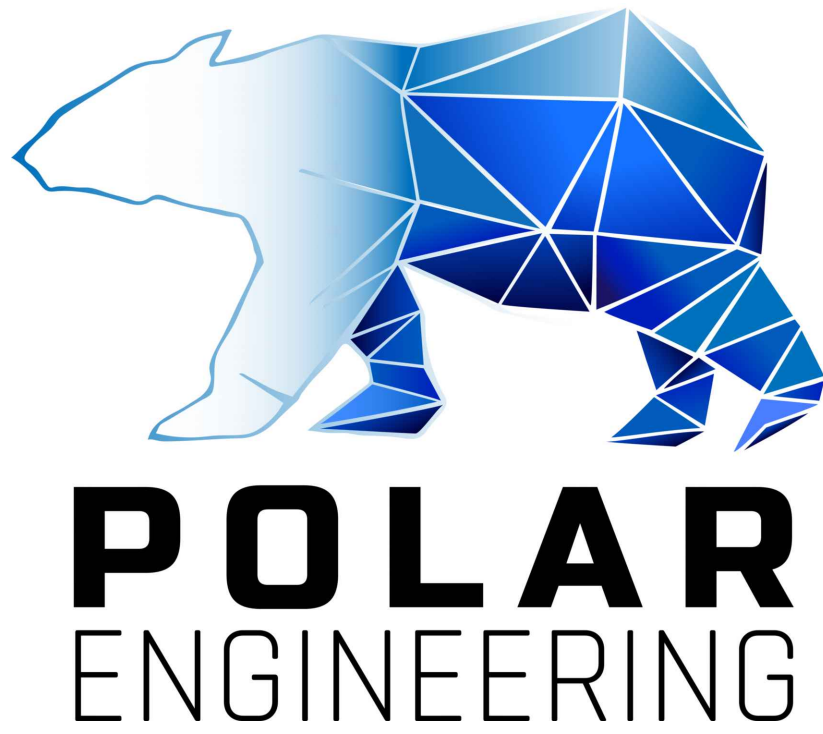




Strathcona Gardens Recreation Complex

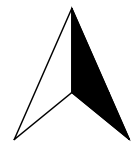
Dehumidifier And CO2 Upgrades



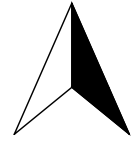
MECHANICAL DRAWING LIST		
DRAWING NO.	DESCRIPTION	SCALE
M1	COVER PAGE	NTS
M2	FACILITY KEY PLAN	NTS
M3	DEHUMIDIFIER REPLACEMENT	1:50, NTS
M4	ROOFTOP UNIT REPLACEMENT	NTS
M5	AHU PLAN VIEW AND SCHEMATIC	NTS
M6	ECO2 PACKAGE CO2 SYSTEM P&ID	NTS
M7	DHW SYSTEM INTEGRATION	NTS
M8	SCHEDULES AND FIGURES	NTS
M9	CONTROLS	NTS



COMPASS
NORTH



PROJECT
NORTH

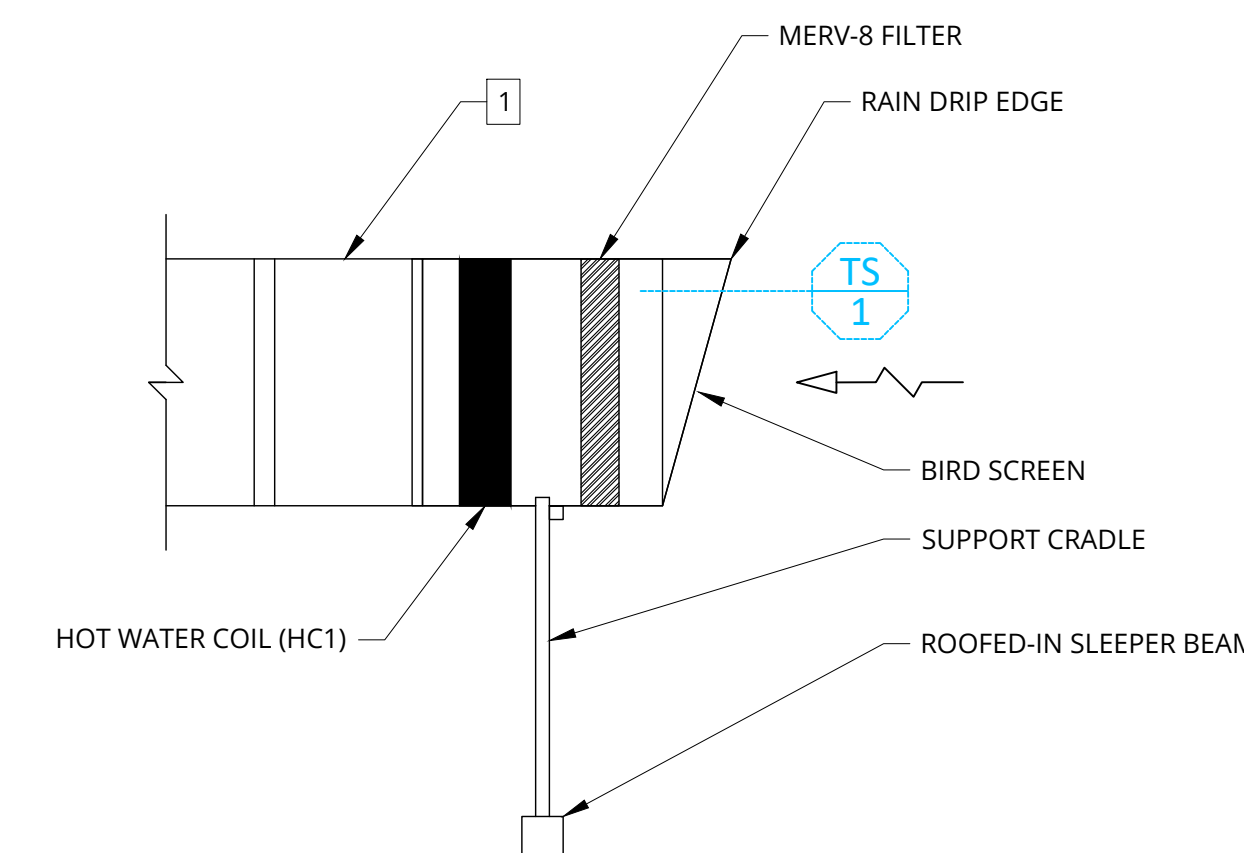


Strathcona Regional District - Strathcona Gardens Recreation Complex
225 South Dogwood Street, Campbell River, BC V9W 8C8

PRIME CONSULTANT PHONE 778-700-1086 WEBSITE www.polareng.ca	CONSULTANT PHONE WEBSITE	CLIENT PHONE 250-830-6777 WEBSITE www.strathconagardens.com	ENGINEER OF RECORD IAN WELLE P.ENG. EGBC PERMIT TO PRACTICE NUMBER 1003657	PROJECT TITLE	REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
				STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES	1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
					2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE
					3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER	D
				DRAWING TITLE	4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER	SHEET NAME
				COVER PAGE	5	-	-	-	-	M1
					6	-	-	-	-	



PRIME CONSULTANT		CONSULTANT		CLIENT		ENGINEER OF RECORD		PROJECT TITLE STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES		REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
 POLAR ENGINEERING				 2025-09-17 IAN WELLE P.ENG. EGBC PERMIT TO PRACTICE NUMBER 1003657		1	2024-10-04			BC	IW	ISSUED FOR REVIEW	2418		
						2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE D				
						3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER		SHEET NAME M2			
						4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER					
						5	-	-	-	-					
6	-	-	-	-											
DRAWING TITLE FACILITY KEY PLAN															
PHONE	WEBSITE	PHONE	WEBSITE	PHONE	WEBSITE	EGBC PERMIT TO PRACTICE NUMBER									
778-700-1086	www.polareng.ca			250-830-6777	www.strathconagardens.com	1003657									



SCALE: 1:50

GENERAL NOTES:

1. DEMO EXISTING DUCTING ON ROOFTOP.
2. DEMO EXISTING DUCTING INSIDE ARENA

SCALE: NTS

KEYED NOTES:

1. FABRICATE TRANSITION TO ACCOMMODATE NEW HOT WATER COIL.

SCALE: 1/50

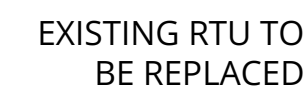
KEYED NOTES:

1. ENSURE ADEQUATE SERVICE CLEARANCE AROUND DH1.
2. FLEX CONNECTION - TYPICAL OF TWO.
3. USE EXISTING WALL PENETRATION - ENLARGE AND REWORK AS REQUIRED.
4. ROOFING UPGRADES TO BE COMPLETED PER STRUCTURAL DRAWINGS.
5. LOCATE INSIDE ARENA.
6. PAINT INSIDE OF RETURN DUCTING BLACK.
7. GLYCOL PIPING TO HC1.
8. ROUTE PIPES ALONG EXTERIOR WALL ABOVE DOORWAYS. COORDINATE WITH EXISTING PIPING.
9. PIPES CONTINUE INTO SOUTH COMPRESSOR ROOM. SEE 4/M7.
10. COORDINATE NEW SUPPLY DUCTING WITH EXISTING SCOREBOARD. SEE 3/M8.
11. MAXIMIZE SPACE BETWEEN HC1 AND EXTERIOR WALL TO ENSURE ACCESS TO BACK SIDE OF DH1
12. ENSURE HC1 HAS SUITABLE SERVICE CLEARANCE.



PRIME CONSULTANT		CONSULTANT		CLIENT		ENGINEER OF RECORD		PROJECT TITLE STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES		REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
						 IAN WELLE P.ENG.				1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
								2	2024-11-09	BC	IW	ISSUED FOR TENDER	D		
								3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER			
								4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER		M3	
								DRAWING TITLE DEHUMIDIFER REPLACEMENT		5	-	-	-		-
6	-	-	-	-											
PHONE	WEBSITE	PHONE	WEBSITE	PHONE	WEBSITE	EGBC PERMIT TO PRACTICE NUMBER									
778-700-1086	www.polareng.ca			250-830-6777	www.strathconagardens.com	1003657									

FILE NAME: 2458-SRD-CO2 AND DEHUMIDIFIER MECHANICAL DRAWINGS-REV DWS | PLOT DATE: 2025-09-10 | SAVED BY: ADAM HITCHCOCK



1



3



4

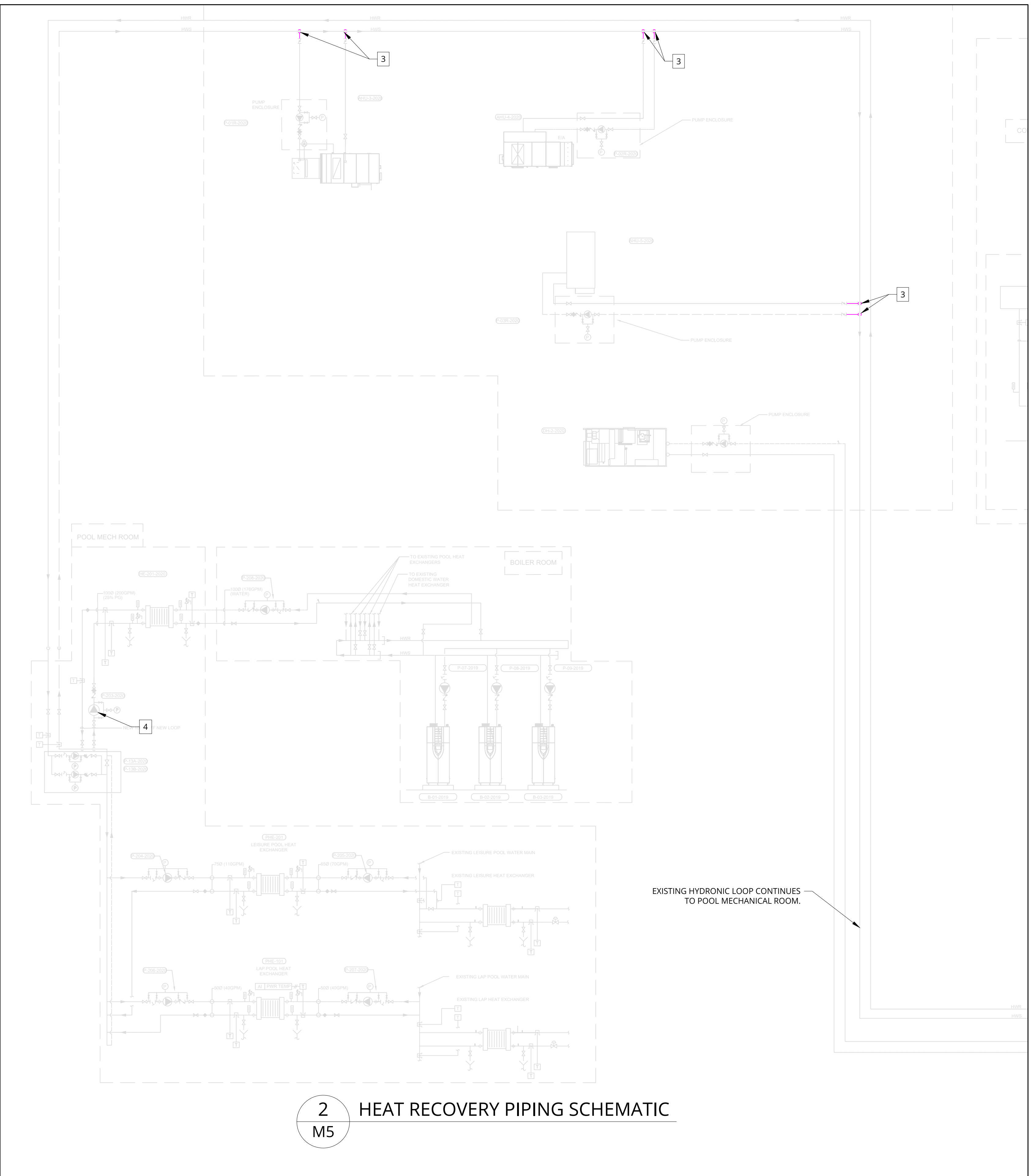


2

NOTES:

