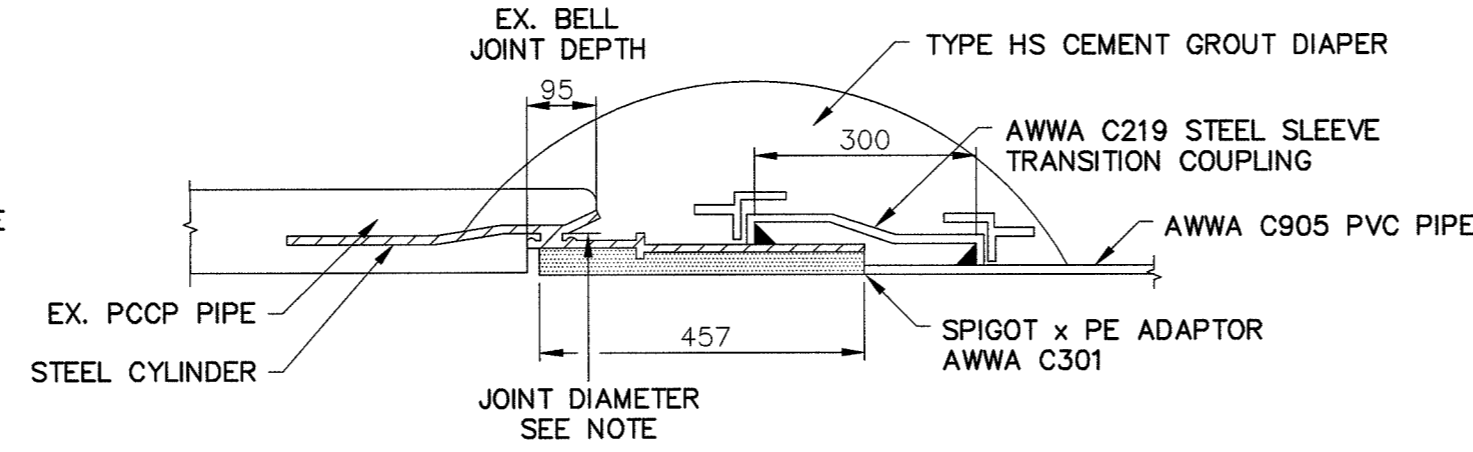
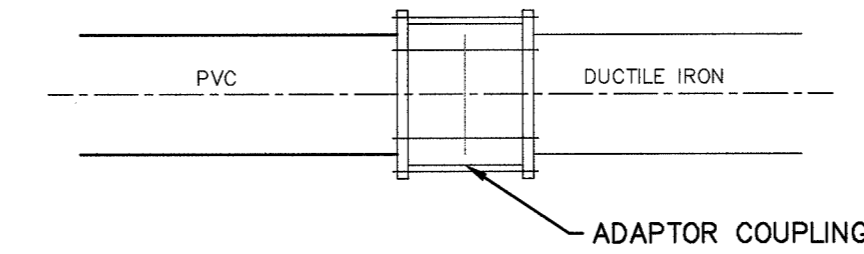


