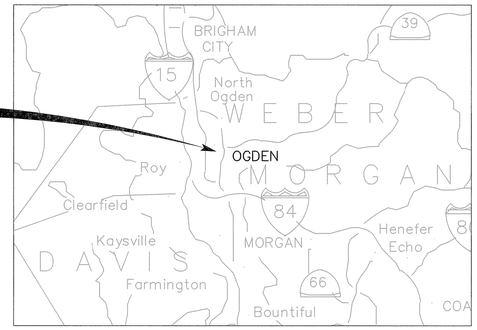
WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS AND FEEDWATER/CONDENSATE PUMP UPGRADE

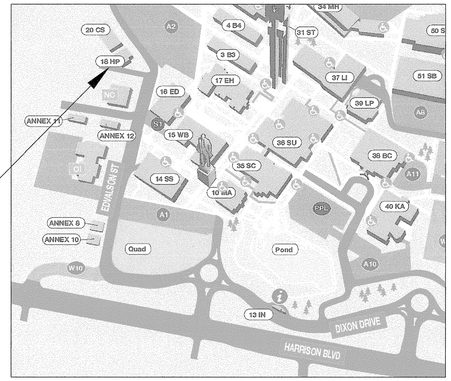
GENERAL, INSTRUMENTATION, MECHANICAL, & ELECTRICAL DRAWINGS

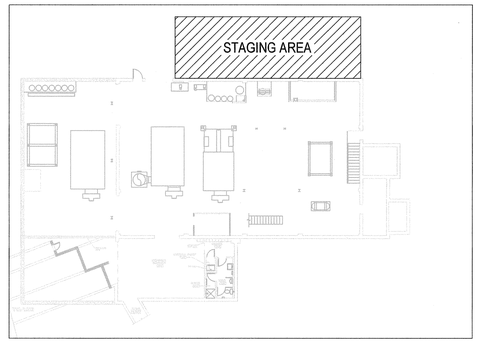
JANUARY 29, 2010

PROJECT LOCATION



HEAT PLANT





NORTH

PROJECT VICINITY MAP

PROJECT LOCATION MAP

STAGING AREA

SHEET NO.	DESCRIPTION
GG0	TITLE SHEET & SHEET INDEX
PG1	PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET 1
PG2	PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET 2
PG3	PIPING AND INSTRUMENTATION DIAGRAM NOTES
PF1	PROCESS FLOW DIAGRAM STEAM AND CONDENSATE
PI1	PIPING AND INSTRUMENTATION DIAGRAM BOILER NO. 1
PI2	PIPING AND INSTRUMENTATION DIAGRAM BOILER NO. 2
PI3	PIPING AND INSTRUMENTATION DIAGRAM BOILER NO. 3
PI4	PIPING AND INSTRUMENTATION DIAGRAM CONDENSATE TANK NO. 1
PI5	PIPING AND INSTRUMENTATION DIAGRAM DEAERATOR NO. 1
PI6	PIPING AND INSTRUMENTATION DIAGRAM CONDENSATE TANK NO. 2
PI7	PIPING AND INSTRUMENTATION DIAGRAM DEAERATOR NO. 2
PI8	PIPING AND INSTRUMENTATION DIAGRAM STEAM
EW1	MOTOR CONTROL SCHEMATICS
IG1	INSTRUMENTATION AND CONTROLS LEGEND SHEET 1
IO1	NETWORK OVERVIEW DIAGRAM
II1	INSTRUMENTATION AND CONTROLS DETAILS SHEET 1
II2	INSTRUMENTATION AND CONTROLS DETAILS SHEET 2
II3	INSTRUMENTATION AND CONTROLS DETAILS SHEET 3
II4	INSTRUMENTATION AND CONTROLS DETAILS SHEET 4

SHEET NO.	DESCRIPTION
IA1	CONTROL PANEL ARRANGEMENT
MG1	MECHANICAL SYMBOL LEGEND
MG2	MECHANICAL EQUIPMENT SCHEDULE & DETAILS
DM1	LOWER LEVEL FLOOR PLAN - MECHANICAL PIPING DEMOLITION
DM2	MECHANICAL PIPING DEMOLITION SECTIONS SHEET 1
DM3	MECHANICAL PIPING DEMOLITION SECTIONS SHEET 2
DM4	MECHANICAL PIPING DEMOLITION SECTIONS SHEET 3
MP1	LOWER LEVEL FLOOR PLAN - NEW MECHANICAL PIPING
MP2	NEW NORTH MECHANICAL PIPING SECTIONS
MP3	NEW SOUTH MECHANICAL PIPING SECTIONS
MP4	NEW SOUTH MECHANICAL PIPING SECTIONS
EG1	ELECTRICAL GENERAL LEGEND AND NOTES
EG2	ELECTRICAL DETAILS SHEET 1
EG3	ELECTRICAL DETAIL SHEET 2
EO1	ELECTRICAL ONE LINE DIAGRAM
DE1	LOWER LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION
EP1	LOWER LEVEL FLOOR PLAN - NEW ELECTRICAL

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REGISTERED PROFESSIONAL ENGINEER — No. 334187 — LYLE D. VANCE — STATE OF UTAH — 1/29/10

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01–29–10

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

TITLE SHEET AND SHEET INDEX

DESIGNED C. KIM
DRAWN J. KIM
CHECKED C. KIM
APPROVED C. KIM
APPROVED L. VANCE
DATE 01–29–10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
GG0

CADD 01–R3

SCI PROJECT NO: 21937.01
$$$$$$$$$$$$FILENAME$$$$$$$$$$$$

LINES

- PROCESS LINE (W/ FLOW ARROW)
- PROCESS LINE (W/ FREEZE PROTECTION) — E — E
- SLOPED PIPING
- EXISTING LINE OR FURNISHED WITH THE EQUIPMENT
- FUTURE LINE
- ELECTRICAL SIGNAL
- PNEUMATIC SIGNAL OR PNEUMATIC TUBING
- CAPILLARY TUBING
- HYDRAULIC LINE
- DIGITAL COMMUNICTIONS SIGNAL
- ULTRASONIC SIGNAL
- AIR SUPPLY
- ELECTRIC HEAT — E — E
- SONIC – NON–GUIDED
- SONIC – GUIDED
- SOFTWARE LINK
- INTERNAL SYSTEM LINK
- MECHANICAL LINK
- FIBER OPTIC SIGNAL — FO — FO
- SINGLEMODE FIBER OPTIC SIGNAL — SM — SM

A — LETTER INDICATES PIPE CODE ON FLAG SIDE OF LINE BREAK. REPRESENTS PIPE CODE CONTINUATION FROM CONNECTING P&ID

DESCRIPTION
XXX
W–MYYY
DRAWING NUMBER
CONNECTION NUMBER

STREAM ARROW INDICATES FLOW ENTERING OR LEAVING DRAWING AND CONTINUED ON OTHER DRAWING.

PROCESS LINE EXITING DRAWING AND NOT CONTINUED ON ANOTHER DRAWING

XX — STREAM IDENTIFICATION (PROCESS FLOW DIAGRAM)

XX — MULTIDIRECTIONAL STREAM IDENTIFICATION (PROCESS FLOW DIAGRAM)

TIE POINT DESIGNATORS

XXY / ZZZ

TIE POINT TO EQUIPMENT OR ANOTHER CONTRACT
X = EQUIPMENT OR CONTRACT DESIGNATOR
YY = P&ID NUMBER
ZZZ= TIE POINT NUMBER

–TP

TIE FOINT INTO AN EXISTING SYSTEM
YYY = P&ID DRAWING NUMBER
XX = TIE POINT NUMBER

EQUIPMENT

- AGITATOR
- AIR FILTER
- AIR FILTER INLET
- LF — LINE FILTER
- BLOWER, CENTRIFUGAL
- BELT FILTER PRESS
- BELT THICKENER
- BOILER
- CALIBRATION CHAMBER
- CENTRIFIGAL COMPRESSOR
- PISTON COMPRESSOR
- ROTARY COMPRESSOR
- CONDENSATE RECEIVER
- DEAERATOR
- DU — DRIVE UNIT
- H — HYDRAULIC DRIVE
- VFD — VARIABLE FREQUENCY DRIVE
- HEAT EXCHANGER (PLATE)
- HEAT EXCHANGER (SHELL)
- SPECIAL HEAT EXCHANGER
- SHELL & TUBE HEAT EXCHANGER
- FAN
- AXIAL FAN
- FLAME ARRESTOR
- GRINDER
- INJECTOR
- MIXER
- MIXER W/ TANK
- JET MIXER
- STATIC MIXER
- HP — MOTOR W/ HP RATING
- PULSATION DAMPENER
- ROLLER CRUSHER
- ROTARY DRUM THICKENER
- ROTARY FEEDER
- SCREEN/LOUVER
- SEPARATOR
- SHOCK ABSORBER
- SILENCER
- TANK
- WASTE GAS BURNER
- WATER HEATER
- WATER SOFTENER
- WEIR BROAD CRESTED
- DOUBLE TURBINE DRIVE
- SINGLE TURBINE DRIVE
- AIR INTAKE
- ASH GATE VALVE
- VACUUM BREAKER

PUMPS

- POSITIVE DISPLACEMENT
- POSITIVE DISPLACEMENT PROGRESSIVE CAVITY
- POSITIVE DISPLACEMENT PISTON CAVITY
- IN–LINE
- CENTRIFUGAL PUMP
- DIAPHRAGM
- ROTARY GEAR
- SUBMERSIBLE
- VERTICAL
- RECIPROCATING
- BOILER FEED
- VACUUM
- VERTICAL CANNED
- SCREW
- VERTICAL WET

FITTINGS

- BF — BLIND FLANGE
- BUTT WELDED CAP
- SCREWED/SOCKET WELD CAP
- TEE
- UNION
- VALVE STUB
- PIPE PLUG
- TANK NOZZLE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- SPECTACLE FLANGE
- EXPANSION JOINT
- EXPANSION JOINT SINGLE END
- EXPANSION JOINT DOUBLE END
- FLEX COUPLING
- FLEX HOSE
- FLEX HOSE W/ QUICK DISCONNECT
- Y–STRAINER
- Y–STRAINER W/ N.C. GATE VALVE
- CAPPED Y STRAINER W/ N.C. BALL VALVE
- SIMPLEX STRAINER
- DUPLEX STRAINER
- BUCKET STRAINER
- START–UP STRAINER
- TEMPORARY IN–LINE STRAINER
- * — MT = MOISTURE TRAP; ST = STEAM TRAP; LF = LINE FILTER
- SEDIMENT TRAP
- T — STEAM TRAP
- V — VACUUM BREAKER
- AIR/GAS FILTER
- FP — FLASH POT
- STEAM VENT
- A — AUTOMATIC AIR VENT
- * — CO = FLOOR CLEANOUT; YCO = YARD CLEANOUT
- WCO — WALL CLEANOUT
- FLOOR OR TRENCH DRAIN
- VARIABLE PRESSURE REDUCING ELEMENT
- INSULATING FLANGE
- CHEMICAL SEAL
- DIAPHRAGM SEAL
- PRESSURE BREAKDOWN ORIFICE
- PRESSURE BREAKDOWN ELEMENT
- RUPTURE DISC, PRESSURE RELIEF
- RUPTURE DISC, VACUUM RELIEF
- RELIEF VALVE VENT SEAL
- SPRAY NOZZLE
- RD PRESSURE VESSEL
- INJECTOR / EDUCTOR
- DESUPERHEATER
- C — CYCLONE SEPARATOR
- ADJUSTABLE WEIR GATE
- DECANTER
- EMERGENCY SHOWER AND EYE WASH
- HOSE BIBB
- QUICK DISCONNECT
- FLAME ARRESTER
- FLOW STRAIGHTENING VANE

GENERAL NOTES

1. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS LEGEND MAY NOT APPEAR ON THIS SET OF DRAWINGS.

REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/29/10
STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET 1

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PG1

VALVES

NORMALLY OPEN	NORMALLY CLOSED
	GATE
	PARALLEL SLIDE GATE
	GLOBE
	BALL
	PLUG
	STOP CHECK
	V-BALL
	BUTTERFLY
	NEEDLE
	DIAPHRAGM
	ANGLE GLOBE
	ANGLE GATE
	KNIFE
	SLIDE GATE
	SLUICE GATE
	SWING CHECK
	BALL CHECK
	WAFER CHECK
	FLOAT
	PINCH
	BALANCING
	FLAP GATE
	ANGLE RELIEF
	VACUUM RELIEF
	QUICK OPEN
	BACKFLOW PREVENTER
	POST INDICATING
	AUTOMATIC RECIRCULATION
	ASH SYSTEM MATERIAL INTAKE VALVE
	GAGE COCK
	POPPET OR TELESCOPING

- PRESSURE REDUCING, EXTERNAL PILOT
- BACK PRESSURE REGULATOR EXTERNAL PILOT
- PRESSURE REDUCING, SELF-CONTAINED
- BACK PRESSURE REGULATOR, SELF-CONTAINED
- THREE-WAY (WITH TYP FAIL POSITION)
- FOUR-WAY (WITH TYP FAIL POSITION)

ACTUATORS

- A – AIR CYLINDER
- G – GEAR
- H – HYDRAULIC CYLINDER
- M – MOTOR OPERATED
- S – SOLENOID

- HAND OPERATOR
- PNEUMATIC CYLINDER, SPRING OPPOSED
- PNEUMATIC CYLINDER, DOUBLE ACTING
- PNEUMATIC DIAPHRAGM, SPRING OPPOSED
- PNEUMATIC DIAPHRAGM, SPRING OPPOSED WITH POSITIONER
- MANUAL RESET
- AUTOMATIC RESET
- FLOAT OPERATOR

FLOW ELEMENTS

(FLOW IS SHOWN FROM LEFT TO RIGHT UNLESS OTHERWISE NOTED)

- AVERAGING PITOT TUBE
- CORIOLIS FLOWMETER
- FLOW NOZZLE
- FLOW SIGHT GLASS
- FLUME
- MAGNETIC FLOWMETER
- MASS FLOW METER
- ORIFICE PLATE
- POSITIVE DISPLACEMENT FLOW METER
- SWIRL METER
- TARGET METER
- THERMAL FLOWMETER
- TURBINE OR PROPELLER METER
- ULTRASONIC OR DOPPLER OR TIME TRANSIENT FLOWMETER
- V-CONE FLOW ELEMENTS
- VARIABLE AREA METER (ROTAMETER)
- VENTURI TUBE
- VORTEX FLOWMETER
- WEIR

TAG IDENTIFICATION

NEW DEVICE (TYP ALL) | EXISTING DEVICE (TYP ALL) | FUTURE DEVICE (TYP ALL)

	FIELD MOUNTED	CONTROL PANEL MOUNTED (FRONT)	CONTROL PANEL MOUNTED (REAR)	AUXILIARY PANEL MOUNTED (FRONT)
DEVICE				
PILOT LIGHT				
DCS I/O				
PLC I/O				

- SINGLE VARIABLE DEVICE WITH MULTIPLE FUNCTIONS
- CONTROL INTERLOCK FUNCTION C – SYSTEM CODE IDENTIFICATION
- 120 VOLT AC SUPPLY VOLTAGE
- 24 VOLT DC SUPPLY VOLTAGE

TAG DESIGNATORS

MAJOR EQUIPMENT

B–1	BOILER NO. 1
B–2	BOILER NO. 2 (PREVIOUSLY BOILER NO. 3)
B–3	BOILER NO. 3 (PREVIOUSLY BOILER NO. 4)
ECO–1	ECONOMIZER NO. 1
ECO–2	ECONOMIZER NO. 2
ECO–3	ECONOMIZER NO. 3
DA–1	DEAERATOR NO. 1
DA–2	DEAERATOR NO. 2
CT–1	CONDENSATE TRANSFER TANK NO. 1
CT–2	CONDENSATE TRANSFER TANK NO. 2
CTP–1A	CONDENSATE PUMP NO. 1A
CTP–1B	CONDENSATE PUMP NO. 1B
CTP–2A	CONDENSATE PUMP NO. 2A
CTP–2B	CONDENSATE PUMP NO. 2B
CTP–2C	CONDENSATE PUMP NO. 2C
FWP–1A	FEEDWATER PUMP NO. 1A
FWP–1B	FEEDWATER PUMP NO. 1B
FWP–1C	FEEDWATER PUMP NO. 1C
FWP–2A	FEEDWATER PUMP NO. 2A
FWP–2B	FEEDWATER PUMP NO. 2B
FWP–2C	FEEDWATER PUMP NO. 2C
WS–1	WATER SOFTENER
AC–1	AIR COMPRESSOR

TAG NUMBERING
INSTRUMENT TAG NUMBER WWWW UXY Z
LINE CODE T ? YYY ZZZ

WHERE: WWWW ISA INSTRUMENT IDENTIFICATION LETTERS
U UNIT TYPE
X UNIT NO.
Y SYSTEM (NUMBER)
Z UNIQUE (SEQUENTIAL) NUMBER
T PIPE SIZE
YYY SYSTEM CODE (ALPHA)

UNIT TYPES (U)
1 BOILERS (B)
2 DEAERATOR (DA)
3 CONDENSATE TRANSFER TANK (CT)
4 CONDENSATE TRANSFER PUMP (CTP)
5 FEEDWATER PUMP (FWP)
6 ECONOMIZER (ECO)

UNIT NO. (X) USE ACTUAL UNIT NUMBER

SYSTEM (Y AND YYY)

Y	YYY	DESCRIPTION	PIPE CODE
0	STM	STEAM	ACS2
1	FW	FEEDWATER	ACS2
2	CB	CONTINUOUS BLOWDOWN	ACS2
3	NG	NATURAL GAS	ACS2
4	FO	FUEL OIL	ACS2
5	CA	COMBUSTION AIR	N/A
6	FG	FLUE GAS	N/A
7	IA	INSTRUMENT AIR	ASS2

UNIT NO. (T) USE ACTUAL LINE SIZE

CONVERSION CODES

I/I	= CURRENT TO CURRENT	I/H	= CURRENT TO HYDRAULIC
I/P	= CURRENT TO PNEUMATIC	E/H	= VOLTAGE TO HYDRAULIC
P/I	= PNEUMATIC TO CURRENT	D/A	= DIGITAL TO ANALOG
I/E	= CURRENT TO VOLTAGE	A/D	= ANALOG TO DIGITAL
E/I	= VOLTAGE TO CURRENT		

FUNCTION IDENTIFICATION

	FIRST LETTER: MEASURED OR INITIATING VARIABLE	FIRST LETTER: MODIFIER	SUCCEEDING LETTERS: READOUT OR PASSIVE FUNCTION	SUCCEEDING LETTERS: OUTPUT FUNCTION	SUCCEEDING LETTERS: MODIFIER
A	ANALYSIS		ALARM		AMBER, AUTO OR REMOTE
B	BURNER FLAME		USER'S CHOICE	BUTTON	BLUE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED OR CONFIRM
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			DOWN
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			FORWARD OR OFF
G	GAUGING (DIMENSIONAL)		GLASS		GREEN
H	HAND (MANUALLY INITIATED)				HIGH OR HAND
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME–SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW OR LEAD
M	MOISTURE OR HUMIDITY				MOTOR
N	PLC/DCS INPUT				
O	USER'S CHOICE		ORIFICE (RESTRICTION)		OPEN OR ON
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		STOP
Q	QUANTITY OR EVENT	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY	REGULATING	RECORD OR PRINT		RED OR REVERSE
S	SPEED OR FREQUENCY	SAFETY		SWITCH	START
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	UP
V	VISCOSITY/VIBRATION			VALVE, DAMPER, OR LOUVER	VALVE
W	WEIGHT OF FORCE		WELL		WHITE
X	PLC/DCS OUTPUT			UNCLASSIFIED	
Y	USER'S CHOICE			RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATOR OR UNCLASSIFIED FINAL CONTROL ELEMENT	

ABBREVIATIONS

EX	EXISTING
FC	FAIL CLOSED
FL	FAIL LAST
FO	FAIL OPEN
HMI	HUMAN MACHINE INTERFACE
MAG	MAGMETER
MCC	MOTOR CONTROL CENTER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
PAC	PROCESS AUTOMATION CONTROLLER
P/S	POWER SUPPLY
T/C	THERMOCOUPLE
UPS	UNINTERUPTABLE POWER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE STROKE DRIVE
WE	WITH EQUIPMENT

GENERAL NOTES

1. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS LEGEND MAY NOT APPEAR ON THIS SET OF DRAWINGS.

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1/23/10
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NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM
LEGEND
SHEET 2

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PG2

LOGO: E1-454

PI1 DRAWING NOTES

1. BURNER MANAGEMENT SYSTEM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT BETWEEN BURNER MANAGEMENT SYSTEM TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. DO NOT DEMO CONTROL SIGNAL WIRING TO/FROM BURNER MANAGEMENT SYSTEM TO FIELD INSTRUMENTS. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM BURNER MANAGEMENT SYSTEM TO/FROM REMOTE I/O PANEL NO. 1.
2. JACKSHAFT ACTUATOR – DEMO PNEUMATIC ACTUATOR, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM JACKSHAFT ACTUATOR (FIELD INSTRUMENT) TO/FROM EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. DO NOT DEMO CONTROL SIGNAL WIRING TO BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW MOTOR OPERATED ACTUATOR, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1. RECONNECT CONTROL SIGNAL WIRING FROM INSTRUMENT TO BURNER MANAGEMENT SYSTEM.
3. FUEL OIL SYSTEM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM FUEL OIL PRESSURE TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
4. INSTRUMENT AIR – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM INSTRUMENT AIR LOW PRESSURE SWITCH TO EXISTING BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM POWER SUPPLY CONFORMATION CONTACT TO REMOTE I/O PANEL NO. 1.
5. NATURAL GAS SYSTEM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
6. BOILER FEEDWATER SYSTEM – DEMO PNEUMATIC ACTUATOR, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM CONTROL VALVE (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW MOTOR OPERATED ACTUATOR CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
7. BOILER STEAM DRUM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM EXISTING PRESSURE TRANSMITTER (FIELD INSTRUMENT) AND LEVEL TRANSMITTER TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM EXISTING PRESSURE AND LEVEL TRANSMITTER (FIELD INSTRUMENT) TO REMOTE I/O PANEL NO. 1. PROVIDE AND INSTALL NEW LEVEL TRANSMITTER AND NEW CONTROL SIGNAL CABLE FROM LEVEL TRANSMITTER TO REMOTE I/O PANEL NO. 1.
8. STEAM SYSTEM – DEMO STEAM FLOW METER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FLOW METER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW McCROMETER STEAM FLOW METER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
9. CONTINUOUS BLOWDOWN SYSTEM – PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENTS TO REMOTE I/O PANEL NO. 1. REFER TO REFERENCE DRAWING ON DRAWING IA1 FOR TERMINATION POINTS.
10. BOILER – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM BOILER DRAFT PRESSURE TRANSMITTER (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
11. ECONOMIZER BOILER FEEDWATER – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM PRESSURE TRANSMITTERS AND TEMPERATURE TRANSMITTERS (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
12. ECONOMIZER FLUE GAS – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM TEMPERATURE TRANSMITTERS (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
13. ECONOMIZER BOILER FEEDWATER BYPASS VALVE – PROVIDE AND INSTALL NEW THREE-WAY CONTROL VALVE AND ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
14. NATURAL GAS SYSTEM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM THERMAL MASS FLOW METER TO EXISTING LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1
15. COMBUSTION AIR – DEMO ASSOCIATED MOTOR, CONTROL SIGNAL WIRING AND CONDUIT FROM FD FAN TO EXISTING BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW MOTOR AND VARIABLE SPEED DRIVE FROM FD FAN TO BURNER MANAGEMENT SYSTEM AND REMOTE I/O PANEL NO. 1.
16. FLUE GAS – PROVIDE AND INSTALL NEW OXYGEN ANALYZER, TRANSMITTER (FIELD INSTRUMENTS), CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1. INSTALL DETECTOR IN FLUE GAS DUCT STRAIGHT RUN DOWNSTREAM OF ECONOMIZER.

PI2 DRAWING NOTES

1. BURNER MANAGEMENT SYSTEM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT BETWEEN BURNER MANAGEMENT SYSTEM TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. DO NOT DEMO CONTROL SIGNAL WIRING TO/FROM BURNER MANAGEMENT SYSTEM TO FIELD INSTRUMENTS. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM BURNER MANAGEMENT SYSTEM TO/FROM REMOTE I/O PANEL NO. 2.
2. JACKSHAFT ACTUATOR – DEMO PNEUMATIC ACTUATOR, CONTROL SIGNAL WIRING, AND CONDUIT FROM JACKSHAFT ACTUATOR (FIELD INSTRUMENT) TO/FROM EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. DO NOT DEMO CONTROL SIGNAL WIRING TO BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW MOTOR OPERATED ACTUATOR, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2. RECONNECT CONTROL SIGNAL WIRING FROM INSTRUMENT TO BURNER MANAGEMENT SYSTEM.
3. FUEL OIL SYSTEM – DEMO FUEL OIL PRESSURE TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
4. INSTRUMENT AIR – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM INSTRUMENT AIR LOW PRESSURE SWITCH TO EXISTING BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM POWER SUPPLY CONFORMATION CONTACT TO REMOTE I/O PANEL NO. 2.
5. NATURAL GAS SYSTEM – DEMO NATURAL GAS PRESSURE TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
6. BOILER FEEDWATER SYSTEM – DEMO BOILER FEEDWATER FLOW CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM CONTROL VALVE (FIELD INSTRUMENT) TO/FROM EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW FEEDWATER CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
7. BOILER STEAM DRUM – DEMO BOILER DRUM PRESSURE TRANSMITTER, BOILER DRUM LEVEL TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM EXISTING PRESSURE AND LEVEL TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTER, NEW BOILER DRUM LEVEL TRANSMITTER, NEW CONTROL SIGNAL WIRING AND CONDUIT FROM TRANSMITTERS (FIELD INSTRUMENTS) TO REMOTE I/O PANEL NO. 2.
8. STEAM SYSTEM – DEMO STEAM FLOW METER, FLOW TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FLOW METER TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW McCROMETER STEAM FLOW METER, FLOW TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
9. CONTINUOUS BLOWDOWN SYSTEM – PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENTS TO REMOTE I/O PANEL NO. 2. REFER TO REFERENCE DRAWING ON DRAWING IA1 FOR TERMINATION POINTS.
10. BOILER – DEMO BOILER DRAFT PRESSURE TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
11. ECONOMIZER BOILER FEEDWATER – DEMO ECONOMIZER BOILER FEEDWATER PRESSURE TRANSMITTERS, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM TRANSMITTERS (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW ECONOMIZER BOILER FEEDWATER PRESSURE TRANSMITTERS, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
12. ECONOMIZER FLUE GAS – DEMO ECONOMIZER FLUE GAS TEMPERATURE TRANSMITTERS, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM TRANSMITTERS (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW TEMPERATURE TRANSMITTERS, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
13. ECONOMIZER BOILER FEEDWATER BYPASS VALVE – DEMO ECONOMIZER BOILER FEEDWATER THREE-WAY VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM BYPASS VALVE (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM.PROVIDE AND INSTALL NEW THREE-WAY CONTROL VALVE AND ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
14. NATURAL GAS SYSTEM – PROVIDE AND INSTALL NEW THERMAL MASS FLOW METER, SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
15. COMBUSTION AIR – DEMO ASSOCIATED MOTOR, CONTROL SIGNAL WIRING AND CONDUIT FROM FD FAN TO EXISTING BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW MOTOR AND VARIABLE SPEED DRIVE FROM FD FAN TO BURNER MANAGEMENT SYSTEM AND REMOTE I/O PANEL NO. 2.
16. FLUE GAS – PROVIDE AND INSTALL NEW OXYGEN ANALYZER, TRANSMITTER (FIELD INSTRUMENTS), CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2. INSTALL DETECTOR IN FLUE GAS DUCT STRAIGHT RUN DOWNSTREAM OF ECONOMIZER.

PI3 DRAWING NOTES

1. BURNER MANAGEMENT SYSTEM – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT BETWEEN BURNER MANAGEMENT SYSTEM TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. DO NOT DEMO CONTROL SIGNAL WIRING TO/FROM BURNER MANAGEMENT SYSTEM TO FIELD INSTRUMENTS. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM BURNER MANAGEMENT SYSTEM TO/FROM REMOTE I/O PANEL NO. 2.
2. JACKSHAFT ACTUATOR – DEMO PNEUMATIC ACTUATOR, CONTROL SIGNAL WIRING, AND CONDUIT FROM JACKSHAFT ACTUATOR (FIELD INSTRUMENT) TO/FROM EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. DO NOT DEMO CONTROL SIGNAL WIRING TO BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW MOTOR OPERATED ACTUATOR, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2. RECONNECT CONTROL SIGNAL WIRING FROM INSTRUMENT TO BURNER MANAGEMENT SYSTEM.
3. FUEL OIL SYSTEM – DEMO FUEL OIL PRESSURE TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
4. INSTRUMENT AIR – DEMO ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM INSTRUMENT AIR LOW PRESSURE SWITCH TO EXISTING BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING, AND CONDUIT FROM POWER SUPPLY CONFORMATION CONTACT TO REMOTE I/O PANEL NO. 2.
5. NATURAL GAS SYSTEM – DEMO NATURAL GAS PRESSURE TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
6. BOILER FEEDWATER SYSTEM – DEMO BOILER FEEDWATER FLOW CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM CONTROL VALVE (FIELD INSTRUMENT) TO/FROM EXISTING SINGLE LOOP CONTROLLER IN CONTROL ROOM. PROVIDE AND INSTALL NEW FEEDWATER CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
7. BOILER STEAM DRUM – DEMO BOILER DRUM PRESSURE TRANSMITTER, BOILER DRUM LEVEL TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM EXISTING PRESSURE AND LEVEL TRANSMITTER (FIELD INSTRUMENT) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTER, NEW BOILER DRUM LEVEL TRANSMITTER, NEW CONTROL SIGNAL WIRING AND CONDUIT FROM TRANSMITTERS (FIELD INSTRUMENTS) TO REMOTE I/O PANEL NO. 2.
8. STEAM SYSTEM – DEMO STEAM FLOW METER, FLOW TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FLOW METER TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW McCROMETER STEAM FLOW METER, FLOW TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
9. CONTINUOUS BLOWDOWN SYSTEM – PROVIDE AND INSTALL NEW CONTROL SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENTS TO REMOTE I/O PANEL NO. 2. REFER TO REFERENCE DRAWING ON DRAWING IA1 FOR TERMINATION POINTS.
10. BOILER – DEMO BOILER DRAFT PRESSURE TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT FROM PRESSURE TRANSMITTER (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
11. ECONOMIZER BOILER FEEDWATER – DEMO ECONOMIZER BOILER FEEDWATER TRANSMITTERS AND TEMPERATURE TRANSMITTERS, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM TRANSMITTERS (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW ECONOMIZER BOILER FEEDWATER PRESSURE TRANSMITTERS, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
12. ECONOMIZER FLUE GAS – DEMO ECONOMIZER FLUE GAS TEMPERATURE TRANSMITTERS, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM TRANSMITTERS (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW TEMPERATURE TRANSMITTERS, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
13. ECONOMIZER BOILER FEEDWATER BYPASS VALVE – DEMO ECONOMIZER BOILER FEEDWATER THREE-WAY VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM BYPASS VALVE (FIELD INSTRUMENTS) TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM.PROVIDE AND INSTALL NEW THREE-WAY CONTROL VALVE AND ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
14. NATURAL GAS SYSTEM – PROVIDE AND INSTALL NEW THERMAL MASS FLOW METER, SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2
15. COMBUSTION AIR – DEMO ASSOCIATED MOTOR, CONTROL SIGNAL WIRING AND CONDUIT FROM FD FAN TO EXISTING BURNER MANAGEMENT SYSTEM. PROVIDE AND INSTALL NEW MOTOR AND VARIABLE SPEED DRIVE FROM FD FAN TO BURNER MANAGEMENT SYSTEM AND REMOTE I/O PANEL NO. 2.
16. FLUE GAS – PROVIDE AND INSTALL NEW OXYGEN ANALYZER, TRANSMITTER (FIELD INSTRUMENTS), CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2. INSTALL DETECTOR IN FLUE GAS DUCT STRAIGHT RUN DOWNSTREAM OF ECONOMIZER.

PI4 DRAWING NOTES

1. CONDENSATE RETURN – DEMO EXISTING CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO FIELD INSTRUMENTS FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENT TO/FROM REMOTE I/O PANEL NO. 1.
2. CONDENSATE TANK – DEMO EXISTING LEVEL SWITCHES, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENTS TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW LEVEL SWITCHES, LEVEL TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
3. CONDENSATE TRANSFER PUMPS – DEMO EXISTING CONDENSATE TRANSFER PUMP SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT. PROVIDE AND INSTALL COMPLETE CONDENSATE TRANSFER PUMP SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT TO/FROM FIELD INSTRUMENT TO/FROM REMOTE I/O PANEL NO. 1.

