


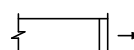
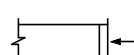

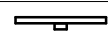


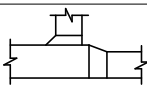
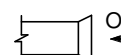

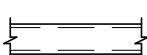




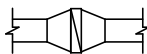
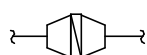

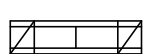
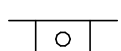
YORK REGIONAL POLICE NEW HELICOPTER HANGAR

350 GARFIELD WRIGHT BOULEVARD
TOWN OF EAST GWILLIMBURY

ISSUED FOR TENDER

SEPTEMBER 9, 2024
PROJECT NO: TT-24-005

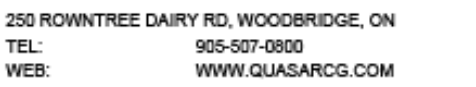
GENERAL	
SYMBOL	DESCRIPTION
	EXISTING TO REMAIN
	NEW WORK
	CONNECT TO EXISTING
	AIRFLOW / PIPE FLOW DIRECTION
	PIPE TURNING DOWN
	PIPE TURNING UP
	PRESSURE REDUCING VALVE
	ROOM THERMOSTAT
	ROOM HUMIDISTAT
	PUMP
	CONTROL VALVE - TWO WAY
	CONTROL VALVE - THREE WAY
	ISOLATION VALVE
	BALANCING VALVE
	CHECK VALVE
	STRAINER - OVER 50MM WITH VALVED FLUSHING DRAIN
	PIPE BRANCH OFF TOP
	PIPE BRANCH OFF BOTTOM
	RELIEF VALVE
	PRESSURE GAUGE
	TEMPERATURE GAUGE
	CAP
	SOLENOID VALVE
	FUSIBLE LINK VALVE
	HEAT TRACING

	DUCT RISE (SINGLE LINE)
	SUPPLY GRILLE - DIMENSIONS AS SHOWN ON SCHEDULE
	EXHAUST/RETURN GRILLE - DIMENSIONS AS SHOWN ON SCHEDULE
	CEILING SUPPLY AIR DIFFUSER - DIMENSIONS AS SHOWN ON SCHEDULE
	LINEAR SLOT DIFFUSER - DIMENSIONS AS SHOWN ON SCHEDULE
	CEILING EXHAUST/RETURN GRILLE - DIMENSIONS AS SHOWN ON SCHEDULE
	SUPPLY AIR ROUND DIFFUSER
	BRANCH TAKE-OFF WITH ADJUSTABLE SPLITTER IN SUPPLY DUCT (DOUBLE LINE)
	O.E.D. OPEN ENDED DUCT WITH BALANCING DAMPER AND BELLMOUTH. DIRECTION AS SHOWN (DOUBLE LINE)
	FLEXIBLE DUCT CONNECTION
	ACOUSTICALLY LINED DUCTWORK (DOUBLE LINE)
	DUCT SILENCER
	FLEXIBLE DUCT (DOUBLE LINE)
	FLEXIBLE DUCT (SINGLE LINE)
	FLEXIBLE DUCT CONNECTION WITH BALANCING DAMPER ON TAKE-OFF
	DUCT MOUNTED HEATING COIL (DOUBLE LINE)
	DUCT MOUNTED HEATING COIL (SINGLE LINE)
	FIRE RATED DUCTWORK (DOUBLE LINE)
	TRANSFER AIR DUCT
	SUPPLY AIR LIGHT TROFFER

FIRE PROTECTION	
SYMBOL	DESCRIPTION
	SPRINKLER LINE
	FIRE MAIN
	STANDPIPE
	SUPERVISED VALVE
	WATER FLOW ALARM
	PRESSURE SWITCH
	TEST CONNECTION
	FIRE DEPARTMENT CONNECTION
	PRESSURE SWITCH
	WATER FLOW ALARM
	EXCESS PRESSURE PUMP
	WET ALARM CHECK VALVE
	TEST & DRAIN VALVE
	WATER FLOW ALARM
	PRESSURE SWITCH
	DRY ALARM CHECK VALVE
	TEST & DRAIN VALVE
	AIR COMPRESSOR
	SPRINKLER VALVE CABINET
	FIRE EXTINGUISHER CABINET
	FIRE HOSE CABINET
	FIRE EXTINGUISHER C/W WALL BRACKET
	POST-INDICATOR VALVE
	FIRE HYDRANT C/W SHUT-OFF VALVE
	PENDENT SPRINKLER HEAD
	UPRIGHT SPRINKLER HEAD
	CONCEALED SPRINKLER HEAD
	FIRE SUPPRESSION (CLEAN AGENT) SPRINKLER HEAD
	SIDEWALL SPRINKLER HEAD

MECHANICAL DRAWING LIST	
DRAWING #	DRAWING NAME
M-000	COVER PAGE
M-001	MECHANICAL LEGEND & DRAWING LIST
M-100	MECHANICAL SITE PLAN
M-150	ROOF PLAN
M-250	FOUNDATION PLAN
M-251	PLUMBING NEW WORK - LEVEL 1
M-252	MECHANICAL ROOM PIPING
M-351	VENTILATION NEW WORK - LEVEL 1
M-551	FIRE PROTECTION NEW WORK - LEVEL 1
M-701	FIRE PROTECTION SCHEMATIC
M-702	HEATING SCHEMATIC
M-703	VRF SCHEMATIC
M-704	GAS SCHEMATIC
M-750	MECHANICAL CONTROL SEQUENCES

M-751	MECHANICAL CONTROL SEQUENCES II
M-752	MECHANICAL CONTROL SEQUENCES III
M-800	MECHANICAL TYPICAL DETAILS I
M-801	MECHANICAL TYPICAL DETAILS II
M-802	MECHANICAL TYPICAL DETAILS III
M-803	MECHANICAL TYPICAL DETAILS IV
M-804	MECHANICAL TYPICAL DETAILS V
M-805	MECHANICAL TYPICAL DETAILS VI
M-806	MECHANICAL TYPICAL DETAILS VII
M-807	MECHANICAL TYPICAL DETAILS VIII
M-808	MECHANICAL TYPICAL DETAILS IX
M-809	MECHANICAL TYPICAL DETAILS X
M-900	MECHANICAL SCHEDULES
M-901	MECHANICAL SCHEDULES II



350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

[illegible]

All measurements are to be checked and verified on site by the contractor before proceeding with work

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: 1 : 500

MECHANICAL SITE PLAN

Drawing
No. **M-100**



TEL: 905-507-0800
WEB: WWW.QUASARCG.COM

YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: Fizzah Khan/Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: 1 : 100

Sheet
Title:

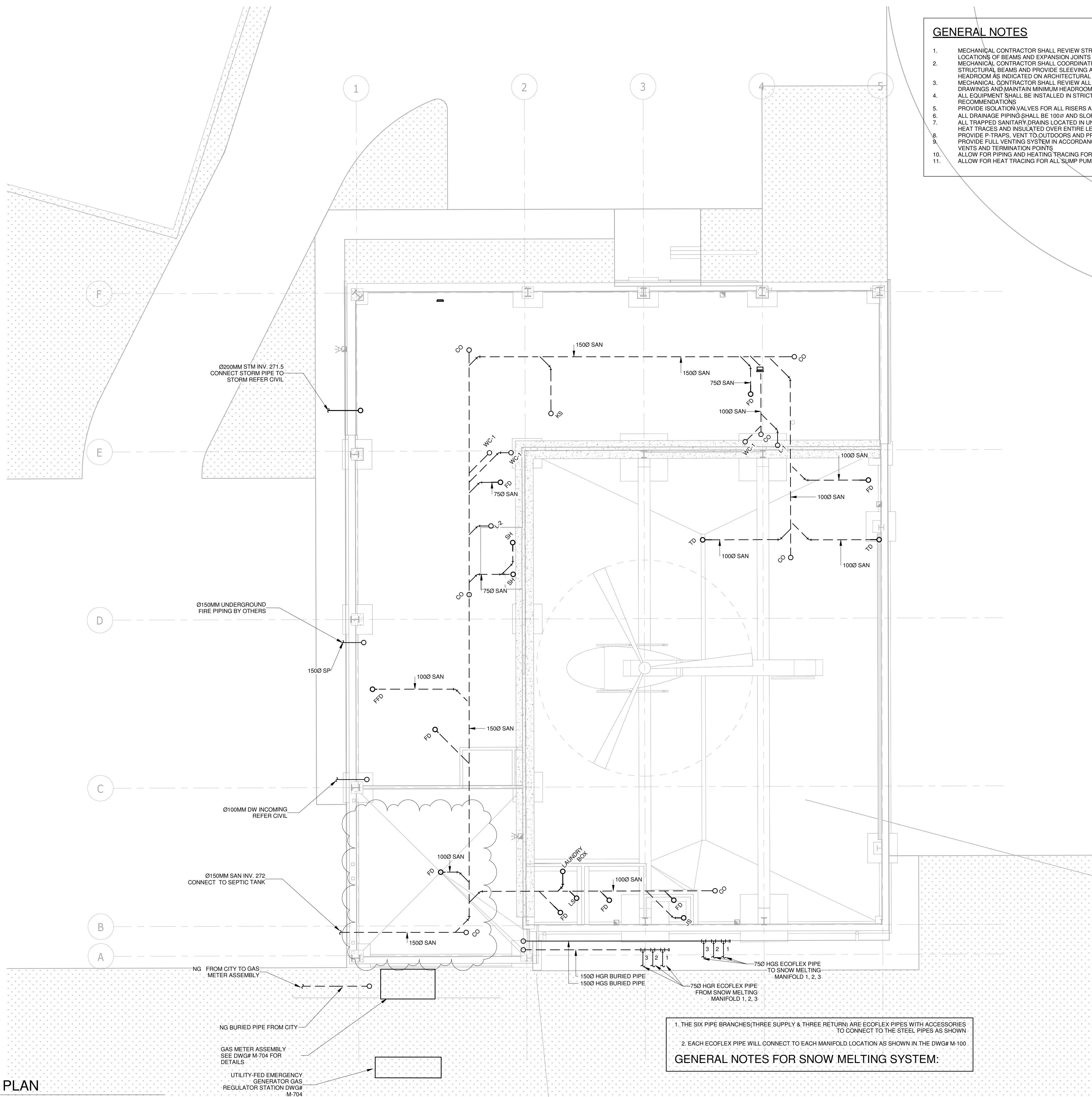
ROOF PLAN

Drawing
No. **M-150**



350 GARFIELD WRIGHT
BOULEVARD
WN OF EAST GWILLIMBURY

Key Plan



GENERAL NOTES

1. MECHANICAL CONTRACTOR SHALL REVIEW STRUCTURAL DRAWINGS REGARDING SIZE AND LOCATIONS OF BEAMS AND EXPANSION JOINTS
2. MECHANICAL CONTRACTOR SHALL COORDINATE ALL PIPING AND DUCTWORK WITH STRUCTURAL BEAMS AND PROVIDE ANY NECESSARY TO MAINTAIN MINIMUM HEADROOM AS INDICATED ON ARCHITECTURAL DRAWINGS
3. MECHANICAL CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND INTERIOR DESIGN DRAWINGS AND MAINTAIN MINIMUM HEADROOM AS INDICATED
4. EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS
5. PROVIDE ISOLATION VALVES FOR ALL RISERS AND AT EACH FIXTURE
6. ALL DRAINAGE PIPING SHALL BE 100% AND SLOPED AT 1% UNLESS NOTED OTHERWISE
7. TRAP AND SANITARY DRAININGS SHALL BE 100% SLOPED AND SHALL BE ELECTRICALLY HEAT TRACES AND INSULATED OVER ENTIRE LENGTH
8. PROVIDE P-TRAPS, VENT TO OUTDOORS AND PRIMING TO ALL FLOOR DRAINS
9. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE WITH OBC PART 7. COORDINATE ALL VENTS AND TERMINATION POINTS
10. ALLOW FOR PIPING AND HEATING TRACING FOR ALL TRAP PRIMERS
11. ALLOW FOR HEAT TRACING FOR ALL SUMP PUMP DISCHARGE PIPING

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Sheet
Title:

FOUNDATION PLAN

Drawing
No.
M-250



350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

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Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

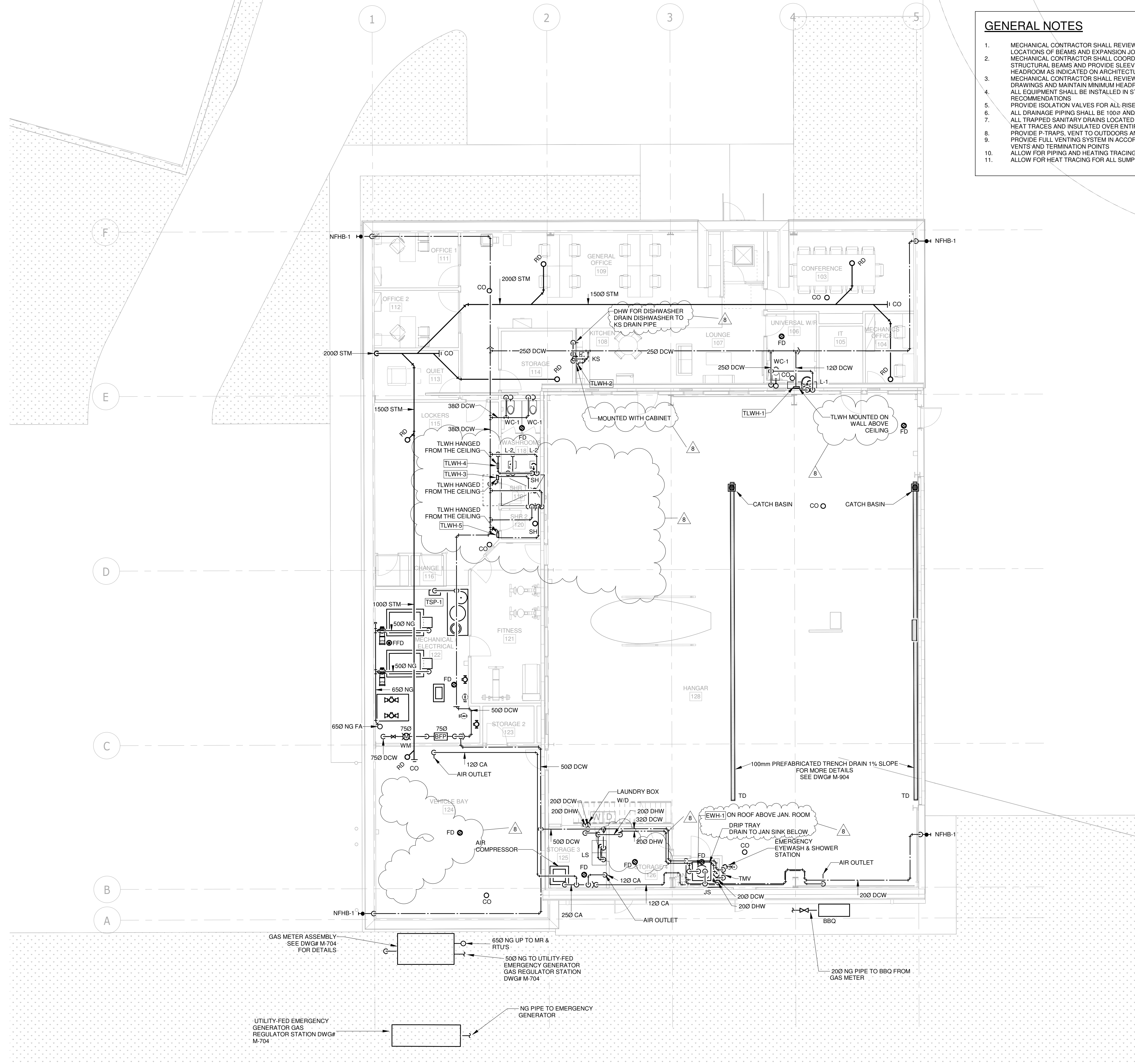
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PLUMBING NEW WORK - LEVEL 1

Drawing
No. **M-251**

GENERAL NOTES

1. MECHANICAL CONTRACTOR SHALL REVIEW STRUCTURAL DRAWINGS REGARDING SIZE AND LOCATIONS OF BEAMS AND EXPANSION JOINTS
2. MECHANICAL CONTRACTOR SHALL COORDINATE ALL PIPING AND DUCTWORK WITH STRUCTURAL BEAMS AND PROVIDE MINIMUM HEADROOM AS NECESSARY TO MAINTAIN MINIMUM HEADROOM AS INDICATED ON ARCHITECTURAL DRAWINGS
3. MECHANICAL CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND INTERIOR DESIGN DRAWINGS AND MAINTAIN MINIMUM HEADROOM AS INDICATED
4. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS
5. PROVIDE ISOLATION VALVES FOR ALL RISERS AND AT EACH FIXTURE
6. ALL DRAINAGE PIPING SHALL BE 100% AND SLOPED AT 1% UNLESS NOTED OTHERWISE
7. ALL TRAPPED SANITARY DRAIN LINES LOCATED IN CEILING SPACE SHALL BE ELECTRICALLY HEAT TRACES AND INSULATED OVER ENTIRE LENGTH
8. PROVIDE P-TRAPS, VENT TO OUTDOORS AND PRIMING TO ALL FLOOR DRAINS
9. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE WITH OBC PART 7. COORDINATE ALL VENTS AND TERMINATION POINTS
10. ALLOW FOR PIPING AND HEATING TRACING FOR ALL TRAP PRIMERS
11. ALLOW FOR HEAT TRACING FOR ALL SUMP PUMP DISCHARGE PIPING



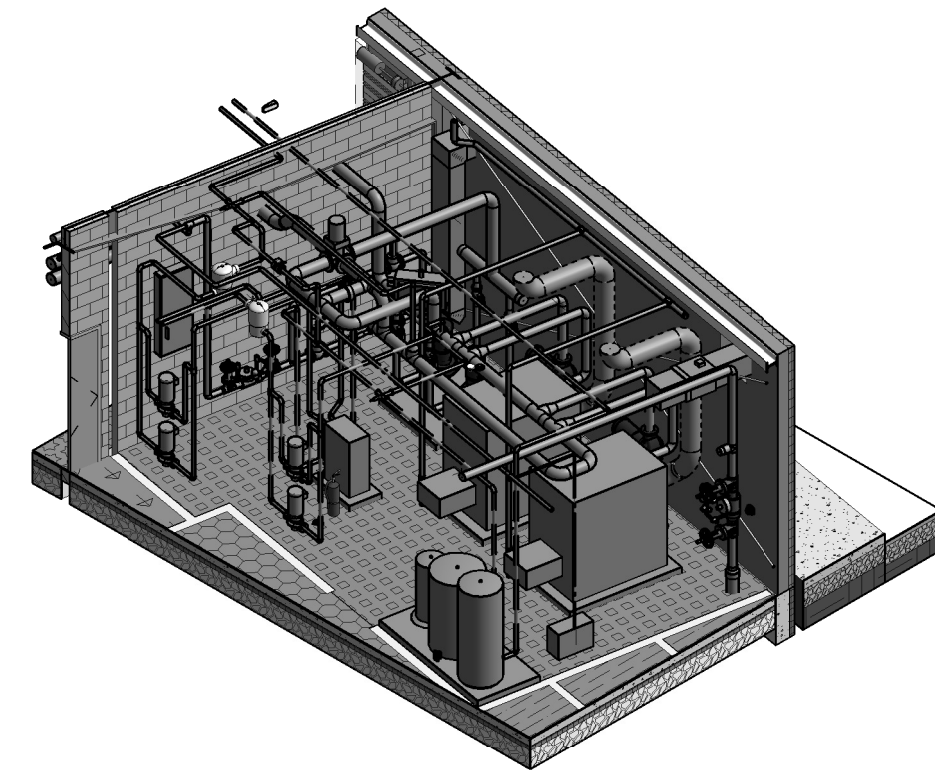
PLUMBING NEW WORK - LEVEL 1

SCALE: 1 : 100

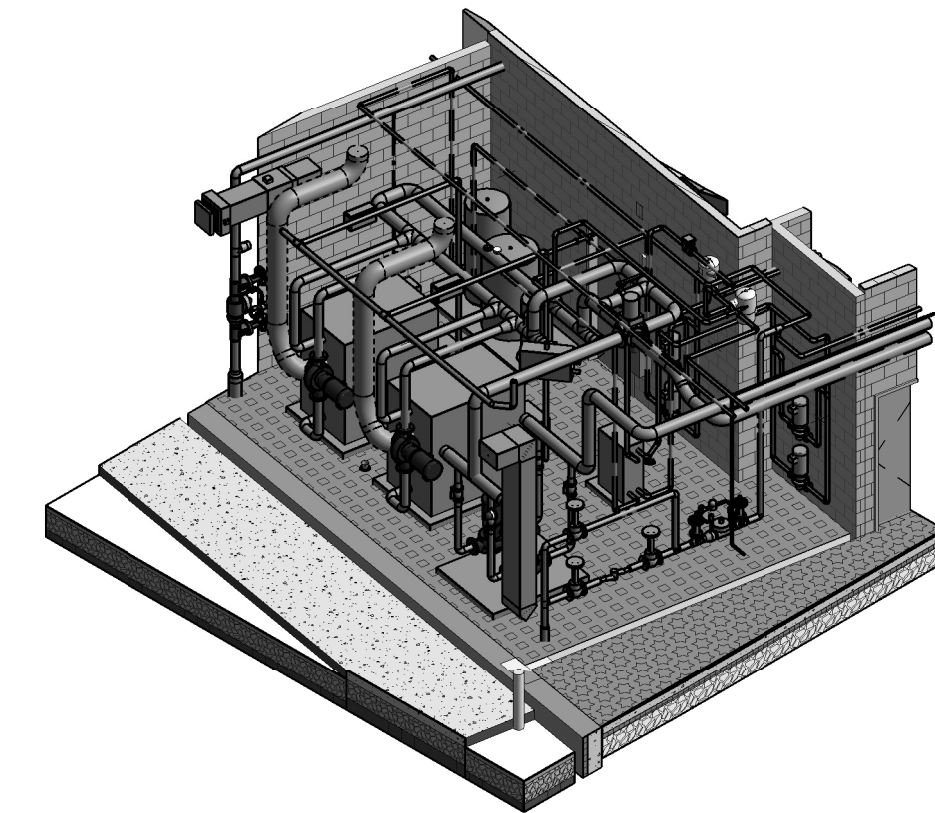
YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

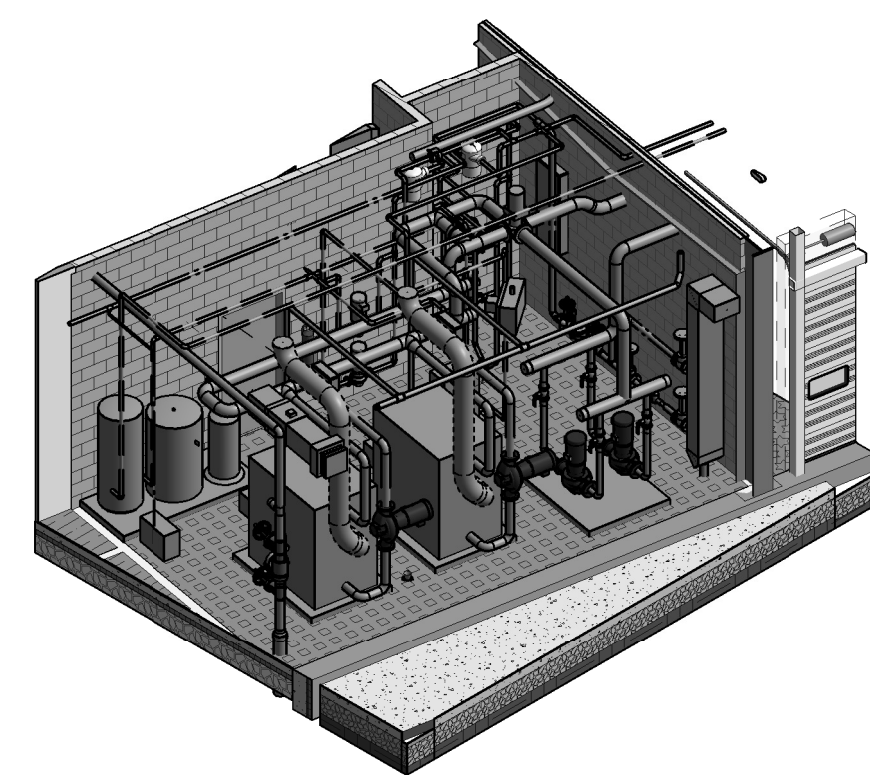
Key Plan



2 MECH ROOM 3D VIEW 1
SCALE:



3 MECH ROOM 3D VIEW 2
SCALE:



4 MECH ROOM 3D VIEW 3
SCALE:

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Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

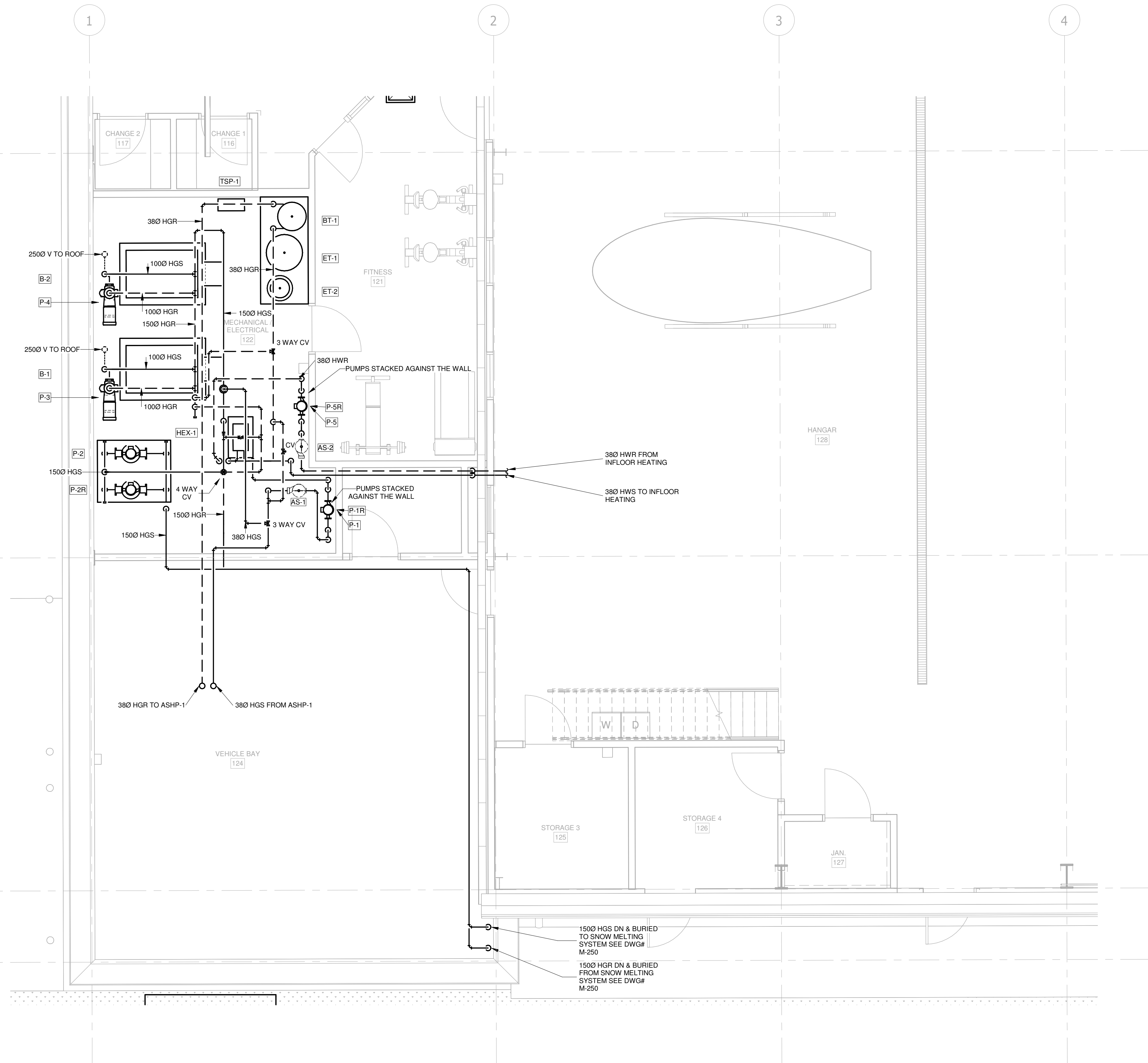
Do not scale drawings

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Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: 1 : 50

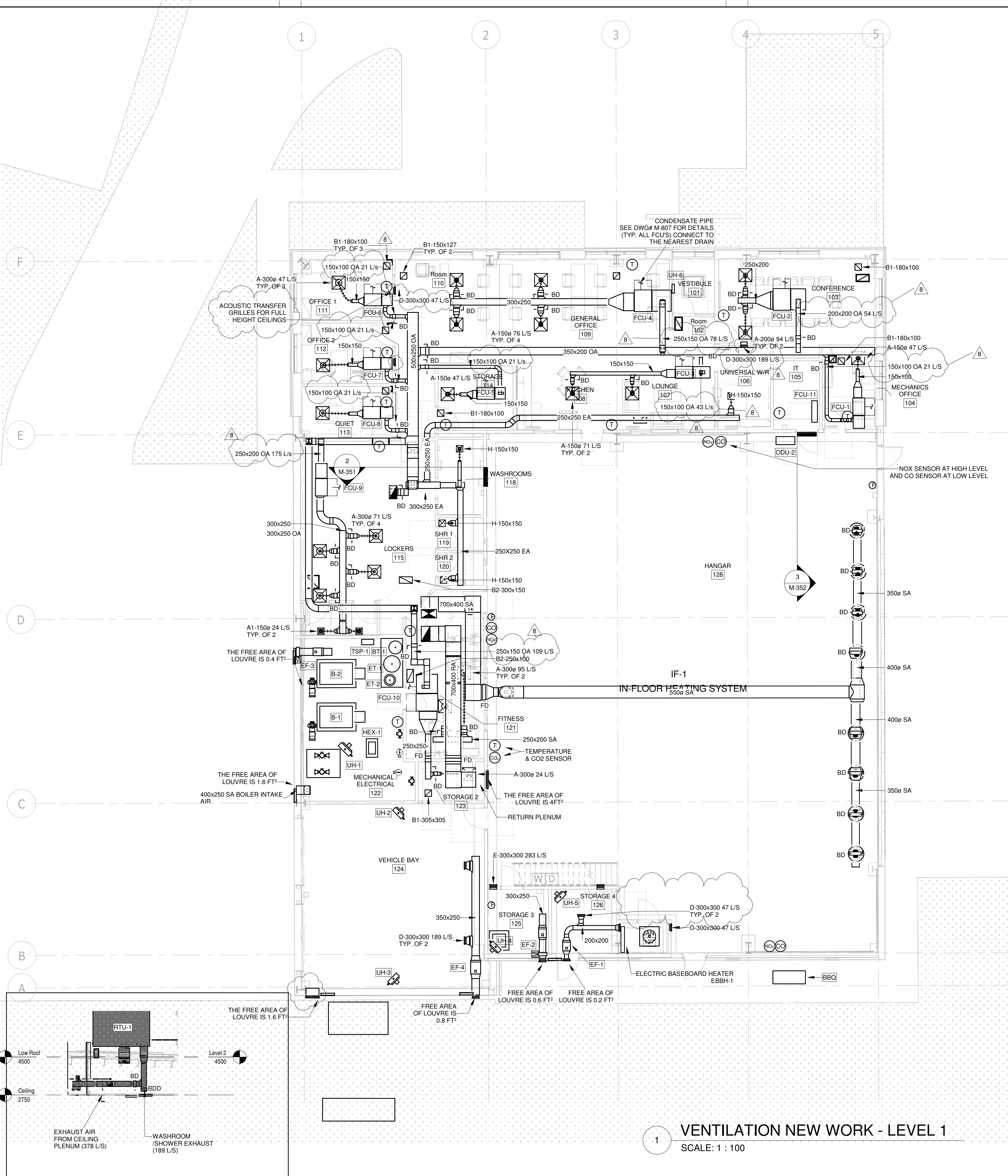
Sheet
Title:

MECHANICAL ROOM
PIPING

Drawing
No.
M-252



- GENERAL NOTES:
1. CONTRACTOR TO PROVIDE ALL MANIFOLDS AND CONNECTIONS AND PIPING FOR INFLOOR HEATING
 2. CONTRACTOR TO PROVIDE PROPOSED MANIFOLD LOCATIONS AND SHOP DRAWING FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.



- 1. SEQUENCE OF OPERATION RTU-1**
- 1.1. GENERAL**
- 1.1.1. THE ROOFTOP UNIT PROVIDES HEATING, COOLING AND VENTILATION AIR TO THE SPACES VIA THE FAN COILS. THE UNIT EXHAUST FAN IS USED TO EXHAUST AIR FROM THE WASHROOMS. SCHEDULING SHOULD BE COORDINATED WITH THE WASHROOM EXHAUST FAN.
- 1.1.2. THE UNIT IS A CONSTANT VOLUME UNIT AND CONSISTS OF SUPPLY FAN, AN EXHAUST FAN, A HEAT WHEEL WITH BYPASS DAMPERS, A GAS FIRED BURNER AND A DX COOLING COIL.
- 1.2. SAFETIES AND LIMITS**
- 1.2.1. A FREEZE STAT IS HARDWIRED TO SHUTDOWN THE FANS AND CLOSE THE DAMPERS WHEN THE SENSED TEMPERATURE DROPS BELOW 2 DEG C. A 5 MINUTE TIME DELAY IS PROVIDED ON START-UP TO BYPASS THE LIMIT AND ALLOW TIME FOR THE HEATING SYSTEM TO COME UNDER CONTROL. ONCE THE TIMER HAS EXPIRED THE UNIT WILL TRIP IF IT DETECTS AN AIR TEMPERATURE OF LESS THAN 2 DEG C. ONCE TRIPPED THE LIMIT MUST BE RESET MANUALLY. PROVIDE A RESET BUTTON ON THE CONTROL PANEL. PROTECTION WILL WORK WHEN THE FAN IS IN EITHER 'HAND' OR 'AUTO'.
- 1.2.2. SUPPLY AIR TEMPERATURE CONTROL IS DISABLED UNTIL FAN RUN STATUS IS RECEIVED.
- 1.2.3. SIMULTANEOUS HEATING AND COOLING IS PROHIBITED.
- 1.2.4. MINIMUM ON/OFF RUN TIMES ARE PROVIDED FOR BOTH THE DX STAGING AND GAS BURNER. COORDINATE WITH MANUFACTURER TO ENSURE PROPER TIME DELAYS.
- 1.2.5. IF THE HEAT WHEEL IS OFF FOR MORE THAN 1 DAY THE CONTROLLER WILL ROTATE THE WHEEL AT MINIMUM SPEED FOR A MINIMUM OF 5 MINUTES.
- 1.3. MODES OF OPERATION**
- 1.3.1. THE OCCUPIED AND UNOCCUPIED MODES ARE DETERMINED BY A TIME OF DAY SCHEDULE.
- 1.4. OCCUPIED MODE**
- 1.4.1. OVERVIEW: THE UNIT WILL PROVIDE HEATING, COOLING AND VENTILATION TO THE SPACES VIA THE FAN COIL UNITS. THE UNIT WILL CONTROL TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT SETPOINT.
- 1.4.2. SUPPLY AIR TEMPERATURE SETPOINT: THE UNIT DELIVERS NEUTRAL AIR FOR THE FAN COILS. THE SETPOINT WILL BE SET TO 16 DEG C (HEATING) AND 18 DEG C (COOLING).
- 1.4.3. SUPPLY FAN + OA DAMPER: THE OUTSIDE AIR DAMPER IS OPEN, AND THE SUPPLY FAN RUNS CONTINUOUSLY.
- 1.4.4. EXHAUST FAN + EA DAMPER: THE EXHAUST AIR DAMPER IS OPEN, AND THE EXHAUST FAN RUNS CONTINUOUSLY.
- 1.4.5. HEAT WHEEL + BYPASS DAMPERS: WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 12 DEG C THE HEAT WHEEL WILL MODULATE TO EITHER MAINTAIN THE SUPPLY AIR TEMPERATURE AT SETPOINT OR TO PROVIDE FROST CONTROL. WHEN THE OUTDOOR AIR TEMPERATURE IS MORE THAN 2 DEG C ABOVE THE RETURN AIR TEMPERATURE THE HEAT WHEEL WILL OPERATE AT MAXIMUM SPEED. OTHERWISE WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 12 DEG C AND LESS THAN THE EXHAUST AIR TEMPERATURE THE HEAT WHEEL WILL BE OFF. WHEN THE HEAT WHEEL IS ROTATING THE BYPASS DAMPERS WILL BE CLOSED. WHEN THE HEAT WHEEL IS OFF THE DAMPERS WILL BE FULLY OPEN. THE CONTROLLER WILL PROVIDE FROST PROTECTION FOR THE HEAT WHEEL. THE CONTROLLER WILL SLOW THE WHEEL DOWN AND STOP IT IF NECESSARY TO MAINTAIN THE SUPPLY AIR TEMPERATURE SLIGHTLY ABOVE THE FROST SETPOINT WHICH VARIES WITH THE EXHAUST AIR HUMIDITY AND OUTDOOR AIR TEMPERATURE AS SHOWN IN THE TABLE BELOW.
- | OAT (C) | SETPOINT RH% (20%) | OAT (C) | SETPOINT RH% (20%) | OAT (C) | SETPOINT RH% (20%) |
|---------|--------------------|---------|--------------------|---------|--------------------|
| -25 | -15.0 C | -19.4 | -11.1 C | -15.6 | -8.3 C |
| -26.1 | -11.7 C | -20.3 | -7.8 C | -16.1 | -4.9 C |
| -28.3 | -8.3 C | -22.2 | -4.4 C | -17.2 | -1.9 C |
| -32.2 | -5.0 C | -25 | -1.9 C | -19.4 | 0.8 C |
| -35 | -3.9 C | -27.2 | -0.6 C | -20.6 | 2.3 C |
| -40 | -3.3 C | -31.1 | -0.3 C | -23.3 | 3.3 C |
- 1.4.6. DX SYSTEM: DX COOLING WILL BE CONTROLLED TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT SETPOINT.
- 1.4.7. GAS BURNER: THE GAS BURNER WILL BE CONTROLLED TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT SETPOINT.
- 1.5. UNOCCUPIED MODE**
- 1.5.1. OVERVIEW: THE UNIT IS OFF.
- 1.5.2. SUPPLY FAN + OA DAMPER: THE DAMPER IS CLOSED AND THE SUPPLY FAN IS OFF.
- 1.5.3. EXHAUST FAN + EA DAMPER: THE DAMPER IS CLOSED AND THE EXHAUST FAN IS OFF.
- 1.5.4. DX SYSTEM: DX COOLING IS OFF.
- 1.5.5. GAS BURNER: THE GAS BURNER IS OFF.
- 1.6. URGENT ALARMS**
- 1.6.1. LOW TEMPERATURE SAFETY ALARM IS TRIPPED.
- 1.7. NON-URGENT ALARMS**
- 1.7.1. FAN IS COMMANDED ON AND STATUS IS NOT RECEIVED (2 MINUTE DELAY).
- 1.7.2. THE UNIT IS RUNNING AND THE SUPPLY AIR TEMPERATURE IS BELOW 8 DEG C OR ABOVE 24 DEG C.
- 1.7.3. FAN IS COMMANDED OFF AND STATUS IS RECEIVED (10 MINUTE DELAY).
- 1.8. MAINTENANCE ALARMS**
- 1.8.1. FILTER DIFFERENTIAL IS ABOVE SETPOINT.
- 1.8.2. MANUAL OVERRIDES ARE PLACED ON THE SYSTEM.
- 1.9. OPERATIONAL TRENDS (5-MINUTE INTERVALS, 7-DAYS)**
- 1.9.1. ALL INPUTS AND OUTPUTS.
- 1.9.2. SUPPLY AIR TEMPERATURE SETPOINT.
- 1.10. PERFORMANCE TRENDS (DAILY INTERVALS, 5-YEARS)**
- 1.10.1. SUPPLY AIR TEMPERATURE INDEX: DAILY AVERAGE OF THE PERCENTAGE OF TIME THE SUPPLY AIR TEMPERATURE IS WITHIN NORMAL LIMITS (BETWEEN THE COOLING SETPOINT (PLUS 1 DEG C) AND HEATING SETPOINT (MINUS 1 DEG C)).
- 1.10.2. AIRFLOW COOLING INTENSITY: DAILY AVERAGE OF THE AMOUNT OF TIME IN THE COOLING MODE.
- 1.10.3. AIRFLOW HEATING INTENSITY: DAILY AVERAGE OF THE AMOUNT OF TIME IN THE HEATING MODE.
- 1.10.4. DAILY AIRFLOW HOURS: THE TOTAL NUMBER OF HOURS THE UNIT OPERATED DURING THE DAY.
- 1.0. SEQUENCE OF OPERATIONS RTU-2**
- 1.1. GENERAL**
- 1.1.1. THE ROOFTOP UNIT PROVIDES HEATING, COOLING (FREE COOLING ONLY), AND VENTILATION TO THE HANGER. WHEN GAS DETECTION SENSORS (CO/NOX) DETECT THE PRESENCE OF GAS, THE UNIT WILL OPERATE AT FULL VOLUME AND 100% OUTSIDE AIR REGARDLESS OF THE COOLING SETPOINT. UNTIL GAS LEVELS DROP TO SUITABLE LEVELS.
- 1.1.2. THE UNIT CONSISTS OF A SUPPLY FAN, EXHAUST FAN, MIXING DAMPERS, ENERGY RECOVERY WHEEL, AND A GAS FIRED BURNER.
- 1.1.3. THE UNIT IS A VARIABLE VOLUME UNIT AND THE SUPPLY AND EXHAUST FANS HAVE BEEN PROVIDED WITH VARIABLE FREQUENCY DRIVES.
- 1.1.4. PROVIDE AN ALARM STROBE/HORN IN THE SPACE FOR LOCAL HIGH GAS ALARM ANNUNCIATION.
- 1.1.5. OCCUPANCY STATUS IS NOT CONSIDERED FOR OPERATION.
- 1.2. SAFETIES AND LIMITS**
- 1.2.1. FAN SPEED MODULATION IS DISABLED UNTIL FAN RUN STATUS IS RECEIVED.
- 1.2.2. THE MINIMUM SPEED FOR THE VFD IS 50% (30 HZ - CONFIRM MIN SPEED WITH BALANCER).
- 1.2.3. SUPPLY AIR TEMPERATURE CONTROL IS DISABLED UNTIL FAN RUN STATUS IS RECEIVED.
- 1.2.4. DAMPER CONTROL IS DISABLED UNTIL FAN RUN STATUS IS RECEIVED.
- 1.2.5. SIMULTANEOUS HEATING AND COOLING IS NOT PERMITTED.
- 1.2.6. IF THE HEAT WHEEL IS OFF FOR MORE THAN 1 DAY THE CONTROLLER WILL ROTATE THE WHEEL FOR A MINIMUM OF 5 MINUTES.
- 1.3. MODES OF OPERATION**
- 1.4. OCCUPIED MODE**
- 1.4.1. OVERVIEW: THE UNIT WILL PROVIDE HEATING, COOLING (FREE COOLING ONLY), AND VENTILATION TO THE SPACE. THE UNIT WILL CONTROL TO MAINTAIN THE SPACE TEMPERATURE AT SETPOINT.
- 1.4.2. SPACE TEMPERATURE SETPOINTS: THE HEATING SETPOINT WILL BE SET TO 16 DEG C (OR 18 DEG C WHEN ASHP IS OFF).
- 1.4.3. GAS DETECTION SETPOINTS: THE CO SETPOINT IS 25 PPM. THE NOX SETPOINT IS 1 PPM. UNIT RUNS AT 100%.
- 1.4.4. SUPPLY FAN: THE SUPPLY FAN RUNS CONTINUOUSLY AT FULL SPEED.
- 1.4.5. EXHAUST FAN: THE POWER EXHAUST FAN RUNS IN CONJUNCTION WITH THE FRESH AIR DAMPER. ONCE THE DAMPER IS OPEN ABOVE 30%, THE POWER EXHAUST FAN WILL START AND ITS SPEED WILL BE SET IN ACCORDANCE WITH THE AMOUNT OF FRESH AIR BEING PROVIDED.
- 1.4.6. MIXED AIR DAMPERS: THE DAMPERS WILL CONTROL TO MAINTAIN THE MINIMUM AMOUNT OF FRESH AIR TO THE SPACE. GAS DETECTION SENSORS BELOW SETPOINT AND FREE COOLING WHEN AVAILABLE AND REQUIRED. THE MINIMUM FRESH AIR LIMIT IS SET TO 20% (BALANCER TO CONFIRM). IF ANY GAS DETECTION SENSOR IS ABOVE SETPOINT, THE DAMPERS WILL BE SET TO 100% OUTDOOR AIR (GAS DETECTION OVERRIDES ALL OTHER CONTROL STRATEGIES). FREE COOLING WILL PROVIDE THE ONLY STAGE OF COOLING FOR THE UNIT. WHEN FREE COOLING IS AVAILABLE THE MIXED AIR DAMPERS WILL MODULATE TO MAINTAIN THE SPACE TEMPERATURE AT SETPOINT. FREE COOLING WILL BE AVAILABLE WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 12 DEG C.
- 1.4.7. GAS BURNER: THE GAS BURNER WILL BE CONTROLLED TO MAINTAIN THE SPACE TEMPERATURE AT SETPOINT.
- 1.4.8. HEAT WHEEL + BYPASS DAMPERS (FREE COOLING MODE): WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 12 DEG C THE HEAT WHEEL WILL MODULATE TO EITHER MAINTAIN THE SPACE TEMPERATURE AT SETPOINT OR TO PROVIDE FROST CONTROL. UNIT TURNS ON FOR THE FOLLOWING TRIGGERS:
- CO2 > LIMIT, 50% RETURN FAN, 50% SUPPLY FAN.
 - CO > LIMIT, 100% RETURN FAN, 80% SUPPLY FAN.
 - NOX > LIMIT, 100% RETURN FAN, 80% SUPPLY FAN OR TEMP < 16 DEG C.
 - OFF 18 DEG C, 100% FAN.
- 1.4.9. FROST TEMPERATURE SETPOINT: THE FROST TEMPERATURE SETPOINT VARIES WITH THE EXHAUST AIR HUMIDITY AND OUTDOOR AIR TEMPERATURE AS SHOWN IN THE TABLE BELOW:
- | OAT (C) | SETPOINT RH% (20%) | OAT (C) | SETPOINT RH% (20%) | OAT (C) | SETPOINT RH% (20%) |
|---------|--------------------|---------|--------------------|---------|--------------------|
| -25 | -15.0 C | -19.4 | -11.1 C | -15.6 | -8.3 C |
| -26.1 | -11.7 C | -20.3 | -7.8 C | -16.1 | -4.9 C |
| -28.3 | -8.3 C | -22.2 | -4.4 C | -17.2 | -1.9 C |
| -32.2 | -5.0 C | -25 | -1.9 C | -19.4 | 0.8 C |
| -35 | -3.9 C | -27.2 | -0.6 C | -20.6 | 2.3 C |
| -40 | -3.3 C | -31.1 | -0.3 C | -23.3 | 3.3 C |
- 1.5. UNOCCUPIED MODE**
- 1.5.1. OVERVIEW: THE ROOFTOP UNIT IS OFF. DURING THE UNOCCUPIED MODE THE RTU WILL START UP TO PROVIDE HEATING/COOLING AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE UNOCCUPIED SETPOINTS AND FOR GAS DETECTION VENTILATION. IF THE SPACE TEMPERATURE DROPS BELOW THE HEATING SETPOINT OR RISES ABOVE THE COOLING SETPOINT THE UNIT WILL BE ENABLED TO PROVIDE UNOCCUPIED HEATING/COOLING. A DEADBAND OF 2 DEG C IS APPLIED TO RETURN THE UNIT TO THE OFF STATE. IF THE GAS DETECTION SENSORS (EITHER CO OR NOX) RISE ABOVE SETPOINT, THE UNIT WILL BE ENGAGED TO VENTILATE THE SPACE.
- 1.5.2. SPACE TEMPERATURE SETPOINTS: THE UNOCCUPIED HEATING SETPOINT IS SET TO 18 DEG C. THE UNOCCUPIED COOLING SETPOINT IS SET TO 28 DEG C.
- 1.5.3. GAS DETECTION SETPOINTS: THE CO SETPOINT IS 25 PPM. THE NOX SETPOINT IS 1 PPM.
- 1.5.4. SUPPLY FAN: WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 4 DEG C, THE FAN WILL RUN CONTINUOUSLY AT 50% SPEED. OTHERWISE THE FAN IS OFF (5 DEG C DIFFERENTIAL). DURING UNOCCUPIED COOLING OR HEATING, THE FAN WILL RUN AT 100% SPEED. DURING UNOCCUPIED GAS DETECTION VENTILATION, THE FAN WILL RUN AT 100% SPEED.
- 1.5.5. EXHAUST FAN: THE EXHAUST FAN CONTROLS AS PER THE OCCUPIED MODE.
- 1.5.6. MIXED AIR DAMPERS: THE FRESH AIR DAMPER IS CLOSED AND THE RETURN DAMPER IS OPEN AT ALL POINTS IN TIME EXCEPT: 1) WHEN GAS IS DETECTED - DAMPERS GO TO 100% FRESH AIR, 2) THE UNIT IS RUNNING FOR TEMPERATURE CONTROL AND FREE COOLING IS PERMITTED AND REQUIRED.
- 1.5.7. GAS HEATING: CONTROLLED AS PER THE OCCUPIED MODE. HEATING IS OFF WHEN THE UNIT IS OFF.
- 1.5.8. HEAT WHEEL CONTROL: CONTROLLED AS PER THE OCCUPIED MODE. THE HEAT WHEEL IS OFF WHEN THE UNIT IS OFF AND/OR WHEN THE UNIT IS SIMPLY CIRCULATING AIR.
- 1.6. URGENT ALARMS**
- 1.6.1. LOW TEMPERATURE LIMIT.
- 1.6.2. LOW SPACE TEMPERATURE.
- 1.6.3. CO LEVEL ABOVE 50 PPM.
- 1.6.4. NOX LEVEL ABOVE 3 PPM.
- 1.7. NON-URGENT ALARMS**
- 1.7.1. FAN IS COMMANDED ON AND STATUS IS NOT RECEIVED (2 MINUTE DELAY).
- 1.7.2. THE SUPPLY AIR TEMPERATURE DROPS BELOW 7 DEG C.
- 1.7.3. THE SUPPLY AIR TEMPERATURE RISES ABOVE 43 DEG C.
- 1.7.4. FAN IS COMMANDED OFF AND STATUS IS ON (10 MINUTE DELAY).
- 1.8. MAINTENANCE ALARMS**
- 1.8.1. FILTER ALARM.
- 1.8.2. MANUAL OVERRIDES ARE PLACED ON THE SYSTEM.
- 1.9. OPERATIONAL TRENDS (5-MINUTE INTERVALS, 7-DAYS)**
- 1.9.1. ALL INPUTS AND OUTPUTS.
- 1.9.2. SUPPLY AIR TEMPERATURE SETPOINT.
- 1.10. PERFORMANCE TRENDS (DAILY INTERVALS, 5-YEARS)**
- 1.10.1. SPACE TEMPERATURE INDEX: DAILY AVERAGE OF THE PERCENTAGE OF TIME THE SPACE TEMPERATURE IS WITHIN NORMAL LIMITS (BETWEEN THE COOLING SETPOINT (PLUS 1 DEG C) AND HEATING SETPOINT (MINUS 1 DEG C)).
- 1.10.2. AIRFLOW HEATING INTENSITY: DAILY AVERAGE OF THE AMOUNT OF TIME IN THE HEATING MODE.
- 1.10.3. DAILY AIRFLOW HOURS: THE TOTAL NUMBER OF HOURS THE UNIT OPERATED DURING THE DAY.

