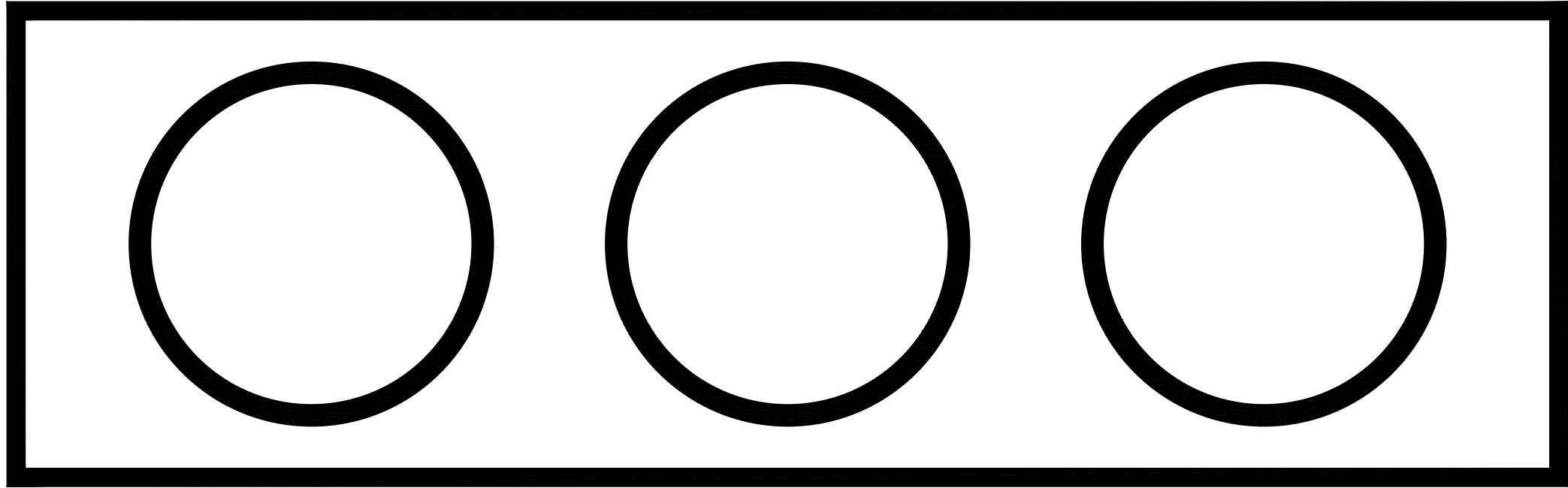


BOARDWALK



PIPELINE PARTNERS

TYPICAL DUAL RUN
REGULATOR PACKAGE
P&ID, INSTRUMENTATION
AND ELECTRICAL
GENERAL STANDARD REV. 1

KYMEA

DRAWING INDEX		
DRAWING NO.	DESCRIPTION	REVISION
DRAWING INDEX & COVER SHEET		
BWP-SKR-IE00	DRAWING INDEX & COVER SHEET	1
TYPICAL DRAWINGS		
BWP-201-33	P&ID SYMBOL & LEGENDS	0
ELECTRICAL DRAWINGS		
BWP-SKR-IE01	PIPING & INSTRUMENTATION DIAGRAM	1
BWP-SKR-IE02	WIRING DIAGRAM - JB-4001	1
BWP-SKR-IE03	WIRING DIAGRAM - JB-4001	1
BWP-SKR-IE04	WIRING DIAGRAM - JB-4101	1
BWP-SKR-IE05	LAYOUTS - JB-4001	1
BWP-SKR-IE06	LAYOUTS - JB-4101	1
BWP-SKR-IE07	INSTRUMENTATION DETAILS	1
BWP-SKR-IE08	CONDUIT & TUBING LAYOUT	1
BWP-SKR-IE09	AREA CLASSIFICATION PLAN & SECTION	1

AA ANALYSIS ALARM

AC ANALYSIS CONTROLLER (SAMPLER)

AE ANALYSIS ELEMENT (SAMPLER)

AJ ANALYSIS INDICATOR

AIC ANALYSIS INDICATING CONTROLLER

AIS* ANALYSIS INDICATING SWITCH

AIT ANALYSIS INDICATING TRANSMITTER

AP ANALYSIS POINT (CHROMATOGRAPH)

AR ANALYSIS RECORDER

AS* ANALYSIS SWITCH

AT ANALYSIS TRANSMITTER (CHROMATOGRAPH)

AV ANALYSIS CONTROL VALVE

AY ANALYSIS RELAY

BA* BURNER ALARM

BE BURNER ELEMENT

BS BURNER SWITCH

ES VOLTAGE INDICATOR

ES* VOLTAGE SWITCH

FA* FLOW ALARM

FC FLOW CONTROLLER

FCV FLOW CONTROL VALVE

FE FLOW ELEMENT

FFC FLOW RATIO CONTROLLER

FI FLOW INDICATOR

FIC FLOW INDICATING CONTROLLER

FLP FAIL LAST POSITION

FO FLOW ORIFICE (RESTRICTION ORIFICE)

FQ FLOW TOTALIZER/FLOW COMPUTER

FQI FLOW TOTALIZING INDICATOR

FQS* FLOW TOTALIZING SWITCH

FR FLOW RECORDER

FRCV FLOW RECORDING CONTROL VALVE

FS* FLOW SWITCH

FT FLOW TRANSMITTER

FV FLOW VALVE

FX FLOW STRAIGHTENING VALVE

FY FLOW RELAY

FYY FLOW COMPUTING RELAY (MASS)

HC HAND CONTROLLER

HCV HAND CONTROL VALVE

HS HAND SWITCH

HV HAND VALVE

GOV GAS OPERATED VALVE

GU GAS FILTER

OV GEAR OPERATED VALVE

L LEVEL DEVICE

LA* LEVEL ALARM

LC LEVEL CONTROLLER

LCV LEVEL CONTROL VALVE

LC LEVEL CONTROLLER

LG LEVEL GAUGE GLASS

LI LEVEL INDICATOR (OTHER THAN LG)

LIC LEVEL INDICATING CONTROLLER

LR LEVEL RECORDER

LS* LEVEL SWITCH

LT LEVEL TRANSMITTER

LV LEVEL VALVE

MA* MOISTURE ALARM

MC MOISTURE CONTROLLER

ME MOISTURE ELEMENT

MI MOISTURE INDICATOR

MR MOISTURE RECORDER

MS* MOISTURE SWITCH

MT MOISTURE ANALYZER/TRANSMITTER

OPP OVER PRESSURE PROTECTION VALVE

OSA* OVER SPEED ALARM

OSS* OVER SPEED SWITCH

PA* PRESSURE ALARM

PC PRESSURE CONTROLLER

PCV PRESSURE CONTROL VALVE (SELF-CONTAINED)

PDA* PRESSURE DIFFERENTIAL ALARM

PDCV PRESSURE DIFFERENTIAL INDICATOR

PDI PRESSURE DIFFERENTIAL INDICATING CONTROLLER

PDR PRESSURE DIFFERENTIAL RECORDING SWITCH

PDT PRESSURE DIFFERENTIAL TRANSMITTER

PI PRESSURE INDICATOR

PIC PRESSURE INDICATING CONTROLLER

PIT PRESSURE INDICATING TRANSMITTER

PR PRESSURE RECORDER

PRC PRESSURE RECORDING CONTROLLER

PRV PRESSURE REGULATING VALVE

PS* PRESSURE SWITCH

PSE PRESSURE SAFETY HEAD

PSV PRESSURE SAFETY/RELIEF VALVE

PT PRESSURE TRANSMITTER

PV PRESSURE CONTROL VALVE

PY PRESSURE RELAY

SA* SPEED ALARM

SDV SHUTDOWN VALVE

SE SPEED ELEMENT (TACHOMETER PICK-UP)

SS* SPEED SWITCH

ST SPEED TRANSMITTER

STR STRAINER

SVC SOLENOID VALVE CLOSED

SVO SOLENOID VALVE OPEN

TA* TEMPERATURE ALARM

TC TEMPERATURE CONTROLLER

TCV TEMPERATURE CONTROL VALVE (SELF-CONTAINED)

TDI TEMPERATURE DIFFERENTIAL INDICATOR

TE TEMPERATURE ELEMENT (WITH THERMOWELL)

TI TEMPERATURE INDICATOR (WITH THERMOWELL)

TIC TEMPERATURE INDICATING CONTROLLER

TCV TEMPERATURE INDICATING CONTROLLER VALVE

TR TEMPERATURE RECORDER

TRC TEMPERATURE RECORDING CONTROLLER

TRCV TEMPERATURE RECORDING CONTROL VALVE

TS* TEMPERATURE SWITCH

TT TEMPERATURE TRANSMITTER

TTI TEMPERATURE INDICATING TRANSMITTER

TV TEMPERATURE CONTROL VALVE

TW TEMPERATURE TEST CONNECTION (THERMOWELL)

UT MULTIVARIABLE TRANSMITTER

VA* VIBRATION ALARM

VE VIBRATION ELEMENT

VRP CATALYTIC HEATER

VS* VIBRATION SWITCH

X RESERVED FOR SHUTDOWN DEVICE

XA* ANNUNCIATOR POINT

XI PIG SIG INDICATOR

XY SPECIAL RELAY (USUALLY A SOLENOID)

Y DEVICE: I/P, SDV, RELAY, ETC.

ZA* POSITION ALARM (MOTION)

ZE POSITION DETECTOR (MOTION)

ZIC POSITION INDICATOR LAMP (VALVE CLOSED)

ZIO POSITION INDICATOR LAMP (VALVE OPEN)

ZS* POSITION SWITCH (MOTION)

ZSC POSITION INDICATOR SWITCH (VALVE CLOSED)

ZSO POSITION INDICATOR SWITCH (VALVE OPEN)

ZT POSITION TRANSMITTER

ZY POSITION RELAY

* ALARMS, SWITCHES & ANNUNCIATORS MAY HAVE SUFFIX LETTERS AS FOLLOWS:

L DENOTES LOW ALARM

LL DENOTES LOW SHUTDOWN

H DENOTES HIGH ALARM

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NOTE:

IDENTIFICATION OF INSTRUMENTS NOT COVERED IN THE LISTINGS ABOVE SHALL CONFORM TO ANSI/ISA S5.1, "INSTRUMENT SYMBOLS AND IDENTIFICATION".

MISCELLANEOUS ABBREVIATIONS

AC AIR TO CLOSE

AO AIR TO OPEN

AOV AIR OPERATED VALVE

AS AIR SUPPLY

ATMOS ATMOSPHERE

BDV BLOWDOWN VALVE

BS BASKET STRAINER

CC CORROSION COUPON

COND. CONDUCTIVITY

CSC CAR SEAL CLOSED

CSO CAR SEAL OPEN

DM DEMISTER

EL ELEVATION

ES ELECTRIC SUPPLY

ESD EMERGENCY SHUTDOWN

FA FLAME ARRESTOR

FBO FURNISHED BY OWNER

FC FAIL CLOSED

FE FLANGED END

FO FAIL OPEN

GOY GAS OPERATED SOLENOID

GS GAS SUPPLY

HC HOSE CONNECTION

HS HYDRAULIC SUPPLY

LC LOCK CLOSED

LO LOCK OPEN

MCC MOTOR CONTROL CENTER

MW MANWAY

MAOP MAX. ALLOWABLE OPERATING PRESSURE

NC NORMALLY CLOSED

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NS NITROGEN SUPPLY

OP OPERATING PRESSURE

OT OPERATING TEMPERATURE

PH PH (ACIDITY)

RA REVERSE ACTING

RTU REMOTE TELEMETRY UNIT

SC SAMPLE CONNECTION

SD SHUTDOWN

SOL SOLENOID

SP SETPOINT

S/S SEAM TO SEAM

SS STAINLESS STEEL

STPL STOPPLE

T/T TANGENT TO TANGENT

TBG TUBING

V VOLT

VF VENDOR FURNISHED

W/ WITH

WE WELD END

WXF WELD BY FLANGE

WXS WELD BY SCREWED

YS Y-STRAINER

INSTRUMENT & EQUIPMENT NUMERATION

3009

LOCATION OWNERSHIP

SEQUENCE ASSOCIATION

LOCATION

0 FIRST METER RUN AREA

1 SECOND METER RUN AREA

2 THIRD METER RUN AREA

3 FOURTH METER RUN AREA

4 FIRST REGULATOR RUN AREA

5 SECOND REGULATOR RUN AREA

6 THIRD REGULATOR RUN AREA

7 FOURTH REGULATOR RUN AREA

8 FILTER SEPARATOR AREA

9 SPARE

C GAS CHROMATOGRAPH AREA

R REMOTE TELEMETRY UNIT AREA

T HOT TAP AREA

OWNERSHIP

0 BOARDWALK PIPELINE PARTNERS

1 CUSTOMER

ASSOCIATION

0 PRIMARY METER

1 SECONDARY METER

2 MONITOR VALVE

3 WORKER VALVE

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5 SAMPLE

6 FILTER SEPARATOR

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1-9 DEVICE NUMBER

INSTRUMENT ABBREVIATIONS

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AR ANALYSIS RECORDER

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FT FLOW TRANSMITTER

FV FLOW VALVE

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FY FLOW RELAY

FYY FLOW COMPUTING RELAY (MASS)

