MECHANICAL GENERAL NOTES:

1. ALL DRAWINGS DESIGNED PER 2021 IMC AND 2021 IECC. CONTRACTOR RESPONSIBLE FOR PERFORMING WORK IN ACCORDANCE WITH APPLICABLE STATUTES, ORDINANCES, CODES AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.

2. INSTRUCT THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS UNTIL THE OWNER IS FULLY PREPARED TO OPERATE AND MAINTAIN THE MECHANICAL SYSTEM. HOWEVER, LENGTH OF INSTRUCTION TIME SHALL BE LIMITED TO ONE DAY.

3. EQUIPMENT, MATERIALS AND LABOR REQUIRED BY THESE CONTRACT DRAWINGS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT UNLESS SPECIFIED OTHERWISE. DEFECTIVE MATERIALS OR WORKMANSHIP OCCURRING DURING THIS PERIOD SHALL BE CORRECTED AT NO ADDITIONAL COST.

4. GENERAL CONTRACTOR TO VERIFY WALL OPENINGS WITH STRUCTURE, LOCATIONS OF NEW AND EXISTING EQUIPMENT, AIR TERMINALS, AND ROUTE OF DUCTWORK WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN.

5. REFER TO ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS TO COORDINATE THE EXACT LOCATIONS OF DIFFUSERS, REGISTERS, GRILLES, PIPING AND OTHER MECHANICAL EQUIPMENT WITH CEILING GRID, LIGHTS, BEAMS AND OTHER BUILDING COMPONENTS.

6. CEILING GRID AND OTHER ITEMS SHALL NOT BE SUPPORTED FROM OR IN CONTACT WITH MECHANICAL EQUIPMENT. CONDUIT, WIRING, PIPING AND SUPPORTS SHALL NOT BE LOCATED IN FRONT OF FAN COIL ACCESS PANELS.

7. DUCTWORK AND PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING WITH ELECTRICAL PANELS WHEN SHOWN NEAR PANELS OR OVER ELECTRICAL ROOMS.

8. MATERIAL AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.

9. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL SUPPORTS REQUIRED TO MOUNT MECHANICAL EQUIPMENT, PIPING AND DUCTWORK. EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

10. ALL DUCTWORK TRANSITIONS AND PIPING INCREASERS/REDUCERS SHALL BE PROVIDED AS REQUIRED FOR EQUIPMENT CONNECTIONS. SEE MANUFACTURERS DATA FOR ACTUAL DUCTWORK AND PIPING CONNECTION SIZES AND LOCATIONS.

11. DUCTWORK AND PIPING LAYOUTS ARE FOR DIAGRAMMATICAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEASURING AND COORDINATING ALL DUCTWORK AND PIPING PRIOR TO INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY AND ALL OFFSETS AS REQUIRED TO MEET THE INTENT OF THE DESIGN DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.

12. THE GENERAL CONTRACTOR SHALL SEAL AND FLASH ALL WALL, ROOF, AND FLOOR PENETRATIONS AIRTIGHT AND WATERTIGHT AT EACH PIPE, DUCTWORK, AND CONDUIT PENETRATION. PROVIDE AIRTIGHT SEAL BETWEEN AT ALL FIRE PARTITION AND OR WALL PENETRATIONS WITH UL APPROVED FIRE-RESISTANT MATERIAL MATCHING OR EXCEEDING THE PENETRATED FIRE PARTITION AND OR WALLS RATING.

13. THE ROUTING OF LARGER SIZE SUPPLY AIR DUCTS SHALL TAKE PRECEDENCE OVER SMALLER DUCTS, AND OVER RETURN AND EXHAUST AIR DUCTS. PROVIDE DUCT OFFSETS, RISES, AND DROPS AS REQUIRED TO INSTALL DUCTWORK AS CLOSELY TO THE LAYOUT SHOWN ON THESE DOCUMENTS AS POSSIBLE.

SYMBOL LEGEND

SYMBOL	DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)
GENERAL	
⬡#	KEY NOTE TAG
△#	REVISION TAG
▨	NEW EQUIPMENT
DUCTWORK	
⊠	SUPPLY AIR DUCTWORK
⧅	RETURN AIR AND OUTSIDE AIR DUCTWORK
⊠	EXHAUST AIR DUCTWORK
┼┼┼┼	FLEXIBLE DUCTWORK
⊠	SUPPLY AIR DUCTWORK THROUGH HORIZONTAL PARTITION
◣	RETURN AIR DUCTWORK THROUGH HORIZONTAL PARTITION
◢	EXHAUST AIR DUCTWORK THROUGH HORIZONTAL PARTITION
╧	MANUAL BALANCING DAMPER
╪	MOTORIZED DAMPER
SENSORS	
(T)	THERMOSTAT AND TEMPERATURE SENSOR
(SD)	SMOKE DETECTOR
(H)	HUMIDISTAT
(CO)	CARBON DIOXIDE
(DT)	DIGITAL TIMER
AIR DEVICES	
⊖ -	GRILLE SIZE TAG (REFER TO GRILLE SIZE LEGEND)
⊠	SUPPLY AIR GRILLE WITH FOUR-WAY THROW
⧅	RETURN AIR GRILLE
⊠	EXHAUST AIR GRILLE
↑	SUPPLY AIR SIDEWALL GRILLE
↓	RETURN AIR SIDEWALL GRILLE
PIPING	
—D—	CONDENSATE DRAIN LINE
—R—	REFRIGERANT LINE
—+O	ELBOW UP
—+C	ELBOW DOWN
┘	90° ELBOW
⟋	45° ELBOW
┼┴┼	TEE
—+C+—	TEE DOWN
—+O+—	TEE UP
—+Ô+—	TOP BRANCH CONNECTION
—+Ĉ+—	BOTTOM BRANCH CONNECTION
—‖	FLANGE
—]	CAP
—ʃ	CONTINUATION

SUBSCRIPTS AND ABBREVIATIONS	
AC	AIR CONDITIONING
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB (TEMPERATURE)
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DIM	DIMENSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
F	FAHRENHEIT
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FT	FEET
G	GAS
GAL	GALLONS
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HZ	HERTZ (CYCLES PER SECOND)
ID	INSIDE DIAMETER
IN	INCHES
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	1000 BTUH
MCA	MINIMUM CIRCUIT AMPS
MD	MANUAL DAMPER
MOD	MOTORIZED OPERATED DAMPER
NC	NOISE CRITERIA OR NORMALLY CLOSED
OA	OUTSIDE AIR
PH	PHASE
PSI	POUNDS PER SQUARE INCH
R	RADIUS
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SD	SMOKE DETECTOR OR SMOKE DAMPER
SEN	SENSIBLE
SP	STATIC PRESSURE
SUP	SUPPLY
TON	12,000 BTUH (COOLING CAPACITY)
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UC	UNDERCUT (DOOR)
V	VOLTS
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
WB	WET BULB TEMPERATURE
WC	WATER COLUMN

BASIS OF DESIGN

THE MANUFACTURER AND MODEL NUMBER LISTED IN THE DRAWINGS OR SPECIFICATIONS ARE THE BASIS OF DESIGN. WHEN PROVIDING EQUIPMENT THAT IS NOT THE BASIS OF DESIGN, THE CONTRACTOR SHALL PROVIDE AN ITEMIZED LIST OF ALL DEVIATIONS FROM THE INFORMATION DETAILED IN BOTH THE SPECIFICATION SECTION AND SCHEDULE. ADDITIONALLY, THE EQUIPMENT MUST MEET THE PHYSICAL CONSTRAINTS OF ROOM INCLUDING COORDINATION WITH OTHER TRADES AND ALL EQUIPMENT CLEARANCES, INCLUDING OTHER TRADES. FINALLY, THE CONTRACTOR SHALL PROVIDE AT THE CONTRACTOR'S COST ANY SCOPE INCREASE AND DEDUCTIONS BASED ON THE NON-BASIS OF DESIGN EQUIPMENT FOR THE FOLLOWING MINIMUM ITEMS:

- ELECTRICAL MODIFICATIONS, INCLUDING WIRING, CONDUIT, DISCONNECTS, OVERCURRENT PROTECTION, PANELS, ETC.
- STRUCTURAL MODIFICATIONS.
- CIVIL MODIFICATIONS.
- PLUMBING MODIFICATIONS.
- DUCT AND PIPE CONNECTIONS OR ARRANGEMENTS.
- SPACE HEATING AND COOLING REQUIREMENTS.
- EXHAUST OR VENTILATION MODIFICATIONS.
- VIBRATION ISOLATION REQUIREMENTS.
- **CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE EQUIPMENT MANUFACTURER FOR ANY CHANGES TO THE REFRIGERANTS REQUIRED PER NEW EPA GUIDELINES. CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES FOR CHANGES IN EQUIPMENT SIZE OR ELECTRICAL REQUIREMENTS.**

HVAC EQUIPMENT SIZES ARE BASED UPON ASHRAE 2021 WEATHER DATA AS LISTED BELOW.
HEATING AND COOLING DESIGN CONDITION LOCATION: ***ROANOKE-BLACKSBURG, VA***
SUMMER:
- OUTDOOR CONDITIONS: ***92.1ºF DB, 72.6 WB***
- INDOOR SETPOINTS: ***75ºF DB 50% RH***

WINTER:
- OUTDOOR CONDITIONS: ***15.5F DB***
- INDOOR SETPOINTS: ***72ºF DB 35% RH***

Salas O'Brien

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Roanoke, Virginia 24011

Project Number: 2550-00634-00

ISSUE DATE	DESCRIPTION
10/24/2025	PERMIT SET

PROFESSIONAL SEAL

10/24/2025
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CONSTRUCTION DRAWINGS
FOR
SOUTHWEST COMMUNITY
CHURCH
MERRIMAN ROAD
ROANOKE, VA

drawn by: JCS
design by: JCS
checked by: SSL
date: 10/24/2025
Rev:

SHEET NAME

MECHANICAL
GENERAL NOTES
AND SYMBOLS

SHEET NUMBER

M001

MECHANICAL SPECIFICATIONS

GENERAL

1. PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATUTES, ORDINANCES, CODES AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
2. OBTAIN ALL PERMITS REQUIRED.
3. CONTRACT DRAWINGS ARE DIAGRAMMATIC ONLY AND DO NOT GIVE FULLY DIMENSIONED LOCATIONS OF VARIOUS ELEMENTS OF WORK. DETERMINE EXACT LOCATIONS FROM FIELD MEASUREMENTS.
4. GUARANTEE WORK FOR 1 YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OF HE PROJECT. DURING THAT PERIOD MAKE GOOD ANY FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIAL, EQUIPMENT OR WORKMANSHIP. AT THE OWNER'S OPTION, REPLACEMENT OF FAILED PARTS OR EQUIPMENT SHALL BE PROVIDED.
5. IMMEDIATELY PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, REPLACE AIR FILTERS.
6. PROVIDE EQUIPMENT HOUSEKEEPING PADS UNDER ALL FLOOR MOUNTED AND GROUND MOUNTED HVAC EQUIPMENT, AND AS SHOWN ON THE DRAWINGS. CONCRETE PADS ARE TO BE 4" THICK UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
7. PROVIDE NAMEPLATES WITH 1/2" HIGH LETTERS AND FASTENED WITH EPOXY OR SCREWS.
8. MAINTAIN QUALITY CONTROL OVER SUPERVISION, SUBCONTRACTORS, SUPPLIERS, MANUFACTURERS, PRODUCTS, SERVICES, SITE CONDITIONS AND WORKMANSHIP TO PRODUCE WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS.
9. COMPLY WITH INDUSTRY STANDARDS EXCEPT WHEN MORE RESTRICTIVE TOLERANCES OR SPECIFIED REQUIREMENTS INDICATE MORE RIGID STANDARDS OR MORE PRECISE WORKMANSHIP.
10. PERFORM WORK BY PERSONS QUALIFIED TO PRODUCE WORKMANSHIP OF SPECIFIED QUALITY.
11. SECURE PRODUCTS IN PLACE WITH POSITIVE ANCHORAGE DEVICES DESIGNED AND SIZED TO WITHSTAND STRESSES, VIBRATION, AND RACKING. UNDER NO CONDITIONS SHALL MATERIAL OR EQUIPMENT BE SUSPENDED FROM STRUCTURAL BRIDGING.
12. PROVIDE FINISHES TO MATCH APPROVED SAMPLES. ALL EXPOSED FINISHES SHALL BE APPROVED BY THE ARCHITECT. SUBMIT COLOR SAMPLES AS REQUIRED.

EARTHWORK

1. EXCAVATE AND BACKFILL FOR PIPE TRENCHES FOR UNDERGROUND PIPING, AND EXCAVATE FOR STRUCTURES INSTALLED AS PART OF MECHANICAL WORK.
2. REMOVE EXCESS EXCAVATION MATERIAL OR MATERIAL UNSUITABLE FOR BACKFILL. EXCESS MATERIAL CAN BE SPREAD ON GRADE, OR SHALL BE REMOVED FROM SITE AS DIRECTED BY THE OWNER/ARCHITECT.

TESTING, BALANCING, AND ADJUSTING

1. VERIFY AND RECORD THE TESTING RESULTS PERFORMED BY THE MECHANICAL CONTRACTOR.
2. THE OUTSIDE AIR, SUPPLY AIR, RETURN AIR, AND EXHAUST AIR FOR THE SYSTEM SHALL BE ADJUSTED TO WITHIN +/- 10 % OF THE VALUE SCHEDULED ON THE DRAWINGS.
3. SUPPLY FANS: TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS. TEST AND RECORD MOTOR VOLTAGE AND AMPERAGES. COMPARE DATA WITH THE NAMEPLATE LIMITS TO ENSURE FAN MOTOR IS NOT IN OR ABOVE THE SERVICE FACTOR. TEST AND ADJUST THE OUTSIDE AIR ON APPLICABLE EQUIPMENT USING A PITOT-TUBE TRAVERSE.
4. EXHAUST FANS: TEST, ADJUST, AND BALANCE EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10 % OF DESIGN REQUIREMENTS. OBSERVE THROWS ARE IN DIRECTION AS INDICATED ON DRAWINGS.
5. ONCE AIR FLOWS ARE SET TO ACCEPTABLE LIMITS, TAKE WET BULB AND DRY BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH COIL (COOLING ONLY).
6. DIRECT EXPANSION EQUIPMENT: WITH EACH UNIT OPERATING AT NEAR DESIGN CONDITIONS, MEASURE AND RECORD THE FOLLOWING: MANUFACTURER, MODEL NUMBER, SERIAL NUMBER AND ALL NAMEPLATE DATA. AMBIENT TEMPERATURE, CONDENSER DISCHARGE TEMPERATURE. AMPERAGE AND VOLTAGE FOR EACH PHASE. LEAVING AND ENTERING AIR TEMPERATURES. SUCTION AND DISCHARGE PRESSURES AND TEMPERATURES. TONS OF COOLING. VERIFICATION THAT MOISTURE INDICATOR SHOWS DRY REFRIGERANT.
7. TAB REPORT: THE ACTIVITIES DESCRIBED IN THIS SECTION SHALL BE RECORDED IN REPORT FORM TO BE PROVIDED IN QUADRUPLICATE (4), INDIVIDUALLY BOUND, TO THE ARCHITECT AND ENGINEER. NEATLY TYPE AND ARRANGE DATA. INCLUDE WITH THE DATA THE DATE TESTED, PERSONNEL PRESENT, WEATHER CONDITIONS, NAMEPLATE RECORD OF THE TEST INSTRUMENTS USED AND LIST ALL MEASUREMENTS TAKEN AFTER ALL CORRECTIONS ARE MADE TO THE SYSTEM. RECORD ALL FAILURES AND CORRECTIVE ACTION TAKEN TO REMEDY ANY INCORRECT SITUATION. THE INTENT OF THE FINAL REPORT IS TO PROVIDE A REFERENCE OF ACTUAL OPERATING CONDITIONS FOR THE OWNER'S OPERATIONS PERSONNEL.

CONDENSATE PIPING

1. TYPE "L" COPPER WITH DRAINAGE PATTERN FITTINGS IN RETURN PLENUM AREAS, PVC WITH DRAINAGE PATTERN FITTINGS IN NON-PLENUM AREAS.
2. INSTALL THE SYSTEM TO FACILITATE EASY REMOVAL, USE THREADED PLUGGED TEE AT EACH CHANGE OF DIRECTION TO PERMIT CLEANING, INSTALL A CLEANOUT EVERY 50 FEET OF STRAIGHT RUN PIPING, MAINTAIN A POSITIVE SLOPE ON ALL PIPING.
3. INSTALL A WATER SEAL TRAP LEG BASED ON THE FAN PRESSURE. SIZE OTHE LENGTH OF THE TRAP LEG 1 INCH LARGER THAN THE ACTUAL SYSTEM PRESSURE.
4. DO NOT INSTALL PIPING SIZED SMALLER THAN THE UNIT DRAIN CONNECTION SIZE.
5. INSULATE PIPING WITH 3/4" ELASTOMERIC INSULATION FOR ALL PIPE BELOW ROOF.
6. INSULATION TO BE 25/50 FLAME AND SMOKE RATING.

REFRIGERANT PIPING

1. REFRIGERANT PIPING: TYPE K SOFT-DRAWN COPPER TUBING WITH SWEAT-TYPE, WROUGHT COPPPER FITTINGS. CAST FITTINGS ARE NOT PERMITTED.
2. PRESSURE TEST: CHARGE THE SYSTEM WITH DRY NITROGEN AND TEST TO 300 PSIG. TEST JOINTS WITH A HALIDE TORCH OR AN ELECTRONIC LEAK DETECTOR. RETEST SYSTEM UNTIL PROVEN TIGHT.
3. EVACUATION AND DRYING: AFTER REFRIGERANT SYSTEM HAS BEEN PRESSURE TESTED, CONNECT A SUITABLE VACUUM PUMP AND EVACUATE PIPING SYSTEM, INCLUDING LINES AND EQUIPMENT. MAINTAIN A VACUUM AS HIGH AS PRACTICABLE FOR LONG ENOUGH TO EVAPORATE THE MOISTURE IN THE SYSTEM (AT LEAST 48 HOURS). CHECK THE HUMIDITY WITHIN THE SYSTEM WITH A WET BULB INDICATOR, AND MAINTAIN THE VACUUM UNTIL THE WET BULB TEMPERATURE IS REDUCED TO -40°F. AFTER THE SYSTEM HAS BEEN EVACUATED AND DRIED, BREAK THE VACUUM BY CHARGING PROPER REFRIGERANT INTO THE SYSTEM.
4. INSULATION: ELASTOMERIC INSULATION WITH A MINIMUM THICKNESS OF 3/4" WITH A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. THERMAL CONDUCTIVITY OF 0.27 AT 75°F MEAN (ASTM C177 OR C 518). INSULATION TO BE ARMSTRONG OR APPROVED EQUAL. ALL INSULATION IS TO BE COVERED BY SMOOTH FABRICATED Z-LOCK ALUMINUM JACKET 0.016" THICK WITH A FACTORY APPLIED 1 MIL POLYETHYLENE/40LB AND FAB STRAP. KRAFT MOISTURE BARRIER. CHILDER LOCK-ON OR APPROVED EQUAL.

ELECTRIC UNIT HEATERS

1. FURNISH AND INSTALL HEATER COMPLETE WITH HEATING ELEMENT, PROPELLER FAN, MOUNTING BRACKETS AND OTHER OPTIONS SPECIFIED.
2. ACCEPTABLE MANUFACTURERS: MODINE, REZNOR, TRANE, MARKEL.
3. CONSTRUCTION: CONSTRUCT CASING OF SHEETMETAL WITH A STRUCTURAL FRAME. ENAMEL OR LACQUER TO FINISH TO MANUFACTURERS STANDARD. HEATING COIL SHALL BE 80% NICKEL AND 20% CHROMIUM AND MADE OF CORROSION RESISTANT MATERIALS.
4. UL LISTING: HEATER SHALL UL LISTED FOR ZERO CLEARANCE TO COMBUSTIBLE SURFACES AND FOR USE WITH CENTRAL AIR CONDITIONERS.
5. AUTOMATIC CONTROLS: FACTORY MOUNTED. PREWIRED TO THE JUNCTION BOX. UNIT MOUNTED THERMOSTAT (24 VOLT LOW VOLTAGE).
6. SAFETY CONTROLS: A PRIMARY AND SECONDARY THERMAL CUT-OFF TO DE-ENERGIZE EACH CIRCUIT. MANUAL RESET HIGH LIMIT. AUTOMATIC RESET THERMAL PROTECTION
7. FAN: PROPELLER BLADE CONSTRUCTED IF ALUMINUM, OR OTHER CORROSION MATERIAL. STATICALLY AND DYNAMICALLY BALANCE. PROVIDE WITH SUBSTANTIAL FAN GUARD.
8. MOUNTING: MOUNTED KIT SHALL BE SUITABLE FOR INSTALLATION
9. INSTALLATION: PROVIDE START-UP TO ENSURE CORRECT OPERATION OF UNIT. ADJUST DISCHARGE LOUVERS TO CONTROL DIRECTION OF AIR FLOW.

AIR DEVICES

1. FURNISH AND INSTALL AIR DISTRIBUTION DEVICES, INCLUDING GRILLES, DIFFUSERS, REGISTERS, DAMPERS, AND EXTRACTORS.
2. ACCEPTABLE MANUFACTURERS: TUTTLE AND BAILEY, TITUS, KRUEGER, METAL-AIRE, NAILOR INDUSTRIES, PRICE

DUCTWORK

1. DUCT MATERIAL AND CONSTRUCTION: USE LOCK FORMING QUALITY PRIME GALVANIZED STEEL SHEETS OR COILS UP TO 60" WIDE. STENCIL EACH SHEET WITH GAUGE AND MANUFACTURER'S NAME. STENCIL COILS OF SHEET STEEL THROUGHOUT ON 10' CENTERS WITH GAUGE AND MANUFACTURER'S NAME. PROVIDE CERTIFICATION OF DUCT GAUGE AND MANUFACTURER FOR EACH SIZE DUCT.
2. RECTANGULAR LOW PRESSURE DUCT CONSTRUCTED OF SHEET METAL IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
3. LOW PRESSURE ROUND DUCTS SHALL BE SHOP FABRICATED WITH SNAP LOCK LONGITUDINAL SEAMS. DUCTS SHALL BE CONSTRUCTED FOR A MINIMUM OF 2" W.G. STATIC PRESSURE. MEDIUM PRESSURE ROUND DUCTWORK SHALL BE WELDED SPIRAL SEAM SUCH AS MANUFACTURED BY UNITED SHEET METAL COMPANY.
4. FLEXIBLE DUCT LOW PRESSURE SHALL BE A CONTINUOUS GALVANIZED SPRING STEEL WIRE HELIX, WITH REINFORCED METALIZED COVER, REINFORCED VAPOR BARRIER JACKET RATED FOR USE AT SYSTEM PRESSURE (6" WC MINIMUM). THERMAL CHARACTERISTICS OF R-6 BTU/HR/SQ. FT./°F AND 2" WALL THICKNESS INSULATION WITH 1" OVERLAP. ACCEPTABLE MANUFACTURERS: FLEXMASTER, HART & COOLEY, OMNIAIR
5. WALL LOUVERS: REFER TO SCHEDULE ON DRAWINGS. COORDINATE WITH ARCHITECTURAL DRAWINGS. ALL LOUVER FRAMES SHALL BE A MINIMUM OF 0.08" EXTRUDED ALUMINUM. ALL BLADES SHALL BE A MINIMUM OF 0.081" EXTRUDED ALUMINUM. BEGINNING POINT OF WATER PENETRATION AT 0.01 OZ/SQ.FT. SHALL BE A MINIMUM OF 800 FT/MIN. PROVIDE ALL LOUVERS WITH REMOVABLE ALUMINUM BIRD SCREEN WITH 1/4" MESH.

