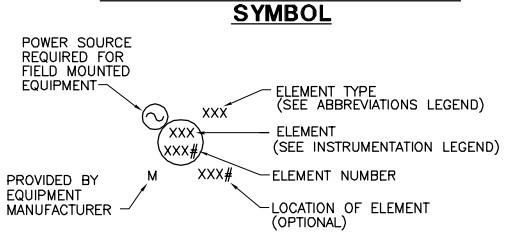
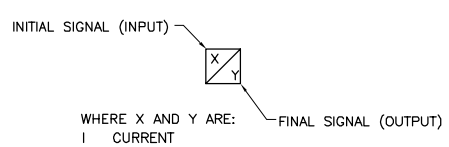
INSTRUMENTATION SYMBOL LEGEND

PROPOSED	DESCRIPTION	EXISTING	DESCRIPTION
	PROCESS FLOW		ELECTRICAL POWER OR PROCESS CONNECTION
	ELECTRICAL POWER OR PROCESS CONNECTION		ELECTRICAL SIGNAL
	ELECTRICAL SIGNAL		DATA LINK
	DATA LINK		PLC INPUT/OUTPUT
I/O	PLC INPUT/OUTPUT	I/O	
	PNEUMATIC SIGNAL		PNEUMATIC SIGNAL
	HYDRAULIC SIGNAL		HYDRAULIC SIGNAL
I/O	DISCRETE OUTPUT SIGNAL	I/O	DISCRETE OUTPUT SIGNAL
I/O	ANALOG OUTPUT SIGNAL	I/O	ANALOG OUTPUT SIGNAL
I/O	DISCRETE INPUT SIGNAL	I/O	DISCRETE INPUT SIGNAL
I/O	ANALOG INPUT SIGNAL	I/O	ANALOG INPUT SIGNAL
I XX#	INTERLOCK (INTERLOCK I.D. NUMBER)	I XX#	INTERLOCK (INTERLOCK I.D. NUMBER)
	PROGRAMMABLE LOGIC CONTROLLER		PROGRAMMABLE LOGIC CONTROLLER
	OPERATOR TERMINAL INTERFACE		OPERATOR TERMINAL INTERFACE
	CONTROLLER		CONTROLLER
	LOCAL(FIELD MOUNTED)		LOCAL(FIELD MOUNTED)
	FRONT PANEL MOUNTED		FRONT PANEL MOUNTED
	REAR PANEL MOUNTED		REAR PANEL MOUNTED
	INTEGRAL EQUIPMENT		INTEGRAL EQUIPMENT
X Y	SIGNAL SPLITTER CONVERTER/ BOOSTER (SEE BELOW)	X Y	SIGNAL SPLITTER CONVERTER/ BOOSTER (SEE BELOW)
M	MOTOR	M	MOTOR
	ALARM/ STATUS LIGHT		ALARM/ STATUS LIGHT

TYPICAL INSTRUMENTATION SYMBOL



TYPICAL SIGNAL CONVERTER SYMBOL



WHERE X AND Y ARE:
- I CURRENT
- E VOLTAGE
- P PRESSURE
- H HYDRAULIC

* ALSO USED AS A MODIFIER AFTER FIRST LETTER (i.e. PDIT: PRESSURE DIFFERENTIAL INDICATING TRANSMITTER)

** ALSO USED AS A MODIFIER AFTER LAST LETTER (i.e. LSHH: LEVEL SWITCH HIGH HIGH)

INSTRUMENTATION LEGEND

FIRST LETTER 1		SUCCEEDING LETTER 2	3
A	ANALYSIS	ALARM	--
B	--	--	--
C	CONTROL	CONTROL	CONTROL
D	DIFFERENTIAL*	DETECT	--
E	--	ELEMENT	--
F	FLOW	--	--
G	GAS	GLASS	GLASS
H	HAND (MANUAL)	--	HIGH**
I	CURRENT	INDICATE	INDICATE
J	POWER	--	--
K	TIME*	--	--
L	LEVEL	LIGHT	LOW**
M	MOTOR	--	INTERMEDIATE
P	PRESSURE	--	--
Q	QUANTITY OR TOTALIZE*	QUANTITY	--
R	RADIATION	RECORD	RECORD
S	SPEED OR FREQUENCY	SWITCH	SIGNAL
T	TEMPERATURE	TRANSMIT	TRANSMIT
V	VACUUM	VALVE	VALVE
W	TORQUE, WEIGHT, FORCE	--	--
X	--	--	--
Y	STATUS	RELAY, COMPUTE, OR CONVERT	RELAY, COMPUTE, OR CONVERT
Z	POSITION	--	--