PI6 DRAWING NOTES

1. CONDENSATE RETURN – DEMO EXISTING CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO FIELD INSTRUMENTS FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENT TO/FROM REMOTE I/O PANEL NO. 2.
2. CONDENSATE TANK – DEMO EXISTING LEVEL SWITCHES, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENTS TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW LEVEL SWITCHES, LEVEL TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
3. CONDENSATE TRANSFER PUMPS – DEMO EXISTING CONDENSATE TRANSFER PUMP SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT. PROVIDE AND INSTALL COMPLETE CONDENSATE TRANSFER PUMP SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT TO/FROM FIELD INSTRUMENT TO/FROM REMOTE I/O PANEL NO. 2.
4. CONDENSATE TANK MAKEUP WATER CONTROL VALVE – DEMO EXISTING MAKEUP WATER CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENTS TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW MAKEUP WATER CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTUMENT TO/FROM REMOTE I/O PANEL NO. 2.

PI5 DRAWING NOTES

1. DEAERATOR LEVEL CONTROL VALVES – DEMO EXISTING LEVEL CONTROL VALVES, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENTS TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW LEVEL CONTROL VALVES, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTUMENT TO/FROM REMOTE I/O PANEL NO. 1.
2. DEAERATOR MAKEUP WATER CONTROL VALVE – DEMO EXISTING MAKEUP WATER CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENTS TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW MAKEUP WATER CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTUMENT TO/FROM REMOTE I/O PANEL NO. 1.
3. DEAERATOR – DEMO EXISTING LEVEL SWITCHES, LEVEL TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENTS TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW LEVEL SWITCHES, LEVEL TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 1.
4. BOILER FEEDWATER PUMPS – DEMO EXISTING BOILER FEEDWATER PUMP SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT. PROVIDE AND INSTALL COMPLETE BOILER FEEDWATER PUMPS SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT TO/FROM FIELD INSTRUMENT TO/FROM REMOTE I/O PANEL NO. 1.

PI7 DRAWING NOTES

1. DEAERATOR LEVEL CONTROL VALVES – DEMO EXISTING LEVEL CONTROL VALVES, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENTS TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW LEVEL CONTROL VALVES, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTUMENT TO/FROM REMOTE I/O PANEL NO. 2.
2. DEAERATOR MAKEUP WATER CONTROL VALVE – DEMO EXISTING MAKEUP WATER CONTROL VALVE, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTRUMENTS TO/FROM EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW MAKEUP WATER CONTROL VALVE, CONTROL SIGNAL WIRING, AND CONDUIT TO/FROM FIELD INSTUMENT TO/FROM REMOTE I/O PANEL NO. 2.
3. DEAERATOR – DEMO EXISTING LEVEL SWITCHES, LEVEL TRANSMITTER, ASSOCIATED CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENTS TO EXISTING SINGLE LOOP CONTROLLERS IN CONTROL ROOM. PROVIDE AND INSTALL NEW LEVEL SWITCHES, LEVEL TRANSMITTER, CONTROL SIGNAL WIRING, AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2.
4. BOILER FEEDWATER PUMPS – DEMO EXISTING BOILER FEEDWATER PUMP SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT. PROVIDE AND INSTALL COMPLETE BOILER FEEDWATER PUMPS SYSTEM INCLUDING ASSOCIATED CONTROL SIGNAL WIRING AND CONDUIT TO/FROM FIELD INSTRUMENT TO/FROM REMOTE I/O PANEL NO. 2.

PI8 DRAWING NOTES

1. PROVIDE AND INSTALL NEW PRESSURE TRANSMITTERS, CONTROLS SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENTS TO REMOTE I/O PANEL NO. 2
2. PROVIDE AND INSTALL NEW FLOW METER, FLOW TRANSMITTER, CONTROLS SIGNAL WIRING AND CONDUIT FROM FIELD INSTRUMENT TO REMOTE I/O PANEL NO. 2

GENERAL NOTES

REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/29/10
STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants INC.

5253 S 960 E, Suite 220, Salt Lake City, Utah 84117-7269
www.stanleygroup.com

WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

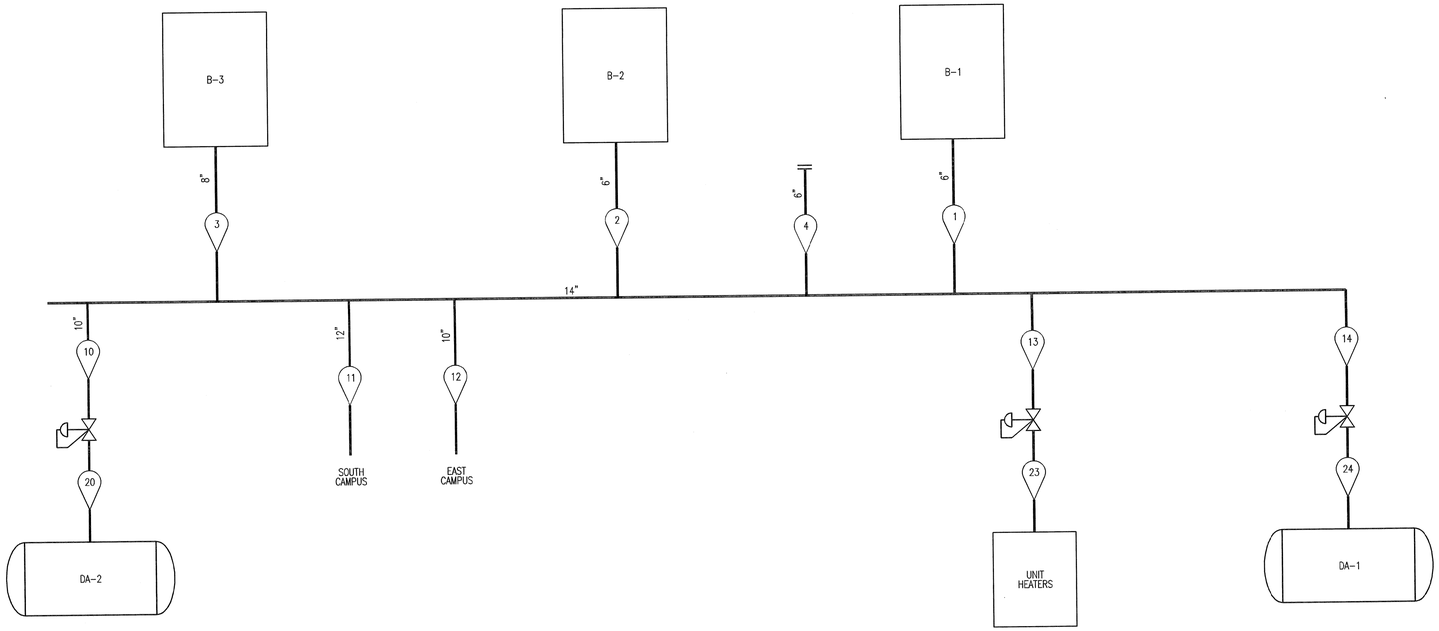
PIPING AND INSTRUMENTATION DIAGRAM NOTES

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00 REV. 0
PG3

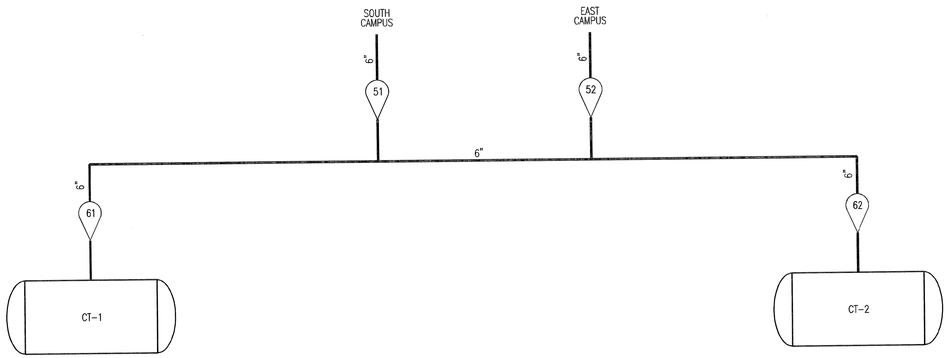
DRAWING NOTES:

1. THIS DRAWING FOR INFORMATION ONLY. DOES NOT DESIGNATE WORK BY CONTRACTOR.
2. FLOWRATE ASSUMES 10% MAKEUP WATER.
3. DESIGN PRESSURE IS 125 PSIG.



PARAMETER \ STREAM NO.	UNITS	1	2	3	4	10 NOTE 2	11	12	13	14 NOTE 2	20 NOTE 2	23	24 NOTE 2
FUTURE WINTER FLOW	PPH	30,000	37,000	45,000	0	3,900	47,000	17,500	100	3,900	3,900	100	3,900
CURRENT WINTER FLOW	PPH	30,000	37,000	45,000	0	3,300	40,300	13,800	100	3,300	3,300	100	3,300
SUMMER FLOW	PPH	10,900	10,900	10,900	0	660	8,100	2,800	0	660	660	0	660
TEMPERATURE	°F	338	338	338	338	338	338	338	338	338	219	250	219
GAUGE PRESSURE NOTE 3	PSIG	100	100	100	100	100	100	100	100	100	4	15	4

STEAM



PARAMETER \ STREAM NO.	UNITS	51	52	61	62
FUTURE WINTER FLOW	GPM	108	40	148	148
CURRENT WINTER FLOW	GPM	92	32	124	124
SUMMER FLOW	GPM	18	6	24	24
TEMPERATURE	°F	175	175	175	175
GAUGE PRESSURE	PSIG	5	5	5	5

CONDENSATE

LICENSED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/28/10
STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PROCESS FLOW DIAGRAM STEAM AND CONDENSATE

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PF1

GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

G2. VALVES ARE SHOWN EITHER OPEN OR CLOSED BASED ON NORMAL OPERATING MODE.

DRAWING NOTES:

1. EXISTING JACK SHAFT ACTUATOR AND LINKAGE.
2. ⬡ DENOTES SCOPE OF WORK ITEMS NOTED ON DRAWING PG3.

INSTRUMENT AIR
1/2"-IA
TO INSTRUMENTS ON THIS DWG
PSLL BMS 4
V
LOW FIRE
XSL 1199 DI
PURGE
XSP 1199 DI
RELEASE AND MODULATE
XSM 1199 DI
BURNER MANAGEMENT SYSTEM 1
PLANT SUPPLY AND FANS
POWER SOURCE TO ACTUATOR
JY 1151
FROM FEEDWATER FLOW CONTROL VALVE
FROM ECONOMIZER BYPASS VALVE
BY 1151
NOTE 1
NSA 1151 DI
FC 1151 AO
ZI 1151 AI
ZT 1151
ZSC BMS
ZSO BMS
SIC 1152 AO
NAA 1152 DI
SIZ 1152 AI
SIZ 1152
XLR 1152
XLG 1152
VFD-1152 VARIABLE SPEED DRIVE
M 15
COMBUSTION AIR
DUCT"-CA
FCV 1151
FD FAN
VTR
ATOMIZING MEDIA
PRV
NOTE 1
1"-AM
PSLL BMS
PDRV
ZSC BMS
FV BMS
PDSL BMS
3 PI 1141 AI
PT 1141
PSHH BMS
FUEL OIL
1"-FO
FCV 1141
WINDBOX AND BURNER
IGNITOR
3/4"-NG
NOTE 1
BIT BMS
BE BMS
IA
NATURAL GAS
14 FI 1131 AI
FIT 1131 BMS
FE 1131
FCV 1131
2 1/2"-NG
5 PI 1131 AI
PT 1131
FEEDWATER
TO BOILER DISTRIBUTION PANEL
6
NSA 1111 DI
FC 1111 AO
ZI 1111 AI
FY 1111
ZT 1111
FCV 1111
FL
2"-FW
1 1/2"-BD
HS BMS
LOW LEVEL SHUNT
LSLL LSL LSH BMS
LI
LSLL BMS
7 LT 1101 AI
LIT 1101
LIT 1102
7 LT 1102 AI
PI
7 PI 1101 AI
PT 1101
PSHH BMS
VTR
1/2"-STM
PSV
STEAM DRUM
MUD DRUM
EXISTING BOILER NO. 1
FURNACE
HIGH FURNACE PRESSURE
LOW PURGE AIR FLOW
PT 1150
PI 1150 AI 10
PSHH BMS
PSLL BMS
6"-STM
TO STEAM HEADER SEE DRAWING P1B
8 PI 1101 AI
FT 1101
FE 1101
9 CI 1121 AI
CIC 1121
CE 1121
9 S
CV
1"-CB
CONTINUOUS BLOWDOWN
2"-FW
PI 6112 AI
PT 6112 11
TI
ECONOMIZER
TI 6162 AI
TT 6162 12
TE 6162
AI 6163 AI
AIT 6163 O2
AE 6163 O2
16
DUCT-FG
STACK
PI 6111 AI
PT 6111 11
TO BOILER DISTRIBUTION PANEL
13
FL
M
NSA 6121 DI
TC 6111 AO
TCV 6111
ZT 6111
ZI 6111 AI
TE 6161
TT 6161
TI 6161 AI 12
DUCT-FG
2"-FW

REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
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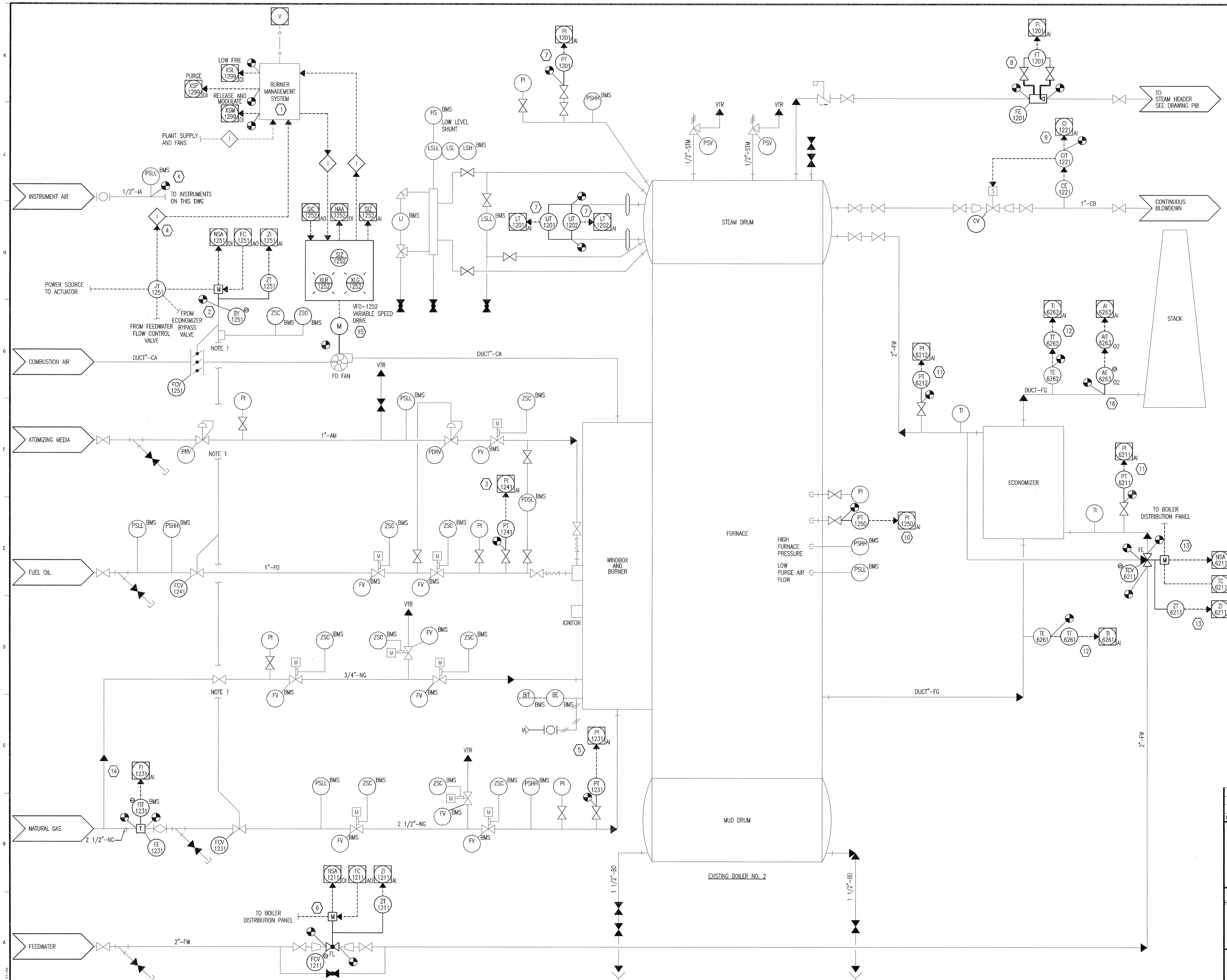
WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM BOILER NO. 1

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PI1



GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

G2. VALVES ARE SHOWN EITHER OPEN OR CLOSED BASED ON NORMAL OPERATING MODE.

DRAWING NOTES:

1. EXISTING JACK SHAFT ACTUATOR AND LINKAGE.
2. ⬡ DENOTES SCOPE OF WORK ITEMS NOTED ON DRAWING PG3.

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM BOILER NO. 2

DESIGNED TJ MERGEN
DRAWN BW DEEN
CHECKED SA WARREN
APPROVED LD VANCE
APPROVED LD VANCE
DATE JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
PI2
REV. 0

GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

G2. VALVES ARE SHOWN EITHER OPEN OR CLOSED BASED ON NORMAL OPERATING MODE.

DRAWING NOTES:

1. EXISTING JACK SHAFT ACTUATOR AND LINKAGE.
2. ⬡ DENOTES SCOPE OF WORK ITEMS NOTED ON DRAWING PG3.

V
LOW FIRE
XSL 1399 DI
PURGE
XSP 1399 DI
RELEASE AND MODULATE
XSM 1399 DI
BURNER MANAGEMENT SYSTEM 1
PLANT SUPPLY AND FANS
INSTRUMENT AIR
1/2"-IA
PSLL BMS 4
TO INSTRUMENTS ON THIS DWG
SIC 1352 AO
NAA 1352 DI
SIZ 1352 AI
NSA 1351 DI
FC 1351 AO
ZI 1351 AI
ZT 1351
SIZ 1352
XLR 1352
XLG 1352
VFD-1352 VARIABLE SPEED DRIVE
POWER SOURCE TO ACTUATOR
JY 1351
FROM FEEDWATER FLOW CONTROL VALVE
FROM ECONOMIZER BYPASS VALVE
BY 1351
ZSC BMS
ZSO BMS
NOTE 1
COMBUSTION AIR
DUCT"-CA
FCV 1351
FD FAN
VTR
ATOMIZING MEDIA
PRV
1"-AM
PSLL BMS
PDRV
FV BMS
PDSL BMS
PT 1341 AI
FUEL OIL
PSHH BMS
FCV 1341
1"-FO
WINDBOX AND BURNER
IGNITOR
3/4"-NG
BIT BMS
BE BMS
IA
NATURAL GAS
2 1/2"-NG
FE 1331
FIT 1331 BMS
FI 1331 AI
PT 1331 AI
2 1/2"-NC
FEEDWATER
2"-FW
FCV 1311
FL
NSA 1311 DI
FC 1311 DI
ZI 1311 AI
ZT 1311
TO BOILER DISTRIBUTION PANEL
HS BMS
LOW LEVEL SHUNT
LSLL LSL LSH BMS
LI BMS
PI 1301 AI
PT 1301
PSHH BMS
LSLL BMS
LT 1301 AI
LIT 1301
LIT 1302
LT 1302 AI
1/2"-STM
PSV
STEAM DRUM
MUD DRUM
EXISTING BOILER NO. 3
FURNACE
HIGH FURNACE PRESSURE
LOW PURGE AIR FLOW
PT 1350
PI 1350 AI
PSHH BMS
PSLL BMS
6"-STM
FI 1301 AI
FT 1301
FE 1301
TO STEAM HEADER SEE DRAWING P18
CI 1321 AI
CIT 1321
CE 1321
S
CV
1"-CB
CONTINUOUS BLOWDOWN
2"-FW
PI 6312 AI
PT 6312
TE
ECONOMIZER
TI 6362 AI
TT 6362
TE 6362
AI 6363 AI
AIT 6363 O2
AE 6363 O2
STACK
PI 6311 AI
PT 6311
TE
TO BOILER DISTRIBUTION PANEL
NSA 6311 DI
TC 6311 AO
TCV 6311
ZT 6311
ZI 6311 AI
TE 6361
TT 6361
TI 6361 AI
DUCT"-FG
1 1/2"-BD

No. 334187 LYLE D. VANCE 1/28/10 REGISTERED PROFESSIONAL ENGINEER STATE OF UTAH

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM BOILER NO. 3

DESIGNED	TJ MERSEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PI3

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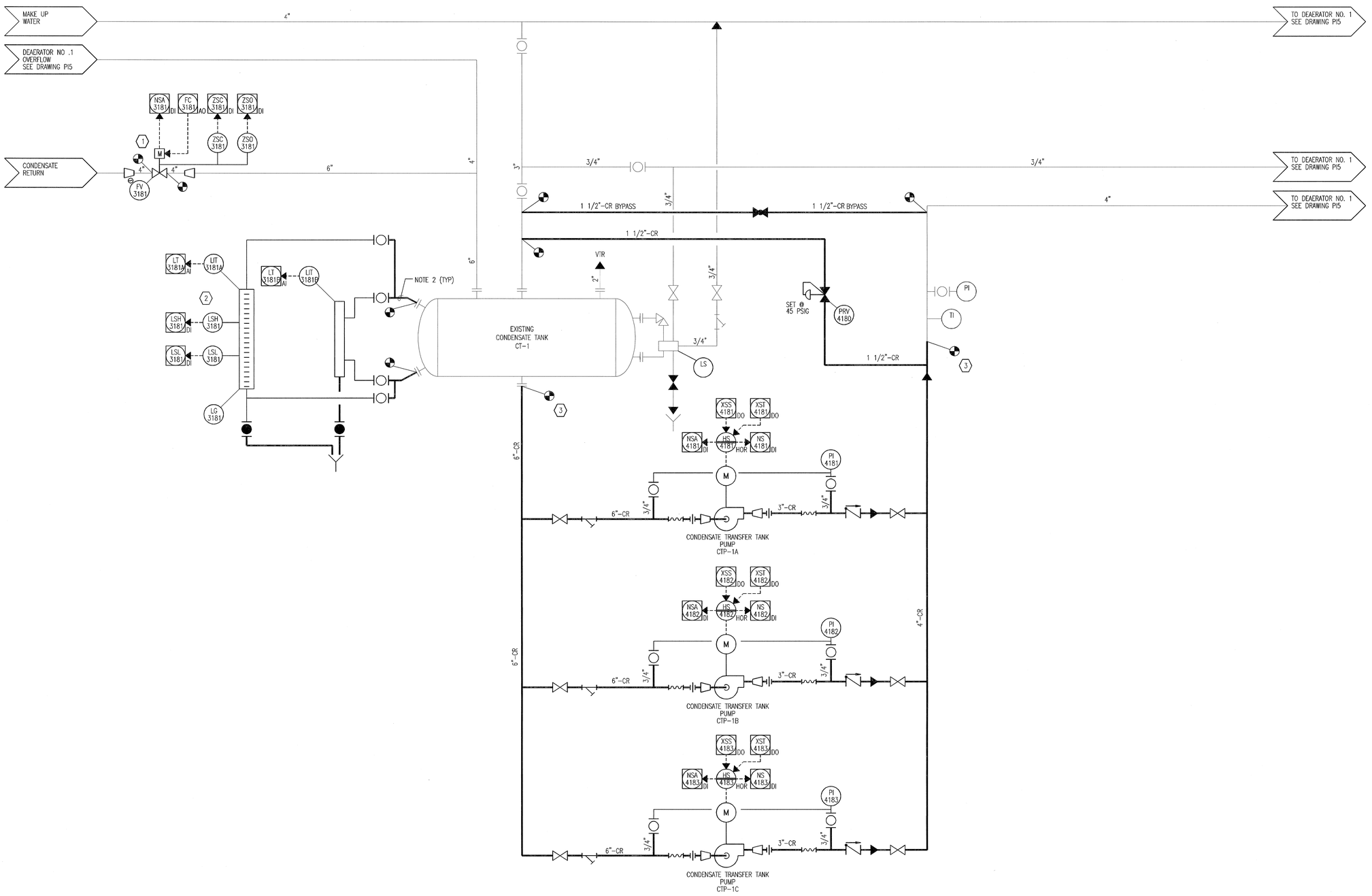
GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

G2. VALVES ARE SHOWN EITHER OPEN OR CLOSED BASED ON NORMAL OPERATING MODE.

DRAWING NOTES:

1. ⬡ DENOTES SCOPE OF WORK ITEMS NOTED ON DRAWING PG3.
2. CONTRACTOR TO COORDINATE CONNECTION SIZE AND TYPE WITH EXISTING EQUIPMENT AND LEVEL DATASHEET.



REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/21/10
STATE OF UTAH

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM CONDENSATE TANK NO. 1

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PI4

GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

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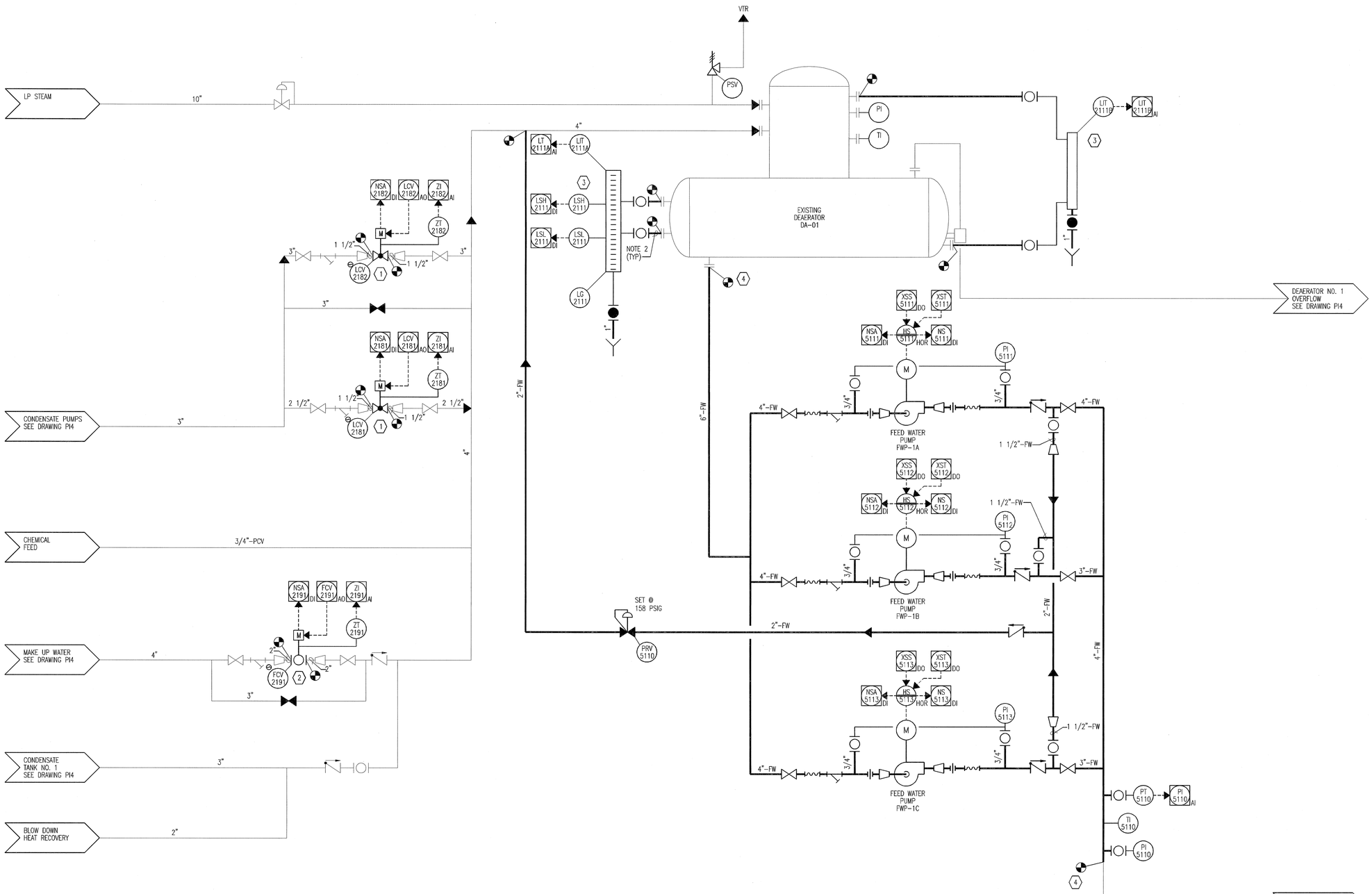
DRAWING NOTES:

1. ⬡ DENOTES SCOPE OF WORK ITEMS NOTED ON DRAWING PG3.
2. CONTRACTOR TO COORDINATE CONNECTION SIZE AND TYPE WITH EXISTING EQUIPMENT AND LEVEL DATASHEET.



