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| ABBREVIATIONS | | | | | | | | | | GENERAL NOTES | | LIST OF DRAWINGS | |
|---------------|-------------------------------|-------|---------------------------------------|-------|--|-----|--------------------------|--|---|---------------|--|------------------|--|
| (A) | ABANDON | DTR | DUAL TEMPERATURE WATER RETURN | IN | INCHES | RHS | REHEAT WATER SUPPLY | <div>1. THE FOLLOWING NOTES APPLY TO ALL MECHANICAL DRAWINGS.</div> <div>2. ALL WORK SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE 2018 AND ALL OTHER APPLICABLE CODES AND STANDARDS.</div> <div>3. MECHANICAL CONTRACTOR SHALL ENSURE 36" MIN. CLEARANCE IN FRONT OF ALL ACCESS PANELS.</div> <div>4. ALL DRAWINGS ARE DIAGRAMMATIC. MECHANICAL CONTRACTOR SHALL CAREFULLY EXAMINE EXISTING CONDITIONS PRIOR TO STARTING WORK.</div> <div>5. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, CLEARANCES AND LOCATIONS PRIOR TO THE START OF CONSTRUCTION. WHEN CONFLICTS ARISE, MAKE ANY NECESSARY CHANGES TO ROUTING OF DUCTWORK AND PIPING AT NO ADDITIONAL COST.</div> <div>6. ALL FLOOR MOUNTED HVAC EQUIPMENT SHALL BE INSTALLED ON 4" HIGH CONCRETE HOUSEKEEPING PADS PROVIDED BY THE MECHANICAL CONTRACTOR.</div> <div>7. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING COORDINATION DRAWINGS SHOWING ALL TRADES. NO EQUIPMENT, PIPING, DUCTWORK, ETC. IS TO BE INSTALLED WITHOUT APPROVAL BY THE ENGINEER.</div> <div>8. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.</div> <div>9. SCHEDULES DO NOT REPRESENT EQUIPMENT QUANTITIES. REFER TO THE PLANS FOR ACTUAL QUANTITIES.</div> <div>10. DUCT SIZES SHOWN ON DRAWINGS REFER TO INSIDE CLEAR DIMENSIONS UNLESS OTHERWISE NOTED.</div> <div>11. ALL BRANCH DUCTS TO SUPPLY/RETURN/EXHAUST REGISTERS AND DIFFUSERS SHALL BE 2" LARGER (WIDER) THAN REGISTER/DIFFUSER NECK SIZE, UNLESS NOTED OTHERWISE.</div> <div>12. MECHANICAL CONTRACTOR SHALL PROVIDE FLEXIBLE CONNECTIONS AT ALL DUCTWORK TO EQUIPMENT CONNECTIONS.</div> <div>13. PROVIDE SUPPLY, RETURN AND EXHAUST DUCTWORK TRANSITIONS AS REQUIRED BY THE PLANS, SPECIFICATIONS, AND ACTUAL JOB CONDITIONS.</div> <div>14. COORDINATE ALL THERMOSTAT/TEMPERATURE SENSOR LOCATIONS WITH THE ARCHITECT PRIOR TO INSTALLATION.</div> <div>15. COORDINATE ALL HUMIDISTAT/HUMIDITY SENSOR LOCATIONS WITH THE ARCHITECT PRIOR TO INSTALLATION.</div> <div>16. MECHANICAL CONTRACTOR SHALL PROVIDE "UL" LISTED FIRE DAMPERS FOR ALL DUCTWORK PENETRATIONS THROUGH FIRE RATED SURFACES AND "UL" LISTED FIRE/SMOKE DAMPERS FOR ALL DUCTWORK PENETRATIONS THROUGH FIRE/SMOKE RATED SURFACES.</div> <div>17. MECHANICAL CONTRACTOR SHALL PROVIDE "UL" LISTED THROUGH PENETRATION FIRESTOP SYSTEMS WITH FIREPROOF SLEEVES AT ALL NEW PIPING PENETRATIONS THRU FIRE RATED WALLS AND FLOORS.</div> <div>18. INDICATED DUCT AND PIPING ARE DIAGRAMMATIC. MECHANICAL CONTRACTOR SHALL DETERMINE ALL REQUIRED OFFSETS AND DIRECTION CHANGES BEFORE FABRICATION AND INSTALLATION TO AVOID INTERFERENCE WITH OTHER TRADES.</div> <div>19. UNLESS OTHERWISE NOTED, ALL DUCTWORK AND PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB/STEEL, WITH SPACE FOR INSULATION.</div> <div>20. MANUFACTURERS AND MODEL NUMBERS INDICATED ON THE PLANS, SCHEDULES AND SKETCHES ARE PROVIDED AS A BASIS OF DESIGN ONLY. BIDDERS SHALL REFER TO THE SPECIFICATIONS FOR A LISTING OF MULTIPLE ACCEPTABLE MANUFACTURERS FOR EACH OF THESE ITEMS. SIMILAR PRODUCTS FROM ANY OF THESE MANUFACTURERS MAY BE FURNISHED PROVIDED THEY MEET THE INTENT OF THE SPECIFICATIONS. ANY CHANGES TO THE DESIGN REQUIRED AS A RESULT OF A SUBSTITUTION ARE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.</div> <div>21. PROVIDE P-TRAP OF SUFFICIENT SEAL DEPTH TO OVERCOME UNIT STATIC PRESSURE ON ALL AIR HANDLING UNITS.</div> <div>22. REFER TO ELECTRICAL DRAWINGS FOR SMOKE DETECTOR LOCATIONS.</div> | <div>MECHANICAL DRAWINGS</div> <div>M001MECHANICAL COVER SHEET</div> <div>M101MECHANICAL FIELD HOUSE DUCTWORK AND ROOF PLANS</div> <div>M102MECHANICAL GROUNDS AND FIELD BUILDING PLAN</div> <div>M201MECHANICAL FIELD HOUSE PIPING PLAN</div> <div>M301MECHANICAL SCHEDULES</div> <div>M401MECHANICAL CONTROLS</div> <div>M501MECHANICAL DETAILS</div> <div>M502MECHANICAL DETAILS</div> <div>M503MECHANICAL DETAILS</div> | | | | |
| AAV | AUTOMATIC AIR VENT | DTS | DUAL TEMPERATURE WATER SUPPLY | INCL | INCLUD(E), (ING) | RL | REFRIGERANT LIQUID | | | | | | |
| AC | AIR CONDITIONER | DWG | DRAWING | INSL | INSULAT(E), (ED), (ION) | RP | RADIANT PANEL | | | | | | |
| ABS | ABSOLUTE | (E) | EXISTING | INT | INTERIOR | RPM | REVOLUTIONS PER MINUTE | | | | | | |
| ABV | ABOVE | EA | EXHAUST AIR | I/O | INPUT/OUTPUT | RS | REFRIGERANT SUCTION | | | | | | |
| AD | ACCESS DOOR | EAT | ENTERING AIR TEMPERATURE | IPS | INTERNATIONAL PIPE STANDARD | RTU | ROOFTOP UNIT | | | | | | |
| AFF | ABOVE FINISHED FLOOR | EBH | ELECTRIC BASEBOARD HEATER | KW | KILOWATT | RV | RELIEF VALVE | | | | | | |
| AFS | AIR FLOW STATION | EC | ELECTRICAL CONTRACTOR | L | LOUVER OR LENGTH | SA | SUPPLY AIR | | | | | | |
| AHU | AIR HANDLING UNIT | EER | ENERGY EFFICIENCY RATIO | LAT | LEAVING AIR TEMP | SD | SUPPLY DIFFUSER | | | | | | |
| AI | ANALOG INPUT | EF | EXHAUST FAN | LB | POUND | SEC | SECONDS | | | | | | |
| AO | ANALOG OUTPUT | EG | EXHAUST AIR GRILLE | LD | LINEAR DIFFUSER | SF | SUPPLY FAN | | | | | | |
| AP | ACCESS PANEL | EHC | ELECTRIC HEATING COIL | LF | LINEAR FEET | SG | SUPPLY GRILLE | | | | | | |
| APD | AIR PRESSURE DROP | ELEC | ELECTRICAL | LPG | LIQUEFIED PETROLEUM GAS | SP | STATIC PRESSURE | | | | | | |
| ATC | AUTOMATIC TEMPERATURE CONTROL | ELEV | ELEVATION | LPR | LOW PRESSURE STEAM CONDENSATE RETURN | SQ | SQUARE | | | | | | |
| ATM | ATMOSPHERE | ENT | ENTERING | LPS | LOW PRESSURE STEAM | SR | SUPPLY REGISTER | | | | | | |
| AS | AIR SEPARATOR | EQUIP | EQUIPMENT | LVG | LEAVING | ST | SOUND TRAP | | | | | | |
| AVG | AVERAGE | ER | EXHAUST REGISTER | LVR | LOUVER | STC | STEAM CONDENSATE | | | | | | |
| AWT | AVERAGE WATER TEMPERATURE | ERU | ENERGY RECOVERY UNIT | LWT | LEAVING WATER TEMP | STM | STEAM | | | | | | |
| BCU | BLOWER COIL UNIT | ESP | EXTERNAL STATIC PRESSURE | MAU | MAKEUP AIR UNIT | TDH | TOTAL DYNAMIC HEAD | | | | | | |
| BDD | BACK DRAFT DAMPER | ET | EXPANSION TANK | MAV | MANUAL AIR VENT | TDV | TRIPLE DUTY VALVE | | | | | | |
| BFP | BACKFLOW PREVENTER | EWB | ELECTRIC WALL HEATER | MAX | MAXIMUM | TG | TRANSFER GRILLE | | | | | | |
| BFW | BOILER FEEDWATER | EWI | ENTERING WATER TEMPERATURE | MBH | 1,000 BTUH | TSP | TOTAL STATIC PRESSURE | | | | | | |
| BFWP | BOILER FEEDWATER PUMP | EXP | EXPANSION | MC | MECHANICAL CONTRACTOR | TYP | TYPICAL | | | | | | |
| BI | BINARY INPUT | F | FAHRENHEIT | MECH | MECHANICAL | UC | UNDER CUT | | | | | | |
| BLR | BOILER | FA | FACE AREA | MIN | MINIMUM | UH | UNIT HEATER | | | | | | |
| BLW | BELOW | FBD | FACE & BYPASS DAMPER | MISC | MISCELLANEOUS | UNO | UNLESS NOTED OTHERWISE | | | | | | |
| BNR | BURNER | F&T | FLOAT & THERMOSTATIC | (N) | NEW | UV | UNIT VENTILATOR | | | | | | |
| BO | BINARY OUTPUT | FC | FLEXIBLE CONNECTION | NC | NOISE CRITERIA | VA | VOLT AMPERE | | | | | | |
| BOD | BOTTOM OF DUCT | FCU | FAN COIL UNIT | NK | NECK | VAV | VARIABLE AIR VOLUME | | | | | | |
| BOP | BOTTOM OF PIPE | FD | FIRE DAMPER | NTS | NOT TO SCALE | VB | VACUUM BREAKER | | | | | | |
| BTU | BRITISH THERMAL UNIT | FF | FINAL FILTER | OA | OUTSIDE AIR | VD | VOLUME DAMPER | | | | | | |
| BTUH | BTU PER HOUR | FIN | FINISH | OAD | OUTSIDE AIR DAMPER | VEL | VELOCITY | | | | | | |
| BYP | BYPASS | FLR | FLOOR | OAI | OUTSIDE AIR INTAKE | VFD | VARIABLE FREQUENCY DRIVE | | | | | | |
| C | CONVECTOR | FO | FUEL OIL | OAT | OUTSIDE AIR TEMPERATURE | VP | VELOCITY PRESSURE | | | | | | |
| CAP | CAPACITY | FOP | FUEL OIL PUMP | OD | OUTSIDE DIMENSIONS OR OUTSIDE DIAMETER | W | WIDTH | | | | | | |
| CAV | CONSTANT AIR VOLUME | FOR | FUEL OIL RETURN | OED | OPEN END DUCT | W/ | WITH | | | | | | |
| CC | COOLING COIL | FOS | FUEL OIL SUPPLY | OS&Y | OUTSIDE SCREW & YOKE | WB | WET BULB | | | | | | |
| CD | CONDENSATE DRAIN | FOV | FUEL OIL VENT | P | PUMP | W/O | WITHOUT | | | | | | |
| CFM | CUBIC FEET PER MINUTE | FTR | FINNED TUBE RADIATION | PD | PRESSURE DROP | WC | WATER COLUMN | | | | | | |
| CH | CHILLER | G | NATURAL GAS | PF | PRE FILTER | WH | WATER HEATER | | | | | | |
| CHWP | CHILLED WATER PUMP | GAL | GALLON | PH | PHASE | WMS | WIRE MESH SCREEN | | | | | | |
| CHWR | CHILLED WATER RETURN | GC | GENERAL CONTRACTOR | PHC | PREHEAT COIL | WT | WEIGHT | | | | | | |
| CHWS | CHILLED WATER SUPPLY | GPH | GALLONS PER HOUR | PHR | PREHEAT WATER RETURN | | | | | | | | |
| CKT | CIRCUIT | GPM | GALLONS PER MINUTE | PHS | PREHEAT WATER SUPPLY | | | | | | | | |
| CLG | CEILING | GRV | GRAVITY RELIEF VENTILATOR | PLMB | PLUMBING | | | | | | | | |
| CONC | CONCRETE | H | HUMIDIFIER | PPM | PARTS PER MILLION | | | | | | | | |
| COP | COEFFICIENT OF PERFORMANCE | HC | HEATING COIL | PRV | PRESSURE REDUCING VALVE | | | | | | | | |
| CP | CONDENSATE PUMP | HOA | HAND OFF AUTO | PSI | POUNDS PER SQUARE INCH | | | | | | | | |
| CRP | CONDENSATE RETURN PUMP | HORIZ | HORIZONTAL | PSIA | POUNDS PER SQUARE INCH ABSOLUTE | | | | | | | | |
| CT | COOLING TOWER | HP | HEAT PUMP OR HORSEPOWER | PSIG | POUNDS PER SQUARE INCH GAUGE | | | | | | | | |
| CU | CONDENSING UNIT | HPLR | HEAT PUMP WATER LOOP RETURN | PTAC | PACKAGED TERMINAL AIR CONDITIONER | | | | | | | | |
| CUH | CABINET UNIT HEATER | HPLS | HEAT PUMP WATER LOOP SUPPLY | PUH | PROPELLER UNIT HEATER | | | | | | | | |
| CW | COLD WATER (DOMESTIC) | HPR | HIGH PRESSURE STEAM CONDENSATE RETURN | PVC | POLYVINYL CHLORIDE | | | | | | | | |
| CWP | CONDENSER WATER PUMP | HPS | HIGH PRESSURE STEAM | QTY | QUANTITY | | | | | | | | |
| CWR | CONDENSER WATER RETURN | HR | HOUR | (R) | REMOVE | | | | | | | | |
| CWS | CONDENSER WATER SUPPLY | HT | HEIGHT | RA | RETURN AIR | | | | | | | | |
| DB | DRY BULB TEMPERATURE | HW | HOT WATER | RAG | RELIEF AIR GRILLE | | | | | | | | |
| DDC | DIRECT DIGITAL CONTROL | HWP | HOT WATER PUMP | RAV | RELIEF AIR VENT | | | | | | | | |
| DEG | DEGREE | HWR | HEATING HOT WATER RETURN | (REL) | RELOCATE | | | | | | | | |
| DIA | DIAMETER | HWS | HEATING HOT WATER SUPPLY | RF | RETURN FAN | | | | | | | | |
| DN | DOWN | HZ | HERTZ | RG | RETURN GRILLE | | | | | | | | |
| DOAS | DEDICATED OUTSIDE AIR SYSTEM | ID | INSIDE DIMENSIONS OR INSIDE DIAMETER | RH | RELATIVE HUMIDITY | | | | | | | | |
| DS | DUCT SILENCER | IH | INFRARED HEATER | RHR | REHEAT WATER RETURN | | | | | | | | |

TESD CONESTOGA
ATHLETIC FIELDS

TREDYFFRIN TOWNSHIP
CHESTER COUNTY, PA

HSA PROJECT # :21-019


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| SYMBOL LEGEND | | | | | | | | | | | |
|---------------|--|--|---|--|--|--|--|--|---------------------------------|--|-----------------------------|
| | EQUIPMENT MARKER (TYPE SF, NUMBER 1) | | OGEE OFFSET | | BALL VALVE | | PIPE REDUCER | | DUAL TEMPERATURE SUPPLY PIPE | | DENOTES CONNECT TO EXISTING |
| | SECTION INDICATOR (SECTION 1 ON DWG M301) | | MITRE OFFSET | | LOCKSHIELD BALL VALVE | | PIPE FLANGE | | DUAL TEMPERATURE RETURN PIPE | | DENOTES LIMIT OF DEMOLITION |
| | DETAIL INDICATOR (DETAIL 1 ON DWG M501) | | FLEXIBLE DUCT CONNECTION | | BUTTERFLY VALVE | | PIPE UNION | | HEAT PUMP LOOP SUPPLY PIPE | | EXISTING WORK TO REMAIN |
| | KEY NOTE INDICATOR (REFERS TO NOTES ON SAME SHEET) | | BELLMOUTH TAKE-OFF | | GATE VALVE | | Y-TYPE STRAINER | | HEAT PUMP LOOP RETURN PIPE | | WORK TO BE REMOVED |
| | INSIDE DUCT DIMENSIONS (IN INCHES, FIRST DIM AS VIEWED) DASHED LINED INDICATES INTERNAL LINING | | FLEXIBLE DUCT | | OS&Y GATE VALVE | | FUNNEL DRAIN | | HIGH PRESSURE STEAM SUPPLY PIPE | | NEW WORK |
| | RECTANGULAR SUPPLY DUCT TURNED UP | | BELLMOUTH TAKE-OFF | | GLOBE VALVE | | RELIEF VALVE | | HIGH PRESSURE STEAM RETURN PIPE | | |
| | RECTANGULAR SUPPLY DUCT TURNED DOWN | | DUCT TO OFFSET UP IN DIRECTION OF ARROW TO AVOID OBSTRUCTION | | PLUG VALVE | | AIR VENT | | HOT WATER SUPPLY PIPE | | |
| | ROUND DUCT TURNED UP | | FIRE DAMPER | | 3-WAY CONTROL VALVE | | THERMOMETER IN THERMOWELL | | HOT WATER RETURN PIPE | | |
| | ROUND DUCT TURNED DOWN | | FLEXIBLE DUCT | | 2-WAY CONTROL VALVE | | PRESSURE GAUGE W/SHUTOFF COCK | | FUEL OIL SUPPLY PIPE | | |
| | RECTANGULAR RETURN/EXHAUST DUCT TURNED UP | | SMOKE DAMPER | | PRESSURE REDUCING VALVE | | PRESSURE GAUGE W/SYPHON AND SHUTOFF COCK | | LOW PRESSURE STEAM SUPPLY PIPE | | |
| | RECTANGULAR RETURN/EXHAUST DUCT TURNED DOWN | | BACKDRAFT DAMPER | | GAS PRESSURE REGULATOR | | TEMPERATURE AND PRESSURE PORT | | LOW PRESSURE STEAM RETURN PIPE | | |
| | SQUARE ELBOW WITH TURNING VANE | | MOTORIZED ATC DAMPER | | CHECK VALVE | | FLEXIBLE PIPE CONNECTION | | PUMPED STEAM CONDENSATE | | |
| | ROUND ELBOW OR RADIUS ELBOW | | COMBINATION FIRE/SMOKE DAMPER | | CALIBRATED BALANCING VALVE | | PIPE CAP | | COOLING COIL CONDENSATE DRAIN | | |
| | | | 8"Ø 200 CFM GRILLE, REGISTER, DIFFUSER (GRD) MARKER (TAG A, 8"Ø NECK, 200 CFM) S=SUPPLY R=RETURN E=EXHAUST T=TRANSFER | | AUTOMATIC FLOW CONTROL VALVE | | TRIPLE DUTY VALVE (COMBINATION CHECK, BALANCING, SHUTOFF) | | PREHEAT SUPPLY PIPE | | |
| | | | SUPPLY AIR DIFFUSER (BLACK TRIANGLE INDICATES BLANK-OFF) | | TDV | | PIPE TURNED DOWN | | PREHEAT RETURN PIPE | | |
| | | | RETURN/EXHAUST GRILLE OR REGISTER | | PIPE ANCHOR | | PIPE TURNED UP | | REHEAT SUPPLY PIPE | | |
| | | | | | PIPE GUIDE | | TEE TURNED DOWN | | REHEAT RETURN PIPE | | |
| | | | | | PIPE EXPANSION JOINT/EXPANSION COMPENSATOR | | TEE TURNED UP | | PUMP | | |
| | | | | | FLOW SWITCH | | CHILLED WATER SUPPLY PIPE | | THERMOSTAT/TEMPERATURE SENSOR | | |
| | | | | | PRESSURE SWITCH | | CHILLED WATER RETURN PIPE | | HUMIDITY SENSOR | | |
| | | | | | | | CONDENSER WATER SUPPLY PIPE | | STATIC PRESSURE SENSOR | | |
| | | | | | VENTURI FLOW MEASURING DEVICE | | CONDENSER WATER RETURN PIPE | | CARBON DIOXIDE SENSOR | | |
| | | | | | PITOT DEVICE | | DOOR TO BE UNDERCUT 3/4" | | | | |

PLAN
NORTH

| ISSUE HISTORY | | |
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SHEET TITLE
**MECHANICAL
COVER SHEET**

DRAWING NUMBER
M001

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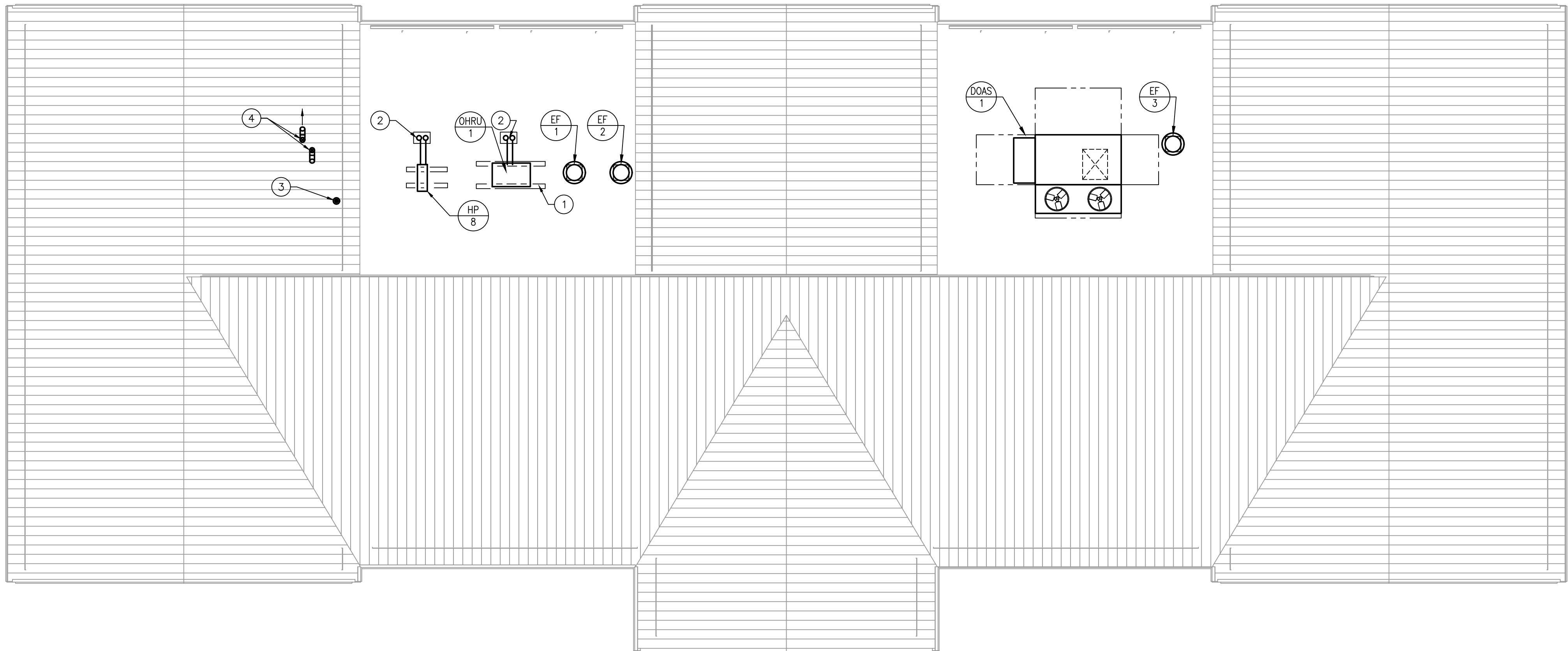
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GENERAL NOTES:

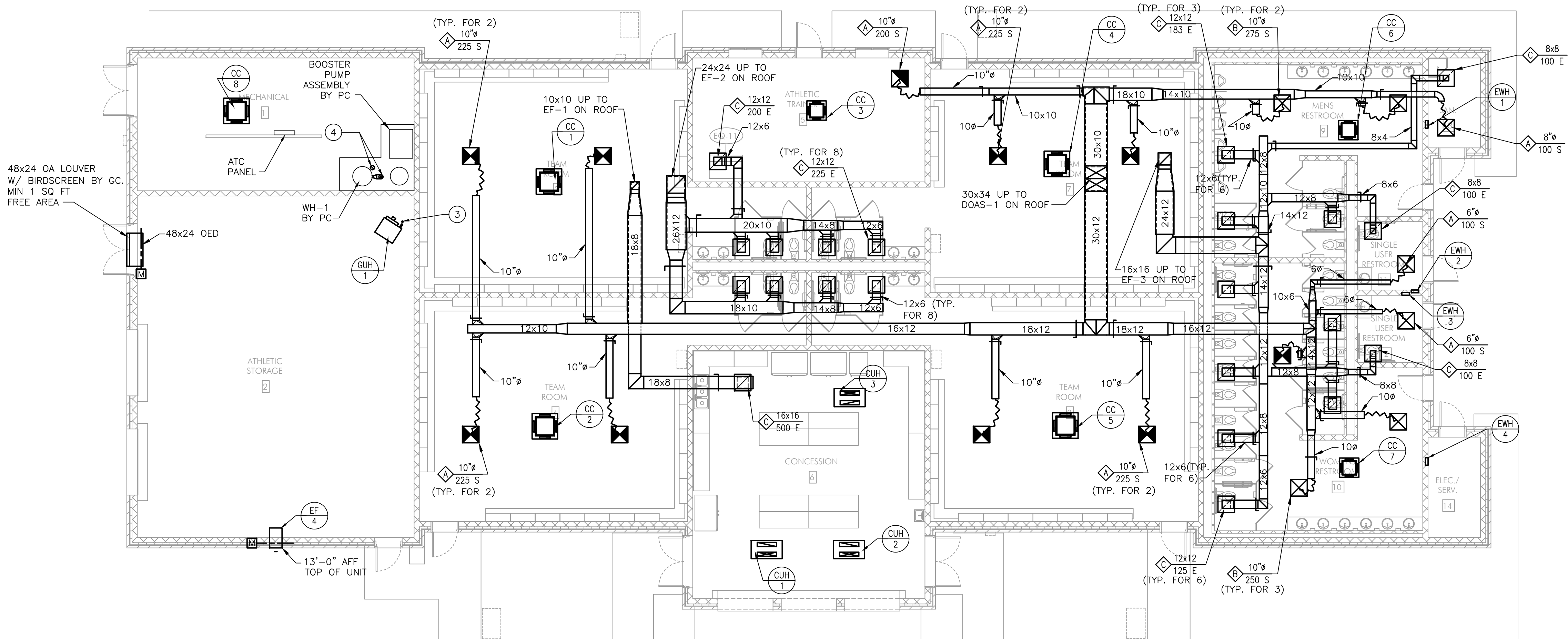
1. REFER TO DRAWING M001 FOR GENERAL NOTES.
2. PROVIDE ACOUSTICAL LINING ON FIRST 10 FT OF SUPPLY DUCT & FIRST 10 FT OF EXHAUST DUCTWORK ON ALL DOAS & EFS. REFER TO SPECIFICATION 233113 FOR ADDITIONAL LINER REQUIREMENTS.

