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Code Consultant
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SEAL | DATE 01/27/25

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PROJECT NO. 23112.000

10. *Journal of the American Academy of Religion*, 47 (1979), 1–22.

Journal of Management Education 36(7) 809–824

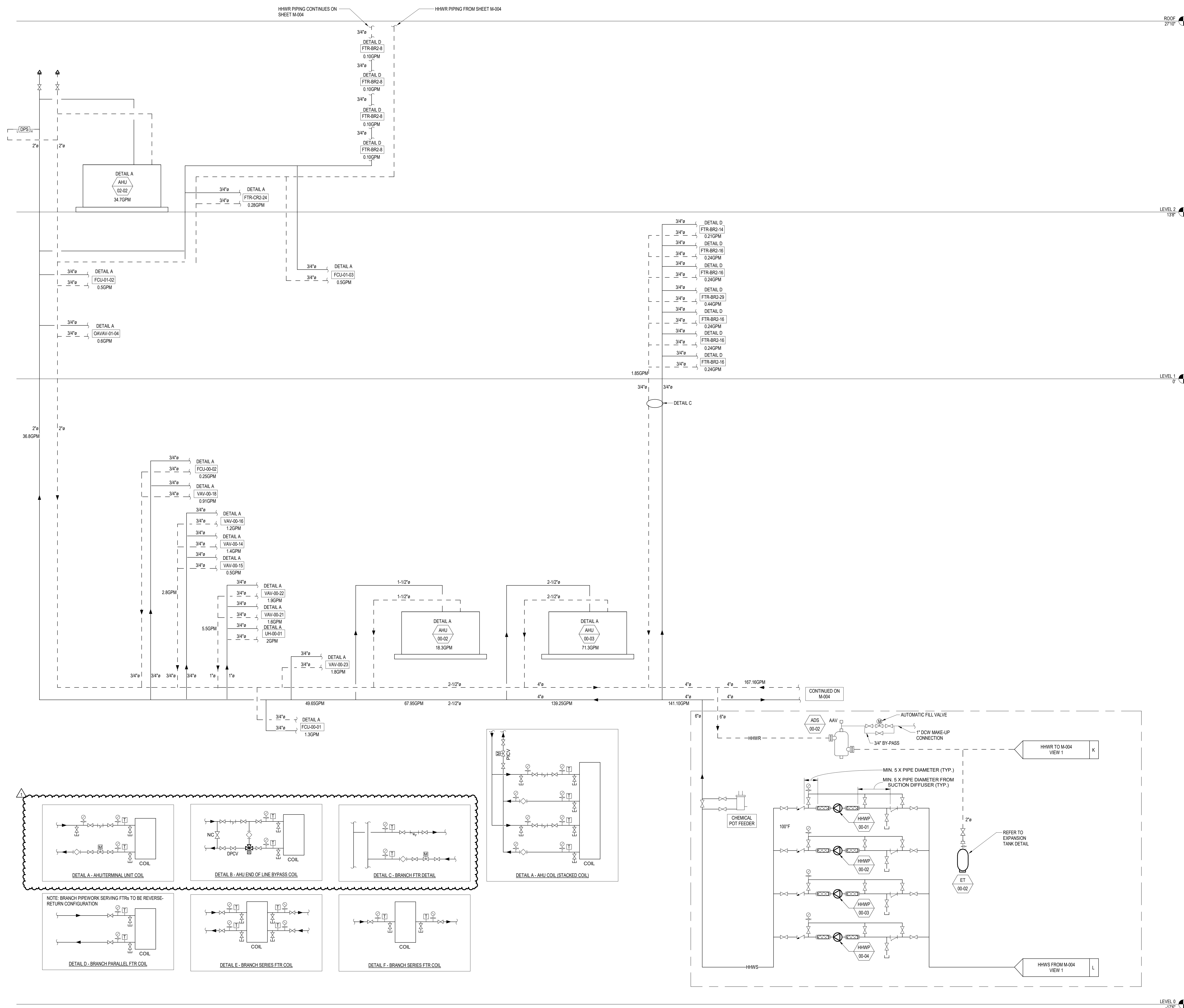
Journal of Management Education 36(7) 809–824

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SHEET NUMBER

M 002

MI-002

IN128 - JAMES T.
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Abstract

100

1. **Introduction**

100

100

100

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SEAL DATE 01/27/

SEAL | DATE 01/27/2018

REGISTERED

STATE OF

PROFESSIONAL ENGINEER

SHEET ISSUE

2 DESIGN DEVELOPMENT

4	33% CONSTRUCTION DOCUMENTS
5	CONSTRUCTION DOCUMENTS

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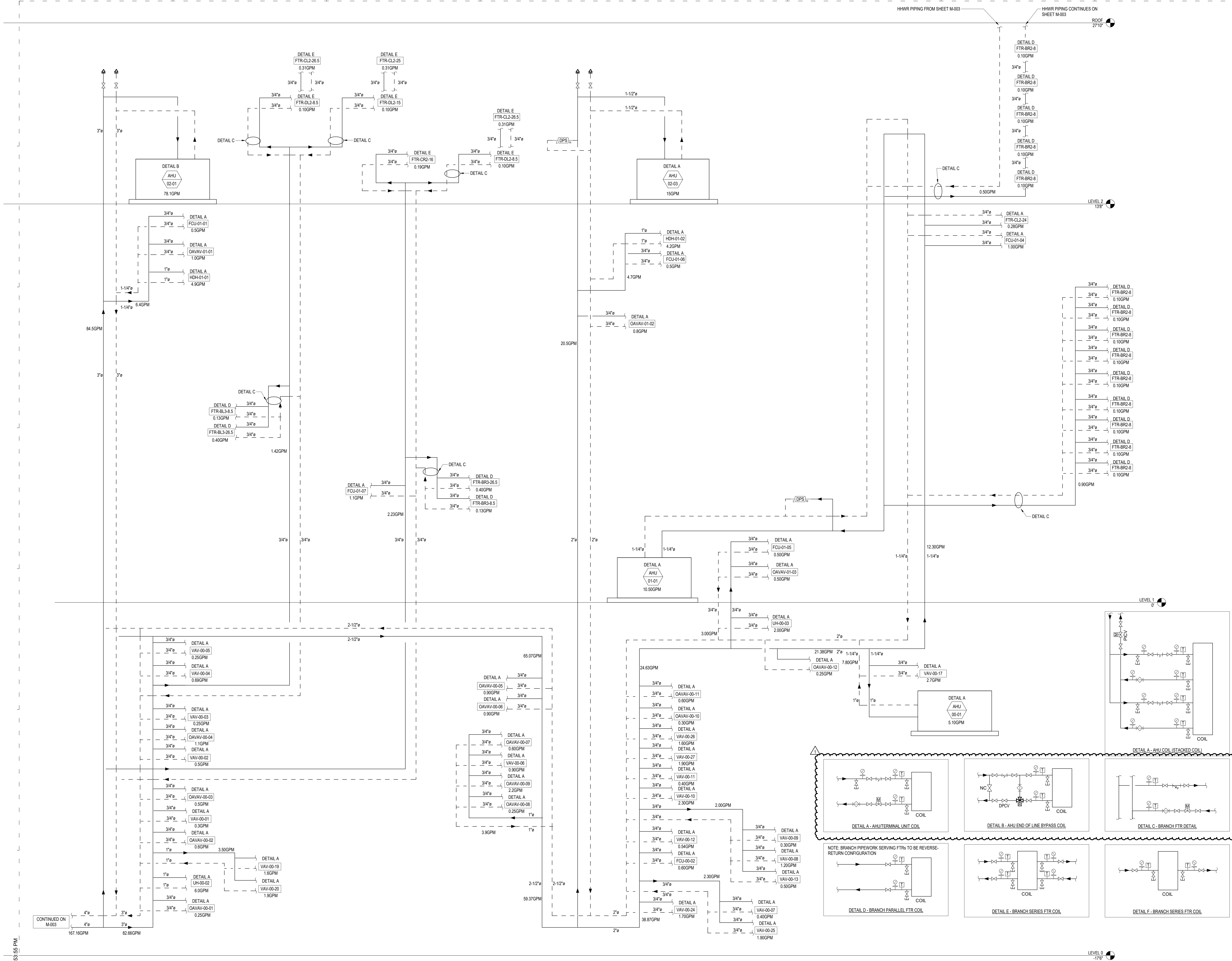
SHEET TITLE

PHYSIOLOGICAL DIAGNOSIS

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M 00

1. **Introduction**



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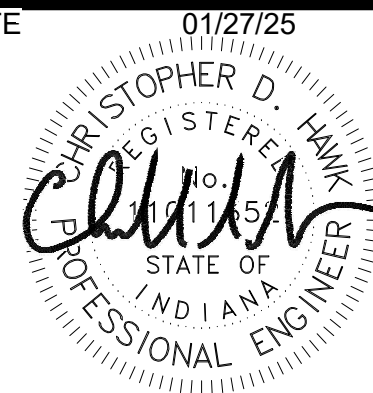
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SHEET ISSUE

1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

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SHEET TITLE

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SHEET NUMBER

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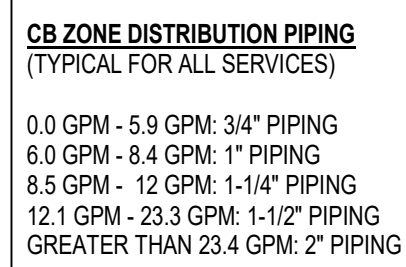
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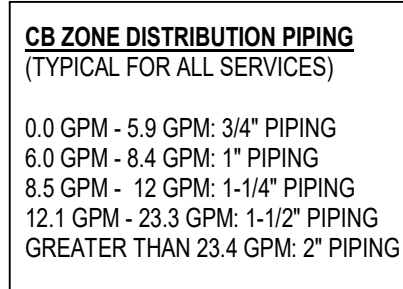
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SHEET TITLE
CHILLED BEAMS
DIAGRAM

SHEET NUMBER
M-006



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M-007

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816-806-3729

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT FLOW MUST BE RADIOUS 15 R/W WHERE SPACE ALLOWS. RECTANGULAR FLOWS MUST BE CW TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
- C. DIRECTIONAL Baffles SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE INDICATED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY SPECIFICATION. DIMENSIONS AND CELLS MUST INDICATE FREE-AIR DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING IS TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEARANCES SHALL BE LOCATED TO COMPLY WITH IMC 508.3.8.
- I. ALL TRANSFER OPENINGS UNDER 2'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 12" LATER TRANSFER OPENINGS BETWEEN 2'0" AND 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 16" LATER TRANSFER OPENINGS LARGER THAN 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- J. MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE GY CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- K. WHERE LINE SLOTS ARE INSTALLED IN LINE AND ARE UNBOKEN BY WALL DIVIDERS, PROVIDE BULK SECTIONS OF DUCTS TO MAINTAIN THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.



SEAL | DATE 01/27/25



SHEET ISSUE		
1	DD PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
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PROJECT NO.	23112.000
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SHEET TITLE
EVENT FLOOR PLAN
- AREA A - HVAC

SHEET NUMBER

M-101A

IN128 - JAMES T. MORRIS ARENA

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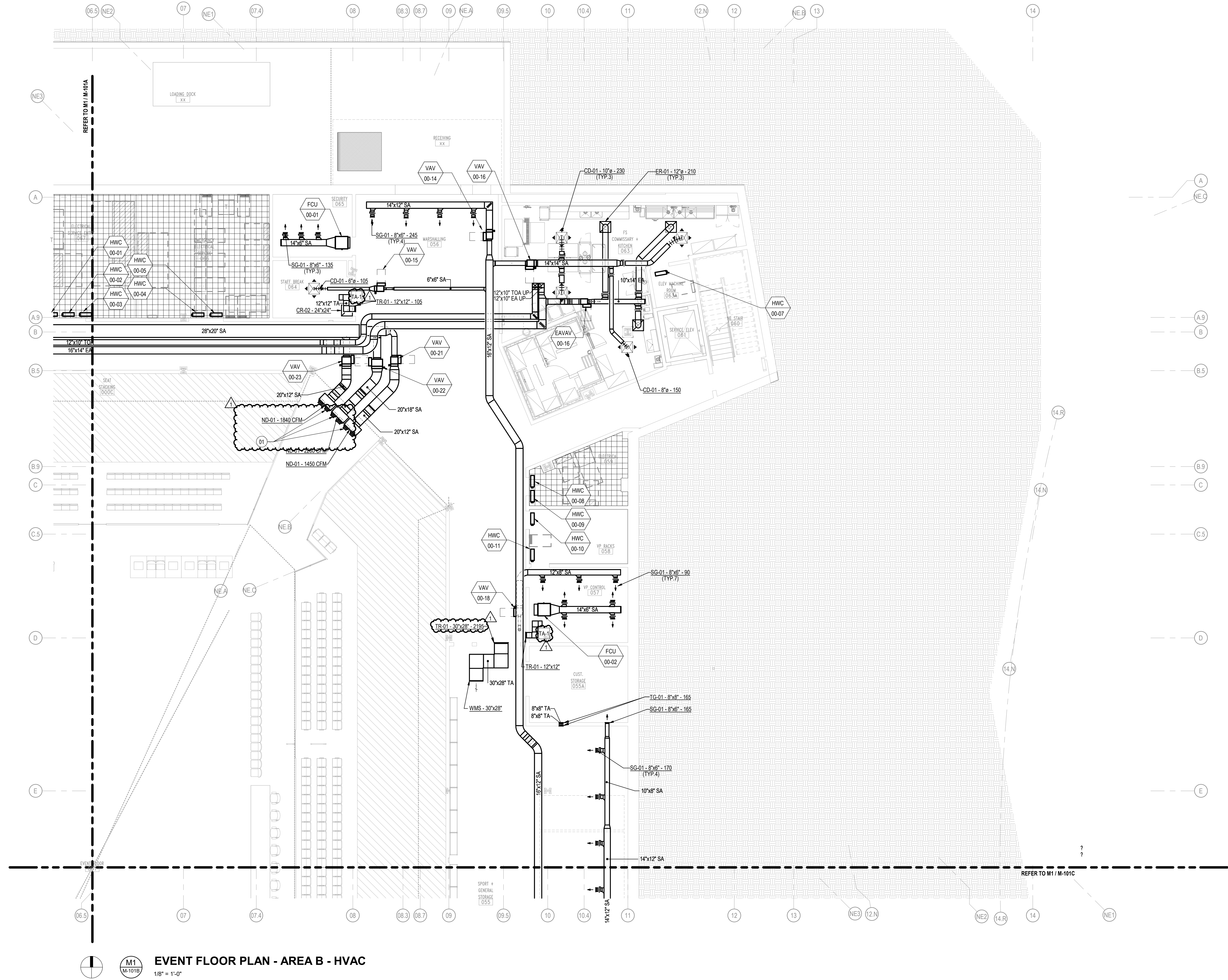
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816-806-3729

GENERAL HVAC NOTES:

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT ELBOWS TO BE RADIUS 1.5 RW WHERE SPACE ALLOWS. RECTANGULAR ELBOWS TO BE C/W TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
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- K. WHERE LINEAR SLOTS ARE INSTALLED IN LINE AND ARE UNBROKEN BY WALL DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS MATCHING THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

SHEET NOTES:

- 01 DUAL NOZZLE BOXES ARE MOUNTED INSIDE EXTENDED SOFFIT.



IN128 - JAMES T. MORRIS ARENA

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IU Project NO. 20240127

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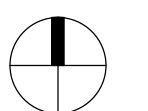
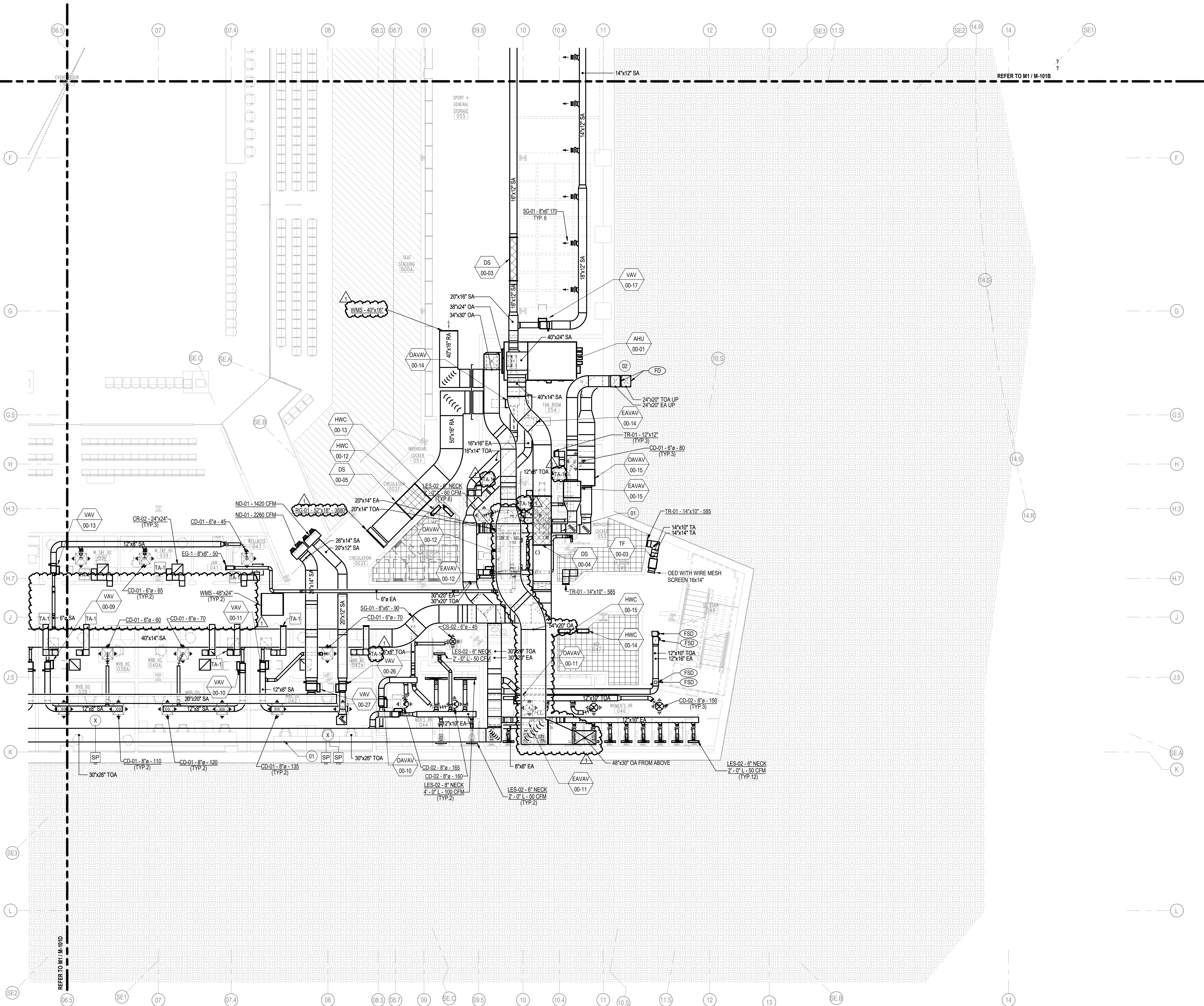
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SHEET NOTES:

- 01 DUCTWORK IS STACKED. EXHAUST DUCTWORK RUNS OVER TOP OF THE OUTSIDE AIR DUCTWORK.
- 02 DUCTS TO RUN IN TRENCH UP TO CONCOURSE LEVEL. REFER TO ARCHITECTURAL SET FOR TRENCH DETAIL. INSTALL COMBINATION FIRE-SMOKE DAMPERS AT FLOOR PENETRATION ON BOTH DUCT RISERS.



M1
M-101C

EVENT FLOOR PLAN - AREA C - HVAC
1/8" = 1'-0"

SEAL | DATE 01/27/25



SHEET ISSUE

1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
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PROJECT NO. 23112.000

SHEET TITLE
EVENT FLOOR PLAN
- AREA C - HVAC

SHEET NUMBER

M-101C

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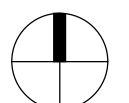
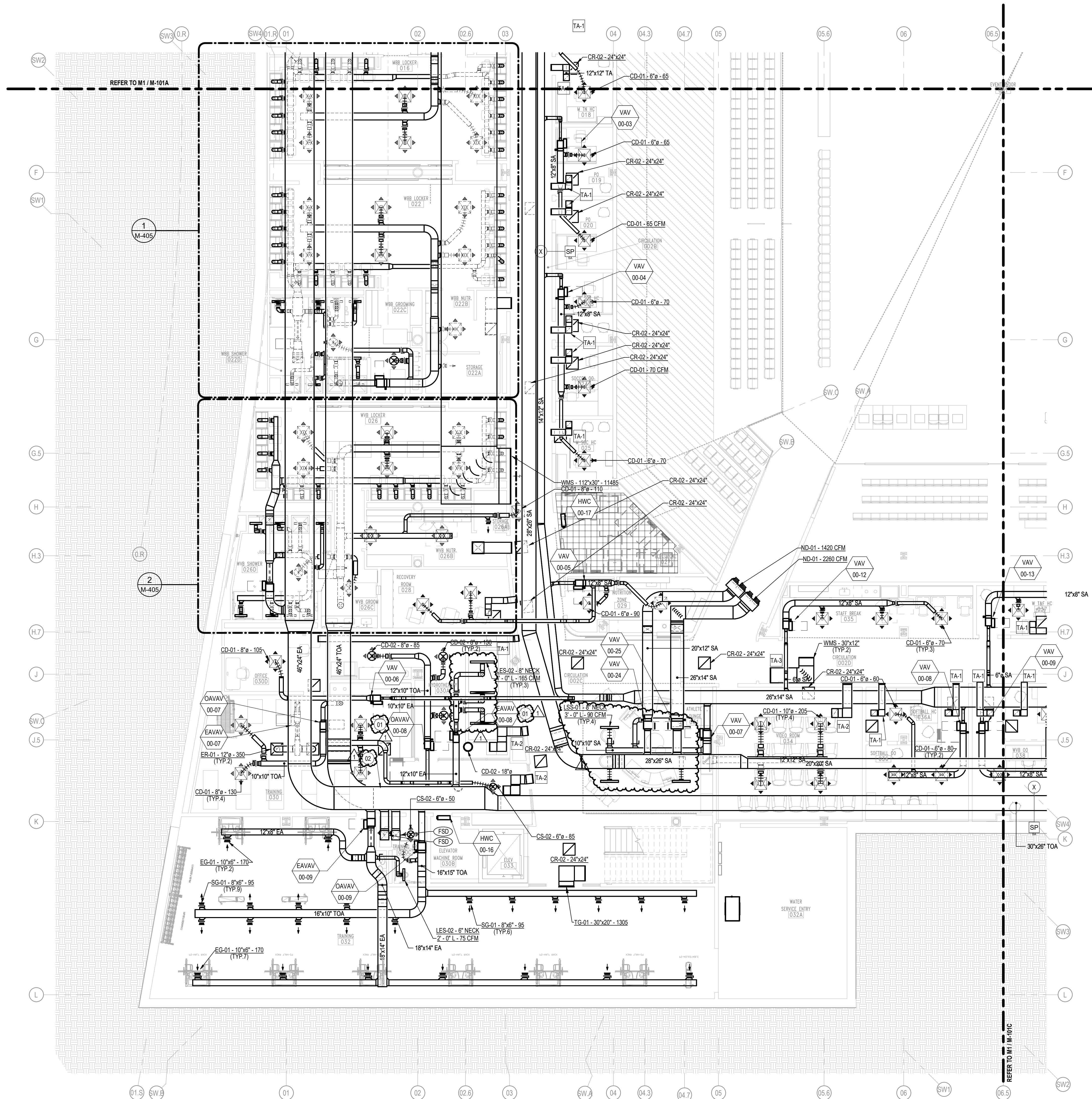
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SHEET NOTES:

- ALL SUPPLY AND EXHAUST DUCTWORK AND AIR TERMINAL DEVICES SERVING THE HYDROTHERAPY ROOM SHALL BE ALUMINUM.
- DUCTWORK IS STACKED. EXHAUST DUCTWORK RUNS OVER TOP OF THE OUTSIDE AIR DUCTWORK.

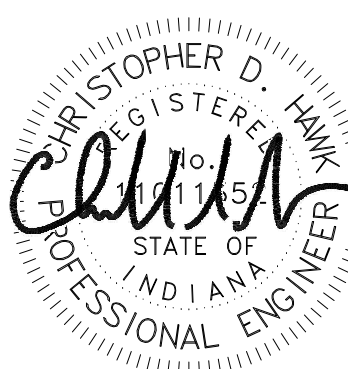


M1
M-101D

EVENT FLOOR PLAN - AREA D - HVAC

1/8" = 1'-0"

SEAL | DATE 01/27/25



SHEET ISSUE

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2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

RATIO

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PROJECT NO. 23112.000

SHEET TITLE

EVENT FLOOR PLAN
- AREA D - HVAC

SHEET NUMBER

M-101D

IN128 - JAMES T. MORRIS ARENA

Ohio St & N Blackford St
Indianapolis, IN 46202

IU Project NO. 20240127

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954-846-8600

Code Consultant
FORZA
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HARRISONVILLE, MO 64701
816-806-3729

GENERAL HVAC NOTES:

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT ELBOWS TO BE RADIUS 1.5 RW WHERE SPACE ALLOWS. RECTANGULAR ELBOWS TO BE CW TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
- C. DIRECTIONAL BAFFLES SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE INDICATED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY SPECIFICATIONS. DIMENSIONS ON PLANS INDICATE FREE-AREA DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEANOUTS SHALL BE LOCATED TO COMPLY WITH IMC 506.3.8.
- I. ALL TRANSFER OPENINGS UNDER 2 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 12". ALL TRANSFER OPENINGS BETWEEN 2 SQFT AND 6 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 18". ALL TRANSFER OPENINGS LARGER THAN 6 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- J. MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE GYP CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- K. WHERE LINEAR SLOTS ARE INSTALLED IN LINE AND ARE UNBROKEN BY WALL DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS MATCHING THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

SHEET NOTES:

- 01 FCU IS PROVIDED BASED ON BLOCK LOADING. USE OF THIS SPACE IS UNDEFINED IN THE DESIGN PERIOD.
- 02 PROVIDE ACCESS DOOR FOR ACCESS TO FSDS.

SEAL | DATE



SHEET ISSUE

1	DD PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

RATIO

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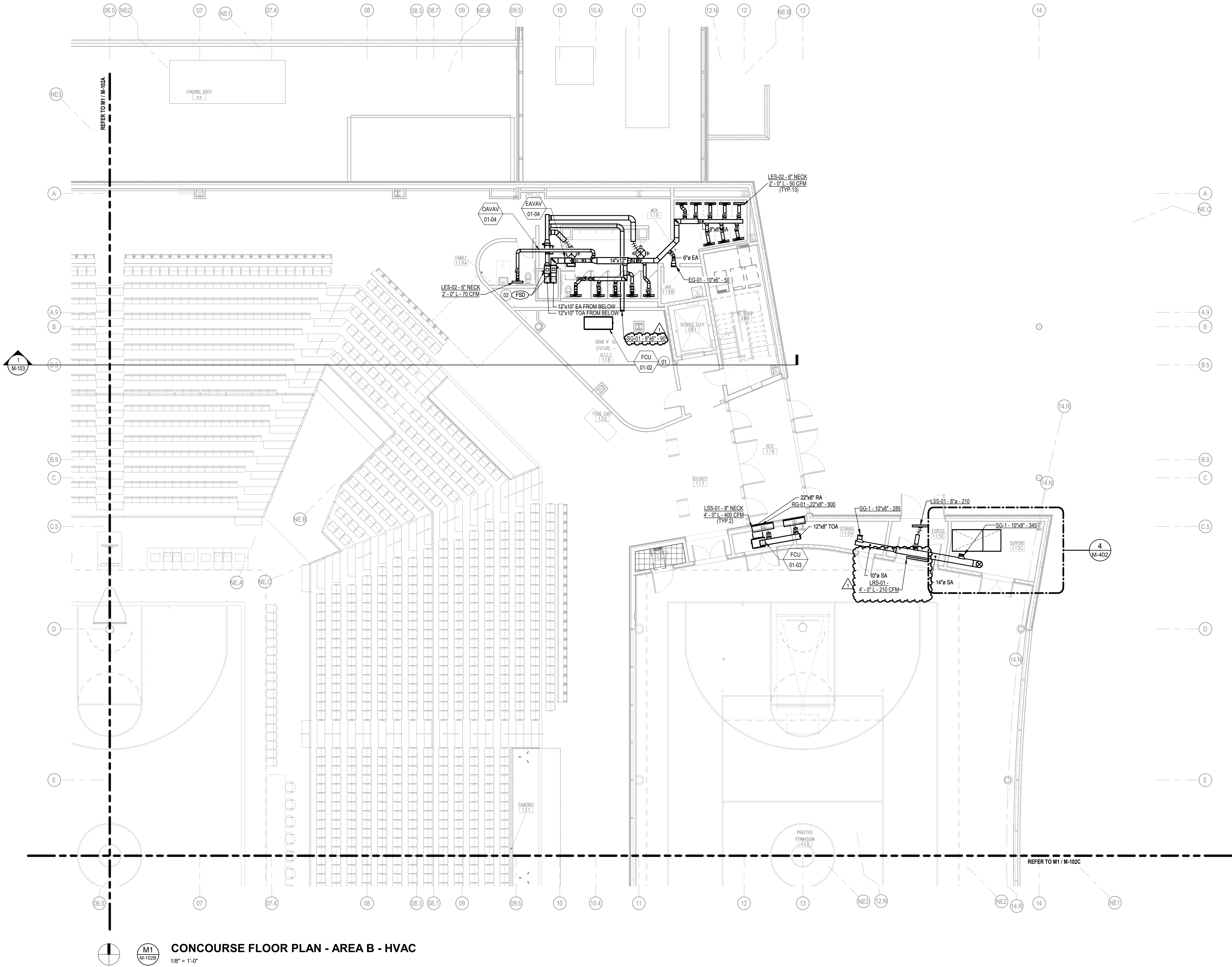
PROJECT NO. 23112.000

SHEET TITLE

CONCOURSE FLOOR
PLAN - AREA B -
HVAC

SHEET NUMBER

M-102B



CONCOURSE FLOOR PLAN - AREA B - HVAC

1/8" = 1'-0"

Ohio St & N Blackford S
Indianapolis, IN 46202

IU Project NO. 20240127

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954-846-9600

Code Consultant
FORZA
2502 WEST MECHANIC ST, SUITE C
HARRISONVILLE, MO 64701
816-806-3729

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT ELBOWS TO BE RADIUS 15 R/W WHERE SPACE ALLOWED. ALL FRANGIBLE ELBOWS TO BE 90° TURNING VANS. SEE DETAILS FOR ADDITIONAL INFORMATION.
- C. DIRECTIONAL Baffles SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE INDICATED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY SPECIFICATIONS. DIMENSIONS ON PLANS INDICATE FREE-AREA DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEANOUTS SHALL BE LOCATED TO COMPLY WITH IMC 506.3.8.
- I. ALL TRANSFER OPENINGS UNDER 2'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 12" ALL TRANSFER OPENINGS BETWEEN 2'0" AND 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 16" ALL TRANSFER OPENINGS LARGER THAN 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- J. MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE CYP CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- K. WHERE LINEAR SLOTS ARE INSTALLED IN LINE AND ARE UNBROKEN BY WALL DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS MATCHING THE APPEARANCE OF THE ACTIVE PORTION OF THE CONTROL DAMPER.

01 PROVIDE ACCESS DOOR FOR ACCESS TO FDS AND DUCT/PIPING PENETRATIONS.

02 ACCURATE RISER SHALL OFFSET WITHIN CHASE TO ACCOMMODATE PENETRATION OF SLAB TO EVENT LEVEL.

03 FCU IS PROVIDED BASED ON BLOCK LOADING. USE OF THIS SPACE IS UNDEFINED IN THE DESIGN PERIOD.

SEAL | DATE 01/27/25



SHEET ISSUE		
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RATIO

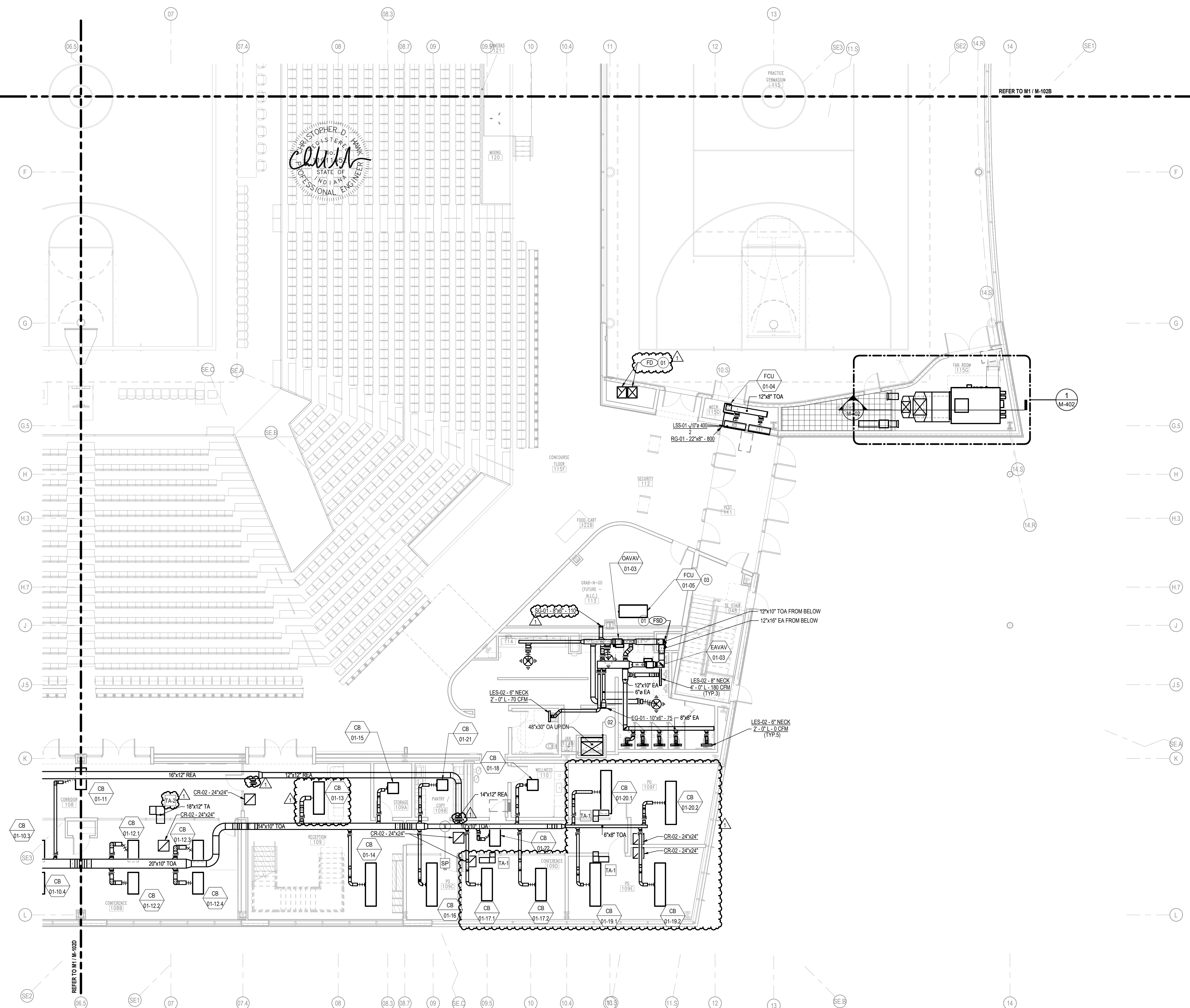
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PROJECT NO.	23112.000
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PROJECT NO. 25112.000
SHEET TITLE
CONCOURSE FLOOR
PLAN - AREA C -
HVAC

SHEET NUMBER

M-102C



CONCOURSE FLOOR PLAN - AREA C - HVAC

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 954-846-9600

Code Consultant
FORZA
2502 WEST MECHANIC ST, SUITE C
HARRISONVILLE, MO 64701
816-806-3729

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS. PROVIDE OR OBTAIN GENERAL CONTRACTOR'S RESPONSIBILITY FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT ELBOWS TO BE RADIUS 15 R/W WHERE SPACE ALLOWED. RECTANGULAR ELBOWS TO BE C/W TURNING VANES. SEE DETAILS FOR AN ADDITIONAL INFORMATION.
- C. DIRECTIONAL, Baffles SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE NOTED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY THE SUPPLY DUCTWORK. DIMENSIONS SHALL INDICATE FREE-AIR DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEANOUTS SHALL BE LOCATED TO COMPLY WITH IMC 508.3.
- I. ALL TRANSFER OPENINGS UNDER 2'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 12" ALL TRANSFER OPENINGS BETWEEN 2'0" AND 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 16" ALL TRANSFER OPENINGS LARGER THAN 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
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- K. WHERE LINE SLOTS ARE INSTALLED IN LINE AND ARE UNBOKEN BY PAID DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS TO MATCH THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

- 01 GREASE DUCT SHALL CONNECT TO THE TOP OF THE EXHAUST HOOD (BY OTHERS) AND RUN HORIZONTALLY ABOVE CEILING. THE DUCT SHALL BE INSTALLED AS A ZERO-CLEARANCE RATED DUCT PRODUCT IN LIEU OF A BUILT-OUT RATED DUCT ENCLOSURE. PRODUCT SHALL BE PROVIDED AS CAPTIVEAIRE DW-32 OR APPROVEEQUAL. ALL HANGING, PENETRATION, AND CONSTRUCTION DETAILS SHALL BE COMPLIANT WITH MANUFACTURER'S RECOMMENDATIONS.
- 02 PROVIDE ACCESS DOOR FOR ACCESS TO FSDS.

SEAL | DATE 01/27/25

CHRISTOPHER D. HANK
REGISTERED
No. 110115
STATE OF
INDIANA
PROFESSIONAL ENGINEER

[illegible]

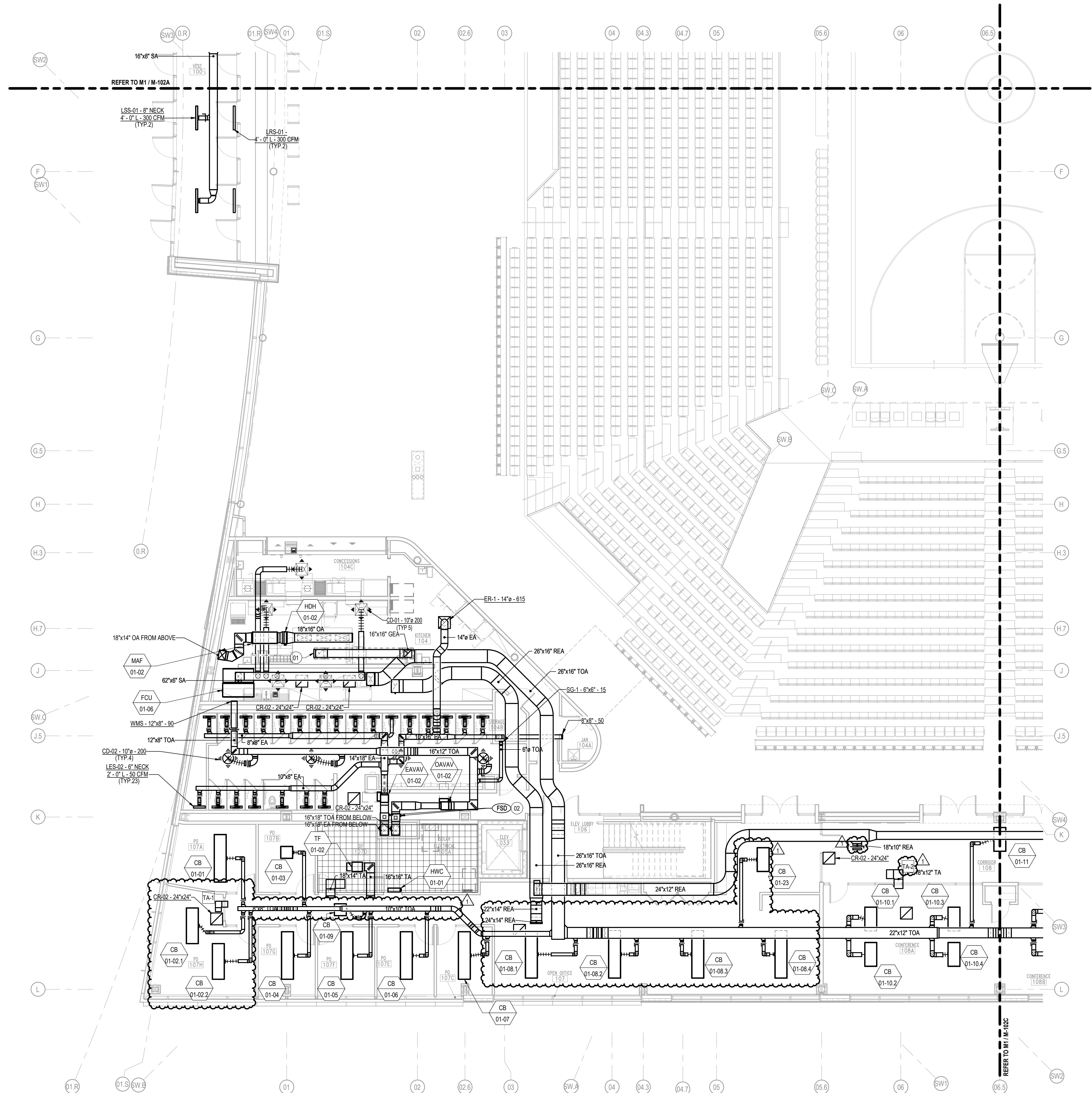
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SHEET TITLE

CONCOURSE FLOOR PLAN - AREA D - HVAC

M-102D





CONCOURSE FLOOR PLAN - AREA D - HVAC
 1/8" = 1'-0"

IN128 - JAMES T. MORRIS ARENA

Ohio St & N Blackford St
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IU Project NO. 20240127

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9025 RIVER ROAD
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Food Service Consultant
CINILITTLE
3405 NW 9TH AVENUE #1202
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954-846-8600

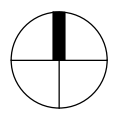
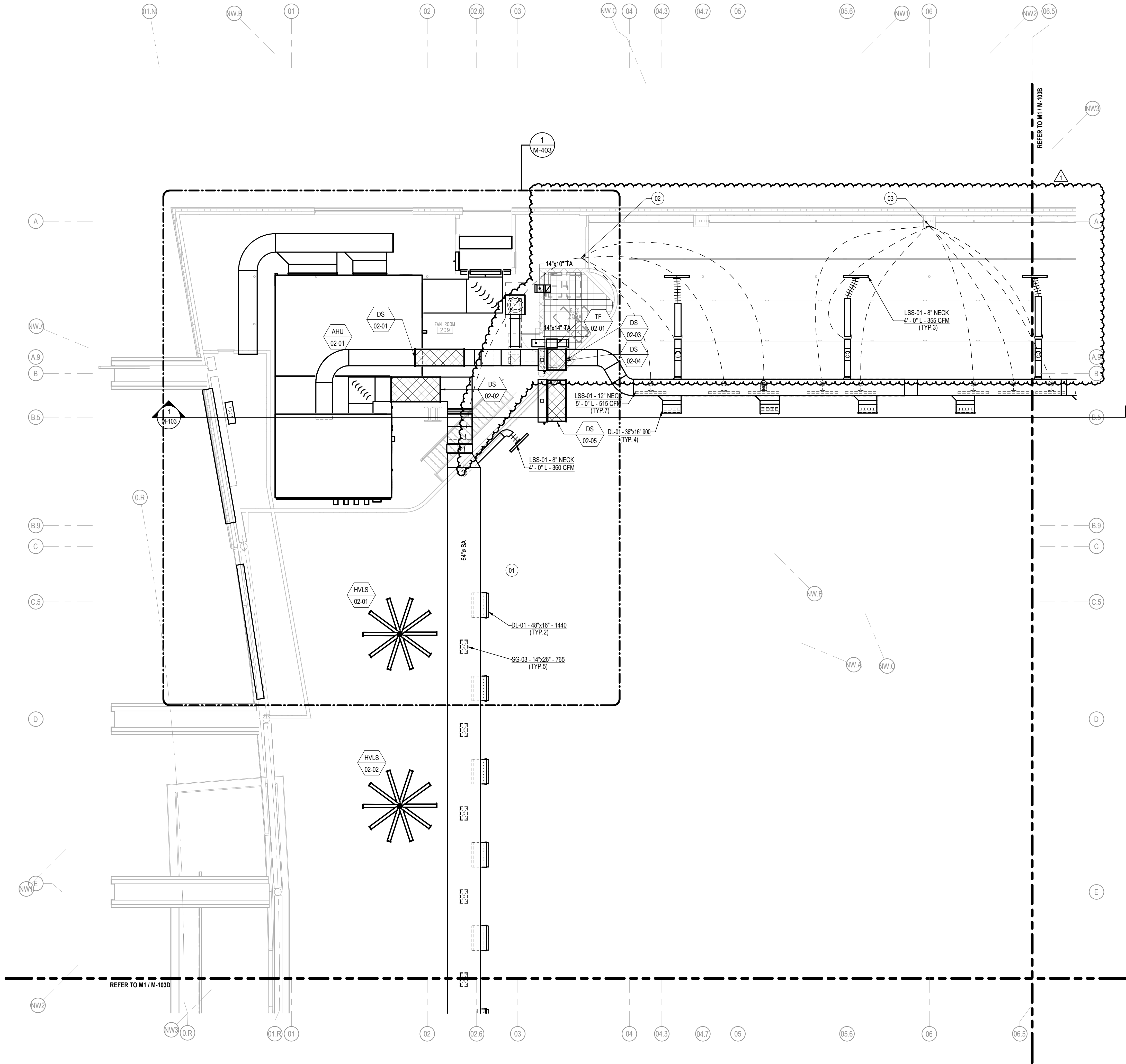
Code Consultant
FORZA
2502 WEST MECHANIC ST, SUITE C
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816-806-3729

GENERAL HVAC NOTES:

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT ELBOWS TO BE RADIUS 1.5 RW WHERE SPACE ALLOWS. RECTANGULAR ELBOWS TO BE CW TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
- C. DIRECTIONAL BAFFLES SHALL BE PROVIDED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE INDICATED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY SPECIFICATIONS. DIMENSIONS ON PLANS INDICATE FREE-AREA DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEANOUTS SHALL BE LOCATED TO COMPLY WITH IMC 506.3.8.
- I. ALL TRANSFER OPENINGS UNDER 2 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 12". ALL TRANSFER OPENINGS BETWEEN 2 SQFT AND 6 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 18". ALL TRANSFER OPENINGS LARGER THAN 6 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- J. MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE GYP CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- K. WHERE LINEAR SLOTS ARE INSTALLED IN LINE AND ARE UNBROKEN BY WALL DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS MATCHING THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

SHEET NOTES:

- 01 ALL DUCT EXPOSED TO VIEW IN THE CONCOURSE AREA SHALL BE DOUBLE-WALL DUCTWORK WITH PERFORATED INNER WALL AND 2" ELASTOMERIC INTERSTITIAL INSULATION.
- 02 ROUTE REMOTE ACCESS CABLES TO LOCATION INDICATED AND LABEL EACH CABLE INDIVIDUALLY. PROVIDE ACCESS PANEL FOR TERMINATION POINTS OR A TERMINATION PANEL BY MANUFACTURER. CABLE LENGTH NOT TO EXCEED MANUFACTURER'S RECOMMENDED LENGTH. COORDINATE EXACT LOCATION WITH ARCHITECTURAL DRAWINGS CABLES SHALL BE ACCESSIBLE WITHOUT THE NEED FOR A LADDER.
- 03 ROUTE REMOTE ACCESS CABLES TO LOCATION INDICATED AND LABEL EACH CABLE INDIVIDUALLY. PROVIDE ACCESS DOOR FOR TERMINATION POINTS. DOOR SELECTION AND TREATMENT BY ARCHITECT. CABLE LENGTH NOT TO EXCEED MANUFACTURER'S RECOMMENDED LENGTH. COORDINATE EXACT HEIGHT WITH ARCHITECTURAL DRAWINGS.



M1
M-103A

UPPER FLOOR PLAN - AREA A - HVAC

1/8" = 1'-0"

RATIO

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PROJECT NO. 23112.000

SHEET TITLE
UPPER FLOOR PLAN
- AREA A - HVAC

SHEET NUMBER

M-103A

Ohio St & N Blackford St
Indianapolis, IN 46202

IU Project NO. 20240127

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Code Consultant
FORZA
2502 WEST MECHANIC ST, SUITE C
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- B. ALL DUCT FLOW MUST BE RADIOUS 15 R/W WHERE SPACE ALLOWS. RECTANGULAR FLOWS MUST BE CW TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
- C. DIRECTIONAL Baffles SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT REQUIRED UNLESS OTHERWISE INDICATED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY SPECIFICATIONS AND SHALL BE TO INDICATE FREE-AREA DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEANOUTS SHALL BE LOCATED TO COMPLY WITH IMC 508.3.
- I. ALL TRANSFER OPENINGS UNDER 2' SLOFT SHALL BE FREE OF OBSTRUCTION BY MIN. 12" ALL TRANSFER OPENINGS BETWEEN 2' SLOFT AND 6' SLOFT SHALL BE FREE OF OBSTRUCTION BY MIN. 18" ALL TRANSFER OPENINGS LARGER THAN 6' SLOFT SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- J. MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE GYP CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- K. WHERE LINEAR SLOTS ARE INSTALLED IN LINE AND ARE UNBROKEN BY WALL DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS MATCHING THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

01 ALL DUCT EXPOSED TO VIEW SHALL BE
DOUBLY-WALLED DUCTWORK WITH PERFORATED
INNER WALL & ELASTOMERIC INTERSTITIAL
INSULATION.

02 ROUTE REMOTE ACCESS CABLES TO LOCATION
INDICATED AND LABEL EACH CABLE INDIVIDUALLY.
PROVIDE ACCESS PANEL FOR TERMINATION POINTS
OR A TERMINATION PANEL BY MANUFACTURER.
CABLE LENGTH NOT TO EXCEED MANUFACTURER'S
RECOMMENDED LENGTH. COORDINATE EXACT
LOCATION WITH ARCHITECTURAL DRAWINGS.
CABLES SHALL BE ACCESSIBLE WITHOUT THE NEED
FOR A LADDER.

03 ROUTE REMOTE ACCESS CABLES TO LOCATION
INDICATED AND LABEL EACH CABLE INDIVIDUALLY.
PROVIDE ACCESS DOOR FOR TERMINATION POINTS.
CABLE LENGTH NOT TO EXCEED MANUFACTURER'S
RECOMMENDED LENGTH. COORDINATE EXACT
HEIGHT WITH ARCHITECTURAL DRAWINGS.

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RATIO

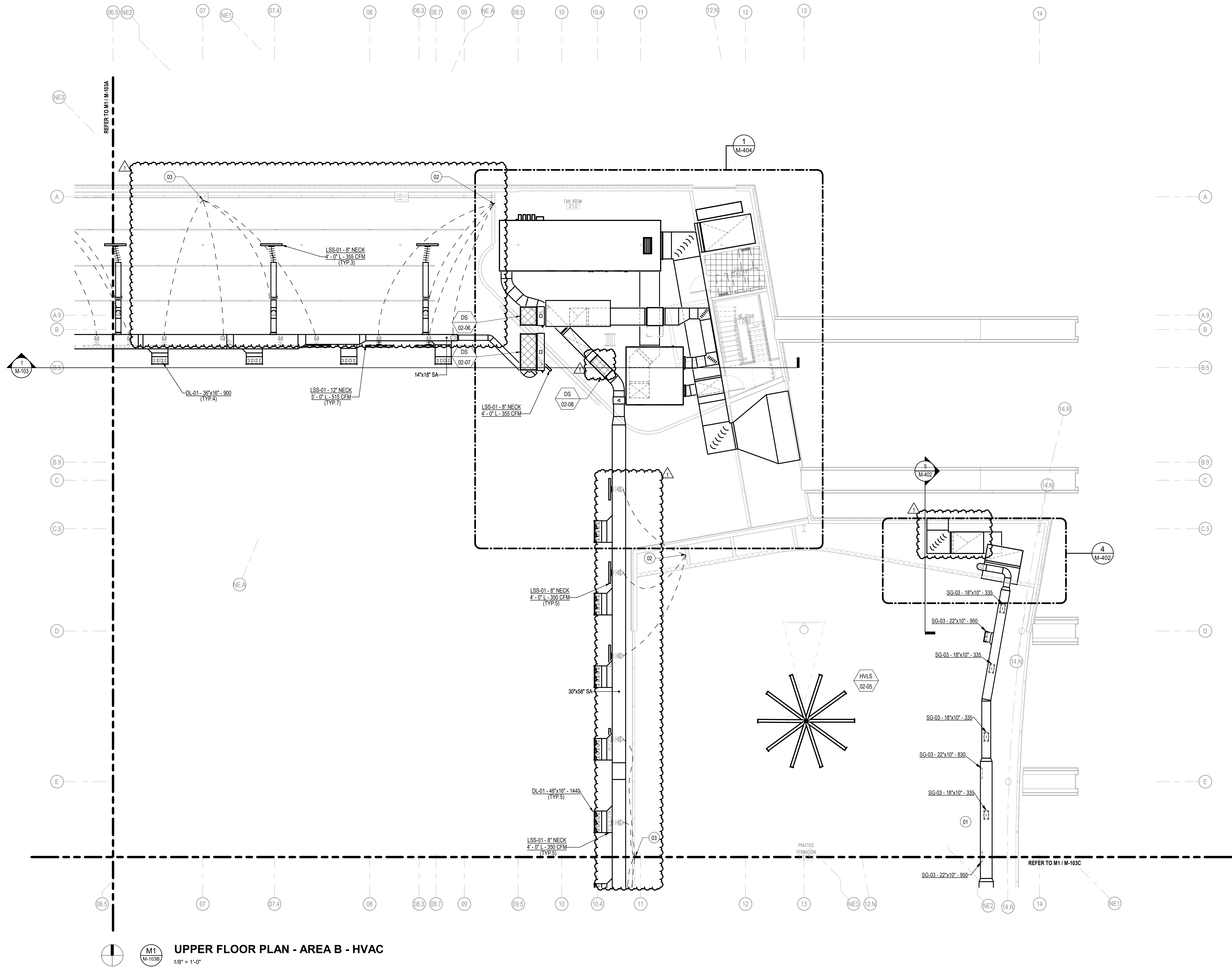
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PROJECT NO.	23112.000
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SHEET TITLE
UPPER FLOOR PLAN
- AREA B - HVAC

SHEET NUMBER

M-103B



Ohio St & N Blackford St
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 317-547-5580

Code Consultant
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2502 WEST MECHANIC ST, SUITE C
HARRISONVILLE, MO 64701
816-806-3729

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. ALL DUCT FLOW MUST BE RADIOUS 15 R/W WHERE SPACE ALLOWS. RECTANGULAR FLOWS MUST BE C/W TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
- C. DIRECTIONAL Baffles SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- D. ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE INDICATED.
- E. INSULATION SHALL BE APPLIED WHERE INDICATED BY THE MECHANICAL ENGINEER. DIMENSIONS INDICATE FREE-AREA DIMENSIONS OF THE INSIDE OF THE DUCT.
- F. DUCT AND EQUIPMENT ABOVE CEILING IS TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- G. BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. GREASE DUCT CLEARANCES SHALL BE LOCATED TO COMPLY WITH IMC 508.3.8.
- I. ALL TRANSFER OPENINGS UNDER 2'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 12" LATER TRANSFER OPENINGS BETWEEN 2'0" AND 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 16" LATER TRANSFER OPENINGS LARGER THAN 6'0" SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- J. MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE GYP CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- K. WHERE LINE SLOTS ARE INSTALLED IN LINE AND ARE SUBSERVEN BY WALL DIFFUSERS, PROVIDE BULK SECTIONS OF DUCTS TO MAINTAIN THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

- 01 OUTSIDE AIR DUCT RUN WITHIN THE SHAFT SHALL
CONNECT TO THE INTAKE HOOD LOCATED ON THE
ROOF.
- 02 RELIEF AIR INLET SHALL BE BALANCED TO
PREVENT STAGNANT AIRFLOW IN THE FURTHEST
AREA OF OFFICE.
- 03 ALL DUCT EXPOSED TO VIEW SHALL BE
DOUBLE-WALL DUCTWORK WITH PERFORATED
INNER WALL AND 2" ELASTOMERIC INTERSTITIAL
INSULATION.
- 04 EXHAUST LOUVER, SPECIFIED BY ARCHITECT, IS
SIZED FOR THE FULL AIRFLOW OF CFM-02-01. THIS
IS EQUAL TO TOTAL AIRFLOW OF APPROXIMATELY 735
CFM. THE PROVIDED LOUVER SHALL HAVE A CORE
VELOCITY LESS THAN 500 FPM AND A PRESSURE
DROP LESS THAN 0.1" W.C. PLenum OFF THE BACK
OF THE LOUVER SHALL BE AT LEAST 24" DEEP.
FREE AREA OF THE LOUVER IS 0.5 SQFT BASED ON
A FREE AREA PERCENTAGE OF 50% AND AN
OVERALL SIZE OF 12" X 12". IF A LOUVER LARGER
THAN WHAT IS SPECIFIED HERE IS PROVIDED, THE
REQUIRED FAS SHALL BE PLANNED, CALCULATED AND
INSULATED. REFER TO ARCHITECTURAL PLANS FOR
LOUVER SPECIFICATION.

05 ROUTE REMOTE ACCESS CABLES TO LOCATION
INDICATED AND LABEL EACH CABLE INDIVIDUALLY.
PROVIDE ACCESS PANEL FOR TERMINATION
POINTS OR A TERMINATION PANEL BY
MANUFACTURER. CABLE LENGTH NOT TO EXCEED
MANUFACTURERS RECOMMENDED LENGTH.
COORDINATE EXACT LOCATION WITH
ARCHITECTURAL DRAWINGS. CABLES SHALL BE
ACCESSIBLE WITHOUT THE NEED FOR A LADDER.

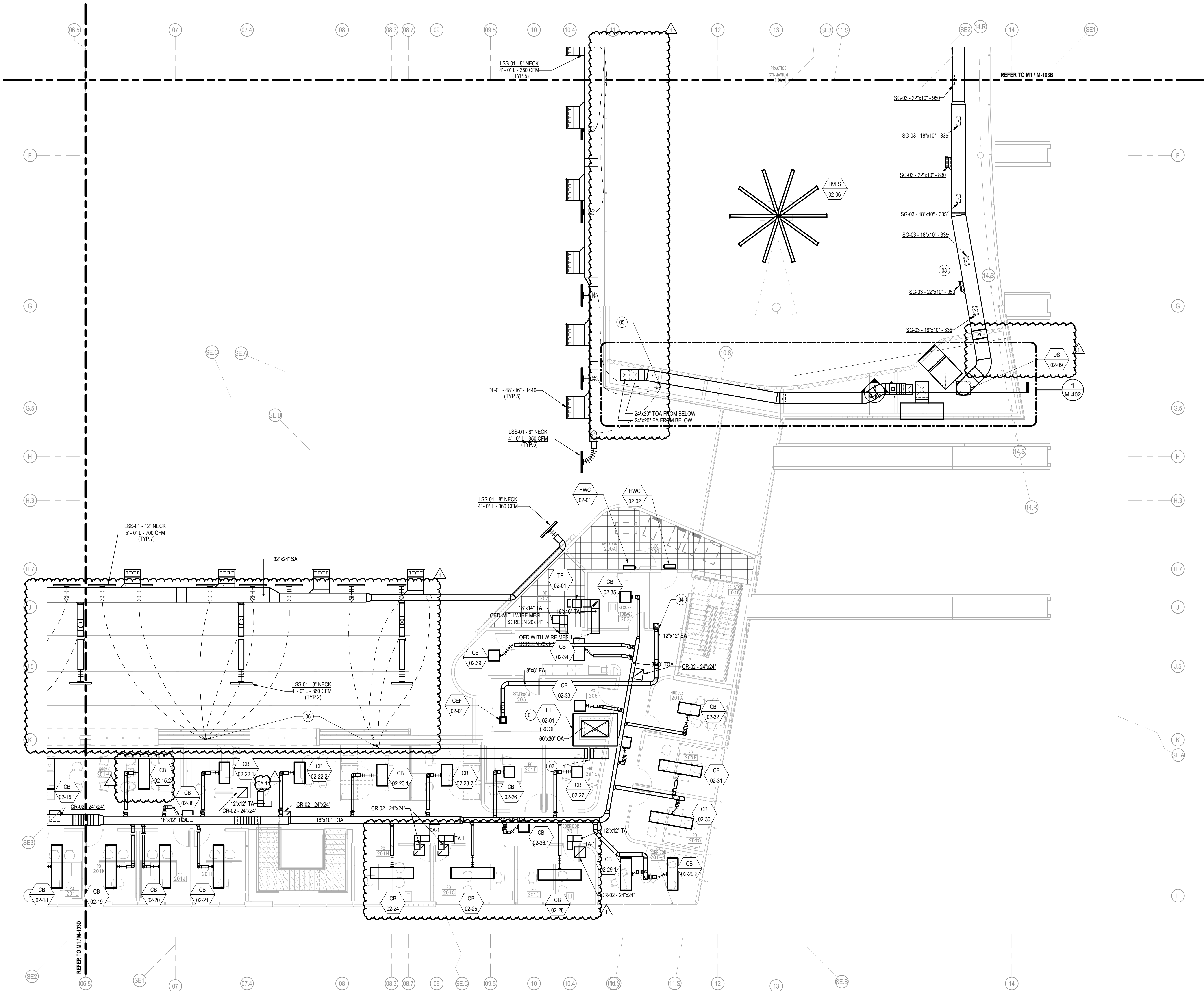
06 ROUTE REMOTE ACCESS CABLES TO LOCATION
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MANUFACTURERS RECOMMENDED LENGTH.
COORDINATE EXACT LOCATION WITH
ARCHITECTURAL DRAWINGS. ACCESS POINT FOR
CABLES SHALL BE ABOVE THE CEILING.

SHEET ISSUE		
1	DD PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

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SHEET TITLE
UPPER FLOOR PLAN
- AREA C - HVAC

M-103C



UPPER FLOOR PLAN - AREA C - HVAC

$$1/8^{\circ} = 1'-0''$$

IN128 - JAMES T. MORRIS ARENA

Ohio St & N Blackford St
Indianapolis, IN 46202

IU Project NO. 20240127

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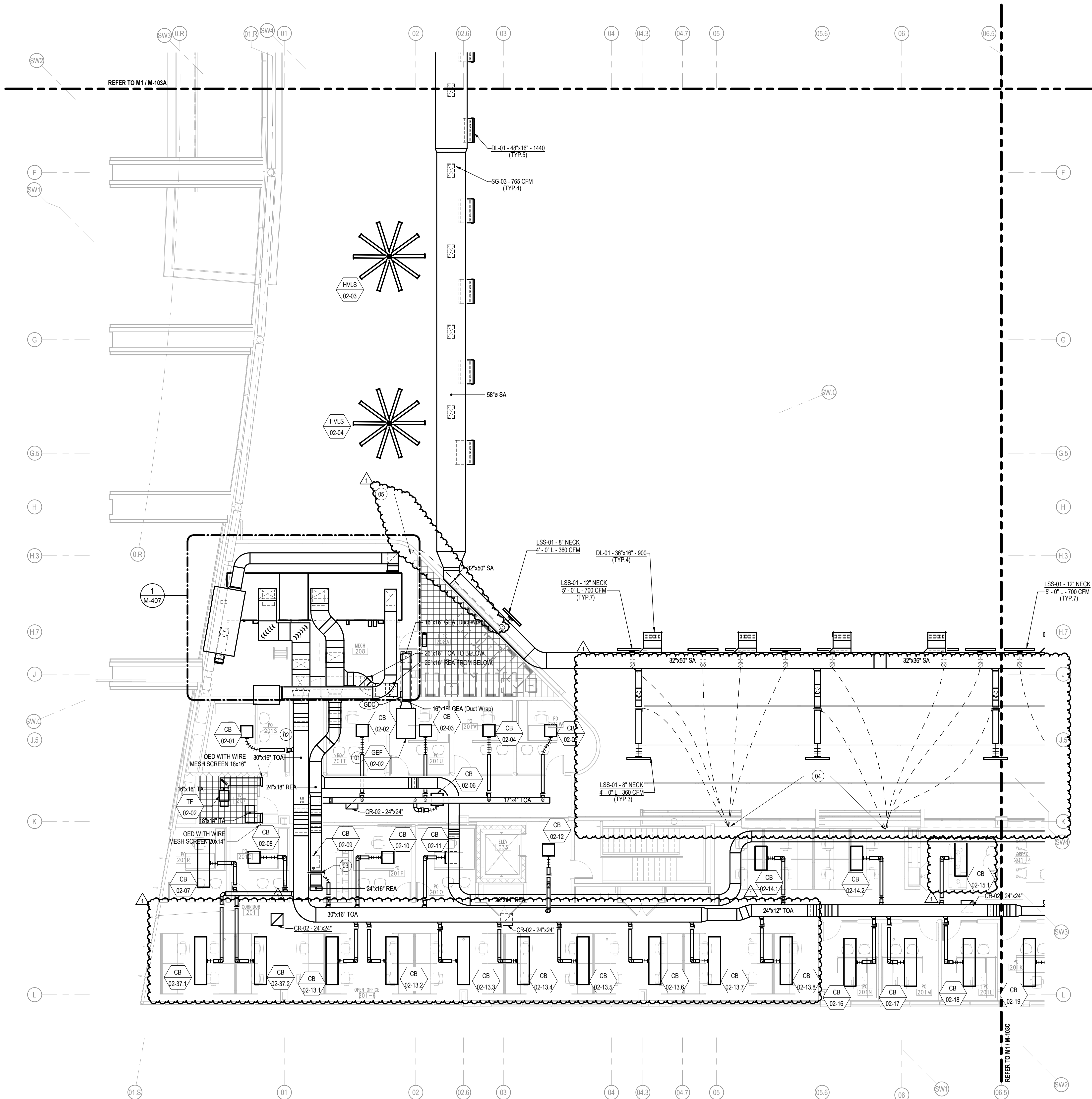
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GENERAL HVAC NOTES:

- VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- ALL DUCT ELBOWS TO BE RADIUS 1.5 RW WHERE SPACE ALLOWS. RECTANGULAR ELBOWS TO BE CW TURNING VANES. SEE DETAILS FOR ADDITIONAL INFORMATION.
- DIRECTIONAL BAFFLES SHALL BE INSTALLED INSIDE OF DIFFUSERS TO ACHIEVE AIRFLOW DIRECTIONS INDICATED ON PLANS.
- ALL VOLUME DAMPERS SHALL BE PROVIDED IN THE SUPPLY DUCTWORK NEAR THE BRANCH TAKEOFF FROM THE MAIN. BALANCING DAMPERS AT THE GRILLE FACE ARE NOT PERMITTED UNLESS OTHERWISE INDICATED.
- INSULATION SHALL BE APPLIED WHERE INDICATED BY SPECIFICATIONS. DIMENSIONS ON PLANS INDICATE FREE-AREA DIMENSIONS OF THE INSIDE OF THE DUCT.
- DUCT AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- BRANCH DUCTS TO TERMINAL DEVICES (CHILLED BEAMS, DIFFUSERS, ETC.) SHALL BE THE SAME SIZE AS INLET UNLESS SPECIFICALLY NOTED OTHERWISE.
- GREASE DUCT CLEANOUTS SHALL BE LOCATED TO COMPLY WITH IMC 506.3.8.
- ALL TRANSFER OPENINGS UNDER 2 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 12". ALL TRANSFER OPENINGS BETWEEN 2 SQFT AND 6 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 18". ALL TRANSFER OPENINGS LARGER THAN 6 SQFT SHALL BE FREE OF OBSTRUCTION BY MIN. 24" UNLESS OTHERWISE NOTED.
- MC TO ENSURE ALL VOLUME CONTROL DAMPERS LOCATED ABOVE GYP CEILING TO HAVE REMOTE OPERATION CAPABILITIES OR BE PROVIDED WITH AN ACCESS PANEL. COORDINATE USE OF ACCESS PANELS WITH ARCHITECT.
- WHERE LINEAR SLOTS ARE INSTALLED IN LINE AND ARE UNBROKEN BY WALL DIVIDERS, PROVIDE BLANK SECTIONS OF SLOTS MATCHING THE APPEARANCE OF THE ACTIVE SECTIONS FOR A CONTINUOUS APPEARANCE.

SHEET NOTES:

- CONNECT TO GREASE FAN THROUGH WALL, WHERE FAN IS MOUNTED HORIZONTALLY ABOVE ROOF.
- A SECOND DAMPER OR OTHER STATIC ORIFICE PRESSURE REDUCER MAY BE REQUIRED FOR PROPER BALANCING OF THE FIRST 50% OF CHILLED BEAMS. CONTRACTOR SHALL DETERMINE DURING TAB WHERE ADDITIONAL AIR PRESSURE REDUCTION MEASURES ARE REQUIRED AND APPLY THEM AS NECESSARY.
- RELIEF AIR INLET SHALL BE BALANCED TO PREVENT STAGNANT AIRFLOW IN THE FURTHEST AREA OF THE OFFICE.
- ROUTE REMOTE ACCESS CABLES TO LOCATION INDICATED AND LABEL EACH CABLE INDIVIDUALLY. PROVIDE ACCESS PANEL FOR TERMINATION POINTS OR A TERMINATION PANEL BY MANUFACTURER. CABLE LENGTH NOT TO EXCEED MANUFACTURER'S RECOMMENDED LENGTH. COORDINATE EXACT LOCATION WITH ARCHITECTURAL DRAWINGS. ACCESS POINT FOR CABLES SHALL BE ABOVE THE CEILING.
- ROUTE REMOTE ACCESS CABLES TO LOCATION INDICATED AND LABEL EACH CABLE INDIVIDUALLY. PROVIDE ACCESS PANEL FOR TERMINATION POINTS OR A TERMINATION PANEL BY MANUFACTURER. CABLE LENGTH NOT TO EXCEED MANUFACTURER'S RECOMMENDED LENGTH. COORDINATE EXACT LOCATION WITH ARCHITECTURAL DRAWINGS. CABLES SHALL BE ACCESSIBLE WITHOUT THE NEED FOR A LADDER.



UPPER FLOOR PLAN - AREA D - HVAC

1/8" = 1'-0"

RATIO

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PROJECT NO. 23112.000

SHEET TITLE
UPPER FLOOR PLAN
- AREA D - HVAC

SHEET NUMBER

M-103D

Ohio St & N Blackford S
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IU Project NO. 20240127

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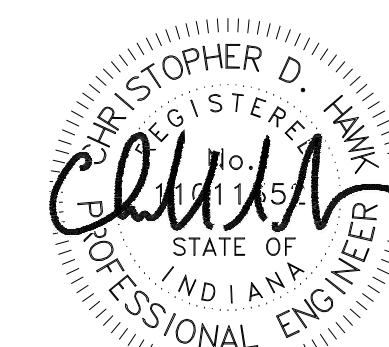
GENERAL PIPING NOTES:

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATE EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. PIPING AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- C. PUMPED CONDENSATE PIPING FIELD ROUTED TO A CONDENSATE HEADER SHALL CONNECT ON TOP OF THE HEADER. WHICH IS SLOPED AT 1/8" PER FOOT TOWARDS THE ROOM. RESEARCHER CONDENSATE MANS SHALL NOT TURN UP IN THE DIRECTION OF FLOW. CONDENSATE MANS SHALL BE SIZED IN ACCORDANCE WITH TABLE 307.2.2. CONDENSATE DRAIN SIZING IN THE INTERNATIONAL MECHANICAL CODE.
- D. CONDENSATE PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO ALLOW CLEARING OF BLOCKAGES AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE LINE TO BE OUT IN ACCORDANCE WITH SECTION 307.2.2.2. LINE MAINTENANCE IN THE INTERNATIONAL MECHANICAL CODE.
- E. CONDENSATE PUMPS SHALL BE INSTALLED IN SUCH A WAY THAT FAILURE OF THE PUMP SHALL PREVENT THE ASSOCIATED UNIT FROM OPERATING.
- F. DRAIN VALVES WITH CAPS SHALL BE INSTALLED AT ALL DRAIN LOW POINTS IN THE HYDRONIC PIPING SYSTEM. IF THIS DRAIN VALVE IS LOCATED OVER A HARD CEILING, IT SHALL BE INSTALLED TO AN ACCESS PANEL LOCATION OR PROVIDED WITH AN ACCESS PANEL.
- G. ALL PIPING TO REMAIN SHALL BE CLEANED AND SEALED DURING CONSTRUCTION.
- H. PROVIDE AIR VENTS OR DRAINS AS APPROPRIATE FOR LOCAL HIGH OR LOW DRAIN LOCATIONS. ALL DRAINS SHALL BE SEALED WITH VALVE AND CAP. SEE DETAILS FOR ADDITIONAL INFORMATION.
- I. ALL PRESSURIZED PIPING SYSTEMS IMPACTED BY CONSTRUCTION SHALL BE FLUSHED CLEAN PRIOR TO ANY STARTUP. ALL DRAINS SHALL BE FLUSHED CLEAN.