No. 334187
LYLE D. VANCE
1/24/10
REGISTERED PROFESSIONAL ENGINEER
STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM DEAERATOR NO. 1

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PI5

GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

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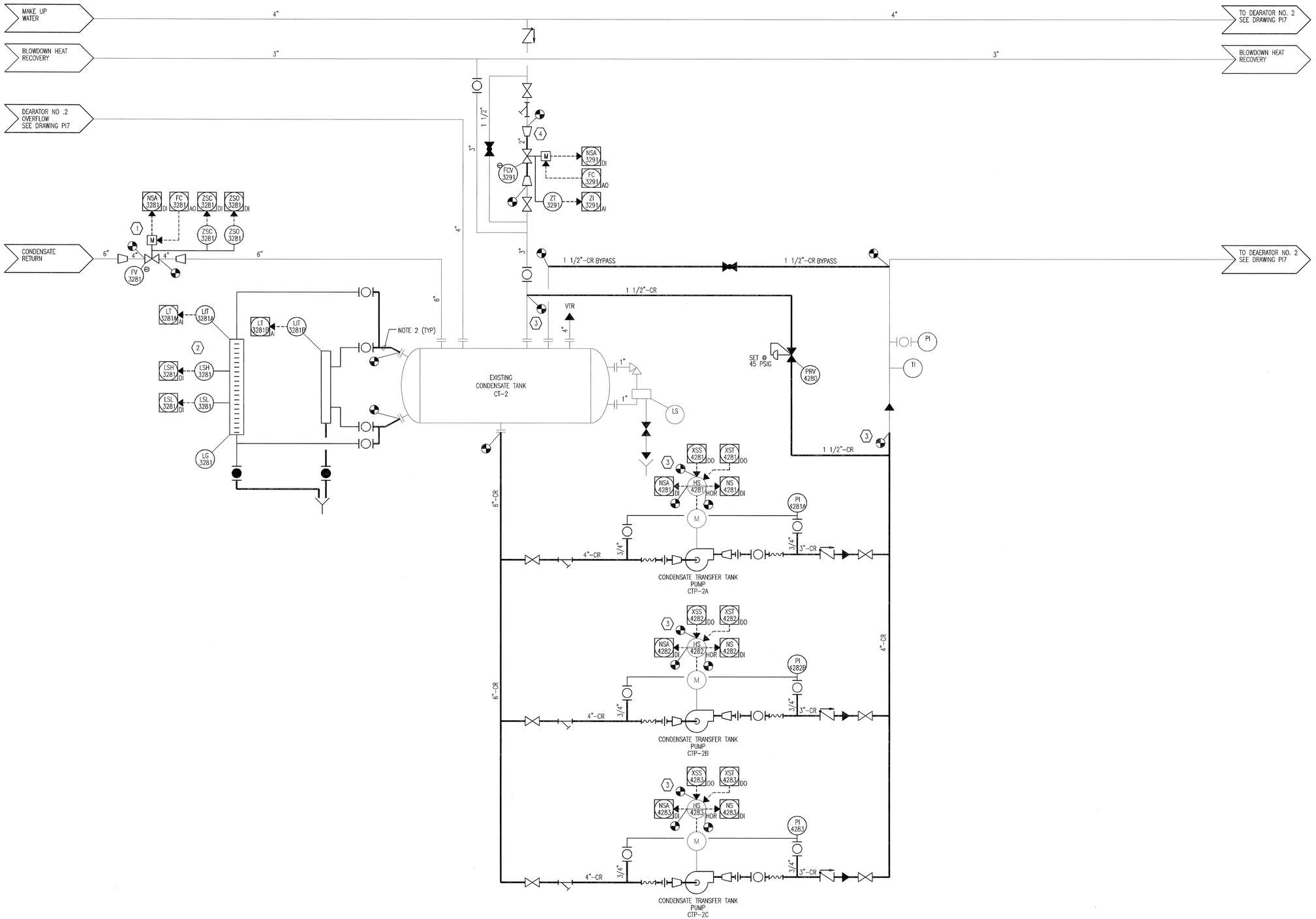

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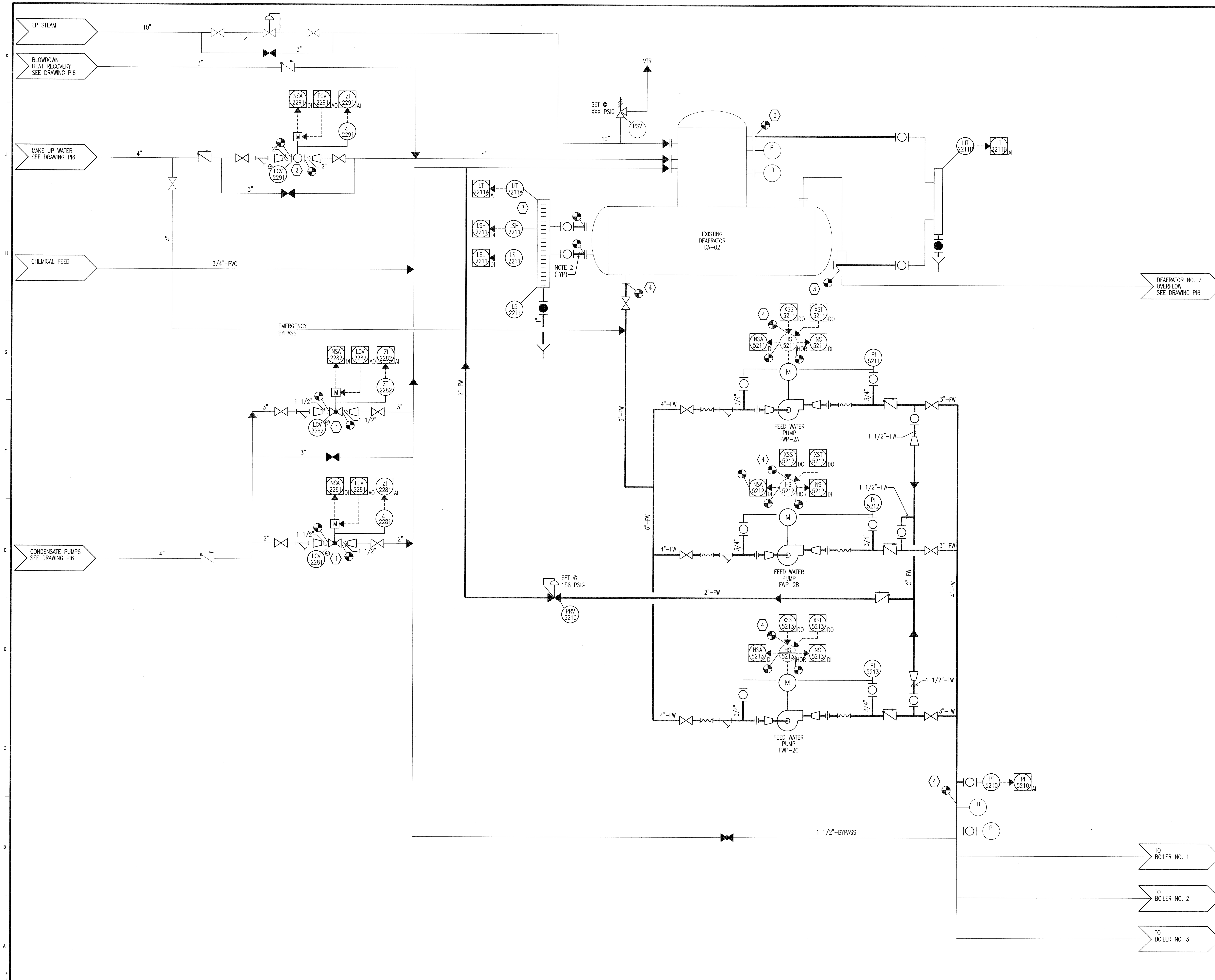
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM CONDENSATE TANK NO. 2

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
PI6



GENERAL NOTES:

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No. 334187 LYLE D. VANCE 1/28/10 REGISTERED PROFESSIONAL ENGINEER STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

PIPING AND INSTRUMENTATION DIAGRAM DEAERATOR NO. 2

DESIGNED TJ MERGEN
DRAWN BW DEEN
CHECKED SA WARREN
APPROVED LD VANCE
APPROVED LD VANCE
DATE JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00 REV.
PI7 0

GENERAL NOTES:

G1. HIGH POINT VENTS AND LOW POINT DRAINS ARE REQUIRED BUT NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.

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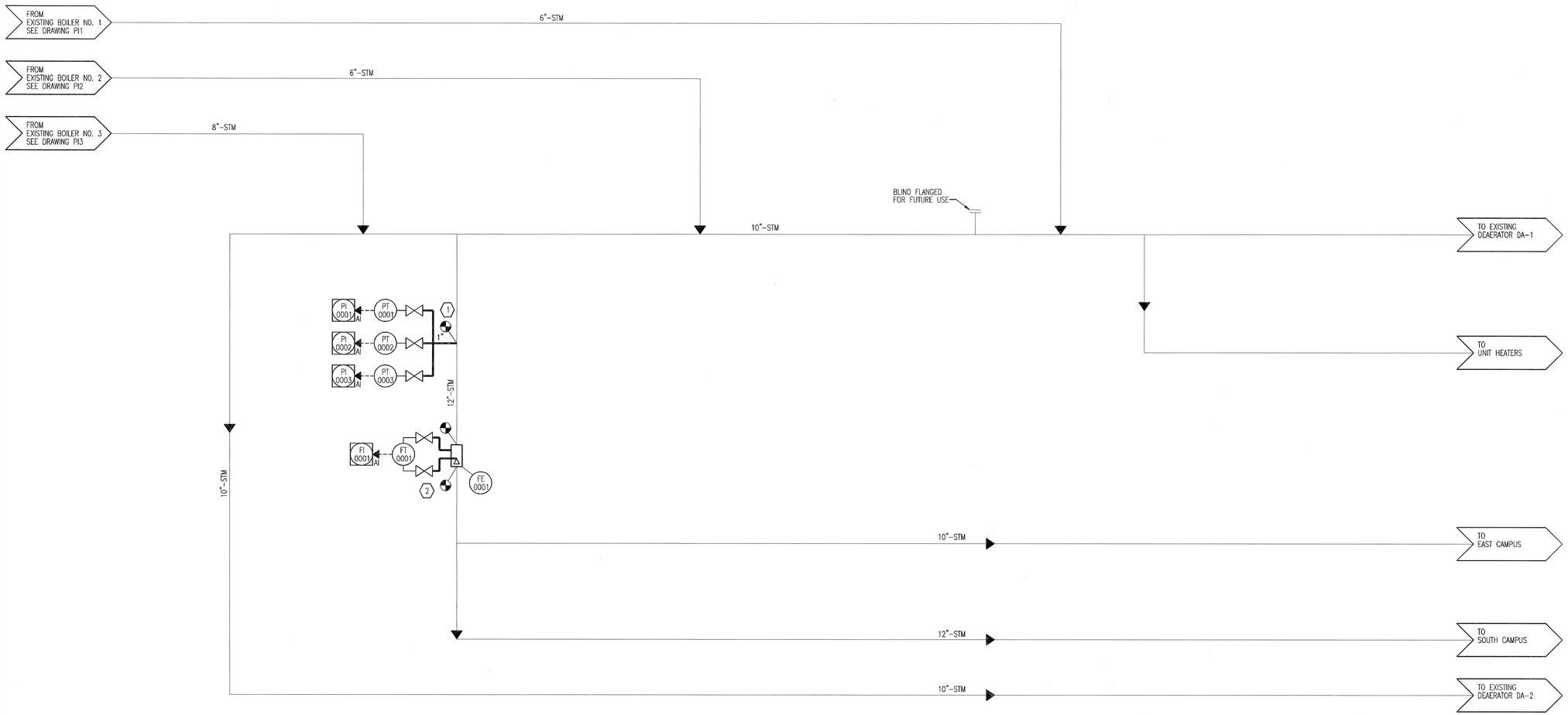
1. ⬡ DENOTES SCOPE OF WORK ITEMS NOTED ON DRAWING PG3.



LYLE D. VANCE No. 334187 STATE OF UTAH REGISTERED ENGINEER 1/28/10

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

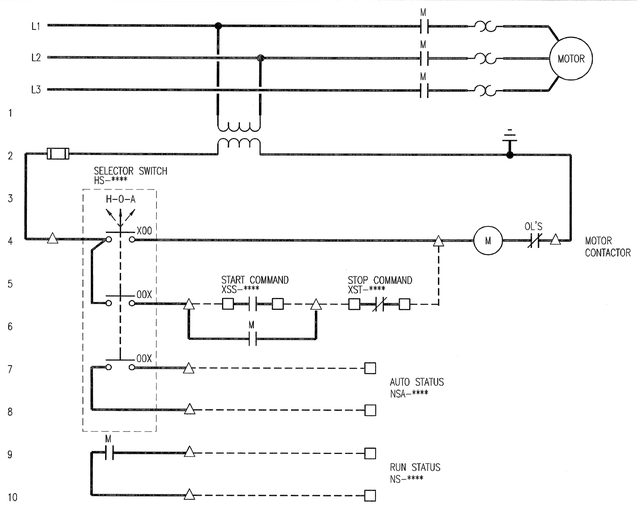
PIPING AND INSTRUMENTATION DIAGRAM STEAM

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE

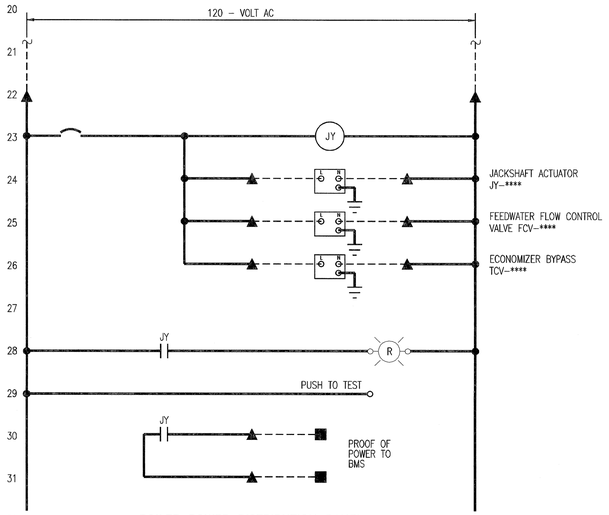
NO. 21937.01.00	REV.
PI8	0

EADD 11-94



PUMP MOTOR CONTROLS

REV.	EQUIPMENT NO.	DESCRIPTION	STARTER LOCATION	P&ID NO.	TAG NO. ****
0	CTP-1A	CONDENSATE TRANSFER PUMP 1A	MCC 1	PI4	4181
0	CTP-1B	CONDENSATE TRANSFER PUMP 1B	MCC 1	PI4	4182
0	CTP-1C	CONDENSATE TRANSFER PUMP 1C	MCC 1	PI4	4183
0	CTP-2A	CONDENSATE TRANSFER PUMP 2A	MCC 2	PI6	4281
0	CTP-2B	CONDENSATE TRANSFER PUMP 2B	MCC 2	PI6	4282
0	CTP-2C	CONDENSATE TRANSFER PUMP 2C	MCC 2	PI6	4283
0	FWP-1A	FEED WATER PUMP 1A	MCC 1	PI5	5111
0	FWP-1B	FEED WATER PUMP 1B	MCC 1	PI5	5112
0	FWP-1C	FEED WATER PUMP 1C	MCC 1	PI5	5113
0	FWP-2A	FEED WATER PUMP 2A	MCC 2	PI7	5211
0	FWP-2B	FEED WATER PUMP 2B	MCC 2	PI7	5212
0	FWP-2C	FEED WATER PUMP 2C	MCC 2	PI7	5213



BOILER POWER DISTRIBUTION PANEL

REV.	SERVICE	JACKSHAFT ACTUATOR	FEEDWATER FLOW CONTROL	ECONOMIZER TEMP. BYPASS
0	EXISTING BOILER 1	BY-1151	FCV-1111	TCV-6111
0	EXISTING BOILER 2	BY-1251	FCV-1211	TCV-6211
0	EXISTING BOILER 3	BY-1351	FCV-1311	TCV-6311

DRAWING NOTES:

1. FACTORY CONFIGURE NEW MOTOR CONTROL CENTER STARTERS TO PROVIDE FUNCTIONALITY SHOWN IN PUMP MOTOR CONTROL SCHEMATIC.
2. PROVIDE NEW HAND-OFF-AUTO SWITCHES WITH AUXILIARY CONTACTS AND TERMINAL LOCKS, AS NEEDED. INSTALL IN MOTOR CONTROL CENTER STARTER CUBICLE FOR EACH MOTOR.

△ STARTER/MCC
▲ POWER DISTRIBUTION
□ PAC
■ BMS
○ FIELD

LYLE D. VANCE
No. 334187
LYLE D. VANCE
REGISTERED PROFESSIONAL ENGINEER
STATE OF UTAH
1/29/10

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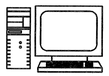
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

MOTOR CONTROL SCHEMATICS

DESIGNED	TJ MERSEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV.
EW1

NETWORK OVERVIEW DIAGRAM


OPERATOR WORKSTATION
(PC – PERSONAL COMPUTER)

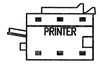

MONITOR


SERVER


COMMUNICATIONS
TRANSCEIVER


HUB/SWITCH

INKJET PRINTER



LASER PRINTER


PRINTER

CONTROLLER
(WITH GATEWAYS)


I/O GATEWAY


DCS
REMOTE I/O


REMOTE
I/O CHASSIS


PLC


POWER MONITOR
UNIT

NETWORK COMMUNICATIONS

COPPER
MODBUS TCP/IP
BY OTHERS
EXISTING
FIBER — F — F — F — F —
ETHERNET

NETWORK OVERVIEW DIAGRAM ABBREVIATIONS

BOP	–	BALANCE OF PLANT
CPU	–	CENTRAL PROCESSING UNIT
DCS	–	DISTRIBUTED CONTROL SYSTEM
EWS	–	ENGINEERING WORKSTATION
ETH SW	–	ETHERNET SWITCH
FF	–	FOUNDATION FIELDBUS
FOB	–	FIBER OPTIC BRIDGE
FT	–	FIBER TRANSCEIVER
HMI	–	HUMAN MANCHINE INTERFACE
I/O	–	INPUT/OUTPUT
LAN	–	LOCAL AREA NETWORK
LCP	–	LOCAL CONTROL PANEL
MCC	–	MOTOR CONTROL CENTER
MCS	–	MOTOR CONTROL SYSTEM
MM	–	MULTI-FUNCTION METER
OPC	–	OLE FOR PROCESS CONTROL
OLE	–	OBJECT LINKAGE AND EMBEDDING
OWS	–	OPERATOR WORKSTATION
PAC	–	PROCESS AUTOMATION CONTROLLER
PAS	–	PLANT ALARM SYSTEM
PC	–	PERSONAL COMPUTER
PLC	–	PROGRAMMABLE LOGIC CONTROLLER
R I/O	–	REMOTE I/O
RTU	–	REMOTE TERMINAL UNIT
SWGR	–	SWITCHGEAR

SAMA


MEASURING OR READOUT


MANUAL SIGNAL PROCESSING


AUTOMATIC SIGNAL PROCESSING


FINAL CONTROLLING


FINAL CONTROLLING
WITH POSITIONER

TIME DELAY OR
PULSE DURATION
(OPTIONAL RESET)

MANUAL STATION

AUTO–MANUAL STATION

AUTO–MANUAL STATION W/BIAS

NONLINEAR FUNCTION

DISCRETE STATE ENERGIZED ON
HIGH ANALOG SIGNAL

DISCRETE STATE ENERGIZED ON
LOW ANALOG SIGNAL

HIGH OR LOW
SIGNAL MONITOR

TRANSFER BLOCK

MEDIAN SELECT


HIGH SELECTING


LOW SELECTING


HIGH LIMITING


LOW LIMITING


VELOCITY


BIASING

MULTIPLICATION


DIVISION

SUM


DIFFERENCE


ROOT EXTRACTION
(eg: SQUARE)

PROPORTIONAL–INTEGRAL–DERIVATIVE (PID)
CONTROLLER

TEST STATION

I/O INTERFACE

RECORDER

GENERAL NOTES

1. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS LEGEND MAY NOT APPEAR ON THIS SET OF DRAWINGS.
2. FOR GENERAL LEGEND AND ABBREVIATIONS, SEE "GG" DRAWINGS.

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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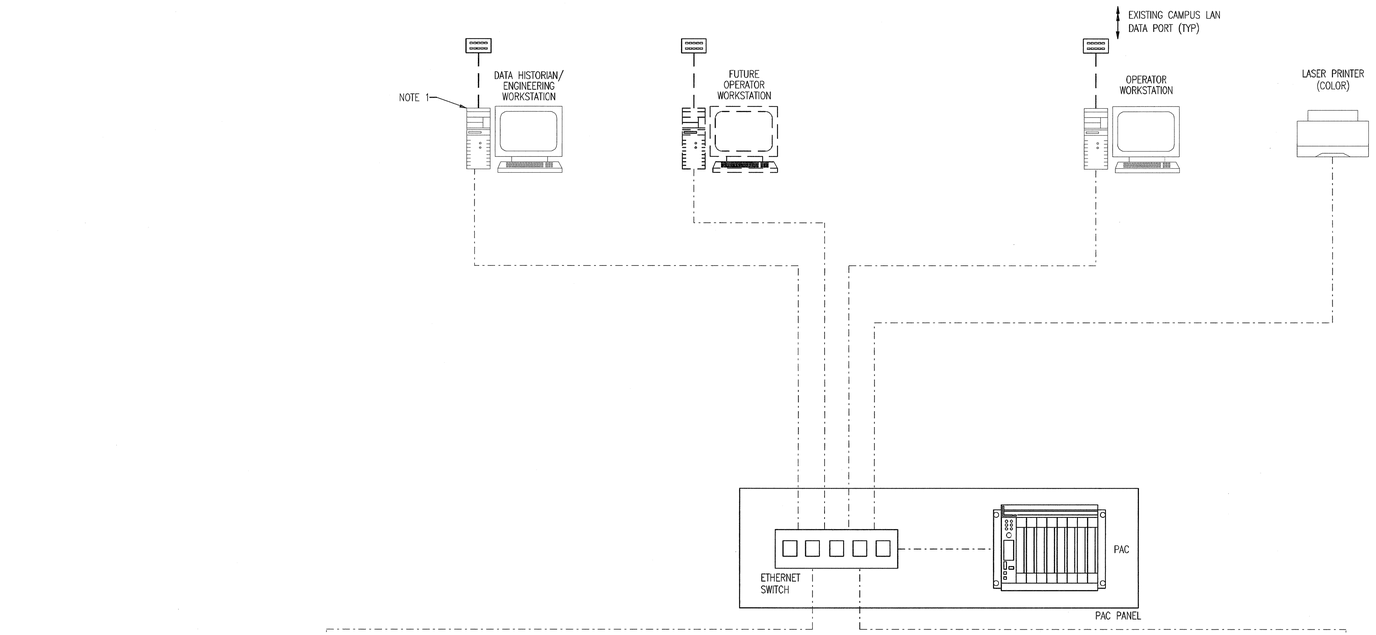
WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

INSTRUMENTATION AND CONTROLS LEGEND SHEET 1

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
IG1



REMOTE I/O PANEL NO. 1

REMOTE I/O PANEL NO. 2

DRAWING NOTES:

1. LOCATED IN INFORMATION TECHNOLOGIES ROOM NEXT DOOR TO CONTROL ROOM.
2. REMOTE ACCESS TO HMI AND DATA HISTORIAN VIA INTERNET THROUGH EXISTING CAMPAS LAN. REFER TO OPERATOR INTERFACE REQUIREMENTS FOR FUNCTIONAL REQUIREMENTS.

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

NETWORK OVERVIEW DIAGRAM

DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
101

INSTALLATION DETAIL INDEX

CATEGORY	SHEET	TITLE
INDEX	N/A	INSTALLATION DETAILS INDEX
GUIDE SPECIFICATIONS	N/A	GUIDE SPECIFICATIONS
000–PRESSURE	I–010.10	DP TRANSMITTER
	I–010.20	DP TRANSMITTER
	I–010.30	DP TRANSMITTER
	I–011.10	PRESSURE TRANSMITTER
	I–011.60	PRESSURE TRANSMITTER
	I–080.20	PRESSURE SWITCH
	I–090.10	PRESSURE GAUGE – PIPE MOUNTED
200–LEVEL MEASUREMENT	I–276	LEVEL GAUGE TRANSMITTER
	I–214	ULTRASONIC LEVEL TRANSMITTER
	I–241	ULTRASONIC LEVEL SWITCH
300–TEMPERATURE MEASUREMENT	I–303.10	TEMPERATURE TRANSMITTER
	I–303.20	TEMPERATURE TRANSMITTER
	I–313	RTD W/ THERMOWELL
	I–370	THERMOWELL – THREADED
	I–371	THERMOWELL – WELDED
	I–372	THERMOWELL INSTALLATION
	I–373	THERMOWELL INSTALLATION – SMALL PIPE (1 1/2" AND SMALLER)
	I–390	TEMPERATURE GAUGE
900–MISCELLANEOUS	I–901	CONDENSATE POTS
	I–905	INSTRUMENT CONDUIT CONNECTION
	I–950	TRANSMITTER PIPE STAND MOUNT
	I–952.10	INSTRUMENT MOUNTING
	I–952.20	INSTRUMENT MOUNTING
	I–953	MULTIPLE XMTR PIPE STAND MOUNT
	I–954	MULTIPLE XMTR PIPE STAND MOUNT
	I–955	PIPE STAND GRATING MOUNT
	I–956	PIPE PRESSURE TAP GUIDE

INSTALLATION NOTES

INSTALLATION – GENERAL

1. INSTALL INSTRUMENT AND CONTROL DEVICES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND/OR WHERE APPROVED BY OWNER'S REPRESENTATIVE.
2. LOCATE INSTRUMENTS AND CONTROL DEVICES WHERE SHOWN ON DRAWINGS, AS DEPICTED ON P&IDS, AND/OR DESIGNATED BY OWNER'S REPRESENTATIVE.
3. MOUNT INSTRUMENTS SO THEY ARE RIGIDLY SUPPORTED, LEVEL AND PLUMB, AND IN SUCH A MANNER AS TO PROVIDE ACCESSIBILITY; PROTECTION FROM DAMAGE; ISOLATION FROM HEAT, SHOCK AND VIBRATION; AND FREEDOM FROM INTERFERENCE WITH OTHER EQUIPMENT, PIPING, AND ELECTRICAL WORK.
4. DO NOT INSTALL INSTRUMENTS UNTIL HEAVY CONSTRUCTION WORK ADJACENT TO INSTRUMENTS HAS BEEN COMPLETED TO EXTENT THAT DAMAGE WILL BE UNLIKELY TO INSTALLATION BY SUCH CONSTRUCTION WORK.
5 MANUFACTURER'S RECOMMENDATIONS REFERRED TO HEREIN SHALL BE AS STATED IN MANUFACTURER'S INSTALLATION MANUAL AND/OR BY MANUFACTURER'S SERVICE REPRESENTATIVE. FINAL INTERPRETATION OF "INSTALLATION REQUIREMENTS" WILL BE BY OWNER'S REPRESENTATIVE.
6. INSTALLATION OF INSTRUMENTS SHALL BE IN ACCORDANCE WITH INSTALLATION DETAILS AND/OR MANUFACTURER' RECOMMENDATION.

INSTRUMENT EQUIPMENT MOUNTING

1. MOUNT INSTRUMENT EQUIPMENT TO BUILDING STEEL, CONCRETE FLOORS, OR WALLS USING PIPE MOUNTING STANDS OR FIELD–FABRICATED MOUNTING BRACKETS.
   A. SECURE INSTRUMENT EQUIPMENT MOUNTING BRACKET TO BUILDING STEEL BY WELDING, AND TO CONCRETE OR MASONRY BUILDING STRUCTURE BY EXPANSION–TYPE ANCHORS. DO NOT MOUNT INSTRUMENTATION EQUIPMENT TO EXTERIOR REMOVABLE PANELS.
   B. GROUT MOUNTING BRACKETS ON CONCRETE FLOORS WITH NONMETALLIC, CHLORIDE–FREE GYPSUM MATERIAL, ASTM C1107, GRADE A; FORMULATION SUITABLE FOR APPLICATION.
   C. IF VIBRATION–FREE LOCATION IS NOT AVAILABLE FOR INSTRUMENT MOUNTING, APPROPRIATE VIBRATION SHOCK MOUNTING SHALL BE PROVIDED BY USE OF RUBBER GROMMETS OR OTHER VIBRATION DAMPENERS DESIGNED FOR VIBRATION ABSORPTION SUBJECT TO OWNER'S REVIEW. MOUNTING OF PROCESS PRESSURE AND TEMPERATURE GAGES OR PROCESS PRESSURE AND TEMPERATURE SWITCHES TO PROCESS PIPING SHALL BE ALLOWABLE ONLY IF VIBRATION IS MINIMIZED.
2. INSTRUMENT ACCESSIBILITY: FOLLOWING GENERAL RULES SHALL BE ADHERED TO, UNLESS LIMITED BY OTHER REQUIREMENTS IN DESIGN OF SYSTEM.
   A. LOCATE INSTRUMENT PROCESS CONNECTIONS FOR MAXIMUM CONVENIENCE IN OPERATION AND SERVICING OF INSTRUMENT. ORIENT CONNECTIONS SO INSTRUMENTS OR PIPING WILL NOT OBSTRUCT AISLES, PLATFORMS, OR LADDERS.
   B. INSTALL FIELD–MOUNTED INSTRUMENTS SO THEY ARE ACCESSIBLE FROM GRADE, PLATFORM, OR PERMANENT LADDER.
   C. LOCATE REMOTE INSTRUMENTS AND CONTROL DEVICES (DEVICES NOT LOCATED IN OR ON PROCESS LINES) AT NOMINAL HEIGHT OF 4–1/2' ABOVE FINISHED FLOOR, GRADE, OR PLATFORM. PROVIDE INSTRUMENT RACKS FOR LOCATION IN WHICH 3 OR MORE INSTRUMENTS OR CONTROL DEVICES ARE LOCATED WITHIN CLOSE PROXIMITY OF EACH OTHER.
   D. MOUNT LOCAL INDICATORS, RECORDERS, AND CONTROLLERS SO THEY ARE READABLE, CONTROLLABLE, AND SERVICEABLE FROM GRADE OR PLATFORMS.

IMPULSE TUBING INSTALLATION

1. INSTALL INSTRUMENT IMPULSE PIPING PARALLEL (EXCEPT FOR SLOPE) TO BUILDING LINES AND OTHER PIPING FOLLOWING INSTRUMENT MANUFACTURER'S INSTRUCTIONS.
   A. INSTRUMENT IMPULSE PIPING WORK SHALL BE FROM LAST BLOCK VALVE THROUGH, AND INCLUDING, BLOWDOWN PIPING TO NEAREST EQUIPMENT DRAIN.
   B. INSTALL HORIZONTAL IMPULSE PIPING WITH SLOPE OF 1" PER FOOT.
      A. SLOPE IMPULSE PIPING TOWARD INSTRUMENT FOR LIQUID AND STEAM SERVICE.
      B. SLOPE IMPULSE PIPING AWAY FROM INSTRUMENT FOR GAS SERVICE.
   C. IMPULSE PIPING SHALL BE CONTINUOUSLY SUPPORTED WITH 12–GAGE ALUMINUM OR GALVANIZED ANGLE AND HELD IN PLACE WITH APPROPRIATE TUBING CLIPS AND FASTENERS. INSTALL TUBING SUPPORTS IN SUCH A MANNER TO PRECLUDE FATIGUE FAILURE OF TUBING DUE TO VIBRATION.
2. BLOWDOWN AND DRAIN VALVES ARE REQUIRED IN IMPULSE LINES TO ALL TRANSMITTERS AND INSTRUMENTS USED ON WATER, STEAM, AND CONDENSING VAPOR SERVICES.
3. ATTACH ISOLATION VALVES TO INSTRUMENTS SO THAT IT IS POSSIBLE TO DISCONNECT INSTRUMENT FROM CONNECTING PIPE WITHOUT HAVING TO DRAIN THE PIPE.
4. INSTALL EXPANSION LOOPS IN IMPULSE PIPING INSTALLATIONS WHERE MOVEMENT OF LAST BLOCK VALVE AND INSTRUMENT IS NOT IN SAME PLANE OR LENGTH OF EXPANSION VARIES.
5. SUPPORT PRESSURE GAGES AND OTHER INSTRUMENTS CONNECTED TO IMPULSE PIPING INDEPENDENTLY OF TUBING. PROVIDE AMPLE EXPANSION LOOPS IN TUBING CONNECTIONS TO INSTRUMENTS SUBJECT TO VIBRATIONS TO PREVENT FAILURE DUE TO METAL FATIGUE.
6. FURNISH AND INSTALL ACCESSORIES REQUIRED FOR COMPLETE IMPULSE PIPING SYSTEM INCLUDING INSTRUMENT ISOLATION VALVES, SNUBBERS, SIPHONS, AND CALIBRATION AND TEST CONNECTIONS AT INSTRUMENT.

CONTROL TUBING AND/OR INSTRUMENT PNEUMATIC TUBING INSTALLATION

1. SINGLE RUNS OF CONTROL TUBING SHALL BE 1/4" OR 3/8" OUTSIDE DIAMETER TUBING. 3/8" TUBING SHALL BE USED FOR INSTRUMENT AIR SUPPLY LINES TO VALVES AND CONTROLLERS. UNLESS OTHERWISE SPECIFIED, OTHER INSTRUMENT AIR LINES SHALL BE 1/4".
2. INSTRUMENT TUBING SHALL BE ROUTED AN ADEQUATE DISTANCE FROM OUTSIDE WALLS, DOORWAYS, AND AREAS OF EXTREME HEAT TO MINIMIZE AMBIENT EFFECTS ON CONTROL LINES.
3. LINES IN INSTRUMENT SUPPLY DISTRIBUTION SYSTEM SHALL BE SIZED SUCH THAT MAXIMUM PRESSURE DROP FROM AIR DRYER TO MOST REMOTE AIR USER DOES NOT EXCEED 5 PSIG WITH A 100 PSIG SUPPLY WHEN ALL USERS ARE TAKING AIR AT APPROXIMATELY 2 TO 5 SCFM.
4. ONLY TOOL–MADE BENDS SHALL BE ACCEPTABLE.
5. SUPPORT EACH RUN OF INSTRUMENT SUPPLY TUBING WITH 12–GAGE ALUMINUM OR GALVANIZED ANGLE, INSTALLED PARALLEL TO BUILDING LINES AND OTHER PIPING, AND HELD IN PLACE WITH THE APPROPRIATE TUBING CLIPS AND FASTENERS. TUBING SUPPORTS SHALL BE INSTALLED IN SUCH A MANNER TO PRECLUDE FATIGUE FAILURE OF TUBING DUE TO VIBRATION.
6. SIGNAL TUBING TERMINATION AT EACH INSTRUMENT SHALL HAVE GAGE TEE WITH PLUG FOR CALIBRATION AND SERVICE.

CLEANING

1. BEFORE ASSEMBLY OR ERECTION, THOROUGHLY CLEAN INSTRUMENTS OF TEMPORARY PROTECTIVE COATINGS AND FOREIGN MATERIALS.
2. AFTER ERECTION OF EQUIPMENT, CLEAN EXTERNAL SURFACES OF OIL, GREASE, DIRT, OR OTHER FOREIGN MATERIAL.

