

**GENERAL NOTES**

- EXISTING BUILDING AUTOMATIC CONTROLS SYSTEM IS A SIEMENS CONTROLS SYSTEM. ALL TIE IN TO OR MODIFICATION OF EXISTING BUILDING CONTROLS SYSTEMS TO BE PERFORMED BY CURRENT CONTROLS PROVIDER.
- PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOUR REQUIRED FOR AUTOMATIC CONTROL OF ALL NEW MECHANICAL SYSTEMS AS INDICATED ON THIS DRAWING, IN THE PROJECT MECHANICAL AND ELECTRICAL SPECIFICATIONS, AND AS REQUIRED BY CODE.
- PROVIDE ALL NEW WIRING AND NEW CONDUIT USED FOR ALL NEW FIELD DEVICES, CONTROLLERS, OR PANELS AND ASSOCIATED EQUIPMENT INSTALLED UNDER THIS CONTRACT
- DECOMMISSION OLD CONTROL SYSTEMS AND DEMOLISH ALL UNUSED MATERIAL AND EQUIPMENT.
- PROVIDE UPDATES TO EXISTING SHOP DRAWINGS AND SEQUENCES OF OPERATION UPON COMPLETION OF ALL WORK AND SUBMIT TO ENGINEER FOR APPROVAL.
- PROVIDE NEW GRAPHICAL INTERFACE DISPLAYS ON THE OPERATOR WORK STATION (OWS) FOR ALL NEW PIECES OF EQUIPMENT INSTALLED. INTERFACE DISPLAYS TO BE REVIEWED AND APPROVED BY ENGINEER. REMOVE ALL OLD GRAPHICAL INTERFACE DISPLAYS FROM SYSTEM.
- ALL WIRING SHALL BE CONTAINED IN METAL CONDUIT.
- TIE INTO EXISTING 24V POWER SOURCE WHERE AVAILABLE. PROVIDE ADDITIONAL TRANSFORMERS ONLY IF REQUIRED.
- TIE INTO EXISTING MAIN BAS CONTROL PANELS. PROVIDE ADDITIONAL PANELS ONLY IF REQUIRED.
- PROVIDE GATEWAY(S) REQUIRED FOR TIE-IN TO EQUIPMENT PANELS WHERE REQUIRED.
- LABEL ALL WIRES, WIRE TERMINATIONS, PANELS, CONTROLLER, JUNCTION BOXES, FIELD DEVICES, ETC. TYPE OF TAGS IN ACCORDANCE WITH MECHANICAL AND ELECTRICAL SPECIFICATION SECTIONS.

**COOLING TOWER SYSTEM**

THERE ARE THREE COOLING TOWERS; EACH ONE DEDICATED TO A CHILLER WITH A DEDICATED CONDENSER WATER PUMP. ONLY ONE OR TWO CHILLER/COOLING TOWER SYSTEMS EVER OPERATE AT ONE TIME IN ORDER TO PROVIDE CHILLED WATER TO THE BUILDING. THE THIRD SYSTEM IS REDUNDANT FOR BACK UP. THE WATER LEVEL IN THE COOLING TOWER SUMP IS MAINTAINED BY A STAND-ALONE ELECTRIC WATER LEVEL CONTROLLER. IN ORDER TO HELP PREVENT STAGNANT WATER ISSUES OF ANY STAND-BY COOLING TOWER SYSTEM, THE RESPECTIVE CONDENSER WATER PUMP SHALL BE AUTOMATICALLY OPERATED FOR A SET AMOUNT OF TIME ON A DAILY BASIS.

