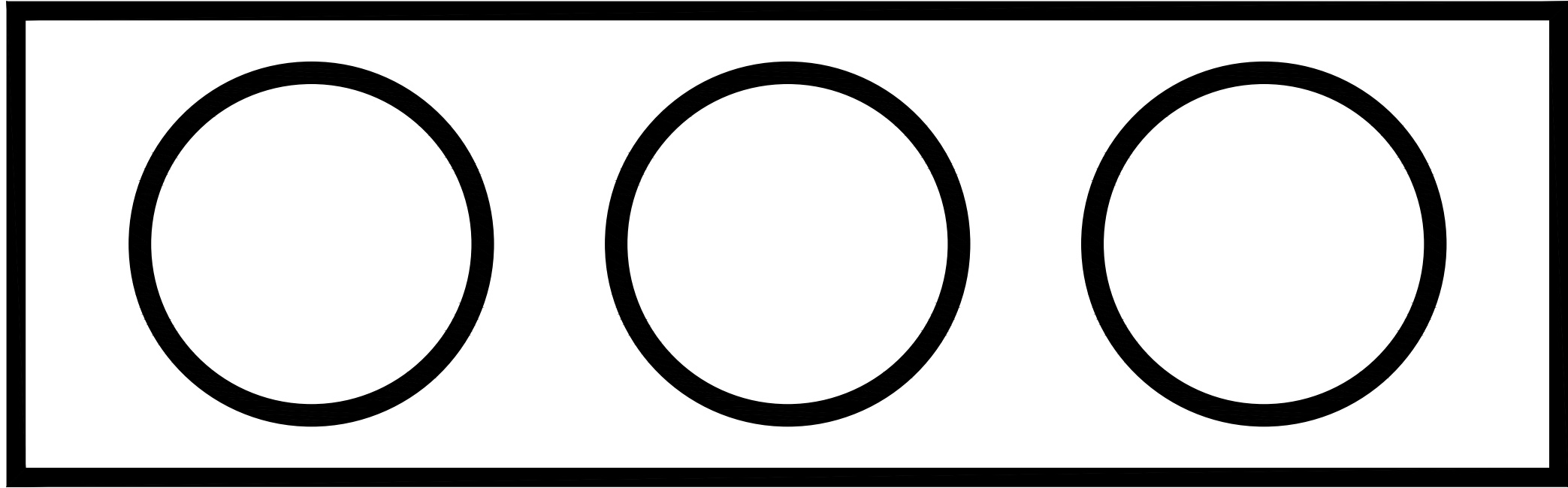


BOARDWALK



PIPELINE PARTNERS

TYPICAL METER 3" - 6" PACKAGE P&ID, INSTRUMENTATION AND ELECTRICAL GENERAL STANDARD REV. 3

KYMEA

DRAWING INDEX		
DRAWING NO.	DESCRIPTION	REVISION
DRAWING INDEX & COVER SHEET		
BWP-SMS-IE00	DRAWING INDEX & COVER SHEET	3
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BWP-SMS-IE09	BLOCK DIAGRAM AND CONDUIT CABLE SCHEDULE	0
BWP-SMS-IE10	AREA CLASSIFICATION PLAN & SECTION	1

[BWP-SMS-IE06A | WIRING DIAGRAM - INSTROMET QSONIC PLUS]

INSTRUMENT ABBREVIATIONS		MISCELLANEOUS ABBREVIATIONS	
AA	ANALYSIS ALARM	AC	AIR TO CLOSE
AC	ANALYSIS CONTROLLER (SAMPLER)	AO	AIR TO OPEN
AE	ANALYSIS ELEMENT (SAMPLER)	AOV	AIR OPERATED VALVE
AI	ANALYSIS INDICATOR	AS	AIR SUPPLY
AIC	ANALYSIS INDICATING CONTROLLER	ATMOS	ATMOSPHERE
AIS*	ANALYSIS INDICATING SWITCH	BDV	BLOWDOWN VALVE
AIT	ANALYSIS INDICATING TRANSMITTER	BS	BASKET STRAINER
AP	ANALYSIS POINT (CHROMATOGRAPH)	CC	CORROSION COUPON
AR	ANALYSIS RECORDER	COND.	CONDUCTIVITY
AS*	ANALYSIS SWITCH	CSC	CAR SEAL CLOSED
AT	ANALYSIS TRANSMITTER (CHROMATOGRAPH)	CSO	CAR SEAL OPEN
AV	ANALYSIS CONTROL VALVE	DM	DEMISTER
AY	ANALYSIS RELAY	EL	ELEVATION
BA*	BURNER ALARM	ES	ELECTRIC SUPPLY
BE	BURNER ELEMENT	ESD	EMERGENCY SHUTDOWN
BS	BURNER SWITCH	FA	FLAME ARRESTOR
EI	VOLTAGE INDICATOR	FBO	FURNISHED BY OWNER
ES*	VOLTAGE SWITCH	FC	FAIL CLOSED
FA*	FLOW ALARM	FE	FLANGED END
FC	FLOW CONTROLLER	FO	FAIL OPEN
FCV	FLOW CONTROL VALVE	GOY	GAS OPERATED SOLENOID
FE	FLOW ELEMENT	GS	GAS SUPPLY
FFC	FLOW RATIO CONTROLLER	HC	HOSE CONNECTION
FI	FLOW INDICATOR	HS	HYDRAULIC SUPPLY
FIC	FLOW INDICATING CONTROLLER	LC	LOCK CLOSED
FLP	FAIL LAST POSITION	LO	LOCK OPEN
FO	FLOW ORIFICE (RESTRICTION ORIFICE)	MCC	MOTOR CONTROL CENTER
FQ	FLOW TOTALIZER/FLOW COMPUTER	MW	MANWAY
FQI	FLOW TOTALIZING INDICATOR	MAOP	MAX. ALLOWABLE OPERATING PRESSURE
FQS*	FLOW TOTALIZING SWITCH	NC	NORMALLY CLOSED
FR	FLOW RECORDER	NO	NORMALLY OPEN
FRCV	FLOW RECORDING CONTROL VALVE	NS	NITROGEN SUPPLY
FS*	FLOW SWITCH	OP	OPERATING PRESSURE
FT	FLOW TRANSMITTER	OT	OPERATING TEMPERATURE
FV	FLOW VALVE	PH	PH (ACIDITY)
FX	FLOW STRAIGHTENING VALVE	RA	REVERSE ACTING
FY	FLOW RELAY	RTU	REMOTE TELEMETRY UNIT
FYY	FLOW COMPUTING RELAY (MASS)	SC	SAMPLE CONNECTION
HC	HAND CONTROLLER	SD	SHUTDOWN
HCV	HAND CONTROL VALVE	SOL	SOLENOID
HS	HAND SWITCH	SP	SETPOINT
HV	HAND VALVE	S/S	SEAM TO SEAM
GOV	GAS OPERATED VALVE	SS	STAINLESS STEEL
GU	GAS FILTER	STPL	STOPPLE
GV	GEAR OPERATED VALVE	T/T	TANGENT TO TANGENT
L	LEVEL DEVICE	TBG	TUBING
LA*	LEVEL ALARM	V	VOLT
LC	LEVEL CONTROLLER	VF	VENDOR FURNISHED
LCV	LEVEL CONTROL VALVE	W/	WITH
LC	LEVEL CONTROLLER	WE	WELD END
LG	LEVEL GAUGE GLASS	WXF	WELD BY FLANGE
LI	LEVEL INDICATOR (OTHER THAN LG)	WXS	WELD BY SCREWED
LIC	LEVEL INDICATING CONTROLLER	YS	Y-STRAINER
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		
TICV	TEMPERATURE INDICATING CONTROLLER VALVE		
TR	TEMPERATURE RECORDER		
TRC	TEMPERATURE RECORDING CONTROLLER		
TRCV	TEMPERATURE RECORDING CONTROL VALVE		
TS*	TEMPERATURE SWITCH		
TT	TEMPERATURE TRANSMITTER		
TIT	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		
HH	DENOTES HIGH SHUTDOWN		

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

INSTRUMENT & EQUIPMENT NUMERATION	
LOCATION	SEQUENCE
OWNERSHIP	ASSOCIATION
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
0	BOARDWALK PIPELINE PARTNERS
1	CUSTOMER
0	PRIMARY METER
1	SECONDARY METER
2	MONITOR VALVE
3	WORKER VALVE
4	SHUT-IN VALVE
5	SAMPLE
6	FILTER SEPARATOR
7	CONDENSATE TANK
1-9	DEVICE NUMBER

INTERLOCK LOGIC SYMBOLS	
I	COMPLEX OR UNDEFINED INTERLOCK
R	RESET
AND	OUTPUT ONLY IF ALL INPUTS PRESENT
P	PILOT
OR	OUTPUT IF ANY INPUTS ARE PRESENT
ESD	EMERGENCY SHUTDOWN LOGIC

