FLOWS AND LINES

- NEW MAIN FLOW
- EXISTING MAIN FLOW
- FUTURE MAIN FLOW
- NEW SECONDARY FLOW
- EXISTING SECONDARY FLOW
- FUTURE SECONDARY FLOW

( ) AVERAGE FLOW
[ ] PEAK FLOW

ABBREVIATIONS

A TO C	–	AIR TO CLOSE
A TO O	–	AIR TO OPEN
AVG	–	AVERAGE
B/EL	–	BOTTOM ELEVATION
℄	–	CENTER LINE
CFM	–	CUBIC FEET PER MINUTE
CW	–	CITY WATER (POTABLE)
CFM	–	CUBIC FEET PER MINUTE
DIA	–	DIAMETER
DWG	–	DRAWING
ECC	–	ECCENTRIC
EL	–	ELEVATION
F.C.	–	FAIL CLOSED
F.O.	–	FAIL OPEN
GAL	–	GALLONS
GPD	–	GALLONS PER DAY
GPH	–	GALLONS PER HOUR
GPM	–	GALLONS PER MINUTE
HB	–	HOSE BIB
HG	–	INCHES OF MERCURY
HI	–	HIGH
HOA	–	HAND/OFF/AUTO
HP	–	HORSEPOWER
HT & I	–	HEAT TRACE & INSULATE
IA	–	INSTRUMENT AIR
ID	–	INSIDE DIAMETER
INV	–	INVERT
LO	–	LOW
MH	–	MANHOLE
MW	–	MANWAY
N.C.	–	NORMALLY CLOSED
N.O.	–	NORMALLY OPEN
OAL	–	OVERALL LENGTH
O.D.	–	OUTSIDE DIAMETER
PA	–	PLANT AIR
PSIG	–	POUNDS PER SQUARE INCH – GAUGE
PW	–	PLANT WATER
RED	–	REDUCER
RPM	–	REVOLUTIONS PER MINUTE
SCFM	–	STANDARD CUBIC FEET PER MINUTE
SCH	–	SCHEDULE
SD	–	SIDE DEPTH
SG	–	SPECIFIC GRAVITY
SP	–	SETPOINT
SS	–	STRAIGHT SIDE OR STAINLESS STEEL
ST & I	–	STEAM TRACE & INSULATE
STD	–	STANDARD
SW	–	SEAL WATER
SWD	–	SIDE WATER DEPTH
TDH	–	TOTAL DYNAMIC HEAD(FT OF FLUID)
T/EL	–	TOP ELEVATION
TYP	–	TYPICAL
VAC	–	VACUUM
VS	–	VARIABLE SPEED
VSD	–	VARIABLE SPEED DRIVE
WC	–	WATER COLUMN
WD	–	WATER DEPTH
WL	–	WATER LEVEL
WV	–	WORKING VOLUME (DOES NOT INCLUDE FREEBOARD OR HEEL)

VALVE SYMBOLS

- ANGLE
- BALL
- BUTTERFLY
- CHECK
- DIAPHRAGM
- GATE
- GLOBE
- KNIFE
- NEEDLE
- PINCH
- PLUG
- PRESSURE REDUCING
- RELIEF
- SQUEEZE
- THREE WAY
- FOUR WAY
- VACUUM BREAKER
- FLOW REGULATOR VALVE
- STROKE ADJUSTER, OPEN

ACTUATORS

- CYLINDER
- DIAPHRAGM–SPRING
- ELECTRO HYDRAULIC
- ELECTRO PNEUMATIC
- MOTOR
- OR SOLENOID

ACCESSORIES

- STRAINER
- FLEX JOINT
- PRE–SCREEN W/MOTOR
- COMPRESSOR AND DRYER

PUMPS

- CENTRIFUGAL PUMP
- AIR DRIVEN DIAPRAM PUMP
- VERTICAL TURBINE PUMP
- PS CONSTANT PRESSURE PUMP SET

PIPING ACCESSORIES

- CHEMICAL SEAL
- DRESSER COUPLING
- EJECTOR/EDUCTOR
- EXPANSION JOINT
- FLANGED CONNECTION
- HOSE CONNECTION
- INSULATION
- INSULATED PIPE WITH ELECTRIC HEAT TRACE
- INSULATED PIPE WITH STEAM HEAT TRACE
- PIPE TO TUBING ADAPTER
- PULSATION DAMPENER
- QUICK DISCONNECT
- REDUCER
- RUPTURE DISK
- SIGHT FLOW INDICATOR
- STRAINER
- UNION

INSTRUMENTATION AND RELATED ITEMS

- CAPILLARY TUBING
- ELECTRICAL
- HYDRAULIC
- INSTRUMENT AIR
- SOFTWARE
- FLUME
- ROTAMETER
- SONIC FLOW METER
- TURBINE FLOW METER
- VENTURI
- WEIR
- FIT 101 MAGNETIC FLOW METER