**COOLING TOWER SEQUENCE OF OPERATION:**

- ON A CALL FOR CHILLED WATER, EITHER COOLING TOWER PUMP P-97, P-98 AND/OR P-99 SHALL START (REF SEQUENCE OF OPERATION - CHILLERS), THEN THE RESPECTIVE COOLING TOWER FAN VFD'S SHALL BE MODULATED TO MAINTAIN CONDENSER WATER TEMPERATURE SETPOINT OF 18°C AS MEASURED BY TEMPERATURE SENSOR T1. WHEN EITHER COOLING TOWER PUMP P-97, P-98 OR P-99 ARE STOPPED, THEN THE RESPECTIVE COOLING TOWER FAN VFD'S SHALL STOP.
- IF THE CONDENSER WATER TEMPERATURE DROPS BELOW SETPOINT AND THE COOLING TOWER VFD'S HAVE MODULATED OFF, THEN THE 3-WAY DIVERTING VALVE SHALL BYPASS WATER PAST TOWER AND MODULATE TO MAINTAIN A CONDENSER WATER TEMPERATURE SETPOINT OF 18°C AS MEASURED AT TEMPERATURE SENSOR T1. WHEN EITHER COOLING TOWER PUMP P-97, P-98 OR P-99 HAVE BEEN STOPPED, THEN THE 3-WAY DIVERTING VALVE SHALL CLOSE OFF THE BYPASS. TO PREVENT SEIZING OF 3-WAY VALVE THE VALVES SHALL BE CYCLED FROM FULL OPEN TO FULL CLOSE AT A PERIOD OF ONCE PER MONTH AND WHEN THE CONDENSER PUMPS ARE NOT RUNNING.
- IF DURING OPERATION, THE WATER TEMPERATURE AS MEASURED AT TEMPERATURE SENSOR T1 DROPS DOWN TO 13°C, THEN THE RESPECTIVE CHILLER CH-1, CH-2 OR CH-3 SHALL BE DISABLED AND THE RESPECTIVE PUMP P-97, P-98 OR P-99 SHALL STOP.
- IF WATER LEVEL IN THE COOLING TOWER SUMP DROPS BELOW THE LEVEL AS SENSED BY THE LOW WATER LEVEL SENSOR, THEN THE RESPECTIVE CHILLER CH-1, CH-2 OR CH-3 SHALL BE DISABLED AND THE RESPECTIVE PUMP P-97, P-98 OR P-99 SHALL STOP.
- TEMPERATURE AS SENSED FROM TEMPERATURE SENSOR T2 SHALL BE FOR MONITORING ONLY
- IF A COOLING TOWER SYSTEM HAS REMAINED OFF FOR A TIME PERIOD OF GREATER THAN 24 HRS, THEN THE CONDENSER WATER PUMP SHALL RUN FOR A 1 HOUR TIME PERIOD. THE 1 HOUR RUN TIME SHALL OCCUR AS PER A USER ENTERED TIME OF DAY SCHEDULE.
- LOW WATER LEVEL ALARM: COOLING TOWER WATER LEVEL DROPS BELOW THE LOW WATER LEVEL SENSOR AS SENSED BY THE ELECTRIC WATER LEVEL CONTROLLER.
- LOW WATER TEMPERATURE ALARM: CONDENSER WATER TEMPERATURE AS SENSED BY TEMPERATURE SENSOR T1 DROPS BELOW 13°C WHEN CHILLER IS ENABLED.
- HIGH WATER LEVEL ALARM: COOLING TOWER WATER LEVEL RISES ABOVE THE HIGH WATER LEVEL SENSOR AS SENSED BY THE ELECTRIC WATER LEVEL CONTROLLER.
- 3-WAY VALVE ALARM: 3-WAY VALVE IS COMMANDED TO OPEN/CLOSE BUT VALVE FAILS TO MOVE TO POSITION.
- COOLING TOWER FAULT: IF VIBRATION CUT OFF SWITCH OR OTHER SAFETY DEVICE SHUTS DOWN THE TOWER, THEN THE RESPECTIVE CHILLER SHALL BE DISABLED AND THE RESPECTIVE CONDENSER WATER PUMP SHALL STOP, AND A FAULT CONDITION SHALL BE RELAYED TO THE BAS.

**CONDENSER WATER CHEMICAL TREATMENT SYSTEM**

THE WATER TREATMENT IS CONTROLLED BY A STAND-ALONE CHEMICAL CONTROL PANEL WHICH SERVES ALL THREE COOLING TOWER SYSTEMS. THE CHEMICAL CONTROL PANEL IS TIED INTO THE BAS FOR MONITORING ONLY. THE CHEMICAL CONTROL PANEL SHALL MONITOR THE QUANTITY OF MAKE-UP WATER TO EACH COOLING TOWER AND CONTROL THE RESPECTIVE QUANTITY OF CORROSION INHIBITOR CHEMICAL INTRODUCED INTO THE SYSTEM. THE CONTROL PANEL SHALL MONITOR WATER HARDNESS VIA THE CONDUCTIVITY SENSOR AND CONTROL THE RESPECTIVE QUANTITY OF BLOW DOWN WATER (TO DRAIN) VIA THE BLOW DOWN SOLENOID VALVE. ALL PARAMETERS SHALL BE ADJUSTED AND SET BY THE WATER TREATMENT CONTRACTOR.

