I/O SUMMARY TABLE

PROJECT:
GRAND JUNCTION VAMC
REPLACEMENT OF ABSORPTION CHILLER

SYSTEM/POINT DESCRIPTION	QUANTITY REQUIRED	GRAPHIC DISPLAY	HARDWARE – OUTPUT – DIGITAL: CONTROL RELAY (INSTANTANEOUS)	CONTROL RELAY (LATCHING)	OFF/AUTO	OPEN/CLOSE	OUTPUT – ANALOG: 4-20 MILLIAMP	CONTROL POINT ADJUSTMENT	POSITION ADJUSTMENT	ELECTRIC-PNEUMATIC TRANSDUCER	INPUT – DIGITAL: PRESSURE SWITCH	DIFFERENTIAL PRESSURE SWITCH	THERMOSTAT	CURRENT SWITCH	AUXILIARY CONTACT	STATUS CONTACT	FLOW SWITCH	PULSE	INPUT – ANALOG: TEMPERATURE	HUMIDITY	LEVEL	PRESSURE	FLOW	CONDUCTIVITY	POSITION FEEDBACK	ALARMS – DIGITAL: CURRENT	CONTACT CLOSURE	SAFETY SHUTDOWN	ALARMS – ANALOG: HIGH LIMIT	LOW LIMIT	RUN TIME	SOFTWARE – APPLICATION PROGRAMS: SCHEDULED START/STOP	OPTIMUM START/STOP	EVENT	TEMPERATURE CONTROL	DAYNIGHT SETBACK	ECONOMIZER	LEVEL CONTROL	CONDENSER WATER RECIRCULATION	HUMIDITY CONTROL	SETPOINT TEMPERATURE RESET	CHILLER DEMAND LIMIT	CONDUCTIVITY CONTROL	PRESSURE CONTROL	FLOW CONTROL	ENERGY MONITORING	ALARM INSTRUCTION	LOGS: ALL POINTS LOG	ALARM SUMMARY LOG	STATUS SUMMARY LOG	TIME EVENT LOG	TREND LOG	POWER FAILURE MODE	COMMUNICATIONS FAILURE MODE	NEW (N)/EXISTING (E) POINT	REMARKS
CHILLERS (9-SCU-1 & 9-ACU-1)																																																										
CHILLER (9–SCU–1 & 9–ACU–1) ENABLE/DISABLE	2	Y		X																													X	X												X			X		C	N	E	
CHILLER (9–SCU–1 & 9–ACU–1) STATUS	2	Y															X									X					X												X	X		X		X			E	
CHILLER (9–SCU–1 & ACU–1) ALARM	1	Y															X									X							X										X	X	X			X			E	
CHILLER (9–SCU–1 & 9–ACU–1) CHILLED WATER SUPPLY SETPOINT TEMPERATURE	2	Y																	X									X	X			X					X						X	X	X			X			E	
CHILLER (9–SCU–1 & 9–ACU–1) PERCENT LOAD	2	Y																																																		N	THRU COMMUNICATIONS INTERFACE.
CHILLER (9–SCU–1 & 9–ACU–1) KW DEMAND	2	Y																																																		N	THRU COMMUNICATIONS INTERFACE.
CHILLER (9–SCU–1 & 9–ACU–1) TONAGE	2	Y																																																		N	THRU COMMUNICATIONS INTERFACE.
CHILLER (9–SCU–1 & 9–ACU–1) CHILLED WATER ISOLATION VALVE CONTROL	2	Y					X																								X													X	X	X	X					E	RELOCATE EXISTING VALVE AS REQUIRED.
CHILLER (9–SCU–1 & 9–ACU–1) CHILLED WATER ISOLATION VALVE STATUS	2	y															X									X					X												X	X	X	X					E	RELOCATE EXISTING VALVE AS REQUIRED.
CHILLER (9–SCU–1 & 9–ACU–1) CHILLED WATER SUPPLY TEMPERATURE	2	Y																		X									X	X			X				X						X	X	X			X			E	RELOCATE EXISTING DEVICE AS REQUIRED.
CHILLER (9–SCU–1 & 9–ACU–1) CONDENSER WATER RETURN TEMPERATURE	2	Y																		X									X	X			X										X	X	X			X			E	RELOCATE EXISTING DEVICE AS REQUIRED.
CHILLER (9–SCU–1) ALL AVAILABLE POINTS	1																																																			N	BACNET INTEGRATION.
