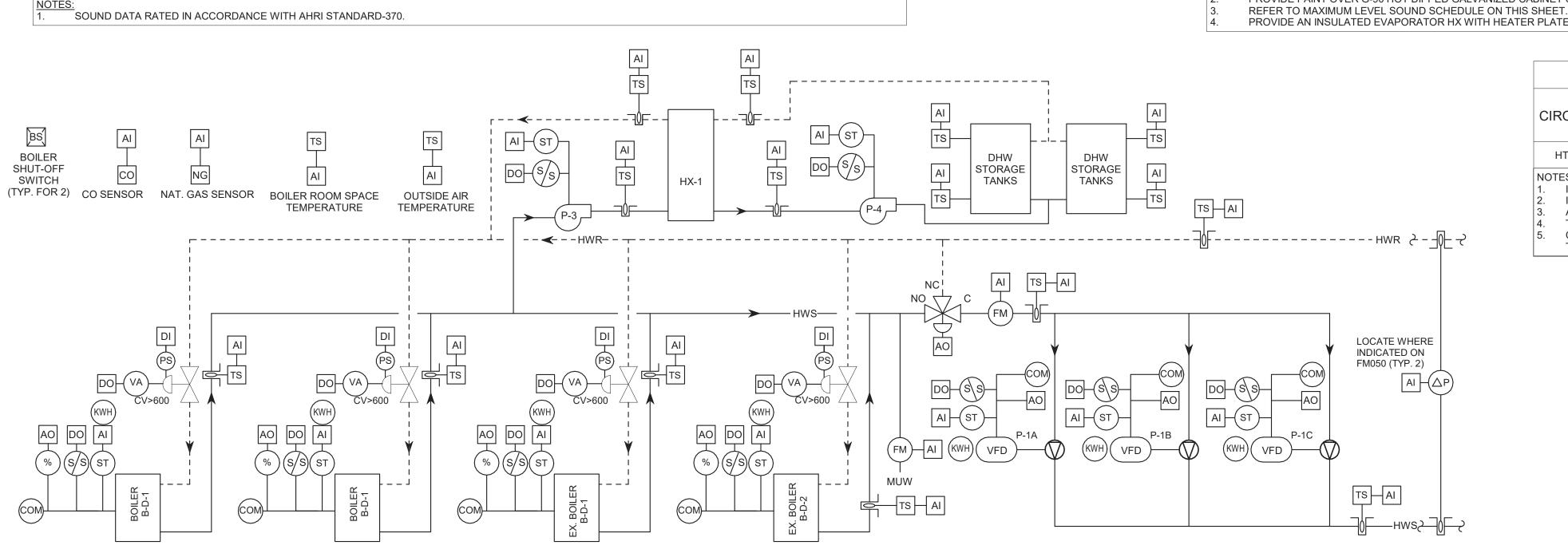


SOUND POWER

63 HZ | 125 HZ | 250 HZ | 500 HZ | 1000 HZ | 2000 HZ | 4000 HZ | 8000 HZ | NOTES

81, 54 85, 58 93, 66 91, 64 92, 65 84, 57 80, 53

MAXIMUM LEVEL SOUND SCHEDULE



#### HEATING PLANT CONTROL

#### BOILER CONTROL:

1. THE EMCS SHALL PROVIDE FUNCTIONAL CONTROL OF THE BOILER SYSTEM

SOUND READING

LOCATION

77, 50

AT UNIT, AT 30 FEET

**UNIT TYPE** 

AIR-COOLED CHILLER

THE BOILER SYSTEM ENABLE INSTRUCTION SHALL BE MANUALLY INPUT FROM THE OWS. THEREAFTER, THE BOILER SYSTEM SHALL FUNCTION AUTOMATICALLY AS CONTROLLED BY THE EMCS, SUBJECT TO OPERATOR OVERRIDE AND BOILER INTERNAL

THE DISABLE INSTRUCTION SHALL ALSO BE MANUALLY INPUT AND DISABLE SEQUENCE SHALL BE THE REVERSE OF ENABLE.

- TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE ALL FIELD CONTROLS WIRING OF BOILER CONTROL PANELS AND
- INTEGRATION INTO THE EMCS. COORDINATE AND RECEIVE INSTRUCTIONS FOR THE BOILER MANUFACTURER'S CONTROLS (LEAD/LAG, BOILER PANELS). UPON FAILURE OF EMCS, BOILER SYSTEM CONTROL SHALL REVERT TO ENABLED INDIVIDUAL BOILER
- WHEN THE BOILER SHUT-OFF SWITCH IS ACTIVATED SHUT OFF THE FUEL SUPPLY AND INITIATE BOILER SHUTDOWN FOR BOTH
- BOILER ROOM VENTILATION:
- A. WHEN THE BOILER ROOM SPACE TEMPERATURE EXCEEDS 75°F (ADJ.), OPEN BOILER ROOM VENTILATION AIR DAMPERS.
- HOT WATER HEATING BOILER OPERATION. START ONE SYSTEM HOT WATER CIRCULATION PUMP.
- PROVIDE SLOW ACTING TWO POSITION, SPRING RETURN, FAIL OPEN, BUTTERFLY CONTROL VALVES TO CONTROL THE FLOW THROUGH EACH BOILER. OPEN ON CALL FOR THAT BOILER TO FIRE AND PROVE OPEN BY MEANS OF AN END SWITCH. TO AVOID "DEAD-HEADING" SYSTEM PUMPS, CONTROL VALVE SERVING BOILER CURRENTLY DESIGNATED AS "LEAD BOILER" SHALL REMAIN OPEN REGARDLESS OF SYSTEM FLOW OR LEAD BOILER FIRING RATE
- WHEN A BOILER CYCLES OFF, LEAVE VALVE OPEN AND CONTINUE CIRCULATING UNTIL THE OUTLET TEMP IS WITHIN 3°F OF THE BOILER RETURN TEMP, THEN CLOSE THE CONTROL VALVE WHILE OFF.

#### BOILER LEAD LAG CONTROL:

CONTROL AND SEQUENCE THE BOILERS TO MAINTAIN THE REQUIRED BOILER OUTPUT AND FLOWRATE WHICH WILL MAINTAIN THE BUILDING HEATING LOOP AT THE REQUIRED TEMPERATURES. PROVIDE CONTROL AS REQUIRED TO MINIMIZE SEEKING AND BURNER CYCLING, COORDINATED WITH BOILER/BURNER MANUFACTURER'S RECOMMENDATIONS. FIRE THE LEAD BOILER TO THE MINIMUM FIRING RATE REQUIRED TO MAINTAIN LOOP TEMPERATURE

AS THE FLOWRATE AND SYSTEM HEATING LOAD INCREASES TO ABOVE THE MINIMUM FIRING RATE OF THE LEAD BOILER AS

- CALCULATED FROM THE MEASURED FLOWRATE AND BOILER TEMPERATURE RISE, PROVE FLOW THROUGH AND FIRE SECOND BOILER SIMULTANEOUSLY. MODULATE THE FIRING RATE OF BOTH BOILERS SIMULTANEOUSLY AT THE MINIMUM RATE WHICH WILL MAINTAIN THE REQUIRED LOOP TEMPERATURE. IF THE FLOWRATE AND SYSTEM HEATING LOAD INCREASES, FOLLOW THE ABOVE SEQUENCE FOR ENABLING THE THIRD AND FOURTH BOILERS ACCORDINGLY. ON A REDUCTION IN DEMAND WHEN THE COMBINED FIRING RATE OF ACTIVE BOILERS IS LESS THAN THEIR COMBINED MINIMUM CAPACITY AS MEASURED BY A RISE IN SUPPLY WATER TEMPERATURE ABOVE SETPOINT IN SPITE OF BOILERS AT LOW FIRE, DE-STAGE THE LAG BOILERS IN ORDER, CLOSE THE RESPECTIVE CONTROL VALVE AS DESCRIBED ABOVE CAUSING ALL FLOW TO GO
- ON A FURTHER REDUCTION IN DEMAND, MODULATE THE LEAD BOILER TO LOW FIRE AND THEN OFF. SHOULD A LEAD BOILER FAIL TO FIRE ON REQUEST, SWITCH THE LEAD BOILER TO LAG AS DESCRIBED ABOVE, FIRE THE NEW LEAD BOILER IMMEDIATELY, AND INITIATE A PROPERLY ANNUNCIATED ALARM CONDITION.

THROUGH THE LEAD BOILER, AND MODULATE IT'S FIRING RATE AS REQUIRED TO MAINTAIN THE LOOP TEMPERATURE.

