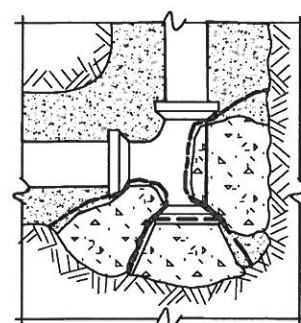
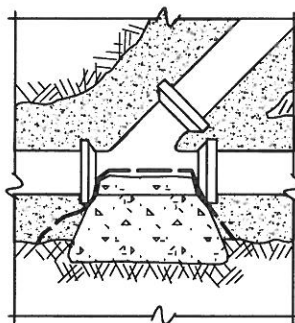
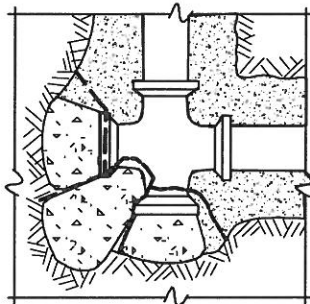
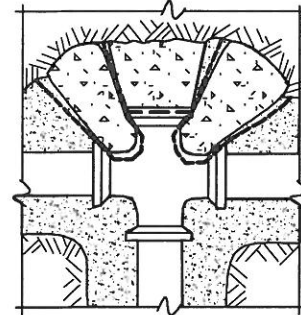
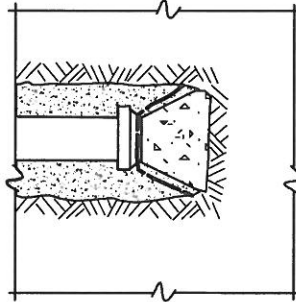
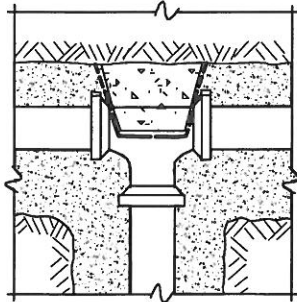
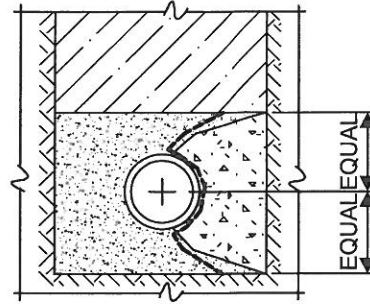
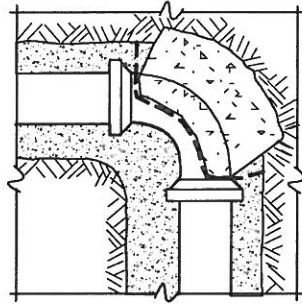


APPENDIX A

The Standard Details from the City of Winnipeg Construction
Specifications included herein shall apply to the work.



CONCRETE THRUST BLOCK BEARING AREA FOR HORIZONTAL FITTINGS
TEST PRESSURE 1.0 MPa, SOIL BEARING PRESSURE = 71.8 kPa

PIPE SIZE mm	TEE, PLUG OR CROSS m ²	BENDS			
		11 1/4° m ²	22 1/2° m ²	45° m ²	90° m ²
150	0.27	0.11	0.21	0.39	0.55
200	0.47	0.18	0.36	0.67	0.95
250	0.71	0.28	0.54	1.01	1.42
300	1.00	0.39	0.77	1.42	2.01
350	1.35	0.53	1.03	1.91	2.70
400	1.75	0.68	1.34	2.48	3.51
450	2.18	0.85	1.67	3.09	4.37

--- POLYETHYLENE
BOND BREAKER
(NOT REQUIRED
WITH PVC
FITTINGS)

MECHANICAL RESTRAINERS TO BE USED ON ALL PLUGS

DIMENSIONS IN MILLIMETERS



THE CITY OF WINNIPEG
WATER & WASTE DEPARTMENT

Reference Spec. No.