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HCV HAND CONTROL VALVE

HS HAND SWITCH

HV HAND VALVE

GOV GAS OPERATED VALVE

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OV GEAR OPERATED VALVE

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PT PRESSURE TRANSMITTER

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L DENOTES LOW ALARM

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MISCELLANEOUS ABBREVIATIONS

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COND. CONDUCTIVITY

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CSO CAR SEAL OPEN

DM DEMISTER

EL ELEVATION

ES ELECTRIC SUPPLY

ESD EMERGENCY SHUTDOWN

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FBO FURNISHED BY OWNER

FC FAIL CLOSED

FE FLANGED END

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HS HYDRAULIC SUPPLY

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OP OPERATING PRESSURE

OT OPERATING TEMPERATURE

PH PH (ACIDITY)

RA REVERSE ACTING

RTU REMOTE TELEMETRY UNIT

SC SAMPLE CONNECTION

SD SHUTDOWN

SOL SOLENOID

SP SETPOINT

S/S SEAM TO SEAM

SS STAINLESS STEEL

STPL STOPPLE

T/T TANGENT TO TANGENT

TBG TUBING

V VOLT

VF VENDOR FURNISHED

W/ WITH

WE WELD END

WXF WELD BY FLANGE

WXS WELD BY SCREWED

YS Y-STRAINER

INSTRUMENT & EQUIPMENT NUMERATION

3009

LOCATION OWNERSHIP

SEQUENCE ASSOCIATION

LOCATION

0 FIRST METER RUN AREA

1 SECOND METER RUN AREA

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5 SECOND REGULATOR RUN AREA

6 THIRD REGULATOR RUN AREA

7 FOURTH REGULATOR RUN AREA

8 FILTER SEPARATOR AREA

9 SPARE

C GAS CHROMATOGRAPH AREA

R REMOTE TELEMETRY UNIT AREA

T HOT TAP AREA

OWNERSHIP

0 BOARDWALK PIPELINE PARTNERS

1 CUSTOMER

ASSOCIATION

0 PRIMARY METER

1 SECONDARY METER

2 MONITOR VALVE

3 WORKER VALVE

4 SHUT-IN VALVE

5 SAMPLE

6 FILTER SEPARATOR

7 CONDENSATE TANK

SEQUENCE

1-9 DEVICE NUMBER

INSTRUMENT SYMBOLS

FIELD MOUNTED INSTRUMENT/VALVE TAG

SIGNAL TO REMOTELY MOUNTED CONTROL PANEL - MOUNTED ON FRONT

SIGNAL TO REMOTELY MOUNTED CONTROL PANEL - MOUNTED ON REAR

INSTRUMENT DIRECTLY MOUNTED TO PIPING

SIGNAL TO AUXILIARY CONTROL PANEL - MOUNTED ON FRONT

SIGNAL TO AUXILIARY CONTROL PANEL - MOUNTED ON REAR

FLOW COMPUTER (RTU)

PROGRAMMABLE LOGIC CONTROLLER

PILOT LIGHT

INTERLOCK LOGIC SYMBOLS

COMPLEX OR UNDEFINED INTERLOCK

OUTPUT ONLY IF ALL INPUTS PRESENT

OUTPUT IF ANY INPUTS ARE PRESENT

RESET

PILOT

EMERGENCY SHUTDOWN LOGIC

RELAY FUNCTION DESIGNATIONS

SELECT LOW SIGNAL

SELECT HIGH SIGNAL

HIGH LIMITING

MOTOR TO PNEUMATIC TRANSDUCER

PNEUMATIC TO CURRENT TRANSDUCER

CURRENT TO PNEUMATIC TRANSDUCER

TOTALIZER

SQUARE ROOT

RESISTANCE TO CURRENT TRANSDUCER

ELECTROHYDRAULIC TRANSDUCER

AUTO/MANUAL LOADING STATION

VALVE IDENTIFICATION (NON-INSTRUMENTATION)

TYPE

PRESSURE CLASS

CONNECTION

A GATE VALVE

B BALL VALVE

C PLUG VALVE

D GLOBE VALVE

E NEEDLE VALVE

F BUTTERFLY VALVE

G SWING CHECK VALVE

H WAFER CHECK VALVE

J BALL CHECK VALVE

K DURABLE CHECK VALVE

L SHEAR (BARKSDALE) VALVE

P PISTON CHECK VALVE

S SOLENOID VALVE

X SPECIAL VALVE

PRESSURE CLASS

A 150# ANSI

B 300# ANSI

C 400# ANSI

D 600# ANSI

E 900# ANSI

F 1500# ANSI

G 2500# ANSI

P 150# WOG

Q 200# WOG

R 300# WOG

S 800# WOG

T 1000# WOG

U 2000# WOG

W 3000# WOG

X 6000# WOG

CONNECTION

A FLANGED, RAISED FACE

B FLANGED, RING JOINT

C WELD x FLANGED, RAISED FACE

D WELD x FLANGED, RING JOINT

E WELD x WELD

F SCREWED, FPT

G SCREWED, MPT

H SCREWED, MPT x FPT

J FLANGED, FLAT FACE

K SOCKET WELD x SCREWED, FPT

LINE LEGEND

PROCESS LINE

SECONDARY LINE

UTILITY LINE

SUPPLY SIGNAL

SENSING LINE

ELECTRICAL SIGNAL

CAPILLARY TUBING

HYDRAULIC SIGNAL

INTERNAL SOFTWARE LINK

ELECTROMAGNETIC OR SONIC SIGNAL

MECHANICAL CONNECTION

NOTE:

1. THE PNEUMATIC SIGNAL SYMBOL APPLIES TO A SIGNAL USING ANY GAS AS THE SIGNAL MEDIUM. IF A GAS OTHER THAN AIR IS USED, THE GAS SHALL BE IDENTIFIED BY A NOTE ON THE SIGNAL SYMBOL OR OTHERWISE.

2. ELECTROMAGNETIC SIGNALS INCLUDE HEAT, RADIO WAVES, NUCLEAR RADIATION AND LIGHT.

MANUALLY OPERATED VALVES

GATE VALVE, PLAIN END

GATE VALVE, FLANGED END

BALL VALVE, PLAIN END

BALL VALVE, FLANGED END

CHECK VALVE, PLAIN END

CHECK VALVE, FLANGED END

BUTTERFLY VALVE, PLAIN END

BUTTERFLY VALVE, FLANGED END

ANGLE VALVE, PLAIN END

ANGLE VALVE, FLANGED END

ANGLE CHECK VALVE, PLAIN END

ANGLE CHOKE VALVE, PLAIN END

ANGLE CHOKE VALVE, FLANGED END

INSTRUMENT VALVE, NEEDLE

INSTRUMENT VALVE, GATE

INSTRUMENT VALVE, PLUG

INSTRUMENT VALVE, BALL

INSTRUMENT VALVE, 3-WAY

3 VALVE MANIFOLD

2 VALVE MANIFOLD

GLOBE VALVE, PLAIN END

GLOBE VALVE, FLANGED END

PLUG VALVE, PLAIN END

PLUG VALVE, FLANGED END

3-WAY VALVE, PLAIN END

3-WAY VALVE, FLANGED END

4-WAY VALVE, PLAIN END

4-WAY VALVE, FLANGED END

EXCESS FLOW VALVE, PLAIN END

EXCESS FLOW VALVE, FLANGED END

VACUUM SAFETY VALVE

INSTRUMENT VALVE, GAGE

INSTRUMENT VALVE, BALL

INSTRUMENT VALVE, 3-WAY SOLENOID

INSTRUMENT VALVE, 4-WAY

5 VALVE MANIFOLD

NORMALLY CLOSED VALVE

VALVE ACTUATORS

DIAPHRAGM

DIAPHRAGM W/ MANUAL OVERRIDE

DIAPHRAGM W/ POSITIONER

ELECTROHYDRAULIC OPERATED VALVE

PISTON OPERATED VALVE, SINGLE ACTING

PISTON OPERATED VALVE, DOUBLE ACTING

SOLENOID OPERATED VALVE

REGULATOR, SELF-CONTAINED

REGULATOR WITH EXTERNAL PRESSURE TAP

REGULATOR, W/ INTEGRAL OUTLET PRESSURE RELIEF VALVE

MOTOR OPERATED VALVE

DOUBLE ACTING PISTON, SPRING RETURN

MISCELLANEOUS SYMBOLS

POSITIVE DISPLACEMENT METER

SENIOR ORIFICE

ORIFICE METER

DIAPHRAGM SEAL

CONCENTRIC REDUCER

BLEED RING W/GATE VALVE

LINE INSULATION

LINE CAP

HORN

EXPANSION JOINT

INSULATING SET

INSULATING UNION

SPECTACLE BLIND: OPEN

ROTAMETER TYPE FLOW INDICATOR

FLOW NOZZLE

PITOT TUBE OR PITOT-VENTURI TUBE

IN-LINE MIXER

DRAIN: CS=CHEMICAL SEWER
HS=SANITARY SEWER
OS=OILY SEWER
SS=STORM SEWER

SILENCER

TUBE BUNDLE

FLOW CONDITIONER

STRAIGHTENING VANES

ULTRASONIC FLOW METER

TURBINE METER (FLANGED)

IN-LINE FILTER STRAINER

FILTER/DRYER

Y STRAINER

START UP STRAINER

PLUG

LINE INSULATION W/HEAT TRACING FLANGES

FLAME ARRESTOR

FLEXIBLE HOSE

DIRECTIONAL ARROW

SPECTACLE BLIND: CLOSED

NEW VENDOR

MAG FLOW METER

TIE-IN

RUPTURE DISC

HOSE CONNECTION

LINE SPEC CHANGE

HOSE REEL

LINE CONTINUATION BOX WITH I.D. AND DWG. NO.

EQUIPMENT I.D. NUMBER

BOARDWALK PIPELINE PARTNERS

BOARDWALK TYPICAL METER & REGULATOR STANDARD P&ID SYMBOLS & LEGENDS

ENGINEER: MSG

DRAWN BY: MHR

CHECKED BY: CH

DATE: 02/02/2016

DRAWING NO. BWP-201-33

SHEET: SCALE: NONE

INDEX NO.: -

REV. 0

Hatch Mott MacDonald

11233 Shadow Creek Pkwy, Suite 400, Pearland, TX 77584
T: (832) 736-9590 • F: (832) 736-9580

This is a go-by reference Boardwalk. Refer to P&ID from EnSiteUSA for revised P&ID design.

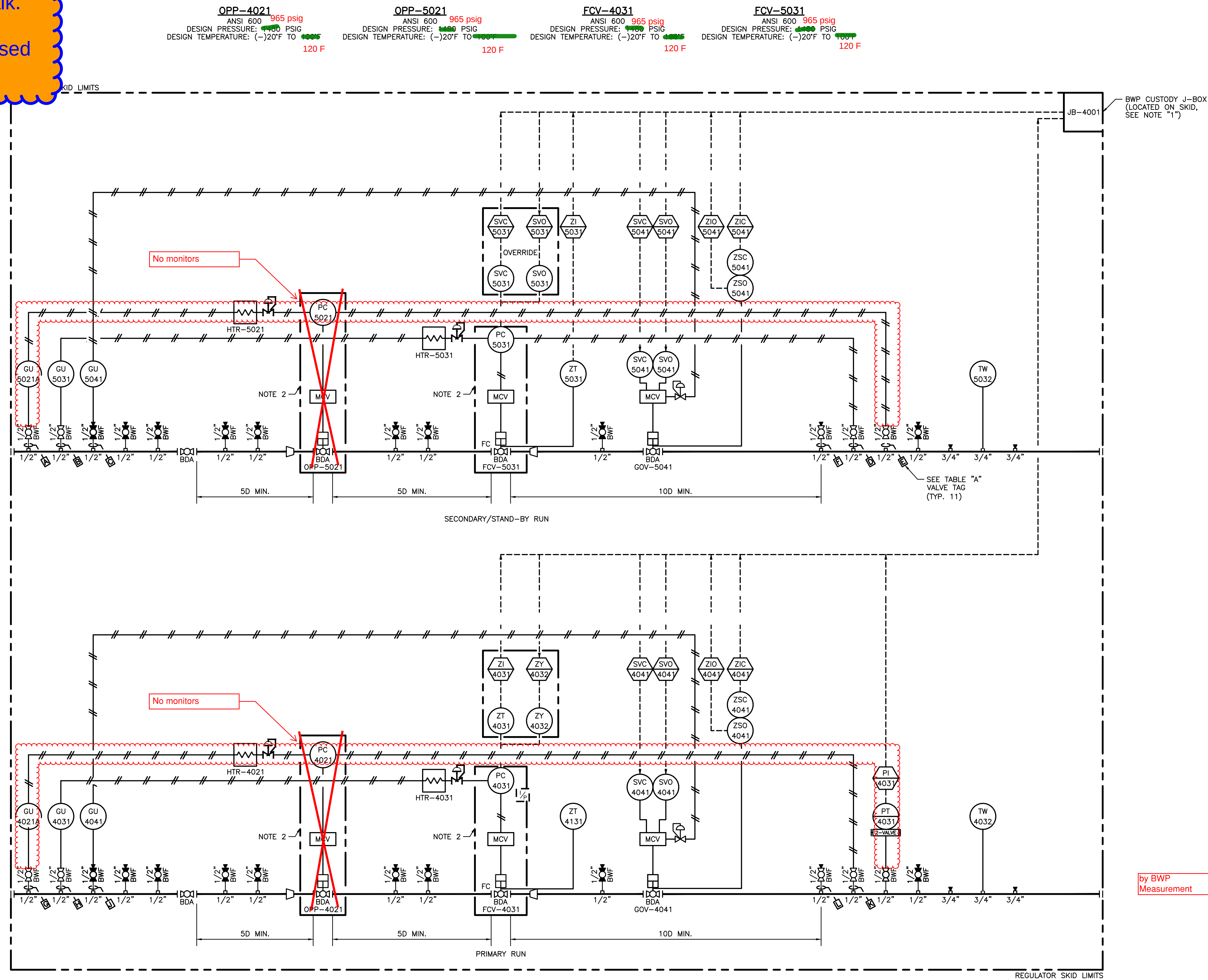


TABLE "A"
TAGGED VALVE INFORMATION

TAG	DESCRIPTION
A	OPP-5021A UPSTREAM MONITOR SUPPLY
B	FCV-5031 FLOW CONTROL VALVE SUPPLY
C	GOV 5041 VALVE SUPPLY
D	FCV 5031 FLOW CONTROL VALVE WORKER SENSE
E	OPP-5021 MONITOR SENSE
F	OPP-5021B DOWNSTREAM MONITOR SUPPLY