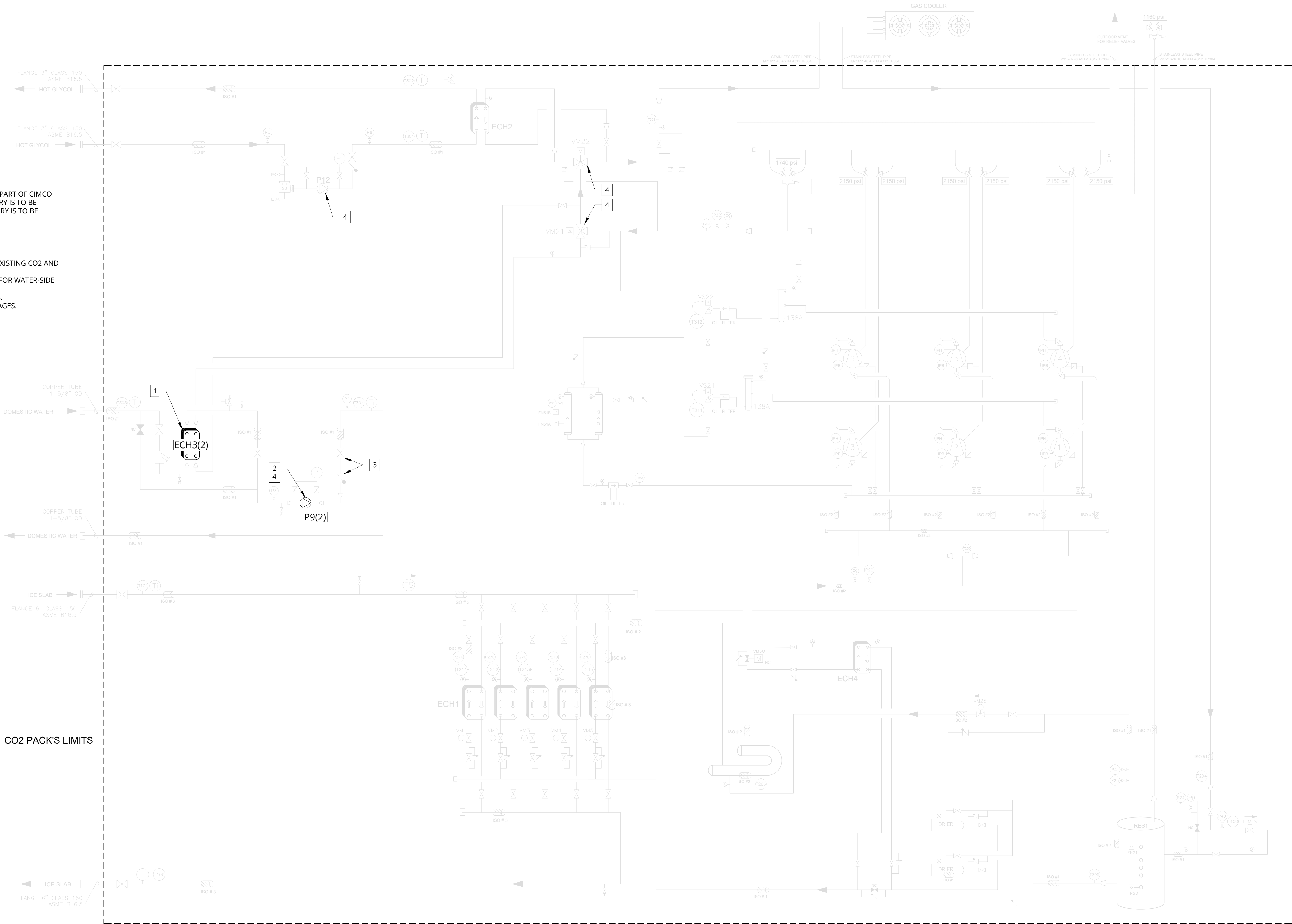
CONSTRUCTION NOTES

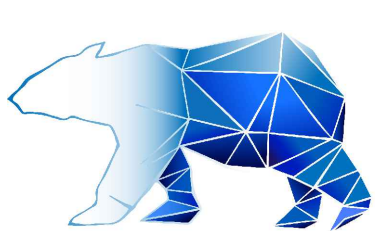
1. REPLACE RUSTED GAS PIPE TO UNIT.
2. REPLACE ALL CURB FLASHING AND MAKE GOOD.
3. CURB OVERHANG AS PERMISSIBLE BY RTU MANUFACTURER SPECIFICATIONS.
4. CONTRACTOR TO PROVIDE NEW ROOF CURB ADAPTER TO TRANSITION EXISTING DUCT PENETRATIONS TO NEW UNIT.

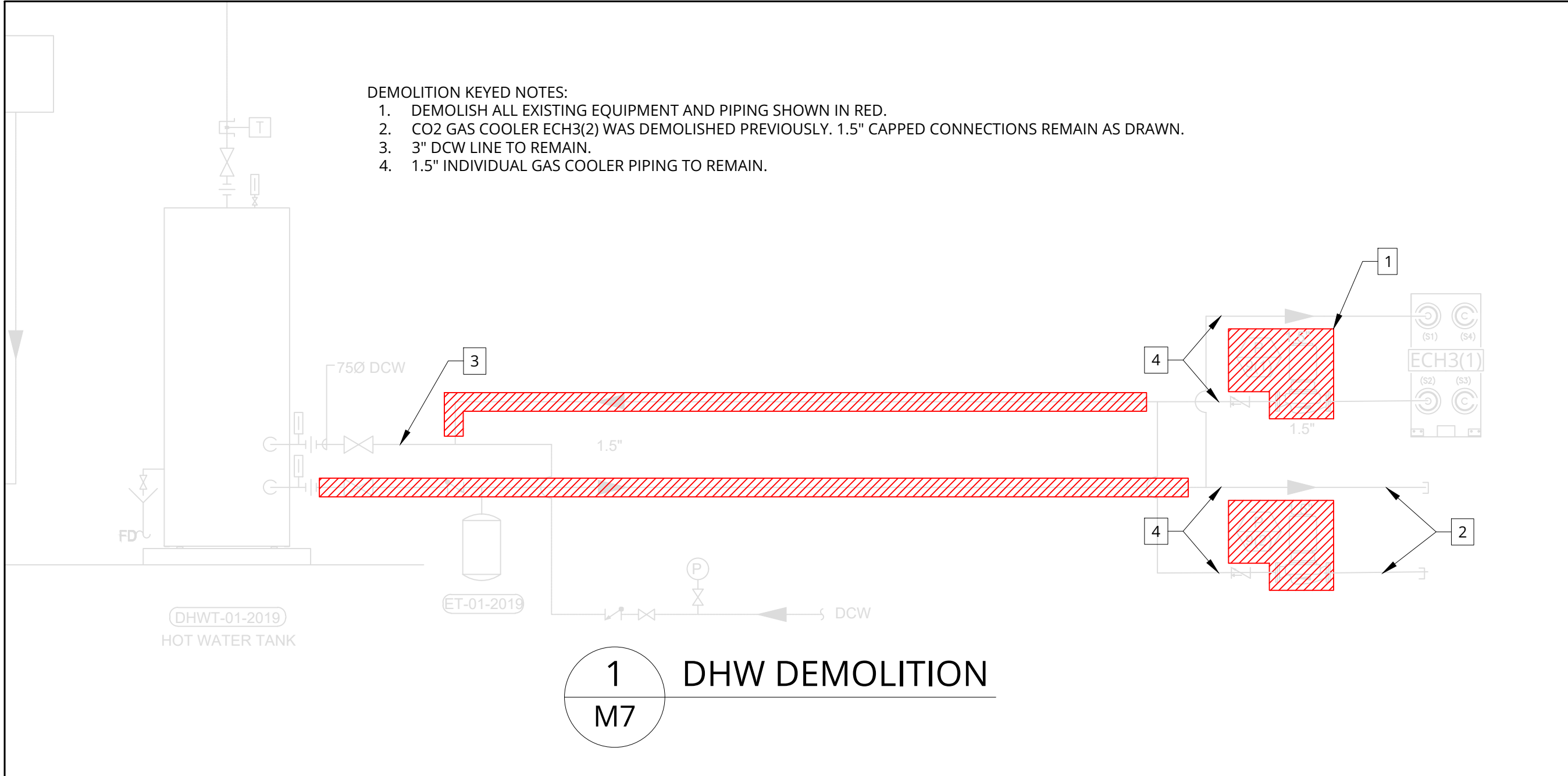


PRIME CONSULTANT  PHONEWEBSITE 778-700-1086www.polareng.ca	CONSULTANT  PHONEWEBSITE	CLIENT  PHONEWEBSITE 250-830-6777www.strathconagardens.com	ENGINEER OF RECORD  2025-09-11 NATALIE VADEBONCOEUR, P.ENG EGBC PERMIT TO PRACTICE NUMBER VC ENERGY (SUB-CONSULTANT): 1005060	PROJECT TITLE STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES DRAWING TITLE AHU PLAN VIEW AND SCHEMATIC	REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
					1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
					2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE
					3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER	
					4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER	SHEET NAME
					5	-	-	-	-	
6	-	-	-	-	M5					

- GENERAL NOTES:
1. WORK ON THIS SHEET IS INCLUDED FOR COMPLETENESS, AND IS BEING PERFORMED AS PART OF CIMCO REFRIGERATION'S MAINTENANCE CONTRACT. ALL WORK INSIDE THE CO2 PACK BOUNDARY IS TO BE COMPLETED BY CIMCO REFRIGERATION. ALL WORK OUTSIDE OF THE CO2 PACK BOUNDARY IS TO BE COMPLETED BY THE SUCCESSFUL CONTRACTOR.
 2. THERE ARE TWO IDENTICAL CO2 PACKS ON SITE, ECO1 PACKAGE AND ECO2 PACKAGE.
 3. INCREASE DISCHARGE PRESSURE SETPOINT OF BOTH PACKS TO 1250 PSIG.
- KEYED NOTES:
1. ECH3(2) WAS PREVIOUSLY REMOVED. INSTALL NEW ECH3(2) IN ITS PLACE. RE-CONNECT EXISTING CO2 AND WATER-SIDE PIPING. ONLY APPLIES TO ECO2 PACKAGE.
 2. PUMP P9(1) AND P9(2) TO BE DEMOLISHED AND NEW PUMPS INSTALLED. SEE SHEET M7 FOR WATER-SIDE SCHEMATIC, TYPICAL FOR ECO1 AND ECO2 PACKAGES.
 3. EXISTING VALVES AND EQUIPMENT TO REMAIN. TYPICAL FOR ECO1 AND ECO2 PACKAGES.
 4. SEE SHEET M9 FOR CONTROL SEQUENCE CHANGES. TYPICAL FOR ECO1 AND ECO2 PACKAGES.