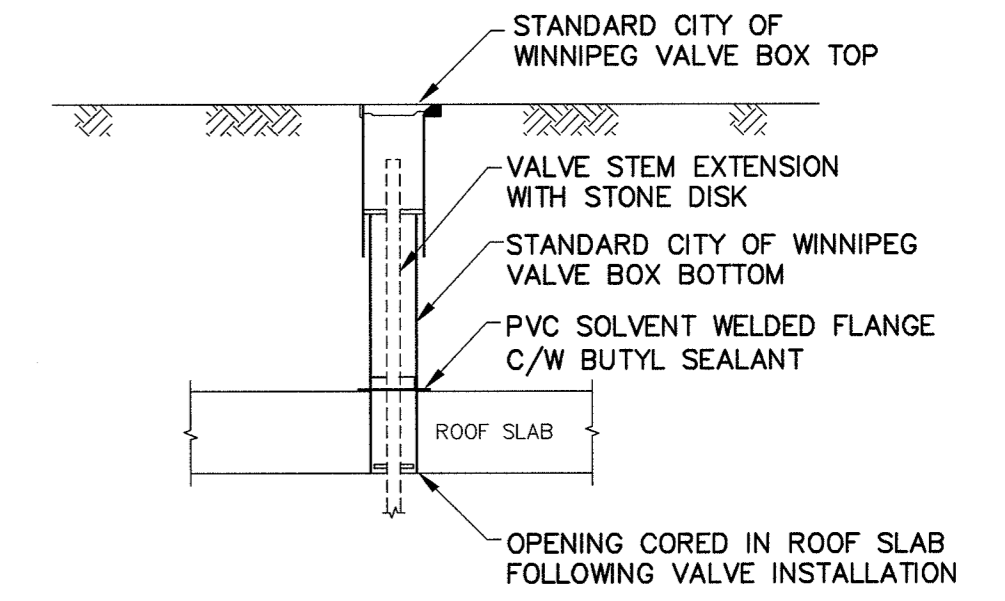
**1** DETAIL N.T.S.  
EXISTING PCPP SPIGOT TO PVC CONNECTION



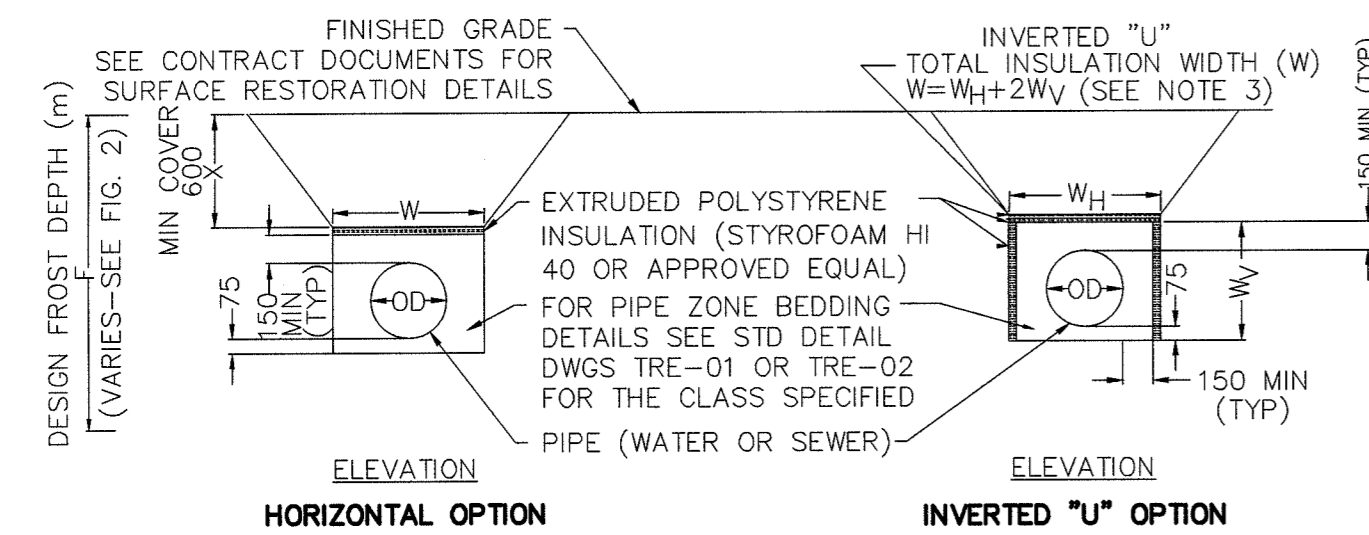
**2** DETAIL N.T.S.  
EXISTING PCPP BELL TO PVC CONNECTION



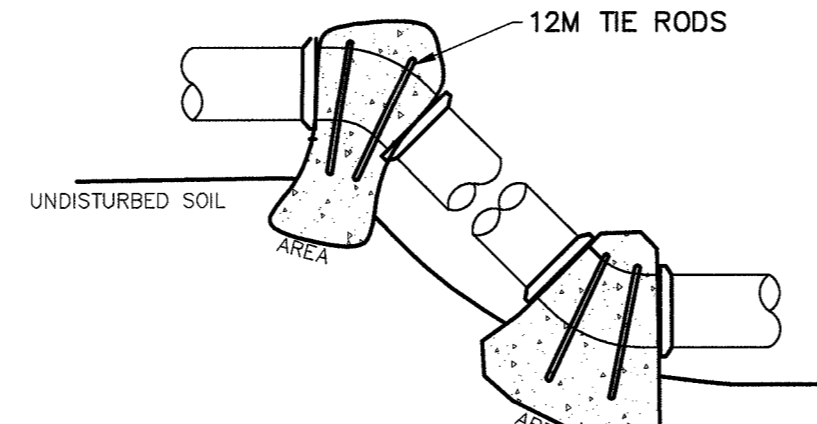