NEW WORK KEY NOTES:

- 1 PROVIDE AND INSTALL EQUIPMENT SUPPORTS SIMILAR TO PATE MODEL ES AND ANCHOR CU TO CURB. ANCHOR CURB TO STRUCTURE WITH ANCHOR BOLTS. EQUIPMENT SUPPORT TO EXTEND PAST CONDENSING UNIT BY MIN 1' FOR MOUNTING OF RECEPTACLE & DISCONNECT BY EC.
- 2 REFRIGERANT PIPING DN TO INDOOR UNIT. PROVIDE AND INSTALL NEW PIPE CURB SIMILAR TO ROOF PENETRATION HOUSING AW SERIES WITH WITH ALL BOOTS AND CLAMPS AS REQUIRED FOR NEW REFRIGERANT PIPING AND ELECTRICAL CONDUITS. COORDINATE WITH EC FOR LOCATIONS AND QUANTITY OF CONDUITS. CUT OPENINGS AS REQUIRED. ANCHOR CURB TO STRUCTURE. REFER TO ARCHITECTURAL PLANS FOR FLASHING OF ROOF.
- 3 WH 2" CPVC INTAKE & EXHAUST UP THRU ROOF W/ CONCENTRIC VENT. REFER TO DETAIL 10, DWG M502 FOR TERMINATION REQUIREMENTS.
- 4 WH 6" CPVC INTAKE & 6" CPVC EXHAUST UP THRU ROOF. REFER TO DETAIL 9, DWG M502 FOR TERMINATION REQUIREMENTS.



2 FIELD HOUSE - ROOF
M101 1/8" = 1'-0"



1 FIELD HOUSE FLOOR PLAN- DUCTWORK
M101 1/8" = 1'-0"



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SHEET TITLE

**MECHANICAL FIELD
HOUSE DUCTWORK
AND ROOF PLANS**

DRAWING NUMBER

M101

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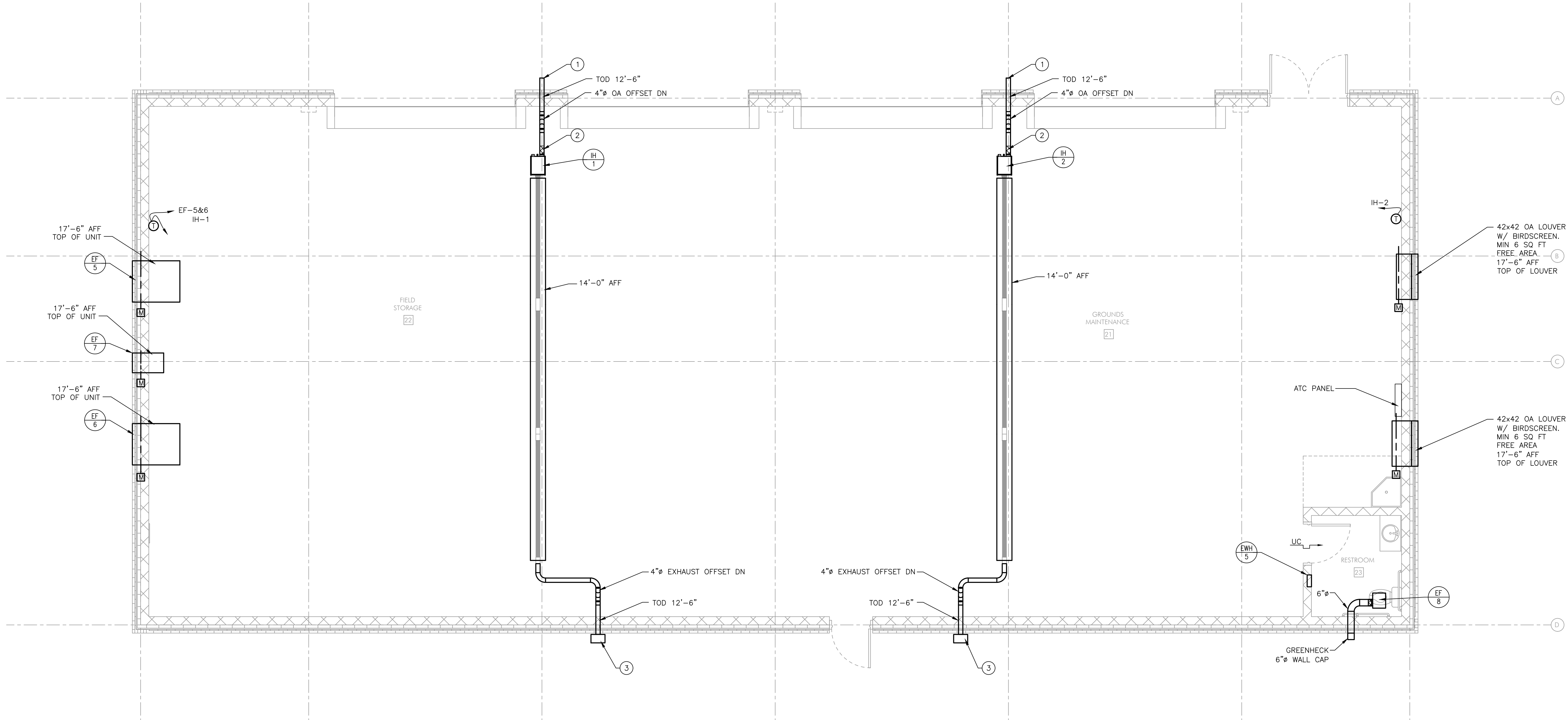
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GENERAL NOTES:
1. REFER TO DRAWING M001 FOR GENERAL NOTES.

NEW WORK KEY NOTES:
1 4" INFRARED HEATER INTAKE THRU WALL TO ROBERTS GORDON 4" VENT CAP W/ BIRD SCREEN.
2 PROVIDE CORRUGATED 0.006" THICK FLEXIBLE STAINLESS STEEL DUST CONNECTION.
3 PROVIDE 4" INFRARED HEATER EXHAUST PIPING TERMINATION WITH INTEGRAL WALL THIMBLE ROBERTS GORDON P/N 90502100. SEAL AROUND PENETRATION WITH THERMAL INSULATING CAULKING. CENTER TERMINATION BETWEEN WINDOWS. REFER TO SPECIFICATION 235523 FOR ADDITIONAL EXHAUST VENT REQUIREMENTS.



1 GROUND
M102 1/4" = 1'-0"



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SHEET TITLE

**MECHANICAL
GROUNDS & FIELDS
BUILDING PLAN**

DRAWING NUMBER

M102

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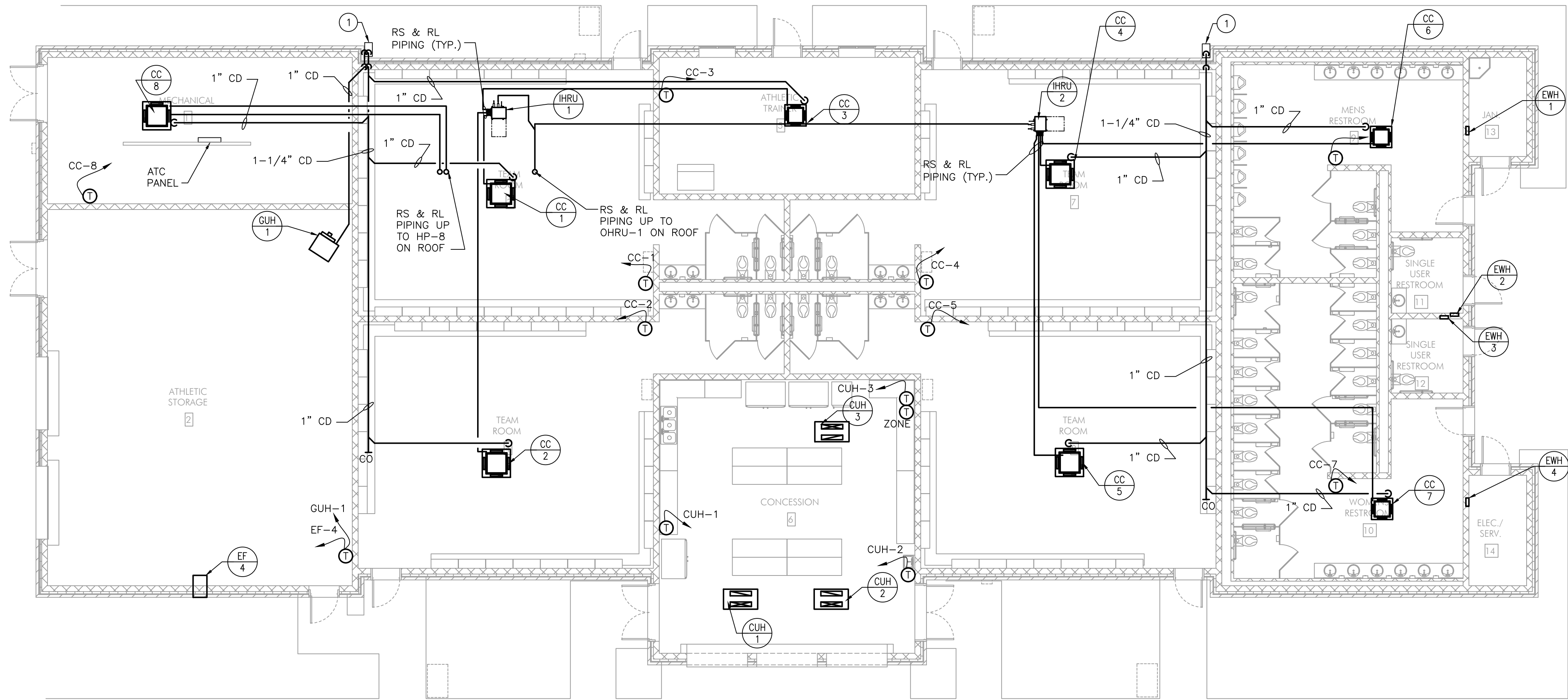
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NOTES:

1. FOR GENERAL NOTES, REFER TO DRAWING M0-1.

NEW WORK KEY NOTES:

- ① RUN 1-1/4" CONDENSATE DN IN WALL TO EXTERIOR, W/ ELBOW DN AND SPILL 4" ABOVE GRADE ONTO CONCRETE SPLASH BLOCK. MAKE PENETRATION THROUGH WALL WEATHER-TIGHT. CONNECT CONDENSATE PIPING TO UNIT.



1 FIELD HOUSE FLOOR PLAN
M201 1/8" = 1'-0"

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|---|------------|------------|
| | 2024-03-18 | BID ISSUE |

SHEET TITLE

**MECHANICAL FIELD
HOUSE PIPING PLAN**

DRAWING NUMBER

M201



PROJECT TEAM

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DOAS UNIT SCHEDULE

| DOAS UNIT SCHEDULE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------------------|---|---------------------|---|------------|---|-----|---|---------|---|-------|--|-------|--------------|-----------------|--------------------|---------------|------------------|---------------------|----------------|---------|------------|-------------|--------------|---------|--------|--------|----------------------------|-------|------------|-------|-------|--------|------------------------------|---------------------|-----------------------|--|--------------------|-----------|---------------|--------------------------------|-------|--------------------------|
| DOAS TAG | AREA SERVED | MAX SUPPLY CFM | MINIMUM COOLING CFM | MINIMUM OA CFM | SUPPLY FAN | | | | | D/X COOLING @ 95 °F | | | | | | | | | | HOT GAS REHEAT | | | GAS HEAT | | | | | ELECTRICAL CHARACTERISTICS | | | | | EER | MAXIMUM DIMENSIONS L x W x H | AIRFLOW ARRANGEMENT | OPERATING WEIGHT LBS. | BASIS OF DESIGN MANUFACTURER AND MODEL NO. | | | | | | |
| | | | | | ESP IN. WC | TSP IN. WC | BHP | HP | FAN RPM | ENT AIR | | LVG AIR | | FACE VEL FPM | GROSS TOTAL MBH | GROSS SENSIBLE MBH | NET TOTAL MBH | NET SENSIBLE MBH | CONDENSER FAN MOTOR | | | COMPRESSOR | | CAPACITY MBH | LVG AIR | | AIR | | | | | | | | | | | HEATING MODULATION | INPUT MBH | OUTPUT MBH | MANIFOLD GAS PRESSURE IN. W.C. | | |
| | | | | | | | | | | DB °F | WB °F | DB °F | WB °F | | | | | | NO. | H.P. EA. | FLA EA. | NO. | RLA EA. 1/2 | | DB °F | WB ° F | ENT °F | LVG °F | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | VOLTS | PHASE | CYCLE | MCA | | | | | | | | | | MOCP | |
| DOAS-1 | TEAM ROOMS/RESTROOMS | 3,600 | 3,600 | 3,600 | 1.5 | 2.3 | 2.1 | 3 | 1170 | 93.0 | 76.0 | 55.1 | 56.6 | 181 | 246.7 | 143.0 | 240.7 | 137.0 | 2 | 1 | 3.6 | 2 | 14.7/14.8 | 63.4 | 72 | 61.3 | 0.0 | 84.3 | 13:1 | MODULATING | 405 | 328.1 | 6-10.5 | 460 | 3 | 60 | 50 | 60 | 12.2 | 111"x101"x60" | DOWNFLOW | 2,900 | AAON RN-020-3-0-HA09-38B |
| 1. PROVIDE UNIT COMPLETE W/ FACTORY MOUNTED, NON-FUSED DISCONNECT SWITCH. | | 3. PROVIDE UNIT COMPLETE W/ 0-100% OUTSIDE AIR ECONOMIZER DAMPERS AND HOODS. | | 5. PROVIDE UNIT COMPLETE W/ HOT GAS REHEAT COIL WITH RH SENSOR. | | 9. PROVIDE UNIT COMPLETE W/ HOT GAS REHEAT AIR TEMPERATURE SENSOR. | | 11. PROVIDE UNIT COMPLETE W/ TERMINAL STRIP CONTROL INTERFACE. REFER TO SPECIFICATION DWG M401 FOR ADDITIONAL REQUIREMENTS. | | 13. PROVIDE UNIT COMPLETE W/ MINIMUM 18" HIGH ROOF CURB. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. PROVIDE UNIT COMPLETE W/VARIABLE CAPACITY LEAD COMPRESSOR. | | 4. PROVIDE UNIT COMPLETE W/SUPPLY FAN WITH VFD DRIVE & HIGH EFFICIENCY MOTOR. | | 6. PROVIDE UNIT COMPLETE W/ 2" PLEATED MERV 13 FILTERS. | | 10. PROVIDE UNIT COMPLETE W/ VARIABLE SPEED CONDENSER FAN WITH HEAD PRESSURE CONTROL AND VFD FOR BOTH FANS. | | 12. PROVIDE UNIT COMPLETE W/ LED SERVICE LIGHTS &CONVENIENCE OUTLET WIRED TO LINE SIDE OF DISCONNECT. | | 14. PROVIDE UNIT COMPLETE W/ A SHORT CIRCUIT CURRENT RATING OF 35 KAIC. | | 15. PROVIDE UNIT COMPLETE W/ MODULATING GAS HEAT W/ STAINLESS STEEL GAS HEAT EXCHANGER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| GAS-FIRED INFRARED HEATER | | | | | | | | | | | | | | |
|---------------------------|----------------------|----|---------------------|---------------|--------------------------|------------------------------------|-------------------------|----------------------------|-------|-------|-----|------------------------------|--------------------|--|
| UNIT TAG | AREA SERVED | | MODULATING GAS HEAT | | INLET PRESSURE (N. W.C.) | RADIANT TUBE REFLECTOR LENGTH (FT) | RADIANT TUBE DIA. (IN.) | ELECTRICAL CHARACTERISTICS | | | | MAXIMUM DIMENSIONS L x W x H | MOUNT HEIGHT (FT.) | BASIS OF DESIGN MANUFACTURER AND MODEL NO. |
| | | | HEAT INPUT MBH | MAX INPUT MBH | | | | VOLTS | PHASE | CYCLE | MCA | | | |
| | | | | | | | | | | | | | | |
| IH-1 | GROUND'S MAINTENANCE | 21 | 75-115 | 115 | 5.5-14 | 30 | 4 | 120 | 1 | 60 | 4.8 | 378"x21"x10" | 14'-0" | RG VANTAGE CTH3-115-30A |
| IH-2 | FIELD STORAGE | 22 | 75-115 | 115 | 5.5-14 | 30 | 4 | 120 | 1 | 60 | 4.8 | 378"x21"x10" | 14'-0" | RG VANTAGE CTH3-115-30A |

PROVIDE ALL UNITS COMPLETE WITH WALL-MOUNTED, NON-FUSED DISCONNECT SWITCH PROVIDED AND INSTALLED BY EC.
PROVIDE ALL UNITS COMPLETE WITH HIGH EFFICIENCY REFLECTORS WITH AN INFRARED FACTOR OF 14 OR HIGHER.
PROVIDE ALL UNITS COMPLETE WITH ALUMINIZED STEEL TUBING. COORDINATE EXACT LENGTH OF EXHAUST PIPING REQUIRED.

| GAS-FIRED UNIT HEATER SCHEDULE | | | | | | | | | | | | | | | |
|--------------------------------|--------------------|-------|--------------|----------------------------|-------|-------|-----|----------------|-----------------|--------------------------|----------------------|--------------------|--------------------|-------------|--|
| UNIT TAG | AREA SERVED | CFM | FAN MOTOR | | | | | GAS HEAT | | | | MOUNT HEIGHT (FT.) | MAX DIM. LxWxH (N) | WEIGHT LBS. | BASIS OF DESIGN MANUFACTURER & MODEL NO. |
| | | | H.P. (WATTS) | ELECTRICAL CHARACTERISTICS | | | | HEAT INPUT MBH | HEAT OUTPUT MBH | INLET PRESSURE (N. W.C.) | THERMAL EFFICIENCY % | | | | |
| | | | | VOLTS | PHASE | CYCLE | FLA | | | | | | | | |
| | | | | | | | | | | | | | | | |
| GUH-1 | ATHLETIC STORAGE 2 | 1,206 | 1/20 | 120 | 1 | 60 | 2.2 | 85 | 79.1 | 5-14 | 93 | 10'-0" | 31x21x33 | 110 | REZNOR UEZ-085 |

PROVIDE UNIT COMPLETE WITH WALL MOUNTED DISCONNECT SWITCH.
PROVIDE UNIT COMPLETE WITH 2"x40" VERTICAL TERMINAL/COMBUSTION AIR KIT.

| ELECTRIC CABINET UNIT HEATER SCHEDULE | | | | | | | | | | | | | | |
|---------------------------------------|--------------|------------|-----|----------------------------|-------|----|-----|----------------------------------|------------|------------|------------|-------------------------------|-------------|--|
| UNIT TAG | AREA SERVED | SUPPLY FAN | | ELECTRICAL CHARACTERISTICS | | | | ELECTRIC RESISTANCE HEATING COIL | | | | MAXIMUM DIMENSIONS LxWxH, IN. | WEIGHT LBS. | BASIS OF DESIGN MANUFACTURER AND MODEL NO. |
| | | CFM | HP | VOLTS | PHASE | HZ | FLA | CAPACITY BTUH | ENT AIR °F | LVG AIR °F | kW (277 V) | | | |
| | | | | | | | | | | | | | | |
| CUH-1 | CONCESSION 6 | 500 | 1/8 | 277 | 1 | 60 | 16 | 13,652 | 60.0 | 85 | 4 | 45x10x27 | 160 | QMARK CU-945 |
| CUH-2 | CONCESSION 6 | 500 | 1/8 | 277 | 1 | 60 | 16 | 13,652 | 60.0 | 85 | 4 | 45x10x27 | 160 | QMARK CU-945 |
| CUH-3 | CONCESSION 6 | 500 | 1/8 | 277 | 1 | 60 | 16 | 13,652 | 60.0 | 85 | 4 | 45x10x27 | 160 | QMARK CU-945 |

PROVIDE ALL UNITS COMPLETE WITH UNIT MOUNTED DISCONNECT SWITCH, 1" THROWAWAY FILTERS.
PROVIDE ALL UNITS COMPLETE WITH FRONT INLET & OUTLET.
PROVIDE ALL UNITS COMPLETE WITH REMOTE WALL MOUNTED LINE-VOLTAGE THERMOSTAT.

| ELECTRIC WALL HEATER SCHEDULE | | | | | | | | | | |
|-------------------------------|-------------------------|-----------------|-----|-------|-------|------|----------|-------------------------------|--|--|
| UNIT TAG | AREA SERVED | ELECTRIC HEATER | | | | | MOUNT HT | MAXIMUM DIMENSIONS LxWxH, IN. | BASIS OF DESIGN MANUFACTURER AND MODEL NO. | |
| | | BTU/HR CAP. | KW | VOLTS | PHASE | AMPS | | | | |
| EWH-1 | JAN. 13 | 5,120 | 1.5 | 120 | 1 | 12.5 | 2' AFF | 11"x5"x12" | BERKO SRA1512DSAF | |
| EWH-2 | SINGLE USER RESTROOM 11 | 5,120 | 1.5 | 120 | 1 | 12.5 | 2' AFF | 11"x5"x12" | BERKO SRA1512DSAF | |
| EWH-3 | SINGLE USER RESTROOM 12 | 5,120 | 1.5 | 120 | 1 | 12.5 | 2' AFF | 11"x5"x12" | BERKO SRA1512DSAF | |
| EWH-4 | ELEC./SERV. 14 | 5,120 | 1.5 | 120 | 1 | 12.5 | 2' AFF | 11"x5"x12" | BERKO SRA1512DSAF | |
| EWH-5 | RESTROOM 23 | 5,120 | 1.5 | 120 | 1 | 12.5 | 2' AFF | 11"x5"x12" | BERKO SRA1512DSAF | |

PROVIDE ALL UNITS COMPLETE WITH BUILT-IN DISCONNECT SWITCH & BUILT-IN INTEGRAL TAMPER RESISTANT THERMOSTAT.
PROVIDE ALL UNITS COMPLETE WITH RECESSED WALL MOUNTING FRAME.