TABLE "B"
TAGGED VALVE INFORMATION

TAG	DESCRIPTION
G	OPP-4021A UPSTREAM MONITOR SUPPLY
H	FCV-4031 FLOW CONTROL VALVE SUPPLY
J	GOV 4041 VALVE SUPPLY
K	OPP-4021 MONITOR SENSE
L	OPP-4021B DOWNSTREAM MONITOR SUPPLY

DESIGN BASIS:
DESIGN PRESSURE: 1480 PSIG @ 100'
DESIGN FACTOR: 0.5
MIN. HYDROSTATIC PRESSURE: 2220 PSIG
MAX. HYDROSTATIC PRESSURE: 2225 PSIG

- NOTES:**
- JUNCTION BOX SHALL ALLOW ADEQUATE SPARE TERMINALS TO MAKE PROVISIONS FOR FUTURE I/O TERMINATIONS.
 - CONTROL VALVES SHALL BE SIZED AND SPECIFIED FOR ACTUAL OPERATING CONDITIONS.

REFERENCE DRAWINGS

DRAWING NO.	DESCRIPTION
BWP-SKR-1603	16" - PIPING PLAN, SECTIONS & BILL OF MATERIALS
BWP-SKR-1203	12" - PIPING PLAN, SECTIONS & BILL OF MATERIALS
BWP-SKR-1003	10" - PIPING PLAN, SECTIONS & BILL OF MATERIALS
BWP-SKR-0803	8" - PIPING PLAN, SECTIONS & BILL OF MATERIALS
BWP-SKR-0603	6" - PIPING PLAN, SECTIONS & BILL OF MATERIALS



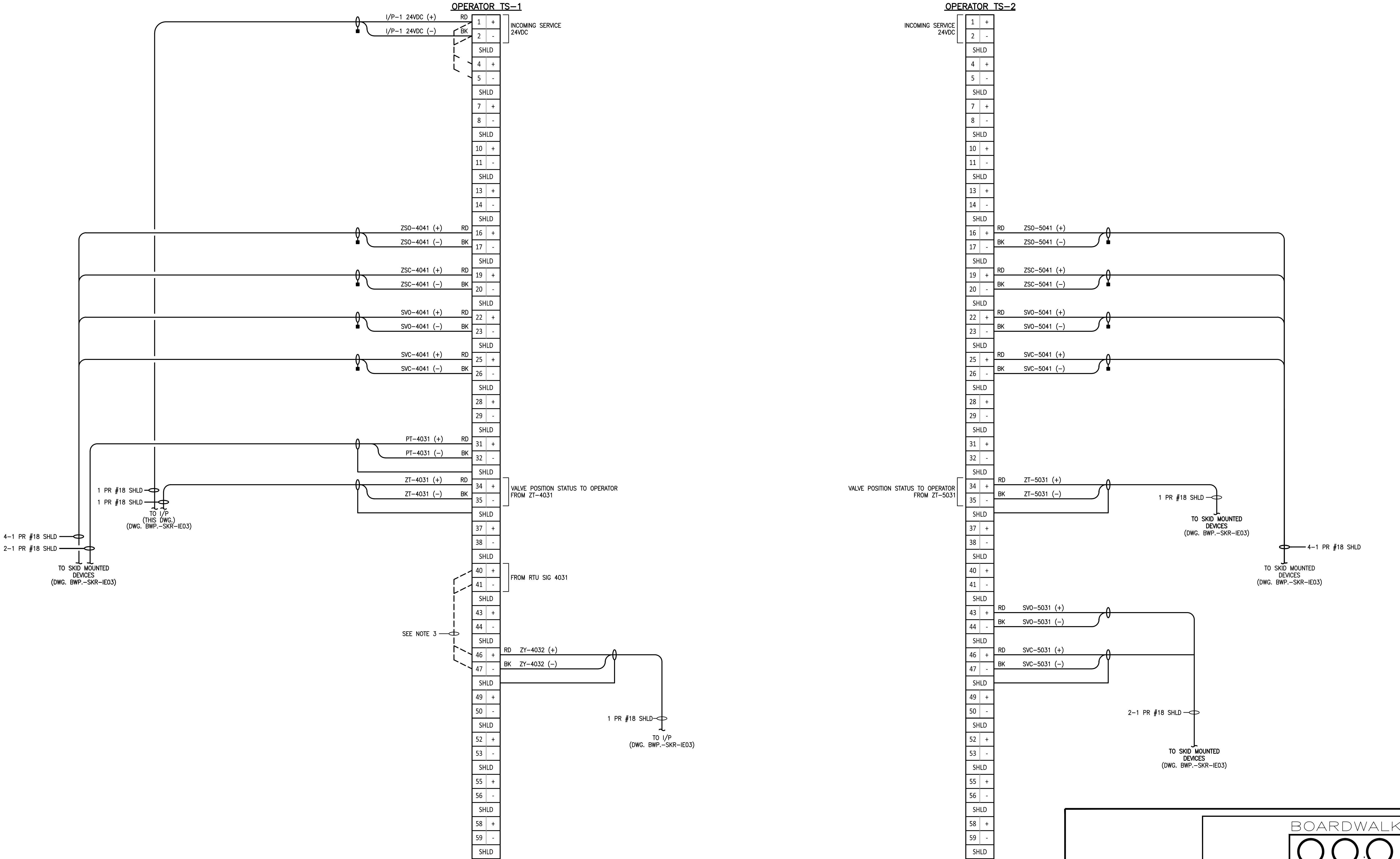
BOARDWALK TYPICAL STANDARD
PIPING & INSTRUMENTATION DIAGRAM
SINGLE RUN REGULATOR SKID

ENGINEER: MG	DRAWING NO. BWP-SKR-IE01	REV. 1
DRAWN BY: MHR	CHECKED BY: CH	
DATE: 01/10/2010	SCALE: NONE	
AFE NUMBER: -	INDEX NO.:	

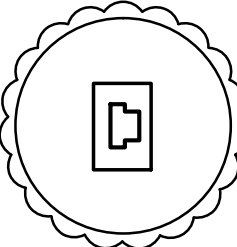
06-30-16	1	GENERAL STANDARD - REVISED	JCQ	KML	JMK
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW
DATE:	NO.	REVISION	DWN.	CK'D	APV'D

Any deviation from standard, requires prior approval from BWP measurement group. Failure to do so could result in changes to meet standard at contractor's expense.

REGULATOR SKID JB-4001



CONEC-4001
(SEE NOTE "2")



CAT 5E
ETH CONEC-4001 TX/RX

TO RTU PANEL

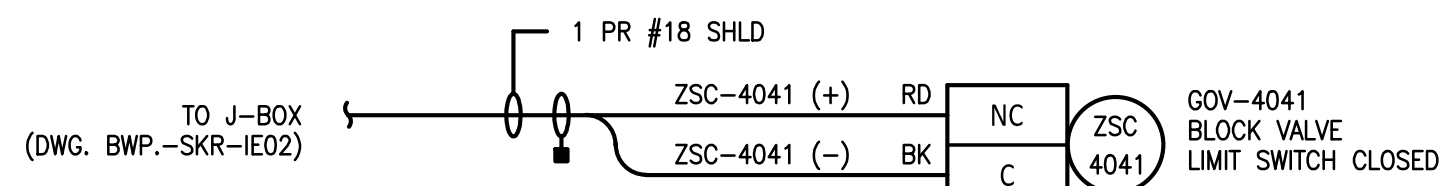
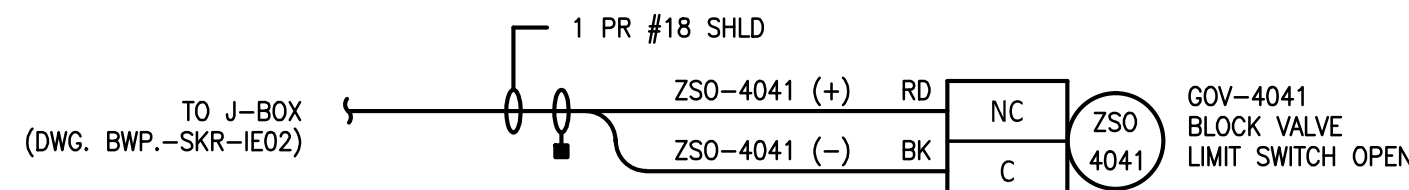
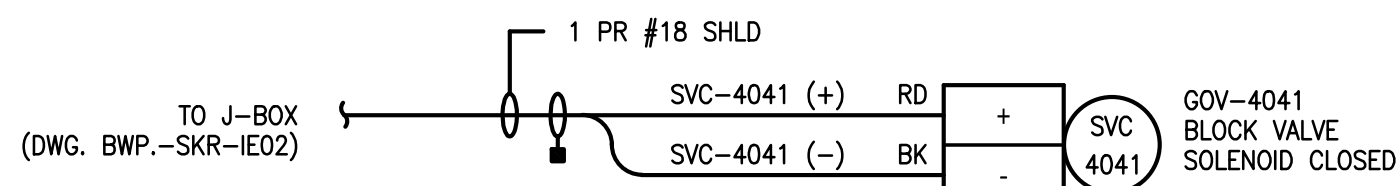
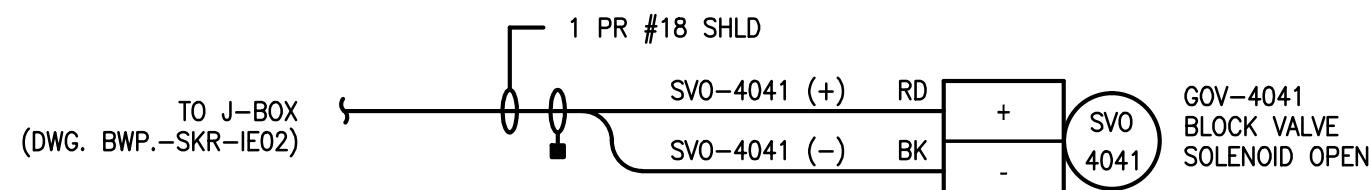
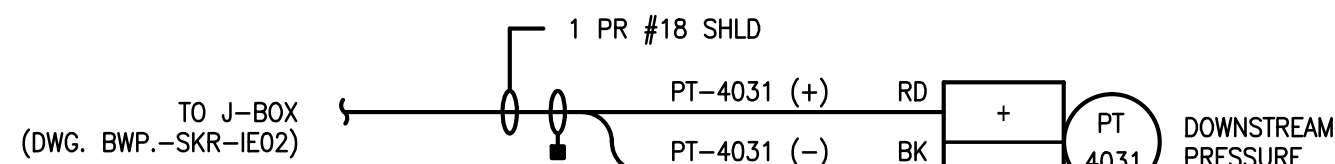
NOTES:
1.) ACTUAL INSTRUMENTATION AND TERMINATION TO BE DETERMINED FOR SPECIFIC PROJECT REQUIREMENTS.
2.) ALL ETHERNET CABLING LINKS SHALL BE TERMINATED AND TESTED IN ACCORDANCE WITH THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) STANDARDS ANSI/TIA/EIA-568-B.1
3.) SELECT RELAY TO BE INSTALLED IF OVERRIDE SIGNAL IS REQUIRED. OTHERWISE INSTALL A JUMPER CABLE FROM TS-40(+), TS-41(-), TO TS-46(+), TS-47(-), AS SHOWN.



