION THAT MAY FORM TRAPPED WATER.
5. PROVIDE SIDEWALL DRY-SPRINKLER HEADS WITHIN THE MAIN VESTIBULE.
6. 1.5" CLASS-2 STANDPIPE. PROVIDE SURFACE MOUNT CABINET, EQUAL TO POTTER ROEMER 1885. COORDINATE LOCATION AND INSTALL WITH ALL TRADES, CONNECT AS REQUIRED.

1 **FIRE SUPPRESSION 1ST FLOOR**
SCALE: 3/32" = 1'-0"

PLOT DATE/TIME:6/9/2022 1:58:32 PM

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GREENFIELD CENTRAL HIGH SCHOOL
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EHREN E. LOHRMANN
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PROFESSIONAL ENGINEER

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9	06.17.22	BID PKG. #2 ADD. #9

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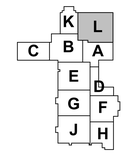
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: ME

FIRE SUPPRESSION FLOOR PLAN - FIRST FLOOR - UNIT L

FS101L



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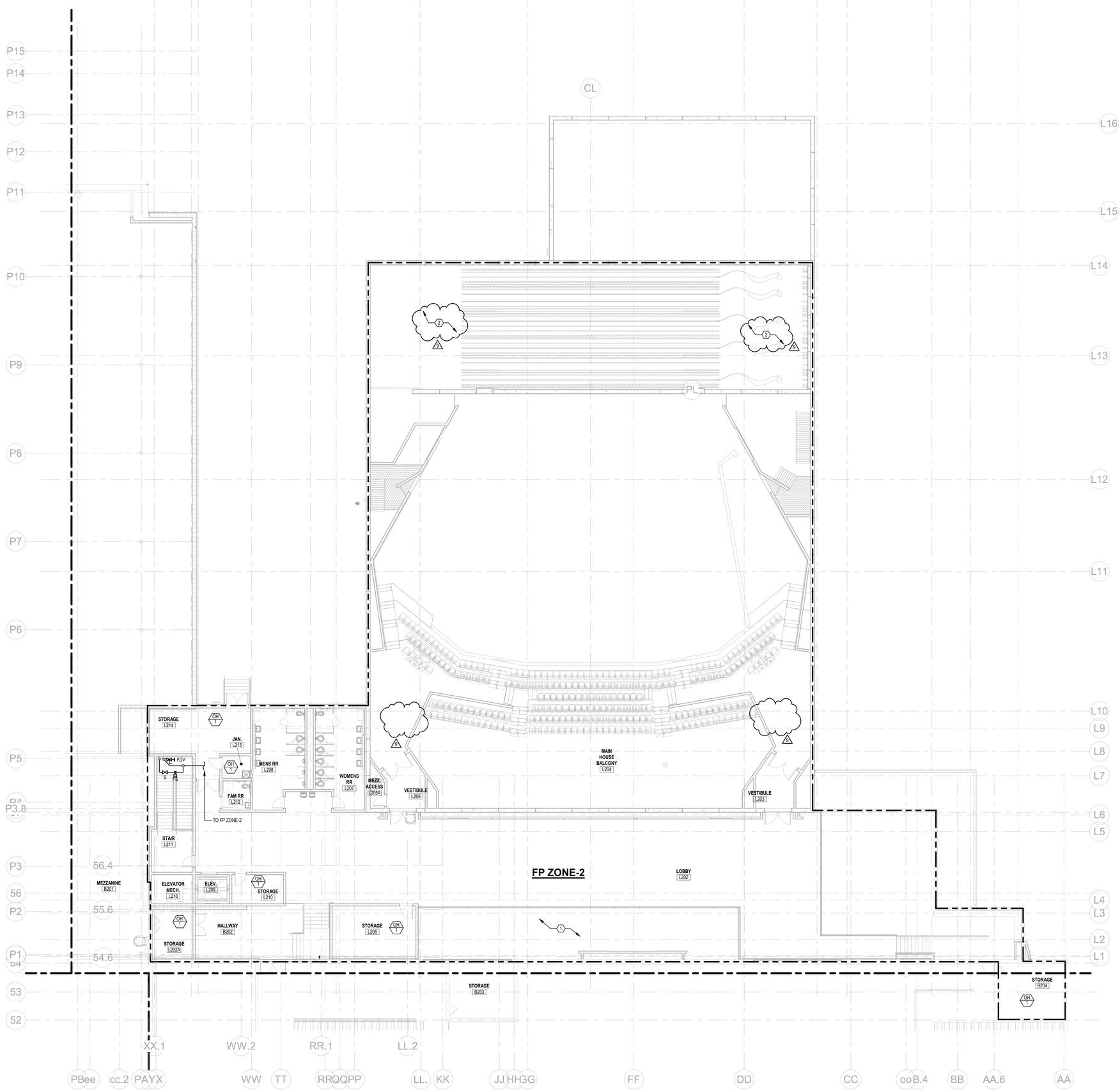

PLAN NOTES

1. AREA OPEN TO BELOW SHALL BE FED FROM FP ZONE-2.
2. COORDINATE SPRINKLER INSTALL WITH CURTAIN SUPPORTS.

1 **FIRE SUPPRESSION 2ND FLOOR**
SCALE: 3/32" = 1'-0"

PLOT DATE/TIME:6/10/2022 1:58:39 PM

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9	06.17.22	BID PKG. #2 ADD. #9

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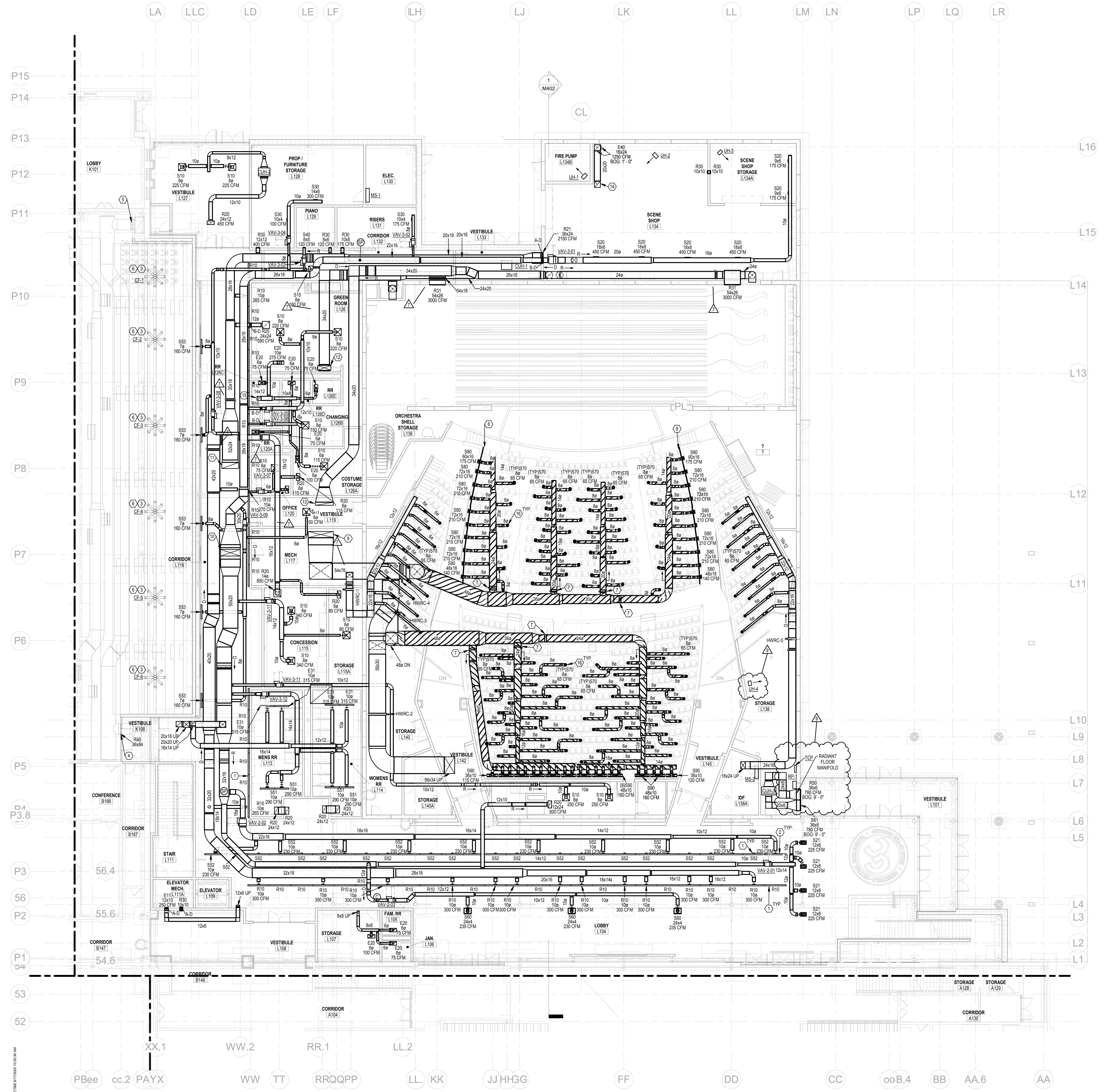
FIRE SUPPRESSION FLOOR PLAN - SECOND FLOOR - UNIT L

FS102L

K L
C B A
E D
G F
J H

N
TRUE NORTH



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

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. COORDINATE CABLE ACCESS LOCATION WITH ARCHITECT.
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. 20" X 20" EXHAUST UP TO EF-4 ON 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.

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GREENFIELD CENTRAL HIGH SCHOOL
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PROFESSIONAL ENGINEER

REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

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PROJECT: #21107
DATE: 05.20.2022
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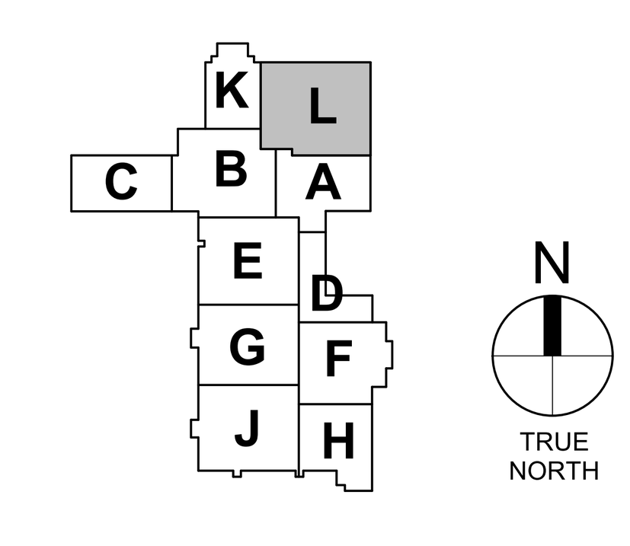


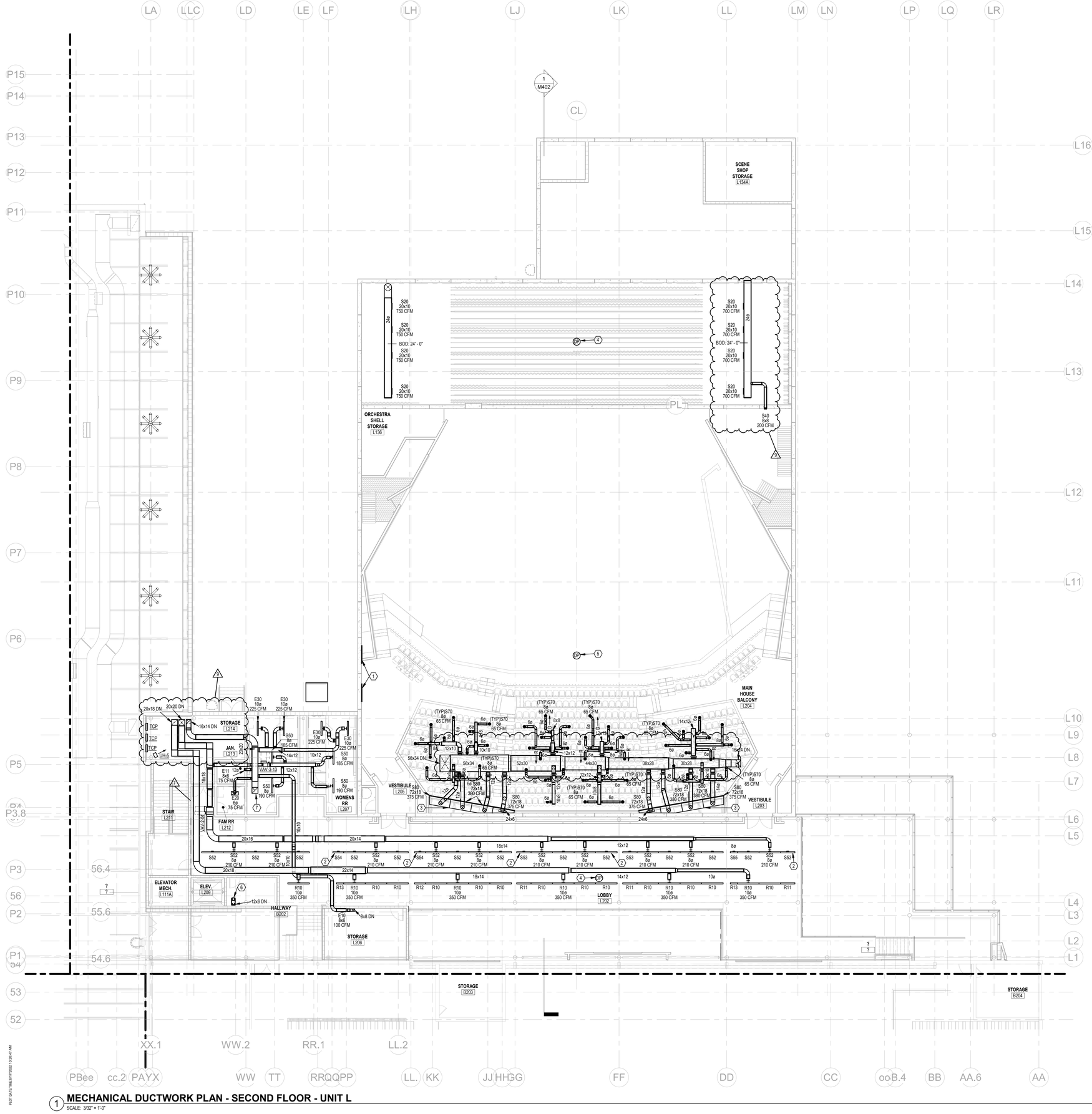
MECHANICAL DUCTWORK PLAN - FIRST FLOOR - UNIT L

M101L

PLOT DATE/TIME:6/17/2022 10:20:36 AM

PLAN NOTES

1. COVER RETURN AIR OPENING WITH 1/2" MESH HARDWARE CLOTH. REFER TO ROOF PLAN FOR CONTINUATION.
2. DIFFUSER AT EDGE OF 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"

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7	06.09.22	BID PKG. #2 ADD. #7
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PROJECT: #21107
DATE: 05.20.2022
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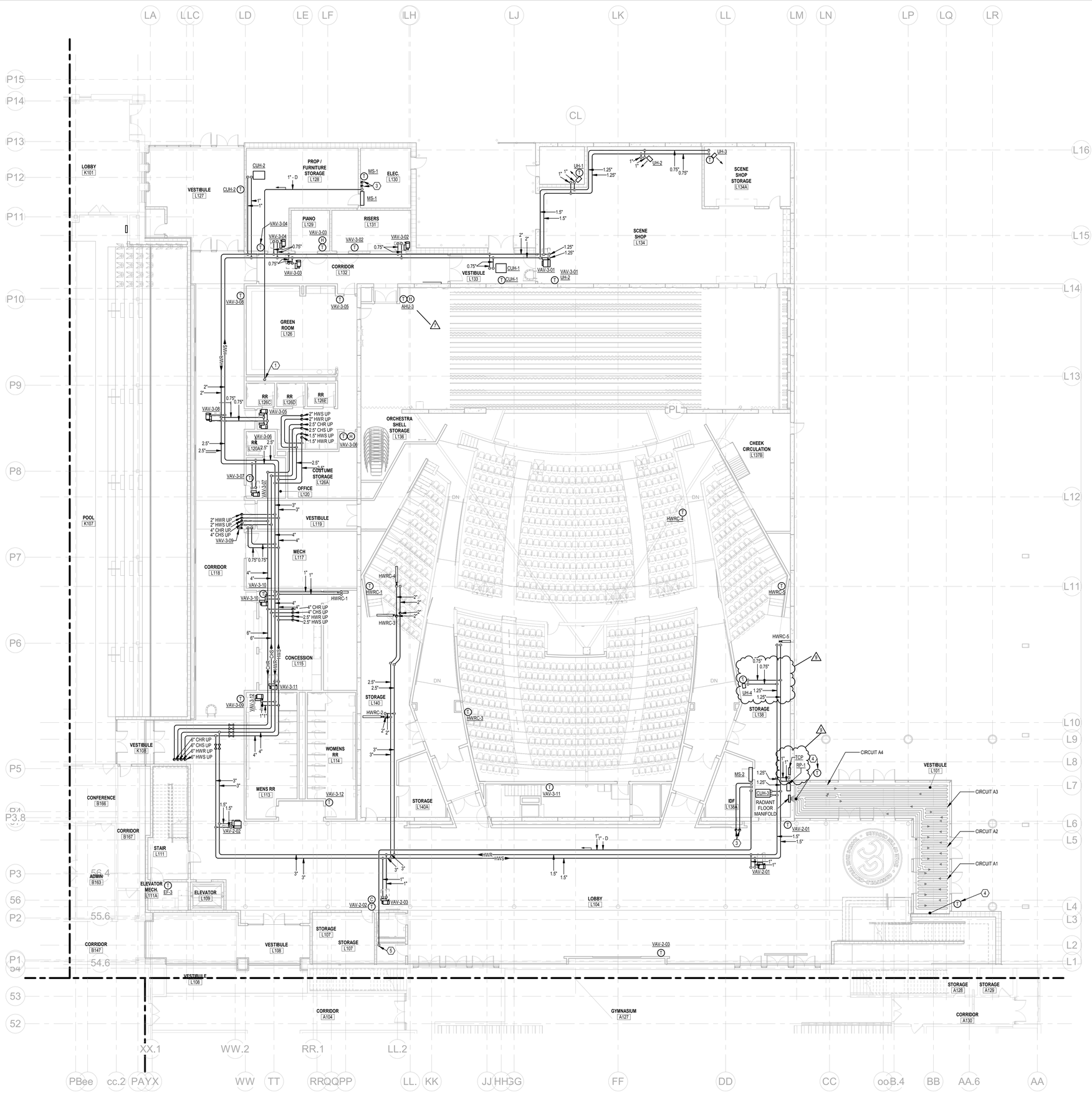
MECHANICAL DUCTWORK PLAN - SECOND FLOOR - UNIT L

M102L

K L C B A E D G F J H

N TRUE NORTH

PLOT DATE/TIME:6/17/2022 10:26:47 AM



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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GREENFIELD CENTRAL HIGH SCHOOL
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PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	BMW

MECHANICAL PIPING PLAN - FIRST FLOOR - UNIT L

M201L

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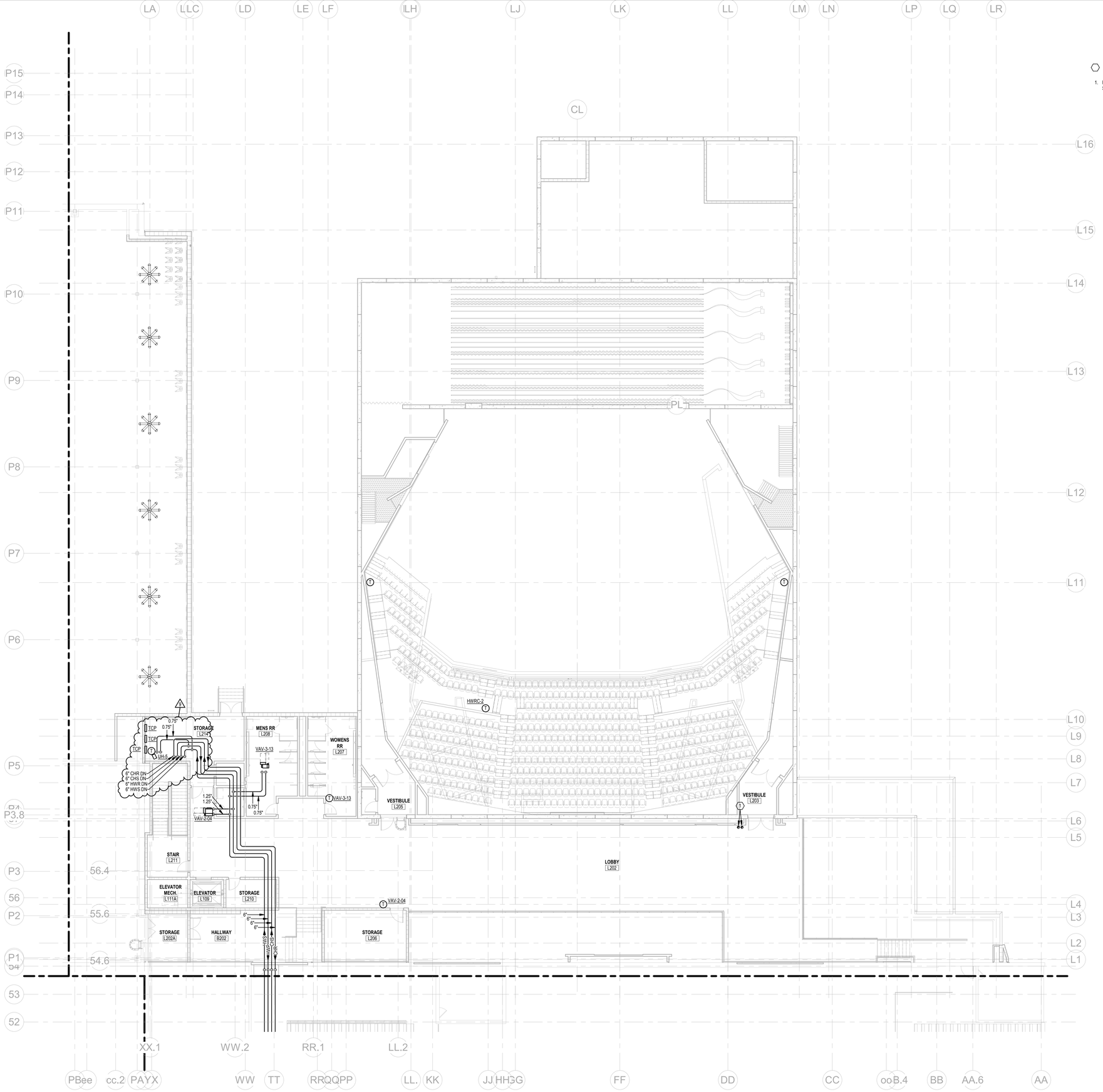
N TRUE NORTH

