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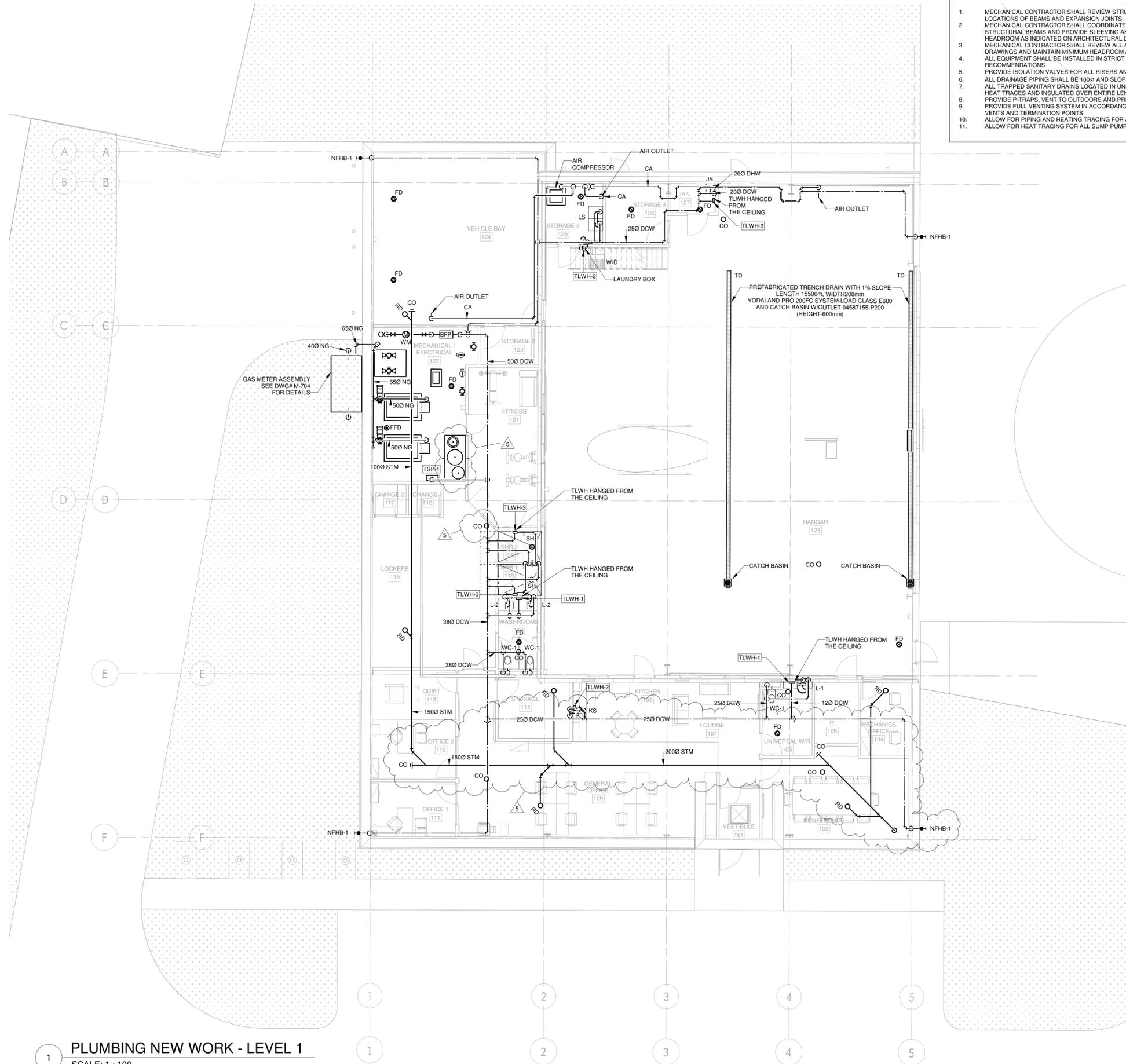
## YORK REGIONAL POLICE HELICOPTER HANGAR

350 GARFIELD WRIGHT  
BOULEVARD  
TOWN OF EAST GWILLIMBURY

Key  
Plan

### 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



1 PLUMBING NEW WORK - LEVEL 1  
SCALE: 1 : 100

NO.	ISSUED	DATE
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

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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:  
**PLUMBING NEW WORK -  
 LEVEL 1**

Drawing  
 No:  
**M-251**



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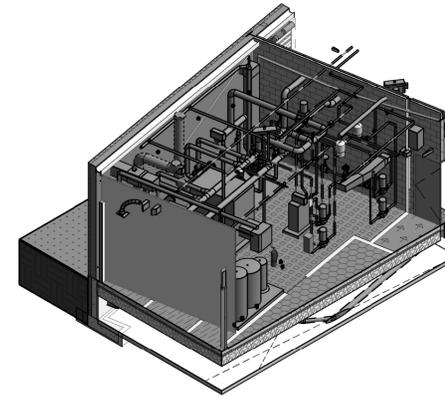
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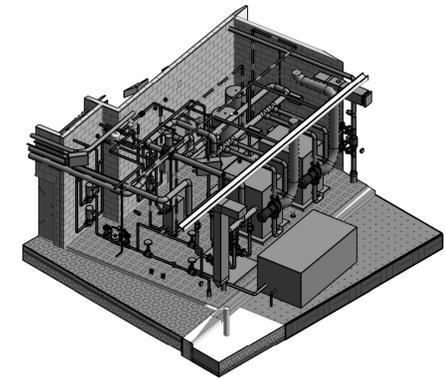
Drawn by: Fizzah Khan/ Iulian Turiga  
Checked by: Ali Nakhaei-Zadeh  
Original Issue Date: 2024-07-31  
Project No: TT-24-005  
Scale: 1 : 50

