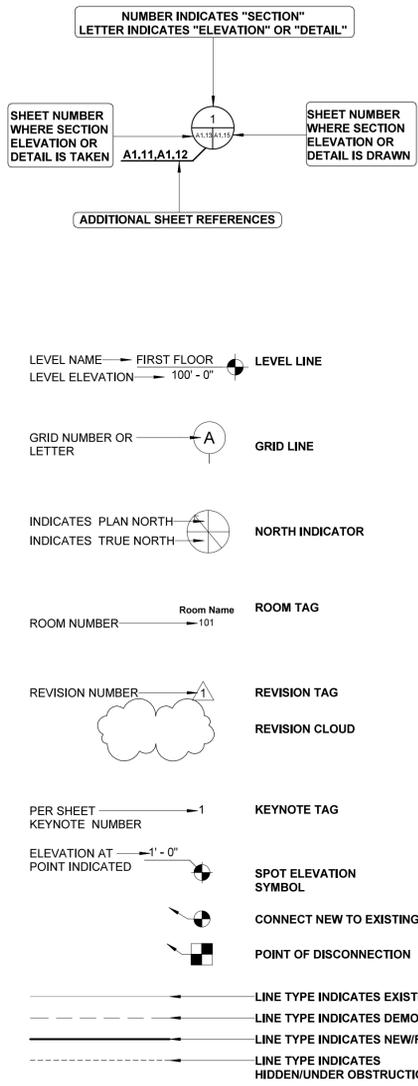


STANDARD DETAILING SYMBOLS



HVAC SYMBOLS

Table with columns SYMBOL and DESCRIPTION. Includes sub-sections for GRILLES and various ductwork symbols like supply, return, and exhaust air ducts.

MECHANICAL PIPING SYSTEMS

Table with columns SYMBOL and DESCRIPTION. Lists various piping systems such as condensate drain, chilled water return, high pressure steam, and refrigerant.

MECHANICAL PIPING SYMBOLS

Table with columns SYMBOL and DESCRIPTION. Lists various valve and pipe symbols including ball valves, stop valves, 3-way valves, and pressure regulating valves.

HVAC SYMBOLS CONTINUED

Table with columns SYMBOL and DESCRIPTION. Includes sub-sections for DAMPERS and CONTROLS, listing symbols for various damper types and sensors.

ABBREVIATIONS -...

Table of abbreviations including symbols for PERCENT, DEMOLISH, EXISTING, AIR CONDITIONING, and various HVAC components like ATC, AHU, and AH.

ABBREVIATIONS -...

Table of abbreviations including symbols for DOWN, DIGITAL OUTPUT, DIFFERENTIAL PRESSURE, DRAWING, and various HVAC components like EAT, ECM, and EF.

ABBREVIATIONS -...

Table of abbreviations including symbols for POUNDS, LINEAR FEET, LINEAR, LEAVING WATER TEMPERATURE, and various HVAC components like MA, MAT, and MAU.

ABBREVIATIONS -...

Table of abbreviations including symbols for STATIC PRESSURE, SPLIT SYSTEM, TEMPERATURE AND PRESSURE, TEMPERATURE, and various HVAC components like T-STAT, TON, and TSP.

DRAWING LIST - MECHANICAL

Table listing drawing details including NO., DATE, BY, and DESCRIPTION for various mechanical drawings.



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DEB APPROVAL



SEAL



1/22/2026

KEY PLAN:

SCALE:

REVISIONS

Table with columns NO., DATE, BY, and DESCRIPTION for tracking revisions to the drawing.

DRAWN BY: SMF

APPROVED BY: SWD

CHECKED BY: JDR

DATE: January 12, 2024

TITLE MECHANICAL SYMBOLS & ABBREVIATIONS

DEI PROJECT NO: 50158550 RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

M0.01

E
D
C
B
A

MECHANICAL GENERAL NEW WORK NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE STATE CODES AND REGULATIONS. MECHANICAL EQUIPMENT SHALL BE SELECTED TO MEET OR EXCEED THE REQUIREMENTS OF THE STATE ENERGY CONSERVATION CODE. MECHANICAL WORK SHALL COMPLY WITH PROJECT SPECIFICATIONS.
- FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES REQUIRED TO MAKE THE MECHANICAL WORK COMPLETE AND OPERATIONAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING, TESTING AND VERIFYING CONTROL SEQUENCES, LINE BY LINE, AND VERIFYING OPERATION OF THE EQUIPMENT, ALL EQUIPMENT, VALVES, DAMPERS ACTUATORS, ETC. SHALL BE FUNCTIONAL PRIOR TO FINAL COMMISSIONING. COORDINATE WITH ELECTRICAL AND TAB CONTRACTORS. REFER TO SECTION 239000 FOR MORE DETAIL.
- THESE DRAWINGS ARE DIAGRAMMATIC. EXACT EQUIPMENT LOCATIONS AND DUCT AND PIPING ROUTING SHALL BE COORDINATED WITH THE BUILDING AND SITE CONDITIONS. THE ACTUAL EQUIPMENT AND MINIMUM CLEARANCE DIMENSIONS SHALL BE VERIFIED WITH THE SUPPLIERS. FITTINGS NOT SHOWN ON THE DRAWINGS MIGHT BE REQUIRED.
- EQUIPMENT, DUCTWORK, PIPING AND CONDUIT LAYOUT SHALL BE COORDINATED WITH BUILDING COMPONENTS AND OTHER TRADES PRIOR TO INSTALLATION. THE SYSTEM SHALL BE NEATLY ARRANGED TO MAXIMIZE SPACE ABOVE CEILINGS AND WITHIN CHASES. MAINTAIN MINIMUM EQUIPMENT AND DEVICE MAINTENANCE CLEARANCES. DEVICES SHALL BE READILY MAINTAINABLE. METERS AND GAGES SHALL BE ORIENTED FOR BEST VIEW. INSTALLED MATERIALS NOT COORDINATED SHALL BE REMOVED AND REINSTALLED AT NO ADDITIONAL COST.
- DUCT OFFSETS SHALL BE MADE AT 15 OR 30-DEGREE ANGLES WHERE POSSIBLE BUT AT NEVER MORE THAN 45-DEGREES.
- CEILING-MOUNTED EQUIPMENT EXACT LOCATIONS SHALL BE COORDINATED WITH THE REFLECTED CEILING PLANS AND THE EXISTING CONDITIONS. AIR OUTLETS AND SMOKE DETECTORS SHALL BE COORDINATED TO BE NO LESS THAN 36-INCHES APART.
- WALL-MOUNTED CONTROL SENSORS SHALL BE INSTALLED AT 48-INCHES ABOVE THE FLOOR TO THE TOP OF BACK-BOX. COORDINATE EXACT LOCATIONS WITH LIGHT SWITCHES. WHEN BOTH ARE INDICATED ADJACENT TO A DOOR, LOCATE THE SWITCH CLOSEST TO THE DOOR AND THE SENSOR WITHIN 12-INCHES OF THE SWITCH.
- CONTROL AND ALARM DEVICES SHALL BE INSTALLED IN BACK-BOXES WITHIN NEW AND EXISTING WALLS. SURFACE-MOUNTED CONDUIT AND RACEWAY WILL NOT BE ACCEPTED EXCEPT FOR EXISTING SOLID CONCRETE WALLS. DEVICE BACK-BOXES IN FIRE-RATED WALLS SHALL HAVE FIRESTOP PUTTY PADS OR EQUIVALENT UL-LISTED INSTALLATION.
- PROVIDE APPROVED UL-LISTED FIRESTOP SYSTEMS AT PENETRATIONS OF LIFE-SAFETY RATED ASSEMBLIES AS REQUIRED FOR THE WORK. REFERENCE SECTION 078413 "THROUGH PENETRATION FIRESTOP SYSTEMS" FOR REQUIREMENTS AND THE UL DESIGN APPENDIX IN THE PROJECT MANUAL FOR FIRESTOP SYSTEM DETAILS.
- INSTALL LIFE-SAFETY (FIRE, SMOKE AND COMBINATION FIRE AND SMOKE) DAMPERS IN RATED ASSEMBLIES PER UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE AND MANUFACTURER'S LISTING REQUIREMENTS.
- PROVIDE A DUCT ACCESS DOOR FOR EACH DUCT-MOUNTED DEVICE REQUIRING MAINTENANCE OR INSPECTION. REFER TO SECTION 23 33 00 FOR DOOR SIZING REQUIREMENTS. COORDINATE CEILING AND WALL ACCESS DOORS WITH DUCT ACCESS DOORS.
- HVAC PIPING SHALL BE NO LESS THAN 3/4-INCH, EXCEPT REFRIGERANT PIPING.
- ALL MOTORIZED EQUIPMENT SHALL BE CONNECTED TO DUCTWORK OR PIPING WITH FLEXIBLE CONNECTIONS.
- ROOF MODIFICATIONS AND REPAIRS SHALL MEET THE REQUIREMENTS OF THE ROOF WARRANTY.
- EXTEND POWER CONDUIT AND WIRING FROM DEDICATED POWER SOURCES TO CONTROL EQUIPMENT AND DEVICES. COORDINATE POWER SOURCES WITH ELECTRICAL CONTRACTOR.
- DUCT BRANCH DUCT FROM MAIN TAKEOFF TO AIR INLET OR OUTLET SHALL MATCH SCHEDULED NECK SIZE UNLESS OTHERWISE NOTED.
- SUPPLY DUCT BRANCH DUCTS FROM MAIN TO TERMINAL UNIT INLETS AND DISCHARGE DUCT SIZES SHALL MATCH CONNECTION SIZES UNLESS OTHERWISE NOTED. PROVIDE NO LESS THAN 3 DUCT DIAMETERS OF STRAIGHT LENGTH AT UNIT INLET.
- PIPING BRANCHES FROM MAINS TO HEATING AND COOLING COILS SHALL MATCH SCHEDULED SIZES UNLESS OTHERWISE NOTED.
- MAINTAIN MINIMUM 36-INCH CLEARANCE FOR 120/208V POWER OR 42-INCH CLEARANCE FOR 277/480V POWER AS REQUIRED BY THE NATIONAL ELECTRIC CODE FOR ELECTRICAL EQUIPMENT AND TO PROVIDE MAINTENANCE ACCESS.
- MAINTAIN CLEAR SPACE BETWEEN THE CEILING AND THE TOP OF EACH TERMINAL UNIT. COORDINATE ALL CLEARANCES WITH OTHER TRADES. ENSURE ACCESS DOORS CAN BE OPENED FULLY AND ALL VALVES, DAMPERS AND DEVICES CAN BE EASILY REACHED AND ACTUATED.
- FIELD VERIFY EXACT PIPING SIZES AND FLOW DIRECTIONS PRIOR TO CONNECTING TO PIPING SYSTEM.
- EXPOSED DUCT, PIPING AND CONDUIT SHALL BE PRIMED AND PAINTED TO MATCH ADJACENT SURFACES. REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
- SCHEDULE ALL SERVICE DISRUPTIONS AND SHUTDOWNS WITH THE OWNER NO LESS THAN 2 WEEKS PRIOR.
- AIR HANDLING UNIT INTAKES SHALL BE SEPARATED BY MINIMUM 10 FEET FROM EXHAUST FANS, EXHAUST VENTS, FLUES, PLUMBING VENTS, ETC.
- EXISTING DUCTWORK AND PIPING SHOWN ARE BASED ON AS-BUILT DRAWINGS AND EXISTING CONDITIONS NOTED TO THE BEST OF ENGINEER'S ABILITY DURING DESIGN. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING MECHANICAL ITEMS SHOWN PRIOR TO COMMENCING WORK.

MECHANICAL GENERAL DEMOLITION WORK NOTES

- VERIFY PROJECT SITE EXISTING CONDITIONS PRIOR TO BID. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE APPROXIMATE AND DO NOT INCLUDE EVERY COMPONENT.
- RECORD EXISTING CONDITIONS PRIOR TO THE START OF WORK. REPAIR DAMAGES RESULTING FROM PROJECT WORK.
- COORDINATE MATERIALS TO BE RETAINED BY THE OWNER PRIOR TO THE START OF DEMOLITION WORK. RETAINED MATERIALS SHALL BE DELIVERED TO A POINT DESIGNATED BY THE OWNER WITHIN A 10-MILE RADIUS OF THE PROJECT SITE. PROPERLY DISPOSE OF ALL REMAINING DEMOLITION MATERIALS. COMPLY WITH MATERIAL RECYCLING REQUIREMENTS. DO NOT ABANDON IN PLACE ANY ITEMS IDENTIFIED TO BE REMOVED UNLESS OTHERWISE NOTED.
- THE SCOPE OF DEMOLITION FOR ITEMS TO BE REMOVED INCLUDES ASSOCIATED SUPPORTS, POWER CONNECTIONS, CONTROLS, CONDUIT, ETC.
- PERFORM ALL DEMOLITION INDICATED INCLUDING THAT REQUIRED TO INSTALL NEW WORK. REMOVE AND REINSTALL MATERIALS TO REMAIN AS NEEDED WHERE REQUIRED TO PERFORM DEMOLITION OR TO INSTALL NEW WORK. REPAIR DAMAGED SURFACES TO MATCH EXISTING ADJACENT SURFACES.
- REMOVE DUCT, PIPING AND CONDUIT BACK TO POINTS INDICATED. PREPARE OPEN ENDS FOR CONNECTION TO NEW WORK INDICATED OR CAP.
- REPAIR DAMAGE TO ANY OPENINGS IN LIFE-SAFETY RATED ASSEMBLIES CREATED BY THE DEMOLITION WORK PER APPROVED UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE.
- PIPING AND CONDUIT TO BE REMOVED THAT IS LOCATED BELOW CONCRETE SLAB-ON-GRADE FLOORS OR WITHIN CONCRETE SOLID OR BLOCK WALLS MAY BE ABANDONED IN PLACE UNLESS NECESSARY TO INSTALL NEW WORK OR NOTED OTHERWISE. WHEN ABANDONING CUT PIPING OR CONDUIT BACK AT LEAST 1-INCH BEHIND THE SURFACE, PLUG THE ENDS AND PATCH THE SURFACE WITH SIMILAR MATERIAL.
- CAPTURE AND RECYCLE REFRIGERANT FROM HVAC EQUIPMENT. COMPLY WITH THE EPA REFRIGERANT RECYCLING REQUIREMENTS.
- REMOVE AND REINSTALL LAY-IN CEILING TILES AND GRID AS NEEDED TO PERFORM CONTRACT WORK. STORE CEILING MATERIALS IN A CLEAN DRY PLACE. REPLACE DAMAGED TILES WITH NEW TO MATCH. SELECT ONE ROOM TO INSTALL ALL NEW TILE AND GRID TO PROVIDE THE TILES NEEDED TO REPLACE DAMAGED TILES IN OTHER SPACES.
- DURING RENOVATION, MAINTAIN OPERATION OF EXISTING CONTROL SYSTEM AND COMPONENTS OUTLINED ON CONTROLS DRAWINGS AND THE CONSTRUCTION PHASING CRITERIA DRAWING. AT EACH PHASE RE-VERIFY OPERATION OF REMAINING CONTROLLED DEVICES AFTER REMOVAL WORK IS COMPLETE.
- DURING CONSTRUCTION, TEMPORARY HEATING AND AIR CONDITIONING SHALL BE PROVIDED FOR OCCUPIED SPACES AND AREAS SUBJECT TO FREEZING AS OUTLINED ON THE CONSTRUCTION PHASING CRITERIA DRAWING. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.
- EXISTING SYSTEMS SERVING AREAS OCCUPIED DURING CONSTRUCTION AND SYSTEMS EXPLICITLY INDICATED SHALL BE KEPT IN OPERATION BY TEMPORARY MEANS. TEMPORARY MEANS INCLUDES TEMPORARY BYPASSES OR CONNECTIONS TO BUILDING SYSTEMS AND / OR CONNECTIONS TO TEMPORARY EQUIPMENT. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.

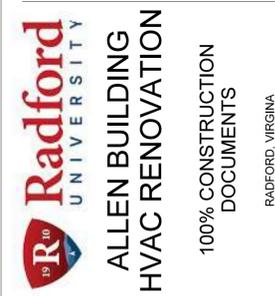
HAZARDOUS MATERIAL NOTES

- HAZARDOUS MATERIALS WARNING:** HAZARDOUS MATERIALS ARE ANTICIPATED TO BE ON SITE. REFER TO THE HAZARDOUS MATERIALS TESTING REPORT PROVIDED BY THE OWNER PRIOR TO THE START OF WORK. IF UNCOVERED MATERIALS ARE SUSPECTED OF CONTAINING ASBESTOS, LEAD-BASED PAINT, PCB'S OR ANY OTHER HAZARDOUS MATERIAL, STOP WORK IN THAT AREA AND REPORT THE CONCERN TO THE CONSTRUCTION MANAGER, OWNER, ARCHITECT AND ENGINEER IMMEDIATELY.



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DEB APPROVAL



1/22/2026

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
6	01/22/26	SWD	DEB COMMENTS
5	12/17/25	SWD	DEB COMMENTS
4	11/14/25	SWD	REMOVE MECH ROOM
3	12/06/24	SWD	DEB COMMENTS
2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

DRAWN BY _____ SMF
 APPROVED BY _____ SWD
 CHECKED BY _____ JDR
 DATE _____ January 12, 2024

TITLE
MECHANICAL NOTES

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

M0.02

GENERAL PROJECT INFORMATION AND CRITICAL SYSTEMS REQUIREMENTS

GENERAL

RADFORD UNIVERSITY PLANS TO FULLY RENOVATE THE ALLEN BUILDING HVAC SYSTEMS. THIS WORK WILL BE PERFORMED IN TWO CONSECUTIVE PROJECT PHASES UNDER SEPARATE CONTRACTS. THIS PROJECT IS THE SECOND PHASE.

THE FIRST PHASE, THE "ALLEN BUILDING ELECTRICAL IMPROVEMENTS" CONSISTS OF UPGRADES TO THE BUILDING ELECTRICAL SYSTEMS TO SUPPORT THE HVAC RENOVATION, AND THE DEMOLITION AND REPLACEMENT OF THE CENTRAL CHILLED WATER AND HEATING HOT WATER SYSTEMS AND ASSOCIATED EQUIPMENT AND CONTROLS. PHASE 1 PROJECT SCOPE IS GENERALLY LOCATED IN GROUND FLOOR MECHANICAL ROOM 002 AND ON THE BUILDING EXTERIOR. THIS PROJECT WILL BE ISSUED FOR BID IN NOVEMBER OF 2025.

THIS SECOND PHASE PROJECT IS THE "ALLEN BUILDING HVAC RENOVATION" WHICH CONSISTS OF DEMOLITION AND REPLACEMENT OF THE REMAINING BUILDING HVAC SYSTEMS NOT REPLACED UNDER THE PHASE 1 PROJECT. NEW BUILDING HYDRONIC PIPING SYSTEMS WILL BE CONNECTED TO THE CENTRAL CHILLED WATER AND HEATING HOT WATER PLANT SYSTEMS INSTALLED UNDER THE PHASE 1 PROJECT SCOPE.