PLOT DATE/TIME:6/17/2022 10:28:59 AM

PLAN NOTES

1. REFRIGERANT PIPING UP TO MSACCU-2 ON ROOF AND DOWN TO FIRST FLOOR. PIPE SIZING AND SPECIALTIES BY MANUFACTURER.



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

PLOT DATE/TIME:6/17/2022 10:25:56 AM

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PROJECT:	#21107
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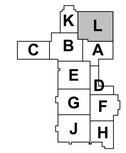
MECHANICAL PIPING PLAN - SECOND FLOOR - UNIT L



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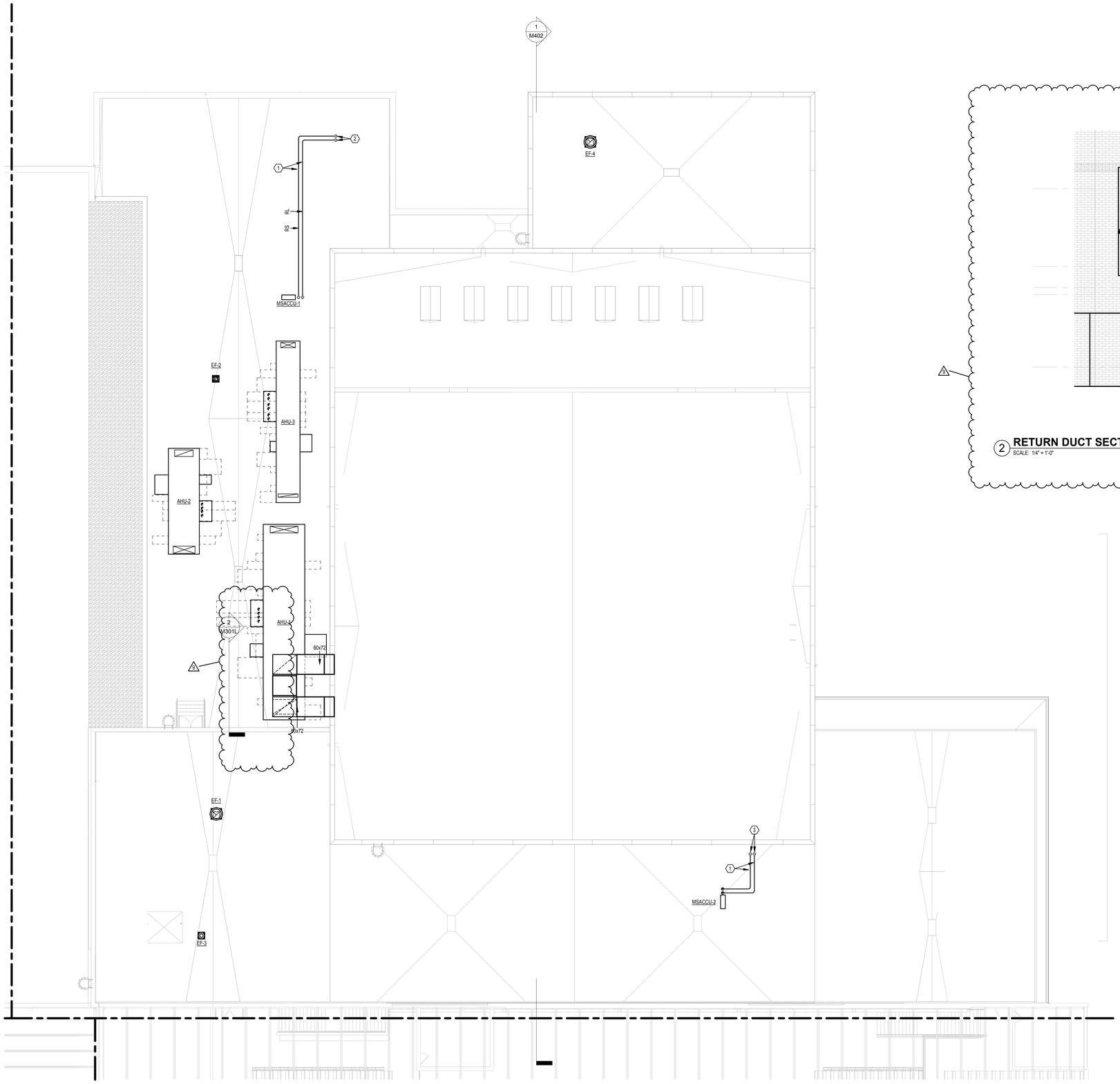
TRUE NORTH

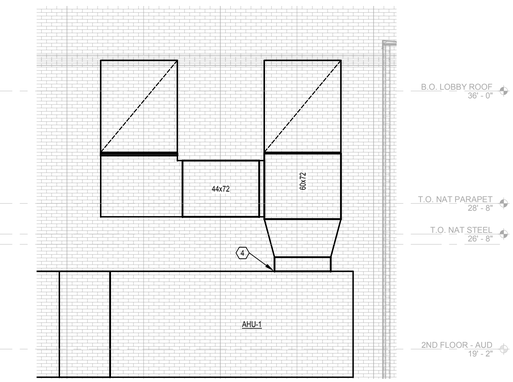
M202L

PLAN NOTES

1. REFRIGERANT PIPE SIZING AND SPECIALTIES BY MANUFACTURER.
2. REFRIGERANT PIPE DOWN TO MS-1.
3. REFRIGERANT PIPE DOWN TO MS-2.
4. TRANSITION AS REQUIRED FOR CONNECTION TO AIR HANDLING UNIT.



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



2 **RETURN DUCT SECTION**
SCALE: 1/4" = 1'-0"

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#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

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PROJECT: #21107
DATE: 05.20.2022
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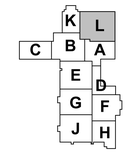
MECHANICAL ROOF PLAN - UNIT L



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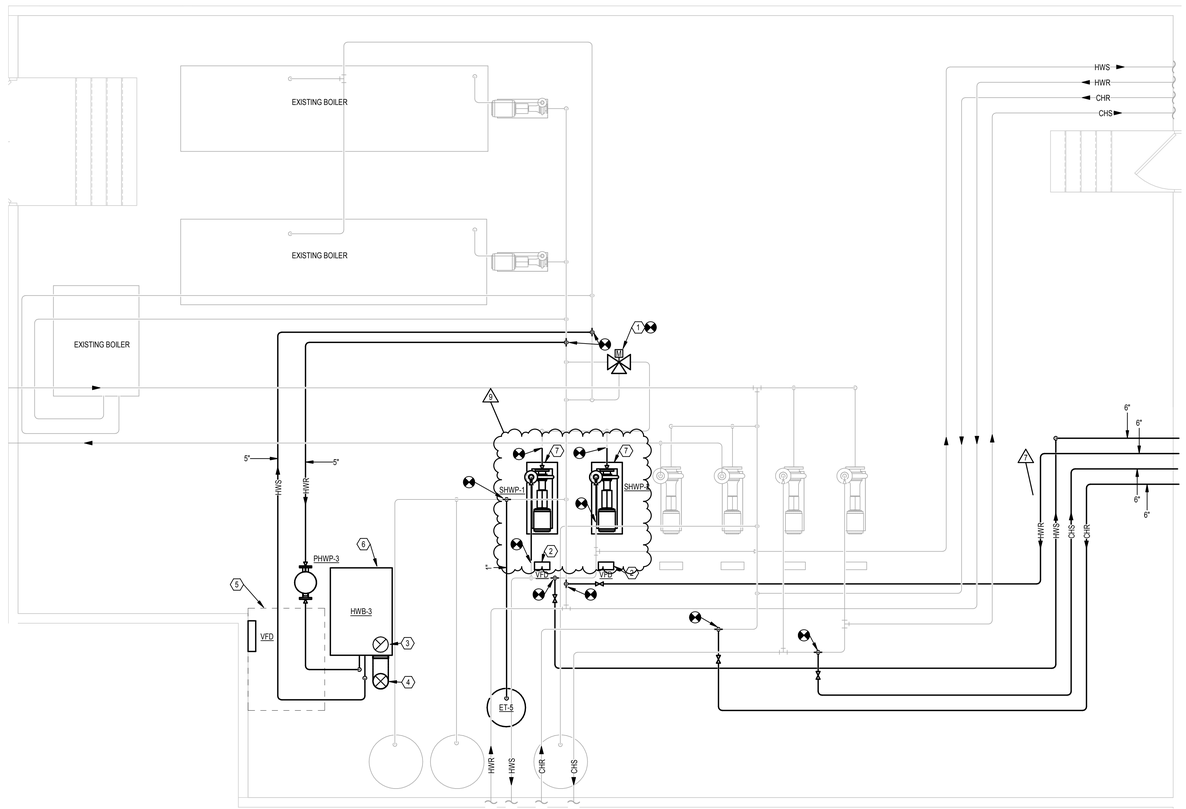
M301L

PLOT DATE/TIME:6/17/2022 10:20:59 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. ~~PUMP TO BE MOUNTED ON HOUSE KEEPING PAD.~~ EXTEND PAD AS REQUIRED.
7. 4" CONCRETE HOUSEKEEPING PAD.



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

PLOT DATE/TIME:5/17/2022 10:21:02 AM

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7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
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ENLARGED MECHANICAL PLANS

M401

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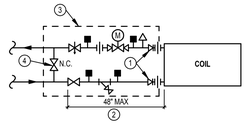


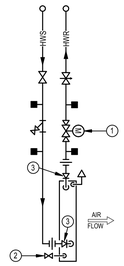
NOTES

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



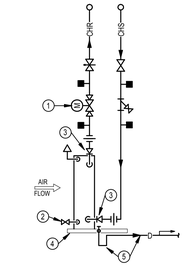
NOTES

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



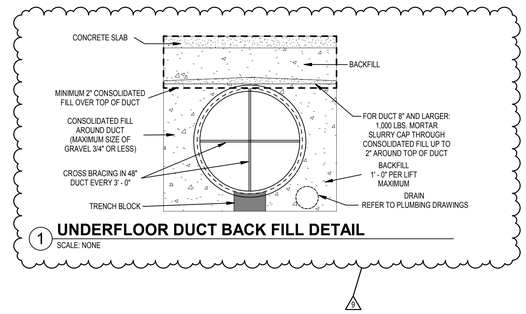
NOTES

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.

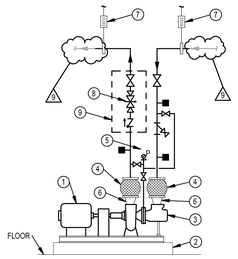
GENERAL NOTES

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



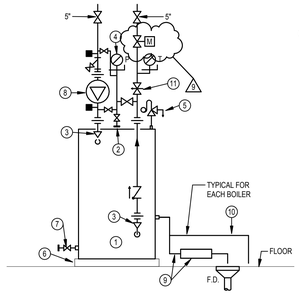
1 UNDERFLOOR DUCT BACK FILL DETAIL
SCALE: NONE



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).

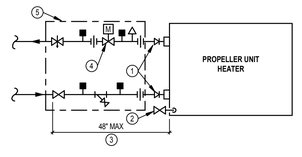
7 BASE MOUNTED PUMP - END SUCTION
SCALE: NONE



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).

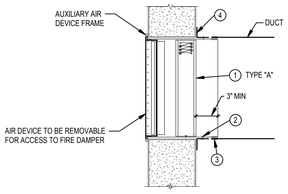
GENERAL NOTES

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.

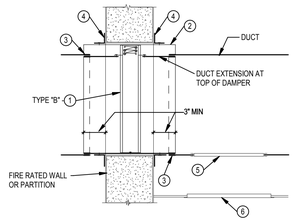
5 PROPELLER UNIT HEATER
SCALE: NONE

GENERAL NOTES

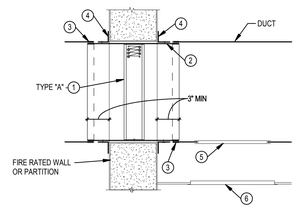
A. FIRE DAMPERS SHALL BE UL LABELED.
B. INSTALLATION OF FIRE DAMPERS AND ACCESSORIES SHALL CONFORM TO NFPA 90A, SMACNA AND MANUFACTURER'S INSTRUCTIONS.
C. DETAILS SHOW INSTALLATION OF FIRE DAMPER IN WALL. DAMPER INSTALLATION IN FLOOR SIMILAR. COORDINATE REQUIRED ACCESS LOCATIONS.
D. INSULATE RETAINING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



11 FIRE DAMPER AT AIR DEVICE - WALL
SCALE: NONE



10 FIRE DAMPER TYPE "B"
SCALE: NONE

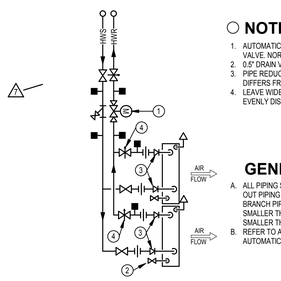


9 FIRE DAMPER TYPE "A"
SCALE: NONE

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



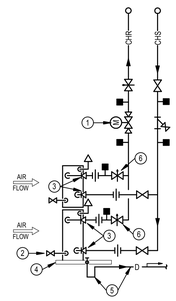
NOTES

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

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.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

MECHANICAL DETAILS

M502

PLOT DATE/TIME: 6/17/2022, 10:21:07 AM

LEGEND-
AUTOMATIC TEMPERATURE CONTROLS

XX-01	CONTROL POINT - SEE POINTS SCHEDULE
AI	ANALOG INPUT
AO	ANALOG OUTPUT
BI	BINARY INPUT
BO	BINARY OUTPUT
PI	PULSED INPUT
OAT	OUTSIDE AIR TEMPERATURE
MAT	MIXED AIR TEMPERATURE
RAT	RETURN AIR TEMPERATURE
SAT	SUPPLY AIR TEMPERATURE
CCAT	COOLING COIL LEAVING AIR TEMPERATURE
HCAT	HEATING COIL LEAVING AIR TEMPERATURE
OAHY	OUTSIDE AIR HUMIDITY
RAH	RETURN AIR HUMIDITY
SAH	SUPPLY AIR HUMIDITY
NC	NORMALLY CLOSED (CLOSES ON LOSS OF POWER)
NO	NORMALLY OPEN (OPENS ON LOSS OF POWER)
L	LOW
H	HIGH
C	COMMON
M	2-WAY AUTOMATIC 2-POSITION CONTROL VALVE
M	3-WAY AUTOMATIC 2-POSITION CONTROL VALVE
M	2-WAY AUTOMATIC MODULATING CONTROL VALVE
M	3-WAY AUTOMATIC MODULATING CONTROL VALVE
H DP L	DIFFERENTIAL PRESSURE SENSOR
L DP H	DIFFERENTIAL PRESSURE SWITCH
C	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
CS	CURRENT SENSOR TRANSMITTER
EPT	ELECTRONIC TO PNEUMATIC TRANSDUCER
FM	FLOW METER TRANSMITTER
H	HUMIDITY SENSOR
LC	LEVEL CONTROLLER
LT	LEVEL TRANSMITTER
P	PRESSURE SENSOR
SP	STATIC PRESSURE SENSOR
T	TEMPERATURE SENSOR
WF	WATER FLOW SENSOR
WL	WATER LEVEL SENSOR
CS	CURRENT SWITCH
ES	END SWITCH
FS	FLOW SWITCH
H	HUMIDISTAT
OS	OCCUPANCY SENSOR
P HL	PRESSURE SWITCH, HIGH LIMIT
P LL	PRESSURE SWITCH, LOW LIMIT
T LL	TEMPERATURE LOW LIMIT (FREEZE STAT)
T	ROOM THERMOSTAT
WL	WATER LEVEL SWITCH
	EMERGENCY SHUT-OFF STATION

LEGEND-
AUTOMATIC TEMPERATURE CONTROLS

AFMS	AIR FLOW MEASURING STATION
VFD	VARIABLE FREQUENCY DRIVE (ADJUSTABLE FREQUENCY MOTOR CONTROLLER)
MS	MOTOR STARTER
CON	CONTACTOR
TCP	LOCAL TEMPERATURE CONTROL PANEL
PSH	PRESSURE SAFETY - HIGH
PSL	PRESSURE SAFETY - LOW
SD	SMOKE DETECTOR
M	DAMPER OR VALVE ACTUATOR - MODULATING
M	DAMPER OR VALVE ACTUATOR - 2-POSITION
R	RELAY
UV	UVGI LIGHT
	PUMP
	FAN
	COOLING COIL
	HEATING COIL
	HUMIDIFIER
	FILTER
	ENERGY RECOVERY WHEEL
	OPPOSED BLADE CONTROL DAMPER
	PARALLEL BLADE CONTROL DAMPER
SD	SMOKE DAMPER
ECON M / MIN M	MIN OA / ECON DAMPER
R	DX COIL
X	WALL MOUNTED DEVICE
X	DUCT INSERTION DEVICE
X	PIPE INSERTION OR IMMERSION DEVICE WITH WELL
X	AVERAGING SENSOR OR DEVICE
X	OUTDOOR SENSOR OR DEVICE, SHIELDED
X x Y	FAN ARRAY, "X" FANS VERTICAL x "Y" FANS HORIZONTAL

GENERAL NOTES-
AUTOMATIC TEMPERATURE CONTROLS

A A COMPLETE SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS SHALL BE INSTALLED AS REQUIRED TO ACCOMPLISH THE SEQUENCE OF CONTROL FOR VARIOUS ITEMS OF EQUIPMENT AND SYSTEMS DESCRIBED HEREINAFTER. THE SYSTEM SHALL BE A DIRECT DIGITAL CONTROL SYSTEM UTILIZING ELECTRIC OR PNEUMATIC ACTUATION AS DEFINED IN THE SPECIFICATIONS.

B THE CONTROL DIAGRAMS AND INFORMATION CONTAINED WITHIN ARE TO SHOW DESIGN INTENT. IT IS THE CONTROL SYSTEM SUPPLIERS RESPONSIBILITY TO DEVELOP DETAILED AND COMPLETE CONTROL DIAGRAMS AND SHOP DRAWINGS TO ACCOMPLISH THE SPECIFIED SEQUENCES.

C THE POINTS LIST IS SHOWN AS AN AID TO THE CONTRACTOR INDICATING THE MINIMUM POINTS REQUIRED FOR CONTROL, AND MONITORING. ALL INPUT AND OUTPUT POINTS, AND THEIR REQUIRED INTERFACE AND ACCESSORY HARDWARE, SHALL BE PROVIDED FOR A COMPLETE AND FUNCTIONAL CONTROL SYSTEM. IF OR WHEN ADDITIONAL POINTS ARE REQUIRED TO ACCOMPLISH THE SEQUENCES OF CONTROL SPECIFIED, THESE POINTS, ALONG WITH ADDITIONAL DIRECT DIGITAL CONTROL PANE(S) (IF REQUIRED), SHALL ALSO BE PROVIDED.

D BULB WELLS FOR TEMPERATURE SENSING AS INDICATED SHALL BE PROVIDED BY THE HVAC CONTRACT. PIPING WORK SHALL INCLUDE PROPERLY SIZED WELDOLET OR THREADOLET FITTINGS PLACED AS DIRECTED BY THE CONTROL SYSTEM SUPPLIER.

E ELECTRICAL WORK INCLUDES A POWER SOURCE TO THE MOTOR STARTERS. PROVIDE ALL HVAC POWER SOURCES REQUIRED BEYOND THESE STARTERS OR BEYOND SOURCES EXPLICITLY SHOWN ON THE ELECTRICAL DRAWINGS. THIS SHALL INCLUDE BUT NOT BE LIMITED TO WIRING, CONDUIT, TRANSFORMERS, RELAYS AND FUSES.

