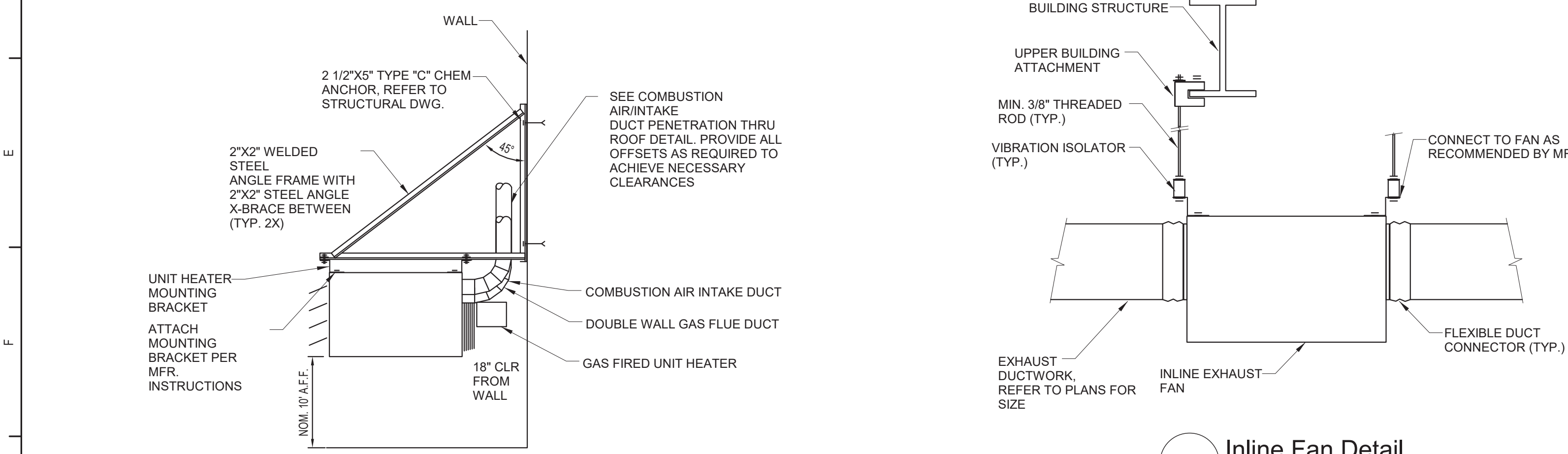
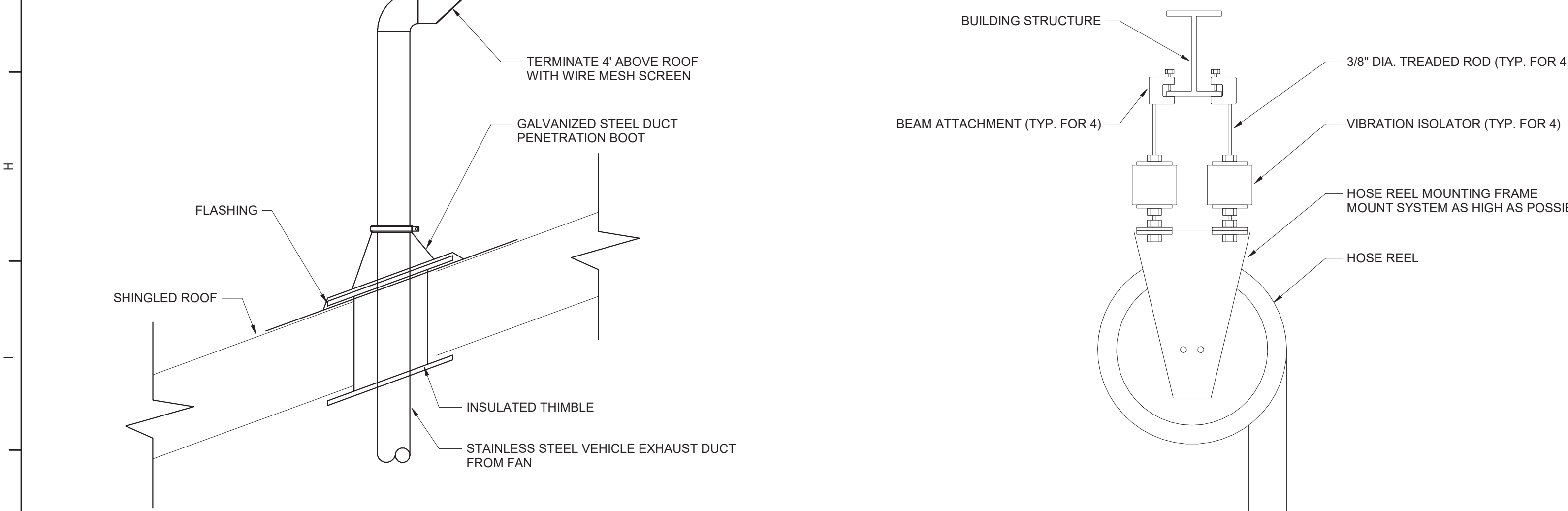