SHEET NOTES:

- 01 CONDENSATE PIPING SHALL RUN DOWN THROUGH-
WALL AND DISCHARGE INTO FLOOR SINK BELOW
UTILITY SINK. MAINTAIN A MINIMUM 3" AIR GAP.
03 PROVIDE A PIPE ANCHOR FOR EXPANSION LOOP
SYSTEM. PROVIDE ADDITIONAL PIPE GUIDES
COMPLIANT WITH MANUFACTURER
RECOMMENDATIONS. EXACT LOCATIONS OF
ANCHORS AND GUIDES TO BE COMPLIANT WITH
MANUFACTURER RECOMMENDATIONS.

SEAL | DATE 01/27/25

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RATIO

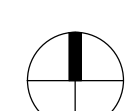
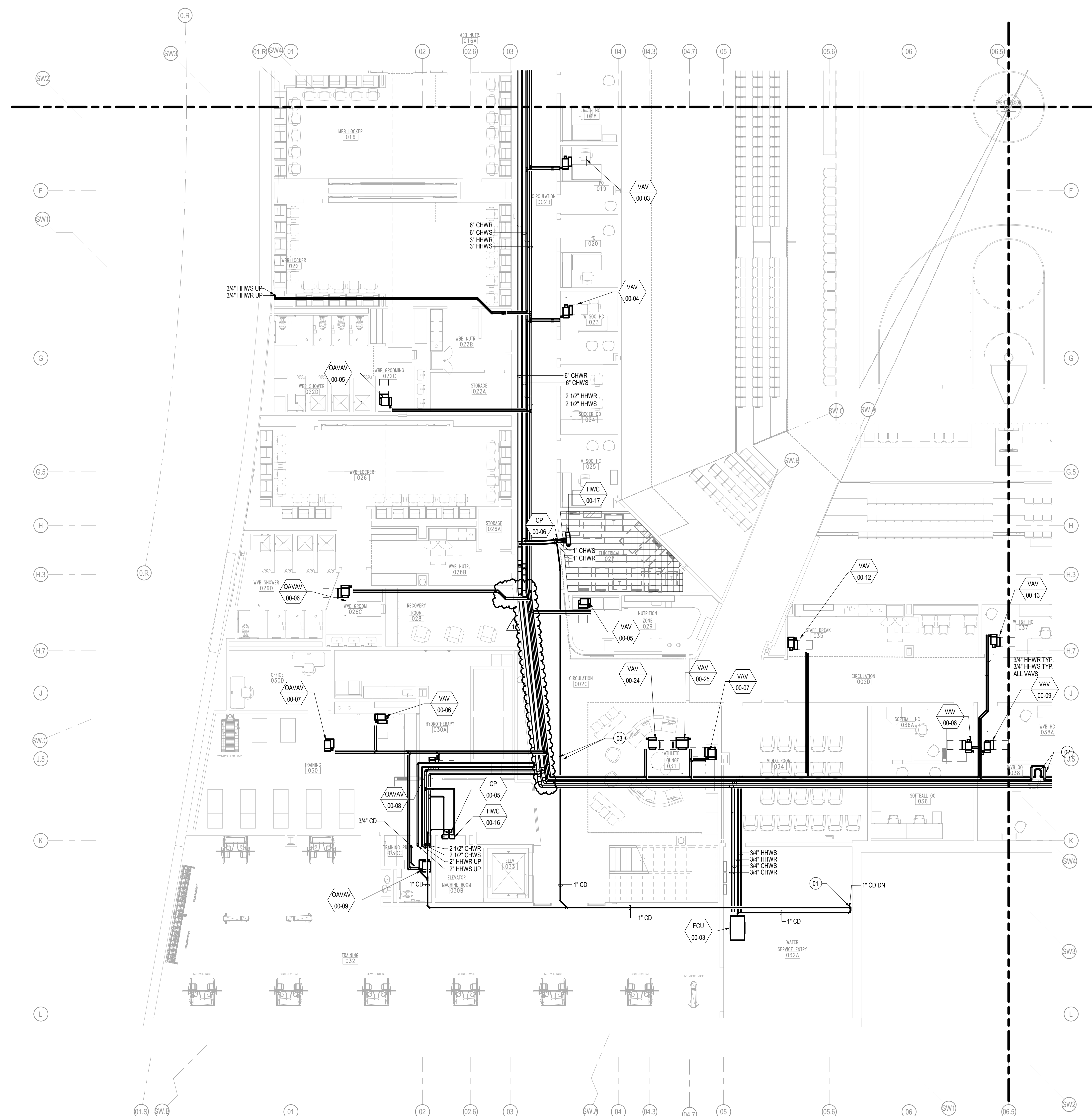
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PROJECT NO.	23112.000
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SHEET TITLE
EVENT FLOOR PLAN
- AREA D - PIPING

SHEET NUMBER

M-201D



EVENT FLOOR PLAN - AREA D - PIPING

IN128 - JAMES T. MORRIS ARENA

Ohio St & N Blackford St
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IU Project NO. 20240127

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Code Consultant
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HARRISONVILLE, MO 64701
816-806-3729

GENERAL PIPING NOTES:

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. PIPING AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- C. PUMPED CONDENSATE PIPING FIELD ROUTED TO A CONDENSATE HEADER SHALL CONNECT ON TOP OF THE HEADER, WHICH IS SLOPED AT 1/8" PER FOOT TOWARDS THE POINT OF DISCHARGE. CONDENSATE MAINS SHALL NOT TURN UP IN THE DIRECTION OF FLOW. CONDENSATE MAINS SHALL BE SIZED IN ACCORDANCE WITH TABLE 307.2.2 "CONDENSATE DRAIN SIZING" IN THE INTERNATIONAL MECHANICAL CODE.
- D. CONDENSATE PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO ALLOW CLEARING OF BLOCKAGES AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE LINE TO BE CUT IN ACCORDANCE WITH SECTION 307.2.3 "DRAIN LINE MAINTENANCE" OF THE INTERNATIONAL MECHANICAL CODE.
- E. CONDENSATE PUMPS SHALL BE INSTALLED IN SUCH A WAY THAT FAILURE OF THE PUMP SHALL PREVENT THE ASSOCIATED UNIT FROM OPERATING.
- F. DRAIN VALVES WITH CAPS SHALL BE INSTALLED AT ALL LOCAL LOW POINTS IN THE HYDRONIC PIPING SYSTEM. IF THIS DRAIN VALVE IS LOCATED OVER A HARD CEILING, IT SHALL BE PIPED TO AN ACCESSIBLE LOCATION OR PROVIDED WITH AN ACCESS PANEL.
- G. ALL PIPING TO REMAIN SHALL BE CLEANED AND SEALED DURING CONSTRUCTION.
- H. PROVIDE AIR VENTS OR DRAINS AS APPROPRIATE FOR LOCAL HIGH OR LOW PIPING LOCATIONS. ALL DRAINS SHALL BE SEALED WITH VALVE AND CAP. SEE DETAILS FOR ADDITIONAL INFORMATION.
- I. ALL PRESSURIZED PIPING SYSTEMS IMPACTED BY CONSTRUCTION SHALL BE FLUSHED CLEAN PRIOR TO ANY STRAINERS OR COILS BEING ENGAGED.

SHEET NOTES:

- 01 FLOOR MOUNTED FIN-TUBE RADIATORS TO BE PIPED IN PARALLEL UTILIZING A REVERSE RETURN CONFIGURATION.
- 02 CONDENSATE SHALL RUN DOWN THROUGH WALL CHASE TO TIE INTO JANITOR SINK TAILPIECE ABOVE THE WATER LEVEL OF THE TRAP.
- 03 CONDENSATE SHALL DROP DOWN TO DISCHARGE INTO FLOOR DRAIN. MAINTAIN MINIMUM 3" AIR GAP.
- 04 HYDRONIC DIFFERENTIAL PRESSURE SENSORS SHALL BE LOCATED ABOVE THE FLOOR PENETRATION. COORDINATE ACCESS DOOR LOCATION SUCH THAT A SINGLE ACCESS DOOR CAN BE USED FOR BOTH THE FIRE DAMPER AND DIFFERENTIAL PRESSURE SENSORS.

SEAL | DATE 01/27/25



SHEET ISSUE

1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
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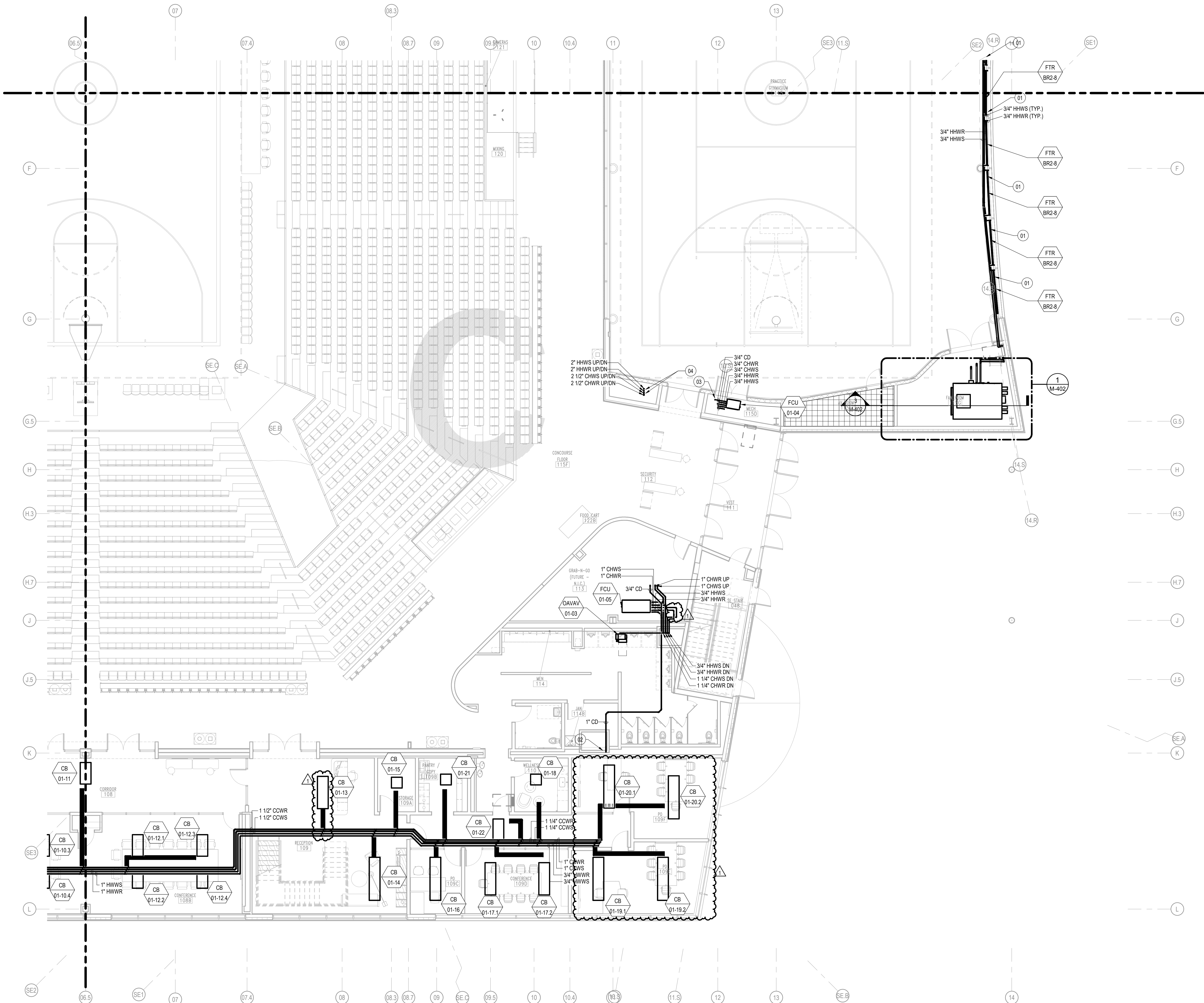
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PROJECT NO. 23112.000

SHEET TITLE
CONCOURSE FLOOR PLAN - AREA C - PIPING

SHEET NUMBER

M-202C



CONCOURSE FLOOR PLAN - AREA C - PIPING

1/8" = 1'-0"

IN128 - JAMES T. MORRIS ARENA

Ohio St & N Blackford St
Indianapolis, IN 46202

IU Project NO. 20240127

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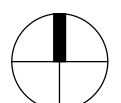
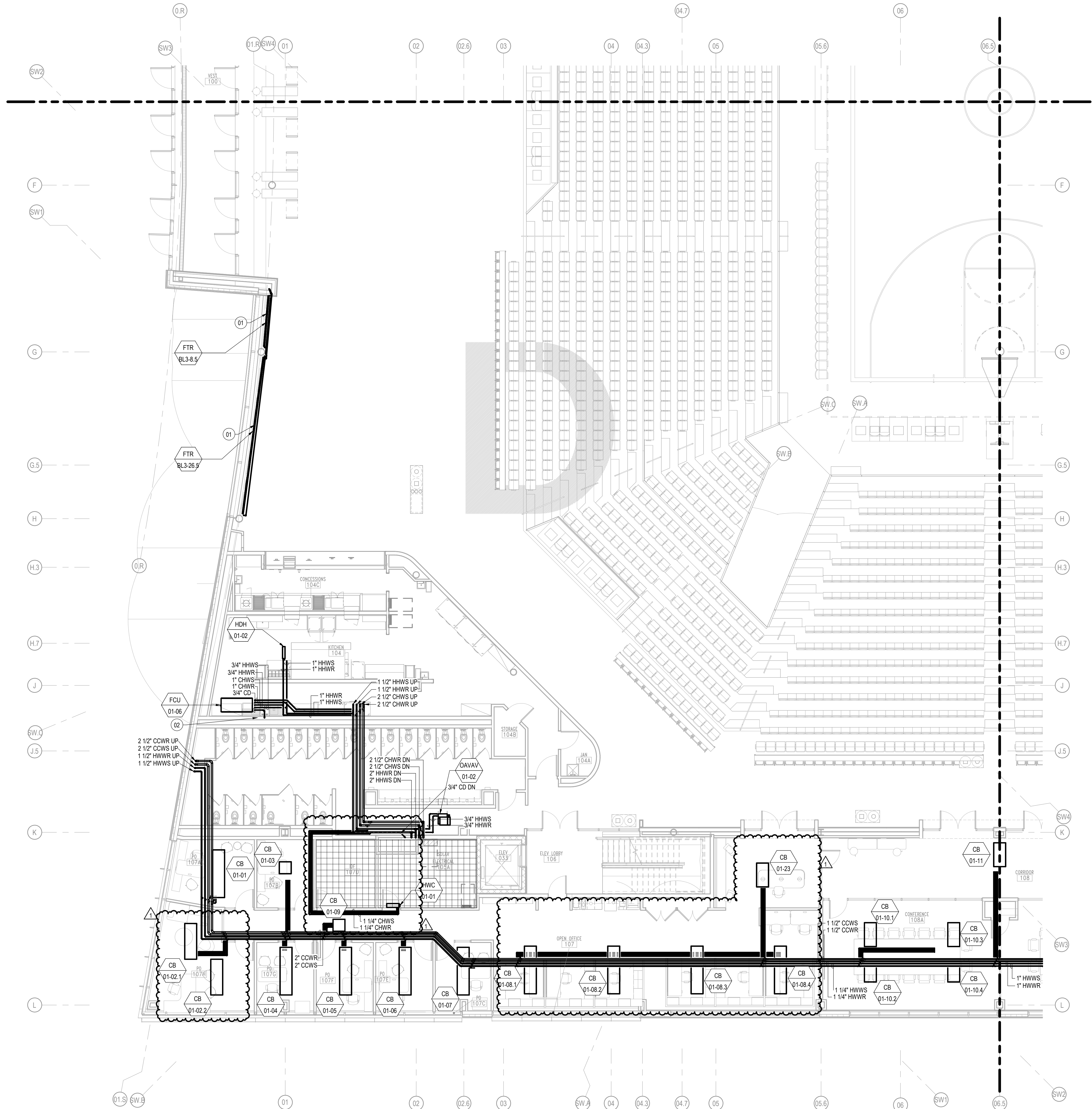
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GENERAL PIPING NOTES:

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- B. PIPING AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- C. PUMPED CONDENSATE PIPING FIELD ROUTED TO A CONDENSATE HEADER SHALL CONNECT ON TOP OF THE HEADER, WHICH IS SLOPED AT 1/8" PER FOOT TOWARDS THE POINT OF DISCHARGE. CONDENSATE MAINS SHALL NOT TURN UP IN THE DIRECTION OF FLOW. CONDENSATE MAINS SHALL BE SIZED IN ACCORDANCE WITH TABLE 307.2.2 "CONDENSATE DRAIN SIZING" IN THE INTERNATIONAL MECHANICAL CODE.
- D. CONDENSATE PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO ALLOW CLEARING OF BLOCKAGES AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE LINE TO BE CUT IN ACCORDANCE WITH SECTION 307.2.5 "DRAIN LINE MAINTENANCE" OF THE INTERNATIONAL MECHANICAL CODE.
- E. CONDENSATE PUMPS SHALL BE INSTALLED IN SUCH A WAY THAT FAILURE OF THE PUMP SHALL PREVENT THE ASSOCIATED UNIT FROM OPERATING.
- F. DRAIN VALVES WITH CAPS SHALL BE INSTALLED AT ALL LOCAL LOW POINTS IN THE HYDRONIC PIPING SYSTEM. IF THIS DRAIN VALVE IS LOCATED OVER A HARD CEILING, IT SHALL BE PIPED TO AN ACCESSIBLE LOCATION OR PROVIDED WITH AN ACCESS PANEL.
- G. ALL PIPING TO REMAIN SHALL BE CLEANED AND SEALED DURING CONSTRUCTION.
- H. PROVIDE AIR VENTS OR DRAINS AS APPROPRIATE FOR LOCAL HIGH OR LOW PIPING LOCATIONS. ALL DRAINS SHALL BE SEALED WITH VALVE AND CAP. SEE DETAILS FOR ADDITIONAL INFORMATION.
- I. ALL PRESSURIZED PIPING SYSTEMS IMPACTED BY CONSTRUCTION SHALL BE FLUSHED CLEAN PRIOR TO ANY STRAINERS OR COILS BEING ENGAGED.

SHEET NOTES:

- 01 FLOOR MOUNTED FIN-TUBE RADIATORS TO BE PIPED IN PARALLEL UTILIZING A REVERSE RETURN CONFIGURATION.
- 02 CONDENSATE PIPING SHALL RUN DOWN THROUGH WALL AND DISCHARGE INTO FLOOR SINK BELOW UTILITY SINK. MAINTAIN A MINIMUM 3" AIR GAP.



CONCOURSE FLOOR PLAN - AREA D - PIPING
1/8" = 1'-0"

SEAL | DATE 01/27/25



SHEET ISSUE

1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25



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PROJECT NO. 23112.000

SHEET TITLE
CONCOURSE FLOOR PLAN - AREA D - PIPING

SHEET NUMBER

M-202D

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IU Project NO. 20240127

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A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.

B. PIPING AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.

C. PUMPED CONDENSATE PIPING LINE ROUTED TO A CONDENSATE HEADER SHALL CONNECT ON TOP OF THE HEADER, WHICH IS SLOPED AT 1/8" PER FOOT TOWARDS THE POINT OF DISCHARGE. CONDENSATE MAINS SHALL NOT TURN UP IN THE DIRECTION OF FLOW. CONDENSATE MAINS SHALL BE SIZED IN ACCORDANCE WITH TABLE 307.2.2 "CONDENSATE DRAIN SIZING" IN THE INTERNATIONAL MECHANICAL CODE.

D. CONDENSATE PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO ALLOW CLEARING OF BLOCKAGES AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE LINE TO BE CUT IN ACCORDANCE WITH SECTION 307.2.5 "DRAIN LINE MAINTENANCE" OF THE INTERNATIONAL MECHANICAL CODE.

E. CONDENSATE PUMPS SHALL BE INSTALLED IN SUCH A WAY THAT FAILURE OF THE PUMP SHALL PREVENT THE ASSOCIATED UNIT FROM OPERATING.

F. DRAIN VALVES WITH CAPS SHALL BE INSTALLED AT ALL LOCAL LOW POINTS IN THE HYDRONIC PIPING SYSTEM. IF THIS DRAIN VALVE IS LOCATED OVER A HARD CEILING, IT SHALL BE PIPED TO AN ACCESSIBLE LOCATION OR PROVIDED WITH AN ACCESS PANEL.

G. ALL PIPING TO REMAIN SHALL BE CLEANED AND SEALED DURING CONSTRUCTION.

H. PROVIDE AIR VENTS OR DRAINS AS APPROPRIATE FOR LOCAL HIGH OR LOW PIPING LOCATIONS. ALL DRAINS SHALL BE SEALED WITH VALVE AND CAP. SEE DETAILS FOR ADDITIONAL INFORMATION.

I. ALL PRESSURIZED PIPING SYSTEMS IMPACTED BY CONSTRUCTION SHALL BE FLUSHED CLEAN PRIOR TO ANY STRAINERS OR COILS BEING ENGAGED.

- 01 FIN-TUBE RADIATORS TO BE INSTALLED ON THE MIDSPAN STRUCTURAL MEMBER AND BE PIPED IN AN OPPOSITE END SERIES CONFIGURATION.
- 02 PIPING WILL PASS THROUGH CUT-OUTS IN COLUMNS IN A STACKED ORIENTATION.
- 03 FIN-TUBE RADIATORS TO BE INSTALLED ON THE MIDSPAN STRUCTURAL MEMBER OF THE CURTAIN WALL.

SEAL | DATE 01/27/25



SHEET ISSUE

1	DD PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

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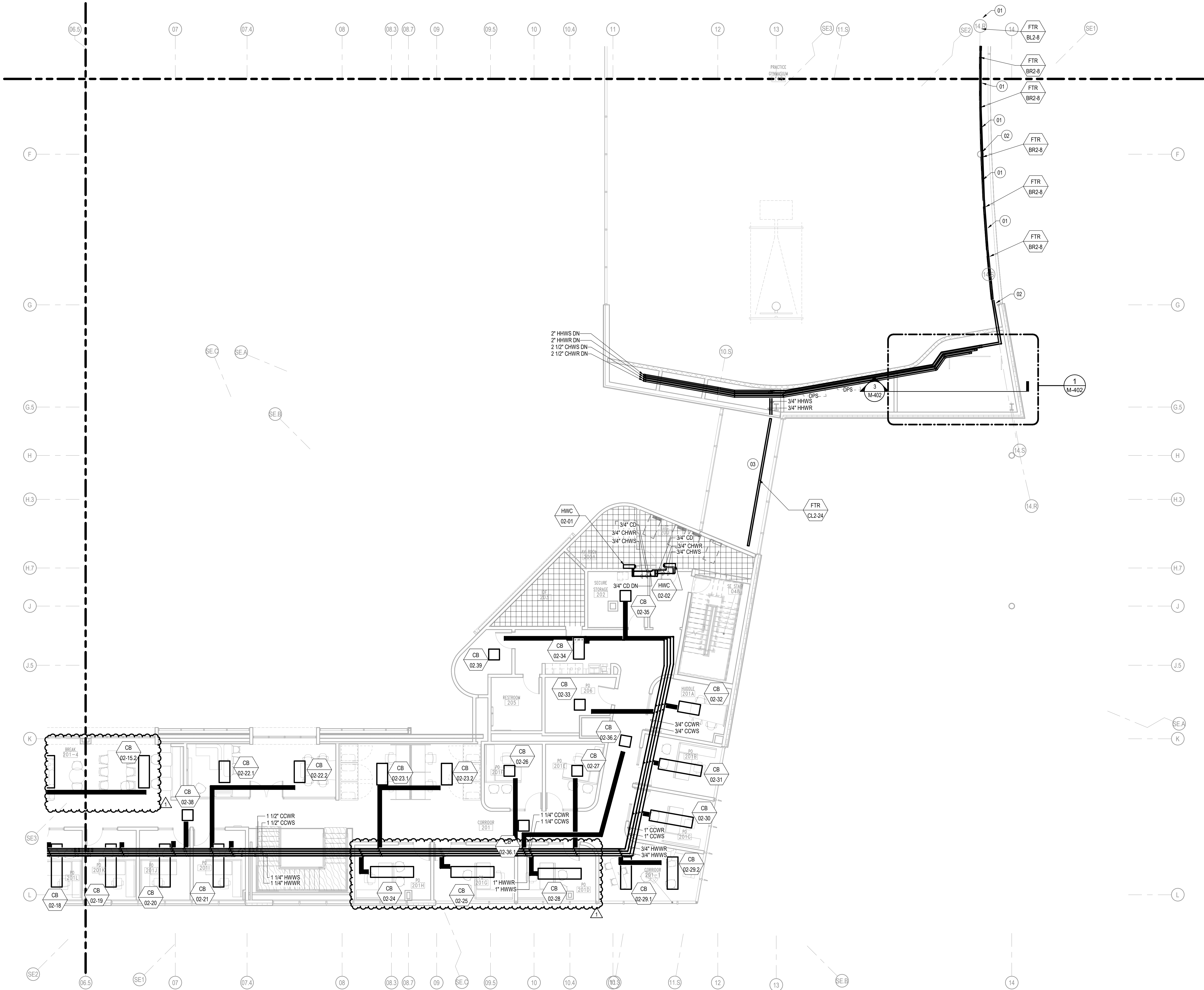
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PROJECT NO.	23112.000
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SHEET TITLE
UPPER FLOOR PLAN
- AREA C - PIPING

SHEET NUMBER

M-203C



UPPER FLOOR PLAN - AREA C - PIPING
1/8" = 1'-0"

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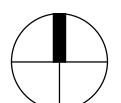
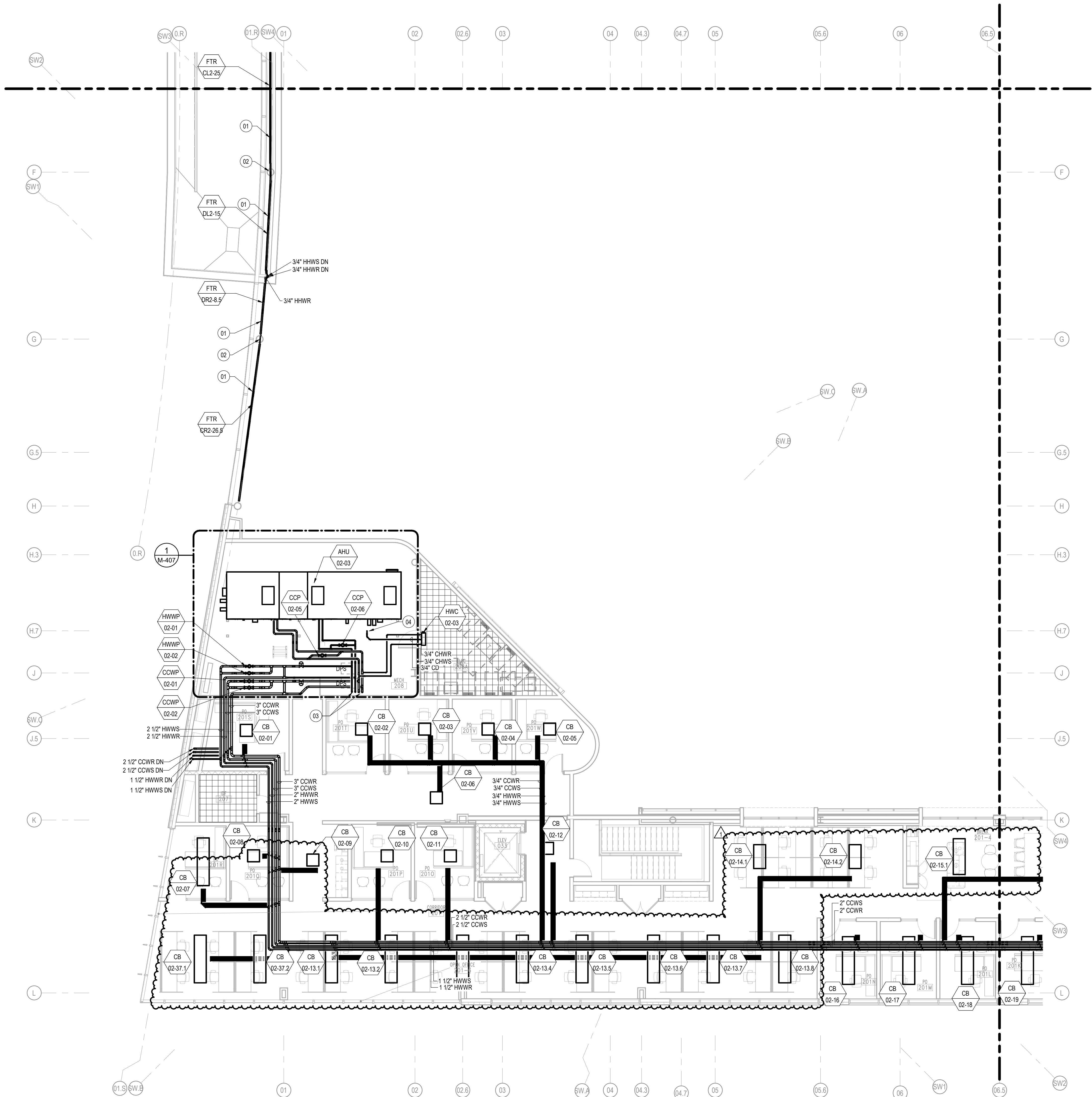
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GENERAL PIPING NOTES:

- A. VERIFY ALL DIMENSIONS, CLEARANCES AND INTERFERENCES AGAINST ON SITE CONDITIONS AND OTHER DISCIPLINE DRAWINGS PRIOR TO ORDERING MATERIAL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EQUIPMENT AND DUCT LOCATIONS WITH OTHER TRADES.
- B. PIPING AND EQUIPMENT ABOVE CEILING TO BE INSTALLED SO AS TO LEAVE ROOM TO INSTALL LIGHTS AND ASSOCIATED HARDWARE.
- C. PUMPED CONDENSATE PIPING FIELD ROUTED TO A CONDENSATE HEADER SHALL CONNECT ON TOP OF THE HEADER, WHICH IS SLOPED AT 1/8" PER FOOT TOWARDS THE POINT OF DISCHARGE. CONDENSATE MAINS SHALL NOT TURN UP IN THE DIRECTION OF FLOW. CONDENSATE MAINS SHALL BE SIZED IN ACCORDANCE WITH TABLE 307.2.2 "CONDENSATE DRAIN SIZING" IN THE INTERNATIONAL MECHANICAL CODE.
- D. CONDENSATE PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO ALLOW CLEARING OF BLOCKAGES AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE LINE TO BE CUT IN ACCORDANCE WITH SECTION 307.2.5 "DRAIN LINE MAINTENANCE" OF THE INTERNATIONAL MECHANICAL CODE.
- E. CONDENSATE PUMPS SHALL BE INSTALLED IN SUCH A WAY THAT FAILURE OF THE PUMP SHALL PREVENT THE ASSOCIATED UNIT FROM OPERATING.
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- G. ALL PIPING TO REMAIN SHALL BE CLEANED AND SEALED DURING CONSTRUCTION.
- H. PROVIDE AIR VENTS OR DRAINS AS APPROPRIATE FOR LOCAL HIGH OR LOW PIPING LOCATIONS. ALL DRAINS SHALL BE SEALED WITH VALVE AND CAP. SEE DETAILS FOR ADDITIONAL INFORMATION.
- I. ALL PRESSURIZED PIPING SYSTEMS IMPACTED BY CONSTRUCTION SHALL BE FLUSHED CLEAN PRIOR TO ANY STRAINERS OR COILS BEING ENGAGED.

SHEET NOTES:

- 01 FIN-TUBE RADIATORS TO BE INSTALLED ON THE MIDSPAN STRUCTURAL MEMBER AND BE PIPED IN A SAME END SERIES CONFIGURATION.
- 02 PIPING WILL PASS THROUGH CUT-OUTS IN COLUMNS IN A STACKED ORIENTATION.
- 03 HYDRONIC DIFFERENTIAL PRESSURE SENSORS SHALL BE LOCATED ABOVE THE FLOOR PENETRATION, ACCESSIBLE FROM STANDING HEIGHT.
- 04 CONDENSATE SHALL DROP DOWN TO DISCHARGE INTO FLOOR DRAIN. MAINTAIN MINIMUM 3" AIR GAP.



M1
M-203D

UPPER FLOOR PLAN - AREA D - PIPING
1/8" = 1'-0"

SEAL | DATE 01/27/25



SHEET ISSUE

1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

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PROJECT NO. 23112.000

SHEET TITLE
UPPER FLOOR PLAN
- AREA D - PIPING

SHEET NUMBER

M-203D

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SEAL | DATE 01/27/25



SHEET ISSUE		
1	95% CONSTRUCTION DOCUMENTS	12/19/2
2	CONSTRUCTION DOCUMENTS	01/13/2
3	ADDENDUM 01	01/27/2

[illegible]

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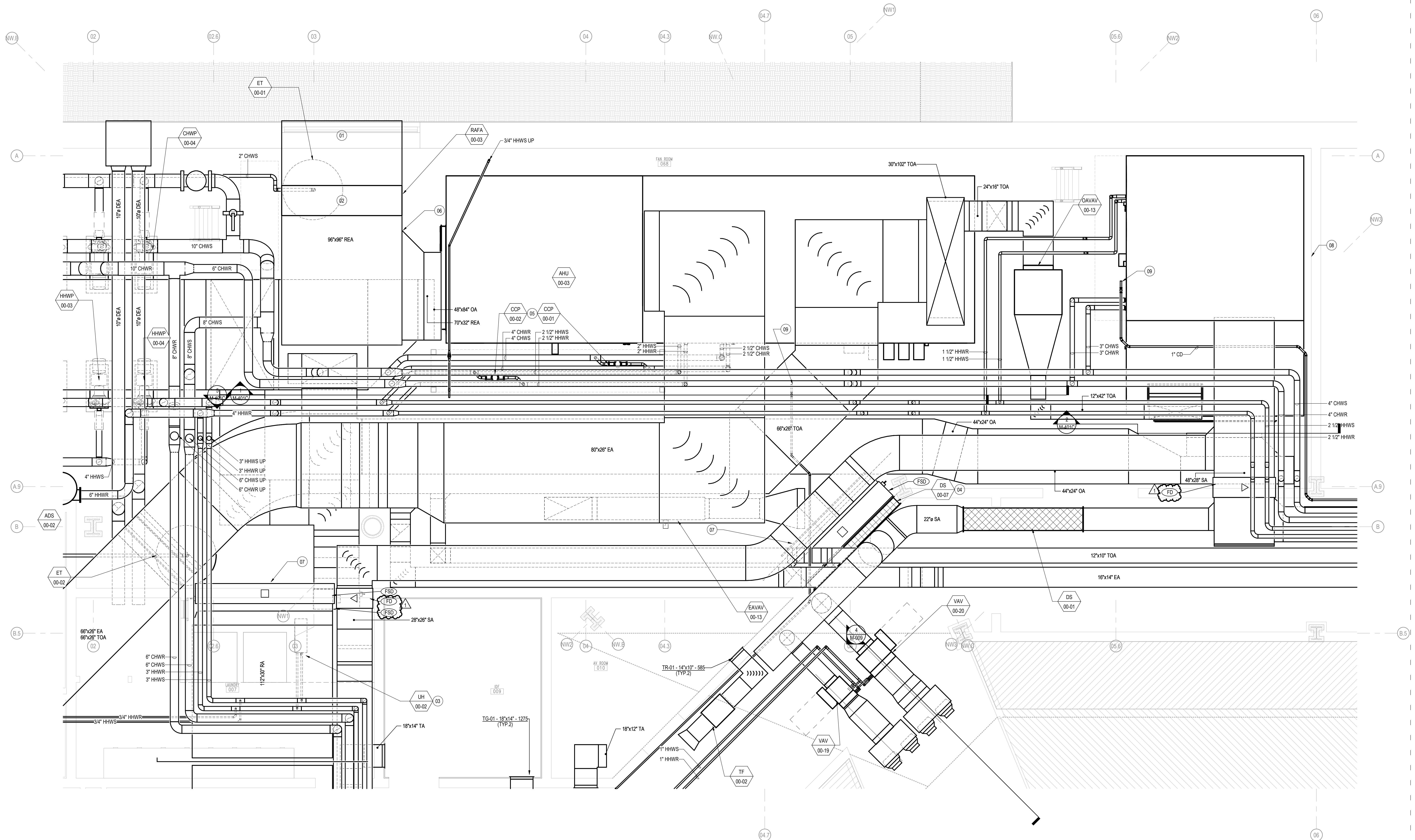
PROJECT NO. 23112.00

SHEET TITLE

EVENT LEVEL
ENLARGED PLAN -
DOAS, AHU,
LAUNDRY ROOMS

SHEET NUMBER

M-401B



1
M-401B

EVENT LEVEL ENLARGED PLAN - DOAS, AHU, LAUNDRY

3/8" = 1'-0"

SHEET NOTES:

- 01 AHU RELIEF LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL FLOW OF AHU-00-03. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 23,905 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 750 FPM AND A PRESSURE DROP LESS THAN 0.1 " WC. PLENUM OFF THE BACK OF THE LOUVER SHALL CONNECT TO THE DUCT ENCLOSURE FOR RAFA-00-03. FREE AREA OF THE LOUVER IS 32 SQ FT BASED ON A FREE AREA PLENUM COEFF OF 80% AND AN OVER SIZE OF 96" X 96". IF A LOUVER LARGER THAN WHAT IS SPECIFIED HERE IS PROVIDED, THE UNUSED AREA SHALL BE BLANKED OFF AND INSULATED. REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 02 RAFA SHALL BE INDEPENDENTLY SUPPORTED FROM THE STRUCTURE. PROVIDE ACCESS DOORS ON EITHER SIDE OF THE FAN ARRAY TO PROVIDE MAINTENANCE ACCESS.
- 03 UNIT HEATER SHALL BE MOUNTED IN THE AIR-TIGHT DRYER EXHAUST MAKEUP AIR PLENUM. ACCESS DOOR SHALL BE SUFFICIENTLY LARGE TO MAINTAIN AND REPLACE UNIT HEATER IF REQUIRED.
- 04 ACOUSTICAL LOUVER SHALL BE MOUNTED THROUGH THE WALL AT 1'-0" A.F.F. A DUCTED PLENUM OF SUFFICIENT LENGTH SHALL BE PROVIDED OFF THE BACK OF THE LOUVER TO DUCT THE DAMPERS AS SHOWN.
- 05 COP AND ASSOCIATED PIPING SHALL BE INSTALLED BENEATH THE ACCESS PLATFORM SUCH THAT THEY ALLOW ADEQUATE ACCESS TO THE AHU AND ARE MAINTAINABLE FROM THE FLOOR.
- 06 RELIEF AIR CONNECTION SHALL TIE INTO PLENUM OF RAFA-00-03
- 07 RETURN OPENING MECHANICAL ROOM SHALL BE PROVIDED WITH WIRE MESH SCREEN AND SHALL BE UNOBSTRUCTED FOR MIN. 8"
- 08 VFDs AND POWER DISTRIBUTION PANEL ARE SHIPPED LOOSE. COORDINATE FIELD INSTALLATION. PROVIDE MIN. 48" CLEAR IN FRONT OF ALL VFDs AND POWER DISTRIBUTION PANELS.
- 09 CONDENSATE SHALL SPLIT INTO FLOOR SINK. COORDINATE EXHAUST ROUTE TO AVOID INTERFERING WITH ACCESS TO AHU.

IN128 - JAMES T. MORRIS ARENA

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SHEET NOTES:

- 01 RAFA SHALL BE SUPPORTED INDEPENDENTLY BY THE FLOOR. PROVIDE A DUCT ACCESS DOOR FOR FAN MOTOR MAINTENANCE FOR EACH FAN.
- 02 AHU ECONOMIZER RELIEF LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL AIRFLOW OF RAFA-01-01. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 9,000 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 1,000 FPM AND A PRESSURE DROP LESS THAN 0.1" WC. PLENUM OFF THE BACK OF THE LOUVER SHALL BE NO LESS THAN 24" DEEP. FREE AREA OF THE LOUVER IS 11.3 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 68" X 48". IF A LOUVER LARGER THAN WHAT IS SPECIFIED HERE IS PROVIDED, THE UNUSED AREAS SHALL BE BLANKED OFF AND INSULATED. REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 03 6" CONCRETE HOUSEKEEPING PAD BY OTHERS. MECHANICAL CONTRACTOR TO INFORM GC IF TRAP HEIGHT REQUIRES A TALLER PAD. PAD SHALL EXCEED FOOTPRINT OF UNIT BY MIN. 3" IN ALL DIMENSIONS.
- 04 RETURN AIR OPENING SHALL REMAIN UNOBSTRUCTED FOR MIN. 36".
- 05 VFDS AND POWER DISTRIBUTION PANEL ARE SHIPPED LOOSE. COORDINATE FIELD INSTALLATION. PROVIDE MIN. 48" CLEAR IN FRONT OF ALL VFDS AND POWER DISTRIBUTION PANELS.
- 06 AHU ECONOMIZER LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL AIRFLOW OF AHU-01-01. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 9,000 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 750 FPM AND A PRESSURE DROP LESS THAN 0.1" WC. PLENUM OFF THE BACK OF THE LOUVER SHALL BE NO LESS THAN 24" DEEP. FREE AREA OF THE LOUVER IS 16 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 90" X 48". IF A LOUVER LARGER THAN WHAT IS SPECIFIED HERE IS PROVIDED, THE UNUSED AREAS SHALL BE BLANKED OFF AND INSULATED. REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 08 RETURN OPENING INTO MECHANICAL ROOM SHALL BE PROVIDED WITH WIRE MESH SCREEN AND SHALL BE UNOBSTRUCTED FOR MIN. 36".
- 09 RELIEF OPENING SHALL BE PROVIDED WITH WIRE MESH SCREEN AND SHALL BE UNOBSTRUCTED FOR MIN. 36".

CONCOURSE LEVEL SECTION VIEW - STORAGE 115D

1/4" = 1'-0"

CONCOURSE LEVEL ENLARGED PLAN - STORAGE 115D

1/4" = 1'-0"

UPPER FLOOR LEVEL SECTION VIEW - SUPPORT 115B

1/4" = 1'-0"

UPPER FLOOR LEVEL ENLARGED PLAN - SUPPORT 115B

1/4" = 1'-0"

CONCOURSE LEVEL ISOMETRIC VIEW - STORAGE 115D

3D VIEWS PROVIDED FOR CONVENIENCE. SOME MATERIAL MAY HAVE BEEN HIDDEN FOR CLARITY. REFER TO OTHER VIEWS FOR SYSTEM INFORMATION.

SEAL | DATE 01/27/25



SHEET ISSUE		
1	DESIGN DEVELOPMENT	08/30/24
2	50% CONSTRUCTION DOCUMENTS	11/01/24
3	95% CONSTRUCTION DOCUMENTS	12/19/24
4	CONSTRUCTION DOCUMENTS	01/13/25
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PROJECT NO. 23112.000

SHEET TITLE
ENLARGED PLANS - PRACTICE GYM

SHEET NUMBER

M-402

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This diagram shows an exploded view of the RAFA 02-01 and GEF 02-01 components. The RAFA 02-01 component is shown on the left, and the GEF 02-01 component is shown on the right. The diagram illustrates how these components are assembled into a larger system, with various parts like the main body, internal components, and a large cylindrical pipe shown in their relative positions.

2 ISOMETRIC VIEW - FAN ROOM 206

SHEET NOTES:

- 01 FAN WALL, IS HOSTED IN BUILT-UP FRAME INSIDE RELIEF FAN ROOM. ROOM CONSTRUCTION DETAILS BY ARCHITECT, FAN WALL STRUCTURE BY STRUCTURAL ENGINEER.
- 02 FAN WALL ROOM INLET DAMPER SHALL BE INSTALLED IN THE FACE OF THE WALL AND SHALL BE MOTOR OPERATED. OPERATION OF THE DAMPER IS INTERLOCKED WITH AHU-02-01 DAMPER SHALL BE MOUNTED APPROXIMATELY 6" A.F.F.
- 03 GREASE DUCT SHALL BE PROVIDED AND INSTALLED AS A ZERO-CLEARANCE RATED DUCT PRODUCT IN LIEU OF A BUILT-OUT RATED DUCT ENCLOSURE. PRODUCT SHALL BE PROVIDED AS CAPTIVEAIRE DWI-32 OR APPROVED EQUAL.
- 04 FAN WALL ROOM INLET DAMPER SHALL BE INSTALLED IN THE FACE OF THE WALL AND SHALL BE MOTOR OPERATED. OPERATION OF THE DAMPER IS INTERLOCKED WITH AHU-02-01. DAMPER SHALL BE MOUNTED APPROXIMATELY 6" ABOVE THE PENETRATION OF THE AHU RELIEF AIR RELIEF AIR OUTLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL AIRFLOW OF AHU-02-01. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 65,000 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 1000 FPM AND A PRESSURE DROP LESS THAN 0.1" W.C. LOUVER CONNECTS INTO BUILT-UP FAN ROOM. FREE AREA OF THE LOUVER IS 60 SQ FT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 96" X 180". REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 06 OA INLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL ECONOMIZER AIRFLOW OF AHU-01-01 AND THE MAKEUP AIR TO THE KITCHEN HOOD ON THE FLOOR BELOW. THE TWO EQUALLY SIZED LOUVERS SHARING THIS PLENUM. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 56,700 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 1000 FPM AND A PRESSURE DROP LESS THAN 0.1" W.C. LOUVER CONNECTS INTO BUILT-UP SHARED PLENUM. FREE AREA OF THE LOUVER IS 60 SQ FT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 96" X 180". THE RESULTS IN AN OVERALL FREE AREA OF 121 SQ FT. THIS IS REDUCED TO APPROXIMATELY 98 SQ FT DUE TO THE WRAPPED BEAMS DIRECTLY BEHIND THE FACE OF THE LOUVER. REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 07 THE CONNECTION TO THE OA LOUVER SHALL BE A BUILT-OUT INSULATED PLENUM. THE INNER WALL OF THE PLENUM SHALL CONSIST OF A SHEET METAL SKIN AND SHALL MEET ALL THE REQUIREMENTS OF 1" PRESSURE CLASS DUCTWORK PER SMACNA WALL INSULATION SHALL MEET THE REQUIREMENTS OF 1" R-10 INSULATION PER THE REQUIREMENTS OF THE SPECIFICATIONS. VFDs AND POWER DISTRIBUTION PANEL ARE SHIPPED LOOSE. COORDINATE FIELD INSTALLATION. PROVIDE MIN. 48" CLEAR IN FRONT OF ALL VFDs AND POWER DISTRIBUTION PANELS.
- 08 ALL DUCT SHALL BE HUNG SUCH THAT 7'-0" CLEAR A.F.F. IS MAINTAINED.
- 09 FIRE-SMOKE DAMPERS WITH AN HOUR RATING COMPLIANT WITH THE WALL CONSTRUCTION SHALL BE INSTALLED IN A BUILT-UP PLENUM DIVIDING THE COMMON RETURN PLENUM AND THE MECHANICAL ROOM.
- 11 STEAM VENT PIPING FROM BELOW TO ABOVE ROOF. SEE RELIEF VENT DETAILS FOR INFORMATION ON TERMINATION HEIGHT.
- 12 6" CONCRETE HOUSEKEEPING PAD OVER ROOF. MECHANICAL CONTRACTOR TO INFORM GC IF TRAP HEIGHT REQUIRES A TALLER PAD. PAD SHALL EXCEED FOOTPRINT OF UNIT BY MIN. 3" IN ALL DIMENSIONS.

SEAL | DATE 01/27/25

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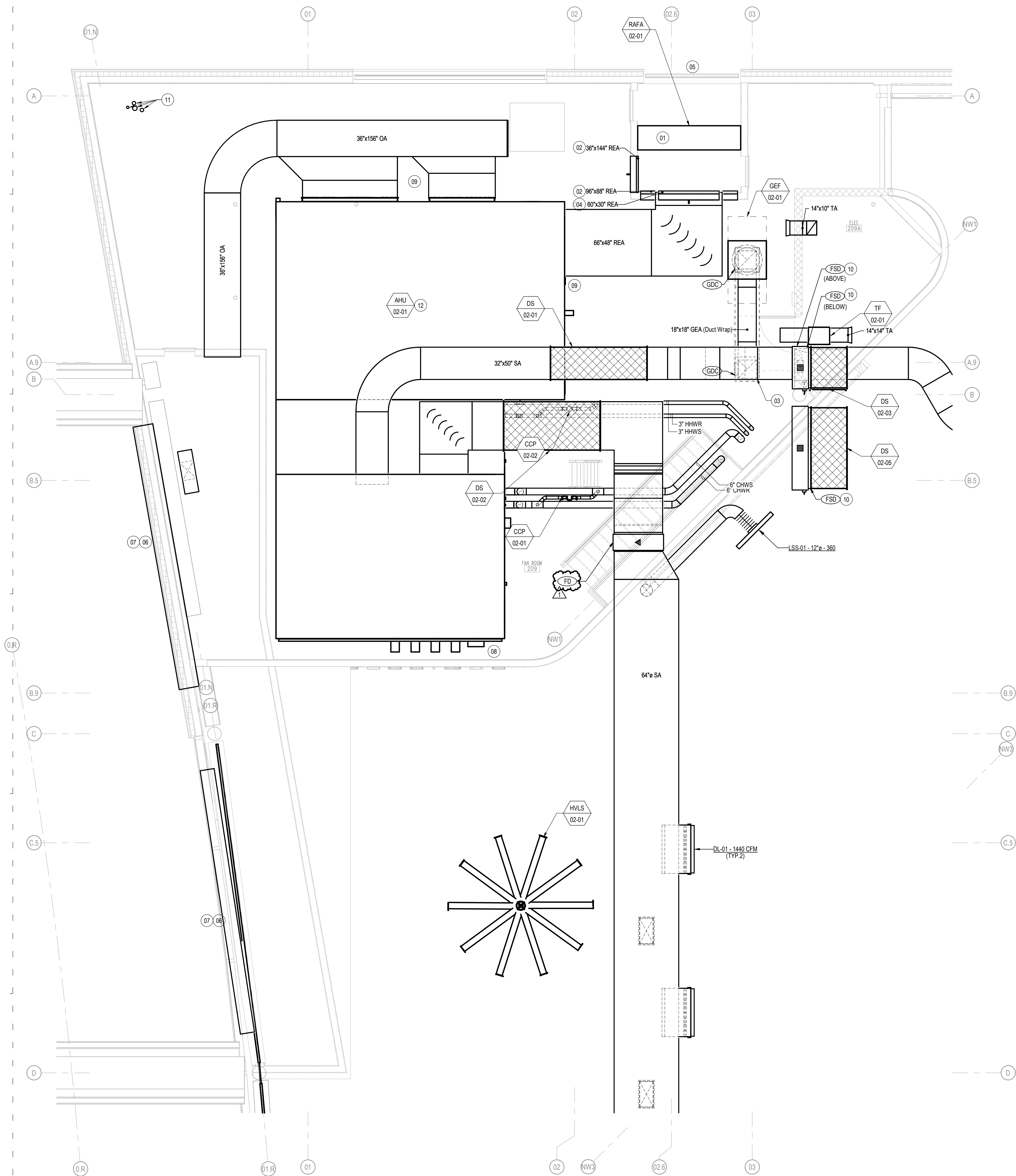
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PROJECT NO.	23112.000
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SHEET TITLE
ENLARGED PLAN -
FAN ROOM 209

SHEET NUMBER

M-403



1
M-403

UPPER LEVEL ENLARGED PLAN - FAN ROOM 209

1/4" = 1'-0"

Ohio St & N Blackford St
Indianapolis, IN 46202

IU Project NO. 20240127

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 812-855-1692

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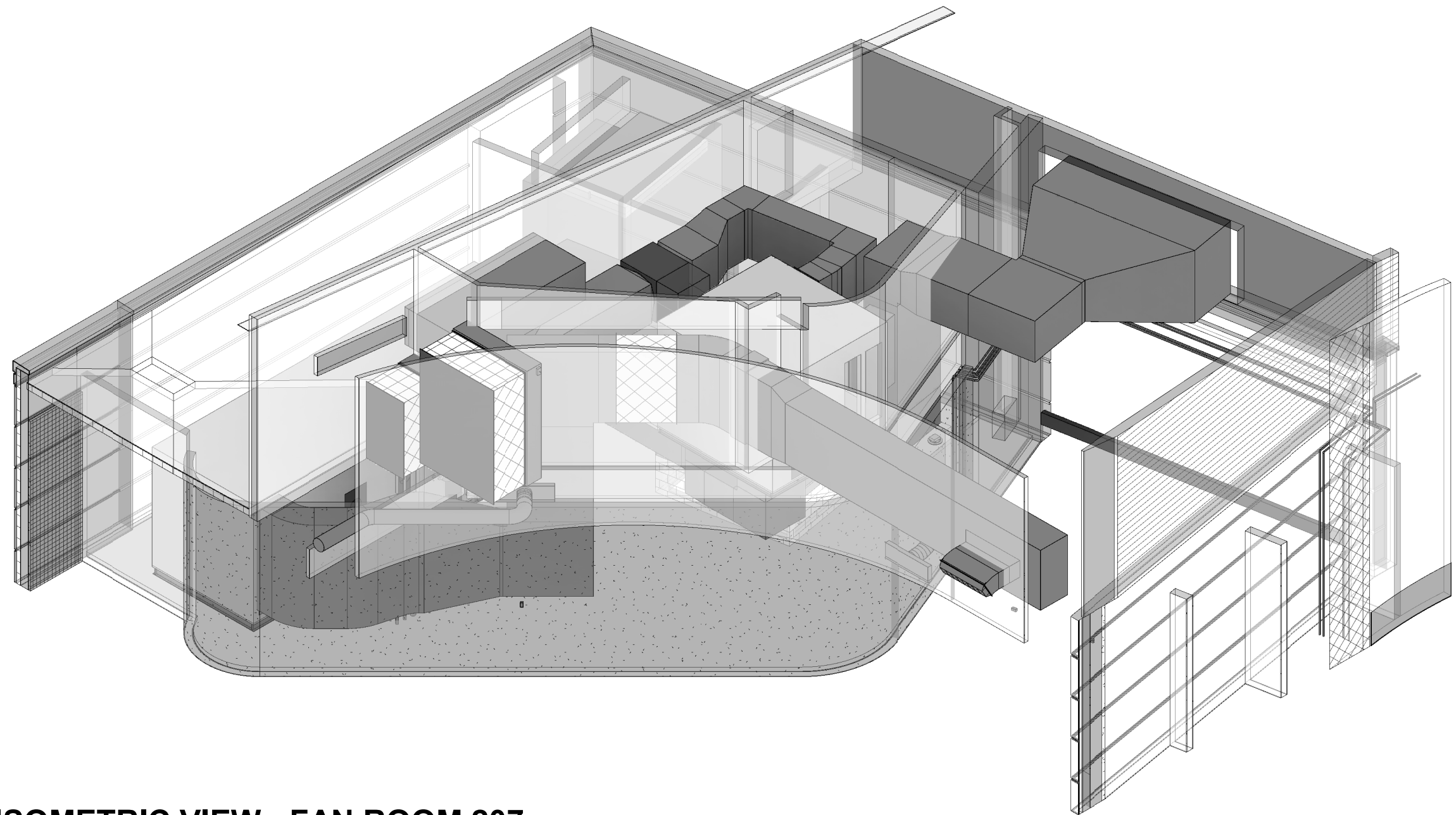
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816-806-3729

**3D VIEWS PROVIDED FOR
CONVENIENCE. SOME MATERIAL
MAY HAVE BEEN HIDDEN FOR
CLARITY. REFER TO OTHER VIEWS
FOR SYSTEM INFORMATION.**



ISOMETRIC VIEW - FAN ROOM 207

SHEET NOTES:

- 01 FAN WALL IS HOSTED IN BUILT-UP FRAME INSIDE RELIEF FAN ROOM. ROOM CONSTRUCTION DETAILS BY ARCHITECT. FAN WALL STRUCTURE BY STRUCTURAL ENGINEER. EACH FAN IS PROVIDED WITH A WEIGHTED BACKDRIFT DAMPER ON THE INLET.
- 02 FAN WALL ROOM INLET DAMPER SHALL BE INSTALLED IN THE FACE OF THE WALL AND SHALL BE MOTOR OPERATED. OPERATION OF THE DAMPER IS INTERLOCKED WITH AHU-02-01. DAMPER SHALL BE SIZED TO PROVIDE APPROXIMATELY 6" A/F. FAN WALL SHALL BE INSTALLED SUCH THAT IT IS REMOVED TO PROVIDE ACCESS TO THE FAN.
- 03 FAN WALL ROOM INLET DAMPER SHALL BE INSTALLED HORIZONTALLY IN THE FACE OF THE LI2 AND SHALL BE MOTOR OPERATED. OPERATION OF THE DAMPER IS INTERLOCKED WITH RAFA-02-02.
- 04 RELIEF AIR OUTLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL AIRFLOW OF RAFA-02-01. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 42,660 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 750 FPM AND A PRESSURE DROP LESS THAN 0.1" W.C. LOUVER CONNECTS INTO BUILT-UP FAN ROOM. FREE AREA OF THE LOUVER IS 80 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 96" X 180". REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 05 OA INLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL ECONOMIZER AIRFLOW OF AHU-02-02. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 18,000 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 500 FPM AND A PRESSURE DROP LESS THAN 0.1" W.C. LOUVER CONNECTS INTO BUILT-UP SHARED PLENUM. FREE AREA OF THE LOUVER IS 38 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 156" X 70". REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 06 ALL DUCT SHALL BE HUNG SUCH THAT IT IS CLEAR A/F IS MAINTAINED.
- 07 FIRE-SMOKE DAMPERS WITH AN HOUR RATING COMPLIANT WITH THE WALL CONSTRUCTION SHALL BE INSTALLED IN A BUILT-UP WALL DIVIDING THE COMMON RETURN PLENUM AND THE MECHANICAL ROOM.
- 08 EA OUTLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL ECONOMIZER AIRFLOW OF ERU-02-02. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 12,500 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 750 FPM AND A PRESSURE DROP LESS THAN 0.1" W.C. LOUVER CONNECTS INTO BUILT-UP SHARED PLENUM. FREE AREA OF THE LOUVER IS 18 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 144" X 36". REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 09 6" CONCRETE HOUSEKEEPING PAD BY OTHERS. MECHANICAL CONTRACTOR TO INFORM GC IF TRAP HEIGHT REQUIRES A TALLER PAD. PAD SHALL EXCEED FOOTPRINT OF UNIT BY MIN. 3" IN ALL DIMENSIONS.

SEAL | DATE 01/27/25



SHEET ISSUE

1	DESIGN DEVELOPMENT	08/30/24
2	50% CONSTRUCTION DOCUMENTS	11/01/24
3	95% CONSTRUCTION DOCUMENTS	12/19/24
4	CONSTRUCTION DOCUMENTS	01/13/25
5	ADDENDUM 01	01/27/25

RATIO

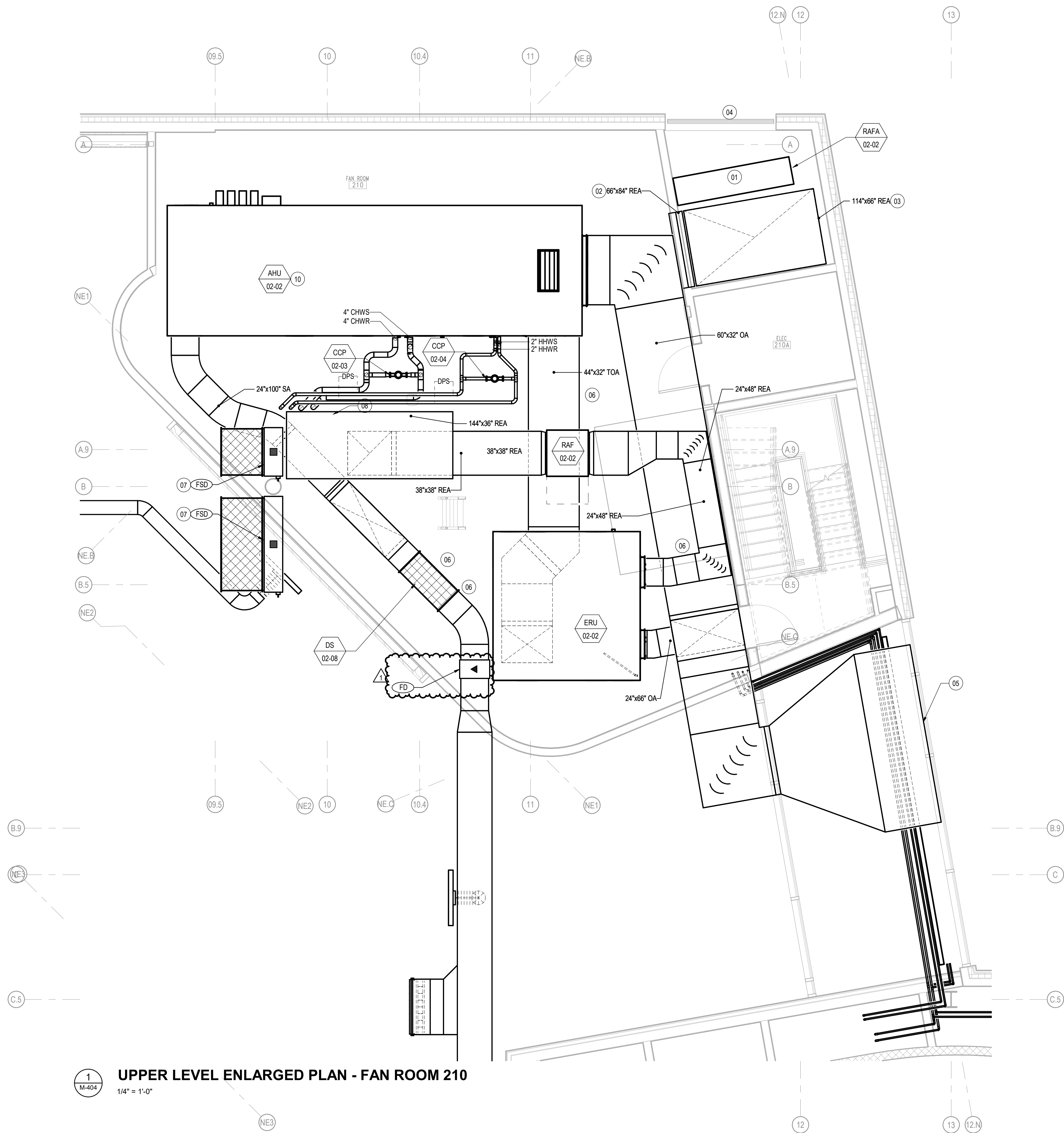
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PROJECT NO.	23112.000
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SHEET TITLE
ENLARGED PLAN -
FAN ROOM 210

SHEET NUMBER

M-404



UPPER LEVEL ENLARGED PLAN - FAN ROOM 210

$$1/4'' = 1'-0''$$

IN128 - JAMES T. MORRIS ARENA

Ohio St & N Blackford St
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IU Project NO. 20240127

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Civil Engineer
AMERICAN STRUCTUREPOINT, INC.
9025 RIVER ROAD
SUITE 200
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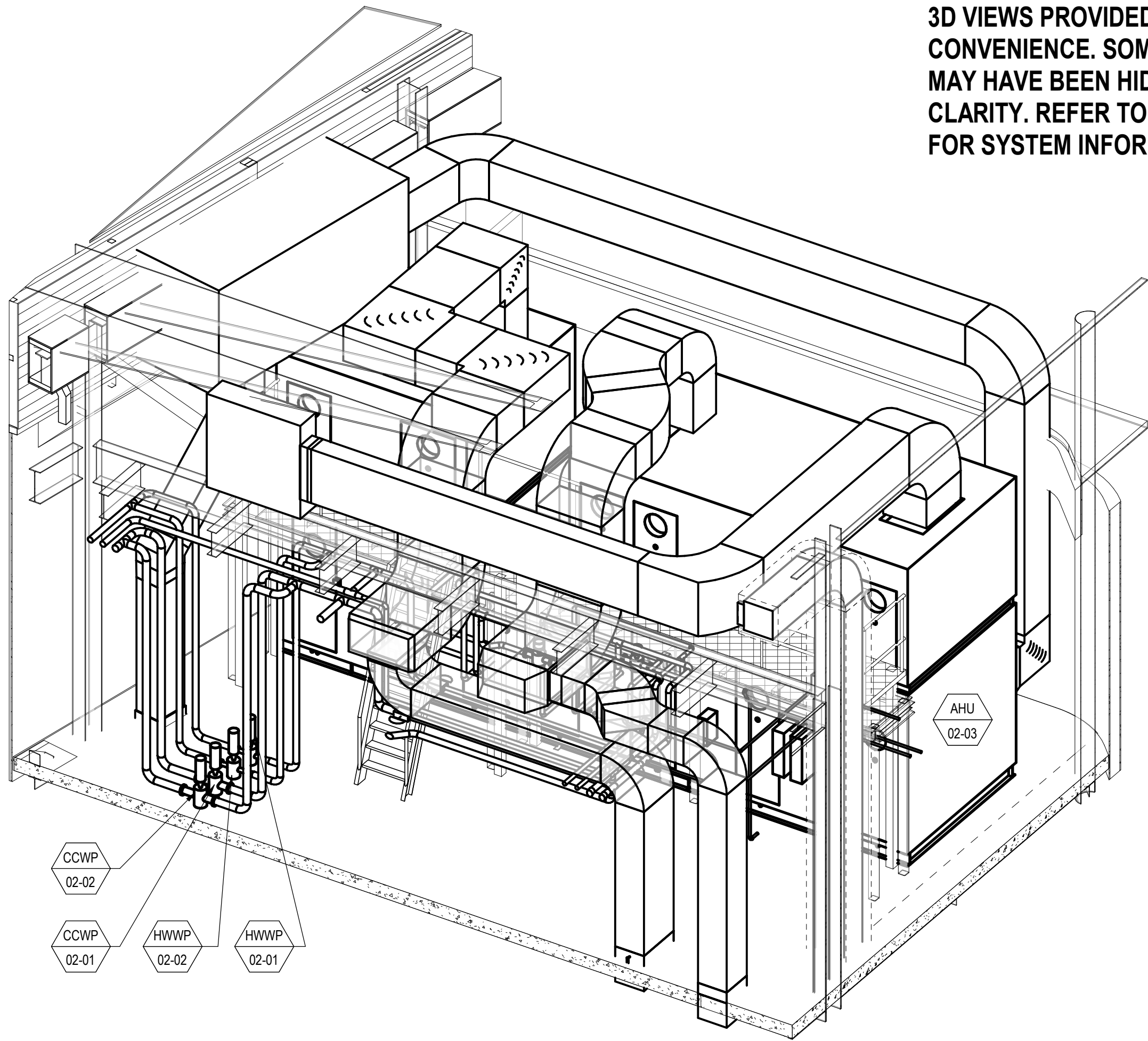
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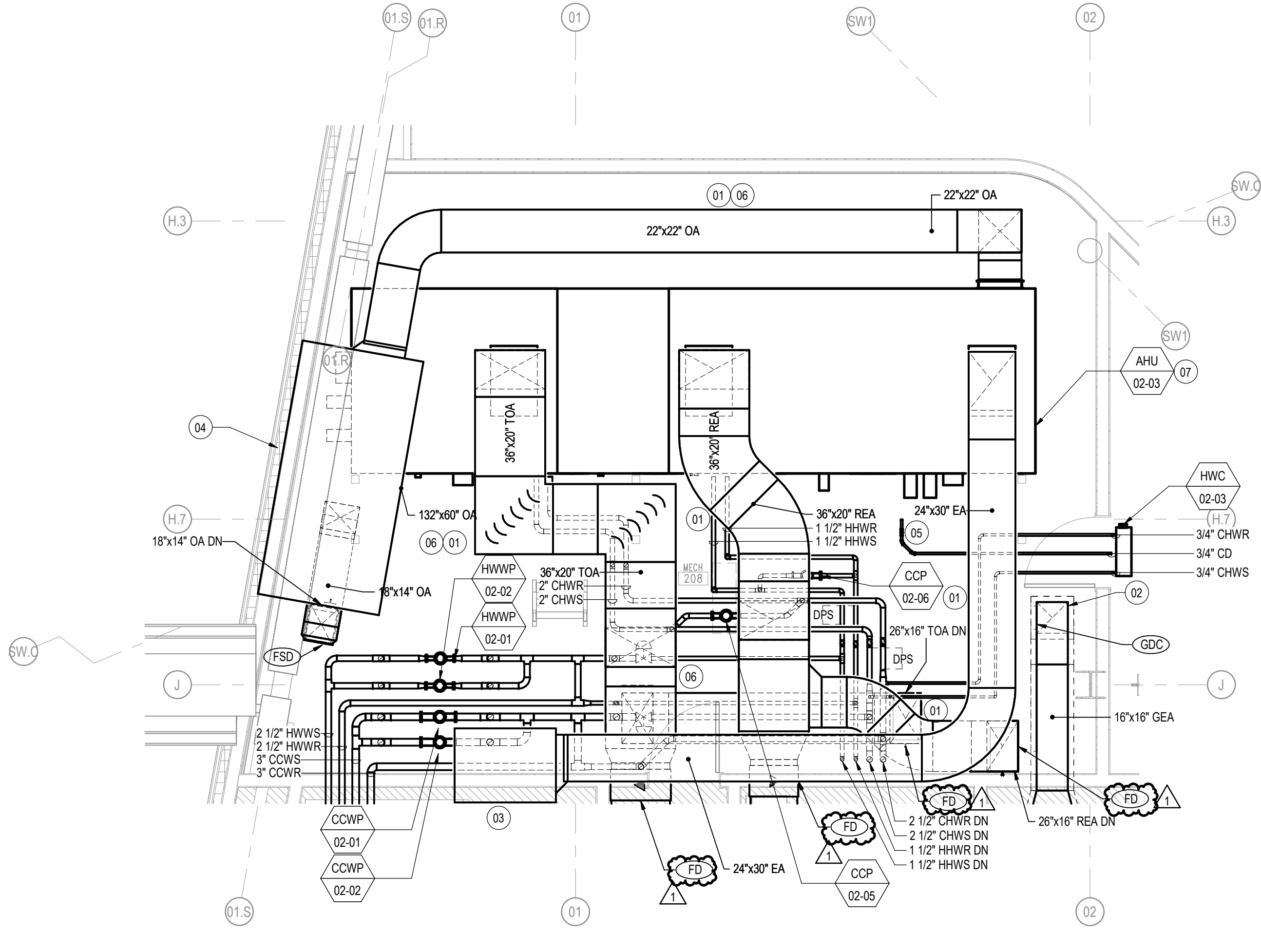
SHEET NOTES:

- 01 ALL DUCT INSIDE MECHANICAL ROOM SHALL BE DOUBLE-WALL DUCTWORK WITH PERFORATED INNER WALL AND 2" ELASTOMERIC INTERSTITIAL INSULATION.
- 02 GREASE DUCT SHALL BE PROVIDED AND INSTALLED AS A ZERO-CLEARANCE RATED DUCT PRODUCT IN LIEU OF A BUILT-OUT RATED DUCT ENCLOSURE. PRODUCT SHALL BE PROVIDED AS CAPTIVEAIRE DW-3Z OR APPROVED EQUAL.
- 03 EXHAUST AIR OUTLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL EXHAUST AIRFLOW OF AHU 02-03. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 6310 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 750 FPM AND A PRESSURE DROP LESS THAN 0.1" WC. FREE AREA OF THE LOUVER IS 9.4 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 52" X 52". REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 04 OA INLET LOUVER, SPECIFIED BY ARCHITECT, IS SIZED FOR THE FULL ECONOMIZER AIRFLOW OF AHU-02-03 AND THE MAKEUP AIR TO THE KITCHEN HOOD ON THE FLOOR BELOW. THIS EQUALS A TOTAL AIRFLOW OF APPROXIMATELY 7,820 CFM. THE PROVIDED LOUVER SHALL HAVE A CORE VELOCITY LESS THAN 500 FPM AND A PRESSURE DROP LESS THAN 0.1" WC. LOUVER CONNECTS INTO BUILT-UP SHARED PLENUM. FREE AREA OF THE LOUVER IS 60.5 SQFT BASED ON A FREE AREA PERCENTAGE OF 50% AND AN OVERALL SIZE OF 132" X 60". THIS RESULTS IN AN OVERALL FREE AREA OF 55 SQFT, WHICH IS REDUCED TO APPROXIMATELY 15.6 SQFT DUE TO THE WRAPPED BEAMS DIRECTLY BEHIND THE FACE OF THE LOUVER. REFER TO ARCHITECTURAL PLANS FOR LOUVER SPECIFICATION.
- 05 CONDENSATE SHALL SPILL INTO FLOOR SINK. COORDINATE EXACT ROUTE TO AVOID INTERFERING WITH ACCESS TO AHU.
- 06 ALL DUCT AND PIPING SHALL BE HUNG SUCH THAT 7'-0" CLEAR A.F.F. IS MAINTAINED.
- 07 6" CONCRETE HOUSEKEEPING PAD BY OTHERS. MECHANICAL CONTRACTOR TO INFORM GC IF TRAP HEIGHT REQUIRES A TALLER PAD. PAD SHALL EXCEED FOOTPRINT OF UNIT BY MIN. 3" IN ALL DIMENSIONS.

3D VIEWS PROVIDED FOR CONVENIENCE. SOME MATERIAL MAY HAVE BEEN HIDDEN FOR CLARITY. REFER TO OTHER VIEWS FOR SYSTEM INFORMATION.