23 09 93 SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 - GENERAL

1.1 IMPLEMENTED SEQUENCES OF OPERATION SHALL BE IN COMPLIANCE WITH ASHRAE 90.1-2007, UNLESS DEVIATED BY THE SEQUENCES WITH-IN. ANY ADDITIONAL DEVIATIONS MUST BE REVIEWED WITH THE ENGINEER PRIOR TO IMPLEMENTATION.
1.2 PROVIDE ALL EQUIPMENT (VALVES, DAMPERS, ACTUATORS, CONTROLLERS, ETC.) REQUIRED TO PERFORM THE FUNCTIONS SPECIFIED UNLESS NOTED HEREIN OR ELSEWHERE IN THESE CONTRACT DOCUMENTS. ELECTRIC MOTOR DRIVEN EQUIPMENT (PUMPS, CHILLERS, COMPRESSORS, COOLING TOWERS, ETC.) SHALL BE PROVIDED WITH MINIMUM ON (RUN) AND MINIMUM OFF TIMERS TO PREVENT SHORT CYCLING OF THE EQUIPMENT (COORDINATE WITH EQUIPMENT MANUFACTURER'S).
1.3 ALL DDC SYSTEM CONTROL POINTS SHALL HAVE A DEFAULT VALUE IN CASE OF SENSOR FAILURE OR LOGIC ERROR. ALL CONTROLLED DEVICES SHALL FAIL SAFE ON LOSS OF CONTROL. ALL SETPOINTS AND PARAMETERS SHALL BE FULLY ADJUSTABLE FROM THE END USER / OWNER INTERFACE.
1.4 REFER TO SECTION 23 09 23 FOR SEQUENCES OF OPERATIONS MEETING.
1.5 THESE SEQUENCES ARE INTENDED TO BE PERFORMANCE BASED. IMPLEMENTATIONS THAT PROVIDE THE SAME FUNCTIONAL RESULT USING DIFFERENT UNDERLYING DETAILED LOGIC WILL BE ACCEPTABLE, PENDING ENGINEER REVIEW.
1.6 UNLESS OTHERWISE INDICATED, CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON THE STATUS OF THE SYSTEM BEING CONTROLLED TO PREVENT WINDUP.
1.7 WHEN A CONTROL LOOP IS ENABLED OR REENABLED, IT AND ALL ITS CONSTITUENTS (SUCH AS THE PROPORTIONAL AND INTEGRAL TERMS) SHALL BE SET INITIALLY TO A NEUTRAL VALUE.
1.8 A CONTROL LOOP IN NEUTRAL SHALL CORRESPOND TO A CONDITION THAT APPLIES THE MINIMUM CONTROL EFFECT, I.E., VALVES/ DAMPERS CLOSED, VFDS AT MINIMUM SPEED, ETC.
1.9 WHEN THERE ARE MULTIPLE OUTDOOR AIR TEMPERATURE SENSORS, THE SYSTEM SHALL USE THE VALID SENSOR THAT MOST ACCURATELY REPRESENTS THE OUTDOOR AIR CONDITIONS AT THE EQUIPMENT BEING CONTROLLED.
1.10 OUTDOOR AIR TEMPERATURE SENSORS AT AIR-HANDLER OUTDOOR AIR INTAKES SHALL BE CONSIDERED VALID ONLY WHEN THE SUPPLY FAN IS PROVEN ON AND THE UNIT IS IN OCCUPIED MODE OR IN ANY OTHER MODE WITH THE ECONOMIZER ENABLED.
1.11 THE OUTDOOR AIR TEMPERATURE USED FOR OPTIMUM START, PLANT LOCKOUT, AND OTHER GLOBAL SEQUENCES SHALL BE THE AVERAGE OF ALL VALID SENSOR READINGS. IF THERE ARE FOUR OR MORE VALID OUTDOOR AIR TEMPERATURE SENSORS, DISCARD THE HIGHEST AND LOWEST TEMPERATURE READINGS.
1.12 THE TERM "PROVEN" (I.E., "PROVEN ON"/"PROVEN OFF") SHALL MEAN THAT THE EQUIPMENT'S DI STATUS POINT (WHERE PROVIDED, E.G., CURRENT SWITCH, DP SWITCH, OR VFD STATUS) MATCHES THE STATE SET BY THE EQUIPMENT'S DO COMMAND POINT.
1.13 THE TERM "SOFTWARE POINT" SHALL MEAN AN ANALOG VARIABLE, AND "SOFTWARE SWITCH" SHALL MEAN A DIGITAL (BINARY) VARIABLE, THAT ARE NOT ASSOCIATED WITH REAL I/O POINTS. THEY SHALL BE READ/WRITE CAPABLE (E.G., BACNET ANALOG VARIABLE AND BINARY VARIABLE).
1.14 THE TERM "CONTROL LOOP" OR "LOOP" IS USED GENERICALLY FOR ALL CONTROL LOOPS. THESE WILL TYPICALLY BE PID LOOPS, BUT PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE GAINS ARE NOT REQUIRED ON ALL LOOPS. UNLESS SPECIFICALLY INDICATED OTHERWISE, THE GUIDELINES IN THE FOLLOWING SUBSECTIONS SHALL BE FOLLOWED.
1.15 USE PROPORTIONAL ONLY (P-ONLY) LOOPS FOR LIMITING LOOPS (SUCH AS ZONE CO2 CONTROL LOOPS, ETC.).
1.16 DO NOT USE THE DERIVATIVE TERM ON ANY LOOPS UNLESS FIELD TUNING IS NOT POSSIBLE WITHOUT IT.
1.17 TO AVOID ABRUPT CHANGES IN EQUIPMENT OPERATION, THE OUTPUT OF EVERY CONTROL LOOP SHALL BE CAPABLE OF BEING LIMITED BY A USER ADJUSTABLE MAXIMUM RATE OF CHANGE, WITH A DEFAULT OF 25% PER MINUTE.
1.18 ALL SETPOINTS, TIMERS, DEADLANDS, PID GAINS, ETC. LISTED IN SEQUENCES SHALL BE ADJUSTABLE BY THE USER WITH APPROPRIATE ACCESS LEVEL WHETHER INDICATED AS ADJUSTABLE IN SEQUENCES OR NOT. SOFTWARE POINTS SHALL BE USED FOR THESE VARIABLES. FIXED SCALAR NUMBERS SHALL NOT BE EMBEDDED IN PROGRAMS EXCEPT FOR PHYSICAL CONSTANTS AND CONVERSION FACTORS.
1.19 VALUES FOR ALL POINTS, INCLUDING REAL (HARDWARE) POINTS USED IN CONTROL SEQUENCES SHALL BE CAPABLE OF BEING OVERRIDDEN BY THE USER WITH APPROPRIATE ACCESS LEVEL (E.G., FOR TESTING AND COMMISSIONING). IF HARDWARE DESIGN PREVENTS THIS FOR HARDWARE POINTS, THEY SHALL BE EQUATED TO A SOFTWARE POINT, AND THE SOFTWARE POINT SHALL BE USED IN ALL SEQUENCES. EXCEPTIONS SHALL BE MADE FOR MACHINE OR LIFE SAFETY.
1.20 VFD SPEED SETPOINTS. THE SPEED AO SENT TO VFDS SHALL BE CONFIGURED SUCH THAT 0% SPEED CORRESPONDS TO 0 HZ, AND 100% SPEED CORRESPONDS TO MAXIMUM SPEED CONFIGURED IN THE VFD. FOR EACH PIECE OF EQUIPMENT, THE MINIMUM SPEED SHALL BE STORED IN A SINGLE SOFTWARE POINT. THIS VALUE SHALL BE WRITTEN TO THE VFD'S MINIMUM SPEED SETPOINT EVERY 15 MINUTES VIA THE DRIVE'S NETWORK INTERFACE; IN THE CASE OF A HARD-WIRED VFD INTERFACE, THE MINIMUM SPEED SHALL BE THE LOWEST SPEED COMMAND SENT TO THE DRIVE BY THE BAS. MINIMUM SPEED SETPOINTS FOR ALL VFD-DRIVEN EQUIPMENT SHALL BE DETERMINED IN ACCORDANCE WITH THE TESTING, ADJUSTING, AND BALANCING (TAB) SPECIFICATIONS FOR THE FOLLOWING, AS APPLICABLE: SUPPLY FAN, RETURN FAN, RELIEF FAN.

PART 2 - PRODUCTS

2.1 REFER TO SECTION 23 09 23 AND 23 09 25 FOR APPLICABLE PRODUCTS.

PART 3 - EXECUTION

3.1 "OCCUPIED", "UNOCCUPIED" AND OVERRIDE MODES
- A. EACH AIR-SIDE SYSTEM SHALL BE SCHEDULED (INDEPENDENTLY) FOR "OCCUPIED" AND "UNOCCUPIED" MODES OF OPERATION, UNLESS STATED OTHERWISE IN THE SPECIFIC SYSTEM SEQUENCES OF OPERATIONS WITH-IN.
- B. AUTOMATIC CONTROLS SHALL BE CAPABLE OF RETAINING PROGRAMMING AND TIME SETTINGS DURING LOSS OF POWER FOR A PERIOD OF AT LEAST TEN HOURS, AND SHALL INCLUDE AN ACCESSIBLE OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF EACH SYSTEM FOR UP TO TWO HOURS.
- C. THE "OCCUPIED" MODE OF OPERATION SHALL BE SCHEDULED THROUGH A TIME AND DATE CALENDAR FUNCTION AT THE DDC SYSTEM OPERATOR WORKSTATION. THE INITIAL "OCCUPIED" MODE SCHEDULE SHALL BE IN EFFECT MONDAY THROUGH FRIDAY, 7:00 A.M. TO 5:00 P.M. UNLESS NOTED OTHERWISE IN THE SPECIFIC SYSTEM SEQUENCES WITH-IN. COORDINATE TIME OF DAY SCHEDULING WITH OWNER. SCHEDULING SOFTWARE SHALL BE CAPABLE OF SEVEN DIFFERENT DAY-TYPES PER WEEK.
- D. THE "UNOCCUPIED" MODE SHALL BE IN EFFECT WHENEVER THE ZONE OR SYSTEM IS NOT IN "OCCUPIED" MODE.
- E. "OVERRIDE" MODE SHALL PUT THE ZONE OR SYSTEM INTO "OCCUPIED" MODE WHEN ANY OF THE FOLLOWING OCCURS:
  1. "OCCUPIED" MODE INITIATED THROUGH MANUAL OVERRIDE OF THE "UNOCCUPIED" MODE AT THE OPERATOR WORKSTATION.
  2. "OCCUPIED" MODE INITIATED BY A ZONE OVERRIDE DEVICE. A ZONE OVERRIDE DEVICE SHALL BE A MANUALLY OPERATED BUTTON OR SWITCH.

3.2 ADAPTIVE OPTIMAL START MODE
- A. FOR EACH AIR-SIDE SYSTEM, THE DDC SYSTEM SHALL UTILIZE SPACE TEMPERATURE, OUTDOOR AIR TEMPERATURE, APPLICABLE "OCCUPIED" HEATING AND COOLING SETPOINTS AND OCCUPANCY SCHEDULE TO CONTINUOUSLY ADAPT ITSELF USING A "LEARNING" PROCESS TO CALCULATE THE MOST OPTIMAL START TIME, UP TO 4 HOURS (ADJUSTABLE) PRIOR TO SCHEDULED OCCUPANCY TIME, TO ALLOW THE AVERAGE BUILDING SPACE TEMPERATURE TO REACH THE "OCCUPIED" SPACE TEMPERATURE SETPOINT DETERMINED BY THE HEATING OR COOLING MODE. PROGRAMS WHICH REQUIRE MANUAL FINE-TUNING OF EACH FAN SYSTEM'S ALGORITHMS SHALL NOT BE ACCEPTABLE.

3.3 ZONE HEATING AND COOLING SETPOINTS
- A. ZONE HEATING AND COOLING SETPOINTS SHALL BE AS FOLLOWS EXCEPT AS SPECIFIED OTHERWISE. ALL SETPOINTS SHALL BE ADJUSTABLE.
  "OCCUPIED" ZONE COOLING SETPOINT: AS DEFINED ON THE DRAWINGS
  "OCCUPIED" ZONE HEATING SETPOINT: 5 DEG F BELOW "OCCUPIED" ZONE COOLING SETPOINT
  "UNOCCUPIED" ZONE COOLING SETPOINT: 7 DEG F ABOVE "OCCUPIED" ZONE COOLING SETPOINT BUT NO WARMER THAN 82 DEG F
  "UNOCCUPIED" ZONE HEATING SETPOINT: 10 DEG F BELOW "OCCUPIED" ZONE HEATING SETPOINT BUT NO LOWER THAN 60 DEG F. FOR RADIANT SYSTEMS, THE "UNOCCUPIED" ZONE HEATING SETPOINT SHALL BE 4 DEGREES BELOW THE "OCCUPIED" ZONE HEATING SETPOINT.

3.4 HEATING HOT WATER BOILERS SYSTEM
- A. SYSTEM DESCRIPTION:
  1. THE PRIMARY-SECONDARY HEATING HOT WATER BOILERS SYSTEM CONSISTS OF THREE (3) EXISTING BOILERS WITH PRIMARY PUMPS, ONE (1) NEW BOILER WITH PRIMARY PUMP, AND TWO (2) NEW SECONDARY PUMPS (REPLACING EXISTING).
- B. SYSTEM ENABLE AND INTERLOCK CONDITIONS:
  1. UTILIZE EXISTING SEQUENCE.
- C. BOILER AUTOMATIC ISOLATION VALVE OPERATION:
  1. BOILER WILL BE FURNISHED WITH A LINE-SIZE 2-POSITION AUTO VALVE AND ELECTRIC ACTUATOR TO ISOLATE THE BOILER FROM THE PIPING LOOP WHEN THE BOILER IS "OFF". REFER TO DRAWINGS. CONTROL AND WIRING OF THE VALVE WILL BE BY THE BOILER MANUFACTURER.

     NOTE THAT THE BOILER CONTROLS ARE TO HOLD OPEN THE LEAD BOILER ISOLATION VALVE EVEN WHEN THE BOILER SYSTEM IS "OFF" TO ALLOW FOR THE HOT WATER PUMPS TO CIRCULATE WATER.
- D. PRIMARY-SECONDARY PUMPS OPERATION
  1. PRIMARY HOT WATER BOILER PUMPS OPERATION:
     A. EACH BOILER IS BEING EQUIPPED WITH A DEDICATED PRIMARY PUMP. EACH PUMP SHALL BE WIRED TO ITS ASSOCIATED BOILER CONTROLLER IF NOT FACTORY WIRED, ON-OFF CONTROL BY THE INTEGRAL BOILER CONTROLS.
  2. SECONDARY HOT WATER PUMP LEAD-LAG OPERATION:-
     A. SECONDARY PUMPS SHALL OPERATE PER SEQUENCE IN PLACE PRIOR TO PROJECT.
- E. HOT WATER SYSTEM DIFFERENTIAL PRESSURE CONTROL AND RESET:
  1. EXISTING TO REMAIN. ADJUST SETPOINT AS REQUIRED TO BALANCE SYSTEM.
- F. HOT WATER SUPPLY TEMPERATURE SETPOINT AND RESET:
  1. SETPOINT AND RESET SCHEDULE ARE EXISTING TO REMAIN.

3.5 MAIN VESTIBULE HOT WATER RADIANT FLOOR / CABINET HEATER (SEE DIAGRAM)

3.6 HOT WATER UNIT HEATERS
- A. SYSTEM DESCRIPTION:
  1. HOT WATER CABINET UNIT HEATERS AND PROPELLER UNIT HEATERS ARE BEING INSTALLED TO PROVIDE SUPPLEMENTAL HEATING. REFER TO DRAWINGS.
- B. RUN CONDITIONS:
  1. EACH UNIT HEATER SEASONAL ISOLATION VALVE SHALL BE CLOSED WHENEVER THE OUTSIDE AIR TEMPERATURE IS ABOVE 55 DEG F (ADJUSTABLE).
- C. SPACE TEMPERATURE CONTROL
  1. EACH HEATER SHALL BE FURNISHED WITH A LINE-SIZE 2-POSITION SEASONAL AUTO ISOLATION VALVE.
  2. FOR UNITS WITH INTEGRAL THERMOSTATS, FAN CONTROL IS INTEGRAL. ON A CALL FOR HEATING THE FAN SHALL RUN.
  3. FOR UNITS WITH REMOTE WALL MOUNTED THERMOSTATS, LOW VOLTAGE 24 VOLT THERMOSTAT SHALL BE PROVIDED TO CONTROL FAN OPERATION. ON A CALL FOR HEATING THE FAN SHALL RUN.
- D. UH-2 IN SCENE SHOP L134 AND UH-3 IN SCENE SHOP STORAGE L134A SHALL ACT AS SUPPLEMENT HEAT FOR VAV-3-01. UH-2 AND UH-3 SHALL CYCLE TO MAINTAIN SPACE SETPOINT IF SPACE TEMPERATURE FALLS BELOW HEATING SETPOINT BY 2 DEG F (ADJUSTABLE).

3.7 VAV BOXES (AIR TERMINAL UNITS) (SEE DIAGRAM)
3.8 AIR HANDLING UNIT AHU-1 (SEE DIAGRAM)
3.9 AIR HANDLING UNIT AHU-2 (SEE DIAGRAM)
3.10 AIR HANDLING UNIT AHU-3 (SEE DIAGRAM)

9

3.11 GENERAL EXHAUST FANS
EACH EXHAUST FAN (AND ITS RESPECTIVE AUTOMATIC DAMPER) SHALL BE A SEPARATE START/STOP POINT OF THE DIGITAL CONTROL SYSTEM UNLESS SPECIFICALLY STATED AS LOCAL MANUAL CONTROL ONLY.
EF-3 SHALL ENERGIZE WHEN SPACE TEMPERATURE RISES ABOVE 90 DEG F (ADJUSTABLE).

3.12 DUCT REHEAT COILS (SEE DIAGRAM)

3.13 MONITORING AND ALARMS
THE FOLLOWING POINTS SHALL BE MONITORED AND ALARMED AT THE MONITORING CONSOLE AND AS OTHERWISE SPECIFIED HEREINAFTER:
- A. POINT DESCRIPTIONS:
  1. CURRENT SENSING RELAYS PROVIDE FOR ALL AIR HANDLING UNIT SUPPLY AND RETURN/EXHAUST FANS; ALL HOT, AND DOMESTIC HOT RECIRCULATING PUMPS; ALL GENERAL EXHAUST FANS.
  2. HIGH/LOW TEMPERATURE ALARMS ON ALL DDCS TEMPERATURE SENSORS WITH OFF NORMAL MESSAGES.
  3. FIRE ALARM SYSTEM INPUTS FIRE ALARM SHALL BE INPUT INTO THE DDCS FOR INFORMATION AND SMOKE CONTROL MODE. PROVIDE WIRING FROM THE DDCS INPUTS TO THE FIRE ALARM SYSTEM OUTPUTS. COORDINATE CONNECTION POINTS WITH THE ELECTRICAL CONTRACTOR.
  4. BOILER FLAME FAILURE (TROUBLE).
  5. HIGH/LOW TEMPERATURE ALARMS ON SPACES SERVED BY SPLIT SYSTEM HEAT PUMPS.
- B. WHEN INTERFACING WITH EQUIPMENT PROVIDING REMOTE ANALOG INPUTS OR RECEIVING ANALOG OUTPUTS TO THE DDCS OR WHEN MONITORING REQUIRES THE INSTALLATION OF EXTERNAL RELAYS AT THE EQUIPMENT BEING MONITORED, COORDINATE ALL REQUIREMENTS SUCH AS RANGE, SIGNAL CONDITION, GROUNDING, WIRING AND INPUT IMPEDANCE WITH THE SUPPLIER OF THE EQUIPMENT BEING MONITORED.

END OF SECTION

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REVISIONS:

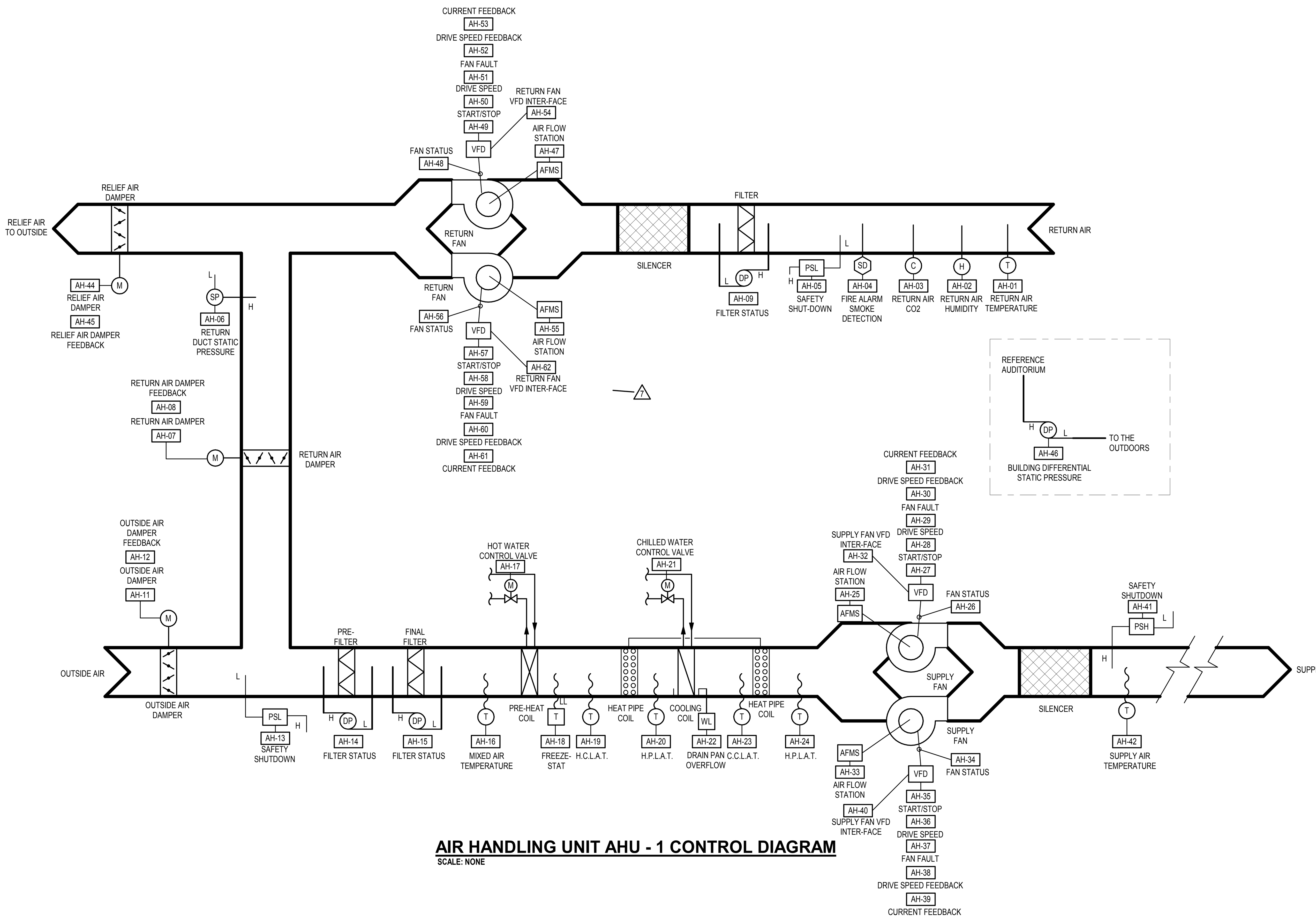
#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100%
CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

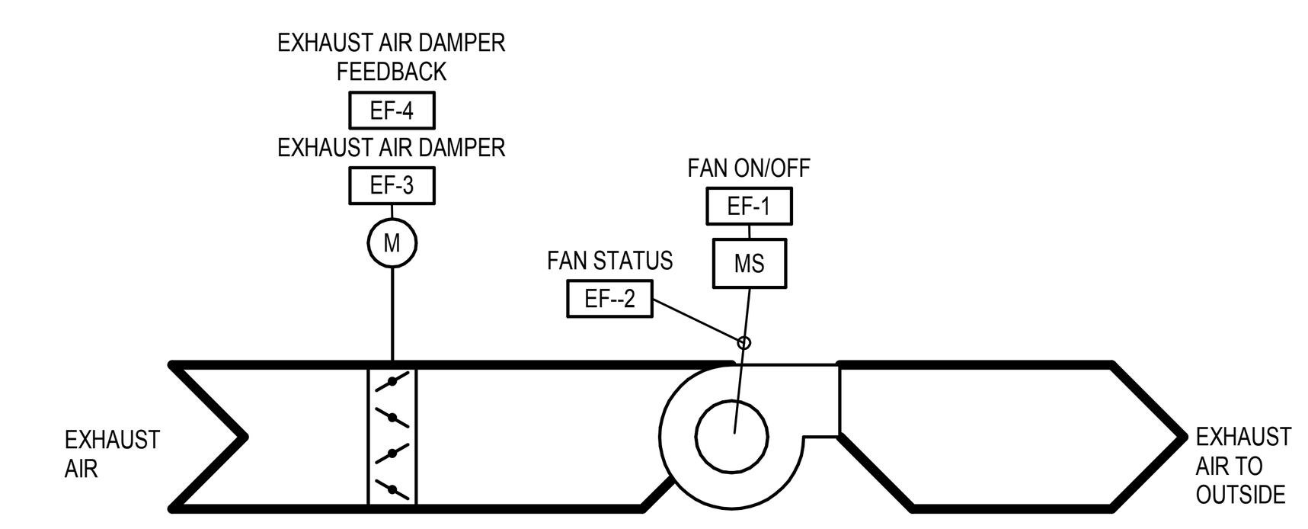
ATC LEGEND

M601



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.	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
POINT NAME	RETURN AIR TEMPERATURE	RETURN AIR HUMIDITY	RETURN AIR CO2	RETURN AIR F.A. SMOKE DETECTION	PRESSURE SAFETY SHUT-DOWN	RETURN DUCT STATIC PRESSURE	RETURN AIR DAMPER	RETURN AIR DAMPER FEEDBACK	FILTER STATUS			OUTSIDE AIR DAMPER FEEDBACK	PRESSURE SAFETY SHUT-DOWN	PRE-FILTER STATUS	FINAL FILTER STATUS	MIXED AIR TEMPERATURE
TYPE	AI	AI	AI	BI	BI	AI	AO	AI	BI			AI	BI	BI	BI	AI
ALARM	HIGH/LOW	HIGH/LOW	HIGH ALARM	ON TRIP	LOW PRESS. SYSTEM ALARM	HIGH/LOW		ON MISMATCH	ADJUSTABLE HIGH PRESS.			ON MISMATCH	LOW PRESS. SYSTEM ALARM	ADJUSTABLE HIGH PRESS.	ADJUSTABLE HIGH PRESSURE	HIGH/LOW
NOTES				3,4	4								4			

POINT NO.	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
POINT NAME	HOT WATER COIL CONTROL VALVE	FREEZE-STAT	PREHEAT COIL - LEAVING AIR TEMPERATURE	HEAT PIPE - LEAVING AIR TEMPERATURE	CHILLED WATER COIL CONTROL VALVE	DRAIN PAN OVERFLOW	COOLING COIL - LEAVING AIR TEMPERATURE	HEAT PIPE - LEAVING AIR TEMPERATURE	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
TYPE	AO	BI	AI	AI	AO	BI	AI	AI	AI	BI	BO	AO	BI	AI	AI	INTER-FACE
ALARM		ON TRIP	HIGH/LOW	HIGH/LOW		ON TRIP	HIGH/LOW	HIGH/LOW		ON FAILURE			ON TRIP	ON MISMATCH		
NOTES		4		5		4		5		1	2	2	2	2	2	2

POINT NO.	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
POINT NAME	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	RETURN FAN - AIRFLOW MEASURING STATION
TYPE	AI	BI	BO	AO	BI	AI	AI	INTER-FACE	BI	AI		AO	AI	AI	AI
ALARM		ON FAILURE			ON TRIP	ON MISMATCH			HIGH PRESS. SYSTEM ALARM	HIGH/LOW			ON MISMATCH	HIGH/LOW	
NOTES		1	2	2	2	2	2	2	4						

POINT NO.	AH-48	AH-49	AH-50	AH-51	AH-52	AH-53	AH-54	AH-55	AH-56	AH-57	AH-58	AH-59	AH-60	AH-61	AH-62
POINT NAME	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 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
TYPE	BI	BO	AO	BI	AI	AI	INTER-FACE	AI	BI	BO	AO	BI	AI	AI	INTER-FACE
ALARM	ON FAILURE			ON TRIP	ON MISMATCH				ON FAILURE			ON TRIP	ON MISMATCH		
NOTES	1	2	2	2	2	2	2		1	2	2	2	2	2	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, 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. MODULATE OUTSIDE AIR DAMPER BETWEEN 1000CFM AND 6700CFM IN "OCCUPIED" MODE TO MAINTAIN A CO2 READING BETWEEN 800 PPM (ADJUSTABLE) AND 1000 PPM (ADJUSTABLE).

