

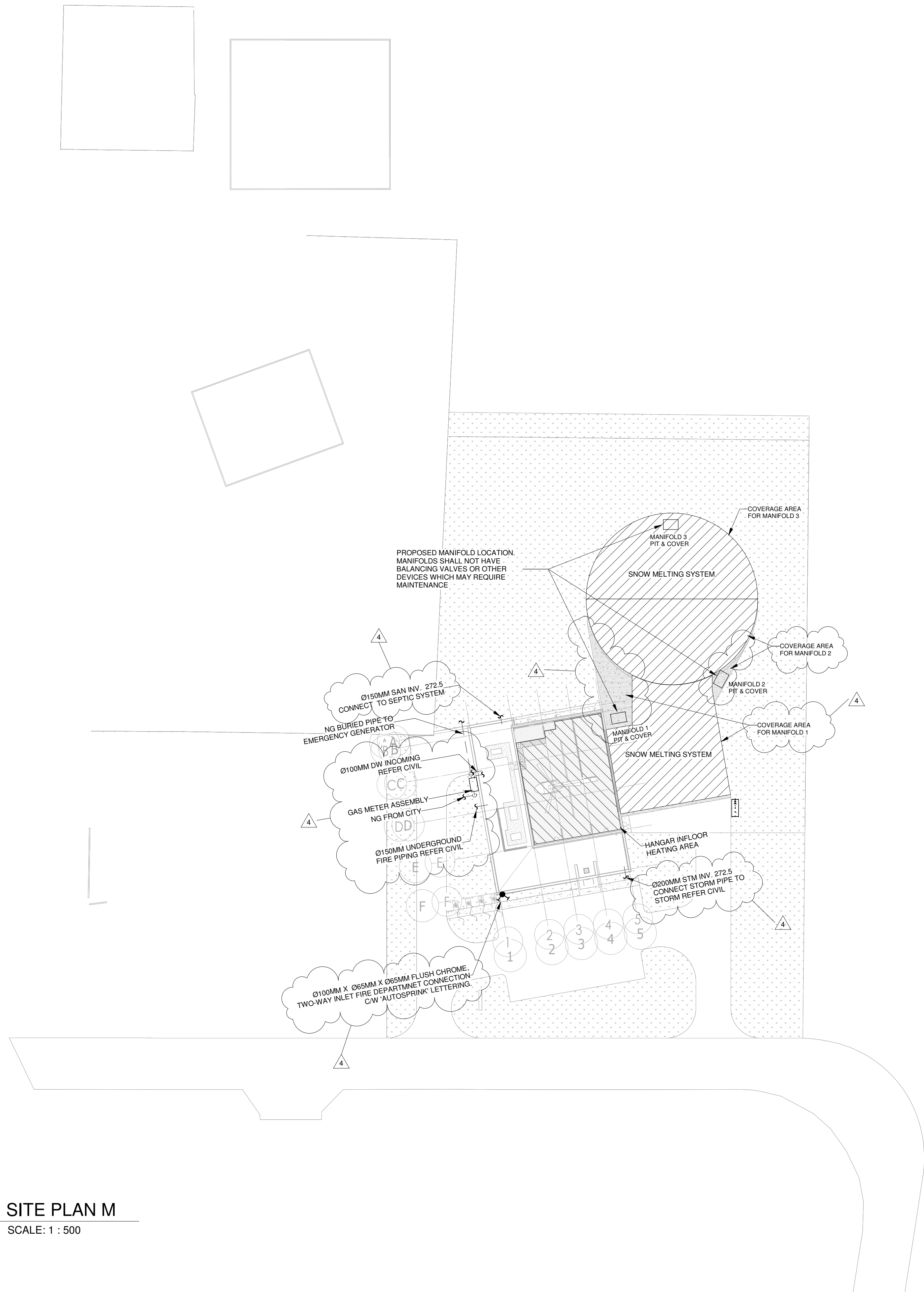
350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

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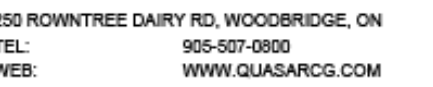
All measurements are to be checked and verified on site by the contractor before proceeding with work

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

Drawing  
No.  
**M-100**



1 SITE PLAN M  
SCALE: 1 : 500



350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

### Key Plan

[illegible]

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

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Scale: 1 : 100

## ROOF PLAN

Drawing  
No. **M-150**

1 ROOF PLAN - M  
SCALE: 1 : 100

YORK REGIONAL POLICE  
HELICOPTER HANGAR

350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

## Key Plan

4	ISSUED FOR ADDENDUM 6	2024-09-30
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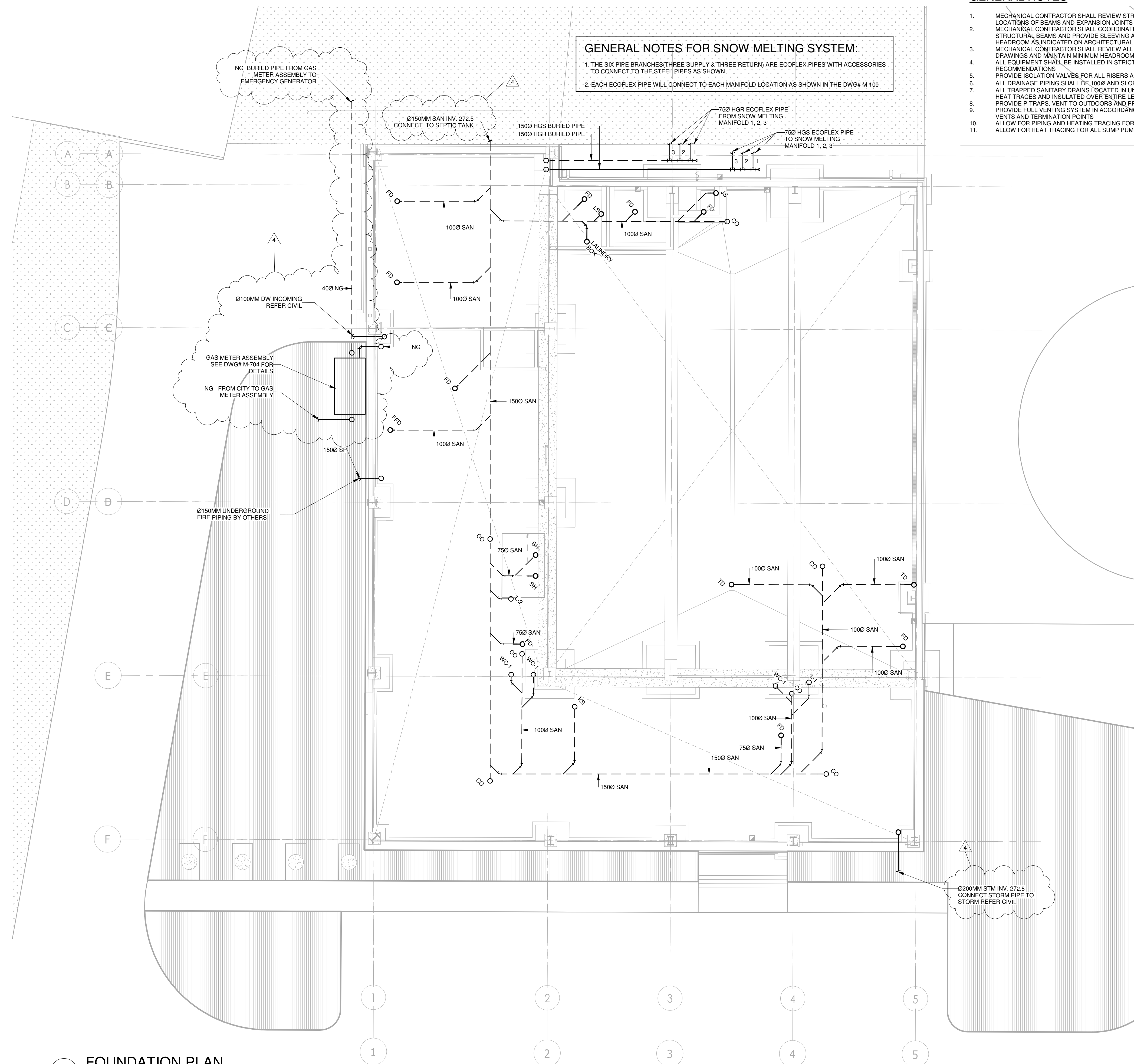
Do not scale drawings

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Sheet  
Title:

## FOUNDATION PLAN

Drawing  
No.  
**M-250**

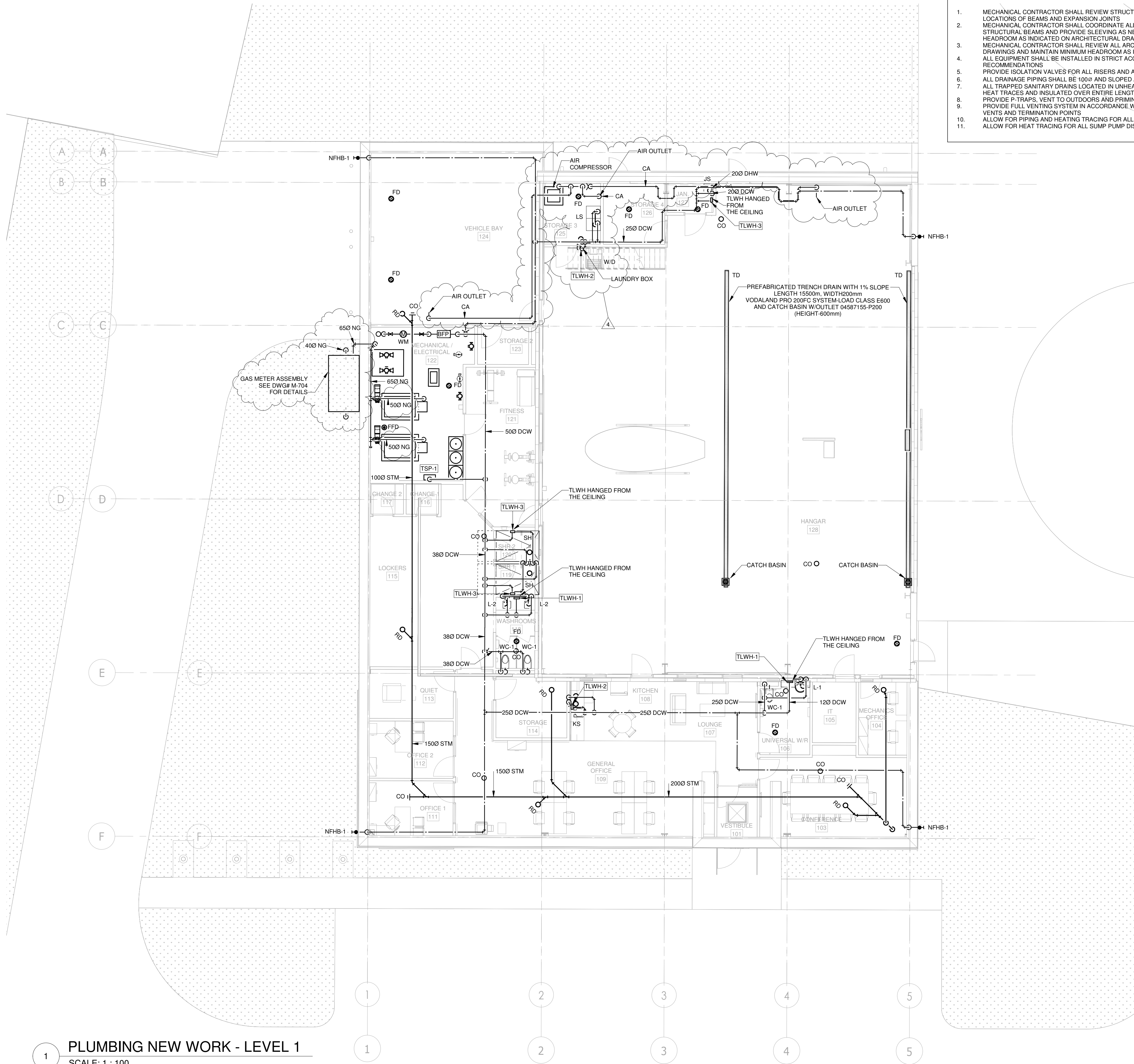


## FOUNDATION PLAN

SCALE: 1 : 100



2024-09-30 3:10:15 PM  
Autodesk Docs\\2402 - YRP Helicopter Hangar\\TT-24-005-YRP-QCG ME Model\_P24.rvt



### GENERAL NOTES

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

# PARKIN

Parkin Architects Limited  
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## YORK REGIONAL POLICE HELICOPTER HANGAR

350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

Key  
Plan

NO.	ISSUED	DATE
4	ISSUED FOR ADDENDUM 6	2024-09-30
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1	ISSUED FOR BUILDING PERMIT	2024-07-31

### Issues

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Do not scale drawings

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Scale: As indicated

Sheet  
Title:

## PLUMBING NEW WORK - LEVEL 1

Drawing  
No.  
M-251



350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

### Key Plan

[illegible]

## Issues

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Do not scale drawings

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Original Issue Date: 2024-07-31  
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Scale: 1 : 50

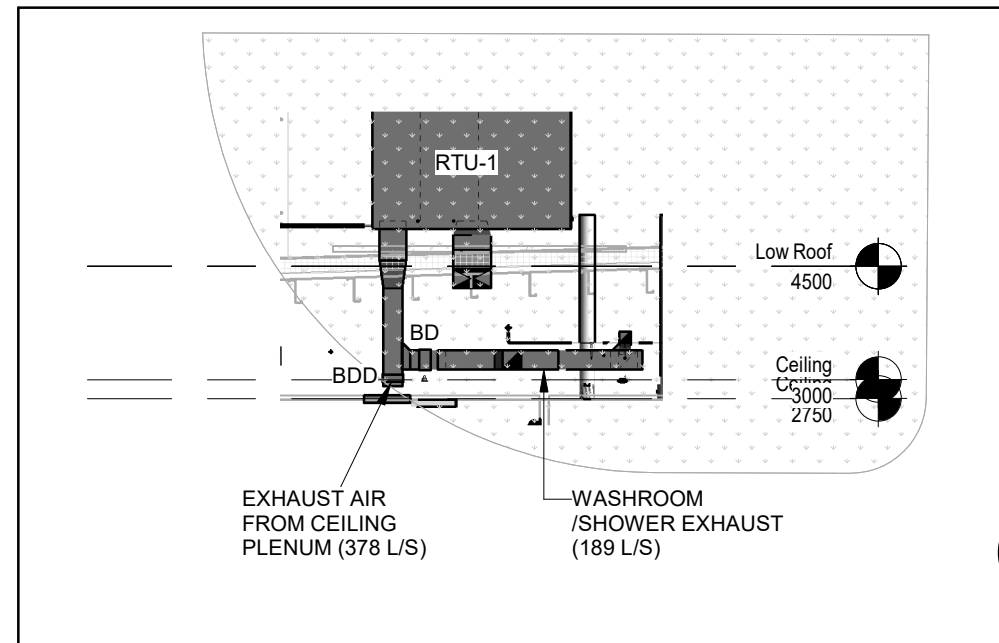
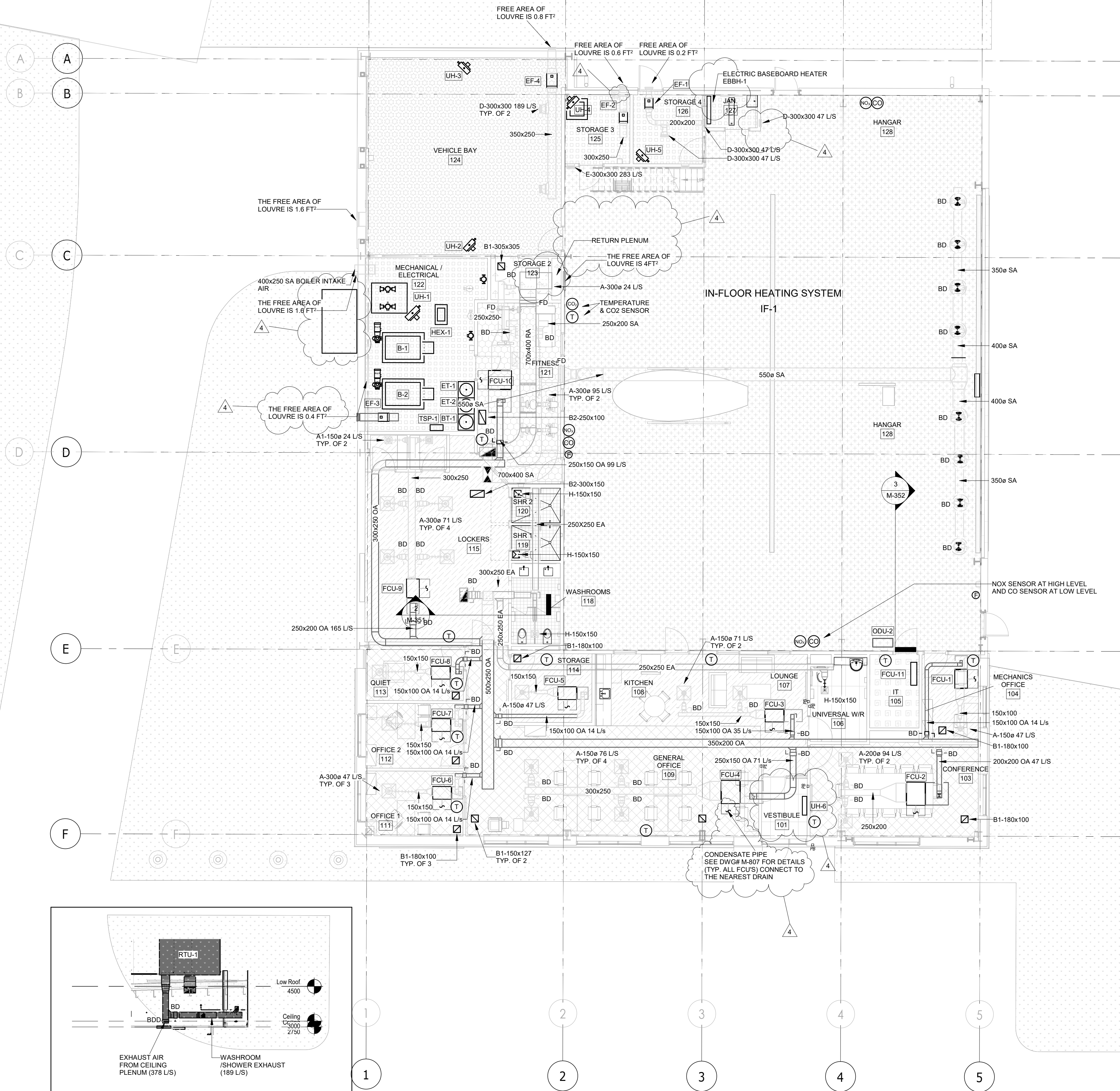
Sheet  
Title: MECHANICAL ROOM  
PIPING

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.