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YORK REGIONAL POLICE HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GUILMBURY

Key
Plan

NO.	ISSUED	DATE
8	ISSUED FOR ADDENDUM 15	2024-12-04
7	ISSUED FOR ADDENDUM 14	2024-11-27
6	ISSUED FOR ADDENDUM 10	2024-10-15
5	ISSUED FOR ADDENDUM 8	2024-10-07
4	ISSUED FOR ADDENDUM 6	2024-09-30
3	ISSUED FOR ADDENDUM 3	2024-09-23
2	ISSUED FOR TENDER	2024-09-09
1	ISSUED FOR BUILDING PERMIT	2024-07-31

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

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Project No: TT-24-005
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Sheet
Title:

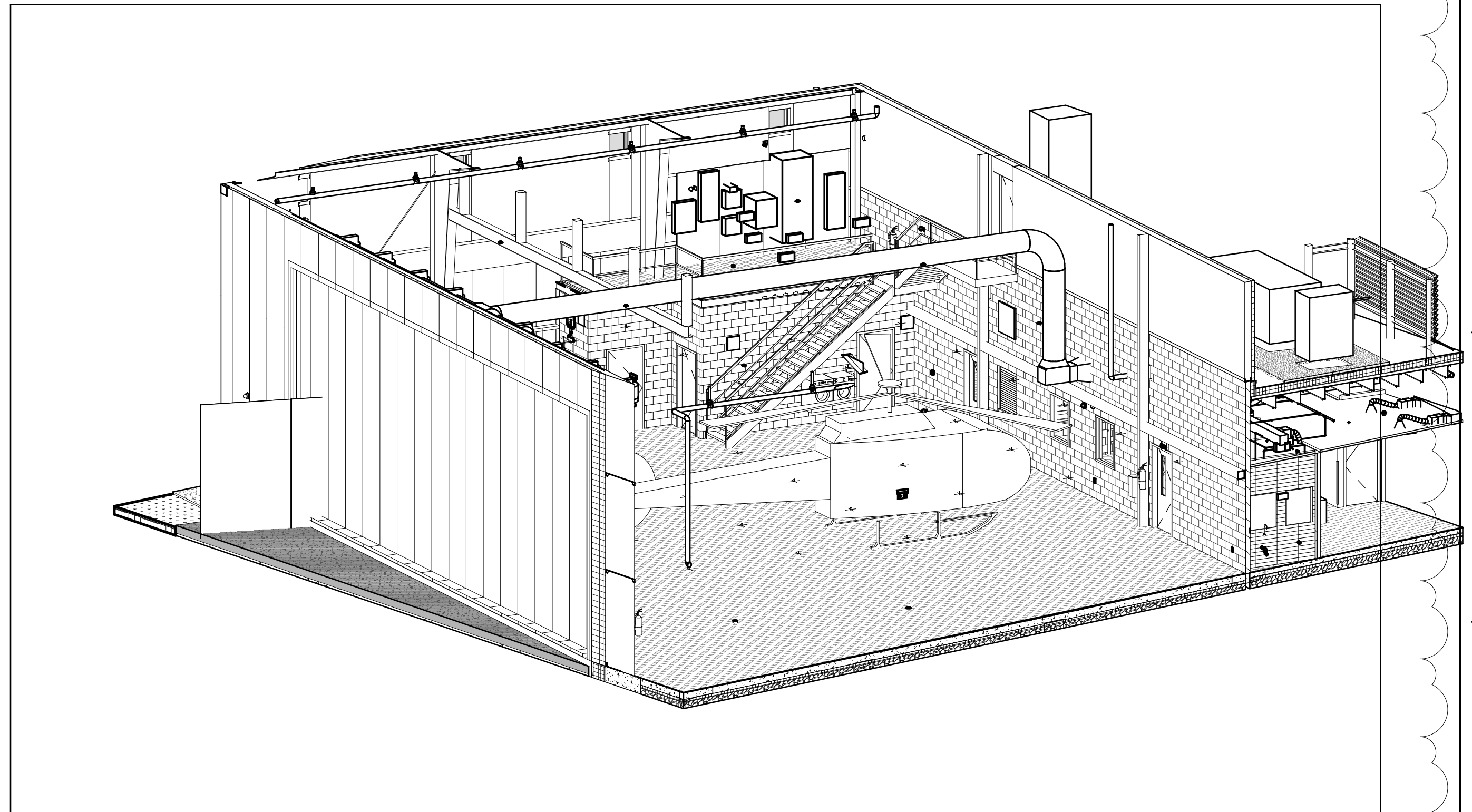
**VENTILATION NEW
WORK - LEVEL 1**

Drawing
No:
M-351

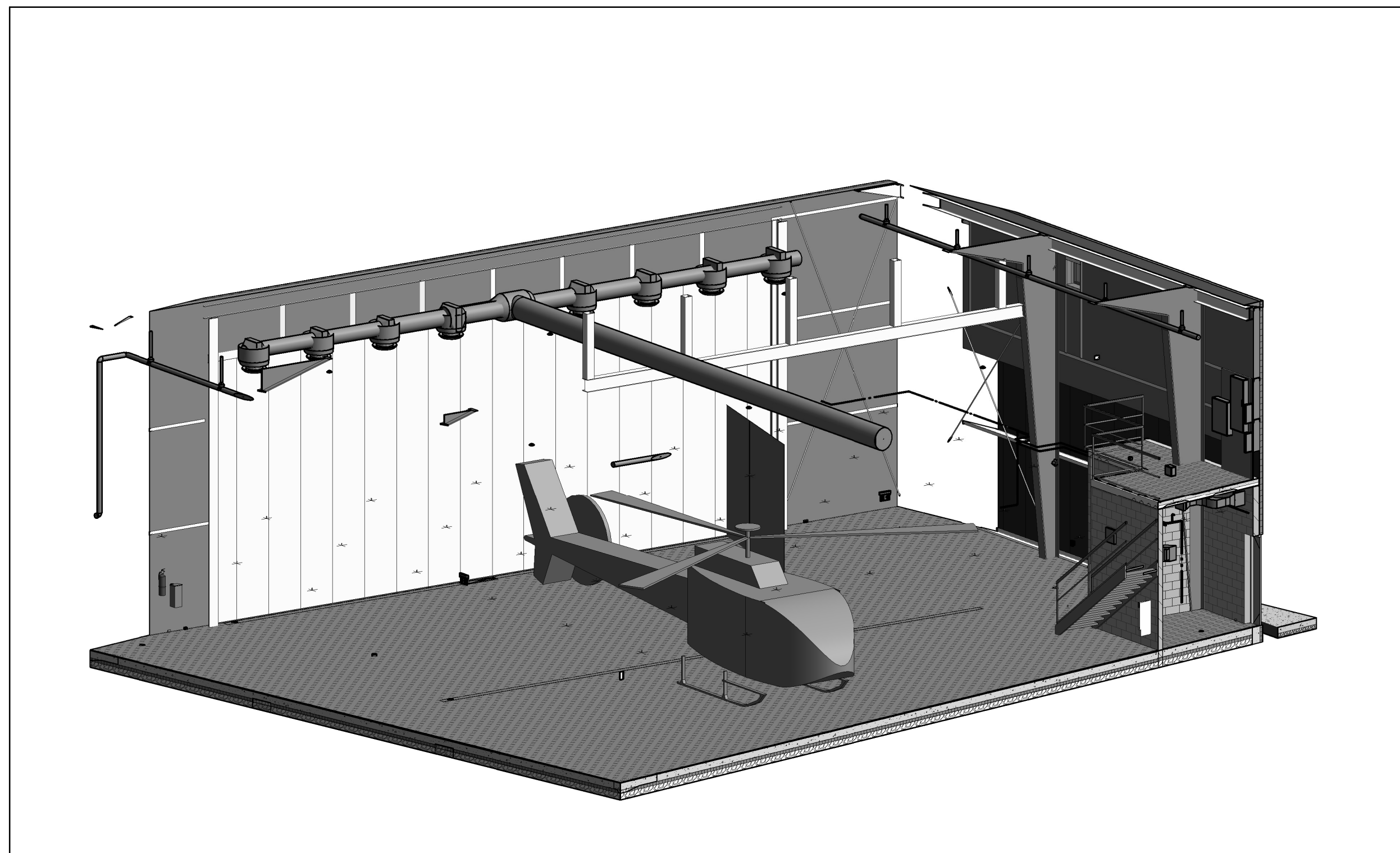
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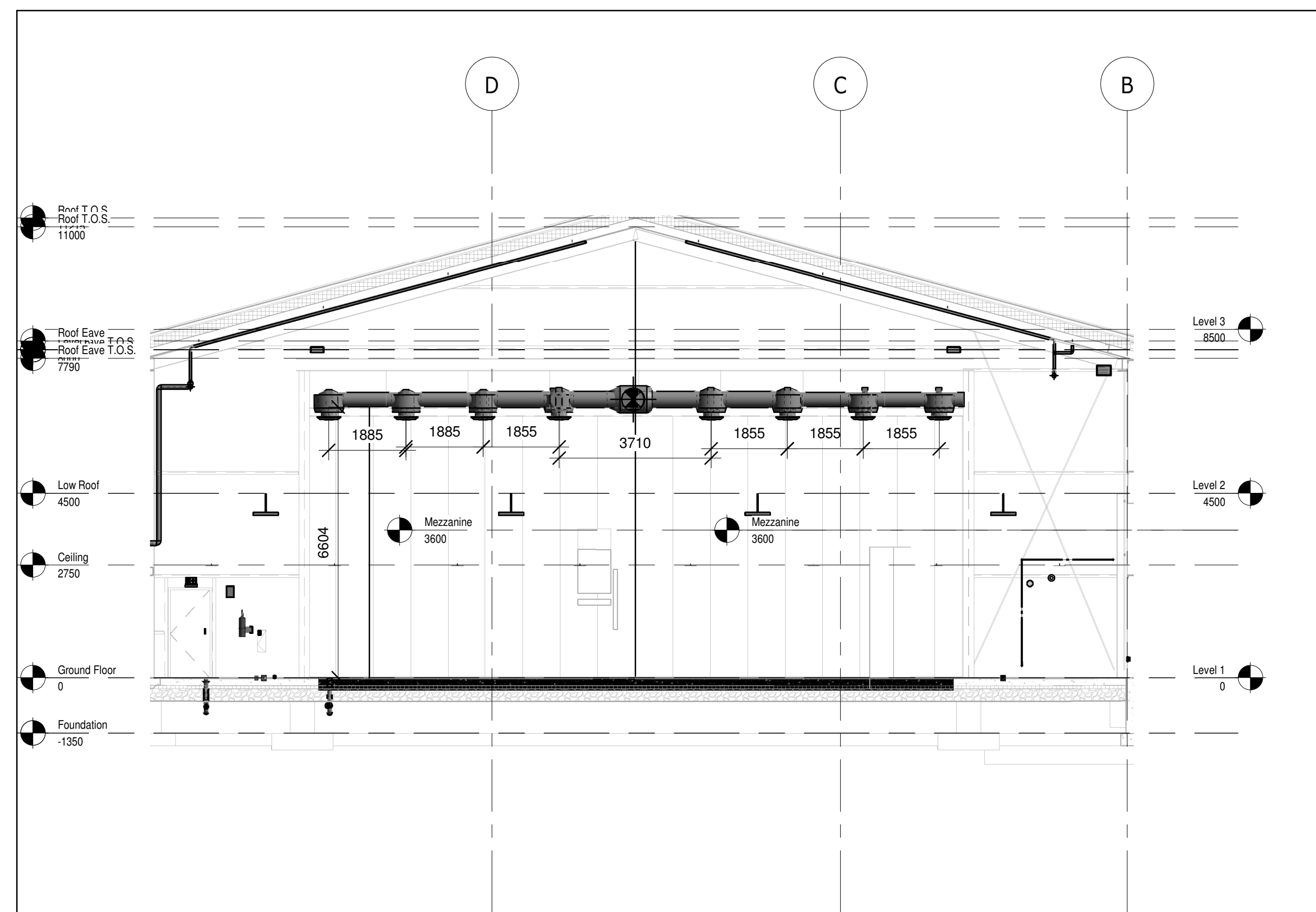
Key Plan



2 HANGAR VENTILATION ISOMETRIC 2
SCALE:



1 HANGAR VENTILATION ISOMETRIC
SCALE:



3 HANGAR VENTILATION SECTION VIEW
SCALE: 1 : 100

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Issues

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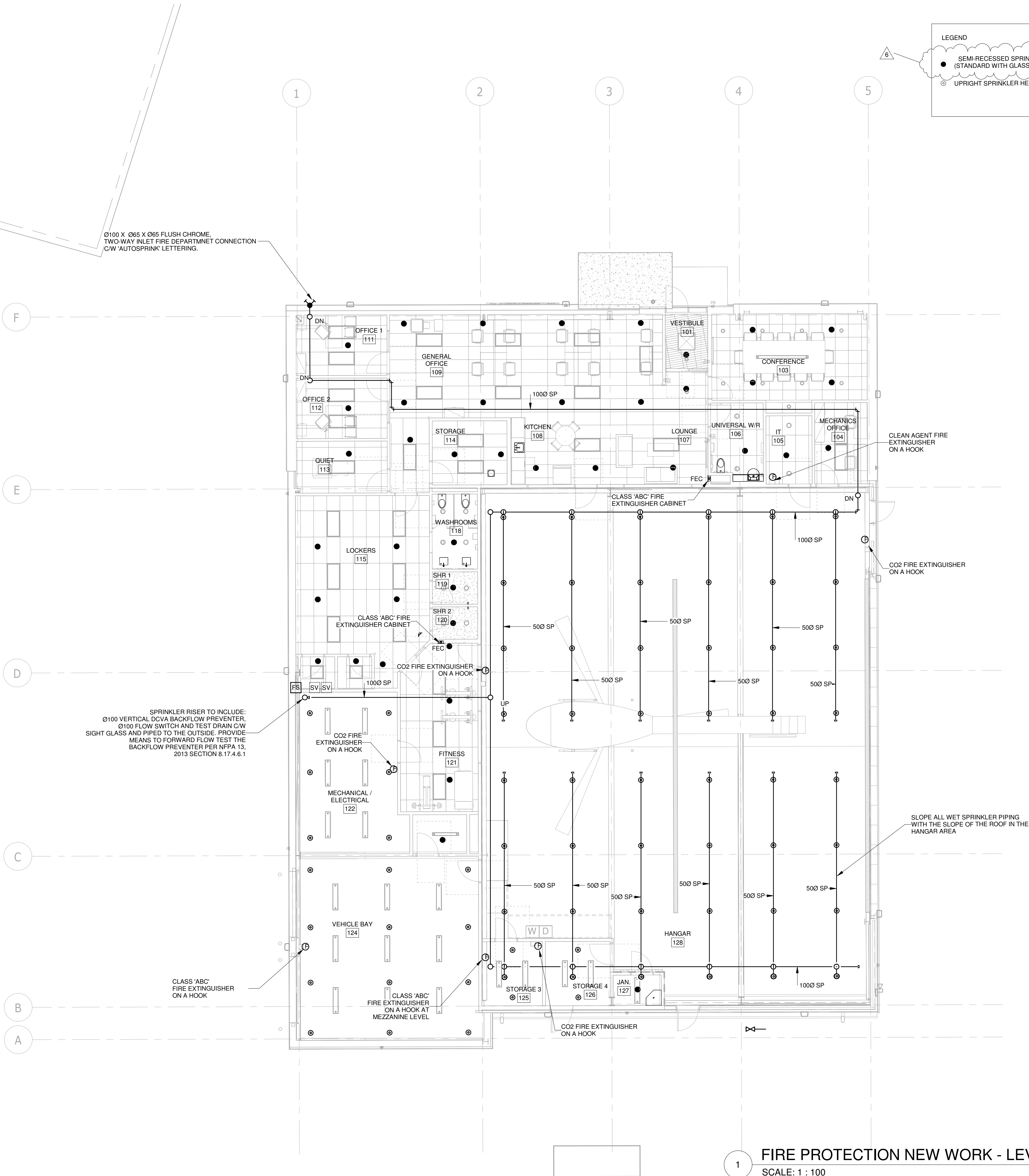
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VENTILATION NEW WORK - ISOMETRIC VIEWS

Drawing
No.
M-352



GENERAL NOTES - FIRE PROTECTION

1. SPRINKLER SYSTEM DESIGN AND INSTALLATION TO BE IN ACCORDANCE WITH NFPA 13-2013, THE ONTARIO BUILDING CODE-2012, THE ONTARIO FIRE CODE-2012, AND LOCAL AUTHORITY REQUIREMENTS.
2. ADHERE TO AND OBTAIN ALL PERMITS, LICENSES AND GOVERNMENT REQUIREMENTS, IF APPLICABLE.
3. CUTTING OF STRUCTURAL AND/OR ARCHITECTURAL MEMBERS TO BE DONE ONLY WITH THE WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER.
4. ALL ELECTRICAL WIRING OF SPRINKLER DEVICES IS BY OTHERS. COORDINATE ALL ELECTRICAL ITEMS WITH ELECTRICAL CONTRACTOR AND ENSURE PROPER COORDINATION.
5. PROVIDE STOCK OF EXTRA SPRINKLERS IN ACCORDANCE WITH NFPA-13, 6.2.9.
6. COORDINATION IS TO TAKE PLACE BETWEEN THE SPRINKLER CONTRACTOR AND ALL OTHER TRADES.
7. THE SPRINKLER CONTRACTOR IS TO FIELD SURVEY THE SITE, INCLUDING STRUCTURAL STEEL AND MECHANICAL/ELECTRICAL SERVICES PRIOR TO FABRICATION AND INSTALLATION.
8. CONFLICTS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE DESIGN CONSULTANTS.
9. INSTALL HIGH TEMPERATURE SPRINKLERS AROUND ALL HEAT SOURCES IN ACCORDANCE WITH NFPA 13-2013.
10. INSTALL GUARDS ON SPRINKLERS IN WAREHOUSE, MECHANICAL, ELECTRICAL AND STORAGE ROOMS.
11. INSTALL LOW POINT DRAINS ON ALL TRAPPED SECTIONS OF PIPING IN ACCORDANCE WITH NFPA 13-2013.
12. PROVIDE TAGS AND SIGNAGE AS PER NFPA 13-2013.
13. SPRINKLER SYSTEMS ARE TO BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH NFPA 13-2013.
14. CONTRACTOR SHALL VERIFY FLOWS AND PRESSURES VIA A FIRE HYDRANT FLOW TEST PERFORMED BY A LICENSED COMPANY, AT THE SITE PRIOR TO ANY DESIGN, HYDRAULIC CALCULATIONS AND INSTALLATION OF ANY FIRE PROTECTION SYSTEMS.
15. CONTRACTOR SHALL PROVIDE AND INSTALL NEW FIRE EXTINGUISHERS ON HOOKS OR IN CABINETS AS SHOWN ON THE DRAWINGS.
16. CONTRACTOR SHALL INSTALL THE FOLLOWING TYPES OF FIRE EXTINGUISHERS OR EQUIVALENT:

FIRE EXTINGUISHER CABINETS-BOH AND OFFICE AREAS: NATIONAL FIRE EQUIPMENT LTD OR EQUIVALENT, MODEL 102F C/W A CLASS 'ABC' 5LB DRY CHEM FIRE EXTINGUISHER

FIRE EXTINGUISHER ON HOOK-VEHICLE BAY: NATIONAL FIRE EQUIPMENT LTD OR EQUIVALENT, MODEL SF-ABC680, 10LB CLASS 'ABC' DRY CHEM FIRE EXTINGUISHER

CLEAN AGENT FIRE EXTINGUISHER ON HOOK-IT ROOM: NATIONAL FIRE EQUIPMENT LTD OR EQUIVALENT, MODEL CA07, 7.5LB CLEANGUARD FK-5-1-12 CLEAN AGENT FIRE EXTINGUISHER

CO2 FIRE EXTINGUISHER ON HOOK- MECHANICAL ROOMS, HANGER AREA, PAINT ROOM: NATIONAL FIRE EQUIPMENT LTD OR EQUIVALENT, STRIKE FIRST, MODELS SF-10CO2A (MECH. RM & PAINT RM) AND SF-20CO2A (HANGER BAY) CO2 FIRE EXTINGUISHER

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Key
Plan

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6	ISSUED FOR ADDENDUM 14	2024-11-27
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Issues

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Do not scale drawings

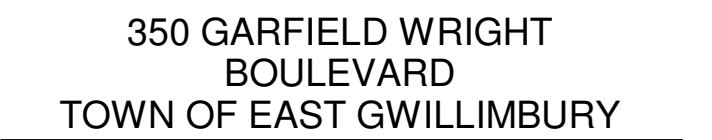
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**FIRE PROTECTION NEW
WORK - LEVEL 1**

Drawing
No.
M-551

FIRE PROTECTION NEW WORK - LEVEL 1

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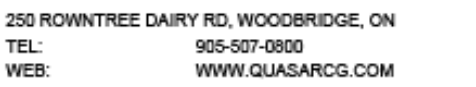


2	ISSUED FOR TENDER	2024-09-09
1	ISSUED FOR BUILDING PERMIT	2024-07-31
NO.	ISSUED	DATE

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Project No: TT-24-005
Scale: 1 : 1

Drawing
No.
M-701





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Issues

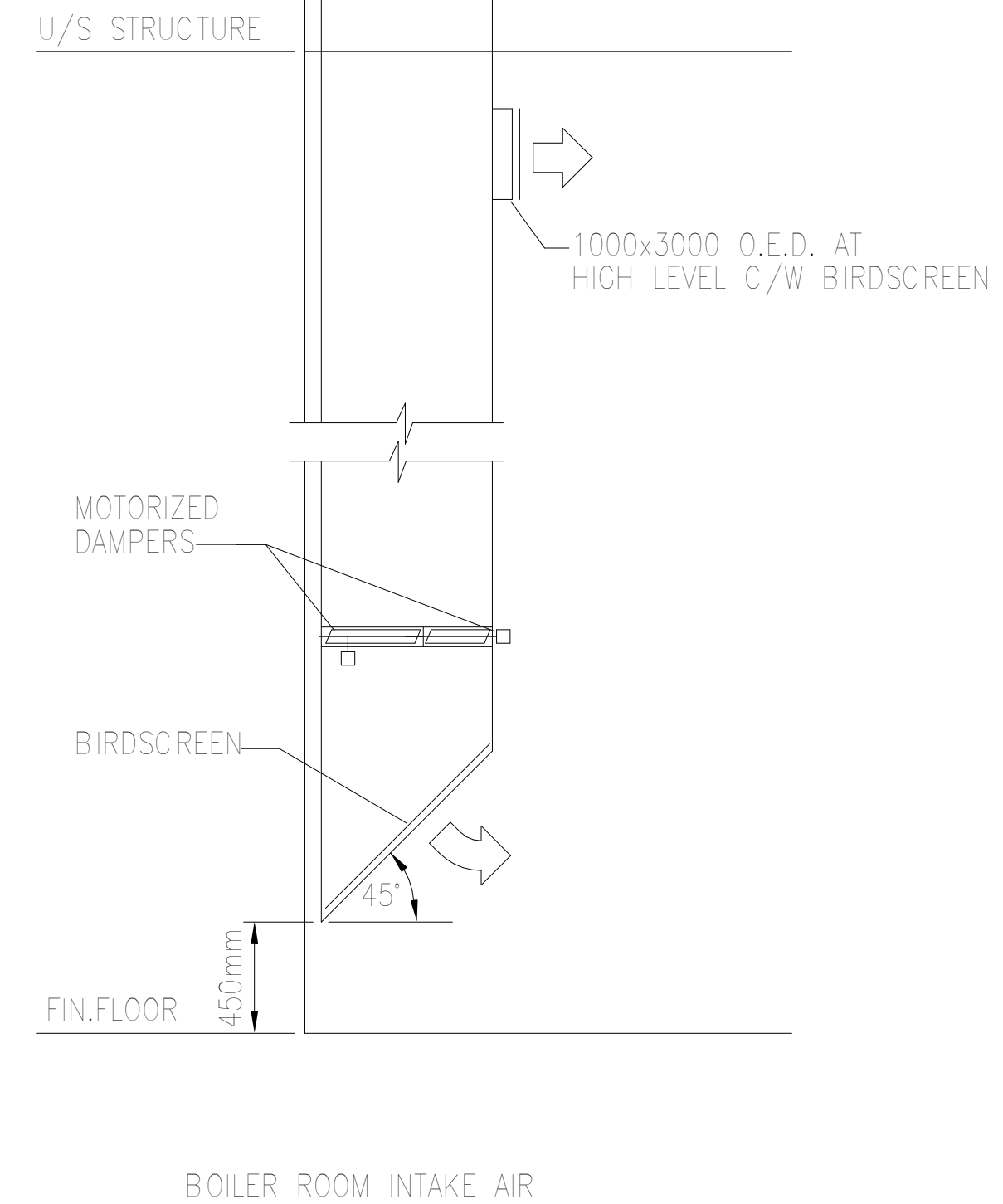
Do not scale drawings

Sheet
Title: HEATING SCHEMATIC

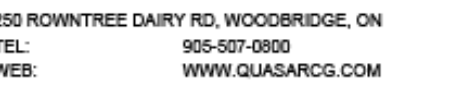
Drawing
No. **M-702**

WHEN SPACE TEMPERATURE FALLS BELOW 18C (64F) (ADJUSTABLE):

- BASE PRICE AND SEPARATE PRICE NO.1
EXCLUDE IN SEPARATE PRICE NO.2



SCALE:N.T.S.



350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

[illegible]

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Project No: TT-24-005
Scale: N.T.S.

VRF SCHEMATIC

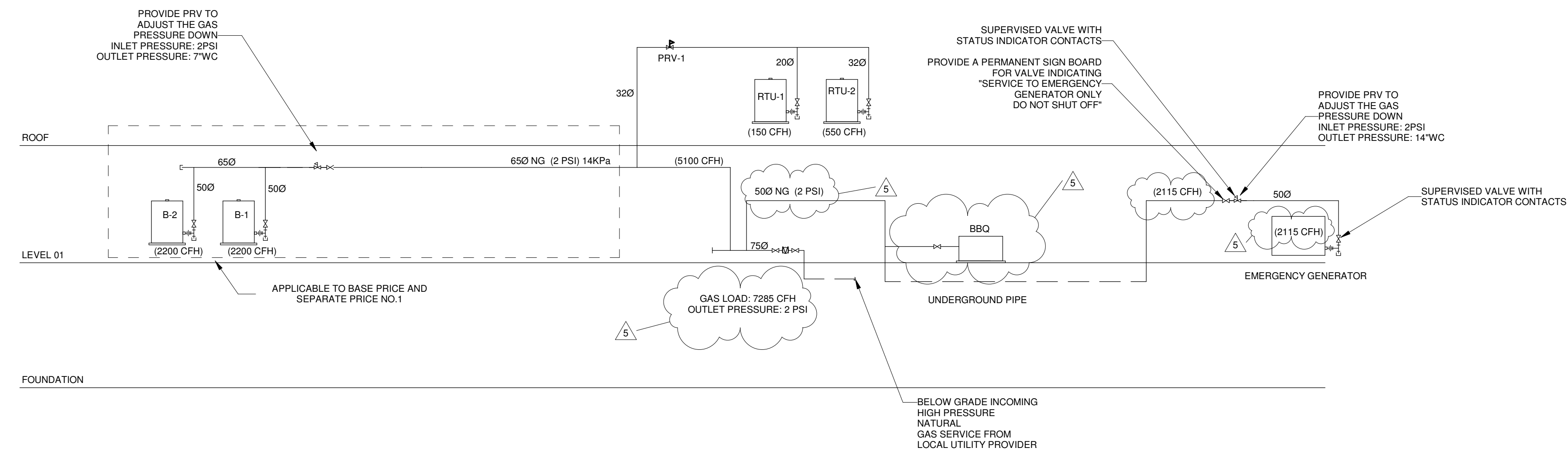
Drawing
No.
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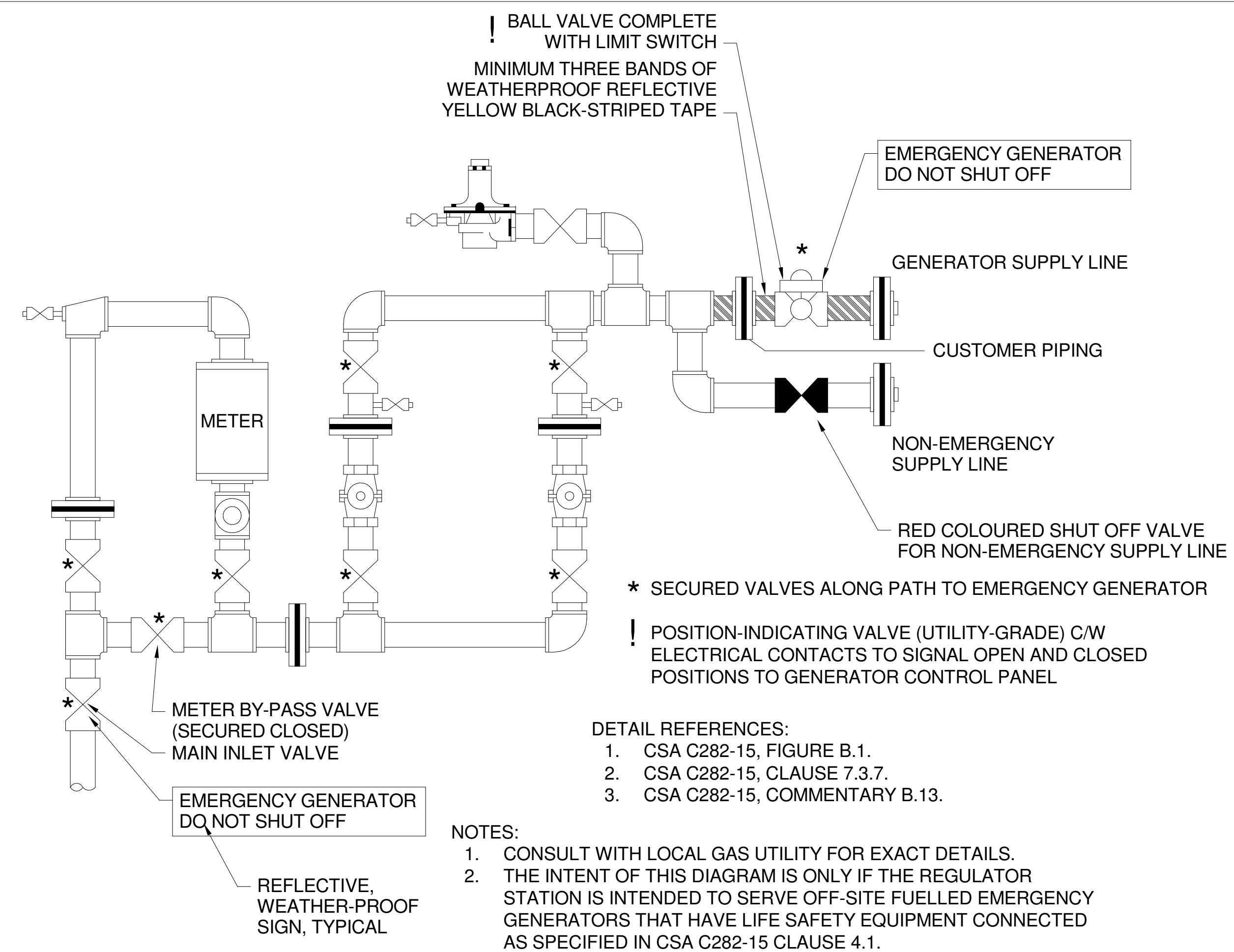
Key Plan



NOTE:
EARTHQUAKE ACTIVATED AUTOMATIC SHUT-OFF VALVE TO BE INSTALLED AS PER SPECIFICATION (23 11 23)

GAS SCHEMATIC

SCALE:N.T.S.



UTILITY-FED EMERGENCY GENERATOR GAS REGULATOR STATION

SCALE: 1 : 1

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

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Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Sheet
Title:

GAS SCHEMATIC

Drawing
No.
M-704

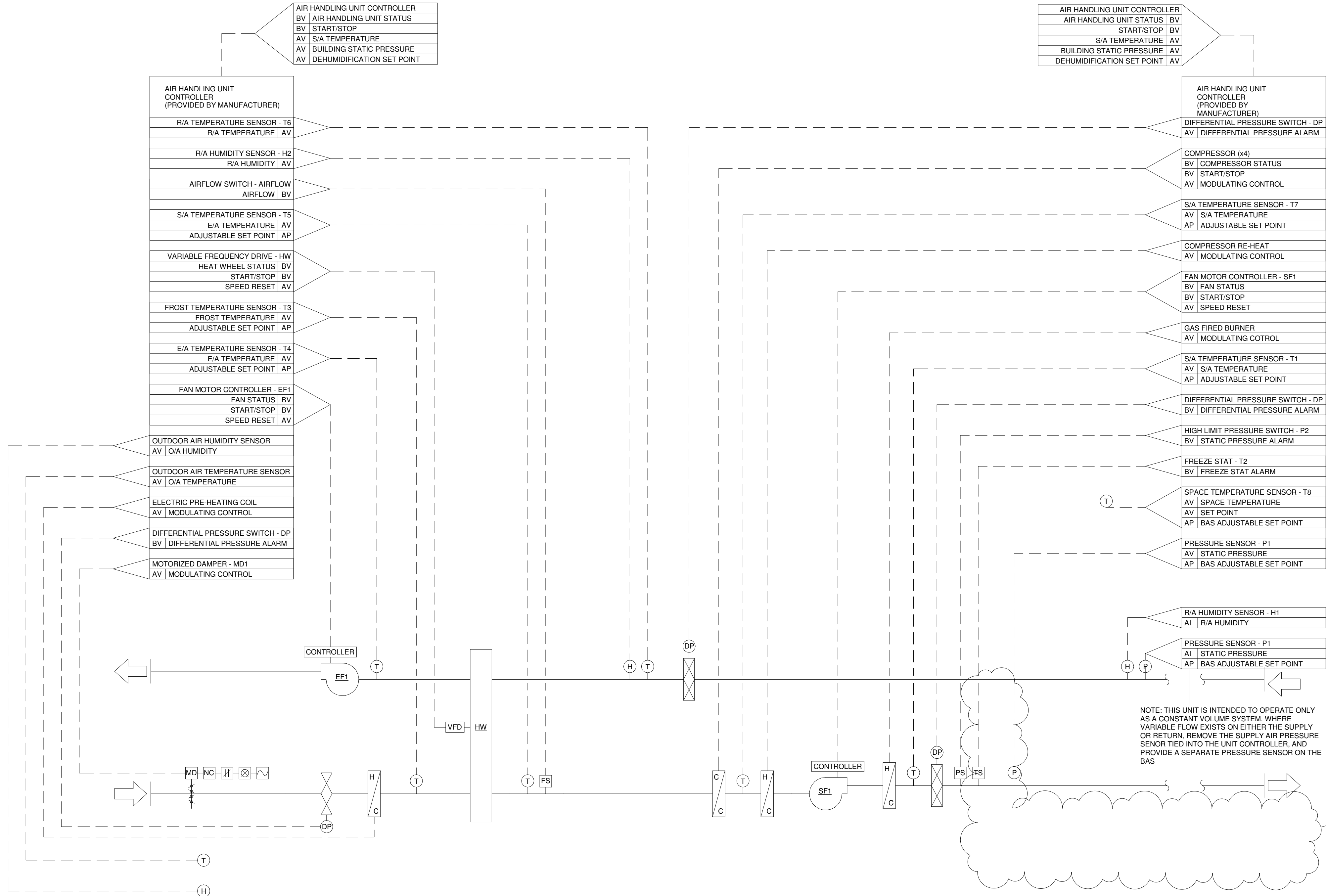
ROOF TOP UNIT - 100% OUTDOOR AIR WITH HOT GAS RE-HEAT AND HEAT WHEEL - RTU-1 - OFFICE SPACE

SCALE:N.T.S.

- OPERATING MODE:
THE SYSTEM SHALL BE ENABLED BY THE BAS ACCORDING TO THE FOLLOWING MODE:
- CONTROL MODE (OFF, AUTO, COOL ONLY, FAN ONLY, HEAT ONLY)
 - OCCUPANCY MODE (AUTO, TENANT, OVERRIDE, OCCUPIED, UNOCCUPIED)
 - CHANGE OVER MODE (RETURN AIR, SPACE TEMPERATURE, NETWORK SIGNAL)
 - COOLING AND HEATING DISCHARGE AIR TEMPERATURE CONTROL
 - SCHEDULING
 - BUILDING STATIC PRESSURE CONTROL
- INITIAL SET UP:
THE SYSTEM SHALL BE A 100% OUTDOOR AIR SYSTEM.
- THE ROOF TOP UNIT SHALL BE SUPPLIED WITH A BACKNET/MSFP CONTROLLER CAPABLE OF INTERFACING WITH THE BAS.
 - THE ROOF TOP UNIT SHALL BE CAPABLE OF PROVIDING THE FOLLOWING FUNCTIONS:
 - MECHANICAL COOLING VIA DX COOLING COIL AND CONDENSING UNIT.
 - MECHANICAL HEATING VIA GAS FIRED HEATING COIL AND BURNER.
 - MECHANICAL HOT GAS RECOVERY VIA COMPRESSOR RE-HEAT COIL. RE-HEAT SHALL BE AVAILABLE WHEN THERE IS A CALL FOR MECHANICAL COOLING.
 - ELECTRIC PRE-HEATING FOR FROST CONTROL MODE OF OPERATION.
 - THE ROOF TOP UNIT SHALL BE PROVIDED WITH A MANUFACTURER SUPPLIED SPACE TEMPERATURE SENSOR (T8) CAPABLE OF MAINTAINING THE SPACE TEMPERATURE SET POINT. THE SPACE TEMPERATURE SENSOR (T1) SHALL INCLUDE THE FOLLOWING:
 - (DESCRIBE SPECIFIC FEATURES ABOUT THE SPACE TEMPERATURE SENSOR)
 - MD1 SHALL BE NORMALLY CLOSED.
 - HEAT WHEEL SHALL BE DISABLED.
 - ELECTRIC PRE-HEATING COIL SHALL BE DISABLED.
 - GAS FIRED BURNER SHALL BE DISABLED.
 - COMPRESSOR SHALL BE DISABLED.
 - GAS FIRED HUMIDIFIER SHALL BE DISABLED.
 - FANS SHALL OPERATE AT A FIELD DETERMINED AIRFLOW & STATIC PRESSURE AS PER THE VALUES INDICATED ON THE DRAWINGS DURING SYSTEM BALANCING AND COMMISSIONING.
 - AFTER THE SYSTEM BALANCING AND COMMISSIONING IS COMPLETE, OBTAIN THE AIRFLOW DIFFERENTIAL BETWEEN THE SUPPLY FAN AND THE EXHAUST FAN.
 - P1 SHALL BE LOCATED APPROXIMATELY TWO-THIRDS DOWNSTREAM/UPSTREAM OF THE FAN. FINAL LOCATION SHALL BE COORDINATED WITH THE BALANCING CONTRACTOR AND THE CONTROLS CONTRACTOR.
 - (SYSTEM SHALL BE ENABLED BASED ON COOLING AND HEATING DISCHARGE AIR TEMPERATURE CONTROL AND CHANGE OVER MODE BASED ON NETWORK SIGNAL FOR SUMMER COOLING MODE AND WINTER HEATING MODE COOLING).
 - FANS SHALL BE ENABLED/DISABLED LOCALLY AT THE UNIT OR REMOTELY THROUGH THE BAS.
- FAN CONTROL:
ON COMMAND TO START MD1 SHALL OPEN. UPON PROOF OF MOTORIZED DAMPER POSITION FANS SHALL BE ENABLED.
- FAN SHALL MODULATE TO MAINTAIN THE STATIC PRESSURE SET POINT DETERMINED BY P1.
 - EXHAUST FAN SHALL RUN AT CONSTANT SPEED.
- ECONOMIZER (FREE COOLING) CONTROL:
N/A
- DEHUMIDIFICATION CONTROL:
DEHUMIDIFICATION IS ENABLED WHEN:
- O/A DEWPOINT IS GREATER THAN SET POINT.
 - O/A DEWPOINT SHALL BE SET TO (15°C DRY BULB, 15°C WET BULB).
- HEAT WHEEL CONTROL:
HEAT WHEEL IS ENABLED WHEN:
- ROOF TOP UNIT IS IN OPERATION AND ECONOMIZER (FREE COOLING) CONTROL IS NOT REQUIRED OR AVAILABLE.

- FROST PREVENTION CONTROL SEQUENCE:
FIRST STAGE.
- T3 SHALL BE SET TO (-15°C DRY BULB).
 - ELECTRIC PRE-HEATING COIL SHALL BE ENABLED TO MAINTAIN THE T3 SET POINT.
- SECOND STAGE OF FROST PROTECTION.
- N/A
- COMPRESSOR RE-HEAT CONTROL SEQUENCE:
COMPRESSOR RE-HEAT IS ENABLED WHEN:
- DEHUMIDIFICATION SEQUENCE IS REQUIRED AND AVAILABLE.
- TEMPERATURE CONTROL:
THE AIR HANDLING SYSTEM SHALL MAINTAIN THE FOLLOWING S/A TEMPERATURE SET POINTS:
- SUMMER COOLING MODE: (18°C DRY BULB). O/A TEMPERATURE IS GREATER THAN (20°C DRY BULB).
 - WINTER HEATING MODE: (24°C DRY BULB). O/A TEMPERATURE IS LESS THAN (18°C DRY BULB).
- O/A TEMPERATURE IS GREATER THAN (20°C DRY BULB).
 - T1 SHALL BE SET TO (18°C DRY BULB).
 - ELECTRIC PRE-HEATING COIL SHALL BE DISABLED.
 - GAS FIRED BURNER SHALL BE DISABLED.
 - GAS FIRED HUMIDIFIER SHALL BE DISABLED.
 - HEAT WHEEL SHALL MODULATE ITS SPEED TO MAINTAIN THE T1 SET POINT.
 - IF THE T1 SET POINT IS NOT SATISFIED AND ADDITIONAL COOLING IS REQUIRED, COMPRESSORS SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT. COMPRESSORS SHALL BE STAGED ON/OFF AS REQUIRED.
 - COMPRESSOR RE-HEAT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.
- O/A TEMPERATURE IS BETWEEN (12°C DRY BULB & 20°C DRY BULB).
- T1 SHALL BE SET TO (20°C DRY BULB).
 - ELECTRIC PRE-HEATING COIL SHALL BE DISABLED.
 - GAS FIRED BURNER SHALL BE DISABLED.
 - COMPRESSOR SHALL BE DISABLED.
 - GAS FIRED HUMIDIFIER SHALL BE DISABLED.
 - HEAT WHEEL SHALL MODULATE ITS SPEED TO MAINTAIN THE T1 SET POINT IF AVAILABLE.
 - IF THE T1 SET POINT IS NOT SATISFIED AND ADDITIONAL COOLING IS REQUIRED, COMPRESSORS SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT. COMPRESSORS SHALL BE STAGED ON/OFF AS REQUIRED.
 - COMPRESSOR RE-HEAT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.
- O/A TEMPERATURE LESS THAN (18°C DRY BULB).
- T1 SHALL BE SET TO (24°C DRY BULB).
 - COMPRESSOR SHALL BE DISABLED.
 - HEAT WHEEL SHALL MODULATE ITS SPEED TO MAINTAIN THE T1 SET POINT. SET POINT CAN BE OVERRIDDEN BY HEAT WHEEL FROST PROTECTION CONTROL SEQUENCE.
 - IF THE T1 SET POINT IS NOT SATISFIED AND ADDITIONAL HEATING IS REQUIRED, THE GAS FIRED BURNER SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.