| GRILLES, REGISTERS AND DIFFUSERS SCHEDULE | | | | | | | |
|---|------------------------|-----------|----------|-----------------------|--------|--|---------|
| TAG | STYLE | CFM | MOUNT | FACE | MAX NC | BASIS OF DESIGN MANUFACTURER AND MODEL NO. | REMARKS |
| A | LOUVERED FACE DIFFUSER | VARIABLES | AS REQ'D | 24x24 | 24 | PRICE SHR | 1 |
| B | LOUVERED FACE DIFFUSER | VARIABLES | AS REQ'D | 24x24 | 24 | PRICE SMX | 1, 3 |
| C | FIXED FACE BAR GRILLE | VARIABLES | AS REQ'D | VARIABLES W/NECK SIZE | 25 | PRICE 530 | 1, 2 |

1. REFER TO PLANS FOR QUANTITIES, NECK SIZE, CFM, AND PATTERN.
2. PROVIDE WITH 3P LAY-IN PANEL FOR ACOUSTICAL TILE CEILING INSTALLATIONS.
3. PROVIDE THROW REDUCING VANES.

| EXHAUST FAN SCHEDULE | | | | | | | | | | | | | | | | |
|----------------------|----------|-------------------------|-------|------------|---------|-------------|------------------|------------|------------------------|----------------------------|-------|-------|-----------------------------------|-------------|--|---------|
| UNIT TAG | LOCATION | SERVICE | CFM | ESP IN. WC | FAN RPM | BHP (WATTS) | MOTOR HP (WATTS) | SONES (dB) | DRIVE: DIRECT / V-BELT | ELECTRICAL CHARACTERISTICS | | | MAXIMUM DIMENSIONS L x W x H, IN. | WEIGHT LBS. | BASIS OF DESIGN MANUFACTURER AND MODEL NO. | REMARKS |
| | | | | | | | | | | VOLTS | PHASE | CYCLE | | | | |
| EF-1 | ROOF | CONCESSION 6 | 500 | 0.4 | 1337 | 0.08 | 1/6 | 6.7 | DIRECT | 115 | 1 | 60 | 22ø x 17 | 34 | GREENHECK G-095-VG | 1 |
| EF-2 | ROOF | TRAINING ROOM/BATHROOMS | 2,000 | 0.5 | 749 | 0.27 | 3/4 | 7.2 | DIRECT | 115 | 1 | 60 | 37ø x 46 | 158 | GREENHECK G-180-VG | 1 |
| EF-3 | ROOF | RESTROOMS | 1,600 | 0.6 | 896 | 0.27 | 1/2 | 9.8 | DIRECT | 115 | 1 | 60 | 29ø x 48 | 123 | GREENHECK CUE-160-VG | 1 |
| EF-4 | WALL | ATHLETIC STORAGE 2 | 600 | 0.3 | 1302 | 0.09 | 1/4 | 7.9 | DIRECT | 115 | 1 | 60 | 29x18x18 | 84 | GREENHECK SE1-12-432-VG | 2 |
| EF-5 | WALL | FIELD STORAGE 22 | 3,500 | 0.35 | 749 | 0.39 | 3/4 | 7.2 | DIRECT | 208 | 3 | 60 | 44x39x39 | 338 | GREENHECK SE2-30-610-B15-VG | 3 |
| EF-6 | WALL | FIELD STORAGE 22 | 3,500 | 0.35 | 749 | 0.39 | 3/4 | 7.2 | DIRECT | 208 | 3 | 60 | 44x39x39 | 338 | GREENHECK SE2-30-610-B15-VG | 3 |
| EF-7 | WALL | FIELD STORAGE 22 | 600 | 0.3 | 1302 | 0.09 | 1/4 | 7.9 | DIRECT | 115 | 1 | 60 | 29x18x18 | 84 | GREENHECK SE1-12-432-VG | 2 |
| EF-8 | WALL | RESTROOM 23 | 70 | 0.3 | 698 | — | (36) | 0.3 | DIRECT | 115 | 1 | 60 | 14x14x7 | 14 | GREENHECK SP-B110 | 4 |

1. PROVIDE UNIT COMPLETE WITH 18" ROOF CURB W/ HINGED BASE & DAMPER TRAY, BACKDRAFT DAMPER, UNIT MOUNTED DISCONNECT SWITCH, EC MOTOR W/ MOTOR MOUNTED SPEED DIAL.
2. PROVIDE UNIT COMPLETE WITH MOTORIZED WD-320 DAMPER, UNIT MOUNTED DISCONNECT SWITCH, EC MOTOR WITH MOTOR MOUNTED SPEED DIAL, CLOSURE ANGLES AND WALL HOUSING W/ OSHA GUARD.
3. PROVIDE UNIT COMPLETE WITH MOTORIZED VCD-23 DAMPER, UNIT MOUNTED DISCONNECT SWITCH, EC MOTOR WITH MOTOR MOUNTED SPEED DIAL, CLOSURE ANGLES AND WALL HOUSING W/ OSHA GUARD.
4. PROVIDE UNIT COMPLETE WITH UNIT MOUNTED DISCONNECT SWITCH, BACKDRAFT DAMPER, 6" WALL CAP GREENHECK WC-6 & MOTOR MOUNTED SPEED DIAL.

| HEAT PUMP UNIT SCHEDULE | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|------|-----------------------|-----------------------|------------|----------|------|---------------------|--------|----------------------------|-------|-------|-------|------|-----------------------|------------|------------|-------------------------------|------------------------------------|----------------------|--|--------------------|
| UNIT TAG | TONS | COOLING CAPACITY BTUH | HEATING CAPACITY BTUH | COMPRESSOR | | | CONDENSER FAN MOTOR | | ELECTRICAL CHARACTERISTICS | | | | | MAX. AMBIENT TEMP. °F | SEER (EER) | HSPF (COP) | MAXIMUM DIMENSIONS, IN. LxWxH | MAXIMUM SOUND PRESSURE LEVEL dB(A) | OPERATING WEIGHT LBS | BASIS OF DESIGN MANUFACTURER AND MODEL NO. | |
| | | | | QTY. | H.P. EA. | RLA | QTY. | KW EA. | FLA EA. | VOLTS | PHASE | CYCLE | MCA | | | | | | | | MOCP |
| | | | | | | | | | | | | | | | | | | | | | |
| HP-8 | 2 | 24,000 | 27,000 | 1 | — | 15.3 | 1 | — | — | 208 | 1 | 60 | 16.5 | 20 | 95 | 18.5 | 10.2 | 37x13x39 | 58 | 172 | DAIKEN RZ024TAVJUA |

1. UNITS TO BE PROVIDED WITH NON-FUSED, UNIT MOUNTED DISCONNECT SWITCH BY THE EC.
2. PROVIDE UNIT COMPLETE WITH LOW AMBIENT OPERATION DOWN TO 0°F.

| HEAT PUMP UNIT SCHEDULE | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|------|-----------------------|-----------------------|-----------------------------|------------|----------|---------------------|---------------------|--------|----------------------------|-------|-------|-------|------|-----------------------|------------|------------|-------------------------------|------------------------------------|----------------------|--|---------------------|
| UNIT TAG | TONS | COOLING CAPACITY BTUH | HEATING CAPACITY BTUH | HEAT RECOVERY CAPACITY BTUH | COMPRESSOR | | | CONDENSER FAN MOTOR | | ELECTRICAL CHARACTERISTICS | | | | | MAX. AMBIENT TEMP. °F | SEER (EER) | HSPF (COP) | MAXIMUM DIMENSIONS, IN. LxWxH | MAXIMUM SOUND PRESSURE LEVEL dB(A) | OPERATING WEIGHT LBS | BASIS OF DESIGN MANUFACTURER AND MODEL NO. | |
| | | | | | QTY. | H.P. EA. | RLA, COMP.# 1/2/3/4 | QTY. | KW EA. | FLA EA. | VOLTS | PHASE | CYCLE | MCA | | | | | | | | MOCP |
| OHRU-1 | 12 | 141,000 | 108,000 | 108,000 | 1 | — | 19.3 | 1 | — | — | 460 | 3 | 60 | 21.3 | 25 | 95 | (12.5) | (3.8) | 49x31x66 | 65 | 800 | DAIKEN REYQ14A4AYDA |

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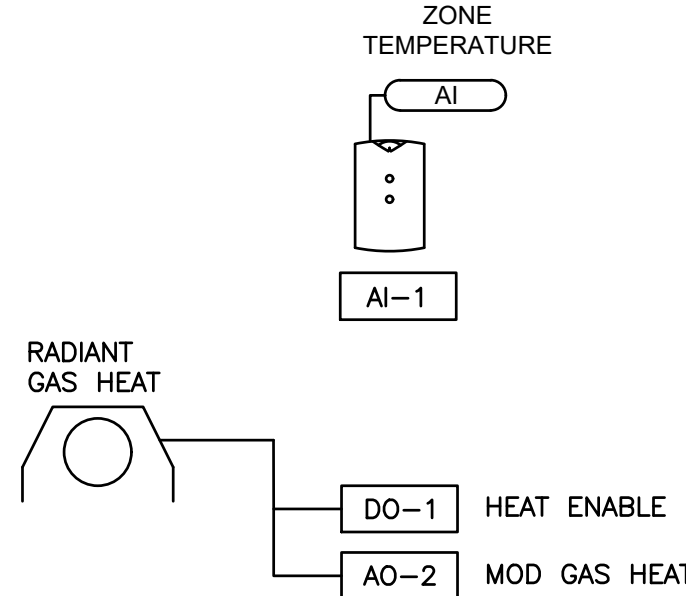
SEQUENCE OF OPERATION: INFRARED RADIANT HEATERS:

NEW CONTROL REQUIREMENTS SHALL INCLUDE THE PLACEMENT OF A NEW UNIT CONTROLLER FOR INTERFACE WITH MANUFACTURER PROVIDED TERMINAL STRIP. THIS UNIT SHALL BE CONNECTED TO THE BUILDING WIDE COMMUNICATION CABLE (BUS) AND SHALL INTEGRATE ALL POINTS BACK TO NEW SUPERVISORY CONTROLLER. MOUNT NEW CONTROLLER IN UNIT ENCLOSURE AND PROVIDE 120/24V TRANSFORMER FOR POWER.

PROVIDE SPACE MOUNTED TEMPERATURE SENSOR FOR FULL UNIT CONTROL. WIRE SENSOR BACK TO UNIT FOR FULL INTEGRATION. SENSOR TO HAVE NO READOUT BUT SHALL HAVE TEMPERATURE ADJUSTMENT AND OCCUPANCY OVERRIDE BUTTON SET FOR 1 HR INCREMENTS. THIS BUTTON WILL ENABLE THE 'OCCUPIED CYCLE' FOR THAT TIME PERIOD. PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH NEW BUILDING SUPERVISORY CONTROLLER.

SEQUENCE OF OPERATION:

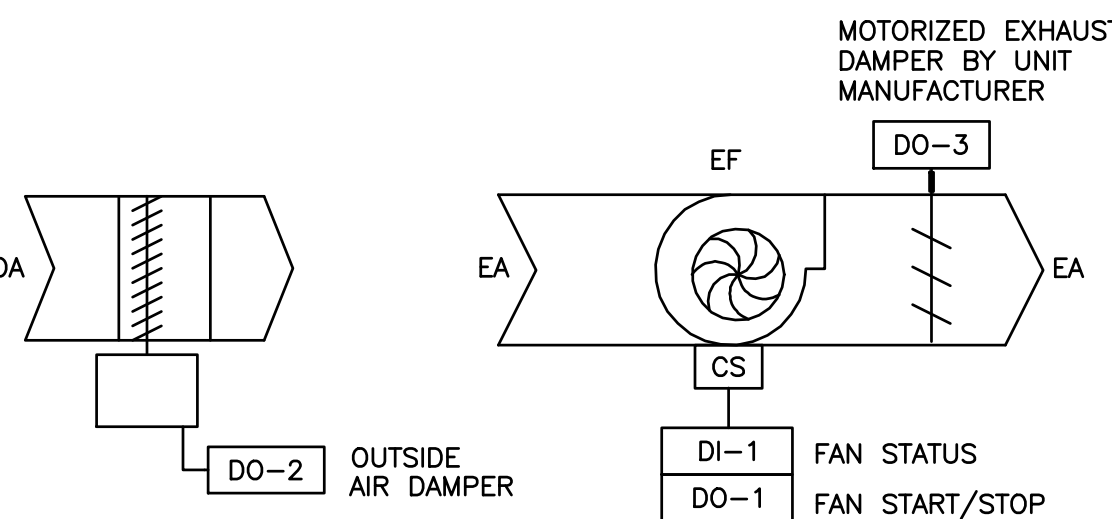
A. HEATING DEMAND: ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW THE HEATING SETPOINT (ADJ.), BAS UNIT CONTROLLER SHALL MODULATE THE GAS BURNER TO MAINTAIN SPACE TEMPERATURE. ON A RISE IN SPACE TEMPERATURE ABOVE SETPOINT, DISABLE THE GAS HEAT.



| | | POINTS LIST | | | | | | | | | | | | | | | | |
|-----------|-------------------|------------------|---------|--------------|----------|-------------|----------|----------|----------|-------|--------|------------|--------|-----------------|----------|-------|-------|---------|
| POINT TAG | POINT DESCRIPTION | SAFETY SHUT DOWN | INPUTS | | | | | | OUTPUTS | | | | | | | | | |
| | | | DIGITAL | | ANALOG | | | | DIGITAL | | ANALOG | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | STATUS | LOC OVERRIDE | PRESSURE | TEMPERATURE | HUMIDITY | SETPOINT | FEEDBACK | SPEED | ARROW | START/STOP | ON/OFF | DAMPER ACTUATOR | MODULATE | SPEED | ALARM | REMARKS |
| AO-1 | MOD GAS HEAT | | | | | | | | | | | | | | X | | | |
| DO-1 | GAS HEAT ENABLE | | | | | | | | | | | | X | | | | | |
| AI-1 | ZONE TEMPERATURE | | | | X | | | | | | | | | | | | X | |

2 INFRARED RADIANT HEATERS

NO SCALE



EXHAUST FAN SEQUENCE OF OPERATION:

- EXHAUST FAN EF-1: THE FAN SHALL BE CONTROLLED MANUALLY BY A WALL MOUNTED SWITCH. THE SWITCH SHALL BE PROVIDED BY THE EC. THE ATC CONTRACTOR SHALL PROVIDE A RELAY INTERLOCK TO DISABLE THE EF WHENEVER THE BUILDING IS IN UNOCCUPIED MODE BASED ON UNIT OCCUPANCY SCHEDULE. THE BAS SHALL MONITOR THE STATUS OF THE EXHAUST FAN AND SHALL BE REPRESENTED GRAPHICALLY AND OPERATIONALLY THROUGH THE SERVER.
- EXHAUST FAN EF-4, 5 & 6: THE EXHAUST FAN SHALL BE OPERATED BY THE SAME THERMOSTAT AS THE HEATER IN THE SAME ZONE. UPON A RISE IN SPACE TEMPERATURE ABOVE 85 DEGREES F. (ADJ.) THE EA & OA DAMPER(S) (EF-5 & 6: TYP. FOR 2 LOUVERS) SHALL OPEN AND THE EF SHALL INDEX ON. UPON A FALL IN SPACE TEMPERATURE BELOW 85 DEGREES F. (ADJUSTABLE) EF SHALL INDEX OFF AND THE DAMPER SHALL CLOSE. THE EF SHALL BE DISABLED BELOW AN OUTSIDE AIR TEMPERATURE OF 50 DEG F (ADJ.) OR GUH-1 IS IN OPERATION. THE BAS SHALL MONITOR THE STATUS OF THE EXHAUST FAN AND GENERATE AN ALARM IF THE FAN FAILS TO RESPOND TO A START/STOP COMMAND. INTEGRATE THERMOSTAT DIRECTLY BACK TO SUPERVISORY CONTROLLER FOR OPERATIONAL INTERFACE AND SHALL BE REPRESENTED GRAPHICALLY AND OPERATIONALLY THROUGH THE SERVER.
- EF-7 TO BE CONTROLLED BY THE OCCUPANCY SENSORS WHICH ARE PROVIDED BY THE EC. ON OCCUPANCY, EXHAUST FAN SHALL ENERGIZE AND MOTORIZED EA DAMPER AND DAMPER ON OUTDOOR AIR LOUVER 1 SHALL OPEN. ATC CONTRACTOR SHALL PROVIDE ALL ASSOCIATED TRANSFORMERS, RELAYS AND CONTROL WIRING TO THE EFs, DAMPERS AND OCCUPANCY SENSORS. THE BAS SHALL MONITOR THE STATUS OF THE EXHAUST FAN ND SHALL BE REPRESENTED GRAPHICALLY AND OPERATIONALLY THROUGH THE SERVER.
- EF-8 TO BE CONTROLLED BY THE OCCUPANCY SENSOR PROVIDED BY THE EC. ON OCCUPANCY, EXHAUST FAN SHALL ENERGIZE. ATC CONTRACTOR SHALL PROVIDE ALL ASSOCIATED TRANSFORMERS, RELAYS AND CONTROL WIRING TO THE EFs, DAMPERS AND OCCUPANCY SENSORS. THE BAS SHALL MONITOR THE STATUS OF THE EXHAUST FAN ND SHALL BE REPRESENTED GRAPHICALLY AND OPERATIONALLY THROUGH THE SERVER.

| | | POINTS LIST | | | | | | | | | | | | | | | |
|-----------|-------------------|------------------|---------|--------------|----------|-------------|----------|----------|----------|-------|---------|------------|---------|--------|-----------------|----------|-------|
| POINT TAG | POINT DESCRIPTION | SAFETY SHUT DOWN | INPUTS | | | | | | OUTPUTS | | | | REMARKS | | | | |
| | | | DIGITAL | | ANALOG | | | | DIGITAL | | ANALOG | | | | | | |
| | | | STATUS | OCC OVERRIDE | PRESSURE | TEMPERATURE | HUMIDITY | SETPOINT | FEEDBACK | SPEED | AIRFLOW | START/STOP | | ON/OFF | DAMPER ACTUATOR | MODULATE | SPEED |
| DI-1 | FAN STATUS | | X | | | | | | | | | | | | | X | |
| DO-1 | FAN ENABLE | | | | | | | | | | X | | | | | | |
| DO-2 | OA DAMPER | | | | | | | | | | | X | | | | | |
| DO-3 | EA DAMPER | | | | | | | | | | | X | | | | | |

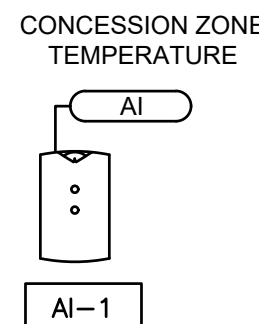
5 EXHAUST FANS

NO SCALE

| POINTS LIST | | | | | | | | | | | | | | | |
|-------------|-------------------------------|------------------|---------|--------------|----------|-------------|----------|----------|----------|-------|--------|--------------|---------|----------|-----------------|
| POINT TAG | POINT DESCRIPTION | SAFETY SHUT DOWN | INPUTS | | | | | | OUTPUTS | | | | REMARKS | | |
| | | | DIGITAL | | ANALOG | | | | DIGITAL | | ANALOG | | | | |
| | | | STATUS | OCC OVERRIDE | PRESSURE | TEMPERATURE | HUMIDITY | SETPOINT | FEEDBACK | SPEED | ARROW | START / STOP | | ON / OFF | DAMPER ACTUATOR |
| AI-1 | CONCESSION 6 ZONE TEMPERATURE | | | | X | | | | | | | | | | X |

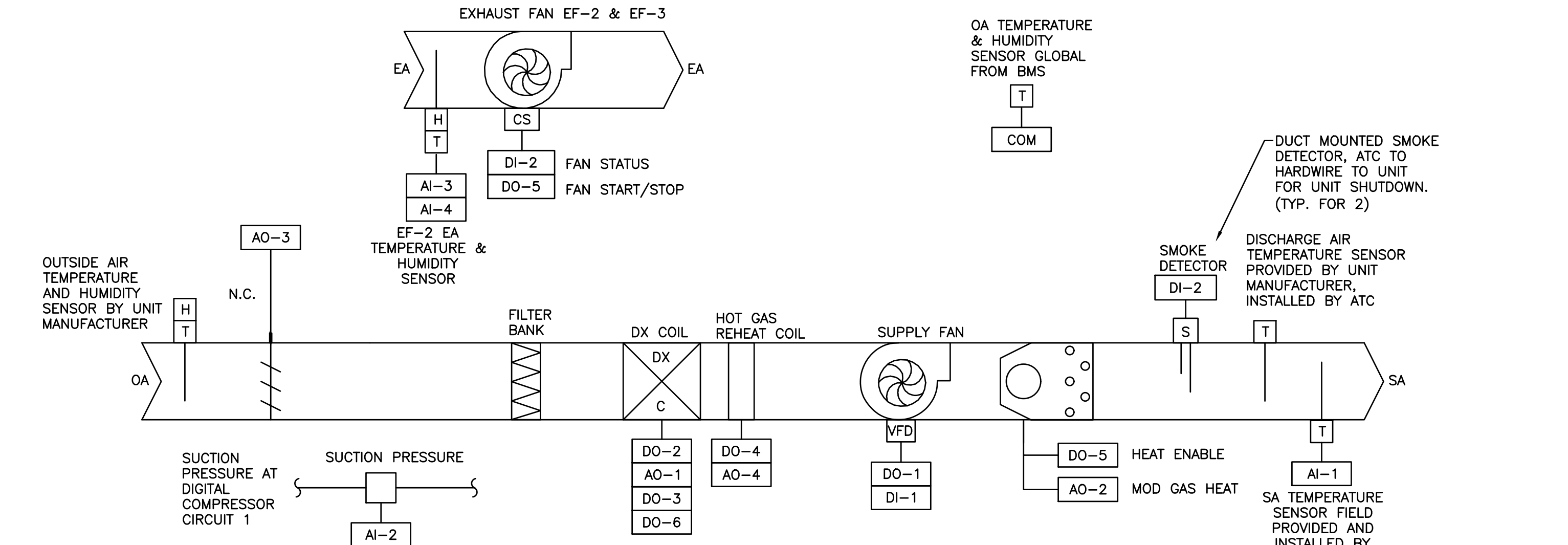
ELECTRIC CUH, RCP & EWH

- UNITS SHALL BE OPERATED BY MANUFACTURER FURNISHED CONTROLS AND SHALL HAVE NO INTERFACE WITH THE ATC. THE ATC CONTRACTOR SHALL PROVIDE A WALL MOUNTED TEMPERATURE SENSOR TO MONITOR THE TEMPERATURE IN CONCESSION 6.



6 ELECTRIC CUH, RCP & EWH CONTROLS

NO SCALE



SEQUENCE OF OPERATION: DOAS-1

NEW CONTROL REQUIREMENTS SHALL INCLUDE THE PLACEMENT OF A NEW UNIT CONTROLLER WITH I/O EXPANSION INSIDE THE UNIT CONTROLLER CABINET FOR CONTROL OF UNIT VIA MANUFACTURER PROVIDED TERMINAL STRIP. THIS UNIT SHALL BE CONNECTED TO THE BUILDING WIDE COMMUNICATION CABLE (BUS) AND SHALL INTEGRATE ALL POINTS BACK TO SUPERVISORY CONTROLLER. MOUNT NEW CONTROLLER IN UNIT ENCLOSURE AND PROVIDE 120/24V TRANSFORMER FOR POWER. PROVIDE DUCT MOUNTED PRESSURE SENSORS FOR FULL UNIT CONTROL. THE ATC CONTRACTOR SHALL INSTALL THE DISCHARGE AIR TEMPERATURE SENSOR FURNISHED BY THE UNIT MANUFACTURER. PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH BUILDING SUPERVISORY CONTROLLER. THE BAS WILL EARLY START THE UNIT TO ACHIEVE SPACE TEMPERATURE SETPOINT FOR OCCUPANCY. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE OPERATOR'S WORKSTATION.

