

ABBREVIATIONS			
Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	M/A	MIXED AIR
ADD	ADDENDUM	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MBH	ONE THOUSAND BTU PER HOUR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MISC	MISCELLANEOUS
BLW	BELOW	MTR	MOTOR
BTU	BRITISH THERMAL UNITS	MU/A	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	NIC	NOT IN CONTRACT
CLG	CEILING	NO	NORMALLY OPEN
D	DEGREE	NTS	NOT TO SCALE
DB	DRY BULB	O/A	OUTSIDE AIR
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PSI	POUNDS PER SQUARE INCH
ELEC	ELECTRICAL	PSIG	POUNDS PER SQUARE INCH GAUGE
EQUIP	EQUIPMENT	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R/A	RETURN AIR
E/A	EXHAUST AIR	RH	RELATIVE HUMIDITY
EXIST	EXISTING	RL/A	RELIEF AIR
F	DEGREES FAHRENHEIT	RM	REMAIN
FD	FIRE DAMPER	RPM	REVOLUTIONS PER MINUTE
FL	FLOOR	SF	SQUARE FOOT
FPM	FEET PER MINUTE	S/A	SUPPLY AIR
FT	FOOT/FEET	SF	SQUARE FOOT
GC	GENERAL CONTRACTOR	SD	SMOKE DAMPER
GPM	GALLONS PER MINUTE	SP	STATIC PRESSURE
HP	HORSE POWER	T	THERMOSTAT
HTG	HEATING	TD	TEMPERATURE DROP
HTR	HEATER	TEMP	TEMPERATURE
HW	HOT WATER	TYP	TYPICAL
IN	INCH	VAV	VARIABLE AIR VOLUME
LB	POUND	VENT	VENTILATION
LAT	LEAVING AIR TEMPERATURE	WB	WET BULB
LP	LOW PRESSURE		

EQUIPMENT ABBREVIATIONS			
AC	AIR CONDITIONING UNIT	EWH	ELECTRIC WATER HEATER
ACC	AIR COOLED CONDENSER	FCU	FAN COIL UNIT
ACCU	AIR COOLING CONDENSING UNIT	FP	FIRE PUMP
AHU	AIR HANDLING UNIT	GI	GREASE INTERCEPTOR
AS	AIR SEPARATOR	GRV	GRAVITY ROOF VENTILATOR
B	BOILER	HWP	HEATING WATER PUMP
CH	CHILLER	HX	HEAT EXCHANGER
CT	COOLING TOWER	HRU	HEAT RECOVERY UNIT
CUH	CABINET UNIT HEATER	PRV	POWER ROOF VENTILATOR
CWP	CONDENSER WATER PUMP	RE	RETURN/EXHAUST FAN
CHWP	CHILLED WATER PUMP	RTU	ROOFTOP UNIT
DBP	DOMESTIC WATER BOOSTER PUMP	SEP	SEWAGE EJECTOR PUMP
DC	DUCT MOUNTED COIL	SF	SUPPLY FAN
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER
ET	EXPANSION TANK		

MECHANICAL DUCT SYMBOLS	
SYMBOL	DESCRIPTION
	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
	OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
	ROUND DUCT SIZE TAG (DIAMETER)
	EXISTING DUCT TAG
	DUCT BEING DEMOLISHED
	SUPPLY AIR
	OUTDOOR AIR
	RETURN AIR
	EXHAUST AIR
	RELIEF AIR
	SUPPLY AIR DIFFUSER (4-WAY)
	RETURN AIR GRILLE
	RETURN AIR GRILLE WITH SOUND BOOT
	EXHAUST AIR GRILLE
	POINT OF EXISTING TO NEW CONNECTION
	POINT OF DISCONNECT TO EXISTING CONNECTION
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
N.I.C.	NOT IN CONTRACT
(EX)	EXISTING
AFF	ABOVE FINISHED FLOOR
DN	DOWN
UP	UP
	SECTION CUT ← REFERRING DETAIL NUMBER → REFERRING SHEET NUMBER

MECHANICAL ACCESSORIES SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	NOITROGEN DIOXIDE (NO2)
	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)
	CARBON MONOXIDE SENSOR
	SWITCH (4'-0" AFF TO TOP)
	FIRE DAMPER W/ACCESS DOOR (SEE DETAIL)

MECHANICAL PIPING SYMBOLS	
SYMBOL	DESCRIPTION
	BUTTERFLY VALVE
	3-PIECE BALL VALVE
	CHECK VALVE
	STRAINER WITH BLOWDOWN VALVE WITH HOSE CONN.
	BALANCING VALVE
	B&G CIRCUIT SETTER
	UNION
	THERMOMETER
	PRESSURE GAGE & COCK
	GAGE COCK
	FLOW SWITCH
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	STEAM TRAP, F&T
	STEAM TRAP, TB
	CONTROL VALVE
	GAS COCK
	PRESSURE REDUCING/REGULATING VALVE
	SOLENOID VALVE

MECHANICAL PIPING SYSTEMS LEGEND	
SYMBOL	DESCRIPTION
	CONDENSATE DRAINAGE
	NATURAL GAS
	REFRIGERANT

2018 NORTH CAROLINA ENERGY CONSERVATION CODE					
COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY					
C401 METHOD OF COMPLIANCE					
<input checked="" type="checkbox"/> 2018 NCECC CHAPTER 4		<input type="checkbox"/> COMCHECK PROVIDED (2018 NCECC)			
<input type="checkbox"/> ASHRAE 90.1-2013 PRESCRIPTIVE		<input type="checkbox"/> COMCHECK PROVIDED (90.1-2013)			
<input type="checkbox"/> ASHRAE 90.1-2013 PERFORMANCE		<input type="checkbox"/> ENERGY MODELING DATA PROVIDED			
<input type="checkbox"/> N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)					
C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS					
<input type="checkbox"/> C406.2 EFFICIENT MECH EQUIPMENT		<input type="checkbox"/> C406.5 ON-SITE RENEWABLE ENERGY			
<input checked="" type="checkbox"/> C406.3 REDUCED LTG DENSITY		<input type="checkbox"/> C406.6 DEDICATED OA SYSTEM			
<input type="checkbox"/> C406.4 ENHANCED LTG CONTROLS		<input type="checkbox"/> C406.7 SERVICE WATER HEATING			
C301 CLIMATE ZONE					
3A - NEW HANOVER COUNTY, NORTH CAROLINA DESIGN CONDITIONS					
EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)					
winter dry bulb		28° F.			
summer dry bulb		90° F.			
summer wet bulb		76° F.			
INTERIOR (2018 NCECC SECTION C302.1)					
winter dry bulb		72° F.			
summer dry bulb		75° F.			
C403.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING					
BUILDING HEATING LOAD		225,800 BTUH (peak)			
BUILDING COOLING LOAD		230,100 BTUH (peak)			
INSTALLED HEATING CAPACITY		467,811 BTUH			
INSTALLED COOLING CAPACITY		417,368 BTUH			
C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE					
SYSTEM DESCRIPTION - DX VRF HEAT PUMP SYSTEM, DOAS HEAT PUMP WITH ELECTRIC STRIP HEAT AND HOT GAS REHEAT, AND INFRARED NATURAL GAS HEATERS					
<input checked="" type="checkbox"/> MINIMUM HVAC EQUIP EFFICIENCY COMPLIANCE - TABLE C403.2.3					
<input type="checkbox"/> INCREASED HVAC EQUIP EFFICIENCY COMPLIANCE - 10% OVER TABLE C403.2.3					
EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	C403.2.3 MINIMUM EFFICIENCY (a)	10% INCREASED EFF. (a)	DESIGN EFFIC.
TABLE C403.2.3(2) - ELECTRICALLY OPERATED UNITARY AND APPLIED HEAT PUMPS					
AIR COOLED COOLING MODE	>= 135,000 BTUH < 240,000 BTUH	SPLIT SYSTEM & SINGLE PACKAGE	10.6 EER	11.66 SEER	SEE SCHEDULE
TABLE C403.2.3(2) - ELECTRICALLY OPERATED UNITARY AND APPLIED HEAT PUMPS					
AIR COOLED HEATING MODE	>= 135,000 BTUH (COOLING CAP)	47°F db/43°F wb OUTDOOR AIR	3.2 COP	3.52 COP	SEE SCHEDULE
		17°F db/ 15°F wb OUTDOOR AIR	2.05 COP	2.26 COP	
C403.2.4 THRU C403.2.11					
<input checked="" type="checkbox"/> HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.					
C403.2.12 - AIR SYSTEM DESIGN AND CONTROL					
<input checked="" type="checkbox"/> ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.					
<input type="checkbox"/> FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:					
OPTION 1 - FAN SYSTEM MOTOR NAMEPLATE HP - TABLE C403.2.12.1(1)					
ALLOWABLE NAMEPLATE MOTOR HP	CONSTANT VOLUME MINIMUM CFM	VARIABLE VOLUME MINIMUM CFM	DESIGN CFM		
7.5	6,818 CFM	5,000 CFM	SEE SCHEDULE		
10	9,091 CFM	6,667 CFM	SEE SCHEDULE		
15	13,636 CFM	10,000 CFM	SEE SCHEDULE		
20	18,182 CFM	13,333 CFM	SEE SCHEDULE		
25	22,727 CFM	16,667 CFM	SEE SCHEDULE		
30	27,272 CFM	20,000 CFM	SEE SCHEDULE		
40	36,364 CFM	26,667 CFM	SEE SCHEDULE		
50	45,455 CFM	33,333 CFM	SEE SCHEDULE		
C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).					
<input checked="" type="checkbox"/> ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.					
<input type="checkbox"/> NOT APPLICABLE.					
C408 - SYSTEM COMMISSIONING					
<input type="checkbox"/> PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.					
<input checked="" type="checkbox"/> PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.					

MECHANICAL SHEET INDEX	
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M0.03	MECHANICAL SCHEDULES
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M0.05	MECHANICAL VENTILATION SCHEDULES
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M5.03	MECHANICAL DETAILS
M5.04	MECHANICAL SECTIONS

Project No.

1691

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GORDON ROAD FIRE  
DEPARTMENT

MECHANICAL LEGEND AND NOTES

Sheet No.

M0.01

TESTING, ADJUSTING, AND BALANCING

1. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.
2. CONDUCT TESTING AND BALANCING IN ACCORDANCE WITH TECHNICAL PORTIONS OF THE AABC "NATIONAL STANDARDS FOR TESTING AND BALANCING HVAC SYSTEMS", LATEST EDITION.
3. INSTRUMENTS USED FOR BALANCING MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX (6) MONTHS PRIOR TO BALANCING. SUBMIT SERIAL NUMBERS, AND DATES OF CALIBRATION OF ALL INSTRUMENTS TO BE USED PRIOR TO THE START OF WORK.
4. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:
  - A. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: MINUS 5 TO PLUS 10 PERCENT.
  - B. AIR OUTLETS AND INLETS: PLUS OR MINUS 10 PERCENT.

VRF PIPING SYSTEM DESIGN NOTES:

THE VRF SYSTEM MANUFACTURER SHALL USE MANUFACTURER'S PROPRIETARY SELECTION SOFTWARE FOR A COMPLETE DESIGN OF THE REFRIGERANT PIPE LENGTHS, SIZING, AND OTHER REQUIRED SPECIALTIES. SUBMITTALS SHALL INCLUDE PIPE LENGTHS, NUMBER OF ELBOWS, CONTROLS WIRING, POWER WIRING DIAGRAM, ADDITIONAL REFRIGERANT CHARGE, AND OTHER APPURTENANCES REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THE PIPING DIAGRAMS INDICATED ON THIS SHEET ARE BASED OFF OF THE ROUTING SHOWN ON DIAGRAMMATIC CONSTRUCTION DRAWINGS, AND WILL BE ADJUSTED THROUGH THE COORDINATION DRAWINGS PHASE, AND AS REQUIRED DURING THE COORDINATION PHASE. ADDITIONAL LENGTHS OF PIPE, BRANCHES, AND PIPE FITTINGS MAY BE REQUIRED.

CONTROLS SCOPE OF WORK

THE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A COMPLETE BAS ALONG WITH ALL CONTROLLERS, WIRING, CONDUITS, AND ACCESSORIES REQUIRED FOR A COMPLETE AND FULLY FUNCTIONING SYSTEM.

THE BAS SHALL INCORPORATE ALL MECHANICAL EQUIPMENT INTO A SINGLE FRONT-END FOR OCCUPANCY SCHEDULING, SETPOINT ADJUSTMENT, AND PERFORMANCE MONITORING.

THE VRF SYSTEMS SHALL BE CONTROLLED BY THE MANUFACTURER'S CONTROLS SYSTEM. THIS SYSTEM SHALL BE TIED BACK TO THE CENTRAL BAS FOR SETPOINT ADJUSTMENT AND EQUIPMENT SCHEDULING ALONG WITH MONITORING OF SPACE TEMPERATURES, SYSTEM STATUS, AND ALARMS.

DOAS UNIT SHALL BE CONTROLLED BY A FACTORY CONTROLLER AND TIED INTO THE BAS FOR SETPOINT ADJUSTMENT, SCHEDULING, AND MONITORING OF SYSTEM STATUS AND ALARMS.

MECHANICAL GENERAL NOTES

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL EQUIPMENT LISTED IN PROJECT SCHEDULES IS TO BE CONSIDERED DESIGN BASIS EQUIPMENT. ALL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0. TRANSFER DUCTS SHALL BE LINED WITH 1" THICK FIBERGLASS DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE. ALL EXPOSED SPIRAL DUCTWORK SHALL BE A DOUBLE WALL LINDAB SPIROSAFE SELF-SEALING DUCT SYSTEM WITH PAINT GRIP FINISH (OR APPROVED EQUAL).
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA MECHANICAL CODE. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.
5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
7. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CONFIRM FILTERS ARE CLEAN, AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.
8. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS. IN ADDITION, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO HIRE A REGISTERED DESIGN PROFESSIONAL TO COMMISSION THE INSTALLED SYSTEM AND PROVIDE THE OWNER AND CODE REVIEWER A SEALED STATEMENT OF SYSTEM COMMISSIONING (PER 2018 NCECC APPENDIX C1).
9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
11. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED. CONDENSATE DRAINS SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE 3/4".
12. ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. REFRIGERANT PIPING INSULATION EXPOSED OUTDOORS SHALL BE COVERED WITH AN OUTER ALUMINUM JACKET.
13. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
14. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
15. CONTRACTOR SHALL VERIFY LOCATION OF ALL ROOF PENETRATIONS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
16. ROOF CURBS SHALL ALLOW A MINIMUM OF 8" ABOVE ROOF INSULATION FOR FLASHING, OR AS INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER. IN ADDITION, ALL ROOF CURBS OR EQUIPMENT SUPPORT RAILS THAT SUPPORT EQUIPMENT, PIPING, CONDUIT, ETC. EXPOSED ON THE ROOF SHALL HAVE SUFFICIENT HEIGHT TO MAINTAIN A MINIMUM OF 18" CLEARANCE BELOW SUPPORTED EQUIPMENT FOR ROOF MAINTENANCE.
17. CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKE.
18. DRYER VENT WALL CAPS SHALL BE PROVIDED WITH A BACKDRAFT DAMPER. DRYER VENT SHALL NOT EXCEED A TOTAL EQUIVALENT LENGTH OF 35'-0" WITH A 2.5' DEDUCTION FOR EACH 45° BEND AND A 5' DEDUCTION FOR EACH 90° BEND.
19. MINIMUM GAS PIPING SIZE SHALL BE 3/4".
20. GAS PIPING AND FITTINGS SHALL BE BLACK STEEL, SCHEDULE 40, IN ACCORDANCE WITH ASTM SPECIFICATION A 106, WITH 150 PSI BLACK MALLEABLE IRON FITTINGS IN ACCORDANCE WITH ASTM SPECIFICATION A 47, GRADE 32510, AND ASA SPECIFICATION B16.3, 125 LB.
21. GAS PIPING SHALL BE INSTALLED TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND NFPA STANDARD NO. 54. ALL PIPING TO BE SUPPORTED BY CLEVIS HANGERS WITH GALVANIZED ROD A MAXIMUM OF 8' ON CENTER. PIPING SHALL BE SUPPORTED BY ROD HANGERS IN THE PIPE RUN 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE PER THE STATE BUILDING CODE AND ASCE 7.
22. GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN NFPA NO 54. ANY OTHER TEST AS REQUIRED BY THE LOCAL GAS INSPECTION DEPARTMENT OR GAS COMPANY SHALL ALSO BE PERFORMED.
23. NATURAL GAS PIPING AND FITTINGS ABOVE GRADE: SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234), PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2 1/2" AND LARGER.
24. NATURAL GAS PIPING AND FITTINGS OUTSIDE BELOW GRADE: SCHEDULE 40 BLACK STEEL, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND FORGED STEEL WELDING TYPE FITTINGS (ASTM A234) WITH (AWWA C105) POLYETHYLENE JACKET OR DOUBLE LAYER, HALF LAPPED 10 MIL POLYETHYLENE TAPE. PROVIDE WELDED JOINTS (ASME B31.9) FOR ALL UNDERGROUND PIPE.
25. SPACE GAS PIPING HANGER RODS 8'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.
26. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
27. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). PROVIDE PRE-PRINTED LABELS WITH BLACK LETTERING INDICATING THE GAS PRESSURE AND THE WORD "GAS" ON THE PIPE AT 5'-0" CENTERS FOR ALL GAS PIPING.
28. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
29. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
30. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING ACCESS AND SERVICE SHALL BE INSTALLED WITHIN 18" OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCATIONS SHALL BE INDICATED ON THE CEILING GRID PER THE SPECIFICATIONS.
31. ALL EQUIPMENT CONCRETE PAD SIZES FOR MECHANICAL EQUIPMENT SHALL BE CONFIRMED WITH APPROVED SHOP DRAWING SUBMITTALS AND ASSOCIATED UNIT MANUFACTURER ANCHOR LOCATIONS PRIOR TO FABRICATION/INSTALLATION. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL COORDINATE THE EXACT LOCATION OF MECHANICAL EQUIPMENT HOUSEKEEPING PADS WITH THE FLOOR DRAIN LOCATIONS PRIOR TO INSTALLATION OF DRAINS AT EQUIPMENT/PAD LOCATIONS.
32. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.
33. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.
34. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE EARTHQUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE FOUND IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF THE MECHANICAL SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND ASCE 7.
35. MECHANICAL CONTRACTOR SHALL PROVIDE PRE-PRINTED COLOR-CODED PIPE LABELS WITH 1-1/2" HIGH LETTERING INDICATING SERVICE AND FLOW DIRECTION. PLASTIC PIPE LABELS UTILIZED IN A RETURN AIR PLENUM SHALL BE LISTED/APPROVED FOR USE IN A RETURN AIR PLENUM. ALL PIPING TO MATCH EXISTING FACILITIES STANDARD (IF APPLICABLE). OTHERWISE, PIPE LABELS SHALL MATCH THE FOLLOWING: REFRIGERANT PIPING: YELLOW BACKGROUD, BLACK LETTERING
36. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT THROUGH INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.

Project No.

1691

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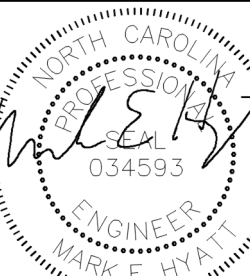
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03/28/2024

GORDON ROAD FIRE  
DEPARTMENT

MECHANICAL NOTES

Sheet No.