Sheet  
Title:  
**MECHANICAL ROOM  
PIPING**

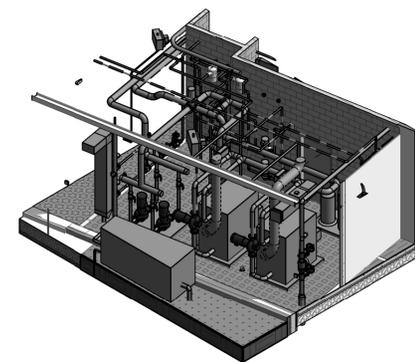
Drawing  
No:  
**M-252**



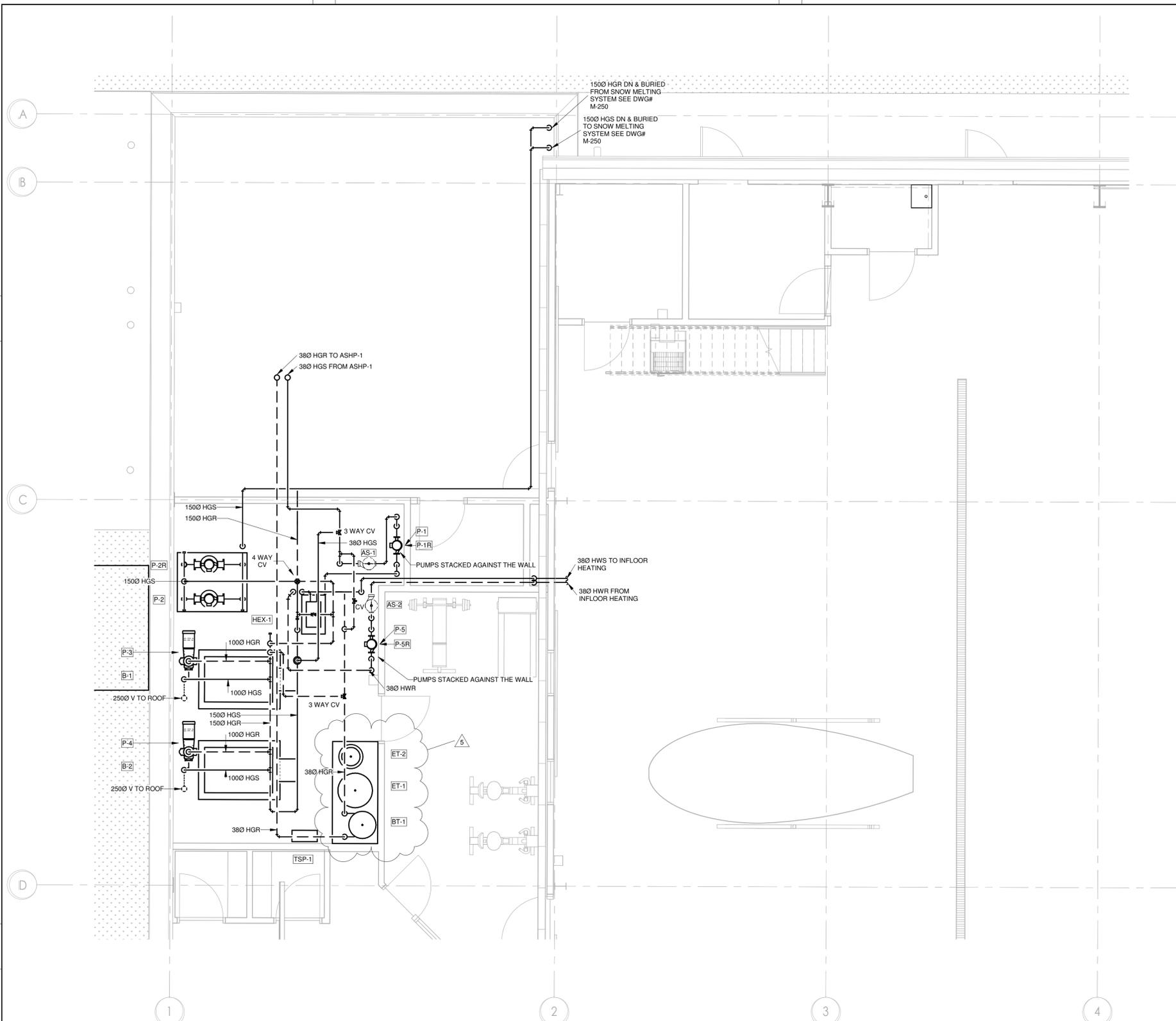
2 **MECH ROOM 3D VIEW 1**  
SCALE:



3 **MECH ROOM 3D VIEW 2**  
SCALE:



4 **MECH ROOM 3D VIEW 3**  
SCALE:



1 **MECHANICAL ROOM PIPING**  
SCALE: 1 : 50

**GENERAL NOTES:**

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



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- 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 frost temperature slightly above the frost setpoint which varies with the exhaust air humidity and outdoor air temperature as shown in the table below.
- | OUT (C) | SETPOINT RHAI (DPS) | OUT (C) | SETPOINT RHAI (DPS) | OUT (C) | SETPOINT RHAI (DPS) |
|---------|---------------------|---------|---------------------|---------|---------------------|
| 25      | -15.0               | -19.4   | -11.1               | -15.6   | -8.2                |
| 26.1    | -11.7               | -20.3   | -7.8                | -16.1   | -4.9                |
| 28.3    | -4.3                | -22.2   | -4.4                | -17.2   | -1.5                |
| 32.2    | -0.4                | -25     | -1.5                | -19.4   | 0.8                 |
| 35      | -0.3                | -27.2   | -0.6                | -20.6   | 2.3                 |
| 40      | -0.3                | -31.1   | -0.3                | -23.3   | 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 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 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.
- 1.1.5. Provide an occupied mode push button at the main entrance.
- 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 RHAI (DPS) | OAT (C) | SETPOINT RHAI (DPS) | OAT (C) | SETPOINT RHAI (DPS) |
|---------|---------------------|---------|---------------------|---------|---------------------|
| -25     | -15.0               | -19.4   | -11.1               | -15.6   | -8.2                |
| 26.1    | -11.7               | -20.3   | -7.8                | -16.1   | -4.9                |
| 28.3    | -4.3                | -22.2   | -4.4                | -17.2   | -1.5                |
| 32.2    | -0.4                | -25     | -1.5                | -19.4   | 0.8                 |
| 35      | -0.3                | -27.2   | -0.6                | -20.6   | 2.3                 |
| 40      | -0.3                | -31.1   | -0.3                | -23.3   | 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 not (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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5	ISSUED FOR ADDENDUM 8	2024-10-07
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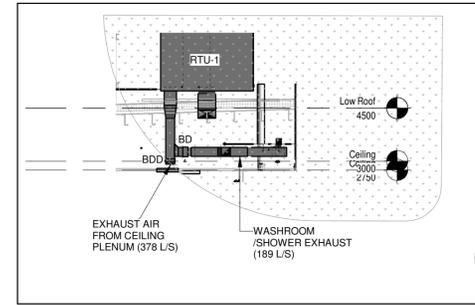
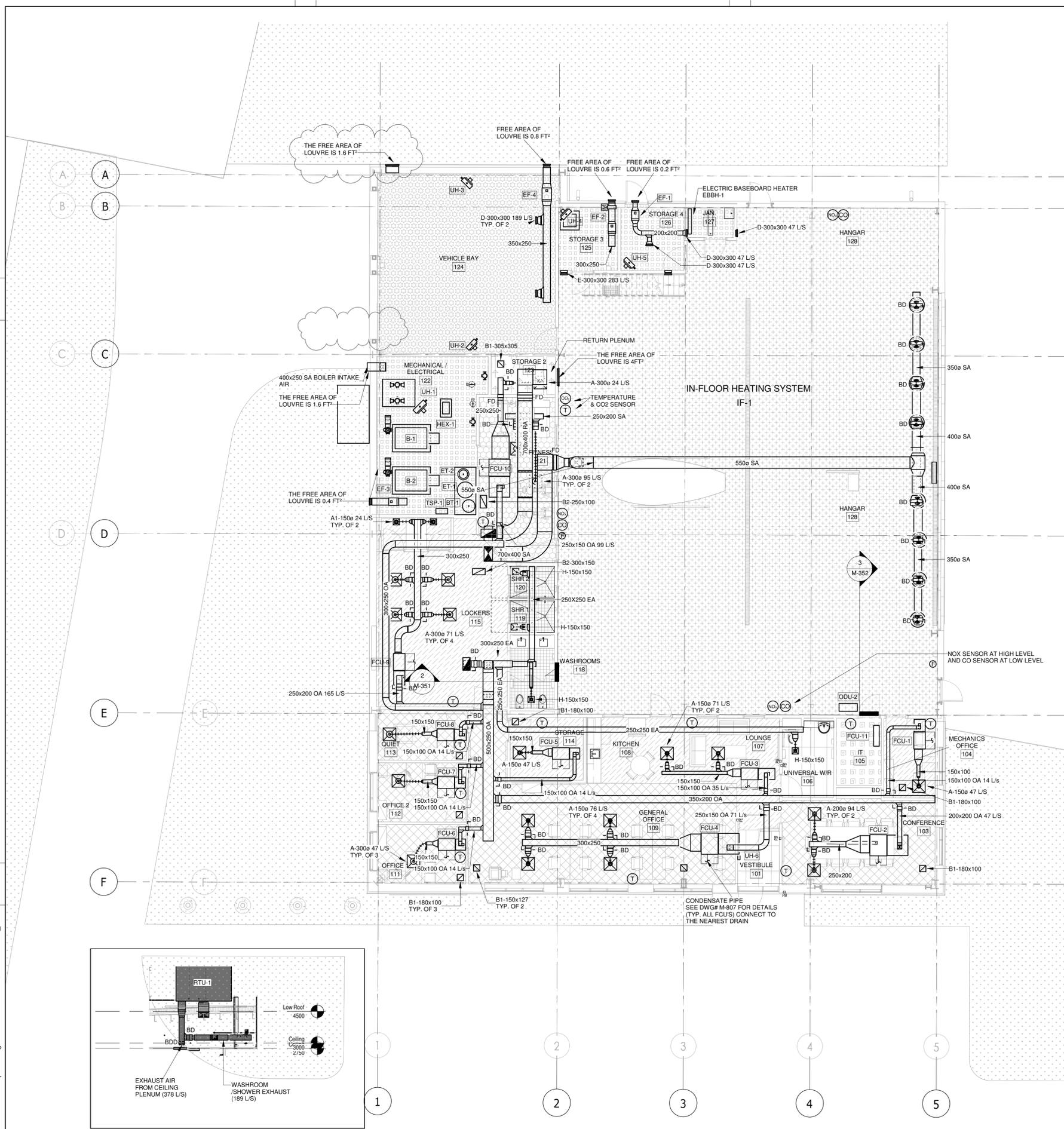
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 Checked by: Ali Nakhaei-Zadeh  
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 Scale: 1 : 100

