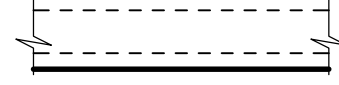
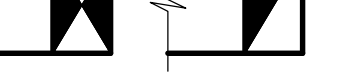
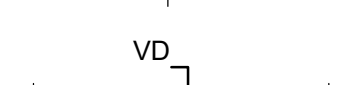
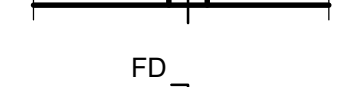
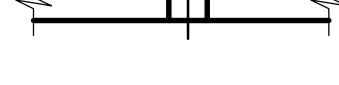
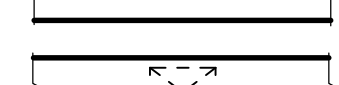
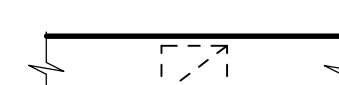
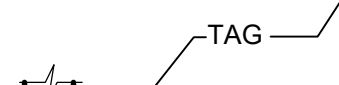
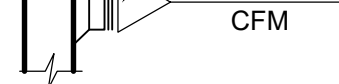
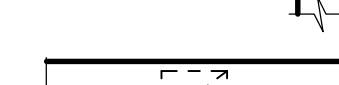
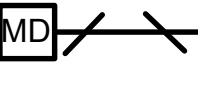
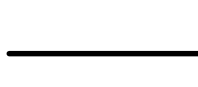
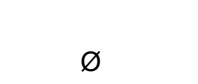
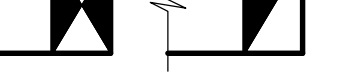
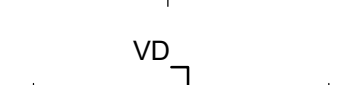
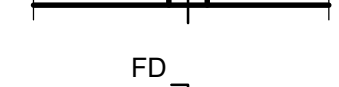
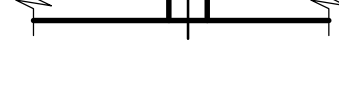
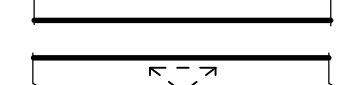
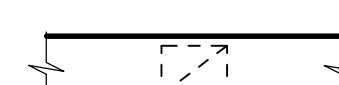
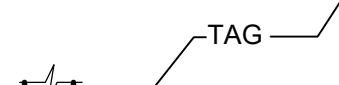
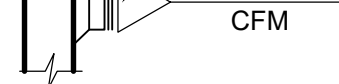
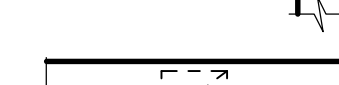
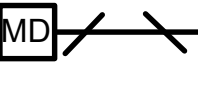
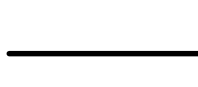
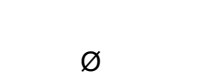
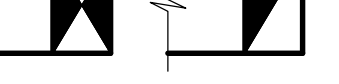
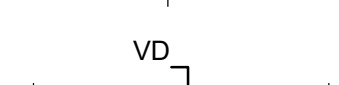
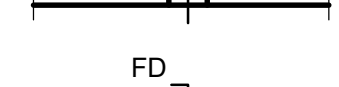
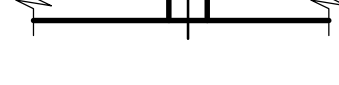
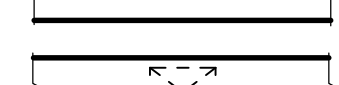
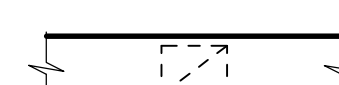
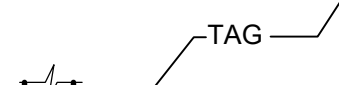
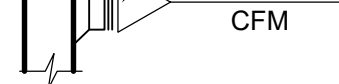
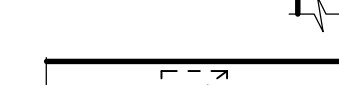
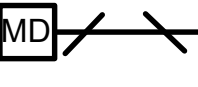
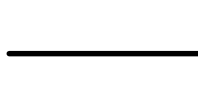
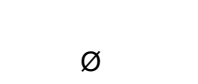


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ABBREVIATIONS				LEGENDS		EQUIPMENT SYMBOLS		DUCTWORK MATERIAL SCHEDULE			GENERAL HVAC NOTES																																									
A AC AFF AFM ALT AHU ARCH AUTO AUX ATC		AIR CONDITIONING UNIT ABOVE FINISHED FLOOR AIR FLOW MEASURING STATION ALTITUDE AIR HANDLING UNIT ARCHITECT(URAL) AUTOMATIC AUXILIARY AUTOMATIC TEMP CONTROL		M MD MAU MBH MCA MTD MCC CENTER MFR MISC MPD		MOTORIZED DAMPER MAKE-UP AIR HANDLING UNIT THOUSAND BTU PER HOUR MINIMUM CIRCUIT AMPACITY MOUNTED MAXIMUM MAX MOTOR CONTROL MANUFACTURE(ER)(ED) MISCELLANEOUS MEDIUM PRESSURE GAS		                  		DUCTWORK DUCTWORK WITH DUCT LINING REDUCER OR INCREASER SUPPLY DUCTWORK RISE UP TO FLOOR ABOVE, RETURN DUCTWORK DROP DOWN FROM FLOOR ABOVE, AND EXHAUST DUCTWORK DROP DOWN FROM FLOOR ABOVE SUPPLY DUCTWORK DROP DOWN TO BELOW RETURN DUCTWORK RISE UP FROM BELOW, AND EXHAUST DUCTWORK RISE UP FROM BELOW VOLUME DAMPER (VD) FIRE DAMPER (FD) RADIUS ELBOW (CLR=1.5) ELBOW WITH TURNING VANES BRANCH DUCT TAKE-OFF DIFFUSER CEILING RETURN REGISTER OR GRILLE SUPPLY AIR GRILLE (G) OR SUPPLY AIR REGISTER (R) RETURN AND/OR EXHAUST AIR GRILLE (G) OR REGISTER (R) CEILING EXHAUST AIR REGISTER OR GRILLE ACCESS DOOR (AD) EXISTING DUCT TO BE REMOVED FLEXIBLE DUCT CHECK VALVE		                            		MOTORIZED DAMPER (OPPOSED BLADE) EXHAUST FAN LOUVER WITH MOTORIZED DAMPERS ELECTRIC UNIT HEATER SMOKE DETECTOR CARBON DIOXIDE SENSOR DIFFERENTIAL PRES SENSOR OZONE SENSOR OCCUPANCY SENSOR HUMIDISTAT CURRENT TRANSFORMER HUMIDITY SENSOR STATIC PRESSURE SENSOR THERMOSTAT TEMPERATURE SENSOR AIRFLOW RETURN AIR CEILING DIFFUSER WITH DIRECTION OF THROWS AS INDICATED SUPPLY AIR CEILING DIFFUSER WITH DIRECTION OF THROWS AS INDICATED EXHAUST AIR CEILING DIFFUSER WITH DIRECTION OF THROWS AS INDICATED GAS UNIT HEATER INTAKE HOOD PUMP FAN OR BLOWER PNEUMATIC PIPING ELECTRICAL WIRING FLOW INDICATOR POINT OF CONNECTION POINT OF DISCONNECTION CENTERLINE DIAMETER		<table><tr><th>LOCATION</th><th>MATERIAL</th><th>REMARKS</th></tr><tr><td>ALL AREAS UNLESS OTHERWISE NOTED</td><td>ALUMINUM</td><td>-</td></tr><tr><td>UNCLASSIFIED PROCESS AREAS</td><td>ALUMINUM</td><td>-</td></tr><tr><td>ELECTRICAL ROOMS</td><td>ALUMINUM</td><td>-</td></tr></table> NOTES: 1. 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REFER TO THE SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS. 3. DUCTWORK 3.1. DUCTWORK MATERIAL SHALL BE PER SCHEDULE ON THIS SHEET. 3.2. DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS. ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE. 3.3. THE HVAC CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND PANELS IN ALL DUCTWORK THAT PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION. UNLESS OTHERWISE SHOWN ON THE DRAWINGS. 3.4. ALL BRANCH DUCTS SHALL HAVE VOLUME DAMPERS. 3.5. WHERE FLOW EXCEEDS 150 CFM, THE CONTRACTOR SHALL USE SMOOTH RADIUS ELBOWS OR TURNING VANES. 3.6. ALL DUCT JOINTS SHALL BE SEALED IN ACCORDANCE WITH SMACNA STANDARDS AND ACCEPTED GOOD PRACTICE. 3.7. ALL DUCT DIMENSIONS ARE NET INSIDE VALUES. DIMENSIONS MAY BE CHANGED PROVIDED THAT THE NET FREE AREA IS MAINTAINED. 4. HVAC CONTROLS 4.1. THE HVAC CONTRACTOR SHALL SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED. 5. ELECTRICAL 5.1. THE HVAC CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR LOCATION OF POWER WIRING TO EACH HVAC UNIT. 6. DUCTWORK AND PIPE SUPPORTS 6.1. ALL DUCTWORK AND PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAPS TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL NOT EXCEED 8 FEET FOR ALL PIPING. PLASTIC PIPING SHALL BE SUPPORTED EVERY 4 FEET. 7. MISCELLANEOUS 7.1. WIND RESISTANCE: EXTERIOR MECHANICAL EQUIPMENT SHALL BE ANCHORED/TIED DOWN TO STRUCTURE OR CONCRETE PADS TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, AND LOCAL REQUIREMENTS. 7.2. SEISMIC RESISTANCE: MECHANICAL SYSTEM SUPPORTS SHALL BE DESIGNED AND INSTALLED FOR THE SEISMIC FORCES IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE. RESTRAINTS SHALL BE DESIGN FOR THE PROJECT'S LOCATION'S SEISMIC DESIGN CATEGORY AND SEISMIC RISK CATEGORY. 7.3. ALL EXTERIOR OPENINGS SHALL BE PROPERLY CAULKED AND SEALED TO PREVENT INFILTRATION OF OUTSIDE AIR INTO THE CONDITIONED SPACE. 7.4. COORDINATE THE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATIONS. 7.5. THE HVAC CONTRACTOR SHALL VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE. 8. TESTING AND BALANCING 8.1. THE HVAC SYSTEMS SHALL BE TESTED AND BALANCED PER SPECIFICATION 23 05 00 - HVAC TESTING AND BALANCING. 9. COMMISSIONING 9.1. THE HVAC SYSTEMS SHALL BE COMMISSIONED PER SPECIFICATION 23 08 00 - HVAC COMMISSIONING 10. GUARANTEE 10.1. MATERIALS, EQUIPMENT, AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE. DEFECTS THAT APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE. 10.2. COMPRESSOR SHALL COME WITH MANUFACTURER'S STANDARD 5-YEAR WARRANTY.
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LOCATION	MATERIAL	REMARKS																																																		
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C CDR CDS CFM CH CT CU CWR CWS CA CC COP CLR CD		CONDENSER WATER RETURN CONDENSER WATER SUPPLY CUBIC FEET PER MINUTE CHILLER COOLING TOWER CONDENSING UNIT CHILLED WATER RETURN CHILLED WATER SUPPLY COMBUSTION AIR COOLING COIL COEFFICIENT OF PERFORMANCE CENTERLINE RADIUS CONDENSATE DRAIN		O OA OAT OBD OD OD		OUTSIDE AIR OUTSIDE AIR TEMPERATURE OPPOSED BLADE DAMPER OUTDOOR AMBIENT TEMPERATURE AMB OUTSIDE DIAMETER		               		DUCTWORK DUCTWORK WITH DUCT LINING REDUCER OR INCREASER SUPPLY DUCTWORK RISE UP TO FLOOR ABOVE, RETURN DUCTWORK DROP DOWN FROM FLOOR ABOVE, AND EXHAUST DUCTWORK DROP DOWN FROM FLOOR ABOVE SUPPLY DUCTWORK DROP DOWN TO BELOW RETURN DUCTWORK RISE UP FROM BELOW, AND EXHAUST DUCTWORK RISE UP FROM BELOW VOLUME DAMPER (VD) FIRE DAMPER (FD) RADIUS ELBOW (CLR=1.5) ELBOW WITH TURNING VANES BRANCH DUCT TAKE-OFF DIFFUSER CEILING RETURN REGISTER OR GRILLE SUPPLY AIR GRILLE (G) OR SUPPLY AIR REGISTER (R) RETURN AND/OR EXHAUST AIR GRILLE (G) OR REGISTER (R) CEILING EXHAUST AIR REGISTER OR GRILLE ACCESS DOOR (AD) EXISTING DUCT TO BE REMOVED FLEXIBLE DUCT CHECK VALVE		                            		MOTORIZED DAMPER (OPPOSED BLADE) EXHAUST FAN LOUVER WITH MOTORIZED DAMPERS ELECTRIC UNIT HEATER SMOKE DETECTOR CARBON DIOXIDE SENSOR DIFFERENTIAL PRES SENSOR OZONE SENSOR OCCUPANCY SENSOR HUMIDISTAT CURRENT TRANSFORMER HUMIDITY SENSOR STATIC PRESSURE SENSOR THERMOSTAT TEMPERATURE SENSOR AIRFLOW RETURN AIR CEILING DIFFUSER WITH DIRECTION OF THROWS AS INDICATED SUPPLY AIR CEILING DIFFUSER WITH DIRECTION OF THROWS AS INDICATED EXHAUST AIR CEILING DIFFUSER WITH DIRECTION OF THROWS AS INDICATED GAS UNIT HEATER INTAKE HOOD PUMP FAN OR BLOWER PNEUMATIC PIPING ELECTRICAL WIRING FLOW INDICATOR POINT OF CONNECTION POINT OF DISCONNECTION CENTERLINE DIAMETER		<table><tr><th>LOCATION</th><th>MATERIAL</th><th>REMARKS</th></tr><tr><td>ALL AREAS UNLESS OTHERWISE NOTED</td><td>ALUMINUM</td><td>-</td></tr><tr><td>UNCLASSIFIED PROCESS AREAS</td><td>ALUMINUM</td><td>-</td></tr><tr><td>ELECTRICAL ROOMS</td><td>ALUMINUM</td><td>-</td></tr></table> NOTES: 1. GALVANIZED SHEET METAL IS NOT ACCEPTABLE IN ANY AREA <table><tr><th colspan="3">DUCTWORK INSULATION AND LINER</th></tr><tr><th>LOCATION</th><th>REQUIREMENT</th><th>REMARKS</th></tr><tr><td>ALL CONCEALED DUCTWORK</td><td>INSULATE</td><td>-</td></tr><tr><td>ALL EXTERIOR DUCTWORK</td><td>INSULATE</td><td>WITH SS JACKET</td></tr><tr><td>OUTSIDE AIR DUCTWORK</td><td>INSULATE</td><td>-</td></tr><tr><td>SUPPLY AIR DUCTWORK</td><td>NONE</td><td>ONLY IF IN CONDITIONED SPACE</td></tr><tr><td>EXHAUST AIR DUCTWORK</td><td>INSULATE</td><td>-</td></tr></table> NOTES: 1. REFER TO SPECIFICATION FOR THICKNESS. MINIMUM R-VALUES SHALL MEET CURRENT IECC AND LOCAL REQUIREMENTS. 2. 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				NOTICE 01/2 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE		RK DESIGNED SP DRAWN SHS CHECKED		REGISTERED PROFESSIONAL ENGINEER 99804PE OREGON MAY 10, 2022 SILVIAN AMOL SAPIRTHIGHT EXPIRES: 06/30/2028		BID SET		consor Stantec		South Fork WATER PURE WATER SINCE 1915 WATER QUALITY SYSTEMS BUILDING		HVAC ABBREVIATIONS NOTES, AND LEGEND				SHEET H-001	
NO.	DATE	BY	REVISION										PROJECT NO.: 21-3045		SCALE:	DATE:	AUGUST 2026				

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HVAC DESIGN SUMMARY												
SPACE NAME	AREA [FT²]	HEIGHT [FT]	SPACE VOLUME [FT³]	AIR CONDITIONING METHOD	HEATING METHOD	VENTILATION METHOD	BASIS OF VENTILATION RATES	NEC CLASSIFICATION AFTER APPLYING VENTILATION	DESIGN SPACE TEMPERATURE [F]		MINIMUM OUTSIDE AIR (CFM)	NOTE
									SUMMER	WINTER		
CHEMICAL ROOM	3080	21	57750	NOT PROVIDED	NATURAL GAS HEATING VIA MAKEUP AIR HANDLING UNIT	MAKEUP AIR HANDLING UNIT AND EXHAUST FAN	1.5 ACH	UNCLASSIFIED	104	60	1550	1
ELECTRICAL ROOM	290	10	2900	VRF HEAT PUMP	VRF HEAT PUMP	NOT PROVIDED	N/A	UNCLASSIFIED	80	60	N/A	1
MECHANICAL ROOM	300	10.3	3090	NOT PROVIDED	ELECTRIC UNIT HEATER	EXHAUST FAN AND INTAKE LOUVER	INTERMITTENT VENTILATION TO REMOVE INTERNAL HEAT GAIN	UNCLASSIFIED	104	60	N/A	1
MEETING ROOM	930	8.2	7626	VRF HEAT PUMP	VRF HEAT PUMP	INTAKE LOUVER AND SUPPLY FAN	5 CFM/ PERSON +0.06 CFM/ FT²	UNCLASSIFIED	75	70	290	1
KITCHEN	184	8	1472	VRF HEAT PUMP	VRF HEAT PUMP	INTAKE LOUVER AND SUPPLY FAN	7.5 CFM/PERSON + 0.12 CFM/SQFT	UNCLASSIFIED	75	70	60	1
STORAGE	1414	11	15554	VRF HEAT PUMP	VRF HEAT PUMP	INTAKE LOUVER AND SUPPLY FAN	0.12 CFM/SQFT	UNCLASSIFIED	80	60	170	1
UNISEX A (RESTROOM)	47	8	376	NOT PROVIDED	NOT PROVIDED	DOOR GRILLE AND EXHAUST FAN	75 CFM PER TOILET AND URINAL INTERMITTENT EXHAUST	UNCLASSIFIED	75	70	N/A	1
UNISEX B (RESTROOM)	47	8	376	NOT PROVIDED	NOT PROVIDED	DOOR GRILLE AND EXHAUST FAN	75 CFM PER TOILET AND URINAL INTERMITTENT EXHAUST	UNCLASSIFIED	75	70	N/A	1
JANITOR	37	8	296	NOT PROVIDED	NOT PROVIDED	DOOR GRILLE AND EXHAUST FAN	50 CFM PER TOILET AND URINAL INTERMITTENT EXHAUST	UNCLASSIFIED	75	70	N/A	1
ENTRY	112	8	896	VRF HEAT PUMP	VRF HEAT PUMP	NOT PROVIDED	N/A	UNCLASSIFIED	75	70	N/A	1
NOTE: 1. ACCORDING TO 2021 ASHRAE WEATHER DATA, AURORA, OR, USA HAS A SUMMER DESIGN TEMPERATURE OF 92.4F DB/67.1 F WB AND A WINTER DESIGN TEMPERATURE OF 25.4 F DB THESE TEMPERATURES DO NOT REPRESENT EXTREME WEATHER CONDITIONS THAT MAY OCCUR.												

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NOTICE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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DESIGNED
SP

