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Typical Trench Payment Width (Water, Wastewater and Stormwater Systems).....	HWSD-1000
Typical Trench Detail Water System Installation (Water Only) .....	HWSD-1010
Polyethylene Encasement on Ductile Iron Water Mains .....	HWSD-1020
Water Main Valve.....	HWSD-1030
Standard Sliding Type Valve Box .....	HWSD-1032
Standard Water Valve Location – New Construction.....	HWSD-1034
Cul-De-Sac Water Main Reduction .....	HWSD-1036
Zinc Anode for Valves and Copper Service Connections .....	HWSD-1040
Asphalt Apron Detail .....	HWSD-1050
Valve Closing Direction By Region .....	HWSD-1060
Thrust Block Requirements .....	HWSD-1070
Concrete Thrust Block .....	HWSD-1080
Mechanical Joint Restraint Requirements .....	HWSD-1090
Hydrant Installation Rural Street .....	HWSD-1100
Hydrant Installation Urban Street .....	HWSD-1110
Hydrant Location in Relation to Driveways & Other Utility Structures .....	HWSD-1120
Bollard Installation Detail.....	HWSD-1130
Hydrant Painting.....	HWSD-1140
Standard Service Connection from Water Main to House Plumbing Urban Street (No Sidewalk) .....	HWSD-1150
Water Service Connection from Water Main to House Plumbing Urban Street (With Sidewalk).....	HWSD-1160
Water Service Connection from Water Main to House Plumbing Rural Street .....	HWSD-1170

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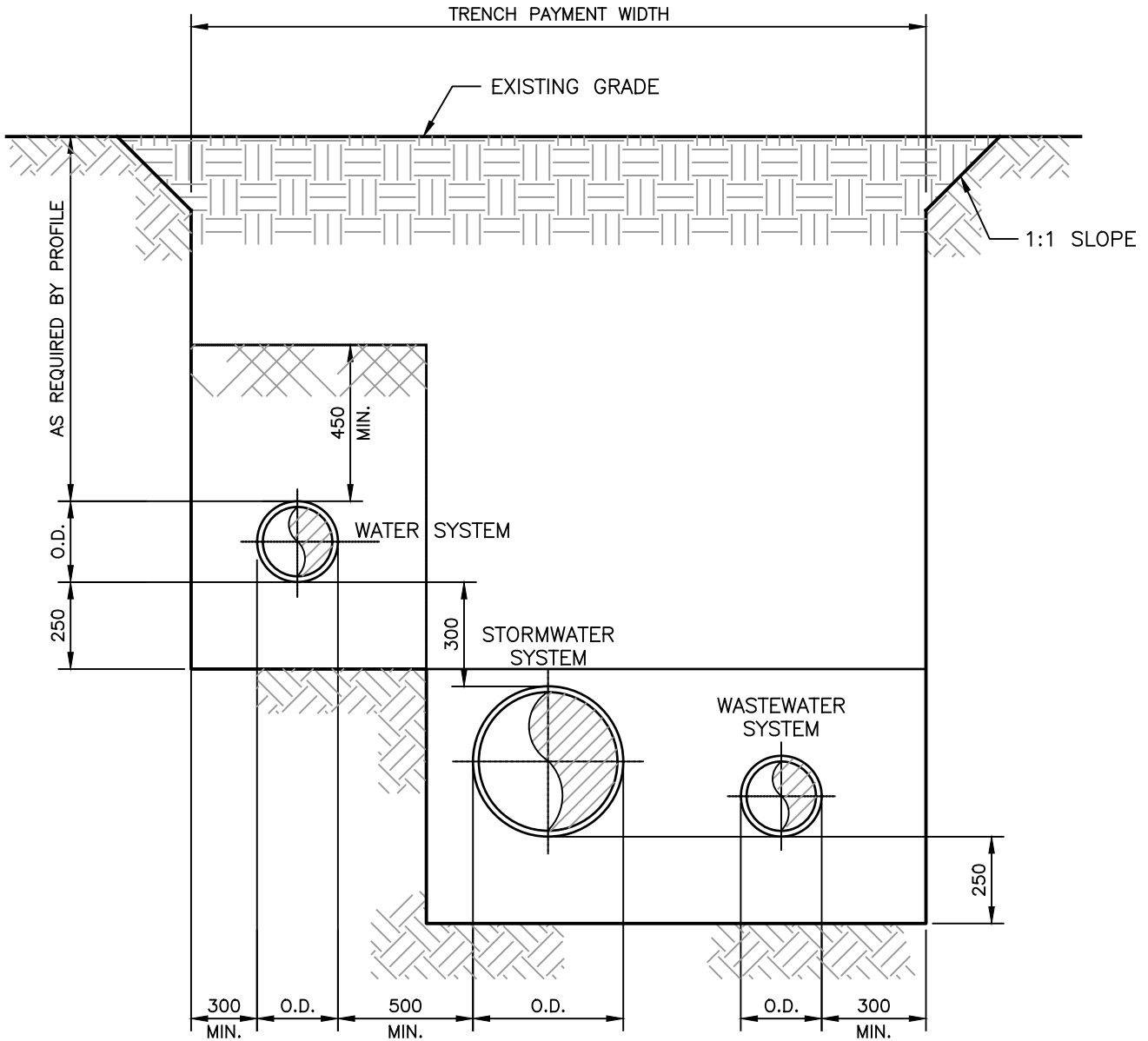
Water Service Connection 38 mm $\phi$ and Over .....	HWSD-1180
Water Service Installation Detail for Slab on Grade Construction.....	HWSD-1182
Typical Domestic & Sprinkler Connections as Separate Service Connection .....	HWSD-1210
Public Branch Domestic & Sprinkler Connections as One Service Connection .....	HWSD-1220
Private Branch Domestic & Sprinkler Connections as One Service Connection.....	HWSD-1230
Private Hydrant Off Sprinkler Service Connection .....	HWSD-1232
Private Hydrant Off Sprinkler Service Connection .....	HWSD-1234
Water Service Connection for Campus Arrangement .....	HWSD-1236
Water Service Connection for Campus Arrangement .....	HWSD-1238
Existing Wastewater Service Connection Repair Detail .....	HWSD-1240
Required Minimum Clearances between Underground Conduits and Water System .....	HWSD-1250
Required Minimum Clearances between Underground Conduits and Existing Water Main / Sprinkler (PVC Sleeves) .....	HWSD-1260
Pipe Support Detail .....	HWSD-1270
PRV Chamber – Plan .....	HWSD-1290
PRV Chamber – Section .....	HWSD-1292
Commercial / Industrial Air Release / Air Vacuum Valve Chamber (50 mm) .....	HWSD-1310
Commercial / Industrial Air Release / Air Vacuum Valve Chamber (75 mm & Larger).....	HWSD-1320
Residential Air Release / Air Vacuum Valve Chamber (50 mm).....	HWSD-1330
Meter Chamber for PVC Water Mains .....	HWSD-1340
Standard Insulation Detail of Water Service Connection for Mobile Home .....	HWSD-1370
Standard Trace Wire Detail for PVC Water Main.....	HWSD-1380

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Standard Trace Wire Detail for Cross-Linked Polyethylene (PEXa) Service .....	HWSD-1390
Natural Gas Installation Separations (Polyethylene Main).....	HWSD-1400
Transmission Main Crossing Detail.....	HWSD-1410
Access Road Gate .....	HWSD-1420
Trench Drainage Relief System Plan & Sections .....	HWSD-1430
Trench and Backfill Cross Section .....	HWSD-1440
Standard Bedding Detail for Concrete Pipe.....	HWSD-1442
Precast Manhole.....	HWSD-1450
Manhole Frame and Cover.....	HWSD-1460
Adjustable Manhole Frame and Cover c/w R-10 Cover & Cone Guide Frame .....	HWSD-1462
Manhole Asphalt Apron Detail.....	HWSD-1464
Precast Internal Drop Manhole Section .....	HWSD-1470
Precast External Drop Manhole Section.....	HWSD-1480
Cast-in-Place Base for Precast Manhole.....	HWSD-1490
Air Release / Air Vacuum Valve Chamber (Force Main Wastewater System).....	HWSD-1500
Force Main Valve Chamber – Plan.....	HWSD-1502
Force Main Valve Chamber – Section.....	HWSD-1504
Building Service Connection – Profile View.....	HWSD-1510
Standard 50 mm Pressurized Wastewater Service Connection .....	HWSD-1520
Residential Service Connection Access Tee.....	HWSD-1530
Deflection Gauge Testing .....	HWSD-1532
Service Connections for Single Family Dwelling, Over & Under Duplex .....	HWSD-1540

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Service Connections for Side By Side Duplex .....	HWSD-1550
Service Connections for Townhouse Dwellings.....	HWSD-1552
Services Connections for ICI Buildings .....	HWSD-1560
Service Connections for ICI Buildings – Zero Setback.....	HWSD-1562
Combined Services Connection Detail – Over & Under Duplex and Single Family Dwelling .....	HWSD-1564
Combined Services Connection Detail – ICI Buildings .....	HWSD-1566
Combined Services Connection Detail – ICI Buildings – Zero Setback .....	HWSD-1568
1050 mm Precast Catch Basin .....	HWSD-1570
Catch Basin Frame and Grate for Curb & Gutter Installations.....	HWSD-1580
S-441 Area Catch Basin Frame & Grate.....	HWSD-1590
S-401 Area Catch Basin Frame & Grate.....	HWSD-1592
R-361 Grating for Bell End of 750 dia. Pipe .....	HWSD-1594
Private 750 mm Concrete off Street Catch Basin .....	HWSD-1600
Private Swale and Under Drain Details .....	HWSD-1610
Inlet/Outlet Precast Concrete Headwall .....	HWSD-1620
Precast Concrete Driveway Headwall .....	HWSD-1622
Headwall Railing Detail for On Street Installations (Inside Street R.O.W) .....	HWSD-1624
Headwall Railing Detail for Off Street Installations (Outside Street R.O.W).....	HWSD-1626
Inlet Grate Detail.....	HWSD-1628
Typical Ditch Cross Section .....	HWSD-1630
HRM Core Boundary Map.....	HWSD-1640
Standard Fence & Double Swing Gate Detail .....	HWSD-1650



REFER TO STANDARD  
DRAWING HWSD - 1440  
FOR TRENCH DETAILS

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT

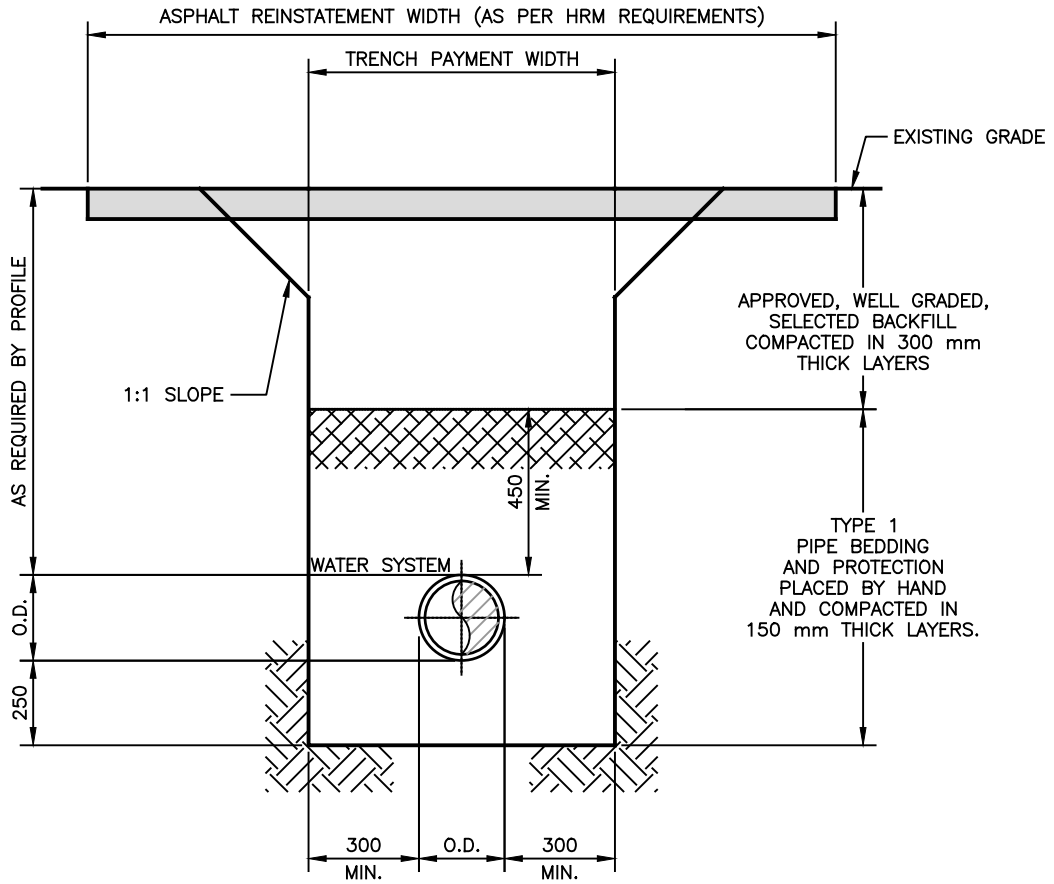
**TYPICAL TRENCH PAYMENT  
WIDTH (WATER, WASTEWATER  
AND STORMWATER SYSTEMS)**

DRAWN	J.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15

PROJECT No.

DWG. No. **HWSD - 1000 (2019)**

No.	DESCRIPTION	DATE	BY	CHKD
11	GENERAL REVISIONS FOR 2019	19 04 29	ST	
10	GENERAL REVISIONS FOR 2016	18 03 01	SS	
9	ADDED TRENCH STABILITY CUTS	12 12 05	JW	
8	GENERAL REVISIONS FOR 2010	10 05 17	ML	
7	GENERAL REVISIONS FOR 2009	09 06 08	ML	
6	BACKFILL TYPE REVISED	04 04 01	BC	
5	TITLE BLOCK CLEANUP	03 04 08	BC	
4	HORIZONTAL SEPARATION REVISED	02 04 04	PSP	
3	BEDDING TYPE REVISED	00 03 20	MC	
2	BEDDING TYPE ADDED	99 12 20	RJ	

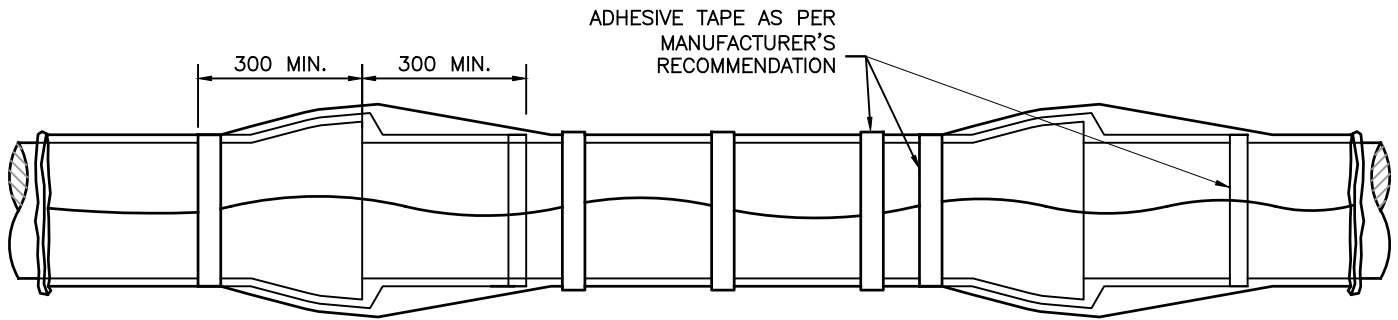


No.	DESCRIPTION	DATE	BY	CHKD
8	GENERAL REVISIONS FOR 2016	16 03 01	SS	
7	REMOVED HRM REQUIREMENTS TEXT	12 02 14	JW	
6	ADDED TRENCH STABILITY CUTS	12 12 11	JW	
5	GENERAL REVISIONS FOR 2009	09 06 08	ML	
5	BACKFILL TYPE REVISED	04 04 01	BC	
4	TITLE BLOCK CLEANUP	03 04 08	BC	
3	BEDDING TYPE REVISED	00 03 20	MC	
2	BEDDING TYPE ADDED	99 12 20	RJ	
1	NEW DETAIL DRAWING FOR 1999 SPEC	99 02 10	MC	

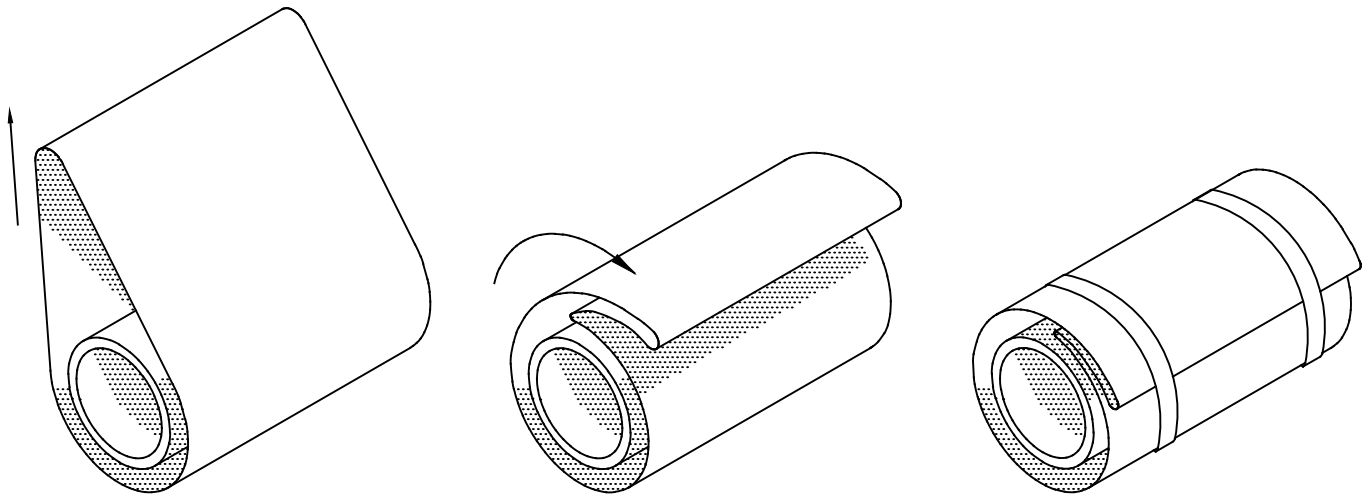
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT	
<b>TYPICAL TRENCH DETAIL WATER SYSTEM INSTALLATION (WATER ONLY)</b>	
DRAWN JW	SCALE (PLAN) NTS
CHECKED JD	SCALE (PROFILE)
APPROVED KG	DATE 17/02/15
PROJECT No.	
DWG. No. <b>HWSD - 1010</b>	




ONE\_LENGTH OF CLEAR POLYETHYLENE TUBE FOR EACH LENGTH OF PIPE, OVERLAPPED 300 mm AT JOINT. SECURE EACH END OF TUBE WITH ADHESIVE TAPE AS PER MANUFACTURER'S RECOMMENDATION.

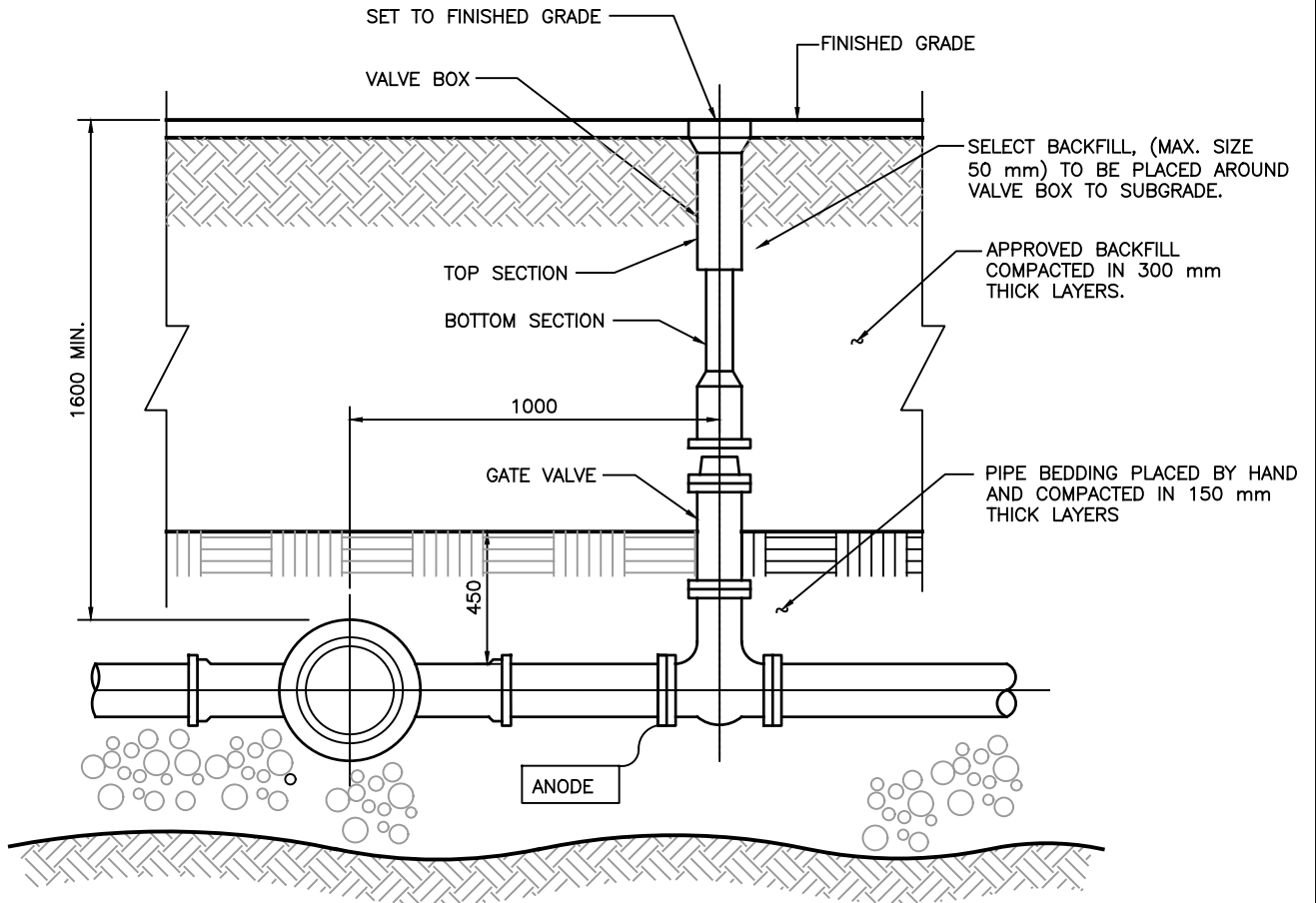


TAKE UP SLACK IN TUBE TO MAKE A SNUG, BUT NOT TIGHT, FIT. FOLD EXCESS BACK OVER TOP OF PIPE, SECURING THE FOLD AT QUARTER POINTS ALONG THE LENGTH OF THE PIPE.

NOTES:


1. DUCTILE PIPE AND FITTINGS TO BE ENCASED IN 200 MICRON CLEAR POLYETHYLENE TUBE OR SHEET SECURED AT QUARTERS WITH ADHESIVE TAPE AS PER MANUFACTURER'S RECOMMENDATION.
2. DURING INCLEMENT WEATHER OR WET TRENCH CONDITIONS, USE PLASTIC STRIP TIES TO SECURE POLYETHYLENE.
3. FOR EACH TAP, PLACE 150 mm LONG BAND OF 50 mm 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.

No.	DESCRIPTION	DATE	BY	CHKD		PROJECT																				
6	NEW DETAIL FOR 2019	06 06 19	ST		<p>NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p> 	<p>POLYETHYLENE ENCASMENT ON DUCTILE IRON WATER MAINS</p>																				
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																							
						<table border="1"> <tr> <td>DRAWN</td> <td>J.W.</td> <td>SCALE (PLAN)</td> <td>N.T.S.</td> </tr> <tr> <td>CHECKED</td> <td>J.D.</td> <td>SCALE (PROFILE)</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.G.</td> <td>DATE</td> <td>17/02/15</td> </tr> <tr> <td colspan="4">PROJECT No.</td> </tr> <tr> <td colspan="4">DWG. No. HWSD - 1020 (2019)</td> </tr> </table>	DRAWN	J.W.	SCALE (PLAN)	N.T.S.	CHECKED	J.D.	SCALE (PROFILE)		APPROVED	K.G.	DATE	17/02/15	PROJECT No.				DWG. No. HWSD - 1020 (2019)			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.																							
CHECKED	J.D.	SCALE (PROFILE)																								
APPROVED	K.G.	DATE	17/02/15																							
PROJECT No.																										
DWG. No. HWSD - 1020 (2019)																										

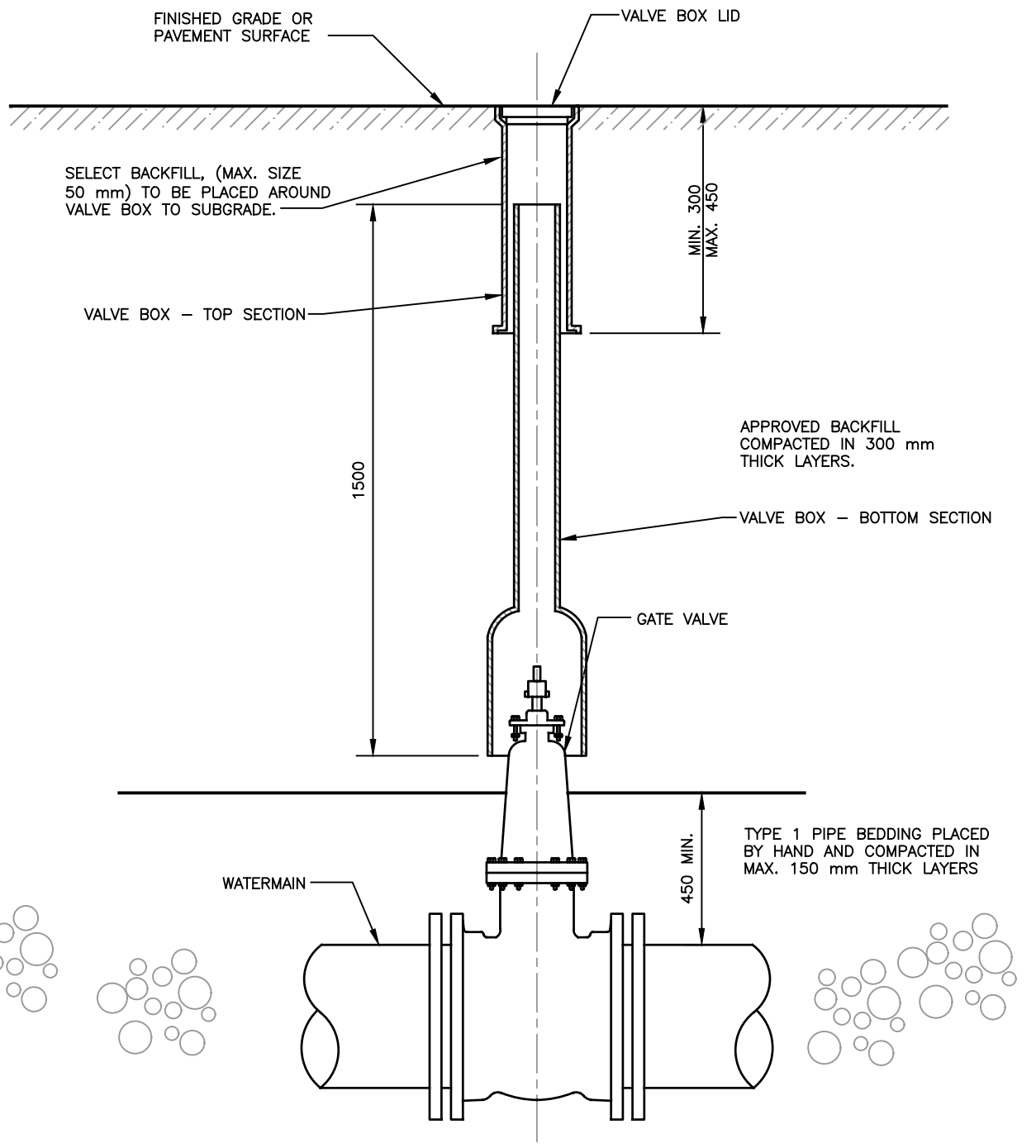


**NOTES:**

1. ANODE TO BE ZINC 24-48 TYPE INSTALLED PER DETAIL ON DWG. HWSD - 1040
2. ANODE CONNECTION TO GATE VALVE BY DOUBLE NUTTING ON ACCESSIBLE STUD.