- FIRE ALARM MODE:
FANS SHALL (SHUT DOWN) DURING FIRE ALARM.
- SMOKE VENTING MODE:
N/A
- 100% RE-CIRCULATION MODE:
N/A
- FAN FAILURE:
UPON SUPPLY FAN OR EXHAUST FAN FAILURE THE FOLLOWING SHALL OCCUR:
- REMAINING OPERATIONAL FAN SHALL BE DISABLED.
 - MD1 SHALL BE CLOSED.
- SAFETY SHUT DOWN:
HIGH LIMIT DUCT STATIC PRESSURE SENSOR P2 AT THE SUPPLY AIR MAIN SHALL BE INTERLOCKED WITH THE SUPPLY FAN AND THE EXHAUST FAN. FANS WILL BE DISABLED WHEN P2 EXCEEDS 3 IN.WC.
- FREESTAT T2 SHALL BE INTERLOCKED WITH THE SUPPLY AND EXHAUST FAN AND DISABLE THE FANS WHEN T2 DROPS BELOW 4°C. FANS MUST BE MANUALLY RESET PRIOR TO RESTARTING. CLOSE ALL DAMPERS.
- HEAT WHEEL FAILURE:
N/A
- OPTIMIZATION:
N/A
- SYSTEM ALARMS & PRIORITY AT BAS:
- FAN FAILURE: COMMANDED ON/STATUS OFF
 - HIGH SUPPLY AIR TEMPERATURE: T1 IS GREATER THAN 20°C FOR MORE THAN 30 MINUTES IN SUMMER COOLING MODE
 - LOW SUPPLY AIR TEMPERATURE: T1 IS LOWER THAN 22°C FOR MORE THAN 30 MINUTES IN WINTER HEATING MODE
 - FREESTAT: T2 IS EQUAL TO OR LOWER THAN 4°C
 - HIGH RETURN AIR TEMPERATURE: T3 IS GREATER THAN 26°F FOR MORE THAN 30 MINUTES IN SUMMER COOLING MODE
 - LOW RETURN AIR TEMPERATURE: T3 IS LOWER THAN 18°C FOR MORE THAN 30 MINUTES IN WINTER HEATING MODE
 - HIGH RETURN AIR HUMIDITY: H1 IS GREATER THAN 10% R.H. ABOVE DEHUMIDIFICATION MODE SET POINT FOR MORE THAN 30 MINUTES
 - LOW RETURN AIR HUMIDITY: H1 IS LOWER THAN 5% R.H. BELOW DEHUMIDIFICATION MODE SET POINT FOR MORE THAN 30 MINUTES
- SYSTEM TRENDS AT BAS:
- ROOF TOP UNIT STATUS
 - TEMPERATURE SET POINT
 - BUILDING STATIC PRESSURE
 - DEHUMIDIFICATION SET POINT



AIR HANDLING UNIT CONTROLLER	
BV AIR HANDLING UNIT STATUS	
AV START/STOP	
AV S/A TEMPERATURE	
AV BUILDING STATIC PRESSURE	
AV DEHUMIDIFICATION SET POINT	

AIR HANDLING UNIT CONTROLLER	
AIR HANDLING UNIT STATUS	BV
START/STOP	BV
S/A TEMPERATURE	AV
BUILDING STATIC PRESSURE	AV
DEHUMIDIFICATION SET POINT	AV

AIR HANDLING UNIT CONTROLLER (PROVIDED BY MANUFACTURER)	
R/A TEMPERATURE SENSOR - T6	
R/A TEMPERATURE	AV
R/A HUMIDITY SENSOR - H2	
R/A HUMIDITY	AV
AIRFLOW SWITCH - AIRFLOW	
AIRFLOW	BV
S/A TEMPERATURE SENSOR - T5	
E/A TEMPERATURE	AV
ADJUSTABLE SET POINT	AP
VARIABLE FREQUENCY DRIVE - HW	
HEAT WHEEL STATUS	BV
START/STOP	BV
SPEED RESET	AV
FROST TEMPERATURE SENSOR - T3	
FROST TEMPERATURE	AV
ADJUSTABLE SET POINT	AP
E/A TEMPERATURE SENSOR - T4	
E/A TEMPERATURE	AV
ADJUSTABLE SET POINT	AP
FAN MOTOR CONTROLLER - EF1	
FAN STATUS	BV
START/STOP	BV
SPEED RESET	AV
OUTDOOR AIR HUMIDITY SENSOR	
O/A HUMIDITY	AV
OUTDOOR AIR TEMPERATURE SENSOR	
O/A TEMPERATURE	AV
ELECTRIC PRE-HEATING COIL	
MODULATING CONTROL	AV
DIFFERENTIAL PRESSURE SWITCH - DP	
DIFFERENTIAL PRESSURE ALARM	BV
MOTORIZED DAMPER - MD1	
MODULATING CONTROL	AV

AIR HANDLING UNIT CONTROLLER (PROVIDED BY MANUFACTURER)	
DIFFERENTIAL PRESSURE SWITCH - DP	
DIFFERENTIAL PRESSURE ALARM	AV
COMPRESSOR (x4)	
COMPRESSOR STATUS	BV
START/STOP	BV
MODULATING CONTROL	AV
S/A TEMPERATURE SENSOR - T7	
S/A TEMPERATURE	AV
ADJUSTABLE SET POINT	AP
COMPRESSOR RE-HEAT	
MODULATING CONTROL	AV
FAN MOTOR CONTROLLER - SF1	
FAN STATUS	BV
START/STOP	BV
SPEED RESET	AV
GAS FIRED BURNER	
MODULATING CONTROL	AV
S/A TEMPERATURE SENSOR - T1	
S/A TEMPERATURE	AV
ADJUSTABLE SET POINT	AP
DIFFERENTIAL PRESSURE SWITCH - DP	
DIFFERENTIAL PRESSURE ALARM	BV
HIGH LIMIT PRESSURE SWITCH - P2	
STATIC PRESSURE ALARM	BV
FREESTAT - T2	
FREESTAT ALARM	BV
SPACE TEMPERATURE SENSOR - T8	
SPACE TEMPERATURE	AV
SET POINT	AV
BAS ADJUSTABLE SET POINT	AP
PRESSURE SENSOR - P1	
STATIC PRESSURE	AV
BAS ADJUSTABLE SET POINT	AP

R/A HUMIDITY SENSOR - H1	
R/A HUMIDITY	AI
PRESSURE SENSOR - P1	
STATIC PRESSURE	AI
BAS ADJUSTABLE SET POINT	AP

NOTE: THIS UNIT IS INTENDED TO OPERATE ONLY AS A CONSTANT VOLUME SYSTEM. WHERE VARIABLE FLOW EXISTS ON EITHER THE SUPPLY OR RETURN, REMOVE THE SUPPLY AIR PRESSURE SENSOR TIED INTO THE UNIT CONTROLLER, AND PROVIDE A SEPARATE PRESSURE SENSOR ON THE BAS

PARKIN

Parkin Architects Limited
1 VALLEYBROOK DRIVE, TORONTO, CANADA, M3B 2S7 416-467-8000



YORK REGIONAL POLICE HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key
Plan

NO.	ISSUED	DATE
4	ISSUED FOR ADDENDUM 15	2024-12-04
3	ISSUED FOR ADDENDUM 14	2024-11-27
2	ISSUED FOR TENDER	2024-09-09
1	ISSUED FOR BUILDING PERMIT	2024-07-31

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

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Project No: TT-24-005
Scale: N.T.S.

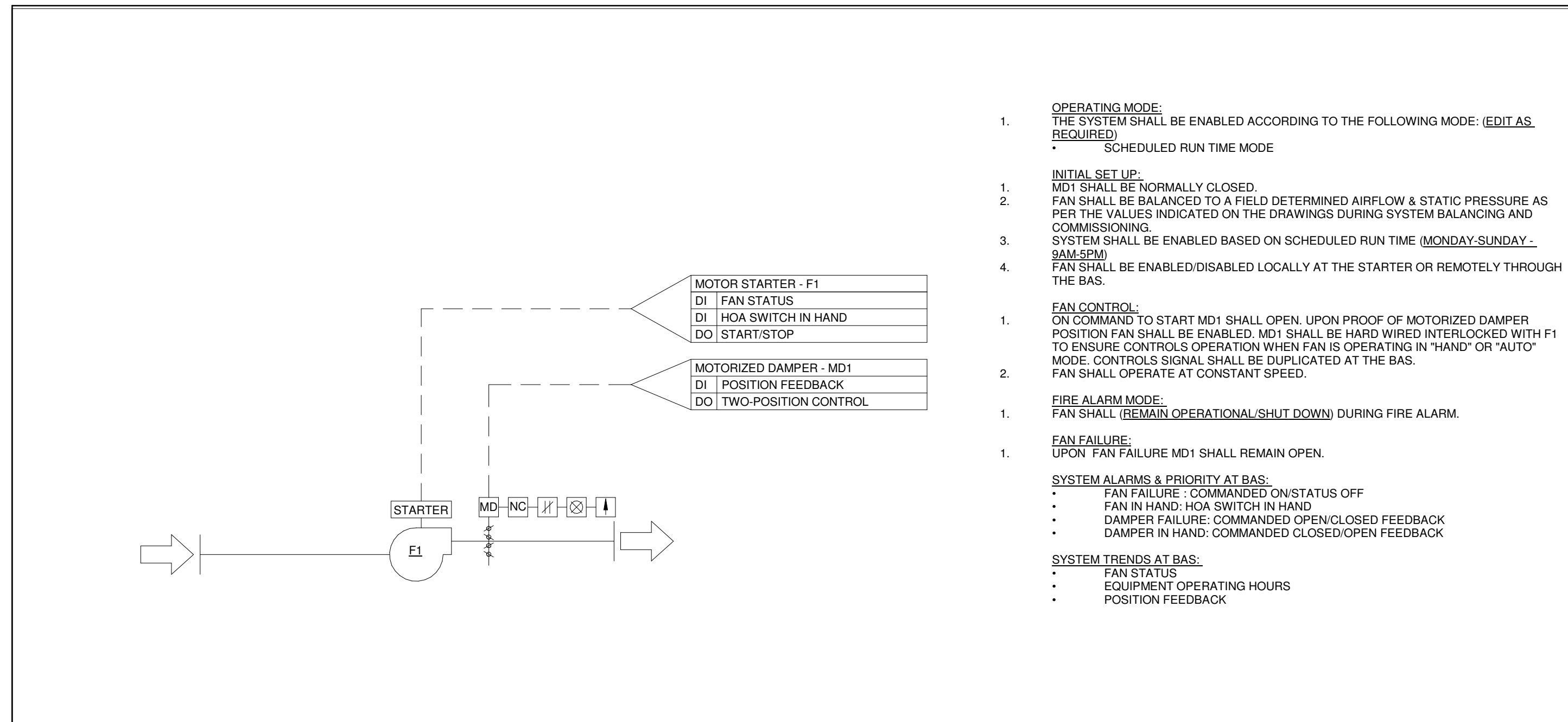
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**MECHANICAL CONTROL
SEQUENCES I**

Drawing
No.
M-750

YORK REGIONAL POLICE
HELICOPTER HANGAR

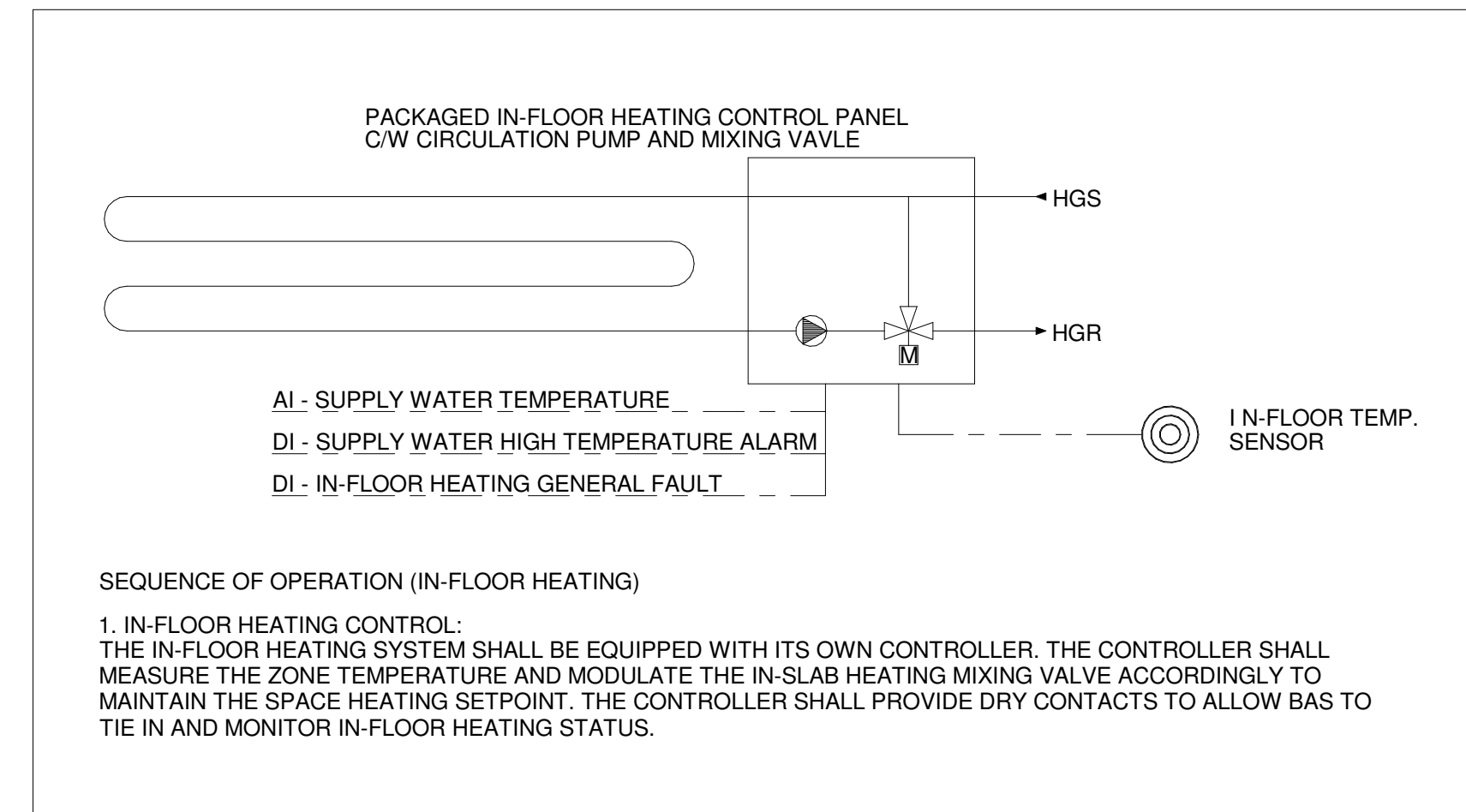
350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan



CONSTANT SPEED FAN - DAMPER INTERLOCK CONTROL SEQUENCE

SCALE:N.T.S.



IN-FLOOR HEATING CONTROLS

SCALE: 1 : 1

SNOW MELTING SYSTEM SEQUENCE OF OPERATION

1. WHEN OUTDOOR TEMPERATURE DROPS BELOW 0°C, THE WARM WEATHER SHUT OFF (WWCO) IS CANCELLED AND THE CONTROL SHALL BE ACTIVE.
2. THE CONTROL SHALL ENABLE THE SNOW MELT PUMP TO OPERATE MODULATING THE 4-WAY VALVE TO INJECT HEAT INTO THE SLAB TO MAINTAIN IDLING TEMPERATURE OF 0°C (ADJUSTABLE).
3. IF SUPPLY WATER TEMPERATURE IS NOT AT SET POINT, THE CONTROL SHALL INITIATE THE LEAD BOILER PUMP TO START AND FIRE THE BOILER.
4. THE BOILER AND 4-WAY VALVE SHALL INJECT HEAT INTO THE SLAB UNTIL THE IDLE TEMPERATURE IS SATISFIED.
5. ONCE THE SLAB IS UP TO TEMPERATURE, THE OILER SHALL SHUT DOWN. THE BOILER PUMP WILL OPERATE FOR 3 MINUTES THEN SHUT DOWN.
6. THE FOUR WAY VALVE WILL MODULATE TO MAINTAIN SET POINT SUPPLY WATER TEMPERATURE AS LONG AS THE SNOW MELT SYSTEM IS ACTIVE.
7. IF SNOW IS DETECTED ON ANY OF THE SNOW/ICE SENSORS, THE CONTROL SHALL INITIATE A SNOW MELT DEMAND. THE SLAB SURFACE SET POINT SHALL BE INCREASED TO 4°C TO MELT SNOW.
8. THE FOUR WAY VALVE SHALL MODULATE OPEN TO INJECT HEAT INTO THE SLAB. ONCE THE SUPPLY WATER TEMPERATURE DROPS BELOW SETPOINT. THE LEAD BOILER WILL FIRE AND MODULATE TO MEET DEMAND. IF AFTER 5 MINUTES SET POINT IS NOT ACHIEVED, THE STANDBY BOILER (3) SHALL STAY ON UNTIL THE 3RD BOILER IS TURNED ON. ONCE ALL BOILERS ARE RUNNING, THEY WILL MODULATE IN UNISON, AND INCREASE MODULATION TO MEET DEMAND. ONCE DEMAND IS REACHED AND BOILERS MODULATE DOWN BELOW 50%, THE LAG BOILER SHALL RUN FOR 15 MINUTES, THEN STAGE OFF.
9. WHEN SNOW/ICE SENSOR DETECTS NO MOISTURE ON ITS SURFACE IT WILL CONTINUE MELTING DEMAND FOR 4 HOURS TO ENSURE SLAB IS CLEAR CONTROL WILL DROP SLAB BACK TO IDLING MODE AND MAINTAIN SLAB AT 0°C.
10. WHEN OUTDOOR TEMPERATURE DROPS BELOW -15°C, CONTROLS WILL INITIATE COLD WEATHER CUT OFF (CWCO).
11. CONTROL SYSTEMS WILL DUTY CYCLE PRIMARY SNOW MELT PUMPS AFTER EVERY 30 HOURS OF OPERATION TO ENSURE EVEN WEAR. PRIMARY PUMPS WILL BE EXERCISED ONCE PER WEEK DURING OFF CYCLES FOR 5 MINUTES.
12. CONTROL SYSTEM WILL DUTY CYCLE BOILERS AND BOILER PUMPS AFTER EVERY 30 HOURS OF OPERATION TO ENSURE EVEN WEAR.
13. CONTROL SYSTEM SHALL BE CAPABLE TO TRANSMIT INFORMATION REGARDING MELTING MODE, WWCO, CWCO, FAULT ON SENSOR, PUMP OPERATION, BOILER OPERATION AND FAULT. CONTROL SYSTEM TO OPEN PROTOCOL SYSTEM VIA MODEM.

[illegible]

Issues

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Sheet
Title:

MECHANICAL CONTROL SEQUENCES II

Drawing
No. **M-751**

YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan

[illegible]

Issues

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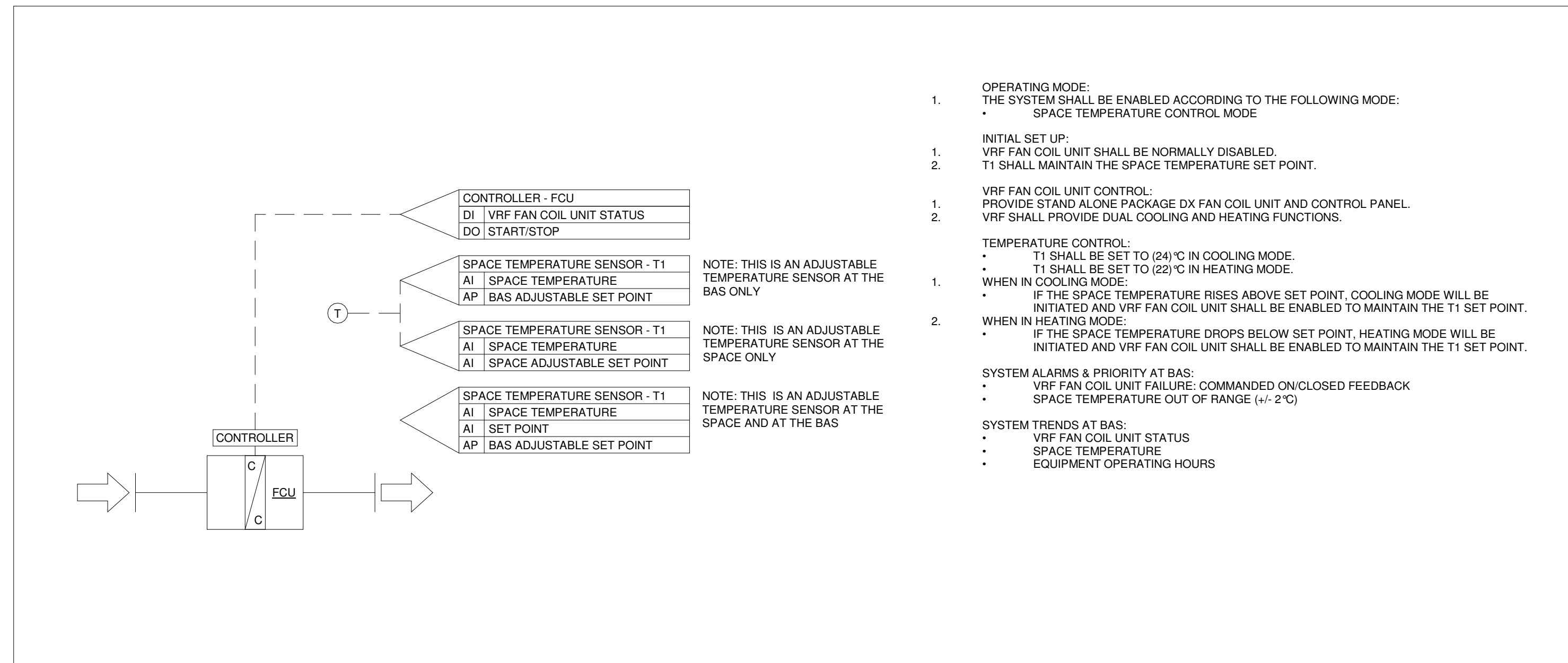
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Project No: TT-24-005
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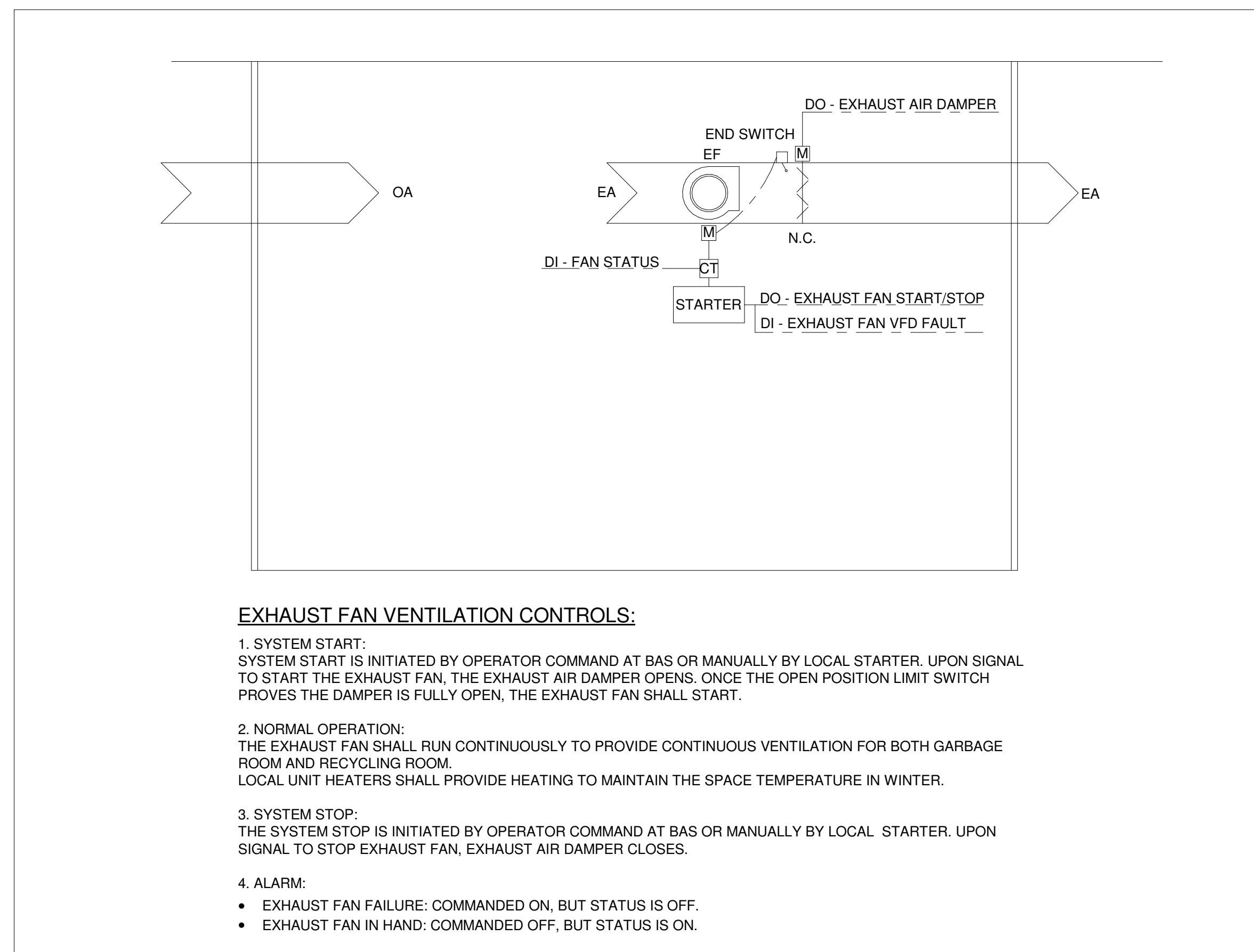
MECHANICAL CONTROL SEQUENCES III

Drawing
No. **M-752**



VRF FAN COIL UNIT CONTROL SEQUENCE

SCALE:N.T.S.



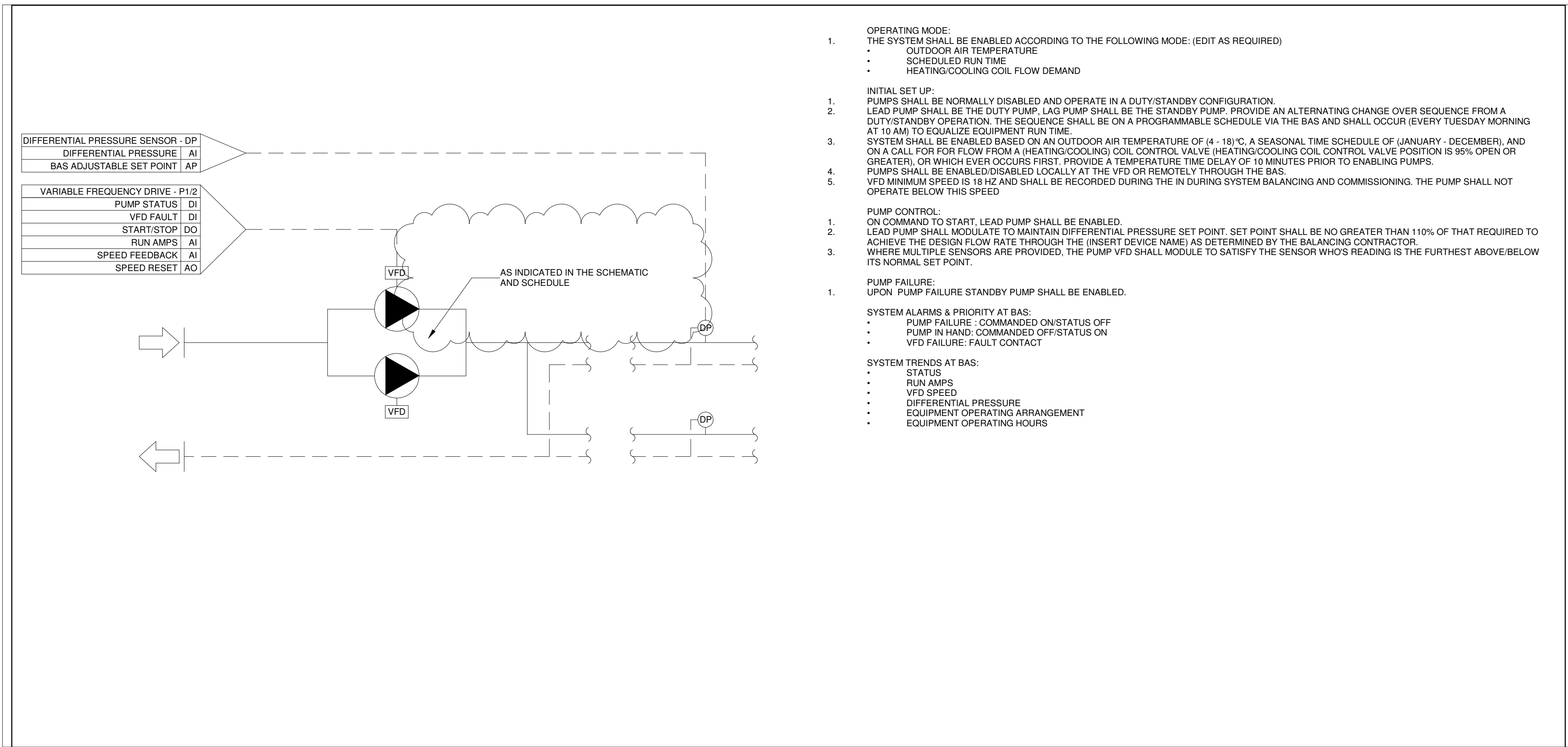
EXHAUST FAN VENT. CONTROLS

SCALE: 1 : 1

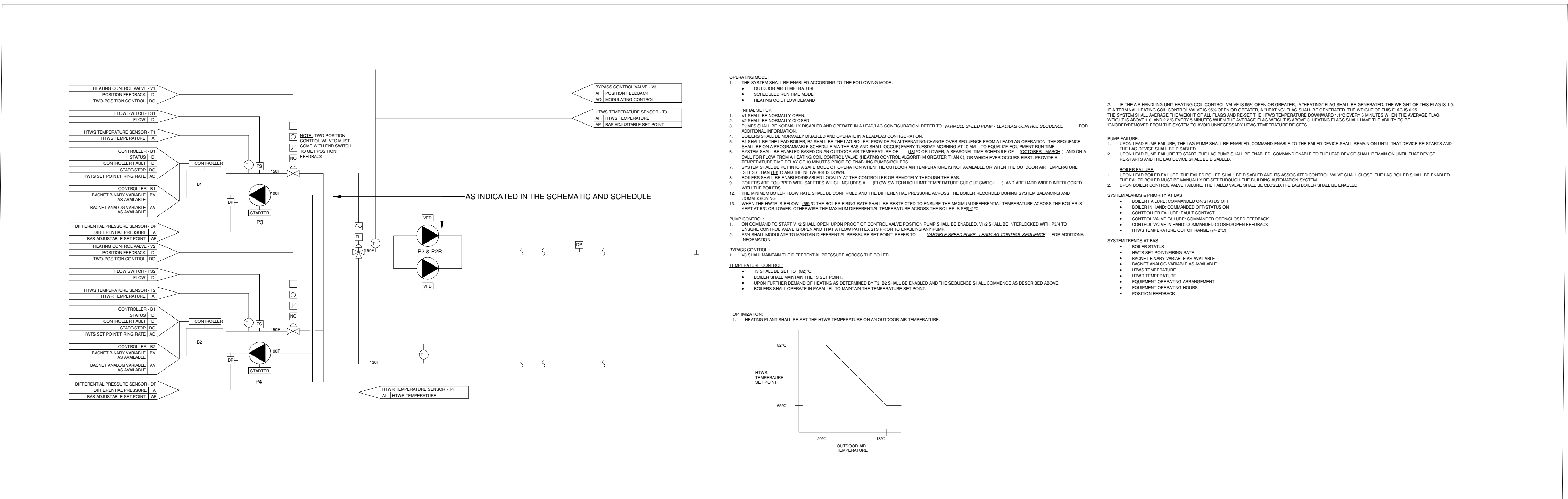
YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan



VARIABLE SPEED PUMP - DUTY/STANDBY CONTROL SEQUENCE



1 CONDENSING BOILER HEATING WATER - LEAD/LAG CONTROL SEQUENCE - VARIABLE/PRIMARY SYSTEM
NOT TO SCALE

[illegible]

Issues

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Scale: N.T.S.



350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan



- OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED BY THE BAS ACCORDING TO THE FOLLOWING MODE:

- CONTROL MODE (OFF, AUTO, COOL ONLY, FAN ONLY, HEAT ONLY)
- OCCUPANCY MODE (AUTO, TENANT, OVERRIDE, OCCUPIED, UNOCCUPIED)
- CHANGE OVER MODE (RETURN AIR, SPACE TEMPERATURE, NETWORK SIGNAL)
- COOLING AND HEATING DISCHARGE AIR TEMPERATURE CONTROL
- SCHEDULING
- BUILDING STATIC PRESSURE CONTROL

INITIAL SET UP:

1. THE SYSTEM SHALL BE A 100% OUTDOOR AIR SYSTEM.
2. THE ROOF TOP UNIT SHALL BE SUPPLIED WITH A BACNET/MSTP CONTROLLER CAPABLE OF INTERFACING WITH THE BAS.
3. THE ROOF TOP UNIT SHALL BE CAPABLE OF PROVIDING THE FOLLOWING FUNCTIONS:
 - MECHANICAL HEATING VIA GAS FIRED HEATING COIL AND BURNER.
 - MECHANICAL HOT GAS RECOVERY VIA COMPRESSOR RE-HEAT COIL.
 - ELECTRIC PRE-HEATING FOR FROST CONTROL. MODE OF OPERATION-HEAT SHALL BE AVAILABLE WHEN THERE IS A
4. THE ROOF TOP UNIT SHALL BE PROVIDED WITH A MANUFACTURER SUPPLIED SPACE TEMPERATURE SENSOR (T8) CAPABLE OF MAINTAINING THE SPACE TEMPERATURE SET POINT. THE SPACE TEMPERATURE SENSOR (T1) SHALL INCLUDE THE FOLLOWING:
 - DESCRIBE SPECIFIC FEATURES ABOUT THE SPACE TEMPERATURE SENSOR
5. MD1 SHALL BE NORMALLY CLOSED.
6. HEAT WHEEL SHALL BE DISABLED.
7. ELECTRIC PRE-HEATING COIL SHALL BE DISABLED.
8. GAS FIRED BURNER SHALL BE DISABLED.
9. COMPRESSOR SHALL BE DISABLED.
10. GAS FIRED HUMIDIFIER SHALL BE DISABLED.
11. FANS SHALL OPERATE AT A FIELD DETERMINED AIRFLOW & STATIC PRESSURE AS PER THE VALUES INDICATED ON THE DRAWINGS DURING SYSTEM BALANCING AND COMMISSIONING.
12. AFTER THE SYSTEM BALANCING AND COMMISSIONING IS COMPLETE, OBTAIN THE AIRFLOW DIFFERENTIAL BETWEEN THE SUPPLY FAN AND THE EXHAUST FAN.
13. P1 SHALL BE LOCATED APPROXIMATELY TWO-THIRDS DOWNSTREAM/UPSTREAM OF THE FAN. FINAL LOCATION SHALL BE COORDINATED WITH THE BALANCING
14. FANS SHALL BE ENABLED/DISABLED LOCALLY AT THE UNIT OR REMOTELY THROUGH THE BAS.

FAN CONTROL:

1. ON COMMAND TO START MD1 SHALL OPEN. UPON PROOF OF MOTORIZED DAMPER POSITION FANS SHALL BE ENABLED.
2. FAN SHALL MODULATE TO MAINTAIN THE STATIC PRESSURE SET POINT DETERMINED BY P1.
3. EXHAUST FAN SHALL RUN AT CONSTANT SPEED.

ECONOMIZER (FREE COOLING) CONTROL:

1. N/A
- DEHUMIDIFICATION IS ENABLED WHEN:
O/A DEWPOINT IS GREATER THAN SET POINT.
O/A DEWPOINT SHALL BE SET TO (15°C DRY BULB, 15°C WET BULB)

HEAT WHEEL CONTROL:

1. HEAT WHEEL IS ENABLED WHEN:
 - ROOF TOP UNIT IS IN OPERATION AND ECONOMIZER (FREE COOLING) CONTROL IS NOT REQUIRED OR AVAILABLE

FROST PREVENTION CONTROL SEQUENCE:

1. FIRST STAGE.
 - T3 SHALL BE SET TO (-15°C DRY BULB).
 - ELECTRIC PRE-HEATING COIL SHALL BE ENABLED TO MAINTAIN THE T3 SET POINT
2. SECOND STAGE OF FROST PROTECTION.
 - N/A

COMPRESSOR RE-HEAT CONTROL SEQUENCE

1. COMPRESSOR RE-HEAT IS ENABLED WHEN:
 - DEHUMIDIFICATION SEQUENCE IS REQUIRED AND AVAILABLE

TEMPERATURE CONTROL:

1. THE AIR HANDLING SYSTEM SHALL MAINTAIN THE FOLLOWING S/A TEMPERATURE SET POINTS:
 - SUMMER COOLING MODE: (18°C DRY BULB). O/A TEMPERATURE IS GREATER THAN (20°C DRY BULB).
 - WINTER HEATING MODE: (24°C DRY BULB). O/A TEMPERATURE IS LESS THAN (18°C DRY BULB).
2. O/A TEMPERATURE IS GREATER THAN (20°C DRY BULB).
 - T1 SHALL BE SET TO (18°C DRY BULB).
 - ELECTRIC PRE-HEATING COIL SHALL BE DISABLED.
 - GAS FIRED BURNER SHALL BE DISABLED.
 - GAS FIRED HUMIDIFIER SHALL BE DISABLED.
 - HEAT WHEEL CONTROL SHALL BE ENABLED, AND THE HEAT WHEEL SHALL MODULATE ITS SPEED TO MAINTAIN THE T1 SET POINT.
 - IF THE T1 SET POINT IS NOT SATISFIED AND ADDITIONAL COOLING IS REQUIRED,
 - COMPRESSORS SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.
 - COMPRESSORS SHALL BE STAGED ON/OFF AS REQUIRED.
 - COMPRESSOR RE-HEAT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.

- OVA TEMPERATURE IS BETWEEN (12°C DRY BULB & 20°C DRY BULB).
 - T1 SHALL BE SET TO (20°C DRY BULB).
 - ELECTRIC PRE-HEATING COIL SHALL BE DISABLED.
 - GAS FIRED BURNER SHALL BE ENABLED.
 - COMPRESSOR SHALL BE DISABLED.
 - GAS FIRED HUMIDIFIER SHALL BE DISABLED.
 - HEAT WHEEL CONTROL SHALL BE ENABLED, AND THE HEAT WHEEL SHALL MODULATE ITS SPEED TO MAINTAIN THE T1 SET POINT IF AVAILABLE.
- IF THE T1 SET POINT IS NOT SATISFIED AND ADDITIONAL COOLING IS REQUIRED, THE FOLLOWING ACTIONS SHALL BE TAKEN TO MAINTAIN THE T1 SET POINT.
- COMPRESSORS SHALL BE STAGED ON/OFF AS REQUIRED.
 - COMPRESSOR RE-HEAT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.

4. O/A TEMPERATURE LESS THAN (18°C DRY BULB).
 • T1 SHALL BE SET TO (24°C DRY BULB).
 • COMPRESSOR SHALL BE DISABLED.
 • HEAT WHEEL CONTROL SHALL BE ENABLED, AND THE HEAT WHEEL SHALL MODULATE ITS SPEED TO MAINTAIN THE T1 SET POINT. SEVERITY: HEAT WHEEL FIRST PROTECTION CONTROL SEQUENCE.
 • IF THE T1 SET POINT IS NOT SATISFIED AND ADDITIONAL HEATING IS REQUIRED, THE GAS FIRED BURNER SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.

HUMIDITY CONTROL

- H1 SHALL BE SET TO (30% R.H.).
- GAS FIRED HUMIDIFIER SHALL BE ENABLED TO MAINTAIN H1 AT/BELOW SET POINT.

FIRE ALARM MODE

1. FANS SHALL (~~SHUT DOWN~~) DURING FIRE ALARM

SMOKE VENTING MODE:

- N/A

100% RE-CIRCULATION MODE:

- 1.

FAN FAILURE:

1. UPON SUPPLY FAN OR EXHAUST FAN FAILURE THE FOLLOWING SHALL OCCUR:
 - REMAINING OPERATIONAL FAN SHALL BE DISABLED.
 - MD1 SHALL BE CLOSED.

SAFETY SHUT DOWN:

1. HIGH LIMIT DUCT STATIC PRESSURE SENSOR P2 AT THE SUPPLY AIR MAIN SHALL BE INTERLOCKED WITH THE SUPPLY FAN AND THE EXHAUST FAN. FANS WILL BE DISABLED WHEN P2 EXCEEDS 3 IN/WG.
2. FREEZE STAT T2 SHALL BE INTERLOCKED WITH THE SUPPLY AND EXHAUST FAN AND DISABLE THE FANS WHEN T2 DROPS BELOW 4°C. FANS MUST BE MANUALLY RESET PRIOR TO RESTARTING. CLOSE ALL DAMPERS

HEAT WHEEL FAILURE:

- 1.

OPTIMIZATION:

- 1.

SYSTEM ALARMS & PRIORITY AT BAS:
CONTRACTOR AND THE CONTROLS CONTRACTOR

- FAN FAILURE : COMMANDED ON/STATUS OFF
- HIGH SUPPLY AIR TEMPERATURE: T1 IS GREATER THAN 20°C FOR MORE THAN 30 MINUTES IN SUMMER COOLING MODE
- LOW SUPPLY AIR TEMPERATURE: T1 IS LOWER THAN 22°C FOR MORE THAN 30 MINUTES IN WINTER HEATING MODE
- FREEZE STAT: T2 IS EQUAL TO OR LOWER THAN 4°C
- HIGH RETURN AIR TEMPERATURE: T3 IS GREATER THAN 26°F FOR MORE THAN 30 MINUTES IN SUMMER COOLING MODE
- LOW RETURN AIR TEMPERATURE: T3 IS LOWER THAN 18°C FOR MORE THAN 30 MINUTES IN WINTER HEATING MODE
- HIGH RETURN AIR HUMIDITY: H1 IS GREATER THAN 10% R.H. ABOVE DEHUMIDIFICATION MODE SET POINT FOR MORE THAN 30 MINUTES
- LOW RETURN AIR HUMIDITY: H1 IS LOWER THAN 5% R.H. BELOW DEHUMIDIFICATION MODE SET POINT FOR MORE THAN 30 MINUTES

SYSTEM TRENDS AT BAS:

- ROOF TOP UNIT STATUS
- TEMPERATURE SET POINT
- BUILDING STATIC PRESSURE
- DEHUMIDIFICATION SET POINT

Do not scale drawings

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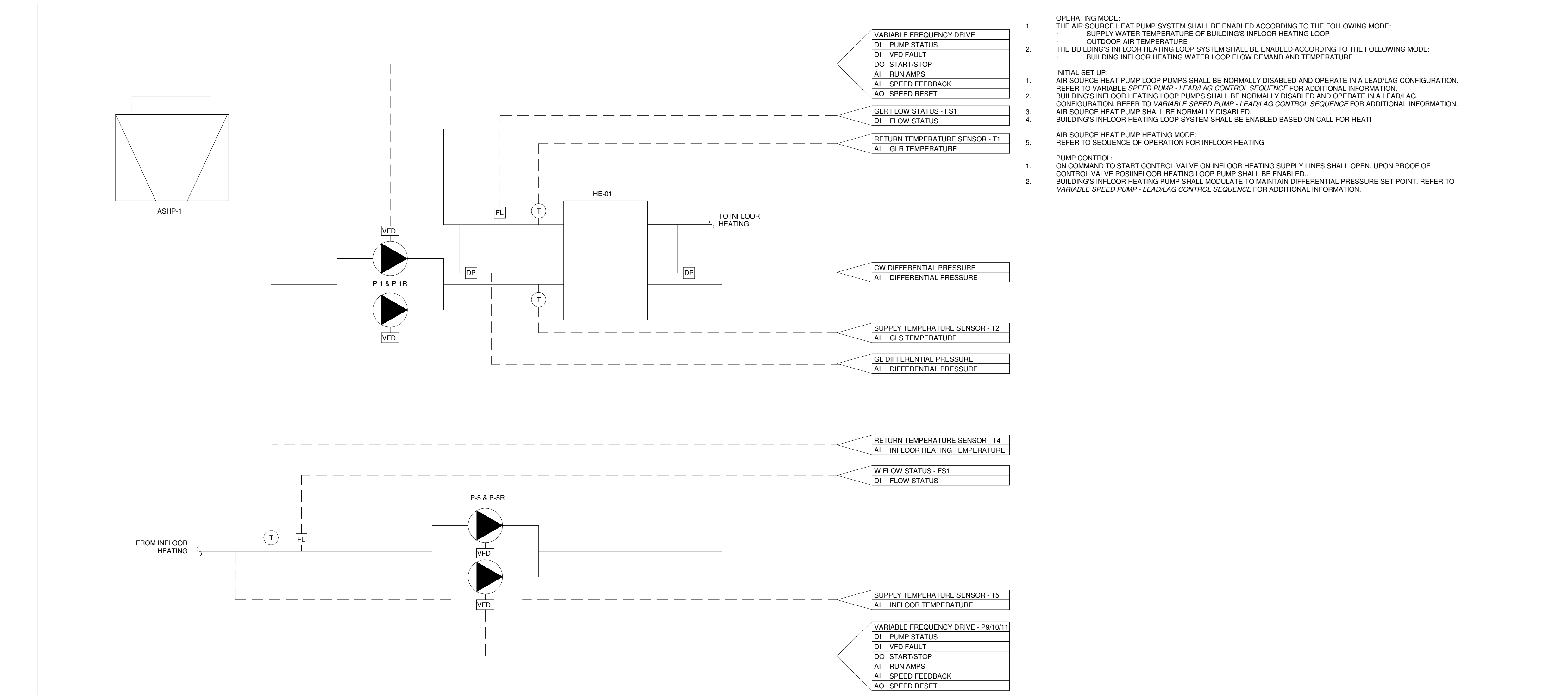
MECHANICAL CONTROL SEQUENCES V

Drawing
No. **M-754**

YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan



1 AIR SOURCE HEAT PUMP LOOP CONTROL SEQUENCE DIAGRAM(HANGAR)
SCALE:N.T.S.

[illegible]

Issues

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Project No: TT-24-005
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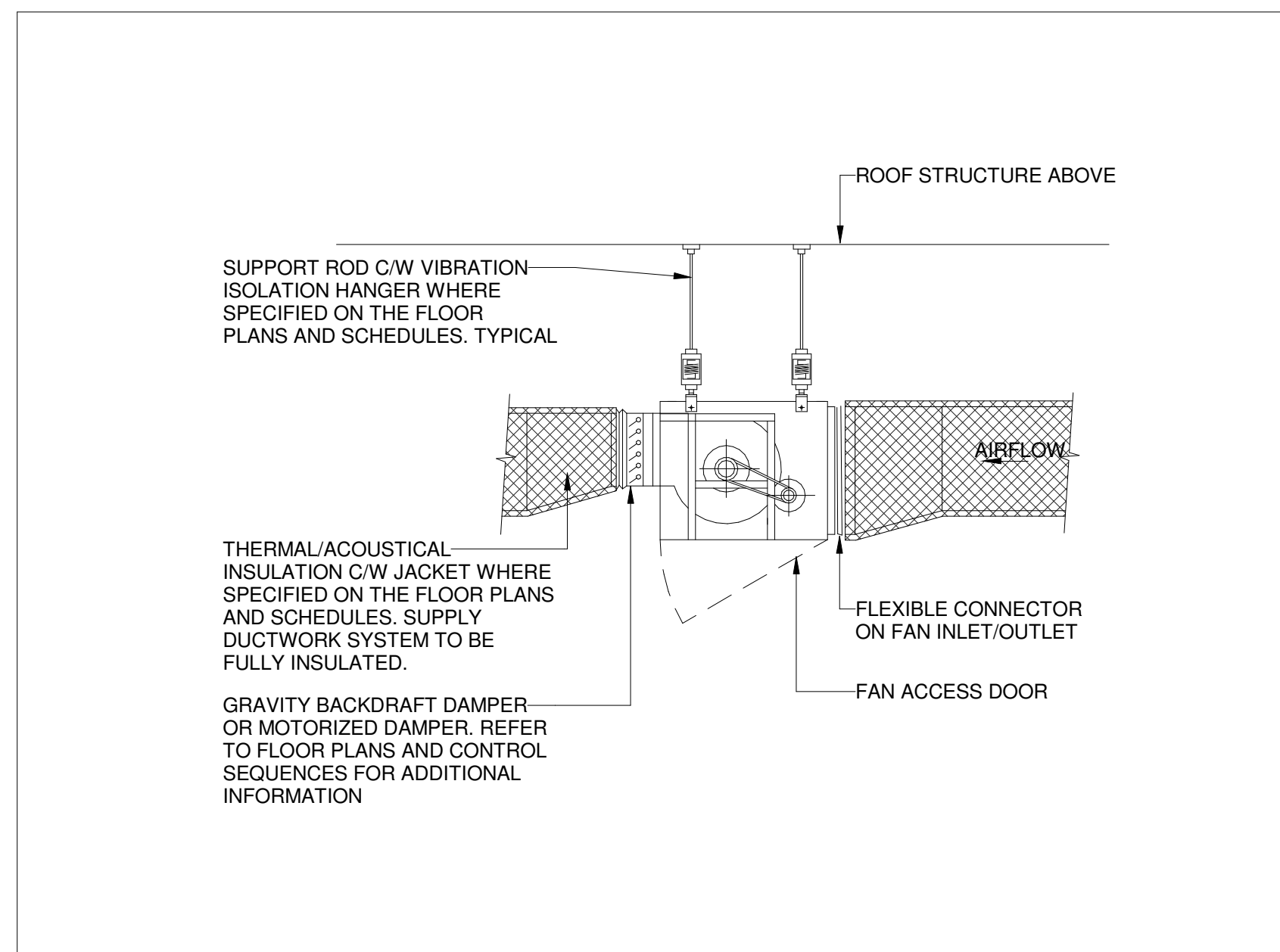
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**MECHANICAL CONTROL
SEQUENCES VI**