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SHS

CHECKED

REGISTERED PROFESSIONAL
ENGINEER
99804PE
OREGON
MAY 10, 2022
SRIVAN AMOL SAPTHIRISHI
EXPIRES: 06/30/2028

BID SET

 consor

 Stantec

 South Fork
WATER
PURE WATER SINCE 1915

WATER QUALITY SYSTEMS BUILDING

HVAC

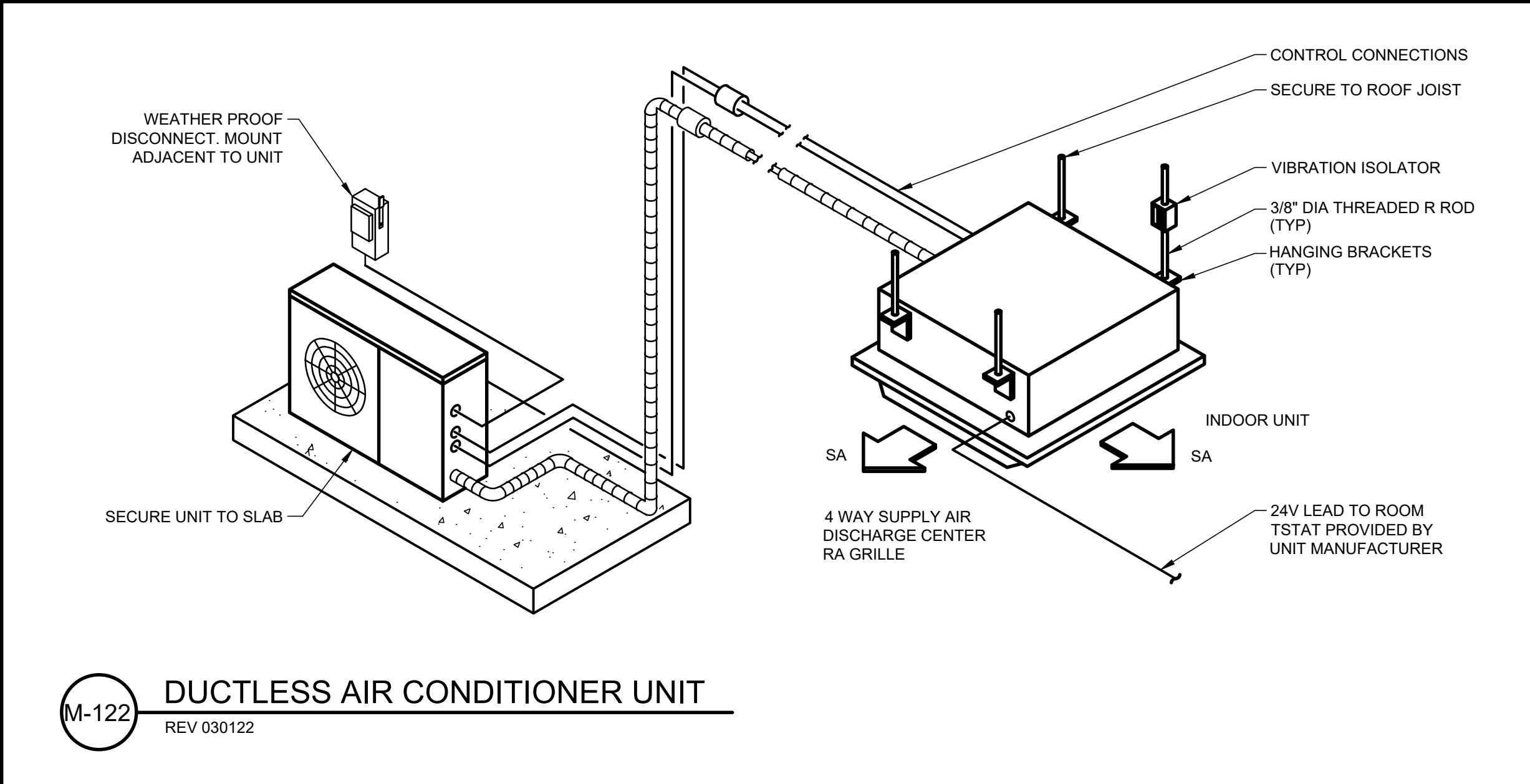
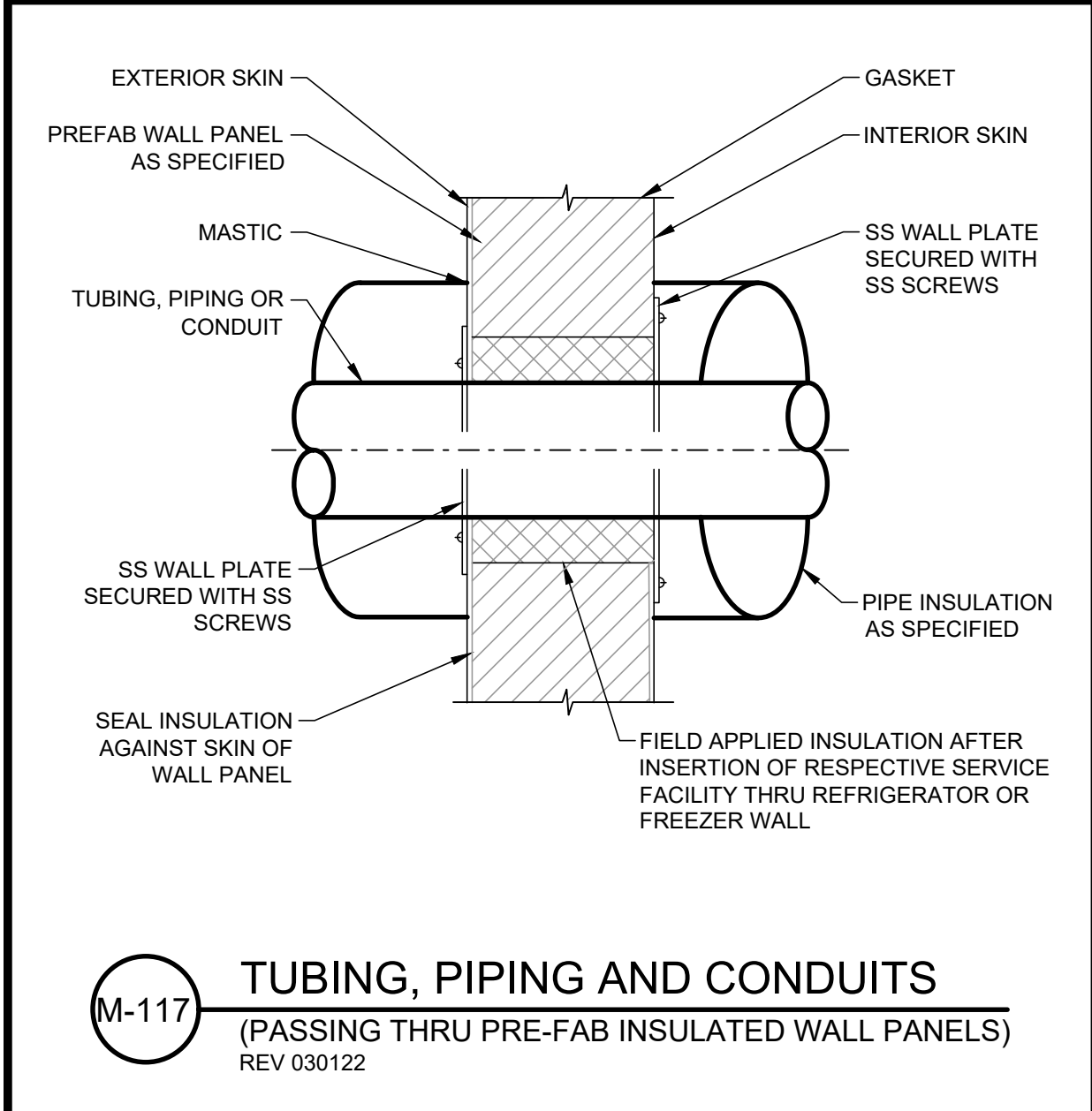
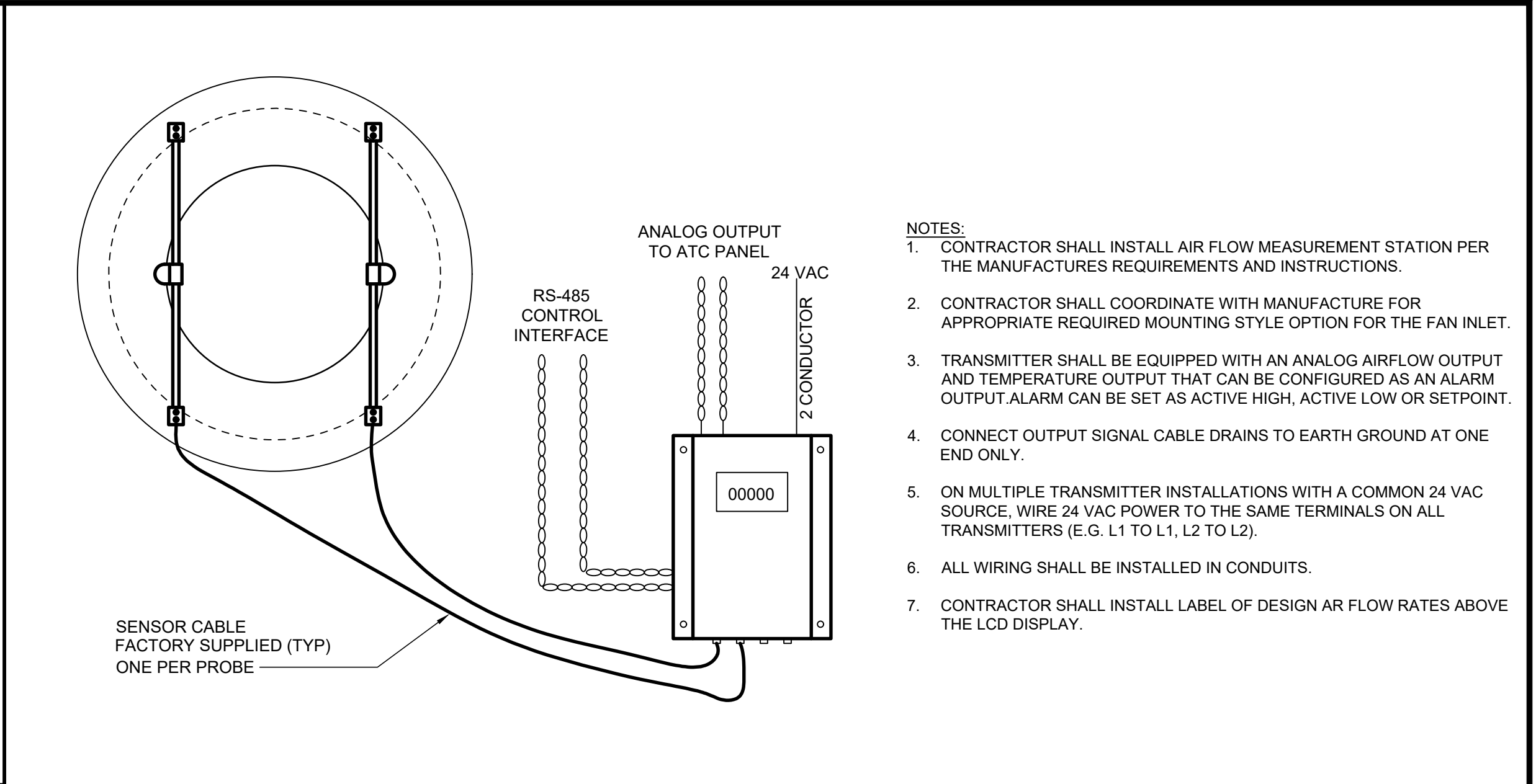
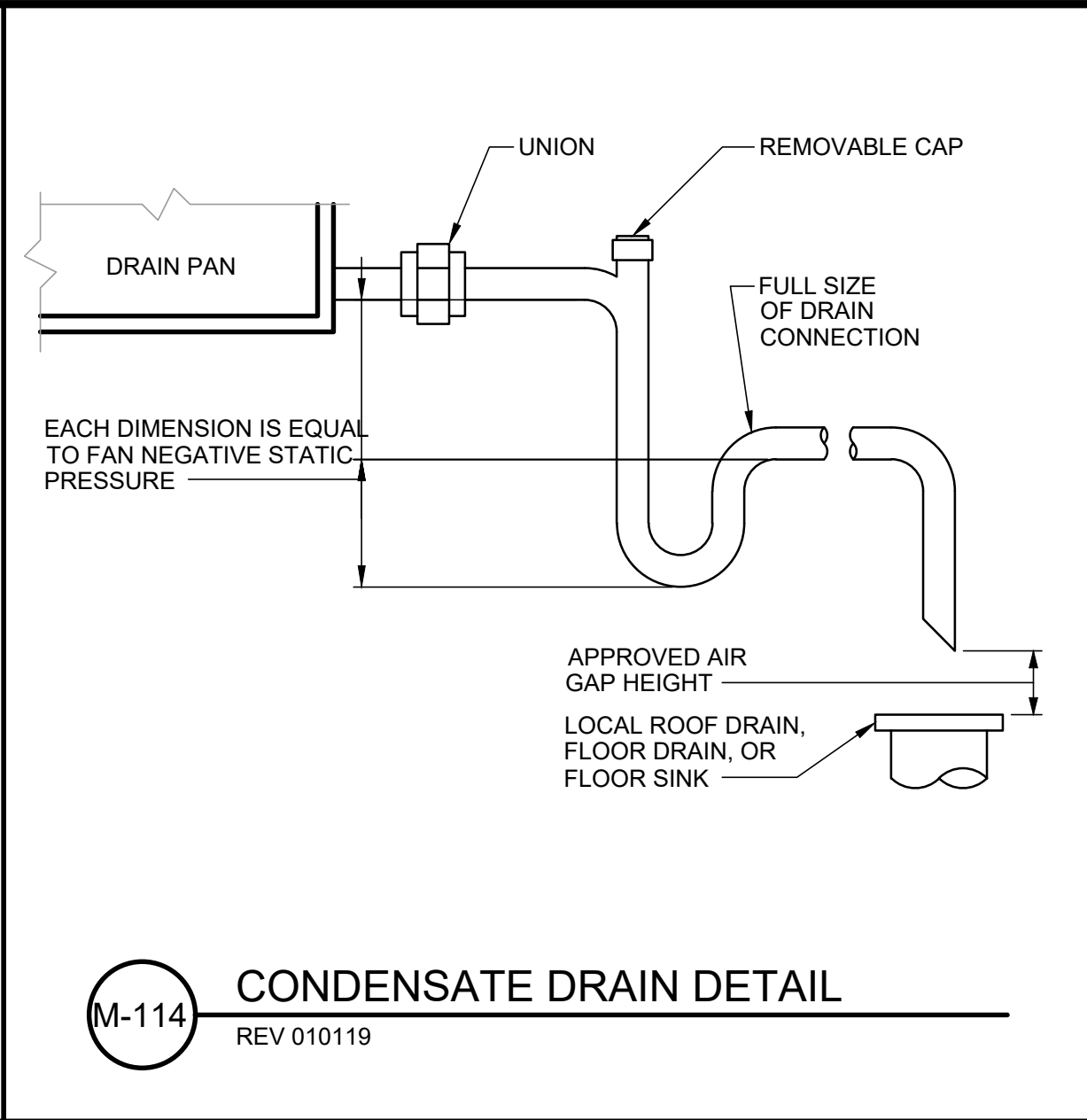
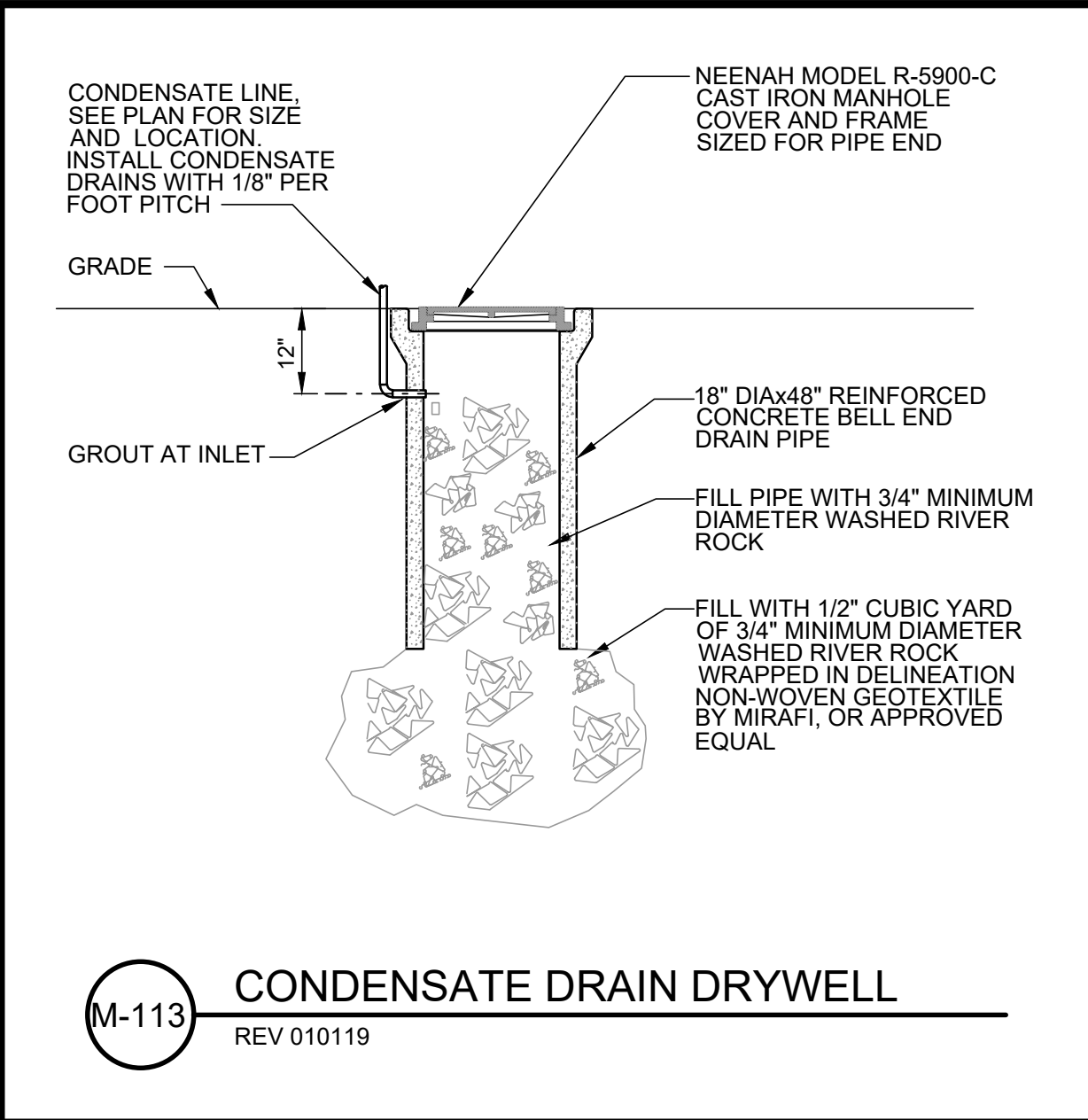
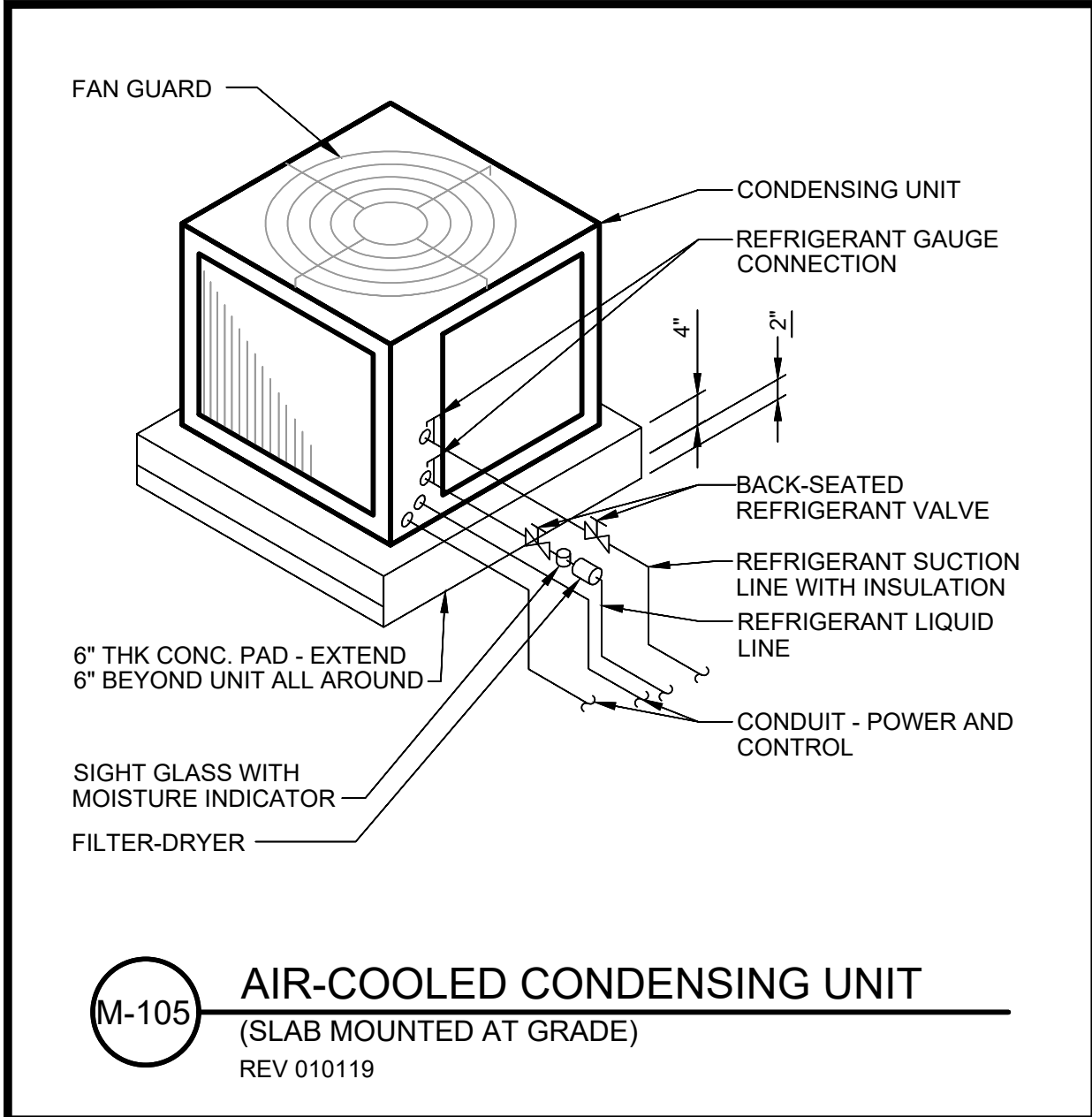
DESIGN SUMMARY

PROJECT NO.: 21-3045SCALE:DATE: AUGUST 2026

SHEET

H-002

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AIRFLOW MEASUREMENT STATION SCHEDULE				
EQUIPMENT TAG NUMBER	SERVICE	LOCATION	MANUFACTURER & MODEL (OR EQUAL)	OPTIONS & ACCESSORIES
AFD	MAU-01 EF-01, 02, 03	MAU DISCHARGE AND EXHAUST FAN INLET	EBTRON GTX-116P	1, 2, 3, 4, 5, 6
OPTIONS & ACCESSORIES:				
1. THE CONTRACTOR SHALL COORDINATE THE ACTUAL FAN THROAT, FORWARD AND FACE DIAMETER WITH THE MANUFACTURER OF THE AIRFLOW MEASURING DEVICE, AFTER THE AIR HANDLING EQUIPMENT HAS BEEN APPROVED BY THE ENGINEER.				
2. AIRFLOW MEASURING DEVICE SHALL BE OF THE THERMAL DISPERSION TYPE. (REFER TO SPECIFICATION 23 09 23).				
3. TRANSMITTER SHALL BE EQUIPPED WITH AN ANALOG TEMPERATURE AND AIRFLOW OUTPUT AND ETHERNET NETWORK CONNECTION.				
4. TRANSMITTER SHALL BE EQUIPPED WITH LCD DISPLAY OF AIRFLOW. CONTRACTOR SHALL PROVIDE LABEL OF DESIGN AIRFLOW ABOVE DISPLAY.				
5. THE CONTRACTOR SHALL INSTALL A LABEL ABOVE THE LCD DISPLAY SHOWING THE DESIGNED AIR FLOW REQUIREMENTS.				
6. THE AIRFLOW MEASURING DEVICE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.				

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NOTICE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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DESIGNED SP

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REGISTERED PROFESSIONAL ENGINEER 99804PE