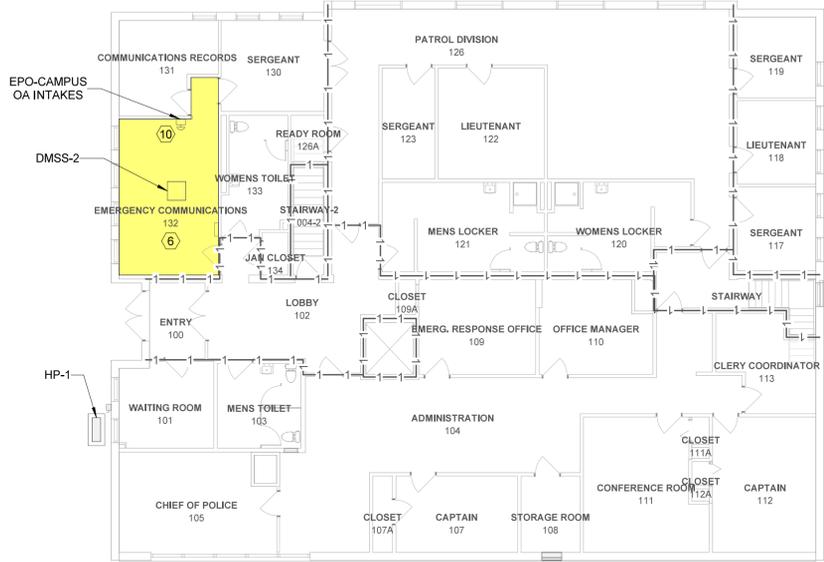
CRITICAL SYSTEMS REQUIREMENTS

THE ALLEN BUILDING IS A FULL-SERVICE EMERGENCY FIRST-RESPONSE POLICE DEPARTMENT SERVING THE RADFORD UNIVERSITY COMMUNITY. AS SUCH, PORTIONS OF THE BUILDING AND ASSOCIATED SYSTEMS MUST REMAIN OPERATIONAL AT ALL TIMES. THIS INCLUDES THE FOLLOWING:

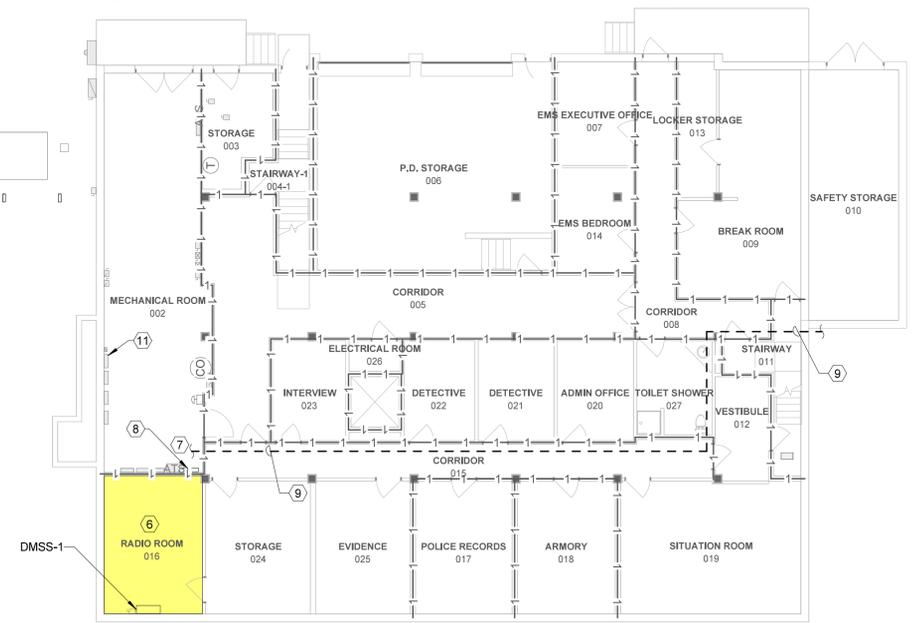
- EMERGENCY COMMUNICATIONS ROOM 132:** THIS DISPATCH ROOM WILL BE OCCUPIED AT ALL TIMES DURING CONSTRUCTION. ROOM CONTAINS CRITICAL EMERGENCY COMMUNICATION, FIRE, DATA, AND SECURITY EQUIPMENT WHICH REQUIRES CONTINUOUS POWER AND HVAC. CONTINUOUS HVAC TO THE ROOM SHALL BE MAINTAINED BY EXISTING DUCTLESS MINI-SPLIT SYSTEM, DMSS-2(E)/CU-2(E) AND ITS REPLACEMENT, DMSS-2(CU)-2. CONTRACTOR SHALL PROVIDE TEMPORARY HVAC AS NEEDED DURING REPLACEMENT OF THE DUCTLESS MINI-SPLIT SYSTEM.
- RADIO ROOM 016:** RADIO ROOM CONTAINS CRITICAL EMERGENCY COMMUNICATION, FIRE, DATA, AND SECURITY EQUIPMENT WHICH REQUIRES CONTINUOUS POWER AND HVAC. CONTINUOUS HVAC TO THE ROOM SHALL BE MAINTAINED BY EXISTING DUCTLESS MINI-SPLIT SYSTEM, DMSS-1(HP)-1. CONTRACTOR SHALL PROVIDE TEMPORARY HVAC AS NEEDED DURING REPLACEMENT OF THE DUCTLESS MINI-SPLIT SYSTEM.
- BUILDING AUTOMATION SYSTEM (BAS):** EXISTING BAS FUNCTIONALITY FOR CONTROL AND MONITORING OF EQUIPMENT AND DEVICES UNRELATED TO THE HVAC REPLACEMENT WORK SCOPE SHALL BE KEPT IN CONTINUOUS OPERATION BY TEMPORARY MEANS. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.
- BAS CONNECTION TO CAMPUS SERVER:** THE EXISTING NETWORK INTERFACE BETWEEN THE BUILDING AUTOMATION SYSTEM AND THE CAMPUS SUPERVISORY SERVER SYSTEM SHALL BE MAINTAINED TO SUPPORT CRITICAL COMMUNICATIONS UNTIL WORK IS COMPLETE AND ALL COMMUNICATIONS HAVE BEEN RELOCATED TO THE NEW BUILDING AUTOMATION SYSTEM HEAD END. REFER TO KEYNOTE 4 ON THIS DRAWING FOR EXISTING SUPERVISORY NETWORK INTERFACE LOCATION IN MECHANICAL ROOM 002.
- EMERGENCY OUTDOOR AIR ISOLATION SWITCH:** BAS INTERFACE AND FUNCTIONALITY OF THE CAMPUS-WIDE EMERGENCY OUTDOOR AIR INTAKE ISOLATION SWITCH LOCATED IN EMERGENCY COMMUNICATIONS 132 SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REFER TO KEYNOTE 10 FOR OA SHUTDOWN SWITCH LOCATION.
- CAMPUS ELECTRIC METER INTERFACE:** THE CAMPUS-WIDE ELECTRIC SERVICE UTILITY METER IS LOCATED IN THE RADFORD CITY ELECTRIC SUBSTATION, DIRECTLY ADJACENT TO THE ALLEN BUILDING. EXISTING ELECTRIC METER CONNECTIONS TO THE SUBSTATION MUST BE MAINTAINED. THIS IS WHAT CONTROLS THE ENERGY SAVINGS/DEMAND LIMITING CONTROLS ON CAMPUS. THE EXISTING CONNECTION TO THE DEMAND RESPONSE VENDOR (CURRENTLY VOLTUS ENERGY) MUST ALSO BE MAINTAINED. THIS IS HOW RADFORD UNIVERSITY PROVIDES DATA FOR DEMAND RESPONSE PARTICIPATION IN THE VIRGINIA ENERGY DEPARTMENT PROGRAM. REFER TO KEYNOTES 3 AND 9 ON THIS SHEET FOR ADDITIONAL INFORMATION.
- BUILDING ELECTRIC METER INTERFACE:** ALLEN BUILDING ELECTRIC METER INTERFACE FROM PANEL MSB TO BAS MUST BE MAINTAINED. REFER TO KEYNOTE 11 ON THIS SHEET.
- OWNER COORDINATION:** CONTRACTOR SHALL COORDINATE THE SEQUENCE OF ALL WORK WITH THE OWNER/OCCUPANTS TO MINIMIZE DISRUPTION. REFER TO GENERAL MECHANICAL NOTES ON M0.02 FOR ADDITIONAL REQUIREMENTS.



1 CRITICAL COMPONENTS IN MECHANICAL ROOM 002
Scale: 3/32" = 1'-0"



2 FIRST FLOOR CRITICAL SYSTEMS
Scale: 3/32" = 1'-0"



3 GROUND FLOOR CRITICAL SYSTEMS
Scale: 3/32" = 1'-0"

KEY NOTES

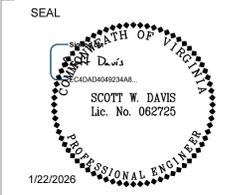
- EXISTING BAS PANELS. CONTRACTOR TO PROTECT PANELS AND MAINTAIN POWER AND CRITICAL DATA CONNECTIONS THROUGHOUT CONSTRUCTION. DISCONNECT POWER AND DEMOLISH FOLLOWING INSTALLATION AND FINAL COMMISSIONING OF NEW BUILDING AUTOMATION SYSTEM. COORDINATE DEMOLITION WITH PHASE 1 PROJECT BAS CONTRACTOR.
- EXISTING BAS UPS PANEL TO BE RELOCATED IN PHASE 1 PROJECT. CONTRACTOR TO PROTECT PANEL IN NEW LOCATION AND MAINTAIN POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION. DISCONNECT POWER AND DEMOLISH FOLLOWING INSTALLATION AND FINAL COMMISSIONING OF NEW BUILDING AUTOMATION SYSTEM. COORDINATE UPS LOCATION AND DEMOLITION WITH PHASE 1 PROJECT BAS CONTRACTOR.
- EXISTING CAMPUS-WIDE ELECTRIC UTILITY DEMAND RESPONSE CONTROL PANEL TO REMAIN ("VOLTUS" IS THE CURRENT CAMPUS DEMAND RESPONSE VENDOR). CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION. FIELD-VERIFY DATA CABLE ROUTING PRIOR TO START OF CONSTRUCTION. REFER TO "CRITICAL SYSTEMS REQUIREMENTS" NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION.
- EXISTING SSI NETWORK INTERFACE PANEL TO CAMPUS SUPERVISORY SERVER TO BE REPLACED BY PHASE 1 CONTRACTOR. THIS CONTRACTOR TO COORDINATE LOCATION OF NEW NETWORK INTERFACE WITH PHASE 1 CONTRACTOR AND SHALL PROTECT INTERFACE PANEL AND COMPONENTS AS REQUIRED TO MAINTAIN POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION.
- EXISTING EXTERIOR LIGHTING RELAY PANEL 'FC' TO REMAIN. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND CONTROL CONNECTIONS THROUGHOUT CONSTRUCTION. COORDINATE RECONNECTION OF EXISTING CONTROL POINTS TO NEW BAS WITH CONSTRUCTION SEQUENCE. REFER TO M7.01.
- THIS ROOM TO REMAIN FULLY OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. REFER TO "CRITICAL SYSTEMS REQUIREMENTS" NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION.
- REFER TO PHOTOGRAPH 1 ON THIS SHEET FOR EXISTING CRITICAL COMPONENTS IN THIS CORNER OF MECHANICAL ROOM 002 THAT REQUIRE PROTECTION AND CONTINUOUS POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION.
- EXISTING BAS PANEL.
- APPROXIMATE ROUTING OF EXISTING ELECTRIC METER CONNECTION TO THE RADFORD CITY ELECTRIC SUBSTATION. CONTRACTOR TO VERIFY EXACT LOCATION WITH OWNER PRIOR TO STARTING DEMOLITION AND PROTECT ROUTING AND CONNECTIVITY THROUGHOUT CONSTRUCTION. REFER TO "CRITICAL SYSTEMS REQUIREMENTS" NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION.
- CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH. CONTRACTOR TO PROTECT SWITCH PRIOR TO STARTING DEMOLITION AND MAINTAIN SWITCH ACCESS, FUNCTIONALITY AND BAS INTERFACE THROUGHOUT CONSTRUCTION.
- ALLEN BUILDING ELECTRIC METER IN EXISTING PANEL MSB.



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Radford UNIVERSITY
ALLEN BUILDING HVAC RENOVATION
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA



1/22/2026

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
6	01/22/26	SWD	DEB COMMENTS
5	12/17/25	SWD	DEB COMMENTS
4	11/14/25	SWD	REMOVE MECH ROOM
3	12/06/24	SWD	DEB COMMENTS
2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

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APPROVED BY _____ SWD
CHECKED BY _____ JDR
DATE _____ January 12, 2024

TITLE
MECHANICAL NOTES

DEI PROJECT NO: 50158550
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M0.03



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1	07/15/24	SWD	DEB COMMENTS

DRAWN BY: SMF
APPROVED BY: SWD
CHECKED BY: JDR
DATE: January 12, 2024

TITLE GROUND FLOOR MECHANICAL DEMOLITION PLAN

DEI PROJECT NO: 50158550
RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

MD1.11

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

GENERAL NOTES:

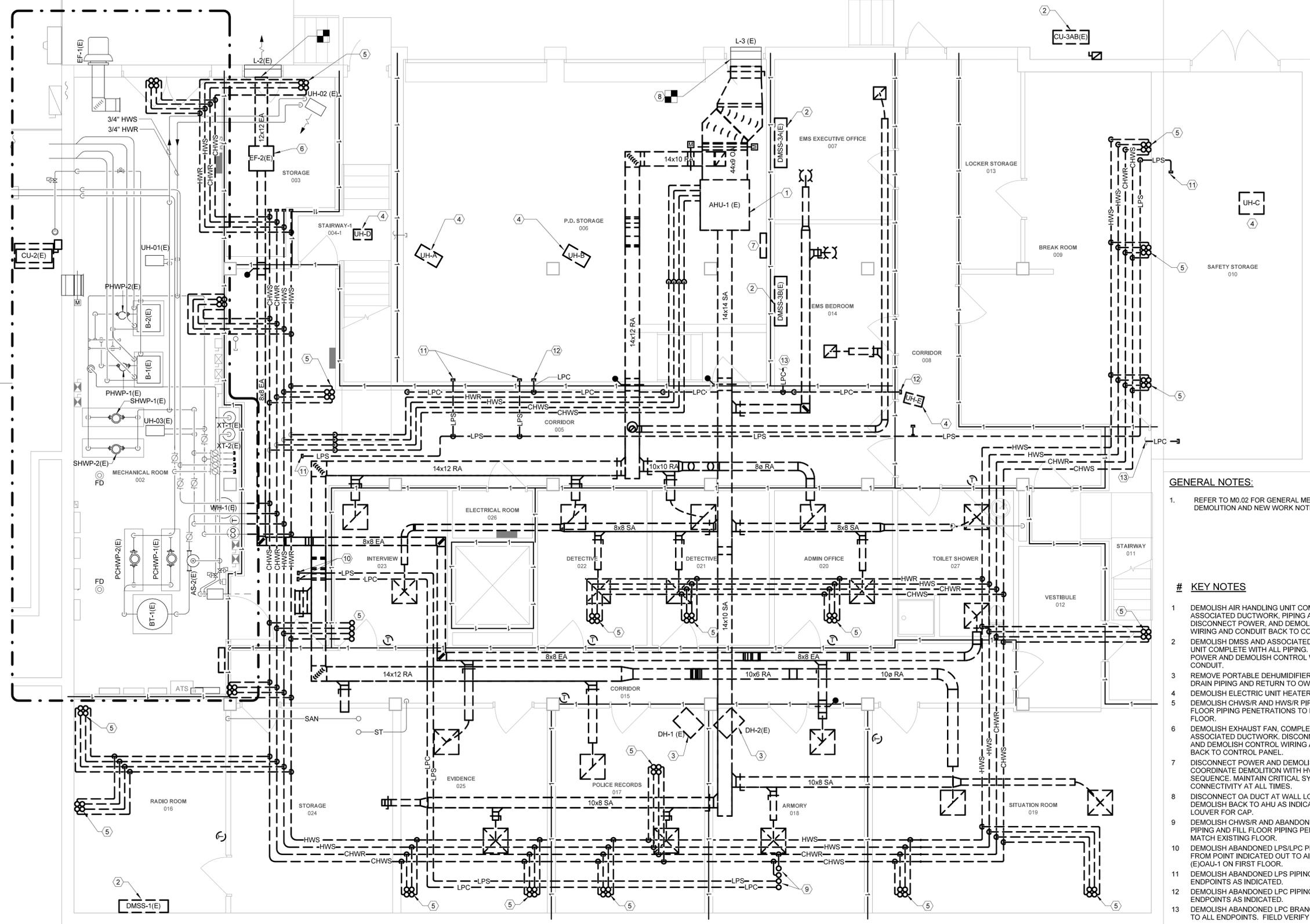
- REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

- DEMOLISH AIR HANDLING UNIT COMPLETE WITH ALL ASSOCIATED DUCTWORK, PIPING AND SUPPORTS. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
- DEMOLISH DMSS AND ASSOCIATED CONDENSING UNIT COMPLETE WITH ALL PIPING. DISCONNECT POWER AND DEMOLISH CONTROL WIRING AND CONDUIT.
- REMOVE PORTABLE DEHUMIDIFIER COMPLETE WITH DRAIN PIPING AND RETURN TO OWNER.
- DEMOLISH ELECTRIC UNIT HEATER.
- DEMOLISH CHWS/R AND HWS/R PIPING AND FILL FLOOR PIPING PENETRATIONS TO MATCH EXISTING FLOOR.
- DEMOLISH EXHAUST FAN, COMPLETE WITH ALL ASSOCIATED DUCTWORK. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
- DISCONNECT POWER AND DEMOLISH BAS PANEL. COORDINATE DEMOLITION WITH HVAC WORK SEQUENCE. MAINTAIN CRITICAL SYSTEMS CONNECTIVITY AT ALL TIMES.
- DISCONNECT OA DUCT AT WALL LOUVER AND DEMOLISH BACK TO AHU AS INDICATED. PREPARE LOUVER FOR CAP.
- DEMOLISH CHWS/R AND ABANDONED LPS/LPC PIPING AND FILL FLOOR PIPING PENETRATIONS TO MATCH EXISTING FLOOR.
- DEMOLISH ABANDONED LPS/LPC PIPING AS SHOWN FROM POINT INDICATED OUT TO AIR HANDLING UNIT (E)OAU-1 ON FIRST FLOOR.
- DEMOLISH ABANDONED LPS PIPING BETWEEN ENDPOINTS AS INDICATED.
- DEMOLISH ABANDONED LPC PIPING BETWEEN ENDPOINTS AS INDICATED.
- DEMOLISH ABANDONED LPC BRANCH PIPING OUT TO ALL ENDPOINTS. FIELD VERIFY EXACT ROUTING.

1 GROUND MECHANICAL DEMOLITION PLAN

Scale: 1/4" = 1'-0"



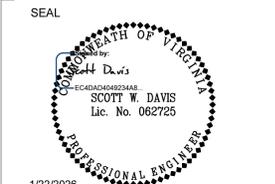
GENERAL NOTES:
1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.



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ALLEN BUILDING HVAC RENOVATION
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RADFORD, VIRGINIA



1/22/2026

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
6	01/22/26	SWD	DEB COMMENTS
5	12/17/25	SWD	DEB COMMENTS
4	11/14/25	SWD	REMOVE MECH ROOM
3	12/06/24	SWD	DEB COMMENTS
2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

DRAWN BY _____ SMF
APPROVED BY _____ SWD
CHECKED BY _____ JDR
DATE January 12, 2024

TITLE
FIRST FLOOR MECHANICAL DEMOLITION PLAN

DEI PROJECT NO: 50158550
RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

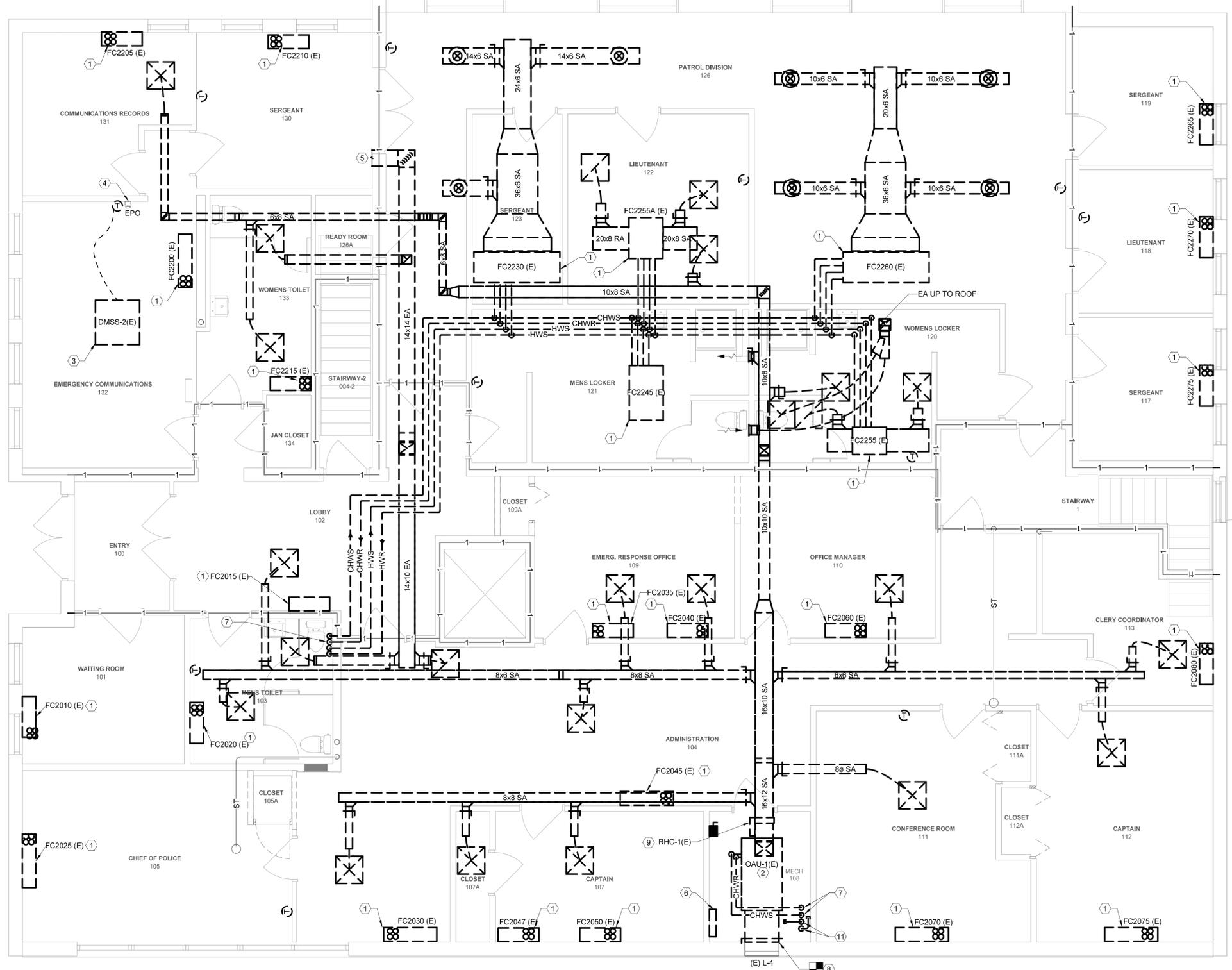
MD1.21

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

KEY NOTES

- DEMOLISH FAN COIL UNIT COMPLETE WITH ALL ASSOCIATED DUCTWORK, PIPING AND ACCESSORIES. DISCONNECT POWER AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
- DEMOLISH OUTSIDE AIR UNIT COMPLETE WITH ALL ASSOCIATED DUCTWORK, PIPING, AND ACCESSORIES. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
- DEMOLISH CASSETTE AND ASSOCIATED CONDENSING UNIT COMPLETE WITH ASSOCIATED PIPING. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
- CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH TO REMAIN FUNCTIONAL WITH BAS INTERFACE AT ALL TIMES. REFER TO CONTROLS. COORDINATE WITH OWNER.
- DEMOLISH EA DUCT. REFER TO MECHANICAL ROOM DEMOLITION PLAN FOR CONTINUATION.
- DISCONNECT POWER AND DEMOLISH BAS PANEL. COORDINATE DEMOLITION WITH HVAC WORK SEQUENCE. MAINTAIN CRITICAL SYSTEMS CONNECTIVITY AT ALL TIMES.
- DEMOLISH HYDRONIC SYSTEM PIPING SERVICES FROM FLOOR BELOW. PATCH FLOOR OPENINGS TO MATCH EXISTING.
- DISCONNECT OA DUCT AT WALL LOUVER AND DEMOLISH BACK TO OAU AS INDICATED. PREPARE LOUVER FOR CAP AS INDICATED ON NEW WORK PLAN.
- DEMOLISH ELECTRIC DUCT HEATER. DISCONNECT POWER AND DEMOLISH HEATER COMPLETE WITH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
- DEMOLISH CONDENSING UNIT COMPLETE WITH ALL PIPING BACK TO WALL UNIT ON FLOOR BELOW. DISCONNECT POWER AND DEMOLISH CONTROL WIRING AND CONDUIT.
- DEMOLISH LPS/LPC PIPING SERVICES FROM FLOOR BELOW. PATCH FLOOR OPENINGS TO MATCH EXISTING.



