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PROCESS LEGEND – MISCELLANEOUS

EQUIPMENT FRAGMENT No. DESIGNATION

LLLL–S–PPP–EEE##

- LOCATION ELEMENT
- SECTION ELEMENT
- PROCESS
- EQUIPMENT

NOTE:
– EQUIPMENT No.'s RESTART AT 1 FOR EACH SECTION.

NON PROCESS RELATED EQUIPMENT

(ie. PANEL, SUMP PUMP, ETC.)

LLL–B##–EEE##

- LOCATION ELEMENT
- BUILDING
- EQUIPMENT
- BUILDING LEVEL: 1 – LOWEST, R – ROOF
- EQUIPMENT # (120/240)
- LETTER 600V

PIPING LINE DESIGNATION

50–PAC–CS#C+E+I

- DIAMETER (mm)
- SERVICE
- PIPE SPECIFICATION
- MULTIPLE PIPE SPECIFICATION No.
- DOUBLE CONTAINMENT
- ELECTRIC TRACED AND INSULATED

PIPE SIZE CONVERSION

IMPERIAL(in)	METRIC(mm)	IMPERIAL(in)	METRIC(mm)
1/8	3	14	350
1/4	6	15	380
3/8	10	16	400
1/2	12	18	450
3/4	20	20	500
1	25	24	600
1–1/4	32	30	750
1–1/2	40	36	900
2	50	42	1050
2–1/2	65	48	1200
3	75	54	1350
4	100	60	1500
5	125	66	1650
6	150	72	1800
8	200	78	2000
10	250	84	2100
12	300		

NOTE:
–PIPE SIZES ARE NOMINAL
–PIPE SIZES FROM 2" TO 60" CONVERSION BASED ON CSA STANDARD Z245.1
–PIPE SIZES FROM 2" AND SMALLER CONVERSION BASED ON EUROPEAN ISO STANDARD
–OTHER PIPE SIZES ARE CONVERSIONS ROUNDED TO THE NEAREST ARBITRARILY ASSIGNED WHOLE NUMBER

PIPE MATERIAL ABBREVIATIONS

SYMBOL	MATERIAL
ABS	ACRYLONITRILE BUTADIENE STYRENE
AL	ALUMINUM
AC	ASBESTOS CEMENT
CONC	CONCRETE GRAVITY
CPP	CONCRETE PRESSURE
CS#	CARBON STEEL
CU#	COPPER
DI	DUCTILE IRON
FRP	FIBERLASS REINFORCED PLASTIC
GALV	GALVANIZED STEEL
RR	REINFORCED RUBBER
PE	POLYETHYLENE
PPL	POLYPROPYLENE LINED CARBON STL.
PVC#	POLYVINYL CHLORIDE
SS#	STAINLESS STEEL
TUB#	TUBING

FOLLOWING SYMBOL INDICATES PIPING WITH MULTIPLE MATERIAL SPECIFICATIONS
EXAMPLE : SS1 (SCH. 40 316SS)
SS2 (SCH. 80 316SS)