ABBREVIATIONS LEGEND

ADM	ADMITTANCE
CAP	CAPACITANCE
CL	CHLORINE
CP	CONTROL PANEL
DO	DISSOLVED OXYGEN
ESTOP	EMERGENCY STOP
FOR	FORWARD-OFF-REVERSE
FSR	FORWARD-STOP-REVERSE
FRSA	FORWARD-STOP-REVERSE-AUTO
HOA	HAND-OFF-AUTO
I	CURRENT
INF	INFLUENT
LOE	LOSS OF ECHO
LOR	LOCAL-OFF-REMOTE
MCC	MOTOR CONTROL CENTER
OCR	OPEN-CLOSE-REMOTE
OPT	OPERATOR TERMINAL
PLC	PROGRAMMABLE LOGIC CONTROLLER
RESET	ALARM RESET
ROL	RAISE OFF LOWER
ROR	RUN-OFF-REMOTE
SCR	SPEED CONTROL RECTIFIER
TURB	TURBIDITY
ULT	ULTRASONIC
VFD	VARIABLE FREQUENCY DRIVE

EQUIPMENT SYMBOL LEGEND

PROPOSED	DESCRIPTION	EXISTING
	PUMP	
	CHEMICAL FEED PUMP	
	GRINDER	
	PRESSURE SAFETY VALVE	
	POSITIVE DISPLACEMENT BLOWER	
	CENTRIFUGAL BLOWER	
	FLOAT SWITCH	
	CAPACITANCE OR ADMITTANCE TYPE PROBE	
	PADDLE OR LEVER TYPE PROBE	
	GENERAL VALVE	
P	PINCH VALVE	P
	BALL VALVE	
	PLUG VALVE	
	BUTTERFLY VALVE	
	NEEDLE VALVE	
	CHECK VALVE	
	KNIFE GATE VALVE	
	SLUICE GATE	
	TURBINE METER	
	ORIFICE FLOW METER	
	VENTURI	
	ULTRASONIC TRANSDUCER	

EQUIPMENT SYMBOL LEGEND CONT'D

PROPOSED	DESCRIPTION	EXISTING
	WEIR	
	FLUME	
	PITOT TUBE	
	AVERAGING PITOT TUBE	
M	MAGNETIC FLOW METER	M
	SONIC FLOW METER	
	PRESSURE TRANSDUCER	
	HORN	
	BACKPRESSURE REGULATOR	
	PRESSURE REDUCING REGULATOR	
	DIAPHRAGM SEAL	
	SPRING OR WEIGHT RELIEF VALVE	
	DIAPHRAGM	
M	MOTOR OPERATED	M
S	SOLENOID	S
	PNEUMATIC/ HYDRAULIC CYLINDER	
	HAND ACTUATOR	
	BUBBLE LIQUID LEVEL ELEMENT	