OREGON MAY 10, 2022

SRIYAN AMOL SAPTHIRATHI

EXPIRES: 06/30/2028

BID SET

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Stantec

South Fork WATER

PURE WATER SINCE 1915

WATER QUALITY SYSTEMS BUILDING

HVAC

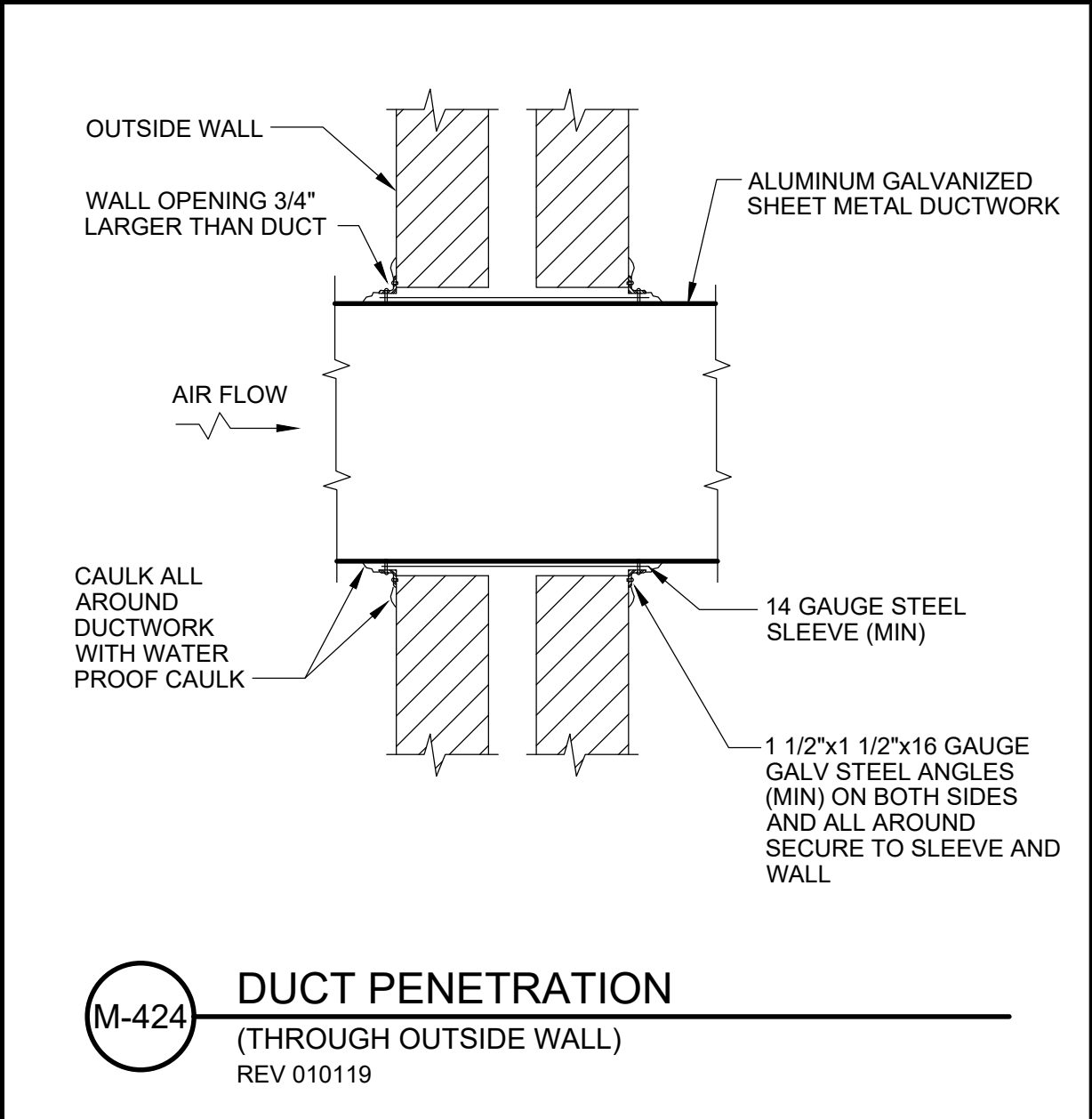
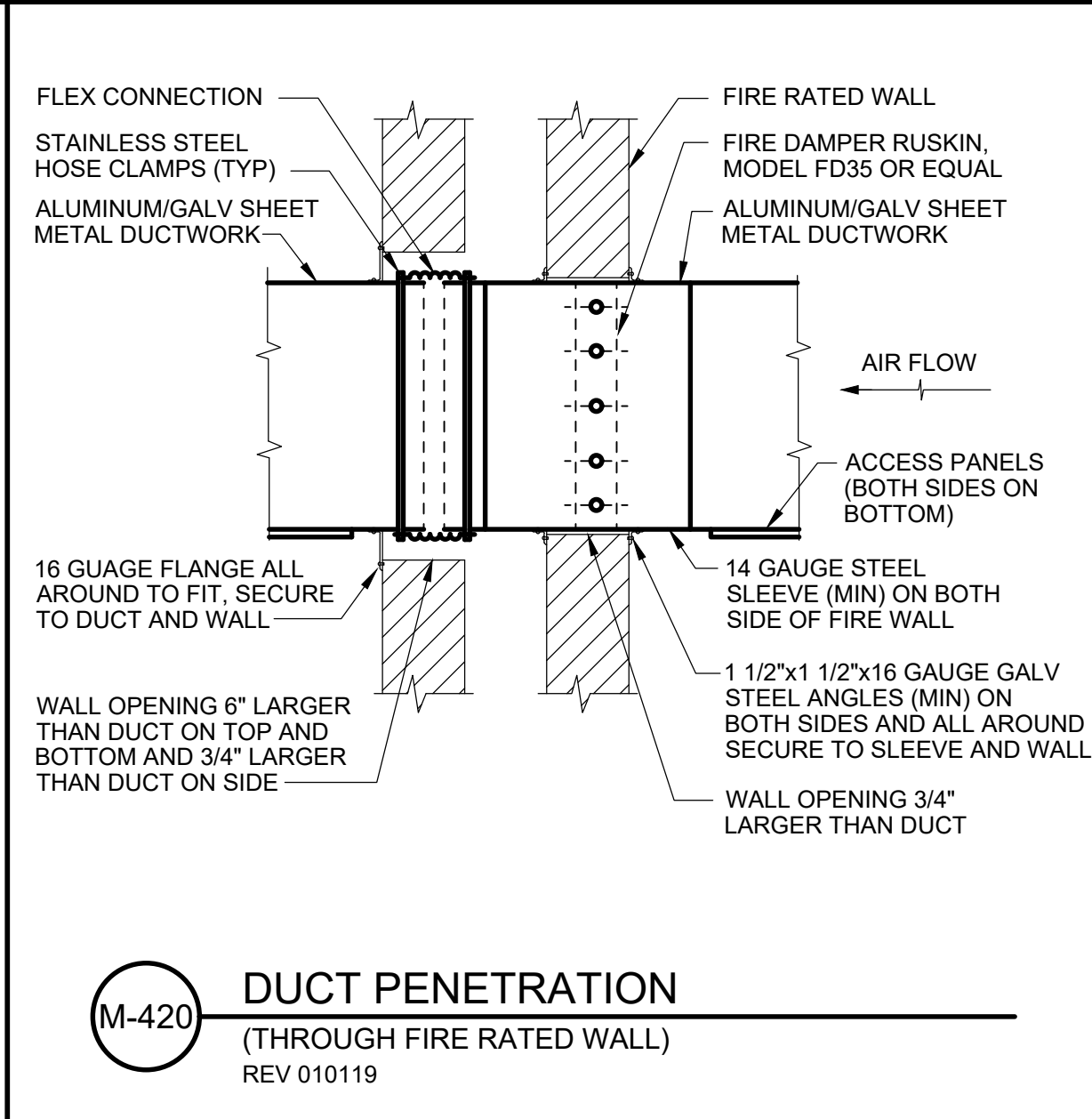
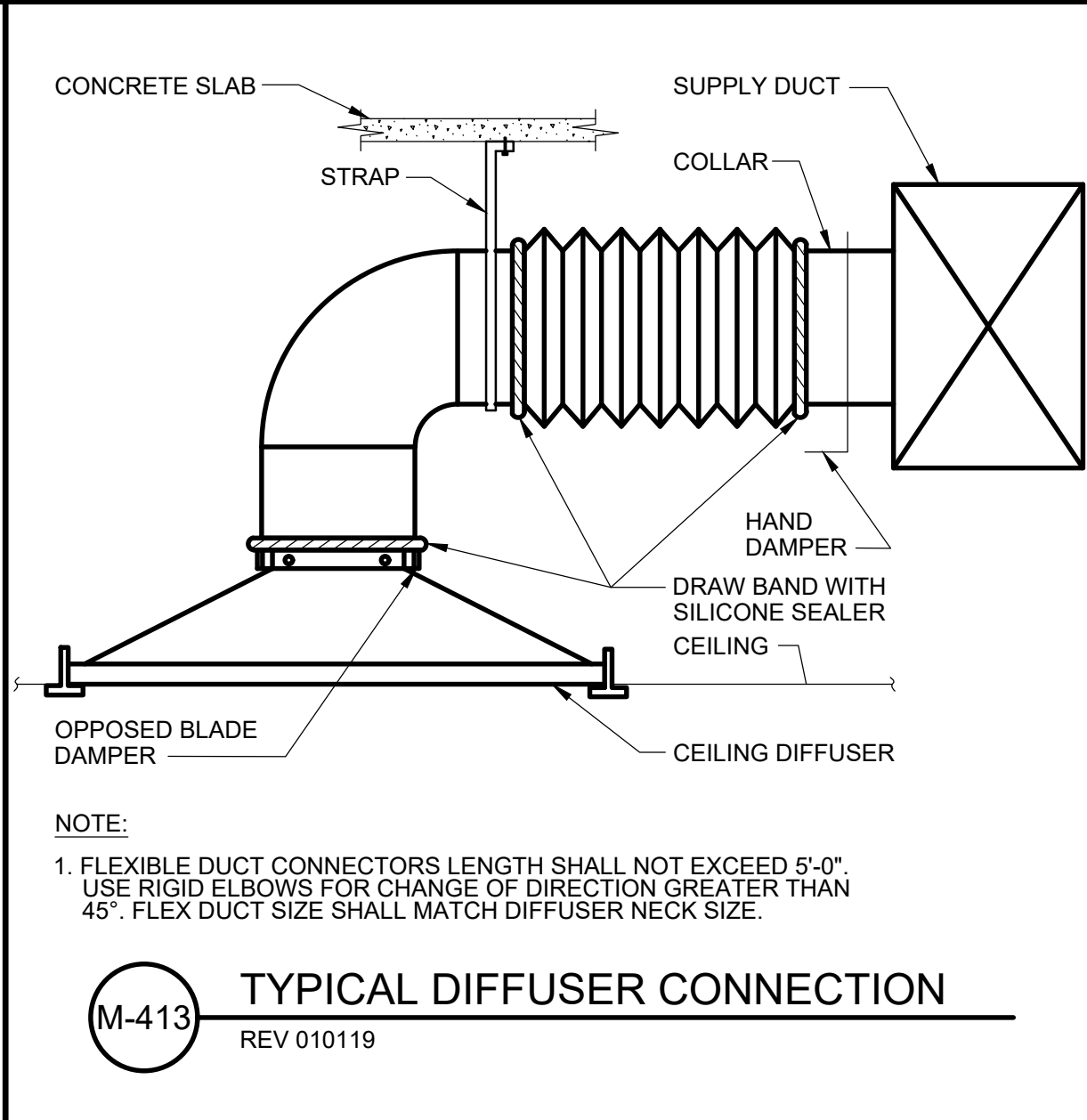
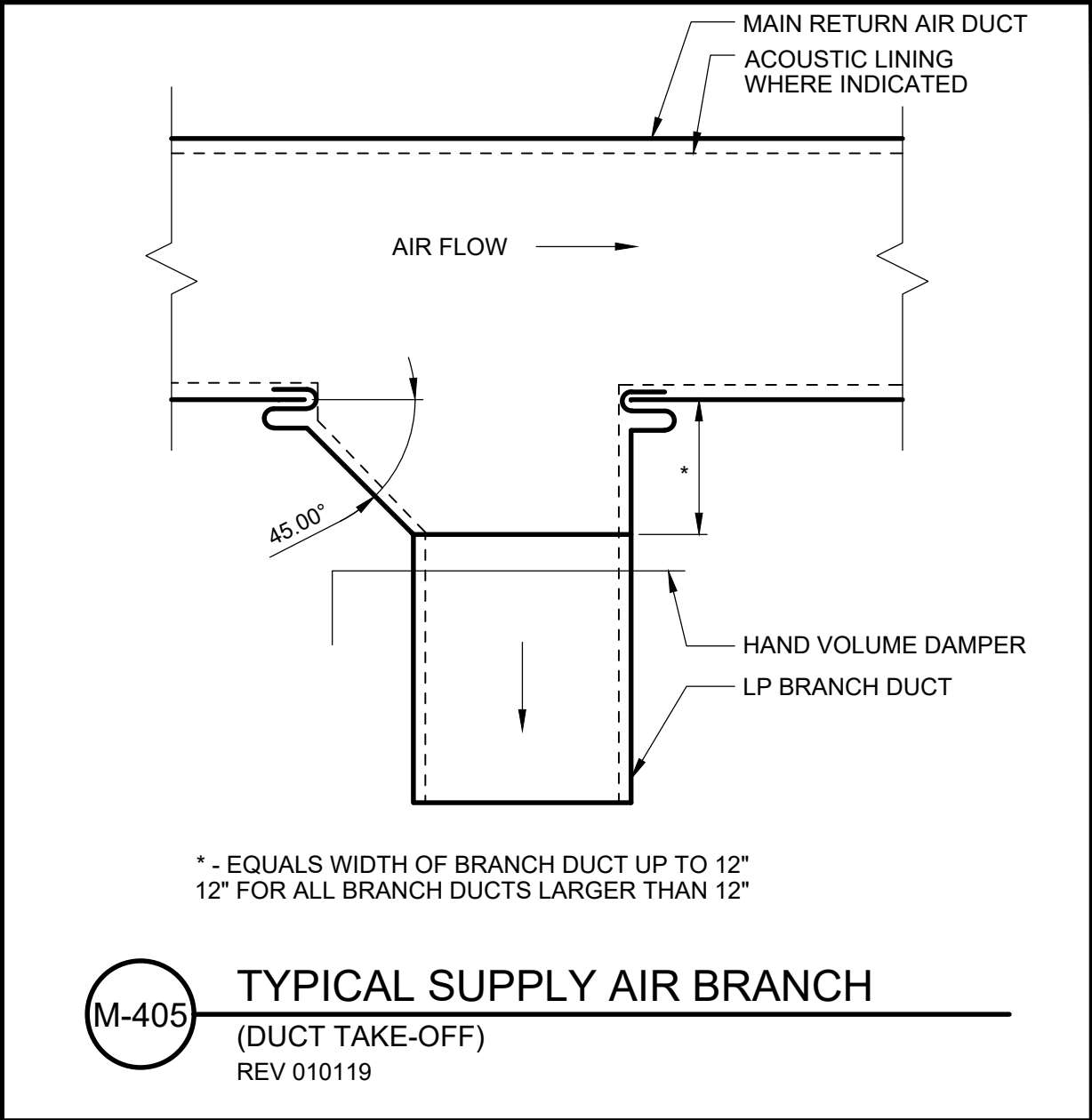
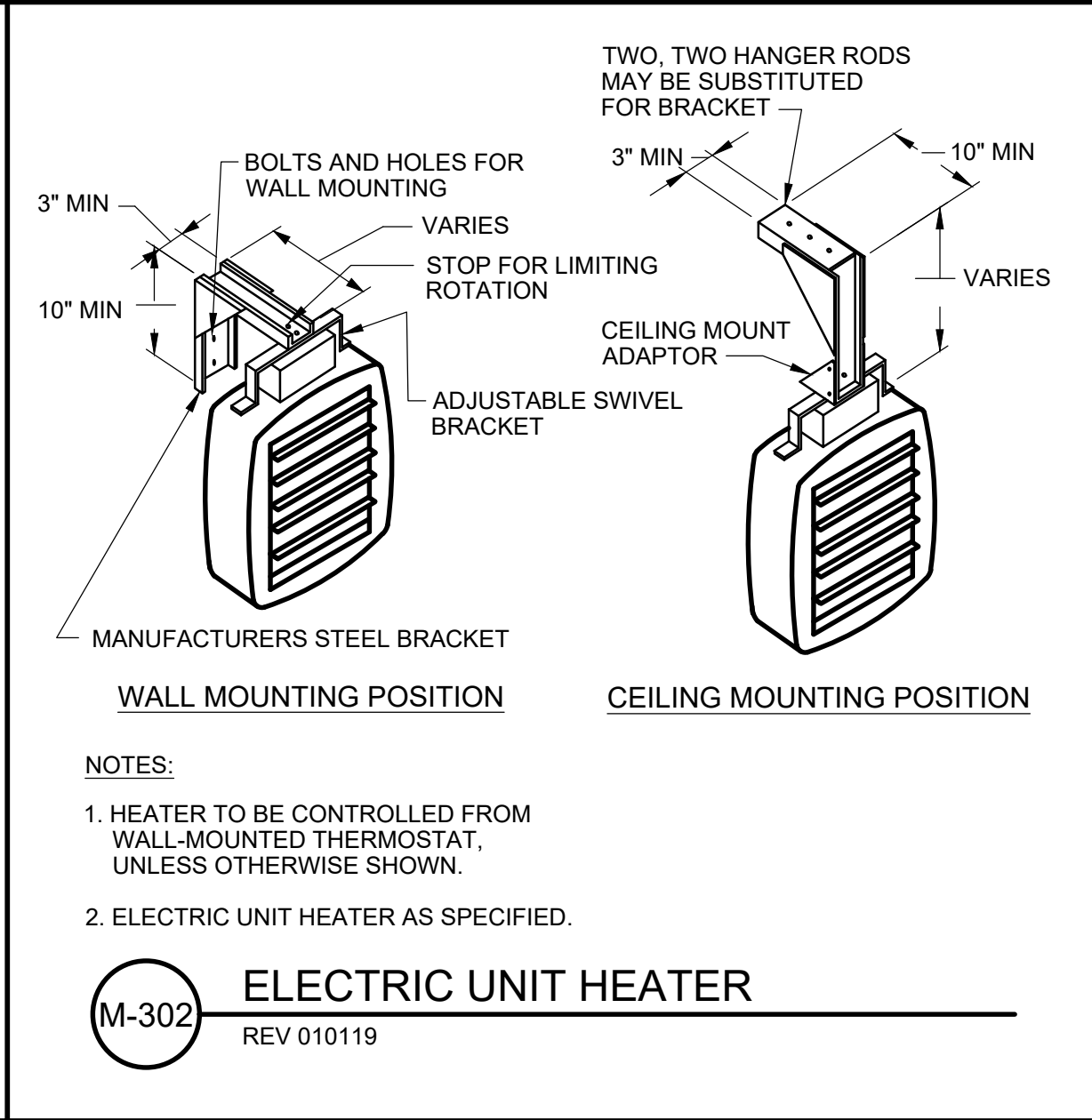
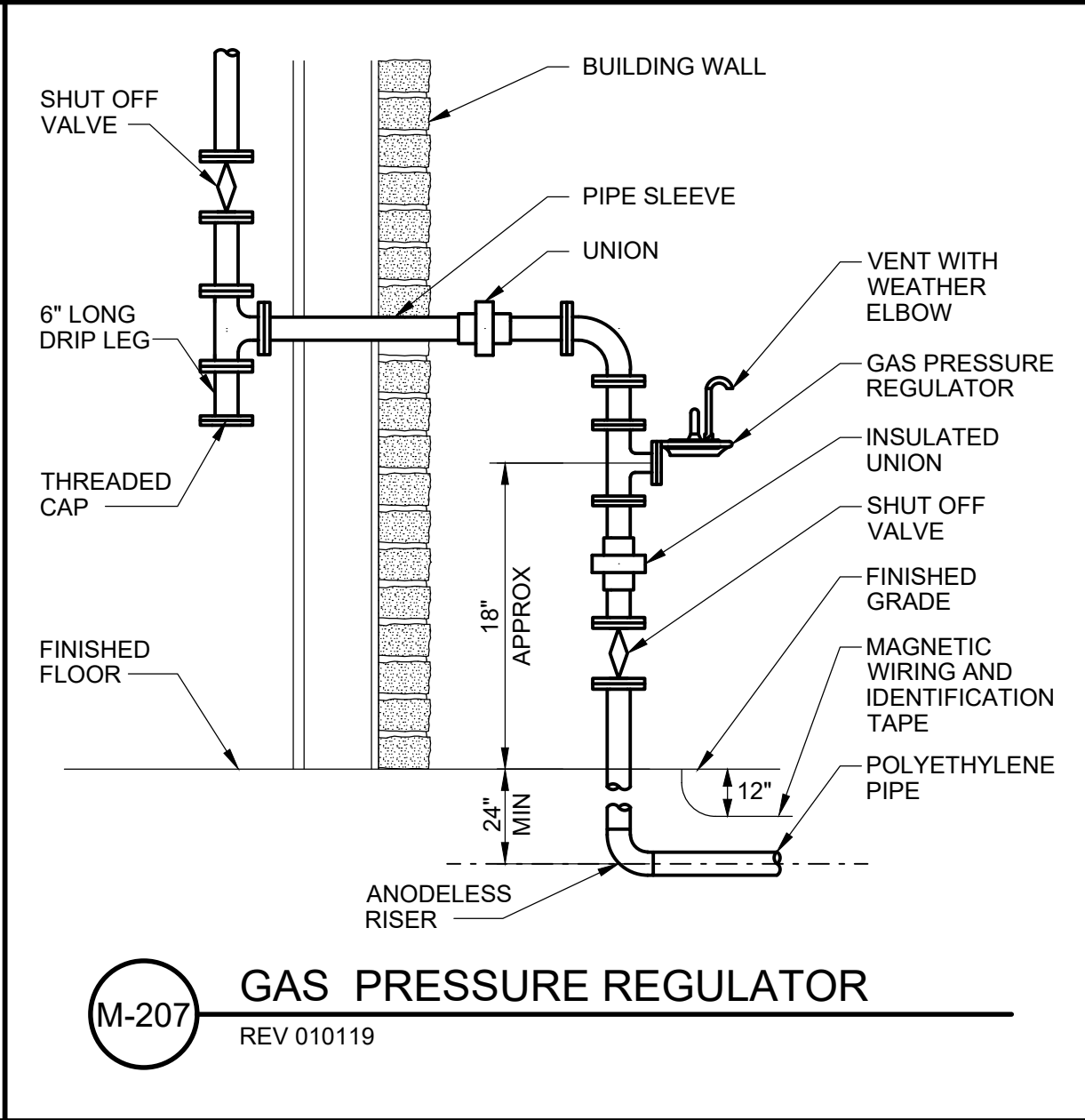
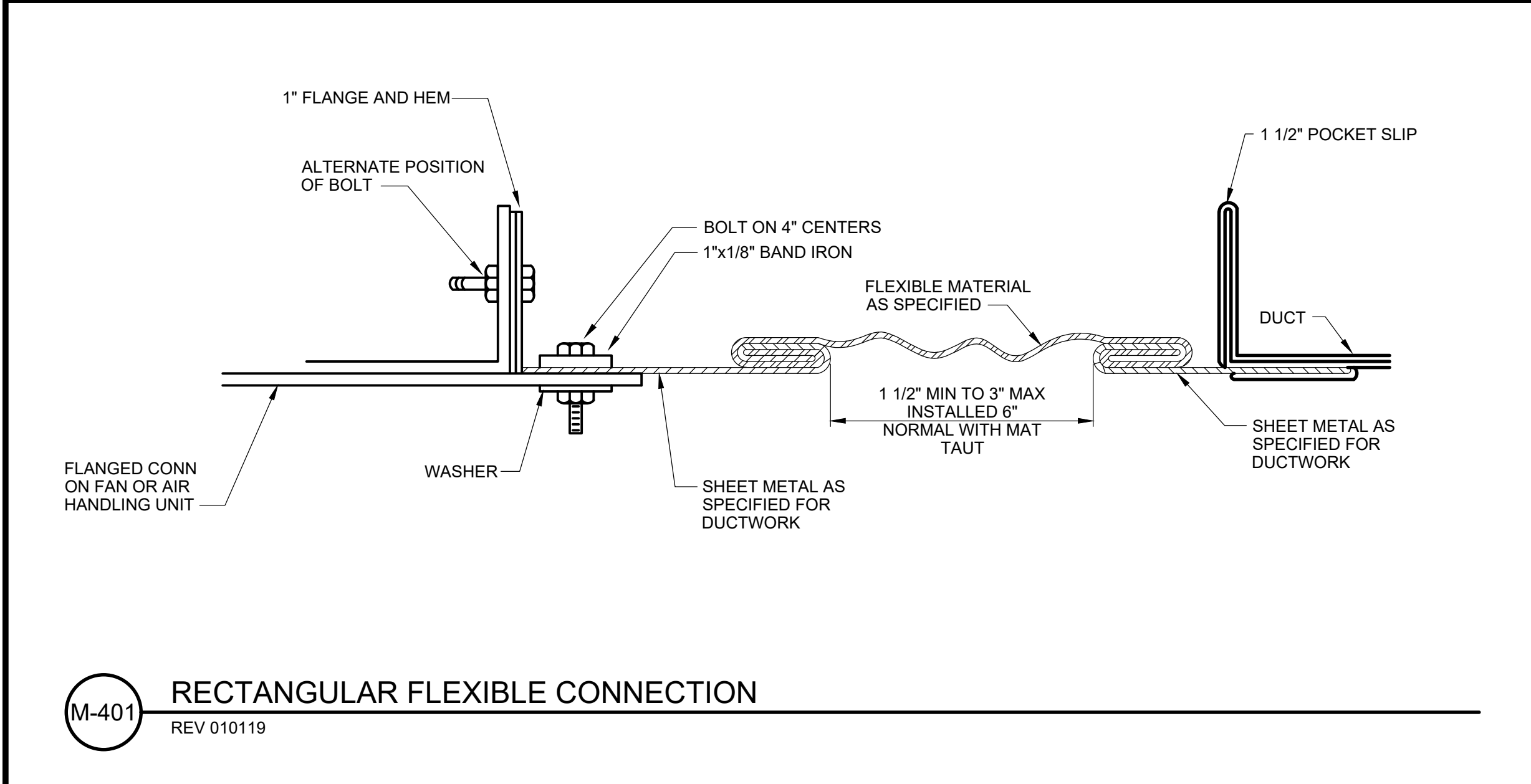
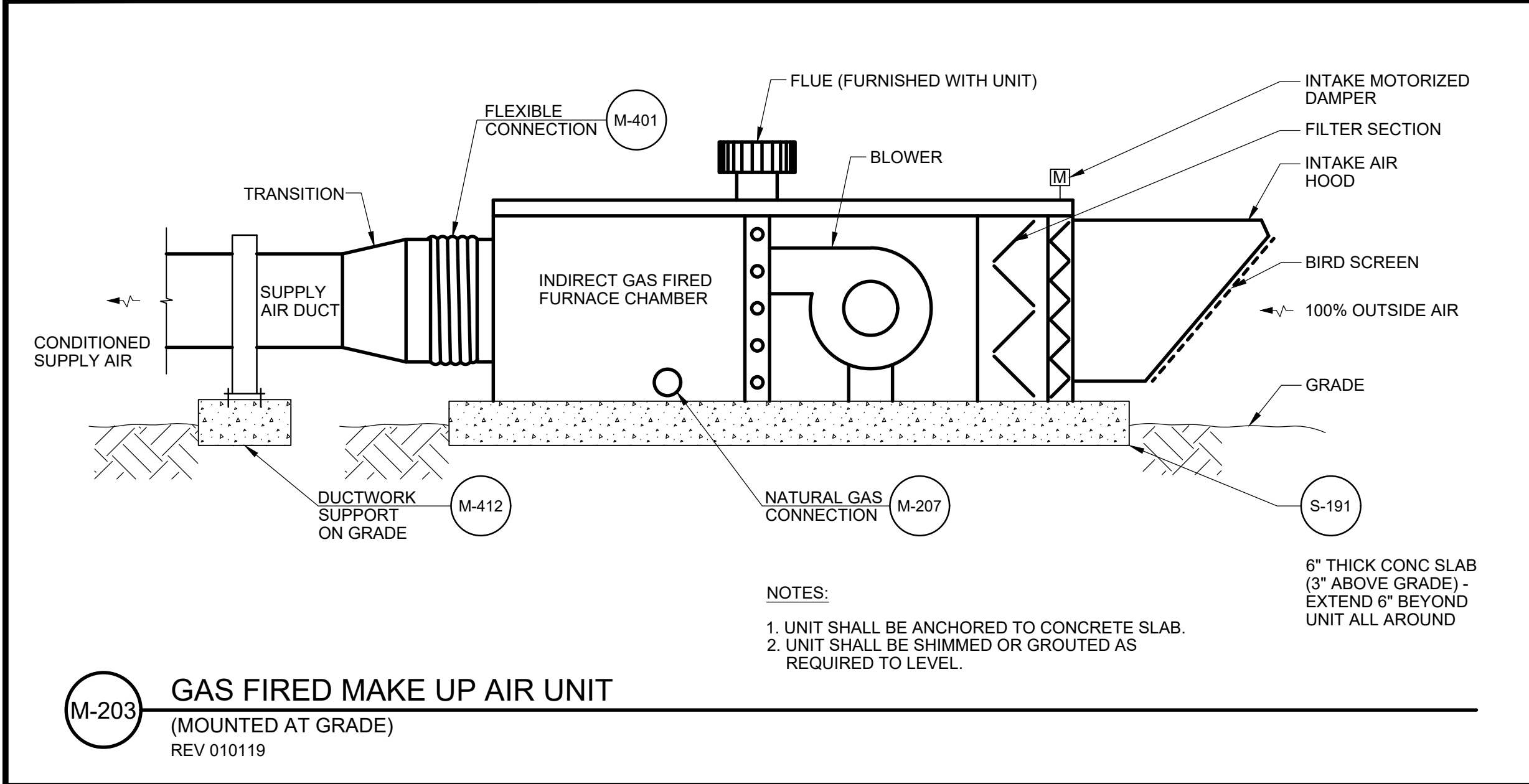
STANDARD DETAILS - I

PROJECT NO.: 21-3045 SCALE: DATE: AUGUST 2026

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H-003

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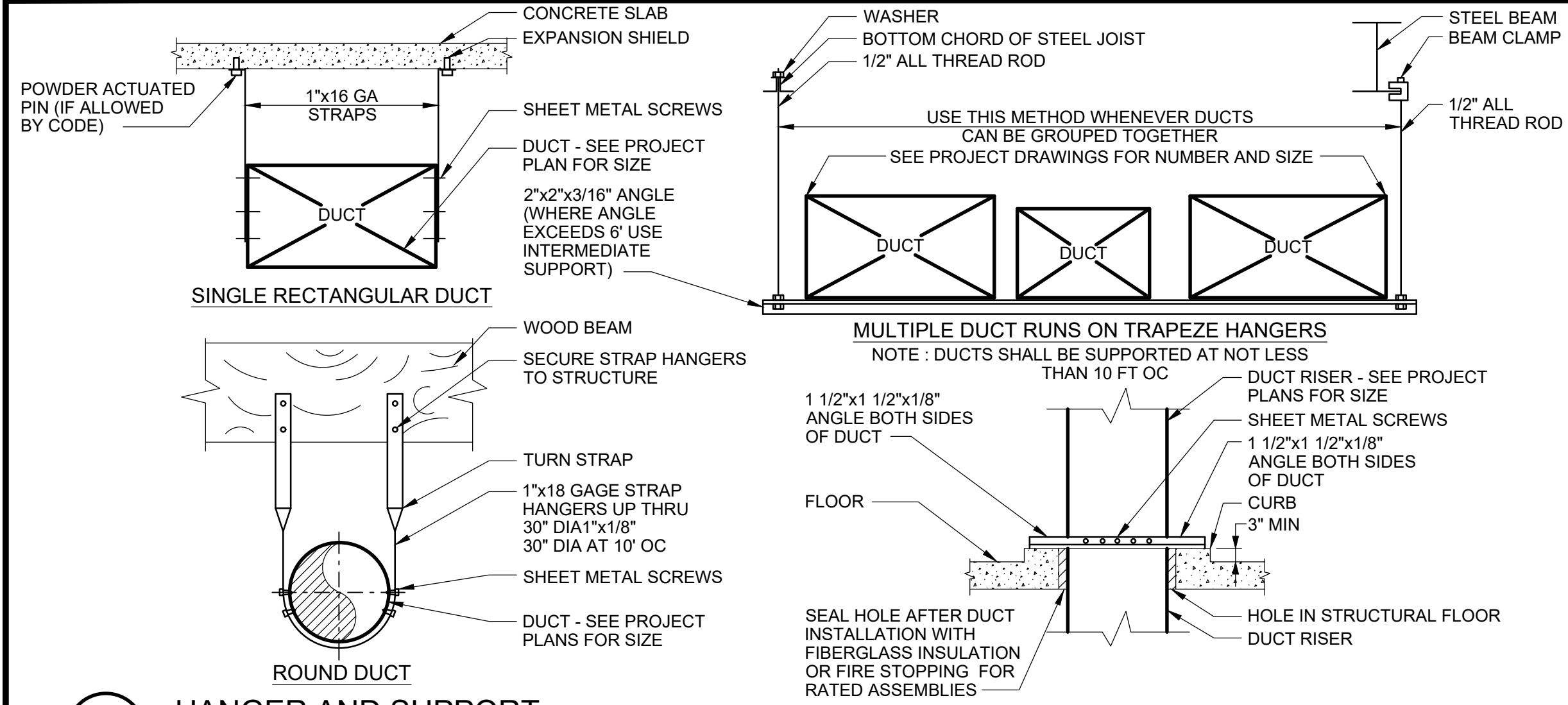


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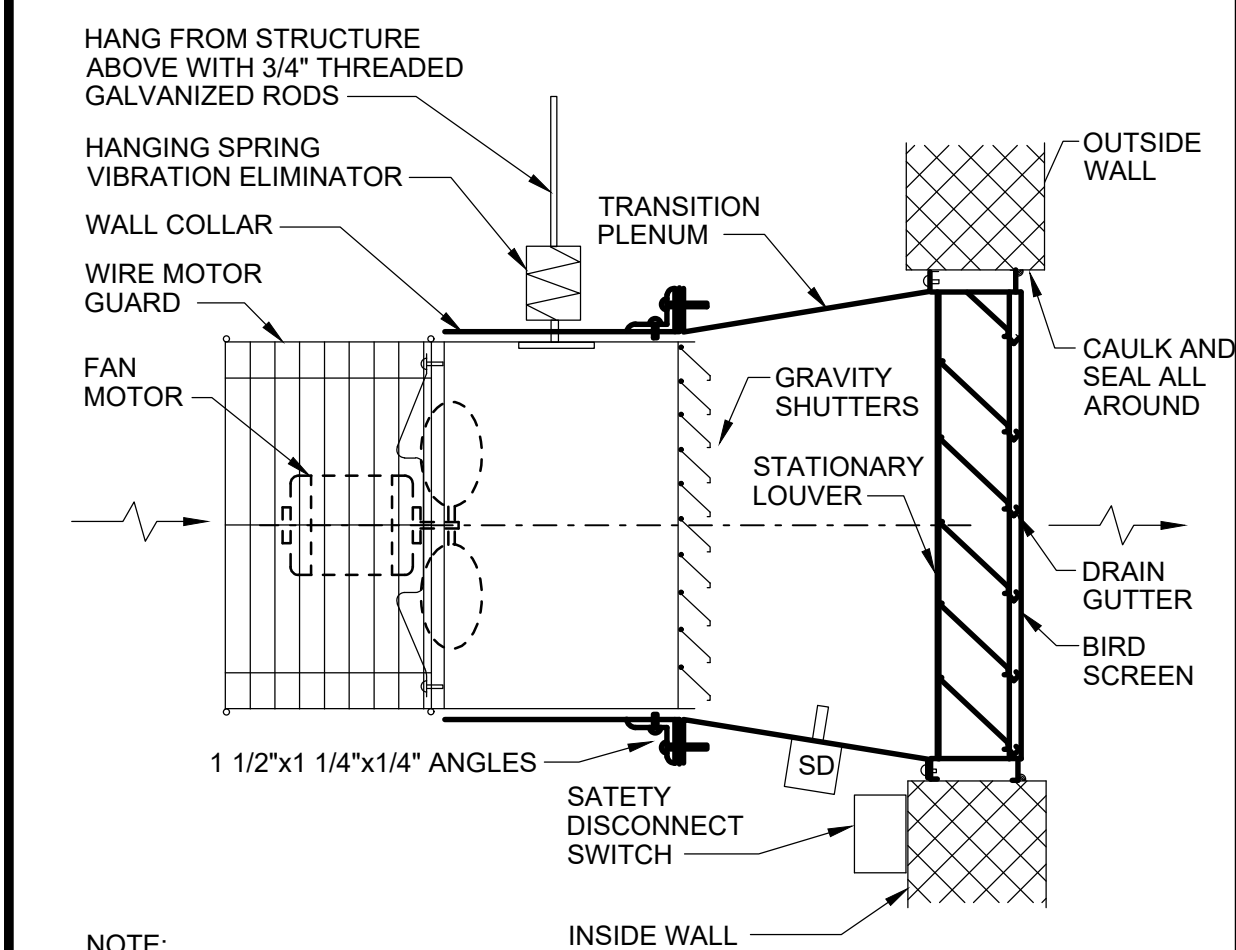