Sheet  
 Title: VENTILATION NEW WORK - LEVEL 1

Drawing No: M-351



**RTU-1 SCHEMATIC CONCEPT**  
SCALE: 1 : 100

**VENTILATION NEW WORK - LEVEL 1**  
SCALE: 1 : 100



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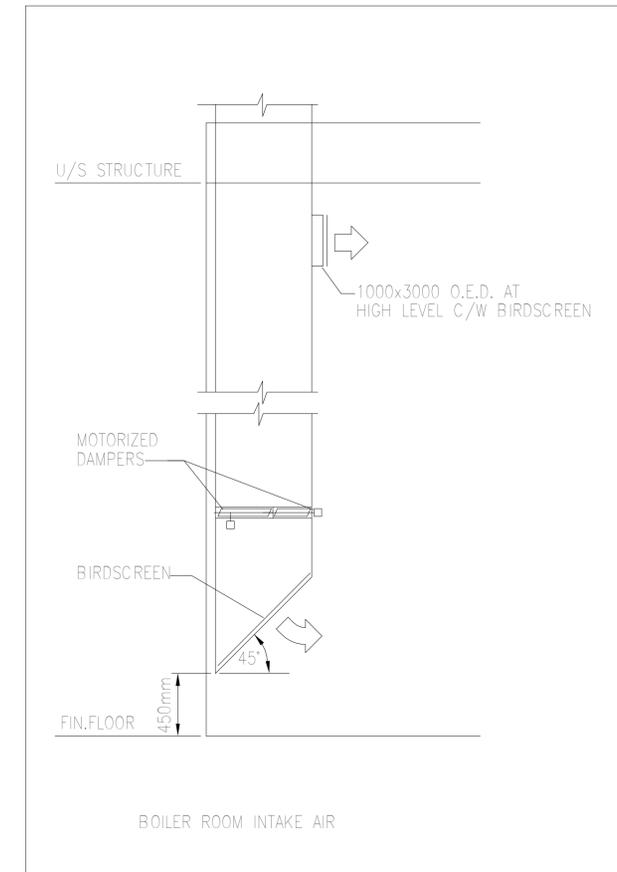
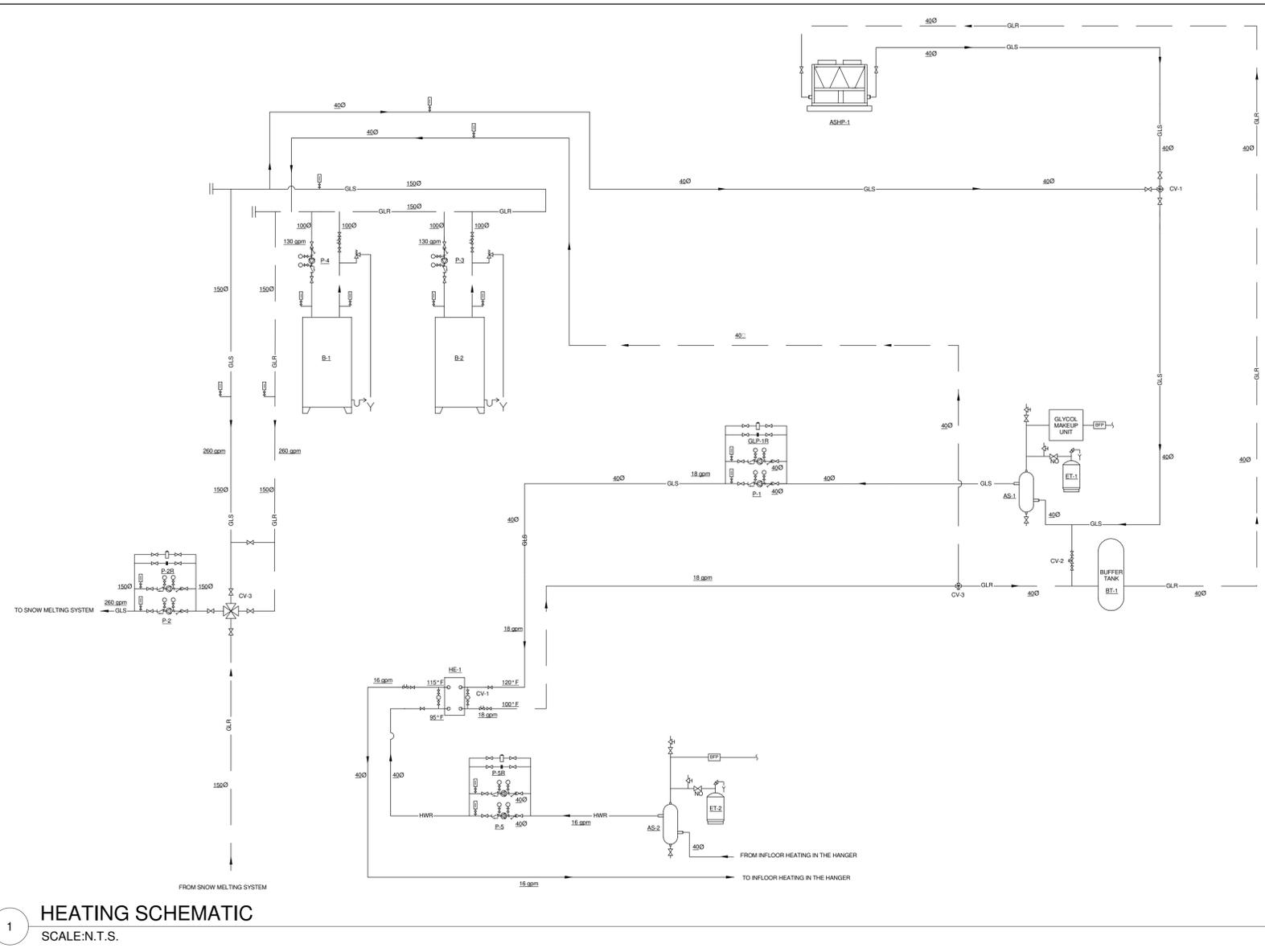
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### SEQUENCE OF OPERATION FOR ASHP (IN FLOOR HEATING)