CONTROL LOOPS

DESCRIPTION	DWG. NO.	LOOP NO.
EXISTING SECONDARY EFFLUENT FLOW METER	I-3	700
EXISTING SECONDARY CHLORINATION MIXER	I-3	701
CHLORINE CONTACT TANK INFLUENT CHANNEL ISOLATION GATE	I-3	702
CHLORINATION CONTROL PANEL	I-3	703
DECHLORINATION CONTROL PANEL	I-3	704
NOT USED	I-3	705
NOT USED	I-3	706
NOT USED	I-3	707
CARRIER WATER PUMP SYSTEM	I-3	708
NOT USED	I-3	709
SODIUM HYPOCHLORITE CHEMICAL STORAGE	I-4	710
SODIUM HYPOCHLORITE CHEMICAL PUMP HYP-1	I-4	711
SODIUM HYPOCHLORITE CHEMICAL PUMP HYP-2	I-4	712
SODIUM HYPOCHLORITE CHEMICAL PUMP HYP-3	I-4	713
SODIUM HYPOCHLORITE CHEMICAL PUMP HYP-4	I-4	714
SODIUM HYPOCHLORITE CHEMICAL PUMP HYP-4	I-4	715
SODIUM HYPOCHLORITE CHEMICAL PUMP HYP-6	I-4	716
SODIUM HYPOCHLORITE CHEMICAL PUMP RAS-HYP-1	I-4	717
SODIUM HYPOCHLORITE CHEMICAL PUMP RAS-HYP-2	I-4	718
SODIUM HYPOCHLORITE CHEMICAL FLOWS	I-4	719
SODIUM BISULFITE CHEMICAL STORAGE	I-4	720
SODIUM BISULFITE PUMP DEC-1	I-4	721
SODIUM BISULFITE PUMP DEC-2	I-4	722
SODIUM BISULFITE PUMP DEC-3	I-4	723
SODIUM BISULFITE PUMP DEC-4	I-4	724
SODIUM BISULFITE PUMP DEC-5	I-4	725
SODIUM BISULFITE PUMP DEC-6	I-4	726
SODIUM BISULFITE CHEMICAL FLOWS		727
CARRIER WATER DELIVERY	I-4	728
NOT USED	I-4	729
EXISTING BYPASS FLOW METER	I-3	730
EXISTING BYPASS CHLORINATION MIXER	I-3	731
NOT USED	I-3	732
SAMPLE PUMP SYSTEM	I-3	733
NOT USED	I-3	734
NOT USED	I-3	735
NOT USED	I-3	736
NOT USED	I-3	737
NOT USED		738
NOT USED		739
CHLORINE RESIDUAL ANALYZERS	I-3	740

NOTES:

1. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
2. PROVIDE SIGNAL REPEATERS/CONVERTERS/BOOSTERS AS REQUIRED BASED UPON EQUIPMENT SELECTED BY INSTRUMENTATION SUPPLIER, DISTANCE AND LOCATION.
3. PROVIDE DRIP SHIELDS TO PROTECT ALL PANELS LOCATED UNDERNEATH PIPES OR OTHER LIQUID-CONTAINING STRUCTURES.
4. REFERENCE PROCESS AND ELECTRICAL DRAWINGS FOR LOCATION OF PANELS AND FIELD INSTRUMENTATION.
5. REFER TO SPECIFICATION SECTION 13440, AND 13442 FOR ADDITIONAL INFORMATION REGARDING INSTRUMENTATION.
6. THE CONTRACTOR WILL PROVIDE AND INSTALL 20% SPARE INSTRUMENTATION WIRES WITH A MINIMUM OF TWO SPARES PER CONDUIT UP TO THE LIMIT OF CONDUIT FILL AS SPECIFIED BY NEC.
7. CONTRACTOR TO COORDINATE NEEDED VOLTAGE BASED UPON EQUIPMENT SUPPLIED.
8. ALL FLOOR MOUNTED CONTROL PANELS SHALL BE INSTALLED ON 4" HIGH CONCRETE EQUIPMENT PADS.
9. WHERE INPUT AND OUTPUT SIGNALS TO A PLC IS REQUIRED, PROVIDE PROPER TYPE AND QUANTITY OF INPUT/OUTPUT MODULES (I/O).
10. CONTRACTOR SHALL COORDINATE THE TYPE OF ANALOG SIGNAL PROVIDED BY THE EQUIPMENT OR FIELD DEVICES WITH THE PROPER TYPE PLC I/O.
11. ALL ANALOG SIGNALS WILL BE 4-20mA, UNLESS OTHERWISE INDICATED OR REQUIRED.

PROGRESS PRINTS
ISSUED FOR REVIEW: 12-15-04
ISSUED FOR BIDDING: 2-18-05

VAULT LOCATION: FF 34
LAST WORKED ON:
FILENAME:

NO	REVISIONS	APP'D	DATE
1			
2			
3			
4			
5			

DRAWN BY SJM
CHECKED BY SLH/PFB
DATE 2-18-05
APPROVED BY PFB
DATE 2-18-05
BOOK NO. --
PROJECT NO. 10301C
SCALE AS NOTED

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PORTLAND WATER DISTRICT
PORTLAND, MAINE
EAST END WWTF DISINFECTION AND DECHLORINATION SYSTEMS UPGRADE

INSTRUMENTATION LEGEND, NOTES AND ABBREVIATIONS

DWG I-1

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