RTU-1 SCHEMATIC CONCEPT  
SCALE: 1 : 100

VENTILATION NEW WORK - LEVEL 1  
SCALE: 1 : 100

- 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 freestat 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 frost 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<br>RAH (20%) | OAT (C) | SETPOINT<br>RAH (20%) | OAT (C) | SETPOINT<br>RAH (20%) |
|---------|-----------------------|---------|-----------------------|---------|-----------------------|
| -25     | -15.6                 | -19.4   | -11.1                 | -15.6   | -8.2                  |
| -26.1   | -11.7                 | -20.3   | -7.8                  | -16.1   | -4.9                  |
| -28.3   | -8.3                  | -22.2   | -4.4                  | -17.2   | -1.9                  |
| -32.2   | -5.8                  | -25     | -1.9                  | -19.4   | 0.8                   |
| -35     | -3.9                  | -27.2   | -0.6                  | -20.6   | 2.3                   |
| -40     | -3.3                  | -31.1   | -0.3                  | -23.5   | 3.3                   |
- 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. Space 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 hangar. When gas detection sensors (CONOX) detect the presence of gas, the unit will operate at full volume and 100% outside air regardless of the mode of operation, 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.
- 1.2. Safeties and Limits**
- 1.2.1. The DDC controller will shutdown and lockout the unit if the supply air temperature drops below 4 Deg C when the unit is running. Once shutdown the operator must correct the problem and manually restart the unit. Low temperature protection is hardwired to the starter and will work when the fans are being controlled in either hand or auto.
- 1.2.2. Fan speed modulation is disabled until fan run status is received.
- 1.2.3. The minimum speed for the VFD is 50% (30 hz - confirm min speed with balancer).
- 1.2.4. Supply air temperature control is disabled until fan run status is received.
- 1.2.5. Damper control is disabled until fan run status is received.
- 1.2.6. Simultaneous heating and cooling is not permitted.
- 1.2.7. 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**
- 1.3.1. The occupied and unoccupied modes of operation are determined by a time-of-day schedule or via the occupancy button located at the main entrance. When pressed, the occupancy button will set the occupied mode for 4 hours (adjustable).
- 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 22 Deg C and the cooling setpoint set to 24 Deg C.
- 1.4.3. Gas Detection Setpoints: The CO setpoint is 25 ppm. The NOx setpoint is 1 ppm.
- 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 it's 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 18 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: 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. 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 return 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 control system will provide frost protection for the heat wheel. The controller will slow the wheel down and stop it if necessary to maintain the frost temperature slightly above the frost setpoint.
- 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<br>RAH (20%) | OAT (C) | SETPOINT<br>RAH (20%) | OAT (C) | SETPOINT<br>RAH (20%) |
|---------|-----------------------|---------|-----------------------|---------|-----------------------|
| -25     | -15.6                 | -19.4   | -11.1                 | -15.6   | -8.2                  |
| -26.1   | -11.7                 | -20.3   | -7.8                  | -16.1   | -4.9                  |
| -28.3   | -8.3                  | -22.2   | -4.4                  | -17.2   | -1.9                  |
| -32.2   | -5.8                  | -25     | -1.9                  | -19.4   | 0.8                   |
| -35     | -3.9                  | -27.2   | -0.6                  | -20.6   | 2.3                   |
| -40     | -3.3                  | -31.1   | -0.3                  | -23.5   | 3.3                   |
- 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 Unoccupied 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 5 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. Alarm strobe/horn in space is activated.
- 1.6.4. NOx level above 3 ppm. Alarm strobe/horn in space is activated.
- 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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Issues

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Do not scale drawings

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Scale: 1 : 100



YORK REGIONAL POLICE  
HELICOPTER HANGAR

350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

## Key Plan

### 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. ALL TYPES OF STRUCTURAL AND MECHANICAL MEMBERS TO BE DONE ONLY WITH THE WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER.
4. ALL ELECTRICAL WELDING OF SPRINKLER DEVICES IS BY OTHERS. COORDINATE ALL ELECTRICAL ITEMS WITH ELECTRICAL CONTRACTOR AND ENSURE PROPER COORDINATION.
5. PROVIDE STOCK OR EXTRA SPRINKLERS IN ACCORDANCE WITH NFPA 13-2013, 6.5.2.9
6. COORDINATION IS TO TAKE PLACE BETWEEN THE SPRINKLER CONTRACTOR AND ALL OTHER TRADES.
7. THE SPRINKLER CONTRACTOR SHALL 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 DESIGNER AND CONSULTANTS.
9. INSTALL HIGH TEMPERATURE SPRINKLERS AROUND ALL HEAT SOURCES IN ACCORDANCE WITH NFPA 13-2013.
10. INSTALL GUARDS OVER SPRINKLER 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 PROVIDE TAGS AND PRESSURES VIA A FIRE HYDRANT FLOW TEST PERFORMED BY A LICENSED COMPANY, AT THE SITE PRIOR TO ANY DESIGN, HYDRAULIC CALCULATIONS AND INSTALLATION AND ANY SUBSEQUENT WORK.
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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## Issues

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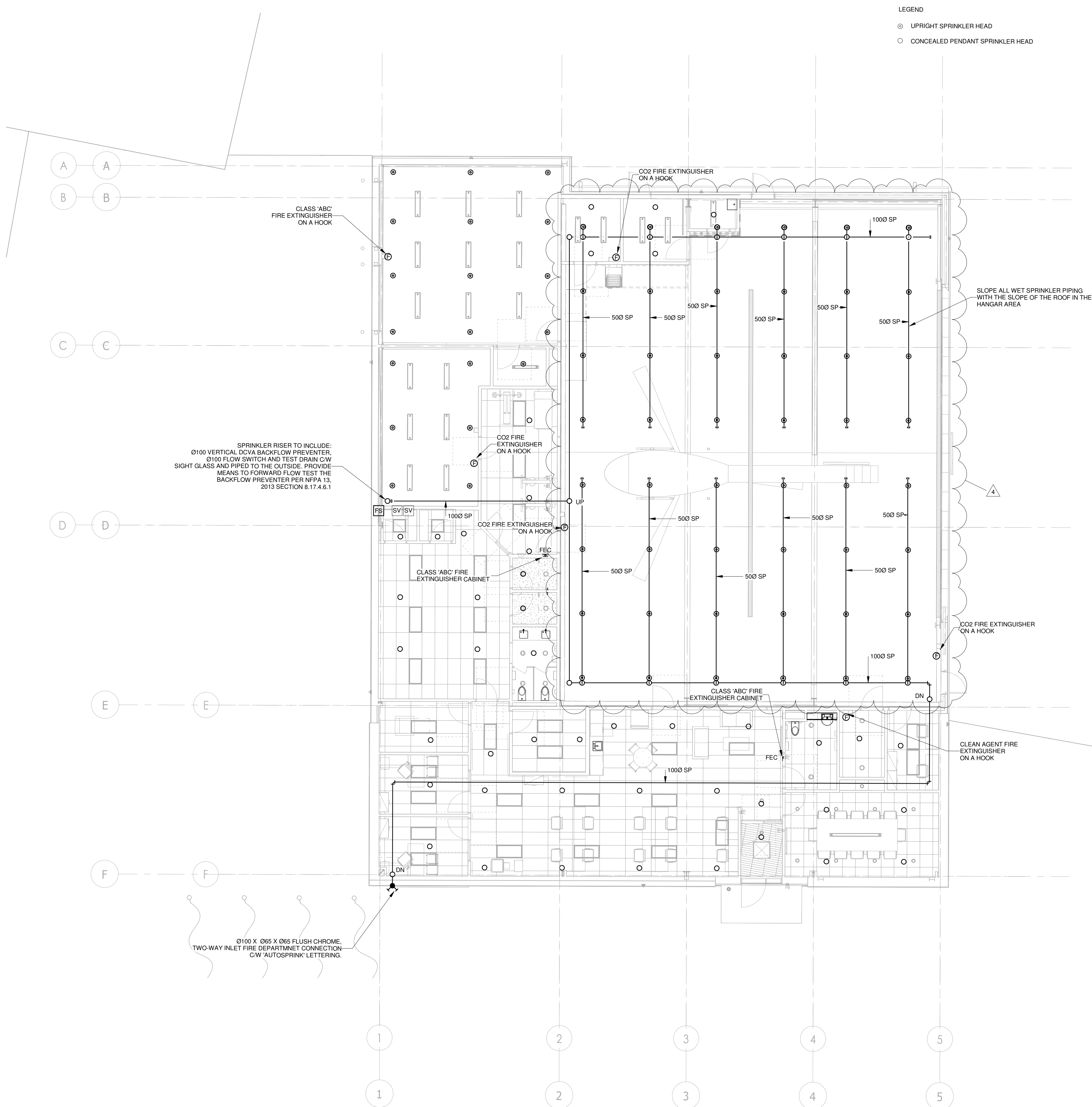
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Sheet  
Title:

# FIRE PROTECTION NEW WORK - LEVEL 1

Drawing  
No. **M-551**



FIRE PROTECTION NEW WORK - LEVEL 1

SCALE: 1 : 100



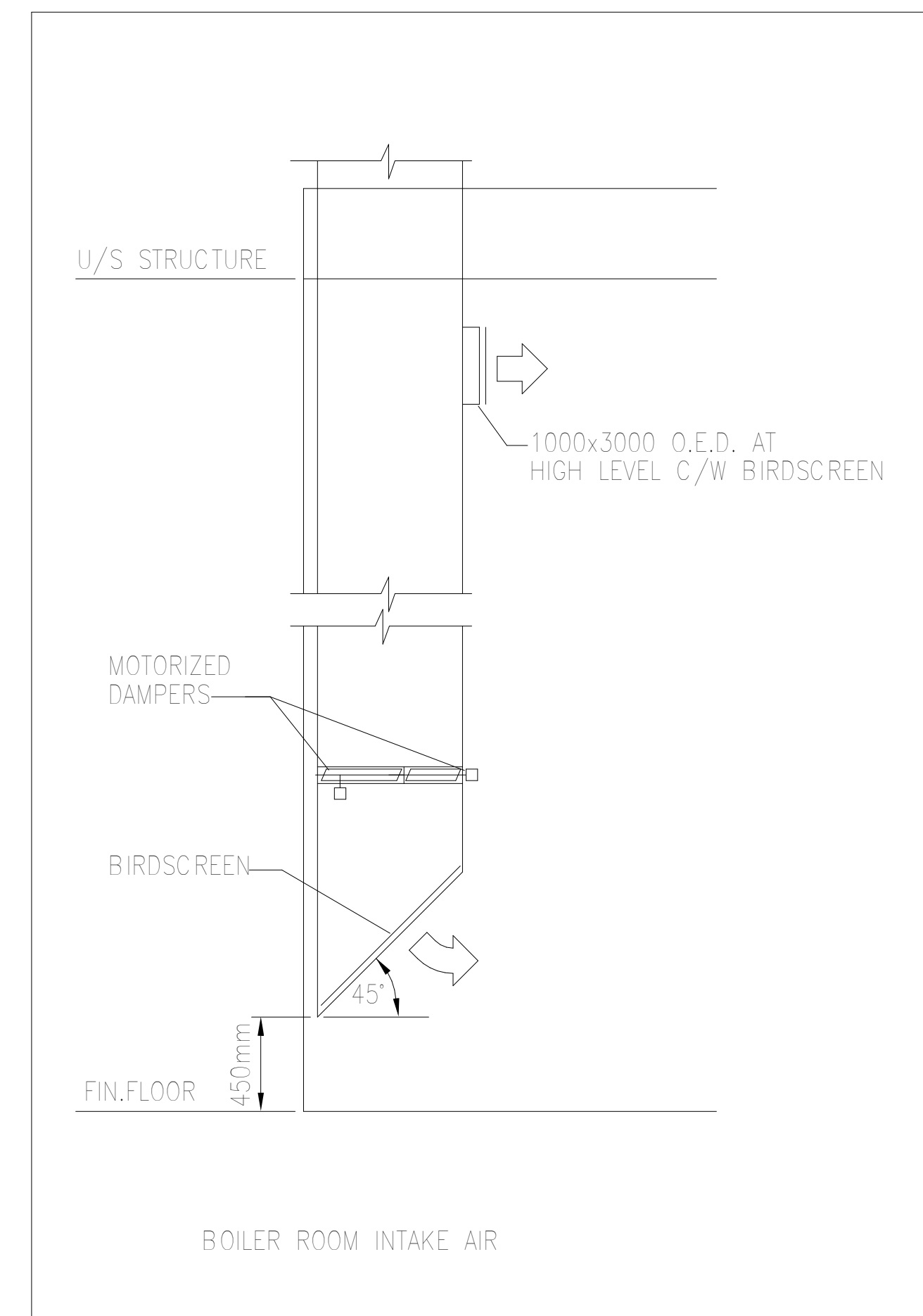
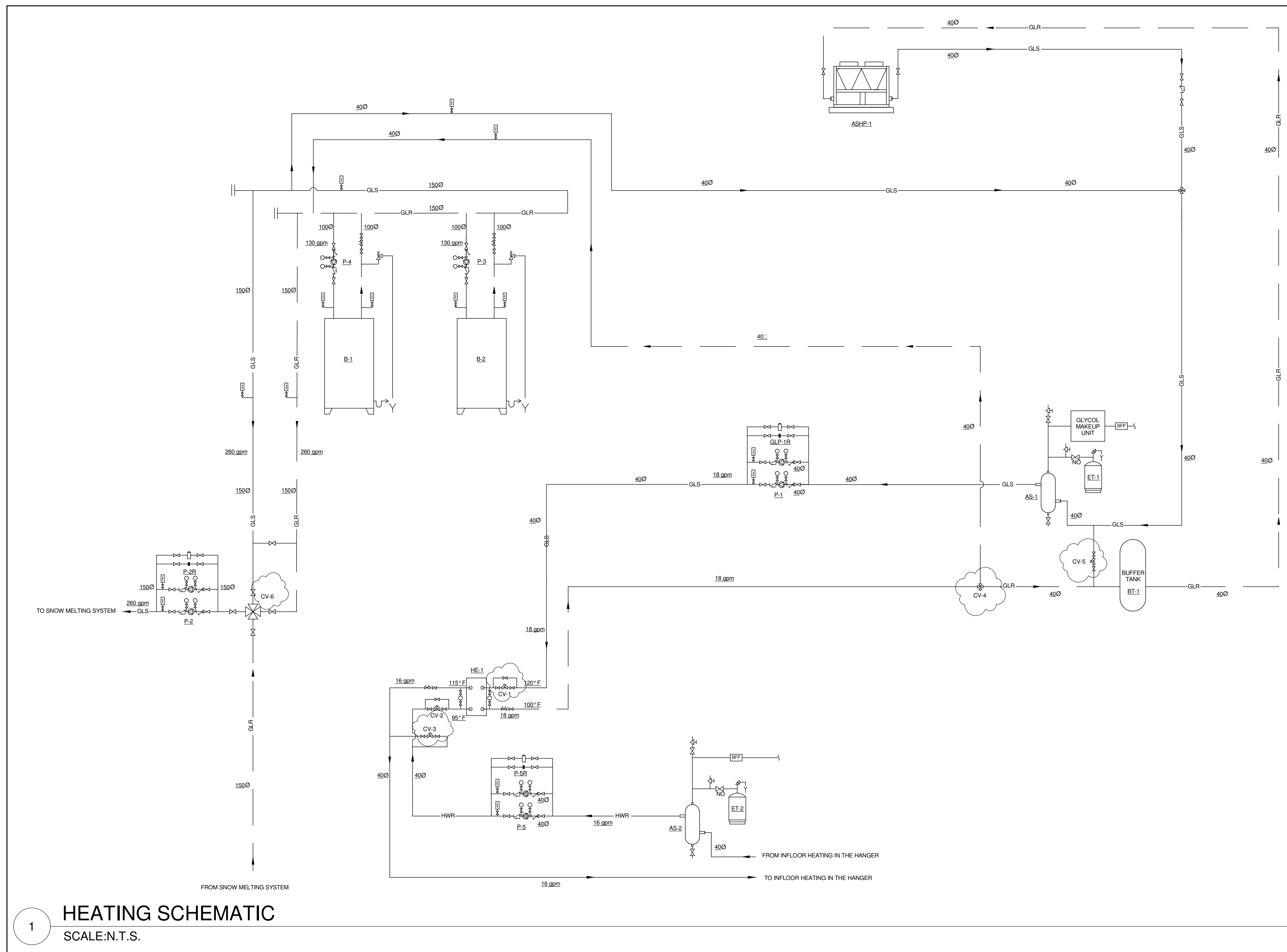


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### Key Plan

[illegible]

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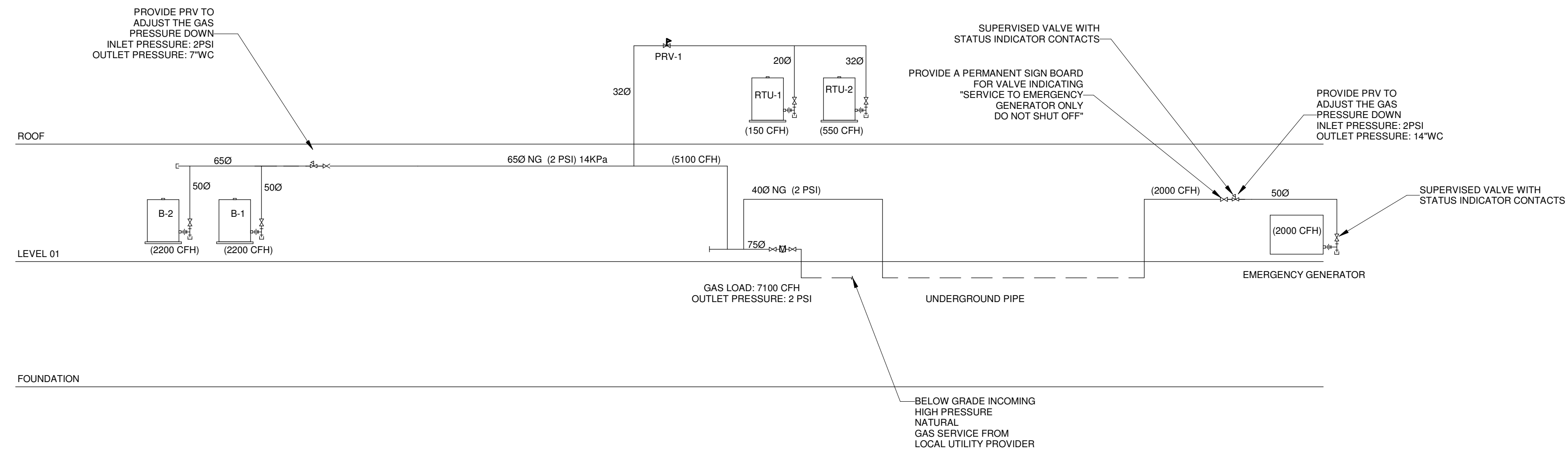
## HEATING SCHEMATIC

Drawing  
No. **M-702**

YORK REGIONAL POLICE  
HELICOPTER HANGAR

350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

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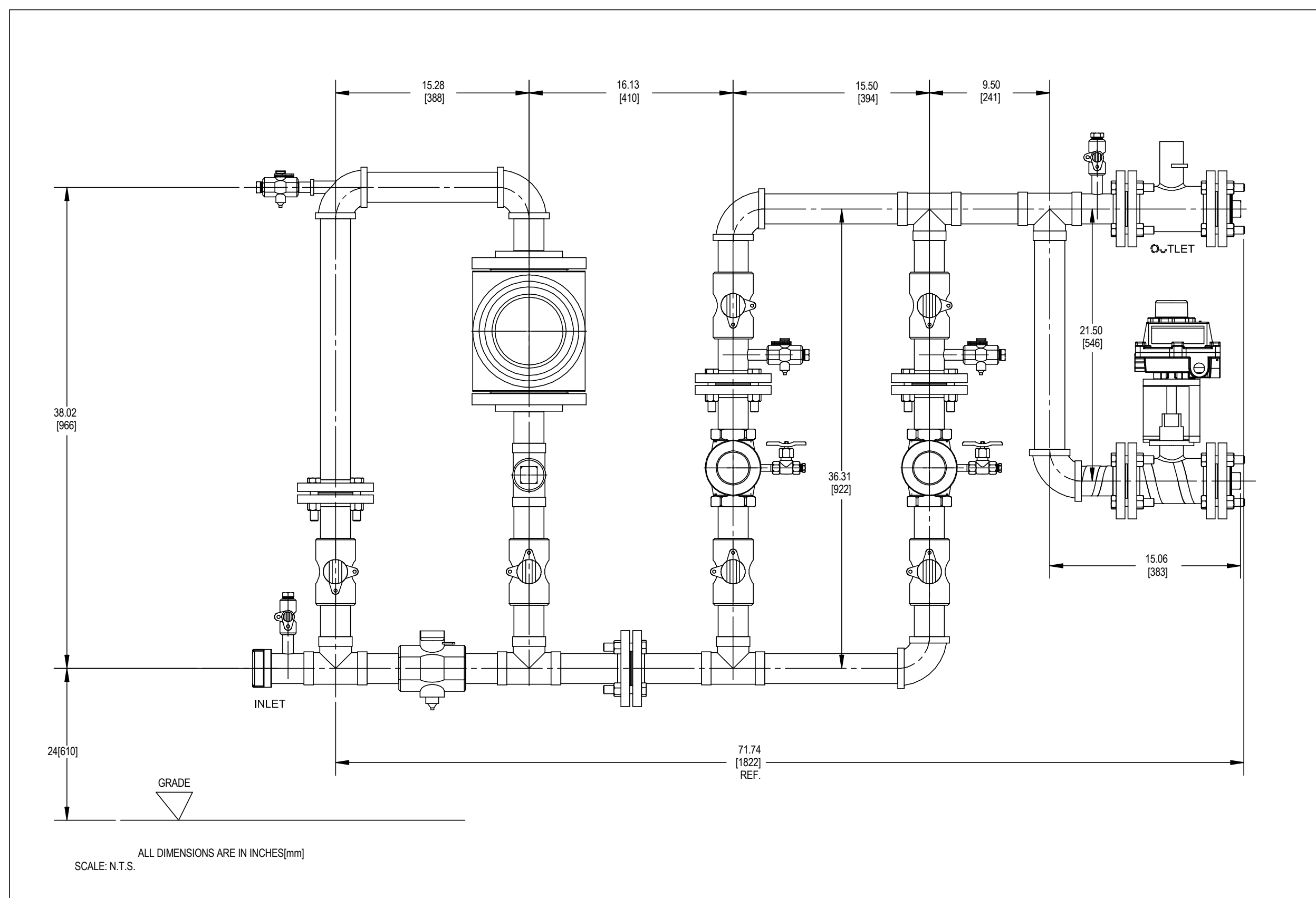


NOTE:

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

## GAS SCHEMATIC

SCALE:N.T.S.