DUCTWORK INSULATION

1. FURNISH AND INSTALL EXTERNAL INSULATION ON SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTWORK.
2. ALL DUCT INSULATION USED ON THE PROJECT INSIDE THE BUILDING MUST HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50 AS DETERMINED BY TEST PROCEDURES ASTM E84, NFPA 255 AND UL 723.
3. CONDENSATION ON ANY INSULATED SYSTEM IS NOT APPROVED.
4. INSULATION: GLASS FIBER BLANKET DUCT INSULATION. ACCEPTABLE MANUFACTURERS ARE: MANVILLE R-SERIES MICROLITE FSKL, OWENS-CORNING ED100 RKF, KNAUF 1.0 PCF FSK.
5. OUTDOOR DUCT LAMINATED JACKETING: RUBBERIZED BITUMEN COMPOUND MATERIAL: ULTRAVIOLET RESISTANT, WEATHERPROOF, VAPOR RETARDING JACKETING, LAMINATED JACKETING, CROSS-LAMINATED HIGH STRENGTH POLYETHYLENE FILM, LAMINATED TO ALUMINUM FOIL, MINIMUM 60-MIL THICKNESS. ACCEPTABLE MANUFACTURERS: ALUMAGUARD 60, FLEX CLAD 400, VENTURE CLAD 1577CW. PROVIDE AS INSULATION COATING CHILDERS ENCACEL X OR FOSTER MONOLAR 60-90. PERMEANCE SHALL BE 0.03 PERMS OR LESS AT 30 MILS DRY. TESTED AT 100°F AND 90% RH PER ASTM F1240.
6. OUTDOOR DUCTWORK COVERING: COVER ALL SUPPLY AND RETURN DUCTWORK OUTDOORS WITH 2" THICK, RIGID CLOSED CELL INSULATION WITH REINFORCED FOIL FACING. INSTALL A HIGH POINT IN CENTER AND SLOPE IN BOTH DIRECTIONS SO WATER WILL NOT STAND ON HORIZONTAL SURFACES. STANDING WATER ON HORIZONTAL SURFACES IS NOT APPROVED. IMPALE THE INSULATION OVER MECHANICAL FASTENERS AND WASHERS: A MINIMUM OF 2 ROWS OF FASTENERS PER SIDE ON 12 INCH CENTERS. SEAL ALL BREAKS, JOINTS, AND PUNCTURES BY APPLYING A 1/8" THICK VAPOR BARRIER MASTIC COATING, EMBEDDED IN OPEN MESH REINFORCING MESH. STANDINGS, OR FLANGED CONNECTIONS SHALL BE COVERED WITH THE SAME THICKNESS OF INSULATION OVERLAPPED A MINIMUM OF 4" APPLY DUCT LAMINATED JACKETING PROTECTION OVER ENTIRE INSULATION SURFACE. APPLY RUBBERIZED BITUMEN COMPOUND, APPLIED TO A CROSS-LAMINATED HIGH STRENGTH POLYETHYLENE FILM, LAMINATED TO ALUMINUM FOIL.

AIR HANDELING UNITS

1. ACCEPTABLE MANUFACTURERS: LENNOX, TRANE, CARRIER, YORK/JCI
2. FAN SECTION: LOCATE THE MOTOR AND DRIVE ASSEMBLY INSIDE THE CABINET. SIZE EACH V-BELT DRIVE FOR 50% OVERLOAD. ADJUSTABLE PITCH MOTOR PULLEY. PROVIDE BUILT-IN MOTOR PROTECTION PROVIDE A BELT ADJUSTMENT MEANS. SELECT THE FAN MOTOR SO THAT THE BRAKE HORSEPOWER REQUIRED TO DELIVER THE DESIGN AIR QUANTITY AT THE SYSTEM STATIC PRESSURE WILL NOT EXCEED THE MOTOR NAMEPLATE AMPERAGE RATING.
3. UNIT HOUSING: CONSTRUCT THE UNIT OF GALVANIZED STEEL SHEETS, AND FORMED MEMBERS. INTERNALLY INSULATE THE ENTIRE UNIT WITH NEOPRENE COATED, 1-1/2 LB. DENSITY GLASS FIBER INSULATION, APPLIED TO INTERNAL SURFACES WITH ADHESIVE AND WELD PINS. COAT EXPOSED EDGES OF INSULATION WITH ADHESIVE. PROVIDE A DUCT FLANGE ON FOUR SIDES OF THE RETURN AIR INLET AND SUPPLY AIR OUTLET OF THE UNIT.
4. CONDENSATE DRAIN PANS: PROVIDE IAQ STYLE DRAIN PANS SHALL BE PROVIDED UNDER ALL COILS. PITCH TO DRAIN CONNECTION.

AIR-COOLED CONDENSING UNITS

1. FURNISH AND INSTALL AIR-COOLED CONDENSING UNITS COMPLETE WITH CASING, COMPRESSOR, CONDENSER COIL, CONDENSER FAN AND CONTROLS REQUIRED FOR A SPLIT AIR CONDITIONING SYSTEM.
2. PROVIDE PERFORMANCE AS SCHEDULED ON DRAWINGS, AND HEAD PRESSURE CONTROL TO ENABLE UNIT TO OPERATE IN TEMPERATURES AS LOW AS 20°F.
3. ACCEPTABLE MANUFACTURERS: CARRIER, TRANE, YORK/JCI.
4. COMPRESSOR: PROVIDE A HERMETIC COMPRESSOR WITH CRANKCASE HEATERS, INHERENTLY MOTORS, SPRING MOUNTS AND CAPACITY MODULATION. PROVIDE EACH COMPRESSOR WITH A 5-YEAR WARRANTY.
5. CONDENSER COILS: PROVIDE COPPER TUBES WITH MECHANICALLY BONDED ALUMINUM FINS. PROTECT CONDENSER COILS WITH A HEAVY GAUGE, CORROSION RESISTANT WIRE GUARD. F. FANS AND MOTORS: PROVIDE PROPELLER-TYPE FANS WITH DIRECT DRIVE OR BELT DRIVE AND VERTICAL DISCHARGE. PROTECT FAN WITH A HEAVY-GAUGE, CORROSION RESITANT WIRE GUARD. PROVIDE INHERENTLY PROTECTED, PERMANENTLY LUBRICATED, AND WEATHERPROOF MOTORS.
6. CONTROLS: PROVIDE SAFETY AND OPERATING CONTROLS FACTORY WIRED AND MOUNTED IN A SEPARATE ENCLOSURE. INCLUDE HIGH AND LOW PRESSURE SWITCHES AND COMPRESSOR MOTOR OVERLOAD DEVICES. FURNISH A TIME DELAY DEVICE TO PREVENT SHORT CYCLING. EMPLOY A CONTROL TRANSFORMER, A PRESSURE RELIEF DEVICE AND SUCTION AND DISCHARGE VALVES WITH SERVICE CONNECTIONS.
7. THERMOSTAT: LOW VOLTAGE THERMOSTAT IS A COMPONENT OF THE UNIT MANUFACTURER UNLESS SPECIFIED IN ANOTHER SECTION. INDIVIDUAL HEATING/COOLING SET POINTS. AUTOMATIC HEAT/COOL CHANGE-OVER. SUB-BASE ON-OFF-AUTO FAN SELECTION. SUB-BASE HEAT-OFF-COOL-AUTO SYSTEM SELECTION.
8. INSTALLATION: MOUNT CONDENSING UNITS ON 4" FOUNDATION PADS AND PIPE AS SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER. INSTALL REMOVABLE CORE REFRIGERANT FILTER DRYER AND SIGHT INDICATING GLASS.
9. CONTROL WIRING: FURNISH AND INSTALL CONTROL WIRING AS REQUIRED. INSTALL CONTROL WIRING IN CONDUIT.

SMOKE DETECTORS

1. ACCEPTABLE MANUFACTURERS: AUTOCALL, SIMPLEX, SIEMENS, NOTIFIER, GAMEWELL, PYROTRONICS.
2. THE UNIT SHALL CONSIST OF A CLEAR MOLDED PLASTIC ENCLOSURE (OR REMOTE MOUNTED LED STATUS INDICATOR SHALL BE PROVIDED NEXT TO THE SMOKE DETECTOR) WITH INTEGRAL CONDUIT KNOCKOUTS TO PROVIDE VISUAL VIEWING OF DETECTOR/SENSOR FOR MONITORING SENSOR OPERATION AND CHAMBER CONDITION. THE DUCT HOUSING SHALL BE PROVIDED WITH GASKET SEALS TO INSURE PROPER SEATING OF THE HOUSING TO THE ASSOCIATED DUCTWORK. EACH UNIT'S SAMPLING TUBES SHALL EXTEND THE WIDTH OF THE DUCT AND BE PROVIDED WITH POROSITY FILTERS TO REDUCE SENSOR/CHAMBER CONTAMINATION.
3. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) SECTIONS NFPA 72, NFPA 90A, NFPA 101
4. TO MINIMIZE NUISANCE ALARMS, DETECTORS SHALL HAVE AN INSECT SCREEN AND BE DESIGN TO IGNORE INVISIBLE AIRBORNE PARTICLES OR SMOKE DENSITIES THAT ARE BELOW THE FACTORY SET ALARM POINT. NO RADIOACTIVE MATERIAL SHALL BE USED. THE DETECTOR HEAD SHALL BE DIRECTLY INTERCHANGEABLE WITH AN IONIZATION DETECTOR TYPE.
5. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL NECESSARY WIRING, POWER AND OTHER DEVICES FOR INSTALLATION. INTERLOCK THE SMOKE DETECTOR WITH THE RELATED AIR HANDLING EQUIPMENT TO PROVIDE AUTOMATIC SHUT-DOWN OF THE SYSTEM WHENEVER PRODUCTS OF COMBUSTION ARE DETECTED.

AIR FILTERS

1. AIR FILTERS: FURNISH AND INSTALL A DISPOSAL MEDIA AND FRAME FILTER WITH RESISTANCE TO AIR FLOW OF A CLEAN FILTER NOT TO EXCEED 0.12" WG AT 300 FPM.
2. INSTALL THE FILTERS AND FILTER GAUGES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

FANS

1. PROVIDE FAN TYPE, ARRANGEMENT, ROTATION, CAPACITY, SIZE, MOTOR HORSEPOWER, AND MOTOR VOLTAGE AS SHOWN. FAN CAPACITIES AND CHARACTERISTICS ARE SCHEDULED ON THE DRAWINGS. PROVIDE FANS CAPABLE OF ACCOMMODATING STATIC PRESSURE VARIATIONS OF +10% OF SCHEDULED DESIGN AT THE DESIGN AIR FLOW.
2. ACCEPTABLE MANUFACTURERS: COOK, GREENHECK, PENN VENTILATOR, ACME, CARNES, TWIN CITY
3. SAFETY DISCONNECT SWITCH: PROVIDE A FACTORY-WIRED TO MOTOR, SAFETY DISCONNECT SWITCH ON EACH UNIT.
4. PREFABRICATED ROOF CURBS: FURNISH PREFABRICATED ROOF CURBS AS DETAILED. THE MINIMUM HEIGHT IS 14". INCLUDE A RESILIENT PAD ON EACH ROOF CURB SO THE EQUIPMENT CAN BE MOUNTED ON THE TOP FLANGE FOR PROPER SEAL. COORDINATE ROOF SLOPE AND CURB TO ENSURE EQUIPMENT IS INSTALLED IN LEVEL POSITION. PROVIDE DOUBLE SHELL TO PROTECT INSULATION FROM DAMAGE.
5. DAMPERS. WHERE AUTOMATIC BACKDRAFT DAMPER IS SCHEDULED: MULTI-BLADED, ROLL FORMED ALUMINUM BLADES, NYLON BEARINGS, NEOPRENE WEATHER STRIP ON BLADE EDGE.
6. FURNISH SUPPLY FANS WITH 1" ALUMINUM, WASHABLE FILTER SECTION.
7. ROOFTOP VENTILATION AND EXHAUST SYSTEMS: PROVIDE EACH MOTOR WITH INTERNAL OVERLOAD PROTECTION, ALUMINUM, STAINLESS STEEL OR PLASTIC COATED BIRD GUARD, SCREWS AND FASTENERS OF STAINLESS STEEL OR NONFERROUS MATERIAL, ALL ALUMINUM CONSTRUCTION UNLESS INDICATED OTHERWISE ON FAN SCHEDULE, WELDED CONSTRUCTION, CORROSION RESISTANT FASTENERS, MINIMUM 16 GAUGE MARINE ALLOY ALUMINUM, ALUMINUM BASE SHALL BE CONTINUOUSLY WELDED CURB CAP CORNERS.

PAD MOUNTED PACKAGED AIR CONDITIONERS

1. PROVIDE AND INSTALL A SINGLE-PACKAGE, SINGLE-ZONE, ELECTRIC AIR CONDITIONER WITH GAS HEAT FOR PAD MOUNTED APPLICATION.
2. PERFORMANCE: AS SCHEDULED ON DRAWINGS, WITH HEAD PRESSURE CONTROL TO ENABLE UNIT START AND OPERATE DOWN TO 20 DEGREES F AMBIENT.
3. ACCEPTABLE MANUFACTURERS: LENNOX, CARRIER, YORK/JCI, TRANE.
4. COMPRESSOR: PROVIDE A THERMALLY PROTECTED, SERVICEABLE SEMI-HERMETIC COMPRESSOR OR HERMETIC COMPRESSOR WITH SERVICE VALVES, VIBRATION ISOLATION, CRANKCASE HEATERS, SLIGHT GLASS AND FILTER DRIER. PROVIDE WITH A 5-YEAR WARRANTY.
5. EVAPORATOR AND CONDENSER COILS: PROVIDE COPPER TUBES WITH MECHANICALLY BONDED ALUMINUM FINS FOR EVAPORATOR AND CONDENSER COILS. PROVIDE HAIL GUARDS FOR CONDENSER COILS.
6. PAD MOUNTED CURB: INSTALL A PAD MOUNTED CURB OF THE SAME MANUFACTURE AS THE AIR CONDITIONER UNIT. CURB TO SUPPORT THE UNIT AND PROVIDE A WATERTIGHT ENCLOSURE TO PROTECT DUCTWORK AND UTILITY SERVICES. LEVEL CURB ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. THERMOSTAT ASSEMBLY: PROVIDE STAGED 7-DAY PROGRAMMABLE HEATING AND COOLING AS REQUIRED, AUTOMATIC CHANGEOVER AND FAN CONTROL.
8. HEAD PRESSURE CONTROL: PROVIDE SOLID STATE OUTDOOR AIR FAN SPEED CONTROL TO PERMIT UNIT TO OPERATE DOWN TO -20°F.
9. SHORT CYCLE CIRCUIT: PROVIDE CIRCUIT TO PREVENT COMPRESSOR FROM SHORT CYCLING AS A RESULT OF A RAPID CHANGE IN THERMOSTAT SETTING. CIRCUIT ALSO PREVENTS COMPRESSOR RESTART AT LEAST 5 MINUTES AFTER SHUTDOWN.
10. CONVENIENCE OUTLET: PROVIDE 115V OUTLET IN UNIT CABINET.
11. CONTROL WIRING: FURNISH AND INSTALL CONTROL WIRING AS REQUIRED. INSTALL CONTROL WIRING IN CONDUIT.

SYSTEM CONTROL

1. EXHAUST FANS (EF-1) SHALL BE INTERLOCKED WITH LIGHTS IN ROOM UNLESS OTHERWISE NOTED.
2. EXHAUST FANS (EF-2,3,4) SHALL BE INTERLOCKED WITH DIGITAL TIMER IN ROOM UNLESS OTHERWISE NOTED.
3. ELECTRIC UNIT HEATERS (EUH-1 & EUH-2) SHALL BE CONTROLLED BY A BUILT-IN UNIT MOUNTED THERMOSTAT. ON A CALL FOR HEATING, THE THERMOSTAT SHALL CYCLE THE UNIT FAN AND CONTROL THE ELECTRONIC HEAT TO MAINTAIN THE SPACE TEMPERATURE SETPOINT OF 40°F (ADJ.)
4. SPLIT SYSTEM AIR CONDITIONERS (AHU-1 TO AHU-8 & CU-1 TO AHU-8):
   - A. CONTROLLER: UNITS SHALL BE PROVIDED WITH STAND-ALONE FACTORY MOUNTED CONTROLS CAPABLE OF MAINTAINING THE SEQUENCES OF OPERATIONS. THE CONTRACTOR SHALL PROVIDE ALL THE NECESSARY SENSORS, WIRING, AND CONTROLS TO MAINTAIN THE SEQUENCE OF OPERATIONS. THE UNITS SHALL BE CONTROLLED BY SPACE MOUNTED TEMPERATURE AND HUMIDITY SENSORS.
   - B. OCCUPIED/UNOCCUPIED MODE TIME SHALL BE SET THROUGH PROGRAMMED THERMOSTAT (CONSULT WITH OWNER FOR TIMES). A SPACE TEMPERATURE SENSOR SHALL MAINTAIN DESIRED SET POINT TEMPERATURE.
   - C. MORNING WARM-UP/COOL DOWN MODE: ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT, THE UNIT CONTROLS SHALL OPTIMALLY START THE UNIT AND ENERGIZE THE DX COOLING OR GAS FURNACE TO REACH OCCUPIED SETPOINT BY THE SCHEDULED OCCUPIED TIME.
   - D. OCCUPIED MODE: ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT THE SUPPLY AIR FAN SHALL OPERATE CONTINUOUSLY AND THE ASSOCIATED OUTDOOR AIR MOD SHALL MODULATE TO BALANCED SET POSITION. DURING COOLING MODE, THE DX COOLING SHALL SEQUENCE TO MAINTAIN SPACE TEMPERATURE SETPOINT. DURING HEATING MODE, THE GAS FURNACE SHALL STAGE TO MAINTAIN SPACE TEMPERATURE SETPOINT.
   - E. UNOCCUPIED MODE: ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT, THE SUPPLY AIR FAN SHALL CYCLE AND THE ASSOCIATED OUTDOOR AIR MOD SHALL MODULATE FULLY CLOSED. THE DX COOLING OR GAS FURNACE SHALL MODULATE AS REQUIRED TO MAINTAIN SETBACK TEMPERATURE.
5. PAD MOUNTED PACKAGED UNIT (PMU-1):
   - A. CONTROLLER: THE UNIT SHALL BE GOVERNED BY A PROGRAMMABLE CONTROLLER. THE CONTROLLER WILL INITIATE THE UNIT VIA A PREDETERMINED OPTIMUM START SEQUENCE THROUGH SPACE LOCATED CONTROLS AND WILL DE-ENERGIZE THE UNIT IN ACCORDANCE WITH TIME SCHEDULES MANAGED BY THE OWNER SET PREDETERMINED TIMES. THE MANUFACTURER SHALL SUPPLY A FACTORY-MOUNTED CONTROLLER, COMPLETE WITH ALL NECESSARY SENSORS, WIRING, AND CONTROLS TO ENSURE THE PROPER EXECUTION OF THE SPECIFIED SEQUENCE OF OPERATIONS.
   - B. MORNING WARM-UP/COOL DOWN MODE: ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT, THE UNIT CONTROLS SHALL OPTIMALLY START THE UNIT AND ENERGIZE THE DX COOLING OR GAS HEATER TO REACH OCCUPIED SETPOINT BY THE SCHEDULED OCCUPIED TIME.
   - C. OCCUPIED MODE: ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT, THE SUPPLY AIR FAN SHALL OPERATE CONTINUOUSLY, AND THE ASSOCIATED OUTDOOR AIR MODULATOR SHALL MODULATE TO THE BALANCED POSITION. ON A SIGNAL FROM THE SPACE-MOUNTED TEMPERATURE SENSOR, THE UNIT SHALL ENTER COOLING OR HEATING MODE. DURING COOLING MODE, THE DX COOLING SHALL SEQUENCE TO MAINTAIN A SPACE TEMPERATURE SETPOINT OF 72°F (ADJUSTABLE). DURING HEATING MODE, THE GAS HEATER SHALL STAGE TO MAINTAIN A SPACE TEMPERATURE SETPOINT OF 70°F (ADJUSTABLE).
   - D. UNOCCUPIED MODE: ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT, THE SUPPLY AIR FAN SHALL CYCLE, AND THE ASSOCIATED OUTDOOR AIR MOD SHALL MODULATE FULLY CLOSED. THE DX COOLING OR ELECTRIC HEATER SHALL MODULATE AS REQUIRED TO MAINTAIN SETBACK TEMPERATURE.
   - E. DEHUMIDIFICATION: ON A SIGNAL FROM THE SPACE-MOUNTED HUMIDITY SENSOR, THE UNIT SHALL ENTER DEHUMIDIFICATION MODE. THE UNIT SHALL STAGE THE HOT GAS REHEAT AND THE UNIT CONTROLLER SHALL ENERGIZE AND STAGE THE DX COOLING TO MAINTAIN A HUMIDITY SETPOINT OF 50% RH (ADJUSTABLE).
   - F. ECONOMIZER CONTROL (ENTHALPY CONTROL): WHEN THE OUTSIDE AIR ENTHALPY (GLOBAL POINT) IS LESS THAN THE RETURN AIR ENTHALPY AND THERE IS A REQUEST FOR COOLING, ECONOMIZER MODE WILL BE ENABLED. DURING ECONOMIZER MODE, THE SUPPLY COOLING SIGNAL WILL MODULATE THE DAMPERS AS REQUIRED TO SATISFY THE CURRENT COOLING SETPOINT. IF THE OUTSIDE AIR DAMPER IS OPEN 100% AND THE SETPOINT CANNOT BE MET, THEN ADDITIONAL COOLING CONTROL WILL BE ENABLED. AS THE MIXED AIR TEMPERATURE VARIES WITHIN THE RANGE OF 55°F TO 45°F, THE OUTSIDE AIR DAMPER WILL MODULATE CLOSED AS REQUIRED TO PREVENT EXCESSIVELY COLD SUPPLY AIR. MEASURE OSA FLOW TO MAINTAIN MINIMUM FLOW.
   - G. DEMAND CONTROL VENTILATION: ON A SIGNAL FROM THE SPACE-MOUNTED CARBON DIOXIDE SENSOR THAT THE SPACE HAS EXCEEDED THE SET CARBON DIOXIDE SPACE MINIMUM. THE SPACE CARBON DIOXIDE SENSOR SHALL SIGNAL THE UNIT CONTROLLER TO MODULATE THE OUTSIDE AIR DAMPER OPENED OR CLOSED UNTIL SPACE CARBON DIOXIDE SENSOR HAS BEEN SATISFIED.
   - H. SAFETIES AND AUXILIARY CONTROLS:
     - PHASE FAILURE PROTECTION.
     - CONDENSATE OVERFLOW SWITCH.
     - FILTER ALARM (WHEN FILTER DIFFERENTIAL IS GREATER THAN 1” WC, MANUALLY ADJUSTABLE).

