

A1 - 841494  
2013-10-11  
AECOM REVIEW DRAFT CHK  
AECOM/DEFAULT

**INSTRUMENT & FUNCTION SYMBOLS**

**DISCRETE INSTRUMENTS**  
FIELD OR LOCALLY MOUNTED  
NOT PANEL OR CABINET MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR

**DISCRETE INSTRUMENTS**  
SHARING COMMON HOUSING

**DISCRETE INSTRUMENTS**  
SECONDARY OR LOCAL CONTROL ROOM  
FIELD OR LOCAL CONTROL PANEL MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR

**DISCRETE INSTRUMENTS**  
CENTRAL OR MAIN CONTROL ROOM  
FRONT OF MAIN PANEL MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR

**ANNUNCIATOR POINT**  
FIELD OR LOCALLY MOUNTED  
NOT PANEL OR CABINET MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR

**ANNUNCIATOR POINT**  
FIELD OR LOCAL CONTROL PANEL  
PANEL MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR

**ANNUNCIATOR POINT**  
CENTRAL OR MAIN CONTROL ROOM  
MAIN PANEL MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR

**CDACS (COMPUTER DATA ACQUISITION & CONTROL SYSTEM)**  
INPUT, OUTPUT, OR FUNCTION  
ACCESSIBLE  
EG. DCS OR SCADA

**SHARED DISPLAY OR CONTROL**  
DEDICATED SINGLE FUNCTION DEVICE  
FIELD OR LOCALLY MOUNTED  
NORMALLY ACCESSIBLE TO THE OPERATOR AT DEVICE

**SHARED DISPLAY OR CONTROL**  
SECONDARY OR LOCAL CONSOLE  
FIELD OR LOCAL CONTROL PANEL  
VISIBLE ON VIDEO DISPLAY  
NORMALLY ACCESSIBLE TO AN OPERATOR AT CONSOLE

**SHARED DISPLAY OR CONTROL**  
CENTRAL OR MAIN CONSOLE  
VISIBLE ON VIDEO DISPLAY  
NORMALLY ACCESSIBLE TO AN OPERATOR AT CONSOLE

**PROGRAMMABLE LOGIC CONTROL**  
FIELD OR LOCALLY MOUNTED  
NOT PANEL OR CABINET MOUNTED  
NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE

**PROGRAMMABLE LOGIC CONTROL**  
SECONDARY OR LOCAL CONSOLE  
FIELD OR LOCAL CONTROL PANEL  
VISIBLE ON VIDEO DISPLAY  
ACCESSIBLE TO AN OPERATOR AT CONSOLE

**PROGRAMMABLE LOGIC CONTROL**  
CENTRAL OR MAIN CONSOLE  
VISIBLE ON VIDEO DISPLAY  
NORMALLY ACCESSIBLE TO AN OPERATOR AT CONSOLE

**COMPUTER FUNCTIONS**  
FIELD OR LOCALLY MOUNTED

**COMPUTER FUNCTIONS**  
SECONDARY OR LOCAL COMPUTER  
VISIBLE ON VIDEO DISPLAY  
NORMALLY ACCESSIBLE TO AN OPERATOR AT TERMINAL

**COMPUTER FUNCTIONS**  
CENTRAL OR MAIN COMPUTER  
VISIBLE ON VIDEO DISPLAY  
NORMALLY ACCESSIBLE TO AN OPERATOR AT TERMINAL

**COMMUNICATION INTERFACE**  
COMMUNICATES TO AN ADDRESSABLE DEVICE  
(i.e. DB=DEVICEBUS, MB=MODBUS, E=ETHERNET  
IY=CURRENT-FIELDBUS, FB=FIELDBUS, PB=PROFIBUS)

**NOTE:** INSTRUMENTS & DEVICES NOT NORMALLY ACCESSIBLE TO THE OPERATOR OR BEHIND-THE-PANEL DEVICES OR FUNCTIONS MAY BE DEPICTED BY USING THE SAME SYMBOLS BUT WITH DASHED HORIZONTAL BARS, I.E. :

**INSTRUMENT FIELD DEVICE IDENTIFICATION**

**FIELD DEVICE NAMING CONVENTION**

POSITION: N - 999 - ABCD - 1234 - X

PLANT CODE (OPTIONAL) - ALPHA SUFFIX

PROCESS AREA - LOOP OR DEVICE NUMBER

INSTRUMENT IDENTIFICATION CODE - UP TO FOUR CHARACTERS - REFER TO ABBREVIATION LIST

**FIELD DEVICE IDENTIFICATION**

INSTRUMENT IDENTIFICATION CODE - UP TO FOUR CHARACTERS - REFER TO ABBREVIATION LIST

OPERATING FUNCTION - OPTIONAL - REFER TO ABBREVIATION LIST

PROCESS AREA - LOOP OR DEVICE NUMBER

**POINT TAG NAMING CONVENTION**

POSITION: N - 999 - ABCD - 1234 - X

PLANT CODE (OPTIONAL) - ALPHA SUFFIX

PROCESS AREA - FUNCTIONAL IDENTIFICATION CODE OR INTERNAL FUNCTIONAL CODE - UP TO FOUR CHARACTERS - REFER TO ABBREVIATION LIST