## GAS METER DETAILS

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

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:

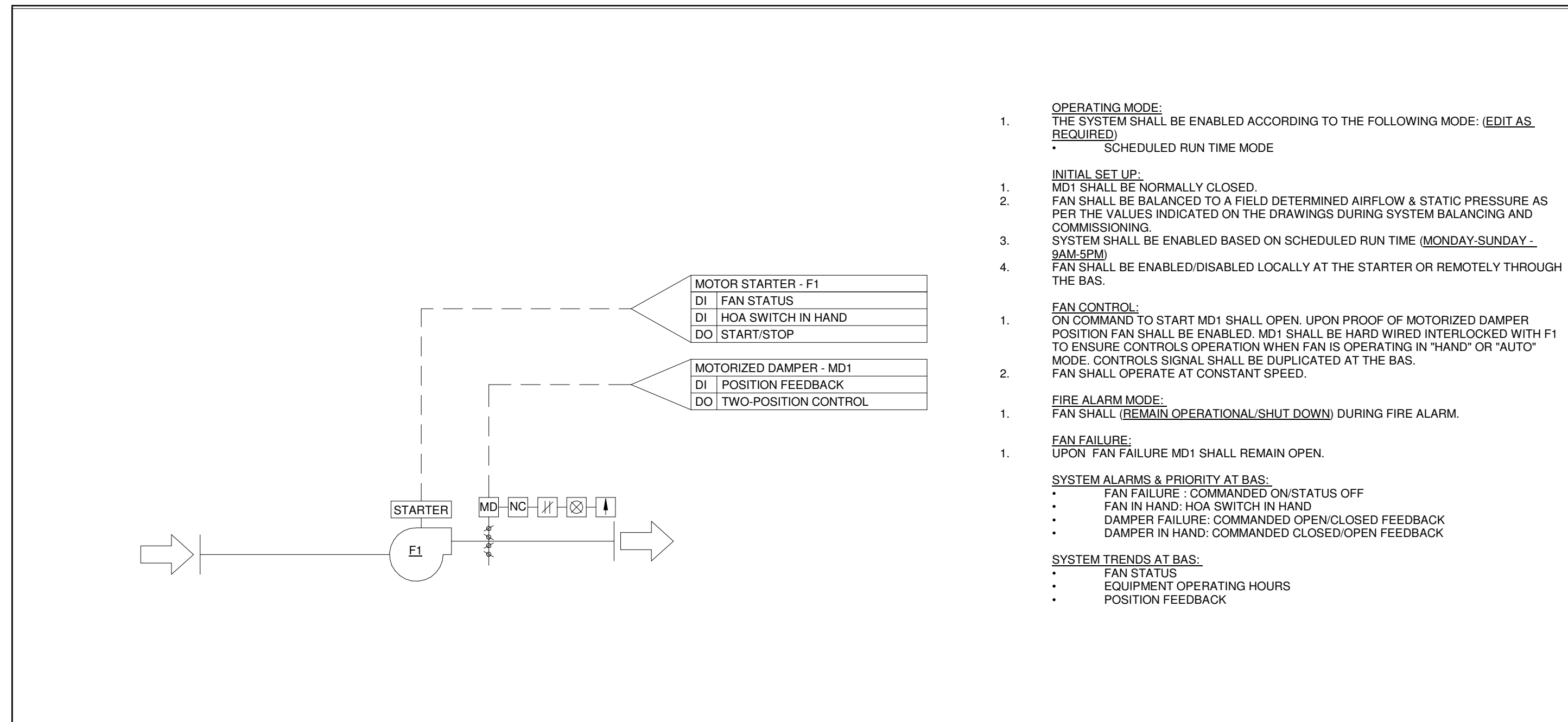
## GAS SCHEMATIC

Drawing  
No.  
**M-704**

YORK REGIONAL POLICE  
HELICOPTER HANGAR

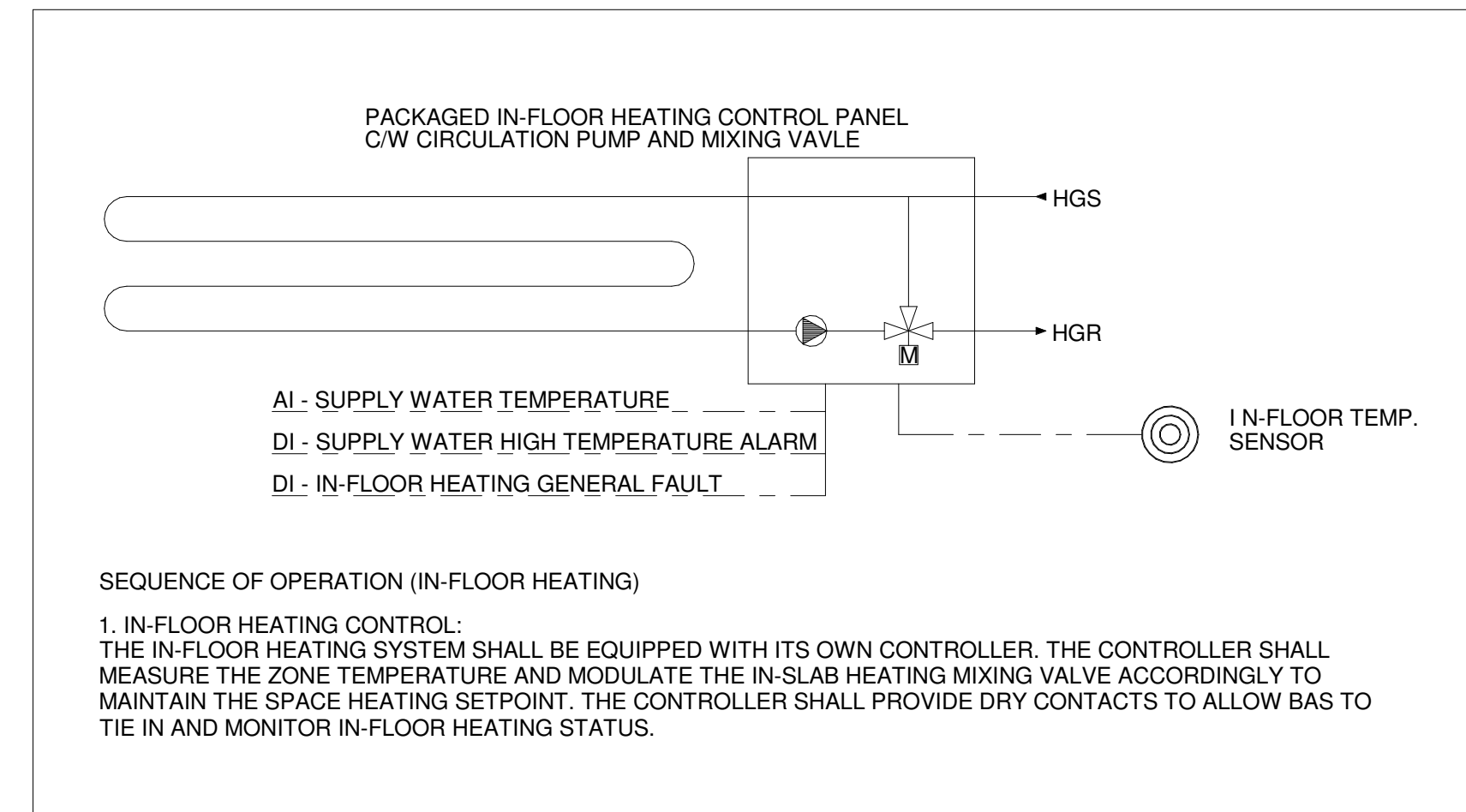
350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

## Key Plan



## CONSTANT SPEED FAN - DAMPER INTERLOCK CONTROL SEQUENCE

SCALE:N.T.S.



## IN-FLOOR HEATING CONTROLS

SCALE: 1 : 1

### SEQUENCE OF OPERATION FOR ASHP (IN FLOOR HEATING)

1. UPON CALL FOR IN FLOOR HEATING (BASED ON OAT (12 C OR LESS) ADJUSTABLE)
2. VALVE CV-1 SHALL OPEN, VALVE CV-2 SHALL CLOSE
3. ENABLE PUMP P-5 OR P-5R SHALL BE ENABLED (BAS SHALL CYCLE PUMPS AFTER EVERY 30 HOURS OF OPERATION TO ENSURE EVEN WEAR)
4. IF IN FLOOR HEATING LOOP SUPPLY TEMPERATURE IS LESS THAN 115F:
  - A. BAS TO ENABLE PUMP P-1 OR GLP-1R (BAS SHALL CYCLE PUMPS AFTER EVERY 30 HOURS OF OPERATION TO ENSURE EVEN WEAR)
  - B. BAS TO ENABLE AIR SOURCE BOILER ASHP-1 TO MAINTAIN 120F GLYCOL SUPPLY TEMPERATURE TO HEAT EXCHANGER HE-1
  - C. IN FLOOR HEATING WATER SUPPLY TEMPERATURE SHALL BE MAINTAINED AT 115F TO HANGER IN FLOOR HEATING. IF SUPPLY WATER TEMPERATURE REACHES 118F (ADJUSTABLE), VALVE CV-2 SHALL OPEN AND VALVE CV-1 SHALL CLOSE TO BYPASS HEAT EXCHANGER, AIR SOURCE BOILER SHALL CONTINUE TO MAINTAIN 120F GLYCOL SUPPLY TEMPERATURE.
  - D. IF IN FLOOR HEATING WATER SUPPLY TEMPERATURE CONTINUES TO DROP BY 112F (ADJUSTABLE), VALVE CV-2 SHALL CLOSE AND VALVE CV-1 SHALL OPEN SO THAT HE-1 IS NOT BYPASSED
  - E. SYSTEM SHALL OPERATE AS SUCH TO MAINTAIN 115F IN FLOOR HOT WATER HEATING SUPPLY UNTIL THERE IS NO LONGER A CALL FOR IN FLOOR HEATING.
4. WHEN CALL FOR IN FLOOR HEATING IS COMPLETE:
  - A) PUMPS P-5 AND P-5R SHALL BE DISABLED.
  - B) VALVE CV-1 SHALL CLOSE AND VALVE CV-2 SHALL OPEN
  - C) AIR SOURCE BOILER ASHP-1 SHALL BE DISABLED
  - D) PUMPS P-1 AND GLP-1R SHALL BE DISABLED
  - E) PUMPS P-5, P-5R, P-1 AND GLP-1R TO BE EXERCISED ONCE PER WEEK DURING OFF CYCLES FOR 5 MINUTES.
5. IF ASHP BOILER IS NOT ABLE TO PROVIDE THE REQUIRED HEAT FOR IN FLOOR HEATING:
  - A) THE THREE WAY VALVE CV-3 WILL DIRECT THE FLOW BETWEEN THE BOILERS TO THE HEAT EXCHANGER VIA ASSOCIATED BOILER'S PUMPS AND P-1 & P-1R
  - B) THE PORT AT CV-3 ( ASHP SIDE) WILL BE CLOSED.
  - C) THE BOILERS AND THE ASSOCIATED PUMPS WILL BE ACTIVATED TO ALLOW THE DESIGN REQUIREMENTS TO BE SATISFIED

