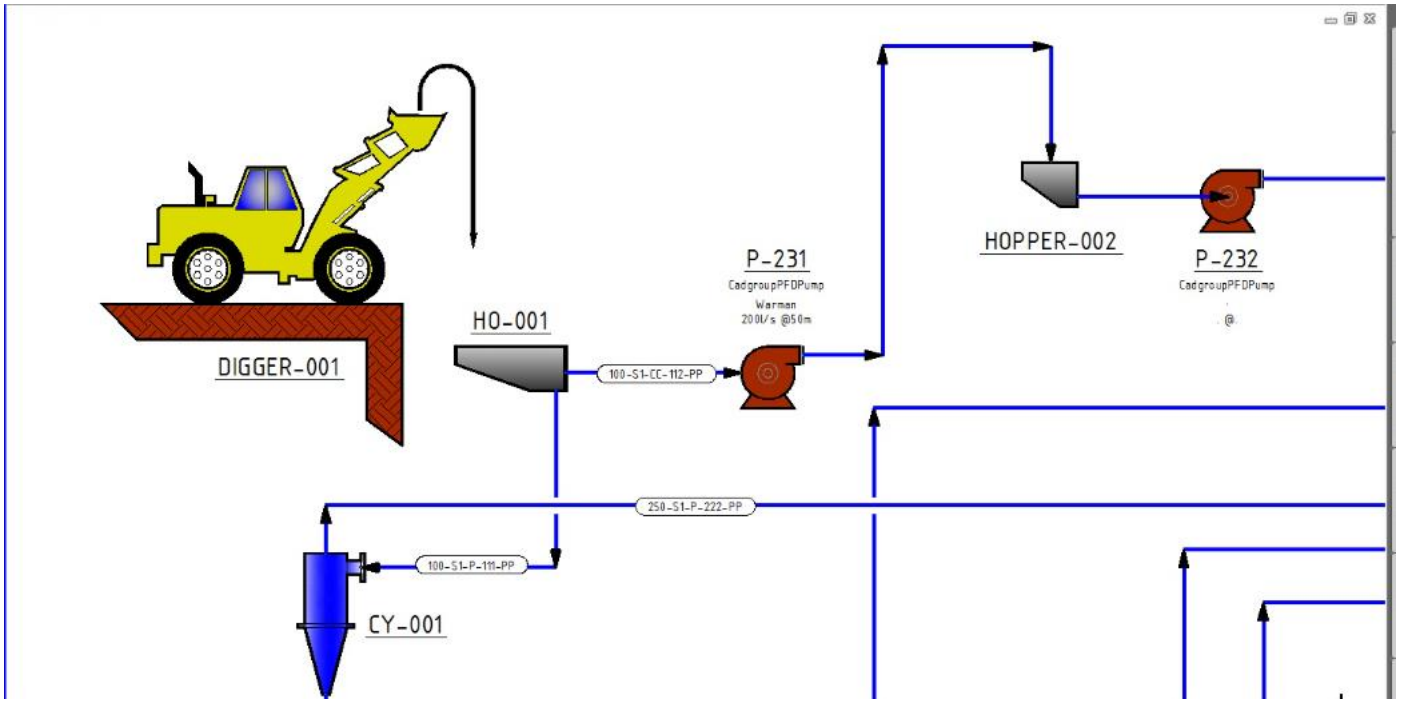
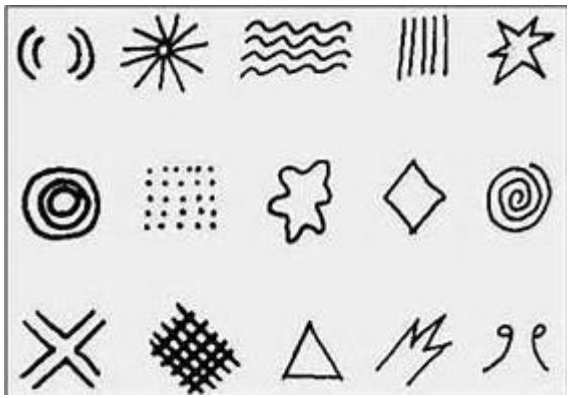
Piping & Flow/Instrumentation Drawing's

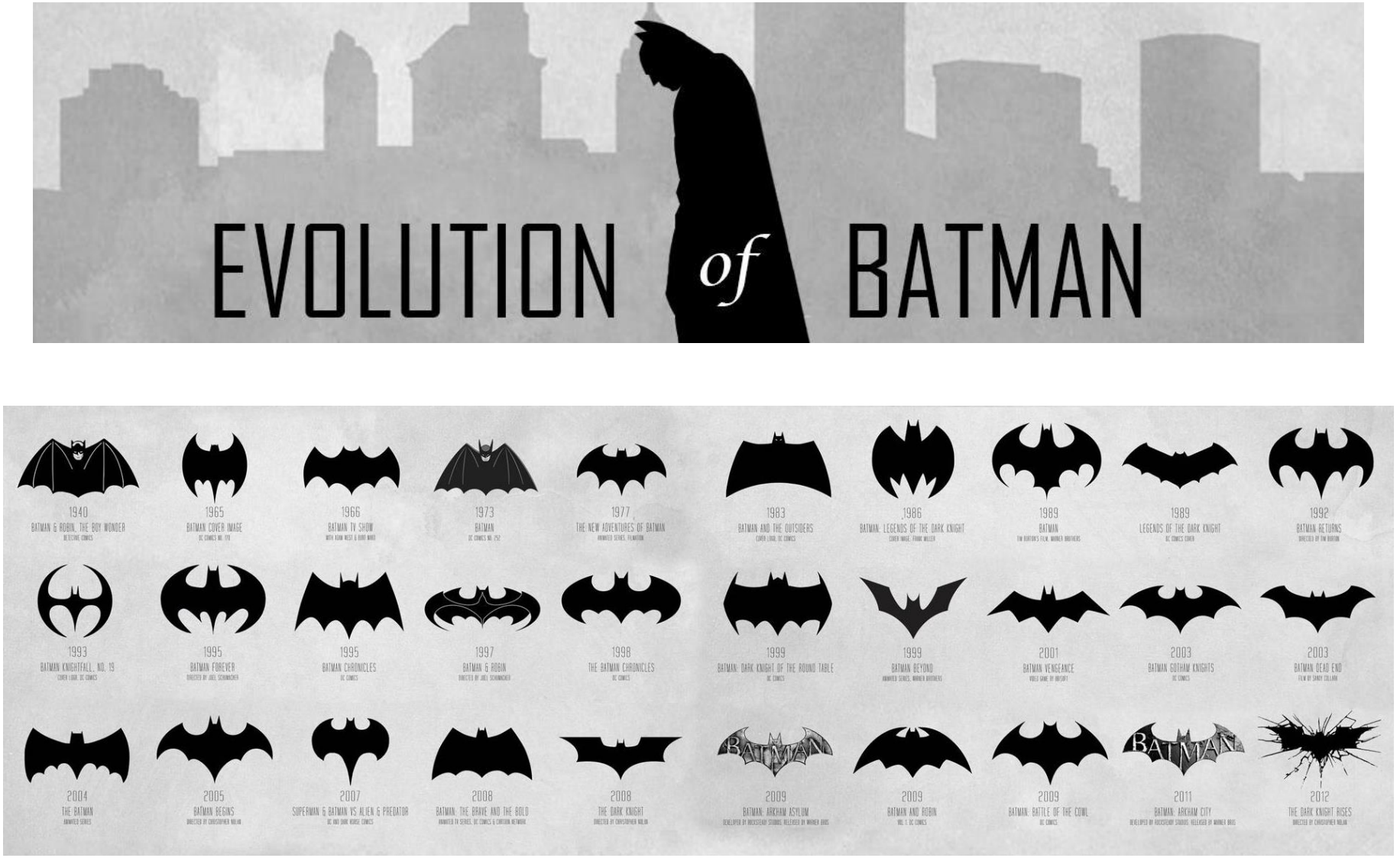
P&FD ***P&ID***



It's a detailed story told through *Symbology*

An 1877 dictionary defines the word as "the art of expressing through symbols."



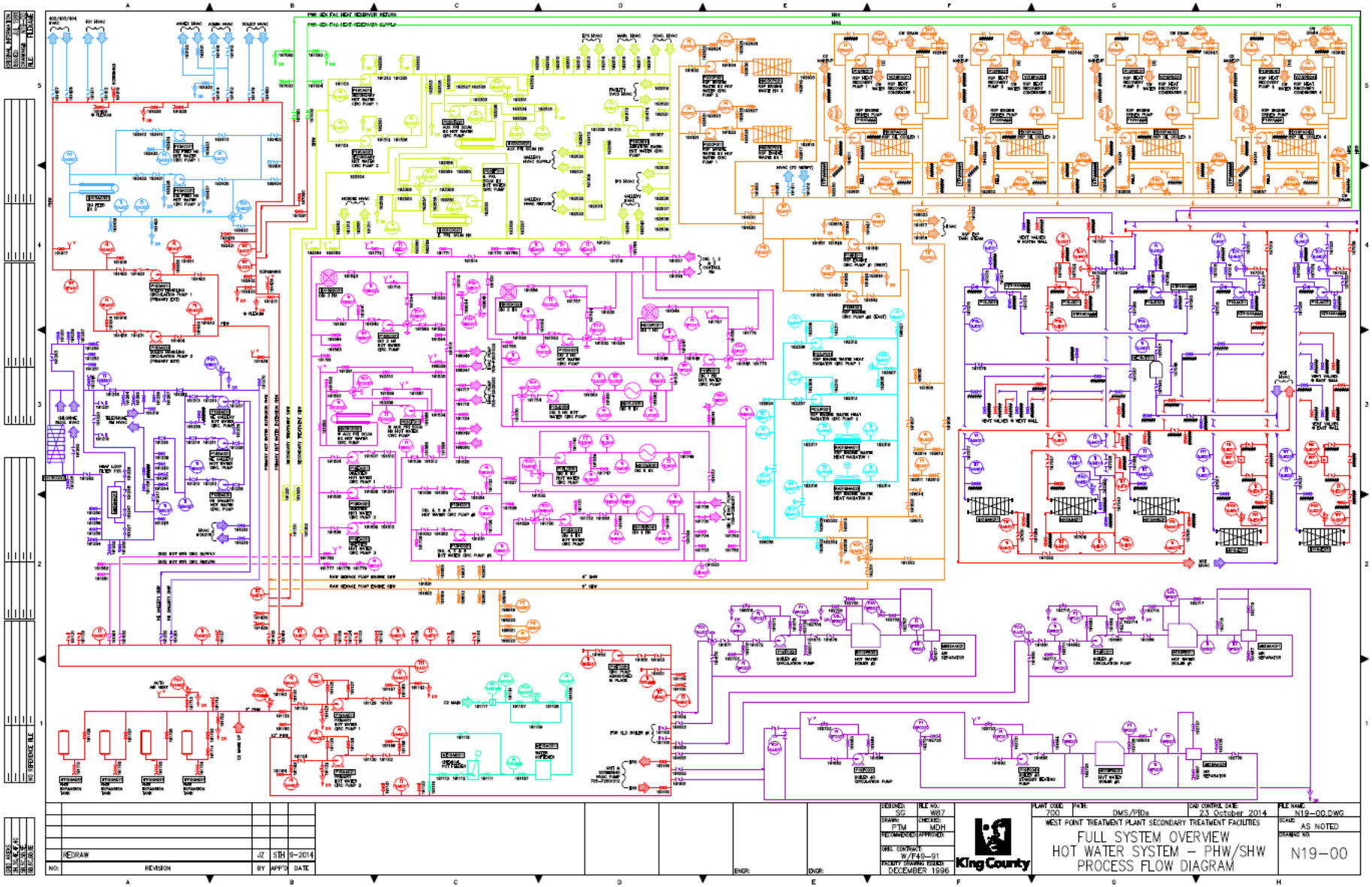

EVOLUTION of BATMAN
1940
BATMAN & ROBIN, THE BOY WONDER
DETECTIVE COMICS
1965
BATMAN COVER IMAGE
DC COMICS NO. 170
1966
BATMAN TV SHOW
WITH ADAM WEST & BURT WARD
1973
BATMAN
DC COMICS NO. 252
1977
THE NEW ADVENTURES OF BATMAN
ANIMATED SERIES, FILMATION
1983
BATMAN AND THE OUTSIDERS
COVER LOGO, DC COMICS
1986
BATMAN: LEGENDS OF THE DARK KNIGHT
COVER IMAGE, FRANK MILLER
1989
BATMAN
TIM BURTON'S FILM, WARNER BROTHERS
1989
LEGENDS OF THE DARK KNIGHT
DC COMICS COVER
1992
BATMAN RETURNS
DIRECTED BY TIM BURTON
1993
BATMAN KNIGHTFALL, NO. 19
COVER LOGO, DC COMICS
1995
BATMAN FOREVER
DIRECTED BY JOEL SCHUMACHER
1995
BATMAN CHRONICLES
DC COMICS
1997
BATMAN & ROBIN
DIRECTED BY JOEL SCHUMACHER
1998
THE BATMAN CHRONICLES
DC COMICS
1999
BATMAN: DARK KNIGHT OF THE ROUND TABLE
DC COMICS
1999
BATMAN BEYOND
ANIMATED SERIES, WARNER BROTHERS
2001
BATMAN VENGEANCE
VIDEO GAME BY INFOGRAMES
2003
BATMAN GOTHAM KNIGHTS
DC COMICS
2003
BATMAN DEAD END
FILM BY SANDY COLLORA
2004
THE BATMAN
ANIMATED SERIES
2005
BATMAN BEGINS
DIRECTED BY CHRISTOPHER NOLAN
2007
SUPERMAN & BATMAN VS ALIEN & PREDATOR
DC AND DARK HORSE COMICS
2008
BATMAN: THE BRAVE AND THE BOLD
ANIMATED TV SERIES, DC COMICS & CARTOON NETWORK
2008
THE DARK KNIGHT
DIRECTED BY CHRISTOPHER NOLAN
2009
BATMAN: ARKHAM ASYLUM
DEVELOPED BY ROCKSTEADY STUDIOS, RELEASED BY WARNER BROS
2009
BATMAN AND ROBIN
VOL 1, DC COMICS
2009
BATMAN: BATTLE OF THE COWL
DC COMICS
2011
BATMAN: ARKHAM CITY
DEVELOPED BY ROCKSTEADY STUDIOS, RELEASED BY WARNER BROS
2012
THE DARK KNIGHT RISES
DIRECTED BY CHRISTOPHER NOLAN

Todays Agenda

- Understanding a P&ID Layout
  - Symbology
  - Equipment
  - Piping that connects the equipment
  - Lines and instruments used to monitor and control the process

Who Uses P&IDs?