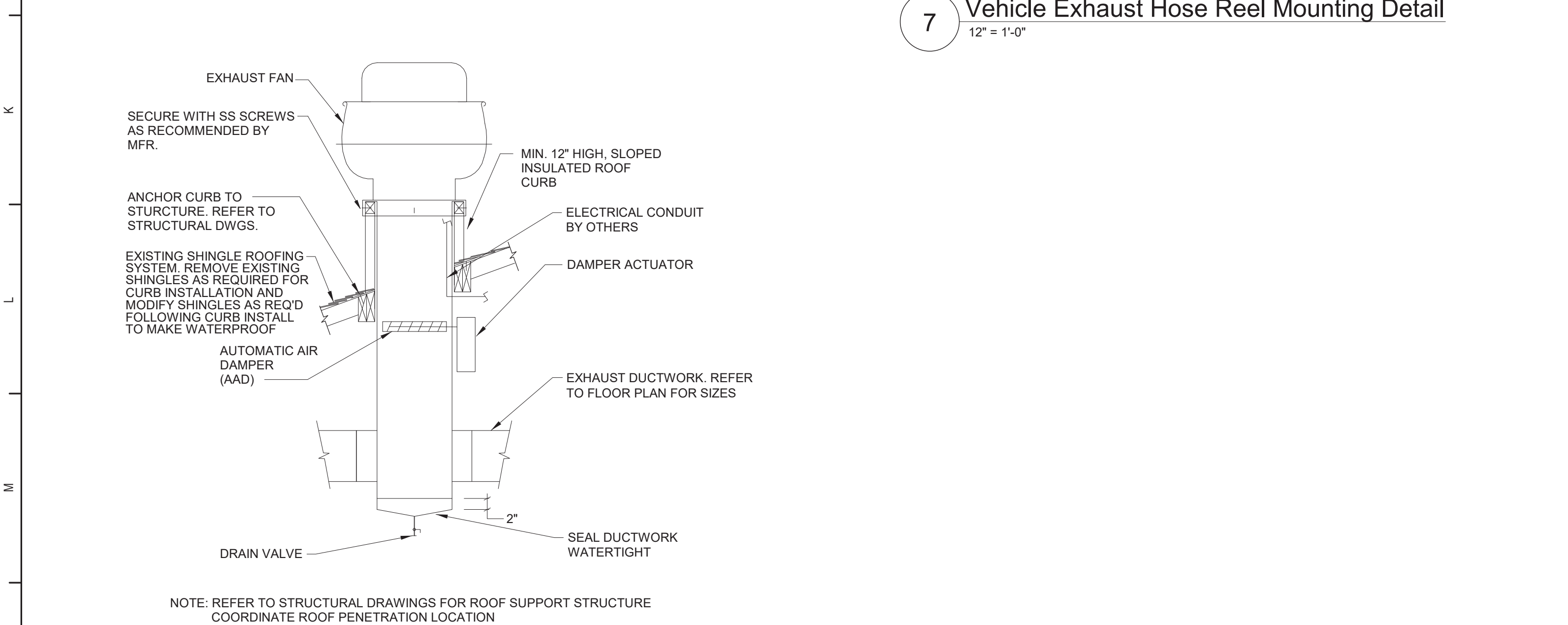
1 Gas Fired Equipment Intake/Vent Detail  
NTS