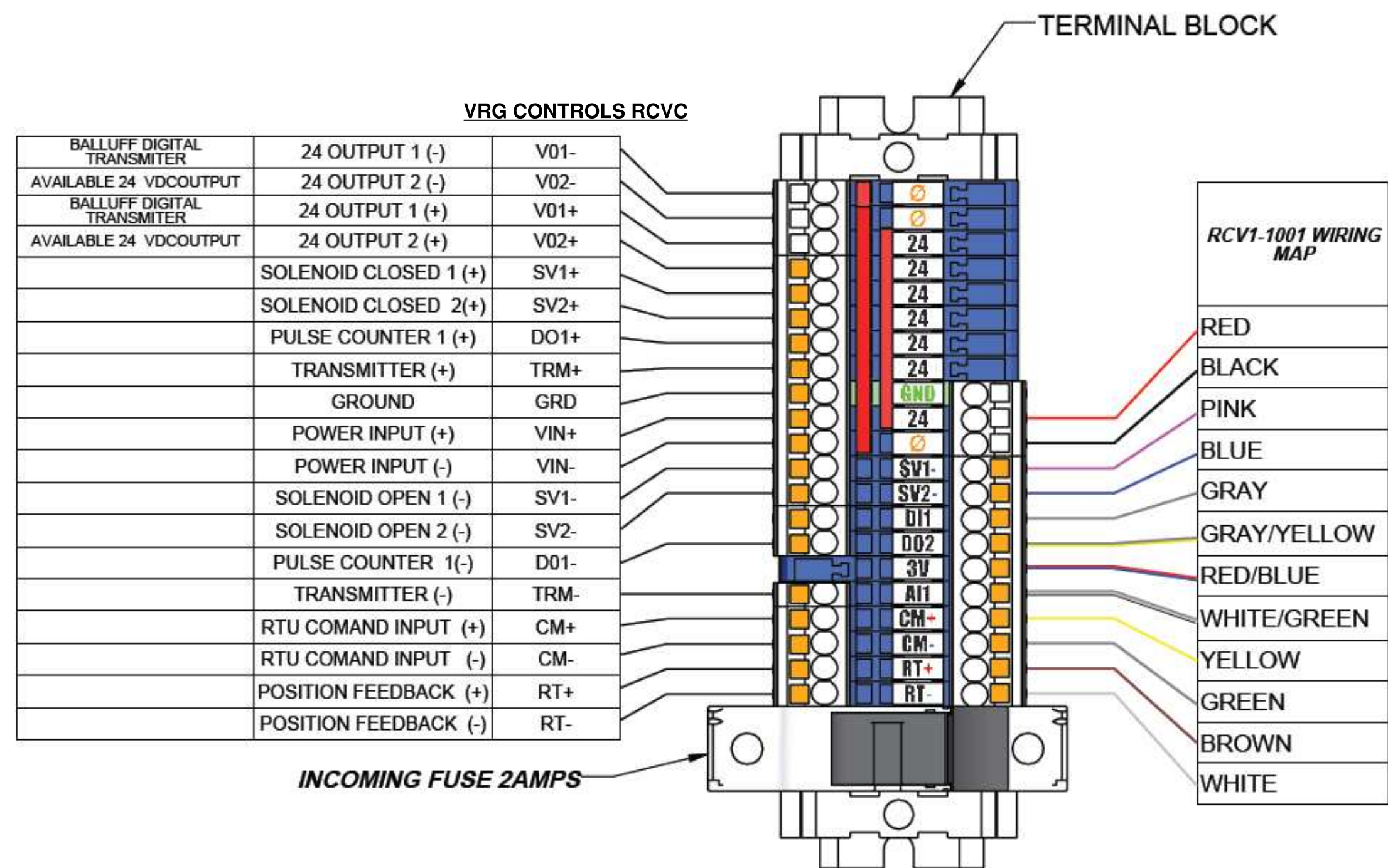
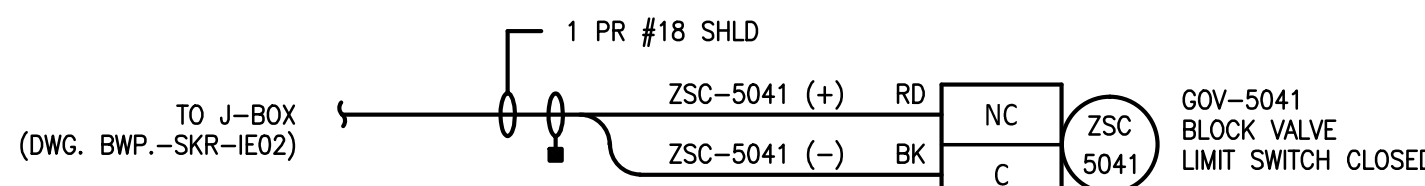
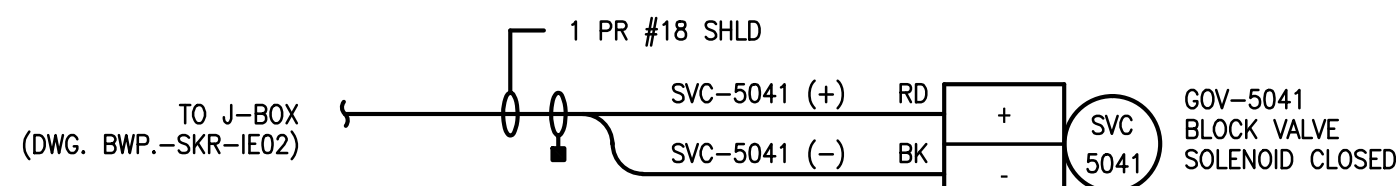
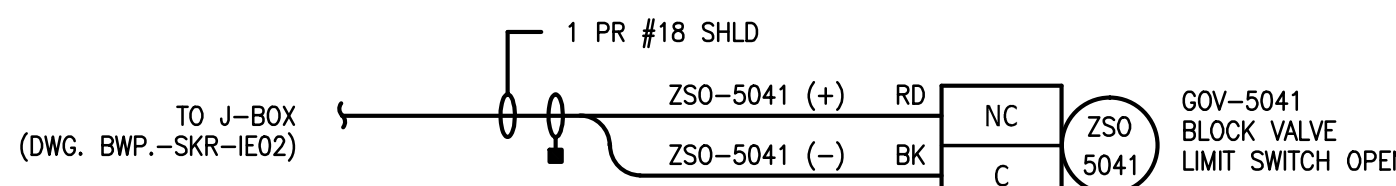
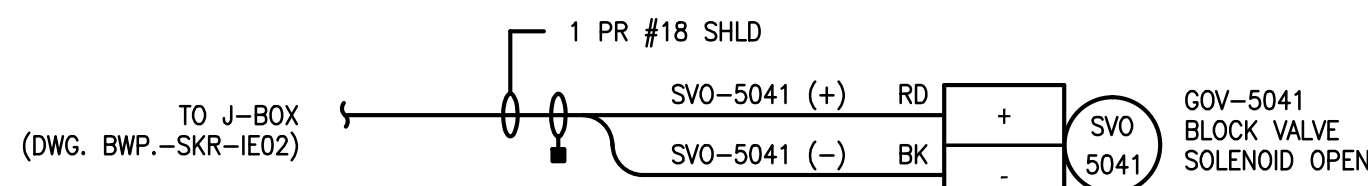
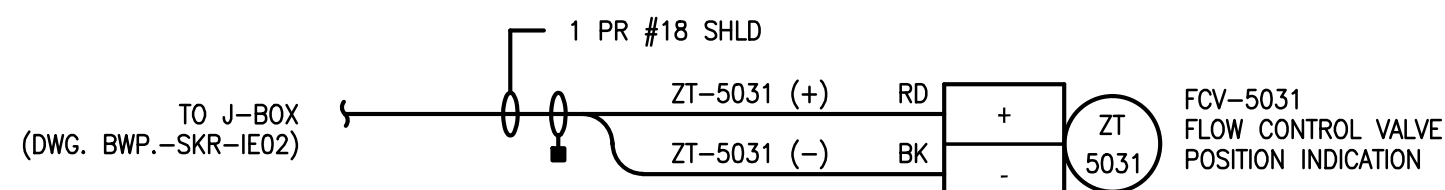
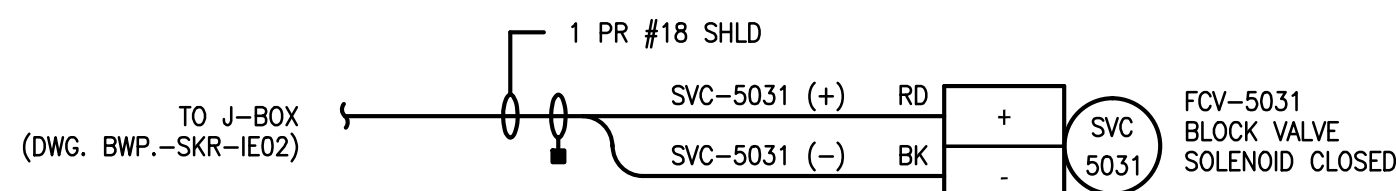
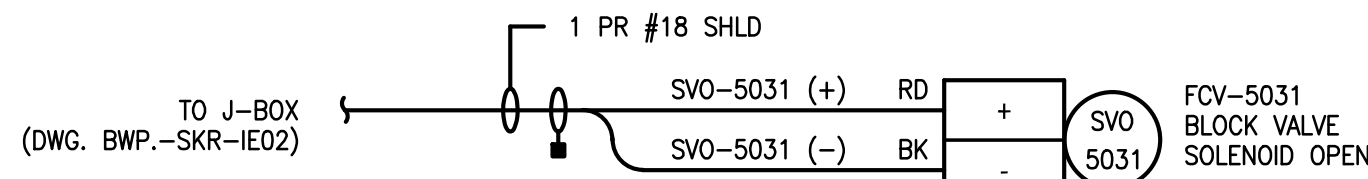
BOARDWALK TYPICAL STANDARD
WIRING DIAGRAM - JB-4001
DUAL RUN REGULATOR SKID

						BOARDWALK TYPICAL STANDARD WIRING DIAGRAM - JB-4001 DUAL RUN REGULATOR SKID				
						ENGINEER: RL DRAWN BY: RO		DRAWING NO. BWP-SKR-IE02		REV. 1
06-30-16	1	GENERAL STANDARD -- REVISED	JCQ	KML	JMK	CHECKED BY: JMW		SHEET:		
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW	DATE:		SCALE: NONE		
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -		INDEX NO.: -		

SKID MOUNTED DEVICES

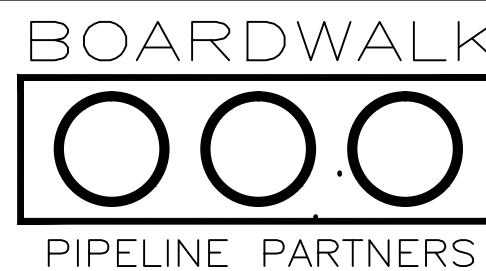


SKID MOUNTED DEVICES



NOTES:

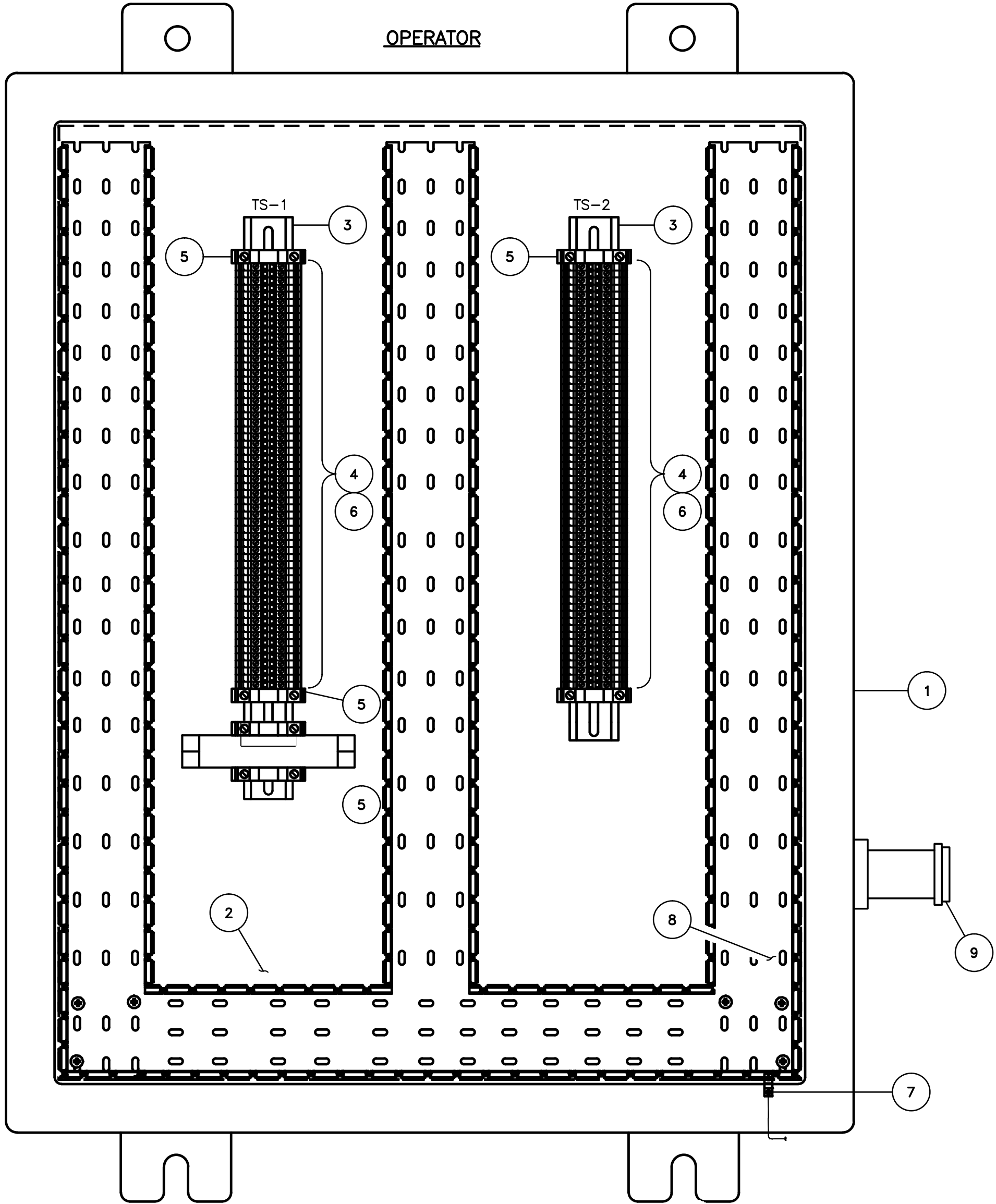
1. ACTUAL INSTRUMENTATION AND TERMINATION TO BE DETERMINED FOR SPECIFIC PROJECT REQUIREMENTS.
2. ALL ETHERNET CABLING LINKS SHALL BE TERMINATED AND TESTED IN ACCORDANCE WITH THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) STANDARDS ANSI/TIA/EIA-568-B.1
3. SELECT RELAY TO BE INSTALLED IF OVERRIDE SIGNAL IS REQUIRED.



