

PIPING SYMBOLS

INSTRUMENTATION SYMBOLS

MECHANICAL EQUIPMENT SYMBOLS		PIPE LINE DEVICE SYMBOLS		VALVE & ACTUATOR SYMBOLS		PRIMARY ELEMENT SYMBOLS		FUNCTION IDENTIFICATION						
								MEASURED OR INITIATING VARIABLE	FIRST LETTER(S)	MODIFIER	READOUT OR PASSIVE FUNCTION	SUCCESSING LETTERS	OUTPUT FUNCTION	MODIFIER
	CENTRIFUGAL PUMP (PCN)		INJECTOR		SLUICE GATE (CSL) OR DAMPER		ORIFICE PLATE	A	ANALYSIS					
	GRINDER PUMP		INDUCTOR		GATE VALVE (GVT)		VENTURI OR FLOW TUBE	B	BURNER (FLAME)					
	PROGRESSIVE CAVITY PUMP (PPC)		CARTRIDGE FILTER/SEPARATOR		GLOBE VALVE (VGL)		AVERAGING PITOT TUBE	C	CONDUCTIVITY					
	LIQUID RING BLOWER OR COMPRESSOR		CAP OR PLUG		PLUG VALVE (VPL)		PROPELLER OR TURBINE METER	D	DENSITY	DIFFERENTIAL				
	SILENCER		PORT CONNECTION		BALL VALVE (VBL)		POSITIVE DISPLACEMENT FLOW METER	E	POTENTIAL (ELEC)					
	MIXER (MIX)		BLIND FLANGE		BUTTERFLY VALVE (VBF)		MAGNETIC FLOW ELEMENT	F	FLOW RATE	RATIO				
	HEAT EXCHANGER		STRAINER		CHECK VALVE (VCK)		FLUME	G	FIRE, SMOKE					
	HEATING COIL		REDUCER OR INCREASER		BALL CHECK VALVE		WEIR	H	HAND					
	COOLING COIL		BACK FLOW PREVENTER		PINCH VALVE (VFN)		FLOW METER (HYDRONIC)	I	CURRENT (ELEC)					
	INTAKE FILTER		CALIBRATION TUBE		DIAPHRAGM VALVE (VDI)		VARIABLE AREA FLOW METER (ROTAMETER)	J	POWER	SCAN				
	TANK (TNK)		STEAM TRAP WITH BY-PASS		NEEDLE VALVE (VND)		RUPTURE DISC	K	TIME	TIME RATE CHANGE				
	VARIABLE SPEED DRIVE - DC (VSD)		PULSATION DAMPENER		PRESSURE RELIEF VALVE (VRF)		FLOW STRAIGHTENING VALVE	L	LEVEL	MOMENTARY				
	GENERATOR		PIPE FLANGE CONNECTION TO TANK		VACUUM RELIEF VALVE (VRF)		FLOW STRAINING VALVE	M	MOISTURE					
	GRINDER		FLEXIBLE COUPLING		FLOAT VALVE		DIAPHRAGM CHEMICAL SEAL	N	EQUIPMENT STATUS					
	MOTOR (MOT)		EXPANSION JOINT		PRESSURE REDUCING VALVE		ANNULAR CHEMICAL SEAL	O	OXYGEN	INTEGRATE				
	SUBMERSIBLE PUMP		HEAT TRACING		BACK PRESSURE SUSTAINING VALVE		TEMPERATURE WELL	P	PRESSURE	SAFETY				
	VERTICAL PUMP		SPRAY NOZZLE		VALVE WITH HAND OPERATOR		DISPLACER FLOAT SWITCH	Q	QUANTITY					
	GEAR PUMP (PGR)		SIGHT GLASS		SOLENOID OPERATED VALVE (VOS)		GUIDED FLOAT SWITCH	R	RADIATION					
	ROTARY LOBE PUMP (PLB)		EQUIPMENT DRAIN		ELECTRICAL MOTOR OPERATED VALVE		PILOT LIGHT	S	SPEED, FREQUENCY					
	FAN		MISCELLANEOUS		DIAPHRAGM OPERATED VALVE		AAA - FUNCTION	T	TEMPERATURE					
	BLOWER/FAN (CENTRIFUGAL) (PBL)		EQUIPMENT NUMBER		PISTON OPERATED VALVE		BBB - SYSTEM	U	TEMPERATURE					
	ROTARY LOBE BLOWER		AREA DESIGNATION		FLOW BALANCING VALVE (HYDRONIC)		CCC - LOOP NUMBER	V	VIBRATION					
			EQUIPMENT ABBREVIATIONS		THREE-WAY VALVE		DDD - DESCRIPTION	W	WEIGHT, FORCE					
								X	UNCLASSIFIED					
								Y	EVENT, STATUS					
								Z	POSITION					