- SHOULD A LAG BOILER FAIL TO FIRE ON REQUEST, CONTINUE TO FIRE THE LEAD AS REQUIRED, AND INITIATE A PROPERLY ANNUNCIATED ALARM CONDITION. 8. THE CONTROLS SHALL ALTERNATE BOILERS AS DESCRIBED ABOVE, SHALL AUTOMATICALLY ALTERNATE THE LEAD/LAG BOILERS AT
- LEAST ONCE PER WEEK, AND SHALL ALSO PROVIDE FOR MANUAL SWITCHING OF LEAD AND LAG BOILERS. WHEN THE EMCS IS DISABLED, THE BOILERS SHALL OPERATE UNDER CONTROL OF THEIR STANDALONE MODULATING AQUASTATS AND OTHER CONTROLS.

#### BOILER RETURN WATER TEMPERATURE CONTROL:

THE DESIGN MAKE BOILERS SHALL NOT REQUIRE ANY RETURN WATER THERMAL SHOCK TEMPERATURE PROTECTION, AND OPERATE AT INCREASED EFFICIENCY AT LOWER RETURN WATER TEMPERATURE. TWO WAY VALVE MODULATING HEATING CONTROL IS DESIGNED TO AND SHALL BE CONTROLLED TO MAXIMIZE THE TEMPERATURE DROP THROUGH THE SYSTEM CONSISTENT WITH PROVIDING ADEQUATE

#### **BOILER ROOM SAFETIES:**

1. CARBON MONOXIDE AND LP/NATURAL GAS SENSOR CONTROL PROVIDE AND INSTALL CO AND NATURAL GAS SENSORS WITHIN THE BOILER ROOM, WHENEVER EITHER ONE OF THE CONTAMINANT SENSORS INCREASES FROM 10% TO 25% OF ITS THRESHOLD EXPOSURE LIMIT (TEL) SOUND AN AUDIBLE ALARM AND SEND AN ALARM AT THE OPERATOR WORK STATION.

#### BOILER / BUILDING HEATING WATER LOOP SUPPLY TEMPERATURE CONTROL:

- 1. VARY SUPPLY HEATING WATER TEMPERATURE SETPOINT INVERSELY WITH OUTDOOR AIR TEMPERATURE.
- A. SUPPLY TEMPERATURE SHALL VARY INVERSELY WITH OUTDOOR AIR TEMPERATURE FROM 90°F (ADJ.) TO 180°F (ADJ.), AS THE OUTDOOR AIR TEMPERATURE VARIES FROM 55°F (ADJ.) TO -5°F (ADJ.). ABOVE AND BELOW THESE OUTDOOR TEMPERATURES THE
- SUPPLY WATER TEMPERATURE SHALL REMAIN CONSTANT. MODULATE THE BOILER FIRING RATES TO MAINTAIN THE SUPPLY LOOP TEMPERATURE.
- BOILER WATER OUTLET TEMPERATURE SHALL BE SUBJECT TO DOMESTIC HOT WATER TEMPERATURE OVERRIDE (150°F (ADJ.)) AS DESCRIBED BELOW. WHEN THE BOILER TEMPERATURE CALLED FOR BY DOMESTIC WATER HEAT IS HIGHER THAN THAT CALLED FOR BY THE HIGH TEMPERATURE BUILDING LOOP, MODULATE THE THREE WAY VALVE AS REQUIRED TO MAINTAIN BUILDING LOOP TEMPERATURE.
- THE OWS SHALL HAVE INDICATION CAPABILITY FOR OUTDOOR AIR TEMPERATURE, BUILDING SUPPLY HEATING WATER TEMPERATURE, RETURN HEATING WATER TEMPERATURE, AND ALL OTHER INDIVIDUAL HYDRONIC TEMPERATURE SENSORS INSTALLED ON THIS LOOP