- Planning a job
- Writing a job safety analysis (JSA)
- Lockout before a repair
- Troubleshooting when problems arise
- Process hazard review
- Training new employees



NO:	REVISION	BY	APP'D	DATE
	REDRAW	JZ	STH	9-2014

DESIGNED: SG	FILE NO.: W87
DRAWN: PTM	CHECKED: MDH
RECOMMENDED/APPROVED:	
DRG. CONTRACT: W/F49-91	
FACILITY DRAWING ISSUED: DECEMBER 1996	

King County

PLANT CODE: 700	PATH: DMS/PIDs	CAD CONTROL DATE: 23 October 2014

WEST POINT TREATMENT PLANT SECONDARY TREATMENT FACILITIES

FULL SYSTEM OVERVIEW
HOT WATER SYSTEM – PHW/SHW
PROCESS FLOW DIAGRAM

FILE NAME: N19-00.DWG
SCALE: AS NOTED
DRAWING NO.: N19-00

Title Block

ORIGINAL INFORMATION	ISSUED: AUG 1991	DRAWING#: N16-03	FILE: 11600P400.PID

PLANT CODE: 708	PATH: DMS/PIDS	CAD CONTROL DATE: 21 January 2015	FILE NAME: N16-03.DWG
WEST POINT TREATMENT PLANT SECONDARY TREATMENT FACILITIES			SCALE: NONE
DIGESTER 1 GAS SYSTEM			DRAWING NO: N16-03

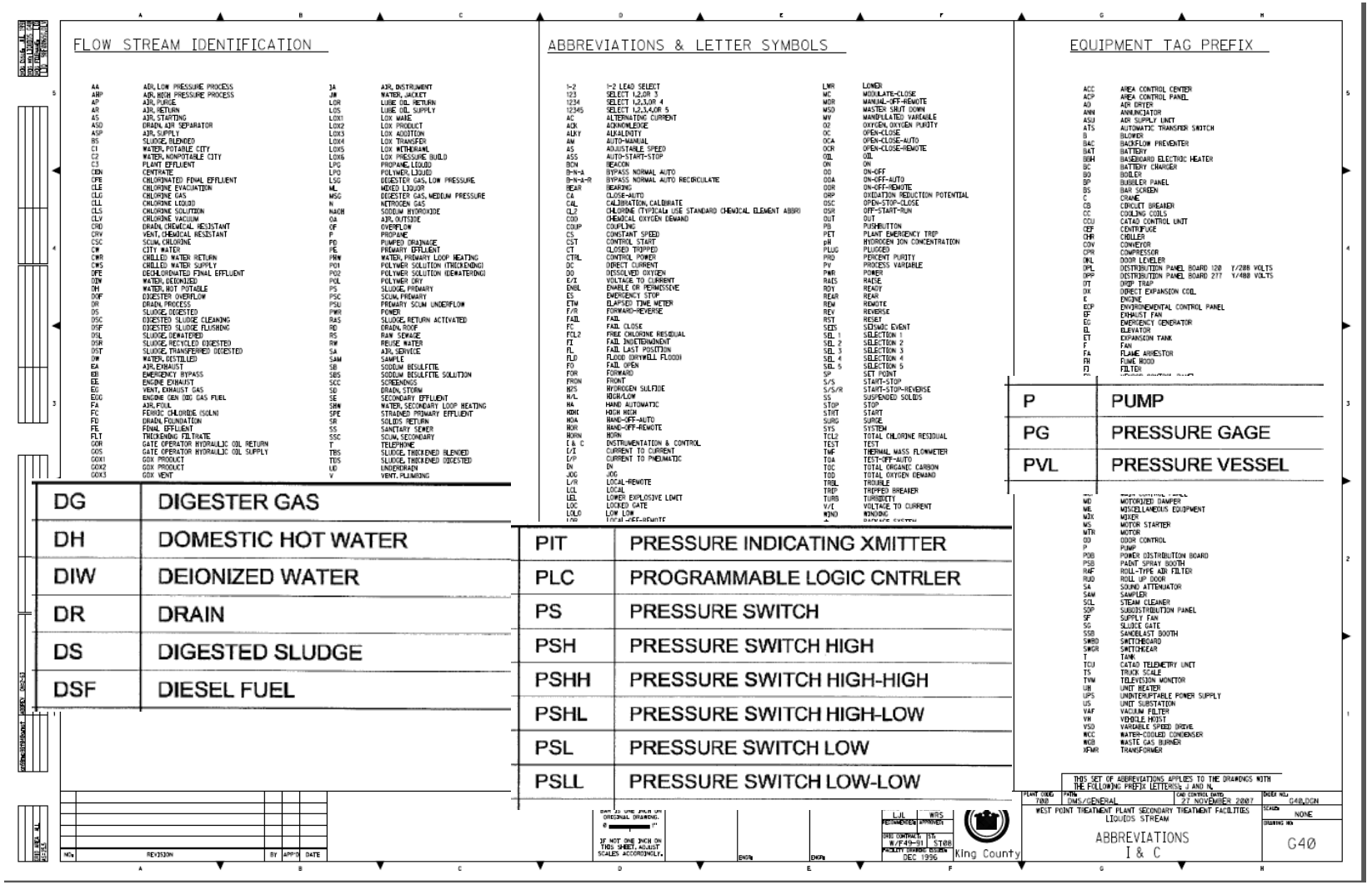
DESIGNED: DCS	FILE NO.: W87
DRAWN: LJL	CHECKED: RHS
RECOMMENDED:	APPROVED:
ORIG. CONTRACT: W/F57-91	
FACILITY DRAWING ISSUED: DECEMBER 1997	

King

NO:	REVISION	BY	APP'D	DATE
13	ADDED MISSING FA VALVES PER CWL 1178	JLR	BNS	JAN 15
12	INCORPORATED REVS FROM C00583C11 – CWL1137	SRK	JLR	JAN 11
11	ADD VALVE NUMBERS – CWL 1067	STH	STH	JUL 13
10	ADDED DUAL FLAME ARRESTOR PER T300337 – CWL 890	JLR	JLB	NOV 12

Piping and Instrumentation Drawings (P&ID)

- I&C abbreviations



FLOW STREAM IDENTIFICATION

AA	AIR, LOW PRESSURE PROCESS
AHP	AIR, HIGH PRESSURE PROCESS
AP	AIR, PURGE
AR	AIR, RETURN
AS	AIR, STARTING
ASD	DRAIN, AIR SEPARATOR
ASP	AIR, SUPPLY
BS	SLUDGE, BLENDED
C1	WATER, POTABLE CITY
C2	WATER, NONPOTABLE CITY
C3	PLANT EFFLUENT
CEN	CENTRATE
CFE	CHLORINATED FINAL EFFLUENT
CLE	CHLORINE EVACUATION
CLG	CHLORINE GAS
CLL	CHLORINE LIQUID
CLS	CHLORINE SOLUTION
CLV	CHLORINE VACUUM
CND	DRAIN, CHEMICAL RESISTANT
CRV	VENT, CHEMICAL RESISTANT
CSC	SCUM, CHLORINE
CW	CITY WATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DFE	DECHLORINATED FINAL EFFLUENT
DIW	WATER, DEIONIZED
DH	WATER, HOT POTABLE
DOF	DIGESTER OVERFLOW
DR	DRAIN, PROCESS
DS	SLUDGE, DIGESTED
DSC	DIGESTED SLUDGE CLEANING
DSF	DIGESTED SLUDGE FLUSHING
DSL	SLUDGE, DEWATERED
DSR	SLUDGE, RECYCLED (DIGESTED)
DST	SLUDGE, TRANSFERRED DIGESTED
DW	WATER, DISTILLED
EA	AIR, EXHAUST
EB	EMERGENCY BYPASS
EE	ENGINE EXHAUST
EV	VENT, EXHAUST GAS
EVG	ENGINE GEN DIG GAS FUEL
FA	AIR, FOUL
FC	FERRIC CHLORIDE (SOLN)
FD	DRAIN, FOUNDATION
FE	FINAL EFFLUENT
FLT	THICKENING FILTRATE
GOR	GATE OPERATOR HYDRAULIC OIL RETURN
GOS	GATE OPERATOR HYDRAULIC OIL SUPPLY
GOX1	GOX PRODUCT
GOX2	GOX PRODUCT
GOX3	GOX VENT
JA	AIR, INSTRUMENT
JW	WATER, JACKET
LOR	LUBE OIL RETURN
LOS	LUBE OIL SUPPLY
LOX1	LOX WARE
LOX2	LOX PRODUCT
LOX3	LOX ADDITION
LOX4	LOX TRANSFER
LOX5	LOX METHANE
LOX6	LOX PRESSURE BUILD
LPG	PROPANE, LIQUID
LPO	POLYMER, LIQUID
LSG	DIGESTER GAS, LOW PRESSURE
ML	MIXED LIQUOR
MSG	DIGESTER GAS, MEDIUM PRESSURE
N	NITROGEN GAS
NAOH	SODIUM HYDROXIDE
OA	AIR, OUTSIDE
OF	OVERFLOW
P	PROPANE
PD	PUMPED DRAINAGE
PE	PRIMARY EFFLUENT
PRW	WATER, PRIMARY LOOP HEATING
PO1	POLYMER SOLUTION (THICKENING)
PO2	POLYMER SOLUTION (DEWATERING)
POL	POLYMER DRY
PS	SLUDGE, PRIMARY
PSC	SCUM, PRIMARY
PSU	PRIMARY SCUM UNDERFLOW
PWR	POWER
RAS	SLUDGE, RETURN ACTIVATED
RD	DRAIN, ROOF
RS	RAW SEWAGE
RW	REUSE WATER
SA	AIR, SERVICE
SAM	SAMPLE
SB	SODIUM BISULFITE
SBS	SODIUM BISULFITE SOLUTION
SCC	SCREENINGS
SD	DRAIN, STORM
SE	SECONDARY EFFLUENT
SHW	WATER, SECONDARY LOOP HEATING
SPE	STRAINED PRIMARY EFFLUENT
SR	SOLIDS RETURN
SS	SANITARY SEWER
SSC	SCUM, SECONDARY
T	TELEPHONE
TBS	SLUDGE, THICKENED BLENDED
TDS	SLUDGE, THICKENED DIGESTED
UD	UNDERDRAIN
V	VENT, PLUMBING

ABBREVIATIONS & LETTER SYMBOLS

1-2	1-2 LEAD SELECT
123	SELECT 1,2,OR 3
1234	SELECT 1,2,3,OR 4
12345	SELECT 1,2,3,4,OR 5
AC	ALTERNATING CURRENT
ACK	ACKNOWLEDGE
ALKY	ALKALINITY
AM	AUTO-MANUAL
AS	ADJUSTABLE SPEED
ASS	AUTO-START-STOP
BCN	BEACON
B-N-A	BYPASS NORMAL AUTO
B-N-A-R	BYPASS NORMAL AUTO RECIRCULATE
BEAR	BEARING
CA	CLOSE-AUTO
CAL	CALIBRATION, CALIBRATE
CL2	CHLORINE (TYPICAL; USE STANDARD CHEMICAL ELEMENT ABBR)
COD	CHEMICAL OXYGEN DEMAND
COUP	COUPLING
CS	CONSTANT SPEED
CST	CONTROL START
CT	CLOSED TRIPPED
CTRL	CONTROL POWER
DC	DIRECT CURRENT
DO	DISSOLVED OXYGEN
E/I	VOLTAGE TO CURRENT
ENBL	ENABLE OR PERMISSIVE
ES	EMERGENCY STOP
ETM	ELAPSED TIME METER
F/R	FORWARD-REVERSE
FAIL	FAIL
FC	FAIL CLOSE
FCL2	FREE CHLORINE RESIDUAL
FI	FAIL INDETERMINENT
FL	FAIL LAST POSITION
FLD	FLOOD (DRYWELL FLOOD)
FO	FAIL OPEN
FOR	FORWARD
FRON	FRONT
H2S	HYDROGEN SULFIDE
H/L	HIGH/LOW
HA	HAND AUTOMATIC
HDK	HOOK
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORN	HORN
I & C	INSTRUMENTATION & CONTROL
I/I	CURRENT TO CURRENT
I/P	CURRENT TO PNEUMATIC
IN	IN
JOG	JOG
L/R	LOCAL-REMOTE
LCL	LOCAL
LEL	LOWER EXPLOSIVE LIMIT
LOC	LOCKED GATE
LOLO	LOW LOW
LWR	LOWER
MC	MODULATE-CLOSE
MOR	MANUAL-OFF-REMOTE
MSD	MASTER SHUT DOWN
MV	MANIPULATED VARIABLE
O2	OXYGEN, OXYGEN PURITY
OC	OPEN-CLOSE
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OIL	OIL
ON	ON
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
OSR	OFF-START-RUN
OUT	OUT
PB	PUSHBUTTON
PET	PLANT EMERGENCY TRIP
pH	HYDROGEN ION CONCENTRATION
PLUG	PLUGGED
PRO	PERCENT PURITY
PV	PROCESS VARIABLE
PWR	POWER
RADS	RADIE
RDY	READY
REAR	REAR
REM	REMOTE
REV	REVERSE
RST	RESET
SEIS	SEISMIC EVENT
SEL 1	SELECTION 1
SEL 2	SELECTION 2
SEL 3	SELECTION 3
SEL 4	SELECTION 4
SEL 5	SELECTION 5
SP	SET POINT
S/S	START-STOP
S/S/R	START-STOP-REVERSE
SS	SUSPENDED SOLIDS
STOP	STOP
STRT	START
SURG	SURGE
SYS	SYSTEM
TCL2	TOTAL CHLORINE RESIDUAL
TEST	TEST
TMF	THERMAL MASS FLOWMETER
TOA	TEST-OFF-AUTO
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TROL	TROUBLE
TRP	TRIPPED BREAKER
TURB	TURBIDITY
V/E	VOLTAGE TO CURRENT
WIND	WINDOW

