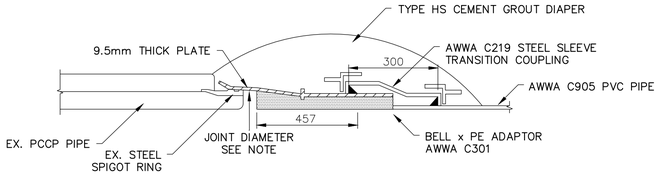
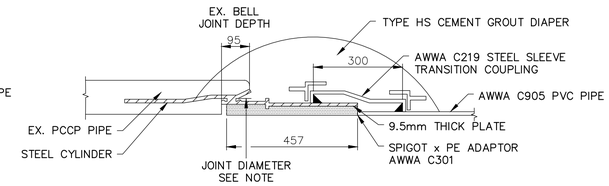
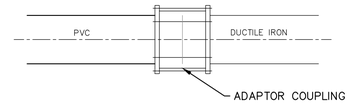


NOTES:
1. ALL EXPOSED STEEL INCLUDING PIPE COUPLING COATED AS PER AWWA C210.
2. JOINT DIAMETERS:
   - 750(NOM)ø:870
   - 600(NOM)ø:699

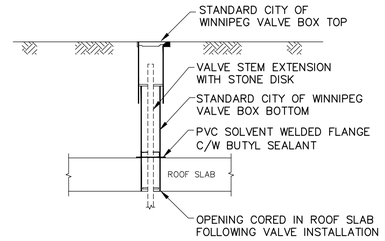
1 - DETAIL N.T.S
EXISTING PCCP SPIGOT TO PVC CONNECTION



2 - DETAIL N.T.S
EXISTING PCCP BELL TO PVC CONNECTION



3 - DETAIL NTS
PVC TO DUCTILE IRON CONNECTION



4 - DETAIL N.T.S
VALVE BOX ASSEMBLY

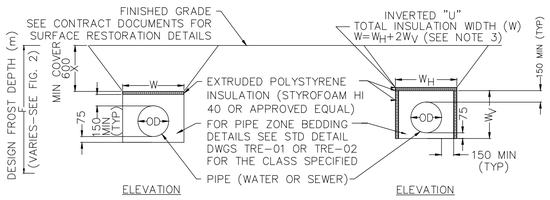
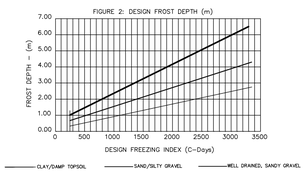


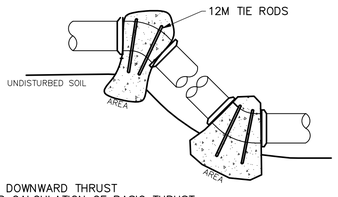
TABLE 2: INSULATION THICKNESS (mm) SELECTION

BACKFILL OVER INSULATION (METRES)	DESIGN FREEZING INDEX (C-Days)						
	850	1125	1400	1675	1950	2225	2500
0.6	50	65	75	90	100	115	125
0.9	40	50	65	75	90	100	115
1.2	25	40	50	65	75	90	100
1.5	25	25	40	50	65	75	90
1.8	25	25	25	40	50	65	75
2.1			25	25	40	50	65
2.4				25	25	40	50
2.7					25	25	40
3.0						25	25



NOTES:
1. BOTTOM OF INSULATION VERTICAL LEGS SHOULD BE LEVEL WITH THE BOTTOM OF THE PIPE (MINIMUM).
2. MINIMUM OF 250 OF COMPACTED BACKFILL IS REQUIRED OVER THE INSULATION PRIOR TO TRAFFIC LOADING.
3. IN SOLID ROCK PIPE IS TO BE BOXED IN COMPLETELY. NOMINAL INSULATION THICKNESS ARE 25, 40, 50 AND 75.
4. MINIMUM PIPE ZONE WIDTH MAY NEED TO BE INCREASED MORE THAN 2xOD DEPENDING ON THE INSULATION THICKNESS. MAINTAIN 150 CLEARANCE ALONG TOP AND SIDES BETWEEN THE PIPE AND INSULATION.
5. FOR PIPE ZONE BEDDING DETAILS SEE STANDARD DETAIL DRAWINGS TRE-01 OR TRE-02 FOR THE CLASS SPECIFIED.
6. SEE STANDARD DETAIL DRAWINGS TRE-03 TO TRE-08 FOR TRENCH BACKFILL DETAILS.
7. REFER TO CONTRACT DOCUMENTS FOR MINIMUM PIPE COVER, AND FOR DETAILED SPECIFICATIONS.
8. ALL DIMENSIONS SHOWN IN MILLIMETRES UNLESS NOTED OTHERWISE.

5 - DETAIL N.T.S
PIPE INSULATION



DOWNWARD THRUST
TABLE - FOR CALCULATION OF BASIC THRUST BLOCK BEARING AREA (IN SQUARE METRES)
CONCRETE UNIT WEIGHT 2400 kg/cu. m

BEND \ PIPE SZ	300	350	400	450	500	600	750	900
11.25°	0.15	0.21	0.27	0.34	0.38	0.41	0.47	0.54
22.50°	0.30	0.41	0.53	0.67	0.73	0.80	0.91	1.04
30°	0.40	0.54	0.71	0.89	0.97	1.06	1.21	1.38
45°	0.59	0.80	1.05	1.32	1.44	1.57	1.80	2.05