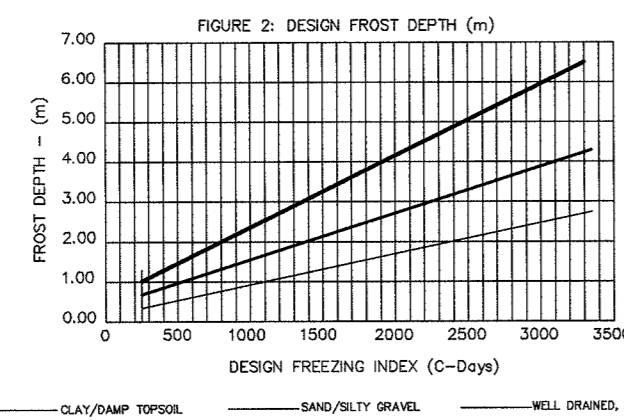
**3** DETAIL N.T.S.  
PVC TO DUCTILE IRON CONNECTION



**4** DETAIL N.T.S.  
VALVE BOX ASSEMBLY



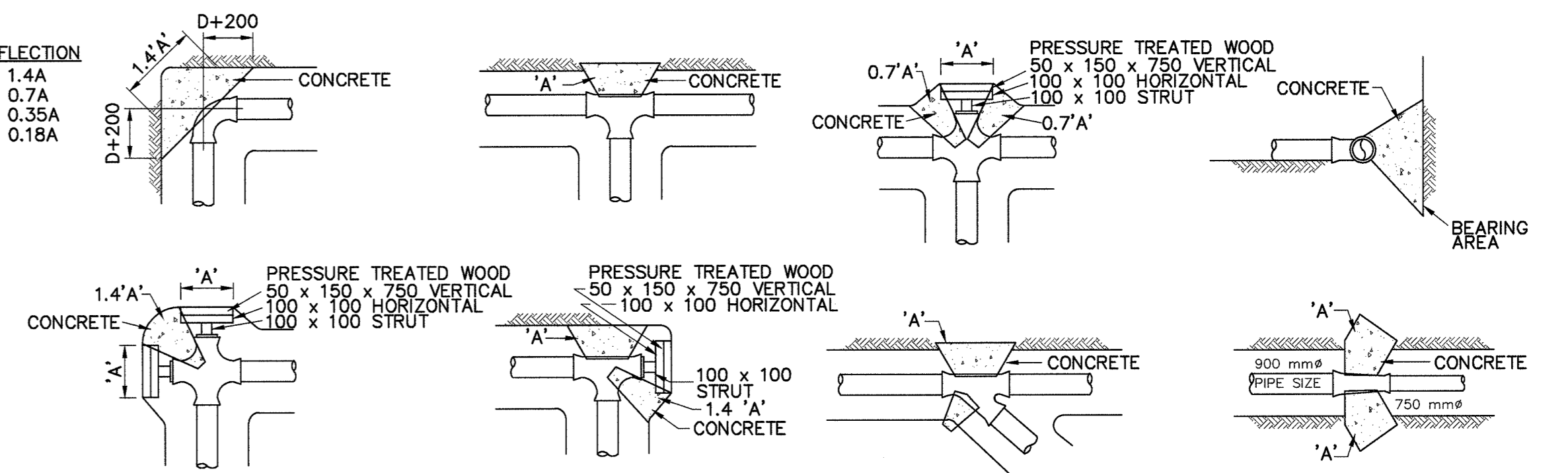
BACKFILL OVER INSULATION (METRES)	DESIGN FREEZING INDEX (C-Days)	1000	1500	2000	2500	3000	3500
0.6	50	50	75	90	100	115	125
0.9	45	50	65	75	90	100	115
1.2	35	40	50	55	75	90	100
1.5	25	30	40	50	60	75	90
1.8	25	30	40	50	65	75	90
2.1	25	35	45	50	65	75	90
2.4	25	35	45	50	65	75	90
2.7	25	35	45	50	65	75	90
3.0	25	35	45	50	65	75	90



