

Appendix A

Standard Reference Drawings

The specifications and the contract drawings reference Halifax Standard Details and Halifax Water Standard Drawings. Copies of the various standard drawings are provided for reference only and do not necessarily constitute a complete compilation of applicable standards.

HRM 44 - Urban Sidewalk

HRM 48 - Concrete Sidewalk Reinforcing

HRM 53 - Concrete Curb & Gutter

HWSD 1020 - Polyethylene Encasement on Ductile Iron Water Pipes

HWSD 1070 - Thrust Block Requirements

HWSD 1080 - Concrete Thrust Block

HWSD 1090 - Mechanical Joint Restraint

HWSD 1110 - Standard Hydrant Installation Urban Street

HWSD 1180 - Standard Service Connection 38 mm Dia. And Over

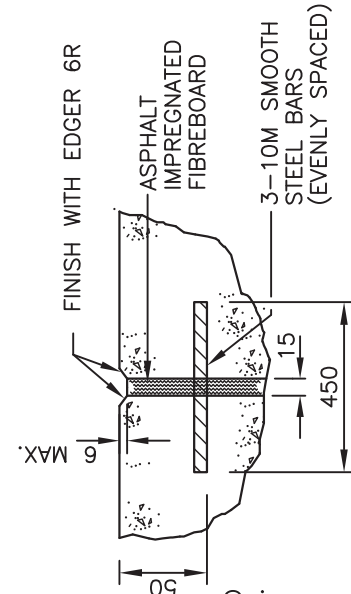
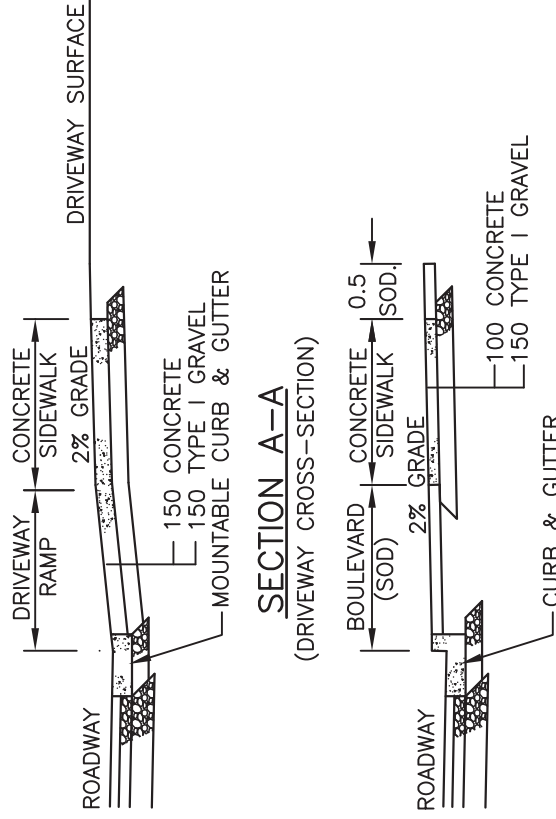
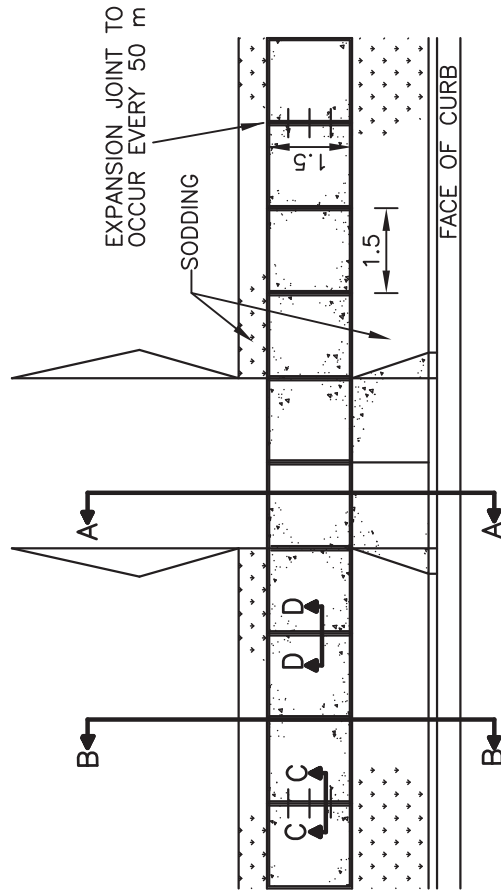
HWSD 1270 - Pipe Support Detail

HWSD 1450 - Precast Manhole

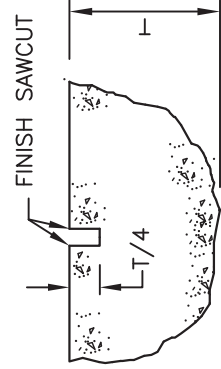
HWSD 1460 - Manhole Frame and Cover

HWSD 1570 - 1050 mm Precast Catchbasin

HWSD 1590 - S - 441 Catchbasin Frame & Grate



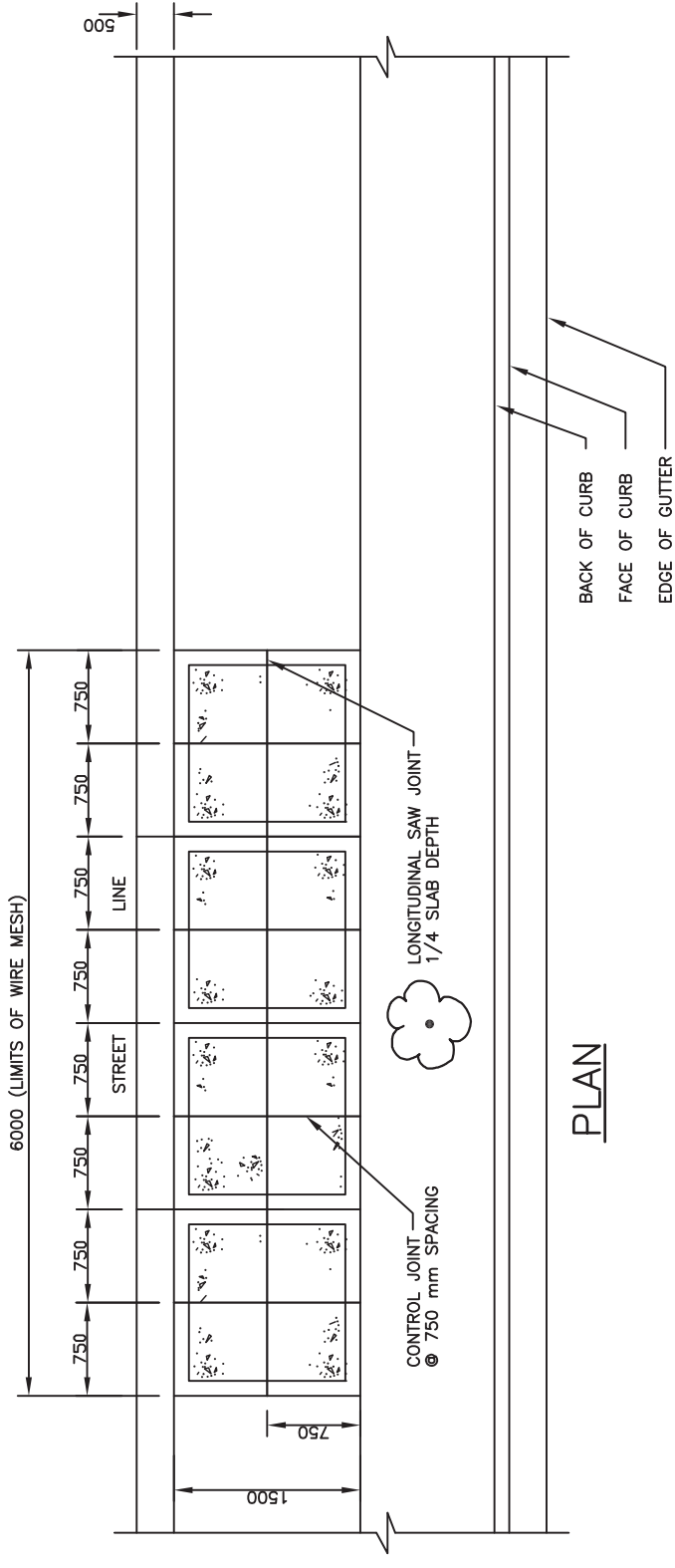
SECTION C-C
(EXPANSION JOINT)