EQUIPMENT TAG PREFIX

ACC	AREA CONTROL CENTER
ACP	AREA CONTROL PANEL
AD	AIR DRYER
ANN	ANNUNCIATOR
ASU	AIR SUPPLY UNIT
ATS	AUTOMATIC TRANSFER SWITCH
B	BLOWER
BAC	BACKFLOW PREVENTER
BAT	BATTERY
BBH	BASEBOARD ELECTRIC HEATER
BC	BATTERY CHARGER
BO	BOILER
BP	BUBBLER PANEL
BS	BAR SCREEN
C	CRANE
CB	CIRCUIT BREAKER
CC	COOLING COILS
CCU	CATAD CONTROL UNIT
CEF	CENTRIFUGE
CHR	CHILLER
CON	CONVEYOR
CPR	COMPRESSOR
DKL	DOOR LEVELER
DPL	DISTRIBUTION PANEL BOARD 120 Y/208 VOLTS
DPP	DISTRIBUTION PANEL BOARD 277 Y/480 VOLTS
DT	DRIP TRAP
DX	DIRECT EXPANSION COIL
E	ENGINE
ECP	ENVIRONMENTAL CONTROL PANEL
EF	EXHAUST FAN
EG	EMERGENCY GENERATOR
EL	ELEVATOR
ET	EXPANSION TANK
F	FAN
FA	FLAME ARRESTOR
FH	FUME HOOD
FI	FILTER

P	PUMP
PG	PRESSURE GAGE
PVL	PRESSURE VESSEL

DG	DIGESTER GAS
DH	DOMESTIC HOT WATER
DIW	DEIONIZED WATER
DR	DRAIN
DS	DIGESTED SLUDGE
DSF	DIESEL FUEL

PIT	PRESSURE INDICATING XMITTER
PLC	PROGRAMMABLE LOGIC CNTRLER
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH HIGH
PSHH	PRESSURE SWITCH HIGH-HIGH
PSHL	PRESSURE SWITCH HIGH-LOW
PSL	PRESSURE SWITCH LOW
PSLL	PRESSURE SWITCH LOW-LOW

MD	MOTORIZED DAMPER
ME	MISCELLANEOUS EQUIPMENT
MIX	MIXER
MS	MOTOR STARTER
MTR	MOTOR
OD	ODOR CONTROL
P	PUMP
POD	POWER DISTRIBUTION BOARD
PSB	PAINT SPRAY BOOTH
RAF	ROLL-TYPE AIR FILTER
RUD	ROLL UP DOOR
SA	SOUND ATTENUATOR
SAM	SAMPLER
SCL	STEAM CLEANER
SDP	SUBDISTRIBUTION PANEL
SF	SUPPLY FAN
SG	SLUICE GATE
SSB	SANDBLAST BOOTH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
T	TANK
TCU	CATAD TELEMETRY UNIT
TS	TRUCK SCALE
TVM	TELEVISION MONITOR
UH	UNIT HEATER
UPS	UNINTERRUPTABLE POWER SUPPLY
US	UNIT SUBSTATION
VAF	VACUUM FILTER
VH	VEHICLE HOIST
VSD	VARIABLE SPEED DRIVE
WCC	WATER-COOLED CONDENSER
WGB	WASTE GAS BURNER
XFMR	TRANSFORMER

THIS SET OF ABBREVIATIONS APPLIES TO THE DRAWINGS WITH THE FOLLOWING PREFIX LETTERS: J AND N.

PLANT CODE: 700 | PATH: DMS/GENERAL | CAD CONTROL DATED: 27 NOVEMBER 2007 | DGN: G40.DGN

WEST POINT TREATMENT PLANT SECONDARY TREATMENT FACILITIES
LIQUIDS STREAM

ABBREVIATIONS
I & C

SCALE: NONE | DRAWING NO: G40

King County

CONTRACT NO. W/F49-01 ST08

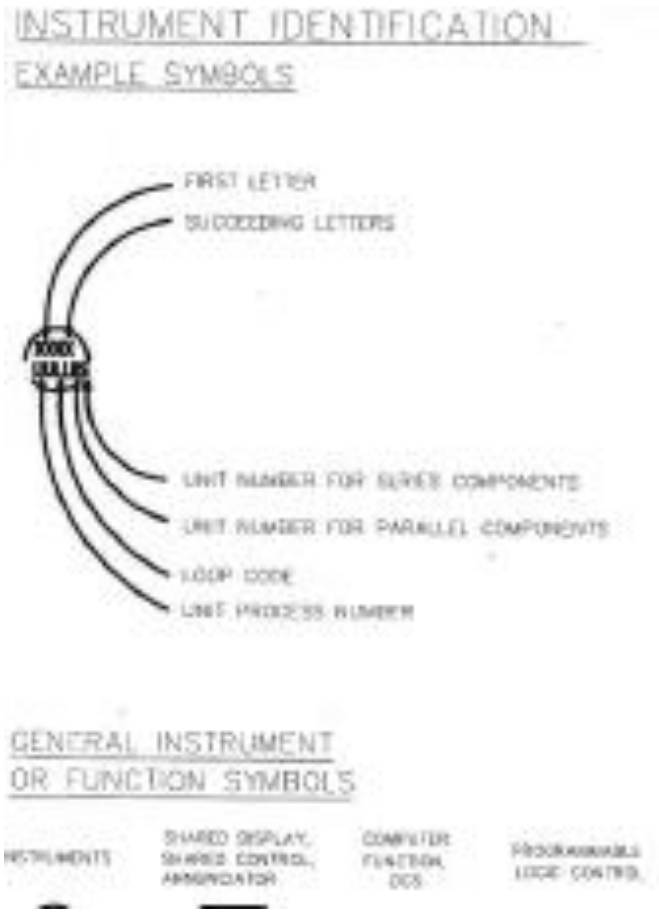
FACILITY DRAWING ISSUED: DEC 1996

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

NO.	REVISION	BY	APP'D	DATE

Piping and Instrumentation Drawings (P&ID)

- Instrument Identification



INSTRUMENT SOCIETY OF AMERICA TABLE

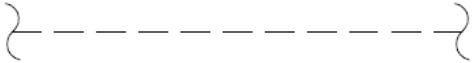
FIRST LETTER			SUCCEEDING LETTERS		
MEASURED OR INITIATING VARIABLE		MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM	ALARM	AUTO
B	BURNER FLAME		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			FAIL, ERROR ABNORMAL
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING (DIMENSIONAL)		GLASS		READY
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			RUNNING, RUN
K	TIME OR TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	STOP
L	LEVEL		LIGHT (PILOT)		LOW, LOCAL
M	MOTOR OR MOISTURE	MOMENTARY			MID
N	EQUIPMENT				
O	USER'S CHOICE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RADIATION		RECORD OR PRINT		REMOTE
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER, OR LOUVER	
W	TORQUE, WEIGHT, FORCE		WELL		
X	UNCLASSIFIED		PLC INPUT	UNCLASSIFIED	
Y	EVENT			RELAY OR COMPUTER OR PLC OUTPUT	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

Piping and Instrumentation Drawings (P&ID)

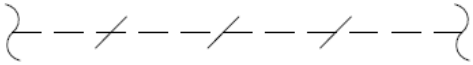
- Line Legend

MAIN PROCESS FLOW
(WITH TYPICAL DIRECTION OF FLOW SHOWN)

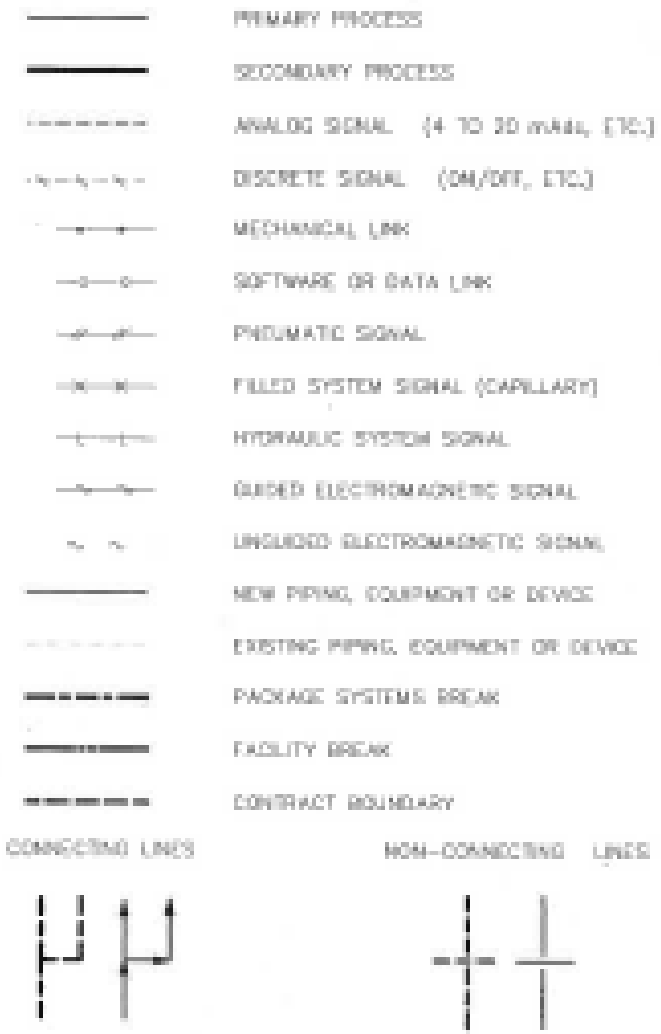
SECONDARY PROCESS FLOW
(WITH TYPICAL DIRECTION OF FLOW SHOWN)



ANALOG SIGNAL LINE

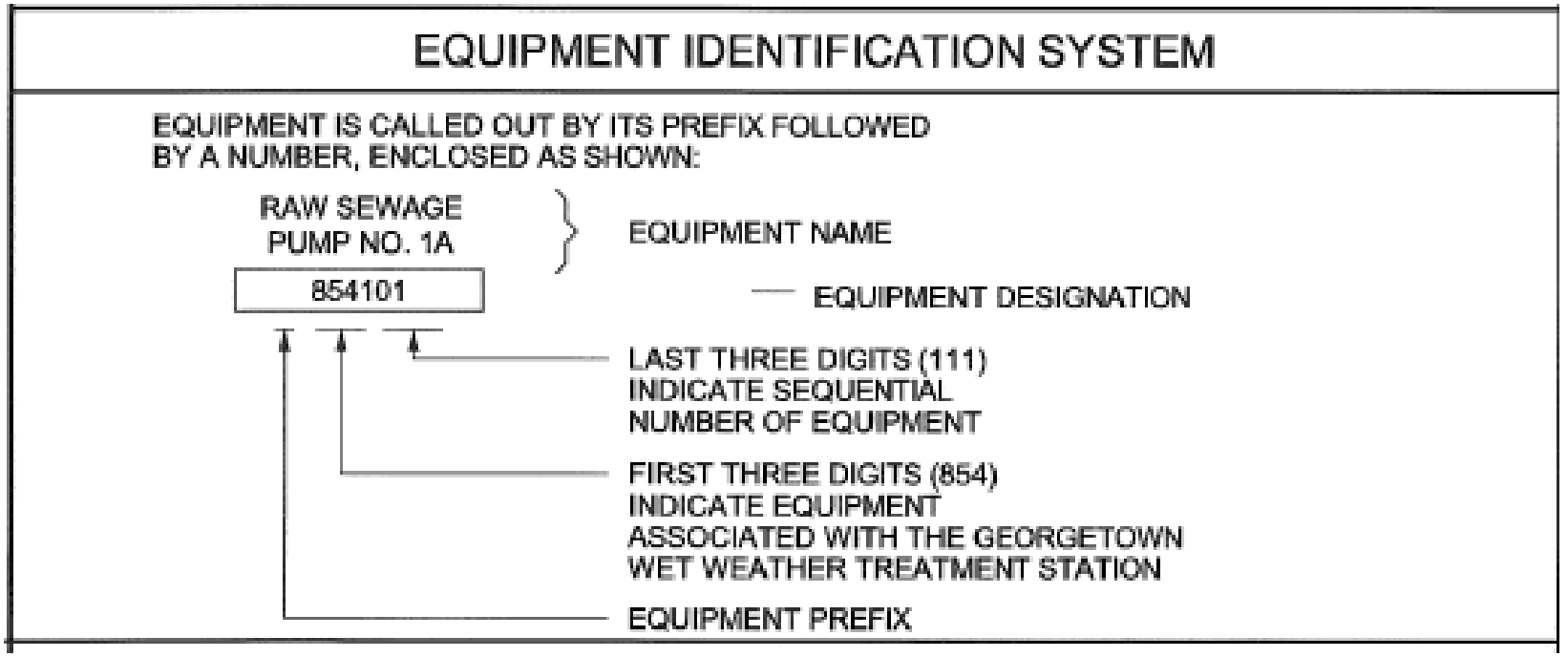


DISCRETE SIGNAL LINE



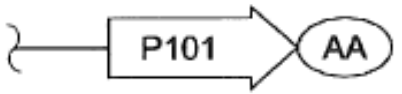
Piping and Instrumentation Drawings (P&ID)

- Tag Numbers



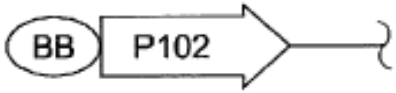
Piping and Instrumentation Drawings (P&ID)

Interface Symbols



REMARK LINE 1
REMARK LINE 2

PROCESS/
SIGNAL FLOW INTERFACE
AA = CONNECTOR NUMBER
P101 = DESTINATION DRAWING NO.