No.	DESCRIPTION	DATE	BY	CHKD	NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.	PROJECT  WATER MAIN VALVE
4	GENERAL REVISIONS FOR 2009	09 06 08	ML			DRAWN J.W. SCALE (PLAN) N.T.S.
3	TITLE BLOCK CLEANUP	03 04 08	BC			CHECKED J.D. SCALE (PROFILE)
2	ANODE RELOCATED	00 03 20	MC			APPROVED K.G. DATE 17/02/15
1	GENERAL REVISION	99 12 20	RJ			PROJECT No.
						DWG. No. HWSD - 1030





**NOTES:**

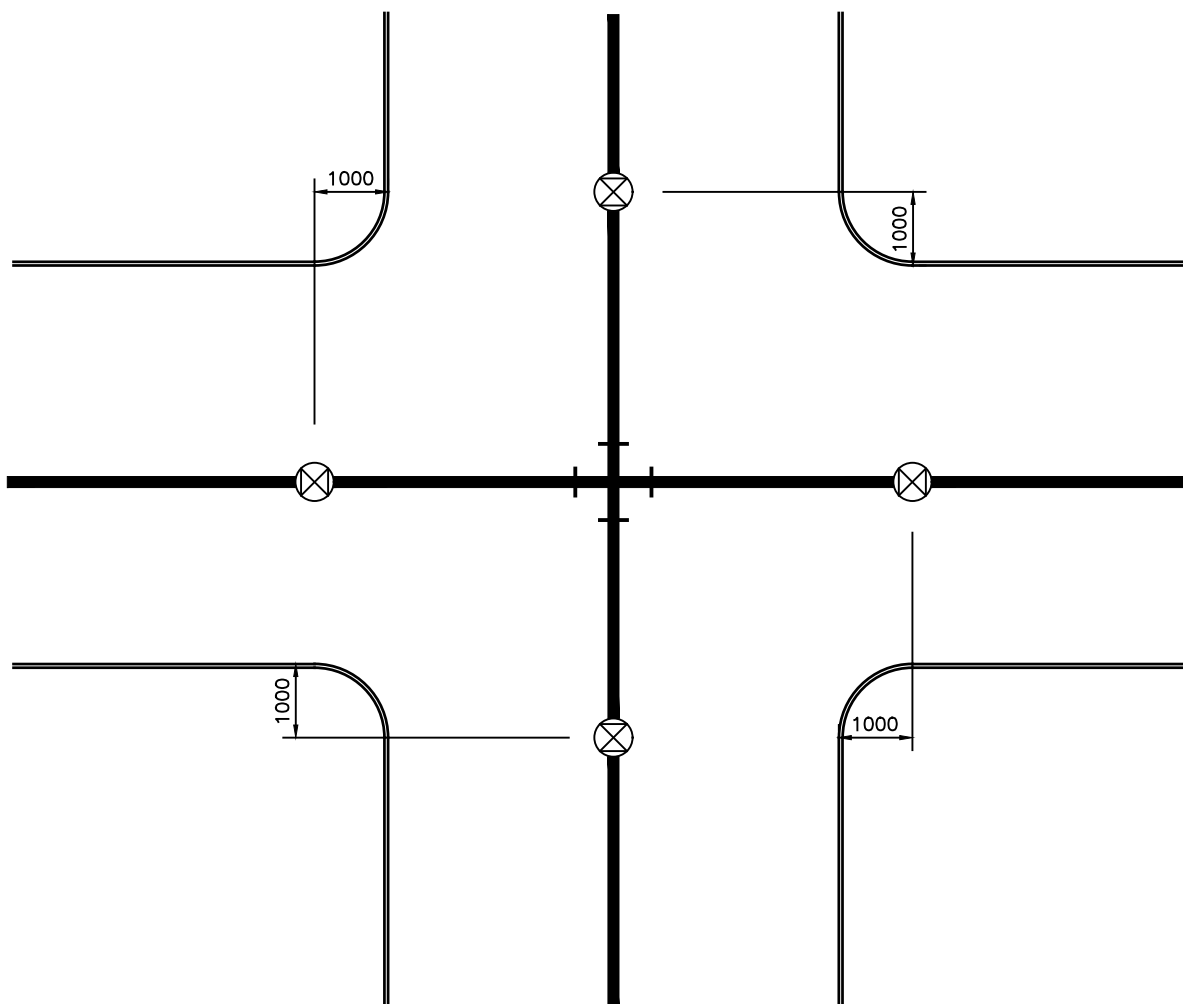
1. ANODE TO BE ZINC 24-48 TYPE INSTALLED PER DETAIL ON DWG. HWSD - 1040
2. ANODE CONNECTION TO GATE VALVE BY DOUBLE NUTTING ON ACCESSIBLE STUD.

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



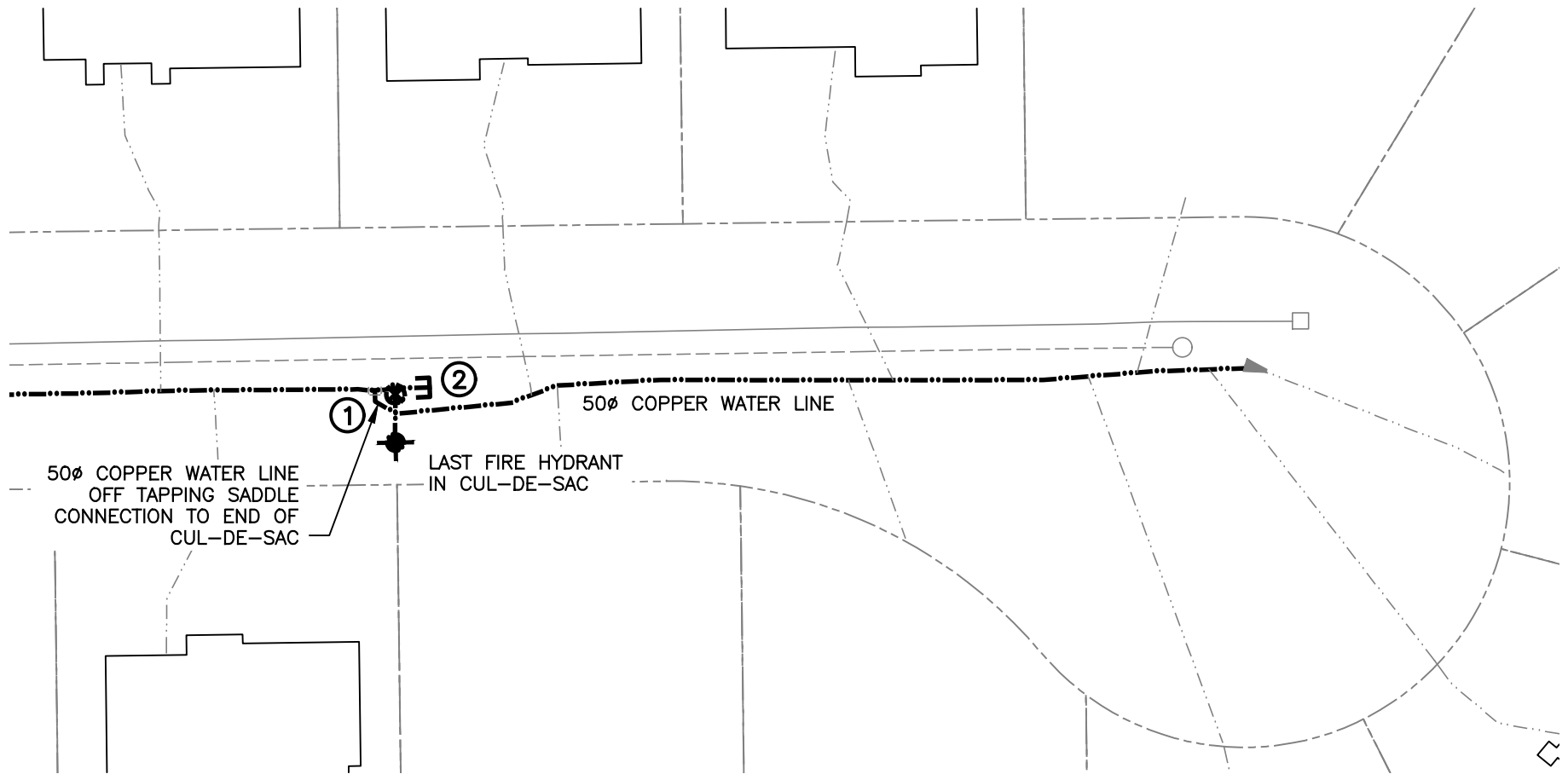
PROJECT	
<b>STANDARD SLIDING TYPE VALVE BOX</b>	
DRAWN	J.W. SCALE (PLAN) N.T.S.
CHECKED	J.D. SCALE (PROFILE)
APPROVED	K.G. DATE 17/02/15
PROJECT No.	
DWG. No. HWSD - 1032	

1	NEW DRAWING	13 02 14	SS	
No.	DESCRIPTION	DATE	BY	CHKD



NOTE:  
VALVES ARE TO BE LOCATED 1000 mm FROM FACE OF CURB.

					NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.	PROJECT <b>STANDARD WATER VALVE LOCATION</b>  <b>NEW CONSTRUCTION</b>	
						DRAWN J.W.      SCALE (PLAN) NTS CHECKED J.D.      SCALE (PROFILE) NTS APPROVED K.G.      DATE 17/02/15	
1	NEW DRAWING	13 02 14	SS			PROJECT No.	
1	REVISION DETAILS	YY MM DD	XX			DWG. No. <b>HWSD - 1034</b>	
No.	DESCRIPTION	DATE	BY	CHKD			




- ① TAPPING SADDLE CONNECTION
- ② MJ CAP C/W THRUSTBLOCK

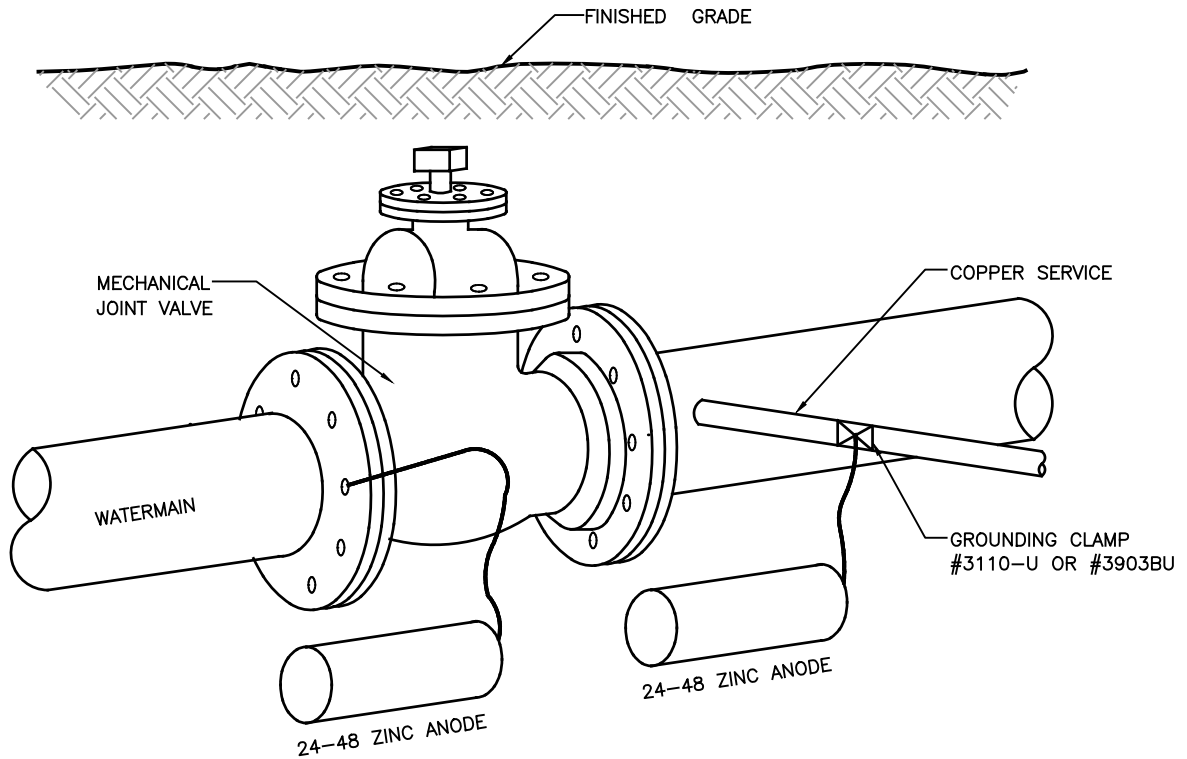
**NOTE:** REDUCTION MAY NOT BE REQUIRED IF THE ENGINEER HAS DETERMINED SUPPLY REDUNDANCY IS REQUIRED.

6	-			
5	-			
4	-			
3	-			
2	-			
1	NEW DRAWING	03/10/22	S.T.	
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



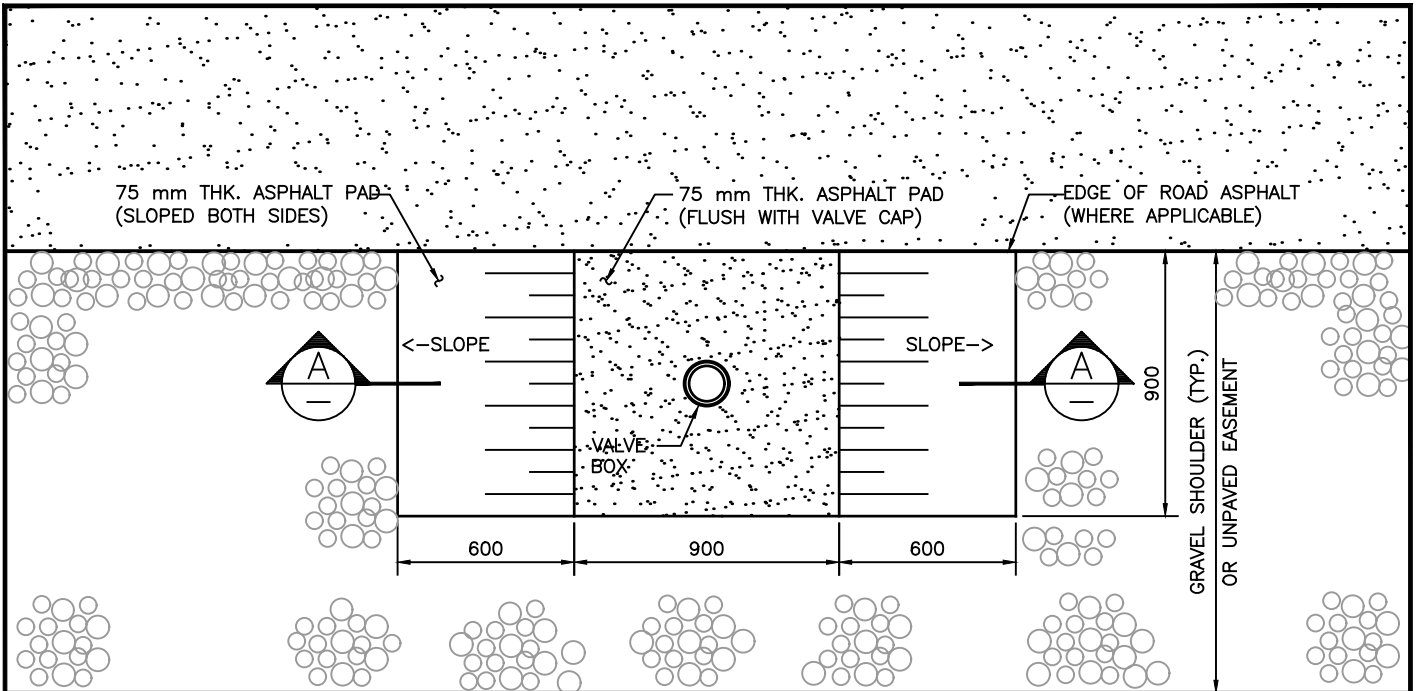
PROJECT			
CUL-DE-SAC WATER MAIN REDUCTION			
DRAWN	S.T.	SCALE (PLAN)	NTS
CHECKED	J.C.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	03/10/22
PROJECT No.			
DWG. No.		HWSD - 1036	



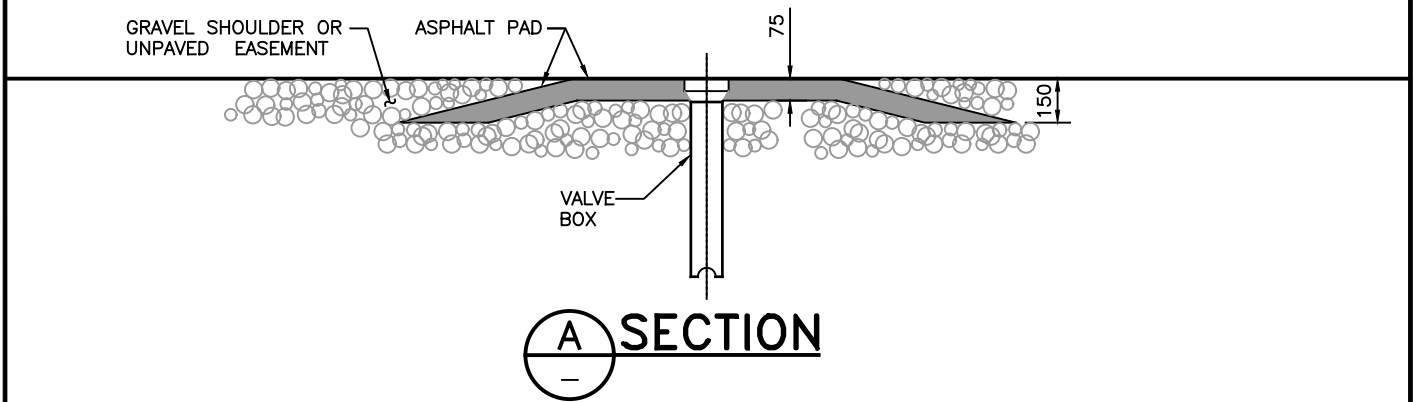
**NOTES:**

1. SEPARATE ANODE AND VALVE / SERVICE USING 50 mm THICK RIGID INSULATION IF ANODE IS INSTALLED WITHIN 600 mm OF VALVE / SERVICE.
2. WRAP ANODE WIRE AROUND A BOLT SEVERAL TIMES AND WRAP WITH NEOPRENE TAPE WHEN ANODES ARE ATTACHED TO MECHANICAL JOINT VALVES. SECURE WIRE TO BOLT BY USING A SECOND NUT.
3. IF ANODE WIRE CANNOT BE ATTACHED AS INDICATED, ANODE WIRE MUST BE ATTACHED TO VALVE WITH SLU-70 WIRE CONNECTOR OR CADWELD. APPLY BITUMINOUS COATING TO SLU-70 WIRE CONNECTOR OR CADWELD.
4. GROUNDING CLAMP TO BE #3110-U FOR 19 mm TO 25 mm DIAMETER SERVICES OR #3903BU FOR 32mm TO 50mm DIAMETER SERVICES.

					<p><b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>	PROJECT			
						ZINC ANODE FOR VALVES AND COPPER SERVICE CONNECTIONS			
4	GENERAL REVISIONS FOR 2009	09 06 09	ML			DRAWN	J.W.	SCALE (PLAN)	N.T.S.
3	TITLE BLOCK CLEANUP	03 04 08	BC			CHECKED	J.D.	SCALE (PROFILE)	
2	NOTE 3 REVISED	99 02 10	M.C.			APPROVED	K.G.	DATE	17/02/15
1	SECURING ANODE WIRE	98 01 15	M.C.			PROJECT No.			
No.	DESCRIPTION	DATE	BY	CHKD		DWG. No.		HWSD - 1040	



**PLAN**

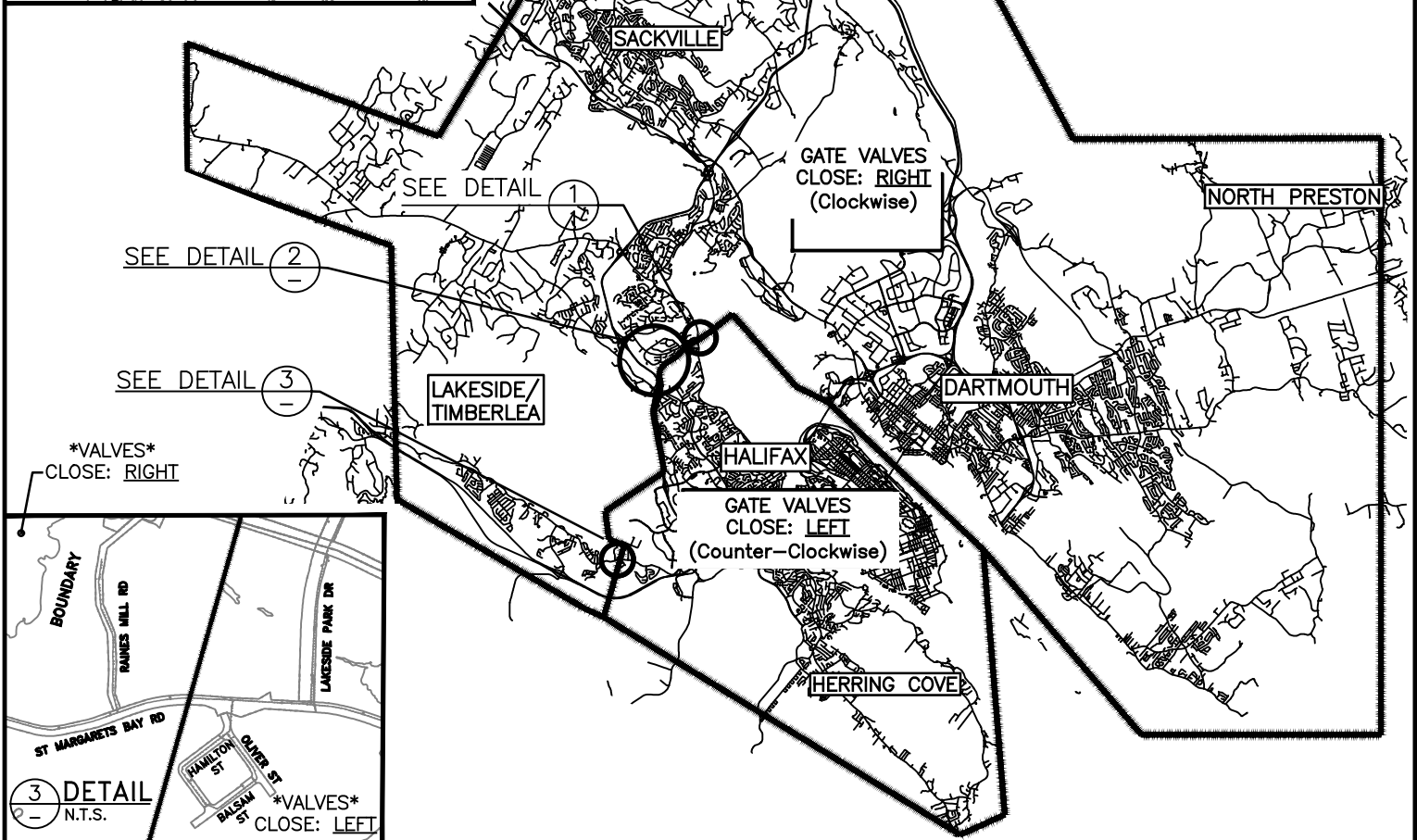
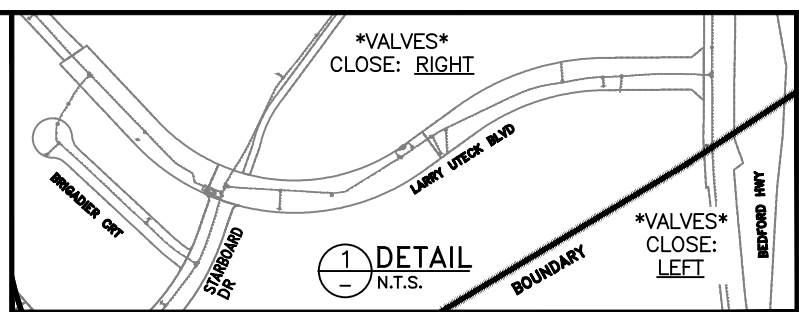
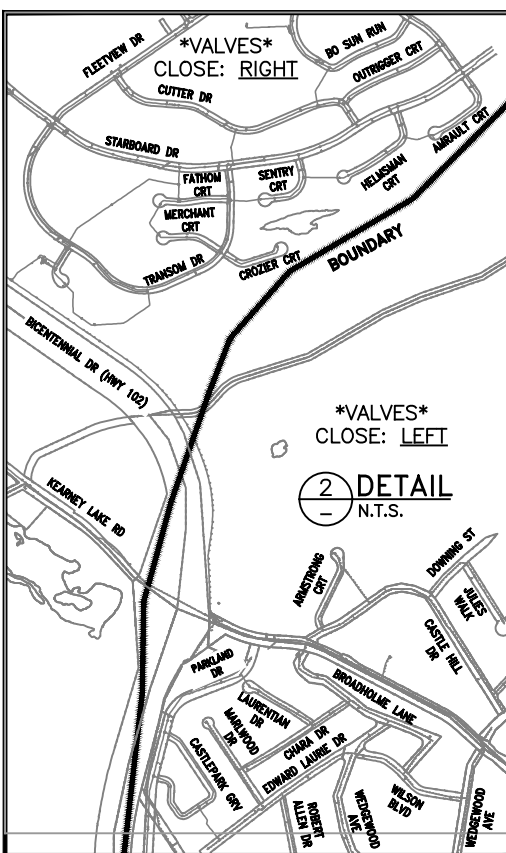


No.	DESCRIPTION	DATE	BY	CHKD
4	GENERAL REVISIONS FOR 2009	09 06 09	ML	
3	TITLE BLOCK CLEANUP	03 04 08	BC	
2	NOTES REVISED	01 01 10	MC	
1	NEW DETAIL FOR 2000 SPEC.	00 03 31	MC	

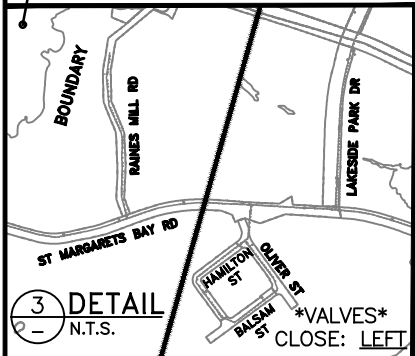
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		
<b>ASPHALT APRON DETAIL</b>		
DRAWN	J.W.	SCALE (PLAN) 1:25
CHECKED	J.D.	SCALE (PROFILE) N/A
APPROVED	K.G.	DATE 17/02/15
PROJECT No.		
DWG. No. <b>HWSD - 1050</b>		



NOTES:  
1. PLEASE CONTACT HALIFAX WATER FOR SPECIFIC VALVE CLOSING BOUNDARY LOCATIONS



8	REVISED STREETS	22 02 11	ST	
7	REVISED STREETS	19 02 06	ST	
6	REVISED BOUNDARY	18 04 27	ST	
5	ADDED BENNERLY LAKE	14 02 21	SS	
4	REVISE BOUNDARY LINE	12 11 30	SS	
3	GENERAL REVISIONS FOR 2009	09 06 09	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	BOUNDARY DETAIL ADDED	99 09 10	PSP	
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.