MATERIAL LIST

ITEM	ITEM NO.	DESCRIPTION
00 TUBING	00	1/4" OD ASTM B88 COPPER 0.035" WALL
	01	3/8" OD ASTM B88 COPPER 0.049" WALL
	02	1/2" OD ASTM B88 COPPER 0.049" WALL
	03	1/4" OD 316SS ASTM A213 0.035" WALL
	04	3/8" OD 316SS ASTM A213 0.035" WALL
	05	1/2" OD 316SS ASTM A213 0.049" WALL
	06	1/2" OD 316SS ASTM A213 0.065" WALL
	07	1/2" OD 316SS ASTM A213 0.083" WALL
10/30 TUBE FITTINGS	10	CONNECTOR: 1/2" TUBE X 3/8" MNPT 316SS
	11	CONNECTOR: 1/2" TSW X 3/8" MNPT 316SS
	12	CONNECTOR: 1/2" TUBE X 1/2" MNPT 316SS
	13	CONNECTOR: 1/2" TSW X 1/2" MNPT 316SS
	14	CONNECTOR: 1/2" TUBE X 3/4" MNPT 316SS
	15	CONNECTOR: 1/2" TSW X 3/4" MNPT 316SS
	16	CONNECTOR: 1/4" TUBE X 1 1/2" MNPT 316SS
	17	CONNECTOR: 1/4" TSW X 1 1/2" MNPT 316SS
	18	ELBOW: 1/4" TUBE 316SS
	19	ELBOW: 1/4" TSW 316SS
	20	ELBOW: 1/2" TUBE 316SS
	21	ELBOW: 1/2" TSW 316SS
	22	PLUG: 1/2" 316SS
	23	UNION: 1/4" TUBE 316SS
	24	UNION: 1/4" TSW 316SS
	25	UNION: 1/2" TUBE 316SS
	26	UNION: 1/2" TSW 316SS
	27	UNION TEE: 1/2" TUBE 316SS
	28	UNION TEE: 1/2" TSW 316SS
	29	UNION TEE: 1 1/2" OD FNPT 316SS
	30	CONNECTOR: 3/8" TUBE X 1/4" MNPT BRASS
	31	CONNECTOR: 3/8" TUBE X 1/2" MNPT BRASS
	32	CONNECTOR: 1/2" TUBE X 1/2" MNPT BRASS
	33	CONNECTOR: 1/4" TUBE X 1/4" MNPT BRASS
	34	CONNECTOR: 1/2" TUBE X 3/4" MNPT BRASS
	35	ELBOW: 1/2" TUBE BRASS
	36	UNION TEE: 1/2" TUBE BRASS
	37	UNION TEE: 3/8" TUBE BRASS
40 PIPES AND CONDUIT	40	PIPE: 2" SCH 80 CS
	41	PIPE: 2" SCH 40 CS
	42	PIPE: 1/2"
50/60 PIPE FITTINGS	50	THERMOWELL BUSHING: 1 1/2" X 3/4"
	51	TEMP SWITCH BUSHING: 1 1/2" X 1/2"
	52	PIPE NIPPLE: 1/2"
	53	PIPE PLUG: 2" MALE NPT
	54	REDUCER BUSHING: 2" BY 1/2"
	55	THREADOLET: 1/2"
	56	NIPPLE–UNION: 1/2" NPT
	57	UNION TEE: 2" PIPE FITTING SCH 80 CS
	58	WELD CAP: 2" SCH 40 CS
70 VALVES	70	1/2" BLOCK AND BLEED VALVE 316SS
	71	BLOWDOWN VALVE: 1/2" W/GRAFOIL PACKING 316SS
	72	1/2" GLOBE VALVE 316SS
	73	1/2" BALL VALVE 316SS
	74	1/2" WHITEY VALVE 316SS
	75	3/8" BRASS BALL VALVE
	76	1/2" FEMALE NPT BRASS VALVE
	77	1/2" BRASS BALL VALVE
80 MANI–FOLDS	80	2–VALVE FLANGE MANIFOLD
	81	3–VALVE FLANGE MANIFOLD
	82	5–VALVE FLANGE MANIFOLD
	83	3–VALVE COPLANAR MANIFOLD
	84	5–VALVE COPLANAR MANIFOLD
	85	2–VALVE MANIFOLD
90 MISC	90	CONDENSATE POT
	91	PIPE STAND MOUNT: L 2 1/2" X 2 1/2" X 1/4"
	92	SIPHON: 3/8" 316SS, 0.035" WALL
	93	SNUBBER: 3/8"

No. 334187
LYLE D. VANCE
STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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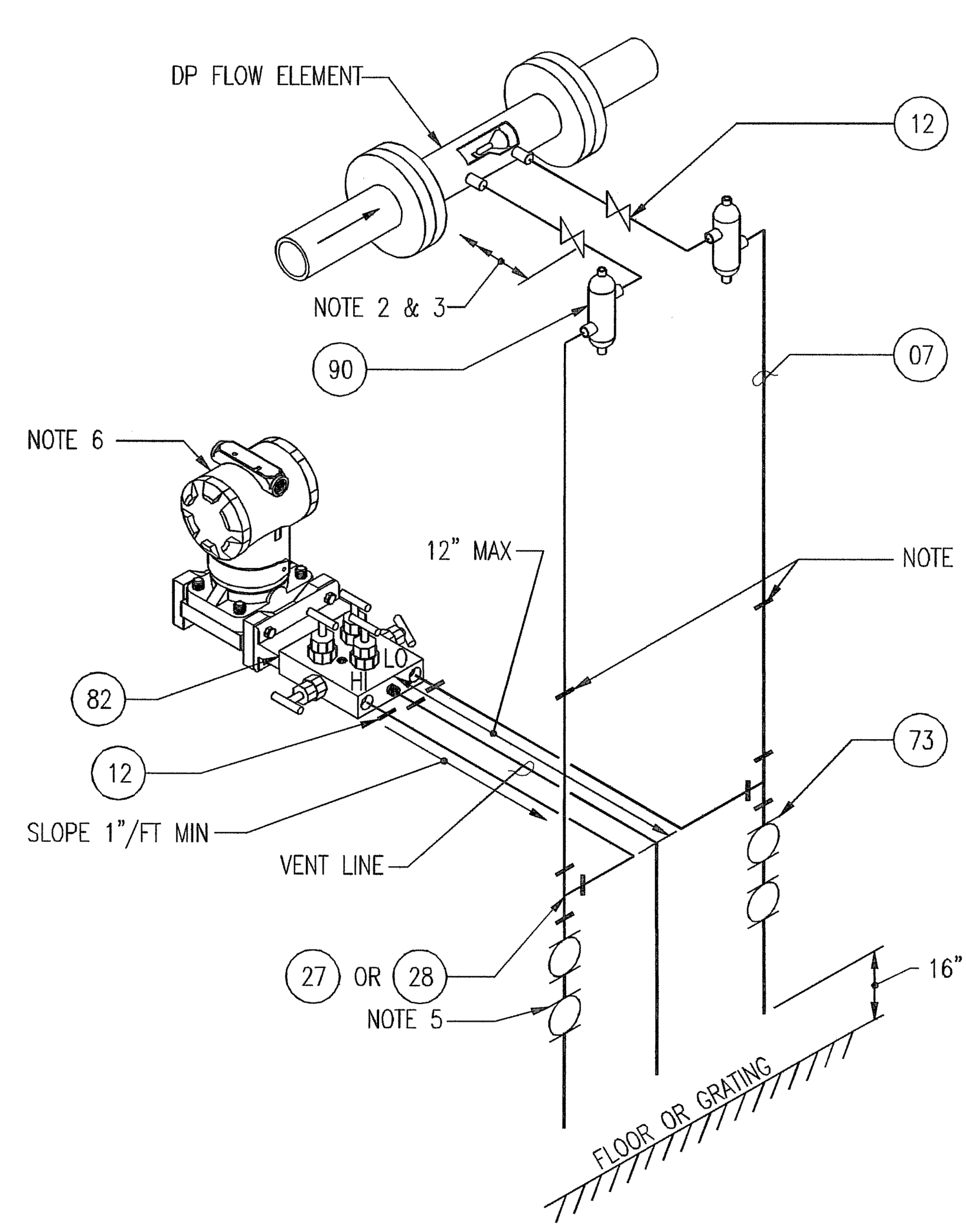
www.stanleygroup.com

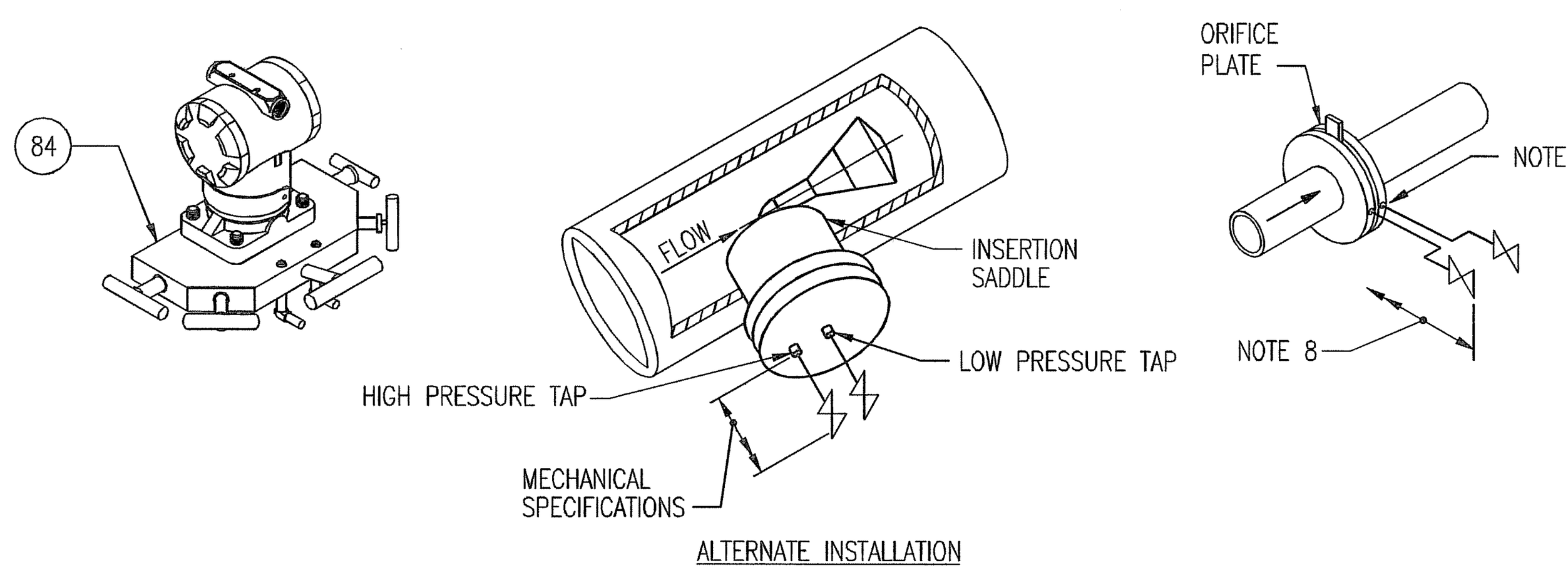
WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

INSTRUMENTATION AND CONTROLS DETAILS SHEET 1

DESIGNED TJ MERGEN
DRAWN BW DEEN
CHECKED SA WARREN
APPROVED LD VANCE
APPROVED LD VANCE
DATE JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
I11
REV. 0



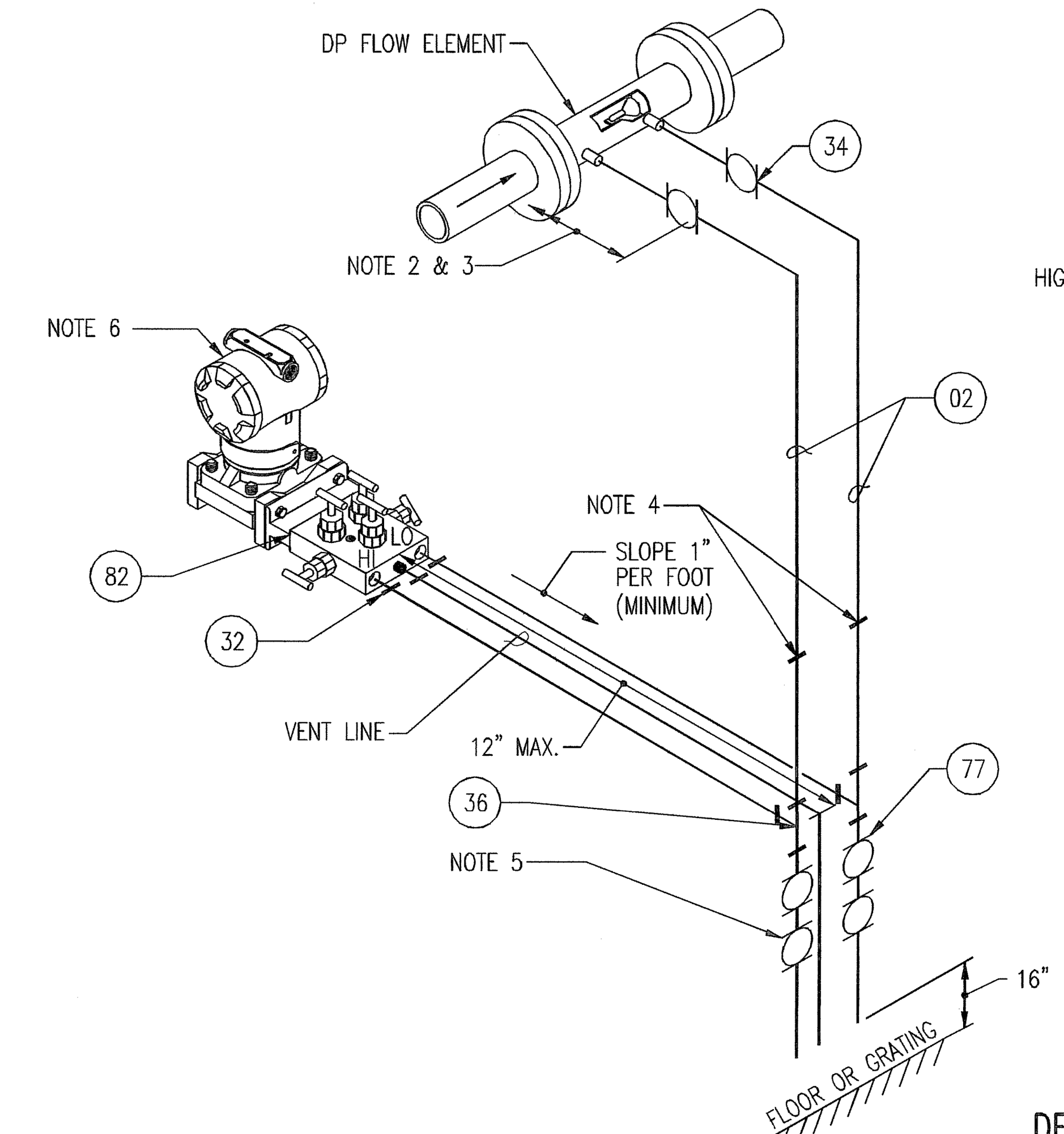


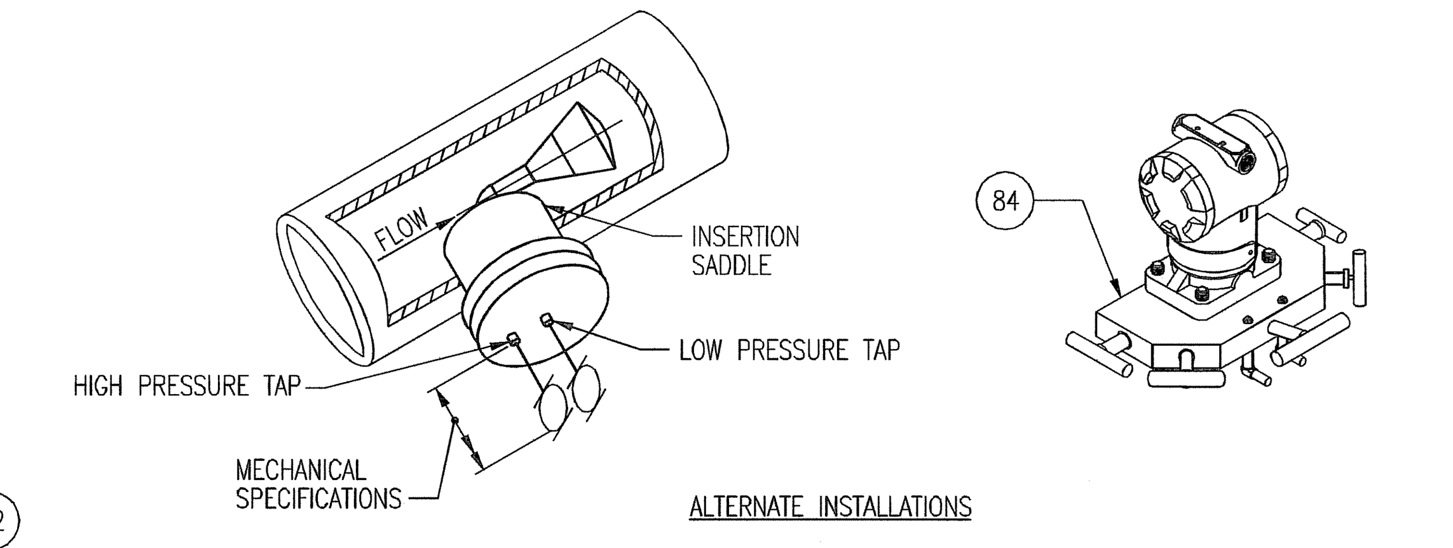
ALTERNATE INSTALLATION

NOTES:

1. INSTALL FLOW ELEMENTS 10 DIAMETERS UPSTREAM AND 5 DIAMETERS DOWNSTREAM OF UNINTRUSIVE, STRAIGHT PIPE. NOTIFY OWNER'S REPRESENTATIVE IF 15 DIAMETERS OF UNINTRUSIVE, STRAIGHT PIPE IS NOT AVAILABLE.
2. REFER TO MECHANICAL SPECIFICATIONS FOR PIPING REQUIREMENTS INCLUDING TAPS, NIPPLES AND ISOLATION VALVES.
3. LOCATE TAPS ON HORIZONTAL CENTERLINE OF PIPE WITH NIPPLES, ISOLATION VALVES, AND CONDENSATE POTS, INSTALLED AT SAME ELEVATION.
4. REFER TO MATERIALS LIST FOR TUBING AND FITTING REQUIREMENT
5. DELETE SECOND BLOWDOWN ISOLATION VALVE ON IMPULSE LINE(S) IF PROCESS PRESSURE IS BELOW 300 PSI AND 500° F.
6. MOUNT TRANSMITTER TO 5-VALVE MANIFOLD BELOW PROCESS TAP.
7. REFER TO ELECTRICAL SPECIFICATIONS FOR ELECTRICAL RACEWAY AND CABLE REQUIREMENTS.
8. EXTEND TUBING FROM LAST BLOWDOWN VALVE TO 16" ABOVE FLOOR OR GRATING.
9. RELATED INSTALLATION DETAILS:
   I-901 CONDENSATE POTS
   I-905 INSTRUMENT CONDUIT CONNECTIONS
   I-950 TO I-955 INSTRUMENT MOUNTING DETAILS

DETAIL I-010.10
DIFFERENTIAL PRESSURE TRANSMITTER – FLOW STEAM SERVICE



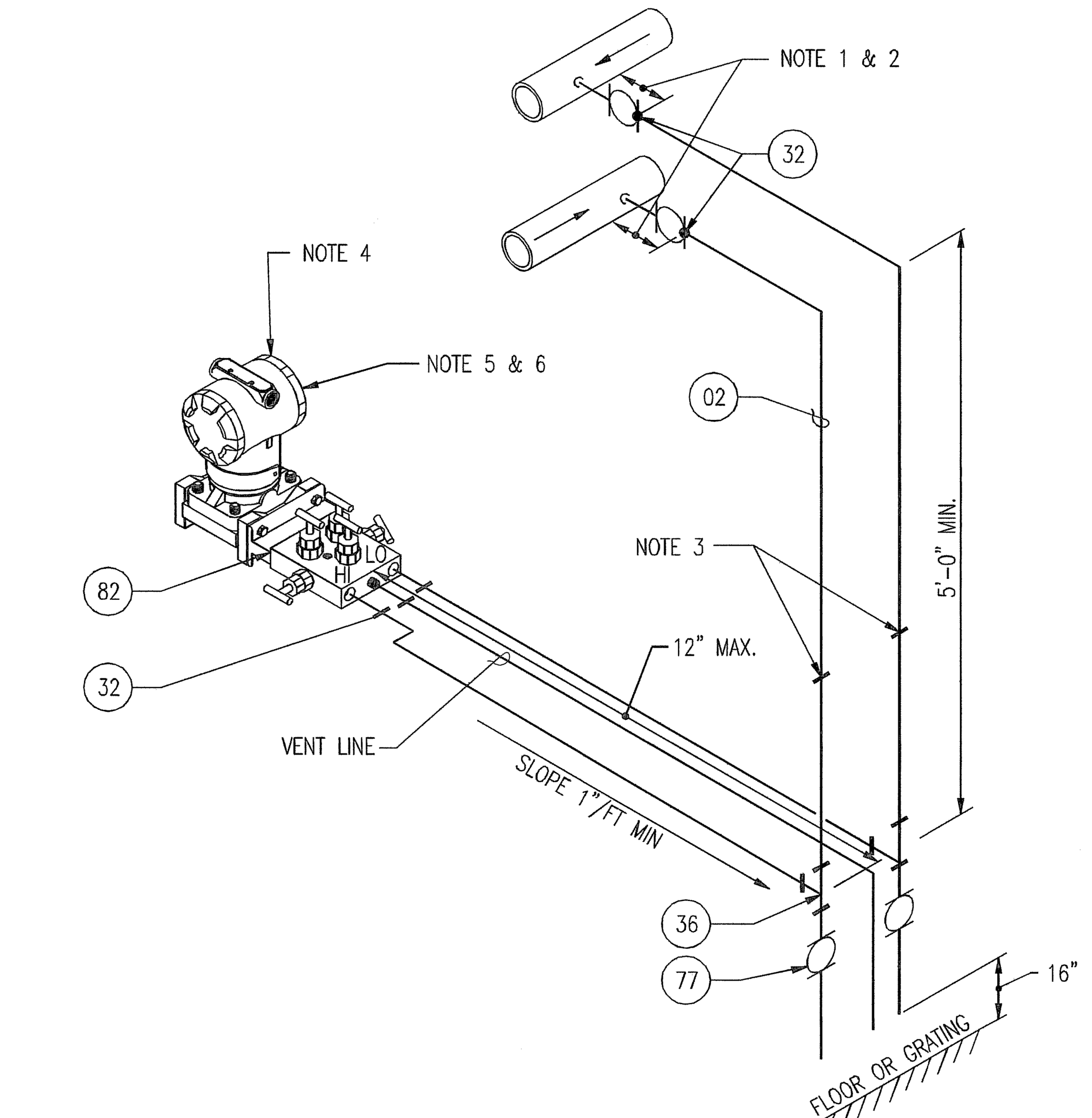


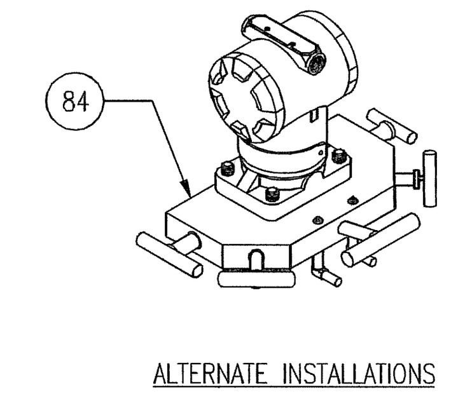
ALTERNATE INSTALLATIONS

NOTES:

1. INSTALL FLOW ELEMENTS 10 DIAMETERS UPSTREAM AND 5 DIAMETERS DOWNSTREAM OF UNITRUSIVE, STRAIGHT PIPE. NOTIFY OWNER'S REPRESENTATIVE IF 15 DIAMETERS OF UNINTRUSIVE PIPE IS NOT AVAILABLE.
2. REFER TO MECHANICAL SPECIFICATIONS FOR PIPING REQUIREMENTS INCLUDING TAPS, NIPPLES AND ISOLATION VALVES.
3. LOCATE TAPS ON HORIZONTAL CENTERLINE OF PIPE WITH NIPPLES, ISOLATION VALVES INSTALLED AT SAME ELEVATION.
4. REFER TO MATERIALS LIST FOR TUBING AND FITTING REQUIREMENTS.
5. DELETE SECOND BLOWDOWN ISOLATION VALVE ON IMPULSE LINE(S) IF PROCESS PRESSURE IS BELOW 300 PSI AND 500° F.
6. MOUNT TRANSMITTER TO 5-VALVE MANIFOLD BELOW PROCESS TAP.
7. REFER TO ELECTRICAL SPECIFICATIONS FOR ELECTRICAL RACEWAY AND CABLE REQUIREMENTS.
8. EXTEND TUBING FROM LAST BLOWDOWN VALVE TO 16" ABOVE FLOOR OR GRATING.
9. RELATED INSTALLATION DETAILS:
   I-905 INSTRUMENT CONDUIT CONNECTIONS
   I-950 TO I-955 INSTRUMENT MOUNTING DETAILS

DETAIL I-010.20
DIFFERENTIAL PRESSURE TRANSMITTER – FLOW LIQUID SERVICE



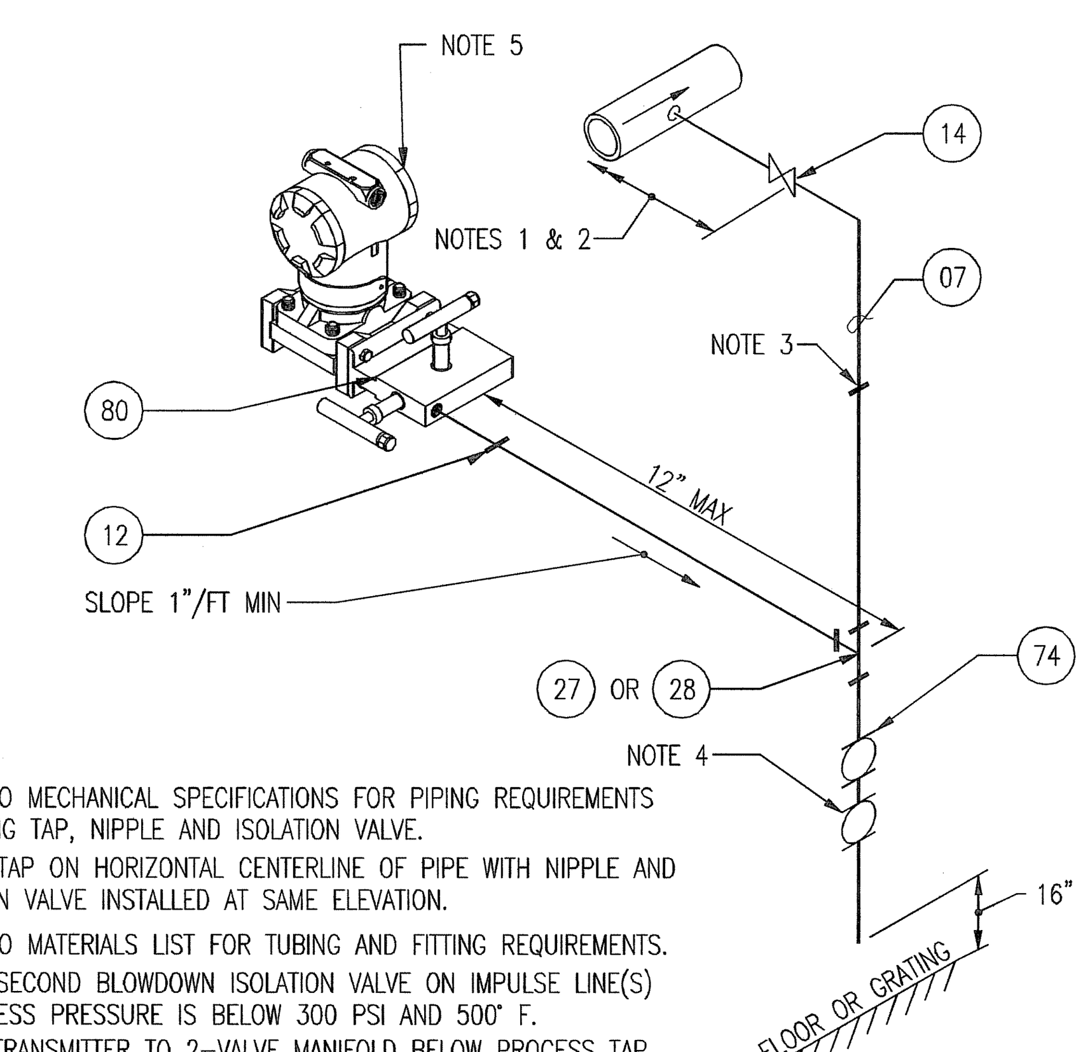


ALTERNATE INSTALLATIONS

NOTES:

1. REFER TO MECHANICAL SPECIFICATIONS FOR PIPING REQUIREMENTS INCLUDING TAPS, NIPPLES AND ISOLATION VALVES.
2. LOCATE TAPS ON HORIZONTAL CENTERLINE OF PIPE WITH NIPPLES AND ISOLATION VALVES INSTALLED AT SAME ELEVATION.
3. REFER TO MATERIALS LIST FOR TUBING AND FITTING REQUIREMENTS.
4. MOUNT TRANSMITTER TO 5-VALVE MANIFOLD BELOW PROCESS TAP.
5. REFER TO ELECTRICAL SPECIFICATIONS FOR ELECTRICAL RACEWAY AND CABLE REQUIREMENTS.
6. EXTEND TUBING FROM LAST BLOWDOWN VALVE TO 16" ABOVE FLOOR OR GRATING.
7. RELATED INSTALLATION DETAILS:
   I-905 INSTRUMENT CONDUIT CONNECTIONS
   I-950 TO I-955 INSTRUMENT MOUNTING DETAILS

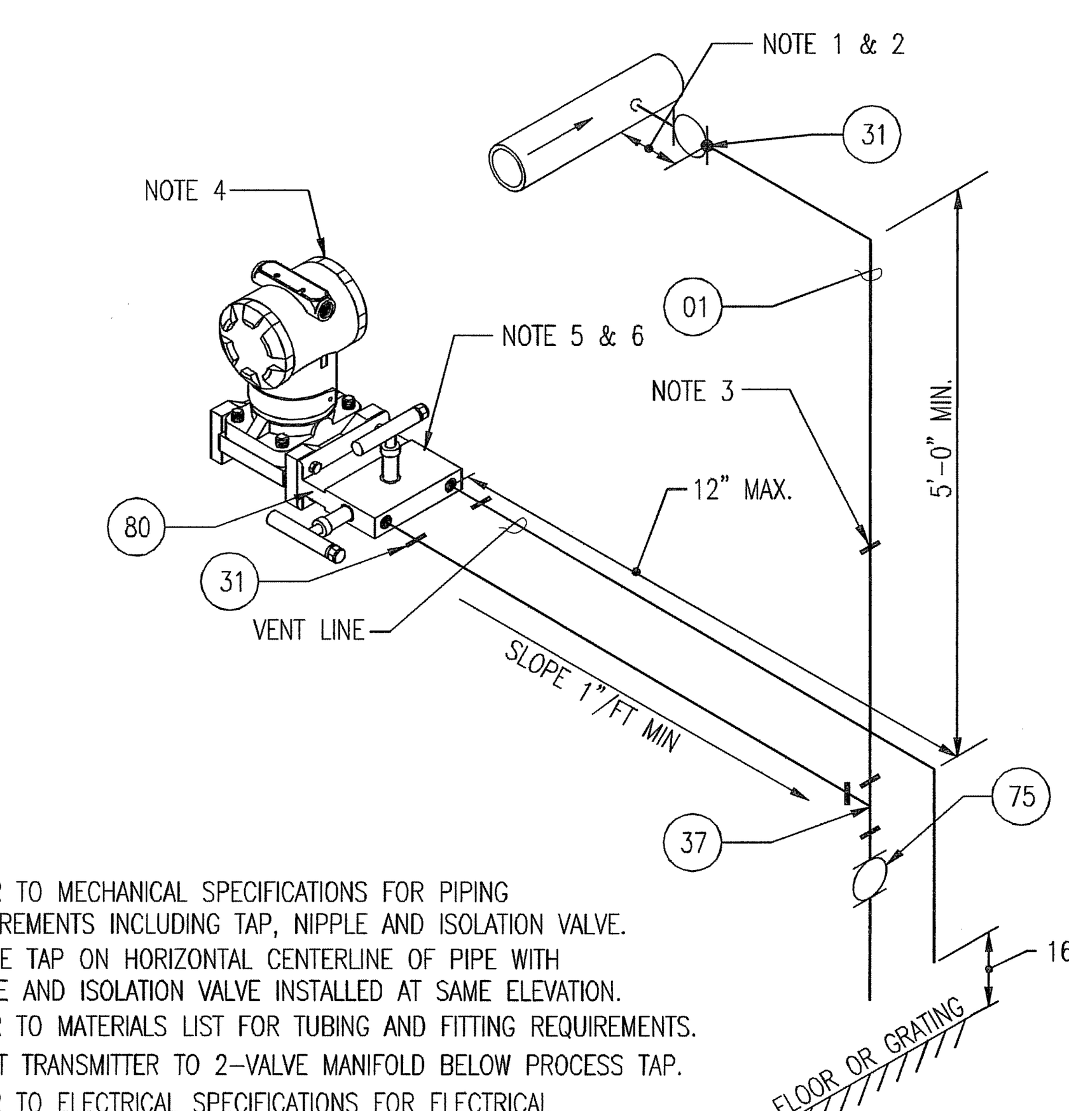
DETAIL I-010.30
DIFFERENTIAL PRESSURE TRANSMITTER – WATER SERVICE



NOTES:

1. REFER TO MECHANICAL SPECIFICATIONS FOR PIPING REQUIREMENTS INCLUDING TAP, NIPPLE AND ISOLATION VALVE.
2. LOCATE TAP ON HORIZONTAL CENTERLINE OF PIPE WITH NIPPLE AND ISOLATION VALVE INSTALLED AT SAME ELEVATION.
3. REFER TO MATERIALS LIST FOR TUBING AND FITTING REQUIREMENTS.
4. DELETE SECOND BLOWDOWN ISOLATION VALVE ON IMPULSE LINE(S) IF PROCESS PRESSURE IS BELOW 300 PSI AND 500° F.
5. MOUNT TRANSMITTER TO 2-VALVE MANIFOLD BELOW PROCESS TAP.
6. REFER TO ELECTRICAL SPECIFICATIONS FOR ELECTRICAL RACEWAY AND CABLE REQUIREMENTS.
7. EXTEND TUBING FROM LAST BLOWDOWN VALVE TO 16" ABOVE FLOOR OR GRATING.
8. RELATED INSTALLATION DETAILS:
   I-905 INSTRUMENT CONDUIT CONNECTIONS
   I-950 TO I-955 INSTRUMENT MOUNTING DETAILS

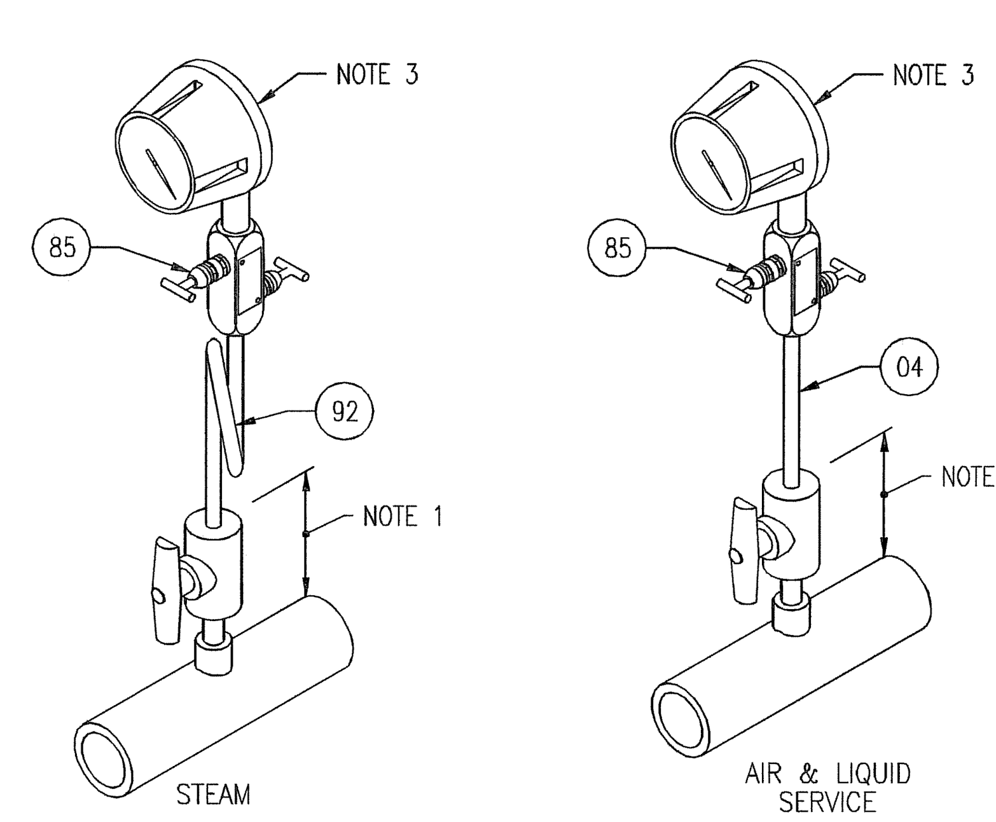
DETAIL I-011.10
PRESSURE TRANSMITTER – STEAM SERVICE



NOTES:

1. REFER TO MECHANICAL SPECIFICATIONS FOR PIPING REQUIREMENTS INCLUDING TAP, NIPPLE AND ISOLATION VALVE.
2. LOCATE TAP ON HORIZONTAL CENTERLINE OF PIPE WITH NIPPLE AND ISOLATION VALVE INSTALLED AT SAME ELEVATION.
3. REFER TO MATERIALS LIST FOR TUBING AND FITTING REQUIREMENTS.
4. MOUNT TRANSMITTER TO 2-VALVE MANIFOLD BELOW PROCESS TAP.
5. REFER TO ELECTRICAL SPECIFICATIONS FOR ELECTRICAL RACEWAY AND CABLE REQUIREMENTS.
6. EXTEND TUBING FROM LAST BLOWDOWN VALVE TO 16" ABOVE FLOOR OR GRATING.
7. RELATED INSTALLATION DETAILS:
   I-905 INSTRUMENT CONDUIT CONNECTIONS
   I-950 TO I-955 INSTRUMENT MOUNTING DETAILS

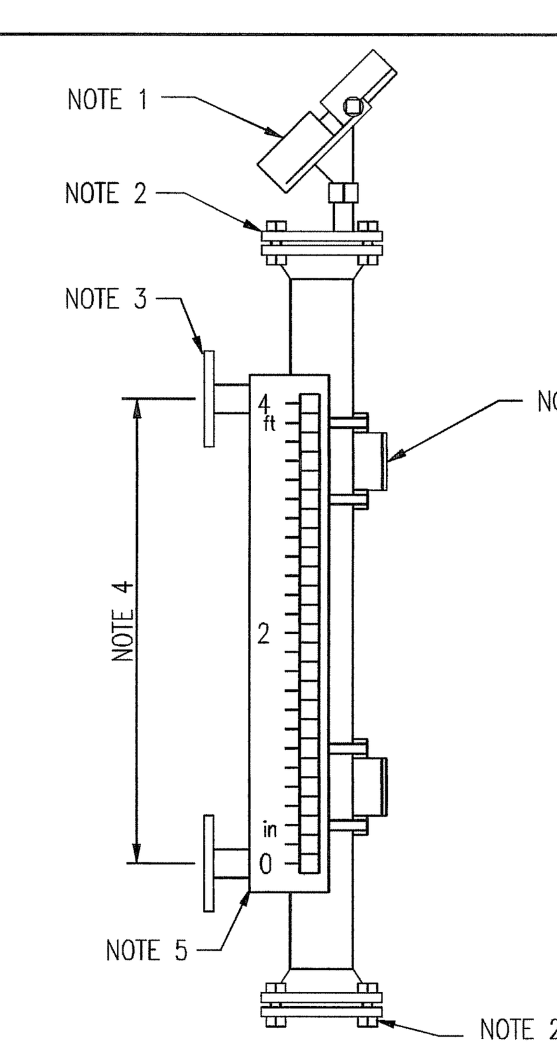
DETAIL I-011.60
GAUGE PRESSURE TRANSMITTER – WATER SERVICE



NOTES

1. REFER TO MECHANICAL SPECIFICATIONS FOR PIPING REQUIREMENTS INCLUDING TAP AND ISOLATION VALVE.
2. REFER TO MATERIALS LIST FOR TUBING AND FITTING REQUIREMENTS.
3. MOUNT SWITCH OR GAUGE ON SUPPORT ATTACHED TO PIPE OR WALL.

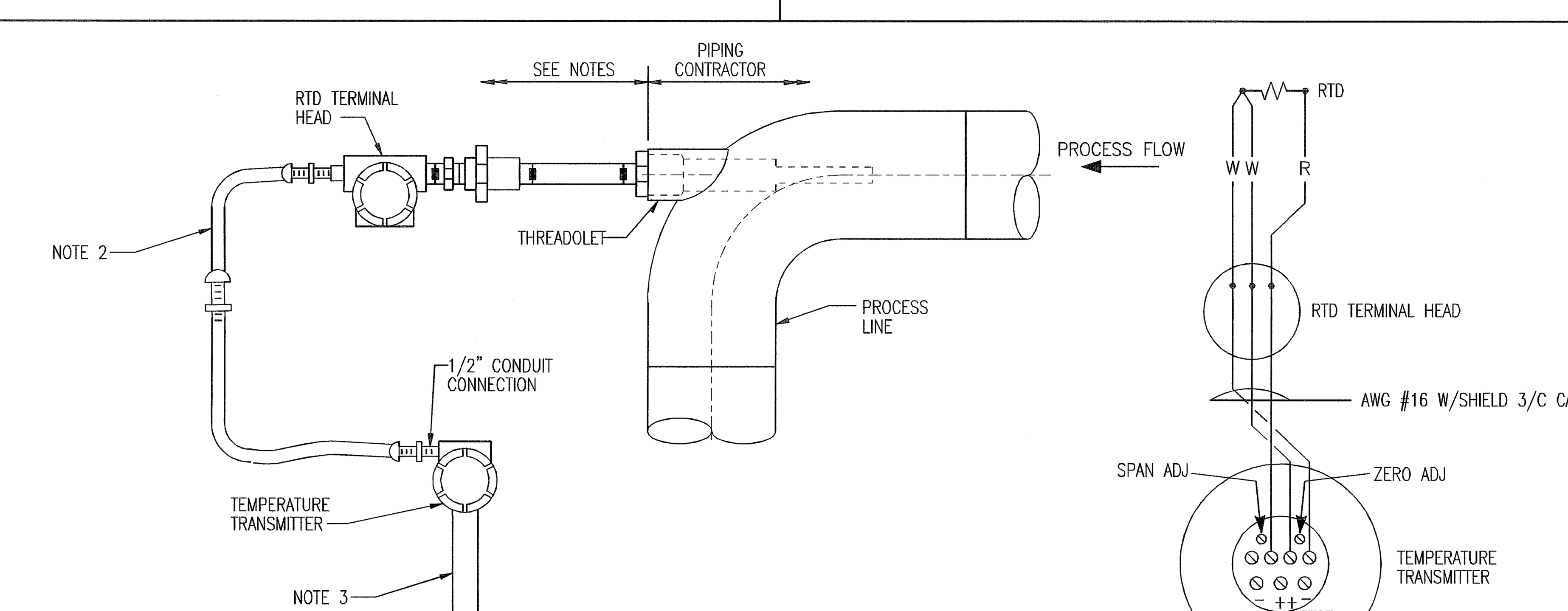
DETAIL I-080.20, I-090.10
LOCAL PRESSURE SWITCH, GAUGE – PIPE MOUNTED



NOTES:

1. LEVEL PROBE/ TRANSMITTER SEE DATASHEET 276.00 IN SPECIFICATION.
2. 1/2" NPT VENT AND DRAIN FLANGE.
3. TANK CONNECTION SIDE/SIDE 1" THREADED COUPLING.
4. 48" CENTER TO CENTER DIMENSION.
5. FLAG STYLE INDICATOR.
6. ELECTRIC REED SWITCHES, HERMETICALLY SEALED, PROVIDING HIGH LEVEL AND LOW LEVEL.

DETAIL I-276
LEVEL GAUGE, TRANSMITTER AND SWITCHES – WATER SERVICE



NOTES:

1. PIPING CONTRACTOR TO PROVIDE PIPE PLUG IN THREADOLET UPON INSTALLATION. AFTER FLUSHING IS COMPLETE, INSTRUMENT CONTRACTOR REMOVES PLUG FOR TW INSTALLATION. PLUG BECOMES PROPERTY OF CLIENT.
2. LIMIT FLEXIBLE LIQUIDTIGHT CONDUIT TO MAX LENGTH OF 3FT, MIN LENGTH 1'-6".
3. 2" PIPE SUPPORT AND FLOOR FLANGE (BOTH GALVANIZED) FOR USE WITH "A" SERIES SECONDARY SUPPORT MODULES.
4. SEE INSTRUMENT INDEX FOR FIELD DEVICE DESCRIPTIONS AND AN ESTIMATE OF THE INSTALLATION RESPONSIBILITIES FOR INSTRUMENTATION AND CONTROL DEVICES.
5. PROVIDE COMPONENT INSTRUMENT RACKS FOR MULTIPLE INSTRUMENTS WHERE INDICATED ON INSTRUMENT LOCATION PLANS UNLESS NOTED OTHERWISE.

DETAIL I-303.10
TEMPERATURE TRANSMITTER – 3 WIRE RTD

MATERIAL LIST

ITEM	ITEM NO.	DESCRIPTION
00 TUBING	00	1/4" OD ASTM B88 COPPER 0.035" WALL
	01	3/8" OD ASTM B88 COPPER 0.049" WALL
	02	1/2" OD ASTM B88 COPPER 0.049" WALL
	03	1/4" OD 316SS ASTM A213 0.035" WALL
	04	3/8" OD 316SS ASTM A213 0.035" WALL
	05	1/2" OD 316SS ASTM A213 0.049" WALL
	06	1/2" OD 316SS ASTM A213 0.065" WALL
	07	1/2" OD 316SS ASTM A213 0.083" WALL
10/30 TUBE FITTINGS	10	CONNECTOR: 1/2" TUBE X 3/8" MNPT 316SS
	11	CONNECTOR: 1/2" TSW X 3/8" MNPT 316SS
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	14	CONNECTOR: 1/2" TUBE X 3/4" MNPT 316SS
	15	CONNECTOR: 1/2" TSW X 3/4" MNPT 316SS
	16	CONNECTOR: 1/4" TUBE X 1 1/2" MNPT 316SS
	17	CONNECTOR: 1/4" TSW X 1 1/2" MNPT 316SS
	18	ELBOW: 1/4" TUBE 316SS
	19	ELBOW: 1/4" TSW 316SS
	20	ELBOW: 1/2" TUBE 316SS
	21	ELBOW: 1/2" TSW 316SS
	22	PLUG: 1/2" 316SS
	23	UNION: 1/4" TUBE 316SS
	24	UNION: 1/4" TSW 316SS
	25	UNION: 1/2" TUBE 316SS
	26	UNION: 1/2" TSW 316SS
	27	UNION TEE: 1/2" TUBE 316SS
	28	UNION TEE: 1/2" TSW 316SS
	29	UNION TEE: 1 1/2" OD FNPT 316SS
	30	CONNECTOR: 3/8" TUBE X 1/4" MNPT BRASS
	31	CONNECTOR: 3/8" TUBE X 1/2" MNPT BRASS
	32	CONNECTOR: 1/2" TUBE X 1/2" MNPT BRASS
	33	CONNECTOR: 1/4" TUBE X 1/4" MNPT BRASS
	34	CONNECTOR: 1/2" TUBE X 3/4" MNPT BRASS
	35	ELBOW: 1/2" TUBE BRASS
	36	UNION TEE: 1/2" TUBE BRASS
	37	UNION TEE: 3/8" TUBE BRASS
40 PIPES AND CONDUIT	40	PIPE: 2" SCH 80 CS
	41	PIPE: 2" SCH 40 CS
	42	PIPE: 1/2"
50/60 PIPE FITTINGS	50	THERMOWELL BUSHING: 1 1/2" X 3/4"
	51	TEMP SWITCH BUSHING: 1 1/2" X 1/2"
	52	PIPE NIPPLE: 1/2"
	53	PIPE PLUG: 2" MALE NPT
	54	REDUCER BUSHING: 2" BY 1/2"
	55	THREADOLET: 1/2"
	56	NIPPLE-UNION: 1/2" NPT
	57	UNION TEE: 2" PIPE FITTING SCH 80 CS
	58	WELD CAP: 2" SCH 40 CS
70 VALVES	70	1/2" BLOCK AND BLEED VALVE 316SS
	71	BLOWDOWN VALVE: 1/2" W/GRAFOIL PACKING 316SS
	72	1/2" GLOBE VALVE 316SS
	73	1/2" BALL VALVE 316SS
	74	1/2" WHITEY VALVE 316SS
	75	3/8" BRASS BALL VALVE
	76	1/2" FEMALE NPT BRASS VALVE
	77	1/2" BRASS BALL VALVE
80 MANI-FOLDS	80	2-VALVE FLANGE MANIFOLD
	81	3-VALVE FLANGE MANIFOLD
	82	5-VALVE FLANGE MANIFOLD
	83	3-VALVE COPLANAR MANIFOLD
	84	5-VALVE COPLANAR MANIFOLD
	85	2-VALVE MANIFOLD
90 MISC	90	CONDENSATE POT
	91	PIPE STAND MOUNT: L 2 1/2" X 2 1/2" X 1/4"
	92	SIPHON: 3/8" 316SS, 0.035" WALL
	93	SNUBBER: 3/8"

PROFESSIONAL ENGINEER No. 334187 LYLE D. VANCE 1/29/10 STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

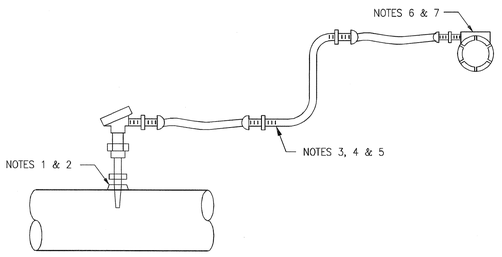
Stanley Consultants INC.

5253 S 960 E, Suite 220, Salt Lake City, Utah 84117-7269
www.stanleygroup.com

WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

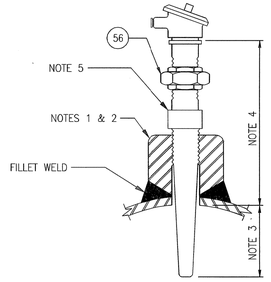
INSTRUMENTATION AND CONTROLS DETAILS SHEET 2

DESIGNED TJ MERGEN	SCALE: NONE	
DRAWN BW DEEN	NO. 21937.01.00	REV.
CHECKED SA WARREN	I12	0
APPROVED LD VANCE		
APPROVED LD VANCE		
DATE JANUARY 28, 2010		



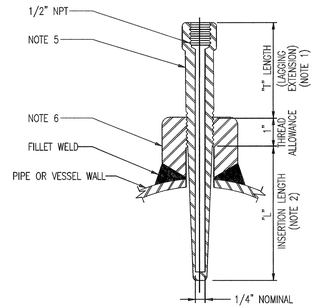
NOTES:
1. REFER TO MECHANICAL SPECIFICATIONS FOR PIPE REQUIREMENTS.
2. REFER TO INSTALLATION DETAIL 313 FOR RTD WITH THERMOWELL.
3. REFER TO ELECTRICAL SPECIFICATIONS FOR ELECTRICAL RACEWAY AND CABLE REQUIREMENTS.
4. REFER TO INSTALLATION DETAIL 905 FOR CONDUIT CONNECTIONS.
5. PROVIDE TWISTED SHIELD TRIAD CABLE FOR RTD EXTENSION WIRE FROM TEMPERATURE ELEMENT TO TEMPERATURE TRANSMITTER.
6. REFER TO INSTALLATION DETAIL 950 THRU 955 FOR TRANSMITTER MOUNTING.
7. PROVIDE TWISTED SHIELDED PAIR CABLE FOR INSTRUMENT CIRCUIT.

DETAIL I-303.20
TEMPERATURE TRANSMITTER
AIR, GAS, STEAM, AND WATER SERVICE



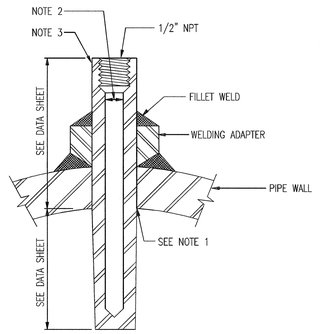
NOTES:
1. REFER TO MECHANICAL SPECIFICATIONS FOR PIPE REQUIREMENTS.
2. INSTALL THREADOLET IN ACCORDANCE WITH INSTALLATION DETAIL 372 AND 373.
3. LIMIT INSERTION LENGTH TO 1/2 DIAMETER OF PIPE TO MAX LENGTH OF 4".
4. DIMENSION AS REQUIRED TO PLACE CONNECTION ABOVE INSULATION. REFER TO MECHCANICAL DRAWINGS ANDSPECIFICATIONS FOR INSULATION CLASS AND THICKNESS.
5. REFER TO INSTALLATION DETAIL 303.10 FOR TEMPERATURE TRANSMITTER.

DETAIL I-313
RTD WITH THERMOWELL
AIR, GAS, STEAM, AND WATER SERVICE



NOTES:
1. "T" LAGGING EXTENSION, AS REQUIRED TO PLACE CONNECTION ABOVE INSULATION. SEE PIPING SCHEMATICS FOR INSULATION CLASS AND THE APPLICABLE INSULATION THICKNESS. SEE MECHANICAL STANDARD M-1008.
2. "L" INSERTION LENGTH, 1/2 DIAMETER OF PIPE OR DUCT, MAXIMUM LENGTH OF 18" FOR DUCT AND 4" FOR PIPE, MINIMUM LENGTH 2 1/2". MANUFACTURER'S STANDARD INSERTION LENGTH NEAREST TO REQUIRED LENGTH WILL BE APPLICABLE.
3. SEE INSTRUMENTATION INSTALLATION DETAIL 373 FOR INSTALLATION IN SMALL PIPE.
4. REFER TO DATA SHEET FOR THERMOWELL CONSTRUCTION.
5. WELL MATERIAL TO MATCH PIPE MATERIAL UNLESS OTHERWISE NOTED ON DATA SHEET.
6. WELDING ADAPTER FOR STEEL ALLOY WELLS, REDUCING TEE WITH ADAPTER AS REQUIRED.

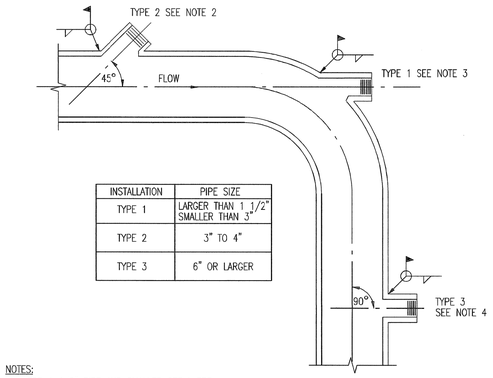
DETAIL I-370
THREADED THERMOWELL



NOTES
1. DRILL AND REAM PIPE TO NOMINAL OUTSIDE DIAMETER OF THERMOWELL. TOLERENCE TO BE -.0005" TO +.000", TO GIVE SLIGHT INTERFERENCE FIT.
2. THERMOMETER AND THERMOCOUPLE WELLS AS REQUIRED TO ACCOMMODATE DEVICE (0.387 INCH MAXIMUM.)
3. WELL MATERIAL TO MATCH PIPE MATERIAL UNLESS OTHERWISE NOTED. SEE DATA SHEET.

DETAIL I-371
WELDED THERMOWELL

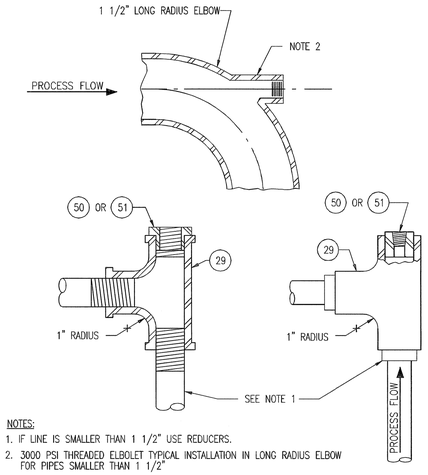
ITEM	ITEM NO.	DESCRIPTION
00 TUBING	00	1/4" OD ASTM B88 COPPER 0.035" WALL
	01	3/8" OD ASTM B88 COPPER 0.049" WALL
	02	1/2" OD ASTM B88 COPPER 0.049" WALL
	03	1/4" OD 316SS ASTM A213 0.035" WALL
	04	3/8" OD 316SS ASTM A213 0.035" WALL
	05	1/2" OD 316SS ASTM A213 0.049" WALL
	06	1/2" OD 316SS ASTM A213 0.065" WALL
	07	1/2" OD 316SS ASTM A213 0.083" WALL
10/30 TUBE FITTINGS	10	CONNECTOR: 1/2" TUBE X 3/8" MNPT 316SS
	11	CONNECTOR: 1/2" TSW X 3/8" MNPT 316SS
	12	CONNECTOR: 1/2" TUBE X 1/2" MNPT 316SS
	13	CONNECTOR: 1/2" TSW X 1/2" MNPT 316SS
	14	CONNECTOR: 1/2" TUBE X 3/4" MNPT 316SS
	15	CONNECTOR: 1/2" TSW X 3/4" MNPT 316SS
	16	CONNECTOR: 1/4" TUBE X 1 1/2" MNPT 316SS
	17	CONNECTOR: 1/4" TSW X 1 1/2" MNPT 316SS
	18	ELBOW: 1/4" TUBE 316SS
	19	ELBOW: 1/4" TSW 316SS
	20	ELBOW: 1/2" TUBE 316SS
	21	ELBOW: 1/2" TSW 316SS
	22	PLUG: 1/2" 316SS
	23	UNION: 1/4" TUBE 316SS
	24	UNION: 1/4" TSW 316SS
	25	UNION: 1/2" TUBE 316SS
	26	UNION: 1/2" TSW 316SS
	27	UNION TEE: 1/2" TUBE 316SS
	28	UNION TEE: 1/2" TSW 316SS
	29	UNION TEE: 1 1/2" OD FNPT 316SS
	30	CONNECTOR: 3/8" TUBE X 1/4" MNPT BRASS
	31	CONNECTOR: 3/8" TUBE X 1/2" MNPT BRASS
	32	CONNECTOR: 1/2" TUBE X 1/2" MNPT BRASS
	33	CONNECTOR: 1/4" TUBE X 1/4" MNPT BRASS
	34	CONNECTOR: 1/2" TUBE X 3/4" MNPT BRASS
	35	ELBOW: 1/2" TUBE BRASS
	36	UNION TEE: 1/2" TUBE BRASS
	37	UNION TEE: 3/8" TUBE BRASS
40 PIPES AND CONDUIT	40	PIPE: 2" SCH 80 CS
	41	PIPE: 2" SCH 40 CS
	42	PIPE: 1/2"
50/60 PIPE FITTINGS	50	THERMOWELL BUSHING: 1 1/2" X 3/4"
	51	TEMP SWITCH BUSHING: 1 1/2" X 1/2"
	52	PIPE NIPPLE: 1/2"
	53	PIPE PLUG: 2" MALE NPT
	54	REDUCER BUSHING: 2" BY 1/2"
	55	THREADOLET: 1/2"
	56	NIPPLE-UNION: 1/2" NPT
	57	UNION TEE: 2" PIPE FITTING SCH 80 CS
	58	WELD CAP: 2" SCH 40 CS
70 VALVES	70	1/2" BLOCK AND BLEED VALVE 316SS
	71	BLOWDOWN VALVE: 1/2" W/GRAFOIL PACKING 316SS
	72	1/2" GLOBE VALVE 316SS
	73	1/2" BALL VALVE 316SS
	74	1/2" WHITEY VALVE 316SS
	75	3/8" BRASS BALL VALVE
	76	1/2" FEMALE NPT BRASS VALVE
	77	1/2" BRASS BALL VALVE
80 MANI-FOLDS	80	2-VALVE FLANGE MANIFOLD
	81	3-VALVE FLANGE MANIFOLD
	82	5-VALVE FLANGE MANIFOLD
	83	3-VALVE COPLANAR MANIFOLD
	84	5-VALVE COPLANAR MANIFOLD
	85	2-VALVE MANIFOLD
90 MISC	90	CONDENSATE POT
	91	PIPE STAND MOUNT: L 2 1/2" X 2 1/2" X 1/4"
	92	SIPHON: 3/8" 316SS, 0.035" WALL
	93	SNUBBER: 3/8"



INSTALLATION	PIPE SIZE
TYPE 1	LARGER THAN 1 1/2" SMALLER THAN 3"
TYPE 2	3" TO 4"
TYPE 3	6" OR LARGER

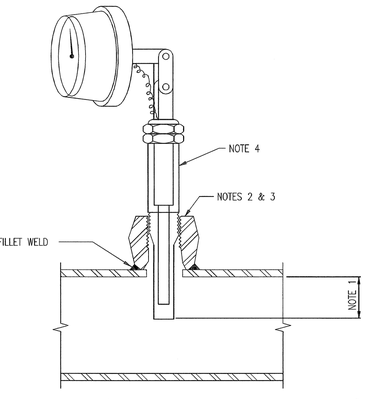
NOTES:
1. FOR 1 1/2" PIPE AND SMALLER SEE I-373.
2. 3000# THREADED LATROLET TYPICAL INSTALLATION WHERE 90° BEND IS NOT CONVENIENTLY LOCATED IN 3" OR 4" PIPE.
3. 3000# THREADED ELBOLET TYPICAL INSTALLATION IN 90° BEND FOR SMALLER THAN 3" PIPE BUT LARGER THAN 1 1/2" PIPE
4. 3000# THREADOLET FOR 6" PIPE OR LARGER, SEE DATASHEET.

DETAIL I-372
THERMOWELLS (SCREWED) OR FLOW SWITCH INSTALLATION



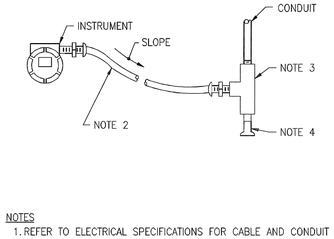
NOTES:
1. IF LINE IS SMALLER THAN 1 1/2" USE REDUCERS.
2. 3000 PSI THREADED ELBOLET TYPICAL INSTALLATION IN LONG RADIUS ELBOW FOR PIPES SMALLER THAN 1 1/2"

DETAIL I-373
THERMOWELLS (SCREWED) OR TEMPERATURE SWITCH INSTALLATION IN PIPES 1 1/2" AND SMALLER



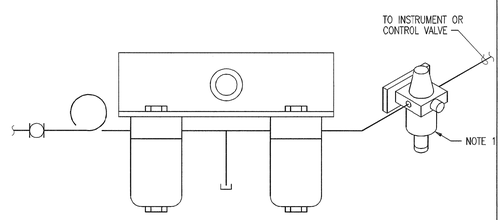
NOTES
1. LIMIT INSERTION LENGTH TO 1/2 DIAMETER OF PIPE TO MAXIMUM INSETION LENGTH OF 4".
2. REFER TO MECHANICAL SPECIFICATIONS FOR PIPE REQUIREMENTS.
3. INSTALL THREADOLET IN ACCORDANCE WITH INSTALLATION DETAIL 372 AND 373.
4. MOUNT INDICATOR VISIBLE FROM WALKWAY.

DETAIL I-390
TEMPERATURE GAUGE
AIR, GAS, STEAM, AND WATER SERVICE



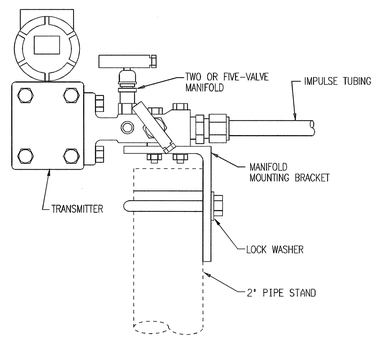
NOTES
1. REFER TO ELECTRICAL SPECIFICATIONS FOR CABLE AND CONDUIT REQUIREMENTS.
2. PROVIDE FLEXIBLE LIQUID TIGHT CONDUIT (MAXIMUM LENGTH OF 3FT).
3. MOUNT CONDUIT BODY BELOW BODY OF INSTRUMENT TO ALLOW CONDENSATION TO DRAIN FROM CONDUIT.
4. PROVIDE VENT DRAIN ASSEMBLY AT LOWER CONNECTION OF CONDUIT BODY.

DETAIL I-905
INSTRUMENT CONDUIT CONNECTION



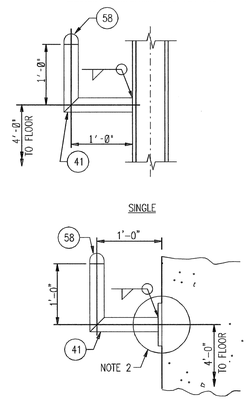
NOTES:
1. FILTER REGULATOR FURNISHED WITH INSTRUMENT OR CONTROL VALVE, UNLESS OTHERWISE SPECIFIED.

DETAIL I-922
INSTRUMENT AIR FILTER ASSEMBLY



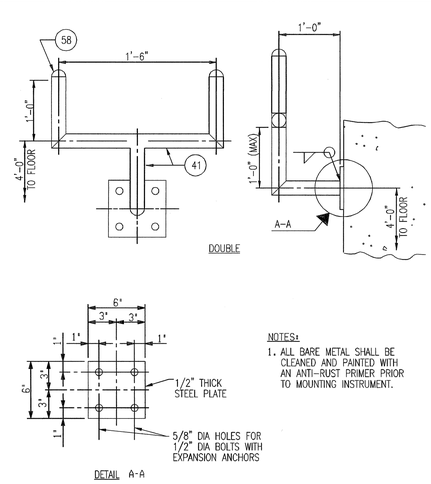
NOTES:
1. MOUNT INDICATOR VISIBLE FROM WALKWAY, PLATFORM OR GRADE.

DETAIL I-950
PIPE STAND MOUNTING BRACKET FOR TRANSMITTER



NOTES:
1. ALL BARE METAL SHALL BE CLEANED AND PAINTED WITH AN ANTI-RUST PRIMER PRIOR TO MOUNTING INSTRUMENT.
2. SEE I-952.20 DETAIL A-A.

DETAIL I-952.10
INSTRUMENT MOUNTING COLUMN OR CONCRETE WALL



NOTES:
1. ALL BARE METAL SHALL BE CLEANED AND PAINTED WITH AN ANTI-RUST PRIMER PRIOR TO MOUNTING INSTRUMENT.