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. 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:6/17/2022 10:21:10 AM

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PROJECT NO. 2021-07128

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

EHREN E. LOHRMANN
REGISTERED
No. PE10911293
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PROFESSIONAL ENGINEER

REVISIONS:

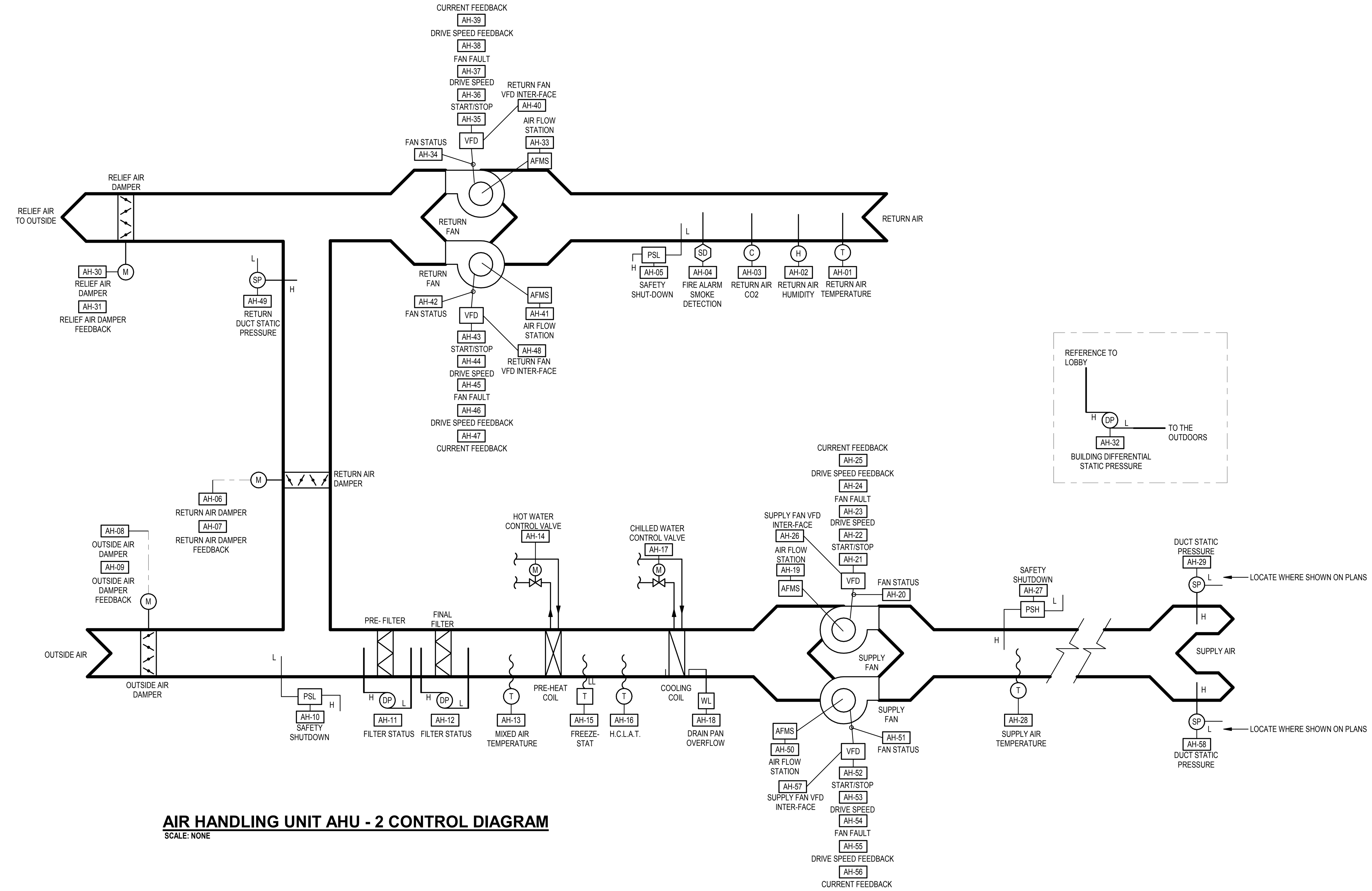
#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

ATC DIAGRAMS

M602



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.	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 AIR DAMPER	AO		
AH-07	RETURN AIR DAMPER FEEDBACK	AI	ON MISMATCH	
AH-08	OUTSIDE AIR DAMPER	AO		
AH-09	OUTSIDE AIR DAMPER FEEDBACK	AI	ON MISMATCH	
AH-10	PRESSURE SAFETY SHUT-DOWN	BI	LOW PRESS. SYSTEM ALARM	4
AH-11	PRE - FILTER STATUS	BI	ADJUSTABLE HIGH PRESS.	
AH-12	FINAL FILTER STATUS	BI	ADJUSTABLE HIGH PRESSURE	
AH-13	MIXED AIR TEMPERATURE	AI	HIGH/LOW	
AH-14	HOT WATER COIL CONTROL VALVE	AO		
AH-15	FREEZE-STAT	BI	ON TRIP	4
AH-16	PREHEAT COIL - LEAVING AIR TEMPERATURE	AI	HIGH/LOW	
AH-17	CHILLED WATER COIL CONTROL VALVE	AO		
AH-18	DRAIN PAN OVERFLOW	BI	ON TRIP	4
AH-19	SUPPLY FAN - AIRFLOW MEASURING STATION	AI	△7	
AH-20	SUPPLY FAN - STATUS	BI	ON FAILURE	1
AH-21	SUPPLY FAN - START/STOP	BO		2
AH-22	SUPPLY FAN - DRIVE SPEED	AO		2
AH-23	SUPPLY FAN - FAULT	BI	ON TRIP	2
AH-24	SUPPLY FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-25	SUPPLY FAN - CURRENT FEEDBACK	AI		2
AH-26	SUPPLY FAN VFD INTER-FACE	INTER-FACE		2
AH-27	PRESSURE SAFETY SHUT-DOWN	BI	HIGH PRESS. SYSTEM ALARM	4
AH-28	SUPPLY AIR - TEMPERATURE	AI	HIGH/LOW	
AH-29	SUPPLY DUCT STATIC PRESSURE	AI	HIGH/LOW	
AH-30	RELIEF AIR DAMPER	AO		
AH-31	RELIEF AIR DAMPER FEEDBACK	AI	ON MISMATCH	
AH-32	BUILDING DIFFERENTIAL STATIC PRESSURE	AI	HIGH/LOW	
AH-33	RETURN FAN - AIRFLOW MEASURING STATION	AI	△7	
AH-34	RETURN FAN - STATUS	BI	ON FAILURE	1
AH-35	RETURN FAN - START/STOP	BO		2
AH-36	RETURN FAN - DRIVE SPEED	AO		2
AH-37	RETURN FAN - FAULT	BI	ON TRIP	2
AH-38	RETURN FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-39	RETURN FAN - CURRENT FEEDBACK	AI		2
AH-40	RETURN FAN VFD INTER-FACE	INTER-FACE		2
AH-41	RETURN FAN - AIRFLOW MEASURING STATION	AI	△7	
AH-42	RETURN FAN - STATUS	BI	ON FAILURE	1
AH-43	RETURN FAN - START/STOP	BO		2
AH-44	RETURN FAN - DRIVE SPEED	AO		2
AH-45	RETURN FAN - FAULT	BI	ON TRIP	2
AH-46	RETURN FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-47	RETURN FAN - CURRENT FEEDBACK	AI		2
AH-48	RETURN FAN VFD INTER-FACE	INTER-FACE		2
AH-49	RETURN DUCT STATIC PRESSURE	AI	HIGH/LOW	
AH-50	SUPPLY FAN - AIRFLOW MEASURING STATION	AI	△7	
AH-51	SUPPLY FAN - STATUS	BI	ON FAILURE	1
AH-52	SUPPLY FAN - START/STOP	BO		2
AH-53	SUPPLY FAN - DRIVE SPEED	AO		2
AH-54	SUPPLY FAN - FAULT	BI	ON TRIP	2
AH-55	SUPPLY FAN - DRIVE SPEED FEEDBACK	AI	ON MISMATCH	2
AH-56	SUPPLY FAN - CURRENT FEEDBACK	AI		2
AH-57	SUPPLY FAN VFD INTER-FACE	INTER-FACE		2
AH-58	SUPPLY DUCT STATIC PRESSURE	AI	HIGH/LOW	

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. △9 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, THE INTERLOCKED GENERAL EXHAUST FANS SHALL REMAIN OFF. PROVIDE WALL MOUNTED RH SENSOR AS SHOWN ON DRAWINGS.
  2. △9 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 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 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.
- 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. 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
PROJECT NO. 2021-07128

GREENFIELD CENTRAL HIGH SCHOOL
AUDITORIUM RENOVATION & ADDITION
810 N BROADWAY ST.
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#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

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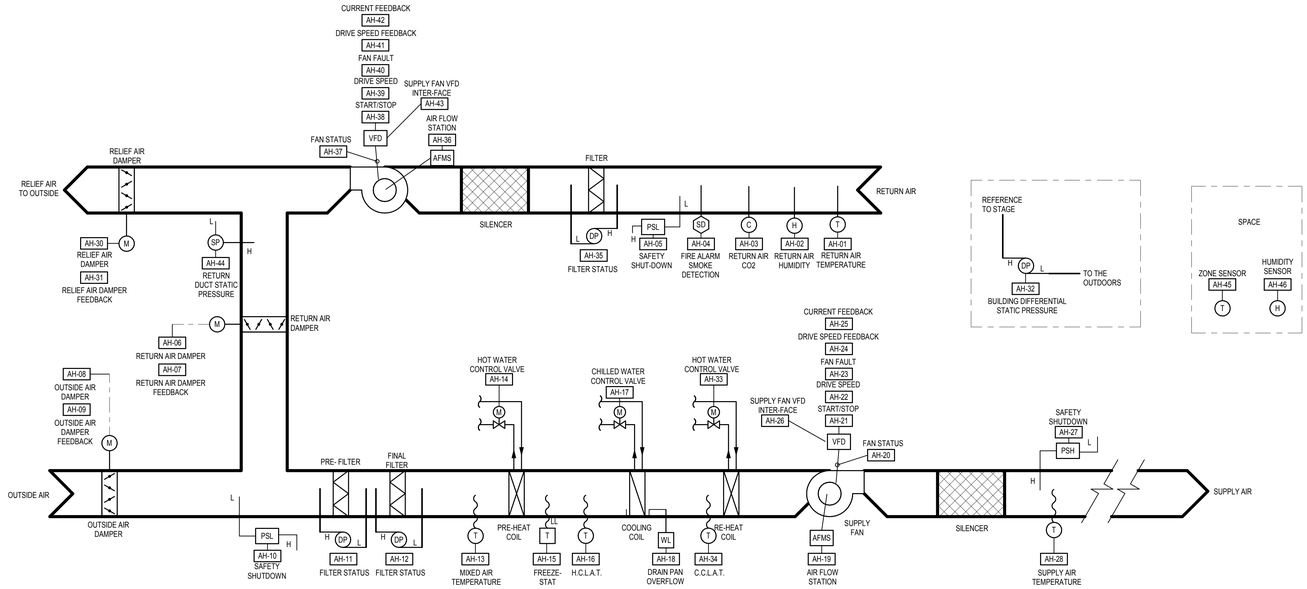
DRAWN BY: BMW

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 - S. 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	AI	AO	AI	BI	AI	AI	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	ON FAILURE	ON TRIP			ON TRIP	ON MISMATCH			HIGH PRESS SYSTEM ALARM	HIGH/LOW					ON MISMATCH	HIGH/LOW	ADJUSTABLE HIGH PRESS		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				

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, 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 A 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 A FAN AND ASSOCIATED 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 REVERSE IN ORDER.

M. RETURN FAN SYSTEM CONTROL
1. THE RETURN FAN SYSTEM CONSISTS OF A FAN AND ASSOCIATED 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.

N. SUPPLY AIR TEMPERATURE SET POINT AND RESET
1. THE AIR HANDLING UNIT COMPONENTS SHALL BE SEQUENCED TO PROVIDE A SUPPLY AIR TEMPERATURE OF 90 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 LOCALLY 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
PROJECT NO. 2021-07128

REVISIONS:

#	Date	Desc.
7	06.09.22	BID PKG. #2 ADD. #7
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	BMW

ATC DIAGRAMS

GREENFIELD CENTRAL HIGH SCHOOL AUDITORIUM RENOVATION & ADDITION

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GREENFIELD, IN 46140

EHREN E. LOHRMANN
REGISTERED
No. PE10911293
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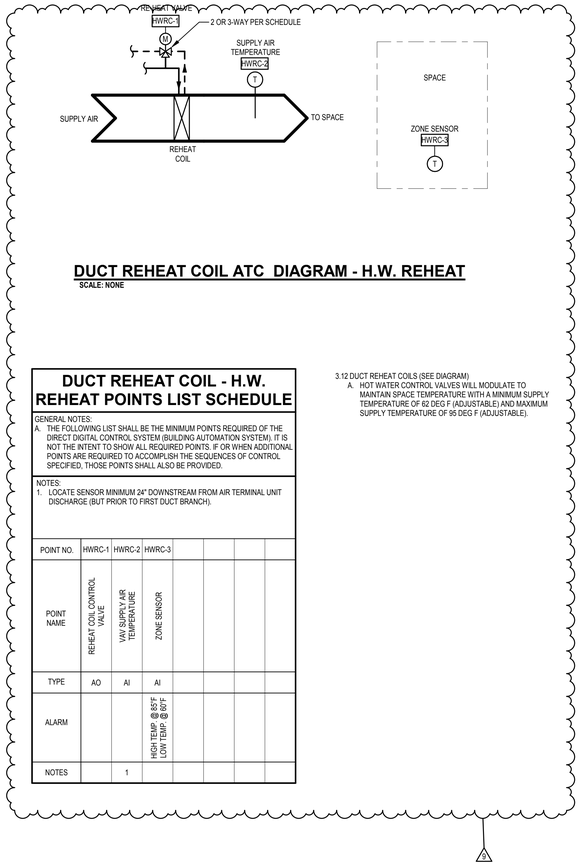
M604



DUCT REHEAT COIL ATC DIAGRAM - H.W. REHEAT

SCALE: NONE

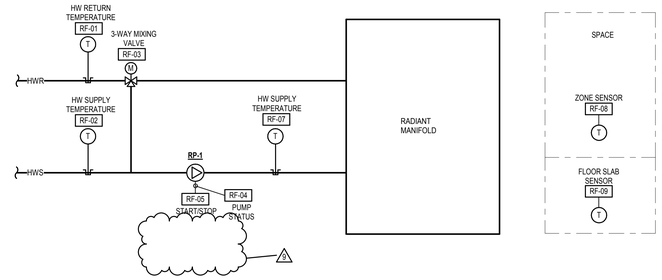
DUCT REHEAT COIL - H.W. REHEAT POINTS LIST SCHEDULE

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. LOCATE SENSOR MINIMUM 24" DOWNSTREAM FROM AIR TERMINAL UNIT DISCHARGE (BUT PRIOR TO FIRST DUCT BRANCH).

POINT NO.	HWRC-1	HWRC-2	HWRC-3				
POINT NAME	REHEAT COIL CONTROL VALVE	VAV SUPPLY AIR TEMPERATURE	ZONE SENSOR				
TYPE	AO	AI	AI				
ALARM			HIGH TEMP. @ 85°F LOW TEMP. @ 0°F				
NOTES		1					

3.12 DUCT REHEAT COILS (SEE DIAGRAM)
A. 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).



RADIANT FLOOR ATC DIAGRAM

SCALE: NONE

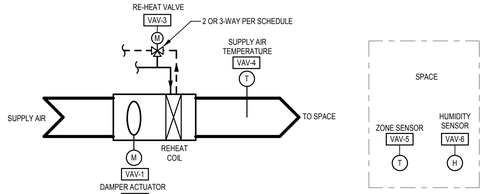
RADIANT FLOOR POINTS LIST

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.	RF-01	RF-02	RF-03	RF-04	RF-05	RF-06	RF-07	RF-08	RF-09
POINT NAME	HOT WATER SYSTEM RETURN TEMPERATURE	HOT WATER SYSTEM SUPPLY TEMPERATURE	3-WAY MIXING VALVE	RADIANT PUMP (RP-1) STATUS	RADIANT PUMP (RP-1) START/STOP	HOT WATER SYSTEM SUPPLY TEMPERATURE	HOT WATER SYSTEM SUPPLY TEMPERATURE	ZONE SENSOR	FLOOR SLAB SENSOR
TYPE	AI	AI	AO	BI	BO	AI	AI	AI	AI
ALARM	HIGH/LOW	HIGH/LOW		ON FAILURE		HIGH/LOW	LOW	HIGH/LOW	
NOTES				1					

3.5 MAIN VESTIBULE HOT WATER RADIANT FLOOR / CABINET HEATER
A. SYSTEM DESCRIPTION:
1. HOT WATER RADIANT FLOOR IS THE PRIMARY HEATING FOR THE MAIN VESTIBULE. CABINET UNIT HEATER IS SECONDARY. REFER TO DRAWINGS.
B. RADIANT FLOOR:
1. WHEN THERE IS A CALL FOR HEAT, THE CIRCULATION PUMP SHALL ENERGIZE AND CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.
2. SUPPLY WATER TEMPERATURE TO FLOOR SHALL BE LIMITED TO A MAXIMUM OF 120 DEG F. SLAB TEMPERATURE SHALL BE LIMITED TO 90 DEG F.
C. CABINET UNIT HEATER:
1. IF RADIANT FLOOR IS UNABLE TO MAINTAIN SPACE TEMPERATURE, THE FAN SHALL ENERGIZE AND HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.



AIR TERMINAL UNIT ATC DIAGRAM - H.W. REHEAT

SCALE: NONE

AIR TERMINAL UNIT - H.W. REHEAT POINTS LIST SCHEDULE

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. CONNECT DP FLOW SENSOR PROVIDED WITH AIR TERMINAL UNIT.
2. LOCATE SENSOR MINIMUM 24" DOWNSTREAM FROM AIR TERMINAL UNIT DISCHARGE (BUT PRIOR TO FIRST DUCT BRANCH).
3. APPLIES TO AIR TERMINAL UNITS IN ROOM L126A, L129.