M0.02

## INDOOR UNIT SCHEDULE

SYMBOL	CFM	O.A. CFM	NOMINAL TONNAGE	E.S.P.	COOLING CAPACITY		HEATING CAPACITY (BTUH)	ELECTRICAL DATA				MANUFACTURER	MODEL	EQUIPMENT TYPE	WEIGHT	MATCHING OUTDOOR UNIT
					TC (BTUH)	SHC (BTUH)		MCA	MOC	VOLTAGE	PH					
IDU-1	300	25	0.66		8,000	6,429	4,408	1.75	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY008MA144A	CONCEALED DUCTED	47.0 lb	ODU-1
IDU-2	315	25	0.66		8,000	6,218	4,408	0.28	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY008FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-3	494	65	1.25	0.40	15,000	11,364	8,327	2.88	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY015MA144A	CONCEALED DUCTED	58.0 lb	ODU-1
IDU-4	210	0	0.5		6,000	4,254	3,282	0.19	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPKFY006BM142B	DUCTLESS WALL MTD	22.0 lb	ODU-1
IDU-5	300	70	0.66	0.40	8,000	6,429	4,408	1.75	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY008MA144A	CONCEALED DUCTED	47.0 lb	ODU-1
IDU-6	777	240	2.25	0.60	27,000	18,449	14,694	2.35	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY027MH142A	CONCEALED DUCTED	124.0 lb	ODU-1
IDU-7	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-8	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-9	300	40	0.66	0.40	8,000	6,429	4,408	1.75	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY008MA144A	CONCEALED DUCTED	47.0 lb	ODU-1
IDU-10	600	160	1.5	0.40	18,000	13,716	9,796	2.94	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY018MA144A	CONCEALED DUCTED	58.0 lb	ODU-1
IDU-11	315	35	0.66		8,000	6,218	4,408	0.28	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY008FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-12	300	40	0.66	0.40	8,000	6,429	4,408	1.75	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY008MA144A	CONCEALED DUCTED	47.0 lb	ODU-1
IDU-13	315	20	0.66		8,000	6,218	4,408	0.28	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY008FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-14	600	175	1.5	0.40	18,000	13,716	9,796	2.94	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY018MA144A	CONCEALED DUCTED	58.0 lb	ODU-1
IDU-15	777	255	2	0.60	24,000	16,551	13,225	2.11	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY024MA142A	CONCEALED DUCTED	100.0 lb	ODU-1
IDU-16	210	0	0.5		6,000	4,254	3,282	0.19	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPKFY006BM142B	DUCTLESS WALL MTD	22.0 lb	ODU-1
IDU-17	300	45	0.66	0.40	8,000	6,429	4,408	1.75	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY008MA144A	CONCEALED DUCTED	47.0 lb	ODU-1
IDU-18	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-19	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-20	315	30	0.66		8,000	6,218	4,408	0.28	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY008FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-21	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-22	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPLFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-23	280	20	0.42		5,000	4,383	2,743	0.24	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY005FM140A	CASSETTE - 2'X2'	28.9 lb	ODU-1
IDU-24	777	200	2.25	0.60	27,000	18,449	14,694	2.35	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPEFY027MH142A	CONCEALED DUCTED	124.0 lb	ODU-1
IDU-25	210	0	0.5		6,000	4,254	3,282	0.19	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPKFY006BM142B	DUCTLESS WALL MTD	22.0 lb	ODU-1
IDU-26	297	0	1		12,000	8,000	13,500	0.20	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPKFY012LM140A	DUCTLESS WALL MTD	24.5 lb	ODU-1
IDU-27	210	0	0.5		6,000	4,254	3,282	0.19	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPKFY006BM142B	DUCTLESS WALL MTD	22.0 lb	ODU-1
IDU-28	413	0	1.25		15,000	9,893	8,327	0.38	15.0	208 V	1	TRANE/MITSUBISHI ELECTRIC	TPKFY015HM142A	DUCTLESS WALL MTD	29.0 lb	ODU-1

## VRF INDOOR UNIT SCHEDULE NOTES:

- COOLING CAPACITY BASED ON 80°/67° ENTERING AIR.
- PROVIDE UNITS WITH: PROGRAMMABLE BAS-COMPATIBLE THERMOSTAT WITH DIGITAL DISPLAY, TWO WASHABLE FILTERS, U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, 1-INCH INSULATION.
- PROVIDE UNITS WITH DRAIN PAN, FLOAT SWITCH, MANUFACTURER'S INTEGRAL CONDENSATE PUMP, FULL-PORT ISOLATION VALVES WITH SHRADER PORT BETWEEN VALVES AND INDOOR UNIT (ON BOTH LIQUID AND SUCTION LINES).

## VRF HEAT PUMP SCHEDULE (AIR COOLED)

SYMBOL	NOMINAL TONNAGE	COOLING TC (BTUH)	HEATING CAPACITY (BTUH)	ELECTRICAL DATA				MANUFACTURER	MODEL	DESCRIPTION	WEIGHT
				MCA	MOC	VOLTAGE	PH				
ODU-1	20	212,758	158,548	82	125	208 V	3	TRANE/MITSUBISHI ELECTRIC	TURY2403AN40AB	AIR COOLED HEAT RECOVERY	887

## VRF HEAT PUMP SCHEDULE NOTES:

- COOLING CAPACITY AT 93F AMBIENT, HEATING CAPACITY AT 23F AMBIENT.
- UNIT SHALL BE UL LISTED WITH A MINIMUM EER OF 10.6 AT 95F AND COP OF 3.2 AT 47F.
- MOUNT UNITS ON A 4" THICK CONCRETE PAD AND PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNITS.
- SYSTEM SHALL UTILIZE R410 REFRIGERANT.
- INSTALL PER MANUFACTURER'S REQUIREMENTS.
- PROVIDE ALL EQUIPMENT WITH 5-YEAR PARTS-ONLY WARRANTY, AND PROVIDE OUTDOOR UNIT WITH 7 YEAR (MINIMUM) COMPRESSOR WARRANTY.
- MECHANICAL CONTRACTOR BIDDING THIS PROJECT SHALL HAVE MANUFACTURER'S FACTORY CERTIFIED TRAINING IN ALL ASPECTS OF EQUIPMENT INSTALLATION REQUIREMENTS, INCLUDING BUT NOT LIMITED TO WIRING, CONTROLS, AND REFRIGERANT PIPING METHODS.
- ALL REFRIGERANT PIPING ROUTED OUTSIDE SHALL BE INSULATED AND COVERED WITH ALUMINUM ROLL JACKETING (PABCO CHILDERS 0.016" THICK OR EQUAL) AND ALUMINUM ELBOWS. PIPING TO BE ROUTED ON PIPING-SUPPORTS.
- THE MANUFACTURER SHALL USE MANUFACTURER'S VRF SELECTION SOFTWARE FOR A COMPLETE DESIGN OF THE REFRIGERANT PIPE LENGTHS, SIZING, AND OTHER REQUIRED SPECIALTIES. SUBMITTALS SHALL INCLUDE PIPE LENGTHS, NUMBER OF ELBOWS, CONTROLS WIRING, POWER WIRING DIAGRAM, ADDITIONAL REFRIGERANT CHARGE, AND OTHER APPURTENANCES REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
- PROVIDE COMPLETE AND OPERATIONAL BUILDING CONTROL SYSTEM FOR VRF SYSTEM, INCLUDING DATA MANAGEMENT SERVER WITH WEB ACCESS, BUILDING CONTROL AND MONITORING, SIMPLIFIED WIRE REMOTE CONTROLLER (FOR EACH INDOOR UNIT). BUILDING CONTROL SYSTEM MUST HAVE A MINIMUM OF 12 DIGITAL INPUTS AND 12 DIGITAL OUTPUTS FOR MISCELLANEOUS CONTROL POINTS SPECIFIED.
- ALL NEW CONTROL WIRING MUST BE ROUTED BEHIND WALLS, OR ABOVE CEILINGS WHERE POSSIBLE. ANY CONTROL WIRING THAT MUST BE EXPOSED IN EMT CONDUIT, PAINTED TO MATCH ADJACENT SURFACE.

## BRANCH CONTROLLER SCHEDULE

SYMBOL	TYPE	# OF BRANCHES	ELECTRICAL INFO				WEIGHT (LBS)	MODEL
			MCA	MOC	VOLTS	PH		
BC-1	16-Branch-JA1	16	1.60 A	20.00 A	208 V	1	150	TCMBM1016JA1T1N4
BC-2	8-Branch	8	0.70 A	20.00 A	208 V	1	69	TCMB50108KB11N4
BC-3	8-Branch	8	0.70 A	20.00 A	208 V	1	69	TCMB50108KB11N4

## BRANCH CONTROLLER SCHEDULE NOTES:

- REFRIGERANT ISOLATION VALVES (LINE-SIZE) SHALL BE INSTALLED WITHIN 3 FEET OF ALL HEAT RECOVERY UNIT CONNECTIONS IN ORDER TO ISOLATE INDIVIDUAL REFRIGERANT CIRCUITS.
- MAXIMUM 54,000 BTUH ON EACH PORT, PORTS WITH MORE THAN 54,000 BTUH REQUIRE COMBINATION OF MULTIPLE PORTS.

## EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS. ALL EQUIPMENT LISTED IN THE PROJECT SCHEDULE IS TO BE CONSIDERED DESIGN BASIS EQUIPMENT. PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED.

## (ALPHABETICAL ORDER)

AIR DISTRIBUTION: CARNES, KRUEGER, METAL-AIRE, NAILOR, PRICE, TITUS, TUTTLE & BAILEY

DDC CONTROLS: ALERTON, HONEYWELL, SEIMENS, TRANE

DOAS UNITS: AAO, ANNEXAIRE, DESERT AIRE, ENGINEERED AIR, MUNTERS

ELECTRIC WALL/UNIT HEATERS: BERKO, MARKEL, MODINE, QMARK, RAYWALL

FANS: COOK, GREENHECK, PENN, TWIN CITY

FIRE DAMPERS: GREENHECK, NAILOR, NCA, POTTORFF, RUSKIN, SAFE-AIRE

LOUVER: GREENHECK, POTTORFF, RUSKIN, SAFE-AIR

RADIANT HEATERS: RE-VERBER, RAY, ROBERTS GORDON, SPACE RAY

SPIRAL DUCTWORK: EASTERN SHEET METAL, HAMLIN, UNIDAR, UNITED MCGILL

VARIABLE REFRIGERANT FLOW (VRF) SYSTEMS: DAIKIN, MITSUBISHI, TRANE

## NOTE:

ALL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL REPLACEMENT OF SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

## DOAS INDOOR UNIT SCHEDULE

SYMBOL	CFM	O.A. CFM	E.S.P.	COOLING CAPACITY		HEATING CAPACITY (BTUH)	REHEAT CAPACITY (BTUH)	ELECTRIC HEAT					ELECTRICAL DATA					MANUFACTURER	MODEL	WEIGHT	REFRIGERANT TYPE	MATCHING OUTDOOR UNIT
				TC (BTUH)	SHC (BTUH)			KW	STAGES	FLA	VOLTAGE	PH	FLA	MCA	MOC	VOLTAGE	PH					
DOAS-1	2665	2665	1.00 in-wg	204,610	107,520	161,500	51,000	52.5	10	145.7	208	3	150.0	151.0	175.0	208 V	3	AAON	H3-DR8-8-0-162C-7KS- F41E-FE0-000-0A0-00A00- 20-00-0000000000	975 lb	R-410A	CU-1

## NOTES:

- COOLING CAPACITY BASED ON 80°/67° ENTERING AIR.
- PROVIDE UNITS WITH: 1" THICK DISPOSABLE FILTER (MERV 8 MINIMUM), U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, 1-INCH INSULATION.
- SEQUENCE OF OPERATION: UNIT SHALL BE CONTROLLED BY BAS ON 24/7/365 BUILDING SCHEDULE. UNIT SHALL PROVIDE SUPPLY AIR AT NEUTRAL CONDITIONS (67-73°F AND 45-55% RH).

## DOAS CONDENSING UNIT SCHEDULE

SYMBOL	COOLING COIL		HEATING CAPACITY (BTUH)	EFFICIENCY		COMPRESSOR		ELECTRICAL DATA					REFRIG. TYPE	MANUFACTURER AAO MODEL	WEIGHT	MATCHING INDOOR UNIT	
	TC (BTUH)	SHC (BTUH)		EER	COP	QTY	RLA-1	RLA-2	FLA	MCA	FUSE	VOLTAGE					PH
CU-1	204,610	107,520	161,500	11.1	2.93	2	30.1	32.6	70.0	78.0	110.0	208 V	3	R-410A	CFA-020-C-A-8-DJ00N: 0-00-E0-00-AR0-L-JE00-0000E00-00000DB	1,416 lb	DOAS-1

## NOTES:

- COOLING CAPACITY AT 95F AMBIENT.
- HEATING CAPACITY AT 32F AMBIENT.
- ALL UNITS SHALL BE U.L. LISTED.
- HEAT PUMP SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL BE PROVIDED WITH CONTROLS TO PREVENT OPERATION WHEN THE REVERSE CYCLE HEAT CAN MEET HEATING LOAD. SUPPLEMENTAL ELECTRIC HEAT SHALL BE ALLOWED TO OPERATE DURING HEAT PUMP DEFROST CYCLE. SUPPLEMENTAL ELECTRIC HEAT SHALL BE LOCKED OUT WHEN THE OUTDOOR TEMPERATURE IS BETWEEN 35°F AND 40°F AND THE INDOOR TEMPERATURE SETPOINT IS INCREASED.
- MOUNT UNITS ON A 4" THICK CONCRETE PAD AND PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNITS.
- PROVIDE UNITS WITH CONDENSER COIL HAIL GUARDS AND LOW AMBIENT CONTROLS.

## EXHAUST FAN SCHEDULE

SYMBOL	LOCATION	MANUFACTURER	MODEL NO.	TYPE	CFM	APPROX. ESP	DRIVE TYPE	FAN RPM	ELECTRICAL DATA			ACCESSORIES	CONTROL TYPE
									WATTS	H.P.	VOLTAGE-PHASEØ		
EF-1	GEAR 152	GREENHECK	SQ-120-VG	EXHAUST	830	0.400	DIRECT	1050	0	0.50	115 V-1Ø	A,B,F,G	6
EF-2	PUB. TOILET	GREENHECK	SP-A90	EXHAUST	75	0.260	DIRECT	1063	16	0.00	115 V-1Ø	A,B,F,G,H,O	2
EF-3	DECON 138	GREENHECK	SP-A390-VG	EXHAUST	250	0.250	DIRECT	1063	35	0.00	115 V-1Ø	A,B,F,G,O	6
EF-4	TOILET/SHR 135	GREENHECK	SQ 90	EXHAUST	315	0.520	DIRECT	1550	0	0.10	115 V-1Ø	A,B,F,G	6
EF-5	TOILET 115	GREENHECK	SP-A90	EXHAUST	75	0.260	DIRECT	1063	16	0.00	115 V-1Ø	A,B,F,G,O	2
EF-6	JANITOR 113	GREENHECK	SP-A70	EXHAUST	50	0.260	DIRECT	1063	13	0.00	115 V-1Ø	A,B,F,G,O	2
EF-G1	APPARATUS BAYS 149	GREENHECK	SBE-3H24	EXHAUST	4000	0.420	BELT	1151	1440	0.75	208 V-3Ø	A,B,J,N	7
SF-G1	APPARATUS BAYS 149	GREENHECK	SBS-3H24	SUPPLY	4000	0.420	BELT	1151	1440	0.75	208 V-3Ø	A,B,J,N	7
VEF-1	MEZZANINE 200	PLYMOVENT	TEV-S85	EXHAUST	3400	6.000	DIRECT	3450	0	7.50	208 V-3Ø	A,G	7

## EXHAUST FAN SCHEDULE ACCESSORIES:

- DISCONNECT SWITCH
- GRAVITY BACKDRAFT DAMPER
- MOTORIZED BACKDRAFT DAMPER
- PREFAB. ROOF CURB
- BIRDSCREEN
- ACOUSTICAL LINING
- HANGING BRACKETS WITH VIBRATION ISOLATION
- WL, WALL LOUVER DISCHARGE
- RCC OR GRS ROOF CAP (FLAT ROOF) OR RU ROOF CAP (PITCHED ROOF)
- WALL MOUNTING COLLAR
- INLET GAUDD

- 2" WASHABLE ALUMINUM FILTERS
- MOTORSIDE FAN GUARD
- EXHAUST GRILLE
- U.L. 762
- VENTED ROOF CURB EXTENSION
- COMBINATION KITCHEN HOOD FAN CURB
- INTERLOCK WITH FUME HOOD
- PROVIDE DRAIN PLUG ACCESSORY
- U. ROOF SUPPORT RAILS
- V. VFD

## EXHAUST FAN SCHEDULE CONTROLS:

- WALL MOUNTED THERMOSTAT (REVERSE ACTING, SET FOR 80°)
- INTERLOCK WITH ROOM LIGHT SWITCH (FAN SHALL OPERATE WHEN LIGHT IS ON IF ANY ROOM IS SERVED BY FAN)
- WALL MOUNTED ON/OFF SWITCH WITH IDENTIFICATION LABEL
- WALL MOUNTED MUSHROOM PUSH BUTTON SWITCH/STARTER WITH IDENTIFICATION LABEL
- CONTROLLED BY BUILDING AUTOMATION SYSTEM
- CONTINUOUS OPERATION
- CONTROLLED BY THE 'SAFEAIR' PANEL (BY ACS, INC.) WITH ON/OFF/AUTO, INTERLOCK ASSOCIATED SUPPLY/ EXHAUST FANS

## EXHAUST FAN SCHEDULE NOTES:

- ALL F



VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-1									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
TOILET	-	-	-	70 CFM/FIXTURE	1 FIXTURE	0	0	0	70
MAIN ENTRANCE LOBBIES	5	0.06	10	-	136	2	10	8	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		25	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		25	
						TOTAL EXHAUST AIR REQUIRED (CFM)		70	
						TOTAL EXHAUST AIR PROVIDED (CFM)		75	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-3									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CORRIDOR	-	0.06	-	-	85	0	0	5	0
OFFICE	5	0.06	5	-	524	3	15	32	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		65	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		65	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-6									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CONFERENCE	5	0.06	50	-	600	30	150	36	0
STORAGE	-	0.12	-	-	43	0	0	6	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		240	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		240	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-8									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE	5	0.06	5	-	143	1	5	9	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		20	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		20	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-10									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CONFERENCE	5	0.06	50	-	379	19	95	23	0
STORAGE	-	0.12	-	-	53	0	0	6	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		160	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		160	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-12									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE	5	0.06	5	-	319	2	10	19	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		40	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		40	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-2									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE	5	0.06	5	-	190	1	5	11	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		25	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		25	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-5									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CORRIDOR	-	0.06	-	-	428	0	0	26	0
OFFICE	5	0.06	5	-	121	1	5	7	0
STORAGE	-	0.12	-	-	117	0	0	14	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		65	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		70	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-7									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE	5	0.06	5	-	146	1	5	9	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		20	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		20	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-9									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CORRIDOR	-	0.06	-	-	317	0	0	19	0
STORAGE	-	0.12	-	-	96	0	0	12	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		40	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		40	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-11									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE	5	0.06	5	-	263	2	10	16	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		35	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		35	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-13									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE	5	0.06	5	-	183	1	5	11	0
						TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)		20	
						TOTAL OUTSIDE AIR PROVIDED (CFM)		20	
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-14									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DAY ROOM	5	0.06	30	-	651	20	100	39	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						175			
TOTAL OUTSIDE AIR PROVIDED (CFM)						175			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-17									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CORRIDOR	-	0.06	-	-	558	0	0	34	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						45			
TOTAL OUTSIDE AIR PROVIDED (CFM)						45			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-19									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DORMITORY SLEEPING AREAS	5	0.06	20	-	100	2	10	6	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						20			
TOTAL OUTSIDE AIR PROVIDED (CFM)						20			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-21									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DORMITORY SLEEPING AREAS	5	0.06	20	-	99	2	10	6	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						20			
TOTAL OUTSIDE AIR PROVIDED (CFM)						20			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-23									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DORMITORY SLEEPING AREAS	5	0.06	20	-	99	2	10	6	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						20			
TOTAL OUTSIDE AIR PROVIDED (CFM)						20			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-15									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DINING ROOM	7.5	0.18	70	-	270	19	142.5	49	0
STORAGE	-	0.12	-	-	99	0	0	12	0
KITCHEN	-	-	-	0.7	282	0	0	0	197
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						255			
TOTAL OUTSIDE AIR PROVIDED (CFM)						255			
						TOTAL EXHAUST AIR REQUIRED (CFM)		197	
						TOTAL EXHAUST AIR PROVIDED (CFM)		-	