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

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:
- 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)
  - THRUST BLOCK DESIGN ASSUMES A MIN. VERTICAL SOIL BEARING OF 100 kPa
  - THRUST BLOCK BEARING AREA BASED ON PVC PIPE (AWWA C900 DR18 AND C905 DR25)
  - CONCRETE 20 MPa TYPE 50 CEMENT
  - UNIT WEIGHT OF CONCRETE ASSUMED IS 2400 kg/m<sup>3</sup>

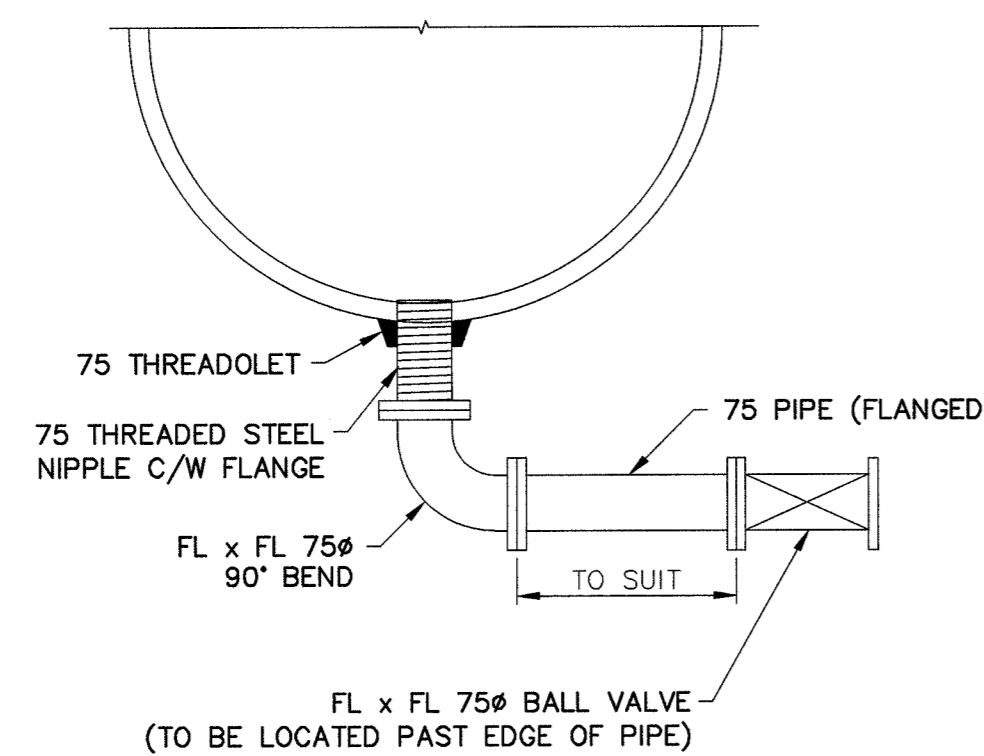


PIPE SIZE	300	350	400	450	600	750	900
'A'	1.54	2.08	2.72	3.44	5.95	9.33	13.4

- THRUST BLOCK DESIGN BASED ON:
- 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)
  - THRUST BLOCK DESIGN ASSUMES A MIN. VERTICAL SOIL BEARING OF 100 kPa
  - THRUST BLOCK BEARING AREA BASED ON PVC PIPE (AWWA C900 AND C905)
  - CONCRETE 20 MPa TYPE 50 CEMENT

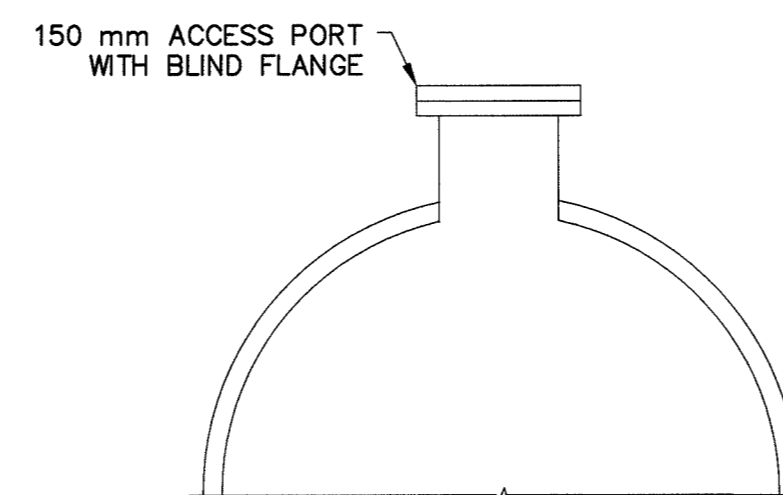
- NOTES:
- BOTTOM OF INSULATION VERTICAL LEGS SHOULD BE LEVEL WITH THE BOTTOM OF THE PIPE (MINIMUM).
  - MINIMUM OF 250 OF COMPACTED BACKFILL IS REQUIRED OVER THE INSULATION PRIOR TO TRAFFIC LOADING.
  - IN SOLID ROCK PIPE IS TO BE BOXED IN COMPLETELY. NOMINAL INSULATION THICKNESS ARE 25, 40, 50 AND 75.
  - 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.
  - FOR PIPE ZONE BEDDING DETAILS SEE STANDARD DETAIL DRAWINGS TRE-01 OR TRE-02 FOR THE CLASS SPECIFIED.
  - SEE STANDARD DETAIL DRAWINGS TRE-03 TO TRE-08 FOR TRENCH BACKFILL DETAILS.
  - REFER TO CONTRACT DOCUMENTS FOR MINIMUM PIPE COVER, AND FOR DETAILED SPECIFICATIONS.
  - ALL DIMENSIONS SHOWN IN MILLIMETRES UNLESS NOTED OTHERWISE.

