

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

8	ISSUED FOR ADDENDUM 15	2024-10-04
7	ISSUED FOR ADDENDUM 14	2024-11-27
6	ISSUED FOR ADDENDUM 13	2024-10-30
5	ISSUED FOR ADDENDUM 10	2024-10-15
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
NO.	ISSUED	DATE

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

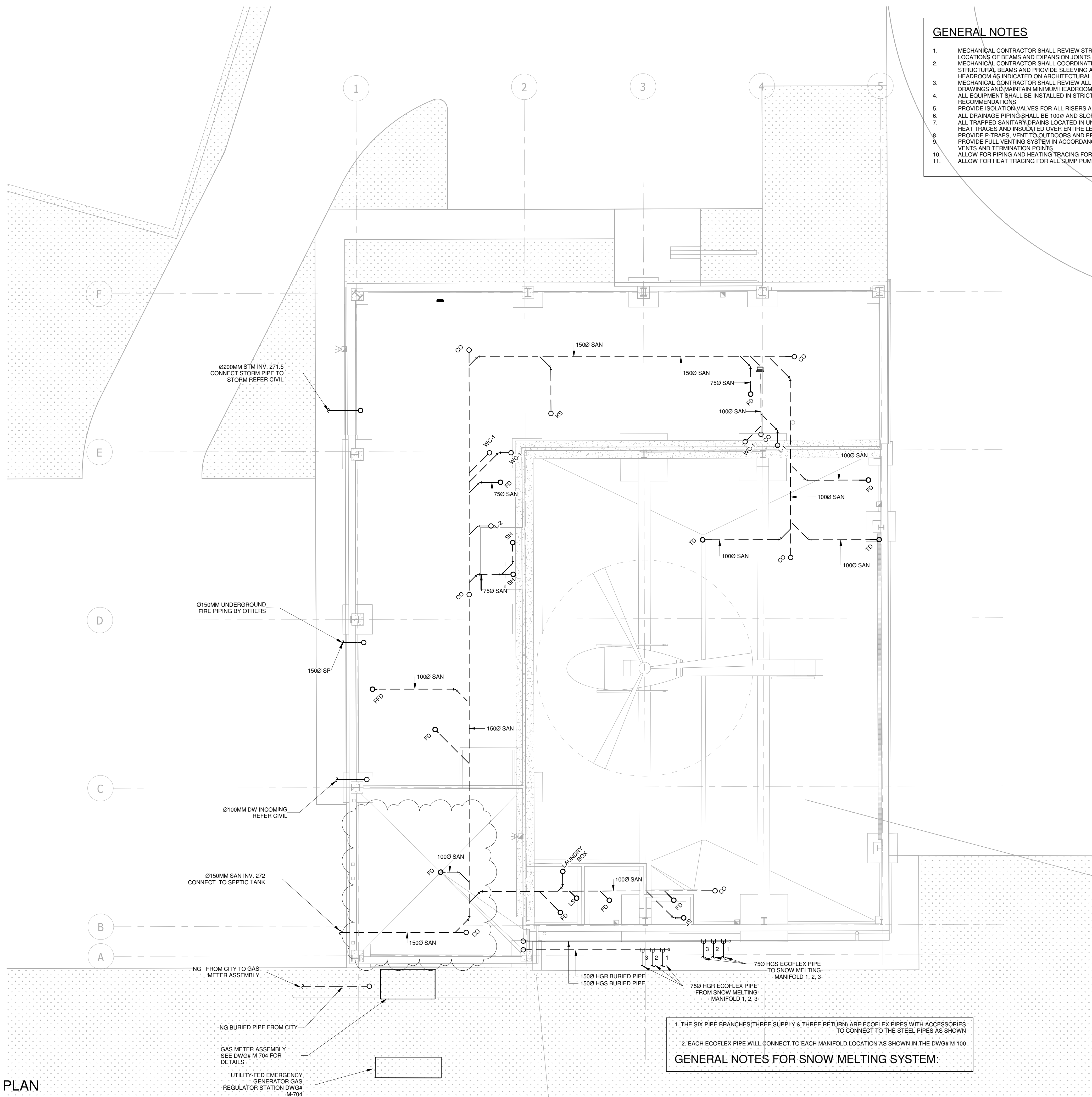
Drawing
No. **M-100**



YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN 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 ARCHITECTURAL 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. 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 DRAINS 100% SLOPED AND SLOPE 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

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Issues

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

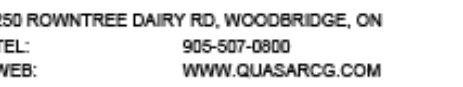
Do not scale drawings

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

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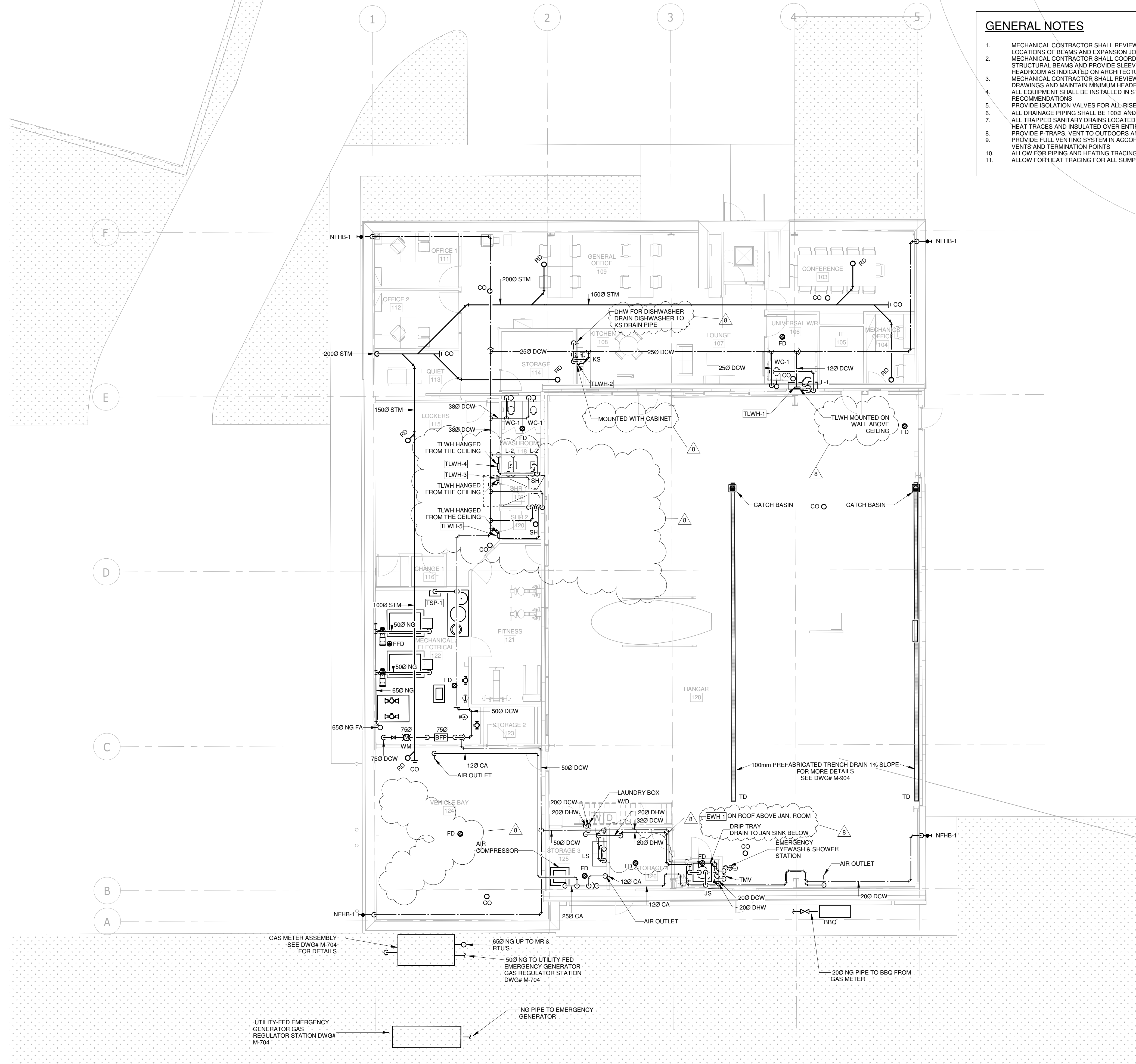
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Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: As indicated