- THE UNIT SHALL BE CONFIGURED FOR CONSTANT VOLUME VAV OPERATION AND SHALL BE PROVIDED WITH VFD DRIVES. ZONE TEMPERATURE SHALL BE CONTROLLED VIA A SEQUENCED DAT RESET. THE UNIT CONTROLLER SHALL USE ZONE TEMPERATURE TO AUTOMATICALLY SELECT HEATING OR COOLING MODE. HEATING AND COOLING DEMAND SHALL BE CALCULATED THROUGH INDEPENDENT HEATING AND COOLING PID OUTPUTS.
- OCCUPIED MODE: SUPPLY FAN SHALL RUN CONTINUOUSLY AT CONSTANT VOLUME (VFD FOR BALANCING ONLY) WITH OA DAMPER IN ITS OPEN POSITION WHENEVER THE UNIT IS IN OCCUPIED MODE. THE UNIT CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING AND COOLING TO MAINTAIN ITS HEATING AND COOLING SETPOINT. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP TIMES USING THE OPERATOR'S WORKSTATION. THE BAS WILL MONITOR THE STATUS OF THE FAN AND GENERATE AN ALARM IF THE FAN FAILS TO A START/STOP COMMAND.
- OCCUPANCY OVERRIDE: THE SPACE SENSORS WILL HAVE A PUSHBUTTON THE WHEN PRESSED DURING THE UNOCCUPIED MODE, WILL INDEX THE EQUIPMENT TO AN OCCUPIED MODE FOR A PERIOD OF 2-HOURS (ADJUSTABLE).
- UNOCCUPIED MODE: WHEN THE UNIT IS IN UNOCCUPIED MODE OR IS SHUT DOWN BY SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS: SUPPLY FAN WILL BE OFF, OUTDOOR AIR DAMPER CLOSED, AND DX COOLING OFF. UNIT SHALL CYCLE IF SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT IN HEATING MODE (ADJ.) AND ABOVE UNOCCUPIED COOLING MODE (ADJ.) WITH OUTSIDE AIR DAMPERS OPEN. THE UNIT WILL DE-ENERGIZE WHEN THE SPACE TEMPERATURE IS AT LEAST 4 DEGREE F ABOVE THE UNOCCUPIED HEATING SETPOINT. UNOCCUPIED COOLING IS IDENTICAL TO THE OCCUPIED OPERATION.
- TEMPERATURE CONTROL: TEMPERATURE CONTROL SEQUENCES DETERMINE WHEN THE UNIT IS IN FAN-ONLY, HEATING OR COOLING MODES. THE FOLLOWING CONTROL SEQUENCES SHALL BE AVAILABLE:
 - EXHAUST TEMPERATURE RESET: THE SUPPLY TEMPERATURE SETPOINT IS CALCULATED BASED ON THE ACTIVE SETPOINT AND THE CURRENT RETURN TEMPERATURE. THE CALCULATED SETPOINT IS SCALED BETWEEN THE SUPPLY TEMPERATURE MINIMUM AND MAXIMUM SETPOINTS DETERMINED BY THE CURRENT MODE OF OPERATION.
 - WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN 60°F (ADJ.), THE MINIMUM SUPPLY TEMPERATURE FOR THE DOAS UNIT SHALL BE 70°F (ADJ.) AND THE MAXIMUM SUPPLY TEMPERATURE FOR THE DOAS UNIT SHALL BE 80°F (ADJ.).
 - WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 65°F (ADJ.), THE MINIMUM SUPPLY TEMPERATURE FOR THE DOAS UNIT SHALL BE 60°F (ADJ.) AND THE MAXIMUM SUPPLY TEMPERATURE FOR THE DOAS UNIT SHALL BE 70°F (ADJ.).
 - ACTIVE SETPOINT: THE HEATING AND COOLING SETPOINTS ARE DETERMINED BY THE TEMPERATURE SETPOINT AND DEADBAND. THE DEADBAND IS DIVIDED BY TWO(2) AND ADDED TO AND SUBTRACTED FROM THE SETPOINT TO DETERMINE THE COOLING AND HEATING SETPOINTS.
 - DUAL SETPOINT MODE: WHEN A DEADBAND VALUE IS GREATER THAN ZERO, THE UNIT IS PLACED IN DUAL SETPOINT MODE.
 - COOLING: IF THE SPACE OR RETURN TEMPERATURE IS ABOVE THE COOLING SETPOINT, THE COOLING SETPOINT IS ACTIVE.
 - HEATING IF THE SPACE OR RETURN TEMPERATURE IS BELOW THE HEATING SETPOINT, THE HEATING SETPOINT IS ACTIVE.
 - TRANSITIONING BETWEEN SETPOINTS: IF THE SPACE OR RETURN TEMPERATURE IS BETWEEN THE HEATING AND COOLING SETPOINT, THE LAST ACTIVE SETPOINT IS USED.
 - START BETWEEN SETPOINTS: IF THE UNIT STARTS WHILE IN BETWEEN SETPOINTS, THE HEATING SETPOINT IS ACTIVE.
 - HEAT/COOL MODE SWITCH DELAY: THIS DELAY IS USED IN TRANSITIONING BETWEEN HEATING AND COOLING MODES. THE DELAY TIMER STARTS COUNTING WHEN THE UNIT IS NO LONGER HEATING, COOLING OR ECONOMICIZING.
 - ENABLE COOLING: THE UNIT ENABLES COOLING WHEN THE FOLLOWING OCCURS:
 - ALL HEATING DEVISE ARE OFF; AND
 - THE HEAT COOL MODE SWITCH TIMER HAS EXPIRED; AND
 - COOLING IS NOT LOCKED OUT; AND
 - THERE IS A DEMAND FOR COOLING.
 - FALL BACK: DURING A SENSOR FAILURE THE TEMPERATURE CONTROL MODE REVERTS TO THE PREVIOUS AVAILABLE OPTION BASED ON THE FOLLOWING ORDER:
 - SUPPLY TEMPERATURE CONTROL.
 - OUTSIDE AIR RESET.
 - SPACE/RETURN RESET: IF BOTH SPACE AND RETURN TEMPERATURE SENSORS ARE PRESENT, THE REMAINING SENSOR IS USED DURING A FAILURE.
- DX COOLING: MODULATION OF COOLING SHALL BE CONFIGURED SUBJECT TO USER ADJUSTABLE MINIMUM RUN TIMES, MINIMUM OFF TIMES, MODULATING UP AND MODULATING DOWN DELAYS.
 - ONCE IN THE COOLING MODE THE UNIT WILL MAINTAIN THE SUPPLY AIR TEMPERATURE AT THE ACTIVE SUPPLY AIR COOLING SETPOINT BY MODULATING THE DIGITAL COMPRESSOR (1.5 ~5.0 VDC OPERATION). A COOLING RELAY MUST BE CONFIGURED.
 - THE DIGITAL COMPRESSOR CONTINUES TO MODULATE DURING THE ENTIRE COOLING OPERATION.
 - IF ADDITIONAL COOLING IS REQUIRED, FIXED COMPRESSOR STAGES CAN BE STAGED ON WHILE THE DIGITAL COMPRESSOR CONTINUES TO MODULATE. TO STAGE UP THE EXTRA COMPRESSORS, THE SUPPLY AIR TEMPERATURE NEEDS TO BE ABOVE THE ACTIVE SUPPLY AIR SETPOINT AND THE DIGITAL COMPRESSOR NEEDS TO BE AT 100% FOR A PERIOD OF TIME EQUAL TO THE STAGE UP DELAY. TO STAGE DOWN THE EXTRA COMPRESSORS, THE SUPPLY AIR TEMPERATURE NEEDS TO BE BELOW THE ACTIVE SUPPLY AIR SETPOINT AND THE DIGITAL COMPRESSOR NEEDS TO BE AT 0% FOR A PERIOD OF TIME EQUAL TO THE STAGING DOWN DELAY.
- DEHUMIDIFICATION: WHEN THE EXHAUST HUMIDITY SENSOR RISES ABOVE 55% RH (ADJ.), BAS SHALL ENABLE HOT GAS RE-HEAT AND MODULATE DIGITAL COMPRESSOR TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETTING (ADJ.) LOGIC MUST BE SET TO MAKE COOLING OR DEHUMIDIFICATION THE PRIORITY.
 - ONCE IN DEHUMIDIFICATION, THE UNIT WILL MAINTAIN THE EVAPORATOR COIL SUCTION TEMPERATURE AT THE COIL SUCTION TEMPERATURE SETPOINT BY MODULATING THE DIGITAL COMPRESSOR (1.5 ~5.0 VDC OPERATION).
 - IF ADDITIONAL DEHUMIDIFICATION IS REQUIRED, FIXED COMPRESSOR STAGES SHALL BE STAGED ON WHILE THE DIGITAL COMPRESSOR CONTINUES TO MODULATE. TO STAGE UP THE EXTRA COMPRESSORS, THE EVAPORATOR COIL SUCTION TEMPERATURE NEEDS TO BE ABOVE THE EVAPORATOR COIL SUCTION TEMPERATURE SETPOINT AND THE DIGITAL COMPRESSOR NEEDS TO BE AT 100% FOR A PERIOD OF TIME EQUAL TO THE STAGE UP DELAY.
 - TO STAGE DOWN THE EXTRA COMPRESSORS, THE EVAPORATOR COIL SUCTION TEMPERATURE NEEDS TO BE BELOW THE EVAPORATOR COIL SUCTION TEMPERATURE SETPOINT AND THE DIGITAL COMPRESSOR NEEDS TO BE AT 0% FOR A PERIOD OF TIME EQUAL TO THE STAGING DOWN DELAY.
 - REHEAT IS ALWAYS CONTROLLED TO THE ACTIVE SUPPLY AIR TEMPERATURE SETPOINT.
- COIL SUCTION TEMPERATURE SETPOINT RESET: DURING DEHUMIDIFICATION THE SYSTEM WILL AUTOMATICALLY RESET THE COIL SUCTION TEMPERATURE SETPOINT WITHIN A ± 5 DEG RANGE BASED ON THE RETURN AIR HUMIDITY SENSOR CONDITION CHANGING ± 5 % FROM THE HUMIDITY SETPOINT.
- MORNING WARM-UP: THE DOAS UNIT WILL REMAIN OFF DURING MORNING WARM-UP MODE AND THE ZONE UNITS WILL PERFORM ALL MORNING WARM-UP.
- HEATING DEMAND: ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW THE HEATING SETPOINT (ADJ.), THE GAS VALVE SHALL MODULATE TO MAINTAIN THE ACTIVE HEATING SETPOINT. DURING HEATING MODE, COOLING SHALL BE DISABLED.
- LOW TEMPERATURE PROTECTION: AN SUPPLY AIR TEMPERATURE SENSOR DIRECTLY AFTER THE HEATING COIL DE-ENERGIZES THE SUPPLY & EXHAUST FAN WHEN TEMPERATURES BELOW 40 DEGREES F ARE SENSED. ALL DAMPERS (OA DAMPER SHALL CLOSE/RA DAMPER SHALL OPEN). AFTER THE TEMPERATURE RISES 5 DEGREES ABOVE THE LOW TEMPERATURE SETTING, THE UNIT WILL RESET AND THE UNIT WILL RESUME ITS NORMAL CONTROL SEQUENCE.
- ACTIVE HEAD PRESSURE CONTROL: TO MAINTAIN A CONSISTENT CONDENSING TEMPERATURE IN COOLING AND DEHUMIDIFICATION MODE, THE CONTROLLER SHALL ENABLE AND MODULATE ALL CONDENSING FANS WITH EC MOTORS AT THE SAME SPEED TO MAINTAIN A CONDENSING TEMPERATURE OF 110°F.
- DUCT SMOKE DETECTOR: DUCT MOUNTED SMOKE DETECTORS SHALL BE INTEGRATED TO THE MICROPROCESSOR CONTROLLER AS FOLLOWS: THE MC SHALL WIRE THE DUAL POLE DETECTOR TO THE UNIT CONTROLLER FOR SYSTEM SHUTDOWN AND ALARM.
- EF-2 & 3: SYSTEM ENABLED IN OCCUPIED MODE, ASSOCIATED EXHAUST FAN EF-2 & 3 SHALL BE ENABLED. MOUNT A CURRENT SENSOR ON THE FAN MOTOR LEADS TO PROVE OPERATION.

| POINT TAG | POINT DESCRIPTION | POINTS LIST | | | | | | | | | | | | | REMARKS |
|-----------|-----------------------------|------------------|---------|--------------|----------|-------------|----------|----------|----------|---------|---------|------------|--|--------|---------|
| | | SAFETY SHUT DOWN | INPUTS | | | | | | | OUTPUTS | | | | | |
| | | | DIGITAL | | ANALOG | | | | | DIGITAL | ANALOG | | | | |
| | | | STATUS | DCC OVERRIDE | PRESSURE | TEMPERATURE | HUMIDITY | SETPOINT | FEEDBACK | SPEED | AIRFLOW | START/STOP | | ON/OFF | |
| DI-1 | SUPPLY FAN STATUS | | X | | | | | | | | | | | X | |
| DO-1 | SUPPLY FAN ENABLE | | | | | | | | | | X | | | | 1 |
| DO-2 | DX COOLING ENABLE | | | | | | | | | | X | | | | 1 |
| AO-1 | COMPRESSOR SPEED | | | | | | | | | | | X | | | 1 |
| DO-3 | DX STAGE 2 ENABLE | | | | | | | | | | X | | | | 1 |
| DO-4 | HOT GAS REHEAT ENABLE | | | | | | | | | | X | | | | 1 |
| AI-1 | SUPPLY AIR TEMPERATURE | X | | | X | | | | | | | | | X | |
| AO-4 | HOT GAS REHEAT RESET SIGNAL | | | | | | | | | | | X | | | 1 |
| COM | OUTSIDE AIR TEMPERATURE | | | | X | | | | | | | | | | |
| AI-2 | SUCTION PRESSURE 1 | | | | X | | | | | | | | | | 1 |
| COM | OUTSIDE AIR HUMIDITY | | | | | X | | | | | | | | | |
| AO-2 | MOD GAS HEAT | | | | | | | | | | | X | | | 1 |
| DO-5 | GAS HEAT ENABLE | | | | | | | | | | X | | | | 1 |
| AI-3 | ZONE TEMPERATURE | | | | | X | | | | | | | | | |
| AI-4 | ZONE HUMIDITY | | | | | | X | | | | | | | | |
| AO-3 | OA DAMPER | | | | | | | | | | | X | | | 1 |
| DI-2 | SMOKE DETECTION | | X | | | | | | | | | | | X | |
| DO-6 | DX STAGE 3 ENABLE | | | | | | | | | | X | | | | 1 |

- POINT PROVIDED ON RTU TERMINAL STRIP

1 DOAS-1 CONTROLS

NO SCALE

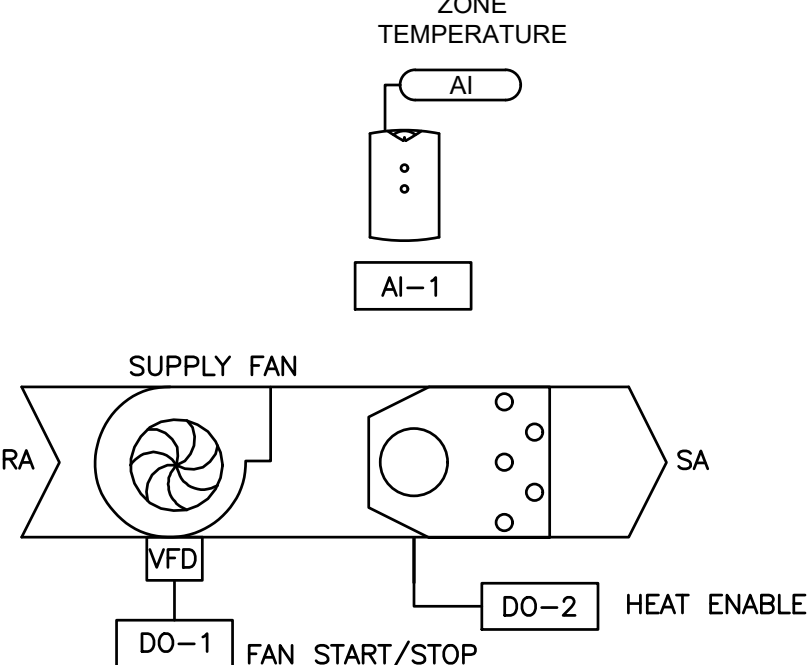
SEQUENCE OF OPERATION: GAS-FIRED UNIT HEATER:

NEW CONTROL REQUIREMENTS SHALL INCLUDE THE PLACEMENT OF A NEW UNIT CONTROLLER FOR INTERFACE WITH MANUFACTURER PROVIDED TERMINAL STRIP. THIS UNIT SHALL BE CONNECTED TO THE BUILDING WIDE COMMUNICATION CABLE (BUS) AND SHALL INTEGRATE ALL POINTS BACK TO NEW SUPERVISORY CONTROLLER. MOUNT NEW CONTROLLER IN UNIT ENCLOSURE AND PROVIDE 120/24V TRANSFORMER FOR POWER.

PROVIDE SPACE MOUNTED BLANK PLATE TEMPERATURE SENSOR FOR FULL UNIT CONTROL. WIRE SENSOR BACK TO UNIT FOR FULL INTEGRATION. PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH NEW BUILDING SUPERVISORY CONTROLLER.

SEQUENCE OF OPERATION:

A. HEATING DEMAND: ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW THE HEATING SETPOINT (ADJ.), BAS UNIT CONTROLLER SHALL INDEX ON THE FAN & GAS BURNER TO MAINTAIN SPACE TEMPERATURE. ON A RISE IN SPACE TEMPERATURE ABOVE SETPOINT, DISABLE THE GAS HEAT.



3 GAS FIRED UNIT HEATER

NO SCALE

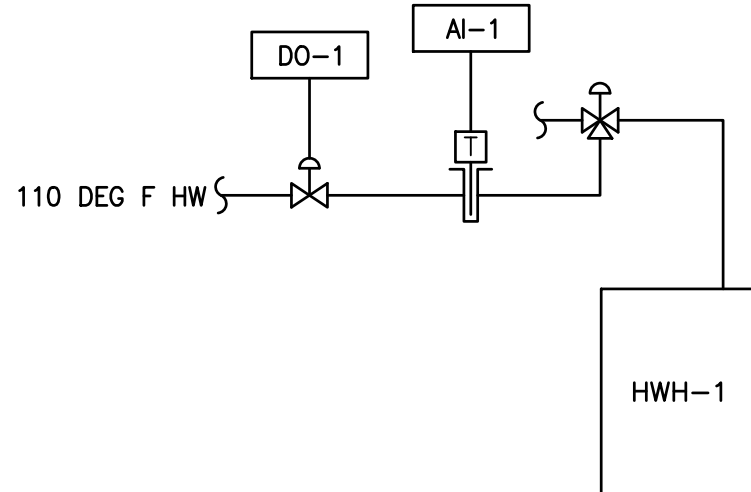
VRF & SPLIT SYSTEM SEQUENCE OF OPERATION:

- DUCTLESS SPLIT SYSTEM HEAT PUMP AND VRF SYSTEMS SHALL BE OPERATED BY MANUFACTURER CONTROLS. THE ATC CONTRACTOR SHALL PROVIDE A WALL MOUNTED TEMPERATURE SENSOR TO MONITOR THE TEMPERATURE IN EACH ROOM. AN ALARM SHALL BE GENERATED IF THE TEMPERATURE RISES ABOVE A USER DEFINABLE SETPOINT.
- THE CONDENSATE PUMP SAFETY SWITCH SHALL BE WIRED TO ASSOCIATED UNIT. UPON CONDENSATE PUMP FAILURE VIA PUMP SAFETY SWITCH, UNIT SHALL BE DISABLED.
- DISPLAY/INTERFACE REQUIREMENTS:
 - ROOM #
 - ZONE TEMPERATURE
 - UNIT OPERATION (MOUNT A CURRENT SENSOR ON THE COMPRESSOR MOTOR LEADS TO PROVE OPERATION)

4 SPLIT SYSTEM HEAT PUMP & VRF CONTROLS

NO SCALE

HHW-1 AND PIPING BY PC. HHW SUPPLY TEMPERATURE SENSOR IN PC PROVIDED THERMOWELL. HW SOLENOID VALVE, TEMPERATURE SENSOR AND ALL ASSOCIATED WIRING AND DEVICES PROVIDED AND INSTALLED BY ATC. REFER TO WH-1 PIPING DETAIL, DWG P301.



HHW SEQUENCE OF OPERATION:

- HHW-1: ATC TO FURNISH A NEW 'ANTI-SCALD' SOLENOID VALVE, SENSOR AND ACTUATOR FOR THE 110 DEGREE F DOMESTIC HOT WATER SUPPLY AS SHOWN ON CONTRACT DRAWINGS. VALVE AND SENSORS SHALL BE INSTALLED BY THE PC AND WIRED BY THE ATC CONTRACTOR. THE SOLENOID VALVE SHALL CLOSE WHEN THE WATER TEMPERATURE RISES ABOVE 120 DEGREES F (ADJ.) AND OPEN WHEN THE WATER TEMPERATURE FALLS BELOW 115 DEGREES F (ADJ.) THIS VALVE SHALL BE VIEWABLE IN BOTH VALVE POSITION AND TEMPERATURES (SET POINT AND ACTUAL) ON SYSTEM FRONT END GRAPHIC PACKAGE.

| DOMESTIC HOT WATER SYSTEM POINTS LIST | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|-----------------------|------------|--------|----------|-------------|----------|-------------------|---------|--------|------------|--------|---------|-------|------------|----------|-------|---------------|--|---|-------|
| POINT TAG | POINT DESCRIPTION | | | | | | | | | FUNCTION | | REMARKS | | | | | | | | |
| | | INPUTS | | | | OUTPUTS | | | | | | | | | | | | | | |
| | | DIGITAL | ANALOG | DIGITAL | ANALOG | DIGITAL | ANALOG | DIGITAL | ANALOG | | | | | | | | | | | |
| | | OPEN/CLOSE | STATUS | PRESSURE | TEMPERATURE | SETPOINT | RELATIVE HUMIDITY | FLOW | SPEED | START/STOP | ON/OFF | MODE | INDEX | OPEN/CLOSE | MODULATE | SPEED | SETPOINT ADJ. | | | ALARM |
| DO-1 | HHW SOLENOID VALVE | | | | | | | | | | | | | | X | | | | | |
| AI-1 | HHW SUPPLY WATER TEMP | | | | X | | | | | | | | | | | | | | X | |

7 HHW CONTROLS

NO SCALE

OUTDOOR LIGHTING INTEGRATION:

- PROVIDE INTEGRATION INTO THE BUILDINGS EXTERIOR LIGHTING CONTROL SYSTEM W/ (2) DIGITAL OUTPUTS AND DISPLAY LIGHTING CONTROLS GRAPHICALLY ON BAS INTERFACE.

| OUTDOOR LIGHTING POINTS LIST | | | | | | | | | | | | | | |
|------------------------------|----------------------------|------------------|--------|-----------|-------------|-------------|----------|----------|----------|---------|--------|------------|----------|---------|
| POINT TAG | POINT DESCRIPTION | | | | | | | | | OUTPUTS | | FUNCTION | | REMARKS |
| | | INPUTS | | | | | | | | DIGITAL | ANALOG | | | |
| | | DIGITAL | ANALOG | | | DIGITAL | ANALOG | | | | | | | |
| | | SAFETY SHUT DOWN | STATUS | OCCUPANCY | LIGHT LEVEL | TEMPERATURE | HUMIDITY | SETPOINT | FEEDBACK | ON/OFF | SPEED | OPEN/CLOSE | SETPOINT | |
| DO-1 | EXTERIOR LIGHTING 1 ENABLE | | | | | | | | X | | | | | |
| DO-2 | EXTERIOR LIGHTING 2 ENABLE | | | | | | | | X | | | | | |