CHILLER (9–SCU–1) CHILLED WATER RETURN TEMPERATURE	1	Y																		X									X	X			X										X	X	X			X			E	RELOCATE EXISTING DEVICE AS REQUIRED.
CHILLER (9–SCU–1) CHILLED WATER FLOW	1	Y																				X							X	X			X									X	X	X	X	X			X			N	PROVIDE NEW MAGNETIC FLOW METER.
CHILLER (9–SCU–1) HEAD PRESSURE	1	Y																					X						X	X			X									X		X	X	X	X	X			E	
CHILLER (9–SCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–13A) CONTROL	1	Y					X																						X		X		X								X			X	X	X	X					N	PROVIDE NEW VALVE.
CHILLER (9–SCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–13A) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X			X	X		N	PROVIDE NEW VALVE.
CHILLER (9–SCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–13B) CONTROL	1	Y					X																						X		X		X								X			X	X	X	X					E	EXISTING VALVE TO BE RELOCATED.
CHILLER (9–SCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–13B) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X			X	X		E	EXISTING VALVE TO BE RELOCATED.
CHILLER (9–SCU–1) CONDENSER WATER FLOW	1	Y																					X						X	X			X									X	X	X	X	X			X			N	PROVIDE NEW MAGNETIC FLOW METER.
CHILLER (9–ACU–1) ALL AVAILABLE POINTS	1	Y																																																		E	MODBUS INTEGRATION.
CHILLER (9–ACU–1) CONDENSER WATER ISOLATION VALVE (CV–12) CONTROL	1	Y			X																								X		X													X	X	X	X					E	
CHILLER (9–ACU–1) CONDENSER WATER ISOLATION VALVE (CV–12) STATUS	1	y															X									X					X												X	X	X	X	X				E	
CHILLERS (9-CCU-1)																																																										
ALL AVAILABLE POINTS FROM CHILLER (9–CCU–1) UNIT CONTROL PANEL	1	Y																																																		N	BACNET INTEGRATION.
CHILLER (9–CCU–1) ENABLE/DISABLE	1	Y		X																									X	X														X		X		C	N	N	
CHILLER (9–CCU–1) STATUS	1	Y															X									X					X												X	X		X		X			N	
CHILLER (9–CCU–1) ALARM	1	Y															X									X							X										X	X	X			X			N	
CHILLER (9–CCU–1) CHILLED WATER SUPPLY SETPOINT TEMPERATURE	1	Y																	X									X	X			X				X						X	X	X			X			N	
CHILLER (9–CCU–1) PERCENT LOAD	2	Y																																																		N	THRU COMMUNICATIONS INTERFACE.
CHILLER (9–CCU–1) KW DEMAND	2	Y																																																		N	THRU COMMUNICATIONS INTERFACE.
CHILLER (9–CCU–1) TONAGE	2	Y																																																		N	THRU COMMUNICATIONS INTERFACE.
CHILLER (9–CCU–1) HEAD PRESSURE	1	Y																					X						X													X	X	X	X	X	X			N	
CHILLER (9–CCU–1) CHILLED WATER ISOLATION VALVE CONTROL	1	Y					X																						X		X													X	X	X	X					N	
CHILLER (9–CCU–1) CHILLED WATER ISOLATION VALVE STATUS	1	y															X									X					X												X	X	X	X	X				N	
CHILLER (9–CCU–1) CHILLED WATER SUPPLY TEMPERATURE	1	Y																	X									X	X			X				X						X	X	X			X			N	
CHILLER (9–CCU–1) CHILLED WATER RETURN TEMPERATURE	1	Y																	X									X	X			X				X						X	X	X			X			N	
CHILLER (9–SCU–1) CHILLED WATER FLOW	1	Y																				X							X	X			X									X	X	X	X	X			X			N	
CHILLER (9–CCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–11A) CONTROL	1	Y					X																						X		X												X	X	X	X	X				N	PROVIDE NEW VALVE.
CHILLER (9–CCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–11A) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X	X	X				N	PROVIDE NEW VALVE.
CHILLER (9–CCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–11A) CONTROL	1	Y					X																						X		X												X	X	X	X	X				N	PROVIDE NEW VALVE.
CHILLER (9–CCU–1) CONDENSER WATER HEAD PRESSURE VALVE (CV–11A) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X	X	X				N	PROVIDE NEW VALVE.
CHILLER (9–CCU–1) CONDENSER WATER RETURN TEMPERATURE	1	Y																	X										X	X			X										X	X	X			X			N	PROVIDE NEW DEVICE.