SECTION D-D
(CONTROL JOINT)

NOTES:

1. CONCRETE SIDEWALK AT COMMERCIAL DRIVEWAY TO BE 150 THICK WITH 150x150 WELDED WIRE MESH.
2. CRUSHED ROCK BASE TO EXTEND 150 BEYOND EDGE OF SIDEWALK STRUCTURE.
3. CONTROL JOINTS ARE TO BE SAW CUT.
4. SIDEWALK ABUTTING HIGH DENSITY AREAS SHALL HAVE FULL WIDTH (3 m) SIDEWALKS.
5. SIDEWALKS ABUTTING COMMERCIAL AREAS ARE TO BE FULL WIDTH (3 m) AND 150 mm THICKNESS.
6. EXPANSION JOINT BARS ARE TO BE GREASED ON ONE SIDE OF THE JOINT.
7. DURING CONSECUTIVE POURS, THE END OF EACH POUR IS TO OCCUR AT AN EXPANSION JOINT. WHERE THIS IS NOT FEASIBLE, AN ADDITIONAL EXPANSION JOINT IS TO BE INSTALLED.
8. INSTALL A 9 m LONG CONCRETE LANDING PAD AT ALL BUS STOP LOCATIONS. INCREASE THIS TO 14.5 m FOR ARTICULATED BUS ROUTES.
9. WHEN BOULEVARD IS LESS THAN 1.5 m OR WHEN THE SIDEWALK ABUTS THE CURB & GUTTER, SLOPE SIDEWALK AND DRIVEWAY RAMP IN A STRAIGHT LINE GRADE FROM BACK OF SIDEWALK TO LIP ON CURB OPENING.



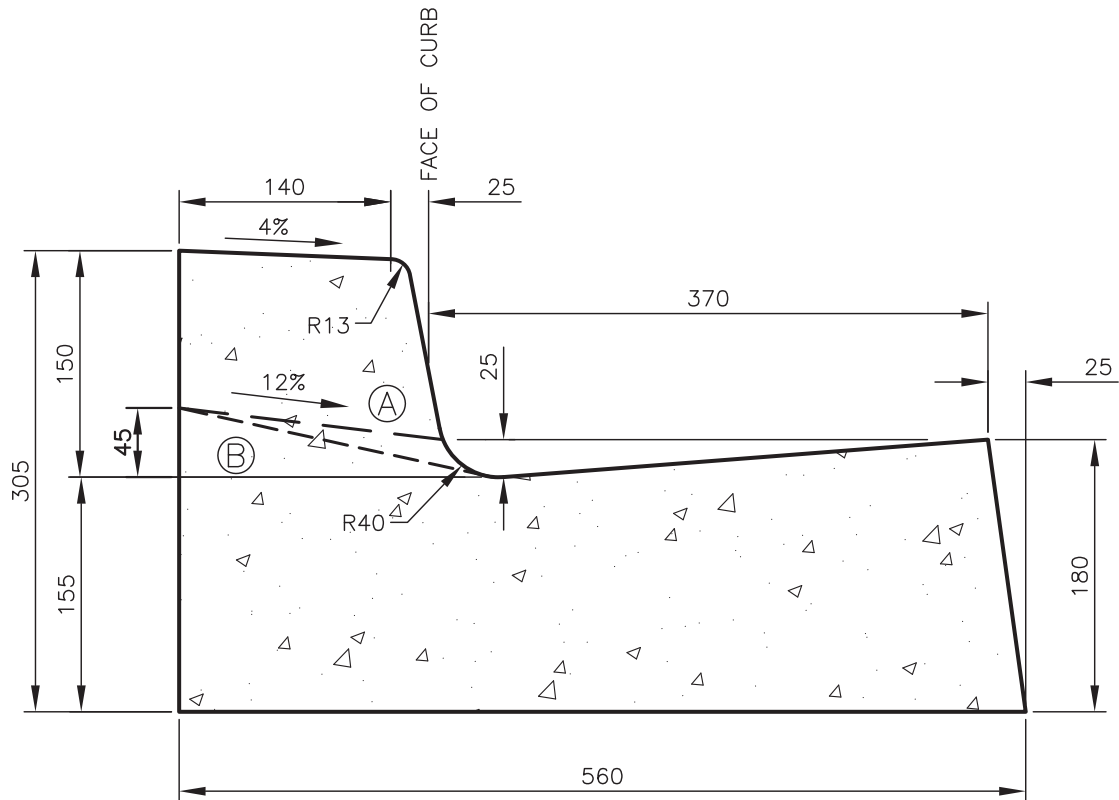
PLAN

NOTES:

1. 150 X 150 – M.W. 18.7 X M.W. 18.7 (WELDED WIRE FABRIC) PLACED AT 1/2 THE SLAB DEPTH.
2. NO TREE ROOTS TO BE REMOVED WITHOUT HRM APPROVAL



STANDARD DRAWING			
CONCRETE SIDEWALK REINFORCING			
DATE:	2013	REFERENCE	APPROVED
SCALE:	NTS	FIG. NO.	HRM 48



CURB & GUTTER SECTION

NOTES:

1. DASHED LINE "A" INDICATES CURB AT DRIVEWAYS.
2. DASHED LINE "B" INDICATES CURB AT PEDESTRIAN RAMPS.
3. TRANSITION TAPERS SHALL BE PROVIDED AT DRIVEWAYS AND PEDESTRIAN RAMPS AS PER THE "PEDESTRIAN RAMP ALIGNMENT" DETAIL AND "DRIVEWAY RAMP" DETAIL.

HALIFAX
REGIONAL MUNICIPALITY

STANDARD DETAIL

**CONCRETE CURB
& GUTTER**

DATE: 2013

REFERENCE

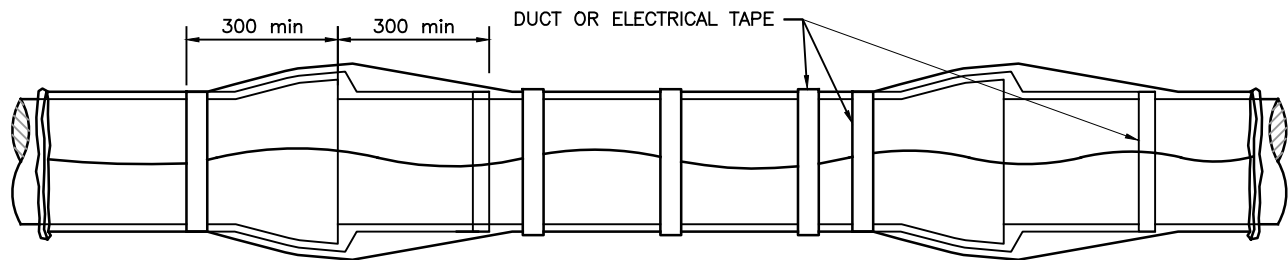
APPROVED

SCALE:

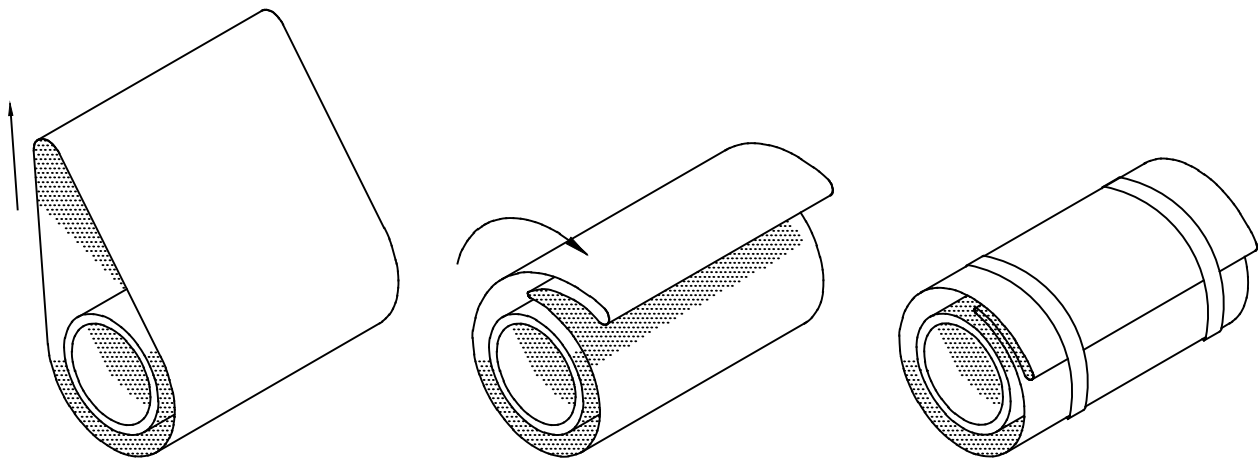
1:5

FIG No.:

HRM 53



ONE LENGTH OF CLEAR POLYETHYLENE TUBE FOR EACH LENGTH OF PIPE, OVERLAPPED 300mm AT JOINT. SECURE EACH END OF TUBE WITH DUCT OR ELECTRICAL TAPE.