CW 2110

CONCRETE THRUST BLOCKS
FOR HORIZONTAL WATERMAIN
FITTINGS

Designed By:
TW

Checked By:
TW

Approved:
UNDERGROUND WORKS COMMITTEE

Drawn By:
BH

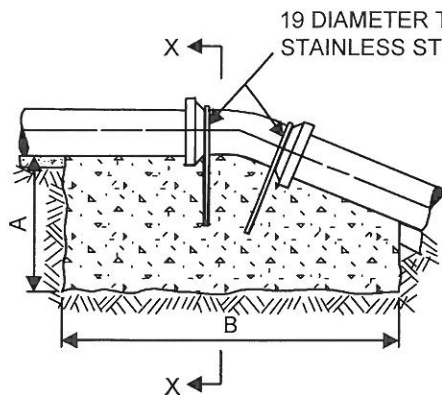
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Revision: 1

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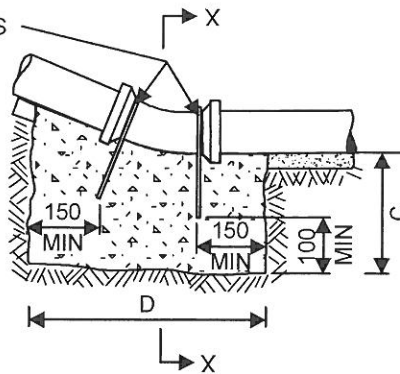
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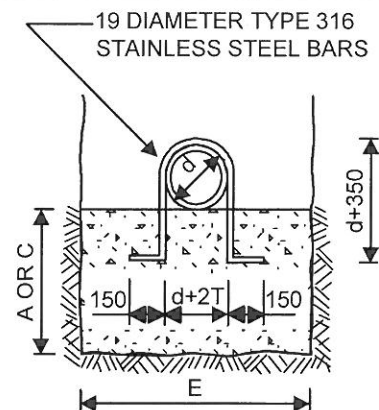
SD-004



VERTICAL BEND UP



VERTICAL BEND DOWN



SECTION X-X

PIPE SIZE (D) (millimetres)	ANGLE OF BEND	VOLUME OF CONCRETE FOR VERTICAL BEND UP (m ³)	DIMENSIONS FOR CONCRETE THRUST BLOCKS FOR VERTICAL BENDS * (millimetres)				
			A	B	C	D	E
150	11 1/4°	0.21	265	750	450	750	1050
	22 1/2°	0.41	385	1000	450	750	1050
	45°	0.75	715	1000	600	750	1050
200	11 1/4°	0.36	340	1000	450	750	1050
	22 1/2°	0.70	665	1000	450	750	1050
	45°	1.29	1025	1200	600	750	1050
250	11 1/4°	0.53	510	1000	450	1000	1050
	22 1/2°	1.05	835	1200	450	1000	1050
	45°	1.94	1230	1500	600	1000	1050
300	11 1/4°	0.76	685	1050	600	1050	1050
	22 1/2°	1.48	940	1500	600	1050	1050
	45°	2.74	1450	1800	750	1050	1050
350	11 1/4°	1.02	805	1200	600	1200	1050
	22 1/2°	1.99	1055	1800	600	1200	1050
	45°	3.68	1630	2150	750	1200	1050
400	11 1/4°	1.31	835	1500	1000	1350	1050
	22 1/2°	2.58	1140	2150	1050	1350	1050
	45°	4.76	1850	2450	1200	1350	1050
450	11 1/4°	1.65	1045	1500	1050	1350	1050
	22 1/2°	3.24	1435	2150	1050	1350	1050
	45°	5.98	1965	2900	1350	1350	1050

* TEST PRESSURE 1.0 MPa, SOIL BEARING PRESSURE = 71.8 kPa

* IF DIMENSION FOR A PARTICULAR SIDE OF THE THRUST BLOCK VARIES FROM THAT SHOWN,
ADJUST REMAINING DIMENSIONS TO OBTAIN REQUIRED VOLUME

DIMENSIONS IN MILLIMETERS



THE CITY OF WINNIPEG
WATER & WASTE DEPARTMENT

Reference Spec. No.