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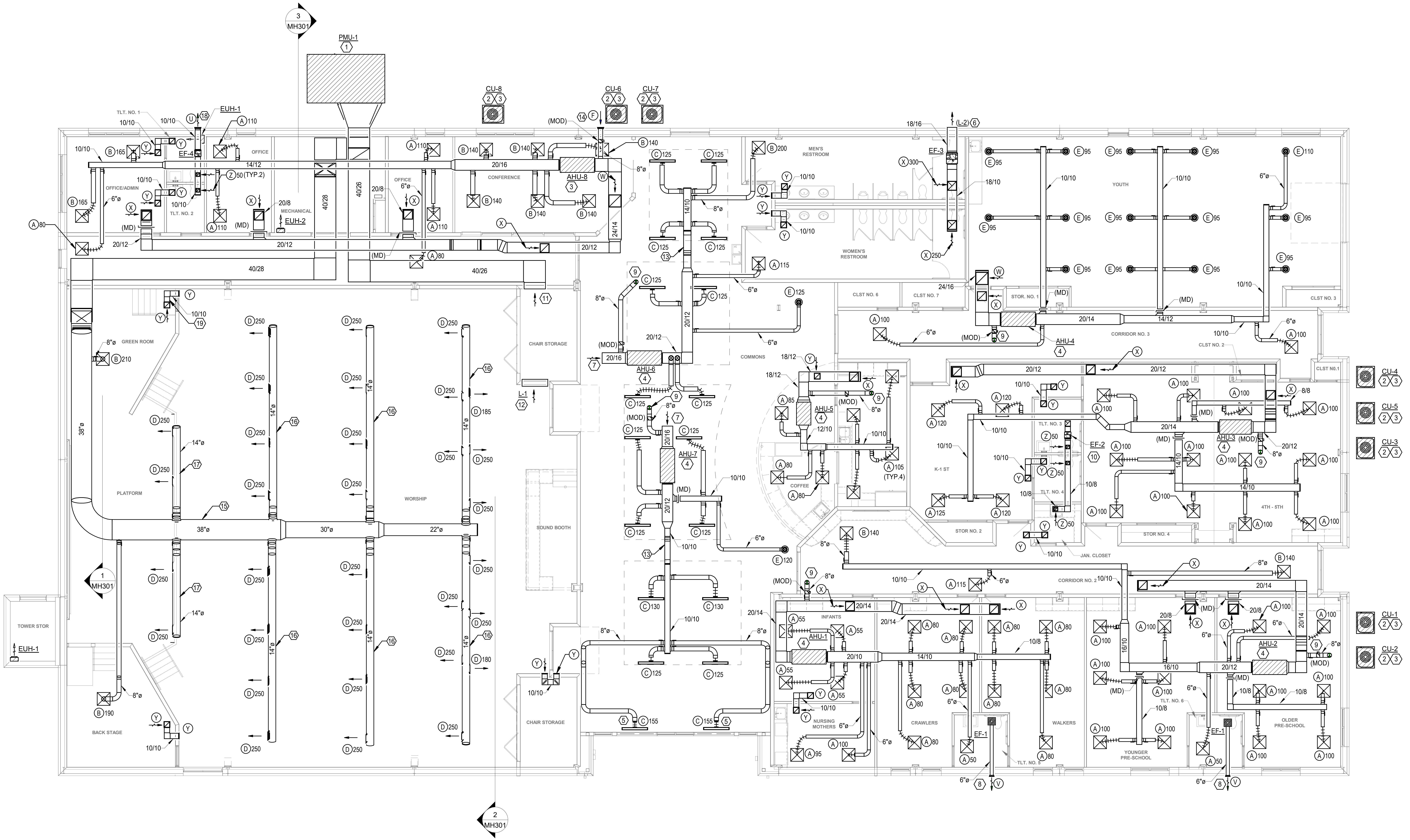
SHEET NAME

MECHANICAL SPECIFICATIONS

SHEET NUMBER

M002



1 **FLOOR PLAN - DUCTWORK**

Scale: 1/8" = 1'-0"

SHEET KEYNOTES: ⬡

1. COORDINATE UNIT WITH MANUFACTURERS HOUSEKEEPING PAD REQUIREMENTS. FURNISH AND INSTALL FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS. CONTRACTOR TO TRANSITION AS REQUIRED TO MAKE CONNECTIONS.
2. PROVIDE 4" THICK REINFORCED CONCRETE HOUSEKEEPING PAD. SIZE PAD PER UNIT MANUFACTURERS RECOMMENDATIONS. COORDINATE UNIT LOCATION TO MAINTAIN THE MANUFACTURER'S REQUIRED CLEARANCES AND ADJUST LOCATION AS REQUIRED.
3. LOCATE CONDENSING UNITS IN THE MOST PRACTICAL WAY THAT ALLOWS THE MOST EFFICIENT ROUTING OF REFRIGERANT PIPING. EXPOSED PIPING SHALL BE WEATHERPROOFED AND COVERED WITH PVC JACKETING. PIPING INSTALLED THROUGH WALL SHALL BE INSTALLED THROUGH A PIPE SLEEVE AND SEALED AIR AND WATER TIGHT.
4. AHU SHALL BE HORIZONTALLY MOUNTED IN ABOVE FINISHED CEILING. COORDINATE WITH ALL TRADES DRAWINGS TO POSITION THE UNIT SO THAT THE UNIT, PIPING, AND ACCESSORIES MAINTAIN MANUFACTURER SERVICE CLEARANCES. COORDINATE WITH MANUFACTURER DRAWINGS FOR REQUIRED UNIT CLEARANCES.
5. SLOT DIFFUSER TO BE MOUNTED FROM STRUCTURE WITH SECURED BY THREADED STEEL ROD. CONTRACTOR TO PROVIDE MISC. THREADED STEEL TO HANG SLOT DIFFUSER AT 12'-0" ABOVE FINISHED FLOOR.
6. L-2: BASIS OF DESIGN GREENHECK ESD-403-18X16. CONTRACTOR TO MOUNT BOTTOM OF LOUVER L-2 9'-6" ABOVE FINISHED FLOOR.
7. CONTRACTOR TO TERMINATE RETURN AIR DUCT ABOVE FLOATING ACOUSTICAL CEILING. CONTRACTOR TO COVER RETURN AIR TERMINATION WITH 1/4" MESH SCREEN.
8. BOTTOM OF EXHAUST WALL CAP SHALL BE MOUNTED 9'-4" ABOVE FINISHED FLOOR. CONTRACTOR TO SEAL EXTERIOR WALL PENETRATION WEATHER TIGHT.
9. ROUTE 8" Ø OUTDOOR AIR DUCT DOWN FROM GREENHECK GRAVITY VENTILATOR MODEL GRSI-8 OR EQUAL AND CONNECT TO THE RETURN AIR DUCT. CONTRACTOR TO PROVIDE INSECT SCREEN ON ALL GRAVITY VENTILATORS. INSTALL AN MOD PRIOR TO CONNECTING TO THE RETURN DUCT AND INTERLOCK WITH THE ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE MOUNTED SO THAT IT IS ACCESSIBLE ABOVE FINISHED CEILING.
10. ROUTE 10" X 8" EXHAUST DUCT UP FROM EF-2 THROUGH ROOF TO GREENHECK GRAVITY VENTILATOR MODEL GRSR-8 OR EQUAL. CONTRACTOR TO TRANSITION DUCT AS NECESSARY TO MAKE CONNECTION WITH GRAVITY VENTILATOR.
11. CONTRACTOR TO TERMINATE RETURN AIR DUCT IN CHAIR STORAGE. CONTRACTOR TO COVER RETURN AIR TERMINATION WITH 1/4" MESH SCREEN.
12. L-1: BASIS OF DESIGN GREENHECK ESD-635-48X78. CONTRACTOR TO MOUNT BOTTOM OF LOUVER L-1 1'-0" ABOVE FINISHED FLOOR.
13. APPROXIMATE LOCATION OF FLOATING ACOUSTICAL CEILING SHOWN FOR COORDINATION PURPOSES. ROUTE EXPOSED SUPPLY DUCT WORK ABOVE ACOUSTICAL CEILING. ADJUST ELEVATION AND ROUTING OF DUCTWORK AS REQUIRED. CONTRACTOR SHALL REFER TO ARCHITECTURAL CEILING PLAN FOR EXACT LOCATION AND ELEVATION OF FLOATING ACOUSTICAL CEILING.
14. BOTTOM OF OUTDOOR AIR INTAKE WALL CAP SHALL BE MOUNTED 12'-2" ABOVE FINISHED FLOOR. CONTRACTOR TO SEAL EXTERIOR WALL PENETRATION WEATHER TIGHT.
15. ROUTE DOUBLE WALL SPIRAL SUPPLY DUCT WORK TIGHT TO PEAK OF STRUCTURE IN WORSHIP. CONTRACTOR TO ADJUST ROUTING AS REQUIRED TO MAINTAIN DUCT ROUTING TIGHT TO STRUCTURE.
16. ROUTE DOUBLE WALL SPIRAL SUPPLY DUCT WORK TIGHT TO STRUCTURE DOWN FROM THE PEAK OF WORSHIP. CONTRACTOR TO ADJUST ROUTING AS REQUIRED TO MAINTAIN TIGHT TO STRUCTURE.
17. ROUTE DOUBLE WALL SPIRAL SUPPLY DUCT WORK TIGHT TO STRUCTURE DOWN FROM THE PEAK OF WORSHIP. CONTRACTOR TO COORDINATE WITH STAGE SOUND LIGHTING AND EQUIPMENT. ADJUST DUCTWORK ROUTING AS REQUIRED.
18. BOTTOM OF EXHAUST AIR DUCTWORK WALL CAP SHALL BE MOUNTED 9'-6" ABOVE FINISHED FLOOR. CONTRACTOR TO SEAL EXTERIOR WALL PENETRATION WEATHER TIGHT.
19. BOTTOM OF TRANSFER AIR DUCTWORK SHALL BE MOUNTED 9'-6" ABOVE FINISHED FLOOR.

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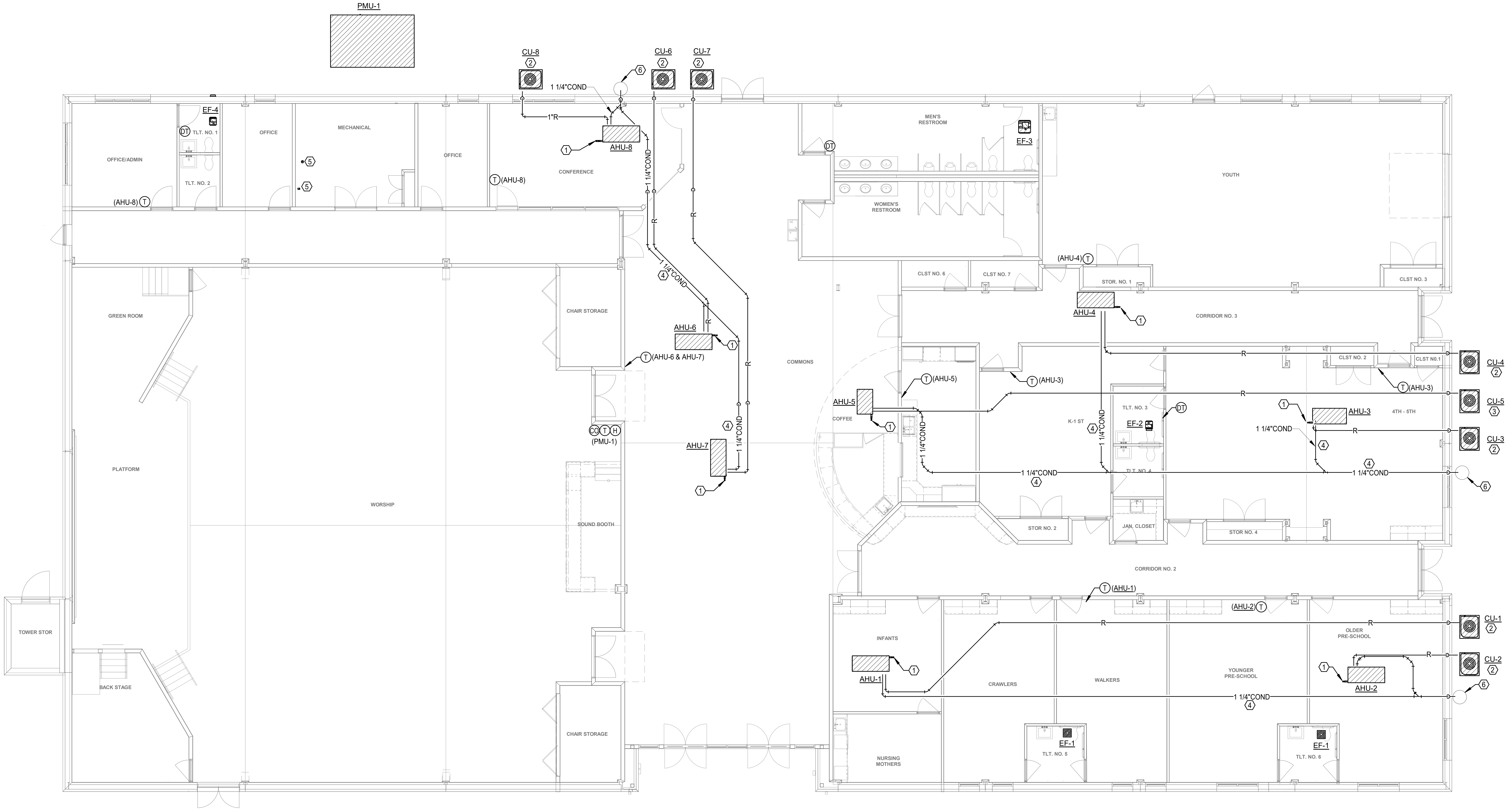
FLOOR PLAN - DUCTWORK

SHEET NUMBER

MH111



1 **FLOOR PLAN - PIPING**
Scale: 1/8" = 1'-0"

SHEET KEYNOTES:

1. ROUTE GAS FLUE DUCT PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS FROM AIR HANDLER UNITS UP TO ROOF. GAS FLUE TO TERMINATE TO MANUFACTURER'S RECOMMENDED CONCENTRIC KIT A MINIMUM OF 3'-0" ABOVE OUTDOOR AIR INTAKES WITHIN A 10'-0" HORIZONTAL RADIUS.
2. ROUTE REFRIGERANT LINES UP INSIDE EXTERIOR WALL. PENETRATE AT 12" ABOVE FINISHED FLOOR. PROVIDE AND INSTALL COPPER HOOD AT ALL REFRIGERANT WALL PENETRATIONS ON EXTERIOR WALL OF BUILDING. FIELD ROUTE REFRIGERANT LINES AS REQUIRED RESPECTIVE INDOOR UNIT. REFRIGERANT PIPING RUNS SHALL NOT EXCEEDED 200'-0" OR THE MANUFACTURER'S RECOMMENDED EQUIVALENT LENGTH.
3. ROUTE REFRIGERANT LINES UP INSIDE EXTERIOR WALL. PENETRATE AT 12" ABOVE FINISHED FLOOR. PROVIDE AND INSTALL COPPER HOOD AT ALL REFRIGERANT WALL PENETRATIONS ON EXTERIOR WALL OF BUILDING. FIELD ROUTE REFRIGERANT LINES AS REQUIRED RESPECTIVE INDOOR UNIT. REFRIGERANT PIPING RUNS SHALL NOT EXCEEDED 150'-0" OR THE MANUFACTURER'S RECOMMENDED EQUIVALENT LENGTH.
4. ROUTE1 1/4" CONDENSATE DRAIN LINE AT 1/8" PER 1'-0" DOWN FROM RESPECTIVE AHU TO EXTERIOR WALL. CONTRACTOR TO PENETRATE WALL AND DISCHARGE TO DRYWELL. REFER TO DETAILS FOR EXACT ROUTING. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
5. ROUTE GAS FLUE DUCT PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS FROM GAS WATER HEATER UP TO ROOF. TERMINATE TO MANUFACTURER'S RECOMMENDED CONCENTRIC KIT A MINIMUM OF 3'-0" ABOVE OUTDOOR AIR INTAKES.
6. APPROXIMATE SIZE AND LOCATION OF DRYWELL SHOWN FOR COORDINATION PURPOSES.

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FLOOR PLAN - PIPING

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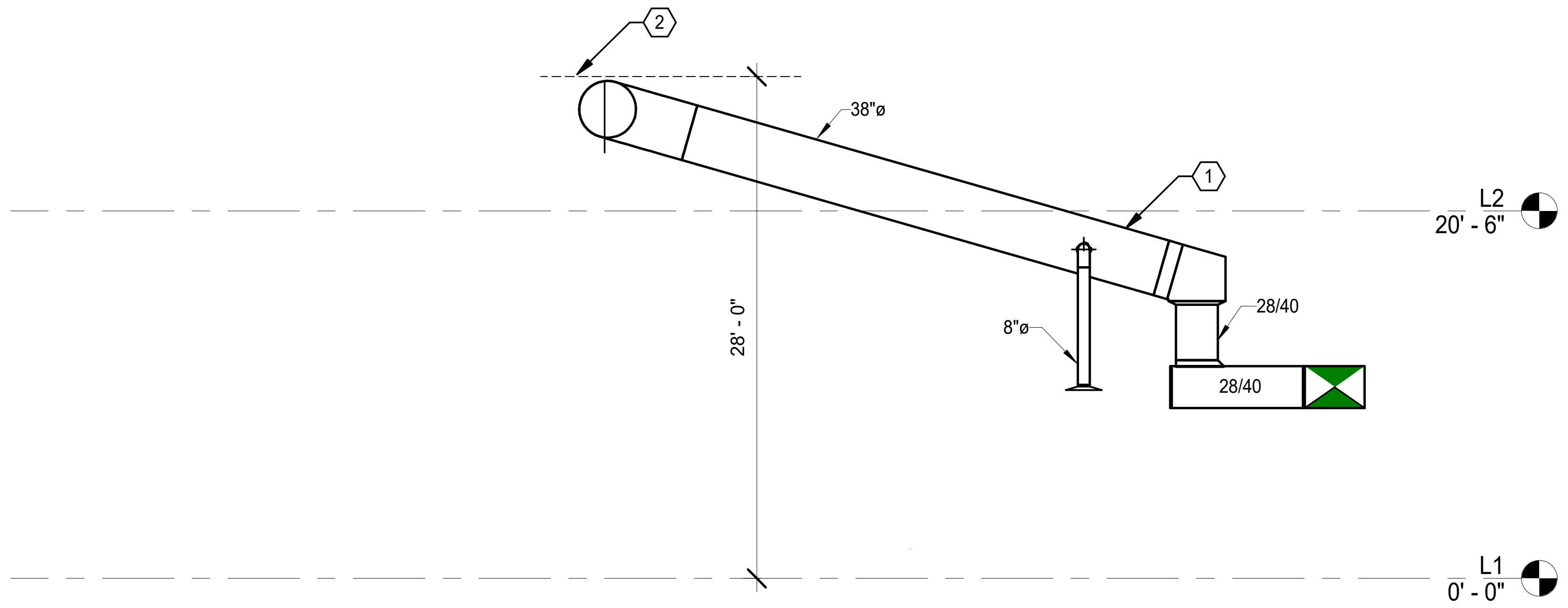
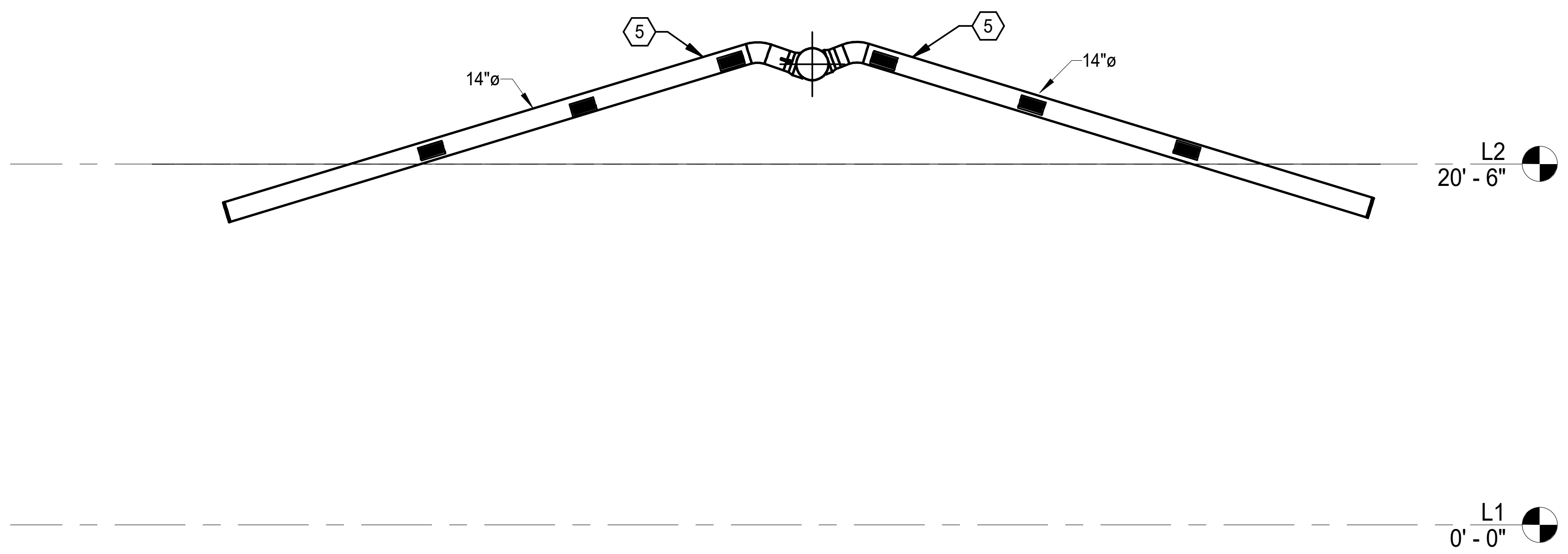