PROCESS LEGEND – SERVICE ABBREVIATIONS

SYMBOL	COMMODITY	SYMBOL	COMMODITY
AA	AQUEOUS AMMONIA	NaOCl	SODIUM HYPOCHLORITE
AAS	AERATION AIR SUPPLY	NaOH	SODIUM HYDROXIDE
ACTSI	ACTIVATED SILICA	NaSI	SODIUM SILICATE
AMG	AMMONIA GAS (ANHYDROUS)	NG	NATURAL GAS
AML	AMMONIA LIQUID (ANHYDROUS)	OF	OVERFLOW
AMS	AMMONIA SOLUTION	OZNE	OZONE TANK EFFLUENT
ALUM	ALUMINUM SULPHATE	OZNI	OZONE TANK INFLUENT
AS	AERATED SEWAGE	OZ	OZONE
CBD	CLARIFIER BLOWDOWN	PA	PROCESS AIR
CHW	CHEMICAL WASTE	PACL	POLYALUMINUM CHLORIDE
CLD	CHLORINE DIOXIDE	PLY	POLYELECTROLYTE
CLG	CHLORINE GAS	PLYPH	POLYPHOSPHATE
CLS	CHLORINE SOLUTION	PS	PRIMARY SLUDGE
CO2	CARBON DIOXIDE	PSW	PLANT SERVICE WATER
CUS	COPPER SULPHATE	PW	POTABLE WATER
CW	COLD WATER	RAS	RETURN ACTIVATED SLUDGE
CWR	COOLING WATER RETURN	RSD	RECIRCULATED SLUDGE DISCHARGE
CWS	COOLING WATER SUPPLY	RSS	RECIRCULATED SLUDGE SUCTION
CWW	COOLING WATER WASTE	RSW	RAW SEWAGE
DHW	DOMESTIC HOT WATER	RW	RAW WATER
DIS	DIGESTED SLUDGE	RWAS	RAW WASTE ACTIVATED SLUDGE
DR	DRAIN	RWL	RAINWATER LEADER
EE	ENGINE EXHAUST	SA	SCOURING AIR
EW	EFFLUENT WATER	SAM	SAMPLE
F	FLUORIDE	SAN	SANITARY
FA	FLUOSILICIC ACID	SCE	SECONDARY CLARIFIER EFFLUENT
FBW	FILTER BACKWASH SUPPLY	SCS	SCRUBBING SOLUTION
FEC	FERRIC CHLORIDE	SCUM	SCUM
FEFF	FILTER EFFLUENT	SDG	SULPHUR DIOXIDE GAS
FESU	FERRIC SULPHATE	SDS	SULPHUR DIOXIDE SOLUTION
FHS	HYDROFLUOSILICIC ACID	SETW	SETTLED WATER
FILW	FILTER TO WASTE	SG	SLUDGE GAS (DIGESTER)
FINF	FILTER INFLUENT	SGC	SLUDGE GAS CIRCULATED (DIGESTER)
FLW	FLOCCULATED WATER	SGF	SLUDGE GAS FUEL (DIGESTER)
FLS	FLUORIDE SOLUTION	SGH	SLUDGE GAS (HIGH PRESSURE)
FO	FUEL OIL	SLD	SETTLED SLUDGE
FOF	FUEL OIL FILL	SLG	MIXED SLUDGE
FOR	FUEL OIL RETURN	SLU	SLUDGE UNLOADING
FOS	FUEL OIL SUPPLY	SQW	SQUEEZE WATER (FILTER PRESS)
FOV	FUEL OIL VENT	STM	STORM
FSW	FILTER SURFACE WASH	SUP	SUPERNATANT
FW	FILTERED WATER	TRW	TREATED WATER
HCL	HYDROCHLORIC ACID	TS	THICKENED SLUDGE
HSO	SULPHURIC ACID	TWAS	TREATED WASTE ACTIVATED SLUDGE
HWR	HOT WATER RETURN (HEATING)	V	VENT
HWS	HOT WATER SUPPLY (HEATING)	VA	VENT (AIR)
IA	INSTRUMENT AIR	VP	VENT (PUMPING)
LPG	LIQUID PROPANE GAS	VT	VENT (TANK)
KMnO	POTASSIUM PERMANGANATE	WAS	WASTE ACTIVATED SLUDGE
NaCO	SODIUM CARBONATE	WD	WASTE DRAIN
NaHCO	SODIUM BICARBONATE	WBW	WASTE BACKWASH WATER