CHILLER (9–CCU–1) CONDENSER WATER FLOW	1	Y																				X							X	X			X									X	X	X	X	X			X			N	PROVIDE NEW MAGNETIC FLOW METER.
HEAT EXCHANGER (9-HX-1)																																																										
HEAT EXCHANGER (9–HX–1) CHILLED WATER ISOLATION VALVE CONTROL	1	Y			X																								X		X		X									X	X	X	X	X				E	EXISTING VALVE TO BE REMOVED.
HEAT EXCHANGER (9–HX–1) CHILLED WATER ISOLATION VALVE STATUS	1	Y															X									X					X												X	X	X	X	X				E	EXISTING VALVE TO BE REMOVED.
HEAT EXCHANGER (9–HX–1) CHILLED WATER BYPASS MIXING VALVE (CV–1) CONTROL	1	Y					X																																		X				X	X	C	N	N	PROVIDE NEW VALVE.
HEAT EXCHANGER (9–HX–1) CHILLED WATER BYPASS MIXING VALVE (CV–1) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X			X	X		N	PROVIDE NEW VALVE.
CHILLED WATER RETURN TEMPERATURE (TE–2) DOWNSTREAM OF HEAT EXCHANGER (9–HX–1)	1	Y																	X										X	X			X					X						X	X			X			E	RELOCATE EXISTING DEVICE AS REQUIRED.
HEAT EXCHANGER (9–HX–1) CHILLED WATER DIFFERENTIAL PRESSURE	1	Y																				X							X	X			X									X	X	X			X			N	PROVIDE NEW DEVICE.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER ISOLATION VALVE CONTROL	1	Y			X																								X		X		X									X	X	X	X					E	EXISTING CONTROL VALVE TO BE REMOVED.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER ISOLATION VALVE STATUS	1	y															X									X					X												X	X	X	X	X				E	EXISTING CONTROL VALVE TO BE REMOVED.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER SERIES/PARALLEL VALVE (CV–2) CONTROL	1	Y					X																						X												X			X	X	C	N	N	PROVIDE NEW VALVE.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER SERIES/PARALLEL VALVE (CV–2) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X			X			N	PROVIDE NEW VALVE.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER VALVE (CV–3) CONTROL	1	Y					X																						X												X			X	X	C	N	N	PROVIDE NEW VALVE.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER VALVE (CV–3) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X			X			N	PROVIDE NEW VALVE.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER RETURN TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	EXISTING DEVICE TO BE RELOCATED.
HEAT EXCHANGER (9–HX–1) CONDENSER WATER DIFFERENTIAL PRESSURE	1	Y																				X							X	X			X										X	X	X			X			N	PROVIDE NEW DEVICE.
PRIMARY CHILLED WATER LOOP																																																										
PRIMARY LOOP CHILLED WATER FLOW	1	Y																				X							X	X			X										X	X	X	X		X			E	REMOVE EXISTING TURBINE METER.
PRIMARY LOOP CHILLED WATER RETURN TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	REMOVE EXISTING DEVICE.
PRIMARY LOOP CHILLED WATER FLOW	1	Y																				X							X	X			X									X	X	X	X	X		X			E	PROVIDE NEW MAGNETIC FLOW METER.
PRIMARY LOOP CHILLED WATER RETURN TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	PROVIDE NEW DEVICE (MATCHED PAIR).
PRIMARY LOOP CHILLED WATER SUPPLY TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			N	PROVIDE NEW DEVICE (MATCHED PAIR).
SECONDARY CHILLED WATER LOOP																																																										
SECONDARY CHILLED WATER FLOW	1	Y																				X							X	X			X										X	X	X	X		X			E	REMOVE EXISTING TURBINE FLOW METER.
SECONDARY CHILLED WATER SUPPLY TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	REMOVE EXISTING DEVICE.
SECONDARY CHILLED WATER RETURN TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	REMOVE EXISTING DEVICE.
SECONDARY CHILLED WATER FLOW	1	Y																				X							X	X			X										X	X	X	X		X			N	PROVIDE NEW MAGNETIC FLOW METER.
SECONDARY CHILLED WATER SUPPLY TEMPERATURE (TE–3)	1	Y																	X										X	X			X					X						X	X			X			N	PROVIDE NEW TEMPERATURE SENSOR
SECONDARY CHILLED WATER RETURN TEMPERATURE (TE–1)	1	Y																	X										X	X			X					X						X	X			X			N	PROVIDE NEW TEMPERATURE SENSOR
BRIDAL LOOP CHILLED WATER FLOW	1	Y																				X							X	X			X								X	X	X	X	X	X			N	PROVIDE NEW MAGNETIC FLOW METER.
