SHEET: TBLOCK-COW-A1 (10/2004)

MISCELLANEOUS EQUIPMENT SYMBOLS

- ORIFICE PLATE
- FLANGE
- PIPE REDUCER
- STRAINER
- PUMP
- FAN/BLOWER
- MOTOR
- STRAINER
- DRAIN
- UNION
- TEMPERATURE ELEMENT WITH THERMOWELL
- SCREWED CAP
- FIRE HYDRANT
- HOSE STATION
- ANNUNCIATIOR HORN
- GROUND
- CORIOLIS MASS FLOWMETER
- FLOAT LEVEL ELEMENT
- FLOW ELEMENT INTEGRAL WITH TRANSMITTER (MASS FLOW, ETC)
- SONIC FLOWMETER (DOPPLER OR TRANSIT TIME)
- EJECTOR
- FILTER
- SILENCER
- WASTE GAS BURNER
- GRINDER
- STOP LOG
- LEVEL CONTROL GATE
- BAR SCREEN, MECHANICAL
- DIFFUSER HEADER
- ENGINE
- FILTER
- MAGNETIC FLOW METER ELEMENT
- EXPANSION JOINT
- TRAP
- MIX TEE
- DUPLEX STRAINER
- MIXER, INLINE STATIC
- FLOW NOZZLE
- FLOAT
- SINGLE PORT PITOT TUBE
- AVERAGING PITOT TUBE
- SLUICE GATE
- SLIDE GATE
- VARIABLE AREA FLOW INDICATOR (ROTAMETER)
- VORTEX FLOW METER
- GENERATOR
- HEAT EXCHANGER
- FLAME CHECK
- CALIBRATION CHAMBER
- EMERGENCY EYE WASH AND SHOWER
- BOILER
- RECEIVER OR PRESSURE VESSEL
- TANK, DOUBLE WALLED
- TANK
- LIQUID SEPARATOR
- PUMP, SUBMERSIBLE
- PUMP, VERTICAL
- WEIR
- PUMP, ROTARY LOBE
- PUMP, METERING
- PUMP, PROGRESSIVE CAVITY
- FLOW STRAIGHTENING VANES
- AIR FILTER (HVAC)
- MIXER
- PUMP, DIAPHRAGM
- PUMP, DIAPHRAGM OPERATED
- PUMP, GEAR
- PULSATION DAMPER
- AIR SEPARATOR
- MIXER
- SITE GLASS
- COMPRESSOR ROTARY SCREEN
- FLEXIBLE HOSE
- IN-LINE FLOW METER
- INJECTOR
- PROPELLER OR TURBINE METER

VALVES

VALVE BODIES

- NORMALLY OPEN GATE VALVE
- NORMALLY CLOSED GATE VALVE
- NORMALLY OPEN GLOBE VALVE
- NORMALLY CLOSED GLOBE VALVE
- NORMALLY OPEN BALL VALVE
- NORMALLY CLOSED BALL VALVE
- BUTTERFLY
- NEEDLE
- CHECK
- PLUG
- ANGLE
- PRESSURE SAFETY (RELIEF)
- IN-LINE SAFETY
- UNCLASSIFIED WRITE TYPE OF BODY ADJACENT TO SYMBOL
- STOP CHECK
- AIR ASSISTED CHECK
- SPRING OPERATED CHECK
- COCK VALVE
- DUCKBILL VALVE
- DIAPHRAGM VALVE
- FLAP VALVE
- FLOAT VALVE
- MUD VALVE
- CHECK VALVE (NON RETURN)
- QUICK CONNECT AIR HOSE COUPLING
- VACUUM RELIEF
- BALL CHECK VALVE

CONTROL VALVES

- ROTARY BALL VALVE
- CYLINDER-ACTUATED SINGLE-ACTING
- CYLINDER-ACTUATED DOUBLE-ACTING
- PRESSURE-REDUCING REGULATOR, SELF-CONTAINED
- PRESSURE-REDUCING REGULATOR, WITH EXTERNAL PRESSURE TAP
- BACKPRESSURE REGULATOR, SELF-CONTAINED
- BACKPRESSURE REGULATOR, WITH EXTERNAL PRESSURE TAP
- CONE VALVE
- THREE-WAY VALVE
- FOUR-WAY VALVE
- AIR RELEASE VALVE

VALVE ACTUATORS/OPERATORS

- HAND OPERATOR
- DIAPHRAM OPERATOR
- SOLENOID OPERATOR
- MOTOR OPERATOR
- PNEUMATIC CYLINDER
- DIAPHRAM OPERATOR WITH POSITIONER
- DIAPHRAM OPERATOR WITH POSITIONER FAIL OPEN
- DIAPHRAM OPERATOR WITH POSITIONER FAIL CLOSE