PRIME CONSULTANT  POLAR ENGINEERING PHONE 778-700-1086WEBSITE www.polareng.ca	CONSULTANT	CLIENT	ENGINEER OF RECORD	PROJECT TITLE STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES DRAWING TITLE ECO2 PACKAGE CO2 SYSTEM P&ID	REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #	
					 IAN WELLE P.ENG.	1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
						2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE D
						3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER	
						4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER	SHEET NAME M6
						5	-	-	-	-	
						6	-	-	-	-	



3
M7

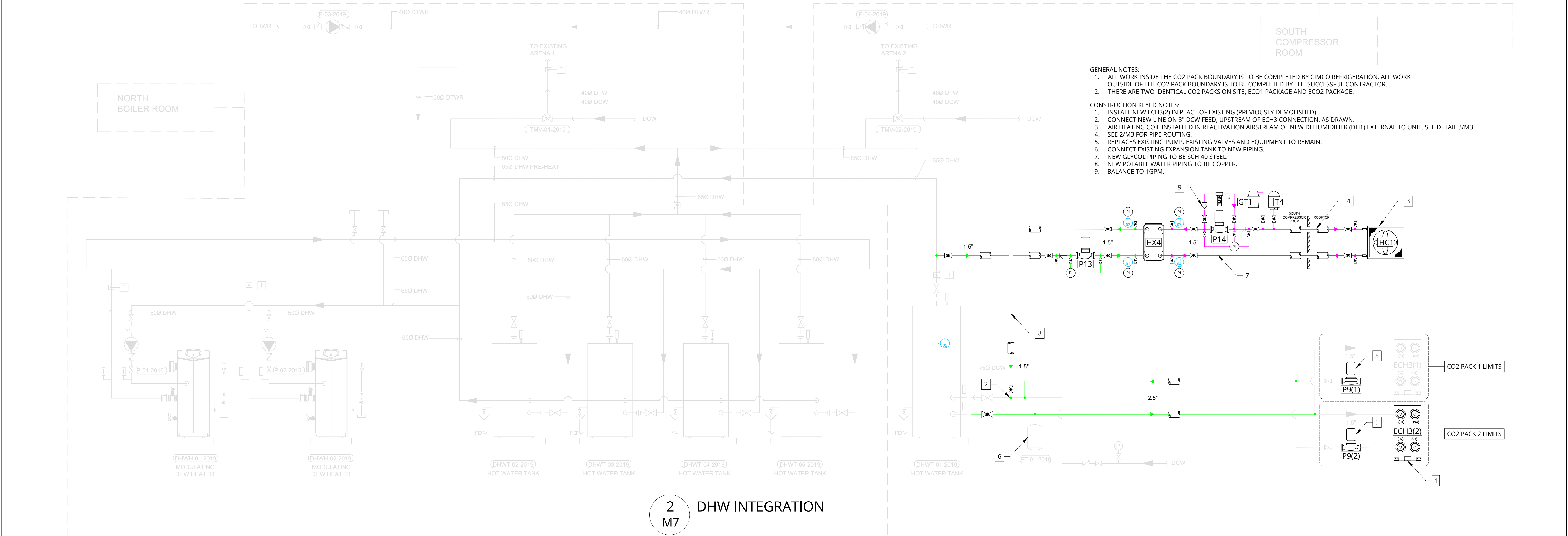
EXTERIOR PIPE RUN

1. ROUTE NEW HC1 PIPING ALONG EXTERIOR WALL.
2. COORDINATE WITH EXISTING PIPING AND EQUIPMENT.

4
M7

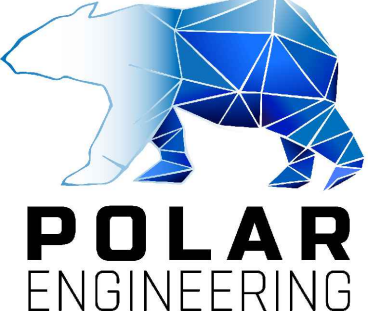
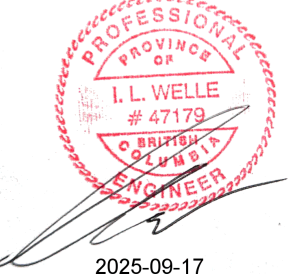
STORAGE TANK ROOM

1. INSTALL NEW EQUIPMENT HX4, P13, P14, T4, GT1 IN STORAGE TANK ROOM.



2
M7

DHW INTEGRATION

PRIME CONSULTANT	CONSULTANT	CLIENT	ENGINEER OF RECORD	PROJECT TITLE	REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
 POLAR ENGINEERING		 Strathcona REGIONAL DISTRICT	 IAN WELLE P.ENG. 2025-09-17 EGBC PERMIT TO PRACTICE NUMBER 1003657	STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES	1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
					2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE
					3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER	D
					4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER	SHEET NAME
					5	-	-	-	-	M7
					6	-	-	-	-	
PHONE 778-700-1086	WEBSITE www.polareng.ca	PHONE 250-830-6777	WEBSITE www.strathconagardens.com							

AIR COILS															
TAG	DESCRIPTION	SIDE 1					SIDE 2					CAPACITY (MBH)	MAKE	MODEL	NOTES
		FLUID	FLOW (GPM)	TEMP IN (F)	TEMP OUT (F)	PRESSURE DROP (PSI)	FLUID	FLOW (CFM)	DRY BULB TEMP IN (F)	DRY BULB TEMP OUT (F)	PRESSURE DROP (IN.WC.)				
HC1	DH1 REACT AIR PREHEAT COIL	30% PG	26.0	135.0	115.0	1.74	AIR	4500	69.3	120.0	0.46	250	MADOK	61F5R33Y40GPH	1

NOTES:
1. 1-1/2" SUPPLY/RETURN CONNECTIONS, 40"L x 33"H FINNED AREA.

DEHUMIDIFIER SCHEDULE										
TAG	DESCRIPTION	MAKE	MODEL	SUPPLY AIR (CFM)	SUPPLY AIR ESP (IN-WC)	H ₂ O REMOVAL RATE (LB/HR)	REACT AIR (CFM)	POWER (V/PH/HZ)	HEATER (MBH)	NOTES
DH1	DEHUMIDIFIER	EI SOLUTIONS	A35G	16,000	1.0	261	4,500	575/3/60	1100	1,2,3

NOTES:
1. REFER TO STRUCTURAL FOR LOCATION & CURB DETAILS.
2. CONTRACTOR TO COORDINATE BAS INTEGRATION AS PER POINTS LIST AND SEQUENCES PROVIDED.
3. INCLUDES CABINET SPACE FOR FUTURE COOLING COIL C/W DRAIN PAN.

HEAT EXCHANGER													
TAG	DESCRIPTION	MAKE	MODEL	CAPACITY (MBH)	HOT SIDE				COLD SIDE				NOTES
					FLUID	PRESSURE DROP (PSI)	INLET TEMP. (F)	OUTLET TEMP. (F)	FLUID	PRESSURE DROP (PSI)	INLET TEMP. (F)	OUTLET TEMP. (F)	
ECH3(2)	CO2 GAS COOLER	SWEP	BDW16DWHX100/1P	400	CO2	24.4	241	173	POTABLE WATER	5.64	120	140	1,2,3
HX4	DH1 GLYCOL HEATING HX	SWEP	BDW35TDWM4X197/2P	250	POTABLE WATER	0.26	140	120	30% PG	0.31	115	135	1

NOTES:
1. DOUBLE-WALLED CONSTRUCTION SUITABLE FOR POTABLE WATER SERVICE.
2. MAWP = 1445 PSI. SAME AS EXISTING ECH3.
3. INCLUDED FOR COMPLETENESS. INSTALLED AS PART OF CIMCO REFRIGERATION'S MAINTENANCE CONTRACT.