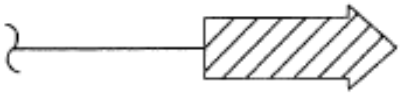


REMARK LINE 1
REMARK LINE 2

PROCESS/
SIGNAL FLOW INTERFACE
BB = CONNECTOR NUMBER
P102 = SOURCE DRAWING NO.

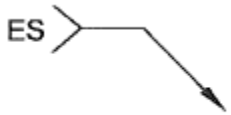
REMARK LINE 1
REMARK LINE 2

FROM PROCESS EXTERNAL
TO PROJECT



REMARK LINE 1
REMARK LINE 2

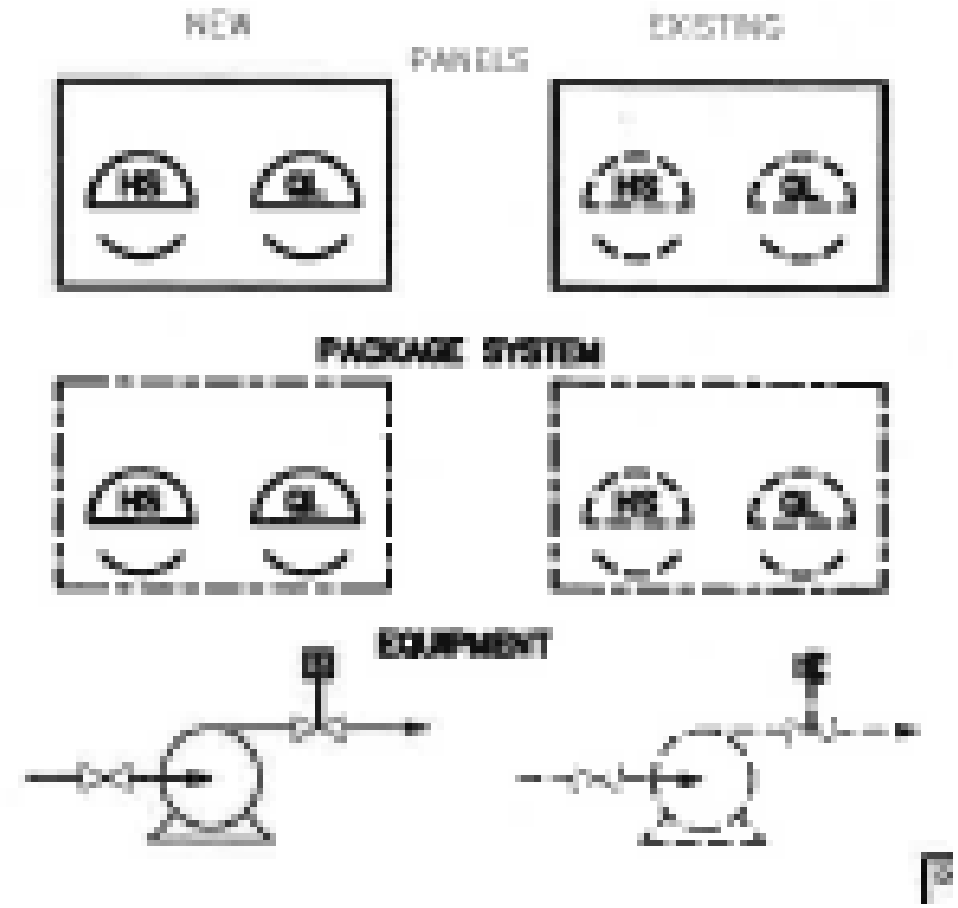
TO PROCESS EXTERNAL
FROM PROJECT



ELECTRIC SUPPLY
ES: DEFINES TYPE OF SUPPLY
EXAMPLE:
120=120VAC, SINGLE PHASE

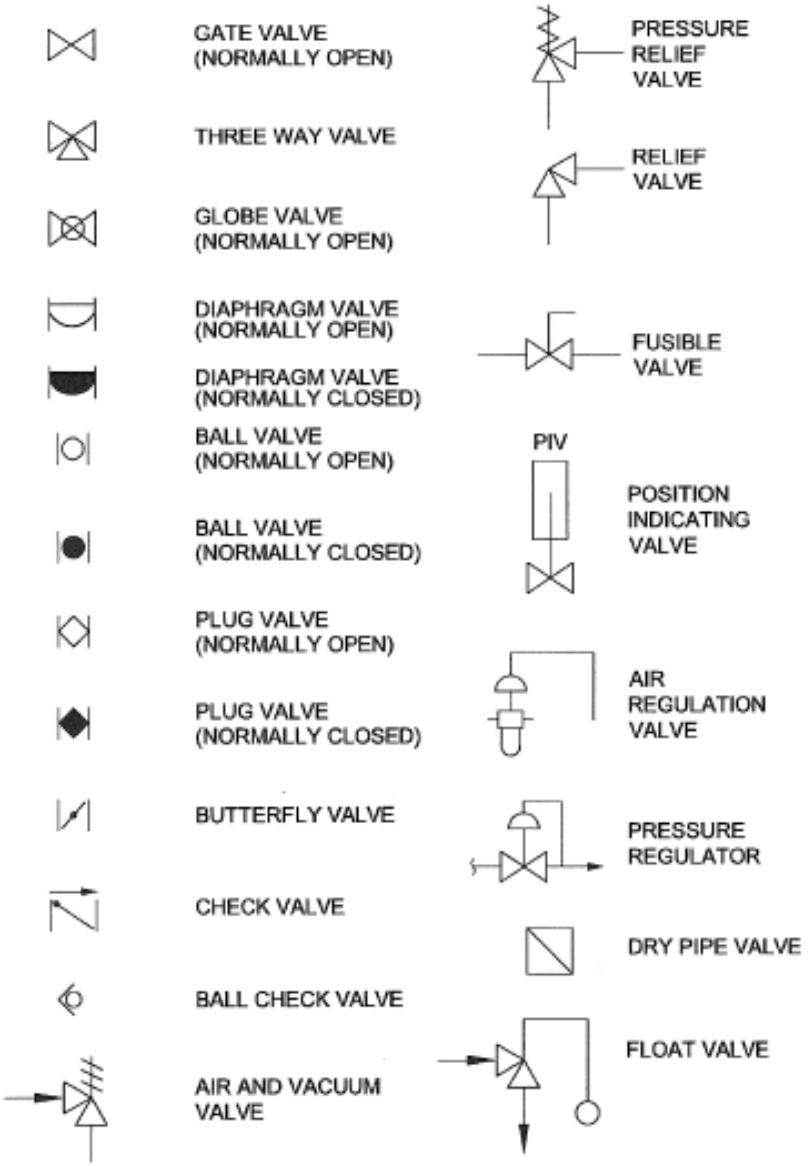
Piping and Instrumentation Drawings (P&ID)

- Construction Status



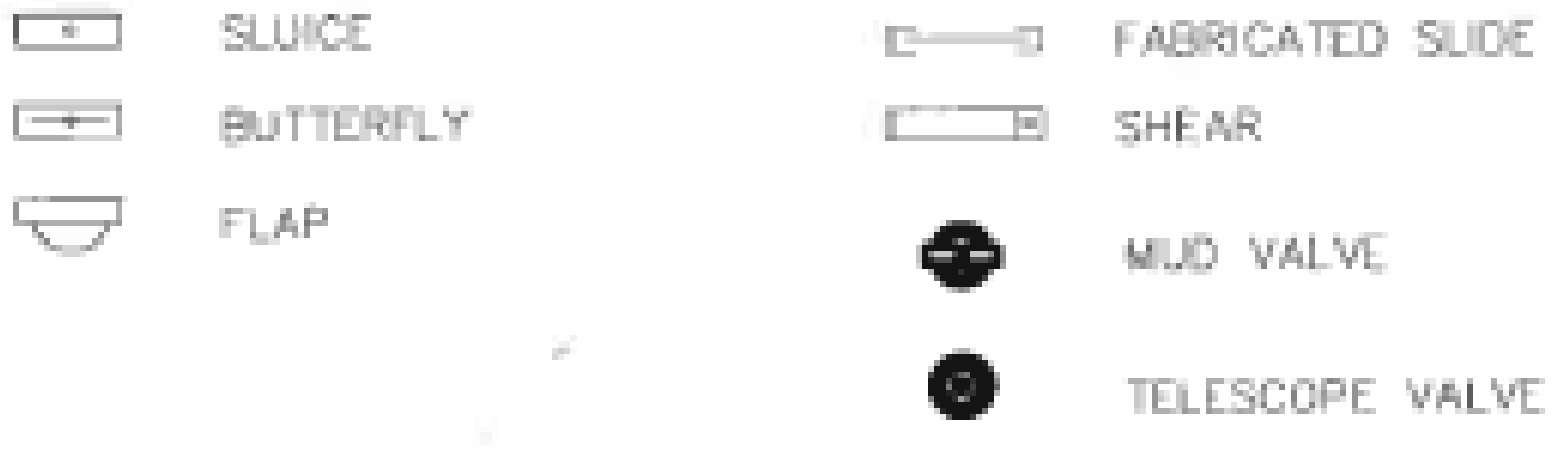
Piping and Instrumentation Drawings (P&ID)

- Valve Symbols



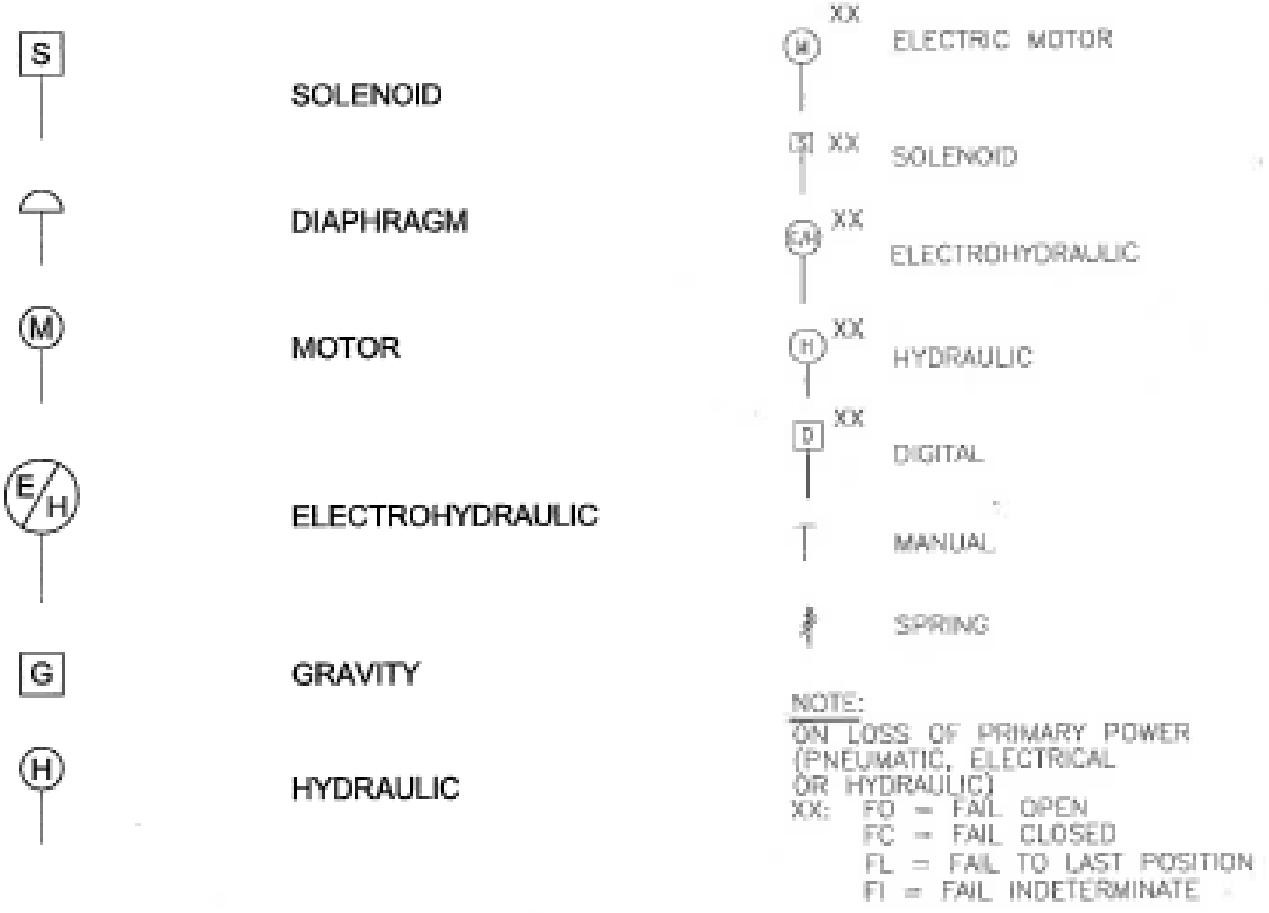
Piping and Instrumentation Drawings (P&ID)