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No.
M-755

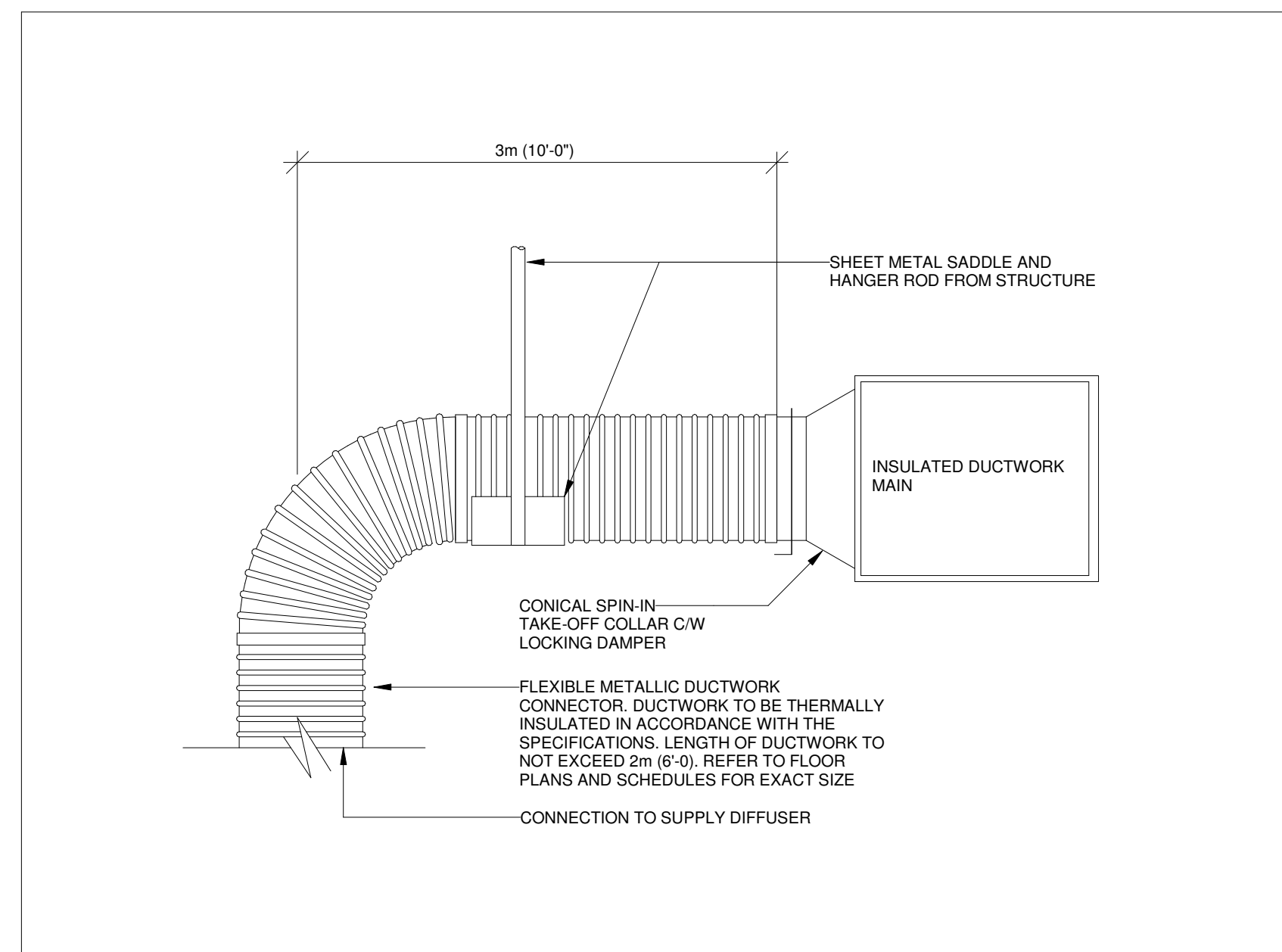
YORK REGIONAL POLICE
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350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

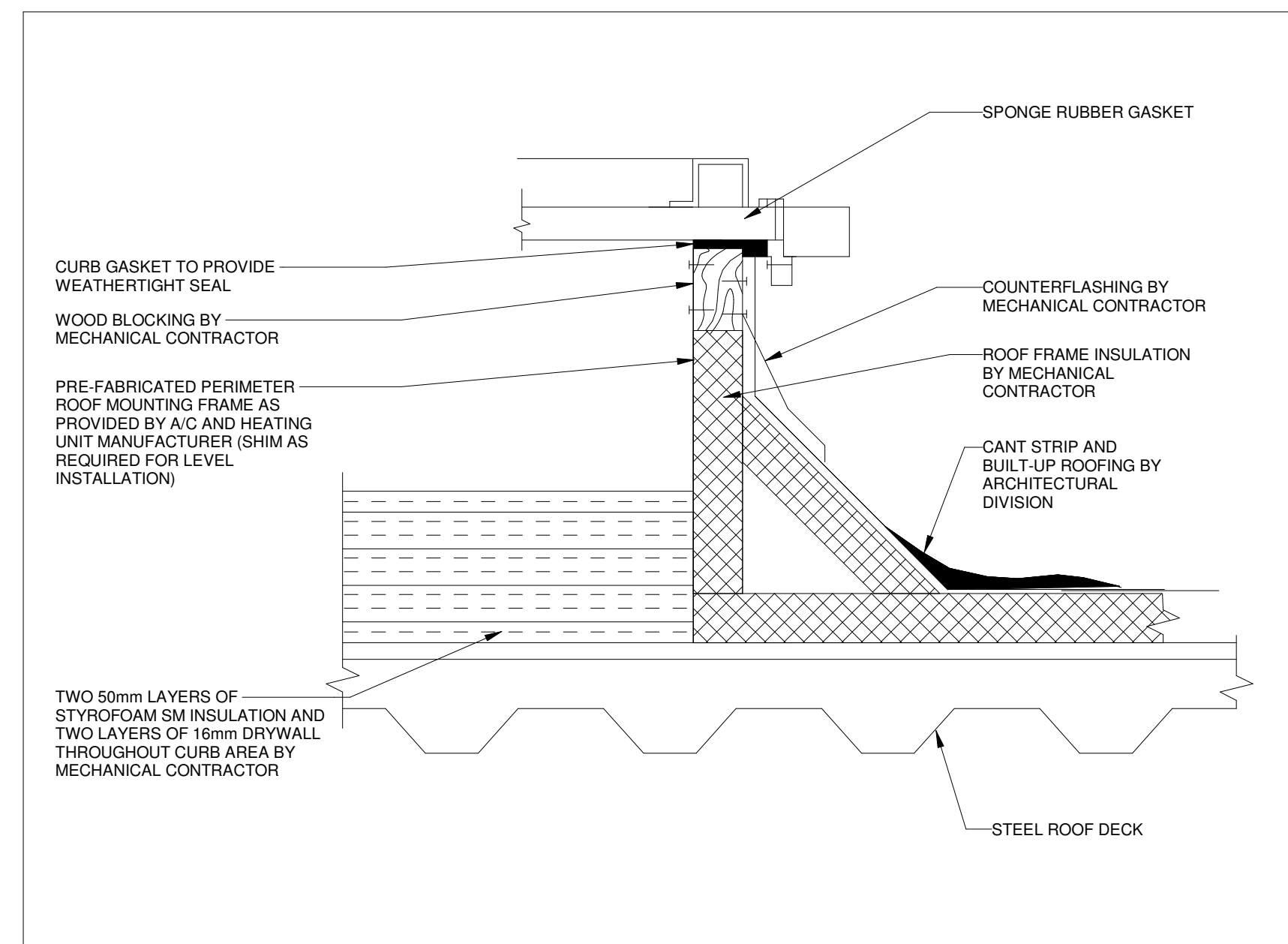
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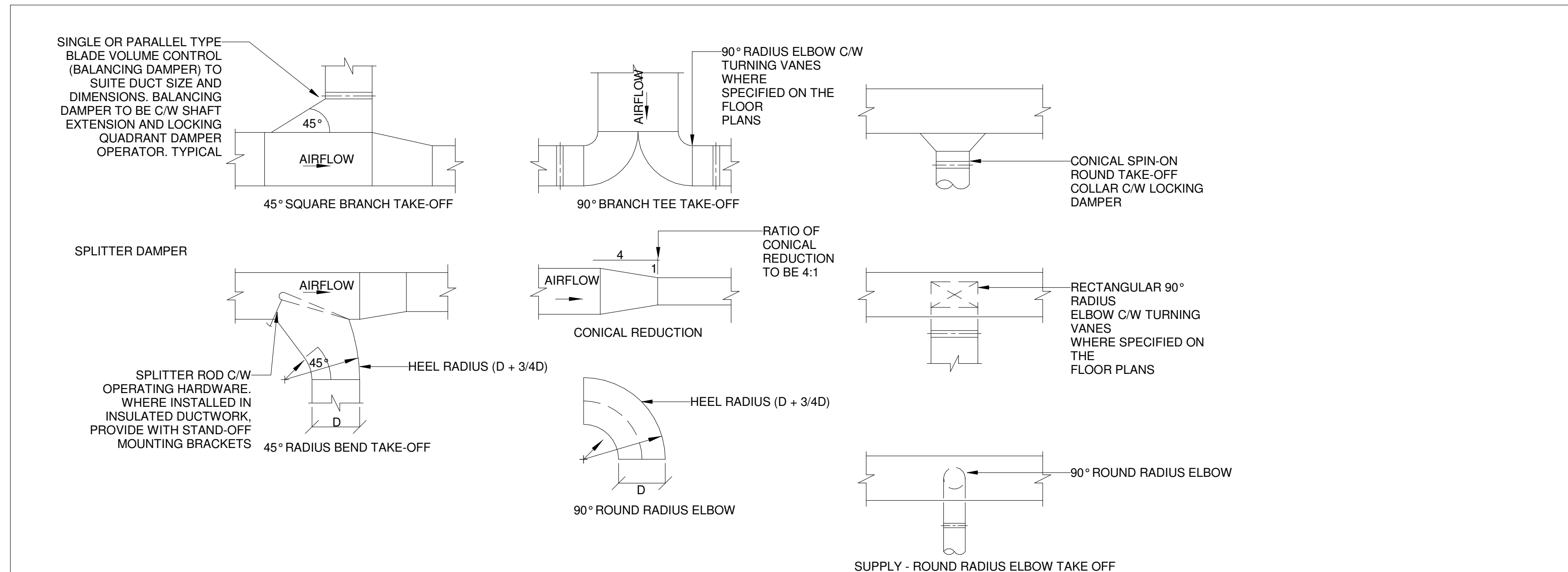
8 CENTRIFUGAL INLINE FAN
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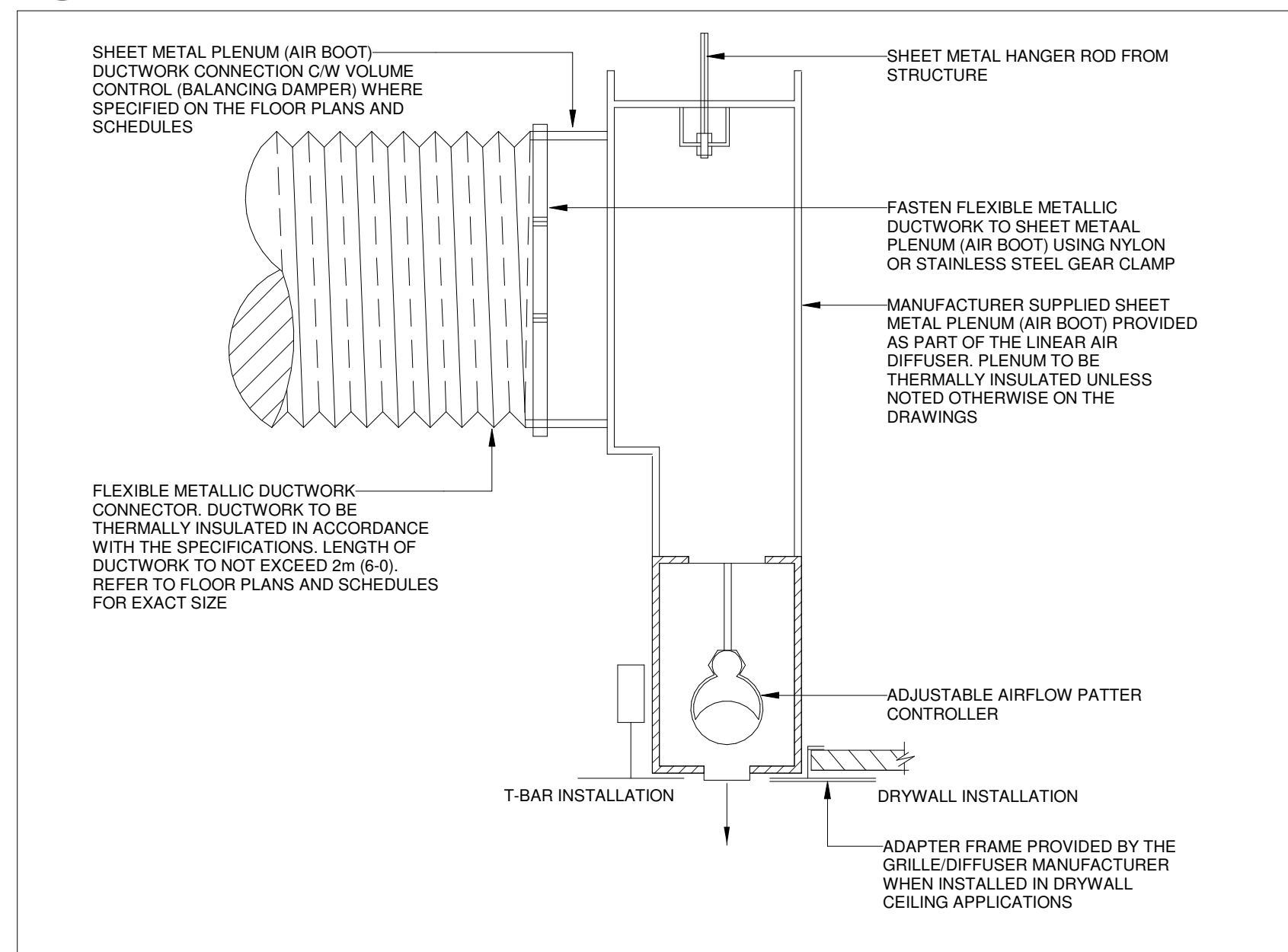
6 FLEXIBLE METALLIC DUCTWORK
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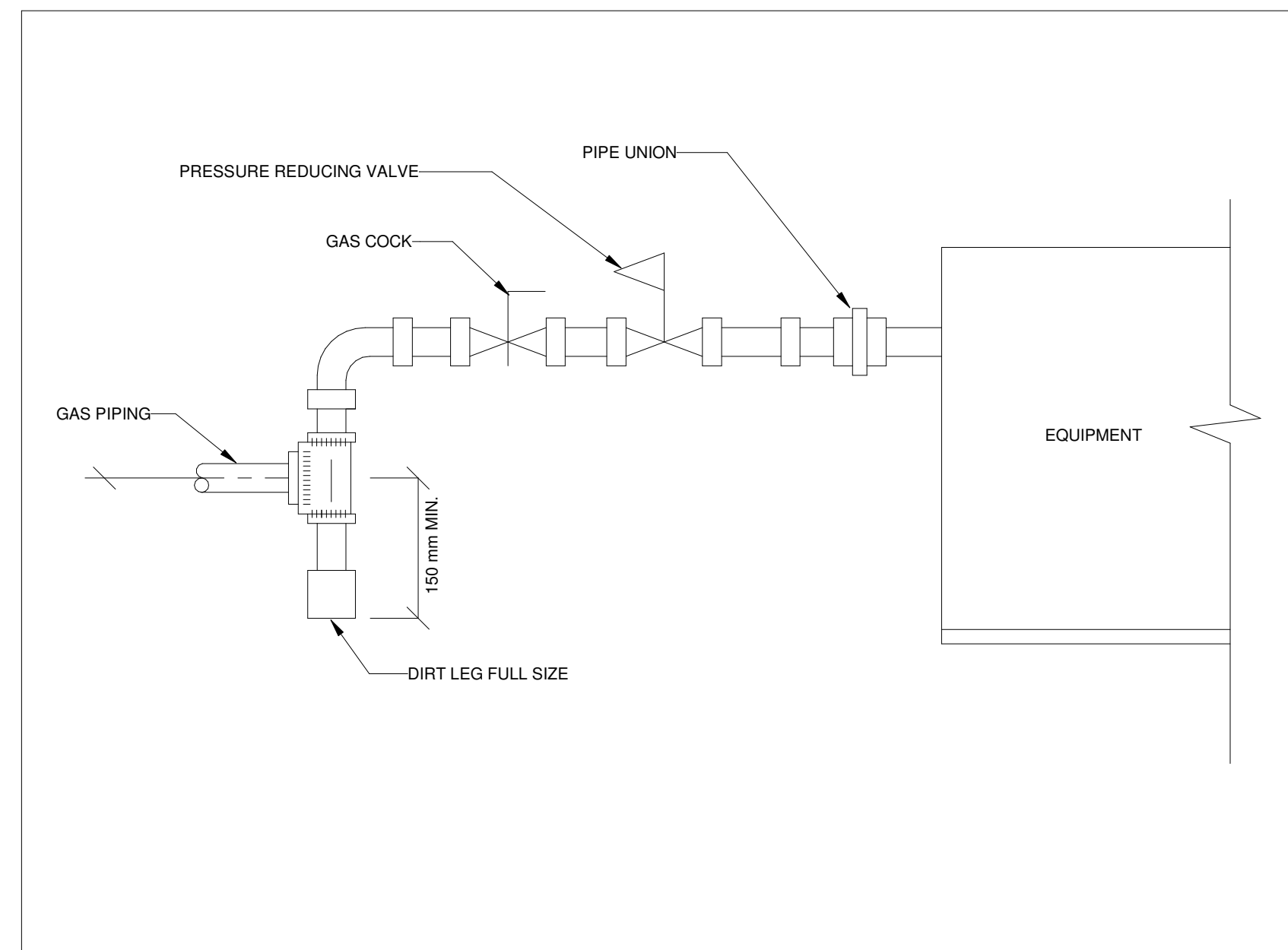
3 ROOFTOP UNIT ROOF CURB
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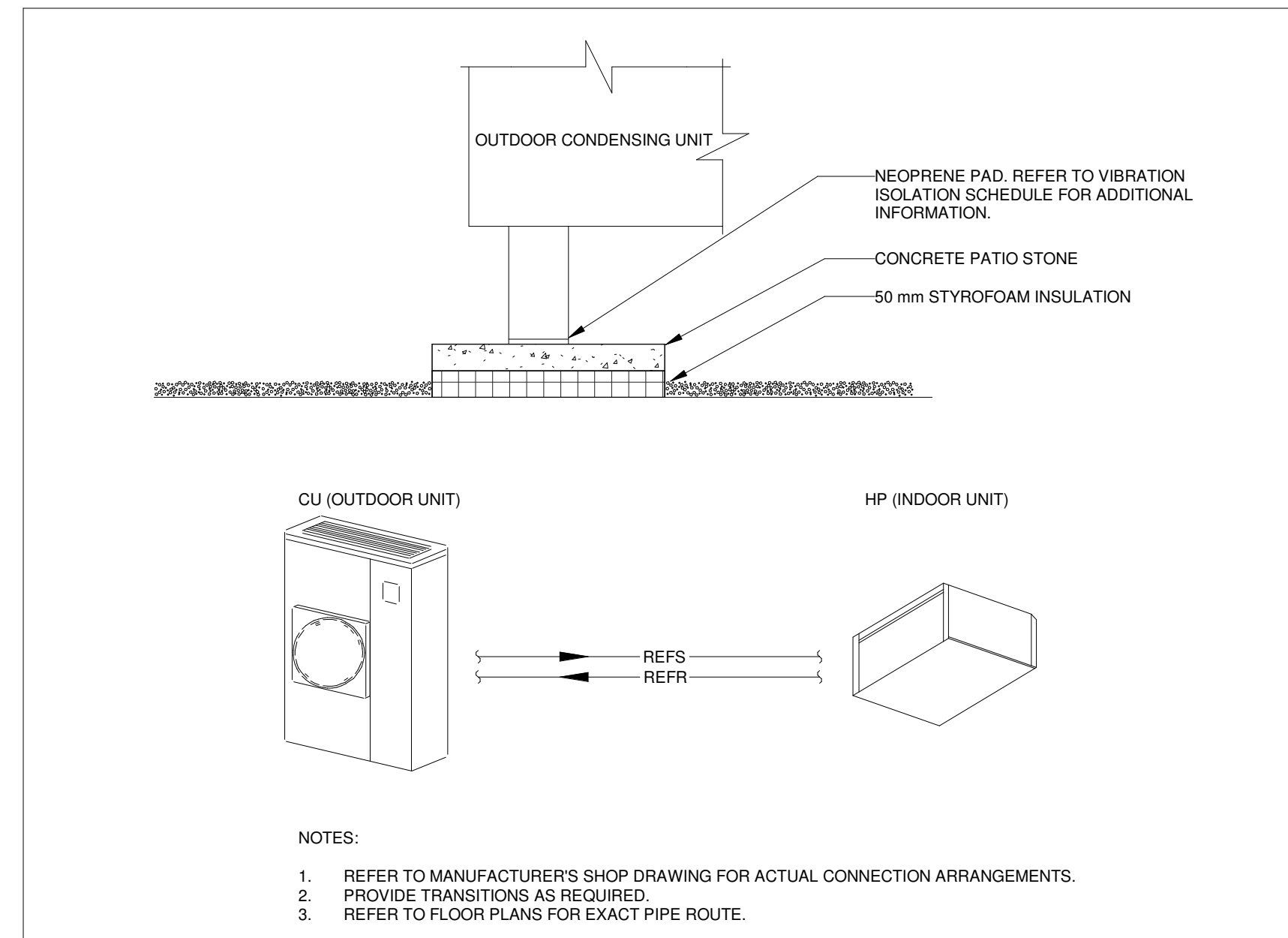
5 DUCTWORK FITTINGS & TAKE-OFF'S
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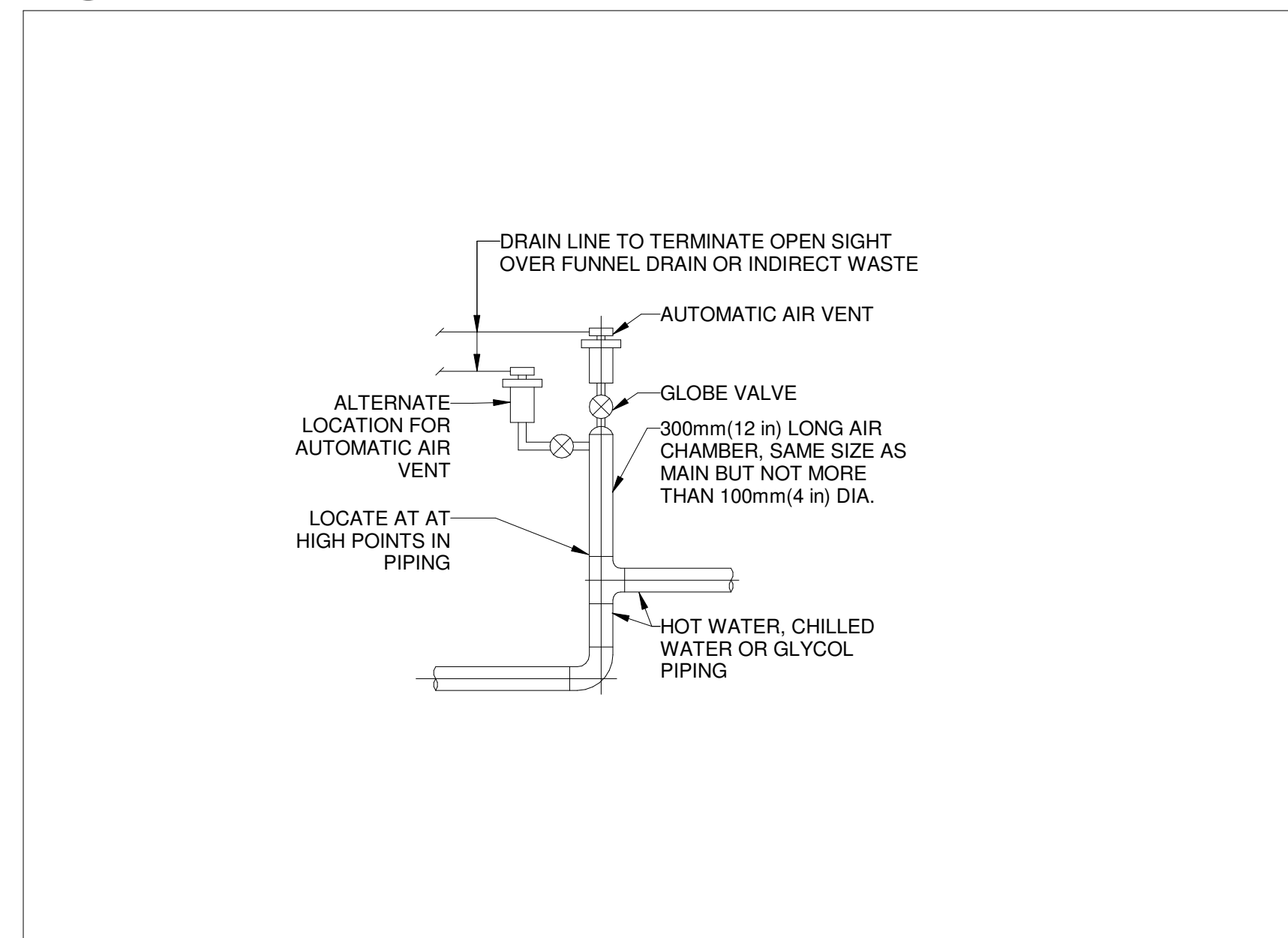
7 SUPPLY AIR LINEAR DIFFUSER (T-BAR CEILING)
SCALE:N.T.S.



4 GAS PIPE CONNECTION TO EQUIPMENT
SCALE:N.T.S.



2 OUTDOOR CONDENSING UNIT
SCALE:N.T.S.



1 AUTOMATIC AIR VENT
SCALE:N.T.S.

[illegible]

Issues

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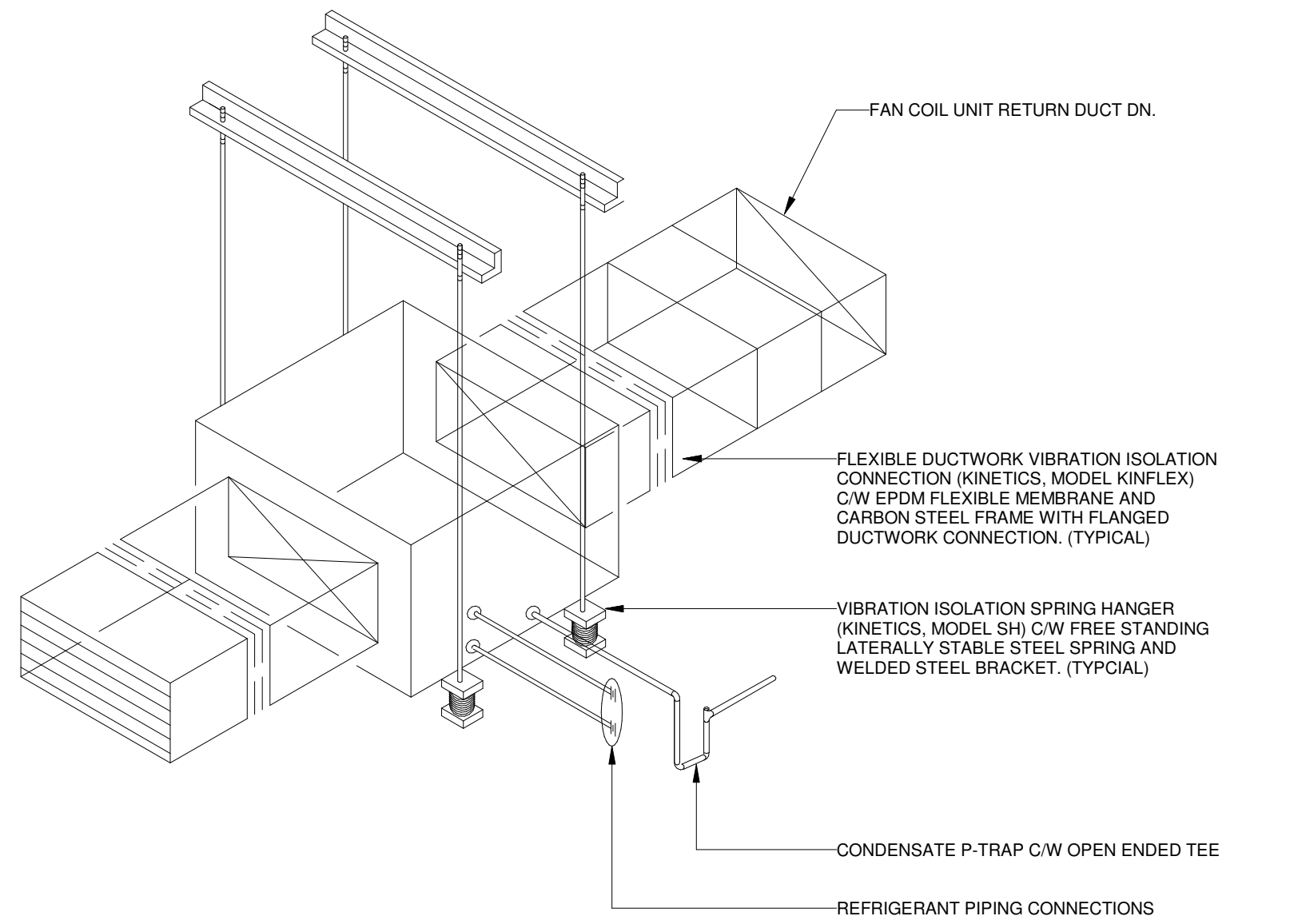
MECHANICAL TYPICAL DETAILS I

Drawing
No.
M-800

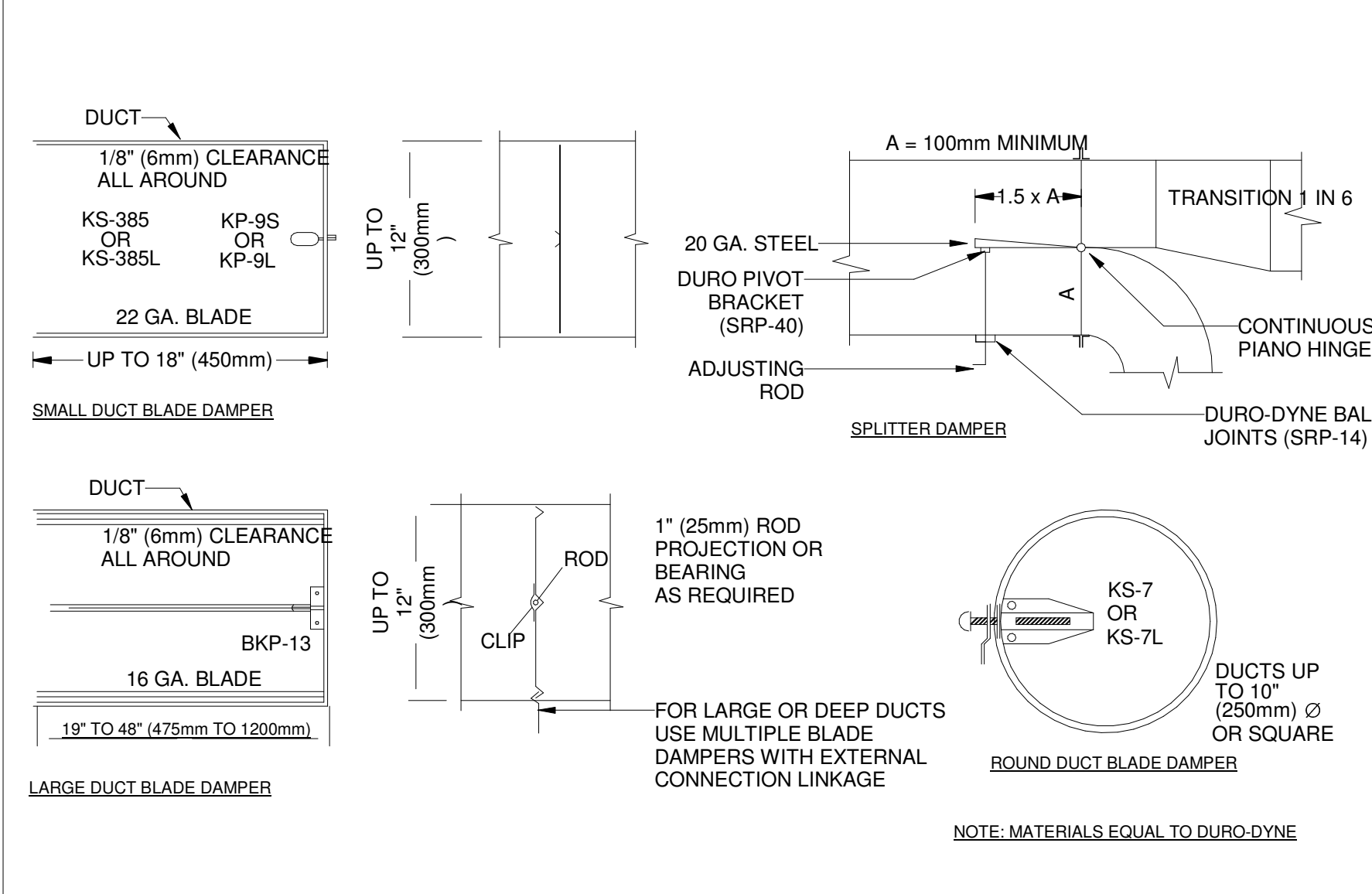
YORK REGIONAL POLICE HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

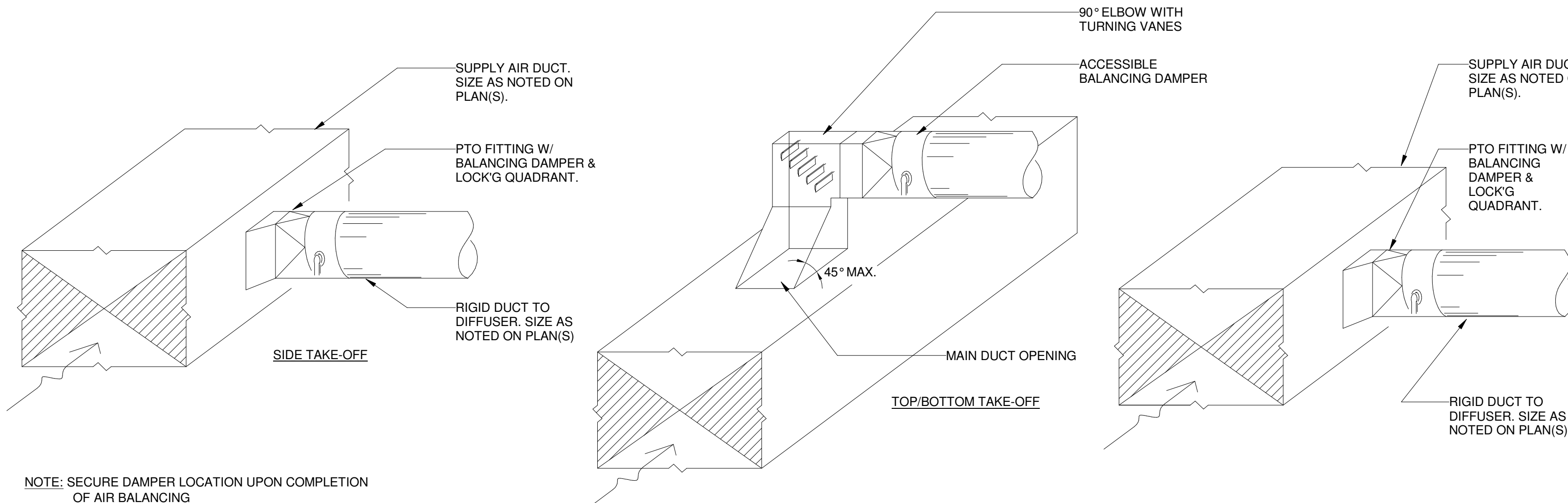
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Plan



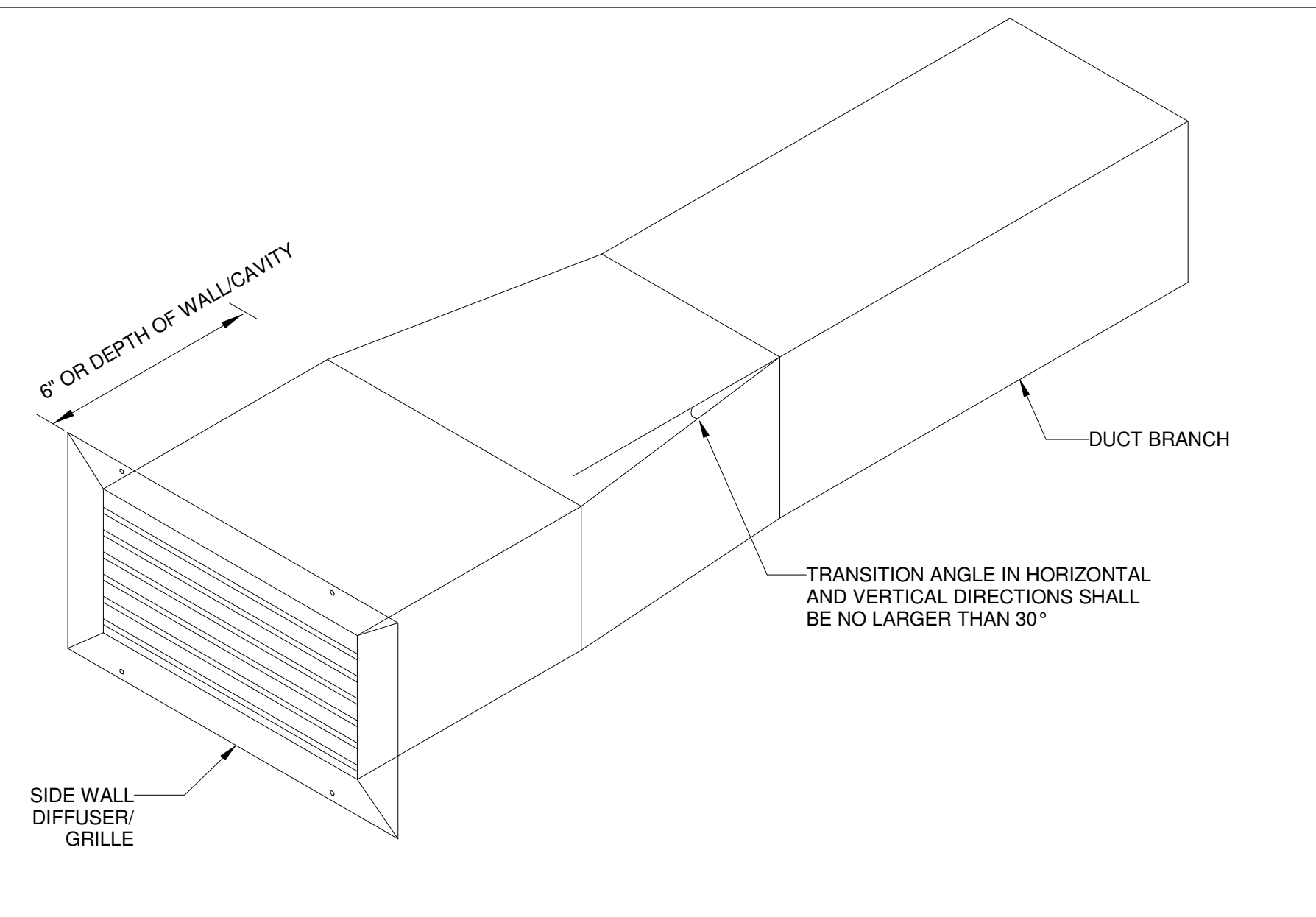
7 DUCTED FAN COIL UNIT
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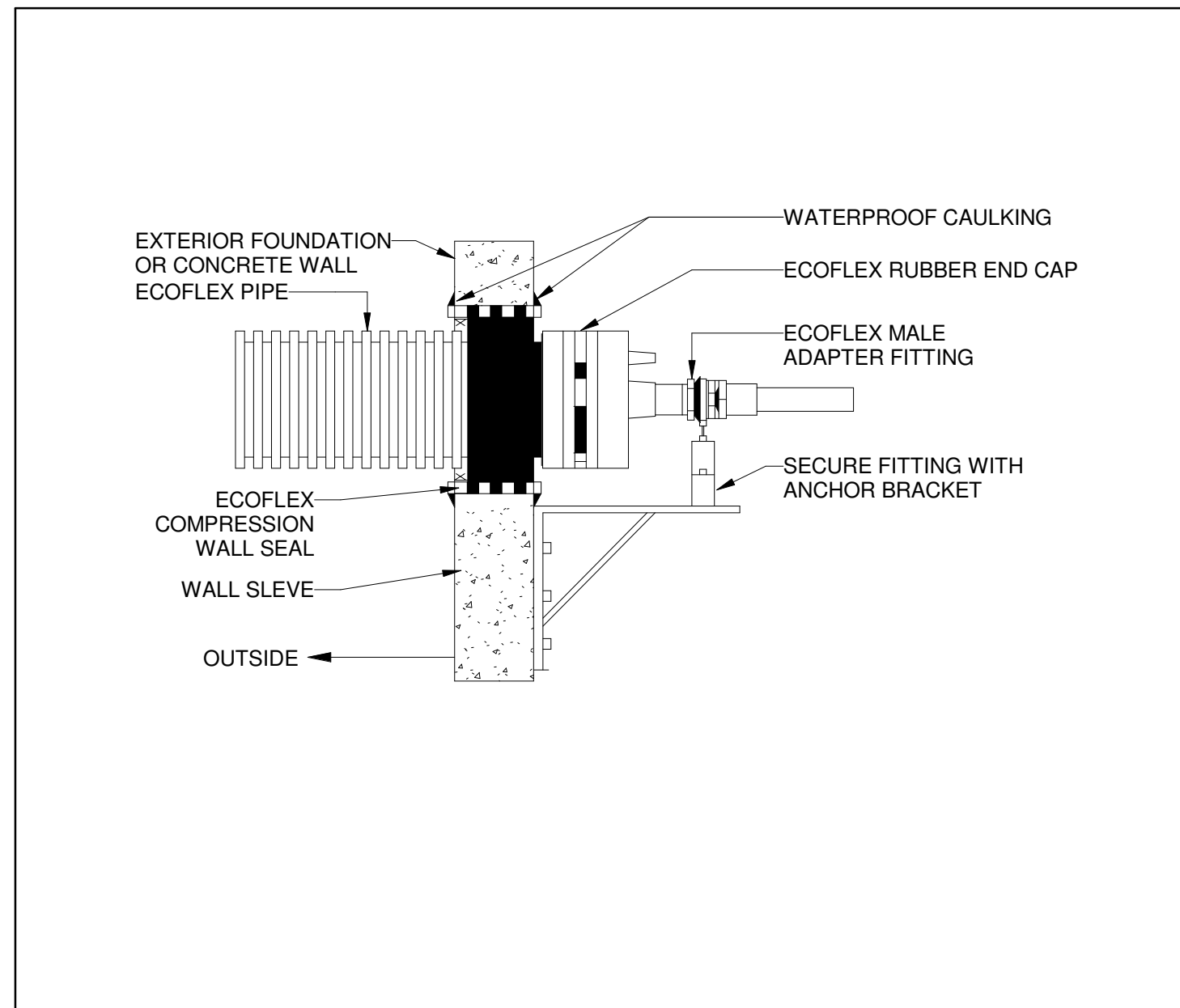
2 VOLUME DAMPER
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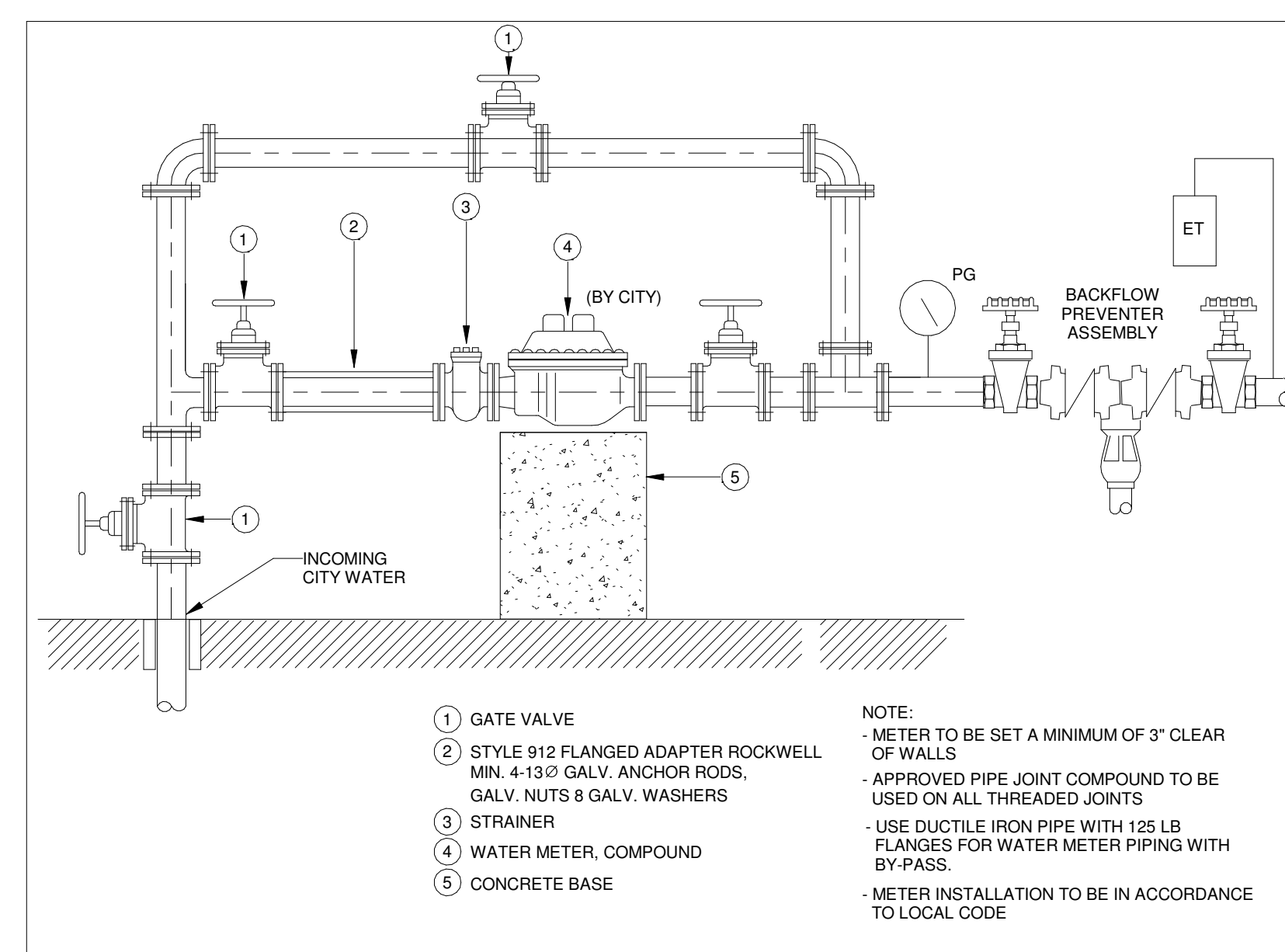
4 TYPICAL BRANCH TAKE-OFF INSTALLATION
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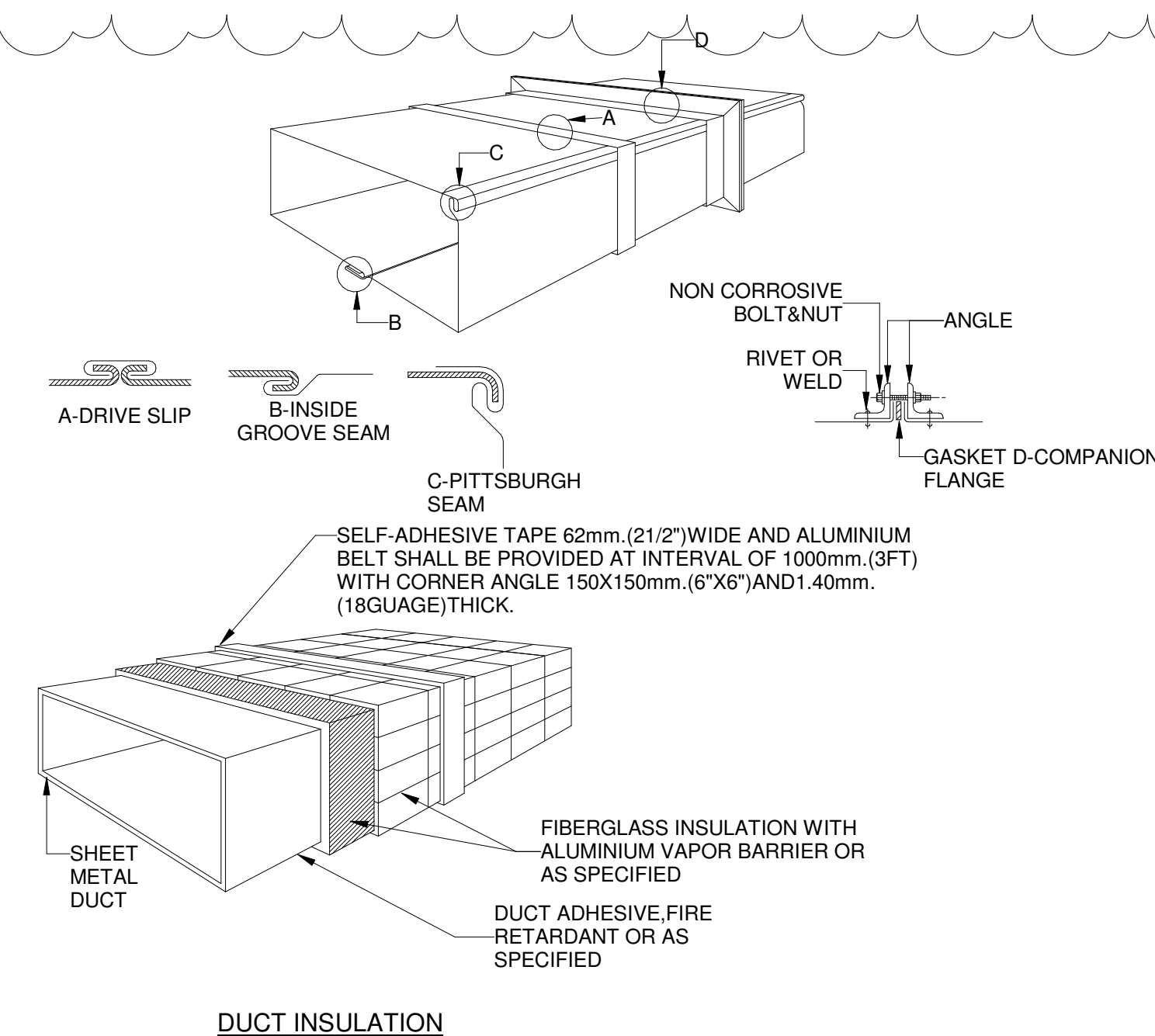
6 TYPICAL DETAIL OF SIDE WALL DIFFUSER/GRILLE
SCALE: N.T.S.



