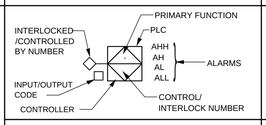
ABBREVIATIONS

AA -	ANALYSIS ALARM
AAE -	AUTOMATIC AIR ELIMINATOR
AAIR -	ANALYSIS ALARM INDICATING RECORDER
AAV -	AUTOMATIC AIR VENT
AB -	AERATION BLOWER
AC -	ANALYSIS CONTROL OR AIR COMPRESSION
ACS -	AUTOMATIC COARSE SCREEN
AD -	AIR DRYER
ADE -	ANAEROBIC DIGESTER EFFLUENT
ADG -	ANAEROBIC DIGESTER GAS
ADR -	ANAEROBIC DIGESTER RECYCLE
ADRP -	ANAEROBIC DIGESTER RECYCLE PUMP
AE -	ANALYSIS ELEMENT
AF -	AIR FILTER
AFP -	ALUM FEED PUMP
AHLR -	ALARM HIGH/LOW RECORDING
AH -	ALARM HIGH
AHH -	ALARM HIGH/HIGH
AI -	ANALYSIS INDICATOR
AIR -	AIR
AIT -	ANALYSIS INDICATING TRANSMITTER
AL -	ALARM LOW
ALL -	ALARM LOW/LOW
AM -	AUGER MOTOR
AMS -	ALKALINITY METERING SYSTEM
AnMBR -	ANAEROBIC MEMBRANE BIOREACTOR
AOV -	AIR OPERATED VALVE
AR -	ANALYSIS RECORDER
ARI -	ANALYSIS RECORDER/INDICATOR OR ANAEROBIC REACTOR INFLUENT
ART -	AIR RECEIVER TANK
ARVB -	AIR RELIEF AND VACUUM BREAKER
AS -	AUTOMATIC SAMPLER
BB -	BIOGAS BLOWER
BC -	BELT CONVEYOR
BF -	BACK FLUSH
BFP -	BIOLOGICAL FEED PUMP
BG -	BIOGAS
BP -	BYPASS
BPV -	BACK PRESSURE VALVE
BS -	BAR SCREEN OR BASKET STRAINER
BSP -	BUILDING SUMP PUMP
BSV -	BLOCKING SAFETY VALVE
BVF -	BULK VOLUME FERMENTER
BWP -	BOOSTER WATER PUMP
CA -	COMPRESSED AIR
CAD -	COMPRESSED AIR DRYER
CBP -	CHEMICAL CLEANING WATER BOOSTER PUMP
CC -	CALIBRATION COLUMN
CD -	CONDENSATE DRAIN
CF -	COOLING FAN OR CHEMICAL FEED
CFP -	CHEMICAL FEED PUMP
CPF -	CHEMICAL POT FEEDER
CS -	CONTROL STATION
CV -	CONTROL VALVE
DBC -	DISTRIBUTION BELT CONVEYOR
DCS -	DISTRIBUTED CONTROL SYSTEM
DFB -	DUAL FUEL BOILER
DFO -	DROP FEED OILER
DFP -	DEFOAMER METERING PUMP
DO -	DISSOLVED OXYGEN
DP -	DEWATERING PRESS OR DILUTE POLYMER
DPG -	DIFFERENTIAL PRESSURE GAUGE OR DIGITAL PRESSURE GAUGE
DR -	DRAIN
DS -	DRAIN SUMP
DSP -	DRAIN SUMP PUMP
DT -	DRIP TRAP
ED -	EDUCTOR
EFF -	EFFLUENT
EFP -	EDUCTOR FEED PUMP
EJ -	EXPANSION JOINT
EOF -	EMERGENCY OVERFLOW
EP -	EFFLUENT PUMP
ETK -	EXPANSION TANK
FA -	FLOW ALARM
FAL -	FLOW ALARM LOW
FC -	FLOW CONTROLLER OR FLAME CHECK OR FLUSH CONNECTION
FCP -	FLARE CONTROL PANEL OR FERRIC CHLORIDE PUMP
FCV -	FLOW CONTROL VALVE
FD -	FLOOR DRAIN
FDS -	FINE DRUM SCREEN