TAKE UP SLACK IN TUBE TO MAKE A SNUG, BUT NOT TIGHT, FIT. FOLD EXCESS BACK OVER TOP OF PIPE, SECURING THE FOLD AT QUARTER POINTS ALONG THE LENGTH OF THE PIPE.

NOTES:

1. DUCTILE PIPE AND FITTINGS TO BE ENCASED IN 200 MICRON CLEAR POLYETHYLENE TUBE OR SHEET SECURED AT QUARTERS WITH DUCT OR ELECTRICAL TAPE.
2. DURING INCLEMENT WEATHER OR WET TRENCH CONDITIONS, USE PLASTIC STRIP TIES TO SECURE POLYETHYLENE.
3. FOR EACH TAP, PLACE 150mm LONG BAND OF 50mm WIDE TAPE AROUND AREA TO BE TAPPED. MAINTAIN INTEGRITY OF POLYWRAP AROUND PIPE.
4. REFER TO SECTION 33 11 00, PART 2.2 FOR PRODUCT REQUIREMENTS.

SCALE PLOTTED: 1=1 DATE PLOTTED: 4/18/2008 NOTES: HWSD - 1020.DWG

5	REVISED NOTES	15 02 17	JW	
4	GENERAL REVISIONS FOR 2009	09 06 08	ML	
3	REVISED NOTE #3	07 04 27	BC	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	REVISED LAPPING DETAIL	98 01 09	MC	
No.	DESCRIPTION	DATE	BY	CHKD



ENGINEERING DEPARTMENT

PROJECT			
POLYETHYLENE ENCASEMENT ON DUCTILE IRON WATER PIPES.			
DRAWN	MC	SCALE (PLAN)	N.T.S.
CHECKED	HM	SCALE (PROFILE)	
APPROVED	TG	DATE	97/01/22
PROJECT No.			
DWG. No. HWSD - 1020			

HRWC-A4P.dwg DWG FILENAME:

MINIMUM CONTACT AREAS FOR HORIZONTAL CONCRETE THRUST BLOCKS

PIPE DIAMETER	AREA M ² FOR SOIL SUPPORTING CAPACITY OF 100 kPa					
mm	CAP/PLUG	TEE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
100	0.25	0.25	0.32	0.20	0.16	0.16
150	0.48	0.48	0.64	0.40	0.24	0.16
200	0.80	0.80	1.12	0.64	0.32	0.16
250	1.28	1.28	1.76	0.96	0.48	0.24
300	1.76	1.76	2.56	1.44	0.72	0.40

MINIMUM DISTANCE FROM FITTING TO UNDISTURBED GROUND

PIPE DIAMETER mm	mm
100	450
150	450
200	450
250	600
300	750

VERTICAL THRUST BLOCKS THRUST COMPENSATED FOR BY MASS OF CONCRETE (m³)

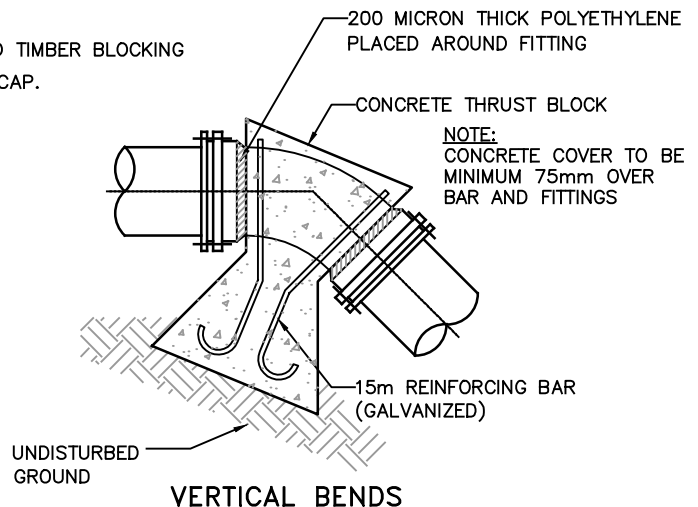
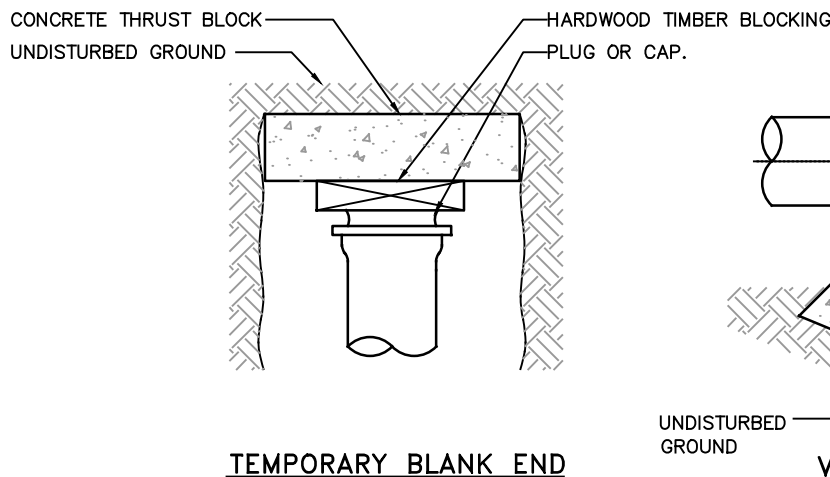
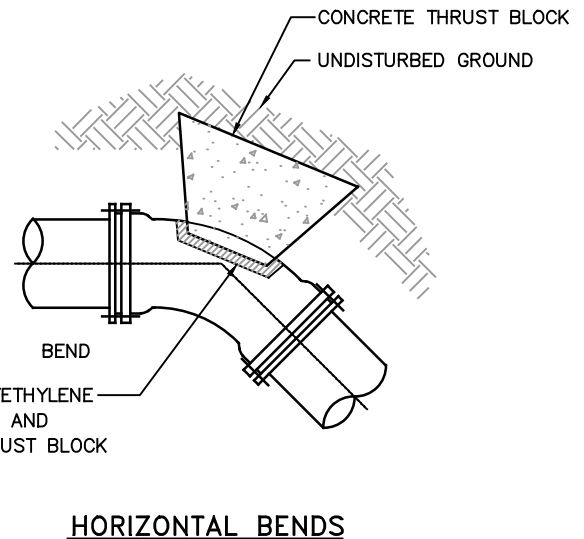
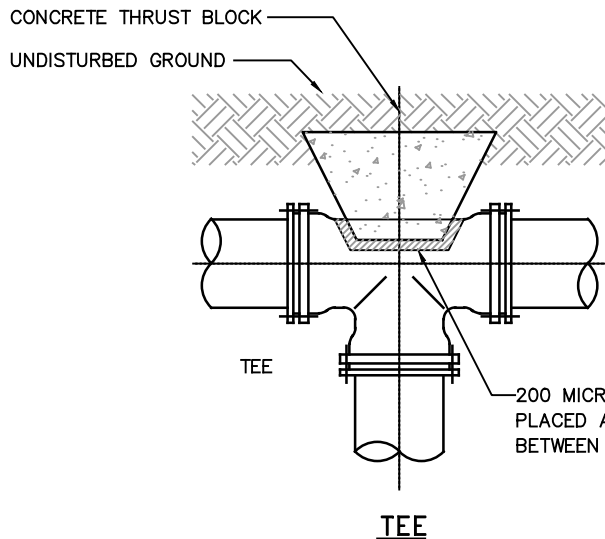
PIPE DIAMETER mm	45° BEND	22.5° BEND	11.25 BEND
100	0.40	0.20	0.20
150	0.80	0.40	0.40
200	1.40	0.70	0.70
250	2.10	1.10	1.10
300	3.00	1.50	1.50