**POINT IDENTIFICATION**

FUNCTIONAL DESCRIPTION - FUNCTIONAL IDENTIFICATION CODE - UP TO FOUR CHARACTERS - REFER TO ABBREVIATION LIST

LOOP OR DEVICE NUMBER - I/O OR COMMUNICATION TYPE

NOTE: HYPHENS ARE OPTIONAL

**PROCESS & INSTRUMENTATION ABBREVIATIONS**

**OPERATING FUNCTIONS**

**ANALYTICAL FUNCTIONS**

AE - EXPOSED PROBE OR GAS DETECTOR

AE - TAPPED OR SAMPLED

AE - IN-LINE

CH4 METHANE  
Cl2 CHLORINE  
CO CARBON MONOXIDE  
COMB COMBUSTIBLE GAS  
DO DISSOLVED OXYGEN  
HC HYDROCARBONS  
H2S HYDROGEN SULFIDE  
HUM HUMIDITY  
LEL LOWER EXPLOSIVE LIMIT  
MLSS MIXED LIQUOR SUSPENDED SOLIDS  
NH4 AMMONIA GAS  
NO NITRIC OXIDE  
NO2 NITROGEN DIOXIDE  
NO3 NITRATE  
O2 OXYGEN  
ORP OXIDATION REDUCTION POTENTIAL  
OUR OXYGEN UPTAKE RATE  
pH pH  
PO4 PHOSPHORUS  
SO2 SULPHUR DIOXIDE  
SS SUSPENDED SOLIDS (DENSITY)  
TSS TOTAL SUSPENDED SOLIDS  
TURB TURBIDITY  
VIB VIBRATION

**SWITCHING FUNCTIONS**

ACK ACKNOWLEDGE (ALARM)  
ALOH AUTO-LOCAL-OFF-HAND  
AM AUTO/MANUAL  
CLS CLOSE  
COB COMPUTER-OFF-BYPASS  
COH COMPUTER-OFF-HAND  
ESD EMERGENCY SHUTDOWN DEVICE  
F/S FAST-SLOW SELECTION  
FOR FORWARD-OFF-REVERSE  
FWD FORWARD SELECTION  
HA HAND-AUTO SELECTION  
HOA HAND-OFF-AUTO SELECTION  
L/L LEAD-LAG SELECTION  
LOR LOCAL-OFF-REMOTE  
LOS LOCK-OFF-STOP  
L/R LOCAL-REMOTE SELECTION  
M/A MANUAL-AUTO SELECTION  
MAN MANUAL  
O/C OPEN/CLOSE  
O/O ON-OFF SELECTION  
OCA OPEN-CLOSE-AUTO SELECTION  
OAA ON-OFF-AUTO SELECTION  
OPN OPEN  
OSC OPEN-STOP-CLOSE SELECTION  
OVR INTERLOCK OVERRIDE SWITCH  
P/M POSITIONER/MANUAL  
P/R PANEL/REMOTE  
POT POTENTIOMETER  
R/B RUN/BYPASS  
R/L RAISE-LOWER  
REV REVERSE SELECTION  
RST RESET  
SEL SELECTOR SWITCH  
S/S START-STOP  
SP SET POINT

**GENERAL INSTRUMENTATION**

**GENERAL INSTRUMENTATION**

AI ANALOG INPUT  
AO ANALOG OUTPUT  
DI DIGITAL INPUT  
DO DIGITAL OUTPUT  
I/O INPUT/OUTPUT

**PROCESS EQUIPMENT**

BFV BUTTERFLY VALVE  
CV CHECK VALVE  
M MOTOR  
P PUMP  
SG SLUICE GATE  
SLG SLIDE GATE

**COMMODITIES**

DRA DRAIN  
STM STORM WATER

**PIPE MATERIALS**

CON CONCRETE  
CS CARBON STEEL

**ANNOTATION SYMBOLS**

**PIPE IDENTIFICATION**

0000 - 999 - NNN - MMM

LINE NUMBER  
NOMINAL DIAMETER  
PIPE MATERIAL  
COMMODITY

**CHANNEL / CHUTE IDENTIFICATION**

999 - NNN

COMMODITY  
CHANNEL OR CHUTE SIZE  
WIDTH x HEIGHT (mm)