DETAIL I-952.20
INSTRUMENT MOUNTING COLUMN OR CONCRETE WALL

REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/29/10
STATE OF UTAH

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

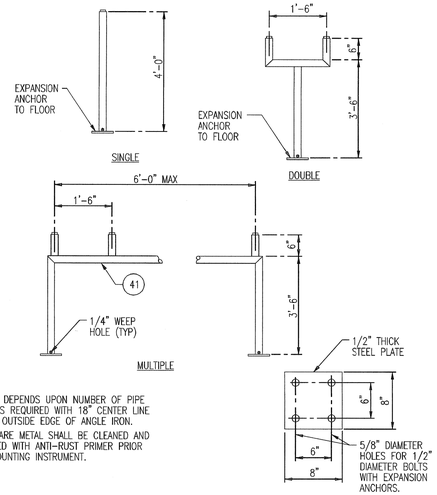
Stanley Consultants INC.
5253 S 960 E, Suite 220, Salt Lake City, Utah 84117-7269
www.stanleygroup.com

WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

INSTRUMENTATION AND CONTROLS DETAILS SHEET 3

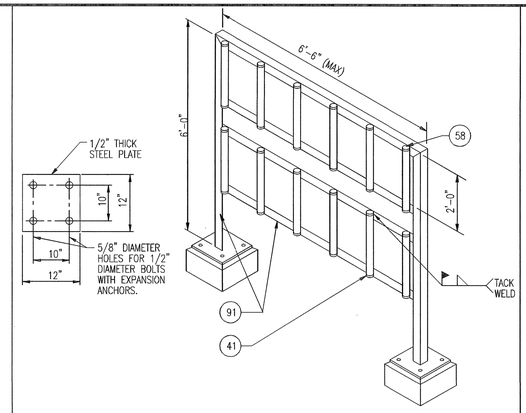
DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
113



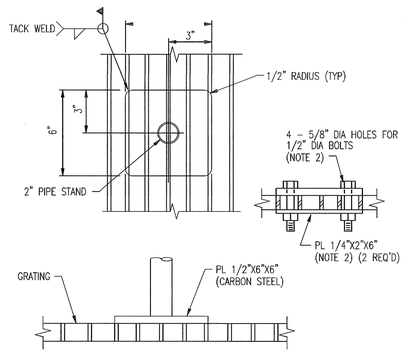
NOTES:
1. WIDTH DEPENDS UPON NUMBER OF PIPE STANDS REQUIRED WITH 18" CENTER LINE FROM OUTSIDE EDGE OF ANGLE IRON.
2. ALL BARE METAL SHALL BE CLEANED AND PAINTED WITH ANTI-RUST PRIMER PRIOR TO MOUNTING INSTRUMENT.

DETAIL I-953
PIPE STAND MOUNTING



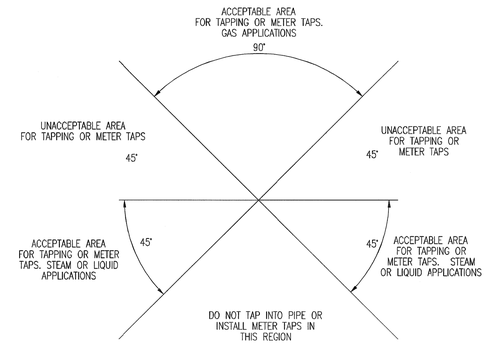
NOTES:
1. WIDTH DEPENDS UPON NUMBER OF PIPE STANDS REQUIRED WITH 15" CENTER LINE FROM OUTSIDE EDGE OF ANGLE IRON.
2. ALL BARE METAL SHALL BE CLEANED AND PAINTED WITH ANTI-RUST PRIMER PRIOR TO MOUNTING INSTRUMENT.

DETAIL I-954
PIPE STAND MOUNTING FOR INSTRUMENT GROUP



NOTES:
1. ALL BARE METAL SHALL BE CLEANED AND PAINTED WITH AN ANTI-RUST PRIMER PRIOR TO MOUNTING INSTRUMENT.
2. OPTIONAL MOUNTING.

DETAIL I-955
PIPE STAND GRATING MOUNT



DETAIL I-956
PIPE PRESSURE TAP GUIDE

MATERIAL LIST

ITEM	ITEM NO.	DESCRIPTION
00 TUBING	00	1/4" OD ASTM B88 COPPER 0.035" WALL
	01	3/8" OD ASTM B88 COPPER 0.049" WALL
	02	1/2" OD ASTM B88 COPPER 0.049" WALL
	03	1/4" OD 316SS ASTM A213 0.035" WALL
	04	3/8" OD 316SS ASTM A213 0.035" WALL
	05	1/2" OD 316SS ASTM A213 0.049" WALL
	06	1/2" OD 316SS ASTM A213 0.065" WALL
	07	1/2" OD 316SS ASTM A213 0.083" WALL
10/30 TUBE FITTINGS	10	CONNECTOR: 1/2" TUBE X 3/8" MNPT 316SS
	11	CONNECTOR: 1/2" TSW X 3/8" MNPT 316SS
	12	CONNECTOR: 1/2" TUBE X 1/2" MNPT 316SS
	13	CONNECTOR: 1/2" TSW X 1/2" MNPT 316SS
	14	CONNECTOR: 1/2" TUBE X 3/4" MNPT 316SS
	15	CONNECTOR: 1/2" TSW X 3/4" MNPT 316SS
	16	CONNECTOR: 1/4" TUBE X 1 1/2" MNPT 316SS
	17	CONNECTOR: 1/4" TSW X 1 1/2" MNPT 316SS
	18	ELBOW: 1/4" TUBE 316SS
	19	ELBOW: 1/4" TSW 316SS
	20	ELBOW: 1/2" TUBE 316SS
	21	ELBOW: 1/2" TSW 316SS
	22	PLUG: 1/2" 316SS
	23	UNION: 1/4" TUBE 316SS
	24	UNION: 1/4" TSW 316SS
	25	UNION: 1/2" TUBE 316SS
	26	UNION: 1/2" TSW 316SS
	27	UNION TEE: 1/2" TUBE 316SS
	28	UNION TEE: 1/2" TSW 316SS
	29	UNION TEE: 1 1/2" OD FNPT 316SS
	30	CONNECTOR: 3/8" TUBE X 1/4" MNPT BRASS
	31	CONNECTOR: 3/8" TUBE X 1/2" MNPT BRASS
	32	CONNECTOR: 1/2" TUBE X 1/2" MNPT BRASS
	33	CONNECTOR: 1/4" TUBE X 1/4" MNPT BRASS
	34	CONNECTOR: 1/2" TUBE X 3/4" MNPT BRASS
	35	ELBOW: 1/2" TUBE BRASS
	36	UNION TEE: 1/2" TUBE BRASS
	37	UNION TEE: 3/8" TUBE BRASS
40 PIPES AND CONDUIT	40	PIPE: 2" SCH 80 CS
	41	PIPE: 2" SCH 40 CS
	42	PIPE: 1/2"
50/60 PIPE FITTINGS	50	THERMOWELL BUSHING: 1 1/2" X 3/4"
	51	TEMP SWITCH BUSHING: 1 1/2" X 1/2"
	52	PIPE NIPPLE: 1/2"
	53	PIPE PLUG: 2" MALE NPT
	54	REDUCER BUSHING: 2" BY 1/2"
	55	THREADOLET: 1/2"
	56	NIPPLE-UNION: 1/2" NPT
	57	UNION TEE: 2" PIPE FITTING SCH 80 CS
	58	WELD CAP: 2" SCH 40 CS
70 VALVES	70	1/2" BLOCK AND BLEED VALVE 316SS
	71	BLOWDOWN VALVE: 1/2" W/GRAFOIL PACKING 316SS
	72	1/2" GLOBE VALVE 316SS
	73	1/2" BALL VALVE 316SS
	74	1/2" WHITEY VALVE 316SS
	75	3/8" BRASS BALL VALVE
	76	1/2" FEMALE NPT BRASS VALVE
	77	1/2" BRASS BALL VALVE
80 MANI-FOLDS	80	2-VALVE FLANGE MANIFOLD
	81	3-VALVE FLANGE MANIFOLD
	82	5-VALVE FLANGE MANIFOLD
	83	3-VALVE COPLANAR MANIFOLD
	84	5-VALVE COPLANAR MANIFOLD
	85	2-VALVE MANIFOLD
90 MISC	90	CONDENSATE POT
	91	PIPE STAND MOUNT: L 2 1/2" X 2 1/2" X 1/4"
	92	SIPHON: 3/8" 316SS, 0.035" WALL
	93	SNUBBER: 3/8"

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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5253 S 960 E, Suite 220, Salt Lake City, Utah 84117-7269
www.stanleygroup.com

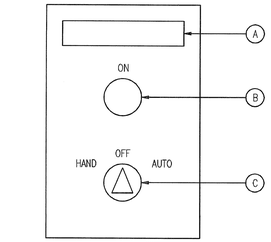
WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

INSTRUMENTATION AND CONTROLS
DETAILS
SHEET 4

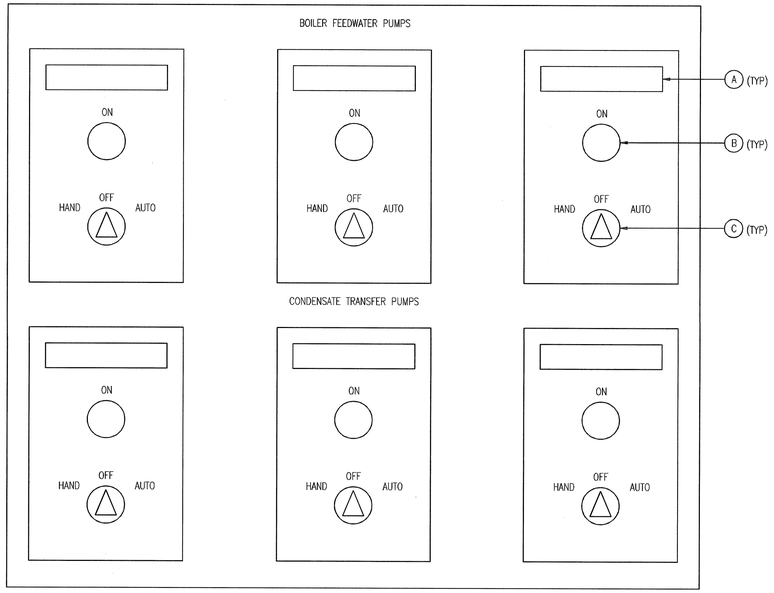
DESIGNED	TJ MERGEN
DRAWN	BW DEEN
CHECKED	SA WARREN
APPROVED	LD VANCE
APPROVED	LD VANCE
DATE	JANUARY 28, 2010

SCALE: NONE
NO. 21937.01.00
REV. 0
114

CADD I1-R4



PUMP HAND STATIONS (INDIVIDUAL)



ALTERNATE – PUMP HAND STATION (CONSOILDATED)
NOTE 1

LETTER	COMPONENT	LEGEND
A	NAMEPLATE	(SEE NAMEPLATE SCHEDULE)
B	PUSH TO TEST, PILOT LIGHT, GREEN LENS	ON
C	THREE–POSITION SELECTOR SWITCH, MAINTAINED CONTACT	HAND–OFF–AUTO

NAMEPLATE SCHEDULE

EQUIPMENT NO.	LINE 1	LINE 2
CTP–1A	CONDENSATE TRANSFER	PUMP NO. 1A
CTP–1B	CONDENSATE TRANSFER	PUMP NO. 1B
CTP–1C	CONDENSATE TRANSFER	PUMP NO. 1C
CTP–2A	CONDENSATE TRANSFER	PUMP NO. 2A
CTP–2B	CONDENSATE TRANSFER	PUMP NO. 2B
CTP–2C	CONDENSATE TRANSFER	PUMP NO. 2C
FWP–1A	FEEDWATER	PUMP NO. 1A
FWP–1B	FEEDWATER	PUMP NO. 1B
FWP–1C	FEEDWATER	PUMP NO. 1C
FWP–2A	FEEDWATER	PUMP NO. 2A
FWP–2B	FEEDWATER	PUMP NO. 2B
FWP–2C	FEEDWATER	PUMP NO. 2C

GENERAL NOTES:

DRAWING NOTES:

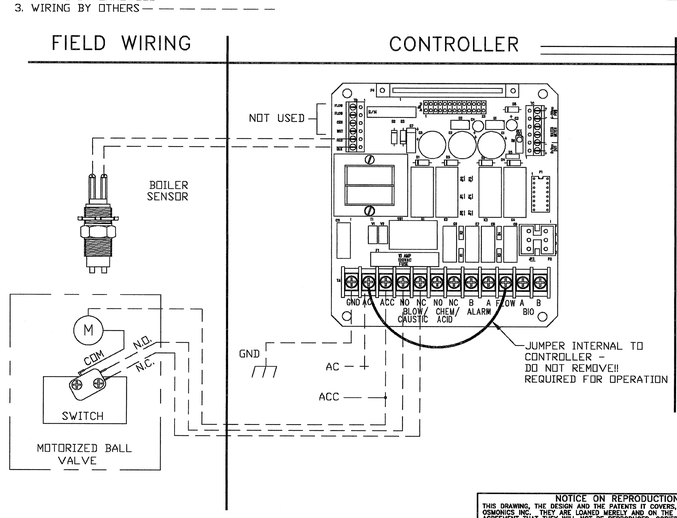
1. AT CONTRACTOR'S OPTION, PUMP HAND STATIONS MAY BE CONSOLIDATED INTO SINGLE PANEL. ONE PANEL FOR PUMPS ASSOCIATED WITH CONDENSATE TANK NO. 1 (CT–1) AND DEAERATOR NO. 1 (DA–01), AND ONE PANEL FOR CONDENSATE TANK NO. 2 (CT–2) AND DEAERATOR NO. 2 (DA–02).

REFERENCE DRAWINGS:

OSMONICS:
1107167

REVISION HISTORY					
REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	RELEASE	1809	BZ	11/13/98	

NOTES: UNLESS OTHERWISE SPECIFIED
1. POWER CONSUMPTION–2 AMPS.
2. WIRING BY LAKEWOOD ————————
3. WIRING BY OTHERS — — — — — — —



MATERIAL	FRAC	DECIMALS X ± .1	ANGLES
FINISH		.XX ± .03	
	±1/16	.XXX ± .010	±.5°
ORDER NO.	DWN B.ZAMMIT	DATE 11/13/98	
CUSTOMER	CHKD	DATE	
CUSTOMER LOC.	APVD	DATE	
DO NOT SCALE	APVD	DATE	

OSMONICS
PHOENIX OPERATIONS

TITLE: WIRING DIAGRAM
UNIVERSAL BACKBOARD, M250/260

SIZE B | THIRD ANGLE | DWG NO/PN 1107167 | REV A
SCALE NONE | FILE TYPE .DWG | SHEET 1 OF 1

P/N 61676 REV–A PG–1/2

CONTINUOUS BLOWDOWN CONTROL PANEL

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants INC.
5253 S 960 E, Suite 220, Salt Lake City, Utah 84117–7269
www.stanleygroup.com

WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

CONTROL PANEL ARRANGEMENT

DESIGNED	TJ MERGEN	SCALE: NONE	
DRAWN	BW DEEN		
CHECKED	SA WARREN	NO. 21937.01.00	REV.
APPROVED	LD VANCE	IA1	0
APPROVED	LD VANCE		
DATE	JANUARY 28, 2010		

GENERAL

NEW WORK

EXISTING

FUTURE

FLOW ARROW

PITCH DOWN IN DIRECTION OF FLOW

TIE POINT DESIGNATORS

TIE POINT INTO AN EXISTING SYSTEM
YYY = P&ID DRAWING NUMBER
XX = TIE POINT NUMBER

VALVES

SWING CHECK

PRESSURE RELIEF

NORMALLY OPEN	NORMALLY CLOSED	
		GATE
		BALL

PIPING FITTINGS

Y-STRAINER

DRAIN

BLIND FLANGE

CONCENTRIC REDUCER

90° BEND PIPE TURN DOWN

90° BEND PIPE TURN UP

45° BEND

UNION

GENERAL NOTES

1. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS LEGEND MAY NOT APPEAR ON THIS SET OF DRAWINGS
2. FOR GENERAL LEGEND AND ABBREVIATIONS, SEE "GG" DRAWINGS.

AT FULL SIZE

0 1 2 3 IN

0 1 2 3 4 5 6 7 8 cm

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

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383 West Vine Street, Suite 400, Murray City, Utah 84123
www.stanleygroup.com

WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

MECHANICAL SYMBOL LEGEND

DESIGNED	C. KIM	SCALE: AS NOTED	
DRAWN	J. KIM	NO. 21937.01.00	REV.
CHECKED	C. KIM	MG1	0
APPROVED	C. KIM		
APPROVED	L. VANCE		
DATE	01-29-10		

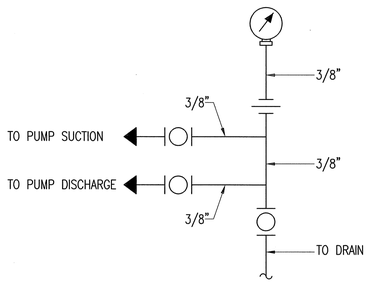
SCI PROJECT NO: 21937.01

CADD 01-R3

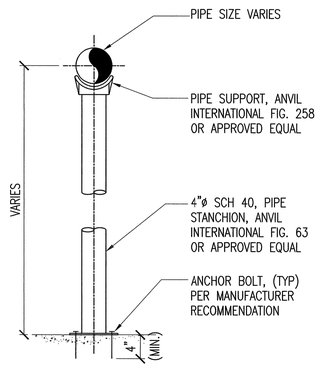
PUMP SCHEDULE

PLAN DESIGNATION	TYPE	SERVICE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	BASIS OF DESIGN SIZE	FLOW RATE (GPM)	MIN CONTINUOUS FLOW RATE (GPM)	OPERATING HEAD (FT)	REQ'D NPSH (FT)	MINIMUM OPERATING EFFICIENCY	IMPELLER DIA (IN)	RPM	BRAKE POWER (hp)	MOTOR POWER (hp)	ELECTRICAL (V/Hz/PHASE)	DISCHARGE SIZE (IN)	SUCTION SIZE (IN)	NOTES
FWP-1A	CENTRIFUGAL	BOILER FEED SYS NO.1	FLOWSERVE	DURCO MARK III	2K2x1-10ARV	85	14.9	350	3.3	40%	9.00	3600	26.6	30.00	208/60/3	1	2	
FWP-1B	CENTRIFUGAL	BOILER FEED SYS NO.1	FLOWSERVE	DURCO MARK III	2K2x1-10ARV	85	14.9	350	3.3	40%	9.00	3600	26.6	30.00	208/60/3	1	2	
FWP-1C	CENTRIFUGAL	BOILER FEED SYS NO.1	FLOWSERVE	DURCO MARK III	2K2x1-10ARV	85	14.9	350	3.3	40%	9.00	3600	26.6	30.00	208/60/3	1	2	
FWP-2A	CENTRIFUGAL	BOILER FEED SYS NO.2	FLOWSERVE	DURCO MARK III	2K2x1-10ARV	85	14.9	350	3.3	40%	9.00	3600	26.6	30.00	208/60/3	1	2	
FWP-2B	CENTRIFUGAL	BOILER FEED SYS NO.2	FLOWSERVE	DURCO MARK III	2K2x1-10ARV	85	14.9	350	3.3	40%	9.00	3600	26.6	30.00	208/60/3	1	2	
FWP-2C	CENTRIFUGAL	BOILER FEED SYS NO.2	FLOWSERVE	DURCO MARK III	2K2x1-10ARV	85	14.9	350	3.3	40%	9.00	3600	26.6	30.00	208/60/3	1	2	
CTP-1A	CENTRIFUGAL	COND TRANS SYS NO.1	FLOWSERVE	DURCO MARK III	1K1.5x1-62ARV	85	9.2	100	5.3	45%	5.63	3600	5.62	7.50	208/60/3	1	1.5	
CTP-1B	CENTRIFUGAL	COND TRANS SYS NO.1	FLOWSERVE	DURCO MARK III	1K1.5x1-62ARV	85	9.2	100	5.3	45%	5.63	3600	5.62	7.50	208/60/3	1	1.5	
CTP-1C	CENTRIFUGAL	COND TRANS SYS NO.1	FLOWSERVE	DURCO MARK III	1K1.5x1-62ARV	85	9.2	100	5.3	45%	5.63	3600	5.62	7.50	208/60/3	1	1.5	
CTP-2A	CENTRIFUGAL	COND TRANS SYS NO.2	FLOWSERVE	DURCO MARK III	1K1.5x1-62ARV	85	9.2	100	5.3	45%	5.69	3600	5.62	7.50	208/60/3	1	1.5	
CTP-2B	CENTRIFUGAL	COND TRANS SYS NO.2	FLOWSERVE	DURCO MARK III	1K1.5x1-62ARV	85	9.2	100	5.3	45%	5.63	3600	5.62	7.50	208/60/3	1	1.5	
CTP-2C	CENTRIFUGAL	COND TRANS SYS NO.2	FLOWSERVE	DURCO MARK III	1K1.5x1-62ARV	85	9.2	100	5.3	45%	5.63	3600	5.62	7.50	208/60/3	1	1.5	

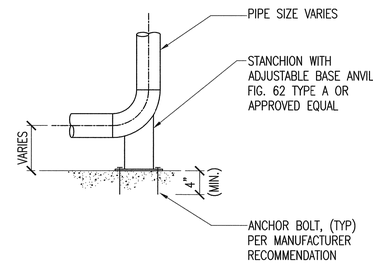
NOTES:
(1)
(2)
(3)
(4)
(5)



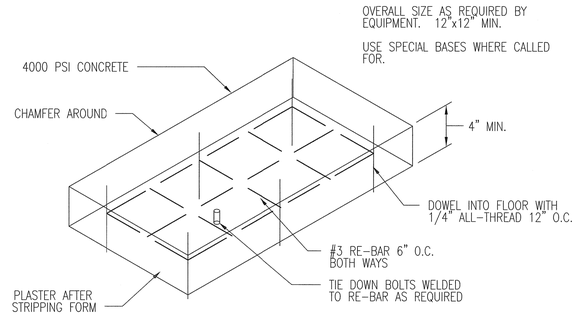
PUMP GAGE DETAIL
SCALE: NTS



GENERAL PIPE SUPPORT TYPE 1 DETAIL
SCALE: NTS



GENERAL PIPE SUPPORT TYPE 2 DETAIL
SCALE: NTS



TYPICAL EQUIPMENT CONCRETE PAD DETAIL
SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

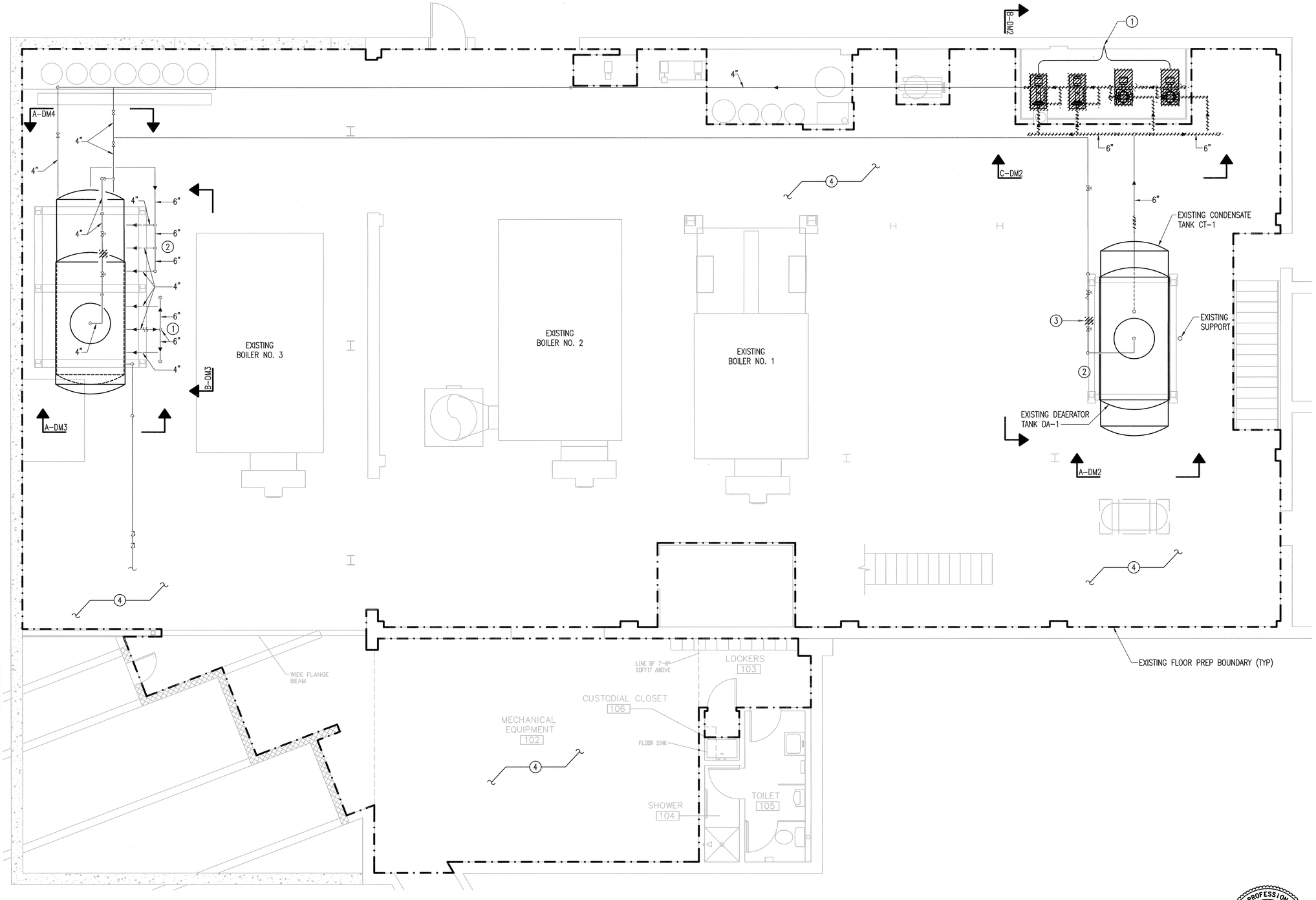
MECHANICAL EQUIPMENT SCHEDULE & DETAILS

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
MG2

SCI PROJECT NO: 21937.01

CADD D1-R3



KEY NOTES: ◯

1. REMOVE EXISTING FEED WATER PUMPS. SEE SHEET MD2 AND MD3 FOR ADDITIONAL INFORMATION.
2. REMOVE EXISTING CONDENSATE TRANSFER PUMPS. SEE SHEET MD2 AND MD3 FOR ADDITIONAL INFORMATION.
3. REMOVE EXISTING CONTROL VALVES AS SHOWN. SEE SHEET MD2 AND MD3 FOR ADDITIONAL INFORMATION.
4. PREP EXISTING FLOOR PER MANUFACTURER'S RECOMMENDATIONS PRIOR TO INSTALLING NEW FLOOR COATING SYSTEM. SEE SPECIFICATIONS AND SHEET MP1 FOR ADDITIONAL INFORMATION. THE PREPARATION OF THE FLOOR SHALL TAKE PLACE AFTER ALL PUMPS AND CONTROLS HAVE BEEN REPLACED.

LOWER LEVEL FLOOR PLAN – MECHANICAL PIPING DEMOLITION

SCALE: 1/4" = 1'-0"

NORTH

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

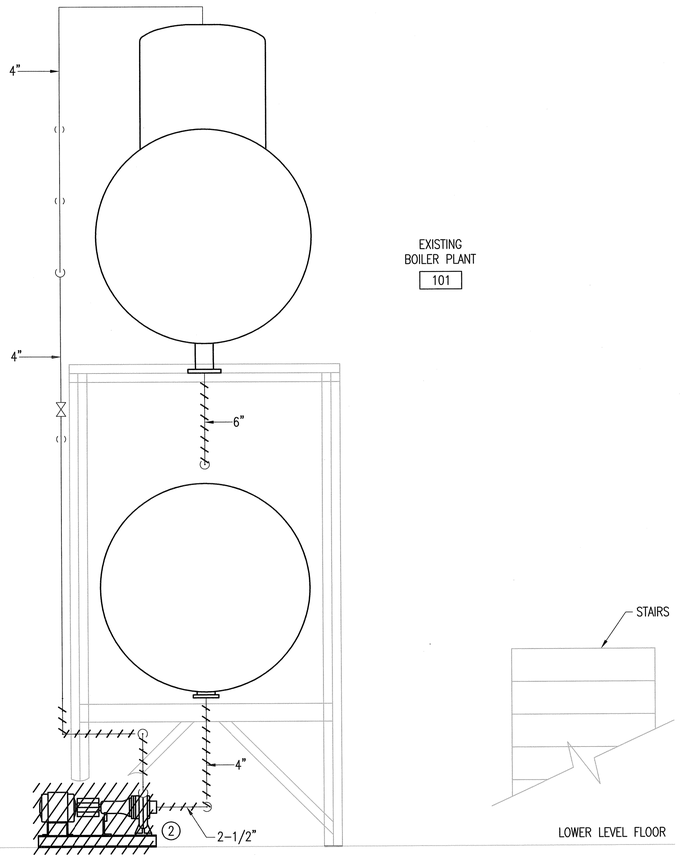
LOWER LEVEL FLOOR PLAN
MECHANICAL PIPING DEMOLITION

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	L. VANCE
APPROVED	C. KIM
DATE	01-29-10

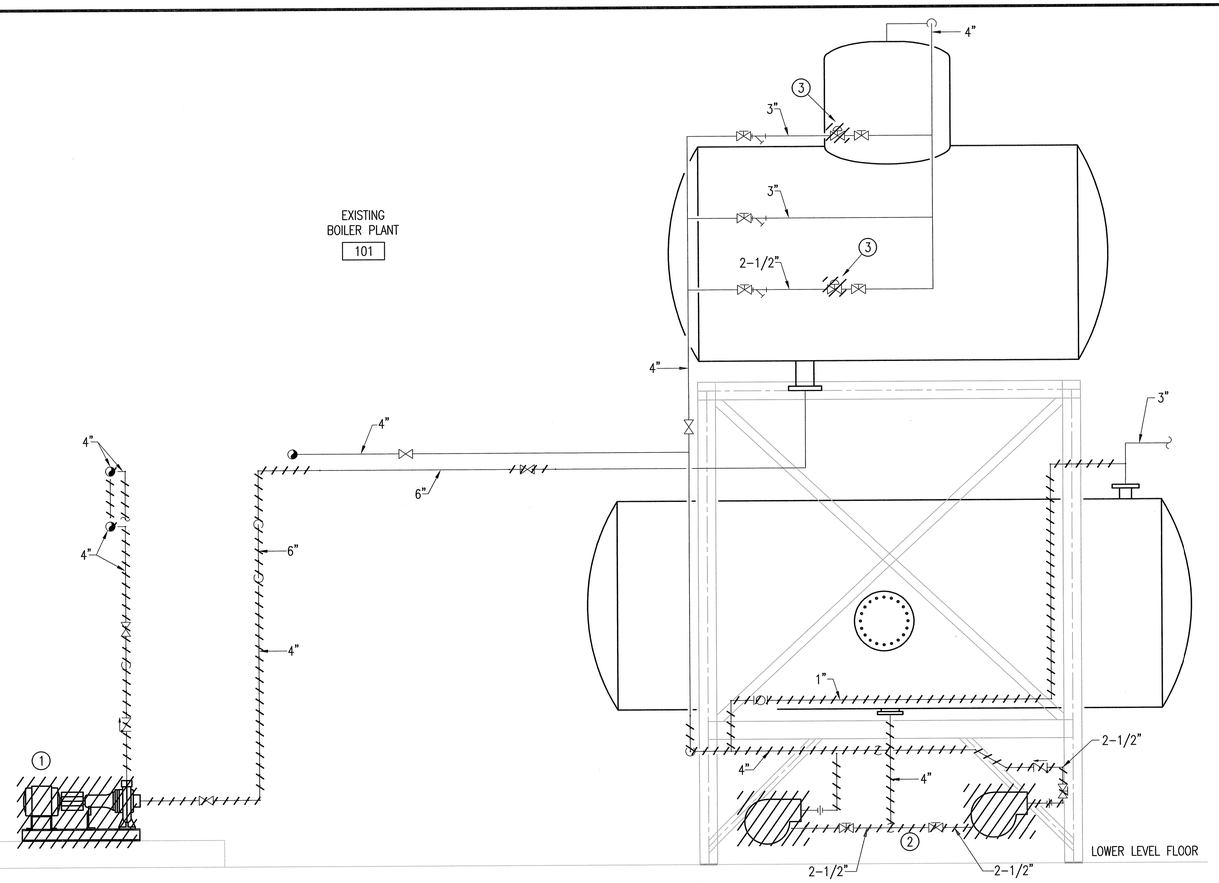
SCALE: AS NOTED
NO. 21937.01.00
DM1
REV. 0

CADD D1-R3

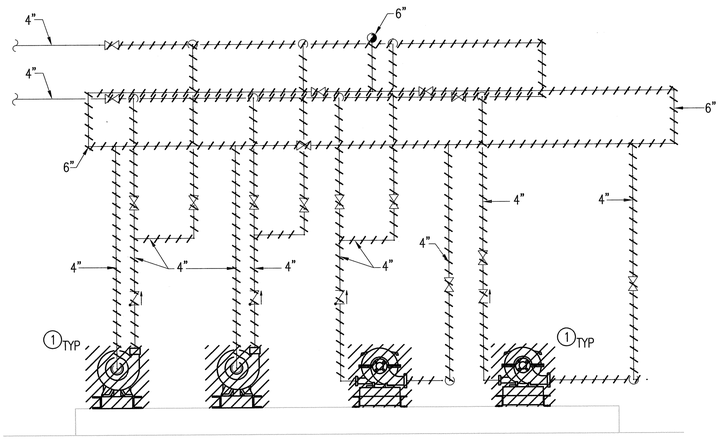
SCI PROJECT NO: 21937.01



SECTION A-DM2 / DM1
SCALE: 1/2" = 1'-0"



SECTION B-DM2 / DM1
SCALE: 1/2" = 1'-0"



SECTION C-DM2 / DM1
SCALE: 1/2" = 1'-0"

KEY NOTES: ◯

1. REMOVE EXISTING FEEDWATER PUMPS AND ASSOCIATED PIPING AS SHOWN.
2. REMOVE EXISTING CONDENSATE TRANSFER PUMPS AND ASSOCIATED PIPING AS SHOWN.
3. SEE CONTROL DRAWINGS FOR REPLACING THIS VALVE.