## SNOW MELTING SYSTEM SEQUENCE OF OPERATION

1. WHEN OUTDOOR TEMPERATURE DROPS BELOW 0°C, THE WARM WEATHER CUT 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

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 CONTROL SEQUENCES II

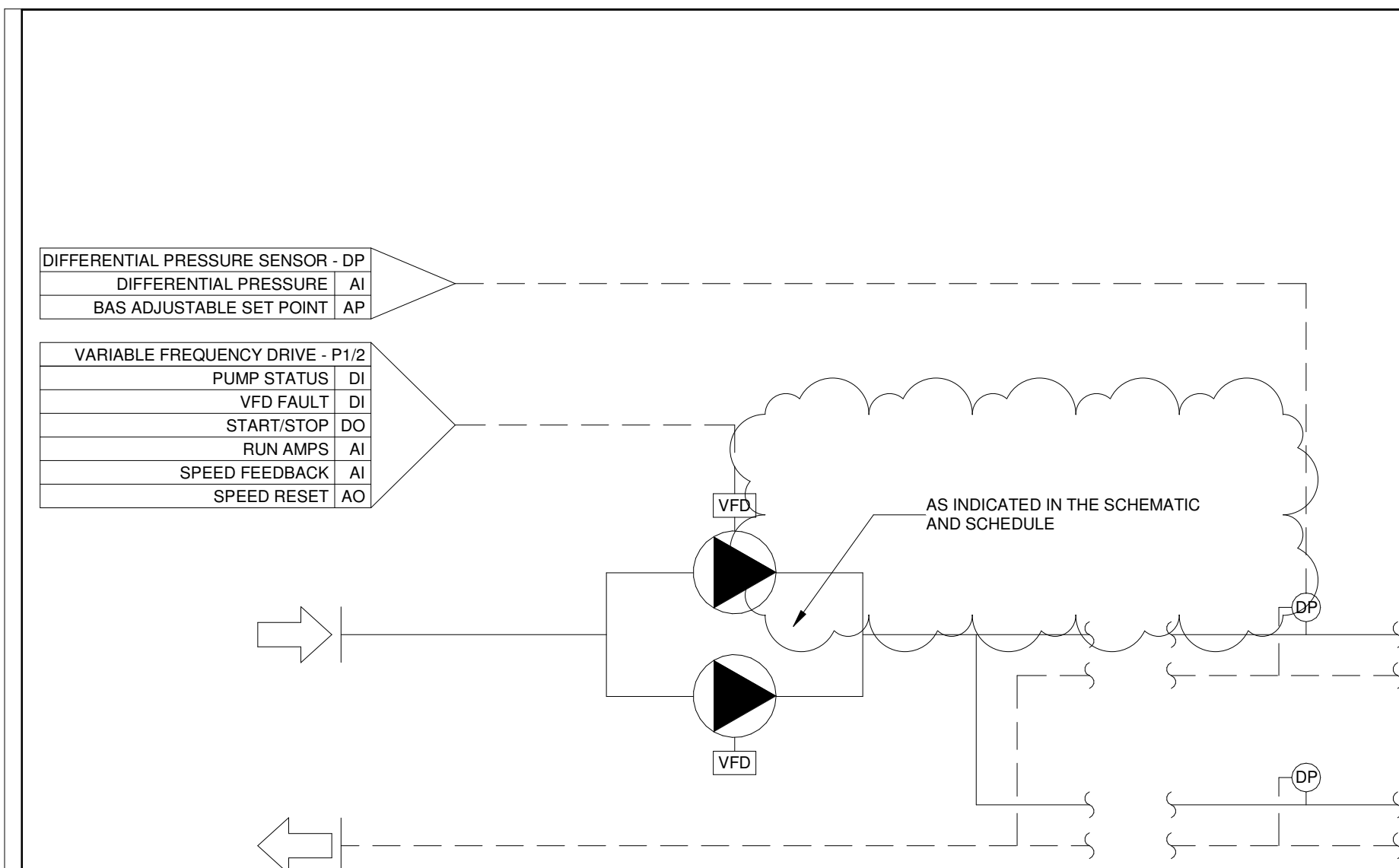
Drawing  
No. **M-751**



YORK REGIONAL POLICE  
HELICOPTER HANGAR

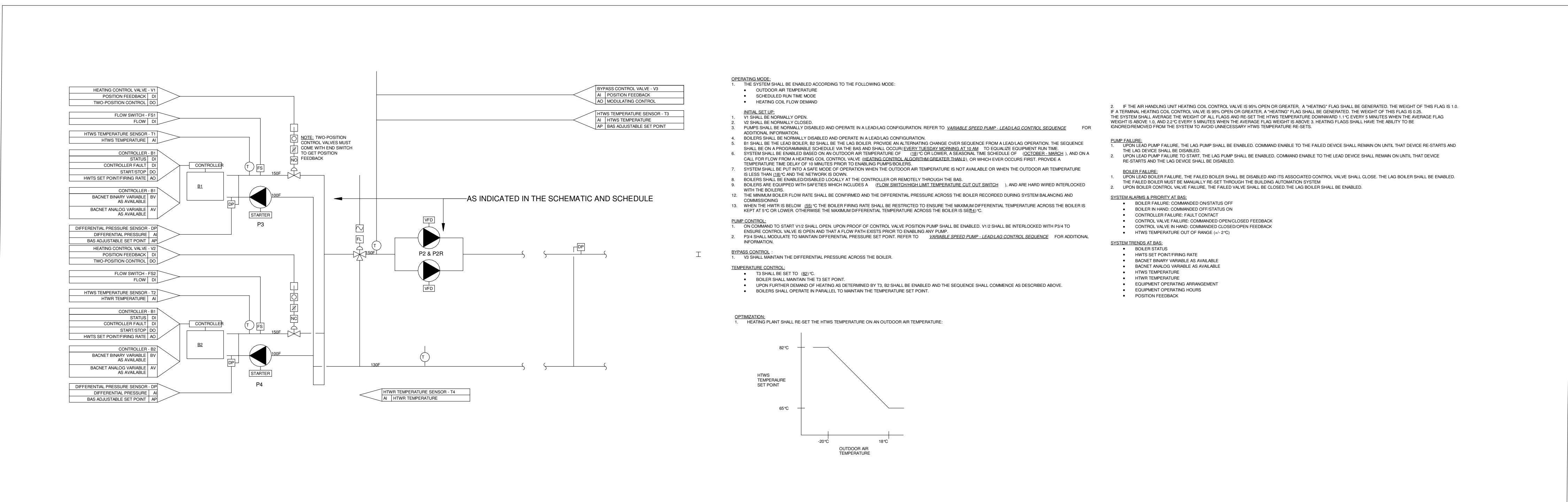
350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

## Key Plan



- OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE: (EDIT AS REQUIRED)
- OUTDOOR AIR TEMPERATURE
  - SCHEDULED RUN TIME
  - HEATING/COOLING COIL FLOW DEMAND
- INITIAL SET UP:
1. PUMPS SHALL BE NORMALLY DISABLED AND OPERATE IN A DUTY/STANDBY CONFIGURATION.
2. LEAD PUMP SHALL BE THE DUTY PUMP. LAG PUMP SHALL BE THE STANDBY PUMP. PROVIDE AN ALTERNATING CHANGE OVER SEQUENCE FROM A DUTY/STANDBY OPERATION. THE SEQUENCE SHALL BE ON A PROGRAMMABLE SCHEDULE VIA THE BAS AND SHALL OCCUR (EVERY TUESDAY MORNING AT 10 AM) TO EQUILIBRATE EQUIPMENT RUN TIME.
3. SYSTEM SHALL BE ENABLED BASED ON AN OUTDOOR AIR TEMPERATURE OF (4 - 18) °C. A SEASONAL TIME SCHEDULE OF (JANUARY - DECEMBER), AND ON A CALL FOR FLOW FROM A (HEATING/COOLING) COIL CONTROL VALVE (HEATING/COOLING COIL CONTROL VALVE POSITION IS 95% OPEN OR GREATER), OR WHICH EVER OCCURS FIRST. PROVIDE A TEMPERATURE TIME DELAY OF 10 MINUTES PRIOR TO ENABLING PUMPS.
4. PUMPS SHALL BE ENABLED/DISABLED LOCALLY AT THE VFD OR REMOTELY THROUGH THE BAS.
5. VFD MINIMUM SPEED IS 18 HZ AND SHALL BE RECORDED DURING THE IN DURING SYSTEM BALANCING AND COMMISSIONING. THE PUMP SHALL NOT OPERATE BELOW THIS SPEED
- PUMP CONTROL:
1. ON COMMAND TO START, LEAD PUMP SHALL BE ENABLED.
2. LEAD PUMP SHALL MODULATE TO MAINTAIN DIFFERENTIAL PRESSURE SET POINT. SET POINT SHALL BE NO GREATER THAN 110% OF THAT REQUIRED TO ACHIEVE THE DESIGN FLOW RATE THROUGH THE (INSERT DEVICE NAME) AS DETERMINED BY THE BALANCING CONTRACTOR.
3. WHERE MULTIPLE SENSORS ARE PROVIDED, THE PUMP VFD SHALL MODULE TO SATISFY THE SENSOR WHO'S READING IS THE FURTHEST ABOVE/BELONG ITS NORMAL SET POINT.
- PUMP FAILURE:
1. UPON PUMP FAILURE STANDBY PUMP SHALL BE ENABLED.
- SYSTEM ALARMS & PRIORITY AT BAS:
- PUMP FAILURE - COMMANDED ON/STATUS OFF
  - PUMP IN HAND - COMMANDED OFF/STATUS ON
  - VFD FAILURE - FAULT CONTACT
- SYSTEM TRENDS AT BAS:
- STATUS
  - RUN AMPS
  - VFD SPEED
  - DIFFERENTIAL PRESSURE
  - EQUIPMENT OPERATING ARRANGEMENT
  - EQUIPMENT OPERATING HOURS

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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Checked by: Ali Nakhaei-Zadeh  
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Project No: TT-24-005  
Scale: N.T.S.