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STANDARD DETAILS - II		
PROJECT NO.:	21-3045	SCALE:
DATE:	AUGUST 2026	

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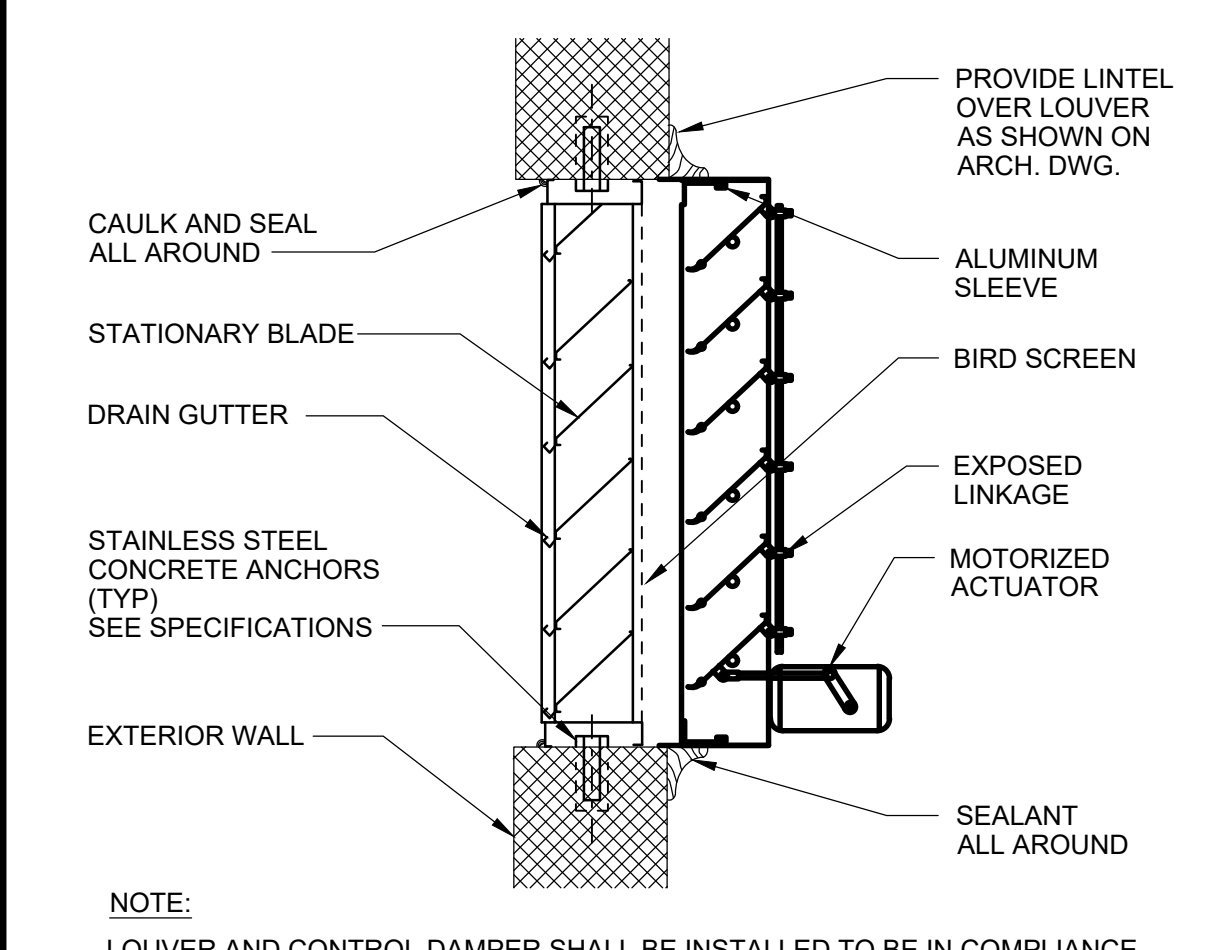


M-410 HANGER AND SUPPORT
(LOW PRESSURE DUCT)
REV 010119



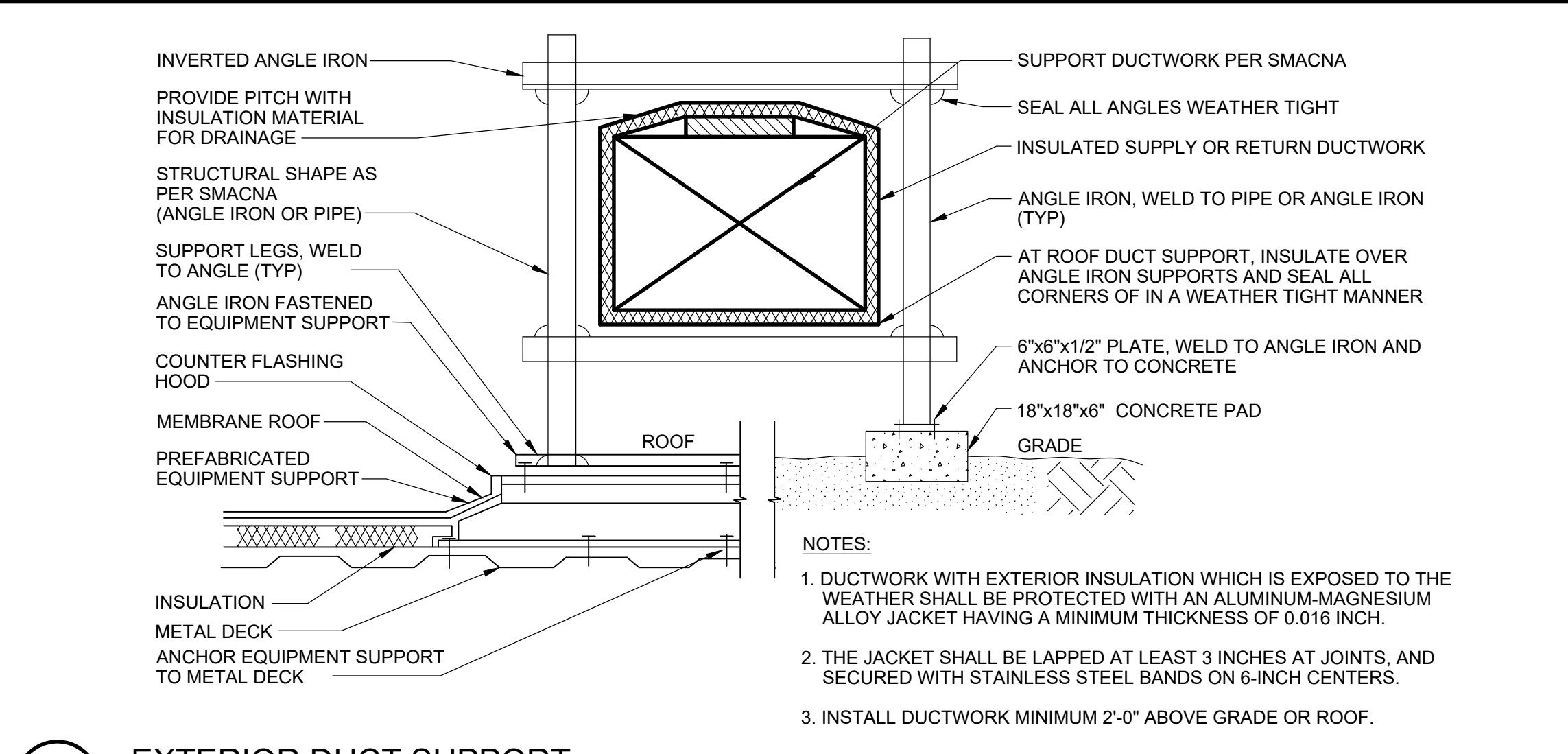
NOTE:
FOR LOUVER INSTALLATION DETAILS, SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS.

M-511 SIDEWALL EXHAUST FAN
(WITH LOUVER)
REV 010119

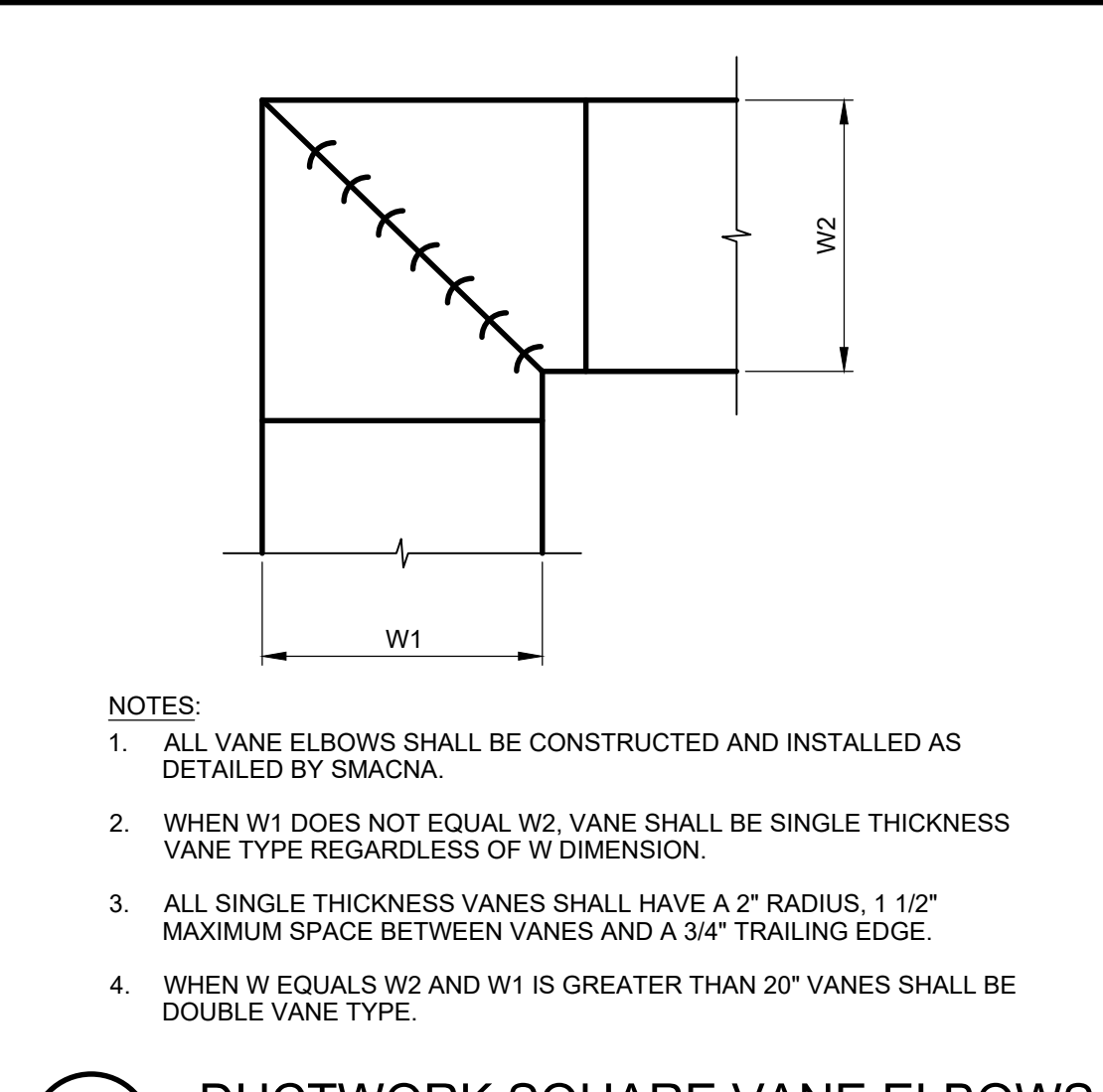


NOTE:
LOUVER AND CONTROL DAMPER SHALL BE INSTALLED TO BE IN COMPLIANCE WITH FLORIDA BUILDING CODE FOR INSTALLATION WITHIN MIAMI DADE COUNTY FOR CLOSED STRUCTURES.

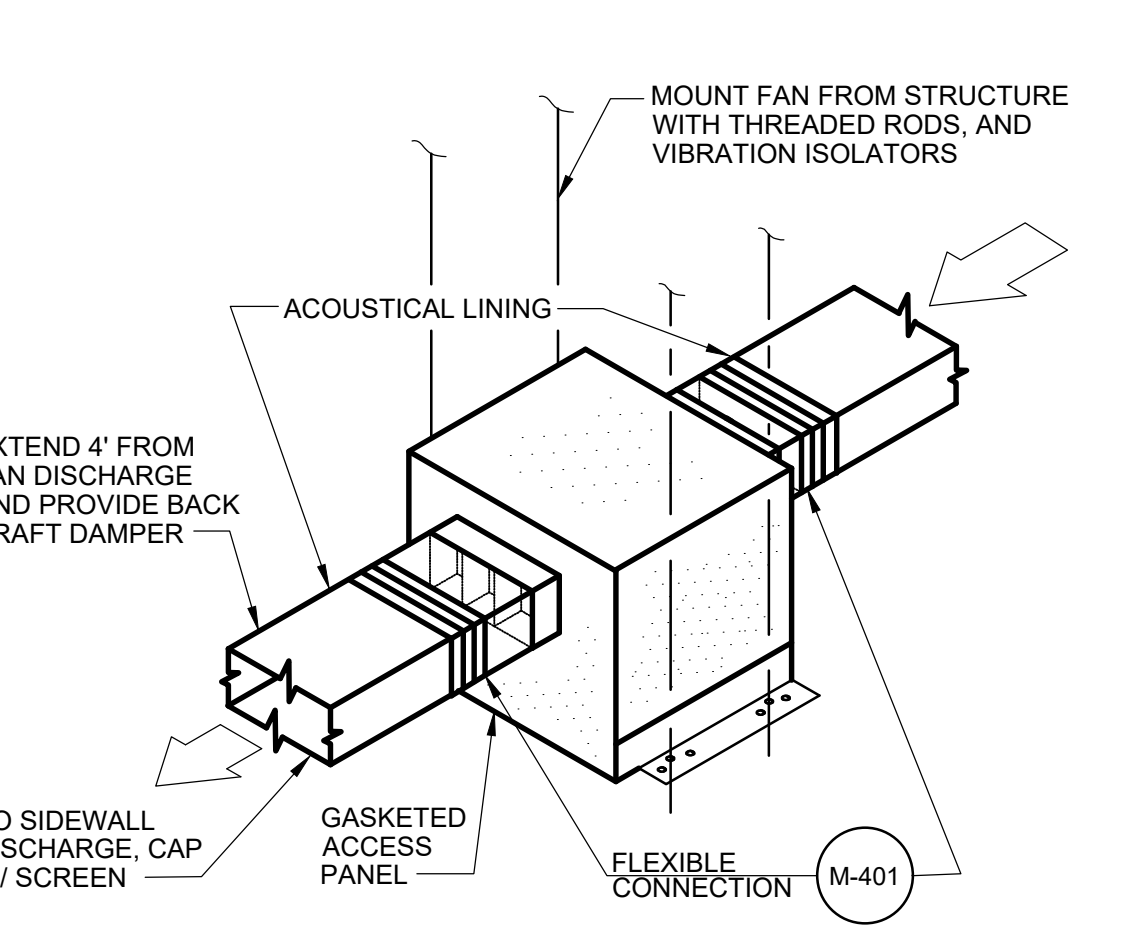
M-610 STATIONARY LOUVER
(W/ MOTORIZED DAMPER)
REV 051524



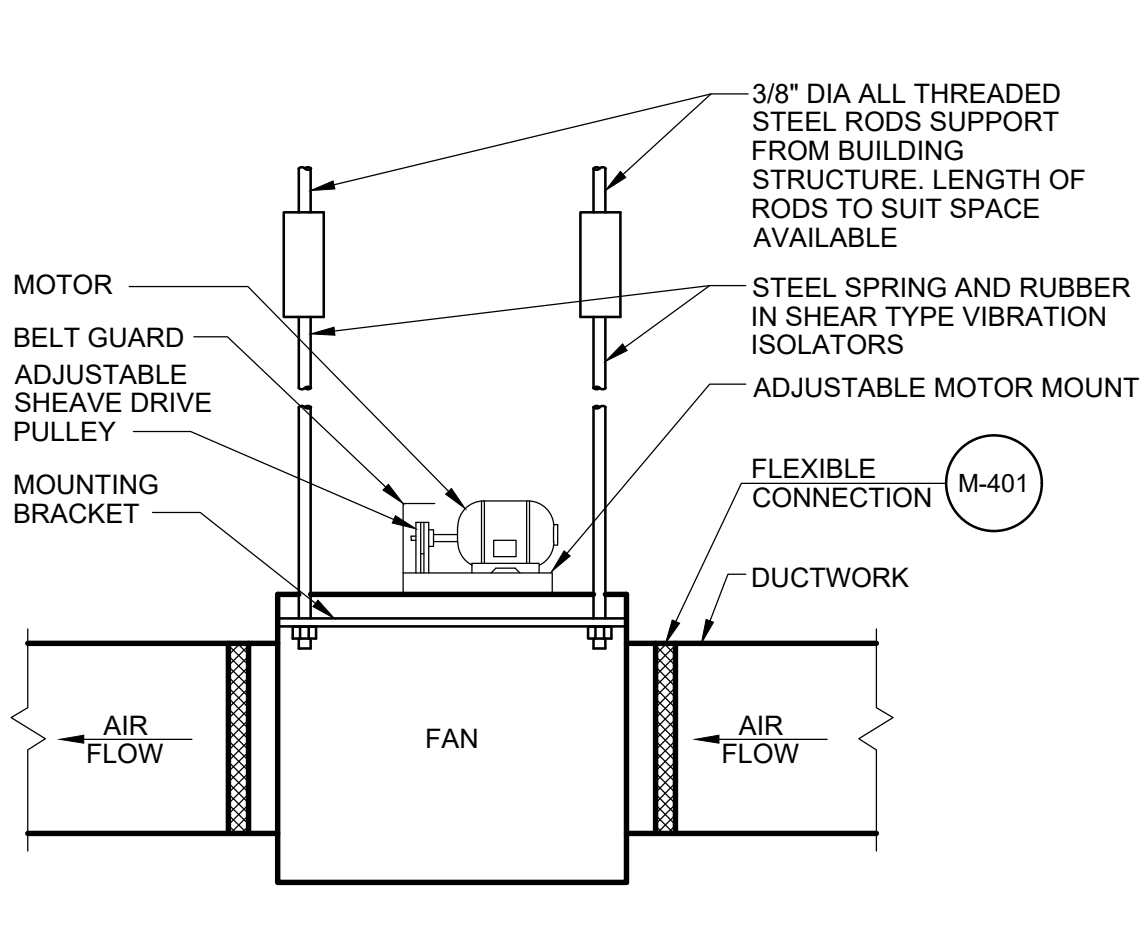
M-412 EXTERIOR DUCT SUPPORT
REV 010119



M-431 DUCTWORK SQUARE VANE ELBOWS
REV 030122



M-505 IN-LINE CEILING EXHAUST FAN
REV 010119



M-504 CENTRIFUGAL IN-LINE FAN
REV 010119

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HVAC
STANDARD DETAILS - III
PROJECT NO.: 21-3045 SCALE: DATE: AUGUST 2026

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GENERAL INFORMATION ABOUT HVAC CONTROLS

HVAC CONTROLS:
HVAC CONTROLS LOGIC IS BASED ON STANDALONE HVAC CONTROLS.

IN THE NOTES BELOW, "HVAC CONTROLLER" REFERS TO BOTH EQUIPMENT CONTROLLERS AS INDICATED ON THE EQUIPMENT SCHEDULES AND AUTOMATIC TEMPERATURE CONTROL PANELS INDICATED ON THE SEQUENCE OF OPERATIONS.

FOR ALL AREAS THAT ARE NOT PROTECTED BY THE FIRE ALARM SYSTEM, SMOKE DETECTION SIGNAL SHALL FIRST BE SENT TO THE HVAC CONTROLLER ASSOCIATED WITH THE ACTIVATED SMOKE DETECTOR, AND THE CONTROLLER SHALL THEN:

A. SHUTDOWN THE INDICATED HVAC EQUIPMENT (SEE SEQUENCE OF OPERATION)
B. SEND A SIGNAL TO THE SCADA

THE HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DELIVERY OF ALL HVAC ALARMS AND CONTROLS BETWEEN THE HVAC CONTROLLER AND SCADA WITH THE I&C CONTRACTOR, WHERE SUCH COMMUNICATIONS BETWEEN THE SYSTEMS ARE NOTED IN THE SEQUENCE OF OPERATION.

CONDUIT AND WIRING OF ALL HVAC CONTROLS INCLUDING 120 VOLTS CONTROLS SHALL BE PROVIDED BY DIVISION 23.

CONDUIT AND WIRING BETWEEN THE HVAC CONTROLLER AND THE SCADA PLC SHALL BE PROVIDED BY DIVISION 26.

HVAC AUTOMATIC TEMPERATURE CONTROL (ATC) PANEL:

HVAC AUTOMATIC TEMPERATURE CONTROL PANELS SHALL CONTAIN ALL ACCESSORIES NECESSARY TO PROVIDE THE CONTROL SEQUENCES DESCRIBED HEREIN.

ALL AUTOMATIC TEMPERATURE CONTROL PANELS (ATCs) SHALL INCLUDE HOA SWITCHES, HIGH AND LOW SPEED CONTROLLERS, AND EXTRA DRY CONTACTS FOR SENDING SIGNALS TO SCADA.

ATC CONTROL PANEL CONSTRUCTION:

PANELS SHALL BE 316 STAINLESS STEEL, NEMA 4X CONSTRUCTION, AND INCLUDE A HINGED FRONT DOOR WITH LOCKING HANDLE.

ALL MANUAL SWITCHES AND DIRECT READING GAUGES SHALL BE FLUSH MOUNTED ON THE FRONT FACE, AND BE IDENTIFIED BY ENGRAVED AND RIVETED BAKELITE OR LAMINATED PLASTIC NAMEPLATES WITH BLACK LETTERS ON WHITE BACKGROUND.

MANUAL SWITCHES AND PILOT LIGHTS SHALL BE HEAVY DUTY, OIL TIGHT CONSTRUCTION.

ATC PANEL CONSTRUCTION AND COMPONENTS SHALL CONFORM TO SPECIFICATION 26 06 15.

DIVISION 23 SHALL BE RESPONSIBLE FOR ALL HVAC CONTROL PANELS AND WIRING TO AND FROM THE ATCs AND HVAC EQUIPMENT.

115/120V CONDUIT AND WIRING TO CONTROL DAMPERS SHALL BE PROVIDED BY DIV 23 CONTRACTOR.

EACH ATC SHALL BE POWERED BY ONE 208V 3-PHASE BRANCH CIRCUIT BY DIV 26 , AND THE VENDOR SHALL CONNECT THEIR LOADS TO THE PHASES TO BALANCE THE LOAD TO THE EXTENT POSSIBLE.

SEQUENCE OF OPERATIONS OF VRF SYSTEM
SAFETY SHUTOFF VALVE AND REFRIGERANT LEAK

OVERVIEW:

ALL VRF INDOOR UNIT (AC-01 TO AC-11) ARE EQUIPPED WITH A R32 LEAK DETECTION SENSORS

SAFETY SHUTOFF VALVE ARE PROVIDED UPSTREAM OF INDOOR UNIT (AC-01, 02, 03, 04, 05, AC-07, 08, 11) FOR MITIGATION CONTROL.

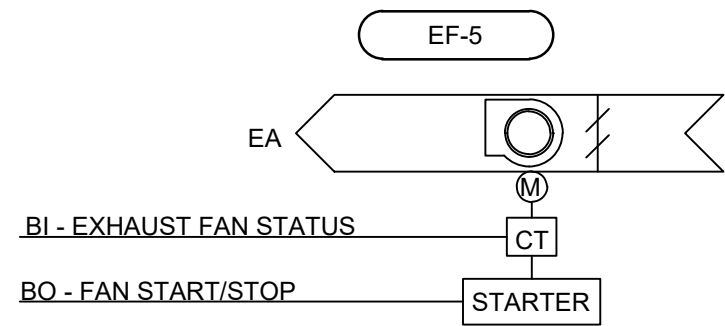
LEAK DETECTION:
UPON DETECTION OF R32 REFRIGERANT CONCENTRATION AT OR ABOVE 25% OF THE LOWER FLAMMABILITY LIMIT (LFL) AT ANY INDOOR UNIT, THE ASSOCIATED LEAK DETECTION SENSOR SHALL TRANSMIT AN ALARM SIGNAL TO THE VRF VALVE BOX CONTROL SYSTEM.

SYSTEM SHUTDOWN:
UPON RECEIPT OF THE LEAK DETECTION SIGNAL, THE CONTROL SYSTEM SHALL:

CLOSE THE SAFETY SHUTOFF VALVE AND

COMMAND THE VRF COMPRESSOR TO SHUT DOWN.