MISCELLANEOUS

LINE SYMBOLS – PROCESS & INSTRUMENTATION DIAGRAMS

- NEW PROCESS LINES
- EXISTING PROCESS LINES
- ALL OTHER MECHANICAL LINES
- ELECTRIC SIGNAL
- ELECTRICAL BINARY (ON/OFF) SIGNAL
- PNEUMATIC SIGNAL
- PNEUMATIC BINARY SIGNAL
- CAPILLARY TUBING
- HYDRAULIC SIGNAL
- INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
- ELECTROMAGNETIC or SONIC SIGNAL (GUIDED AND NOT GUIDED)
- TELEMETERED SIGNAL
- PACKAGED UNIT
- INSTRUMENT SUPPLY OR CONNECTION TO PROCESS DESIGNATED AS FOLLOWS:
  - AS = AIR SUPPLY
  - ES = ELECTRICAL SUPPLY
  - GS = GAS SUPPLY
  - HS = HYDRAULIC SUPPLY
  - NS = NITROGEN SUPPLY
  - SS = STEAM SUPPLY
  - WS = WATER SUPPLY

LINE SYMBOLS – INSTRUMENTATION LOCATION LAYOUTS AND ELECTRICAL POWER LAYOUTS

- INSTRUMENT OR GROUP OF INSTRUMENTS
- CONDUIT RUN EXPOSED
- CONDUIT RUN CONCEALED
- CONDUIT BELOW GRADE
- INCANDESCENT OR H.I.D. FIXTURE: CEILING MOUNTED
- DIRECTLY-BURIED CABLE
- JUNCTION BOX
- DUPLEX RECEPTACLE
- GROUND FAULT RECEPTACLE
- SINGLE POLE SWITCH
- WEATHER PROOF

PID STANDARDS

1. DRAWINGS UTILIZE CITY OF WINNIPEG STANDARDS FOR BORDER AND TITLE BLOCK. ALL DRAWINGS ARE PRODUCED ON AUTOCAD (LATEST REV., R2000 OR LATER).
2. ALL UNITS ARE IN METRIC, EXCEPT AS NOTED OTHERWISE. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS (mm).
3. DRAWING CONTENT GENERALLY CONFORMS TO ANSI/ISA STANDARDS S5.1 & S5.3.
4. PID'S INDICATE MAJOR PROCESS PIPING AND EQUIPMENT AND ASSOCIATED LOCAL INSTRUMENTATION, DCS AND OTHER PROCESS I/O.
5. EQUIPMENT INCLUDING VESSELS, DRUMS, EXCHANGERS, HEATERS, PUMPS, COMPRESSORS, ETC. ARE ARRANGED IN SEQUENCE WITH PRINCIPLE FUNCTIONS AND FLOWS.
6. ALL MAJOR EQUIPMENT INCLUDING PUMPS, COMPRESSORS, TANKS, ETC. ARE LABELLED AS TO FUNCTION WITH DESIGN SIZES AND RATINGS.
7. ALL PROCESS LINES ARE LABELLED ACCORDING TO FUNCTION AND SIZE UTILIZING SYSTEM CODES DEFINED HEREIN.
8. EACH SYSTEM INTERCONNECTION POINT BETWEEN DRAWINGS IS LABELLED WITH A SOURCE DRAWING NUMBER OR DESTINATION DRAWING NUMBER. ARROWS ON PROCESS PIPING INDICATE DIRECTION OF FLOW BETWEEN DRAWINGS.

IMPERIAL PIPE SIZE CHART (METRIC EQUIVALENT)

IN	mm	IN	mm	IN	mm	IN	mm
1/8	3	2 1/2	65	14	350	32	800
1/4	6	3	75	16	400	34	850
3/8	10	3 1/2	90	18	450	36	900
1/2	12	4	100	20	500	38	950
3/4	20	4 1/2	112	22	550	40	1000
1	25	5	125	24	600	42	1050
1 1/4	32	6	150	26	650	44	1100
1 1/2	38	7	175	28	700	46	1150
2	50	8	200	30	750	48	1200
		9	225			50	1250
		10	250			52	1300
		11	275			54	1350
		12	300				

FOR INFORMATION ONLY - NOT IN CONTRACT

B.M.
ELEV.

NO.	REVISIONS	DATE	BY
00	ISSUED FOR TENDER (N.I.C.)	05/04/17	JBC

CH2MHILL
Fredericksen Cooper ARCHITECTS
EarthTech A Tyco International Ltd. Company
uma

DESIGNED BY BLM	CHECKED BY
DRAWN BY JBC	APPROVED BY
HOR. SCALE: NONE VERTICAL SCALE: NONE	RELEASED FOR CONSTRUCTION BY:
DATE	DATE

ENGINEER'S SEAL

CONSULTANT DRAWING NO.
WM-1002

Winnipeg
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT
ENGINEERING DIVISION

WATER TREATMENT PLANT

CITY FILE NUMBER
SHEET OF

INSTRUMENT AND PROCESS SYMBOLS
PIPING AND INSTRUMENTATION DIAGRAM

CITY DRAWING NUMBER