						BOARDWALK TYPICAL STANDARD WIRING DIAGRAM - JB-4001 DUAL RUN REGULATOR SKID		
						ENGINEER: RL DRAWN BY: RO	DRAWING NO. BWP-SKR-IE03	REV.
						CHECKED BY: JMW	SHEET:	1
						DATE:	SCALE: NONE	
						AFE NUMBER: -	INDEX NO.: -	
06-30-16	1	GENERAL STANDARD - REVISED	JCQ	KML	JMK			
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW			
DATE:	NO.	REVISION	DWN.	CK'D	APV'D			

MATERIAL INFORMATION				
MARK. NO.	ITEM DESCRIPTION	QTY.	UNIT	REQ.
1	NEMA 4X ENCLOSURE	1	EA.	HOFFMAN #A30H2410SS6LP
2	BACK PANEL	1	EA.	HOFFMAN #A30P24
3	DIN-RAIL	AS REQ'D.		DIN RAIL, 35mm
4	TERMINAL BLOCK	120	EA.	PHOENIX CONTACT, TERMINAL BLOCK #3044076
5	END BRACKET	4	EA.	PHOENIX CONTACT, END BRACKET#E/NS 35
6	TERMINAL STRIP MARKER	60	PKG.	PHOENIX CONTACT, TERMINAL STRIP MARKER #KLM
7	GROUND LUG	1	EA.	BURNDY, GROUND TERMINALQAIC-B QIKLUG
8	PANDUIT	AS REQ'D.		PANDUIT, 2-1/2"
9	RJ45 CONNECTOR	1	EA.	CONEC IP67 CONNECTOR, #17-10011

UPDATE WITH
MENCOM
CONNECTOR



REGULATOR SKID JB-4001
DETAIL "1"
SCALE: NONE

OPERATOR

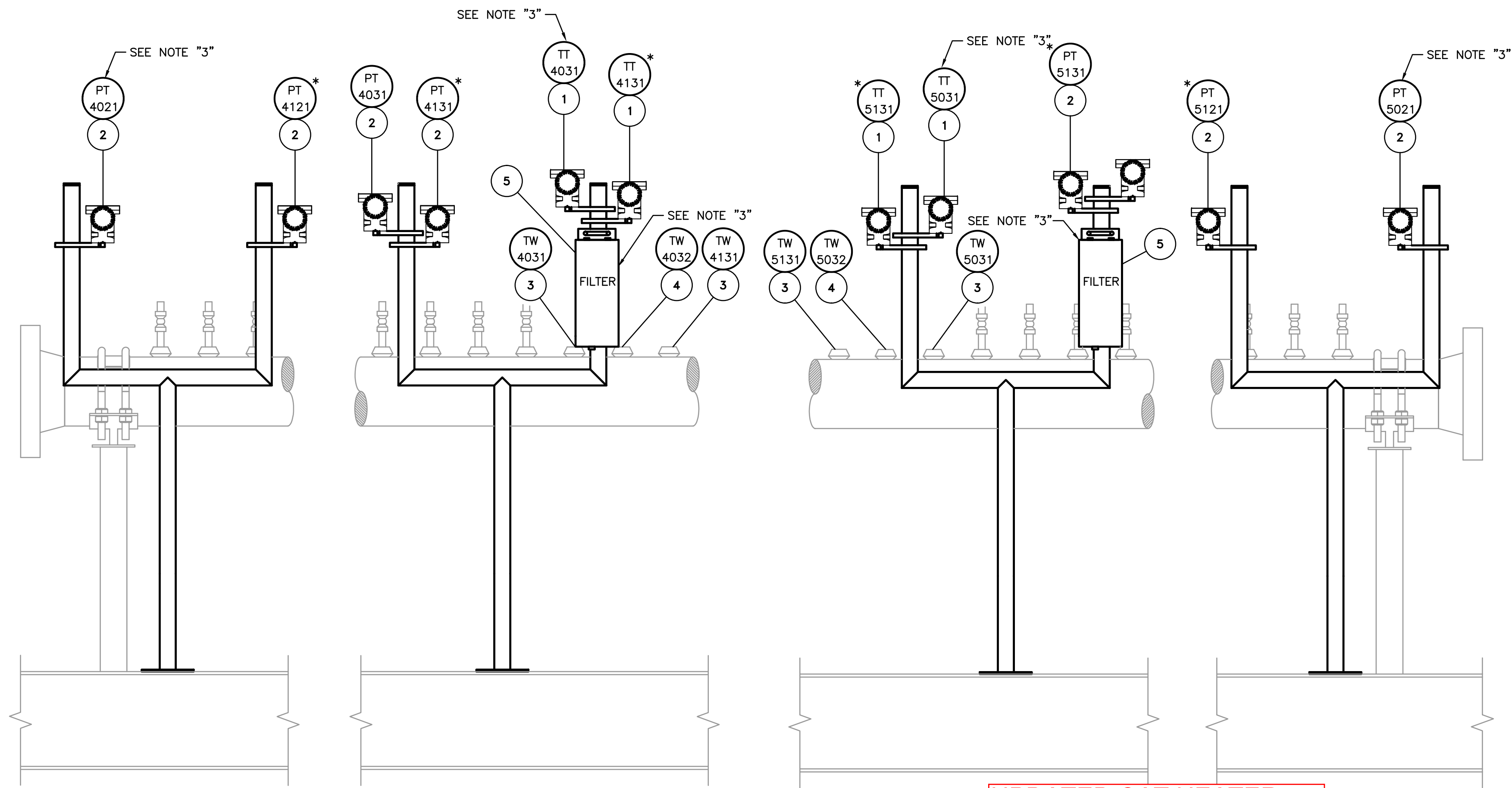
TS-1		
1	ZY-4031 24VDC	(+)
2	ZY-4031 24VDC	(-)
3	SPARE	
4	DNGP-1 24VDC	(+)
5	DNGP-1 24VDC	(-)
6	SPARE	
7	SPARE	
8	SPARE	
9	SPARE	
10	ZSO-4021	(+)
11	ZSO-4021	(-)
12	SPARE	
13	ZSC-4021	(+)
14	ZSC-4021	(-)
15	SPARE	
16	ZSO-4041	(+)
17	ZSO-4041	(-)
18	SPARE	
19	ZSC-4041	(+)
20	ZSC-4041	(-)
21	SPARE	
22	SVO-4041	(+)
23	SVO-4041	(-)
24	SPARE	
25	SVC-4041	(+)
26	SVC-4041	(-)
27	SPARE	
28	PT-4021	(+)
29	PT-4021	(-)
30	PT-4021	(SHLD)
31	PT-4031	(+)
32	PT-4031	(-)
33	PT-4031	(SHLD)
34	ZT-4031	(+)
35	ZT-4031	(-)
36	ZT-4031	(SHLD)
37	TT-4031	(+)
38	TT-4031	(-)
39	TT-4031	(SHLD)
40	ZY-4031-1	(+)
41	ZY-4031-4	(-)
42	ZY-4031	(SHLD)
43	ZY-4131-5	(+)
44	ZY-4131-8	(-)
45	ZY-4131	(SHLD)
46	ZY-4032-9	(+)
47	ZY-4032-12	(-)
48	ZY-4032	(SHLD)
49	SPARE	
50	SPARE	
51	SPARE	
52	SPARE	
53	SPARE	
54	SPARE	
55	SPARE	
56	SPARE	
57	SPARE	
58	SPARE	
59	SPARE	
60	SPARE	

TS-2		
1	PT-5021	(+)
2	PT-5021	(-)
3	SPARE	
4	ZSO-5021	(+)
5	ZSO-5021	(-)
6	SPARE	
7	ZSC-5021	
8	ZSC-5021	
9	SPARE	
10	SVC-5031	(+)
11	SVC-5031	(-)
12	SPARE	
13	SVO-5032	(+)
14	SVO-5032	(-)
15	SPARE	
16	SVC-5041	(+)
17	SVC-5041	(-)
18	SPARE	
19	SVO-5041	(+)
20	SVO-5041	(-)
21	SPARE	
22	ZSO-5041	(+)
23	ZSO-5041	(-)
24	SPARE	
25	ZSC-5041	(+)
26	ZSC-5041	(-)
27	SPARE	
28	PT-5031	(+)
29	PT-5031	(-)
30	PT-5031	(SHLD)
31	TT-5031	(+)
32	TT-5031	(-)
33	TT-5031	(SHLD)
34	SPARE	
35	SPARE	
36	SPARE	
37	SPARE	
38	SPARE	
39	SPARE	
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60	SPARE	

TERMINAL STRIP MARKER LEGEND
DETAIL "2"
SCALE: NONE
(THIS DWG.)

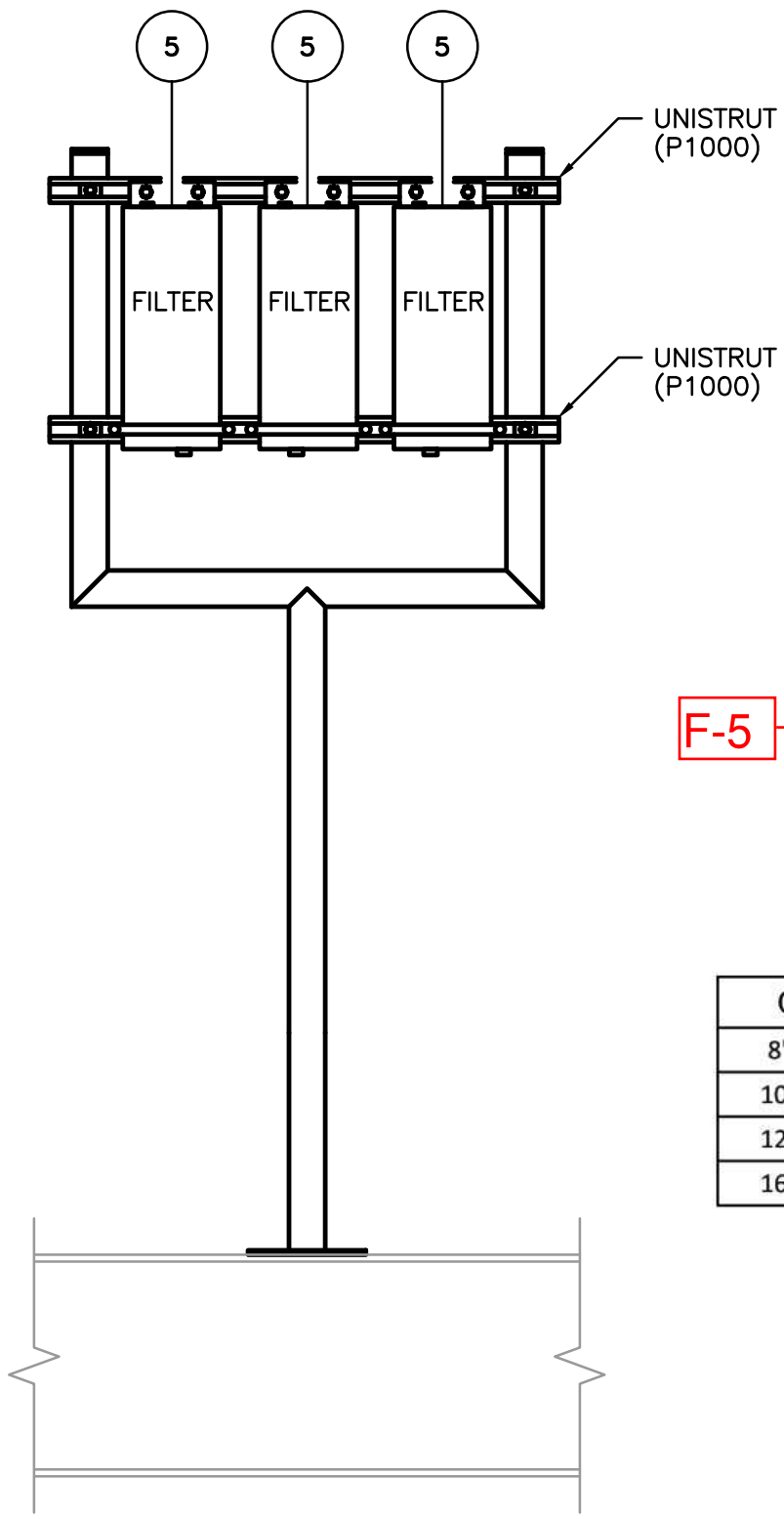
- NOTES:
- JUNCTION BOX SHALL ALLOW ADEQUATE SPARE TERMINALS TO MAKE PROVISIONS FOR FUTURE I/O TERMINATIONS.