NOTES:

- SEE HWSD-1080 FOR THRUST BLOCK CONFIGURATIONS
- THESE TABLES ARE BASED ON SOIL SUPPORTING CAPACITIES OF 100kPa AND AN INTERNAL PIPE PRESSURE OF 1035kPa. WHERE DIFFERENT SUPPORTING CAPACITIES OR INTERNAL PRESSURES ARE ENCOUNTERED, CONTACT AREAS SHOULD BE CALCULATED. ACCORDINGLY, SAFE SUPPORTING CAPACITY SHOULD BE DETERMINED BY THE DESIGN ENGINEER, AND SHOULD INCLUDE AN APPROPRIATE FACTOR OF SAFETY.
- FOR PIPE SIZES GREATER THAN 300mm – THE DESIGNER SHALL CALCULATE THE REQUIRED THRUST BLOCK SIZES BASED ON LOCAL SOIL CONDITIONS. THIS INFORMATION SHALL BE IDENTIFIED ON THE DRAWINGS.

SCALE PLOTTED: 1=1 DATE PLOTTED: 4/18/2008 NOTES:

						 <div>ENGINEERING DEPARTMENT</div>	PROJECT	
							THRUST BLOCK REQUIREMENTS	
2	ADDED NOTE 3.	10 05 11	ML				DRAWN MC	SCALE (PLAN) N.T.S.
2	GENERAL REVISIONS FOR 2009	09 06 08	ML				CHECKED HM	SCALE (PROFILE)
1	TITLE BLOCK CLEANUP	03 04 08	BC				APPROVED TG	DATE 02/03/26
						PROJECT No.		
No.	DESCRIPTION	DATE	BY	CHKD	DWG. No. HWSD – 1070			



NOTES:

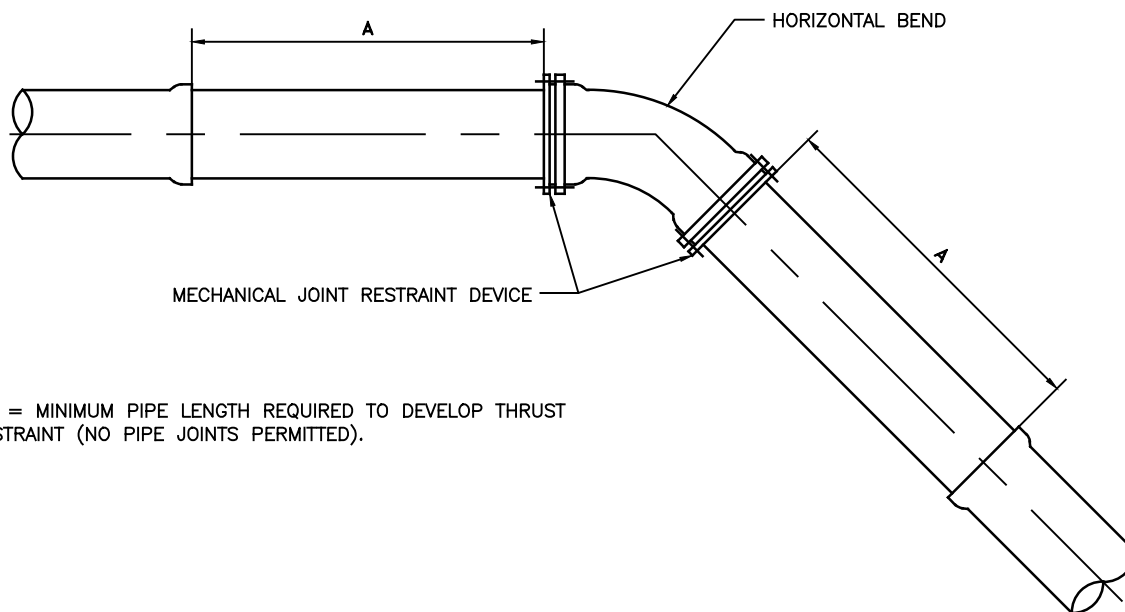
1. ALL CONCRETE 25 MPa.
2. REINFORCING BARS ARE TO BE PRESHAPED PRIOR TO INSTALLATION.
3. GALVANIZED COATING TO BE COMPLETE PRIOR TO USE. REPAIR DAMAGED COATING AS NECESSARY ON SITE PRIOR TO USE.

No.	DESCRIPTION	DATE	BY	CHKD
5	ADDED NOTES 2 AND 3	16 01 28	SS	
4	ADDED GALVANIZED TO REBAR NOTE	12 12 05	JW	
3	GENERAL REVISIONS FOR 2009	09 06 08	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	BLANK END NOTED AS "TEMPORARY"	00 03 20	MC	



ENGINEERING DEPARTMENT

PROJECT			
CONCRETE THRUST BLOCK			
DRAWN	MC	SCALE (PLAN)	N.T.S.
CHECKED	HM	SCALE (PROFILE)	N.T.S.
APPROVED	TG	DATE	02/03/26
PROJECT No.			
DWG. No. HWSD - 1080			



"A" = MINIMUM PIPE LENGTH REQUIRED TO DEVELOP THRUST RESTRAINT (NO PIPE JOINTS PERMITTED).

PIPE DIAMETER	BEND	MINIMUM PIPE LENGTH REQUIRED TO DEVELOP THRUST RESTRAINT*
200mm (8")	11.25°	0.6m (2 ft)
	22.5°	1.2m (4 ft)
	45°	2.4m (8 ft)
250mm (10")	11.25°	0.6m (2 ft)
	22.5°	1.5m (5 ft)
	45°	2.7m (9 ft)
300mm (12")	11.25°	0.9m (3 ft)
	22.5°	1.5 (5 ft)
	45°	3.3m (11 ft)

*BASED ON HRWC SPECIFIED BURY AND BEDDING CONDITIONS.
MAXIMUM TEST PRESSURE 1035kPa. WHERE CONDITIONS VARY
"A" SHALL BE CALCULATED BY THE DESIGN ENGINEER.