#### WHEN SPACE TEMPERATURE FALLS BELOW 20C (68F) (ADJUSTABLE):

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 21.1C (70F) (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. IF ASHP BOILER IS NOT ABLE TO PROVIDE THE REQUIRED HEAT FOR IN FLOOR HEATING AT LOW AMBIENT TEMPERATURE:
  - 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.



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Sheet  
Title:  
**HEATING SCHEMATIC**

Drawing  
No:  
**M-702**





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6	ISSUED FOR ADDENDUM 8	2024-10-07
5	ISSUED FOR ADDENDUM 7	2024-10-03
4	ISSUED FOR ADDENDUM 6	2024-09-30
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## MECHANICAL SCHEDULES

Drawing  
No.  
M-900

### ROOFTOP UNITS - DOAS (DEDICATED OUTDOOR AIR SUPPLY)

TAG	MANUFACTURER	MODEL	LOCATION	SERVICE	AIRFLOW		OUTDOOR AIR %	FANS			FILTERS	HEATING COIL (KW)		COOLING COIL (KW)		SOUND POWER @ INLET/OUTLET/RADIATED (DB)						ELECTRICAL				WEIGHT (kg)	NOTES
					TOTAL AIRFLOW...	OUTDOOR AIRFLOW...		TYPE	SERIES	FAN SPEED...		63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	FLA	MCA	MOCP	V/Ph/Hz					
RTU-1	DAIKIN	DPSH03B	ROOF	OFFICE	567	567	100	SWSI AF	II	2200	2 IN. MERV 8	8.78	11.3	78	77	85	80	82	81	76	35.8	40.6	50	208/3/60	754	THE ROOF CURBS SUPPLIED BY THE MANUFACTURER AND INSTALLED BY THE MECHANICAL CONTRACTOR.	
RTU-2	DAIKIN	DAHA11A	ROOF	HANGAR	1652	1652	100	SWSI AF	I	1441	2 IN. MERV 8	93.8	-	83	84	80	81	76	73	67	23.7	27.1	40	208/3/60	866	THE ROOF CURBS SUPPLIED BY THE MANUFACTURER AND INSTALLED BY THE MECHANICAL CONTRACTOR.	