2 ISOMETRIC VIEW - MECH ROOM 208



1 ENLARGED PLAN - MECH ROOM 208 (TENANT OFFICE)
1/4" = 1'-0"

SEAL | DATE 01/27/25



SHEET ISSUE		
1	DESIGN DEVELOPMENT	08/30/24
2	50% CONSTRUCTION DOCUMENTS	11/01/24
3	95% CONSTRUCTION DOCUMENTS	12/19/24
4	CONSTRUCTION DOCUMENTS	01/13/25
5	ADDENDUM 01	01/27/25

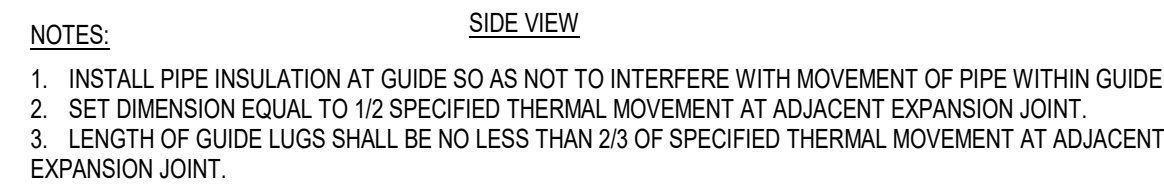
RATIO
ARCHITECTS
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PROJECT NO. 23112.000

SHEET TITLE
ENLARGED PLAN - MECHANICAL ROOM 208

SHEET NUMBER

M-407



FORZA
2502 WEST MECHANIC ST, SUITE C
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816-806-3729

01/27/25

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SHEET NUMBER

M-505

MECHANICAL - VAV OUTSIDE AIR WITH REHEAT COIL SCHEDULE																						
<div>NOTES:</div> <div>(1) CONNECT TO DDC SYSTEM.</div> <div>(2) NO RE-HEAT COIL</div> <div>(3) IF DCV AIRFLOW REQUIRED IS "0" THEN DCV IS NOT REQUIRED FOR THE SPACES BEING SERVED.</div>																						
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	AREA SERVED	ZONE WEIGHTING FACTOR	INLET SIZE (IN)	AIRFLOW (CFM)			HEATING COIL											NOTES
								DESIGN AIRFLOW	BOX MINIMUM AIRFLOW	DCV AIRFLOW REQUIRED	TOTAL HEATING (BTU/H)	DESIGN HEATING AIR FLOW (CFM)	EAT DB (°F)	LAT DB (°F)	EWT (°F)	LWT (°F)	WATER FLOW (GPM)	WPD (PSI)	NO. OF ROWS	APD (IN.WG)	OPERATING WEIGHT (LB)	
OAVAV	00-01	PRICE	SDV	AUX LKR SHOWER / GROOM 005A	AUX LCKR ROOM	1	6	260	65	0	2,526	170	60.0	83.0	140.0	133.1	1.54	1.53	1	0.05	19	1
OAVAV	00-02	PRICE	SDV	VISITOR LKR 006	VISITOR LCKR ROOM	1	9	905	160	0	7,803	530	60.0	83.0	140.0	101.3	0.64	0.25	2	0.36	29	1
OAVAV	00-03	PRICE	SDV	HOME COACH LKR RM 014B	HOME COACH LCKR ROOM	1	8	615	95	6	5,456	370	60.0	83.0	140.0	102.1	0.46	0.11	2	0.35	22	1
OAVAV	00-04	PRICE	SDV	MBB GROOM 016C	MENS BBALL	1	12	1,125	300	0	12,833	860	60.0	83.0	140.0	104.0	1.11	0.81	2	0.31	36	1
OAVAV	00-05	PRICE	SDV	WBB GROOMING 022C	WOMENS BBALL	1	12	1,090	300	0	10,608	720	60.0	83.0	140.0	100.9	0.86	0.52	2	0.29	36	1
OAVAV	00-06	PRICE	SDV	WVB GROOM 026C	WOMENS VBALL	1	12	1,220	300	0	11,436	770	60.0	83.0	140.0	102.0	0.94	0.61	2	0.36	36	1
OAVAV	00-07	PRICE	SDV	TRAINING 030	TRAINING ROOM	1	8	605	125	0	6,451	440	60.0	83.0	140.0	105.5	0.59	0.17	2	0.34	22	1
OAVAV	00-08	PRICE	SDV	HYDROTHERAPY 030A	HYDROTHERAPY	1	6	345	65	0	2,609	190	60.0	83.0	140.0	98.6	0.25	0.02	2	0.18	19	1
OAVAV	00-09	PRICE	SDV	STORAGE 030B	SPORTS PERFORMANCE	1	12	1,470	300	0	20,129	1,350	60.0	83.0	140.0	114.8	2.18	3.35	2	0.52	36	1
OAVAV	00-10	PRICE	SDV	MENS RR 044	MENS RR	1	7	450	65	0	3,624	250	60.0	83.0	140.0	96.8	0.33	0.03	2	0.21	22	1
OAVAV	00-11	PRICE	SDV	WOMENS RR 046	WOMENS RR	1	7	455	95	0	6,573	445	60.0	83.0	140.0	105.8	0.59	0.18	2	0.21	22	1
OAVAV	00-12	PRICE	SDV	INDIVIDUAL LOCKER 051	INDIVIDUAL LCKRS	1	6	240	65	0	2,578	180	60.0	83.0	140.0	97.9	0.25	0.02	2	0.10	19	1
OAVAV	00-13	PRICE	SDV	FAN ROOM 068	AHU 00-02	0	24X16	5,550	1,185	0	0	0	0.0	0.0	0.0	0.0	0.00	0.00	0	0.00	62	1,2
OAVAV	00-14	PRICE	SDV	FAN ROOM 054	AHU 00-01	1,2	16	2,640	575	0	0	0	0.0	0.0	0.0	0.0	0.00	0.00	0	0.00	54	1,2
OAVAV	00-15	PRICE	SDV	INDIVIDUAL LOCKER 053	AHU 01-01	0	24X16	3,650	1,185	0	0	0	0.0	0.0	0.0	0.0	0.00	0.00	0	0.00	62	1,2
OAVAV	01-01	PRICE	SDV	WOMEN 105	NW WOMENS RR	1	12	1,165	300	0	11,805	800	60.0	83.0	140.0	102.7	1.33	0.67	2	0.33	36	1
OAVAV	01-02	PRICE	SDV	WOMEN 118	SW WOMENS RR	1	12	1,140	300	0	9,627	650	60.0	83.0	140.0	98.9	0.98	0.39	2	0.32	36	1
OAVAV	01-03	PRICE	SDV	MEN 114	SE MENS RR	1	8	795	125	0	6,224	450	60.0	83.0	140.0	106.1	0.83	0.18	2	0.54	22	1
OAVAV	01-04	PRICE	SDV	MEN 119	NE MENS RR	1	8	585	125	0	6,292	430	60.0	83.0	140.0	105.3	0.77	0.16	2	0.32	22	1

MECHANICAL - VAV SUPPLY AIR WITH REHEAT COIL SCHEDULE																								
<div>NOTES:</div> <div>(1) CONNECT TO DDC SYSTEM.</div> <div>(2) IF DCV AIRFLOW REQUIRED IS "0" THEN DCV IS NOT REQUIRED FOR THE SPACES BEING SERVED.</div>																								
TYPE	EQUIPMENT NUMBER	ASSOCIATED AHU	MANUFACTURER	MODEL	LOCATION	AREA SERVED	ZONE WEIGHTING FACTOR	INLET SIZE (IN)	AIRFLOW (CFM)			HEATING COIL											OPERATING WEIGHT (LB)	NOTES
									DESIGN AIRFLOW	BOX MINIMUM AIRFLOW	DCV MIN AIRFLOW	TOTAL HEATING (BTU/H)	DESIGN HEATING AIR FLOW (CFM)	EAT DB (°F)	LAT DB (°F)	EWT (°F)	LWT (°F)	WATER FLOW (GPM)	WPD (PSI)	NO. OF ROWS	APD (IN.WG)			
VAV	00-01	AHU-00-01	PRICE	SDV	GOLF OO 059AA	GOLF	ALL	5	160	60	0	1,501	105	60.0	83.0	140.0	125.0	0.45	0.17	1	0.02	18	ALL	
VAV	00-02	AHU-00-01	PRICE	SDV	W TN HC 028	TENNIS	ALL	5	220	60	0	2,197	150	60.0	83.0	140.0	130.6	1.00	0.71	1	0.04	18	ALL	
VAV	00-03	AHU-00-01	PRICE	SDV	M T&F HC 028	UNASSIGNED OFFICES	ALL	4	130	45	0	1,279	90	60.0	83.0	140.0	122.9	0.33	0.11	1	0.02	18	ALL	
VAV	00-04	AHU-00-01	PRICE	SDV	W SOC HC 490	SOCCER	ALL	5	210	60	0	1,934	130	60.0	83.0	140.0	128.1	0.69	0.37	1	0.02	18	ALL	
VAV	00-05	AHU-00-01	PRICE	SDV	NUTRITION ZONE 038	NUTRITION	ALL	6	340	65	0	2,859	195	60.0	83.0	140.0	99.3	0.31	0.02	2	0.17	19	ALL	
VAV	00-06	AHU-00-01	PRICE	SDV	OFFICE 024C	TRAINING OFFICE	ALL	4	105	45	0	1,488	100	60.0	83.0	140.0	124.4	0.41	0.15	1	0.01	18	ALL	
VAV	00-07	AHU-00-01	PRICE	SDV	ATHLETE LOUNGE 039	ATHLETE LOUNGE	ALL	12	1,180	300	326	5,463	370	60.0	83.0	140.0	92.0	0.47	0.11	2	0.31	36	ALL	
VAV	00-08	AHU-00-01	PRICE	SDV	SOFTBALL OO 059Y	SOFTBALL	ALL	5	220	60	0	3,194	215	60.0	83.0	140.0	99.0	0.33	0.02	2	0.04	20	ALL	
VAV	00-09	AHU-00-01	PRICE	SDV	WVB OO 059V	VOLLEYBALL	ALL	6	280	60	0	3,294	225	60.0	83.0	140.0	99.5	0.34	0.02	2	0.13	19	ALL	
VAV	00-10	AHU-00-01	PRICE	SDV	WBB AC 044A	WBB OFFICES	ALL	6	310	60	0	3,733	250	60.0	83.0	140.0	101.2	0.40	0.04	2	0.07	19	ALL	
VAV	00-11	AHU-00-01	PRICE	SDV	WBB AC 044A	MBB OFFICES	ALL	6	340	60	0	4,155	280	60.0	83.0	140.0	103.3	0.47	0.05	2	0.17	19	ALL	
VAV	00-12	AHU-00-01	PRICE	SDV	STAFF BREAK 045	STAFF BREAK S	ALL	5	210	60	110	1,649	115	60.0	83.0	140.0	126.4	0.54	0.24	1	0.01	18	ALL	
VAV	00-13	AHU-00-01	PRICE	SDV	EXAM ROOM 046	T&F	ALL	5	175	60	0	2,189	150	60.0	83.0	140.0	130.6	1.00	0.71	1	0.04	18	ALL	
VAV	00-14	AHU-00-01	PRICE	SDV	MARSHALLING 056	MARSHALLING	ALL	10	980	210	0	13,616	910	60.0	83.0	140.0	113.1	2.09	1.20	2	0.42	29	ALL	
VAV	00-15	AHU-00-01	PRICE	SDV	MARSHALLING 056	STAFF BREAK N	ALL	4	105	65	65	1,118	95	60.0	83.0	140.0	123.7	0.37	0.13	1	0.01	18	ALL	
VAV	00-16	AHU-00-01	PRICE	SDV	FS COMMISSARY + KITCHEN 063	FS COMMISSARY + KITCHEN 063	ALL	10	840	210	0	9,310	840	60.0	83.0	140.0	111.0	1.79	0.91	2	0.32	29	ALL	
VAV	00-17	AHU-00-01	PRICE	SDV	SPORT + GENRAL STORAGE 059	SPORT + GENERAL STORAGE 059	ALL	12	1,525	300	0	22,531	1,530	60.0	83.0	140.0	118.9	4.46	5.69	2	0.53	36	ALL	
VAV	00-18	AHU-00-01	PRICE	SDV	MARSHALLING 056	VP CONTROL 057	ALL	6	270	65	0	1,973	145	60.0	83.0	140.0	130.0	0.91	0.60	1	0.02	17	ALL	
VAV	00-19	AHU-00-02	PRICE	SDV	CIRCULATION 060	NW OPEN COURT	ALL	12	1,480	300	0	16,823	1,130	60.0	83.0	140.0	110.0	2.33	1.80	2	0.50	36	ALL	
VAV	00-20	AHU-00-02	PRICE	SDV	CIRCULATION 060	NW COURT	ALL	16	2,260	575	0	22,862	1,535	60.0	83.0	140.0	102.1	2.50	0.98	2	0.39	54	ALL	
VAV	00-21	AHU-00-02	PRICE	SDV	CIRCULATION 060	NE OPEN COURT	ALL	12	1,480	300	0	16,823	1,110	60.0	83.0	140.0	109.6	2.26	1.70	2	0.50	36	ALL	
VAV	00-22	AHU-00-02	PRICE	SDV	CIRCULATION 060	NE COURT	ALL	16	2,260	575	0	22,862	1,535	60.0	83.0	140.0	102.1	2.50	0.98	2	0.38	54	ALL	
VAV	00-23	AHU-00-02	PRICE	SDV	CIRCULATION 060	N OPEN COURT	ALL	14	1,840	430	0	20,755	1,400	60.0	83.0	140.0	104.6	2.44	0.88	2	0.39	47	ALL	
VAV	00-24	AHU-00-02	PRICE	SDV	ATHLETE LOUNGE 039	SW OPEN COURT	ALL	12	1,480	300	0	17,015	1,150	60.0	83.0	140.0	110.4	2.40	1.90	2	0.50	36	ALL	
VAV	00-25	AHU-00-02	PRICE	SDV	VIDEO ROOM 040	SW COURT	ALL	16	2,260	575	0	22,862	1,535	60.0	83.0	140.0	102.1	2.50	0.98	2	0.38	54	ALL	
VAV	00-26	AHU-00-02	PRICE	SDV	WBB HC 036	SE OPEN COURT	ALL	12	1,480	300	0	16,832	1,130	60.0	83.0	140.0	110.0	2.33	1.80	2	0.50	36	ALL	
VAV	00-27	AHU-00-02	PRICE	SDV	WBB HC 036	SE COURT	ALL	16	2,260	575	0	22,862	1,535	60.0	83.0	140.0	102.1	2.50	0.98	2	0.38	54	ALL	

MECHANICAL - VAV EXHAUST AIR SCHEDULE												
<div>NOTES:</div> <div>(1) CONNECT TO DDC SYSTEM.</div>												
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	AREA SERVED	INLET SIZE (IN)	AIRFLOW (CFM)		MAX PRESS. DROP (IN-WG)	OPERATING WEIGHT (LB)	NOTES	
							DESIGN AIRFLOW	MINIMUM AIRFLOW				
EAVAV	00-01	PRICE	SDV	GREEN ROOM / VIS COACH LOCKER 003	AUX LCKR ROOM	6	340	65	0.2	12	ALL	
EAVAV	00-02	PRICE	SDV	VISITOR LOCKER 019	VISITOR LCKR ROOM	12	1,130	300	0.2	22	ALL	
EAVAV	00-03	PRICE	SDV	HOME COACH LKR RM 023	HOME COACH LCKR ROOM	8	690	125	0.2	14	ALL	
EAVAV	00-04	PRICE	SDV	MBB NUTR. 020	MENS BBALL	12	1,360	300	0.2	22	ALL	
EAVAV	00-05	PRICE	SDV	WBB LOUNGE 021B	WOMENS BBALL	12	1,360	300	0.2	22	ALL	
EAVAV	00-06	PRICE	SDV	WVB LOCKER 022	WOMENS VBALL	12	1,360	300	0.2	22	ALL	
EAVAV	00-07	PRICE	SDV	TRAINING 024	TRAINING ROOM	8	700	125	0.2	14	ALL	
EAVAV	00-08	PRICE	SDV	HYDROTHERAPY 024AA	HYDROTHERAPY	7	495	95	0.2	14	ALL	
EAVAV	00-09	PRICE	SDV	SPORTS PERFORMANCE 025	SPORTS PERFORMANCE	12	1,605	300	0.2	22	ALL	
EAVAV	00-10	PRICE	SDV	MENS RR 050	MENS RR	7	440	95	0.2	14	ALL	
EAVAV	00-11	PRICE	SDV	WOMENS RR 051	WOMENS RR	8	600	125	0.2	14	ALL	
EAVAV	00-12	PRICE	SDV	INDIVIDUAL LOCKER 057	INDIVIDUAL LCKRS	6	410	65	0.2	12	ALL	
EAVAV	00-13	PRICE	SDV	FAN ROOM 068	FAN ROOM 068	24X16	5,550	1,185	0.2	62	ALL	
EAVAV	00-14	PRICE	SDV	FAN ROOM 054	FAN ROOM 054	16	2,640	430	0.2	33	ALL	
EAVAV	00-15	PRICE	SDV	INDIVIDUAL LOCKER 053	SUPPORT 115D	24X16	3,620	1,185	0.2	62	ALL	
EAVAV	00-16	PRICE	SDV	FS COMMISSARY + KITCHEN 063	FS COMMISSARY + KITCHEN 063	8	630	125	0.2	14	ALL	
EAVAV	01-01	PRICE	SDV	CONCESSIONS 102	NW WOMENS RR	14	1,845	430	0.2	28	ALL	
EAVAV	01-02	PRICE	SDV	WOMEN 118	SW WOMENS RR	14	1,865	430	0.2	28	ALL	
EAVAV	01-03	PRICE	SDV	MEN 112	SE MENS RR	10	1,070	210	0.2	18	ALL	
EAVAV	01-04	PRICE	SDV	MEN 104	NE MENS RR	8	750	125	0.2	14	ALL	

NOTES:

(1) RAFA IS PROVIDED AS AN ASSEMBLED UNIT FROM MANUFACTURER WITH SINGLE POINT OF POWER CONNECTION AND SPEED CONTROLLER.

(2) UNIT IS SIZED WITH N-1 OPERATION OF FANS. PERFORMANCE IS INDICATED WITH ALL FANS RUNNING.

(3) UPON ANY SINGULAR FAN FAILURE, THE UNIT SHALL ADJUST THE REMAINING FANS TO COMPENSATE.

(4) ALL FAN MOTORS ARE DIRECT-DRIVE.

(5) ADD-ALT SHALL BE PROVIDED FOR UNIT TO BE PROVIDED BY AHU MANUFACTURER WITH INDEPENDENT VFDS WITH MOTORIZED SHUTOFF DAMPERS ON EACH FAN. IF THE ADD-ALT IS SELECTED, A REVISION TO THE ELECTRICAL DESIGN WILL BE REQUIRED.

MECHANICAL - RELIEF AIR FAN ARRAY																										
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	FANS										ELECTRICAL							OPERATING WEIGHT (LB)	HEIGHT	WIDTH	NOTES
						AIR FLOW (EACH) (CFM)	OVERALL ESP (IN-WG)	OVERALL TSP (IN-WG)	ECM	SPEED (RPM)	FAN QTY	HP (EACH)	BHP (EACH)	MCA (A)	MOCP (A)	VOLT (V)	PHASE	FREQUENCY (HZ)	EMERG. PWR. (Y/N)							
RAFA	00-03	GREENHECK	MOA-560	FAN ROOM 068	RELIEF AIR	6,625	2.0	2.0	Yes	1295	4	8	5.1	32	40	460	3	60	No	902	8' - 0"	8' - 0"	ALL			
RAFA	01-01	GREENHECK	MOA-560	SUPPORT 115B	RELIEF AIR	4,470	1.0	1.0	Yes	994	2	8	5.2	17	25	460	3	60	No	518	4' - 0"	9' - 0"	ALL			
RAFA	02-01	GREENHECK	MOA-560	FAN ROOM 209	RELIEF AIR	9,165	1.0	1.0	Yes	1780	6	8	5.1	46	50	460	3	60	No	1133	12' - 0"	8' - 6"	ALL			
RAFA	02-02	GREENHECK	MOA - 560	FAN ROOM 210	RELIEF AIR	6,945	1.0	1.0	Yes	1356	6	8	5.1	46	50	460	3	60	No	1133	12' - 0"	8' - 6"	ALL			

MECHANICAL - RELIEF FAN SCHEDULE																								
<div>NOTES: (1) BACKDRAFT DAMPER (2) REFER TO SPECIFICATIONS FOR VIBRATION ISOLATION REQUIREMENTS</div>																								
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	TYPE	FAN						MOTOR DRIVE			ELECTRICAL					EMERG. PWR. (Y/N)	OPERATING WEIGHT (LB)	NOTES	
							AIR FLOW (CFM)	TYPE	ESP (IN-WG)	TSP (IN-WG)	SPEED [RPM]	MIN. STATIC EFFICIENCY [%]	HP	BHP	ECM	FLA (A)	MOCP (A)	VOLT(V)	PH	HZ				
RAF	02-02	GREENHECK	SQ-27-M2-VG	FAN ROOM 203	EXHAUST	IN-LINE	12,500	IN-LINE	2.0	2.0	1111	59	10	6.6	Yes	14	20	460	3	60	No	494	ALL	

MECHANICAL - GREASE EXHAUST FAN SCHEDULE																							
NOTES: (1) GREASE TRAP (2) HERESITE COATED FAN (3) REFER TO SPECIFICATIONS FOR VIBRATION ISOLATION REQUIREMENTS (4) PROVIDE MATCHED VENTILATED ROOF CURB (5) PROVIDE WALL MOUNTING SUPPORT FOR GREASE EXHAUST APPLICATIONS BY MANUFACTURER.																							
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	TYPE	FAN					MOTOR DRIVE			ELECTRICAL					EMERG. PWR. (Y/N)	OPERATING WEIGHT (LB)	NOTES	
							AIR FLOW (CFM)	TYPE	ESP (IN-WG)	TSP (IN-WG)	SPEED (RPM)	STATIC EFFICIENCY (%)	HP	BHP	ECM	FLA (A)	MOCP (A)	VOLT(V)	PH				HZ
GEF	02-01	GREENHECK	CUE-180HP-VG	ROOF	GREASE EXHAUST	UPBLAST	1,890	UP-BLAST	1.5	1.5	1220	59	1	0.8	Yes	4	15	208	3	60	No	119	1-4
GEF	02-02	GREENHECK	CUE-180HP-VG	ROOF	GREASE EXHAUST	UPBLAST	1,890	UP-BLAST	1.5	1.5	1220	59	1	0.8	Yes	4	15	208	3	60	No	119	1-3, 5

MECHANICAL - MAKE UP AIR FAN SCHEDULE																										
<div>NOTES: (1) BACKDRAFT DAMPER. (2) REFER TO SPECIFICATIONS FOR VIBRATION ISOLATION REQUIREMENTS. (3) REQUIRES GREENHECK SQ DIRECT DRIVE FILTER BOX EQUAL OR APPROVED.</div>																										
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	TYPE	FAN					MOTOR DRIVE			ELECTRICAL					EMERG. PWR. (Y/N)	FILTER BOX				NOTES	
							AIR FLOW (CFM)	TYPE	ESP (IN-WG)	TSP (IN-WG)	SPEED [RPM]	MIN. STATIC EFFICIENCY [%]	HP	BHP	ECM	FLA (A)	MOCP (A)	VOLT(V)	PH		HZ	FILTER TYPE	FILTER QUANTITY	FILTER SIZE (IN)		FILTER BOX LENGTH (IN)
MAF	01-01	GREENHECK	SQ-140-VG	CONCESSIONS 102	MAKE-UP AIR	IN-LINE	1,700	AXIAL	1.3	1.3	1522	49	1.00	0.6	Yes	4	15	230	3	60	No	MERV 8	2	20x25	28	ALL
MAF	01-02	GREENHECK	SQ-140-VG	CONCESSIONS 119	MAKE-UP AIR	IN-LINE	1,700	AXIAL	1.3	1.3	1522	49	1.00	0.6	Yes	4	15	230	3	60	No	MERV 8	2	20x25	28	ALL

MECHANICAL - TRANSFER FAN SCHEDULE																									
<div>NOTES: (1) BACKDRAFT DAMPER. (2) REFER TO SPECIFICATIONS FOR VIBRATION ISOLATION REQUIREMENTS.</div>																									
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	TYPE	FAN						MOTOR DRIVE			ELECTRICAL					EMERG. PWR. (Y/N)	OPERATING WEIGHT (LB)	NOTES		
							AIR FLOW (CFM)	WHEEL		ESP (IN-WG)	TSP (IN-WG)	SPEED (RPM)	STATIC EFFICIENCY (%)	HP	BHP	ECM (Y/N)	FLA (A)	MOCp (A)	VOLT(V)	PH				HZ	
								TYPE	MIN. DIA. (IN)																
TF	00-01	GREENHECK	SQ-120-VG	IDF 009	TRANSFER AIR	IN-LINE	1,275	AXIAL	19	0.5	0.5	1409	40	0.25	0.17	Yes	6	15	115	1	60	Yes	63	ALL	
TF	00-02	GREENHECK	SQ-100-VG	AV ROOM 010	TRANSFER AIR	IN-LINE	585	AXIAL	17	0.5	0.5	1221	59	0.25	0.17	Yes	3	15	115	1	60	No	55	ALL	
TF	00-03	GREENHECK	SQ-100-VG	AV ROOM 049	TRANSFER AIR	IN-LINE	585	AXIAL	17	0.5	0.5	1221	59	0.25	0.17	Yes	3	15	115	1	60	No	55	ALL	
TF	01-01	GREENHECK	SQ-100-VG	AV ROOM 010	TRANSFER AIR	IN-LINE	585	AXIAL	17	0.5	0.5	1221	59	0.25	0.17	Yes	3	15	115	1	60	No	55	ALL	
TF	01-02	GREENHECK	SQ-120-VG	IDF 107D	TRANSFER AIR	IN-LINE	1,275	AXIAL	19	0.5	0.5	1409	40	0.25	0.17	Yes	6	15	115	1	60	Yes	63	ALL	
TF	02-01	GREENHECK	SQ-120-VG	IDF 202	TRANSFER AIR	IN-LINE	1,275	AXIAL	19	0.5	0.5	1409	40	0.25	0.17	Yes	6	15	115	1	60	Yes	63	ALL	
TF	02-01	GREENHECK	SQ-100-VG	AV ROOM 010	TRANSFER AIR	IN-LINE	730	AXIAL	17	0.5	0.5	1297	56	0.25	0.10	Yes	3	15	115	1	60	Yes	55	ALL	
TF	02-02	GREENHECK	SQ-120-VG	IDF 204	TRANSFER AIR	IN-LINE	1,275	AXIAL	19	0.5	0.5	1409	40	0.25	0.17	Yes	6	15	115	1	60	Yes	63	ALL	

MECHANICAL - CEILING EXHAUST FAN SCHEDULE'

* CELLS WITH SHADED BACKGROUNDS ARE UNASSIGNED OR UNDER REVIEW

NOTES:
(1) BACKDRAFT DAMPER.
(2) FAN INTERLOCK WITH LIGHTING POWER AND WIRING BY ELECTRICAL.
(3) FAN CONTROLLED BY WALL ON/OFF SWITCH WITH LIGHT INDICATOR.
(4) PROVIDE LAY-IN FRAMING FOR GYPSUM INSTALLATION TO ALLOW UNIT ACCESS THROUGH CEILING.

TYPE	EQUIPMENT NUMBER	MANUFACTURER	SYSTEM MODEL/ FAN MODEL	LOCATION SPACE NAME NUMBER	SERVICE	TYPE	FAN		ELECTRICAL			EMERGENCY POWER (Y/N)	OPERATING WEIGHT (LB)	NOTES	
							AIR FLOW (CFM)	ESP (IN-WG)	FLA (A)	VOLT (V)	PHASE				FREQUENCY (HZ)
CEF	02-01	GREENHECK	SP-A200-QD	RESTROOM 205	RESTROOM EXHAUST	CENTRIFUGAL	75	0.04	0.47	115	1	60	No	18	ALL

NOTES:

1. PROVIDE BACNET ADAPTER BY MANUFACTURER

2. FAN TO BE REVERSIBLE

3. DIRECT DRIVE IP56 MOTOR WITH VFD BY MANUFACTURER.

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	DIAMETER	ELECTRICAL				OPERATING WEIGHT (LB)	NOTES
						MOTOR (HP)	VOLT	PHASE	FREQUENCY (HZ)		
HVLS	02-01	BAF	PFX4.0	WEST CONCOURSE	12' - 0"	2	460	3	60	245	ALL
HVLS	02-02	BAF	PFX4.0	WEST CONCOURSE	12' - 0"	2	460	3	60	245	ALL
HVLS	02-03	BAF	PFX4.0	WEST CONCOURSE	12' - 0"	2	460	3	60	245	ALL
HVLS	02-04	BAF	PFX4.0	WEST CONCOURSE	12' - 0"	2	460	3	60	245	ALL
HVLS	02-05	BAF	PFX4.0	PRACTICE COURT	18' - 0"	2	460	3	60	245	ALL
HVLS	02-06	BAF	PFX4.0	PRACTICE COURT	18' - 0"	2	460	3	60	245	ALL

MECHANICAL - INTAKE HOOD SCHEDULE												
<div>NOTES: (1) PROVIDE MOTORIZED BACKDRAFT DAMPER (2) PROVIDE MATCHED ROOF CURB</div>												
TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	AIR FLOW (CFM)	MAX VELOCITY (FPM)	MAX APD (IN-WG)	THROAT AREA (SF)	DIMENSIONS (IN)			NOTES
									LENGTH	WIDTH	HEIGHT	
IH	02-01	GREENHECK	FGI-36X60	ROOF	6,520	750	0.1	15	99"	72"	31"	ALL

IN128 - JAMES T. MORRIS ARENA

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Indianapolis, IN 46202

IU Project NO. 20240127

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SEAL | DATE 01/27/25



MECHANICAL - ACTIVE CHILLED BEAMS SCHEDULE

NOTES:

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	TYPE	LENGTH	WIDTH	COIL CIRCUIT	PRIMARY AIRFLOW (CFM)	TOTAL DISCHARGE (CFM)	INDUCTION RATIO	BEAM APD (IN-WG)	COOLING COIL										HEATING COIL										DUCT CONNECTION SIZE (IN)	MAX APD SOUND PRESSURE (DB)	NOTES
												COOLING AIR SIDE CAPACITY (BTU/H)	COOLING PRIMARY AIR TEMP DB (°F)	COOLING ROOM AIR TEMP DB (°F)	LAT DB (°F)	EWT (°F)	LWT (°F)	FLOW (GPM)	WPD (FT WC)	HEATING AIR SIDE CAPACITY (BTU/H)	HEATING PRIMARY AIR TEMP (°F)	HEATING ROOM AIR TEMP DB (°F)	LAT DB (°F)	EWT (°F)	LWT (°F)	FLOW (GPM)	WPD (FT WC)							
CB	01-01	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	45	307.5803	5.8	0.54	5564.2	57.5	54.9	78	61.5	58.0	64.1	1.8	8.1	5615.1	60	68.0	86.7	120.0	93.2	0.5	0.4	5"		26			
CB	01-02.1	PRICE	ACBL24_2W	4 PIPE	6'-0"	2'-0"	SINGLE	50	302.4321	5	0.72	5512.2	57.5	54.9	78	61.5	58.0	62.9	1.8	8.1	5615.1	60	68.0	84.7	120.0	96.1	0.5	0.3	5"		31			
CB	01-02.2	PRICE	ACBL24_2W	4 PIPE	6'-0"	2'-0"	SINGLE	50	302.4321	5	0.72	5512.2	57.5	54.9	78	61.5	58.0	62.9	1.8	8.1	5615.1	60	68.0	84.7	120.0	96.1	0.5	0.3	5"		31			
CB	01-03	PRICE	ACBL24_2W	4 PIPE	2'-0"	2'-0"	SINGLE	40	148.1237	2.7	0.56	2159.6	57.5	54.9	78	64.8	58.0	63.0	0.5	0.3	1848.7	60	68.0	79.2	120.0	111.3	0.5	0.1	5"		34			
CB	01-04	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	50	341.7559	5.8	0.65	5905.2	57.5	54.9	78	62.4	58.0	65.3	1.3	5.7	6722.1	60	68.0	85.7	120.0	91.7	0.5	0.4	5"		28			
CB	01-05	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	50	341.7559	5.8	0.65	5990.2	57.5	54.9	78	62.2	58.0	64.9	1.4	6.6	6722.1	60	68.0	85.7	120.0	91.7	0.5	0.4	5"		28			
CB	01-06	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	50	341.7559	5.8	0.65	6203.2	57.5	54.9	78	61.6	58.0	64.0	1.7	9.3	6722.1	60	68.0	85.7	120.0	91.7	0.5	0.4	5"		28			
CB	01-07	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	60	362.9186	5	0.58	6526.9	57.5	54.9	78	61.8	58.0	63.2	2.0	2.9	6349.5	60	68.0	83.8	120.0	92.9	0.5	0.4	5"		29			
CB	01-08.1	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	105	532.0735	4.1	0.69	8917.2	57.5	54.9	78	62.5	58.0	64.2	2.1	3.1	6925.4	60	68.0	79.7	120.0	89.0	0.5	0.4	5"		38			
CB	01-08.2	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	105	532.0735	4.1	0.69	8917.2	57.5	54.9	78	62.9	58.0	64.2	2.1	3.1	6925.4	60	68.0	79.7	120.0	89.0	0.5	0.4	5"		38			
CB	01-08.3	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	105	532.0735	4.1	0.69	8917.2	57.5	54.9	78	62.9	58.0	64.2	2.1	3.1	6925.4	60	68.0	79.7	120.0	89.0	0.5	0.4	5"		38			
CB	01-08.4	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	105	532.0735	4.1	0.69	8917.2	57.5	54.9	78	62.9	58.0	64.2	2.1	3.1	6925.4	60	68.0	79.7	120.0	89.0	0.5	0.4	5"		38			
CB	01-09	PRICE	ACBL24_2W	4 PIPE	2'-0"	2'-0"	SINGLE	40	148.1237	2.7	0.56	2159.6	57.5	54.9	78	62.0	58.0	59.6	2.1	4.3	2281.7	60	68.0	81.9	120.0	114.2	0.9	0.4	5"		34			
CB	01-10.1	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-10.2	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-10.3	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-10.4	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-11	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	50	253.3684	4.1	0.70	4504.2	57.5	54.9	78	61.9	58.0	63.2	1.3	3.2	4277.1	60	68.0	83.2	120.0	101.4	0.5	0.2	5"		34			
CB	01-12.1	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-12.2	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-12.3	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-12.4	PRICE	ACBL24_2W	4 PIPE	4'-0"	2'-0"	SINGLE	115	425.8558	2.7	0.74	6008.9	57.5	54.9	78	65.2	58.0	69.4	0.6	0.8	4159.9	60	68.0	76.8	120.0	99.6	0.5	0.2	8"		45			
CB	01-13	PRICE	ACBL24_2W	4 PIPE	6'-0"	2'-0"	SINGLE	165	871.0105	2.7	0.80	14021	57.5	54.9	78	67.0	58.0	72.1	1.5	1.8	5650.9	60	68.0	76.3	120.0	92.0	0.5	0.3	8"		41			
CB	01-14	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	50	341.7559	5.8	0.65	6007.2	57.5	54.9	78	61.7	58.0	62.1	2.5	4.4	6381.1	60	68.0	84.8	120.0	93.1	0.5	0.4	5"		28			
CB	01-15	PRICE	ACBL24_2W	4 PIPE	2'-0"	2'-0"	SINGLE	40	148.1237	2.7	0.56	2159.6	57.5	54.9	78	64.8	58.0	63.0	0.5	0.3	1848.7	60	68.0	79.2	120.0	111.3	0.5	0.1	5"		34			
CB	01-16	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	DUAL	50	341.7559	5.8	0.65	6233.2	57.5	54.9	78	61.5	58.0	62.4	2.3	3.7	6381.1	60	68.0	84.8	120.0	93.1	0.5	0.4	5"		28			
CB	01-17.1	PRICE	ACBL24_2W	4 PIPE	6'-0"	2'-0"	SINGLE	100	432.4117	3.3	0.52	6644.4	57.5	54.9	78	64.1	58.0	67.7	0.9	2.3	5647.2	60	68.0	79.8	120.0	94.3	0.5	0.3	5"		38			
CB	01-17.2	PRICE	ACBL24_2W	4 PIPE	6'-0"	2'-0"	SINGLE	100	432.4117	3.3	0.52	6644.4	57.5	54.9	78	64.1	58.0	67.7	0.9	2.3	5647.2	60	68.0	79.8	120.0	94.3	0.5	0.3	5"		38			
CB	01-18	PRICE	ACBL24_2W	4 PIPE	2'-0"	2'-0"	SINGLE	40	148.1237	2.7	0.56	2159.6	57.5	54.9	78	64.8	58.0	63.0	0.5	0.3	1848.7	60	68.0	79.2	120.0	111.3	0.5	0.1	5"		34			
CB	01-19.1	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	50	341.7559	5.8	0.65	5990.2	57.5	54.9	78	62.2	58.0	64.9	1.4	6.6	6722.1	60	68.0	85.7	120.0	91.7	0.5	0.4	5"		28			
CB	01-19.2	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	50	341.7559	5.8	0.65	5990.2	57.5	54.9	78	62.2	58.0	64.9	1.4	6.6	6722.1	60	68.0	85.7	120.0	91.7	0.5	0.4	5"		28			
CB	01-20.1	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	45	307.5803	5.8	0.54	5340.4	57.5	54.9	78	62.3	58.0	65.2	1.2	5.0	6396.9	60	68.0	86.7	120.0	93.2	0.5	0.4	5"		26			
CB	01-20.2	PRICE	ACBL24_2W	4 PIPE	8'-0"	2'-0"	SINGLE	45	307.5803	5.8	0.54	5340.4	57.5	54.9	78	62.3	58.0	65.2	1.2	5.0	6396.9	60	68.0	86.7	120.0	93.2	0.5	0.4	5"		26			
CB	01-21	PRICE	ACBL24_2W	4 PIPE	2'-0"	2'-0"	SINGLE	40	148.1237	2.7	0.56	2159.6	57.5	54.9	78	64.8	58.0	63.0	0.5	0.3	1848.7	60	68.0	79.2	120.0	111.3	0.5	0.1	5"		34			
CB	01-22	PRICE	ACBL24																															

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A. TEMPERATURE SENSORS, HUMIDISTATS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION. WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.

B. VAVS ARE POWERED BY CONTROL VOLTAGE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROUTING, GROUPING, AND POWER FOR THE LOW-VOLTAGE VAV UNITS.

C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SEQUENCES OF OPERATION, WHETHER OR NOT THEY ARE EXPLICITLY NAMED.

D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.

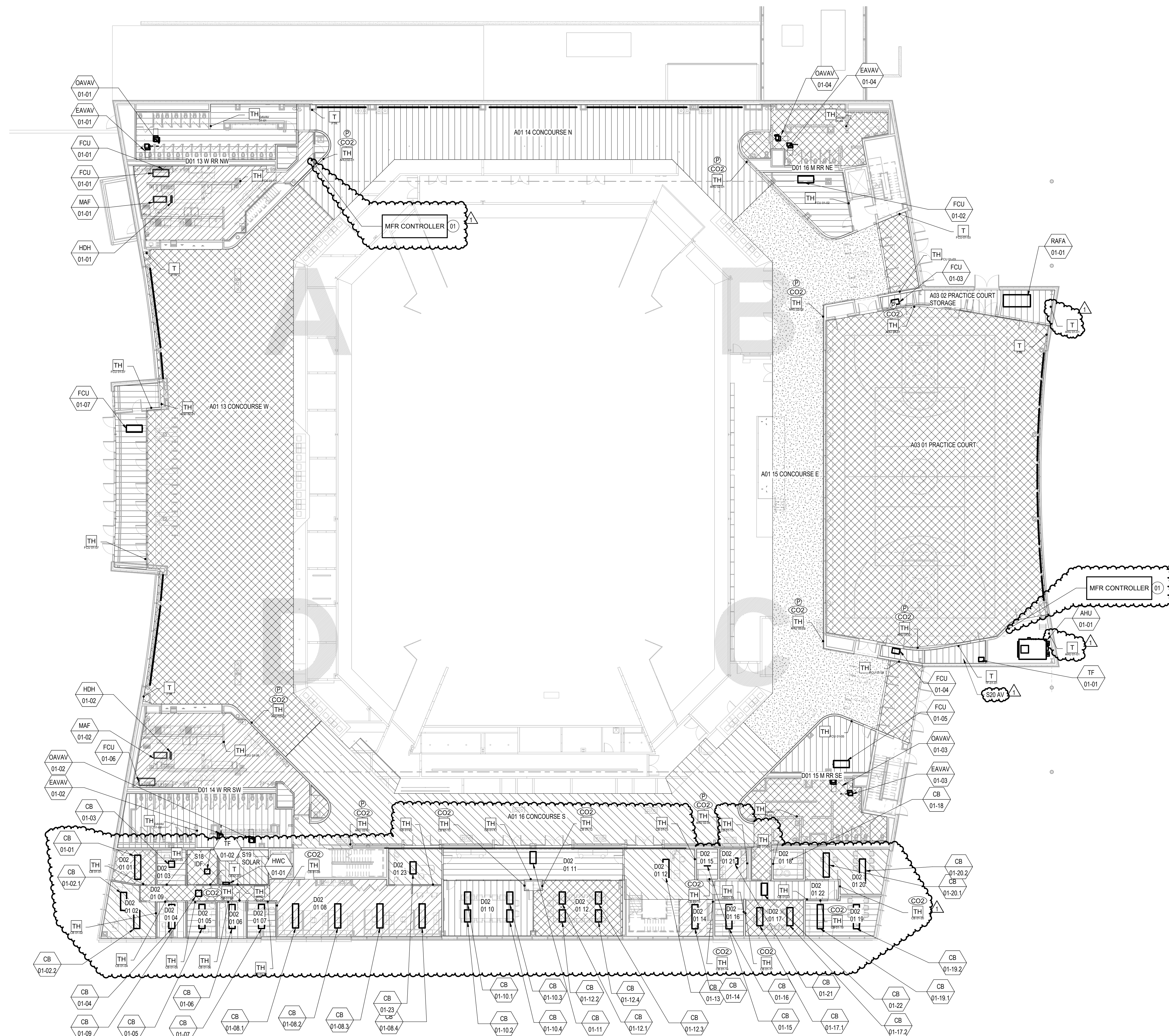
E. CONTROLS CONTRACTOR SHALL COORDINATE WITH THE
IUC CONTROL INTEGRATOR.

F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.

G. LOCAL MAGNEHELIC GAUGE SUPPLIED AT EACH FILTER SECTION.

H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS, A PIEZOMETER RING SHALL BE SUPPLIED AT EACH INLET CONE BY MANUFACTURER.

01 PROVIDE MANUFACTURER'S CONTROLLER ON WALL
PROVIDE CLEAR, LOCKABLE, PLEXIGLASS ACCESS
CAGE AROUND CONTROLLER.



1 CONOURSE FLOOR PLAN - OVERALL - ZONE
1/16" = 1'-0"

SEAL | DATE 01/27/25

[illegible]RATIO

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PROJECT NO. 23112.000

SHEET TITLE
MECHANICAL
ZONING PLAN -
CONCOURSE LEVEL

SHEET NUMBER

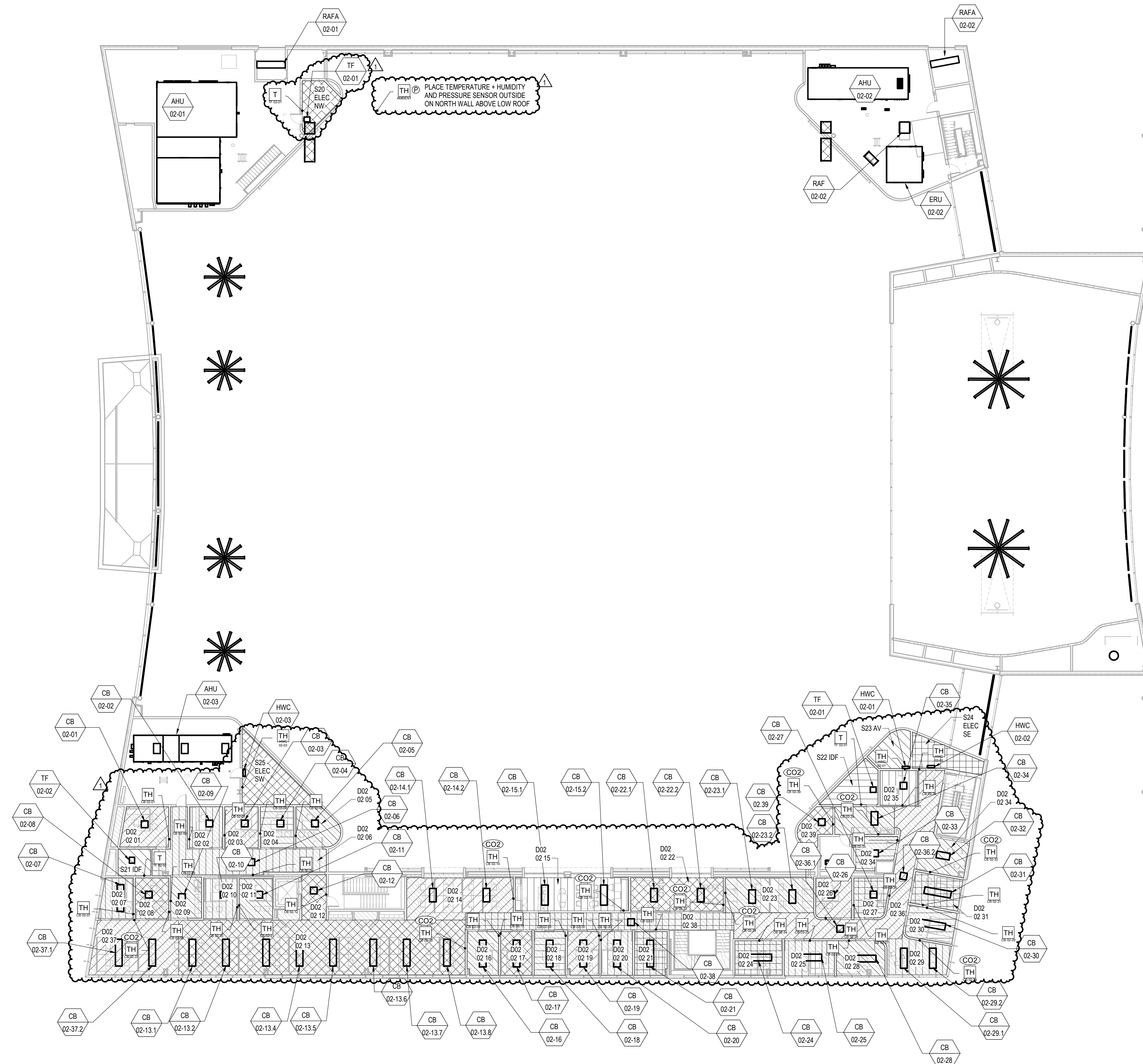
M-701

A. TEMPERATURE SENSORS, HUMIDISTATS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION. WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.

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F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.

H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS, PIEZOMETER RING SHALL BE SUPPLIED AT EACH INLET CONE BY MANUFACTURER.



1 UPPER LEVEL - OVERALL - ZONE
1/16" = 1'-0"

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SEAL DATE	01/27/25
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[illegible]RATIO

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PROJECT NO. 23112.000

SHEET TITLE
MECHANICAL
ZONING PLAN -
UPPER FLOOR

SHEET NUMBER

M-702

A. TEMPERATURE SENSORS, HUMIDISTATS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION. WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.

C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SEQUENCES OF OPERATION WHETHER OR NOT THEY ARE EXPLICITLY NAMED.

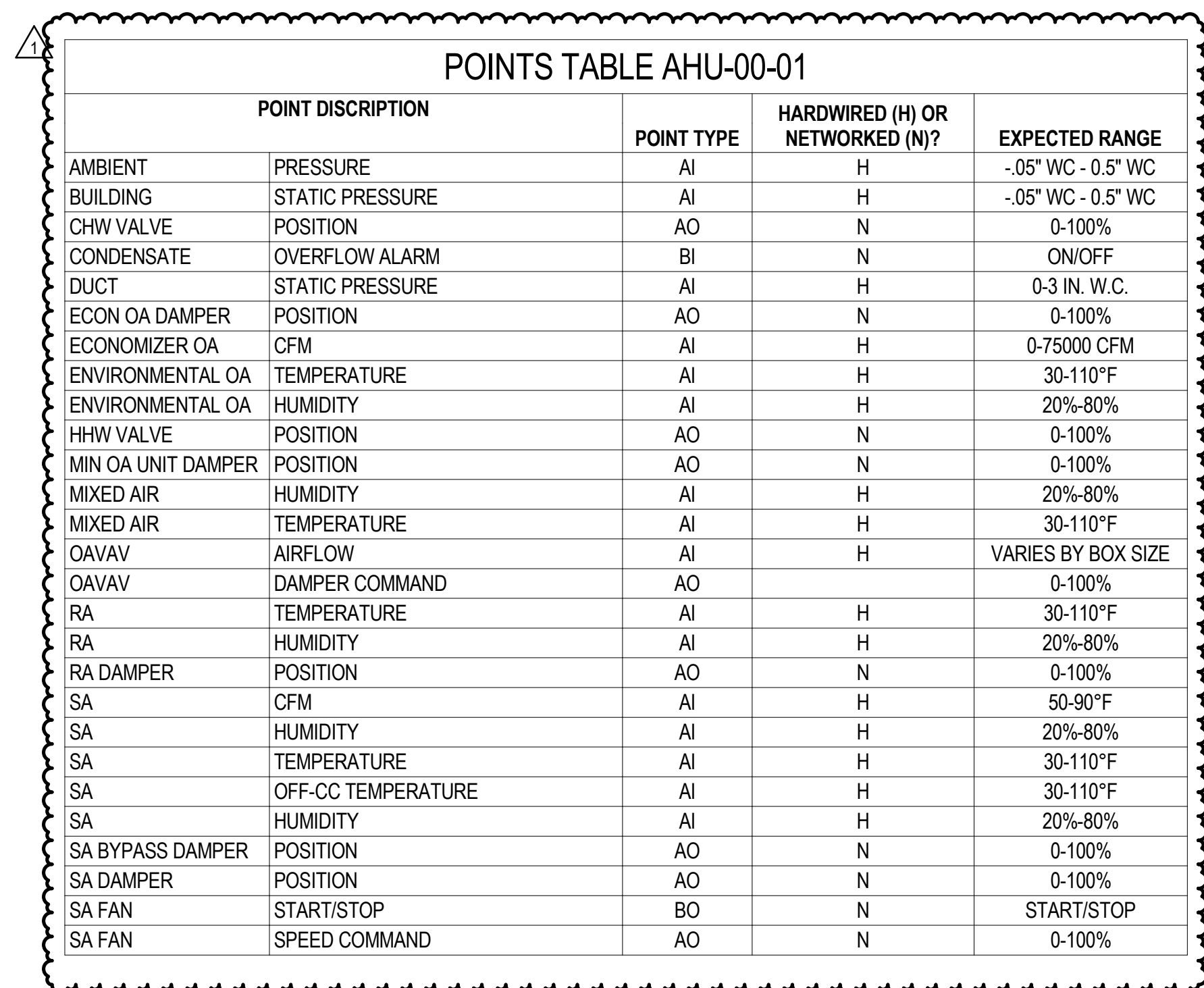
D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.

E. CONTROLS CONTRACTOR SHALL COORDINATE WITH T
IU CONTROL INTEGRATOR.

F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.

G. LOCAL MAGNEHELIC GAUGE SUPPLIED AT EACH FILTER SECTION.

H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS
PIEZIOMETER RING SHALL BE SUPPLIED AT EACH INLE



1. GENERAL:

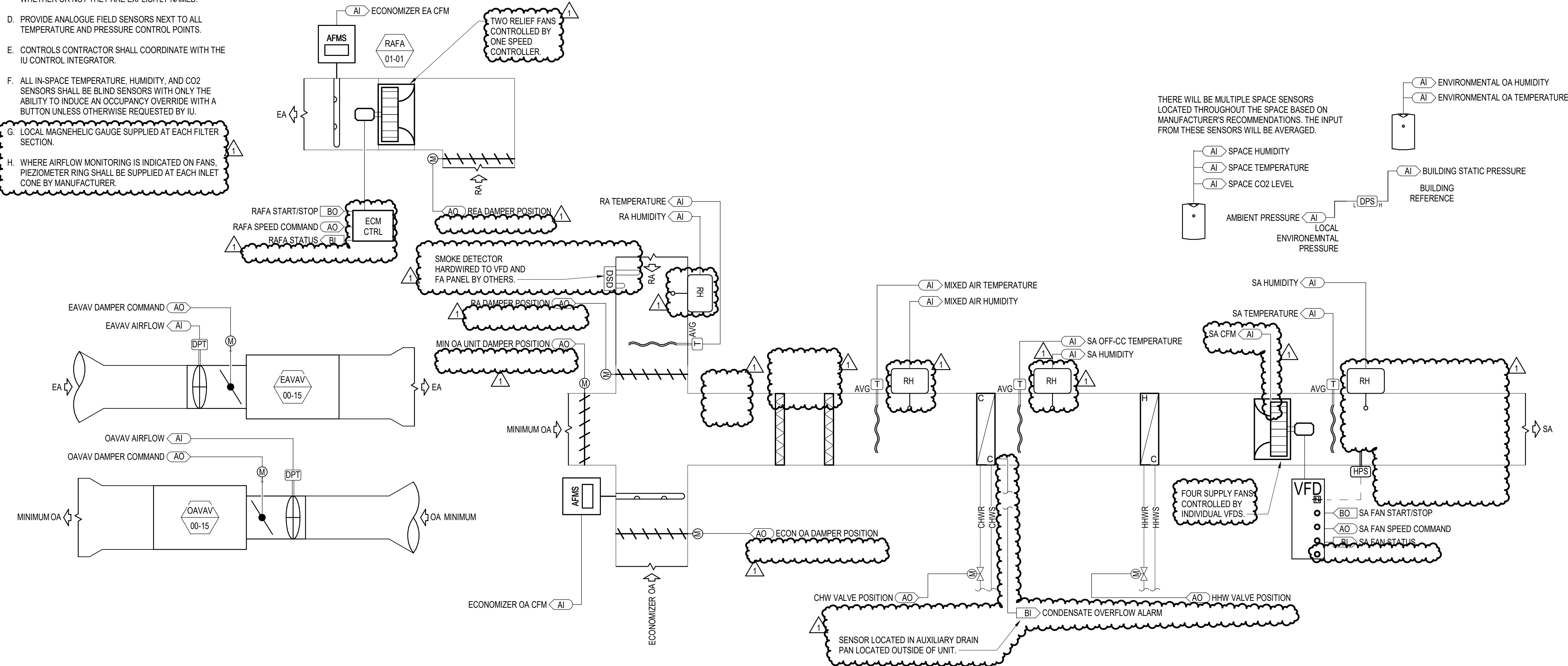
1. DEMAND CONTROL VENTILATION
- a. THE OA/VAV AND RETURN AIR DAMPER SHALL MODULATE IN RESPONSE TO CO2 SENSORS LOCATED THROUGHOUT THE SPACE TO MAINTAIN A CO2 CONCENTRATION LESS THAN 800 PPM (ADJ.)
10. BUILDING FREEZE PROTECTION:
- a. IF THE SUPPLY AIR TEMPERATURE DROPS BELOW 40°F (ADJ.) FOR 90 SEC (ADJ.), THE BAS WILL DE-ENERGIZE THE UNIT AND ASSOCIATED EQUIPMENT, CLOSE ALL OPERATIONAL DAMPERS, AND ACTIVATE THE ALARM OUTPUT.
11. CONDENSATE OVERFLOW:
- a. IN THE EVENT THAT THE HIGH-LEVEL CONDENSATE SWITCH IS TRIPPED, ALL COOLING COMPONENTS SHALL SHUT DOWN AND ALARMS SHALL BE SENT TO THE BAS.
12. SMOKE DETECTION:
- a. IN THE EVENT THAT SMOKE DETECTORS LOCATED IN THE SUPPLY AND EXHAUST AIR DUCT SHALL INDICATE AN ALARM AT THE BAS WORKSTATION (WHEN AN ALARM CONDITION IS DETECTED FOR SECONDARY MONITORING. THE WIRING AND CONDUIT FOR SECONDARY MONITORING FROM THE DUCT SMOKE DETECTORS AUXILIARY CONTACT TO THE BAS SHALL BE PROVIDED. THE WIRING AND CONDUIT FROM THE DUCT DETECTOR FOR FAN SHUT DOWN SHALL BE PROVIDED.
13. FIRE COMMAND CONTROL:
- a. NORMAL: UNITS SHALL OPERATE PER SEQUENCES ABOVE.
- b. IF, WHEN THE FIRE COMMAND OVERRIDE IS INDEXED TO OFF, THE AHU SHALL BE DE-ENERGIZED AND ALL OPERATIONAL DAMPERS SHALL CLOSE.
14. ALARMS INDICATION: THE CONTROLLER WILL DISPLAY ALARMS AND HAVE ONE DIGITAL OUTPUT FOR REMOTE INDICATION OF AN ALARM CONDITION. POSSIBLE ALARMS INCLUDE:
- a. BUILDING MANAGEMENT SYSTEM.
- b. THE CONTROLLER WILL SEND ALL ALARMS TO THE BAS.
15. FILTER ALARM:
- a. A DIGITAL SIGNAL IS SENT TO THE CONTROLLER INDICATING AN INCREASED PRESSURE DROP ACROSS AN AIR FILTER (MUST BE ADJUSTED IN FIELD DURING START UP). THE CONTROLLER WILL THEN PROVIDE A DIRTY FILTER ALARM.
16. SUPPLY AND EXHAUST AIR ALARM:
- a. THE CONTROLLER MONITORS THE PROVING SWITCH ON EACH BLOWER AND SENDS AN ALARM IN THE CASE OF EITHER BLOWER PROVING SWITCH NOT ENGAGING.
17. TEMPERATURE SENSOR ALARM:
- a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.
18. PRESSURE SENSOR ALARM:
- a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED PRESSURE SENSOR.
19. HUMIDITY SENSOR ALARM:
- a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED HUMIDITY SENSOR.
20. BUILDING FREEZE PROTECTION:
- a. THE CONTROLLER SENDS AN ALARM IN CASE OF BUILDING FREEZE PROTECTION BEING ENGAGED.
21. SMOKE DETECTION:
- a. THE CONTROLLER SENDS AN ALARM TO THE BAS AND THE FIRE ALARM CONTROL PANEL UPON POSITIVE DETECTION OF SMOKE.
22. FAN FAILURE:
- a. THE BAS SHALL PROVE FAN ARRAY OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF ANY OF THE FANS, THE BAS SHALL ALARM THAT FAN FAILURE CONDITION OCCURRED. UPON FAILURE OF MORE THAN ONE FAN IN AN ARRAY, THE BAS SHALL REMOVE THE COMMAND TO RUN THE REMAINING FANS (BOTH INTERNAL TO THE AHU AND THE ASSOCIATED RA), LOCKOUT THE RUN COMMAND TO BOTH FAN ARRAYS AND ANNUNCIATE AN ALARM.
23. HIGH OR LOW PRESSURE SWITCH:
- a. UPON ACTIVATION OF A HIGH OR LOW PRESSURE SAFETY SWITCH, AHU SHALL BE DEENERGIZED, FANS SHALL BE DEENERGIZED VIA A HARD WIRED INTERLOCK, AND AN INDICATION OF THE OPERATION SHALL BE SENSED BY THE BAS. BAS SHALL ANNUNCIATE APPROPRIATE ALARM AND REMOVE AND LOCK OUT THE START COMMAND.
24. ACCESSORIES: PROVIDE THE FOLLOWING:
- a. BAS INTERFACING:
- i. A BAS PORT OR SERIAL CARD IS PROVIDED WITH THE CONTROLLER FOR FIELD INTERFACING WITH A BUILDING AUTOMATION SYSTEM.
- b. UPDATE DEFAULT SETTINGS TO THE APPROPRIATE ADDRESSES TO MATCH THE BAS SETTINGS.
- b. DDC RETE INTERFACE:
- i. HIGH OR LOW PRESSURE SAFETY.
- c. FACTORY PROVIDED: FIELD MOUNTED INTERFACE PANEL THAT WILL BE WIRED TO THE MAIN CONTROLLER FOR MONITORING AND REMOTE ADJUSTMENTS OF SET POINTS.
- c. PHASE AND BROWNOUT PROTECTION:
- i. FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT.
- d. IF A PHASE DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.
- d. CONDENSATE OVERFLOW LOW UNIT SHUTDOWN:
- i. FACTORY MOUNTED CONDENSATE OVERFLOW SWITCH WIRED TO THE UNIT CONTROLLER. THE CONTROLLER MONITORS THE CONDENSATE OVERFLOW SWITCH.
- e. IF THE WATER LEVEL IN THE DRAIN PAN REACHES A CERTAIN LEVEL, THE UNIT WILL SHUT DOWN AND SEND AN ALARM.
- e. AIRFLOW MONITORING:
- i. THE SUPPLY AND EXHAUST FANS WILL EACH HAVE AN AIRFLOW MONITORING PRESSURE TAP ON THE INLET CONE.
- j. THE DIFFERENTIAL PRESSURE ACROSS THE FAN CONE IS CONVERTED TO AN AIRFLOW READING BY USING THE ENERGY CONSERVATION PRINCIPLE AND THE FAN WHEEL K-FACTOR.
- k. THE AIRFLOW CAN BE MONITORED VIA THE LCD AND BAS.
- f. DAMPER END SWITCH
15. MINIMUM REQUIREMENTS FOR OPERATOR WORKSTATION DISPLAY
- a. SUPPLY AIRFLOW
- b. SUPPLY FAN ON-OFF STATUS
- c. SUPPLY FAN SPEED
- d. ECONOMIZER STATUS
- e. ALL TEMPERATURE SENSORS ON THE UNIT
- f. DEWPOINT OF SA, RA, AND EA
- g. CHW AND HHV VALVE POSITIONS
- h. HEAT PIPE STATUS
- i. COOLING DEMAND % OF TOTAL CAPACITY
- j. TEMPERATURE LEAVING COOLING COIL
- k. TEMPERATURE LEAVING REHEAT COIL
- l. TEMPERATURE LEAVING UNIT
- m. DAMPER POSITIONS
- n. LIMS TO ASSOCIATED OA/VAV AND EA/VAV
- o. ALARMS

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M-703

GENERAL CONTROLS NOTES:

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- B. VAVS ARE POWERED BY CONTROL VOLTAGE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROUTING, GROUPING, AND POWER FOR THE LOW-VOLTAGE VAV UNITS.
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- D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.
- E. CONTROLS CONTRACTOR SHALL COORDINATE WITH THE IU CONTROL INTEGRATOR.
- F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.
- G. LOCAL MAGNETIC GAUGE SUPPLIED AT EACH FILTER SECTION.
- H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS, PIEZOMETER RING SHALL BE SUPPLIED AT EACH INLET CONE BY MANUFACTURER.



SEQUENCE OF OPERATIONS - AHU-01-01, RAFA-01-01, ASSOCIATED EAVAV AND OAVAV

1. GENERAL:
- A. AHU-01-01 IS A CONSTANT-VOLUME HYDRONIC AHU CONSISTING OF A SUPPLY FAN ARRAY, COOLING COIL, RE-HEAT COIL, AND A DECOUPLED RELIEF AIR FAN ARRAY (RAFA). THE AHU SERVES THE PRACTICE GYMNASIUM 115 AND THE ANCILLARY SPACES. THE AHU RECEIVED OA FROM A DEDICATED EAVAV AND OAVAV FROM AHU-00-03. ADDITIONALLY, THE AHU HAS THE CAPABILITY OF OPERATING IN ECONOMIZER MODE VIA A SEPARATE ECONOMIZER AIR CONNECTION.
2. CONTROLS ARCHITECTURE:
- A. CONTROL POINTS SHALL BE CONTROLLED BY THE CENTRAL BAS VIA BACNET COMMUNICATION PROTOCOL. ALL CONTROL POINTS, WHETHER EXPLICITLY LISTED OR NOT, SHALL BE VISIBLE AND CONTROLLABLE VIA THE BAS.
- B. UNIT START COMMAND:
- a. OPERATIONALLY RELEVANT DAMPER ACTUATORS ARE POWERED.
- b. SUPPLY FANS START AFTER A 15 SEC (ADJ.) DELAY WHEN THE ASSOCIATED DAMPERS ARE PROVEN OPEN.
- c. TEMPERING OPTIONS TO FUNCTION AS DESCRIBED.
- C. UNIT STOP COMMAND (OR DE-ENERGIZED):
- a. SUPPLY FANS, ASSOCIATED RAFA AND TEMPERING OPTIONS DE-ENERGIZED.
- b. OPERATIONAL DAMPERS ARE CLOSED AND DAMPER ACTUATOR IS SPRING RETURN CLOSE.
3. OCCUPIED/UNOCCUPIED MODES:
- A. TEMPERATURE SETPOINTS
- a. OCCUPIED:
- COOLING: 78°F +/- 2°F
 - HEATING: 68°F +/- 2°F
 - RELATIVE HUMIDITY: 55%
- b. UNOCCUPIED:
- COOLING: 82°F +/- 2°F
 - HEATING: 60°F +/- 2°F
- B. SCHEDULE SHALL BE BASED ON AN OCCUPANCY SCHEDULE PROVIDED BY THE OWNER.
- C. OCCUPANCY OVERRIDE: IF DURING THE UNOCCUPIED PERIOD THERE IS A REQUEST FOR OCCUPANCY OVERRIDE, THE OCCUPANCY MODE SHALL BECOME ACTIVE FOR 2 HOURS (ADJ.).
- D. PRIOR TO SCHEDULED OCCUPANCY, OCCUPIED MODE SHALL BE ENGAGED WITH SUFFICIENT TIME TO ENSURE THE SPACES SERVED ARE AT THE OCCUPIED TEMPERATURE SETPOINT AND VENTILATION RATES PRIOR TO THE SCHEDULED OCCUPANCY.
- E. OCCUPIED MODE:
- a. SUPPLY FANS ON.
- b. ALL COILS AVAILABLE FOR OPERATION.
- c. OPERATIONAL DAMPERS PROVEN OPEN AND ENGAGED TO THEIR OPERATING POSITION.
- d. ASSOCIATED RAFA IS AVAILABLE FOR PRESSURIZATION CONTROL.
- e. TEMPERATURE CONTROL PER SUPPLY AIR RESET SEQUENCE.
- F. UNOCCUPIED MODE (UNIT OFF): UNIT REMAINS OFF WHEN IN UNOCCUPIED MODE.
- a. SUPPLY FANS OFF
- b. ASSOCIATED RAFA OFF
- c. TEMPERING OFF
- d. OPERATIONAL DAMPERS CLOSED
4. SUPPLY FANS SEQUENCE:
- A. START/STOP: BAS SHALL COMMAND THE RELEVANT OPERATIONAL DAMPERS OPEN WHENEVER THE AHU IS ENERGIZED. UPON PROOF OF THE DAMPER POSITION, THE INTERLOCKED SUPPLY FANS SHALL RUN CONTINUOUSLY.
- B. THE SUPPLY FANS ARE PROVIDED WITH A FACTORY PROVIDED VARIABLE FREQUENCY DRIVE(S). THE SUPPLY FAN SPEED WILL BE CONTROLLED TO MAINTAIN CONSTANT SUPPLY AIRFLOW.
5. EAVAV SEQUENCE:
- A. THE EAVAV RESPONDS TO ROOM-SIDE SPACE PRESSURIZATION SENSORS. IS PROVIDED WITH A FACTORY MOUNTED CONTROL ENCLOSURE.
- B. THE RAFA SPEED WILL BE CONTROLLED WITH THE FOLLOWING SEQUENCE:
- C. ROOM PRESSURIZATION SHALL BE MAINTAINED EQUAL TO THE BUILDING PRESSURIZATION OF MINIMUM 0.025" WC.
- a. THE ROOM PRESSURIZATION SHALL BE RELAYED THROUGH A SERIES OF SPACE PRESSURE SENSORS LOCATED THROUGHOUT THE SPACE SERVED.
- b. THE EAVAV SERVED THE SPACE SHALL MODULATE TO MAINTAIN THE ZONE PRESSURIZATION.
- c. MECHANICAL HIGH STATIC PROTECTION CUTOFFS SHALL BE INSTALLED TO PROTECT THE SYSTEM AND EQUIPMENT FROM PRESSURIZATION RELATED DAMAGE.
6. ECONOMIZER MODE (CONSTANT VOLUME):
- A. WHEN OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY AND OUTSIDE AIR TEMPERATURE IS ABOVE 53°F, THE BAS SHALL:
- a. CLOSE THE ASSOCIATED OAVAV AND EAVAV.
- b. MODULATE THE ECONOMIZER OUTSIDE AIR AND RETURN AIR DAMPERS TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT
- c. ENERGIZE THE ASSOCIATED RAFA AND OPEN THE ASSOCIATED DAMPERS
- d. MODULATE THE FAN SPEED OF THE ASSOCIATED RAFA TO MAINTAIN ROOM PRESSURIZATION EQUAL TO THE BUILDING PRESSURIZATION SETPOINT.
- B. WHEN OUTSIDE AIR ENTHALPY IS GREATER THAN RETURN AIR ENTHALPY, THE BAS SHALL:
- a. RETURN THE ASSOCIATED OAVAV AND EAVAV TO STANDARD OPERATION
- b. CLOSE THE ECONOMIZER OA DAMPER AND OPEN THE MINIMUM OA AND RA DAMPER.
- c. DE-ENERGIZE THE ASSOCIATED RAFA AND CLOSE THE ASSOCIATED DAMPERS
7. FAN OPERATION AND PROTECTION:
- A. THE FAN SPEEDS WILL NOT DROP BELOW 20 HZ (ADJ.) AND SHALL NOT EXCEED 60 HZ.
- B. THE DUCT STATIC PRESSURE SHALL BE ESTABLISHED DURING THE SYSTEM TESTING AND BALANCING.
- C. MECHANICAL HIGH STATIC PROTECTION CUTOFFS SHALL BE INSTALLED TO PROTECT THE SYSTEM AND EQUIPMENT FROM PRESSURIZATION-RELATED DAMAGE.
- D. THE FANS ARE SIZED FOR N+1 OPERATION. IN THE EVENT OF A FAN FAILURE, THE REMAINING FANS WILL ADJUST TO COMPENSATE FOR THE MISSING FAN.
8. SUPPLY AIR TEMPERATURE CONTROL (OPTIMIZED):
- A. THE CONTROLLER WILL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS. THE VALVES TO THE COOLING AND RE-HEAT COILS WILL MODULATE TO MAINTAIN SPACE TEMPERATURE AND HUMIDITY REQUIREMENTS.
- B. DEHUMIDIFICATION:
- a. IN THE EVENT THAT COOLING DEMAND IS SATISFIED BUT A ZONE DEWPOINT IS ABOVE 58°F(ADJ.), THE OAVAV AND EAVAV WILL MODULATE OPEN INCREMENTALLY AFTER THE ZONE DEWPOINT IS BELOW 56°F(ADJ.) FOR 30 MINUTES (ADJ.). THE UNIT WILL RETURN TO STANDARD CONDITIONING MODE.
9. DEMAND CONTROLLED VENTILATION:
- A. THE OAVAV SHALL MODULATE IN RESPONSE TO CO2 SENSORS LOCATED THROUGHOUT THE SPACE TO MAINTAIN A CO2 CONCENTRATION LESS THAN 900 PPM (ADJ.)