PUMP SCHEDULE										
TAG	DESCRIPTION	MAKE	MODEL	FLUID	HEAD (PSI)	FLOW (GPM)	MOTOR HP	IMPELLER SIZE (IN)	ELECTRICAL (V/PH/HZ)	NOTES
P9 (1)	ECH3 (1) CIRCULATOR PUMP	ARMSTRONG	4380 0103-000.7	POTABLE WATER	14	40	1.5	3.05	575/3/60	1,2,3
P9 (2)	ECH3 (2) CIRCULATOR PUMP	ARMSTRONG	4380 0103-000.7	POTABLE WATER	12	40	1.5	3.05	575/3/60	1,2,3
P13	HX3 CIRCULATION PUMP	ARMSTRONG	ASTRO 210SS	POTABLE WATER	2	25	0.27	2.3	120/1/60	1
P14	HC1 CIRCULATION PUMP	ARMSTRONG	E22.2 STD125	30% PG	11	26	0.4	2.7	120/1/60	-

NOTES:
1. SUITABLE FOR POTABLE WATER SERVICE.
2. DESIGN ENVELOPE PUMP.
3. INCLUDED FOR COMPLETENESS. INSTALLED AS PART OF CIMCO REFRIGERATION'S MAINTENANCE CONTRACT.

EXPANSION TANK SCHEDULE						
TAG	PURPOSE	MAKE	MODEL	FLUID	AIR-SIDE CHARGE	NOTES
T4	GLYCOL EXPANSION TANK	AMTROL	AX-10-DD	30% PG	20 PSIG	1

NOTES:
1. FULL ACCEPTANCE BLADDER EXPANSION TANK.

GRILLE & DIFFUSER SCHEDULE						
TAG	DESCRIPTION	MAKE	MODEL	AIRFLOW (CFM)	SIZE	NOTES
RG1	RETURN LOUVER	PRICE INDUSTRIES	JE443	8,000	48" X 48"	
SG1	HIGH CAPACITY DRUM LOUVER	PRICE INDUSTRIES	HCD	4,000	48" X 15"	1

NOTES:
1. TYPICAL OF TWO

GLYCOL FEED TANK SCHEDULE							
TAG	MAKE	MODEL	MAKE-UP CAPACITY (GAL)	PUMP (GPM)	FILL PRESSURE (PSIG)	ELECTRICAL (V/PH/HZ)	NOTES
GT1	CALEFACTIO	GMP6	6	1.6	20	120/1/60	1,2,3,4

NOTES:
1. C/W ALARM PANEL KIT (#GMPAL).
2. DIMENSIONS 12X12X39" WITH 12" CLEARANCE.
3. C/W LIQUID LEVEL GAUGE, PUMP SUCTION HOSE W/STRAINER, PRESSURE PUMP W/ CHECK VALVE, CUTOUT PIGGYBACK LEVEL FLOAT SWITCH, ADJUSTABLE PRV.
4. 0.5" HYDRONIC CONNECTION MAY BE OF FLEXIBLE TYPE. MINIMUM 50PSI RATING.



1

M8

EXISTING DEHUMIDIFIER

1. DEMOLISH EXISTING DUCTWORK.

2. RELOCATE EXISTING DEHUMIDIFIER AS PER 1.

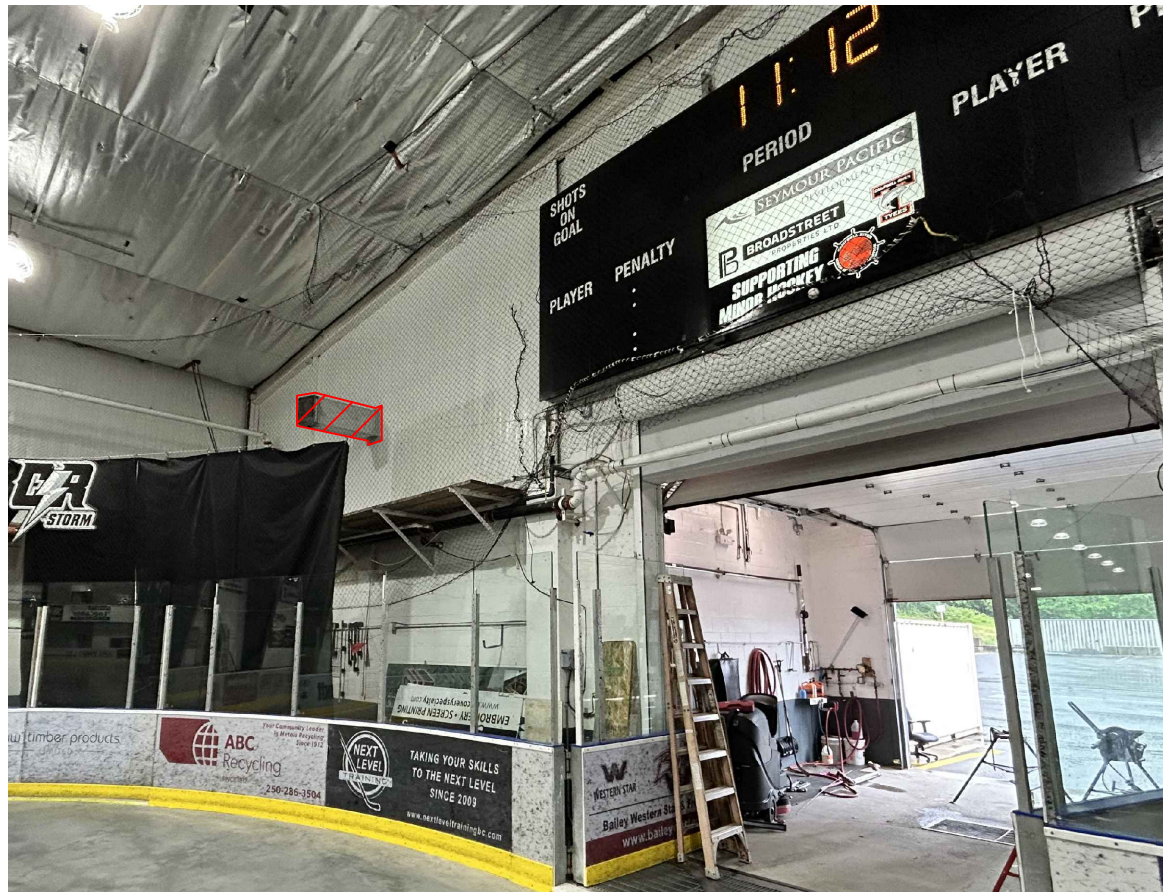


2

M8

EXTERIOR DEHUMIDIFIER DUCTWORK

1. DEMOLISH EXISTING EXTERIOR DEHUMIDIFIER DUCTING.



3

M8

INTERIOR DEHUMIDIFIER DUCTWORK

1. DEMOLISH EXISTING INTERIOR DEHUMIDIFIER DUCTING.

2. COORDINATE NEW DUCTING WITH SCOREBOARD AND OTHER EQUIPMENT.



4

M8

AHU-3 PIPING

1. RE-LOCATE EXISTING AHU TIE-INS TO OPPOSITE SIDE OF HYDRONIC LOOP.

2. ENSURE THAT SUPPLY TIE-IN (FLUID TO UNIT) IS UPSTREAM OF RETURN TIE-IN.

3. SEE SHEET M5.



5

M8

AHU-4 PIPING

1. RE-LOCATE EXISTING AHU TIE-INS TO OPPOSITE SIDE OF HYDRONIC LOOP.

2. ENSURE THAT SUPPLY TIE-IN (FLUID TO UNIT) IS UPSTREAM OF RETURN TIE-IN.

3. SEE SHEET M5.



6

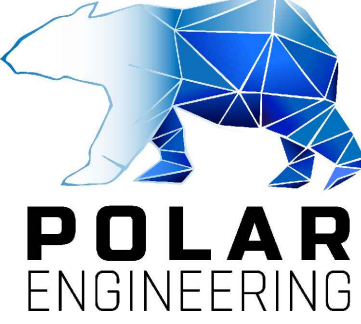
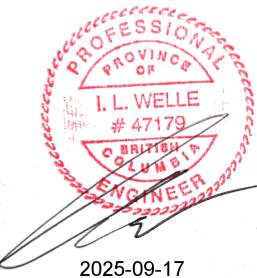
M8