- Gate Symbols



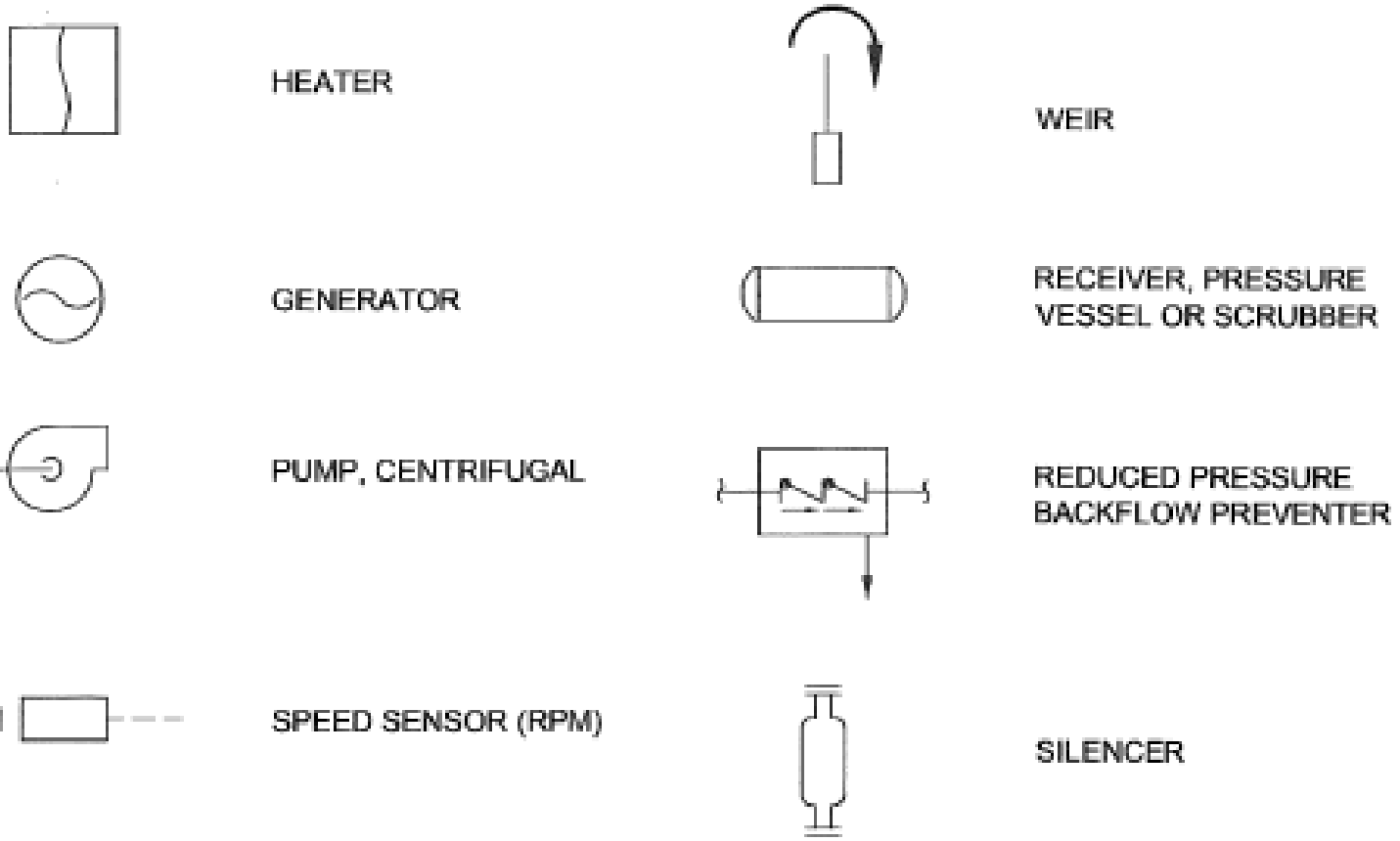
Piping and Instrumentation Drawings (P&ID)

- Actuator Symbols



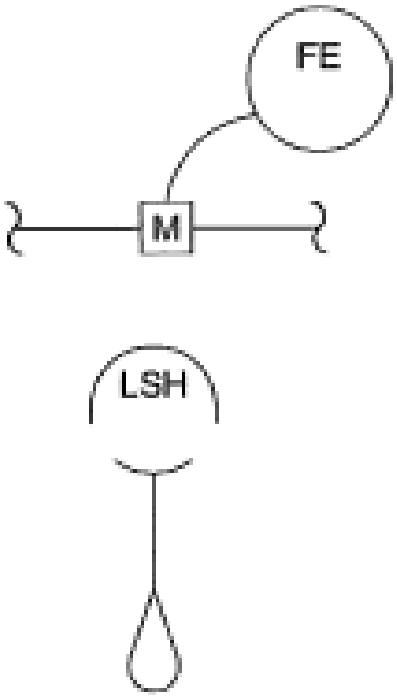
Piping and Instrumentation Drawings (P&ID)

- Mechanical Equipment Symbols



Piping and Instrumentation Drawings (P&ID)

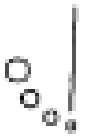
Primary Element Symbols



MAGNETIC FLOW TUBE

FLOAT SWITCH
(HIGH WATER LEVEL)

ULTRASONIC LEVEL
ELEMENT



BUBBLER

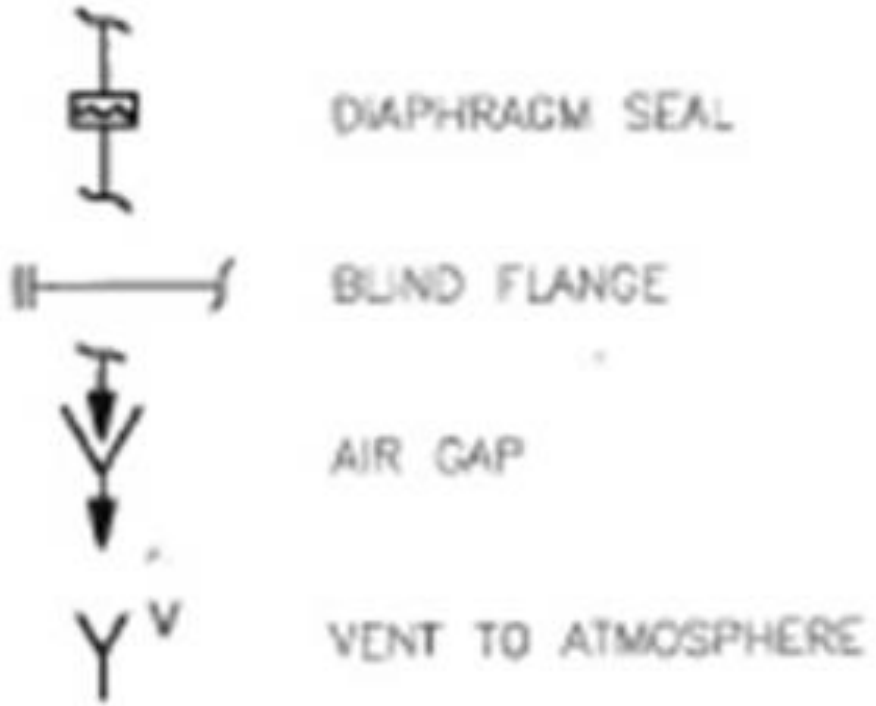
VARIABLE AREA
FLOW INDICATOR
(ROTAMETER)

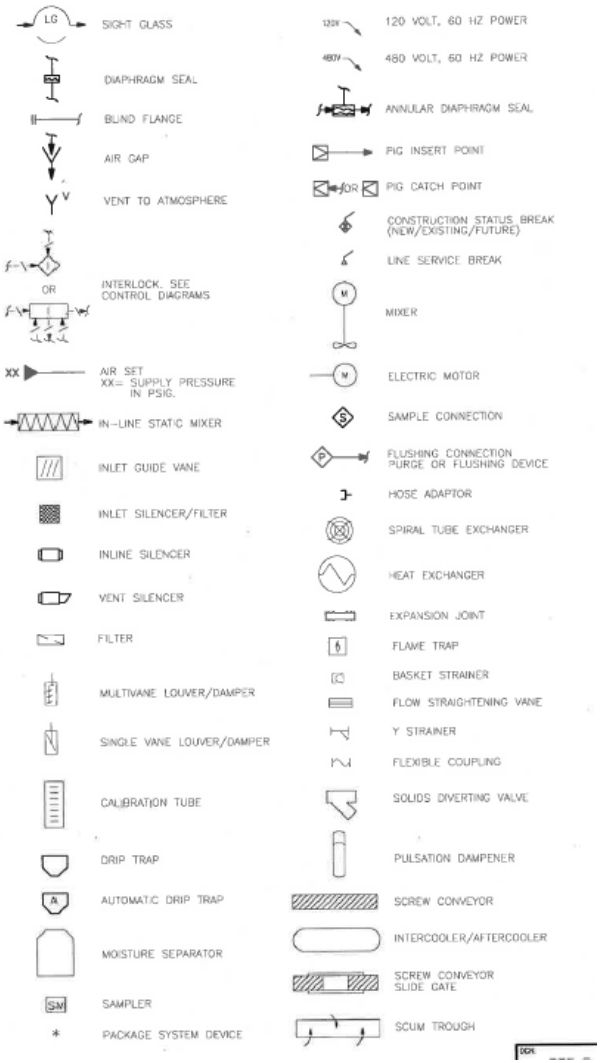
UTILITY METER

DIAPHRAGM SEAL

Piping and Instrumentation Drawings (P&ID)