FE -	FLOW ELEMENT
FI -	FLOW INDICATOR
FIT -	FLOW INDICATING TRANSMITTER
FL -	FLARE
FLV -	FLOAT VALVE
FM -	FLOWMETER
FQI -	FLOW QUANTITY INDICATOR
FQR -	FLOW QUANTITY RECORDER
FQRI -	FLOW QUANTITY RECORDER/INDICATOR
FS -	FERMENTER SLUDGE OR FINE SCREEN
FTA -	FLAME TRAP ASSEMBLY
FV -	FILL VALVE OR FOOT VALVE
FW -	FLUSH WATER
GEC -	GAS ELIMINATION CHAMBER
GG -	GAUGE GUARD
GR -	GRINDER
GV&B -	GATE VALVE & BOX
H -	HORN
HB -	HOSE BIBB
HOP -	HOPPER
HP -	HEATING PUMP
HS -	HAND SWITCH
HSFA -	HIGH SPEED FLOATING AERATOR
HX -	HEAT EXCHANGER
IC -	CURRENT CONTROLLER
INF -	INFLUENT
INJ -	VENTURI INJECTOR
IP -	INFLUENT PUMP
IT -	CURRENT TRANSMITTER
IV -	INJECTION VALVE
JRC -	JET RECIRCULATION
JRP -	JET RECIRCULATION PUMP
KC -	TIMER CONTROLLER
LA -	LEVEL ALARM
LAH -	LEVEL ALARM HIGH
LAL -	LEVEL ALARM LOW
LAHL -	LEVEL ALARM HIGH/LOW
LARI -	LEVEL ALARM RECORDER INDICATOR
LC -	LEVEL CONTROLLER
LCP -	LOCAL CONTROL PANEL
LE -	LEVEL ELEMENT
LI -	LEVEL INDICATOR
LIT -	LEVEL INDICATING TRANSMITTER
LR -	LEVEL RECORDER
LPS -	LADDER PIPE SUPPORT
LRI -	LEVEL RECORDER/INDICATOR
LS -	LEVEL SWITCH
LSC -	LEVEL SWITCH CLOSED
LSH -	LEVEL SWITCH HIGH
LSL -	LEVEL SWITCH LOW
MBR -	MEMBRANE BIOREACTOR
MCV -	MODULATING CONTROL VALVE
MFP -	MEMBRANE BIOREACTOR FEED PUMP
MFV -	MULTI-FUNCTION VALVE
MH -	MAGNESIUM HYDROXIDE
MHP -	MAGNESIUM HYDROXIDE PUMP
MIX -	MIXER
MP -	MAGNESIUM HYDROXIDE PUMP
MPP -	MEMBRANE BIOREACTOR PERMEATE PUMP
MRP -	MEMBRANE BIOREACTOR RECYCLE PUMP
MV -	MOTORIZED VALVE
MWP -	MONITORING WELL PUMP
NC -	NORMALLY CLOSED
NMP -	NITROGEN METERING PUMP
NO -	NORMALLY OPEN
NOx -	NITROGEN
NP -	NUTRIENT PUMP OR NEAT POLYMER
NPW -	NON-POTABLE WATER
NWL -	NORMAL WATER LEVEL
NWP -	NON-POTABLE WATER PUMP
O2 -	OXYGEN
OCV -	OPEN/CLOSE VALVE
PAH -	PRESSURE ALARM HIGH
PAC -	POLY ALUMINUM CHLORIDE
PAL -	PRESSURE ALARM LOW
PAP -	PHOSPHORIC ACID PUMP
PAM -	POLYMER SYSTEM
PB -	PLOW BLENDER
PC -	PRESSURE CONTROLLER OR PRIMING CONNECTION
PCRI -	PRESSURE CONTROLLER RECORDER INDICATOR
PE -	PRESSURE ELEMENT
PFP -	POLYMER FEED PUMP
PG -	PRESSURE GAUGE OR PROPANE GAS
PH/T -	PH AND TEMPERATURE
PI -	PROCESS AND INSTRUMENTATION DIAGRAM