**CONDENSER WATER CHEMICAL TREATMENT SEQUENCE OF OPERATION:**

- WATER HARDNESS LEVELS SHALL BE MONITORED BY THE BAS
- ALARMS: THE CHEMICAL CONTROL PANEL SHALL RELAY ANY GENERAL ALARMS TO THE BAS.
- FAULTS: THE CHEMICAL CONTROL PANEL SHALL RELAY ANY EQUIPMENT FAULTS TO THE BAS.

**WATER COOLED CHILLERS SYSTEM**

THERE ARE THREE WATER COOLED CHILLERS WHICH PROVIDE CHILLED WATER TO THE MAIN AHU'S THROUGHOUT THE BUILDING. EACH CHILLER HAS A DEDICATED CHILLED WATER PUMP AS PART OF A PRIMARY LOOP, AND CHILLED WATER IS CIRCULATED THROUGHOUT THE BUILDING BY A DOUBLE SET OF CHILLED WATER PUMPS AS PART OF THE SECONDARY LOOP. ONLY ONE OR TWO CHILLER SYSTEMS EVER OPERATE AT ONE TIME IN ORDER TO PROVIDE CHILLED WATER TO THE BUILDING; AND THE THIRD CHILLER IS BACK-UP. EACH CHILLER IS CONTROLLED BY ITS ON-BOARD CONTROLLER.

**WATER COOLED CHILLERS SEQUENCE OF OPERATION:**

- PUMPS P-3 AND P-4 OPERATION SHALL BE DICTATED BY A USER ENTERED COMMAND AND SHALL FOLLOW ANY TIME OF DAY SCHEDULE THAT IS CURRENTLY IN PLACE IN THE EXISTING CONTROL SEQUENCE. PUMPS TO OPERATE IN A 100% REDUNDANT CONFIGURATION ALTERNATING ON A 2 WEEK BASIS AND SHALL BACK EACH OTHER UP IN THE CASE OF FAILURE.
- UPON DEMAND FOR CHILLED WATER, THE LEAD CHILLER SYSTEM SHALL BECOME OPERATIONAL BY FIRST STARTING THE RESPECTIVE CHILLED WATER PUMP AND CONDENSER WATER PUMP, AND THEN UPON CONFIRMATION OF PUMPS OPERATION, THE CHILLER SHALL BE ENABLED THROUGH THE ON-BOARD CHILLER CONTROLLER. ONCE THE LEAD CHILLER IS 40% LOADED (USER ADJUSTABLE VALUE), THEN THE LAG CHILLER SYSTEM SHALL BECOME OPERATIONAL. STAGING OFF IS THE OPPOSITE. THE THIRD CHILLER SYSTEM IS A REDUNDANT SYSTEM FOR BACK UP. EQUAL RUN TIMES OF ALL THREE CHILLER SYSTEMS SHALL BE ACHIEVED BY ALTERNATING THE LEAD AND LAG CHILLER SYSTEMS. THE LAG CHILLER AND PUMPS SHALL BACK UP THE LEAD CHILLER AND PUMPS IN THE EVENT OF FAILURE. IN THIS FAILURE EVENT, THE ORIGINAL LEAD CHILLER AND PUMPS SHALL SHUT DOWN BEFORE THE LAG CHILLER AND PUMPS START UP.
- THE DEMAND FOR CHILLED WATER IS DICTATED WHEN EITHER PUMPS P-3 OR P4 ARE RUNNING. THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT TO BE 5.0°C, AND SHALL BE ADJUSTABLE THROUGH THE BAS.
- THE CHILLED WATER PUMPS SHALL NORMALLY RUN AT A CONSTANT SPEED. THE PUMP VFD'S SHALL BE USED TO SLOWLY RAMP UP/DOWN THE PUMP SPEED WHEN THE PUMPS ARE COMMANDED TO BE STARTED/STOPPED.
- THE BAS SHALL MONITOR ALL TEMPERATURE SENSORS.
- THE BAS SHALL MONITOR CHILLER OPERATING STATUS INCLUDING ALL IN/OUT TEMPERATURES, % DEMAND, COMPRESSOR STATUS, AND OTHER OPERATING VALUES DESIRED BY USER.
- CHILLER ALARMS: THE BAS SHALL REPORT ALL ALARMS FROM THE CHILLER CONTROL PANELS.
- PUMP ALARMS: IF A PUMP FAILS TO START, AN ALARM CONDITION TO BE REPORTED BY THE BAS.
- FAULTS: IF A CHILLER SYSTEM FAILS OFF, THE FAULT CONDITION SHALL BE RELAYED TO THE BAS.