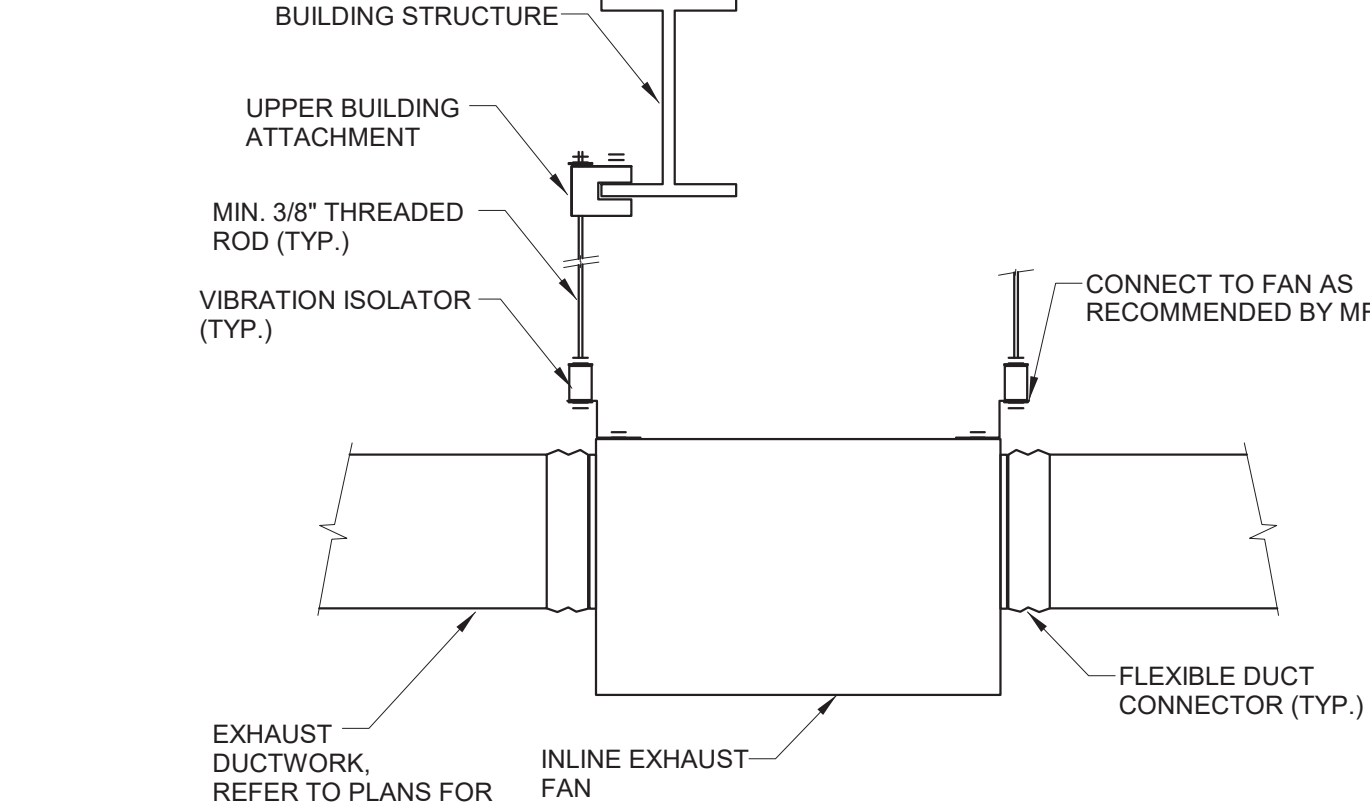
2 Gas-Fired Unit Heater Detail  
NTS