PROCESS LEGEND – VALVE SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
VGA*	GATE	VGL*	GLOBE
VTW*	THREE–WAY	VAN*	ANGLE
VBA*	BALL	VPL*	PLUG
VBU*	BUTTERFLY	VSQ*	STOP COCK
VKG*	KNIFE GATE	VNE*	NEEDLE
VDM*	DIAPHRAGM	VPN*	PINCH
VMU*	MUD	VSQ*	SQUARE HEAD COCK
VSC*	SWING CHECK	VSC*	SPRING CHECK
VSC*	WEIGHTED CHECK	VEC*	ELECTRIC CHECK
VDC*	DOUBLE DOOR CHECK	VBC*	BALL CHECK
VFP*	FLAP	VFS*	FOOT VALVE/ STRAINER
VAC*	AIR VACUUM	VAV*	AIR & VACUUM
VAR*	AIR RELEASE	VSR*	SAFETY RELIEF
PRV*	PRESSURE REDUCING (SELF CONTAINED)	PRV*	PRESSURE REDUCING
BPV*	BACK PRESSURE (SELF CONTAINED)	BPV*	BACK PRESSURE
SG*	STOP GATE	AWG*	ADJUSTABLE WEIR GATE
SLG*	SLIDE GATE	STL*	STOP LOGS
VRO*	ROTARY	VHYD*	YARD HYDRANT
	DAMPER		

1. DIRECTION OF FLOW FOR THE ABOVE SYMBOLS IS FROM LEFT TO RIGHT.
2. STATUS MAY BE SHOWN– N.O.=NORMALLY OPEN, N.C.=NORMALLY CLOSED.
3. (VKG*) VKG INDICATES VALVE TYPE AND * INDICATES SPECIFICATION No..
4. ADD ACTUATORS TO VALVES FROM VALVE ACTUATOR TABLE.

PROCESS LEGEND – VALVE ACTUATORS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLOAT		DIAPHRAGM
G	GEAR	S	SOLENOID
	LEVER	CW	CHAIN WHEEL
M	MOTORIZED		VALVE BOX (C/W EXTENSION STEM)
	NON RISING STEM (HANDWHEEL)		QUICK OPENING
	RISING STEM (HANDWHEEL)		
	SINGLE ACTION PISTON (FAIL OPEN)		DOUBLE ACTION PISTON (FAIL CLOSE)

NOTE : GATE VALVES ARE USED FOR ILLUSTRATION PURPOSES ONLY

PROCESS LEGEND – EQUIPMENT

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CENTRIFUGAL PUMP		ROTARY PUMP
	METERING PUMP		DUPLEX METERING PUMP
	VERTICAL TURBINE PUMP		CIRCULATING PUMP
	SUBMERSIBLE PUMP		PROGRESSIVE CAVITY PUMP
	SUMP PUMP		RECIPROCATING PUMP
	RECIPROCATING COMPRESSOR		BLOWER (LOBE TYPE)
ENG.	COMBUSTION ENGINE	GEN. EI	GENERATOR
	CENTRIFUGAL COMPRESSOR		BLOWER (CENTRIFUGAL)
VAC	VACUUM PUMP		CENTRIFUGE
	INLINE MIXER		TRAVELLING WATER SCREEN
	MIXER		HEAT EXCHANGER
	TANK (OPEN)		PRESSURE TANK OR ACCUMULATOR
OR	TANK (CLOSED)		GAS CYLINDER (INDICATE CONTENTS)
	SWAB LAUNCHER		SWAB CATCHER

(M) – DENOTES CONSTANT SPEED DRIVE
(VSD) * – DENOTES VARIABLE SPEED DRIVE (* M FOR MECHANICAL, E FOR ELECTRICAL)
CONSTANT SPEED DRIVES ARE USED FOR ILLUSTRATION PURPOSES ONLY.