**AIR COOLED CHILLERS SYSTEM**

THERE ARE TWO AIR COOLED CHILLERS WHICH PROVIDE CHILLED WATER TO THE DATA CENTRE AND OTHER CRITICAL EQUIPMENT ROOMS. THEY OPERATE CONTINUOUSLY TO MEET COOLING DEMANDS YEAR ROUND. EACH CHILLER IS SIZED TO MEET THE MAXIMUM COOLING LOAD AND THUS PROVIDING 100% REDUNDANCY. THE CHILLERS INCLUDE A FREE COOLING OPERATING MODE THAT WORKS WHEN OUTDOOR TEMPERATURE DROPS BELOW A CERTAIN VALUE. THE FREE COOLING MODE ALLOWS THE REFRIGERANT TO CIRCULATE BY GRAVITY WITHOUT THE USE OF THE COMPRESSORS. EACH CHILLER IS CONNECTED TO AN AIR COOLED CONDENSER LOCATED OUTDOORS. EACH CHILLER/CONDENSER IS CONTROLLED BY ITS ON-BOARD CONTROLLER. THE CHILLERS, CONDENSERS AND ASSOCIATED PUMPS ARE ALL CONNECTED TO THE BUILDING'S EMERGENCY POWER SYSTEM AND SHALL OPERATE IN THE CASE OF A POWER OUTAGE.

**AIR COOLED CHILLERS SEQUENCE OF OPERATION:**

**DEFINITIONS**

- NORMAL MODE: CHILLERS OPERATE UNDER COMPRESSOR POWER.  
FREE COOLING MODE: CHILLER OPERATE BY GRAVITY FLOW OF LIQUID REFRIGERANT AND COMPRESSORS ARE BYPASSED.
- CHILLER OPERATION NORMAL MODE: WHEN OUTDOOR AIR TEMPERATURE IS ABOVE SETPOINT OF -2°C AS SENSED BY THE OUTDOOR AIR TEMP SENSOR, AND THERE IS A DEMAND FOR CHILLED WATER, THE LEAD CHILLER SYSTEM SHALL BECOME OPERATIONAL BY FIRST STARTING THE RESPECTIVE CHILLED WATER PUMP, AND THEN UPON CONFIRMATION OF PUMP OPERATION, THE CHILLER SHALL BE ENABLED. STAGING OFF IS THE OPPOSITE. THE CHILLER SHALL MAINTAIN A SUPPLY WATER SETPOINT OF 5.0°C AS SENSED BY THE ON BOARD TEMPERATURE SENSOR. THE SECOND CHILLER AND PUMP SYSTEM SHALL OPERATE AS STANDBY IN CASE OF FAILURE OF LEAD CHILLER SYSTEM. LEAD CHILLER CONSIDERED FAILED IF SUPPLY WATER TEMPERATURE AS SENSED BY TEMPERATURE SENSOR T-11 OR T-12 RISES 3°C ABOVE CHILLED WATER SUPPLY SETPOINT OVER A SET AMOUNT OF TIME OR FAILURE OF BOTH LEAD AND LAG CHILLED WATER PUMPS. EQUAL RUN TIMES OF BOTH CHILLER SYSTEMS SHALL BE ACHIEVED BY ALTERNATING THE LEAD AND STANDBY CHILLER SYSTEMS.
  - CHILLER OPERATION FREE COOLING MODE: WHEN OUTDOOR AIR TEMPERATURE DROPS BELOW SETPOINT OF -2°C AS SENSED BY OUTDOOR AIR TEMP SENSOR, AND THERE IS A DEMAND FOR CHILLED WATER, BOTH CHILLER SYSTEMS SHALL BECOME OPERATIONAL BY FIRST STARTING LEAD PUMPS OF BOTH CHILLERS, AND THEN UPON CONFIRMATION OF PUMPS OPERATION, BOTH CHILLERS SHALL BE ENABLED. BOTH CHILLERS SHALL MAINTAIN A SUPPLY WATER SETPOINT OF 5.0°C AS SENSED BY THE ON BOARD TEMPERATURE SENSOR.