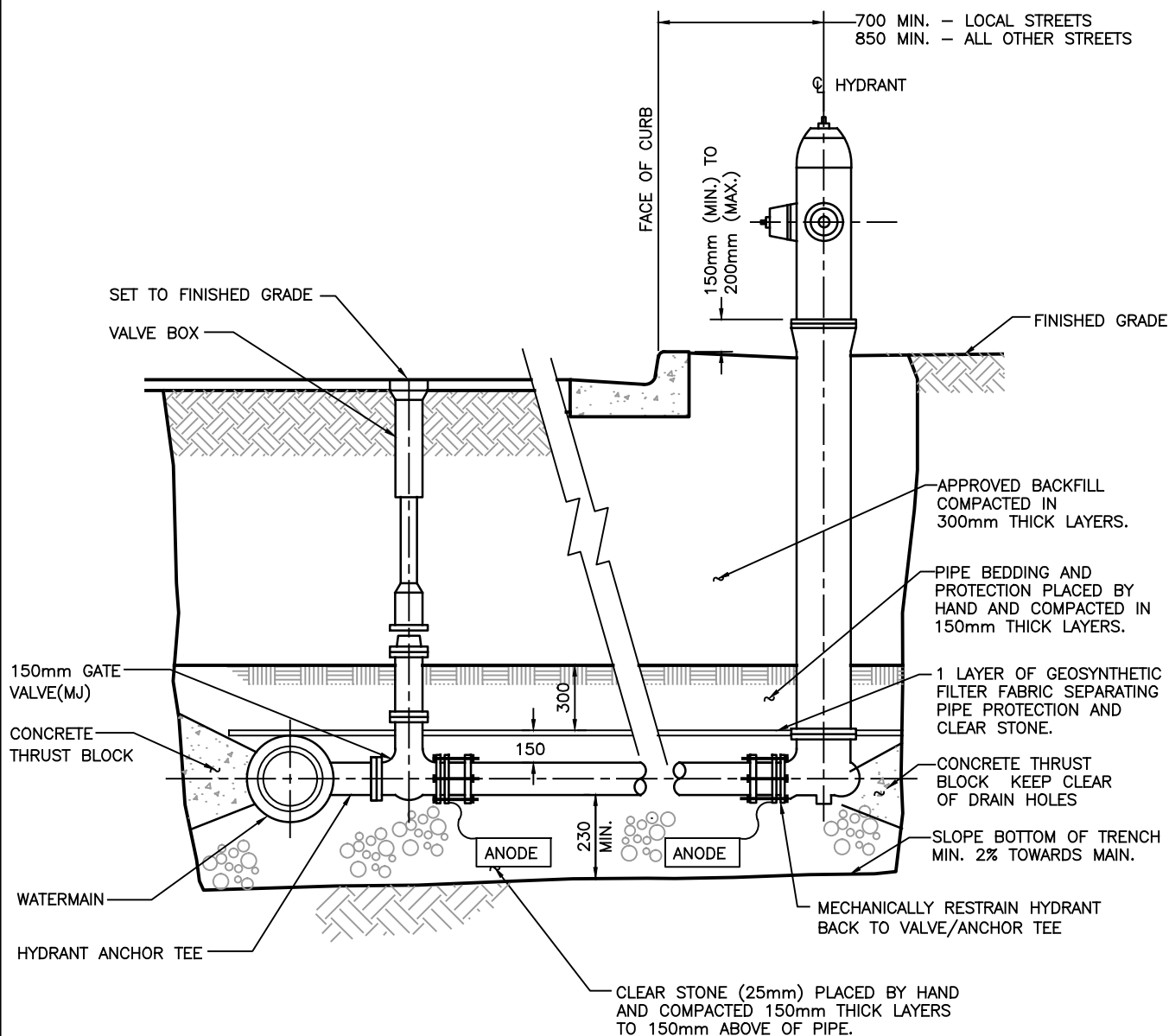
SCALE PLOTTED: 1=1 DATE PLOTTED: 4/29/2008 NOTES:

3	GENERAL REVISIONS FOR 2009	09 06 09	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	FOOT-NOTE MODIFIED	01 01 10	MC	SS
No.	DESCRIPTION	DATE	BY	CHKD



ENGINEERING DEPARTMENT

PROJECT			
MECHANICAL JOINT RESTRAINT			
DRAWN	M.C.	SCALE (PLAN)	NTS
CHECKED	H.M.	SCALE (PROFILE)	NTS
APPROVED		DATE	99/02/22
PROJECT No.			
DWG. No. HWSD - 1090			



NOTES:

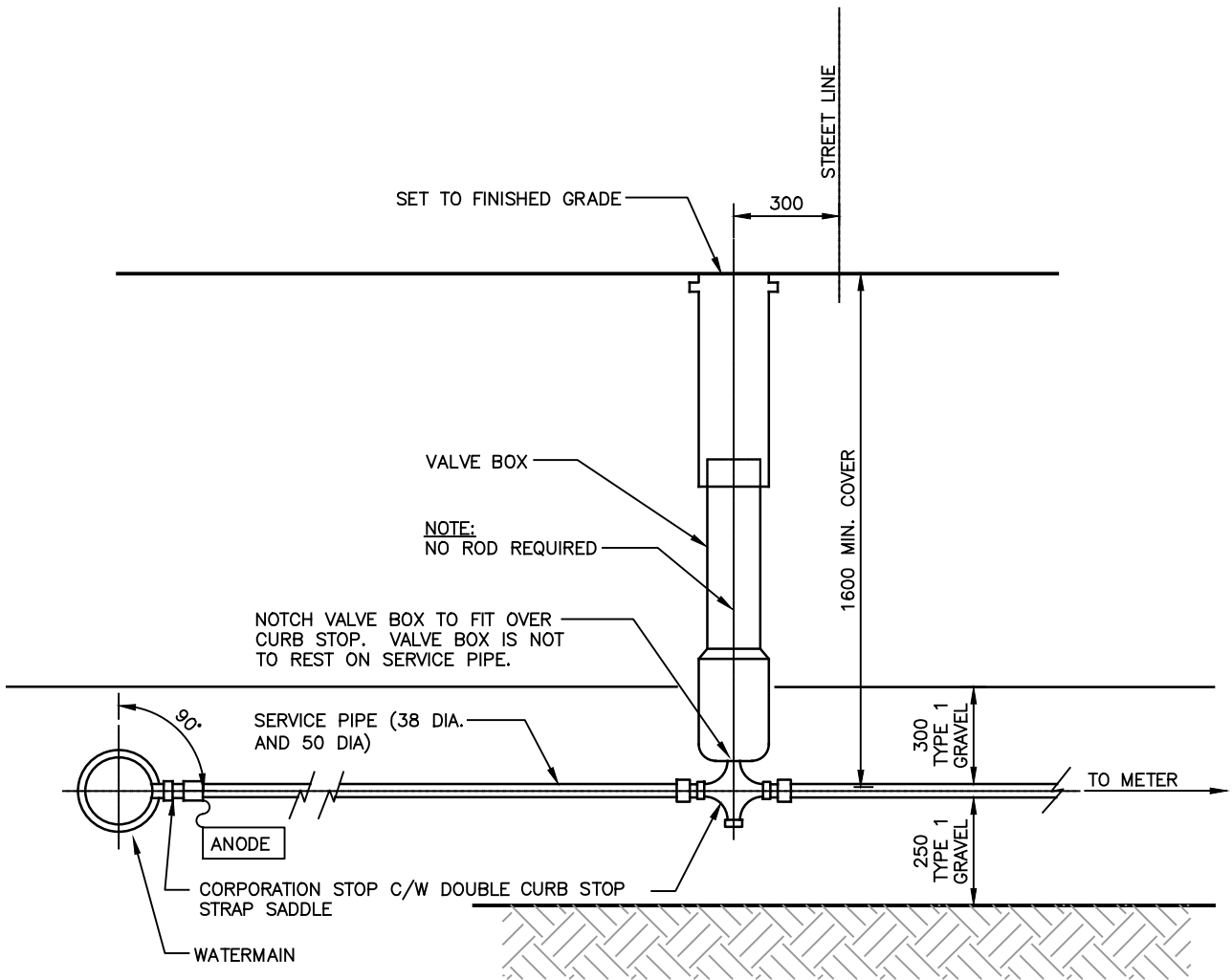
1. ANODE TO BE ZINC 24-48 TYPE INSTALLED BY USE OF DOUBLE NUT PER DETAIL ON DWG. HWSD - 1040
2. USE ONLY HRWC APPROVED PRODUCTS FOR MECHANICAL RESTRAINT.

7	GENERAL REVISIONS FOR 2009	09 06 08	ML	
6	ADDED NOTE #2	07 04 27	BC	
5	MECH. RESTRAINT ADDED	06 03 22	BC	
4	TITLE BLOCK CLEANUP	03 04 08	BC	
3	HYDRANT FLANGE/FINISHED GRADE REVISED	02 03 13	PSP	
2	HYDRANT/CURB DIMENSION REVISED	00 03 20	MC	
1	ANODES RELOCATED	00 03 20	MC	
No.	DESCRIPTION	DATE	BY	CHKD



ENGINEERING DEPARTMENT

PROJECT	
STANDARD HYDRANT INSTALLATION URBAN STREET	
DRAWN BC	SCALE (PLAN) N.T.S.
CHECKED JB	SCALE (PROFILE)
APPROVED TG	DATE 02/03/26
PROJECT No.	
DWG. No. HWSD - 1110	



NOTES:

1. SELECT BACKFILL, (MAX. SIZE 50mm) TO BE PLACED AROUND VALVE BOX TO SUBGRADE.
2. WHERE A POLYWRAPPED WATERMAIN IS TAPPED, PLACE 150mm WIDE BAND OF 50mm WIDE DUCT TAPE AROUND AREA TO BE TAPPED.
3. ANODE TO BE ZINC 24-48 TYPE INSTALLED PER DETAIL ON DWG. HWSD - 1180.
4. SERVICE SADDLE REQUIRED FOR 38mm AND LARGER CONNECTIONS.
5. BACKFILLING OF SERVICE TRENCH TO BE IN ACCORDANCE WITH SECTION 33 11 00 (3.2.1.1)
6. AN ANODE IS NOT REQUIRED IF MUNICIPEX SERVICE PIPE IS USED.
7. REFER TO HWSD - 1390 (TRACE WIRE DETAIL) FOR MUNICIPEX INSTALLATIONS.
8. REFER TO HWSD - 1160 IF SIDEWALK IS INSTALLED IN R.O.W. FOR VALVE BOX LOCATION.