3 ECOFLEX THERMO CROSS LINKED WALL PENETRATION
SCALE: N.T.S.



5 WATER METER ASSEMBLY
SCALE: N.T.S.



1 RECTANGULAR DUCT INSULATION
SCALE: N.T.S.

Issues

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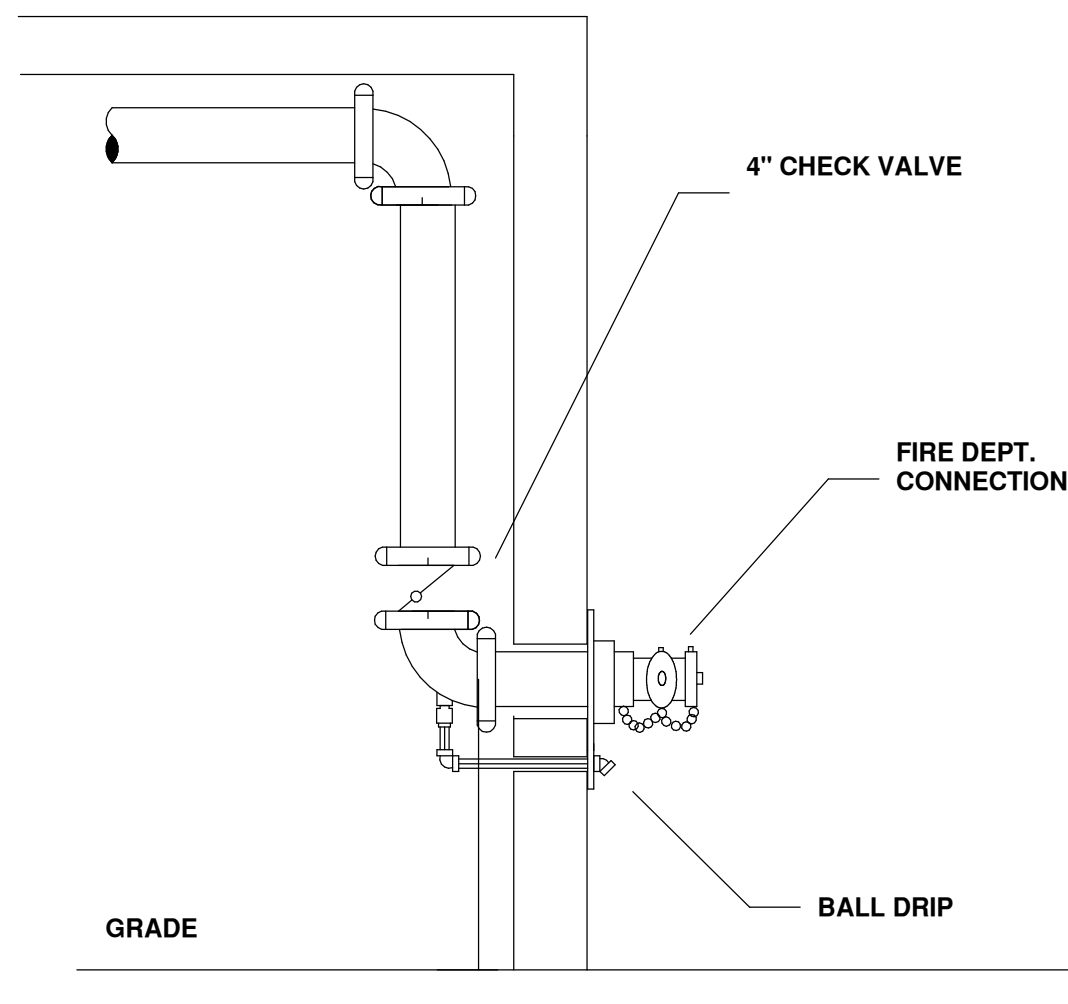
MECHANICAL TYPICAL DETAILS II

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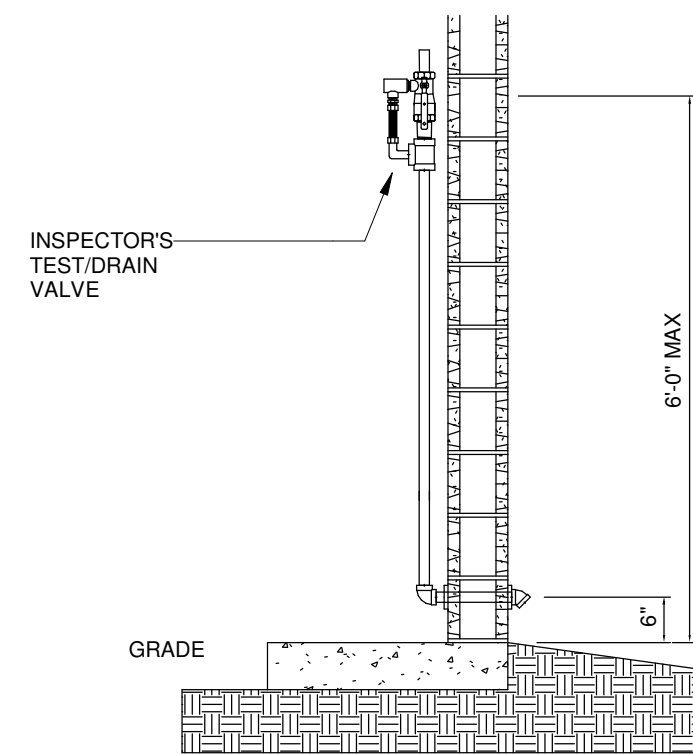
YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

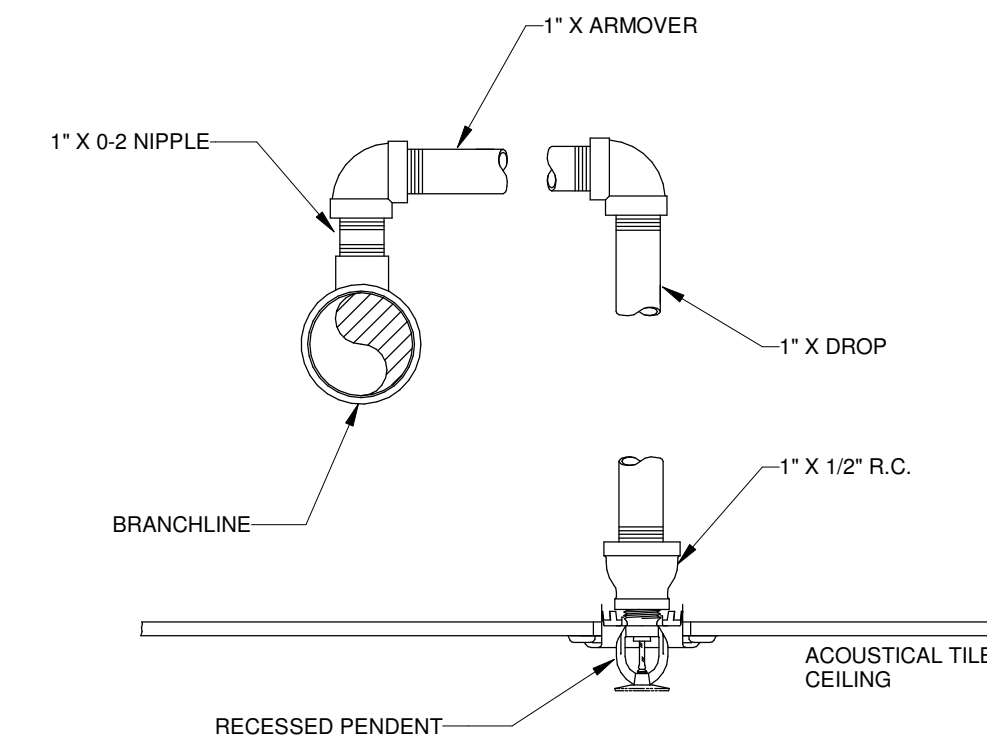
Key Plan



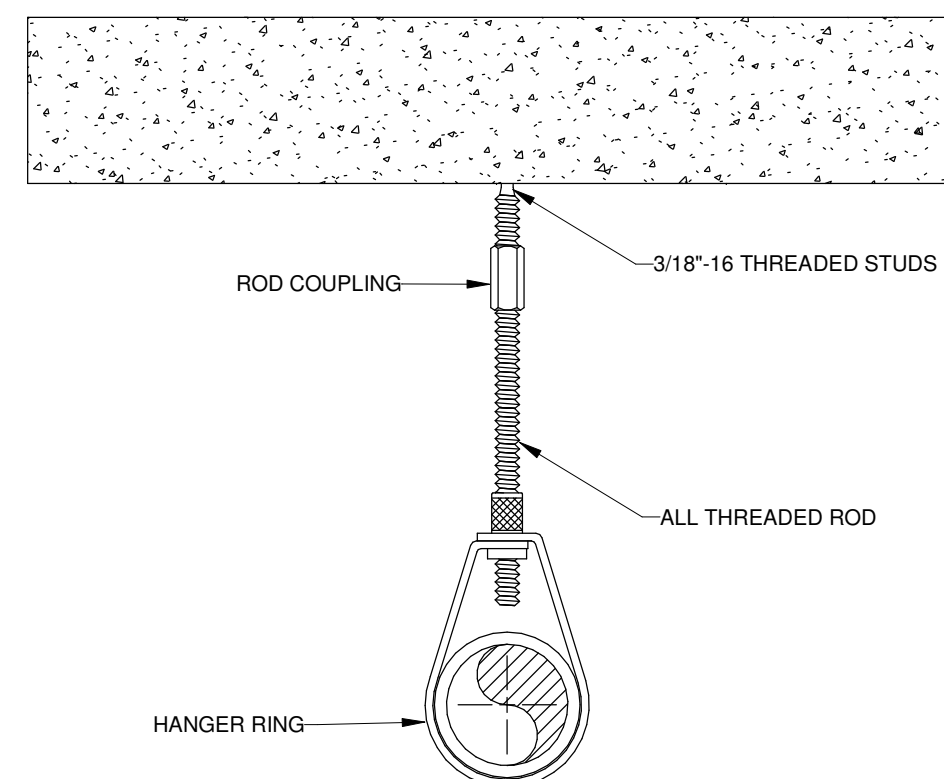
9 FIRE DEPARTMENT CONNECTION
SCALE:N.T.S.



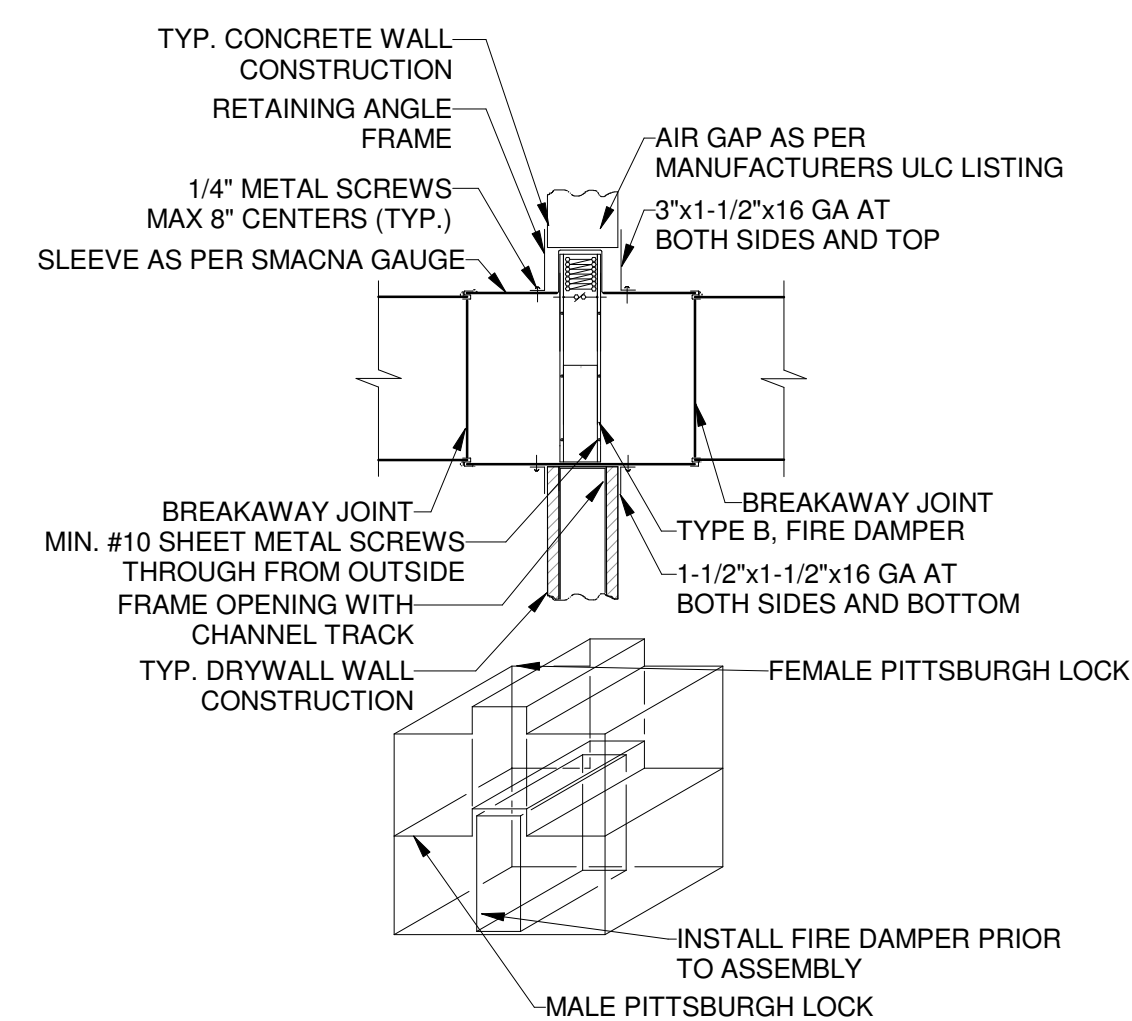
INSPECTOR'S TEST DETAIL



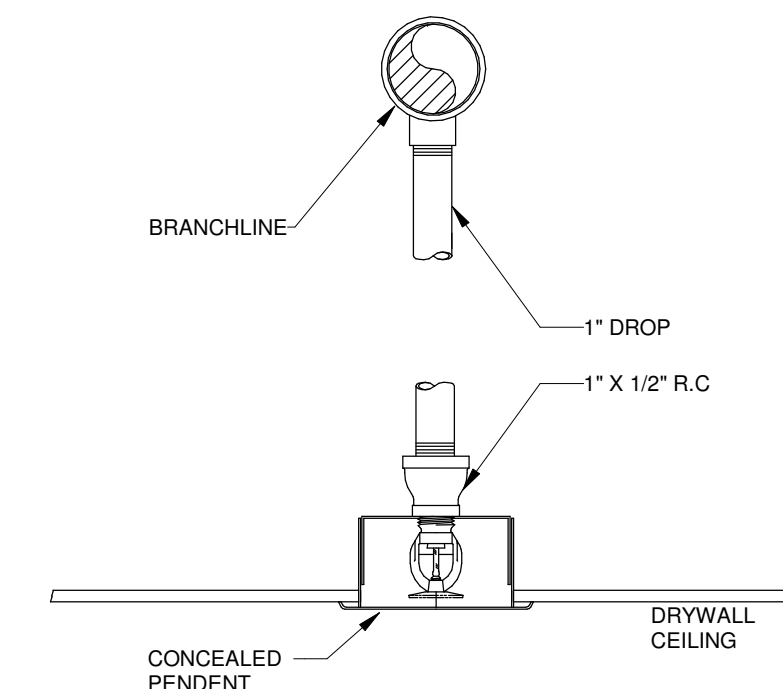
3 RETURN BEND DETAIL
SCALE:N.T.S.



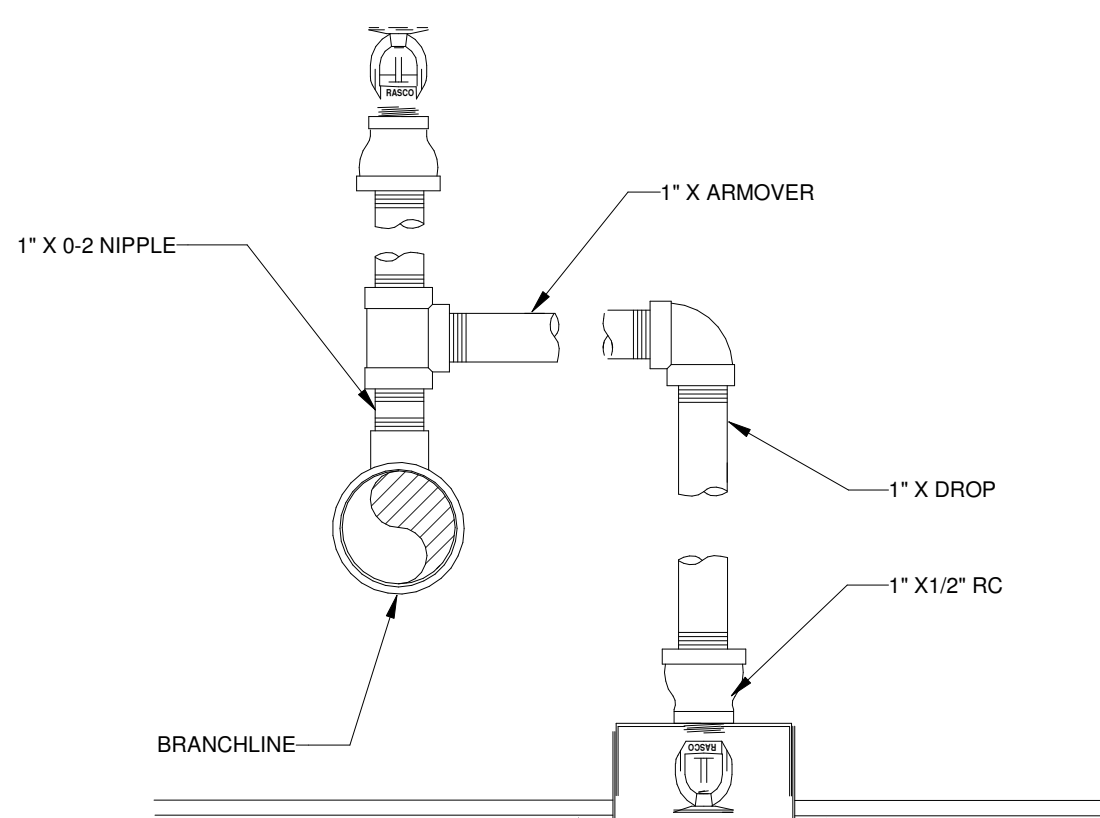
8 FIRE PROTECTION HANGER DETAIL-1
SCALE:N.T.S.



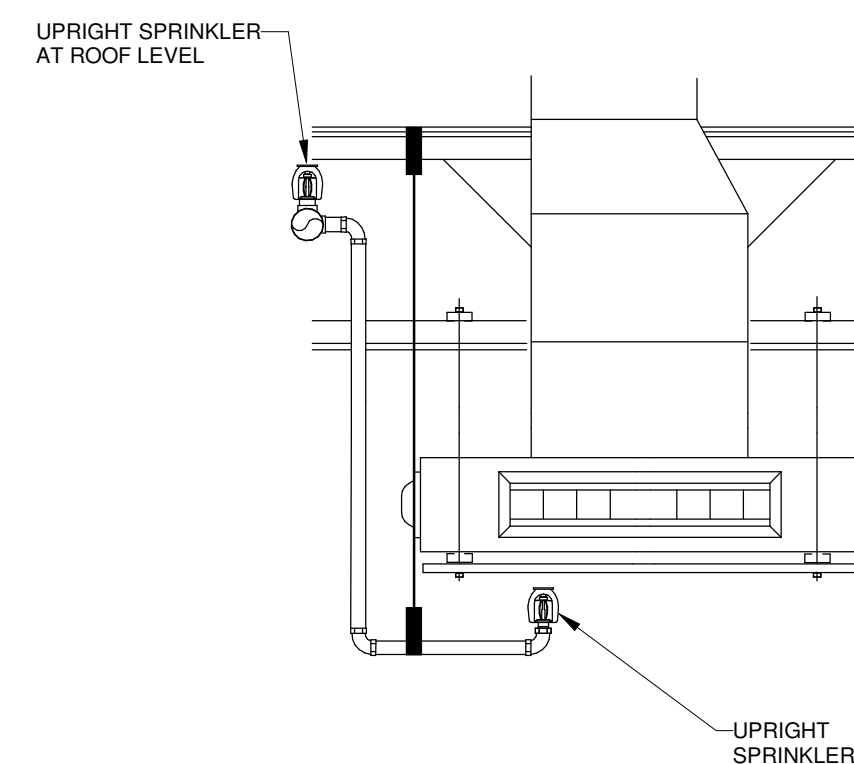
5 TYPE "B" FIRE DAMPER
SCALE:N.T.S.



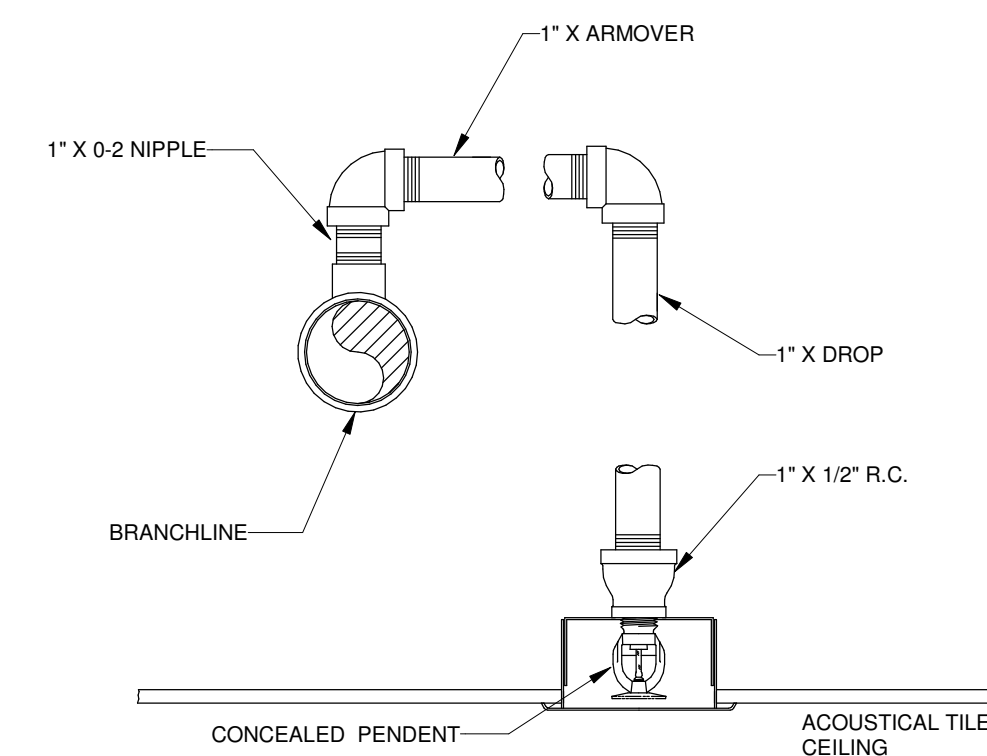
2 CONCEALED SPRINKLER DROP DETAIL
SCALE:N.T.S.



7 SPRINKLER UP AND DOWN DETAIL
SCALE:N.T.S.



4 SPRINKLERS BENEATH DUCTWORK
SCALE:N.T.S.



1 CONCEALED RETURN BEND DETAIL
SCALE:N.T.S.

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Sheet
Title:

MECHANICAL TYPICAL DETAILS III

Drawing
No.
M-802

YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

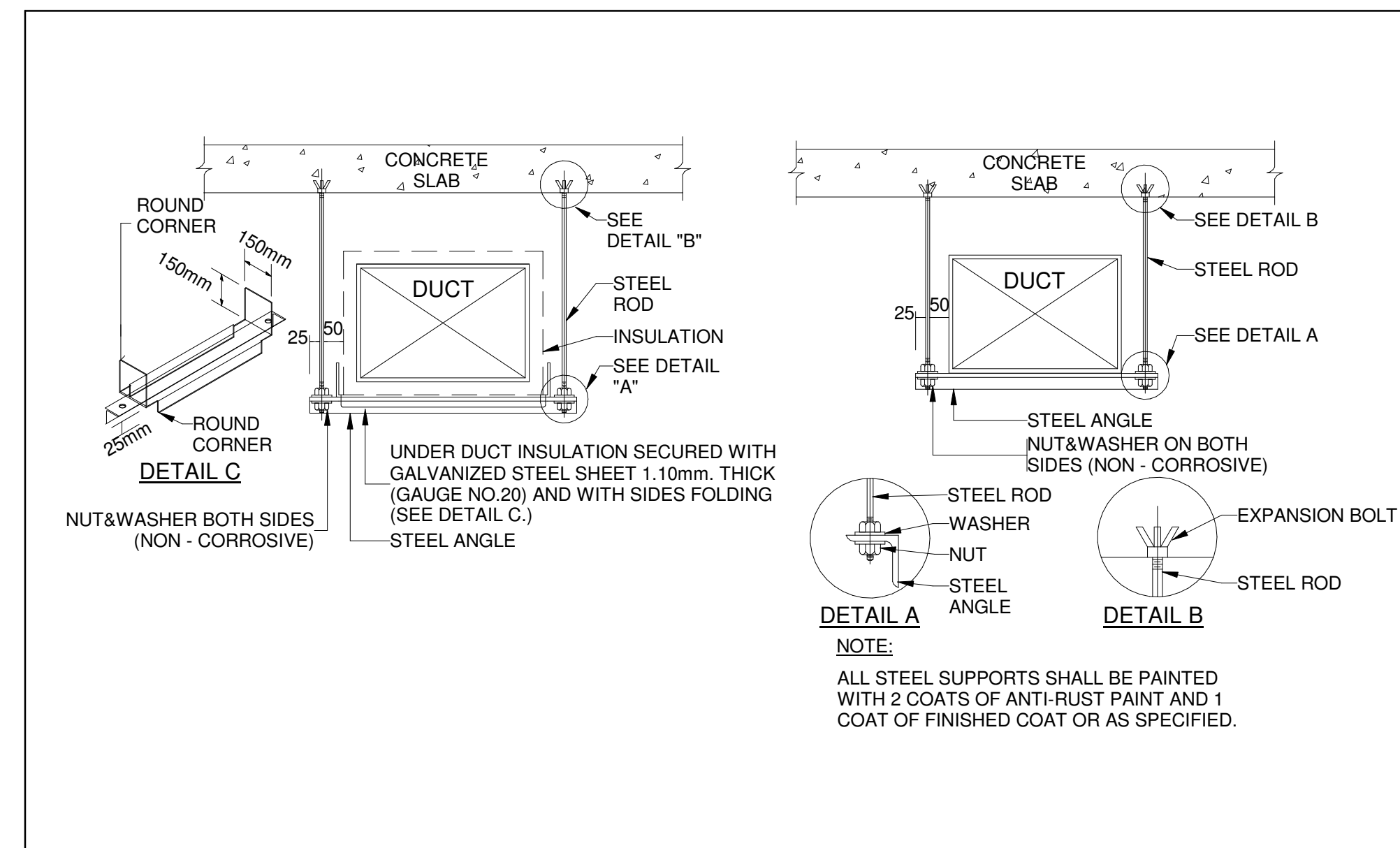
Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Tulriga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

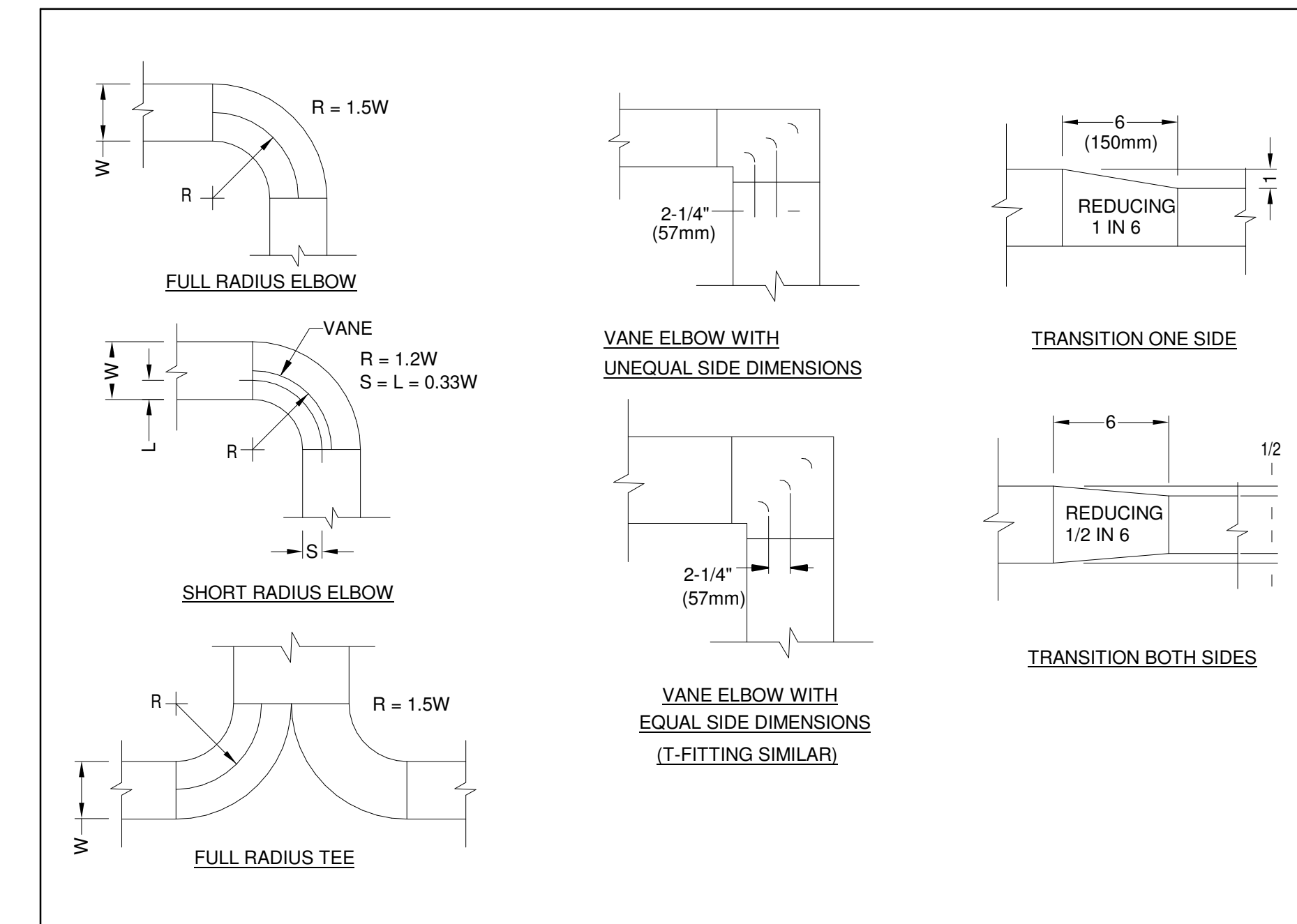
Sheet
Title:

MECHANICAL TYPICAL DETAILS IV

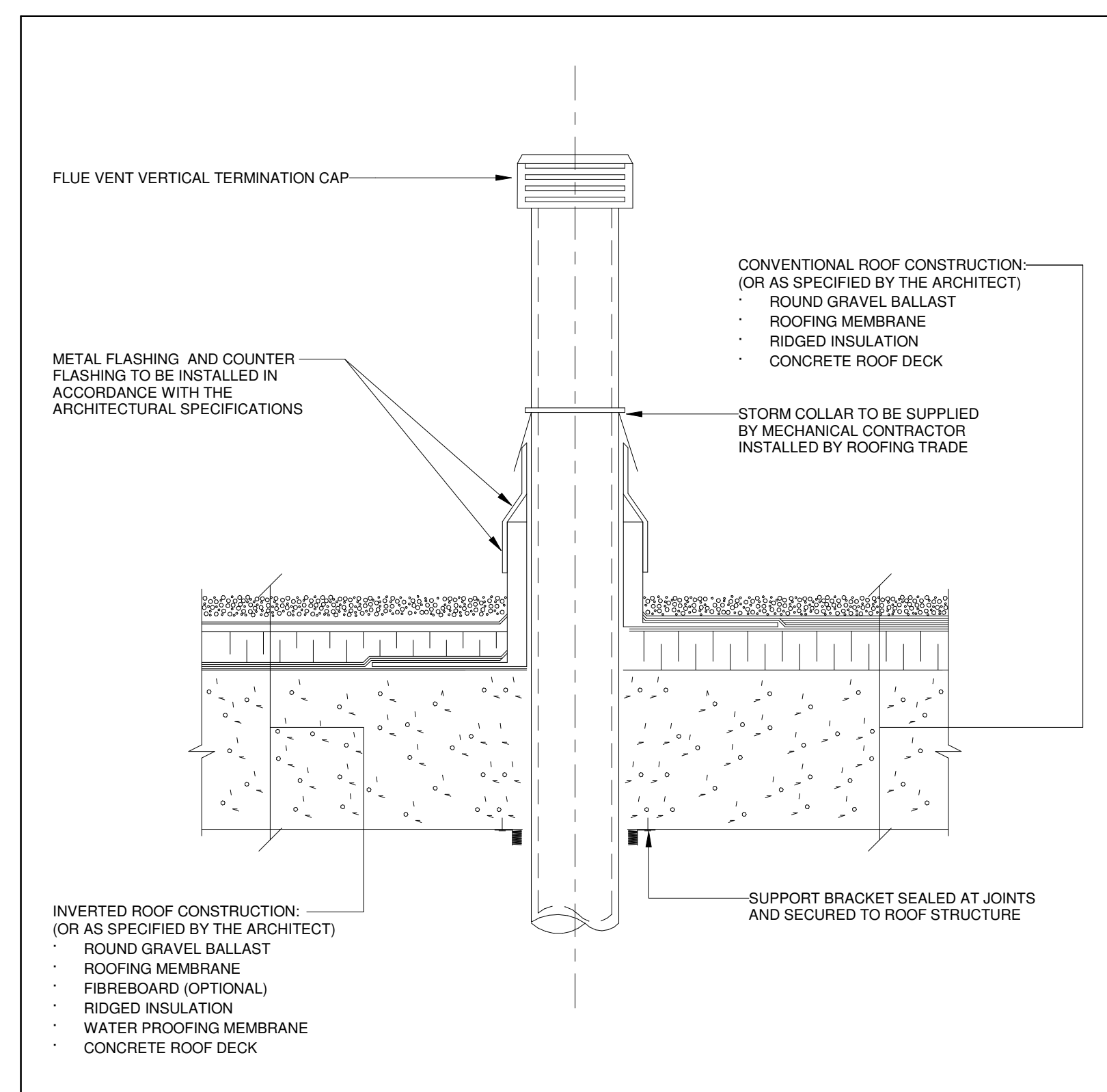
Drawing
No. **M-803**



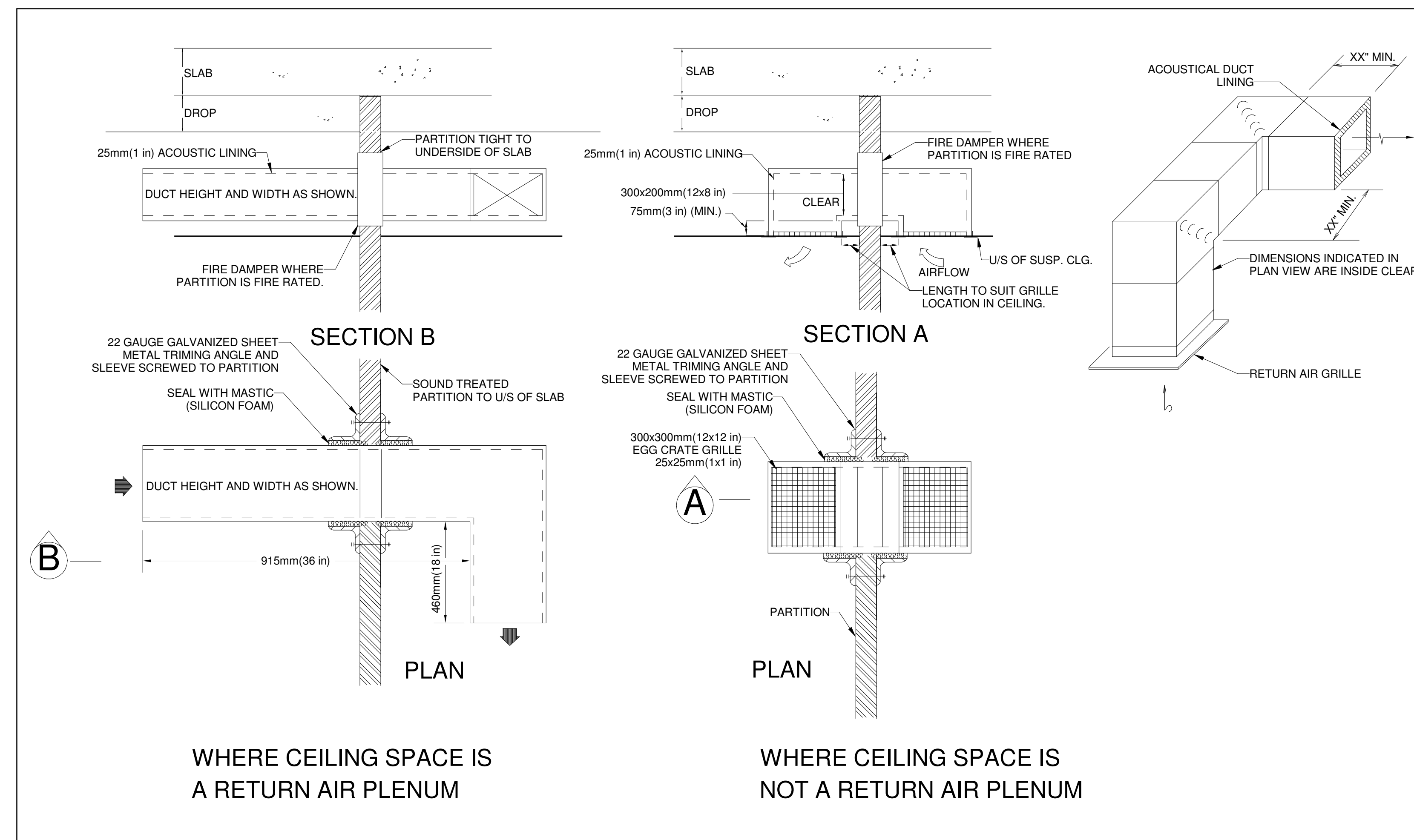
3 DUCT HANGER AND SUPPORTS



2 SQUARE & RADIUS ELBOWS
SCALE:N.T.S.



4 EXHAUST FLUE VENT ROOF PENETRATION
SCALE:N.T.S.

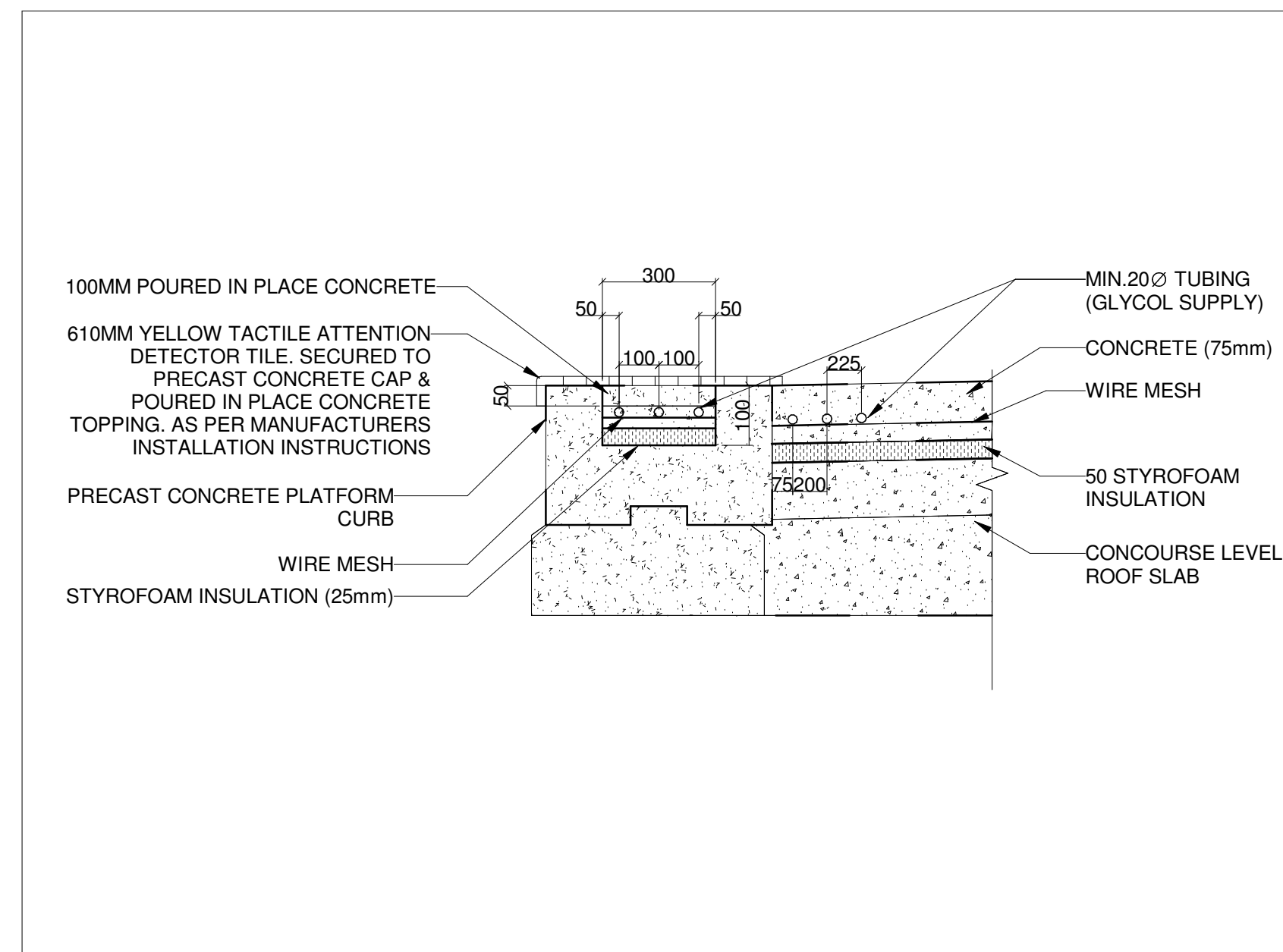


1 TRANSFER AIR DUCT
SCALE: N.T.S.

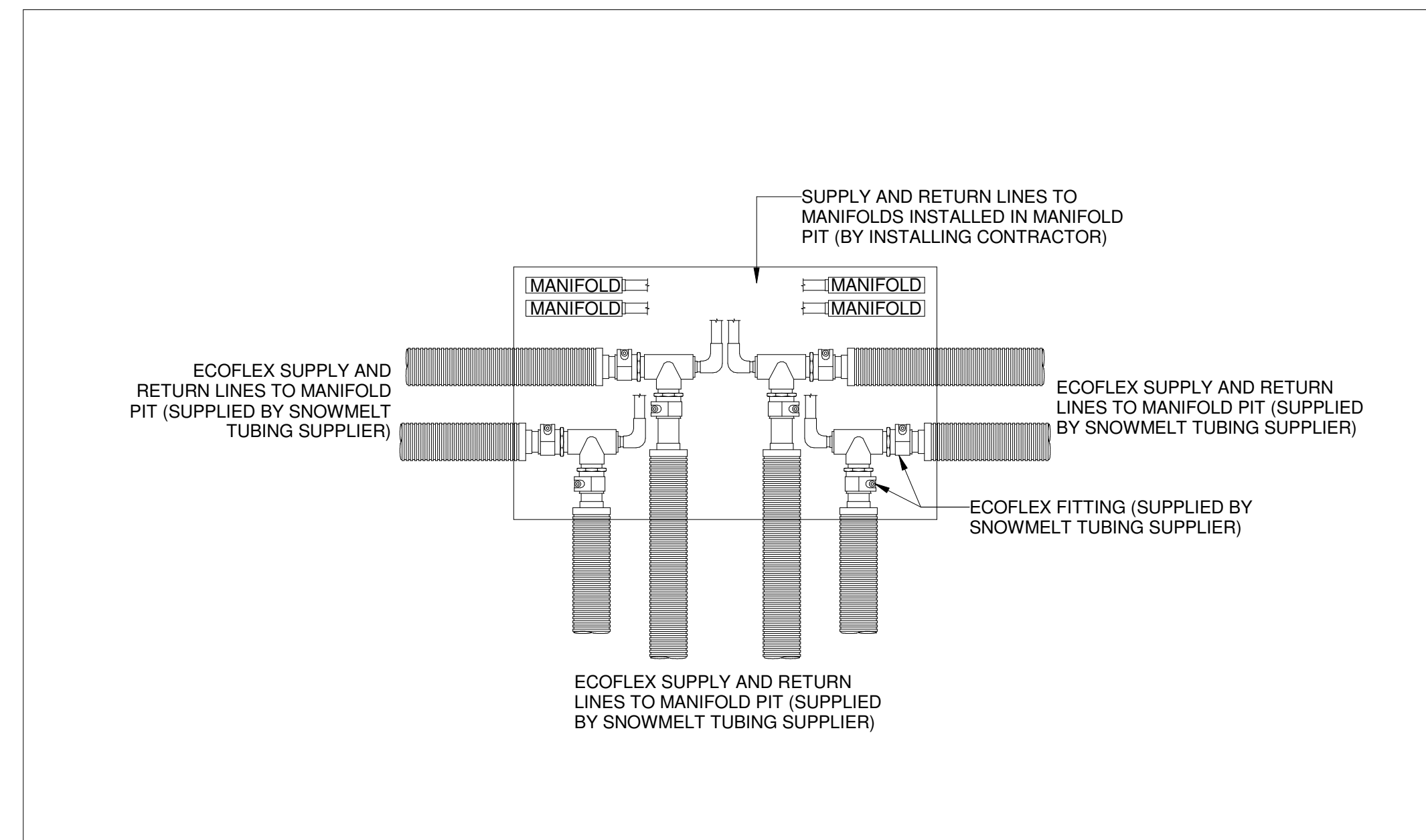
YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