1 FIRST FLOOR MECHANICAL DEMOLITION PLAN
Scale: 1/4" = 1'-0"

GENERAL NOTES:

- 1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.



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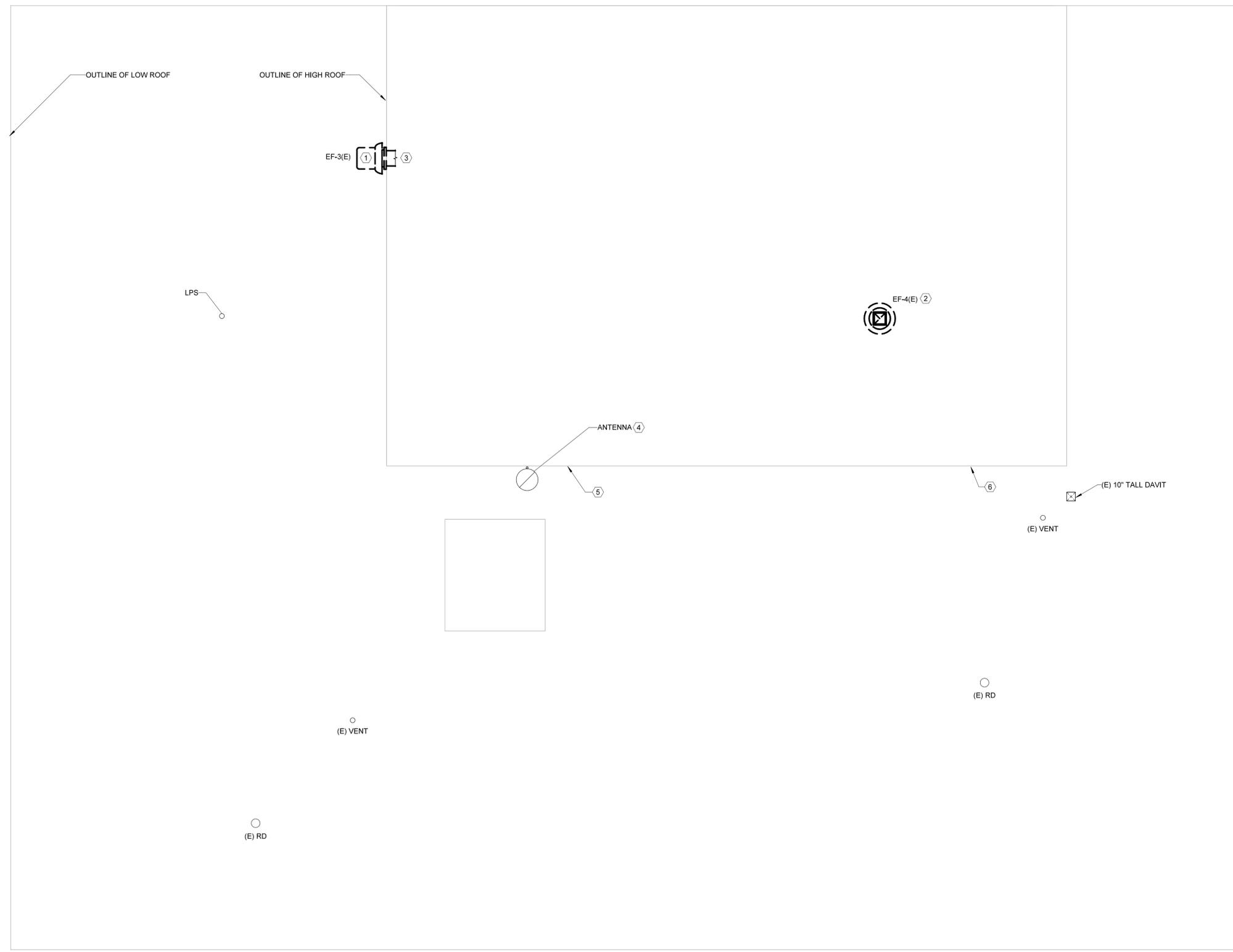
TITLE
ROOF MECHANICAL DEMOLITION PLAN

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017
 SHEET NO.

MD1.31

KEY NOTES

- 1. DEMOLISH EXHAUST FAN WITH DUCTWORK AND SUPPORTS. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL. PREPARE WALL OPENING FOR NEW FAN.
- 2. DEMOLISH EXHAUST FAN WITH ROOF CURB, DUCTWORK, AND SUPPORTS. DISCONNECT POWER AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL. PATCH ROOF IN ACCORDANCE WITH ROOF WARRANTY REQUIREMENTS.
- 3. DEMOLISH EA DUCT THROUGH WALL. REFER TO FIRST FLOOR MECHANICAL DEMOLITION PLAN FOR CONTINUATION. PREPARE WALL OPENING TO RECEIVE NEW FAN.
- 4. EXISTING COMMUNICATION ANTENNA TO REMAIN.
- 5. REMOVE EXISTING WINDOW IN PREPARATION FOR ROUTING DUCT THROUGH OPENING. REFER TO MECHANICAL NEW WORK ROOF PLAN AND ARCHITECTURAL FOR MORE INFORMATION.
- 6. REMOVE EXISTING WINDOW AND ENLARGE OPENING IN PREPARATION FOR ROUTING DUCT THROUGH OPENING. REFER TO MECHANICAL NEW WORK ROOF PLAN AND ARCHITECTURAL FOR MORE INFORMATION. REFER TO STRUCTURAL FOR LINTEL REQUIREMENTS AT OPENING.

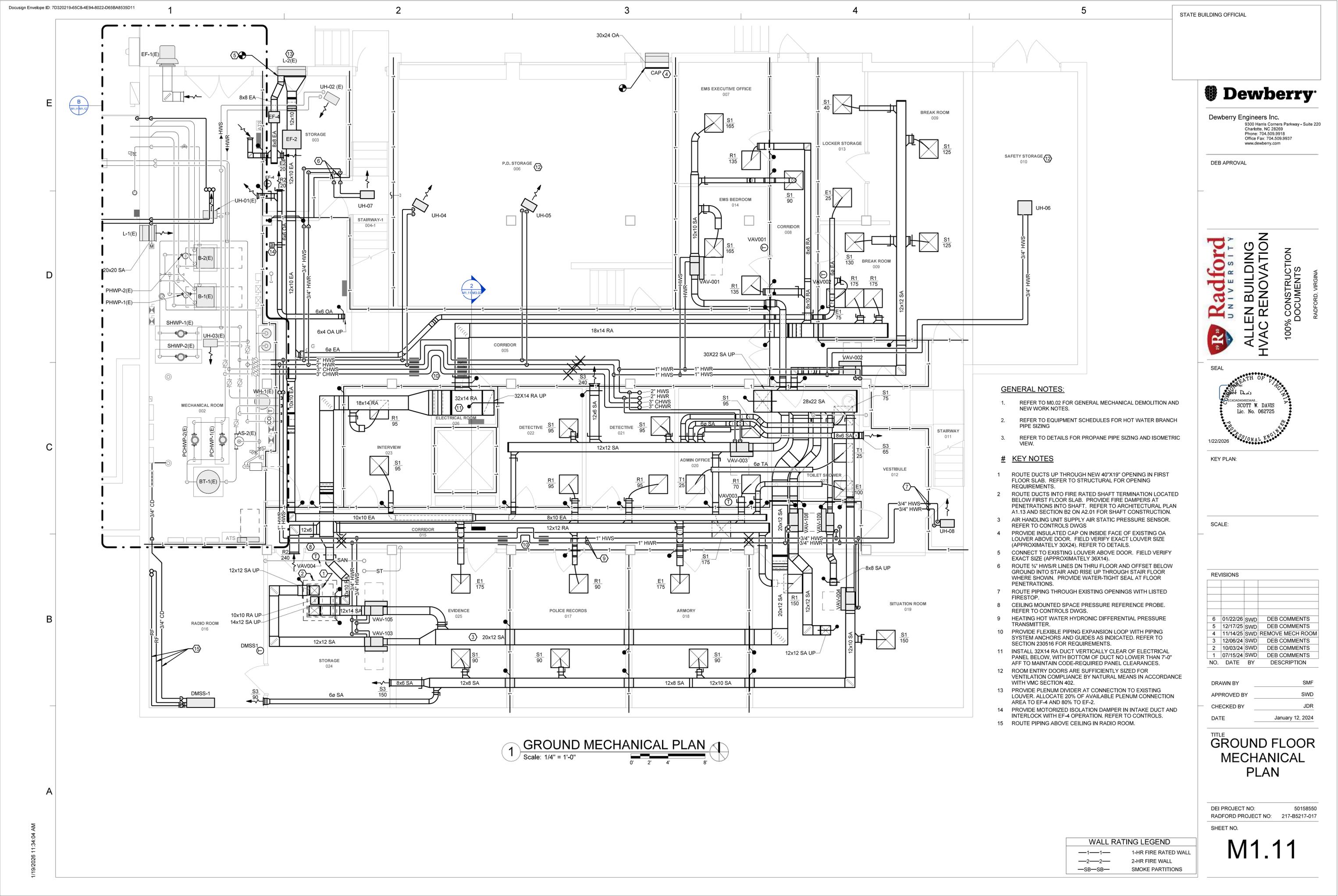


1 ROOF MECHANICAL DEMOLITION PLAN
 Scale: 1/4" = 1'-0"



WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS



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1	07/15/24	SWD	DEB COMMENTS

DRAWN BY: SMF
 APPROVED BY: SWD
 CHECKED BY: JDR
 DATE: January 12, 2024

TITLE
GROUND FLOOR MECHANICAL PLAN

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017
 SHEET NO.

M1.11

GENERAL NOTES:

- REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.
- REFER TO EQUIPMENT SCHEDULES FOR HOT WATER BRANCH PIPE SIZING
- REFER TO DETAILS FOR PROPANE PIPE SIZING AND ISOMETRIC VIEW.

KEY NOTES

- ROUTE DUCTS UP THROUGH NEW 40"x19" OPENING IN FIRST FLOOR SLAB. REFER TO STRUCTURAL FOR OPENING REQUIREMENTS.
- ROUTE DUCTS INTO FIRE RATED SHAFT TERMINATION LOCATED BELOW FIRST FLOOR SLAB. PROVIDE FIRE DAMPERS AT PENETRATIONS INTO SHAFT. REFER TO ARCHITECTURAL PLAN A1.13 AND SECTION B2 ON A2.01 FOR SHAFT CONSTRUCTION.
- AIR HANDLING UNIT SUPPLY AIR STATIC PRESSURE SENSOR. REFER TO CONTROLS DWGS
- PROVIDE INSULATED CAP ON INSIDE FACE OF EXISTING OA LOUVER ABOVE DOOR. FIELD VERIFY EXACT LOUVER SIZE (APPROXIMATELY 30X24). REFER TO DETAILS.
- CONNECT TO EXISTING LOUVER ABOVE DOOR. FIELD VERIFY EXACT SIZE (APPROXIMATELY 36X14).
- ROUTE 3/4" HWS/R LINES DN THRU FLOOR AND OFFSET BELOW GROUND INTO STAIR AND RISE UP THROUGH STAIR FLOOR WHERE SHOWN. PROVIDE WATER-TIGHT SEAL AT FLOOR PENETRATIONS.
- ROUTE PIPING THROUGH EXISTING OPENINGS WITH LISTED FIRESTOP.
- CEILING MOUNTED SPACE PRESSURE REFERENCE PROBE. REFER TO CONTROLS DWGS.
- HEATING HOT WATER HYDRONIC DIFFERENTIAL PRESSURE TRANSMITTER.
- PROVIDE FLEXIBLE PIPING EXPANSION LOOP WITH PIPING SYSTEM ANCHORS AND GUIDES AS INDICATED. REFER TO SECTION 230516 FOR REQUIREMENTS.
- INSTALL 32X14 RA DUCT VERTICALLY CLEAR OF ELECTRICAL PANEL BELOW, WITH BOTTOM OF DUCT NO LOWER THAN 7'-0" AFF TO MAINTAIN CODE-REQUIRED PANEL CLEARANCES.
- ROOM ENTRY DOORS ARE SUFFICIENTLY SIZED FOR VENTILATION COMPLIANCE BY NATURAL MEANS IN ACCORDANCE WITH VMC SECTION 402.
- PROVIDE PLENUM DIVIDER AT CONNECTION TO EXISTING LOUVER. ALLOCATE 20% OF AVAILABLE PLENUM CONNECTION AREA TO EF-4 AND 80% TO EF-2.
- PROVIDE MOTORIZED ISOLATION DAMPER IN INTAKE DUCT AND INTERLOCK WITH EF-4 OPERATION. REFER TO CONTROLS.
- ROUTE PIPING ABOVE CEILING IN RADIO ROOM.

1 GROUND MECHANICAL PLAN
 Scale: 1/4" = 1'-0"
 0 2 4 8'

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

GENERAL NOTES:

- 1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

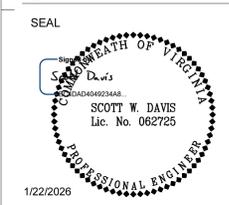
- 1. DEMOLISH CONDENSING UNIT COMPLETE WITH ALL PIPING BACK TO CEILING CASSETTE UNIT ON FIRST FLOOR. DISCONNECT POWER AND DEMOLISH CONTROL WIRING AND CONDUIT.
- 2. ROUTE CONDENSATE DOWN ON INSIDE OF EXTERIOR WALL. PENETRATE EXTERIOR WALL 12" ABOVE GRADE AND PROVIDE 90 DEGREE ELBOW DOWN. TERMINATE 6" ABOVE CONCRETE SPLASH BLOCK.
- 3. DEMOLISH CHWS/R AND HWS/R PIPING AND FILL FLOOR PIPING PENETRATIONS TO MATCH EXISTING FLOOR.
- 4. ROUTE 3/4" CD DOWN TO 12" AFF. CONTINUING ALONG FOUNDATION WALL WITH CONTINUOUS SLOPE. TERMINATE WITH AIR GAP AT FLOOR DRAIN. ANCHOR PIPE TO FLOOR WITHIN 6-INCHES OF FLOOR DRAIN.
- 5. ROUTE REFRIGERANT PIPING APPROXIMATELY 6-INCHES ABOVE GRADE. SUPPORT ON PREFABRICATED PIPE SUPPORTS WITH ADJUSTABLE HEIGHT CAPABILITY, DURA-BLOCK OR APPROVED EQUAL.
- 6. ROUTE CONDENSATE DRAIN AND REFRIGERANT PIPING UP THROUGH SLAB TO FLOOR ABOVE.
- 7. PROVIDE CONCRETE PAD FOR HEAT PUMP SUPPORT. REFER TO STRUCTURAL AND CIVIL DRAWINGS.
- 8. DISCONNECT POWER AND DEMOLISH EXISTING BAS PANEL AFTER INSTALLATION AND FINAL COMMISSIONING OF NEW BAS SYSTEM COMPONENTS. COORDINATE DEMOLITION WITH HVAC WORK SEQUENCE. MAINTAIN CRITICAL SYSTEMS CONNECTIVITY AT ALL TIMES. REFER TO M0.03 FOR ADDITIONAL INFORMATION.
- 9. EXISTING EXTERIOR LIGHTING RELAY PANEL 'FC' TO REMAIN. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND CONTROL CONNECTIONS THROUGHOUT CONSTRUCTION. REFER TO 1/M0.03.
- 10. REMOVE CAP AND PREPARE PIPING FOR NEW CONNECTION.
- 11. PROVIDE MOTORIZED ISOLATION DAMPER IN INTAKE DUCT AND INTERLOCK WITH EF-4 OPERATION. REFER TO CONTROLS.
- 12. INSTALL CAP WITH INSULATION AND JACKET ON EXISTING PIPE.
- 13. CONNECT NEW BUILDING HW AND CHW DISTRIBUTION PIPING MAINS TO EXISTING PIPING PLANT AT POINT INDICATED. PATCH INSULATION AND JACKETING AT CONNECTION POINT.
- 14. DISCONNECT PIPING MAINS AT MECHANICAL ROOM WALL AND DEMOLISH THROUGHOUT BUILDING BACK TO ALL CONNECTED EQUIPMENT AS SHOWN ON MECHANICAL DEMOLITION DRAWINGS.



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DRAWN BY _____ SMF
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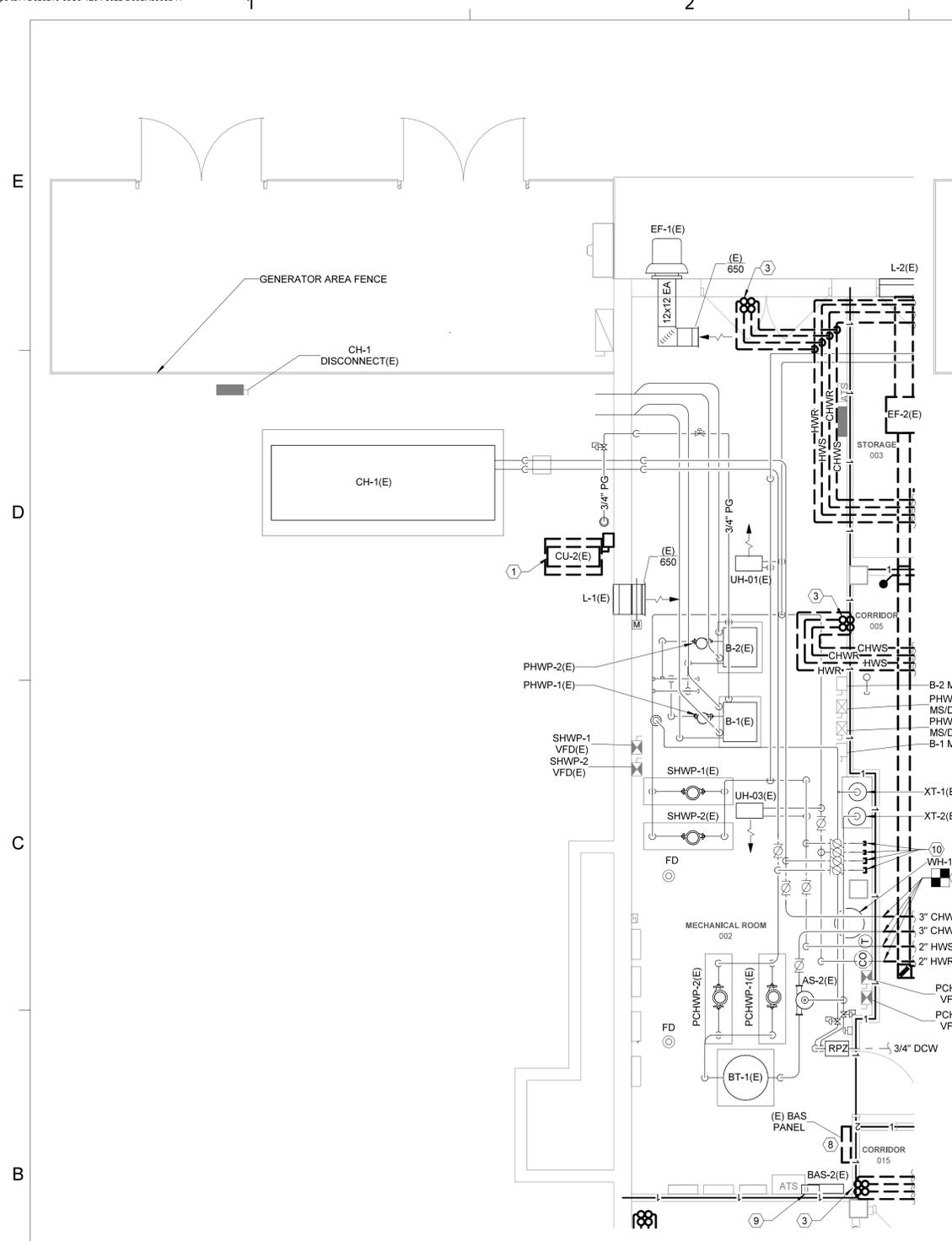
TITLE
GROUND FLOOR MECHANICAL PLAN

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017
 SHEET NO.