						BOARDWALK PIPELINE PARTNERS		
						BOARDWALK TYPICAL STANDARD LAYOUT - JB-4001 DUAL REGULATOR SKID		
						ENGINEER: RL	DRAWING NO.	REV.
						DRAWN BY: RO	BWP-SKR-IE05	
						CHECKED BY: JMW	SHEET:	
						DATE: -	SCALE: AS NOTED	
						AFE NUMBER: -	INDEX NO.: -	
06-30-16	1	GENERAL STANDARD - REVISED	JCQ	KML	JMK			
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW			
DATE:	NO.	REVISION	DWN.	CK'D	APV'D			



TYPICAL INSTRUMENT STANDS
DETAIL "1"
SCALE: NONE

UPDATED CAT HEATER
SPEC CAN BE SEEN
BELOW

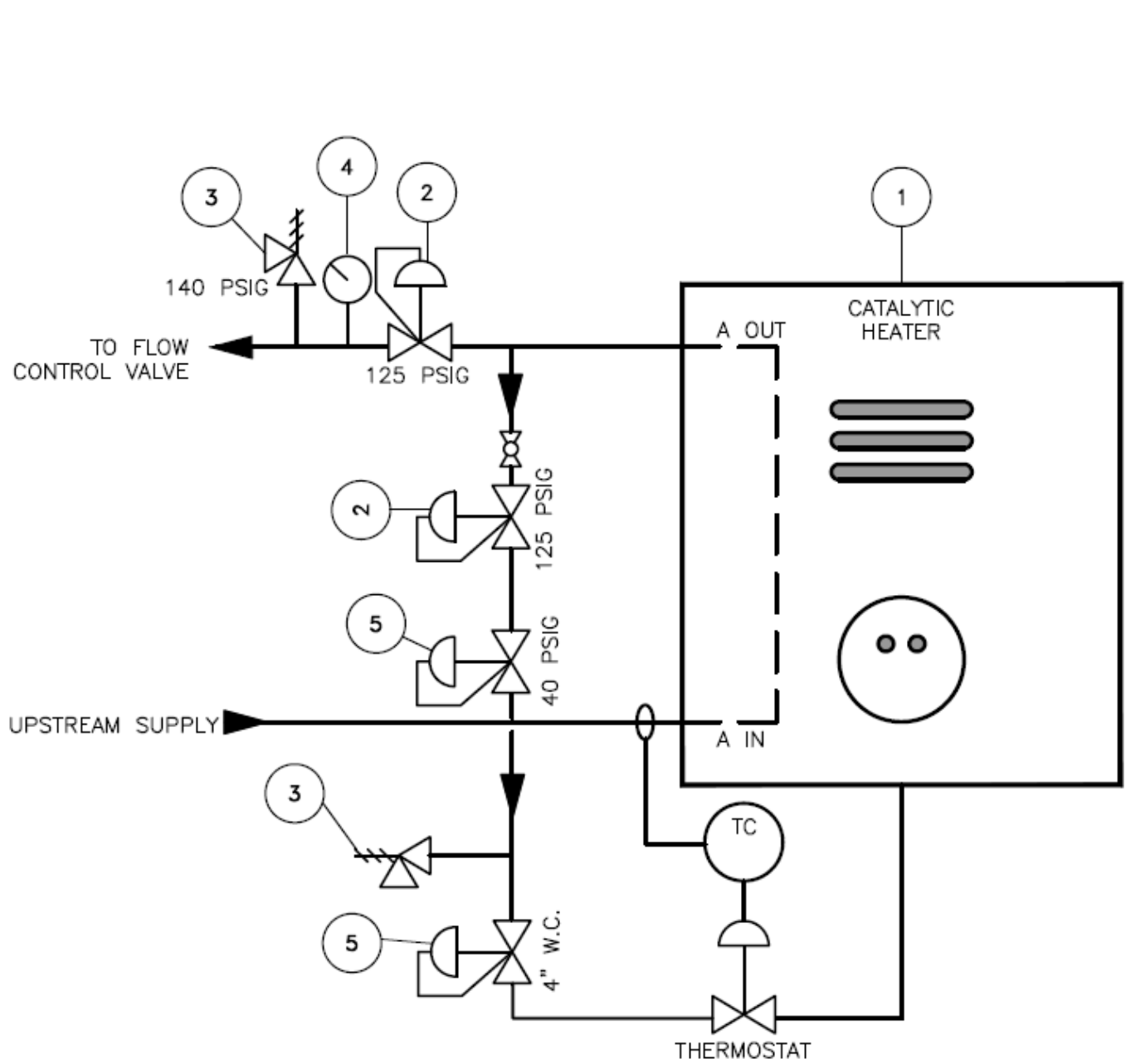


TYPICAL FILTER STAND
DETAIL "2"
SCALE: NONE
(2 REQ'D)

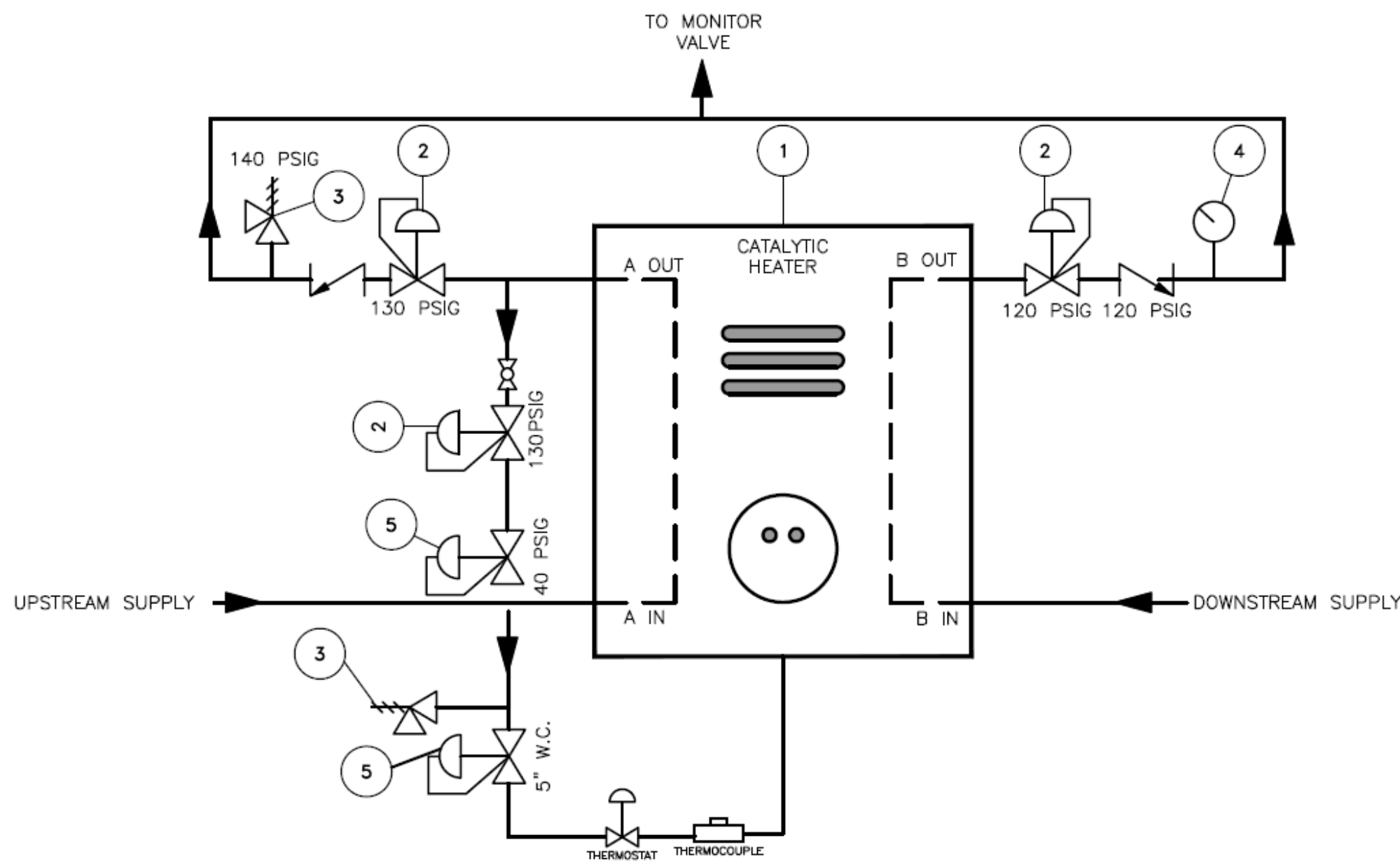
MATERIAL INFORMATION	
ITEM NO.	ITEM DESCRIPTION
1	ROSEMOUNT TEMPERATURE TRANSMITTER, 3144PD1A1E5B4T1, FIELD MOUNT HOUSING (DUAL-COMPARTMENT) ALUMINUM, NPT CONDUIT ENTRY, 4-20mA OUTPUT WITH HART PROTOCOL, SINGLE SENSOR TYPE MEASUREMENT INPUT, FM INTRINSICALLY SAFE, NON-INCENDIVE, EXPLOSION-PROOF COMBINATION, AND AN INTEGRAL TRANSIENT PROTECTOR. TAG # TT-4031, TT-4131
2	ROSEMOUNT PRESSURE TRANSMITTERS, 3051TG4A2B21A5S84E5T1, 0306RT22BA11, GAGE PRESSURE TRANSMITTER, RANGES FROM -14.7 TO 4000 PSI, 4-20mA OUTPUT WITH HART PROTOCOL, 1/2" NPT FEMALE PROCESS CONNECTION TYPE, 316L SST ISOLATING DIAPHRAGM, SILICONE FILLED, POLYURETHANE-COVERED ALUMINUM, BRACKET FOR 2-INCH PIPE, EXPLOSION-PROOF FOR CLASS I, DIVISION 1, GROUPS B, C, & D, T5 TEMPERATURE RATED, FACTORY SEALED, ENCLOSURE TYPE 4X, INTEGRAL TRANSIENT PROTECTION TERMINAL BLOCK (MEETING APPLICABLE STANDARDS IEEE 587 & 472), INTEGRAL MOUNT ROSEMOUNT 306 THREADED 2-VALVE 316 SST, 1/2" NPT FEMALE PROCESS CONNECTION TYPE MANIFOLD WITH PTFE PACKING MATERIAL. TAG # PT-4021, PT-4121, PT-4031, PT-4131
3	PGI THERMOSYNC RTD WITH THERMOWELL, FOR MODEL NO. SEE CHART "1" BELOW, RTD SENSOR ASSEMBLY WITHOUT HEAD & PLUG CONNECTOR, 3/4" NPT THERMOWELL WITH VENT HOLE, 316SST WITH CALIBRATION & ID TAG.
4	PGI THERMOSYNC THERMOWELL, FOR MODEL NO. SEE CHART "2" BELOW, WITH PLUG CONNECTOR, 3/4" NPT THERMOWELL WITH VENT HOLE, 316SST WITH CALIBRATION & ID TAG. TAG# TW-4032
5	WELKER F-4 FILTER/DRYER OR EQUIVALENT FABRICATOR TO VERIFY BOM

CHART "1" - RTD AND THERMOWELL MODEL NO.	
8" PIPING	ATA-1000-L2-BCFR6VW1C
10" PIPING	ATA-1000-L4-BCFR6VW1C
12" PIPING	ATA-1000-L4-BCFR6VW1C
16" PIPING	ATA-1000-L8-BCFR6VW1C