PROCESS LEGEND – P & ID SYMBOL DESIGNATIONS

SYMBOL	DESCRIPTION
	PRIMARY FLOW LINE
	SECONDARY FLOW LINE
	TERTIARY LINE
	EXISTING PRIMARY FLOW LINE
	EXISTING SECONDARY FLOW LINE
	EXISTING TERTIARY LINE
	FUTURE LINE
	DIRECTION OF FLOW
2% SLOPE	DIRECTION OF SLOPE
	CONNECTION LINE
	LINES CROSSING OVER (BREAK VERTICAL LINE)
	CHANNEL
TEXT TEXT	LINE CONTINUATION– TO ANOTHER DRAWING
TEXT TEXT	LINE CONTINUATION– FROM ANOTHER DRAWING
SS PVC	LINE SPECIFICATION CHANGE
	PNEUMATIC LINE
	ELECTRICAL SIGNAL
	HYDRAULIC LINE
	INSULATED LINE
E	INSULATED LINE WITH ELECTRIC TRACING
	FLEXIBLE LINE

PROCESS LEGEND – INSTRUMENTATION

INSTRUMENTATION DESIGNATION – TYPICAL LETTER COMBINATION

FIRST–LETTERS	INITIATING OR MEASURED VARIABLE	CONTROLLERS INDICATING	CONTROLLERS BLIND	READOUT DEVICES INDICATING	SWITCHES AND ALARM DEVICES* HIGH**	LOW**	COMB	TRANSMITTERS INDICATING	TRANSMITTERS BLIND	PRIMARY ELEMENT	VIEWING DEVICE, GLASS	SAFETY DEVICE	VALVE
A ***	ANALYSIS	AIC	AC	AI	ASH	ASL	ASHL	AIT	AT	AE			
D	DENSITY	DIC	DC	DI	DSH	DSL	DSHL	DIT	DT	DE			
F	FLOW RATE	FIC	FC	FI	FSH	FSL	FSHL	FIT	FT	FE	FG		FCV
H	HAND ON/OFF	HIC	HC										HV
I	CURRENT	IIC		II	ISH	ISL	ISHL	IIT	IT	IE			
L	LEVEL	LIC	LC	LI	LSH	LSL	LSHL	LIT	LT	LE	LG		LCV
M	MOTORIZED												MV
P	PRESSURE/ VACUUM	PIC	PC	PI	PSH	PSL	PSHL	PIT	PT	PE		PSV,PSE	PCV
PD	PRESSURE, DIFFERENTIAL	PDIC	PDC	PDI	PDSH	PDSL		PDIT	PDT	PE			PDCV
S	SPEED/ FREQUENCY	SIC	SC	SI	SSH	SSL	SSHL	SIT	ST	SE			SCV
T	TEMPERATURE	TIC	TC	TI	TSH	TSL	TSHL	TIT	TT	TE		TSE	TCV
V	VIBRATION			VI	VSH	VSL	VSHL	VIT	VT	VE			
W	WEIGHT/FORCE	WIC	WC	WI	WSH	WSL	WSHL	WIT	WT	WE			WCV
Y	STATUS	YIC	YC	YI	YSH	YSL			YT	YE			
Z	POSITION/ DIMENSION	ZIC	ZC	ZI	ZSH	ZSL	ZSHL	ZIT	ZT	ZE			ZCV

WATER TREATMENT / WASTEWATER

*** (WATER TREATMENT)	DESCRIPTION	*** (WASTEWATER)	DESCRIPTION
pH	pH	pH	pH
CLR	CHLORINE RESIDUAL	CLR	CHLORINE RESIDUAL
CLC	CHLORINE LEAK	CLC	CHLORINE LEAK
Tu	TURBIDITY	CB	COMBUSTION GAS
OZR	OZONE RESIDUAL	H2S	HYDROGEN SULPHIDE
OZL	OZONE LEAK	CO	CARBON MONOXIDE
SCD	STREAMING CURRENT DETECTOR	CH4	METHANE
ALU	ALUMINUM	DO	DISSOLVED OXYGEN
COL	COLOUR	ALU	ALUMINUM
F	FLUORIDE	Tu	TURBIDITY
CON	CONDUCTIVITY	SS	SUSPENDED SOLIDS
SBI	SLUDGE BLANKET INTERFACE		

NOTE :
THIS TABLE IS NOT ALL–INCLUSIVE.
*A, ALARM, THE ANNUNCIATING DEVICE, MAY BE USED IN THE SAME FASHION AS S, SWITCH, THE ACTUATING DEVICE.
**THE LETTERS H AND L MAY BE OMITTED IN THE UNDEFINED CASE.