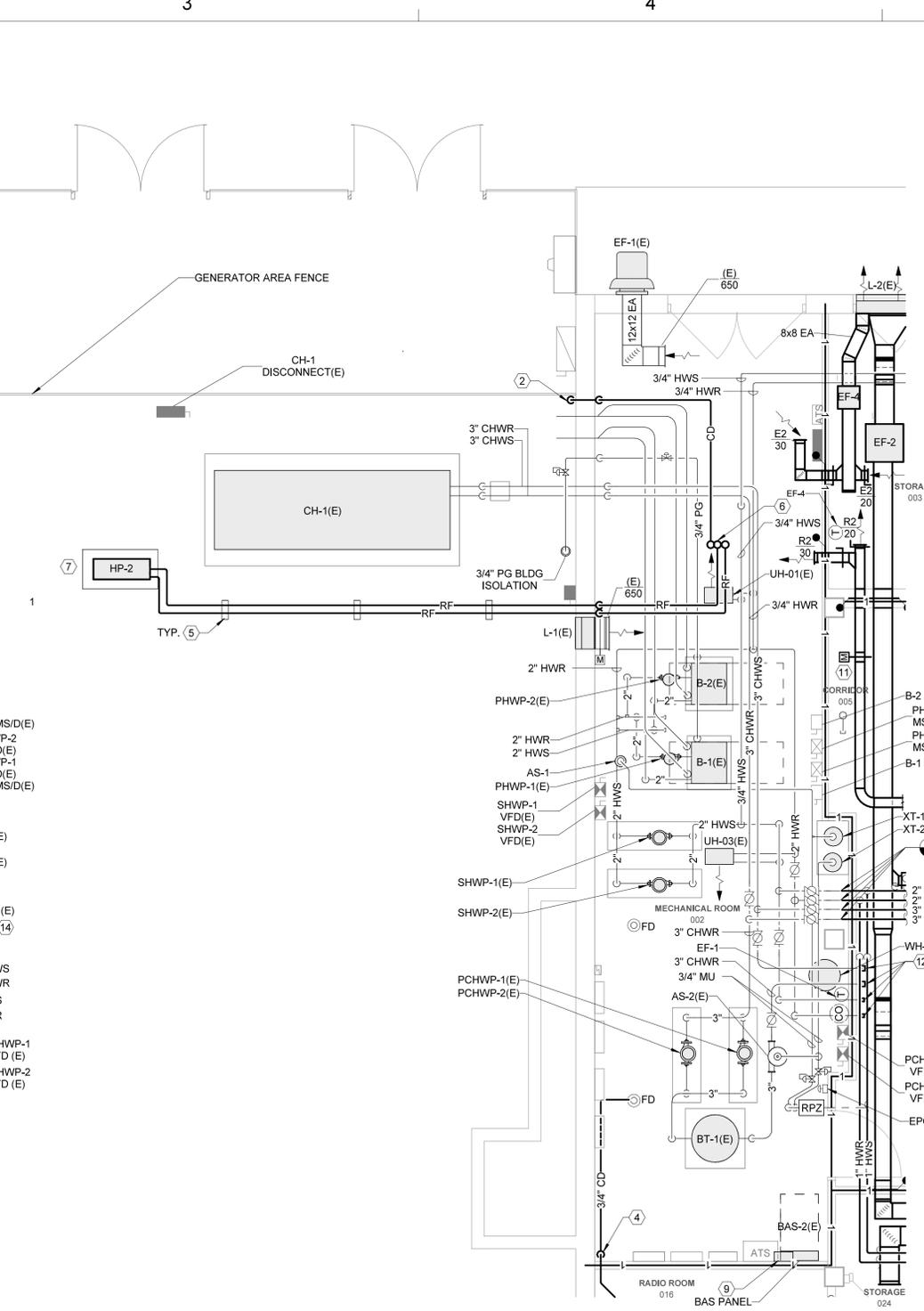
M1.12

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS



A GROUND FLOOR MECHANICAL DEMOLITION PLAN AT CHILLER / BOILER AREA
 1/4" = 1'-0"
 MD1.11 M1.12



B GROUND FLOOR MECHANICAL PLAN AT CHILLER / BOILER AREA
 1/4" = 1'-0"
 M1.11 M1.12

GENERAL NOTES:

- REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.
- REFER TO EQUIPMENT SCHEDULES FOR HOT WATER BRANCH PIPE SIZING.

KEY NOTES

- ROUTE DUCT THROUGH JOIST WEBBING.
- ROUTE DUCT IN SOFFIT. REFER TO ARCH DRAWINGS.
- ROUTE DUCT AS HIGH AS POSSIBLE BETWEEN JOISTS.
- PROVIDE CORE-DRILLED WALL OPENING. COORDINATE LOCATION WITH LOW ROOF JOIST WEBBING BEYOND. REFER TO STRUCTURAL FOR WALL OPENING SEPARATION/SPACING REQUIREMENTS.
- HEATING HOT WATER HYDRONIC DIFFERENTIAL PRESSURE TRANSMITTER ABOVE CEILING.
- ROUTE DUCT THROUGH WALL OPENING ONTO ROOF ABOVE. REFER TO ROOF PLAN.
- ROUTE DUCT THROUGH WALL BELOW LOW ROOF. REFER TO STRUCTURAL FOR OPENING REQUIREMENTS.
- PROVIDE 24"x24" ACCESS DOOR IN CHASE WALL FOR ACCESS TO FIRE DAMPER IN FLOOR. MOUNT BOTTOM 12" AFF.
- AIR HANDLING UNIT SUPPLY AIR STATIC PRESSURE SENSOR. REFER TO CONTROLS DWGS.
- ROUTE DUCT THROUGH EXISTING WALL OPENING ABOVE LOW ROOF AND CONNECT TO WALL-MOUNTED EXHAUST FAN INLET. REFER TO ROOF PLAN.
- ROUTE PIPING FROM FLOOR BELOW THROUGH EXISTING FLOOR AND WALL OPENINGS TO HP-1. PROVIDE NEW FRAMED GWB FLOOR-TO-CEILING PIPE CHASE IN CORNER OF ROOM TO CONCEAL PIPING. REFER TO ARCHITECTURAL.
- INSTALL INSULATED SHEETMETAL CAP ON LOUVER. MAKE MODIFICATIONS IF REQUIRED TO CONCEAL CAP WITHIN WALL ASSEMBLY. PATCH AND PAINT WALL TO MATCH ADJACENT. REFER TO DETAILS.
- CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH PROTECT COMMUNICATION CABLE INTERFACE WITH SWITCH PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SWITCH FUNCTIONALITY AND BAS INTERFACE AT ALL TIMES.
- CEILING MOUNTED SPACE PRESSURE REFERENCE PROBE. REFER TO CONTROLS DWGS.
- HEATING HOT WATER HYDRONIC DIFFERENTIAL PRESSURE TRANSMITTER
- EXISTING STAIR INCLUDES HORIZONTAL FIRE-RATED LID. ROUTE DUCT TO ROOF ABOVE STAIR ENCLOSURE.
- PROVIDE FIRE DAMPERS IN SHAFT WALL ASSEMBLY ON GROUND FLOOR TO MAINTAIN FIRST FLOOR SLAB FIRE RATING. REFER TO M1.11 FOR DAMPER LOCATIONS. FIRE-STOP EACH DUCT ON FIRST FLOOR AT SHAFT WALL PENETRATIONS. REFER TO LIFE SAFETY PENETRATION SCHEDULE FOR FIRE-STOP REQUIREMENTS.
- PROVIDE 10"x10" ACCESS DOOR IN CHASE WALL FOR ACCESS TO FIRE DAMPER IN FLOOR. MOUNT BOTTOM 12" AFF.
- ROUTE DUCT THROUGH JOIST WEBBING.
- ROUTE DUCT THROUGH JOIST WEBBING.
- ROUTE DUCT THRU EXISTING WALL OPENING.



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TITLE
FIRST FLOOR MECHANICAL PLAN

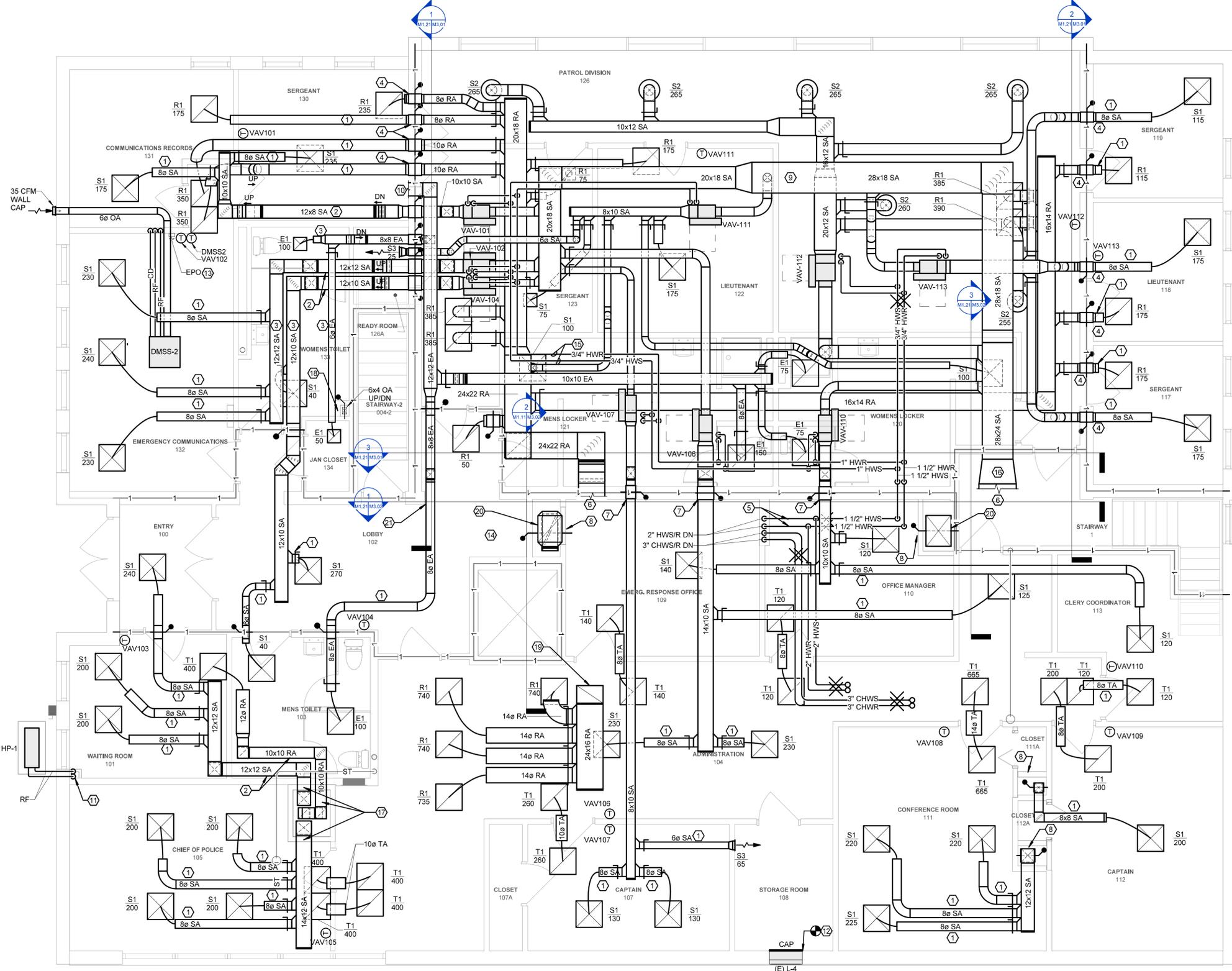
DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017
 SHEET NO.

M1.21

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

E
D
C
B
A



1 FIRST FLOOR MECHANICAL PLAN
 Scale: 1/4" = 1'-0"
 0 2 4 8

GENERAL NOTES:

- 1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.



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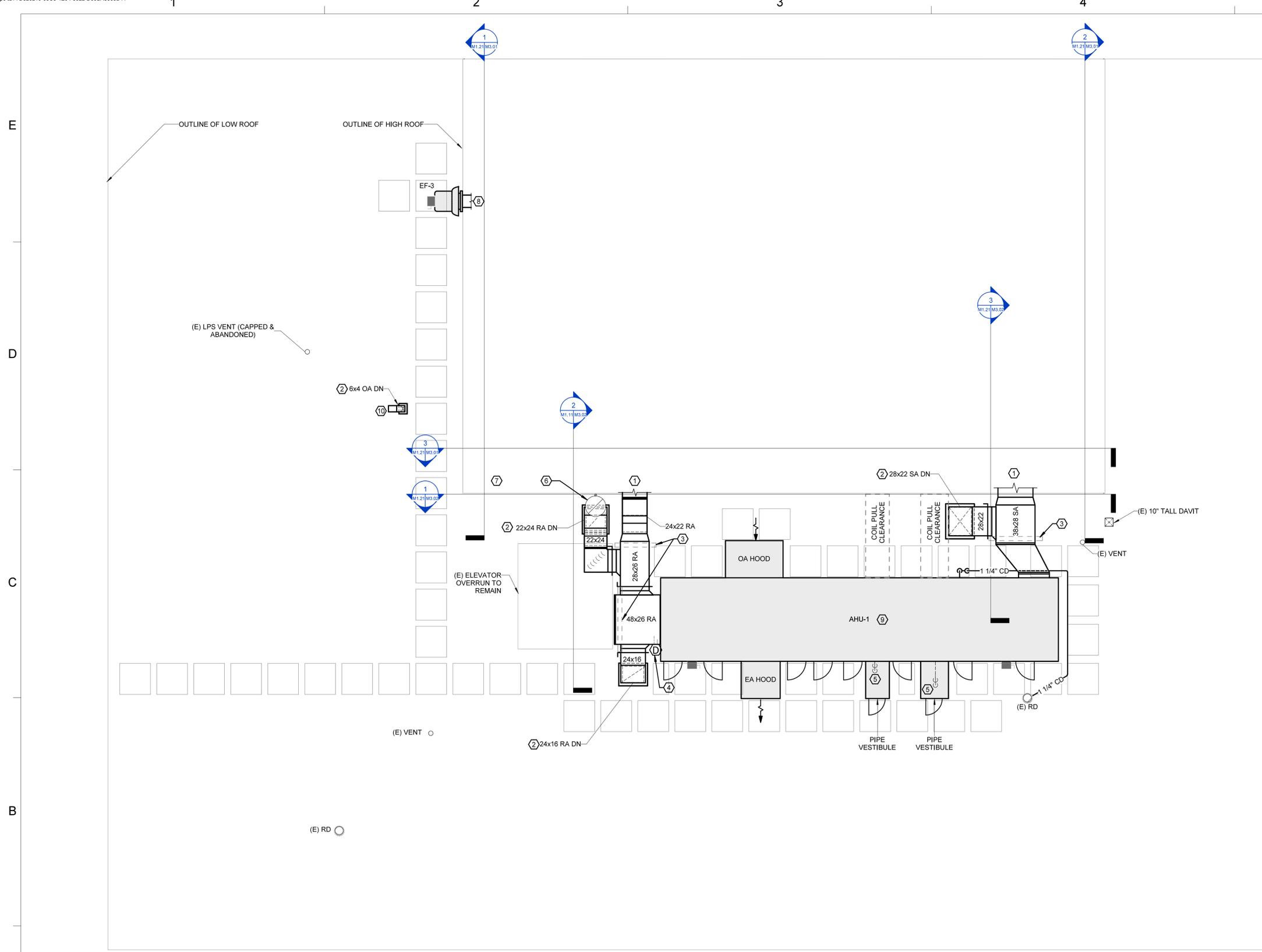
TITLE
ROOF MECHANICAL PLAN

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017
 SHEET NO.

M1.31

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS



1 ROOF MECHANICAL PLAN
 Scale: 1/4" = 1'-0"
 0 2 4 8

GENERAL NOTES:

- 1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

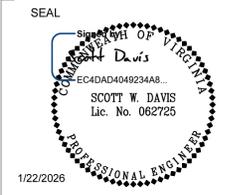
- 1. PROVIDE WALL OPENING WITH LINTEL. REFER TO STRUCTURAL.
- 2. PROVIDE CORE-DRILLED WALL OPENING. COORDINATE LOCATION WITH JOIST WEBBING BEYOND. REFER TO STRUCTURAL FOR WALL OPENING SEPARATION/SPACING REQUIREMENTS.
- 3. ROUTE DUCT THROUGH EXISTING WALL OPENING.



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TITLE BUILDING SECTIONS

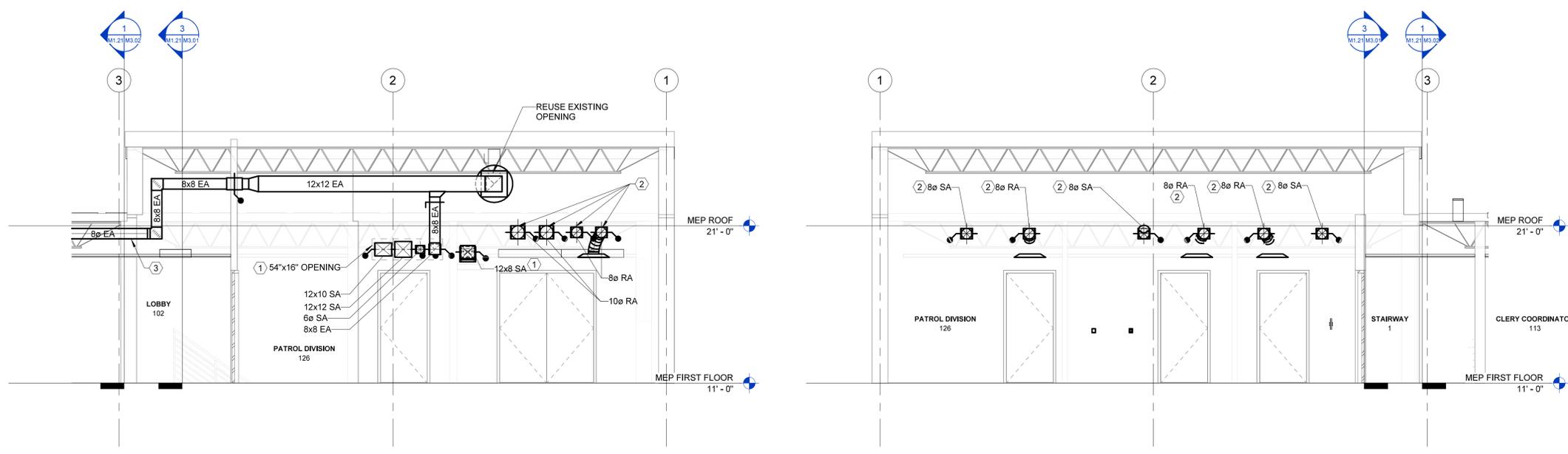
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 SHEET NO.