CW 2110

CONCRETE THRUST
BLOCKS FOR VERTICAL
WATERMAIN BENDS

Designed By:
TW

Checked By:
TW

Approved:
UNDERGROUND WORKS COMMITTEE

Drawn By:
BH

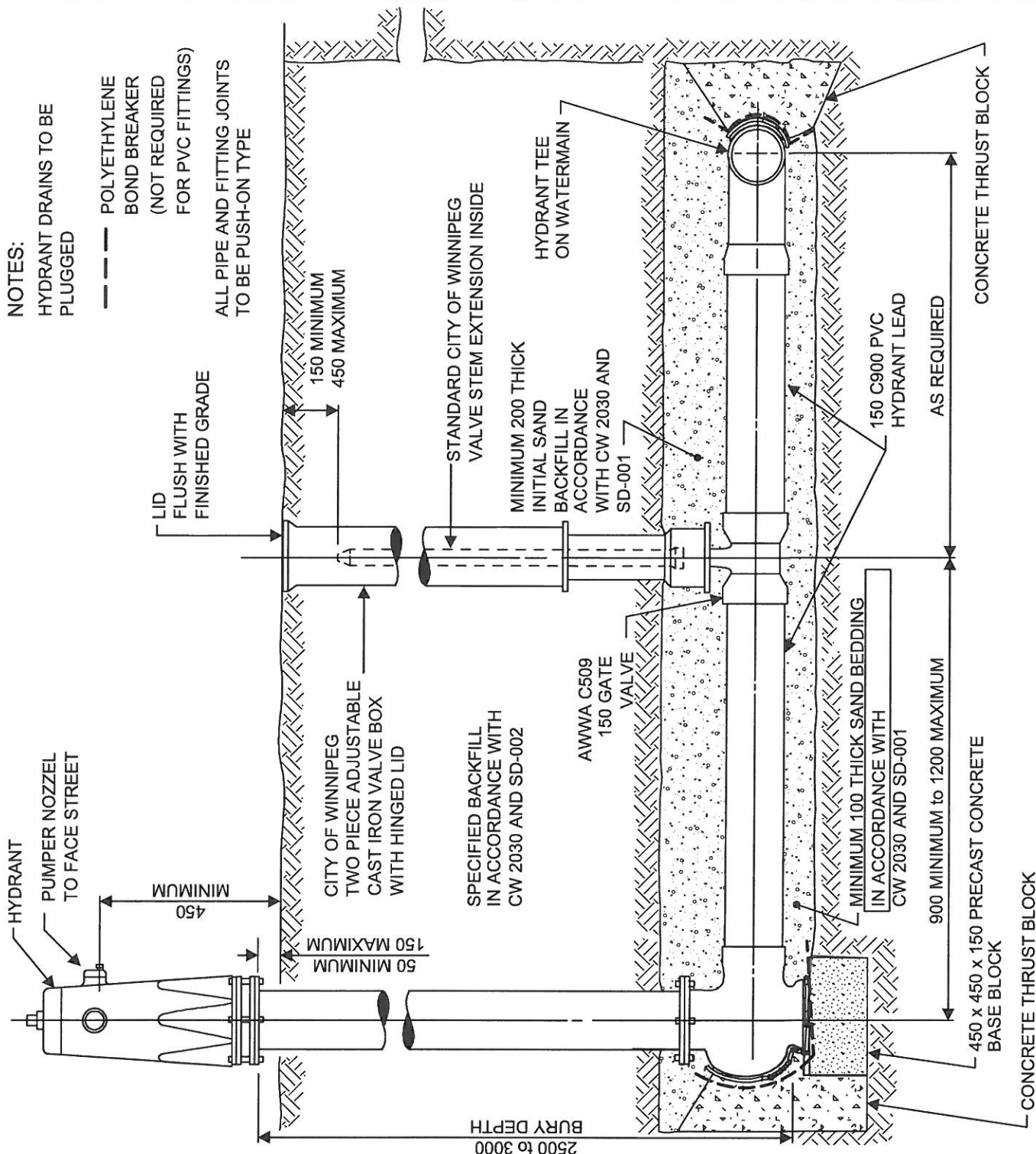
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Revision: 2

Scale:

N.T.S.

Drawing No.

SD-005



DIMENSIONS IN MILLIMETERS



THE CITY OF WINNIPEG **WATER & WASTE DEPARTMENT**

Reference Spec. No.