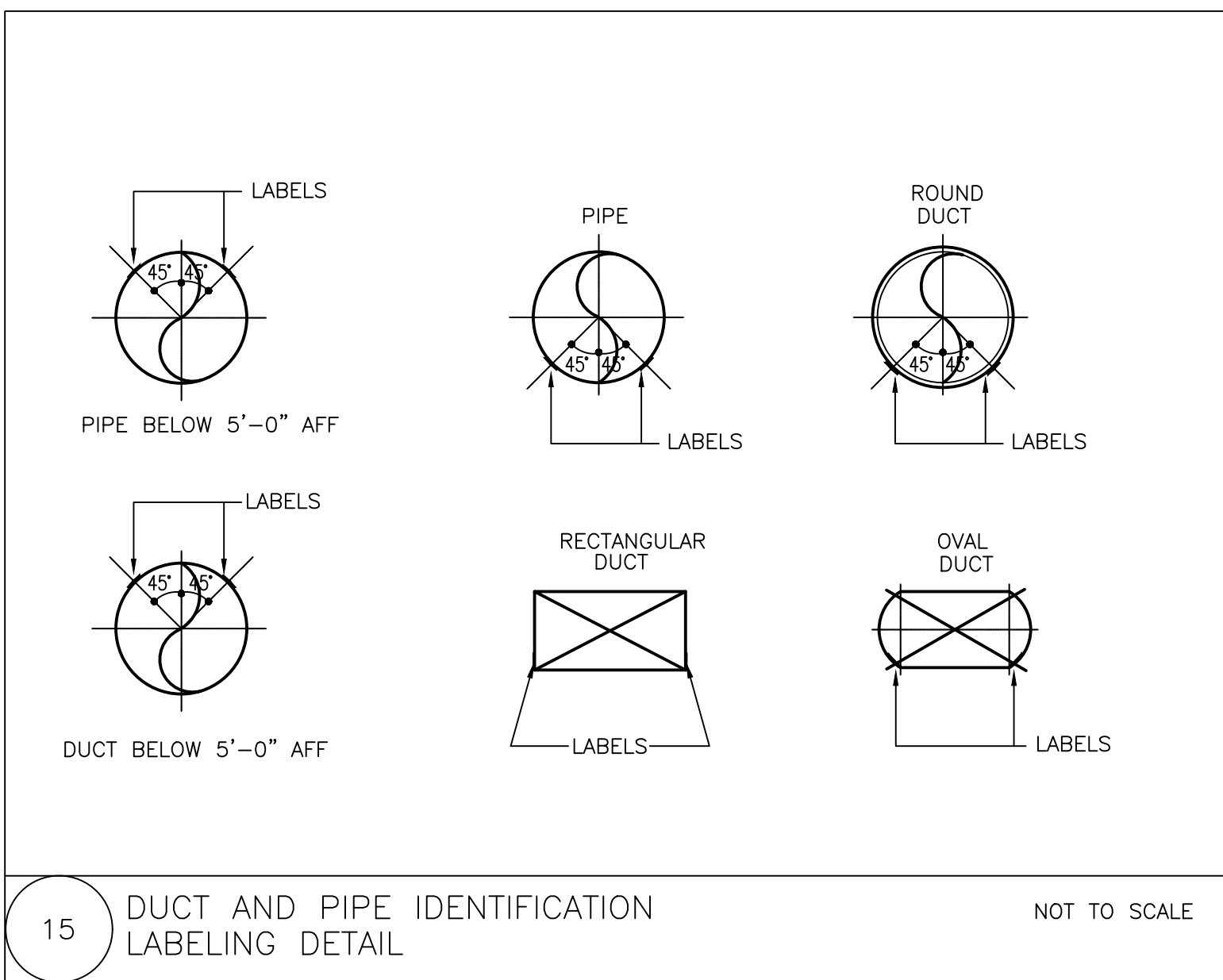
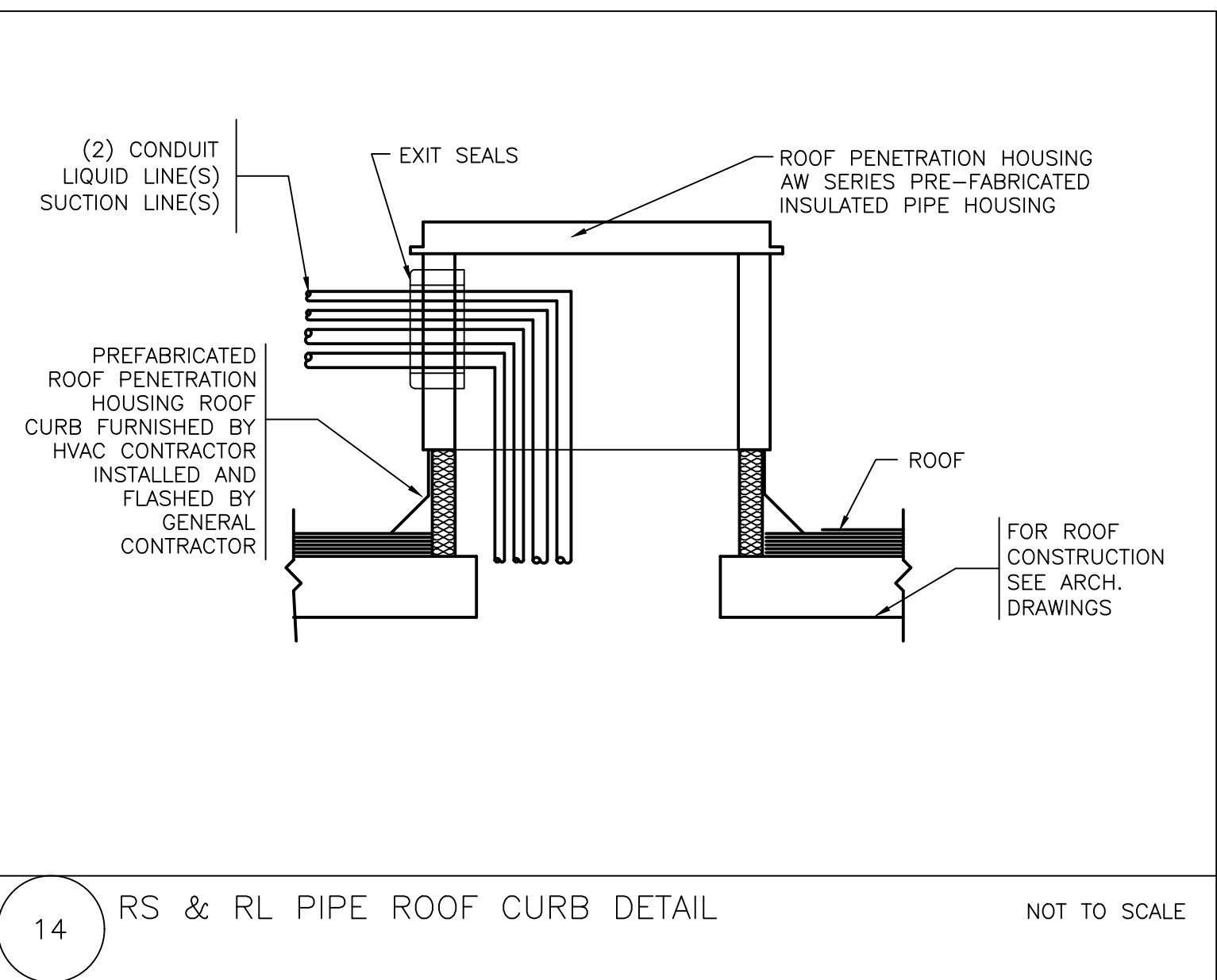
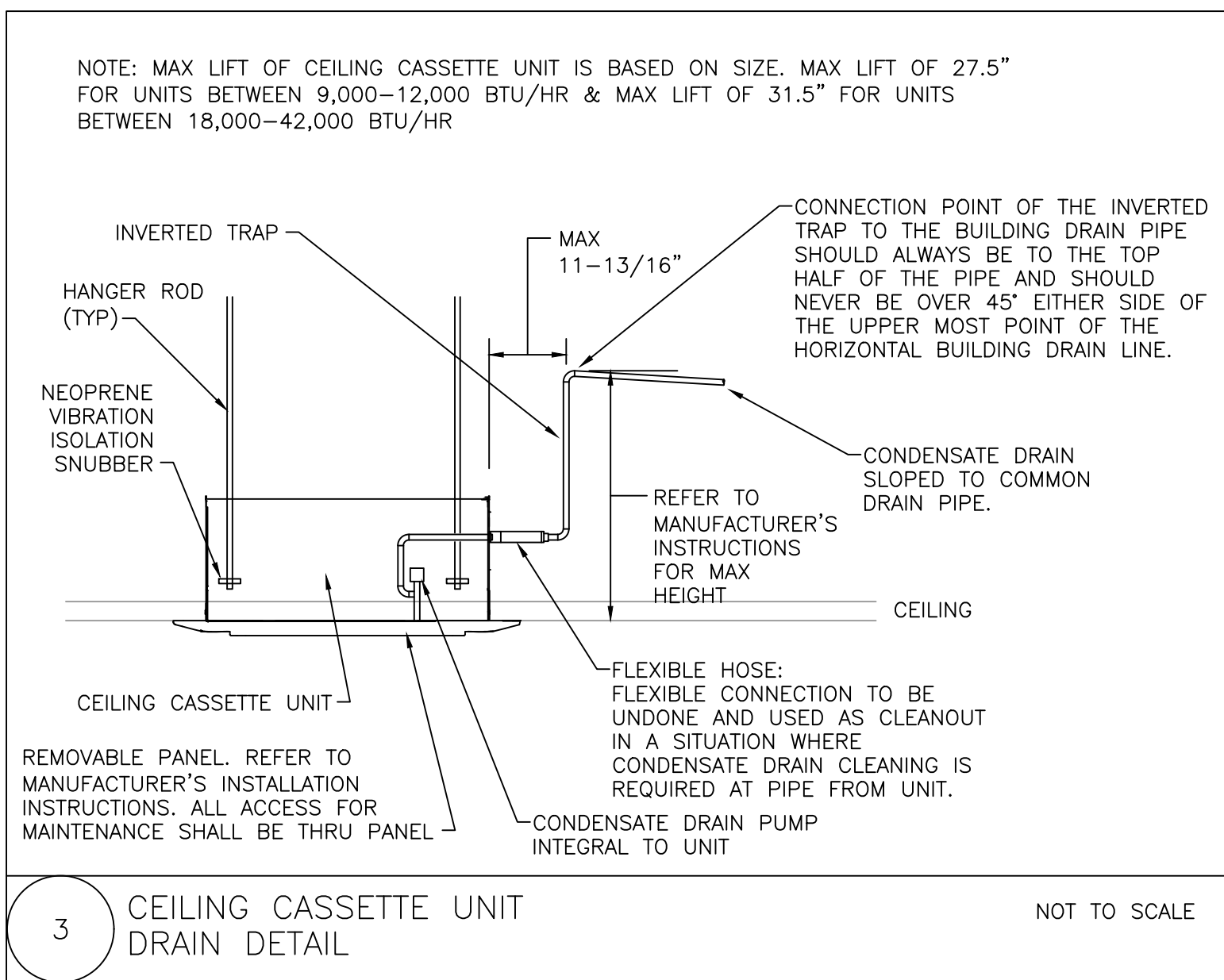
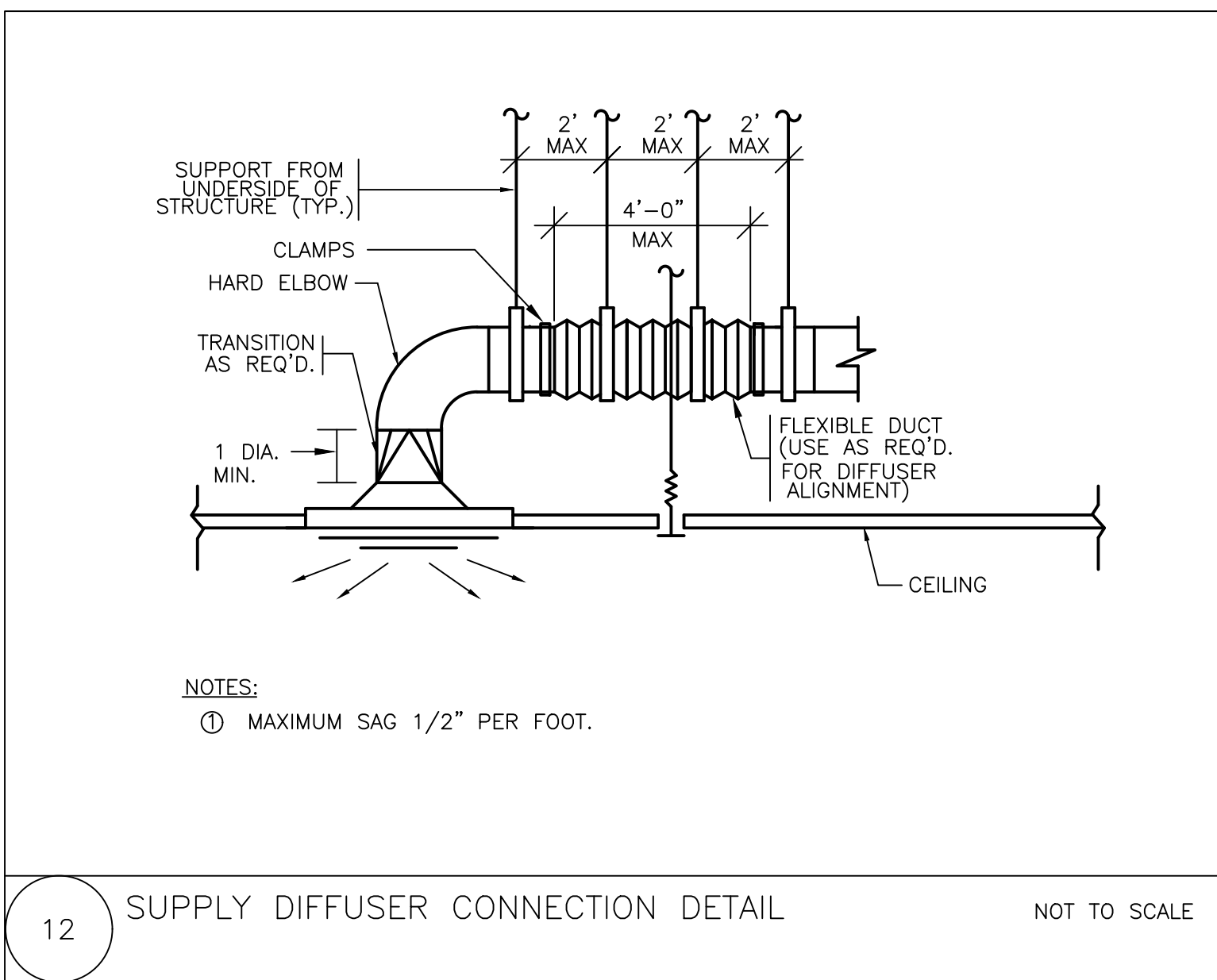
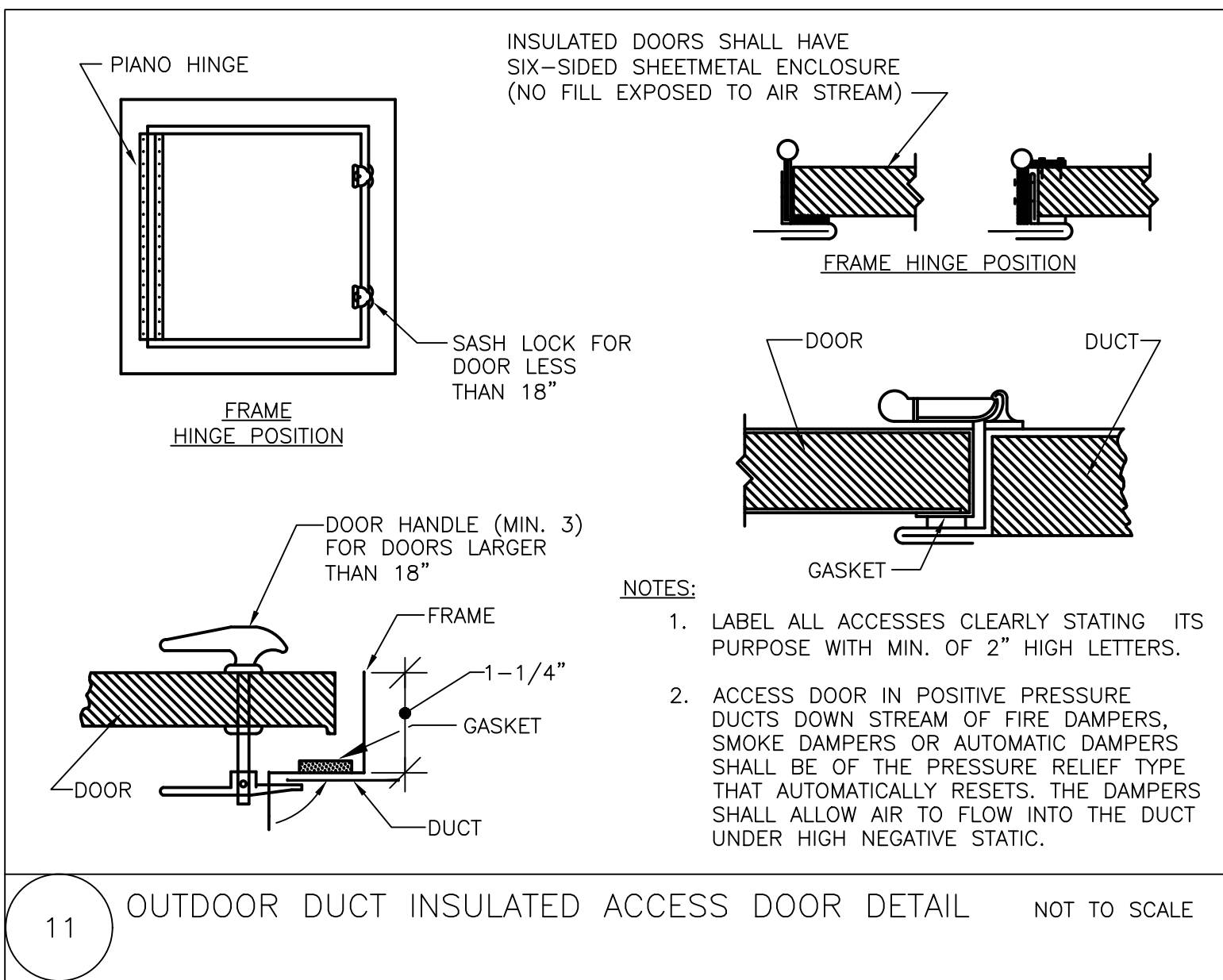
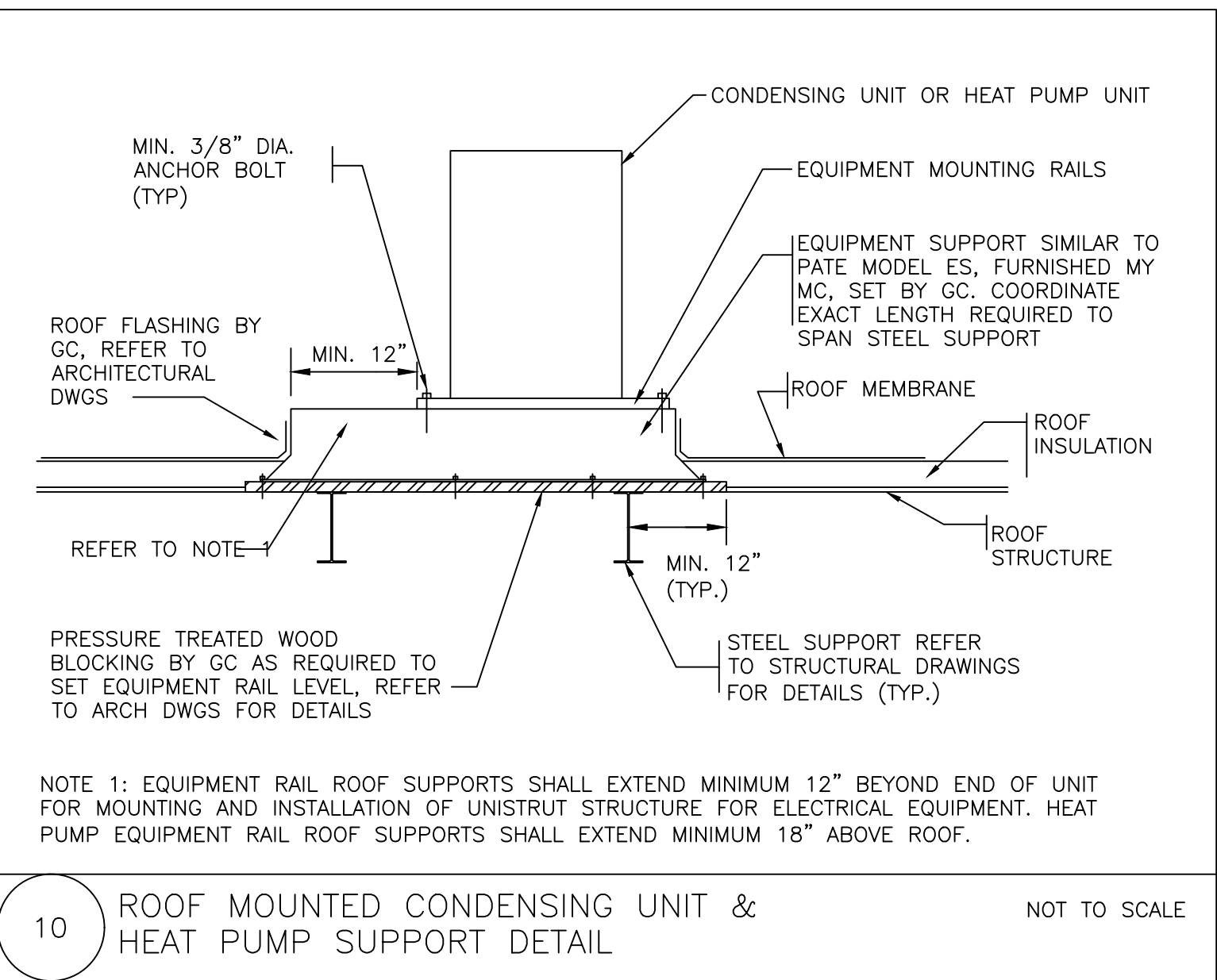
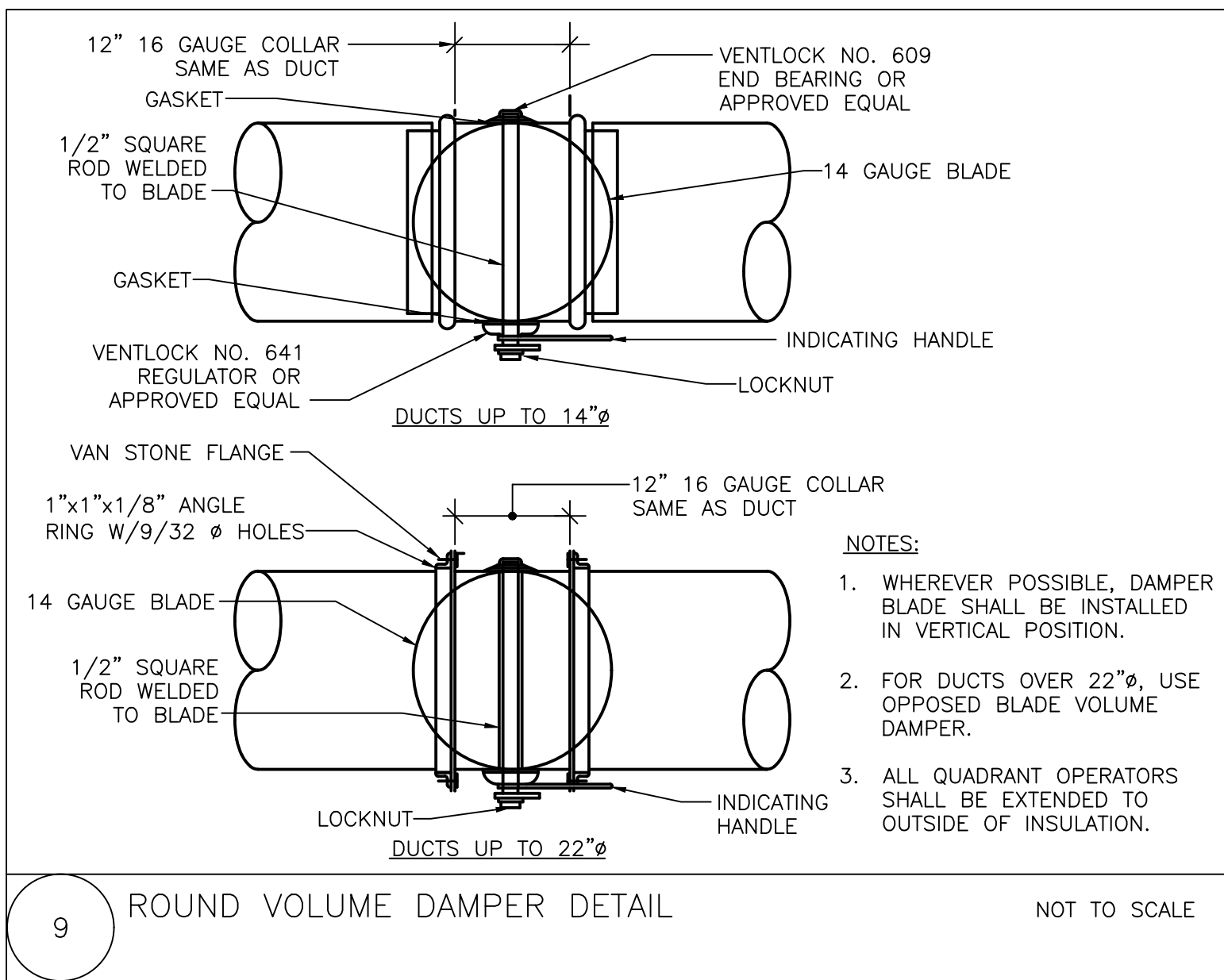
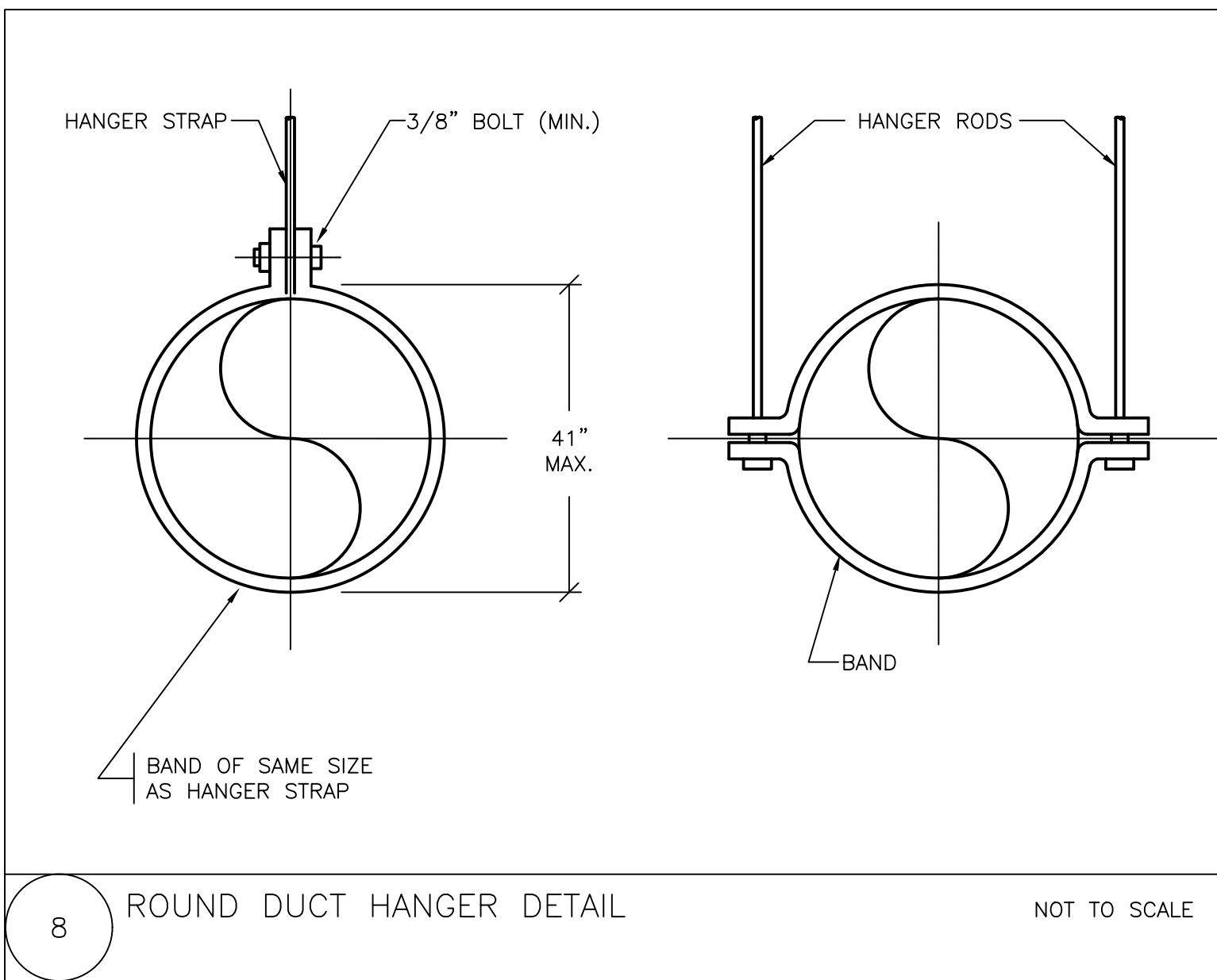