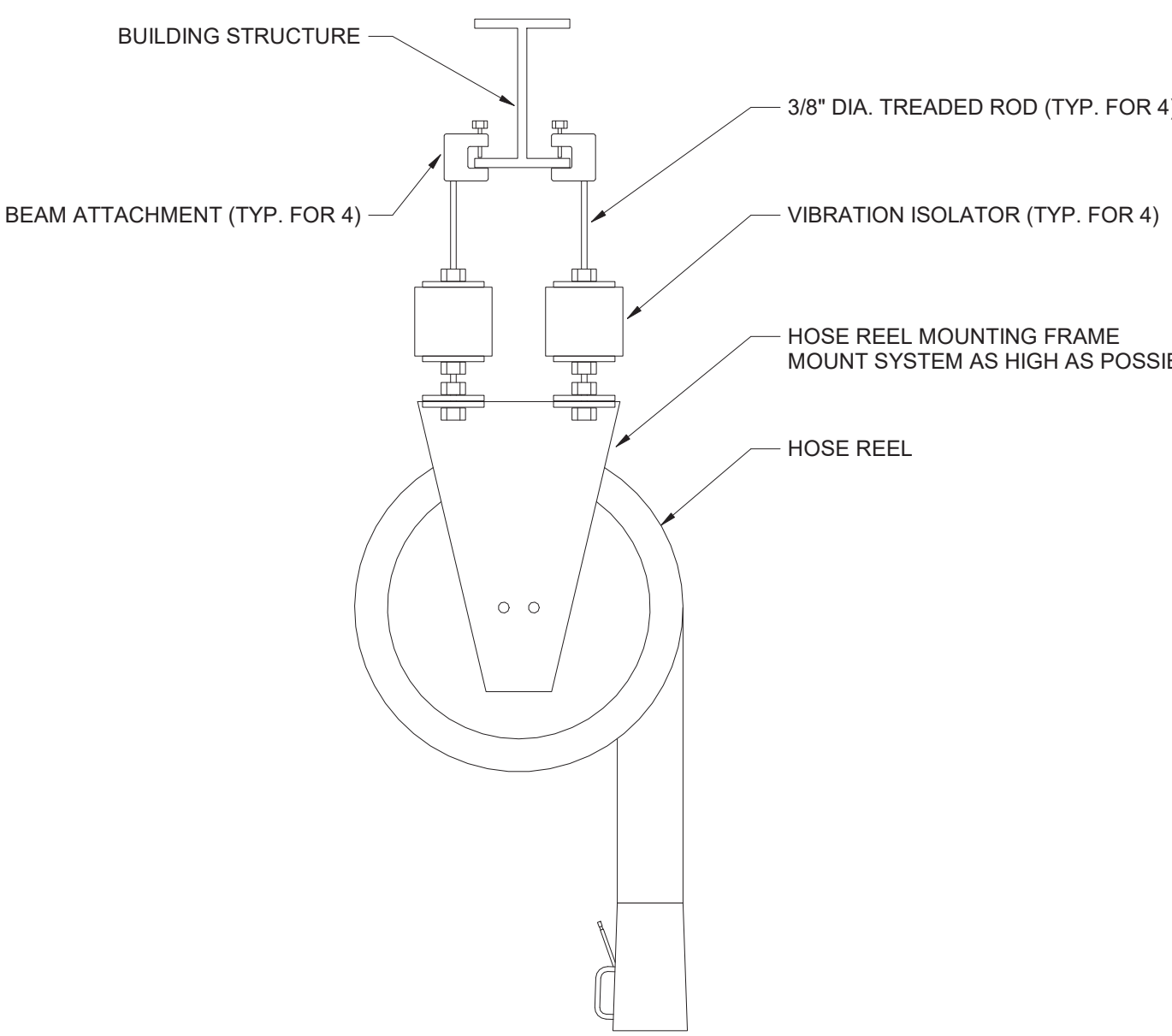
3 Vehicle Exhaust Duct Roof Penetration Detail  
NTS