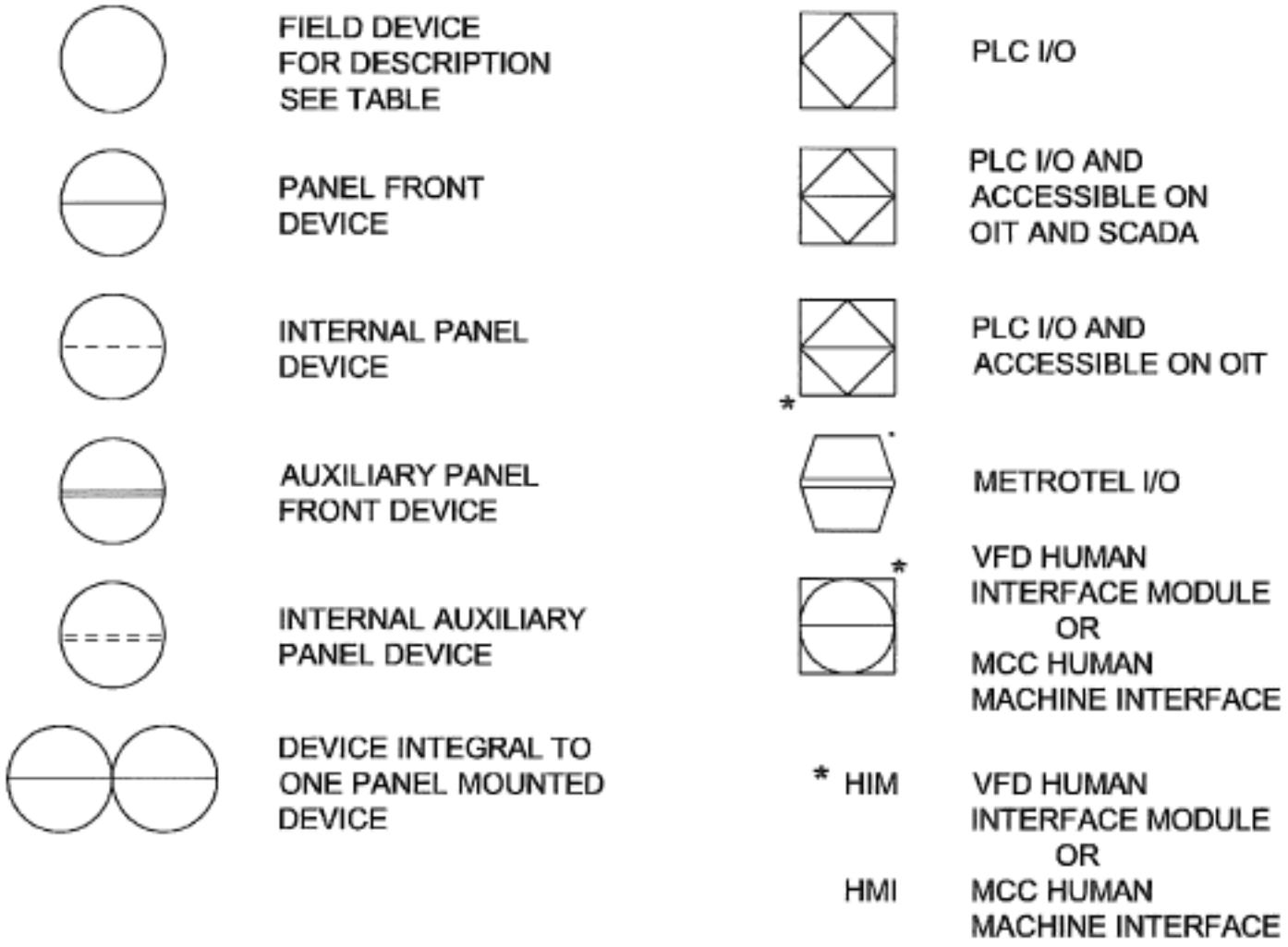
- Miscellaneous Symbols



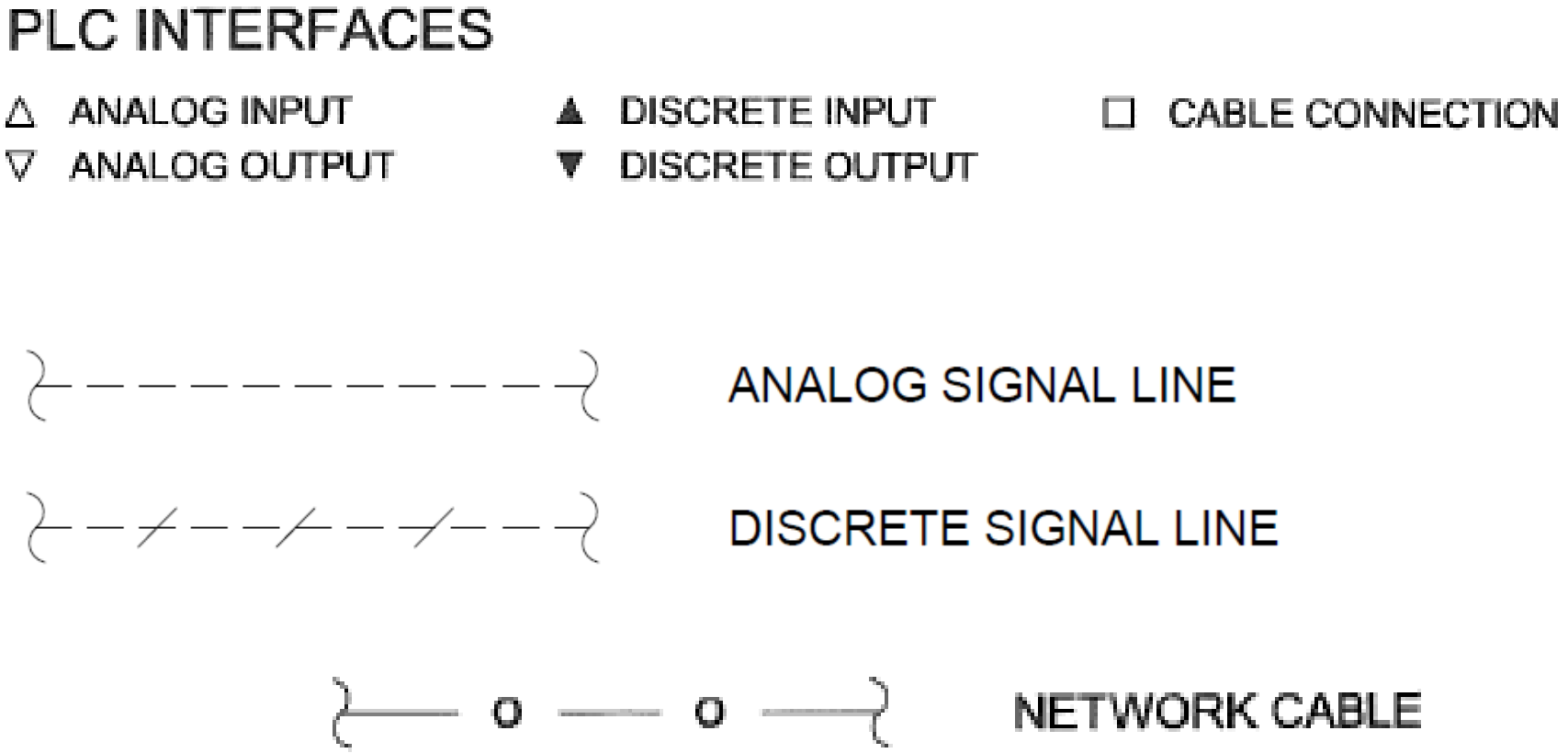


Piping and Instrumentation Drawings (P&ID)

Functional Logic Diagrams



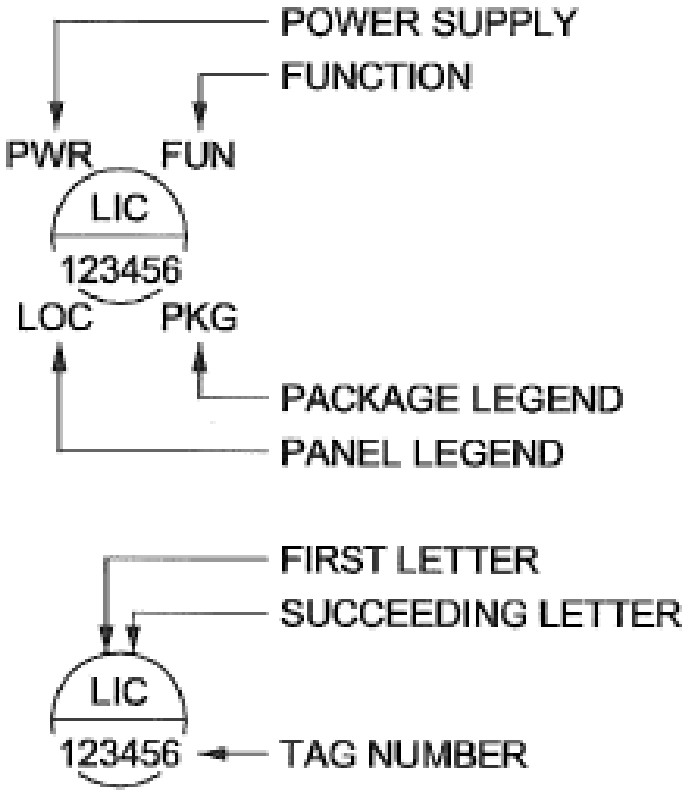
Piping and Instrumentation Drawings (P&ID)



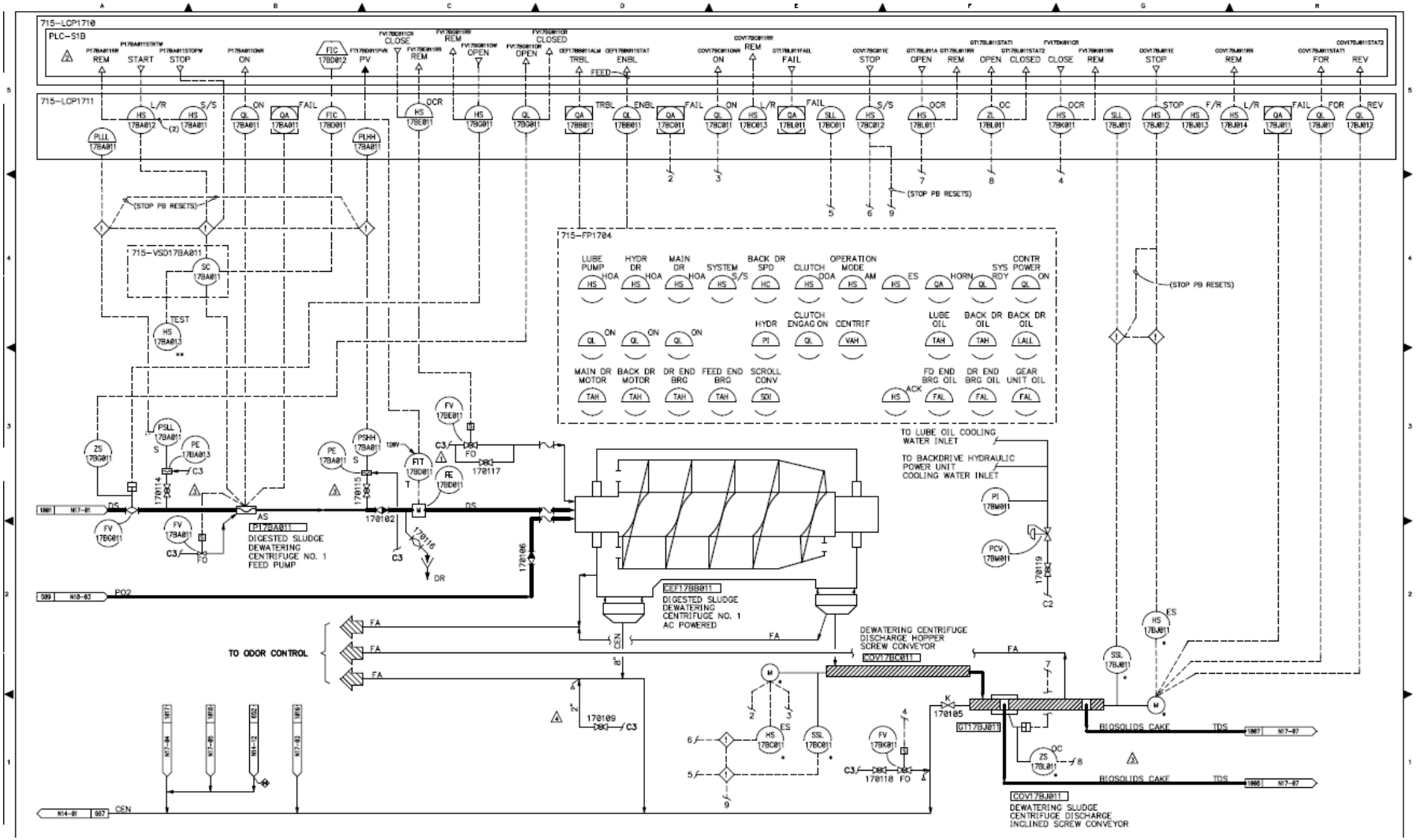
Piping and Instrumentation Drawings (P&ID)

Instrumentation Identification

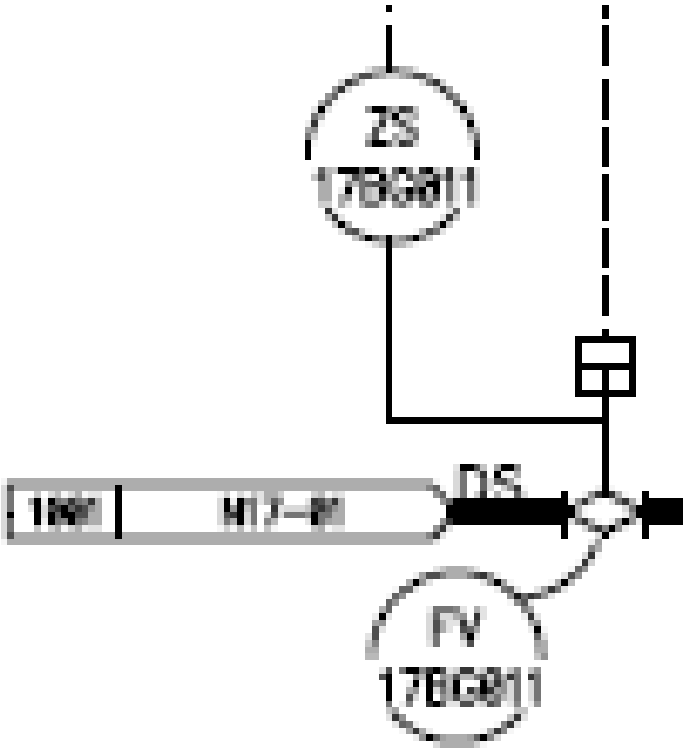
FIRST LETTER			SUCCEEDING LETTERS		
MEASURED OR INITIATING VARIABLE		MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM	ALARM	AUTO
B	BURNER FLAME		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			FAIL, ERROR ABNORMAL
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING (DIMENSIONAL)		GLASS		READY
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			RUNNING, RUN
K	TIME OR TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	STOP
L	LEVEL		LIGHT (PILOT)		LOW, LOCAL
M	MOTOR OR MOISTURE	MOMENTARY			MID
N	EQUIPMENT				
O	USER'S CHOICE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RADIATION		RECORD OR PRINT		REMOTE
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER, OR LOUVER	
W	TORQUE, WEIGHT, FORCE		WELL		
X	UNCLASSIFIED		PLC INPUT	UNCLASSIFIED	
Y	EVENT			RELAY OR COMPUTER OR PLC OUTPUT	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	