#### THE EMCS SHALL CONTROL OPERATION OF THE SYSTEM PUMPS AND CAUSE THE VARIABLE FREQUENCY DRIVES TO VARY THE POWER

- FREQUENCY TO THE BUILDING CHILLED WATER PUMPS. UPON INITIAL CALL FOR HEATING, CONTROL THE LEAD HOT WATER PUMP (P-2A,2B,2C) TO RUN. PUMPS ARE DESIGNED TO RUN
- INDIVIDUALLY UNDER LIGHT TO AVERAGE LOAD CONDITIONS, AND IN PARALLEL UNDER PEAK LOAD CONDITIONS. STAGE AND SEQUENCE THE LEAD LAG OPERATION OF THE PUMPS AS DESCRIBED BELOW:
- ONCE FLOW HAS BEEN PROVEN, ENERGIZE THE LEAD CHILLER TO MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE WITH THE LEAD CHILLER RUNNING AT CAPACITY, AND THE CHILLED WATER TEMPERATURE SETPOINT CANNOT BE MAINTAINED, ENERGIZE
- A MANUAL OVERRIDE AT THE DRIVE SHALL PERMIT TEMPORARY MANUAL ADJUSTMENT OF SUPPLY WATER FLOW. IF THIS OCCURS, THE CONTROL PANEL ALARM SYSTEM SHALL INITIATE A PROPERLY ANNUNCIATED ALARM CONDITION. PROVIDE AUTOMATIC, ADJUSTABLE, PARALLEL AND LEAD-LAG CAPABILITY TO PERMIT SWITCHING BETWEEN CHILLED WATER PUMPS. IF THE LEAD PUMP CANNOT MAINTAIN THE REQUIRED FLOW, THE EMCS SHALL SWITCH LEAD AND LAG PUMPS AND CAUSE AN ALARM TO BE
- QUANTITY OF PUMPS IN OPERATION SHALL VARY AS FOLLOWS: A. WHEN THE OPERATING PUMP(S) RAMP UP TO 55 HZ (ADJ.), ENERGIZE THE NEXT PUMP TO AND RUN ALL PUMPS AT THE SAME
- FREQUENCY OF 35 HZ (ADJ.). B. WHEN THE OPERATING PUMPS RAMP DOWN TO 25 HZ (ADJ.), DE-ENERGIZE ONE LAG PUMP AND RUN OPERATING PUMP AT THE FREQUENCY OF 50 HZ (ADJ.).
- ALARMS SHALL BE PROVIDED AS FOLLOWS: A. HIGH DIFFERENTIAL PRESSURE: IF 25% (ADJ. ) GREATER THAN SETPOINT. B. LOW DIFFERENTIAL PRESSURE: IF 25% (ADJ.) LESS THAN SETPOINT.

#### DOMESTIC HOT WATER CONTROL:

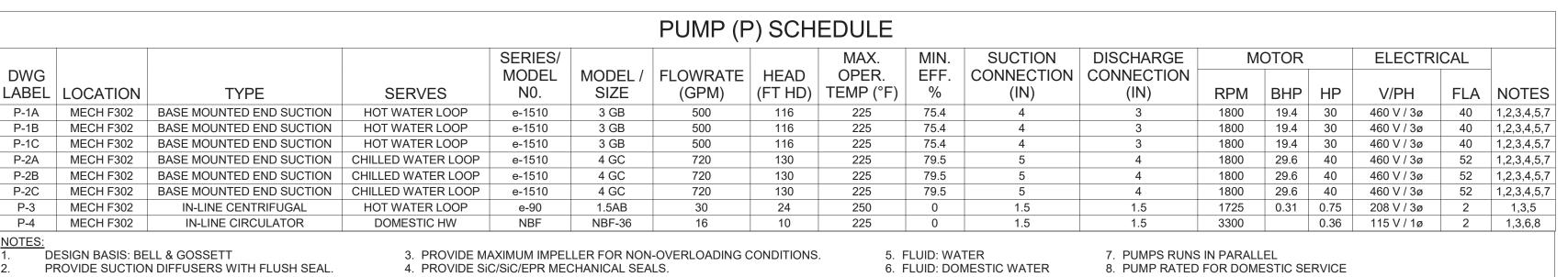
- MONITOR AND CONTROL THE DOMESTIC HOT WATER SERVICE AS FOLLOWS: A. PROVIDE A SYSTEM GRAPHIC SHOWING SCHEMATIC WITH ALL POINTS AND ENABLING THE OWNER TO RESET THE DHW
- STORAGE TANKS DESIGN TEMPERATURES AND RETURN PUMP RUNTIME BASED ON CUSTOMIZED SCHEDULES PROVIDE TEMPERATURE SENSORS IN DOMESTIC WATER STORAGE TANKS. THE BOILER WATER SUPPLY AND RETURN TO AND FROM THE DHW HEAT EXCHANGER HX-1, AND THE FULL TEMPERATURE AS WELL AS REDUCED TEMPERATURE
- C. CONTROL THE HEATING OF THE DOMESTIC HOT WATER TANKS AS FOLLOWS PROVIDE START/STOP CONTROL AND CURRENT SENSING RUN INDICATION FOR THE HEATING WATER PUMP P-3
- SERVING DOMESTIC HOT WATER HEAT EXCHANGER AS WELL AS THE DOMESTIC WATER PUMP P-4 CIRCULATING BETWEEN THE TANKS AND HX-1. PROVIDE TWO DHW TANK TEMPERATURE SENSORS FOR EACH TANK, ONE IN THE TANK NEAR THE BOTTOM AND ONE SURFACE MOUNTED ANALOG SENSOR UNDER THE TANK INSULATION NEAR THE TANK OUTLET. USE THE TANK BOTTOM SENSOR TO CALL FOR TANK HEAT UNLESS THE OUTLET SENSOR RISES TO MORE THAN 10°F
- ABOVE SETPOINT, THEN USE THE AVERAGE OF THE TEMPERATURE READINGS. MAINTAIN THE TEMPERATURE OF THE TANK AT 140° F MINIMUM, BUT ALLOW TANK TEMPERATURE TO DROP TO 130° F BEFORE CALLING FOR PUMP OPERATION AND BOILER HEAT TO AVOID SHORT CYCLING BOILERS. WHEN DHW TANK IS CALLING FOR HEAT, CIRCULATE ONE BOILER MINIMUM, FIRE ITS RESPECTIVE BURNER TO MAINTAIN 155°F MINIMUM BOILER SUPPLY WATER TEMPERATURE, AND CONTROL THE HEAT EXCHANGER PUMPS