SCALE PLOTTED: DATE PLOTTED: 4/21/2008 NOTES:

No.	DESCRIPTION	DATE	BY	CHKD
8	GENERAL REVISIONS FOR 2016	16/03/01	SS	
7	ADDED NOTE #8	12/12/06	JW	
6	GENERAL REVISIONS FOR 2009	09/06/09	ML	
5	NOTES 6 & 7 ADDED	04/04/01	BC	
4	TITLE BLOCK CLEANUP	03/04/08	BC	
3	BEDDING TYPE REVISED	00/03/20	MC	
2	NOTE 3 REVISED	99/02/10	MC	
1	GENERAL REVISION	98/01/09	MC	

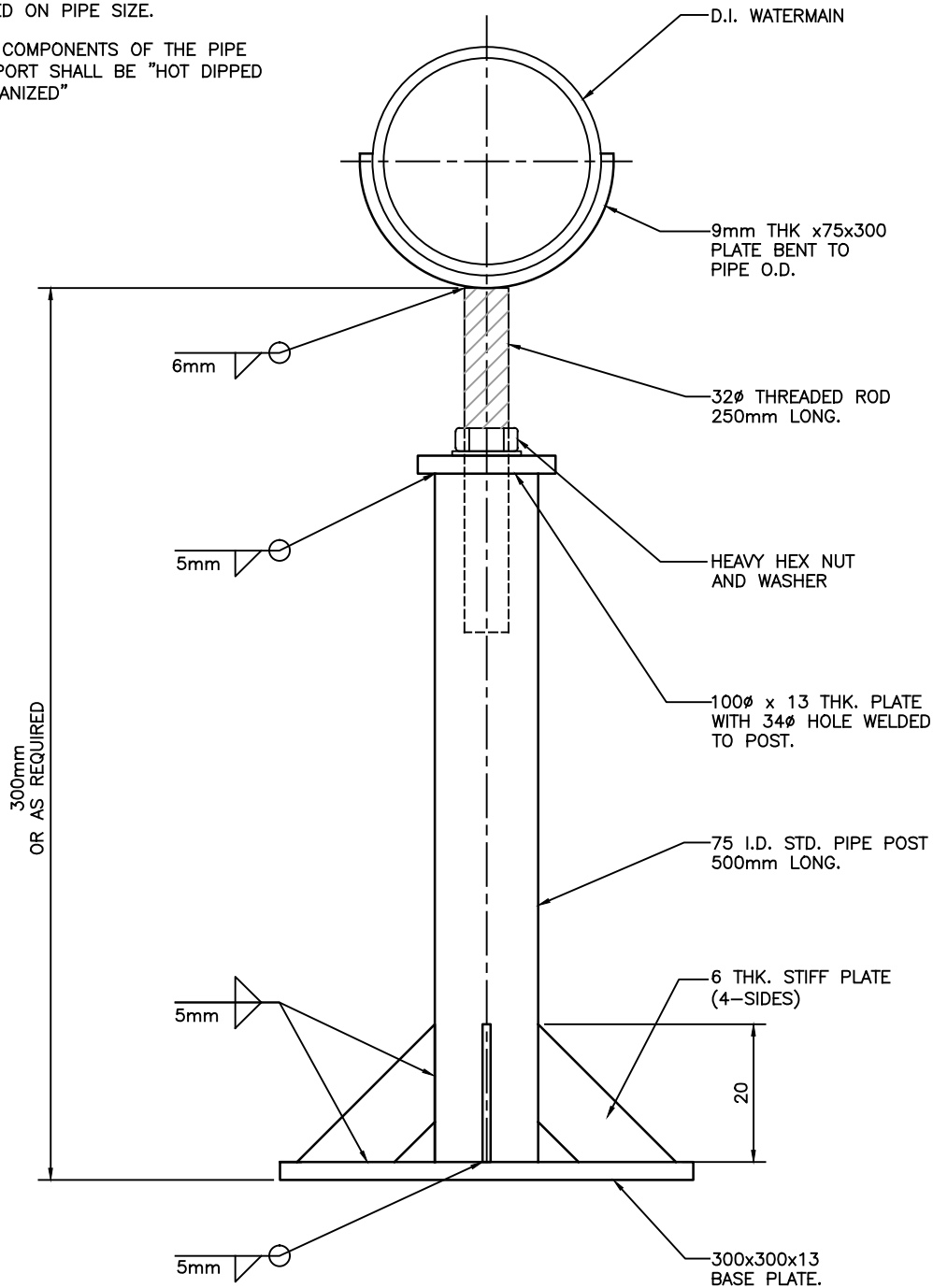


ENGINEERING DEPARTMENT

PROJECT			
STANDARD SERVICE CONNECTION 38mm (1-1/2") DIA. AND OVER			
DRAWN	M.C.	SCALE (PLAN)	N.T.S.
CHECKED	H.M.	SCALE (PROFILE)	
APPROVED	TG	DATE	02/03/26
PROJECT No.			
DWG. No. HWSD - 1180			

NOTES:

1. NUMBER OF SUPPORTS NEEDED BASED ON PIPE SIZE.
2. ALL COMPONENTS OF THE PIPE SUPPORT SHALL BE "HOT DIPPED GALVANIZED"



SCALE PLOTTED: 1=1 DATE PLOTTED: 4/29/2008 NOTES:

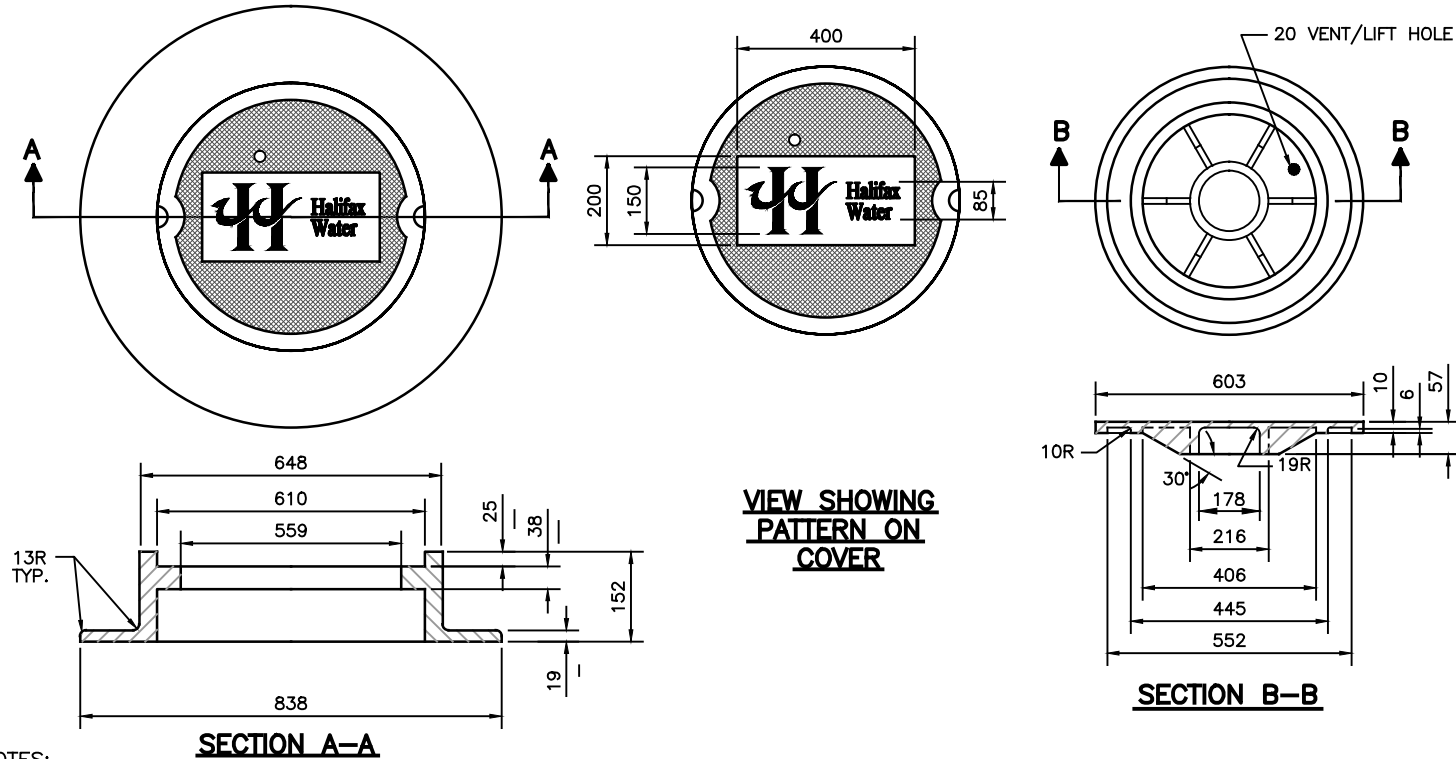
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4	GENERAL REVISIONS FOR 2009	09 06 09	ML	
3	NOTE #2 ADDED	07 05 07	BC	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	NEW DETAIL FOR 2000 SPEC	00 03 28	M.C.	
No.	DESCRIPTION	DATE	BY	CHKD