Drawing
No.
M-251

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 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. ALL TRAPPED SANITARY DRAINS LOCATED IN UNHEATED SPACE SHALL BE ELECTRICALLY TRAPPED AND INSULATED ON ALL EXPOSED 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



250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0880
WEB: WWW.QUASARGROUP.COMYORK REGIONAL POLICE
HELICOPTER HANGAR350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GUILMBURYKey
Plan

A

NO.	ISSUED	DATE
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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: 1 : 100Sheet
Title:VENTILATION NEW
WORK - LEVEL 1Drawing
No:
M-351

- 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 | -5.6 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 | -5.6 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.

VENTILATION NEW WORK - LEVEL 1

SCALE: 1 : 100

1

F

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D

C

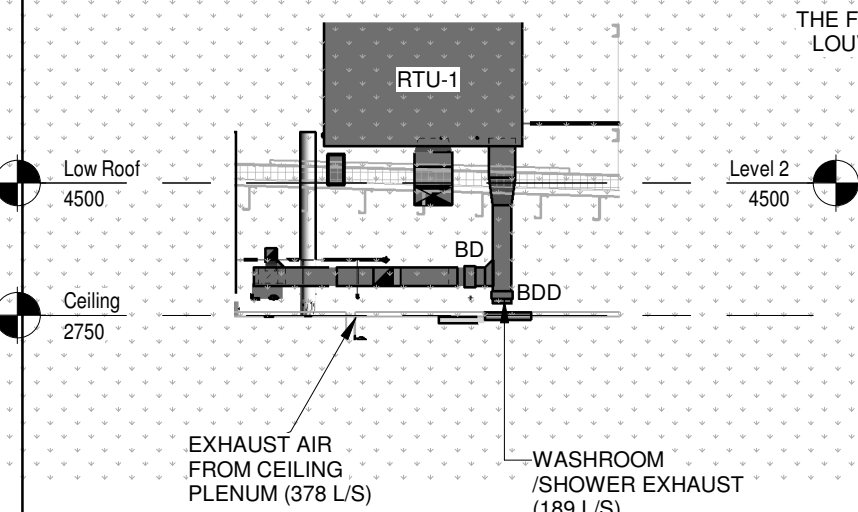
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A

2

RTU-1 SCHEMATIC CONCEPT

SCALE: 1 : 100





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
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Scale: As indicated

Sheet
Title: HEATING SCHEMATIC

Drawing
No. **M-702**

1. ENABLE PUMP P-5 OR P-5R, P-1 OR P-1R SHALL BE ENABLED (BAS SHALL CYCLE PUMPS AFTER EVERY 30 HOURS OF OPERATION TO ENSURE EVEN WEAR)
2. ASHP SHALL BE ENABLED
3. WHEN SPACE TEMPERATURE REACHES 20C (68F) (ADJUSTABLE):
 - A) PUMPS P-5 AND P-5R SHALL BE DISABLED.
 - B) AIR SOURCE BOILER (ASHP-1) SHALL BE DISABLED
 - C) PUMPS P-1 AND P-1R SHALL BE DISABLED
4. WHEN OUTDOOR AIR TEMPERATURE IS BELOW -10 DEG C (ADJUSTABLE):
 - A) THE THREE WAY VALVE CV-3 WILL DIRECT THE FLOW BETWEEN THE BOILERS TO HEAT EXCHANGER VIA ASSOCIATED BOILER'S PUMP AND P-1 & P-1R
 - B) THE PORT AT CV-1 (ASHP SIDE) WILL BE CLOSED AND LET THE FLOW FROM BOILER(S) DIRECT TO PUMPS P-1 & P-1R.
 - C) THE BOILERS AND THE ASSOCIATED PUMPS WILL BE ACTIVATED TO ALLOW THE DESIGN REQUIREMENTS TO BE REACHED.
 - D) ASHP IS DISABLED

1

HEATING SCHEMATIC
SCALE: N.T.S.