**5** DETAIL N.T.S.  
PIPE INSULATION



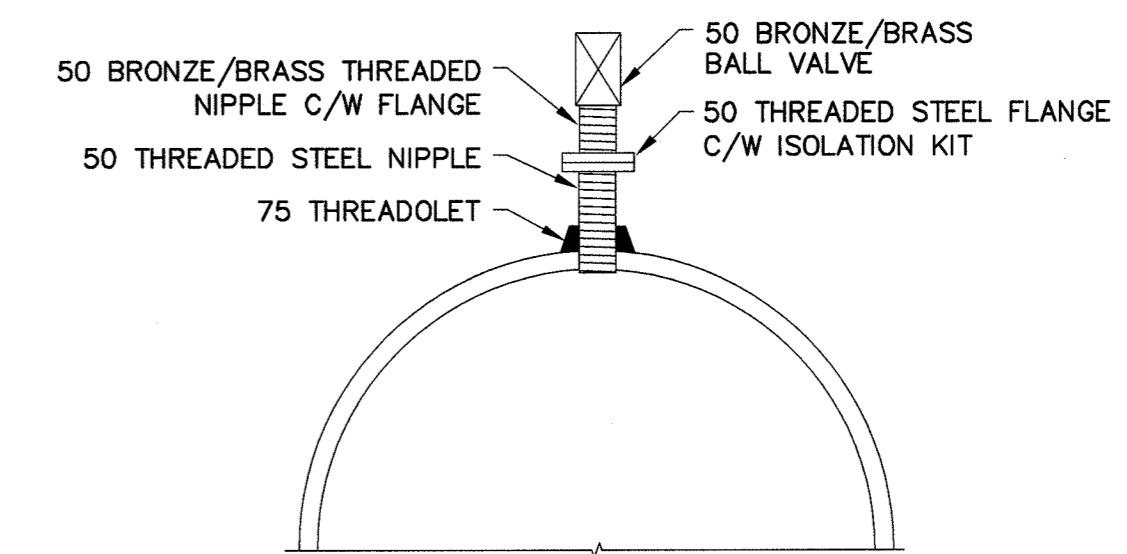
**8** DETAIL N.T.S.  
DRAIN ASSEMBLY

**6** DETAIL N.T.S.  
VERTICAL THRUST BLOCK



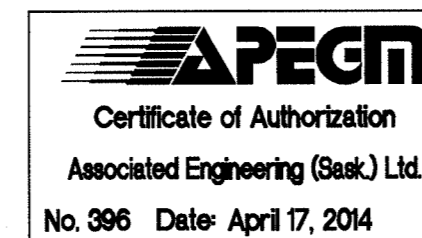
**9** DETAIL N.T.S.  
INSPECTION ACCESS PORT

**7** DETAIL N.T.S.  
POURED CONCRETE THRUST BLOCKS FOR HORIZONTAL TEES AND BENDS



**10** DETAIL N.T.S.  
VALVE PORT

METRIC  
WHOLE NUMBERS INDICATE MILLIMETRES  
DECIMALIZED NUMBERS INDICATE METRES



LOCATION APPROVED UNDERGROUND STRUCTURES	B.M. ELEV.		ENGINEER'S SEAL
SUPV. U/G STRUCTURES COMMITTEE DATE	CONSTRUCTION COMPLETION DATE: YYYY MM DD		
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 UTILITIES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.		DESIGNED BY: CL	CHECKED BY: JL
		DRAWN BY: MT	APPROVED BY: JL
		SCALE: HORIZONTAL AS SHOWN VERTICAL AS SHOWN	RELEASED FOR CONSTRUCTION
ISSUED FOR TENDER	14-APR-17	DATE	2014 04 17
NO. REVISIONS	DATE	BY	DATE

CONTRACT NUMBER	20134376
CONSULTANT DRAWING NUMBER	20134376
CONTRACT NUMBER	20134376
FILE NAME	D-13511.dwg

THE CITY OF WINNIPEG	WATER AND WASTE DEPARTMENT	ENGINEERING DIVISION
NORTH KILDONAN FEEDERMAIN	SHEET 5 OF 8	
MISCELLANEOUS DETAILS	CITY DRAWING NUMBER	
	D-13511	

FILE PATH: \\s-mc-fs-01\projects\20134376\00_NK_Feedermain\Working_Dwgs\100_Civil
FILE NAME: D-13511.dwg