





























LEGEND

	MANUAL VALVE (FOR TYPE, SEE MECHANICAL DWGS)
	MOTOR OPERATED VALVE
	HYDROPNEUMATIC CYLINDER-OPERATED VALVE
	2-WAY SOLENOID VALVE
	3-WAY SOLENOID VALVE
	4-WAY SOLENOID VALVE
	PUMP
	PROPORTIONING OR METERING PUMP
	MIXER/FAN/AGITATOR
	GATE
	MOTOR
	GRINDER
	ISOLATING DIAPHRAGM SEAL
	BAR SCREEN
	HYDRAULIC GATE
	STOP LOGS
	CHECK VALVE
	OPEN CHANNEL WEIR
	THERMOWELL


GENERAL INSTRUMENT SYMBOLS		
	FIELD MOUNTED	
	COMMON HOUSING	
	FRONT-PANEL MOUNTED DEVICE (LOCAL CONTROL PANEL)	
	REAR-PANEL MOUNTED DEVICE (LOCAL CONTROL PANEL)	
	PROGRAMMABLE LOGIC CONTROLLER SYSTEM FUNCTION BLOCK	
	DEVICE MOUNTED ON MCC CUBICLE FRONT	
	OPERATIONAL INTERLOCK	
	LOGIC BLOCK	
	CONTROL STRATEGY DESCRIPTION	

INSTRUMENT IDENTIFICATION LETTERS					
LETTER	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM OR PLC/DCS DISCRETE INPUT		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	BYPASS
C	CONDUCTIVITY (ELECTRICAL)			CONTROLLER	CLOSE
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			DRIVE (VFD)
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS		
H	HAND SWITCH (SELECTOR SWITCH)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE OR PLC/DCS ANALOG INPUT		
J	POWER	SCAN			
K	TIME OR TIME-SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY	MOMENTARY			MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		NOTIFY OR PLC/DCS DISCRETE INPUT	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY		INTEGRATE OR TOTALIZE		
R	RADIATION	REMOTE CONTROL	RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	PLC COMMAND		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE			RELAY OR COMPUTE	
Z	POSITION, DIMENSION			DRIVE, ACTUATOR OR UNCLASSIFIED FINAL CONTROL ELEMENT	




INSTRUMENT MODIFIER / ABBREVIATIONS

INSTRUMENT NUMBERING CONVENTION	<div>XXXX 123</div>	AUTO : AUTO STATUS	
		DOB : DRIVE/OFF/BY-PASS/ DRIVE : VARIABLE FREQUENCY DRIVE STATUS	
GENERAL INSTRUMENT SYMBOLS (SEE TABLE)		BYPASS : ACROSS-THE-LINE STARTER OR REDUCED VOLTAGE STARTER STATUS	
		FAIL : FAIL STATUS	
		H-O-A : HAND/OFF/AUTO	
		H-O-R : HAND/OFF/REMOTE	
		OPEN : OPEN COMMAND	
		CLOSE : CLOSE COMMAND	
		REMOTE : REMOTE STATUS	
		START/ : REMOTE START & STOP	
		STOP : EQUIPMENT RUN STATUS	
		F-O-R : FORWARD/OFF/REVERSE	
		RAISE : RAISE STATUS	
		LOWER : LOWER STATUS	
		0-100% : SPEED INDICATION OR CONTROL	
		FWD : FORWARD STATUS	
		REV : REVERSE STATUS	
		OPENED : OPENED STATUS	
		CLOSED : CLOSED STATUS	
		R/S : RUN/STOP	
		CL2 : CHLORINE GAS	
		CLR : CHLORINE RESIDUAL	
		MAG : MAGMETER	
		ORP : OXIDATION-REDUCTION POTENTIAL	
		pH : pH	
		VFD : VARIABLE FREQUENCY DRIVE	
		US : ULTRASONIC	
		OCM : OPEN CHANNEL FLOW MONITOR	
		O2 : OXYGEN	
		H2S : HYDROGEN SULFIDE	
		CG : COMBUSTIBLE GAS	
		TTM : TRANSIT-TIME METER	
		SO2 : SULFUR DIOXIDE	
		DO : DISSOLVED OXYGEN	
		DPLR : DOPPLER	
		BLR : BUBBLER	
		MCC : MOTOR CONTROL CENTER	





LOGIC AND SEQUENTIAL CONTROL ABBREVIATIONS

	DEC - DECISION
	DIFF - DIFFERENCE
	Σ - SUM
	SEL - SELECTOR
	RAT. - RATIO

OPERATIONAL INTERLOCK ABBREVIATIONS

	- OR LOGIC
	- AND LOGIC
	- DIRECT INTERLOCK OR COMPLEX LOGIC

INSTRUMENT LINE SYMBOLS

	ELECTRICAL SIGNAL (HARDWIRED)
	INTERNAL SYSTEM LINK (SOFTWARE)
	HYDRAULIC LINE
	PROCESS PIPES OR CHANNELS OR INSTRUMENT PROCESS CONNECTION

NOTE
(*) ASTERISK IDENTIFIES FIELD INSTRUMENTS FURNISHED BY EQUIPMENT SUPPLIERS.
⊗ ASTERISK IDENTIFIES LOCAL CONTROL PANELS FURNISHED BY EQUIPMENT SUPPLIERS

				DESIGNED _____ DMC
				DRAWN _____ DMC
				CHECKED _____
3	AS BUILT	OCT 2007	RLT	PROJ. ENGR. _____ DAN
2	CONSTRUCTION	MAR 2004	RLT	
1	REGULATORY APPROVAL	NOV 2003	RLT	
NO.	ISSUED FOR	DATE	BY	APPROVED _____

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CITY OF ROANOKE
VIRGINIA

REGIONAL WATER POLLUTION CONTROL PLANT
PROCESS TRAIN IMPROVEMENTS

INSTRUMENTATION AND CONTROL
LEGEND AND GENERAL NOTES

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE MARCH 2004
	H & S JOB NUMBER 30788B
	CONTRACT NUMBER B
	DRAWING NUMBER 11