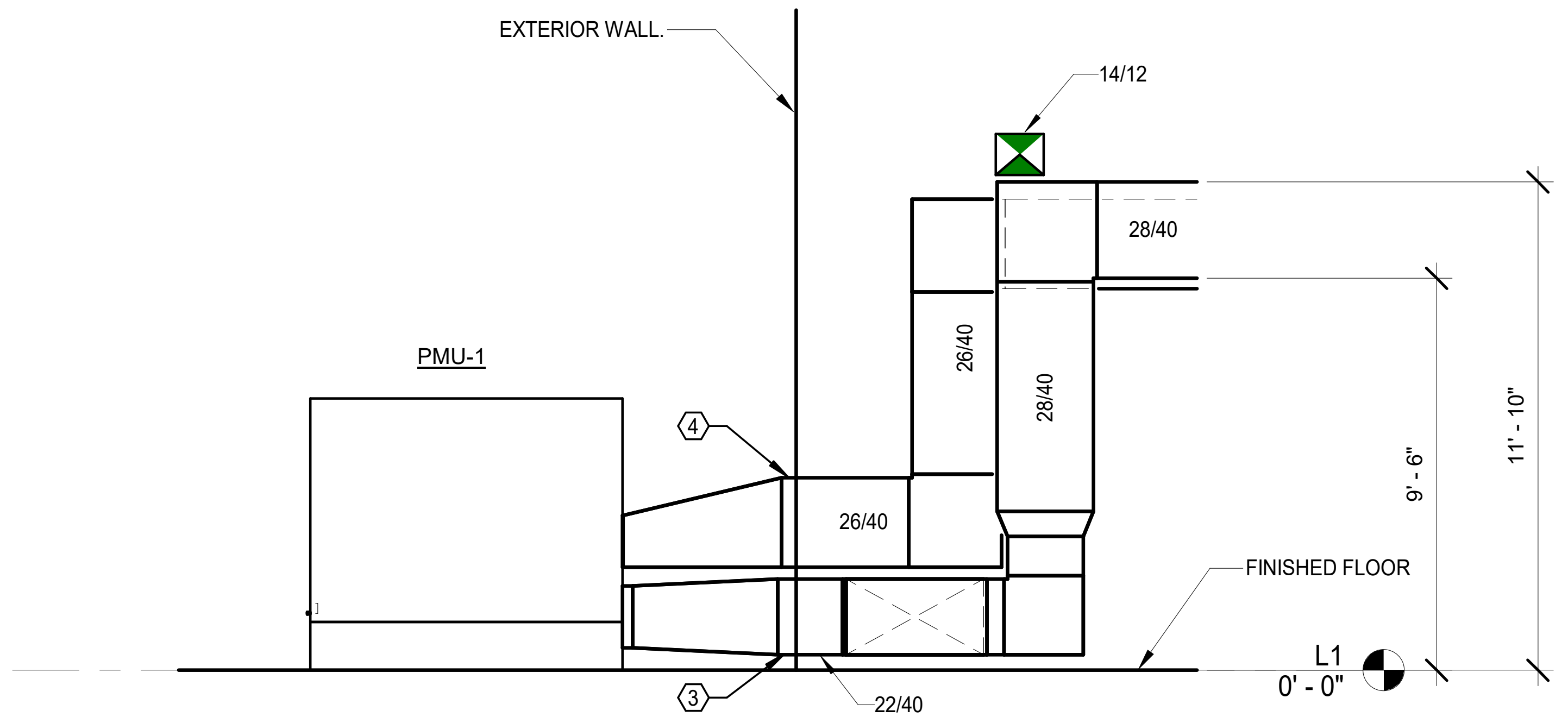
1 BACK OF STAGE SECTION VIEW

Scale: 1/8" = 1'-0"



2 WORSHIP SECTION VIEW

Scale: 1/8" = 1'-0"



3 PAD MOUNTED UNIT SECTION VIEW

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

SHEET KEYNOTES: ⬡

1. ROUTE 38"ø DOUBLE WALL SPIRAL SUPPLY DUCT WORK UP AND TIGHT TO STRUCTURE TO PEAK OF WORSHIP. CONTRACTOR TO ADJUST ROUTING AS REQUIRED TO MAINTAIN TIGHT TO STRUCTURE.
2. PEAK OF WORSHIP LOCATED APPROXIMATELY 28'-0" ABOVE FINISHED FLOOR. CONTRACTOR TO CONFIRM FINAL PEAK HEIGHT OF WORSHIP WITH ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION.
3. ROUTE 22" X 40" SUPPLY AIR DUCT TO AND THROUGH EXTERIOR WALL. BOTTOM OF SUPPLY DUCT TO PENETRATE EXTERIOR WALL AT 0'-4" ABOVE FINISHED FLOOR. EXTERIOR WALL PENETRATIONS ARE TO BE SEALED WEATHER TIGHT.
4. ROUTE 26" X 40" RETURN AIR DUCT TO AND THROUGH EXTERIOR WALL. BOTTOM OF RETURN AIR DUCT TO PENETRATE EXTERIOR WALL AT 2'-6" ABOVE FINISHED FLOOR. EXTERIOR WALL PENETRATIONS ARE TO BE SEALED WEATHER TIGHT.
5. ROUTE DOUBLE WALL SPIRAL SUPPLY DUCT WORK TIGHT TO DECKING DOWN FROM THE PEAK OF WORSHIP. CONTRACTOR TO ADJUST ROUTING AS REQUIRED TO MAINTAIN TIGHT TO DECKING.

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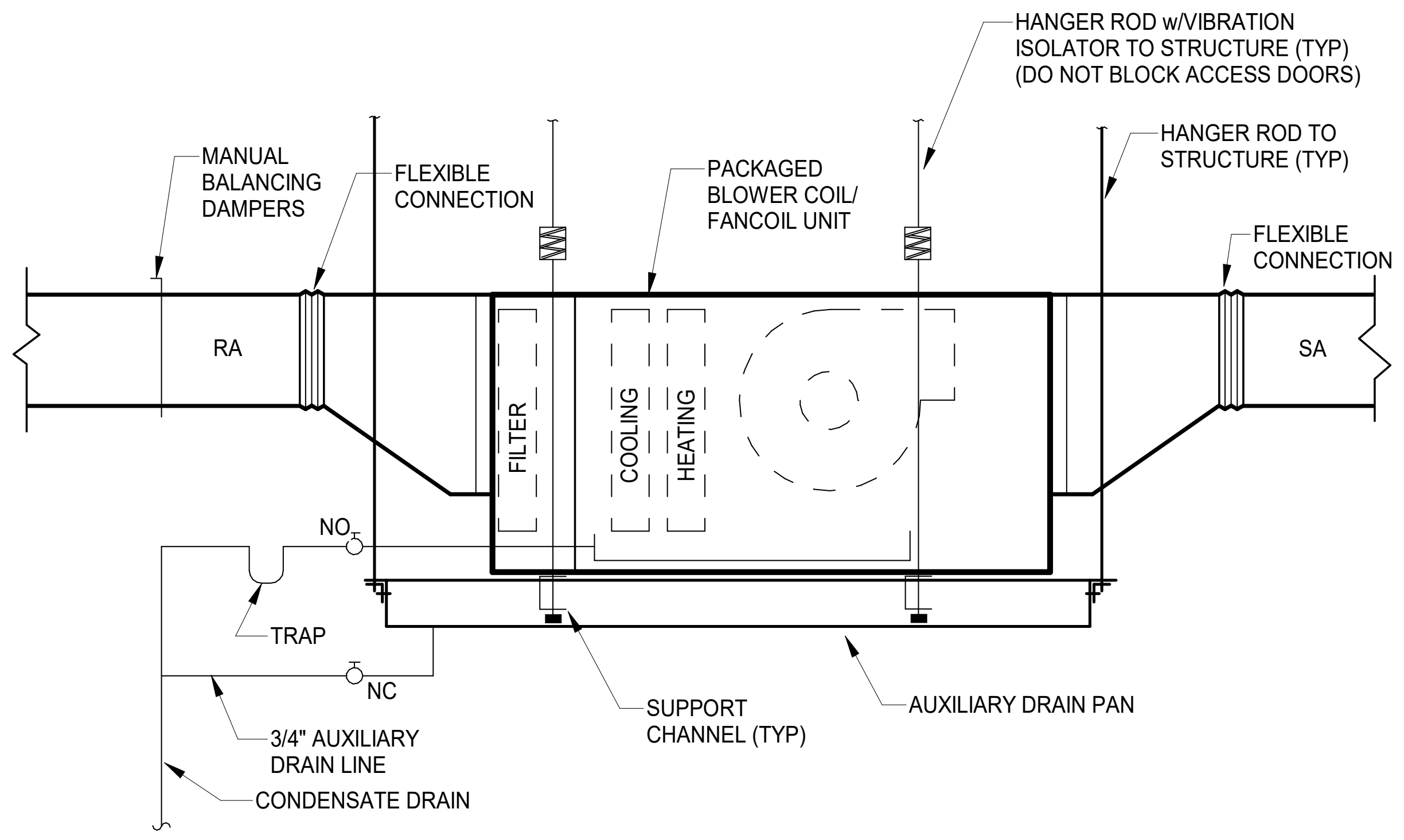
SECTIONAL PLANS -
DUCTWORK

SHEET NUMBER

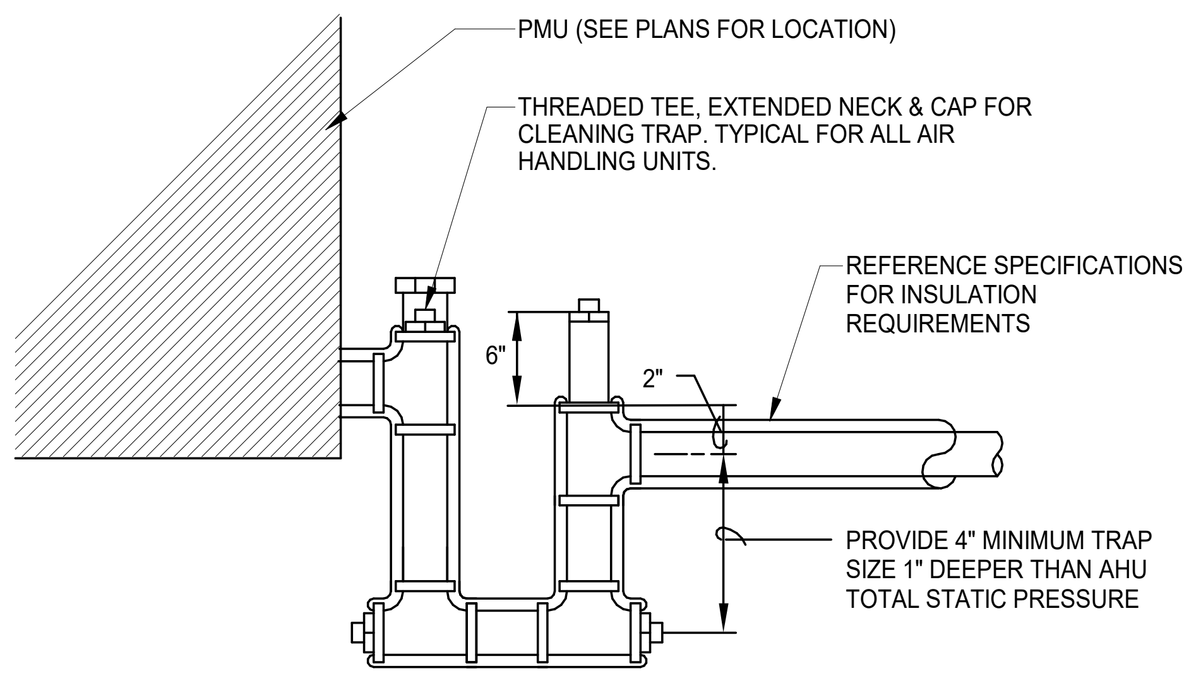
MH301



NOTE:
1. PROVIDE CONDENSATE OVERFLOW SENSOR AND SWITCH IN PRIMARY [AUXILARY] DRAIN PAN.
2. CONTRACTOR TO COORDINATE ALL CONNECTIONS WITH MANUFACTURER SPECIFICATIONS.

1 HORIZONTAL PACKAGED INDOOR AHU

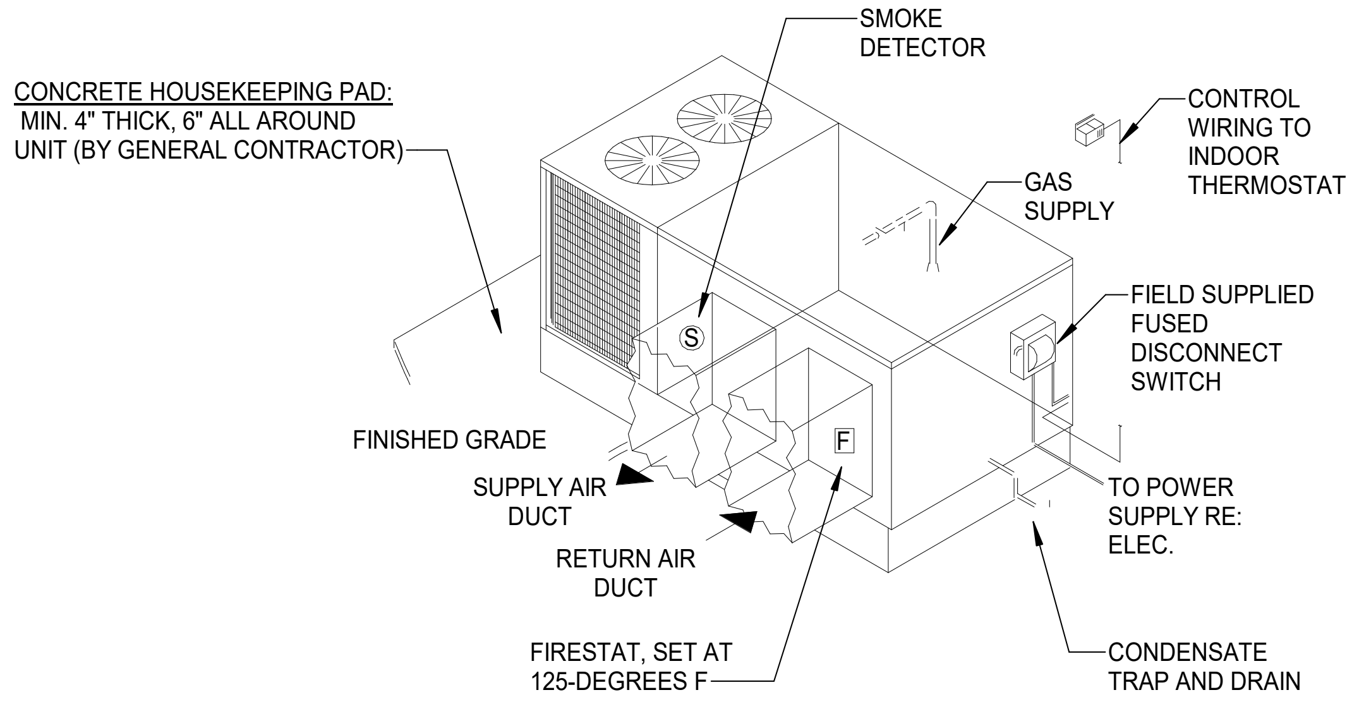
Scale: NONE



2 CONDENSATE DRAIN PIPING AT PMU/AHU

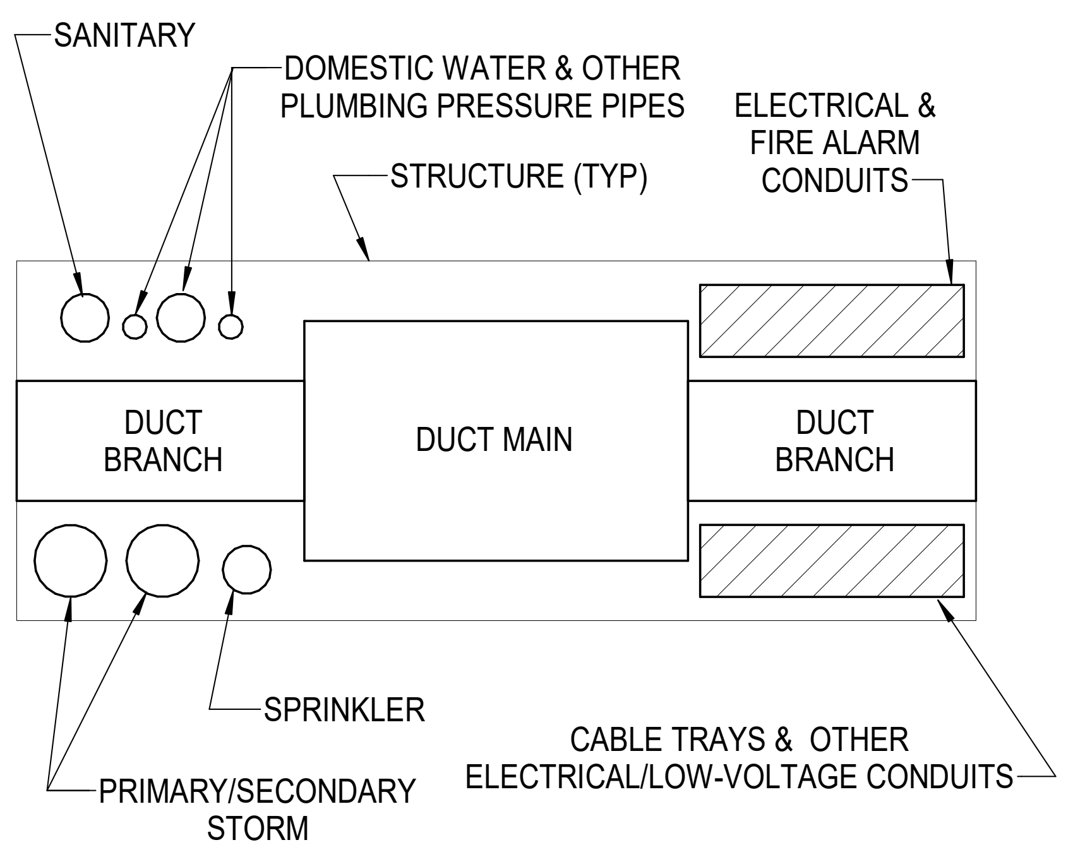
Scale: NONE

NOTE:
1. CONTRACTOR TO COORDINATE ALL CONNECTIONS WITH MANUFACTURER SPECIFICATIONS.



3 SLAB MOUNTED PACKAGE UNIT (GAS HEAT)

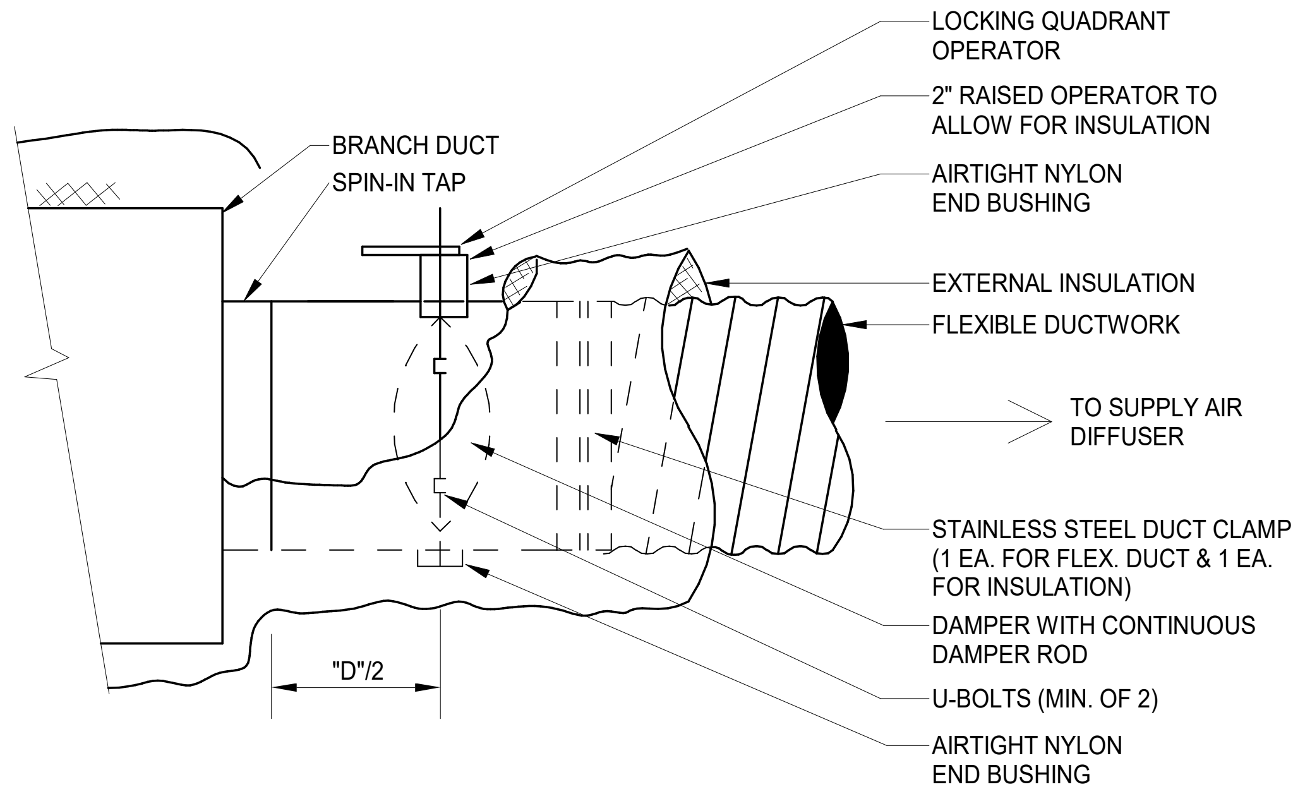
Scale: NONE



NOTE: AT THE CONTRACTOR'S DISCRETION, SYSTEMS SHOWN IN THIS DETAIL MAY BE REARRANGED TO FACILITATE CONSTRUCTION. SYSTEMS NOT SHOWN SHALL BE COORDINATED IN THE FIELD BETWEEN TRADES. ABOVE CEILING COORDINATION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND ANY CONFLICTS SHALL BE COORDINATED IN THE FILED BETWEEN TRADES.