### VRF FAN COIL UNIT

TAG	ASSOCIATED CONDENSER	MANUFACTURER	MODEL	TYPE	SERVICE	REFRIGERANT	AIRFLOW (L/S)				TOTAL CAPACITY (KW)	SENSIBLE CAPACITY (KW)	COOLING				HEATING				SOUND (DBA)				ELECTRICAL				WEIGHT (kg)	NOTES
							LOW SPEED	MEDIUM SPEED	HIGH SPEED	E.S.P (Pa)			SET POINT DB (°C)	SET POINT WB (°C)	S.A.T. DB (°C)	S.A.T. WB (°C)	CAPACITY (KW)	SET POINT DB (°C)	S.A.T. DB (°C)	PRESSURE (H/M/L)	POWER	MCA	MOCP	V/Ph/Hz						
FCU-1	ODU-1	DAIKIN	FXSQ07TBVJU	HORIZONTAL, DUCTED	CONFERENCE RM	R-410A	109	125	133	0.10	2.20	1.61	26.7	19.4	12.8	12.2	2.49	21.1	29.4	33/30/28	61	0.8	15	208/1/60	24.9					
FCU-2	ODU-1	DAIKIN	FXSQ24TBVJU	HORIZONTAL, DUCTED	MECHANICS OFFICE	R-410A	242	292	350	0.10	7.03	5.01	26.7	19.4	12.8	12.2	7.91	21.1	29.4	36/32/29	64	1.8	15	208/1/60	60					
FCU-3	ODU-1	DAIKIN	FXSQ07TBVJU	HORIZONTAL, DUCTED	KITCHEN/LUNGE	R-410A	109	125	133	0.10	2.20	1.61	26.7	19.4	12.8	12.2	2.49	21.1	29.4	33/30/28	61	0.8	15	208/1/60	24.9					
FCU-4	ODU-1	DAIKIN	FXSQ24TBVJU	HORIZONTAL, DUCTED	GENERAL OFFICE	R-410A	242	292	350	0.10	7.03	5.01	26.7	19.4	12.8	12.2	7.91	21.1	29.4	36/32/29	64	1.8	15	208/1/60	60					
FCU-5	ODU-1	DAIKIN	FXSQ07TBVJU	HORIZONTAL, DUCTED	QUARTER MASTER	R-410A	133	125	133	0.10	1.70	1.38	26.7	19.4	12.8	12.2	1.90	21.1	29.4	33/30/28	61	0.8	15	208/1/60	24.9					
FCU-6	ODU-1	DAIKIN	FXSQ07TBVJU	HORIZONTAL, DUCTED	OFFICE 1	R-410A	133	125	133	0.10	1.70	1.38	26.7	19.4	12.8	12.2	1.90	21.1	29.4	33/30/28	61	0.8	15	208/1/60	24.9					
FCU-7	ODU-1	DAIKIN	FXSQ07TBVJU	HORIZONTAL, DUCTED	OFFICE 2	R-410A	133	125	133	0.10	1.70	1.38	26.7	19.4	12.8	12.2	1.90	21.1	29.4	33/30/28	61	0.8	15	208/1/60	24.9					
FCU-8	ODU-1	DAIKIN	FXSQ09TBVJU	HORIZONTAL, DUCTED	QUIET RM	R-410A	109	125	150	0.10	2.78	2.05	26.7	19.4	12.8	12.2	3.08	21.1	29.4	33/30/28	61	0.8	15	208/1/60	24.9					
FCU-9	ODU-1	DAIKIN	FXSQ12TBVJU	HORIZONTAL, DUCTED	LOCKER RM	R-410A	117	134	158	0.20	3.52	2.84	26.7	19.4	12.8	12.2	3.96	21.1	29.4	34/32/30	62	0.8	15	208/1/60	24.9					
FCU-10	ODU-1	DAIKIN	FXSQ24TBVJU	HORIZONTAL, DUCTED	FITNESS RM	R-410A	242	292	350	0.10	7.03	5.01	26.7	19.4	12.8	12.2	7.91	21.1	29.4	36/32/29	64	1.8	15	208/1/60	60					
FCU-11	ODU-2	DAIKIN	FTX24WVJUR	WALL MOUNTED, NON-DUCTED	IT ROOM	R-410A	0	0	155	0.00	6.21	4.82	26.7	19.4	12.8	12.2	7.03	21.1	273.2	51/44/37	0	18.8	0	208/1/60	14.96					

### EXHAUST FANS

TAG	QUANTITY	MANUFACTURER	MODEL	SERVICE	AIRFLOW (L/S)	SOUND POWER						E.S.P (PA)	MOTOR CHARACTERISTICS				WEIGHT (KG)	NOTES		
						63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ		4000 HZ	FAN SPEED (RPM)	VFD	BHP			FLA	V/PH/Hz
EF-1	1	PENNBARRY	Z8H - INLINE - SC	JANITOR/STORAGE 4	95	59	60	56	52	48	43	38	0.5	1218	NO	0.04	1.6	115/1/60	7	
EF-2	1	PENNBARRY	SQX135	STORAGE 3	283	70	64/71	63/68	61/62	60/66	56/65	50/59	0.5	1053	NO	0.14	5.8	115/1/60	14	Spark resistance construction
EF-3	1	PENNBARRY	SQX100	MECHANICAL ROOM	182	73/76	62/73	67/71	65/66	64/65	68/64	53/52	0.5	1525	YES	0.1	7.2	115/1/60	20	
EF-4	1	PENNBARRY	SQX122	VEHICLE BAY	378	61/71	64/68	62/63	61/62	65/62	57/56	52/51	0.5	1525	NO	0.5	9.8	115/1/60	34	

### TANKLESS ELECTRIC WATER HEATER

TAG	MANUFACTURER	MODEL	SERVICE	OUPUT CAPACITY (KW)	FLUID			ELECTRICAL				WEIGHT (kg)	REMARKS	
					TYPE	FLOW RATE (L/S)	TEMP. RISE (C)	AMPS (A)	MCA	MOCP	V/Ph/Hz			
TLWH-1	RHEEM	RETEX-04	LAVATORY	3.5	WATER	0.03	8.9	29				120/1/60	2.0	
TLWH-2	RHEEM	RETEX-11	KITCHEN/WASHER	11.8	WATER	0.09	10	46				240/1/60	3.9	
TLWH-3	RHEEM	RETEX-13	SHOWER/JAN RM	13.0	WATER	0.13	6.7	54				240/1/60	3.9	