POINT NO.	VAV-1	VAV-2	VAV-3	VAV-4	VAV-5	VAV-6	
POINT NAME	DAMPER ACTUATOR	AIRFLOW	REHEAT COIL CONTROL VALVE	VAV SUPPLY AIR TEMPERATURE	ZONE SENSOR	ROOM HUMIDITY SENSOR	
TYPE	AO	AI	AO	AI	AI	AI	
ALARM					HIGH TEMP. @ 85°F LOW TEMP. @ 0°F		
NOTES		1		2		3	

3.7 VAV BOXES (AIR TERMINAL UNITS)
A. THE AIR TERMINAL UNIT MANUFACTURER SHALL PROVIDE THE BOX WITH VELOCITY SENSOR AND AIR FLOW TAPS FOR USE IN THE TEMPERATURE CONTROLS. PROVIDE ALL OTHER CONTROL COMPONENTS. REHEAT BOXES SHALL BE PROVIDED WITH A 2-WAY OR 3-WAY MODULATING HOT WATER VALVE AS INDICATED ON THE DRAWINGS, AND A DISCHARGE AIR TEMPERATURE SENSOR MOUNTED MINIMUM 24" DOWNSTREAM OF THE REHEAT COIL (BUT BEFORE ANY BRANCH TAKE-OFFS). ALSO REFER TO DRAWINGS FOR LISTED CFM SET POINTS AND LISTED DISCHARGE AIR TEMPERATURE SET POINTS AS DESCRIBED BELOW. PROVIDE AUTO ZERO'ING FUNCTION TO ADJUST THE ZERO CALIBRATION POINT OF THE PRESSURE OR VELOCITY TRANSDUCER. AIR TERMINAL UNIT CONTROL SEQUENCES SHALL BE ACTIVE WHEN THE ASSOCIATED AHU SUPPLY FAN IS 'ON'.
B. VAV SHUTOFF (COOLING-ONLY) CONTROL - IF THE SPACE TEMPERATURE IS BELOW SETPOINT, THE AIR TERMINAL UNIT DAMPER SHALL BE AT THE LISTED DEAD BAND MINIMUM CFM. IF SPACE TEMPERATURE RISES ABOVE THE COOLING SETPOINT, THE CONTROL SHALL MODULATE THE AIR TERMINAL UNIT DAMPER BETWEEN THE LISTED DEAD BAND MINIMUM CFM AND THE LISTED COOLING MAXIMUM CFM TO SATISFY THE SPACE COOLING SETPOINT. AIR TERMINAL UNIT VAV SHUTOFF CONTROLS SHALL REVERSE ACTION DURING 'WARM-UP' CYCLES.
C. VAV HOT WATER REHEAT AND HEATING CONTROL
1. FIXED SET POINTS (ADJUSTABLE):
A. COOLING MAXIMUM CFM – REFER TO AIR TERMINAL UNIT SCHEDULE FOR SPECIFIED COOLING MAXIMUM CFM SET POINT.
B. DEADBAND MINIMUM CFM – REFER TO AIR TERMINAL UNIT SCHEDULE FOR SPECIFIED DEADBAND MINIMUM CFM (NOTE: UNLESS NOTED OTHERWISE ON THE DRAWINGS, DEAD BAND MINIMUM CFM SHALL BE SET TO THE SCHEDULED VALUE EVEN IF BELOW MANUFACTURER'S MINIMUM BOX CFM.).
C. REHEAT MAXIMUM CFM – REFER TO AIR TERMINAL UNIT SCHEDULE FOR SPECIFIED REHEAT MAXIMUM CFM. REHEAT MODE IS DEFINED AS ANYTIME THE ASSOCIATED AHU IS IN COOLING MODE (MECHANICAL COOLING ACTIVE, OR CHILLED WATER VALVE ACTIVE, OR ECONOMIZER IS ACTIVE).
D. HEATING MAXIMUM CFM – REFER TO AIR TERMINAL UNIT SCHEDULE FOR SPECIFIED HEATING MAXIMUM CFM. HEATING MODE IS DEFINED AS ANYTIME THE ASSOCIATED AHU IS NOT IN COOLING MODE (MECHANICAL COOLING INACTIVE, CHILLED WATER VALVE INACTIVE, AND OUTSIDE AIR DAMPERS ARE BEING CONTROLLED TO MINIMUM POSITION).
2. ACTIVE SET POINTS (ADJUSTABLE):
A. SUPPLY AIR CFM SET POINT
B. MAXIMUM DISCHARGE AIR TEMPERATURE LIMITS:
1) REHEAT MODE DISCHARGE AIR TEMPERATURE SHALL BE LIMITED TO 20 DEGF ABOVE THE ACTIVE SPACE HEATING TEMPERATURE SET POINT (EXCEPT DURING MORNING WARM-UP CYCLE).
2) HEATING MODE DISCHARGE AIR TEMPERATURE SHALL BE LIMITED TO 25 DEGF ABOVE THE ACTIVE SPACE HEATING TEMPERATURE SET POINT (EXCEPT DURING MORNING WARM-UP CYCLE).
3. AIR TERMINAL UNIT DAMPER CONTROL – MODULATE DAMPER POSITION TO MAINTAIN CURRENT SUPPLY AIR CFM SET POINT.
4. COOLING SEQUENCE - IF SPACE TEMPERATURE RISES ABOVE THE COOLING SETPOINT, RESET THE SUPPLY AIR CFM SET POINT BETWEEN THE LISTED DEAD BAND MINIMUM CFM AND THE LISTED COOLING MAXIMUM CFM TO SATISFY THE SPACE COOLING SETPOINT.
5. DEADBAND MODE - IF THE SPACE TEMPERATURE IS IN THE DEAD BAND BETWEEN HEATING AND COOLING SET POINTS, THE SUPPLY AIR CFM SET POINT SHALL BE SET TO THE LISTED DEAD BAND MINIMUM CFM.
6. REHEAT / HEATING SEQUENCE:
IF SPACE TEMPERATURE DROPS BELOW THE HEATING SETPOINT, AND HEATING HOT WATER IS AVAILABLE, THE AIR TERMINAL UNIT SHALL CONTROL AS FOLLOWS:
A. 1ST STAGE OF REHEAT / HEATING SHALL BE TO ACTIVATE A DISCHARGE AIR TEMPERATURE CONTROL SEQUENCE AND RESET AN ACTIVE DISCHARGE AIR TEMPERATURE SET POINT TO MAINTAIN THE SPACE HEATING SET POINT, WITH THE REHEAT OR HEATING DISCHARGE AIR TEMPERATURE HIGH LIMIT DEFINED ABOVE. SUPPLY AIR CFM SET POINT SHALL REMAIN AT DEADBAND MINIMUM CFM DURING THIS 1ST STAGE SEQUENCE.
B. 2ND STAGE OF REHEAT / HEATING SHALL BE TO RESET THE SUPPLY AIR CFM SET POINT BETWEEN THE MINIMUM DEADBAND CFM AND THE ACTIVE MAXIMUM REHEAT OR MAXIMUM HEATING CFM WHILE MAINTAINING THE ACTIVE DISCHARGE AIR TEMPERATURE HIGH LIMIT.
C. REVERSE THE SEQUENCE WHEN SPACE HEATING SETPOINT IS REACHED. WHEN IN A 'WARM UP' CYCLE, THE AIR TERMINAL UNIT CONTROLS SHALL FUNCTION AS IN HEATING MODE.
D. HOT WATER VALVE CONTROL - MODULATE THE VALVE POSITION TO MAINTAIN THE ACTIVE DISCHARGE AIR TEMPERATURE SETPOINT WHILE IN THE REHEAT OR HEATING MODE ONLY. OTHERWISE, THE VALVE SHALL BE CLOSED.
E. IF HOT WATER IS NOT AVAILABLE, THE AIR TERMINAL UNITS SHALL ACT AS SHUTOFF (COOLING ONLY) BOXES.
D. CONSTANT VOLUME HOT WATER REHEAT CONTROL – SAME AS FOR VAV HOT WATER REHEAT AND HEATING CONTROL SEQUENCES ABOVE EXCEPT THAT THE SUPPLY AIR CFM SET POINT SHALL BE HELD CONSTANT AT THE SCHEDULED CFM.
E. CARBON DIOXIDE (CO2) OVER-RIDE – PROVIDE A WALL-MOUNTED CO2 SENSOR FOR EACH HIGH OCCUPANCY SPACE AS NOTED ON THE DRAWINGS. IF MEASURED CO2 LEVEL RISES ABOVE A HIGH LIMIT OF 700 PPM (ADJUSTABLE) FOR 5 MINUTES, INCREASE THE ASSOCIATED BOX SUPPLY AIR FLOW SET POINT BY 10 PERCENT. FOR EVERY 5 MINUTES THE CO2 LEVEL IS ABOVE THE HIGH LIMIT, INCREASE BOX SUPPLY AIR FLOW SET POINT AN ADDITIONAL 10 PERCENT. DO NOT EXCEED THE LISTED COOLING MAXIMUM CFM. ONCE THE MEASURED CO2 LEVEL IS BELOW 600 PPM FOR 10 MINUTES, CANCEL THE OVER-RIDE SEQUENCE. IF A SPACE CO2 LEVEL RISES ABOVE 1200 PPM AN ALARM SHALL BE ISSUED THRU THE BAS SYSTEM.
F. ENERGY MANAGEMENT - EACH AIR TERMINAL UNIT SHALL HAVE ITS OWN TIME OF DAY SCHEDULE FOR "OCCUPIED" AND "UNOCCUPIED" CONTROL. PROVIDE AN OVERRIDE PUSHBUTTON AT EACH SENSOR THERMOSTAT TO OVERRIDE THE "UNOCCUPIED" SCHEDULE FOR A FIXED (PROGRAMMABLE) TIME. REFER TO PARAGRAPH 3.1 'OCCUPIED, 'UNOCCUPIED', AND 'OVERRIDE' MODES ABOVE, SUB-PARA E OVER-RIDE MODE. THE DDC SYSTEM SHALL TRACK, LOG AND REPORT ON THE AMOUNT OF TIME EACH AIR TERMINAL UNIT WAS OVERRIDDEN AS WELL AS ASSOCIATED DISCHARGE AIR TEMPERATURE.
G. VAV-3-01: WHEN EXHAUST FAN EF-4 IS ENERGIZED, THE BOX SHALL GO TO FULL COOLING CFM AND MODULATE REHEAT COIL TO MAINTAIN SPACE TEMPERATURE.

EF-4 ATC DIAGRAM

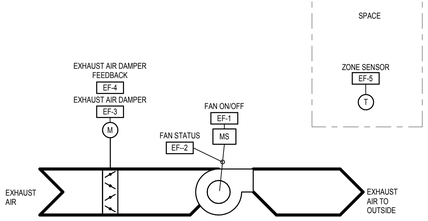
SCALE: NONE

EF-4 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.
2. LOCAL MANUAL CONTROL.

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	2	1						



EF-3 ATC DIAGRAM

SCALE: NONE

EF-3 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	EF-5			
POINT NAME	FAN ON/OFF	FAN STATUS	EXHAUST AIR DAMPER	EXHAUST AIR DAMPER FEEDBACK	ZONE SENSOR			
TYPE	BO	BI	AO	AI	AI			
ALARM		ON FAULT		ON MISMATCH				
NOTES		1						

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HEAPY
PROJECT NO. 2021-07128

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

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT:	#21107
DATE:	05.20.2022
DRAWN BY:	BMW

ATC DIAGRAMS

M605

PLOT DATE/TIME:6/17/2022, 10:21:16 AM

ENERGY RECOVERY SECTIONS

GENERAL NOTES:
A. EQUIPMENT SHALL BE CONSTRUCTED AND LABELED FOR REQUIRED SCCR (SHORT CIRCUIT CURRENT RATING). COORDINATE WITH DIVISION 26.
B. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR SEISMIC RESTRAINT REQUIREMENTS.
C. REFER TO ASHRAE STANDARD 90.1 FOR DEFINITION / CALCULATION OF ENERGY RECOVERY EFFECTIVENESS.
D. WHEN PICV IS INDICATED, MINIMUM REQUIRED INLET PRESSURE SHALL NOT EXCEED 5 PSIG.

NOTES:
1. BASIS OF DESIGN - INNERGY TECH IFA-28TF-230L-11FPI-2RU-45.2 R-134A.
2. ALTERNATE

	ENERGY RECOVERY DEVICE		TYPE			WRAP AROUND COIL					
ASSOCIATED EQUIPMENT MARK	SENSIBLE	ENTHALPY	WHEEL	PLATE	HEAT PIPE	CFM	MAX. VELOCITY (FPM)	CAPACITY (MBH)	ENTERING AIR TEMPERATURE DB / WB (°F)	LEAVING AIR TEMPERATURE DB / WB (°F)	SEE NOTE
AHU-1	●	-	-	-	●	20,000	450	195.3	84.0/70.0	63.1/56.7	1,2

AIR HANDLING UNITS

GENERAL NOTES:
A. HEATING CAPACITY BASED ON 160°F ENT. WATER / 30% GLYCOL.
B. COOLING CAPACITY BASED ON 43°F ENT. WATER / 30% GLYCOL.
C. VFD'S SHALL BE CONSTRUCTED AND LABELED FOR REQUIRED SCCR (SHORT CIRCUIT CURRENT RATING). COORDINATE WITH DIVISION 26.
D. UNIT CONFIGURATIONS (SUPPLY FAN POSITION RELATIVE TO COOLING COIL) - "HDT" - HORIZONTAL DRAW THRU; "VDT" - VERTICAL DRAW THRU; "HBT" - HORIZONTAL BLOW THRU; "VBT" - VERTICAL BLOW THRU. REFER TO DRAWINGS FOR LAYOUT.
E. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR SEISMIC RESTRAINT REQUIREMENTS.
F. WHEN UVGI (ULTRAVIOLET GERMICIDAL IRRADIATION) IS REQUIRED, REFER TO SPECIFICATIONS AND AHU DETAIL FOR REQUIREMENTS AND LOCATION(S). POWER CONNECTION SHALL BE 120VOLT - 1PHASE.
G. IF EC MOTORS ARE INDICATED OR SPECIFIED, EACH MOTOR SHALL BE PROVIDED WITH FACTORY DISCONNECTING MEANS, INTERNAL OVERLOAD PROTECTION, FIELD ADJUSTABLE SPEED CONTROL, AND REMOTE ANALOGUE SPEED CONTROL INPUT WHEN REMOTE CONTROL IS SPECIFIED, COORDINATED WITH THE BUILDING AUTOMATION SYSTEM.
H. THE LISTED MAX UNIT HEIGHT INCLUDES THE INTEGRAL UNIT BASE RAIL BUT DOES NOT INCLUDE THE SPECIFIED CONCRETE PAD. IF THE HEIGHT OF THE SPECIFIED CONCRETE PAD IS REQUIRED TO BE INCREASED, SUCH AS TO ACCOMMODATE CONDENSATE TRAP HEIGHT, THEN THE LISTED MAX UNIT HEIGHT SHALL BE DECREASED BY THAT SAME AMOUNT.
I. WHEN PICV IS INDICATED, MINIMUM REQUIRED INLET PRESSURE SHALL NOT EXCEED 5 PSIG.

NOTES:
1. BASIS OF DESIGN IS TRANE CSAA050.
2. BASIS OF DESIGN IS TRANE CSAA030.
3. BASIS OF DESIGN IS TRANE CSAA014.
4. PREHEAT COIL PERFORMANCE BASED ON 50% SUPPLY CFM.
5. REHEAT COIL PERFORMANCE SHALL BE AS FOLLOWS: 480 FPM MAX FACE VELOCITY; 260.3 MBH CAPACITY WITH 55.0 °F ENTERING AIR AND 95.0 °F LEAVING AIR AT 0.2 IN. W.C. MAX AIR PRESSURE DROP; 26.1 GPM AT1.2 FT HD MAX WATER PRESSURE DROP AND 2 INCH PIPE RUN OUTS.
6. WRAP AROUND HEAT PIPE INCLUDED AS ALTERNATE.
7. SEE SEPARATE SCHEDULES FOR ACOUSTIC SCHEDULES

9

			SUPPLY FAN			MOTOR(S)					RETURN FAN			MOTOR(S)				
UNIT NUMBER	UNIT CONFIGURATION	AREA SERVED	CFM (TOTAL)	EXT / TOTAL STATIC PRESSURE (IN. W.C.)	FAN QUANTITY	MOTOR (HP EACH)	VOLTAGE - PHASE	VARIABLE FREQUENCY DRIVE	VARIABLE FREQUENCY DRIVE (QTY)	MINIMUM SCCR (AMPS)	INTEGRAL PIEZO RING AIRFLOW STATION	CFM (TOTAL)	EXT / TOTAL STATIC PRESSURE (IN. W.C.)	FAN QUANTITY	MOTOR (HP EACH)	VOLTAGE - PHASE	VARIABLE FREQUENCY DRIVE	VARIABLE FREQUENCY DRIVE (QTY)	MINIMUM SCCR (AMPS)	INTEGRAL PIEZO RING AIRFLOW STATION
AHU-1	HDT	AUDITORIUM	20,000	1.5/3.9	2	10	460-3	●	2	10K	●	20,000	1.0/2.4	2	7.5	460/3	●	2	10K	●
AHU-2	HDT	LOBBY AND BACK OF HOUSE	13,800	2.25/4.96	2	10	460-3	●	2	10K	●	13,800	1.0/2.2	2	5	460/3	●	2	10K	●
AHU-3	HDT	STAGE	6,000	2.25/4.95	1	7.5	460-3	●	1	5K	●	6,000	1.0/2.6	1	5	460/3	●	1	5K	●

	PREHEAT COIL								COOLING COIL								
UNIT NUMBER	MAX VELOCITY (FPM)	CAPACITY (MBH)	ENTERING AIR TEMPERATURE DB (°F)	LEAVING AIR TEMPERATURE DB (°F)	MAXIMUM AIR PRESSURE DROP (IN. W.C.)	MAXIMUM WATER PRESSURE DROP (FT. HD.)	GPM	PIPE RUNOUT SIZE	MAX VELOCITY (FPM)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	ENTERING AIR TEMPERATURE DB / WB (°F)	LEAVING AIR TEMPERATURE DB / WB (°F)	MAXIMUM AIR PRESSURE DROP (IN. W.C.)	MAXIMUM WATER PRESSURE DROP (FT. HD.)	GPM	PIPE RUNOUT SIZE
AHU-1	220	508.7	16.0	62.9	0.05	3.3	53.6	2.5	450	1035.1	663.0	84.0/70.0	54.0/53.8	0.6	8.6	160.0	4
AHU-2	250	321.8	17.0	60.0	0.05	2.5	33.9	2	480	710.1	457.5	84.0/70.0	54.0/53.9	0.9	10.0	109.8	4
AHU-3	250	121.3	35.0	72.4	0.05	1.4	12.8	1.5	480	285.4	192.1	83.0/69.0	54.0/53.9	0.8	6.8	44.1	2.5

		FILTER	PRE-FILTER	FINAL FILTER	OUTSIDE AIR			DIMENSIONS			MISC.					
UNIT NUMBER	REHEAT COIL (REFER TO NOTE 5)	THICKNESS / MERV	THICKNESS / MERV	THICKNESS / MERV	MINIMUM CFM	ECONOMIZER	AIRFLOW MEASUREMENT STATION	MAX UNIT LENGTH (INCHES)	MAX UNIT WIDTH (INCHES)	MAX UNIT HEIGHT (INCHES) (NOTE H)	APPROX. UNIT WEIGHT (LBS.)	HUMIDIFIER (SEE SEPARATE SCHEDULE)	ENERGY RECOV. SECTION (SEE SEP. SCHED.)	AIR BLENDER (SEE SEP. SCHED.)	UVGI (NOTE G)	SEE NOTE
AHU-1	-	2"/8	2'/8	4"/13	6700	●	-	591"	126"	83"	21000	-	●	-	-	1,4,6,7
AHU-2	-	-	2"/8	4"/13	4550	●	-	320"	94"	68"	8250	-	-	-	-	2,4,7
AHU-3	●	2"/8	2"/8	4"/13	1325	●	-	489"	72"	48"	8250	-	-	-	-	3,4,7

9 9 9 9

HYDRONIC PUMPS

GENERAL NOTES:
A. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR VIBRATION ISOLATOR TYPES AND SEISMIC RESTRAINT REQUIREMENTS.
B. VFD'S SHALL BE CONSTRUCTED AND LABELED FOR REQUIRED SCCR (SHORT CIRCUIT CURRENT RATING). COORDINATE WITH DIVISION 26.
C. IF EC MOTORS ARE INDICATED OR SPECIFIED, EACH MOTOR SHALL BE PROVIDED WITH FACTORY DISCONNECTING MEANS, INTERNAL OVERLOAD PROTECTION, FIELD ADJUSTABLE SPEED CONTROL, AND REMOTE ANALOGUE SPEED CONTROL INPUT WHEN REMOTE CONTROL IS SPECIFIED, COORDINATED WITH THE BUILDING AUTOMATION SYSTEM.
D. PUMPS REQUIRED TO HAVE A PUMP EFFICIENCY INDEX (PEI) RATING PER DOE MANDATES SHALL BE FACTORY LABELED WITH THEIR RATING. PEIVL RATINGS ARE FOR PUMPS WITH EC MOTORS OR FACTORY-MOUNTED VFD'S. PEICL RATINGS ARE FOR PUMPS WITHOUT EC MOTORS OR FOR PUMPS WITH REMOTE MOUNTED VFD'S.

NOTES:
1.

			PERFORMANCE		MOTOR											BASIS OF DESIGN		
MARK	DESCRIPTION	SERVICE	GPM	MIN. REQUIRED FT. HD.	HORSEPOWER (HP) / WATTS (W)	VOLTAGE - PHASE	RPM	ELECTRONICALLY COMMUTATED	ECM MCA (AMPS, TOTAL)	ECM MOCP (AMPS, TOTAL)	VARIABLE FREQUENCY DRIVE	MINIMUM SCCR (AMPS)	PUMP SUCTION SIZE	PUMP DISCHARGE SIZE	VIBRATION ISOLATOR TYPE	MANUFACTURER	MODEL	SEE NOTE
PHWP-3	INLINE PUMP	HOT WATER	308.0	30	5	460-3	1200	-			●		4"	4"	J1	BELL & GOSSETT	E-80 4X4X9.5B	
RP-1	INLINE PUMP	RADIANT FLOOR PUMP	3.0	15.0	125 W	115-1	2950	-	-	-	-		1"	1"	J1	BELL & GOSSETT	NRF-25	
SHWP-1	BASE MOUNTED END SUCTION PUMP	HOT WATER	750.0	130	40	460-3	1800	-	-	-	●		5"	4"	-	BELL & GOSSETT	E-1510 4GC	
SHWP-2	BASE MOUNTED END SUCTION PUMP	HOT WATER	750.0	130	40	460-3	1800	-	-	-	●		5"	4"	-	BELL & GOSSETT	E-1510 4GC	

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HOT WATER BOILERS

GENERAL NOTES:
A. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR SEISMIC RESTRAINT REQUIREMENTS.
B. LISTED GAS DELIVERY PRESSURE IS DELIVERY PRESSURE TO THE BOILER'S GAS TRAIN.
C. ELECTRIC SERVICE SHALL BE SINGLE POINT POWER CONNECTION. WHEN CONTROL POWER DIFFERS FROM SERVICE POWER, PROVIDE FACTORY INSTALLED TRANSFORMER.
D. IT IS RECOGNIZED THAT SOME BOILER MANUFACTURERS REQUIRE AN INTEGRAL Hx CIRCULATION PUMP IN ADDITION TO THE BOILER'S PRIMARY PUMP. THE SINGLE POINT POWER CONNECTION TO THE BOILER SHALL INCLUDE POWER FOR THE Hx CIRCULATION PUMP. REFER TO PUMP SCHEDULE FOR ASSOCIATED PRIMARY PUMP.

NOTES:
1. BASIS OF DESIGN - CLEAVER BROOKS CFC-E 3500.
2. 30% PROPYLENE GLYCOL.