EXHAUST FAN EF-05 (RESTROOMS AND JANITOR ROOM)
CONTROLLED BY ATC-02



- RUN CONDITIONS:
- WITH THE HOA SWITCH IN THE "H" POSITION, EXHAUST FAN (EF-05) SHALL START
 - WITH THE HOA SWITCH IN THE "O" OFF POSITION, EXHAUST FAN (EF-05) SHALL STOP AND REMAIN OFF.
 - WITH THE HOA SWITCH IN THE "A" AUTO POSITION, EXHAUST FAN (EF-05) SHALL START WHENEVER ACTIVATED BY THE OCCUPANCY SENSOR IN THE RESTROOMS OR JANITOR ROOM PER SIGNAL RECEIVED FROM THE ATC PANEL

SEQUENCE OF OPERATIONS OF VRF SYSTEM FOR OCCUPIED SPACES
CONTROLLED BY ATC-02

EACH ZONE IS PROVIDED WITH A VRF FAN COIL UNIT AND ZONE THERMOSTAT.

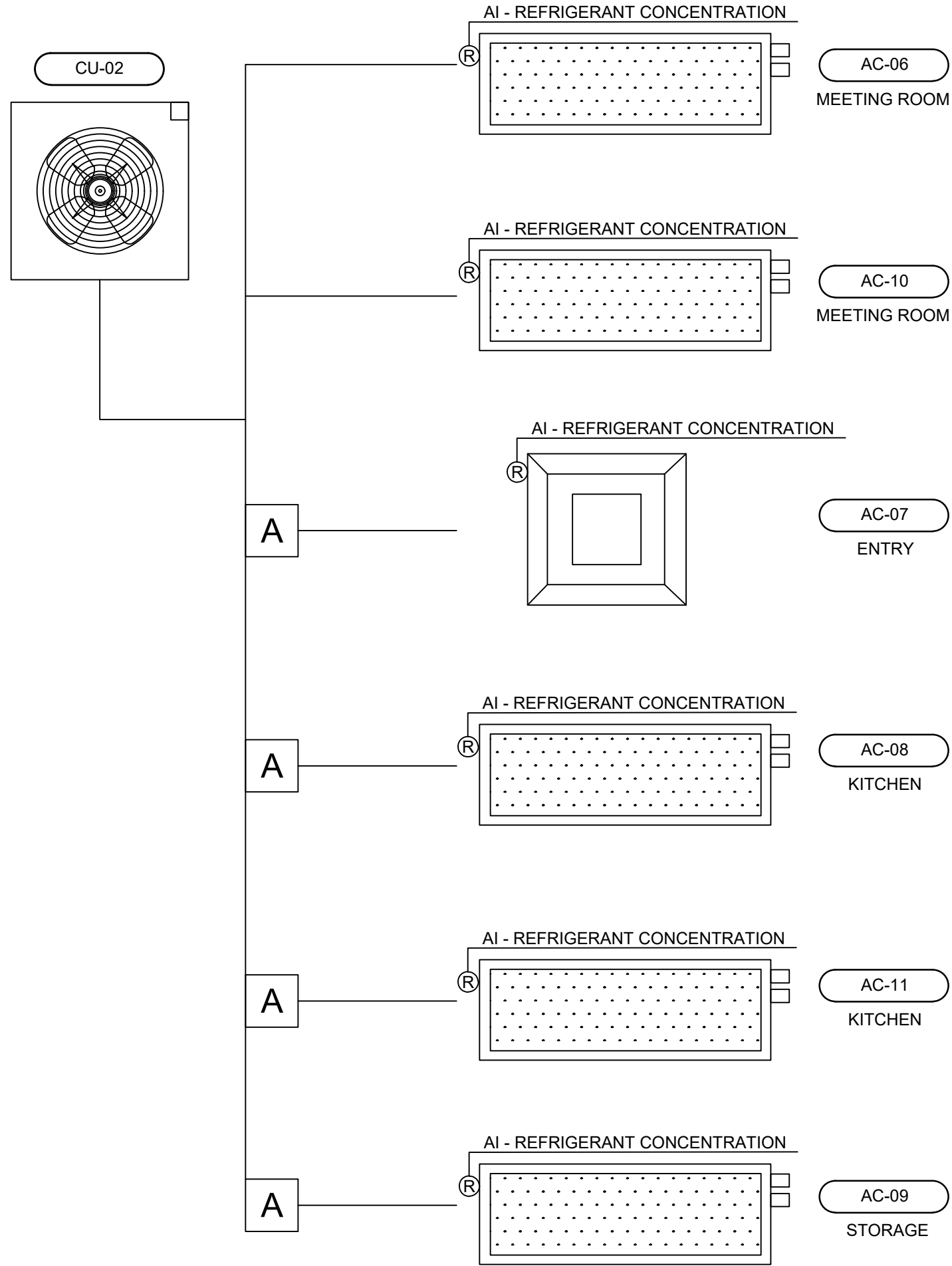
THE VRF SYSTEM INCLUDES CONDENSING UNIT AND FAN COIL UNITS AS INDICATED ON THE EQUIPMENT SCHEDULES.

CENTRALIZED NAVIGATION CONTROLLER, IS PROVIDED BY THE VRF SYSTEM MANUFACTURER AND IS DESIGNED TO MONITOR AND CONTROL THE VRF SYSTEM.

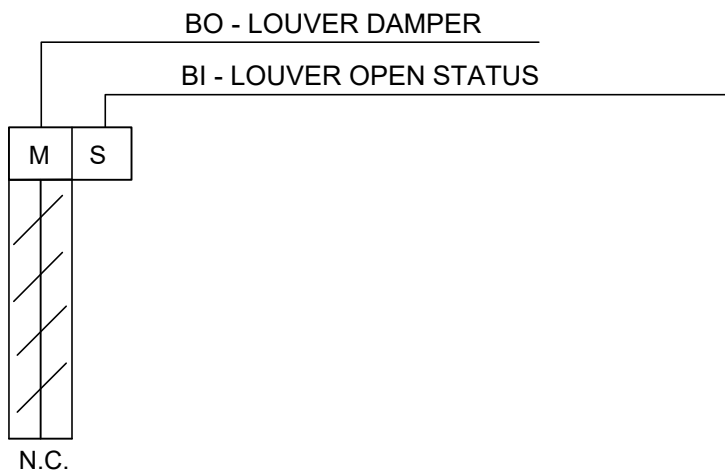
THE VRF SYSTEM CONTROLLER SHALL PROVIDE AUTOMATIC CHANGE OVER BETWEEN COOLING AND HEATING REFRIGERANT PIPE SIZES SHALL BE DETERMINED BY THE VRF SYSTEM MANUFACTURER.

ATC-02 SHALL ACTIVATE A LOCAL VISUAL AND AUDIBLE ALARMS, AND SEND A COMMON ALARM SIGNAL TO THE SCADA SYSTEM FOR THE FOLLOWINGS:

- A. UNIT FAILURE: WHEN ANY OF THE FAN COIL UNITS OR CONDENSING UNIT IS COMMANDED TO RUN BUT FAILED.
- B. HIGH AND LOW TEMPERATURE: ROOM TEMPERATURE IS GREATER THAN OR LOWER THAN THE TEMPERATURE SET POINT BY 5 DEGREES (ADJ.) FOR MORE THAN 30 MINUTES (ADJ.).



SEQUENCE OF OPERATIONS OF LOUVER AND
MOTORIZED DAMPER, L-09 AND MD-09,
(KITCHEN) CONTROLLED BY ATC-02



RUN CONDITION:

THE KITCHEN IS PROVIDED WITH AN INTAKE LOUVER AND MOTORIZED DAMPER INTERLOCKED WITH THE KITCHEN HOOD. THE MOTORIZED DAMPER SHALL OPEN WHEN THE KITCHEN HOOD IS IN OPERATION TO PROVIDE MAKEUP AIR AND SHALL CLOSE WHEN THE KITCHEN HOOD IS OFF.

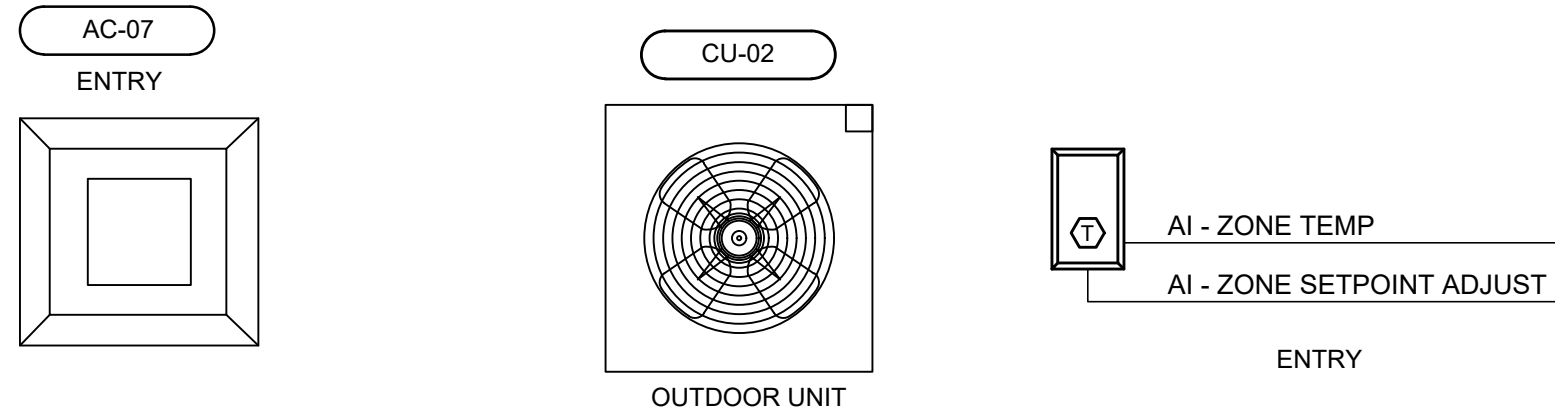
A LOCAL AUDIBLE AND VISUAL ALARM SHALL ACTIVATE AND A COMMON ALARM SIGNAL SHALL BE SENT TO SCADA FOR THE FOLLOWING EVENTS:

MD-09 IS COMMANDED TO RUN BUT FAILS TO START.

GENERAL SHEET NOTES

- REFRIGERANT PIPING DIAGRAM IS DIAGRAMMATICAL. CONTRACTOR SHALL FIELD ROUTE PIPING LAYOUT. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL EQUIPMENT.
- REFRIGERANT PIPING SIZES SHALL BE CONFIRMED BY THE VRF MANUFACTURER, AND INSTALL IN STRICT ACCORDANCE TO THE MANUFACTURERS INSTRUCTION.
- HVAC CONTROLLER PANEL ATC-01 AND ATC-02 SHALL HOUSE THE VRF SYSTEM CONTROLLERS WHICH ARE PROVIDED BY THE VRF SYSTEM MANUFACTURER AND IS USED FOR PROVIDING LOCAL ALARMS AND SENDING SIGNALS TO SCADA

CONTROL SEQUENCE OF OPERATIONS OF AC-07 (ENTRY)
CONTROLLED BY ATC-02



ENTRY IS EQUIPPED WITH THE VRF SYSTEM THAT INCLUDES ONE CASSETTE ASSOCIATED WITH THE OUTDOOR CONDENSING UNIT, CU-02 TO MAINTAIN 75 DEG F (ADJ.) DURING SUMMER AND 70 DEG F (ADJ.) DURING WINTER.

CONTROL PANEL ATC-02 IS USED FOR MONITORING THE ROOM TEMPERATURE.

COOLING MODE:
WHEN THE ROOM TEMPERATURE INCREASES TO 75°F (ADJ.), THE INDOOR UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE DECREASES TO 73°F (ADJ.), THE INDOOR UNIT SHALL STOP.

HEATING MODE:
WHEN THE ROOM TEMPERATURE DECREASES TO 70°F (ADJ.), THE INDOOR UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 72°F (ADJ.), THE INDOOR UNIT SHALL STOP.

ALARMS:
ATC-02 SHALL ACTIVATE A LOCAL VISUAL AND AUDIBLE ALARMS, AND SEND A COMMON ALARM SIGNAL TO THE SCADA SYSTEM FOR THE FOLLOWINGS:

- A. UNIT FAILURE WHEN EACH OF THE UNIT'S IS COMMANDED TO RUN BUT FAILS.
- B. HIGH AND LOW ROOM TEMPERATURE: ROOM TEMPERATURE IS GREATER OR LOWER THEN THE TEMPERATURE SET POINT BY 5 DEGREES FOR MORE THAN 30 MINUTES (ADJ.)
- C. DIRTY FILTER: WHEN THE UNIT REACHES 2500 OPERATION HOURS (ADJ.)

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SEQUENCE OF OPERATIONS I		
PROJECT NO.:	21-3045	SCALE:
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1. MEETING ROOM, KITCHEN, AND STORAGE ROOMS ARE EQUIPPED WITH THE VRF SYSTEM THAT INCLUDES A CONDENSING UNIT AND INDOOR AIR HANDLING UNITS.
2. OUTDOOR UNIT, CU-02, IS ASSOCIATED WITH INDOOR UNITS, AC-06, 08, 09, 10 AND 11
3. CONTROLLER IS USED FOR MONITORING THE ROOM TEMPERATURE.
4. MEETING ROOM AND KITCHEN ARE EQUIPPED WITH TWO INDOOR UNITS OPERATING IN LEAD/LAG MODE TO MAINTAIN 75°F (ADJ.) IN THE SUMMER AND 70°F (ADJ.) IN THE WINTER. ONE UNIT SHALL BE DESIGNATED AS THE LEAD UNIT, AND THE OTHER SHALL BE THE LAG UNIT. EVERY 48 HOURS, THE LEAD, AND THE LAG UNIT DESIGNATIONS SHALL ROTATE AMONG THE UNITS.

PRESSURIZATION SUPPLY FAN AND MOTORIZED DAMPER

SUPPLY FANS SF-01 THROUGH SF-03 SHALL ENERGIZE WHENEVER THEIR ASSOCIATED INDOOR UNITS ARE ENERGIZED. ONCE SUPPLY FANS RECEIVE A COMMAND TO START, MOTORIZED DAMPERS MD-01, MD-03, AND MD-04 SHALL OPEN FIRST; THE ASSOCIATED SUPPLY FAN SHALL START ONLY AFTER PROOF OF DAMPER OPEN POSITION IS CONFIRMED.

STATIC PRESSURE PRESSURE CONTROL:

THE CONTROLLER SHALL MEASURE THE ROOM STATIC PRESSURE IN THE MEETING, KITCHEN, AND STORAGE ROOMS AND MODULE THE SUPPLY AIR TO MAINTAIN A POSITIVE STATIC PRESSURE OF 0.1 IN WC IN THE MEETING, KITCHEN, AND STORAGE ROOMS

MEETING ROOM

DUCT HEATER DH-01 SHALL ENERGIZE UPON PROOF THAT SUPPLY FAN SF-01 IS IN OPERATION AND WHEN THE DUCT THERMOSTAT SENSES OUTDOOR AIR TEMPERATURE BELOW 60°F.

COOLING MODE:

WHEN THE ROOM TEMPERATURE INCREASES TO 75°F (ADJ.), THE LEAD UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 79°F (ADJ.), THE LAG UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE DECREASES TO 77°F (ADJ.), THE LAG UNIT SHALL STOP WHILE THE LEAD UNIT REMAINS ON.
WHEN THE ROOM TEMPERATURE DECREASES TO 73°F (ADJ.), THE LEAD UNIT SHALL STOP.

HEATING MODE:

WHEN THE ROOM TEMPERATURE DECREASES TO 70°F (ADJ.), THE LEAD UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 66°F (ADJ.), THE LAG UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE DECREASES TO 68°F (ADJ.), THE LAG UNIT SHALL STOP WHILE THE LEAD UNIT REMAINS ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 72°F (ADJ.), THE LEAD UNIT SHALL STOP WHILE THE LAG UNIT INCREASES TO 66°F (ADJ.), THE LAG UNIT SHALL TURN ON.

KITCHEN

COOLING MODE:
 WHEN THE ROOM TEMPERATURE INCREASES TO 75°F (ADJ.), THE LEAD UNIT SHALL TURN ON.
 WHEN THE ROOM TEMPERATURE INCREASES TO 79°F (ADJ.), THE LAG UNIT SHALL TURN ON.
 WHEN THE ROOM TEMPERATURE DECREASES TO 77°F (ADJ.), THE LAG UNIT SHALL STOP WHILE THE LEAD UNIT REMAINS ON.
 WHEN THE ROOM TEMPERATURE DECREASES TO 73°F (ADJ.), THE LEAD UNIT SHALL STOP.

HEATING MODE:

WHEN THE ROOM TEMPERATURE DECREASES TO 70°F (ADJ.), THE LEAD UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 66°F (ADJ.), THE LAG UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE DECREASES TO 68°F (ADJ.), THE LAG UNIT SHALL STOP WHILE THE LEAD UNIT REMAINS ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 72°F (ADJ.), THE LEAD UNIT SHALL STOP. TEMPERATURE INCREASES TO 66°F (ADJ.), THE LAG UNIT SHALL TURN ON.

STORAGE

COOLING MODE:
WHEN THE ROOM TEMPERATURE INCREASES TO 80 °F (ADJ), THE INDOOR UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE DECREASES TO 78 F (ADJ), THE INDOOR UNIT SHALL STOP.

HEATING MODE:

WHEN THE ROOM TEMPERATURE DECREASES TO 60°F (ADJ), THE INDOOR UNIT SHALL TURN ON.
WHEN THE ROOM TEMPERATURE INCREASES TO 62°F (ADJ), THE INDOOR UNIT SHALL STOP.

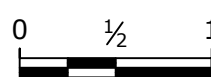
ALARMS:

ATC-02 SHALL ACTIVATE A LOCAL VISUAL AND AUDIBLE ALARMS, AND SEND A COMMON ALARM SIGNAL TO THE SCADA SYSTEM FOR THE FOLLOWINGS:

1. UNIT FAILURE WHEN EACH OF THE UNIT'S IS COMMANDED TO RUN BUT FAILS.
2. HIGH AND LOW ROOM TEMPERATURE: ROOM TEMPERATURE IS GREATER OR LOWER THEN THE TEMPERATURE SET POINT BY 5 DEGREES FOR MORE THAN 30 MINUTES (ADJ.)
3. DIRTY FILTER: WHEN THE UNITS REACH 2500 OPERATION HOURS (ADJ.)

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WATER QUALITY SYSTEMS BUILDING

HVAC

SEQUENCE OF OPERATIONS II

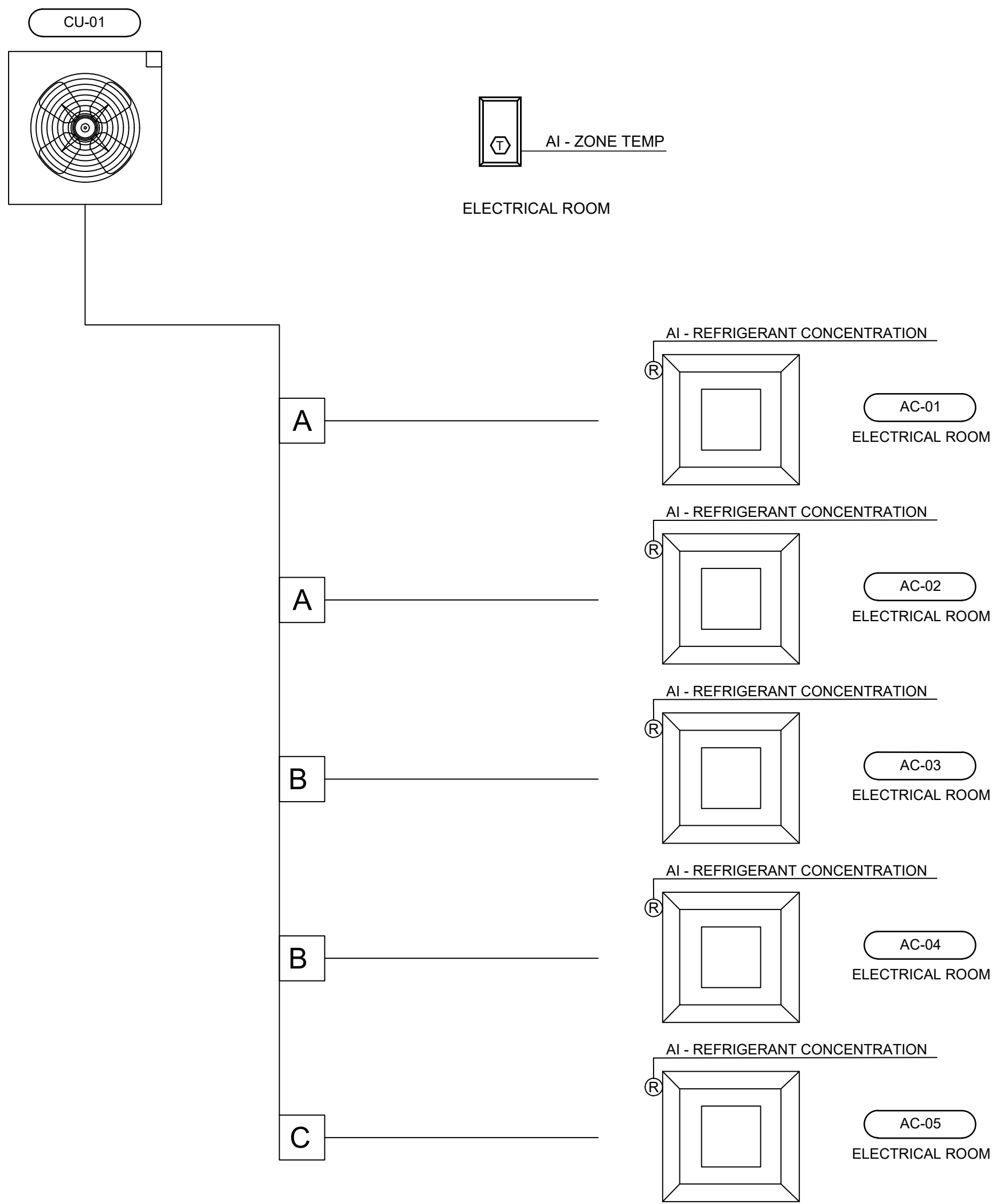
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SEQUENCE OF OPERATIONS OF VRF SYSTEM FOR ELECTRICAL ROOM CONTROLLED BY ATC-01



OVERVIEW:
THE ELECTRICAL ROOM IS EQUIPPED WITH (5) HEAT PUMP UNITS OPERATING IN LEAD/LAG MODE TO MAINTAIN 80 DEG F (ADJ.) IN THE SUMMER AND 60 DEG F (ADJ.) IN THE WINTER.
ONE UNIT SHALL BE DESIGNATED AS THE LEAD UNIT, AND THE OTHERS SHALL BE LAG-1, LAG-2, LAG-3, AND LAG-4. EVERY 48 HOURS, THE LEAD, LAG-1, LAG-2, LAG-3, LAG-4, DESIGNATIONS SHALL ROTATE AMONG THE UNITS.

OUTDOOR CONDENSING UNIT CU-01 IS ASSOCIATED WITH INDOOR UNIT AC-01, 02, 03, 04, AND 10

THE FAN COIL UNITS AC-01, 02, 03, 04, AND 05 SHALL OPERATE IN LEAD-LAG FASHION.

CONTROL PANEL ATC-01 IS USED FOR MONITORING THE ROOM TEMPERATURE, SWITCHING THE LEAD/LAG OPERATION OF THE UNITS, AND SENDING SIGNALS TO PLC/SCADA.

COOLING MODE

WHEN THE ROOM TEMPERATURE RISES TO 76°F (ADJ.), THE LEAD UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE DROPS TO 74°F (ADJ.), THE LEAD UNIT WILL STOP.

WHEN THE ROOM TEMPERATURE RISES TO 78°F (ADJ.), THE LAG-01 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE DROPS TO 76°F (ADJ.), THE LAG-01 UNIT WILL STOP.

WHEN THE ROOM TEMPERATURE RISES TO 80°F (ADJ.), THE LAG-02 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE DROPS TO 78°F (ADJ.), THE LAG-02 UNIT WILL STOP.

WHEN THE ROOM TEMPERATURE RISES TO 82°F (ADJ.), THE LAG-03 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE DROPS TO 80°F (ADJ.), THE LAG-03 UNIT WILL STOP.

WHEN THE ROOM TEMPERATURE RISES TO 84°F (ADJ.), THE LAG-04 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE DROPS TO 82°F (ADJ.), THE LAG-04 UNIT WILL STOP.

HEATING MODE

ALL HEAT PUMPS SHALL SWITCH TO HEATING MODEL WHEN THE ROOM TEMPERATURE DROPS TO 68 DEG F

WHEN THE ROOM TEMPERATURE DROPS TO 64°F (ADJ.), THE LEAD UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE RISES TO 66°F (ADJ.), THE LEAD UNIT WILL STOP

WHEN THE ROOM TEMPERATURE DROPS TO 62°F (ADJ.), THE LAG-01 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE RISES TO 64°F (ADJ.), THE LAG-01 UNIT WILL STOP

WHEN THE ROOM TEMPERATURE DROPS TO 60°F (ADJ.), THE LAG-02 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE RISES TO 62°F (ADJ.), THE LAG-02 UNIT WILL STOP

WHEN THE ROOM TEMPERATURE DROPS TO 58°F (ADJ.), THE LAG-03 UNIT WILL TURN ON
WHEN THE ROOM TEMPERATURE RISES TO 60°F (ADJ.), THE LAG-03 UNIT WILL STOP

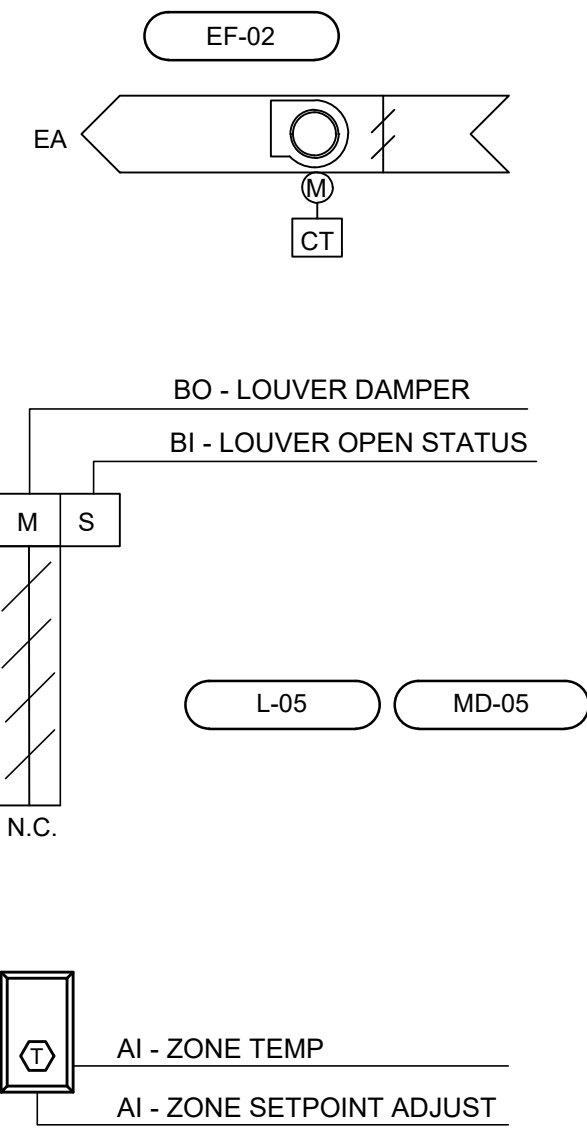
WHEN THE ROOM TEMPERATURE DROPS TO 56°F (ADJ.), THE LAG-04 UNIT WILL TURN ON.
WHEN THE ROOM TEMPERATURE RISES TO 58°F (ADJ.), THE LAG-04 UNIT WILL STOP

THE HEAT PUMP SYSTEM CONTROLLER SHALL PROVIDE AUTOMATIC CHANGE OVER BETWEEN COOLING AND HEATING MODES
THE HEAT PUMP SYSTEM CONTROLLER SHALL AUTOMATICALLY ADJUST EACH SYSTEM OPERATION CAPACITY AS THE ROOM HEATING/COOLING LOAD CHANGES.