4 Roof Exhaust Fan Detail  
NTS



6 Inline Fan Detail  
NTS



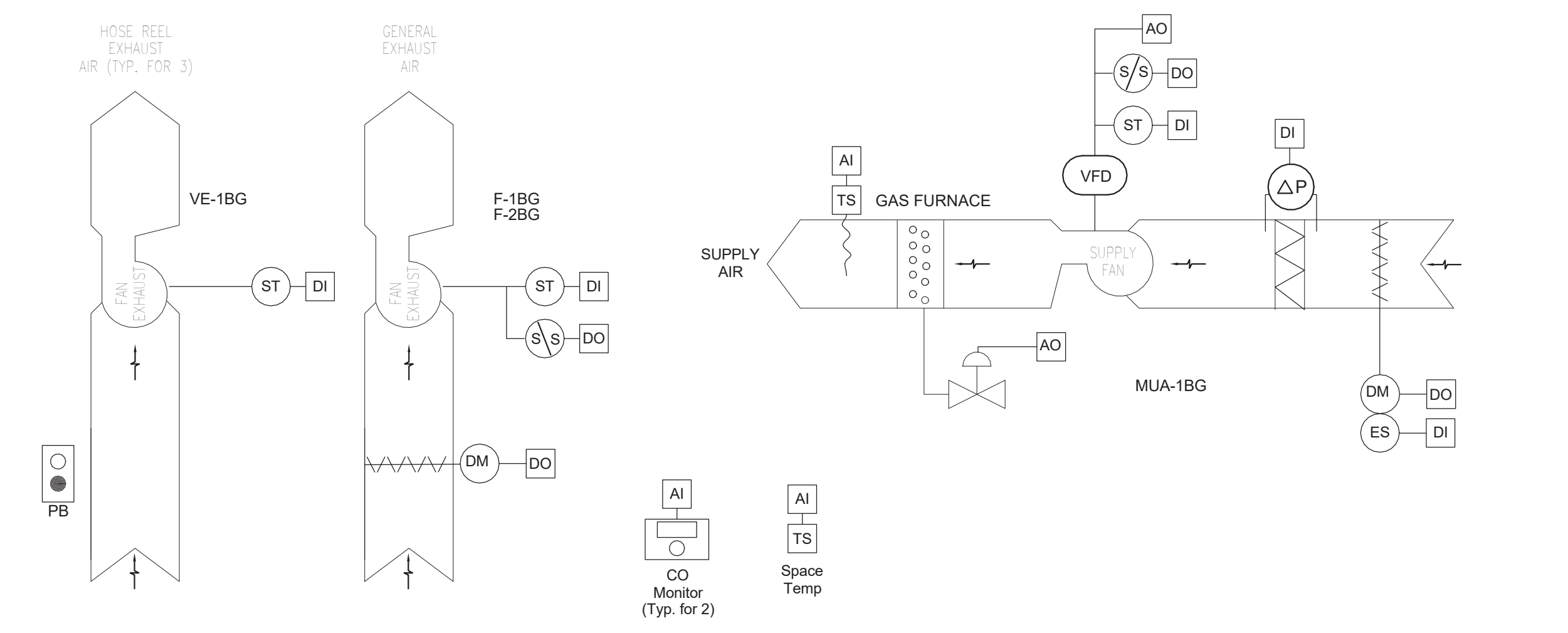
7 Vehicle Exhaust Hose Reel Mounting Detail  
12" = 1'-0"

MAKE-UP AIR UNIT (MUA) SCHEDULE												
EQUIP NO.	LOCATION	MODEL	SERVES	AIR QUANTITY		GAS HEAT				ESP (IN. WG.)	TSP (IN. WG.)	FAN MOTOR HP
				TOTAL AIRFLOW	INPUT (MBH)	OUTPUT CAP. (MBH)	EAT (°F)	LAT (°F)				
MUA-1BG	REAR GARAGE	SSCBL-500	REPAIR GARAGE	4700CFM	500	400	10.0	88.0		1.5	1.6	3
NOTES: 1. NATURAL GAS, MODULATING BURNER. 2. PROVIDE UNIT MANUFACTURER'S VERTICAL VENT KIT FOR THRU THE ROOF APPLICATION. 3. PROVIDE FACTORY FURNISHED VARIABLE SPEED DRIVE AND DISCONNECT SWITCH. 4. PROVIDE CONTROL TERMINAL STRIP FOR BMS CONTROL INTERFACE.												

UNIT HEATER (UH) SCHEDULE												
DWG LABEL	LOCATION	MODEL	MANUFACTURER	NOM. MOUNTING HEIGHT (FT.)	EAT (°F)	LAT (°F)	AIRSIDE DATA		CAPACITY		ELECTRICAL	
							AIRFLOW (CFM)	INPUT (MBH)	OUTPUT (MBH)	MCA	VOLTAGE	PHASE
UH-1BG	GARAGE BAY	UDAS 45	REZNOR	10.0	65.0	119.0	629.0	45.0	37.4	15	115	1
UH-2BG	GARAGE BAY	UDAS 45	REZNOR	10.0	65.0	119.0	629.0	45.0	37.4	15	115	1
UH-3BG	GARAGE BAY	UDAS 45	REZNOR	10.0	65.0	119.0	629.0	45.0	37.4	15	115	1
UH-4BG	GARAGE BAY	UDAS 45	REZNOR	10.0	65.0	119.0	629.0	45.0	37.4	15	115	1
UH-5BG	REAR GARAGE	UDAS 30	REZNOR	10.0	65.0	115.0	456.0	30.0	24.6	15	115	1
UH-6BG	REAR GARAGE	UDAS 30	REZNOR	10.0	65.0	115.0	456.0	30.0	24.6	15	115	1
UH-7BG	OIL TANK AREA	EGHB-2-AK2	REZNOR	7.0	65.0	85.0	510.0			2 kW	15	208
UH-8BG	CORRIDOR	EGHB-2-AK2	REZNOR	7.0	65.0	85.0	510.0			2 kW	15	208
UH-9BG	BOILER ROOM	EGHB-2-AK2	REZNOR	7.0	65.0	85.0	510.0			2 kW	15	208
NOTES: 1. NATURAL GAS, SINGLE STAGE BURNER. 2. PROVIDE UNIT MANUFACTURER'S VERTICAL VENT KIT FOR THRU THE ROOF APPLICATION. 3. PROVIDE FACTORY FURNISHED DISCONNECT SWITCH. 4. PROVIDE FACTORY MOUNTING HANGER BRACKET. 5. PROVIDE WITH MANUFACTURER'S STANDARD WALL MOUNTING BRACKET. 6. PROVIDE WITH MANUFACTURER'S STANDARD INTEGRAL THERMOSTAT. 7. PROVIDE UNIT MANUFACTURER'S STANDARD WALL-MOUNTED SINGLE STAGE, 24V THERMOSTAT.												