		TYPE							CAPACITY						ELECTRICAL SERVICE	BLOWER						SERVICE SIZES			APPROX. DIMENSIONS				MISC.	
MARK	DESCRIPTION	CONDENSING	NON-CONDENSING	NATURAL GAS	OIL-FIRED	COMBINATION NATURAL GAS / OIL	PROPANE	COMBINATION NATURAL GAS / PROPANE	INPUT (MBH)	OUTPUT (MBH)	ENTERING WATER TEMPERATURE (°F)	LEAVING WATER TEMPERATURE (°F)	GPM	MIN. HEATING SURFACE AREA (SQ. FT.)	BLOWER MOTOR (HP)	VOLTAGE - PHASE	INTEGRAL Hx CIRC. PUMP (NOTE D)	VOLTAGE - PHASE	MIN CIRCUIT AMPS (MCA)	MAX OVER CURRENT PROTECTION (MOCP)	MINIMUM SCCR (AMPS)	WATER SUPPLY AND RETURN RUN-OUT SIZE	FLUE VENT	COMBUSTION AIR DUCT / PIPE	LENGTH	WIDTH	HEIGHT	APPROX. OPERATING WEIGHT (LBS)	SAFETY RELIEF VALVE(S) SETTING (PSIG)	SEE NOTE
HWB-3	CONDENSING BOILER	●	-	●	-	-	-	-	3,500	3,080	140	160	308	889	2400W	460-3	-	460-3	4	20	5K	5"	12"	12"	5'-8"	4'-0"	7'-7"	5,250	MATCH EXISTING	1,2

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AHU-1 RETURN FAN ACOUSTICS

SOUND PATH	63 (HZ)	125	250	500	1K	2K	4K	8K
SUPPLY BOTTOM	65 dB	66 dB	70 dB	57 dB	52 dB	55 dB	46 dB	42 dB
RETURN	70 dB	67 dB	69 dB	49 dB	52 dB	58 dB	51 dB	47 dB
OUTDOOR	80 dB	76 dB	85 dB	78 dB	79 dB	80 dB	68 dB	58 dB
EXHAUST	81 dB	76 dB	86 dB	79 dB	79 dB	81 dB	69 dB	59 dB
CASING	76 dB	76 dB	79 dB	72 dB	70 dB	60 dB	55 dB	50 dB

AHU-1 SUPPLY FAN ACOUSTICS

SOUND PATH	63 (HZ)	125	250	500	1K	2K	4K	8K
SUPPLY BOTTOM	78 dB	77 dB	77 dB	65 dB	61 dB	65 dB	60 dB	55 dB
RETURN	73 dB	69 dB	69 dB	49 dB	52 dB	59 dB	51 dB	48 dB
OUTDOOR	76 dB	70 dB	82 dB	67 dB	68 dB	71 dB	59 dB	51 dB
EXHAUST	76 dB	70 dB	82 dB	66 dB	68 dB	71 dB	58 dB	50 dB
CASING	82 dB	80 dB	80 dB	75 dB	73 dB	64 dB	60 dB	56 dB

AHU-3 RETURN FAN ACOUSTICS

SOUND PATH	63 (HZ)	125	250	500	1K	2K	4K	8K
SUPPLY BOTTOM	57 dB	71 dB	72 dB	56 dB	48 dB	47 dB	47 dB	46 dB
RETURN	64 dB	68 dB	65 dB	51 dB	48 dB	51 dB	53 dB	48 dB
OUTDOOR	73 dB	82 dB	85 dB	77 dB	74 dB	70 dB	68 dB	63 dB
EXHAUST	74 dB	83 dB	86 dB	78 dB	75 dB	71 dB	69 dB	64 dB
CASING	73 dB	82 dB	82 dB	71 dB	68 dB	55 dB	51 dB	49 dB

AHU-3 SUPPLY FAN ACOUSTICS

SOUND PATH	63 (HZ)	125	250	500	1K	2K	4K	8K
SUPPLY BOTTOM	68 dB	75 dB	71 dB	68 dB	60 dB	62 dB	64 dB	57 dB
RETURN	70 dB	65 dB	60 dB	58 dB	50 dB	55 dB	55 dB	46 dB
OUTDOOR	69 dB	67 dB	74 dB	72 dB	64 dB	65 dB	61 dB	50 dB
EXHAUST	68 dB	66 dB	73 dB	71 dB	63 dB	64 dB	61 dB	49 dB
CASING	81 dB	75 dB	82 dB	82 dB	76 dB	63 dB	62 dB	57 dB

EXPANSION TANKS

GENERAL NOTES:
A. AIR CHARGE TANK IN THE FIELD TO SCHEDULED AIR PRESSURE.
B. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR SEISMIC RESTRAINT REQUIREMENTS.

NOTES:
1. BASIS OF DESIGN: BELL AND GOSSETT B-600

		TYPE				CAPACITY			APPROX. DIMENSIONS		CONNECTION SIZES		
MARK	SYSTEM	DIAPHRAGM / BLADDER	CONVENTIONAL / VENTED	VERTICAL	HORIZONTAL	MIN. TOTAL VOLUME (GAL)	MIN. ACCEPT. VOL. (GAL)	AIR PRESSURE (PSIG)	DIAMETER	HEIGHT / LENGTH	INLET CONNECTION	DRAIN CONNECTION	SEE NOTE
ET-5	HOT WATER	●	-	●	-	158	158	MATCH EXISTING	30"	65"	0.75"	2"	1

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HVAC DESIGN DATA

GENERAL NOTES:
A. OUTDOOR DESIGN CONDITIONS:
95°F DB SUMMER
76°F WB SUMMER
-10°F DB WINTER
B. DESIGN ALTITUDE: 850 FT.

NOTES:
1. LISTED RH IS MAXIMUM ANTICIPATED AT LISTED DB TEMPERATURE.
2. REFER TO ATC SEQUENCES FOR ACTUAL ROOM SETPOINTS.
3. "FLOATING" MEANS THERE IS NO ACTIVE CONTROL.
4. OUTDOOR AIR VENTILATION ONLY.

	INTERIOR DESIGN DATA				
	SUMMER		WINTER		
SPACE NAME / TYPE	°F DB	% RH (NOTE 1)	°F DB	% RH	SEE NOTE
STAGE	75	55	72	FLOATING	3
ENTRY	75	55	72	FLOATING	3
TOILET ROOMS	78	60	72	FLOATING	3
MECHANICAL ROOMS	NOTE 4	FLOATING	68	FLOATING	3
AUDITORIUM	75	55	72	FLOATING	3
ALL OTHER SPACES	75	55	72	FLOATING	3

RADIANT FLOOR HEATING SYSTEMS

GENERAL NOTES:
A. MAXIMUM PRESSURE DROP: 4.5 FT.
B. BASIS OF DESIGN: REHAU.
C. PIPING SPACED 6" ON CENTER.
D. CAPACITY BASED ON 124°F ENT. WATER WITH 30% PROPYLENE GLYCOL AND 20 DEGREE DELTA.

LOOP	LOOP LENGTH (FT)	HEATING BTUH	GPM	SLAB TEMP.	TUBE SIZE	PRESS. DROP (FT. HD.)
MANIFOLD 1		26,752	2.82	85	-	4.5
A1	315	6,884	0.73	-	5/8"	3.4
A2	313	6,520	0.69	-	5/8"	3.0
A3	317	5,937	0.63	-	5/8"	2.6
A4	327	7,412	0.78	-	5/8"	4.0

AIR TERMINAL UNITS - HOT WATER HEAT

GENERAL NOTES:
A. TYPES: "V.V." - VARIABLE VOLUME; "V.V.R." - VARIABLE VOLUME REHEAT; "C.V.R." - CONSTANT VOLUME REHEAT; "V.V.E." - VARIABLE VOLUME EXHAUST; "C.V.E." - CONSTANT VOLUME EXHAUST.
B. 0.5" MAX. S.P. DROP THRU UNIT & COIL AT MAX. CFM.
C. REHEAT COIL CAPACITIES BASED ON HEATING MAX. CFM, 55°F ENT. AIR & 160°F ENT. WATER WITH 30% PROPYLENE GLYCOL, AND MAX. 5FT. HD. W.P.D.
D. AUTO VALVES SHALL BE 2-WAY TYPE UNLESS NOTED OTHERWISE.
E. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR SEISMIC RESTRAINT REQUIREMENTS.
F. WHEN PICV IS INDICATED, MINIMUM REQUIRED INLET PRESSURE SHALL NOT EXCEED 5 PSIG.
G. IF REHEAT COIL IS FURNISHED SEPARATELY FROM TERMINAL UNIT, PROVIDE DUCT TRANSITION AS REQUIRED BETWEEN TERMINAL UNIT AND COIL.
H. MINIMUM 2-ROW COIL.

NOTES:
1. 3-WAY VALVE.

		MINIMUM INLET SIZE			CFM				REHEAT COIL			
Type Mark	TYPE	DIAMETER	WIDTH	HEIGHT	COOLING MAXIMUM	DEAD BAND MINIMUM	REHEAT MAXIMUM	HEATING MAXIMUM	MBH	GPM	PIPE RUNOUT SIZE	REFER TO NOTE
VAV-2-01	V.V.R.	10"			900	180	450	900	35.5	3.7	1"	
VAV-2-02	V.V.R.	16"			2,300	675	1,150	2,300	96.6	10.0	1.5"	
VAV-2-03	V.V.R.	8"			700	155	350	700	26.6	2.8	1"	
VAV-2-04	V.V.R.	16"			2,100	675	1,050	2,100	86.6	9.0	1.25"	
VAV-3-01	V.V.R.	16"			2,150	790	1,075	2,150	93.4	9.7	1.25"	1
VAV-3-02	V.V.R.	5"			175	35	90	175	7.6	0.9	0.75"	
VAV-3-03	V.V.R.	5"			120	25	60	120	5.1	0.6	0.75"	
VAV-3-04	V.V.R.	6"			400	80	200	400	17.4	1.9	0.75"	
VAV-3-05	V.V.R.	8"			590	120	295	445	19.0	2.0	0.75"	
VAV-3-06	V.V.R.	5"			115	30	60	115	5.0	0.6	0.75"	
VAV-3-07	V.V.R.	5"			70	25	35	70	2.7	0.6	0.75"	
VAV-3-08	V.V.R.	8"			480	160	240	480	21.0	2.2	0.75"	
VAV-3-09	V.V.R.	8"			530	180	265	530	23.1	2.4	0.75"	
VAV-3-10	V.V.R.	8"			760	250	380	380	15.1	1.7	0.75"	
VAV-3-11	V.V.R.	8"			500	100	250	250	9.5	1.1	0.75"	
VAV-3-12	C.V.R.	10"			1,160	1,160	1,160	1,160	35.2	3.7	1"	
VAV-3-13	C.V.R.	8"			750	750	750	750	24.7	2.6	1"	

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HOT WATER DUCT REHEAT COILS

GENERAL NOTES:
A. HEATING CAPACITY BASED ON 160°F ENTERING WATER TEMPERATURE WITH 30% PROPYLENE GLYCOL AND 55°F ENTERING AIR TEMPERATURE.
B. MAXIMUM 0.5" W.C. AIR STATIC PRESSURE DROP AND 10 FT. HD. WATER PRESSURE DROP, UNLESS NOTED OTHERWISE.
C. AUTO VALVES SHALL BE 2-WAY TYPE UNLESS NOTED OTHERWISE.
D. PROVIDE DUCT TRANSITIONS TO & FROM, AND DUCT ACCESS PANEL UPSTREAM & DOWNSTREAM OF EACH COIL.
E. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR SEISMIC RESTRAINT REQUIREMENTS.
F. WHEN PICV IS INDICATED, MINIMUM REQUIRED INLET PRESSURE SHALL NOT EXCEED 5 PSIG.

NOTES:
1. 3-WAY CONTROL VALVE

		CAPACITY			DIMENSIONS			
MARK	SERVICE	CFM	HEATING (MBH)	GPM	FINNED WIDTH	FINNED HEIGHT	PIPE RUNOUT SIZE	SEE NOTE
HWRC-1	WEST WATERFALL	1,105	42	4.5	22"	16"	1"	
HWRC-2	BALCONY	6,075	231	24.4	56"	30"	2"	
HWRC-3	UPPER MAIN FLOOR	5,735	218	23.0	50"	36"	2"	
HWRC-4	LOWER MAIN FLOOR	5,720	217	22.9	48"	48"	2"	
HWRC-5	EAST WATERFALL	1,105	42	4.5	24"	16"	1"	1

FANS

GENERAL NOTES:
A. ALL FANS SHALL BE A.M.C.A. 211 AND 311 PERFORMANCE CERTIFIED AND SHALL BEAR THE A.M.C.A. LABEL.
B. SONES VALUES BASED ON A.M.C.A. 301 MEASURED AT 5 FT.
C. MOTOR HORSEPOWERS LISTED SHALL BE CONSIDERED MINIMUM.
E. ROOF & WALL OPENINGS ARE APPROX. VERIFY SIZE & COORDINATE.
F. COORDINATE STEEL FRAMING AROUND ROOF OPENING WHERE REQUIRED FOR DECK SUPPORT, AND WALL LINTELS FOR WALL OPENINGS.
G. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR VIBRATION ISOLATOR TYPES AND SEISMIC RESTRAINT REQUIREMENTS.
H. VFD'S SHALL BE CONSTRUCTED AND LABELED FOR REQUIRED SCCR (SHORT CIRCUIT CURRENT RATING). COORDINATE WITH DIVISION 26.
I. IF EC MOTORS ARE INDICATED OR SPECIFIED, EACH MOTOR SHALL BE PROVIDED WITH FACTORY DISCONNECTING MEANS, INTERNAL OVERLOAD PROTECTION, FIELD ADJUSTABLE SPEED CONTROL, AND REMOTE ANALOGUE SPEED CONTROL INPUT WHEN REMOTE CONTROL IS SPECIFIED, COORDINATED WITH THE BUILDING AUTOMATION SYSTEM.

NOTES:
1.

					MOTOR							BASIS OF DESIGN		
MARK	DESCRIPTION	FAN CFM	STATIC PRESSURE (IN. W.C.)	MAXIMUM SONES	HORSEPOWER (HP) / WATTS (W)	VOLTAGE - PHASE	ELECTRONICALLY COMMUTATED	VARIABLE FREQUENCY DRIVE	MINIMUM SCCR (AMPS)	APPROX. WEIGHT (LBS.)	VIBRATION ISOLATOR TYPE	MANUFACTURER	MODEL	SEE NOTE
CF-1	6' HVLS FAN	12660	-	-	50W	115-1	-	●	5K	35	-	GREENHECK	DC-5-6-3LV	
CF-2	6' HVLS FAN	12660	-	-	50W	115-1	-	●	5K	35	-	GREENHECK	DC-5-6-3LV	
CF-3	6' HVLS FAN	12660	-	-	50W	115-1	-	●	5K	35	-	GREENHECK	DC-5-6-3LV	
CF-4	6' HVLS FAN	12660	-	-	50W	115-1	-	●	5K	35	-	GREENHECK	DC-5-6-3LV	
CF-5	6' HVLS FAN	12660	-	-	50W	115-1	-	●	5K	35	-	GREENHECK	DC-5-6-3LV	
CF-6	6' HVLS FAN	12660	-	-	50W	115-1	-	●	5K	35	-	GREENHECK	DC-5-6-3LV	
EF-1	DOWNBLAST CENTRIFUGAL EXHAUST FAN	2660	0.6	10.0	1	115-1	●	-	5K	100	-	GREENHECK	G-180-VG	
EF-2	DOWNBLAST CENTRIFUGAL EXHAUST FAN	675	0.4	8.5	1/6	115-1	●	-	5K	30	-	GREENHECK	G-095-VG	
EF-3	DOWNBLAST CENTRIFUGAL EXHAUST FAN	250	0.3	4.7	1/15	115-1	●	-	5K	20	-	GREENHECK	G-070-VG	
EF-4	DOWNBLAST CENTRIFUGAL EXHAUST FAN	2500	0.3	10.0	3/4	115-1	●	-	5K	100	-	GREENHECK	G-180-VG	

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HOT WATER HEATING UNITS

GENERAL NOTES:
A. HEATING CAPACITY BASED ON 60°F ENT. AIR & 160°F ENT. WATER / 30%GLYCOL.
B. MAXIMUM 5FT. HD. W.P.D. THRU COIL.
C. MOTOR: 115V-1PH UNLESS NOTED OTHERWISE.
D. VERIFY / COORDINATE CABINET DIMENSIONS, MOUNTING & RECESS REQUIREMENTS PRIOR TO ORDERING.
E. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR VIBRATION ISOLATOR TYPES AND SEISMIC RESTRAINT REQUIREMENTS.
F. RECESSED UNITS SHALL HAVE FOUR(4) SIDE OVERLAP UNLESS NOTED OTHERWISE.
G. COORDINATE LINTELS IN MASONRY WALLS FOR FULL & SEMI-RECESSED UNIT WALL OPENINGS.
H. IF EC MOTORS ARE INDICATED OR SPECIFIED, EACH MOTOR SHALL BE PROVIDED WITH FACTORY DISCONNECTING MEANS, INTERNAL OVERLOAD PROTECTION, FIELD ADJUSTABLE SPEED CONTROL, AND REMOTE ANALOGUE SPEED CONTROL INPUT WHEN REMOTE CONTROL IS SPECIFIED, COORDINATED WITH THE BUILDING AUTOMATION SYSTEM.
I. WHEN PICV IS INDICATED, MINIMUM REQUIRED INLET PRESSURE SHALL NOT EXCEED 5 PSIG.

NOTES:
1. BASIS OF DESIGN: TRANE FFDB060 WITH DUCT COLLAR INLET AND OUTLET.
2. BASIS OF DESIGN: TRANE FFDB040 WITH DUCT COLLAR INLET AND OUTLET.
3. BASIS OF DESIGN: TRANE FFE030 WITH BOTTOM STAMPED LOUVER INLET AND OUTLET.
4. BASIS OF DESIGN: TRANE UHSB060.
5. BASIS OF DESIGN: TRANE UHSB018.
6. LOW SPEED OUTPUT.

							MOTOR	APPROX. CABINET DIMENSIONS				THERMOSTAT		
MARK	DESCRIPTION	MOUNTING	CFM	HEATING CAPACITY (MBH)	GPM	PIPE RUNOUT SIZE	HP / WATTS	WIDTH	DEPTH	HEIGHT	VIBRATION ISOLATOR TYPE	UNIT MOUNTED	WALL MOUNTED	SEE NOTE
CUH-1	HORIZONTAL RECESSED HEATER	CEILING MOUNTED	285	25.0	2.0	0.75"	1/20	35"	30"	11"	J1	-	-	3
CUH-2	HORIZONTAL CABINT HEATER	SUSPENDED	450	38.0	3.1	1"	1/8	39"	27"	11"	J1	-	●	2
CUH-3	HORIZONTAL CABINT HEATER	SUSPENDED	780	54.0	4.4	1"	1/4	48"	27"	11"	J1	-	●	1
UH-1	HORIZONTAL PROPELLER UNIT HEATER	SUSPENDED	900	29.4	4.4	1"	1/20	18"	11"	21"	J1	●	-	4
UH-2	HORIZONTAL PROPELLER UNIT HEATER	SUSPENDED	900	29.4	4.4	1"	1/20	18"	11"	21"	J1	-	●	4
~~UH-3~~	~~HORIZONTAL PROPELLER UNIT HEATER~~	~~SUSPENDED~~	~~395~~	~~8.8~~	~~1.3~~	~~0.75"~~	~~16W~~	~~15"~~	~~10"~~	~~15"~~	~~J1~~	~~●~~	~~-~~	~~5~~
UH-4	HORIZONTAL PROPELLER UNIT HEATER	SUSPENDED	350	7.9	1.3	0.75"	16W	15"	10"	15"	J1	●	-	5,6
UH-5	HORIZONTAL PROPELLER UNIT HEATER	SUSPENDED	395	8.8	1.3	0.75"	16W	15"	10"	15"	J1	●	-	5

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REGISTERED
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PROFESSIONAL ENGINEER

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

MECHANICAL SCHEDULES

M701

PLOT DATE/TIME:6/17/2022 10:21:16 AM

SPLIT SYSTEM HEAT PUMP UNITS

GENERAL NOTES:
A. UNLESS NOTED OTHERWISE, CAPACITIES SHALL BE BASED ON INTERIOR DESIGN CONDITIONS OF 80 DB / 67 WB COOLING; 70 DB HEATING.
B. HEAT PUMP COOLING CAPACITY SHALL BE BASED ON 95°F AMBIENT CONDITIONS.
C. HEAT PUMP HEATING CAPACITY SHALL BE BASED ON 17°F AMBIENT CONDITIONS.
D. CONDENSING UNITS SHALL INCLUDE LOW AMBIENT COOLING & HEATING CONTROLS AND ACCESSORIES, OPERATIONAL TO 0°F.
E. WHEN APPLICABLE, REFER TO SPECIFICATIONS FOR VIBRATION ISOLATOR TYPES AND SEISMIC RESTRAINT REQUIREMENTS.
F. REFRIGERANT PIPING - SIZING, NUMBER OF PIPES AND CIRCUITS, ARRANGEMENT, ETC. SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
G. ELECTRIC SERVICES FOR OUTDOOR UNIT AND INDOOR UNIT - SINGLE POINT POWER SERVICE CONNECTIONS TO EACH UNIT. UNLESS NOTED OTHERWISE, ADEQUACY OF LISTED CIRCUIT SIZES MUST BE VERIFIED BY H.C. AND UNIT SUPPLIER. COST FOR INCREASE OR CHANGE OF ELECTRIC SERVICE FOR EQUIPMENT SELECTED SHALL BE BORNE BY H.C.
H. IF EC MOTORS ARE INDICATED OR SPECIFIED, EACH MOTOR SHALL BE PROVIDED WITH FACTORY DISCONNECTING MEANS, INTERNAL OVERLOAD PROTECTION, FIELD ADJUSTABLE SPEED CONTROL, AND REMOTE ANALOGUE SPEED CONTROL INPUT WHEN REMOTE CONTROL IS SPECIFIED, COORDINATED WITH THE BUILDING AUTOMATION SYSTEM.
I. COOLING COIL CONDENSATE PUMPS SHALL BE FACTORY-FURNISHED, COMPATIBLE WITH INDOOR FAN COIL UNIT VOLTAGE AND POWERED FROM THE INDOOR FAN COIL UNIT SINGLE POINT POWER CONNECTION.

NOTES:
1. POWER FOR INDOOR UNIT IS TO BE FED THRU THE OUTDOOR UNIT POWER SUPPLY.

INDOOR UNIT																		OUTDOOR HEAT PUMP CONDENSING UNIT - AIR COOLED									
		TYPE				FAN	COIL CAPACITY				ELECTRICAL SERVICE	APPROX. DIMENSIONS				BASIS OF DESIGN				ELECTRICAL SERVICE				BASIS OF DESIGN		
							COOLING		HEATING																	
MARK	DESCRIPTION	WALL-MOUNTED	CEILING-MOUNTED	CEILING RECESSED	DUCTED	CFM	ENT. AIR TEMP DB/WB	TOTAL / SENSIBLE CAPACITY (MBH)	ENTERING AIR TEMP. DB	CAPACITY (MBH)	SERVED THRU OUTDOOR UNIT (NOTE 1)	VOLTAGE - PHASE	LENGTH	WIDTH	HEIGHT	COOLING COIL CONDENSATE DRAIN PUMP (NOTE I)	MANUFACTURER	MODEL	MARK	DESCRIPTION	NOMINAL TONS (SIZED TO MATCH COIL)	VARIABLE SPEED COMPRESSOR(S)	VOLTAGE - PHASE	MIN CIRCUIT AMPS (MCA)	MAX OVER CURRENT PROTECTION (MOCP)	MINIMUM SCCR (AMPS)	MANUFACTURER	MODEL	SEE NOTE
MS-1	WALL-MOUNTED INDOOR UNIT	●	-	-	-	920	80.0/67.0	36/25	70.0	22.4	●	208-1	46"	12"	14"	●	MITSUBISHI	PKA-A36KA7	MSACCU-1	HEAT PUMP	3	●	208-1	25	31	5K	MITSUBISHI	PUZ-A36NKA7	1
MS-2	WALL-MOUNTED INDOOR UNIT	●	-	-	-	920	80.0/67.0	36/25	70.0	22.4	●	208-1	46"	12"	14"	●	MITSUBISHI	PKA-A36KA7	MSACCU-2	HEAT PUMP	3	●	208-1	25	31	5K	MITSUBISHI	PUZ-A36NKA7	1

AIR DISTRIBUTION DEVICES

GENERAL NOTES:
A. ALL LAY-IN AIR DEVICES SHALL FIT IN 24"X24" LAY-IN CLG SYSTEM. VERIFY GRID TYPE AND COORDINATE AIR DEVICE COMPATIBILITY.
B. FINISH KEY: "W.B.E." - WHITE BAKED ENAMEL; "E.C.L." - ETCHED CLEAR LACQUER OR ANODIZED; "C.C.B.A." - CUSTOM COLOR SELECTED BY ARCHITECT.
C. SUPPLY AIR DIFFUSERS SHALL BE 4-WAY BLOW, UNLESS INDICATED OTHERWISE ON DRAWINGS.
D. PROVIDE AUX. FRAMES FOR AIR DEVICES IN PLASTER, GYPSUM BOARD, TILE OR OTHER HARD SURFACES.