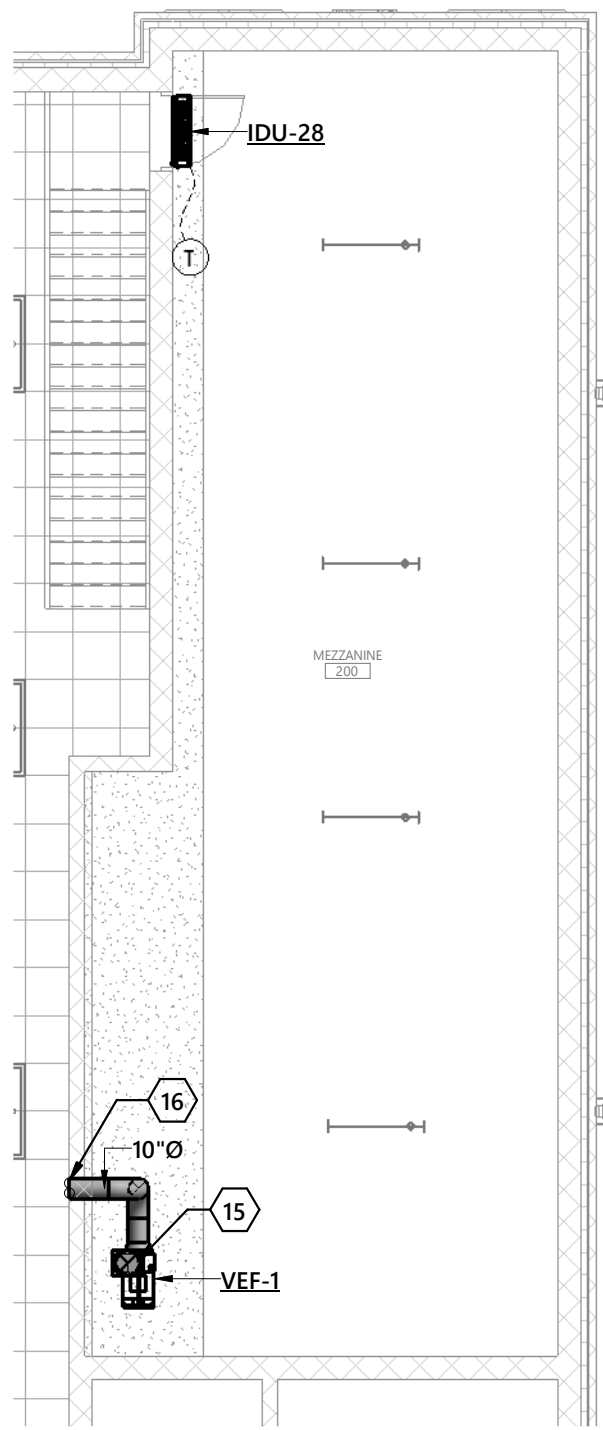
VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-18									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DORMITORY SLEEPING AREAS	5	0.06	20	-	100	2	10	6	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						20			
TOTAL OUTSIDE AIR PROVIDED (CFM)						20			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-20									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DORMITORY SLEEPING AREAS	5	0.06	20	-	128	3	15	8	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						30			
TOTAL OUTSIDE AIR PROVIDED (CFM)						30			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

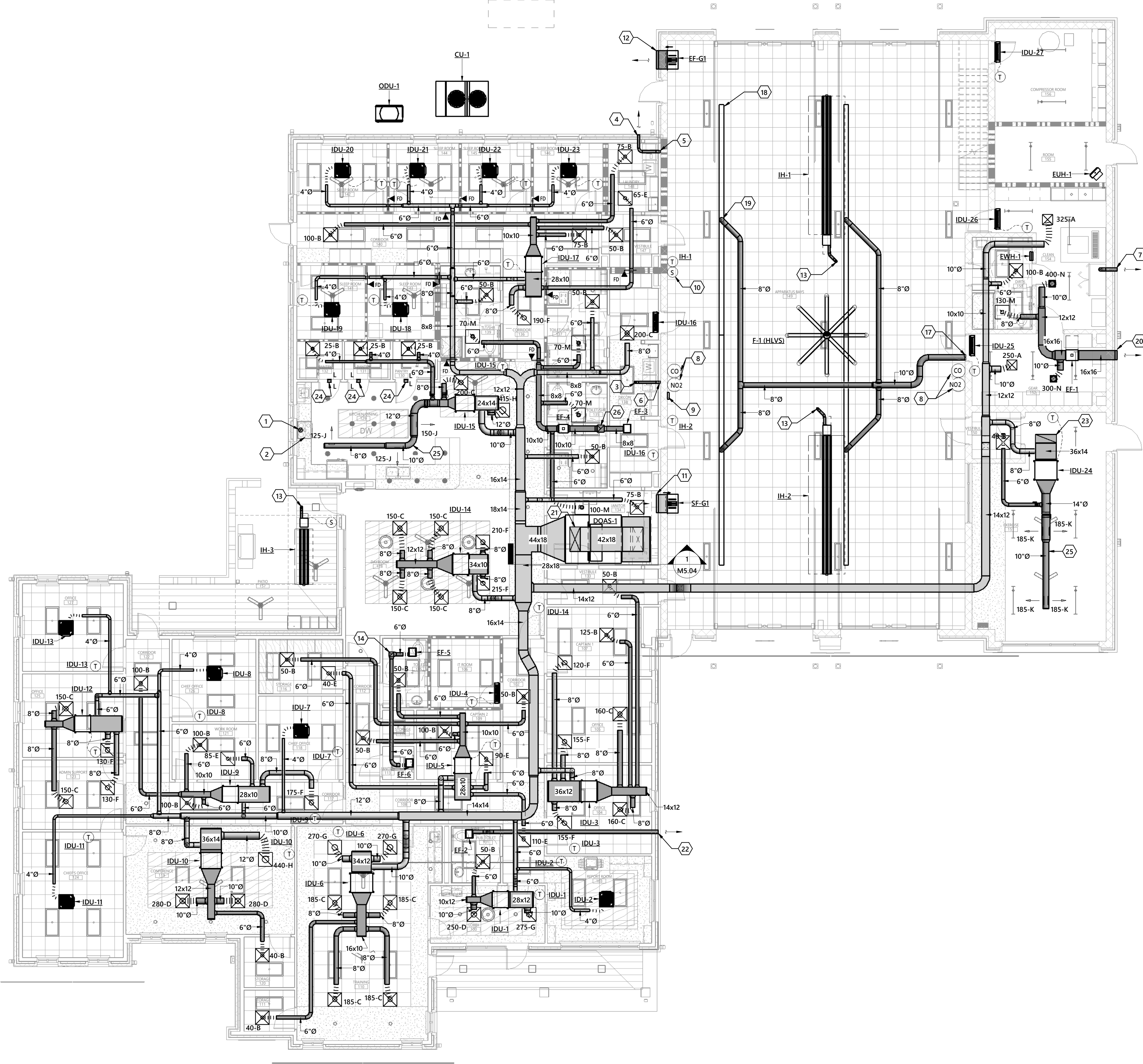
VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-22									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
DORMITORY SLEEPING AREAS	5	0.06	20	-	99	2	10	6	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						20			
TOTAL OUTSIDE AIR PROVIDED (CFM)						20			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): IDU-24									
OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
HEALTH CLUB/WEIGHT ROOM	20	0.06	10	-	579	6	120	35	0
CORRIDOR	-	0.06	-	-	47	0	0	3	0
TOTAL OUTSIDE AIR REQUIRED (PEOPLE + AREA, CFM)						200			
TOTAL OUTSIDE AIR PROVIDED (CFM)						200			
						TOTAL EXHAUST AIR REQUIRED (CFM)		0	
						TOTAL EXHAUST AIR PROVIDED (CFM)		0	

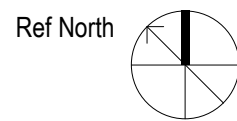
KEYNOTE LEGEND	
1	8"Ø KITCHEN EXHAUST DUCT UP TO ROOF. SEE 1/M1.02 FOR CONTINUATION.
2	UL LISTED AND LABELED RESIDENTIAL RANGE HOOD WITH INTEGRAL EXHAUST FAN OF LESS THAN 400 CFM PROVIDED BY OWNER. INSTALLED BY CONTRACTOR. HOOD TO BE INSTALLED OVER UL LISTED AND LABELED RESIDENTIAL RANGE.
3	4"Ø RIGID DRYER EXHAUST UP TO ROOF. SEE 1/M1.02 FOR CONTINUATION.
4	4"Ø RIGID DRYER EXHAUST UP AND OUT SIDEWALL WITH WALL CAP.
5	4"Ø RIGID DRYER DUCT DOWN IN WALL TO DRYER BOX. SEE DETAIL 5/M5.01.
6	4"Ø RIGID DRYER DUCT DOWN IN WALL TO DRYER BOX. SEE DETAIL 4/M5.01.
7	6"Ø GEAR DRYER DUCT UP AND OUT SIDEWALL WITH WALL CAP.
8	COMBINATION NITROGEN DIOXIDE AND CARBON MONOXIDE DETECTORS. COORDINATE INTERLOCK WIRING WITH SAFEAIR PANEL AND ELECTRICAL CONTRACTOR.
9	SAFEAIR FULLY INTEGRATED APPARATUS BAY VENTILATION AND VEHICLE EXHAUST CONTROL PANEL.
10	MANUFACTURER'S MULTI-SPEED CONTROLLER FOR F-1 THRU F-4.
11	32"X32" INTAKE LOUVER (GREENHECK EVH-501 OR EQUAL) WITH A MIN. OF 50% FREE AREA AND BIRD SCREEN.
12	32"X32" EXHAUST LOUVER (GREENHECK EVH-501 OR EQUAL) WITH A MIN. OF 50% FREE AREA AND BIRD SCREEN.
13	TYPE 'B' FLUE FOR INFRARED HEATERS. SEE DETAIL 2/M5.02.
14	8X8 EXHAUST DUCT UP TO ROOF. SEE 1/M1.02 FOR CONTINUATION.
15	12"Ø EXHAUST DUCT UP TO ROOF. SEE 1/M1.02 FOR CONTINUATION.
16	SEE 1/M1.01 FOR CONTINUATION.
17	SEE 2/M1.01 FOR CONTINUATION.
18	VEHICLE EXHAUST RAIL. (TYP.)
19	8"Ø DROP DOWN TO VEHICLE EXHAUST RAIL. (TYP.)
20	16"X16" EXHAUST LOUVER (GREENHECK EVH-501 OR EQUAL) WITH A MIN. OF 50% FREE AREA AND BIRD SCREEN.
21	42X18 OUTSIDE AIR DUCT UP TO ROOF. SEE 1/M1.02 FOR CONTINUATION.
22	WALL CAP WITH BIRD SCREEN AND DAMPER (GREENHECK WC-6).
23	OPEN RETURN DUCT WITH 90 DEGREE ELBOW UP.
24	6X6 TRANSFER DUCT WITH (2) TYPE-M GRILLES ON EACH END.
25	EXPOSED SPIRAL DUCTWORK. SEE DETAIL 10/M5.01.
26	12X12 EXHAUST DUCT UP TO ROOF. SEE 1/M1.02 FOR CONTINUATION.



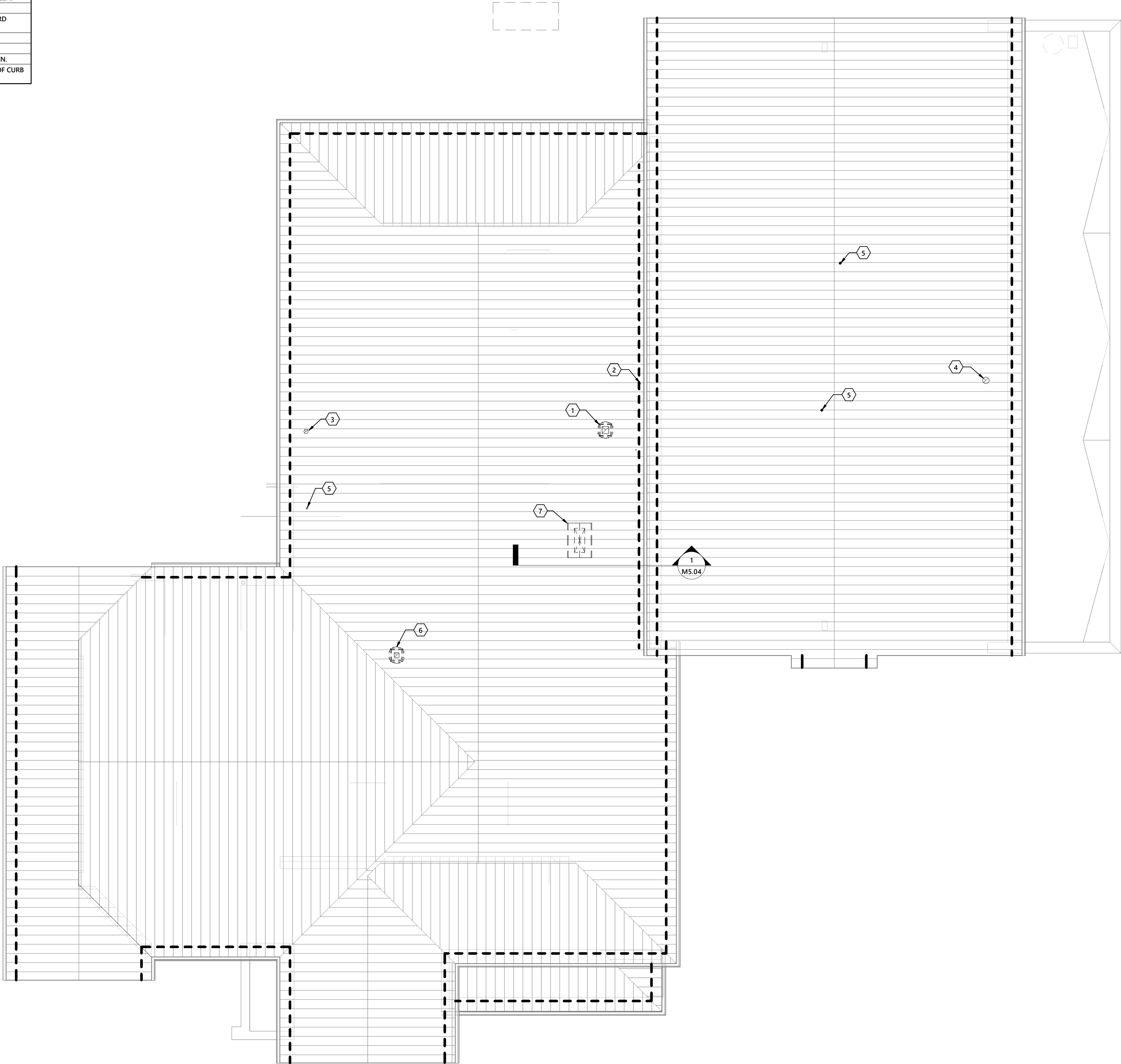
2 MEZZANINE MECHANICAL FLOOR PLAN  
1/8" = 1'-0"



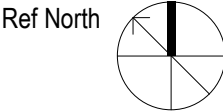
1 FIRST FLOOR MECHANICAL FLOOR PLAN  
1/8" = 1'-0"



KEYNOTE LEGEND	
1	12X12 EXHAUST DUCT UP TO ROOF. PROVIDE ROOF CAP EQUAL TO GREENHECK GR-SR-12 WITH BIRD SCREEN.
2	4"Ø RIGID DRYER EXHAUST UP TO ROOF. PROVIDE A GOOSENECK TERMINATION, NON-SCREENED.
3	8"Ø KITCHEN EXHAUST DUCT UP TO ROOF. PROVIDE ROOF CAP EQUAL TO GREENHECK GR-SR-8 WITH BIRD SCREEN.
4	12"Ø EXHAUST DUCT UP TO ROOF. TERMINATION TO BE WITH PLYMOVENT PROVIDED RAIN CAP.
5	COMBUSTION AIR AND VENT UP TO ROOF TERMINATING WITH MANUFACTURER'S CONCENTRIC VENT.
6	8X8 EXHAUST DUCT UP TO ROOF. PROVIDE ROOF CAP EQUAL TO GREENHECK GR-SR-12 WITH BIRD SCREEN.
7	42X18 OUTSIDE AIR DUCT UP TO ROOF. PROVIDE ROOF CAP EQUAL TO GREENHECK FGI-18X42 WITH ROOF CURB AND BIRD SCREEN.

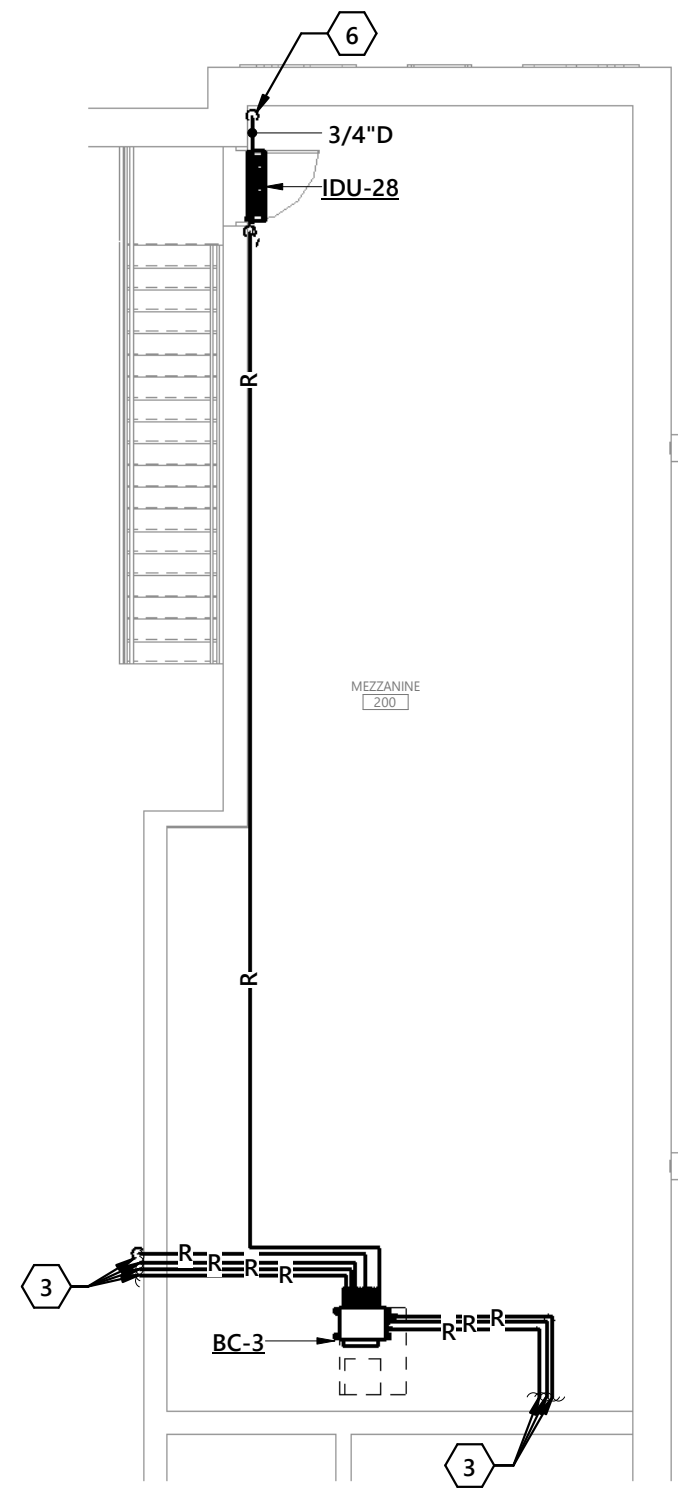


1 MECHANICAL ROOF PLAN  
1/8" = 1'-0"

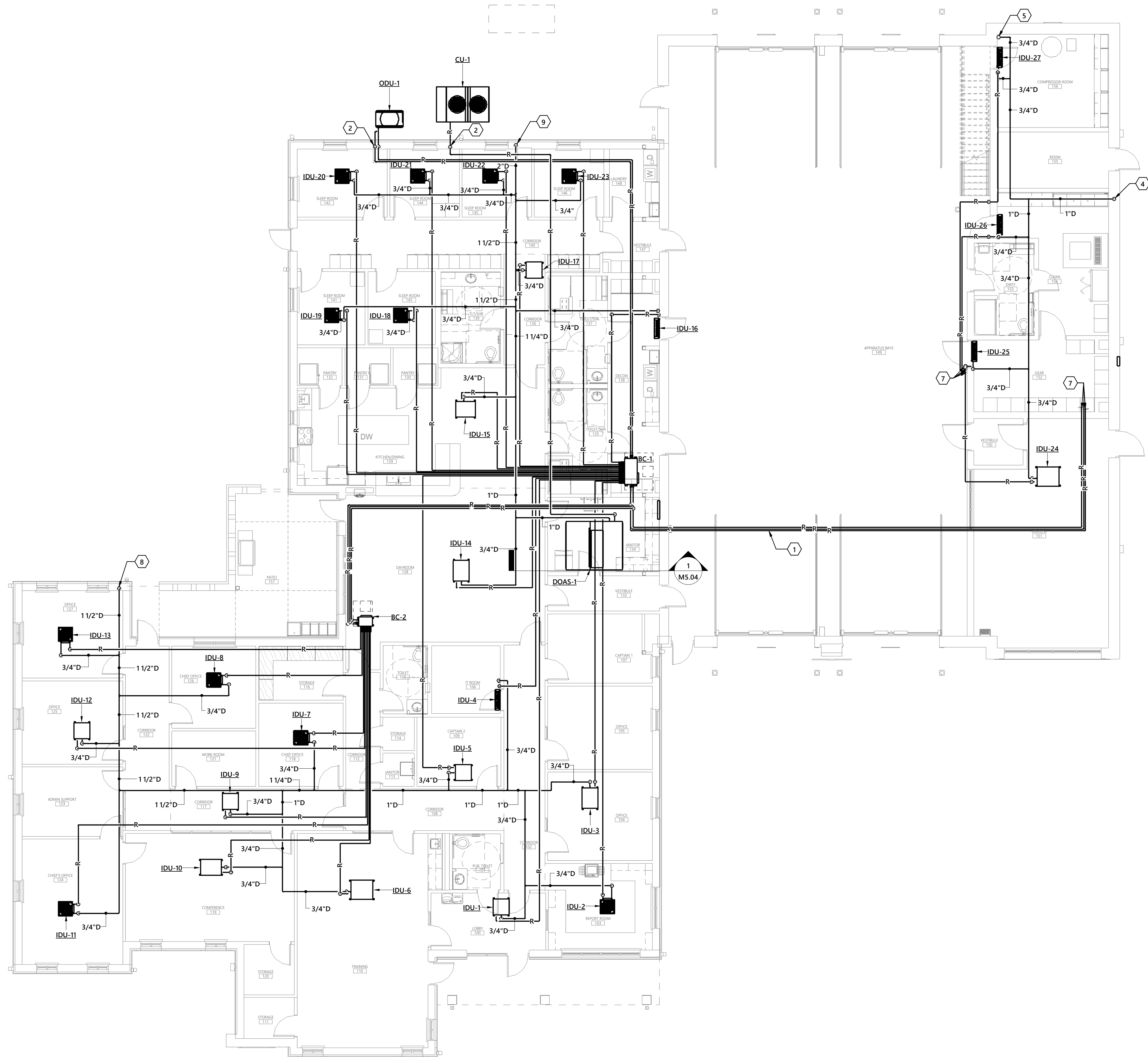




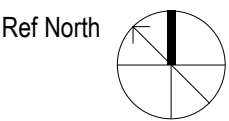
KEYNOTE LEGEND	
1	REFER TO MANUFACTURER'S SIZING PROGRAM FOR REFRIGERANT LINE SIZES. SEE NOTES ON M0.03 AND M5.02. (TYP.)
2	REFRIGERANT PIPING DOWN IN WALL TO OUTDOOR UNIT.
3	SEE 1/M2.01 FOR CONTINUATION.
4	1" CONDENSATE DRAIN DOWN IN WALL TO DRYWELL. SEE DETAIL 8/M5.02.
5	3/4"D DOWN FROM ABOVE. SEE 2/M2.01 FOR CONTINUATION.
6	3/4"D DOWN TO BELOW. SEE 1/M2.01 FOR CONTINUATION.
7	SEE 2/M2.01 FOR CONTINUATION.
8	1-1/2" CONDENSATE DRAIN DOWN IN WALL TO DRYWELL. SEE DETAIL 8/M5.02.
9	2" CONDENSATE DRAIN DOWN IN WALL TO DRYWELL. SEE DETAIL 8/M5.02.