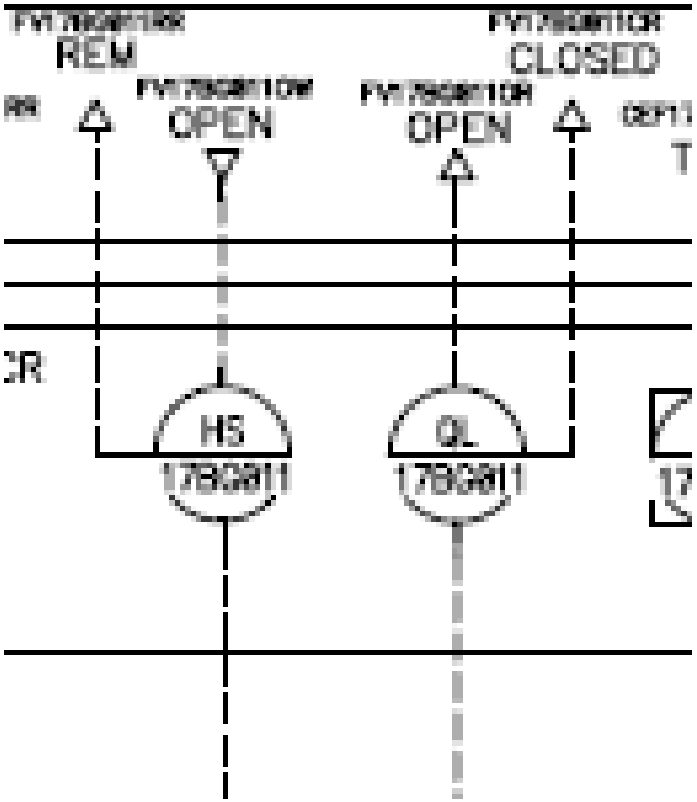
Sludge Dewatering Centrifuge No.1



FV 17BG011

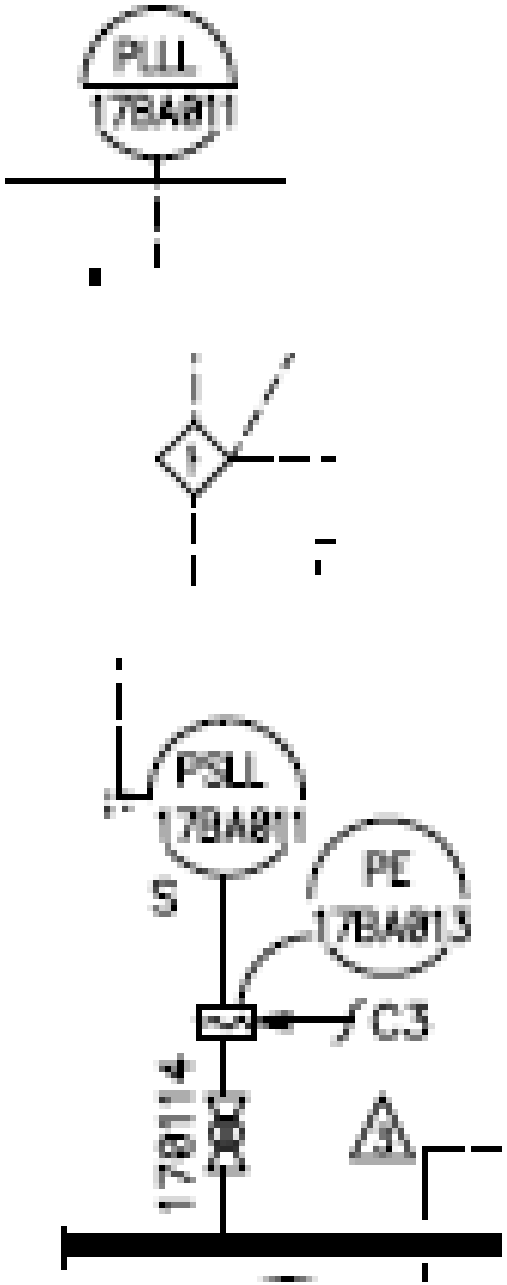


FV 17BG011


REM
CLOSED
OPEN
OPEN
HS
17BG011
QL
17BG011

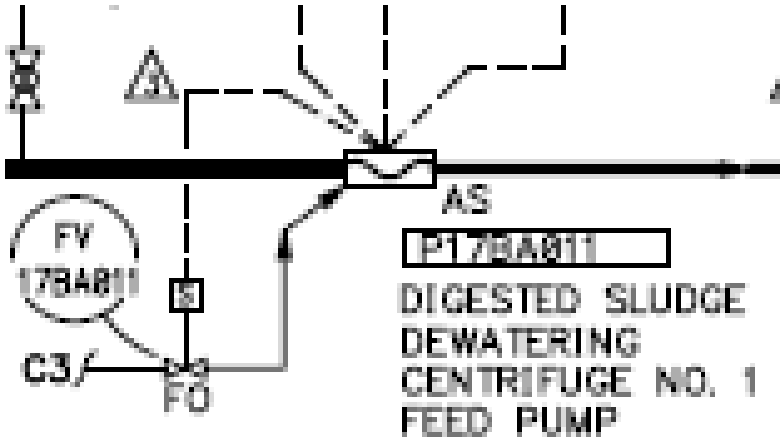

CLOSE
OPEN
CLOSE
REMOTE
SLUDGE DEWATERING
CENTRFG NO. 1 FEED
PUMP SUCTION VALVE
FV17BG011

PE 17B013

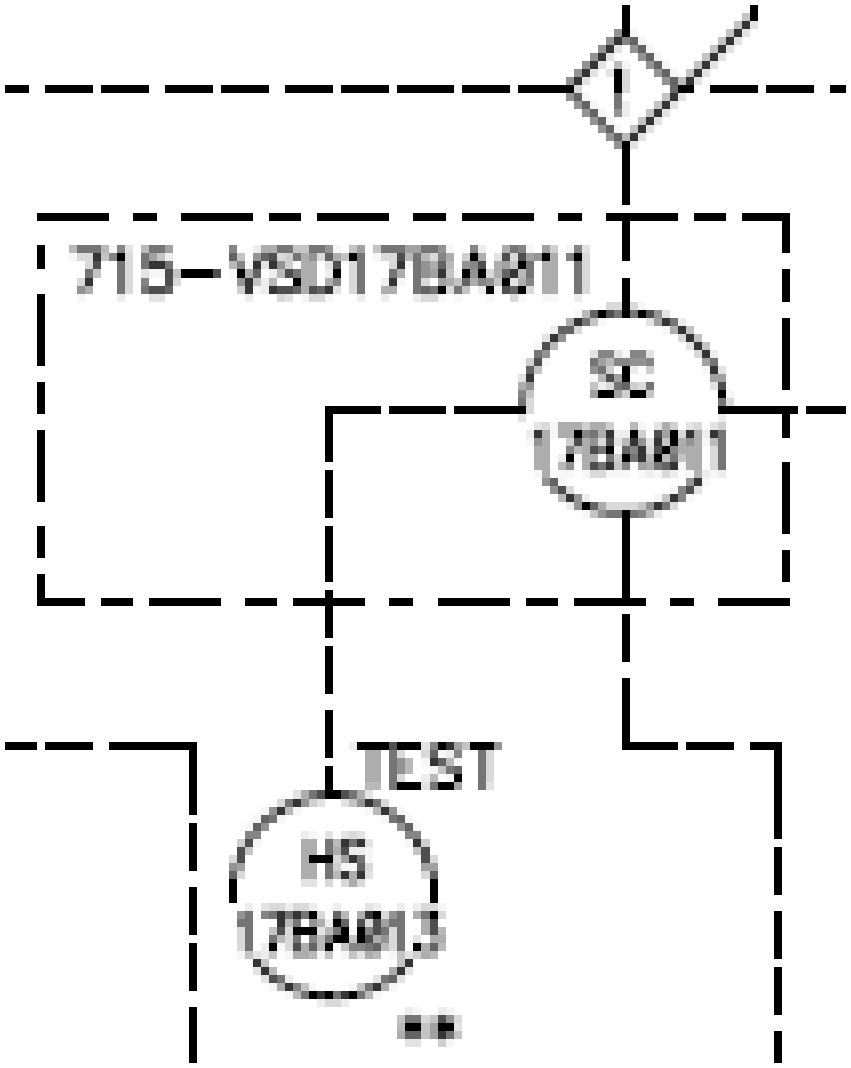

PSLL
17BA811
PSLL
17BA811
S
PE
17BA813
C3
17B114


LOW-LOW
PRESSURE
HIGH-HIGH
PRESSURE
ON
START
STOP
DIGESTED SLUDGE
DEWATERING OFF

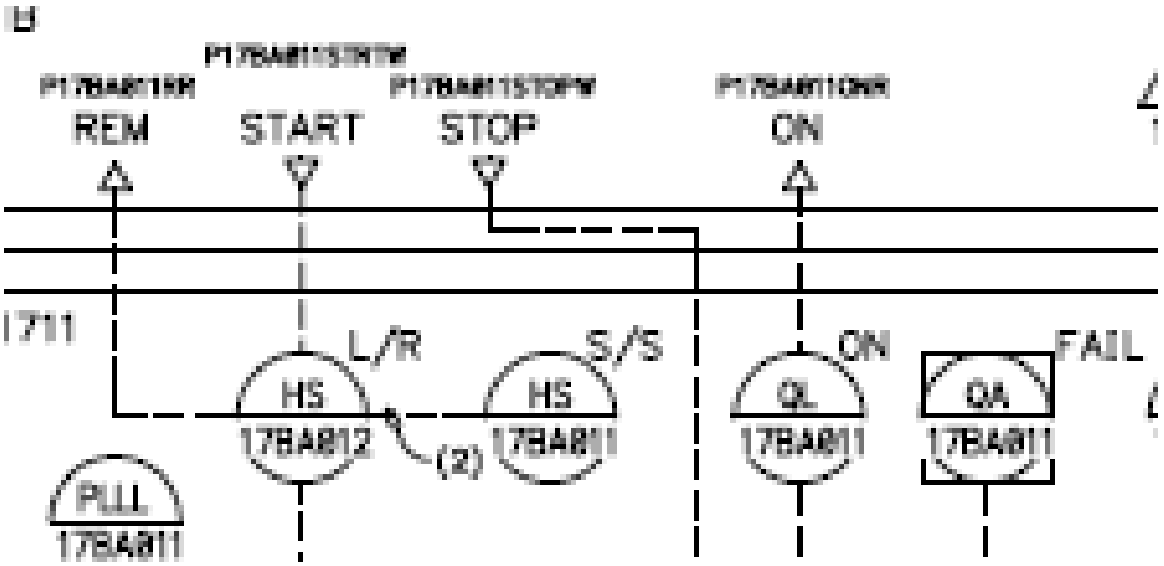
FV17BA011 / P17BA011



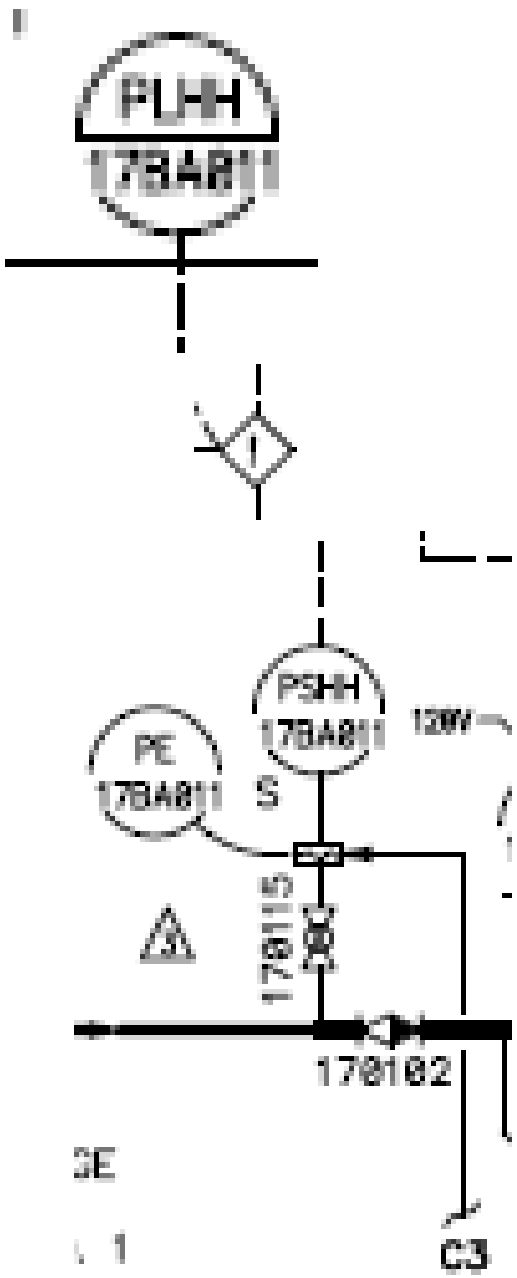
FV17BA011 / P17BA011



FV17BA011 / P17BA011



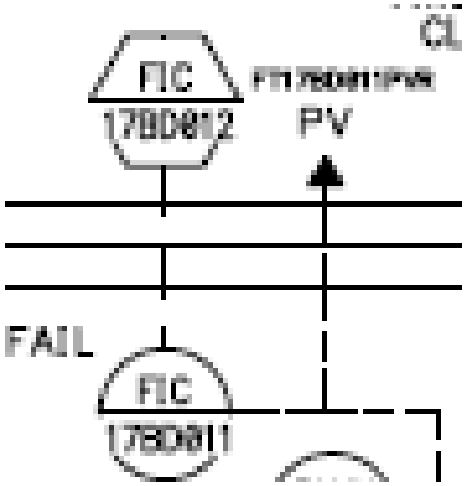
PE 17BA011

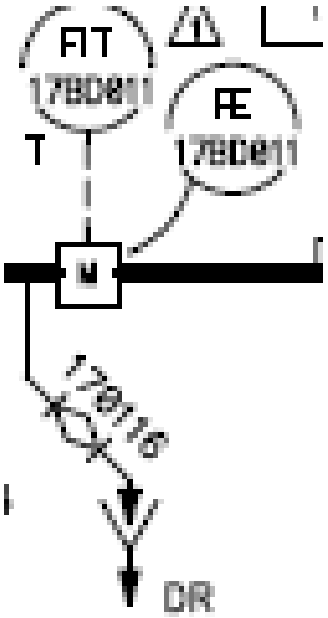

PLHH
17BA811
PSHH
17BA811
120V
PE
17BA811
S
170102
C3


ON
LOW-LOW
PRESSURE
HIGH-HIGH
PRESSURE
START
STOP
DIGESTED SLUDGE
DEWATERING CEF
FEED PUMP 1

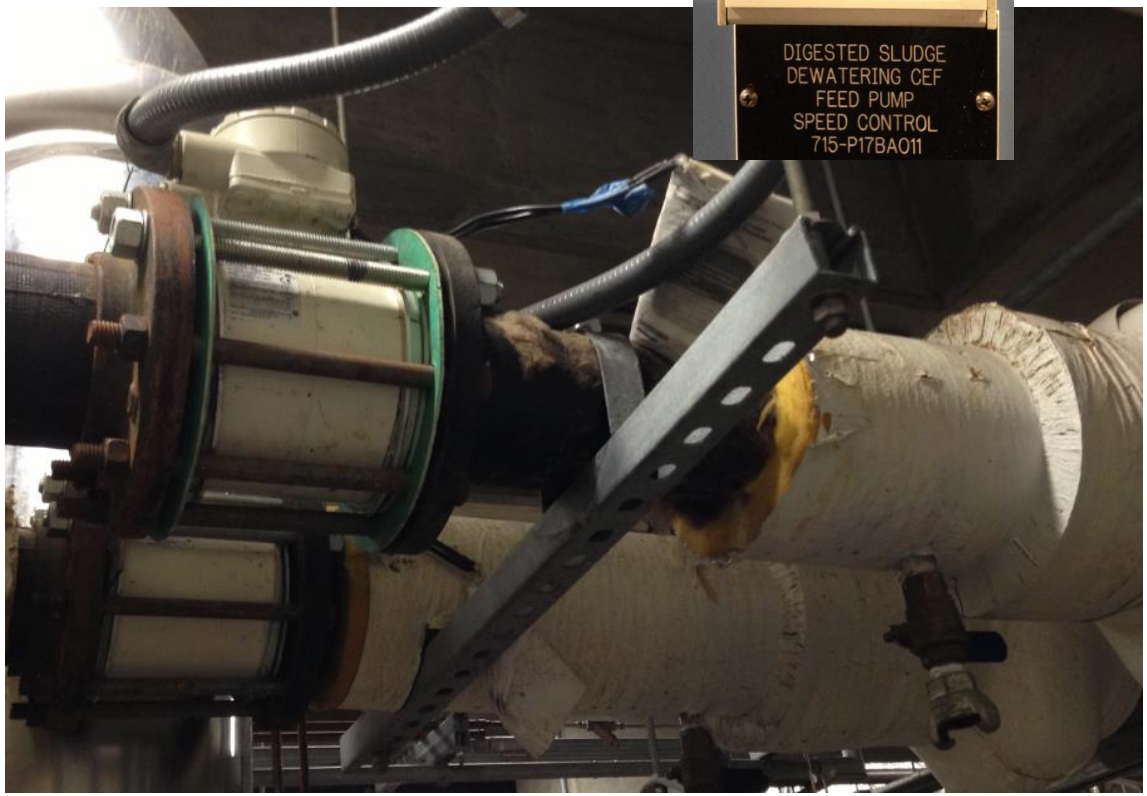

WARNING

FE 178D011

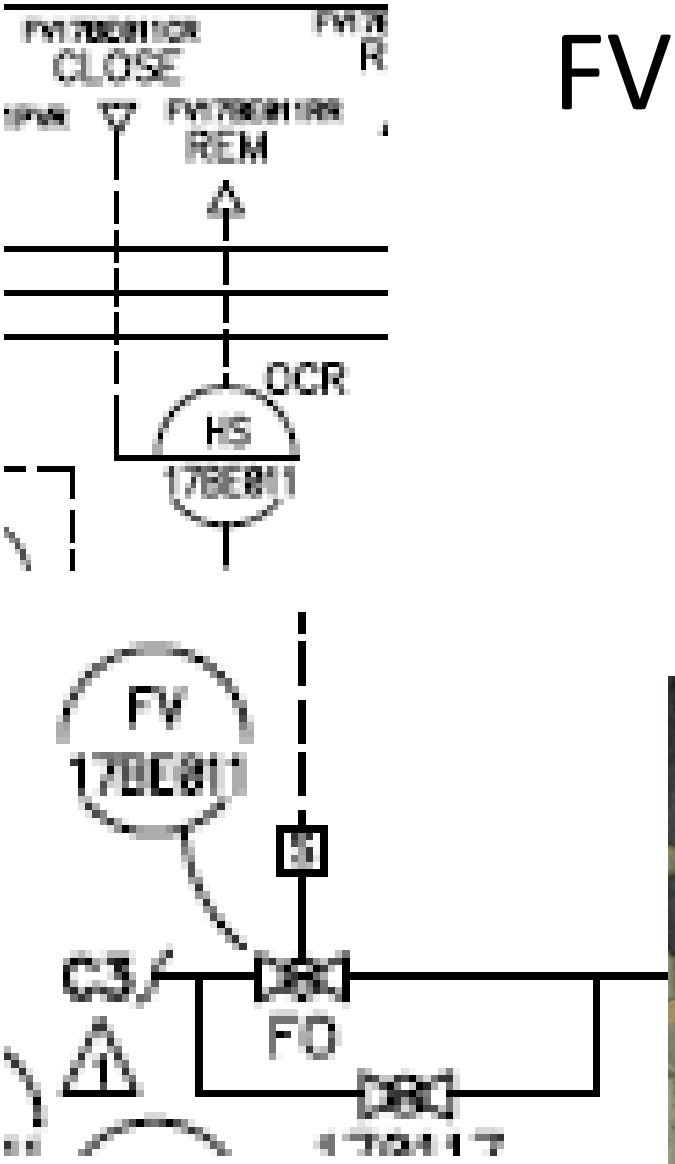

FIC
178D012
PV
FAIL
FIC
178D011


FIT