U/S STRUCTURE

1000x3000 O.E.D. AT
HIGH LEVEL C/W BIRDSCREEN

MOTORIZED DAMPERS—

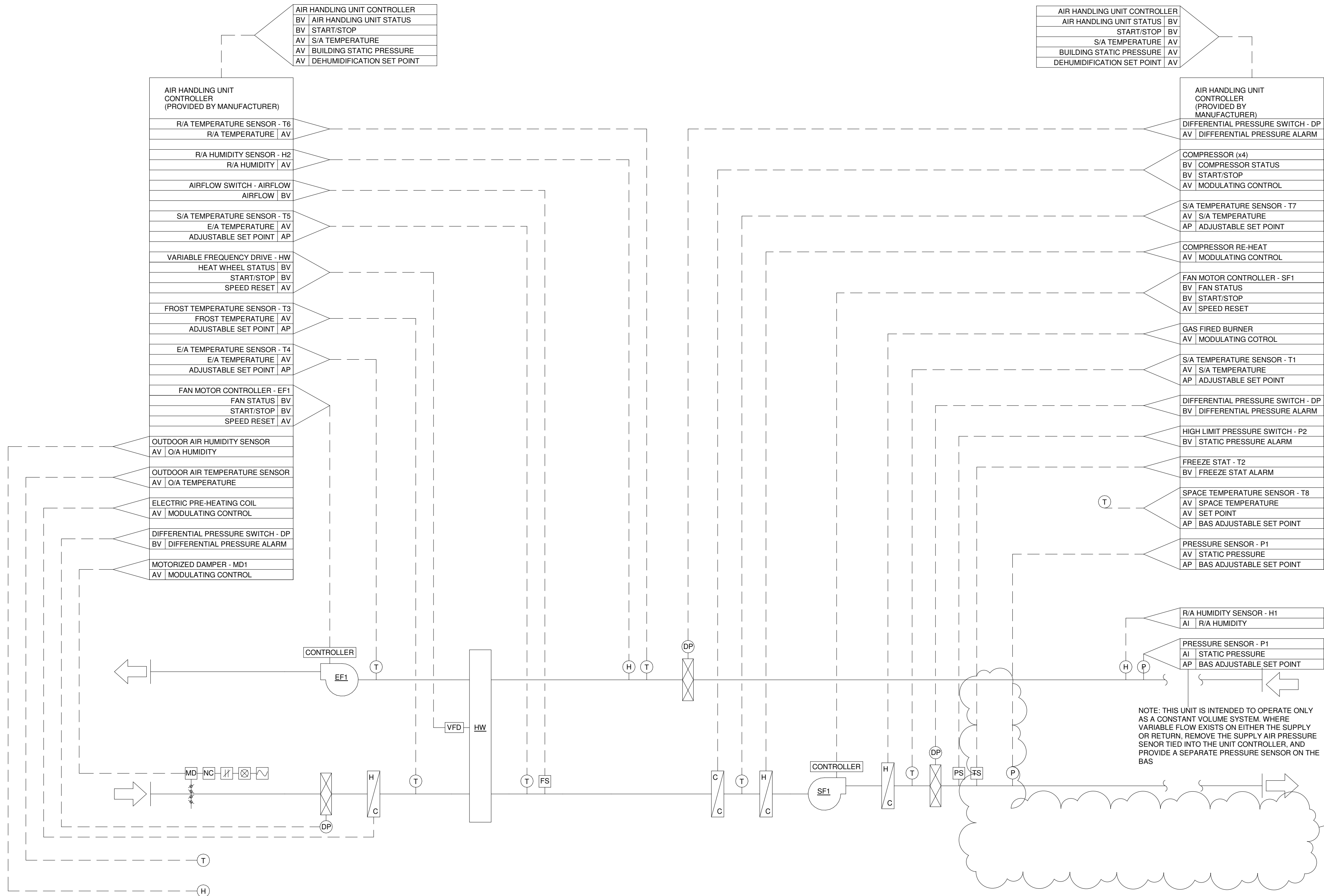
BIRDSCREEN—

FIN.FLOOR

BOILER ROOM INTAKE AIR

BOILER INTAKE SCHEMATIC

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/MSSTP 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