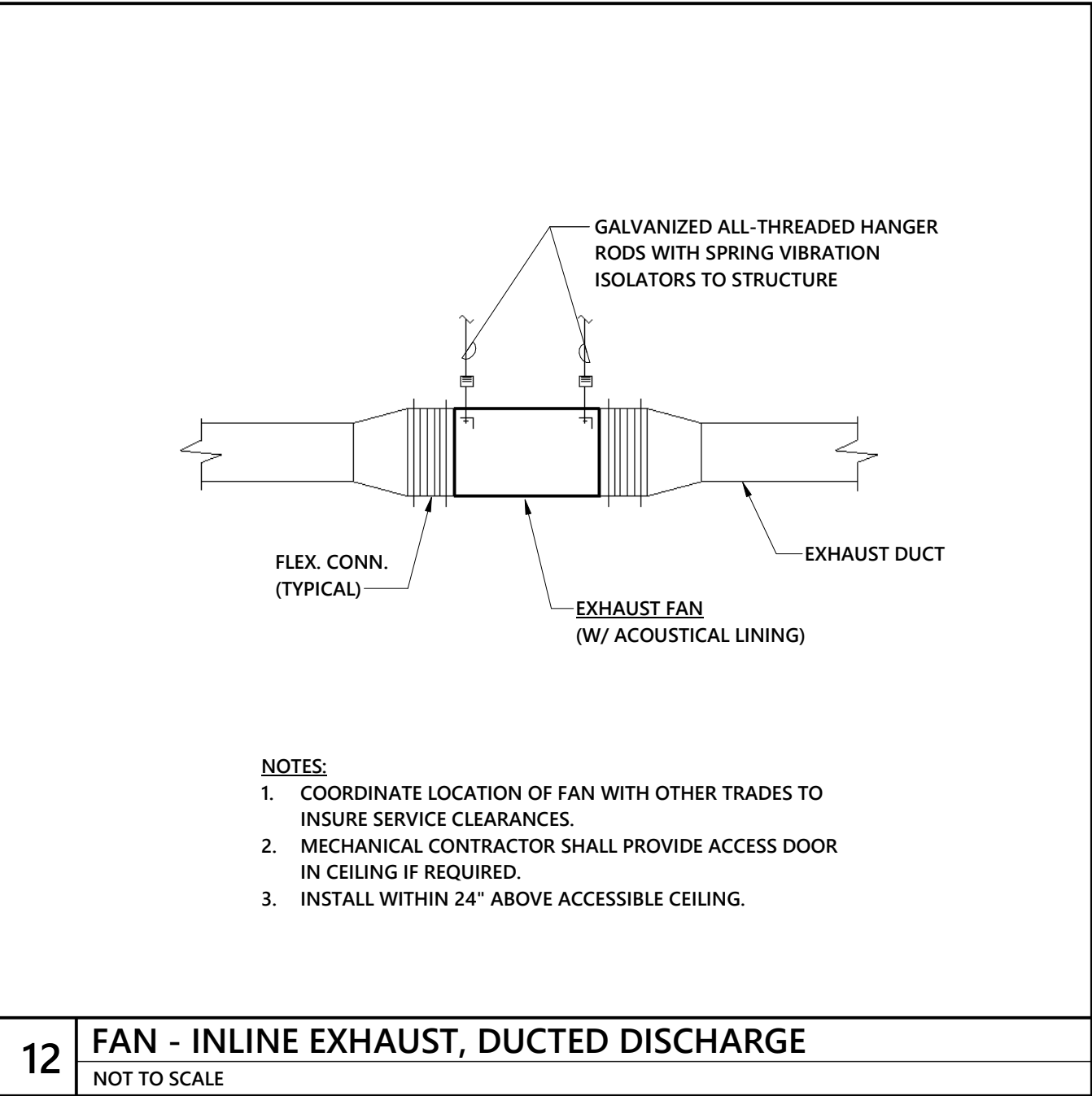
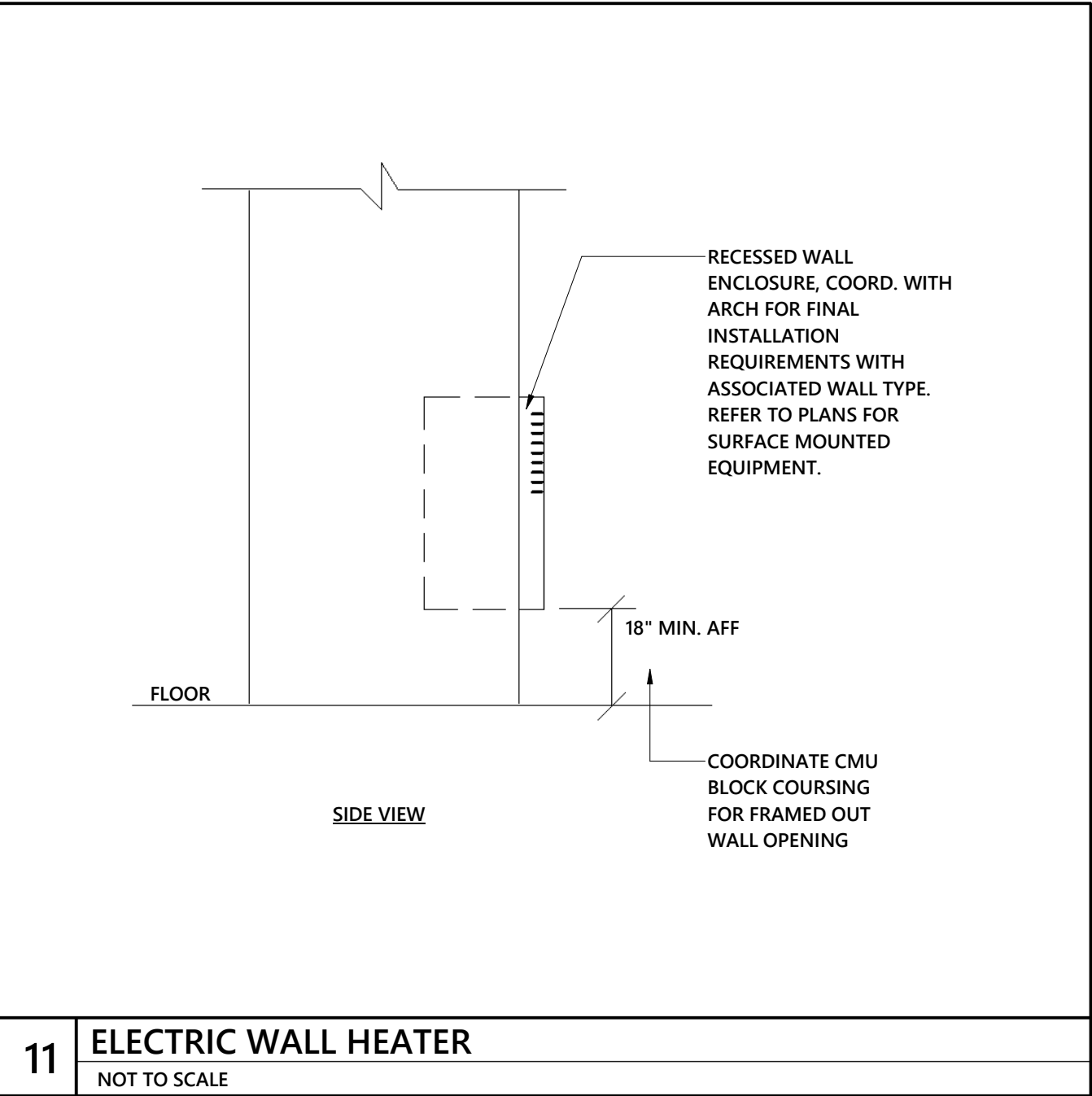
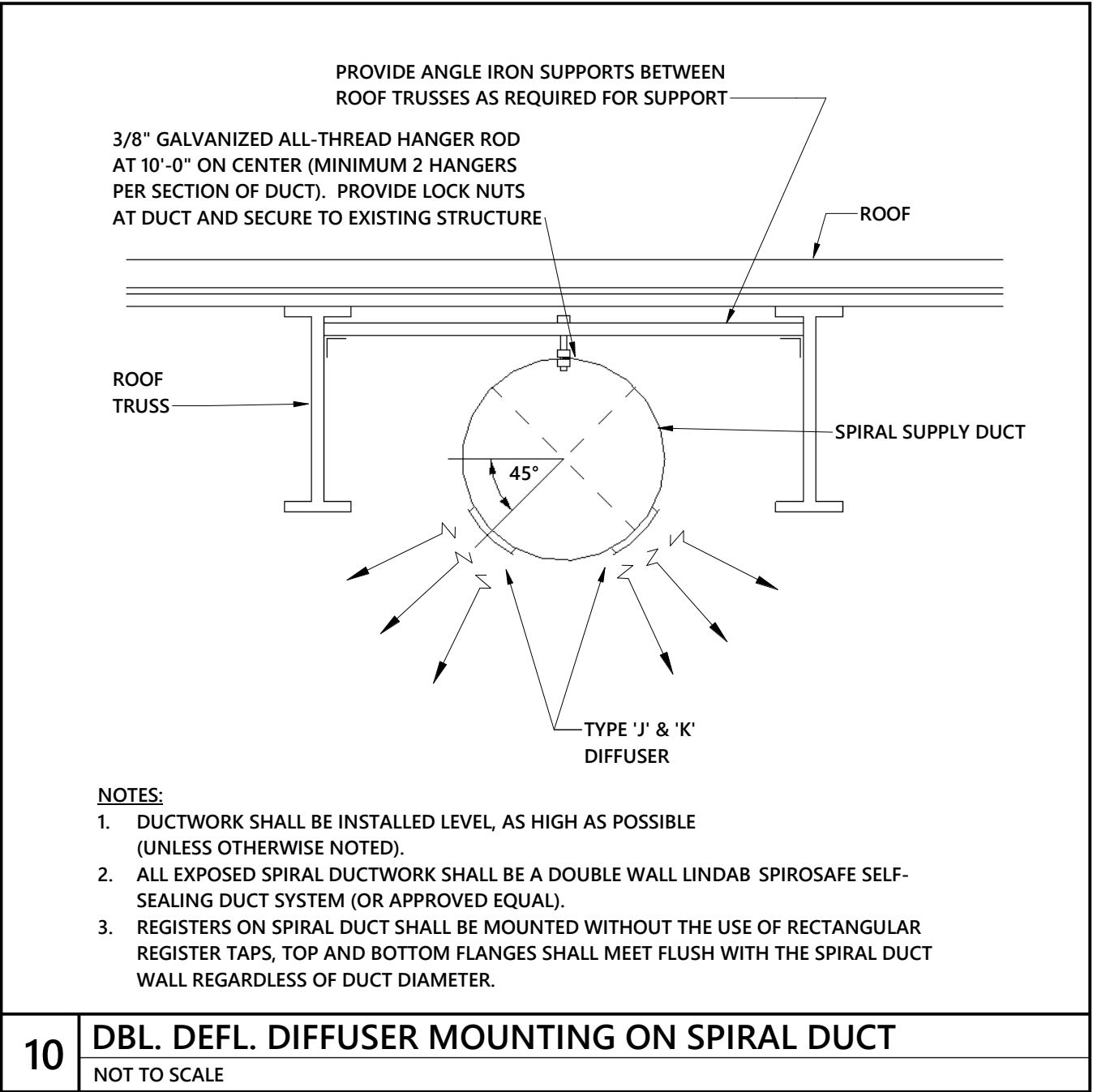
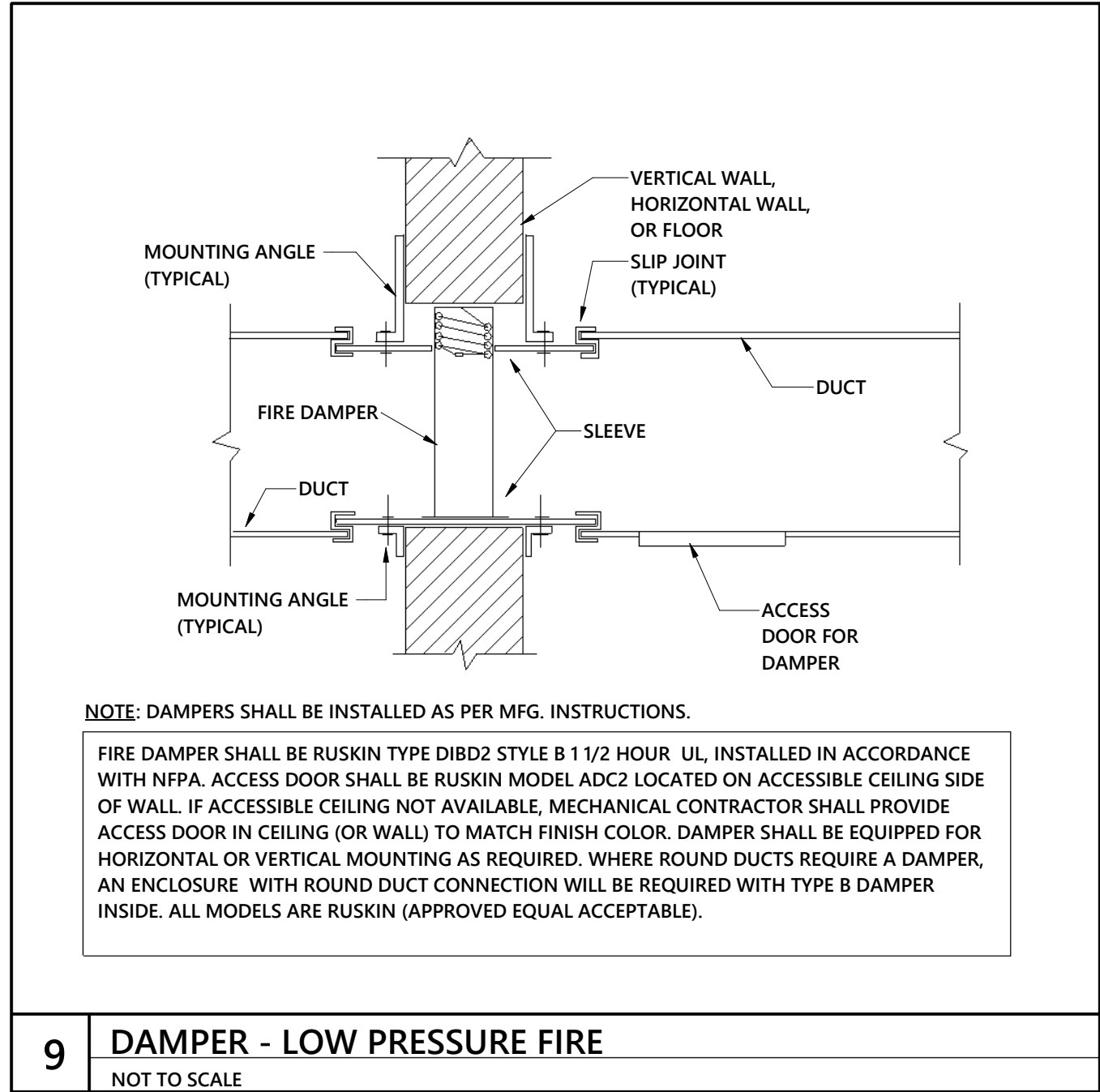
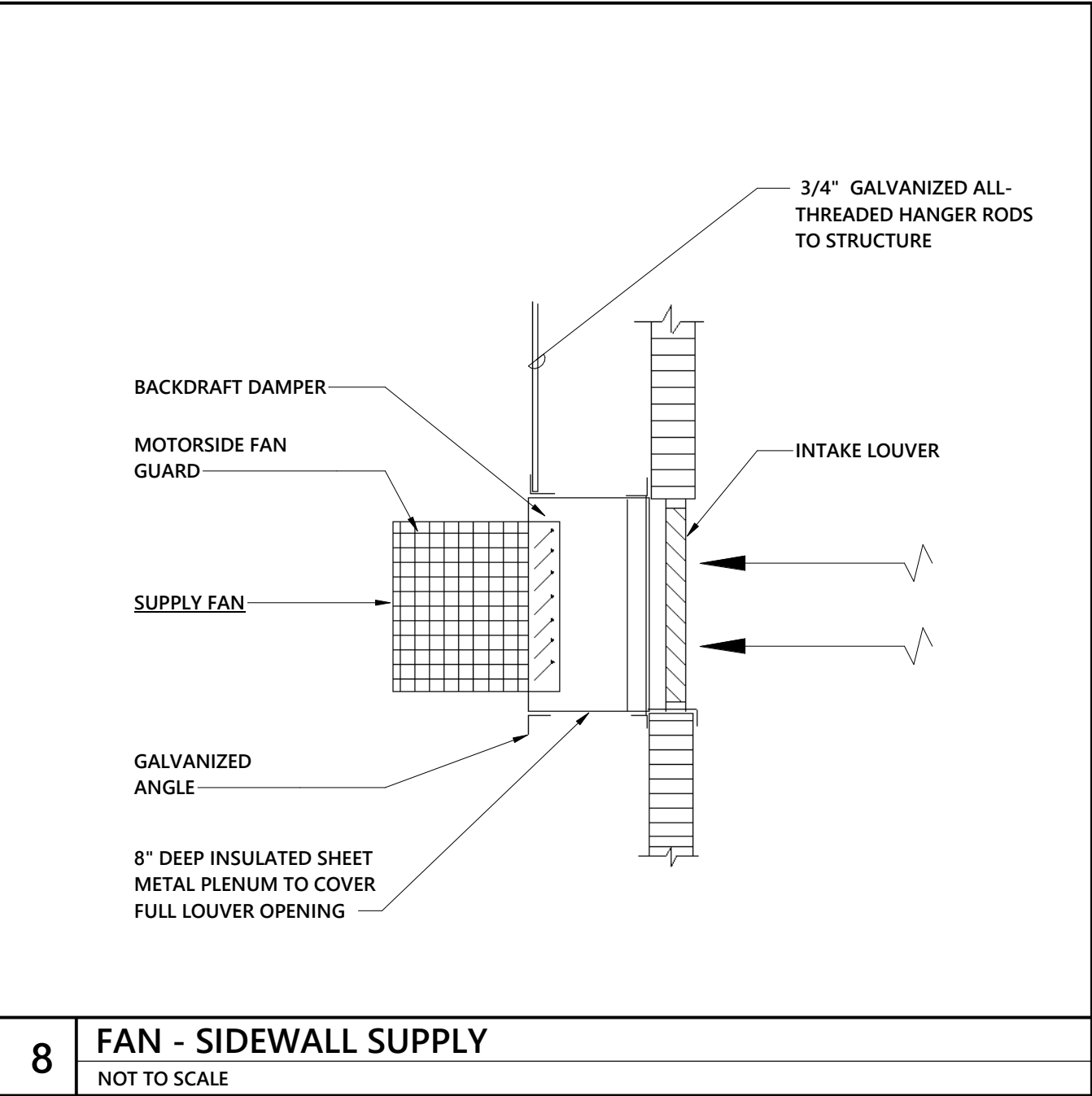
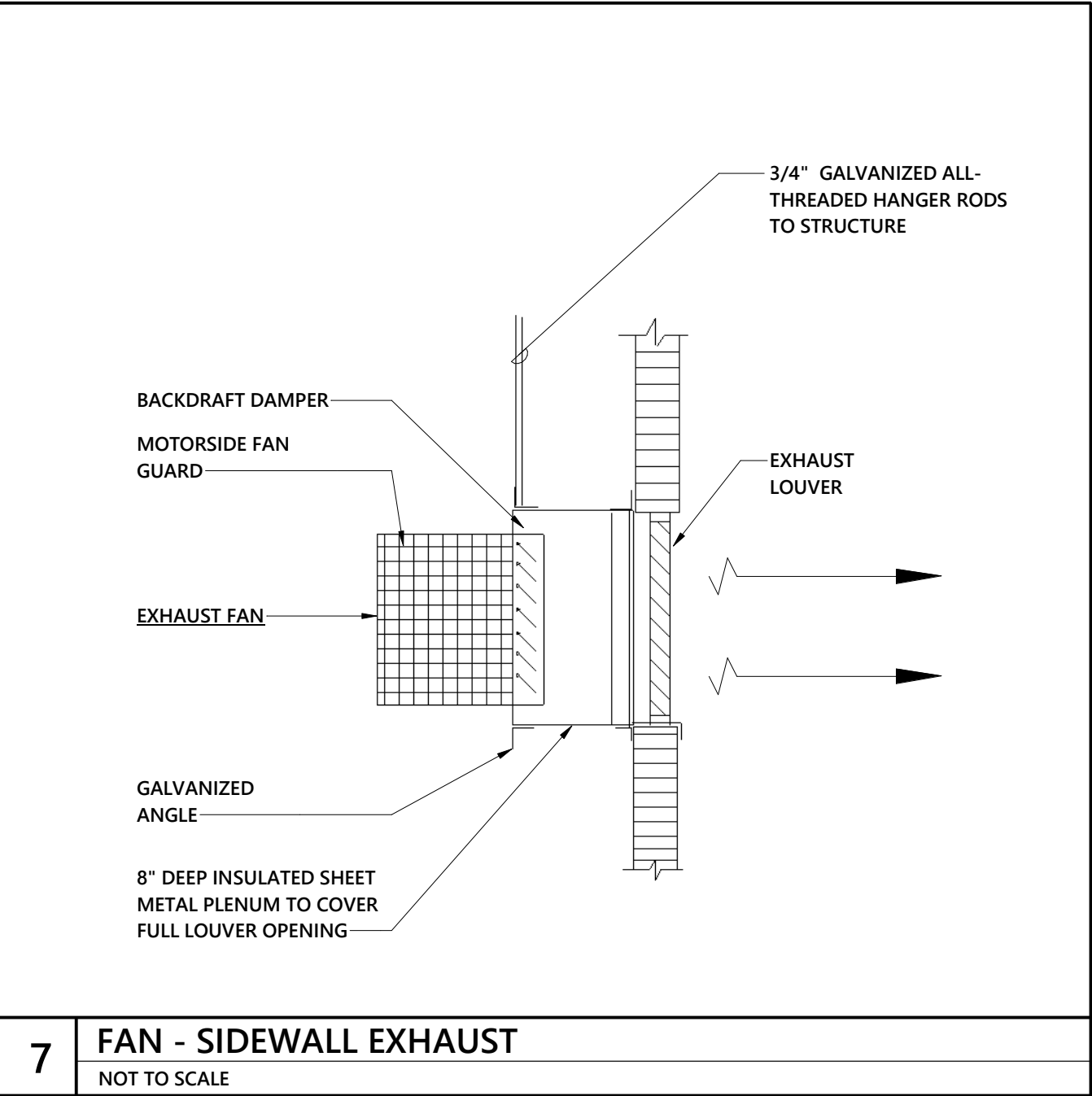
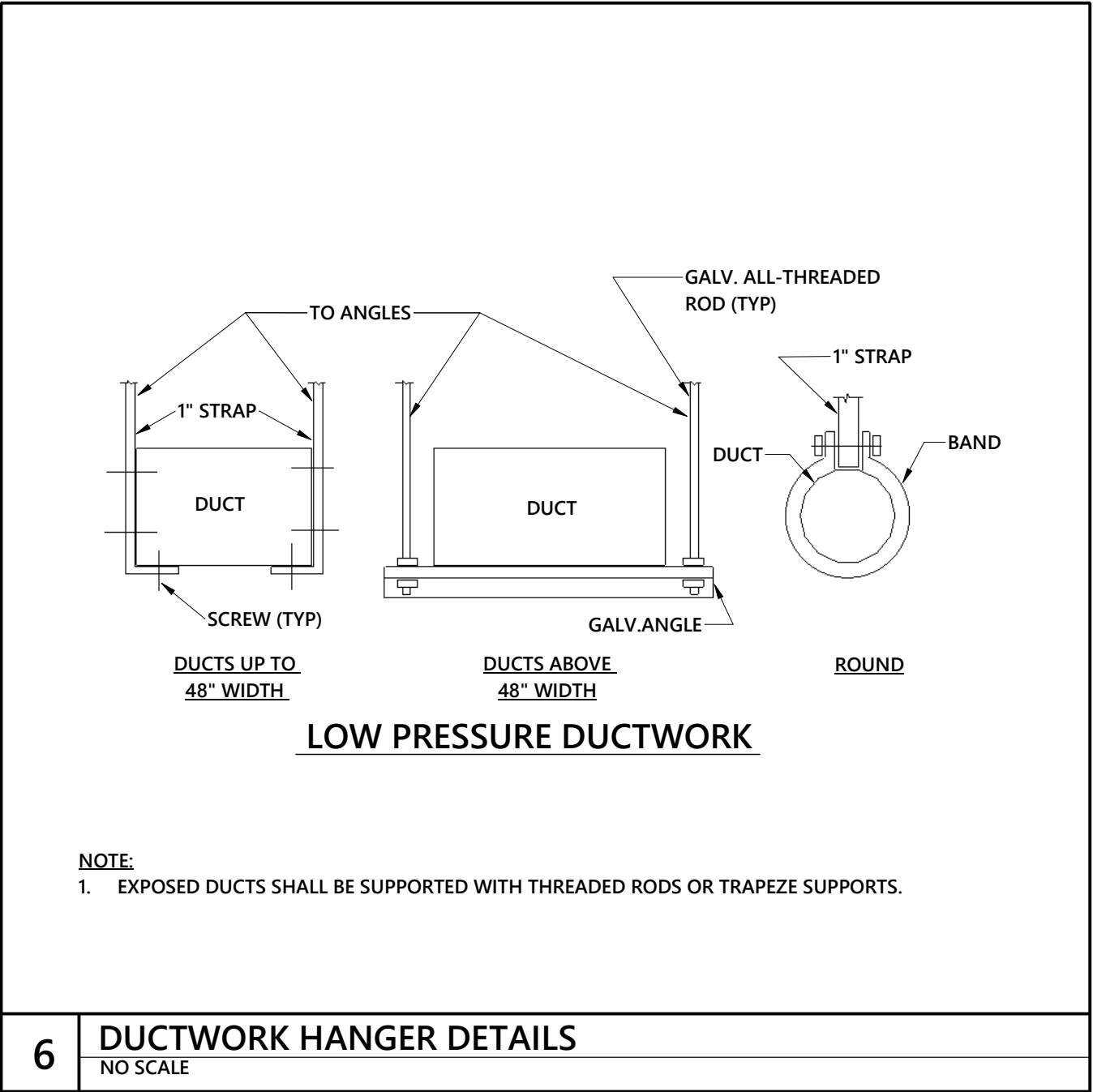