M3.01

WALL RATING LEGEND

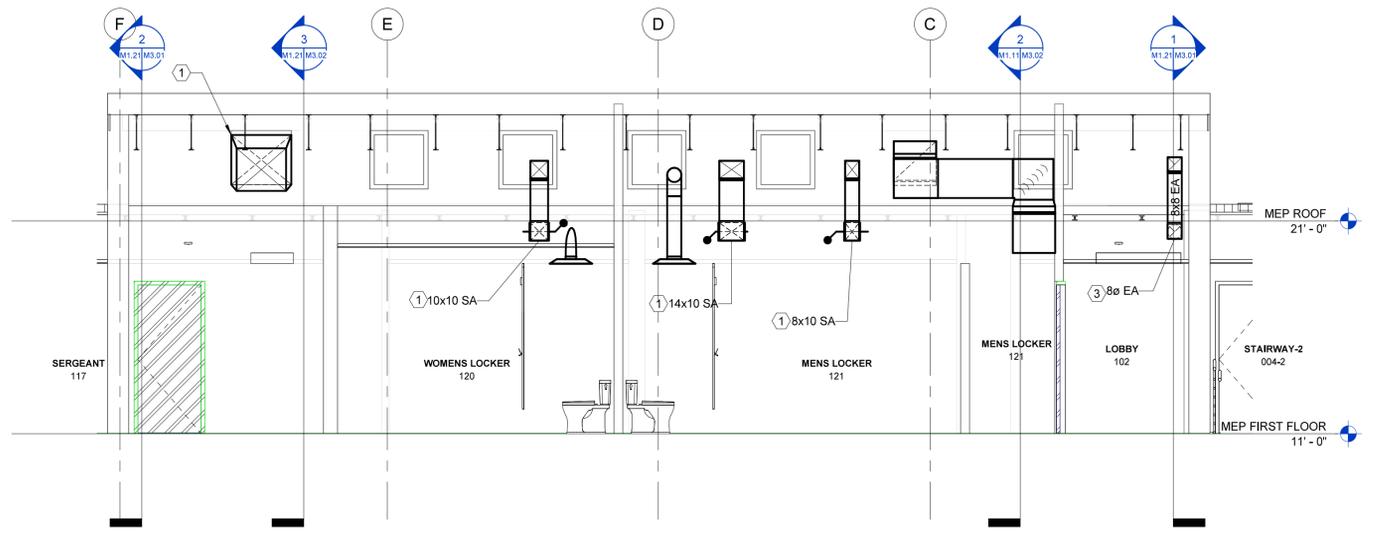
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—SB—SB—	SMOKE PARTITIONS

E
D
C
B
A

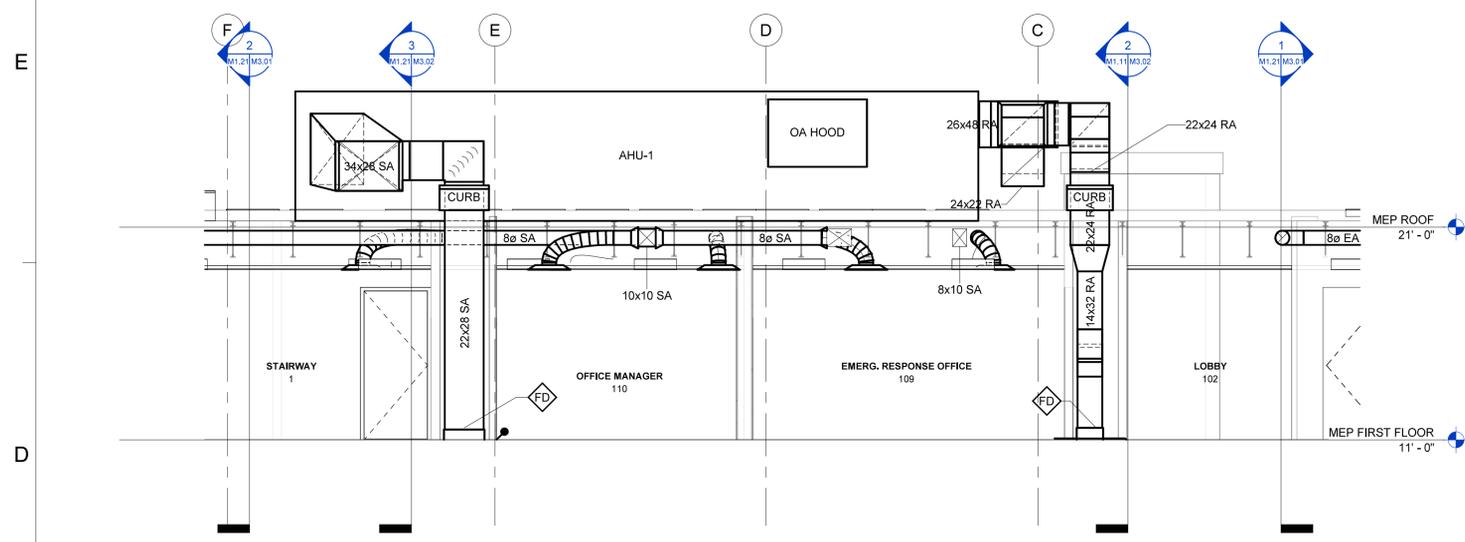


1 MECHANICAL SECTION AT PATROL DIVISION 126 - LOOKING WEST
 Scale: 1/4" = 1'-0"

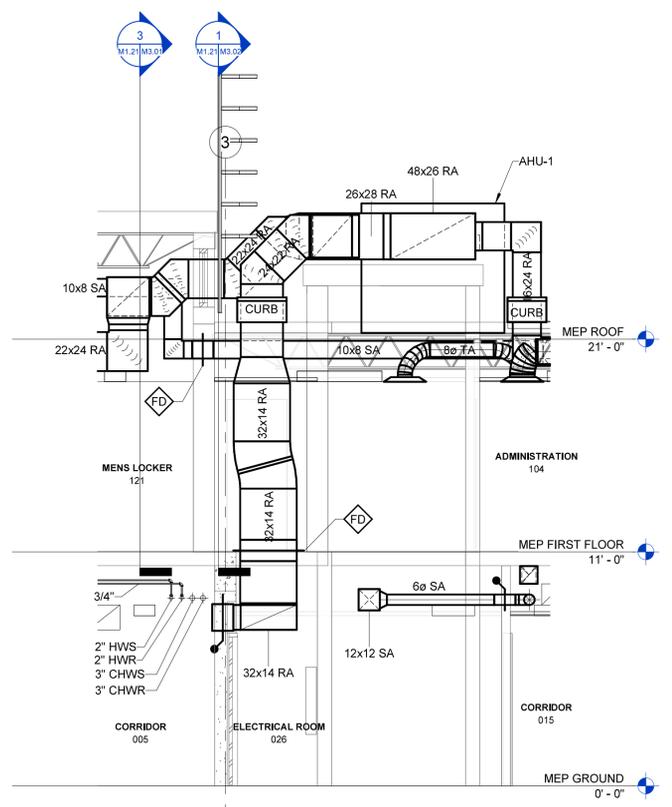
2 MECHANICAL SECTION AT PATROL DIVISION 126 - LOOKING EAST
 Scale: 1/4" = 1'-0"



3 MECHANICAL SECTION AT PATROL DIVISION 126 - LOOKING SOUTH
 Scale: 1/4" = 1'-0"



1 MECHANICAL SECTION AT FIRST FLOOR - LOOKING SOUTH
Scale: 1/4" = 1'-0"



2 MECHANICAL SECTION AT DUCT RISER
Scale: 1/4" = 1'-0"

GENERAL NOTES:

- REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

- ROUTE DUCT THROUGH WALL OPENING. REFER TO ARCHITECTURAL FOR CLOSURE OF THE ANNULAR WALL OPENING AROUND DUCT PERIMETER.
- DUCT SUPPORT. REFER TO DETAILS.

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SEAL
Signed
Scott W. Davis
Professional Engineer
Lic. No. 062725
1/22/2026

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DRAWN BY _____ SMF
APPROVED BY _____ SWD
CHECKED BY _____ JDR
DATE _____ January 12, 2024

TITLE
BUILDING SECTIONS

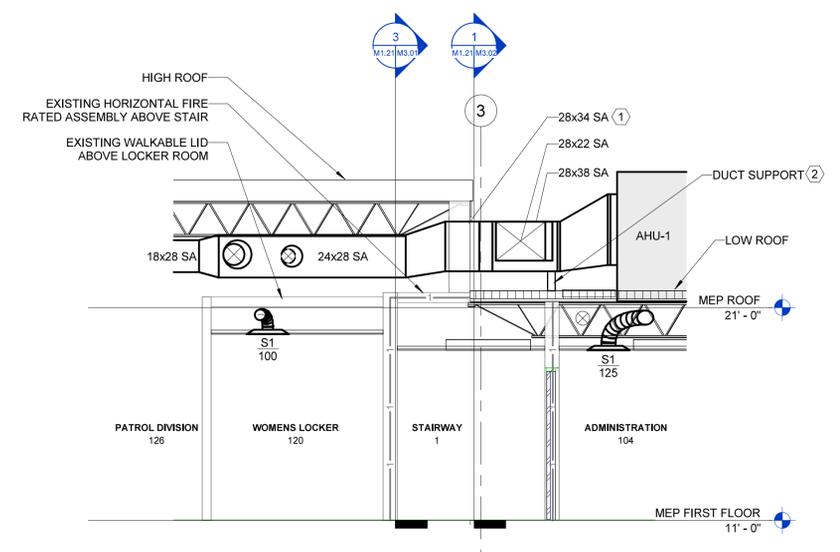
DEI PROJECT NO: 50158550
RADFORD PROJECT NO: 217-B5217-017
SHEET NO.

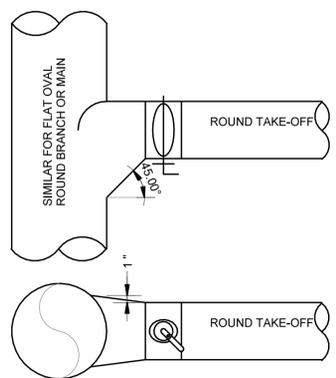
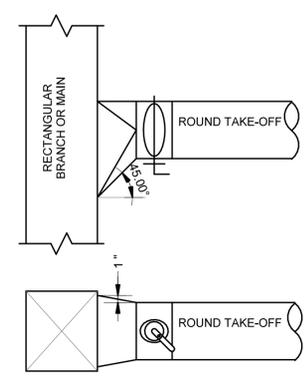
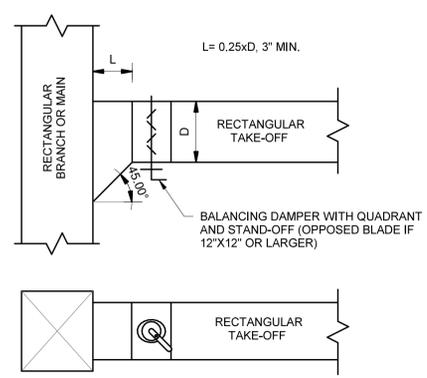
WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

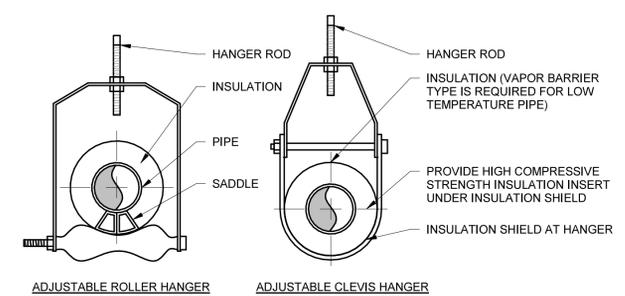
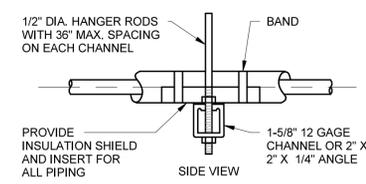
M3.02

3 MECHANICAL SECTION AT AHU-1 SA DUCT ABOVE STAIR 011
Scale: 1/4" = 1'-0"



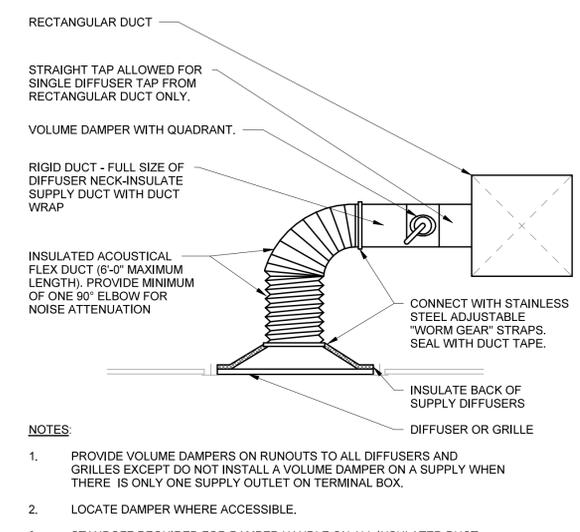
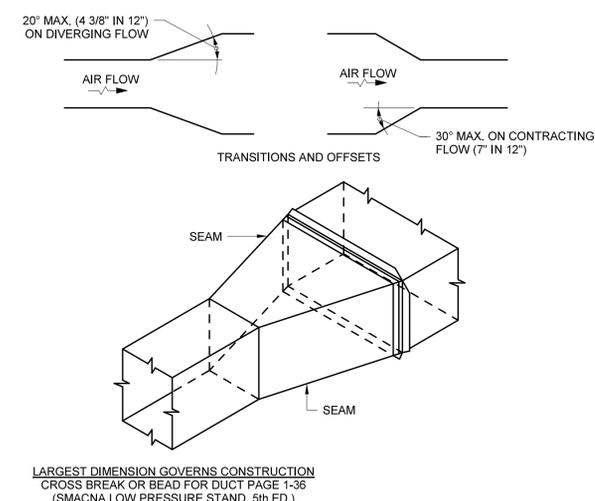
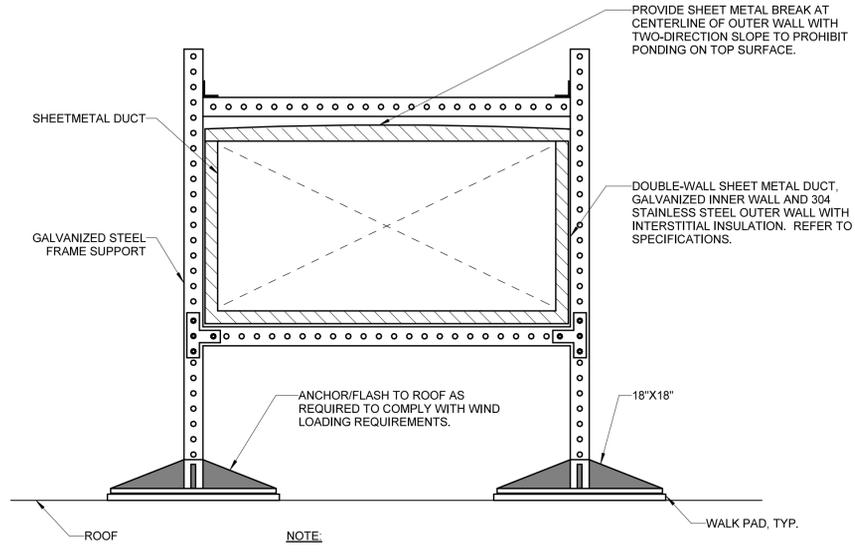


- NOTES:**
1. PROVIDE 45° LATERAL WYE TAKE-OFFS.
 2. WHEN SPACE DOES NOT ALLOW 45° LATERAL WYE TAKE-OFF, USE 90° CONICAL TEE CONNECTIONS.
 3. STRAIGHT IN FACTORY BUILT CONNECTIONS ARE PERMITTED FOR:
 - A. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS FOR EXHAUST OR RETURN AIR APPLICATIONS.
 - B. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS ON THE LOW PRESSURE SIDE OF TERMINAL BOXES.
 4. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.



1 DUCT 45 DEG. LATERAL TAKE-OFF
Scale: N.T.S.

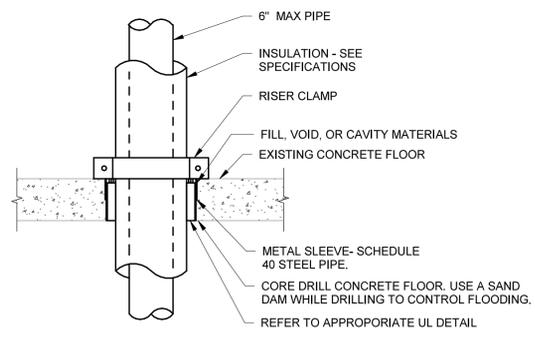
2 TYPICAL PIPE HANGERS
Scale: N.T.S.



3 EXTERIOR DUCT AND SUPPORT
Scale: N.T.S.

4 DUCT TRANSITION
Scale: N.T.S.

5 GRILLE AND DIFFUSER ASSEMBLY
Scale: N.T.S.



NOTE:
LOCATE FLOOR SUPPORT MEMBERS AND ADJUST LOCATION OF FLOOR PENETRATIONS AS NECESSARY TO AVOID ANY CONFLICTS WITH THESE MEMBERS.

6 FLOOR PIPE PENETRATION DETAIL
Scale: N.T.S.

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SEAL
Signed: SCOTT W. DAVIS
Professional Engineer
Lic. No. 062725

1/22/2026

KEY PLAN:

SCALE:

REVISIONS

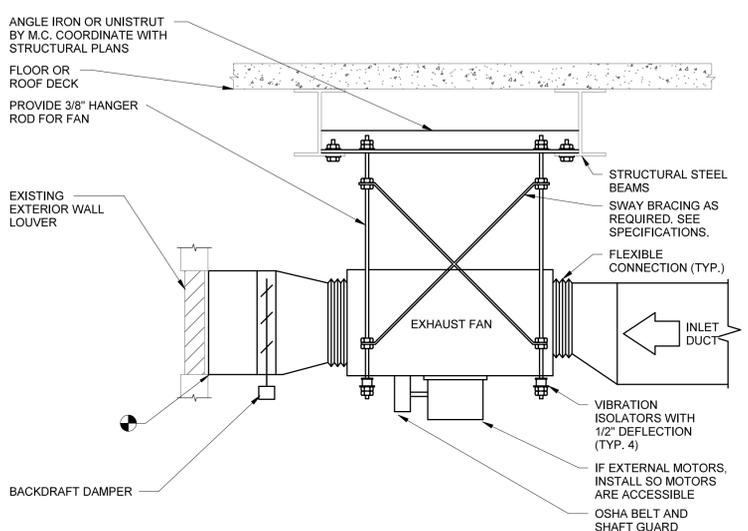
NO.	DATE	BY	DESCRIPTION
6	01/22/26	SWD	DEB COMMENTS
5	12/17/25	SWD	DEB COMMENTS
4	11/14/25	SWD	REMOVE MECH ROOM
3	12/06/24	SWD	DEB COMMENTS
2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

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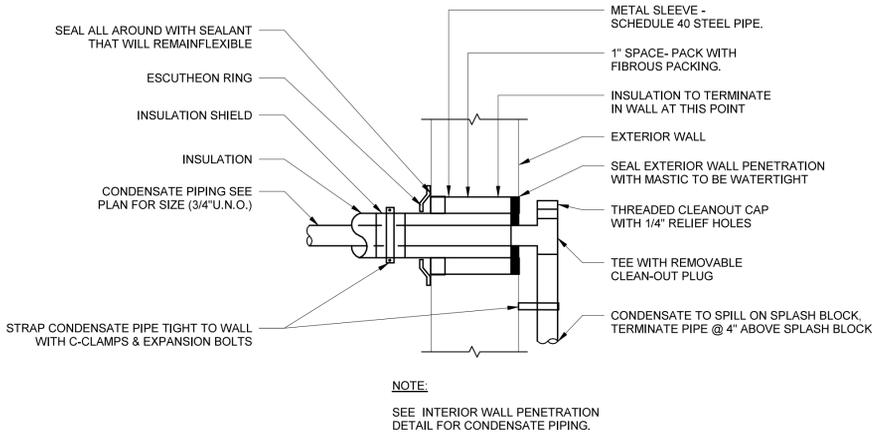
TITLE
MECHANICAL DETAILS

DEI PROJECT NO: 50158550
RADFORD PROJECT NO: 217-B5217-017
SHEET NO.

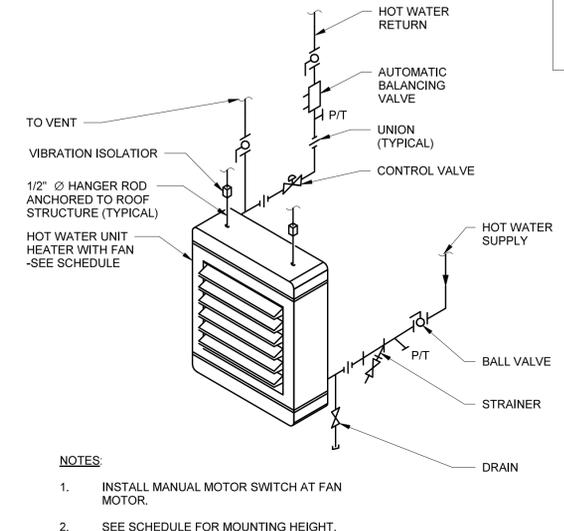
M5.01



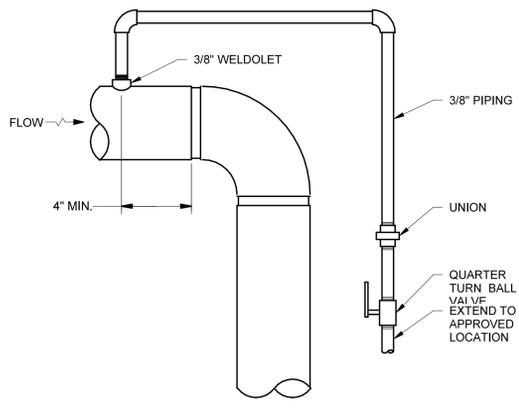
1 SUSPENDED INLINE EXHAUST FAN
Scale: N.T.S.



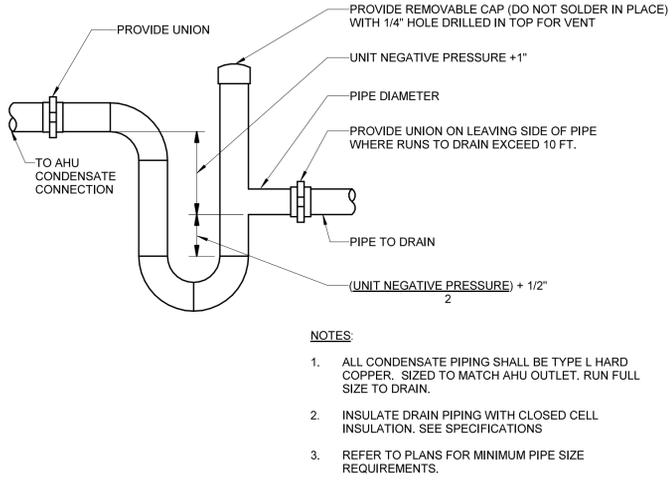
2 EXTERIOR WALL CONDENSATE PENETRATION
Scale: N.T.S.