GENERAL INSTRUMENTATION

SYMBOL	DESCRIPTION	GROUP	SYMBOL	DESCRIPTION	GROUP
	MOUNTED LOCALLY	INSTRUMENT SYMBOLS	AND	LOGIC GATE – AND (INTERLOCK IS EFFECTIVE ONLY IF ALL INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
	MOUNTED ON FACE OF PANEL	INSTRUMENT SYMBOLS	OR	LOGIC GATE – OR (INTERLOCK IS EFFECTIVE IF ONE OR MORE INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
	MOUNTED BEHIND PANEL DOOR	INSTRUMENT SYMBOLS	XOR	LOGIC GATE – OR (INTERLOCK IS EFFECTIVE IF ONE OR MORE INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
	SCADA INPUT/OUTPUT	SCADA SYMBOL	I	COMPLEX OR UNDEFINED INTERLOCK	INTERLOCK SYMBOLS
	NOT ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL SYMBOLS OR SHARED INSTRUMENTS	n	PANEL NUMBER n	AUTOMATION SYMBOLS
	ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL SYMBOLS OR SHARED INSTRUMENTS	n	MOTOR CONTROL CENTRE NUMBER n	AUTOMATION SYMBOLS
	AUXILIARY LOCATION	DISTRIBUTED CONTROL SYMBOLS OR SHARED INSTRUMENTS	n	PROGRAMMABLE CONTROLLER I/O RACK NUMBER n	AUTOMATION SYMBOLS
	NOT ACCESSIBLE TO OPERATOR	PROGRAMMABLE CONTROLLER SYMBOLS		SUPPLIED AND INSTALLED BY OTHER DIVISIONS. CONNECTED BY THIS DIVISION.	AUTOMATION SYMBOLS
	ACCESSIBLE TO OPERATOR	PROGRAMMABLE CONTROLLER SYMBOLS	R	RESET FOR LATCH TYPE ACTUATOR	MISCELLANEOUS SYMBOLS
	PILOT LIGHT		P	PURGE OR FLUSHING DEVICE	MISCELLANEOUS SYMBOLS

PROCESS LEGEND – PRIMARY FLOW ELEMENTS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	WEIR	F	SNAP–ON FLOW METER
	INSERT VENTURI		SONIC FLOW METER
	PITOT TUBE (SINGLE)	M	MAGNETIC FLOW METER
	PITOT TUBE (AVERAGING)		ORIFICE PLATE
	FLUME	FG	FLOW SIGHT GLASS
	TURBINE / PROPELLER	FG	ROTAMETER
	POSITIVE DISPLACEMENT		STATIC INLINE MIXER
	GUAGE INDICATOR		

PROCESS LEGEND – MISCELLANEOUS SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
S.P.	SAMPLE POINT (12mm)		UNION
D.P.	DRAIN POINT (MIN. 12mm)		HOSE CONNECTION
	IN LINE STRAINER		EYEWASH
	DRAIN / OVERFLOW		

THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS and GEOPHYSICISTS OF THE NORTHWEST TERRITORIES
PERMIT NUMBER P 010
DILLON CONSULTING LIMITED

REGISTERED PROFESSIONAL ENGINEER G. STRONG N.W.T.

Nunavut

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No.	ISSUED FOR	DATE	BY
3	ISSUED FOR TENDER	06/06/08	GS
2	ISSUED FOR 100% CLIENT REVIEW	04/30/08	GS
1	ISSUED FOR CLIENT REVIEW	03/15/08	GS

DESIGN: GS | REVIEWED BY: GS
DRAWN: NTB | CHECKED BY: GS
DATE: JUNE 2008
SCALE: NTS

TALOYOAK WATER TREATMENT PLANT
TALOYOAK, NUNAVUT

P & ID PROCESS LEGEND

PROJECT NO. 07-8107-2000

SHEET NO. 301