ABBREVIATIONS

PROCESS & SIGNAL LINE SYMBOLS

LINE	DESCRIPTION
	MAIN PROCESS FLOW (WITH TYPICAL DIRECTION OF FLOW SHOWN)
	SECONDARY PROCESS FLOW
	INSTRUMENT SUPPLY, PROCESS TAPS, TERTIARY PROCESS FLOW
	ELECTRIC SIGNAL (ANALOG)
	ELECTRIC SIGNAL (DISCRETE)
	PNEUMATIC SIGNAL
	ELECTROMAGNETIC OR SONIC SIGNAL
	SOFTWARE OR DATA LINK
	MECHANICAL LINK
	HYDRAULIC
	ELECTRIC POWER SUPPLY 120VAC, 60HZ - OR AS NOTED
	AIR SUPPLY LINE (INSTRUMENT)
	UNGUIDED AIR FLOW
	CONTINUED ON DRAWING XXXX RELEVANT DATA X

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GENERAL NOTES

**CITY OF ENTIAI
2007 WASTEWATER TREATMENT
FACILITIES IMPROVEMENTS**

SYMBOLS & ABBREVIATIONS

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PIPING SERVICE ABBREVIATIONS

A	AERATION AIR	ML	MIXED LIQUOR
AA	AGITATION AIR	MS	MIXED SLUDGE
AL	ALUM	OF	OVERFLOW
AS	AIR SUPPLY	OG	ORIGINAL GROUND
BS	BLENDED SLUDGE	PE	PRIMARY EFFLUENT
BS(R)	BLENDED SLUDGE RETURN	PF	PRESSURIZATION FLOW
BS(S)	BLENDED SLUDGE SUPPLY	POL	POLYELECTROLYTE
BWW	BACKWASH WASTE	POC	POINT OF CONNECTION
		PRM	PERMEATE
		PS	PRIMARY SLUDGE
		PVC	PRIMARY SCUM
			POLYVINYLCHLORIDE
			RETURN ACTIVATED SLUDGE
		RAS	RAW SEWAGE
		RS	RAINWATER PIPE
		RWP	SERVICE AIR
		SA	SLUDGE GAS SCRUBBING WATER RETURN
		SCBR	SLUDGE GAS SCRUBBING WATER RETURN - HP
		SCBR-H	SLUDGE GAS SCRUBBING WATER SUPPLY
		SCBS	SCREENINGS
		SCC	STORM DRAIN
		SD	SECONDARY EFFLUENT
		SE	SECONDARY EFFLUENT LOW PRESSURE
		SELP	STRAINED FINAL EFFLUENT
		SFE	SLUMP WATER
		SPW	SLUMP RETURN
		SR	SECONDARY SCUM
		SSC	SANITARY DRAIN
		STD	THICKENED BOTTOM SLUDGE
		TBS	TANK DRAIN
		TD	THICKENED SLUDGE
		THS	THICKENER OVERFLOW
		TO	TRANSFER SLUDGE
		TS	THICKENED WASTE ACTIVATED SLUDGE
		TWAS	VENT
		V	VACUUM
		VA	CHEMICAL VENT
		VC	VENT THROUGH ROOF
		VTR	WASTE ACTIVATED SLUDGE
		WAS	DEIONIZED WATER
		WD	POTABLE HOT WATER
		WH	NONPOTABLE WATER
		WI	IRRIGATION NONPOTABLE WATER
		WNI	POTABLE WATER
		WP	RECLAIMED WATER
		WR	STRAINED RECLAIMED WATER
		WRS	WATER RECLAMATION WASTE
		WRW	PUMP SEAL PURGE WATER
		WS	