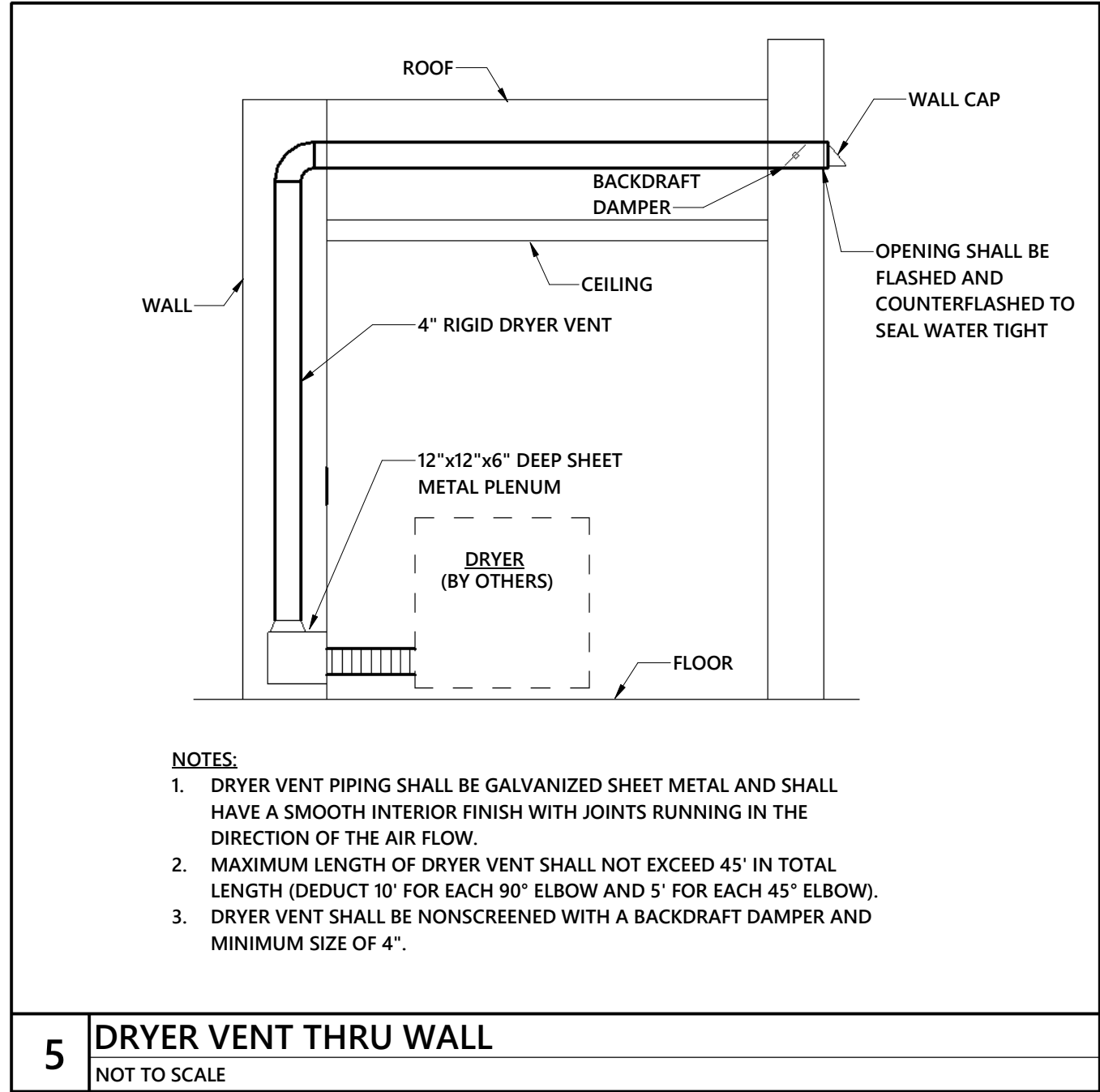
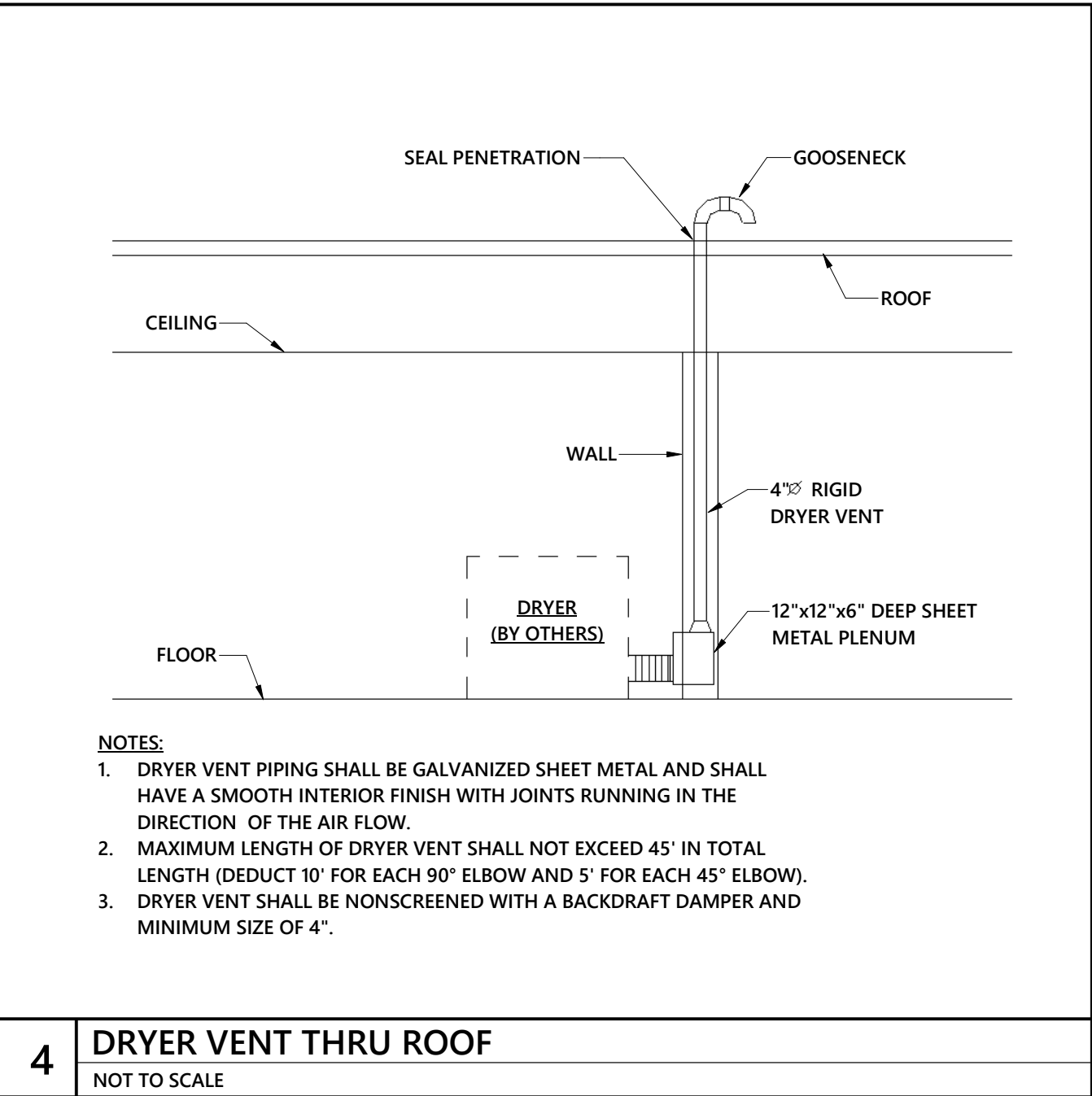
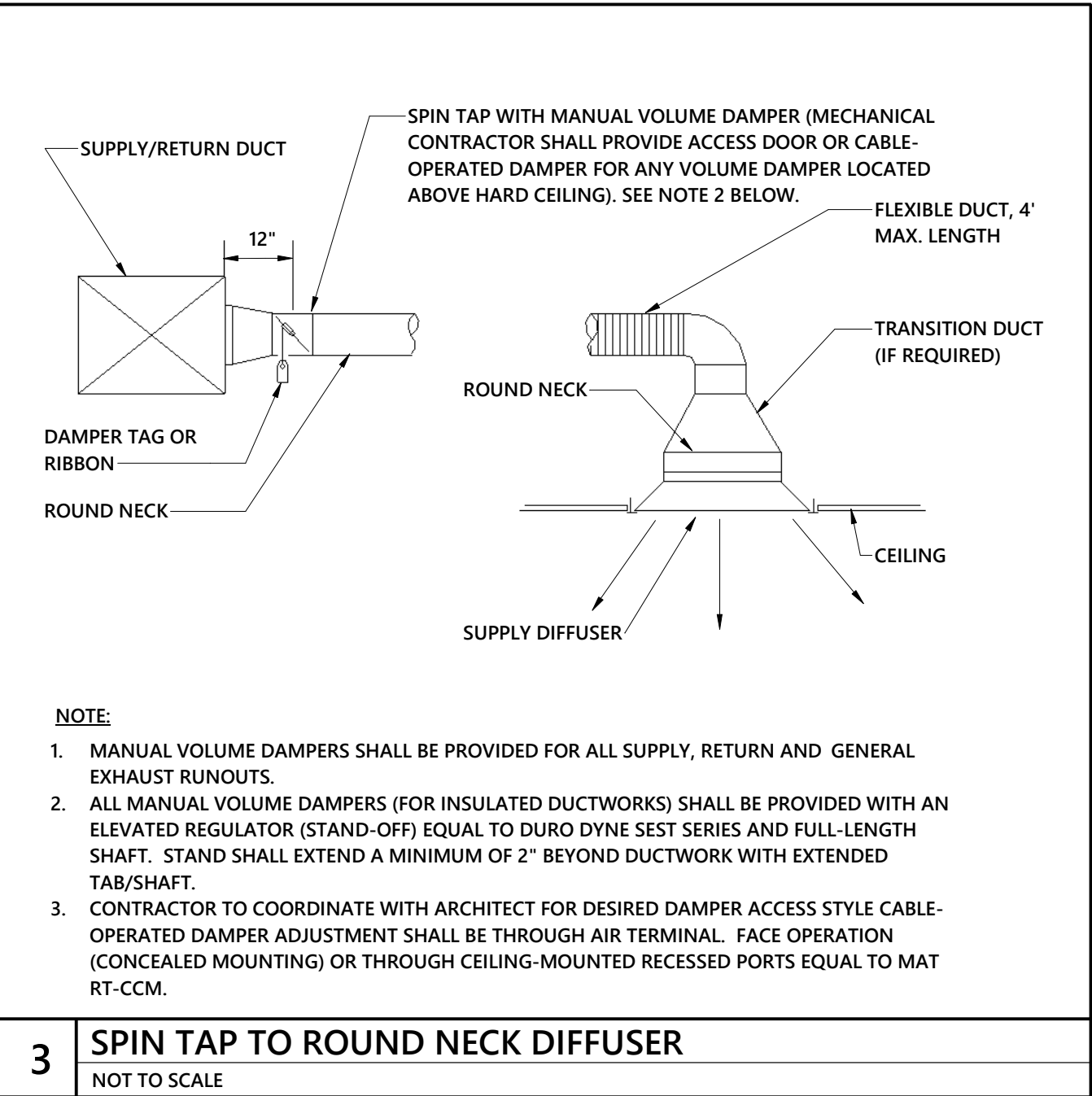
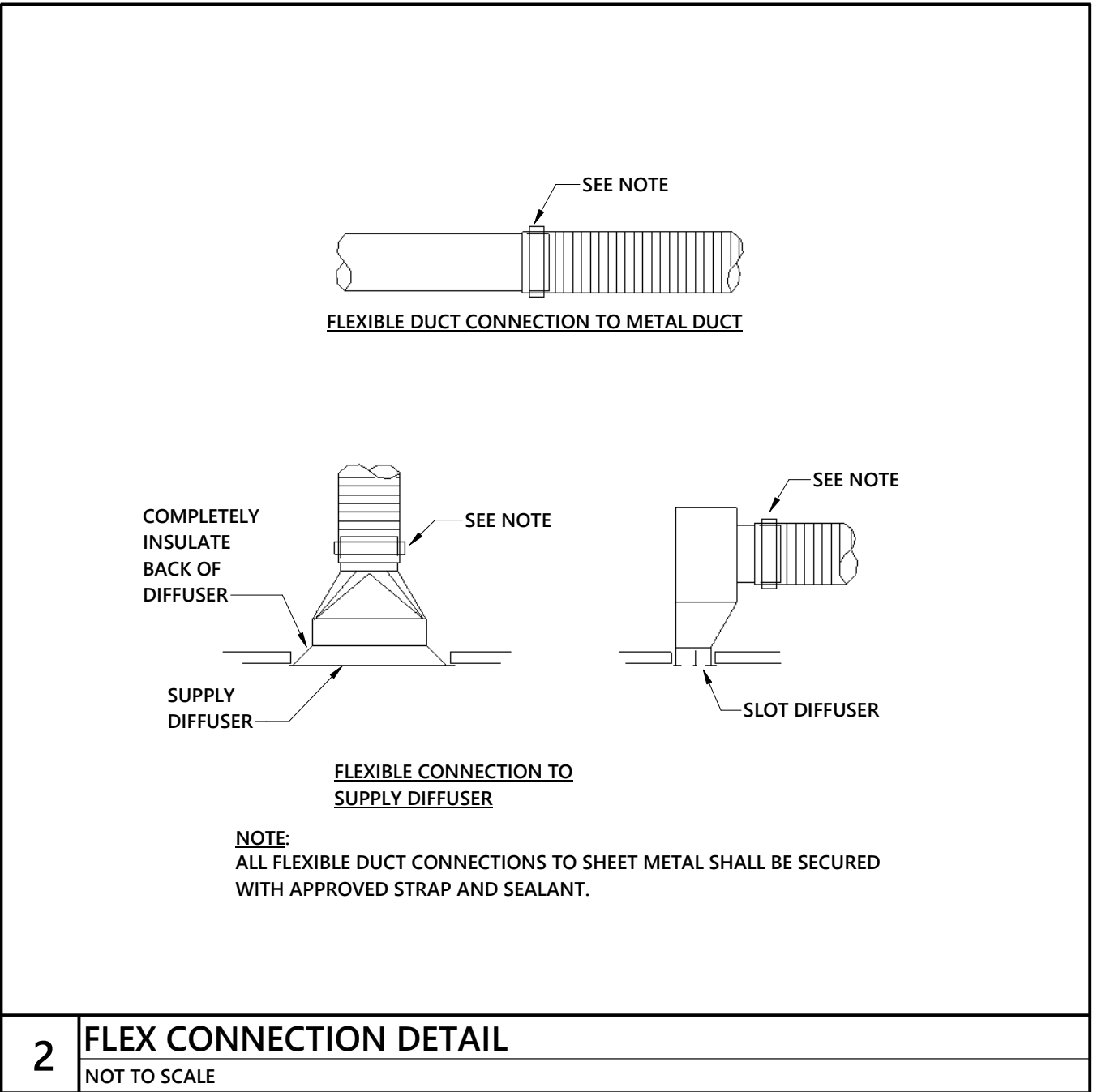
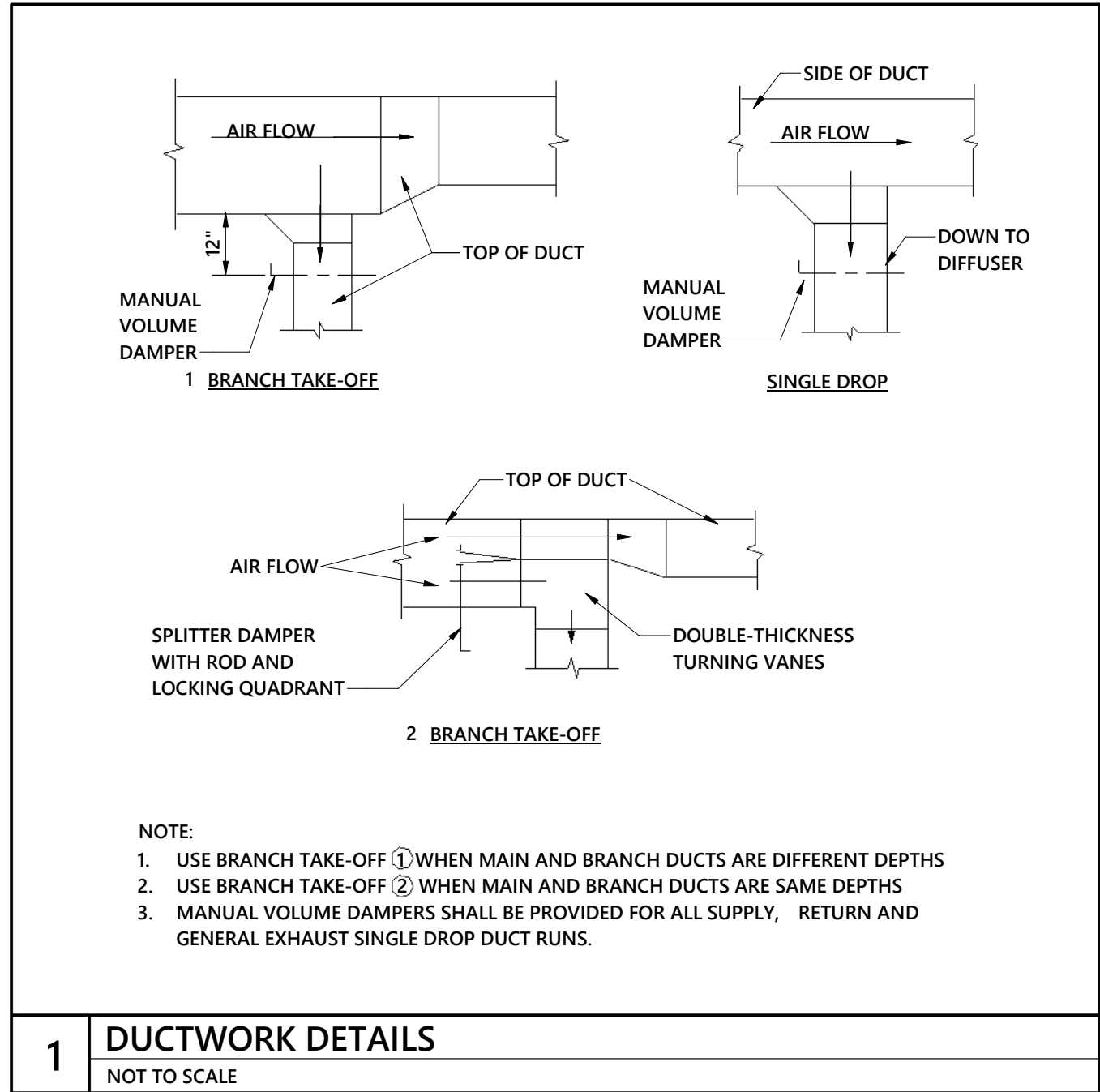
2 MEZZANINE MECHANICAL PIPING FLOOR PLAN  
1/8" = 1'-0"