RELAY FUNCTION DESIGNATIONS	
<	SELECT LOW SIGNAL
>	SELECT HIGH SIGNAL
H	HIGH LIMITING
M/P	MOTOR TO PNEUMATIC TRANSDUCER
P/I	PNEUMATIC TO CURRENT TRANSDUCER
I/P	CURRENT TO PNEUMATIC TRANSDUCER
Σ	TOTALIZER
√	SQUARE ROOT
R/I	RESISTANCE TO CURRENT TRANSDUCER
E/I	ELECTROHYDRAULIC TRANSDUCER
A/M	AUTO/MANUAL LOADING STATION

VALVE IDENTIFICATION (NON-INSTRUMENTATION)	
TYPE	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
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	GLOBE VALVE, PLAIN END
GATE VALVE, FLANGED END	GLOBE VALVE, FLANGED END
BALL VALVE, PLAIN END	PLUG VALVE, PLAIN END
BALL VALVE, FLANGED END	PLUG VALVE, FLANGED END
CHECK VALVE, PLAIN END	3-WAY VALVE, PLAIN END
CHECK VALVE, FLANGED END	3-WAY VALVE, FLANGED END
BUTTERFLY VALVE, PLAIN END	4-WAY VALVE, PLAIN END
BUTTERFLY VALVE, FLANGED END	4-WAY VALVE, FLANGED END
ANGLE VALVE, PLAIN END	EXCESS FLOW VALVE, PLAIN END
ANGLE VALVE, FLANGED END	EXCESS FLOW VALVE, FLANGED END
ANGLE CHECK VALVE, PLAIN END	VACUUM SAFETY VALVE
ANGLE CHECK VALVE, FLANGED END	INSTRUMENT VALVE, GAGE
ANGLE CHOKE VALVE, PLAIN END	INSTRUMENT VALVE, BALL
ANGLE CHOKE VALVE, FLANGED END	INSTRUMENT VALVE, 3-WAY SOLENOID
INSTRUMENT VALVE, NEEDLE	5 WAY VALVE
INSTRUMENT VALVE, GATE	INSTRUMENT VALVE, 4-WAY
INSTRUMENT VALVE, PLUG	5 VALVE MANIFOLD
INSTRUMENT VALVE, BALL	NORMALLY CLOSED VALVE
INSTRUMENT VALVE, 3-WAY	
3 VALVE MANIFOLD	
2 VALVE MANIFOLD	

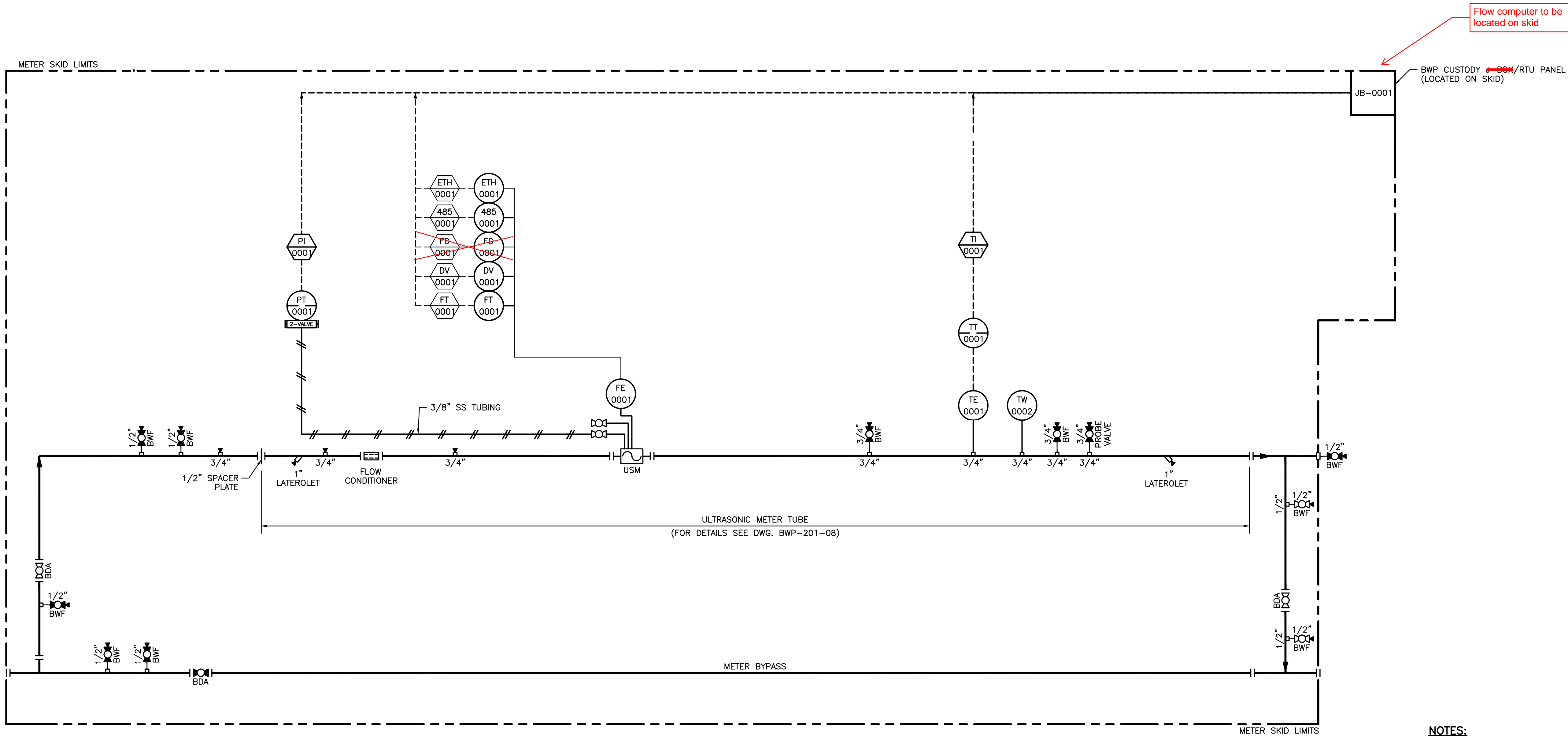
VALVE ACTUATORS	
DIAPHRAGM	SOLENOID OPERATED VALVE
DIAPHRAGM W/ MANUAL OVERRIDE	REGULATOR, SELF-CONTAINED
DIAPHRAGM W/ POSITIONER	REGULATOR WITH EXTERNAL PRESSURE TAP
ELECTROHYDRAULIC OPERATED VALVE	REGULATOR, W/ INTEGRAL OUTLET PRESSURE RELIEF VALVE
PISTON OPERATED VALVE, SINGLE ACTING	MOTOR OPERATED VALVE
PISTON OPERATED VALVE, DOUBLE ACTING	DOUBLE ACTING PISTON, SPRING RETURN

BOARDWALK
PIPELINE PARTNERS

BOARDWALK TYPICAL METER & REGULATOR STANDARD P&ID SYMBOLS & LEGENDS								
11-01-13	3	REVISED INST. ABBREVIATIONS	JCQ	RL	MHR	ENGINEER: MSG	DRAWING NO. BWP-201-33	REV.
03-12-11	2	INSTRUMENT NUMERATION REVISED	MHR	MGS	FMM	DRAWN BY: MHR		
09-08-10	1	INSTRUMENT LIST REVISED	MHR	CH	FMM	CHECKED BY: CH	SHEET:	
04-19-10	0	ISSUED FOR CONSTRUCTION	MHR	CH	MSG	DATE: 06/24/2016	SCALE: NONE	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -	INDEX NO.: -	