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

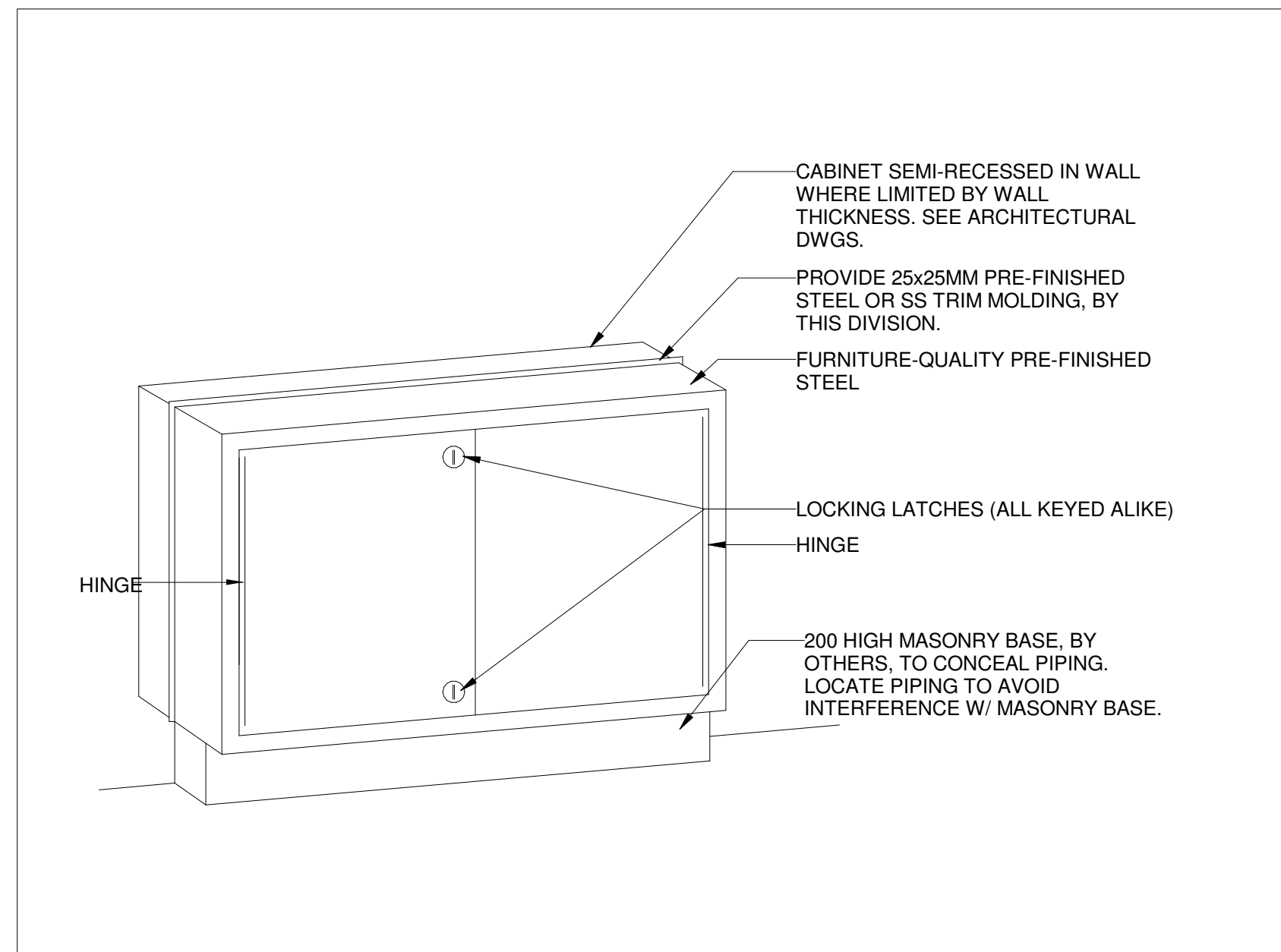
Do not scale drawings

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Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
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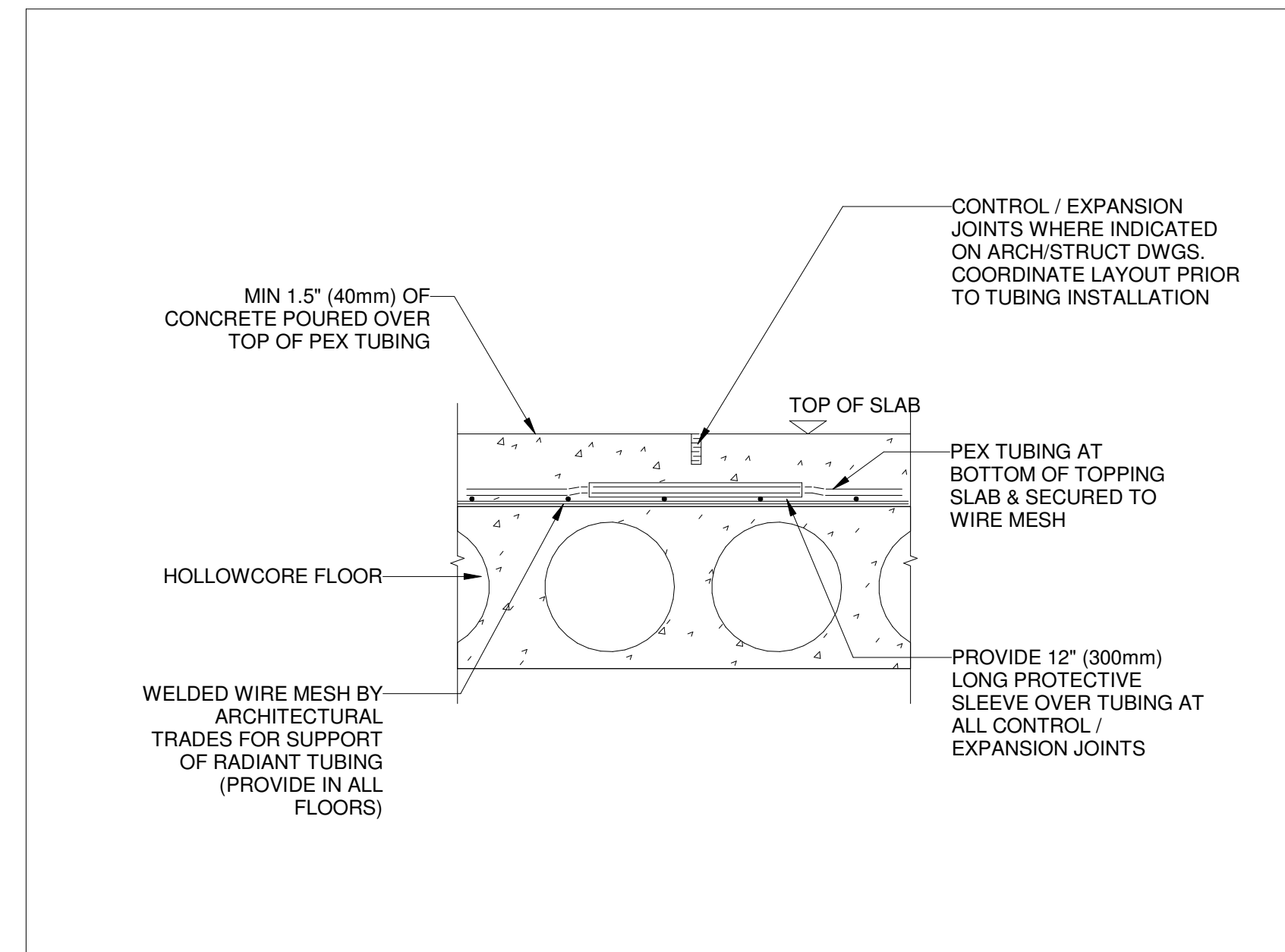
YORK REGIONAL POLICE
HELICOPTER HANGAR