**INSTRUMENT SIGNAL IDENTIFICATION**

NNN

SIGNAL IDENTIFICATION

**EQUIPMENT & VALVE IDENTIFICATION**

**MOTORIZED EQUIPMENT**

NN - 999

EQUIPMENT ABBREVIATION  
EQUIPMENT NUMBER  
PROCESS AREA

**NON-MOTORIZED EQUIPMENT / VALVES**

NN - 99 - 999

EQUIPMENT / VALVE ABBREVIATION  
EQUIPMENT NUMBER  
PROCESS AREA

**FLOW: LEFT TO RIGHT**

REFERENCE NUMBER  
COMMODITY  
TO / FROM  
REFERENCE DRAWING  
SOURCE OR DESTINATION

**FLOW: BOTH DIRECTIONS**

REFERENCE NUMBER  
COMMODITY  
TO / FROM  
REFERENCE DRAWING  
SOURCE OR DESTINATION

**FLOW: RIGHT TO LEFT**

REFERENCE NUMBER  
COMMODITY  
TO / FROM  
SOURCE OR DESTINATION  
REFERENCE DRAWING

**GENERAL SYMBOLS**

→ FLOW ARROW  
↔ OVER / UNDER FLOW ARROW  
▽ WATER LEVEL

**GATE SYMBOLS**

SLUICE GATE

WEIR GATE

**VALVE SYMBOLS**

DUCKBILL CHECK VALVE

BUTTERFLY VALVE

**EQUIPMENT SYMBOLS**

SUBMERSIBLE PUMP

SUBMERSIBLE PROPELLER PUMP

MOTOR

**INSTRUMENT SIGNAL TYPES**

INSTRUMENT SUPPLY, PROCESS TAPS

PNEUMATIC SIGNAL

ELECTRIC SIGNAL

CAPILLARY TUBE OR FILLED SYSTEM

ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)

ELECTROMAGNETIC OR SONIC SIGNAL (UNGUIDED)

SOFTWARE OR DATA LINK

FOUNDATION FIELDBUS

HYDRAULIC

MECHANICAL LINK

**INSTRUMENT IDENTIFICATION TABLE**

LETTER	FIRST LETTER (4)		SUCCEEDING-LETTERS (3)		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE (1)			CONTROL	
D	USER'S CHOICE (1)	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER CHOICE (1)		GLASS, VIEWING DEVICE		
H	HAND				H-HIGH-(ALARM) HH-HIGH-(SHUTDOWN)
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		L-LOW-(ALARM) LL-LOW-(SHUTDOWN) MIDDLE, INTERMEDIATE
M	USER'S CHOICE (1)	MOMENTARY			USER'S CHOICE
O	USER'S CHOICE (1)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY, SOLENOID	SAFETY		SWITCH, OR SAFETY	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED - FINAL CONTROL ELEMENT	

NOTES:  
(1) USER'S CHOICE - INTENDED TO COVER UNLISTED MEANINGS SPECIFIC TO A PROJECT  
(2) INSTRUMENT SYMBOLS AND IDENTIFICATION STANDARD, ISA-S5.1-1984

**METRIC**  
WHOLE NUMBERS INDICATE MILLIMETRES  
DECIMALIZED NUMBERS INDICATE METRES  
BID OPPORTUNITY NO. 712-2013

**LOCATION APPROVED UNDERGROUND STRUCTURES**

SUPV. U/G STRUCTURES COMMITTEE DATE

**NOTE:** LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE, BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

NO.	REVISIONS	DATE	BY
0	ISSUED FOR TENDER	13/10/15	SRG

**AECOM**

DESIGNED BY: CL  
CHECKED BY: DME  
DRAWN BY: SRG  
APPROVED BY: [Signature]  
HOR. SCALE: AS NOTED  
VERTICAL: AS NOTED  
RELEASED FOR CONSTRUCTION BY: [Signature]

ENGINEER'S SEAL  
PROVINCE OF MANITOBA  
D.M.R.  
ENNS  
Member  
31777  
OCT 15 2013  
REGISTERED PROFESSIONAL ENGINEER

**THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT**

PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDIT SUBDIVISION CONTRACT 3

CITY DRAWING NUMBER: U238-2014-2371  
SHEET 1 OF 5

**PUMPING STATION**  
PROCESS MECHANICAL LEGEND & ABBREVIATIONS  
**P-1001**

**APEGM**  
Certificate of Authorization  
AECOM Canada Ltd.  
No. 4671 Date: OCT 15 2013