NOTES:
1. DUCTED SLOTS SHALL USE PLENUM SIMILAR TO PRICE SDB
2. 1" MERV 8 FILTER.
3. ENVIROTHANE FINISH.
4. AIR DEVICE SHALL BE COMPATIBLE WITH ARMSTRONG TECHZONE CEILING SYSTEM.
5. BLANK OFF UNUSED AIR DEVICES

		MOUNTING TYPE				MATERIAL		FINISH				BASIS OF DESIGN		
MARK	DESCRIPTION	LAY-IN	SURFACE	DUCT	SPLINE	SNAP-IN	STEEL	ALUMINUM	STAINLESS STEEL	W.B.E.	E.C.L.	C.C.B.A.	OPPOSED BLADE DAMPER	SQ-TO-RD NECK ADAPTOR	MANUFACTURER	MODEL	SEE NOTE
E10	LOUVERED RETURN GRILLE			●			●			●			●		PRICE	530	
E11	LOUVERED RETURN GRILLE		●				●			●					PRICE	530	
E20	EGGCRATE CEILING GRILLE	●						●		●					PRICE	80	
E30	48" 2 SLOT DIFFUSER	●						●		●					PRICE	SDR75	1
E31	48" 3 SLOT DIFFUSER	●						●		●					PRICE	SDR75	
E40	HEAVY DUTY RETURN GYM GRILLE			●			●			●					PRICE	96	
R10	72" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDR75	1,4,5
R11	48" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDR75	1,4,5
R12	36" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDR75	1,4,5
R13	24" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDR75	1,4,5
R20	EGGCRATE CEILING GRILLE	●						●		●					PRICE	80	
R21	FILTERED EGGCRATE GRILLE		●					●		●					PRICE	80FF	2
R30	LOUVERED RETURN GRILLE		●				●			●					PRICE	530	
R31	LOUVERED RETURN GRILLE WITH 0 DEGREE DEFLECTION		●				●					●			PRICE	510Z	
R40	RETURN GRILLE 0 DEFLECTION		●					●				●	●		TITUS	33SZFL	3
R50	LINEAR BAR GRILLE CORE 15B		●					●				●			PRICE	LBP	
S10	STANDARD SQ. PLAQUE CEILING DIFFUSER - ROUND NECK - 24 X 24	●					●			●					PRICE	SCD	
S11	STANDARD SQ. PLAQUE CEILING DIFFUSER - ROUND NECK - 24 X 24		●				●			●					PRICE	SCD	
S20	HIGH CAPACITY DRUM LOUVER			●			●					●	●		PRICE	HCD	
S21	HIGH CAPACITY DRUM LOUVER		●				●					●			PRICE	HCD	
S30	SPIRAL DUCT GRILLE			●			●			●					PRICE	SDG	
S40	LOUVERED SUPPLY GRILLE		●				●			●					PRICE	520	
S50	48" 2 SLOT DIFFUSER	●						●		●					PRICE	SDS75	1
S51	48" 4 SLOT DIFFUSER	●						●		●					PRICE	SDS75	1
S52	72" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDS75	1,4,5
S53	48" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDS75	1,4,5
S54	36" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDS75	1,4,5
S55	24" 2 SLOT TECHZONE DIFFUSER	●						●				●			PRICE	SDS75	1,4,5
S60	LINEAR BAR GRILLE CORE 27C		●					●				●			PRICE	LBP	
S61	LINEAR BAR GRILLE CORE 15B		●					●				●			PRICE	LBP	
S70	ROUND MODULAR FLOOR DIFFUSER		●					●				●			PRICE	MDF-DP	
S80	DISPLACEMENT FLOW RECESSED DIFFUSER		●				●					●			PRICE	DFR	
S90	LINEAR DISPLACEMENT FLOOR GRILLE		●					●				●			PRICE	DFGL	

DUCT CONSTRUCTION, SEALING, AND INSULATION

GENERAL NOTES:
A. REFER TO SPECIFICATIONS FOR DUCT CONSTRUCTION: SHEET METAL DUCT; INTERIOR LINING; EXTERIOR INSULATION; ETC.
B. DUCT CONSTRUCTION AND SEALING SHALL BE PER LATEST S.M.A.C.N.A. STANDARDS.

NOTES:
1. ROUND SHEET METAL RUN-OUTS TO AIR DEVICES DOWNSTREAM OF VAV BOXES SHALL BE EXTERNALLY INSULATED.
2. RETURN DUCTWORK WITHIN 15' OF AIR HANDLING UNIT SHALL BE INTERNALLY LINED WITH 2" FLEXIBLE ELASTOMERIC INSULATION.
3. AIR DEVICES ARE DIRECTLY CONNECTED TO SUPPLY DUCT.
4. WATERTIGHT SEAL.
5. FIRE WRAPPED, PER CODE REQUIREMENTS.
6. ALUMINUM DUCTWORK.
7. STAINLESS STEEL DUCTWORK.
8. REFER TO DETAIL ON SHEET M501.
9. INSULATE FROM 24" UPSTREAM OF BACKDRAFT / ISOLATION DAMPER TO PENETRATION OF WALL / ROOF.
10. CONCEALED ROUND RUNOUT DUCTS TO AIR DEVICES MAY BE 1" S.P. CLASS.
11. RETURN DUCTWORK OF AIR HANDLING UNIT SHALL BE INTERNALLY LINED WITH 2" FLEXIBLE ELASTOMERIC INSULATION.
12. SUPPLY DUCTWORK WITHIN 10' OF AIR HANDLING UNIT SHALL BE INTERNALLY LINED WITH 2" FLEXIBLE ELASTOMERIC INSULATION.
13. SUPPLY DUCTWORK WITHIN 15' OF AIR HANDLING UNIT SHALL BE INTERNALLY LINED WITH 2" FLEXIBLE ELASTOMERIC INSULATION.
14. EXPOSED DUCTWORK SHALL BE DOUBLE WALL INSULATED.

	S.M.A.C.N.A. CLASS.								
			LEAKAGE CLASS						
DUCT SYSTEM	S.P. CONSTRUCT.	SEAL CLASS	RECT	RND	INTERNALLY LINED	EXTERNAL INSULATION	DOUBLE WALL INSULATED	NOT INSULATED	SEE NOTE
SUPPLY DUCTWORK UPSTREAM OF VAV BOXES FOR AHU-2	+3"	A	8	4	-	●	-	-	-
SUPPLY DUCTWORK DOWNSTREAM OF VAV BOXES AHU-2	+1"	A	16	8	-	●	-	-	1,14
SUPPLY DUCTWORK DOWNSTREAM FOR AHU-1	+2"	A	16	8	-	●	-	-	12
SUPPLY DUCTWORK FOR STAGE UNIT AHU-3	+2"	A	16	8	-	●	-	-	3,13,14
RETURN DUCTWORK FOR AHU-2	-2"	A	16	8	-	-	-	●	10
TRANSFER/RETURN AIR SOUND BOOT	-1"	A	16	-	●	-	-	-	8
TOILET OR GENERAL EXHAUST DUCTWORK	-1"	A	16	8	-	NOTE 9	-	-	-
RETURN DUCTWORK FOR AHU-1	-2"	A	16	8	●	-	-	-	4,6,11
RETURN DUCTWORK FOR AHU-3	-2"	A	16	8	-	-	-	●	2,14

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
06.17.2022

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: BMW

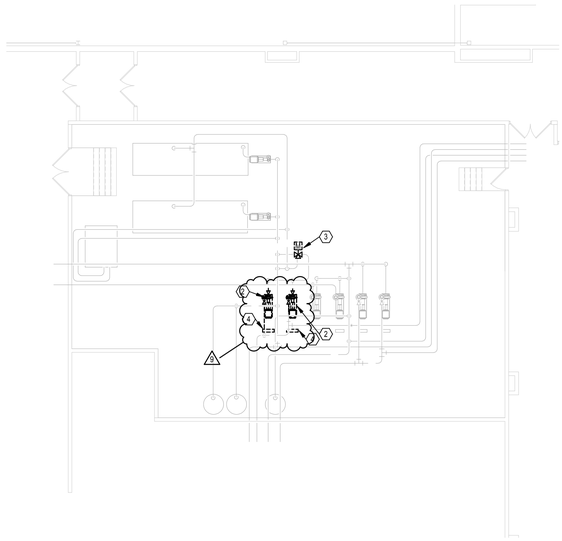
MECHANICAL SCHEDULES

M702

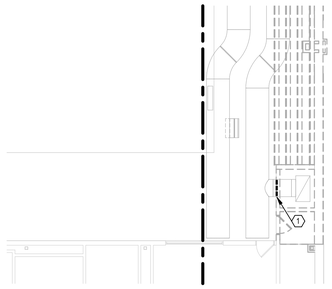
PLOT DATE/TIME:6/17/2022 10:21:17 AM

PLAN NOTES

1. REMOVE TWO EXISTING RETURN GRILLES. UPPER OPENING TO BE EXTENDED AND REUSED IN NEW WORK.
2. REMOVE EXISTING SECONDARY HOT WATER PUMP.
3. REMOVE EXISTING CONTROL VALVE.
4. REMOVE EXISTING VFD.



2 **MECHANICAL DEMOLITION PLAN - FIRST FLOOR - BOILER ROOM**
SCALE: 3/32" = 1'-0"



1 **MECHANICAL DEMOLITION PLAN - FIRST FLOOR - POOL**
SCALE: 3/32" = 1'-0"

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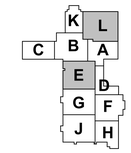
DRAWN BY: BMW

MECHANICAL DEMOLITION PLANS

MD101L

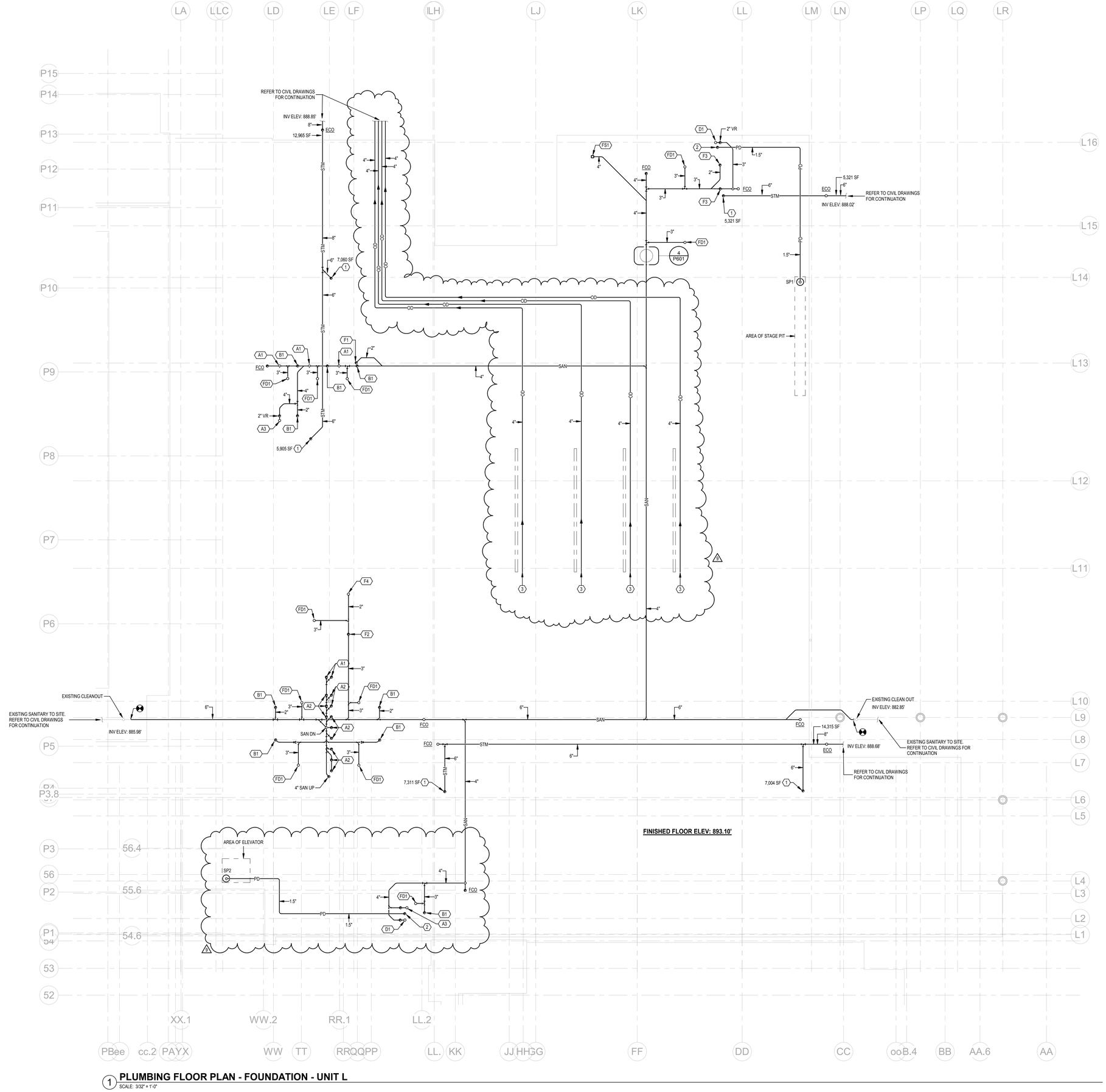


N
TRUE NORTH

PLOT DATE/TIME:6/17/2022 10:21:17 AM

PLAN NOTES

1. 6" STM UP.
2. 1.5" PUMP DISCHARGE UP.
3. SUBSOIL DRAIN LINE FOR MECHANICAL TRENCH. PLUMBING CONTRACTOR TO PROVIDE PERFORATED POLYVINYL CHLORIDE PIPE ASTM D2729 FOR INSTALL. COORDINATE LOCATION WITH MECHANICAL CONTRACTOR. CONNECT AS REQUIRED.



1 **PLUMBING FLOOR PLAN - FOUNDATION - UNIT L**
SCALE: 3/32" = 1'-0"

PLOT DATE/TIME: 6/16/2022 4:28:39 PM

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220 N. COLLEGE AVE
INDIANAPOLIS, IN
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HEAPY
PROJECT NO. 2021-07128

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

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

REVISIONS:

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9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: ME

PLUMBING FLOOR PLAN - FOUNDATION - UNIT L

P100L

K L
C B A
E D
G F
J H

N
TRUE NORTH

PLUMBING FIXTURES

CATALOG NUMBERS INDICATED ARE THOSE OF THE FIRST NAMED MANUFACTURER IN EACH CATEGORY LISTED BELOW - ADDITIONAL MANUFACTURERS ARE LISTED IN PARENTHESIS

A. KOHLER (OR AN APPROVED UNIT BY AMERICAN STD, TOTO, ZURN)
B. SLOAN (DELANY, ZURN)
C. BEMIS (BENEKE, KOHLER, AMERICAN STD.)
D. SMITH (WADE, ZURN, JOSAM, WATTS)
E. CHICAGO (TOTO, T&S BRASS, ZURN)
F. GUY GRAY (OATEY, PLASTIC ODDITIES)
G. McGUIRE (EBC, DEARBORN BRASS, ZURN)
H. FIAT (STERN WILLIAMS, CREATIVE IND., MUSTEE, ZURN)
J. ELKAY (JUST WITH LUG AND SCREW)
K. OASIS (ACORN, ELKAY, HAWS, HALSEY TAYLOR)
L. JR SMITH (WOODFORD, MIFAB, ZURN)
M. AQUARIUS (AQUA-BATH, KOHLER, COMFORT DESIGNS)
N. IN-SINK ERATOR (OR APPROVED EQUAL)
O. WOODFORD (OR APPROVED EQUAL)
P. ZURN (CHICAGO)
Q. TRUEBRO (ZURN, PLUMBEREX)

SCHEDULE ABBREVIATIONS:

ADA	HANDICAP ACCESSIBLE	QD	QUICK DISCONNECT
BO	BACK OUTLET	SB	SINGLE BOWL
BPW	BED PAN WASHER	SST	STAINLESS STEEL
DB	DOUBLE BOWL	UCM	UNDER COUNTER MOUNT
FS	FLOOR SET	VB	VACUUM BREAKER
FT	FLUSH TANK	VR	VANDAL RESISTANT
FV	FLUSH VALVE	WB	WRIST BLADE
GN	GOOSENECK	WH	WALL HUNG
HS	HAND SHOWER	RO	REAR OUTLET

GENERAL NOTE:
1. SUPPLY PIPE SIZES IN THIS SCHEDULE ARE FIXTURE OR SUPPLY STOP CONNECTION SIZES. DOMESTIC COLD AND HOT WATER SUPPLY PIPE SIZES SERVING FIXTURES SHALL BE, AT A MINIMUM, THE SIZES LISTED UNLESS NOTED OTHERWISE OR LABELED ON THE FLOOR PLANS. DOMESTIC COLD WATER SUPPLY PIPE SIZES SERVING FLUSH VALVES SHALL BE AT MINIMUM ONE PIPE SIZE LARGER THAN THE INDICATED CONNECTION SIZE, OR SIZED AS SHOWN ON THE FLOOR PLANS. PIPING AT THE FLUSH VALVE CONNECTION OF A SIZE EQUAL TO THE CONNECTION SIZE SHALL BE LIMITED TO A MAXIMUM 2 FEET IN DEVELOPED LENGTH AND INCLUDE A MAXIMUM OF ONE 90 DEGREE ELBOW FITTING. FULL SIZE MANIFOLDS, WHERE INDICATED ON THE FLOOR PLANS, SHALL BE PROVIDED FULL SIZE FOR THE LENGTH OF THE PIPING CHASE AND TERMINATED WITH A FULL SIZE CAP.

NOTES:
1. PLUMBING FIXTURES AND INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF ANSI 117.1
2. PROVIDE ASSE 1070 LISTED MIXING VALVE FOR LAVATORY FAUCET
3. PC TO PROVIDE VERSAFILTER, AND ADDITIONAL FILTERS TO THE OWNER.
4. PROVIDE PLASTER TRAP FOR UTILITY SINKS.
5. PC TO COORDINATE ELECTRICAL REQUIREMENTS WITH EC.

MARK	DESCRIPTION	MOUNTING HEIGHT	FLOW GPM	FLOW GPF	CONTROL MANUAL	CONTROL SENSOR METERING	CONTROL SENSOR ELECTRIC	CONTROL SENSOR BATTERY	SUPPLY COLD WATER	SUPPLY HOT WATER	SUPPLY TEMPERED	SUPPLY NAT. GAS	WASTE & VENT FIX. OUTLET	WASTE & VENT TRAP	WASTE & VENT FIX. DRAIN	WASTE & VENT WASTE-MIN.	WASTE & VENT VENT-MIN.	WASTE & VENT INDIRECT	WASTE & VENT AIR GAP	WASTE & VENT AIR BREAK	FIXTURE MFR.	FIXTURE CAT. NO.	SUPPLY TRIM MFR.	SUPPLY TRIM CAT. NO.	SUPPLY / STOP MFR.	SUPPLY / STOP CAT. NO.	WASTE TRIM MFR.	WASTE TRIM CAT. NO.	TRAP / FIX. DR. MFR.	TRAP / FIX. DR. CAT. NO.	MISC. MFR.	MISC. CAT. NO.	SEE NOTE
A1	WATER CLOSET / ADA / FS / RO / FV	17" TO THE RIM		1.6	•				1.25"				4"	INT	4"	4"	2"				A	K-4352-SS	B	REGAL 111-1.6	B	UNIT	A	INTEGRAL	A	INTEGRAL	C	1655SSCT	1
A2	WATER CLOSET / FS / RO / FV	15" TO THE RIM		1.6	•				1.25"				4"	INT	4"	4"	2"				A	K-4386-SS	B	REGAL 111-1.6	B	UNIT	A	INTEGRAL	A	INTEGRAL	C	1655SSCT	
A3	WATER CLOSET / ADA / FS / FV	17" TO THE RIM		1.6	•				1"				3"	INT	4"	4"	2"				A	K-4303-SS	B	REGAL 111-1.6	B	UNIT	A	INTEGRAL	A	INTEGRAL	C	1655SSCT	1
B1	LAVATORY / ADA / WH	-	0.5		•				0.5"	0.5"			1.25"	1.25"	1.25"	2"	2"				A	K-2084	P	Z82200-XL-3M	G	LFBV2165CC	G	155AECO	G	8912CBECO	Q	102 E-Z	1,2
C1	URINAL / ADA / WH / FV	17" TO THE RIM		0.125	•				0.75"				2"	INT	2"	2"	2"				A	K-4991-ET-0	B	REGAL 186-0.125	B	UNIT	A	UNIT	A	INTEGRAL		-	1
C2	URINAL / WH / FV	24" TO THE RIM		0.125	•				0.75"				2"	INT	2"	2"	2"				A	K-4991-ET-0	B	REGAL 186-0.125	B	UNIT	A	UNIT	A	INTEGRAL		-	
D1	MOP BASIN	36" TO FAUCET			•				0.5"	0.5"			3"	3"	3"	3"	2"				H	MSB 2424	E	897-CP	E	UNIT	H	UNIT	H	ROUGH		-	
F1	SINK / SST / SB	-	1.2		•				0.5"	0.5"			1.25"								A	K-2609-SU	A	K-14406-4	G	LFBV2165CC	G	155AECO	G	8912CBECO	Q	102 E-Z	1,2
F2	SINK	-	1.5		•				0.5"	0.5"			1.5"	1.5"	1.5"	2"	2"				J	LRQ2522	E	432-ABCP	G	LFBV2165CC	J	LK35	J	8912CBECO		-	
F3	UTILITY SINK	-	2.2		•				0.75"	0.75"			1.5"								H	FL-1	E	526-ABCP		-		-		-		-	4
F4	HANDWASHING SINK / WH	-	1.5		•				0.5"	0.5"			1.5"	1.5"	1.5"	2"	2"				J	EHS-18X	J	INTEGRAL	G	LFBV2165CC	J	LK35	G	8912CBECO		-	
G1	WATER COOLER	36" FLOOR TO LOWER BUBBLER			•				0.375"				1.5"	1.5"	1.5"	2"	2"				K	PGVF8EBFSL	K	UNIT	G	LFBV2165CC	K	UNIT	G	8912CBECO		-	1,3,5
G2	BOTTLE FILL STATION / SURFACE MOUNTED	27" TO THE BOTTOM OF THE UNIT			•				0.375"				1.25"								K	PWSMF2EBQ	K	UNIT	G	LFBV2165CC	K	UNIT	G	8912CBECO		-	5
HB1	HOSE BIBB	36" AFG			•				0.5"												E	952										-	
RH1	ROOF HYDRANT	-			•				0.75"												O	SRH-MS		-		-		-		-		-	
WH1	WALL HYDRANT	24" AFG			•				0.75"												L	5619		-		-		-		-		-	

DRAINS

GENERAL NOTES:
1. ALL DRAINS ARE MANUFACTURED BY J.R. SMITH UNLESS NOTED OTHERWISE.
2. ADDITIONAL ACCEPTABLE MANUFACTURERS ARE WADE, JOSAM, WATTS, MIFAB AND ZURN.