Sheet  
Title: MECHANICAL CONTROL  
SEQUENCES IV

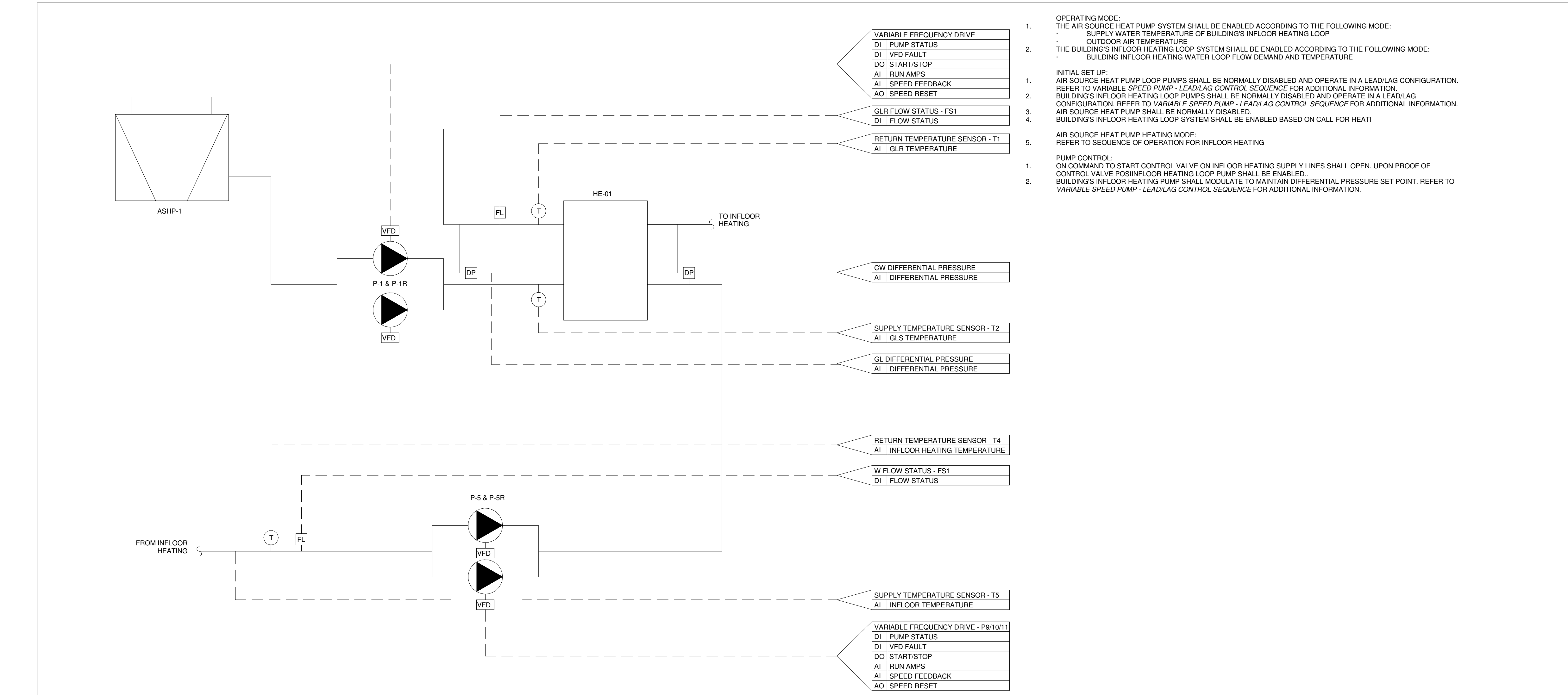
Drawing  
No. **M-753**



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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Do not scale drawings

Drawn by: Author  
Checked by: Checker  
Original Issue Date: 2024-07-31  
Project No: TT-24-005  
Scale: N.T.S.

Sheet  
Title:  
**MECHANICAL CONTROL  
SEQUENCES VI**

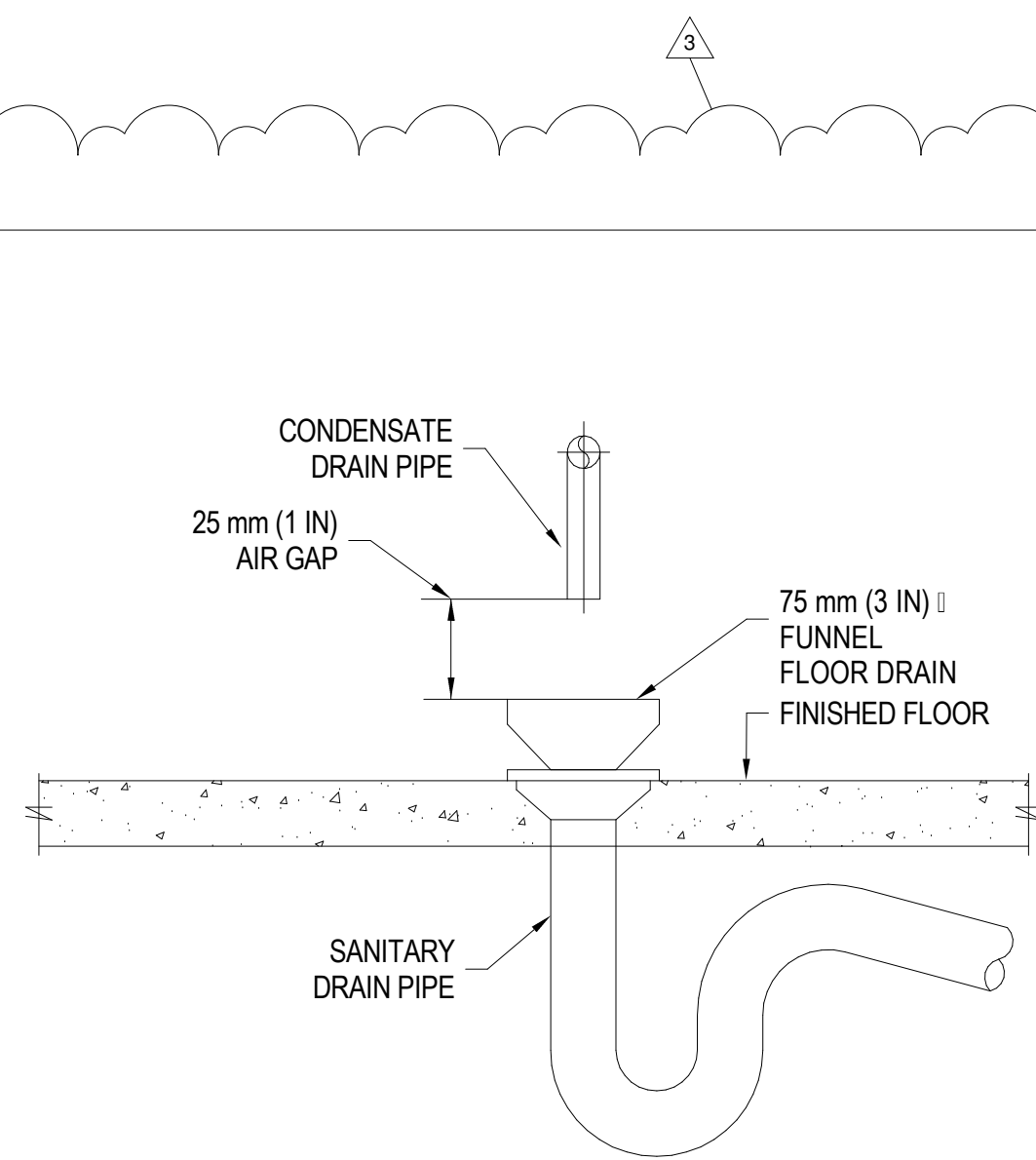
Drawing  
No.  
**M-755**



YORK REGIONAL POLICE  
HELICOPTER HANGAR

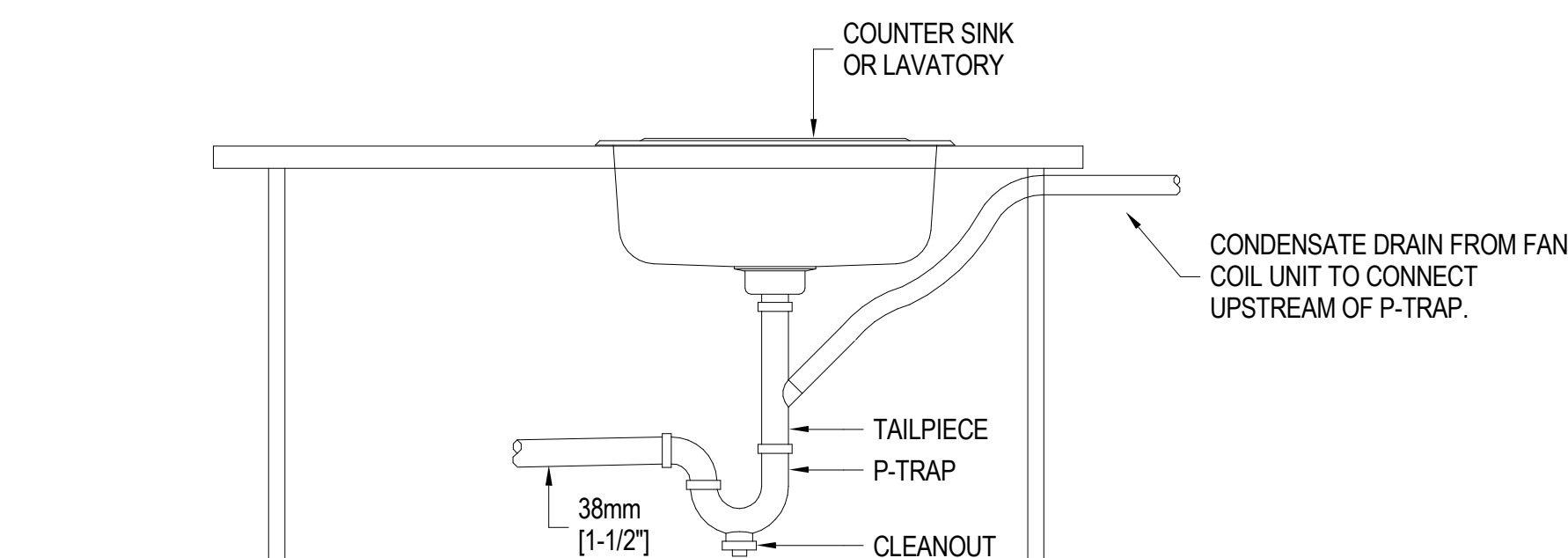
350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