#### FUTURE POOL HEATING CONTROL (INFORMATION INCLUDED FOR FUTURE WORK, NIC):

(P-3 & P-4) TO RUN AND HEAT THE DHW TANK.

1. UTILIZE EXISTING POOL TEMPERATURE SENSORS. WHEN POOL TEMPERATURE DROPS BELOW SETPOINT, ENERGIZE (FUTURE) PUMP P-5, AND POSITION EXISTING THREE-WAY CONTROL VALVE FULLY OPEN TO HEAT EXCHANGER.





VARIABLE FREQUENCY DRIVE (VFD) SCHEDULE														
DWG			MOTOR		MOTOR	VOLTAGE	FREQUENCY		NO. OF	CONSTRUCTION				
LABEL	SERVES	MODEL NO.:	HP	AMPERAGE	KW	(V)	(HZ)	UL ENCLOSURE	PULSES	TYPE	NOTES			
VFD P-1A	PUMP P-1A	ACH550-PDR-045A-4	30	44	22.4	460	60	UL Type 1 / NEMA 1	6	PDR = Drive, Disconnect	1,2,3,4			
VFD P-1B	PUMP P-1B	ACH550-PDR-045A-4	30	44	22.4	460	60	UL Type 1 / NEMA 1	6	PDR = Drive, Disconnect	1,2,3,4			
VFD P-1C	PUMP P-1C	ACH550-PDR-045A-4	30	44	22.4	460	60	UL Type 1 / NEMA 1	6	PDR = Drive, Disconnect	1,2,3,4			
VFD P-2A	PUMP P-2A	ACH550-PDR-059A-4	40	59	29.8	460	60	UL Type 1 / NEMA 1	6	PDR = Drive, Disconnect	1,2,3,4			
VFD P-2B	PUMP P-2B	ACH550-PDR-059A-4	40	59	29.8	460	60	UL Type 1 / NEMA 1	6	PDR = Drive, Disconnect	1,2,3,4			
VFD P-2C	PUMP P-2C	ACH550-PDR-059A-4	40	59	29.8	460	60	UL Type 1 / NEMA 1	6	PDR = Drive, Disconnect	1,2,3,4			
NOTES:														