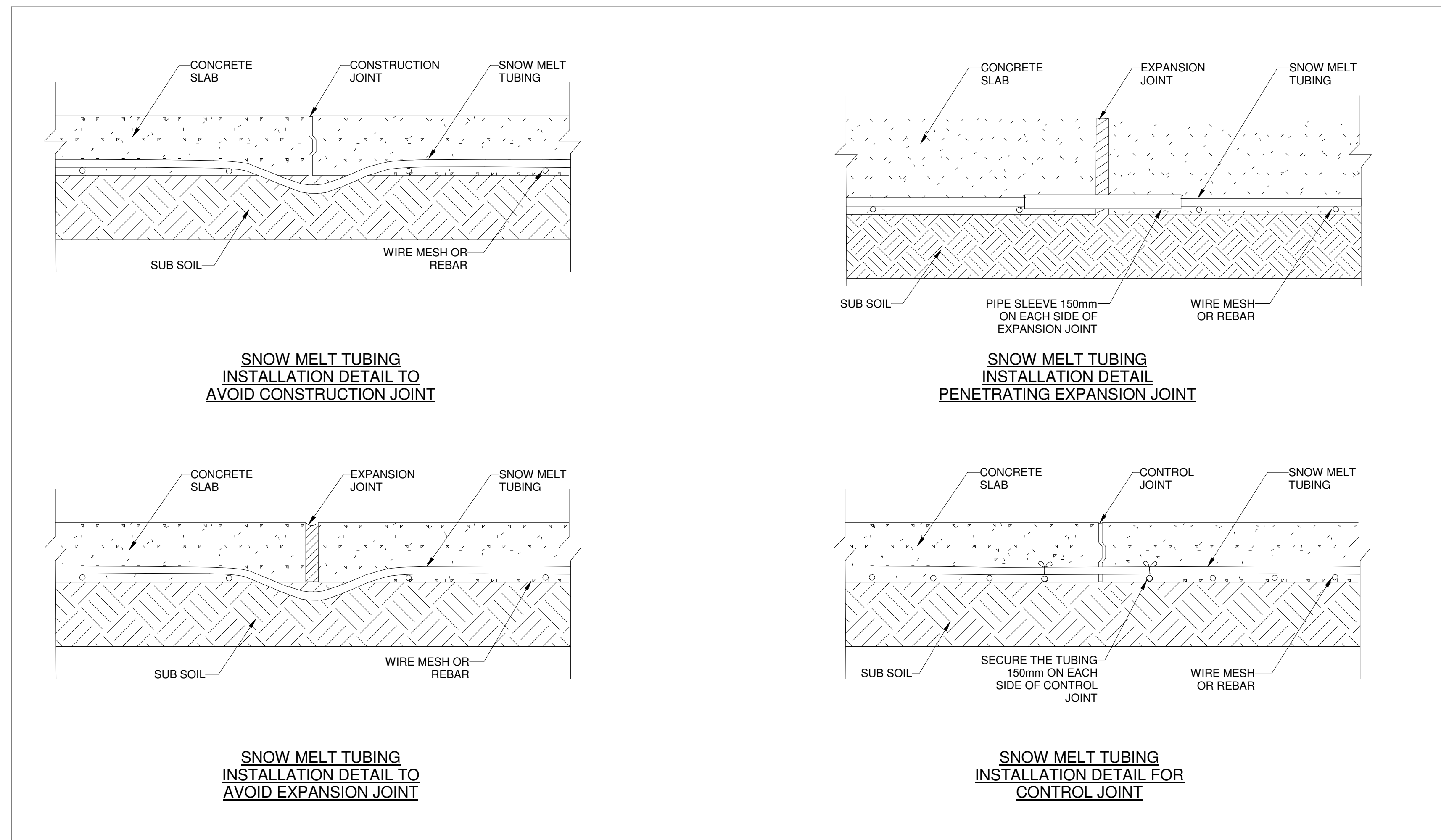
Key Plan



3 SNOWMELT TUBING INSTALLATION
SCALE:N.T.S.



2 SNOWMELT MANIFOLD PIT PIPING
SCALE:N.T.S.



1 SNOWMELT TUBING CROSSING JOINT
SCALE:N.T.S.

[illegible]

Issues

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Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Sheet
Title:

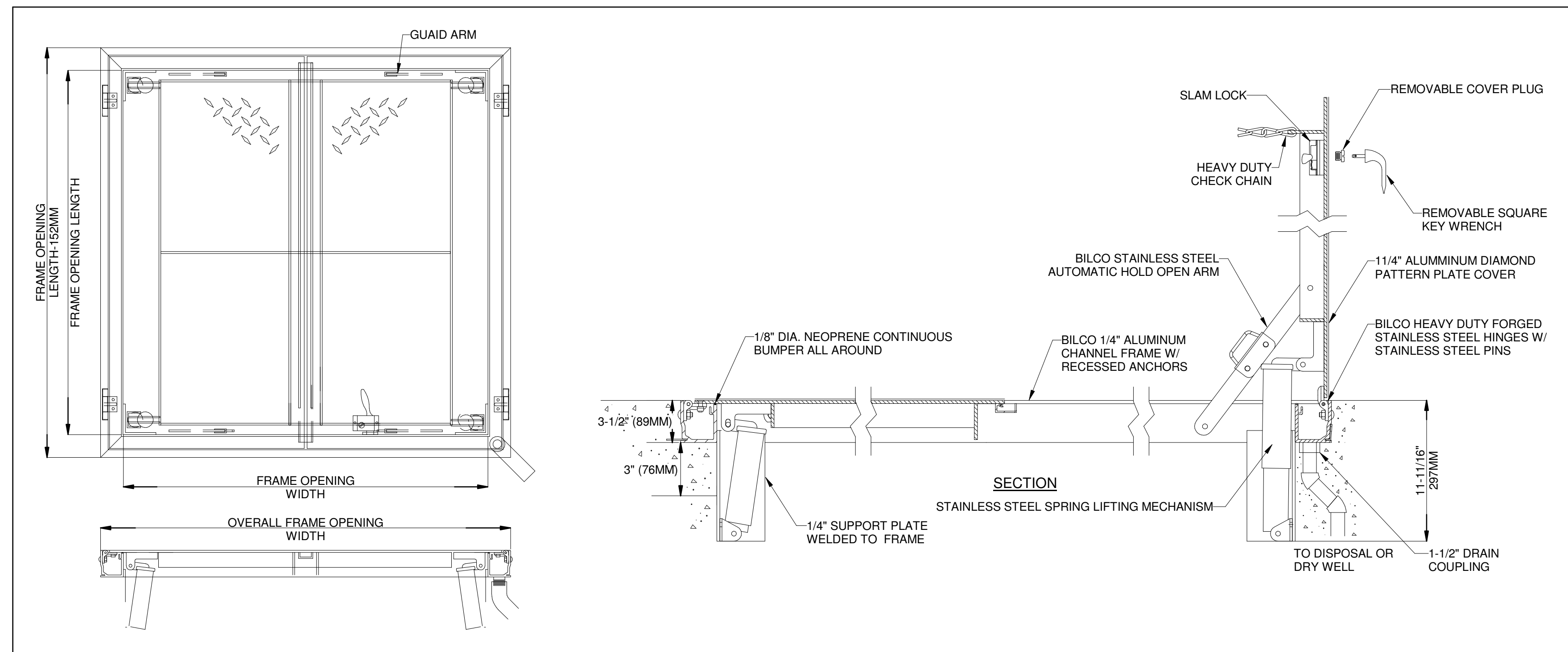
MECHANICAL TYPICAL DETAILS V

Drawing
No.
M-804

YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

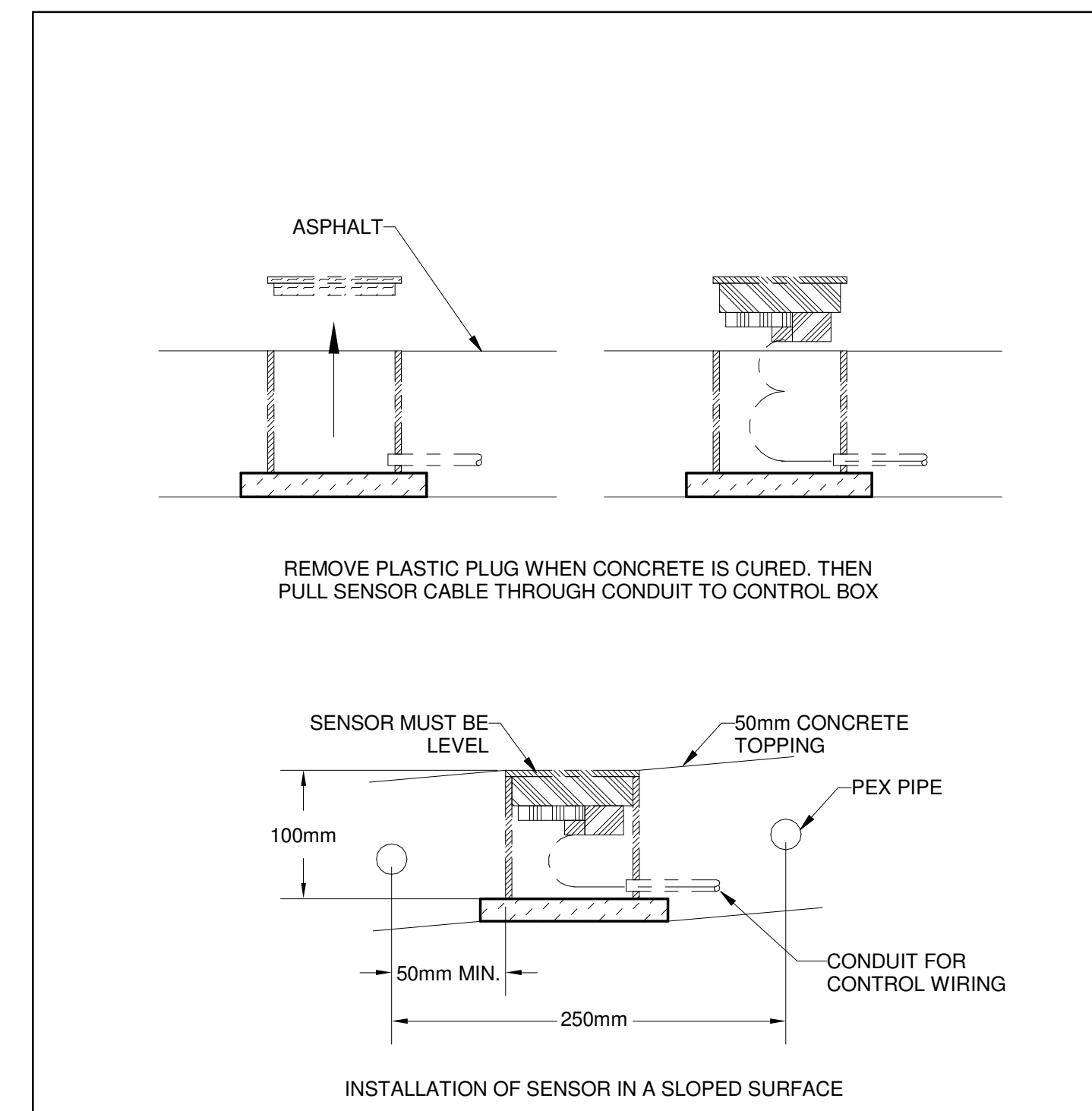
Key Plan



PLAN

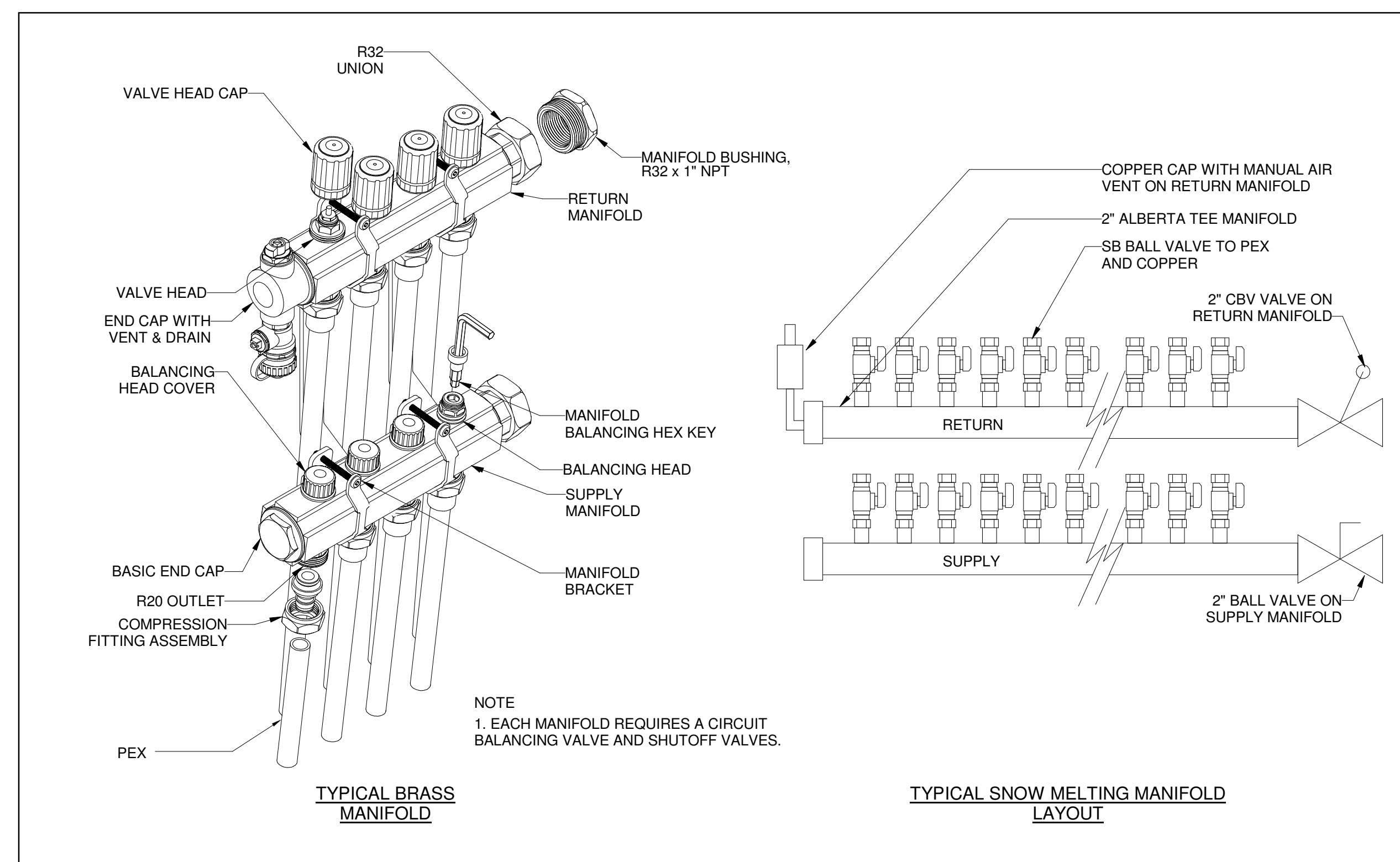
SNOW MELT MANIFOLD PIT ACCESS DOOR DETAIL

SCALE:N.T.S.



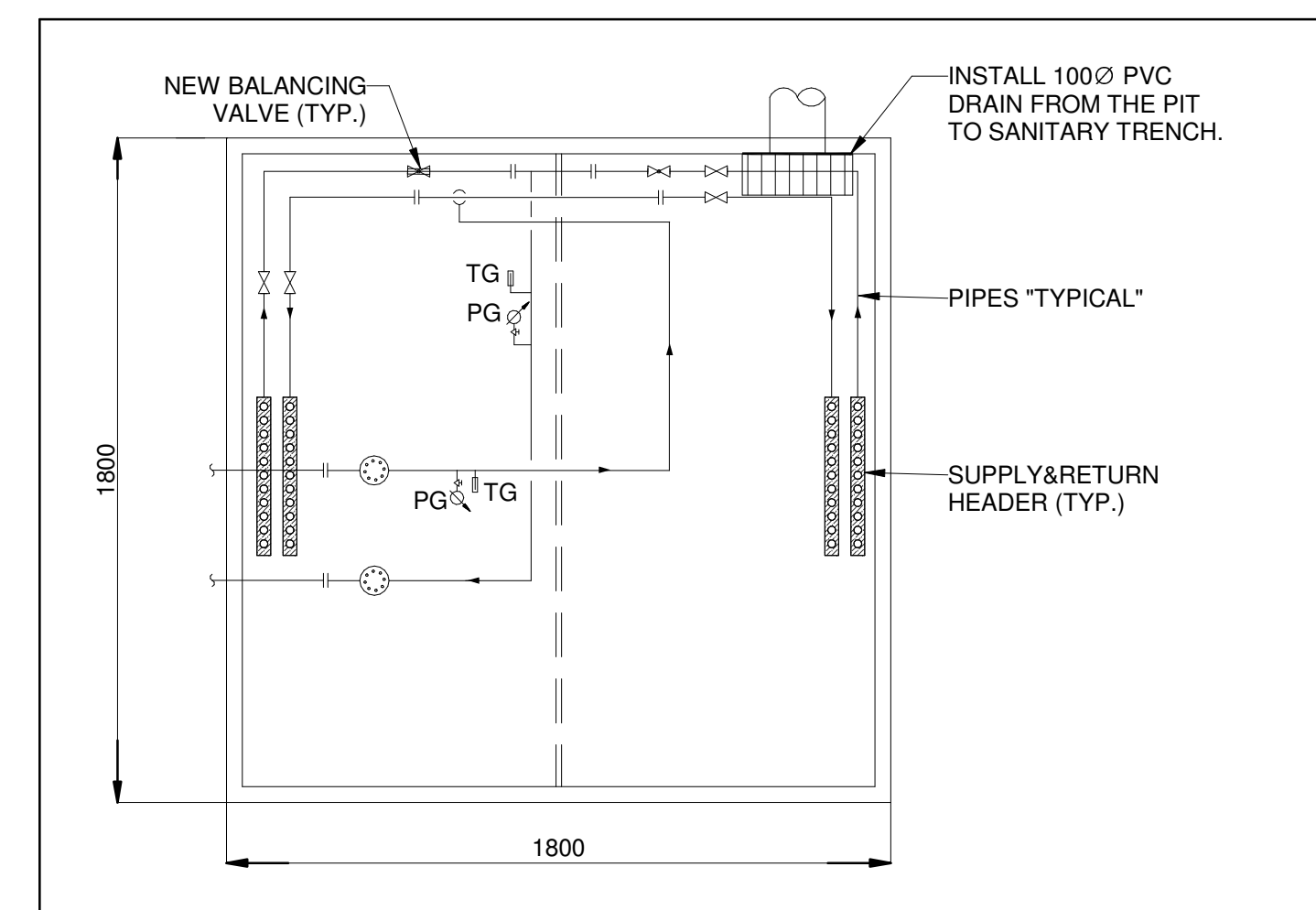
SNOW/ICE SENSOR DETAIL

SCALE:N.T.S.



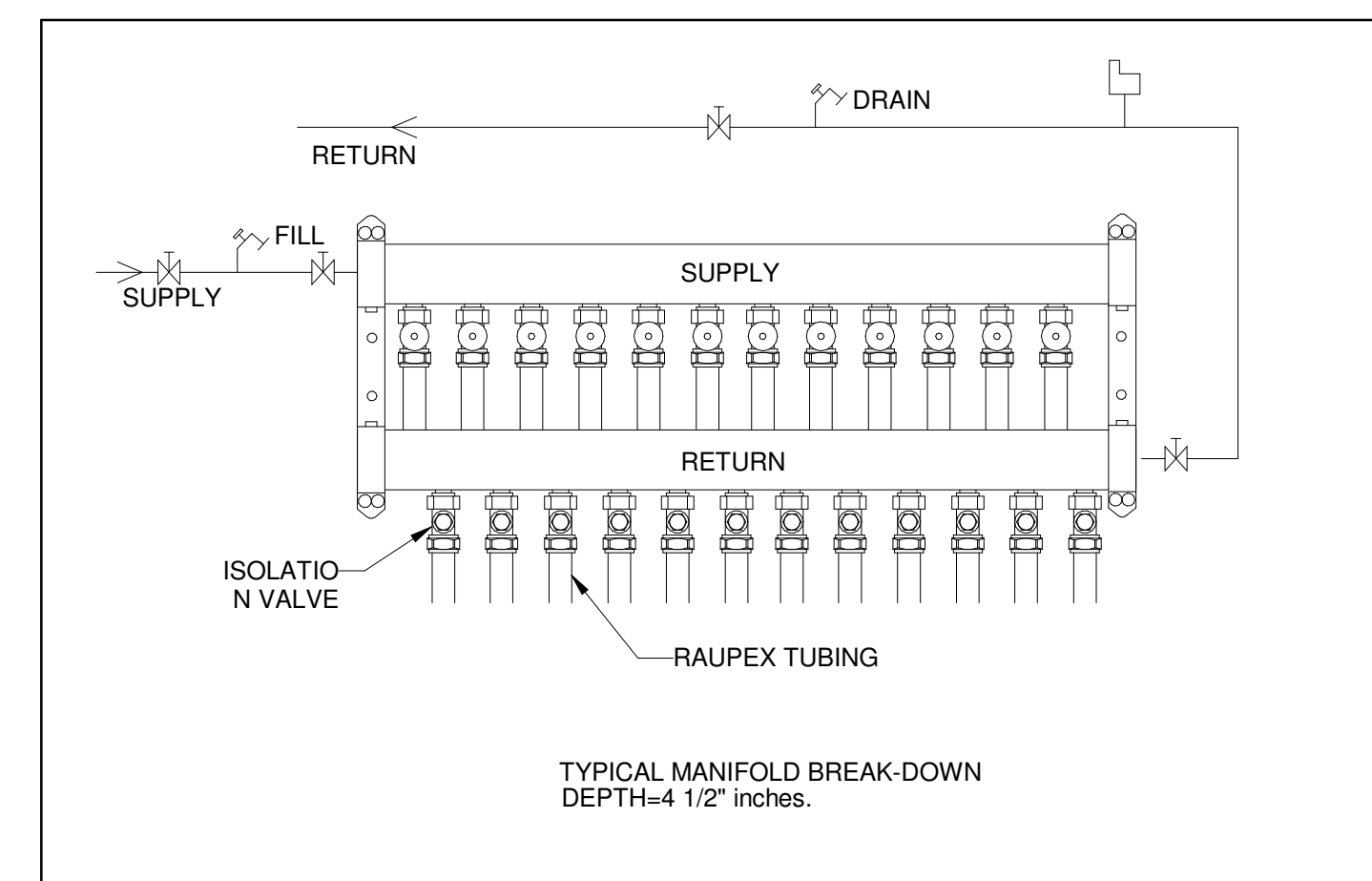
TYPICAL SNOW MELTING MANIFOLD DETAIL

SCALE:N.T.S.



SNOW MELT MANIFOLD PIT PLAN

SCALE:N.T.S.



SNOWMELT MANIFOLD DETAIL

SCALE:N.T.S.

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

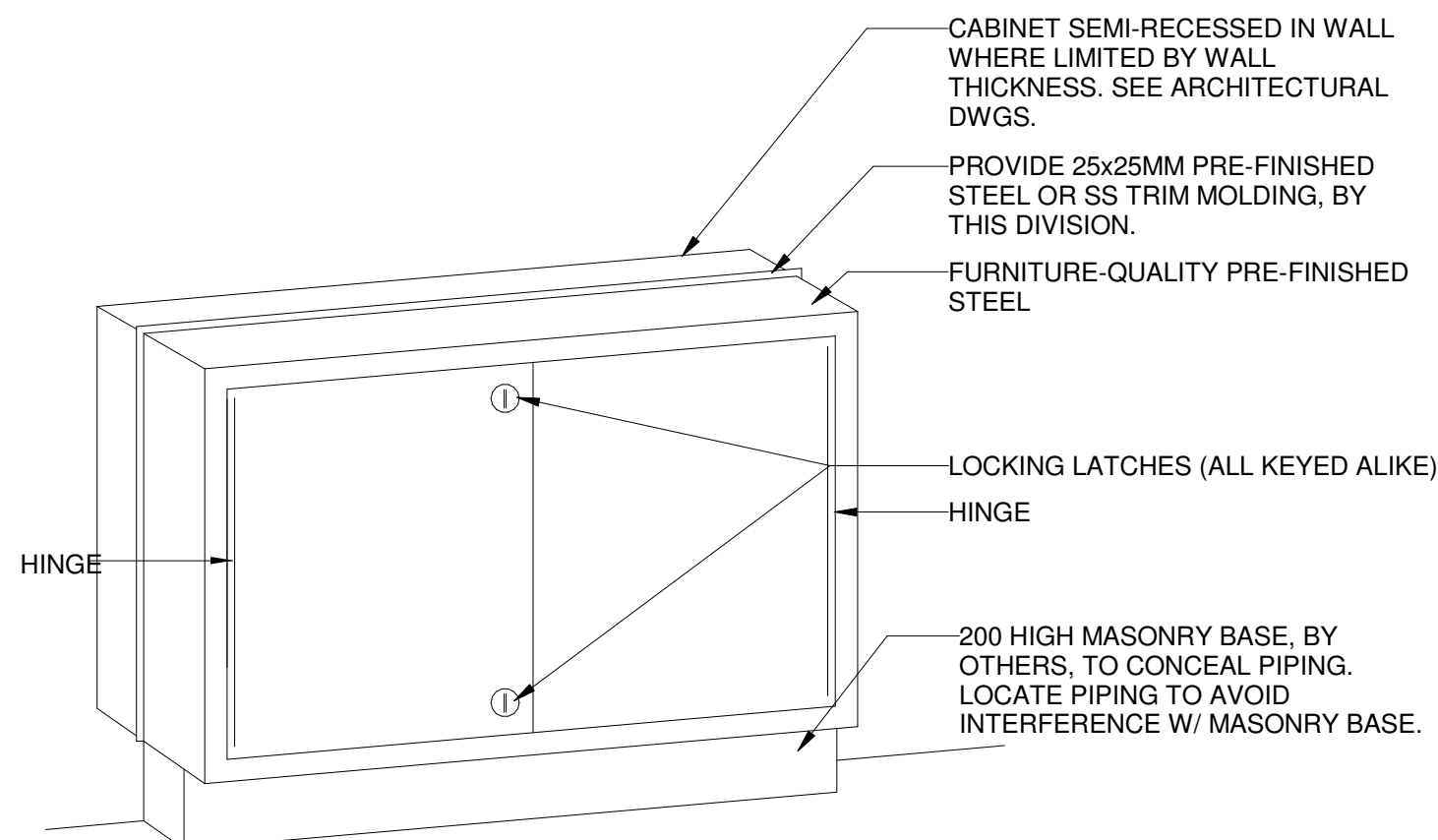
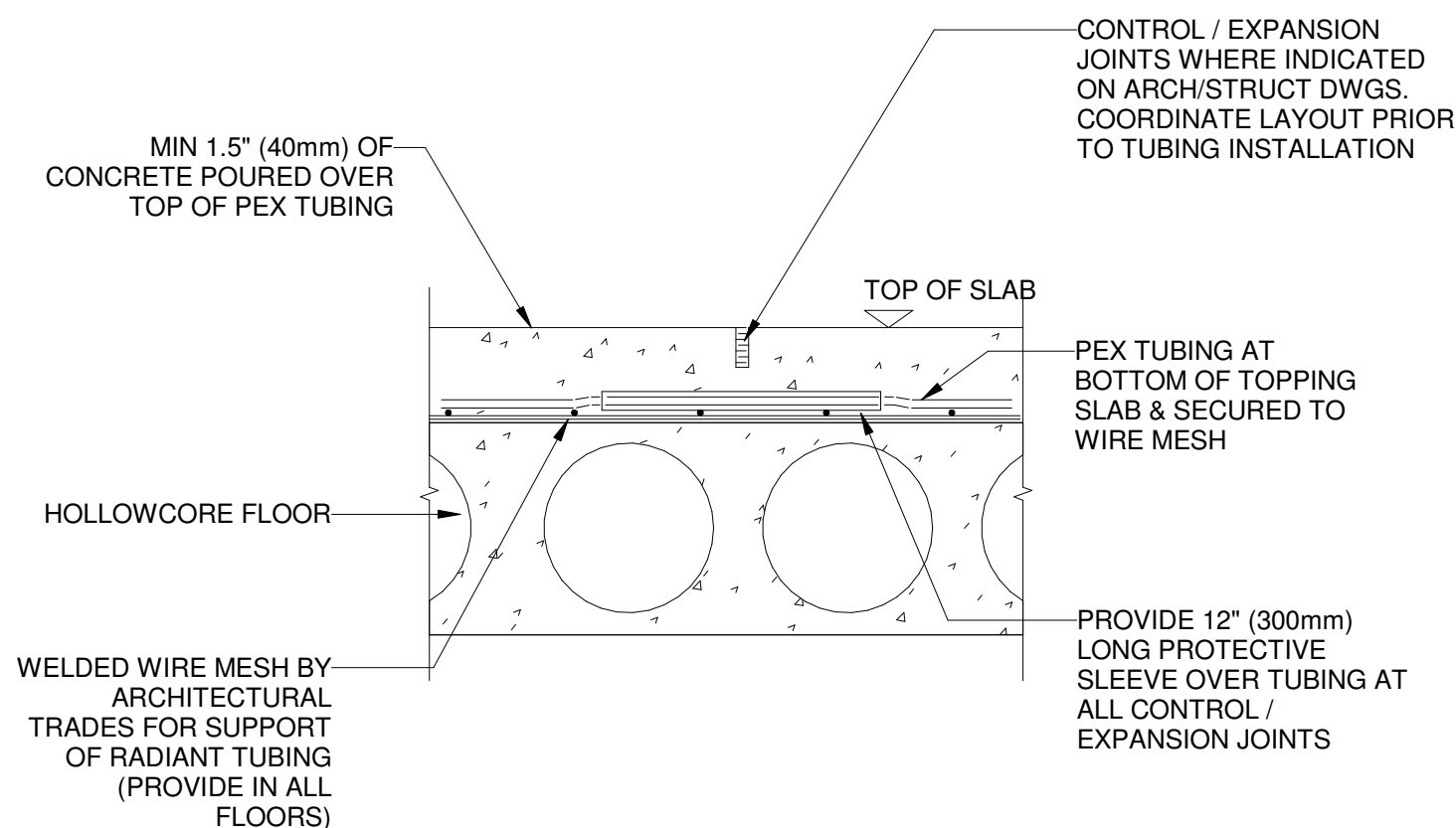
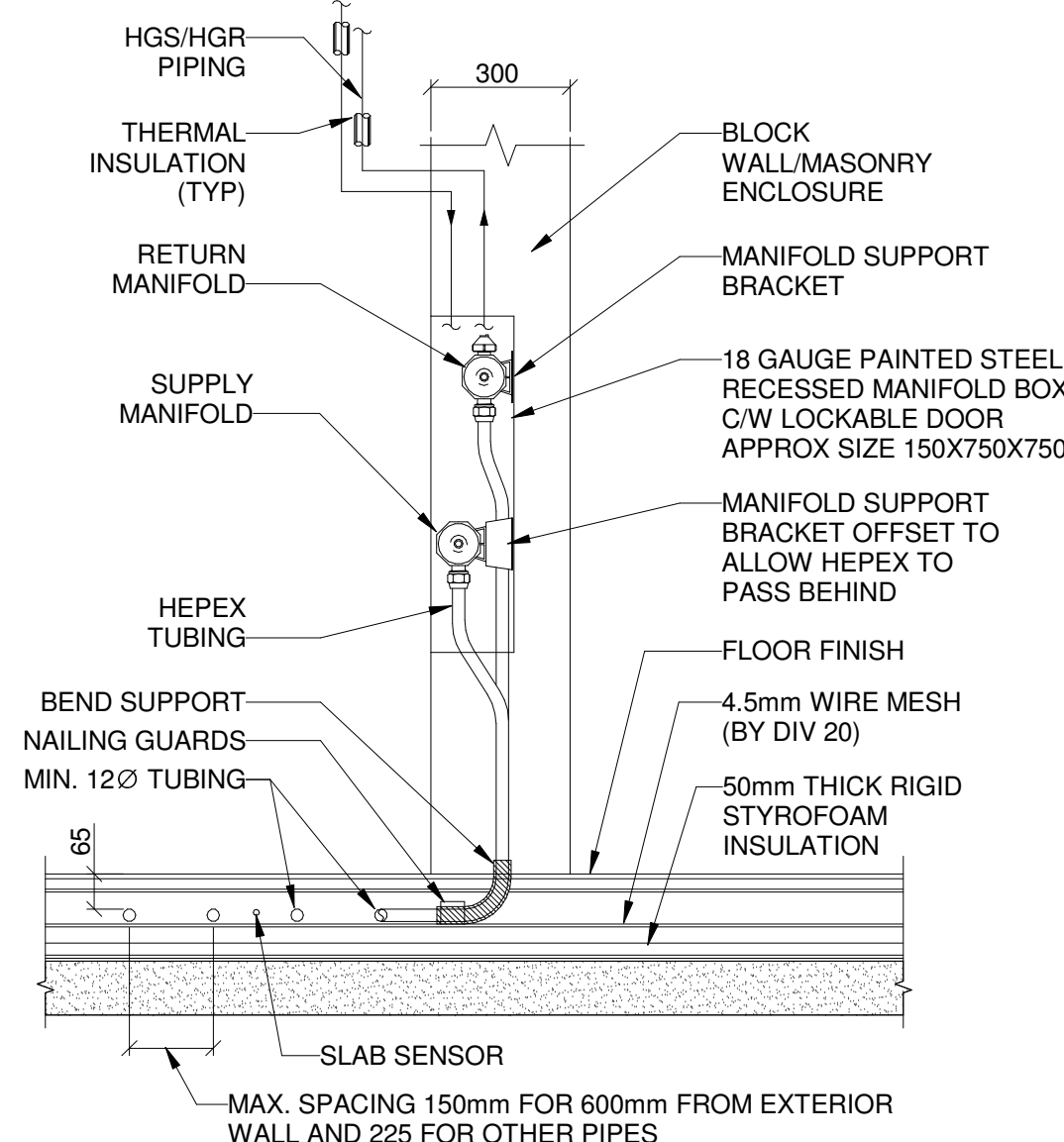
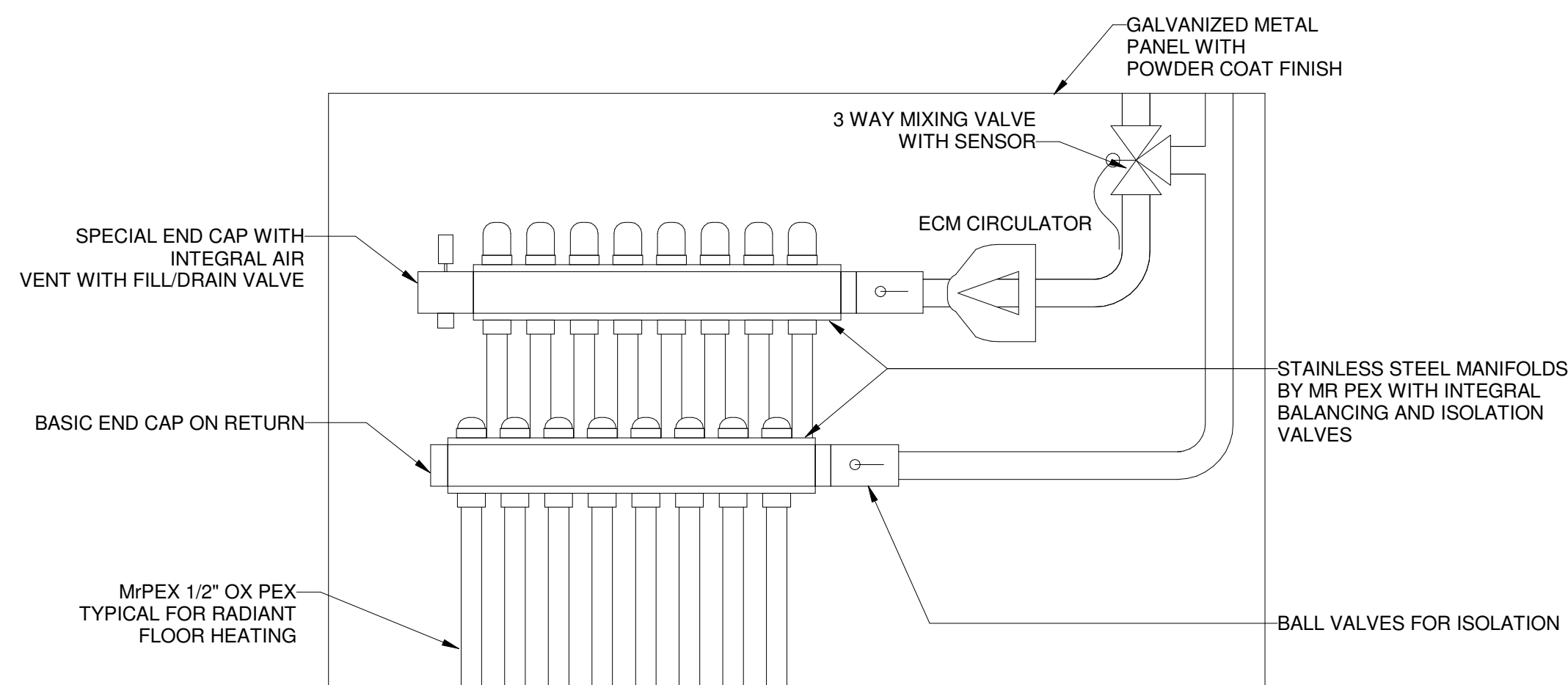
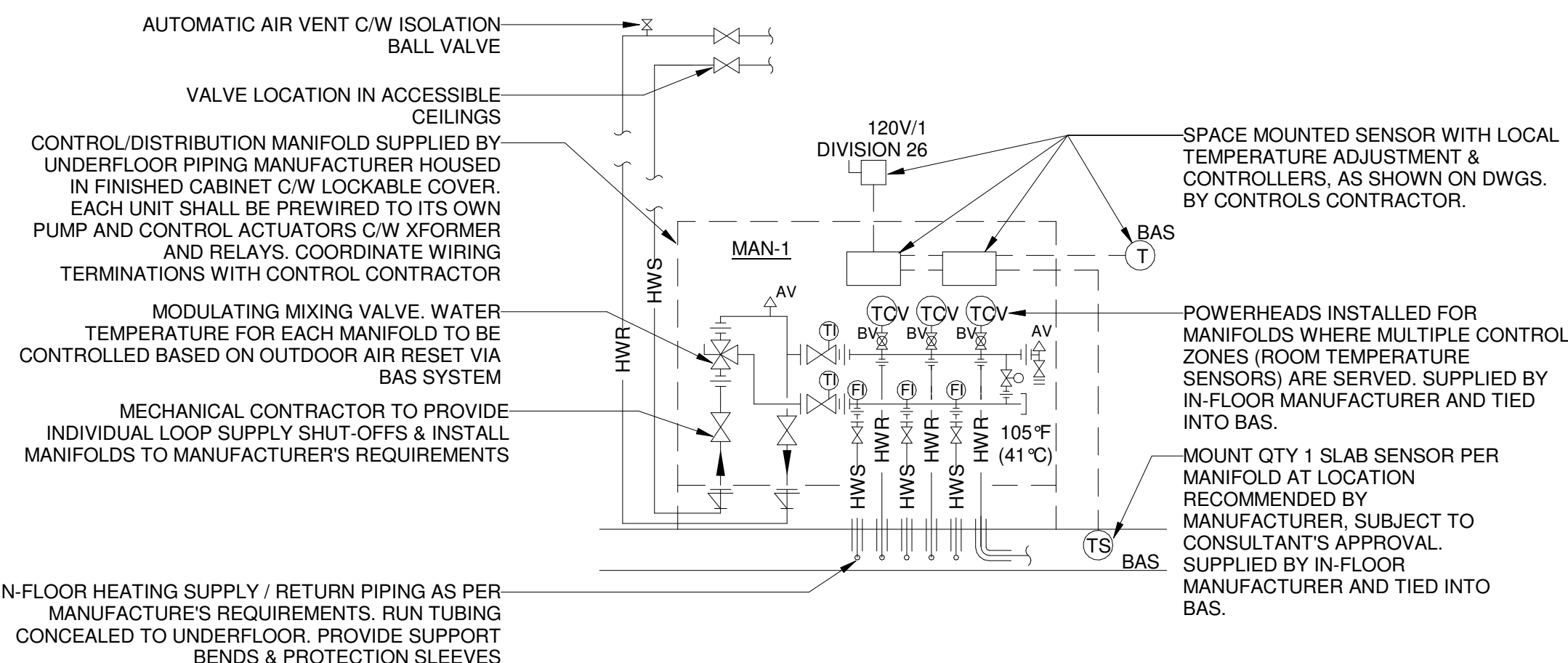
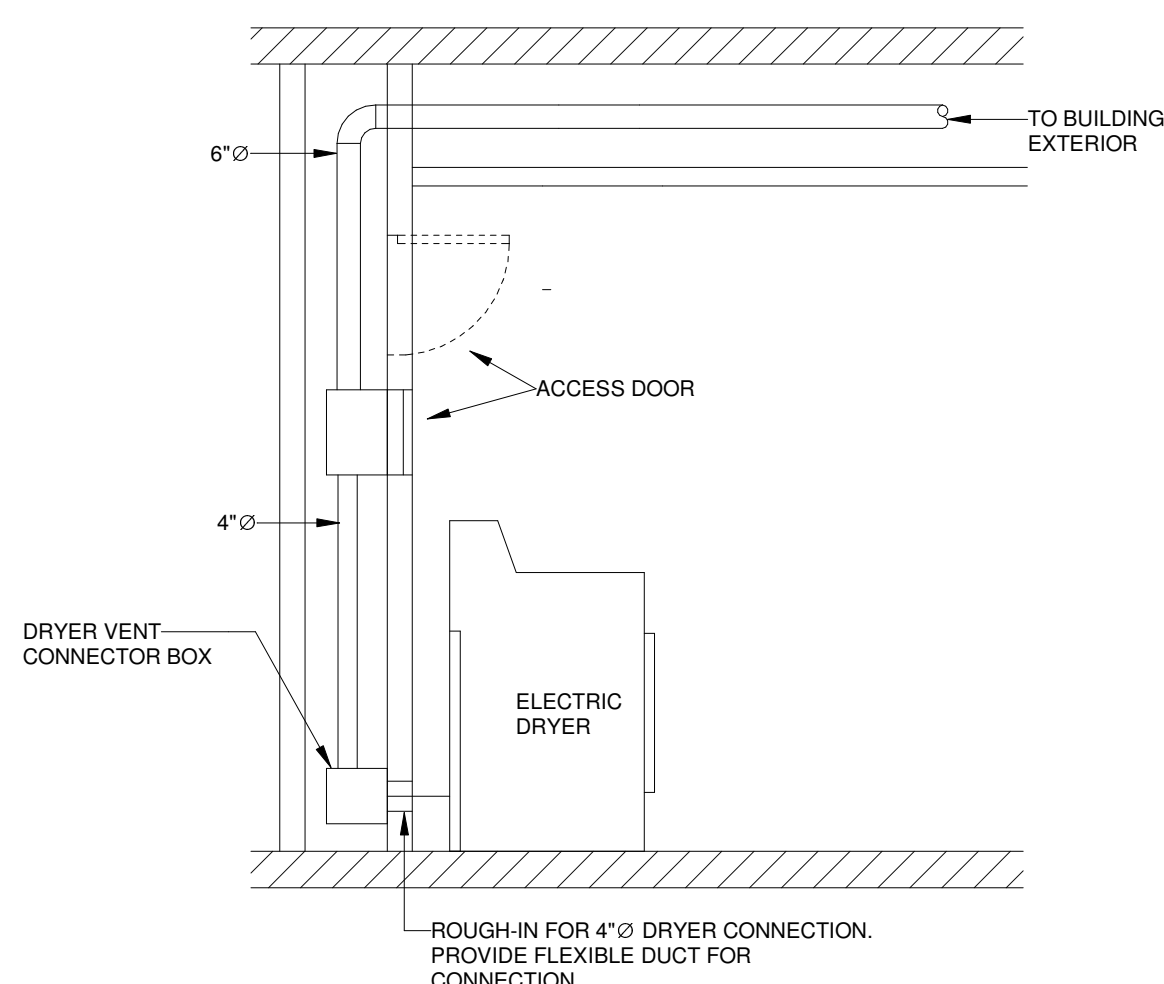
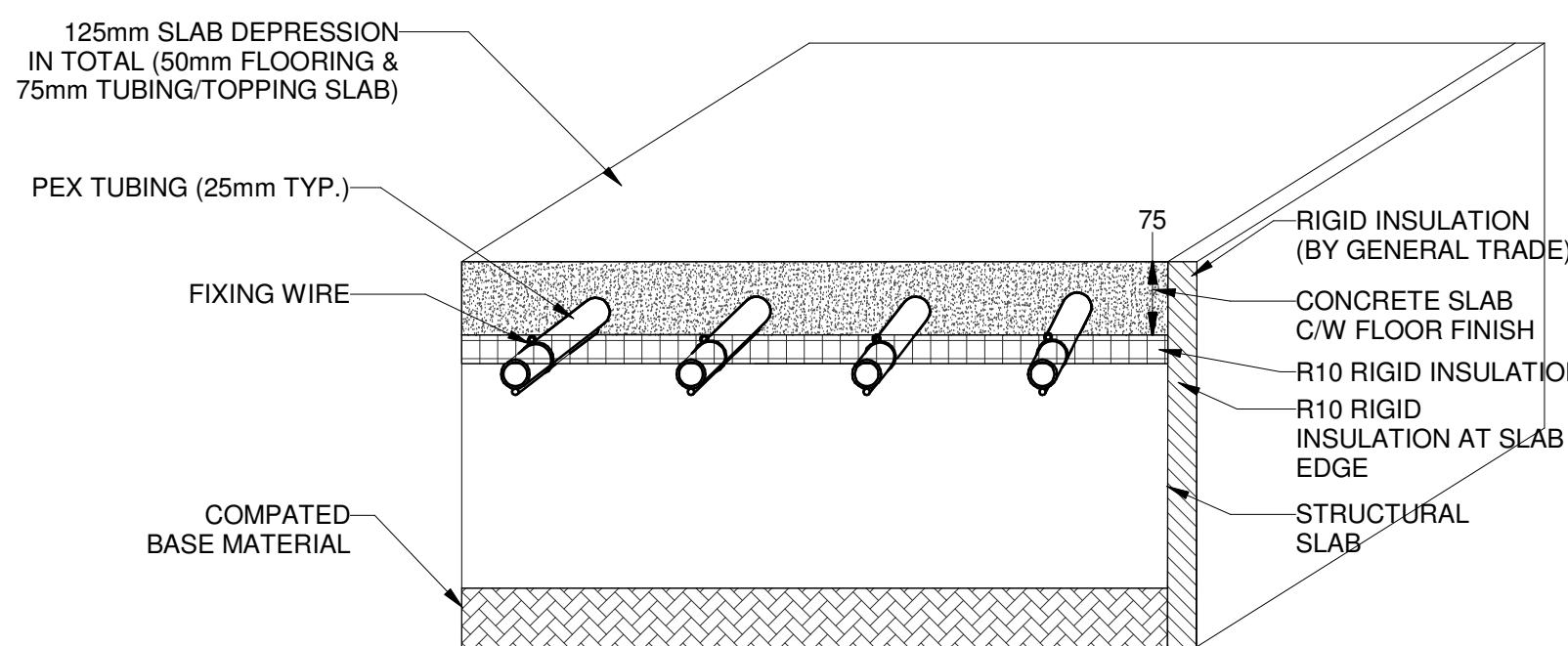
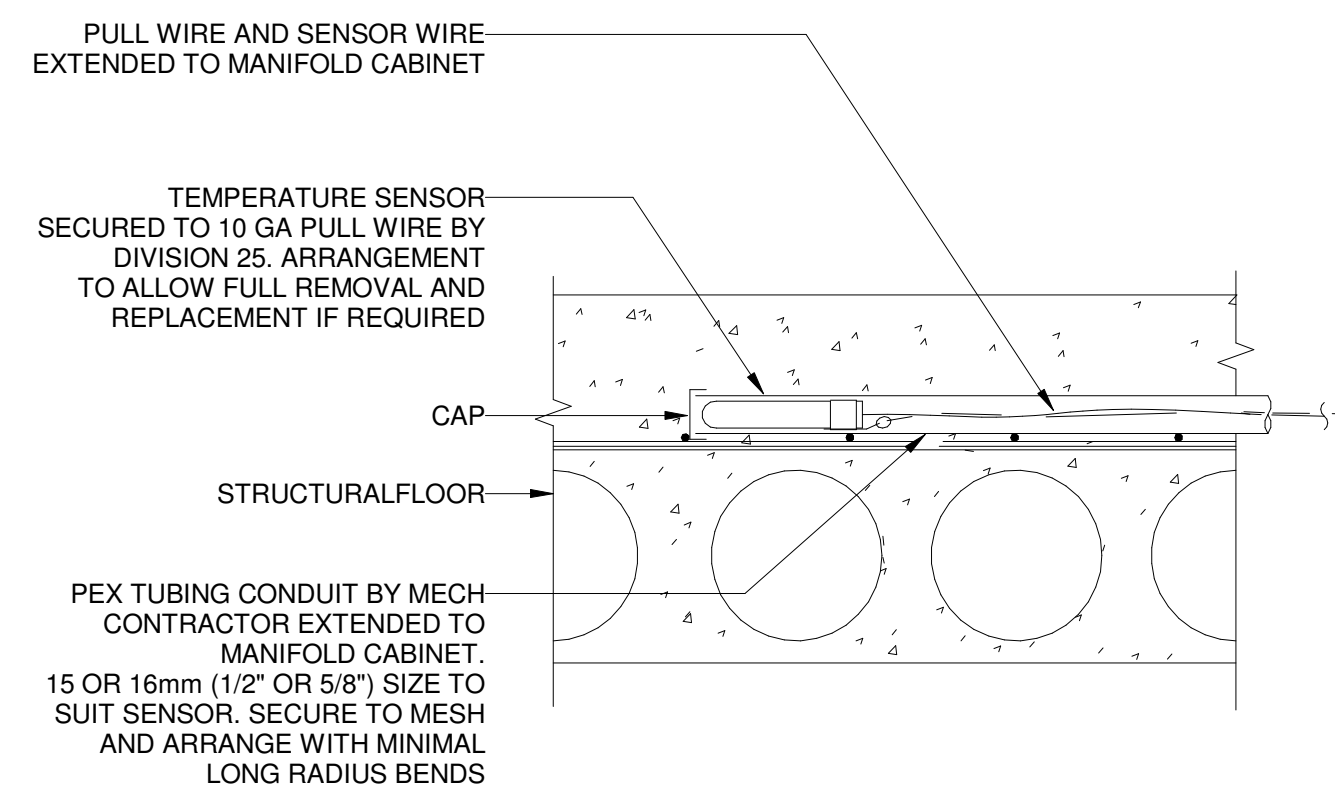
Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Sheet
Title:

MECHANICAL TYPICAL DETAILS VI

Drawing
No. **M-805**

YORK REGIONAL POLICE
HELICOPTER HANGAR350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURYKey
Plan7 IN-FLOOR HEATING MANIFOLD CABINETS
SCALE:N.T.S.6 IN-FLOOR RADIANT TUBING INSTALLATION
SCALE:N.T.S.3 IN-FLOOR HEATING MANIFOLD DETAILS
SCALE:N.T.S.5 IN-FLOOR HEATING MANIFOLD LAYOUT
SCALE:N.T.S.2 TYP. IN-FLOOR MANIFOLD INSTALLATION
SCALE:N.T.S.8 LAUNDRY DRYER EXHAUST
SCALE:N.T.S.4 IN-FLOOR HEATING PIPING AND INSULATION
SCALE:N.T.S.1 RADIANT FLOOR HEATING SLABL SENSOR
SCALE:N.T.S.

