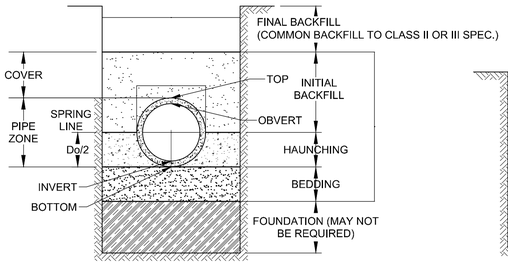
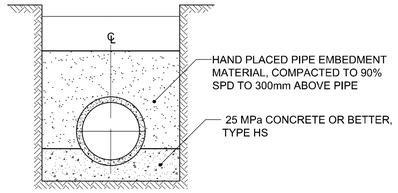
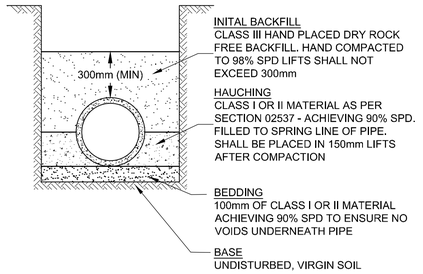


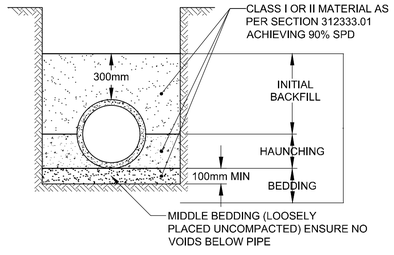
TERMINOLOGY



CLASS A BEDDING
(CONCRETE BACKFILL & BEDDING)



BEDDING DETAILS



WATER MAIN BEDDING DETAILS

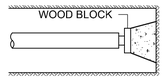
NOTES:

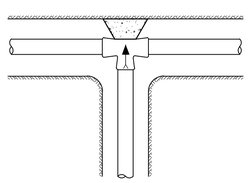
1. W (TRENCH WIDTH) = O.D. + 600mm (MINIMUM), O.D. = OUTSIDE DIAMETER
2. d = DEPTH OF BEDDING BELOW PIPE;
   I.D. = 750mm OR SMALLER, d MIN = 100mm
   I.D. = 750mm TO 1500mm, d MIN = 100mm
   I.D. = 1650mm AND LARGER, d MIN = 150mm
   I.D. = INSIDE PIPE DIAMETER
3. BEDDING UNDER THE MIDDLE THIRD OF THE PIPE SHALL BE LOOSE, UNCOMPACTED MATERIAL.
4. IF A ROCK FOUNDATION, THEN MINIMUM BEDDING THICKNESS IS Do/24.

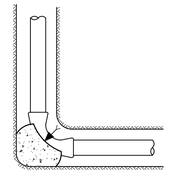
1 | PIPE BEDDING
Scale 1:10

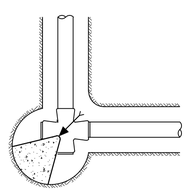
SAFE BEARING LOADS	
SOIL TYPE	SAFE BEARING LOAD (kPa)
SOFT CLAY	100
SAND OR HARD CLAY	250
SAND AND GRAVEL	400
SAND, GRAVEL CEMENTED WITH CLAY	500
SHALE (UNDISTURBED)	1000

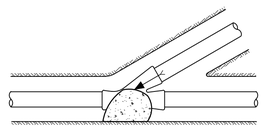
THRUST BLOCKS

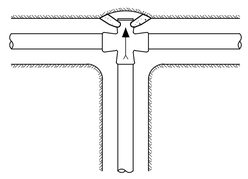


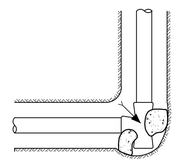






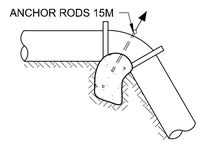






THRUST AT FITTINGS					
THRUST OF WATER PRESSURE					
PIPE SIZE	DEAD END OR TEE	90° BEND	45° BEND	22 ½° BEND	11 ¼° BEND
100	.012	.018	.010	.005	.002
150	.025	.036	.019	.010	.005
200	.044	.062	.033	.017	.010
250	.071	.100	.054	.028	.014
300	.100	.141	.077	.039	.021
350	.135	.190	.105	.053	.026
400	.174	.248	.135	.068	.034
450	.220	.295	.170	.090	.045

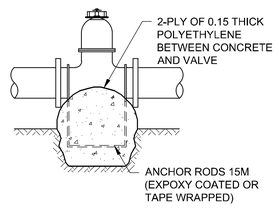
NOTE: TO OBTAIN TOTAL THRUST AT FITTINGS MULTIPLY ABOVE VALUE BY MAXIMUM ALLOWABLE WORKING PRESSURE OF PIPE IN kPa.



SAMPLE CALCULATIONS

FOR WORKING PRESSURE OF 690 kPa AND Ø 200 PIPE
AT 90° BEND (0.062 m^2) IN SOFT CLAY (100 kPa)
AREA REQUIRED = $\frac{690 \times 0.062}{100} = 0.427\ m^2$

WORKING PRESSURE (kPa)		SIZE OF VALVE REQUIRING ANCHORAGE
345	690	300 AND UP
690	1035	200 AND UP
1035	1380	ALL SIZES



GATE VALVE ANCHORS

2 | REACTION BLOCKING AND ANCHORAGE
Scale 1:10

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

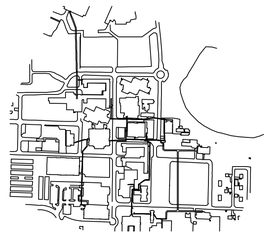
TENDER
NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER
C.L. CUNNINGHAM
MEMBER 11013
19 09 30
YR. MN. DAY
SASKATCHEWAN

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
AECOM Canada Ltd.
NUMBER C1667
PERMISSION TO CONSULT HELD BY:

DISCIPLINE	SASK. REG. No.	SIGNATURE
Civil	11013	

Key Plan



Revision	Description	Date
E	Issued For Tender	19/09/30
D	Issued For 99% Review	19/06/21
C	Issued For 85% Review	19/03/15
B	Issued For 50% Review	18/11/13
A	Not Issued	18/09/07

Client

Public Works and Government Services Canada

Project title

Tunnel Revitalization

Designed by: C. Cunningham
Drawn by: G. Soltys
Approved by: B. Wolfater
PWGSC Project Manager: J. Dayman

Drawing title

Package 1 - TBU43
Civil
Details

Project no.	Drawing no.	Revision no.
1004259	C1.09	E

PWGSC – A1 – 841X594

0 10 20 30 40 50 60 70 80 90 100mm