CONTROL SYSTEM ABBREVIATIONS

AM	AUTOMANUAL SELECTOR SWITCH	PAL	LOW PRESSURE ALARM
CP	CONTROL POWER INDICATING LIGHT (IL)	PB	PUSH BUTTON
EL	RUN INDICATION	PLC	PROGRAMMABLE LOGIC CONTROLLER
EI	RUN LIGHT	PS	PRESSURE SWITCH
ES	EMERGENCY STOP (PB)	RCP	REMOTE CONTROL PANEL
FI	FLOW INDICATOR	RDY	READY
FWD	FORWARD (IL)	RVS	REVERSE IL
HOA	HAND/OFF/AUTO	RUN	RUNNING
JOA	JOG/OFF/AUTO (SEL SW)	RF	REVERSE/OFF/FFORWARD
LCP	LOCAL CONTROL PANEL	RST	RESET
LL	LEAD/LAG	SC	SPEED CONTROL RHEOSTAT
LOR	LOCAL/OFF/REMOTE	SI	SPEED INDICATOR
LOS	LOCKOUT STOP	SW	SWITCH
MLH	MOISTURE (IL)		
OC	OPEN/CLOSE		
OCA	OPEN CLOSE/AUTO (SEL SW)		
OL	OVERLOAD	TI	TEMPERATURE INDICATOR
OO	ON/OFF	UH	HYDRAULIC UNIT HEATER
		ZVL	VALVE POSITION CLOSED
		ZVH	VALVE POSITION OPEN
		WSH	HIGH TORQUE SWITCH

EQUIPMENT ABBREVIATION

AB	AEROBIC TANK	H	HOIST
AC	AUGER CONVEYOR	HC	HEAT EXCHANGER
ACC	AREA CONTROL CENTER	HRC	HEAT RECOVERY COIL
AD	AREA DRAIN	HPU	HYDRAULIC POWER UNIT
AE	ANALYZING EQUIPMENT	HTR	ELECTRIC RESISTANCE TYPE UNIT HEATER
AF	AIR FILTER	HC	HEATING COIL
AH	AIR HANDLING UNIT	HXT	HEAT EXTRACTOR
ALF	AIR LIFT UNIT	HV	HAND VALVE
ARV	AIR RELEASE VALVE	HVL	HVAC LOOP
ASC	ADJUSTABLE SPEED CONTROLLER	IL	INSTRUMENT LOOP
ASD	ADJUSTABLE SPEED DRIVE	JWH	JACKET WATER PUMP
ATS	AUTOMATIC TRANSFER SWITCH	LC	LEVEL CONTROL
AX	ANOXIC TANK	LT	LEVEL TRANSMITTER
		LVR	LOUVER
B	BLOWER	M	MOTOR
BAT	BATTERY	MBR	MEMBRANE TANK
BFD	BACKFLOW PREVENTER DEVICE	MCC	MOTOR CONTROL CENTER
BKR	CIRCUIT BREAKER	MME	MISCELLANEOUS MECHANICAL EQUIPMENT
BLR	BOILER	MEE	MISCELLANEOUS ELECTRICAL EQUIPMENT
BSN	BAR SCREEN	MP	METERING PUMP
BV	BALL VALVE	MX	MIXER (FLASH, EDUCTOR, ETC.)
BUV	BUTTERFLY VALVE	MV	MODULATING VALVE
BWT	BACKWASH TANK	MT	MEMBRANE TANK
		OD	OXIDATION DITCH
C	CRANE	ODR	OXIDATION DITCH ROTOR
CB	CATCH BASIN	P	PUMP
CE	CENTRIFUGE	PCV	PRESSURE CONTROL VALVE
CFR	CHEMICAL FEEDER	PDT	PRESSURE DECAY TEST
CHR	CHILLER	PF	POLYMER FEED
CHV	CHECK VALVE	PLC	PROGRAMMABLE LOGIC CONTROLLER
CIP	CLEAN-IN-PLACE TANK	PNL	PANEL
CON	CONVEYOR	PRV	PRESSURE RELIEF OR REGULATING VALVE
CPV	PNEUMATIC VALVE MANIFOLD	PS	PRESSURE SENSOR
CP	COMPRESSOR/CENTER POINT	PT	PRESSURE TRANSMITTER
CRN	(BRIDGE, JIB, ETC., PLUS	PV	PLUG VALVE
	HOIST - ENTIRE PACKAGE)	PVS	PRESSURE VESSEL
CV	CONTROL VALVE	PWS	PLANT WATER STORAGE
CYL	CYLINDER (HYDRAULIC,	RAD	REFRIGERATED AIR DRYER
	PNEUMATIC, ETC.)	REC	RECEIVER
CU	CONTROL UNIT	S	SILENCER
DGS	DISTRIBUTED CONTROL SYSTEM	SAMP	SAMPLER
DIS	DISCONNECT	SEP	SEPARATOR
DK	DECANTER	SF	SUPPLY FAN
DPR	DAMPER	SG	SLUICE GATE
DT	DRIPT TRAP	SL	SLIDE GATE
DU	DRIVE UNIT	SUB	SUBSTATION
DV	DIAPHRAGM VALVE	SUMP	SUMP PUMP
		SV	SOLENOID VALVE
E	ENGINE	SWB	SWITCHBOARD
EF	EXHAUST FAN	SWC	SCREENINGS WASHER/COMPACTOR
EG	ENGINE GENERATOR	SWGR	SWITCHGEAR
EP	ELECTRO PNEUMATIC SWITCH		
EPR	EVAPORATOR	T	TANK
EWS	EMERGENCY EYE WASH AND SHOWER	TBN	TURBINE
		TFR	TRANSFORMER
F	FAN	TS	TEMPERATURE SENSOR
FE	FLOW ELEMENT (METER)	TST	THERMOSTAT (HVAC)
FLM	FLUME	UH	UNIT HEATER
FLT	FILTER	UPS	UNINTERRUPTIBLE POWER SUPPLY
FP	FLUID POWER UNIT	UMB	ULTRAVIOLET BANK
FZS	FREEZESTAT	VAF	VENTILATION AIR FILTER
		VSD	VARIABLE SPEED DRIVE
GC	GRIT COLLECTOR	WH	WATER HEATER
GH	GRIT HOPPER	WG	WEIR GATE
GR	GRINDER		
GV	GATE VALVE		