PROJECT			
VALVE CLOSING DIRECTION BY REGION			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1060 (2022)			

## MINIMUM CONTACT AREAS FOR HORIZONTAL CONCRETE THRUST BLOCKS

PIPE DIAMETER	AREA M <sup>2</sup> FOR SOIL SUPPORTING CAPACITY OF 100 kPa					
	mm	CAP/PLUG	TEE	90° BEND	45° BEND	22.5° 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

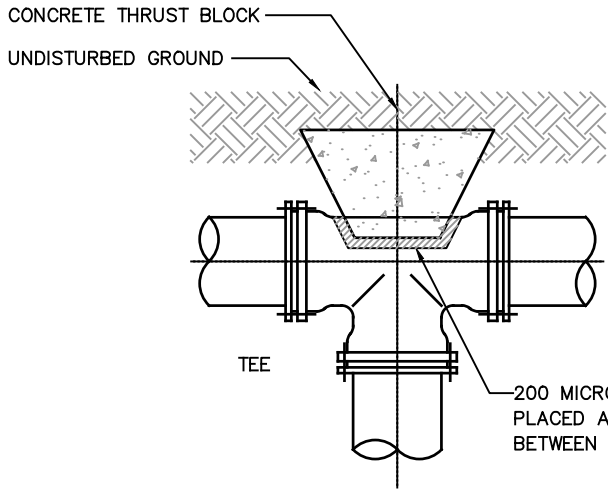
## VERTICAL THRUST BLOCKS THRUST COMPENSATED FOR BY MASS OF CONCRETE (m<sup>3</sup>)

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

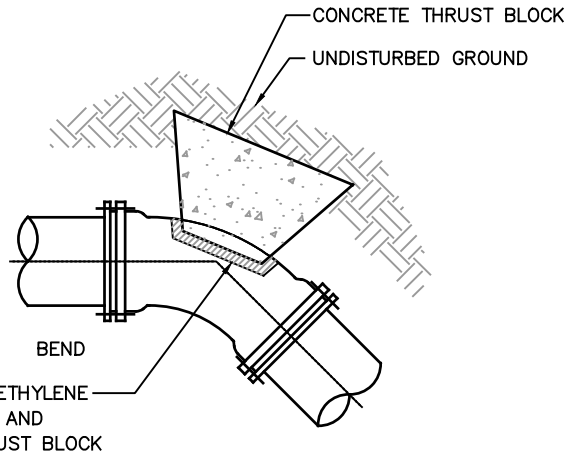
**NOTES:**

- 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 300 mm – THE DESIGNER SHALL CALCULATE THE REQUIRED THRUST BLOCK SIZES BASED ON LOCAL SOIL CONDITIONS. THIS INFORMATION SHALL BE IDENTIFIED ON THE DRAWINGS.

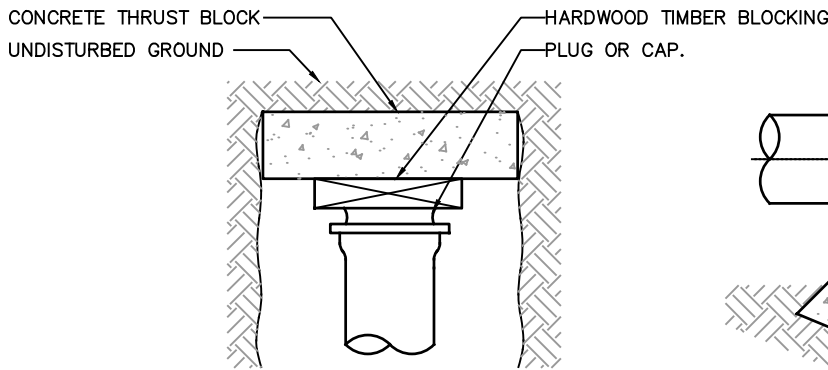
				<p><b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>		<p>PROJECT</p> <p style="text-align: center;"><b>THRUST BLOCK REQUIREMENTS</b></p>	
						<p>DRAWN J.W. SCALE (PLAN) N.T.S.</p>	
						<p>CHECKED J.D. SCALE (PROFILE)</p>	
						<p>APPROVED K.G. DATE 17/02/15</p>	
						<p>PROJECT No.</p>	
				<p>DWG. No. <b>HWSD – 1070</b></p>			
No.	DESCRIPTION	DATE	BY	CHKD			
2	ADDED NOTE 3.	10 05 11	ML				
2	GENERAL REVISIONS FOR 2009	09 06 08	ML				
1	TITLE BLOCK CLEANUP	03 04 08	BC				



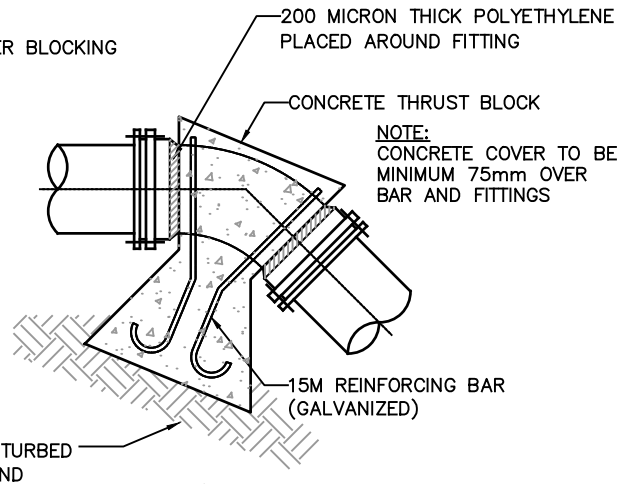
**TEE**



**HORIZONTAL BENDS**



**TEMPORARY BLANK END**



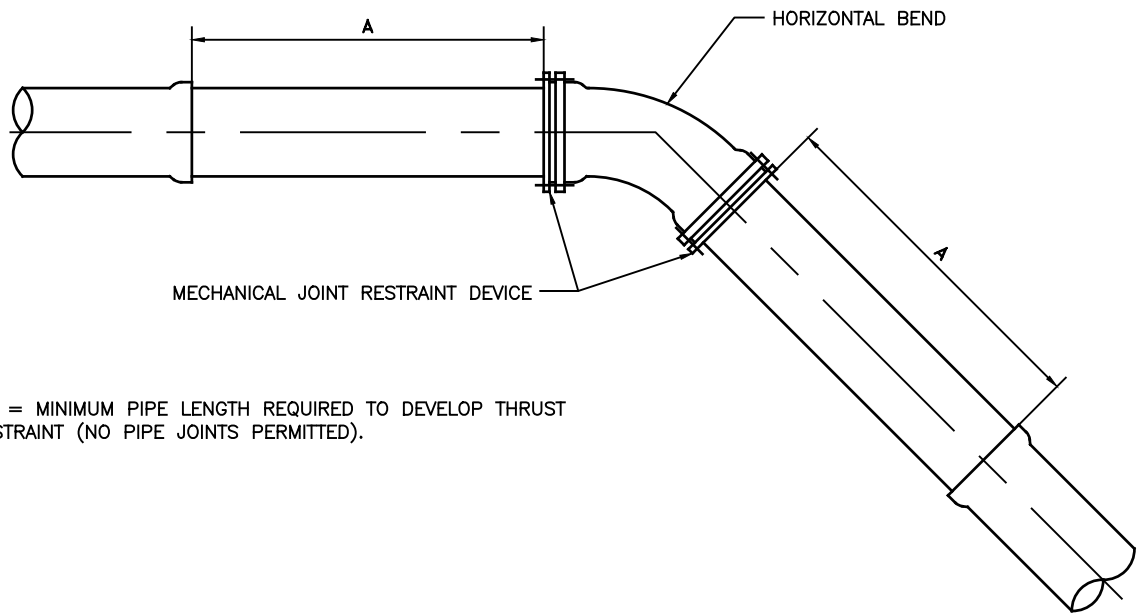
**VERTICAL BENDS**

**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.

					<p><b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>	PROJECT			
						CONCRETE THRUST BLOCK			
5	ADDED NOTES 2 AND 3	16 01 28	SS			DRAWN	J.W.	SCALE (PLAN)	N.T.S.
4	ADDED GALVANIZED TO REBAR NOTE	12 12 05	JW			CHECKED	J.D.	SCALE (PROFILE)	N.T.S.
3	GENERAL REVISIONS FOR 2009	09 06 08	ML			APPROVED	K.G.	DATE	17/02/15
2	TITLE BLOCK CLEANUP	03 04 08	BC			PROJECT No.			
1	BLANK END NOTED AS "TEMPORARY"	00 03 20	MC			DWG. No. HWSD - 1080			
No.	DESCRIPTION	DATE	BY	CHKD					



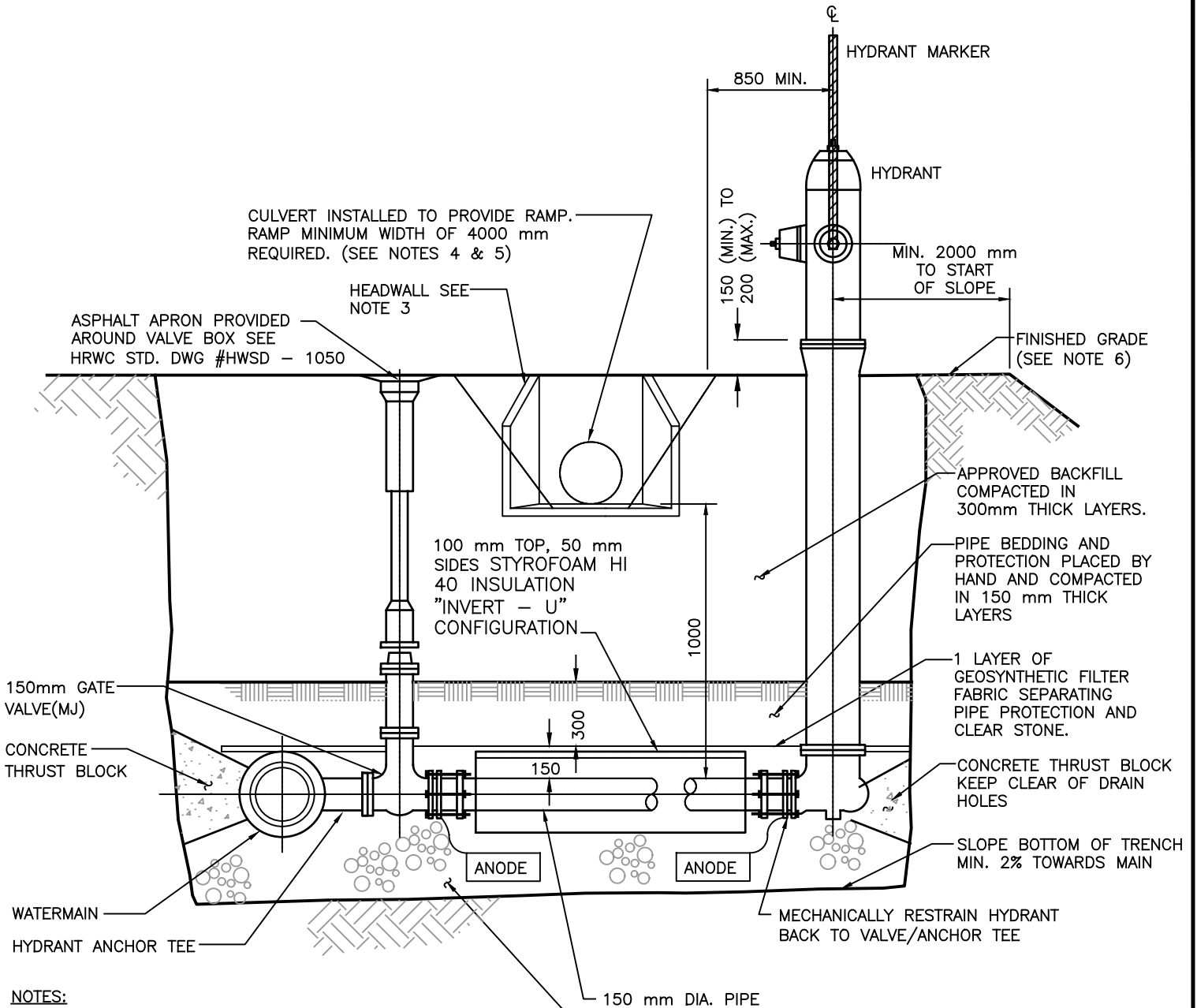


"A" = MINIMUM PIPE LENGTH REQUIRED TO DEVELOP THRUST RESTRAINT (NO PIPE JOINTS PERMITTED).

PIPE DIAMETER	BEND	MINIMUM PIPE LENGTH REQUIRED TO DEVELOP THRUST RESTRAINT*
200	11.25°	600
	22.5°	1200
	45°	2400
250	11.25°	600
	22.5°	1500
	45°	2700
300	11.25°	984
	22.5°	1500
	45°	3300

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

					<b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.		PROJECT <b>MECHANICAL JOINT RESTRAINT REQUIREMENTS</b>	
							DRAWN J.W.	SCALE (PLAN) NTS
3 GENERAL REVISIONS FOR 2009 09 06 09 ML							CHECKED J.D.	SCALE (PROFILE) NTS
2 TITLE BLOCK CLEANUP 03 04 08 BC							APPROVED K.G.	DATE 17/02/15
1 FOOT-NOTE MODIFIED 01 01 10 MC SS							PROJECT No.	
No. DESCRIPTION DATE BY CHKD					DWG. No.		<b>HWSD - 1090</b>	



**NOTES:**

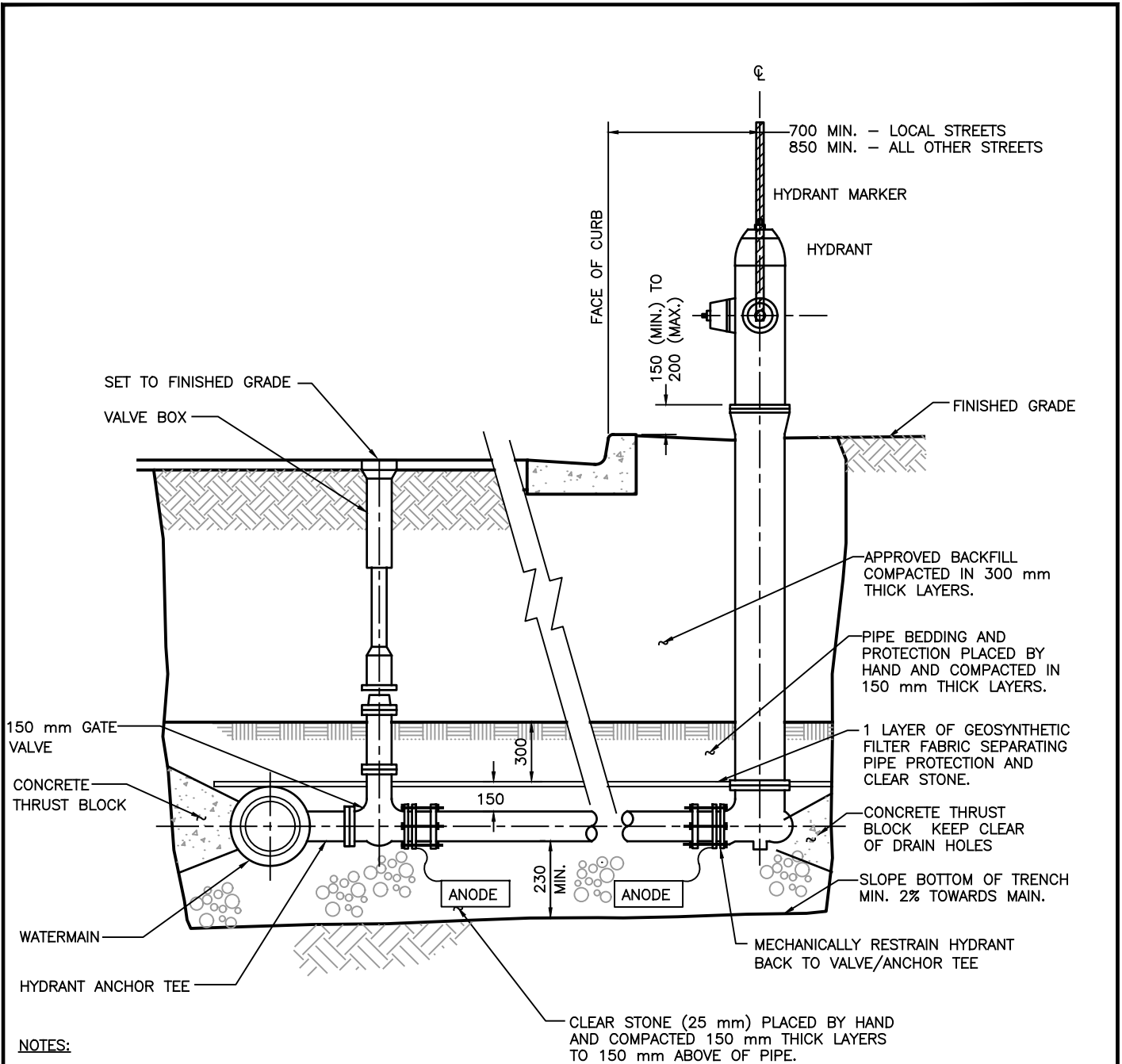
1. ANODE TO BE ZINC 24-48 TYPE INSTALLED BY USE OF DOUBLE NUT PER DETAIL ON DWG. HWSD - 1040
2. SEE STANDARD SPEC DETAIL HWSD - 1080 FOR THRUST BLOCK DETAILS.
3. BOTH ENDS OF CULVERT REQUIRE PRE-CAST CONCRETE HEADWALL. SPACE AROUND PIPE OPENING IN HEADWALL TO BE GROUTED & PARGED TO ELIMINATE VOIDS.
4. CULVERT PIPE MATERIAL TO BE IN ACCORDANCE WITH HRWC STANDARD SPECIFICATION.
5. CULVERT TO BE SIZED IN ACCORDANCE WITH HRWC REQUIREMENTS.
6. ALL SURFACES WITHIN 2000 mm OF HYDRANT MUST BE STABILIZED USING GRASS, CLEAR STONE, ARMOUR STONE, OR ASPHALT.
7. FINISHED GRADE FROM SHOULDER TO HYDRANT AREA TO BE IN ACCORDANCE WITH HALIFAX REGIONAL MUNICIPALITY DESIGN GUIDELINES.
8. USE ONLY HRWC APPROVED PRODUCTS FOR MECHANICAL RESTRAINT.
9. HYDRANT MARKER AS PER HRWC SSS 33 11 00

13	GENERAL REVISIONS FOR 2019	06 06 19	ST	
12	GENERAL REVISIONS FOR 2018	18 05 07	ST	
11	GENERAL REVISIONS FOR 2009	09 06 08	ML	
10	REVISED NOTE #4	07 05 08	BC	
9	ADDED NOTE #7	07 04 27	BC	
8	ADD MECH RESTRAINTS & REVISE HEADWALL	06 03 21	BC	
7	TITLE BLOCK CLEANUP	03 04 08	BC	
6	HYDRANT FLANGE/FINISHED GRADE REVISED	02 04 04	PSP	
5	GENERAL REV - NOTE 7 REMOVED	02 03 13	PSP	
No.	DESCRIPTION	DATE	BY	CHKD

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT			
<b>HYDRANT INSTALLATION RURAL STREET</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1100 (2019)			



**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.
- 3. HYDRANT MARKER AS PER HRWC SSS 33 11 00

8	GENERAL REVISIONS FOR 2018	18 05 07	ST	
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

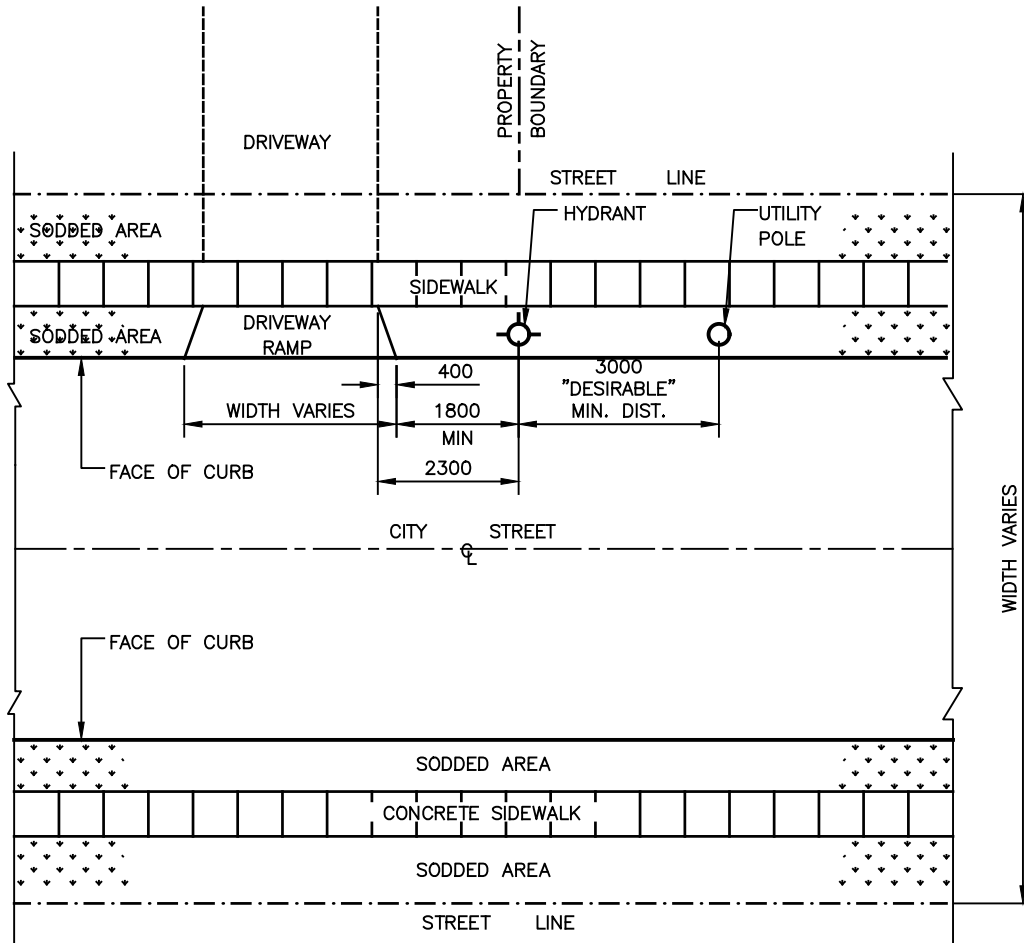
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT

**HYDRANT INSTALLATION  
URBAN STREET**

DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.	HWSD - 1110 (2018)		