350 GARFIELD WRIGHT
BOULEVARD
TOWN OF EAST GWILLIMBURY

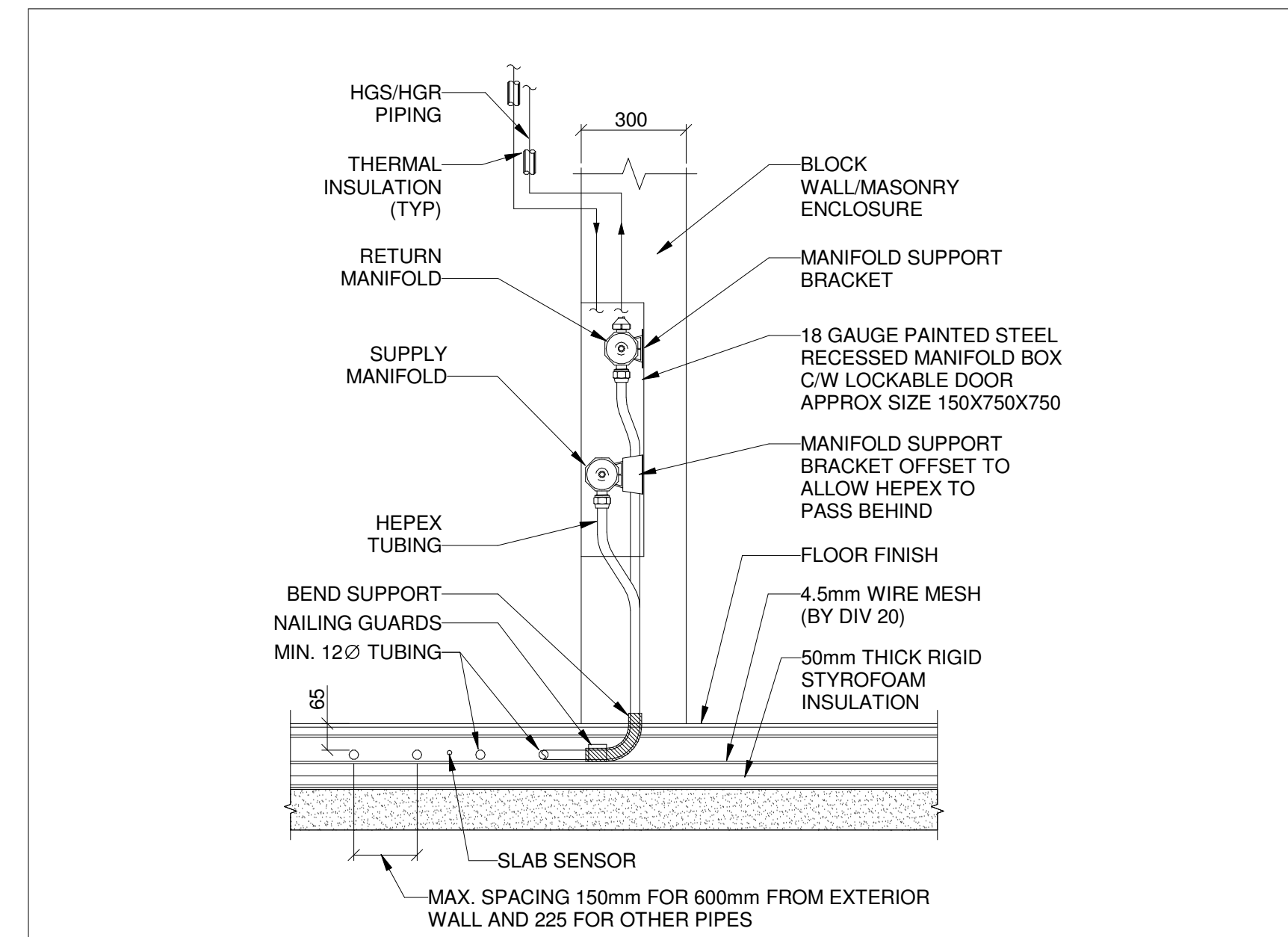
Key Plan



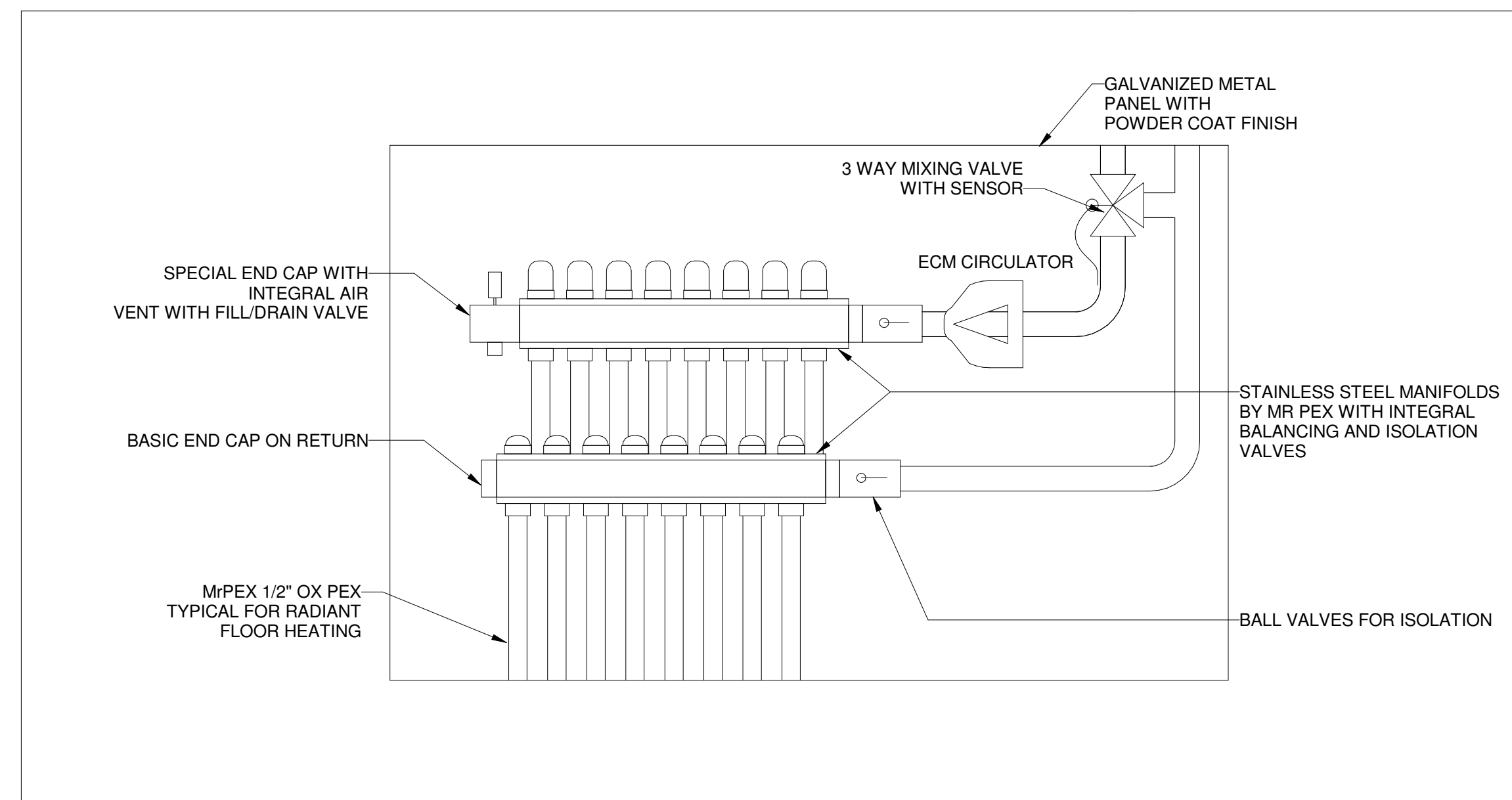
7 IN-FLOOR HEATING MANIFOLD CABINETS
SCALE:N.T.S.