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

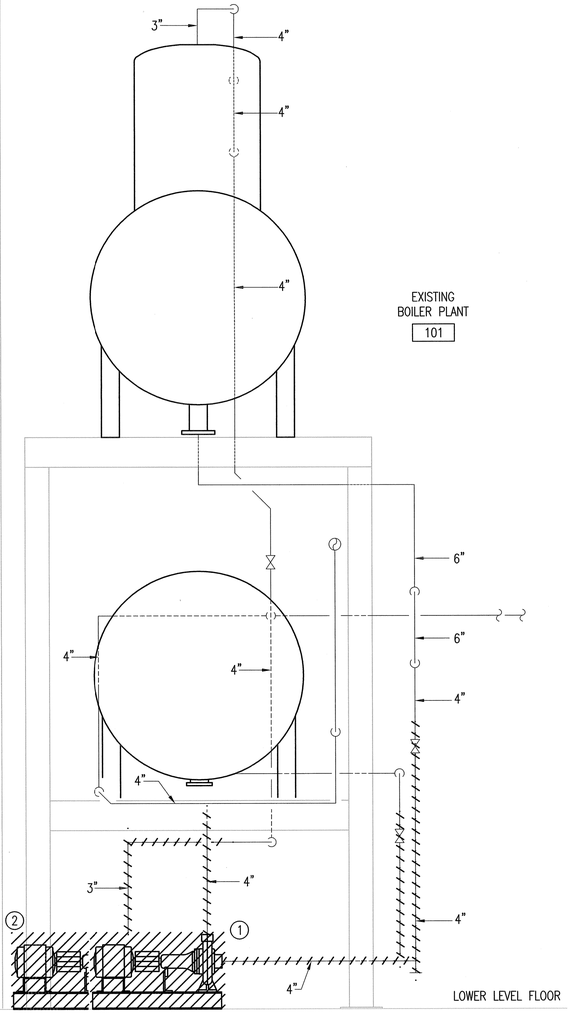
MECHANICAL PIPING DEMOLITION SECTIONS SHEET 1

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
DM2
REV. 0

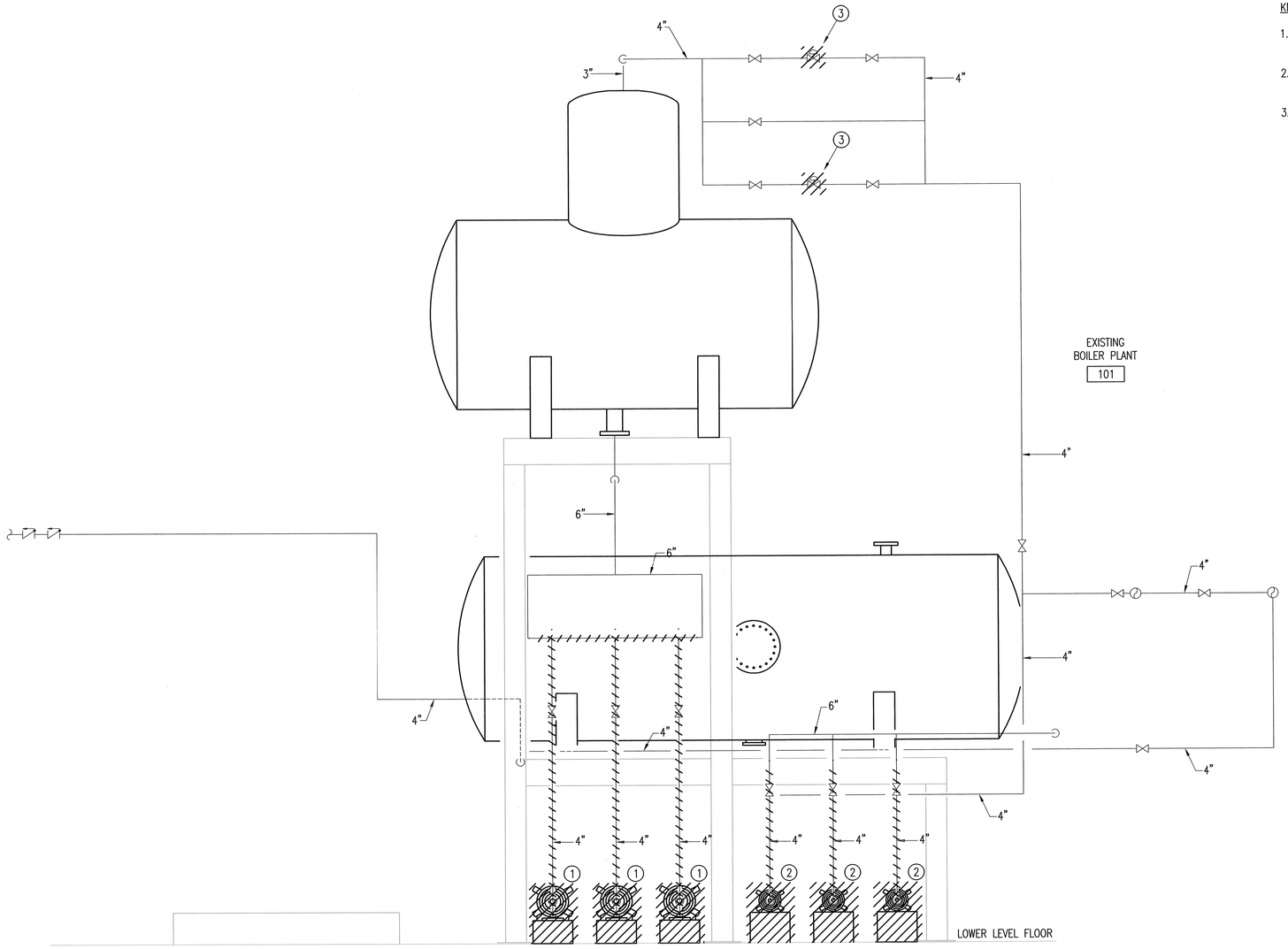
12
SCI PROJECT NO: 21937.01

CADD D1-R3



SECTION A-DM3 / DM1

SCALE: 1/2" = 1'-0"



SECTION B-DM3 / DM1

SCALE: 1/2" = 1'-0"

KEY NOTES: ◯

1. REMOVE EXISTING FEEDWATER PUMPS AND ASSOCIATED PIPING AS SHOWN.
2. REMOVE EXISTING CONDENSATE TRANSFER PUMPS AND ASSOCIATED PIPING AS SHOWN.
3. SEE CONTROL DRAWINGS FOR REPLACING THIS VALVE.

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

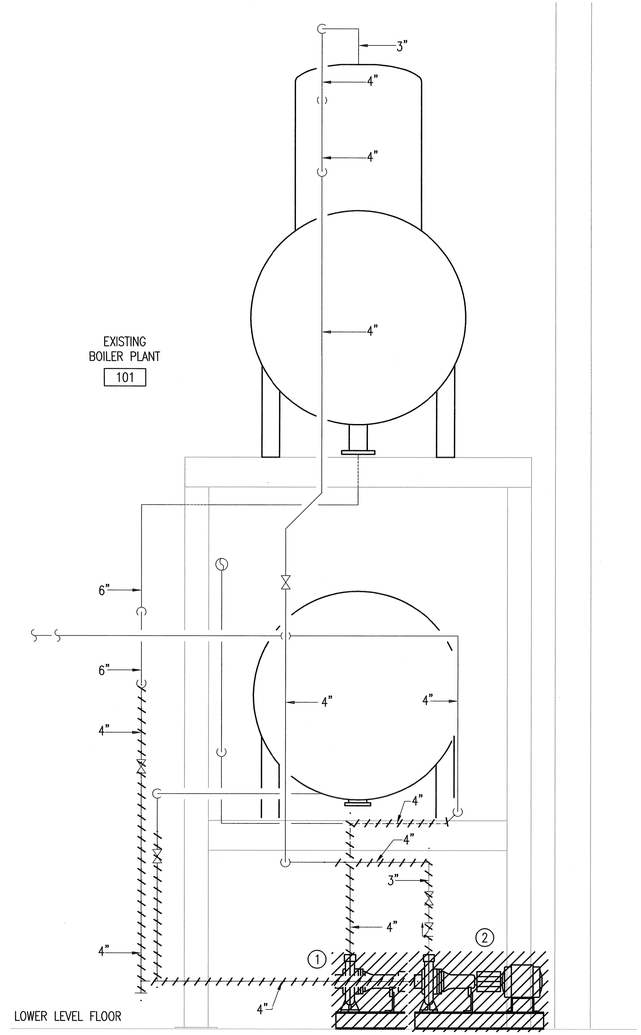
MECHANICAL PIPING DEMOLITION SECTIONS SHEET 2

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
DM3

SCI PROJECT NO: 21937.01

CADD 01-R3



SECTION A-DM4 / DM1

SCALE: 1/2" = 1'-0"

KEY NOTES: ◯

1. REMOVE EXISTING FEEDWATER PUMPS AND ASSOCIATED PIPING AS SHOWN.
2. REMOVE EXISTING CONDENSATE TRANSFER PUMPS AND ASSOCIATED PIPING AS SHOWN.

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

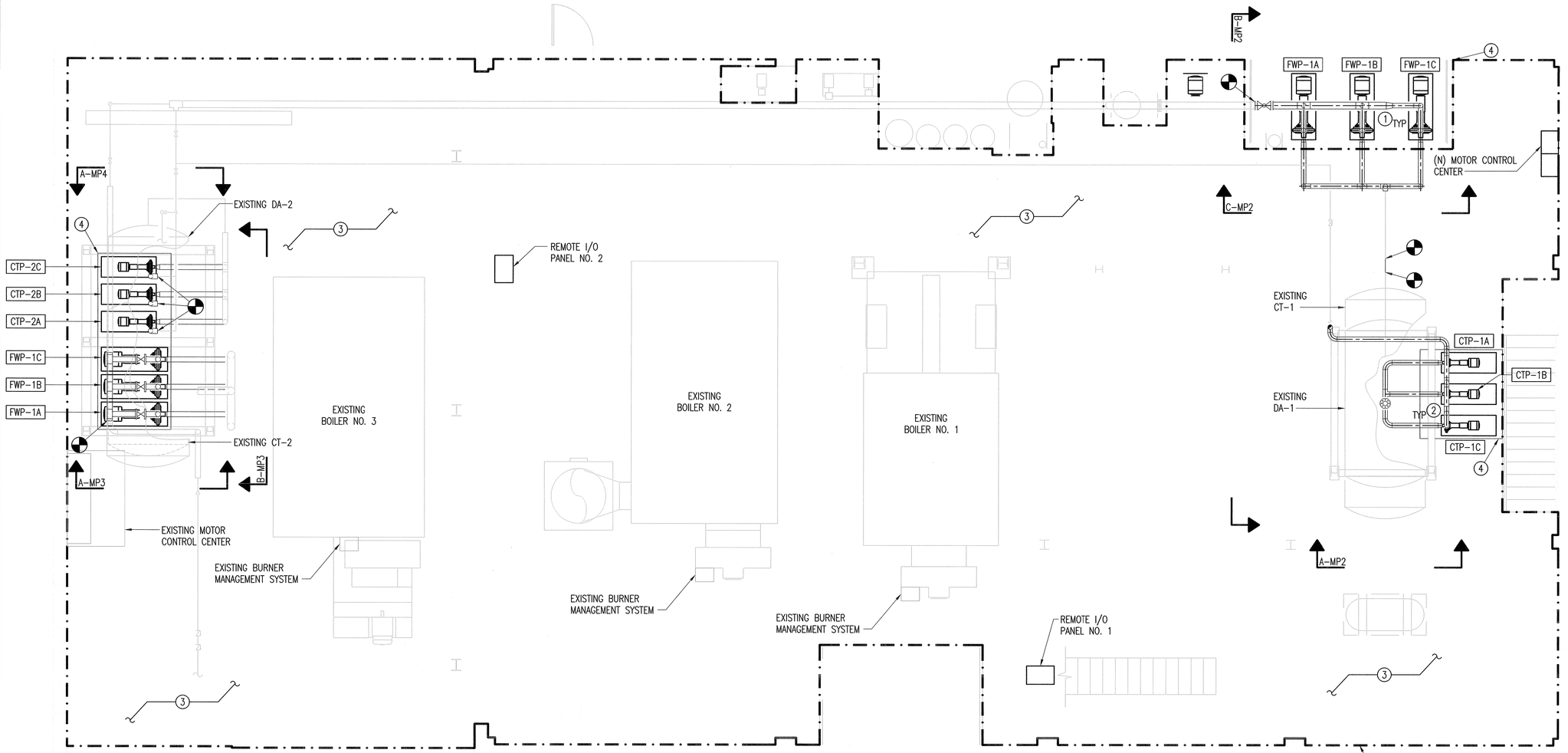
MECHANICAL PIPING DEMOLITION SECTION SHEET 3

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
DM4

SCI PROJECT NO: 21937.01

CADD D1-R3



GENERAL NOTE:

1. SUPPORT PIPING, VALVES, ETC. AS REQUIRED.

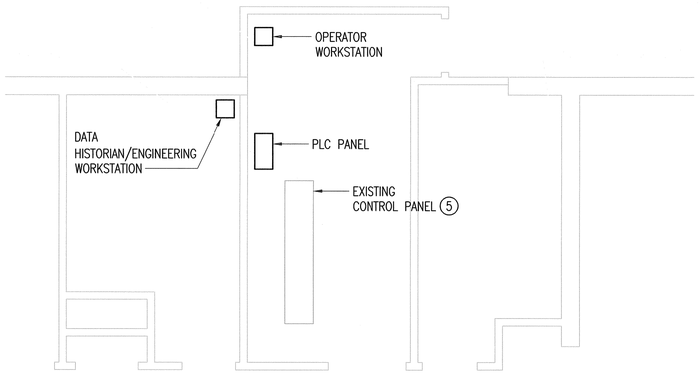
KEY NOTES: ◯

1. INSTALL NEW FEEDWATER PUMPS AND PIPING AS SHOWN.
2. INSTALL CONDENSATE TRANSFER PUMPS AND PIPING AS SHOWN.
3. INSTALL NEW FLOOR COATING SYSTEM. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4. NEW CONCRETE PAD. SEE DETAIL SHEET FOR ADDITIONAL INFORMATION.
5. DEMOLISH EXISTING CONTROL PANEL AFTER THE INTEGRATION AND TESTING OF NEW CONTROL SYSTEM HAS BEEN COMPLETED.

LOWER LEVEL FLOOR PLAN – NEW MECHANICAL PLUMBING

SCALE: 1/4" = 1'-0"

NORTH



UPPER LEVEL CONTROL ROOM LAYOUT

SCALE: 1/4" = 1'-0"

NORTH

AT FULL SIZE

0 1 2 3 IN

0 1 2 3 4 5 6 7 8 cm

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

LOWER LEVEL FLOOR PLAN NEW MECHANICAL PIPING

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED

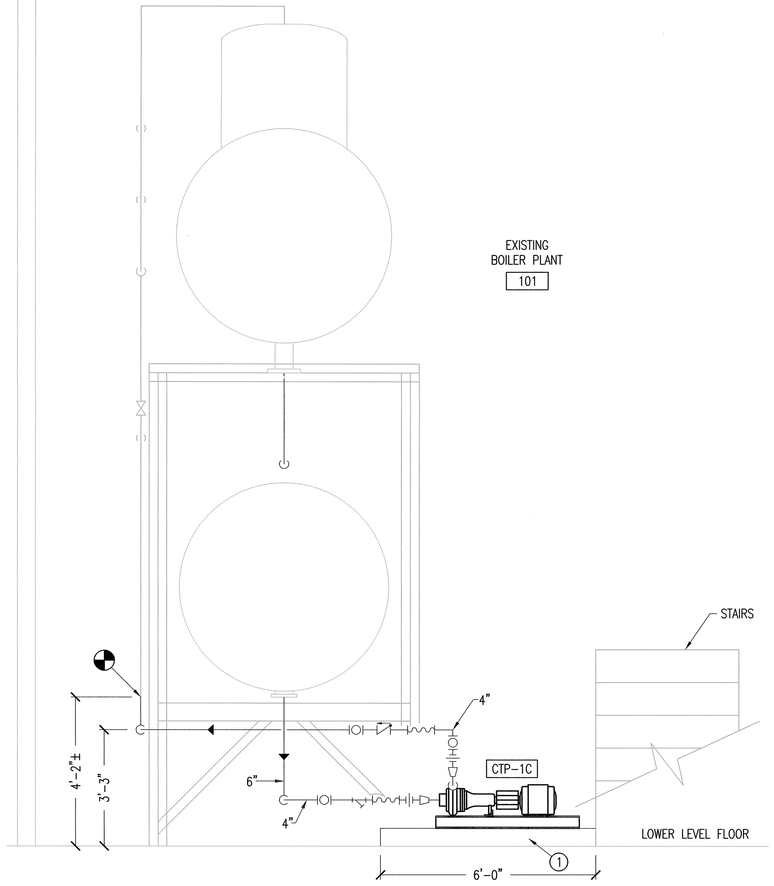
NO. 21937.01.00

REV. 0

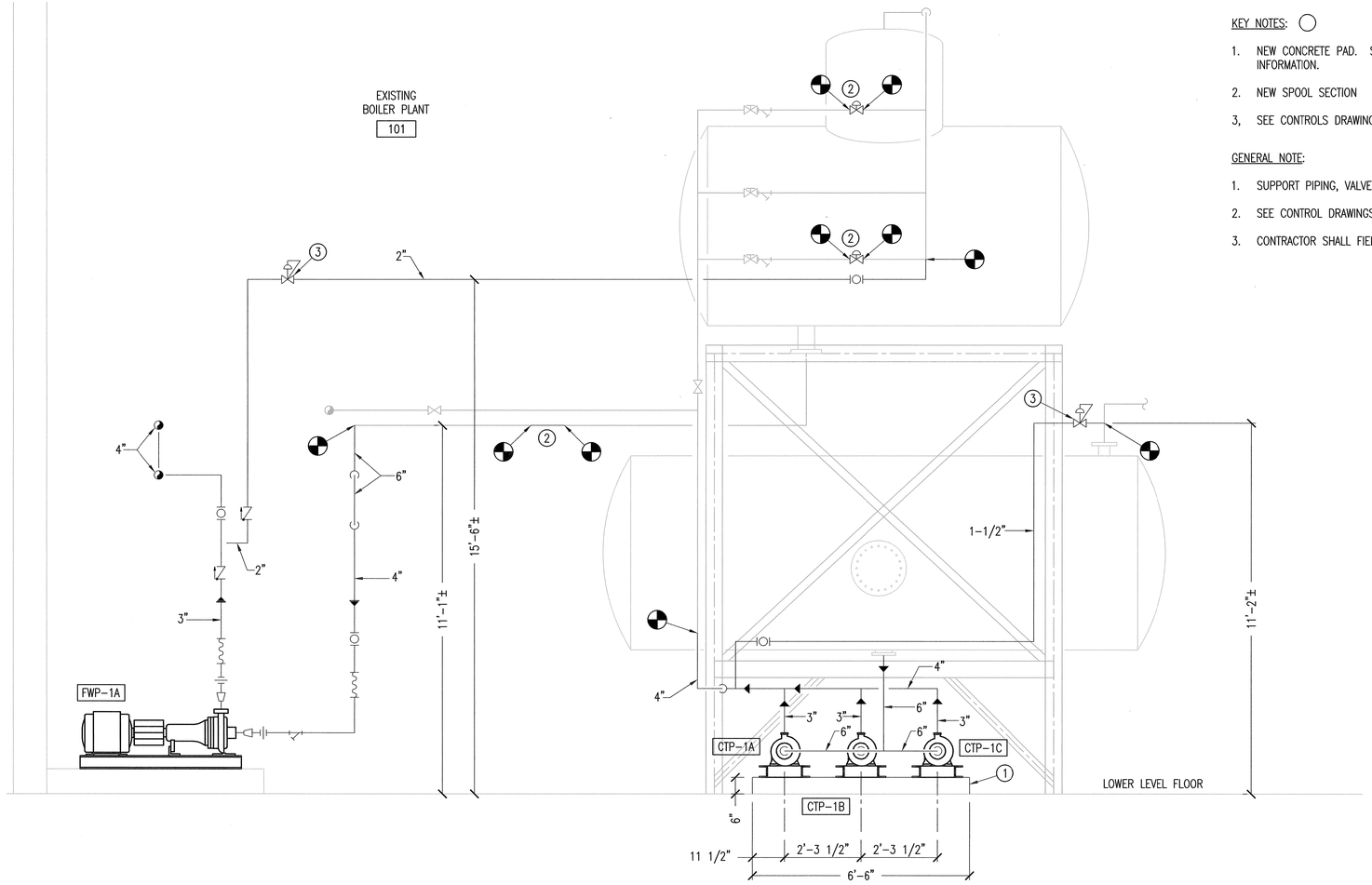
MP1

SCI PROJECT NO: 21937.01

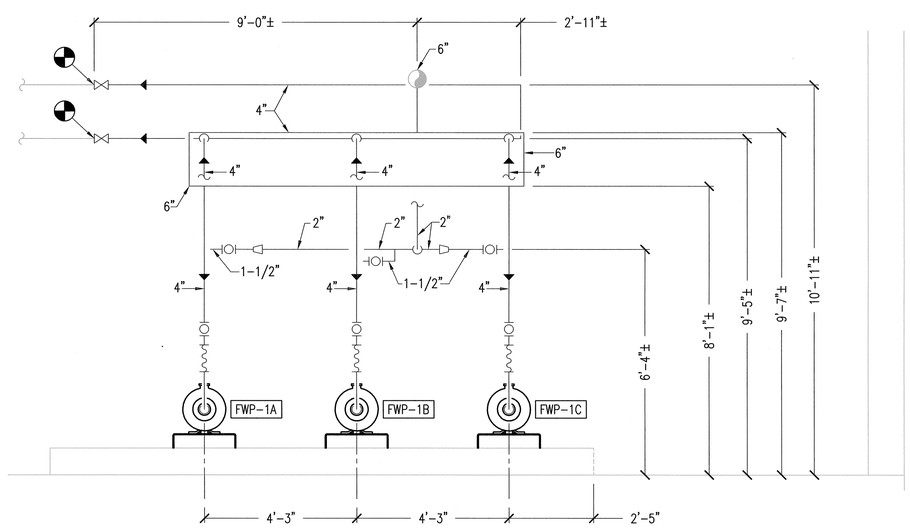
CADD 01-R3



SECTION A-MP2
MP1
SCALE: 1/2" = 1'-0"



SECTION B-MP2
MP1
SCALE: 1/2" = 1'-0"



SECTION C-MP2
MP1
SCALE: 1/2" = 1'-0"

KEY NOTES: ◯

1. NEW CONCRETE PAD. SEE DETAIL SHEET FOR ADDITIONAL INFORMATION.
2. NEW SPOOL SECTION
3. SEE CONTROLS DRAWING FOR MORE INFORMATION.

GENERAL NOTE:

1. SUPPORT PIPING, VALVES, ETC. AS REQUIRED.
2. SEE CONTROL DRAWINGS FOR CONTROL VALVE INFORMATION.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

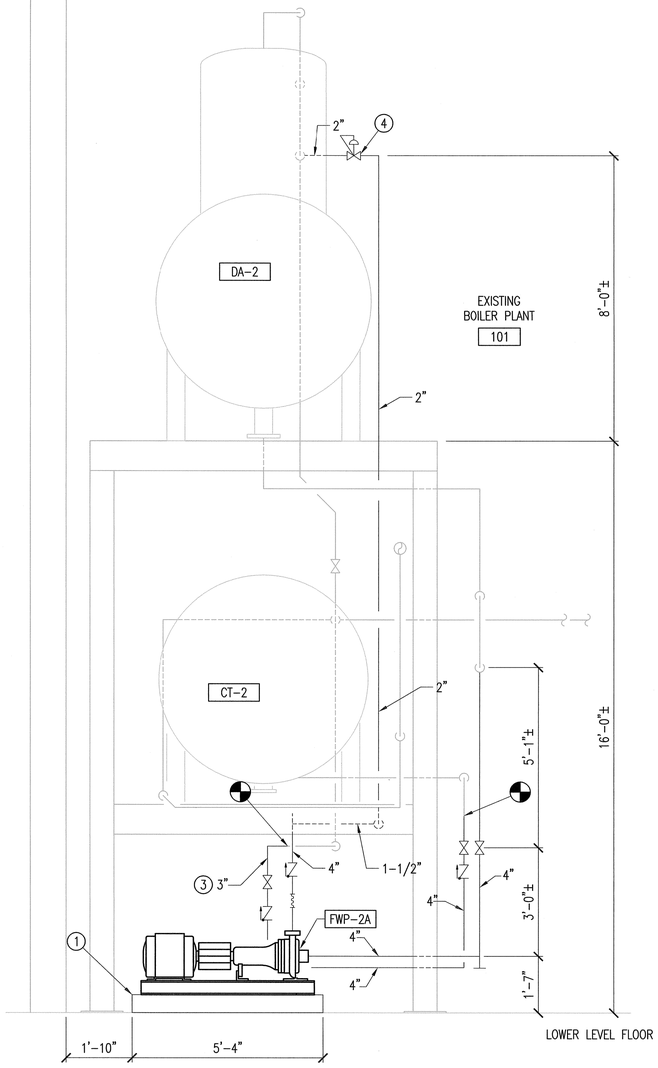
NEW NORTH MECHANICAL PIPING SECTIONS

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

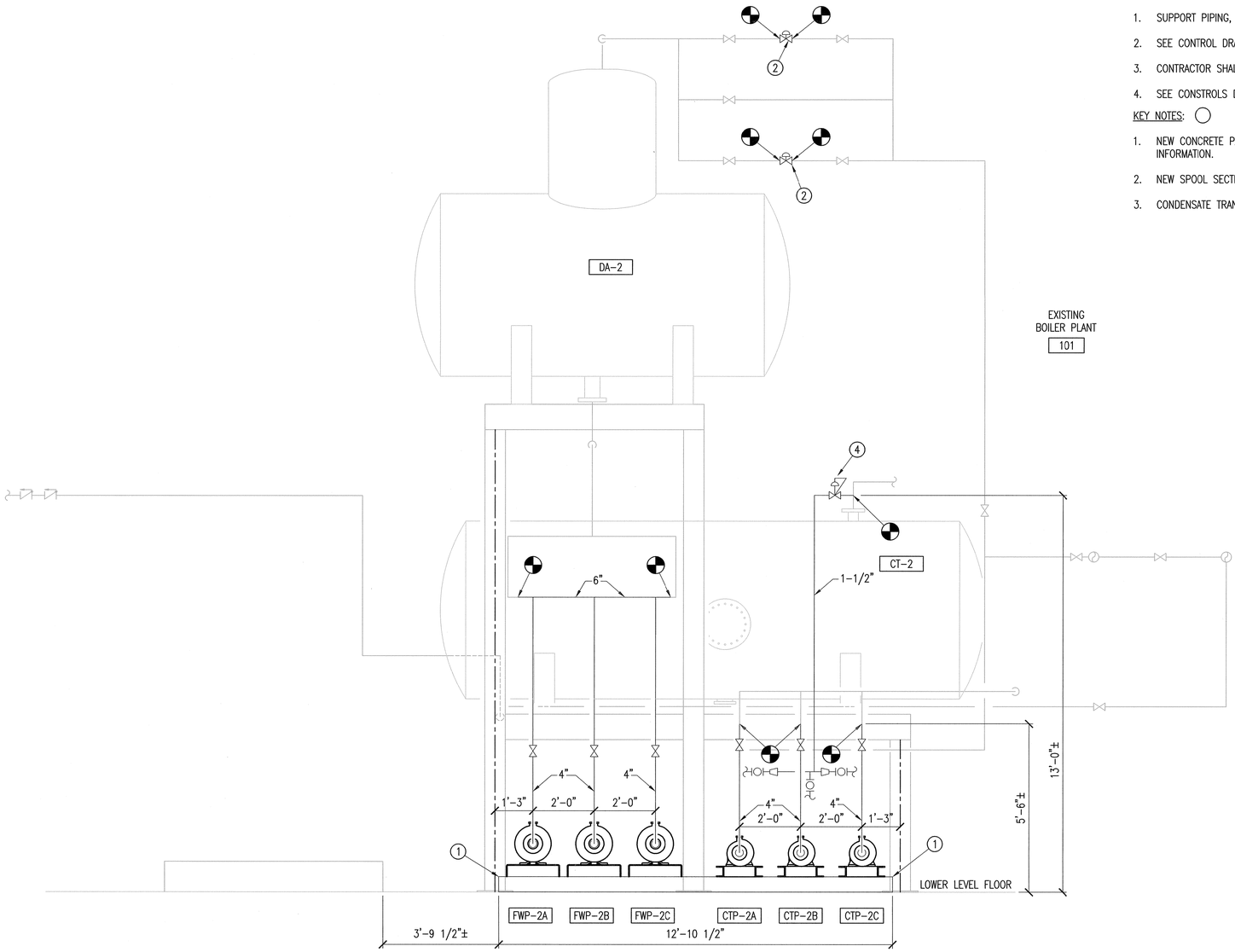
SCALE: AS NOTED
NO. 21937.01.00
REV. 0
MP2

SCI PROJECT NO: 21937.01

CADD D1-R3



SECTION A-MP3
MP11
SCALE: 1/2" = 1'-0"



SECTION B-MP3
MP1
SCALE: 1/2" = 1'-0"

GENERAL NOTE:

1. SUPPORT PIPING, VALVES, ETC. AS REQUIRED.
2. SEE CONTROL DRAWINGS FOR CONTROL VALVE INFORMATION.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
4. SEE CONSTROLS DRAWING FOR MORE INFORMATION.

KEY NOTES: ◯

1. NEW CONCRETE PAD. SEE DETAIL SHEET FOR ADDITIONAL INFORMATION.
2. NEW SPOOL SECTION.
3. CONDENSATE TRANSFER LINE.

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

NEW SOUTH MECHANICAL PIPING SECTIONS SHEET 1

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
MP3

SCI PROJECT NO: 21937.01

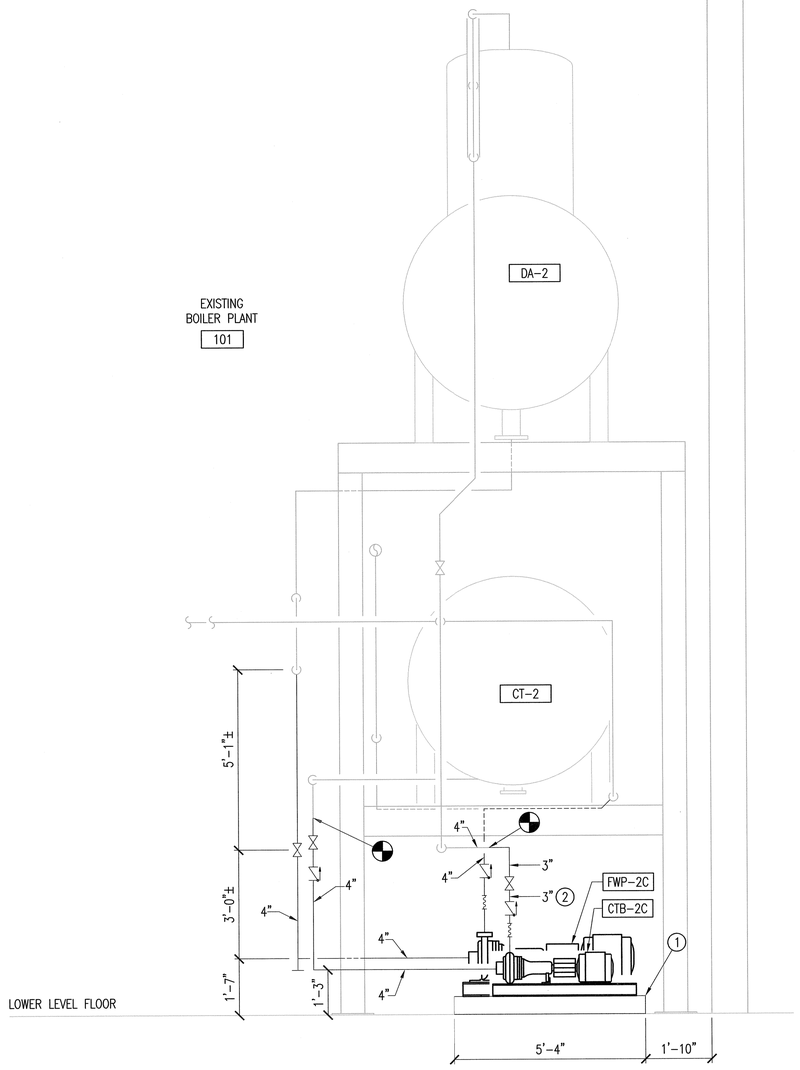
CADD 01-R3

GENERAL NOTE:

1. SUPPORT PIPING, VALVES, ETC. AS REQUIRED.
2. SEE CONTROL DRAWINGS FOR CONTROL VALVE INFORMATION.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.