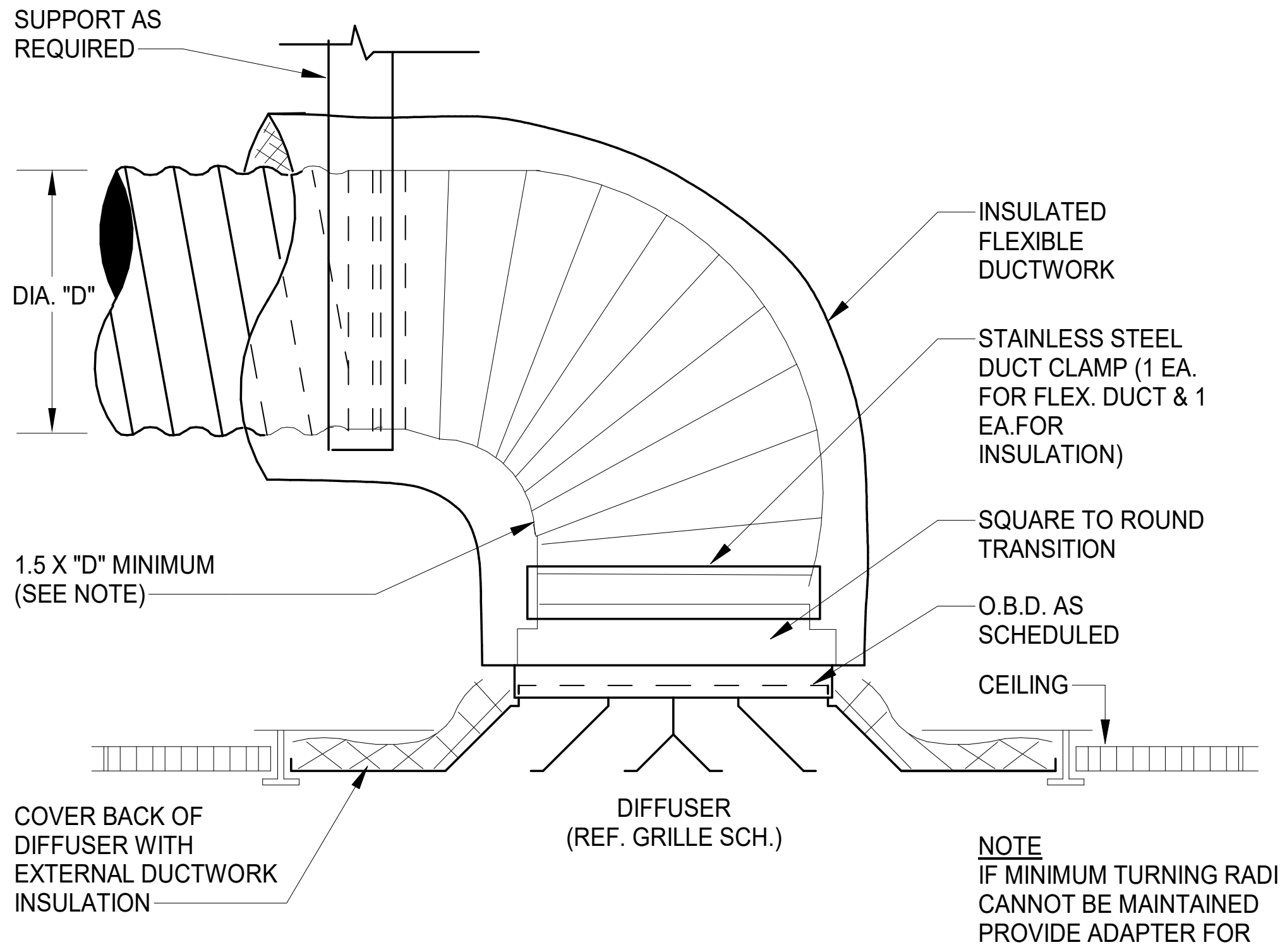
4 MEP CEILING COORDINATION

Scale: NONE



5 FLEXIBLE DUCT TAP - SPIN-IN

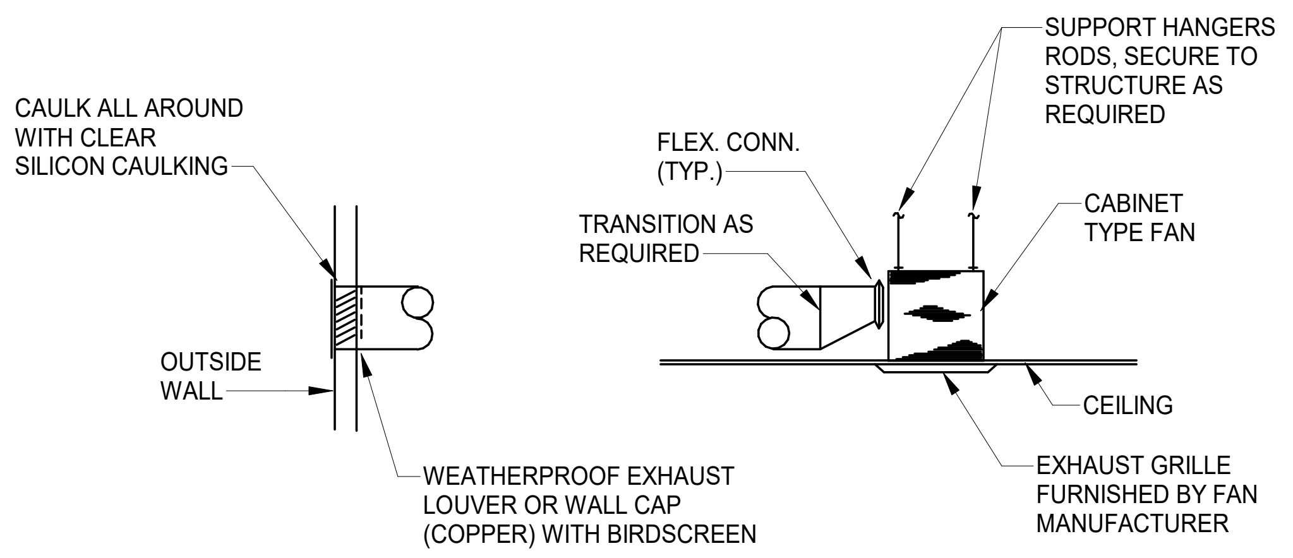
Scale: NONE



NOTE
IF MINIMUM TURNING RADIUS CANNOT BE MAINTAINED PROVIDE ADAPTER FOR FLEXIBLE DUCT.

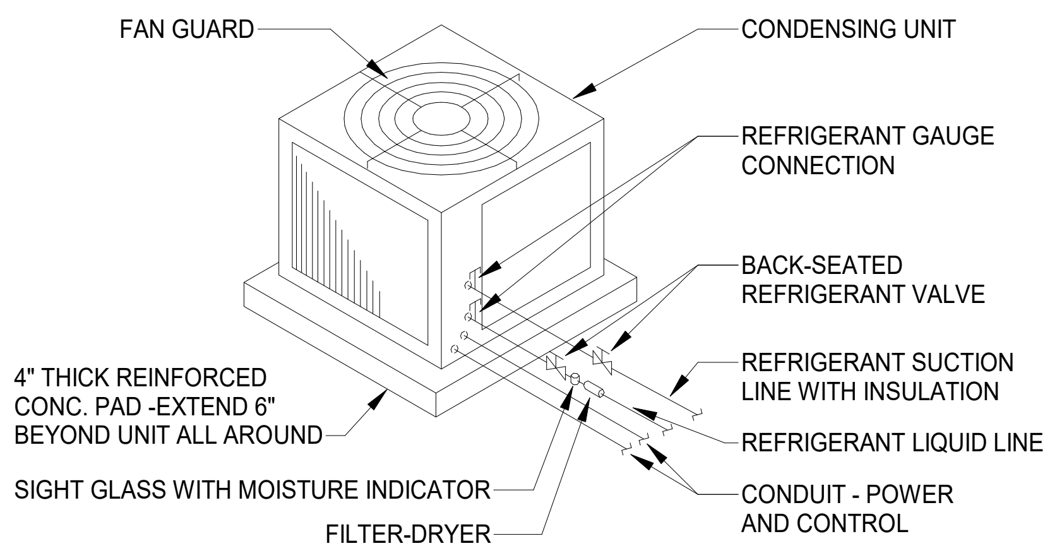
6 FLEX DUCT CONNECTION AT SUPPLY AIR DIFFUSER

Scale: NONE



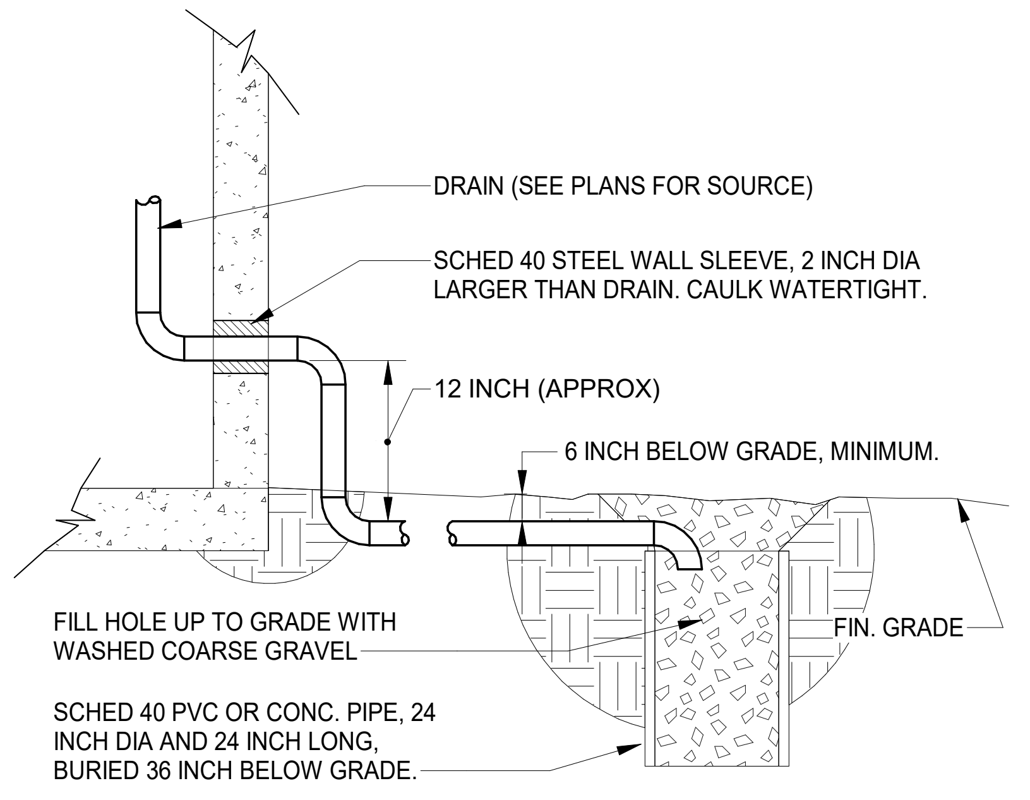
7 EXHAUST FAN (TO EXTERIOR WALL)

Scale: NONE



8 AIR COOLED CONDENSING UNIT

Scale: NONE



9 CONDENSATE DISCHARGE INTO DRYWELL

Scale: NONE

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CONSTRUCTION DRAWINGS
FOR
SOUTHWEST COMMUNITY
CHURCH
MERRIMAN ROAD
ROANOKE, VA

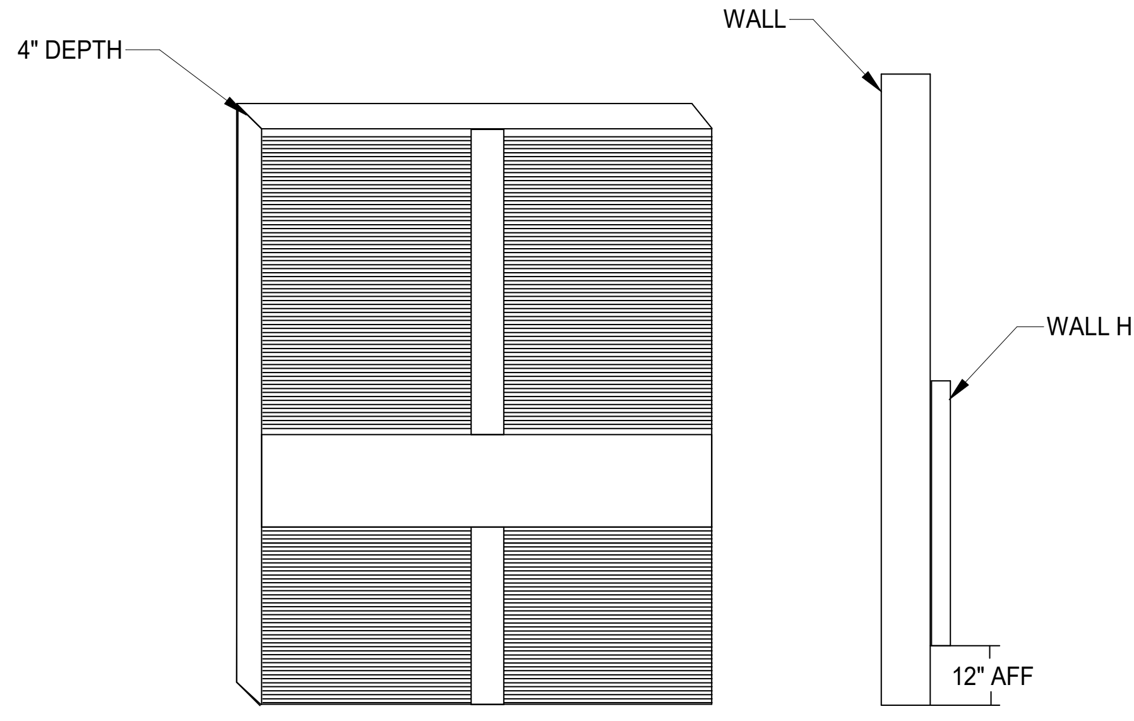
drawn by: JCS
design by: JCS
checked by: SSL
date: 10/24/2025
Rev:

SHEET NAME

MECHANICAL DETAILS

SHEET NUMBER

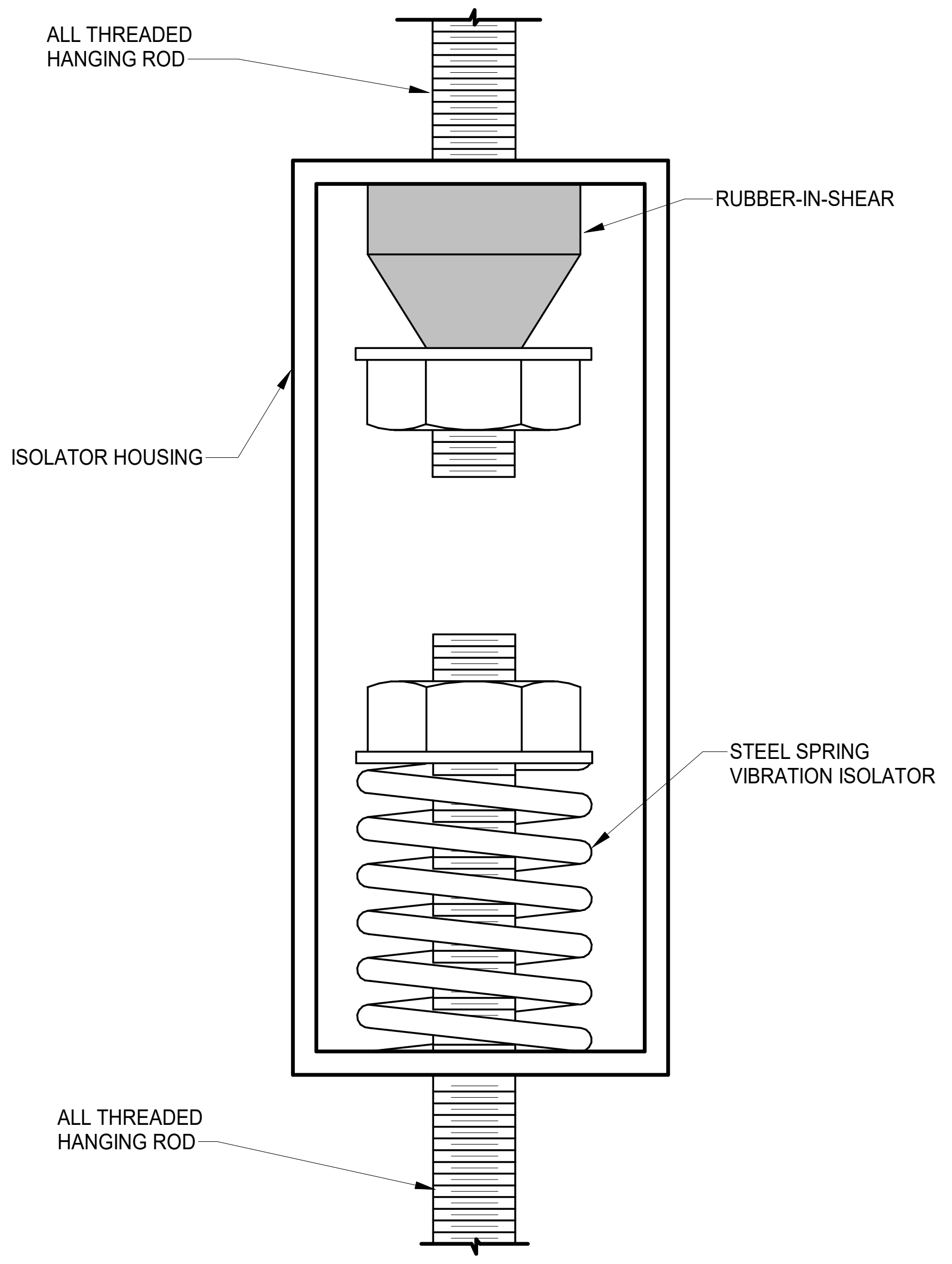
M501



NOTES:
1. INTEGRAL THERMOSTAT. SETPOINT AT 45 DEGREES (ADJUSTABLE).
2. SURFACE MOUNTED FOR ALL RATED WALLS.
3. RECESSED MOUNTED FOR NON-RATED WALLS.
4. OPTIONAL ACCESSORIES: SURFACE MOUNTED ADAPTER OR SEMI-RECESSED MOUNTED ADAPTER.
5. CONFIRM ROUGH IN DIMENSIONS (FOR RECESSED APPLICATION) WITH MANUFACTURER SPECIFICATIONS.