**NOTES:**

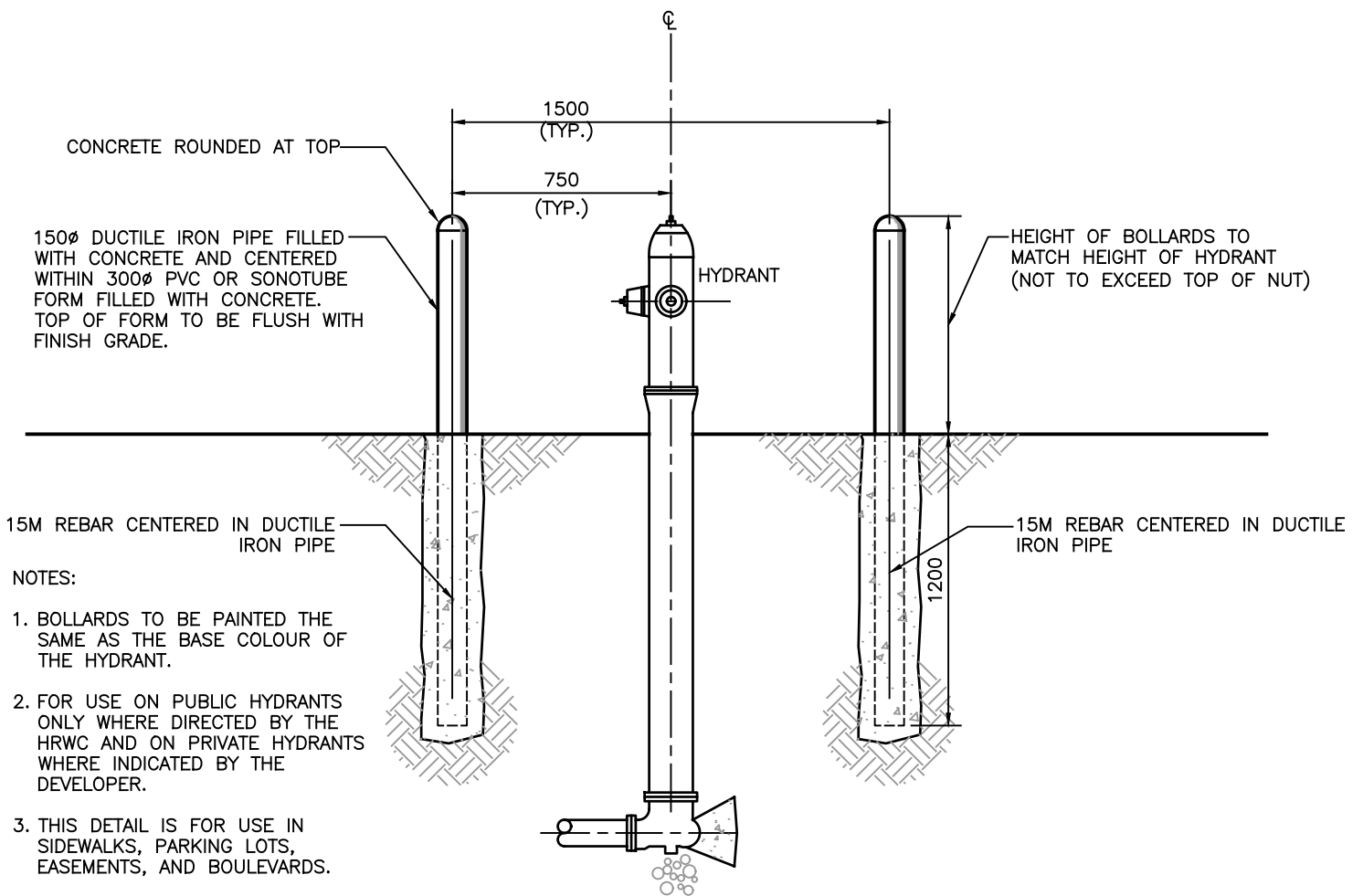
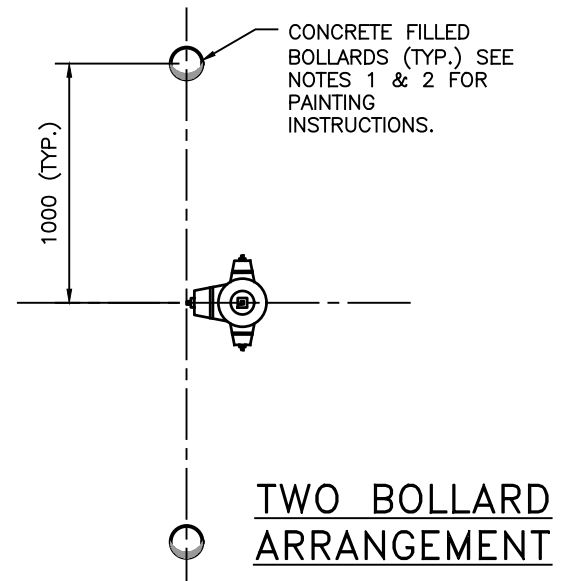
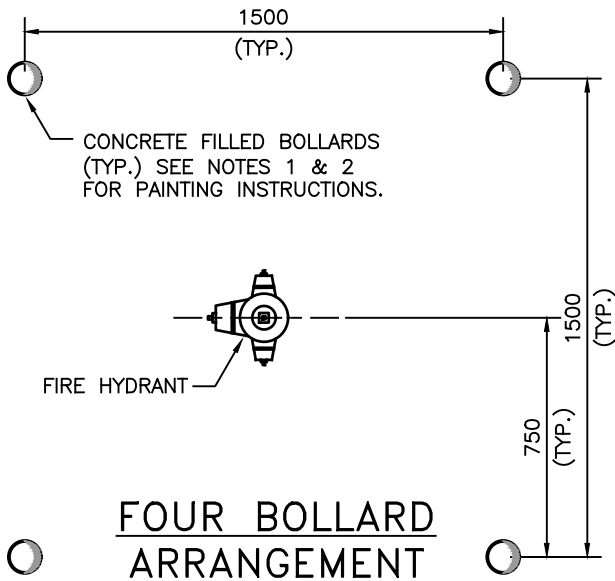
1. IN THE CASE OF SINGLE UNIT DWELLING LOT; HYDRANT STRUCTURES TO BE LOCATED ADJACENT TO SIDE PROPERTY BOUNDARY LINE WITH DRIVEWAY STRUCTURE LOCATED AT OPPOSITE SIDE OF PROPERTY BOUNDARY LINE.
2. IN THE CASE OF TOWNHOUSE UNIT LOT; HYDRANTS TO BE LOCATED MID-LOT WHEN DRIVEWAYS ARE LOCATED ADJACENT TO BOTH SIDE PROPERTY BOUNDARY LINES.
3. IN THE CASE OF HIGH DENSITY RESIDENTIAL STRUCTURES, COMMERCIAL OR "GENERAL USE" LOT AREAS; LOCATION OF HYDRANT STRUCTURES ETC. WILL DEPEND UPON THE APPROVED LOT LAYOUT DEVELOPMENT AND DRIVEWAY LOCATION PLAN.
4. FOR MINIMUM DISTANCE BETWEEN FACE OF CURB AND HYDRANT LOCATION SEE STANDARD DRAWING HWSD - 1110

No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2009	09 06 08	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	GENERAL REVISION	99 12 20	RJ	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



<b>PROJECT</b>		<b>HYDRANT LOCATION IN RELATION TO DRIVEWAYS &amp; OTHER UTILITY STRUCTURES</b>	
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1120</b>			



NOTES:

1. BOLLARDS TO BE PAINTED THE SAME AS THE BASE COLOUR OF THE HYDRANT.
2. FOR USE ON PUBLIC HYDRANTS ONLY WHERE DIRECTED BY THE HRWC AND ON PRIVATE HYDRANTS WHERE INDICATED BY THE DEVELOPER.
3. THIS DETAIL IS FOR USE IN SIDEWALKS, PARKING LOTS, EASEMENTS, AND BOULEVARDS.
4. NUMBER OF BOLLARDS TO BE DETERMINED BY LOCATION OF HYDRANT

**ELEVATION**

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT

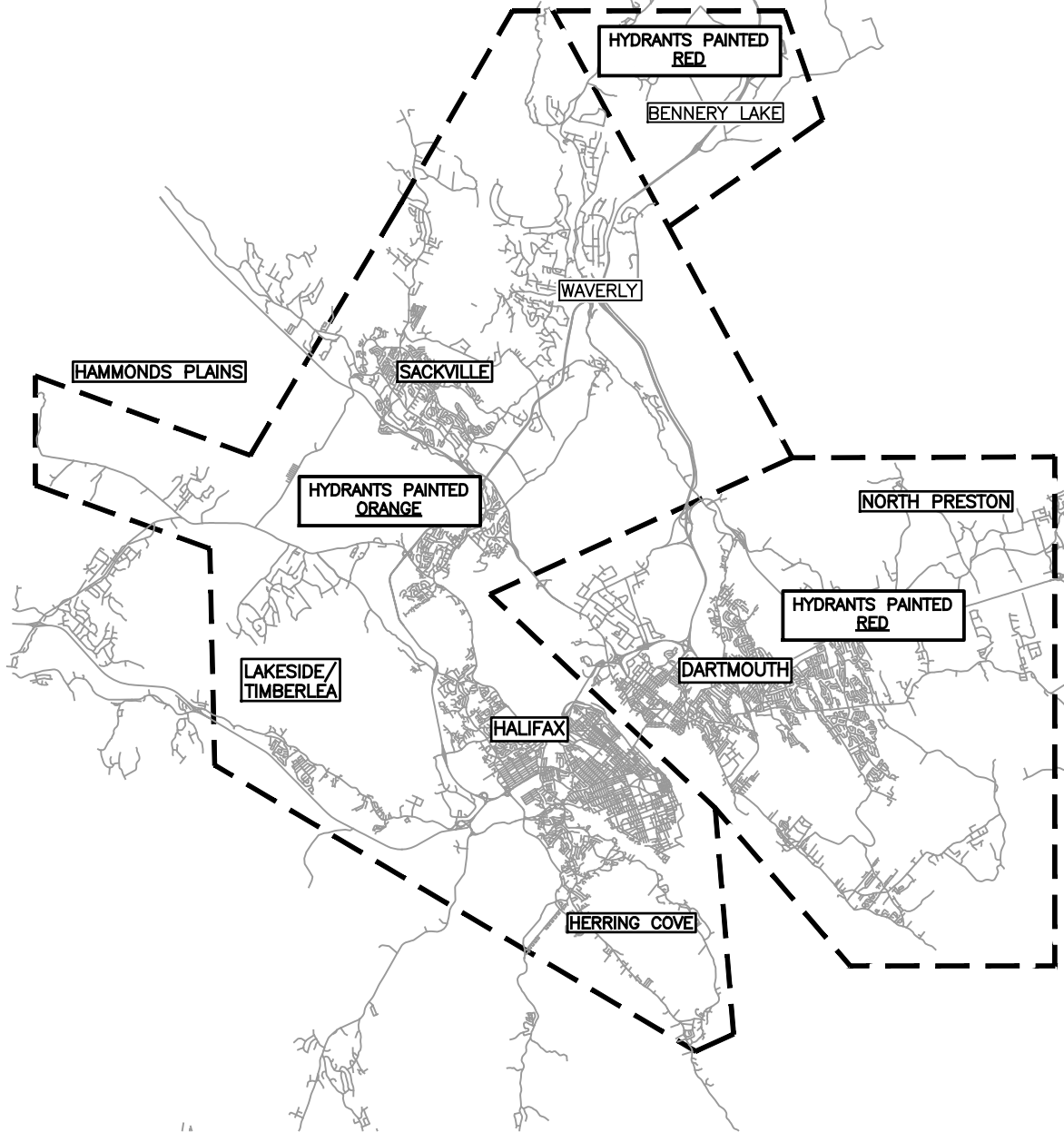
**BOLLARD INSTALLATION DETAIL**

DRAWN	J.W.	SCALE (PLAN)	1:25
CHECKED	J.D.	SCALE (PROFILE)	1:25
APPROVED	K.G.	DATE	17/02/15

PROJECT No.

DWG. No. **HWSD - 1130 (2019)**

No.	DESCRIPTION	DATE	BY	CHKD
5	GENERAL REVISIONS FOR 2019	19 04 29	ST	
4	GENERAL REVISIONS FOR 2018	18 05 07	ST	
3	GENERAL REVISIONS FOR 2009	09 06 09	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	NEW DETAIL FOR 2001 SPEC.	01 01 10	MC	SS



**NOTES:**

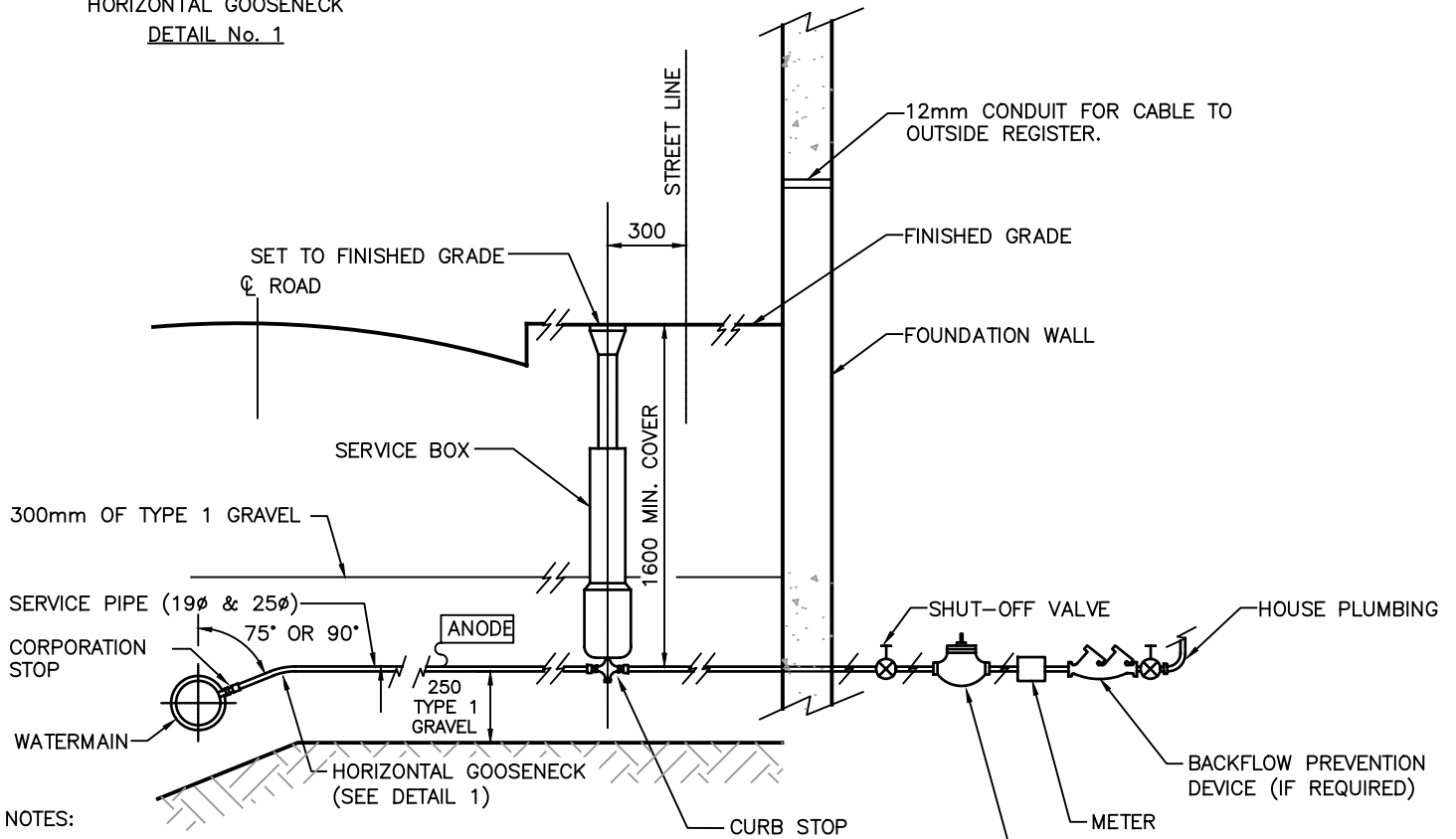
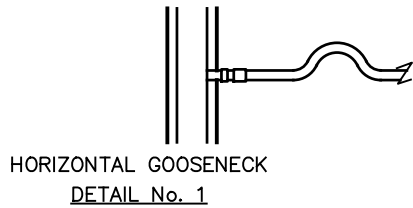
1. HYDRANTS TO BE PAINTED ORANGE IN THE FOLLOWING COMMUNITIES:  
HALIFAX, SACKVILLE, WAVERLEY, BEDFORD, HAMMONDS PLAINS,  
LAKESIDE AND TIMBERLEA.
2. HYDRANTS TO BE PAINTED RED IN THE FOLLOWING COMMUNITIES:  
DARTMOUTH, COLE HARBOUR, EASTERN PASSAGE, NORTH PRESTON &  
BENNERY LAKE SYSTEM.
3. HYDRANT MARKER AS PER HRWC SSS 33 11 00

No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2018	18 05 07	ST	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	BOUNDARY DETAIL ADDED	99 09 10	PSP	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
<b>HYDRANT PAINTING</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1140 (2018)</b>			



NOTES:

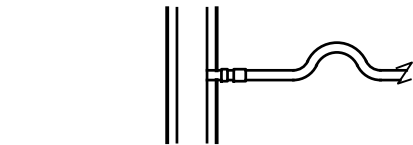
1. ANODE CONNECTED TO SERVICES PIPE FROM MAIN WITH GROUNDING CLAMP (#3110-U OR #3903-BU)
2. MINIMUM 300mm VERTICAL AND HORIZONTAL SEPARATION TO BE MAINTAINED BETWEEN WATER AND WASTEWATER / STORMWATER PIPES.
3. SEE HWSD - 1180 FOR STANDARD SERVICE 38 DIA. AND LARGER.
4. SERVICES BOXES TO HAVE S.S. OPERATING RODS AND COTTER PINS.
5. PLACE SELECT BACKFILL MATERIAL, MAX. 50 mm AROUND SERVICE BOX TO SUB GRADE.
6. TAPE POLYWRAPPING AT TAP LOCATION.
7. BACKFILLING OF SERVICE TRENCH TO BE IN ACCORDANCE WITH SECTION 33 11 00 (3.2.1.1)
8. AN ANODE IS NOT REQUIRED IF CROSSLINKED POLYETHYLENE (PEX<sub>a</sub>) SERVICE PIPE IS USED.
9. MINIMUM SERVICE SIZE OF MUNICIPEX SERVICE PIPE IS 25 mm.
10. REFER TO HWSD - 1390 (TRACE WIRE DETAIL) FOR MUNICIPEX INSTALLATIONS

No.	DESCRIPTION	DATE	BY	CHKD
10	GENERAL REVISIONS FOR 2019	19 10 07	ST	
9	GENERAL REVISIONS FOR 2016	16 03 01	SS	
8	GENERAL REVISIONS FOR 2009	09 06 08	ML	
7	NOTES 7 & 8 ADDED	04 04 01	BC	
6	TITLE BLOCK CLEANUP	03 04 08	BC	
5	NOTES REVISED	00 03 20	MC	
4	BEDDING REVISED	00 03 20	MC	
3	BEDDING REVISED	99 12 20	RJ	
2	NOTE REVISIONS	99 01 01	MC	

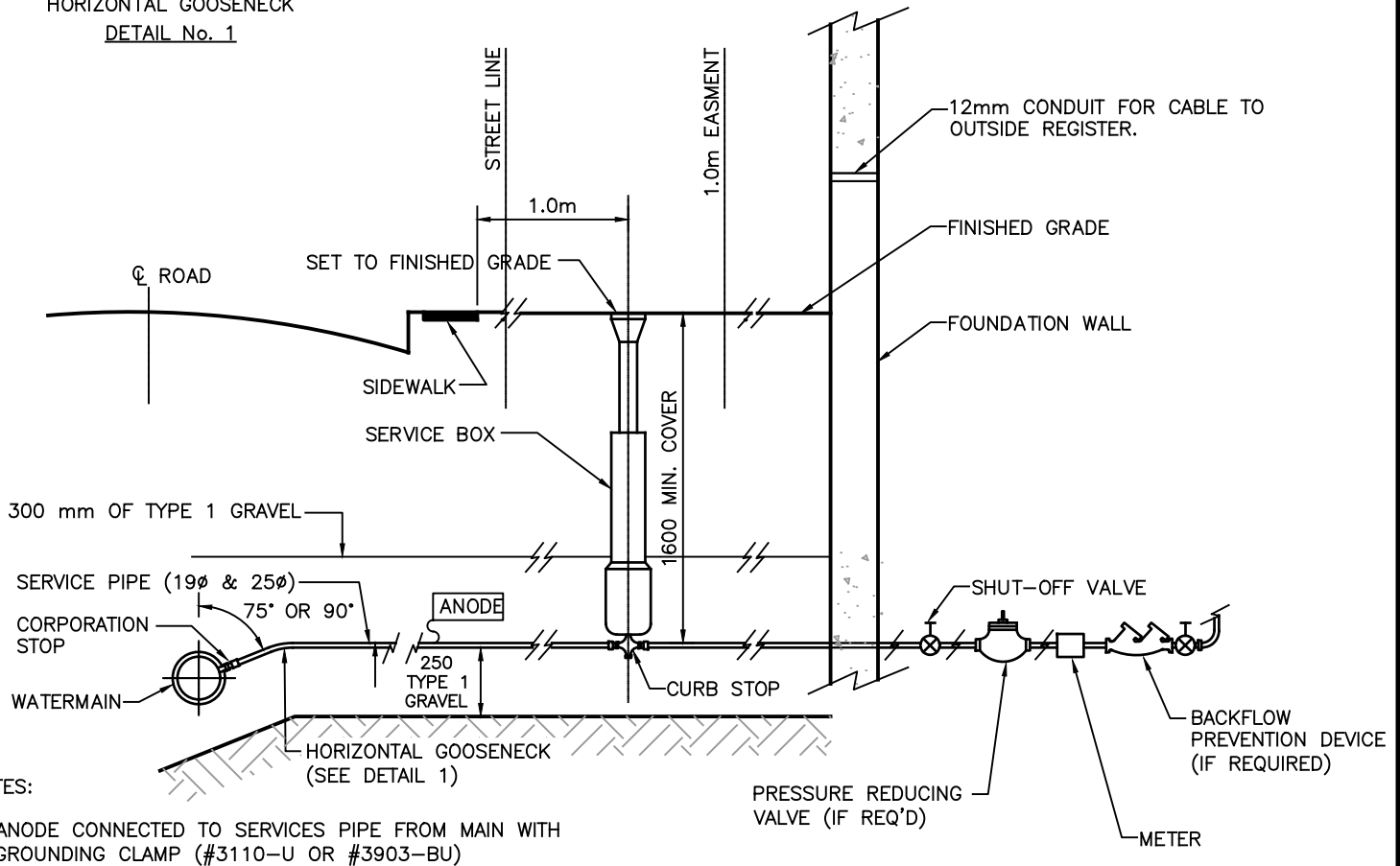
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
<b>STANDARD SERVICE CONNECTION FROM WATERMAIN TO HOUSE PLUMBING URBAN STREET (NO SIDEWALK)</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1150</b>			

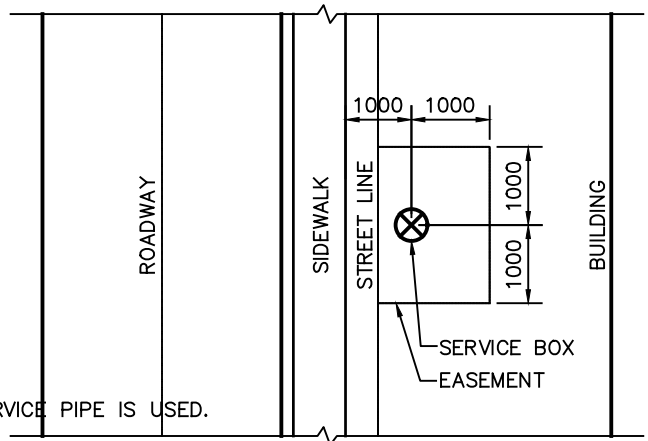


HORIZONTAL GOOSENECK  
DETAIL No. 1



NOTES:

1. ANODE CONNECTED TO SERVICES PIPE FROM MAIN WITH GROUNDING CLAMP (#3110-U OR #3903-BU)
2. MINIMUM 300 mm VERTICAL AND HORIZONTAL SEPARATION TO BE MAINTAINED BETWEEN WATER AND WASTEWATER / STORMWATER PIPES.
3. SEE HWSD - 1180 FOR SERVICE 38 DIA. AND LARGER.
4. SERVICES BOXES TO HAVE STAINLESS STEEL OPERATING RODS AND COTTER PINS.
5. PLACE SELECT BACKFILL MATERIAL, MAX. 50 mm AROUND SERVICE BOX TO SUB GRADE.
6. TAPE POLYWRAPPING AT TAP LOCATION.
7. BACKFILLING OF SERVICE TRENCH TO BE IN ACCORDANCE WITH SECTION 33 11 00.
8. AN ANODE IS NOT REQUIRED IF CROSSLINKED POLYETHYLENE (PEXa) SERVICE PIPE IS USED.
9. MINIMUM SERVICE SIZE OF CROSSLINKED POLYETHYLENE (PEXa) SERVICE PIPE IS 25 mm.
10. REFER TO HWSD - 1390 (TRACE WIRE DETAIL) FOR CROSSLINKED POLYETHYLENE (PEXa) SERVICE PIPE INSTALLATIONS.



SCALE PLOTTED: 1=1 DATE PLOTTED: 4/18/2008 NOTES: HWSD - 1160.DWG

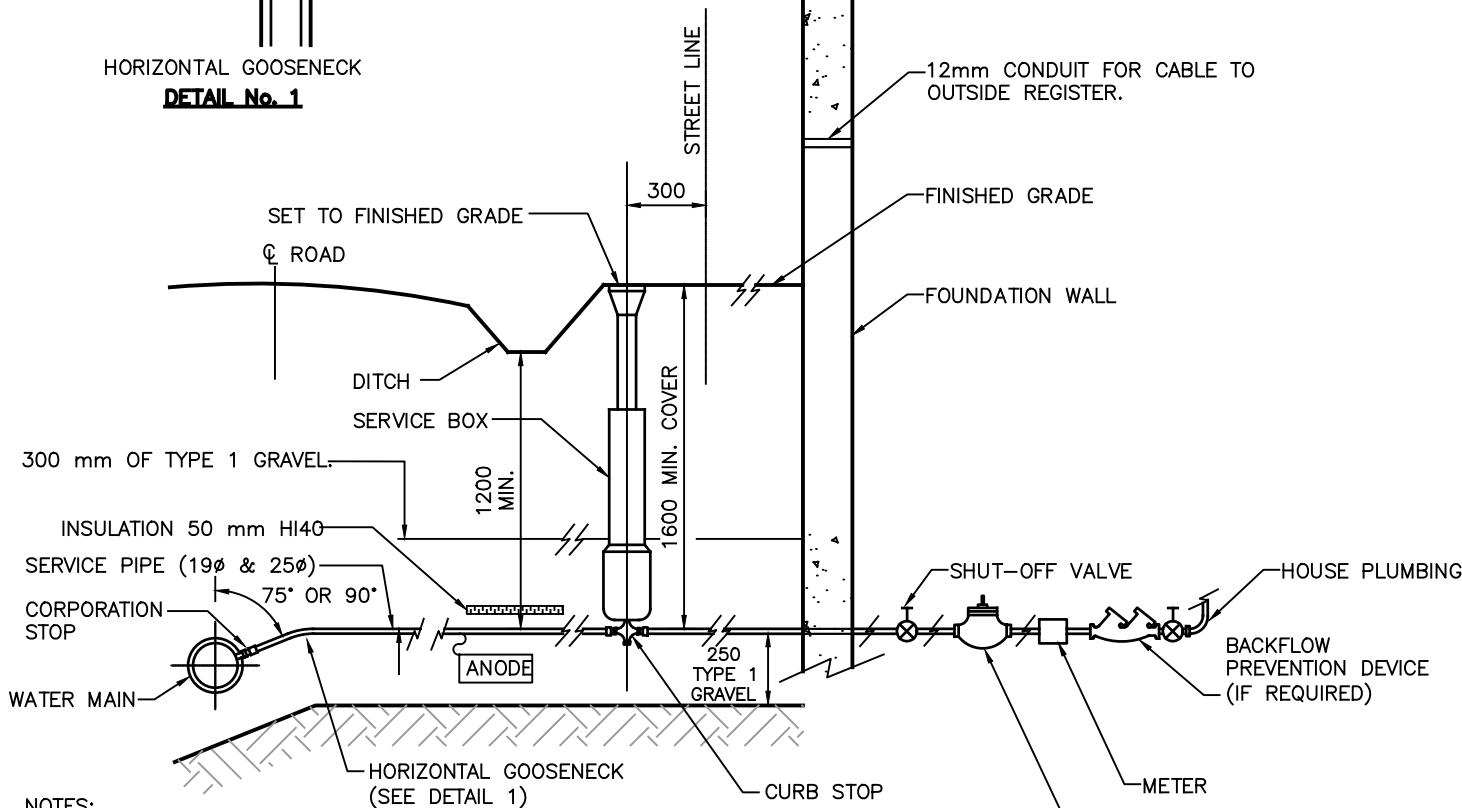
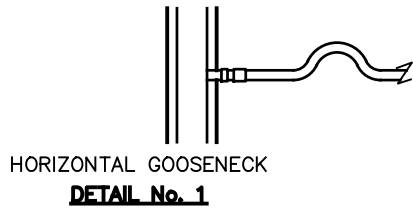
No.	DESCRIPTION	DATE	BY	CHKD
9	GENERAL REVISIONS FOR 2019	19/10/07	ST	
8	GENERAL REVISIONS FOR 2016	16/03/01	SS	
7	GENERAL REVISIONS FOR 2009	09/06/08	ML	
6	NOTES 7 & 8 ADDED	04/04/01	BC	
5	TITLE BLOCK CLEANUP	03/04/08	BC	
4	NOTES REVISED	00/03/20	MC	
3	BEDDING REVISED	00/03/20	MC	
2	BEDDING REVISED	99/12/20	RJ	
1	NEW DETAIL DRAWING FOR 1999 SPEC.	99/02/10	MC	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		WATER SERVICE CONNECTION FROM WATER MAIN TO HOUSE PLUMBING URBAN STREET (WITH SIDEWALK)	
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1160	





NOTES:

1. ANODE CONNECTED TO SERVICES PIPE FROM MAIN WITH GROUNDING CLAMP (#3110-U OR #3903-BU)
2. MINIMUM 300mm VERTICAL AND HORIZONTAL SEPARATION TO BE MAINTAINED BETWEEN WATER AND WASTEWATER / STORMWATER PIPES.
3. SEE HWSD - 1180 FOR STANDARD SERVICE 38 DIA. AND LARGER.
4. SERVICES BOXES TO HAVE STAINLESS STEEL. OPERATING RODS AND COTTER PINS.
5. PLACE SELECT BACKFILL MATERIAL, MAX. 50 mm AROUND SERVICE BOX TO SUB GRADE.
6. TAPE POLYWRAPPING AT TAP LOCATION.
7. PROVIDE 6.0 m HORIZONTAL SEPARATION FROM ANY PORTION OF A WASTEWATER DISPOSAL FIELD.
8. BACKFILLING OF SERVICE TRENCH TO BE IN ACCORDANCE WITH SECTION 33 11 00
9. AN ANODE IS NOT REQUIRED IF CROSSLINKED POLYETHYLENE (PEXa) SERVICE PIPE IS USED.
10. MINIMUM SERVICE SIZE OF CROSSLINKED POLYETHYLENE (PEXa) SERVICE PIPE IS 25 mm.
11. REFER TO HWSD - 1390 (TRACE WIRE DETAIL) FOR CROSSLINKED POLYETHYLENE (PEXa) SERVICE PIPE INSTALLATIONS.