A LOCAL AUDIBLE AND VISUAL ALARM SHALL ACTIVATE AND A COMMON ALARM SIGNAL SHALL BE SENT TO THE SCADA FOR THE FOLLOWING EVENTS:

- A) ROOM TEMPERATURE IS GREATER THAN THE TEMPERATURE SETPOINT BY 5°F ADJ FOR MORE THAN 30 MINUTES ADJ.
B) ROOM TEMPERATURE IS LOWER THAN THE TEMPERATURE SETPOINT BY 5°F ADJ FOR MORE THAN 30 MINUTES ADJ.
C) ANY AC OR CU UNIT FAILS

SEQUENCE OF OPERATIONS OF EF-04 AND L-05 FOR MECHANICAL ROOM CONTROLLED BY ATC-01



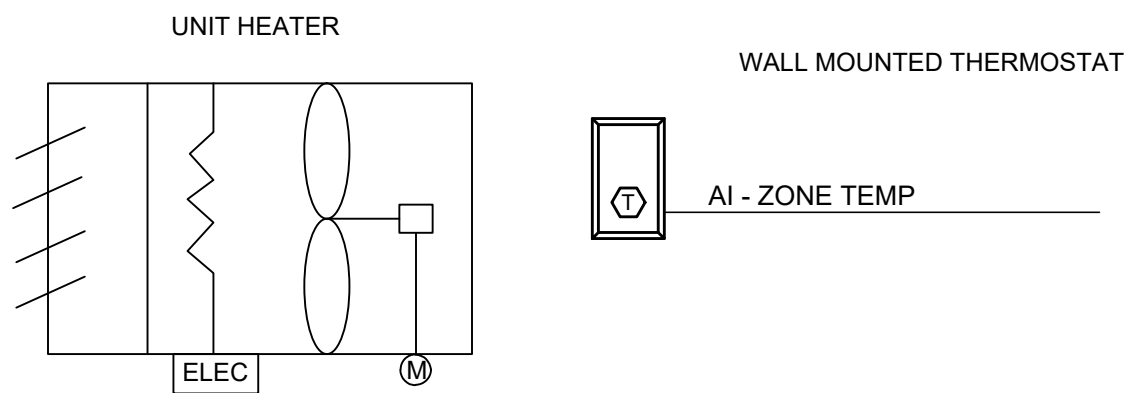
AUTOMATIC CONTROL PANEL:
1. EXHAUST FAN IS CONTROLLED BY AN ASSOCIATED THERMOSTAT.
2. EXHAUST FAN SHALL BE PROVIDED WITH AN HOA SWITCH.
3. INTAKE AIR LOUVERS L-05 IS EQUIPPED WITH MOTORIZED DAMPERS MD-05

- EXHAUST FAN RUN CONDITIONS:
- WITH THE HOA SWITCH IN THE "H" (HAND OR MANUAL) POSITION, THE EXHAUST FAN SHALL START AND THE SPEED SHALL BE ADJUSTED AT THE VARIABLE SPEED DRIVE.
 - WITH THE HOA SWITCH IN THE "O" (OFF) POSITION, THE EXHAUST FAN SHALL STOP.
 - WITH THE HOA SWITCH IN THE "A" (AUTOMATIC) POSITION, THE EXHAUST FANS SHALL BE ENABLED TO RUN WHEN THE ROOM TEMPERATURE REACHES 90°F (ADJ.), AND SHALL CONTINUE TO RUN AS LONG AS THE ROOM TEMPERATURE IS ABOVE 92°F (ADJ.).
 - WHEN THE ROOM TEMPERATURE EXCEEDS 100 F (ADJ.) THE EXHAUST FAN SHALL TURN ON AND RUN AT 100% SPEED AND, WHEN THE ROOM TEMPERATURE DROPS TO 98 F (ADJ.) THE EXHAUST FAN SHALL TURN OFF

MOTORIZED DAMPER MD-05 OF LOUVER L-05 :

- MOTORIZED DAMPER SHALL OPEN WHEN THE EXHAUST FAN IS COMMANDED TO RUN AND SHALL CLOSE WHEN THE FAN STOPS.
 - MOTORIZED DAMPERS SHALL BE PROVEN OPEN BEFORE THE EXHAUST FAN ARE ENERGIZED AND SHALL CLOSE 30 SEC (ADJ.) AFTER THE FAN STOPS.
- ALARMS:
- ATC-01 SHALL ACTIVATE A LOCAL VISUAL AND AUDIBLE ALARMS, AND SEND A COMMON ALARM SIGNAL TO THE SCADA SYSTEM FOR THE FOLLOWINGS:
A. EXHAUST FANS ARE COMMANDED TO RUN BUT FAILED.
B. HIGH ROOM TEMPERATURE:
WHEN ROOM TEMPERATURE IS GREATER THAN 104 DEG F (ADJ.) FOR MORE THAN 30 MINUTES (ADJ.)
C. LOW ROOM TEMPERATURE:
WHEN THE ROOM TEMPERATURE IS LESS THAN 50 DEG F (ADJ.) FOR MORE THAN 30 MINUTES (ADJ.)

ELECTRICAL UNIT HEATERS SEQUENCE OF OPERATION



ZONE SETPOINT ADJUST:

THE OCCUPANT SHALL BE ABLE TO TO ADJUST THE ZONE TEMPERATURE HEATING SETPOINTS AT THE INTEGRAL THERMOSTAT.
THE TEMPERATURE SETPOINT OF THE HEATERS SHALL BE ADJUSTED TO 60 F (ADJ.).

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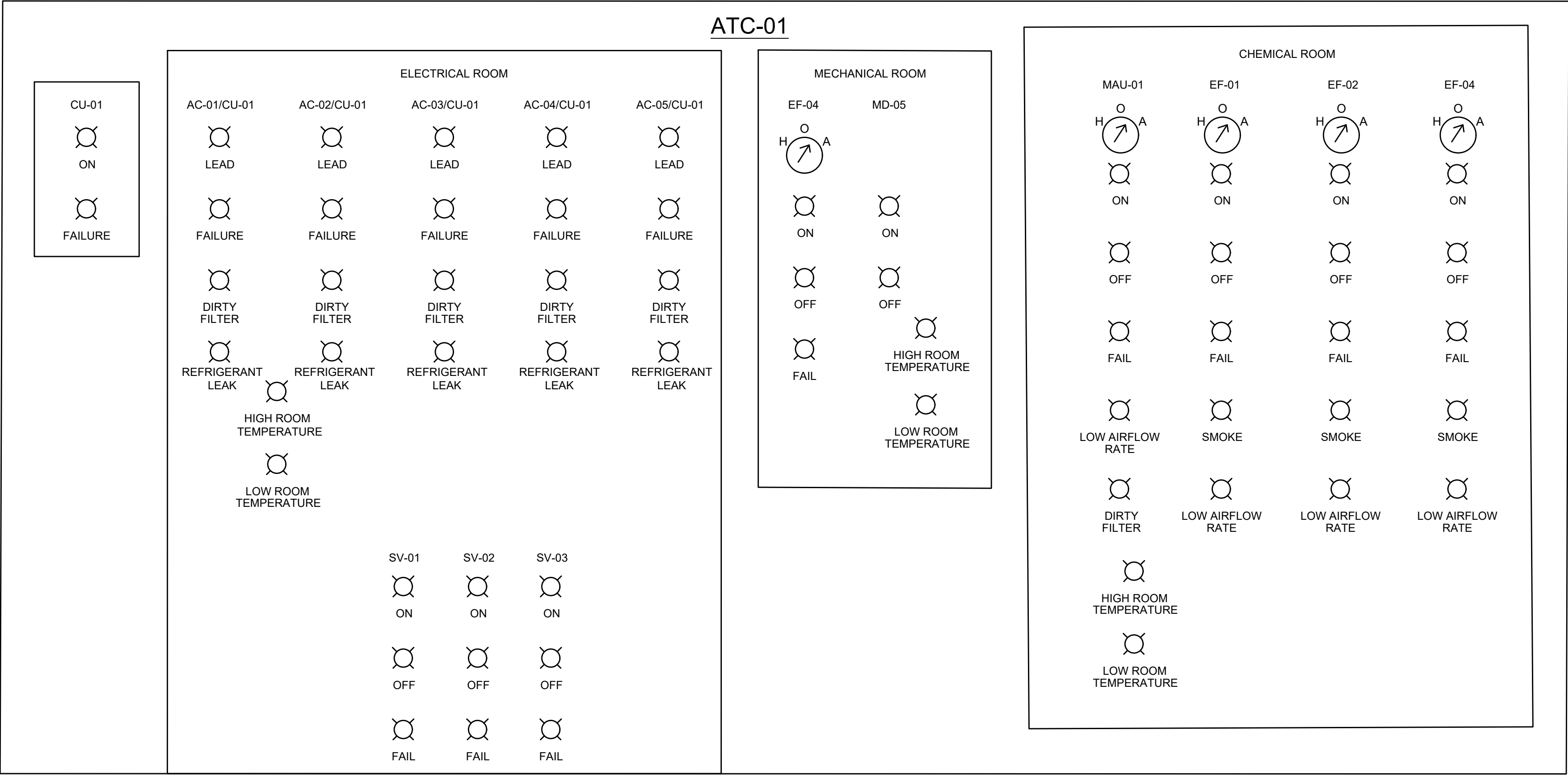


HVAC		
SEQUENCE OF OPERATIONS III		
PROJECT NO.:	21-3045	SCALE:
DATE:	AUGUST 2026	

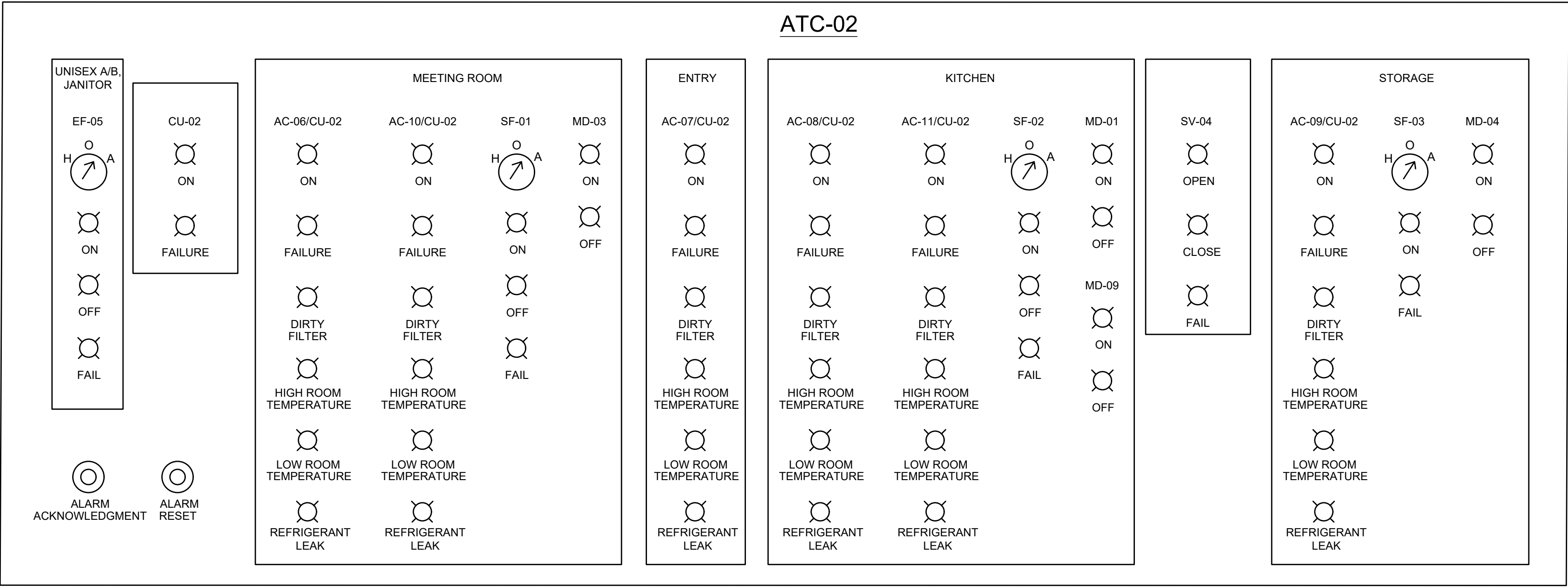
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H-008

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SEQUENCE OF OPERATIONS OF VRF SYSTEM FOR ELECTRICAL ROOM CONTROLLED BY ATC-01



SEQUENCE OF OPERATIONS OF VRF SYSTEM FOR OCCUPIED SPACES
CONTROLLED BY ATC-02



NO.	DATE	BY	REVISION

NOTICE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

RK

DESIGNED SP

DRAWN SHS

CHECKED

REGISTERED PROFESSIONAL ENGINEER 99804PE

OREGON

MAY 10, 2022

SVIAN AMOL SAPIRTHI

EXPIRES: 06/30/2028

BID SET

consor

Stantec

South Fork WATER

PURE WATER SINCE 1915

WATER QUALITY SYSTEMS BUILDING

HVAC

SEQUENCE OF OPERATIONS IV

PROJECT NO.: 21-3045

SCALE:

DATE: AUGUST 2026

SHEET

H-009

MAKE-UP AIR UNIT WITH GAS HEATING SCHEDULE									
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EQUIPMENT NUMBER	SERVICE	LOCATION	DESIGN AIRFLOW HIGH (CFM)		DESIGN AIRFLOW LOW (CFM)		FAN SECTION				HEATING SECTION (NATURAL GAS)				TEMPERATURE RISE		ELECTRICAL				WEIGHT (LBS)	MANUFACTURER LANUFACT MODEL NO.	OPTIONS & ACCESSORIES
			SUPPLY	OUTDOOR AIR	SUPPLY	OUTDOOR AIR	OPERATING BHP	MOTOR HP	ESP (IN WG)	SPEED (RPM)	BURNER TYPE	INPUT (MBH)	OUTPUT (MBH)	GAS PRESSURE (IN WC)	MIN (F)	MAX (F)	V/P/C	MCA (A)	MOCP (A)	FLA	(EXCLUDING CURB)		
MAU-01	CHEMICAL ROOM	OUTDOOR	3100	3100	1550	1550	1.65	2	1.5	1673	INDIRECT	200	162	6	3	48.3	460/3/60	4.9	15	3.9	1569	GREENHECK/ RV-40-0-G-F1	1-17

OPTIONS-ACCESSORIES:		
1. INSULATION - 2 INCH 2.4# R16 FORM	7. BMS PROTOCOL - BACNET MSTP	13. OUTDOOR AIR DAMPER - LOW LEAKAGE
2. CORROSION RESISTANT FASTENERS	8. HEATING IS LOCKED OUT ABOVE 60 F AMBIENT TEMPERATURE	14. SUPPLY AIR FILTERS-2' MERV 8, 2-20X20X2, 2-20X24X2
3. FACTORY WIRED VFD	9. SUPPLY FAN CONTROL - 0-10 VDC FOR TWO SPEED CONTROLS	15. DISCONNECT PROVIDED BY VENDOR IN ACCORDANCE WITH 26 05 15 - INDUSTRIAL CONTROL PANELS.
4. FACTORY WIRED NON-FUSED DISCONNECT SWITCH	10. DAMPER CONTROL - 100% OA-NO RECIRCULATION	16. INTERNALLY MOUNTED CONTROL CENTER WITH 24 VAC CONTROL TRANSFORMER(S)
5. STAINLESS STEEL CONDENSATE DRAIN PAN AND CONNECTION	11. FURNACE CONTROL - 12.1	17. UNIT CONTROLS- FULL FACTORY CONTROL
6. CONDENSATE DRAIN TRAP	12. DIRTY FILTER SENSOR(S) - SUPPLY	

GRILLE, REGISTER AND DIFFUSER SCHEDULE

TAG NO.	DESCRIPTION	MATERIAL	DAMPER	FINISH	FRAME	MANUFACTURER AND MODEL
A	EXHAUST GRILLE	ALUMINUM	DUCT	CLEAR ANODIZED	DUCT	TITUS 350-FL
B	SUPPLY AIR REGISTER	ALUMINUM	DUCT	WHITE	DUCT	TITUS 300-FL
C	SUPPLY AIR DIFFUSER	ALUMINUM	DUCT	WHITE	SURFACE MOUNTED	TITUS OMNI-AA
D	RETURN AIR DIFFUSER	ALUMINUM	DUCT	WHITE	SURFACE MOUNTED	TITUS PAR-AA

SAFETY SHUTOFF VALVES FOR VRF SYSTEM

TAG NO.	DESCRIPTION	LOCATION	SERVE	ELECTRICAL			MANUFACTURER AND MODEL
				V/PH/CY	MCA	MOCP	
SV-01 TO 03	SAFETY SHUT OFF VALVE	CHEMICAL ROOM	AC-01 TO 05/CU-01	208/60/1	0.9	15	DAIKIN/SVA96AAVJ & SVA60AAVJ
SV-04	SAFETY SHUT OFF VALVE	STORAGE ROOM	AC-07,08, 11/CU-01	208/60/1	0.9	15	DAIKIN/SVA60AAVJ

NOTES:
1. PROVIDES LOW AMBIENT COOLING CAPACITY FOR HP UNITS DOWN TO - 4F

[illegible]

EQUIPMENT TAG NO	SERVICE	LOCATION	ELECTRIC HEATER		AIRFLOW (CFM)	ELECTRICAL		DUCT DIMENSIONS		WEIGHT	MANUFACTURER & MODEL	OPTIONS AND ACCESSORIES
			KW	STAGES		V-PH-CY	AMPS	HEIGHT (IN) MIN/MAX	WIDTH (IN) MIN/MAX			
DH-01	MEETING ROOM	MEETING ROOM	3	1	290	480/3/60	3.6	8	8	15 LBS	GREENHECK/IDHE	1-4

<u>OPTIONS-ACCESSORIES:</u> 1. DISCONNECT BY VENDOR IN ACCORDANCE WITH 26 05 15 - INDUSTRIAL CONTROL PANELS. 2. DUCT THERMOSTAT 3. FAN INTERLOCK 4. PILOT SWITCH

NO.	DATE	BY	REVISION

NOTICE

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WATER QUALITY SYSTEMS BUILDING

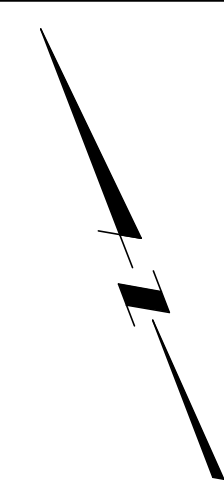
HVAC

SCHEDULES - II

PROJECT NO.:	21-3045	SCALE:	DATE:	AUGUST 2026
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SHEET

H-602

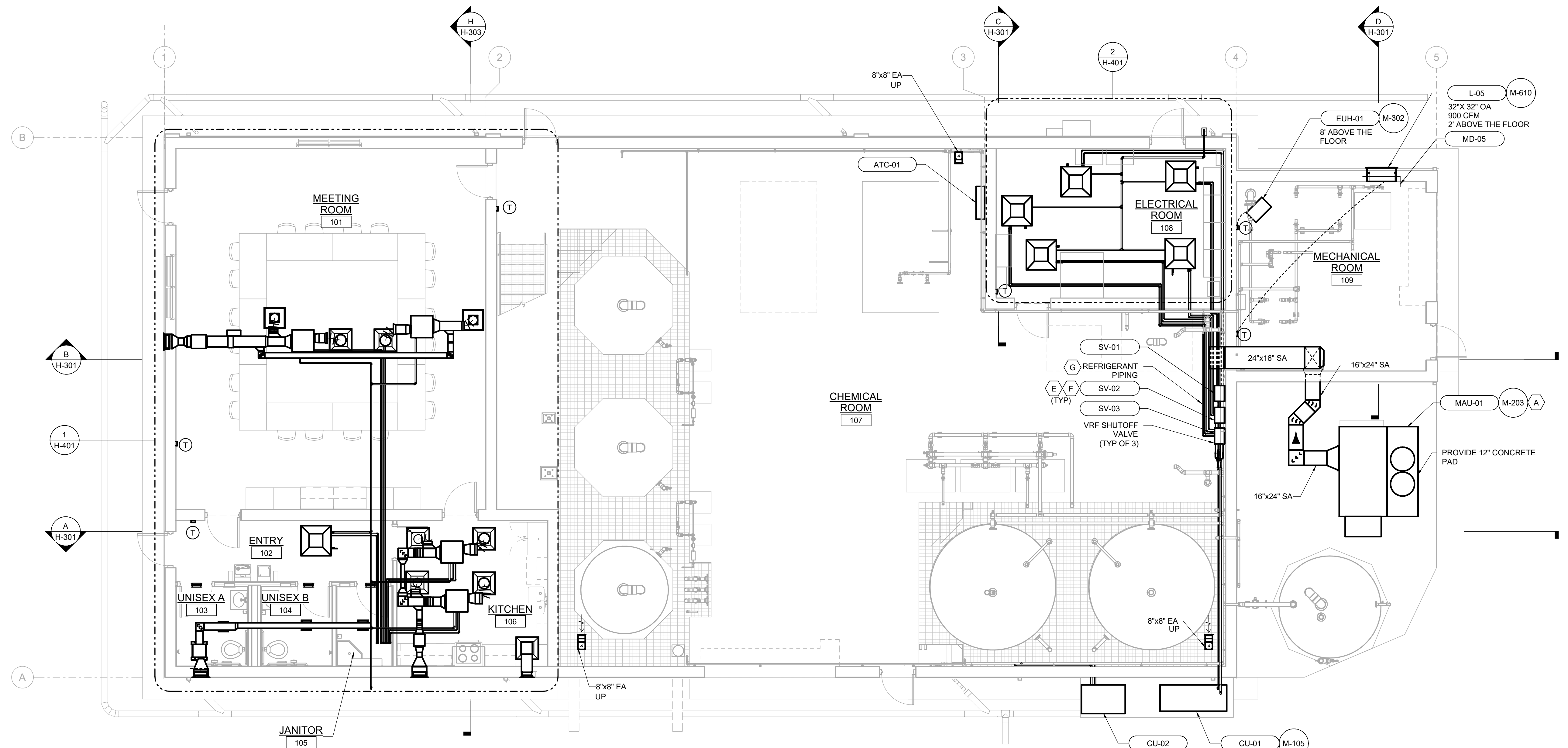


 SHEET KEYNOTES

- A. REFRIGERANT OR CONDENSATE PIPING SHALL NOT BE INSTALLED ABOVE ANY ELECTRICAL EQUIPMENT, CONDUITS, OR CABLE TRAYS.
- B. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 20 MM PER METER (1/4" PER FOOT) (2% SLOPE).
- C. SIZE AND INSTALL REFRIGERANT LINES AND CONDENSATE DRAINS PER MANUFACTURER'S RECOMMENDATIONS.
- D. 2" MERV 8 THROW AWAY PLEATED FILTER
- E. INSTALL REFRIGERANT SHUTOFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. LOCATE SHUTOFF VALVE AND IN ACCESSIBLE AREAS FOR MAINTENANCE.
- F. PROVIDE INSULATION FOR VRF SAFETY SHU-OFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION MANUAL. INSULATION SHALL BE GLASS WOOL OR POLYETHYLENE, MINIMUM 3/8" THICK.
- G. REFRIGERANT PIPING ROUTING SHOWN IS SCHEMATIC. CONTRACTOR SHALL VERIFY FINAL ROUTING AND REQUIRED CLEARANCES PRIOR TO INSTALLATION AND SHALL SUBMIT SHOP DRAWINGS SHOWING REFRIGERANT PIPE SIZES, LENGTHS, AND ASSOCIATED ACCESSORIES IN ACCORDANCE WITH SPECIFICATION 23 23 00 – REFRIGERANT PIPING.