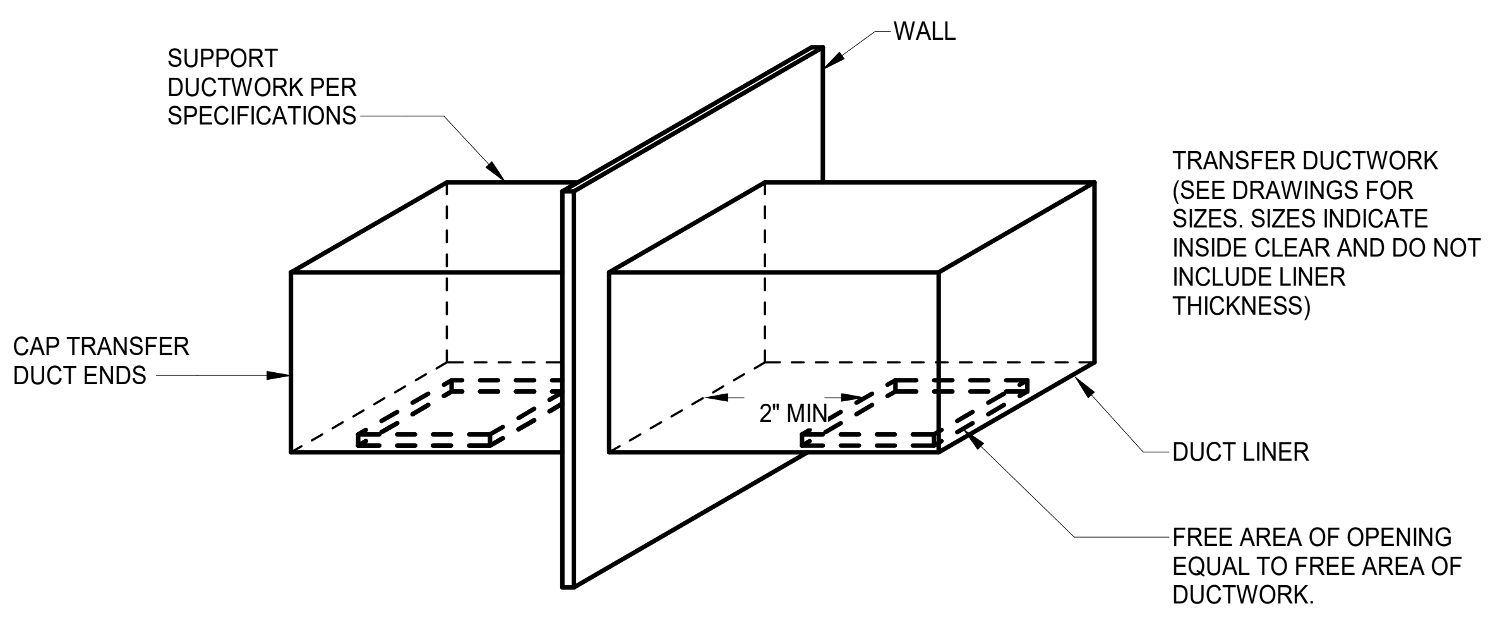
1 ELECTRIC WALL HEATER

Scale: NONE



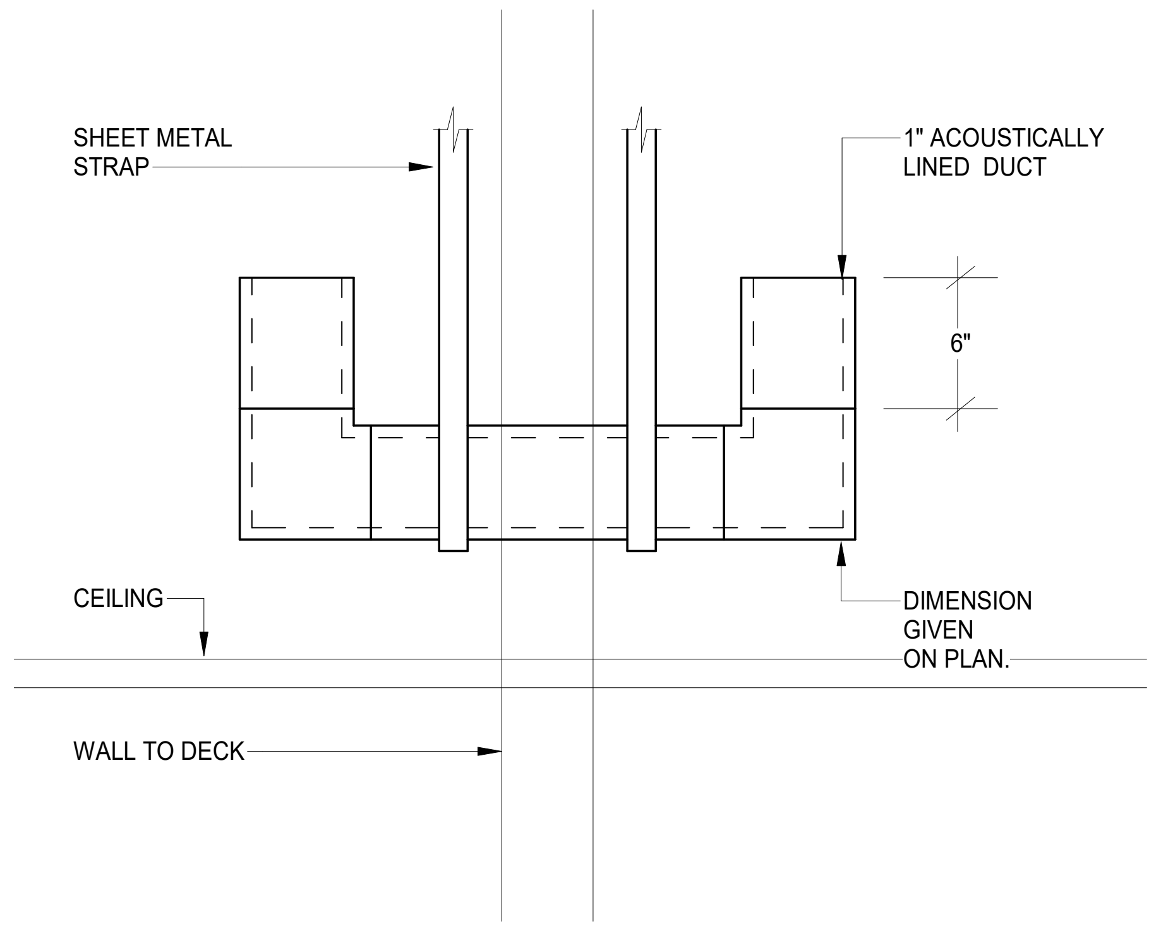
2 VIBRATION ISOLATOR DETAIL

Scale: NONE



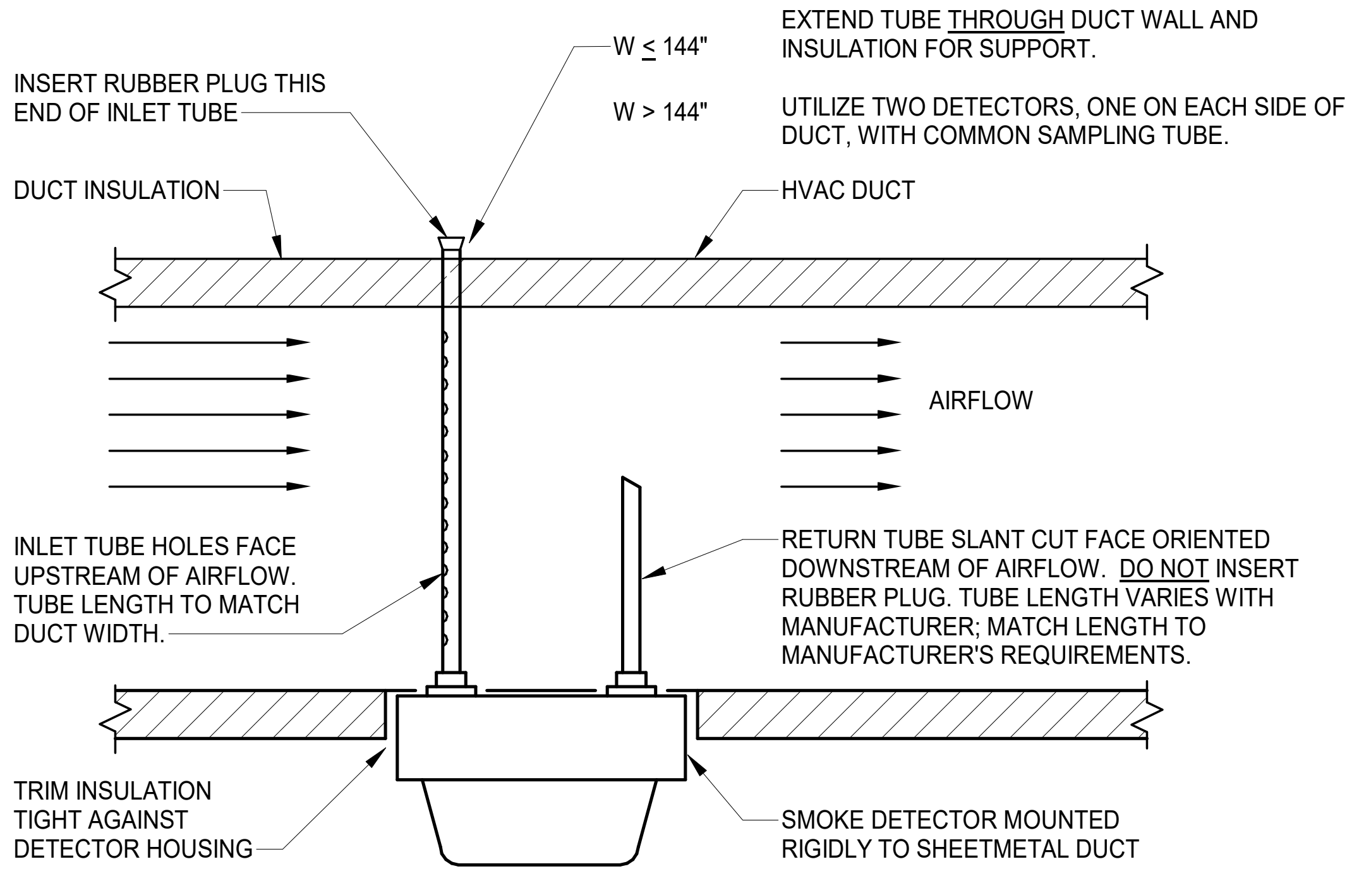
3 TRANSFER DUCT THRU NON-RATED WALL DETAIL

Scale: NONE



4 TRANSFER AIR DUCT

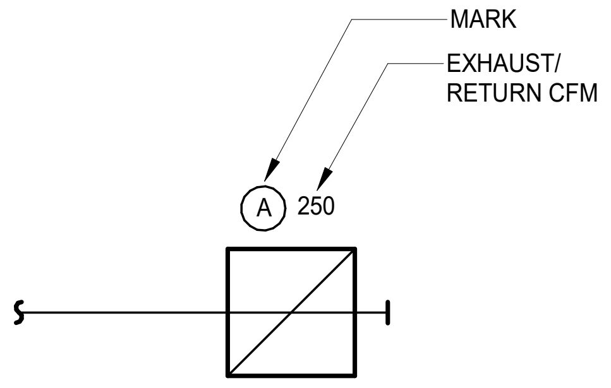
Scale: NONE



NOTE:
1. PROVIDE DUCT ACCESS TO SAMPLE/INLET TUBES VIA ACCESS DOOR.
2. COORDINATE EXACT LOCATION WITH ELECTRICAL CONTRACTOR AND FIRE ALARM SUPPLIER.
3. DUCT DETECTOR CANNOT BE INSTALLED IN RETURN AIR OPENINGS.

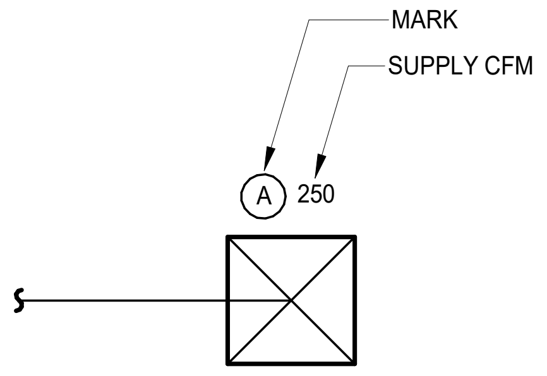
5 DUCT DETECTOR MOUNTING DETAIL

Scale: NONE



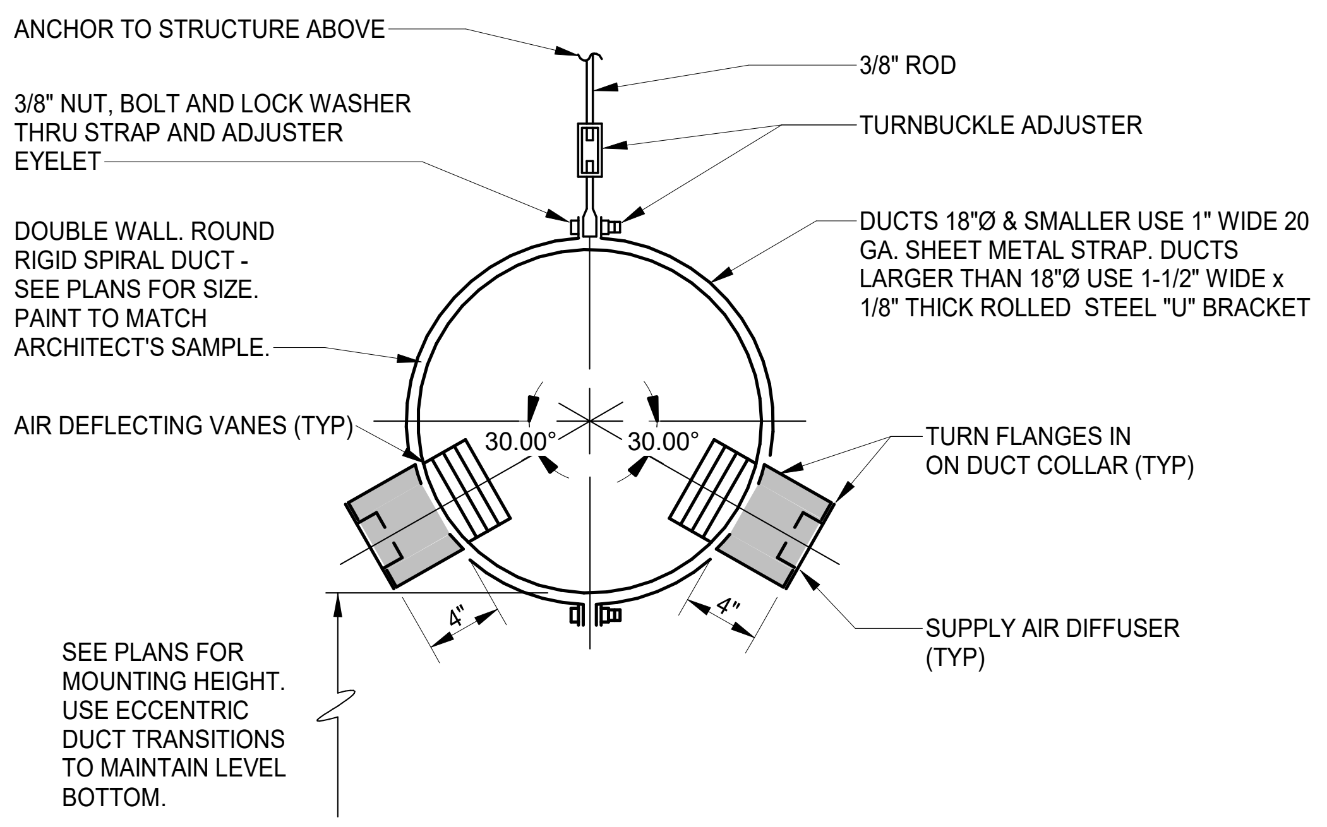
6 REGISTER SIZING

Scale: NONE



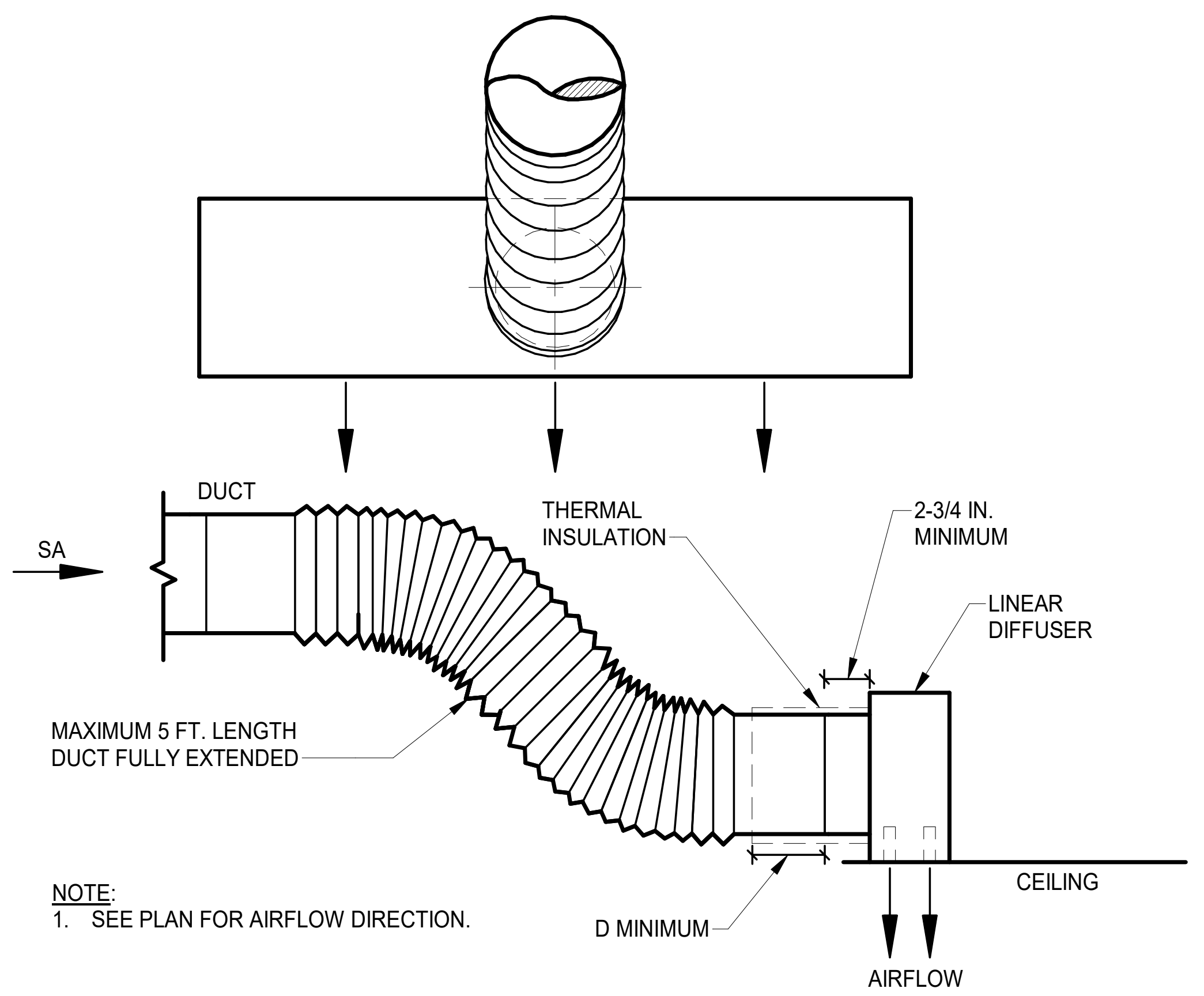
7 DIFFUSER SIZING

Scale: NONE



8 SECTION - EXPOSED ROUND DUCT

Scale: NONE

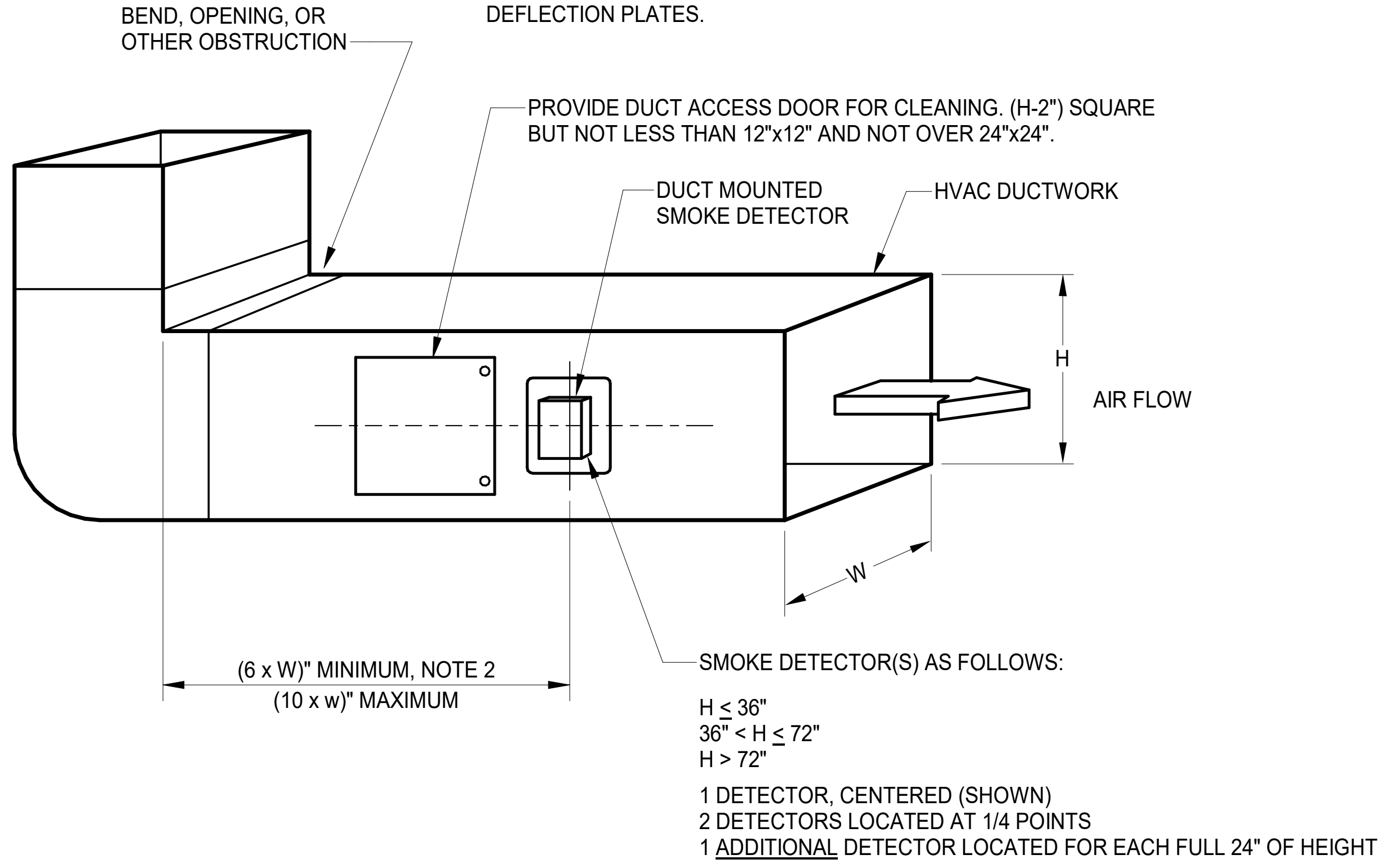


NOTE:
1. SEE PLAN FOR AIRFLOW DIRECTION.

9 LINEAR DIFFUSER VERTICAL INSTALLATION DETAIL

Scale: NONE

GENERAL NOTES:
1. THIS DETAIL IS INTENDED TO PROVIDE GUIDANCE IN PROPER POSITIONING OF DUCT MOUNTED SMOKE DETECTORS. FOLLOW ANY MANUFACTURER'S INSTRUCTIONS SPECIFIC TO THE DEVICE BEING INSTALLED.
2. THIS DIMENSION MAY BE REDUCED IF IT IS PHYSICALLY IMPOSSIBLE TO OBTAIN SIX DUCT WIDTHS FROM A BEND OR OBSTRUCTION. IN SUCH CASES POSITION DETECTOR AS FAR AS POSSIBLE FROM OPENING, BENDS, OR DEFLECTION PLATES.



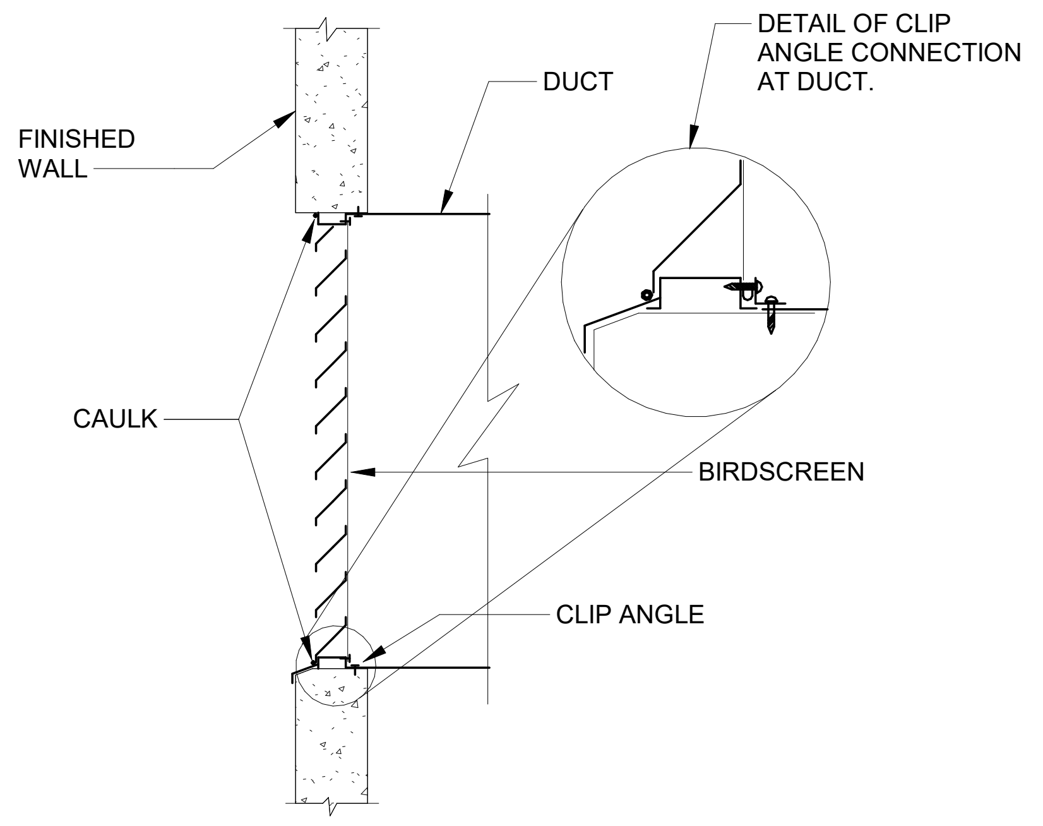
SMOKE DETECTOR(S) AS FOLLOWS:

H ≤ 36"
36" < H ≤ 72"
H > 72"

1 DETECTOR, CENTERED (SHOWN)
2 DETECTORS LOCATED AT 1/4 POINTS
1 ADDITIONAL DETECTOR LOCATED FOR EACH FULL 24" OF HEIGHT

10 DUCT DETECTOR LOCATION DETAIL

Scale: NONE



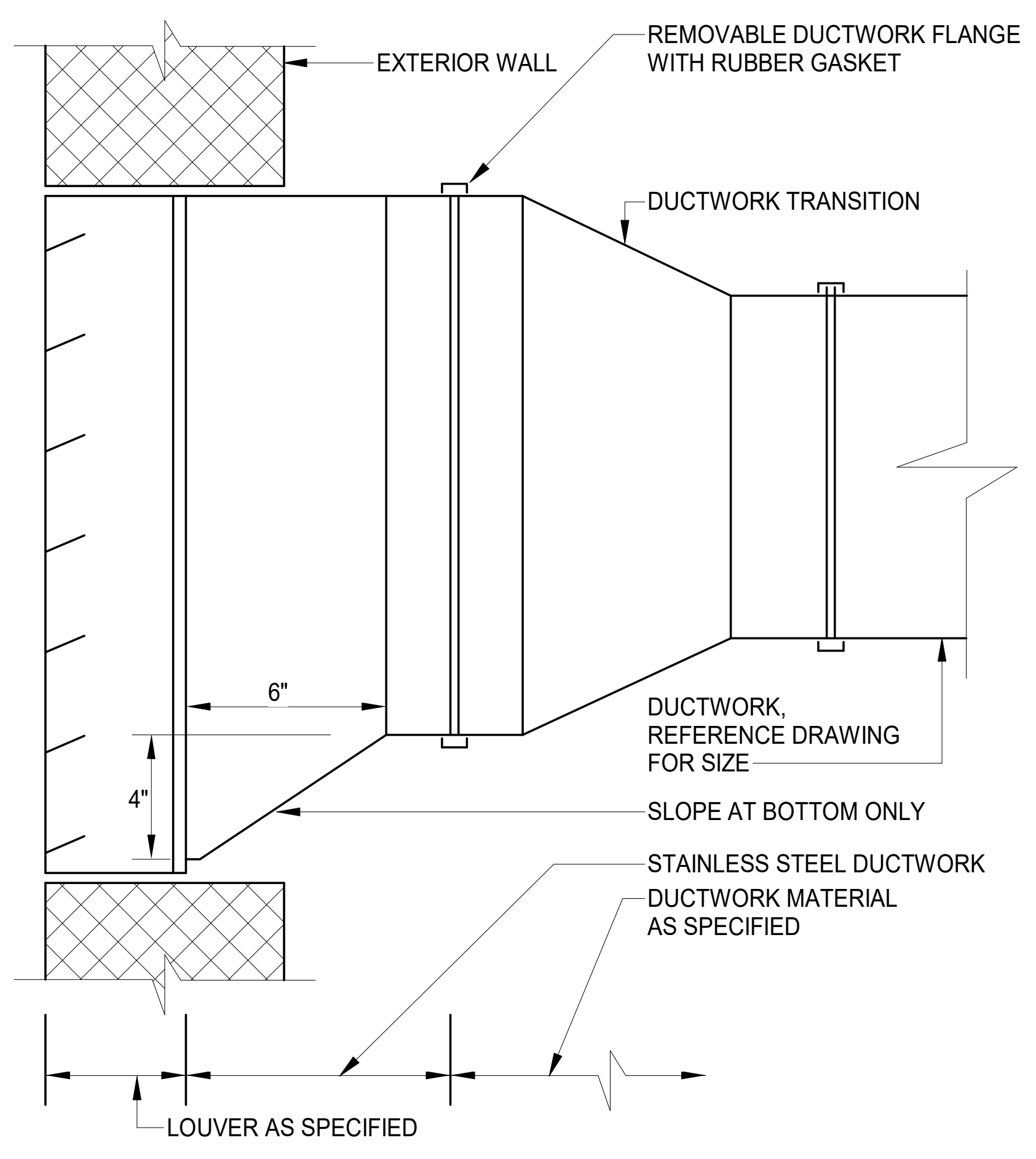
NOTES:
1. OVERALL SIZE OF OPENING SHOULD BE 1/4" GREATER IN BOTH DIRECTIONS THAN SIZE OF LOUVER.