### BOILER

TAG	MANUFACTURER	MODEL	LOCATION	GAS				FLUID				ELECTRICAL				WEIGHT (kg)	REMARKS	
				OUPUT CAPACITY (KW)	BOILER EFF (%)	MIN GAS PRES. (IN)	MAX GAS PRES. (IN)	TYPE	FLOW RATE (GPM)	E.F.T (F)	L.F.T (F)	AMP	MCA	MOCP	V/Ph/Hz			
B-1	DE DIETRICH	GT 430-8A PLUS	MECH RM	432	96	7	14	40% GLYCOL	130	120	95	9.8				120/1/60	1470	CONDENSING
B-2	DE DIETRICH	GT 430-8A PLUS	MECH RM	432	96	7	14	40% GLYCOL	130	120	95	9.8				120/1/60	1470	CONDENSING

### ELECTRIC UNIT HEATER

TAG	MANUFACTURER	MODEL	LOCATION	MOUNTING CONFIGURATION	HEATING CAPACITY (KW)	AIRFLOW (L/s)	MOTOR KW	FAN RPM	ELECTRICAL			WEIGHT (kg)	NOTES
									FLA	MOCP	V/Ph/Hz		
UH-1	SIGMA	058H	MECH RM	WALL MOUNT	10.76	94	0.093	1550	1.8	15	120/1/60	21.8	
UH-2	SIGMA	047H	VEHICLE BAY	WALL MOUNT	7.62	190	0.093	1550	1.8	15	120/1/60	18.1	
UH-3	SIGMA	047H	VEHICLE BAY	WALL MOUNT	7.62	190	0.093	1550	1.8	15	120/1/60	18.1	
UH-4	SIGMA	047H	PAINT ROOM	WALL MOUNT	7.62	190	0.093	1550	1.8	15	120/1/60	18.1	
UH-5	SIGMA	047H	MAINTENANCE STG	WALL MOUNT	7.62	190	0.093	1550	1.8	15	120/1/60	18.1	
UH-6	REZVOR	EHC	VESTIBULE	WALL MOUNTED	3.00	76	3.0		12.5	20	240/1/60	10.9	

### SNOW MELTING SYSTEM

TAG	AREA (M2)	HEATING LOAD (KW)	FLOW (L/S)	HEAD LOSS (M)	FLUID TYPE	DELTA T	LOOP TYPE	SPACING
SM-1	1,582	998	21	34	40% PROP. GLYCOL	13.9C	25.4MM UPONER HEPEX	229MM CTRS TUBES

### 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



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PUMPS											
TAG	MANUFACTURER	MODEL	DISCHARGE SIZE	VFD	FLOW (GPM)	HEAD (FT)	EFF. (%)	FLUID	POWER (HP)	SPEED @ 100% (RPM)	V/PH/HZ
P-1	ARMSTRONG	SERIES 4380	2 IN.	YES	20	115	18.3	40% PG	10	4209	575/3/60
P-1R	ARMSTRONG	SERIES 4380	2 IN.	YES	20	115	18.3	40% PG	10	4209	575/3/60
P-2	ARMSTRONG	V2A9A-RC	2 IN.	YES	170	180	60.4	40% PG	20	3600	575/3/60
P-2R	ARMSTRONG	V2A9A-RC	2 IN.	YES	170	180	60.4	40% PG	20	3600	575/3/60
P-3	ARMSTRONG	V2B7A-CC	4 IN.	YES	130	45	70.2	40% PG	3	1800	575/3/60
P-4	ARMSTRONG	V2B7A-CC	4 IN.	YES	130	45	70.2	40% PG	3	1800	575/3/60
P-5	ARMSTRONG	SERIES 4380	2 IN.	YES	20	75	41.4	WATER	2	3326	575/3/60
P-5R	ARMSTRONG	SERIES 4380	2 IN.	YES	20	75	41.4	WATER	2	3326	575/3/60

AIR SOURCE HEAT PUMP														
TAG	MODEL	REFRIGERANT	OUTDOOR AMB. TEMP C (F)	HEAT CAPACITY (KW)	FLUID TYPE	FLOW RATE (L/S)	R. TEMP (C)	S. TEMP (C)	P. DROP (PSI)	POWER (KW)	MCA	FLA	MOCP	V/PH/HZ
ASHP-1	ASB-25	R-507	-23.4 (-10)	48.7	40% PG	1.1	38	50	0.3	23	87.6	73.3	125	575/3/60

HEAT EXCHANGER													
TAG	LOCATION	MODEL	HEAT EXCH. (KBTU/H)	HOT SIDE				COLD SIDE				PLATE MATERIAL	
				FLOW RATE (L/S)	INLET TEMP (C)	OUTLET TEMP (C)	P. DROP (PSI)	FLOW RATE (L/S)	INLET TEMP (C)	OUTLET TEMP (C)	P. DROP (PSI)		
HEX-1	MECH RM	AQ2T-BFG	233.9	1.6	50	38	4.7	1.5	35	46	3.7	ALLOY 340/0.5 MM	