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



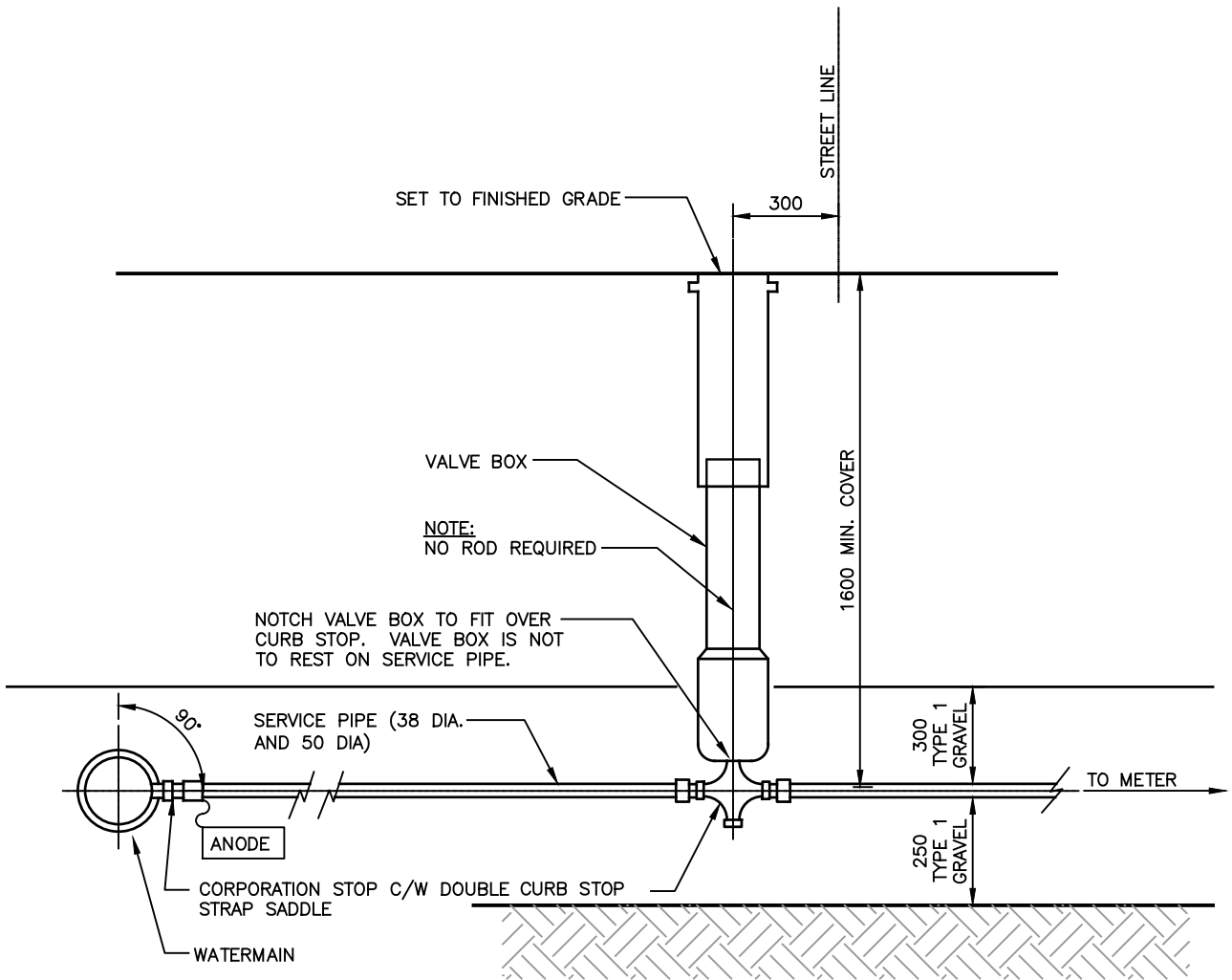
PROJECT  
**WATER SERVICE  
CONNECTION FROM WATER MAIN  
TO HOUSE PLUMBING  
RURAL STREET**

DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15

PROJECT No.

DWG. No. **HWSD - 1170**

No.	DESCRIPTION	DATE	BY	CHKD
9	GENERAL REVISIONS FOR 2019	19/10/07	ST	
8	GENERAL REVISIONS FOR 2016	16/03/01	SS	
7	GENERAL REVISIONS FOR 2009	09/06/08	ML	
6	NOTES 8 & 9 ADDED	04/04/01	BC	
5	TITLE BLOCK CLEANUP	03/04/08	BC	
4	NOTES REVISED	00/03/20	MC	
3	BEDDING REVISED	00/03/20	MC	
2	BEDDING REVISED	99/12/20	RJ	
1	NEW DETAIL DRAWING FOR 1999 SPEC	99/02/10	MC	



NOTES:

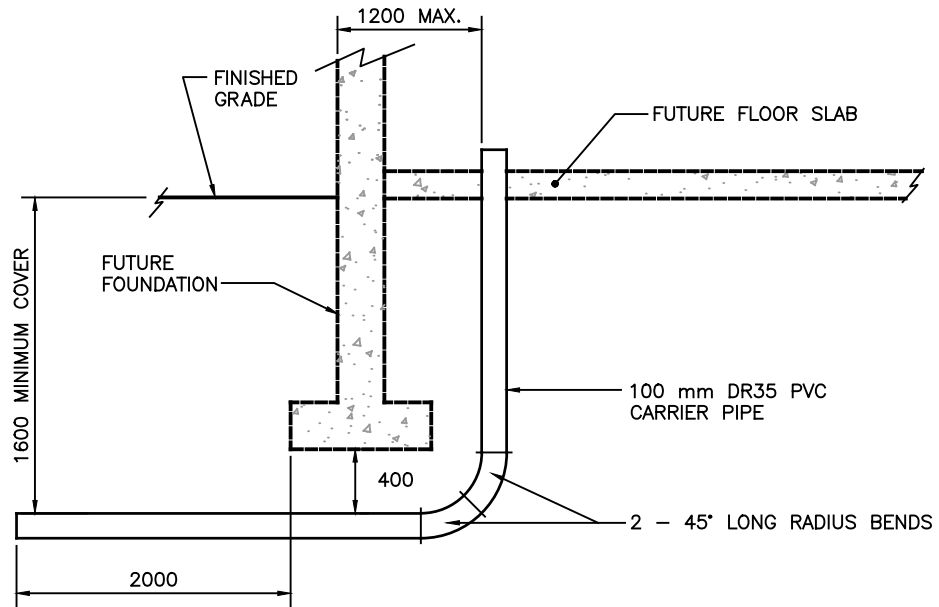
1. SELECT BACKFILL, (MAX. SIZE 50 mm) TO BE PLACED AROUND VALVE BOX TO SUBGRADE.
2. WHERE A POLYWRAPPED WATERMAIN IS TAPPED, PLACE 150 mm WIDE BAND OF 50 mm WIDE DUCT TAPE AROUND AREA TO BE TAPPED.
3. ANODE TO BE ZINC 24-48 TYPE INSTALLED PER DETAIL ON DWG. HWSD - 1180.
4. SERVICE SADDLE REQUIRED FOR 38 mm 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.

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	

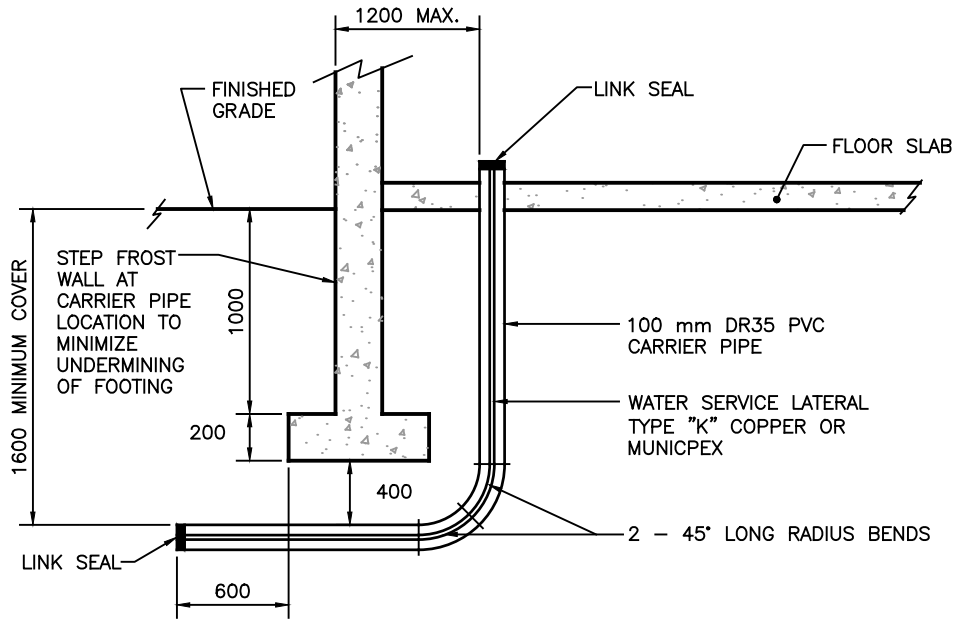
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		<b>WATER SERVICE CONNECTION</b> 38mm (1-1/2") DIA. AND OVER	
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1180	



CARRIER PIPE INSTALLED PRIOR TO FOUNDATION INSTALLATION  
NTS



CARRIER PIPE INSTALLED AFTER FOUNDATION INSTALLATION  
NTS

NOTES:

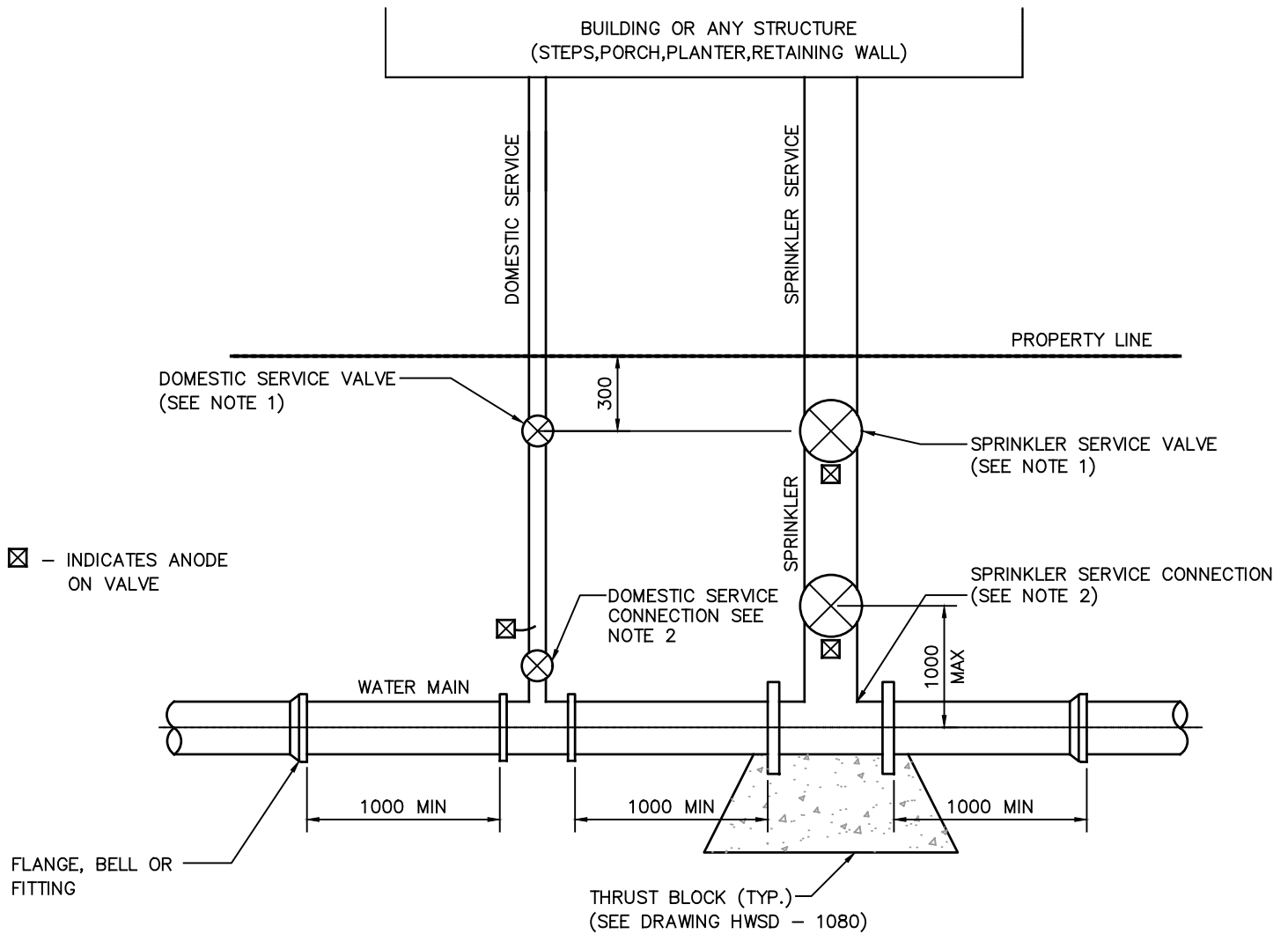
1. 90° BENDS ARE NOT PERMITTED ON CARRIER PIPES.
2. CARRIER PIPE AND LONG RADIUS BENDS TO BE GASKETED.
3. NO COUPLINGS / CONNECTIONS ARE PERMITTED IN CARRIER PIPE.
4. CARRIER PIPE TO BE INSPECTED PRIOR TO BACKFILLING.
5. BACKFILLING OF SERVICE TRENCH AS PER SECTION 33 11 00 (PART 3.2.1.1).
6. REFER TO SECTION 39 00 00 FOR STANDARD SERVICE INSTALLATIONS.
7. COVER OF 1600mm IS TO BE MAINTAINED TO THE VERTICAL BEND UNDERNEATH GARAGES.

No.	DESCRIPTION	DATE	BY	CHKD
2	GENERAL REVISIONS FOR 2018	05 04 18	ST	
1	GENERAL REVISIONS FOR 2016	16 03 01	SS	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
<b>WATER SERVICE CONNECTION FOR SLAB ON GRADE CONSTRUCTION</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N.A.
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1182</b>			



**NOTES:**

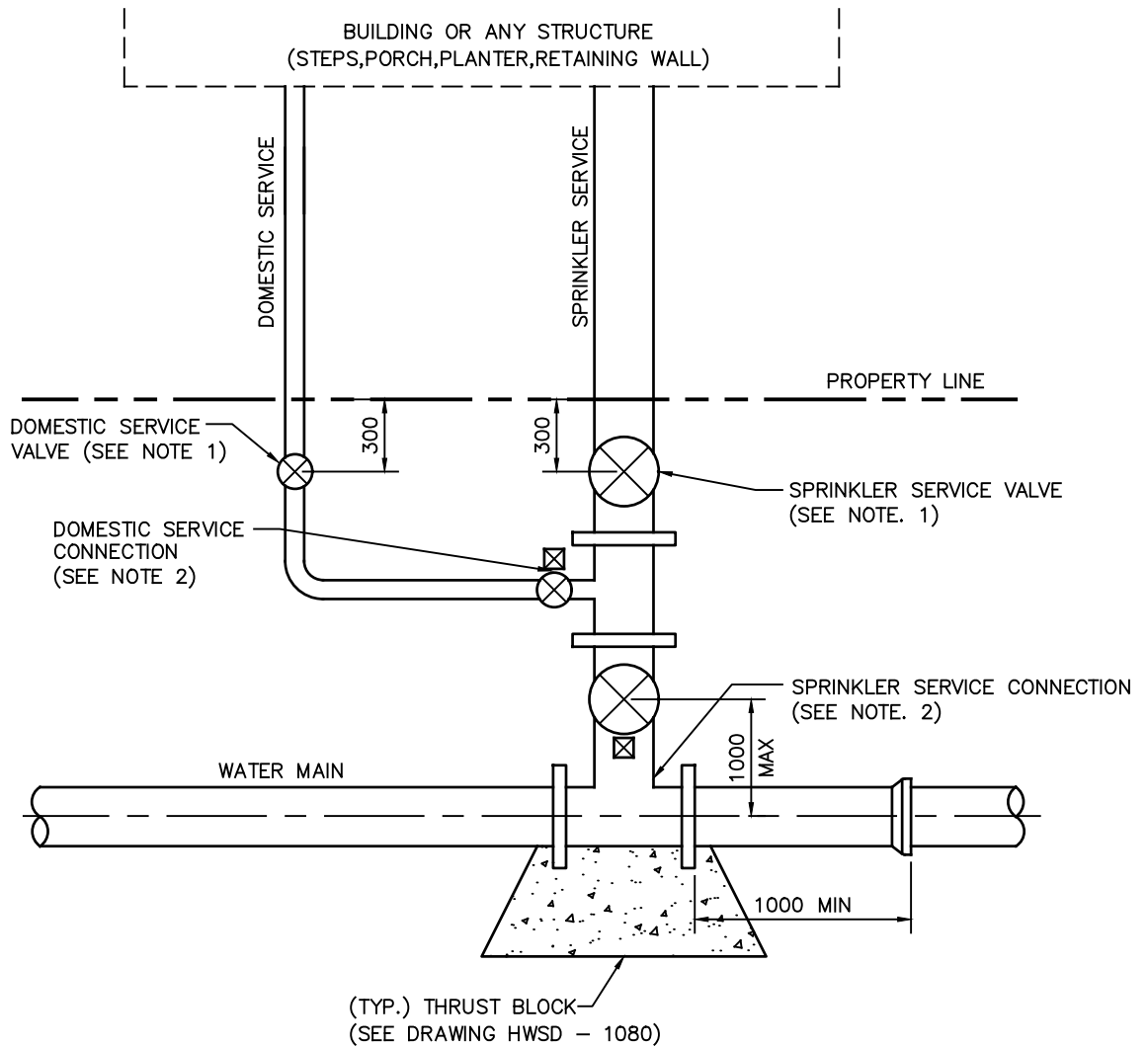
1. **DOMESTIC / SPRINKLER SERVICE VALVE REQUIREMENTS**
  - 19 mm TO 25 mm - CURB STOP WITH SERVICE BOX (SEE HWSO-1150/1160/1170)
  - 38 mm TO 50 mm - CURB STOP INSTALLED IN VALVE BOX (SEE HWSO-1180)
  - 100 mm AND LARGER - GATE VALVE C/W VALVE BOX
  
2. **DOMESTIC / SPRINKLER SERVICE CONNECTION REQUIREMENTS**
  - 19 mm TO 25 mm SERVICES - CORPORATION STOP, C/W ANODE (SEE HWSO-1150/1160/1170)
  - 38 mm TO 50 mm SERVICES - CORPORATION STOP, C/W SERVICE SADDLE AND ANODE (SEE HWSO-1180)
  - 100 mm AND LARGER - TAPPING SLEEVE AND VALVE C/W VALVE BOX, ANODE AND THRUST BLOCK / OR CUT IN TEE AND VALVE C/W VALVE BOX, ANODE AND THRUST BLOCK
  - (SEE SECTIONS 3.3.10.1.2 AND 3.3.10.1.3 FOR TAPPING SLEEVE / CUT-IN-TEE REQUIREMENTS)
  
3. **VALVE COVER REQUIREMENTS**
  - SPRINKLER VALVE BOX SHALL READ "SPKLR"
  - DOMESTIC VALVE BOX COVERS SHALL READ "SERV"

No.	DESCRIPTION	DATE	BY	CHKD
11	NEW DETAIL FOR 2019	19 06 07	ST	
11	NOTE 2 REVISED	16 01 28	SS	
10	ADDED SPRINKLER VALVE AT PL	14 02 25	SS	
9	GENERAL REVISIONS FOR 2011	11 03 21	SK	
8	GENERAL REVISIONS FOR 2009	09 06 09	ML	
7	DIMENSIONS ADJUSTED	04 04 01	BC	
6	TITLE BLOCK CLEANUP	03 04 08	BC	
5	NOTE 2 REVISED	01 01 10	MC	
4	TAPPING VALVE DIMENSION CHANGED	00 03 20	MC	
3	NOTES 3 & 4 REVISED	00 03 20	MC	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
<b>TYPICAL DOMESTIC &amp; SPRINKLER SEPARATE SERVICE CONNECTION</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1210 (2019)</b>			



NOTES:

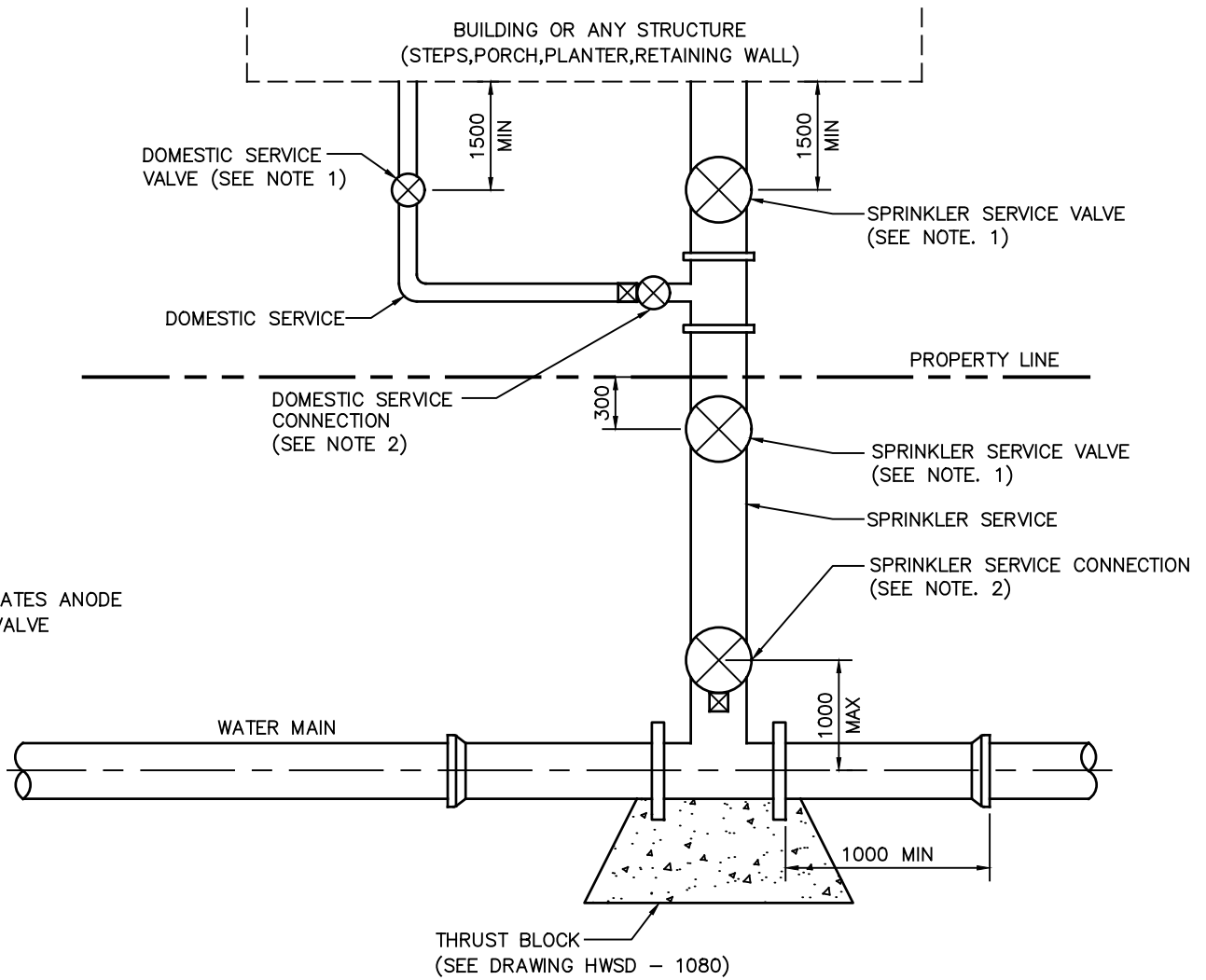
1. **DOMESTIC / SPRINKLER SERVICE VALVE REQUIREMENTS**
  - 19 mm TO 25 mm - CURB STOP WITH SERVICE BOX (SEE HWSO-1150/1160/1170)
  - 38 mm TO 50 mm - CURB STOP INSTALLED IN VALVE BOX (SEE HWSO-1180)
  - 100 mm AND LARGER - GATE VALVE C/W VALVE BOX
2. **DOMESTIC / SPRINKLER SERVICE CONNECTION REQUIREMENTS**
  - 19 mm TO 25 mm SERVICES - CORPORATION STOP, C/W ANODE (SEE HWSO-1150/1160/1170)
  - 38 mm TO 50 mm SERVICES - CORPORATION STOP, C/W SERVICE SADDLE AND ANODE (SEE HWSO-1180)
  - 100 mm AND LARGER - TAPPING SLEEVE AND VALVE C/W VALVE BOX, ANODE AND THRUST BLOCK / OR CUT IN TEE AND VALVE C/W VALVE BOX, ANODE AND THRUST BLOCK
  - (SEE SECTIONS 3.3.10.1.2 AND 3.3.10.1.3 FOR TAPPING SLEEVE / CUT-IN-TEE REQUIREMENTS)
3. **VALVE COVER REQUIREMENTS**
  - SPRINKLER VALVE BOX SHALL READ "SPKLR"
  - DOMESTIC VALVE BOX COVERS SHALL READ "SERV"