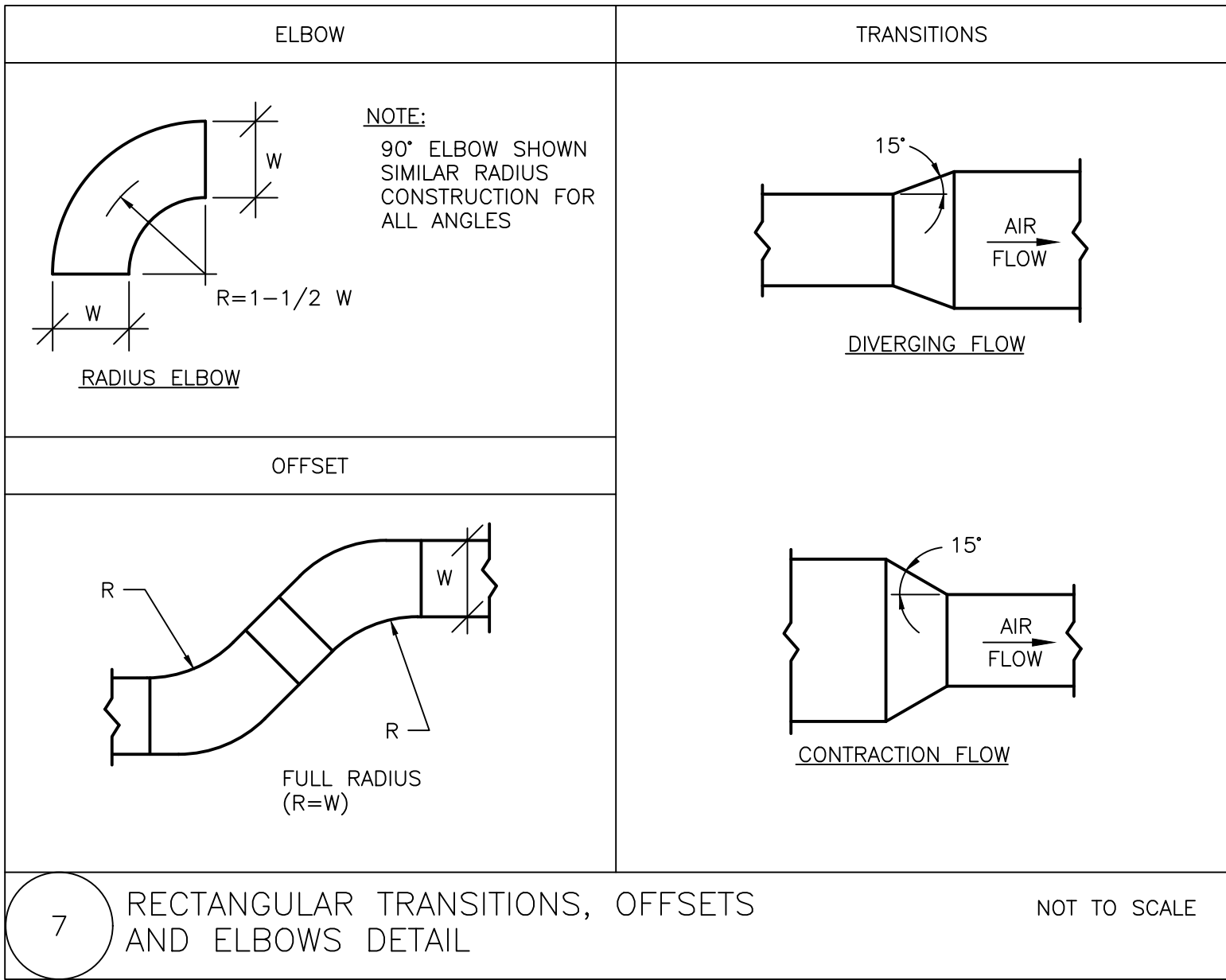
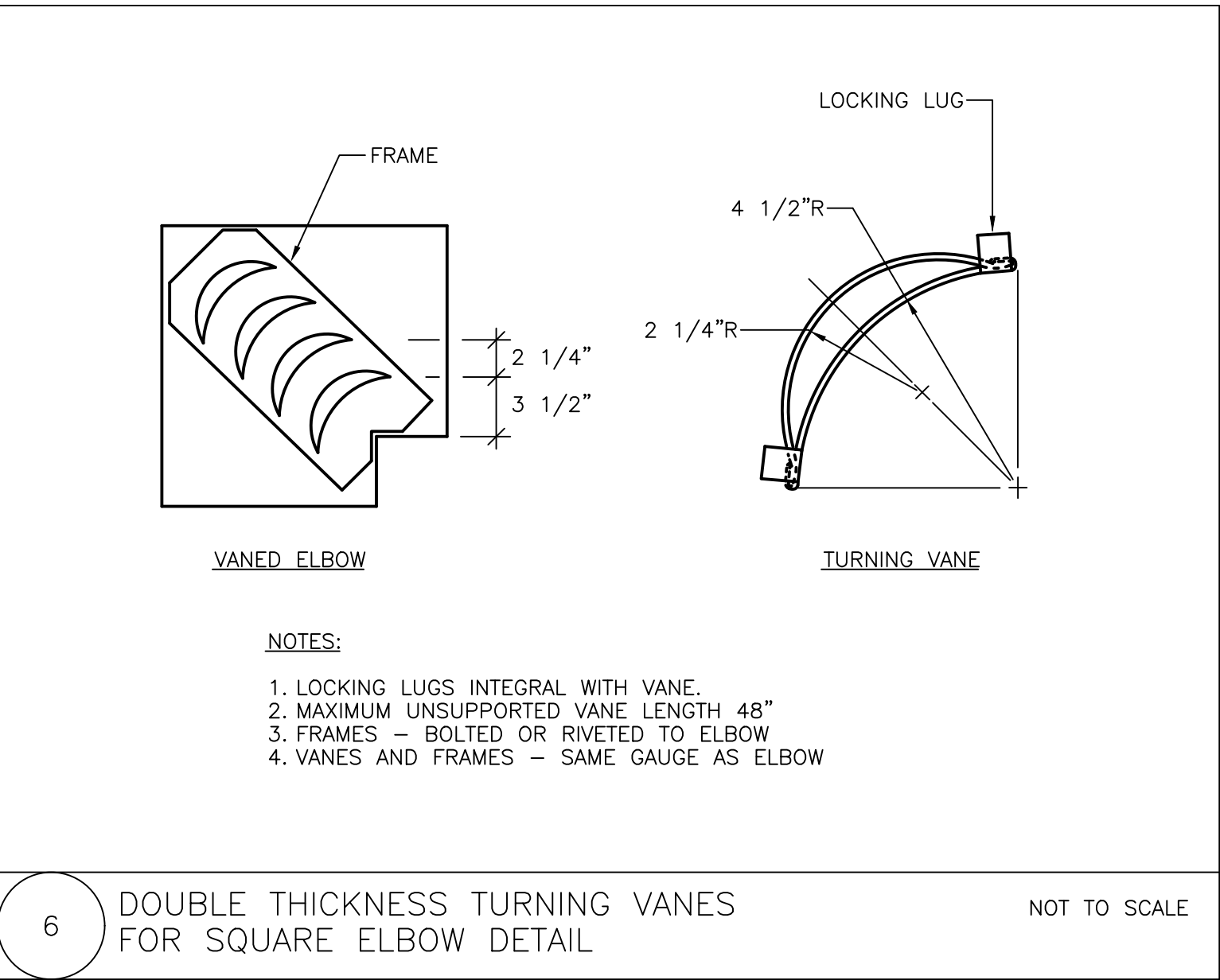
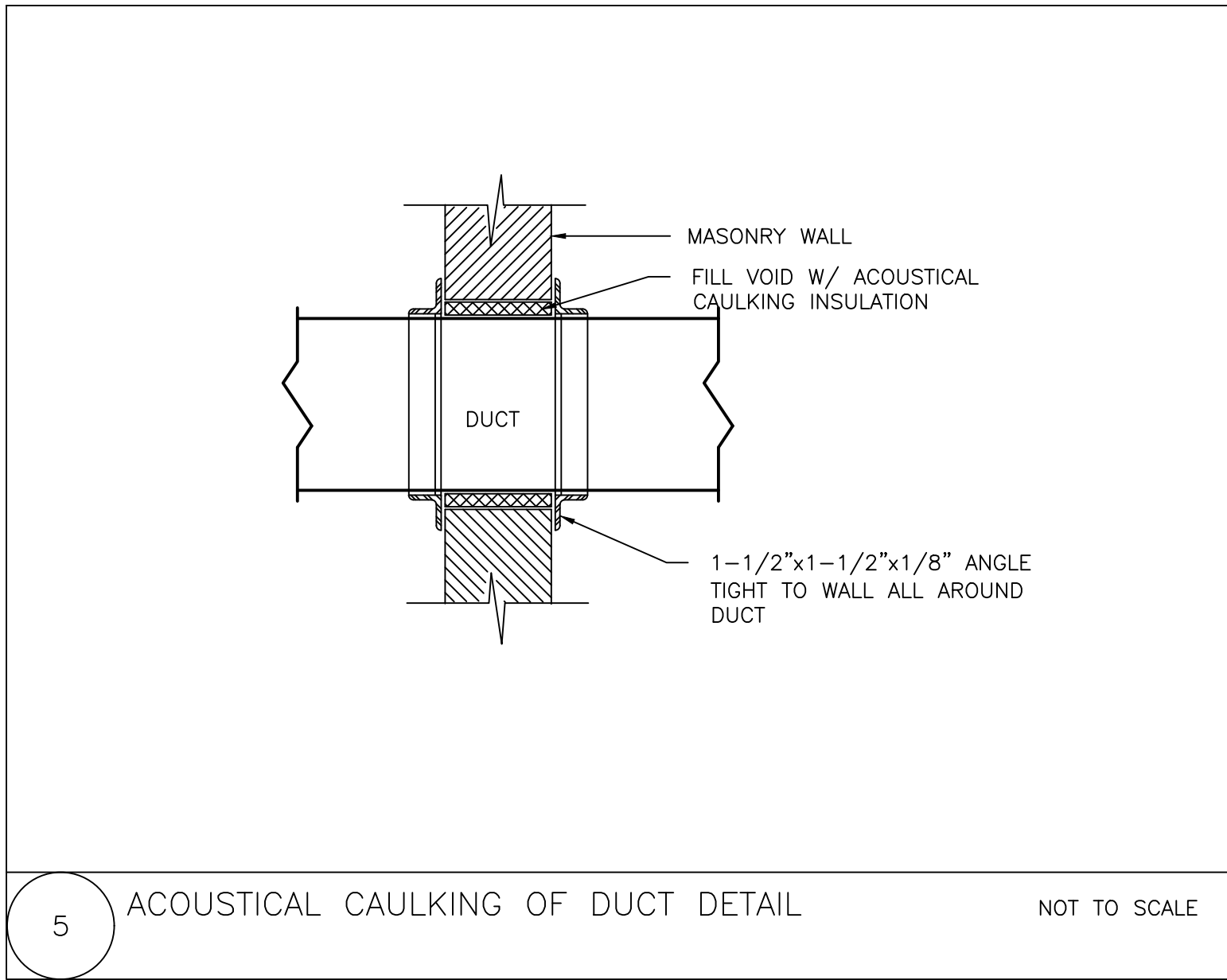
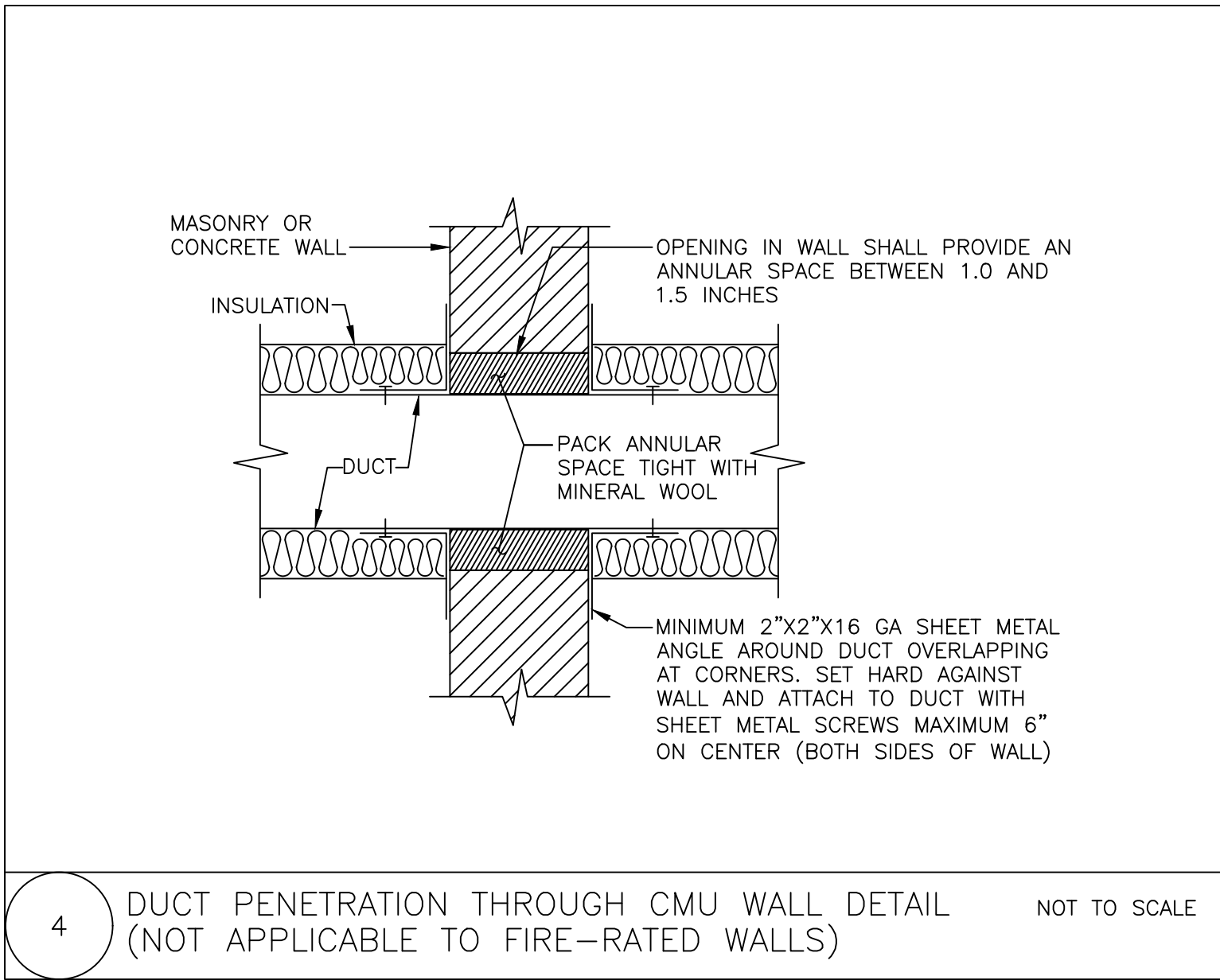
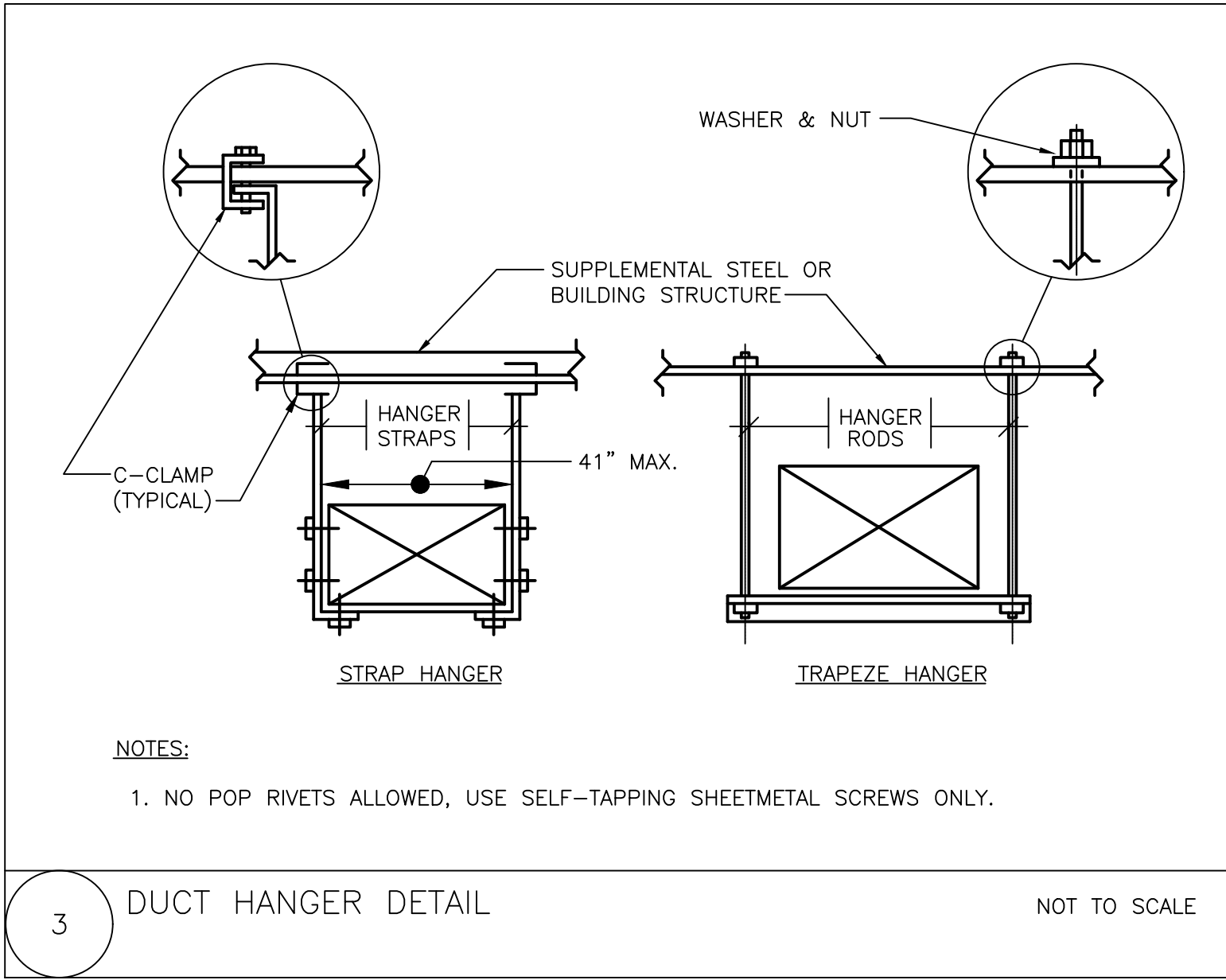
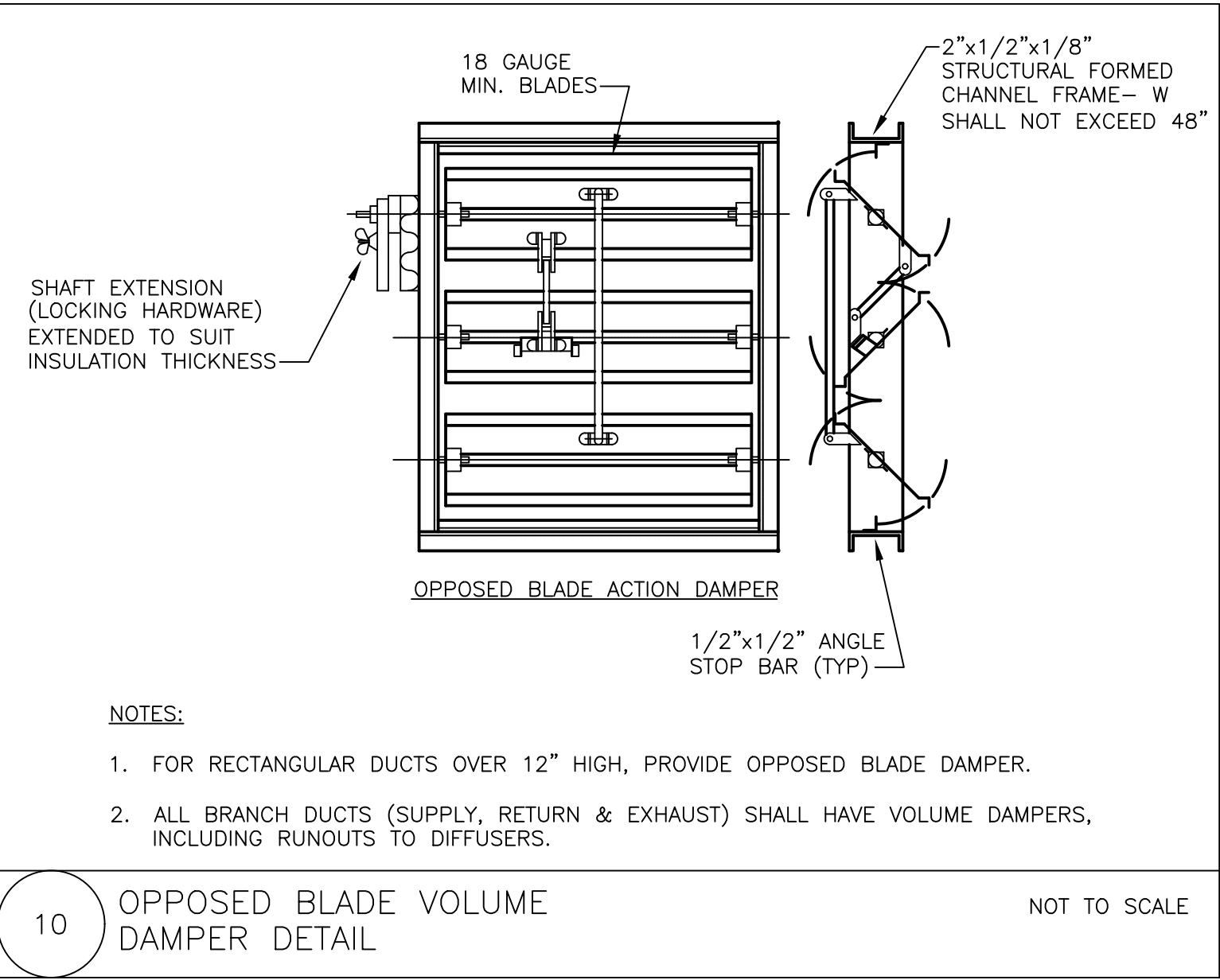
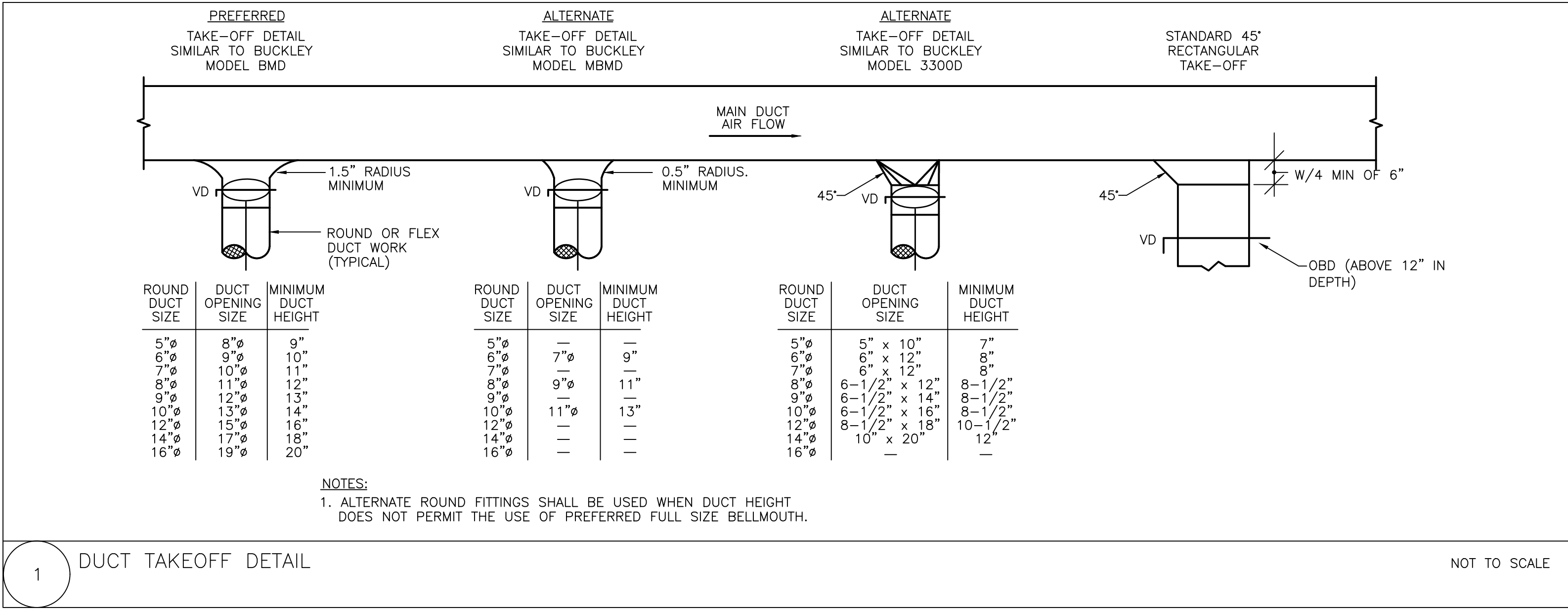
8 EXTERIOR LIGHTING CONTROLS