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

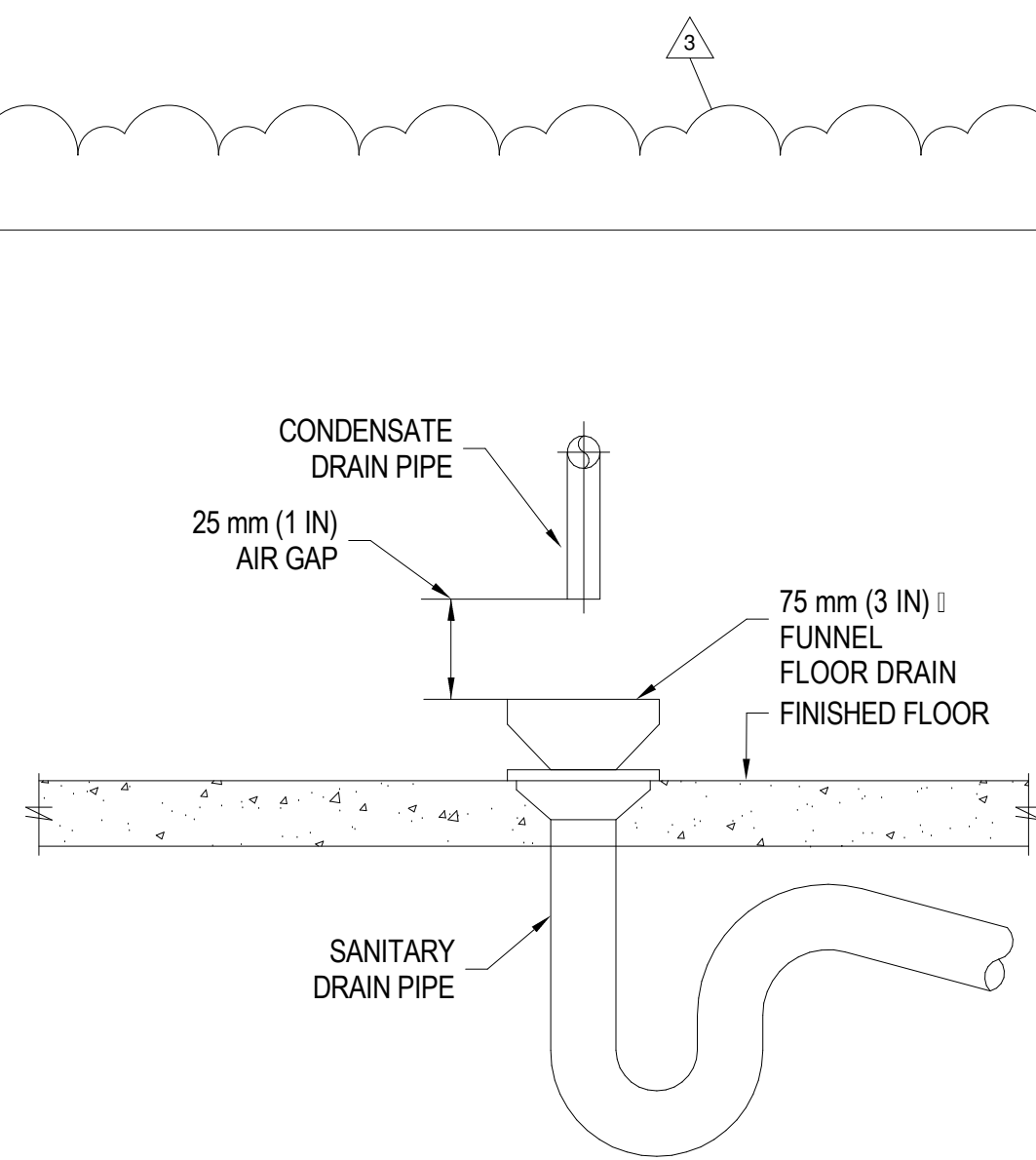
Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicatedSheet
Title:
MECHANICAL TYPICAL
DETAILS VIIDrawing
No:
M-806

YORK REGIONAL POLICE
HELICOPTER HANGAR

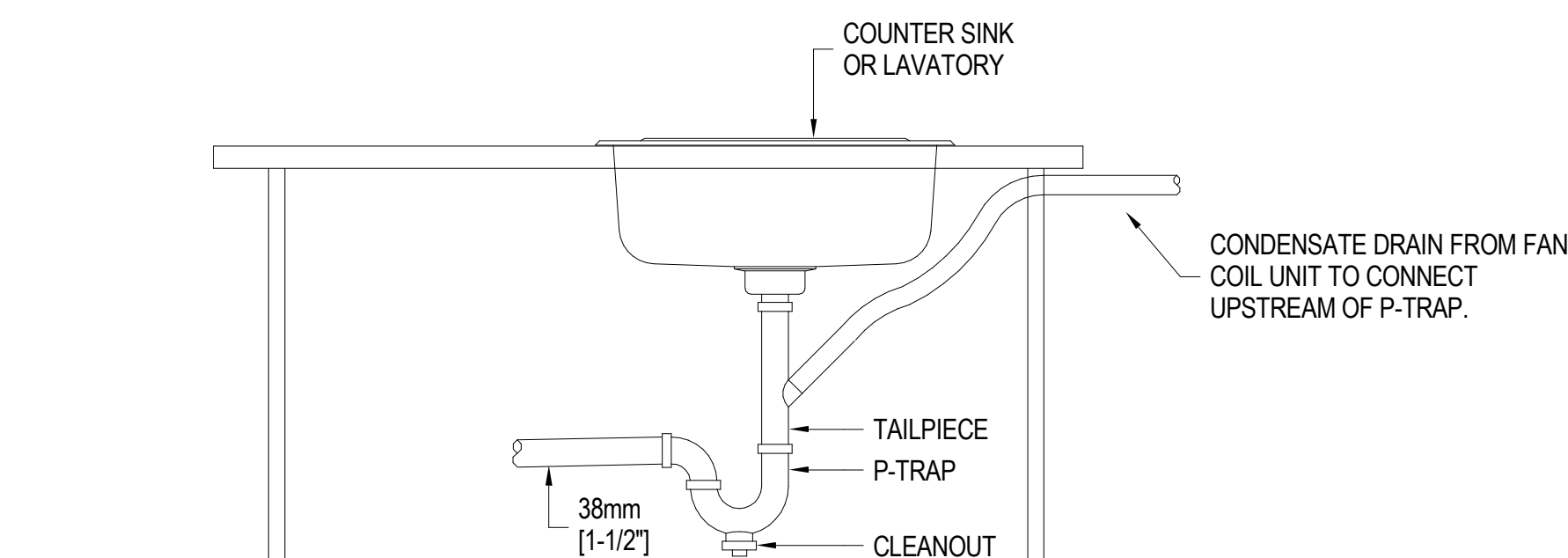
350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan



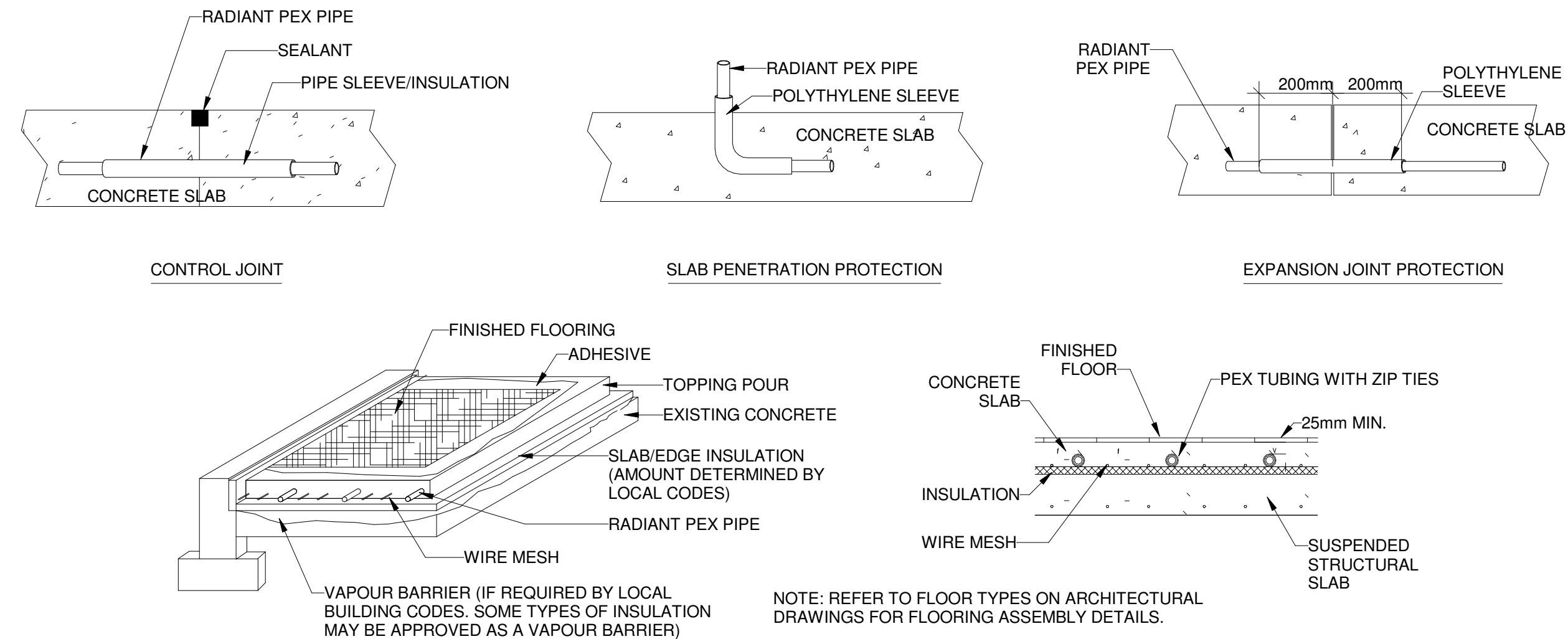
CONDENSATE DRAIN TO FUNNEL FLOOR DRAIN

SCALE: 1 : 1



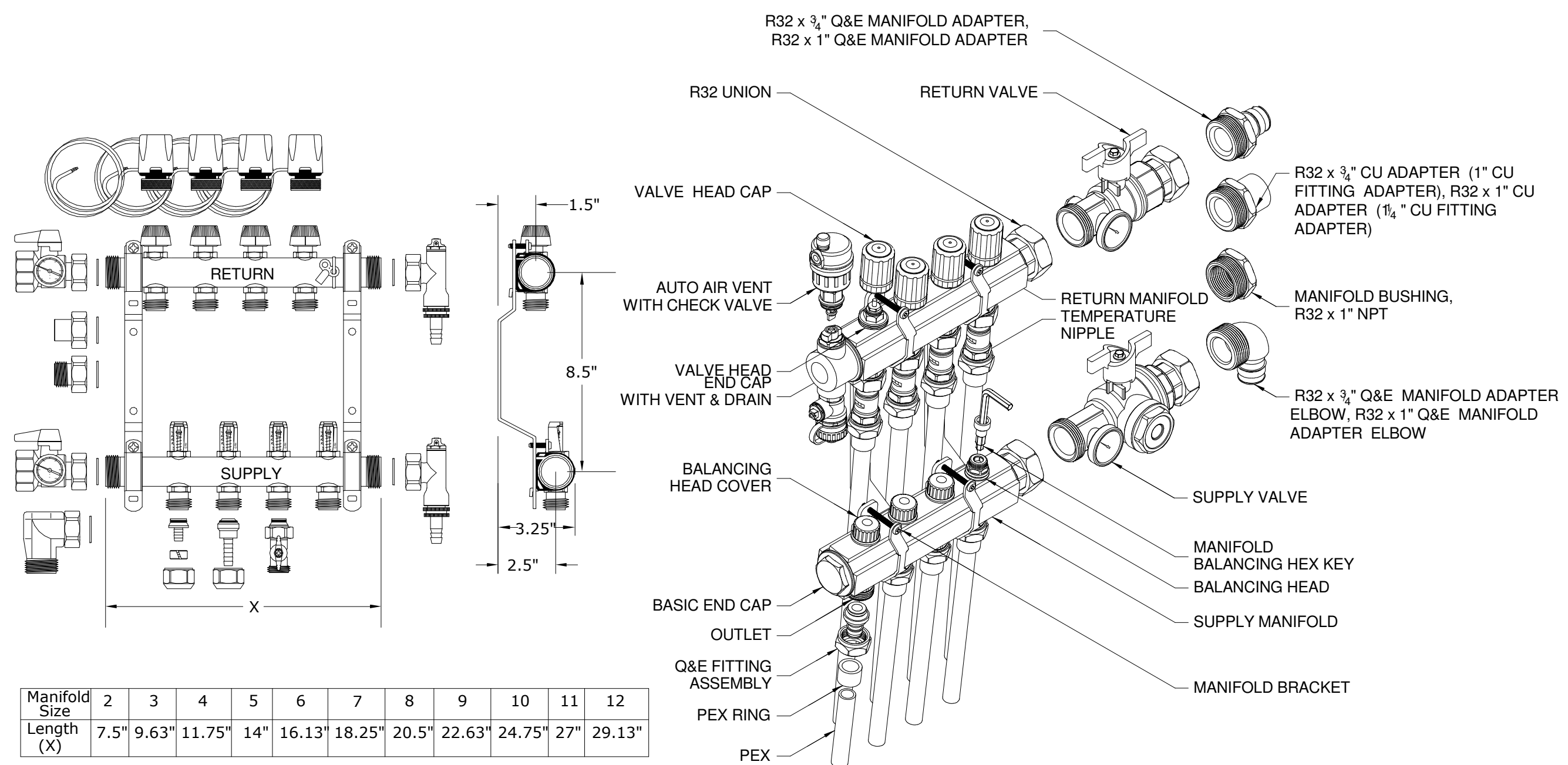
CONDENSATE DRAIN CONNECTION TO SANITARY

SCALE: 1 : 1



IN-FLOOR HEATING INSTALLATION DETAILS

SCALE:N.T.S.



IN-FLOOR HEATING SYSTEM MANIFOLD DETAIL

SCALE:N.T.S.

[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: 1 : 1

Sheet
Title:

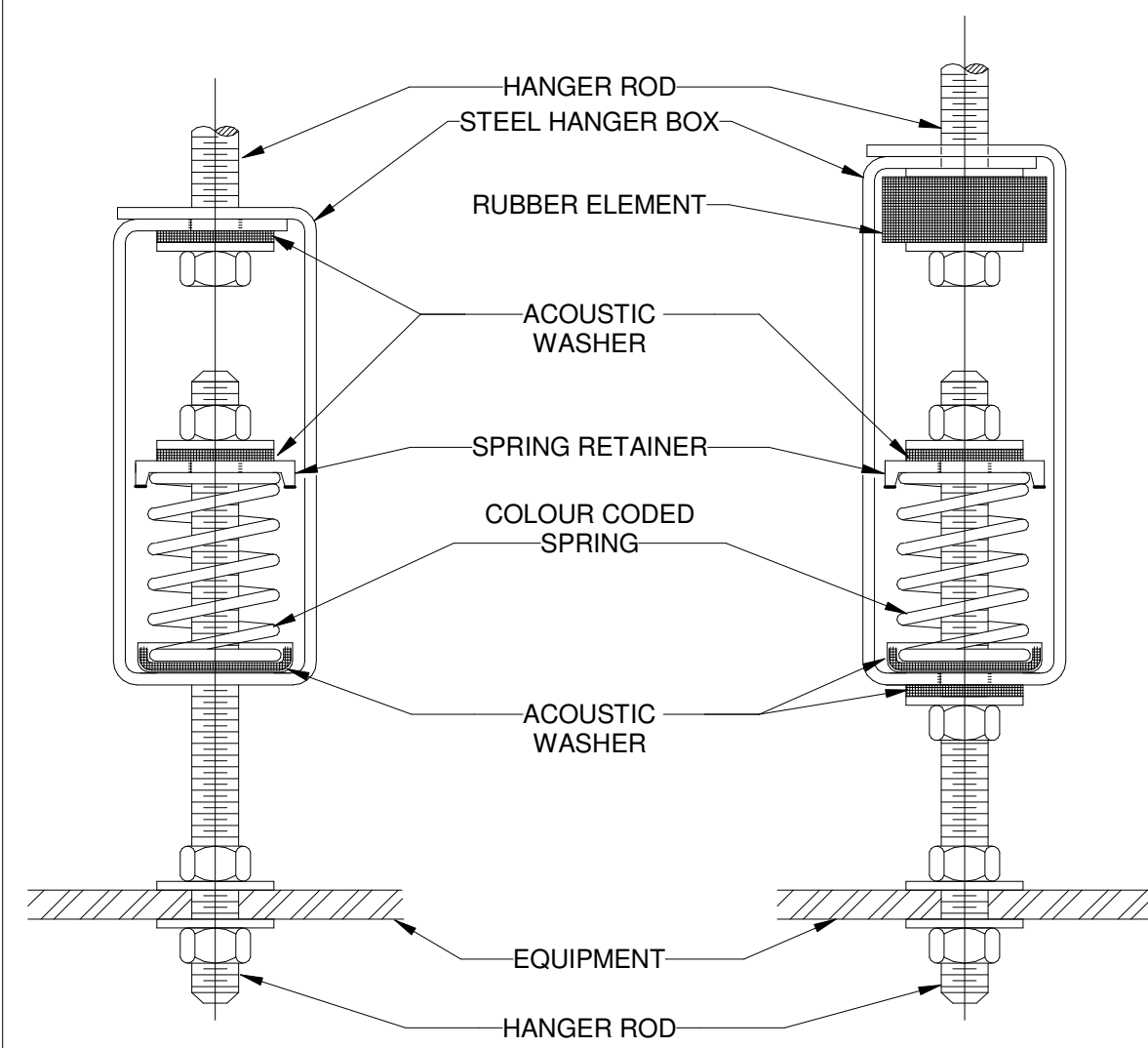
MECHANICAL TYPICAL DETAILS VIII

Drawing
No.
M-807

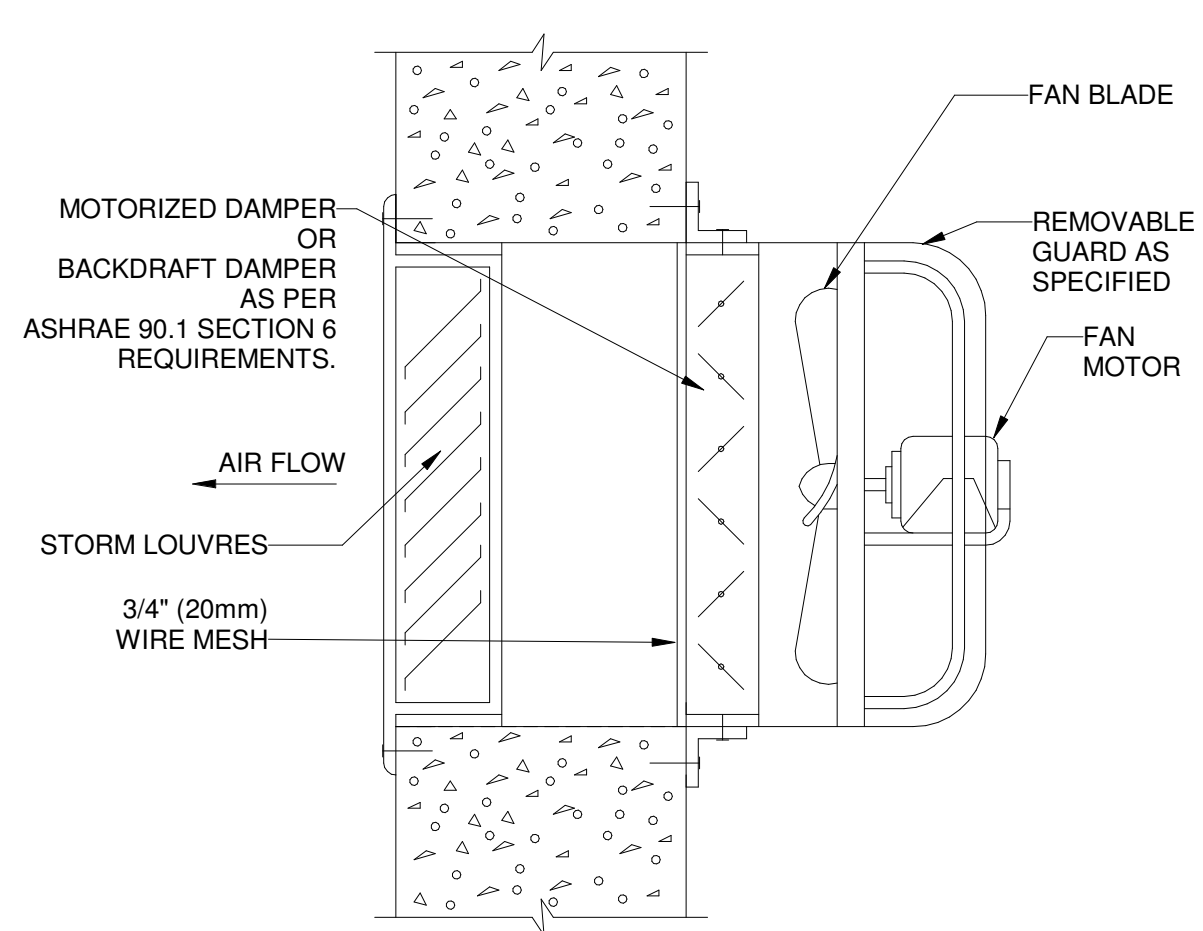
YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan

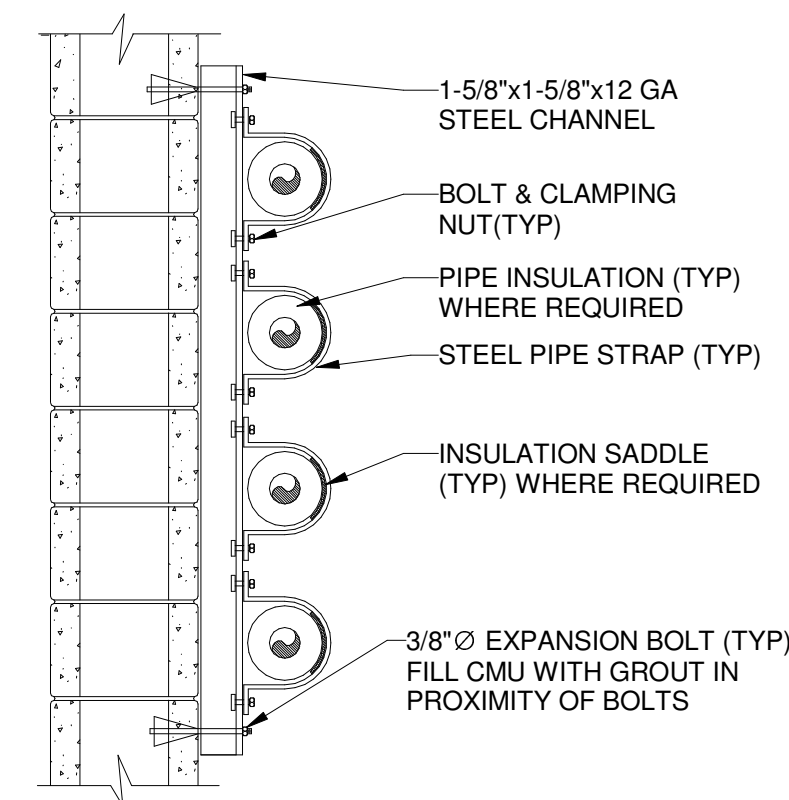


6 SPRING HANGER
SCALE:N.T.S.

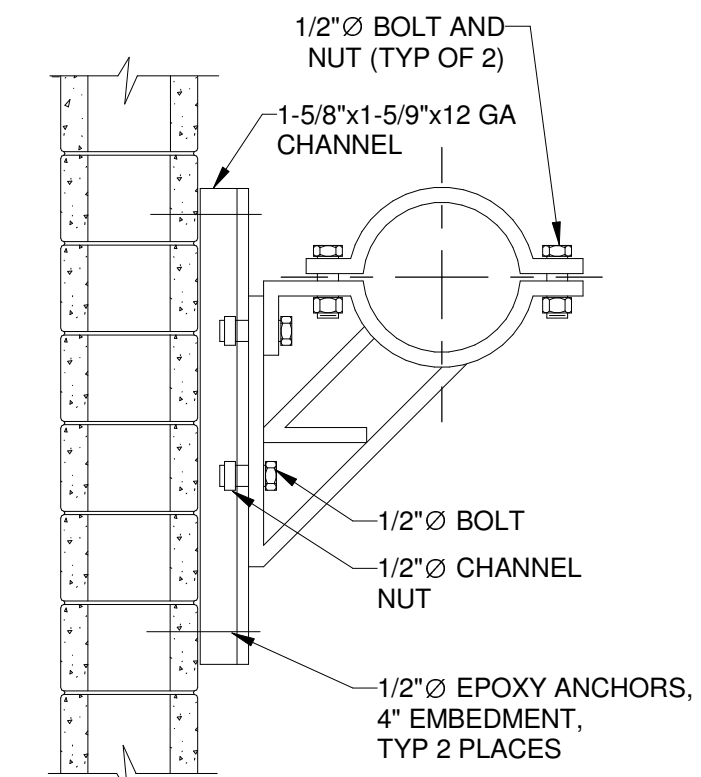


NOTES :

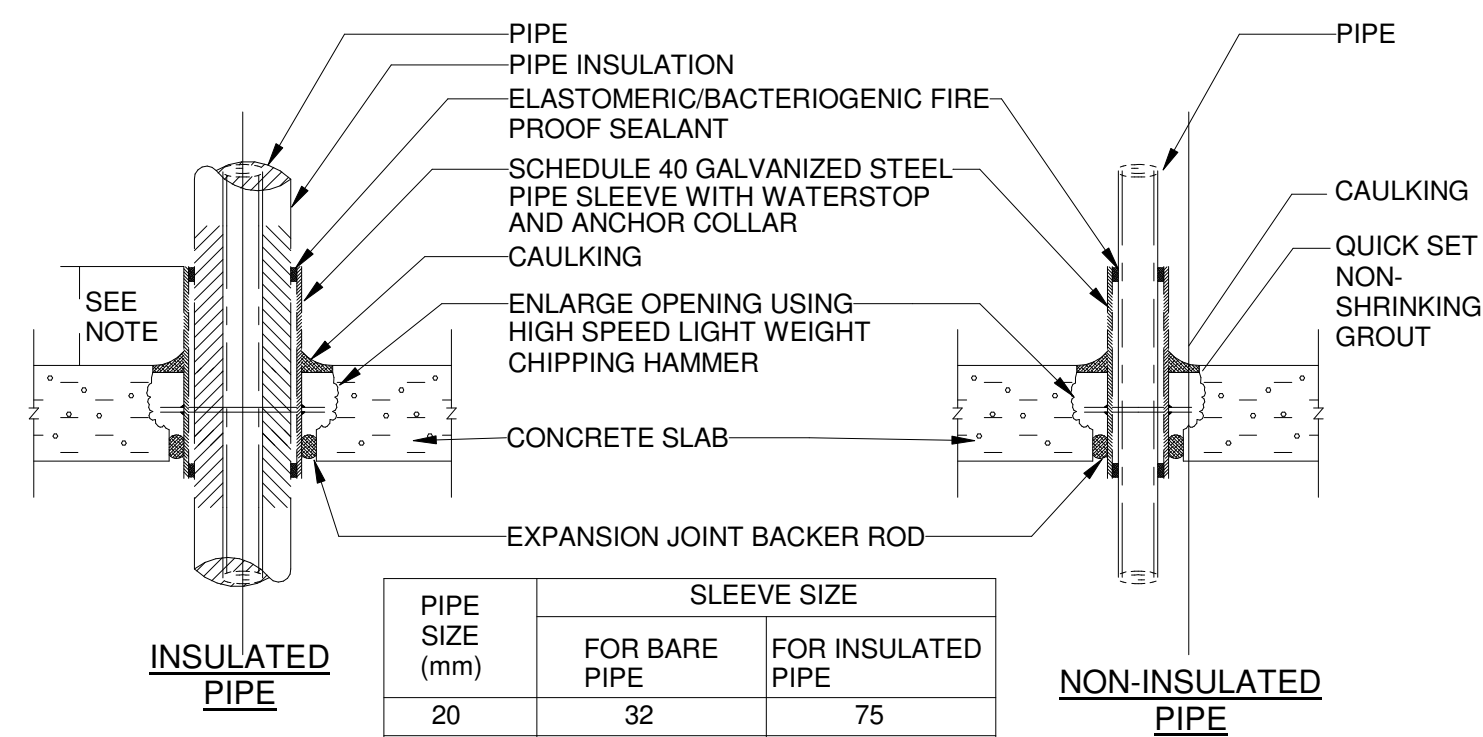
- ① SEE FLOOR PLANS FOR STORM LOUVRE REQUIREMENTS.
- ② WHERE DUCTWORK IS PROVIDED (SEE FLOOR PLANS). PROVIDE ACCESS DOOR FOR FAN AND MOTOR SERVICING.



4 PIPE SUPPORT ON SIDEWALL
SCALE:N.T.S.



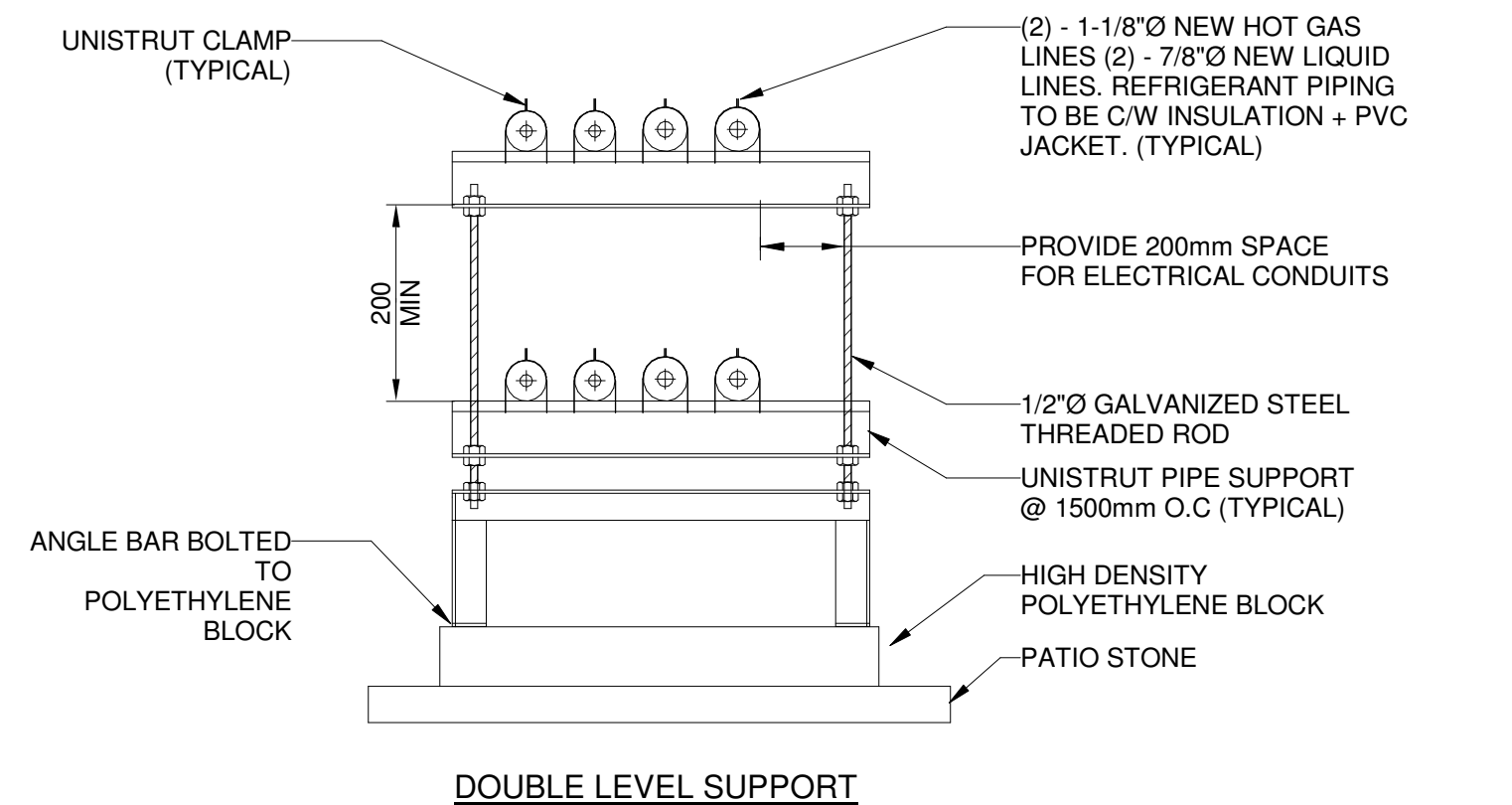
3 PIPE SUPPORT ON SIDEWALL-SINGLE
SCALE:N.T.S.



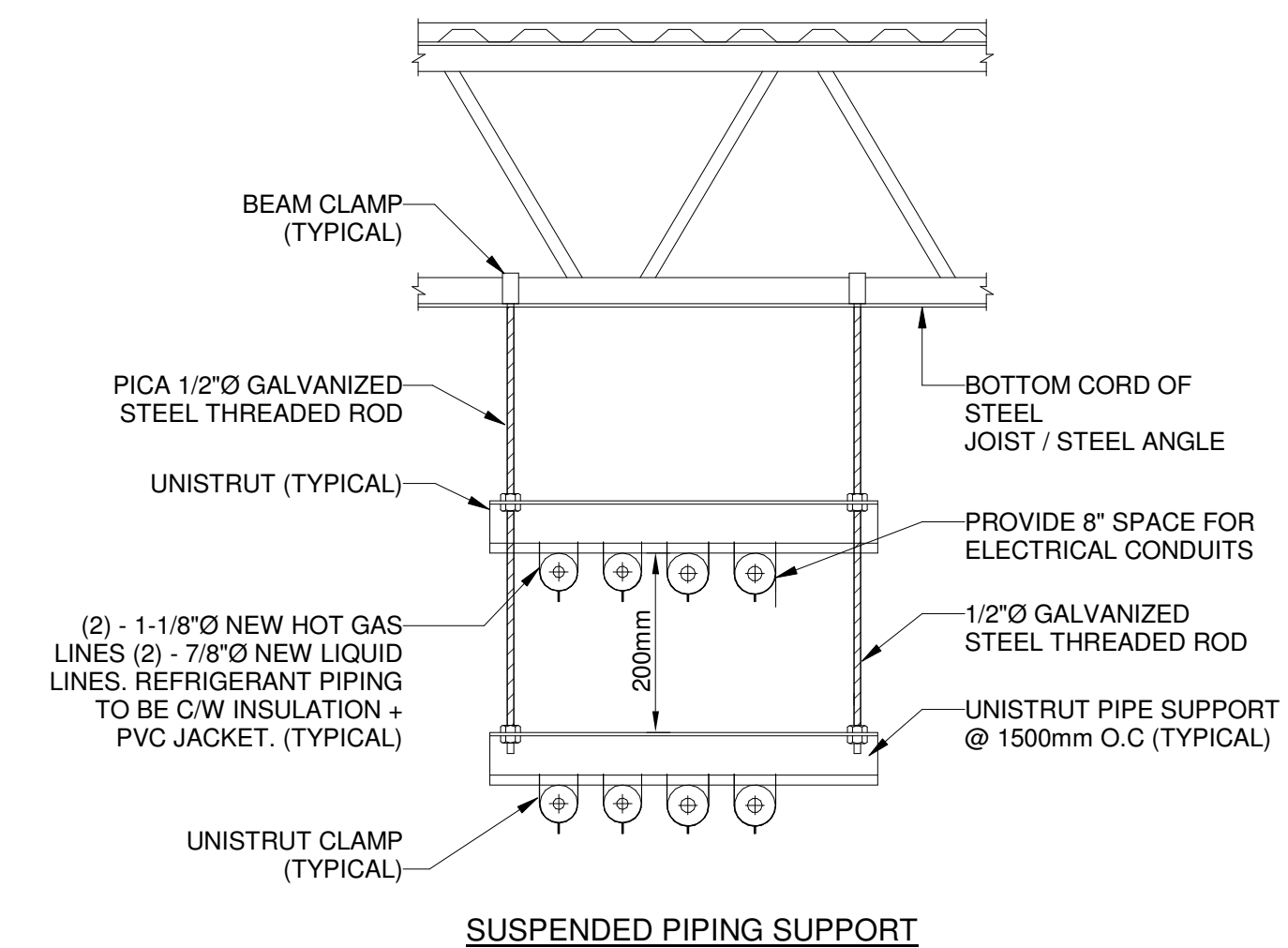
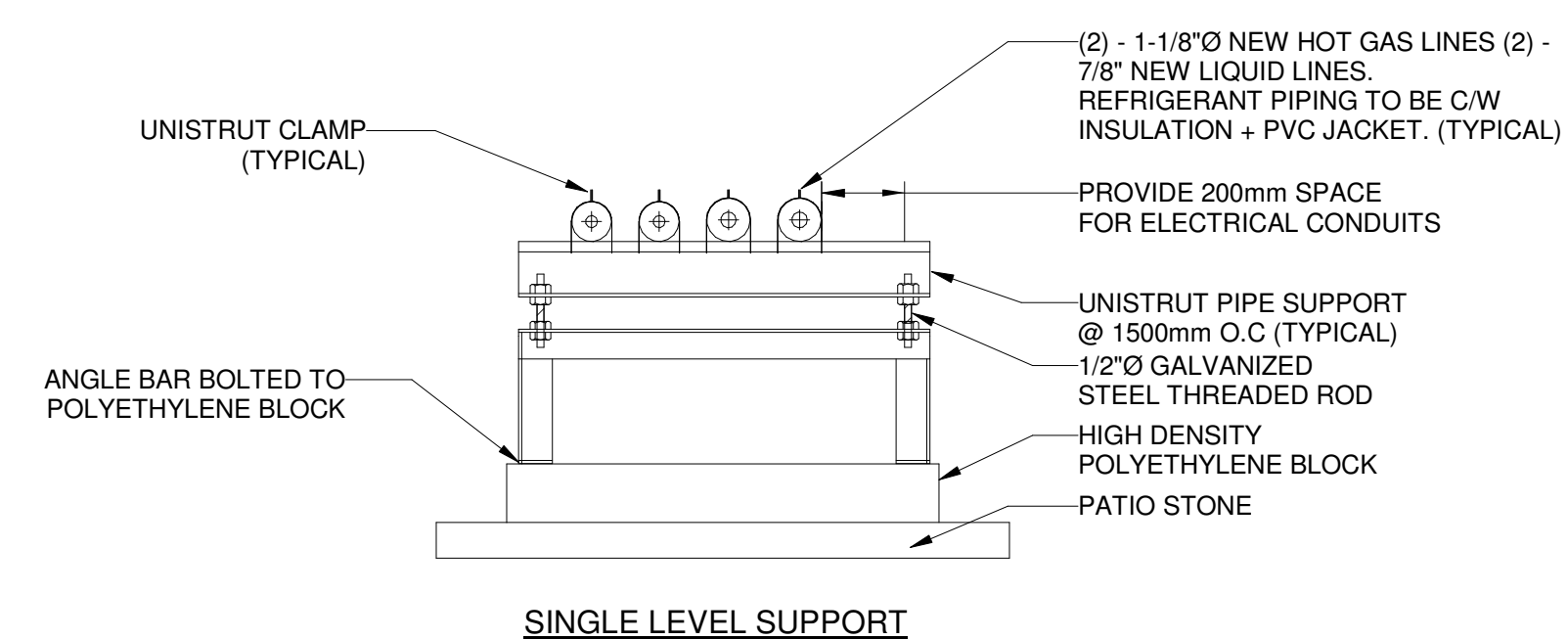
PIPE SIZE (mm)	SLEEVE SIZE	
	FOR BARE PIPE	FOR INSULATED PIPE
20	32	75
25	38	100
32	50	100
38	50	100
50	75	150
75	100	150
100	150	200
150	200	250
200	250	300

NOTE:
100mm HIGH WHERE
THERE IS A POSSIBILITY
OF WATER ON FLOOR,
50mm HIGH WHERE
WATER IS NOT PRESENT.