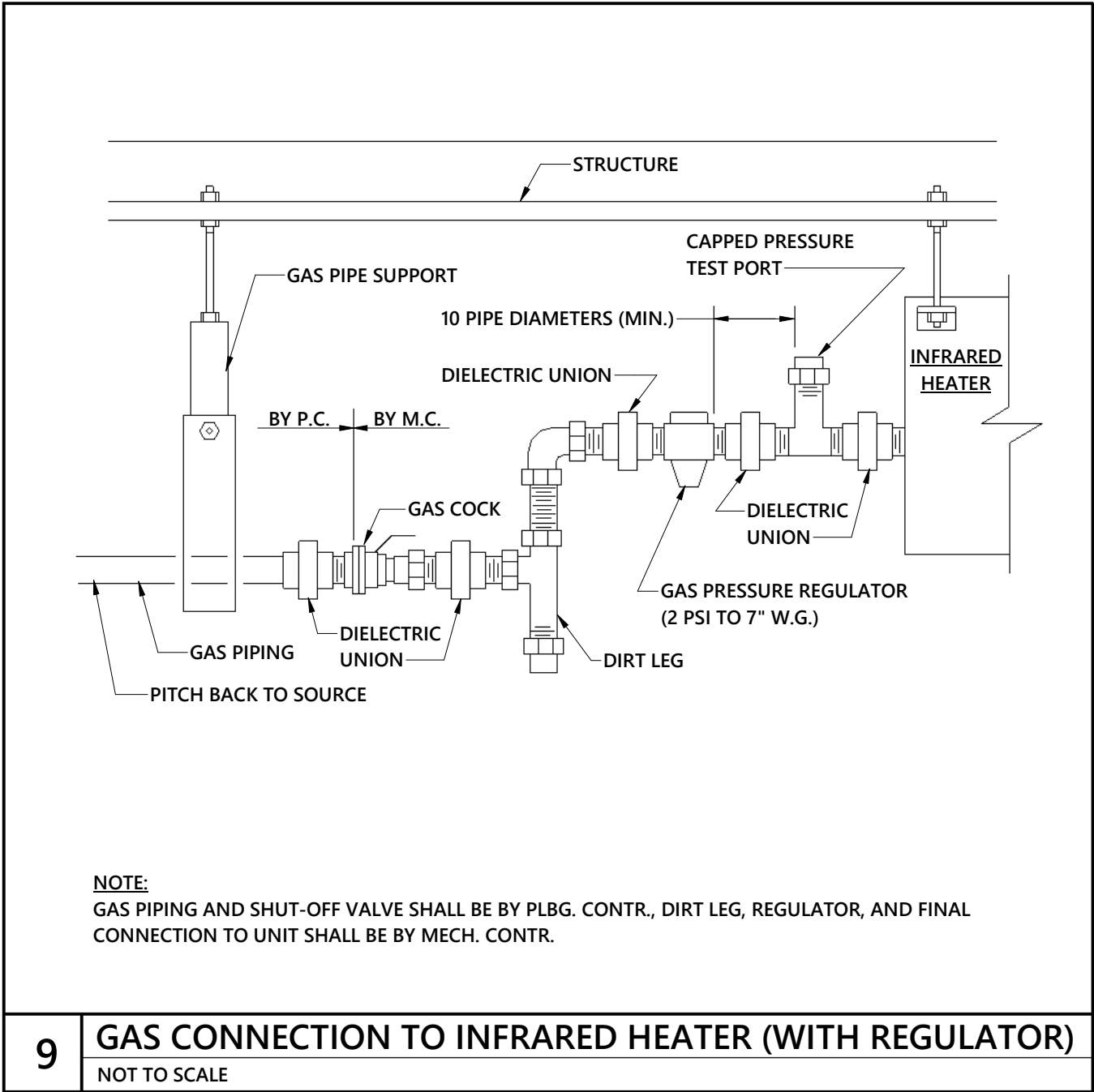
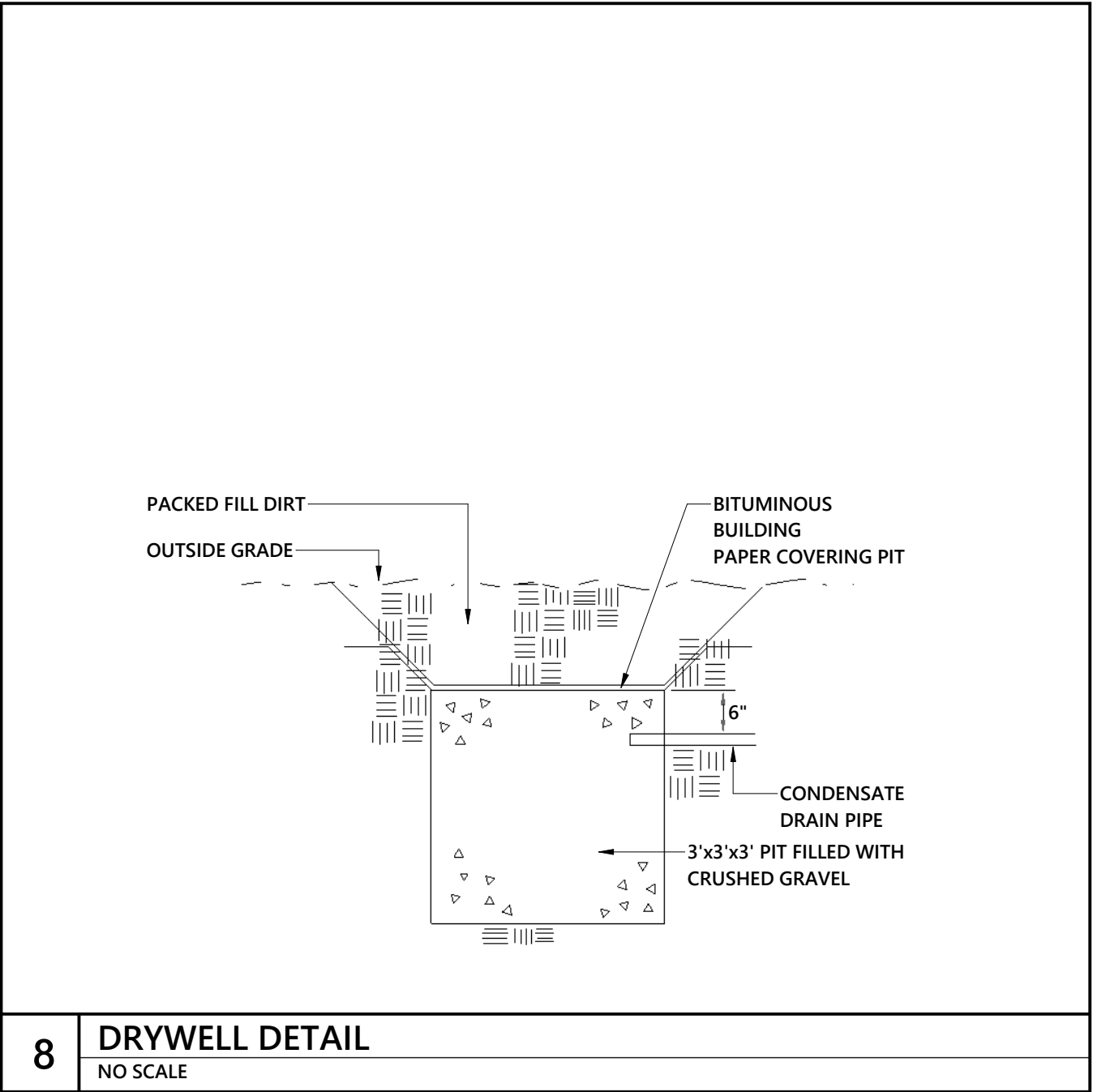
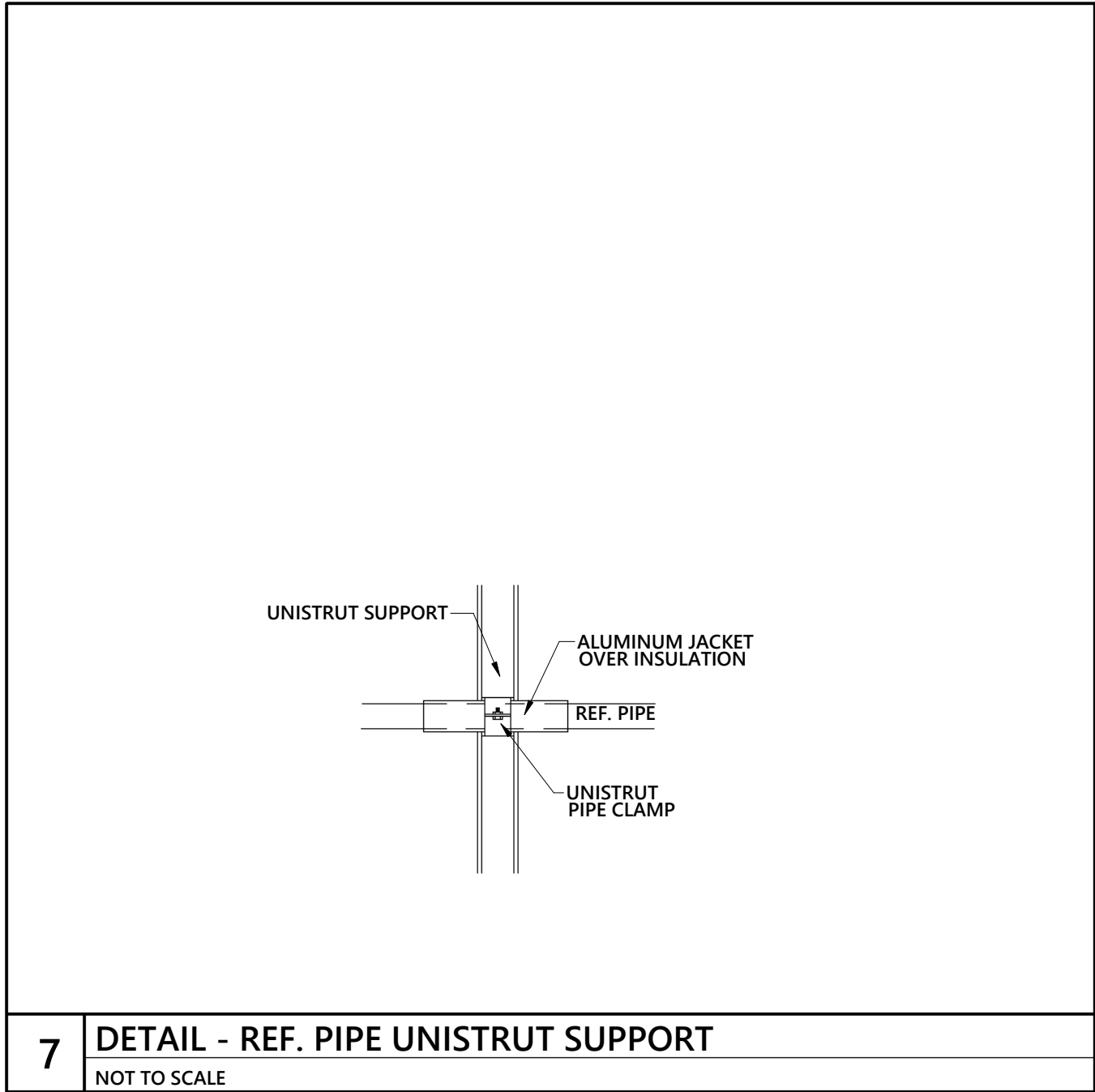
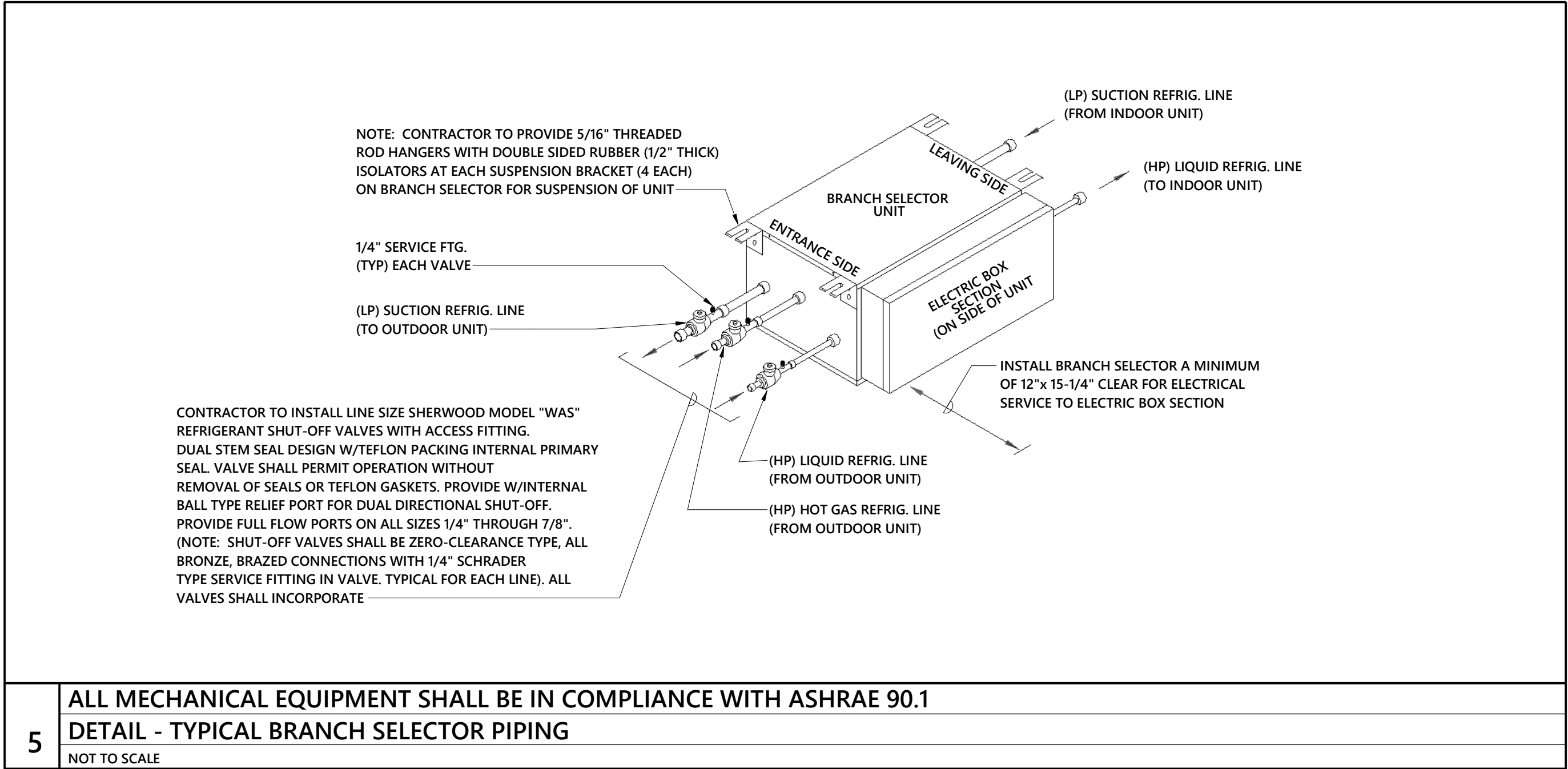