- THE CHILLERS SHALL AUTOMATICALLY SWITCH BETWEEN NORMAL MODE AND FREE COOLING MODE AS THE OUTDOOR AIR TEMPERATURE RISES ABOVE AND DROPS BELOW SETPOINT. THE OUTDOOR SWITCHOVER TEMPERATURE SETPOINT OF -2°C SHALL BE USER ADJUSTABLE THROUGH THE BAS.
- FREE COOLING MODE FAILURE WHEN OUTDOOR AIR TEMPERATURE IS -7°C OR HIGHER: UPON FAILURE OF EITHER CHILLER SYSTEM THEN BOTH CHILLER PLANTS SHALL SWITCH BACK TO MECHANICAL COOLING MODE UNTIL EITHER OF THE FOLLOWING CONDITIONS OCCUR: (1) THE OUTDOOR AIR TEMPERATURE DROPS ANOTHER 2°C AT WHICH TIME FREE COOLING MODE SHALL BE INITIATED AGAIN, OR (2) A TIME PERIOD OF 4 HOURS HAS PASSED AT WHICH TIME FREE COOLING MODE SHALL BE INITIATED AGAIN. CHILLER SYSTEM CONSIDERED TO HAVE FAILED IF SUPPLY WATER TEMPERATURE AS SENSED BY TEMPERATURE SENSOR T-11 OR T-12 RISES 3°C ABOVE CHILLED WATER SUPPLY SETPOINT OVER A SET AMOUNT OF TIME, OR FAILURE OF BOTH LEAD AND LAG CHILLED WATER PUMPS.
- FREE COOLING MODE FAILURE WHEN OUTDOOR AIR TEMPERATURE IS LESS THAN -7°C: UPON FAILURE OF ONE OF THE TWO CHILLER SYSTEMS THEN CHILLER FAILURE ALARM SHALL BE GENERATED AND BOTH LEAD AND LAG CHILLER PUMPS OF THE FAILED CHILLER SHALL STOP OPERATING. CHILLER SYSTEM CONSIDERED FAILED IF CHILLER IS NOT RESPONDING TO A CALL FOR COOLING, OR FAILURE OF BOTH LEAD AND LAG CHILLED WATER PUMPS.
- THE DEMAND FOR CHILLED WATER IS DICTATED WHEN ANY OF THE BUILDING PUMPS (P-80, P-81, P-92, P-93, P-90 OR P91) ARE RUNNING.
- THE CHILLER PUMPS SETS P-82/P-83 AND P-62A/P-62B ARE A 100% REDUNDANT CONFIGURATION ALTERNATING ON A 2 WEEK BASIS. THE PUMP VFD'S SHALL BE USED TO SLOWLY RAMP UP/DOWN THE PUMP SPEED WHEN THE PUMPS ARE COMMANDED TO BE STARTED/STOPPED.
- THE BAS SHALL MONITOR ALL TEMPERATURE SENSORS.
- THE BAS SHALL MONITOR CHILLER OPERATING STATUS INCLUDING ALL IN/OUT TEMPERATURES, % DEMAND, COMPRESSOR STATUS, CONDENSER FAN STATUS AND OTHER OPERATING VALUES DESIRED BY OWNER.
- HIGH CHILLED WATER TEMP WARNING ALARM: IF THE CHILLED WATER SUPPLY TEMPERATURE AS SENSED BY TEMPERATURE SENSOR T-8 IS MAINTAINED ABOVE THE CHILLER CHILLED WATER SUPPLY SETPOINT FOR MORE THAN 5 MINUTES, THEN AN ALARM SHALL BE GENERATED.
- HIGH CHILLED WATER TEMP EMERGENCY ALARM: IF THE CHILLED WATER SUPPLY TEMPERATURE AS SENSED BY TEMPERATURE SENSOR T-8 RISES ABOVE THE CHILLER CHILLED WATER SUPPLY SETPOINT BY A DIFFERENCE OF 3°C FOR MORE THAN 2 MINUTES THEN AN ALARM SHALL BE GENERATED.
- HIGH BUILDING WATER TEMP ALARM: IF THE CHILLED WATER SUPPLY TEMPERATURE AS SENSED BY TEMPERATURE SENSOR T-10 EXCEEDS A VALUE OF 8.0°C THEN AN ALARM SHALL BE GENERATED.
- CHILLED WATER TEMPERATURE SENSOR CALIBRATION ALERT: IF TEMPERATURES SENSED BY EITHER SENSOR T-11 OR T-12 ARE DIFFERENT THAN TEMPERATURES SENSED BY THE RESPECTIVE ON BOARD CHILLER TEMPERATURE SENSORS BY MORE THAN 1°C, THEN A CALIBRATION ALERT SHALL BE GENERATED.
- OUTDOOR TEMPERATURE SENSOR CALIBRATION ALERT: IF TEMPERATURES SENSED BY THE TWO OUTDOOR SENSORS ARE DIFFERENT BY MORE THAN 1°C, THEN A CALIBRATION ALERT SHALL BE GENERATED.
- CHILLER ALARMS: THE BAS SHALL REPORT ALL ALARMS FROM THE CHILLER CONTROL PANELS.
- PUMP START ALARMS: IF A PUMP FAILS TO START, AN ALARM CONDITION TO BE REPORTED BY THE BAS.
- PUMP STATUS ALARM: PUMP CONTROLLERS SHALL RELAY ALL STATUS ALARMS TO THE BAS.
- FAULTS: IF A CHILLER SYSTEM FAILS OFF, THE FAULT CONDITION SHALL BE RELAYED TO THE BAS.