No.	DESCRIPTION	DATE	BY	CHKD
11	NEW DETAIL FOR 2019	06 07 19	SS	
10	GENERAL REVISIONS	28 01 16	SS	
9	GENERAL REVISIONS FOR 2011	11 03 21	SK	
8	GENERAL REVISIONS FOR 2009	09 06 09	ML	
7	NOTE 5 REVISED	04 04 01	BC	
6	TITLE BLOCK CLEANUP	03 04 08	BC	
5	NOTE 2 REVISED	01 01 10	MC	
4	PROPERTY LINE VALVE ADDED	00 03 20	MC	
3	TAPPING VALVE DIMENSION REVISED	00 03 20	MC	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
PUBLIC BRANCH DOMESTIC & SPRINKLER CONNECTIONS AS ONE SERVICE CONNECTION			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1220 (2019)			



**NOTES:**

1. **DOMESTIC / SPRINKLER SERVICE VALVE REQUIREMENTS**
  - 19 mm TO 25 mm – CURB STOP WITH SERVICE BOX (SEE HWSD-1150/1160/1170)
  - 38 mm TO 50 mm – CURB STOP INSTALLED IN VALVE BOX (SEE HWSD-1180)
  - 100 mm AND LARGER – GATE VALVE C/W VALVE BOX
  
2. **DOMESTIC / SPRINKLER SERVICE CONNECTION REQUIREMENTS**
  - 19 mm TO 25 mm SERVICES – CORPORATION STOP, C/W ANODE (SEE HWSD-1150/1160/1170)
  - 38 mm TO 50 mm SERVICES – CORPORATION STOP, C/W SERVICE SADDLE AND ANODE (SEE HWSD-1180)
  - 100 mm AND LARGER – TAPPING SLEEVE AND VALVE C/W VALVE BOX, ANODE AND THRUST BLOCK / OR – CUT IN TEE AND VALVE C/W VALVE BOX, ANODE AND THRUST BLOCK
  - (SEE SECTIONS 3.3.10.1.2 AND 3.3.10.1.3 FOR TAPPING SLEEVE / CUT-IN-TEE REQUIREMENTS)
  
3. **VALVE COVER REQUIREMENTS**
  - SPRINKLER VALVE BOX SHALL READ "SPKLR"
  - DOMESTIC VALVE BOX COVERS SHALL READ "SERV"

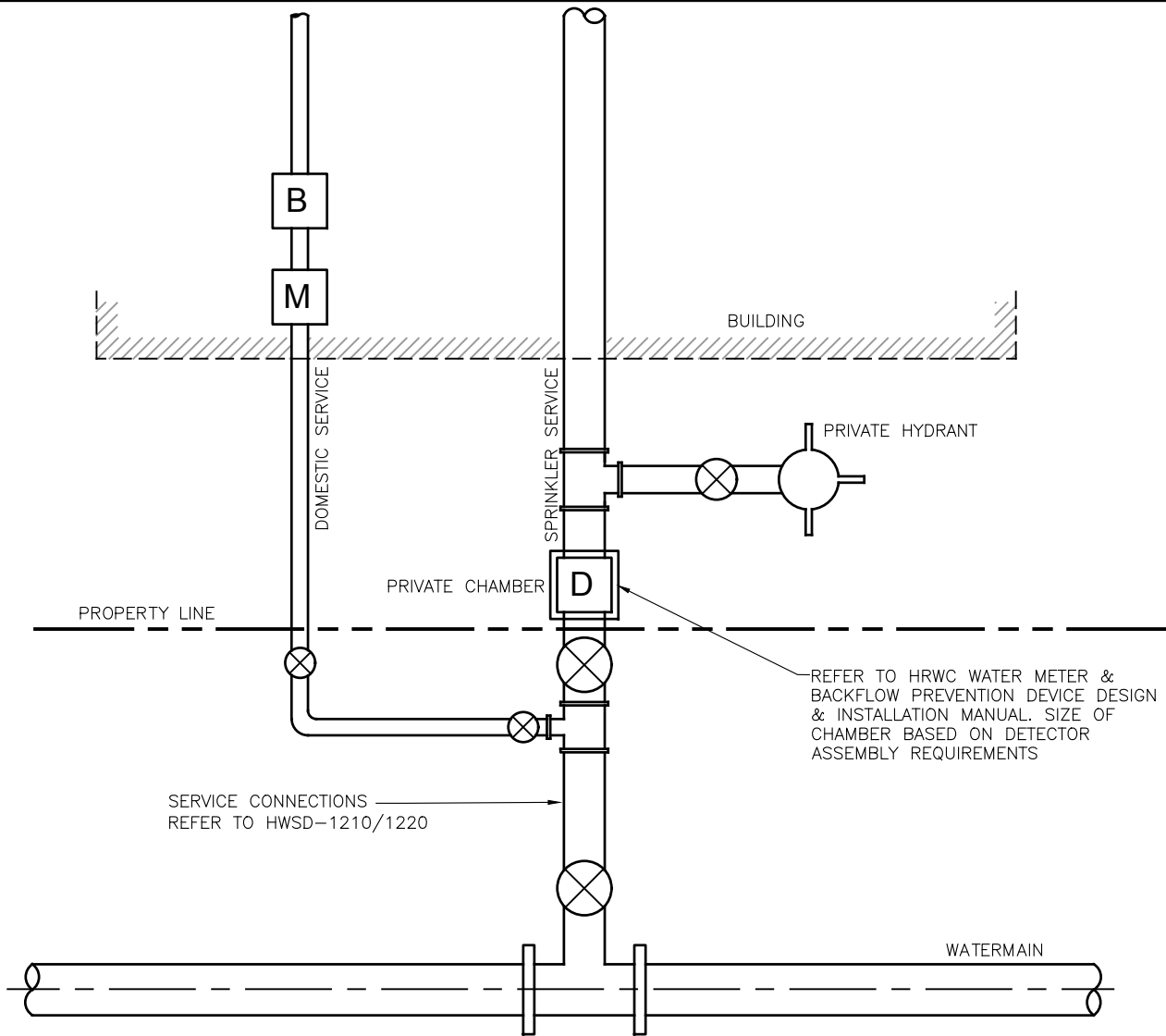
No.	DESCRIPTION	DATE	BY	CHKD
11	NEW DETAIL FOR 2019	16 06 07	ST	
10	NOTE 2 REVISED	16 01 28	SS	
9	ADDED SPRINKLER VALVE AT PL	14 02 25	SS	
8	GENERAL REVISIONS FOR 2011	11 03 21	SK	
7	GENERAL REVISIONS FOR 2009	09 06 09	ML	
6	NOTE 4 REVISED	04 04 01	BC	
5	TITLE BLOCK CLEANUP	03 04 08	BC	
4	NOTE 2 REVISED	01 01 10	MC	
3	TAPPING VALVE DIMENSION REVISED	00 03 20	MC	
2	PROPERTY LINE VALVE REMOVED	99 12 20	RJ	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



<b>PROJECT</b>			
PRIVATE BRANCH DOMESTIC & SPRINKLER CONNECTIONS AS ONE SERVICE CONNECTION			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1230 (2019)			





LEGEND:

- D DETECTOR ASSEMBLY (DOUBLE CHECK DETECTOR ASSEMBLY OR REDUCED PRESSURE DETECTOR ASSEMBLY) IN CHAMBER/ENCLOSURE
- M WATER METER
- B BACKFLOW PREVENTION DEVICE

NOTES:

1. THE REQUIRED DETECTOR ASSEMBLY ON THE SPRINKLER SERVICE IS DETERMINED BASED ON THE TYPE OF SPRINKLER OR STANDPIPE SYSTEM PROPOSED TO BE INSTALLED.
2. PRIVATE HYDRANTS TO BE PAINTED SAFETY YELLOW.
3. BOLLARDS, IF REQUIRED, REFER TO HWS-1130.
4. REDUCED PRESSURE DETECTOR ASSEMBLY DEVICES CANNOT BE INSTALLED IN A CHAMBER. THESE DEVICES MUST BE INSTALLED IN AN ABOVE GROUND HEATED ENCLOSURE.

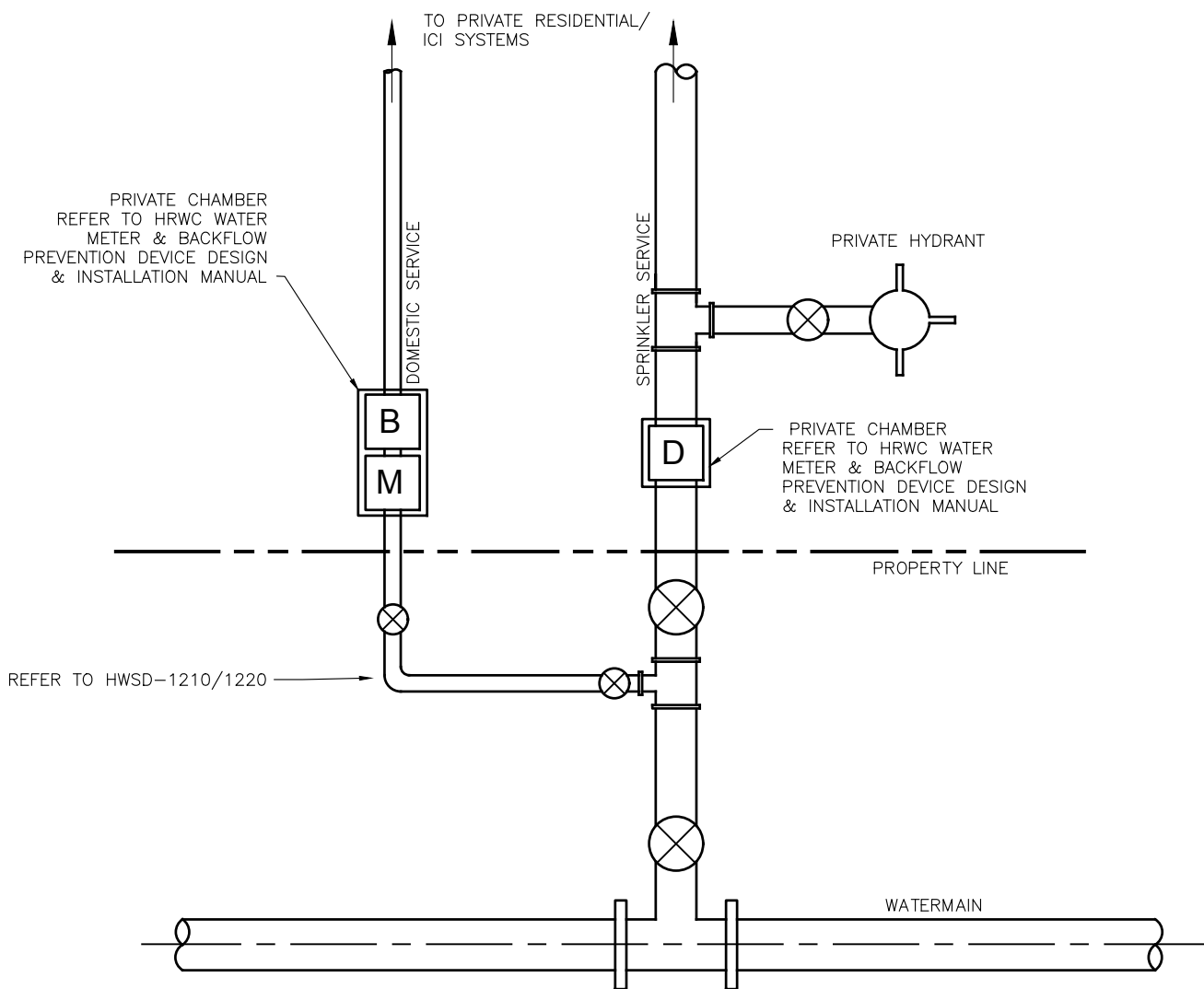
1	GENERAL REVISIONS FOR 2018	05/04/18	ST				
No.	DESCRIPTION	DATE	BY	CHKD			

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



<b>PROJECT</b>			
<b>PRIVATE HYDRANT OFF SPRINKLER SERVICE CONNECTION</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1234</b>			





**LEGEND:**

- |   |   |
|---|---|
| D | DETECTOR ASSEMBLY (DOUBLE CHECK DETECTOR ASSEMBLY OR REDUCED PRESSURE DETECTOR ASSEMBLY) IN CHAMBER/ENCLOSURE |
| B | BACKFLOW PREVENTION DEVICE IN CHAMBER   |
| M | WATER METER IN CHAMBER  |

**NOTES:**

1. THE REQUIRED DETECTOR ASSEMBLY ON THE SPRINKLER SERVICE IS DETERMINED BASED ON THE TYPE OF SPRINKLER OR STANDPIPE SYSTEM PROPOSED TO BE INSTALLED.
2. PRIVATE HYDRANTS TO BE PAINTED SAFETY YELLOW.
3. BOLLARDS, IF REQUIRED, REFER TO HWS-1130.
4. REDUCED PRESSURE DETECTOR ASSEMBLY DEVICES CANNOT BE INSTALLED IN A CHAMBER. THESE DEVICES MUST BE INSTALLED IN AN ABOVE GROUND HEATED ENCLOSURE.

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.

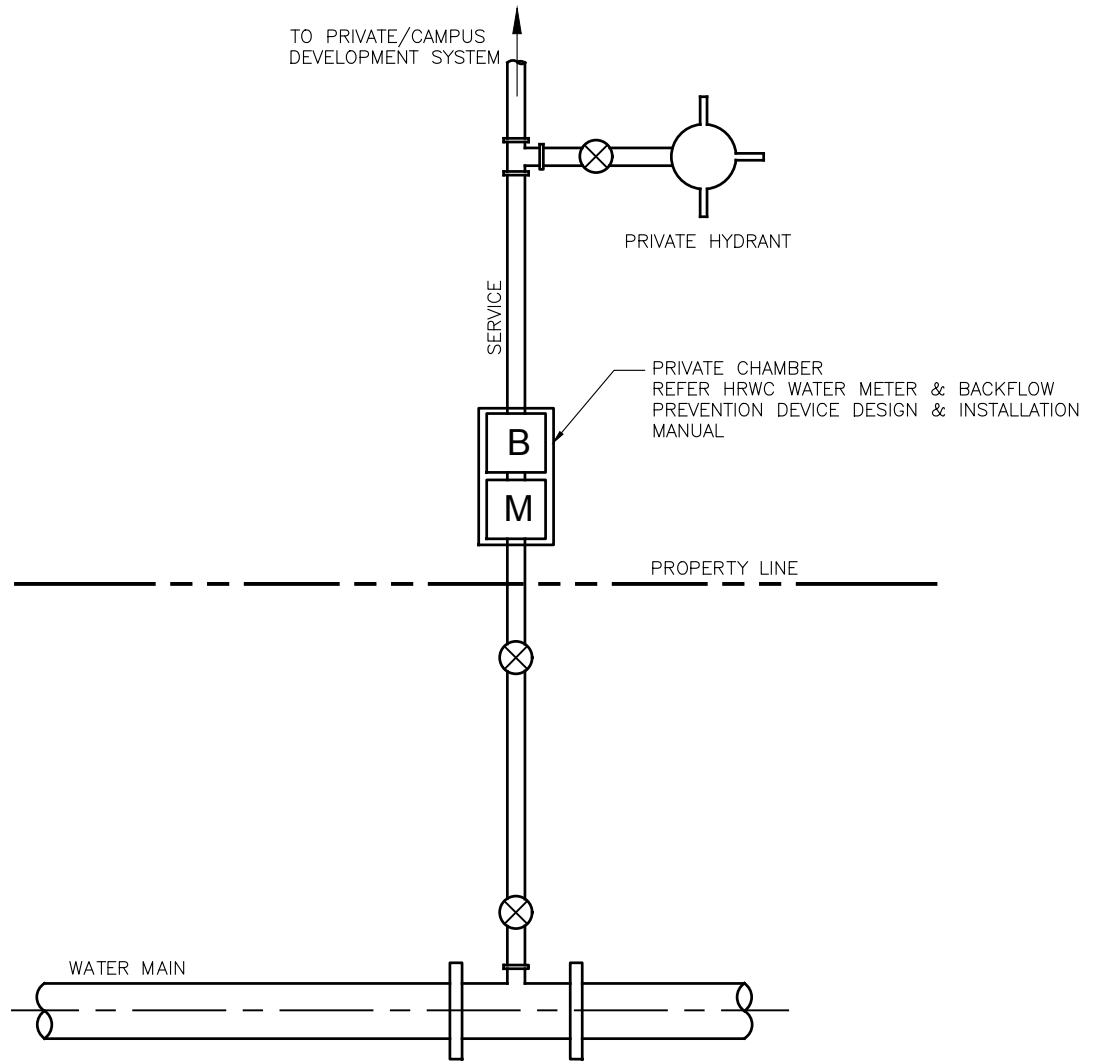


**PROJECT**  
WATER SERVICE CONNECTION  
FOR  
CAMPUS ARRANGEMENT

DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15

PROJECT No.  
DWG. No. **HWSD - 1236**

1	GENERAL REVISIONS FOR 2018	05/04/18	ST	
No.	DESCRIPTION	DATE	BY	CHKD



LEGEND:

<b>B</b>	BACKFLOW PREVENTION DEVICE IN CHAMBER/ENCLOSURE
<b>M</b>	WATER METER IN CHAMBER

NOTES:

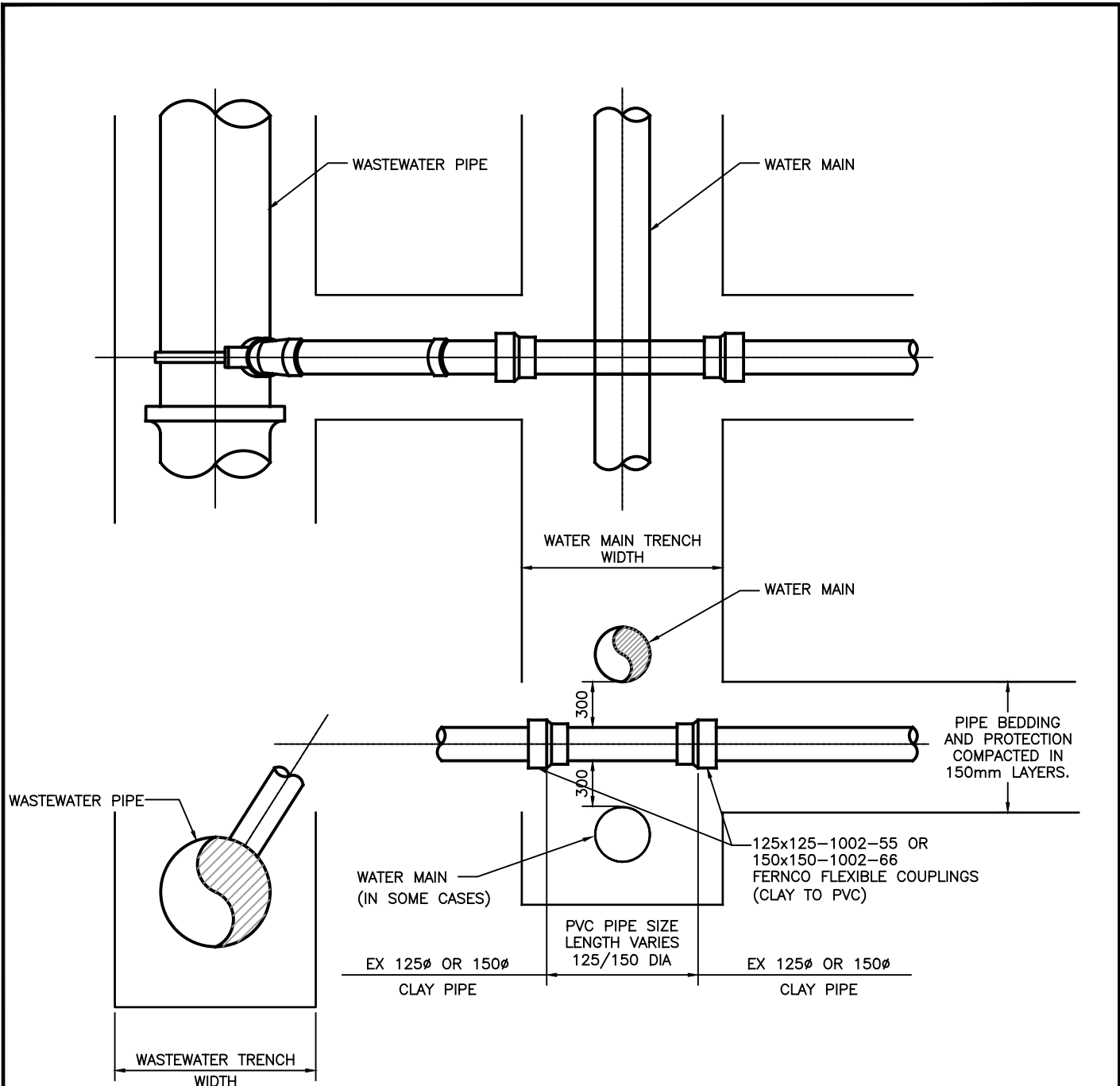
1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICES CANNOT BE INSTALLED IN A CHAMBER. THESE DEVICES MUST BE INSTALLED IN AN ABOVE GROUND HEATED ENCLOSURE.

No.	DESCRIPTION	DATE	BY	CHKD
1	GENERAL REVISIONS FOR 2018	05/04/18	ST	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT	
<b>WATER SERVICE CONNECTION FOR CAMPUS ARRANGEMENT</b>	
DRAWN J.W.	SCALE (PLAN) N.T.S.
CHECKED J.D.	SCALE (PROFILE)
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. <b>HWSD - 1238</b>	



**NOTES:**

1. ALL PVC GRAVITY WASTEWATER PIPE LESS THAN 200 DIA. SHALL BE DR-28
2. FOR 200 DIA AND OVER PVC PIPE SHALL BE DR35.
3. TAMPING EQUIPMENT AND METHODS AS PER PIPE MANUFACTURERS INSTRUCTIONS.

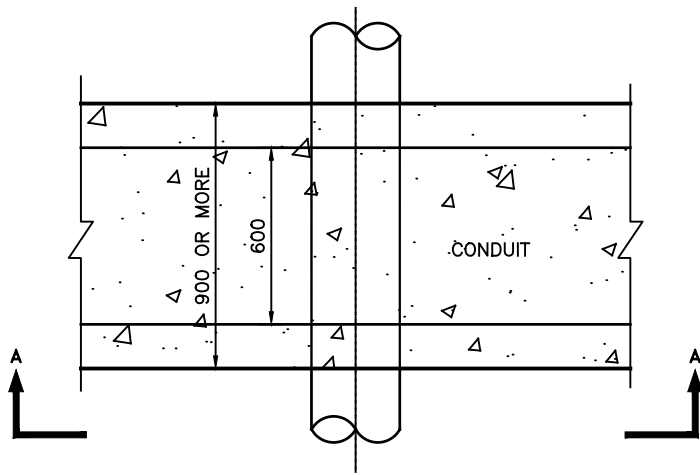
SCALE PLOTTED: 1=1 DATE PLOTTED: 4/23/2008 NOTES:

No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2016	16 03 01	SS	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	TITLE BLOCK CLEANUP	03 04 08	BC	

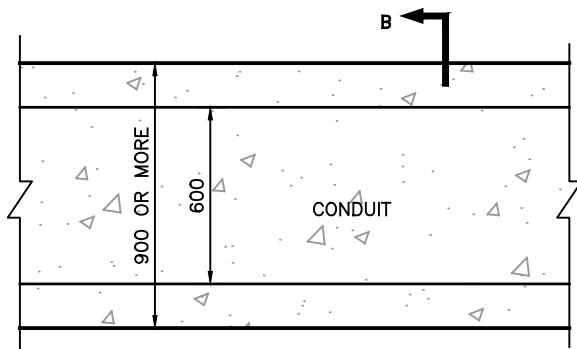
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		<b>EXISTING WASTEWATER SERVICE CONNECTION REPAIR DETAIL</b>	
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1240</b>			

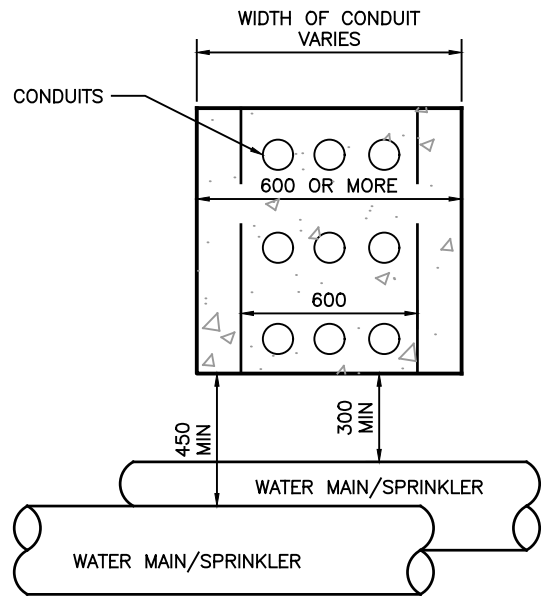
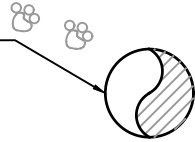


PLAN VIEW



SECTION 'A'

WATER MAIN OR  
SPRINKLER SERVICE



SECTION 'B'

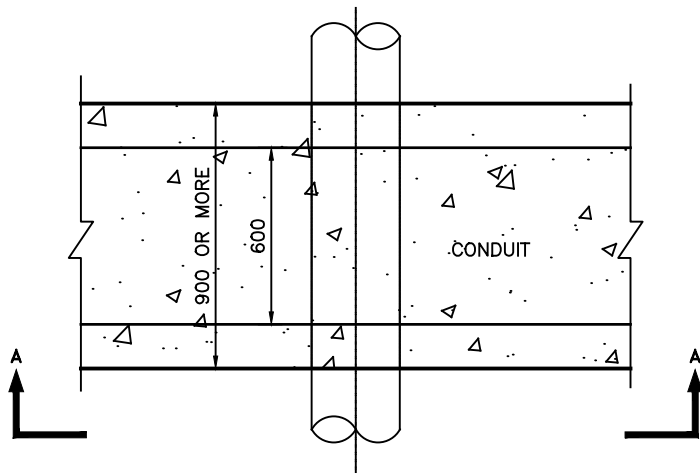
**NOTES**

REQUIRED SEPARATION BETWEEN WATER MAIN/SPRINKLER AND CONDUIT IS AS FOLLOWS

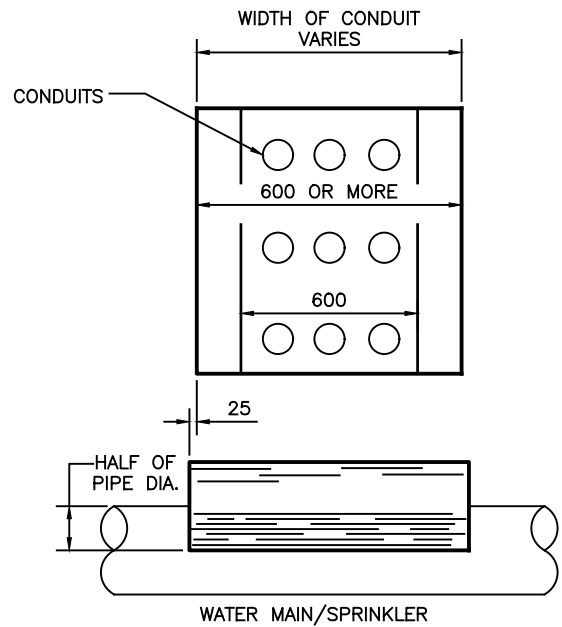
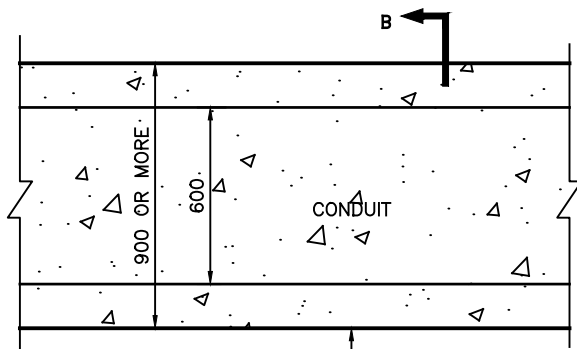
WIDTH OF CONDUIT ENCASED IN CONCRETE	MINIMUM CLEARANCE
UP TO 600 mm	300 mm
600 mm AND GREATER	450 mm