2. LOUVER BLADES SHOULD NOT EXCEED 5 FT. IN WIDTH. USE MULLION CONNECTED SECTIONS FOR GREATER WIDTHS.

3. CAULKING AS SPECIFIED.

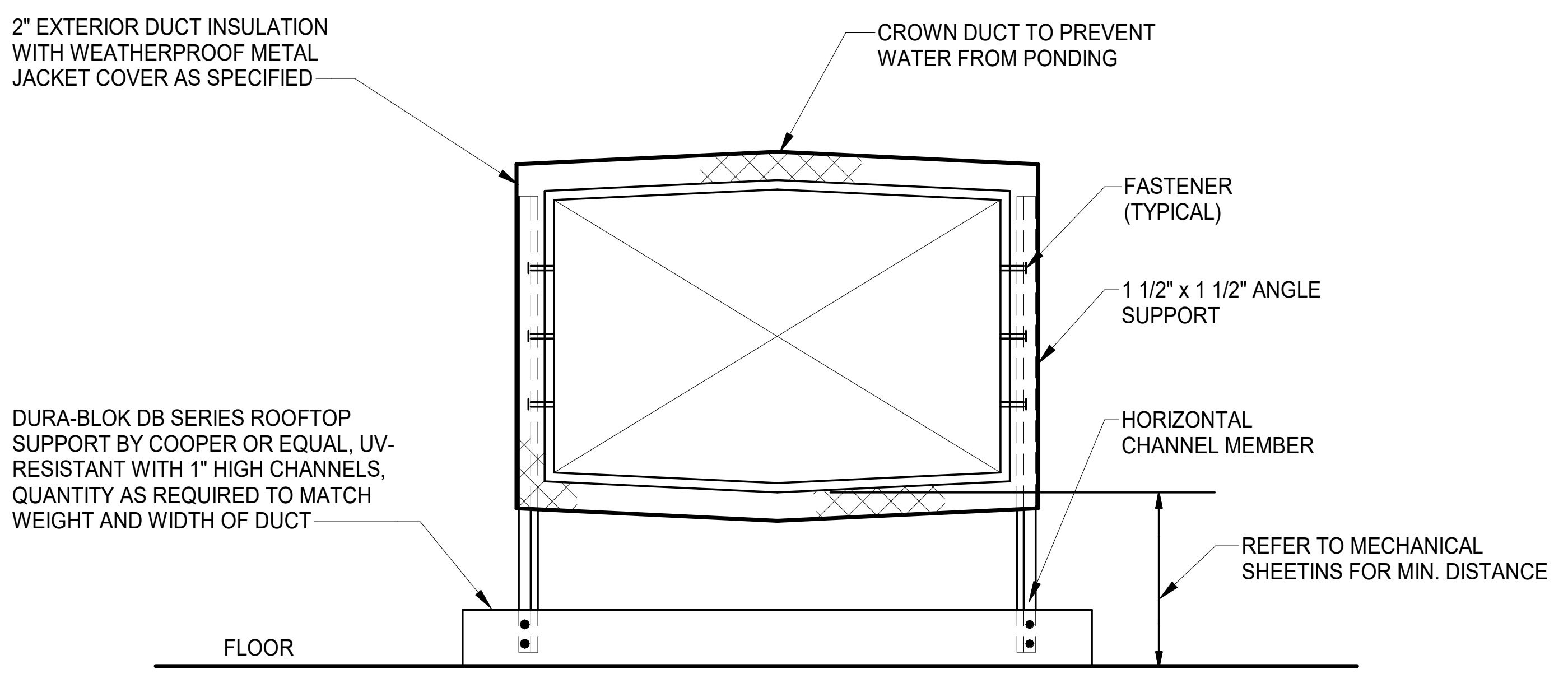
11 LOUVER MOUNTING DETAIL

Scale: NONE



12 DUCTWORK AT LOUVER

Scale: NONE



NOTES:
1. DUCT SUPPORTS SHALL BE SPACED 4'-0" OC MAX., OR AS RECOMMENDED BY MANUFACTURER.
2. INSTALL SUPPORTS AS RECOMMENDED BY SMACNA DUCT INSTALLATION.

13 OUTDOOR DUCT-MOUNTING DETAIL

Scale: NONE

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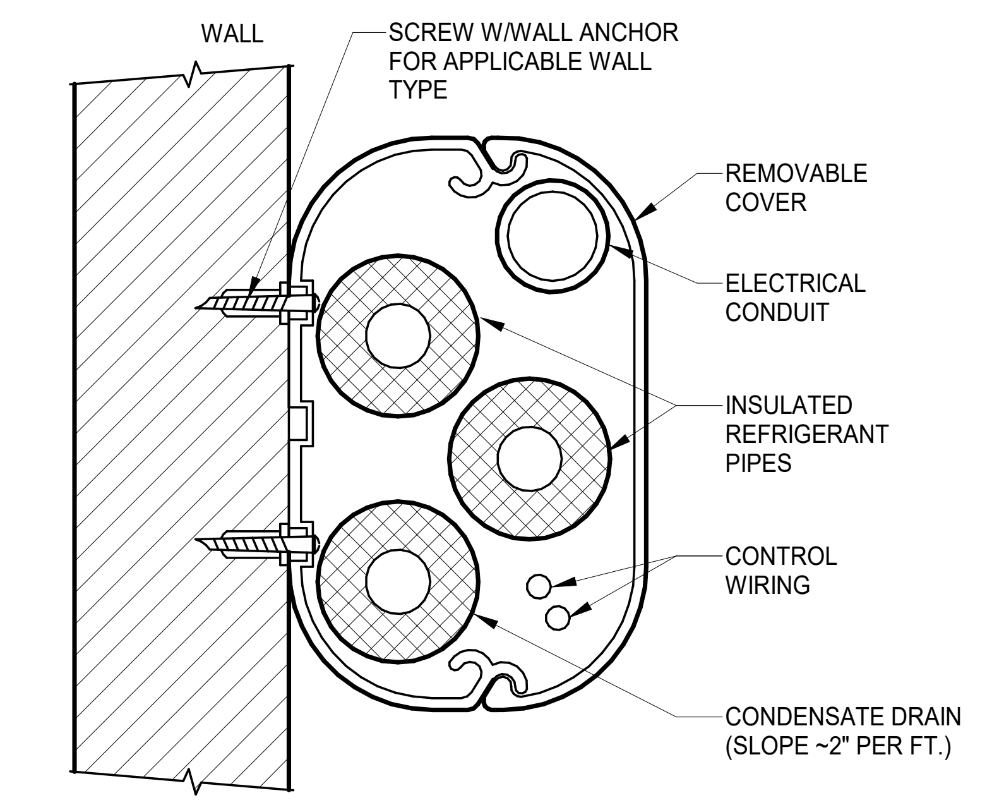
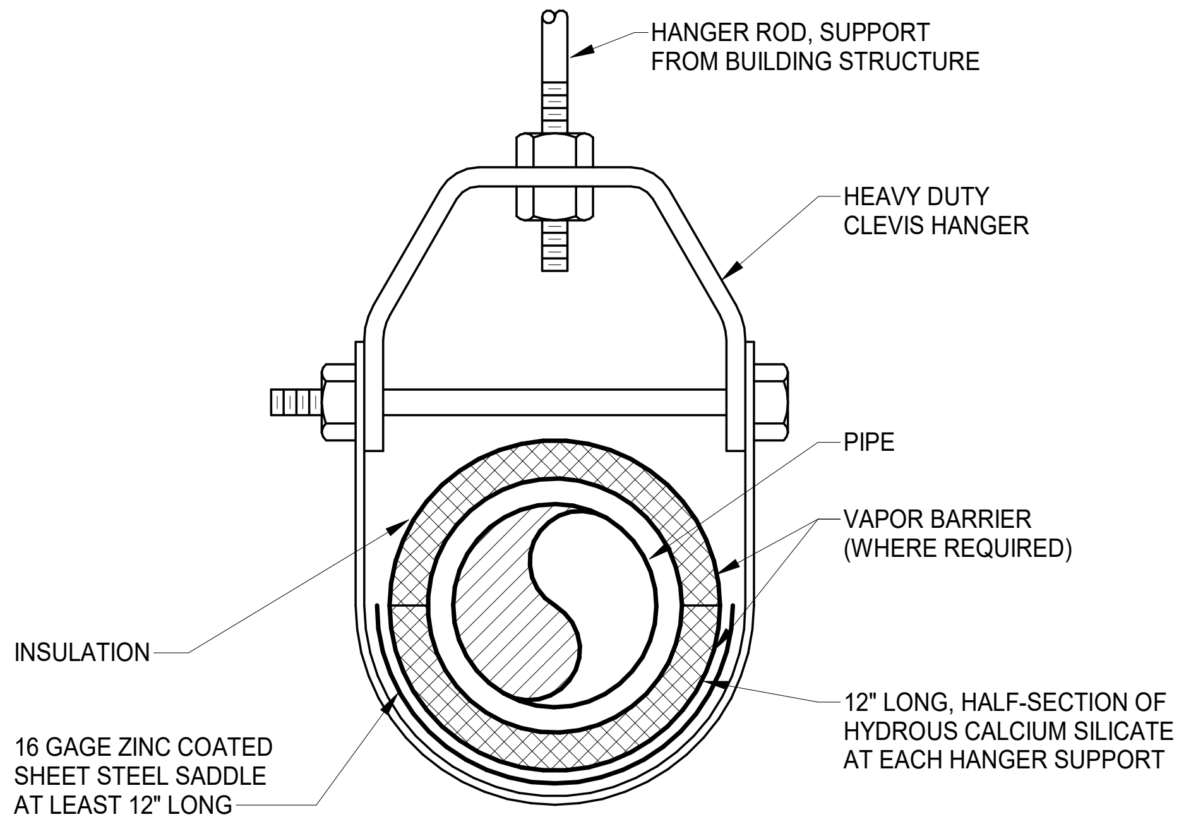
M502



NOTE:
PIPE COVER SHALL BE SLIMDUCT MANUFACTURED BY AIRTECH OR EQUAL FOR CONCEALING ALL PIPES, CONDUITS AND WIRING WHERE OTHERWISE EXPOSED IN ROOMS. CONTRACTOR SHALL SELECT FROM EITHER SIZE SD-100 (4"W X 2~w"D) OR SD-140 (5~6"W X 3~2"D) TO MATCH THE APPLICABE QUANTITY AND SIZE OF CONCEALED ITEMS. UTILIZE MATCHING FITTINGS FOR ALL CHANGES IN DIRECTION. COORDINATE COLOR, SELECTION OF WHITE OR IVORY WITH OWNER. INSTALL COVER AS RECCOMMENDED BY MANUFACTURER FOR A NEAT FINISHED APPEARANCE.

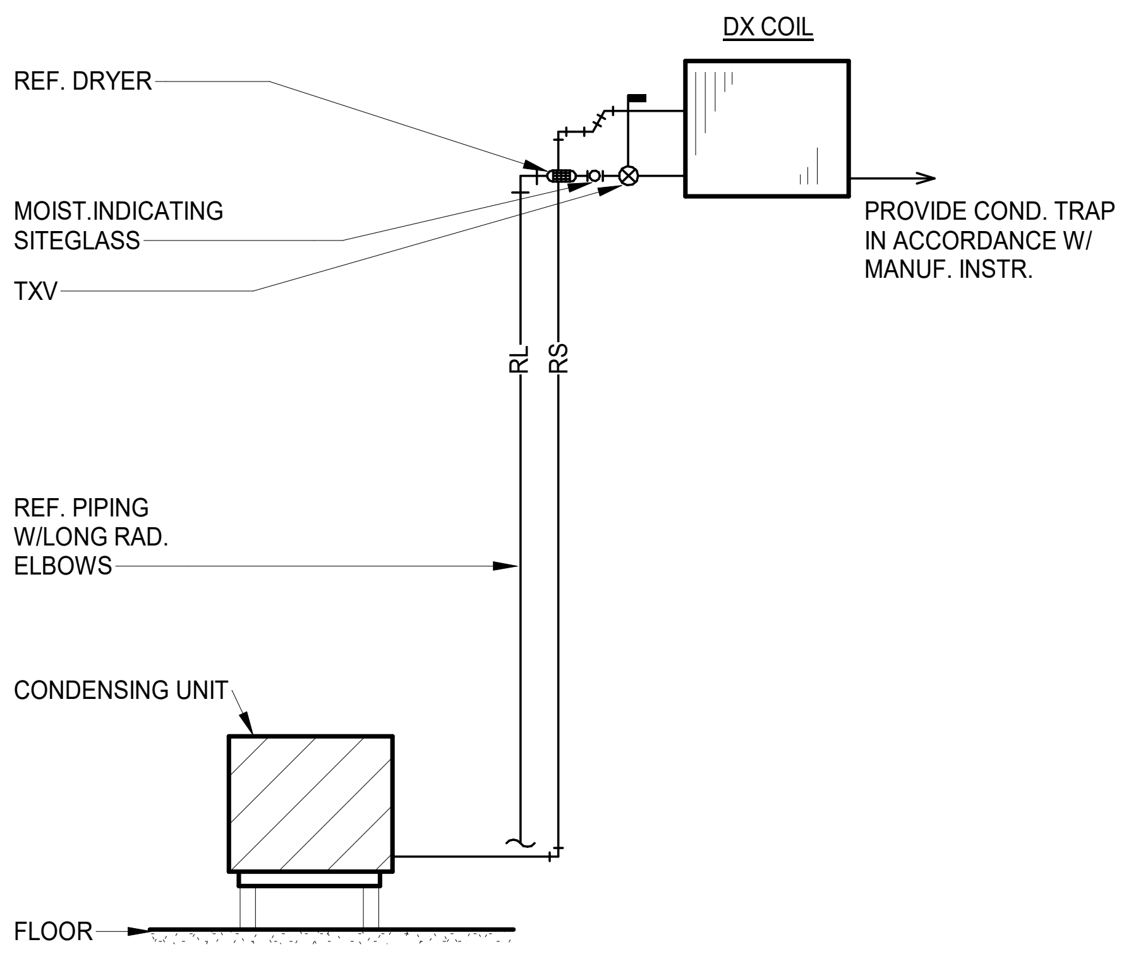
1 PIPE GUIDE DETAIL
Scale: NONE



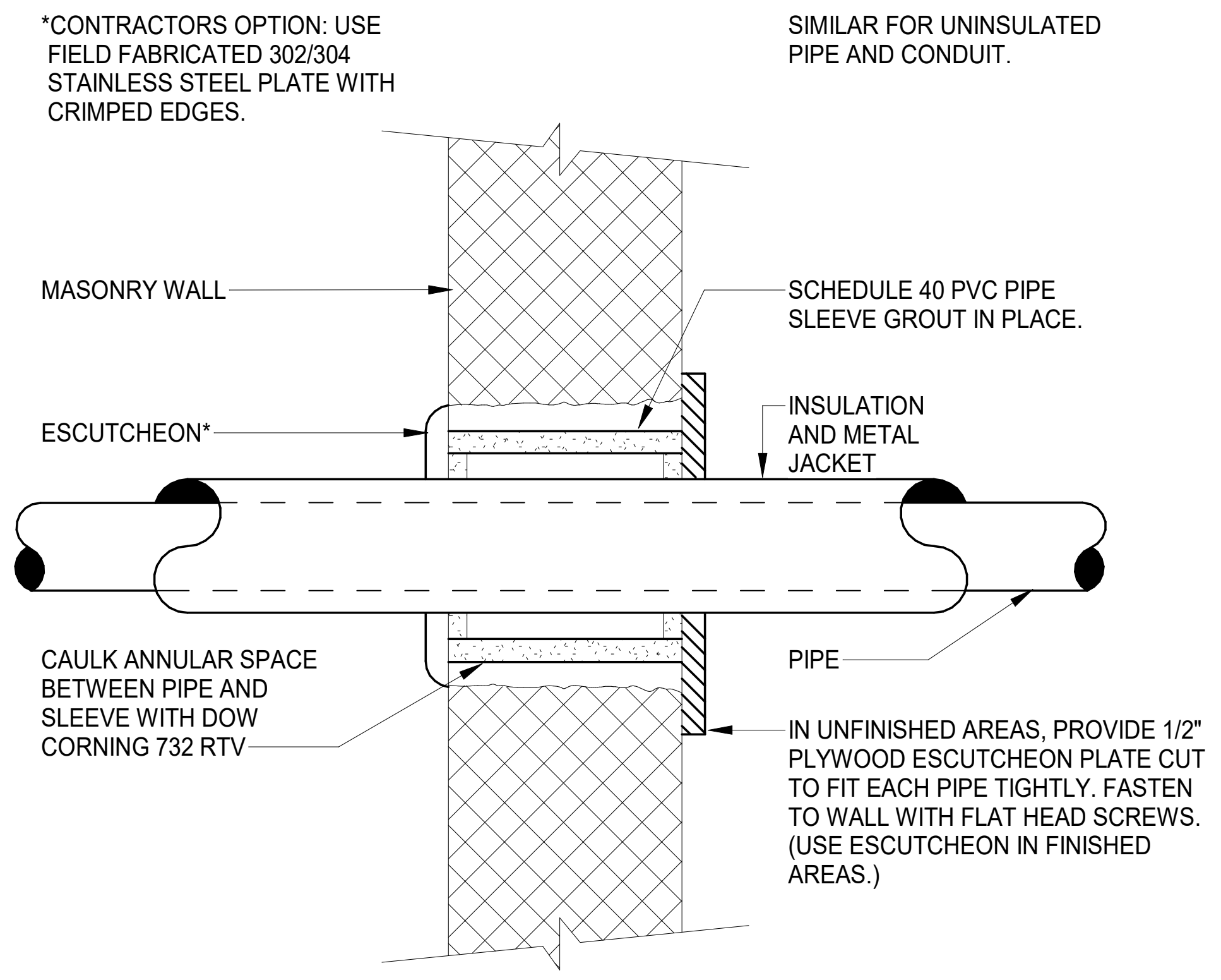
NOTE:
SADDLE AND HALF-SECTION OF HYDROUS CALCIUM SILICATE SHALL BE INSTALLED AT THE SAME TIME THAT THE PIPE AND PIPE HANGERS ARE INSTALLED.

SEE SPECIFICATIONS FOR LOCATIONS WHERE HYDROUS CALCIUM SILICATE SHALL BE REQUIRED.