4. OUTPUT CABLE (WHEN CABLE IS GREATER THAN 50 FT)

10. SCCR:65KA.

3. EXTERNAL FILTERS

PROVIDE CHILLER CONTROLLER BACNET INTERFACE

AIR COOLED CHILLER (CH) SCHEDULE																								
			TOT.		COMPRE	ESSOR		UNIT SIZE (IN) DESIGN						ELECTRICAL					OPER.					
DWG			CAP.	CHILLER		COMP.	MIN. FLOW	FLOW	EWT	LWT		WPD				AMB.				N	ЛСА	MOCP	WT.	
LABEL	LOCATION	MODEL	(TONS)	TYPE	TYPE	QTY	(GPM)	(GPM)	(°F)	(°F)	REFRIG.	(FT WG)	L	W	Н	(°F)	IPLV	EER	VOLT.	PH	(A)	(A)	(LB)	NOTES
CH-1	EXTERIOR PAD	AGZ014F	179	AIR-COOLED	SCROLL	6	276	380	54	42	R32	7.40	298	88	99	95	17.8	10.3	460	3	402	450	9927	1,2,3,4,5,6,7,8,9,10
CH-2	EXTERIOR PAD	AGZ014F	179	AIR-COOLED	SCROLL	6	276	380	54	42	R32	7.40	298	88	99	95	17.8	10.3	460	3	402	450	9927	1,2,3,4,5,6,7,8,9,10
NOTES:	NOTES:  1. DESIGN MAKE: DAIKIN  5. PROVIDE FACTORY INSTALLED DISCONNECTS.  8. PROVIDE GROUND FAULT PROTECTION.																							
1	PROVIDE PAINT OVER	=	PPED GALVA	NIZED CABINE	T CONSTRUC	CTION, SAL	T SPRAY 6000 HC	URS.			VARIABLE S											CONVENIEN		

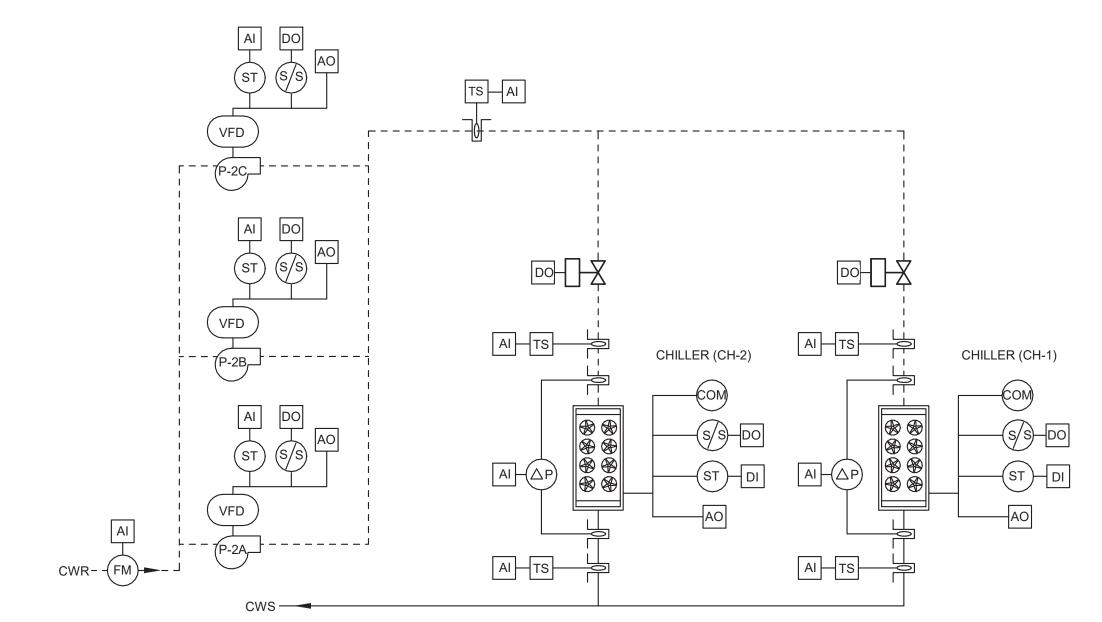
#### PIPE FREEZE PROTECTION HEAT TRACE SCHEDULE PIPE SIZE & WATTS OPERATING V/PH BREAKER LENGTH AT 40F CONTROLLER NOTES CIRCUIT | MANUFACTURER | MODEL # | APPLICATION w/ 30mA GFI STARTUP (FT) 208 V / 1ø RAYCHEM XL-TRACE | 8XLE2-CR | FREEZE PROTECTION | 6" &8" METAL 40F C910-485 1,2,3,4,5

INSTALL IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. XL TRACE INSTALL MANUAL H58033 INSTALL SYSTEM UNDER PIPE INSULATION FOLLOWING MANUFACTURER'S INSTRUCTIONS.