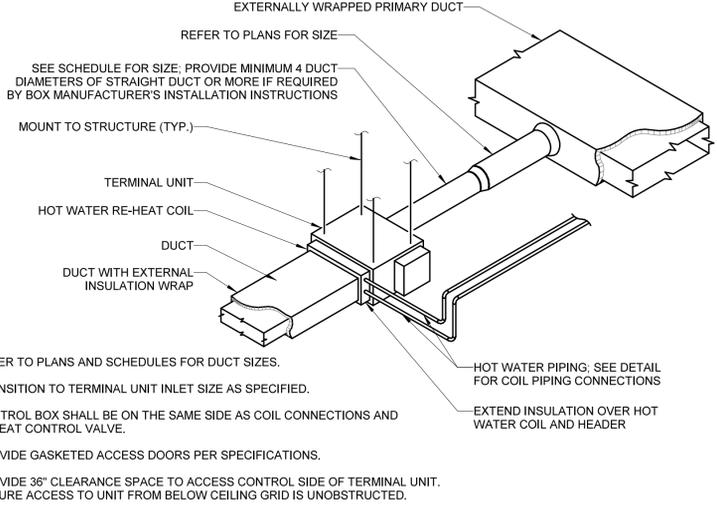
3 HORIZONTAL H.W. UNIT HEATER
Scale: N.T.S.



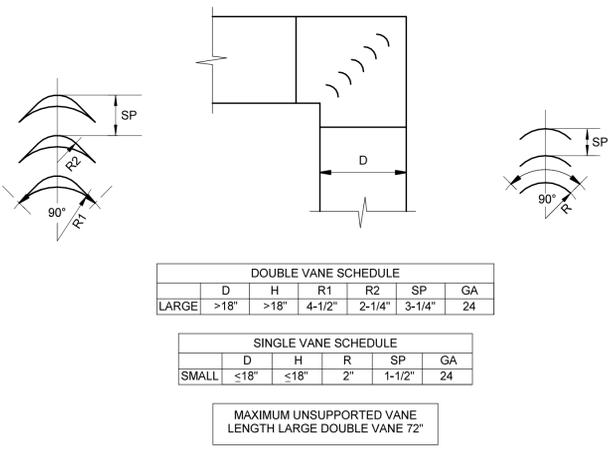
4 MANUAL AIR VENT ON MAIN
Scale: N.T.S.



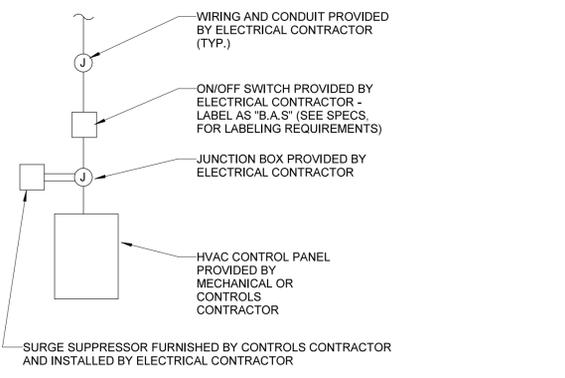
5 AHU DRAIN TRAP - DRAW THRU
Scale: N.T.S.



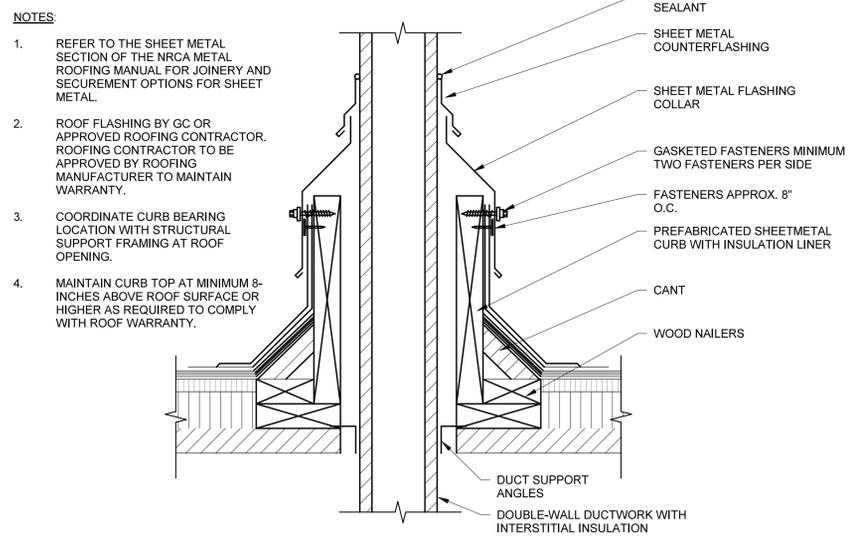
6 TERMINAL UNIT - HOT WATER REHEAT
Scale: N.T.S.



7 DUCT MITERED 90° ELBOW
Scale: N.T.S.



8 POWER SUPPLY TO HVAC CONTROL PANEL
Scale: N.T.S.



9 PREFABRICATED CURB FOR DUCT ROOF PENETRATIONS
Scale: N.T.S.

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SEAL
Signed by
SCOTT W. DAVIS
Professional Engineer
Lic. No. 062725
1/22/2026

KEY PLAN:

SCALE:

REVISIONS

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3	12/06/24	SWD	DEB COMMENTS
2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

DRAWN BY _____ SMF
APPROVED BY _____ SWD
CHECKED BY _____ JDR
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TITLE
MECHANICAL DETAILS

DEI PROJECT NO: 50158550
RADFORD PROJECT NO: 217-B5217-017
SHEET NO.

M5.02



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SCALE:

Table with 4 columns: NO., DATE, BY, DESCRIPTION. Contains revision history for the document.

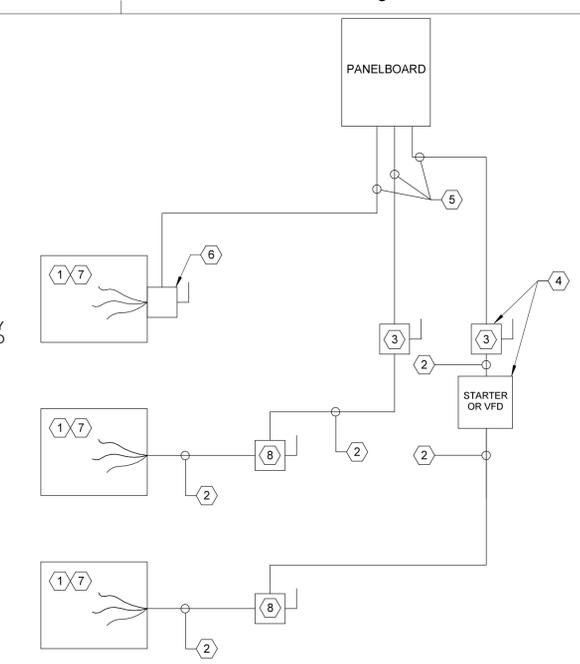
DRAWN BY: SMF, APPROVED BY: SWD, CHECKED BY: JDR, DATE: January 12, 2024

TITLE: MECHANICAL DETAILS

DEI PROJECT NO: 50158550, RADFORD PROJECT NO: 217-B5217-017

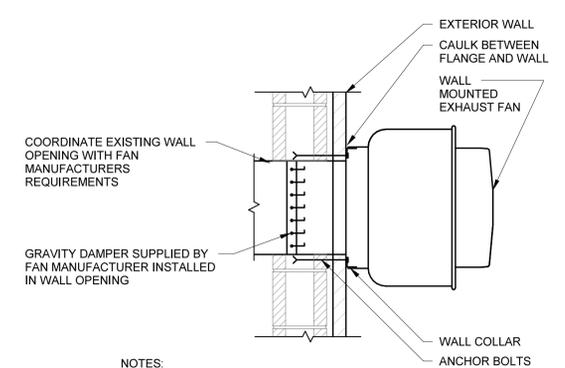
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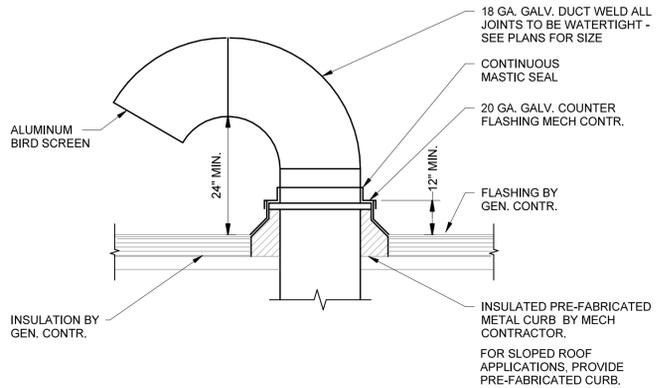
- DETAIL KEY NOTES: 1. EQUIPMENT BY MECHANICAL CONTRACTOR. 2. CONDUIT & WIRING BY ELECTRICAL CONTRACTOR. 3. DISCONNECT SWITCH FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR. 4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER / VFD. 5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. 6. EQUIPMENT PROVIDED BY MECHANICAL CONTRACTOR, WITH INTEGRAL DISCONNECTING MEANS. 7. MECHANICAL CONTRACTOR SHALL MAKE FINAL EQUIPMENT CONNECTIONS, START UP, AND TEST EQUIPMENT. 8. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC IT SHALL BE FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR.

4 ELECTRICAL TO MECHANICAL EQUIPMENT Scale: N.T.S.

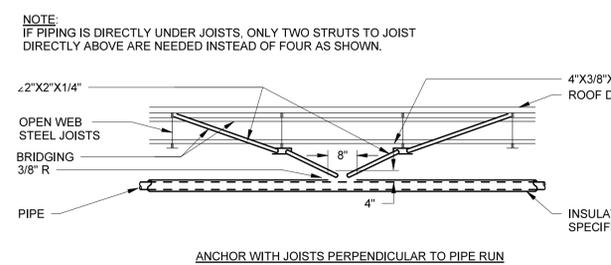
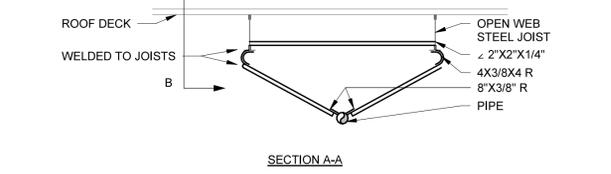
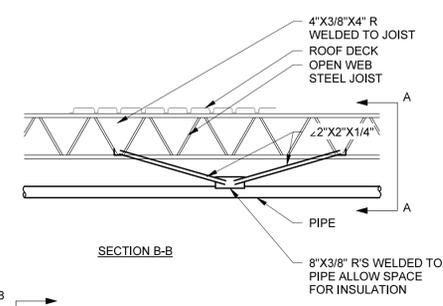


- NOTES: 1. FOR INSTALLATION ON SPLIT FACE BLOCK, GRIND AREA ON BLOCK SMOOTH WHERE WALL COLLAR SEATS, SHIM AND CAULK AS REQUIRED. 2. ALL CAVITIES AROUND WALL OPENING SHALL BE FILLED SOLID WITH MORTAR. 3. WHERE EXHAUST FAN IS INSTALLED ON CAVITY WALL CONSTRUCTION, CAVITY SHALL BE FILLED SOLID WITH MORTAR ALL AROUND OPENING.

2 WALL MOUNTED EXHAUST FAN Scale: N.T.S.

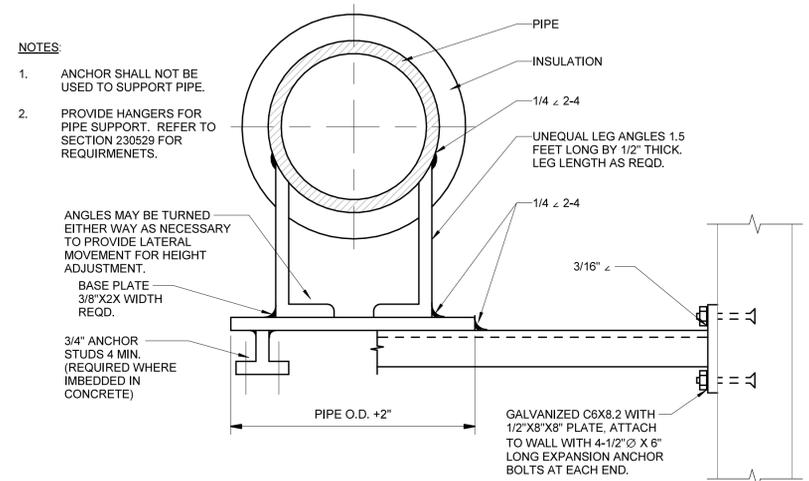


3 GOOSENECK Scale: N.T.S.



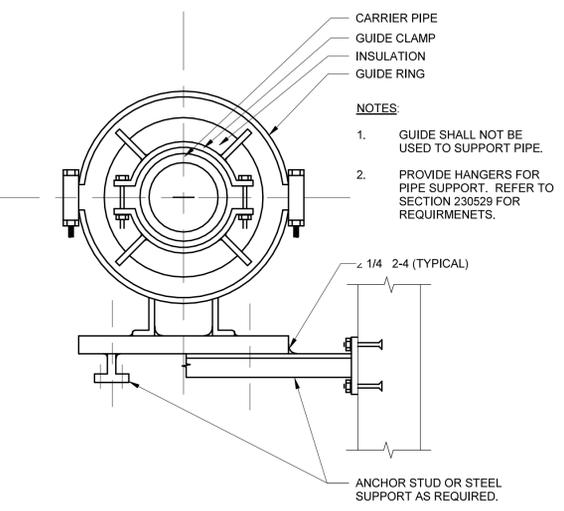
- NOTES: 1. ANCHOR TO ROOF STRUCTURE PERMITTED FOR 3" PIPE AND SMALLER ONLY. 2. WHERE GUIDES ARE SHOWN, GUIDE SHALL BE WELDED TO ANCHOR SUPPORT STEEL. 3. ANCHORS SHALL BE WELDED TO JOISTS AT PANEL POINTS ONLY.

1 PIPING ANCHOR - JOIST Scale: N.T.S.



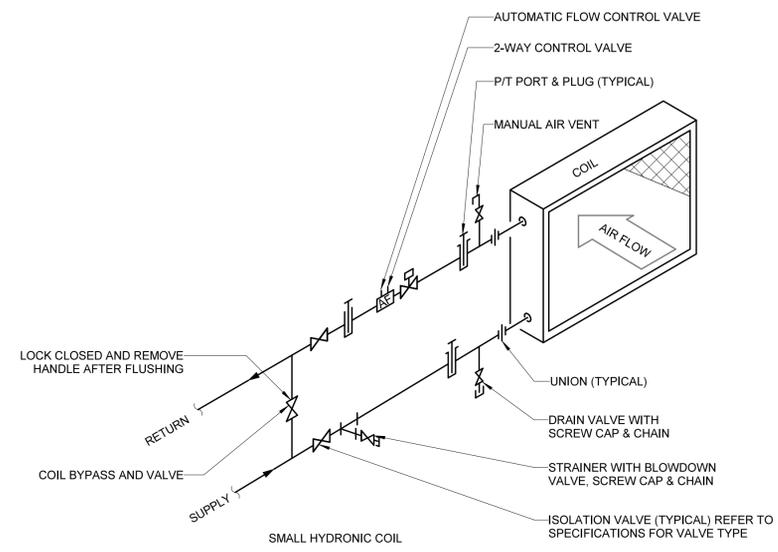
- NOTES: 1. ANCHOR SHALL NOT BE USED TO SUPPORT PIPE. 2. PROVIDE HANGERS FOR PIPE SUPPORT. REFER TO SECTION 230529 FOR REQUIREMENTS. ANGLES MAY BE TURNED EITHER WAY AS NECESSARY TO PROVIDE LATERAL MOVEMENT FOR HEIGHT ADJUSTMENT. BASE PLATE 3/8" X 2" WIDTH REQD. 3/4" ANCHOR STUDS 4 MIN. (REQUIRED WHERE IMBEDDED IN CONCRETE)

6 PIPE ANCHOR Scale: N.T.S.



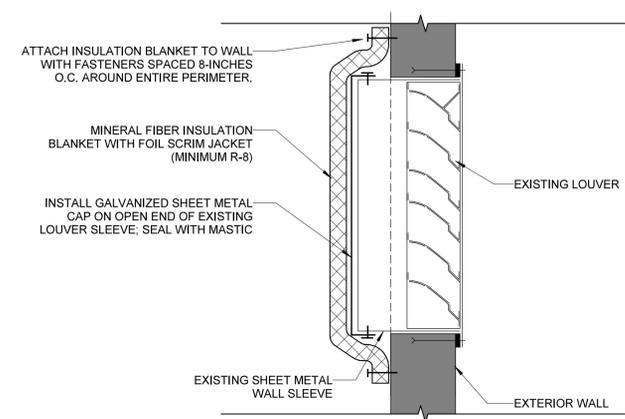
- NOTES: 1. GUIDE SHALL NOT BE USED TO SUPPORT PIPE. 2. PROVIDE HANGERS FOR PIPE SUPPORT. REFER TO SECTION 230529 FOR REQUIREMENTS.

5 PIPE GUIDE Scale: N.T.S.



- NOTE: REFER TO SPECIFICATIONS FOR CONTROL AND BALANCING VALVE TYPES.

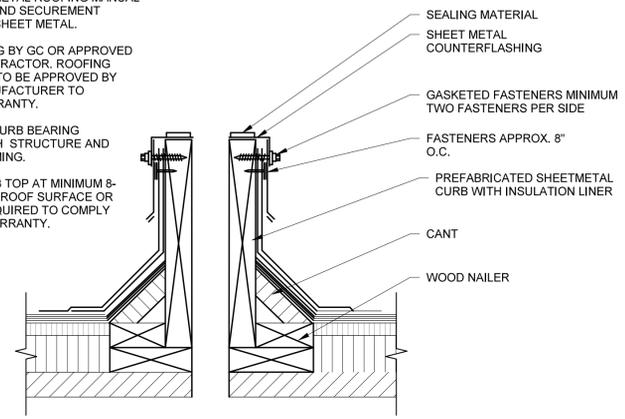
7 TERMINAL UNIT HYDRONIC COIL Scale: N.T.S.



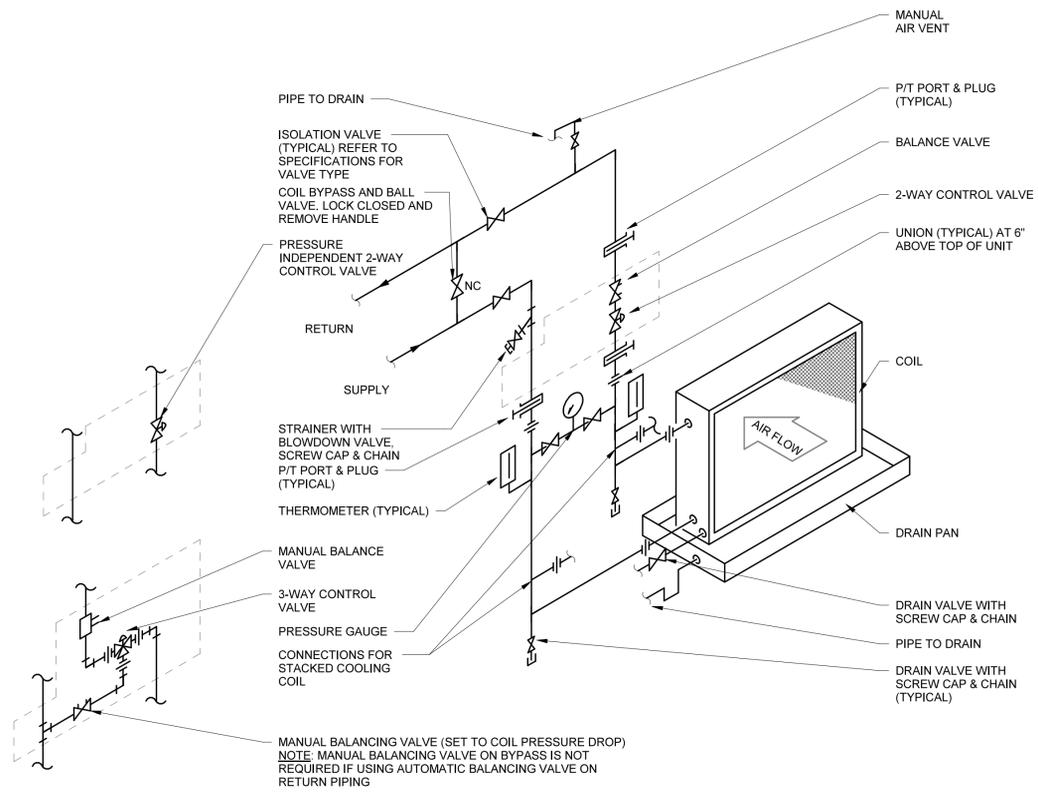
- NOTES:**
1. TRIM INTERIOR END OF LOUVER SLEEVE AS CLOSE TO INTERIOR FACE OF WALL AS POSSIBLE PRIOR TO INSTALLING CAP.

1 LOUVER CAP
Scale: N.T.S.

- NOTES:**
1. THE MECHANICAL UNITS SHALL NOT BE SET UNTIL THE ROOF MEMBRANE AND FLASHING HAVE BEEN INSTALLED.
 2. REFER TO THE SHEET METAL SECTION OF THE NRCA METAL ROOFING MANUAL FOR JOINERY AND SECUREMENT OPTIONS FOR SHEET METAL.
 3. ROOF FLASHING BY GC OR APPROVED ROOFING CONTRACTOR. ROOFING CONTRACTOR TO BE APPROVED BY ROOFING MANUFACTURER TO MAINTAIN WARRANTY.
 4. COORDINATE CURB BEARING LOCATION WITH STRUCTURE AND SUPPORT FRAMING.
 5. MAINTAIN CURB TOP AT MINIMUM 8-INCHES ABOVE ROOF SURFACE OR HIGHER AS REQUIRED TO COMPLY WITH ROOF WARRANTY.