NO SCALE

ISSUE HISTORY

| A | DATE | ISSUED FOR |
|---|------------|------------|
| 1 | 2024-03-18 | BID ISSUE |

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CHESTER COUNTY, PA

HSA PROJECT # :21-019

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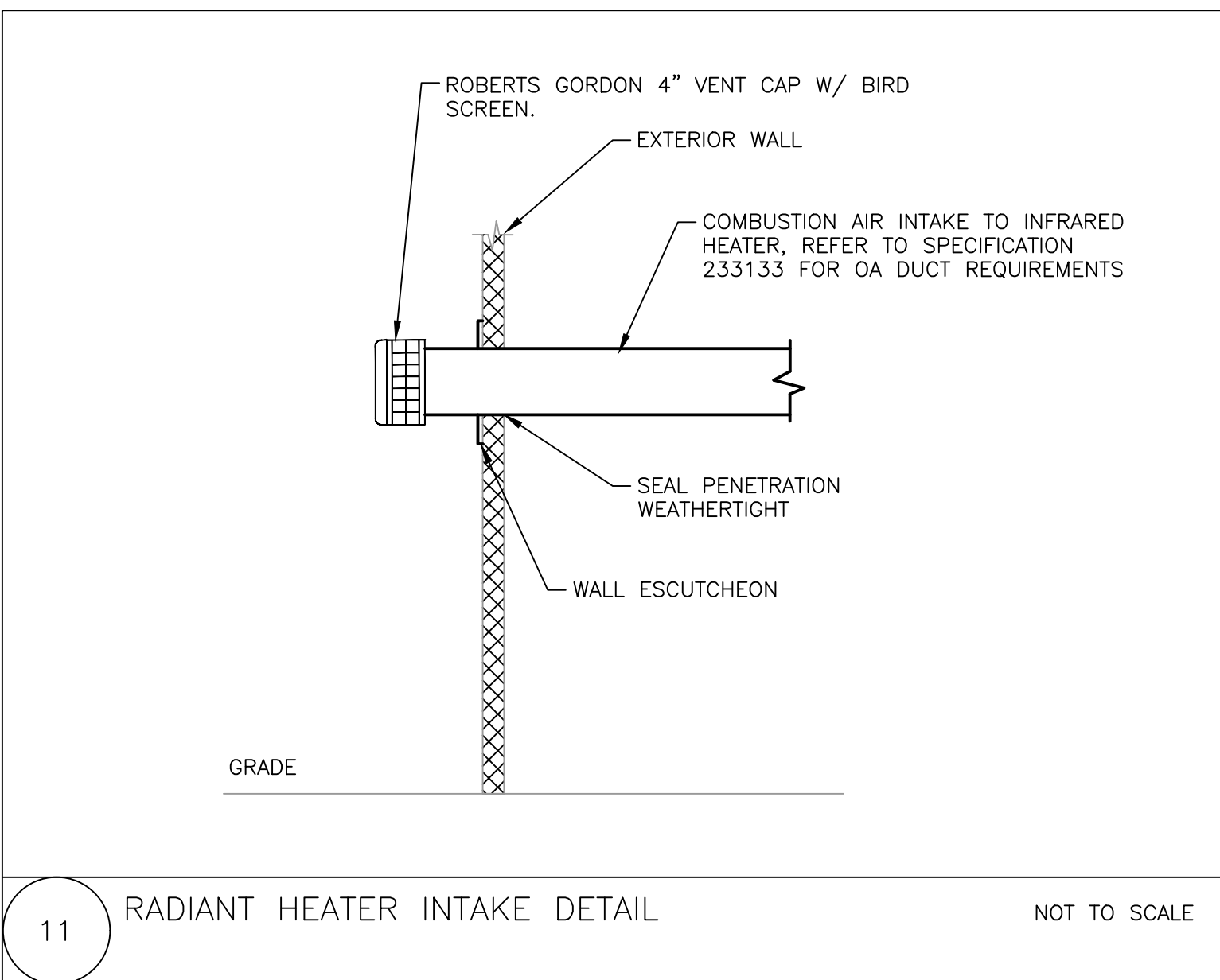
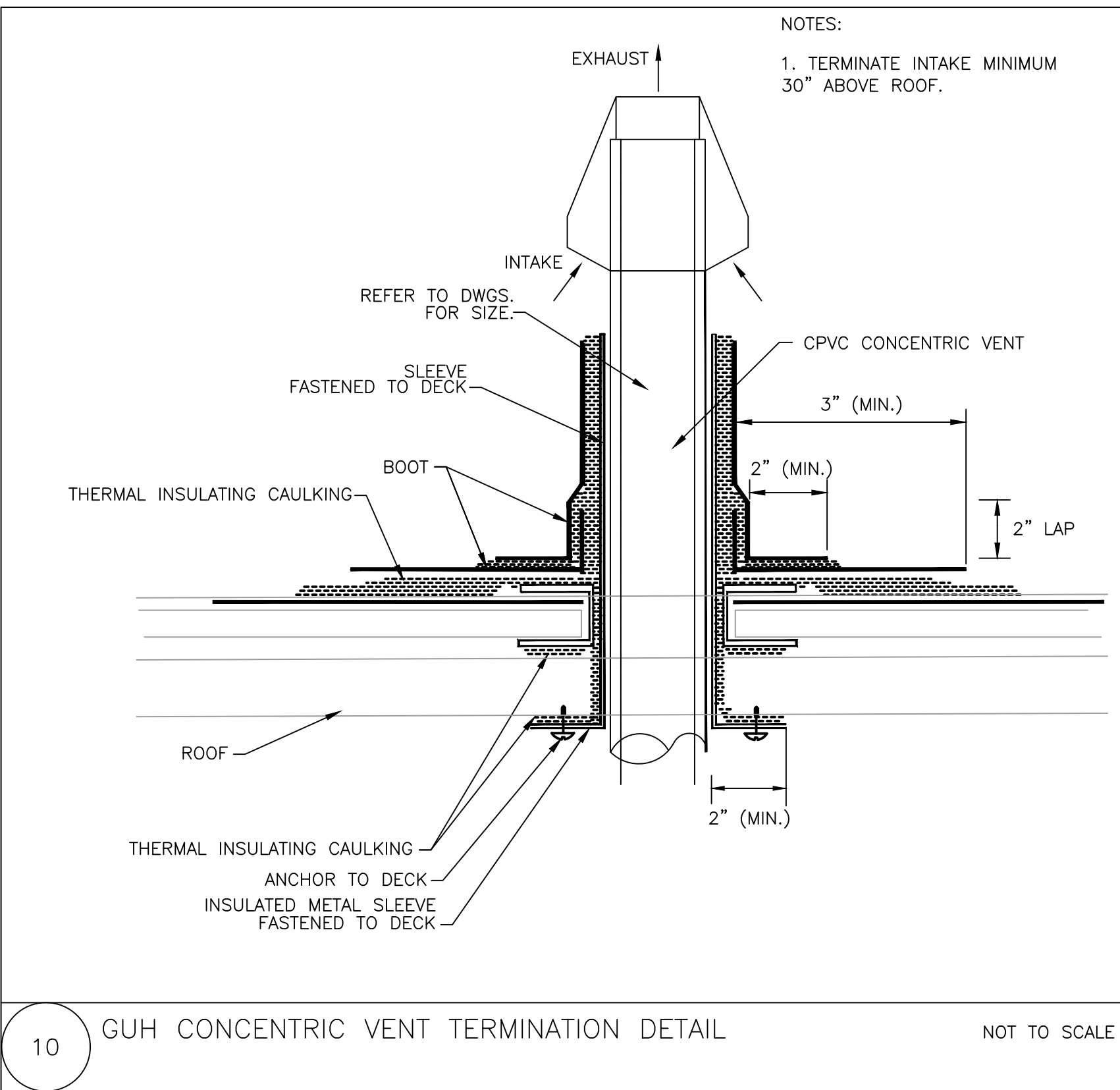
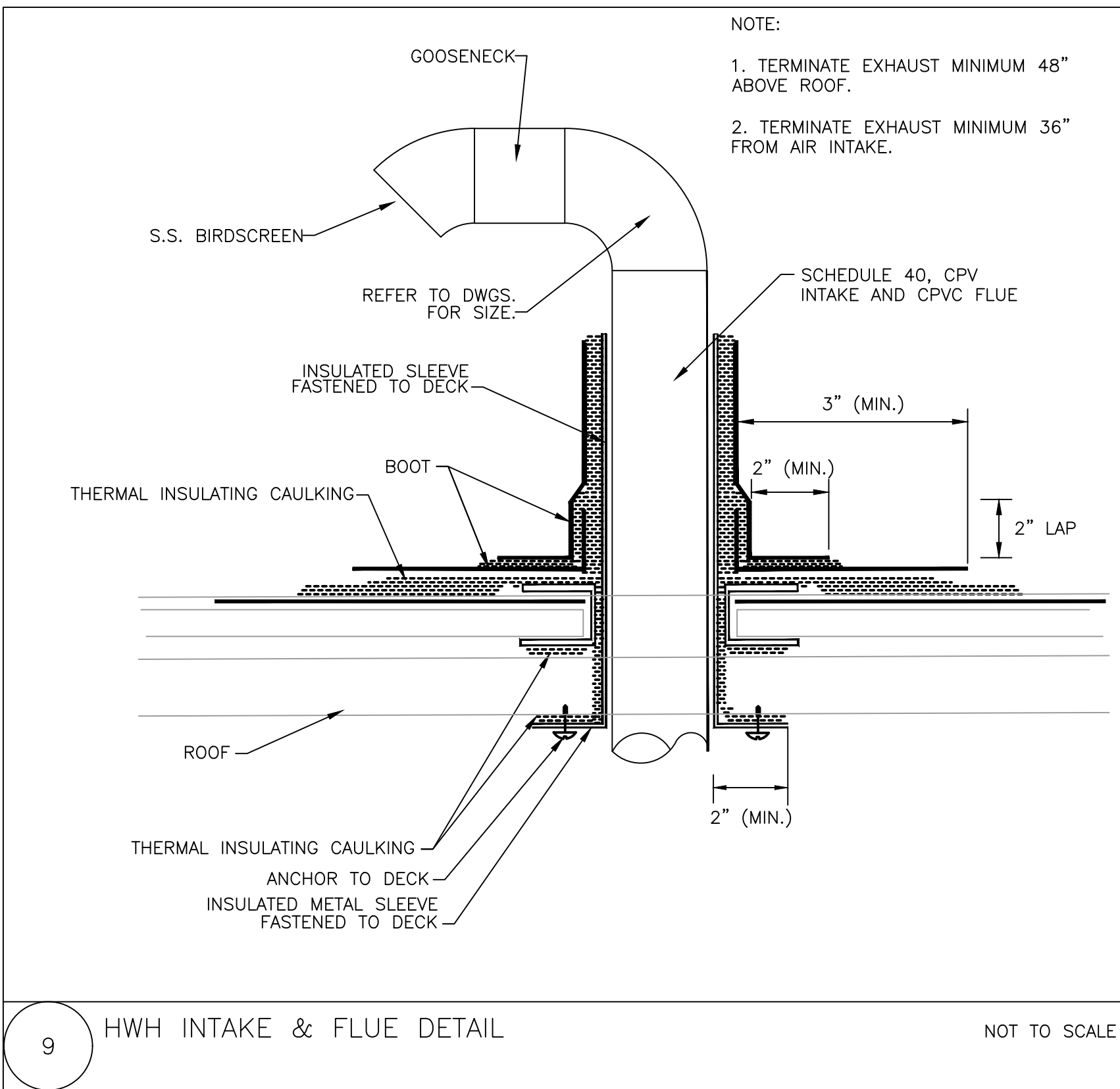
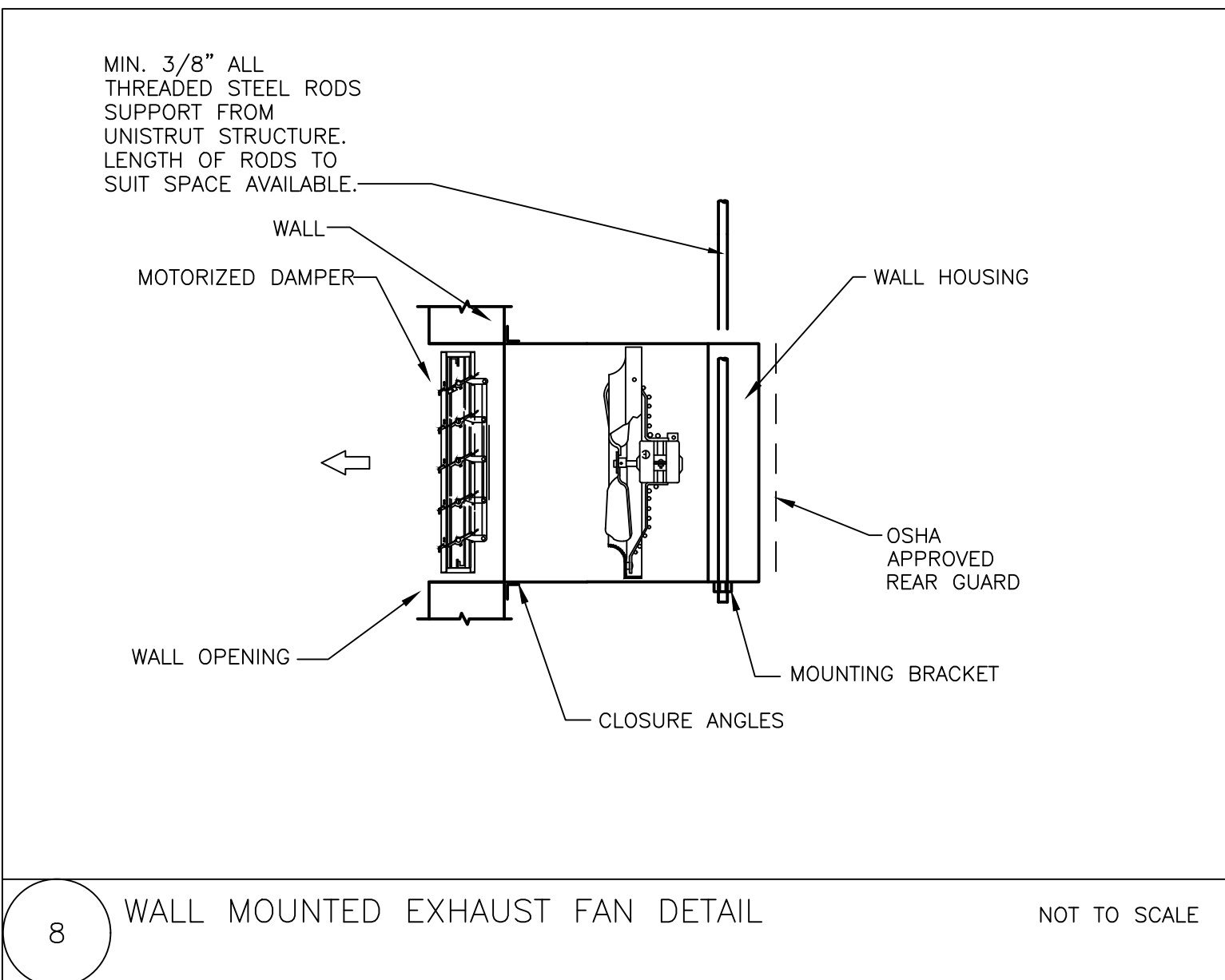
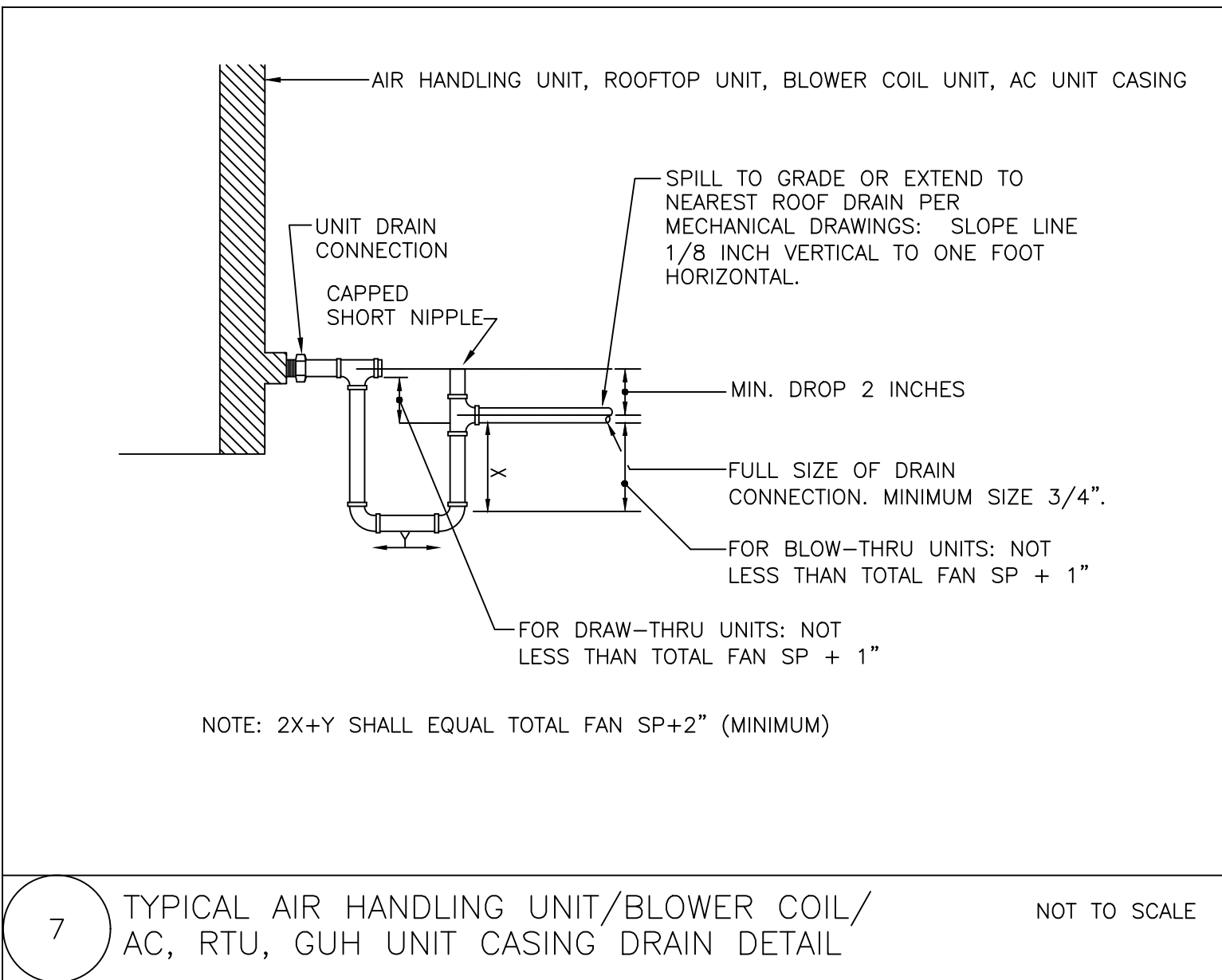
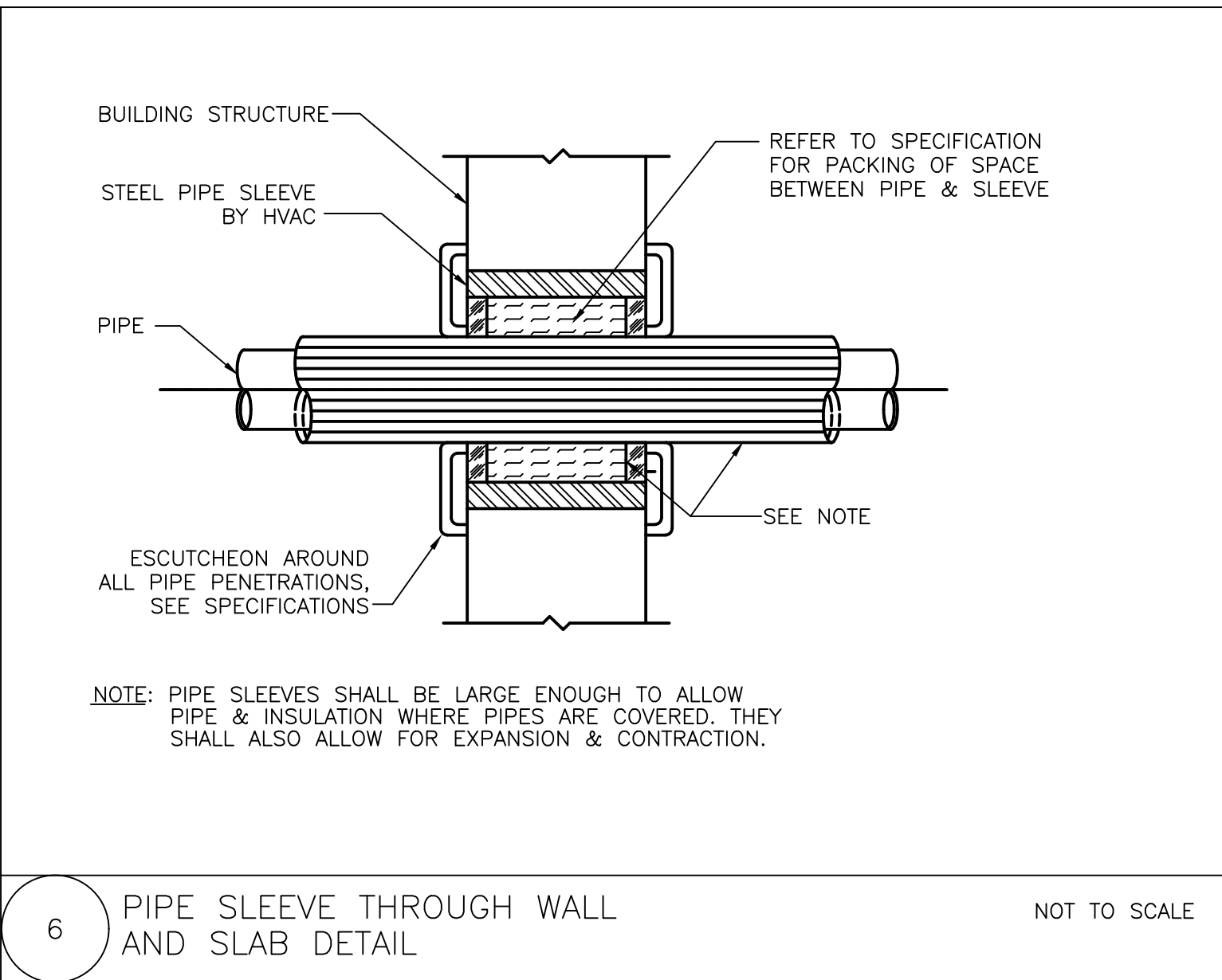
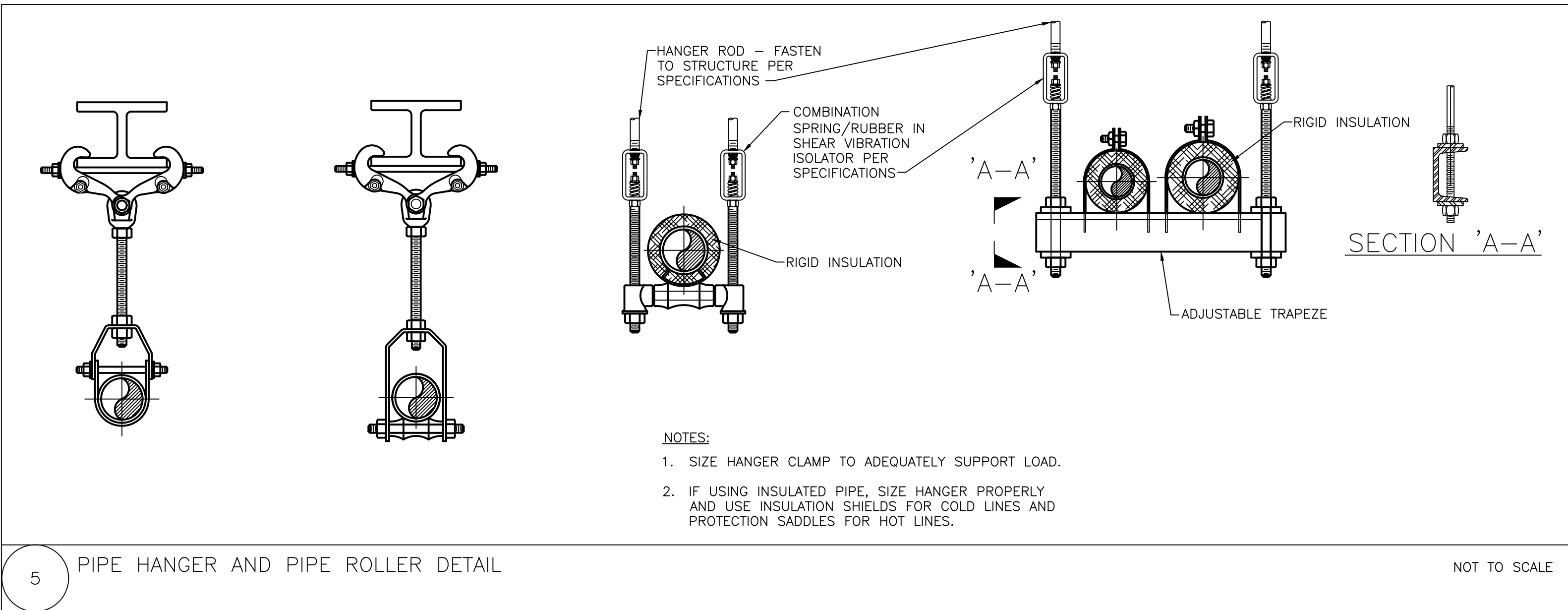
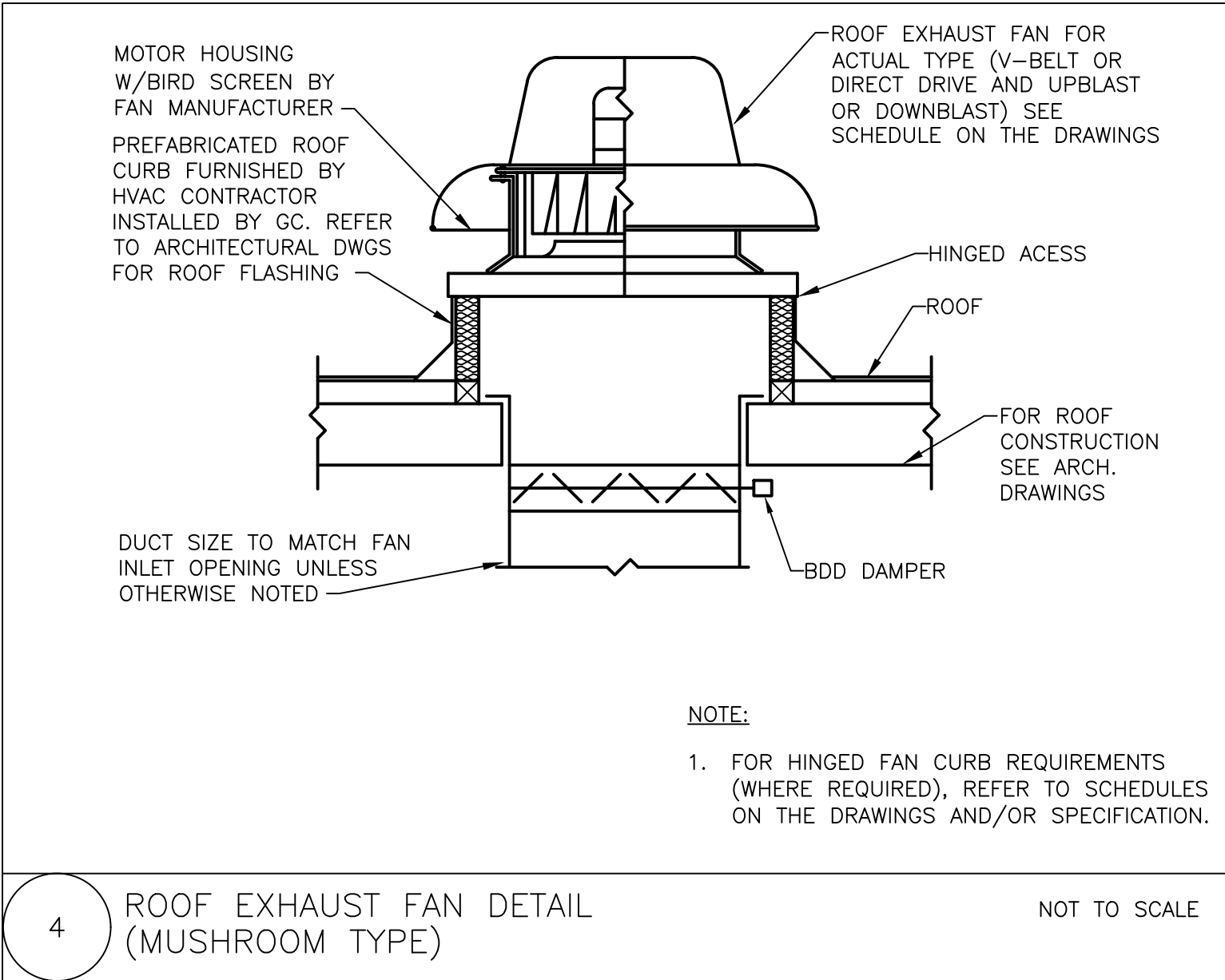
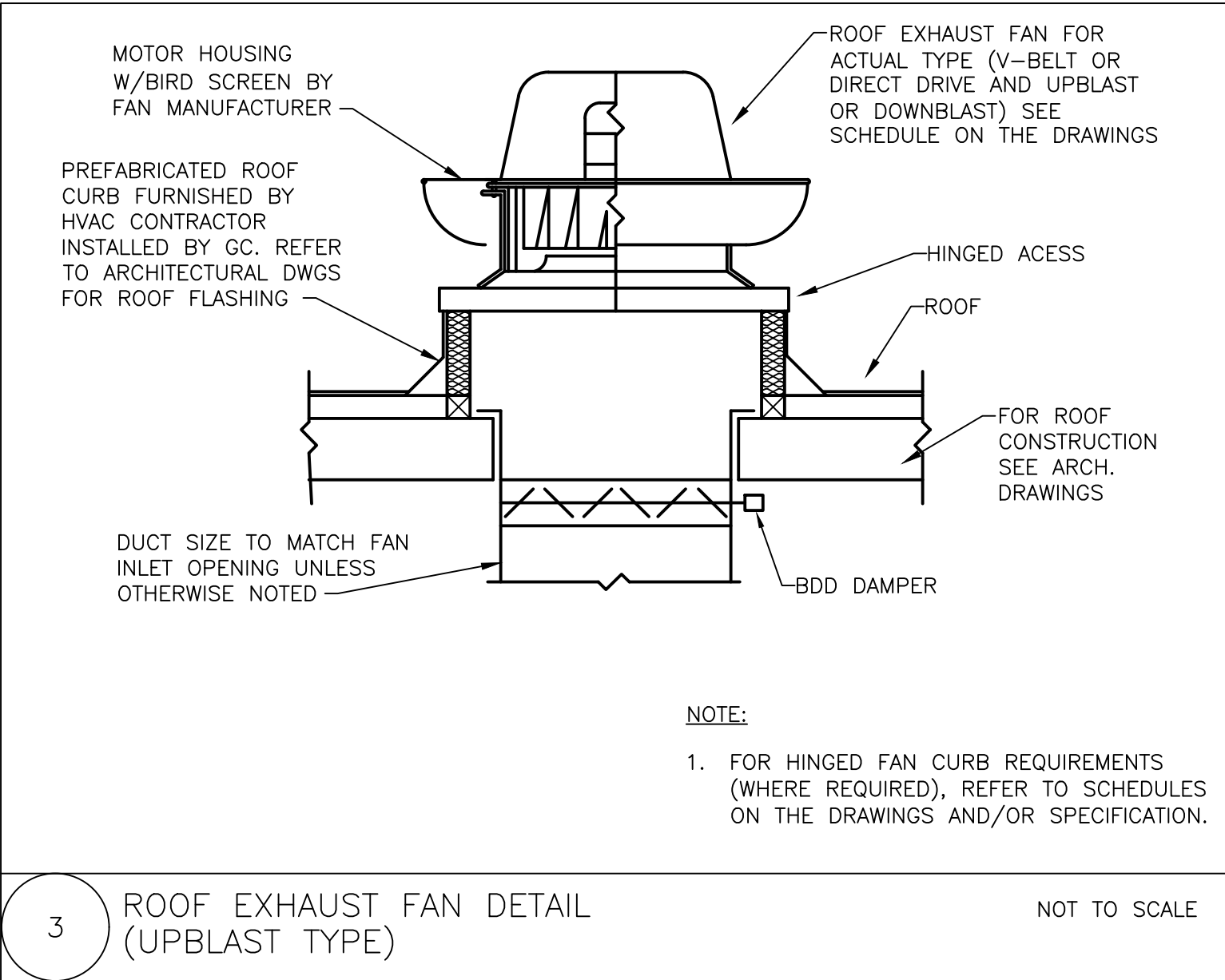
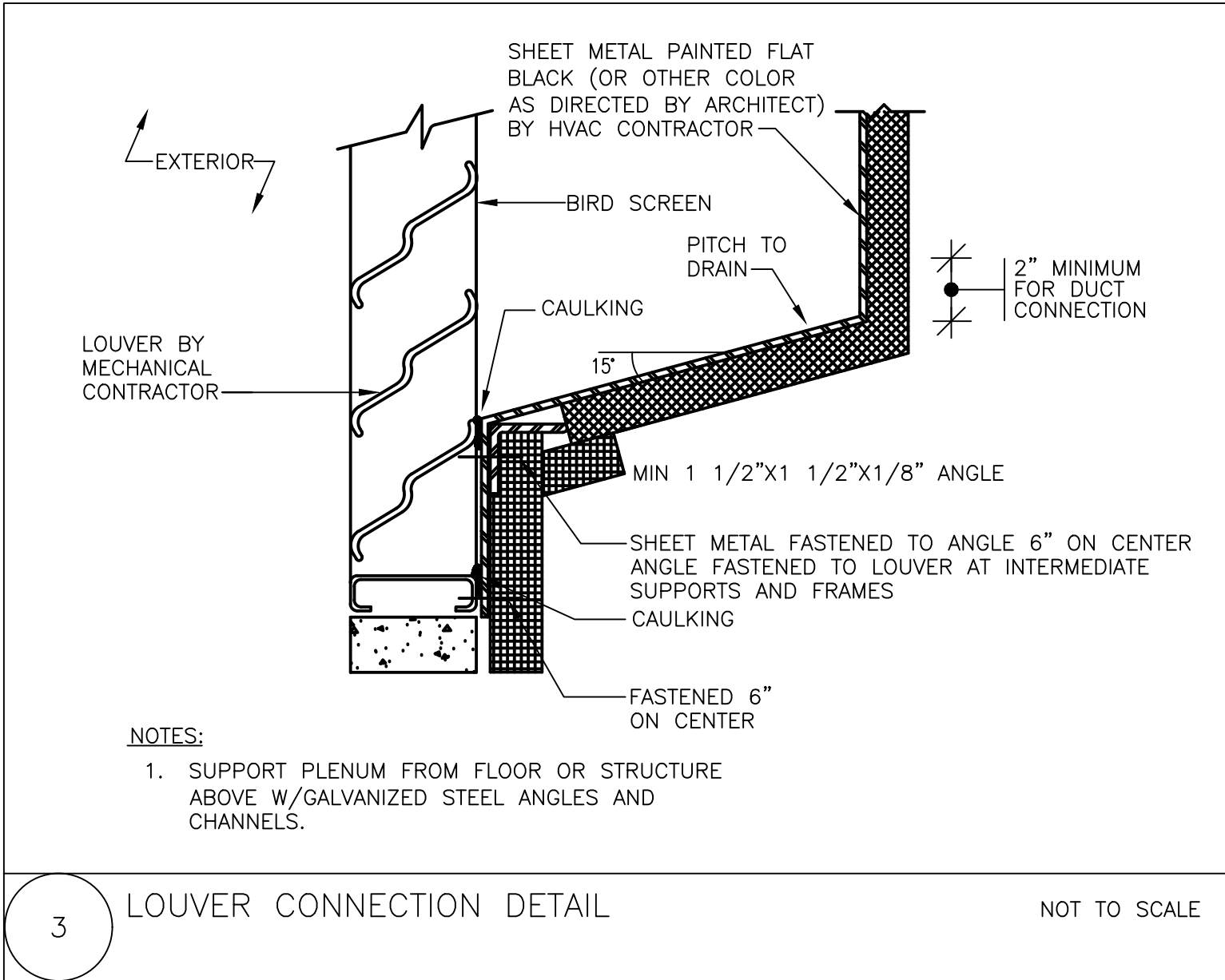
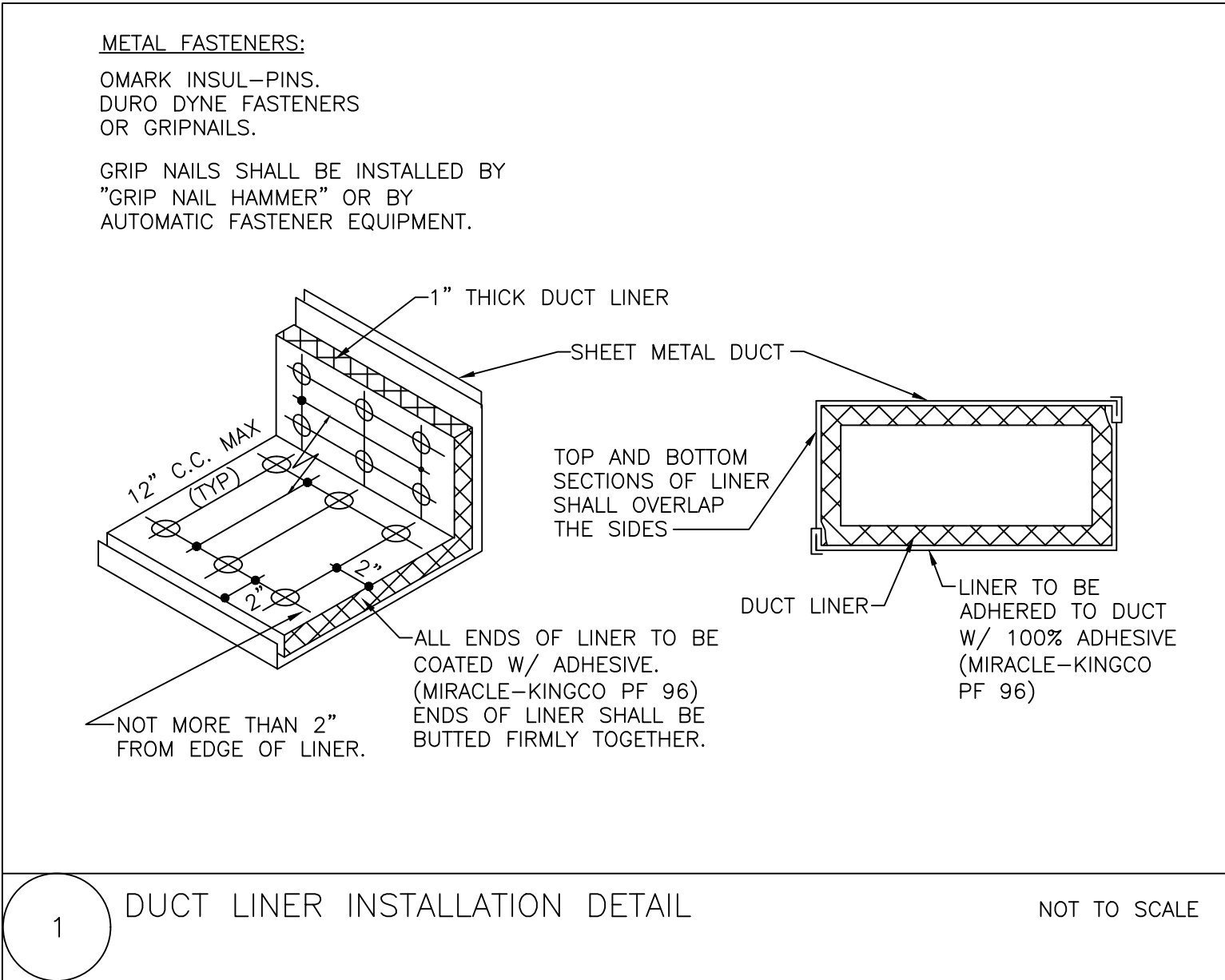
ISSUE HISTORY