AHU-5 PIPING

1. RE-LOCATE EXISTING AHU TIE-INS TO OPPOSITE SIDE OF HYDRONIC LOOP.

2. ENSURE THAT SUPPLY TIE-IN (FLUID TO UNIT) IS UPSTREAM OF RETURN TIE-IN.

3. SEE SHEET M5.

PRIME CONSULTANT  PHONE 778-700-1086 WEBSITE www.polareng.ca	CONSULTANT PHONE WEBSITE	CLIENT  PHONE 250-830-6777 WEBSITE www.strathconagardens.com	ENGINEER OF RECORD  2025-09-17 IAN WELLE P.ENG. EGBC PERMIT TO PRACTICE NUMBER 1003657	PROJECT TITLE	REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
				STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES	1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
					2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE
					3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER	D
				DRAWING TITLE	4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER	SHEET NAME
				SCHEDULES & FIGURES	5	-	-	-	-	M8
					6	-	-	-	-	

INPUTS - BUILDING AUTOMATION SYSTEM						
TAG	DESCRIPTION	PURPOSE	LOCATION	SIGNAL	DISPLAY UNITS	NOTES
AQ1	CO2 SENSOR	MEASURE INTERIOR CO2	AHU3 RETURN AIR DUCT	AI	PPM	1
AQ2	CO2 SENSOR	MEASURE INTERIOR CO2	AHU4 RETURN AIR DUCT	AI	PPM	1
RH1	RH & TEMP SENSOR	INTERIOR RH & TEMP	RBA ARENA	AI	% F	
AQ3	CO2 SENSOR	MEASURE EXTERIOR CO2	BUILDING EXTERIOR	AI	PPM	
AQ4	CO2 SENSOR	MEASURE INTERIOR CO2	RBA ARENA	AI	PPM	
AQ5	CO & NO2 SENSOR	MEASURE INTERIOR CO/NO2	RBA ARENA	AI	PPM/PPB	
DP1	DEWPOINT SENSOR	MEASURE INTERIOR DEWPOINT	RBA ARENA	AI	F	
TS1	TEMP SENSOR	MEASURE AIR TEMP	DH1 REGEN DUCT	AI	F	2
BAC01	BACnet CONNECTION	DH1 INPUTS/OUTPUTS	DH1	BACnet	-	
TT01	TEMP SENSOR	HX4 H2O ENTERING TEMP	SOUTH COMPRESSOR ROOM	AI	F	
TT02	TEMP SENSOR	HX4 H2O LEAVING TEMP	SOUTH COMPRESSOR ROOM	AI	F	
TT03	TEMP SENSOR	HX4 PG ENTERING TEMP	SOUTH COMPRESSOR ROOM	AI	F	
TT04	TEMP SENSOR	HX4 PG LEAVING TEMP	SOUTH COMPRESSOR ROOM	AI	F	
TT05	TEMP SENSOR	DHW TEMP	DHWT-01-2019	AI	F	
CT01	CURRENT TRANSDUCER	P13 STATUS	SOUTH COMPRESSOR ROOM	AI	A	
CT02	CURRENT TRANSDUCER	P14 STATUS	SOUTH COMPRESSOR ROOM	AI	A	
BAC02	RTU3-FEEDBACK	RTU FEEDBACK	ROOFTOP	BACnet	MULTI	
TS1	RTU3-TS	ADJUSTABLE THERMOSTAT	DOGWOOD ROOM	AI	C	
OCC1	RTU3-OCC	OCCUPANCY SENSOR	DOGWOOD ROOM	DI	OCC/U/N	

NOTES:

1. ADD TO EXISTING UNIT CONTROL PANEL.
2. INSTALL IN REACTIVATION DUCTING, UPSTREAM OF HC1.

OUTPUTS - BUILDING AUTOMATION SYSTEM				
EQUIPMENT TO CONTROL		PURPOSE	LOCATION	SIGNAL
TAG	DESCRIPTION			
CV1	3-WAY CONTROL VALVE	HP CONDENSER RETURN GLYCOL TEMP CONTROL	C126 - BOILER ROOM	AO
RTU3	ROOFTOP UNIT	UNIT START - BASED ON WEEKLY SCHEDULE	ROOFTOP	DO
RTU3	ROOFTOP UNIT	ROOM TEMPERATURE SETPOINT - FROM TS1	ROOFTOP	AO
BAC01	BACnet CONNECTION	DH1 INPUTS/OUTPUTS	DH1	BACnet
P13	CIRCULATION PUMP	PUMP ON/OFF	SOUTH COMPRESSOR ROOM	DO
P14	CIRCULATION PUMP	PUMP ON/OFF	SOUTH COMPRESSOR ROOM	DO

INPUTS - CIMCO REFRIGERATION PLANT CONTROL SYSTEM						
TAG	DESCRIPTION	PURPOSE	LOCATION	SIGNAL	DISPLAY UNITS	NOTES
CT03	CURRENT TRANSDUCER	P9(1) STATUS	SOUTH COMPRESSOR ROOM (ECO1 SKID)	AI	A	1,2
CT04	CURRENT TRANSDUCER	P9(2) STATUS	SOUTH COMPRESSOR ROOM (ECO2 SKID)	AI	A	1,2

NOTES:
1. INTEGRATE REPLACEMENT PUMPS P9(1/2) INTO CIMCO CONTROL GRAPHICS IN PLACE OF PC9(1/2).
2. INCLUDED FOR COMPLETENESS. POINTS TO BE UPDATED AS PART OF CIMCO REFRIGERATION'S MAINTENANCE CONTRACT.

OUTPUTS - CIMCO REFRIGERATION PLANT CONTROL SYSTEM					
EQUIPMENT TO CONTROL		PURPOSE	LOCATION	SIGNAL	NOTES
TAG	DESCRIPTION				
P9(1)	CIRCULATION PUMP	PUMP ON/OFF	SOUTH COMPRESSOR ROOM (ECO1 SKID)	DO	1
P9(2)	CIRCULATION PUMP	PUMP ON/OFF	SOUTH COMPRESSOR ROOM (ECO2 SKID)	DO	1

NOTES:
1. INCLUDED FOR COMPLETENESS. POINTS TO BE UPDATED AS PART OF CIMCO REFRIGERATION'S MAINTENANCE CONTRACT.

AHU-3 CONTROL STRATEGY - BUILDING AUTOMATION SYSTEM

RETURN AIR DAMPER (RAD) CONTROL

1. MAX RAD% CONTROL
 - 1.1. CO2 SENSOR S1 TO BE INSTALLED IN AHU3 RETURN AIR DUCT AND CONNECTED TO AHU3 CONTROL PANEL TO MONITOR SPACE CO2 LEVEL.
 - 1.2. CO2 THRESHOLD (AQ1 READING) SETPOINT IS 800 PPM (ADJUSTABLE).
 - 1.3. CONTROL THE MAX RAD SETPOINT TO MAINTAIN CO2 THRESHOLD SETPOINT
 - 1.3.1. MAX RAD SETPOINT IS ALLOWED TO RESET BASED ON RETURN AIR CO2 LEVELS AND OUTDOOR AIR TEMP.
 - 1.3.2. IF OAT $\geq 10C$, MAX RAD POSITION RESETS BETWEEN 0-100%.
 - 1.3.3. IF OAT $< 10C$, MAX RAD POSITION RESETS BETWEEN 50-100%.
 - 1.3.4. IF OAT $< 0C$, MAX RAD POSITION RESETS BETWEEN 80-100%.
2. COOLING OPERATION (SPACE TEMP $>$ SUPPLY AIR TEMP SETPOINT)
 - 2.1. FREE COOLING: WHEN OAT $\leq$ SAT SETPOINT, RAD CONTROLS BETWEEN 0%-MAX RAD% TO MAINTAIN THE SAT SETPOINT.
 - 2.2. MECHANICAL COOLING: WHEN OAT $>$ SAT SETPOINT, RAD POSITION = MAX RAD%.
3. HEATING OPERATION
 - 3.1. MECHANICAL HEATING: WHEN SAT $<$ SPACE TEMP SETPOINT, RAD POSITION = MAX RAD%.