**REFRIGERANT ALARM AND PURGE FAN**

IF THE CHILLER SYSTEMS LEAK REFRIGERANT IN THE BUILDING THE REFRIGERANT MONITORING SYSTEM IS DESIGNED TO SENSE THE PRESENCE OF REFRIGERANT IN THE ROOM AND INITIATE AN ALARM AND START THE PURGE FAN. A STROBE LIGHT/ALARM IS LOCATED NEAR EACH DOOR LEADING INTO THE MECHANICAL ROOM IN ORDER TO PROVIDE NOTIFICATION TO BUILDING OPERATIONS STAFF THAT A REFRIGERANT LEAK HAS OCCURRED. ALSO THERE IS A MANUAL PURGE FAN START UP SWITCH NEAR EACH DOOR LEADING INTO THE MECHANICAL ROOM SO THAT BUILDING OPERATORS CAN START UP THE PURGE FAN.

IN THE CASE OF A REFRIGERANT LEAK OUTDOORS FROM THE CONDENSERS, NEAR BY AHU FRESH AIR INTAKE DUCTS COULD DRAW IN THE REFRIGERANT. REFRIGERANT SENSORS IN THE DUCTWORK ARE DESIGNED TO DETECT THE PRESENCE OF REFRIGERANT AND SHUT DOWN THE AHU FANS.

**MECHANICAL ROOM REFRIGERANT ALARM AND PURGE FAN SEQUENCE OF OPERATION:**

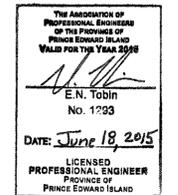
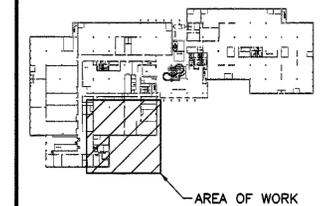
- THE REFRIGERANT MONITORING SYSTEM TO DETECT CONCENTRATION OF REFRIGERANT IN THE MECHANICAL ROOM AND UPON DETECTION OF ANY CONCENTRATION THE PURGE FAN DAMPERS SHALL OPEN, THE PURGE FAN SHALL START AND THE RELIEF AIR INTAKE DUCT DAMPERS SHALL OPEN. FAN SHALL REMAIN IN OPERATION UNTIL MANUALLY SHUT DOWN.
- WHEN ANY OF THE MANUAL PUSH BUTTON SWITCHES, LOCATED OUTSIDE OF EACH DOOR LEADING INTO THE MECHANICAL ROOM, ARE DEPRESSED THEN THE PURGE FAN SHALL START.
- REFRIGERANT ALARM: UPON DETECTION OF REFRIGERANT IN THE MECHANICAL ROOM AN ALARM CONDITION TO BE RELAYED TO THE BAS AND THE LIGHT/ALARM DEVICES SHALL TURN ON.