KEY NOTES: ◯

1. NEW CONCRETE PAD. SEE DETAIL SHEET FOR ADDITIONAL INFORMATION.
2. CONDENSATE TRANSFER LINE.



SECTION A-MP4 / MP1
SCALE: 1/2" = 1'-0"

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	CK	LV	01-29-10

REGISTERED PROFESSIONAL ENGINEER
No. 5048550
CHEOL H. KIM
STATE OF UTAH
1/29/10

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

NEW SOUTH MECHANICAL PIPING SECTION SHEET 2

DESIGNED	C. KIM
DRAWN	J. KIM
CHECKED	C. KIM
APPROVED	C. KIM
APPROVED	L. VANCE
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
MP4

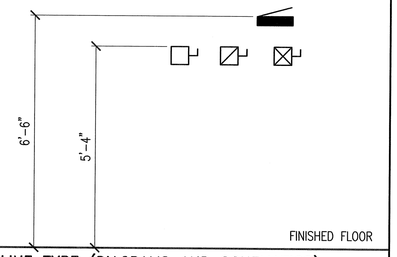
SCI PROJECT NO: 21937.01

CADD D1-R3

POWER

- FUSED DISCONNECT SWITCH
- COMBINATION DISCONNECT WITH STARTER
- PANELBOARD, 120/240V

ELECTRICAL DEVICE MOUNTING HEIGHT



RACEWAY

- CONDUIT
- CONDUIT STUB WITH CAP
- CONDUIT:
  - DUCTBANK
  - EMBEDDED
  - EXPOSED
  - UNDERGROUND DIRECT BURIAL
- JUNCTION BOX
- ARROWS INDICATE HOME RUNS – LINES INDICATE NUMBER CONDUCTORS

ONE-LINE AND THREE LINE DIAGRAMS

- (QTY) PRI/SEC ACCUR — CURRENT TRANSFORMER INDICATES POLARITY
- M — METERING
- TRANSFER SWITCH (AUTOMATIC OR MANUAL)
- GEN (KW, KVA, PF, Z) — GENERATOR
- KVA, CLG, HV–LV, Z — TRANSFORMER
- AMP — FUSE
- HP — MOTOR
- A — MOLDED CASE CIRCUIT BREAKER
- AMP, FUSE — FUSED DISCONNECT SWITCH

LINE TYPE (DIAGRAMS AND SCHEMATICS)

- POWER CIRCUIT
- ELECTRICAL ENCLOSURE

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	LV	JO	01–29–10

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

ELECTRICAL GENERAL LEGEND & NOTES

REGISTERED PROFESSIONAL ENGINEER — No. 334187 — LYLE D. VANCE — 1/29/10 — STATE OF UTAH

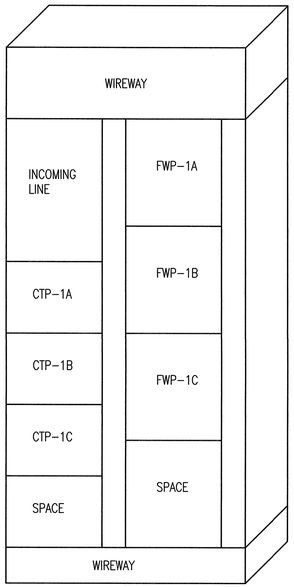
AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

DESIGNED	L. VANCE
DRAWN	J. KIM
CHECKED	J. OGG
APPROVED	L. VANCE
APPROVED	J. OGG
DATE	01–29–10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
EG1

SCI PROJECT NO: 21937.01

CADD 01-R3



NEW MCC #1 FRONT ELEVATION

SCALE: N.T.S.

MOTOR CONTROL CENTER "MCC1" SCHEDULE

MOTOR CONTROL CENTER CHARACTERISTICS

VOLTS 208	AMPS 600	WIRE 4	NEUTRAL BUS
MANUFACTURER: SQUARE D OR EQUAL		MOUNTING FREE-STAND	
MODEL	MODEL 6 SERIES	NEMA ENCLOSURE 1	
RATED FAULT WITHSTAND 42 KAIC			

SPECIFICATIONS: MCC SHALL MEET ALL PROVISIONS OF SPECIFICATION 26 24 19. ALL LOADS ARE THREE-PHASE UNLESS OTHERWISE SHOWN. ALL SWITCHES ARE FUSIBLE TYPE UNLESS OTHERWISE SHOWN.

ADDITIONAL NOTES: PROVIDE 4" CONCRETE HOUSE KEEPING PAD

REV	BKT	MOTOR OR UNIT NAMEPLATE	DESCRIPTION	MOTOR DATA HP	MOTOR DATA RLA	SQUARE-D COMBINATION STARTER	ACCESSORIES CONTACTS N.O.	CONTACTS N.C.	PILOT LTS RED	PILOT LTS GRN	SW. TYPE	CTL. XFMR	REMARKS
	1A	FWP-1A	FEEDWATER PUMP	30.	92.	SBA040CFTMA	2	2	Y	Y	HOA	Y	
	1B	FWP-1B	FEEDWATER PUMP	30.	92.	SBA040CFTMA	2	2	Y	Y	HOA	Y	
	1C	FWP-1C	FEEDWATER PUMP	30.	92.	SBA040CFTMA	2	2	Y	Y	HOA	Y	
	1D	SPACE											
	2A	CTP-1A	CONDENSATE TRANSFER PUMP	7.5	25.3	SBA007CFTMA	2	2	Y	Y	HOA	Y	
	2B	CTP-1B	CONDENSATE TRANSFER PUMP	7.5	25.3	SBA007CFTMA	2	2	Y	Y	HOA	Y	
	2C	CTP-1C	CONDENSATE TRANSFER PUMP	7.5	25.3	SBA007CFTMA	2	2	Y	Y	HOA	Y	
	1D	SPACE											
			TOTAL HORSEPOWER	112.5	351.9	AMPS							

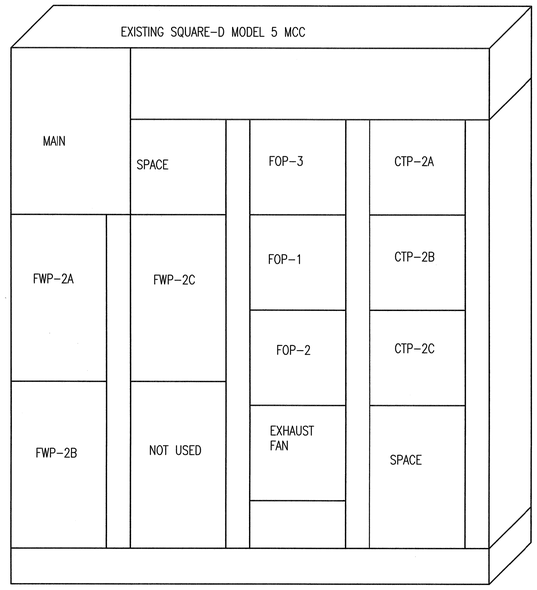
120/208 COLOR CODING
A-BLACK, B-ORANGE, C-YELLOW
NEUTRAL-WHITE (IF USED)
GROUND - GREEN

126.8 kVA

MECHANICAL EQUIPMENT SCHEDULE

	NAME OF MECHANICAL EQUIPMENT	FEEDWATER PUMP (SYSTEM #1)	CONDENSATE TRANSFER PUMP (SYSTEM #1)	FEEDWATER PUMP (SYSTEM #2)	CONDENSATE TRANSFER PUMP (SYSTEM #2)			
MOTOR DATA	EQUIPMENT NO.	FWP–1A,1B,1C	CTP–1A,1B,1C	FWP–2A,2B,2C	CTP–2A,2B,2C	--	--	--
	RATING/WATTS	30HP	7–1/2HP	30HP	7–1/2HP	--	--	--
	VOLTAGE	208	208	208	208	--	--	--
	PHASE	3	3	3	3	--	--	--
	AMPS	92	25.3	92	25.3	--	--	--
	WIRE SIZE	3 #1/0	3 #6	3 #1/0	3 #6	--	--	--
	GROUND WIRE	1 #6	1 #10	1 #6	1 #10	--	--	--
	CONDUIT SIZE	2"	1–1/4"	2"	1–1/4"	--	--	--
	FUSE DISC. SW.	100	30	100	30	--	--	--
	TYPE RKI FUSES	100	30	100	30	--	--	--
	NON–FUSE SW.	--	--	--	--	--	--	--
	CAPACITOR (KVAR)	--	--	--	--	--	--	--
	NOTES	1	1	1	1	--	--	--

NOTES:
1. SEE MCC SCHEDULE FOR STARTER.



EXISTING MCC #2 FRONT ELEVATION

SCALE: N.T.S.

EXISTING MOTOR CONTROL CENTER "MCC2" SCHEDULE

MOTOR CONTROL CENTER CHARACTERISTICS

VOLTS 208	AMPS 600		
MANUFACTURER: SQUARE D		MOUNTING FREE-STAND	
MODEL	MODEL 5 SERIES	NEMA ENCLOSURE 1	

REV	BKT	MOTOR OR UNIT NAMEPLATE	DESCRIPTION	MOTOR DATA HP	MOTOR DATA RLA	STARTER	ACCESSORIES CONTACTS N.O.	CONTACTS N.C.	PILOT LTS RED	PILOT LTS GRN	SW. TYPE	CTL. XFMR	REMARKS
	1A	FWP-2A	FEEDWATER PUMP	30.	92.	EXISTING	2	2	Y	Y	HOA	Y	New motor & control, existing starter
	1B	FWP-2B	FEEDWATER PUMP	30.	92.	EXISTING	2	2	Y	Y	HOA	Y	New motor & control, existing starter
	2B	FWP-2C	FEEDWATER PUMP	30.	92.	EXISTING	2	2	Y	Y	HOA	Y	New motor & control, existing starter
	3A	FOP-3	FUEL OIL PUMP	7.5	25.3	EXISTING	2	2	Y	Y	HOA	Y	New motor & control, existing starter
	3B	FOP-1	FUEL OIL PUMP	7.5	25.3	EXISTING	2	2	Y	Y	HOA	Y	New motor & control, existing starter
	3C	FOP-2	FUEL OIL PUMP	7.5	25.3	EXISTING	2	2	Y	Y	HOA	Y	New motor & control, existing starter
	3D	Exhaust Fan	EXHAUST FAN	3.	10.6	EXISTING							Existing equipment, confirm size
	4A	CTP-2A	CONDENSATE TRANSFER PUMP	3.	10.6	EXISTING							Existing equipment
	4B	CTP-2B	CONDENSATE TRANSFER PUMP	3.	10.6	EXISTING							Existing equipment
	4C	CTP-2C	CONDENSATE TRANSFER PUMP	3.	10.6	EXISTING							Existing equipment
			TOTAL HORSEPOWER	124.5	394.3	AMPS							

142.1 kVA

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	LV	JO	01–29–10

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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

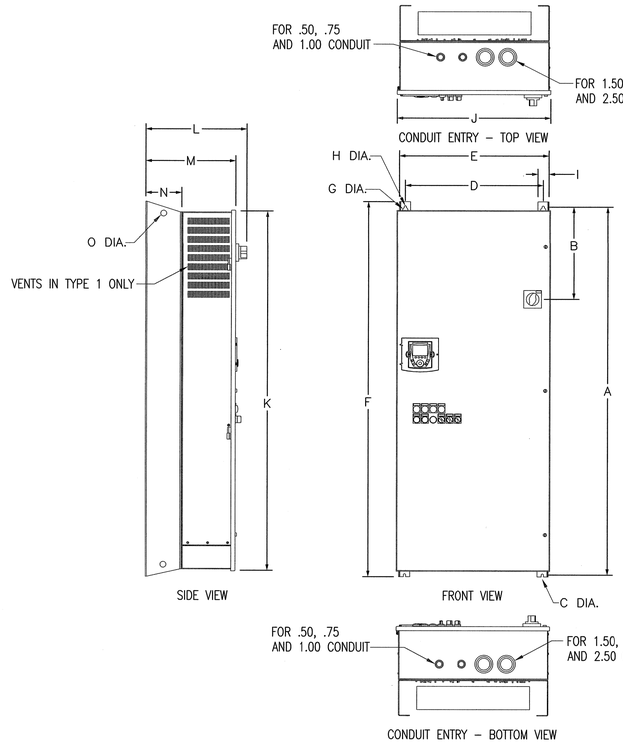
ELECTRICAL DETAILS
SHEET 1

DESIGNED	L. VANCE
DRAWN	J. KIM
CHECKED	J. OGG
APPROVED	L. VANCE
APPROVED	J. OGG
DATE	01–29–10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
EG2

SCI PROJECT NO: 21937.01

CADD 01–R3



E–FLEX ENCLOSED AC DRIVE
CLASS 8839 TYPE EFD_
208/230V 30–50/15–25 HP
TYPE 1 AND TYPE 12K (WALL MOUNT)

HP	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
25	47.83	7.75	.38	18.04	20	49.02	.88	.37	1.86	20.65	46.64	16.83	14.98	6	1
40	61.81	15.52	.38	23.04	25	63	.88	.38	1.86	25.65	60.38	16.83	14.98	6	1

HP	HP	WEIGHT	
460V	208/230V	LB	KG
60 TO 100	30 TO 50	211	95.9
30 TO 50	15 TO 25	177	80.5

NOTE:

1. PROVIDE AT LEAST 3.00/[76] OF MOUNTING CLEARANCE ON EACH SIDE OF THE DRIVE CONTROLLER.
2. PROVIDE AT LEAST 6.00/[152] OF MOUNTING CLEARANCE ON EACH TOP AND BOTTOM OF THE DRIVE CONTROLLER.

VARIABLE FREQUENCY DRIVE DETAIL

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/29/10
STATE OF UTAH

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

NO.	REVISIONS	DWN	APVD	APVD	DATE
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WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

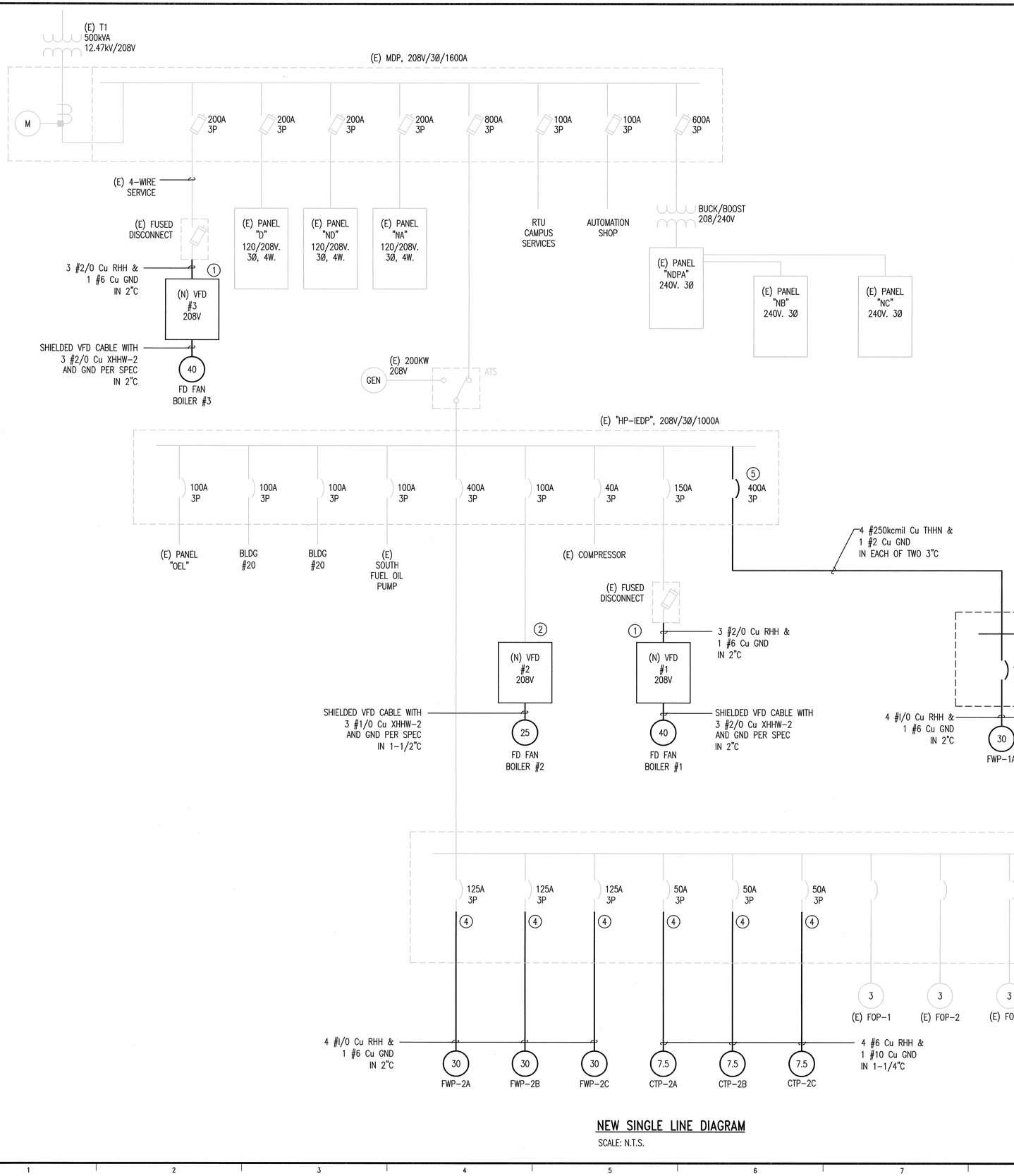
ELECTRICAL DETAILS
SHEET 2

DESIGNED L. VANCE
DRAWN J. KIM
CHECKED J. OGG
APPROVED L. VANCE
APPROVED J. OGG
DATE 01–29–10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
EG3

SCI PROJECT NO: 21937.01

CADD D1–R3



NEW SINGLE LINE DIAGRAM

SCALE: N.T.S.

GENERAL NOTES:

1. OPERATING RESTRICTION – FEED WATER PUMPS AND CONDENSATE TRANSFER PUMPS IN MCC #1 SHALL NOT BE OPERATED SIMULTANEOUSLY WITH FEED WATER PUMPS AND CONDENSATE TRANSFER PUMPS IN MCC #2.

KEY NOTES: ◯

1. REMOVE EXISTING FD FAN MOTOR AND MOTOR STARTER, PROVIDE AND INSTALL NEW VFD AND FD FAN MOTOR. PROVIDE SERVICE TO THE NEW VFD FROM THE EXISTING FUSED DISCONNECT.
2. REMOVE EXISTING FD FAN MOTOR AND MOTOR STARTER, PROVIDE AND INSTALL NEW VFD AND FD FAN MOTOR, AND REROUTE THE EXISTING SERVICE TO FEED THE NEW VFD.
3. PROVIDE AND INSTALL NEW SYSTEM #1 FEED WATER PUMPS AND CONDENSATE TRANSFER PUMPS AS INDICATED IN THE MECHANICAL DRAWINGS. PROVIDE AND INSTALL A NEW MOTOR CONTROL CENTER (MCC#1) WITH SERVICE TO THE NEW SYSTEM #1 PUMPS.
4. PROVIDE AND INSTALL NEW SYSTEM #2 FEED WATER PUMPS AND CONDENSATE TRANSFER PUMPS AS INDICATED IN THE MECHANICAL DRAWINGS. PROVIDE SERVICE TO THE NEW SYSTEM #2 PUMPS FROM THE EXISTING MOTOR CONTROL CENTER (MCC#2). ADD H-O-A SWITCHES AND MODIFY THE PUMP MOTOR CONTROLS TO BE CONSISTENT WITH THE CONTROL DIAGRAM SHOWN ON DRAWING EW1.
5. IN PANEL "HP-IEDP" RELOCATE EXISTING BREAKER AT POSITION LABELED 20,22,24 TO POSITION LABELED 25,27,29. CONTRACTOR SHALL PROVIDE AND INSTALL NEW 400A BREAKER TO FEED NEW MCC #1.

OVERALL SYSTEM LOAD ESTIMATE

DESCRIPTION	kW	PF	kVA	AMPS @ 208V
HISTORICAL PEAK DEMAND PRIOR TO IMPROVEMENTS	174	0.80	218	604
ESTIMATE OF NET ADDITIONAL OPERATING LOAD	27	0.90	30	83
TOTAL	201	0	248	687

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	LV	JO	01-29-10

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REGISTERED PROFESSIONAL ENGINEER No. 334187 LYLE D. VANCE 1/29/10 STATE OF UTAH

WEBER STATE UNIVERSITY
HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

ELECTRICAL
ONE LINE DIAGRAM

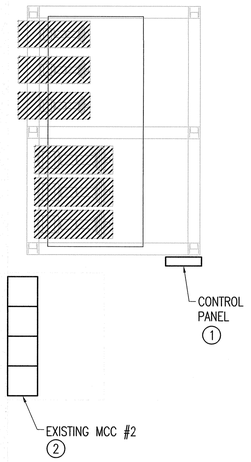
DESIGNED	L. VANCE
DRAWN	J. KIM
CHECKED	J. OGG
APPROVED	L. VANCE
APPROVED	J. OGG
DATE	01-29-10

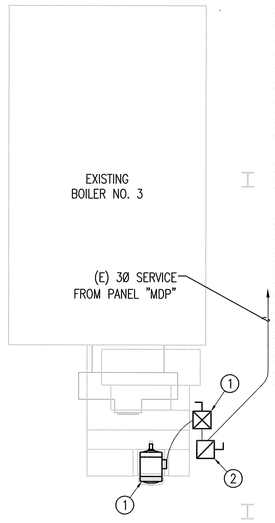
SCALE: AS NOTED
NO. 21937.01.00
REV. 0
E01

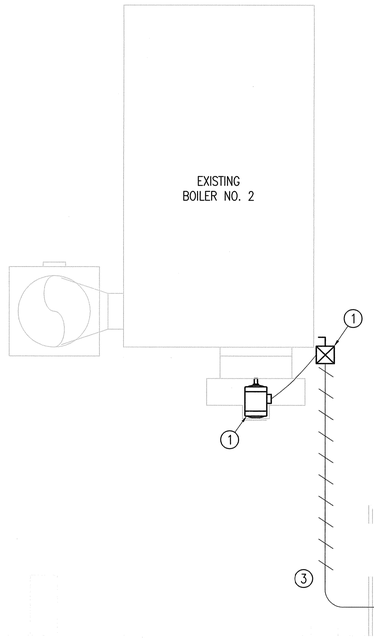
AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

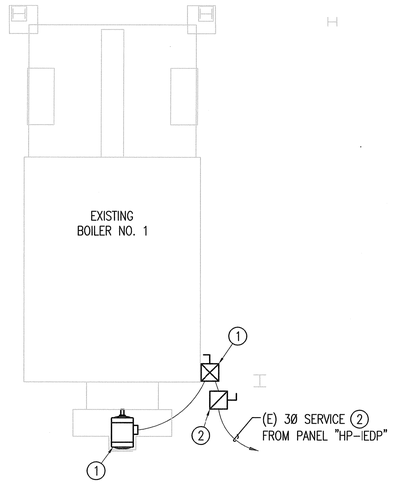
SCI PROJECT NO: 21937.01

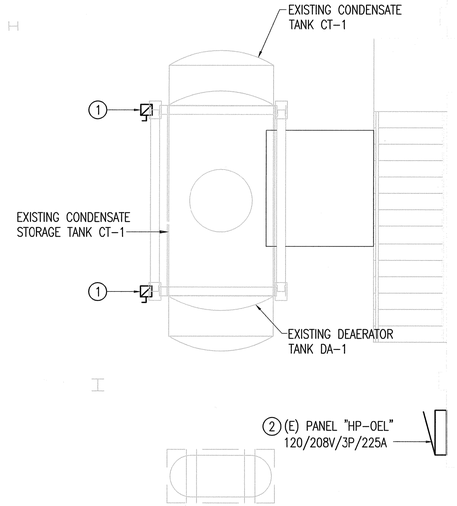
CADD D1-R3

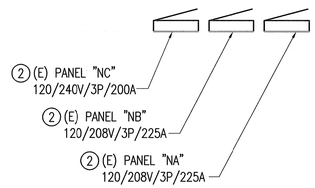












KEY NOTES: ◯

1. EXISTING DEVICE TO BE REMOVED. REMOVE ASSOCIATED CONDUIT AND CONDUCTORS BACK TO THE POINT OF ORIGIN. WHERE POSSIBLE UTILIZE EXISTING CONDUIT AND CONDUCTORS FOR RENOVATION. SEE DRAWING EP1 FOR MORE INFORMATION.
2. EXISTING DEVICE TO REMAIN.
3. REROUTE CONDUIT AND CONDUCTOR TO NEW EQUIPMENT. SEE DRAWING EP1.

GENERAL NOTES:

1. NOT ALL EXISTING DEVICES ARE SHOWN. MAKE ALL NECESSARY MODIFICATIONS TO MAINTAIN EXISTING CIRCUIT INTEGRITY.

LOWER LEVEL FLOOR PLAN – ELECTRICAL DEMOLITION

SCALE: 1/4" = 1'-0"

NORTH

REGISTERED PROFESSIONAL ENGINEER
No. 334187
LYLE D. VANCE
1/29/10
STATE OF UTAH

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	LV	JO	01-29-10

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

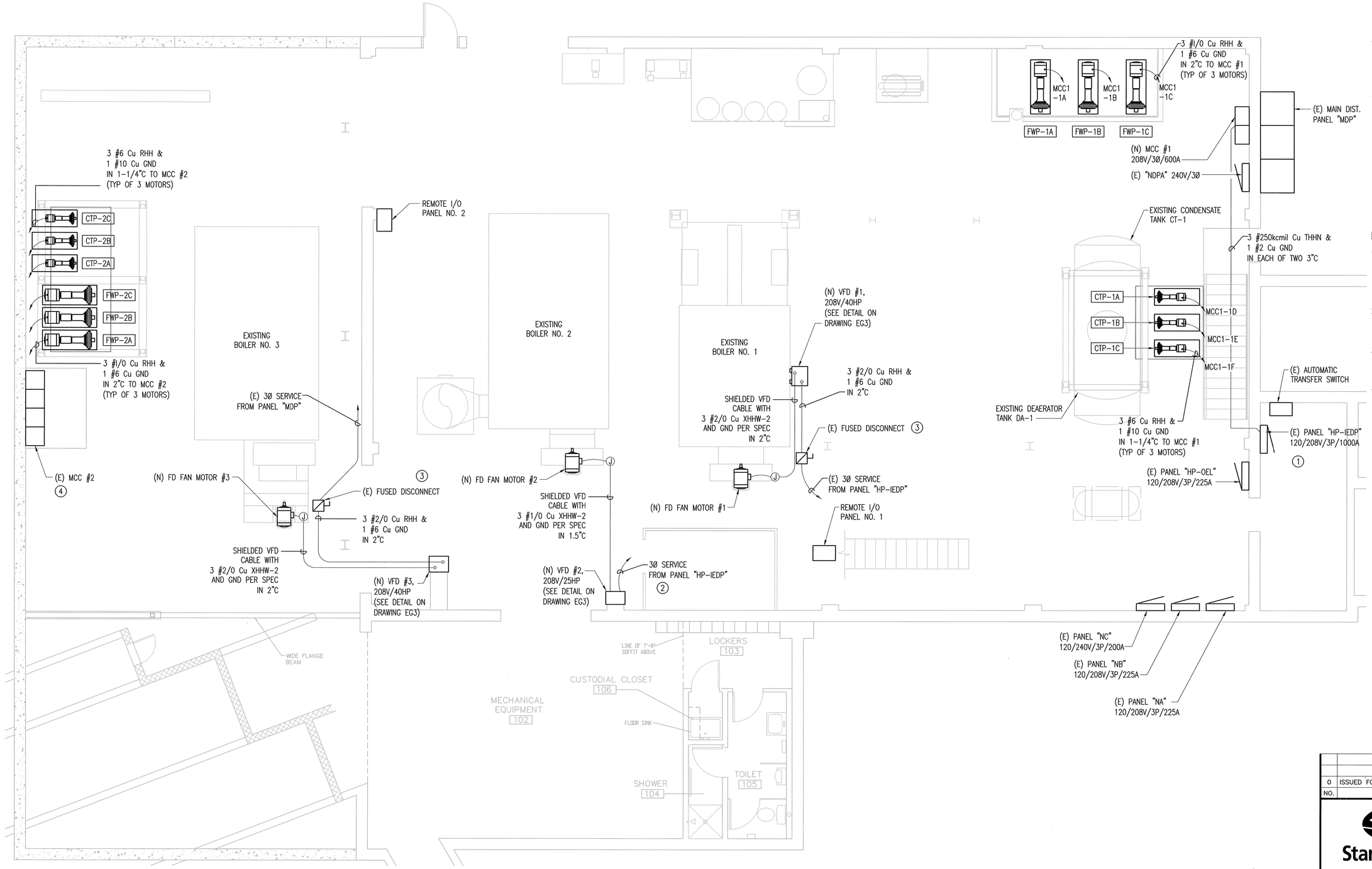
LOWER LEVEL FLOOR PLAN
ELECTRICAL DEMOLITION

DESIGNED	L. VANCE
DRAWN	J. KIM
CHECKED	J. OGG
APPROVED	L. VANCE
APPROVED	J. OGG
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
DE1

SCI PROJECT NO: 21937.01

CADD 01-R3



LOWER LEVEL FLOOR PLAN – NEW ELECTRICAL

SCALE: 1/4" = 1'-0"

NORTH

GENERAL NOTE:

1. WHERE POSSIBLE, REUSE EXISTING CONDUIT, CONDUCTORS, J-BOX, ETC. DURING RENOVATION.
2. MAKE ALL NECESSARY MODIFICATIONS FOR A COMPLETE AND OPERABLE INSTALLATION.

KEY NOTES: ◯

1. RELOCATE EXISTING EXISTING BREAKER AT POSITION LABELED 20,22,24 TO POSITION LABELED 25,27,29. CONTRACTOR SHALL PROVIDE AND INSTALL NEW 400A BREAKER TO FEED NEW MCC #1.
2. REROUTE THE CABLE AND CONDUIT THAT PREVIOUSLY SERVED THE FD FAN MOTOR STARTER TO VFD #2.
3. PROVIDE SERVICE TO THE NEW VFD (#1 & #3) FROM THE EXISTING FUSED DISCONNECT SWITCH.
4. PROVIDE SERVICE TO THE NEW MOTORS FWP-2A, FWP-2B, FWP-2C, CTP-2A, CTP-2B, CTP-2C, FROM THE EXISTING MCC #2. VERIFY THAT THE STARTERS AND CIRCUIT PROTECTION DEVICES ARE SIZED IN ACCORDANCE WITH THE NEC FOR THE NEW MOTORS. PROVIDE MOTOR CONTROL AS INDICATED ON DRAWINGS EW1 & IA1. SEE DETAIL ON DRAWING EG2.

NO.	REVISIONS	DWN	APVD	APVD	DATE
0	ISSUED FOR CONSTRUCTION	JK	LV	JO	01-29-10

REGISTERED PROFESSIONAL ENGINEER
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LYLE D. VANCE
01-29-10
STATE OF UTAH

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

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HEAT PLANT CONTROLS & FEEDWATER/CONDENSATE PUMP UPGRADE
OGDEN, UTAH

LOWER LEVEL FLOOR PLAN
NEW ELECTRICAL

DESIGNED	L. VANCE
DRAWN	J. KIM
CHECKED	J. OGG
APPROVED	L. VANCE
APPROVED	J. OGG
DATE	01-29-10

SCALE: AS NOTED
NO. 21937.01.00
REV. 0
EP1

SCI PROJECT NO: 21937.01

CADD 01-R3