ELECTRICAL AND RELATED ITEMS

- S SELECTOR SWITCHES
- VFD VARIABLE FREQUENCY DRIVE
- EM EMERGENCY POWER
- TE 5.2kW HEATER ELEMENT

PIPING AND TUBING MATERIALS

ABS	–	ACRYLONTRILE BUTADIENE STYRENE TRUSS PIPE
ALM	–	ALUMINUM PIPE OR TUBING
ARP	–	ALUMINUM REINFORCED PLASTIC PIPE
BPT	–	BRAIDED PLASTIC TUBING–PVC
CI	–	CAST IRON PIPE
CISP	–	CAST IRON SOIL PIPE
CMCP	–	CORRUGATED METAL CULVERT PIPE
CMH	–	CHEMICAL HOSE
CMP	–	CORRUGATED METAL PIPE
COP	–	COPPER PIPE
CPVC	–	CHLORINATED POLYVINYL CHLORIDE PIPE
DI	–	DUCTILE CAST IRON PIPE
ERP	–	EPOXY RESIN PIPE
FRP	–	FIBERGLASS REINFORCED PLASTIC PIPE
GALV	–	GALVANIZED STEEL PIPE
HSI	–	HIGH SILICON IRON PIPE
KLS	–	PVDF LINED STEEL PIPE (KYNAR ® LINED TYPICAL)
KYN	–	PVDF (KYNAR ® TYPICAL)
NEO	–	NEOPRENE HOSE
NLS	–	NEOPRENE LINED STEEL PIPE
PEP	–	POLYETHYLENE PIPE
PLS	–	POLYPROPYLENE LINED STEEL PIPE
POP	–	POLYPROPYLENE PIPE
PVC	–	POLYVINYL CHLORIDE PIPE
PRP	–	PHENOLIC RESIN PIPE
RBR	–	RUBBER HOSE
RCCP	–	REINFORCED CONCRETE CULVERT PIPE
RCP	–	REINFORCED CONCRETE PIPE
SAR	–	SARAN TUBING
SLH	–	SLUDGE HOSE
SLS	–	SARAN LINED STEEL PIPE
SST	–	STAINLESS STEEL PIPE OR TUBING
STL	–	STEEL PIPE
TEF	–	TEFLON TUBING
TLS	–	TEFLON LINED STEEL PIPE
TYB	–	TYGON ® TUBING–BRAIDED
TYG	–	TYGON ® TUBING–UNBRAIDED

INSTRUMENT IDENTIFICATION TABLE

	FIRST LETTER		SUCCEEDING LETTERS	
	PROCESS VARIABLE	MODIFIER (IF NEEDED)	READOUT OR COMPUTER FUNCTION	MODIFIER (IF NEEDED)
A	ANALYSIS	ALARM	ALARM	
B	BURNER		BATCH	
C	CONTROL		CONTROL	
D	DENSITY	DIFFERENTIAL		
E	VOLTAGE (EMF)	VIDEO	ELEMENT	
F	FLOW	RATIO (FRACTION)	ELEMENT	
G		VIDEO	GAUGE, GLASS	
H	HAND	VIDEO		HIGH
I	CURRENT (ELECTRICAL)		INDICATE	
J	POWER	SCAN	INDICATELASS	
K	TIME	TIME RATE OF CHANGE	CONTROL STATION	
L	LEVEL	VIDEO	LIGHT	LOW
M		MOMENTARY		MIDDLE
N				
O	OPERATING	VIDEO	ORIFICE (RESTRICTION)	
P	PRESSURE, VACUUM	VIDEO	POINT (TEST CONNECTION)	
Q	QUANTITY (EVENT)	INTEGRATE, TOTALIZE	INDICATELASS	
R	RADIATION		RECORD	
S	SPEED/FREQUENCY	SAFETY	SWITCH	
T	TEMPERATURE	VIDEO	TRANSMIT	
U	MULTIVARIABLE	VIDEO	MULTIFUNCTION	
V	VIBRATION	VISCOSITY	VALVE	
W	WEIGHT (FORCE)	VIDEO	WELL	
X	UNCLASSIFIED	VIDEO	WELLE	
Y	EVENT, STATE OR PRESENCE	VIDEO	RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	VIDEO	DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

LEGEND BASED ON ISA STANDARD S 5.1

RECORD DRAWING
APRIL 28, 2003

REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN
0	PRELIMINARY ISSUE	8/10/01	MOC	---	---	---

STD: 2–0799–22x34D

INTERNAL REF NO:

BAR = 1" AT PLOT SCALE

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CHECKER ---	DATE ---	
ENGINEER ---	DATE ---	CLIENT CRYSTAL SPRINGS WATER TREATMENT PLANT ROANOKE, VA.
MANAGER	DATE	USFilter 2118 GREENSPRING DRIVE TIMONIUM, MD 21093 USA TEL: 1–800–MEMCOR®
FILE: 260056–0001		
SCALE: NONE		

PROJECT	CODE	DRAWING	SHEET	REV
260056		P–24	OF	0