178D011
FE
178D011
T
M
DR


MOORE
0.3
CL
EI
AM
D
ACK
CLOSE
OPEN
DIGESTED SLUDGE
DEWATERING CEF
FEED PUMP
SPEED CONTROL
715-P17BA011

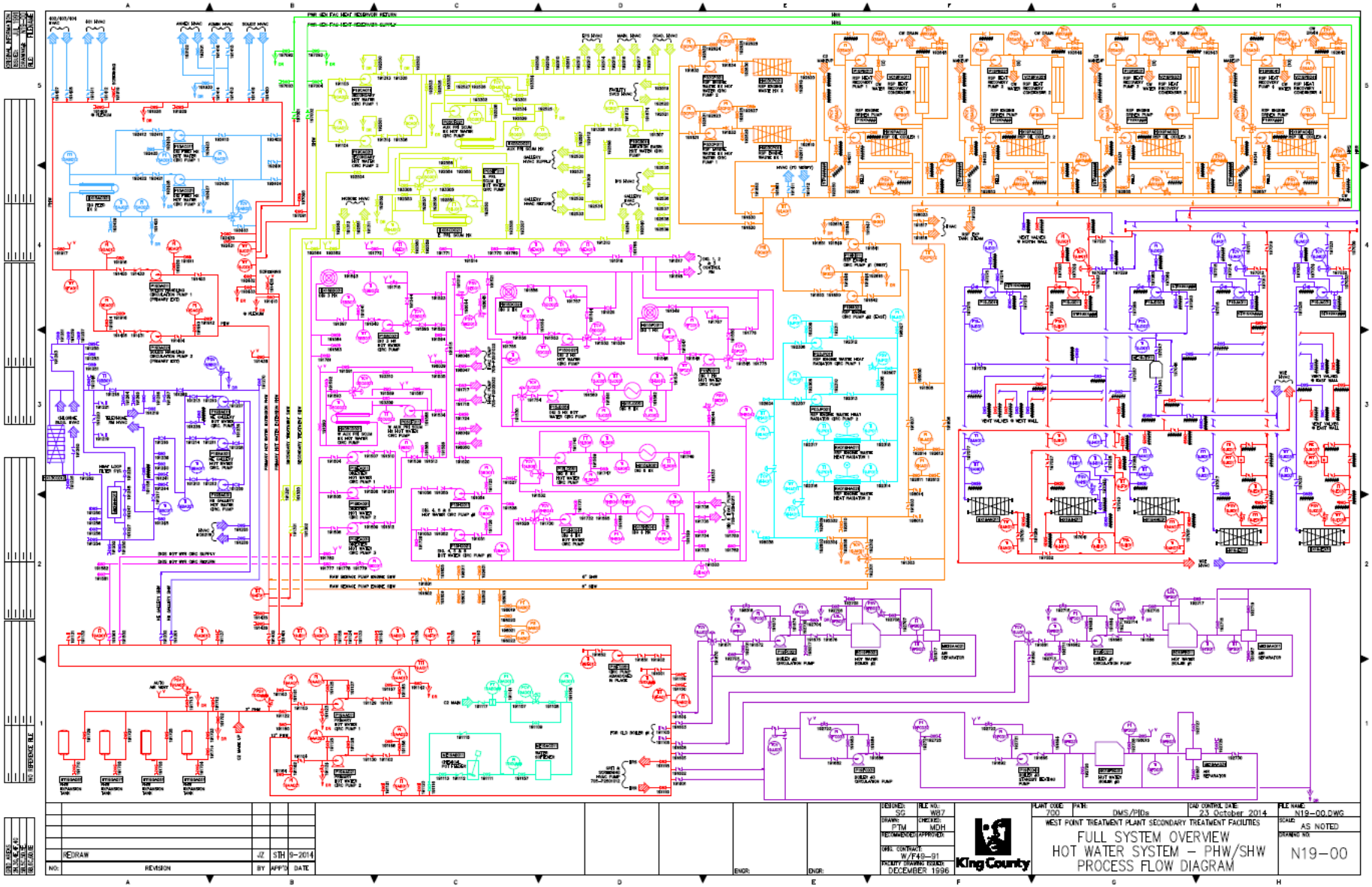


FV 178B011


CLOSE
REM
OCR
HS
FV
C3
FO


FLUSH
CLOSE
OPEN
REM
DIGESTED SLUDGE
DEWATERING CEF
C3 FLOW VALVE


DANGER
ARC FLASH HAZARD
DANGEROUS
DANGER
HIGH VOLTAGE
DANGER
HIGH VOLTAGE
WARNING
ARC FLASH HAZARD
DANGER



NO:	REVISION	BY	APP'D	DATE
	REDRAW	JZ	STH	9-2014

DESIGNED: SG	FILE NO.: W87
DRAWN: PTM	CHECKED: MDH
RECOMMENDED/APPROVED:	
DRG. CONTRACT: W/F49-91	
FACILITY DRAWING ISSUED: DECEMBER 1996	

King County

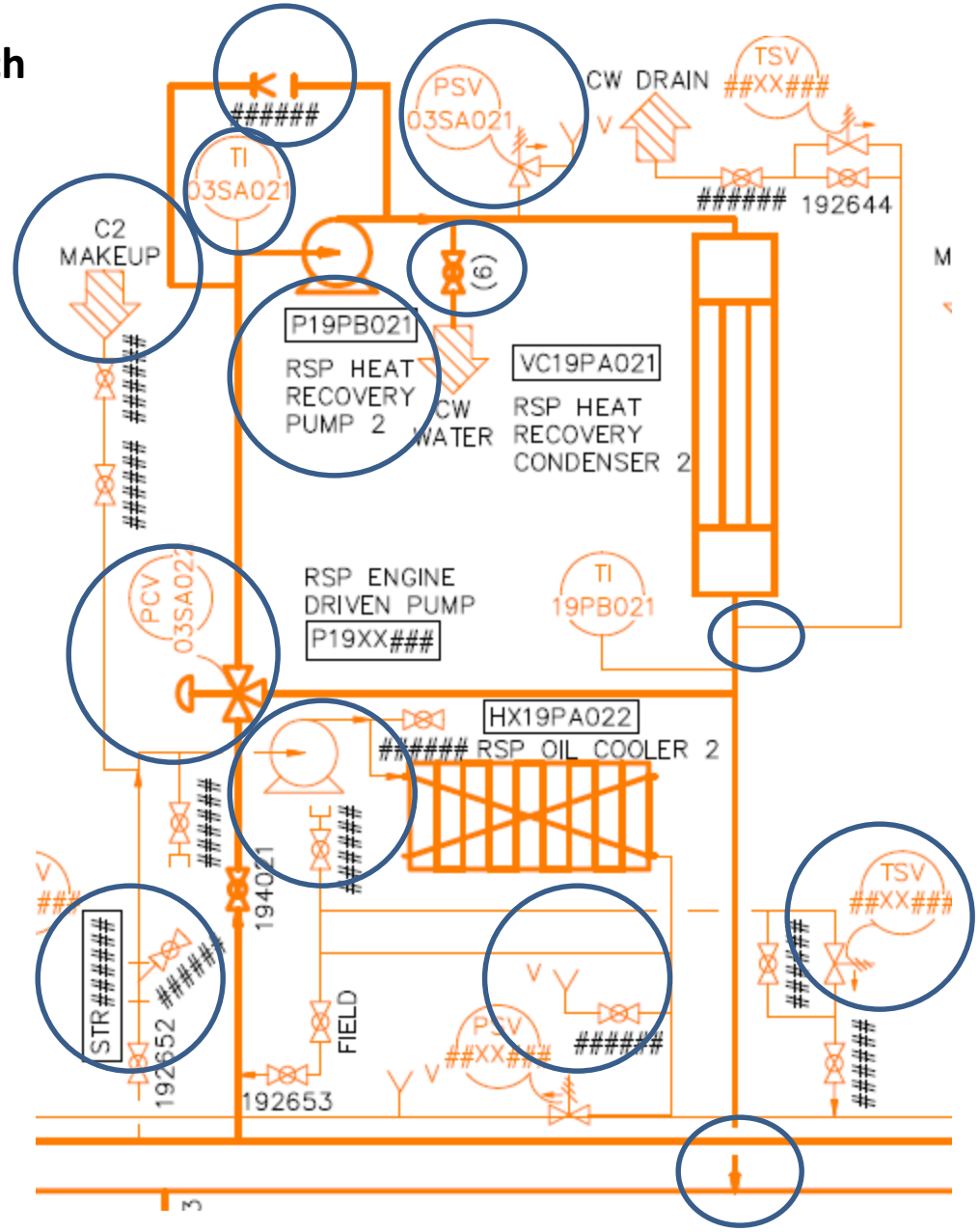
PLANT CODE: 700	PATH: DMS/PIDs	CAD CONTROL DATE: 23 October 2014

WEST POINT TREATMENT PLANT SECONDARY TREATMENT FACILITIES

FULL SYSTEM OVERVIEW
HOT WATER SYSTEM – PHW/SHW
PROCESS FLOW DIAGRAM

FILE NAME: N19-00.DWG
SCALE: AS NOTED
DRAWING NO.: N19-00

Identify what is in each circle and which table is used to find the information



Identify what is in each circle and which table is used to find the information