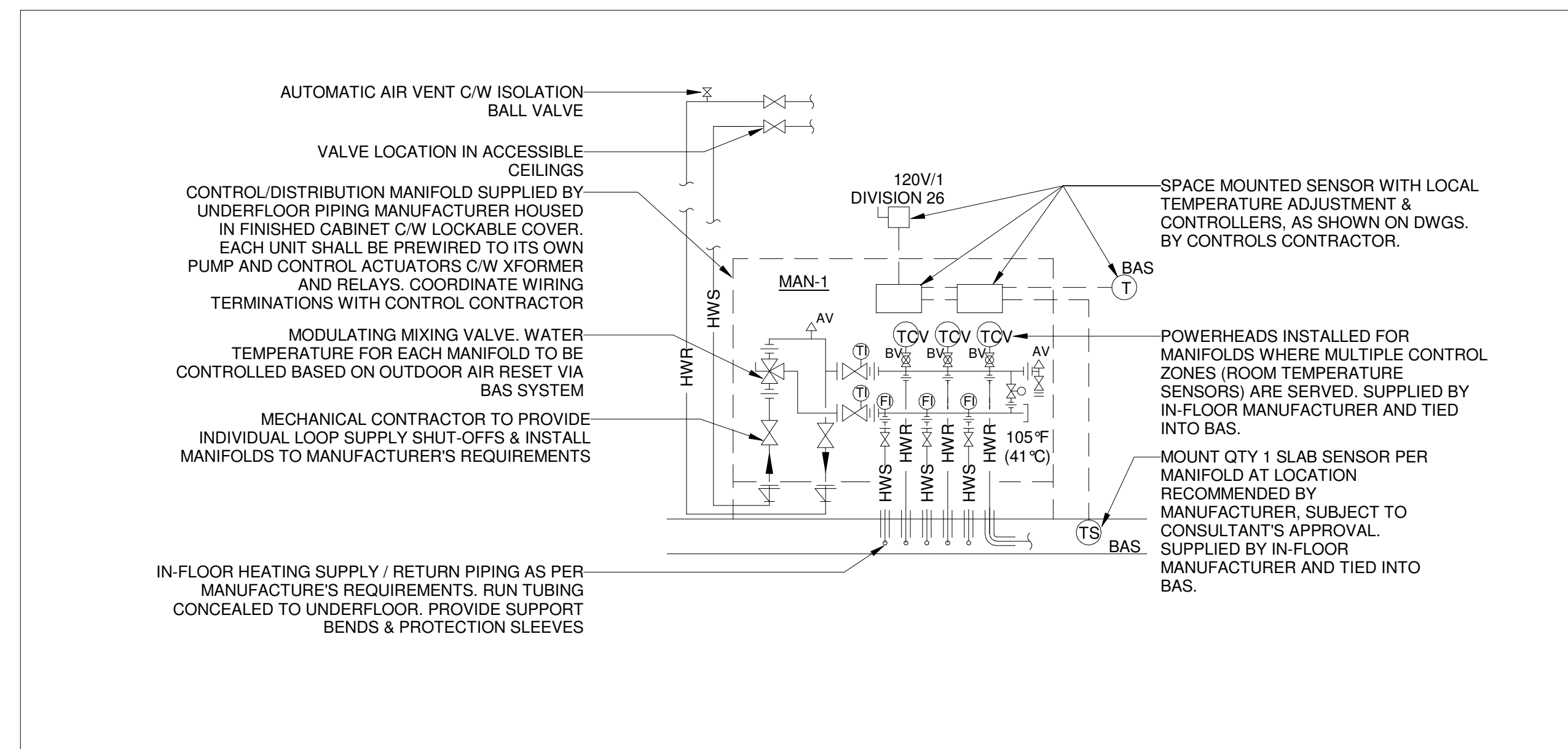
6 IN-FLOOR RADIANT TUBING INSTALLATION
SCALE:N.T.S.