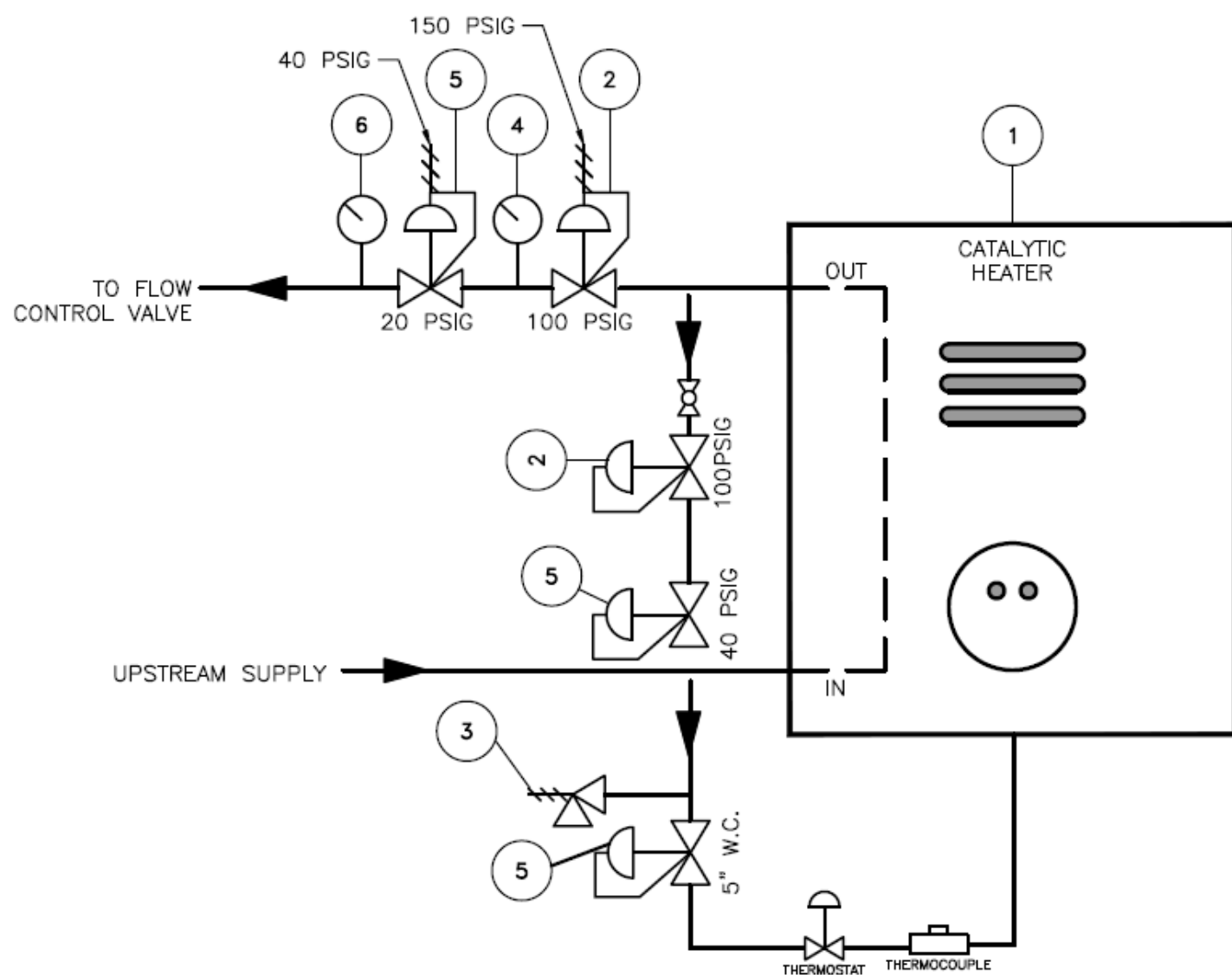
CHART "2" - TEST WELL MODEL NO.	
8" PIPING	TAN-34-CO-L2-PV
10" PIPING	TAN-34-CO-L4-PV
12" PIPING	TAN-34-CO-L4-PV
16" PIPING	TAN-34-CO-L8-PV



CATALYTIC HEATER POWER GAS SUPPLY
SINGLE PASS FOR PILOT CONTROL
DETAIL "3"
SCALE: NONE



CATALYTIC HEATER POWER GAS SUPPLY
PRIMARY AND STANDBY FOR PILOT CONTROL
DETAIL "4"
SCALE: NONE



CATALYTIC HEATER POWER GAS SUPPLY
SINGLE PASS FOR 3-15/6-30 PSI CONTROLLER
DETAIL "5"
SCALE: NONE

ITEM	DESCRIPTION
1	CATALYTIC HEATER (with thermostat and fuel gas regulators)
	CATCO SFT2600SSI HEATER w/ 40-030SS THERMOSTAT, 12V
	BRUEST S1800-11012 HEATER w/ 777-025 THERMOSTAT, 12V
2	HP INSTRUMENT SUPPLY REGULATOR
	MEECO MODEL P
	FISHER MODEL 1301F
3	HP REGULATOR SAFETY RELIEF VALVE
	FISHER H120
4	PRESSURE GUAGE (0-200 PSIG)
5	LP INSTRUMENT SUPPLY REGULATOR
	FISHER 67CF
6	PRESSURE GUAGE (0-60 PSIG)

- NOTES:
- CONTRACTOR TO INSTALL TRANSMITTERS SO THAT TERMINALS FACE SKID PIPING with unobstructed access
 - CONTRACTOR TO ROUTE TUBING TO MAINTAIN POSITIVE SLOPE BACK TO TAP AND AVOID LIQUID TRAPS.
 - INSTRUMENTATION FOR SPECIFIC APPLICATIONS TO BE DETERMINED ON A PER SITE BASIS.
 - FOR TYPICAL TUBING ROUTING SEE BWP-SKR-IE06.
 - INSTRUMENT VALVES SHALL BE SOLID OR BOLTED BODY OR WELDED SEAM.

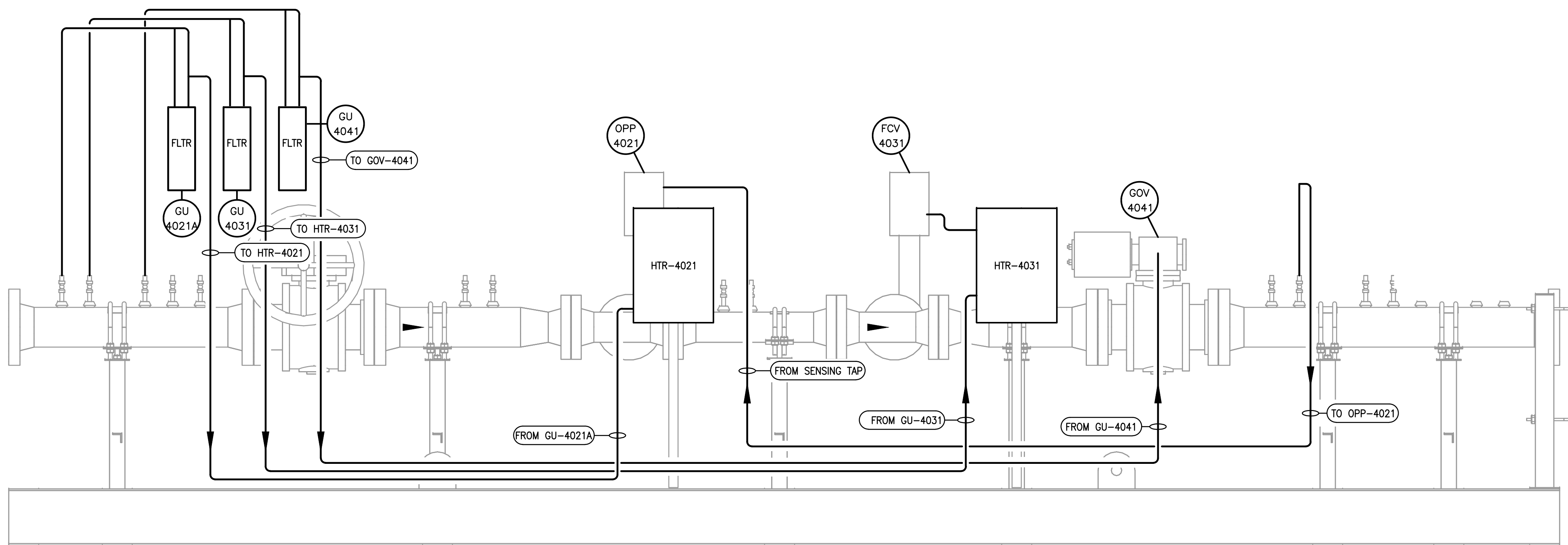


* OPTIONAL CUSTOMER INSTRUMENTATION

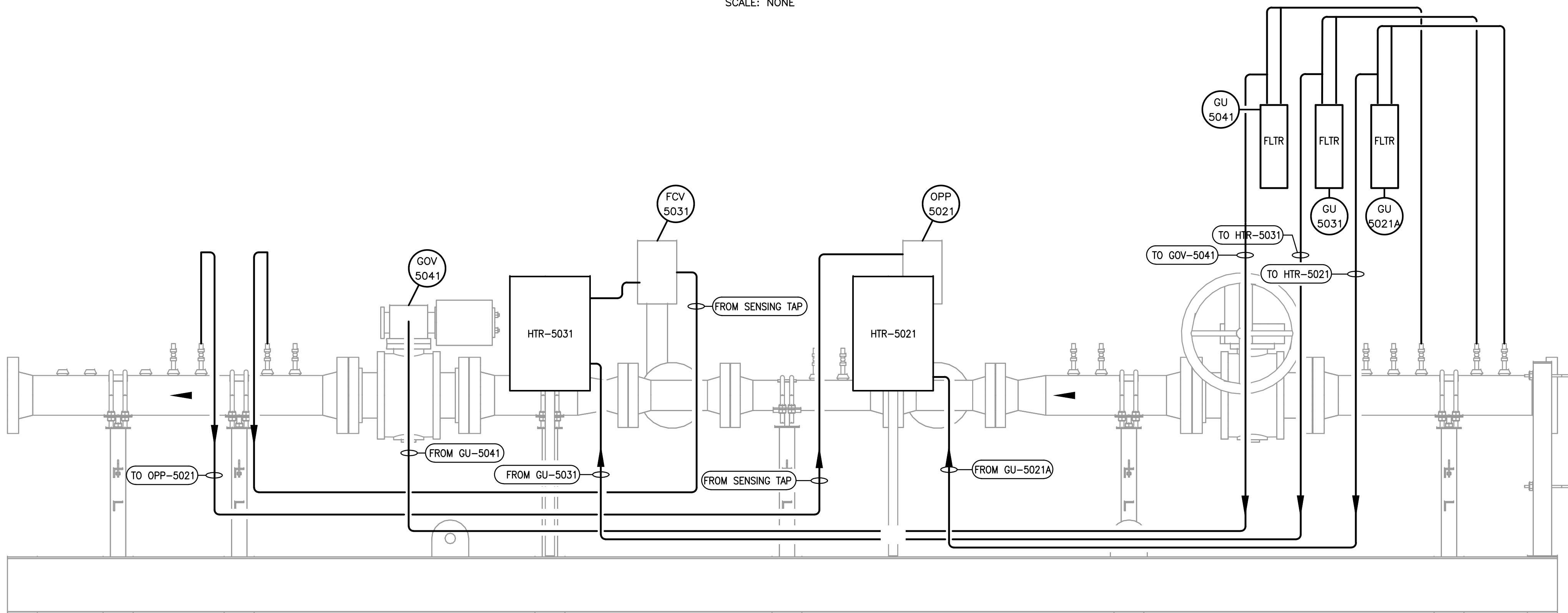
06-30-16	1	GENERAL STANDARD - REVISED	JCQ	KML	JMK
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW
DATE:	NO.	REVISION	DWN.	CK'D	APV'D