P&ID -	PRESSURE INDICATOR/MANOMETER
PIR -	POLYMER INJECTION RING
PIT -	PRESSURE INDICATING TRANSMITTER
PLC -	PROGRAMMABLE LOGIC CONTROLLER
PM -	PADDLE MOTOR
PMP -	PHOSPHORUS METERING PUMP
PP -	PURGE POINT OR POLYMER PUMP
PRI -	PRESSURE RECORDER/INDICATOR
PRV -	PRESSURE RELIEF, REGULATING OR REDUCING VALVE
PS -	PRESSURE SWITCH
PSH -	PRESSURE SWITCH HIGH
PT -	PRESSURE TRANSMITTER
PV -	PINCH VALVE
QC -	QUICK CONNECT
RADS -	RECYCLE ANAEROBIC DIGESTER SLUDGE
RANS -	RETURN ANAEROBIC SLUDGE
RAS -	RECYCLE ACTIVATED SLUDGE
RAW -	RAW WASTEWATER
REC -	RECYCLE
REP -	REACTOR FEED PUMP
RP -	RETURN ACTIVATED SLUDGE PUMP
RSP -	RAW SEWAGE PUMP
RTP -	RAW WASTEWATER TRANSFER PUMP
S -	SOLENOID
SA -	SAMPLE
SARV -	SEWAGE AIR RELIEF VALVE
SBR -	SEQUENCING BATCH REACTOR
SC -	SPEED CONTROLLE/VFD OR SCREEN
SDB -	SLUDGE DUMPING BIN
SFB -	SINGLE FUEL BOILER
SFP -	SLUDGE FEED PUMP
SG -	SUCTION GUIDE OR SIGHT GLASS
SM -	STATIC MIXER
SMP -	SAMPLER PUMP
SMT -	SEDIMENT MOISTURE TRAP
SMU -	SUBMERGED MEMBRANE UNIT
SN -	SPARE NIPPLE
SO -	SULFIDE OXIDATION
SP -	SAMPLE POINT OR SOLUTION PUMP
SSP -	SCREENED SEWAGE PUMP
ST -	SAMPLE TAP
STR -	STRAINER
SV -	SOLENOID VALVE
SW -	SLUDGE WASTE
TA -	TEMPERATURE ALARM
TAH -	TEMPERATURE ALARM HIGH
TC -	TEMPERATURE CONTROLLER
TE -	TEMPERATURE ELEMENT
TG -	TEMPERATURE GAUGE
TI -	TEMPERATURE INDICATOR
TIT -	TEMPERATURE INDICATING TRANSMITTER
TIS -	TEMPERATURE INDICATING SWITCH
TK -	TANK
TR -	TRAILER
TRI -	TEMPERATURE RECORDER/INDICATOR
TS -	TEMPERATURE SWITCH OR TUBE SETTLER
TT -	TEMPERATURE TRANSMITTER
UAP -	UREA ADDITION PUMP
UV -	ULTRAVIOLET DISINFECTION
V -	VALVE
VAFM -	VARIABLE AREA FLOW METER
VFD -	VARIABLE FREQUENCY DRIVE
VE -	VACUUM EJECTOR
VT -	VENT
W -	WATER
WADS -	WASTE ANAEROBIC DIGESTER SLUDGE
WANS -	WASTE ANAEROBIC SLUDGE
WAS -	WASTE ACTIVATED SLUDGE
WC -	WASHER/CONTACTOR
WCP -	WATER CIRCULATING PUMP
WP -	WASTE ANAEROBIC SLUDGE PUMP
WPS -	WALL PIPE SUPPORT
WSP -	WASTE SLUDGE PUMP
WW -	WASTEWATER
WWP -	WASH WATER PUMP
YA -	EVENT ALARM
YC -	EVENT/STATUS CONTROLLER
YS -	EVENT SWITCH
ZS -	LIMIT SWITCH
ZSL -	LIMIT SWITCH LOW
ZSC -	LIMIT SWITCH CLOSED
ZSO -	LIMIT SWITCH OPEN
ZSOC -	LIMIT SWITCH OPEN/CLOSED