### Key Plan



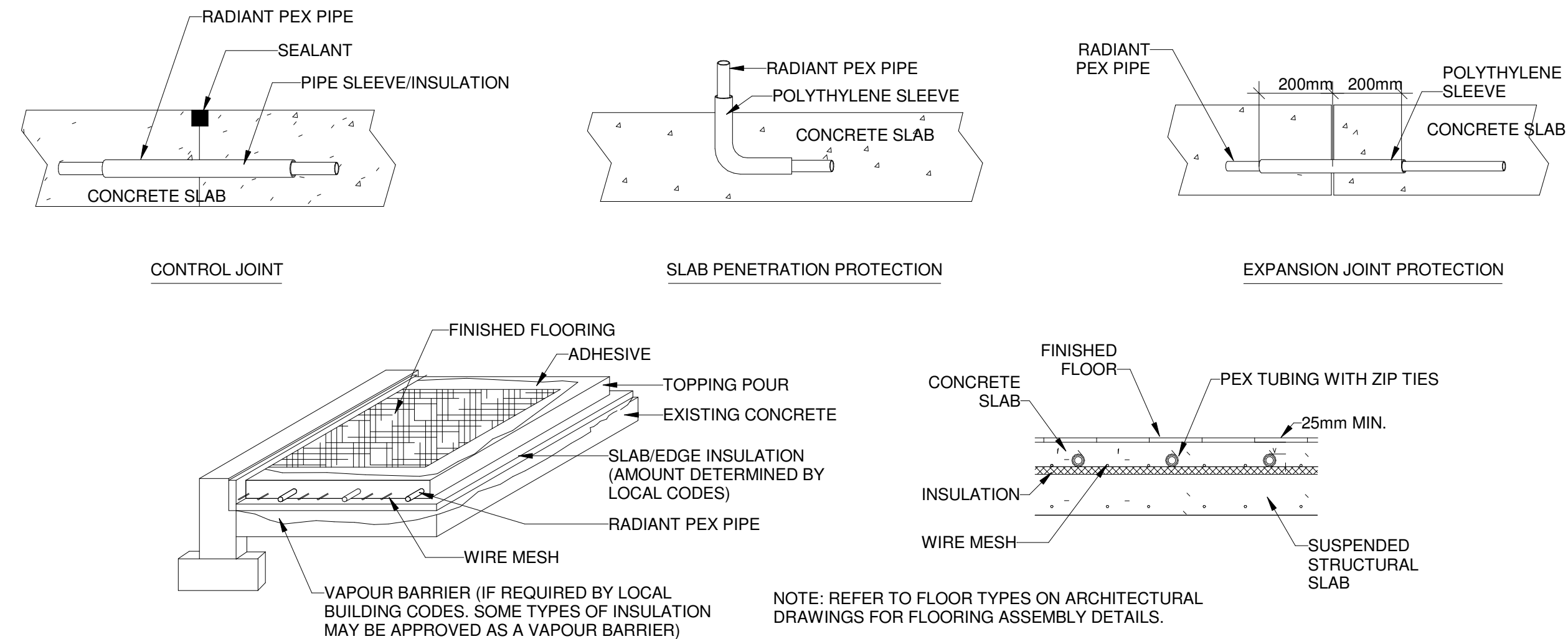
## CONDENSATE DRAIN TO FUNNEL FLOOR DRAIN

SCALE: 1 : 1



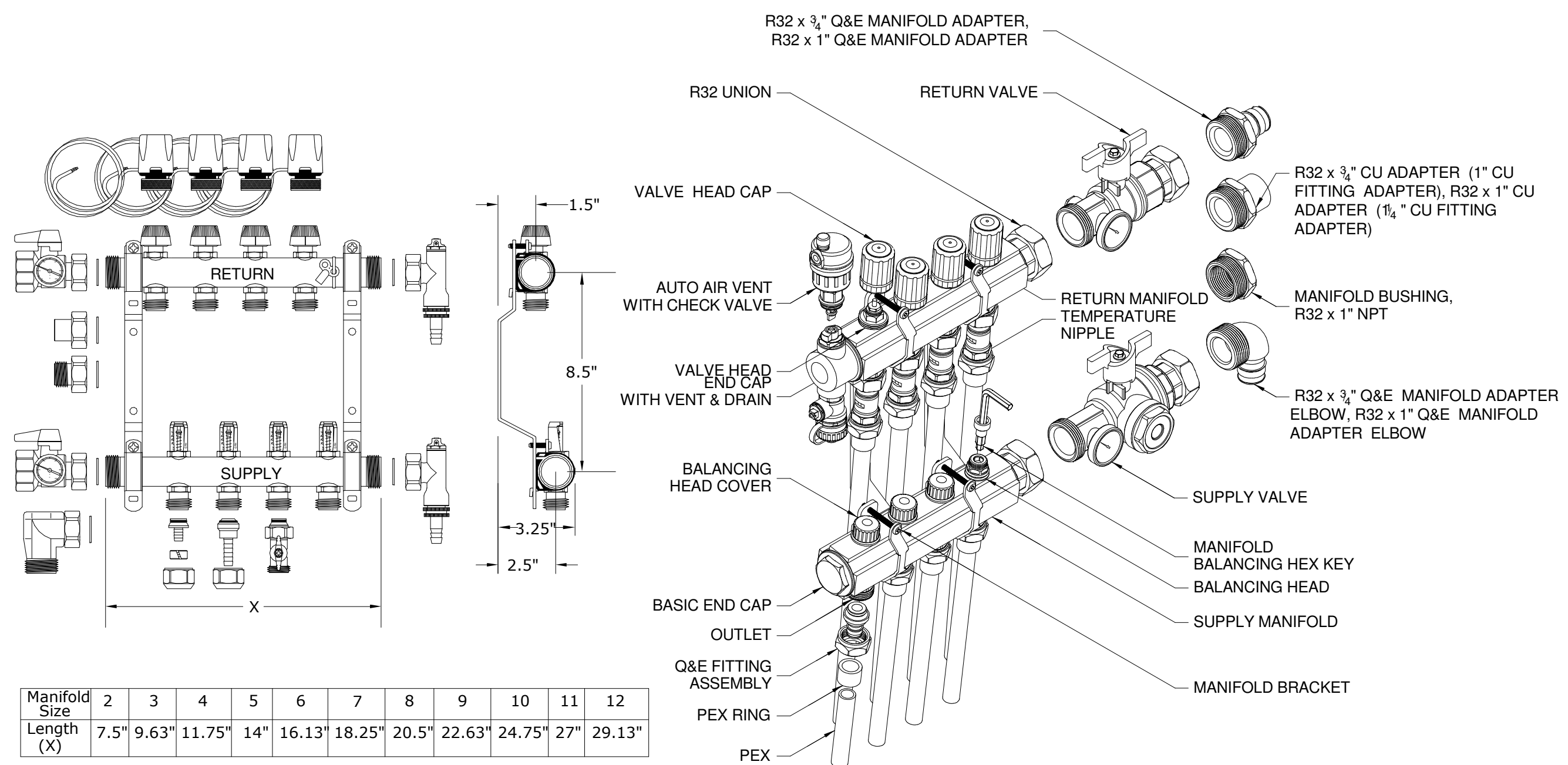
## CONDENSATE DRAIN CONNECTION TO SANITARY

SCALE: 1 : 1



## IN-FLOOR HEATING INSTALLATION DETAILS

SCALE:N.T.S.



## IN-FLOOR HEATING SYSTEM MANIFOLD DETAIL

SCALE:N.T.S.

[illegible]

## Issues

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Checked by: Ali Nakhaei-Zadeh  
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Project No: TT-24-005  
Scale: 1 : 1

Sheet  
Title:

## MECHANICAL TYPICAL DETAILS VIII

Drawing  
No. **M-807**

350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

4	ISSUED FOR ADDENDUM 6	2024-08-30
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

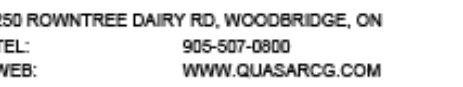
All measurements are to be checked and verified on site by the contractor before proceeding with work

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Checked by: Ali Nakhaei-Zadeh  
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Project No: TT-24-005  
Scale:

## MECHANICAL SCHEDULES

Drawing  
No. **M-900**

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



350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

[illegible]

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Scale: N.T.S.

## MECHANICAL SCHEDULES II

Autodesk Docs://2402 - YRP Helicopter Hanger/TT-24-005-YRP-QCG ME Model\_R24.rvt



## HEAT EXCHANGER

## CONDENSERS

## GRILLES AND DIFFUSERS

## EXPANSION TANKS

## OUTDOOR CONDENSERS

## BUFFER TANK

## ELECTRIC BASEBOARD HEATER

## PLUMBING FIXTURES SCHEDULE

NOTES: VALUES IN MM. REFER TO SPECIFICATIONS DWG# M-902 FOR PLUMBING FIXTURE DETAILS  
ALL PLUMBING FIXTURES COMPLETE WITH FAUCET. REFER TO DWG# M-902 FOR MORE DETAILS





WS24-1-407M

Double Bowl Large Laundry Tub: Freestanding Rectangular Design in Steel - Whitehaus Collection

FEET SHOWN IN ALL DIMENSIONS

VIEW: 3D

VIEW: 2D

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

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

VIEW: 1/16" = 1'-0"

VIEW: 1/32" = 1'-0"

VIEW: 1/64" = 1'-0"

VIEW: 1/128" = 1'-0"

VIEW: 1/256" = 1'-0"

VIEW: 1/512" = 1'-0"

VIEW: 1/1024" = 1'-0"

VIEW: 1/2048" = 1'-0"

VIEW: 1/4096" = 1'-0"

VIEW: 1/8192" = 1'-0"

VIEW: 1/16384" = 1'-0"

VIEW: 1/32768" = 1'-0"

VIEW: 1/65536" = 1'-0"

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