IF REQUIRED SEPARATION CANNOT BE ACHIEVED USE DRAWING HWSD – 1260

					<p>NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>	<p>PROJECT <b>REQUIRED MINIMUM CLEARANCES BETWEEN UNDERGROUND CONDUITS AND WATER SYSTEM</b></p>	
						<p>DRAWN J.W. SCALE (PLAN) N.T.S.</p> <p>CHECKED J.D. SCALE (PROFILE)</p> <p>APPROVED K.G. DATE 17/02/15</p>	
					<p>PROJECT No.</p>		
					<p>DWG. No. <b>HWSD – 1250</b></p>		
3	GENERAL REVISIONS FOR 2009	09 06 09	ML				
2	TITLE BLOCK CLEANUP	03 04 08	BC				
1	GENERAL REVISION	99 12 20	RJ				
No.	DESCRIPTION	DATE	BY	CHKD			



PLAN VIEW



SEE NOTE

MIN. 150 mm AROUND  
AND DOWN TO  $\phi$  OF PIPE

PVC PIPE  
(AWWA C900)

TYPE 1 GRAVEL  
WELL COMPACTED

WATER MAIN OR  
SPRINKLER SERVICE

SECTION 'A'

SECTION 'B'

**NOTES**

PVC SLEEVES OVER WATER MAIN REQUIRED WHEN:

WIDTH OF CONDUIT ENCASED IN CONCRETE

LESS THAN 600 mm  
600 mm AND GREATER

MINIMUM CLEARANCE

LESS THAN 300 mm  
LESS THAN 450 mm

No.	DESCRIPTION	DATE	BY	CHKD
4	REVISED TITLE	16 01 28	SS	
3	GENERAL REVISIONS FOR 2009	09 06 09	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	GENERAL REVISION	99 12 20	RJ	

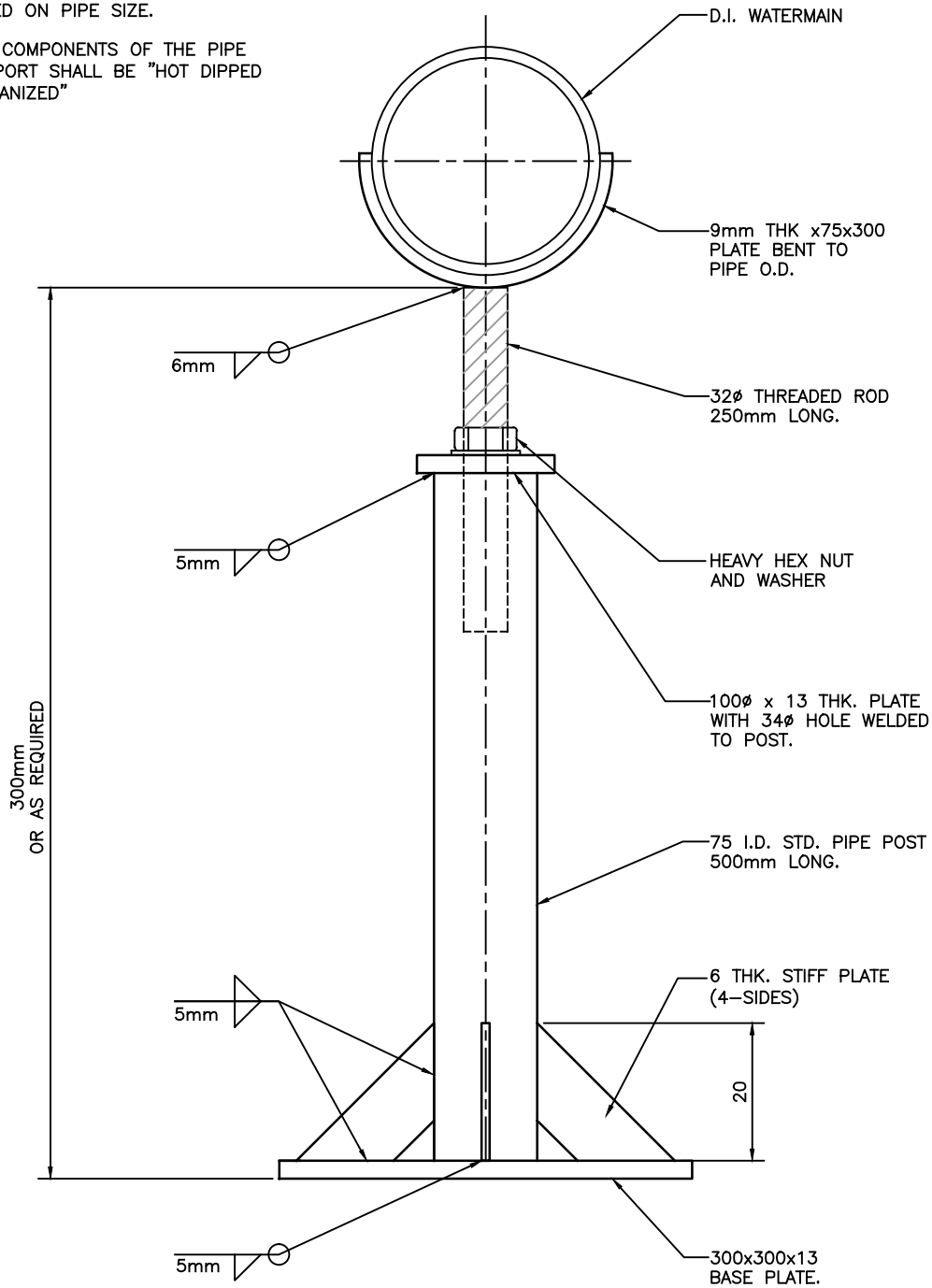
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT	
REQUIRED MINIMUM CLEARANCES BETWEEN NEW UNDERGROUND CONDUITS AND EX. WATER MAIN/SPRINKLER (PVC SLEEVES)	
DRAWN J.W.	SCALE (PLAN) N.T.S.
CHECKED J.D.	SCALE (PROFILE)
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. HWSD - 1260	

**NOTES:**

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



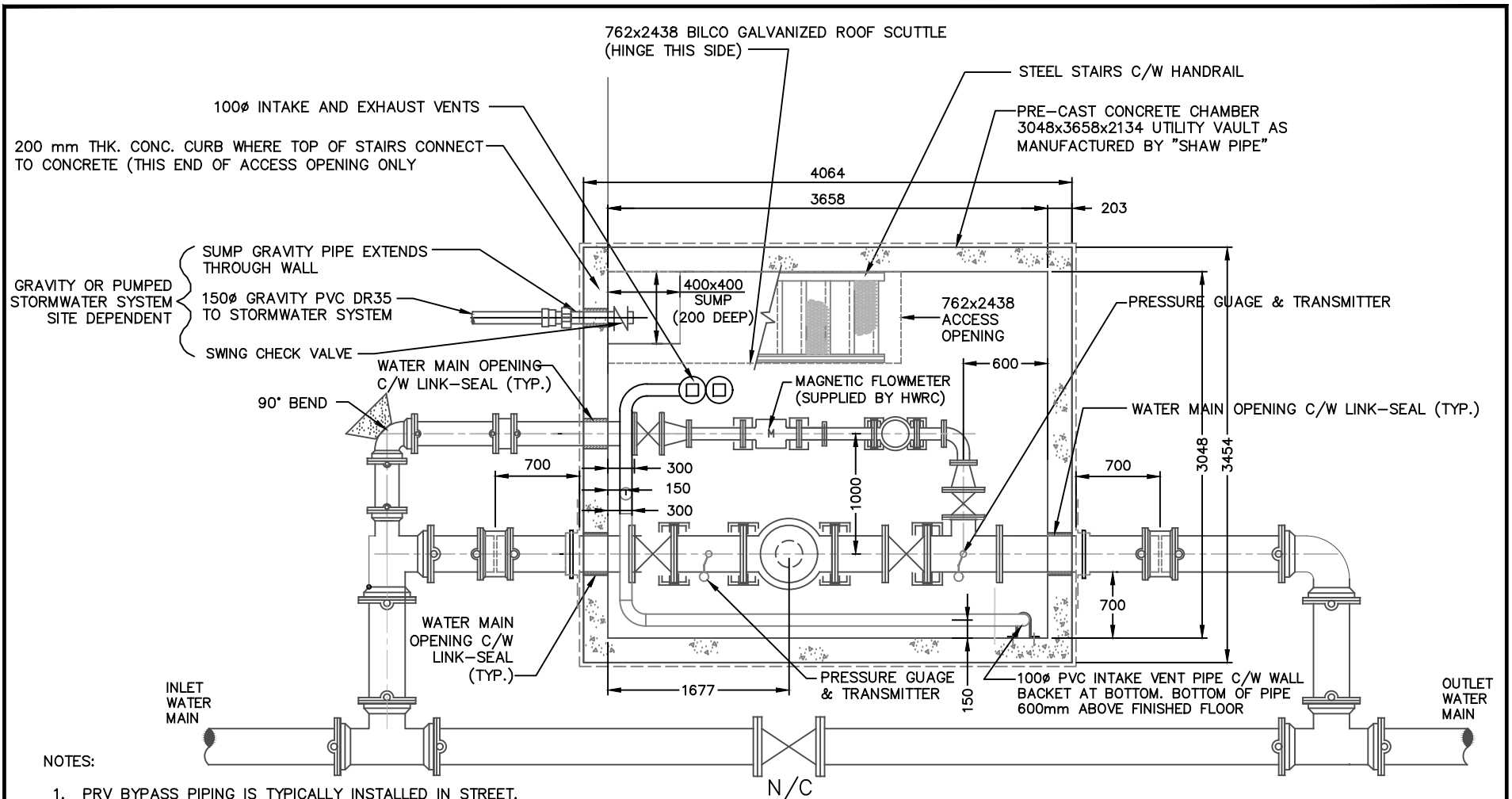
SCALE PLOTTED: 1=1 DATE PLOTTED: 4/29/2008 NOTES:

No.	DESCRIPTION	DATE	BY	CHKD
5	GENERAL REVISIONS FOR 2016	16 03 01	SS	
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.	



**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			



NOTES:

1. PRV BYPASS PIPING IS TYPICALLY INSTALLED IN STREET.
2. HALIFAX WATER WILL ADVISE ON PIPE / VALVE SIZING DEPENDING ON PROJECT REQUIREMENTS.
3. SEE DWG. HWSD - 1292 FOR SECTION VIEW.
4. ALL INTERNAL PIPING WITHIN THE CHAMBER SHALL BE STAINLESS STEEL.
5. VICTAULIC COUPLINGS NOT SHOWN
6. DETAILED DESIGN OF PRV TO BE SUBMITTED TO HRWC FOR REVIEW

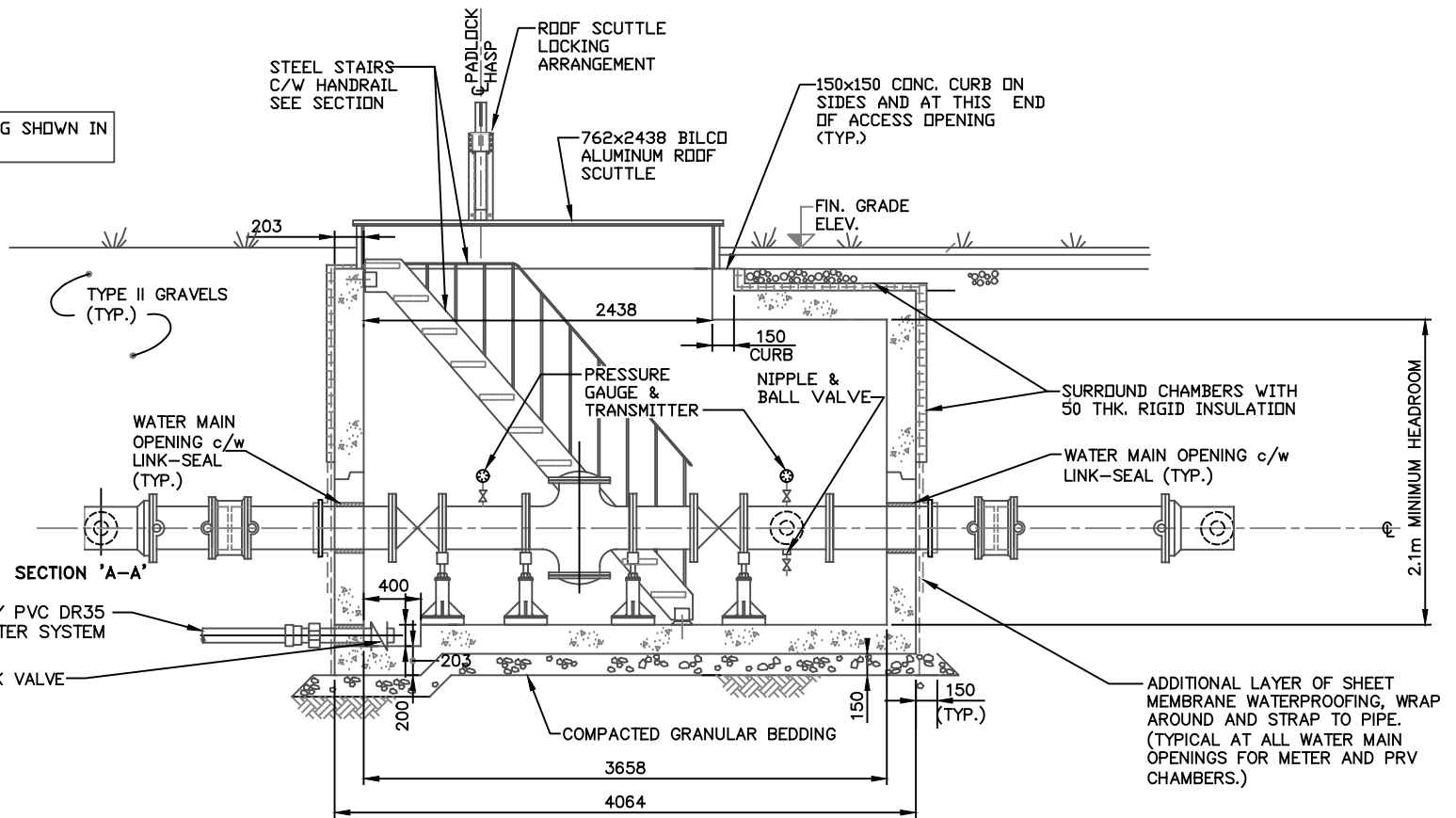
No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2018	05/04/18	ST	
2	GENERAL REVISIONS FOR 2016	16 03 01	SS	
1	REVISED VALVE, REDUCER SEQUENCE INSIDE CHAMBER	15 02 17	SS	.
0	REVISION DETAILS	YY MM DD	XX	.

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
<b>PRV CHAMBER</b>			
<b>PLAN</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N/A
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1290</b>			

SUMP AND ACCESS OPENING SHOWN IN FOREGROUND FOR CLARITY



NOTES:

1. PRV BYPASS PIPING IS TYPICALLY INSTALLED IN STREET.
2. HALIFAX WATER WILL ADVISE ON PIPE / VALVE SIZING DEPENDING ON PROJECT REQUIREMENTS.
3. SEE DWG. HWSO - 1290 FOR PLAN VIEW.
4. 2% SLOPE ON FLOOR TO SUMP
5. ALL INTERNAL PIPING WITHIN THE CHAMBER SHALL BE STAINLESS STEEL.
6. VICTAULIC COUPLINGS NOT SHOWN
7. DETAILED DESIGN OF PRV TO BE SUBMITTED TO HRWC FOR REVIEW

PRE-CAST CONCRETE CHAMBER IS A 3048x3658x2134 UTILITY VAULT AS MANUFACTURED BY "SHAW PIPE"

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.

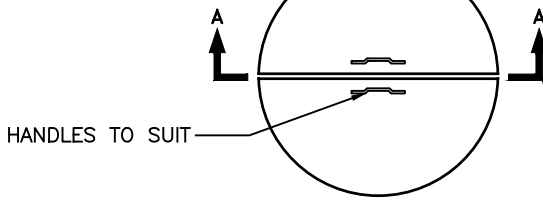


PROJECT			
<b>PRV CHAMBER</b>			
<b>SECTION</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N/A
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1292</b>			

No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2018	18 7 05	ST	
2	GENERAL REVISIONS FOR 2016	16 03 01	SS	
1	ADDED NOTE 4, HEADROOM DIMENSION	15 03 02	SS	
0	NEW DRAWING	14 02 04	SS	



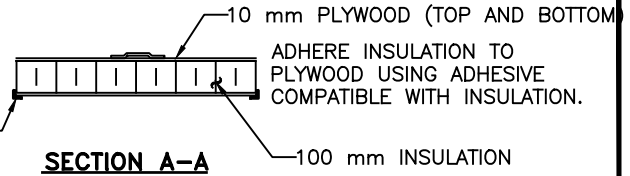
CONSTRUCT IN TWO PIECES.  
DIAMETER TO MATCH OPENING  
IN CHAMBER COVER



HANDLES TO SUIT

PLAN

25 mm x 25 mm x 6 mm  
ANGLE AROUND  
OPENING ANCHORED  
TO CONCRETE.



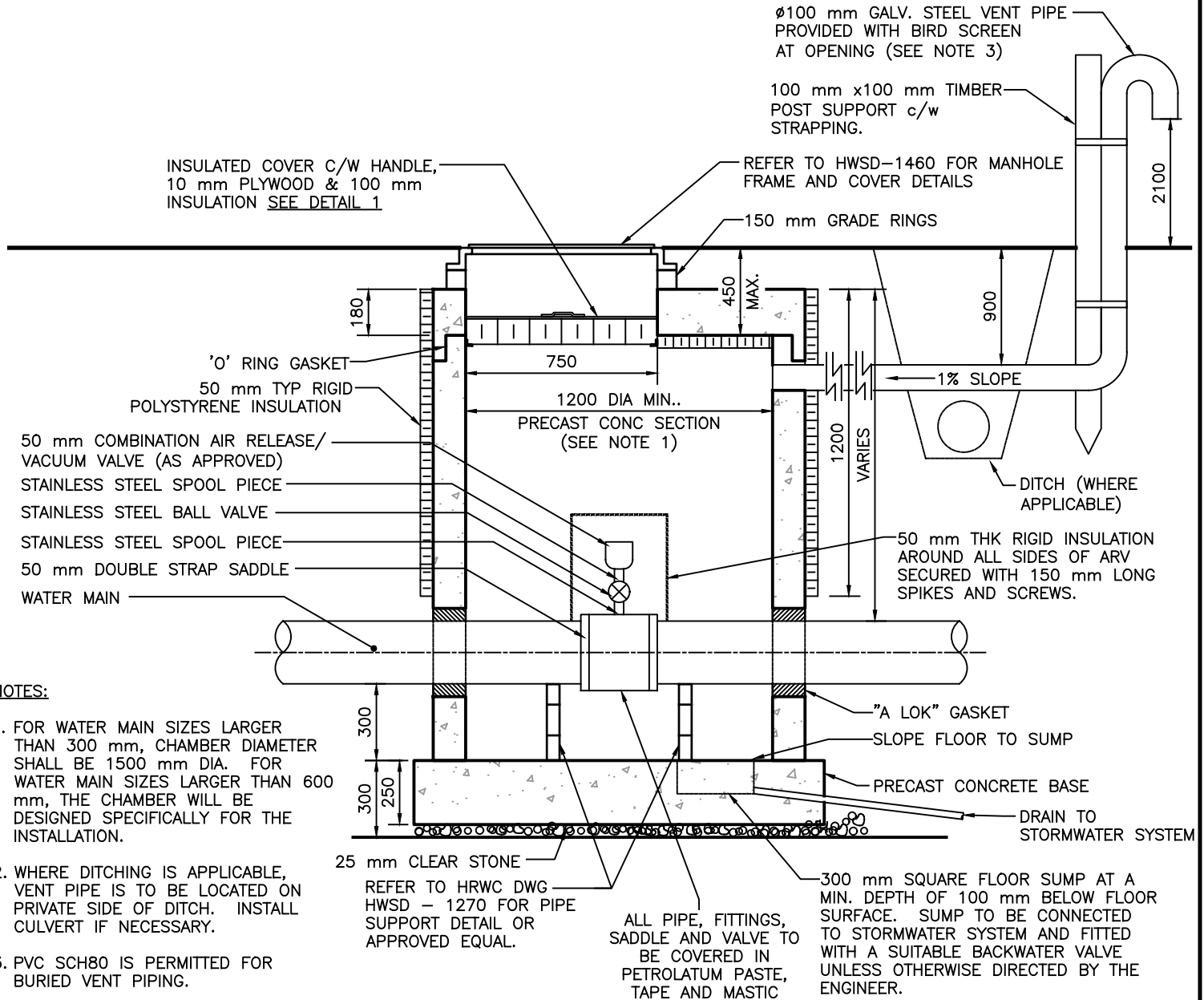
SECTION A-A

ADHERE INSULATION TO  
PLYWOOD USING ADHESIVE  
COMPATIBLE WITH INSULATION.

100 mm INSULATION

# 1 MANHOLE COVER DETAIL

SCALE: 1:25



**NOTES:**

- FOR WATER MAIN SIZES LARGER THAN 300 mm, CHAMBER DIAMETER SHALL BE 1500 mm DIA. FOR WATER MAIN SIZES LARGER THAN 600 mm, THE CHAMBER WILL BE DESIGNED SPECIFICALLY FOR THE INSTALLATION.
- WHERE DITCHING IS APPLICABLE, VENT PIPE IS TO BE LOCATED ON PRIVATE SIDE OF DITCH. INSTALL CULVERT IF NECESSARY.
- PVC SCH80 IS PERMITTED FOR BURIED VENT PIPING.

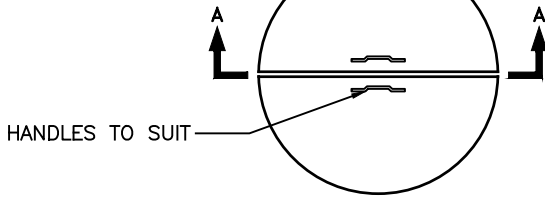
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
COMMERCIAL/INDUSTRIAL AIR RELEASE / AIR VACUUM VALVE CHAMBER (50 mm)			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N.T.S.
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1310 (2019)			

No.	DESCRIPTION	DATE	BY	CHKD
8	NEW DETAIL FOR 2019	19 06 07	ST	
7	ADDED FLOOR DRAIN, REVISED NOTE	16 01 28	SS	
6	DELETE LADDER	11 03 21	BDC	
5	GENERAL REVISIONS FOR 2009	09 06 09	ML	
4	PIPE SUPPORT REVISION	07 04 27	RJ	
3	TITLE BLOCK CLEANUP	03 04 08	BC	
2	GENERAL REVISIONS	99 01 06	MC	
1	GENERAL REVISIONS	98 01 22	MC	

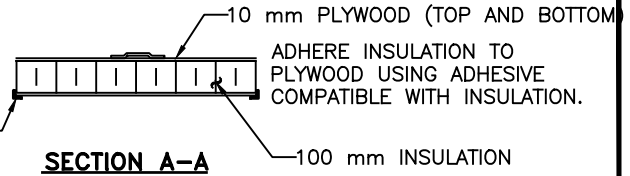
CONSTRUCT IN TWO PIECES.  
DIAMETER TO MATCH OPENING  
IN CHAMBER COVER



HANDLES TO SUIT

PLAN

25 mm x25 mm x6 mm  
ANGLE AROUND  
OPENING ANCHORED  
TO CONCRETE.



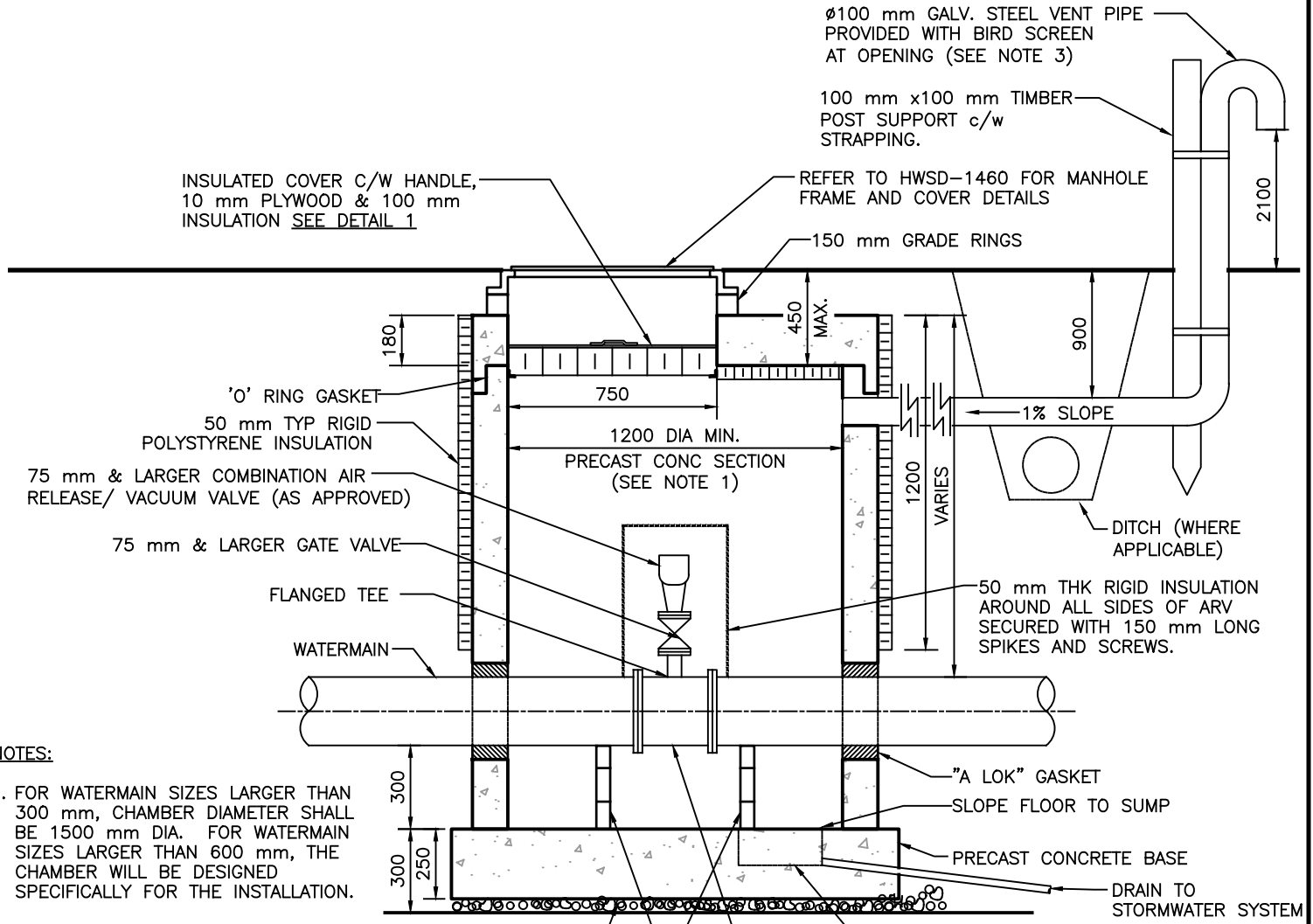
SECTION A-A

ADHERE INSULATION TO  
PLYWOOD USING ADHESIVE  
COMPATIBLE WITH INSULATION.