BOARDWALK TYPICAL STANDARD
INSTRUMENTATION DETAILS
DUAL RUN REGULATOR SKID

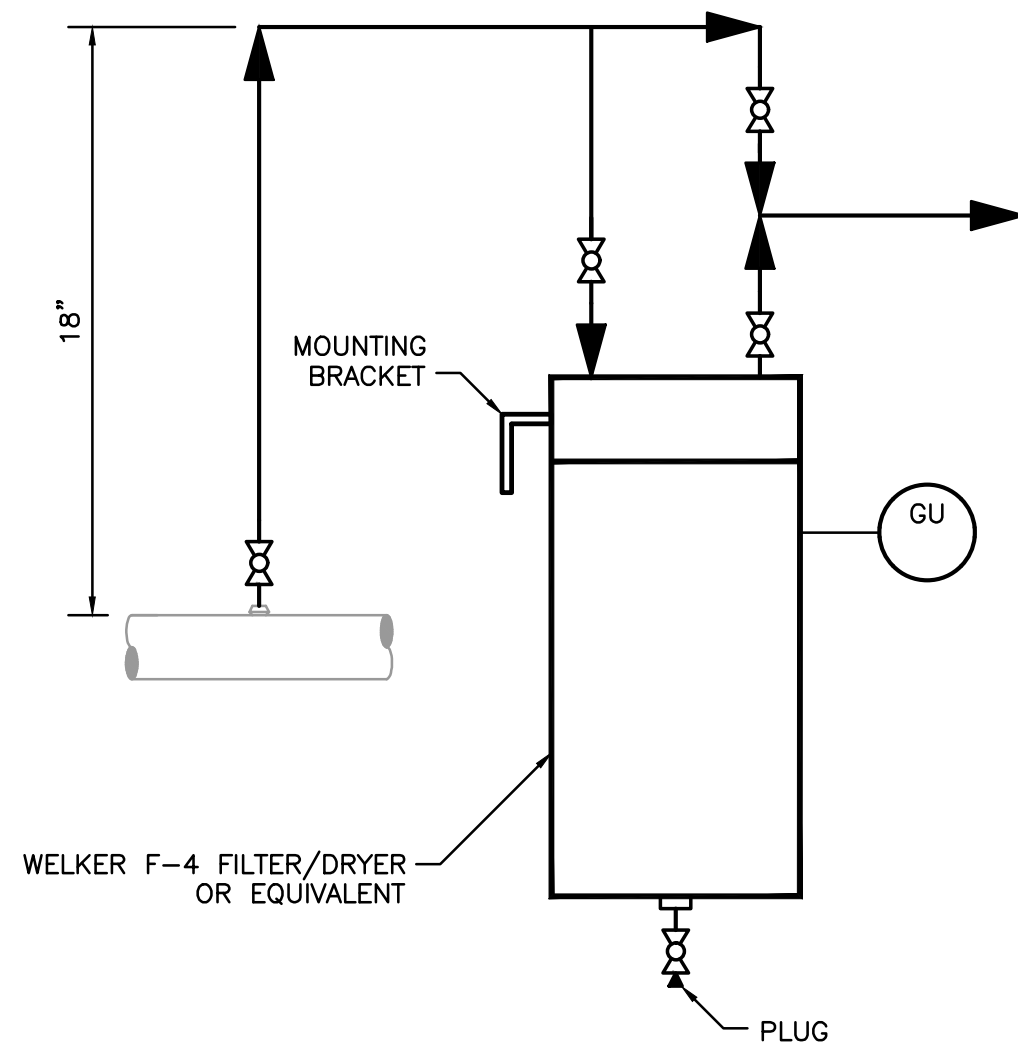
ENGINEER: RL	DRAWING NO. BWP-SKR-IE07	REV. 1
DRAWN BY: RO	CHECKED BY: JMW	
DATE: 10/06/2010	SCALE: NONE	
AFE NUMBER: -	INDEX NO.: -	



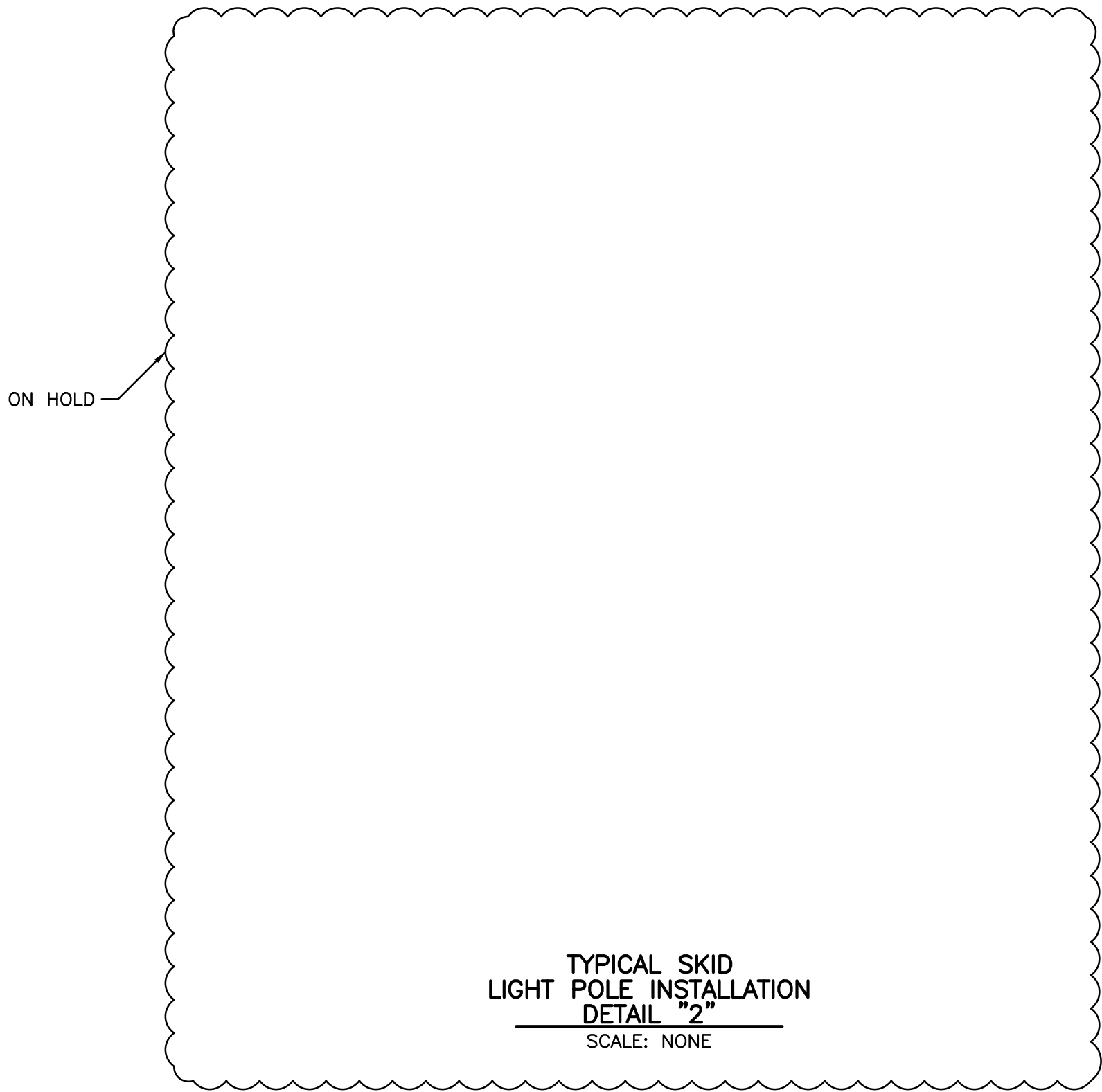
PRIMARY RUN ELEVATION
SCALE: NONE



SECONDARY/STAND-BY RUN ELEVATION
SCALE: NONE



TYPICAL SUPPLY
FILTER INSTALLATION
DETAIL "1"
SCALE: NONE



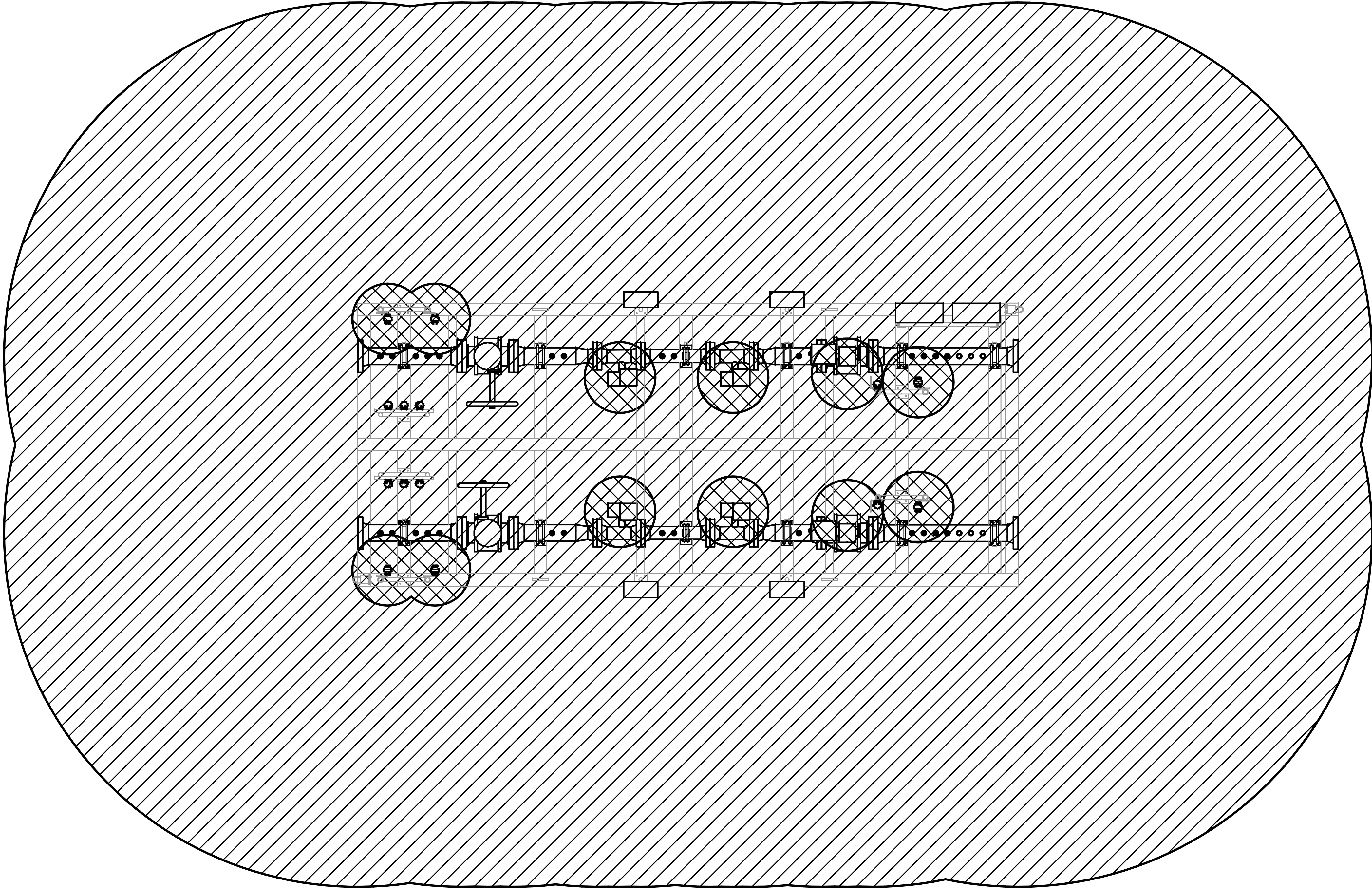
TYPICAL SKID
LIGHT POLE INSTALLATION
DETAIL "2"
SCALE: NONE

- NOTES**
1. TUBING SHALL BE 3/8" ASTM A268 316 STAINLESS STEEL, SEAMLESS, 0.035" WT.
 2. TUBING FITTINGS SHALL BE ALL STAINLESS STEEL MATERIAL.
 3. TUBING TRAY AND SUPPORTS SHALL BE CONSTRUCTED OF NON-METALLIC OR 3/16" STAINLESS STEEL MATERIAL.
 4. INSTRUMENT SUPPLY TUBING SHALL BE INSTALLED WITH A MINIMUM OF 18" VERTICAL RISER FROM THE PROCESS CONNECTION.
 5. EACH INSTRUMENT SHALL BE PROVIDED WITH ITS OWN INDIVIDUAL INSTRUMENT SUPPLY LINE AND ISOLATION VALVE AT THE PROCESS CONNECTION AS SHOWN ON THE P&ID.
 6. EACH TUBING RUN SHALL HAVE A TAG AT EACH END REFERENCING THE INSTRUMENT SUPPLIED.
 7. PRESSURE TRANSMITTER SENSE LINES SHALL BE INSTALLED TO SLOPE BACK TO THE PROCESS CONNECTION.



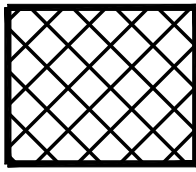
BOARDWALK TYPICAL STANDARD
TUBING LAYOUT & DETAILS
DUAL RUN REGULATOR SKID

						ENGINEER: RL	DRAWING NO.	REV.
						DRAWN BY: RO	BWP-SKR-IE08	
06-30-16	1	GENERAL STANDARD — REVISED	JCQ	KML	JMK	CHECKED BY: JMW	SHEET:	1
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW	DATE: 10-31-12	SCALE: NONE	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: —	INDEX NO.: —	

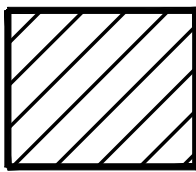


PLAN
SCALE: NONE
(GRATING NOT SHOWN FOR CLARITY)

LEGEND



CLASS 1 DIVISION 1



CLASS 1 DIVISION 2



BOARDWALK TYPICAL STANDARD
AREA CLASSIFICATION PLAN & SECTION
DUAL RUN REGULATOR SKID

							ENGINEER: RL	DRAWING NO.	REV.
							DRAWN BY: RO	BWP-SKR-IE09	
06-30-16	1	GENERAL STANDARD - REVISED	JCQ	KML	JMK		CHECKED BY: JMW	SHEET:	1
07-06-15	0	GENERAL STANDARD	JCQ	RL	JMW		DATE: 10-31-12	SCALE: NONE	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -	INDEX NO.: -		