FAN (F) SCHEDULE												
EQUIP NO.	LOCATION	MODEL	MANUFACTURER	AIRFLOW (CFM)	SONES	FAN DATA				ELECTRICAL		NOTES
						ESP (IN WG)	DRIVE	MOTOR RPM	HP	VOLTAGE	PHASE	
F-1BG	ROOF	180R8B	LOREN COOK	2725	15.9	1.5	BELT	1725	1 1/2	208	3	1.2,3
F-2BG	REAR GARAGE	120SQN100	LOREN COOK	876	4.8	.15	DIRECT	1050	1/6	115	1	2.3,4
F-3BG	REPAIR BAYS	CMW-11	CAR-MON	870	24	4.0	DIRECT	1250	1	208	3	3.5
F-4BG	REPAIR BAYS	CMW-11	CAR-MON	870	24	4.0	DIRECT	1250	1	208	3	3.5
F-5BG	REPAIR BAYS	CMW-11	CAR-MON	870	24	4.0	DIRECT	1250	1	208	3	3.5
NOTES: 1. PROVIDE MANUFACTURER'S STANDARD ALUMINUM, INSULATED ROOF CURB FOR SLOPED ROOF. 2. PROVIDE MANUFACTURER'S STANDARD HAND-OFF-AUTO SWITCH. 3. PROVIDE MANUFACTURER'S STANDARD DISCONNECT SWITCH. 4. PROVIDE MANUFACTURER'S STANDARD FAN SPEED SWITCH FOR BALANCING. 5. PROVIDE MANUFACTURER'S FAN STARTER. FAN STARTS VIA MANUAL PUSHBUTTON												

LOUVER (L) SCHEDULE												
TAG	SERVES	MODEL	TYPE	WIDTH (IN)	HEIGHT (IN)	DEPTH (IN)	FREE AREA (S.F.)	AIRFLOW	VELOCITY (FPM)	MAX APD (IN WG)	NOTES	
L-1BG	F-2BG	ELF375DXH	EXHAUST	20	18	4	1.0	876 CFM	876	0.075	1,2,3	
NOTES: 1. DESIGN MAKE: RUSKIN 2. PROVIDE WITH ALUMINUM INSECT SCREEN. 3. ANODIZED FINISH. SUBMIT MANUFACTURER'S COLOR CHART FOR APPROVAL BY ARCHITECT.												