PLC AND DEVICE LEGEND



PLC I/O

A	1 DISCRETE OUTPUT	I	1 ANALOG OUTPUT
B	1 DISCRETE OUTPUT 2 DISCRETE INPUTS	J	2 DISCRETE OUTPUT
C	1 DISCRETE INPUT	K	4 DISCRETE INPUTS 2 ANALOG INPUTS
D	1 ANALOG INPUT	L	DEVICENET
E		XX	INTERLOCKS USED: 1-
F	1 DISCRETE OUTPUT 2 DISCRETE INPUTS 1 ANALOG OUTPUT		
G			
H	1 ANALOG OUTPUT 1 DISCRETE INPUT		

CONTROLLER | CONTROL PANELS

1 MBR
2 DEWATERING
3 DELTA V
4 AERATION

FIELD MOUNTED

PRIMARY REMOTE LOCATION

PLC SYMBOLS

FIELD MOUNTED

PRIMARY REMOTE LOCATION

INSTRUMENT SYMBOLS

SINGLE DEVICE FIELD MOUNTED

MULTIPLE DEVICES INTEGRALLY CONNECTED

MULTIPLE DEVICES REMOTELY CONNECTED

EQUIPMENT IDENTIFICATION PROCEDURE

NN DDD #

INSTRUMENT OR PRIMARY SENSING ELEMENT

NN: TWO DIGIT PROCESS AREA NUMBER. THIS IS USED TO IDENTIFY THE AREA OF THE PROCESS IN WHICH THE EQUIPMENT IS USED RATHER THAN THE AREA IN WHICH IT IS LOCATED.

DDDD: DEVICE DESCRIPTION FROM LEGEND IN AREA NN. EG., THE FIRST PI IN THE HEADWORK SYSTEM IS 10-PI-01; ETC.

#: DEVICE/EQUIPMENT NUMBER

INFORMATION BLOCKS

FLOWSTREAM CONTINUATION TO/FROM OTHER DRAWINGS OR TO/FROM PROCESS BY OTHERS.

A — FLOWSTREAM CONTINUATION ON SAME DRAWING.

END DELIVERY (BATTERY LIMITS)

PIPING ACCESSORIES

- AIR FILTER
- PIPE CAP OR PLUG
- COUPLING
- BLIND FLANGE (IN-LINE)
- BLIND FLANGE
- COMPENSATOR
- DRAIN
- SPRAY NOZZLE
- VENT
- PULSE ABSORBER
- VENTURI INJECTOR
- UNION
- SIPHON
- SIGHT-GLASS WITH FLOW READING
- SIGHT-GLASS
- FLEXIBLE CONNECTOR
- FLEXIBLE CONNECTING REDUCER
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- TRUCK CONNECTION
- GRAVITY FLOW
- JET MIX / JET AERATION
- SILENCER
- SPRAY NOZZLE
- HEADER
- FLAME ARRESTOR
- CONDENSATE OR DRIP TRAP
- STRAINER
- STATIC MIXER
- BRAIDED HOSE
- CO — CLEANOUT
- PP — PURGE POINT
- DECANTER
- BASKET STRAINER
- LIQUID SEAL
- HEAT EXCHANGER
- GG — GUAGE GUARD
- SMT — SEDIMENT MOISTURE TRAP
- AIR RELIEF VALVE AND BREAKER
- HOSE CONNECTION