2 PREFABRICATED STEEL CURB FOR ROOFTOP AHU'S
Scale: N.T.S.



- NOTES:**
1. REFER TO SPECIFICATIONS FOR CONTROL AND BALANCING VALVE TYPES.
 2. MANUAL BALANCING VALVE ON BYPASS IS NOT REQUIRED IF USING AUTOMATIC BALANCING VALVE.
 3. PROVIDE DRAIN PAN OVERFLOW SWITCH FOR COOLING COIL.

3 AIR HANDLING UNIT COIL
Scale: N.T.S.



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PROFESSIONAL ENGINEER
1/22/2026

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2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

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SHEET NO.

M5.04

BUILDING LOADS SCHEDULE table with columns for component and value.

VENTILATION RATE SCHEDULE table with columns for occupancy classification, occupant density, and airflow rate.

VENTILATION CALCULATION SUMMARY table with columns for 2021 Virginia Mechanical Code and AHU-1 values.

AIR HANDLING UNIT SCHEDULE table with columns for MARK, SERVICE, TYPE, MANUFACTURER / MODEL, and various unit specifications.

FAN SCHEDULE table with columns for MARK, SERVICE / LOCATION, TYPE, MANUFACTURER / MODEL, and fan specifications.

- NOTES: 1. THE DESIGN SHOWN ON THE DRAWINGS IS BASED ON THE EQUIPMENT MANUFACTURER AND MODEL SCHEDULED AND IS INTENDED ONLY TO SHOW THE GENERAL SIZE, CONFIGURATION, LOCATION, CONNECTIONS AND SUPPORT FOR EQUIPMENT OR SYSTEMS SPECIFIED WITH RELATION TO THE OTHER BUILDING SYSTEMS.

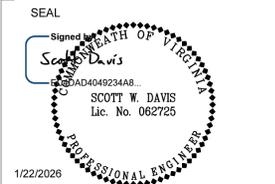
TERMINAL UNIT SCHEDULE table with columns for MARK, SOURCE, TYPE, MANUFACTURER / MODEL, and detailed terminal unit specifications.

- NOTES: 1. THE DESIGN SHOWN ON THE DRAWINGS IS BASED ON THE EQUIPMENT MANUFACTURER AND MODEL SCHEDULED AND IS INTENDED ONLY TO SHOW THE GENERAL SIZE, CONFIGURATION, LOCATION, CONNECTIONS AND SUPPORT FOR EQUIPMENT OR SYSTEMS SPECIFIED WITH RELATION TO THE OTHER BUILDING SYSTEMS.



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REVISIONS table with columns for NO., DATE, BY, and DESCRIPTION.

DRAWN BY: SMF APPROVED BY: SWD CHECKED BY: JDR DATE: January 12, 2024

TITLE MECHANICAL SCHEDULES

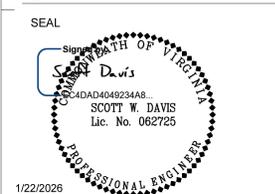
DEI PROJECT NO: 50158550 RADFORD PROJECT NO: 217-B5217-017 SHEET NO.

M6.01



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MECHANICAL SCHEDULES

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

M6.02

DUCTLESS MINI-SPLIT UNIT SCHEDULE

MARK (INDOOR UNIT)	MARK (OUTDOOR UNIT)	SERVICE	TYPE	MANUFACTURER / MODEL INDOOR & OUTDOOR	REFRIG. TYPE	REFRIG. AMOUNT (LBS)	SUPPLY AIR FLOW (CFM)	OUTSIDE AIR FLOW (CFM)	COOLING				HEAT PUMP			MAX. SOUND		ELECTRICAL - INDOOR UNIT			ELECTRICAL - OUTDOOR UNIT			MAX. EQUIV. PIPE LENGTHS		DIMENSIONS AND WEIGHT - OUTDOOR			NOTES
									TOT. CAP. (MBH)	SENS. CAP. (MBH)	SEER2/EER (BTU/HW)	AMB. (F)	CAPACITY (MBH)	HSPF2/ COP (F)	AMB. (F)	INDOOR (dBA)	OUTDOOR (dBA)	MCA (A)	FLA (A)	VOLTAGE/ PHASE	MCA (A)	MOCP (A)	VOLTAGE/ PHASE	HEIGHT (FT)	LENGTH (FT)	FOOTPRINT (IN x IN)	HEIGHT (IN)	WEIGHT (LBS)	
DMSS-1	HP-1	RADIO ROOM 016	WALL MOUNTED / HEAT PUMP	LG / KNSAP241A & KUSAP241A	R-32	5.1	813	VAV-004	24.0	18.5	22.0	95	24.0	9.7	6	49	56	1.0	0.5	208/1	19.0	30	208/1	100	165	38 x 16	32	200	1,2,3,4,5,6,7,8,9,10,11,12,13
DMSS-2	HP-2	EMERG. COMMS. 132	CEILING CASSETTE / HEAT PUMP	LG / KNSCB241A & KUSXB241A	R-32	5.4	794		23.0	19.8	21.0	95	23.0	10.2	5	40	48	1.0	0.6	208/1	16.0	25	208/1	100	165	38 x 15	33	200	1,2,3,4,5,6,7,8,9,10,11,12,13

- NOTES:
- THE DESIGN SHOWN ON THE DRAWINGS IS BASED ON THE EQUIPMENT MANUFACTURER AND MODEL SCHEDULED AND IS INTENDED ONLY TO SHOW THE GENERAL SIZE, CONFIGURATION, LOCATION, CONNECTIONS AND SUPPORT FOR EQUIPMENT OR SYSTEMS SPECIFIED WITH RELATION TO THE OTHER BUILDING SYSTEMS. SEE SPECIFICATION SECTION 238116 FOR TECHNICAL REQUIREMENTS PERTAINING TO THE EQUIPMENT.
 - SOUND PERFORMANCE IS BASED ON SOUND PRESSURE LEVELS MEASURED AT 3 FEET FROM UNIT AT FULL CAPACITY IN ACCORDANCE WITH AHRI 270 AND 350.
 - ALL UNITS SHALL MEET OR EXCEED SECOND GENERATION SEASONAL ENERGY EFFICIENCY RATIO (SEER2) FOR NOMINAL COOLING SIZES LESS THAN 65,000 BTUH AND ENERGY EFFICIENCY RATIO (EER) FOR SIZES GREATER THAN OR EQUAL TO 65,000 BTUH.
 - HEAT PUMPS SHALL MEET OR EXCEED SECOND GENERATION HEATING SEASONAL PERFORMANCE FACTOR (HSPF2) FOR NOMINAL COOLING SIZES LESS THAN 65,000 BTUH AND COEFFICIENT OF PERFORMANCE (COP) FOR SIZES GREATER THAN OR EQUAL TO 65,000 BTUH.
 - SIZE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
 - PROVIDE SINGLE-POINT POWER CONNECTION. PROVIDE FUSED-DISCONNECT SWITCH FOR OUTDOOR UNIT. PROVIDE MOTOR-RATED DISCONNECT SWITCH FOR INDOOR UNIT.
 - PROVIDE LOW AMBIENT TEMPERATURE OPTION FOR COOLING AND HEATING.
 - PROVIDE WIRED THERMOSTAT / TEMPERATURE SENSOR AS INDICATED. WIRELESS REMOTE CONTROLS ARE NOT ACCEPTABLE.
 - PROVIDE CONDENSATE DRAIN PUMP WITH SEPARATE 120-VOLT, 1-PHASE ELECTRICAL CONNECTION.
 - PROVIDE OUTDOOR UNIT WIND BAFFLE FOR IMPROVED LOW AMBIENT HEATING PERFORMANCE.
 - SET OUTDOOR UNIT ON NEW CONCRETE PAD THAT IS 6-INCHES ABOVE ADJACENT GRADE FOR OUTDOOR UNIT.
 - MAXIMUM ACCEPTABLE REFRIGERANT CHARGE OF 6.6 LBS OR LESS INCLUDING ANY ADDITIONAL CHARGE REQUIRED FOR INSTALLED PIPE LENGTH. EQUIPMENT SUBMITTAL SHALL INCLUDE TOTAL REQUIRED CHARGE FOR EACH SYSTEM INSTALLATION.

REFRIGERANT VOLUME CALCULATIONS

MARK (INDOOR UNIT)	MARK (OUTDOOR UNIT)	INDOOR UNIT LOCATION	REFRIGERANT DATA		OCCUPIABLE SPACE VOLUME (FT3)	MAX. ALLOWABLE SYSTEM REFRIGERANT (LBS)	NOTES
			TYPE	CLASS			
DMSS-1	HP-1	RADIO ROOM 016	R-32	A2L	4.8	1712	1,2,3
DMSS-2	HP-2	EMERG. COMMS. 132	R-32	A2L	4.8	2095	1,2,3

- NOTES:
- CALCULATION IN ACCORDANCE WITH 2021 VMC 1104.4.
 - REFRIGERANT DATA PER 2021 VMC TABLE 1103.1.
 - SPACE ABOVE CEILING IS NOT A PLENUM AND IS NOT INCLUDED IN OCCUPIABLE SPACE VOLUME SCHEDULED.

UNIT HEATER SCHEDULE

MARK	SERVICE	TYPE	MANUFACTURER / MODEL	FAN			AIR		MOUNTING HEIGHT (FT)	HEATING WATER				CONTROL VALVE	NOTES		
				AIR FLOW (CFM)	MOTOR (HP)	VOLTAGE/ PHASE	EAT (F)	LAT (F)		CAPACITY (MBH)	EWT (F)	LWT (F)	FLOW (GPM)			MAX. WPD (FT H2O)	PIPE SIZE (INCHES)
UH-1 (E)	MECHANICAL 002	HORIZONTAL UNIT HEATER	EXISTING	-	-	-	-	-	-	16.3	140	110	1.25	-	-	2-WAY PD	5
UH-2 (E)	STORAGE 003	HORIZONTAL UNIT HEATER	EXISTING	-	-	-	-	-	-	8.0	140	110	0.75	-	-	2-WAY PD	5
UH-3 (E)	MECHANICAL 002	HORIZONTAL UNIT HEATER	EXISTING	-	-	-	-	-	-	18.9	140	110	1.50	-	-	2-WAY PD	5
UH-4	P.D. STORAGE 006	HORIZONTAL UNIT HEATER	TRANE / S-A36	850	1/20	120/1	65	95	9	27.7	140	110	2.00	5	0.75	2-WAY PD	1,2,3,4
UH-5	P.D. STORAGE 006	HORIZONTAL UNIT HEATER	TRANE / S-A36	850	1/20	120/1	65	95	9	27.7	140	110	2.00	5	0.75	2-WAY PD	1,2,3,4
UH-6	SAFETY STORAGE 010	VERTICAL UNIT HEATER	TRANE / P-64	989	1/20	120/1	65	95	9	32.2	140	110	2.25	5	0.75	2-WAY PD	1,2,3,4
UH-7	STAIRWAY 004	HORIZONTAL UNIT HEATER	TRANE / S-A18	500	16 WATTS	120/1	65	95	8	16.3	140	110	1.25	5	0.75	2-WAY PD	1,2,3,4
UH-8	STAIRWAY 011	HORIZONTAL UNIT HEATER	TRANE / S-A18	500	16 WATTS	120/1	65	95	8	16.3	140	110	1.25	5	0.75	2-WAY PD	1,2,3,4

- NOTES:
- THE DESIGN SHOWN ON THE DRAWINGS IS BASED ON THE EQUIPMENT MANUFACTURER AND MODEL SCHEDULED AND IS INTENDED ONLY TO SHOW THE GENERAL SIZE, CONFIGURATION, LOCATION, CONNECTIONS AND SUPPORT FOR EQUIPMENT OR SYSTEMS SPECIFIED WITH RELATION TO THE OTHER BUILDING SYSTEMS. SEE SPECIFICATION SECTION 238239 FOR TECHNICAL REQUIREMENTS PERTAINING TO THE EQUIPMENT.
 - PROVIDE MOTOR-RATED DISCONNECT SWITCH.
 - PROVIDE FACTORY-FABRICATED WALL/CEILING SUPPORT. MOUNT AT SCHEDULED HEIGHT AFF TO BOTTOM OF HEATER UNLESS OTHERWISE NOTED ON PLANS.
 - UNIT-MOUNTED THERMOSTAT.
 - EXISTING HEATER TO REMAIN. BALANCE TO GPM INDICATED.

AIR DISTRIBUTION SCHEDULE

MARK	SERVICE	TYPE	MATERIAL	COLOR	PATTERN	MAX. AIR FLOW (CFM)	FACE SIZE (IN x IN)	NECK SIZE (IN x IN)	APD (IN WG)	MAX. SOUND (NC)	NOTES
						250	12 x 12	8	0.08		
						120	24 x 24	6	0.08		
						250	24 x 24	8	0.08		
						325	24 x 24	10	0.10		
						500	24 x 24	12	0.10		
						675	24 x 24	14	0.10		
S2	SUPPLY	ROUND LOUVERED FACE	ALUMINUM	WHITE	360-DEG.	100	18	6	0.08	20	
						200	24	8	0.08		
						300	29	10	0.08		
						425	35	12	0.08		
						575	41	14	0.08		
S3	SUPPLY	STANDARD BLADE GRILLE	ALUMINUM	WHITE	90 DEG.	150	10 x 8	8 x 6	0.10	20	1,2,3,4,5,6,7
						275	14 x 8	12 x 6	0.10		
						450	18 x 10	16 x 8	0.10		
						1,600	22 x 22	20 x 20	0.10		
R1 / E1 / T1	RETURN/EXHAUST TRANSFER	SQUARE PERFORATED FACE	ALUMINUM	WHITE	N/A	120	12 x 12	6	0.10	20	1,2,3,4,5,6,7
						250	12 x 12	8	0.10		
						120	24 x 24	6	0.10		
						250	24 x 24	8	0.10		
						325	24 x 24	10	0.10		
						450	24 x 24	12	0.10		
						600	24 x 24	14	0.10		
						750	24 x 24	16	0.10		
						800	24 x 12	22 x 10	0.10		
						1,300	24 x 24	22 x 22	0.10		
R2 / E2	RETURN/EXHAUST	STANDARD BLADE GRILLE	ALUMINUM	WHITE	N/A	50	8 x 8	6 x 6	0.05	20	1,2,3,4,5,6,7
						150	10 x 10	8 x 8	0.05		
						200	12 x 8	10 x 6	0.05		
						250	14 x 8	12 x 6	0.05		
						500	18 x 10	16 x 8	0.05		
						1,650	24 x 24	22 x 22	0.05		

- NOTES:
- REFER TO SECTION 233713 FOR ADDITIONAL REQUIREMENTS.
 - SOUND LEVELS SHALL BE BASED ON ASHRAE 70.
 - VERIFY MOUNTING FRAME STYLE WITH ARCHITECTURAL REFLECTED CEILING PLANS, FINISH SCHEDULES AND EXISTING CEILINGS.
 - DUCT BRANCH FROM MAIN TAKEOFF TO AIR INLET / OUTLET SHALL MATCH SCHEDULED NECK SIZE UNLESS OTHERWISE NOTED.
 - PROVIDE INTEGRAL DAMPERS ADJUSTABLE AT THE DEVICE FACE ONLY AT LOCATIONS NOTED ON PLANS.
 - PROVIDE PRIMED-FOR-PAINT FINISH FOR DIFFUSERS AND GRILLES IN SPACES WITH EXPOSED STRUCTURE CEILINGS AND/OR MOUNTED TO EXPOSED DUCT.
 - PROVIDE ALUMINUM CONSTRUCTION FOR HUMID AREAS SUCH AS KITCHENS, TOILET ROOMS, LOCKER ROOMS, AND MECHANICAL SPACES.

CONTROLS LEGEND

- AI = ANALOG INPUT
AO = ANALOG OUTPUT
DI = DIGITAL INPUT
DO = DIGITAL OUTPUT
N = NETWORK CONNECTION
AC = ACTUATOR CONTROL
AF = AIR FLOW SWITCH
CO = CARBON MONOXIDE SENSOR
CO2 = CARBON DIOXIDE SENSOR
CS = CURRENT SENSING RELAY
DP = DIFFERENTIAL PRESSURE SENSOR
EM = ENERGY METER
FM = FLOW METER
FS = FLOAT SWITCH OR FLOW SWITCH
HL = HUMIDITY HIGH LIMIT SWITCH
HS = HUMIDITY SENSOR
OS = OCCUPANCY SENSOR
PS = PRESSURE SENSOR
R = RELAY
ES = END SWITCH
SD = DUCT SMOKE DETECTOR
STR = STARTER
TS = TEMPERATURE SENSOR
VF = VARIABLE FLOW VALVE OR DAMPER
VS = VELOCITY SENSOR
VFD = VARIABLE FREQUENCY DRIVE
S = OVERRIDE SWITCH
FA = FIRE ALARM CONTACT
FO = FAIL OPEN
FC = FAIL CLOSED
= THREE WAY CONTROL VALVE
= TWO WAY CONTROL VALVE
M = MOTOR
AFMS = AIR FLOW MONITORING STATION
= DAMPER
= COOLING OR HEATING COIL
TS = FREEZE STAT
= FILTER
= FAN
= FAN
= PUMP

CONTROLS SCOPE:

- 1. GENERAL PROJECT DESCRIPTION: THIS PROJECT CONSISTS OF A FULL REPLACEMENT OF ALL ALLEN BUILDING HVAC SYSTEMS NOT REPLACED UNDER THE SEPARATE PHASE 1, 'ALLEN BUILDING ELECTRICAL UPGRADES' PROJECT CONTRACT.
2. A NEW BAS SYSTEM COMPLYING WITH SECTION 239000 REQUIREMENTS SHALL BE PROVIDED TO SERVE THE NEW SYSTEMS AND EQUIPMENT. THE NEW SYSTEM SHALL BE CONNECTED TO, AND FULLY INTEGRATED WITH, THE BAS SYSTEM PROVIDED UNDER THE PHASE 1 PROJECT AND WITH THE EXISTING CAMPUS NETWORK. THE BAS SHALL INCLUDE ALL REQUIRED SENSORS, DEVICES, FIELD CONTROLLERS AND PANELS, NETWORK CONTROLLERS AND SERVERS, INTEGRATION WITH ALL BUILDING SENSORS, DEVICES, AND FIELD CONTROLLERS, INTEGRATION WITH THE CAMPUS FRONT END OPERATOR INTERFACE, SOFTWARE AND ANY OTHER HARDWARE OR SOFTWARE COMPONENTS FOR A FULLY FUNCTIONING BAS SYSTEM.
3. BUILDING CONTROLS SERVING CRITICAL SYSTEMS AND COMPONENTS REQUIRING CONTINUOUS OPERATION SHALL REMAIN IN SERVICE AT ALL TIMES. CONTRACTOR SHALL PROVIDE TEMPORARY MEANS AS REQUIRED TO MAINTAIN FUNCTIONALITY. THIS MAY REQUIRE RELOCATION OF EXISTING CONTROLLERS, WIRING, AND/OR OTHER BAS COMPONENTS. REFER TO M0.03 FOR MORE INFORMATION.
4. ALL COMMISSIONING AND FUNCTIONAL TESTING WITH THE UNIVERSITY COMMISSIONING TEAM SHALL BE INCLUDED IN THIS CONTRACT AND CONSIST OF ALL PROCEDURES OUTLINED IN THE COMMISSIONING SPECIFICATIONS.

BAS CONTROL SYSTEM GENERAL NOTES

DESCRIPTION: OPEN ARCHITECTURE SYSTEM SHALL VIEW, MONITOR AND CONTROL BACNET PROTOCOL DEVICES OVER ETHERNET OR IP. REFER TO SECTION 239000 SPECIFICATIONS FOR DETAILED INFORMATION.

SET POINTS: ALL SET POINTS AND NUMERIC VALUES SHALL BE ADJUSTABLE.

TIME DELAYS: TIME DELAYS NOTED IN THE SEQUENCES OF OPERATION ARE INTENDED TO ALLOW FOR OTHER DEVICES TO ACT IN ADVANCE. FOR EXAMPLE, A FAN NOTED TO START ON A TIME DELAY IS WAITING FOR AN ASSOCIATED DAMPER TO OPEN. TIME DELAY DURATIONS SHALL BE DETERMINED WITH THE ENGINEER ONCE THE ACTUATORS HAVE BEEN SELECTED.

VARIABLE SPEED DRIVE OPERATION: WHEN A FAN OR PUMP IS STARTED, THE VARIABLE FREQUENCY DRIVE SHALL START AT MINIMUM SPEED AND SLOWLY INCREASE UNTIL REACHING THE REQUIRED SPEED TO SATISFY THE REFERENCE SIGNAL. STARTING AT FULL SPEED AND SLOWING TO MEET SET POINT IS NOT ACCEPTABLE.

EQUIPMENT WITH PACKAGED CONTROLS: HVAC EQUIPMENT THAT COMES EQUIPPED WITH FACTORY-INSTALLED PACKAGED CONTROLS SHALL COME WITH BACNET INTERFACE CARDS THAT ALLOW FULL VISIBILITY OF INTERNAL CONTROL AND MONITORING POINTS. THIS REQUIREMENT SHALL INCLUDE CHILLERS AND BOILERS. ELECTRICAL OR INDUSTRIAL EQUIPMENT THAT IS NOT AVAILABLE WITH A DIRECT BACNET INTERFACE SHALL BE MODBUS.