ENGINEERING DEPARTMENT

PROJECT		PIPE SUPPORT DETAIL	
DRAWN	MC	SCALE (PLAN)	1:5
CHECKED	BC	SCALE (PROFILE)	
APPROVED	HM	DATE	
PROJECT No.			
DWG. No.		HWSD - 1270	

HRWC-A4L.dwg



NOTES:

1. ALL MANHOLES ARE TO HAVE AN HRWC LOGO.
2. STANDARD MANHOLE FRAME AND COVER TO BE IMP R-10 OR EQUIVALENT.
3. MATERIAL - GRAY CAST IRON, A.S.T.M. A48/ A48M (2008).
LOAD CAPACITY - 7250kg.
FRAME WEIGHT - 77.1 Kg.
COVER WEIGHT - 68.0 Kg.
4. ALL MANHOLES NOT LOCATED IN THE STREET ARE TO HAVE AN IMP R12 FRAME AND COVER (WITH LOCKING SYSTEM) OR EQUIVALENT.
5. MANHOLES LOCATED ON PRIVATE PROPERTY ARE TO HAVE A PLAIN COVER WITH NO HALIFAX WATER LOGO.
6. IN PARK AREAS AND AREAS SUBJECT TO FLOODING, THE FRAME AND COVER SHALL HAVE THE SAME GENERAL DIMENSIONS OF AN IMP R10, A WATERTIGHT GASKET BETWEEN THE FRAME AND COVER (INTEGRAL WITH THE COVER), AND THE VENT HOLE IS TO BE PLUGGED WITH A REMOVABLE, WATERTIGHT PLUG.
7. ADJUSTABLE MANHOLE FRAMES AND R10 COVERS AS PER HRWC SPECIFICATIONS SHALL BE USED IN ASPHALT SURFACES.

No.	DESCRIPTION	DATE	BY	CHKD
5	ADDED NOTE 5 (NO HW LOGO ON PRIVATE PROPERTY)	12 12 11	JW	
4	REVISED HALIFAX WATER LOGO ON COVER	12 04 02	JW	
3	GENERAL REVISIONS FOR 2010	10 05 13	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

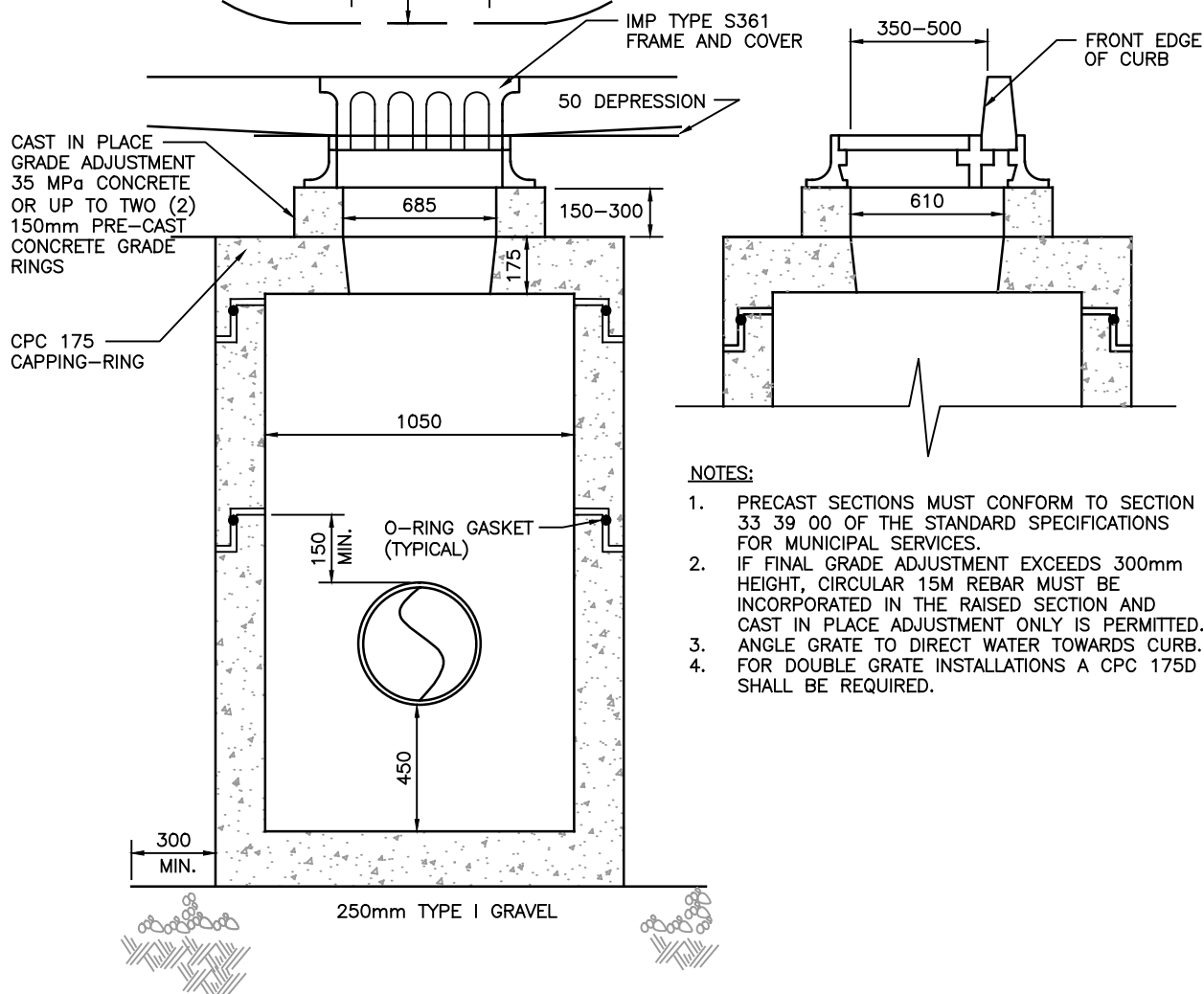
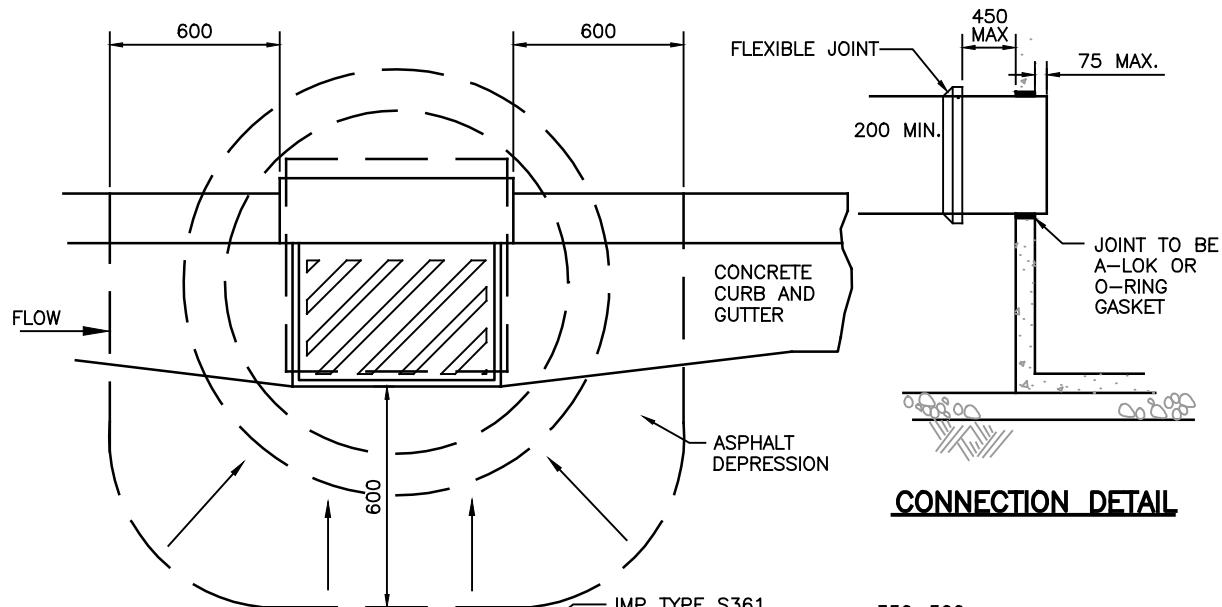