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

FE-0001
FLOWSIC800 XT -4 PATH
DESIGN PRESSURE: 1480 PSIG
DESIGN TEMPERATURE: (-)20°F TO 100°F

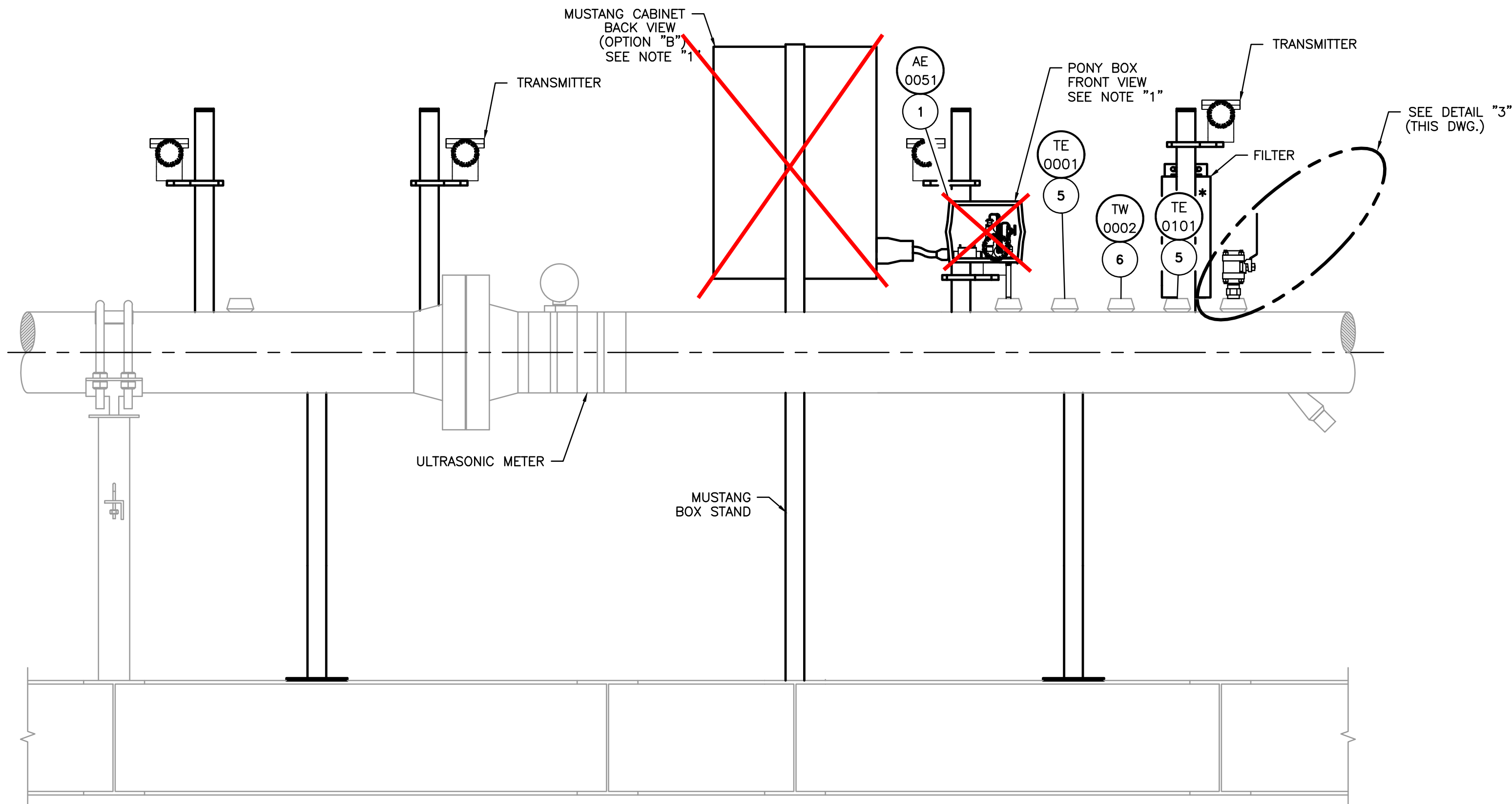


- NOTES:
- ALL OPTIONAL EQUIPMENT SHALL BE SPECIFIED ON A "PER SITE" BASIS.
 - OPTION "B" - THE PONY BOX MUST INCLUDE A GENIE GPR IF SERVICES ARE <800 PSIG & NO MUSTANG BOX, IF SERVICES ARE >800 PSIG THEN THE PONY BOX MUST HAVE A GENIE GP2 & A MUSTANG BOX.
 - NOT ALL SIGNALS ARE AVAILABLE FOR ALL METERS.
 - ROTATE CPA ONE BOLT HOLE FROM TOP DEAD CENTER.

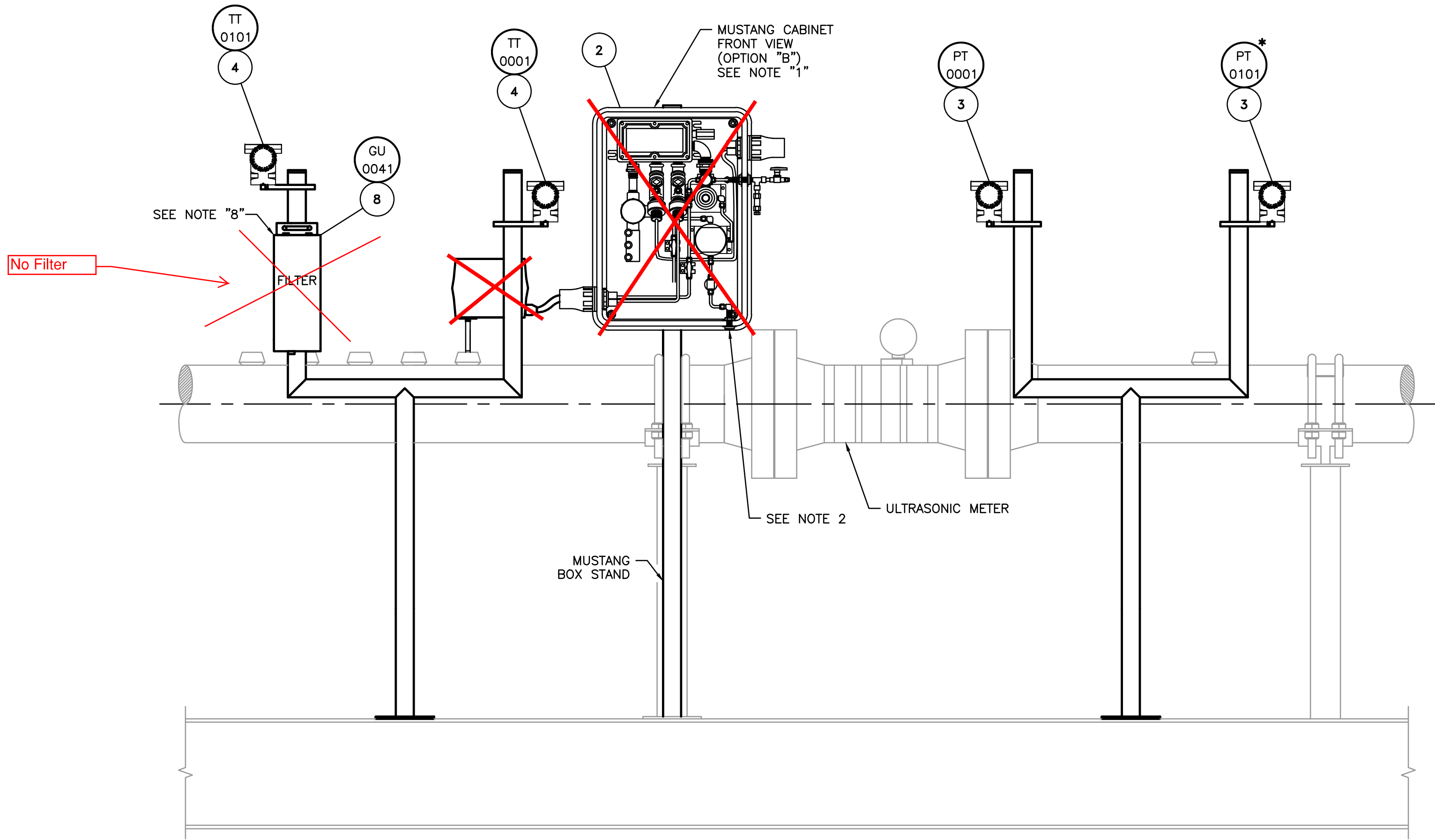
REFERENCE DRAWINGS	
DRAWING NO.	DESCRIPTION
BWP-201-08	STANDARD ULTRASONIC METER TUBE



						BOARDWALK TYPICAL STANDARD PIPING & INSTRUMENTATION DIAGRAM TYPICAL METERS 3"-6"		
06-30-16	4	REVISED	JCQ	KML	JMK	ENGINEER: MSG	DRAWING NO. BWP-SMS-IE01	REV.
02-08-16	3	REVISED	KML	JMK	JMK	DRAWN BY: MHR	SHEET:	4
05-02-14	2	REVISED	JCQ	RL	MHR	CHECKED BY: CH		
11-01-13	1	REVISED	JCQ	RL	MHR	DATE: 09-01-10	SCALE: NONE	
12-31-12	0	GENERAL STANDARD	NPR	MHR	MHR	AFE NUMBER: -	INDEX NO.:	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D			



MUSTANG SAMPLE CONDITIONING CABINET
WITH SAMPLE PROBE PONY BOX
DETAIL "1" – FRONT VIEW
SCALE: NONE



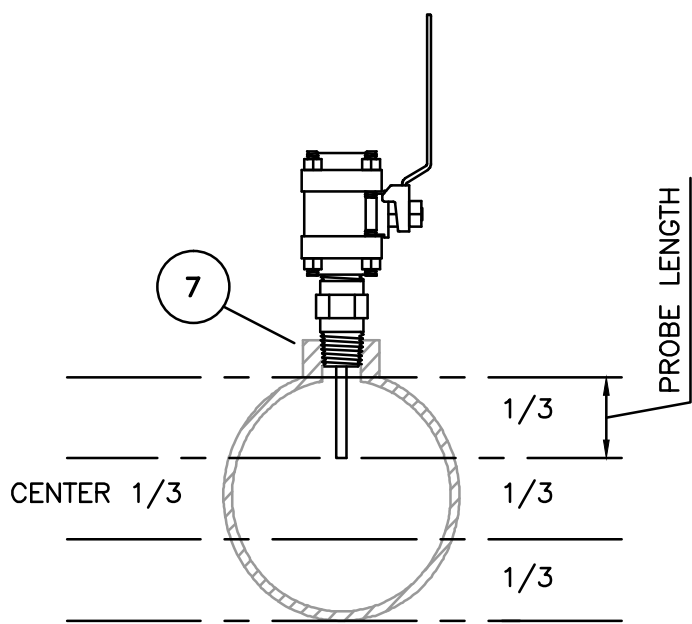
MUSTANG SAMPLE CONDITIONING CABINET
WITH SAMPLE PROBE PONY BOX
DETAIL "2" – BACK VIEW
SCALE: NONE