GENERAL SHEET NOTES

1. ALL PLUMBING SYSTEM, EQUIPMENT, AND COMPONENTS SHALL BE FURNISHED AND INSTALLED IN STRICT COMPLIANCE WITH 2023 OREGON PLUMBING SPECIALTY CODE AND RELATED CODES.
2. PIPING INSULATION SHALL COMPLY WITH 2023 OREGON EFFICIENCY SPECIALTY CODE. COLD WATER PIPING INSULATION THICKNESS SHALL BE 1/2 INCH FOR PIPE SIZES UP TO 1 INCH, 3/4 INCH FOR PIPE SIZES LARGER THAN 1 INCH. HOT WATER PIPING INSULATION THICKNESS SHALL BE 1 INCH FOR PIPE SIZES UP TO 1 INCH AND 1-1/2 INCH FOR PIPE SIZES LARGER THAN 1 INCH.
3. NO PIPING OR DUCTWORK SHALL BE LOCATED ABOVE ANY ELECTRICAL PANEL

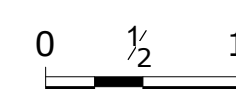


LOW LEVEL FLOOR PLAN

SCALE: 3/16" = 1'-0"

NO.	DATE	BY	REVISION

NOTICE



IF THIS BAR DOES
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THEN DRAWING IS
NOT TO SCALE

RK
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DRAWN
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CHECKED



BID SET



WATER QUALITY SYSTEMS BUILDING

HVAC

FLOOR PLAN

SHEET

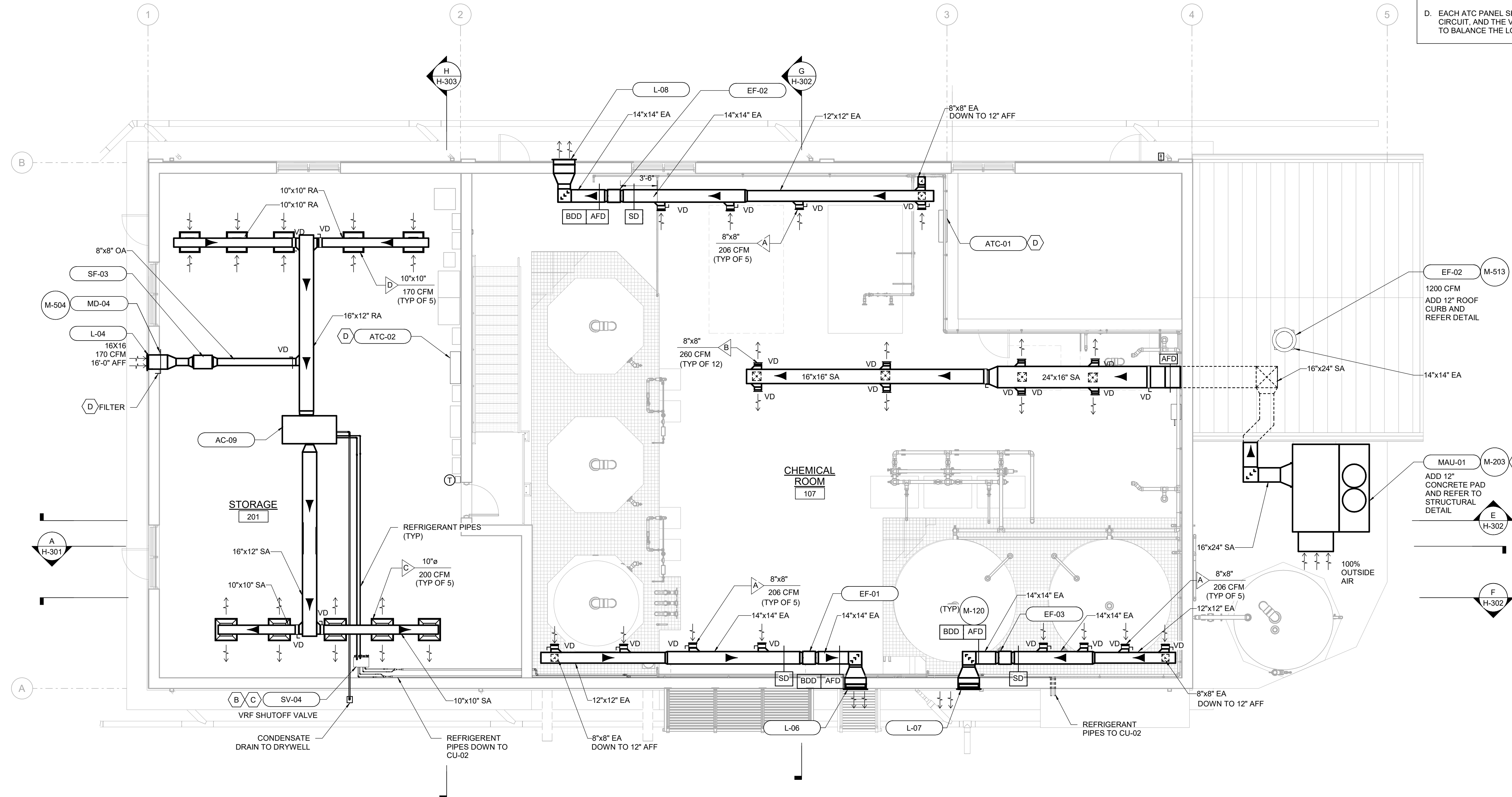
H-101

PROJECT NO.: 21-3045	SCALE: 3/16" = 1'-0"	DATE: AUGUST 2026
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UPPER LEVEL FLOOR PLAN

SCALE: 3/16" = 1'-0"

GENERAL SHEET NOTES

1. NO PIPING OR DUCTWORK SHALL BE LOCATED ABOVE ANY ELECTRICAL PANEL

SHEET KEYNOTES

- A. REFER TO PLUMBING DRAWINGS FOR DETAILS ON THE NATURAL GAS PIPING
- B. INSTALL REFRIGERANT SHUTOFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. LOCATE SHUTOFF VALVE AND IN ACCESSIBLE AREAS FOR MAINTENANCE.
- C. PROVIDE INSULATION FOR VRF SAFETY SHU-OFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION MANUAL. INSULATION SHALL BE GLASS WOOL OR POLYETHYLENE, MINIMUM 3/8" THICK.
- D. EACH ATC PANEL SHALL BE POWERED BY ONE 208V 3 PHASE BRANCH CIRCUIT, AND THE VENDOR SHALL CONNECT THEIR LOADS TO THE PHASES TO BALANCE THE LOAD TO THE EXTENT POSSIBLE.

NO.	DATE	BY	REVISION

NOTICE

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HVAC		
UPPER LEVEL FLOOR PLAN		
PROJECT NO.:	21-3045	SCALE: 3/16" = 1'-0"
DATE:	AUGUST 2026	

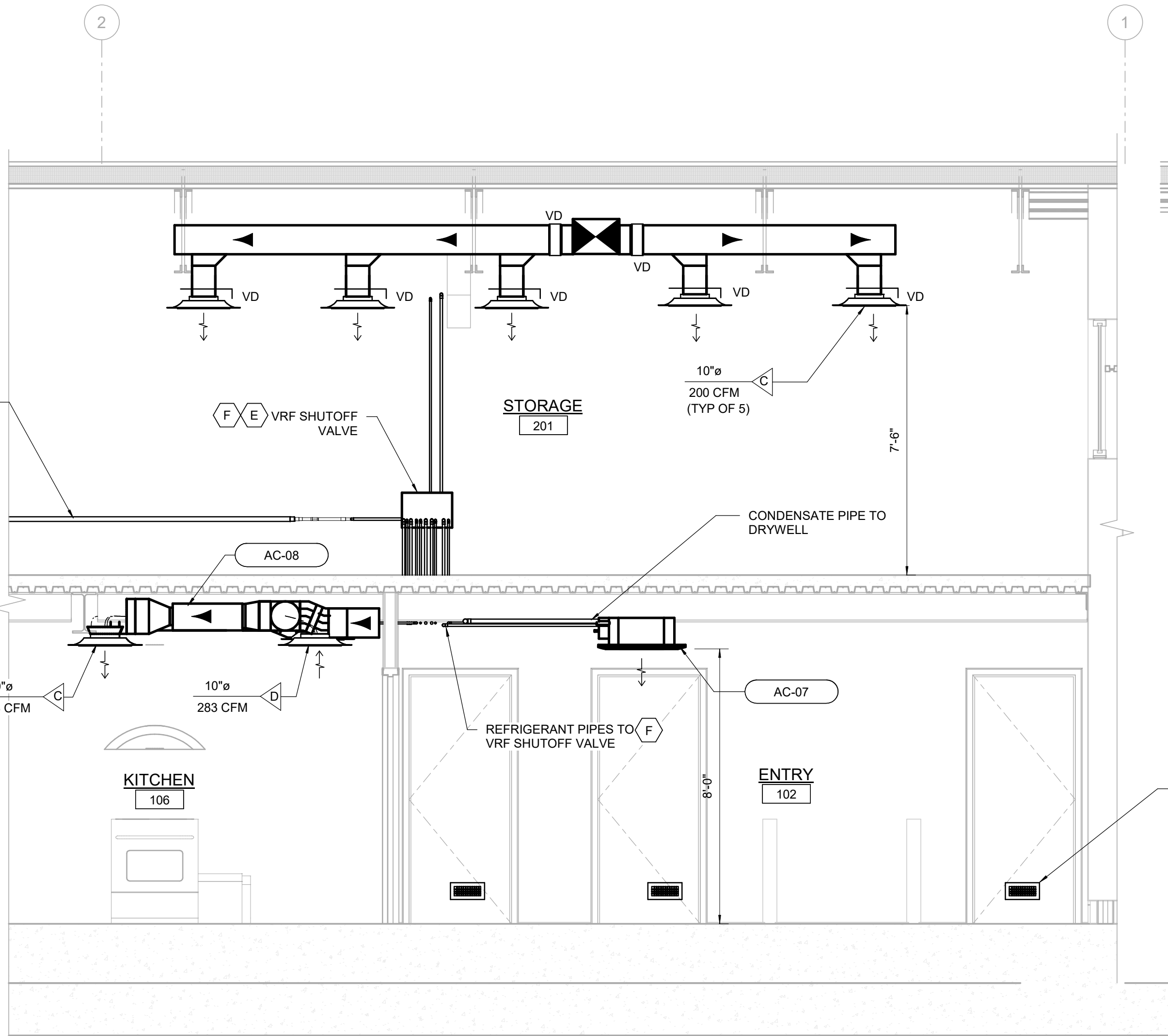
SHEET

H-102

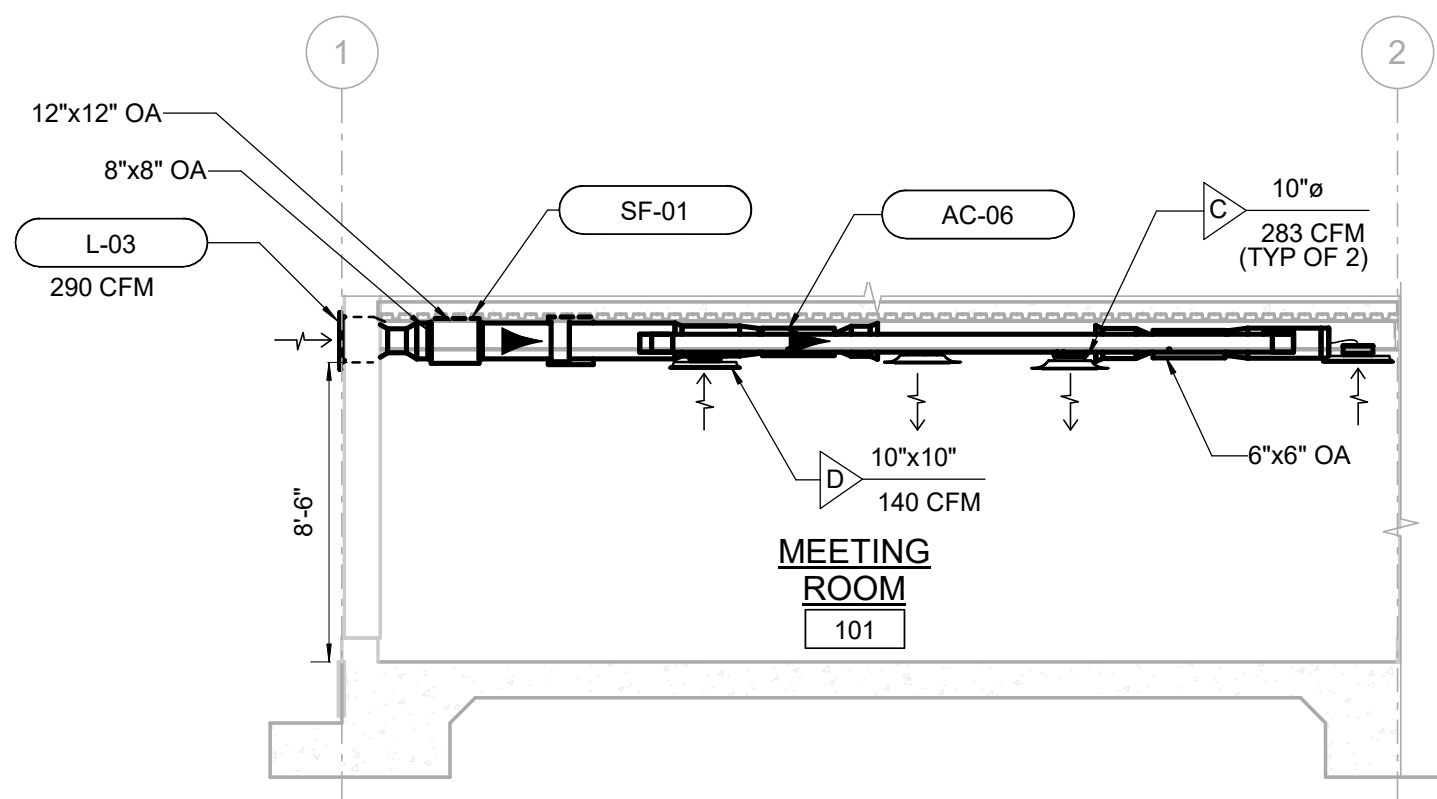
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A SECTION
H-101 SCALE: 3/8" = 1'-0"



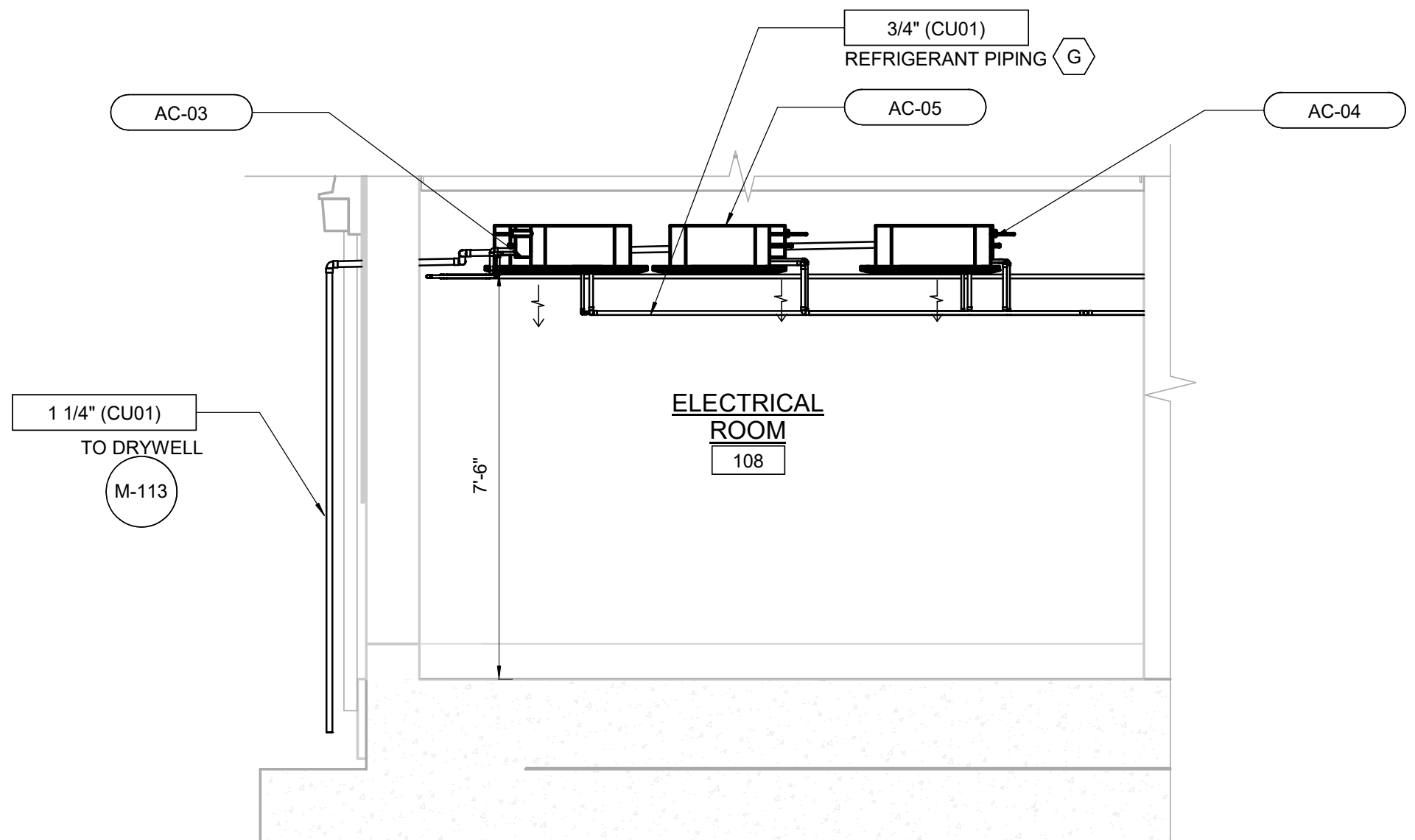
B SECTION
H-101 SCALE: 3/16" = 1'-0"

SHEET KEYNOTES

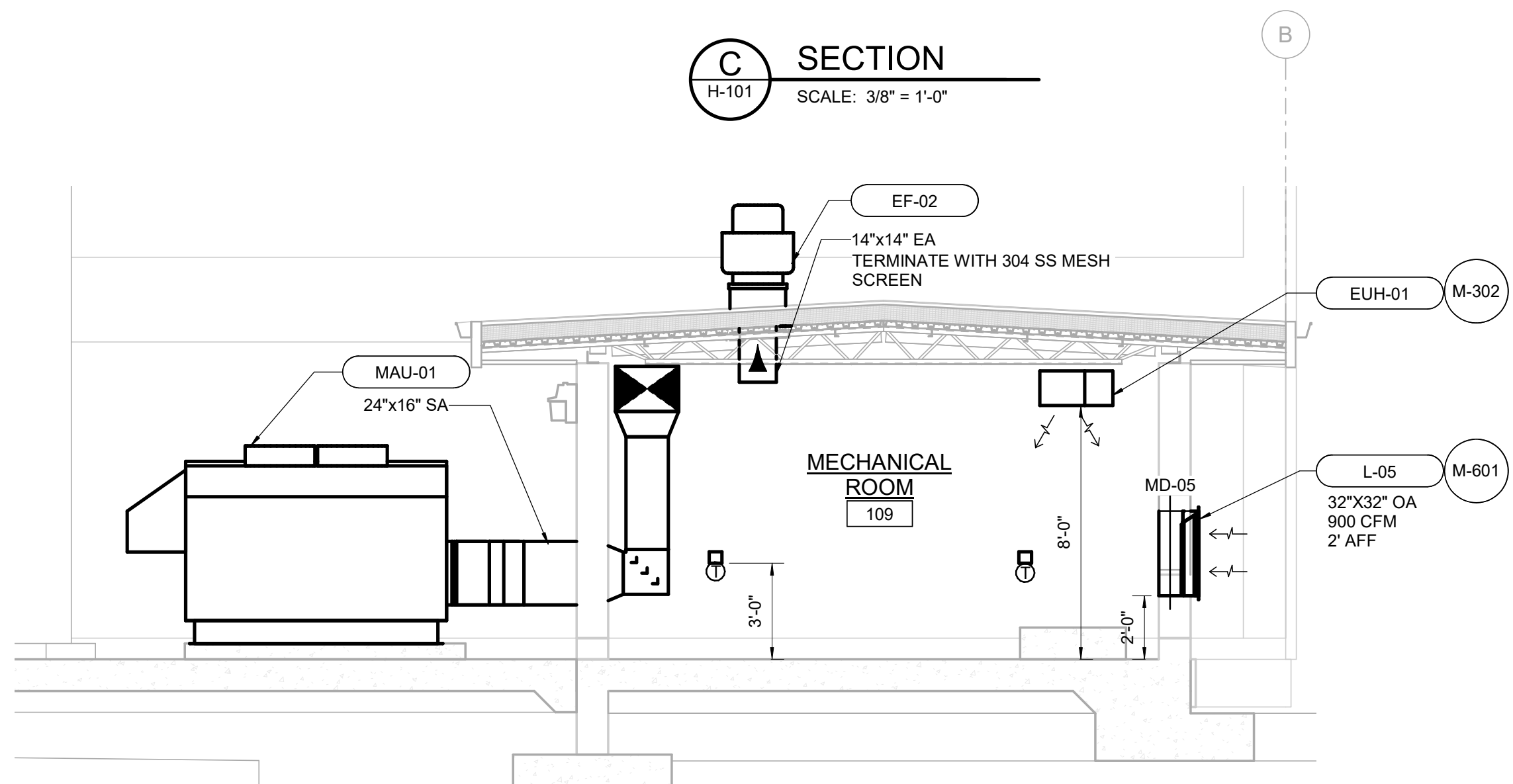
- A. REFRIGERANT OR CONDENSATE PIPING SHALL NOT BE INSTALLED ABOVE ANY ELECTRICAL EQUIPMENT, CONDUITS, OR CABLE TRAYS.
- B. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 20 MM PER METER (1/4" PER FOOT) (2% SLOPE).
- C. SIZE AND INSTALL REFRIGERANT LINES AND CONDENSATE DRAINS PER MANUFACTURER'S RECOMMENDATIONS.
- D. 2" MERV 8 THROW AWAY PLEATED FILTER
- E. INSTALL REFRIGERANT SHUTOFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. LOCATE SHUTOFF VALVE AND IN ACCESSIBLE AREAS FOR MAINTENANCE.
- F. PROVIDE INSULATION FOR VRF SAFETY SHU-OFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION MANUAL. INSULATION SHALL BE GLASS WOOL OR POLYETHYLENE, MINIMUM 3/8" THICK.
- G. REFRIGERANT PIPING ROUTING SHOWN IS SCHEMATIC. CONTRACTOR SHALL VERIFY FINAL ROUTING AND REQUIRED CLEARANCES PRIOR TO INSTALLATION AND SHALL SUBMIT SHOP DRAWINGS SHOWING REFRIGERANT PIPE SIZES, LENGTHS, AND ASSOCIATED ACCESSORIES IN ACCORDANCE WITH SPECIFICATION 23 23 00 - REFRIGERANT PIPING.

GENERAL SHEET NOTES

- 1. ALL PLUMBING SYSTEM, EQUIPMENT, AND COMPONENTS SHALL BE FURNISHED AND INSTALLED IN STRICT COMPLIANCE WITH 2023 OREGON PLUMBING SPECIALTY CODE AND RELATED CODES.
- 2. PIPING INSULATION SHALL COMPLY WITH 2023 OREGON EFFICIENCY SPECIALTY CODE. COLD WATER PIPING INSULATION THICKNESS SHALL BE 1/2 INCH FOR PIPE SIZES UP TO 1 INCH, AND 1 INCH FOR PIPE SIZES LARGER THAN 1 INCH. HOT WATER PIPING INSULATION THICKNESS SHALL BE 1 INCH FOR PIPE SIZES UP TO 1 INCH AND 1-1/2 INCH FOR PIPE SIZES LARGER THAN 1 INCH.
- 3. NO PIPING OR DUCTWORK SHALL BE LOCATED ABOVE ANY ELECTRICAL PANEL



C SECTION
H-101 SCALE: 3/8" = 1'-0"



GENERAL SHEET NOTES

1.

ALL PLUMBING SYSTEM, EQUIPMENT, AND COMPONENTS SHALL BE FURNISHED AND INSTALLED IN STRICT COMPLIANCE WITH 2023 OREGON PLUMBING SPECIALTY CODE AND RELATED CODES.

2.

PIPING INSULATION SHALL COMPLY WITH 2023 OREGON EFFICIENCY SPECIALTY CODE. COLD WATER PIPING INSULATION THICKNESS SHALL BE 1/2 INCH FOR PIPE SIZES UP TO 1 INCH, AND 1 INCH FOR PIPE SIZES LARGER THAN 1 INCH. HOT WATER PIPING INSULATION THICKNESS SHALL BE 1 INCH FOR PIPE SIZES UP TO 1 INCH AND 1-1/2 INCH FOR PIPE SIZES LARGER THAN 1 INCH.

3.

NO PIPING OR DUCTWORK SHALL BE LOCATED ABOVE ANY ELECTRICAL PANEL.

SHEET KEYNOTES

A.

REFRIGERANT OR CONDENSATE PIPING SHALL NOT BE INSTALLED ABOVE ANY ELECTRICAL EQUIPMENT, CONDUITS, OR CABLE TRAYS.

B.

CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 20 MM PER METER (1/4" PER FOOT) (2% SLOPE).

C.

SIZE AND INSTALL REFRIGERANT LINES AND CONDENSATE DRAINS PER MANUFACTURER'S RECOMMENDATIONS.

D.

2" MERV 8 THROW AWAY PLEATED FILTER

E.

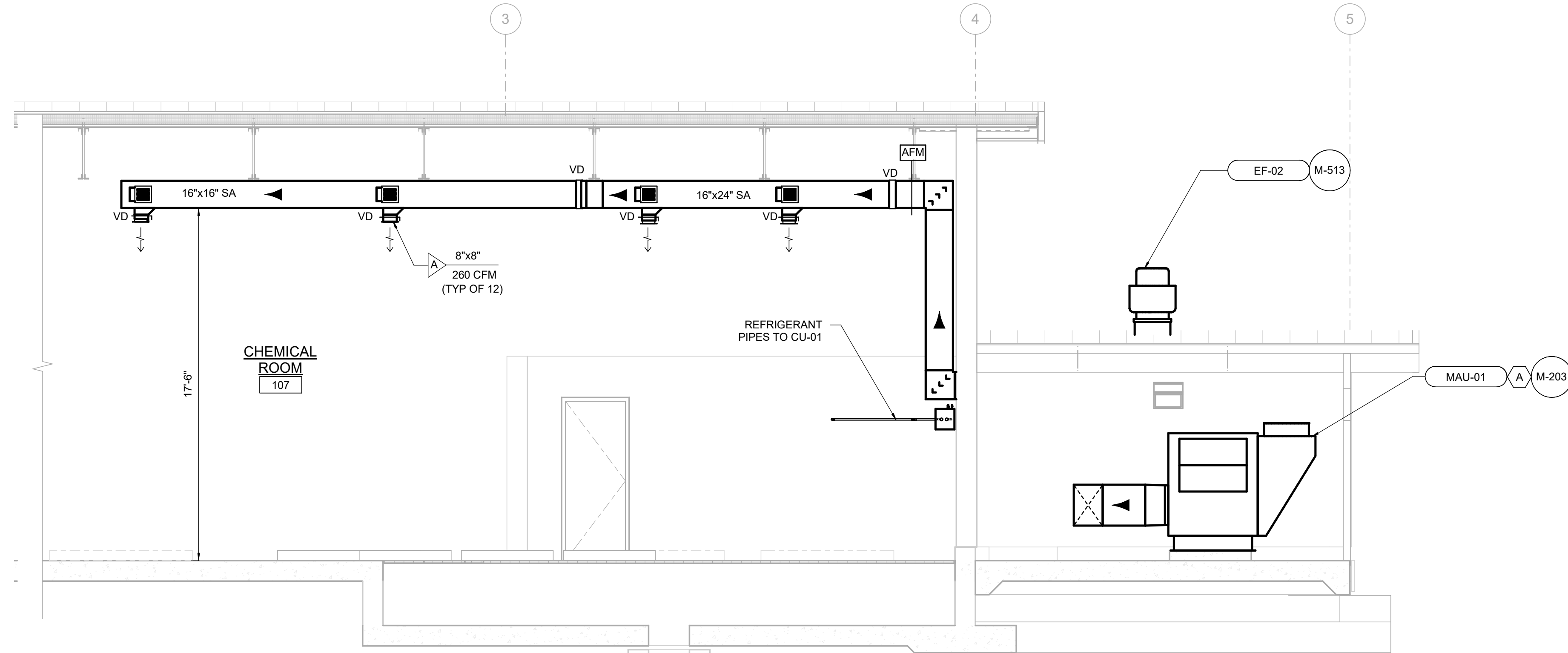
INSTALL REFRIGERANT SHUTOFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. LOCATE SHUTOFF VALVE AND IN ACCESSIBLE AREAS FOR MAINTENANCE.