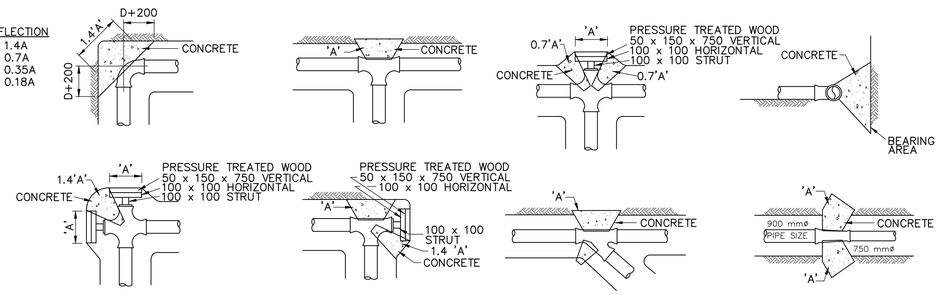
UPWARD THRUST (GRAVITY)
TABLE - FOR CALCULATION OF BASIC THRUST BLOCK BEARING AREA (IN SQUARE METRES)
CONCRETE UNIT WEIGHT 2400 kg/cu. m

BEND \ PIPE SZ	300	350	400	450	500	600	750	900
11.25°	0.64	0.87	1.14	1.44	1.75	2.28	2.65	2.98
22.50°	1.27	1.73	2.26	2.82	3.41	4.08	4.73	5.32
30°	1.69	2.30	3.00	3.80	4.60	6.00	7.00	7.87
45°	2.50	3.40	4.44	5.62	6.81	8.90	10.36	11.65

THRUST BLOCK DESIGN BASED ON:
1. 1050 kPa MAX. SYSTEM PRESSURE OR 700 kPa OPERATING PRESSURE PLUS A SURGE ALLOWANCE OF 345 kPa (2 fps SURGE ALLOWANCE AT 25 psi/fps)
2. THRUST BLOCK DESIGN ASSUMES A MIN. VERTICAL SOIL BEARING OF 100 kPa
3. THRUST BLOCK BEARING AREA BASED ON PVC PIPE (AWWA C900 DR18 AND C905 DR25)
4. CONCRETE 20 MPa TYPE 50 CEMENT
5. UNIT WEIGHT OF CONCRETE ASSUMED IS 2400 kg/m?

6 - DETAIL N.T.S
VERTICAL THRUST BLOCK

BEND DEFLECTION
90° 1.4A
45° 0.7A
22 1/2° 0.35A
11 1/4° 0.18A

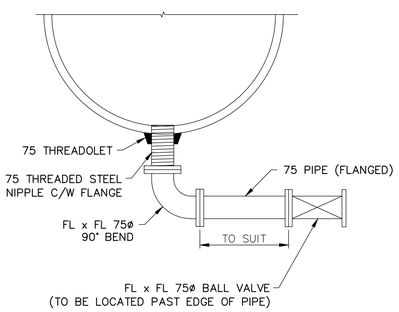


THRUST BLOCK DESIGN BASED ON:
1. 1050 kPa MAX. SYSTEM PRESSURE OR 700 kPa OPERATING PRESSURE PLUS A SURGE ALLOWANCE OF 345 kPa (2 fps SURGE ALLOWANCE AT 25 psi/fps)
2. THRUST BLOCK DESIGN ASSUMES A MIN. VERTICAL SOIL BEARING OF 100 kPa
3. THRUST BLOCK BEARING AREA BASED ON PVC PIPE (AWWA C900 AND C905)
4. CONCRETE 20 MPa TYPE 50 CEMENT

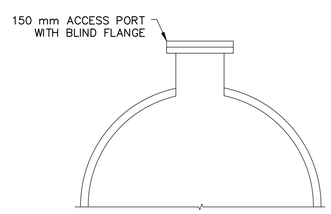
TABLE - FOR CALCULATION OF BASIC THRUST BLOCK BEARING AREA 'A' (IN SQUARE METRES)

PIPE SIZE	300	350	400	450	600	750	900
'A'	1.54	2.08	2.72	3.44	5.95	9.33	13.4

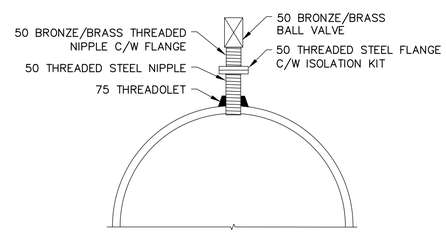
7 - DETAIL NTS
POURED CONCRETE THRUST BLOCKS FOR HORIZONTAL TEES AND BENDS



8 - DETAIL N.T.S
DRAIN ASSEMBLY



9 - DETAIL N.T.S
INSPECTION ACCESS PORT



10 - DETAIL N.T.S
VALVE PORT

APEGM
Certificate of Authorization
Associated Engineering (Sask.) Ltd.
No. 396 Date: January 11, 2016

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.

B.M.
ELEV.
CONSTRUCTION COMPLETION DATE: YYYY MM DD

NO.	REVISIONS	DATE	BY
–	–	–	–

Associated Engineering

DESIGNED BY	CL	CHECKED BY	JL
DRAWN BY	KG	APPROVED BY	JL
SCALE: HORIZONTAL AS SHOWN VERTICAL AS SHOWN		RELEASED FOR CONSTRUCTION	
DATE	2016 01 11	DATE	

PLOT DATE: 2016 01 11

ENGINEER'S SEAL
PROVINCE OF MANITOBA
J.S. LUEKE
Member 36827
REGISTERED PROFESSIONAL ENGINEER
Jan 11, 2016

CONSULTANT DRAWING NUMBER
20134376

Winnipeg
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT
ENGINEERING DIVISION

NORTH KILDONAN FEEDERMAIN
VALVE CHAMBERS AND CONNECTIONS
CONNECTIONS
DETAILS

SHEET 5 OF 9
CITY DRAWING NUMBER
D-14037

BID OPPORTUNITY: 329-2014
CONTRACT NUMBER:
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