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M501



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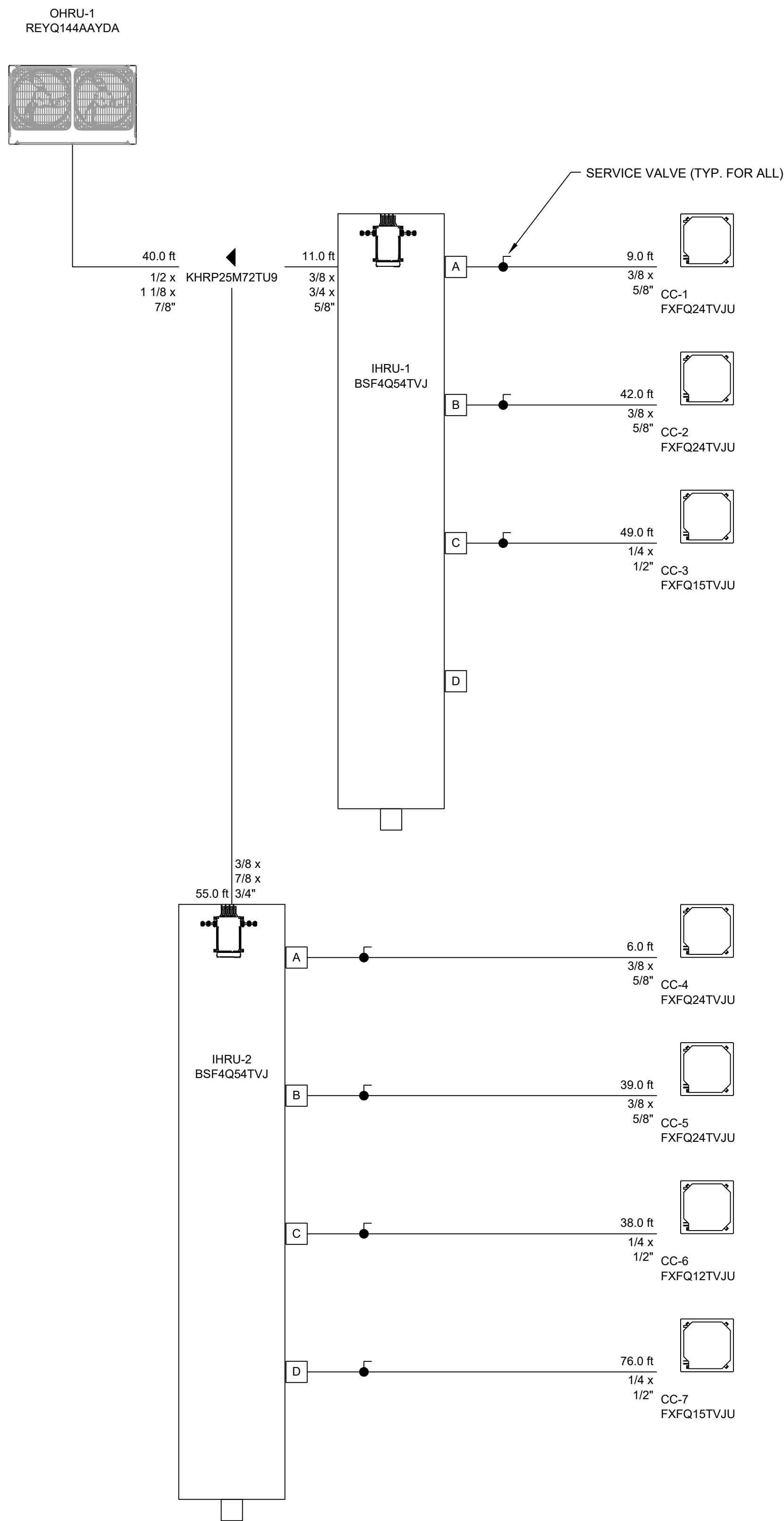
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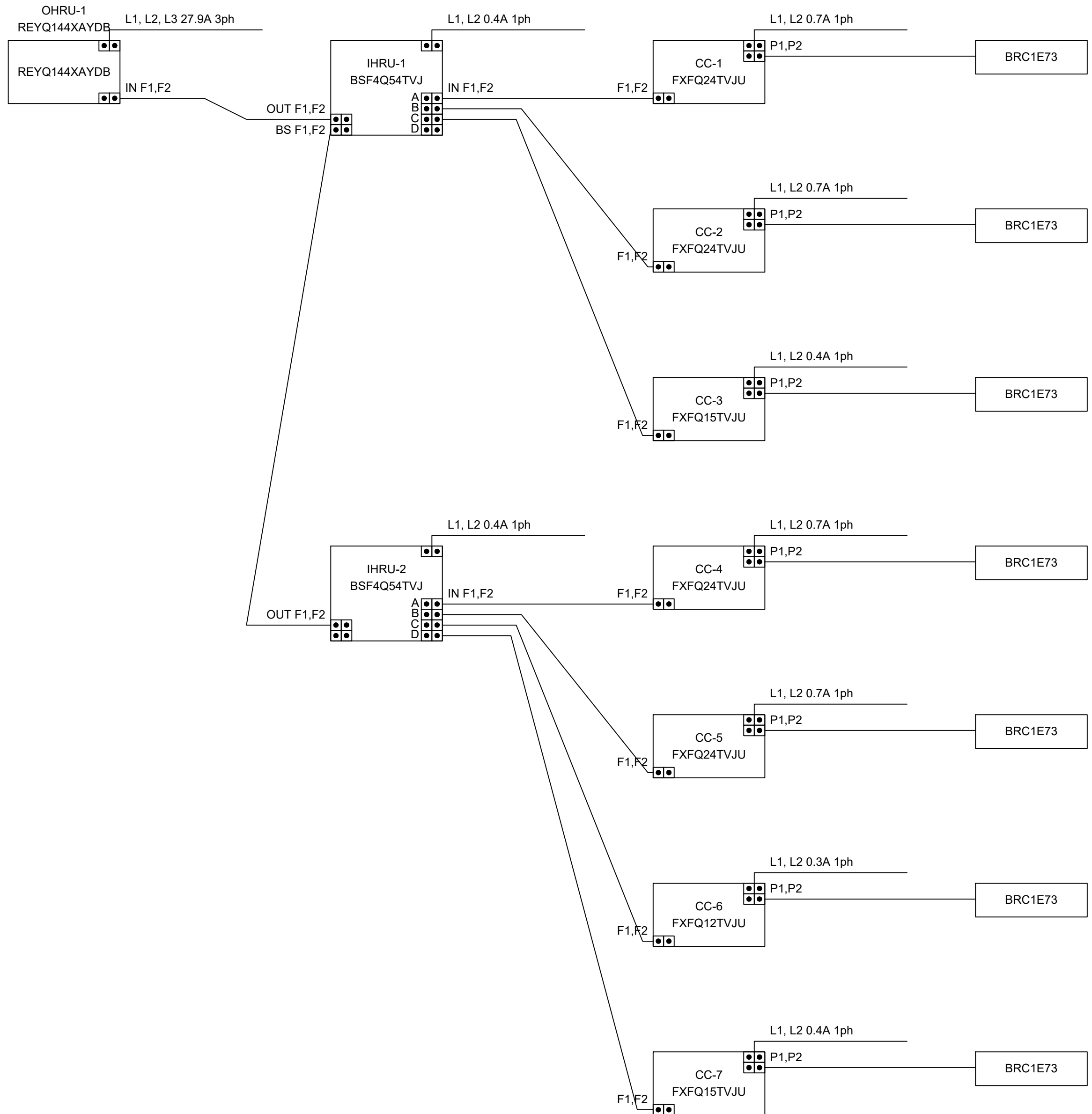
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1 VRF PIPING DIAGRAM
M503 NO SCALE



1 VRF WIRING DIAGRAM
M503 NO SCALE



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