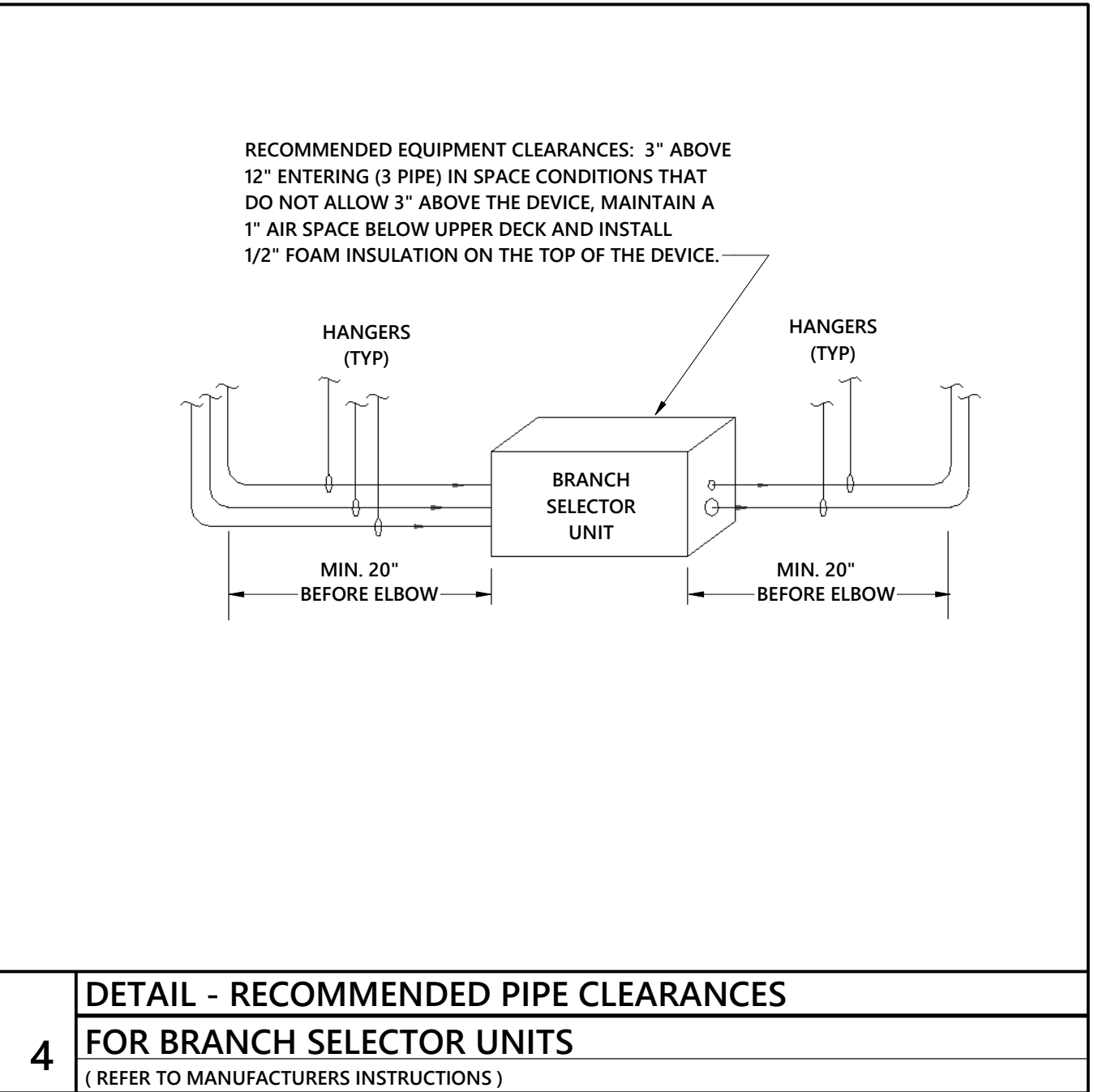
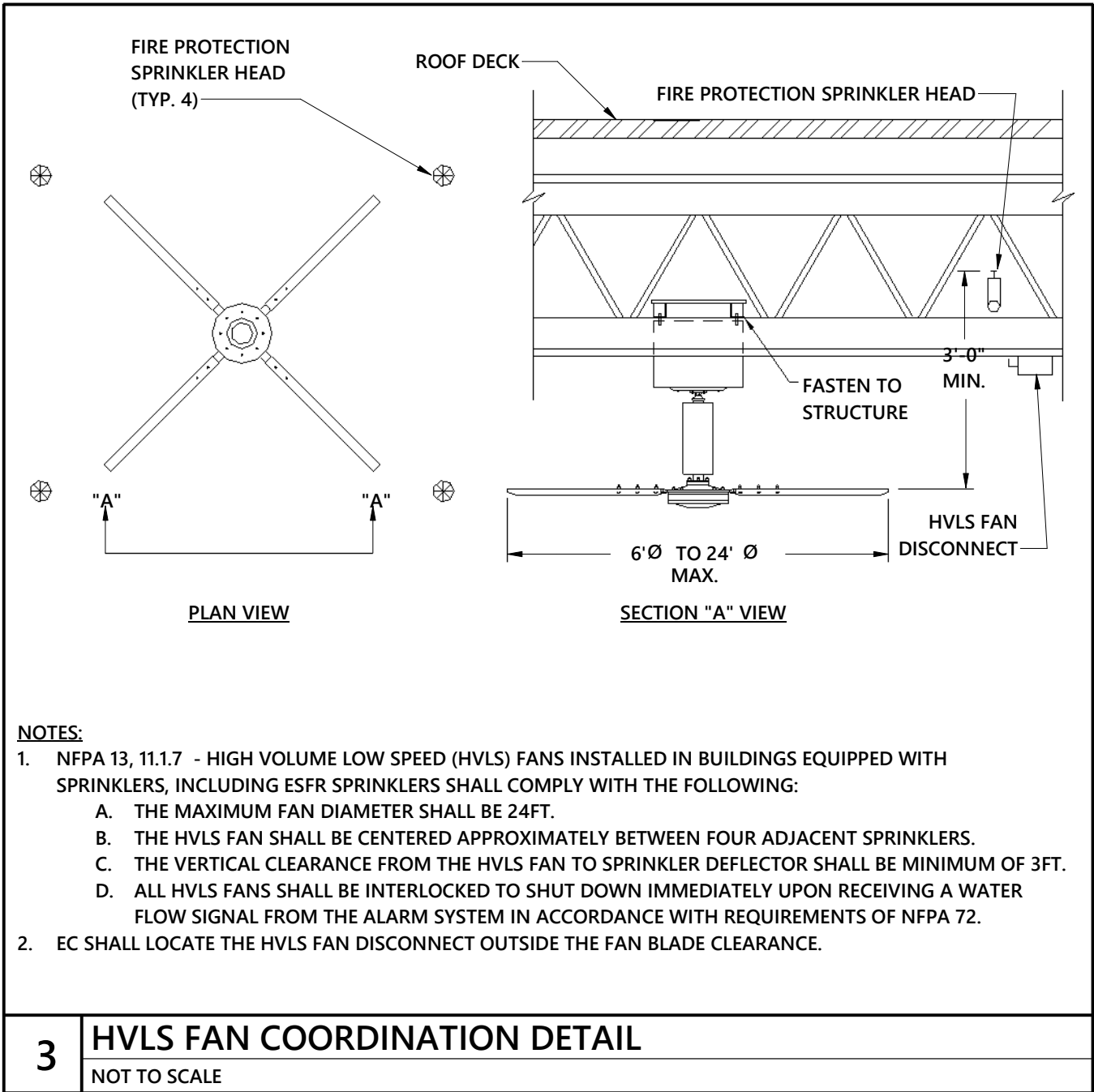
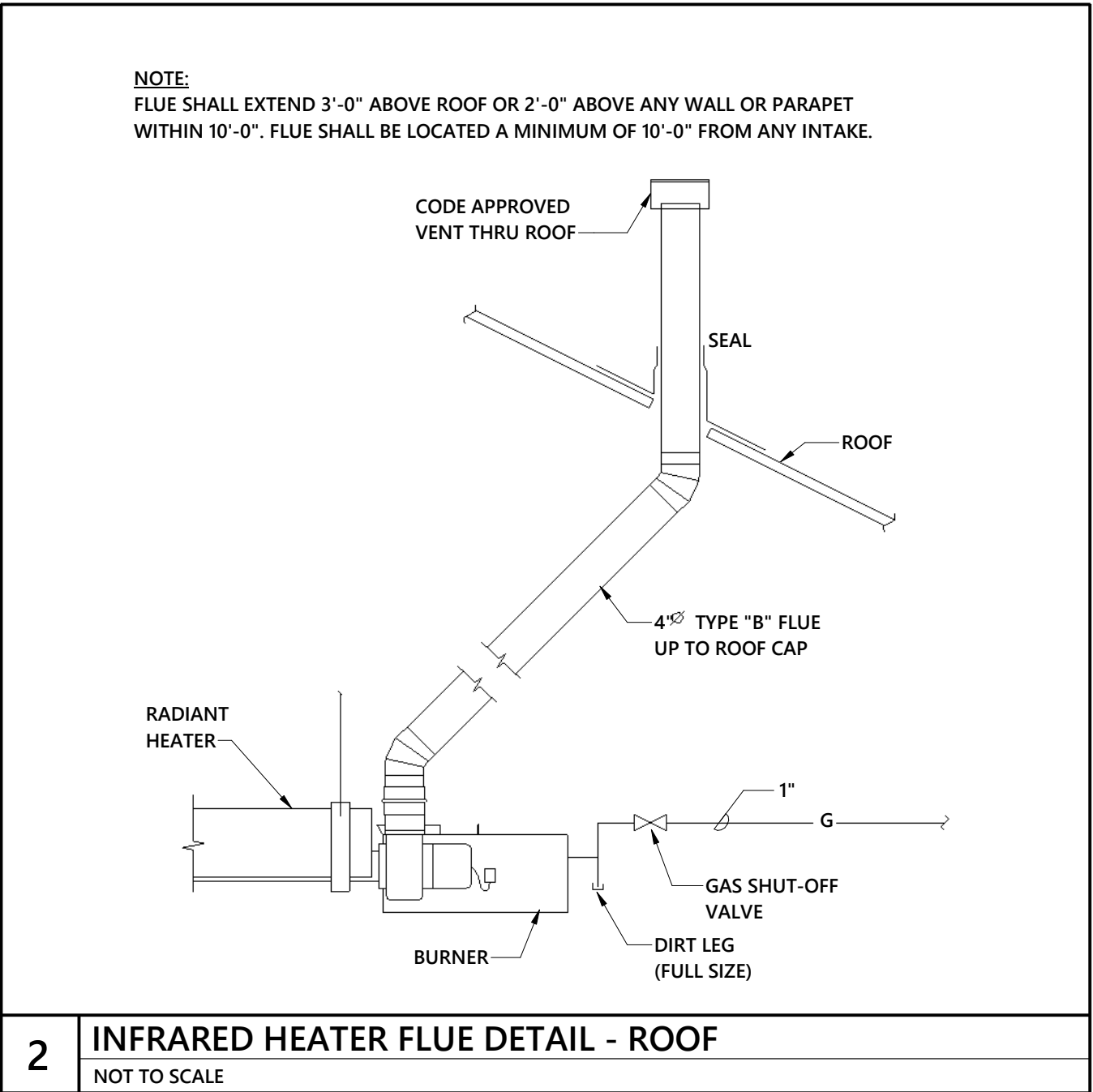
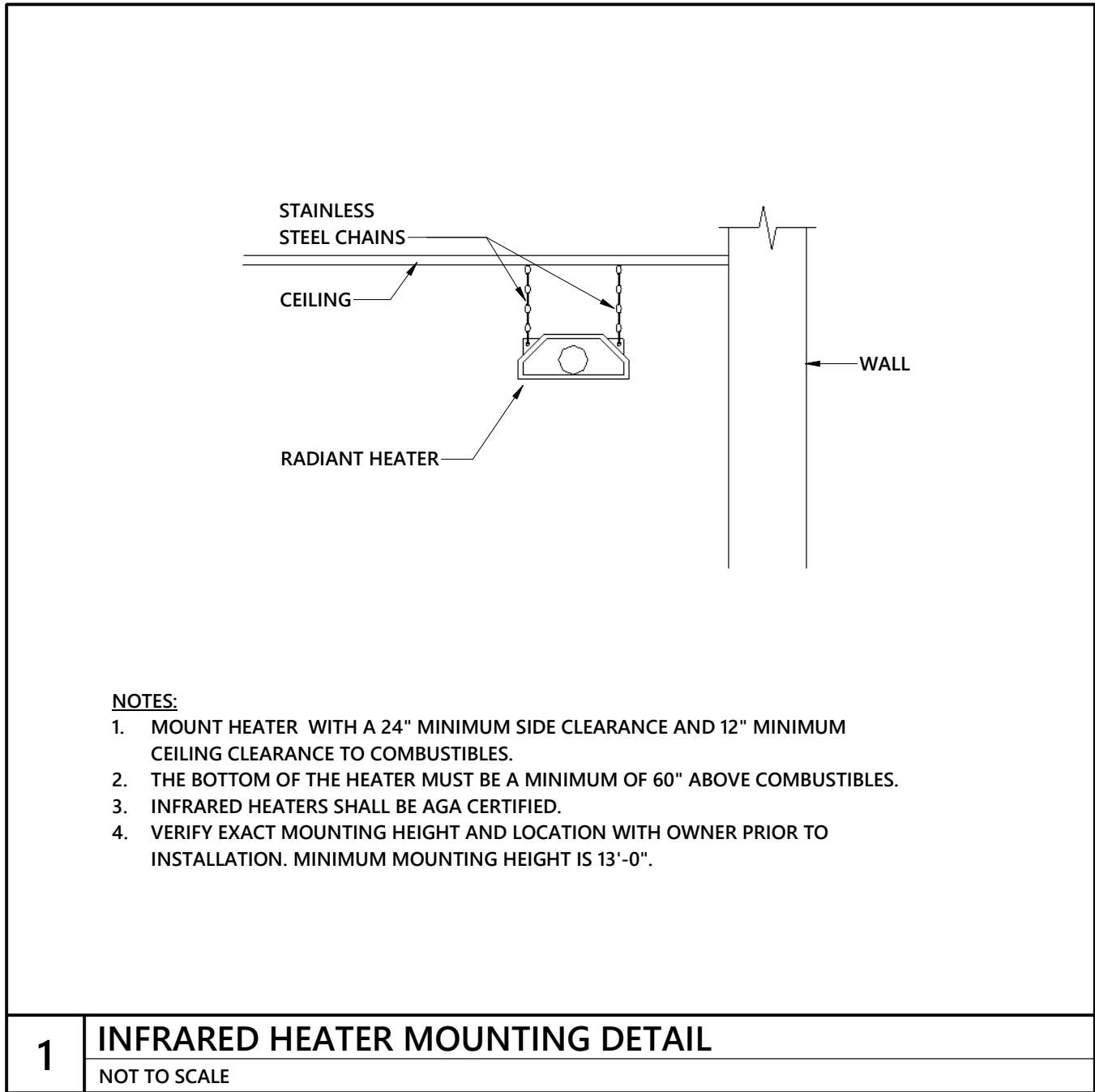