2 PIPE SUPPORT DETAIL
Scale: NONE



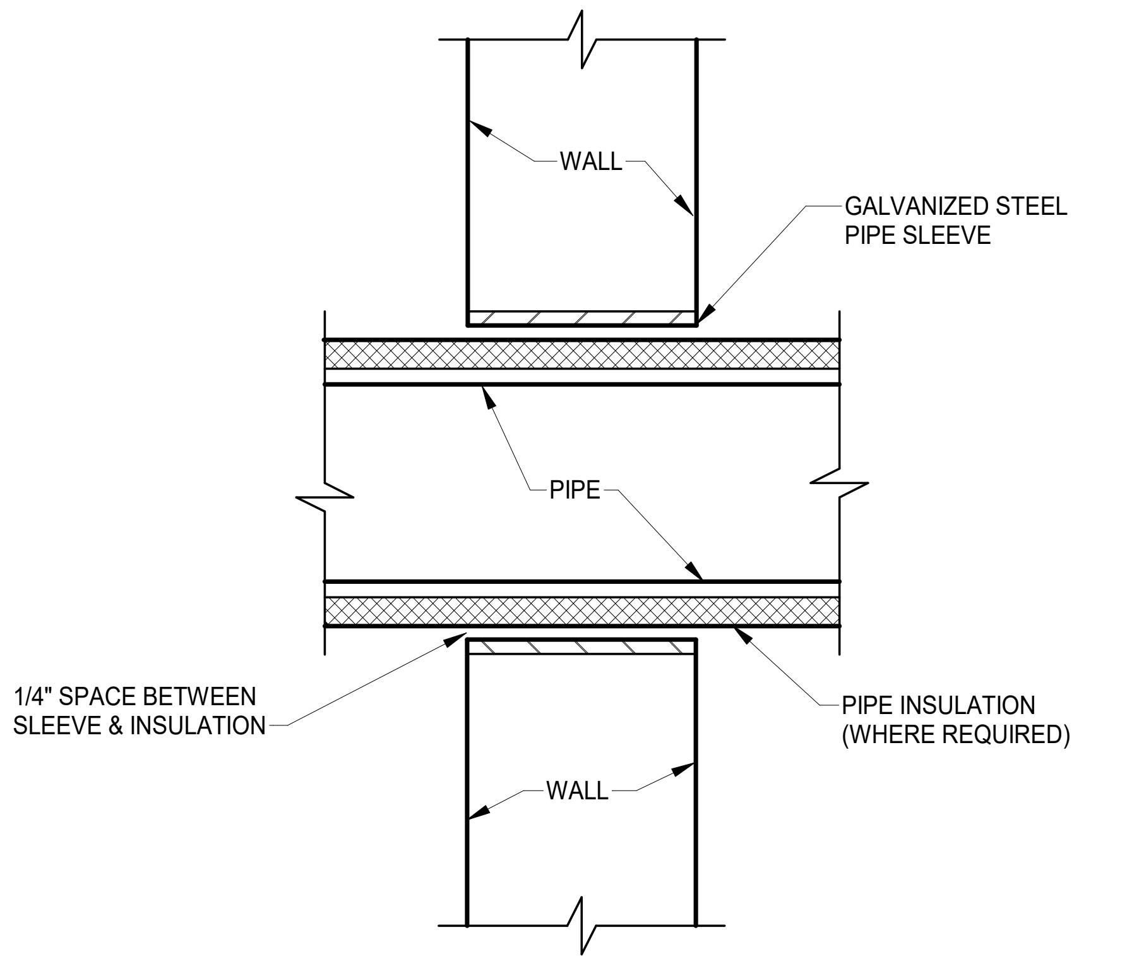
3 REFRIGERANT PIPING DIAGRAM
Scale: NONE



*CONTRACTORS OPTION: USE FIELD FABRICATED 302/304 STAINLESS STEEL PLATE WITH CRIMPED EDGES.

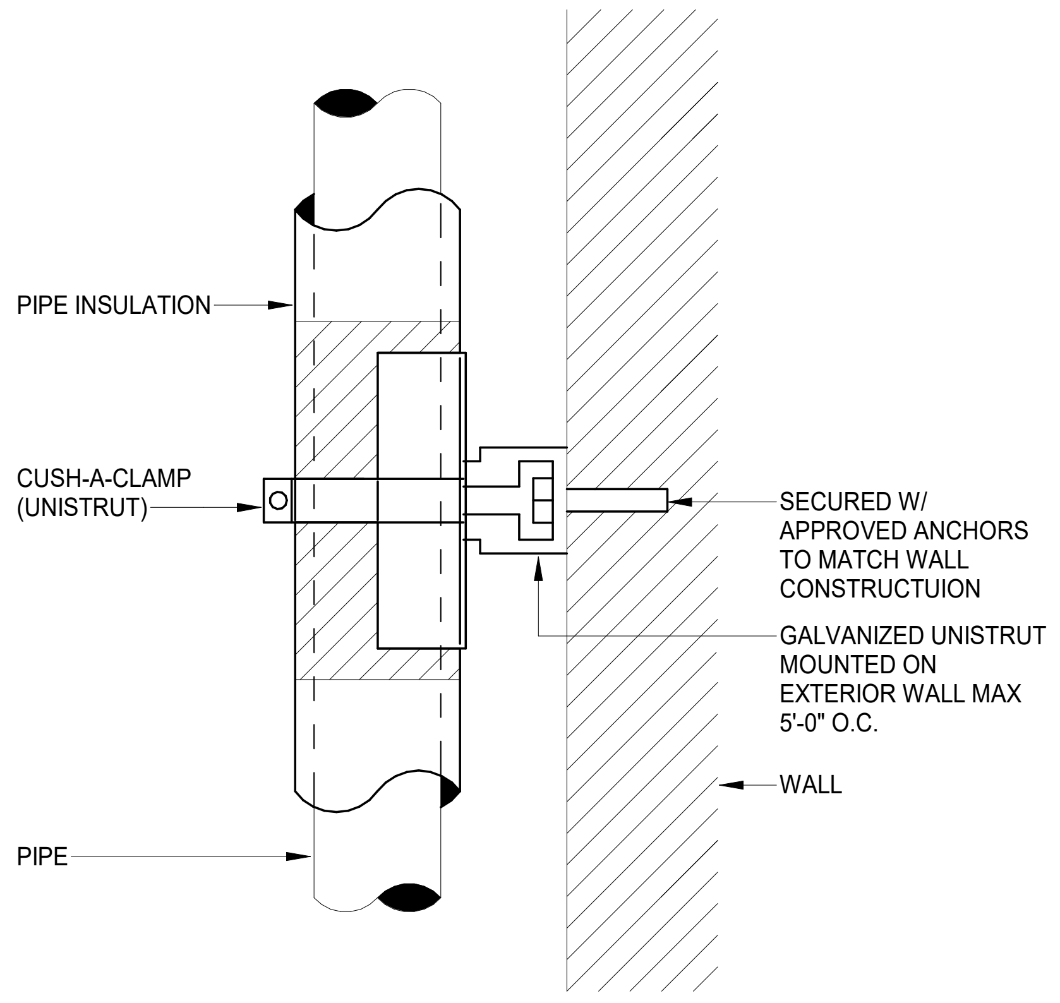
SIMILAR FOR UNINSULATED PIPE AND CONDUIT.

4 PIPE THROUGH EXTERIOR WALL
Scale: NONE



NOTE:
WHERE PIPES PENETRATE FIRE-RATED WALLS, FILL SPACE BETWEEN PIPE AND SLEEVE WITH A FIRE-RESISTANT MATERIAL WITH SUFFICIENT RATING TO MAINTAIN THE FIRE RATING OF THE WALL. WHERE PIPE PENETRATE EXTERIOR WALLS, FILL SPACE BETWEEN PIPE AND SLEEVE WITH FIBERGLASS INSULATION.

5 PIPING WALL SLEEVE DETAIL
Scale: NONE



6 EXTERIOR PIPE MOUNTING DETAIL
Scale: NONE

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M503

FAN

MARK	EXHAUST AIRFLOW (CFM)	EXT. STATIC PRESSURE (IN. W.C.)	FAN RPM	ELECTRICAL CONNECTION					INTERLOCKED WITH	FAN TYPE	WEIGHT (LBS)	MANUFACTURER	MODEL	REMARKS
				V	PH	F	MCA	MOCP						
EF-1	75	0.30	1,207	120	1	60	1	20	LIGHTS	CEILING MOUNTED	19.0	COOK	GN-242	1,2,3
EF-2	150	0.30	1,451	120	1	60	1	20	DIGITAL TIMER	INLINE	28.0	COOK	GN-342	1,2,3
EF-3	550	0.30	1,169	208	3	60	5	20	DIGITAL TIMER	INLINE	195.0	COOK	SQN-D	1,2,3,4
EF-4	100	0.30	683	120	1	60	1	20	DIGITAL TIMER	INLINE	16.0	COOK	GN-186	1,2,3

GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES AND DAMPERS. UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. PROVIDE FAN WITH INTEGRAL DISCONNECT.
2. PROVIDE FAN WITH AUTOMATIC BACKDRAFT DAMPER.
3. PROVIDE FAN WITH FAN SPEED CONTROLLER.
4. PROVIDE FAN WITH VARIABLE SPEED DRIVE.

GRILLES, REGISTERS AND DIFFUSERS

MARK	DESCRIPTION	MOUNTING TYPE	FACE WIDTH	FACE LENGTH	NECK SIZE	MAX AIRFLOW (CFM)	MAX AIR P.D., IN. H2O	MAX N.C.	MANUFACTURER	MODEL	REMARKS
A	SQUARE PLAQUE DIFFUSER	LAY-IN	24.0	24.0	6"ø	110	0.1	25	PRICE	ASPD	1,2
B	SQUARE PLAQUE DIFFUSER	LAY-IN	24.0	24.0	8"ø	230	0.1	25	PRICE	ASPD	1,2,4
C	LINEAR SLOT DIFFUSER (3-SLOT)	LAY-IN	4.5	48.0	7"ø	190	0.1	25	PRICE	SDB	1,2,5
D	SPIRAL DUCT GRILLE	DUCT MOUNTED	6.0	14.0	14/6	300	0.1	25	PRICE	SDG	1,2,6
E	ROUND PLAQUE DIFFUSER	DUCT MOUNTED	6.0	6.0	6"ø	195	0.1	25	PRICE	RPD	1,2
F	OUTDOOR AIR INLET	SURFACE MOUNTED	12.0	12.0	8"ø	170	---	---	BROAN	643 FA	3
U	EXHAUST AIR OUTLET	SURFACE MOUNTED	12.0	12.0	8"ø	160	---	---	BROAN	643	3
V	EXHAUST AIR OUTLET	SURFACE MOUNTED	9.0	9.0	6"ø	75	---	---	BROAN	843BL	3
W	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	SURFACE MOUNTED	22.0	22.0	22/22	1,250	0.05	20	PRICE	630	-
X	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	SURFACE MOUNTED	16.0	16.0	16/16	640	0.05	20	PRICE	630	-
Y	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	SURFACE MOUNTED	10.0	10.0	10/10	275	0.05	20	PRICE	630	-
Z	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	SURFACE MOUNTED	6.0	6.0	6/6	110	0.05	20	PRICE	630	-

GENERAL NOTES:

1. COORDINATE EXACT GRILLE AND DIFFUSER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS.
2. WHERE MULTIPLE WALL MOUNTED REGISTERS ARE INSTALLED IN A ROOM, THE REGISTERS SHALL BE ALIGNED ON THE CENTER POINT OF EACH REGISTER.
3. ALL CEILING DIFFUSERS SHALL BE 4-WAY THROW TYPE UNLESS NOTED OTHERWISE.

REMARKS:

1. DUCT MOUNTED BALANCING DAMPERS SHALL BE FURNISHED AND INSTALLED WHERE RUNOUT IS ABOVE AN ACCESSIBLE CEILING. IN LOCATIONS ABOVE HARD CEILINGS, DIFFUSERS SHALL BE FURNISHED WITH OPPOSED BLADE DAMPER OPERABLE THRU DIFFUSER FACE.
2. THE HARD DUCT TAP FITTING AND FLEXIBLE DUCT CONNECTION SHALL BE SIZED TO EQUAL THE DIAMETER FOR THE DIFFUSER CONNECTION.
3. COORDINATE FINAL COLOR SELECTION WITH OWNER & ARCHITECT PRIOR TO PURCHASING.
4. CONTRACTOR SHALL PROVIDE REQUIRED MOUNTING ACCESSORIES FOR DIFFUSERS TO BE MOUNTED IN EXPOSED CEILING AREA WHERE REQUIRED.
5. CONTRACTOR SHALL PROVIDE CABLE OPERATED DAMPER FOR SLOT DIFFUSER FACE.
6. PROVIDE GRILLE WITH PRICE AIR SCOOP.

PACKAGED PAD MOUNTED UNIT - GAS HEAT

MARK	SUPPLY FAN				ELECTRICAL CONNECTION					COOLING								HOT GAS REHEAT			HEATING						WEIGHT (LBS)	MANUFACTURER	MODEL	REMARKS
	SUPPLY CFM	OUTSIDE AIR CFM	EXT.STATIC PRESSURE (IN. W.C.)	HORSE POWER (HP)	V	PH	F	MCA	MOCP	AIR TEMPERATURE (°F)				MIN. TOTAL CAPACITY (MBH)	MIN. SENS. CAPACITY (MBH)	MINIMUM EER / IEER	NUMNBER OF STAGES	TOTAL CAPACITY (MBH)	LEAVING DRY BULB (°F)	LEAVING WET BULB (°F)	MIXED AIR TEMP.(°F)	LEAVING DRY BULB (°F)	INPUT (MBH)	OUTPUT (MBH)	AFUE %	NUMBER OF STAGES				
										MIXED AIR DRY BULB	MIXED AIR WET BULB	LEAVING DRY BULB	LEAVING WET BULB																	
PMU-1	8,265	1,250	1.30	7.5	208	3	60	135	150	77.7	67.0	55.0	54.0	309.5	203	11.2/15.6	4	159	70.5	61.0	61.5	85.1	260	211	81	2	3,245	LENNOX	LGT302H5M	ALL

GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, DAMPERS, AND DUCT MOUNTED HOT WATER COILS WHERE APPLICABLE. DIRTY FILTER AND UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE FOR COIL PULL AS RECOMMENDED BY UNIT MANUFACTURER. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.
3. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL ELECTRICAL COSTS IF ALTERNATE UNIT IS PROVIDED WITH GREATER ELECTRICAL CHARACTERISTICS THAN SHOWN.

REMARKS:

1. PROVIDE UNIT WITH DISCONNECT SWITCH, AND MOTORIZED OUTSIDE AIR DAMPER WITH INSECT SCREEN.
2. PROVIDE UNIT WITH FACTORY MOUNTED GFCI RECEPTACLE FOR ELECTRICIAN TO WIRE TO SEPARATE CIRCUIT.
3. PROVIDE UNIT WITH BI-POLAR IONIZATION SIZED PER MANUFACTURER'S RECOMMENDATIONS.
4. PROVIDE UNIT WITH 7-DAY PROGRAMMABLE THERMOSTAT AND HUMIDISTAT.
5. PROVIDE UNIT WITH LOW AMBIENT CONTROL.
6. PROVIDE LOW LEAK ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF DAMPER.
7. PROVIDE UNIT WITH 4 STAGE COMPRESSOR AND 2 STAGE GAS HEATER.
8. PROVIDE UNIT WITH 2 STAGE HOT GAS REHEAT SIZED PER MANUFACTURERS RECOMMENDATIONS.
9. ELECTRICAL CONTRACTOR TO PROVIDE UNIT DUCT MOUNTED SMOKE DETECTOR IN BOTH THE SUPPLY AND RETURN DUCT.
10. PROVIDE UNIT WITH REQUIRED SENSORS, ACCESSORIES, AND CONTROLS TO MET VEC 2021 C403.7.1 DEMAND CONTROL VENTILATION REQUIREMENT.
11. PROVIDE UNIT WITH HORIZONTAL RETURN AIR PANEL KIT FIELD INSTALLED.
12. PROVIDE UNIT WITH PAD MOUNTED CURB MODEL C1CURB15C-1 SIZED PER UNIT MANUFACTURERS RECOMMENDATIONS.
13. PROVIDE UNIT WITH 4" HOUSE KEEPING PAD SIZED PER UNIT MANUFACTURERS SIZING RECOMMENDATIONS.
14. PROVIDE UNIT WITH VARIABLE FREQUENCY DRIVE.

ELECTRIC UNIT HEATER

MARK	CFM	ELECTRIC HEATER (KW)	ELECTRICAL CONNECTION					MANUFACTURER	MODEL	REMARKS
			V	PH	F	MCA	MOCP			
EUH-1	175	1	208	1	60	8.3	20	MARKEL	E3322TD-RP	ALL
EUH-2	175	3	208	3	60	14.4	20	MARKEL	HF3326TD-RP	ALL

REMARKS:

1. REFER TO FLOOR PLANS FOR UNIT QUANTITIES.
2. PROVIDE FACTORY INSTALLED THERMAL OVERLOAD PROTECTION, BUILT-IN THERMOSTAT AND DISCONNECT SWITCH.
3. PROVIDE ACCESSORIES NECESSARY FOR SURFACE MOUNTING UNIT ON FIRE RATED WALLS. ALL OTHER UNITS SHALL BE PROVIDED WITH THE NECESSARY ACCESSORIES TO BE RECESSED IN THE WALL.
4. UNITS SHALL BE MOUNTED 12" AFF UNLESS OTHERWISE NOTED.

AIR COOLED CONDENSING UNIT

MARK	MIN. TOTAL CAPACITY (BTU/H)	MINIMUM EER2 / SEER2	ELECTRICAL CONNECTION					RELATED UNIT MARK	MANUFACTURER	MODEL	REMARKS
			V	PH	F	MCA	MOCP				
CU-1	40,100	12.2/14.7	208	3	60	18.0	25.0	AHU-1	LENNOX	ML13KC1-042-233	ALL
CU-2	55,100	11.2/13.4	208	3	60	22.0	30.0	AHU-2	LENNOX	ML17KC2-060-233	ALL
CU-3	57,200	11.2/14.7	208	3	60	23.0	40.0	AHU-3	LENNOX	ML17KC2-060-233	ALL
CU-4	41,400	12.4/14.7	208	3	60	18.0	25.0	AHU-4	LENNOX	ML13KC1-042-233	ALL
CU-5	21,300	14.2/20.5	208	1	60	15.0	25.0	AHU-5	LENNOX	EL22KCV-024-230	ALL
CU-6	56,600	11.2/15.2	208	3	60	23.0	40.0	AHU-6	LENNOX	ML17KC2-060-233	ALL
CU-7	56,600	11.2/15.2	208	3	60	23.0	40.0	AHU-7	LENNOX	ML17KC2-060-233	ALL
CU-8	58,000	11.2/15.2	208	3	60	23.0	40.0	AHU-8	LENNOX	ML17KC2-060-233	ALL

GENERAL NOTES:

1. MINIMUM RECOMMENDED CLEARANCE AROUND ROOFTOP UNIT IS 12 INCHES ON NON-SERVICE SIDES AND 30 INCHES ON SERVICE SIDES. MAINTAIN MINIMUM CLEARANCE FOR CONDENSER AIR FLOW AS RECOMMENDED BY UNIT MANUFACTURER. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. PROVIDE WITH LOW AMBIENT CONTROL DOWN TO 20°F.
2. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.
3. PROVIDE WITH COIL GUARD.
4. OUTDOOR CONDENSING UNIT TO POWER RELATED UNIT.
5. PROVIDE UNITS WITH NAME PLATES TO REFERENCE CORRESPONDING AIR HANDLER UNIT.

AIR HANDLING UNIT - GAS HEAT

MARK	FAN				COOLING								HEATING											MANUFACTURER	REMARKS
	SUPPLY AIR CFM	OUTSIDE AIR CFM	EXT.STATIC PRESSURE (IN. W.C.)	HORSE POWER	AIR TEMPERATURE (°F)				MIN. TOTAL CAPACITY (MBH)	MIN. SENS. CAPACITY (MBH)	COIL MODEL	NUMBER OF STAGES	MIXED AIR TEMP.(°F)	LEAVING AIR TEMP (°F)	INPUT (MBH)	OUTPUT (MBH)	NUMBER OF STAGES	AFUE %	FURNACE MODEL	FURNACE ELECTRICAL					
					MIXED DRY BULB	MIXED WET BULB	LEAVING DRY BULB	LEAVING WET BULB												V	P	F	MOCP		
AHU-1	1,265	120	0.50	0.75	77.9	65.6	56.0	55.0	40.1	31	CK40HT-51/60C	1	57.0	118.5	88	84	2	96	ML296UH090XV48C	120	1	60	15	LENNOX	ALL
AHU-2	1,645	160	0.50	1.00	80.4	67.0	54.7	54.7	57.2	41	CK40HT-60D	2	52.1	101.1	88	87	2	98	SLP99UH090XV60C	120	1	60	20	LENNOX	ALL
AHU-3	1,645	135	0.50	0.75	76.3	65.7	53.3	53.3	55.1	37	CK40HT-48C	1	65.0	113.0	88	84	2	96	ML296UH090XV48C	120	1	60	15	LENNOX	ALL
AHU-4	1,580	110	0.50	0.75	76.2	64.2	53.4	53.4	41.4	35	CK40HT-51/61C	1	57.0	106.2	88	84	2	96	ML296UH090XV48C	120	1	60	15	LENNOX	ALL
AHU-5	665	60	0.50	0.50	78.9	66.3	53.8	53.8	21.3	16	CK40HT-30B	MODULATING	58.1	118.1	44	43	2	96	EL297UH045XE36B	120	1	60	15	LENNOX	ALL
AHU-6	1,440	140	0.80	0.00	79.6	66.9	52.0	52.0	56.6	39	CK40HT-51/61C	2	59.0	113.0	88	84	2	96	ML296UH090XV48C	120	1	60	15	LENNOX	ALL
AHU-7	1,440	140	0.80	0.00	79.6	66.9	52.0	52.0	56.6	39	CK40HT-51/61C	2	59.0	113.0	88	84	2	96	ML296UH090XV48C	120	1	60	15	LENNOX	ALL
AHU-8	1,770	170	0.50	0.75	75.5	63.4	51.3	51.3	56.2	43	CK40HT-51/60C	2	67.2	111.1	88	84	2	96	ML296UH090XV48C	120	1	60	15	LENNOX	ALL

GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, DAMPERS, AND DUCT MOUNTED HOT WATER COILS WHERE APPLICABLE. DIRTY FILTER AND UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE FOR COIL PULL AS RECOMMENDED BY UNIT MANUFACTURER. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.
3. UNIT TO BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.
5. COOLING AND HEATING CAPACITY BASED ON AHRI CONDITIONS.
6. PROVIDE AIR HANDLER UNITS WITH CONDENSATE DRAIN PAN AND OVER FLOW SWITCH.

REMARKS:

1. SUPPLY FAN SHALL OPERATE CONTINUOUSLY DURING OCCUPIED MODE.
2. UNIT SHALL BE CONTROLLED BY 7-DAY PROGRAMMABLE WIRED THERMOSTAT COORDINATE FINAL LOCATION WITH OWNER.
3. AHU MOTOR SHALL BE VARIABLE SPEED ECM TYPE.
4. PROVIDE AIR HANDLING UNITS WITH INTEGRAL ELECTRICAL DISCONNECTING MEANS.
5. PROVIDE AHU WITH BI-POLAR IONIZATION. INSTALL AND SIZE PER MANUFACTURER SPECIFICATIONS.
6. PROVIDE UNIT WITH LOW AMBIENT CONTROL.
7. PROVIDE UNIT WITH HORIZONTAL SUSPENSION KIT.
8. PROVIDE INSECT SCREENS ON ALL OUTDOOR AIR INLETS.
9. PROVIDE UNIT WITH VERTICAL CONCENTRIC VENT TERMINATION SIZED PER UNIT MANUFACTURERS RECOMMENDATIONS.

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ISSUE DATE	DESCRIPTION
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PROFESSIONAL SEAL

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CONSTRUCTION DRAWINGS
FOR
SOUTHWEST COMMUNITY
CHURCH
MERRIMAN ROAD
ROANOKE, VA

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checked by: SSL
date: 10/24/2025
Rev:

SHEET NAME

MECHANICAL
SCHEDULES

SHEET NUMBER

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