DESIGN MAKE: ABB

**BUILT IN 5% INPUT IMPEDANCE** 

- ACCESSORIES: RAYCLIC CONNECTION KITS FOR POWER CONNECTIONS, TEES/SPLICES AND END SEALS. GT-66 GLASS TAPE & ETL ELECTRIC TRACE LABELS TEST INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION, INCLUDING: RESISTANCE TESTING WITH 2500 VDC MEGOHMMETER AND CAPACITANCE TESTING
- CONFIGURE CONTROLLER FOR AMBIENT SENSING WITH RTD-200 TO TURN ON HEAT TRACE AT 40F. PROVIDE RTD10CS LINE SENSING THERMOSTAT TO MONITOR PIPE TEMPERATURE. EXTEND THERMOSTATS AS REQUIRED FOR PROPER INSTALLATION



#### CHILLER PLANT CONTROLS - SEQUENCE OF OPERATIONS

### CHILLER:

- ENABLE AND DISABLE THE CHILLER BASED ON THE ENERGY MANAGEMENT CONTROL PROGRAM. UPON A CALL FOR MECHANICAL COOLING, OPEN LEAD CHILLER 2-WAY VALVE AND ENABLE LEAD CHILLER LOOP PUMP TO RUN CONTINUOUSLY. PROVIDE NORMALLY OPEN CHILLER CONTROL VALVES TO ALLOW VALVES TO FAIL OPEN FOR DRAINAGE IN WINTER. WHEN FLOW IS PROVEN THROUGH CHILLER LOOP BY THE DIFFERENTIAL PRESSURE SENSOR SET FOR MINIMUM FLOW THROUGH THE CHILLER, ENABLE
- THE CHILLER THROUGH BUILDING CONTROL SYSTEMS AND CHILLER CONTROL PANEL TO MAINTAIN CHILLED WATER SUPPLY TEMPERATURE SETPOINT (ADJUSTABLE). VARY THE SUPPLY TEMPERATURE SETPOINT AS AN ADJUSTABLE LINEAR FUNCTION OF OUTSIDE AIR TEMPERATURE SUCH THAT AT 65°F THE LEAVING CHILLED WATER TEMPERATURE IS 50°F AND AT 95°F THE LEAVING CHILLED WATER TEMPERATURE IS 40°F. IF FLOW IS BELOW MINIMUM CHILLER FLOW, MODULATE OPEN BYPASS VALVE AT END OF PIPING LOOP, ALLOWING PUMPS TO RAMP TO INCREASE SPEED
- AND GPM UNTIL MINIMUM FLOW REQUIREMENTS ARE MET. MODULATE BYPASS VALVES TO BE CLOSED TIGHT AT A SYSTEM FLOW 20 GPM ABOVE CHILLER WITH THE LEAD CHILLER RUNNING AT CAPACITY, AND THE CHILLED WATER TEMPERATURE SETPOINT CANNOT BE MAINTAINED, ENERGIZE TO LAG CHILLER. PROVIDE COM PORT INTERFACE WITH CHILLER. CREATE A GRAPHIC SHOWING AT LEAST FIFTEEN AVAILABLE DATA POINTS WITH DESCRIPTIVE MEANING OF EACH. PROVIDE AN ALARM FOR EACH OF THE FOLLOWING:
  - PUMP FAILURE CHILLED WATER PRESSURE SETPOINT LOW/HIGH LIMITS. CHILLED WATER SUPPLY TEMPERATURE SETPOINT LOW/HIGH LIMITS

## CHILLED WATER RETURN TEMPERATURE SETPOINT LOW/HIGH LIMITS

- THE EMCS SHALL CONTROL OPERATION OF THE SYSTEM PUMPS AND CAUSE THE VARIABLE FREQUENCY DRIVES TO VARY THE POWER FREQUENCY TO THE BUILDING CHILLED WATER PUMPS. UPON INITIAL CALL FOR MECHANICAL COOLING, CONTROL THE LEAD CHILLED WATER PUMP (P-2A,2B,2C) TO RUN. PUMPS ARE DESIGNED TO RUN INDIVIDUALLY UNDER LIGHT TO AVERAGE LOAD CONDITIONS, AND IN PARALLEL UNDER PEAK LOAD CONDITIONS. STAGE AND SEQUENCE THE LEAD LAG
- OPERATION OF THE PUMPS AS DESCRIBED BELOW: ONCE FLOW HAS BEEN PROVEN, ENERGIZE THE LEAD CHILLER TO MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE. A MANUAL OVERRIDE AT THE DRIVE SHALL PERMIT TEMPORARY MANUAL ADJUSTMENT OF SUPPLY WATER FLOW. IF THIS OCCURS, THE CONTROL PANEL
- ALARM SYSTEM SHALL INITIATE A PROPERLY ANNUNCIATED ALARM CONDITION. PROVIDE AUTOMATIC, ADJUSTABLE, PARALLEL AND LEAD-LAG CAPABILITY TO PERMIT SWITCHING BETWEEN CHILLED WATER PUMPS. IF THE LEAD PUMP CANNOT MAINTAIN THE REQUIRED FLOW, THE EMCS SHALL SWITCH LEAD AND LAG PUMPS AND CAUSE AN ALARM TO BE OUTPUT TO THE OWS. QUANTITY OF PUMPS IN OPERATION SHALL VARY AS FOLLOWS:
- WHEN THE OPERATING PUMP(S) RAMP UP TO 55 HZ (ADJ.), ENERGIZE THE NEXT PUMP TO AND RUN ALL PUMPS AT THE SAME FREQUENCY OF 35 HZ WHEN THE OPERATING PUMPS RAMP DOWN TO 25 HZ (ADJ.), DE-ENERGIZE ONE LAG PUMP AND RUN OPERATING PUMP AT THE FREQUENCY OF 50 HZ (ADJ.) WINTER OPERATION:
- CHILLERS AND OUTDOOR PIPING HAS BEEN DRAINED AND SEASONAL BYPASS VALVE IS OPEN WHEN OUTDOOR AIR TEMPERATURE IS BELOW 35°F (ADJ.) ALLOW ONE PUMP TO RUN AT 35 HZ (ADJ.) TO ALLOW PARTIAL FLOW THROUGH TERMINAL COILS FOR FREEZE PROTECTION.
- ALARMS SHALL BE PROVIDED AS FOLLOWS: HIGH DIFFERENTIAL PRESSURE: IF 25% (ADJ. ) GREATER THAN SETPOINT. LOW DIFFERENTIAL PRESSURE: IF 25% (ADJ.) LESS THAN SETPOINT.



# **TEMPERATURE CONTROLS** SYMBOLS LIST

AI ANALOG IN AO ANALOG OUT

(COM) COMMUNICATIONS PORT (CS) AIRBORNE CONTAMINANT SENSOR

DI DIGITAL IN DAMPER MOTOR

DO DIGITAL OUT EMCS ENERGY MANAGEMENT CONTROL SYSTEM

FLOW (WATER/AIR) FLOW METER

AIR FLOW SENSOR FREEZE STAT

**HUMIDITY SENSOR** 

HIGH LIMIT

KWH) KILOWATT HOUR METER

LOW LIMIT MANUAL SWITCH STOP / START

PRESSURE SENSOR

ΔP) DIFFERENTIAL PRESSURE

(PS) POSITION SENSOR

STOP / START SMOKE DETECTOR

START) STARTER T ADJUSTABLE THERMOSTAT

( VFD ) VARIABLE FREQUENCY DRIVE

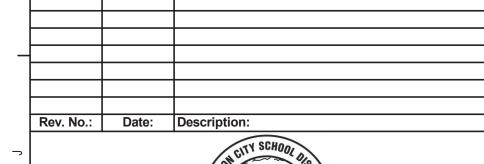
TEMPERATURE SENSOR

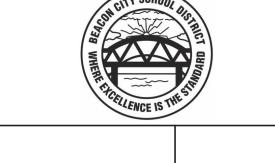
(WS) WATER SENSOR

END SWITCH

BOILER SWITCH

S.E.D. Control No. 13-02-00-01-0-020-01





CLEAR SOLUTIONS Tetra Tech Engineers, Architects & Landscape Architects, P.C.



Beacon City School District Beacon, NY

Reconstruction to: Beacon High School

Schedules and Controls

Drawn By: Drawing Number: DPM/JPF1 03/28/2025 Project No.: 279180-24002.