F.

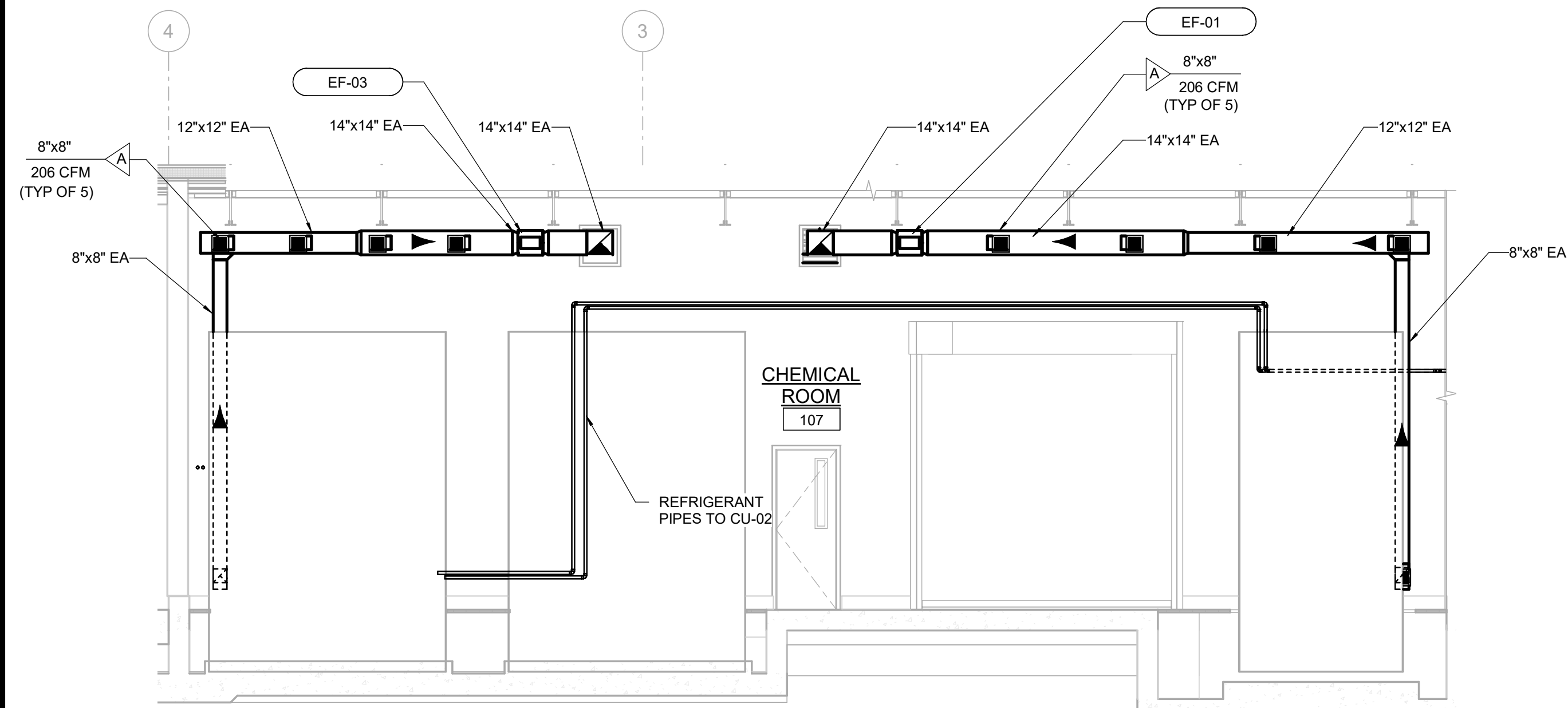
PROVIDE INSULATION FOR VRF SAFETY SHU-OFF VALVE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION MANUAL. INSULATION SHALL BE GLASS WOOL OR POLYETHYLENE, MINIMUM 3/8" THICK.

G.

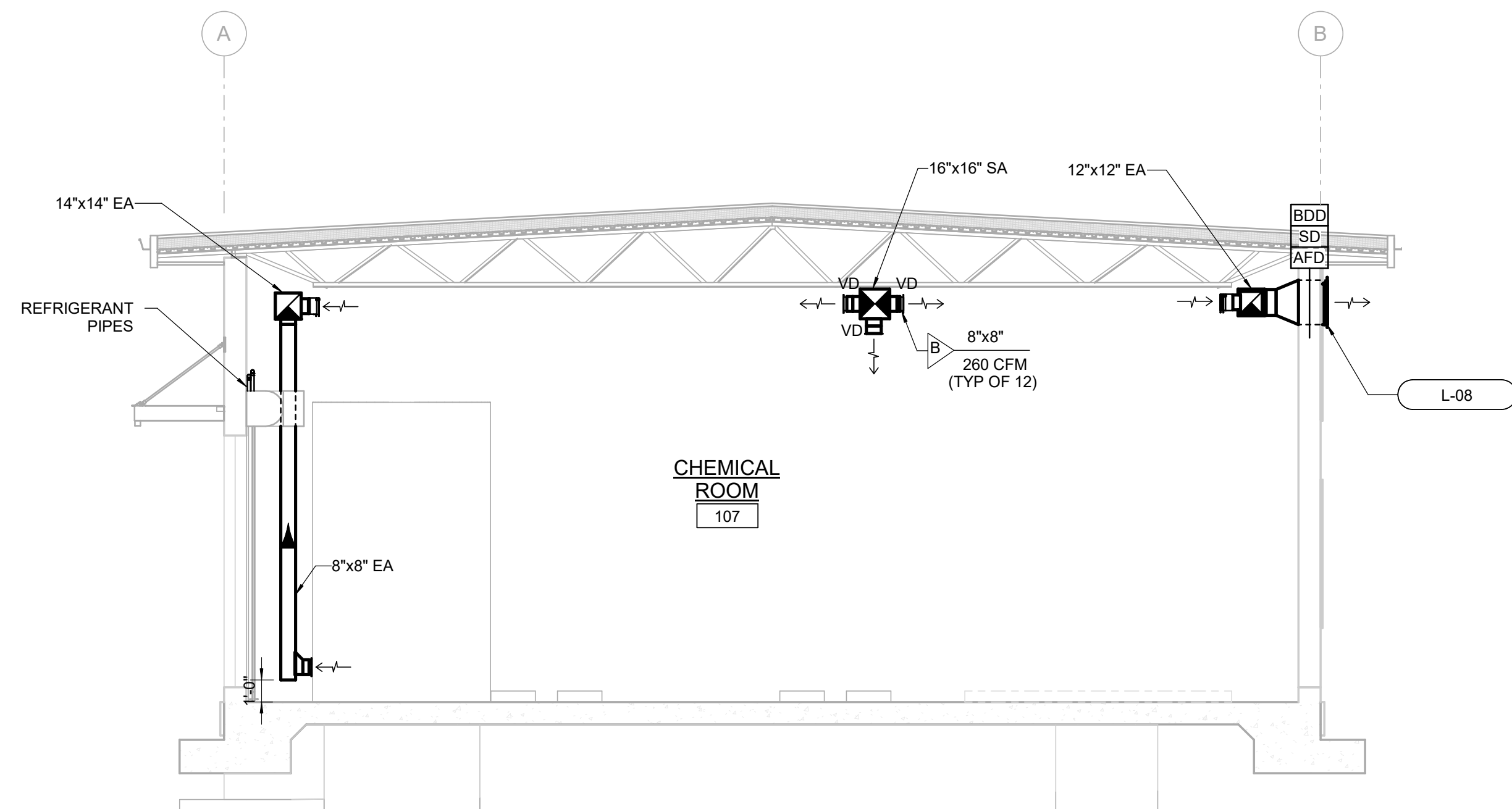
REFRIGERANT PIPING ROUTING SHOWN IS SCHEMATIC. CONTRACTOR SHALL VERIFY FINAL ROUTING AND REQUIRED CLEARANCES PRIOR TO INSTALLATION AND SHALL SUBMIT SHOP DRAWINGS SHOWING REFRIGERANT PIPE SIZES, LENGTHS, AND ASSOCIATED ACCESSORIES IN ACCORDANCE WITH SPECIFICATION 23 23 00 – REFRIGERANT PIPING.



E SECTION
H-102 SCALE: 1/4" = 1'-0"



F SECTION
H-102 SCALE: 3/16" = 1'-0"



G SECTION
H-102 SCALE: 3/16" = 1'-0"

NO.	DATE	BY	REVISION		

NOTICE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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REGISTERED PROFESSIONAL ENGINEER

99804PE

OREGON

MAY 10, 2022

EXPIRES: 06/30/2028

BID SET

WATER QUALITY SYSTEMS BUILDING

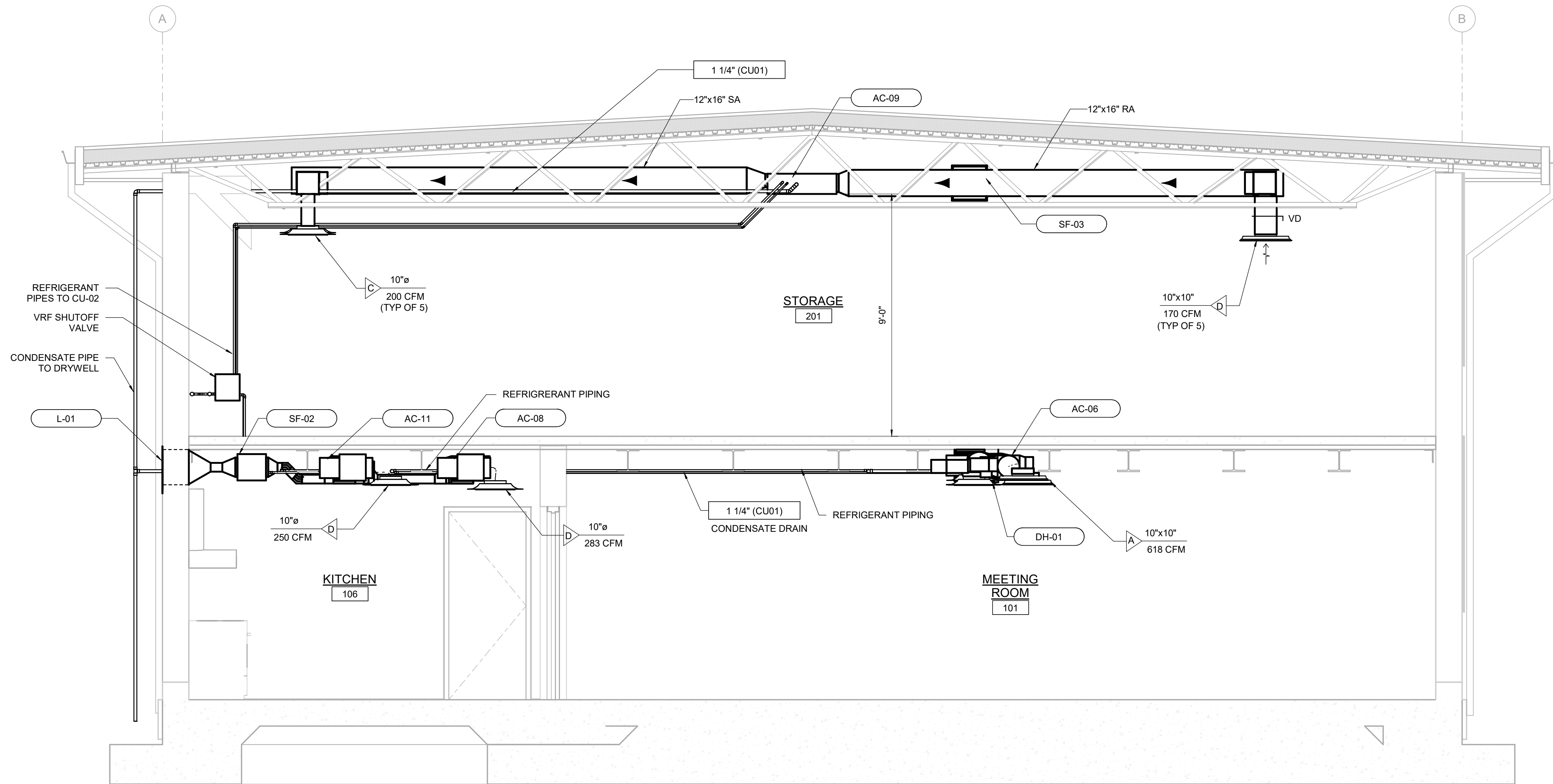
HVAC

SECTIONS

PROJECT NO.: 21-3045 | SCALE: As indicated | DATE: AUGUST 2026

SHEET

H-302



H SECTION
H-101
SCALE: 3/8" = 1'-0"

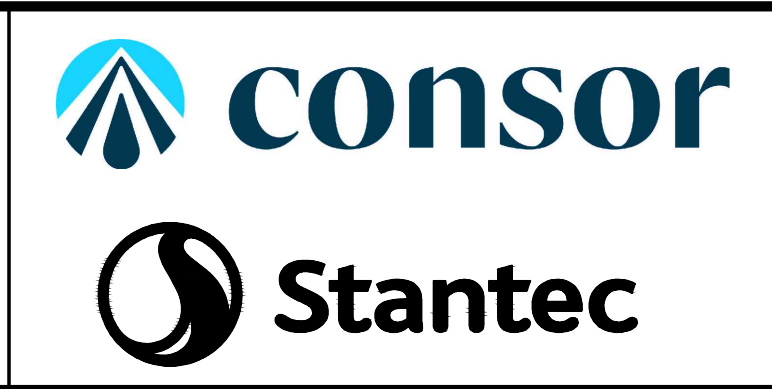
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NOTICE
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HVAC
SECTION
PROJECT NO.: 21-3045 SCALE: 3/8" = 1'-0" DATE: AUGUST 2026

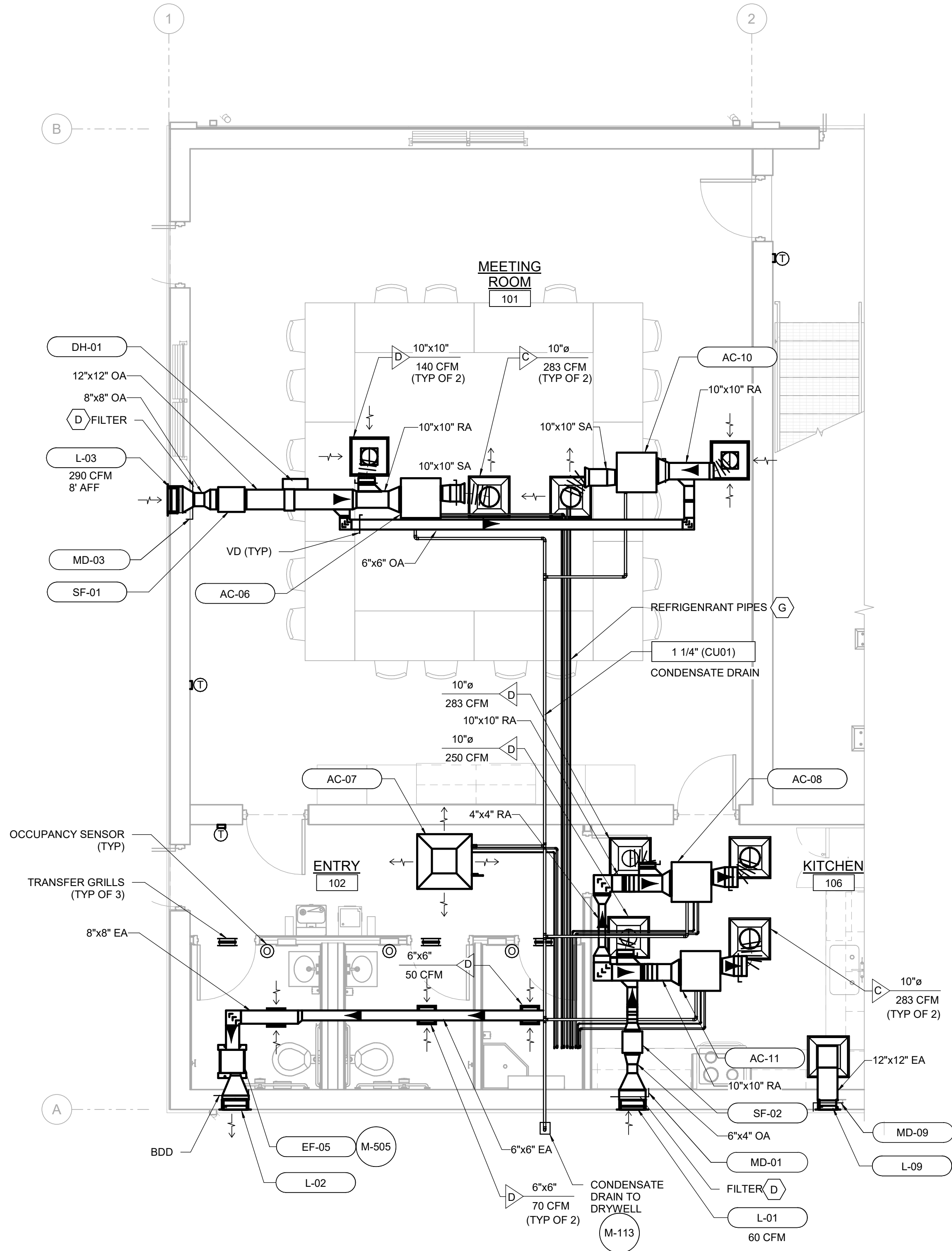
SHEET
H-303

SHEET KEYNOTES

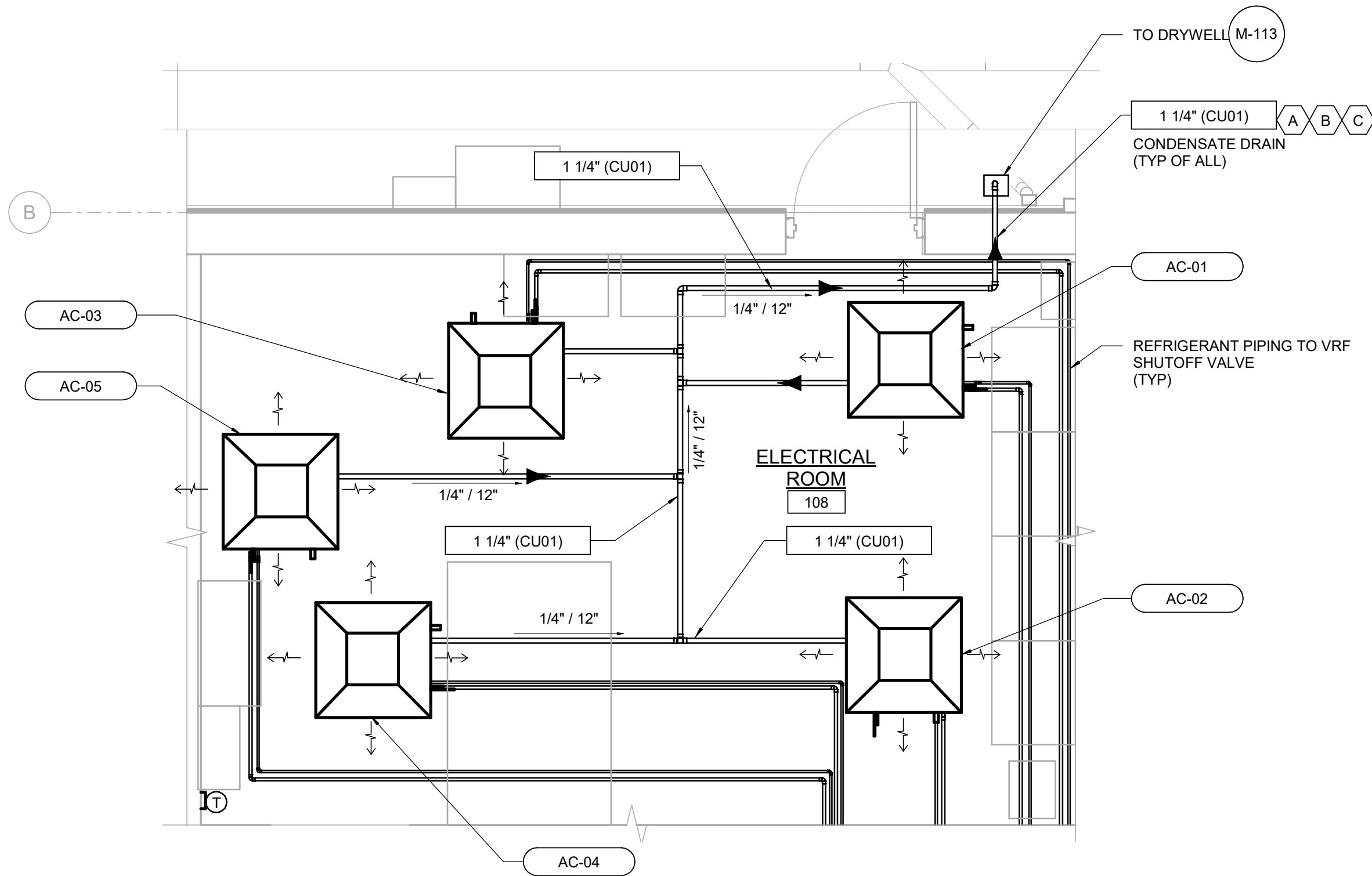
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- D. 2" MERV 8 THROW AWAY PLEATED FILTER
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GENERAL SHEET NOTES

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- 3. NO PIPING OR DUCTWORK SHALL BE LOCATED ABOVE ANY ELECTRICAL PANEL
- 4. PROVIDE DRIP PANS BENEATH ALL PIPING ROUTED DIRECTLY ABOVE ELECTRICAL EQUIPMENT



1 LOW LEVEL ENLARGE PLAN
H-101 SCALE: 1/4" = 1'-0"



2 LOW LEVEL ENLARGE PLAN
H-101 SCALE: 3/8" = 1'-0"

NO.	DATE	BY	REVISION

NOTICE
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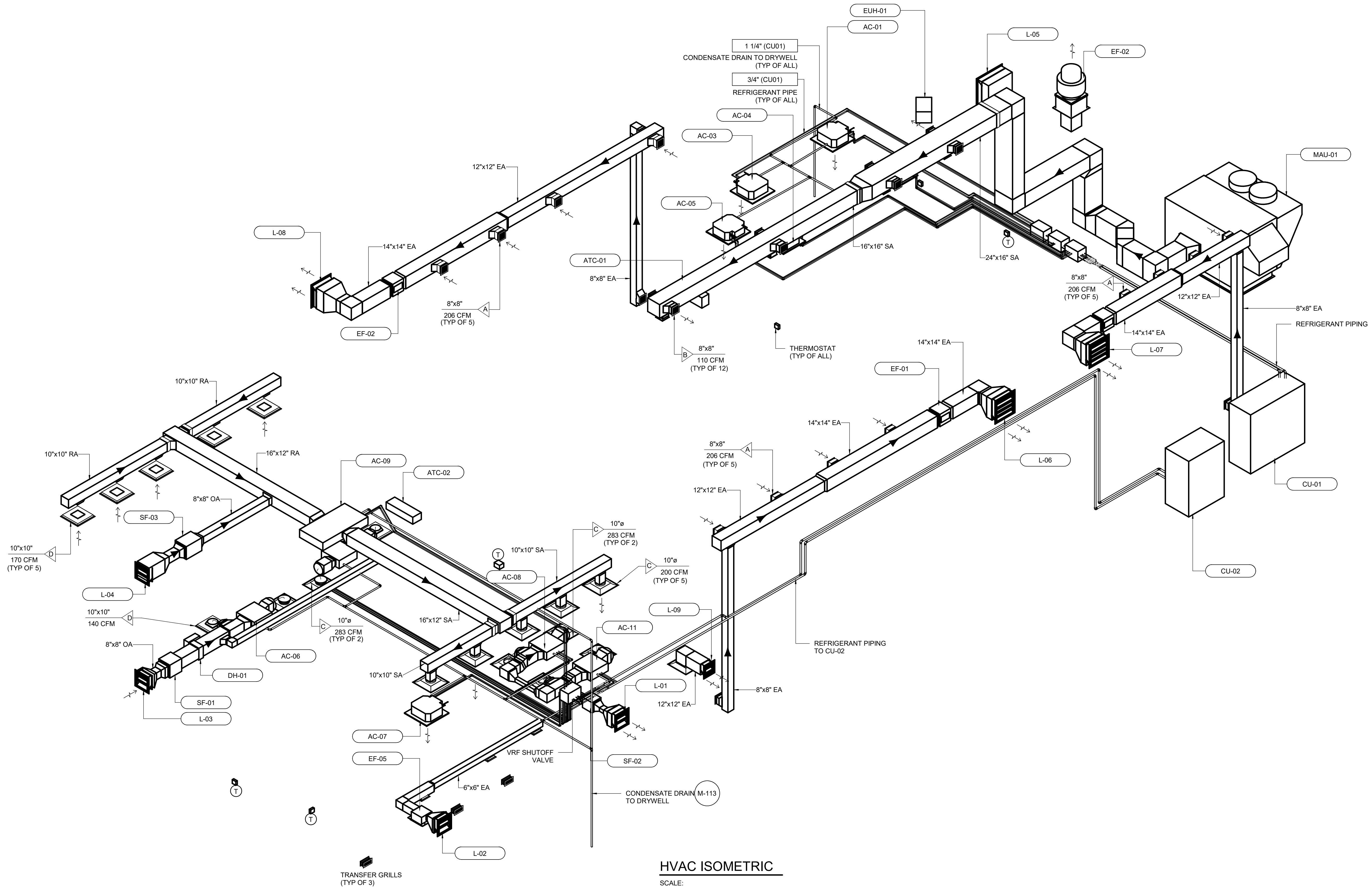


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HVAC		
ENLARGED PLAN		
PROJECT NO.:	21-3045	SCALE: As indicated
DATE:	AUGUST 2026	

SHEET
H-401



HVAC ISOMETRIC

SCALE:

NO.	DATE	BY	REVISION

NOTICE

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EXPIRES: 06/30/2028

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WATER QUALITY SYSTEMS BUILDING

HVAC
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H-901

PROJECT NO.: 21-3045 | SCALE: | DATE: AUGUST 2026