**IN DUCT REFRIGERANT ALARM SEQUENCE OF OPERATION:**

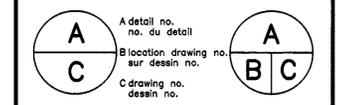
- REFRIGERANT MONITORS TO DETECT CONCENTRATION OF REFRIGERANT IN OUTSIDE AIR DUCT LEADING INTO AHU#2, AHU#3 AND BOILER ROOM MAKE UP FAN. UPON DETECTION OF ANY CONCENTRATION OF REFRIGERANT IN ANY OF THE THREE SYSTEMS, THEN ALL THREE OF THE SYSTEMS SHALL SHUT DOWN.
- REFRIGERANT ALARM: UPON DETECTION OF REFRIGERANT IN THE DUCT LEADING INTO AN AHU, THEN AN ALARM CONDITION TO BE RELAYED TO THE BAS.



**KEYPLAN:**



P3	ISSUED FOR TENDER	JUN 19 2015
P2	ISSUED FOR 100% REVIEW	MAY 4 2015
P1	ISSUED FOR 99% REVIEW	MAR 23 2015
revisions		date

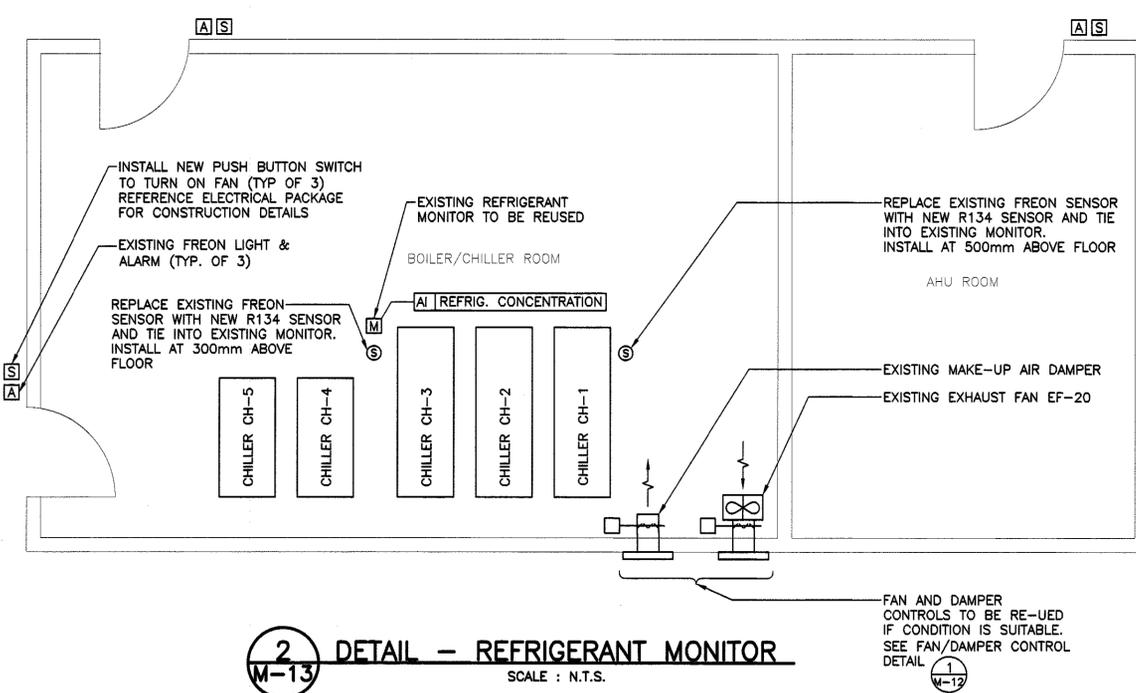


project / projet  
**JOSEPH A GHIZ BUILDING CHILLER PLANT REPLACEMENT**

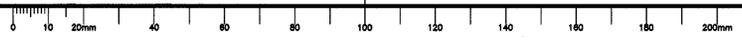
SUMMERSIDE, PEI

**CONTROLS DETAILS & NOTES**

designed/PM	concou
date	JAN, 2015
drawn/TC	dessine
date	JAN, 2015
approved/PM	approuve
date	JAN, 2015
Tender	Soumission
RYAN MCGUIRE	Administrateur de projets TPC
project number	no. du projet
<b>R055258.001</b>	
drawing no.	no. du dessin
<b>M-13</b>	



**2** DETAIL - REFRIGERANT MONITOR  
SCALE : N.T.S.



Plot Scale: