

NOTES:

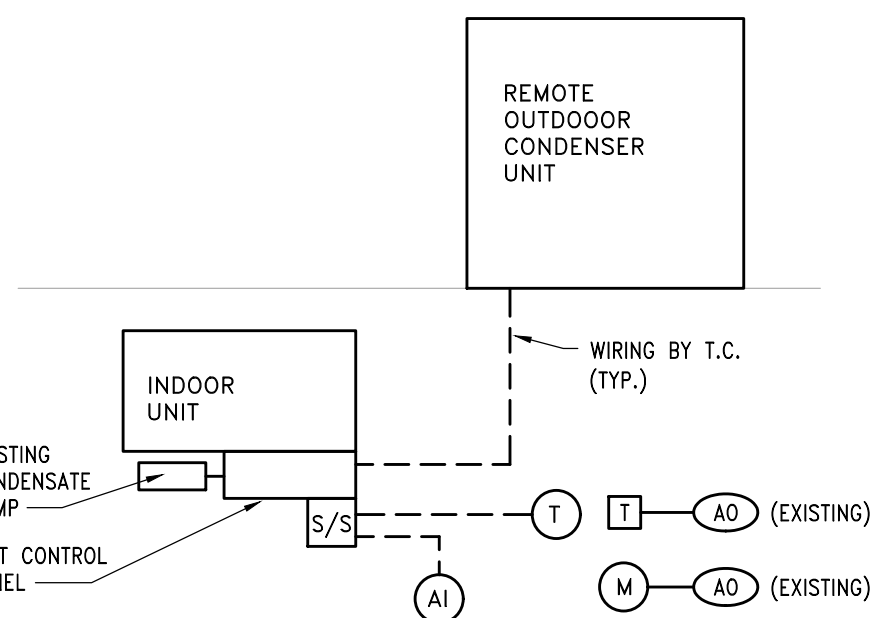
1. LOCATE A SWITCH AT EACH ENTRANCE JUST INSIDE BOILER ROOM. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF ROOM ENTRANCES. COORDINATE SWITCH LOCATION WITH ALL OTHER TRADES.
2. PROVIDE SIGN (NAME PLATE) TO BE PLACED DIRECTLY ABOVE OR BELOW EACH PUSH BUTTON SWITCH THAT READS: "EMERGENCY BOILER SHUTDOWN".
3. SUPPLY POWER TO CONTROL RELAY FROM EMERGENCY POWER CIRCUIT. REFER TO ELECTRICAL PANEL SCHEDULES AND COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY.
4. WIRE BOILERS' CONTROL CIRCUITS (POWER FROM SECONDARY SIDE OF CONTROL TRANSFORMERS) THRU NORMALLY OPEN RELAY CONTACTS. TCC SHALL COORDINATE EXACT WIRING AND TERMINATION REQUIREMENTS WITH BOILER MANUFACTURER.
5. MOUNT SHUTDOWN CONTROL RELAYS AT RESPECTIVE BOILER CONTROL PANELS.
6. PROVIDE PUSH BUTTON SWITCH (PUSH TO LATCH - TURN KEY OR PULL TO RELEASE) WITH MUSHROOM HEAD OPERATOR AND NORMALLY CLOSE (NC) CONTACTS. PROVIDE WITH PROPER ENCLOSURE.

SEQUENCE OF OPERATION:

UNDER NORMAL OPERATING CONDITIONS THE CIRCUIT SHALL BE ENERGIZED AND THE RELAYS NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED. WHEN A SWITCH IS PUSHED (LATCHED) THE RELAY CONTACTS SHALL OPEN AND INTERRUPT EVERY BOILER'S CONTROL CIRCUIT. WHEN SWITCH IS RELEASED, THE RELAY SHALL BE ENERGIZED AND ITS NORMALLY OPEN CONTACTS SHALL CLOSE, ENERGIZING EVERY BOILER'S CONTROL CIRCUIT.

DDC SHALL ACTIVATE AN ALARM WHEN REMOTE SWITCH HAS BEEN PUSHED.

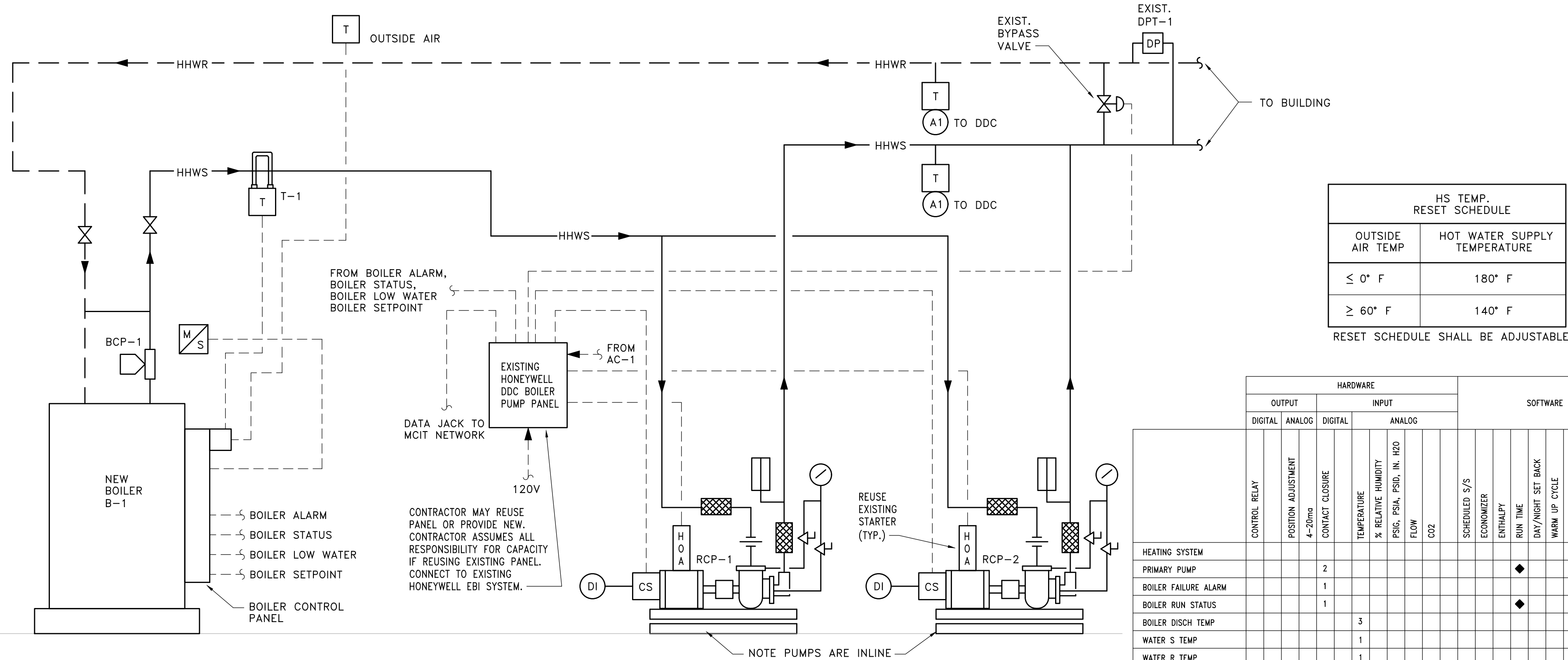
REMOTE BOILER
EMERGENCY SHUTDOWN WIRING
NO SCALE



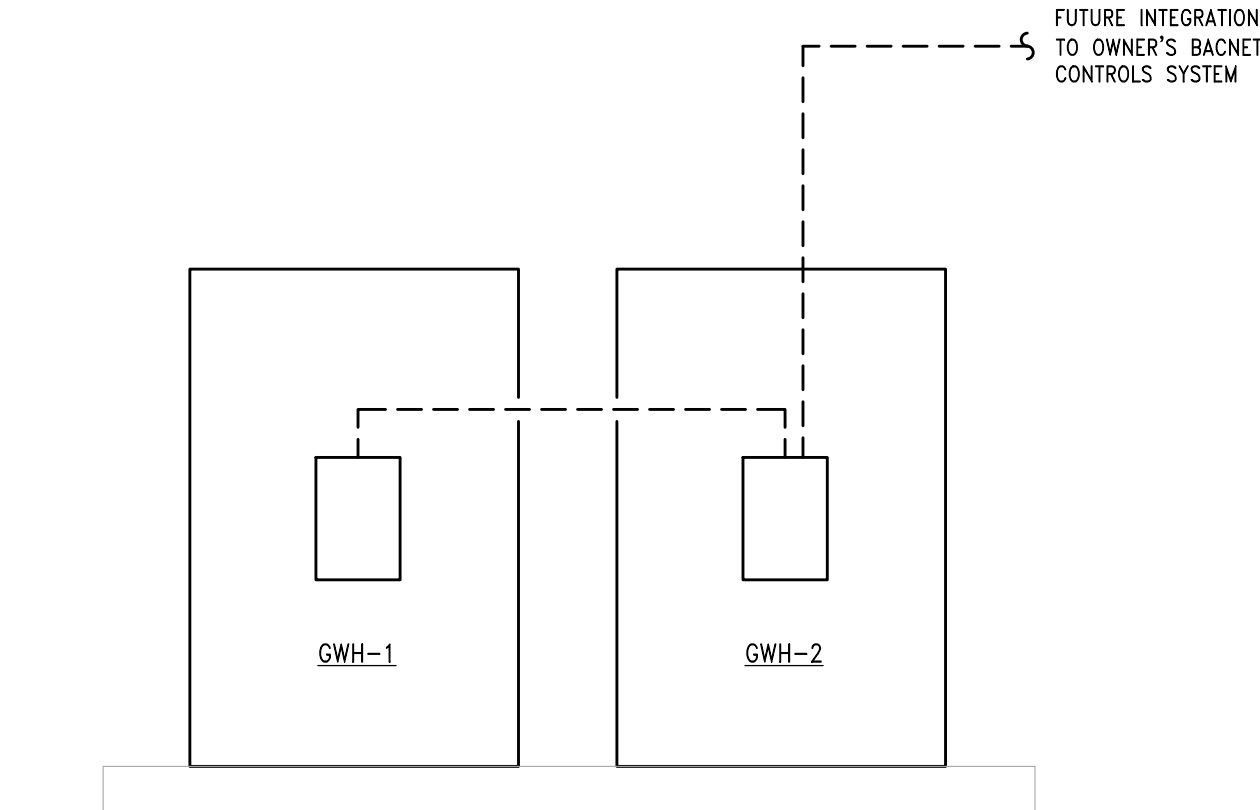
NOTES:

1. TO CONTRACTOR SHALL PROVIDE FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE REMOTE CONDENSER. REFER TO MECH FLOOR PLANS FOR LOCATION OF UNITS.
2. TO CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.
3. EXISTING ASI TEMPERATURE HIGH LEVEL ALARM AND MOISTURE ALARM MOUNTED ON FLOOR BELOW UNIT SHALL CONTINUE ALARM TO DDC. MOISTURE ALARM SHALL SHUT DOWN AC UNIT. INTEGRATE WITH CONTACT.
4. EXISTING CONDENSATE PUMP HAS SELF CONTAINED LEVEL CONTROL. POWER PUMP FROM AC UNIT. PROVIDE ALL REQUIRED TRANSFORMERS, WIRING, ETC...

PACKAGED ACCU FIELD
WIRING & CONTROL - AC-1(N)
NO SCALE



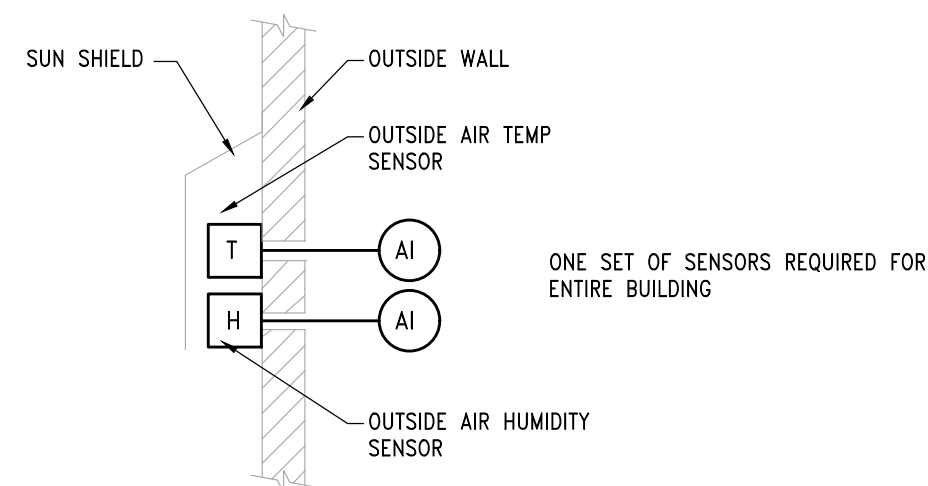
HOT WATER HEATING SYSTEM CONTROL
NO SCALE



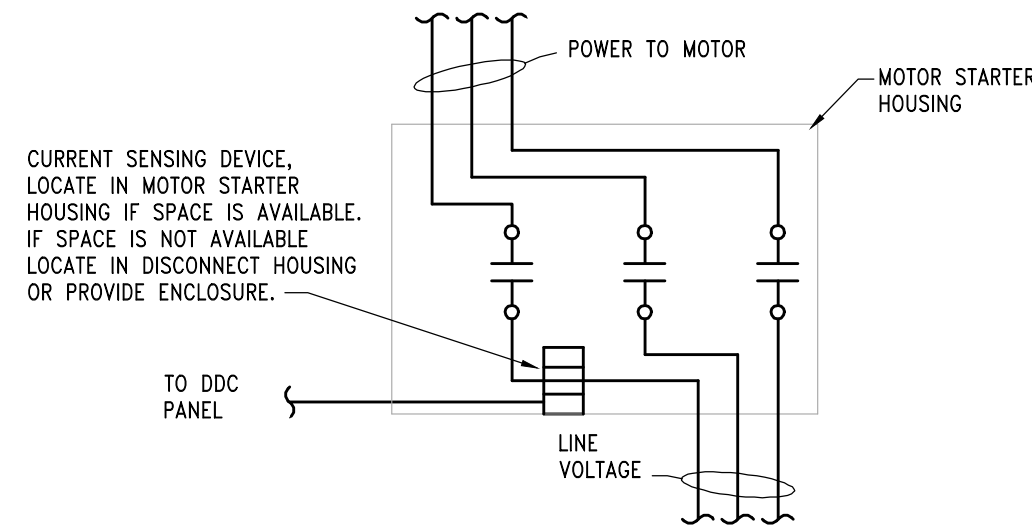
SEQUENCE OF OPERATION:

SELF-CONTAINED CONTROL SYSTEM SEQUENCES WATER HEATERS TO MAXIMIZE EFFICIENCY AND TO MAINTAIN 140°F SUPPLY. PROVIDE COMMUNICATION LINK BETWEEN WATER HEATERS IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS.

DOMESTIC WATER HEATER CONTROL DIAGRAM
NO SCALE



OUTDOOR AIR SENSOR INSTALLATION DETAIL
NO SCALE



CURRENT SWITCH INSTALLATION DETAIL
NO SCALE

HS TEMP. RESET SCHEDULE	
OUTSIDE AIR TEMP	HOT WATER SUPPLY TEMPERATURE
≤ 0° F	180° F
≥ 60° F	140° F

RESET SCHEDULE SHALL BE ADJUSTABLE

	HARDWARE				SOFTWARE							
	OUTPUT		INPUT									
	DIGITAL	ANALOG	DIGITAL	ANALOG								
	CONTROL RELAY	POSITION ADJUSTMENT 4-20ma	CONTACT CLOSURE	TEMPERATURE % RELATIVE HUMIDITY PSSC, PSSA, PSSD, IN, H2O FLOW CO2	SCHEDULED %/S	ECONOMIZER	ENTHALPY	RUN TIME	DAY/NIGHT SET BACK WARM UP CYCLE	SMOKE CONTROL	TREND LOG CAPABILITY	SYSTEM GRAPHICS
HEATING SYSTEM												◆
PRIMARY PUMP			2					◆				
BOILER FAILURE ALARM			1									
BOILER RUN STATUS			1					◆				
BOILER DISCH TEMP				3							◆	
WATER S TEMP				1								
WATER R TEMP				1							◆	
BOILER E-STOP			1									
BYPASS (EXISTING)		1		1								

HOT WATER HEATING SEQUENCE OF OPERATION:

SYSTEM SHALL INTEGRATE WITH EXISTING HONEYWELL EBI SYSTEM.

