

# CONTRACT DRAWINGS - FOR - Pawtucket Regional Water Treatment Facility Pkg 8A - Instrumentation

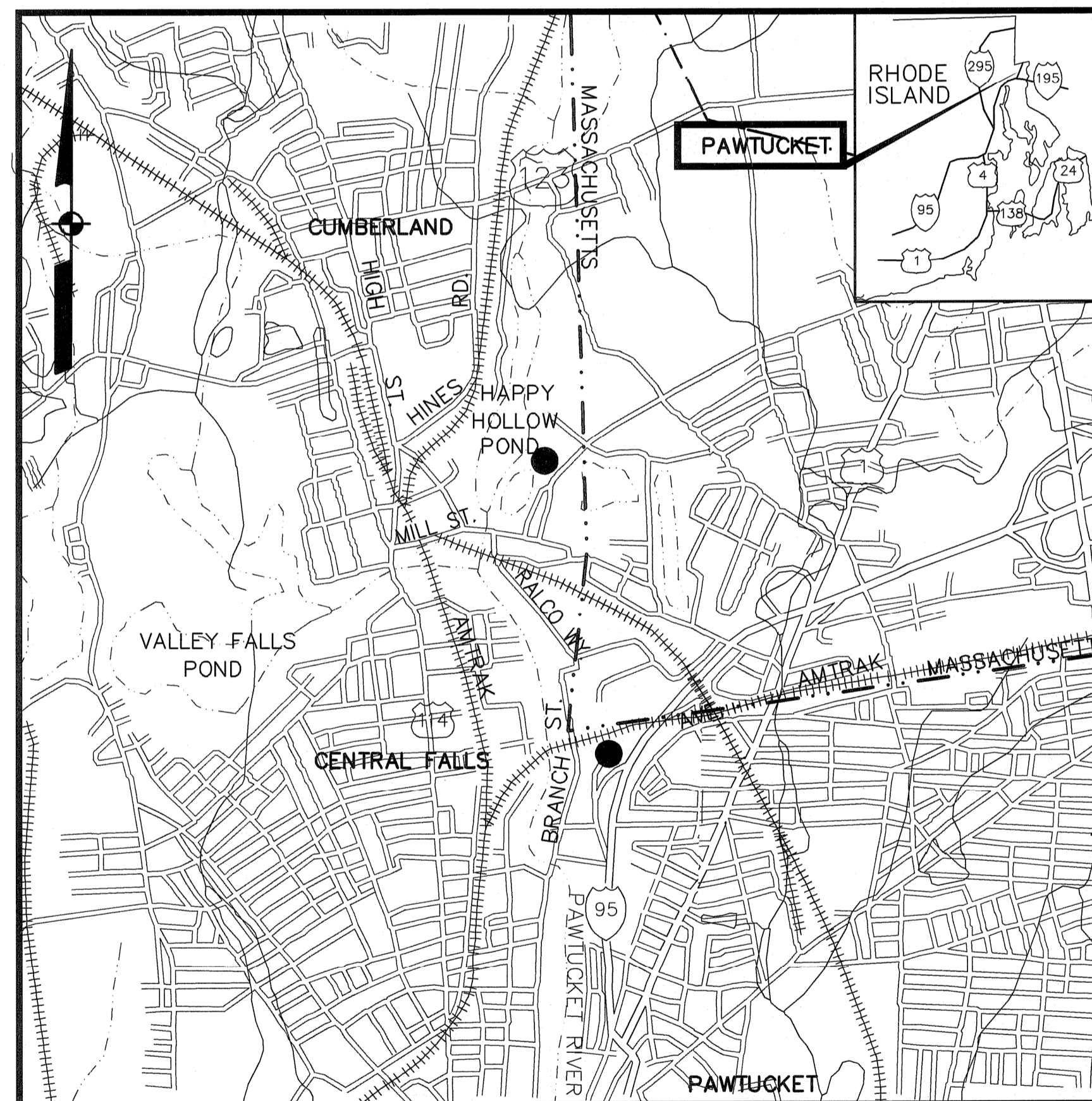
Pawtucket, Rhode Island

INDEX

OCTOBER 31, 2006

DWG.

TITLE



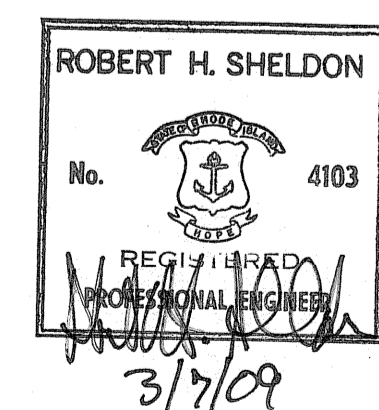
- I-1
- I-2
- I-3
- I-4
- I-5
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COVER

INSTRUMENTATION

- LEGEND, SYMBOLS AND NOTES
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LOCUS  
NOT TO SCALE



GENERAL NOTES

LOCATIONS OF ALL UTILITIES AND SUB-SURFACE STRUCTURES ARE FROM SURVEY AND RECORDS OF TOWN, CORPORATIONS, ETC., AND ARE CONSIDERED APPROXIMATE BOTH AS TO SIZE AND LOCATION AND ARE INDICATED ON THESE DRAWINGS TO GIVE BIDDERS A GENERAL IDEA OF EXISTING CONDITIONS TO BE INVESTIGATED BY THE BIDDER. IT IS UNDERSTOOD AND AGREED THAT EACH BIDDER WILL NOT RELY UPON THESE DRAWINGS FOR SUCH INFORMATION, BUT THAT EACH BIDDER SHALL MAKE EXAMINATIONS IN THE FIELD BY VARIOUS AVAILABLE METHODS AND SHALL OBTAIN INFORMATION FROM UTILITY CORPORATIONS AND INDIVIDUALS AS TO THE LOCATION OF ALL SUB-SURFACE STRUCTURES.

ALL ELEVATIONS REFER TO NATIONAL GEODETIC VERTICAL DATUM OF 1929.



A Tyco International Ltd. Company

300 Baker Avenue Suite 290 Concord, Mass.

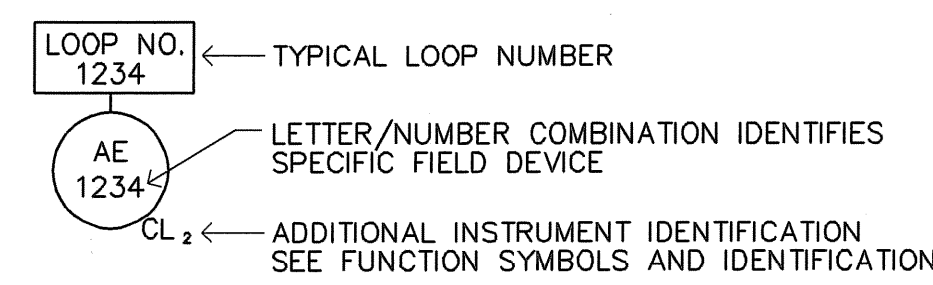
EARTH TECH  
AS-BUILT FILE  
JULY 2008

**GENERAL INSTRUMENT OR FUNCTION SYMBOLS**

- DENOTES EQUIPMENT SPECIFIED UNDER OTHER SECTIONS OF THIS CONTRACT
- DENOTES EXISTING EQUIPMENT OR EQUIPMENT PROVIDED BY OTHERS UNDER A SEPARATE CONTRACT
- INDICATES TYPE OF INPUT OR OUTPUT TO/FROM PLC
- CP-2 ← INDICATES THE CONTROL PANEL TO WHICH THE I/O POINT IS WIRED

	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS			
SHARED DISPLAY, SHARED CONTROL			
COMPUTER FUNCTION			
PROGRAMMABLE LOGIC CONTROL			

**TYPICAL TAG NUMBERS AND DESIGNATION**



**INSTRUMENT LINE SYMBOLS**

ALL LINES TO BE FINE IN RELATION TO PROCESS PIPING LINES

- ES ——— ELECTRICAL SOURCE
- FLOW DIRECTION
- MAJOR PROCESS PIPING
- INSTRUMENT SUPPLY \* OR CONNECTION TO PROCESS
- ETHERNET-CATS UTP
- ETHERNET-FIBER OPTIC CABLE
- SERIAL DATA CABLE
- ANALOG TELEPHONE LINE
- DDS
- MODBUS PLUS NETWORK
- RIO NETWORK
- DH+ NETWORK
- VENDOR SUPPLIED CABLE
- ..... TONE TELEMETRY
- ..... BROADBAND CABLE
- /// UNDEFINED SIGNAL
- /// PNEUMATIC SIGNAL
- OR ELECTRICAL SIGNAL
- L L HYDRAULIC SIGNAL
- x x CAPILLARY TUBE
- ~ ~ ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)
- ~ ~ ELECTROMAGNETIC OR SONIC SIGNAL (NOT GUIDED)
- o o INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
- • MECHANICAL LINK

**OPTIONAL BINARY (ON-OFF) SYMBOLS**

- PNEUMATIC BINARY SIGNAL
- OR ELECTRICAL BINARY SIGNAL

**NOTE:**

\* THE FOLLOWING ABBREVIATIONS ARE SUGGESTED TO DENOTE THE TYPES OF POWER SUPPLY. THESE DESIGNATIONS MAY ALSO BE APPLIED TO PURGE FLUID SUPPLIES.

- AS-AIR SUPPLY
- IA-INSTRUMENT AIR
- PA-PLANT AIR
- ES-ELECTRIC SUPPLY
- GS-GAS SUPPLY
- HS-HYDRAULIC SUPPLY
- NS-NITROGEN SUPPLY
- SS-STEAM SUPPLY
- WS-WATER SUPPLY

THE SUPPLY LEVEL MAY BE ADDED TO THE INSTRUMENT SUPPLY LINE, E.G., AS-100, @ 100-PSIG AIR SUPPLY; ES-24DC, A 24-VOLT DIRECT CURRENT POWER SUPPLY.

**PROCESS DEVICE SYMBOLS**

- FLOW ELEMENT VENTURI TUBE
- FLOW ELEMENT MAGNETIC FLOWMETER
- LEVEL ELEMENT ULTRASONIC LEVEL TRANSDUCER
- FLOW ELEMENT PARSHALL OR TRAPEZOIDAL FLUME
- LEVEL SWITCH (FLOAT) \* "L" DENOTES LOW \* "H" DENOTES HIGH
- PRESSURE DIFFERENTIAL SWITCH
- SUMP PUMP
- CENTRIFUGAL BLOWER
- MIXER
- MOTOR — MAY BE ELECTRIC, HYDRAULIC OR PNEUMATIC ARROW DENOTES VARIABLE SPEED
- DIRECTIONAL ANTENNA
- OMNI-DIRECTIONAL ANTENNA
- UPS WITH DUPLEX 120 VAC RECEPTACLES
- EQUIPMENT RECEIVES 120 VAC POWER FROM UPS

**INSTRUMENT LEGEND**

- AE ANALYSIS ELEMENT
- AI ANALOG INPUT
- AIT ANALYSIS INDICATING TRANSMITTER
- AO ANALOG OUTPUT
- CAT5 CATEGORY 5
- CP CONTROL PANEL
- CPU PLC CENTRAL PROCESSING UNIT
- CSU/DSU CHANNEL SERVICE UNIT/DATA SERVICE UNIT
- DI DIGITAL INPUT
- DDS 56kbps DIGITAL DATA SERVICE TELEPHONE LINE
- DO DIGITAL OUTPUT
- FA FIRE ALARM
- FCC FILTER CONTROL CONSOLE
- FE FLOW ELEMENT
- FIT FLOW INDICATING TRANSMITTER
- FSH FLOW SWITCH HIGH
- HOA HAND-OFF-AUTO SELECTOR SWITCH
- HMI HUMAN-MACHINE INTERFACE
- HS HAND SWITCH
- IA INTRUSION ALARM
- I/O PLC INPUT/OUTPUT MODULE(S)
- LAN LOCAL AREA NETWORK
- LE LEVEL ELEMENT
- LIT LEVEL INDICATING TRANSMITTER
- LOR LOCAL/OFF/REMOTE SELECTOR SWITCH
- LSH LEVEL SWITCH HIGH
- M MOTOR
- NC NORMALLY CLOSED
- NIM NETWORK INTERFACE MODULE
- NO NORMALLY OPEN
- OIT OPERATOR INTERFACE TERMINAL
- PIT PRESSURE INDICATING TRANSMITTER
- PLC PROGRAMMABLE LOGIC CONTROLLER
- PSH PRESSURE SWITCH HIGH
- PSTN PUBLIC SWITCHED TELEPHONE NETWORK
- RIO REMOTE I/O
- SCADA SUPERVISORY CONTROL & DATA ACQUISITION
- TE TEMPERATURE ELEMENT
- TELCO TELEPHONE COMPANY
- TIT TEMPERATURE INDICATING TRANSMITTER
- UPS UNINTERRUPTIBLE POWER SUPPLY
- UTP UNSHIELDED TWISTED PAIR
- VFD VARIABLE FREQUENCY DRIVE
- WAN WIDE AREA NETWORK
- XA TROUBLE ALARM

**GENERAL NOTES**

1. THIS LEGEND APPLIES TO INSTRUMENTATION DIAGRAMS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.
2. IN GENERAL, THIS LEGEND SHEET AND THE INSTRUMENTATION DIAGRAMS ARE BASED ON THE INSTRUMENTATION, SYSTEMS AND AUTOMATION SOCIETY STANDARDS AND PRACTICES FOR INSTRUMENTATION. ADDITIONS AND ALTERATIONS HAVE BEEN MADE TO ACCOMMODATE THE PROJECT REQUIREMENTS.
3. SOME PROCESS ITEMS WHICH ARE NOT CRITICAL TO UNDERSTANDING INSTRUMENTATION FUNCTIONS ARE NOT SHOWN ON THE INSTRUMENTATION SHEETS.
4. SEE OTHER SHEETS AND SPECIFICATIONS FOR OTHER CONTROL AND INTERLOCK REQUIREMENTS.
5. THIS SUB CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS (SPECIFICATIONS AND DRAWINGS) IN ORDER TO DETERMINE EQUIPMENT AND QUANTITIES TO BE PROVIDED. EQUIPMENT INDICATED OR SHOWN IN ANY ONE DOCUMENT AND NOT IN THE OTHER SHALL BE PROVIDED AS NOTED. ANY EQUIPMENT LISTED IN THE LEGEND BUT NOT SHOWN IN A PANEL LAYOUT OR LOOP DESCRIPTION SHALL BE FURNISHED.
6. SEE SPECIFICATIONS FOR FURTHER DETAILS AND INFORMATION CONCERNING EQUIPMENT QUANTITIES DESCRIPTIONS AND FUNCTIONS.
7. REFER TO CONTRACT DRAWINGS, SPECIFICATIONS, AND PLANS FOR EACH INDIVIDUAL SYSTEM THAT WILL PROVIDE DISCRETE INPUTS AND OUTPUTS TO INSTRUMENT CONTROL PANELS.
8. THE SPECIFIC INPUT/OUTPUT (I/O) LOCATION IS DENOTED WITH NOTATION (i.e. - CP-2).

**IDENTIFICATION LETTERS**

FIRST-LETTER		SUCCEEDING-LETTERS		
MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A ANALYSIS		ALARM		
B BURNER, COMBUSTION		USERS CHOICE	USERS CHOICE	USERS CHOICE
C USERS CHOICE			CONTROL	
D USERS CHOICE	DIFFERENTIAL			
E VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F FLOW RATE	RATIO (FRACTION)			
G USERS CHOICE		GLASS, VIEWING DEVICE		
H HAND				HIGH
I CURRENT (ELECTRICAL)		INDICATE (10)		
J POWER	SCAN (7)			
K TIME, TIME SCHEDULE	TIME RATE OF CHANGE (4, 21)		CONTROL STATION	
L LEVEL		LIGHT		LOW
M USERS CHOICE	MOMENTARY			MIDDLE INTERMEDIATE
N USERS CHOICE		USERS CHOICE	USERS CHOICE	USERS CHOICE
O USERS CHOICE		ORIFICE RESTRICTION		
P PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q QUANTITY	INTEGRATE, TOTALIZE			
R RADIATION		RECORD		
S SPEED FREQUENCY	SAFETY		SWITCH	
T TEMPERATURE			TRANSMIT	
U MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W WEIGHT, FORCE		WELL		
X UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

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0 ISSUED FOR CONSTRUCTION	04-08-05
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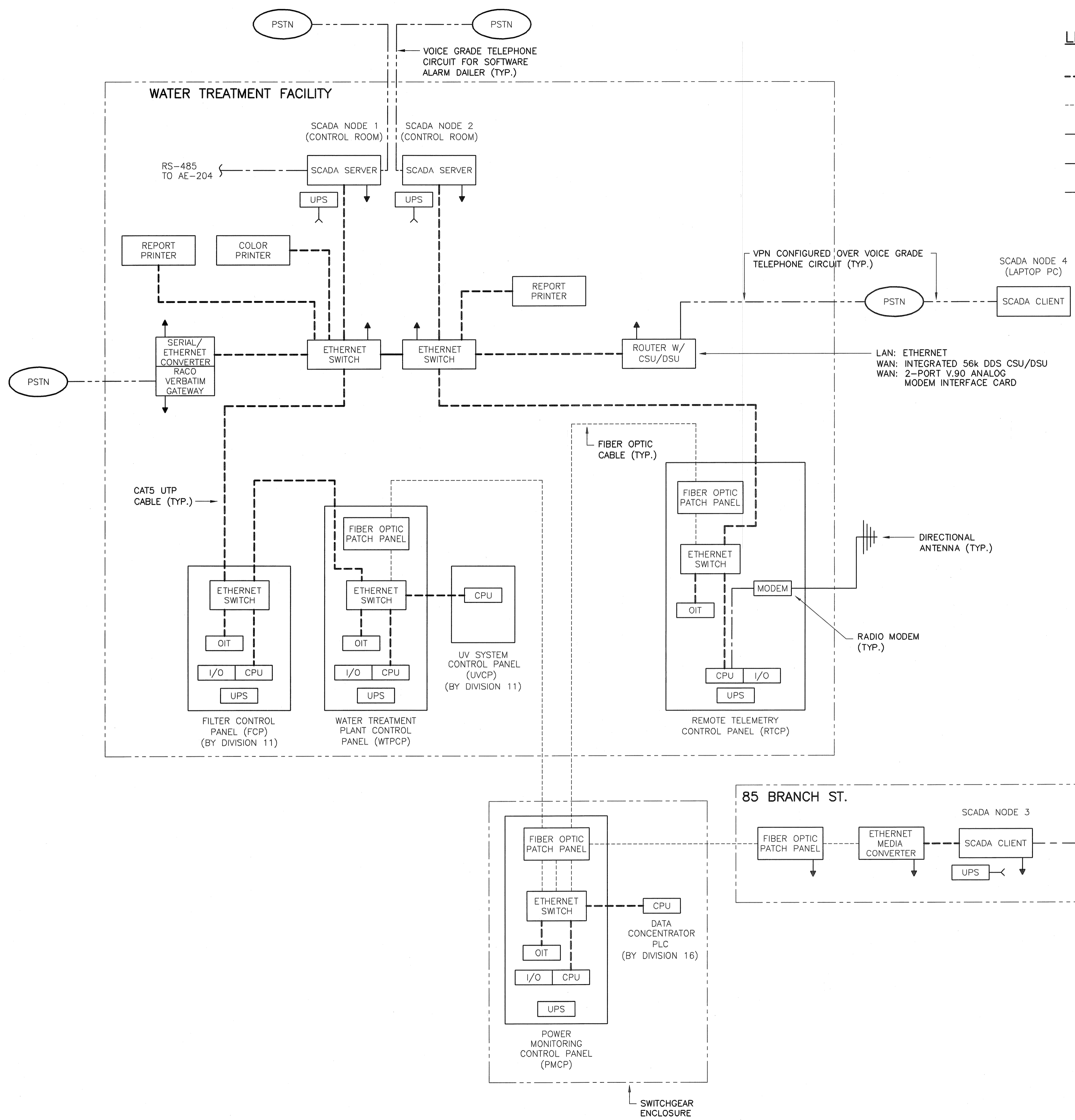
ROBERT H. SHELDON  
 No. 4103  
 3/17/09

PAWTUCKET, RHODE ISLAND  
**PAWTUCKET REGIONAL WATER TREATMENT FACILITY**  
**PKG 8A - INSTRUMENTATION**  
 LEGEND, SYMBOLS AND NOTES

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DRAWN BY	JAZ	CONTRACT NO.	
CHECKED BY	DF	DATE	OCTOBER 31, 2008

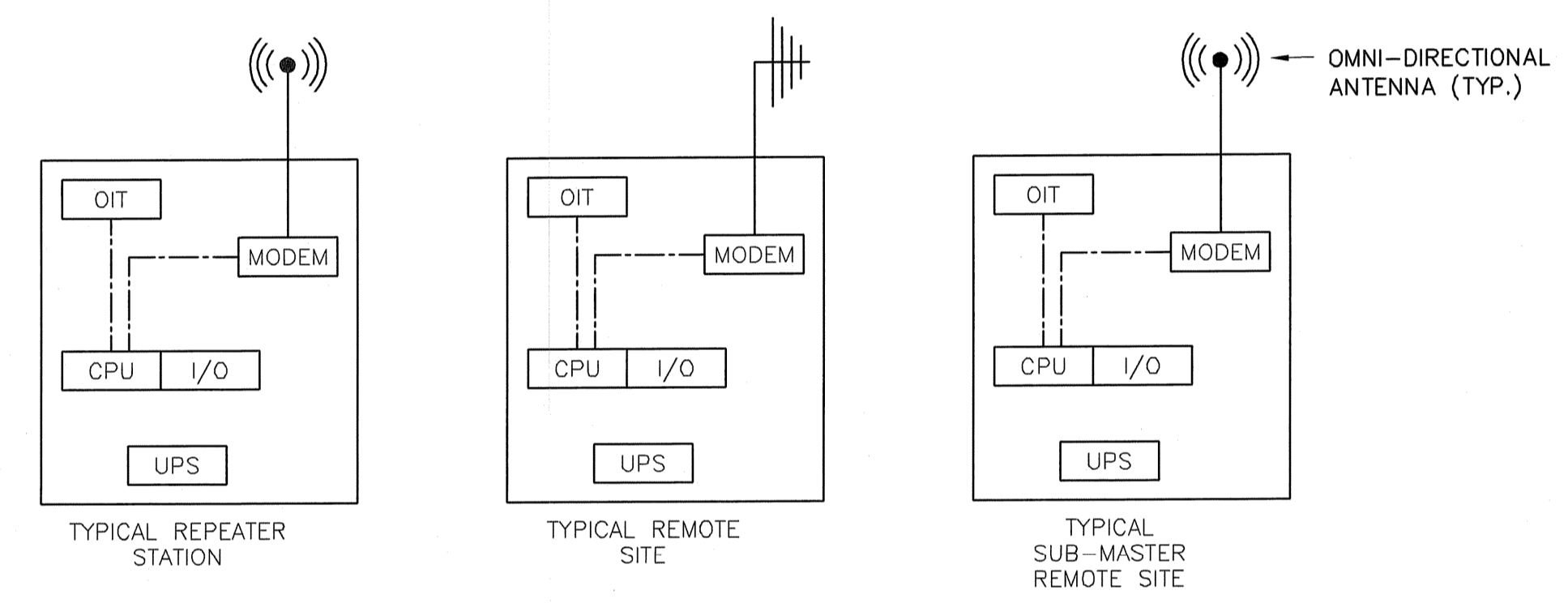
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**LINE SYMBOLS**

- ETHERNET-CATS UTP
- ETHERNET-FIBER OPTIC CABLE
- SERIAL DATA CABLE
- ANALOG TELEPHONE LINE
- DDS



**PLC/SCADA SYSTEM SCHEMATIC**  
 NOT TO SCALE

REMOTE SITE CONTROL PANELS			
DESIGNATION	DESCRIPTION	LOCATION	SITE TYPE
AMRCP	ARNOLD MILLS RESERVOIR LEVEL GAUGING STATION	ARNOLD MILLS RESERVOIR	TBD
ARR1CP	ABBOTT RUN RIVER FLOW GAUGING STATION	DOWNSTREAM DIAMOND HILL RESERVOIR	TBD
ARR2CP	ABBOTT RUN RIVER FLOW GAUGING STATION	DOWNSTREAM ARNOLD MILLS RESERVOIR	TBD
ARR3CP	ABBOTT RUN RIVER FLOW GAUGING STATION	DOWNSTREAM ROBIN HOLLOW POND	TBD
DHRCP	DIAMOND HILL RESERVOIR LEVEL GAUGING STATION	DIAMOND HILL RESERVOIR	TBD
HHPRCP	HAPPY HOLLOW POND RESERVOIR LEVEL GAUGING STATION	HAPPY HOLLOW POND RESERVOIR	TBD
PWW2CP	POTABLE WATER WELL NO. 2	HAPPY HOLLOW POND RESERVOIR	TBD
PWW3CP	POTABLE WATER WELL NO. 3	HAPPY HOLLOW POND RESERVOIR	TBD
PWW4CP	POTABLE WATER WELL NO. 4	HAPPY HOLLOW POND RESERVOIR	TBD
PWW5CP	POTABLE WATER WELL NO. 5	HAPPY HOLLOW POND RESERVOIR	TBD
PWW6CP	POTABLE WATER WELL NO. 6	HAPPY HOLLOW POND RESERVOIR	TBD
PWW7CP	POTABLE WATER WELL NO. 7	HAPPY HOLLOW POND RESERVOIR	TBD
PWW8CP	POTABLE WATER WELL NO. 8	HAPPY HOLLOW POND RESERVOIR	TBD
PWW9CP	POTABLE WATER WELL NO. 9	HAPPY HOLLOW POND RESERVOIR	TBD
RWPSCP	RAW WATER PUMP STATION	RAW WATER PUMP STATION	TBD
SHSTCP	STUMP HILL STORAGE TANK	STUMP HILL STORAGE TANK	TBD

FULL SIZE DRAWING = 4"

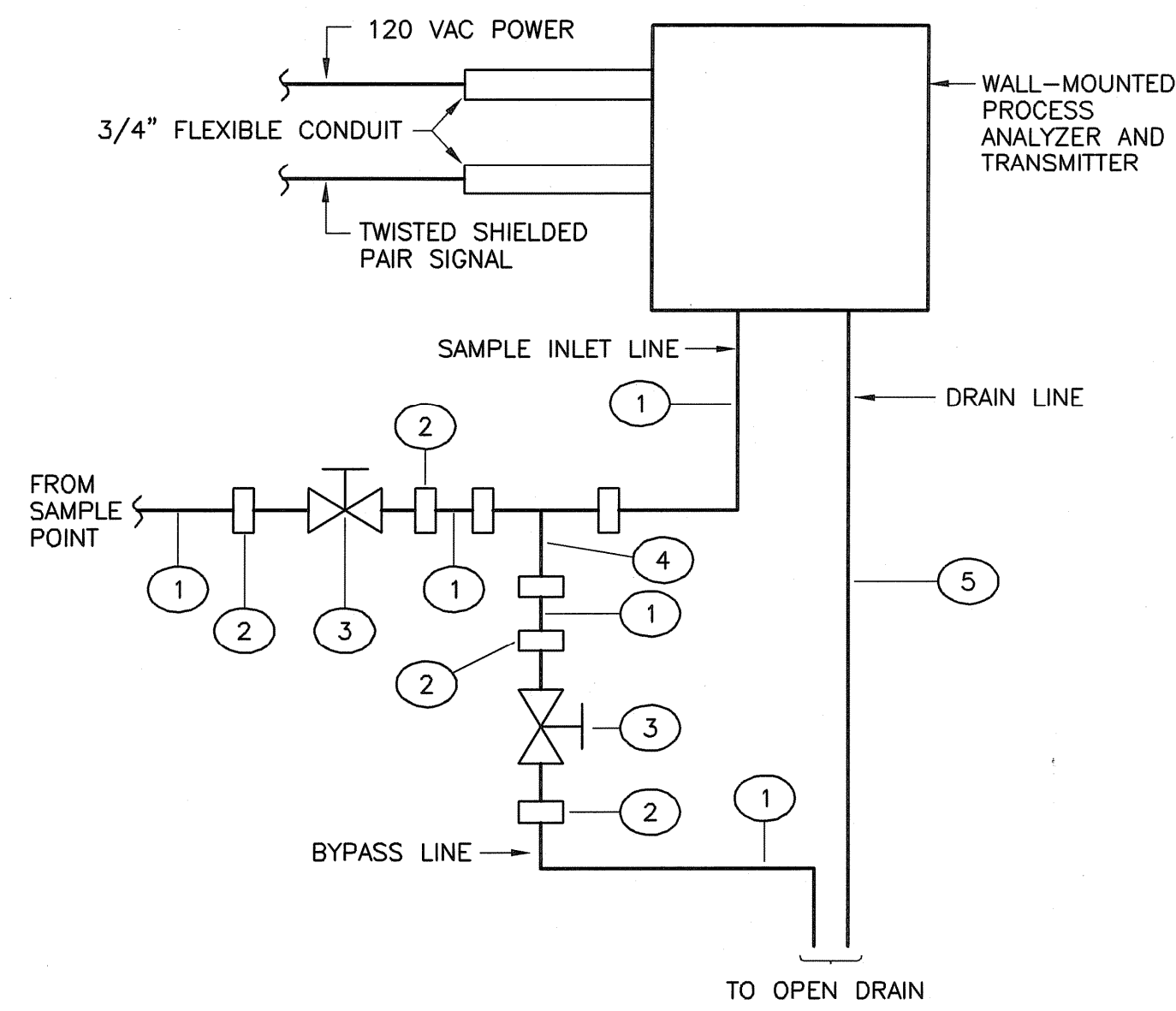
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ROBERT H. SHELDON  
 No. 4103  
 3/7/08

PAWTUCKET, RHODE ISLAND  
**PAWTUCKET REGIONAL WATER TREATMENT FACILITY**  
**PKG 8A - INSTRUMENTATION**  
 SCADA SYSTEM ARCHITECTURE

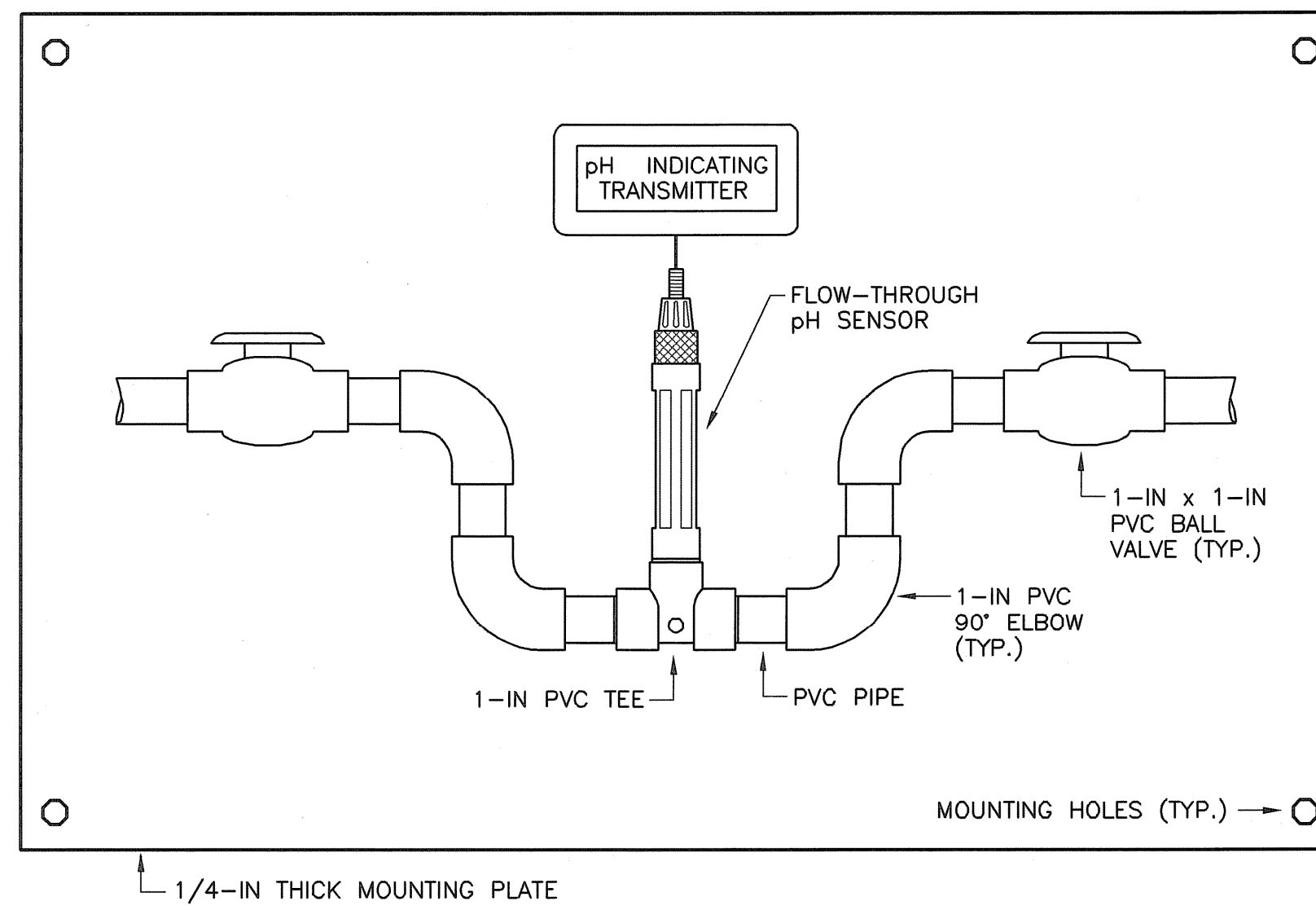
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DRAWN BY JAZ	CONTRACT NO.
CHECKED BY DF	DATE OCTOBER 31, 2008

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 AS-BUILT FILE  
 JULY 2008

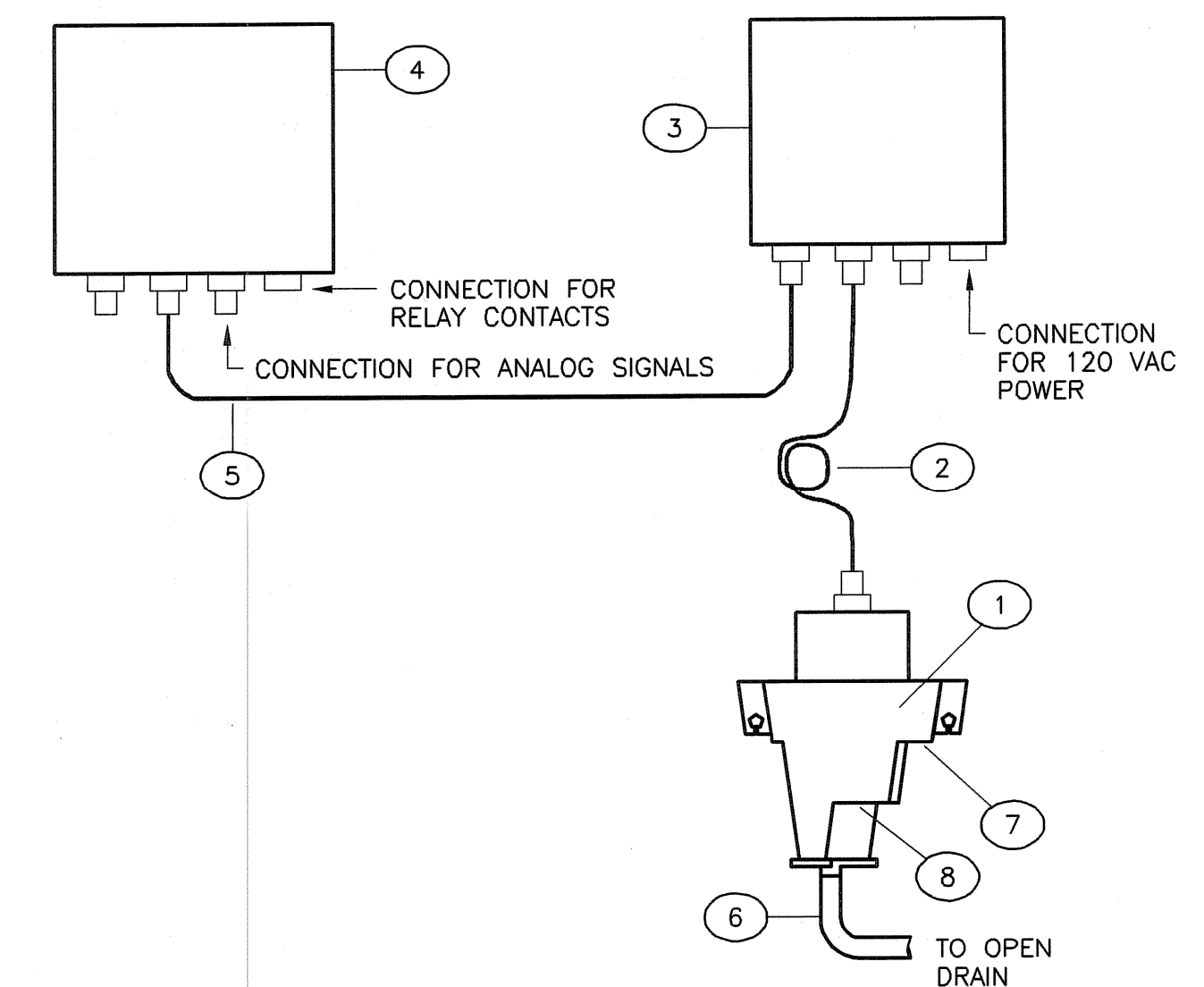


ITEM	SIZE	QUANTITY	DESCRIPTION
1	1/2" ID	AS REQ'D	FLEXIBLE HOSE
2	1/2"	4	ADAPTOR, 1/2" NPT BY 1/2" HOSE
3	1/2"	2	VALVE, 1/2" NPT
4	1/2"	1	TEE HOSE CONNECTOR
5	1" ID	AS REQ'D	FLEXIBLE HOSE

**PROCESS ANALYZER INSTALLATION**  
NOT TO SCALE

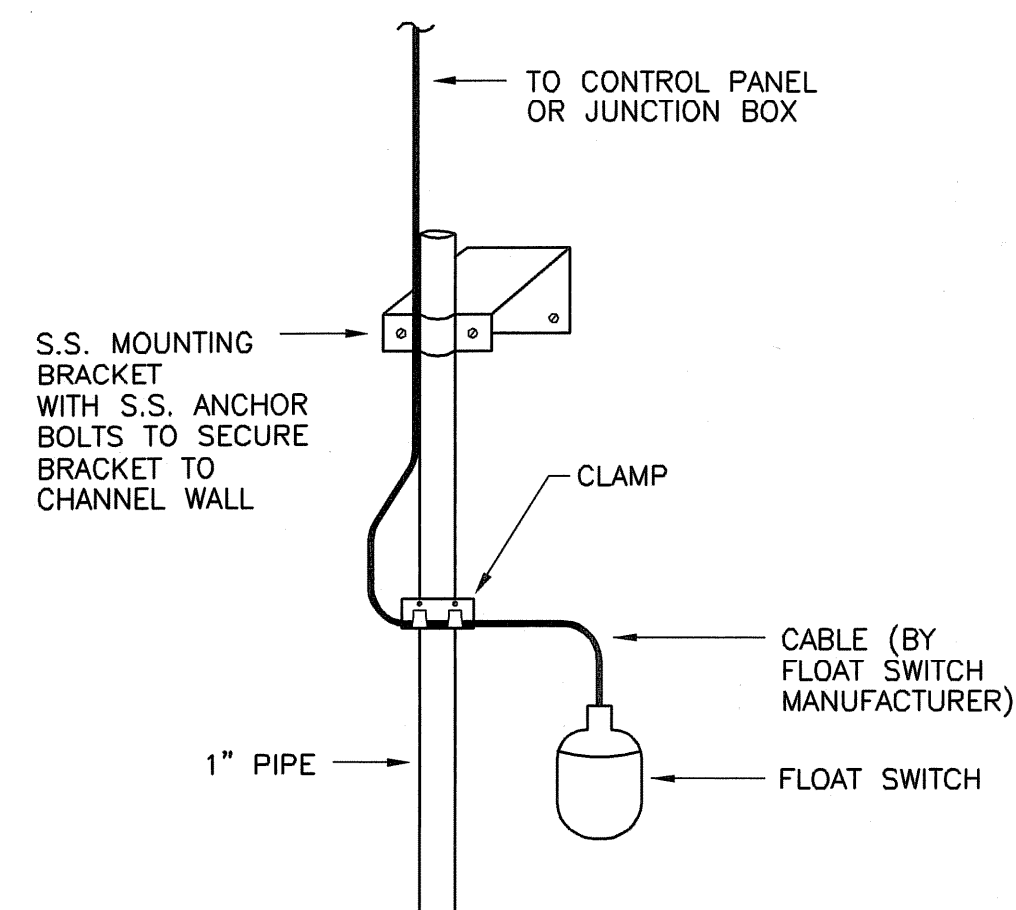


**FLOW-THROUGH pH ELEMENT INSTALLATION**  
NOT TO SCALE

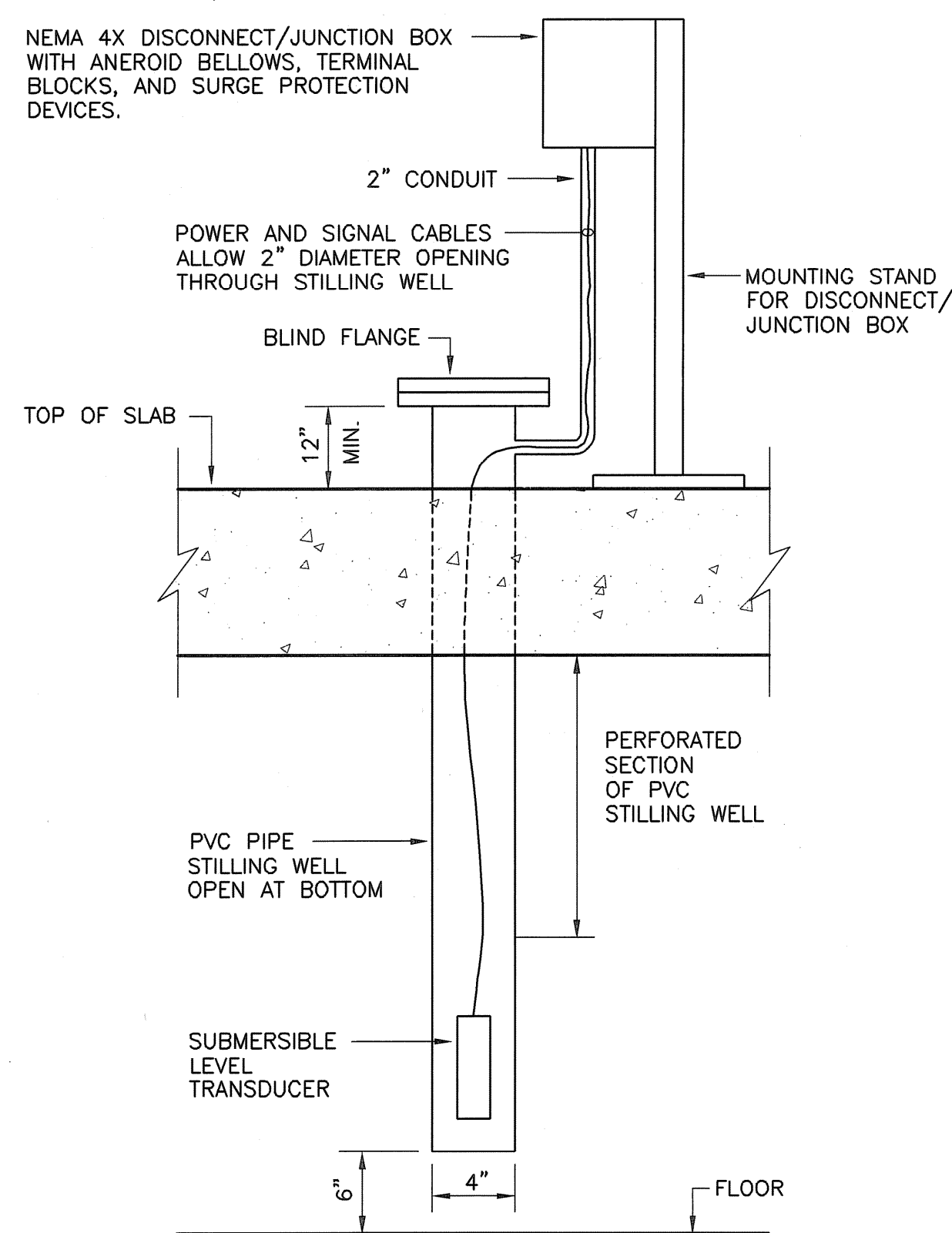


ITEM	SIZE	QUANTITY	DESCRIPTION
1	-	1	TURBIDIMETER
2	-	1	SIGNAL CABLE (BY VENDOR)
3	-	1	POWER SUPPLY
4	-	1	INDICATING TRANSMITTER
5	-	1	5-CONDUCTOR CABLE
6	1" ID	AS REQ'D	SERVICE DRAIN TUBING
7	1/4" OD	AS REQ'D	RIGID OR SEMIRIGID TUBING SAMPLE INLET
8	1/2" OD	AS REQ'D	FLEXIBLE TUBING-SAMPLE OUTLET

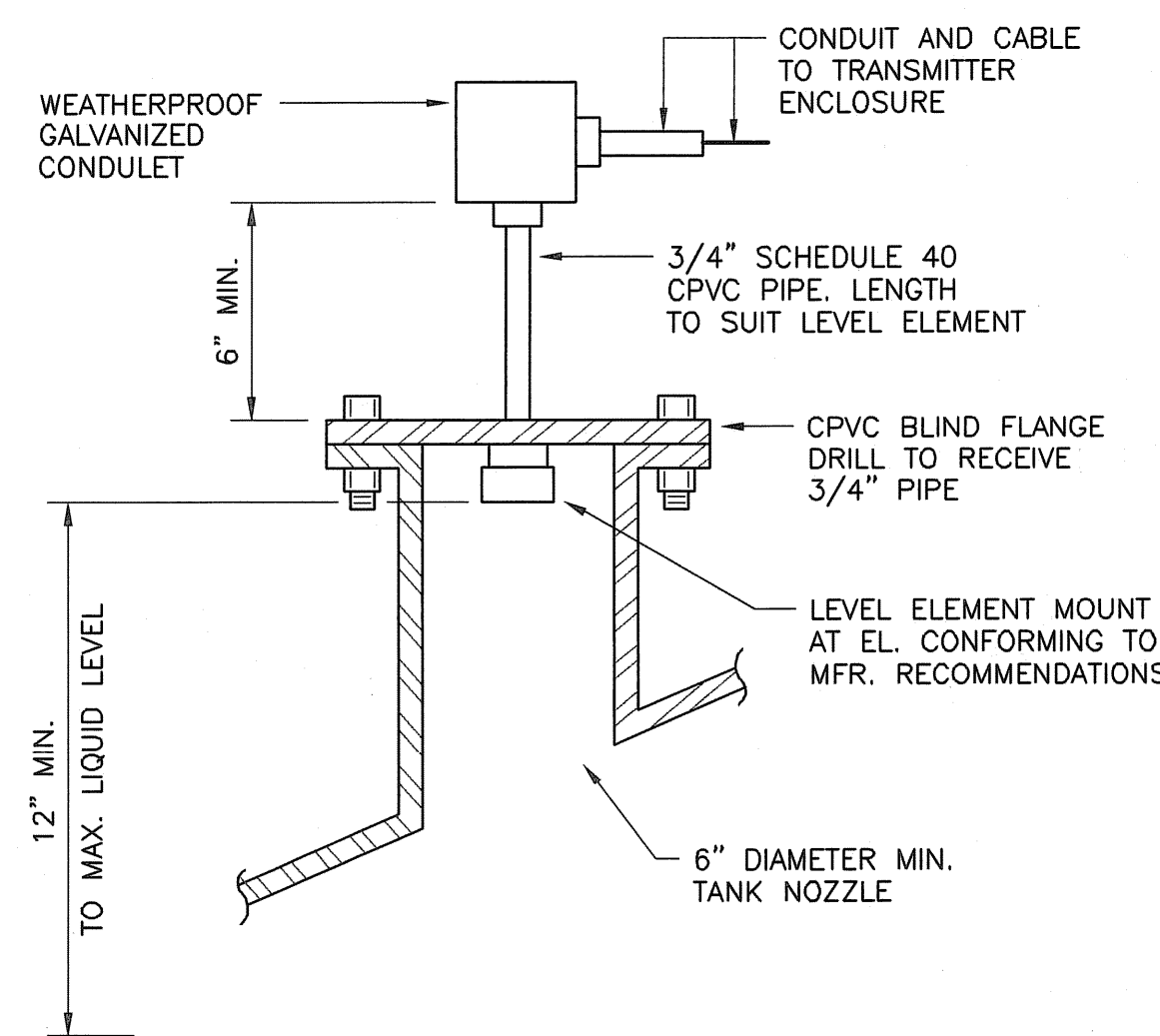
**TURBIDIMETER AND INDICATING TRANSMITTER**  
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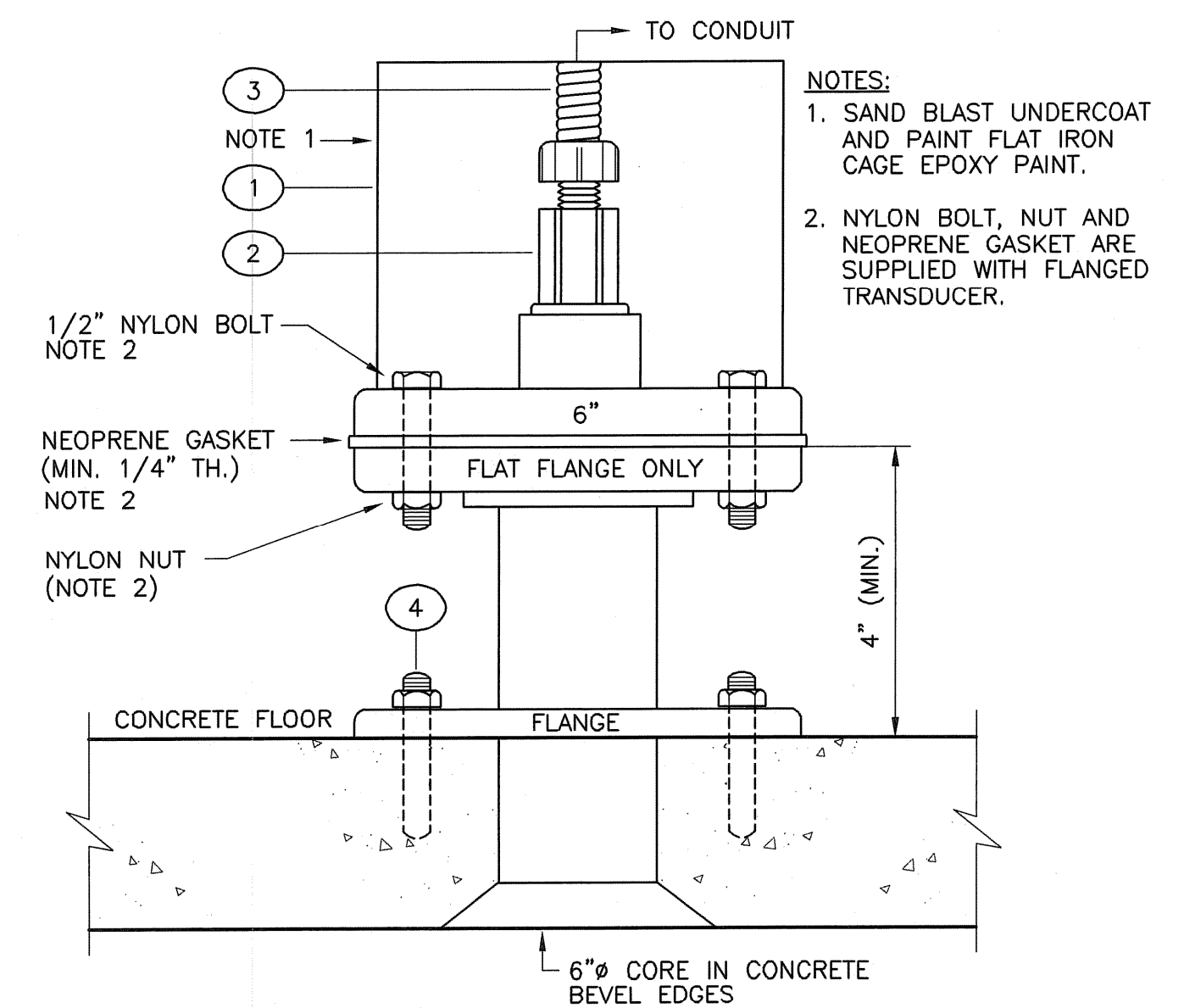
**FLOAT TYPE LEVEL SWITCH**  
NOT TO SCALE



**SUBMERSIBLE LEVEL TRANSDUCER**  
NOT TO SCALE



**DOMED TANK ULTRASONIC LEVEL SENSOR MOUNTING**  
NOT TO SCALE



ITEM	SIZE	QUANTITY	DESCRIPTION
1	1 1/2"	1	FLAT IRON CAGE
2	1"	1	PVC COUPLING
3	24"	1	LIQUID TIGHT FLEX CONDUIT
4	1/2"	2	STAINLESS STEEL ANCHOR BOLT C/W RED HD. CONC. ANCHORS

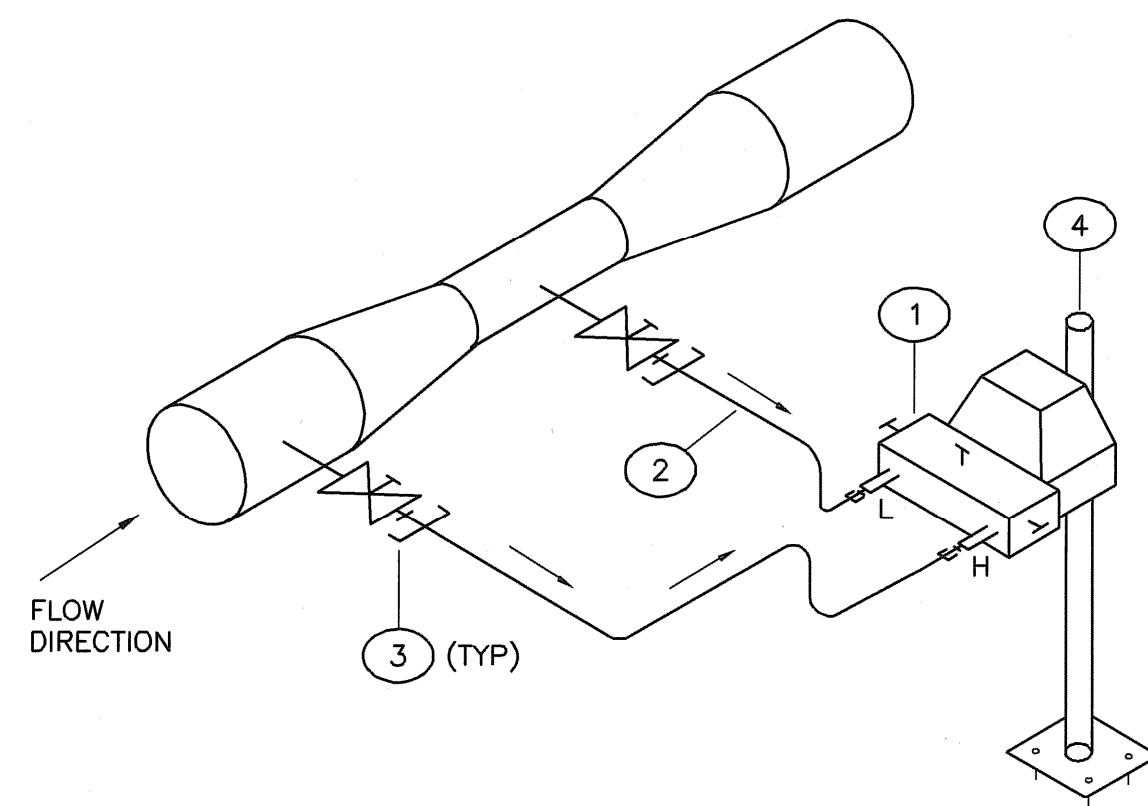
**ULTRASONIC LEVEL SENSOR MOUNTING DETAIL**  
NOT TO SCALE

**EARTH TECH**  
AS-BUILT FILE  
JULY 2008

**EarthTech**  
A Tyco International Ltd. Company  
300 BAKER AVENUE SUITE 250 CONCORD MA 01742 (978) 371-4000

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DRAWN BY	CONTRACT NO.
CHECKED BY	DATE
DATE	OCTOBER 31, 2008

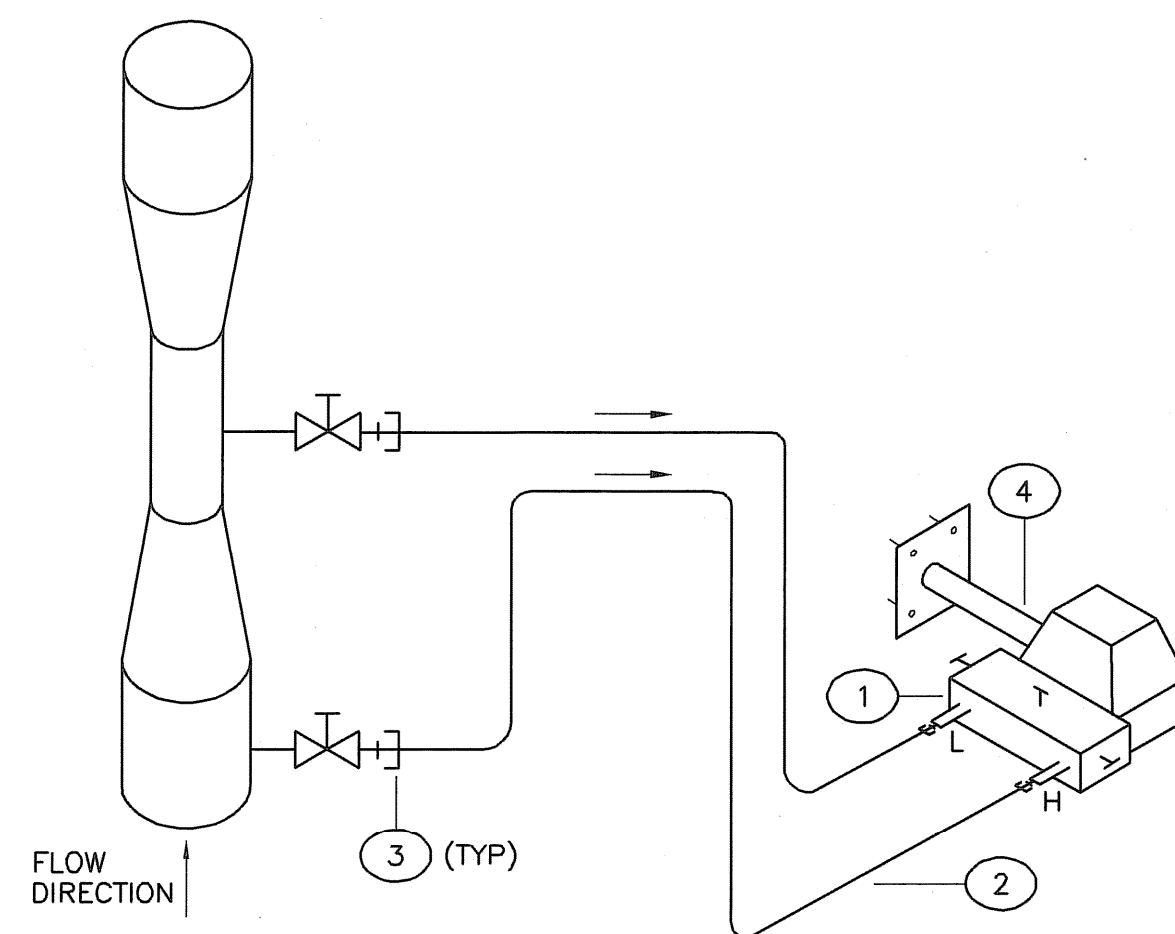
1-3  
SHEET OF



- NOTES:**
- ARROWS INDICATE DIRECTION OF SLOPE FOR SENSING LINE.
  - ON HORIZONTAL SERVICE, THE FLOW TRANSMITTER IS BELOW THE TAPS.
  - IF LIQUID SUSCEPTIBLE TO FREEZING INSULATE. SLOPE AT 1 IN 10.
  - INSTRUMENT SUPPORT TO SUIT LOCATION.
  - PROCESS LINE ISOLATION VALVES TO MATCH PROCESS LINE SPECIFICATION. TO BE SUPPLIED AND INSTALLED BY PIPING CONTRACTOR.

ITEM	SIZE	QUANTITY	DESCRIPTION
①	-	1	THREE VALVE MANIFOLD BLOCK
②	1/4"	AS REQ'D	O.D. S.S. TUBING-SWAGelok
③	1/4"	4	S.S. MALE TUBE CONNECTOR-SWAGelok
④	-	1	INSTRUMENT SUPPORT TO SUIT

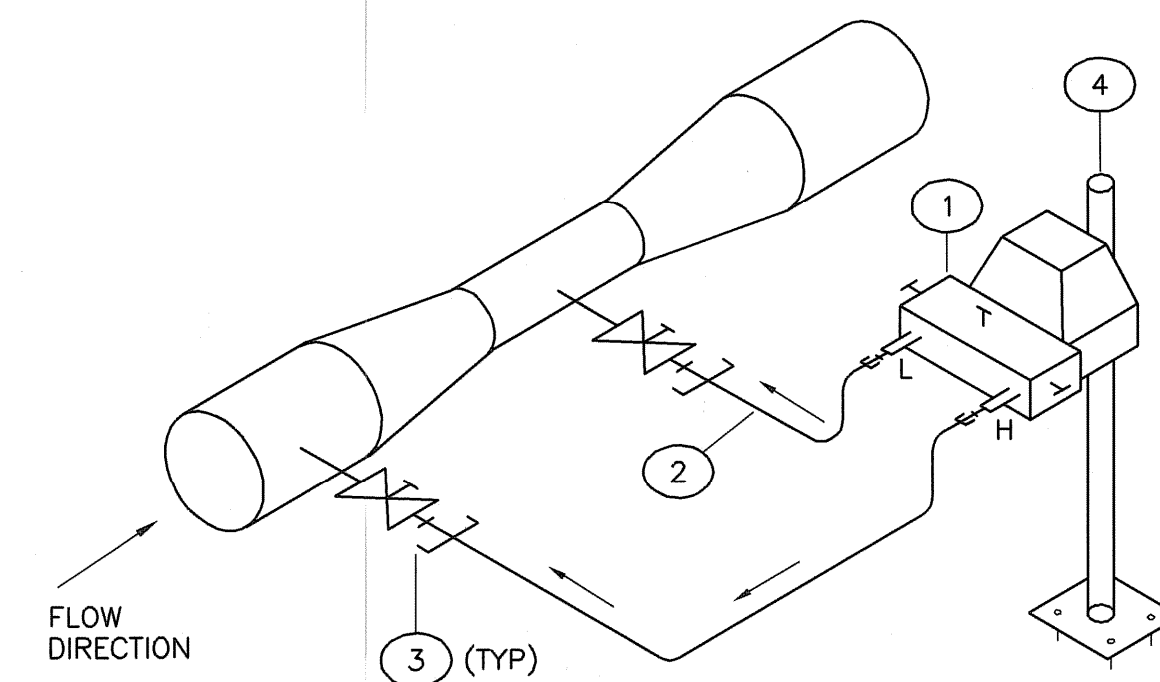
**LIQUID SERVICE VENTURI TUBE & FLOW TRANSMITTER**  
**HORIZONTAL FLOW**  
 NOT TO SCALE



- NOTES:**
- ARROWS INDICATE DIRECTION OF SLOPE FOR SENSING LINE.
  - INSTRUMENT SUPPORT TO SUIT LOCATION.
  - PROCESS LINE ISOLATION VALVES TO MATCH PROCESS LINE SPECIFICATION. TO BE SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR.
  - THE FLOW TRANSMITTER IS BELOW THE TAPS.

ITEM	SIZE	QUANTITY	DESCRIPTION
①	-	1	THREE VALVE MANIFOLD BLOCK
②	1/4"	AS REQ'D	O.D. S.S. TUBING-SWAGelok
③	1/4"	4	S.S. MALE TUBE CONNECTOR-SWAGelok
④	-	1	INSTRUMENT SUPPORT TO SUIT

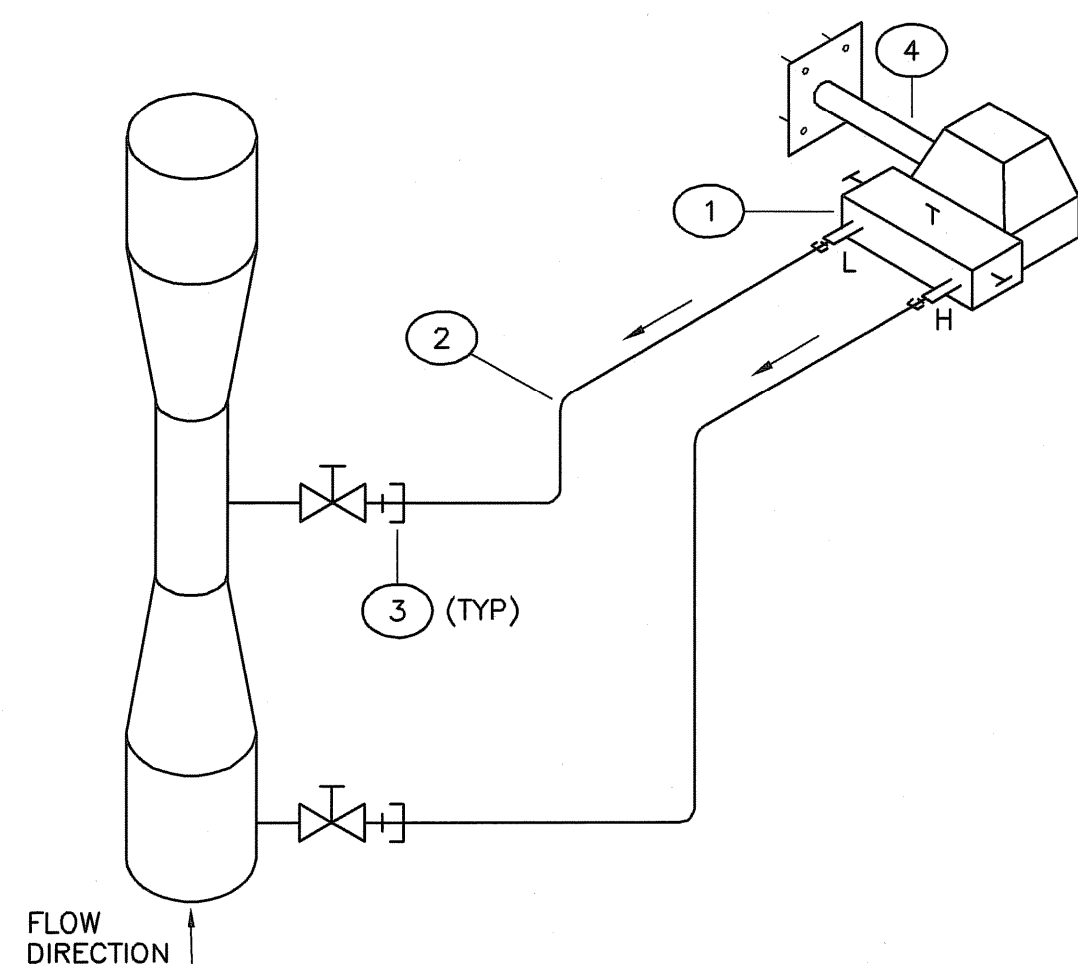
**LIQUID SERVICE VENTURI TUBE & FLOW TRANSMITTER**  
**VERTICAL FLOW**  
 NOT TO SCALE



- NOTES:**
- ARROWS INDICATE DIRECTION OF SLOPE FOR SENSING LINE.
  - ON HORIZONTAL SERVICE, THE FLOW TRANSMITTER IS ABOVE THE TAPS.
  - IF LIQUID SUSCEPTIBLE TO FREEZING INSULATE. SLOPE AT 1 IN 10.
  - INSTRUMENT SUPPORT TO SUIT LOCATION.
  - PROCESS LINE ISOLATION VALVES TO MATCH PROCESS LINE SPECIFICATION. TO BE SUPPLIED AND INSTALLED BY PIPING CONTRACTOR.

ITEM	SIZE	QUANTITY	DESCRIPTION
①	-	1	THREE VALVE MANIFOLD BLOCK
②	1/4"	AS REQ'D	O.D. S.S. TUBING-SWAGelok
③	1/4"	4	S.S. MALE TUBE CONNECTOR-SWAGelok
④	-	1	INSTRUMENT SUPPORT TO SUIT

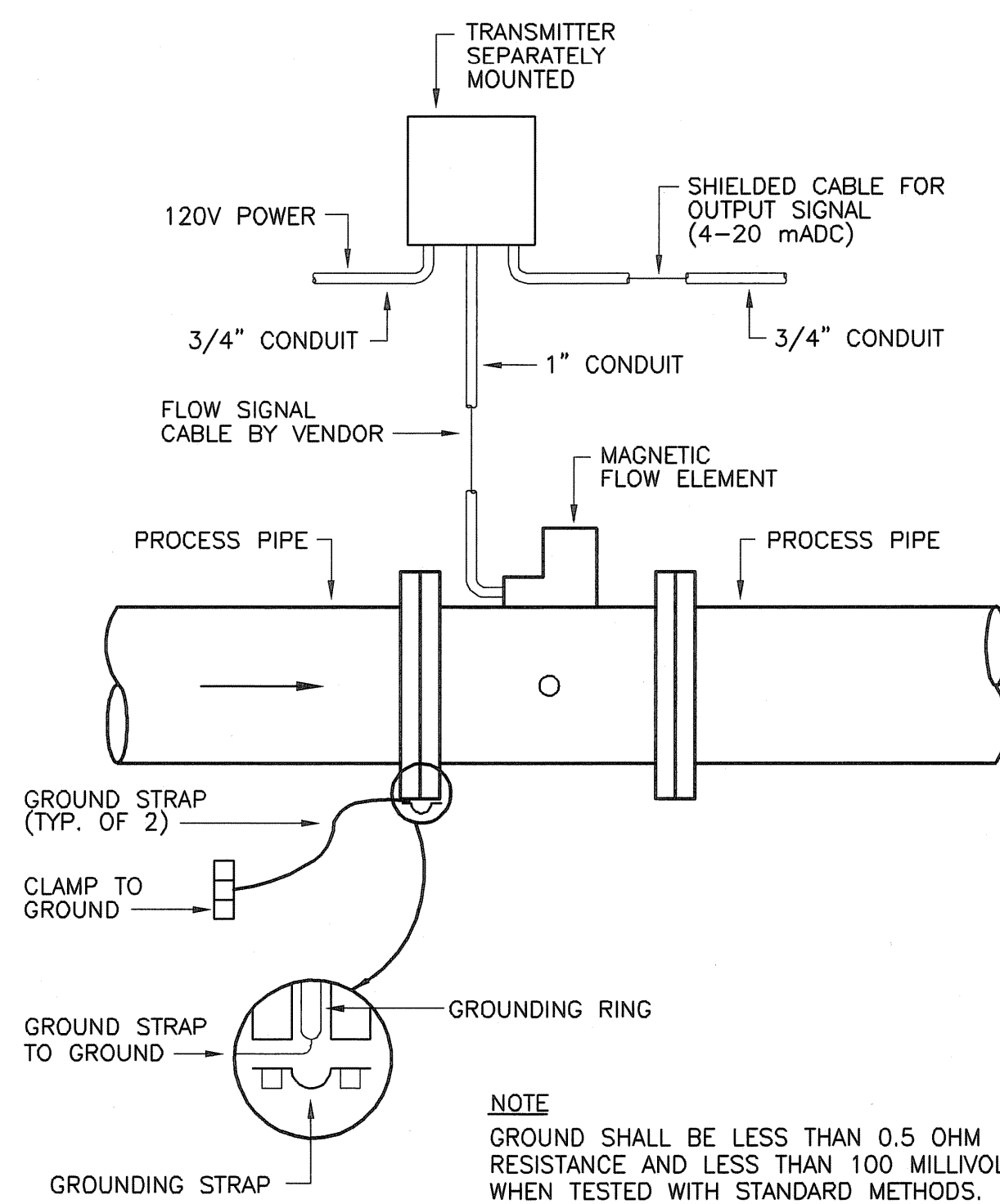
**GAS SERVICE VENTURI TUBE & FLOW TRANSMITTER**  
**HORIZONTAL FLOW**  
 NOT TO SCALE



- NOTES:**
- ARROWS INDICATE DIRECTION OF SLOPE FOR SENSING LINE.
  - INSTRUMENT SUPPORT TO SUIT LOCATION.
  - PROCESS LINE ISOLATION VALVES TO MATCH PROCESS LINE SPECIFICATION. TO BE SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR.
  - THE FLOW TRANSMITTER IS ABOVE THE TAPS.

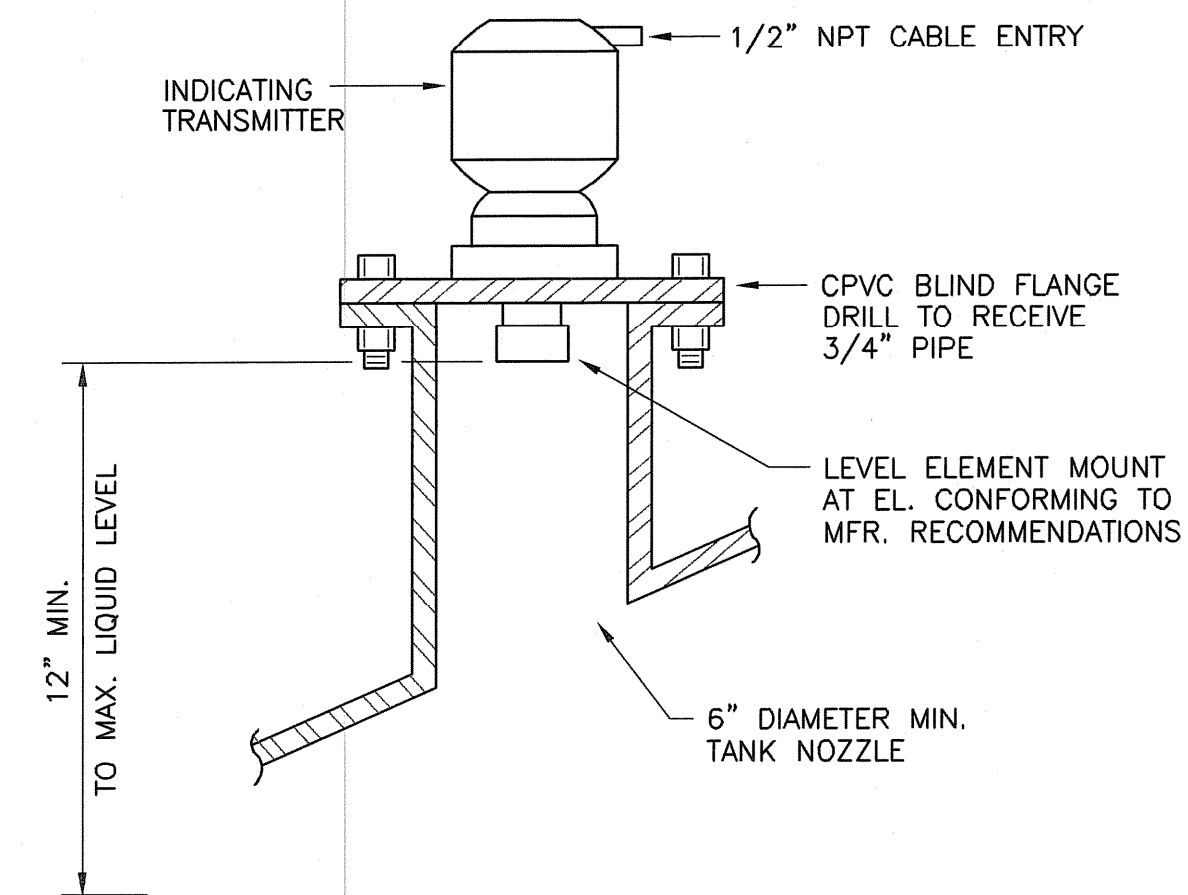
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①	-	1	THREE VALVE MANIFOLD BLOCK
②	1/4"	AS REQ'D	O.D. S.S. TUBING-SWAGelok
③	1/4"	4	S.S. MALE TUBE CONNECTOR-SWAGelok
④	-	1	INSTRUMENT SUPPORT TO SUIT

**GAS SERVICE VENTURI TUBE & FLOW TRANSMITTER**  
**VERTICAL FLOW**  
 NOT TO SCALE



**NOTE**  
 GROUND SHALL BE LESS THAN 0.5 OHM RESISTANCE AND LESS THAN 100 MILLIVOLT WHEN TESTED WITH STANDARD METHODS.

**MAGNETIC FLOW METER FLANGED**  
**REMOTE TRANSMITTER MOUNTING DETAIL**  
 NOT TO SCALE



**DOMED TANK**  
**ULTRASONIC LEVEL SENSOR**  
**AND TRANSMITTER MOUNTING**  
 NOT TO SCALE

NO.	BY	DATE	REVISIONS
2	DFB	JULY 2008	AS-BUILT DRAWING FILE
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0	DFB	11-08-05	ISSUED FOR CONSTRUCTION

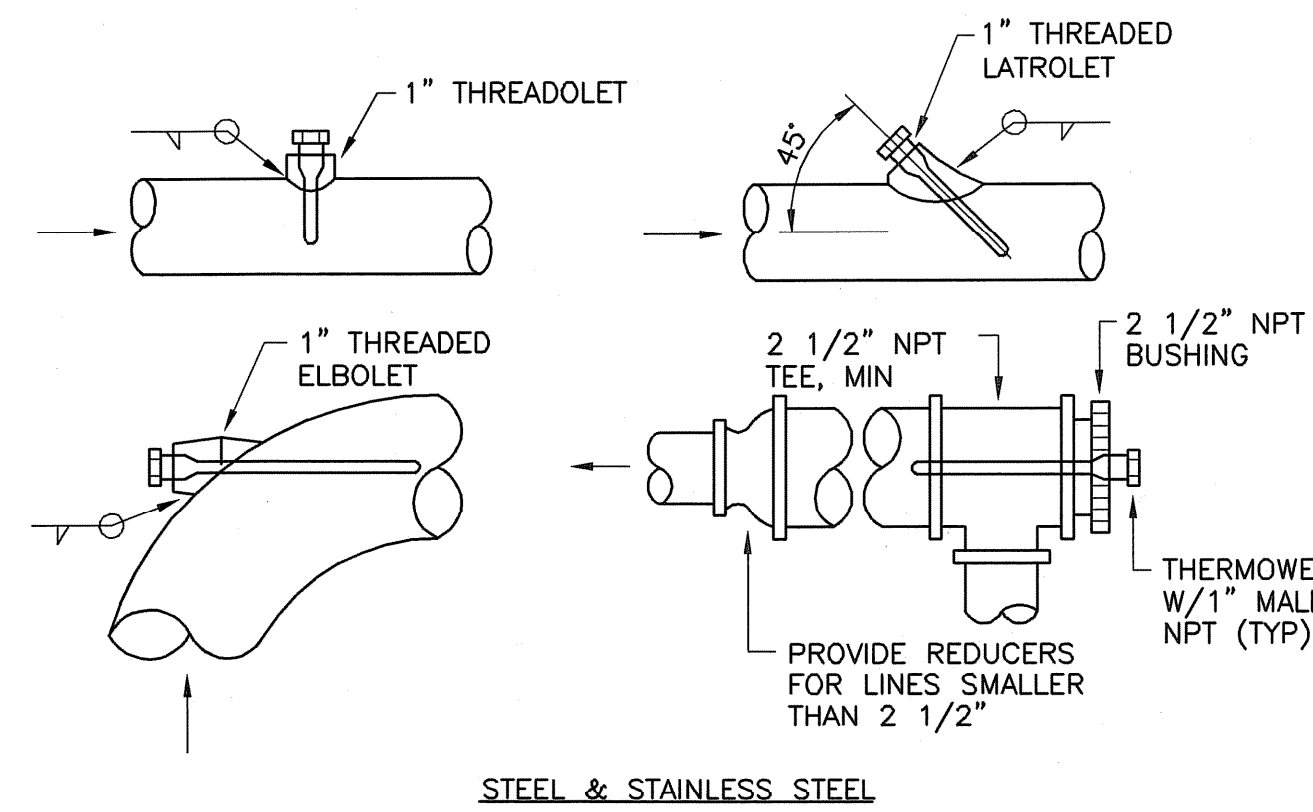
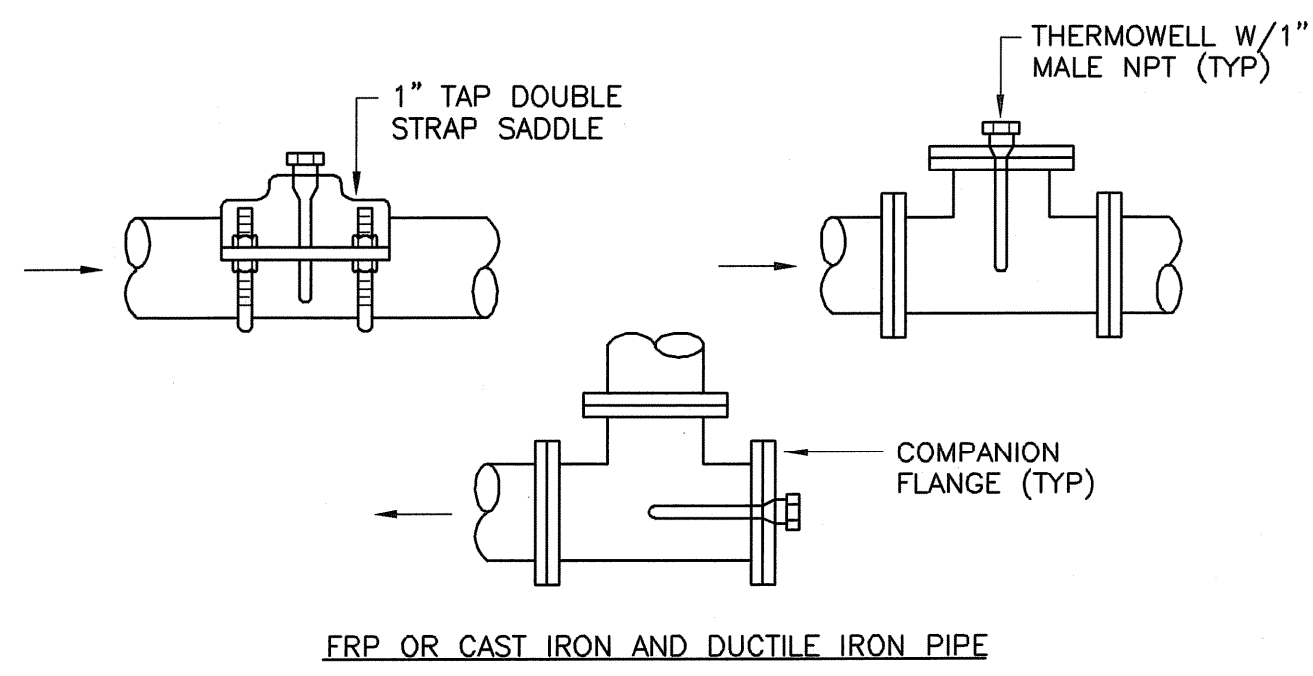
ROBERT H. SHELDON  
 No. 4103  
 5/2/08

PAWTUCKET, RHODE ISLAND  
**PAWTUCKET REGIONAL**  
**WATER TREATMENT FACILITY**  
**PKG 8A - INSTRUMENTATION**  
 INSTALLATION DETAILS - II

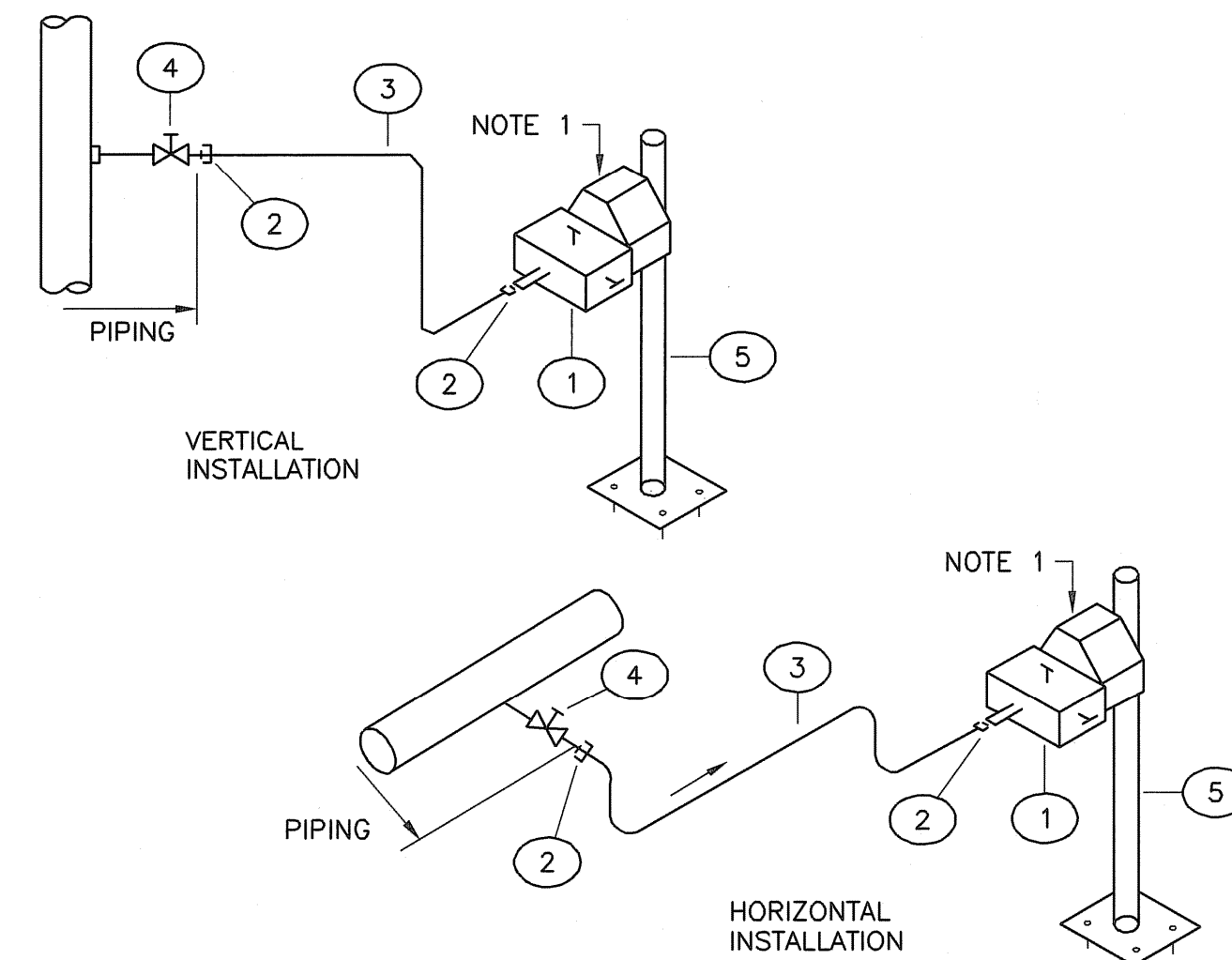
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DRAWN BY	JAZ	CONTRACT NO.	
CHECKED BY	DFB	DATE	OCTOBER 31, 2008

**EARTH TECH**  
**AS-BUILT FILE**  
 JULY 2008

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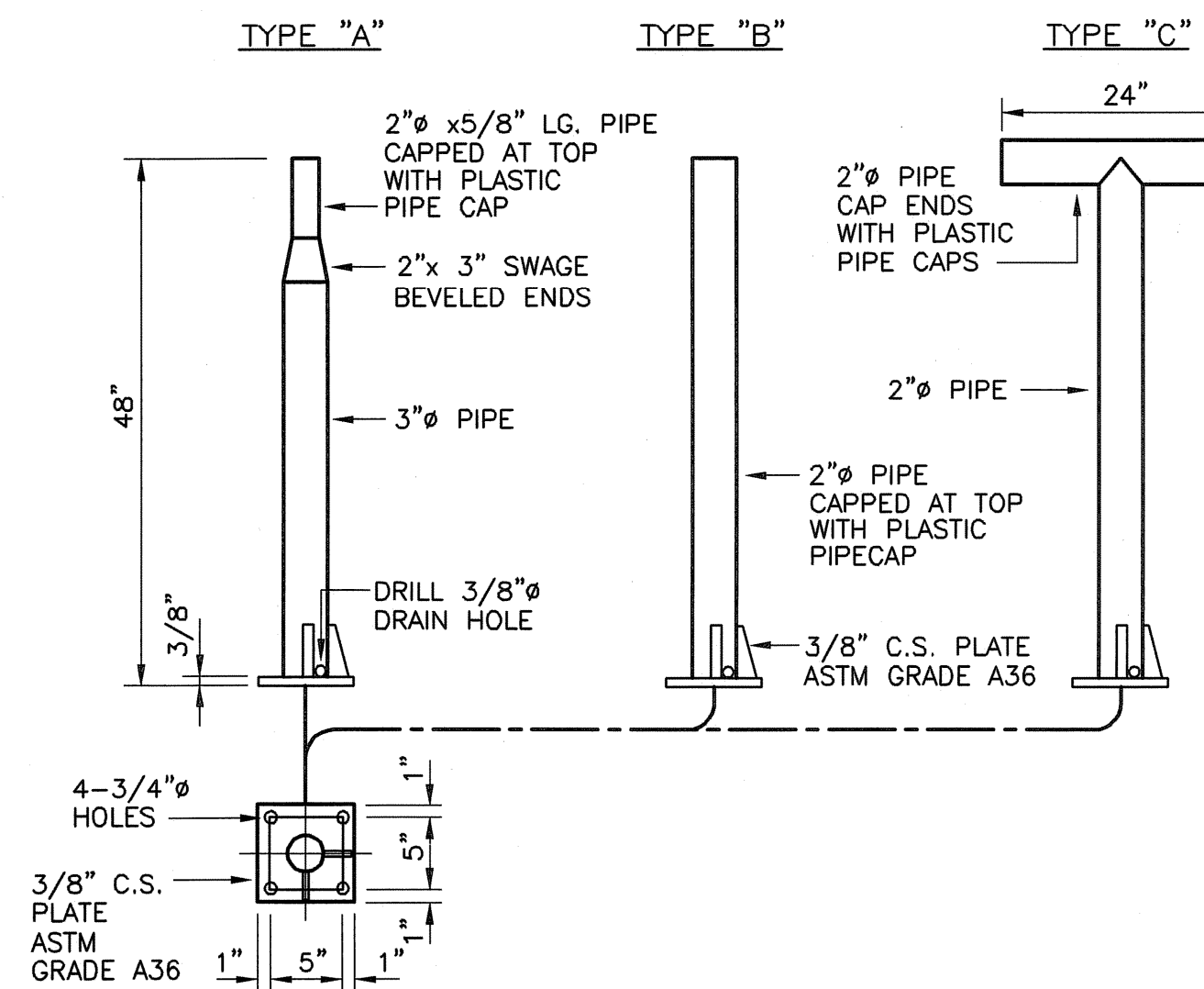
**THERMOWELL INSTALLATION DETAILS**  
NOT TO SCALE



- NOTES:**
1. PRESSURE INSTRUMENT TO BE MOUNTED ON PIPE STAND ABOVE PIPING CONNECTION.
  2. PRESSURE GAUGE TO BE INSTALLED AT EACH POINT OF PRESSURE INSTRUMENT INSTALLATION.

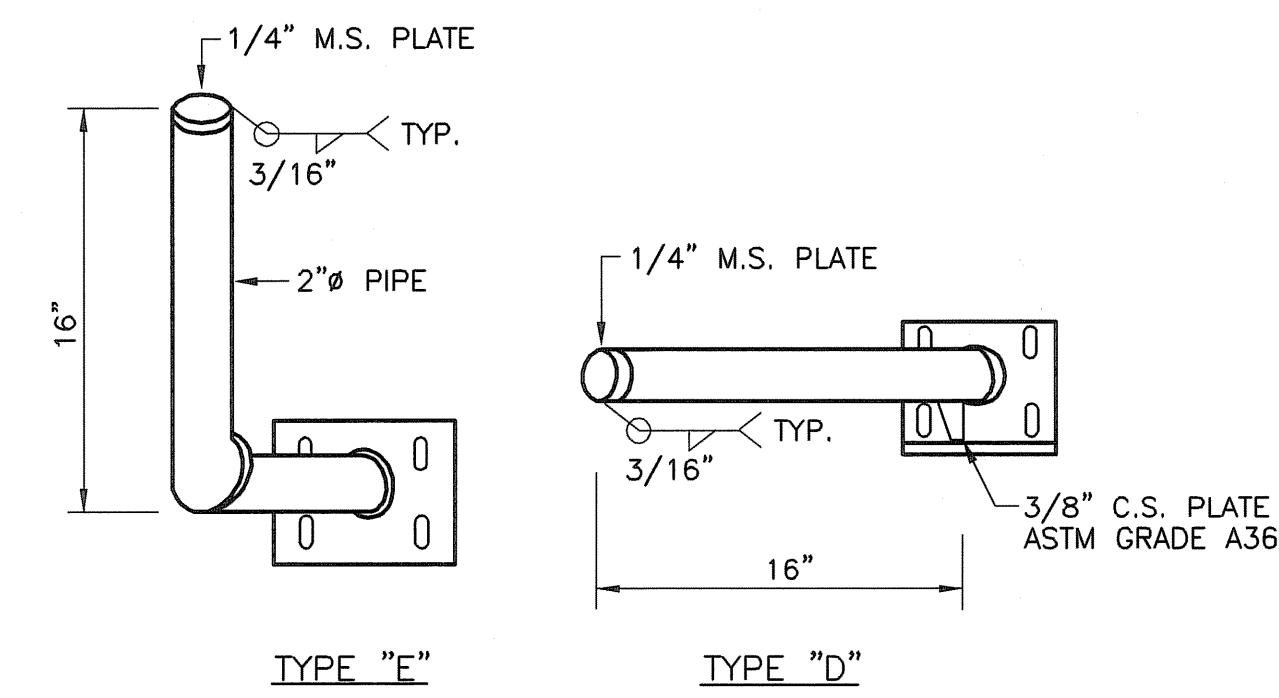
ITEM	SIZE	QUANTITY	DESCRIPTION
1	1/2"	1	2 VALVE MANIFOLD
2	1/2"x 1/2"	2	MALE CONNECTOR, 316 S.S., 1/2" O.D. TUBE x 1/2" NPT, SWAGelok
3	1/2"	1	TUBING, 304 S.S., 1/2" O.D., .049" WALL
4	-	-	ROOT VALVE C/W BLOW DOWN
5	-	-	INSTRUMENT PIPE STAND

**PRESSURE INSTRUMENT INSTALLATIONS**  
(CLEAN LIQUID SERVICE)  
NOT TO SCALE



- NOTES:**
1. PIPE STANDS FULL PERIMETER WELDED TO BASE PLATE STRENGTHENED WITH TWO 3/8" GUSSETS WELDED 90° APART.
  2. SANDBLAST AND PAINT WITH EPOXY BASED PAINT
  3. REMOVE ALL CORNERS AND SHARP EDGES
  4. PIPE STANDS CAN BE FABRICATED OR PURCHASED FROM "ANDERSON-GREENWOOD" (OR EQUAL)
  5. BOLTS, WASHERS AND NUTS SHALL BE ZINC OR CADMIUM PLATED

**INSTRUMENT SUPPORT STAND**  
NOT TO SCALE



- NOTES:**
1. PIPE STANDS FULL PERIMETER WELDED TO BASE PLATE AND STRENGTHENED WITH ONE 3/8" WELDED GUSSET.
  2. REMOVE ALL CORNERS AND SHARP EDGES.
  3. SAND BLAST, UNDERCOAT AND PAINT WITH EPOXY BASED PAINT IN ACCORDANCE WITH SECTION 09900.
  4. PIPE STANDS CAN BE FABRICATED OR PURCHASED FROM "OBRIAN", OR "ANDERSON-GREENWOOD" (OR EQUAL).
  5. BOLTS, WASHERS AND NUTS SHALL BE ZINC OR CADMIUM PLATED.

**INSTRUMENT SUPPORT STAND**  
NOT TO SCALE

FULL SIZE DRAWING = 4"

NO.	BY	DATE	REVISIONS
2	DFP	JULY 2008	
1		10-31-06	ISSUED FOR RFI POSTED SET
0	DFP	4-08-05	ISSUED FOR CONSTRUCTION

ROBERT H. SHELDON  
No. 4103  
3/17/08

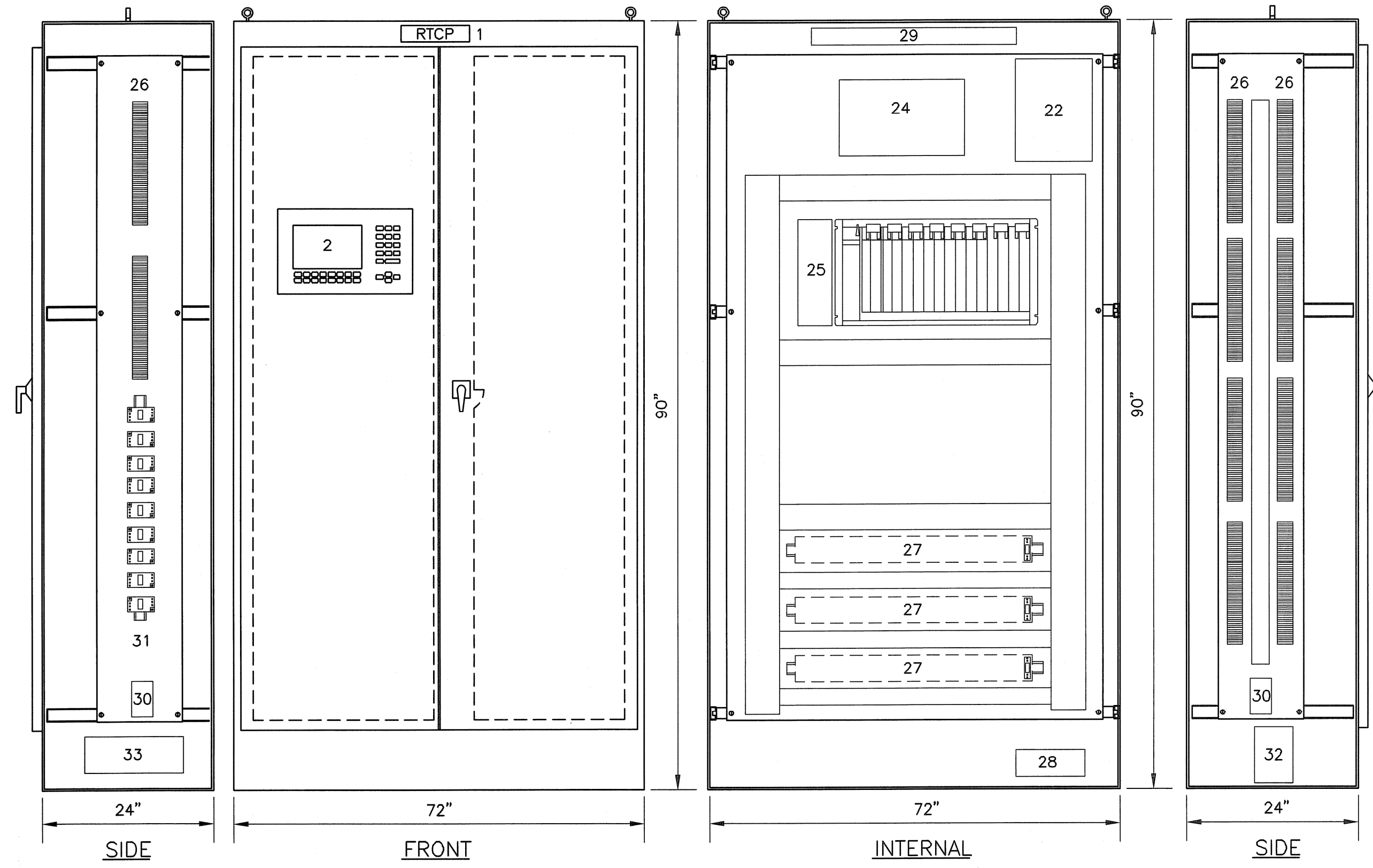
PAWTUCKET, RHODE ISLAND  
**PAWTUCKET REGIONAL WATER TREATMENT FACILITY**  
**PKG 8A - INSTRUMENTATION**  
INSTALLATION DETAILS - III

DESIGNED BY DF	DWG SCALE AS NOTED
DRAWN BY JAZ	CONTRACT NO.
CHECKED BY DF	DATE OCTOBER 31, 2008

**EARTH TECH**  
AS-BUILT FILE  
JULY 2008

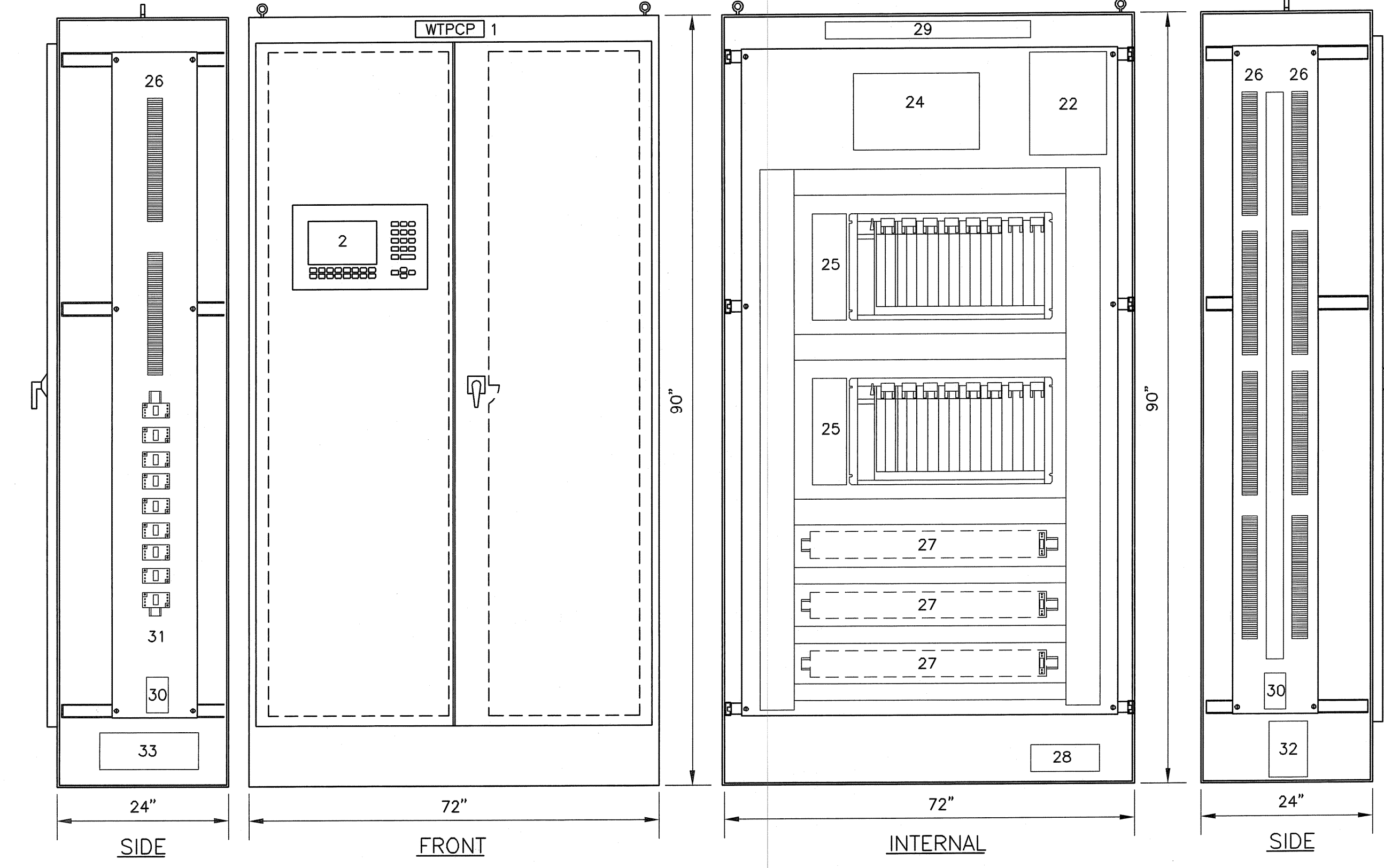
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**RTCP REMOTE TELEMETRY CONTROL PANEL**

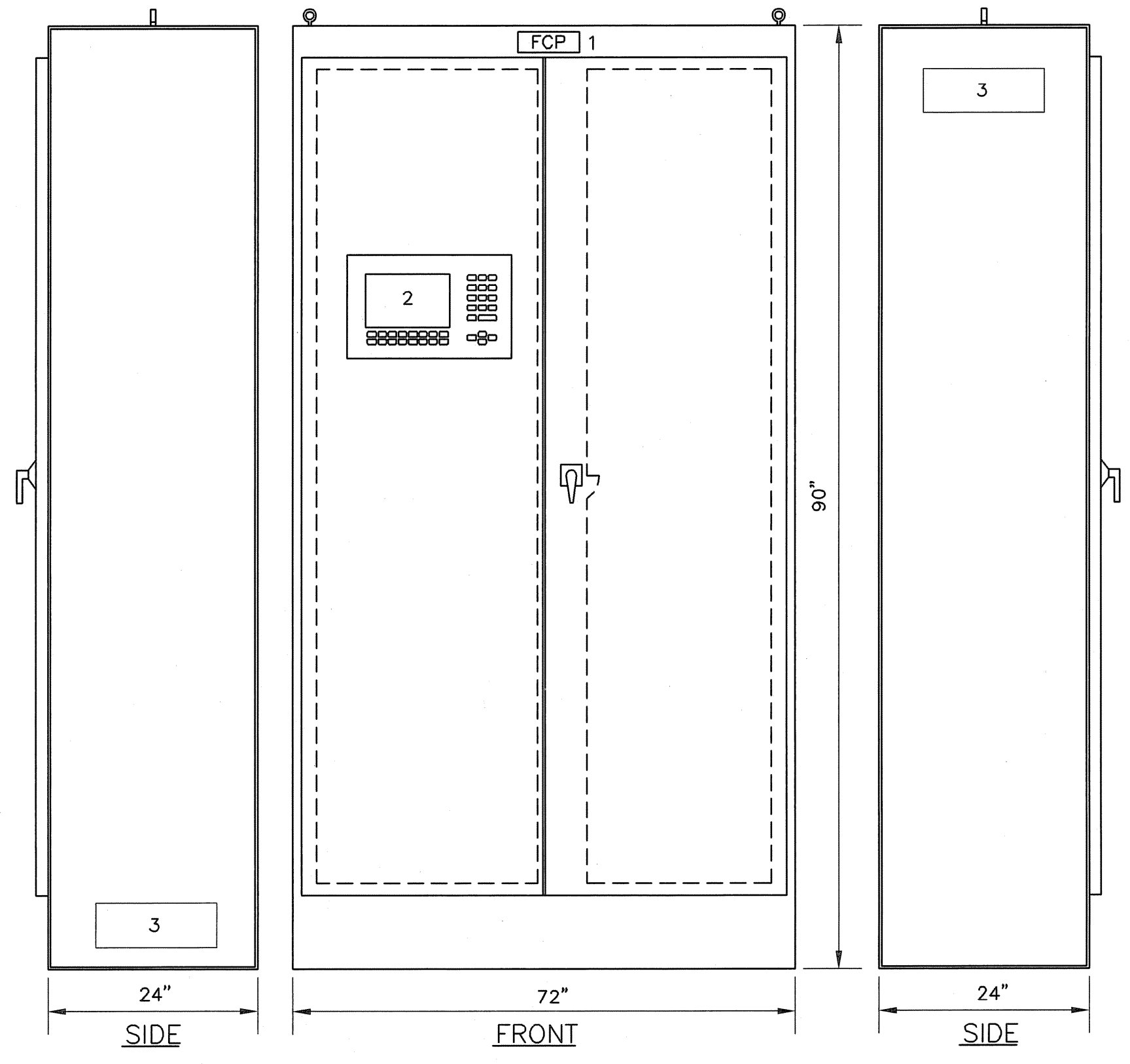
ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	RTCP
2	---	OPERATOR INTERFACE TERMINAL	---
22	PB-1	PANELBOARD	CONTROL POWER
24	---	ETHERNET SWITCH	---
25	---	PLC	---
26	---	TERMINAL BLOCKS	RTCP
27	---	RELAYS	---
28	M-01	RADIO MODEM	---
29	---	PANEL LIGHT	---
30	---	120V AC RECEPTACLE	---
31	---	24V DC POWER SUPPLIES	---
32	---	UNINTERRUPTIBLE POWER SUPPLY	---
33	---	VENTILATION PACKAGE	---



**WTPCP WATER TREATMENT PLANT CONTROL PANEL**

ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	WTPCP
2	---	OPERATOR INTERFACE TERMINAL	---
22	PB-1	PANELBOARD	CONTROL POWER
24	---	ETHERNET SWITCH	---
25	---	PLC	---
26	---	TERMINAL BLOCKS	WTPCP
27	---	RELAYS	---
28	---	PANEL LIGHT	---
29	---	120V AC RECEPTACLE	---
30	---	24V DC POWER SUPPLIES	---
31	---	UNINTERRUPTIBLE POWER SUPPLY	---
32	---	UNINTERRUPTIBLE POWER SUPPLY	---
33	---	VENTILATION PACKAGE	---

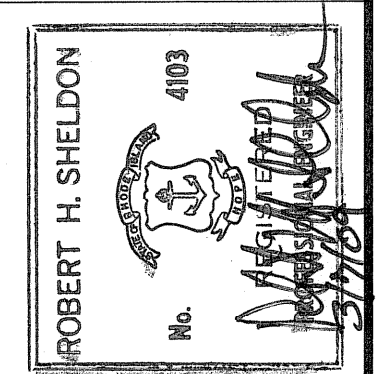
PANEL	LOCATION	NEMA RATING
WTPCP	FILTER GALLERY	4
FCP	FILTER GALLERY	4
RTCP	ELECTRICAL ROOM	12
PMCP	SWITCHGEAR ENCLOSURE	12



**SUGGESTED FCP FILTER CONTROL PANEL**

ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	FCP
2	---	OPERATOR INTERFACE TERMINAL	---
3	---	VENTILATION PACKAGE	---

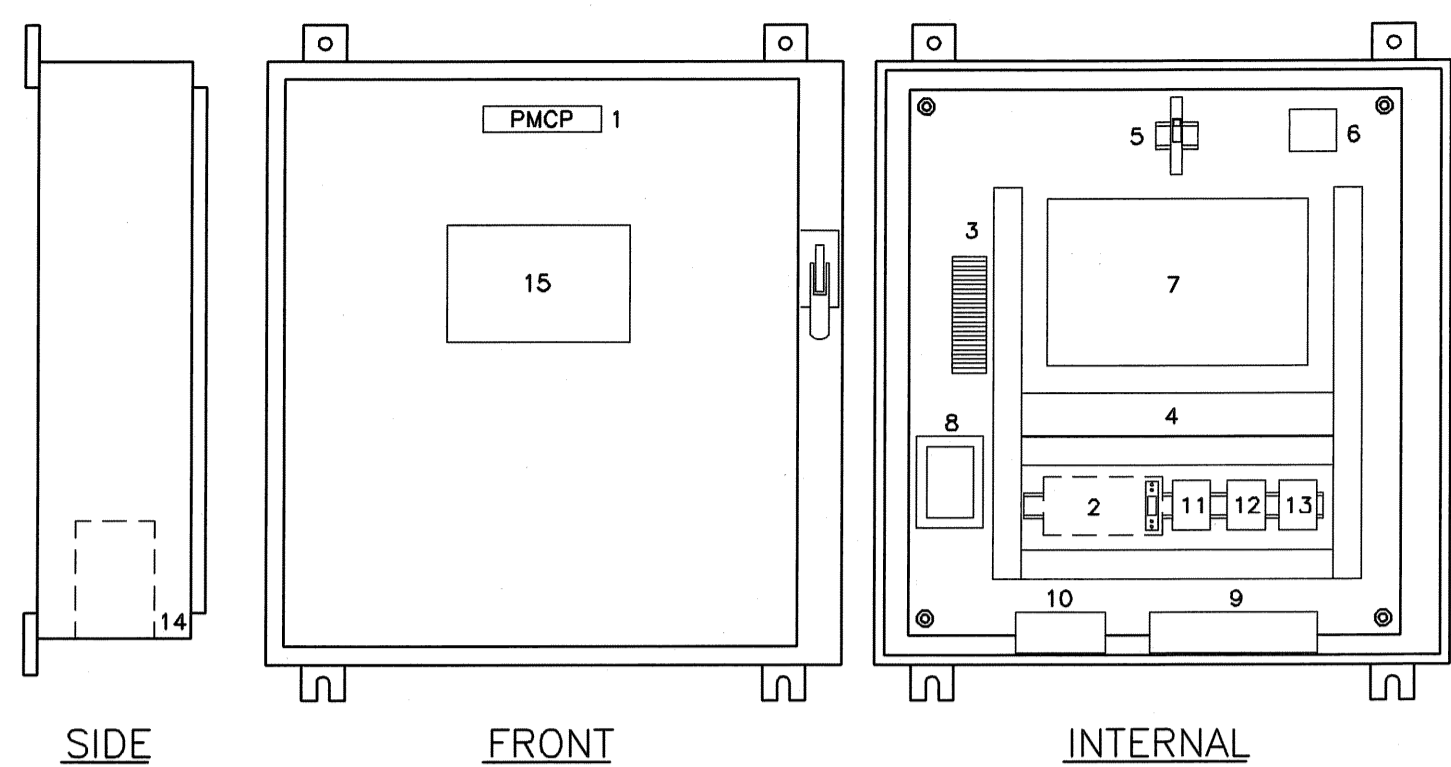
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1	ISSUED FOR RFI POSTED SET	10-31-06	DFB	
0	ISSUED FOR CONSTRUCTION	04-08-05	DFB	



PAWTUCKET, RHODE ISLAND  
**PAWTUCKET REGIONAL  
 WATER TREATMENT FACILITY**  
**PKG 8A - INSTRUMENTATION**  
 CONTROL PANEL LAYOUTS - 1

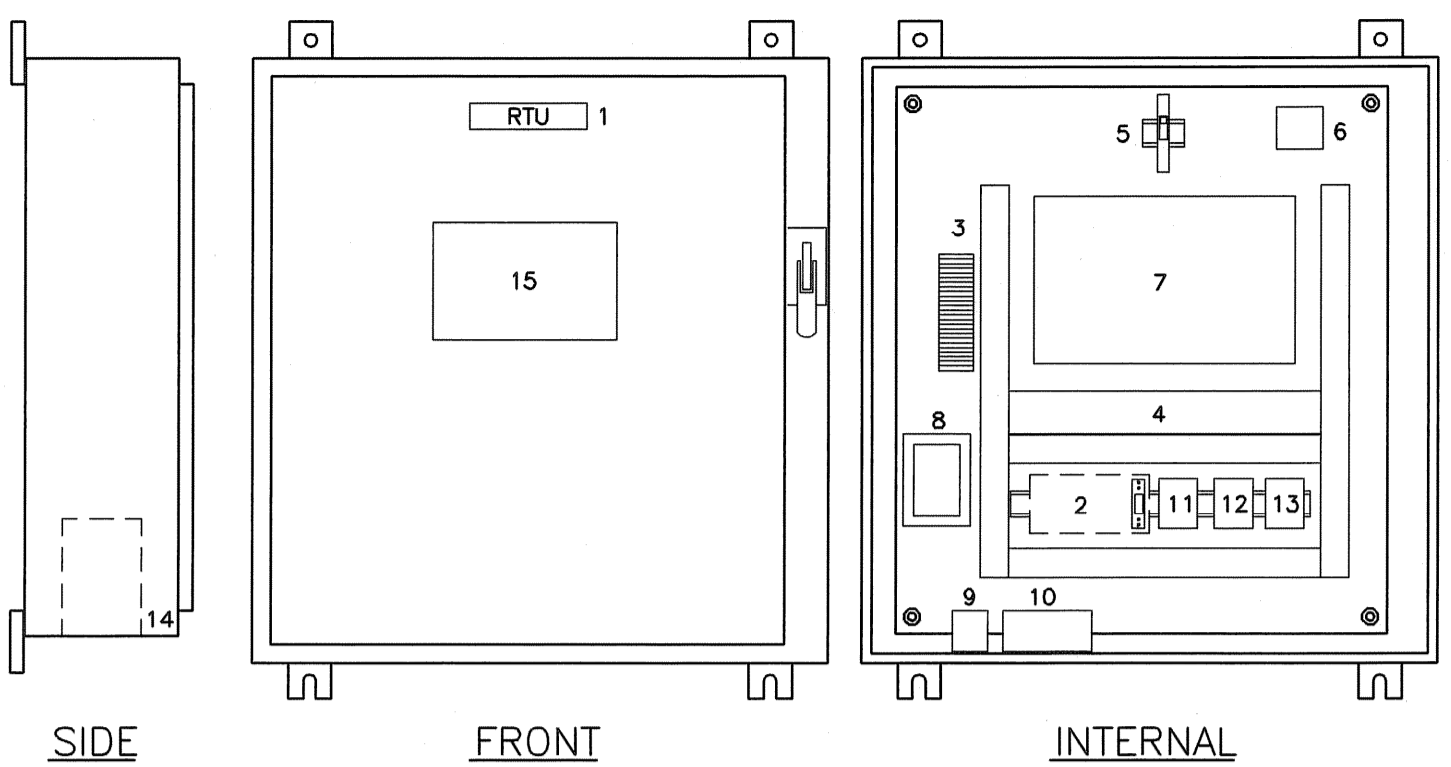
DESIGNED BY	DWG SCALE
DF	AS NOTED
DRAWN BY	CONTRACT NO
JAZ	
CHECKED BY	DATE
DF	OCTOBER 31, 2008

**EARTH TECH**  
 AS-BUILT FILE  
 JULY 2008



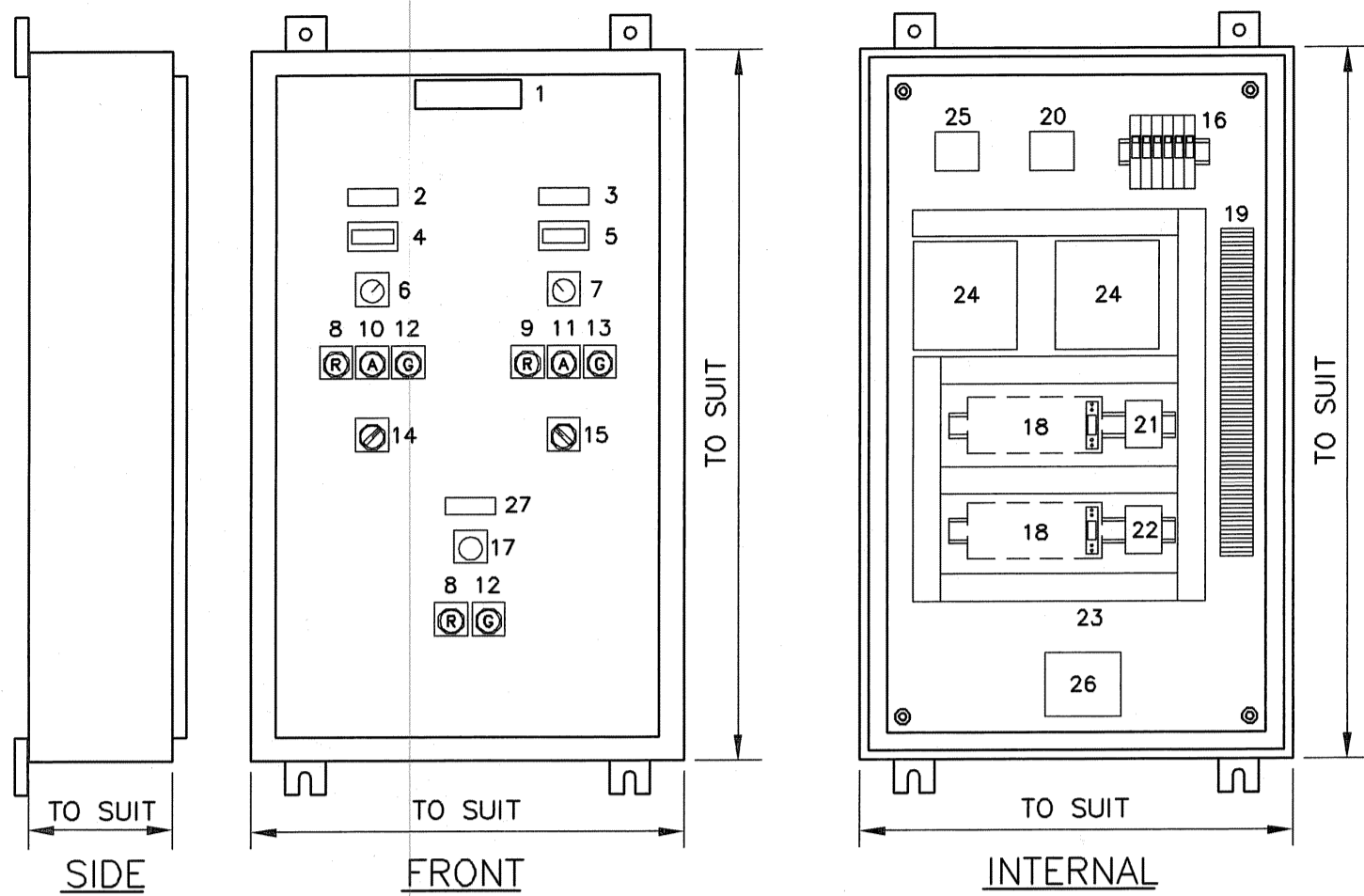
**PMCP POWER MONITORING CONTROL PANEL**

ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	PMCP
2	---	RELAYS	PER DWGS.
3	---	TERMINAL BLOCKS	PER DWGS.
4	---	PLASTIC WIRING DUCT	---
5	CB-1	CIRCUIT BREAKER	CB-1 CONTROL PANEL
6	SA-1	SURGE ARRESTER-POWER	---
7	PER DWGS.	PLC EQUIPMENT	---
8	R-1	RECEPTACLE	---
9	---	ETHERNET SWITCH	---
10	PER DWGS.	POWER SUPPLY 24V DC	---
11	PER DWGS.	TERMINAL BLOCKS-AC	PER DWGS.
12	PS-1	POWER SUPPLY 24V DC	---
13	PER DWGS.	TERMINAL BLOCKS DC	PER DWGS.
14	---	UPS	---
15	---	OPERATOR INTERFACE TERMINAL	---



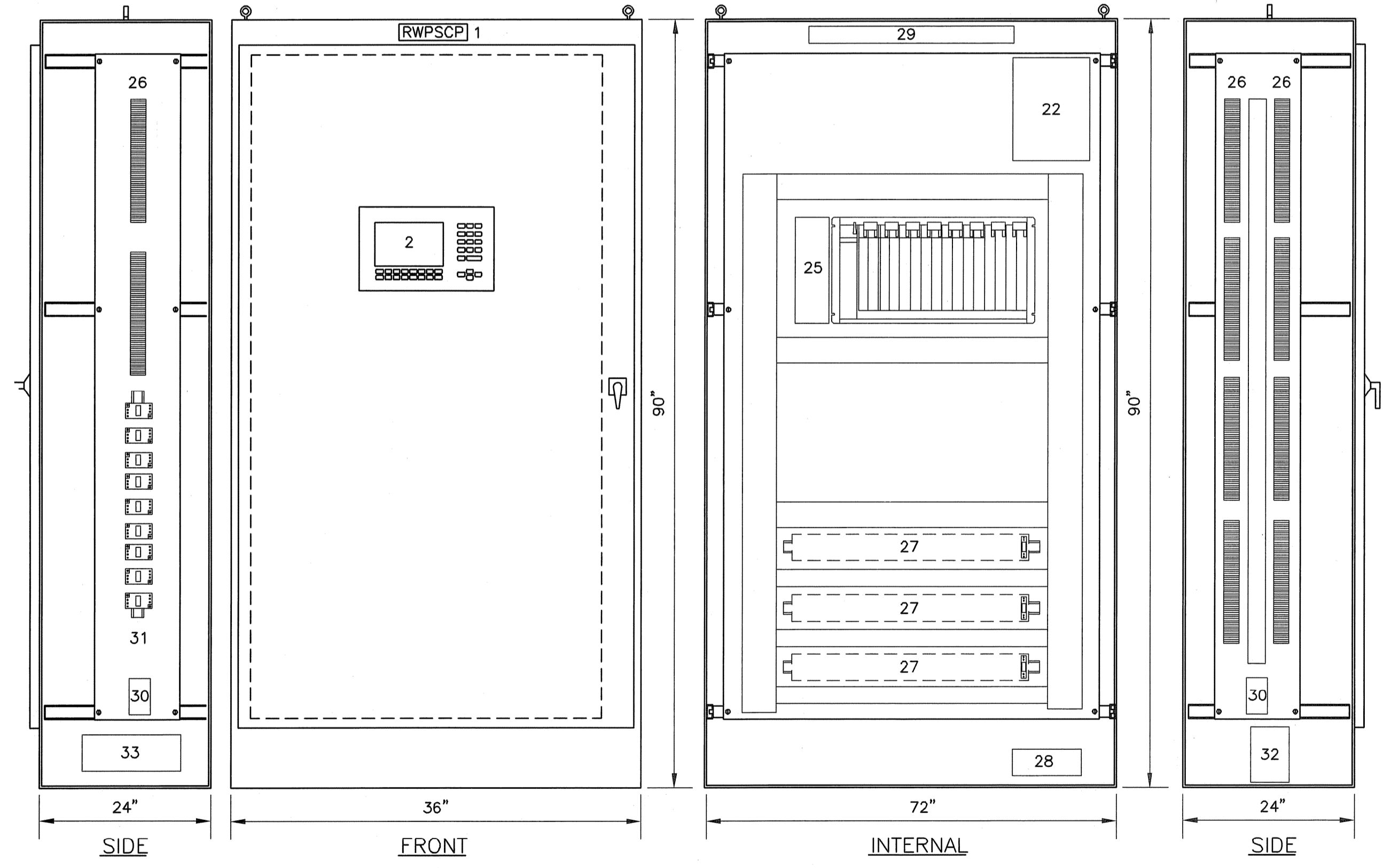
**TYPICAL RTU CONTROL PANEL**

ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	RTU NAMEPLATE PER DWGS.
2	---	RELAYS	PER DWGS.
3	---	TERMINAL BLOCKS	PER DWGS.
4	---	PLASTIC WIRING DUCT	---
5	CB-1	CIRCUIT BREAKER	CB-1 CONTROL PANEL
6	SA-1	SURGE ARRESTER-POWER	---
7	PER DWGS.	PLC EQUIPMENT	---
8	R-1	RECEPTACLE	---
9	SA-2	SURGE ARRESTER-COMMUNICATIONS	---
10	PER DWGS.	RADIO MODEM	---
11	PER DWGS.	TERMINAL BLOCKS-AC	PER DWGS.
12	PS-1	POWER SUPPLY 24V DC	---
13	PER DWGS.	TERMINAL BLOCKS DC	PER DWGS.
14	---	UPS	---
15	---	OPERATOR INTERFACE TERMINAL	---



**TYPICAL CHEMICAL FEED CONTROL PANEL**

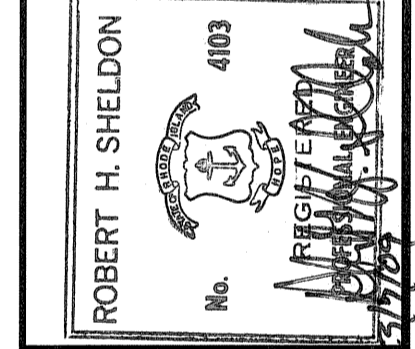
ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	PER SPECIFICATIONS
2	---	NAMEPLATE	METERING PUMP NO. 1
3	---	NAMEPLATE	METERING PUMP NO. 2
4	SI-***	SPEED INDICATOR	---
5	SI-***	SPEED INDICATOR	---
6	SK-***	HAND SPEED CONTROLLER	SPEED POT
7	SK-***	HAND SPEED CONTROLLER	SPEED POT
8	IL-***	INDICATING LIGHT - RED	RUN
9	IL-***	INDICATING LIGHT - RED	RUN
10	IL-***	INDICATING LIGHT - AMBER	FAULT
11	IL-***	INDICATING LIGHT - AMBER	FAULT
12	IL-***	INDICATING LIGHT - GREEN	OFF
13	IL-***	INDICATING LIGHT - GREEN	OFF
14	HS-***	HAND SWITCH - SELECTOR	HAND-OFF-REMOTE
15	HS-***	HAND SWITCH - SELECTOR	HAND-OFF-REMOTE
16	CB-*	CIRCUIT BREAKER	PER SPECIFICATIONS
17	HS-*	HAND SWITCH - PUSHBUTTON	START/STOP
18	---	RELAYS	---
19	---	TERMINAL BLOCKS	---
20	SA-1	SURGE ARRESTER	---
21	I/I-***	CONVERTER	---
22	I/I-***	CONVERTER	---
23	---	PLASTIC WIRING DUCT	---
24	---	VARIABLE FREQUENCY DRIVE	---
25	---	CONTROL POWER TRANSFORMER	---
26	---	MOTOR STARTER	---
27	---	NAMEPLATE	TRANSFER PUMP



**RWPSCP RAW WATER PUMP STATION CONTROL PANEL**

ITEM	TAG	DESCRIPTION	NAMEPLATE
1	---	NAMEPLATE	RWPSCP
2	---	OPERATOR INTERFACE TERMINAL	---
22	PB-1	PANELBOARD	CONTROL POWER
24	---	---	---
25	---	PLC	---
26	---	TERMINAL BLOCKS	---
27	---	RELAYS	---
28	M-01	RADIO MODEM	---
29	---	PANEL LIGHT	---
30	---	120V AC RECEPTACLE	---
31	---	24V DC POWER SUPPLIES	---
32	---	UNINTERRUPTIBLE POWER SUPPLY	---
33	---	VENTILATION PACKAGE	---

NO.	DATE	BY	REVISIONS
1	10-31-06	DOF	H-08-05
2	AS-BUILT DRAWING FILE	DPB	JULY 2008
1	ISSUED FOR RFI POSTED SET		
0	ISSUED FOR CONSTRUCTION		



PAWTUCKET, RHODE ISLAND  
**PAWTUCKET REGIONAL WATER TREATMENT FACILITY**  
**PKG 8A - INSTRUMENTATION**  
CONTROL PANEL LAYOUTS - II

DESIGNED BY	DWG SCALE
DOF	AS NOTED
DRAWN BY	CONTRACT NO
AJZ	
CHECKED BY	DATE
DOF	OCTOBER 31, 2006

**EARTH TECH**  
AS-BUILT FILE  
JULY 2008

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