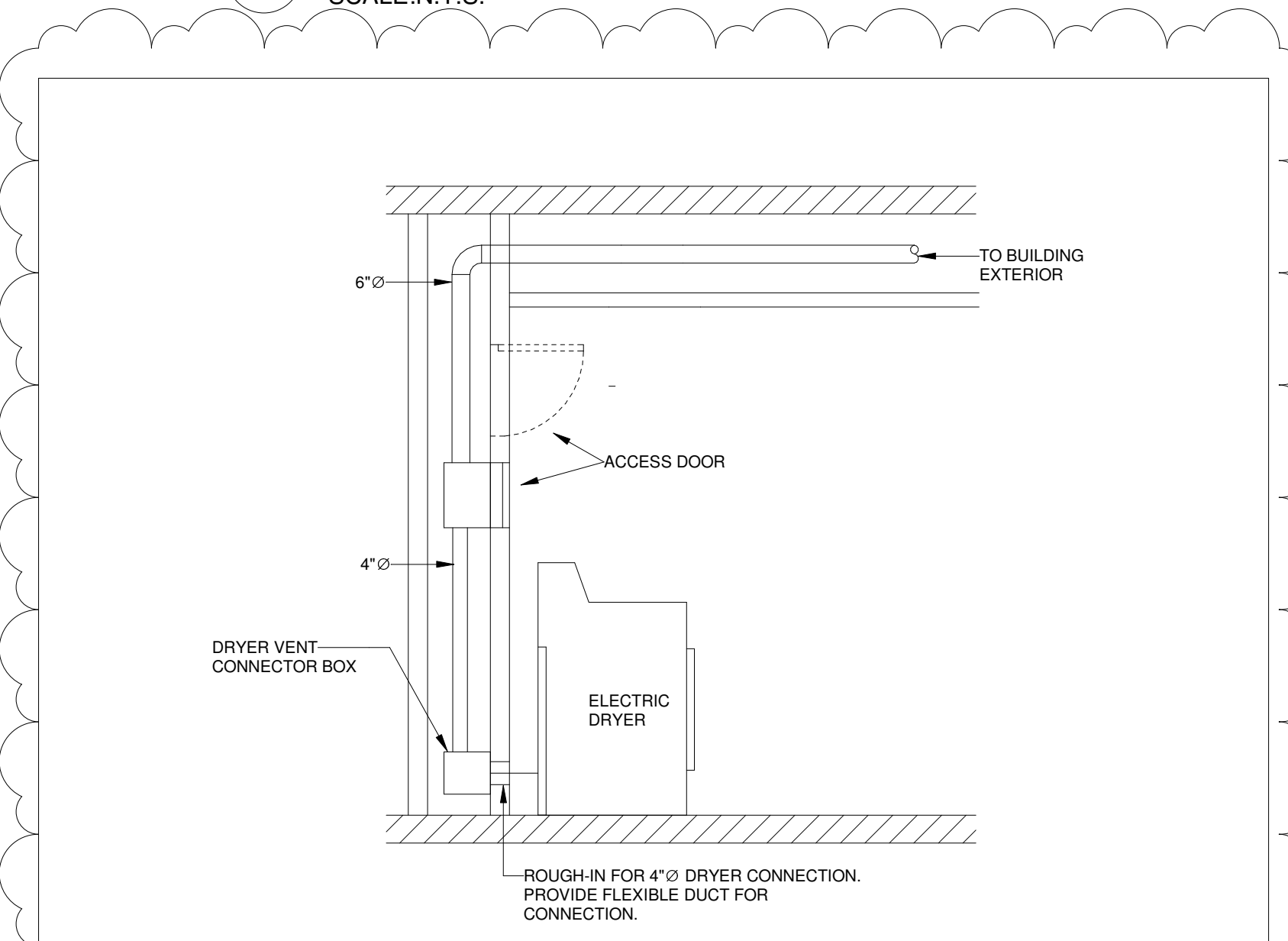
3 IN-FLOOR HEATING MANIFOLD DETAILS



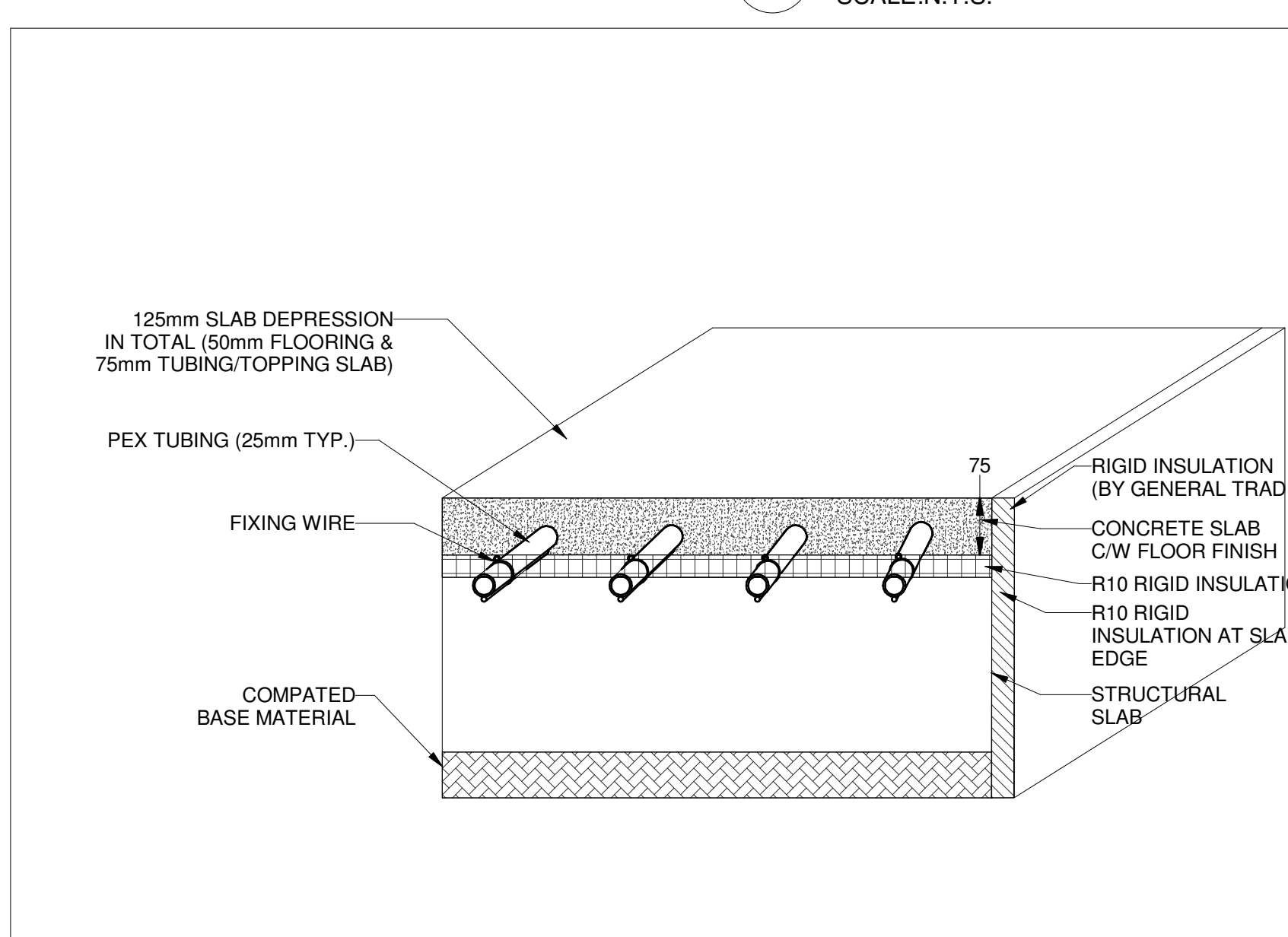
5 IN-FLOOR HEATING MANIFOLD LAYOUT
SCALE:N.T.S.



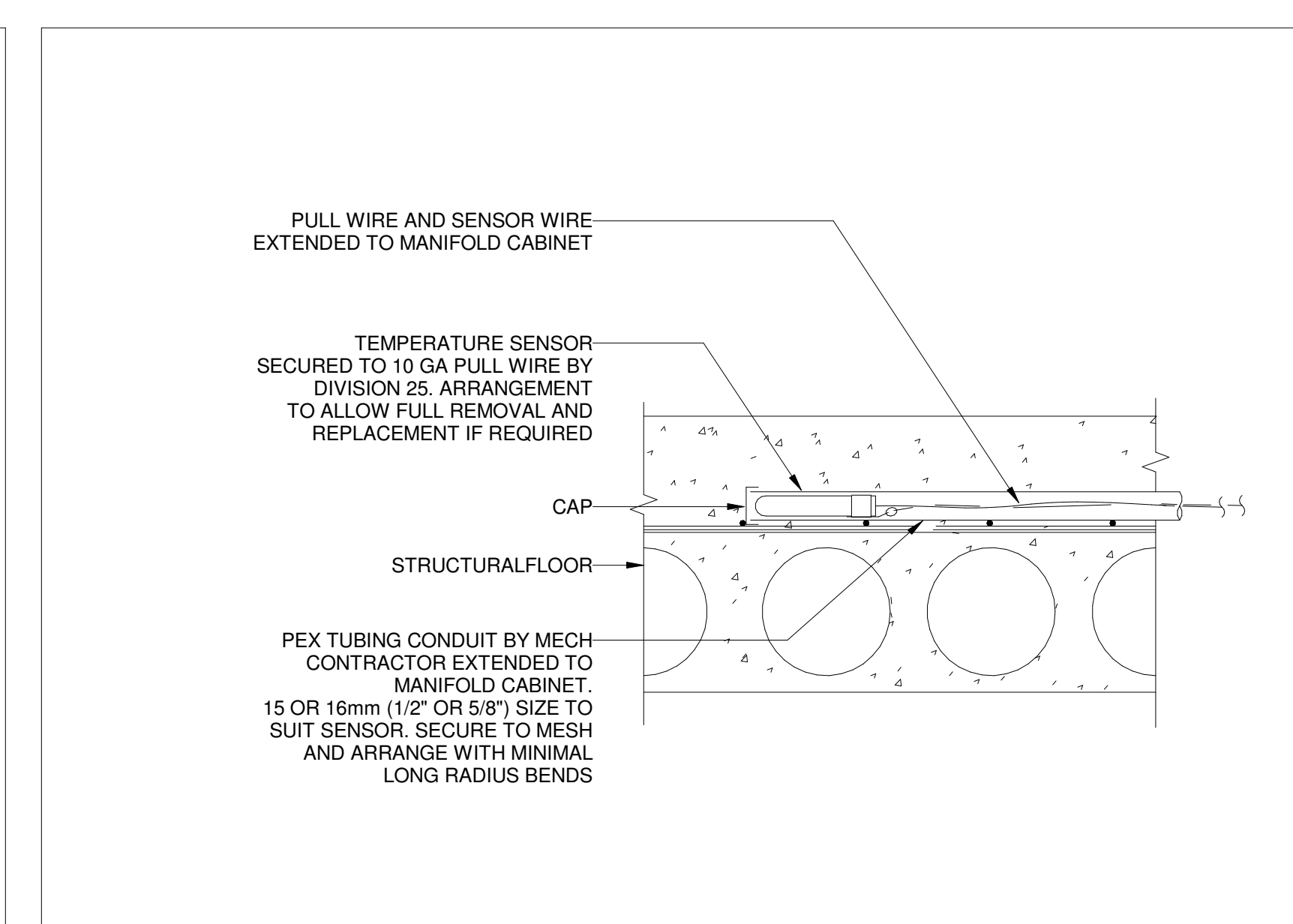
2 TYP. IN-FLOOR MANIFOLD INSTALLATION
SCALE:N.T.S.