REGAIN POWER CONTROL: ENABLE CHILLER AND BOILER AUTOMATIC RESTART 5 MINUTES (ADJ.) AFTER RESUMPTION OF POWER FROM AN OUTAGE. AUTOMATICALLY RESTART ALL OTHER EQUIPMENT BASED ON THE OCCUPANCY SCHEDULE.

POWER SUPPLY: POWER TO THE BAS SYSTEM SHALL BE MAINTAINED BY UPS FOR A POWER LOSS DURATION OF UP TO 30 MINUTES.

SCHEDULING FUNCTIONS: PROVIDE A REAL TIME CLOCK AND SCHEDULE CONTROLLER WITH SUFFICIENT SCHEDULING CAPABILITY TO SCHEDULE ALL REQUIRED CONTROLLERS AND SEQUENCES. SET UP INITIAL OCCUPANCY AND SYSTEM CONTROL SCHEDULES IN COORDINATION WITH THE OWNER.

OCCUPANCY SCHEDULE: EACH TEMPERATURE CONTROL ZONE SHALL REFERENCE A USER-DEFINED AND USER-ADJUSTABLE SCHEDULE. MINIMUM OF 10 SCHEDULES SHALL BE AVAILABLE FOR CURRENT AND FUTURE USE. UNLESS OTHERWISE DIRECTED BY THE OWNER / ENGINEER, USE THE FOLLOWING PRELIMINARY SCHEDULE:

OCCUPIED: MON - SUN. 12:00 AM - 12:00 AM

SPACE SENSORS: ALL SPACE SENSORS SHALL BE COMBINATION TEMPERATURE / HUMIDITY SENSORS. ALL SPACE SENSORS SHALL BE EQUIPPED WITH SETPOINT ADJUSTMENT AND OVERRIDE PUSH BUTTON (ASSOCIATED SYSTEM SHALL OPERATE FOR 90 MINUTE PERIOD (ADJ.)). REFER TO PLANS FOR LOCATIONS OF STAINLESS STEEL FLAT PLATE SENSORS AND FLAT PLATE SENSORS WITH OVERRIDE.

MISCELLANEOUS CONTROL POINTS

OA TEMPERATURE, HUMIDITY & CARBON DIOXIDE: PROVIDE BUILDING OUTDOOR AMBIENT REFERENCE SENSORS FOR TEMPERATURE, HUMIDITY AND CARBON DIOXIDE TO BE USED BY ALL HVAC BUILDING CONTROLLERS TO DETERMINE OUTSIDE AIR TEMPERATURE, HUMIDITY AND CARBON DIOXIDE LEVEL. COORDINATE SENSOR LOCATION WITH OWNER.

LIGHTING CONTROLS: RECONNECT ANY EXISTING LIGHTING CONTROL ZONES AND RELAYS. REFER TO M0.03 FOR REQUIREMENTS FOR EXTERIOR LIGHTING RELAY PANEL 'FC'. CONFIRM DETAILED REQUIREMENTS WITH OWNER.

FIRE ALARM SYSTEM: BAS SHALL SEND THE APPROPRIATE HVAC SHUTDOWN SIGNALS IN THE EVENT THE FIRE ALARM PANEL IS IN ALARM.

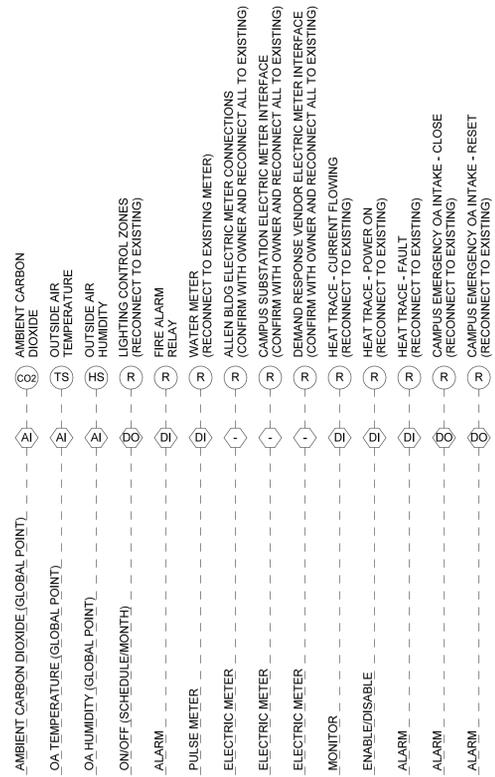
EXISTING DOMESTIC WATER METER: RECONNECT EXISTING DOMESTIC WATER METER IN MECHANICAL ROOM 002 TO THE BAS.

EXISTING ELECTRIC METER DEMAND & CONSUMPTION: CONNECTIONS TO THE EXISTING ELECTRIC METER MUST BE MAINTAINED DURING CONSTRUCTION AND TRANSFERRED TO THE NEW BAS PRIOR TO PROJECT COMPLETION. THIS INCLUDES MONITORING AND CONTROL CONNECTIONS TO RADFORD CITY ELECTRIC SUBSTATION AS REQUIRED FOR THE ENERGY SAVINGS/DEMAND LIMITING CONTROLS ON CAMPUS. THE EXISTING CONNECTION TO THE DEMAND RESPONSE VENDOR (VOLTUS ENERGY) MUST ALSO BE MAINTAINED. THIS IS USED TO PROVIDE RADFORD UNIVERSITY DATA FOR DEMAND RESPONSE PARTICIPATION IN THE VIRGINIA ENERGY DEPARTMENT PROGRAM. FIELD VERIFY CONNECTION REQUIREMENTS SHOWN WITH OWNER. REFER TO CRITICAL SYSTEM NOTES AND PHOTOGRAPH ON DRAWING M0.03 FOR ADDITIONAL INFORMATION.

HEAT TRACE CONTROLS: RECONNECT ANY EXISTING HEAT TRACE CONTROLS TO THE BAS.

CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH: BAS INTERFACE AND FUNCTIONALITY OF THE EMERGENCY OUTDOOR AIR INTAKE SHUTDOWN SWITCH LOCATED IN EMERGENCY COMMUNICATIONS 132 SHALL BE MAINTAINED DURING CONSTRUCTION AND TRANSFERRED TO THE NEW BAS PRIOR TO PROJECT COMPLETION. FIELD VERIFY CONNECTION REQUIREMENTS SHOWN WITH OWNER. REFER TO CRITICAL SYSTEMS REQUIREMENTS ON M0.03 FOR ADDITIONAL INFORMATION.

TREND LOGS: PROVIDE TREND LOGS FOR BOILER OPERATION, CHILLER OPERATION, PUMP OPERATION, AND AIR HANDLING UNIT OPERATION AT OWNER'S DISCRETION. COORDINATE WITH OWNER FOR EXACT REQUIREMENTS OF TREND LOG REQUIREMENTS.

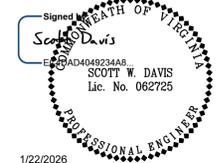


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DEB APPROVAL



SEAL



1/22/2026

KEY PLAN:

SCALE:

REVISIONS

Table with 4 columns: NO., DATE, BY, DESCRIPTION. Contains 6 revision entries.

DRAWN BY: SMF

APPROVED BY: SWD

CHECKED BY: JDR

DATE: January 12, 2024

TITLE: MECHANICAL CONTROLS

DEI PROJECT NO: 50158550

RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

M7.01



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Radford UNIVERSITY ALLEN BUILDING HVAC RENOVATION 100% CONSTRUCTION DOCUMENTS RADFORD, VIRGINIA

SEAL: Signed by Scott W. Davis, Professional Engineer, License No. 062725

KEY PLAN:

SCALE:

Table with 4 columns: NO., DATE, BY, DESCRIPTION. Contains revision history for the document.

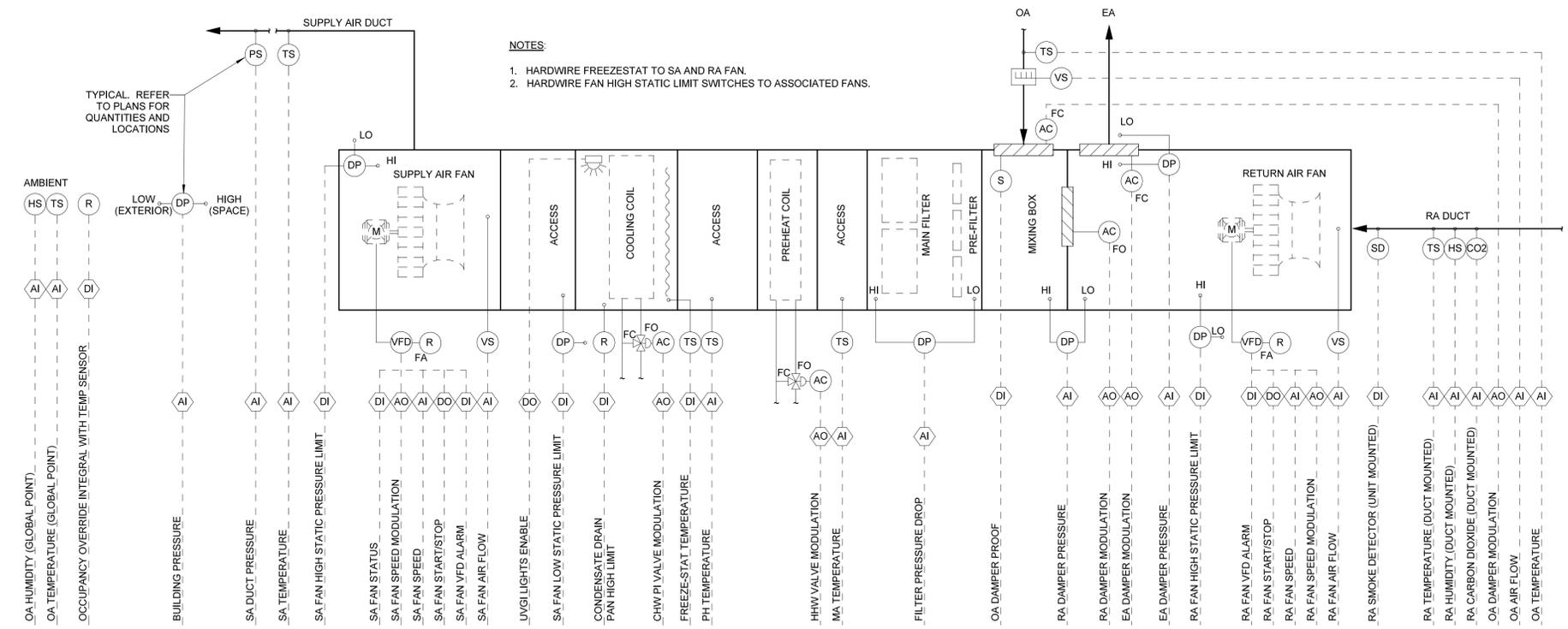
DRAWN BY: SMF APPROVED BY: SWD CHECKED BY: JDR DATE: January 12, 2024

TITLE: MECHANICAL CONTROLS

DEI PROJECT NO: 50158550 RADFORD PROJECT NO: 217-B5217-017

SHEET NO.

M7.02



- NOTES: 1. HARDWIRE FREEZE/STAT TO SA AND RA FAN. 2. HARDWIRE FAN HIGH STATIC LIMIT SWITCHES TO ASSOCIATED FANS.

VFD INTERFACE MATRIX table with columns: POINT NAME, HARDWIRED, INTERFACE COM CARD, POINT DISPLAYED ON GUI. Lists various VFD control points like VFD COMMAND START/STOP, VFD SPEED, etc.

- NOTES: 1. REFER TO OWNER-PROVIDED LIST OF BACNET INTERFACE POINTS FOR VFD'S. 2. PROVIDE DIRECT INTERFACE TO VFD. MAP ALL AVAILABLE POINTS TO THE BAS.

VAV AHU WITH RETURN AIR FAN CONTROL

DESCRIPTION: VARIABLE VOLUME AIR HANDLING UNIT WITH RETURN AIR FAN, CHILLED WATER COIL AND HEATING WATER COIL. UNIT SERVES MULTIPLE TEMPERATURE CONTROL ZONES, EACH WITH A SINGLE-DUCT TERMINAL UNIT WITH HW REHEAT.

- A. OPERATIONAL MODES: 1. OCCUPIED MODE, 2. UNOCCUPIED MODE, 3. PRE-OCCUPIED MODE, 4. SHUTDOWN MODE, 5. OVERRIDE MODES (MANUAL, REMOTE), 6. VERIFICATION MODES (CHILLED, HEATING WATER PLANT), 7. DISCHARGE TEMPERATURE CONTROL, 8. ENERGY CONSERVATION MODES (ECONOMIZER), 9. SUPPLY AIR FAN CONTROL (OCCUPANCY, SHUTDOWN).

- H. DUCT STATIC PRESSURE SET POINT RESET CONTROL. I. RETURN FAN CONTROL. J. DAMPER CONTROL: 1. HEATING OR COOLING, 2. ECONOMIZER, 3. UNOCCUPIED / PRE-OCCUPIED MODE, 4. SHUTDOWN.

- K. CHILLED WATER COIL CONTROL (FAIL OPEN). L. HEATING WATER PREHEAT COIL CONTROL (FAIL OPEN). M. UVGI LIGHTS CONTROL. N. AIR FILTER STATUS CONTROL. O. TERMINAL BOX CONTROL. P. SAFETY & SHUTDOWN: 1. SMOKE DETECTION CONTROL, 2. FREEZE PROTECTION, 3. FREEZE SHUTDOWN, 4. CONDENSATE LEVEL SHUTDOWN CONTROL, 5. FAN PROTECTION CONTROL, 6. GENERAL ALARMS CONTROL.

KEY NOTES

- 1 EXISTING COMMUNICATION ANTENNA. COORDINATE RA DUCT ROUTING TO MAINTAIN MIN 2" CLEAR FROM ANTENNA.
- 2 PROVIDE PROTECTION FOR EXISTING COMMUNICATION ANTENNAS AND CABLING ON ROOF. COORDINATE ANTENNA LOCATIONS AND PROTECTION METHOD TO BE USED WITH OWNER.



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SEAL
 Signed by
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 PROFESSIONAL ENGINEER

1/22/2026

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
6	01/22/26	SWD	DEB COMMENTS
5	12/17/25	SWD	DEB COMMENTS
4	11/14/25	SWD	REMOVE MECH ROOM
3	12/06/24	SWD	DEB COMMENTS
2	10/03/24	SWD	DEB COMMENTS
1	07/15/24	SWD	DEB COMMENTS

DRAWN BY _____ SMF
 APPROVED BY _____ SWD
 CHECKED BY _____ JDR
 DATE January 12, 2024

TITLE
**ISOMETRICS,
 PERSPECTIVES**

DEI PROJECT NO: 50158550
 RADFORD PROJECT NO: 217-B5217-017
 SHEET NO.

M9.01

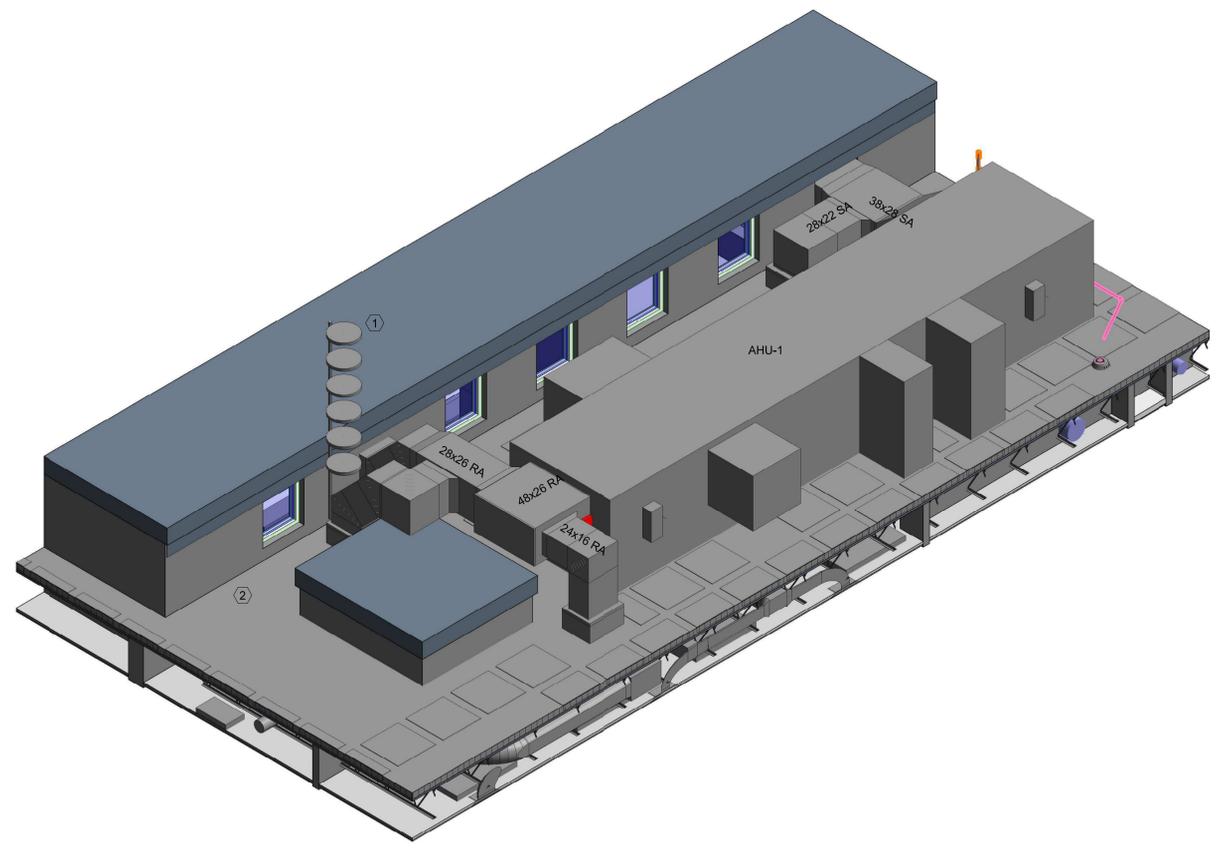
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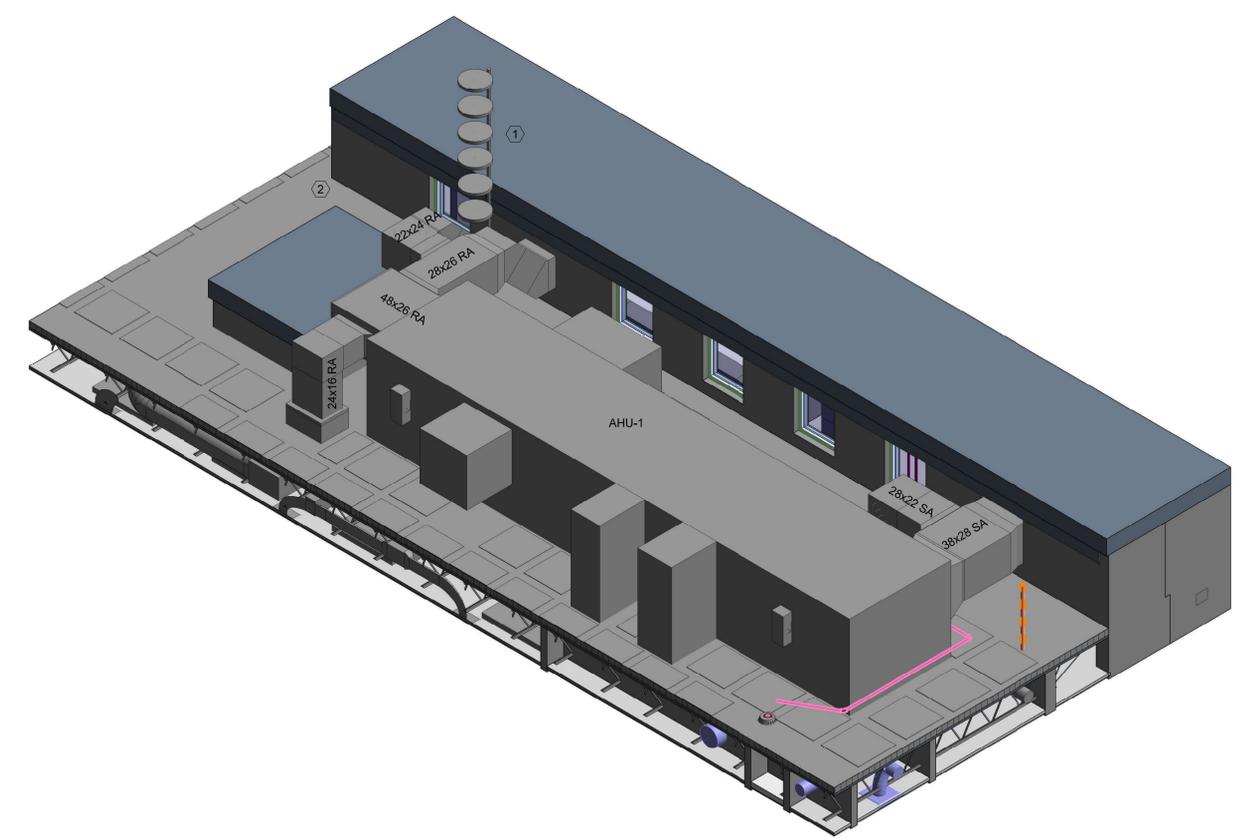
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A



1 ORTHOGRAPHIC ROOF VIEW LOOKING EAST
 Scale: N.T.S.



2 ORTHOGRAPHIC ROOF VIEW LOOKING NORTH
 Scale: N.T.S.