CAMPUS CHILLED WATER FLOW	1	Y																				X							X	X			X										X	X	X			X			E	CONNECTED TO THE CAMPUS METERING SYSTEM.
CAMPUS CHILLED WATER SUPPLY TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	CONNECTED TO THE CAMPUS METERING SYSTEM.
CAMPUS CHILLED WATER RETURN TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	CONNECTED TO THE CAMPUS METERING SYSTEM.
PRIMARY CHILLED WATER PUMPS (9-P-1, 2 & 3)																																																										
ALL AVAILABLE POINTS FROM PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) VFD'S	3	Y																																																		N	BACNET INTEGRATION.
PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) START/STOP	3	Y	X																														X											X			X		C	N	N	HARDWIRED TO BAS.
PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) SPEED CONTROL	3	Y					X																																			X			X		C	N	N	HARDWIRED TO BAS.
PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) CURRENT	3	Y																							X			X	X	X			X									X	X	X	X		X			N	BACNET INTEGRATION.
PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) FAULT ALARM	3	Y														X										X							X										X	X	X			X			N	BACNET INTEGRATION.
PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) START/STOP	3	Y	X																												X	X												X			X		C	N	E	EXISTING POINT TO BE REMOVED.
PRIMARY CHILLED WATER PUMPS (9–P–1, 2 & 3) STATUS	3	Y														X													X	X	X												X	X	X			X			E	EXISTING POINT TO BE REMOVED.
SECONDARY CHILLED WATER PUMPS (9-P-7, 8 & 9)																																																										
ALL AVAILABLE POINTS FROM SECONDARY CHILLED WATER PUMPS (9–P–7, 8 & 9) VFD'S	3	Y																																																		N	BACNET INTEGRATION.
SECONDARY CHILLED WATER PUMPS (9–P–7, 8 & 9) START/STOP	3	Y	X																												X													X			X		C	N	N	HARDWIRED TO BAS.
SECONDARY CHILLED WATER PUMPS (9–P–7, 8 & 9) SPEED CONTROL	3	Y					X																																		X			X		C	N	N	HARDWIRED TO BAS.
SECONDARY CHILLED WATER PUMPS (9–P–7, 8 & 9) CURRENT	3	Y																							X			X	X	X			X									X	X	X	X		X			N	BACNET INTEGRATION.
SECONDARY CHILLED WATER PUMPS (9–P–7, 8 & 9) FAULT ALARM	3	Y														X										X							X										X	X	X			X			N	BACNET INTEGRATION.
SECONDARY CHILLED WATER PUMPS (9–P–7 & 8) START/STOP	2	Y	X																												X	X												X			X		C	N	E	EXISTING POINT TO BE REMOVED.
SECONDARY CHILLED WATER PUMPS (9–P–7 & 8) SPEED CONTROL	2	Y					X																																		X			X		C	N	E	EXISTING POINT TO BE REMOVED.
SECONDARY CHILLED WATER PUMPS (9–P–7 & 8) STATUS	2	Y														X													X	X	X												X	X	X			X			E	EXISTING POINT TO BE REMOVED.
DISTRIBUTION SYSTEM DIFFERENTIAL PRESSURE	1	Y																					X						X	X			X									X	X	X			X			E	
CONDENSER WATER PUMPS (9-P-4 & 5)																																																										
ALL AVAILABLE POINTS FROM CONDENSER WATER PUMPS (9–P–4 & 5) VFD'S	2	Y																																																		N	BACNET INTEGRATION.
CONDENSER WATER PUMP (9–P–4 & 5) START/STOP	2	Y	X																												X													X			X		C	N	E	VERIFY CURRENT AND COMMUNICATIONS
CONDENSER WATER PUMP (9–P–4 & 5) SPEED CONTROL	2	Y					X																																		X					X	C	N	E	
CONDENSER WATER PUMPS (9–P–4 & 5) FAULT ALARM	2	Y														X										X																	X	X		X					E	
CONDENSER WATER PUMP (9–P–4 & 5) CURRENT	2	Y																							X			X	X	X													X	X	X						N	BACNET INTEGRATION.
CHILLER CONDENSER WATER DIFFERENTIAL PRESSURE	1	Y																					X						X	X			X									X	X	X			X			N	PROVIDE NEW DEVICE.