2 PIPE SLEEVE THROUGH SLAB DETAIL



1 REFRIGERANT PIPING SUPPORT DETAILS
SCALE:N.T.S.

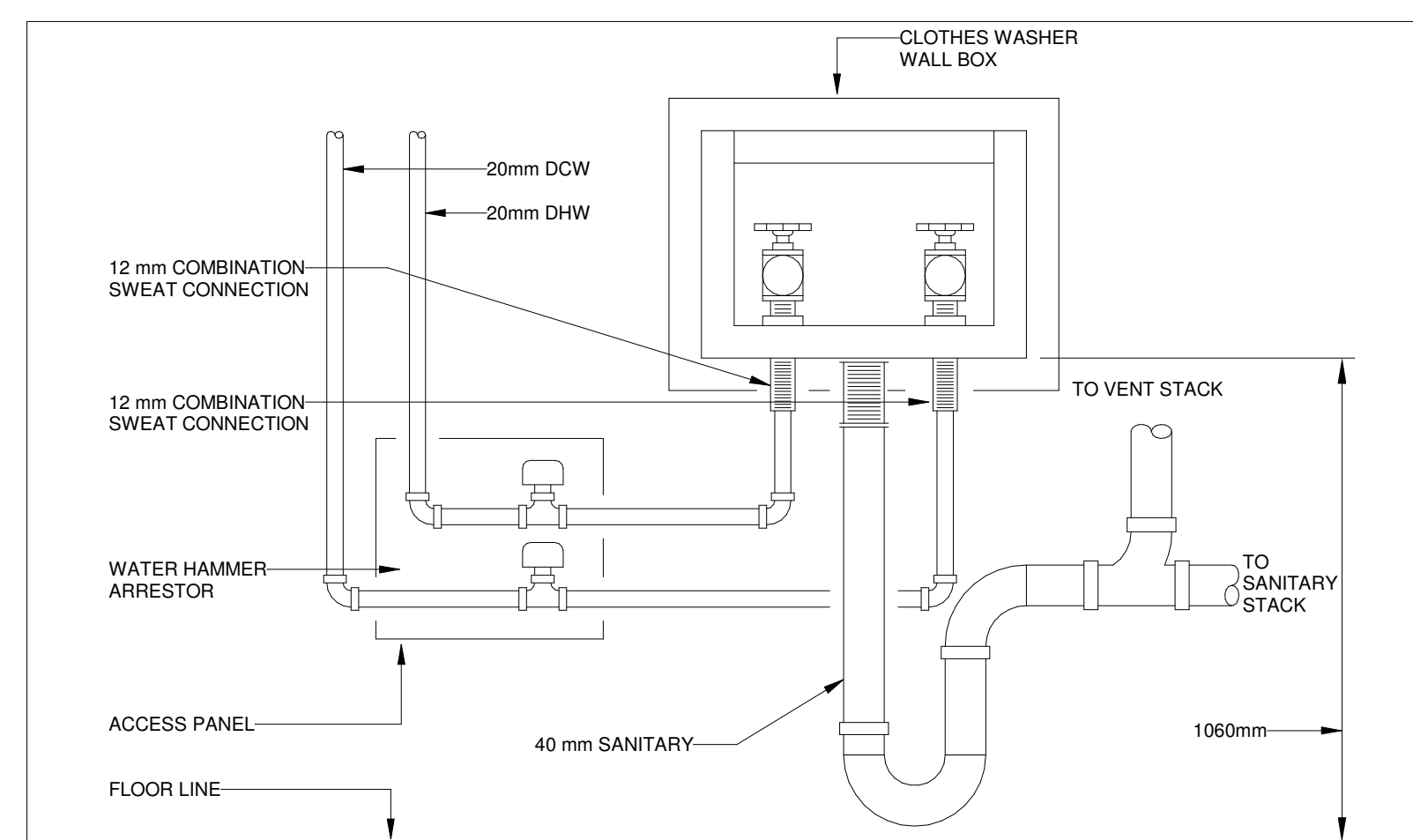
[illegible]

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated



7 LAUNDRY BOX
SCALE:N.T.S.

Sheet
Title:

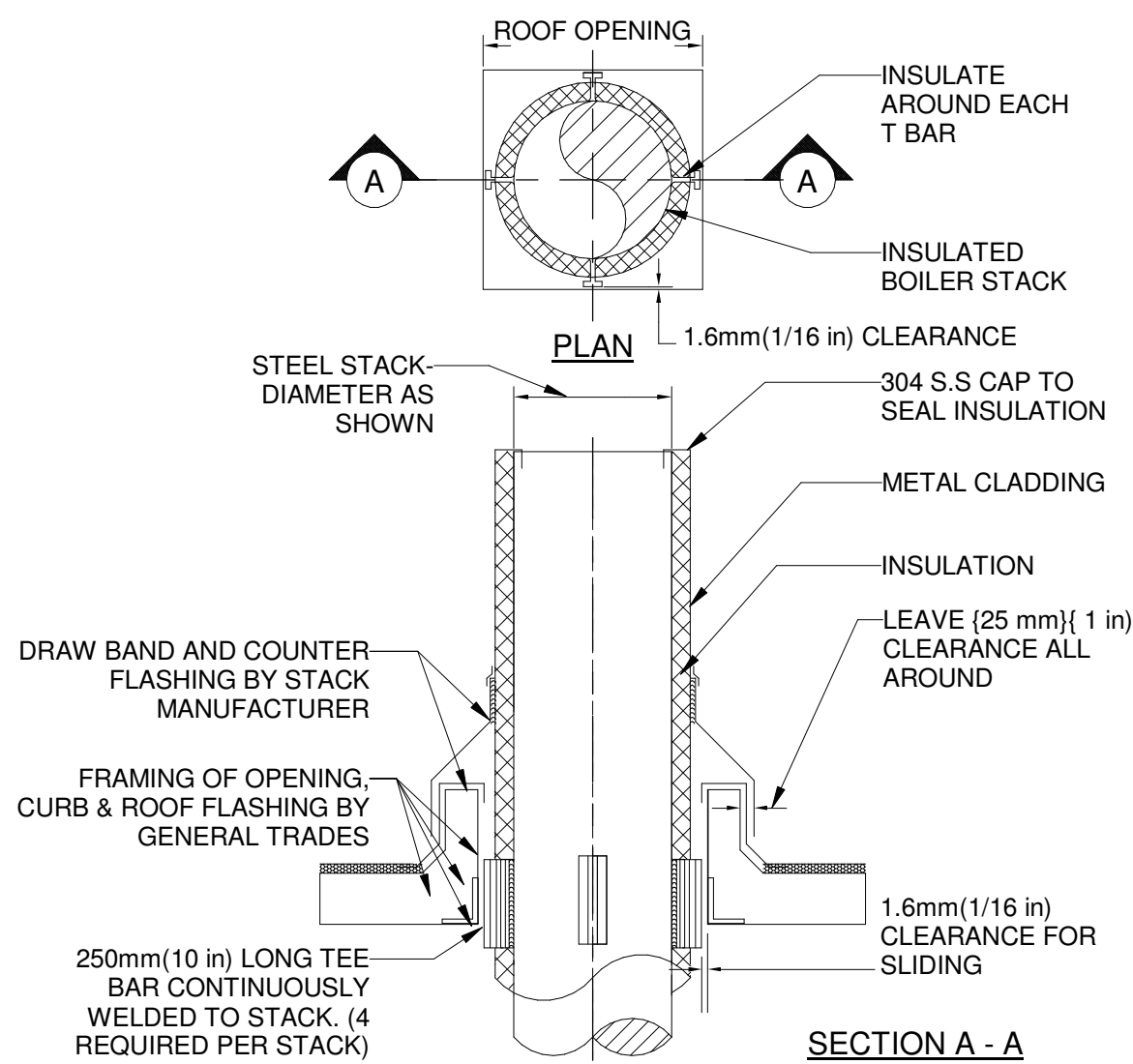
MECHANICAL TYPICAL DETAILS IX

Drawing
No. **M-808**

YORK REGIONAL POLICE
HELICOPTER HANGAR

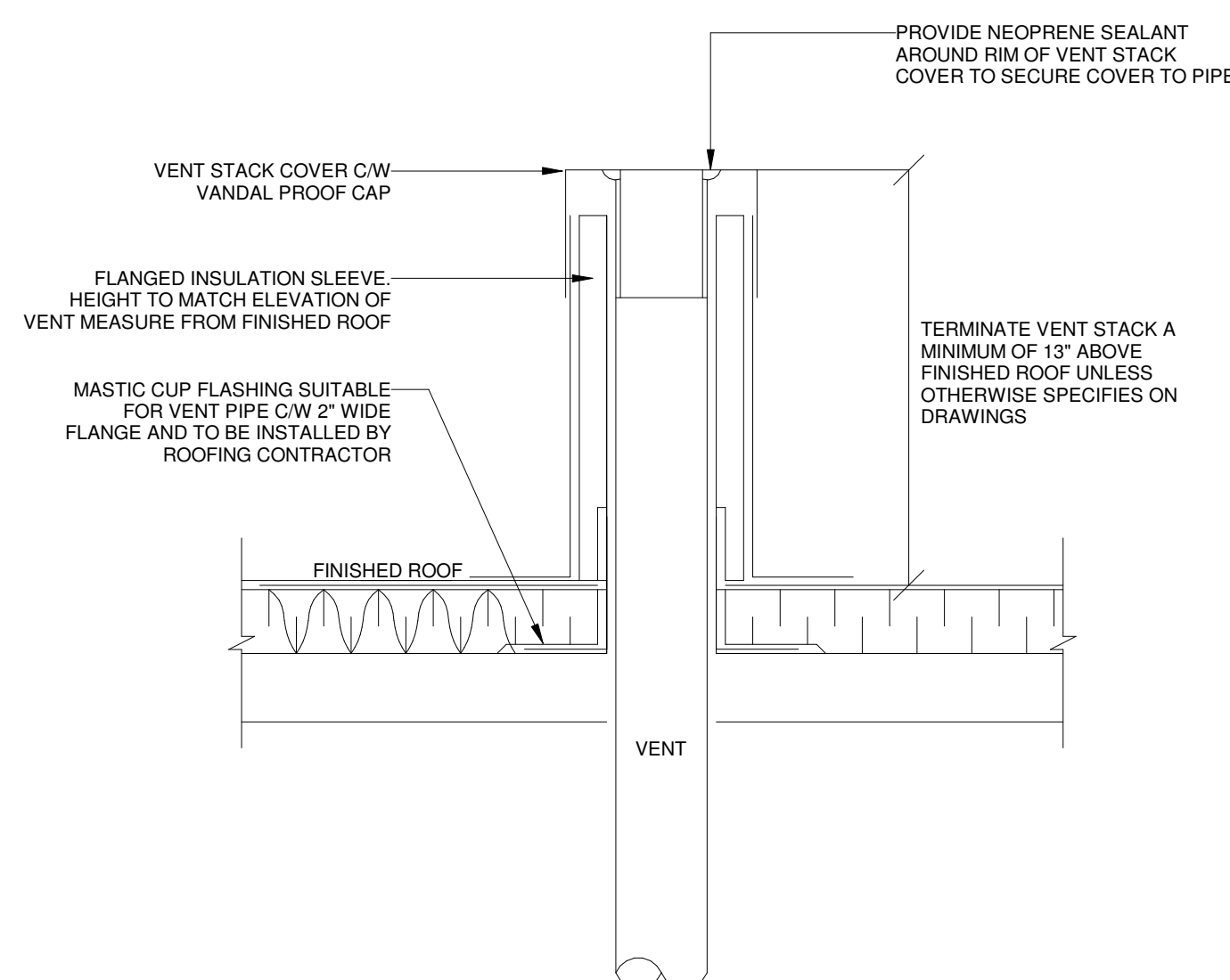
350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan



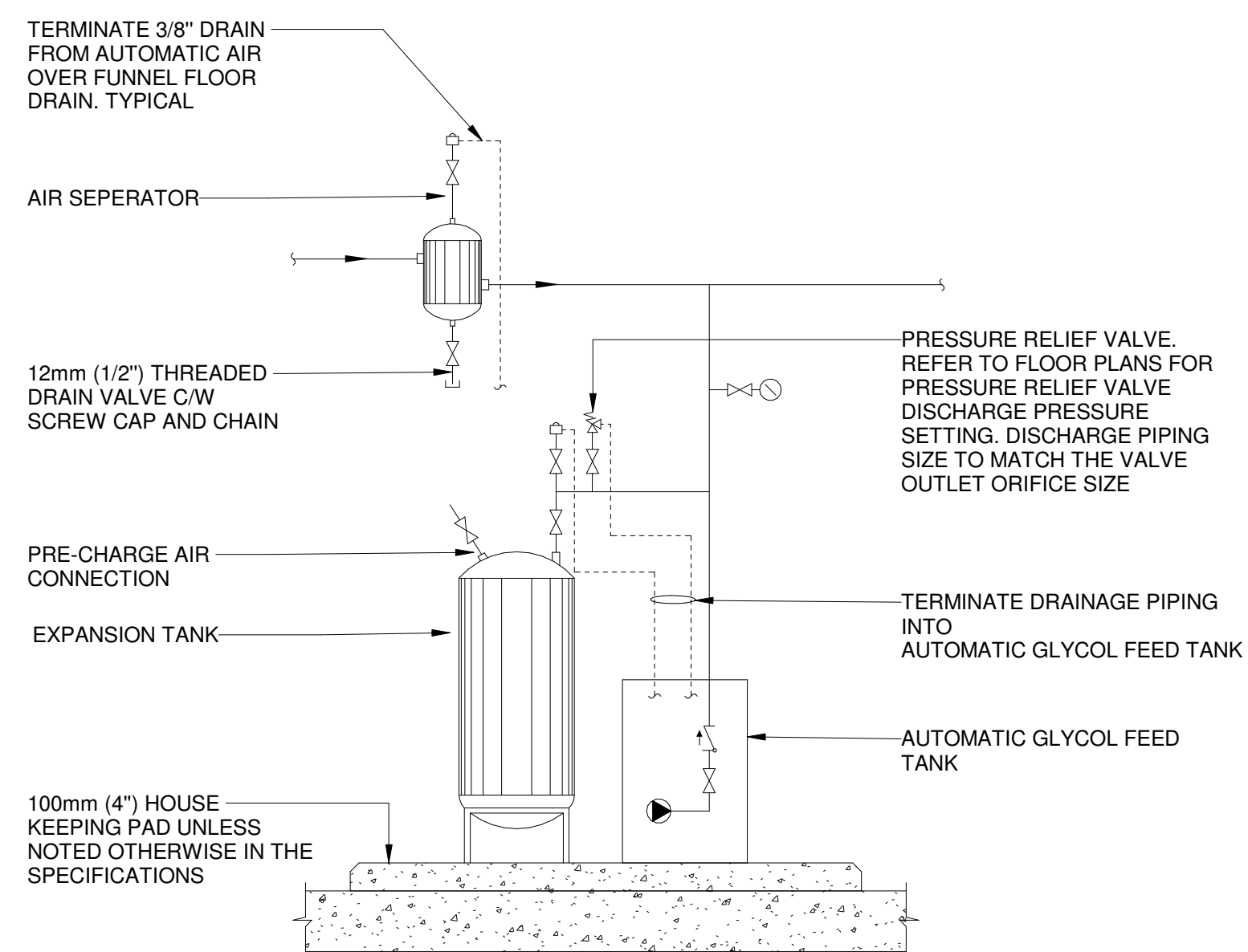
BOILER STACK THRU. ROOF

SCALE:N.T.S.



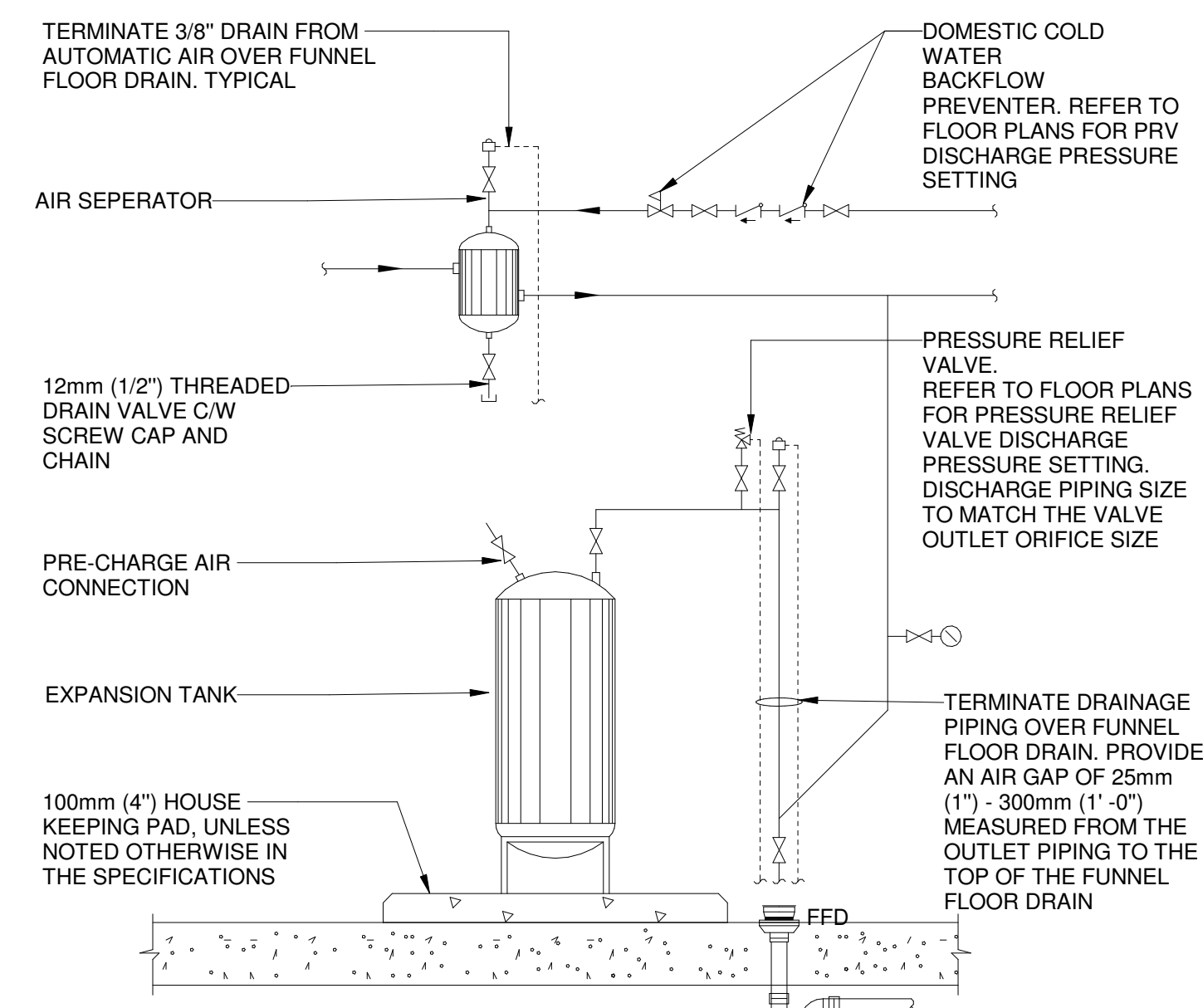
PLUMBING VENT ROOF PENETRATION

SCALE:N.T.S.



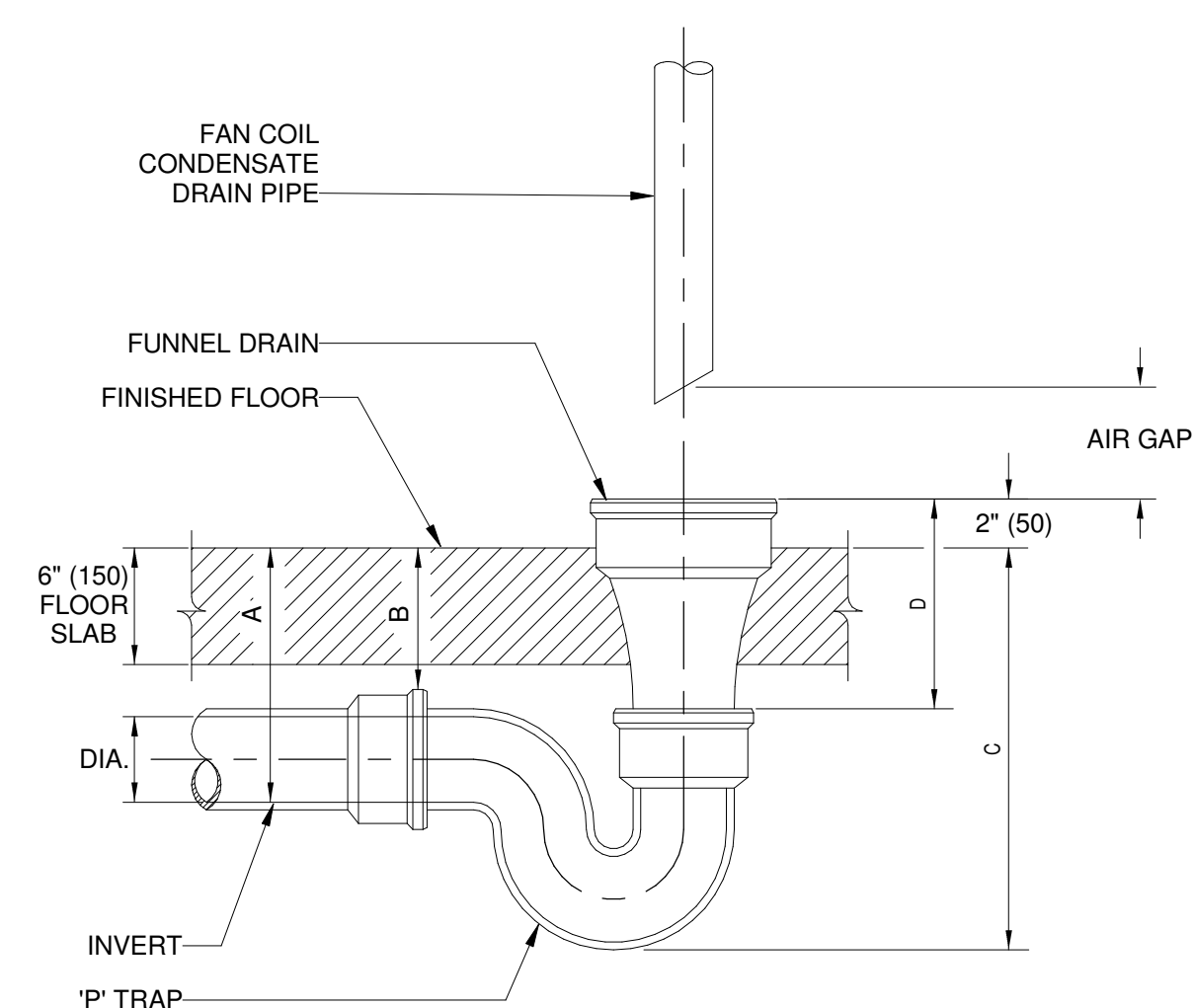
AIR SEPARATOR & EXPANSION TANK - GLYCOL

SCALE:N.T.S.



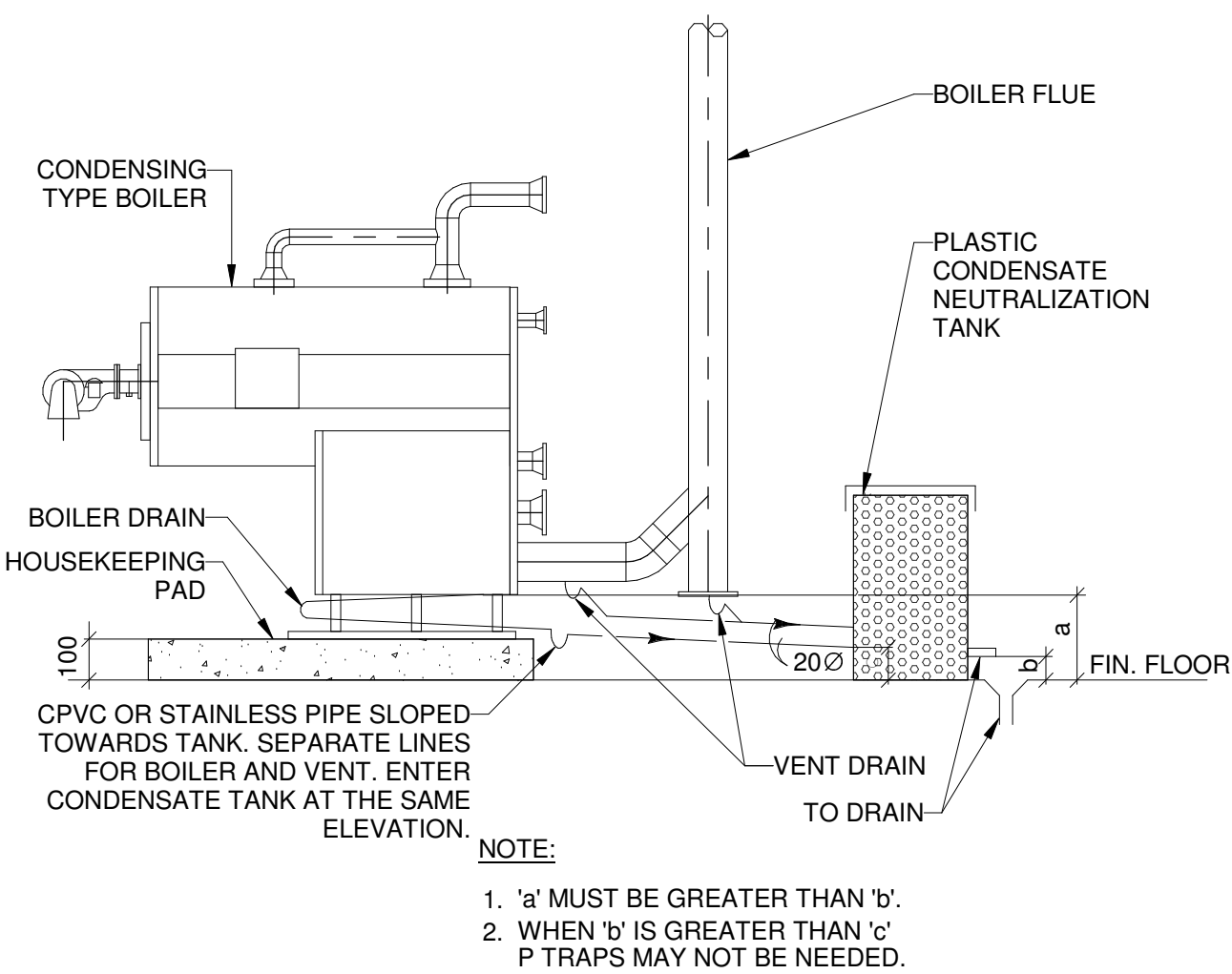
AIR SEPARATOR & EXPANSION TANK - WATER

SCALE:N.T.S.



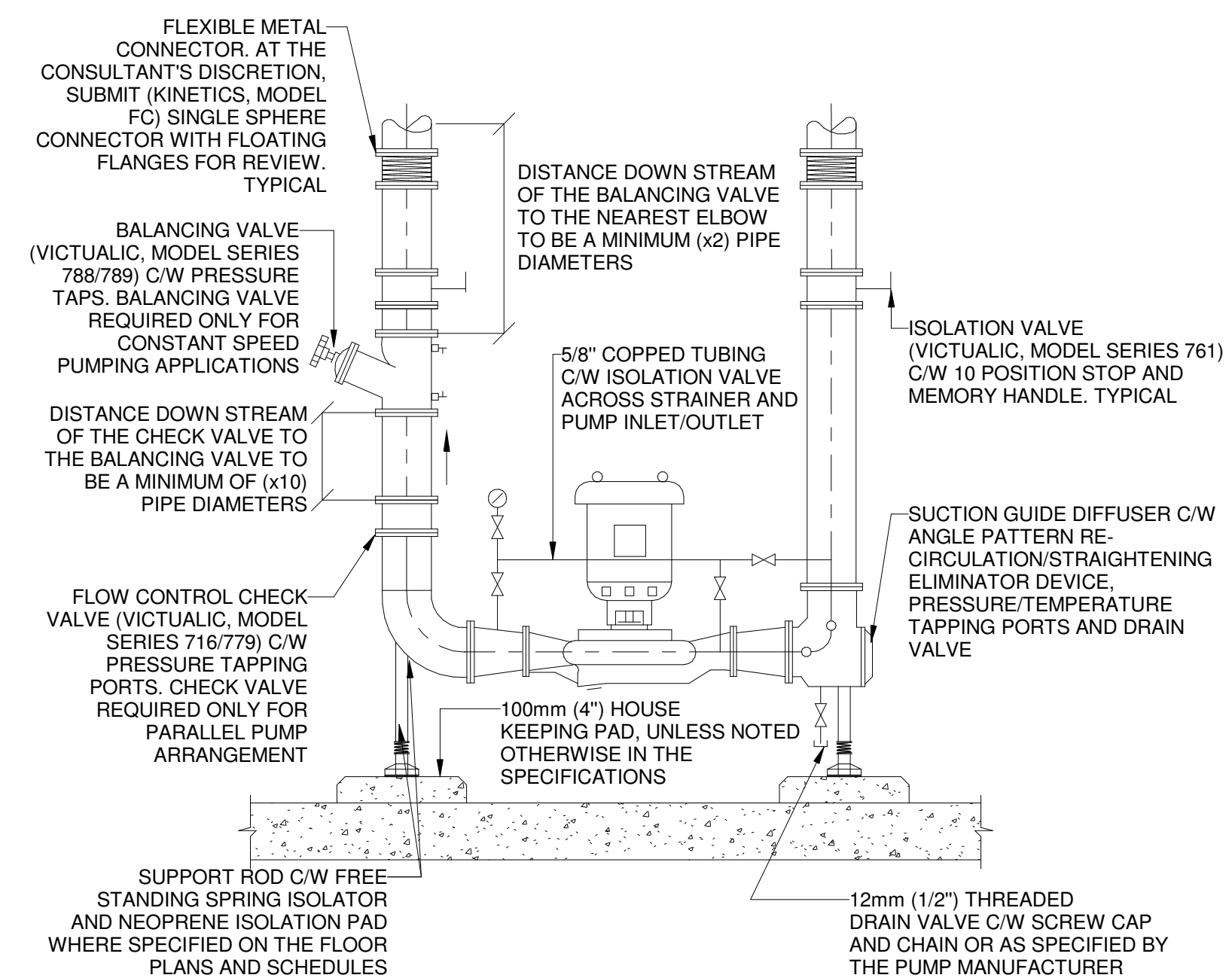
A/C UNIT CONDENSATE DRAIN

SCALE:N.T.S.



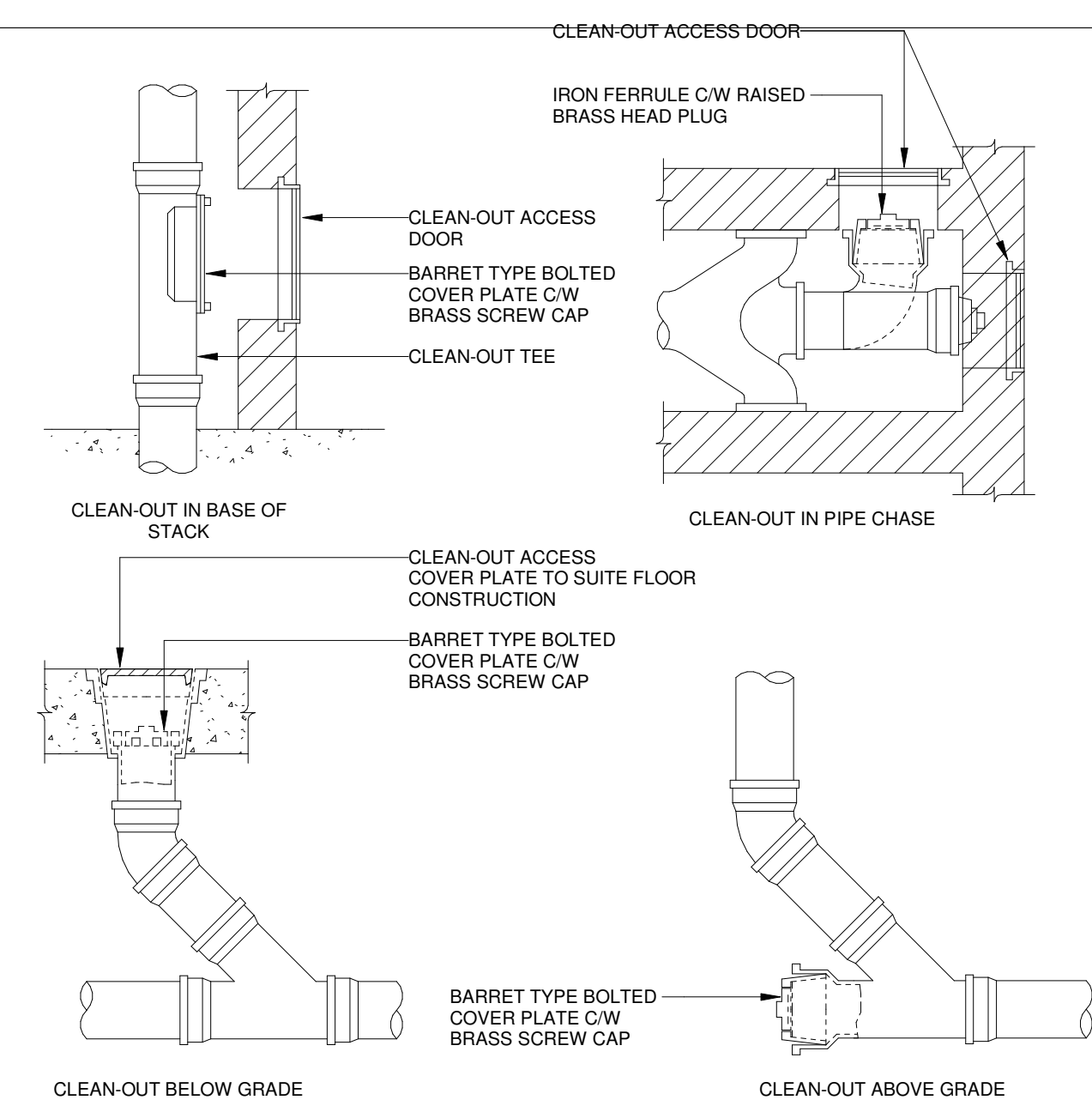
CONDENSING BOILER c/w NEUTRALIZATION

SCALE:N.T.S.



VERTICAL INLINE PUMP

SCALE:N.T.S.



SANITARY & STORM WATER CLEANOUTS

SCALE:N.T.S.

[illegible]

Issues

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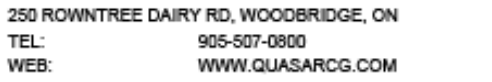
Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Sheet
Title:

MECHANICAL TYPICAL
DETAILS X

Drawing
No. **M-809**



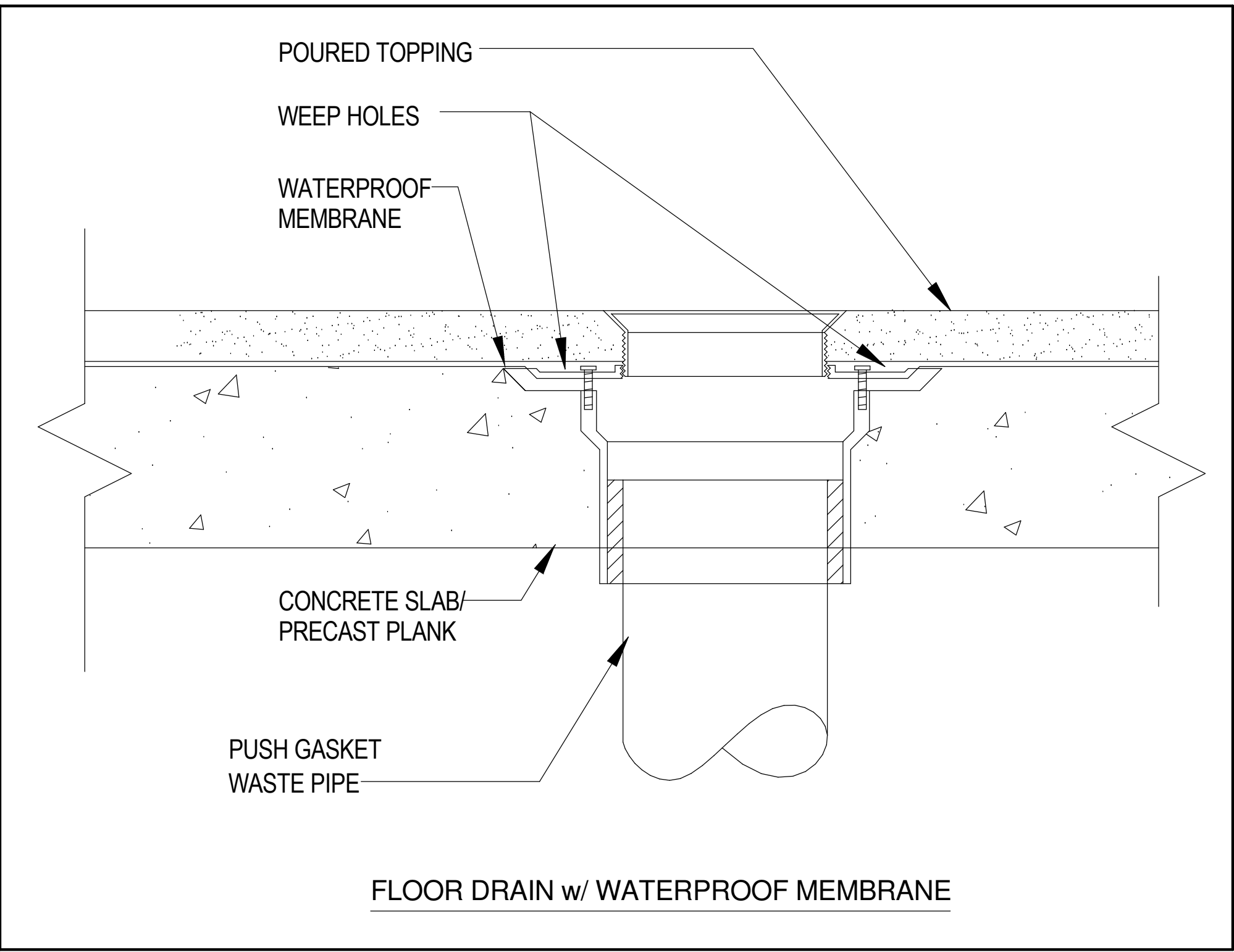
350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

Key Plan

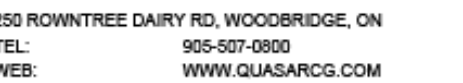
[illegible]

All measurements are to be checked and verified on site by the contractor before proceeding with work

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: N.T.S.



SCALE:N.T.S.



350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

[illegible]

Issues

Do not scale drawings

Drawn by: Fizzah Khan / Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale:

MECHANICAL SCHEDULES

Drawing
No. **M-900**

PRICING OPTIONS

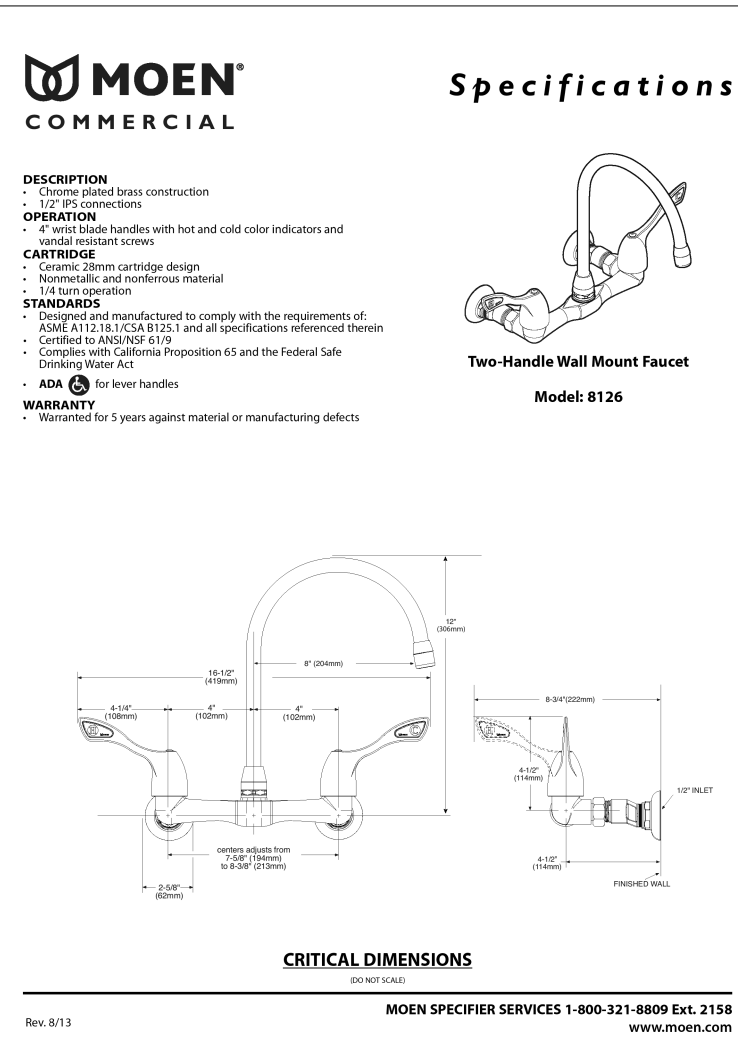
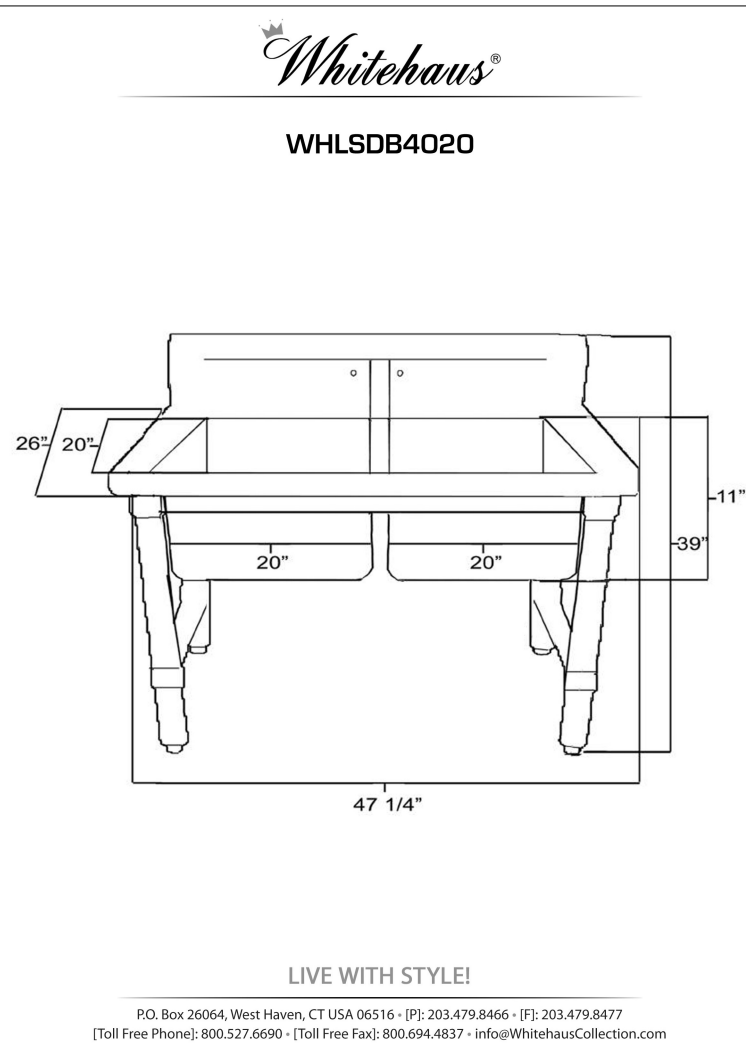
1. BASE PRICE: SNOW MELTING (FULL APRON)
2. SEPARATE PRICE #1: SNOW MELTING (PARKING ONLY)
3. SEPARATE PRICE #2: NO SNOW MELTING

IN FLOOR HEATING								
TAG	AREA (M2)	TOTAL LOAD (KW)	FLOW (L/S)	HEAD LOSS (M)	FLUID TYPE	DELTA T	LOOP TYPE/SIZE	SPACING
IF-1	405	45	2	4	100% WATER	11 C	12.7MM UPONO HEPEX	305MM CTRS TUBES

Measurements	
A	1.5 m
B	0.5 m
C	Max 12" (30.48 cm) ring rail min 30" (76.2 cm)
D	Isolated end
E	Strong wavy flat top
F	Max 0.5" (12.7 mm)
G	Max 0.5" (12.7 mm)
H	0.5" (12.7 mm)
I	0.5" (12.7 mm)
J	0.5" (12.7 mm)
K	0.5" (12.7 mm)
L	0.5" (12.7 mm)
M	0.5" (12.7 mm)

[illegible]

Carrier



1 LAUNDRY SINK LS & FAUCET
SCALE:N.T.S.

model 8300.158

ASD® MSR Emergency Shower and Eyewash

FEATURES & BENEFITS

CONSTRUCTION
1 1/2" (38 mm) Schedule 40 hot-dipped galvanized steel main and fittings, and standard stainless steel (SS) 304 drain lines from floor to drain.

SAFETY
Emergency showers and eyewashes are engineered to make the flushing of face, hair and clothing as easy as possible. The 180° swivel shower arm with the handle of a door bar or a stainless steel foot bar, full and open (3 inches) to allow for complete personal control against chemical and/or electrical injury and personal and personal damage to prevent face and hair from freezing.

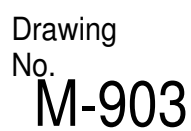
SHOWERSHOWER
Shower and eyewash shall operate through a hydro-mechanical control valve to give rapid distribution of water throughout the entire flow area.

FLOW CONTROL
Shower and eyewash design, flow control, and automatic safety control shall be in accordance with ASSE 158.1 (2011) and ASSE 158.2 (2011) and shall be in accordance with ASSE 158.3 (2011) and ASSE 158.4 (2011) and shall be in accordance with ASSE 158.5 (2011) and ASSE 158.6 (2011) and shall be in accordance with ASSE 158.7 (2011) and ASSE 158.8 (2011) and shall be in accordance with ASSE 158.9 (2011) and ASSE 158.10 (2011) and shall be in accordance with ASSE 158.11 (2011) and ASSE 158.12 (2011) and shall be in accordance with ASSE 158.13 (2011) and ASSE 158.14 (2011) and shall be in accordance with ASSE 158.15 (2011) and ASSE 158.16 (2011) and shall be in accordance with ASSE 158.17 (2011) and ASSE 158.18 (2011) and shall be in accordance with ASSE 158.19 (2011) and ASSE 158.20 (2011) and shall be in accordance with ASSE 158.21 (2011) and ASSE 158.22 (2011) and shall be in accordance with ASSE 158.23 (2011) and ASSE 158.24 (2011) and shall be in accordance with ASSE 158.25 (2011) and ASSE 158.26 (2011) and shall be in accordance with ASSE 158.27 (2011) and ASSE 158.28 (2011) and shall be in accordance with ASSE 158.29 (2011) and ASSE 158.30 (2011) and shall be in accordance with ASSE 158.31 (2011) and ASSE 158.32 (2011) and shall be in accordance with ASSE 158.33 (2011) and ASSE 158.34 (2011) and shall be in accordance with ASSE 158.35 (2011) and ASSE 158.36 (2011) and shall be in accordance with ASSE 158.37 (2011) and ASSE 158.38 (2011) and shall be in accordance with ASSE 158.39 (2011) and ASSE 158.40 (2011) and shall be in accordance with ASSE 158.41 (2011) and ASSE 158.42 (2011) and shall be in accordance with ASSE 158.43 (2011) and ASSE 158.44 (2011) and shall be in accordance with ASSE 158.45 (2011) and ASSE 158.46 (2011) and shall be in accordance with ASSE 158.47 (2011) and ASSE 158.48 (2011) and shall be in accordance with ASSE 158.49 (2011) and ASSE 158.50 (2011) and shall be in accordance with ASSE 158.51 (2011) and ASSE 158.52 (2011) and shall be in accordance with ASSE 158.53 (2011) and ASSE 158.54 (2011) and shall be in accordance with ASSE 158.55 (2011) and ASSE 158.56 (2011) and shall be in accordance with ASSE 158.57 (2011) and ASSE 158.58 (2011) and shall be in accordance with ASSE 158.59 (2011) and ASSE 158.60 (2011) and shall be in accordance with ASSE 158.61 (2011) and ASSE 158.62 (2011) and shall be in accordance with ASSE 158.63 (2011) and ASSE 158.64 (2011) and shall be in accordance with ASSE 158.65 (2011) and ASSE 158.66 (2011) and shall be in accordance with ASSE 158.67 (2011) and ASSE 158.68 (2011) and shall be in accordance with ASSE 158.69 (2011) and ASSE 158.70 (2011) and shall be in accordance with ASSE 158.71 (2011) and ASSE 158.72 (2011) and shall be in accordance with ASSE 158.73 (2011) and ASSE 158.74 (2011) and shall be in accordance with ASSE 158.75 (2011) and ASSE 158.76 (2011) and shall be in accordance with ASSE 158.77 (2011) and ASSE 158.78 (2011) and shall be in accordance with ASSE 158.79 (2011) and ASSE 158.80 (2011) and shall be in accordance with ASSE 158.81 (2011) and ASSE 158.82 (2011) and shall be in accordance with ASSE 158.83 (2011) and ASSE 158.84 (2011) and shall be in accordance with ASSE 158.85 (2011) and ASSE 158.86 (2011) and shall be in accordance with ASSE 158.87 (2011) and ASSE 158.88 (2011) and shall be in accordance with ASSE 158.89 (2011) and ASSE 158.90 (2011) and shall be in accordance with ASSE 158.91 (2011) and ASSE 158.92 (2011) and shall be in accordance with ASSE 158.93 (2011) and ASSE 158.94 (2011) and shall be in accordance with ASSE 158.95 (2011) and ASSE 158.96 (2011) and shall be in accordance with ASSE 158.97 (2011) and ASSE 158.98 (2011) and shall be in accordance with ASSE 158.99 (2011) and ASSE 158.100 (2011) and shall be in accordance with ASSE 158.101 (2011) and ASSE 158.102 (2011) and shall be in accordance with ASSE 158.103 (2011) and ASSE 158.104 (2011) and shall be in accordance with ASSE 158.105 (2011) and ASSE 158.106 (2011) and shall be in accordance with ASSE 158.107 (2011) and ASSE 158.108 (2011) and shall be in accordance with ASSE 158.109 (2011) and ASSE 158.110 (2011) and shall be in accordance with ASSE 158.111 (2011) and ASSE 158.112 (2011) and shall be in accordance with ASSE 158.113 (2011) and ASSE 158.114 (2011) and shall be in accordance with ASSE 158.115 (2011) and ASSE 158.116 (2011) and shall be in accordance with ASSE 158.117 (2011) and ASSE 158.118 (2011) and shall be in accordance with ASSE 158.119 (2011) and ASSE 158.120 (2011) and shall be in accordance with ASSE 158.121 (2011) and ASSE 158.122 (2011) and shall be in accordance with ASSE 158.123 (2011) and ASSE 158.124 (2011) and shall be in accordance with ASSE 158.125 (2011) and ASSE 158.126 (2011) and shall be in accordance with ASSE 158.127 (2011) and ASSE 158.128 (2011) and shall be in accordance with ASSE 158.129 (2011) and ASSE 158.130 (2011) and shall be in accordance with ASSE 158.131 (2011) and ASSE 158.132 (2011) and shall be in accordance with ASSE 158.133 (2011) and ASSE 158.134 (2011) and shall be in accordance with ASSE 158.135 (2011) and ASSE 158.136 (2011) and shall be in accordance with ASSE 158.137 (2011) and ASSE 158.138 (2011) and shall be in accordance with ASSE 158.139 (2011) and ASSE 158.140 (2011) and shall be in accordance with ASSE 158.141 (2011) and ASSE 158.142 (2011) and shall be in accordance with ASSE 158.143 (2011) and ASSE 158.144 (2011) and shall be in accordance with ASSE 158.145 (2011) and ASSE 158.146 (2011) and shall be in accordance with ASSE 158.147 (2011) and ASSE 158.148 (2011) and shall be in accordance with ASSE 158.149 (2011) and ASSE 158.150 (2011) and shall be in accordance with ASSE 158.151 (2011) and ASSE 158.152 (2011) and shall be in accordance with ASSE 158.153 (2011) and ASSE 158.154 (2011) and shall be in accordance with ASSE 158.155 (2011) and ASSE 158.156 (2011) and shall be in accordance with ASSE 158.157 (2011) and ASSE 158.158 (2011) and shall be in accordance with ASSE 158.159 (2011) and ASSE 158.160 (2011) and shall be in accordance with ASSE 158.161 (2011) and ASSE 158.162 (2011) and shall be in accordance with ASSE 158.163 (2011) and ASSE 158.164 (2011) and shall be in accordance with ASSE 158.165 (2011) and ASSE 158.166 (2011) and shall be in accordance with ASSE 158.167 (2011) and ASSE 158.168 (2011) and shall be in accordance with ASSE 158.169 (2011) and ASSE 158.170 (2011) and shall be in accordance with ASSE 158.171 (2011) and ASSE 158.172 (2011) and shall be in accordance with ASSE 158.173 (2011) and ASSE 158.174 (2011) and shall be in accordance with ASSE 158.175 (2011) and ASSE 158.176 (2011) and shall be in accordance with ASSE 158.177 (2011) and ASSE 158.178 (2011) and shall be in accordance with ASSE 158.179 (2011) and ASSE 158.180 (2011) and shall be in accordance with ASSE 158.181 (2011) and ASSE 158.182 (2011) and shall be in accordance with ASSE 158.183 (2011) and ASSE 158.184 (2011) and shall be in accordance with ASSE 158.185 (2011) and ASSE 158.186 (2011) and shall be in accordance with ASSE 158.187 (2011) and ASSE 158.188 (2011) and shall be in accordance with ASSE 158

3 JANITOR SINK JS & FAUCET
SCALE:N.T.S.

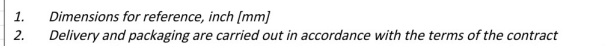
EMERGENCY EYEWASH & SHOWER
SCALE:N.T.S.

5 **SHOWER FLOOR DRAIN**
SCALE:N.T.S.



ELECTRIC WATER HEATER

4



1

SCALE:N.T.S.

4	ISSUED FOR ADDENDUM 15	2024-12-04
3	ISSUED FOR ADDENDUM 10	2024-10-15
2	ISSUED FOR TENDER	2024-09-09
1	ISSUED FOR BUILDING PERMIT	2024-07-31
NO.	ISSUED	DATE

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: Fizzah Khan/ Iulian Turiga
Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: N.T.S.

Title:

MECHANICAL SCHEDULES V

No.

M-904