

MISCELLANEOUS EQUIPMENT SYMBOLS

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

VALVES

| VALVE BODIES |  | CONTROL VALVES |   |
|--------------|--|----------------|---|
|              | NORMALLY OPEN GATE VALVE                           |                | ROTARY BALL VALVE                                       |
|              | NORMALLY CLOSED GATE VALVE                         |                | CYLINDER-ACTUATED SINGLE-ACTING                         |
|              | NORMALLY OPEN GLOBE VALVE                          |                | CYLINDER-ACTUATED DOUBLE-ACTING                         |
|              | NORMALLY CLOSED GLOBE VALVE                        |                | PRESSURE-REDUCING REGULATOR, SELF-CONTAINED             |
|              | NORMALLY OPEN BALL VALVE                           |                | PRESSURE-REDUCING REGULATOR, WITH EXTERNAL PRESSURE TAP |
|              | NORMALLY CLOSED BALL VALVE                         |                | VALVE WITH BLEED  |
|              | BUTTERFLY  |                | AIR RELEASE VALVE                                       |
|              | NEEDLE   |                |   |
|              | CHECK  |                |   |
|              | PLUG   |                |   |
|              | KNIFE  |                |   |
|              | PINCH  |                |   |
|              | BALL CHECK   |                |   |
|              | DOUBLE LEAF CHECK                                  |                |   |
|              | ANGLE  |                |   |
|              | ANGLE AND GATE PRESSURE RELIEF VALVE               |                |   |
|              | GATE PRESSURE RELIEF VALVE                         |                |   |
|              | IN-LINE SAFETY                                     |                |   |
|              | STOP CHECK   |                | BACKPRESSURE REGULATOR, SELF-CONTAINED                  |
|              | SPRING OPERATED CHECK                              |                | BACKPRESSURE REGULATOR, WITH EXTERNAL PRESSURE TAP      |
|              | AIR ASSISTED CHECK                                 |                | CONE VALVE  |
|              | COCK VALVE   |                | THREE-WAY VALVE   |
|              | DUCKBILL VALVE                                     |                | FOUR-WAY VALVE  |
|              | DIAPHRAGM VALVE                                    |                |   |
|              | FLAP VALVE   |                |   |
|              | FLOAT VALVE  |                |   |
|              | MUD VALVE  |                |   |
|              | QUICK CONNECT AIR HOSE COUPLING                    |                |   |
|              | TELESCOPIC VALVE                                   |                |   |
|              | BLAST GATE   |                |   |
|              | SPECTACLE BLIND (OPEN)                             |                |   |
|              | SPECTACLE BLIND (CLOSED)                           |                |   |
|              | UNCLASSIFIED WRITE TYPE OF BODY ADJACENT TO SYMBOL |                |   |
|              | AIR AND VACUUM RELIEF VALVE                        |                |   |

VALVE ACTUATORS/OPERATORS

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

MISCELLANEOUS

| LINE SYMBOLS - PROCESS & INSTRUMENTATION DIAGRAMS                 |   |
|---|---|
|   | MAIN PROCESS LINES                                      |
|   | SECONDARY 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                                      |
|   | SUPPLY CONTRACTOR PACKAGE                               |
|   | VENDOR PACKAGE  |
|   | LOCAL CONTROL PANEL/MCC                                 |
| 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  |

PID STANDARDS

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

MISCELLANEOUS SYMBOLS

|  |                         |
|--|-------------------------|
|  | WATER LEVEL SYMBOL      |
|  | ELECTRICAL HEAT TRACING |
|  | FLOW DIRECTION ARROWS   |
|  | WALL                    |
|  | GRADE                   |

|   |               |   |  |                  |   |   |                                     |    |
|---|---------------|---|--|------------------|---|---|-------------------------------------|----|
| <p>Certificate of Authorization<br/>Earth Tech Canada Inc.<br/>No. 730 Expiry: April 30, 2007</p> | B.M.<br>ELEV. | <p>Frederickson Cooper<br/>ARCHITECTS</p> | <p>A Type International Ltd. Company</p> | ENGINEER'S SEAL  | <p>THE CITY OF WINNIPEG<br/>WATER AND WASTE DEPARTMENT<br/>ENGINEERING DIVISION</p> |   |                                     |    |
|   |               |   |  | DESIGNED BY: SWT |   | CHECKED BY: SWT                             | ORIGINAL SIGNED BY: S.R. BILEVICIUS |    |
|   |               |   |  | DRAWN BY: LAE    |   | APPROVED BY: AHL                            | 2006/03/29                          |    |
|   |               |   |  | SCALE: NONE      |   | RELEASED FOR CONSTRUCTION BY: R. SOROKOWSKI | CONSULTANT DRAWING NO. WM-P0002     |    |
|   | NO. REVISIONS | DATE                                      | DATE                                     | 2005/12/21       | DATE  | 2006/03/29                                  | CITY FILE NUMBER                    |    |
|   |               |   |  |                  |   |   | SHEET                               | OF |
|   |               |   |  |                  |   |   | CITY DRAWING NUMBER                 |    |
|   |               |   |  |                  |   |   | 1-0601M-D-P0002-001-02D             |    |