OPTIMAL START SEQUENCE

4. SCHEDULE
 - 1.1. REVERSE SCHEDULE START TIME TO MATCH WHEN OCCUPANTS ACTUALLY ARRIVE.
 - 1.2. MAX OPTIMAL START TIME IS THE LATER OF TWO HOURS BEFORE SCHEDULED START OR THE EXISTING START TIME.
2. WARM-UP SEQUENCE
 - 2.1. RAD SHALL BE SET TO 100% DURING WARM-UP.
 - 2.2. FOR EACH ZONE, THE BAS SHALL CALCULATE THE REQUIRED WARM-UP TIME BASED ON THE ZONE'S OCCUPIED HEATING SET POINT, THE CURRENT ZONE TEMP, THE OUTDOOR AIR TEMP, AND A MASS/CAPACITY FACTOR FOR EACH ZONE.
 - 2.2.1. THE MASS FACTOR SHALL BE MANUALLY ADJUSTED OR SELF-TUNED BY THE BAS. IF AUTOMATIC, THE TUNING PROCESS SHALL BE TURNED ON OR OFF BY A SOFTWARE SWITCH TO ALLOW TUNING TO BE STOPPED AFTER THE SYSTEM HAS BEEN TRAINED.
 - 2.2.2. WARM-UP MODE SHALL START BASED ON THE ZONE WITH THE LONGEST CALCULATED WARM-UP TIME REQUIREMENT, BUT NO EARLIER THAN 2 HOURS BEFORE THE START OF THE SCHEDULED OCCUPIED PERIOD AND SHALL END AT THE SCHEDULED OCCUPIED START HOUR.
3. COOL-DOWN SEQUENCE
 - 3.1. NORMAL RAD CONTROL TO BE USED DURING COOL-DOWN (USE FREE COOLING PER ITEM 2.1 ABOVE IF AVAILABLE).
 - 3.2. FOR EACH ZONE, THE BAS SHALL CALCULATE THE REQUIRED COOLDOWN TIME BASED ON THE ZONE'S OCCUPIED COOLING SET POINT, THE CURRENT ZONE TEMP, THE OUTDOOR AIR TEMP, AND A MASS/CAPACITY FACTOR FOR EACH ZONE.
 - 3.2.1. THE MASS FACTOR SHALL BE MANUALLY ADJUSTED OR SELF-TUNED BY THE BAS. IF AUTOMATIC, THE TUNING PROCESS SHALL BE TURNED ON OR OFF BY A SOFTWARE SWITCH TO ALLOW TUNING TO BE STOPPED AFTER THE SYSTEM HAS BEEN TRAINED.
 - 3.2.2. COOL-DOWN MODE SHALL START BASED ON THE ZONE WITH THE LONGEST CALCULATED COOL-DOWN TIME REQUIREMENT, BUT NO EARLIER THAN 3 HOURS BEFORE THE START OF THE SCHEDULED OCCUPIED PERIOD AND SHALL END AT THE SCHEDULED OCCUPIED START HOUR.
4. UPDATE DDC GRAPHICS TO SHOW CO2 SENSOR READINGS (S1 AND S3), MAX RAD% FROM ITEM 1 ABOVE, OPTIMAL START WARM-UP/COOL-DOWN TIMES FROM ITEMS 2&3 ABOVE.

AHU-4 CONTROL STRATEGY - ALERTON CONTROL SYSTEM

- OUTDOOR AIR DAMPER (OAD) CONTROL
 1. MIN OAD% CONTROL
 - 1.1. CO2 SENSOR S2 TO BE INSTALLED IN AHU4 RETURN AIR DUCT AND CONNECTED TO AHU4 CONTROL PANEL TO MONITOR SPACE CO2 LEVEL.
 - 1.2. CO2 THRESHOLD (AQ2 READING) SETPOINT IS 800 PPM (ADJUSTABLE).
 - 1.3. CONTROL THE MIN OAD SETPOINT TO MAINTAIN CO2 THRESHOLD SETPOINT.
 - 1.3.1. MIN OAD SETPOINT IS ALLOWED TO RESET BASED ON RETURN AIR CO2 LEVELS AND OUTDOOR AIR TEMP.
 - 1.3.2. IF OAT $\geq$ 10C, MIN OAD POSITION RESETS BETWEEN 0-100%.
 - 1.3.3. IF OAT $<$ 10C, MIN OAD POSITION RESETS BETWEEN 0-50%.
 - 1.3.4. IF OAT $<$ 0C, MIN OAD POSITION RESETS BETWEEN 0-20%.
 2. COOLING OPERATION (SPACE TEMP $>$ SUPPLY AIR TEMP SETPOINT)
 - 2.1. FREE COOLING: WHEN OAT $\leq$ SAT SETPOINT, OAD CONTROLS BETWEEN 100%-MIN OAD% TO MAINTAIN THE SAT SETPOINT.
 - 2.2. MECHANICAL COOLING: WHEN OAT $>$ SAT SETPOINT, OAD POSITION = MIN OAD%.
 3. HEATING OPERATION
 - 3.1. MECHANICAL HEATING: WHEN SAT $>$ SPACE TEMP SETPOINT, OAD POSITION = MIN OAD%.
- OPTIMAL START SEQUENCE
 4. SCHEDULE
 - 1.1. REVISE SCHEDULE START TIME TO MATCH WHEN OCCUPANTS ACTUALLY ARRIVE.
 - 1.1. MAX OPTIMAL START TIME IS THE LATER OF TWO HOURS BEFORE SCHEDULED START OR THE EXISTING START TIME.
 2. WARM-UP SEQUENCE
 - 2.1. OAD SHALL BE SET TO 0% DURING WARM-UP.
 - 2.2. FOR EACH ZONE, THE BAS SHALL CALCULATE THE REQUIRED WARM-UP TIME BASED ON THE ZONE'S OCCUPIED HEATING SET POINT, THE CURRENT ZONE TEMP, THE OUTDOOR AIR TEMP, AND A MASS/CAPACITY FACTOR FOR EACH ZONE.
 - 2.2.1. THE MASS FACTOR SHALL BE MANUALLY ADJUSTED OR SELF-TUNED BY THE BAS. IF AUTOMATIC, THE TUNING PROCESS SHALL BE TURNED ON OR OFF BY A SOFTWARE SWITCH TO ALLOW TUNING TO BE STOPPED AFTER THE SYSTEM HAS BEEN TRAINED.
 - 2.2.2. WARM-UP MODE SHALL START BASED ON THE ZONE WITH THE LONGEST CALCULATED WARM-UP TIME REQUIREMENT, BUT NO EARLIER THAN 2 HOURS BEFORE THE START OF THE SCHEDULED OCCUPIED PERIOD AND SHALL END AT THE SCHEDULED OCCUPIED START HOUR.
 3. COOL DOWN SEQUENCE
 - 3.1. NORMAL OAD CONTROL TO BE USED DURING COOL-DOWN (USE FREE COOLING PER ITEM 2.1 ABOVE IF AVAILABLE).
 - 3.2. FOR EACH ZONE, THE BAS SHALL CALCULATE THE REQUIRED COOLDOWN TIME BASED ON THE ZONE'S OCCUPIED COOLING SET POINT, THE CURRENT ZONE TEMP, THE OUTDOOR AIR TEMP, AND A MASS/CAPACITY FACTOR FOR EACH ZONE.
 - 3.2.1. THE MASS FACTOR SHALL BE MANUALLY ADJUSTED OR SELF-TUNED BY THE BAS. IF AUTOMATIC, THE TUNING PROCESS SHALL BE TURNED ON OR OFF BY A SOFTWARE SWITCH TO ALLOW TUNING TO BE STOPPED AFTER THE SYSTEM HAS BEEN TRAINED.
 - 3.2.2. COOL DOWN MODE SHALL START BASED ON THE ZONE WITH THE LONGEST CALCULATED COOL DOWN TIME REQUIREMENT, BUT NO EARLIER THAN 3 HOURS BEFORE THE START OF THE SCHEDULED OCCUPIED PERIOD AND SHALL END AT THE SCHEDULED OCCUPIED START HOUR.
 4. UPDATE DDC GRAPHICS TO SHOW CO2 SENSOR READINGS (S2 AND S3), MIN OAD% FROM ITEM 1 ABOVE, OPTIMAL START WARM-UP/COOL-DOWN TIMES FROM ITEMS 2&3 ABOVE.