VALVES

- VALVE (BASIC SYMBOL)
- BALL VALVE
- PLUG VALVE
- THREE WAY PLUG VALVE
- DIAPHRAGM VALVE
- NEEDLE VALVE
- KNIFE GATE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- FOOT VALVE
- THREE WAY COCK
- PRESSURE REDUCING VALVE
- PRESSURE RELIEF VALVE
- OVER PRESSURE RELIEF VALVE
- UNDER PRESSURE RELIEF VALVE
- ADJUSTABLE OVER PRESSURE RELIEF VALVE
- BACK PRESSURE VALVE
- PINCH VALVE
- LUBRICATED PLUG VALVE
- MOTOR ACTUATED
- DIAPHRAGM ACTUATED
- FLOAT CONTROLLED
- SPRING ACTUATED
- WEIGHT CONTROLLED
- S — SOLENOID VALVE
- PNEUMATIC CONTROL VALVE
- LOCKABLE ACTUATOR ON VALVE
- VENT VALVE
- PRESSURE REGULATOR
- MOTORIZIED SAFETY SHUT-OFF VALVE
- SHUT-OFF COCK
- TWIN FLAPPER CHECK VALVE
- MULTI-FUNCTION VALVE
- GV&B — GATE VALVE AND BOX
- BV&B — BUTTERFLY VALVE AND BOX

DRIVER TYPE

- M — ELECTRIC
- H — HYDRAULIC
- P — PNEUMATIC

PUMPS/ROTARY EQUIPMENT

- PUMP
- POSITIVE DISPLACEMENT PUMP
- FAN/ CENTRIFUGAL PUMP
- PD BLOWER
- SUBMERSIBLE MIXER
- IMPELLER TYPE MIXER
- COMPRESSOR
- MIXER
- CENTRIFUGAL BLOWER
- GRINDER
- FINE SCREEN AND COMPACTOR

PROCESS AREA IDENTIFIERS

IDENTIFIER	DESCRIPTION
00-09	UNCLASSIFIED. USE THIS FOR ANY EQUIPMENT WHICH CANNOT BE PLACED INTO ANY OTHER AREA.
10-19	INFLUENT SYSTEM / HEADWORKS
20-29	PRIMARY CLARIFICATION/EQUALIZATION
30-39	ANAEROBIC SYSTEM
40-49	BIOGAS HANDLING/UTILIZATION SYSTEM
50-54	ANOXIC/PRE-AERATION SYSTEM
55-59	MBR SYSTEM
60-64	AERATION SYSTEM
65-69	RAS SYSTEM
70-79	SLUDGE MANAGEMENT SYSTEM
80-89	EFFLUENT TREATMENT AND PUMPING SYSTEMS
90-99	CHEMICAL METERING SYSTEMS

NOTE: NOT ALL ABBREVIATIONS, LEGEND, SYMBOLS, VALVE TYPE, PROCESS AREA IDENTIFIERS, ETC. APPLY

PIPING IDENTIFICATION PROCEDURE

XX - XXX / XXX - XX / XX

- PIPE RATING FOLLOWED BY JOINT TYPE (WHEN REQUIRED FOR CLARIFICATION)
- PIPE MATERIAL ABBREVIATION
- FLOW STREAM ABBREVIATION
- FLOW STREAM SOURCE ABBREVIATION (WHEN REQUIRED FOR CLARIFICATION)
- NOMINAL DIAMETER IN mm

FLOWSTREAM SOURCE ABBREVIATION

MT	MEMBRANE TANK

PIPE MATERIAL ABBREVIATION

CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
CU	COPPER
PE/T	POLYETHYLENE TUBING
PVC	POLYVINYL CHLORIDE
PVC/BT	PVC BRAIDED TUBING
SS	STAINLESS STEEL