1 FIRST FLOOR MECHANICAL PIPING FLOOR PLAN  
1/8" = 1'-0"

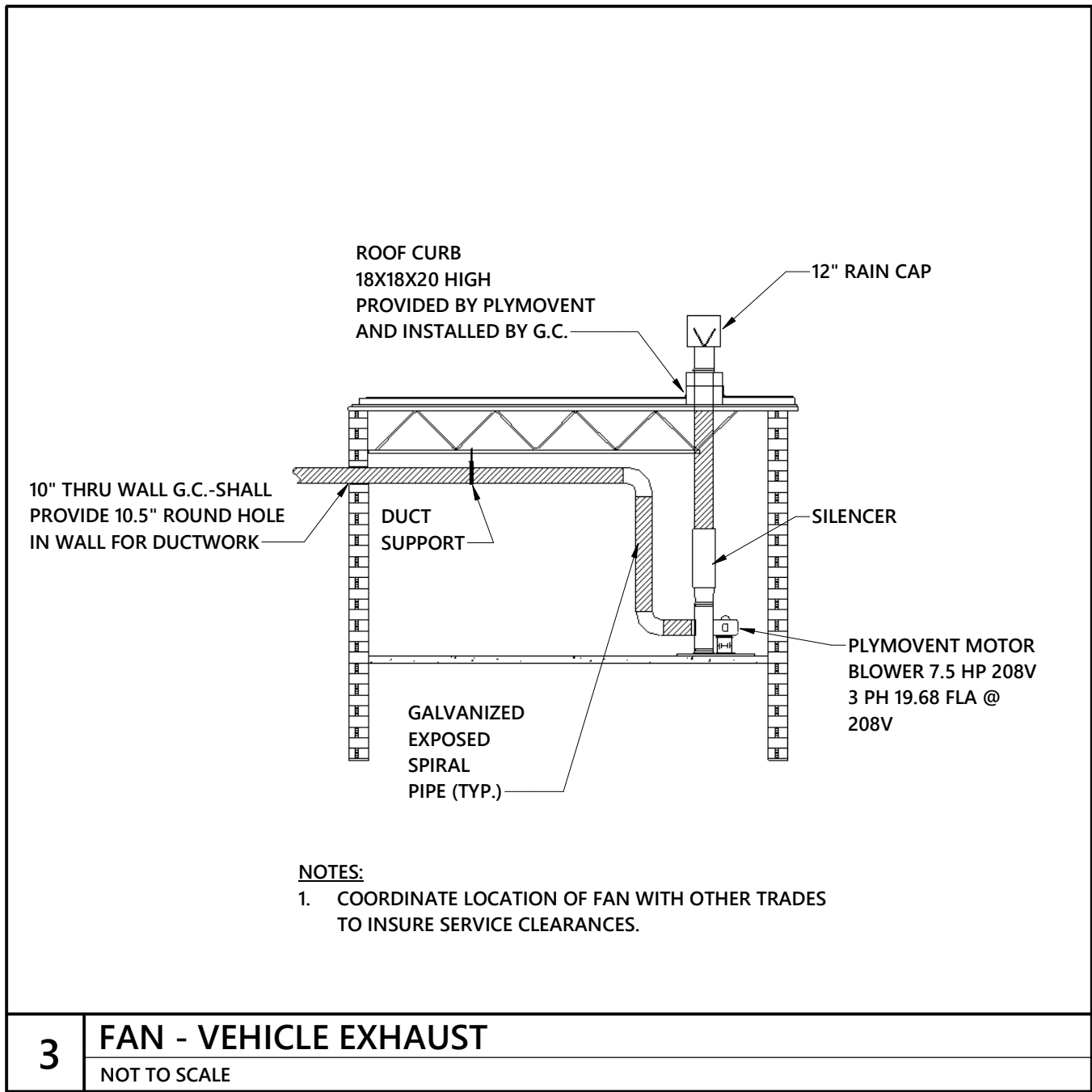
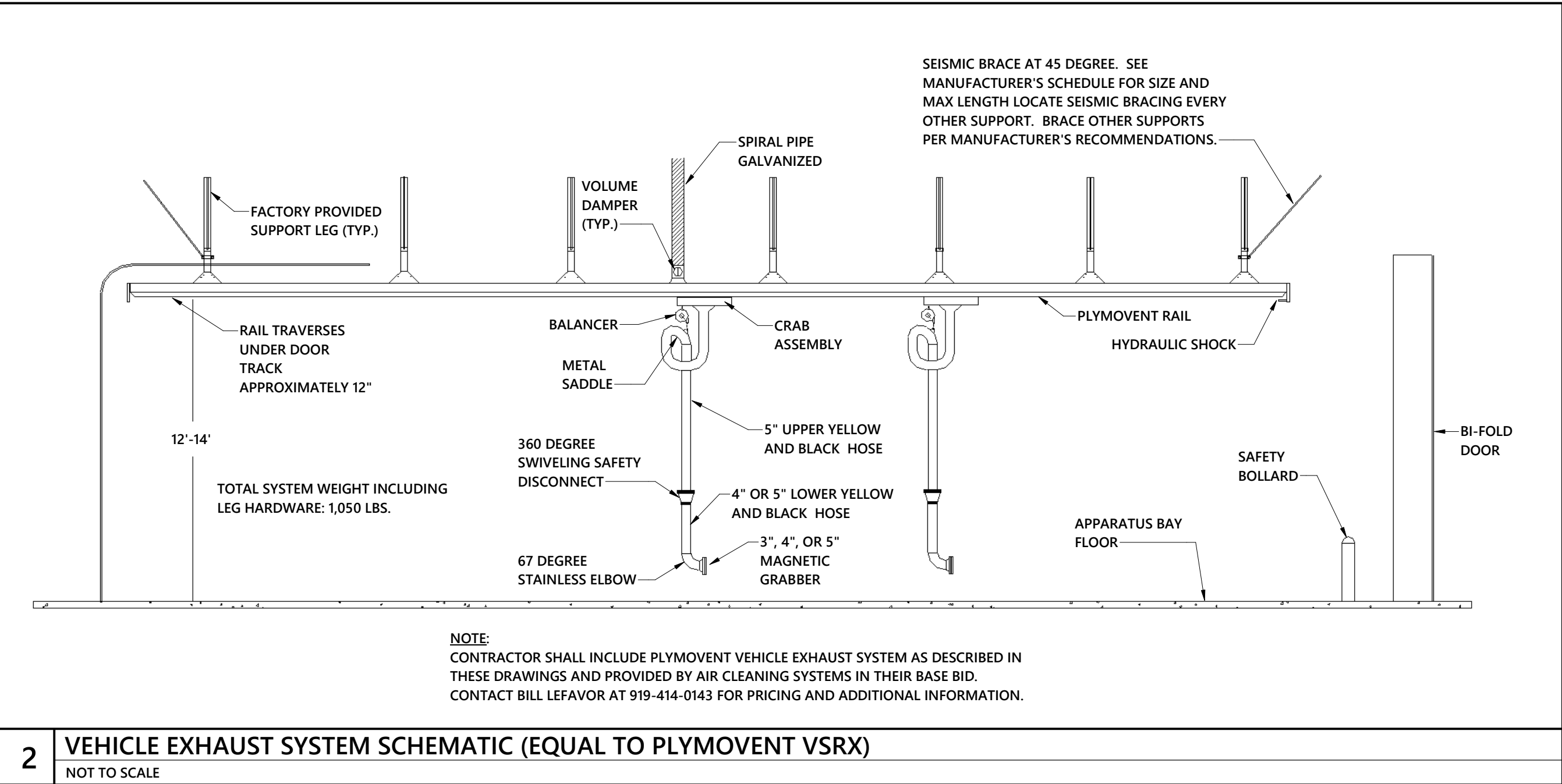
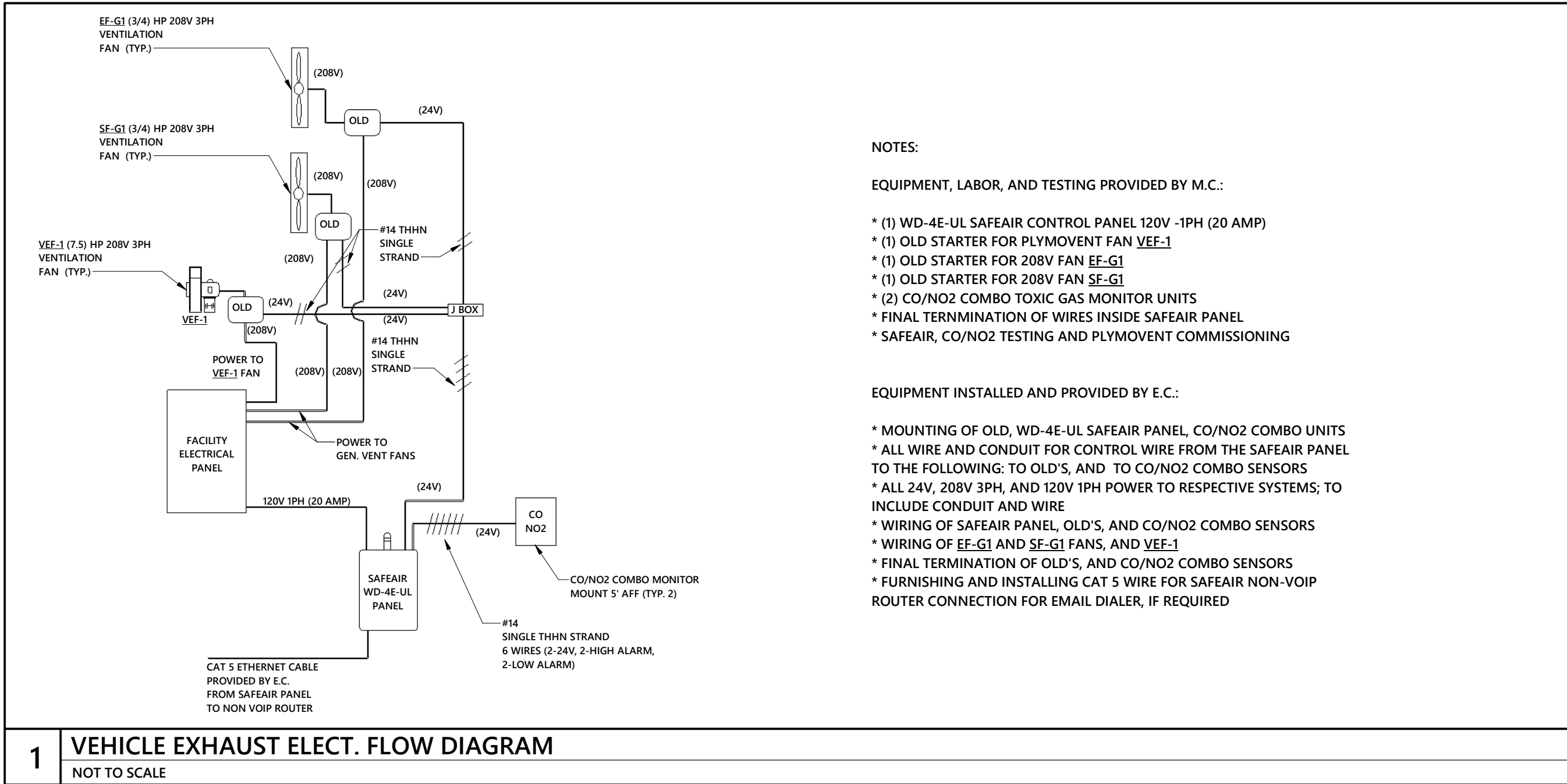




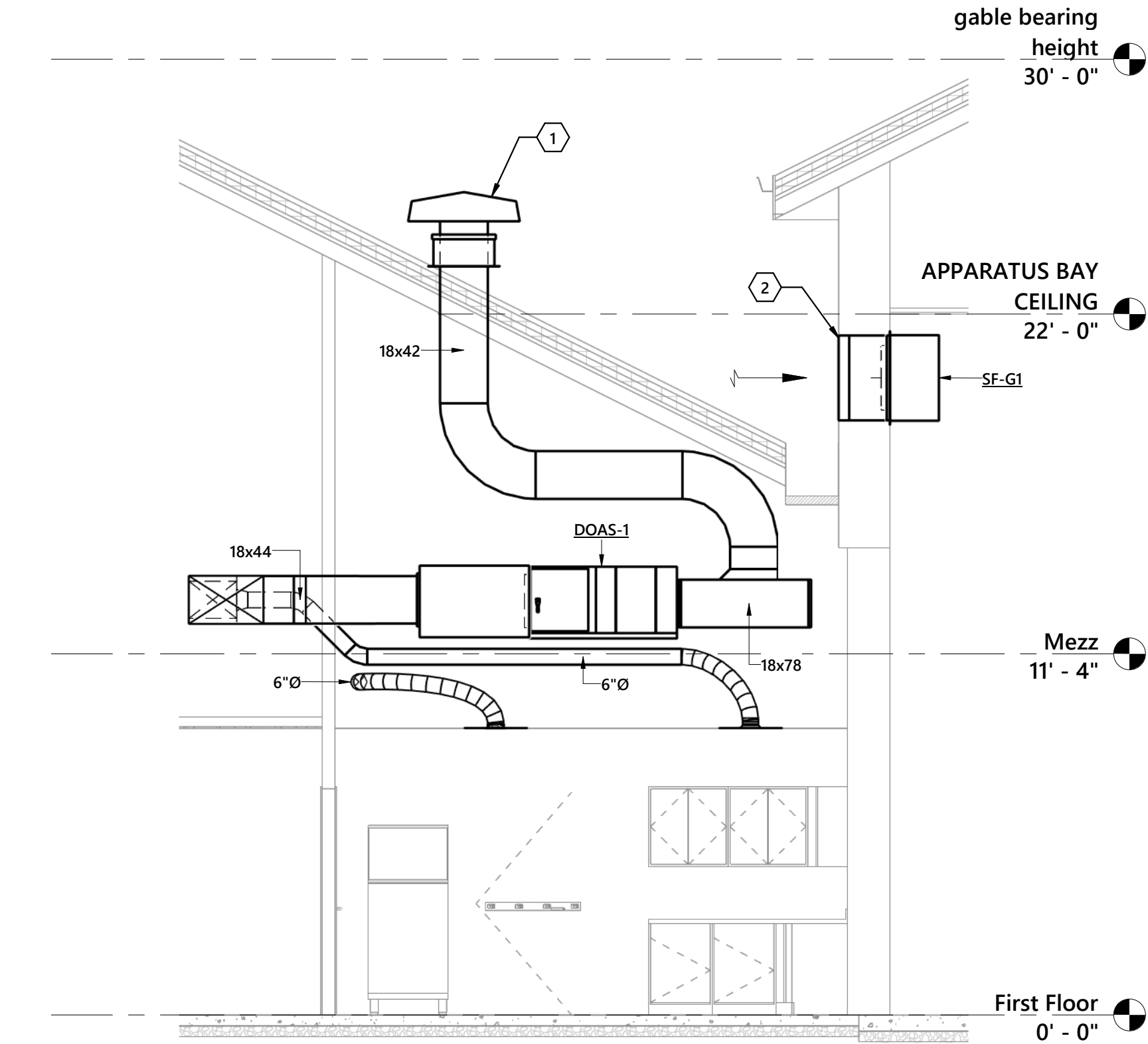




- NOTES FOR VRF REFRIGERANT PIPING**
1. ALL JOINTS SHALL BE BRASED EXCEPT AT THE INDOOR UNITS WHICH SHALL BE FLARED.
  2. ALL PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE MECHANICAL DESIGN. ANY DEVIATION SHALL BE SUBMITTED FOR PRIOR APPROVAL TO THE MECHANICAL ENGINEER PRIOR TO INSTALLATION. SELECTED COPPER TUBE MUST BE OF SUITABLE WALL THICKNESS FOR HIGHER OPERATION PRESSURES.
  3. FLARING: FLARED TUBE ENDS SHOULD HAVE A SMOOTH, EVEN ROUND FLARE OF SUFFICIENT LENGTH TO FULLY ENGAGE THE MATING SURFACE OF THE FLARE NUT, WITHOUT PROTRUDING INTO THE THREADS. USE ONLY "PVE" OR "POE" REFRIGERATION OIL WHEN MAKING FLARES. DEDICATED FLARE BLOCK AND TOOL IS RECOMMENDED. ONLY USE SYNTHETIC OIL ON THE FLARE TOOL.
  4. ALL PIPING EXTERIOR TO BUILDING, SHALL BE A MINIMUM OF TYPE "L", "ACR" RATED STRAIGHT PIPE FOR R-410A OR AS SPECIFIED. ALL PIPING ON THE BUILDING INTERIOR SHALL BE "L", "ACR" RATED ROLLED SOFT COPPER OR LINE SET FOR R-410A OR AS SPECIFIED. PIPING (AFTER ANNEALING) SHALL HAVE SUFFICIENT WALL THICKNESS FOR A CONTINUOUS OPERATING PRESSURE OF 600 PSI PER ASME B 31.5-2010 DRY NITROGEN: DRY NITROGEN MUST BE USED DURING ALL BRAZING (PRESSURE REGULATED TO 3 PSI) TO PREVENT COPPER PLATE OR OXIDATION FORMATION.
  6. PRESSURE TESTING: **TIGHTEN DOWN STOP VALVES BEFORE ANY PRESSURE TESTING** TO PREVENT NITROGEN FROM LEAKING BACK THROUGH CONDENSER AND CONTAMINATING REFRIGERANT. PRESSURE TESTING SHALL BE DONE IN THREE (3) STEPS.  
STEP 1- LEAK CHECK 3 MINUTES AT 150 PSI.  
STEP 2- LEAK CHECK AFTER 5 MINUTES AT 325 PSI.  
STEP 3- LEAK CHECK AFTER 24 HOURS AT 550 PSI.  
ALWAYS CHECK FLARE NUTS FOR LEAKS USING BUBBLE SOLUTION. BE SURE TO USE A RECOMMENDED PRODUCT. DO NOT USE A WATERDOWN FAIRY LIQUID SOLUTION. THESE PROCEDURES MUST BE ADHERED TO, DOCUMENTED AND INCLUDED IN THE CONTRACTORS PRICE.
  7. LEAK TESTING AND EVACUATION SHALL BE DONE IN ACCORDANCE WITH THE US EPA "GREEN CHILL BEST PRACTICES GUIDELINE ENSURING LEAK-TIGHT INSTALLATION OF COMMERCIAL REFRIGERANT EQUIPMENT."
  8. EVACUATION PROCEDURES: EVACUATION PROCEDURES SHALL BE PERFORMED AS FOLLOWS:
    - A. EVACUATE THE SYSTEM TO 4000 MICRONS. BREAK VACUUM WITH DRY NITROGEN TO A PRESSURE OF 2-3 PSI AND HOLD FOR 15 MINUTES.
    - B. EVACUATE SYSTEM TO 1500 MICRONS AND MAINTAIN FOR 20 MINUTES. BREAK VACUUM WITH DRY NITROGEN TO A PRESSURE OF 2-3 PSI AND HOLD FOR 15 MINUTES.
    - C. EVACUATE SYSTEM TO BELOW 500 MICRONS AND HOLD FOR 60 MINUTES.  
VACUUM PUMP CHECK VALVE SHOULD BE USED TO PREVENT MINERAL OIL FROM BEING DRAWN INTO THE SYSTEM. THESE PROCEDURES MUST BE ADHERED TO, DOCUMENTED AND INCLUDED IN THE CONTRACTORS PRICE.
    - D. EVACUATE SYSTEM TO BELOW 300 MICRONS AND HOLD FOR 24 HOURS.
  9. REFRIGERANT CHARGING: WEIGH IN ADDITIONAL REFRIGERANT WITH DIGITAL SCALES. CALCULATE CHARGE BASED ON TOTAL LINE LENGTH PLUS lb/ft OF DIAMETER. CHECK WITH EACH UNIT MODEL FOR CORRECT MULTIPLIER. AFTER THE AMOUNT OF REFRIGERANT TO BE ADDED IS DETERMINED, WRITE IT DOWN ON THE LABEL, ON THE BACK SIDE OF THE FRONT COVER. AFTER THE VACUUM/DRYING IS COMPLETE, CHARGE THE ADDITIONAL REFRIGERANT IN ITS LIQUID STATE THROUGH THE LIQUID STOP VALVE SERVICE PORT.
  10. MAKE SURE TO USE INSTALLATION TOOLS YOU EXCLUSIVELY USE ON R410A INSTALLATIONS TO WITHSTAND THE PRESSURE AND TO PREVENT FOREIGN MATERIAL FROM MIXING INTO THE SYSTEM.  
ALL REFRIGERANT PIPING AND "REFNETS" EXTERIOR TO THE BUILDING SHALL HAVE ALUMINUM JACKET COVERING THE INSULATION IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS.  
EQUIVALENT TO "PABCO-CHILDERS METALS" ALUMINUM ROLL JACKETING, .016" THICK, COMPLYING WITH 3105/3003 STANDARD ALLOYS, STUCCO EMBOSSED FINISH WITH A MOISTURE RETARDER.  
PROVIDE 1/2" ALUMINUM BAND CLAMP EVERY 10 TO 12".
  11. INSULATION TECHNIQUES: ALL PIPE WORK MUST BE INSULATED ALONG IT'S FULL RUN USING CODE COMPLIANT (25/50 RATED), ARMAFLEX MODEL "UT/SOLAFLEX", 1" THICK, HIGH TEMPERATURE & UV RESISTANT CLOSED CELL INSULATION. COVER FLARE NUTS ON THE FAN COILS USING THE INSULATION PROVIDED OR CONDENSATION WILL OCCUR CAUSING LEAKS.  
INSULATION OF PIPES SHOULD BE DONE AFTER PERFORMING WORK REQUIRED BY NOTE 8 (AIR TIGHT TEST AND VACUUM DRYING). INSULATE THE LIQUID PIPING, THE HP/LP GAS PIPING, THE GAS PIPING, THE EQUALIZER PIPE (BETWEEN THE OUTSIDE UNITS FOR THE OUTSIDE MULTI SYSTEM) AND THESE PIPE CONNECTIONS.  
INSULATION SHALL WITHSTAND TEMPERATURES OF 248 DEGREES F OR MORE FOR THE HP/LP GAS PIPING, THE EQUALIZER PIPE AND GAS PIPING.
  12. UN-INSULATED JOINTS WILL CONDENSE MOISTURE AROUND THE FITTINGS.  
LINE COMPONENTS: DO NOT INSTALL DRIERS, OIL TRAPS, SIGHT GLASSES, OR ANY OTHER LINE COMPONENT IN THE PIPE WORK AS THIS WILL EFFECT THE PERFORMANCE AND WARRANTY.
  13. VRV SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASHRAE 15.
  14. VRV SYSTEMS SHALL BE INSTALLED BY A MANUFACTURER CERTIFIED AND TRAINED CONTRACTING COMPANY AND SHALL HAVE DOCUMENTATION OF VRV INSTALLATION & COMMISSIONING TRAINING. FIELD SUPERINTENDENT SHALL HAVE VRV TRAINING AND VRV SUPPLIER SHALL INCLUDE A SPECIAL VRV TOOL KIT ALLOWANCE FOR THE INSTALLING CONTRACTOR CONSISTING OF:
    - A. STANDARD R-410A GAUGE KIT WITH MULTIPLE TOOLS
    - D. R-410A PLASTIC FLARE SIZE GAUGE
    - B. TORQUE WRENCH SETIF INSTALLING CONTRACTOR DOES NOT CURRENTLY HAVE THESE SPECIAL TOOLS CRTIFICATION. CERTIFICATION, TRAINING AND COMMISSIONING DOCUMENTATION TO BE FURNISHED WITH THE CONTRACTORS BID AND/OR NOTICE TO PROCEED.
  15. IN APPLICATIONS WHERE THE "REFNET" KITS ARE INSTALLED IN AN ENVIRONMENT REQUIRING FIRE-RATED MATERIAL TO BE USED, IT IS NECESSARY FOR THE INSTALLER TO OBTAIN FROM A THIRD PARTY SUPPLIER AND TO UTILIZE, FOR INSULATION, FIRE-RATED MATERIALS THAT MEET ALL APPLICABLE BUILDING CODES AND OTHER REQUIREMENTS. THE FACTORY SUPPLIED INSULATION SHOULD BE DISCARDED IN A MANNER MEETING ALL APPLICABLE LAWS.



KEYNOTE LEGEND	
1	42X18 OUTSIDE AIR DUCT UP TO ROOF. PROVIDE ROOF CAP EQUAL TO GREENHECK FGI-18X42 WITH ROOF CURB AND BIRD SCREEN.
2	32"X32" INTAKE LOUVER (GREENHECK EVH-501 OR EQUAL) WITH A MIN. OF 50% FREE AREA AND BIRD SCREEN.



1 DOAS SECTION  
1/4" = 1'-0"

Project No.  
**1691**  
Date:  
3/27/2024 5:18:22 PM  
Drawn by:  
JWA  
Checked by:  
MEH  
Revisions:

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034593  
03/28/2024

GORDON ROAD FIRE  
DEPARTMENT  
MECHANICAL SECTIONS

Sheet No.  
**M5.04**