10. BUILDING FREEZE PROTECTION:
- A. IF THE SUPPLY AIR TEMPERATURE DROPS BELOW 40°F (ADJ.) FOR 90 SEC (ADJ.), THE BAS WILL DE-ENERGIZE THE UNIT AND ASSOCIATED EQUIPMENT, CLOSE ALL OPERATIONAL DAMPERS, AND ACTIVATE THE ALARM OUTPUT. IF THE UNIT IS EQUIPPED WITH COIL RECIRCULATION PUMPS, THE MODULATING CONTROL VALVE SHALL CLOSE. THE RECIRCULATION PUMP ISOLATION VALVE SHALL OPEN, AND THE RECIRCULATION PUMP SHALL OPERATE.
11. CONDENSATE OVERFLOW:
- A. IN THE EVENT THAT THE HIGH-LEVEL CONDENSATE SWITCH IS TRIPPED, ALL COOLING COMPONENTS SHALL SHUT DOWN AND ALARMS SHALL BE SENT TO THE BAS.
12. SMOKE DETECTION:
- A. SMOKE DETECTORS LOCATED IN THE SUPPLY AND EXHAUST AIR DUCT SHALL INDICATE AN ALARM AT THE BAS WORKSTATION WHEN AN ALARM CONDITION IS DETECTED FOR SECONDARY MONITORING. THE WIRING AND CONDUIT FOR SECONDARY MONITORING FROM THE DUCT SMOKE DETECTORS' AUXILIARY CONTACT TO THE BAS SHALL BE PROVIDED. THE WIRING AND CONDUIT FROM THE DUCT DETECTOR FOR FAN SHUT DOWN SHALL BE PROVIDED.
- FIRE COMMAND CONTROL:
- a. NORMAL: UNITS SHALL OPERATE PER SEQUENCES ABOVE.
- b. OFF: WHEN THE FIRE COMMAND OVERRIDE IS INDEXED TO OFF, THE AHU SHALL BE DE-ENERGIZED AND ALL OPERATIONAL DAMPERS SHALL CLOSE.
13. ALARMS INDICATION: THE CONTROLLER WILL DISPLAY ALARMS AND HAVE ONE DIGITAL OUTPUT FOR REMOTE INDICATION OF AN ALARM CONDITION. POSSIBLE ALARMS INCLUDE:
- A. BUILDING MANAGEMENT SYSTEM:
- a. THE CONTROLLER WILL SEND ALL ALARMS TO THE BAS.
- B. DIRTY FILTER ALARM:
- a. A DIGITAL SIGNAL IS SENT TO THE CONTROLLER INDICATING AN INCREASED PRESSURE DROP ACROSS AN AIR FILTER (MUST BE ADJUSTED IN FIELD DURING START UP). THE CONTROLLER WILL THEN PROVIDE A DIRTY FILTER ALARM.
- C. SUPPLY AND EXHAUST AIR ALARM:
- a. THE CONTROLLER MONITORS THE PROVING SWITCH ON EACH BLOWER AND SENDS AN ALARM IN THE CASE OF EITHER BLOWER PROVING SWITCH NOT ENGAGING.
- D. TEMPERATURE SENSOR ALARM:
- a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.
- E. PRESSURE SENSOR ALARM:
- a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED PRESSURE SENSOR.
- F. HUMIDITY SENSOR ALARM:
- a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED HUMIDITY SENSOR.
- G. BUILDING FREEZE PROTECTION:
- a. THE CONTROLLER SENDS AN ALARM IN CASE OF BUILDING FREEZE PROTECTION BEING ENGAGED.
- H. SMOKE DETECTION:
- a. THE CONTROLLER SENDS AN ALARM TO THE BAS AND THE FIRE ALARM CONTROL PANEL UPON POSITIVE DETECTION OF SMOKE.
- I. FAN FAILURE:
- a. BAS SHALL PROVE FAN ARRAY OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF ANY OF THE FANS, THE BAS SHALL ALARM THAT FAN FAILURE CONDITION OCCURRED. UPON FAILURE OF MORE THAN ONE FAN IN AN ARRAY, THE BAS SHALL REMOVE THE COMMAND TO RUN THE REMAINING FANS (BOTH INTERNAL TO THE AHU AND THE ASSOCIATED RAFA). LOCKOUT THE RUN COMMAND TO BOTH FAN ARRAYS AND ANNUNCIATE AN ALARM.
- J. HIGH OR LOW PRESSURE SAFETY:
- a. UPON ACTIVATION OF A HIGH OR LOW PRESSURE SAFETY SWITCH, AH SHALL BE DEENERGIZED, FANS SHALL BE DEENERGIZED VIA A HARD WIRED INTERLOCK, AND AN INDICATION OF THE OPERATION SHALL BE SENSED BY THE BAS. BAS SHALL ANNUNCIATE APPROPRIATE ALARM AND REMOVE AND LOCK OUT THE START COMMAND.
14. ACCESSORIES: PROVIDE THE FOLLOWING:
- A. BAS INTERFACING:
- a. A BAS PORT OR SERIAL CARD IS PROVIDED WITH THE CONTROLLER FOR FIELD INTERFACING WITH A BUILDING AUTOMATION SYSTEM.
- b. UPDATE DEFAULT SETTINGS TO THE APPROPRIATE ADDRESSES TO MATCH THE BAS SETTINGS.
- B. DDC REMOTE INTERFACE:
- a. FACTORY PROVIDED, FIELD MOUNTED INTERFACE PANEL THAT WILL BE WIRED TO THE MAIN CONTROLLER FOR MONITORING AND REMOTE ADJUSTMENTS OF SET POINTS
- C. PHASE AND BROWNOUT PROTECTION:
- a. FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT.
- b. IF A PHASE DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.
- D. CONDENSATE OVERFLOW UNIT SHUTDOWN:
- a. FACTORY MOUNTED CONDENSATE OVERFLOW SWITCH WIRED TO THE UNIT CONTROLLER. THE CONTROLLER MONITORS THE CONDENSATE OVERFLOW SWITCH.
- b. IF THE WATER LEVEL IN THE DRAIN PAN REACHES A CERTAIN LEVEL, THE UNIT WILL SHUTDOWN AND SEND AN ALARM.
- E. AIRFLOW MONITORING:
- a. THE SUPPLY AND EXHAUST FANS WILL EACH HAVE AN AIRFLOW MONITORING PRESSURE TAP ON THE INLET CONE.
- b. THE DIFFERENTIAL PRESSURE ACROSS THE FAN CONE IS CONVERTED TO AN AIRFLOW READING BY USING THE ENERGY CONSERVATION PRINCIPLE AND THE FAN WHEEL K-FACTOR.
- c. THE AIRFLOW CAN BE MONITORED VIA THE LCD AND BAS.
- F. DAMPER END SWITCH:
- a. DAMPER END SWITCHING WILL BE PROVIDED TO ENSURE THE SUPPLY AND EXHAUST FANS DO NOT ENABLE UNTIL THE DAMPERS ARE PROVEN OPEN.
15. MINIMUM REQUIREMENTS FOR OPERATOR WORKSTATION DISPLAY:
- A. SUPPLY AIRFLOW
- B. SUPPLY FAN ON/OFF STATUS
- C. SUPPLY FAN SPEED
- D. RAFA AIRFLOW
- E. RAFA ON/OFF STATUS
- F. RAFA SPEED
- G. ECONOMIZER STATUS
- H. ALL TEMPERATURE SENSORS ON THE UNIT
- I. DEWPOINT OF SA, RA, AND EA
- J. CHW AND HHV VALVE POSITIONS

POINTS TABLE AHU-01-01

POINT DISRIPTION		POINT TYPE	HARDWIRED (H) OR NETWORKED (N)?	EXPECTED RANGE
AMBIENT	PRESSURE	AI	H	-05" WC - 0.5" WC
BUILDING	STATIC PRESSURE	AI	H	-05" WC - 0.5" WC
CHW VALVE	POSITION	AO	N	0-100%
CONDENSATE	OVERFLOW ALARM	BI	N	ON/OFF
EAVAV	AIRFLOW	AI	H	VARIES BY BOX SIZE
EAVAV	DAMPER COMMAND	AO		0-100%
ECON OA DAMPER	POSITION	AO	N	0-100%
ECONOMIZER EA	CFM	AI	H	0-75000 CFM
ECONOMIZER OA	CFM	AI	H	0-75000 CFM
ENVIRONMENTAL OA	TEMPERATURE	AI	H	30-110°F
ENVIRONMENTAL OA	HUMIDITY	AI	H	20%-80%
HHW VALVE	POSITION	AO	N	0-100%
MIN OA UNIT DAMPER	POSITION	AO	N	0-100%
MIXED AIR	HUMIDITY	AI	H	20%-80%
MIXED AIR	TEMPERATURE	AI	H	30-110°F
OAVAV	AIRFLOW	AI	H	VARIES BY BOX SIZE
OAVAV	DAMPER COMMAND	AO		0-100%
RA	TEMPERATURE	AI	H	30-110°F
RA	HUMIDITY	AI	H	20%-80%
RA DAMPER	POSITION	AO	N	0-100%
RAFA	START/STOP	BO	N	START/STOP
RAFA	SPEED COMMAND	AO	N	0-100%
RAFA	STATUS	BI	N	ON/OFF
REA DAMPER	POSITION	AO	N	0-100%
SA	CFM	AI	H	50-90°F
SA	HUMIDITY	AI	H	20%-80%
SA	TEMPERATURE	AI	H	30-110°F
SA	OFF-CC TEMPERATURE	AI	H	30-110°F
SA	HUMIDITY	AI	H	20%-80%
SA FAN	START/STOP	BO	N	START/STOP
SA FAN	SPEED COMMAND	AO	N	0-100%
SA FAN	STATUS	BI	N	ON/OFF
SA FAN	STATUS	BI	N	ON/OFF
SPACE	CO2 LEVEL	AI	H	0-1500 PPM
SPACE	TEMPERATURE	AI	H	30-110°F
SPACE	HUMIDITY	AI	H	20%-80%

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01/27/25



SHEET ISSUE

1	95% CONSTRUCTION DOCUMENTS	12/19/24
2	CONSTRUCTION DOCUMENTS	01/13/25
3	ADDENDUM 01	01/27/25



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PROJECT NO. 23112.000

SHEET TITLE

**MECHANICAL
CONTROLS -
AHU-01-01**

SHEET NUMBER

M-706



1. GENERAL:
- A. BASIS: ANALYSIS OF A SUPPLY FAN AIR COOLING COIL, PRE-HEAT COIL, HEAT PIPE PRE-COOL, AND RE-HEAT SYSTEM, ENERGY RECOVERY WHEEL (ERW) AND A DECOUPLED RECYCLE AIR FAN (RAFA) (RAFA). THE AHU SERVES THE ARENA SEATING AND CONCOURSE. THE UNIT IS FED ON DIRECTLY VIA A MINIMUM OA CONNECTION AND AN ECONOMIZER OA CONNECTION.
2. CONTROLS ARCHITECTURE:
- A. CONTROL POINTS SHALL BE CONTROLLED BY THE CENTRAL BAS VIA BACNET COMMUNICATION PROTOCOL. ALL CONTROL POINTS, WHETHER EXPLICITLY LISTED OR NOT, SHALL BE VISIBLE AND CONTROLLABLE VIA THE BAS.
- B. UNIT START COMMAND:
1. OPERATIONALLY RELEVANT DAMPER ACTUATORS ARE POWERED.
2. SUPPLY FANS START AFTER A 15 SEC (ADJ.) DELAY WHEN THE ASSOCIATED DAMPERS ARE PROVEN OPEN.
3. TEMPERING OPTIONS AND ENERGY WHEEL OPTION TO FUNCTION AS DESCRIBED.
- C. HEAT PIPE COMPONENTS ARE POWERED.
- D. UNIT STOP COMMAND (OR DE-ENERGIZED):
1. SUPPLY FANS ASSOCIATED RAFA, ENERGY WHEEL, AND TEMPERING OPTIONS DE-ENERGIZED.
2. OPERATIONAL DAMPERS ARE CLOSED AND DAMPER ACTUATOR IS SPRING RETURN CLOSE.
3. OCCUPIED/UNOCCUPIED MODES:
- A. TEMPERATURE SETPOINTS
1. OCCUPIED
- a. COOLING: 78°F +/- 2°F
- b. HEATING: 68°F +/- 2°F
- c. RELATIVE HUMIDITY: 55%
2. UNOCCUPIED
- a. COOLING: 82°F +/- 2°F
- b. HEATING: 60°F +/- 2°F
- B. SCHEDULE SHALL BE BASED ON AN OCCUPANCY SCHEDULE PROVIDED BY THE OWNER.
- C. OCCUPANCY OVERRIDE: IF DURING THE UNOCCUPIED PERIOD THERE IS A REQUEST FOR OCCUPANCY OVERRIDE, THE OCCUPANCY MODE SHALL BECOME ACTIVE FOR 2 HOURS (ADJ.).
- D. PRIOR TO SCHEDULED OCCUPANCY, OCCUPIED MODE SHALL BE ENGAGED WITH SUFFICIENT TIME TO ENSURE THE SPACES SERVED ARE AT THE OCCUPIED TEMPERATURE SETPOINT AND VENTILATION AND EXHAUST RATES PRIOR TO THE SCHEDULED OCCUPANCY.
- E. OCCUPIED MODE:
1. SUPPLY FANS ON.
2. ALL COILS AVAILABLE FOR OPERATION.
3. OPERATIONAL DAMPERS PROVEN OPEN AND ENGAGED TO THEIR OPERATING POSITION.
4. ASSOCIATED RAFA IS AVAILABLE FOR PRESSURIZATION CONTROL.
5. TEMPERATURE CONTROL PER SUPPLY AIR RESET SEQUENCE.
- F. UNOCCUPIED MODE (UNIT OFF): UNIT REMAINS OFF WHEN IN UNOCCUPIED MODE.
1. SUPPLY FANS OFF.
2. ASSOCIATED RAFA OFF.
3. TEMPERING OFF.
4. HEAT PIPE SYSTEM OFF.
5. OPERATIONAL DAMPERS CLOSED.
4. SUPPLY FANS SEQUENCE:
- A. START/STOP: BAS SHALL COMMAND THE RELEVANT OPERATIONAL DAMPERS OPEN WHENEVER THE AHU IS ENERGIZED. UPON PROOF OF THE DAMPER POSITION, THE INTERLOCKED DAMPER SHALL RUN TO CLOSE.
- B. THE SUPPLY FANS ARE PROVIDED WITH A FACTORY PROVIDED VARIABLE FREQUENCY DRIVE(S). THE SUPPLY FAN SPEED WILL BE CONTROLLED TO MAINTAIN CONSTANT AIRFLOW.
5. RAFA SEQUENCE:
- A. RAFA IS PROVIDED WITH A FACTORY MOUNTED VARIABLE FREQUENCY DRIVE.
- B. THE RAFA SPEED WILL BE CONTROLLED WITH THE FOLLOWING SEQUENCE:
1. BUILDING PRESSURIZATION BASED ON OPERATION OF AHU.
2. RAFA SHALL BE ENGAGED WHEN THE ASSOCIATED AHU IS IN 'OCCUPIED' MODE. UNDER NORMAL OPERATION, THE RAFA SHALL MODULATE IN RELATION TO THE POSITION OF THE MINIMUM OA DAMPER. THE AIRFLOW THROUGH THE RAFA SHALL BE MAINTAINED AT 10% LESS THAN THE AIRFLOW THROUGH THE MINIMUM OA DAMPER AS IT RESPONDS TO THE DEMAND CONTROL VENTILATION SEQUENCE.
3. MECHANICAL HIGH STATIC PROTECTION CUTOFFS SHALL BE INSTALLED TO PROTECT THE SYSTEM AND EQUIPMENT FROM PRESSURIZATION RELATED DAMAGE.
- B. WHEN OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY AND OUTSIDE AIR TEMPERATURE IS ABOVE 53°F, THE BAS SHALL:
1. CLOSE THE MINIMUM OA DAMPER.
2. MODULATE THE ECONOMIZER OUTSIDE AIR AND RETURN AIR DAMPERS TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.
3. ENERGIZE THE ASSOCIATED RAFA AND OPEN THE ASSOCIATED DAMPERS.
4. MODULATE THE FAN SPEED OF THE ASSOCIATED RAFA TO MAINTAIN AIRFLOW EQUAL TO THE OA (ECONOMIZER) AIRFLOW.
- C. WHEN OUTSIDE AIR ENTHALPY IS GREATER THAN RETURN AIR ENTHALPY, THE BAS SHALL:
1. CLOSE THE ECONOMIZER OA DAMPER.
2. OPEN THE MINIMUM OA DAMPER.
3. RETURN THE RA DAMPER TO STANDARD OPERATION.
4. DE-ENERGIZE THE ASSOCIATED RAFA AND CLOSE THE ASSOCIATED DAMPERS.
7. FAN OPERATION AND PROTECTION:
- A. THE FAN SPEEDS WILL NOT DROP BELOW 20KZ (ADJ) AND SHALL NOT EXCEED 60 KHZ.
- B. THE DUCT STATIC PRESSURE SHALL BE ESTABLISHED DURING THE SYSTEM TESTING AND BALANCING.
- C. MECHANICAL HIGH STATIC PROTECTION CUTOFFS SHALL BE INSTALLED TO PROTECT THE SYSTEM AND EQUIPMENT FROM PRESSURIZATION RELATED DAMAGE.
- D. THE FANS ARE SIZED FOR 1.0 OPERATION. IN THE EVENT OF A FAN FAILURE, THE REMAINING FANS WILL ADJUST TO COMPENSATE FOR THE MISSING FAN.
8. SUPPLY AIR TEMPERATURE CONTROL (OPTIMIZED):
- A. THE CONTROLLER WILL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS. THE VALVES TO THE COOLING AND REHEAT COILS SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE AND HUMIDITY REQUIREMENTS.
- B. DEHUMIDIFICATION:
1. IN THE EVENT THAT COOLING DEMAND IS SATISFIED BUT A ZONE DEWPOINT IS ABOVE 58°F (ADJ.), THE COOLING COIL VALVE WILL BE ALLOWED TO INCREMENTALLY DECREASE TO A MINIMUM OF 55°F (ADJ.) WHILE THE UNIT IS EQUIPPED WITH COIL RECIRCULATION PUMPS. THE MODULATING CONTROL VALVE SHALL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT. AFTER THE ZONE DEWPOINT IS BELOW 58°F (ADJ.) FOR 30 MINUTES (ADJ.), THE UNIT WILL RETURN TO STANDARD CONDITIONING MODE.
9. HEAT PIPE:
- A. HEAT PIPE SOLENOID VALVES SHALL BE MIN. 4 STAGE, MODULATING AS REQUIRED TO SATISFY THE SUPPLY AIR RESET AND HUMIDITY CONTROL STRATEGIES.
10. DEMAND CONTROL VENTILATION
- A. THE MINIMUM OA DAMPER AND THE RA DAMPER SHALL MODULATE IN RESPONSE TO CO2 SENSORS LOCATED THROUGHOUT THE SPACE TO MAINTAIN A CO2 CONCENTRATION LESS THAN 800 PPM (ADJ.)
11. BUILDING FREEZER PROTECTION:
- A. IF THE SUPPLY AIR TEMPERATURE DROPS BELOW 40°F (ADJ.) FOR 90 SEC (ADJ.), THE BAS WILL DE-ENERGIZE THE UNIT AND ASSOCIATED EQUIPMENT, CLOSE ALL OPERATIONAL DAMPERS, AND DEWATER THE ALARM OUTPUT. IF THE UNIT IS EQUIPPED WITH COIL RECIRCULATION PUMPS, THE MODULATING CONTROL VALVE SHALL CLOSE. THE RECIRCULATION PUMP ISOLATION VALVE SHALL OPEN, AND THE RECIRCULATION PUMP SHALL OPERATE.
12. CONDENSATE OVERTLOW:
- A. IF THE UNIT IS NOTICED THAT THE HIGH-LEVEL CONDENSATE SWITCH IS TRIPPED, ALL COOLING COMPONENTS SHALL SHUT DOWN AND ALARMS SHALL BE SENT TO THE BAS ENERGY RECOVERY WHEEL (ERW):
1. BAS SHALL CONTROL THE ERW. THE ERW SHALL BE ENERGIZED WHENEVER THE AHU UNIT IS OPERATING AND THE SPEED OF THE ERW SHALL BE MODULATED TO MAINTAIN THE CURRENT SPACE TEMPERATURE. IF THE ERW IS FULLY UTILIZED AND THE SUPPLY AIR TEMPERATURE IS NOT MET PER THE SUPPLY AIR RESET STRATEGY, THE CORRESPONDING HYDRONIC VALVES WILL BE ENGAGED.
- B. BAS SHALL CONTROL THE STARTING AND STOPPING OF THE ERW AS FOLLOWS:
1. WHENEVER THE UNIT IS DE-ENERGIZED AND THE OUTSIDE AIR ENTHALPY IS GREATER THAN THE ERW EXHAUST AIR ENTHALPY THE WHEEL SPEED SHALL BE MODULATED TO MAINTAIN A 2°F (ADJ.) WHEEL DISCHARGED DEWPOINT TEMPERATURE.
2. WHENEVER THE UNIT IS ENERGIZED AND THE OUTSIDE AIR DEW POINT TEMPERATURE IS LESS THAN 50°F (ADJ.), THE SPEED OF THE WHEEL SHALL BE MODULATED TO MAINTAIN THE OUTSIDE AIR DEW POINT TEMPERATURE AT 52°F (ADJ.). THE SPEED OF THE WHEEL SHALL BE INCREASED UPON A DROP IN SUPPLY AIR DEW POINT TEMPERATURE.
3. PERIODIC SELF-CLEANING: THE WHEEL SHALL RUN AT 5% SPEED FOR 10 SEC EVERY 4 HRS THE UNIT RUNS.
- D. FROST PROTECTION:
1. FROST CONTROL: FOR THE ERW IS ENABLED WHEN FROST IS PRESENT ON THE WHEEL, BASED ON THE OUTSIDE AIR TEMPERATURE AND THE PRESSURE DROP ACROSS THE WHEEL. IF THE OUTDOOR AIR TEMPERATURE IS BELOW 5°F (ADJ.) AND THE DIFFERENTIAL PRESSURE ACROSS THE WHEEL IS 1.5" OR GREATER (ADJ.), FROST CONTROL WILL ENABLE.
2. WHEEL WDM (MODULATE WHEEL): WHEN FROSTING IS OCCURRING, THE VPD MODULATES THE WHEEL DOWN TO A SLOW ROTATIONAL SPEED TO DEFROST WHEEL. ONCE THE UNIT WHEEL PRESSURE DROP DECREASES BELOW THE FROSTING SWITCH SET POINT, OR THE OUTDOOR AIR TEMPERATURE INCREASES ABOVE THE TEMPERATURE SET POINT, THE UNIT WILL RESUME NORMAL OPERATION.

- A. TEMPERATURE SENSORS, HUMIDISTATS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS, ROOFS, OR WHERE EXPOSED TO SOLAR RADIATION, WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED AIR GAP SHALL BE MAINTAINED TO MINIMIZE INTERFERENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.
- B. VAVS ARE POWERED BY CONTROL VOLTAGE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROUTING, GROUPING, AND POWER FOR THE LOW-VOLTAGE VAV UNITS.
- C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SPECIFICATIONS OF OPERATION WHETHER OR NOT THEY ARE EXPLICITLY NAMED.
- D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.
- E. CONTROL SENSORS SHALL COORDINATE WITH THE I/O CONTROL INTEGRATOR.
- F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE IN-SPACE SENSORS WITH ONLY THE BUILT-IN ANALOG GAUGING CAPABILITY OBTAINABLE BY A BUTTON UNLESS OTHERWISE REQUESTED BY UI.
- G. LOCAL MANUAL OVERRIDE SHALL BE AT EACH FILTER SECTION.

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SHEET ISSUE		
1	95% CONSTRUCTION DOCUMENTS	12/19/24
2	CONSTRUCTION DOCUMENTS	01/13/25
3	ADDENDUM 01	01/27/25

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PROJECT NO. 23112.000

SHEET TITLE
MECHANICAL
CONTROLS -
AHU-02-01

SHEET NUMBER

M-707

GENERAL CONTROLS NOTES:

A. TEMPERATURE SENSORS, HUMIDISTS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION, WHERE THERE ARE NO OTHER OPTIONS. A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.

B. VAVS ARE POWERED BY CONTROL VOLTAGE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROUTING, GROUPING, AND POWER FOR THE LOW VOLTAGE VAV UNITS.

C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SEQUENCES OF OPERATION WHETHER OR NOT THEY ARE EXPLICITLY NAMED.

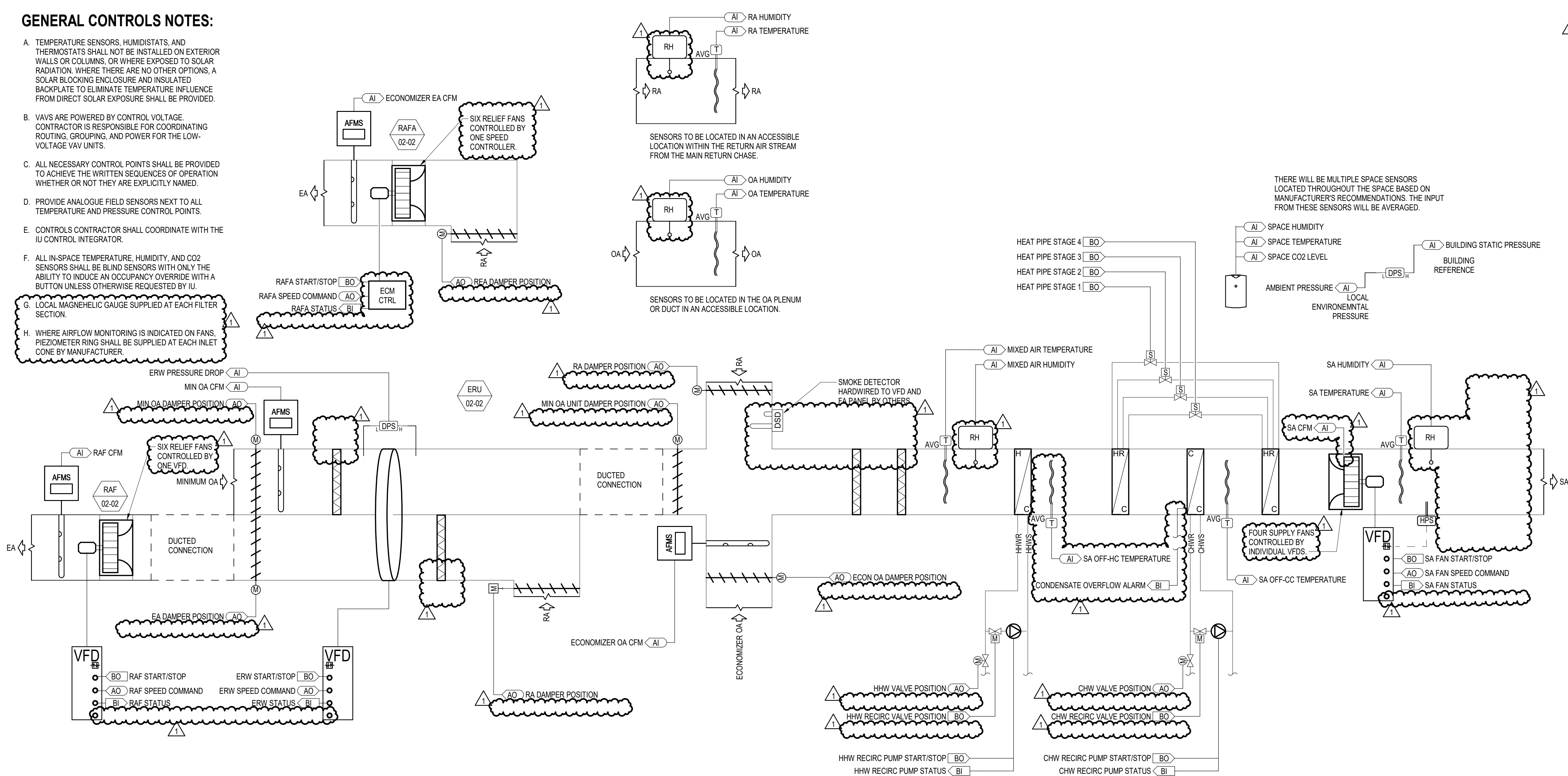
D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.

E. CONTROLS CONTRACTOR SHALL COORDINATE WITH THE IU CONTROL INTEGRATOR.

F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.

G. LOCAL MAGNETIC GAUGE SUPPLIED AT EACH FILTER SECTION.

H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS, PIEZOMETER RING SHALL BE SUPPLIED AT EACH INLET CONE BY MANUFACTURER.



SEQUENCE OF OPERATIONS - AHU-02-02, RAFA-02-02, ERU-03-02, RAF-03-02

- GENERAL:
 - AHU CONSISTS OF A SUPPLY FAN ARRAY, COOLING COIL, PRE-HEAT COIL, HEAT PIPE PRE-COOL, AND RE-HEAT SYSTEM, DECOUPLED ENERGY RECOVERY UNIT (ERU), DECOUPLED RELIEF AIR FAN (RAF) TO SERVE THE ERU, AND A DECOUPLED RELIEF AIR FAN (RAF) TO SERVE THE ARENA SEATING AND CONCOURSE. THE UNIT IS FED QUA DIRECTLY VIA A MINIMUM OA CONNECTION AND AN ECONOMIZER OA CONNECTION.
 - CONTROLS ARCHITECTURE:
 - CONTROL POINTS SHALL BE CONTROLLED BY THE CENTRAL BAS VIA BACNET COMMUNICATION PROTOCOL. ALL CONTROL POINTS, WHETHER EXPLICITLY LISTED OR NOT, SHALL BE VISIBLE AND CONTROLLABLE VIA THE BAS.
 - UNIT START COMMAND:
 - OPERATIONALLY RELEVANT DAMPER ACTUATORS ARE POWERED.
 - SUPPLY FANS START AFTER A 15 SEC (ADJ.) DELAY WHEN THE ASSOCIATED DAMPERS ARE PROVEN OPEN.
 - TEMPERING OPTIONS AND ENERGY WHEEL OPTION TO FUNCTION AS DESCRIBED.
 - HEAT PIPE COMPONENTS ARE POWERED.
 - UNIT STOP COMMAND (OR DE-ENERGIZED):
 - SUPPLY FANS, ASSOCIATED RAFA, ENERGY WHEEL, AND TEMPERING OPTIONS DE-ENERGIZED.
 - OPERATIONAL DAMPERS ARE CLOSED AND DAMPER ACTUATOR IS SPRING RETURN CLOSE.
 - OCCUPIED/UNOCCUPIED MODES:
 - TEMPERATURE SETPOINTS
 - OCCUPIED:
 - COOLING: 78°F +/- 2°F
 - HEATING: 68°F +/- 2°F
 - RELATIVE HUMIDITY: 55%
 - UNOCCUPIED:
 - COOLING: 82°F +/- 2°F
 - HEATING: 60°F +/- 2°F
 - SCHEDULE SHALL BE BASED ON AN OCCUPANCY SCHEDULE PROVIDED BY THE OWNER.
 - OCCUPANCY OVERRIDE: IF DURING THE UNOCCUPIED PERIOD THERE IS A REQUEST FOR OCCUPANCY OVERRIDE, THE OCCUPANCY MODE SHALL BECOME ACTIVE FOR 2 HOURS (ADJ.).
 - PRIOR TO SCHEDULED OCCUPANCY, OCCUPIED MODE SHALL BE ENGAGED WITH SUFFICIENT TIME TO ENSURE THE SPACES SERVED ARE AT THE OCCUPIED TEMPERATURE SETPOINT AND VENTILATION AND EXHAUST RATES PRIOR TO THE SCHEDULED OCCUPANCY.
 - OCCUPIED MODE:
 - SUPPLY FANS ON.
 - ALL COILS AVAILABLE FOR OPERATION.
 - OPERATIONAL DAMPERS PROVEN OPEN AND ENGAGED TO THEIR OPERATING POSITION.
 - ASSOCIATED RAFA IS AVAILABLE FOR PRESSURIZATION CONTROL.
 - TEMPERATURE CONTROL PER SUPPLY AIR RESET SEQUENCE.
 - UNOCCUPIED MODE (UNIT OFF): UNIT REMAINS OFF WHEN IN UNOCCUPIED MODE.
 - SUPPLY FANS OFF.
 - ASSOCIATED RAFA OFF.
 - TEMPERING OFF.
 - HEAT PIPE SYSTEM OFF.
 - OPERATIONAL DAMPERS CLOSED.
- SUPPLY FANS SEQUENCE:
 - START/STOP: BAS SHALL COMMAND THE RELEVANT OPERATIONAL DAMPERS OPEN WHENEVER THE AHU IS ENERGIZED. UPON PROOF OF THE DAMPER POSITION, THE INTERLOCKED SUPPLY FANS SHALL RUN CONTINUOUSLY.
 - THE SUPPLY FANS ARE PROVIDED WITH A FACTORY PROVIDED VARIABLE FREQUENCY DRIVE(S). THE SUPPLY FAN SPEED WILL BE CONTROLLED TO MAINTAIN CONSTANT SUPPLY AIRFLOW.
- RAF SEQUENCE:
 - START/STOP: BAS SHALL COMMAND THE RELEVANT OPERATIONAL DAMPERS OPEN WHENEVER THE AHU IS ENERGIZED. UPON PROOF OF THE DAMPER POSITION, THE INTERLOCKED RELIEF FAN SHALL RUN CONTINUOUSLY.
 - THE RELIEF FAN IS PROVIDED WITH A FACTORY PROVIDED VARIABLE FREQUENCY DRIVE(S). THE RELIEF FAN SPEED WILL INTERLOCK WITH OPERATION OF THE AHU AND SHALL MODULATE WITH THE POSITION OF THE MINIMUM OA DAMPER AND RA DAMPER TO MAINTAIN EQUAL AIRFLOW ACROSS THE ERU.
- RAFA SEQUENCE:
 - THE RAFA IS PROVIDED WITH A FACTORY PROVIDED VARIABLE FREQUENCY DRIVE.
 - THE RAFA SPEED WILL BE CONTROLLED WITH THE FOLLOWING SEQUENCE:
 - IT IS THE INTENT OF THE DESIGN THAT THIS RAFA SERVES AS THE RELIEF AIR PATH FOR AHU-00-01, AHU-02-02, AND AHU-02-02 DURING ECONOMIZER OPERATION.
 - BUILDING PRESSURIZATION DURING ECONOMIZER OPERATION OF AHU-00-01, AHU-02-02, AND/OR AHU-02-02 SHALL BE MAINTAINED AT MINIMUM 0.025" WC (ADJ.).
 - THE BUILDING PRESSURIZATION SHALL BE RELAYED THROUGH A SERIES OF SPACE PRESSURE SENSORS LOCATED THROUGHOUT THE BUILDING.
 - THE RAFA SHALL MODULATE TO MAINTAIN THE POSITIVE BUILDING PRESSURIZATION OUTLINED ABOVE.
 - MECHANICAL HIGH STATIC PROTECTION CUTOFFS SHALL BE INSTALLED TO PROTECT THE SYSTEM AND EQUIPMENT FROM PRESSURIZATION RELATED DAMAGE.
- ECONOMIZER MODE (CONSTANT VOLUME):
 - WHEN OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY AND OUTSIDE AIR TEMPERATURE IS ABOVE 53°F, THE BAS SHALL:
 - CLOSE THE MINIMUM OA DAMPER.
 - DE-ENERGIZE THE ASSOCIATED ERU AND RAF AND CLOSE THEIR OPERATIONAL DAMPERS.
 - MODULATE THE ECONOMIZER OUTSIDE AIR AND RETURN AIR DAMPERS TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.
 - ENERGIZE THE ASSOCIATED RAFA AND OPEN THE ASSOCIATED DAMPERS.
 - MODULATE THE FAN SPEED OF THE ASSOCIATED RAFA TO MAINTAIN POSITIVE BUILDING PRESSURIZATION AS DETAILED IN THE RAFA SEQUENCE.
 - WHEN OUTSIDE AIR ENTHALPY IS GREATER THAN RETURN AIR ENTHALPY, THE BAS SHALL:
 - CLOSE THE ECONOMIZER OA DAMPER.
 - OPEN THE MINIMUM OA DAMPER.
 - RETURN THE RA DAMPER TO STANDARD OPERATION.
 - DE-ENERGIZE THE ASSOCIATED RAFA AND CLOSE THE ASSOCIATED DAMPERS.
 - ENERGIZE THE ERU AND RAF AND OPEN THE ASSOCIATED OPERATIONAL DAMPERS.
 - FAN OPERATION AND PROTECTION:
 - THE FAN SPEEDS WILL NOT DROP BELOW 20HZ (ADJ) AND SHALL NOT EXCEED 80 HZ.
 - THE DUCT STATIC PRESSURE SHALL BE ESTABLISHED DURING THE SYSTEM TESTING AND BALANCING.
 - MECHANICAL HIGH STATIC PROTECTION CUTOFFS SHALL BE INSTALLED TO PROTECT THE SYSTEM AND EQUIPMENT FROM PRESSURIZATION-RELATED DAMAGE.
 - THE FANS ARE SIZED FOR N-1 OPERATION. IN THE EVENT OF A FAN FAILURE, THE REMAINING FANS WILL ADJUST TO COMPENSATE FOR THE MISSING FAN.
 - SUPPLY AIR TEMPERATURE CONTROL (OPTIMIZED):
 - THE CONTROLLER WILL MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS. THE VALVES TO THE COOLING AND REHEAT COILS WILL MODULATE TO MAINTAIN SPACE TEMPERATURE AND HUMIDITY REQUIREMENTS.
 - DEHUMIDIFICATION:
 - IN THE EVENT THAT COOLING DEMAND IS SATISFIED BUT A ZONE DEWPOINT IS ABOVE 58°F (ADJ.), THE COOLING COIL VALVE WILL BE ALLOWED TO INCREMENTALLY DECREASE TO A MINIMUM OF 53°F (ADJ.). WHILE THIS IS OCCURRING, THE HEAT PIPE SYSTEM WILL BE ENGAGED TO PROVIDE REHEAT TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT. AFTER THE ZONE DEWPOINT IS BELOW 58°F (ADJ.) FOR 30 MINUTES (ADJ.), THE UNIT WILL RETURN TO STANDARD CONDITIONING MODE.
 - HEAT PIPE:
 - HEAT PIPE SOLENOID VALVES SHALL BE MIN. 4 STAGE, MODULATING AS REQUIRED TO SATISFY THE SUPPLY AIR RESET AND HUMIDITY CONTROL STRATEGIES.
 - DEMAND CONTROLLED VENTILATION:
 - THE MINIMUM OA DAMPER AND THE RA DAMPER SHALL MODULATE IN RESPONSE TO CO2 SENSORS LOCATED THROUGHOUT THE SPACE TO MAINTAIN A CO2 CONCENTRATION LESS THAN 900 PPM (ADJ.).
 - BUILDING FREEZE PROTECTION:
 - IF THE SUPPLY AIR TEMPERATURE DROPS BELOW 40°F (ADJ.) FOR 90 SEC (ADJ.), THE BAS WILL DE-ENERGIZE THE UNIT AND ASSOCIATED EQUIPMENT. CLOSE ALL OPERATIONAL DAMPERS, AND ACTIVATE THE ALARM OUTPUT. IF THE UNIT IS EQUIPPED WITH COIL RECIRCULATION PUMPS, THE MODULATING CONTROL VALVE SHALL CLOSE, THE RECIRCULATION PUMP-ISOLATION VALVE SHALL OPEN, AND THE RECIRCULATION PUMP SHALL OPERATE.
 - CONDENSATE OVERFLOW:
 - IN THE EVENT THAT THE HIGH-LEVEL CONDENSATE SWITCH IS TRIPPED, ALL COOLING COMPONENTS SHALL SHUT DOWN AND ALARMS SHALL BE SENT TO THE BAS.

POINTS TABLE AHU-02-02

POINT DIScription	POINT TYPE	HARDWIRED (H) OR NETWORKED (N)?	EXPECTED RANGE
AMBIENT	PRESSURE	AI	H
BUILDING	STATIC PRESSURE	AI	H
CHW RECIRC PUMP	START/STOP	BO	N
CHW RECIRC PUMP	STATUS	BI	N
CHW RECIRC VALVE	POSITION	BO	N
CHW VALVE	POSITION	AO	N
CONDENSATE	OVERFLOW ALARM	BI	N
EA DAMPER	POSITION	AO	N
ECON OA DAMPER	POSITION	AO	N
ECONOMIZER EA	CFM	AI	H
ECONOMIZER OA	CFM	AI	H
ERW	START/STOP	BO	N
ERW	SPEED COMMAND	AO	N
ERW	STATUS	BI	N
ERW	PRESSURE DROP	AI	H
HEAT PIPE	STAGE 1	BO	H
HEAT PIPE	STAGE 2	BO	H
HEAT PIPE	STAGE 3	BO	H
HEAT PIPE	STAGE 4	BO	H
HHW RECIRC PUMP	START/STOP	BO	N
HHW RECIRC PUMP	STATUS	BI	N
HHW RECIRC VALVE	POSITION	BO	N
HHW VALVE	POSITION	AO	N
MIN OA	CFM	AI	H
MIN OA DAMPER	POSITION	AO	N
MIN OA UNIT DAMPER	POSITION	AO	N
MIXED AIR	HUMIDITY	AI	H
MIXED AIR	TEMPERATURE	AI	H
OA	TEMPERATURE	AI	H
OA	HUMIDITY	AI	H
RA	TEMPERATURE	AI	H
RA	HUMIDITY	AI	H
RA DAMPER	POSITION	AO	N
RA DAMPER	POSITION	AO	N
RAF	CFM	AI	H
RAF	START/STOP	BO	N
RAF	SPEED COMMAND	AO	N
RAF	STATUS	BI	N
RAFA	START/STOP	BO	N
RAFA	SPEED COMMAND	AO	N
RAFA	STATUS	BI	N
REA DAMPER	POSITION	AO	N
SA	CFM	AI	H
SA	HUMIDITY	AI	H
SA	TEMPERATURE	AI	H
SA	OFF-CC TEMPERATURE	AI	H
SA	OFF-HC TEMPERATURE	AI	H
SA FAN	START/STOP	BO	N
SA FAN	SPEED COMMAND	AO	N
SA FAN	STATUS	BI	N
SPACE	CO2 LEVEL	AI	H
SPACE	TEMPERATURE	AI	H
SPACE	HUMIDITY	AI	H

- ENERGY RECOVERY UNIT (ERU):
 - BAS SHALL CONTROL THE ERU. THE ERU SHALL BE ENERGIZED WHENEVER THE AHU IS OPERATING AND THE SPEED OF THE ERU SHALL BE MODULATED TO MAINTAIN THE CURRENT SUPPLY AIR TEMPERATURE SETPOINT. IF THE ERU IS FULLY UTILIZED AND THE SUPPLY AIR TEMPERATURE IS NOT MET PER THE SUPPLY AIR RESET STRATEGY, THE CORRESPONDING HYDRONIC VALVES WILL BE ENGAGED.
 - BAS SHALL CONTROL THE STARTING AND STOPPING OF THE ERU AS FOLLOWS:
 - WHENEVER THE UNIT IS ENERGIZED AND THE OUTSIDE AIR ENTHALPY IS GREATER THAN THE ERU EXHAUST AIR ENTHALPY THE WHEEL SPEED SHALL BE MODULATED TO MAINTAIN A 52°F (ADJ) WHEEL DISCHARGED DEWPOINT TEMPERATURE.
 - WHENEVER THE UNIT IS ENERGIZED AND THE OUTSIDE AIR DEW POINT TEMPERATURE IS LESS THAN 52°F (ADJ.), THE SPEED OF THE WHEEL SHALL BE MODULATED TO MAINTAIN THE SUPPLY AIR DEW POINT TEMPERATURE AT 52°F (ADJ.). THE SPEED OF THE WHEEL SHALL BE INCREASED UPON A DROP IN SUPPLY AIR DEW POINT TEMPERATURE.
 - PERIODIC SELF-CLEANING: THE WHEEL SHALL RUN AT 5% SPEED FOR 10 SEC EVERY 4HRS THE UNIT RUNS.
 - FROST PROTECTION:
 - FROST CONTROL FOR THE ERU IS ENABLED WHEN FROST IS PRESENT ON THE WHEEL, BASED ON THE OUTSIDE AIR TEMPERATURE AND THE PRESSURE DROP ACROSS THE WHEEL. IF THE OUTDOOR AIR TEMPERATURE IS BELOW 5°F (ADJ.) AND THE DIFFERENTIAL PRESSURE ACROSS THE WHEEL IS 1.5" OR GREATER (ADJ.), FROST CONTROL WILL ENABLE.
 - WHEEL VFD (MODULATE WHEEL) WHEN FROSTING IS OCCURRING, THE VFD MODULATES THE WHEEL DOWN TO A SLOW ROTATIONAL SPEED TO DEFROST WHEEL. ONCE EITHER THE PRESSURE DROP DECREASES BELOW THE PRESSURE SWITCH SET POINT, OR THE OUTDOOR AIR TEMPERATURE INCREASES ABOUT THE TEMPERATURE SET POINT, THE UNIT WILL RESUME NORMAL OPERATION.
- SMOKE DETECTION:
 - SMOKE DETECTORS LOCATED IN THE SUPPLY, RETURN, AND RAFA AIRSTREAMS SHALL INDICATE AN ALARM AT THE BAS WORKSTATION WHEN AN ALARM CONDITION IS DETECTED FOR SECONDARY MONITORING. THE WIRING AND CONDUIT FOR SECONDARY MONITORING FROM THE DUCT SMOKE DETECTORS AUXILIARY CONTACT TO THE BAS SHALL BE PROVIDED. THE WIRING AND CONDUIT FROM THE DUCT DETECTOR FOR FAN SHUT DOWN SHALL BE PROVIDED.
 - FIRE COMMAND CONTROL:
 - NORMAL: UNITS SHALL OPERATE PER SEQUENCES ABOVE.
 - OFF: WHEN THE FIRE COMMAND OVERRIDE IS INDEXED TO OFF, THE AHU SHALL BE DE-ENERGIZED AND ALL OPERATIONAL DAMPERS SHALL CLOSE.
- ALARMS INDICATION: THE CONTROLLER WILL DISPLAY ALARMS AND HAVE ONE DIGITAL OUTPUT FOR REMOTE INDICATION OF AN ALARM CONDITION. POSSIBLE ALARMS INCLUDE:
 - BUILDING MANAGEMENT SYSTEM:
 - THE CONTROLLER WILL SEND ALL ALARMS TO THE BAS.
 - DIRTY FILTER ALARM:
 - A DIGITAL SIGNAL IS SENT TO THE CONTROLLER INDICATING AN INCREASED PRESSURE DROP ACROSS AN AIR FILTER (MUST BE ADJUSTED IN FIELD DURING START UP). THE CONTROLLER WILL THEN PROVIDE A DIRTY FILTER ALARM.
 - DIRTY WHEEL ALARM:
 - THE CONTROLLER MONITORS PRESSURE ACROSS THE WHEEL AND SENDS AN ALARM IN THE CASE OF AN INCREASED PRESSURE DROP.
 - WHEEL ROTATION ALARM:
 - THE CONTROLLER MONITORS WHEEL ROTATION. IF THE WHEEL DOES NOT ROTATE FOR A SET PERIOD OF TIME (ADJ.) AN ALARM WILL GENERATE.
 - SUPPLY AND EXHAUST AIR ALARM:
 - THE CONTROLLER MONITORS THE PROVING SWITCH ON EACH BLOWER AND SENDS AN ALARM IN THE CASE OF EITHER BLOWER PROVING SWITCH NOT ENGAGING.
 - TEMPERATURE SENSOR ALARM:
 - THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.
 - PRESSURE SENSOR ALARM:
 - THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED PRESSURE SENSOR.
 - HUMIDITY SENSOR ALARM:
 - THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED HUMIDITY SENSOR.
 - FROST CONTROL:
 - THE CONTROLLER SENDS AN ALARM IN CASE OF FROST CONTROL BEING ENGAGED.
 - BUILDING FREEZE PROTECTION:
 - THE CONTROLLER SENDS AN ALARM IN CASE OF BUILDING FREEZE PROTECTION BEING ENGAGED.
 - SMOKE DETECTION:
 - THE CONTROLLER SENDS AN ALARM TO THE BAS AND THE FIRE ALARM CONTROL PANEL UPON POSITIVE DETECTION OF SMOKE.
 - FAN FAILURE:
 - BAS SHALL PROVE FAN ARRAY OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF ANY OF THE FANS, THE BAS SHALL ALARM THAT FAN FAILURE CONDITION OCCURRED. UPON FAILURE OF MORE THAN ONE FAN IN AN ARRAY, THE BAS SHALL REMOVE THE COMMAND TO RUN THE REMAINING FANS (BOTH INTERNAL TO THE AHU AND THE ASSOCIATED RAFA). LOCKOUT THE RUN COMMAND TO BOTH FAN ARRAYS AND ANNUNCIATE AN ALARM.
 - RECIRCULATION PUMP FAILURE:
 - UPON A CALL FOR RECIRCULATION PUMP OPERATION, THE BAS SHALL PROVE PUMP OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF THE PUMP, THE BAS SHALL ANNUNCIATE AN ALARM.
 - HIGH OR LOW PRESSURE SAFETY:
 - UPON ACTIVATION OF A HIGH OR LOW PRESSURE SAFETY SWITCH, AH SHALL BE DEENERGIZED. FANS SHALL BE DEENERGIZED VIA A HARD WIRED INTERLOCK, AND AN INDICATION OF THE OPERATION SHALL BE SENSED BY THE BAS. BAS SHALL ANNUNCIATE APPROPRIATE ALARM AND REMOVE AND LOCK OUT THE START COMMAND.
- ACCESSORIES: PROVIDE THE FOLLOWING:
 - BAS INTERFACING:
 - CLOSE BAS PORT OR SERIAL CARD IS PROVIDED WITH THE CONTROLLER FOR FIELD INTERFACING WITH A BUILDING AUTOMATION SYSTEM.
 - UPDATE DEFAULT SETTINGS TO THE APPROPRIATE ADDRESSES TO MATCH THE BAS SETTINGS.
 - DOC REMOTE INTERFACE:
 - FACTORY PROVIDED, FIELD MOUNTED INTERFACE PANEL THAT WILL BE WIRED TO THE MAIN CONTROLLER FOR MONITORING AND REMOTE ADJUSTMENTS OF SET POINTS.
 - PHASE AND BROWNOUT PROTECTION:
 - FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT.
 - IF A PHASE DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.
 - CONDENSATE OVERFLOW UNIT SHUTDOWN:
 - FACTORY MOUNTED CONDENSATE OVERFLOW SWITCH WIRED TO THE UNIT CONTROLLER. THE CONTROLLER MONITORS THE CONDENSATE OVERFLOW SWITCH.
 - IF THE WATER LEVEL IN THE DRAIN PAN REACHES A CERTAIN LEVEL, THE UNIT WILL SHUTDOWN AND SEND AN ALARM.
 - AIRFLOW MONITORING:
 - THE SUPPLY AND EXHAUST FANS WILL EACH HAVE AN AIRFLOW MONITORING PRESSURE TAP ON THE INLET CONE.
 - THE DIFFERENTIAL PRESSURE ACROSS THE FAN CONE IS CONVERTED TO AN AIRFLOW READING BY USING THE ENERGY CONSERVATION PRINCIPLE AND THE FAN WHEEL K-FACTOR.
 - DAMPER END SWITCH:
 - DAMPER END SWITCHED WILL BE PROVIDED TO ENSURE THE SUPPLY AND EXHAUST FANS DO NOT ENABLE UNTIL THE DAMPERS ARE PROVEN OPEN.
- MINIMUM REQUIREMENTS FOR OPERATOR WORKSTATION DISPLAY:
 - SUPPLY AIRFLOW
 - SUPPLY FAN ON-OFF STATUS
 - SUPPLY FAN SPEED
 - RAFA AIRFLOW
 - RAFA ON-OFF STATUS
 - RAFA SPEED
 - ALL DAMPER POSITIONS
 - INDICATION FOR ECONOMIZER MODE STATUS
 - SUPPLY FAN STATIC PRESSURE SET POINT
 - SUPPLY FAN STATIC PRESSURE (ACTUAL)
 - ERU ON OFF STATUS
 - ERU SPEED
 - ALL TEMPERATURE SENSORS ON THE UNIT
 - DEWPOINT OF SA, RA, OA, AND EA
 - CHW AND HHW VALVE POSITIONS
 - HEAT PIPE STATUS
 - RECIRCULATION PUMP STATUS
 - COOLING DEMAND % OF TOTAL CAPACITY
 - ALL RELEVANT DATA POINTS FROM THE HEAT PIPE
 - TEMPERATURE LEAVING COOLING COIL
 - TEMPERATURE LEAVING HEAT PIPE REHEAT COIL
 - TEMPERATURE LEAVING UNIT
 - DAMPER POSITIONS
 - ALARMS

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SEAL / DATE 01/27/25



SHEET ISSUE

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PROJECT NO. 23112.000

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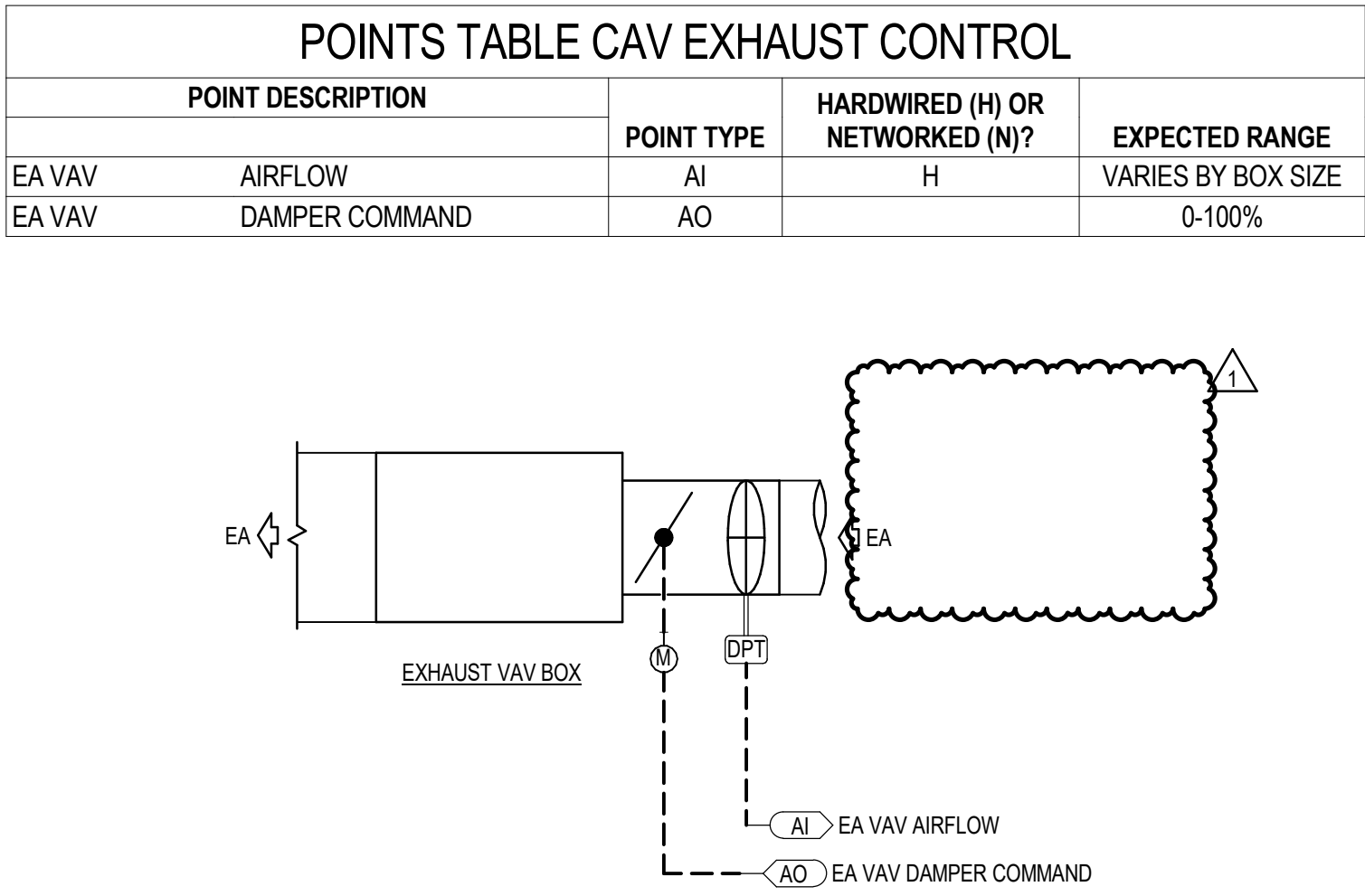
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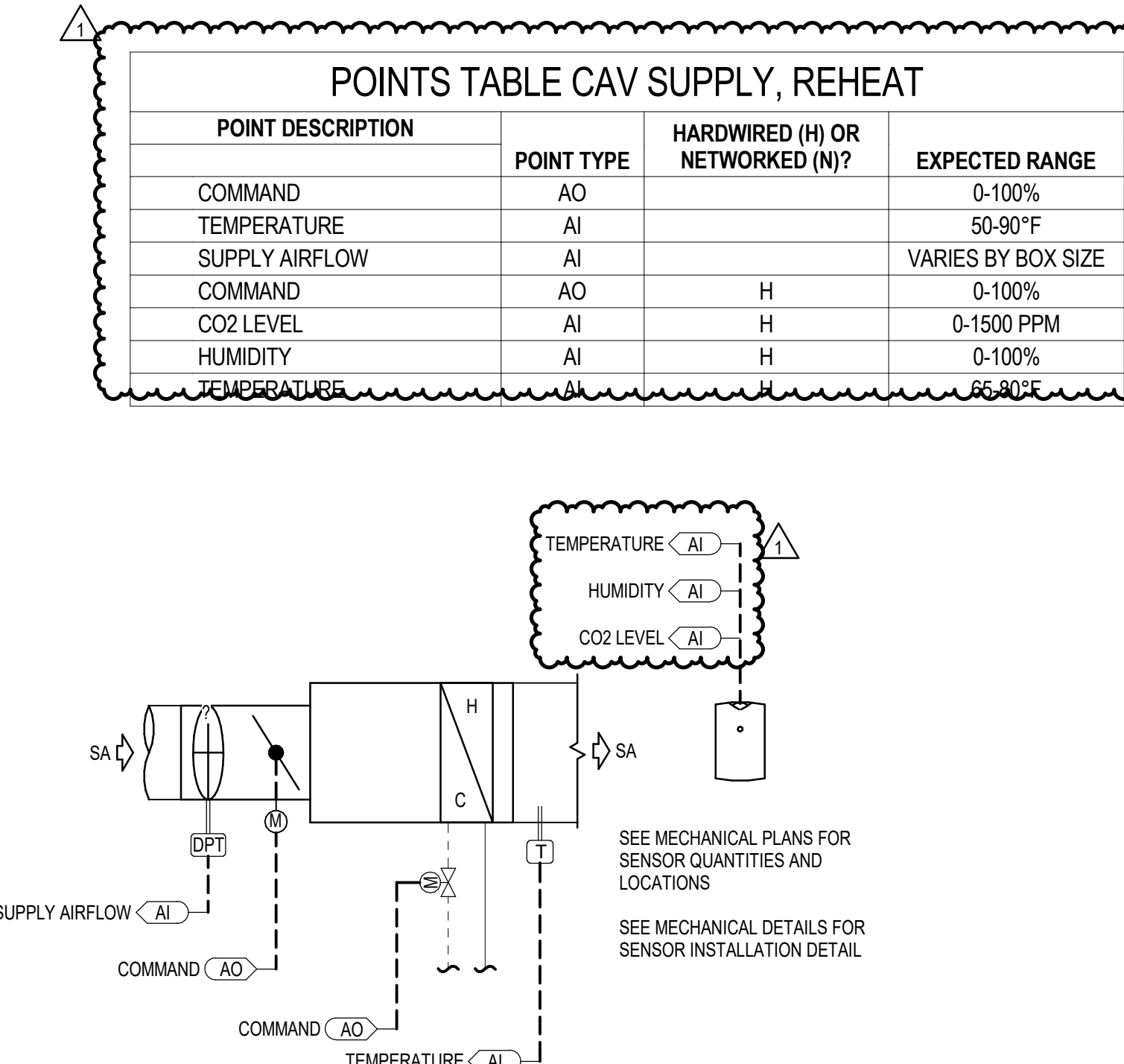
M-708

GENERAL CONTROLS NOTES:

- A. TEMPERATURE SENSORS, HUMIDISTS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION, WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.
- B. VAVS ARE POWERED BY CONTROL VOLTAGE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROUTING, GROUPING, AND POWER FOR THE LOW-VOLTAGE VAV UNITS.
- C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SEQUENCES OF OPERATION WHETHER OR NOT THEY ARE EXPLICITLY NAMED.
- D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.
- E. CONTROLS CONTRACTOR SHALL COORDINATE WITH THE IU CONTROL INTEGRATOR.
- F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.
- G. LOCAL MAGNETIC GAUGE SUPPLIED AT EACH FILTER SECTION.
- H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS, PIEZOMETER RING SHALL BE SUPPLIED AT EACH INLET CONE BY MANUFACTURER.



EAVV BOX - CONSTANT VOLUME CONTROL DIAGRAM



VAV BOX WITH REHEAT - CONSTANT VOLUME CONTROL DIAGRAM

SEQUENCE OF OPERATIONS - CONSTANT AIR VOLUME EXHAUST EAVV BOX (EAVV UNITS ASSOCIATED WITH AHU-0001 SERVING LOCKER ROOMS, RESTROOMS, AND OTHER SPACES REQUIRING A CONSTANT EXHAUST AIRFLOW.)

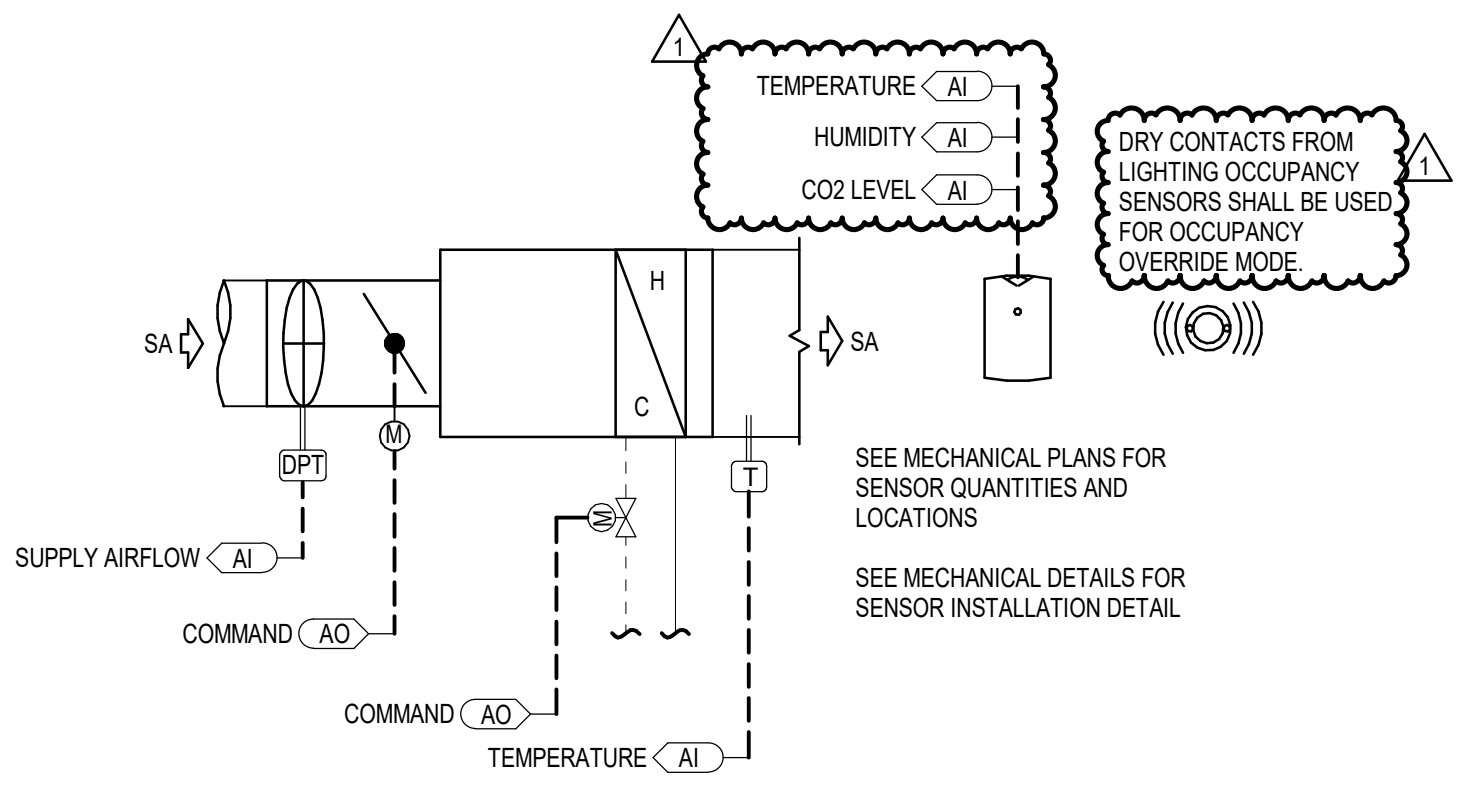
1. GENERAL
- A. BAS EAVV CONTROLLER SHALL MODULATE THE EAVV DAMPER TO MAINTAIN CONSTANT EXHAUST AIRFLOW. THE SYSTEM CONSIST OF:
- a. AIR FLOW CONTROL DAMPER
 - b. FLOW STATION
 - c. OCCUPANCY SENSOR
2. OPERATING MODES
- A. THE AIR TERMINAL UNIT SHALL BE UNDER CONTROL OF THE BAS AND CONFIGURED FOR BOTH OCCUPIED AND UNOCCUPIED MODES OF OPERATION AND FULLY COORDINATE WITH ASSOCIATED DOAS. THE SYSTEM SHALL BE CONFIGURED WITH AN OPERATING SCHEDULE AND UTILIZE NIGHT SETUP/SETBACK AND OPTIMUM START/MORNING WARM-UP ROUTINES.
- B. EAVV IS INTERLOCKED WITH THE OPERATION OF THE CORRESPONDING VAV. OCCUPANCY SENSORS LOCATED IN THE SPACE SHALL BE USED TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.
3. VAV CONTROL
- A. OCCUPIED MODE: MODULATE DAMPER POSITION TO MAINTAIN A CONSTANT AIRFLOW THROUGH THE UNIT.
- B. UNOCCUPIED MODE: DAMPER SHALL CLOSE DURING UNOCCUPIED MODE.
4. ALARMS
- A. IF THE PRIMARY AIR DAMPER IS UNABLE TO MAINTAIN THE AIR FLOW WITHIN 10% OF THE SETPOINT DURING A 10 MINUTE PERIOD (ADJ.) AN ALARM SHALL BE INITIATED TO THE BAS.
- B. FAILURE STATUS OF ANY OPERATING COMPONENT.

SEQUENCE OF OPERATIONS - CONSTANT AIR VOLUME SUPPLY VAV BOX (VAV UNITS ASSOCIATED WITH AHU-00-02)

1. GENERAL
- A. BAS VAV CONTROLLER SHALL MODULATE THE VAV DAMPER AND THE HYDRONIC HEATING COIL OUTPUT TO MAINTAIN A SPACE TEMPERATURE AND CONSTANT AIRFLOW BASED ON A SIGNAL FROM A WALL MOUNTED TEMPERATURE SENSOR. THE SYSTEM CONSIST OF:
- a. AIR FLOW CONTROL DAMPER
 - b. FLOW STATION
 - c. HYDRONIC HEATING COIL CONTROL
 - d. WALL MOUNTED THERMOSTATS WITH OCCUPANCY OVERRIDE ABILITY.
2. SETPOINTS
- A. THE OCCUPIED COOLING SETPOINT SHALL BE 78°F.
- B. THE OCCUPIED HEATING SETPOINT SHALL BE 68°F.
- C. THE UNOCCUPIED COOLING SETPOINT SHALL BE 82°F.
- D. THE UNOCCUPIED HEATING SETPOINT SHALL BE 60°F.
3. OPERATING MODES
- A. THE AIR TERMINAL UNIT SHALL BE UNDER CONTROL OF THE BAS AND CONFIGURED FOR BOTH OCCUPIED AND UNOCCUPIED MODES OF OPERATION AND FULLY COORDINATE WITH ASSOCIATED AHU. THE SYSTEM SHALL BE CONFIGURED WITH AN OPERATING SCHEDULE AND UTILIZE NIGHT SETUP/SETBACK AND OPTIMUM START/MORNING WARM-UP ROUTINES. VENTILATION AIR SHALL BE ENABLED DURING OCCUPIED PERIODS AND DISABLED DURING UNOCCUPIED PERIODS.
- B. ALL VERBAGE ASSOCIATED WITH CONTROL OF HEATING COILS SHALL ONLY APPLY TO VAVS SUPPLIED WITH HEATING COILS.
4. VAV CONTROL
- A. OCCUPIED COOLING MODE: MODULATE DAMPER POSITION TO MAINTAIN A CONSTANT AIRFLOW THROUGH THE UNIT. INCOMING AIR TEMPERATURE WILL BE RESET VIA THE AHU CONTROL LOGIC IN RESPONSE TO FEEDBACK FROM THE ZONE TEMPERATURE SENSOR. THE HEATING OUTPUT REMAINS AT ZERO.
- B. OCCUPIED HEATING MODE: THE CONTROL LOOP SHALL DETERMINE THE AIR TERMINAL UNIT DISCHARGE AIR TEMPERATURE SETPOINT AND THEN THE HEATING COIL SHALL BE MODULATED TO MAINTAIN THAT SETPOINT AS FOLLOWS:
- a. IN HEATING MODE, THE HEATING COIL OUTPUT SHALL BE RESET DISCHARGE AIR TEMPERATURE SETPOINT INCREMENTALLY FROM THE CURRENT ASSOCIATED AHU SUPPLY AIR TEMPERATURE SETPOINT TO 83°F, WHILE MAINTAINING MINIMUM HEATING DEADBAND.
 - b. UNOCCUPIED MODES: ALL UNOCCUPIED MODES SHALL BE TREATED THE SAME AS OCCUPIED MODES ABOVE EXCEPT THAT COOLING/HEATING MINIMUM AIR FLOWS SETPOINTS SHALL BE RESET TO ZERO; HEATING ZONE TEMPERATURE SETPOINT SHALL BE RESET LOWER; COOLING ZONE TEMPERATURE SETPOINT SHALL BE RESET HIGHER, AND DEADBAND BETWEEN HEATING AND COOLING BECOMES LARGER.
5. ALARMS
- A. SEND AN ALARM TO THE BAS OPERATOR INTERFACE IF THE SPACE TEMPERATURE FALLS 3°F BELOW SETPOINT FOR MORE THAN 30 MINUTES.
- B. IF THE PRIMARY AIR DAMPER IS UNABLE TO MAINTAIN THE AIR FLOW WITHIN 10% OF THE SETPOINT DURING A 10 MINUTE PERIOD AN ALARM SHALL BE INITIATED TO THE BAS.
- C. FAILURE STATUS OF ANY OPERATING COMPONENT.
6. AHU DEMAND CONTROLLED VENTILATION (DCV)
- A. CO2 SENSORS SHALL BE PROVIDED IN ZONES EXCEEDING AN OCCUPANCY OF 25 PEOPLE/1000 SQFT. THE CO2 CONCENTRATION OF THESE ZONES SHALL BE MAINTAINED BELOW 900 PPM (ADJ.). IF CONCENTRATIONS ABOVE THAT LIMIT ARE OBSERVED, THE OA AND RA DAMPERS SERVING THE AHU SHALL INCREMENTALLY MODULATE OPEN UNTIL THE CO2 SETPOINT IS SATISFIED.