PIPE RATING

DR	DIMENSION RATIO
DWV	DRAIN, WASTE & VENT
GR	GRAVITY
T	TUBING
SCH	SCHEDULE

JOINT TYPE

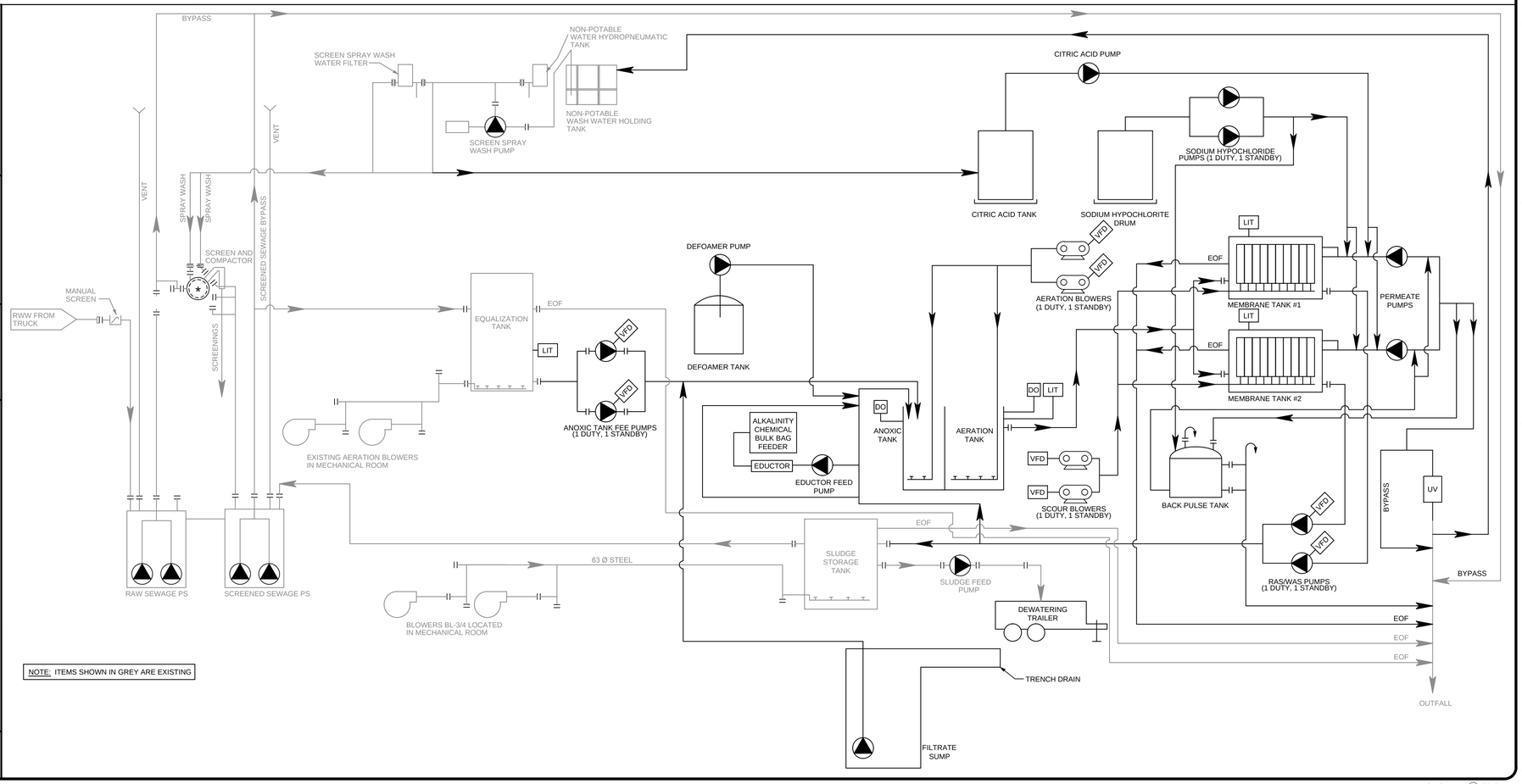
FL	FLANGED
G	GASKETED
NPT	THREADED
SW	SOLVENT WELDED
W	WELDED
SC	THREADED

FLOWSTREAM ABBREVIATION

AA	AERATION AIR	MF	MEMBRANE FEED
AD	ANAEROBIC DIGESTER	NG	NATURAL GAS
ATF	ANOXIC TANK FILL	NP	NEAT POLYMER
ATT	ATTEMPERATION TANK	NPW	NONPOTABLE WATER
BF	BACKFLUSH	OVF	OVERFLOW
BG	BIOGAS	PAC	POLY-ALUMINUM CHLORIDE
BPS	BYPASS	PER	PERMEATE
CA	COMPRESSED AIR	PG	PROPANE GAS
CAF	CITRIC ACID FEED	PF	POLYMER FEED
CC	CLEANING CHEMICAL	PW	POTABLE WATER
CCS	CLEANING CHEMICAL SOLUTION	PX	PEROXIDE
CCW	CLEANING CHEMICAL WASTE	R	RETURN
CEN	CENTRATE	RANS	RETURN ANAEROBIC SLUDGE
CF	CHEMICAL FEED	RAS	RETURN ACTIVATED SLUDGE
CW	COLD WATER	RWW	RAW WASTEWATER
DF	DEFOAMER	RWW FT	RAW WASTEWATER FROM TRUCK
DR	DRAIN	REC	RECYCLE
EFF	EFFLUENT	S	SAMPLE OR SUPPLY
EOF	EMERGENCY OVERFLOW	SA	SANITARY
EQ IN	EQUALIZATION TANK INFLUENT	SCOUR	SCOUR
EQ VT	EQUALIZATION TANK VENT	SCUM	FLOATING SCUM
FE	FERRIC/FERROUS	SF	SOLUTION FEED
FILL	FILL	SHF	SODIUM HYPOCHLORITE FEED
FL	FLAME LINE	SR	SOLUTION RECYCLE
FM	FORCE MAIN	SREC	SUPERNATANT RECYCLE
GLR	GLYCOL RETURN	SW	SERVICE WATER
GLS	GLYCOL SUPPLY	SWW	SCREENED WASTEWATER
GRIT	GRIT	VT	VENT