MATERIAL INFORMATION			
MARK NO.	ITEM DESCRIPTION	QUANTITY	UNIT
	PONY BOX, GC-BWPL-VTPHBDIV1-SCA-7, PONY SAMPLE CONDITIONING SYSTEM WITH HEATER BLOCK AND HOUSING FOR RELATIVE MAIN PIPE	1	EA
	NOM. DIA. HOUSING 1/4" NPT, 316SST MATERIAL, 316SST DIAPHRAGM, NEOPRENE O-RINGS, BUTYL MEMBRANE, REGULATOR SET @ 20 PSIG, 1/4" NPT OUTLET.		
	MUSTANG BOX, P5310011010010, MUSTANG P53 SAMPLE CONDITIONING SYSTEM IN TYPE 60 CABINET, REMOTE MOUNT, INCLUDES HEATED ENCLOSURE, LIQUID MEMBRANE SEPARATOR, HEATED REGULATOR WITH CONTROLLER, SYSTEM PURGE OUTLET PORT, SAMPLE LINE	1	EA
3	ROSEMOUNT PRESSURE TRANSMITTERS, MODEL NO. 3051TG42B21AS5B4E5T1, 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 308 THREADED 2-VALVE 316 SST, 1/2" NPT FEMALE PROCESS CONNECTION TYPE MANIFOLD WITH PTFE PACKING MATERIAL. TAG # PT-0001, PT-0011, PT-0101, PT-0111	2	EA
4	ROSEMOUNT TEMPERATURE TRANSMITTER, MODEL NO. 3144PD1A1E5B4T1XA, 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-0001, TT-0011, TT-0101, TT-0111	2	EA
5	PGI THERMOSYNC RTD WITH THERMOWELL, FOR MODEL NO., SEE CHART "1" BELOW, RTD SENSOR ASSEMBLY WITHOUT HEAD & PLUG CONNECTOR, 6"-8" PIPE, 1/2" NPT THERMOWELL WITH VENT HOLE, 316SST WITH CALIBRATION & ID TAG, TAG# TE-0001/0011, TE-0101/0111	2	EA
6	PGI THERMOSYNC THERMOWELL, FOR MODEL NO., SEE CHART "2" BELOW, WITH PLUG CONNECTOR, 6"-8" PIPE, 1/2" NPT THERMOWELL WITH VENT HOLE, 316SST WITH CALIBRATION & ID TAG, TAG# TW-0002	1	EA
7	YZ 3/4" PROBE, C5-0168, SAMPLE PROBE	1	EA
8	WELKER F4 FILTER/DRYER OR EQUIVALENT	1	EA

FABRICATOR TO VERIFY BOM

CHART "1" - RTD THERMOWELL MODEL NO.	
6" PIPING	ATA-1000-L2-8CFR6VW1C

CHART "2" - THERMOWELL MODEL NO.	
6" PIPING	TAN-34-CO-L2-PV



SAMPLE PROBE INSTALLATION
DETAIL "3"
SCALE: NONE

SAMPLE PROBE INSTALLATION NOTES:

- THE SAMPLE PROBE MOUNTS DIRECTLY TO A ROOT VALVE ON THE PIPELINE. (THE ROOT VALVE CONNECTION FACING THE SAMPLER MUST BE 3/4" FNPT, AND THE VALVE MUST BE A 3/4" OR LARGER FULL PORTED FULL OPENING VALVE)
- THE SAMPLER SHOULD BE MOUNTED VERTICALLY IN A HORIZONTAL RUN OF THE PIPELINE.
- THE END OF THE SAMPLER PROBE SHOULD PENETRATE TO 1/3RD OF THE PIPELINE.
- THE END OF THE SAMPLE PROBE SHOULD BE CUT PARALLEL TO THE PIPELINE.
- BEFORE APPLYING PIPELINE PRESSURE TO THE SAMPLE PROBE, ENSURE THAT THE ISOLATION VALVE AND PURGE VALVE ARE CLOSED.

NOTES:

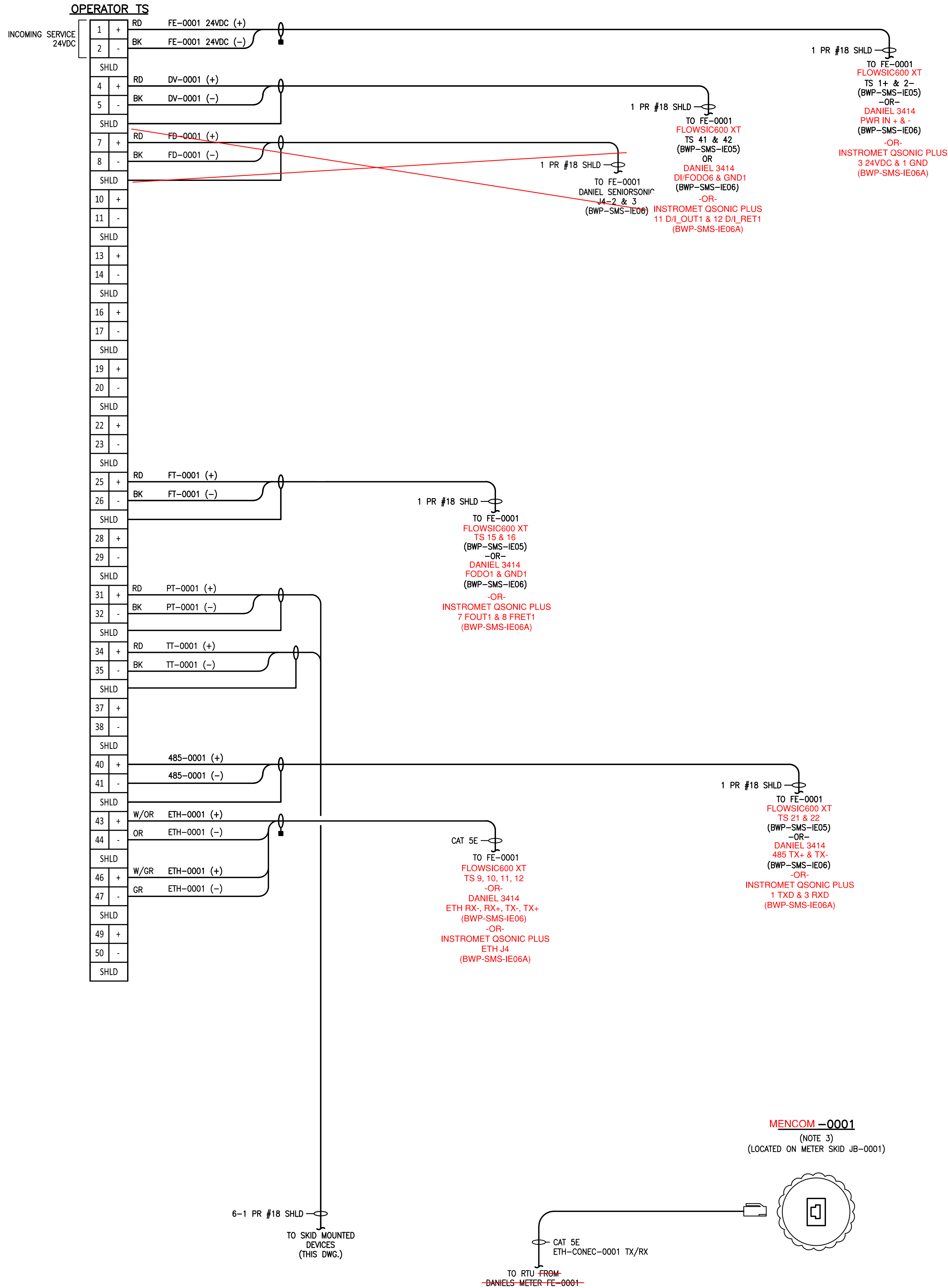
- OPTION "B" – THE PONY BOX MUST INCLUDE A GENIE GPR IF SERVICES ARE <800 PSIG & NO MUSTANG BOX, IF SERVICE >800 PSIG THEN THE PONY BOX MUST HAVE A GENIE GP2 A MUSTANG BOX.
- DIELECTRIC FITTING MOUNTED IN MUSTANG CABINET.
- AFTER PIPELINE PRESSURE HAS BEEN APPLIED TO THE SAMPLER, CHECK THE PROBE BODY/PIPELINE CONNECTION USING A LIQUID LEAK DETECTOR.
- CONTRACTOR TO INSTALL TRANSMITTERS SO THAT TERMINALS FACE SKID PIPING.
- CONTRACTOR TO ROUTE TUBING TO MAINTAIN POSITIVE SLOPE BACK TO TAP AND AVOID LIQUID TRAPS.
- TEMPERATURE RTD SHALL BE CONNECTED TO THE TRANSMITTER WIRING THROUGH A SEPERABLE PHOENIX CONNECTOR, PART NO. 4017918042349.
- INSTRUMENTATION FOR SPECIFIC APPLICATIONS TO BE DETERMINED ON A PER SITE BASIS.