NOTE: ALL SETPOINTS AND TIME INTERVALS SETPOINTS DESCRIBED IN THE SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS).

HEATING HOT WATER SYSTEM CIRCULATING PUMPS RCP-1 & RCP-2 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. THE HAND-OFF-AUTO SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. THE OTHER WILL SERVE AS STAND-BY.

DDC SHALL ALTERNATE PUMP OPERATION BASED ON RUNTIME HOURS OR AT THE BEGINNING OF EACH MONTH - OPERATOR SELECTABLE.

DDC SHALL MONITOR OPERATING STATUS OF EACH PUMP THRU ITS RESPECTIVE CURRENT SWITCH. UPON PUMP FAILURE, DDC SHALL ACTIVATE A FAILURE ALARM AND AUTOMATICALLY START THE STAND-BY PUMP.

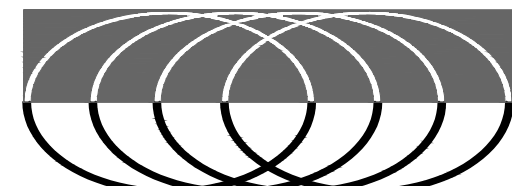
THE BOILER HAS AN ONBOARD CONTROL PANEL THAT CONTROLS BOILER OPERATION. BCP-1 IS STARTED AND STOPPED THRU THE BOILER CONTROL PANEL AND RUNS WHEN THE BOILER IS ON. THE MASTER PANEL SHALL MODULATE THE BOILER GAS CONTROL VALVE AS REQUIRED TO MAINTAIN HHW SUPPLY TEMP (T-1) SETPOINT AND MAXIMIZE ENERGY EFFICIENCY.

DDC SHALL MONITOR BOILER STATUS AND BOILER ALARM THRU DDC INTERFACE OR HARD WIRED INTERLOCKS IN THE BOILER CONTROL PANEL.

A (0-10) VAC SIGNAL SHALL CHANGE BOILER SETPOINT THRU THE DDC.

THE EMERGENCY STOP PUSH BUTTON(S), LOCATED AT EACH BOILER ROOM DOOR(S), DEACTIVATES BOILER WHENEVER THE PUSH BUTTON IS ACTIVATED. THE BOILERS REMAIN DE-ACTIVATED UNTIL THE PUSH BUTTON(S) IS MANUALLY RESET.

THE EXISTING BYPASS VALVE MODULATES TO LIMIT SYSTEM DIFFERENTIAL PRESSURE AS SENSED BY EXISTING DPT-1.



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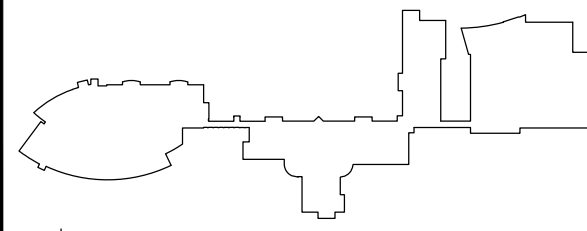
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AS BUILT DRAWINGS	
AS BUILTS ARE BASED ON CONTRACTOR MARK-UPS	
RECORD DRAWINGS	05/01/2017
CONSTRUCTION	05/03/2016
BIDS	03/02/2016
95% CD REVIEW	02/08/2016
DESIGN DEVELOPMENT	12/23/2015
MARK ISSUED FOR/REVISIONS	DATE

East Ann Arbor
Infrastructure
Improvements



East Medical Campus
University Of Michigan
Ann Arbor, MI

SHEET TITLE

Temperature
Controls

SHEET NO.

M-300