POINTS TABLE OAVV SUPPLY, REHEAT

POINT DESCRIPTION	POINT TYPE	HARDWIRED (H) OR NETWORKED (N)?	EXPECTED RANGE
COMMAND	AO		0-100%
TEMPERATURE	AI		50-90°F
SUPPLY AIRFLOW	AI		VARIES BY BOX SIZE
COMMAND	AO	H	0-100%
CO2 LEVEL	AI	H	0-1500 PPM
TEMPERATURE	AI	H	65-80°F
HUMIDITY	AI	H	0-100%



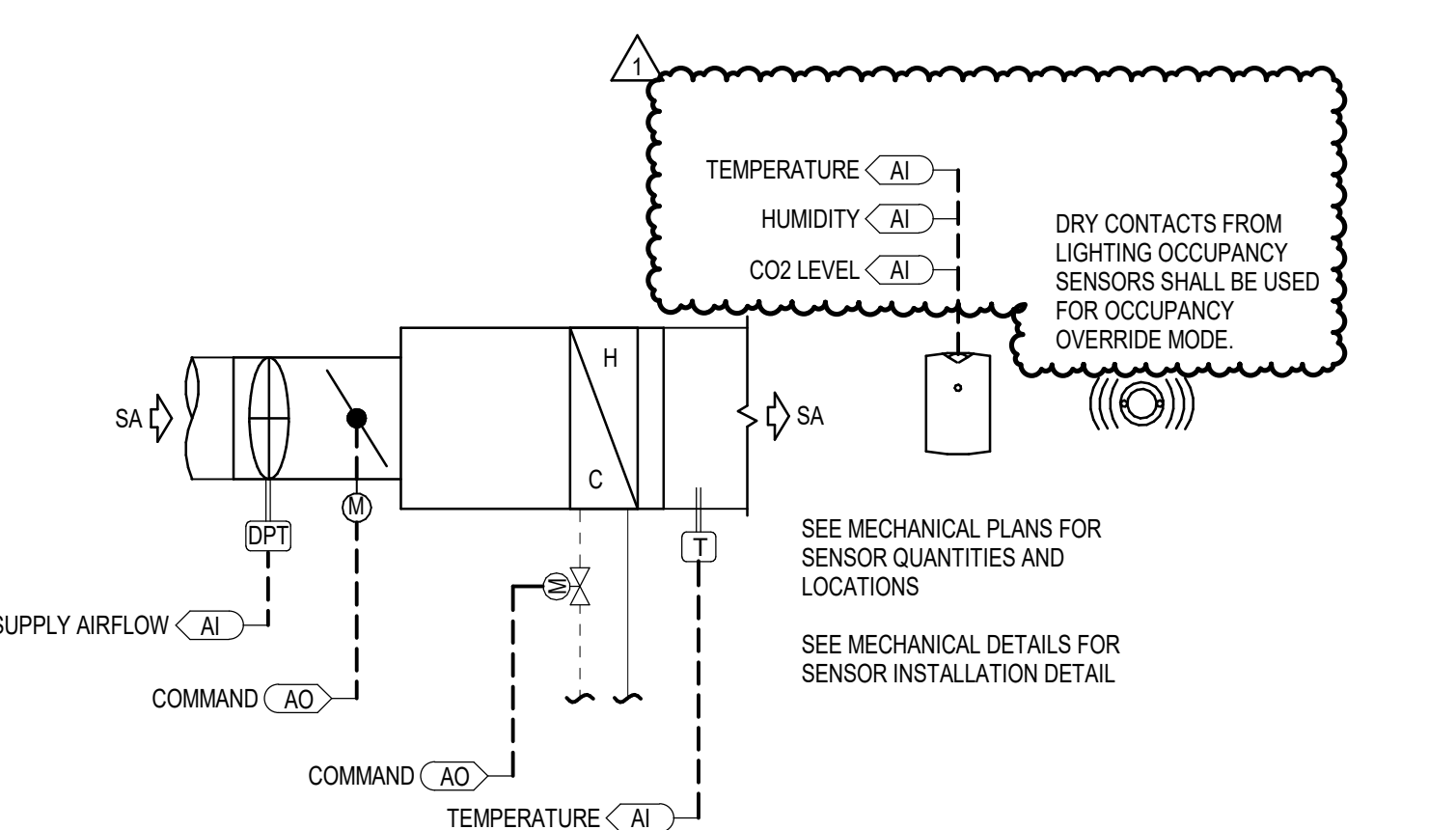
OAVV BOX WITH REHEAT CONTROL DIAGRAM

SEQUENCE OF OPERATIONS - VARIABLE VOLUME SUPPLY OAVV BOX (OAVV DIRECTLY SERVING SPACES ASSOCIATED WITH AHU-00-03)

1. GENERAL
- A. BAS ATU CONTROLLER SHALL MODULATE THE OAVV DAMPER AND THE HYDRONIC HEATING COIL OUTPUT TO MAINTAIN A SPACE TEMPERATURE AND CO2 CONCENTRATION BASED ON A SIGNAL FROM A WALL MOUNTED TEMPERATURE SENSOR. THE SYSTEM CONSIST OF:
- a. AIR FLOW CONTROL DAMPER
 - b. FLOW STATION
 - c. HYDRONIC HEATING COIL CONTROL
 - d. OCCUPANCY SENSOR
 - e. WALL MOUNTED THERMOSTATS WITH OCCUPANCY OVERRIDE ABILITY.
2. SETPOINTS
- A. THE OCCUPIED COOLING SETPOINT SHALL BE 78°F.
- B. THE OCCUPIED HEATING SETPOINT SHALL BE 68°F.
- C. THE UNOCCUPIED COOLING SETPOINT SHALL BE 82°F.
- D. THE UNOCCUPIED HEATING SETPOINT SHALL BE 60°F.
3. OPERATING MODES
- A. THE AIR TERMINAL UNIT SHALL BE UNDER CONTROL OF THE BAS AND CONFIGURED FOR BOTH OCCUPIED AND UNOCCUPIED MODES OF OPERATION AND FULLY COORDINATE WITH ASSOCIATED AHU. THE SYSTEM SHALL BE CONFIGURED WITH AN OPERATING SCHEDULE AND UTILIZE NIGHT SETUP/SETBACK AND OPTIMUM START/MORNING WARM-UP ROUTINES.
- B. OCCUPANCY SENSORS LOCATED IN THE SPACE WILL SEND AN OCCUPANCY SIGNAL TO THE ASSOCIATED DOAS UNIT AND WILL SET THE ZONE TO OCCUPIED MODE FOR A PERIOD OF 3 HOURS (ADJ.).
- C. ALL VERBAGE ASSOCIATED WITH CONTROL OF HEATING COILS SHALL ONLY APPLY TO VAVS SUPPLIED WITH HEATING COILS.
4. VAV CONTROL
- A. OCCUPIED COOLING MODE: MODULATE DAMPER POSITION BETWEEN THE COOLING MINIMUM AND MAXIMUM FLOW SETPOINTS TO MAINTAIN THE SPACE TEMPERATURE SETPOINT IN RESPONSE TO FEEDBACK FROM THE ZONE TEMPERATURE SENSOR. THE HEATING OUTPUT REMAINS AT ZERO.
- B. OCCUPIED DEADBAND MODE: WHEN THE ZONE TEMPERATURE SENSOR IS CALLING FOR NEITHER HEATING NOR COOLING, THE DAMPER IS TO CONTROL TO THE COOLING MINIMUM AIR FLOW SETPOINT.
- C. OCCUPIED HEATING MODE: THE CONTROL LOOP SHALL DETERMINE THE AIR TERMINAL UNIT DISCHARGE AIR TEMPERATURE SETPOINT AND THEN THE HEATING COIL SHALL BE MODULATED TO MAINTAIN THAT SETPOINT AS FOLLOWS:
- a. IN HEATING MODE, THE HEATING COIL OUTPUT SHALL BE RESET DISCHARGE AIR TEMPERATURE SETPOINT INCREMENTALLY FROM THE CURRENT ASSOCIATED DOAS SUPPLY AIR TEMPERATURE SETPOINT TO 83°F WHILE MAINTAINING MINIMUM HEATING DEADBAND.
 - b. UNOCCUPIED MODES: ALL UNOCCUPIED MODES SHALL BE TREATED THE SAME AS OCCUPIED MODES ABOVE EXCEPT THAT COOLING/HEATING MINIMUM AIR FLOWS SETPOINTS SHALL BE RESET TO ZERO; HEATING ZONE TEMPERATURE SETPOINT SHALL BE RESET LOWER; COOLING ZONE TEMPERATURE SETPOINT SHALL BE RESET HIGHER, AND DEADBAND BETWEEN HEATING AND COOLING BECOMES LARGER.
- D. IF OCCUPANCY OF A SPACE IS REPORTED BY THE OCCUPANCY SENSOR WHILE THE ASSOCIATED AHU IS IN UNOCCUPIED MODE, THE ASSOCIATED AHU SHALL RUN IN OCCUPIED MODE FOR A PERIOD OF 1 HOUR (ADJ.), COORDINATE ANY OTHER RELATED REQUESTS WITH DOAS.
5. ALARMS
- A. A "REQUEST" IS A CALL TO RESET A STATIC PRESSURE. THE REQUEST IS SENT UPSTREAM TO THE SYSTEM THAT SERVES THE ZONE. FOR EACH VAV PROVIDE THE FOLLOWING SOFTWARE POINTS:
- a. IMPORTANCE MULTIPLIER (DEFAULT = 1)
 - b. REQUEST. THE REQUEST IS EQUAL TO THE IMPORTANCE MULTIPLIER WHEN THE VAV DAMPER IS GREATER THAN 95% OPEN AND UNTIL IT DROPS TO 80% OPEN.
 - c. REQUEST-HOURS. IF THE REQUEST IS GREATER THAN ZERO AND THE VAV IS OCCUPIED ADD 0.083 TO THE REQUEST HOURS ACCUMULATOR EVERY 5 MINUTES.
 - d. RUN-HOURS. THE NUMBER OF HOURS THE VAV IS OCCUPIED.
 - e. CUMULATIVE %. THIS IS THE ZONE REQUEST-HOURS DIVIDED BY THE ZONE RUN-HOURS.
 - f. REQUEST ALARM. AN ALARM IS GENERATED AND THE ZONE REQUEST IS ZERO IF THE ZONE CUMULATIVE REQUEST-HOURS EXCEEDS 70% AND THE RUN-HOURS ARE GREATER THAN 8.
 - g. THE REQUEST-HOURS AND RUN-HOURS WILL BE RESET TO ZERO AT 12:00 AM.
6. VAV CONTROL
- A. SEND AN ALARM TO THE BAS OPERATOR INTERFACE IF THE SPACE TEMPERATURE FALLS 3°F BELOW SETPOINT FOR MORE THAN 30 MINUTES.
- B. IF THE PRIMARY AIR DAMPER IS UNABLE TO MAINTAIN THE AIR FLOW WITHIN 10% OF THE SETPOINT DURING A 10 MINUTE PERIOD AN ALARM SHALL BE INITIATED TO THE BAS.
- C. FAILURE STATUS OF ANY OPERATING COMPONENT.
7. AHU DEMAND CONTROLLED VENTILATION (DCV)
- A. CO2 SENSORS SHALL BE PROVIDED IN ZONES EXCEEDING AN OCCUPANCY OF 25 PEOPLE/1000 SQFT. THE CO2 CONCENTRATION OF THESE ZONES SHALL BE MAINTAINED BELOW 900 PPM (ADJ.). IF CONCENTRATIONS ABOVE THAT LIMIT ARE OBSERVED, THE OA AND RA DAMPERS SERVING THE AHU SHALL INCREMENTALLY MODULATE OPEN UNTIL THE CO2 SETPOINT IS SATISFIED.

POINTS TABLE VAV SUPPLY, REHEAT

POINT DESCRIPTION	POINT TYPE	HARDWIRED (H) OR NETWORKED (N)?	EXPECTED RANGE
COMMAND	AO		0-100%
TEMPERATURE	AI		50-90°F
SUPPLY AIRFLOW	AI		VARIES BY BOX SIZE
COMMAND	AO	H	0-100%
CO2 LEVEL	AI	H	0-1500 PPM
HUMIDITY	AI	H	0-100%
TEMPERATURE	AI	H	65-80°F



VAV BOX WITH REHEAT - VARIABLE VOLUME CONTROL DIAGRAM

SEQUENCE OF OPERATIONS - VARIABLE VOLUME SUPPLY VAV BOX (VAV UNITS ASSOCIATED WITH AHU-00-01)

1. GENERAL
- A. BAS ATU CONTROLLER SHALL MODULATE THE VAV DAMPER AND THE HYDRONIC HEATING COIL OUTPUT TO MAINTAIN A SPACE TEMPERATURE BASED ON A SIGNAL FROM A WALL MOUNTED TEMPERATURE SENSOR. THE SYSTEM CONSIST OF:
- a. AIR FLOW CONTROL DAMPER
 - b. FLOW STATION
 - c. HYDRONIC HEATING COIL CONTROL
 - d. WALL MOUNTED THERMOSTATS WITH OFFSET ADJUSTMENT AND OCCUPANCY OVERRIDE ABILITY.
 - e. ALL SET-POINTS SHALL BE ADJUSTABLE BY AN OPERATOR WITHOUT ADDITIONAL SOFTWARE.
2. SETPOINTS
- A. THE OCCUPIED COOLING SETPOINT SHALL BE 78°F.
- B. THE OCCUPIED HEATING SETPOINT SHALL BE 68°F.
- C. THE UNOCCUPIED COOLING SETPOINT SHALL BE 82°F.
- D. THE UNOCCUPIED HEATING SETPOINT SHALL BE 60°F.
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- A. THE AIR TERMINAL UNIT SHALL BE UNDER CONTROL OF THE BAS AND CONFIGURED FOR BOTH OCCUPIED AND UNOCCUPIED MODES OF OPERATION AND FULLY COORDINATE WITH ASSOCIATED AHU. THE SYSTEM SHALL BE CONFIGURED WITH AN OPERATING SCHEDULE AND UTILIZE NIGHT SETUP/SETBACK AND OPTIMUM START/MORNING WARM-UP ROUTINES. VENTILATION AIR SHALL BE ENABLED DURING OCCUPIED PERIODS AND DISABLED DURING UNOCCUPIED PERIODS.
- B. ALL VERBAGE ASSOCIATED WITH CONTROL OF HEATING COILS SHALL ONLY APPLY TO VAVS SUPPLIED WITH HEATING COILS.
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- B. OCCUPIED DEADBAND MODE: WHEN THE ZONE TEMPERATURE SENSOR IS CALLING FOR NEITHER HEATING NOR COOLING, THE DAMPER IS TO CONTROL TO THE COOLING MINIMUM AIR FLOW SETPOINT.
- C. OCCUPIED HEATING MODE: THE CONTROL LOOP SHALL DETERMINE THE AIR TERMINAL UNIT DISCHARGE AIR TEMPERATURE SETPOINT AND THEN THE HEATING COIL SHALL BE MODULATED TO MAINTAIN THAT SETPOINT AS FOLLOWS:
- a. IN HEATING MODE, THE HEATING COIL OUTPUT SHALL BE RESET DISCHARGE AIR TEMPERATURE SETPOINT INCREMENTALLY FROM THE CURRENT ASSOCIATED AHU SUPPLY AIR TEMPERATURE SETPOINT TO 83°F WHILE MAINTAINING MINIMUM HEATING DEADBAND.
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- D. IF OCCUPANCY OF A SPACE IS REPORTED BY THE OCCUPANCY SENSOR WHILE THE ASSOCIATED AHU IS IN UNOCCUPIED MODE, THE ASSOCIATED AHU SHALL RUN IN OCCUPIED MODE FOR A PERIOD OF 1 HOUR (ADJ.), COORDINATE ANY OTHER RELATED REQUESTS WITH DOAS.
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- C. FAILURE STATUS OF ANY OPERATING COMPONENT.
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- A. CO2 SENSORS SHALL BE PROVIDED IN ZONES EXCEEDING AN OCCUPANCY OF 25 PEOPLE/1000 SQFT. THE CO2 CONCENTRATION OF THESE ZONES SHALL BE MAINTAINED BELOW 900 PPM (ADJ.). IF CONCENTRATIONS ABOVE THAT LIMIT ARE OBSERVED, THE OA AND RA DAMPERS SERVING THE AHU SHALL INCREMENTALLY MODULATE OPEN UNTIL THE CO2 SETPOINT IS SATISFIED.

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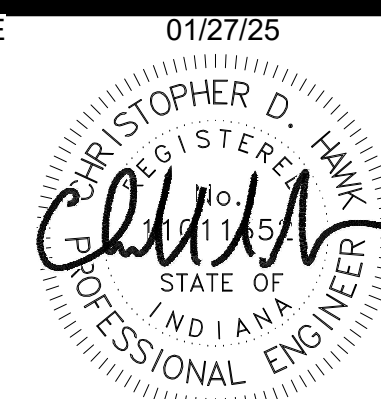
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SEAL / DATE



SHEET ISSUE

NO	DESCRIPTION	DATE
1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

RATIO

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PROJECT NO. 23112.000

SHEET TITLE

MECHANICAL CONTROLS - TERMINAL UNITS

SHEET NUMBER

M-712

ALARM SHALL BE SENT TO THE BAS IF SPACE TEMPERATURE IS 10°F BELOW SETPOINT.



ALARM SHALL BE SENT TO THE BAS IF SPACE TEMPERATURE IS 10°F BELOW SETPOINT.



HVLS CONTROL DIAGRAM



GREASE FAN, MAKEUP AIR FAN, ISOLATION DAMPER, AND HYDRONIC DUCT HEATER OPERATION IS INTERLOCKED WITHIN AND CONTROLLED BY THE M LINK KITCHEN CONTROL SYSTEM (BY OTHERS). OUTPUT TO BAS IS FOR MONITORING STATUS ONLY. COORDINATE REQUIREMENTS WITH KITCHEN DESIGN DRAWINGS.

HEATING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN 55°F LAT.

HWC CONTROL DIAGRAM

1. GENERAL:
 - A. HYDRONIC WALL CASSETTE (HWC) ON THIS PROJECT ARE CONSTANT AIR VOLUME (CAV) HYDRONIC HEATING AND COOLING UNITS AS SPECIFIED AND SERVE SPACES WHICH EITHER REQUIRE 24/7 AVAILABILITY.
2. CONTROLS ARCHITECTURE:
 - A. CONTROL POINTS SHALL BE CONTROLLED BY THE CENTRAL BAS VIA BACNET COMMUNICATION PROTOCOL. HVC SHALL BE SUPPLIED WITH A BACNET CAPABLE THERMOSTAT, WHICH WILL RELAY THE FAN STATUS OF THE UNIT. ALL CONTROL POINTS, WHETHER EXPLICITLY LISTED OR NOT, SHALL BE VISIBLE AND CONTROLLABLE VIA THE BAS.
 - B. UNIT START COMMAND:
 - a. SUPPLY FAN SHALL ALWAYS RUN.
 - C. UNIT STOP COMMAND (OR DE-ENERGIZED):
 - a. SUPPLY FAN AND TEMPERING OPTIONS DE-ENERGIZED.
3. OCCUPIED/UNOCCUPIED MODES:
 - A. TEMPERATURE SETPOINTS
 - a. OCCUPIED:
 - COOLING: 78°F +/- 2°F
 - HEATING: 68°F +/- 2°F
 - b. ZONES CONDITIONED BY HVCs ARE ALWAYS CONSIDERED OCCUPIED.
 - C. OCCUPIED MODE:
 - a. SUPPLY FAN ON.
 - b. ALL COILS AVAILABLE FOR OPERATION.
4. SUPPLY FAN SEQUENCE:
 - A. START/STOP: BAS SHALL COMMAND THE SUPPLY FAN TO RUN CONTINUOUSLY.
 - B. THE SUPPLY FAN IS PROVIDED WITH ECMs. THE SUPPLY FAN SPEED WILL BE CONTROLLED TO MEET THE AIRFLOW SPECIFIED IN THE DESIGN DOCUMENTS.
5. TEMPERING OPTIONS:
 - A. THE CHW OR OIL OF THE HHW COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE TEMPERATURE WITHIN THE SPACE SERVED. THE VALVES SHALL NOT BE OPEN SIMULTANEOUSLY. THERE SHALL BE A 30 MIN (ADJ.) DELAY IN CHANGEOVER FROM COOLING MODE TO HEATING MODE TO PREVENT SHORT CYCLING.
6. CONDENSATE OVERFLOW:
 - A. IN THE EVENT THAT THE HIGH-LEVEL CONDENSATE SWITCH IS TRIPPED, ALL COOLING COMPONENTS SHALL SHUT DOWN AND ALARMS SHALL BE SENT TO THE BAS.
7. MOISTURE SENSOR SHUTDOWN:
 - A. IN THE EVENT THAT THE MOISTURE SENSOR MOUNTED IN THE CATCH PAN BELOW THE HVC SENSES MOISTURE, THE CHW CONTROL AND ISOLATION VALVES SHALL CLOSE AND THE UNIT SHALL SEND A HIGH-LEVEL ALARM TO THE BAS.
8. ALARMS INDICATION: THE CONTROLLER WILL DISPLAY ALARMS AND HAVE ONE DIGITAL OUTPUT FOR REMOTE INDICATION OF AN ALARM CONDITION. POSSIBLE ALARMS INCLUDE:
 - A. BUILDING MANAGEMENT SYSTEM:
 - a. THE CONTROLLER WILL SEND ALL ALARMS TO THE BAS.
 - B. DIRTY FILTER ALARM:
 - a. A DIGITAL SIGNAL IS SENT TO THE CONTROLLER INDICATING AN INCREASED PRESSURE DROP ACROSS AN AIR FILTER (MUST BE ADJUSTED IN FIELD DURING START UP). THE CONTROLLER WILL THEN PROVIDE A DIRTY FILTER ALARM.
 - C. TEMPERATURE SENSOR ALARM:
 - a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.
 - D. FAN FAILURE:
 - a. THE BAS SHALL PROVE FAN OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF ANY OF THE FAN, THE BAS SHALL ALARM THAT FAN FAILURE CONDITION.
 - E. CONDENSATE OVERFLOW:
 - a. THE OVERFLOW SENSOR SHALL SEND AN ALARM TO THE BAS UPON EITHER CONDENSATE PUMP FAILURE OR OVERFLOW SENSOR ACTIVATION.
 - F. MOISTURE SENSOR DETECTION:
 - a. THE MOISTURE SENSOR IN THE CATCH TRAY WILL SEND AN ALARM TO THE BAS UPON DETECTION OF MOISTURE.
9. ACCESSORIES: PROVIDE THE FOLLOWING:
 - A. BAS INTERFACING:
 - a. A BAS PORT OR SERIAL CARD IS PROVIDED WITH THE CONTROLLER FOR FIELD INTERFACING WITH A BUILDING AUTOMATION SYSTEM.
 - B. UPDATE DEFAULT SETTINGS TO THE APPROPRIATE ADDRESSES TO MATCH THE BAS SETTINGS.
10. BDC-REMOTE INTERFACE:
 - A. FACTORY PROVIDED, FIELD MOUNTED INTERFACE PANEL THAT WILL BE WIRED TO THE MAIN CONTROLLER FOR MONITORING AND REMOTE ADJUSTMENTS OF SET POINTS.
11. PHASE AND BROWNOUT PROTECTION:
 - a. FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT.
12. LOW VOLTAGE PROTECTION:
 - a. FACTORY DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.
13. CONDENSATE OVERFLOW UNIT SHUTDOWN:
 - a. FACTORY MOUNTED CONDENSATE OVERFLOW SWITCH WIRED TO THE UNIT CONTROLLER. THE CONTROLLER MONITORS THE CONDENSATE OVERFLOW SWITCH.
14. WATER LEAK DETECTION:
 - a. IF THE WATER LEAK IN THE DRAIN PAN REACHES A CERTAIN LEVEL, THE UNIT WILL SHUTDOWN AND SEND AN ALARM.
15. MINIMUM REQUIREMENTS FOR OPERATOR WORKSTATION DISPLAY:
 - A. SUPPLY FAN ON-OFF STATUS
 - B. SUPPLY FAN SPEED
 - C. ALL TEMPERATURE SENSORS ON THE UNIT
 - D. CHW AND HHW VALVE POSITIONS
 - E. COOLING DEMAND % OF TOTAL CAPACITY
 - F. TEMPERATURE LEAVING UNIT
 - G. ALARMS

POINTS TABLE GEF AND MAF CONTROL



1. GENERAL:
 - a. FAN COIL UNITS (FCU) ON THIS PROJECT ARE CONSTANT AIR VOLUME (CAV) HYDRONIC HEATING AND COOLING FCUS AS SPECIFIED AND SERVE SPACES WHICH EITHER REQUIRE 247 AVAILABILITY OR ARE OTHERWISE NOT SUITABLE TO BE SERVED BY ONE OF THE AHUS.
2. CONTROLS ARCHITECTURE:
 - a. CONTROL POINTS SHALL BE CONTROLLED BY THE CENTRAL BAS VIA BACNET COMMUNICATION PROTOCOL. ALL CONTROL POINTS, WHETHER EXPLICITLY LISTED OR NOT, SHALL BE VISIBLE & CONTROLLABLE VIA THE BAS.
 - b. UNIT START COMMAND:
 - a. SUPPLY FAN STARTS AFTER A 15 SEC (ADJ.) DELAY WHEN THE ASSOCIATED DAMPERS ARE PROVEN OPEN.
 - b. TEMPERING OPTIONS TO FUNCTION AS DESCRIBED.
 - c. UNIT STOP COMMAND (OR DE-ENERGIZED):
 - a. SUPPLY FAN AND TEMPERING OPTIONS DE-ENERGIZED.
3. OCCUPIED UNOCCUPIED MODES
 - a. TEMPERATURE SETPOINTS
 - a. OCCUPIED:
 - COOLING: 78°F +/- 2°F
 - HEATING: 65°F +/- 2°F
 - RELATIVE HUMIDITY: 55%
 - IDF, ELECTRICAL, AV, AND OTHER ROOMS CONTAINING HEAT GENERATING ELECTRICAL EQUIPMENT ARE CONSIDERED OCCUPIED 247.
 - b. UNOCCUPIED:
 - COOLING: 82°F +/- 2°F
 - HEATING: 60°F +/- 2°F
 - b. SCHEDULE SHALL BE BASED ON AN OCCUPANCY SCHEDULE PROVIDED BY THE OWNER.
 - c. OCCUPANCY OVERRIDE: IF DURING THE UNOCCUPIED PERIOD THERE IS A REQUEST FOR OCCUPANCY OVERRIDE, THE OCCUPANCY MODE SHALL BECOME ACTIVE FOR 2 HOURS (ADJ.).
 - d. PRIOR TO SCHEDULED OCCUPANCY, OCCUPIED MODE SHALL BE ENGAGED WITH SUFFICIENT TIME TO ENSURE THE SPACES SERVED ARE AT THE OCCUPIED TEMPERATURE SETPOINT AND VENTILATION RATES PRIOR TO THE SCHEDULED OCCUPANCY.
 - e. OCCUPIED MODE:
 - a. SUPPLY FAN ON
 - b. ALL COILS AVAILABLE FOR OPERATION.
 - f. UNOCCUPIED MODE (UNIT OFF): UNIT REMAINS OFF WHEN IN UNOCCUPIED MODE.
 - a. SUPPLY FAN OFF
 - b. TEMPERING OFF
4. SUPPLY FAN SEQUENCE:
 - a. START/STOP BAS SHALL COMMAND THE SUPPLY FAN TO RUN CONTINUOUSLY.
 - b. THE SUPPLY FAN ARE PROVIDED WITH COILS. THE SUPPLY FAN SPEED WILL BE CONTROLLED TO MEET THE AIRFLOW SPECIFIED IN THE DESIGN DOCUMENTS.
5. TEMPERING OPTIONS:
 - a. THE CHW COIL OR THE HHW COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE TEMPERATURE WITHIN THE SPACE SERVED. THE VALVES SHALL NOT BE OPEN EXCESSIVELY. THERE SHALL BE A 30 MIN (ADJ.) DELAY IN CHANGEOVER FROM COOLING MODE TO HEATING MODE TO PREVENT SHORT CYCLING.
6. CONDENSATE OVERFLOW:
 - a. IN THE EVENT THAT THE HIGH-LEVEL CONDENSATE SWITCH IS TRIPPED, ALL COOLING COMPONENTS SHALL SHUT DOWN AND ALARMS SHALL BE SENT TO THE BAS.
7. FAULTS AND REMOTE INDICATIONS:
 - a. BUILDING MANAGEMENT SYSTEM:
 - a. THE CONTROLLER WILL SEND ALL ALARMS TO THE BAS.
 - b. DIRTY FILTER ALARM:
 - a. A DIGITAL SIGNAL IS SENT TO THE CONTROLLER INDICATING AN INCREASED PRESSURE DROP ACROSS AN AIR FILTER (MUST BE ADJUSTED IN FIELD DURING START UP). THE CONTROLLER WILL THEN PROVIDE A DIRTY FILTER ALARM.
 - c. TEMPERATURE SENSOR ALARM:
 - a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.
8. FAN FAILURE:
 - a. THE BAS SHALL PROVE FAN OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF ANY OF THE FAN, THE BAS SHALL ALARM THAT FAN FAILURE CONDITION.
9. ACCESSORIES: PROVIDE THE FOLLOWING:
 - a. BAS INTERFACE:
 - a. A BAS PORT OR SERIAL CARD IS PROVIDED WITH THE CONTROLLER FOR FIELD INTERFACING WITH A BUILDING AUTOMATION SYSTEM.
 - b. UPDATE DEFAULT SETTINGS TO THE APPROPRIATE ADDRESSES TO MATCH THE BAS SETTINGS.
 - b. DDC REMOTE INTERFACE:
 - a. FACTORY PROVIDED, FIELD MOUNTED INTERFACE PANEL THAT WILL BE WIRED TO THE MAIN CONTROLLER FOR MONITORING AND REMOTE ADJUSTMENTS OF SET POINTS.
 - c. PHASE AND BROWNOUT PROTECTION:
 - a. FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT.
 - b. IF A PHASE DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.
 - d. CONDENSATE OVERFLOW UNIT SHUTDOWN:
 - a. FACTORY MOUNTED CONDENSATE OVERFLOW SWITCH WIRED TO THE UNIT CONTROLLER. THE CONTROLLER MONITORS THE CONDENSATE OVERFLOW SWITCH.
 - b. IF THE WATER LEVEL IN THE DRAIN PAN REACHES A CERTAIN LEVEL, THE UNIT WILL SHUTDOWN AND SEND AN ALARM.
9. MINIMUM REQUIREMENTS FOR OPERATOR WORKSTATION DISPLAY
 - a. SUPPLY FAN ON-OFF STATUS
 - b. SUPPLY FAN SPEED
 - c. ALL TEMPERATURE SENSORS ON THE UNIT
 - d. CHW AND HHW VALVE POSITIONS
 - e. COOLING DEMAND % OF TOTAL CAPACITY
 - f. TEMPERATURE LEAVING UNIT
 - g. ALARMS

A. TEMPERATURE SENSORS, HUMIDISTATS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION. WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.

B. VAVS ARE POWERED BY CONTROL VOLTAGE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROUTING, GROUPING, AND POWER FOR THE LOW-VOLTAGE VAV UNITS.

C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SEQUENCES OF OPERATION WHETHER OR NOT THEY ARE EXPLICITLY NAMED.

- D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.
- E. CONTROLS CONTRACTOR SHALL COORDINATE WITH THE I/O CONTROL INTEGRATOR.

F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY IU.

G. LOCAL MAGNETIC GAUGE SUPPLIED AT EACH FILTER SECTION.

H. WHERE AIRFLOW MONITORING IS INDICATED ON FANS, PIEZOMETER RING SHALL BE SUPPLIED AT EACH INLET CONE BY MANUFACTURER.

A. TEMPERATURE SENSORS, HUMIDISTATS, AND THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS OR COLUMNS, OR WHERE EXPOSED TO SOLAR RADIATION. WHERE THERE ARE NO OTHER OPTIONS, A SOLAR BLOCKING ENCLOSURE AND INSULATED BACKPLATE TO ELIMINATE TEMPERATURE INFLUENCE FROM DIRECT SOLAR EXPOSURE SHALL BE PROVIDED.

C. ALL NECESSARY CONTROL POINTS SHALL BE PROVIDED TO ACHIEVE THE WRITTEN SEQUENCES OF OPERATION WHETHER OR NOT THEY ARE EXPLICITLY NAMED.

D. PROVIDE ANALOGUE FIELD SENSORS NEXT TO ALL TEMPERATURE AND PRESSURE CONTROL POINTS.

E. CONTROLS CONTRACTOR SHALL COORDINATE WITH THE IJU CONTROL INTEGRATOR.

F. ALL IN-SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS SHALL BE BLIND SENSORS WITH ONLY THE ABILITY TO INDUCE AN OCCUPANCY OVERRIDE WITH A BUTTON UNLESS OTHERWISE REQUESTED BY III

G. LOCAL MAGNEHELIC GAUGE SUPPLIED AT EACH FILTER SECTION



POINTS TABLE CHILLED BEAM SYSTEM				
POINT DISCRPTION		POINT TYPE	HARDWIRED (H) OR NETWORKED (N)?	EXPECTED RANGE
CCW	SUPPLY TEMPERATURE	AI	N	0-100%
CCW	RETURN TEMPERATURE	AI	N	0-100%
CCW	DIFFERENTIAL PRESSURE	AI	H	0-40 psi
CCW VALVE	POSITION	AO	N	0-100%
CCWP-02-01	START/STOP	BO	N	-
CCWP-02-01	SPEED COMMAND	AO	N	0-100%
CCWP-02-01	STATUS	BI	N	0-100%
CCWP-02-02	START/STOP	BO	N	-
CCWP-02-02	SPEED COMMAND	AO	N	0-100%
CCWP-02-02	STATUS	BI	N	0-100%
CCWR RECIRCULATION VALVE	POSITION	AO	N	0-100%
CCWS	TEMPERATURE	AI	H	35-65°F
CCWS	OUTLET PRESSURE	AI	H	0-200 psi
CCWS BYPASS VALVE	POSITION	AO	N	0-100%
HWV	SUPPLY TEMPERATURE	AI	N	0-100%
HWV	RETURN TEMPERATURE	AI	N	0-100%
HWV	DIFFERENTIAL PRESSURE	AI	H	0-40 psi
HWV VALVE	POSITION	AO	N	0-100%
HWVP-02-01	START/STOP	BO	N	-
HWVP-02-01	SPEED COMMAND	AO	N	0-100%
HWVP-02-01	STATUS	BI	N	0-100%
HWVP-02-02	START/STOP	BO	N	-
HWVP-02-02	SPEED COMMAND	AO	N	0-100%
HWVP-02-02	STATUS	BI	N	0-100%
HWVR RECIRCULATION VALVE	POSITION	AO	N	0-100%
HWVS	TEMPERATURE	AI	H	35-65°F
HWVS	OUTLET PRESSURE	AI	H	0-200 psi
HWVS BYPASS VALVE	POSITION	AO	N	0-100%
ZONE	CO2 LEVEL	AI	H	0-1500 PPM
ZONE	TEMPERATURE	AI	H	65-80°F
ZONE	HUMIDITY	AI	H	20%-80%

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Code Consultant

FORZA

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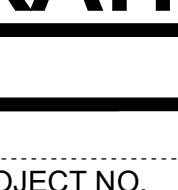
- ALARM INDICATION: THE CONTROLLER WILL DISPLAY ALARMS AND HAVE ONE DIGITAL OUTPUT FOR REMOTE INDICATION OF AN ALARM CONDITION. POSSIBLE ALARMS INCLUDE:
 - A. BUILDING MANAGEMENT SYSTEM
 - a. THE CONTROLLER WILL SEND ALL ALARMS TO THE BAS.
 - B. TEMPERATURE SENSOR ALARM
 - a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.
 - C. PRESSURE SENSOR ALARM
 - a. THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED PRESSURE SENSOR.
 - D. PUMP FAILURE
 - a. BAS SHALL PROVIDE FAN ARRAY OPERATION AND USE THE STATUS INDICATION TO ACCUMULATE RUNTIME. UPON FAILURE OF ANY OF THE PUMPS, THE BAS SHALL ALARM THAT PUMP FAILURE CONDITION.
 - E. HIGH OR LOW PRESSURE SAFETY
 - a. UPON ACTIVATION OF A HIGH OR LOW PRESSURE SAFETY SWITCH, AH SHALL BE DENERGIZED, PUMPS SHALL BE DENERGIZED VIA A HARD WIRED INTERLOCK, AND AN INDICATION OF THE OPERATION SHALL BE SENSED BY THE BAS. BAS SHALL ANNUNCIATE APPROPRIATE ALARM AND REMOVE AND LOCK OUT THE START COMMAND.
- 10. ACCESSORIES: PROVIDE THE FOLLOWING.
 - A. BAS INTERFACING
 - a. A BAS PORT OR SERIAL CARD IS PROVIDED WITH THE CONTROLLER FOR FIELD INTERFACING WITH A BUILDING AUTOMATION SYSTEM.
 - b. UPDATE DEFAULT SETTINGS TO THE APPROPRIATE ADDRESSES TO MATCH THE BAS SETTINGS.
 - B. FACTORY PROVIDED, FIELD MOUNTED INTERFACE PANEL THAT WILL BE WIRED TO THE MAIN CONTROLLER FOR MONITORING AND REMOTE ADJUSTMENTS OF SET POINTS.
 - C. PHASE AND BROUGHTDOWN PROTECTION
 - a. FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT.
 - b. IF A PHASE DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.
- 11. MINIMUM REQUIREMENTS FOR OPERATOR WORKSTATION DISPLAY
 - A. COW AND HWY SYSTEM FLOW
 - B. ALL DATA FROM STU METER
 - C. MAJOR VALVE STATUS
 - D. PUMP ON/OFF STATUS
 - E. PUMP SPEED
 - F. PUMP ASSIGNMENT (LEAD/LAG)
 - G. ALL TEMPERATURE SENSORS
 - H. ALL DIFFERENTIAL PRESSURE SENSORS
 - I. OPERATIONAL STATUS OF EACH CB ZONE
 - J. ALARMS

SEAL | DATE 01/27/25



CHRISTOPHER D. HAWK
REGISTERED PROFESSIONAL ENGINEER
STATE OF INDIANA
LICENSE NO. 100000055

[illegible]

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	PROJECT NO.	23112.000
SHEET TITLE		
MECHANICAL CONTROLS - CHILLED BEAM SYSTEM		
SHEET NUMBER		
M-714		

PLUMBING EQUIPMENT ELECTRICAL CONNECTION SCHEDULE											
GENERAL NOTES: A. MAKE CONNECTIONS TO EQUIPMENT VIA STARTER AND/OR DISCONNECT SWITCHES. B. WHERE STARTER IS NOT WITHIN LINE OF SIGHT OF EQUIPMENT OR SOURCE BREAKER, PROVIDE ADDITIONAL DISCONNECT SWITCH FOR STARTER. C. ALL CONNECTIONS, MOTOR CONTROLS, AND DISCONNECTS USED OUTSIDE OR IN DAMP OR WET LOCATIONS SHALL BE NEMA 3R OR BETTER. D. PROVIDE FUSES IN DISCONNECT SWITCHES PER MANUFACTURER'S RECOMMENDATIONS. DO NOT EXCEED MOCP RATINGS ON NAMEPLATES. E. ALL CIRCUIT BREAKERS FEEDING EQUIPMENT SHALL BE HACR RATED. F. CONTRACTOR SHALL CONFIRM EXACT SIZE, LOCATION, AND WIRING REQUIREMENTS OF ACTUAL EQUIPMENT BEING PROVIDED PRIOR TO ROUGH-IN. G. ALL STARTERS AND DISCONNECT SWITCHES SHALL BE PROVIDED BY DIVISION 26 UNLESS SCHEDULED OR NOTED ON THE DRAWINGS OF OTHER DIVISIONS. H. ALL EQUIPMENT SHALL HAVE LOCAL DISCONNECTING MEANS UNLESS WITHIN LINE OF SIGHT OF SOURCE BREAKER. I. ALL DISCONNECT SWITCHES LOCATED DOWNSTREAM OF VFDs SHALL HAVE SIGN READING, "DO NOT OPERATE WHILE VFD IS ENERGIZED".						STARTER ABBREVIATIONS: FVNR = FULL VOLTAGE NON-REVERSING FVR = FULL VOLTAGE REVERSING RV = REDUCED VOLTAGE VFD = VARIABLE FREQUENCY DRIVE INT = INTEGRAL TO EQUIPMENT HON = FURNISH WITH HAND-OFF-AUTO SWITCH MAN = MANUAL MOTOR STARTER WITH PILOT LIGHT ENC3 = ENCLOSED CIRCUIT BREAKER DISCONNECT MTS = MOTOR RATED TOGGLE SWITCH REC = RECEPTACLE SERVES AS LOCAL DISCONNECT					
KEYED NOTES: 1. PROVIDE GFI BREAKER TO SERVE EQUIPMENT.						KEYED NOTES					

ITEM ID	EQUIP. NO.	VOLTAGE	POLES	CALCULATED AMPS	APPARENT LOAD (VA)	PANEL	CIRCUIT #	FEEDER SIZE	DISCONNECT	VFD	EMERGENCY POWER	LEVEL	KEYED NOTES
DWBP	1	480 V	3	43.3 A	36000	EOSH01	7.9.11	3#4 AWG, 1 1/4" C.	60A/3P	No	Yes	00-EVENT LEVEL	
IBP	1	480 V	3	7.6 A	6300	ENH01	26.28.30	3#10, 1#10G, 3/4" C.	60A/3P	No	No	00-EVENT LEVEL	
RCP	1	120 V	1	0.8 A	100	ENLB1	27	2#12, 1#12G, 1/2" C.	MTR RD SWITCH	No	No	00-EVENT LEVEL	
RCP	2	120 V	1	0.8 A	100	ENLB1	27	2#12, 1#12G, 1/2" C.	MTR RD SWITCH	No	No	00-EVENT LEVEL	
RPZ	1	120 V	1	0.4 A	50	EOSLD1	15	2#12, 1#12G, 1/2" C.	MTR RD SWITCH	No	Yes	00-EVENT LEVEL	
SE	1	480 V	3	6.6 A	5653.4	OSDP	4	3#12, 1#12G, 1/2" C.	30A/3P	No	Yes	00-EVENT LEVEL	
SE	2	480 V	3	7.6 A	6300	EOSH01	13.15.17	3#10, 1#10G, 3/4" C.	30A/3P	No	Yes	00-EVENT LEVEL	
TMZ	1	120 V	1	0.8 A	100	EOSLB2	13	2#12, 1#12G, 1/2" C.	MTR RD SWITCH	No	Yes	00-EVENT LEVEL	
WH	1	120 V	1	0.7 A	86	EOSLB1	3	2#12, 1#12G, 1/2" C.	SIMPLEX OUTLET	No	Yes	00-EVENT LEVEL	
WS	1	120 V	1	0.4 A	50	EOSLD1	15	2#12, 1#12G, 1/2" C.	MTR RD SWITCH	No	Yes	00-EVENT LEVEL	

CONTROL VOLTAGE ELECTRICAL CONNECTION SCHEDULE				
GENERAL NOTES: A. PROVIDE CONDUIT (SIZE AS INDICATED) FROM EQUIPMENT INDICATED TO BAS. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL. B. CONTROL CABLING BY OTHERS.			ABBREVIATIONS: BAS = BUILDING AUTOMATION SYSTEM	
KEYED NOTES:				

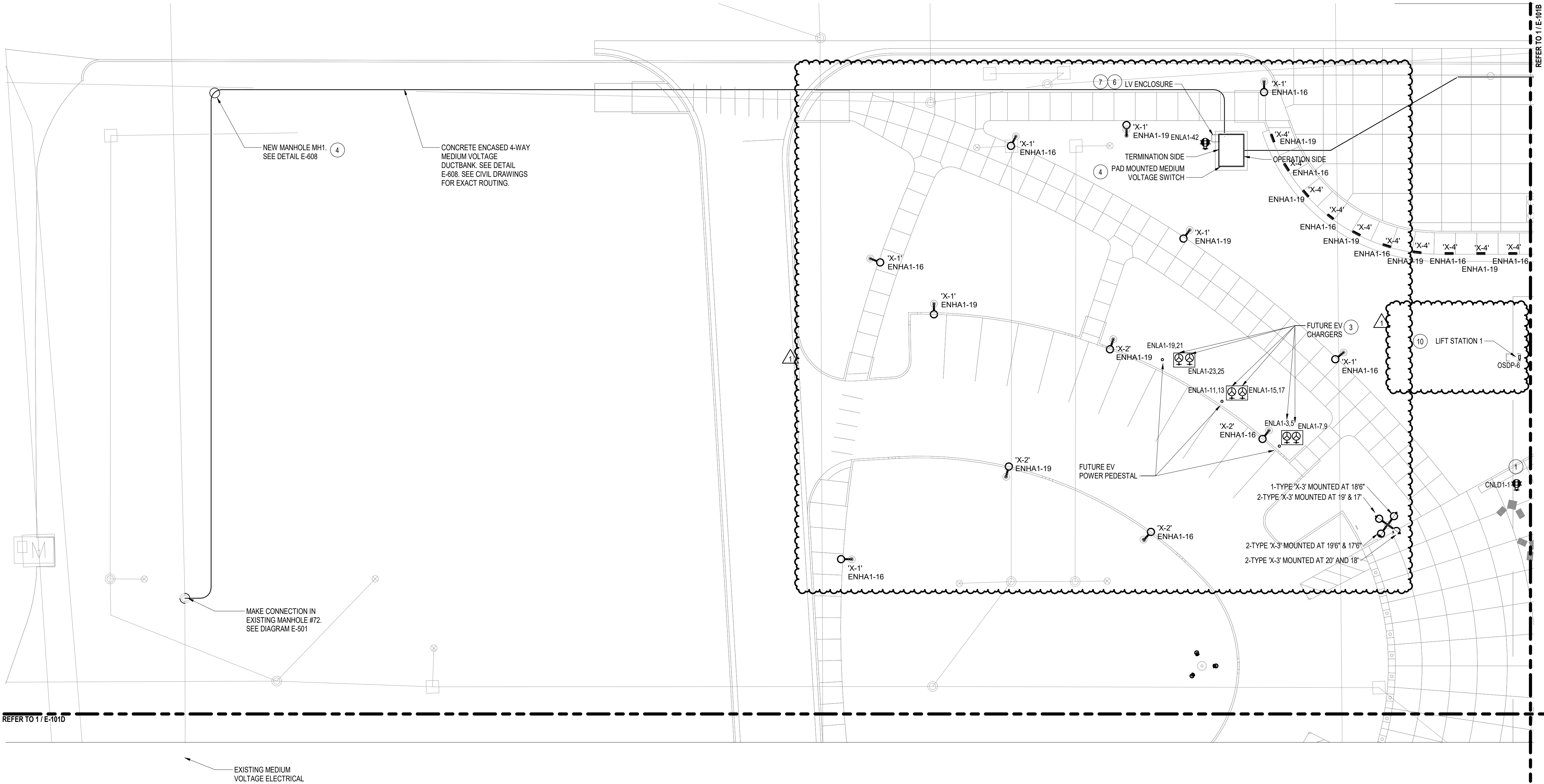
MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE											
GENERAL NOTES: A. MAKE CONNECTIONS TO EQUIPMENT VIA STARTER AND/OR DISCONNECT SWITCHES. B. WHERE STARTER IS NOT WITHIN LINE OF SIGHT OF EQUIPMENT OR SOURCE BREAKER, PROVIDE ADDITIONAL DISCONNECT SWITCH FOR STARTER. C. ALL CONNECTIONS, MOTOR CONTROLS, AND DISCONNECTS USED OUTSIDE OR IN DAMP OR WET LOCATIONS SHALL BE NEMA 3R OR BETTER. D. PROVIDE FUSES IN DISCONNECT SWITCHES PER MANUFACTURER'S RECOMMENDATIONS. DO NOT EXCEED MOCP RATINGS ON NAMEPLATES. E. ALL CIRCUIT BREAKERS FEEDING EQUIPMENT SHALL BE HACR RATED. F. CONTRACTOR SHALL CONFIRM EXACT SIZE, LOCATION, AND WIRING REQUIREMENTS OF ACTUAL EQUIPMENT BEING PROVIDED PRIOR TO ROUGH-IN. G. ALL STARTERS AND DISCONNECT SWITCHES SHALL BE PROVIDED BY DIVISION 26 UNLESS SCHEDULED OR NOTED ON THE DRAWINGS OF OTHER DIVISIONS. H. ALL EQUIPMENT SHALL HAVE LOCAL DISCONNECTING MEANS UNLESS WITHIN LINE OF SIGHT OF SOURCE BREAKER. I. ALL DISCONNECT SWITCHES LOCATED DOWNSTREAM OF VFDs SHALL HAVE SIGN READING, "DO NOT OPERATE WHILE VFD IS ENERGIZED". J. PROVIDE 120V OPTIONAL STANDBY POWER AS REQUIRED TO ALL OF THE BAS CONTROL PANELS. COORDINATE EXACT QUANTITIES, LOCATIONS AND REQUIREMENTS WITH SHOP DRAWINGS AND CONTROLS CONTRACTOR. UPDATE PANEL LEGENDS AS REQUIRED. K. PROVIDE 120V NORMAL POWER/OPTIONAL STANDBY POWER AS REQUIRED FOR VFDs.										STARTER ABBREVIATIONS: FVNR = FULL VOLTAGE NON-REVERSING FVR = FULL VOLTAGE REVERSING RV = REDUCED VOLTAGE VFD = VARIABLE FREQUENCY DRIVE INT = INTEGRAL TO EQUIPMENT HON = FURNISH WITH HAND-OFF-AUTO SWITCH MAN = MANUAL MOTOR STARTER WITH PILOT LIGHT ENC3 = ENCLOSED CIRCUIT BREAKER DISCONNECT MTS = MOTOR RATED TOGGLE SWITCH REC = RECEPTACLE SERVES AS LOCAL DISCONNECT BAS = BUILDING AUTOMATION SYSTEM	

GENERAL NOTES

- A. CAUTION: EXISTING UNDERGROUND UTILITIES AND STRUCTURES ARE KNOWN TO EXIST ON THE PROJECT SITE. CONTRACTOR TO MAKE USE OF ALL CONSTRUCTION DOCUMENTS TO ASSIST IN LOCATING THE UNDERGROUND UTILITIES AND STRUCTURES. NO REPRESENTATION AS TO ACCURACY OR COMPLETENESS OF THE LOCATION OF THE UNDERGROUND UTILITIES OR STRUCTURES EXISTS.
- B. CONTRACTOR TO EXERCISE PRECAUTIONARY MEANS INCLUDING HAND DIGGING OR VACUUM EXCAVATION TO PROTECT THE EXISTING UTILITIES AND STRUCTURES. WHERE EXACT LOCATIONS OF UTILITIES AND STRUCTURES CAN NOT BE DETERMINED HAND OR VACUUM EXCAVATION WILL BE REQUIRED.
- C. UNDERGROUND ELECTRICAL UTILITIES ARE SHOWN DIAGRAMMATICALLY. CONTRACTOR SHALL COORDINATE ACTUAL ROUTING AND DEPTH. WHERE ELECTRICAL SERVICE UTILITIES ARE INDICATED CONTRACTOR SHALL COORDINATE INSTALLATION REQUIREMENTS WITH CIVIL DRAWINGS PRIOR TO INSTALLATION.
- D. ALL UNDERGROUND FEEDER RACEWAYS SHALL BE 4" MINIMUM CONDUIT SIZE UNTIL THEY DAYLIGHT ABOVE GRADE AND CAN TRANSITION TO RACEWAY SIZES INDICATED ON SINGLE LINE DIAGRAMS.
- E. ALL UNDERGROUND DUCT BANKS SHALL INCLUDE 25% SPARE RACEWAYS AND MINIMUM OF (2) RACEWAYS PER DUCT BANK.
- F. ALL UNDERGROUND AND EXTERIOR BRANCH CIRCUIT RACEWAYS SHALL BE 1-1/2" MINIMUM AND CAN TRANSITION TO 3/4" MINIMUM AFTER THEY DAYLIGHT ON THE INTERIOR OF THE BUILDING IN ACCESSIBLE LOCATIONS.
- G. ALL EXTERIOR ELECTRICAL DEVICES, EQUIPMENT, BOXES AND ENCLOSURES SHALL BE WEATHERPROOF AND RATED FOR INSTALLATION IN THE ENVIRONMENT THEY ARE LOCATED. ALL EXTERIOR RECEPTACLES SHALL INCLUDE WEATHERPROOF "WHILE-IN-USE" COVERS AND GFCI PROTECTION FOR EACH DEVICE.
- H. FOR TEMPORARY POWER, CONTRACTOR MUST PAY TO FURNISH AND INSTALL ALL EQUIPMENT AND METERING NECESSARY. CONTRACTOR MUST PAY THE UTILITY BILLS UNTIL SUBSTANTIAL COMPLETION.

SHEET KEYNOTES

1. POWER PEDESTAL. PEDOC, STAINLESS STEEL, 5XS WITH INTEGRAL BASE AND HINGED TOP. 24" NEMA 3R, TWO WP/GFI DUPLEX RECEPTACLES. ROUTE 2#10, 1#10G - 1" C TO CIRCUIT INDICATED. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
2. EMERGENCY BLUE LIGHT STATION. ROUTE 2#10, 1#10G - 1" C TO INDICATED. MAKE FINAL CONNECTION TO DEVICE. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
3. PROVISIONS FOR FUTURE EV CHARGER. PROVIDE LUGS IN HANDHOLE FOR CONNECTION TO FUTURE EV CHARGER. ROUTE 3#6, 1#8G - 1 1/4" C TO CIRCUIT INDICATED. TWO CIRCUITS IN EACH HANDHOLE. ROUTE 2" C FROM HANDHOLE TO FUTURE PEDESTAL LOCATION. STUB UP 6" AND CAP. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
4. PROVIDE PULLING CALCULATIONS AT SWITCH, TRANSFORMER AND ALL MANHOLES.
5. PROVIDE LOCKED FLUSH MOUNTED SHUT OFF DEVICES AND FLUSH MOUNTED KNOX BOX FOR ACCESS. COORDINATE EXACT LOCATION WITH FIRE MARSHAL.
6. PROVIDE 120V POWER TO LOW VOLTAGE COMPARTMENT. ROUTE 2#4, 1#8G - 2" C TO CIRCUIT INDICATED.
7. ROUTE 2" C FOR LOW VOLTAGE CONNECTIONS TO NEAREST IDF ROOM IN BUILDING.
8. PROVIDE CONCRETE PAD. SEE DETAIL SHEET E-604.
9. PROVIDE BREAK GLASS TYPE STATION FOR GENERATOR EMERGENCY SHUTOFF AT EGRESS DOOR FROM AREA.
10. MAKE CONNECTION TO LIFT STATION 1. ROUTE 3#10, 1#10G - 1" C TO CIRCUIT INDICATED. PROVIDE 30/3R DISCONNECT MOUNTED ON GALVANIZED STEEL CHANNEL. COORDINATE EXACT LOCATION IN FIELD.
11. MAKE CONNECTION TO LIFT STATION 2. ROUTE 3#4, 1#8G - 2" C TO CIRCUIT INDICATED. PROVIDE 100/3R DISCONNECT MOUNTED ON GALVANIZED STEEL CHANNEL. COORDINATE EXACT LOCATION IN FIELD.



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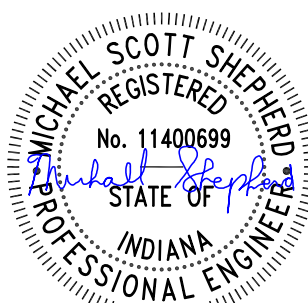
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SEAL | DATE 01/27/25



SHEET ISSUE		
1	DD PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25



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PROJECT NO. 23112.000

SHEET TITLE
PARTIAL SITE PLAN - ELECTRICAL - AREA A

SHEET NUMBER
E-101A

GENERAL NOTES

- A. CAUTION: EXISTING UNDERGROUND UTILITIES AND STRUCTURES ARE KNOWN TO EXIST ON THE PROJECT SITE. CONTRACTOR TO MAKE USE OF ALL CONSTRUCTION DOCUMENTS TO ASSIST IN LOCATING THE UNDERGROUND UTILITIES AND STRUCTURES. NO REPRESENTATION AS TO ACCURACY OR COMPLETENESS OF THE LOCATION OF THE UNDERGROUND UTILITIES OR STRUCTURES EXISTS.
- B. CONTRACTOR TO EXERCISE PRECAUTIONARY MEANS INCLUDING HAND DIGGING OR VACUUM EXCAVATION TO PROTECT THE EXISTING UTILITIES AND STRUCTURES. WHERE EXACT LOCATIONS OF UTILITIES AND STRUCTURES CAN NOT BE DETERMINED HAND OR VACUUM EXCAVATION WILL BE REQUIRED.
- C. UNDERGROUND ELECTRICAL UTILITIES ARE SHOWN DIAGRAMMATICALLY. CONTRACTOR SHALL COORDINATE ACTUAL ROUTING AND DEPTH. WHERE ELECTRICAL SERVICE UTILITIES ARE INDICATED CONTRACTOR SHALL COORDINATE INSTALLATION REQUIREMENTS WITH CIVIL DRAWINGS PRIOR TO INSTALLATION.
- D. ALL UNDERGROUND FEEDER RACEWAYS SHALL BE 4" MINIMUM CONDUIT SIZE UNTIL THEY DAYLIGHT ABOVE GRADE AND CAN TRANSITION TO RACEWAY SIZES INDICATED ON SINGLE LINE DIAGRAM.
- E. ALL UNDERGROUND DUCT BANKS SHALL INCLUDE 25% SPARE RACEWAYS AND MINIMUM OF (2) RACEWAYS PER DUCT BANK.
- F. ALL UNDERGROUND AND EXTERIOR BRANCH CIRCUIT RACEWAYS SHALL BE 1-1/2" MINIMUM AND CAN TRANSITION TO 3/4" MINIMUM AFTER THEY DAYLIGHT ON THE INTERIOR OF THE BUILDING IN ACCESSIBLE LOCATIONS.
- G. ALL EXTERIOR ELECTRICAL DEVICES, EQUIPMENT, BOXES AND ENCLOSURES SHALL BE WEATHERPROOF AND RATED FOR INSTALLATION IN THE ENVIRONMENT THEY ARE LOCATED. ALL EXTERIOR RECEPTACLES SHALL INCLUDE WEATHERPROOF "WHILE-IN-USE" COVERS AND GFCI PROTECTION FOR EACH DEVICE.
- H. FOR TEMPORARY POWER, CONTRACTOR MUST PAY TO FURNISH AND INSTALL ALL EQUIPMENT AND METERING NECESSARY. CONTRACTOR MUST PAY THE UTILITY BILLS UNTIL SUBSTANTIAL COMPLETION.

SHEET KEYNOTES

1. POWER PEDESTAL. PEDOC, STAINLESS STEEL, 5X5 WITH INTEGRAL BASE AND HINGED TOP. 24" NEMA 3R. TWO WP/GFI DUPLEX RECEPTACLES. ROUTE 2#10, 1#10G - 1" C TO CIRCUIT INDICATED. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
2. EMERGENCY BLUE LIGHT STATION. ROUTE 2#10, 1#10G - 1" C TO INDICATED. MAKE FINAL CONNECTION TO DEVICE. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
3. PROVISIONS FOR FUTURE EV CHARGER. PROVIDE LUGS IN HANDHOLE FOR CONNECTION TO FUTURE EV CHARGER. ROUTE 3#6, 1#8G - 1 1/4" C TO CIRCUIT INDICATED. TWO CIRCUITS IN EACH HANDHOLE. ROUTE 2" C FROM HANDHOLE TO FUTURE PEDESTAL LOCATION. STUB UP 6" AND CAP. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
4. PROVIDE PULLING CALCULATIONS AT SWITCH, TRANSFORMER AND ALL MANHOLES.
5. PROVIDE LOCKED FLUSH MOUNTED SHUT OFF DEVICES AND FLUSH MOUNTED KNOX BOX FOR ACCESS. COORDINATE EXACT LOCATION WITH FIRE MARSHAL.
6. PROVIDE 120V POWER TO LOW VOLTAGE COMPARTMENT. ROUTE 2#4, 1#8G - 2" C TO CIRCUIT INDICATED.
7. ROUTE 2" C FOR LOW VOLTAGE CONNECTIONS TO NEAREST IDF ROOM IN BUILDING.
8. PROVIDE CONCRETE PAD. SEE DETAIL SHEET E-604.
9. PROVIDE BREAK GLASS TYPE STATION FOR GENERATOR EMERGENCY SHUTOFF AT EGRESS DOOR FROM AREA.
10. MAKE CONNECTION TO LIFT STATION 1. ROUTE 3#10, 1#10G - 1" C TO CIRCUIT INDICATED. PROVIDE 30/3/3R DISCONNECT MOUNTED ON GALVANIZED STEEL CHANNEL. COORDINATE EXACT LOCATION IN FIELD.
11. MAKE CONNECTION TO LIFT STATION 2. ROUTE 3#4, 1#8G - 2" C TO CIRCUIT INDICATED. PROVIDE 100/3/3R DISCONNECT MOUNTED ON GALVANIZED STEEL CHANNEL. COORDINATE EXACT LOCATION IN FIELD.

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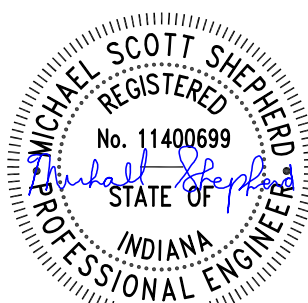
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SEAL | DATE 01/27/25



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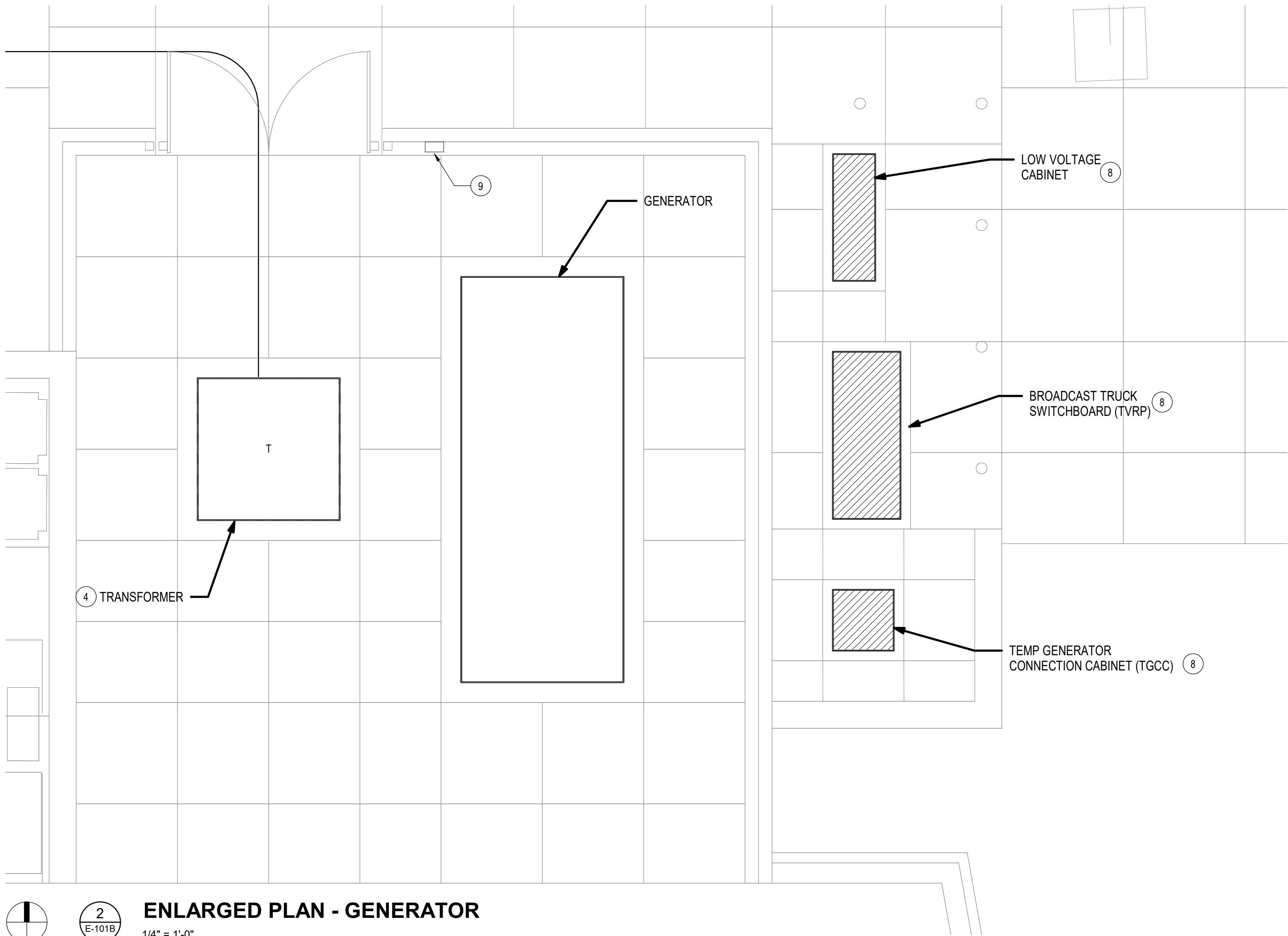
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PROJECT NO. 23112.000

SHEET TITLE
PARTIAL SITE PLAN - ELECTRICAL - AREA B

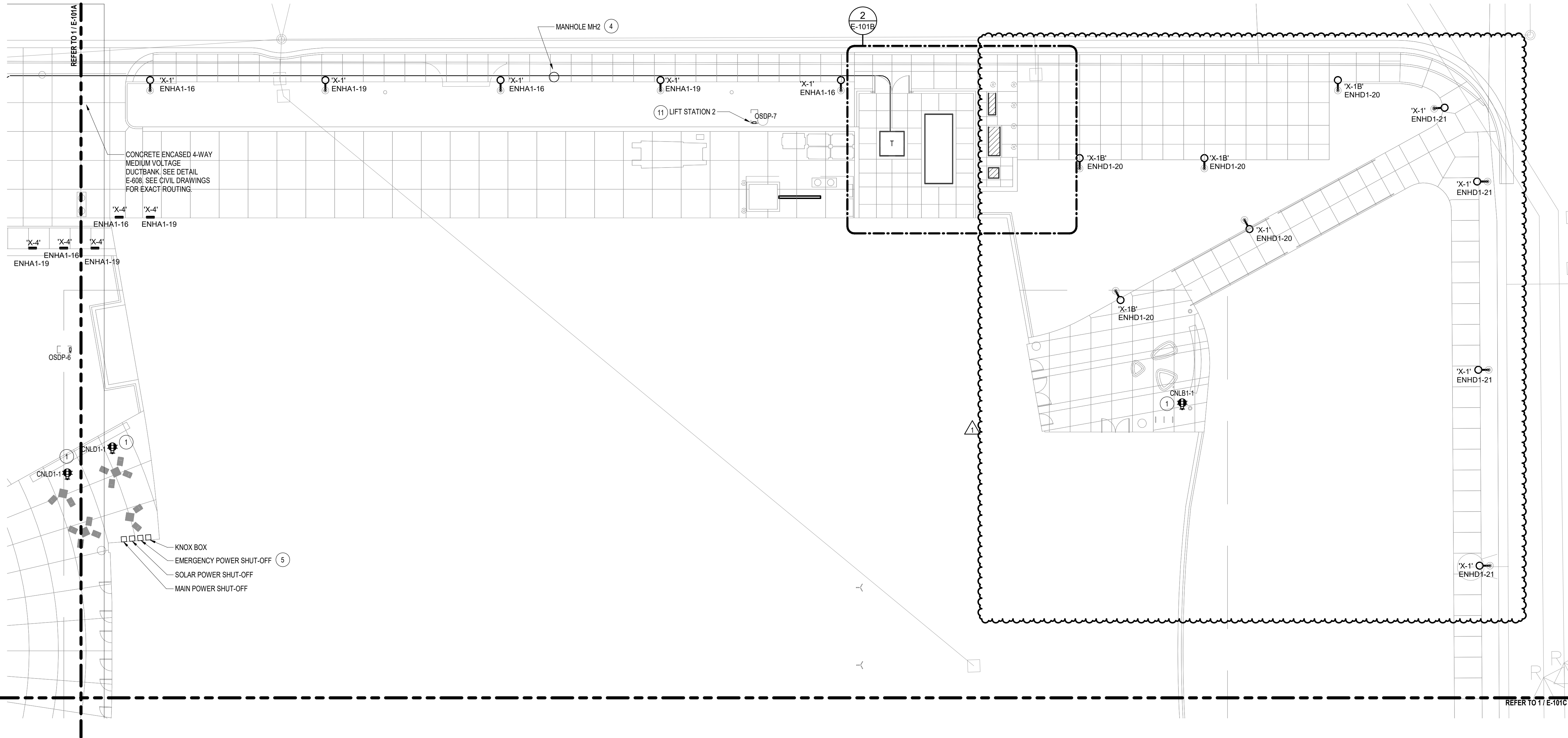
SHEET NUMBER

E-101B



ENLARGED PLAN - GENERATOR

1/4" = 1'-0"



PARTIAL SITE PLAN - ELECTRICAL - AREA B

1/16" = 1'-0"

GENERAL NOTES

A. CAUTION: EXISTING UNDERGROUND UTILITIES AND STRUCTURES ARE KNOWN TO EXIST ON THE PROJECT SITE. CONTRACTOR TO MAKE USE OF ALL AVAILABLE RECORDS AND FIELD SURVEY TO IDENTIFY ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES. NO REPRESENTATION AS TO ACCURACY OR COMPLETENESS OF THE LOCATION OF THE EXISTING UNDERGROUND UTILITIES AND STRUCTURES.

B. CONTRACTOR TO EXERCISE PRECAUTIONARY MEANS INCLUDING HAND DIGGING OR VACUUM EXCAVATION TO PROTECT THE EXISTING UTILITIES AND STRUCTURES. WHERE THE LOCATION OF EXISTING UTILITIES AND STRUCTURES CAN NOT BE DETERMINED HAND OR VACUUM EXCAVATION WILL BE REQUIRED.

C. ALL ELECTRICAL UTILITIES ARE SHOWN DIAGRAMMATICALLY. CONTRACTOR SHALL COORDINATE ACTUAL ROUTINGS AND DEPTH. WHERE ELECTRICAL SERVICE UTILITIES ARE INDICATED CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE UTILITIES BY FIELD DRAWINGS PRIOR TO INSTALLATION.

D. ALL ELECTRICAL FEEDERS SHALL BE MINIMUM 1/2" MINIMUM CONDUIT SIZE UNTIL THEY DRAUGHT ABOVE GRADE AND CAN TRANSITION TO RACEWAY SIZES INDICATED ON SINGLE LINE DIAGRAMS.

E. ALL ELECTRICAL FEEDERS SHALL BE MINIMUM 1/2" MINIMUM SPARE RACEWAYS AND MINIMUM 6" RACEWAYS PER DUCT BANK.

F. ALL UNDERGROUND AND EXTERIOR BURNING CIRCUIT RACEWAYS SHALL BE MARKED WITH RED AND CAN BE OPENED UP AFTER THEY ARE LAID OUT TO THE INTERIOR OF THE BUILDING IS ACCESSIBLE.

G. LOCATIONS

H. ALL ELECTRICAL ELECTRICAL DEVICES, EQUIPMENT, BOXES AND ENCLOSURES SHALL BE WEATHERPROOF AND RATED FOR INSTALLATION IN THE ENVIRONMENT THEY ARE LOCATED. ALL ELECTRICAL RECEPTACLES SHALL BE WEATHERPROOF AND RATED FOR INSTALLATION IN THE ENVIRONMENT FOR EACH DEVICE.

I. FOR TEMPORARY POWER, CONTRACTOR MUST PAY TO FURNISH AND MAINTAIN ALL EQUIPMENT AND WIRING. CONTRACTOR MUST PAY THE UTILITY BILLS UNTIL SUBSTANTIAL COMPLETION.

SHEET KEYNOTES

- 1 POWER PEDESTAL. PEDOC. STAINLESS STEEL, 5X5 WITH INTEGRAL BASE AND HINGED TOP. 24". NEMA 3R. TWO W/P/GFI DUPLEX RECEPTABLES. ROUTE 2#10, 1#10G - 1" C TO CIRCUIT INDICATED. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
- 2 EMERGENCY BLUE LIGHT STATION. ROUTE 2#10, 1#10G - 1" C TO CIRCUIT INDICATED. MAKE FINAL CONNECTION TO THE W/ICE. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
- 3 PROVISIONS FOR FUTURE EV CHARGER. PROVIDE LUGS IN HANDHOLE FOR CONNECTION TO FUTURE EV CHARGER. ROUTE 3#6, 1#6G - 1 1/4" C TO CIRCUIT INDICATED. TWO CIRCUITS IN EACH HANDHOLE. ROUTE 2" C FROM HANDHOLE TO FUTURE PEDESTAL LOCATION. STUB UP 6" AND CAP. SEE L-SERIES DRAWINGS FOR EXACT LOCATION.
- 4 PROVIDE PULLING CALCULATIONS AT SWITCH, TRANSFORMER AND ALL MANHOLES.
- 5 PROVIDE LOCKED FLUSH MOUNTED SHUT OFF DEVICES AND FLUSH MOUNTED KNOX BOX FOR ACCESS. COORDINATE EXACT LOCATION WITH FIRE MARSHAL.
- 6 PROVIDE 120V POWER TO LOW VOLTAGE COMPARTMENT. ROUTE 2#4, 1#6G - 2" C TO CIRCUIT INDICATED.
- 7 ROUTE 2" C FOR ALL VOLTAGE CONNECTIONS TO NEAREST IDF ROOM IN BUILDING.
- 8 PROVIDE CONCRETE PAD. SEE DETAIL SHEET E-604.
- 9 PROVIDE BREAK GLASS TYPE STATION FOR GENERATOR EMERGENCY SHUTOFF AT NEGRESS DOOR FROM AREA.
- 10 MAKE CONNECTION TO LIFT STATION 1. ROUTE 3#10, 1#6G - 1" C TO CIRCUIT INDICATED. PROVIDE 30/3R DISCONNECT MOUNTED ON GALVANIZED STEEL CHANNEL. COORDINATE EXACT LOCATION IN FIELD.
- 11 MAKE CONNECTION TO LIFT STATION 2. ROUTE 3#4, 1#6G - 2" C TO CIRCUIT INDICATED. PROVIDE 100/3R DISCONNECT MOUNTED ON GALVANIZED STEEL CHANNEL. COORDINATE EXACT LOCATION IN FIELD.

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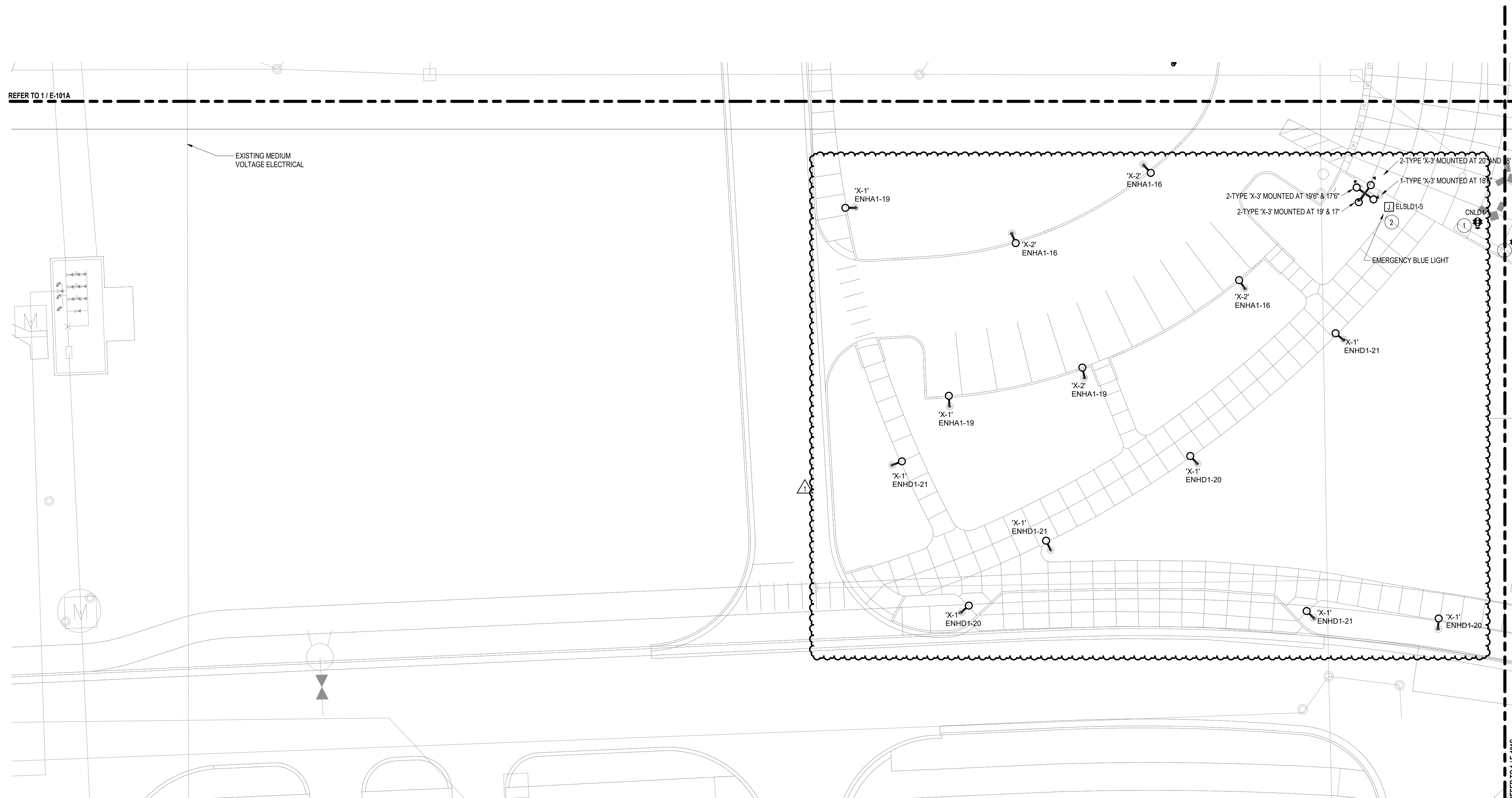
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A control chart with a center line and two control limits. A single data point is plotted exactly on the center line.

PARTIAL SITE PLAN - ELECTRICAL - AREA D

RATIO

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PROJECT NO.	23112.000
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SHEET TITLE
PARTIAL SITE PLAN -
ELECTRICAL - AREA
D

SHEET NUMBER

E-101D

A. CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.

B. REFER TO DATATELECOM, AUDIO-VISUAL AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

- 1 BREAKER A COMPANY SWITCH WITH CIRCUIT BREAKER AND CAM-LOCK CONNECTORS. SEE SINGLE LINE DIAGRAM FOR CIRCUITING AND FEEDER SIZE.
- 2 PROVIDE POWER CONNECTION TO LOCKER SYSTEM
- 3 PROVIDE DEVICE TO BE MOUNTED IN DISPLAY BOX, SEE AV DRAWINGS FOR ADDITIONAL INFORMATION.
- 4 PROVIDE POWER CONNECTION TO DRYER. ROUTE 4#1, 1#6G-2 TO CIRCUIT INDICATED.
- 5 PROVIDE POWER CONNECTION TO FIRE ALARM EQUIPMENT. COORDINATE LOCATION SO THAT EQUIPMENT IS NOT IN DRUGS TRAINING AREA.
- 6 PROVIDE POWER CONNECTION TO RETRACTABLE SEATING. PROVIDE 30/31 DISCONNECT SWITCH. ROUTE 3#10, 1#10G-3/4" TO CIRCUIT INDICATED. COORDINATE EXACT LOCATION WITH SEATING MANUFACTURER.

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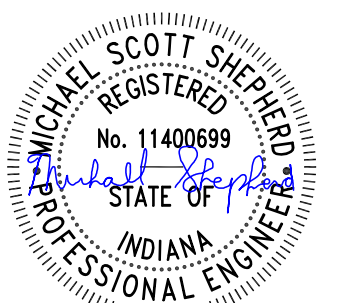
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A diagram of a four-quadrant figure. The figure is divided into four quadrants by a horizontal line and a vertical line. The top-left quadrant is shaded gray and labeled 'A'. The top-right quadrant is white and labeled 'B'. The bottom-left quadrant is white and labeled 'D'. The bottom-right quadrant is white and labeled 'C'.

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RATIO
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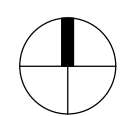
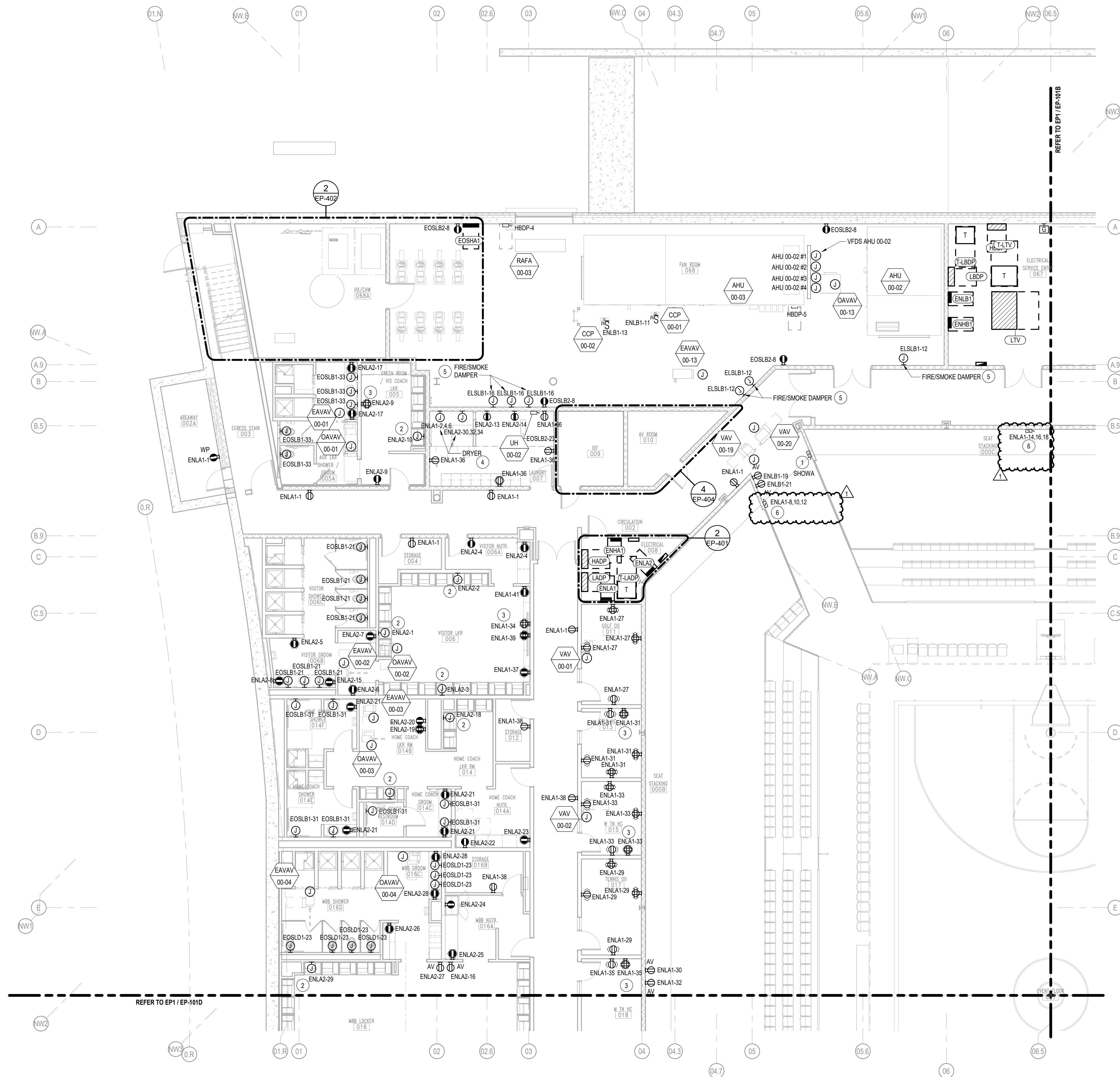
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SHEET TITLE
EVENT FLOOR PLAN

EVENT FLOOR PLAN

- AREA A - POWER

EP-101A



EP1
EP-101A

$$1/8'' = 1'-0''$$

A. CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.

B. REFER TO DATA/TELECOM, AUDIO-VISUAL AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

A. CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.

B. REFER TO DATA/TELECOM, AUDIO-VISUAL AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

- 1 CONNECT CONTROL BOX FOR DOCK LIFT.
PROVIDE ALL CONDUIT AND WIRING AS DIRECTED
BY MANUFACTURER AND CONNECT ALL LIMIT
SWITCHES, SENSORS, CONTROLS, ETC. CONTROL
BOX BY MANUFACTURER.
- 2 PROVIDE 303P NEMA 3R NON FUSIBLE
DISCONNECT SWITCH FOR DOCK LIFT. ROUTE 3#8,
1#10G - 3/4" TO CIRCUIT INDICATED. LOCATE
DISCONNECT SWITCH AS RECOMMENDED BY
MANUFACTURER.
- 3 PROVIDE 30A/3P NON-FUSIBLE DISCONNECT
SWITCH FOR CONNECTION TO OVERHEAD DOOR
OPERATOR. PROVIDE #12 (1#12S, 3#4C
HOMERUN FOR BRANCH CIRCUIT INDICATED.
CONNECT ALL PUSHBUTTON OPERATOR
STATIONS, SENSORS, ETC. COORDINATE ALL
REQUIREMENTS WITH SUPPLIER.
- 4 PROVIDE 30A/3P NON-FUSIBLE DISCONNECT
SWITCH FOR CONNECTION TO RETRACTABLE
SEATING. PROVIDE #12 (1#12S, 3#4C
HOMERUN FOR BRANCH CIRCUIT INDICATED.
LOCATE DISCONNECT SWITCH AND CONNECTION
AS DIRECTED BY RETRACTABLE SEATING
SUPPLIER.
- 5 PROVIDE A COMPANY SWITCH WITH CIRCUIT
BREAKER AND CAME-LOCK CONNECTORS. SEE
SINGLE LINE DIAGRAM FOR CIRCUITING AND
FEEDER SIZE.
- 6 PROVIDE POWER CONNECTION TO HYDRONIC
WALL CASSETTE. COORDINATE MOUNTING
HEIGHT SO THAT RECEPTACLE IS LOCATED
ADJACENT TO UNIT.
- 7 PROVIDE 303P NEMA 3R NON-FUSIBLE
DISCONNECT SWITCH FOR CONNECTION TO
TRASH COMPACTOR. 10 HP. ROUTE 3#8, 1#10G -
3/4" TO CIRCUIT INDICATED.
- 8 PROVIDE RECEPTACLES FOR POWER
CONNECTIONS FOR SCOREBOARD AND GAME
CLOCK. COORDINATE EXACT LOCATION WITH AV
CONTRACTOR.
- 9 PROVIDE POWER CONNECTION TO RETRACTABLE
SEATING. PROVIDE 303P DISCONNECT SWITCH.
ROUTE 3#10, 1#10G-3/4" TO CIRCUIT INDICATED.
COORDINATE EXACT LOCATION WITH SEATING
MANUFACTURER.

- 1 CONNECT CONTROL BOX FOR DOCK LIFT.
PROVIDE ALL CONDUIT AND WIRING AS DIRECTED
BY MANUFACTURER AND CONNECT ALL LIMIT
SWITCHES, SENSORS, CONTROLS, ETC. CONTROL
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- 2 PROVIDE 303P NEMA 3R NON FUSIBLE
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3/4" TO CIRCUIT INDICATED.
- 8 PROVIDE RECEPTACLES FOR POWER
CONNECTIONS FOR SCOREBOARD AND GAME
CLOCK. COORDINATE EXACT LOCATION WITH AV
CONTRACTOR.
- 9 PROVIDE POWER CONNECTION TO RETRACTABLE
SEATING. PROVIDE 303P DISCONNECT SWITCH.
ROUTE 3#10, 1#10G-3/4" TO CIRCUIT INDICATED.
COORDINATE EXACT LOCATION WITH SEATING
MANUFACTURER.

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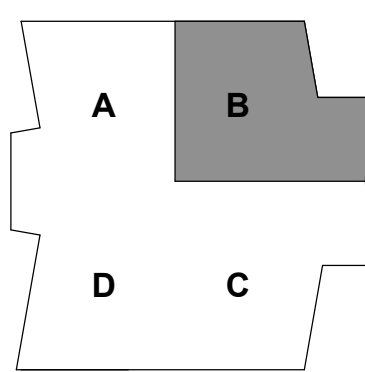
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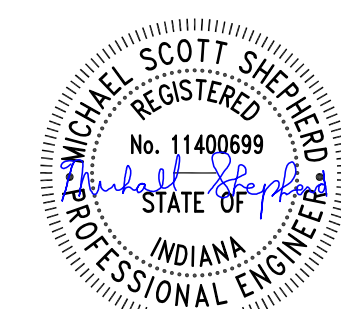
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KEY PLAN

SEAL | DATE 01/27/25

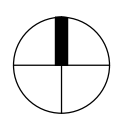
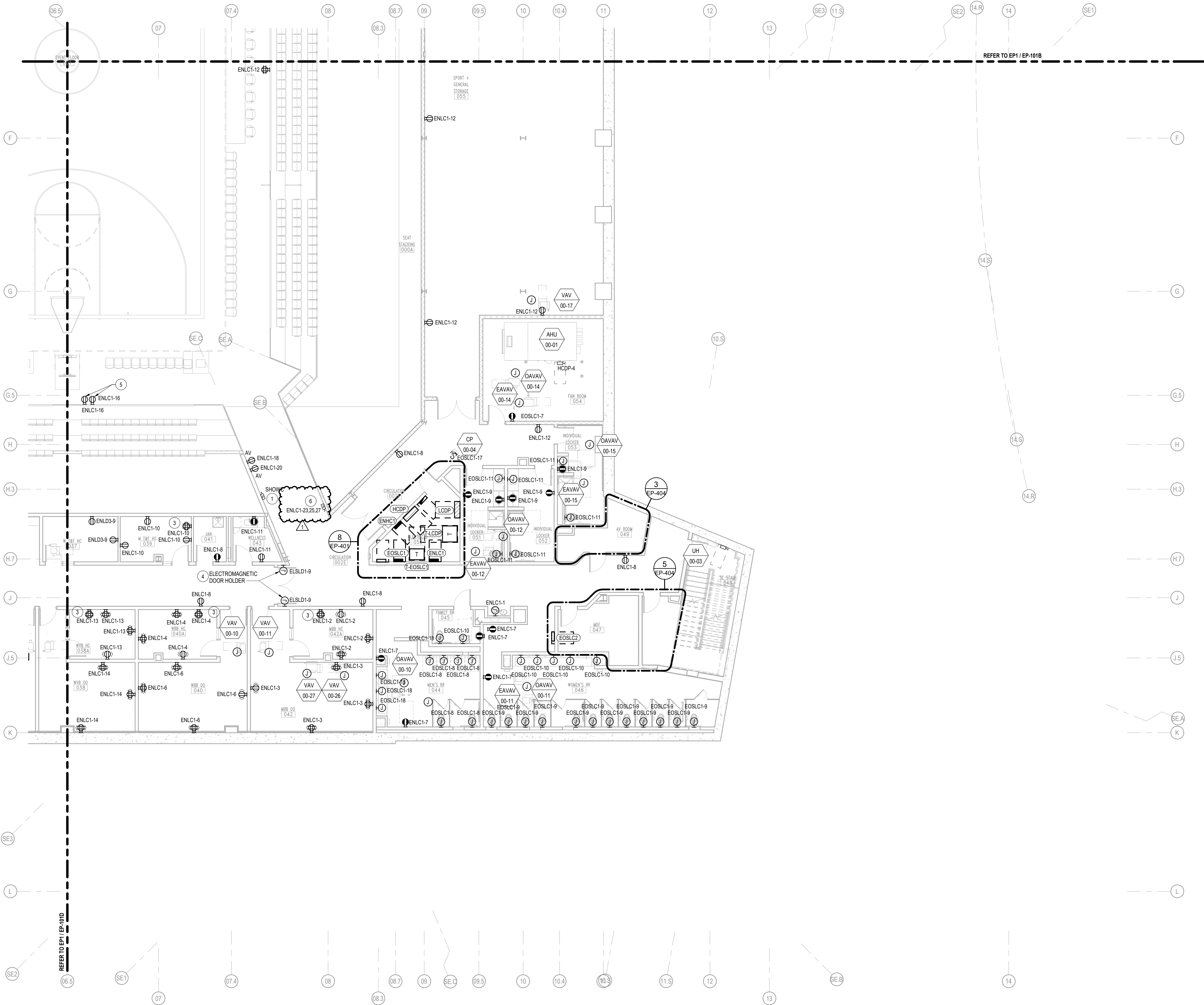
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RATIO

PROJECT NO. 23112.000

SHEET TITLE
EVENT FLOOR PLAN
- AREA B - POWER

SHEET NUMBER
EP-101B



EVENT FLOOR PLAN - AREA C - POWER
1/8" = 1'-0"

GENERAL NOTES

- A. CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.
- B. REFER TO DATA/TELECOM, AUDIO VISUAL, AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

SHEET KEYNOTES

- 1 PROVIDE A COMPANY SWITCH WITH CIRCUIT BREAKER AND CAM-LOCK CONNECTORS. SEE SINGLE LINE DIAGRAM FOR CIRCUITING AND FEEDER SIZE.
- 2 PROVIDE POWER CONNECTION TO HYDRONIC WALL CASSETTE. COORDINATE MOUNTING HEIGHT SO THAT RECEPTACLE IS LOCATED ADJACENT TO UNIT.
- 3 PROVIDE DEVICE TO BE MOUNTED IN DISPLAY BOX, SEE AV DRAWINGS FOR ADDITIONAL INFORMATION.
- 4 PROVIDE POWER CONNECTION TO FIRE ALARM EQUIPMENT. COORDINATE LOCATION SO THAT DEVICE IS LOCATED ADJACENT TO UNIT.
- 5 PROVIDE RECEPTACLES FOR POWER CONNECTIONS FOR SCOREBOARD AND GAME CLOCK. COORDINATE EXACT LOCATION WITH VENDOR.
- 6 PROVIDE POWER CONNECTION TO RETRACTABLE SEATING. PROVIDE 30/31 DISCONNECT SWITCH. ROUTE #10, 1#10G-3/4" TO CIRCUIT INDICATED. COORDINATE EXACT LOCATION WITH SEATING MANUFACTURER.

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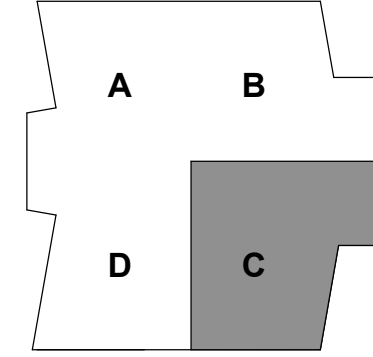
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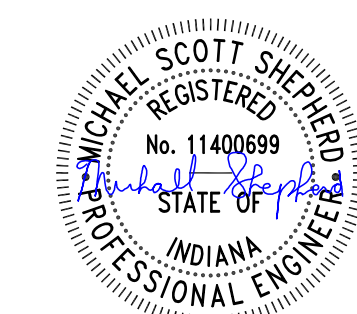
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2502 WEST MECHANIC ST, SUITE C
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816-806-3729



KEY PLAN

SEAL | DATE 01/27/25



SHEET ISSUE

1	DO PROGRESS SET	07/18/24
2	DESIGN DEVELOPMENT	08/30/24
3	50% CONSTRUCTION DOCUMENTS	11/01/24
4	95% CONSTRUCTION DOCUMENTS	12/19/24
5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

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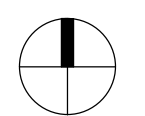
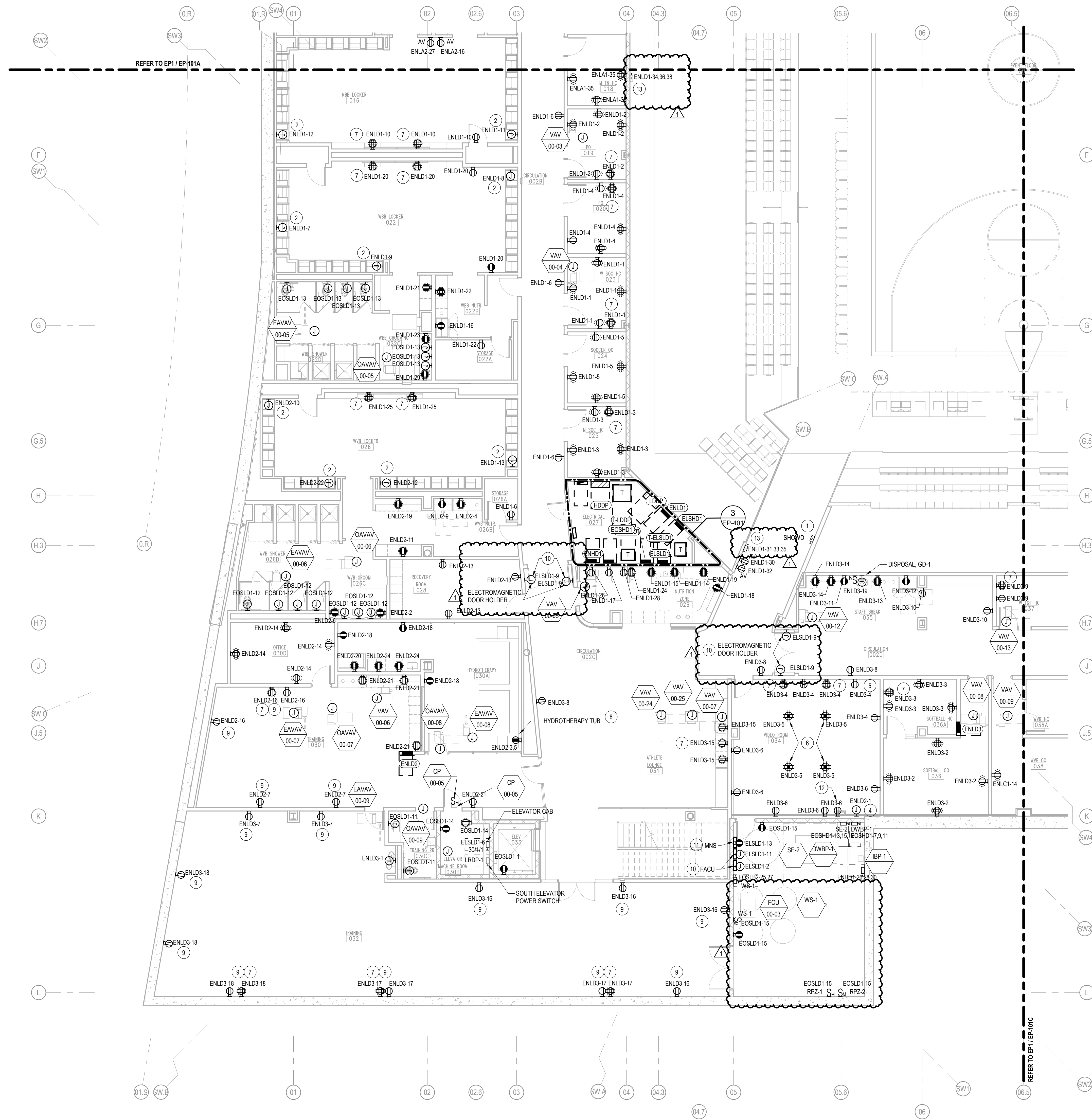
PROJECT NO. 23112.000

SHEET TITLE

EVENT FLOOR PLAN
- AREA C - POWER

SHEET NUMBER

EP-101C



EVENT FLOOR PLAN - AREA D - POWER
1/8" = 1'-0"

GENERAL NOTES

- CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.
- REFER TO DATA TELECOM, AUDIO VISUAL, AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

SHEET KEYNOTES

- PROVIDE A COMPANY SWITCH WITH CIRCUIT BREAKER AND CAM-LOCK CONNECTORS. SEE SINGLE LINE DIAGRAM FOR CIRCUITING AND FEEDER SIZE.
- PROVIDE POWER CONNECTION TO LOCKER SYSTEM
- PROVIDE POWER CONNECTION TO HYDRONIC WALL CASSETTE. COORDINATE MOUNTING HEIGHT SO THAT RECEPTACLE IS LOCATED ADJACENT TO UNIT
- PROVIDE JUNCTION BOX WITH (1) 120V-20A CIRCUIT FOR PRESS JUNCTION BOX. MOUNT JUNCTION BOX AT 4'-0" AFF.
- PROVIDE DUPLEX RECEPTACLE ADVACENT AV PLATE FOR MICROPHONE PLATE.
- PROVIDE CEILING MOUNTED RECEPTACLES FOR TEMPORARY BROADCAST LIGHTING. COORDINATE EXACT LOCATION PRIOR TO INSTALLATION.
- RECEPTACLE TO BE MOUNTED IN DISPLAY BOX. SEE AV DRAWINGS FOR ADDITIONAL INFORMATION.
- NEMA 14-50R FOR HYDROTHERAPY UNIT. ROUTE 2#8, #10G-3/4" TO CIRCUIT INDICATED.
- COORDINATE LOCATION OF RECEPTACLES WITH LOCATION OF MIRRORS
- PROVIDE POWER CONNECTION TO FIRE ALARM EQUIPMENT. COORDINATE LOCATION SO THAT DEVICE IS LOCATED ADJACENT TO UNIT.
- PROVIDE POWER CONNECTION TO FIRE ALARM EQUIPMENT. COORDINATE LOCATION SO THAT DEVICE IS LOCATED INSIDE UNIT.
- PROVIDE RECEPTACLE MOUNTED ADJACENT TO AV PLATE FOR CONNECTION TO PTZ CAMERA. REFER TO AV DRAWINGS FOR ADDITIONAL INFORMATION.
- PROVIDE POWER CONNECTION TO RETRACTABLE SEATING. PROVIDE 30/31 DISCONNECT SWITCH ROUTE 3#10, #10G-3/4" TO CIRCUIT INDICATED. COORDINATE EXACT LOCATION WITH SEATING MANUFACTURER.

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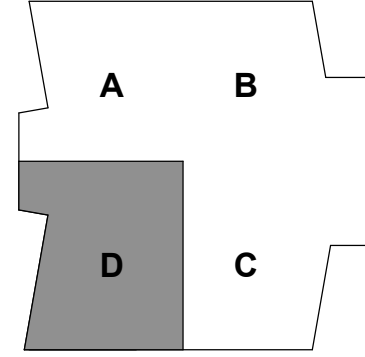
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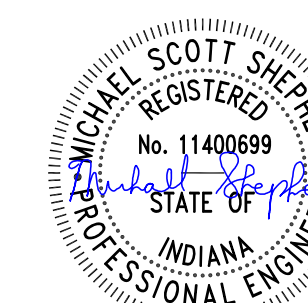
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KEY PLAN

SEAL | DATE 01/27/25



SHEET ISSUE

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PROJECT NO. 23112.000

SHEET TITLE

**EVENT FLOOR PLAN
- AREA D - POWER**

SHEET NUMBER

EP-101D

A. CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.

B. REFER TO DATA/TELECOM, AUDIO-VISUAL AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

- 1 PROVIDE POWER CONNECTION TO FIRE ALARM EQUIPMENT. COORDINATE LOCATION SO THAT DEVICE IS LOCATED ADJACENT TO UNIT.
- 2 PROVIDE POWER CONNECTION TO HEAT TRACE. COORDINATE EXACT LOCATION WITH PLUMBING CONTRACTOR.

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SHEET TITLE
UPPER FLOOR PLAN
- AREA A - POWER

EP-103A



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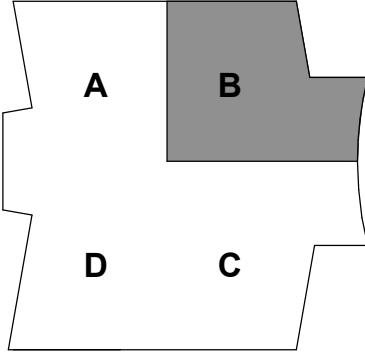
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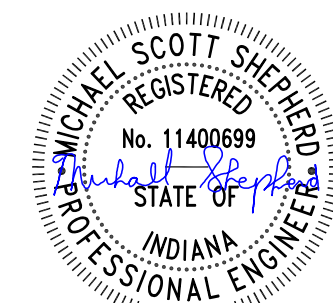
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KEY PLAN

SEAL | DATE 01/27/25



SHEET ISSUE		
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SHEET TITLE
UPPER FLOOR PLAN
- AREA B - POWER

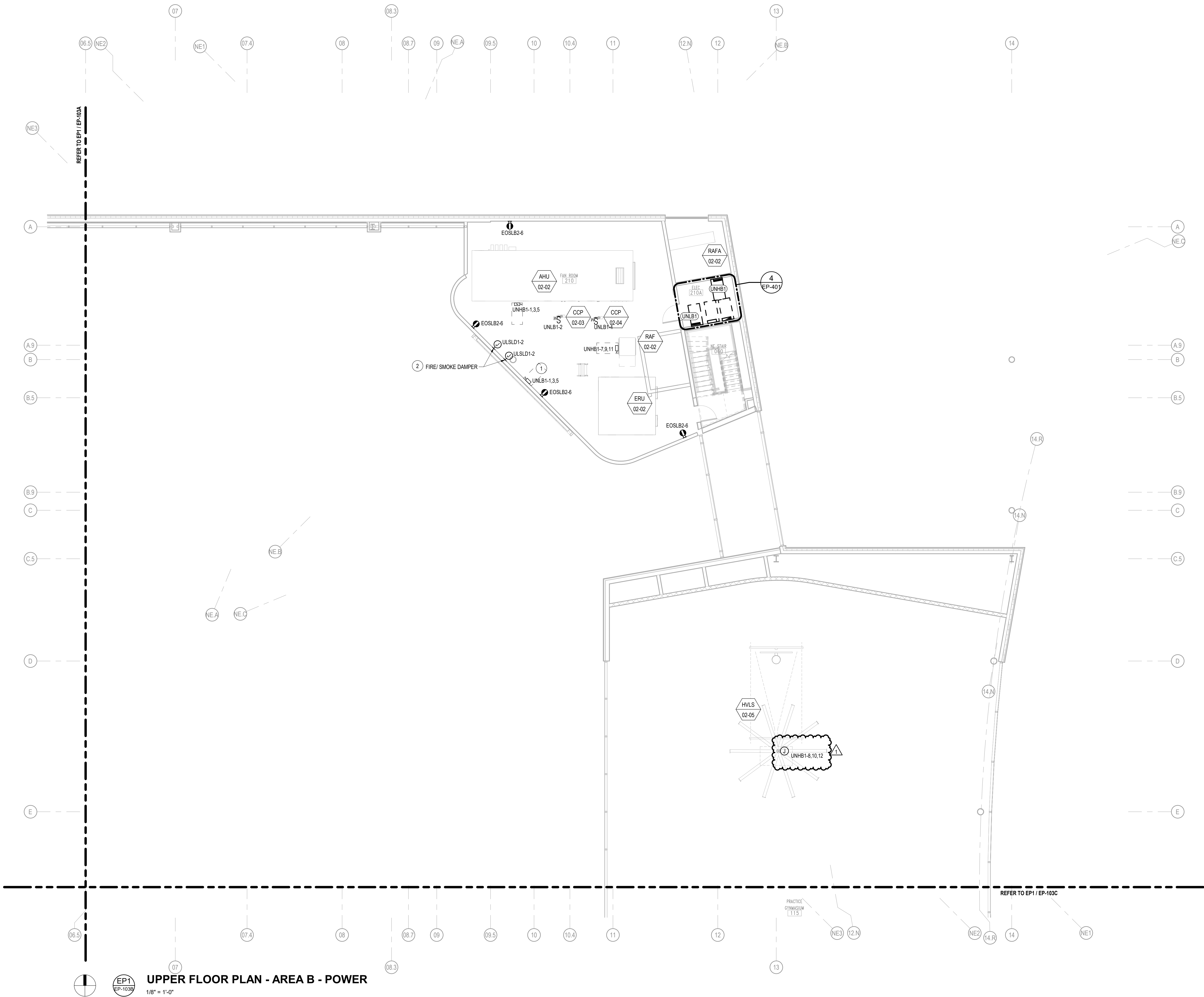
SHEET NUMBER
EP-103B

GENERAL NOTES

- CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.
- REFER TO DATA/TELECOM, AUDIO-VISUAL AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

SHEET KEYNOTES

- 100/3 DISCONNECT SWITCH FOR PRIMARY VIDEO SCREEN. EXACT LOCATION TO BE COORDINATED PRIOR TO INSTALLATION. ROUTE #3, 1#8G - 1 1/4" TO CIRCUIT INDICATED. COORDINATE FINAL CONNECTION TO SCREEN WITH MANUFACTURER.
- PROVIDE POWER CONNECTION TO FIRE ALARM EQUIPMENT. COORDINATE LOCATION SO THAT DEVICE IS LOCATED ADJACENT TO UNIT.

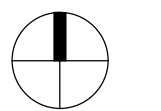
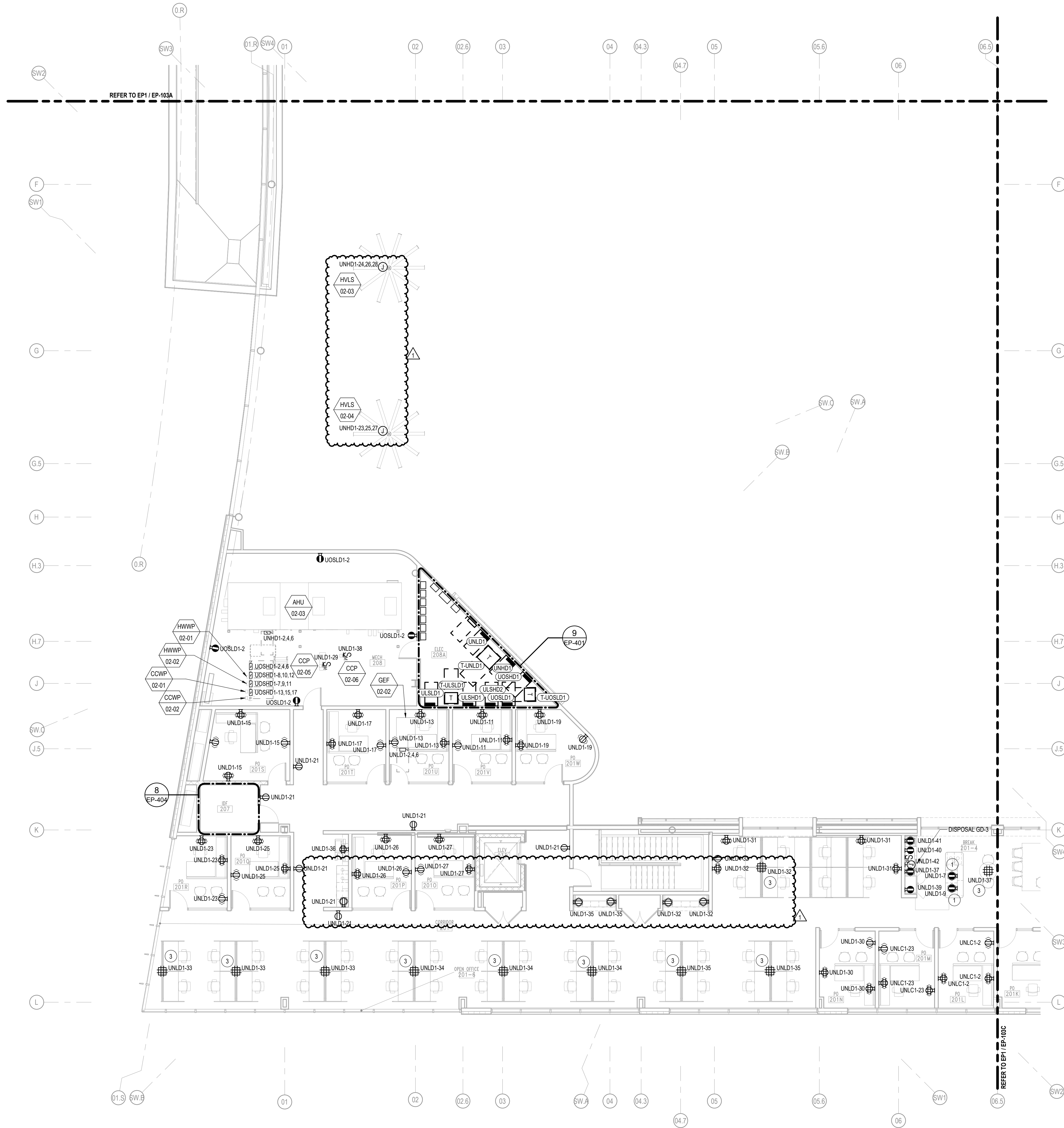


UPPER FLOOR PLAN - AREA B - POWER

EP1
EP-103B

1/8" = 1'-0"





UPPER FLOOR PLAN - AREA D - POWER

1/8" = 1'-0"

GENERAL NOTES

- CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.
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SHEET KEYNOTES

- DUPLEX RECEPTACLE FOR MICROWAVE. COORDINATE LOCATION WITH ARCHITECT.
- PROVIDE POWER CONNECTIONS TO ACCESS CONTROL PANEL. COORDINATE EXACT LOCATION PRIOR TO INSTALLATION.
- FLOOR BOX FOR FURNITURE WITH TWO DUPLEX RECEPTACLES AND TWO GANGS FOR LOW VOLTAGE DEVICES. PROVIDE 1 1/2" CONDUIT FOR COMMUNICATION CABLING AND COORDINATE COVER STYLE, FINISH, AND LOCATION WITH ARCHITECT.

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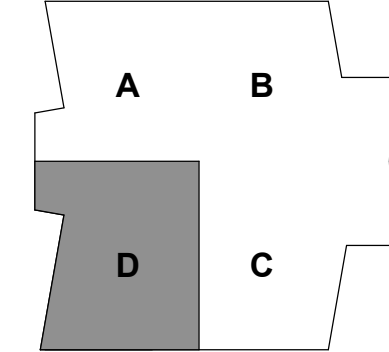
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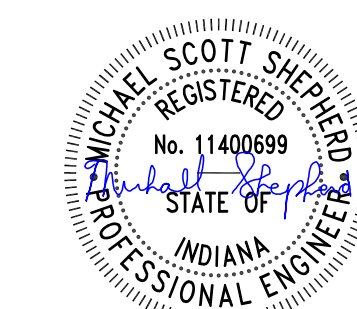
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KEY PLAN

SEAL | DATE 01/27/25



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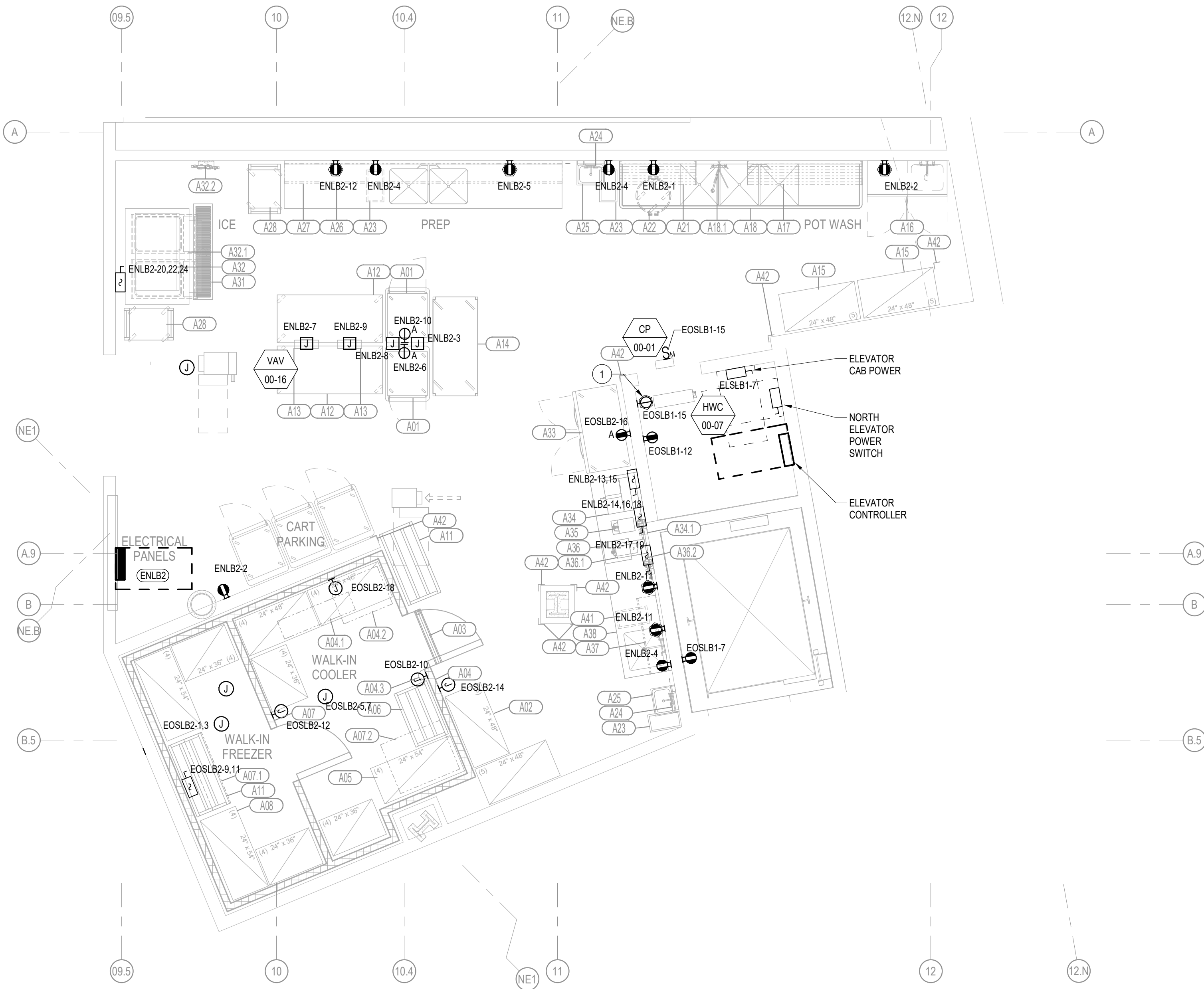
PROJECT NO. 23112.000

SHEET TITLE
**UPPER FLOOR PLAN
- AREA D - POWER**

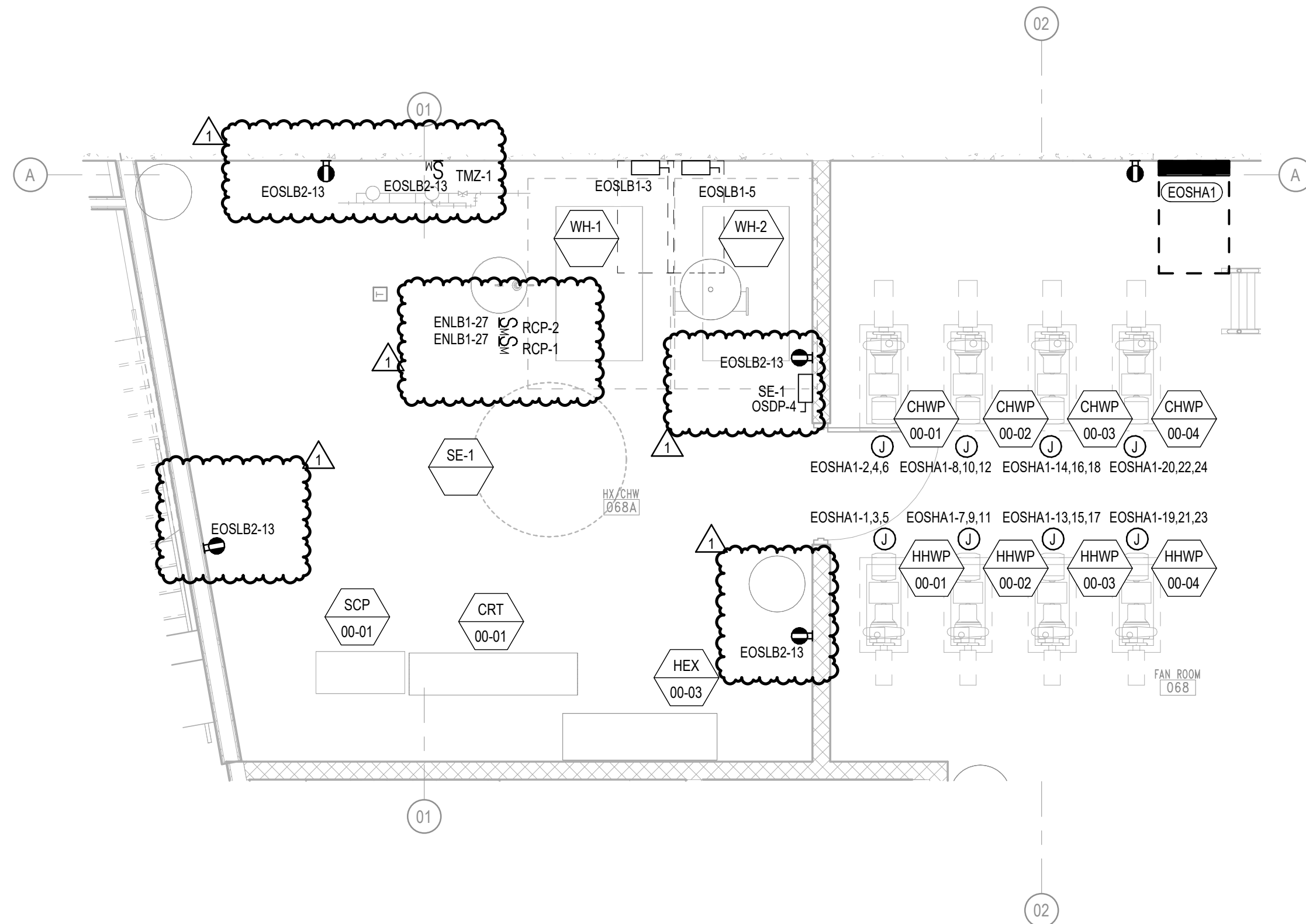
SHEET NUMBER

EP-103D

COMMISSARY KITCHEN EQUIPMENT ELECTRICAL CONNECTION SCHEDULE - QUAD B												
GENERAL NOTES: A. COORDINATE EXACT OUTLET AND DISCONNECT MEANS TYPE WITH FOOD SERVICE DRAWINGS/PROVIDER. MAKE ALL CHANGES AS REQUIRED. B. C.								ABBREVIATIONS: INT = INTEGRAL TO EQUIPMENT MIS = MOTOR RATED TOGGLE SWITCH REC = RECEPTACLE SERVES AS LOCAL DISCONNECT				
KEYED NOTES: 1.												
ITEM ID	NO.	EQUIPMENT TYPE	VOLTAGE	POLES	CALCULATED AMPS	APPARENT LOAD (VA)	PANEL	CIRCUIT #	BREAKER CIRCUIT	DISCONNECT	NEMA CONNECTION	NOTES
A01		HOT HOLDING CABINET	120 V	1	16.0 A	1920	ENLB2	6	2#12, #12G, 1/2"C.			
A01		HOT HOLDING CABINET	120 V	1	16.0 A	1920	ENLB2	10	2#12, #12G, 1/2"C.		5-20P	
A04		WALK-IN COOLER	120 V	1	12.0 A	1440	EOSLB2	14	2#12, #12G, 1/2"C.			
A04.1		EVAPORATOR COIL, +35F	120 V	1	1.6 A	190	EOSLB2	18	2#12, #12G, 1/2"C.			
A04.2		CONDENSER	208 V	2	6.3 A	1310	EOSLB2	5,7	2#12, #12G, 1/2"C.		30A/2P	
A04.3		AIR SHIELD	120 V	1	1.0 A	120	EOSLB2	10	2#12, #12G, 1/2"C.			
A07		WALK-IN FREEZER	120 V	1	12.0 A	1440	EOSLB2	12	2#12, #12G, 1/2"C.		M.T.S.	
A07.1		EVAPORATOR COIL, -10F	208 V	2	10.7 A	2230	EOSLB2	9,11	2#12, #12G, 1/2"C.		30A/2P	
A07.2		CONDENSER	208 V	2	16.4 A	3410	EOSLB2	1,3	2#10, #10G, 3/4"C.		30A/2P	
A13		DROP CORD REEL	120 V	1	16.0 A	1920	ENLB2	8	2#12, #12G, 1/2"C.			
A13		DROP CORD REEL	120 V	1	16.0 A	1920	ENLB2	3	2#12, #12G, 1/2"C.			
A13		DROP CORD REEL	120 V	1	16.0 A	1920	ENLB2	9	2#12, #12G, 1/2"C.			
A13		DROP CORD REEL	120 V	1	16.0 A	1920	ENLB2	7	2#12, #12G, 1/2"C.			
A22		TRASH REC 32 GAL	120 V	1	1.5 A	180	ENLB2	1	2#12, #12G, 1/2"C.			
A23		TRASH REC 23 GAL	120 V	1	1.5 A	180	ENLB2	4	2#12, #12G, 1/2"C.			
A23		TRASH REC 23 GAL	120 V	1	1.5 A	180	ENLB2	4	2#12, #12G, 1/2"C.			
A27		WORKTABLE REC	120 V	1	16.0 A	1920	ENLB2	5	2#12, #12G, 1/2"C.			
A27		WORKTABLE REC	120 V	1	16.0 A	1920	ENLB2	12	2#12, #12G, 1/2"C.			
A32		ICE MACHINE	208 V	3	6.1 A	2200	ENLB2	20,22,24	3#12, #12G, 1/2"C.		30A/3P	
A33		REFRIGERATOR REACH-IN	115 V	1	8.1 A	930	EOSLB2	16	2#12, #12G, 1/2"C.			5-15P
A34		COFFEE BREWER	208 V	2	28.8 A	6000	ENLB2	13,15	2#8, #10G, 3/4"C.		30A/2P	
A35		HOT WATER DISPENSER	208 V	3	16.7 A	6000	ENLB2	14,16,18	3#12, #12G, 1/2"C.		30A/3P	
A36		TEA BREWER	208 V	2	13.0 A	2700	ENLB2	17,19	2#12, #12G, 1/2"C.		30A/2P	
A38		WORKTABLE REC	120 V	1	16.0 A	1920	ENLB2	11	2#12, #12G, 1/2"C.			
A38		WORKTABLE REC	120 V	1	16.0 A	1920	ENLB2	11	2#12, #12G, 1/2"C.			
A41		TRASH REC 23 GAL	120 V	1	1.5 A	180	ENLB2	4	2#12, #12G, 1/2"C.			



EVENT LEVEL ENLARGED PLAN - FS COMMISSARY & KITCHEN 013



EVENT LEVEL ENLARGED PLAN - MECHANICAL ROOM 069A

GENERAL NOTES

- A. CONTRACTOR TO REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL MECHANICAL AND PLUMBING EQUIPMENT AND DEVICES INCLUDING INTERLOCK AND OTHER SPECIFIC REQUIREMENTS.
- B. REFER TO DATA/TELECOM, AUDIO-VISUAL AND SECURITY PLANS FOR ALL ITEMS, LOCATIONS, DEVICES AND EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR INCLUDING BUT NOT LIMITED TO ALL CONDUITS AND JUNCTION BOXES.

SHEET KEYNOTES

1. PROVIDE POWER CONNECTION TO HYDRONIC WALL CASSETTE. COORDINATE MOUNTING HEIGHT SO THAT RECEPTACLE IS LOCATED ADJACENT TO UNIT

IN128 - JAMES T. MORRIS ARENA

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IU Project NO. 20240127

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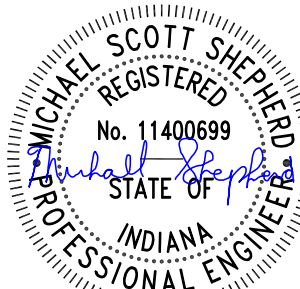
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Code Consultant
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816-806-3729

SEAL / DATE 01/27/25



SHEET ISSUE	
1	DO PROGRESS SET 07/18/24
2	DESIGN DEVELOPMENT 08/30/24
3	50% CONSTRUCTION DOCUMENTS 11/01/24
4	95% CONSTRUCTION DOCUMENTS 12/19/24
5	CONSTRUCTION DOCUMENTS 01/13/25
6	ADDENDUM 01 01/27/25

RATIO

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PROJECT NO. 23112.000

SHEET TITLE
ENLARGED PLANS - POWER

SHEET NUMBER

EP-402

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5	CONSTRUCTION DOCUMENTS	01/13/25
6	ADDENDUM 01	01/27/25

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SHEET TITLE

PANEL SCHEDULES

EP-600

LADP

Vols: 120/208V/3PH4W, 3PH4W
Phases: 3
Wires: 4

LOCATION: ELECTRICAL 008
SUPPLY FROM: T-LADP
KAIC: SEE STUDY

Main Breaker: 500 A
Amp Bussing: 600

CKT	CIRCUIT DESCRIPTION	Load Classification	LOAD (KVA)	TYPE	BREAKER RATING	
1	CNLA1	M, R, GC, G	64.2		225	3
2	ENLA1	R, GC, G	65.3		225	3
3	ENLA2	R, G	40.3		200	3
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Load Classifications:		Connected Load (VA)	Calc. Demand (VA)	Panel Totals:	KVA	A Notes:
(GC) - General, Continuous Equipment = Constant, 125%		5060	5060	Subtotal Connected Load:	190	527
(M) - Motor = 100% + 25% of largest		1700	2075	Subtotal Estimated Demand:	138	383
(R) - Receptacles = 10kVA @ 100% + Remainder @ 50%		114200	62100	Desired Spare Capacity:	20 %	
(G) - RECEPTACLE		400	400	Spare Capacity used:	28	77
R - RECEPTACLE		360	360	Total Est. Demand w/ Spare:	166	460
(GN) - General, Non Continuous Equipment = Constant, 100%		68150	68150			

Volts: 277/480V/3PH/4W, 3PH-4W
Phases: 3
Wires: 4

MSB

LOCATION: ELECTRICAL SERVICE ENTRY 067
SUPPLY FROM:
KAC: SEE STUDY

Main Breaker: 3000 A
Amp Bussing: 3000

CKT	CIRCUIT DESCRIPTION	Load Classification	LOAD (KVA)	TYPE	BREAKER RATING			
1	HADP	M, L, R, GC, G	461.5	LSI	800 3			
2	HBDP	M, L, R, GC, M	429.8	LSI	800 3			
3	HDDP	M, L, R, GC, G	176.7	LSI	400 3			
4	HDDP	M, L, R, GC, G	349.3	LSI	600 3			
5	T-LTV		100	LSI	350 3			
6	T-LAV	R,	5.8	LSI	175 3			
7	T-LSHOWDP	GC	120	LSI	225 3			
8	ATS LS (LSDP)	M, L, R, G	45.6	LSI	400 3			
9	ATS LR (LRDP)	M	43	LSI	225 3			
10	ATS OS (OSDP)	M, R, GC, M, G	432.3	LSI	600 3			
11	SPD	--	0		60 3			
12	SOLAR POWER		0		400 3			
13								
14								
15								
16								
17								
18								
19								
20								
Load Classifications:		Connected Load (VA)	Calc. Demand (VA)	Panel Totals:		KVA	Amps	Notes:
(GC) - General, Continuous Equipment = Constant, 125%		405652	405652	Subtotal Connected Load:		2164	2603	
(L) - Lighting = Constant, 125%		125595	156994	Subtotal Estimated Demand:		2003	2409	
(M) - Motor = 100% + 25% of largest		945719	970140	Desired Spare Capacity:		20 %		
(R) - Receptacles = 10kVA @ 100% + Remainder @ 50%		445170	227585	Spare Capacity used:		401	482	
Lighting		7517		Total Est. Demand w/ Spare:		2403	2891	
(M)		450	475					
(G)		7900	7900					
(F)		100000	100000					
GENERAL LOAD		0	0					
RECEPTACLE LOAD		1800	1800					
R - RECEPTACLE		12900	11450					
(GN) - General, Non Continuous Equipment = Constant, 100%		111390	111390					

[illegible][illegible]

Volts: 120/208/3PH4W, 3PH4W

Phases: 3

Wires: 4

LBQP

LOCATION: ELECTRICAL SERVICE ENTRY 067

SUPPLY FROM: T-LBQP

KM/C: SEE STUDY

Main Breaker: 500 A

Amp Bussing: 600

CKT	CIRCUIT DESCRIPTION	Load Classification	LOAD (KVA)	TYPE	BREAKER RATING
1	ENLB1				
2	CNLB1	M, R, GC, M	9.9		200 3
3	UNLB1	M, L, R,	22.5		200 3
4	ENLB2	M	27.4		200 3
5		R, GC	37.2		200 3
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Load Classifications:	Connected Load (VA)	Calc. Demand (VA)
(GC) - General, Continuous Equipment = Constant, 125%	19900	19900
(L) - Lighting = Constant, 125%	1882	
(M) - Motor = 100% + 25% of largest	44800	51050
(R) - Receptacles = 10kVA @ 100% + Remainder @ 50%	29460	19730
(M)	200	225
(G)	400	400
R - RECEPTACLE	360	360

Panel Totals:	KVA	A	Notes:
Subtotal Connected Load:	97	269	
Subtotal Estimated Demand:	94	261	
Desired Spare Capacity:	20 %		
Spare Capacity used:	19	52	
Total Est. Demand w/ Spare:	113	313	

Branch Panel: ENLB1

VOLTS: 120/208V/3PH/4W

PHASES: 3

WIRES: 4

MOUNTING: SURFACE

LOCATION: ELECTRICAL SERVICE ENTRY 067

SUPPLY FROM: LBDP

KAIC: SEE STUDY

KAIC AVAILABLE: SEE STUDY

MAIN BREAKER: NONE

AMP BUSSING: 200

NEUTRAL BUS: WITH

IG BUS: WITHOUT

CKT	Circuit Description	Load Class	Type	BRKR	ØA	ØB	ØC	BRKR	Type	Load Class	Circuit Description	CKT
1	RM 064	R		20 1	360	500						2
3	RM 064	R		20 1		360	500					4
5	RM 065	R		20 1			540	500	3	20	GC RETRACTABLE SEATING	6
7	COORIDOR	R		20 1	1620	500						8
9	SCORE BOARD/GAME CLOCK	R		20 1		360	500					10
11	CCP 00-01	M		20 1			1200	500	3	20	GC RETRACTABLE SEATING	12
13	CCP 00-02	M		20 1	1200							14
15	AV RECEPTACLES	R		20 1		180	0		1	20	-- SPARE	16
17	AV RECEPTACLES	R		20 1			180	0	1	20	-- SPARE	18
19	AV RECEPTACLES	R		20 1	180	0			1	20	-- SPARE	20
21	AV RECEPTACLES	R		20 1		180	0		1	20	-- SPARE	22
23	AV RECEPTACLES	R		20 1			180	0	1	20	-- SPARE	24
25	AV RECEPTACLES	R		20 1	180	0			1	20	-- SPARE	26
27	RCP-1, RCP-2	M		20 1		200	--		1	--	-- SPACE	28
29	SPACE			--				--	--	--	-- SPACE	30
31	SPACE			--				--	--	--	-- 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 (kVA)					4540	2280	3100					
Total Load (A)					39	19	27					
					ØA	ØB	ØC					
Load Classifications:					Conn. Load (VA)	Calc. Demand (VA)	Panel Totals:			kVA	A	Notes:
(M) - Motor = 100% + 25% of largest					2400	2700	Subtotal connected load:			10	28	
(R) - Receptacles = 10kVA @ 100% + Remainder @ 50%					4320	4320	Subtotal Estimated Demand:			10	28	
(G) - General, Continuous Equipment = Constant, 125%					3000	3000	Desired Spare Capacity:			20	%	
(M)					200	225	Spare Capacity Used:			2	6	
							Total Est. Demand w/ Spare:			12	34	

Branch Panel: ENHB1																			
VOLTS: 277/480V/3PH/4W					LOCATION: ELECTRICAL SERVICE ENTRY 067					MAIN BREAKER: NONE									
PHASES: 3					SUPPLY FROM: HBDP					AMP BREAKING: 100									
WIRES: 4					KAIC: SEE STUDY					NEUTRAL BUS: WITH									
MOUNTING: SURFACE					KAIC AVAILABLE: SEE STUDY					IG BUS: WITHOUT									
CKT		Circuit Description	Load Class	Type	BRKR		ØA		ØB		ØC		BRKR	Type	Load Class	Circuit Description			CKT
1						30	3333	2500					3	20	M	DOCK LIFT			2
3		TRASH COMPACTOR 10 HP	GC						3333	2500									4
5											3333	2500							6
7		CORRIDOR LTS	L		20	1	645	853					1	20	L	CORRIDOR LTS			8
9		KITCHEN 063/ 064	L		20	1			390	320			1	20	L	LTS 055,055A,057			10
11		LTS BOH LEVEL 2	L		20	1					1017	0		1	20	--	SPARE		12
13		SPARE	--		20	1	0	0					1	20	--	SPARE			14
15		SPARE	--		20	1			0	0			1	20	--	SPARE			16
17		SPARE	--		20	1					0	0		1	20	--	SPARE		18
19		SPARE	--		20	1	0	0					1	20	--	SPARE			20
21		SPARE	--		20	1			0	0			1	20	--	SPARE			22
23		SPARE	--		20	1					0	0		1	20	--	SPARE		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 (KVA)							7331		6544		6850								
Total Load (A)							27		24		25								
							ØA		ØB		ØC								

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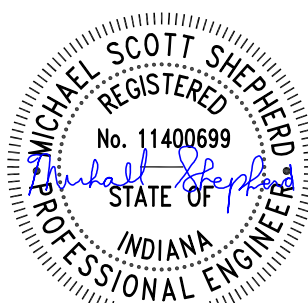
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SEAL | DATE 01/27/25

[illegible]

RATIO

PROJECT NO.	23112.000
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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER

EP-601

Branch Panel: CNLA1														
VOLTS: 120/208V/3PH/4W				LOCATION: KITCHEN 102				MAIN BREAKER: 225 A						
PHASES: 3				SUPPLY FROM: LADP				AMP BUSSING: 225						
WIRES: 4				KAIC: SEE STUDY				NEUTRAL BUS: WITH						
MOUNTING: RECESSED				KAIC AVAILABLE: SEE STUDY				IG BUS: WITHOUT						
CKT	Circuit Description	Load Class	Type	BRKR	ØA	ØB	ØC	BRKR	Type	Load Class	Circuit Description	CKT		
1	B45 POS SYSTEM	R	20	1	1440	630		1	20	R	B46 WARMING DRAWER	2		
3	B14 REFRIGERATED PREP...	R	20	1		730	630		1	20	R	B46 WARMING DRAWER	4	
5	B23 WORKTABLE REC	R	20	1			3840	750	1	20	R	B18 DUMP STATION	6	
7	B21 EXHAUST HOOD	G	20	1	1920	--			1	--	--	SHUNT TRIP	8	
9	B39 POPCORN POPPER	R	20	1		1800	1920		1	20	R	B44 CONCESSION	10	
11	B38 HOT FOOD DISPENSER	R	20	1			840	1800	1	20	R	B39 POPCORN POPPER	12	
13	B42 PRETZEL DISPLAY	R	20	1	1500	840			1	20	R	B38 HOT FOOD DISPENSER	14	
15	B51 SELF ORDER KIOSK	R	20	1		1440	1440		1	20	R	B51 SELF ORDER KIOSK	16	
17	B41 HOT DOG GRILL	R	20	1			1650	1440		1	20	R	B45 POS SYSTEM	18
19	B12 TRASH REC	R	20	1	360	720			1	20	R	B31 TRASH REC	20	
21	B12 TRASH REC	R	20	1		360	3840		1	20	R	B28 WORKTABLE REC	22	
23	B42 PRETZEL DISPLAY	R	20	1			1500	1650		1	20	R	B41 HOT DOG GRILL	24
25	B45 POS SYSTEM	R	20	1	1500	1440			1	20	R	B43.1 CARBONATOR	26	
27	OVERHEAD COILING DOOR	M	20	1		200	360		1	20	R	B48 SODA/VICE DISPENSER	28	
31	SPARE	--	20	1	0	0		0	0	1	20	--	SPARE	32
33	SPARE	--	20	1			0	0		1	20	--	SPARE	34
35	SPARE	--	20	1			0	0		1	20	--	SPARE	36
37	SPARE	--	20	1	0	0			1	20	--	SPARE	38	
39	SPARE	--	20	1			0	0		1	20	--	SPARE	40
41	SPARE	--	20	1				0	0	1	20	--	SPARE	42
Total Load (kVA)					25643	29163	29433							
Total Load (A)					214	248	250							
					ØA	ØB	ØC							
Load Classifications:					Conn. Load (VA)	Calc. Demand (VA)	Panel Totals:		KVA	A	Notes:			
(M) - Motor = 100% + 25% of largest					1700	2075	Subtotal connected load:		84	234				
(R) - Receptacles = 10kVA @ 100% + Remainder @ 50%					76560	44280	Subtotal Estimated Demand:		50	140				
(GC) - General, Continuous Equipment = Constant, 125%					2060	2060	Desired Spare Capacity:		40	%				
(GN) - General, Non Continuous Equipment = Constant, 100%					1920	1920	Spare Capacity Used:		20	56				
							Total Est. Demand w/ Spare:		70	196				

A. REFER TO ARCHITECTURAL CONSTRUCTION DOCUMENTS FOR TYPES OF
CEILINGS AND MATERIALS. COORDINATE LIGHTING FIXTURE CEILING
CUTOUTS AND SIZES. COORDINATE WITH ARCHITECT PRIOR TO
RELEASE OF LIGHTING FIXTURES. COORDINATE WITH ARCHITECTURAL
REFLECTED CEILING PLAN DRAWINGS.

B. FIELD MEASURE ALL LIGHTING Coves TO DETERMINE EXACT LENGTHS.
LIGHTING FIXTURES SHALL PROVIDE UNIFORM LIGHTING FROM END TO
END OF EACH MAXIMUM 10' SPAN ALLOWED AT EACH END OF COVE
FOR CONTINUOUS INSTALLATIONS.

C. REFER TO LIGHTING CONTROLS SEQUENCE OF OPERATIONS SCHEDULE
FOR CONTROLS PROGRAMMING REQUIREMENTS IN EACH SPACE.
COORDINATE LIGHTING CONTROL SEQUENCE OF OPERATIONS
QUANTITIES ONLY. COORDINATE LIGHTING LAYOUT WITH ACTUAL
EQUIPMENT LAYOUT AND WORK OF OTHER TRADES. FIXTURES SHALL BE
PENDANT, WALL OR CEILING MOUNTED AS REQUIRED TO PROVIDE
EVENLY DISTRIBUTED LIGHTING. PROVIDE PROTECTIVE GRATE, LENS AND
TO FACILITATE MAINTENANCE OF ALL LIGHTING IN ROOM.

D. ALL LIGHTING CONTROL WIRING SHALL BE ROUTED IN CONDUIT.

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SEAL DATE	01/27/25
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6	ADDENDUM 01	01/27/25

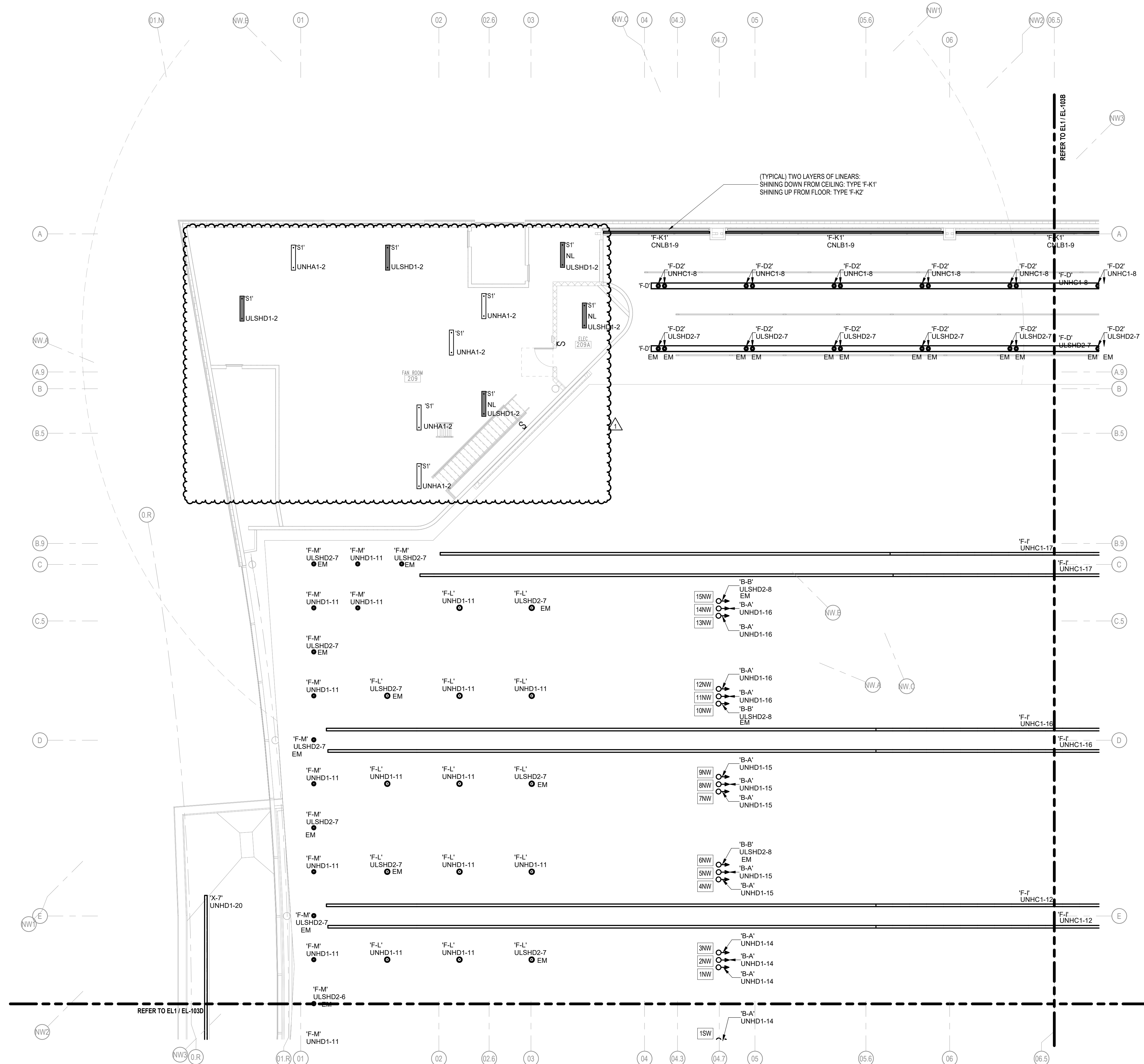
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PROJECT NO. 23112.000

SHEET TITLE
UPPER FLOOR PLAN
- AREA A - LIGHTING
LAYOUT

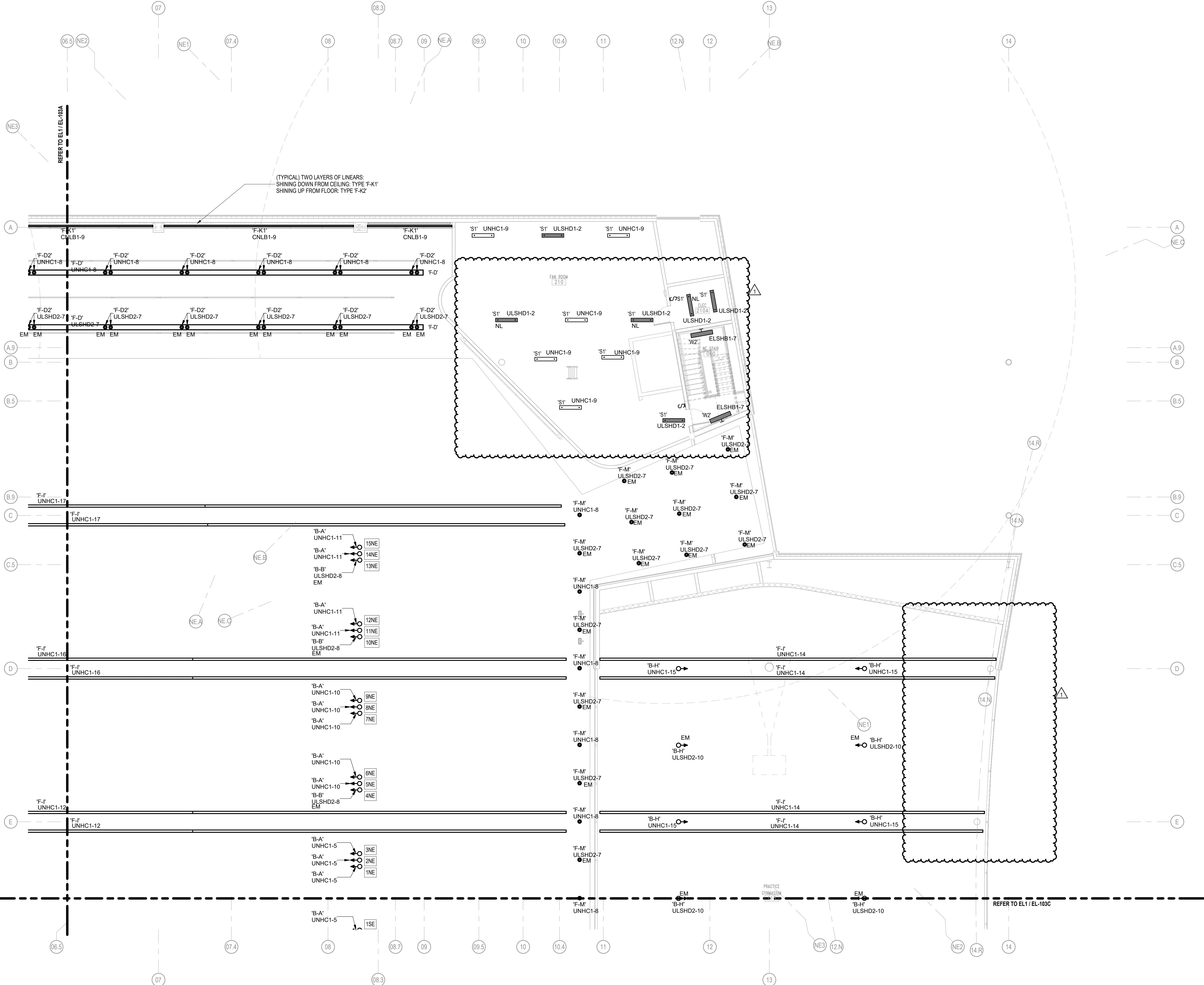
SHEET NUMBER

EL-103A



THIRD LEVEL FLOOR PLAN - AREA A - LIGHTING

$$1/8" = 1'-0"$$



- A. REFER TO ARCHITECTURAL CONSTRUCTION DOCUMENTS FOR TYPES OF CEILING AND MATERIALS. COORDINATE LIGHTING FIXTURE CEILING HEIGHTS WITH ARCHITECTURAL SPECIFICATIONS. COORDINATE RELEASE OF LIGHTING FIXTURES. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN DRAWINGS.
- B. FIELD MEASURE ALL LIGHTING COVES TO DETERMINE EXACT LENGTHS. LIGHTING FIXTURES SHALL PROVIDE UNIFORM ILLUMINATION FROM END TO END. MAXIMUM SPACING SHALL BE ALLOWED AT EACH END OF COVE FOR CONTINUOUS INSTALLATIONS.
- C. REFER TO LIGHTING CONTROLS SEQUENCE OF OPERATIONS SCHEDULE FOR CONTROLS PROGRAMMING REQUIREMENTS IN EACH SPACE.
- D. LIGHTING FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH LOADS FOR QUANTITIES ONLY. COORDINATE LIGHTING LAYOUT WITH ACTUAL EQUIPMENT LAYOUT AND WORK OF OTHER TRADES. FIXTURES SHALL BE PENDANT, WALL OR CEILING MOUNTED AS REQUIRED TO PROVIDE EVENLY DISTRIBUTED LIGHTING LEVELS AT FLOOR LEVEL AND TO FACILITATE THE OPERATION OF THE SPACE.
- E. ALL LIGHTING CONTROL WIRING SHALL BE ROUTED IN CONDUIT.

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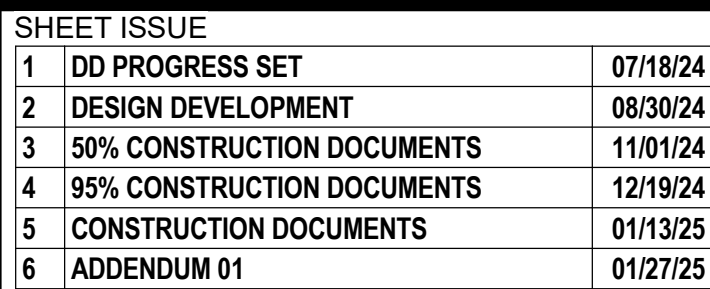
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SEAL | DATE 01/27/25

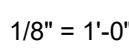


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PROJECT NO.	23112.000
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SHEET NUMBER

EL-103B



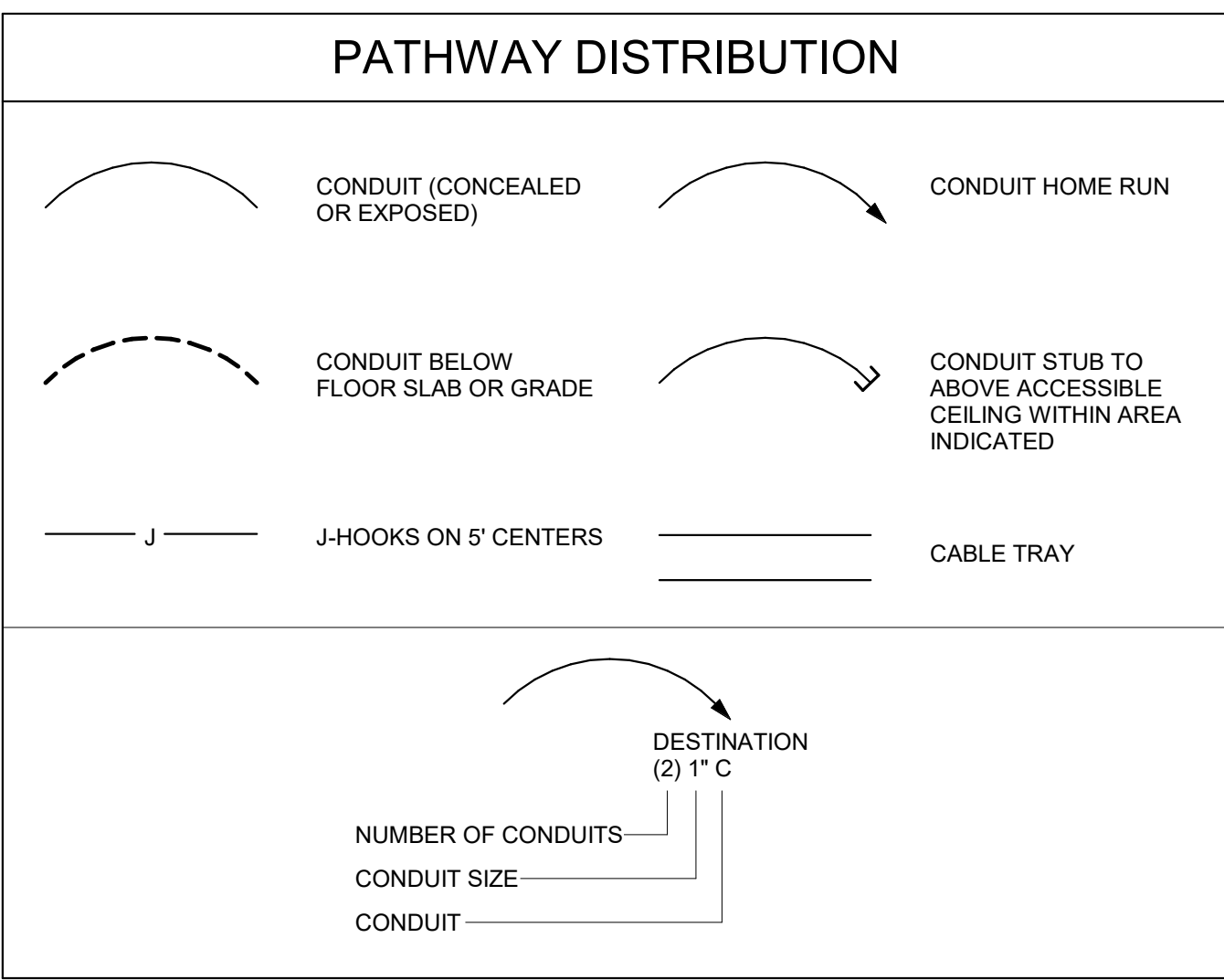
EL-103C

GENERAL ABBREVIATIONS			
--	NOT APPLICABLE	L	LENGTH, LEFT
@	AT	L/R	LEFT/RIGHT
3DC	3D CONTROLLER	LAN	LOCAL AREA NETWORK
AC	AIR CONDITIONING	LB	POUNDS
ABV	ABOVE	LF	LINEAR FEET
AC	ALTERNATING CURRENT	LTG	LIGHTING
ADA	AMERICANS WITH DISABILITIES ACT	MAX	MAXIMUM
ADJ	ADJUSTABLE	MDF	MAIN DISTRIBUTION FRAME
AFC	ABOVE FINISHED CEILING	MECH	MECHANICAL
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	MMFO	MULTIMODE FIBER OPTIC CABLE
AHJ	AUTHORITY HAVING JURISDICTION	MTD	MOUNTED
ALT	ALTERNATE	NA	NOT APPLICABLE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	NC	NORMALLY CLOSED
ARCH	ARCHITECT, ARCHITECTURAL	NEC	NATIONAL ELECTRICAL CODE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOC.
AUX	AUXILIARY	NIC	NOT IN CONTRACT
AWG	AMERICAN WIRE GAUGE	NO	NORMALLY OPEN
		NTS	NOT TO SCALE
BFC	BELOW FINISHED CEILING	OC	ON CENTER
BFF	BELOW FINISHED FLOOR	OD	OUTSIDE DIAMETER
BLOG	BUILDING	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
BOH	BACK OF HOUSE	OFE	OWNER FURNISHED EQUIPMENT
BOP	BOTTOM OF PIPE	OFOI	OWNER FURNISHED OWNER INSTALLED
BOS	BOTTOM OF STRUCTURE		
C	CONDUIT	P	PRIMARY
CAT	CATEGORY CABLE	PID	PART OF
CCT	CIRCUIT	PC	PERSONAL COMPUTER
CL	CENTER LINE	PDU	POWER DISTRIBUTION UNIT
CLG	CEILING	PGM	PROGRAM
CMU	CONCRETE MASONRY UNIT	PH	PHASE
COL	COLUMN	PNL	PANEL
CTRL	CONTROL	PROC	PROCESSOR
		PRH	PROJECT RECEPTACLE HEIGHT
D	DEPTH, DEEP	PRX	PROXIMITY SENSOR
DC	DIRECT CURRENT	PS	POWER SUPPLY
DEL	DOWNSTAGE CENTER	PSF	POUNDS PER SQUARE FOOT
DEG	DEGREES	PSH	PROJECT SWITCH HEIGHT
DEMO	DEMOLITION	PSI	POUNDS PER SQUARE INCH
DIP	DIRECTOR'S FLOOR POCKET	PTH	PASS THROUGH
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
DM	DIMENSION	PWR	POWER
DIV	DIVISION	QTY	QUANTITY
DS	DOWNSTAGE		
DSL	DOWNSTAGE LEFT	R	RIGHT
DSR	DOWNSTAGE RIGHT	RCF	REFLECTED CEILING PLAN
DWG	DRAWING	REF	REFERENCE, REFER
		REIN	REINFORCING
EA	EACH	REQD	REQUIRED
EC	ELECTRICAL CONTRACTOR	REV	REVISION, REVISE
EL	ELEVATION	RM	ROOM
ELEC	ELECTRICAL	RO	ROUGH OPENING
ENCL	ENCLOSURE	RPM	REVOLUTIONS PER MINUTE
EQ	EQUAL		
EQUIP	EQUIPMENT	SCS	SURFACE, SECONDARY
ER	EQUIPMENT RACK	SCS	STRUCTURED CABLING SYSTEM
ESW	ETHERNET SWITCH	SF	SQUARE FEET
EXIST	EXISTING	SOFT	SIMILAR
		SL	STAGE LEFT
FA	FIRE ALARM	SMFO	SINGLE MODE FIBER OPTIC CABLE
FB	FLOOR BOX	SMP	STAGE MANAGER POSITION
FLEX	FLEXIBLE	SPEC	SPECIFICATION
FLR	FLOOR	SQ	SQUARE
FO	FINISHED OPENING	SR	STAGE RIGHT
FPH	FRONT OF HOUSE	STD	STANDARD
FIB	FIBER OPTIC PATCHBAY	STP	SHIELDED TWISTED PAIR
FPM	FEET PER MINUTE	SURF	SURFACE
FT	FOOT, FEET	SUSP	SUSPEND
FV	FIELD VERIFY		
		TBD	TO BE DETERMINED
GND	GROUND	THRU	THROUGH
GA	GAUGE	TYP	TYPICAL
		UC	UPSTAGE CENTER
H	HEIGHT	UL	UNDERWRITERS LABORATORIES, INC.
HL	HOUSE LEFT	UNO	UNLESS NOTED OTHERWISE
HMP	HOUSE MANAGER POSITION	UPS	UNINTERRUPTIBLE POWER SUPPLY
HOR	HORIZONTAL	US	UPSTAGE
HP	HORSEPOWER	USL	UPSTAGE LEFT
HR	HOUSE RIGHT	USR	UPSTAGE RIGHT
HZ	HERTZ	USB	UNIVERSAL SERIAL BUS
		UTP	UNSHIELDED TWISTED PAIR
I/O	INPUT/OUTPUT	V	VOLT
IDF	INSIDE DIAMETER	VA	VOLT-AMPERE
IDG	INTERMEDIATE DISTRIBUTION FRAME	VERT	VERTICAL
IG	ISOLATED GROUND	VIF	VERIFY IN FIELD
ISO	ISOLATED		
		W	WITH
JB	JUNCTION BOX	W/O	WITHOUT
JBD	JUNCTION BOX - DATA	WP	WEATHERPROOF
JBS	JUNCTION BOX - SYSTEM POWER	WT	WEIGHT
KPD	KEYPAD		
KW	KILOWATT		

AUDIO VISUAL ABBREVIATIONS			
--	NOT APPLICABLE	KVM	KEYBOARD VIDEO MOUSE
ADA	AUDIO DISTRIBUTION AMPLIFIER	LA	LINE AMPLIFIER
AES	AUDIO ENGINEERING SOCIETY	LM	LIMITER
ALS	ASSISTED LISTENING SYSTEM	LL	LINE LEVEL
AMP	AMPLIFIER		
ANT	ANTENNAE	MATV	MASTER ANTENNA TELEVISION
ANT DA	ANTENNA DISTRIBUTION AMPLIFIER	MIC	MICROPHONE
APB	AUDIO PATCH BAY	MICPRE	MICROPHONE PREAMP
AV	AUDIO VIDEO	MIX	MIXER
AVS	AUDIO VIDEO SWITCHER	ML	MICROPHONE LEVEL
		MOD	MODULATOR
BR	BLU-RAY DISC PLAYER	MON	MONITOR / VIDEO DISPLAY
BDR	BLU-RAY DISC RECORDER	MTX	MULTITRACK PLAYER/RECORDER
BGM	BACKGROUND MUSIC PLAYER		
		NG	NOISE GENERATOR
CAM	CAMERA		
CATV	CABLE TELEVISION	PA	PUBLIC ADDRESS
CCTV	CLOSED CIRCUIT TELEVISION	PAD	AUDIO ATTENUATOR
CCU	CAMERA CONTROL UNIT	PEQ	PARAMETRIC EQUALIZER
CDP	COMPACT DISC PLAYER	PSP	POWERED SPEAKER
CG	CHARACTER GENERATOR	PTZ	PAN/TILT/ZOOM
CONV	CONVERTER		
CU	COLLABORATION UNIT	REC	RECORDER
		SATRX	SATELLITE RECEIVER
DA	DISTRIBUTION AMPLIFIER	SB	SCOREBOARD
DAN	DIGITAL AUDIO NETWORK	SC	SCAN CONVERTER
DM	DIGITAL MEDIA	SDI	SERIAL DIGITAL INTERFACE
DMA/MTX	DIGITAL MEDIA MATRIX	SPOT	SINGLE POLE DOUBLE THROW
DMP	DIGITAL MEDIA PRESENTATION SWITCHER	SPC	SYNC PULSE GENERATOR
DMR	DIGITAL MEDIA RECORDER	SPL	SPLITTER
DMRX	DIGITAL MEDIA RECEIVER / DECODER	SPK	SPEAKER
DMTX	DIGITAL MEDIA TRANSMITTER / ENCODER	SPLT	SPLIT
DMU	DIGITAL MESSAGE UNIT	SPST	SINGLE POLE SINGLE THROW
DQC CAM	DOCUMENT CAMERA	STREAM	DIGITAL VIDEO STREAMING
DPT	DISPLAY PORT	SUM	AUDIO SUMMING DEVICE
DPST	DOUBLE-POLE, DOUBLE-THROW	SW	SWITCHER
DPST	DOUBLE-POLE, SINGLE-THROW		
DSP	DIGITAL SIGNAL PROCESSOR	TD	THROW DISTANCE
DVE	DIGITAL VIDEO EFFECTS	TP	TOUCH PANEL
DVR	DIGITAL VIDEO RECORDER	TV	TELEVISION
		VBS	VIDEO BURST SYNC
EBU	EUROPEAN BROADCASTING UNION	VC	VOLUME CONTROL
EQ	EQUALIZER	VCA	VOLTAAGE CONTROLLED AMPLIFIER
		VDA	VIDEO DISTRIBUTION AMPLIFIER
FC	FORMAT CONVERTER	VGA	VIDEO GRAPHICS ARRAY
FPM	FLAT PANEL MONITOR	VPR	VIDEO PROJECTOR
FOTX	FIBER OPTIC TRANSMITTER	VPB	VIDEO PATCH BAY
HDMI	HIGH DEFINITION MULTIMEDIA INTERFACE	VS	VECTOR SCOPE
HDRX	HDMI RECEIVER	VSG	VIDEO SYNC GENERATOR
HDSDI	HD SERIAL DIGITAL INTERFACE	VSR	VIDEO SERVER
HDXT	HDMI TRANSMITTER	VSW	VIDEO SWITCH
		VTC	VIDEO TELECONFERENCING SYSTEM
ICOM	INTERCOM	WVP	VIDEO WALL PROCESSOR
IFB	INTERRUPTED FOLDBACK		
IPTV	INTERNET PROTOCOL TELEVISION	WFM	WAVEFORM MONITOR
		WMS	WIRELESS MICROPHONE SYSTEM
JBC	JUNCTION BOX - CONTROL	WTX	WIRELESS TRANSMITTER
JBE	JUNCTION BOX - ENG TRUCKS		
JBL	JUNCTION BOX - AUDIO LINE LEVEL	XFMR	TRANSFORMER
JBM	JUNCTION BOX - AUDIO MIC LEVEL	XOVR	CROSSOVER
JBR	JUNCTION BOX - RADIO		
JBS	JUNCTION BOX - SPEAKER		
JBT	JUNCTION BOX - BROADCAST		
JBV	JUNCTION BOX - VIDEO		

ROUGH-IN BOX SCHEDULE	
TYPE 1	RECESSED, 1-GANG BOX, 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 1-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE; 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED: 1-GANG DIE CAST BOX, 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE 2	RECESSED, 4 11/16" SQUARE BOX, 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 2-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE; 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED: 2-GANG DIE CAST BOX, 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE 3	RECESSED, 3-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 3-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE; 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED: 3-GANG DIE CAST BOX, 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE 4	RECESSED, 4-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 4-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE; 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED: 4-GANG DIE CAST BOX, 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE 5	RECESSED, 5" SQUARE BOX, 2 1/2" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/RING EDGE TO BE FLUSH WITH FINISHED WALL.
TYPE 12	RECESSED, 4 11/16" SQUARE BOX, 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 1-GANG BOX, 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE; 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED: 1-GANG DIE CAST BOX, 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE A	JUNCTION BOX (HxWxD) WITH SCREW COVER. PROVIDE NEMA TYPE 1 AT INDOOR LOCATIONS, PROVIDE NEMA TYPE 3R AT OUTDOOR LOCATIONS. PAINTED AT EXPOSED LOCATIONS.
TYPE B	JUNCTION BOX (HxWxD) WITH HINGED COVER. PROVIDE NEMA TYPE 1 AT INDOOR LOCATIONS, PROVIDE NEMA TYPE 3R AT OUTDOOR LOCATIONS. PAINTED AT EXPOSED LOCATIONS.
TYPE C	JUNCTION BOX (HxWxD) WITH LOCKING HINGED COVER. PROVIDE NEMA TYPE 1 AT INDOOR LOCATIONS, PROVIDE NEMA TYPE 3R AT OUTDOOR LOCATIONS. PAINTED AT EXPOSED LOCATIONS.

CONDUIT AND PATHWAY NOTES	
1.	COORDINATE LOCATION OF EQUIPMENT, JUNCTION BOXES, OUTLETS, CONDUIT, ETC. ACCORDING TO THE PROJECT GENERAL CONDITIONS.
2.	PROVIDE A COMPLETE RACEWAY SYSTEM TO CONSIST OF METALLIC CONDUIT (EXCLUDING IN-GROUND PATHWAY), JUNCTION BOXES, DEVICE BACK BOXES, AND FITTINGS UNLESS NOTED OTHERWISE.
3.	THE DRAWINGS INDICATE ONE ROUTING METHOD OF THE CABLING PATHWAY. CHANGES MAY BE MADE TO THE PATHWAY SYSTEM ROUTING TO ACCOMMODATE SITE CONDITIONS OR TO SIMPLIFY INSTALLATION PROVIDING THAT NOTED CONDUIT SIZE OR LARGER IS MAINTAINED AND DISTANCE LIMITATIONS LISTED BELOW ARE NOT EXCEEDED.
4.	CONDUIT STUBS FROM DEVICES TO THE NEAREST CABLE TRAY, ACCESSIBLE CEILING, OR OTHER DESTINATIONS SHALL BE CONTINUOUS.
5.	UNLESS NOTED OTHERWISE, CONDUIT IS 3/4 INCH TRADE SIZE.
6.	SHOULD ROUGH-IN BOX DEVICE EXIST WITH NO CONDUIT INDICATED TO OR FROM, PROVIDE 3/4 INCH TRADE SIZE CONDUIT FROM DEVICE TO ACCESSIBLE CEILING.
7.	CONDUIT BODIES (LB'S) ARE NOT PERMITTED.
8.	CONDUITS SHALL BE REAMED TO ELIMINATE SHARP EDGES. METALLIC CONDUITS SHALL BE TERMINATED WITH AN INSULATED BUSHING. PULL STRINGS WITH A MINIMUM PULL RATING OF 400 POUNDS SHALL BE PROVIDED.
9.	FOR CONDUIT WITH AN INTERNAL DIAMETER GREATER THAN 2 INCHES, MAINTAIN A BEND RADIUS OF AT LEAST 10 TIMES THE INTERNAL CONDUIT DIAMETER.
10.	BENDS IN THE CONDUIT SHALL NOT CONTAIN ANY KINKS OR OTHER DISCONTINUITIES. FLEX IS NOT PERMITTED UNLESS NOTED OTHERWISE.
11.	NO SECTION OF CONDUIT SHALL EXCEED 100 FEET. RUNS IN EXCESS OF 100 FEET REQUIRE A PULL BOX / HANDHOLE / VAULT.
12.	NO SECTION OF CONDUIT SHALL CONTAIN MORE THAN TWO 90 DEGREE BENDS, OR EQUIVALENT 180 DEGREES, BETWEEN PULL BOXES.
13.	PULL BOX SHALL NOT BE USED IN LIEU OF A BEND. CONDUITS MUST RUN STRAIGHT THROUGH A PULL BOX WITH THE BEND LOCATED EITHER BEFORE OR AFTER THE PULL BOX.
14.	PULL BOX LENGTH TO BE NO LESS THAN 8 TIMES THE DIAMETER OF THE LARGEST TERMINATING CONDUIT. PULL BOX WIDTH TO BE NO LESS 3/4 THE LENGTH.
15.	PROVIDE COVERS WITH LABELING FOR JUNCTION BOXES, BACK BOXES AND PULL BOXES WITHOUT FACEPLATES. LABELING MATCHES DEVICE NAME AS INDICATED ON DRAWINGS, FOR EXAMPLE: "AV1", "ML".
16.	ALL CONDUITS ENTERING OR EXITING EQUIPMENT RACKS TO BE ISOLATED WITH A NON-METALLIC SPACER OR FITTING.
17.	PROVIDE CONDUIT TO CROSS INACCESSIBLE CEILINGS OR IN AREAS WITHOUT CEILINGS UNLESS NOTED OTHERWISE.
18.	PROVIDE CONDUIT IN EXPOSED AREAS, MECHANICAL SPACES, FOOD SERVICES AREAS, AND ELEVATOR CONTROL ROOMS.
19.	REGARDLESS OF PATHWAY TYPE, ALL CABLING SHALL BE SUPPORTED AT 4 FEET MAXIMUM INTERVALS. CABLES SHALL NOT BE LAID DIRECTLY ON THE CEILING TILE OR RAILS OR STRAPPED TO CONDUIT.
20.	ROUTE CONDUIT WITH OTHER BUILDING SERVICES AND CONCEAL WHENEVER POSSIBLE. GROUP AND RUN PARALLEL ALONG A SINGLE BUILDING COLUMN LINE, HOLD TIGHT TO STRUCTURE AND PAINT AS DIRECTED BY THE ARCHITECT.
21.	IF AV AND POWER CONDUITS MUST CROSS, CROSS AT RIGHT ANGLES.
22.	FOR IN-SLAB OR UNDERGROUND CONDUIT ENTERING A BUILDING, TRANSITION BACK TO METALLIC CONDUIT WITHIN 3 FEET OF THE ENTRY POINT.
23.	REFER TO PROJECT MANUAL FOR FIRE STOPPING REQUIREMENTS.
24.	REFER TO ELECTRICAL DRAWINGS AND PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS.



DEVICE SYMBOL KEY - AUDIO/VISUAL SYSTEMS					
	WALL / COLUMN MOUNTED DEVICE		CEILING / OVERHEAD MOUNTED DEVICE		HINGE SIDE (IF SHOWN) FLOOR MOUNTED DEVICE
	DESK / COUNTER MOUNTED DEVICE		UNDER DESK / COUNTER MOUNTED DEVICE		DEVICE ID DEVICE TYPE

SYMBOL LEGEND - AUDIO/VISUAL SYSTEMS							
SIZES, DIMENSIONS AND NOTES DESCRIBE TYPICAL REQUIREMENTS. IF APPLICABLE, VARIATIONS AND/OR ADDITIONAL REQUIREMENTS WILL BE NOTED ON THE DRAWINGS. UNLESS NOTED OTHERWISE, MOUNTING HEIGHTS ARE TO CENTER OF ROUGH-IN BOX.							
TYPE	DEVICE	ROUGH-IN BOX (HxWxD")	DEVICE COVER SIZE	MOUNTING HEIGHT		DEVICE NOTES	CONDUIT NOTES
				WALL/COLUMN	CEILING/OVERHEAD	FLOOR	
A1	ANTENNA PLATE - WIRELESS MIC	TYPE 1	1-GANG	REF ELEVATIONS	FLUSH IN CEILING	--	REF PLANS
A2	ANTENNA PLATE - IN-EAR MONITOR	TYPE 1	1-GANG	REF ELEVATIONS	--	--	REF PLANS
A3	ANTENNA PLATE - ASSIST LISTENING SYSTEM	TYPE 1	1-GANG	REF ELEVATIONS	FLUSH IN CEILING	--	REF PLANS
A4	ANTENNA PLATE - RADIO	TYPE 2	2-GANG	--	SEE MAST DETAIL	--	REF PLANS
AM	AUDIENCE MIC PLATE	TYPE 1	SPECIFIED PRODUCT	REF ELEVATIONS	--	--	REF PLANS
ANC	ANNOUNCER PLATE	TYPE 2	2-GANG	BUILDING OUTLET HEIGHT	--	--	REF PLANS
AV2	AV PLATE	TYPE 2	2-GANG	BUILDING OUTLET HEIGHT	--	--	REF PLANS
AV4	AV PLATE	TYPE 4	4-GANG	BUILDING OUTLET HEIGHT	--	--	1" C TO CABLE TRAY OR NEAREST AV ROOM
BT	BLUE TOOTH RECEIVER PLATE	TYPE 2	SPECIFIED PRODUCT	BUILDING SWITCH HEIGHT	--	--	1" C TO CABLE TRAY OR NEAREST AV ROOM
CM	CEILING MICROPHONE PLATE	TYPE 1	1-GANG	--	FLUSH IN CEILING	--	1" C TO CABLE TRAY OR NEAREST AV ROOM
CP	CONTROL PANEL	TYPE 2	2-GANG	BUILDING SWITCH HEIGHT	--	--	1" C TO CABLE TRAY OR NEAREST AV ROOM
DB	DISPLAY BOX	SEE DEVICE NOTES	--	COORDINATE WITH ARCHITECT	--	--	PROVIDE FSR PWB320 W/ AC3 BACK BOX, REFERENCE DETAIL 31AV092
DJ	DJ PLATE	TYPE 3	3-GANG	BUILDING OUTLET HEIGHT	--	--	REF PLANS
FB	FLOOR BOX	CUSTOM	--	--	INSTALL BACKBOX SUCH THAT LID IS FLUSH WITH FINISHED FLOOR	COORDINATE WITH ELECTRICAL REQUIREMENTS. SEE FUNCTIONAL DIAGRAMS FOR DEVICES INSTALLED IN FLOOR BOX.	REF PLANS
GC	GAME CLOCK	TYPE 1	--	9'-0" AFF	1' 0" BELOW CEILING	--	REF SPEC FOR SIZE
JBA	JUNCTION BOX - AUDIO	TYPE A (18"x18"x4")	BLANK	REF ELEVATIONS/DETAILS	--	--	REF PLANS
JBL	JUNCTION BOX - LECTERN	SEE DEVICE NOTES	--	BUILDING OUTLET HEIGHT	--	--	INSTALL FSR PWB-250
JBR	JUNCTION BOX - RACK	TYPE A (12"x12"x4")	--	REF ELEVATIONS/DETAILS	--	--	REF PLANS
JBS	JUNCTION BOX - SPEAKER	TYPE A (6"x6"x4")	--	REF ELEVATIONS/DETAILS	REF PLANS	--	REF PLANS
JBT	JUNCTION BOX - TELEVISION	--	--	--	--	--	REF BROADCAST BOX SCHEDULE AND DETAILS
JBV	JUNCTION BOX - VIDEO	TYPE C (9"x14"x4")	--	REF ELEVATIONS/DETAILS	--	--	REF PLANS
LED	--	--	--	--	--	--	--
MIX	MICROPHONE PLATE	TYPE 3	3-GANG	BUILDING OUTLET HEIGHT	--	--	REF PLANS
ML	MIC/LINE DEVICE	TYPE 2	SPECIFIED PRODUCT	BUILDING OUTLET HEIGHT	--	--	REF PLANS
PTZ	PTZ CAMERA	TYPE 1	1-GANG	REF ELEVATIONS/DETAILS	COORDINATE WITH ARCHITECT	--	REF PLANS
SB	SCOREBOARD JUNCTION BOX	TYPE 2	2-GANG	REF PLANS/ELEVATIONS	--	--	1" C TO CABLE TRAY OR NEAREST IDF ROOM
TP	TOUCH PANEL	TYPE 2	--	BUILDING SWITCH HEIGHT	--	--	1" C TO CABLE TRAY OR NEAREST AV ROOM
VC	VIDEO CONFERENCE CAMERA	--	--	REF ELEVATIONS/DETAILS	FLUSH IN CEILING	--	REF PLANS
VJB	VIDEO PRODUCTION WALL BOX	TYPE A (12"x12"x4")	--	BUILDING OUTLET HEIGHT	--	--	REF PLANS
VS	VOLUME SELECT PLATE	TYPE 12	1-GANG	BUILDING SWITCH HEIGHT	--	--	1" C TO CABLE TRAY OR NEAREST AV ROOM
WEN	WALL ENCLOSURE	TYPE C (12"x12"x4")	--	BUILDING SWITCH HEIGHT	--	--	HOFFMAN ASE12X12X4NKG WITH SLDF1212W HINGED COVER

LEGEND NOTES - AUDIO/VIDEO SYSTEMS

- CRITICAL DIMENSIONS ARE NOTED IN DOCUMENTATION. FOR ANY DIMENSION THAT IS NOT PROVIDED, FIELD COORDINATE FINAL LOCATION.
- FIELD COORDINATE PLATE/PANEL COVER SIZE BASED ON MOUNTING CONDITIONS. SURFACE MOUNTED ROUGH-IN PLATE/PANEL SHOULD NOT EXTEND BEYOND THE ROUGH-IN BOX.

DEVICE SYMBOL KEY - SPEAKER SYSTEMS		
	WALL / COLUMN MOUNTED SPEAKER	
	SPEAKER ID SPEAKER TYPE	

SYMBOL LEGEND - SPEAKER SYSTEMS							
SIZES, DIMENSIONS AND NOTES DESCRIBE TYPICAL REQUIREMENTS. IF APPLICABLE, VARIATIONS AND/OR ADDITIONAL REQUIREMENTS WILL BE NOTED ON THE DRAWINGS. UNLESS NOTED OTHERWISE, MOUNTING HEIGHTS ARE TO CENTER OF ROUGH-IN BOX.							
TYPE	DEVICE	ROUGH-IN BOX (HxWxD")	DEVICE COVER SIZE	MOUNTING HEIGHT		DEVICE NOTES	CONDUIT NOTES
				WALL/COLUMN	CEILING/OVERHEAD	FLOOR	
1	RECESSED CEILING SPEAKER	TYPE 2	--	--	--	--	REF PLANS
2	RECESSED CEILING SPEAKER	TYPE 2	--	--	--	--	REF PLANS
3	RECESSED CEILING SPEAKER	TYPE 2	--	--	--	--	RATED HIGH HUMIDITY
10	PENDANT CEILING SPEAKER	TYPE 2	--	--	--	--	REF PLANS
20	LINEAR WALL LOUSPEAKER	TYPE 1	BLANK	REFER TO ELEVATION DETAILS	--	--	REF PLANS
30	LOUDSPEAKER CABINET	TYPE A (6"x6"x4")	BLANK	REFER TO ELEVATIONS AND DETAILS	--	--	REF PLANS
31	LOUDSPEAKER CABINET	TYPE A (6"x6"x4")	BLANK	REFER TO ELEVATIONS AND DETAILS	--	--	REF PLANS

LOUDSPEAKER MOUNTING AND INSTALLATION

- RECESSED CEILING SPEAKERS - UTILIZE MANUFACTURERS CEILING SUPPORT ACCESSORIES
- PENDANT SPEAKERS - UTILIZE MANUFACTURERS SUPPORT ACCESSORIES
- WALL SPEAKERS - PROVIDE BLOCKING WITHIN WALL AND RATED HARDWARE TO SUPPORT SPEAKER WEIGHT
- LOUDSPEAKER AND SUBWOOFER CABINETS - UTILIZE RIGGING SYSTEM
- LOUDSPEAKER HEIGHTS - COORDINATE LOUSPEAKER HEIGHT WITH ADJACENT CEILING ELECTRICAL AND MECHANICAL ITEMS.
- COORDINATE EXACT LOCATION OF ALL CEILING LOUDSPEAK

AV DISPLAY SCHEDULE			
DB ID	SIZE	MOUNTING HEIGHT (AFF TO CL.)	COMMENTS
005	55	5' 0"	
006	65	5' 6"	
013	50	5' 0"	COORDINATE WITH CLARIUS GLIDE TV SYSTEM. MOUNT MUST BE THIN. < 0.625"
014B	55	5' 6"	
015	50	5' 0"	
016	65	5' 5"	COORDINATE WITH CLARIUS GLIDE TV SYSTEM. MOUNT MUST BE THIN. < 0.625"
018	50	5' 0"	
019	50	5' 0"	
020	50	5' 0"	
022	65	5' 5"	COORDINATE WITH CLARIUS GLIDE TV SYSTEM. MOUNT MUST BE THIN. < 0.625"
023	50	5' 0"	
025	50	5' 0"	
026	75	5' 5"	COORDINATE WITH CLARIUS GLIDE TV SYSTEM. MOUNT MUST BE THIN. < 0.625"
030	55	6' 0"	
031	75	5' 6"	
032-1	55	7' 0"	
032-2	55	7' 0"	
032-3	55	7' 0"	
034-1	85	6' 0"	
034-2	85	6' 0"	
036A	50	5' 0"	
037	50	5' 0"	
038A	50	5' 0"	
039	50	5' 0"	
042A	50	5' 0"	
042A	50	5' 0"	
102C	55	7' 9"	
102C	55	7' 9"	
104C	55	7' 9"	
104C	55	7' 9"	
108A-2	98	6' 0"	
108B-2	98	6' 0"	
109	55	5' 3"	
109D	75	6' 0"	
109E	55	5' 3"	
109F	55	5' 3"	
201-1	50	4' 6"	
201-2	50	4' 6"	
201-3	55	5' 3"	
201W	55	5' 3"	

AV RACK SCHEDULE											
RACK DESIGNATOR	ROOM	RACK STYLE	TYPE #	RACK MOUNTING HEIGHT (AFF TO BOTTOM OF RACK)	JBR MOUNTING HEIGHT (AFF TO CENTER OF JBR)		DETAIL (SEE BELOW)	NOMINAL SIZE (RU)	NOMINAL DEPTH	OPTIONS	NOTES
					WALL RACK	FLOOR RACK					
		FREE STANDING							36"		
DESK 1	MIXING 650	ROLLTOP RACK	1				5/AV-090	0	34"		
DESK 2	MIXING 650	ROLLTOP RACK	2				5/AV-090	0	34"		
ER-1A1	AV ROOM	WALL MOUNTED	2	1' - 11 1/2"	4' - 0"		4/AV-090	24	28"		
ER-1C1	AV ROOM	WALL MOUNTED	2	1' - 11 1/2"	4' - 0"		4/AV-090	24	28"		
ER-2C1	AV ROOM 108C	FREE STANDING	1		3' - 5 1/2"		1/AV-090	44	36"		
ER-3C1	AV ROOM 200A	FREE STANDING	1		3' - 5 1/2"		2/AV-090	44	36"	GANGED	
ER-3C2	AV ROOM 200A	FREE STANDING	1		3' - 5 1/2"		2/AV-090	44	36"	GANGED	
ER-3C3	AV ROOM 200A	FREE STANDING	1		3' - 5 1/2"		2/AV-090	44	36"	GANGED	
RT-201	MIXING 650	ROLLTOP RACK	1				7/AV-090	24	34"		WITH SLIDE OUT RACK SECTION



AV-090

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PROJECT NO. 23112.000

SHEET TITLE
EVENT FLOOR PLAN
- AREA D

SHEET NUMBER

AV-101D



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CONCOURSE FLOOR
PLAN - AREA C

AV-102C



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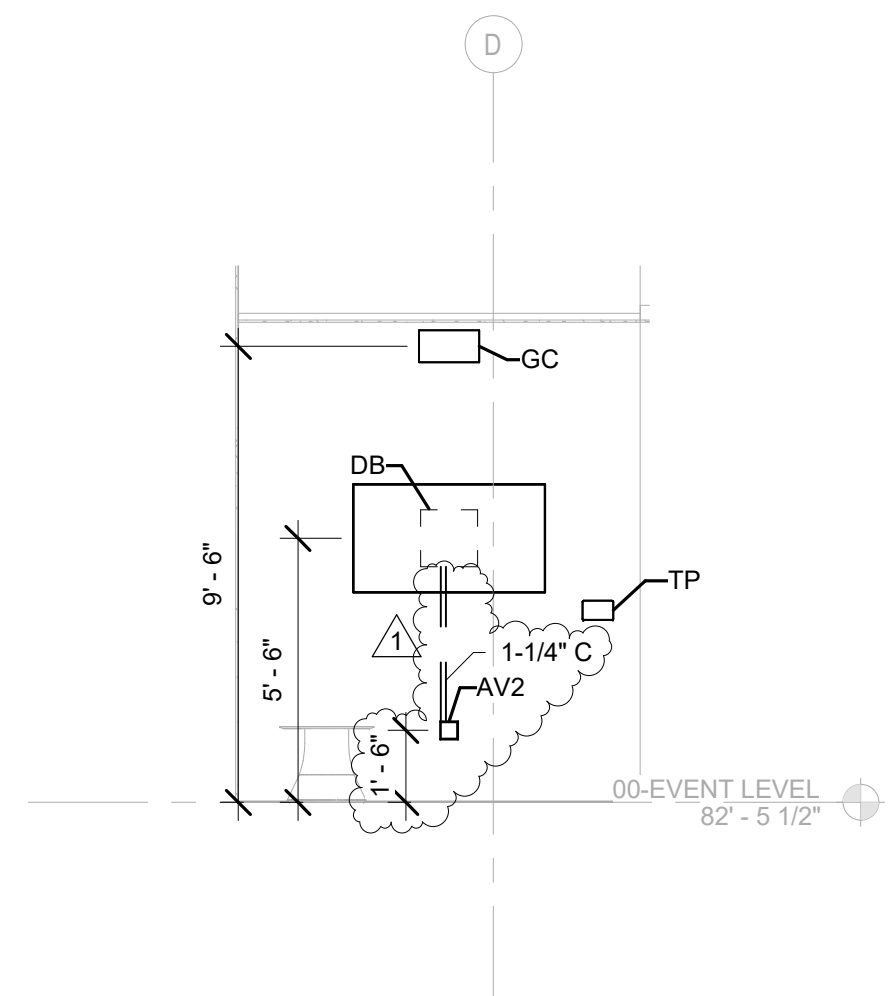
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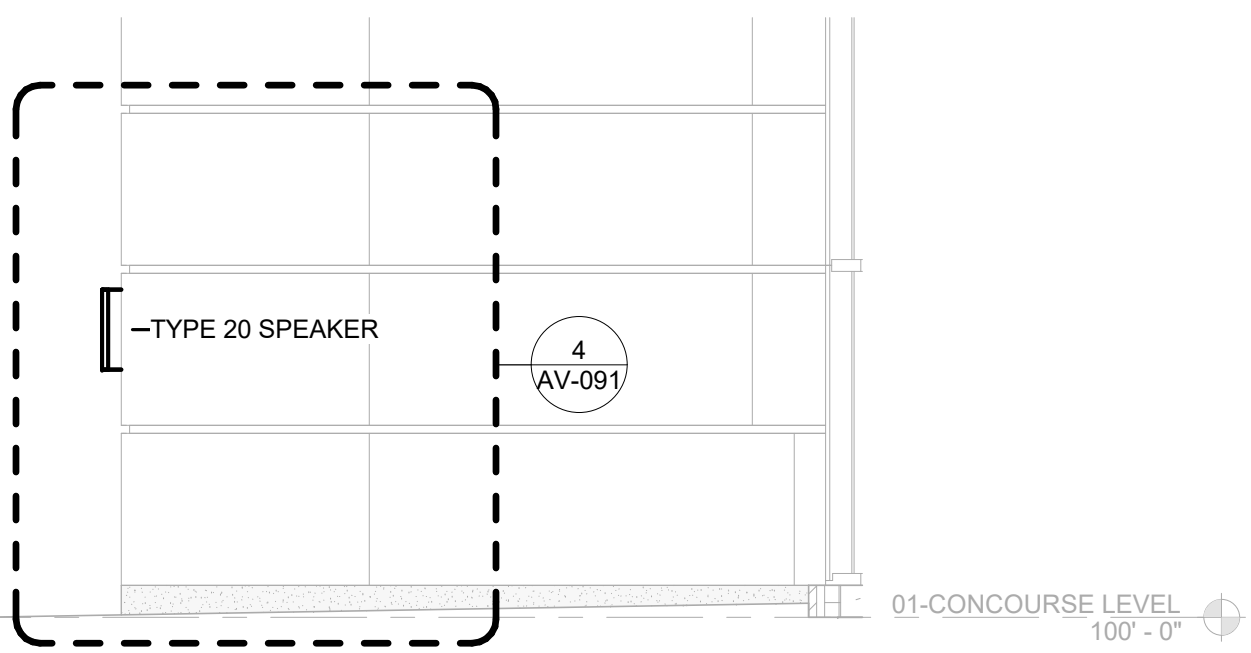
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SHEET NUMBER
AV-103C





ELEVATION - HOME COACH LOCKER

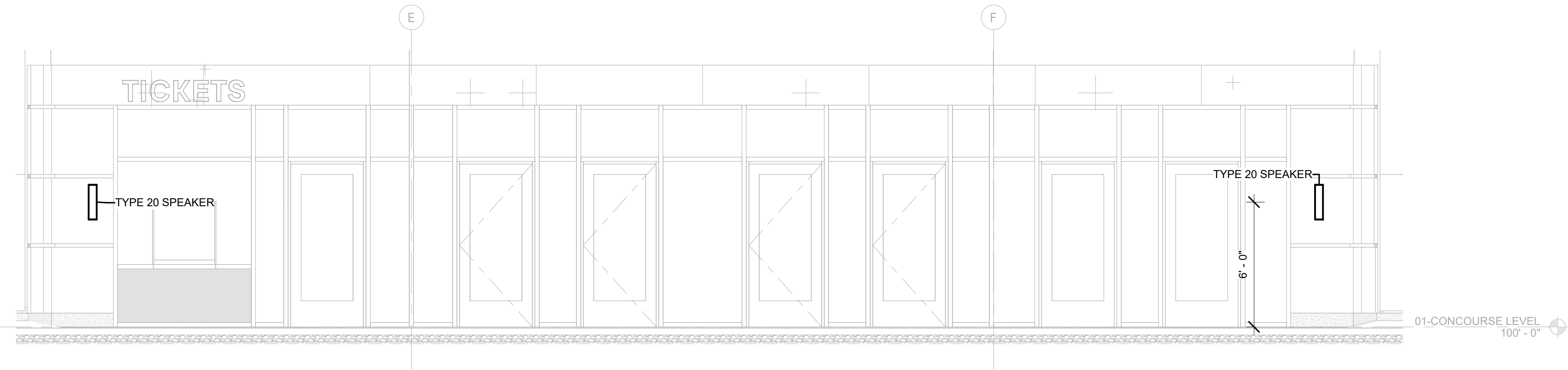


6 VESTIBULE ENTRY LOUDSPEAKER DETAIL

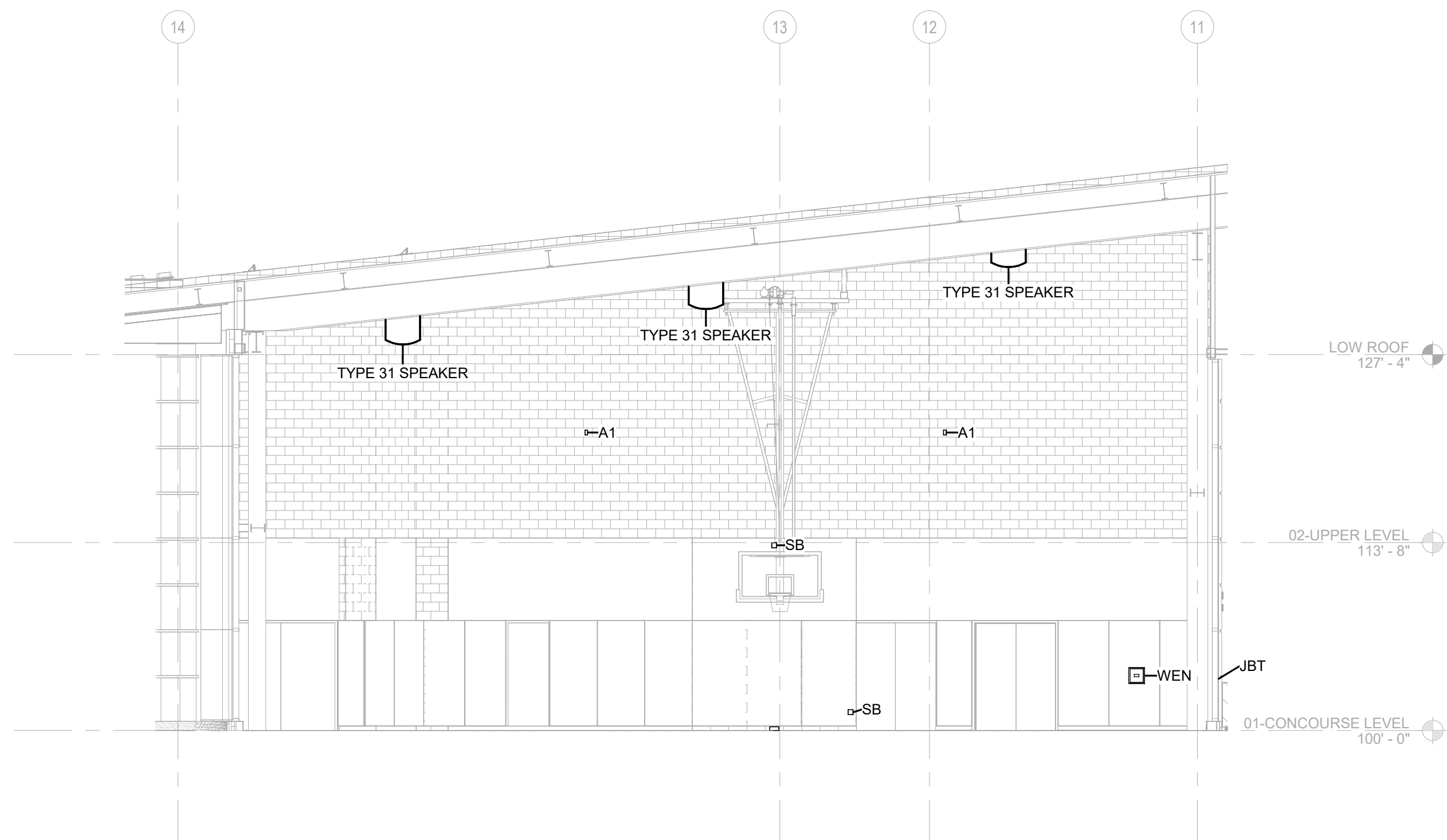
AV-201 1/4" = 1'-0"

ELEVATION - VESTIBULE NORTHEAST

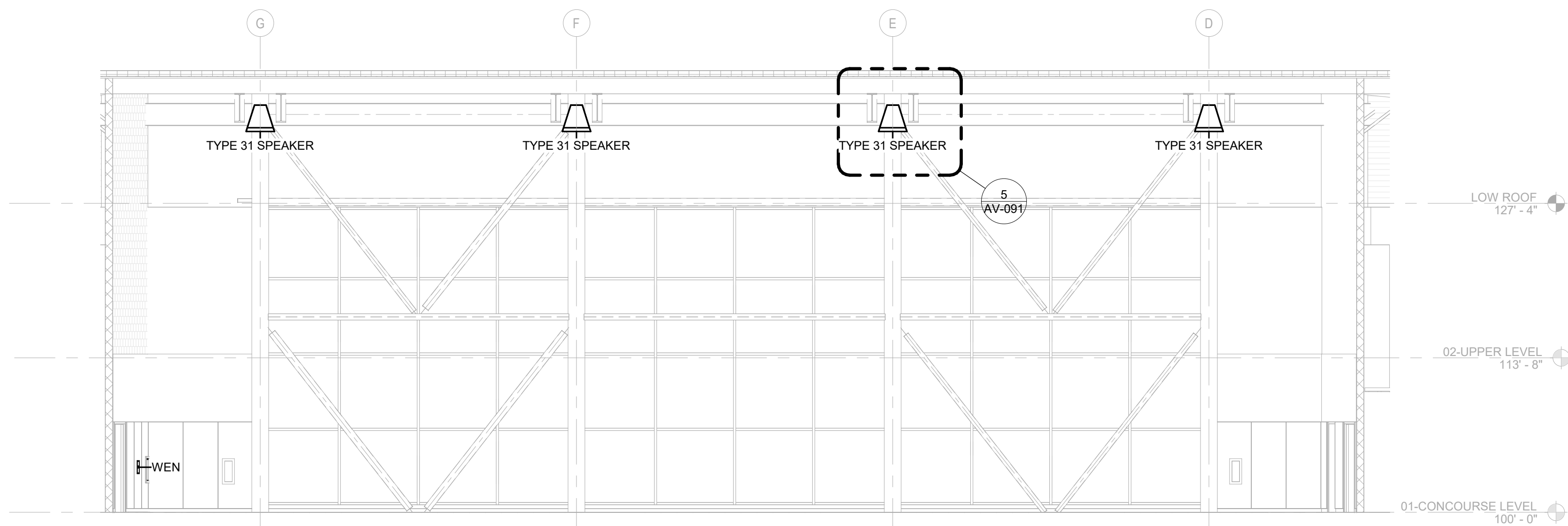
ELEVATION - VESTIBULE SOUTHEAST



ELEVATION - VESTIBULE WEST



ELEVATION - PRACTICE GYM SOUTH



1 ELEVATION - PRACTICE GYM WEST

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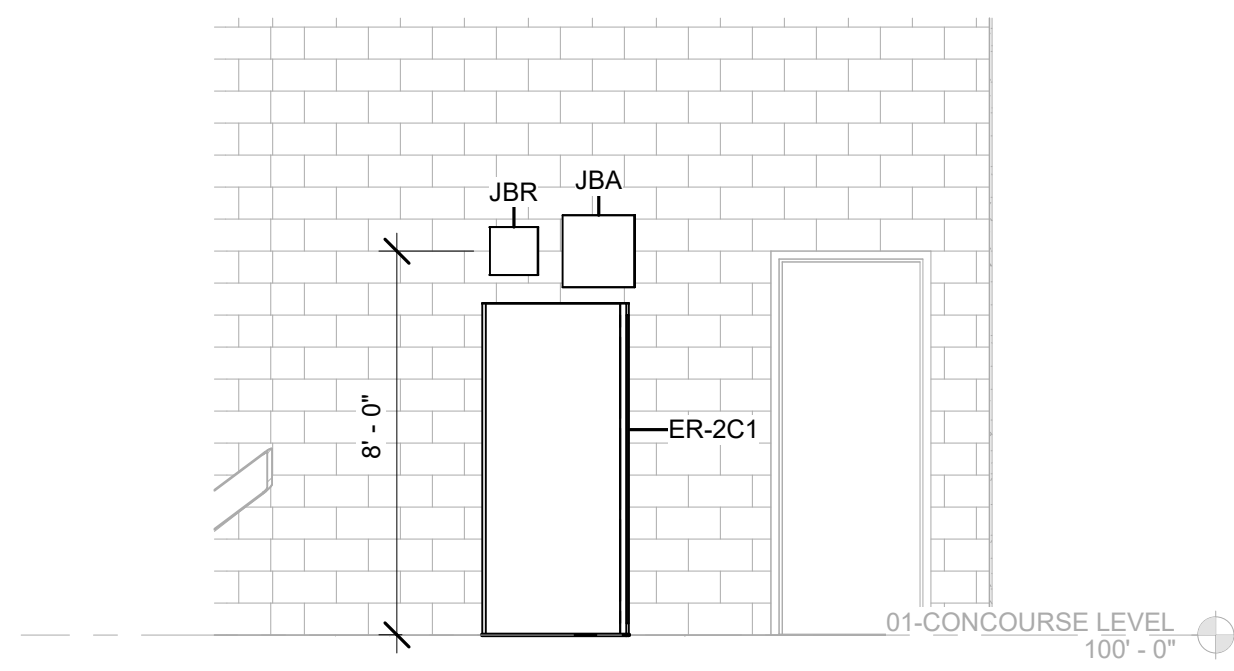
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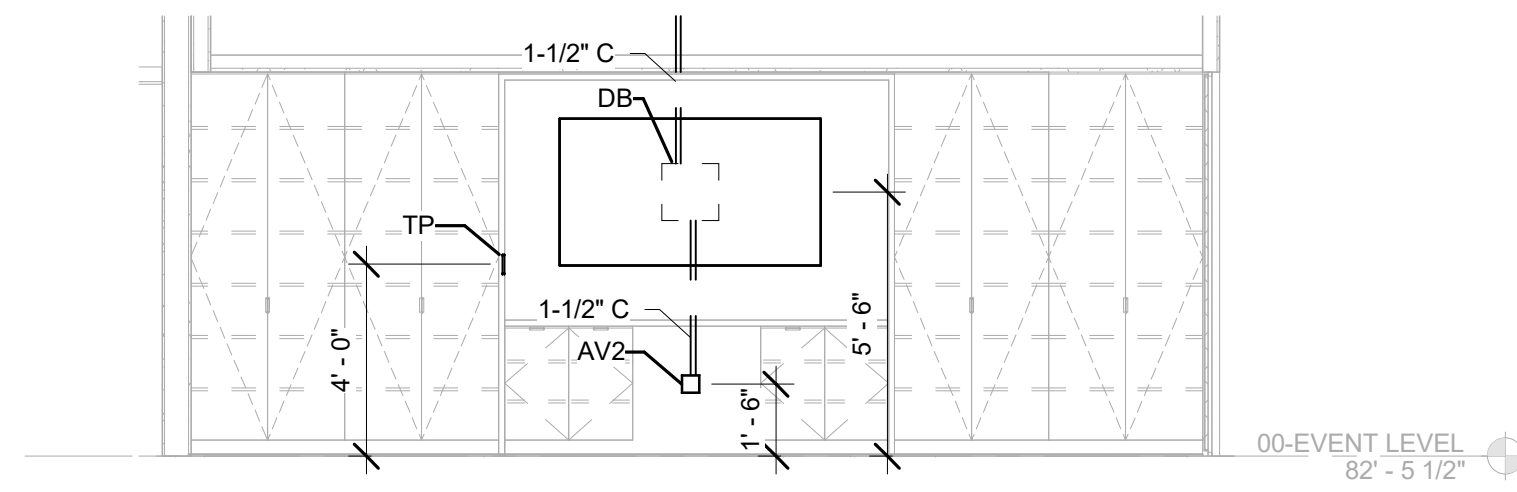
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AV ELEVATIONS

SHEET NUMBER

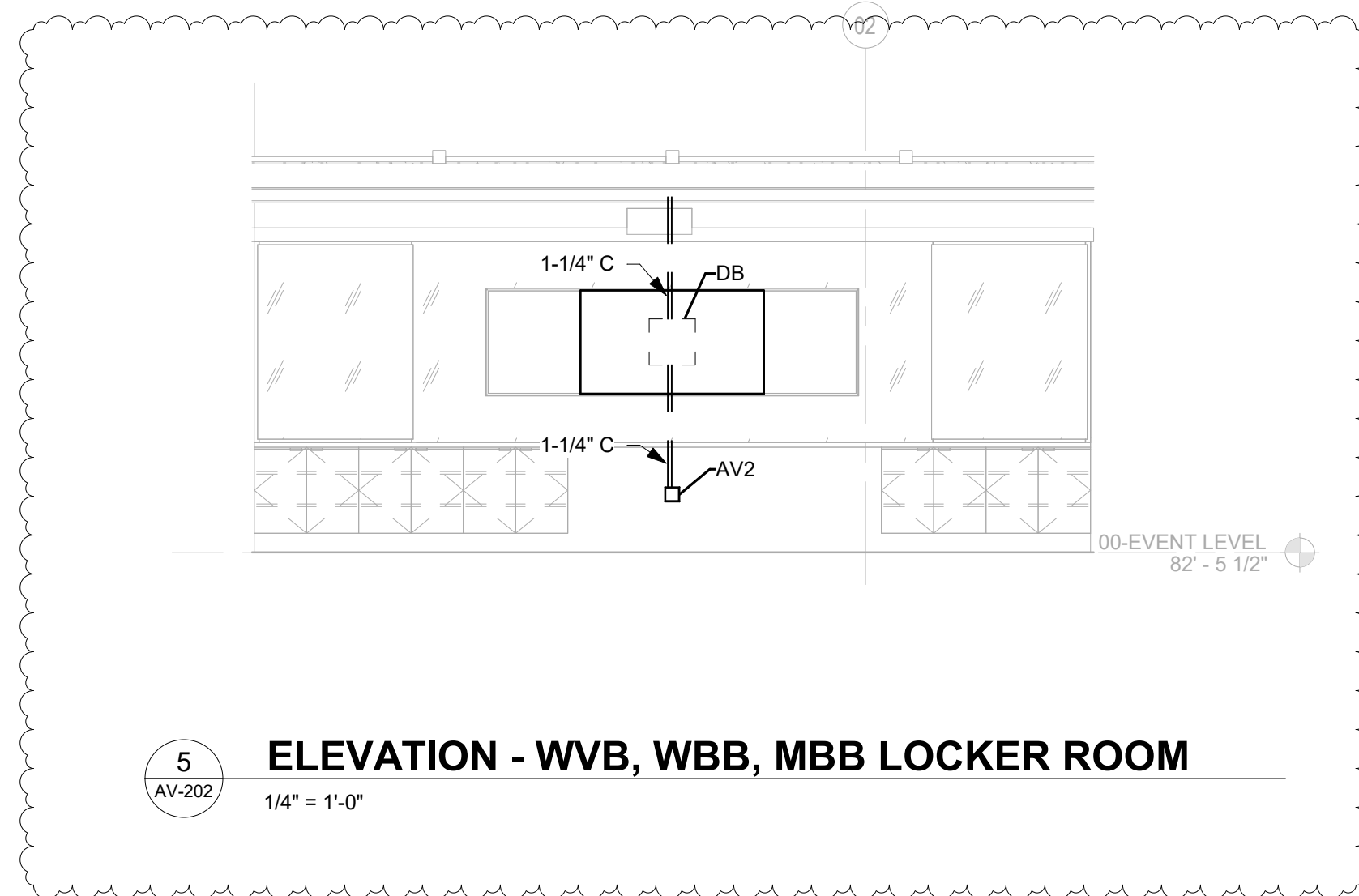
AV-202



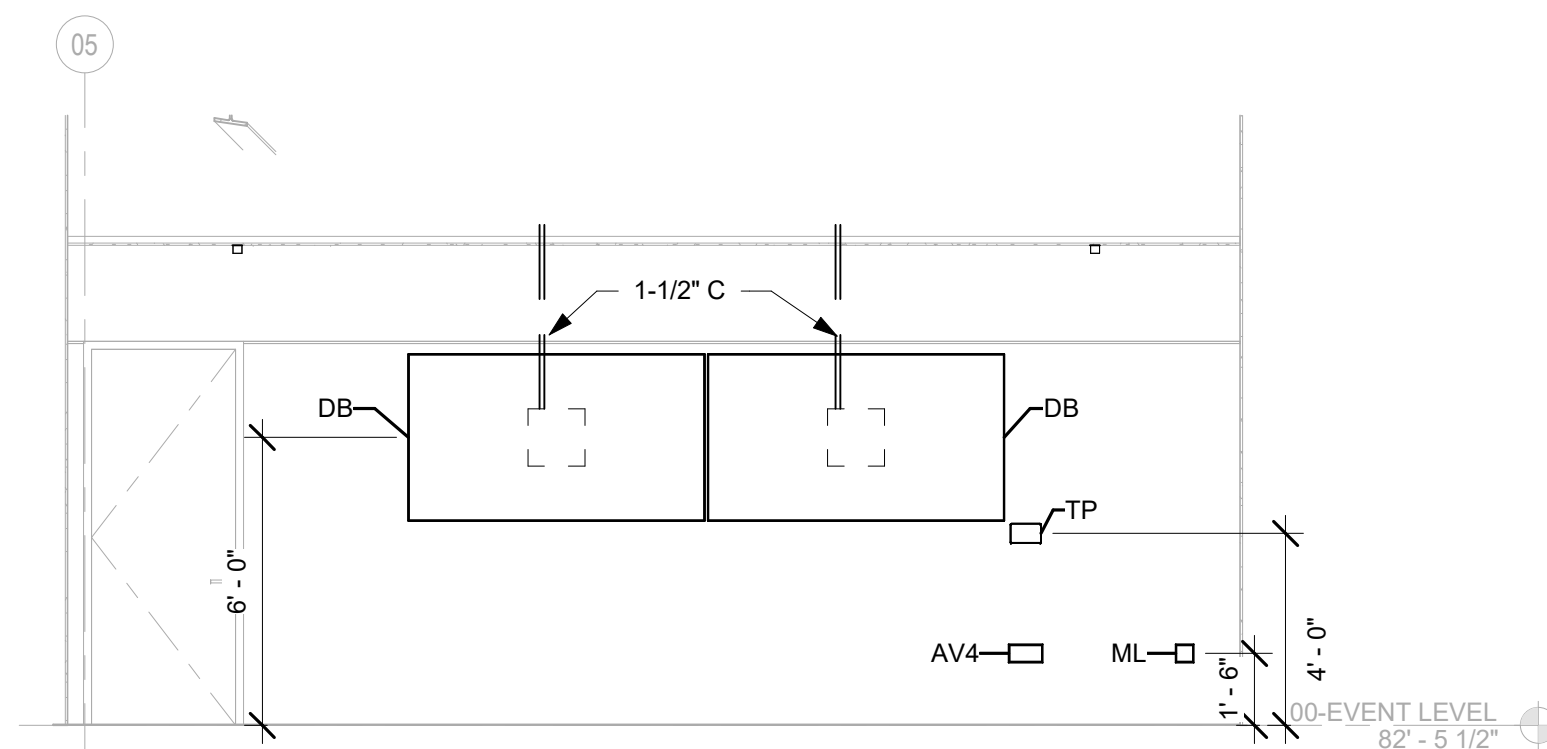
7 ELEVATION - AV ROOM CONCOURSE AREA C
AV-202 1/4" = 1'-0"