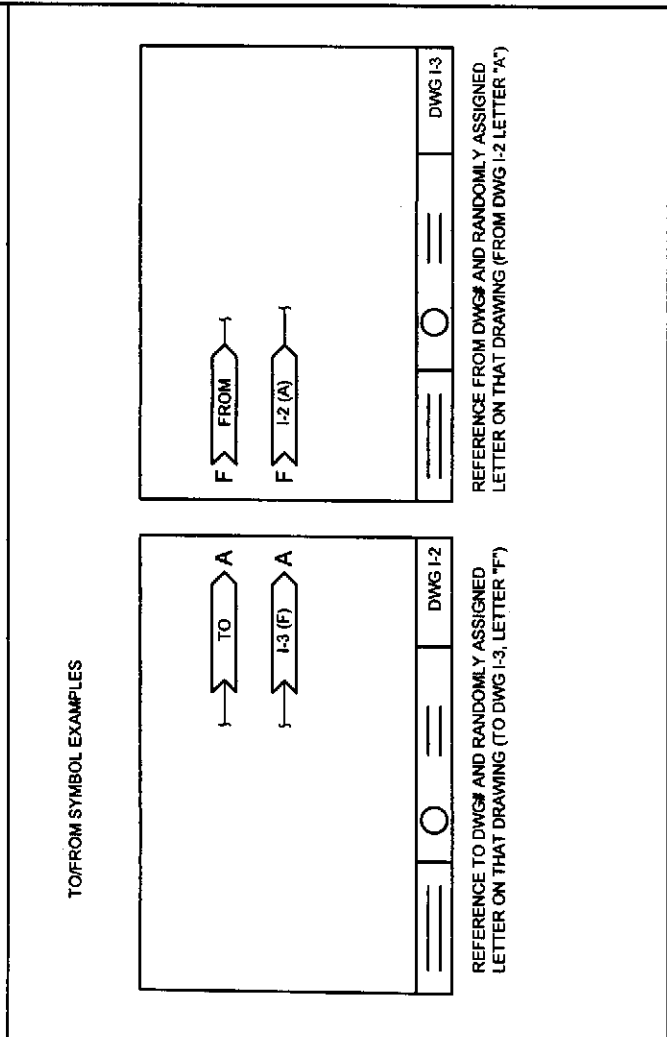
SYSTEM DESIGNATION

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PROCESS AND SIGNAL CROSS REFERENCE SYSTEM



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PIPING & INSTRUMENTATION SYMBOLS LEGEND