CW 2030 CW 2110

STANDARD FIRE HYDRANT ASSEMBLY

Designed By:
 TEJK / TW

Checked By:
 TW

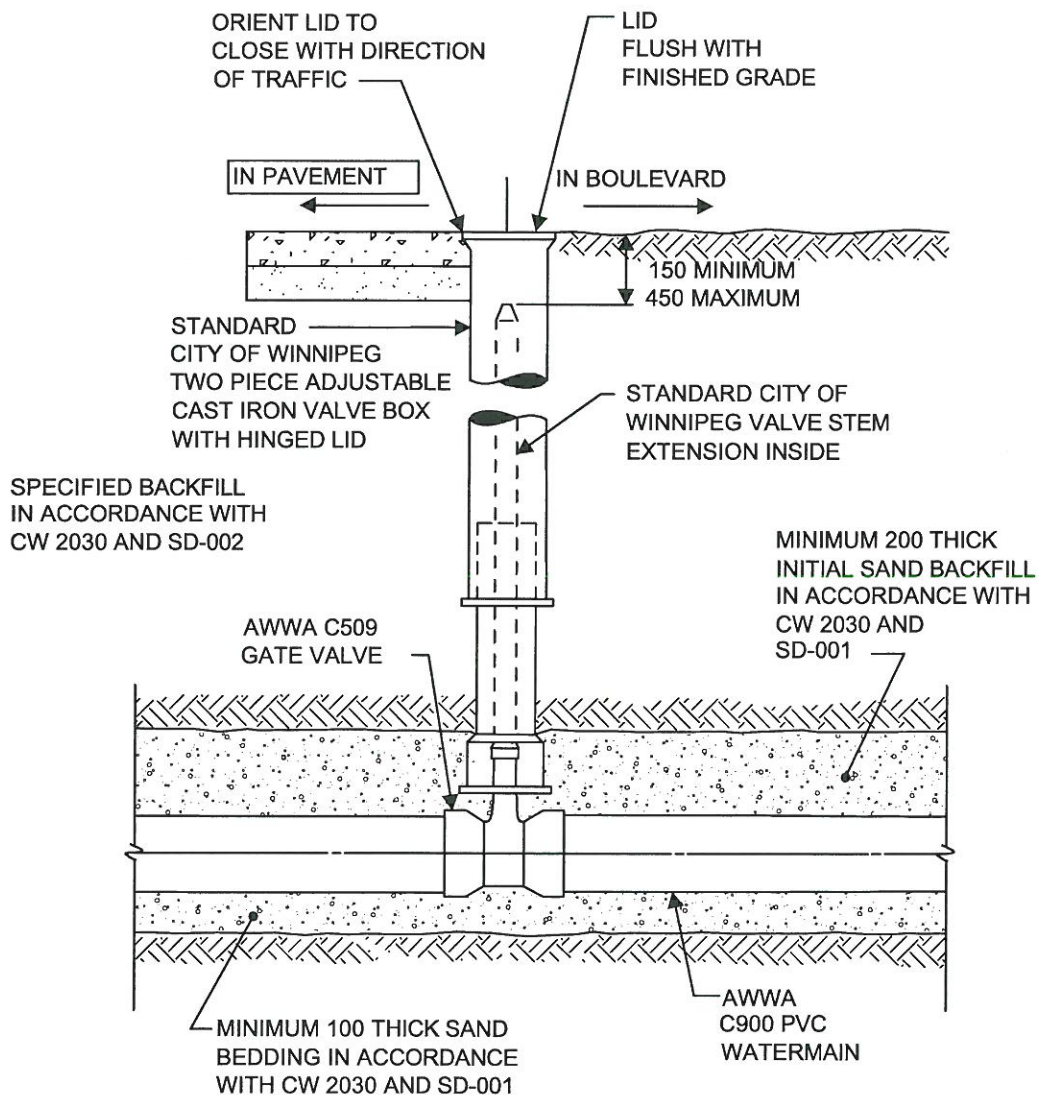
Approved:
 UNDERGROUND WORKS COMMITTEE

Drawn By:
 JMH / BH

Date: 03-03-14
 Revision: 1

Scale:
 N.T.S.

Drawing No.
 SD-006



DIMENSIONS IN MILLIMETERS



THE CITY OF WINNIPEG **WATER & WASTE DEPARTMENT**

Reference Spec. No.

CW 2030 CW 2110

STANDARD WATERMAIN VALVE INSTALLATION

Designed By:

TW

Drawn By:

BH

Scale:

N.T.S.

Checked By:

TW

Date: 03-03-14

Revision:

Drawing No.

Approved:

UNDERGROUND WORKS COMMITTEE

SD-016