CONDENSER WATER FLOW	1	Y																					X						X	X	X		X										X	X	X			X			E	REMOVE EXISTING TURBINE FLOW METER.
CONDENSER WATER FLOW	1	Y																					X						X	X	X		X										X	X	X			X			N	PROVIDE NEW MAGNETIC FLOW METER.
CONDENSER WATER SYSTEM																																																										
CHILLER CONDENSER WATER SUPPLY TEMPERATURE	1	Y																	X										X	X			X										X	X	X			X			N	PROVIDE NEW DEVICE.
ALL AVAILABLE POINTS FROM COOLING TOWER (9–CT–1 & 2) FAN VFD'S	2	Y																																																		N	BACNET INTEGRATION.
COOLING TOWER (9–CT–1 & 2) FAN START/STOP	2	Y	X																												X	X		X										X			X		C	N	E	
COOLING TOWER (9–CT–1 & 2) FAN SPEED CONTROL	2	Y					X																											X										X			X					E	
COOLING TOWER (9–CT–1 & 2) FAN VFD FAULT ALARM	2	Y														X										X																	X	X		X					E	
COOLING TOWER (9–CT–1 & 2) CURRENT	2	Y																							X			X	X	X			X										X	X	X			X			N	BACNET INTEGRATION.
COOLING TOWER (9–CT–1 & 2) VALVE (CV–4 & 5) CONTROL	2	Y					X																								X			X										X			X					E	
COOLING TOWER (9–CT–1 & 2) VALVE (CV–4 & 5) POSITION FEEDBACK	2	Y																						X					X	X			X										X	X	X		X	X			E	VERIFY IF VALVE HAS POSITION FEEDBACK.
CONDENSER WATER SUMP TEMPERATURE	1	Y																	X										X	X			X					X						X	X			X			E	
CONDENSER WATER SUPPLY TEMPERATURE	1	Y																	X										X	X			X										X	X	X			X			E	
CONDENSER WATER RETURN TEMPERATURE	1	Y																	X										X	X			X										X	X	X			X			E	
COOLING TOWER BYPASS VALVE (CV–6) CONTROL	1	Y					X																								X			X										X			X					E	
COOLING TOWER BYPASS VALVE (CV–6) POSITION FEEDBACK	1	Y																						X					X	X			X										X	X	X		X	X			E	VERIFY IF VALVE HAS POSITION FEEDBACK.
CENTRIFUGAL SEPARATOR (9–CS–1) PUMP START/STOP CONTROL	1	Y	X																								X				X													X		X		F	N	N	NEW CONTROL POINT TO BE INSTALLED.
CENTRIFUGAL SEPARATOR (9–CS–1) PUMP STATUS	1	Y														X									X						X			X										X	X	X	X					N	NEW CONTROL POINT TO BE INSTALLED.
CENTRIFUGAL SEPARATOR PURGE VALVE CONTROL	1	Y			X																							X			X			X								X			X		F	N	N	CONNECT TO EXISTING VALVE.
CONDENSER WATER SUMP LEVEL	1	Y																			X								X	X			X			X								X	X	X	X					E	
CONDENSER WATER MAKE–UP WATER VALVE CONTROL	1	Y			X																								X				X											X		X	X				E	
CONDUCTIVITY CONTROLLER BLOWDOWN SIGNAL	1	Y															X												X				X											X		X	X				N	CONNECT TO NEW DEVICE.
BASKET STRAINER PURGE CONTROL	1	Y			X																								X				X											X			X				E	RELOCATE VALVE & RECONNECT.
CONDENSER WATER CONDUCTIVITY	1	Y																						X					X	X			X											X	X	X	X				N	PROVIDE NEW DEVICE.
MAKE–UP WATER TOTALIZATION	1	Y																X											X															X			X				E	
OUTDOOR AIR DRY–BULB TEMPERATURE	1	Y																	X										X	X		X			X								X	X	X			X			N	NEW DEVICE IN NEW LOCATION
OUTDOOR AIR DEWPOINT TEMPERATURE	1	Y																	X										X	X		X			X								X	X	X			X			N	NEW DEVICE IN NEW LOCATION

CODES FOR FAILURE MODE:
H – HIGH VALUE
L – LOW VALUE
O – ON OR OPEN
F – OFF OR CLOSED
C – LAST COMMAND
N – LOCAL LOOP

Revisions	Date

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Drawing Title: MECHANICAL CONTROLS

Project Title: RE