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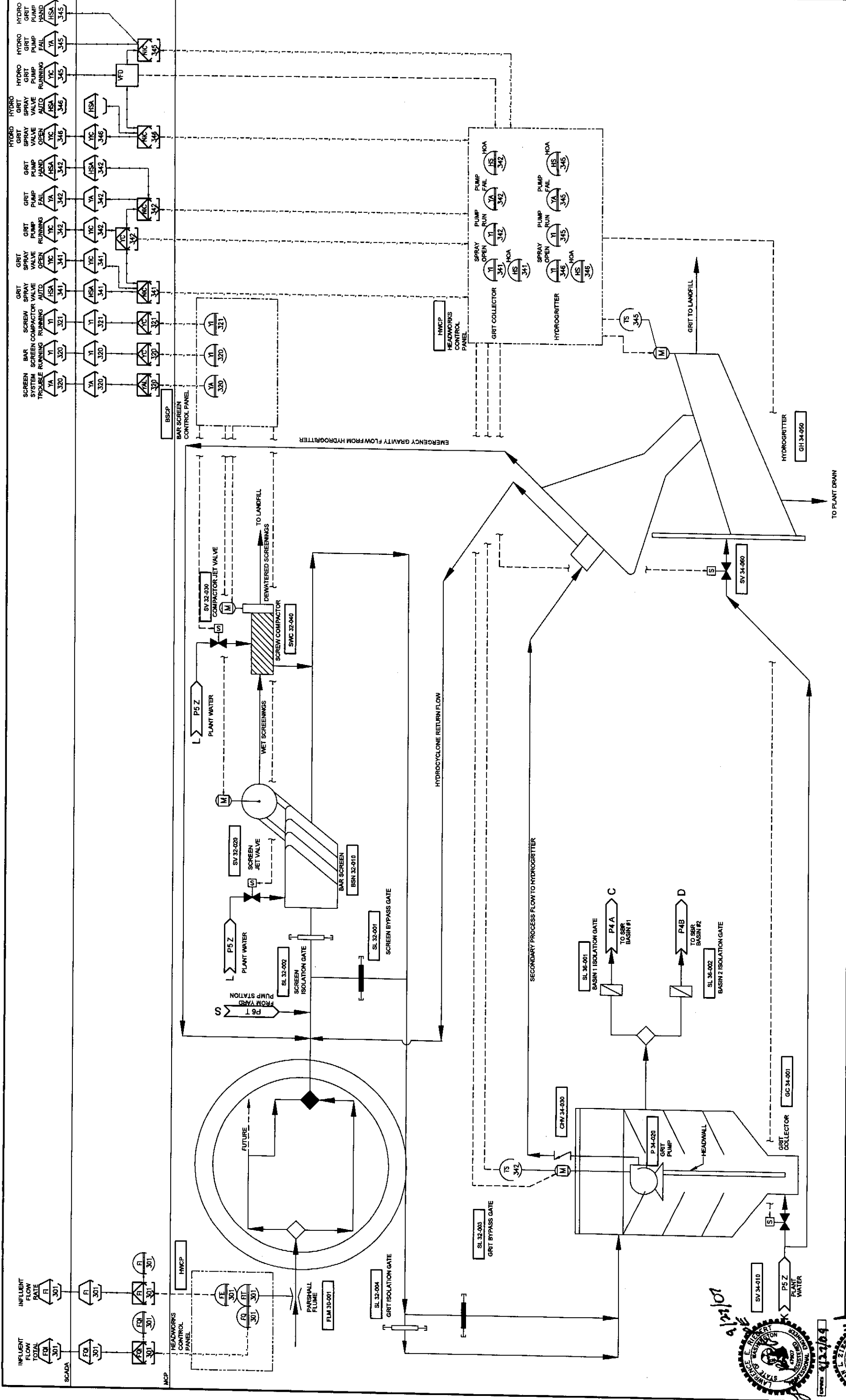
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SCADA INFLENT FLOW TOTAL (FI 301) INFLENT FLOW RATE (FR 301)		HWCP HEADWORKS CONTROL PANEL P 34-020 P 34-021 P 34-022		BSCP BAR SCREEN CONTROL PANEL Y 320 Y 321 Y 322		HWCP HEADWORKS CONTROL PANEL Y 342 Y 343 Y 344		HYDROGRITTER CONTROL PANEL Y 345 Y 346 Y 347		HYDROGRITTER HOA 342 HOA 343 HOA 344		HYDROGRITTER HOA 345 HOA 346		HYDROGRITTER HOA 347 HOA 348		HYDROGRITTER HOA 349 HOA 350		HYDROGRITTER HOA 351 HOA 352		HYDROGRITTER HOA 353 HOA 354		HYDROGRITTER HOA 355 HOA 356		HYDROGRITTER HOA 357 HOA 358		HYDROGRITTER HOA 359 HOA 360																																																					
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