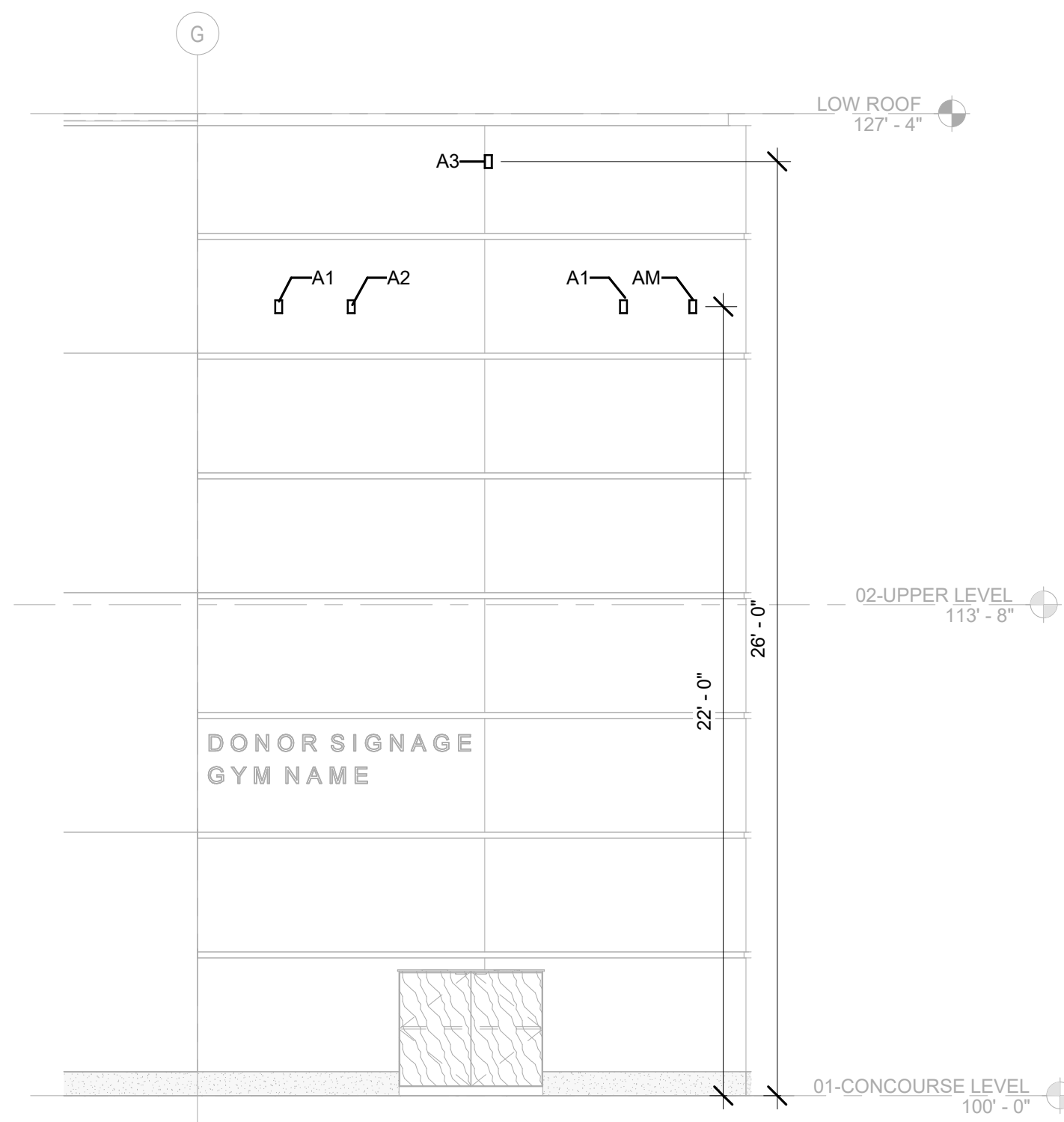
ELEVATION - PLAYER LOUNGE EAST



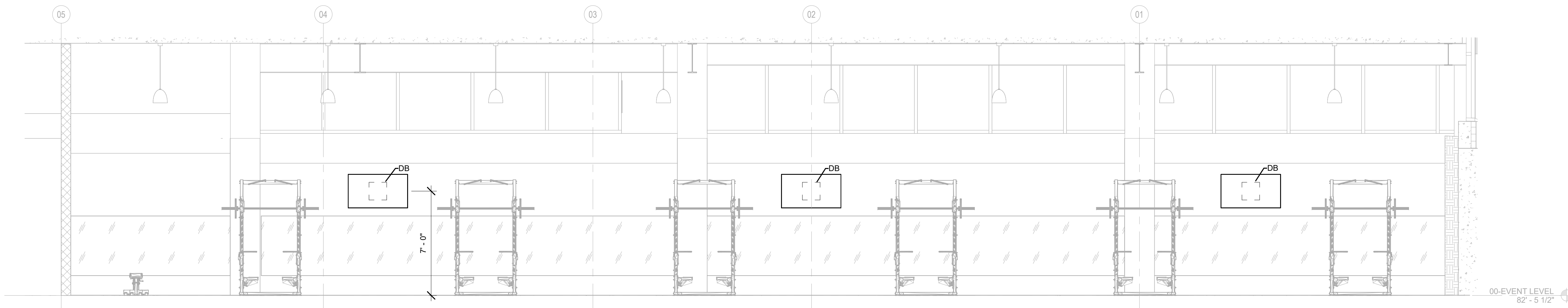
ELEVATION - WVB, WBB, MBB LOCKER ROOM



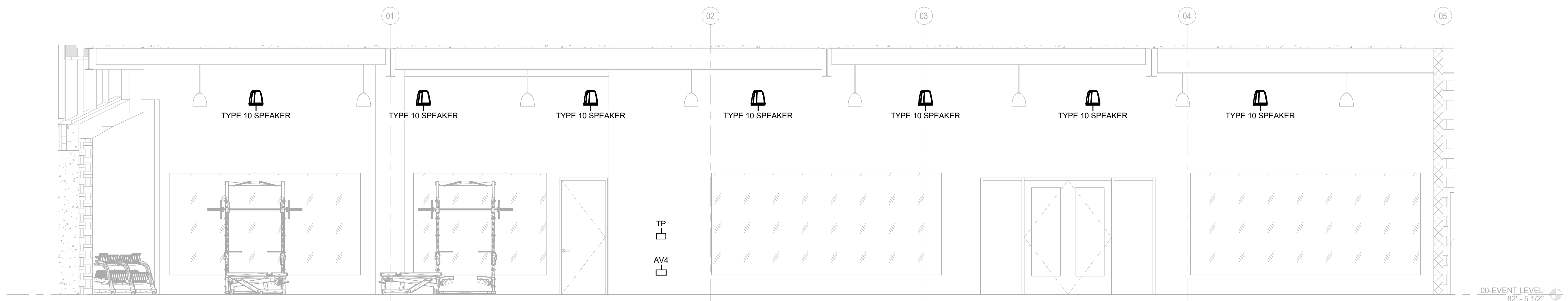
ELEVATION - VIDEO ROOM NORTH



3 ELEVATION - CONCOURSE DEVICES



ELEVATION - TRAINING ROOM SOUTH



ELEVATION - TRAINING ROOM NORTH

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AV ELEVATIONS

SHEET NUMBER

AV-203

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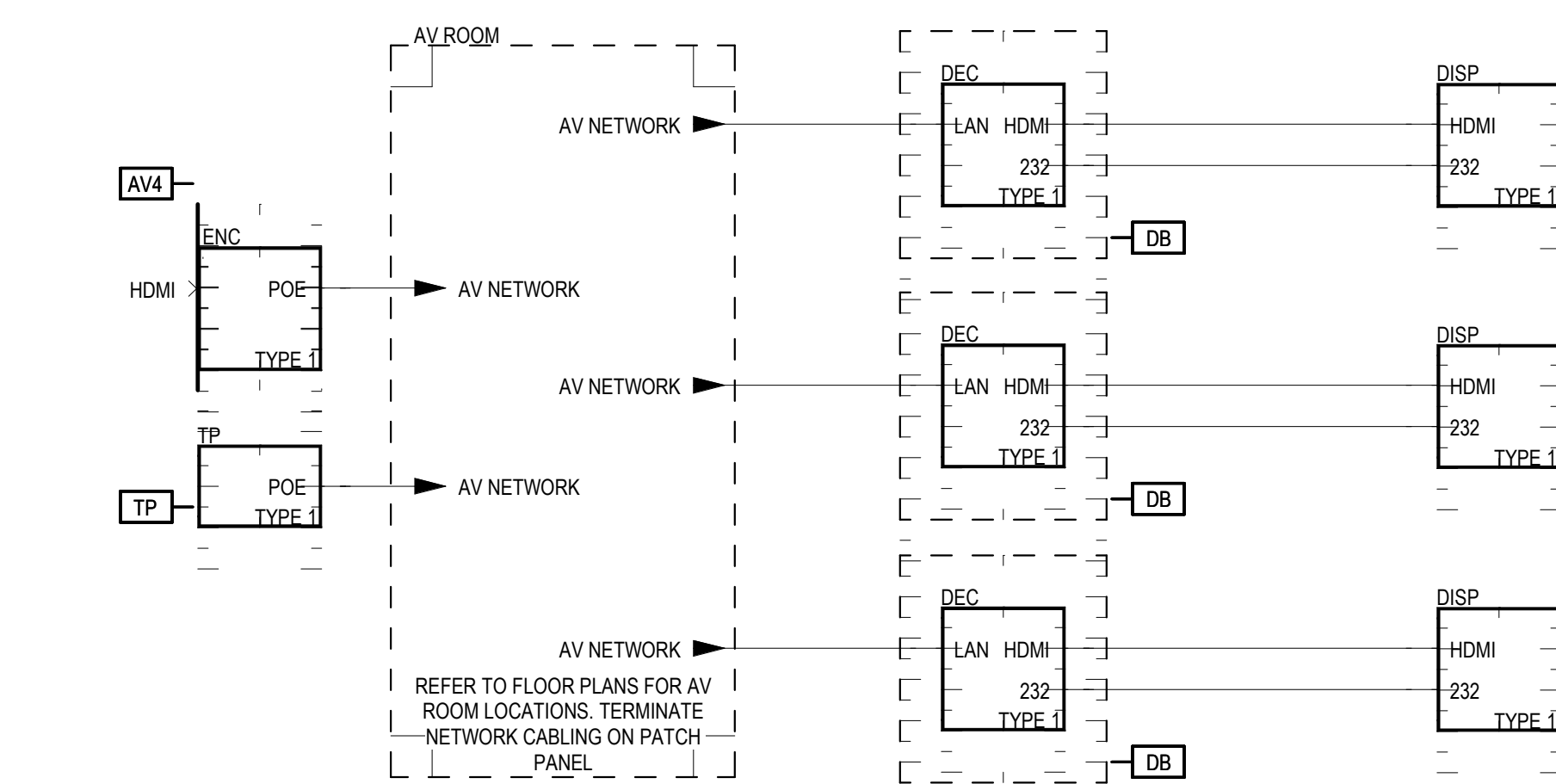
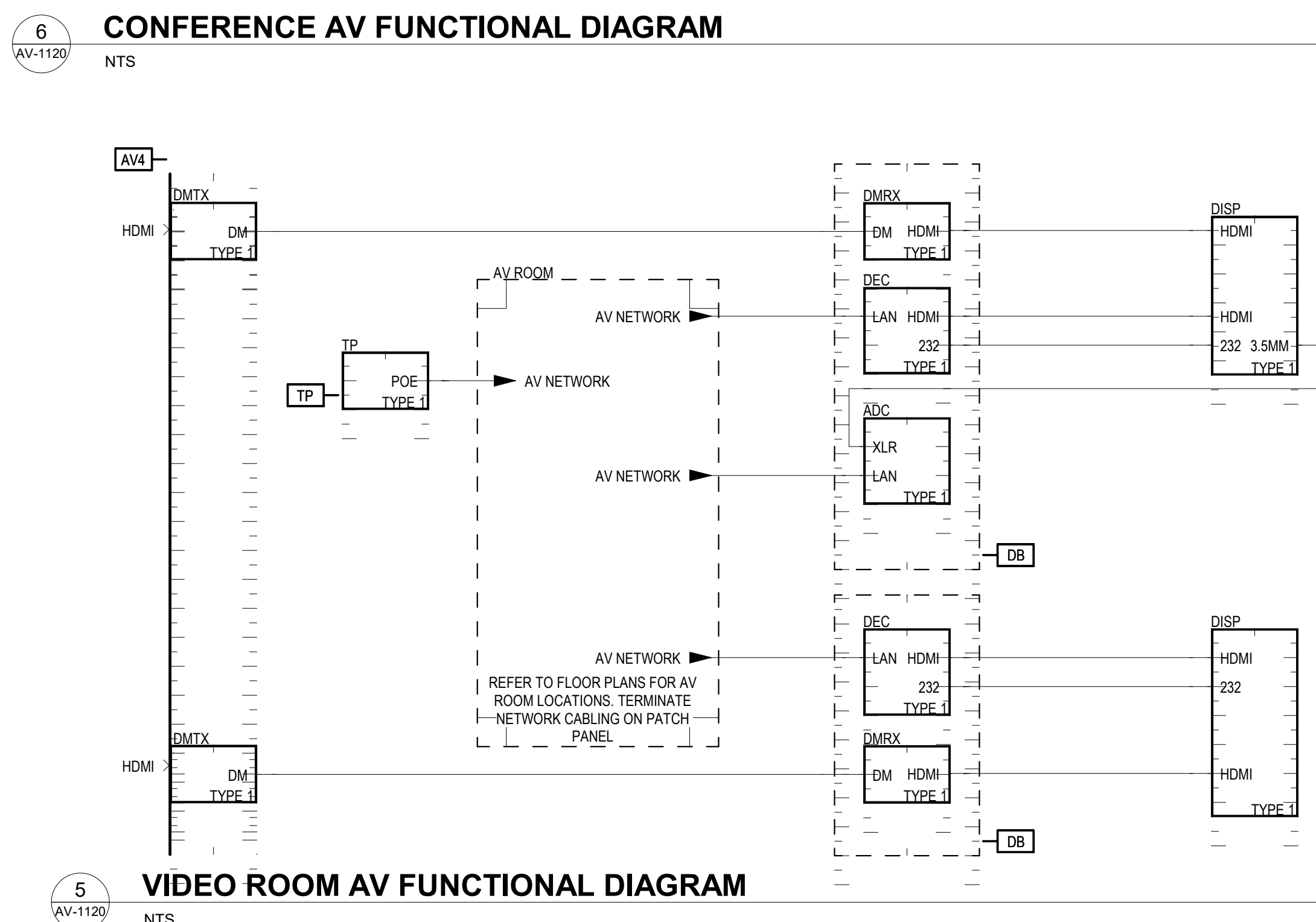
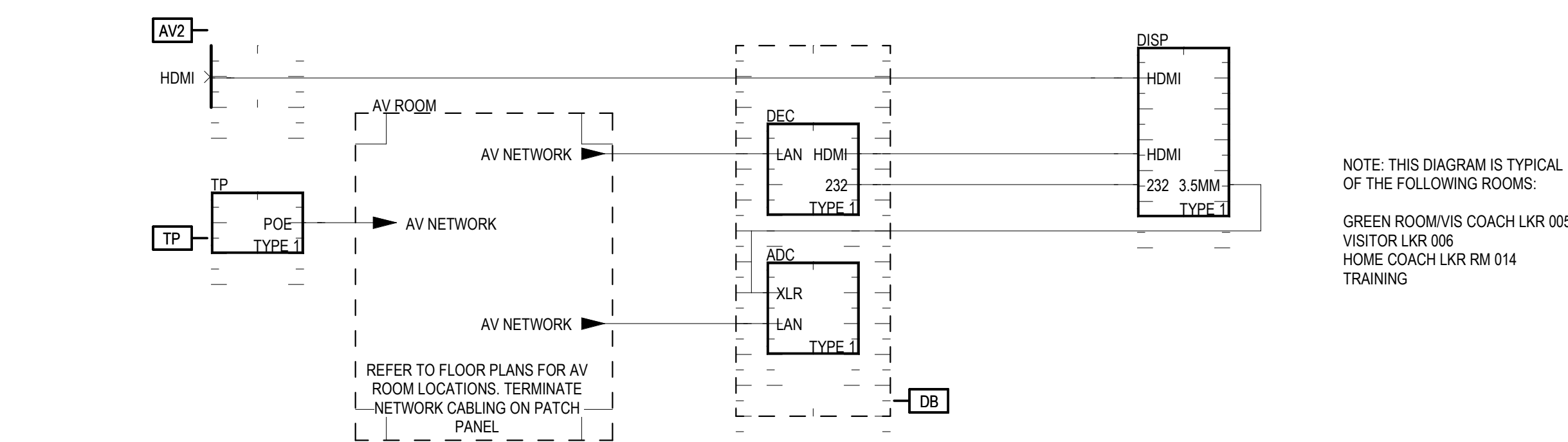
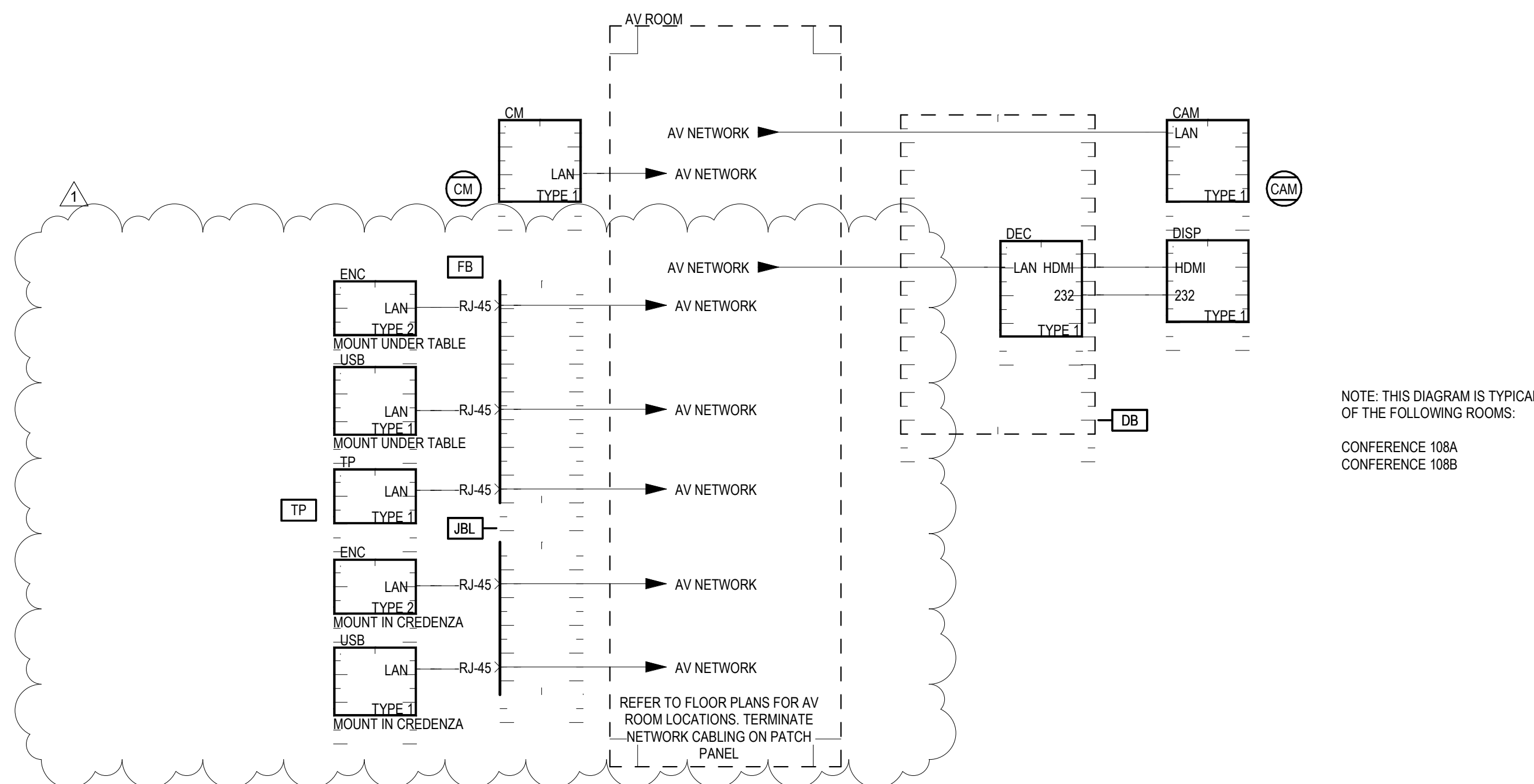
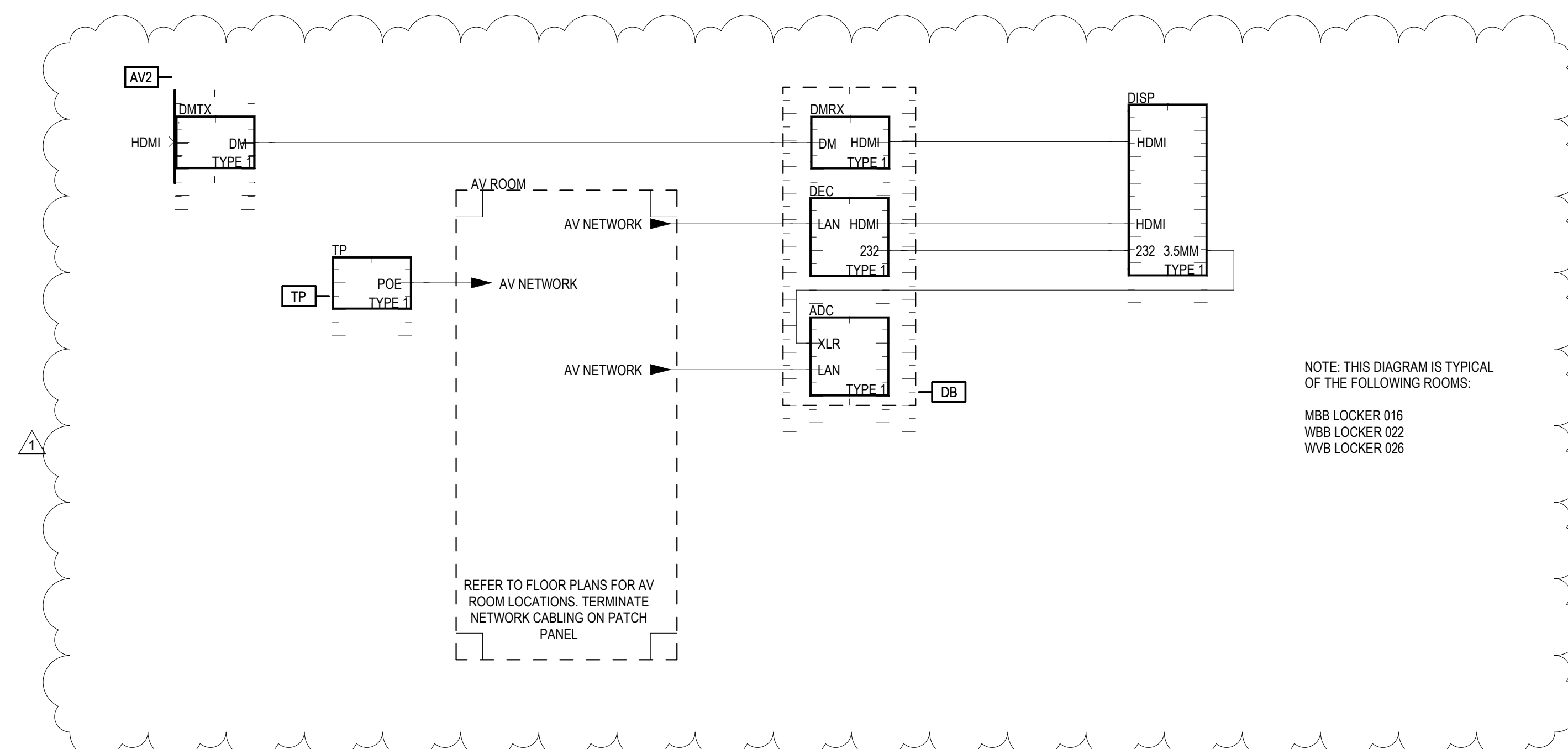
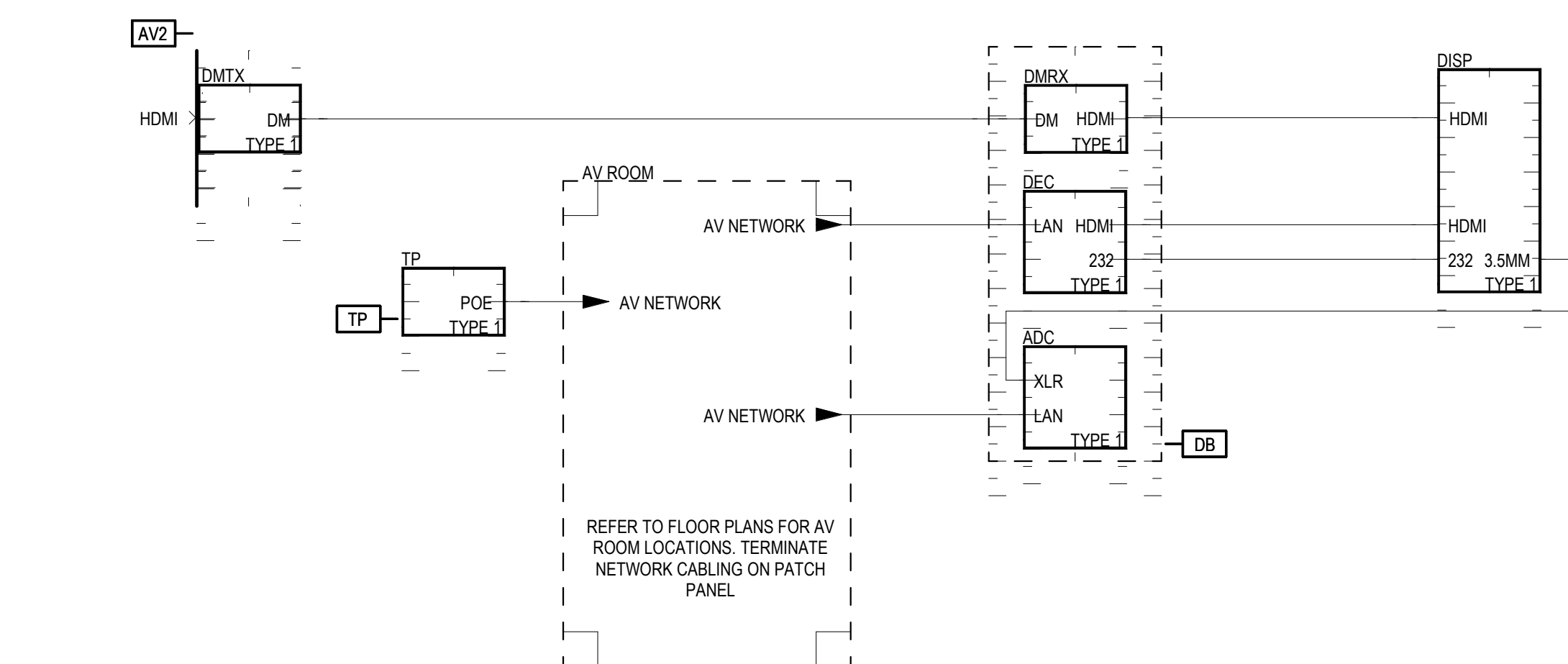
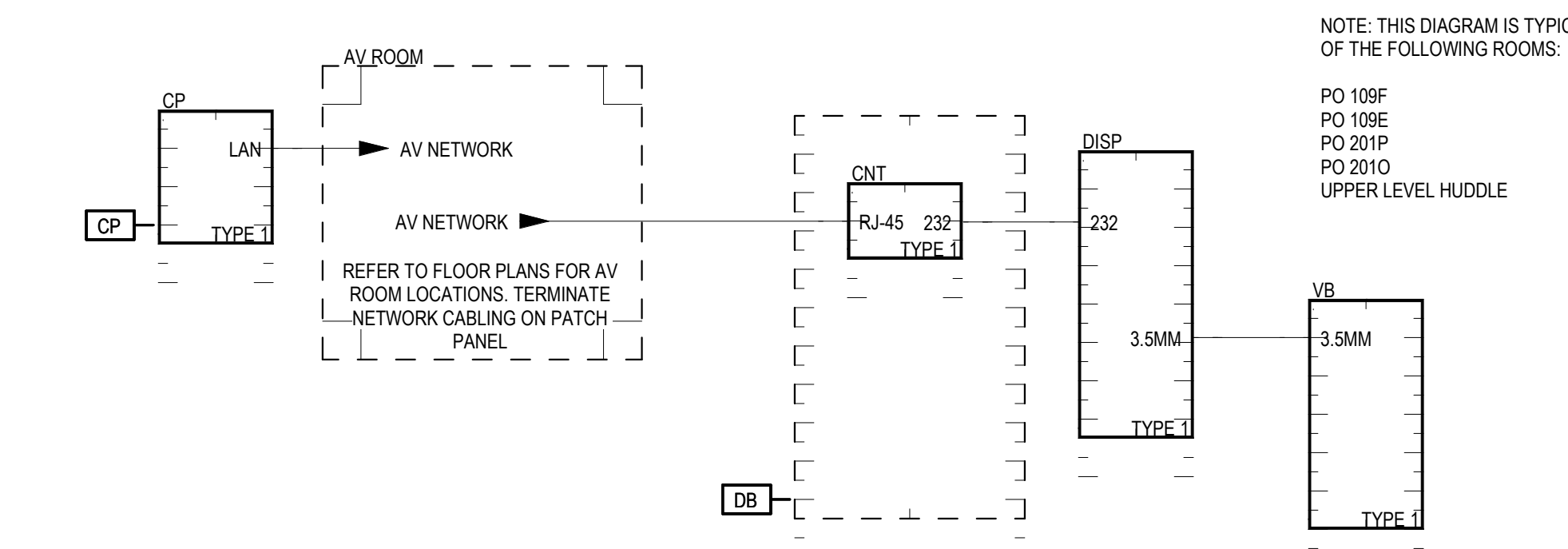
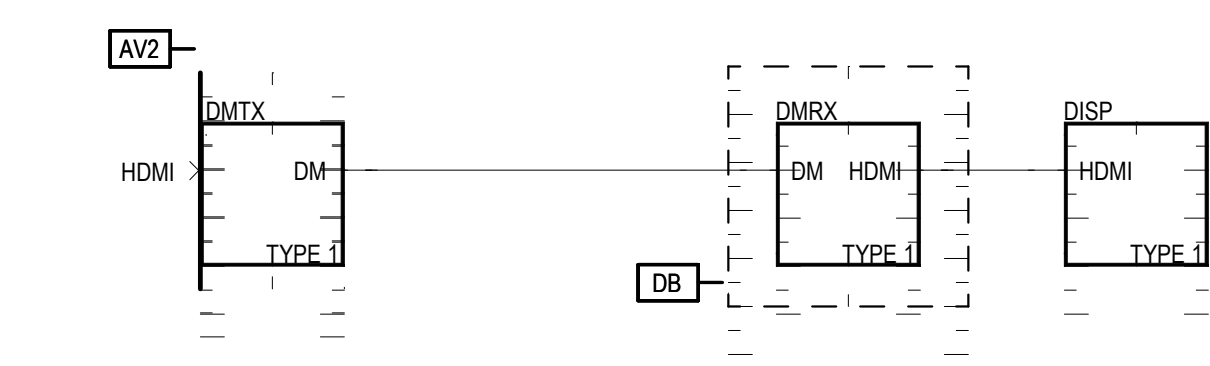
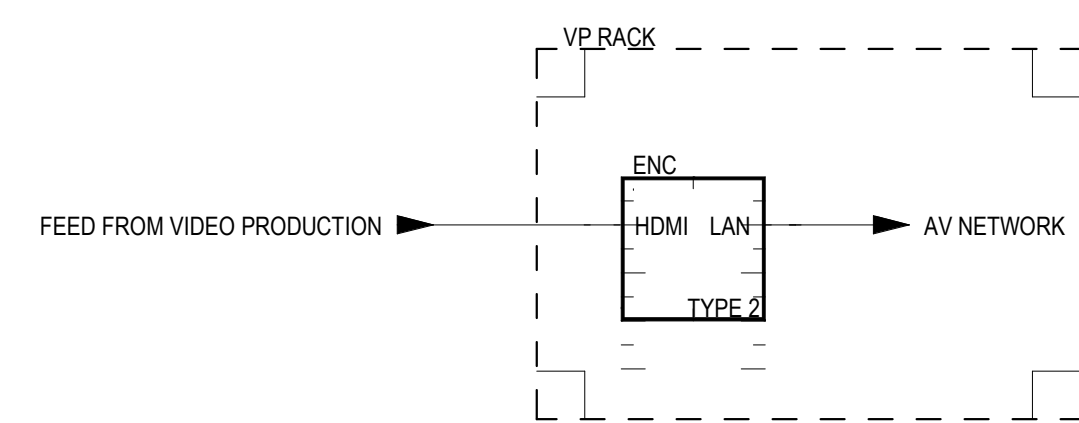
SHEET TITLE

**AUDIO CONTROL
ROOM DIAGRAM**

SHEET NUMBER

AV-1110



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SHEET TITLE
AUDIO VISUAL
FUNCTIONAL
DIAGRAMS

SHEET NUMBER

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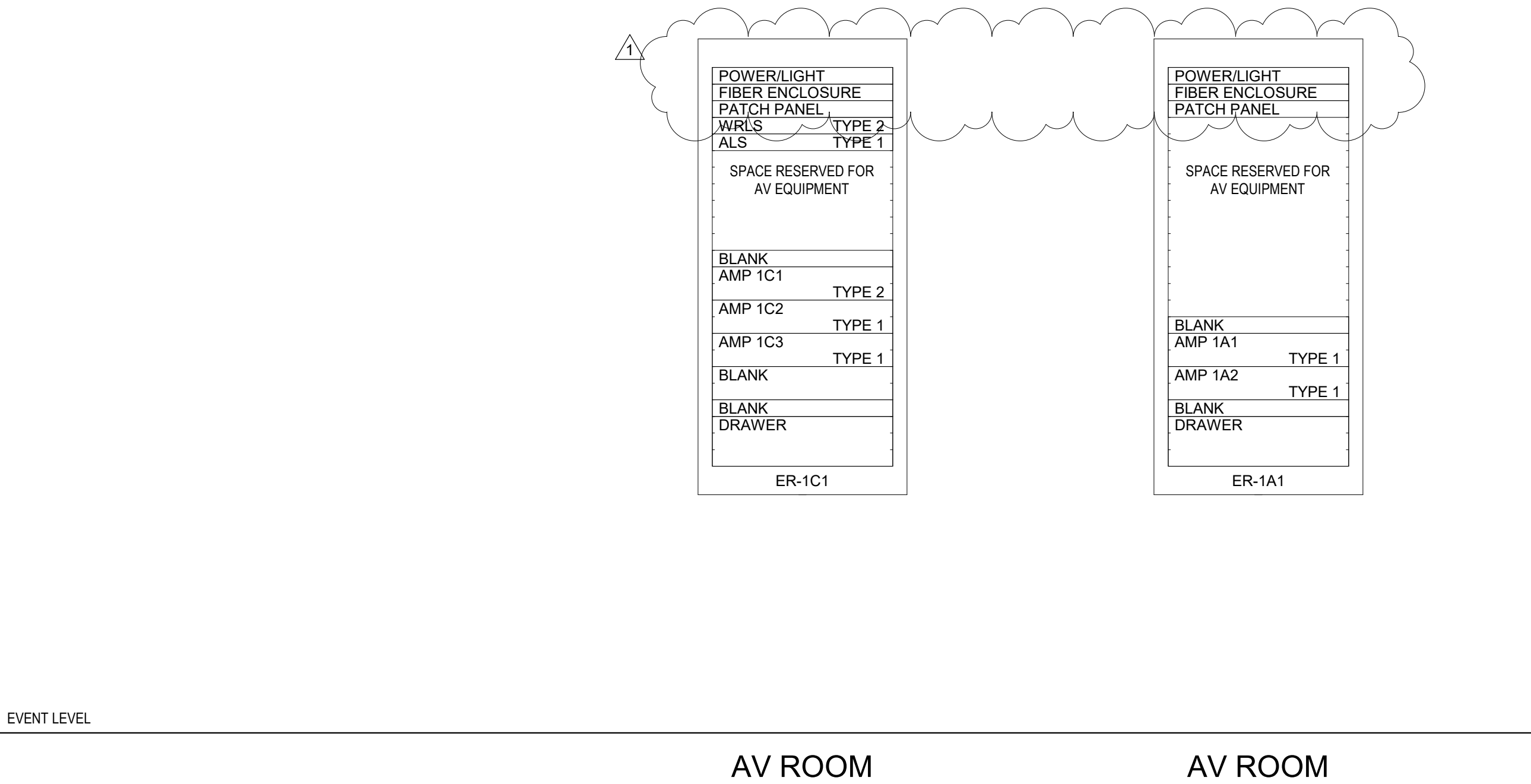
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SHEET TITLE
AV EQUIPMENT
RACK ELEVATIONS

SHEET NUMBER

AV-1180



GENERAL ABBREVIATIONS			
--	NOT APPLICABLE	L	LENGTH, LEFT
@	AT	L/R	LEFT/RIGHT
3DC	3D CONTROLLER	LAN	LOCAL AREA NETWORK
A/C	AIR CONDITIONING	LB	POUNDS
ABV	ABOVE	LF	LINEAR FEET
AC	ALTERNATING CURRENT	LTG	LIGHTING
ADA	AMERICANS WITH DISABILITIES ACT	MAX	MAXIMUM
ADJ	ADJUSTABLE	MDF	MAIN DISTRIBUTION FRAME
AFC	ABOVE FINISHED CEILING	MECH	MECHANICAL
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	MMFO	MULTIMODE FIBER OPTIC CABLE
AHJ	AUTHORITY HAVING JURISDICTION	MTD	MOUNTED
ALT	ALTERNATE	NA	NOT APPLICABLE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	NC	NORMALLY CLOSED
ARCH	ARCHITECT, ARCHITECTURAL	NEC	NATIONAL ELECTRICAL CODE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOC. NETWORK
AUX	AUXILIARY	NIC	NOT IN CONTRACT
AWG	AMERICAN WIRE GAUGE	NO	NORMALLY OPEN
		NTS	NOT TO SCALE
BFC	BELOW FINISHED CEILING	OC	ON CENTER
BFF	BELOW FINISHED FLOOR	OD	OUTSIDE DIAMETER
BLDG	BUILDING	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
BOH	BACK OF HOUSE	OFE	OWNER FURNISHED EQUIPMENT
BOP	BOTTOM OF PIPE	OFOI	OWNER FURNISHED OWNER INSTALLED
BOS	BOTTOM OF STRUCTURE		
C	CONDUIT	P	PRIMARY
CAT	CATEGORY CABLE	P/O	PART OF
CKT	CIRCUIT	PC	PERSONAL COMPUTER
CL	CENTER LINE	PDJ	POWER DISTRIBUTION UNIT
CLG	CEILING	PGM	PROGRAM
CMU	CONCRETE MASONRY UNIT	PH	PHASE
COLUMN	COLUMN	PNL	PANEL
CTRL	CONTROL	PROC	PROCESSOR
D	DEPTH, DEEP	PRH	PROJECT RECEPTACLE HEIGHT
DC	DIRECT CURRENT	PRX	PROXIMITY SENSOR
DC	DOWNSTAGE CENTER	PS	POWER SUPPLY
DEG	DEGREES	PSF	POUNDS PER SQUARE FOOT
DEMO	DEMOLITION	PSH	PROJECT SWITCH HEIGHT
DFP	DIRECTOR'S FLOOR POCKET	PSI	POUNDS PER SQUARE INCH
DIA	DIAMETER	PT	PASS THROUGH
DIM	DIMENSION	PVC	POLYVINYL CHLORIDE
DIV	DIVISION	PWR	POWER
DSL	DOWNSTAGE LEFT	QTY	QUANTITY
DSR	DOWNSTAGE RIGHT		
DWG	DRAWING	R	RIGHT
EA	EACH	RCF	REFLECTED CEILING PLAN
EC	ELECTRICAL CONTRACTOR	REF	REFERENCE, REFER
EL	ELEVATION	RENF	REINFORCING
ELEC	ELECTRICAL	REQD	REQUIRED
ENCL	ENCLOSURE	REV	REVISION, REVISE
EQ	EQUAL	RM	ROOM
EQUIP	EQUIPMENT	RO	ROUGH OPENING
ER	EQUIPMENT RACK	RPM	REVOLUTIONS PER MINUTE
ESW	ETHERNET SWITCH	S	SURFACE, SECONDARY
EXIST	EXISTING	SCS	STRUCTURED CABLING SYSTEM
		SQFT	SQUARE FEET
FA	FIRE ALARM	SIM	SIMILAR
FB	FLOOR BOX	SL	STAGE LEFT
FLX	FLEXIBLE	SMFO	SINGLE MODE FIBER OPTIC CABLE
FLR	FLOOR	SMP	STAGE MANAGER POSITION
FO	FINISHED OPENING	SPEC	SPECIFICATION
FOH	FRONT OF HOUSE	SQ	SQUARE
FPB	FIBER OPTIC PATCHBAY	SR	STAGE RIGHT
PPM	FEET PER MINUTE	STD	STANDARD
FOOT	FOOT, FEET	STP	SHIELDED TWISTED PAIR
FV	FIELD VERIFY	SUSP	SURFACE SUSPEND
		TBD	TO BE DETERMINED
GND	GROUND	THRU	THROUGH
GA	GAUGE	Typ	TYPICAL
H	HEIGHT	UC	UPSTAGE CENTER
HL	HOUSE LEFT	UL	UNDERWRITERS LABORATORIES, INC.
HMP	HOUSE MANAGER POSITION	UNO	UNLESS NOTED OTHERWISE
HOR	HORIZONTAL	UPS	UNINTERRUPTIBLE POWER SUPPLY
HP	HORSEPOWER	US	UPSTAGE
HR	HOUSE RIGHT	USL	UPSTAGE LEFT
HZ	HERTZ	USR	UPSTAGE RIGHT
IO	INPUT/OUTPUT	USB	UNIVERSAL SERIAL BUS
ID	INSIDE DIAMETER	UTP	UNSHIELDED TWISTED PAIR
IDF	INTERMEDIATE DISTRIBUTION FRAME	V	VOLT
ISO	ISOLATED GROUND	VA	VOLT-AMPERE
		VERT	VERTICAL
JB	JUNCTION BOX	VIF	VERIFY IN FIELD
JBD	JUNCTION BOX - DATA		
JP	JUNCTION BOX - SYSTEM POWER	W/	WITH
KPD	KEYPAD	W/O	WITHOUT
KW	KILOWATT	WP	WEATHERPROOF
		WT	WEIGHT

STRUCTURED CABLING ABBREVIATIONS			
DAS	DISTRIBUTED ANTENNA SYSTEM		
ER	EQUIPMENT ROOM		
TBB	TELECOMMUNICATIONS BONDING BACKBONE		
PBB	PRIMARY BONDING BUSBAR		
SSB	SECONDARY BONDING BUSBAR		
TR	TELECOMMUNICATIONS ROOM		

CABLE TYPE LEGEND			
SECURITY	TYPE	DESCRIPTION	NOTES
	A	22AWG, 1 PAIR DATA, SHIELDED, 18 AWG, 2 CONDUCTOR STANDED - OSDP	REFERENCE SPECIFICATION 280513
	B	18AWG, 4 CONDUCTOR, STRANDED, UNSHIELDED	REFERENCE SPECIFICATION 280513
	C	16AWG, 2 CONDUCTOR, STRANDED, UNSHIELDED	REFERENCE SPECIFICATION 280513
	E	22AWG, 4 CONDUCTOR, STRANDED, UNSHIELDED	REFERENCE SPECIFICATION 280513
	F	COMPOSITE ACCESS CONTROLLED DOOR CABLE - OSDP	REFERENCE SPECIFICATION 280513
	M	NETWORK COMMUNICATION CABLE	REFERENCE SPECIFICATION 271000
	J	COMPOSITE COPPER FIBER	REFERENCE SPECIFICATION 271000
STRUCTURED CABLING	M	CATEGORY 6, BLUE	REFERENCE SPECIFICATION 271000
	N	CATEGORY 6, WHITE	REFERENCE SPECIFICATION 271000
	R	CATEGORY 6A, YELLOW	REFERENCE SPECIFICATION 271000
	S	CATEGORY 6, YELLOW	REFERENCE SPECIFICATION 271000
NOTES: 1. PROVIDE CABLE RATED FOR ENVIRONMENTAL AIR TYPE PLENUM WHERE REQUIRED. 2. PROVIDE CABLE RATED FOR WET APPLICATIONS FOR USE IN PATHWAYS BELOW GRADE AND FOR USE IN PATHWAYS IN SLAB ON GRADE.			

CAMERA TYPES	
TYPE	DESCRIPTION
5	FIXED 6 MP DOME WITH IR
10	DUAL HEAD SENSOR
20	12MP FISHEYE
30	360-DEGREE MULTI-IMAGER
NOTE:	

ROUGH-IN BOX SCHEDULE	
TYPE 10	RECESSED; 4 11/16" SQUARE BOX. 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/ RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 2-GANG BOX. 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE. 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED (INDOOR): 4 11/16" SQUARE BOX. 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. SURFACE MOUNTED (OUTDOOR / WEATHER PROOF): 2-GANG DIE CAST BOX. 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE 11	RECESSED; 5" SQUARE BOX. 2 7/8" DEEP. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/ RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 2-GANG BOX. 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE. 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED (INDOOR): 4 11/16" SQUARE BOX. 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. SURFACE MOUNTED (OUTDOOR / WEATHER PROOF): 2-GANG DIE CAST BOX. 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE 12	RECESSED; 4 11/16" SQUARE BOX. 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. DEVICE COVER/ RING EDGE TO BE FLUSH WITH FINISHED WALL. MASONRY: 1-GANG BOX. 2 1/2" DEEP WITH KNOCKOUTS IN 4" CMU/BRICK/CONCRETE. 3 1/2" DEEP WITH KNOCKOUTS IN 6" OR 8" CMU/CONCRETE. COVER EDGE TO BE FLUSH WITH FINISHED WALL. SURFACE MOUNTED (INDOOR): 4 11/16" SQUARE BOX. 2 1/8" DEEP WITH KNOCKOUTS. PROVIDE DEVICE EXTENSION AS REQUIRED TO ACCOMMODATE DEVICE COVER SIZE. SURFACE MOUNTED (OUTDOOR / WEATHER PROOF): 1-GANG DIE CAST BOX. 2 5/8" DEEP WITH THREADED OUTLETS.
TYPE A	JUNCTION BOX (HxWxD) WITH SCREW COVER. PROVIDE NEMA TYPE 1 AT INDOOR LOCATIONS. PROVIDE NEMA TYPE 3R AT OUTDOOR LOCATIONS. PAINTED AT EXPOSED LOCATIONS.
TYPE B	JUNCTION BOX (HxWxD) WITH HINGED COVER. PROVIDE NEMA TYPE 1 AT INDOOR LOCATIONS. PROVIDE NEMA TYPE 3R AT OUTDOOR LOCATIONS. PAINTED AT EXPOSED LOCATIONS.
TYPE C	JUNCTION BOX (HxWxD) WITH LOCKING HINGED COVER. PROVIDE NEMA TYPE 1 AT INDOOR LOCATIONS. PROVIDE NEMA TYPE 3R AT OUTDOOR LOCATIONS. PAINTED AT EXPOSED LOCATIONS.

CONDUIT AND PATHWAY NOTES	
1. COORDINATE LOCATION OF EQUIPMENT, JUNCTION BOXES, OUTLETS, CONDUIT, ETC. ACCORDING TO THE PROJECT GENERAL CONDITIONS. 2. PROVIDE A COMPLETE RACEWAY SYSTEM TO CONSIST OF METALLIC CONDUIT (EXCLUDING IN-GROUND PATHWAY), JUNCTION BOXES, DEVICE BACK BOXES, AND FITTINGS UNLESS NOTED OTHERWISE. 3. THE DRAWINGS INDICATE ONE ROUTING METHOD OF THE CABLING PATHWAY. CHANGES MAY BE MADE TO THE PATHWAY SYSTEM ROUTING TO ACCOMMODATE SITE CONDITIONS OR TO SIMPLIFY INSTALLATION PROVIDING THAT NOTED CONDUIT SIZE OR LARGER IS MAINTAINED AND DISTANCE LIMITATIONS LISTED BELOW ARE NOT EXCEEDED. 4. CONDUIT STUBS FROM DEVICES TO THE NEAREST CABLE TRAY OR OTHER NOTED DESTINATIONS SHALL BE CONTINUOUS. 5. UNLESS NOTED OTHERWISE, CONDUIT IS 1 INCH TRADE SIZE. 6. CONDUIT BODIES (LB'S) ARE NOT PERMITTED. 7. CONDUITS SHALL BE REAMED TO ELIMINATE SHARP EDGES. METALLIC CONDUITS SHALL BE TERMINATED WITH AN INSULATED BUSHING. PULL STRINGS WITH A MINIMUM PULL RATING OF 400 POUNDS SHALL BE PROVIDED. 8. MAINTAIN PROPER CONDUIT BEND RADII. FOR CONDUIT WITH AN INTERNAL DIAMETER OF 2" OR LESS, MAINTAIN A BEND RADIUS OF AT LEAST SIX (6) TIMES THE INTERNAL CONDUIT DIAMETER. FOR CONDUIT WITH AN INTERNAL DIAMETER GREATER THAN 2", MAINTAIN A BEND RADIUS OF AT LEAST TEN (10) TIMES THE INTERNAL CONDUIT DIAMETER. 9. BENDS IN THE CONDUIT SHALL NOT CONTAIN ANY KINKS OR OTHER DISCONTINUITIES. FLEX IS NOT PERMITTED UNLESS NOTED OTHERWISE. 10. NO SECTION OF CONDUIT SHALL EXCEED 100 FEET. RUNS IN EXCESS OF 100 FEET REQUIRE A PULL BOX / HANDHOLE / VAULT. 11. NO SECTION OF CONDUIT SHALL CONTAIN MORE THAN TWO 90 DEGREE BENDS, OR EQUIVALENT 180 DEGREES, BETWEEN PULL BOXES. 12. PULL BOX SHALL NOT BE USED IN LIEU OF A BEND. CONDUITS MUST RUN STRAIGHT THROUGH A PULL BOX WITH THE BEND LOCATED EITHER BEFORE OR AFTER THE PULL BOX. 13. REFER TO PULL BOX SIZING TABLE FOR REQUIRED PULL BOX DIMENSIONS. 14. PROVIDE COVERS WITH LABELING FOR JUNCTION BOXES, BACK BOXES WITHOUT FACEPLATES AND PULL BOXES. LABELING SHALL INCLUDE THE CABLE TYPES AND THE APPLICABLE NUMBERING SCHEME FOR EACH CABLE CONTAINED WITHIN THE BOX. 15. PROVIDE CONDUIT TO CROSS INACCESSIBLE CEILINGS OR IN AREAS WITHOUT CEILINGS UNLESS NOTED OTHERWISE. 16. PROVIDE CONDUIT IN EXPOSED AREAS, MECHANICAL SPACES, AND ELEVATOR CONTROL ROOMS. 17. REGARDLESS OF PATHWAY TYPE, CABLING SHALL BE SUPPORTED AT 5 FEET MAXIMUM INTERVALS UTILIZING INDEPENDENT MOUNTING METHODS IN ACCORDANCE WITH MANUFACTURER INSTALLATION REQUIREMENTS. J-HOOK PATHWAYS SHALL BE ESTABLISHED TO SUPPORT EXPOSED CABLING AND PREVENT PHYSICAL CONTACT OF THE CABLING WITH BUILDING STRUCTURE AND OTHER MECHANICAL AND ELECTRICAL SYSTEMS INCLUDING MECHANICAL AND ELECTRICAL SYSTEMS MOUNTING PRODUCTS. 18. ROUTE CONDUIT WITH OTHER BUILDING SERVICES AND CONCEAL WHENEVER POSSIBLE. GROUP AND RUN PARALLEL, ALONG A SINGLE BUILDING COLUMN LINE, HOLD TIGHT TO STRUCTURE AND PAINT AS DIRECTED BY THE ARCHITECT. 19. IF SC'S AND POWER CONDUITS MUST CROSS, CROSS AT RIGHT ANGLES. 20. FOR IN-SLAB OR UNDERGROUND CONDUIT ENTERING A BUILDING, TRANSITION BACK TO METALLIC CONDUIT WITHIN 3 FEET OF THE ENTRY POINT. 21. REFER TO ELECTRICAL DRAWINGS AND PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS. 22. PROVIDE SPECIFIED FIRE-STOPPING PRODUCTS AT FIRE-RATED WALL AND FLOOR PENETRATIONS IN ORDER TO MAINTAIN THE FIRE RATING OF THE MEMBRANE. 23. PROVIDE THROUGH-WALL ACOUSTICAL PATHWAY PRODUCTS IN ORDER TO MAINTAIN THE ACOUSTIC RATING OF A WALL.	

PATHWAY DISTRIBUTION	
	CONDUIT (CONCEALED OR EXPOSED)
	CONDUIT BELOW FLOOR SLAB OR GRADE
	J-HOOKS ON 5' CENTERS
	NUMBER OF CONDUITS CONDUIT SIZE CONDUIT

DEVICE SYMBOL KEY - SECURITY SYSTEMS					
	WALL / COLUMN MOUNTED DEVICE		CEILING / OVERHEAD MOUNTED DEVICE		FLOOR MOUNTED DEVICE
	DESK / COUNTER MOUNTED DEVICE		UNDER DESK / COUNTER MOUNTED DEVICE		DEVICE ID
	DEVICE TYPE				

SYMBOL LEGEND - SECURITY SYSTEMS								
SIZES, DIMENSIONS AND NOTES DESCRIBE TYPICAL REQUIREMENTS. IF APPLICABLE, VARIATIONS AND/OR ADDITIONAL REQUIREMENTS WILL BE NOTED ON THE DRAWINGS. UNLESS NOTED OTHERWISE, MOUNTING HEIGHTS ARE TO CENTER OF ROUGH-IN BOX.								
TYPE	DEVICE	ROUGH-IN BOX (H"xW"xD")	DEVICE COVER SIZE	WALL/COLUMN	MOUNTING HEIGHT CEILING/OVERHEAD	FLOOR	CABLE (QTY) TYPE	CONDUIT NOTES
ACP	ACCESS CONTROL PANEL	--	--	4'-6" AFF TO CENTER OF PANEL	--	--	(2)M	INCLUDES ENCLOSURE, ACCESS CONTROL PANELS, AND ELECTRIC LOCK POWER SUPPLY.
CB	BLUE PHONE EMERGENCY STATION	REF DETAIL	--	BUILDING SWITCH HEIGHT TO CALL BUTTON	--	ON FLOOR	(1)M	INCLUDES A BLUE LIGHT EMERGENCY STATION DEVICE THAT INCLUDES THE LIGHT, THE ENCLOSURE, AND THE HANDSFREE COMMUNICATION DEVICE.
CRE	CARD READER SYSTEM - ELEVATOR	REF DETAIL	REF DETAIL	REF DETAIL	--	--	(1)F	SYSTEM INCLUDES MULTIPLE DEVICES; REF DETAIL. PROVIDE (1) TYPE B CABLE PER SECURED LEVEL COORDINATE WITH DIV. 14.
CRS	CARD READER SYSTEM	TYPE 12	1-GANG	BUILDING SWITCH HEIGHT	--	--	(1)F	SYSTEM INCLUDES MULTIPLE DEVICES; REF DETAIL.
DC	DOOR CONTACT	--	--	--	--	--	(1)E	INCLUDES A DOOR CONTACT MOUNTED DIRECTLY IN LINE WITH THE DOOR APPROXIMATELY 6" FROM THE STRIKE SIDE DOOR EDGE.
ELI	ELECTRIC LOCK INTERFACE	REF DETAIL	REF DETAIL	--	--	--	(1)F	THIS IS THE CONNECTION TO THE ELECTRIFIED LOCKING HARDWARE AT THE DOOR. THIS TYPICALLY CONNECTS TO AN OUTPUT ON THE ACCESS CONTROL SYSTEM FOR LOCKING OR UNLOCKING THE DOOR.
EP	EMERGENCY PHONE	CUSTOM	CUSTOM	4'-6" AFF	--	--	(1)M, (1)B	AUXILIARY POWERED ANALOG SPEAKERPHONE THAT PROVIDES HANDS-FREE LINK TO FIRST RESPONDERS.
OH	OVERHEAD DOOR CONTACT	TYPE 12	1-GANG	--	--	ON GROUND, BELOW DOOR	(1)E	INCLUDES GROUND MOUNTED CONTACT WITH ARMORED CABLE CONNECTED TO SINGLE GANG JUNCTION BOX.
PB	PANIC BUTTON	TYPE 12	1-GANG	BUILDING SWITCH HEIGHT	--	--	(1)B	INCLUDES A PANIC BUTTON.
VIC	VIDEO INTERCOM DOOR STATION	CUSTOM	--	4'-6" AFF	--	--	(1)M	INCLUDES POE POWERED INTERCOM THAT PROVIDES AUDIO AND VIDEO TO THE MASTER INTERCOM STATION
LEGEND NOTES - SECURITY SYSTEMS								
1. CATEGORY CABLING PROVIDED BY DIVISION 27. 2. PROVIDE QTY. (2) ADDITIONAL 18/6 CABLES FROM ACP TO ACCESS CONTROLLED DOOR LOCATIONS TO AUTO DOOR MOTOR. COORDINATE TERMINATIONS WITH DIVISION 08. 3. REFERENCE SCHEDULES FOR ADDITIONAL INFORMATION. 4. REFERENCE DIVISION 26 FOR ALL ELECTRICAL POWER AND CONDUIT. 5. REFER TO DIVISION 087100 FOR DOOR HARDWARE SPECIFICATIONS. COORDINATE ELECTRIC LOCK POWER AND CABLE PATHWAY REQUIREMENTS WITH DIVISION 08 AND DIVISION 26.								

DEVICE SYMBOL KEY - VIDEO SURVEILLANCE SYSTEMS					
	WALL / COLUMN MOUNTED CAMERA		CEILING / OVERHEAD MOUNTED CAMERA		ROOF MOUNTED CAMERA
	PARAPET MOUNTED CAMERA		CAMERA ID		CAMERA MOUNT TYPE
	CAMERA TYPE				

SYMBOL LEGEND - VIDEO SURVEILLANCE SYSTEMS								
SIZES, DIMENSIONS AND NOTES DESCRIBE TYPICAL REQUIREMENTS. IF APPLICABLE, VARIATIONS AND/OR ADDITIONAL REQUIREMENTS WILL BE NOTED ON THE DRAWINGS. UNLESS NOTED OTHERWISE, MOUNTING HEIGHTS ARE TO CENTER OF ROUGH-IN BOX.								
TYPE	DEVICE	ROUGH-IN BOX (H"xW"xD")	DEVICE COVER SIZE	WALL/COLUMN	MOUNTING HEIGHT CEILING/OVERHEAD	FLOOR	CABLE (QTY) TYPE	CONDUIT NOTES
P	PENDANT MOUNTED CAMERA	TYPE 12	1-GANG	REF SCHEDULE	REF SCHEDULE	--	(1)S	--
S	SURFACE MOUNTED CAMERA	TYPE 12	1-GANG	REF SCHEDULE	REF SCHEDULE	--	(1)S	--
W	WALL MOUNTED CAMERA	TYPE 12	1-GANG	REF SCHEDULE	REF SCHEDULE	--	(1)S	--
LEGEND NOTES - VIDEO SURVEILLANCE SYSTEMS								
1. CATEGORY CABLING PROVIDED BY DIVISION 27. 2. REFERENCE SCHEDULES FOR ADDITIONAL INFORMATION. 3. COORDINATE COMPOSITE FIBER/COPPER CABLE LOCATION WITH DIVISION 27. COMPOSITE FIBER CABLING REQUIRED FOR VIDEO SURVEILLANCE CAMERAS LOCATED ON LIGHT POLES AND AT LOCATIONS EXCEEDING 100 METERS FROM IDF/TELECOM ROOMS.								

SYMBOL LEGEND - STRUCTURED CABLING SYSTEMS								
SIZES, DIMENSIONS AND NOTES DESCRIBE TYPICAL REQUIREMENTS. IF APPLICABLE, VARIATIONS AND/OR ADDITIONAL REQUIREMENTS WILL BE NOTED ON THE DRAWINGS. UNLESS NOTED OTHERWISE, MOUNTING HEIGHTS ARE TO CENTER OF ROUGH-IN BOX.								
TYPE	DEVICE	ROUGH-IN BOX (H"xW"xD")	DEVICE COVER SIZE	WALL/COLUMN	MOUNTING HEIGHT CEILING/OVERHEAD	FLOOR	CABLE TYPE	CONDUIT NOTES
	COMMUNICATIONS WALL OUTLET	TYPE 10	REF DETAILS	BUILDING OUTLET HEIGHT	--	--	(#)N	--
	COMMUNICATIONS FLOOR OUTLET	SEE NOTE 2	--	--	--	COORDINATE WITH ELECTRICAL REQUIREMENTS	(#)N	REF ARCHITECTURAL FOR EXACT LOCATION
	ANNOUNCER PLATE	--	--	--	--	--	--	--
	COMMUNICATIONS WALL OUTLET, WIRELESS ACCESS POINT	TYPE 10	REF DETAILS	10'-0" AFF	--	--	(#)R	ACCESS POINT DEVICE TO BE OWNER FINISHED, CONTRACTOR INSTALLED
	COMMUNICATIONS CEILING OUTLET, WIRELESS ACCESS POINT	TYPE 10	REF DETAILS	--	--	FLUSH WITH CEILING (UNLESS IN ACCESSIBLE CEILING)	(#)R	ACCESS POINT DEVICE TO BE OWNER FINISHED, CONTRACTOR INSTALLED
	DISPLAY BACKBOX DATA WALL OUTLET	TYPE *	* GANG	--	--	--	#A	COORDINATE ROUGH-IN BOX AND DEVICE COVER MOUNTINGS WITH INTEGRATED AV BOX.
	AV RACK	--	--	--	--	--	--	--
	FLOOR OUTLET	SEE NOTE 2	--	--	--	COORDINATE WITH AV AND ELECTRICAL REQUIREMENTS	#A	REF ARCHITECTURAL FOR EXACT LOCATION
	AV PLATE	--	--	--	--	--	--	--
	MICLINE PLATE	--	--	--	--	--	--	--
	COMMUNICATIONS WALL OUTLET	TYPE 10	REF DETAILS	BUILDING OUTLET HEIGHT	--	--	(#)N	--
	AV CAMERA	--	--	--	--	--	--	--
LEGEND NOTES - STRUCTURED CABLING SYSTEMS								
1. (#) REPRESENTS THE NUMBER OF CABLES FOR THAT LOCATION. IF NO NUMBER SHOWN, PROVIDE (1). 2. PROVIDE NECESSARY ADAPTER, BEZELS, OR MODULES TO ACCOMMODATE THE STRUCTURED CABLING SYSTEM WITH THE FLOOR OUTLET SYSTEM. REFERENCE ELECTRICAL DRAWING FOR FLOOR BOX INFORMATION. 3. PROVIDE NECESSARY ADAPTER, BEZELS, OR MODULES TO ACCOMMODATE THE STRUCTURED CABLING SYSTEM WITH THE RACEWAY SYSTEM. REFERENCE ELECTRICAL DRAWING FOR RACEWAY INFORMATION. 4. PROVIDE LEGRAND RA82M20xx FLOOR POKE-THRU DEVICE UNLESS OTHERWISE NOTED. FOR ABOVE GRADE APPLICATION AND LEGRAND 881 BOX WITH LEGRAND 98114FFCTxx COVER FOR ON GRADE APPLICATIONS, SERVE ON-GRADE INSTALLS WITH (2) 1 1/4" CONDUITS WITH PULL LINE. COORDINATE COVER FINISH WITH ARCHITECT.								

PULL BOX SIZING				
TRADE SIZE	WIDTH	LENGTH	DEPTH	WIDTH INCREASE FOR ADDITIONAL CONDUIT
1	4"	16"	3"	2"
1-1/4	6"	20"	3"	3"
1-1/2	8"	27"	4"	4"
2	8"	36"	4"	5"
2-1/2	10"	42"	5"	6"
3	12"	48"	5"	6"
3-1/2	12"	54"	6"	6"
4	15"	60"	8"	8"

IN128 - JAMES T. MORRIS ARENA

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IN128 - JAMES T.
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SEAL DATE	01/27/25
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RATIO

PROJECT NO. 23112.000

SHEET TITLE
EVENT FLOOR PLAN
- AREA A

SHEET NUMBER

ES-101A



KEYNOTES	
304	COORDINATE LOCATION WITH ELECTRICAL PANEL. PROVIDE A CONTINUOUS CONDUIT PATHWAY WITHIN THIS SPACE.

IN128 - JAMES T.
MORRIS ARENA

Ohio St & N Blackford St
Indianapolis, IN 46202

IU Project NO. 20240127

Owner
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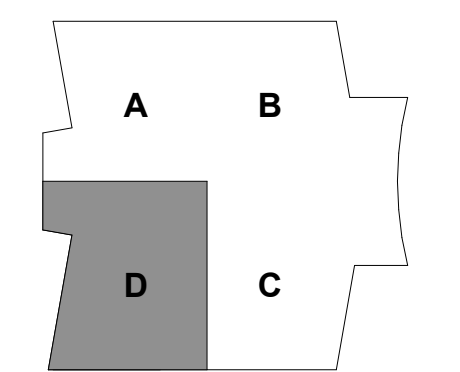
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Code Consultant
FORZA
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816-806-3729

 **KEY PLAN**

SEAL | DATE 01/27/25

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RATIO

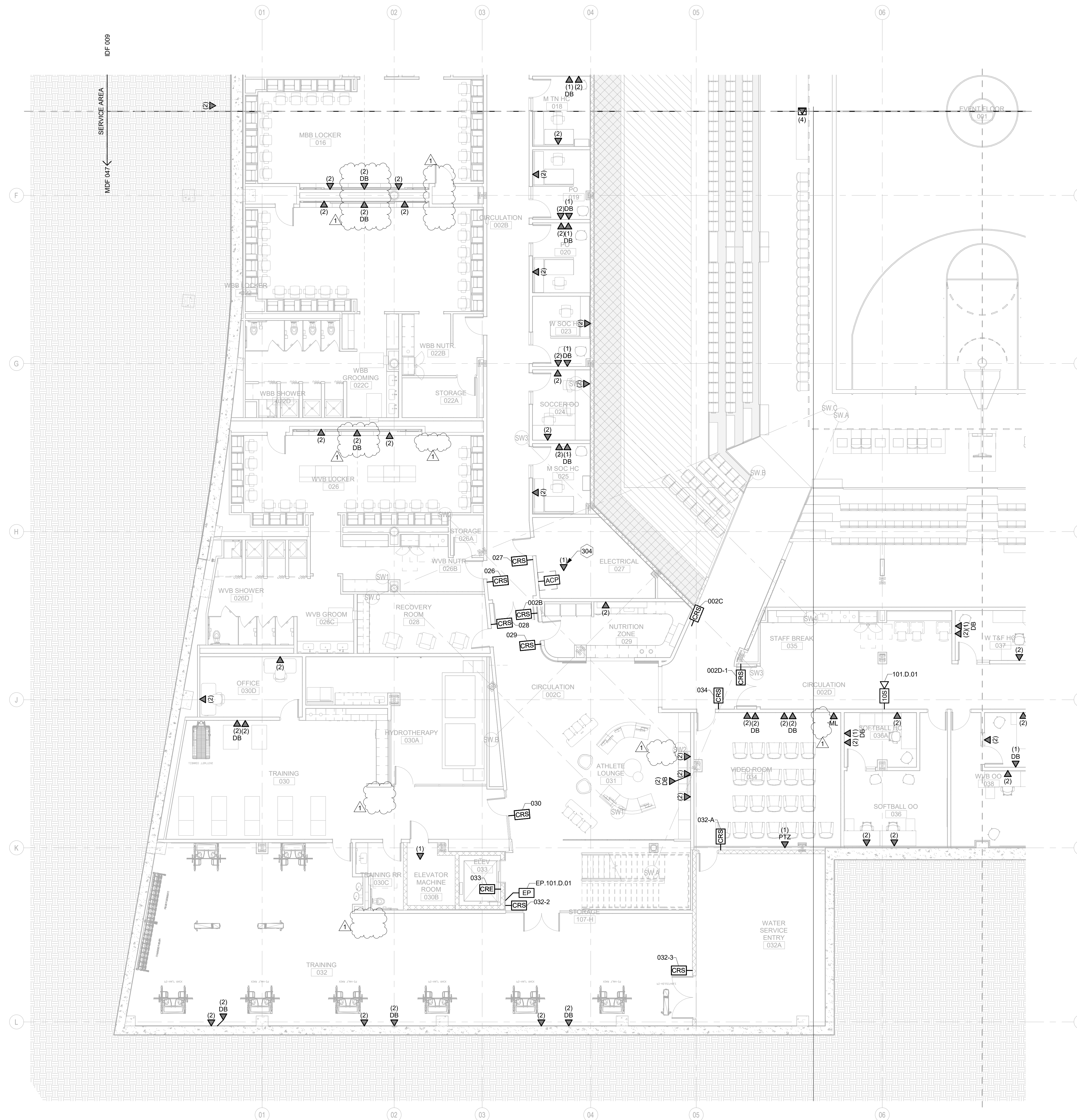
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PROJECT NO.	23112.000
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SHEET TITLE
EVENT FLOOR PLAN
- AREA D

SHEET NUMBER

ES-101D



1
ES-101D

EVENT LEVEL FLOOR PLAN - AREA D

1/8" = 1'-0"

1/23/2025 11:55:07 AM

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SEAL | DATE 01/27/25

RATIO

PROJECT NO. 23112.000

SHEET TITLE
CONCOURSE FLOOR
PLAN - AREA A

SHEET NUMBER

ES-102A



KEYNOTES	
320	COORDINATE WITH ELECTRICAL CONTRACTOR FOR COMBINATION POWER/DATA FLOOR BOX AND SECURITY SCANNING EQUIPMENT PROVIDER FOR FINAL LOCATION. PROVIDE MINIMUM 1-1/4" CONDUIT TO NEAREST WALL AND STUBBED INTO ACCESSIBLE CEILING SPACE.
321	COORDINATE WITH ELECTRICAL CONTRACTOR AND AV FOR COMBINATION POWER/AV/DATA FLOOR BOX LOCATION AND PATHWAYS. PROVIDE MINIMUM 1-1/4" CONDUIT TO NEAREST WALL AND STUBBED INTO ACCESSIBLE CEILING SPACE.
322	COORDINATE DEVICE LOCATIONS AND ROUTING IN CASEWORK WITH CASEWORK SUPPLIER.

IN128 - JAMES T.
MORRIS ARENA

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IU Project NO. 20240127

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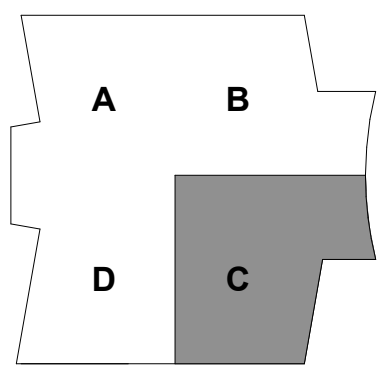
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 **KEY PLAN**

SEAL | DATE 01/27/25

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RATIO

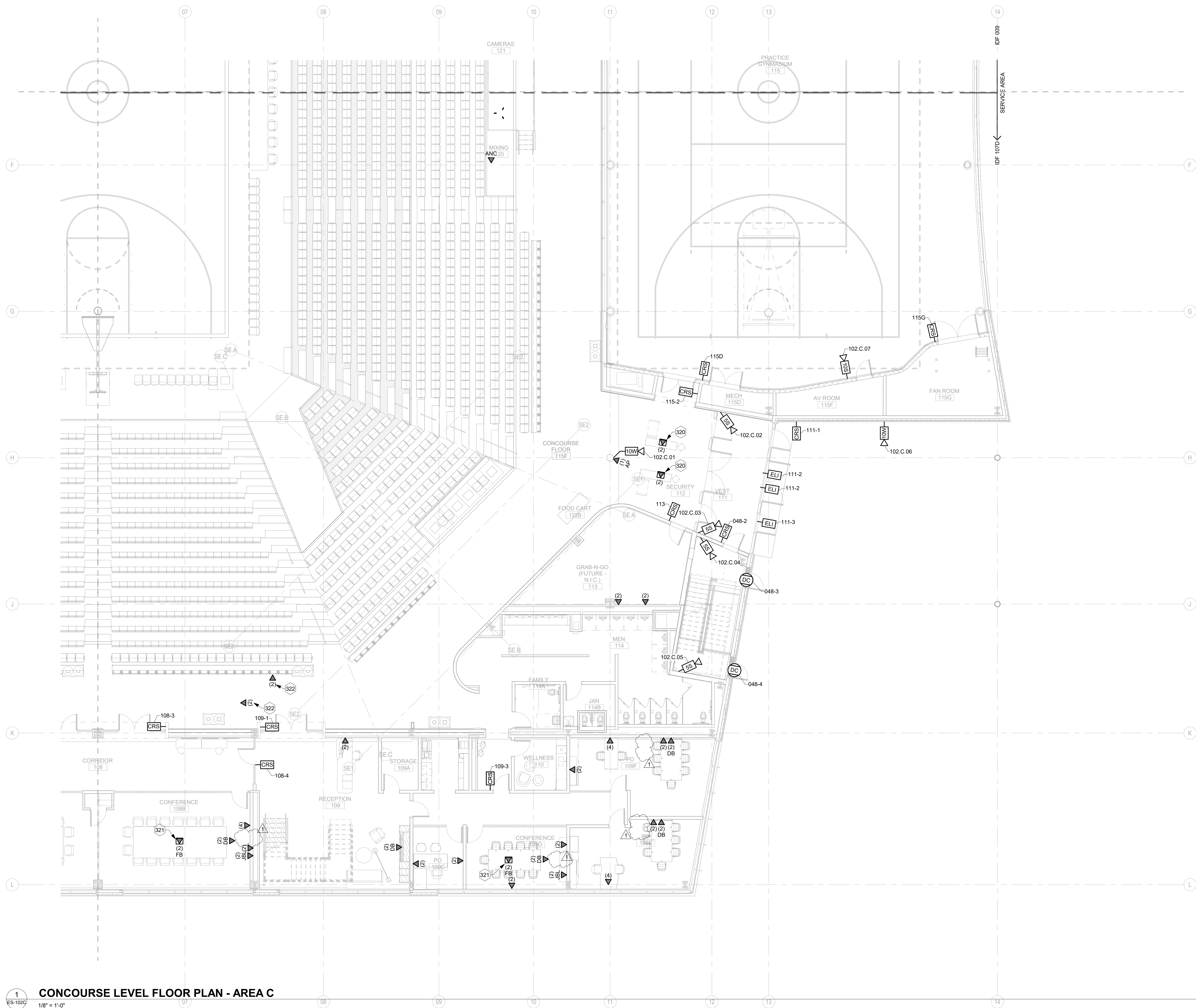
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PROJECT NO. 23112.000

SHEET TITLE
CONCOURSE FLOOR
PLAN - AREA C

SHEET NUMBER

ES-102C



KEYNOTES	
304	COORDINATE LOCATION WITH ELECTRICAL PANEL. PROVIDE A CONTINUOUS CONDUIT PATHWAY WITHIN THIS SPACE.
321	COORDINATE WITH ELECTRICAL CONTRACTOR AND AV FOR COMBINATION POWER/AV DATA FLOOR BOX LOCATION AND PATHWAYS. PROVIDE MINIMUM 1'-1/4" CONDUIT TO NEAREST WALL AND STUBBED INTO ACCESSIBLE CEILING SPACE.
401	PROVIDE INTERFACE TO ACCESS CONTROL SYSTEM FOR EMERGENCY LOCKDOWN OF ALL ACCESS CONTROLLED OPENINGS UPON ACTIVATION OF THE PANIC BUTTON.

IN128 - JAMES T.
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Ohio St & N Blackford St
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IU Project NO. 20240127

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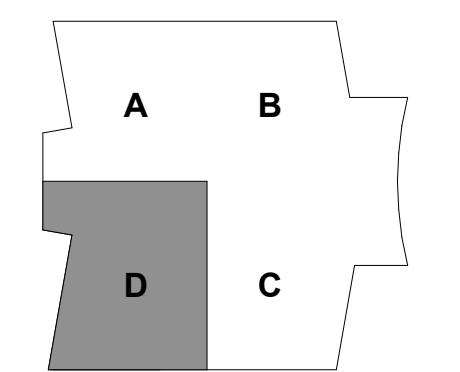
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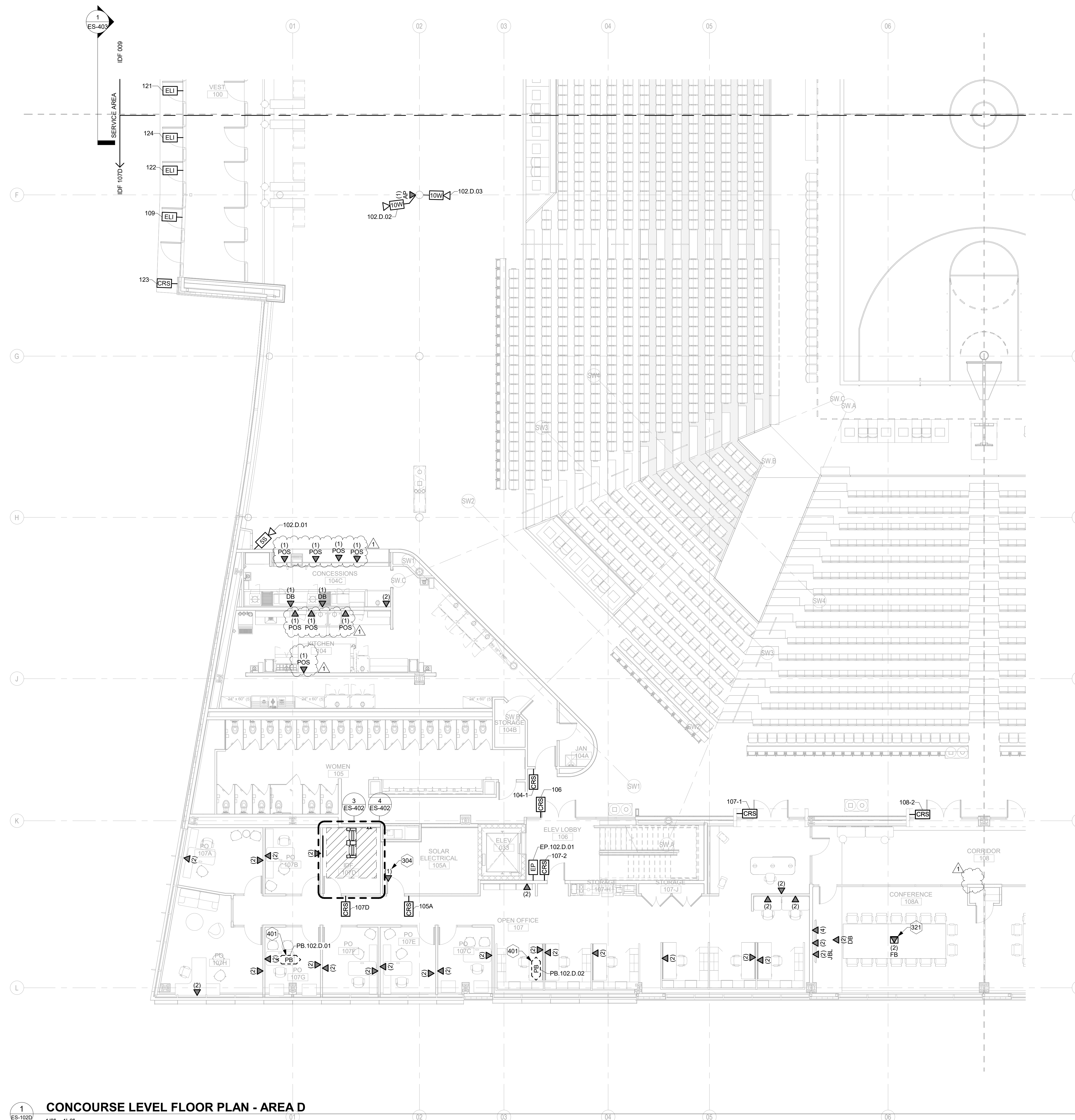
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PROJECT NO.	23112.000
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SHEET TITLE
CONCOURSE FLOOR
PLAN - AREA D

SHEET NUMBER

ES-102D



IU Project NO. 20240127

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PROJECT NO.	23112.000
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SHEET NUMBER



IN128 - JAMES T.
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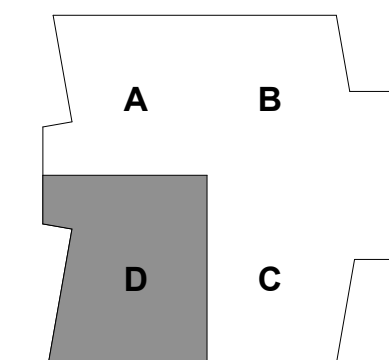
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SEAL DATE	01/27/25
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RATIO

PROJECT NO. 23112.000

SHEET TITLE

CONCOURSE
REFLECTED CEILING
PLAN - AREA D

SHEET NUMBER

ES-132D

1
ES-132D

CONCOURSE LEVEL REFLECTED CEILING PLAN - AREA D

$$1/8'' = 1'-0''$$