- GENERAL: PROVIDE A LOCAL BMS CONTROLLER WITH GRAPHIC USER INTERFACE (GUI) FOR OPERATOR MONITORING, SCHEDULING, ALARMS AND TEMPERATURE SETPOINT ADJUSTMENT. LOCATE CONTROLLER/GUI IN LOCATION APPROVED BY OWNER. PROVIDE A WIRELESS ROUTER FOR COMMUNICATION TO DISTRICT BMS SYSTEM.
- OCCUPIED MODE:
  - THE MAKE-UP AIR UNIT AND GENERAL EXHAUST FAN (F-1BG), WILL RUN BASED ON OPERATOR ADJUSTABLE SCHEDULE.
  - MUA-1BG OUTSIDE AIR DAMPER AND F-1BG EXHAUST DAMPER SHALL BE OPEN ANYTIME THE UNITS ARE IN OPERATION.
  - WHEN F-1BG IS ON, MUA-1BG SUPPLY AIR VARIABLE SPEED DRIVE (VSD) SHALL MODULATE TO MEET 90% OF THE AIRFLOW QUANTITY OF F-1BG.
  - THE CONTROLLER SHALL MONITOR THE OVERHEAD DOOR POSITION. IF ANY OVERHEAD DOOR REMAINS OPEN FOR TEN (10) CONTINUOUS MINUTES, MUA-1BG OUTSIDE AIR DAMPER SHALL CLOSE AND MUA-1A SHALL STOP.
  - UPON A FALL IN SPACE TEMPERATURE AS SENSED BY ITS RESPECTIVE THERMOSTAT, ENABLE UNIT HEATER AND OPEN GAS BURNER VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.
- THE CONTROLLER SHALL MONITOR MUA-1 SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT.
  - AS THE OUTSIDE AIR TEMPERATURE DROPS FROM 85 DEG. F. (ADJ.) TO 20 DEG. F. (ADJ.), THE SUPPLY AIR TEMPERATURE SETPOINT SHALL RESET UPWARD FROM 55 DEG. F. TO 95 DEG. F. (ADJ.).
  - THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE GAS BURNER VALVE TO MAINTAIN ITS HEATING SETPOINT.
  - HEATING SHALL BE ENABLED WHENEVER: THE OUTSIDE AIR TEMPERATURE IS LESS THAN 65 DEG. F. (ADJ.) FAN STATUS IS ON, THE SUPPLY AIR TEMPERATURE IS BELOW HEATING SETPOINT AND OVERHEAD DOORS ARE CLOSED.
  - GARAGE SPACE TEMPERATURE SHALL BE MONITORED.
- EXHAUST FANS ASSOCIATED WITH HOSE REELS SHALL BE MANUALLY STARTED.
  - UPON ACTIVATION OF A HOSE REEL FAN, MUA-1BG VSD SHALL INCREMENTALLY INCREASE ITS OUTPUT TO MEET 90% OF THE COMBINED EXHAUST AIRFLOW QUANTITY. THE REVERSE SHALL OCCUR AS HOSE REEL FANS ARE TURNED OFF.
- UNOCCUPIED MODE:
  - CLOSE OUTSIDE AIR AND EXHAUST AIR DAMPERS, DISABLE MUA-1BG AND F-1BG.
  - UPON A FALL IN SPACE TEMPERATURE AS SENSED BY ITS RESPECTIVE THERMOSTAT, ENABLE UNIT HEATER AND OPEN GAS BURNER VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.
- ALARMS AND SAFETIES:
  - THE CONTROLLER SHALL MONITOR FILTER STATUS. ALARM IF DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
  - HIGH SUPPLY AIR TEMPERATURE: IF SUPPLY AIR TEMPERATURE IS GREATER THAN 120 DEG. F. (ADJ.).
  - LOW SUPPLY AIR TEMPERATURE: IF SUPPLY AIR TEMPERATURE IS LESS THAN 45 DEG. F. (ADJ.).
  - CARBON MONOXIDE SENSOR: ALARM IF CO LEVEL IS GREATER THAN 700 PPM FOR FIVE MINUTES (ADJ.).

8 Garage Ventilation System Control  
NTS

CONTROL SYMBOL LEGEND

- (S/S) START/STOP
- ST STATUS
- DM DAMPER MOTOR
- ES END SWITCH
- TS TEMPERATURE SENSOR
- AO ANALOG OUTPUT
- AI ANALOG INPUT
- DO DIGITAL OUTPUT
- DI DIGITAL INPUT
- VFD VARIABLE SPEED DRIVE
- ΔP DIFF. PRESS. SENSOR
- CONTACT (NO OR NC)
- PB PUSHBUTTON STARTER

S.E.D. Control No. 48-01-01-06-5-010-009

Rev. No.: Date: Description:



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**TETRA TECH**  
ARCHITECTS & ENGINEERS

Mahopac Central School District  
Mahopac, NY

Reconstruction To:  
Mahopac Bus Garage

Schedules, Details and Controls

Drawn By: DPM Date: 8/21/20 Drawing Number:  
Project No.: 12111-19002 **GM131**