CONDENSERS													
TAG	LOCATION	MODEL	MANUFACTURER	COMB RATIO	AIRFLOW RATE (L/S)	COOLING		HEATING		REFRIGERANT	MCA	V/PH/HZ	WEIGHT (KG)
						AMB. TEMP (C)	CAPACITY (KW)	AMB. TEMP (C)	CAPACITY (KW)				
ODU-1	ROOF	RXYQ144AATJB	DAIKIN	92.6	-	35	40	-20	29.4	R-410A	47.8	575/3/60	350

GRILLES AND DIFFUSERS										
TAG	BASIS OF DESIGN		TYPE	VOLUME CONTROL	DIMENSIONS			NECK DIAMETER (mm)	MATERIAL	NOTES
	MANUFACTURER	MODEL			LENGTH (mm)	WIDTH (mm)	DIAMETER (mm)			
A	EH PRICE	SPD	SQUARE PLAQUE DIFFUSER	YES	600	600		REFER TO FLOOR PLANS	STEEL	
A1	EH PRICE	SPD	SQUARE PLAQUE DIFFUSER	YES	300	300		REFER TO FLOOR PLANS	STEEL	
B1	EH PRICE	80 DAL	EGG CRATE GRILLE	YES	300	300			ALUMINUM	
B2	EH PRICE	80 DAL	EGG CRATE GRILLE	YES	600	300			ALUMINUM	
D	EH PRICE	620 DAL	LOUVERED FACE SUPPLY GRILLE	YES	300	300			ALUMINUM	
D1	EH PRICE	620 DAL	LOUVERED FACE SUPPLY GRILLE	YES	600	300			ALUMINUM	
E	EH PRICE	630 DAL	LOUVERED FACE RETURN GRILLE	YES	300	300			ALUMINUM	
E3	EH PRICE	630 DAL	LOUVERED FACE RETURN GRILLE	YES	800	750			ALUMINUM	
F	NAILOR	RPLP	ROUND PUNKAH LOUVERJET NOZZLE		305	213	254			
H	EH PRICE	RECG	EGG CRATE EXHAUST GRILLE				200			

EXPANSION TANKS								
TAG	LOCATION	SERVICE	BASIS OF DESIGN		VOLUME (L)	MAX DESIGN PRESSURE (KPa)	WEIGHT (KG)	REMARKS
			MANUFACTURER	MODEL				
ET-1	MECHANICAL ROOM	GLYCOL SYSTEM	PATTERSON	NLA-400	400	862.0 kPa	136	
ET-2	MECHANICAL ROOM	INFLOOR HEATING	PATTERSON	NLA-85	87	862.0 kPa	41	

OUTDOOR CONDENSERS												
TAG	LOCATION	MODEL	MANUFACTURER	AIRFLOW RATE (L/S)	INDOOR CONDITIONS TEMP. (C)		OUTDOOR CONDITIONS TEMP. (C)		REFRIGERANT	MCA	V/PH/HZ	WEIGHT (KG)
ODU-2	HANGAR	FTX24WVJU9...	DAIKIN	1141	26.7 DB/19.4 WB	21.1 DB / 15.6 WB	35 DB/24 WB	8.3DB/6.1 WB	R-410A	18.8	230/1/60	60

BUFFER TANK									
TAG	MODEL	PART NUMBER	DESCRIPTION	TANK VOLUME (L)	MAX. DESIGN TEMP. (F)	MAX DESIGN PRES. (PSIG)	WEIGHT (KG)	REMARKS	
BT-1	HBT-120	55621200	2-PORT HOT WATER BUFFER TANK	454.2	450	125	0.3	TANK SHOULD BE INSULATED	

ELECTRIC BASEBOARD HEATER							
TAG	MANUFACTURER	PART NUMBER	DESCRIPTION	POWER (W)	V/PH/HZ	WEIGHT (KG)	REMARKS
EBBH-1	OUELLET	OPR0500	HEAVY DUTY STEEL DRAFT BARRIER	500	240/1/60	6.4	

PLUMBING FIXTURES SCHEDULE									
UNIT TAG	DESCRIPTION	MANUFACTURER	MODEL	WASTE	VENT	DCW	DHW	TRAP	REMARKS
WC-1	Awall Millenium Flowise Elongated Flushometer Toilet	AMERICAN STANDARD	3353.101	100	40	25	-	INT	
L-1	LAV. MEZZO SEMI COUNTERTOP (UNIVERSAL WASHROOM)	AMERICAN STANDARD	9960.001	40	32	12	12	40	
L-2	LAVATORY (LOOKER ROOM)	INTEGRAL SOLID POLYMER		40	32	12	12	40	SEE DWG# 8/A-201 FOR DETAILS
LS	LAUNDRY SINK (PAINT ROOM)	WHITEHAUS COLLECTION	WHLSD84020-C	40	32	12	12	40	
KS	KITCHEN SINK	KINDRED	QSL2020/8/3	40	32	12	12	40	
JS	JANITOR'S MOP SINK	STERN-WILLIAMS CO	SB902T35T40BP	75	40	12	12	75	
SH	SHOWER TRIM KIT	MOEN	TL183						

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

NO.	ISSUED FOR	ISSUED	DATE
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

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.

Sheet  
Title:

## MECHANICAL SCHEDULES II

Drawing  
No:  
M-901