HP	HYDROGEN PEROXIDE	W	WATER
HPW	HIGH PRESSURE WATER	WANS	WASTE ANAEROBIC SLUDGE
HW	HOT WATER	WAS	WASTE ACTIVATED SLUDGE
INF	INFLUENT	WCC	WASTE CLEANING CHEMICAL
MBP	MEMBRANE BACKPULSE		

SUPPLEMENT

PIPE SIZES ON SOME PIPING SYSTEMS, (NPW), MAY BE INDICATED USING THE NPS STANDARD BASED ON INCHES.



NOTE: ITEMS SHOWN IN GREY ARE EXISTING

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1	60% REVIEW SUBMISSION	2013-MAR-08
2	ISSUED FOR TENDER	2013-APR-10
3	RELEASED FOR CONSTRUCTION	2013-JUN-27

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Signature
Date 2013/JUNE/27
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NT/NU Association of Professional Engineers and Geoscientists

FOR INFORMATION ONLY

REGISTERED PROFESSIONAL ENGINEER S.G. BLISS LICENSEE NT/NU

Const. North

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• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
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Project Title

WASTE WATER TREATMENT PLANT UPGRADE PANGNIRTUNG, NU

Dwg. Title

FLOW DIAGRAM, SYMBOLS, LEGEND & ABBREVIATIONS

Project No. OTT-00204430-A0

Dwg. No. **P401-1**

Rev. No. 0

Scale NOT TO SCALE
This drawing is not to be scaled

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