AHU-5 CONTROL STRATEGY - BUILDING AUTOMATION SYSTEM

OPTIMAL START SEQUENCE

1. SCHEDULE
 - 1.1. REVISE SCHEDULE START TIME TO MATCH WHEN OCCUPANTS ACTUALLY ARRIVE.
 - 1.2. MAX OPTIMAL START TIME IS THE LATER OF TWO HOURS BEFORE SCHEDULED START OR THE EXISTING START TIME.
2. WARM-UP SEQUENCE
 - 2.1. FOR EACH ZONE, THE BAS SHALL CALCULATE THE REQUIRED WARM-UP TIME BASED ON THE ZONE'S OCCUPIED HEATING SET POINT, THE CURRENT ZONE TEMP, THE OUTDOOR AIR TEMP, AND A MASS/CAPACITY FACTOR FOR EACH ZONE.
 - 2.1.1. THE MASS FACTOR SHALL BE MANUALLY ADJUSTED OR SELF-TUNED BY THE BAS. IF AUTOMATIC, THE TUNING PROCESS SHALL BE TURNED ON OR OFF BY A SOFTWARE SWITCH TO ALLOW TUNING TO BE STOPPED AFTER THE SYSTEM HAS BEEN TRAINED.
 - 2.1.2. WARM-UP MODE SHALL START BASED ON THE ZONE WITH THE LONGEST CALCULATED WARM-UP TIME REQUIREMENT, BUT NO EARLIER THAN 2 HOURS BEFORE THE START OF THE SCHEDULED OCCUPIED PERIOD AND SHALL END AT THE SCHEDULED OCCUPIED START HOUR.
3. UPDATE DDC GRAPHICS TO SHOW OPTIMAL START WARM-UP TIME FROM ITEM 2 ABOVE.

RTU-3 CONTROL STRATEGY - BUILDING AUTOMATION SYSTEM	
1.	ENABLE RTU3 DURING WEEKLY SCHEDULE (TBD) AND AFTER OCCUPANCY IS VERIFIED BY OCCUPANCY SENSOR (OCC1)
2.	USER ROOM TEMPERATURE SETPOINT ADJUSTMENT (T51) LIMITED TO 19-23C.
3.	RTU3 TO RECEIVE CONTROL SIGNAL FROM BAS.
3.1.	SET MINIMUM OUTDOOR AIR DAMPER POSITION TO 10%.
4.	BAS TO RECEIVE FEEDBACK INFORMATION VIA BACNET SIGNAL.
4.1.	NEW GRAPHICS TO SHOW RT, SAT, DX ENABLE, CO2 LEVEL.

DH1 CONTROL STRATEGY - BUILDING AUTOMATION SYSTEM	
1.	DH1 TO BE COMMISSIONED AT 8,000 CFM TO SERVE EXISTING ROD BRIND'AMOUR ARENA. UNIT IS DESIGNED TO SUPPLY 16,000 CFM FOR FUTURE ARENA DESIGN.
2.	ROD BRIND'AMOUR ARENA SETPOINT TO BE CONTROLLED BY DEWPOINT TEMPERATURE. CONTRACTOR TO COORDINATE MONTHLY SETPOINTS WITH POLAR DURING CONSTRUCTION.
3.	THE DEHUMIDIFIER WILL PRIORITIZE ENERGY RECOVERY VIA THE HYDRONIC REGEN PREHEAT COIL (HC1) WHEN AVAILABLE.
4.	THE GAS BURNER WILL SUPPLEMENT THE HYDRONIC COIL TO MAINTAIN THE REACTIVATION TEMPERATURE SETPOINT.
5.	THE DEHUMIDIFIER WILL IMPLEMENT DEMAND CONTROL VENTILATION WHEN PROVIDED INTERIOR CO2 LEVEL SETPOINT. SETPOINT IS CALCULATED BY BMS AS OUTDOOR LEVEL PLUS 700 PPM.
6.	
7.	INTEGRATE DEHUMIDIFIER, SENSORS, AND DAMPERS INTO BUILDING AUTOMATION SYSTEM AND UPDATE GRAPHICS PACKAGE.
7.1.	BAS TO PROVIDE THE FOLLOWING INPUTS TO DH1 VIA BACNET SIGNAL:
7.1.1.	UNIT ENABLE, ARENA RH & TEMP, ARENA CO2, ARENA CO & NO2, ARENA DEWPOINT, INTERIOR CO2 SETPOINT (PER ITEM 5 ABOVE).
7.2.	BAS TO RECEIVE FEEDBACK INFORMATION VIA BACNET SIGNAL:
7.2.1.	O/A/R DAMPER STATUS AND MODULATION, PRE-FILTER PRESSURE DROP, SUPPLY FAN STATUS AND MODULATION, REACT FAN STATUS AND MODULATION, REACTIVATION HEATER MODULATION, DH WHEEL BYPASS DAMPER MODULATION, MIXED AIR TEMP & RH, REACT INLET TEMP, SUPPLY AIR TEMP & RH, SUPPLY AIR DEWPOINT.

DH1 REGEN PREHEAT CONTROL STRATEGY - BUILDING AUTOMATION SYSTEM	
P13	1. ENABLE P13 WHEN DH1 REACT HEATER IS ENABLED AND TT05 > 120F.
P14	2. ENABLE P14 WHEN DH1 REACT HEATER IS ENABLED.

HEAT RECLAIM LOOP CONTROL STRATEGY - BUILDING AUTOMATION SYSTEM	
1.	ADJUST HEAT RECLAIM LOOP SETPOINT (P-203-2020) RANGE:
1.1.	SET MAXIMUM SETPOINT TO 85F.
1.2.	SET MINIMUM SETPOINT TO 75F.

ECH 3(1/2) CONTROL STRATEGY - CIMCO REFRIGERATION PLANT CONTROL SYSTEM 1. CONTROLS UPDATES ARE COMMON TO BOTH CO2 SYSTEMS. 2. CONTROL NEW P9(1/2) WITH SAME STRATEGY AS EXISTING PUMPS P9(1/2) - LABELED PC9 ON CONTROLS GRAPHICS. 2.1. UPDATE PC9 CONTROL SETPOINT TO 140F. 3. UPDATE VM21 SETPOINT TO ALIGN WITH PC9 CHANGES ABOVE.
--

ECH 2(1/2) CONTROL STRATEGY - CIMCO REFRIGERATION PLANT CONTROL SYSTEM	
1.	CONTROLS UPDATES ARE COMMON TO BOTH CO2 SYSTEMS.
2.	UPDATE EXISTING PC12 SETPOINT TO 85F.
3.	UPDATE VM22 SETPOINT TO ALIGN WITH PC12 CHANGES ABOVE.

PRIME CONSULTANT  PHONE 778-700-1086 WEBSITE www.polareng.ca	CONSULTANT	CLIENT 	ENGINEER OF RECORD  EGBC PERMIT TO PRACTICE NUMBER 1003657	PROJECT TITLE STRATHCONA GARDENS RECREATION COMPLEX - DEHUMIDIFIER AND CO2 UPGRADES	REV #	DATE	DRAWN BY	CHECKED BY	DESCRIPTION	PROJ #
					1	2024-10-04	BC	IW	ISSUED FOR REVIEW	2418
					2	2024-11-09	BC	IW	ISSUED FOR TENDER	SHEET SIZE
					3	2025-03-06	AH	NG	RE-ISSUED FOR TENDER	
					4	2025-09-10	AH	BC	RE-ISSUED FOR TENDER	SHEET NAME
					5	-	-	-	-	
					6	-	-	-	-	
DRAWING TITLE CONTROLS										

FILE NAME: 2415-SPD-CO2 AND DEHUMIDIFIER MECHANICAL DRAWINGS-R08.DWG | PLOT DATE: 2025-09-10 | SAVED BY: ADAMHITCHCOUGH