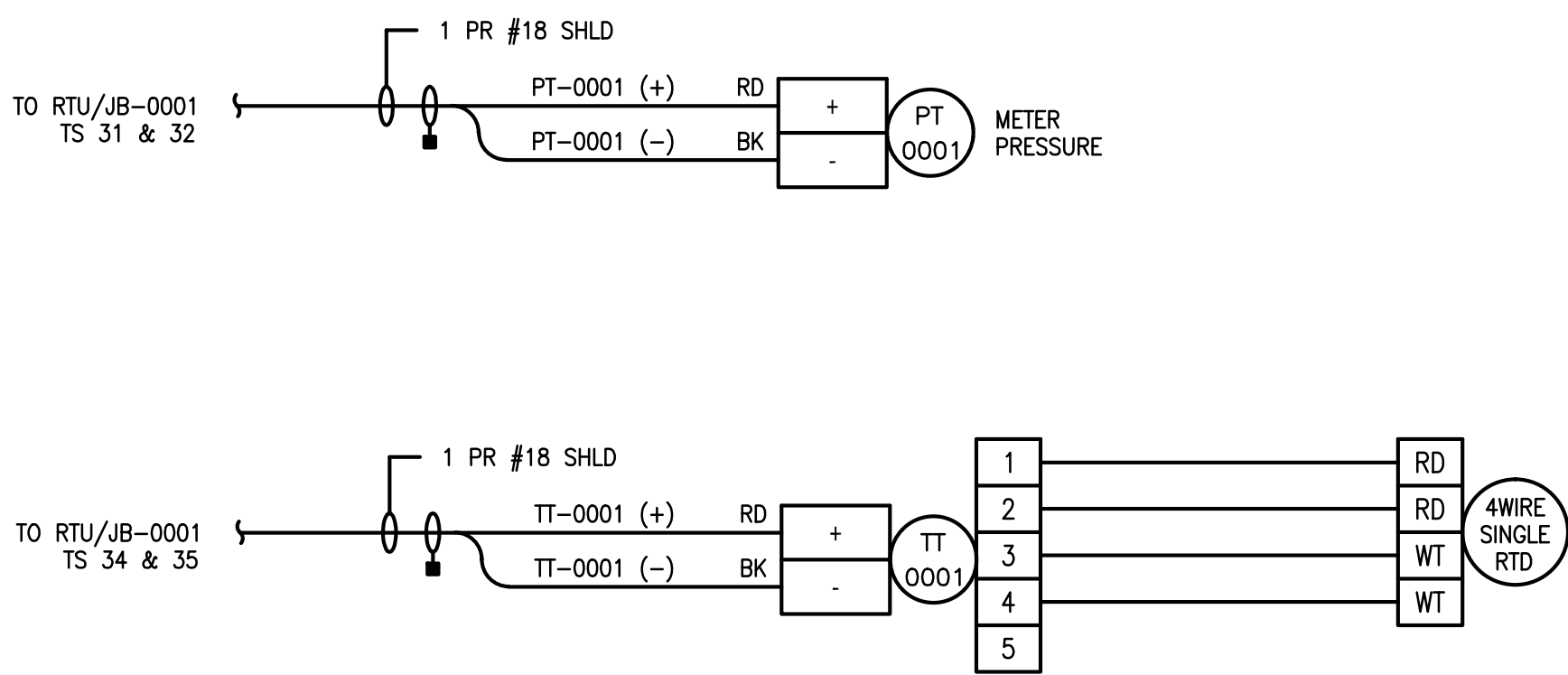
*** OPTIONAL CUSTOMER INSTRUMENTATION**

						BOARDWALK TYPICAL STANDARD INSTRUMENTATION DETAILS TYPICAL METERS 3"—6"		
06—30—16	3	GENERAL STANDARD — REVISED	JCQ	KML	JMK	ENGINEER: MSG	DRAWING NO. BWP—SMS—IE02	REV.
05—02—14	2	REVISED	JCQ	RL	MHR	DRAWN BY: MHR	SHEET: SCALE: NONE INDEX NO.: —	3
11—01—13	1	REVISED	JCQ	RL	MHR	CHECKED BY: MAR		
12—31—12	0	GENERAL STANDARD	GRS	MHR	MHR	DATE: —		
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: —		

METER SKID JUNCTION BOX 0001

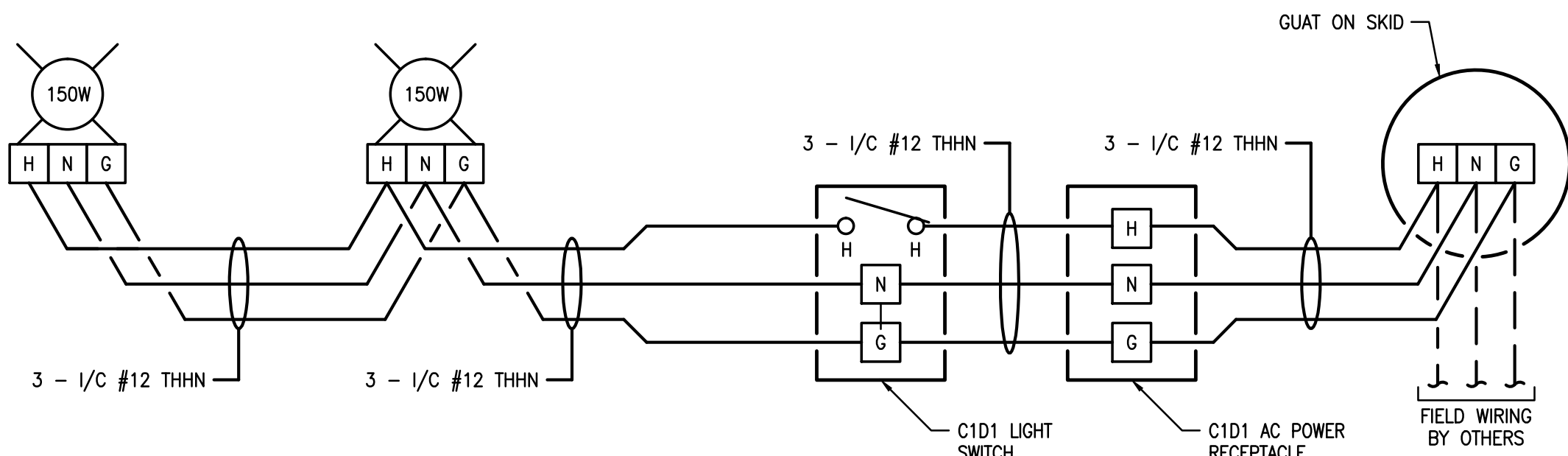


SKID MOUNTED DEVICES



SKID MOUNTED LIGHTING

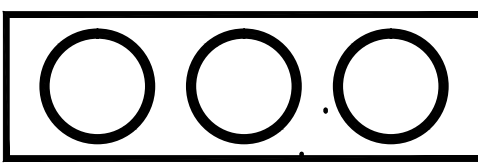
(OPTIONAL)
(SEE NOTES "1" & "2")



NOTES:

- LIGHTING FIXTURES TO BE LOCATED AS SHOWN ON METER SKID PLAN DRAWING.
- LIGHTING FIXTURES AND ACCESSORIES TO BE SHIPPED LOOSE AND ERECTED AT SITE.
- ALL ETHERNET CABLING LINKS SHALL BE TERMINATED AND TESTED IN ACCORDANCE WITH THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) STANDARDS ANSI/TIA/EIA-568-A OR ANSI/TIA/EIA-568-B.

BOARDWALK



PIPELINE PARTNERS

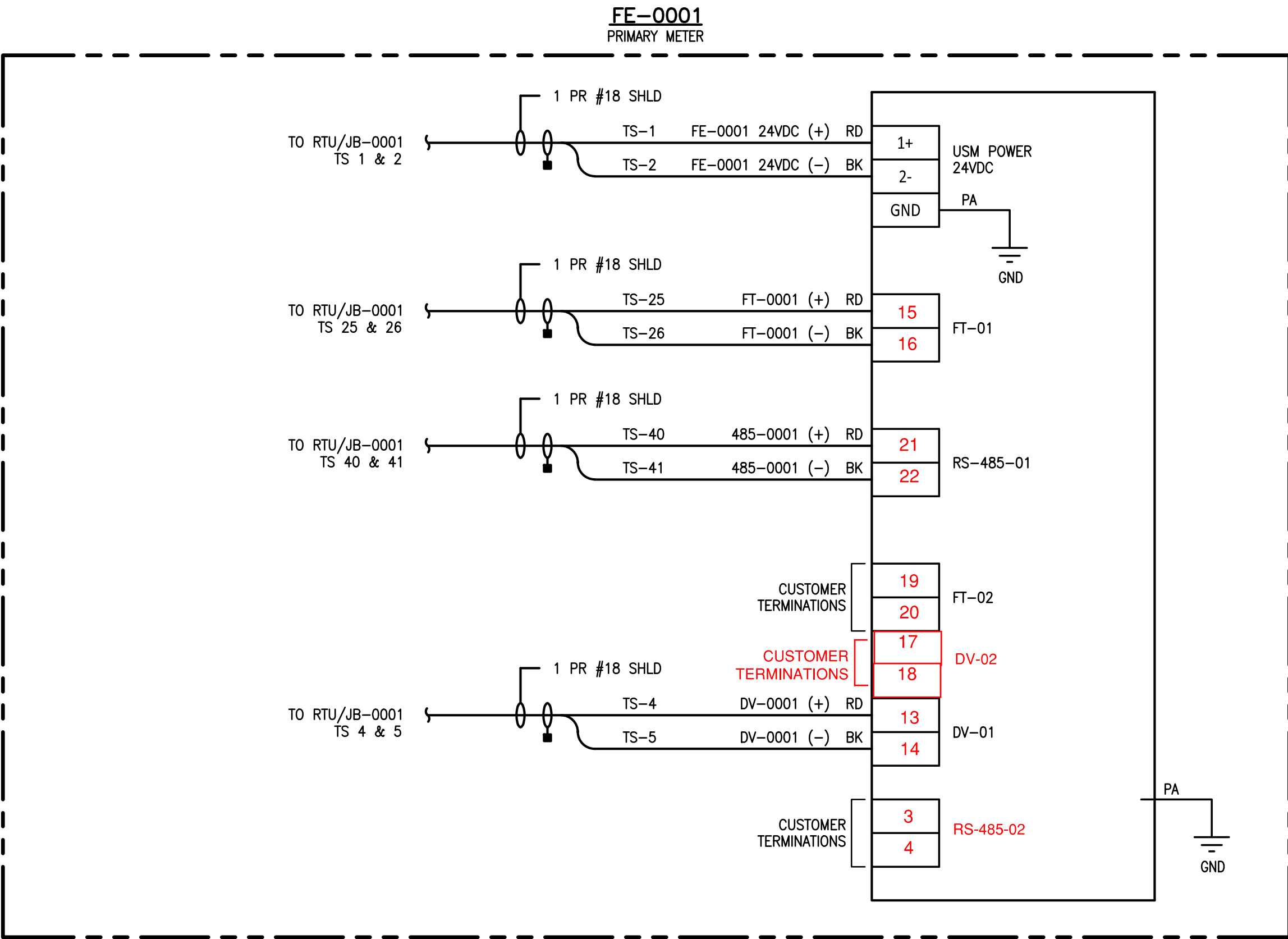
BOARDWALK TYPICAL STANDARD

WIRING DIAGRAM - JB-0001

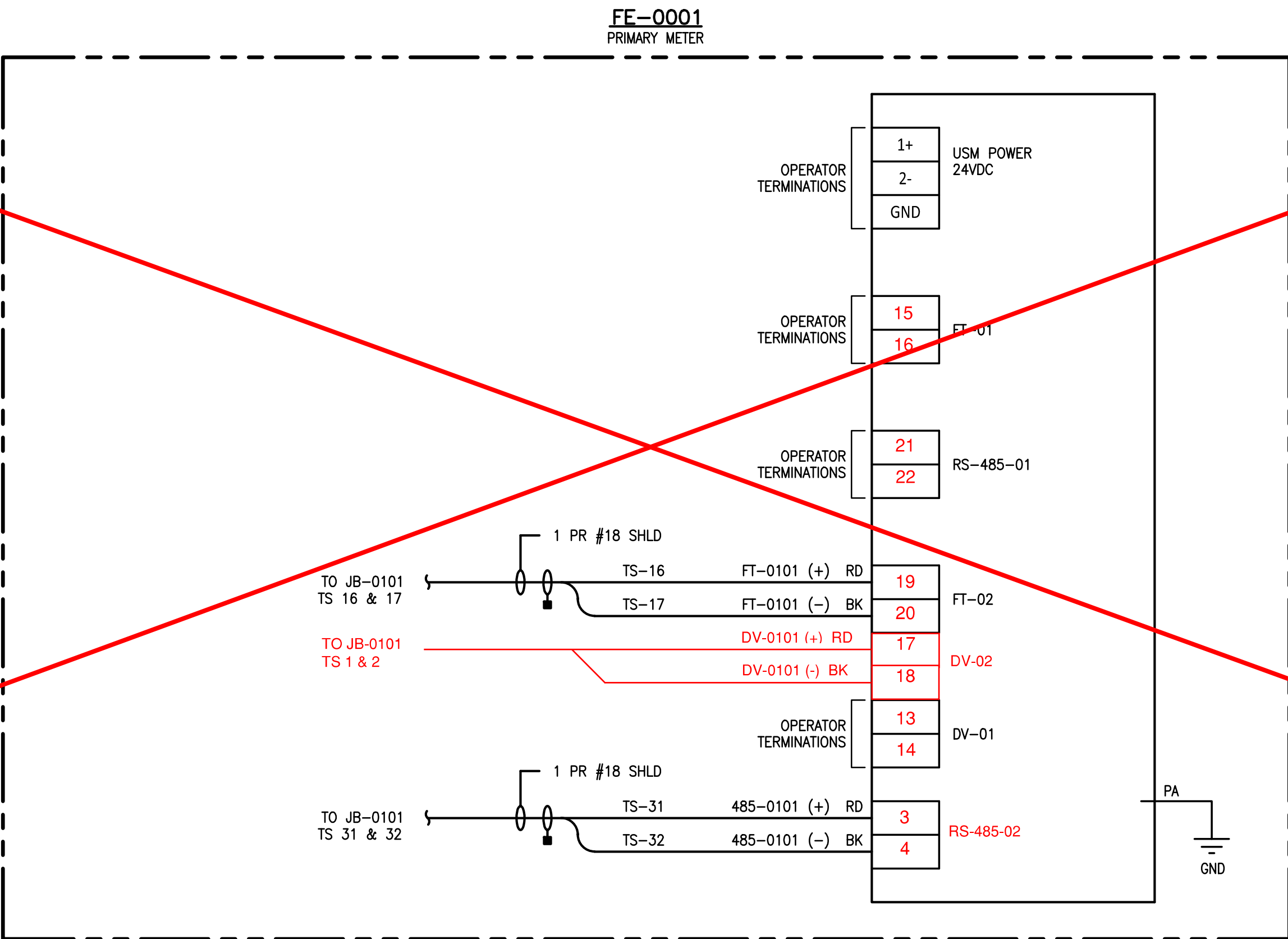
TYPICAL METERS 3"-6"

						ENGINEER: MSG	DRAWING NO. BWP-SMS-IE03	REV.
06-30-16	2	GENERAL STANDARD - REVISED	JCQ	KML	JMK	DRAWN BY: JCQ		
05-02-14	1	REVISED	JCQ	RL	MHR	CHECKED BY: RL	SHEET:	
11-01-13	0	GENERAL STANDARD	JCQ	RL	MHR	DATE: -	SCALE: NONE	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -	INDEX NO.: -	

OPERATOR TERMINATIONS



CUSTOMER TERMINATIONS
(OPTIONAL)



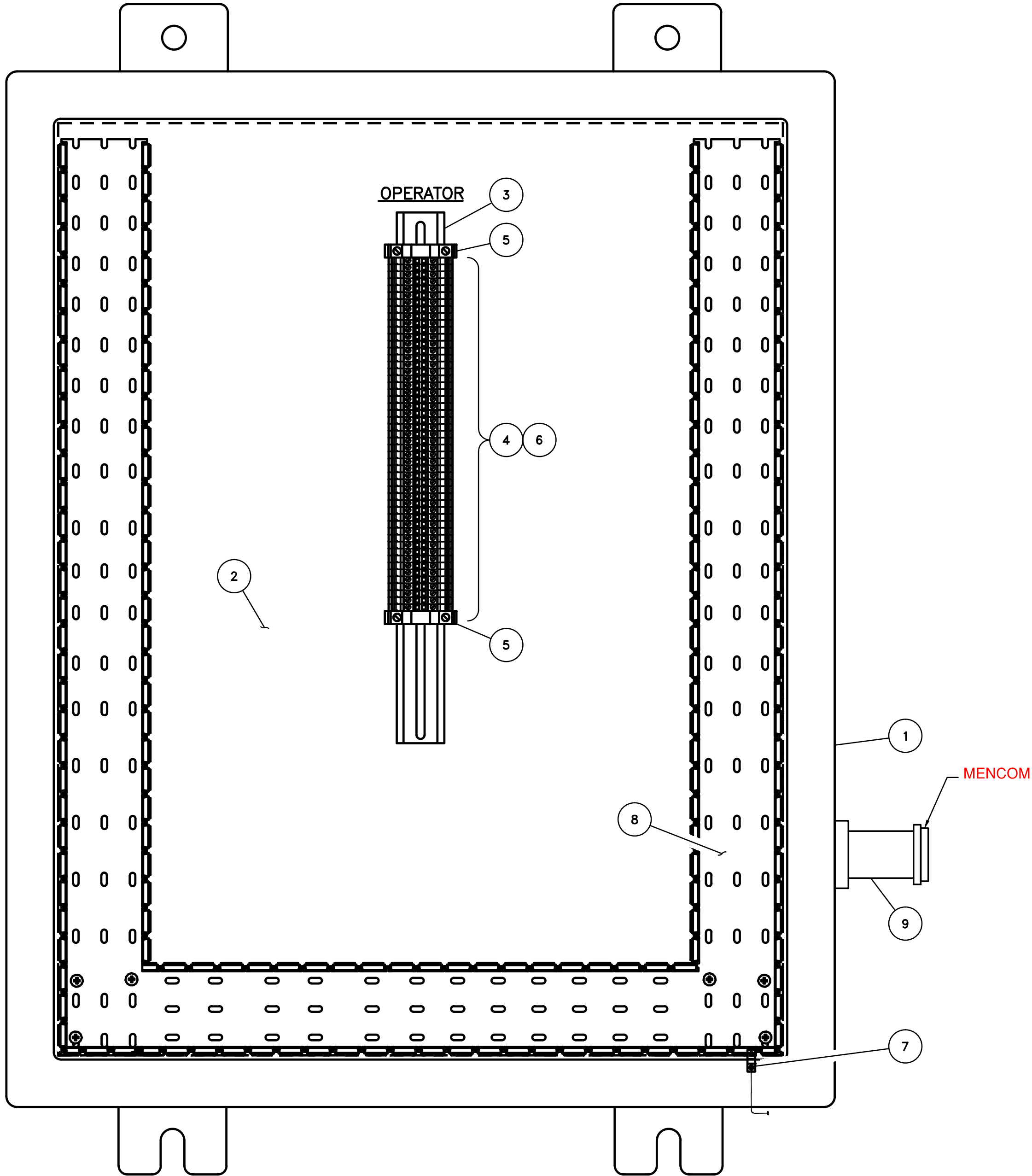
BOARDWALK TYPICAL STANDARD
WIRING DIAGRAM - FLOWSiC600 XT - 4 PATH
TYPICAL METERS 3"-6"

ENGINEER: MSG	DRAWING NO. BWP-SMS-IE05	REV. 0
DRAWN BY: JCQ	CHECKED BY: RL	
DATE: -	SCALE: NONE	
AFE NUMBER: -	INDEX NO.: -	

11-01-13	0	GENERAL STANDARD	JCQ	RL	MHR
DATE:	NO.	REVISION	DWN.	CK'D	APV'D

OPERATOR		
TS		
1	FE-0001 24VDC	(+)
2	FE-0001 24VDC	(-)
3	SPARE	
4	DV-0001	(+)
5	DV-0001	(-)
6	DV-0001	(SHLD)
7	SPARE	
8	SPARE	
9	SPARE	
10	ZSC-0041	(+)
11	ZSC-0041	(-)
12	SPARE	
13	ZSO-0041	(+)
14	ZSO-0041	(-)
15	SPARE	
16	SVC-0041	(+)
17	SVC-0041	(-)
18	SPARE	
19	SVO-0041	(+)
20	SVO-0041	(-)
21	SPARE	
22	SPARE	
23	SPARE	
24	SPARE	
25	FT-0001	(+)
26	FT-0001	(-)
27	FT-0001	(SHLD)
28	SPARE	
29	SPARE	
30	SPARE	
31	PT-0001	(+)
32	PT-0001	(-)
33	PT-0001	(SHLD)
34	TT-0001	(+)
35	TT-0001	(-)
36	TT-0001	(SHLD)
37	SPARE	
38	SPARE	
39	SPARE	
40	485-0001	(+)
41	485-0001	(-)
42	485-0001	(SHLD)
43	ETHERNET	
44	ETHERNET	
45	SPARE	
46	ETHERNET	
47	ETHERNET	
48	SPARE	
49	SPARE	
50	SPARE	
51	SPARE	

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



METER SKID JB-0001
DETAIL "1"
SCALE: NONE
SEE NOTE 3

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	51	EA.	PHOENIX CONTACT, TERMINAL BLOCK #3044076
5	END BRACKET	2	EA.	PHOENIX CONTACT, END BRACKET#E/NS 35
6	TERMINAL STRIP MARKER	51	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.	MENCOM, PANEL INTERFACE CONNECTOR RJ45-06LS

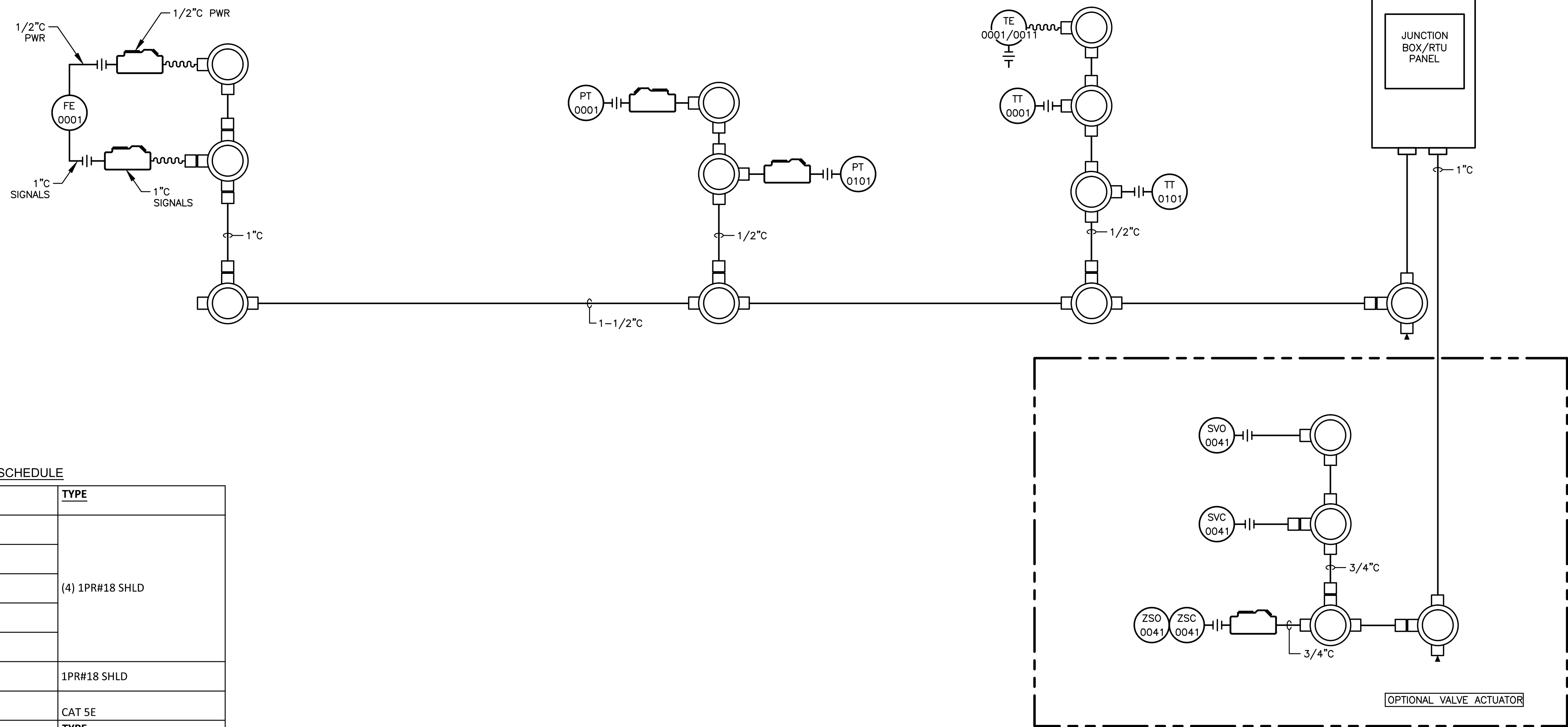
FABRICATOR TO VERIFY BOM

- NOTES:**
- JUNCTION BOX SHALL ALLOW ADEQUATE SPARE TERMINALS TO MAKE PROVISIONS FOR FUTURE I/O TERMINATIONS.
 - ALL OPTIONAL EQUIPMENT SHALL BE SPECIFIED ON A "PER SITE" BASIS. ACTUATION, VALVE INFORMATION, AND POWER GAS SYSTEMS SPECIFIED WITHIN METER STATION OVERALL PIPING & INSTRUMENTATION DIAGRAM.
 - NOT USED IF RTU IS MOUNTED ON SKID.



BOARDWALK TYPICAL STANDARD
LAYOUT - JB-0001
TYPICAL METERS 3"-6"

							ENGINEER: MSG	DRAWING NO.	REV.
							DRAWN BY: JCQ	BWP-SMS-IE07	
05-02-14	1	REVISED	JCQ	RL	MHR	CHECKED BY: RL	SHEET:		1
11-01-13	0	GENERAL STANDARD	JCQ	RL	MHR	DATE: -	SCALE: AS NOTED		
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -	INDEX NO.: -		



CABLE SCHEDULE

DANIEL	SICK	TYPE
POWER	POWER	(4) 1PR#18 SHLD
FLOW-PULSE	FLOW-PULSE	
FLOW-PULSE		
DATA VALID	DATA VALID	
DIRECTION		
RS-232/485	RS-232/485	1PR#18 SHLD
ETHERNET		CAT 5E
INSTRUMENTS		TYPE
PRESSURE TRANSMITTER		1PR#18 SHLD
TEMPERATURE TRANSMITTER		1PR#18 SHLD
RTD		(2) 1PR#18 SHLD
ZSO LIMIT SWITCH ASSEMBLY		1PR#18 SHLD
ZSC LIMIT SWITCH ASSEMBLY		1PR#18 SHLD
SVO SOLENOID VALVE		1PR#18 SHLD
SVC SOLENOID VALVE		1PR#18 SHLD
GROUND		#14 THHN

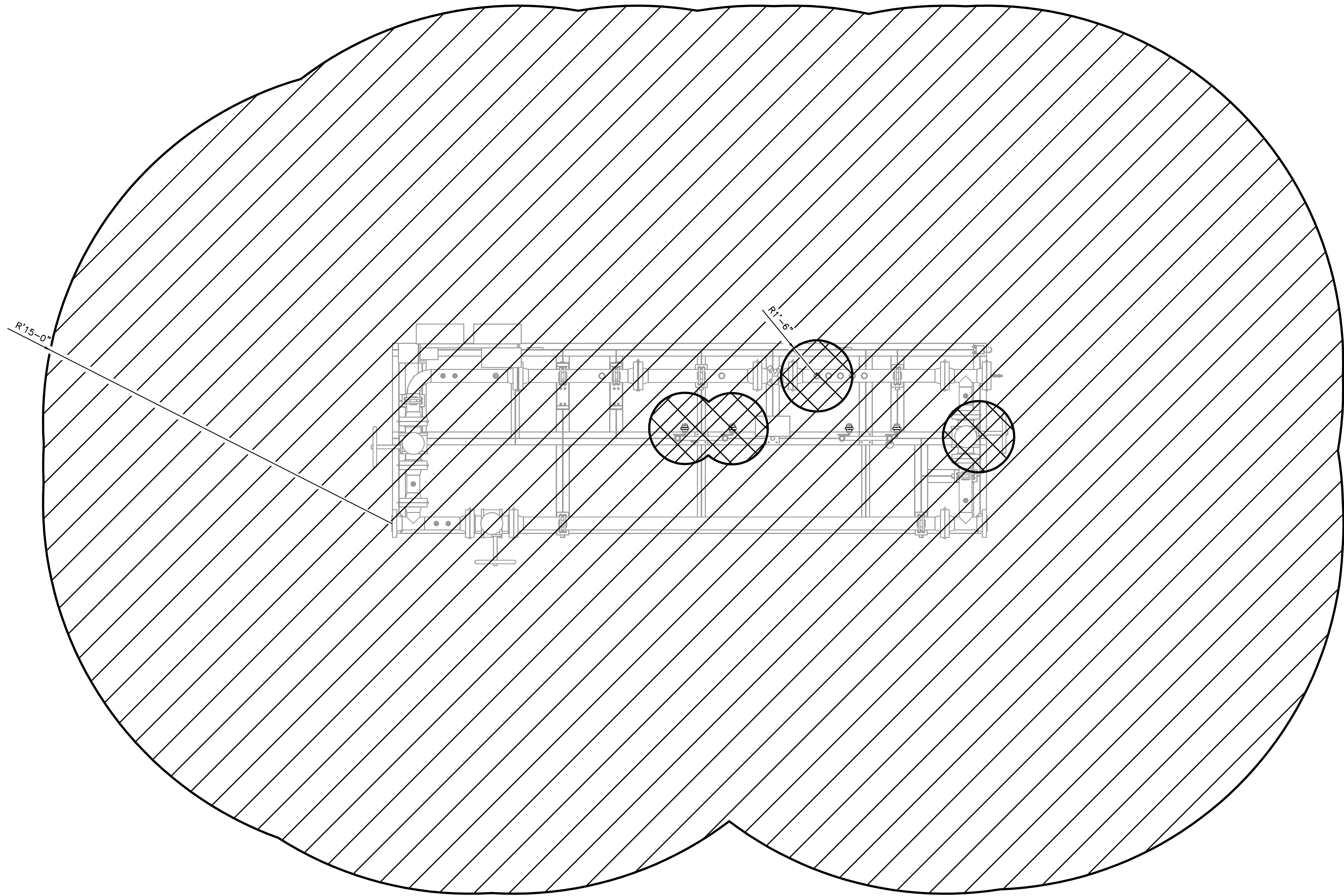
CONDUIT INSTALLATION NOTES:
1. CONDUIT AND WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, LATEST ADDITION.
2. COMPANY CONDUIT SHALL NOT BE SHARED.
3. CONDUIT SHALL BE GALVANIZED RIGID METAL CONDUIT.
4. CONDUIT FITTINGS SHALL BE SCREW-COVER TYPE GUA.
5. USE OF FLEXIBLE CONDUIT SHALL BE AVOIDED.
6. CONDUIT SHALL BE PROPERLY SUPPORTED WITH CHANNEL TYPE SUPPORTS AND CLAMPS; UNISTRUT OR EQUAL.
7. EACH CONDUIT RUN SHALL CONTAIN A SINGLE #14 THHN/THWN GROUND CONDUCTOR, TERMINATED AT EACH INSTRUMENT AND AT THE JUNCTION BOX OR RTU PANEL.
8. CONDUIT SEALS SHALL BE SEALED IN THE FIELD AFTER FINAL INSTALLATION.

INSTRUMENT TUBING
1. TUBING AND FITTINGS SHALL BE ASTM GR. TP-304 OR 316 STAINLESS STEEL.
2. TUBING AND FITTINGS SHALL BE RATED AT A MINIMUM OF 2000 PSIG.
3. TUBING SIZE SHALL BE MINIMUM 3/8" WITH 0.035" WALL THICKNESS.
4. COMPANY AND CUSTOMER SENSE LINES LINES SHALL NOT BE SHARED.
5. SENSE LINE SHALL BE SLOPED BACK TO THE PROCESS PIPE.



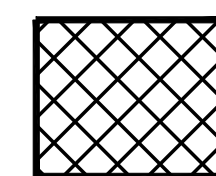
BOARDWALK TYPICAL STANDARD
BLOCK DIAGRAM AND CONDUIT CABLE SCHEDULE
TYPICAL METERS 3"-6"

						ENGINEER: RL	DRAWING NO. BWP-SMS-IE09	REV. 0
						DRAWN BY: JAM		
						CHECKED BY: RL	SHEET:	
11-01-13	0	GENERAL STANDARD	JCQ	RL	MHR	DATE: 10/12/2011	SCALE: NONE	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -	INDEX NO.: -	

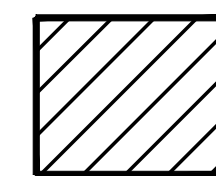


PLAN
SCALE: NONE
(GRATING NOT SHOWN FOR CLARITY)

LEGEND



CLASS 1 DIVISION 1



CLASS 1 DIVISION 2

							BOARDWALK PIPELINE PARTNERS		
							BOARDWALK TYPICAL STANDARD AREA CLASSIFICATION PLAN & SECTION TYPICAL METERS 3"-6"		
							ENGINEER: RL	DRAWING NO.	REV.
							DRAWN BY: JCQ	BWP-SMS-IE10	
06-30-16	1	GENERAL STANDARD - REVISED	JCQ	KML	JMK		CHECKED BY: RL	SHEET:	
11-01-13	0	GENERAL STANDARD	JCQ	RL	MHR		DATE: -	SCALE: NONE	
DATE:	NO.	REVISION	DWN.	CK'D	APV'D	AFE NUMBER: -	INDEX NO.: -		1