NOTES:
1. PROVIDE MECHANICAL TRAP SEAL

MARK	CATALOG NOS.	TYPE FLOOR	TYPE ROOF	TYPE AREAWAY	BODY CAST IRON	BODY BRASS	BODY ACID RESIST.	BODY STAINLESS STEEL	BODY PLASTIC	OUTLET SIZE	OUTLET BOTTOM	OUTLET SIDE	STRAINER / GRATE DIAMETER / WIDTH	STRAINER / GRATE LENGTH	STRAINER / GRATE ADJUSTABLE	STRAINER / GRATE FLAT	STRAINER / GRATE DOME	STRAINER / GRATE RECESSED	STRAINER / GRATE FUNNEL	STRAINER / GRATE HINGED	STRAINER / GRATE STAINLESS STEEL	TOP FINISH NICKLE-BRONZE	TOP FINISH CAST IRON	TOP FINISH ACID RESIST.	TOP FINISH STAINLESS STEEL	TOP FINISH PLASTIC	TOP FINISH DUCTILE IRON	ADDITIONAL FEATURES ANCHOR FLANGE	ADDITIONAL FEATURES FLASHING CLAMP	ADDITIONAL FEATURES DBL DRAINAGE	ADDITIONAL FEATURES SED. BUCKET	ADDITIONAL FEATURES AUX. STRAINER	ADDITIONAL FEATURES BEARING PAN	ADDITIONAL FEATURES UDECK CLAMP	ADDITIONAL FEATURES 2" STANDPIPE	ADDITIONAL FEATURES TRAP PRIMER CON.	ADDITIONAL FEATURES WATER DAM	SEE NOTE
FD1	2005-A	•			•					3"	•		5"		•							•						•	•	•						1
FS1	2633	•			•					4"	•		8"	8"																						
OD1	1045		•		•					6"	•		15"		•							•						•	•				•			
OD2	1045		•		•					4"	•		15"		•		•					•						•	•				•			
RD1	1015		•		•					6"	•		15"		•							•						•	•				•			
RD2	1015		•		•					4"	•		15"		•							•						•	•				•			

PLUMBING EQUIPMENT

GENERAL NOTES:
A. PROVIDE ROUGH-IN.
B. INSTALL ALL "LOOSE" COMPONENTS.
C. CONNECTION SIZES SHALL BE AS LISTED. TERMINAL OUTLETS AND INLETS ON EQUIPMENT MAY BE SMALLER AND INCREASER/REDUCER FITTINGS REQUIRED.

NOTES:
1. BASIS OF DESIGN: AO SMITH EJC10
2. BASIS OF DESIGN: ZOELLER 50 SERIES
3. COORDINATE PUMP LOCATION WITH JUNCTION BOX FOR MOTORIZED WINCHES AND ALL OTHER TRADES.

MARK	DESCRIPTION	CAPACITY	PRESSURE HEAD	EFFICIENCY	INPUT HP	ELECTRICAL (VOLTAGE - PHASE)	CONNECTIONS FLUID IN	CONNECTIONS FLUID OUT	CONNECTIONS FUEL	APPROX. DIMENSIONS WIDTH / DIA.	APPROX. DIMENSIONS LENGTH	APPROX. DIMENSIONS HEIGHT	SEISMIC RESTRAINTS REQUIRED	SEISMIC RESTRAINTS IMPORTANCE FACTOR	SEE NOTE
DWH1	DOMESTIC WATER HEATER	10 GALLON				120V - 1 PHASE	0.75"	0.75"				19"			1
SP1	SUMP PUMP	42 GPM	5 FT		3/10	120V - 1 PHASE					18"	24"			2, 3
SP2	SUMP PUMP	42 GPM	5 FT		3/10	120V - 1 PHASE					18"	24"			2

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

REVISIONS:

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9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

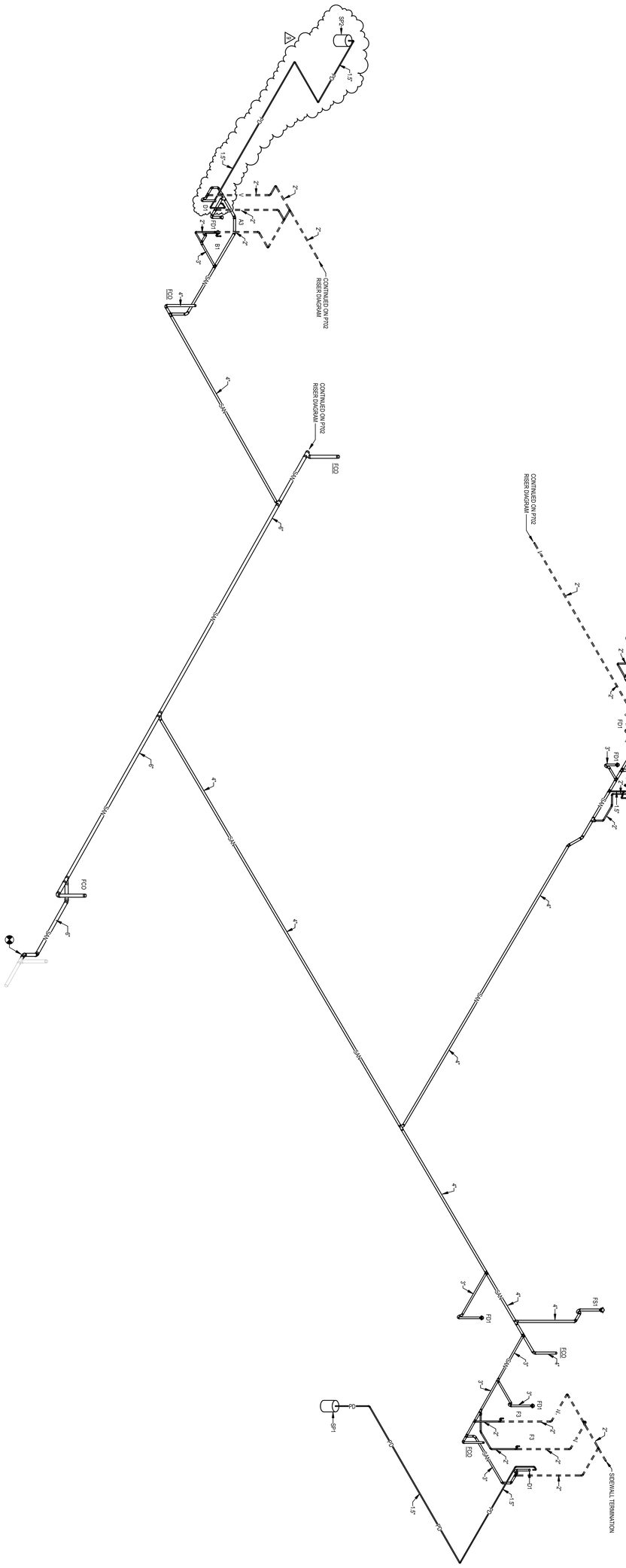
PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: ME

PLUMBING SCHEDULES

P501

PLOT DATE/TIME:6/16/2022 2:01:00 PM

PLOT DATE/TIME:6/16/2022 8:18:44 PM



1 SANITARY RISER DIAGRAM OVERALL
SCALE: NONE

P701

SANITARY
RISER DIAGRAM
- OVERALL

PROJECT:	#2107
DATE:	06.17.22
DRAWN BY:	ME

BID PACKAGE #2 - 100%
CONSTRUCTION DOCUMENTS

REVISIONS:

#	Date	Desc.
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EHREN C. MITCHELL
REGISTERED
PE10911293
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PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

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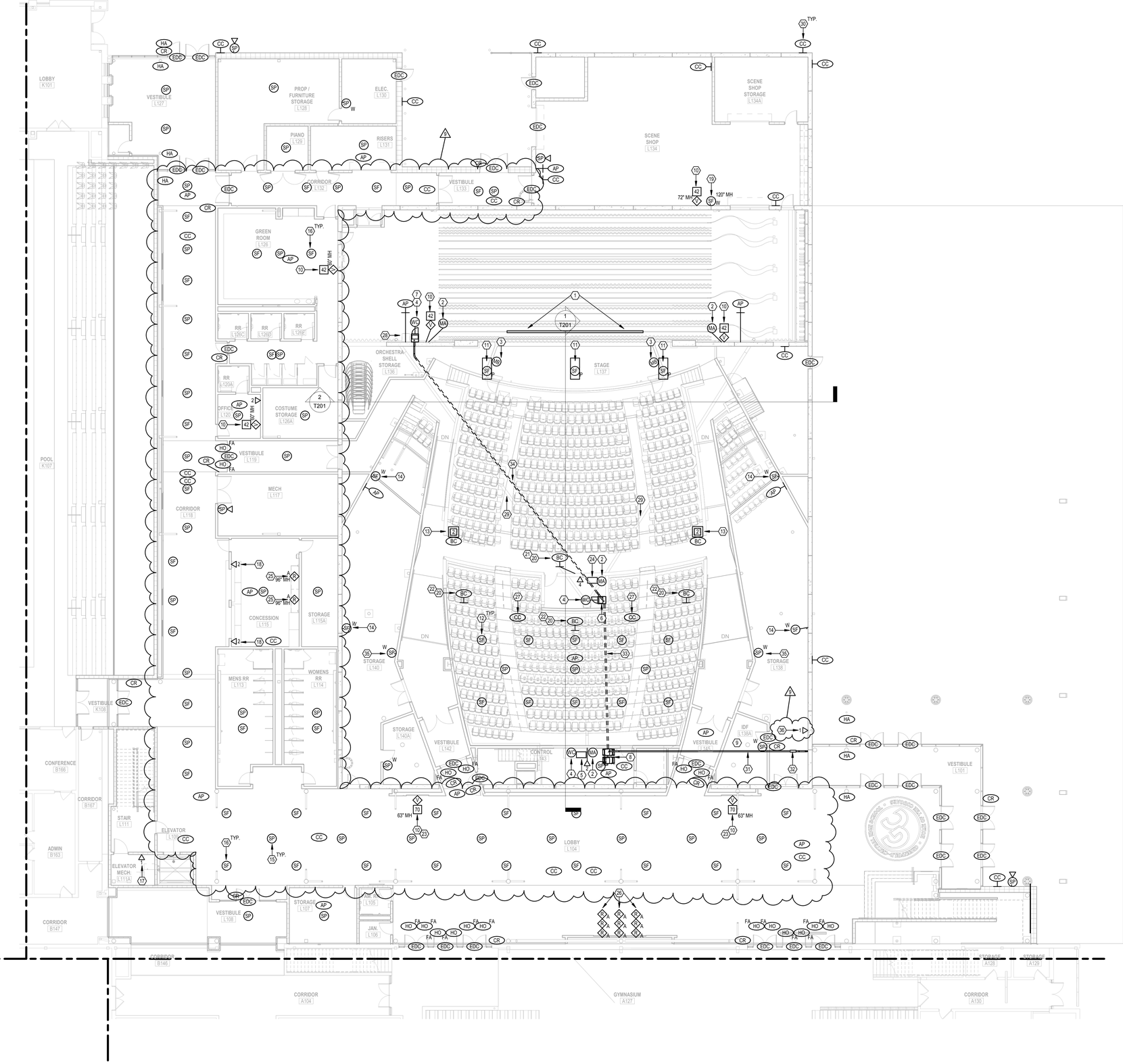

1 **TECHNOLOGY 1ST FLOOR**
SCALE: 3/32" = 1'-0"

PLAN NOTES

1. OFCI LED SCREEN WALL MOUNTED ON MOTORIZED STAGE RIGGING BATTEN. COORDINATE WITH MANUFACTURER FOR HDMI CONNECTIVITY REQUIREMENTS. PROVIDE ONE (1) DATA.
2. TECHNICAL FACILITIES PANEL (TFP) TYPE "A" FOR CONNECTIVITY TO AV SYSTEM, MOUNTED ON WALL.
3. TECHNICAL FACILITIES PANEL (TFP) TYPE "B" FOR CONNECTIVITY TO AV SYSTEM, MOUNTED UNDER STAGE.
4. AV SYSTEM TOUCH PANEL CONTROLLER.
5. MASTER SOUND SYSTEM MIXING CONSOLE.
6. MIXING BOOTH RACK.
7. STAGE MANAGER RACK.
8. AV SYSTEM MAIN EQUIPMENT RACKS. STRUCTURED CABLING FOR AV EQUIPMENT SHALL ROUTE AND TERMINATE AT THIS LOCATION. PROVIDE PATHWAYS AS INDICATED FOR AV CABLING TO CONTROL BOOTH CABINET, STAGE MANAGERS RACK AND AMPLIFIER RACK.
9. NETWORK EQUIPMENT RACKS. CABLING FOR NON-AV EQUIPMENT SHALL ROUTE AND TERMINATE AT THIS LOCATION.
10. OFCI WALL MOUNTED FLAT PANEL DISPLAY. PROVIDE ONE (1) DATA.
11. SPEAKER CLUSTER LOCATED ABOVE STAGE.
12. CEILING MOUNTED REAR FILL SPEAKER LOCATED UNDER BALCONY.
13. FLOOR BOX LOCATED UNDER REMOVEABLE SEAT FOR OFOI CAMERA INPUT/OUTPUT. REFER TO OUTLET DETAILS FOR CONFIGURATION. REFER TO ELECTRICAL DRAWINGS FOR PATHWAY INFORMATION.
14. SURROUND SPEAKER MOUNTED ON WALL.
15. CEILING MOUNTED PAGING SPEAKER.
16. CEILING MOUNTED SOUND SYSTEM SPEAKER.
17. PROVIDE ONE (1) DATA FOR ELEVATOR PHONE. COORDINATE EXACT REQUIREMENTS WITH ELEVATOR CONTRACTOR.
18. PROVIDE TWO (2) DATA FOR POINT OF SALE. COORDINATE FINAL LOCATION IN FIELD WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
19. WALL MOUNTED SOUND SYSTEM SPEAKER.
20. PROVIDE (1) CAT 6A AND (1) HDMI FROM OFOI BROADCAST CAMERA TO TV STUDIO EQUIPMENT LOCATION IN CONTROL ROOM.
21. OFOI BROADCAST CAMERA LOCATED AT MIXING BOOTH. INPUT PLATE SHALL BE LOCATED 18" AFF.
22. OFOI BROADCAST CAMERA MOUNTED ON RECESSED RAIL UNDER BALCONY. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION ON RECESS. INPUT PLATE SHALL BE INSTALLED IN RECESSED CAVITY ON REAR SIDE 6" FROM BOTTOM OF OPENING.
23. OFCI DISPLAY RECESSED IN THIS LOCATION. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
24. SECONDARY SOUND SYSTEM MIXING CONSOLE. MIXER SHALL CONNECT INTO AV NETWORK AND MIRROR FUNCTIONALITY OF MAIN MIXER LOCATED IN CONTROL ROOM. MIXER SHALL BE CAPABLE OF CONNECTING TO AV DATA OUTLETS LOCATED IN AUDITORIUM.
25. FUTURE WALL MOUNTED FLAT PANEL DISPLAY FOR DIGITAL MENU. PROVIDE (1) DATA AND COVER PLATE. COLOR AS SELECTED BY ARCHITECT.
26. FUTURE VIDEO WALL LOCATION. PROVIDE (1) DATA PER AV BACK BOX. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT DISPLAY CONFIGURATION.
27. OFOI SECURITY CAMERA MOUNTED ON RECESSED RAIL UNDER BALCONY. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION ON RECESS. INPUT PLATE SHALL BE INSTALLED IN RECESSED CAVITY ON REAR SIDE 6" FROM BOTTOM OF OPENING.
28. THEATRICAL LIGHTING EQUIPMENT CABINET PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY.
29. UNDERGROUND 8" PATHWAYS PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY.
30. COORDINATE WALL MOUNTED CAMERA, WIRELESS ACCESS POINT, AND PAGING HORN MOUNTING HEIGHTS WITH ARCHITECT PRIOR TO ROUGH-IN, TYPICAL THROUGHOUT.
31. (2)-3" CONDUITS FROM MAIN CONTROL ROOM RACKS TO AMPLIFIER RACK.
32. 18" X 18" X 6" PULL BOX LOCATED AT VERTICAL TRANSITION TO UPPER DECK.
33. (2)-3" FROM MAIN CONTROL ROOM RACKS TO CONTROL BOOTH RACK.
34. (2)-3" FROM CONTROL BOOTH RACK TO STAGE MANAGERS RACK.
35. (4) WALL MOUNTED PAGING SPEAKER LOCATED IN STORAGE AREA.
36. PROVIDE ONE (1) DATA FOR BMS. COORDINATE EXACT LOCATION AND TERMINATION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

LANCER + BEEBE, LLC
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HEAPY
PROJECT NO. 2021-07128

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

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Russell S Gill
BICSI ID # 255680
EXPIRES 12-31-22
RCDD

REVISIONS:

#	Date	Desc.
9	06.17.22	BID PKG. #2 ADD. #9

BID PACKAGE #2 - 100% CONSTRUCTION DOCUMENTS

PROJECT: #21107
DATE: 05.20.2022
DRAWN BY: PJB

TECHNOLOGY FLOOR PLAN - FIRST FLOOR - UNIT L

T101L

K L C B A E D G F J H

N TRUE NORTH

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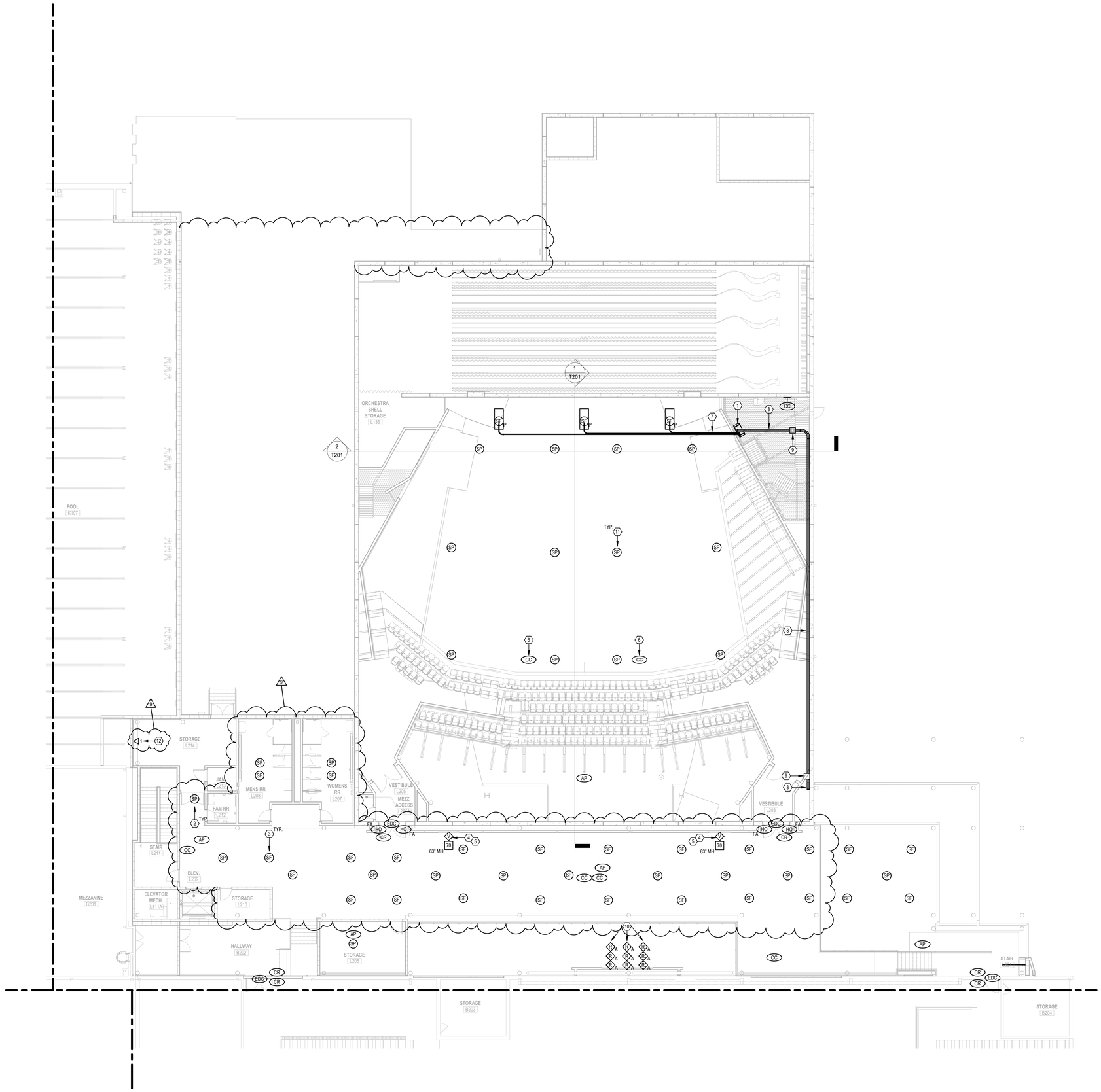

PLAN NOTES

1. AMPLIFIER RACK LOCATED ON INTERMEDIATE LEVEL BEHIND CHEEK WALL. REFER TO SECTIONS FOR MORE INFORMATION. RACK SHALL BE MOUNTED SECURELY TO PLATFORM AS INDICATED.
2. CEILING MOUNTED PAGING SPEAKER.
3. CEILING MOUNTED SOUND SYSTEM SPEAKER.
4. OFCI WALL MOUNTED FLAT PANEL DISPLAY.
5. OFCI DISPLAY RECESSED IN THIS LOCATION. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
6. CEILING MOUNTED OFOI SECURITY CAMERA FOR BALCONY.
7. (3)-2" CONDUITS FROM AMPLIFIER RACK LOCATION TO SPEAKER ARRAYS.
8. (2)-3" CONDUITS FROM MAIN CONTROL ROOM RACKS TO AMPLIFIER RACK.
9. 18" X 18" X 6" PULL BOX LOCATED AT UPPER DECK OF AUDITORIUM SPACE.
10. FUTURE VIDEO WALL LOCATION. PROVIDE (1) DATA PER AV BACK BOX. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT DISPLAY CONFIGURATION.
11. CEILING MOUNTED PAGING SPEAKER. COORDINATE LOCATIONS IN CEILING DEFLECTIONS WITH ELECTRICAL LIGHTING AND ARCHITECT PRIOR TO INSTALLATION.
12. PROVIDE ONE (1) DATA FOR BMS. COORDINATE EXACT LOCATION AND TERMINATION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

1 **TECHNOLOGY 2ND FLOOR - AUD**
SCALE: 3/32" = 1'-0"

PLOT DATE/TIME:6/16/2022 3:51:06 PM

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DATE: 05.20.2022
DRAWN BY: PJB

TECHNOLOGY FLOOR PLAN - SECOND FLOOR - UNIT L

T102L

K L
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