ENGINEERING DEPARTMENT

PROJECT

MANHOLE FRAME
AND COVER

DRAWN	SCALE (PLAN)	NTS
CHECKED	SCALE (PROFILE)	NTS
APPROVED	DATE	4/17/2008
PROJECT No.		
DWG. No. HWSD - 1460		



NOTES:

1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. IF FINAL GRADE ADJUSTMENT EXCEEDS 300mm HEIGHT, CIRCULAR 15M REBAR MUST BE INCORPORATED IN THE RAISED SECTION AND CAST IN PLACE ADJUSTMENT ONLY IS PERMITTED.
3. ANGLE GRATE TO DIRECT WATER TOWARDS CURB.
4. FOR DOUBLE GRATE INSTALLATIONS A CPC 175D SHALL BE REQUIRED.

SCALE PLOTTED: 1=1 DATE PLOTTED: 4/17/2008 NOTES:

7	GENERAL REVISIONS FOR 2016	16 03 01	SS	
6	REVISED CONNECTION DETAIL	15 02 27	SS	
5	REVISED GRADE ADJUSTMENT FOR GRADE RINGS.	14 02 14	SS	
4	REVISED CAST IN PLACE CONCRETE TO 35 MPa	13 02 04	SS	
3	ADD NOTE #4	11 03 21	BDC	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	
No.	DESCRIPTION	DATE	BY	CHKD

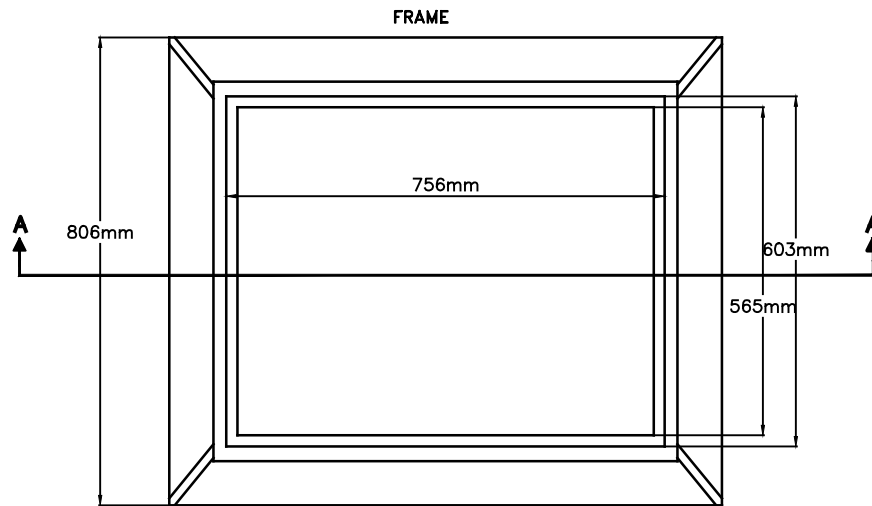


ENGINEERING DEPARTMENT

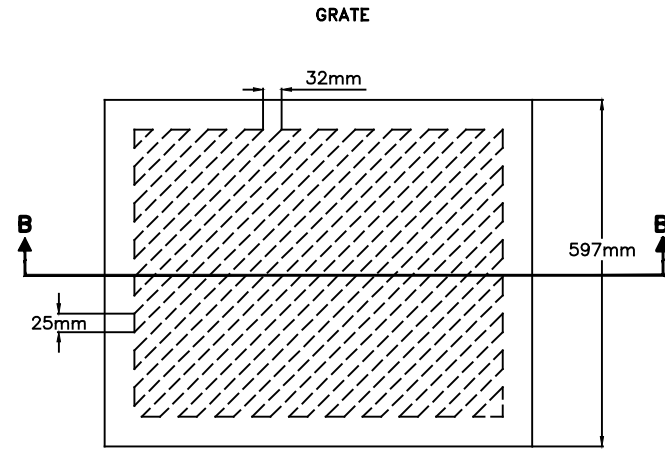
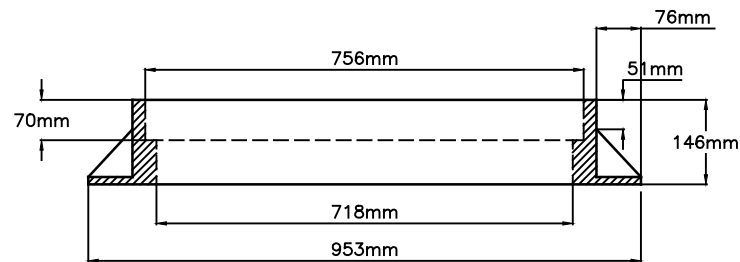
16|03|01 SS

PROJECT		1050MM PRECAST CATCHBASIN	
DRAWN	SCALE (PLAN)	NTS	
CHECKED	SCALE (PROFILE)	NTS	
APPROVED	DATE	4/17/2008	
PROJECT No.			
DWG. No.		HWSD - 1570	

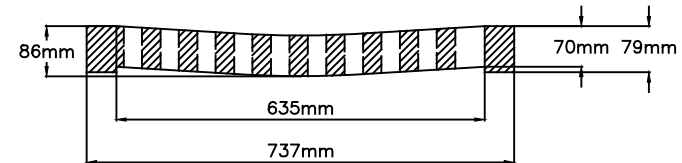
HRWC-A4L.dwg



SECTION 'A-A'



SECTION 'B-B'



NOTE:

MATERIAL - GRAY CAST IRON, A.S.T.M. A48-74, CLASS 30.
 FRAME WEIGHT - 140.2 KG
 GRATE WEIGHT - 126.6 KG
 LOAD CAPACITY - 7,257 KG
 GRATE OVERFLOW - APPROX. 1845 CM² OPENING

NOTE:

TOP OF CATCHBASIN COVER TO BE
 DEPRESSED 50 mm (MIN.) FROM
 SURROUNDING FINISHED GRADE.

1	NEW DRAWING	12/12/14	JW	SS
No.	DESCRIPTION	DATE	BY	CHKD



ENGINEERING DEPARTMENT

PROJECT		S - 441	
		CATCHBASIN FRAME & GRATE	
DRAWN	JW	SCALE (PLAN)	N.T.S.
CHECKED	SS	SCALE (PROFILE)	N/A
APPROVED	SS	DATE	12/12/17
PROJECT No.			
DWG. No.		HWSD - 1590	