8 LAUNDRY DRYER EXHAUST
SCALE:N.T.S.



4 IN-FLOOR HEATING PIPING AND INSULATION



1 RADIANT FLOOR HEATING SLABL SENSOR
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

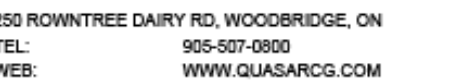
All measurements are to be checked and verified on site by the contractor before proceeding with work

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

Sheet
Title: MECHANICAL TYPICAL
DETAILS VII

Drawing
No. **M-806**



350 GARFIELD WRIGHT
BOULEVARD
WYN OF EAST GWILLIMBURY

[illegible]

Issues

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Project No: TT-24-005
Scale:

MECHANICAL SCHEDULES

Drawing
No. **M-900**

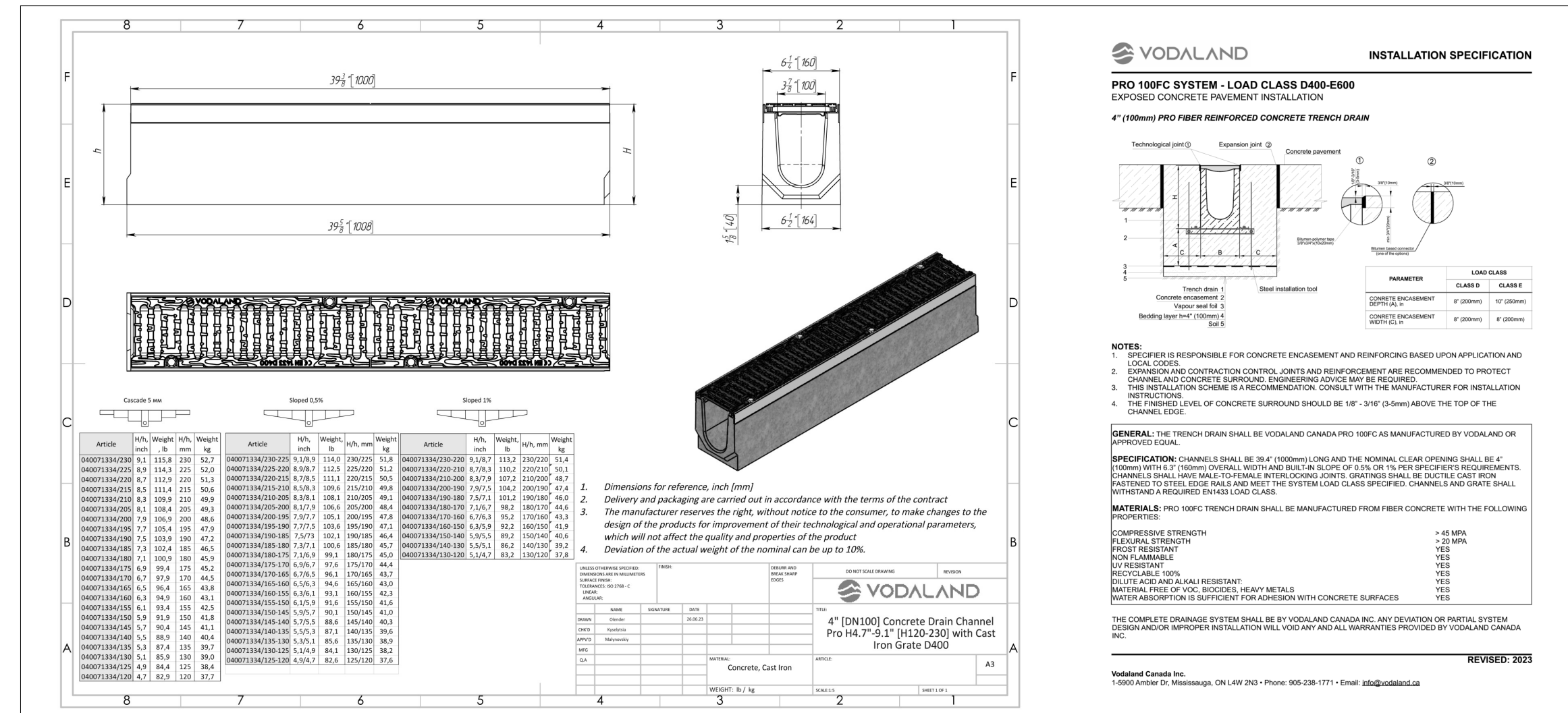
PRICING OPTIONS

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

ELECTRIC WATER HEATER

TAG	MODEL	MANUFACTURER	DESCRIPTION	TANK VOLUME (L)	MAX. DESIGN TEMP. (F)	STANDARD INPUT (KW)	MAXIMUM PRESSURE (PSI)	MCA	MOCP	V/PH/HZ	WEIGHT (KG)	REMARKS
EWH-1	DRE-80	RHEEM	LS/WASHER/JAN.SIN K/EMERG. SHWR	144	180	3	150	14.4	15	208/3/60	62	



TRENCH DRAIN DETAILS

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 ISSUED	2024-07-31 DATE

Issues

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Do not scale drawings

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Checked by: Ali Nakhaei-Zadeh
Original Issue Date: 2024-07-31
Project No: TT-24-005
Scale: N.T.S.

Sheet

Title:

MECHANICAL SCHEDULES V

Drawing

No. 11

M-904