100 mm INSULATION

# 1 MANHOLE COVER DETAIL

SCALE: 1:25



**NOTES:**

- FOR WATERMAIN SIZES LARGER THAN 300 mm, CHAMBER DIAMETER SHALL BE 1500 mm DIA. FOR WATERMAIN SIZES LARGER THAN 600 mm, THE CHAMBER WILL BE DESIGNED SPECIFICALLY FOR THE INSTALLATION.
- WHERE DITCHING IS APPLICABLE, VENT PIPE IS TO BE LOCATED ON PRIVATE SIDE OF DITCH. INSTALL CULVERT IF NECESSARY.
- PVC SCH80 IS PERMITTED FOR BURIED VENT PIPING.

25 mm CLEAR STONE  
REFER TO HRWC DWG  
HWSD - 1270 FOR PIPE  
SUPPORT DETAIL OR  
APPROVED EQUAL.

ALL PIPE, FITTINGS,  
SADDLE AND VALVE TO  
BE COVERED IN  
PETROLATUM PASTE,  
TAPE AND MASTIC

300 mm SQUARE FLOOR SUMP AT A  
MIN. DEPTH OF 100 mm BELOW FLOOR  
SURFACE. SUMP TO BE CONNECTED  
TO STORMWATER SYSTEM AND FITTED  
WITH A SUITABLE BACKWATER VALVE  
UNLESS OTHERWISE DIRECTED BY THE  
ENGINEER.

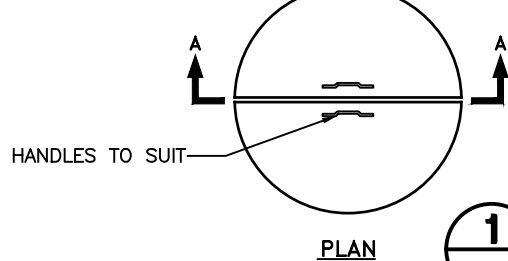
No.	DESCRIPTION	DATE	BY	CHKD
4	NEW DETAIL FOR 2019	19 06 07	ST	
3	DETAIL RENUMBERED	16 02 10	SS	
2	ADDED FLOOR DRAIN, REVISED NOTE	16 01 28	SS	
1	NEW DRAWING	13 02 14	SS	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT <b>COMMERCIAL/INDUSTRIAL AIR RELEASE / AIR VACUUM VALVE CHAMBER (75 mm &amp; LARGER)</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N.T.S.
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1320 (2019)</b>			

CONSTRUCT IN TWO PIECES.  
DIAMETER TO MATCH OPENING  
IN CHAMBER COVER



HANDLES TO SUIT

PLAN

25 mm x25 mm x6 mm  
ANGLE AROUND  
OPENING ANCHORED  
TO CONCRETE.

SECTION A-A

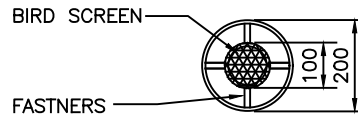
10 mm PLYWOOD  
(TOP AND BOTTOM)

ADHERE INSULATION TO  
PLYWOOD USING ADHESIVE  
COMPATIBLE WITH INSULATION.

100 mm INSULATION

# 1 MANHOLE COVER DETAIL

SCALE: 1:25



SECTION B-B

REFER TO HWS-1460 FOR MANHOLE  
FRAME AND COVER DETAILS

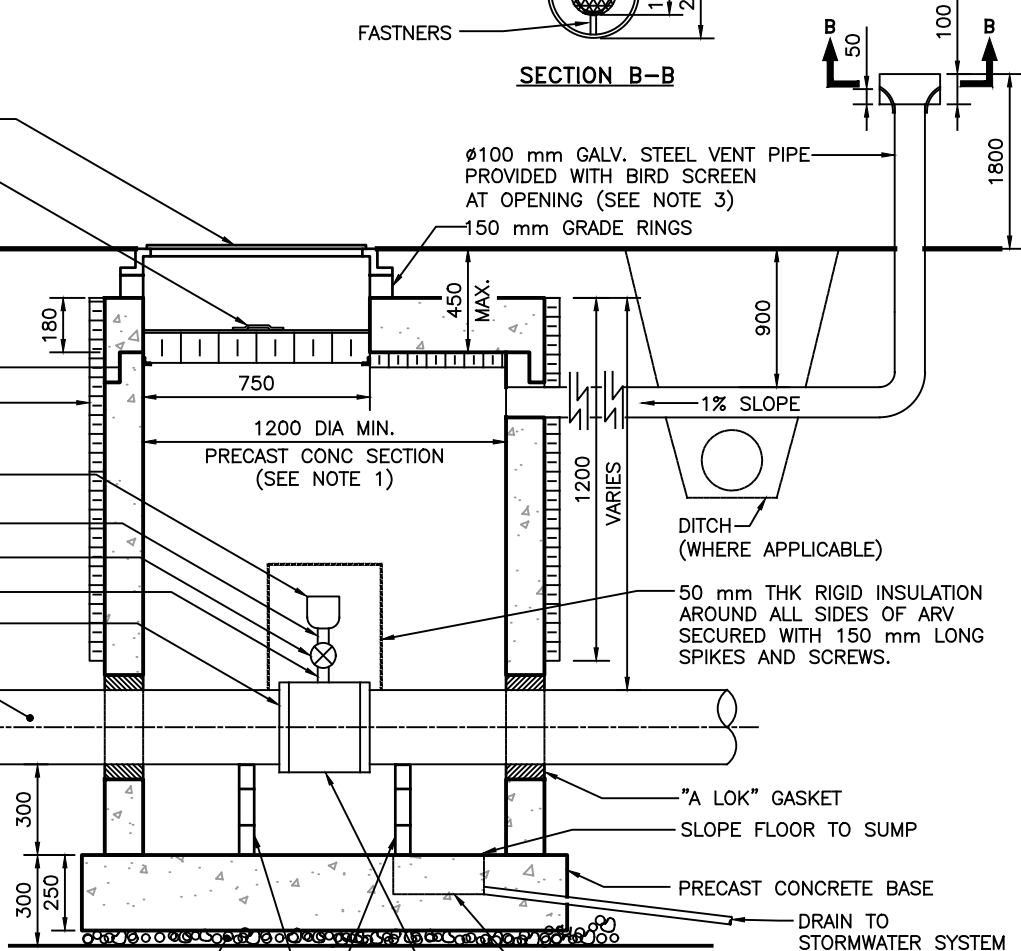
INSULATED COVER C/W HANDLE,  
10 mm PLYWOOD & 100 mm  
INSULATION SEE DETAIL 1

Ø100 mm GALV. STEEL VENT PIPE  
PROVIDED WITH BIRD SCREEN  
AT OPENING (SEE NOTE 3)

150 mm GRADE RINGS

'O' RING GASKET  
50 mm TYP RIGID  
POLYSTYRENE INSULATION

50 mm COMBINATION AIR RELEASE/  
VACUUM VALVE (AS APPROVED)  
STAINLESS STEEL SPOOL PIECE  
STAINLESS STEEL BALL VALVE  
STAINLESS STEEL SPOOL PIECE  
50 mm DOUBLE STRAP SADDLE  
WATER MAIN



**NOTES:**

- FOR WATER MAIN SIZES LARGER THAN 300 mm, CHAMBER DIAMETER SHALL BE 1500 mm DIA. FOR WATER MAIN SIZES LARGER THAN 600 mm, THE CHAMBER WILL BE DESIGNED SPECIFICALLY FOR THE INSTALLATION.
- WHERE DITCHING IS APPLICABLE, VENT PIPE IS TO BE LOCATED ON PRIVATE SIDE OF DITCH. INSTALL CULVERT IF NECESSARY.
- PVC SCH80 IS PERMITTED FOR BURIED VENT PIPING.
- REFER TO HWS-1312 FOR 75 mm & LARGER ARV.

180  
450 MAX.  
900  
1200 VARIES  
300  
250  
300

50 mm THK RIGID INSULATION  
AROUND ALL SIDES OF ARV  
SECURED WITH 150 mm LONG  
SPIKES AND SCREWS.

"A LOK" GASKET  
SLOPE FLOOR TO SUMP

PRECAST CONCRETE BASE

DRAIN TO  
STORMWATER SYSTEM

300 mm SQUARE FLOOR SUMP  
AT A MIN. DEPTH OF 100 mm  
BELOW FLOOR SURFACE. SUMP  
TO BE CONNECTED TO  
STORMWATER SYSTEM AND FITTED  
WITH A SUITABLE BACKWATER  
VALVE UNLESS OTHERWISE  
DIRECTED BY THE ENGINEER.

REFER TO HRWC DWG  
HWS-1270 FOR PIPE  
SUPPORT DETAIL OR  
APPROVED EQUAL.

ALL PIPE, FITTINGS,  
SADDLE AND VALVE TO  
BE COVERED IN  
PETROLATUM PASTE,  
TAPE AND MASTIC

25 mm CLEAR  
STONE

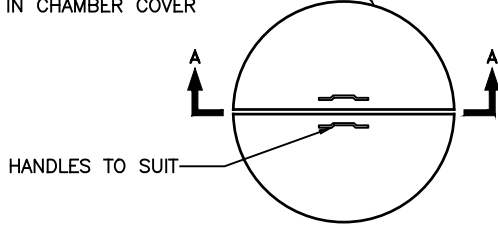
No.	DESCRIPTION	DATE	BY	CHKD
12	NEW DETAIL FOR 2019	19/06/07	ST	
11	DETAIL RENUMBERED	18/02/10	SS	
10	ADDED FLOOR DRAIN, REVISED NOTE	18/01/28	SS	
9	REVISION TO ARV		KW	
8	ADDED NOTE #4	14/02/13	SS	
7	DELETE LADDER	11/03/21	BDC	
6	GENERAL REVISIONS FOR 2009	09/08/09	ML	
5	PIPE SUPPORT REVISION	07/04/27	RJ	
4	VENT PIPE REVISION	06/03/27	RJ	
3	TITLE BLOCK CLEANUP	03/04/08	BC	
2	GENERAL REVISIONS	99/01/06	MC	
1	GENERAL REVISIONS	98/01/22	MC	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT <b>RESIDENTIAL AIR RELEASE / AIR VACUUM VALVE CHAMBER 50 mm</b>			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N.T.S.
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1330 (2019)</b>			

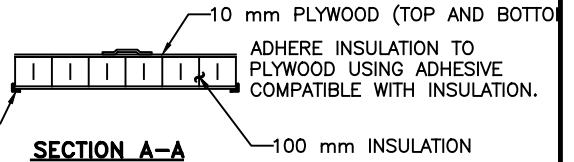
CONSTRUCT IN TWO PIECES.  
DIAMETER TO MATCH OPENING  
IN CHAMBER COVER



HANDLES TO SUIT

PLAN

25 mmx25 mmx6 mm  
ANGLE AROUND  
OPENING ANCHORED  
TO CONCRETE.



SECTION A-A

ADHERE INSULATION TO  
PLYWOOD USING ADHESIVE  
COMPATIBLE WITH INSULATION.

100 mm INSULATION

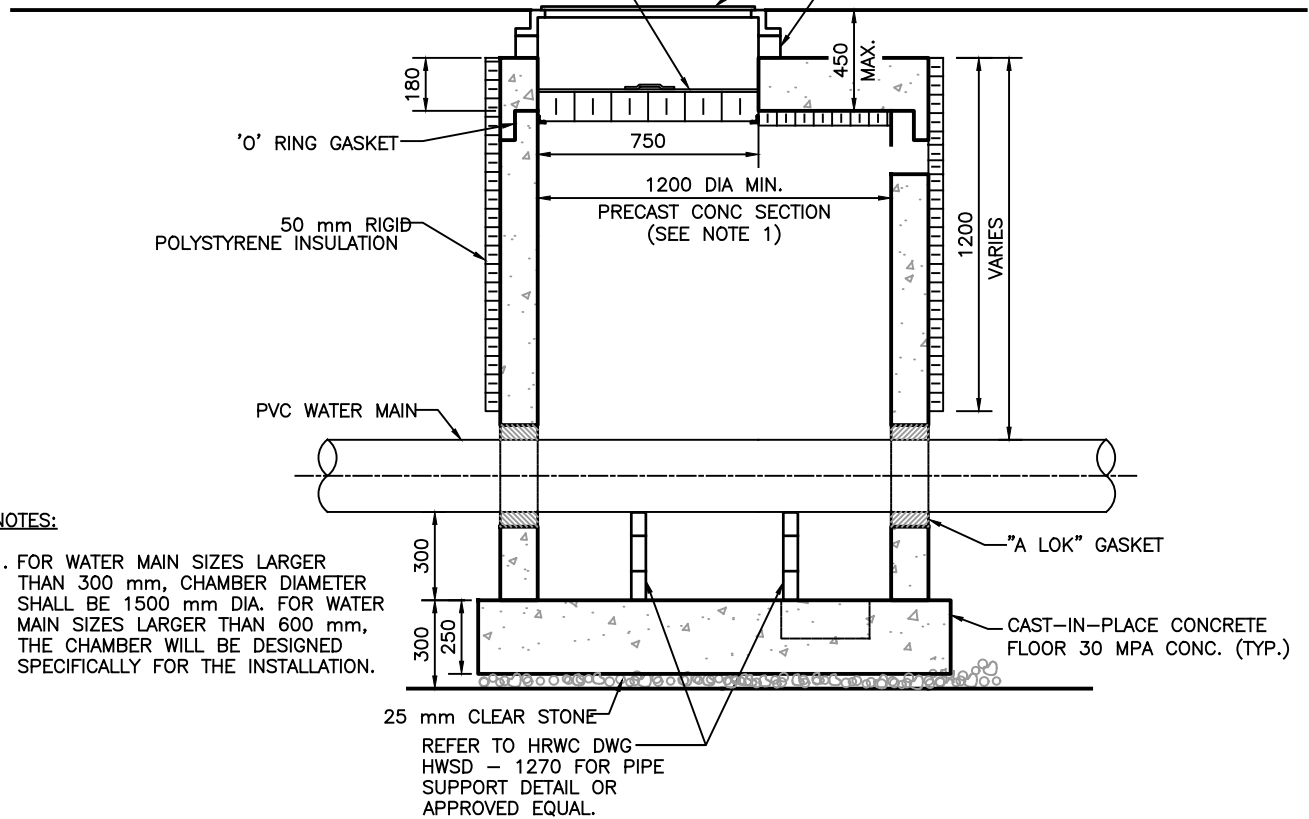
# 1 MANHOLE COVER DETAIL

SCALE: 1:25

INSULATED COVER C/W HANDLE,  
10 mm PLYWOOD & 100 mm  
INSULATION SEE DETAIL 1

REFER TO HWS-1460 FOR MANHOLE  
FRAME AND COVER DETAILS

150 mm GRADE RINGS



**NOTES:**

1. FOR WATER MAIN SIZES LARGER THAN 300 mm, CHAMBER DIAMETER SHALL BE 1500 mm DIA. FOR WATER MAIN SIZES LARGER THAN 600 mm, THE CHAMBER WILL BE DESIGNED SPECIFICALLY FOR THE INSTALLATION.

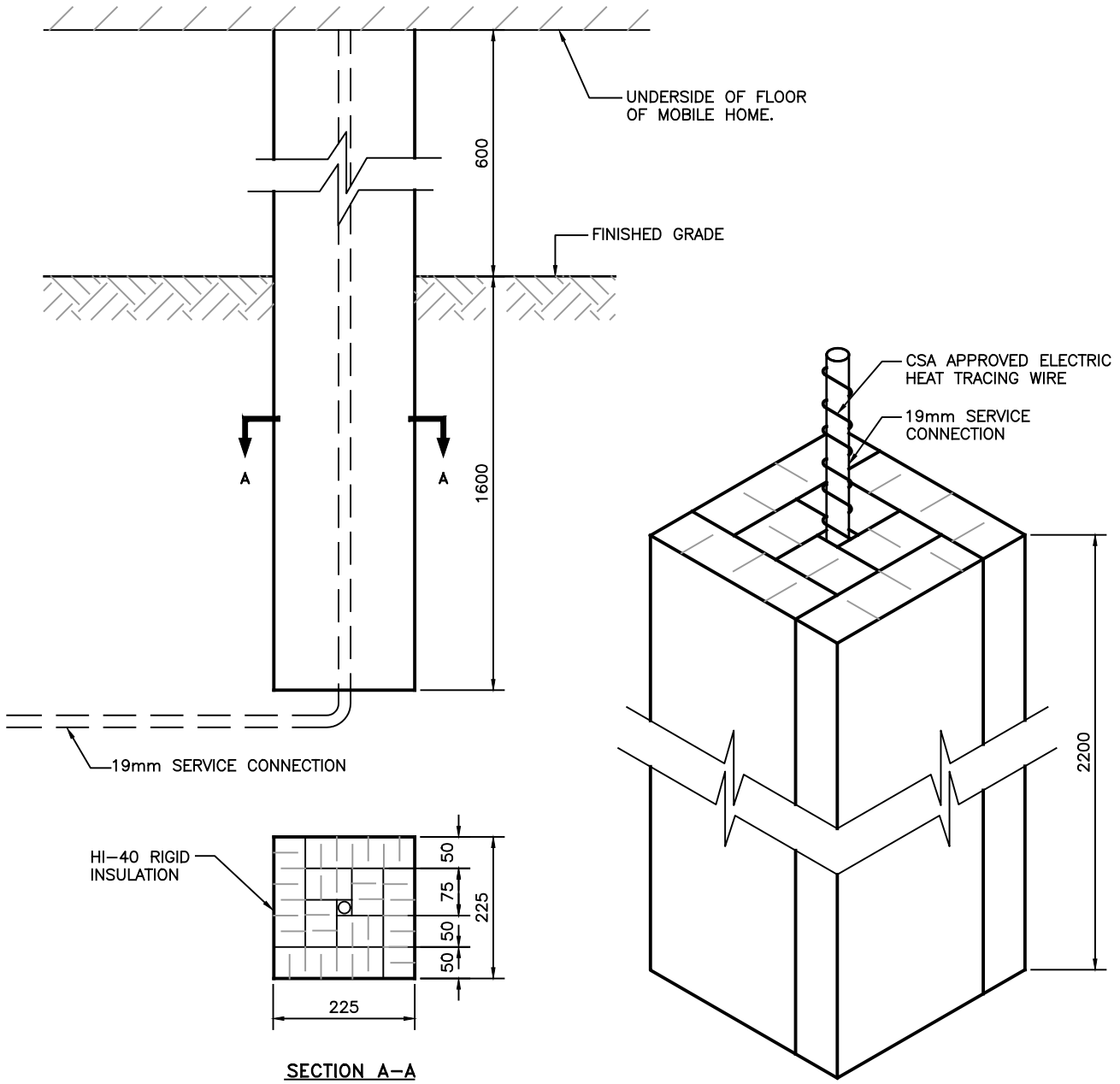
25 mm CLEAR STONE  
REFER TO HRWC DWG  
HWS - 1270 FOR PIPE  
SUPPORT DETAIL OR  
APPROVED EQUAL.

No.	DESCRIPTION	DATE	BY	CHKD
4	DETAIL RENUMBERED	16 02 10	SS	
3	DELETE LADDER	11 03 21	BDC	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	CHANGED PIPE SUPPORT	07 04 27	BC	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT			
METER CHAMBER FOR PVC WATERMAINS			
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N.T.S.
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1340			



No.	DESCRIPTION	DATE	BY	CHKD
4	GENERAL REVISIONS FOR 2016	16 03 01	SS	
3	GENERAL REVISIONS FOR 2009	09 06 09	ML	
2	REVISED TRACING WIRE NOTE	07 04 27	BC	
1	TITLE BLOCK CLEANUP	03 04 08	BC	

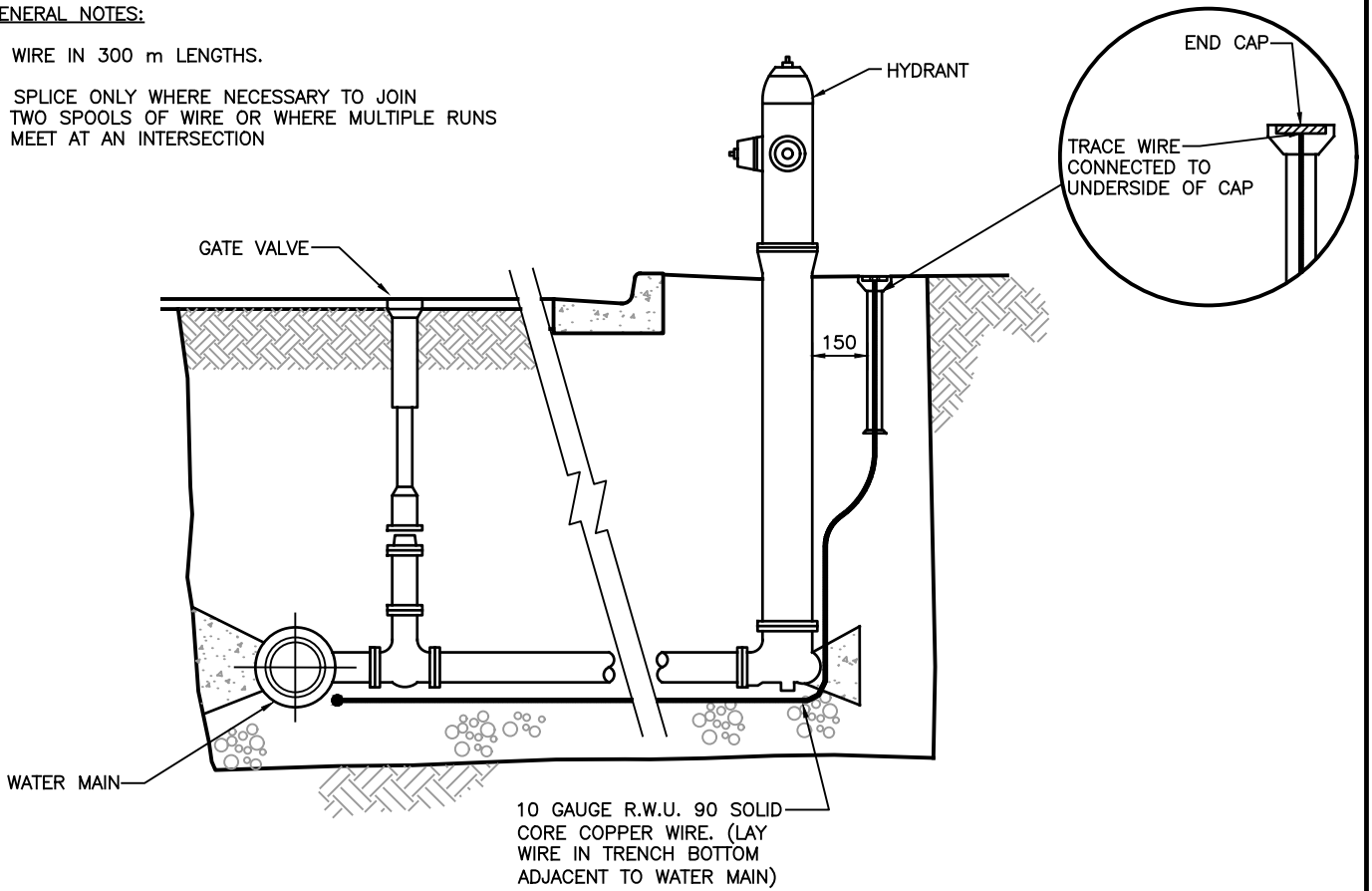
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT	
STANDARD INSULATION DETAIL OF WATER SERVICE CONNECTION FOR MOBILE HOME	
DRAWN J.W.	SCALE (PLAN) N.T.S.
CHECKED J.D.	SCALE (PROFILE)
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. HWSD - 1370	

**GENERAL NOTES:**

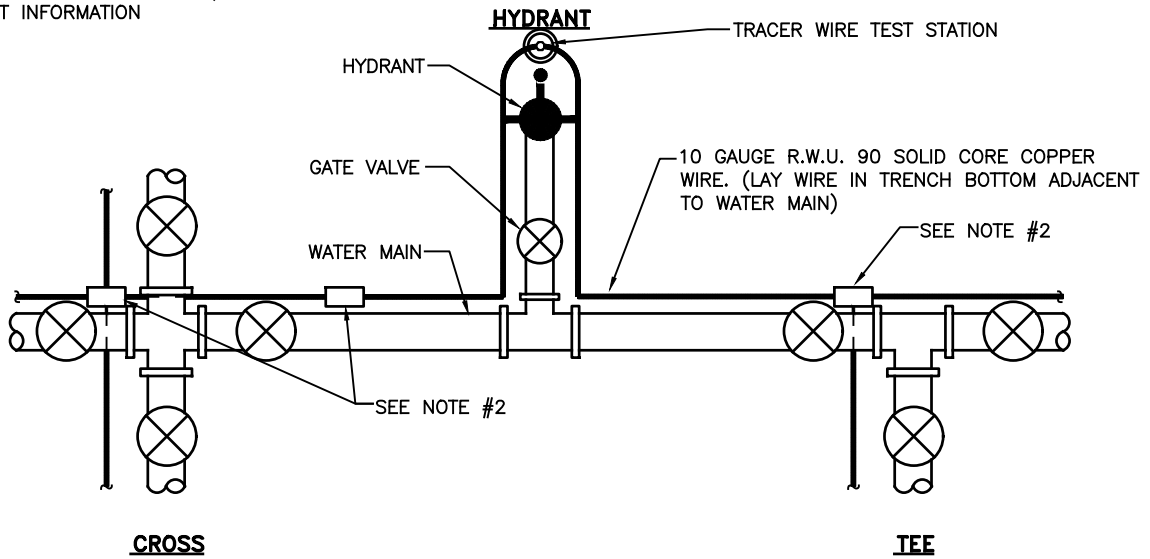
1. WIRE IN 300 m LENGTHS.
2. SPLICE ONLY WHERE NECESSARY TO JOIN TWO SPOOLS OF WIRE OR WHERE MULTIPLE RUNS MEET AT AN INTERSECTION



10 GAUGE R.W.U. 90 SOLID CORE COPPER WIRE. (LAY WIRE IN TRENCH BOTTOM ADJACENT TO WATER MAIN)

**NOTE:**

1. TRACE WIRE SYSTEM TO BE TESTED TO ENSURE CONTINUITY
2. REFER TO SECTION 33 11 00, 2.25 FOR PRODUCT INFORMATION

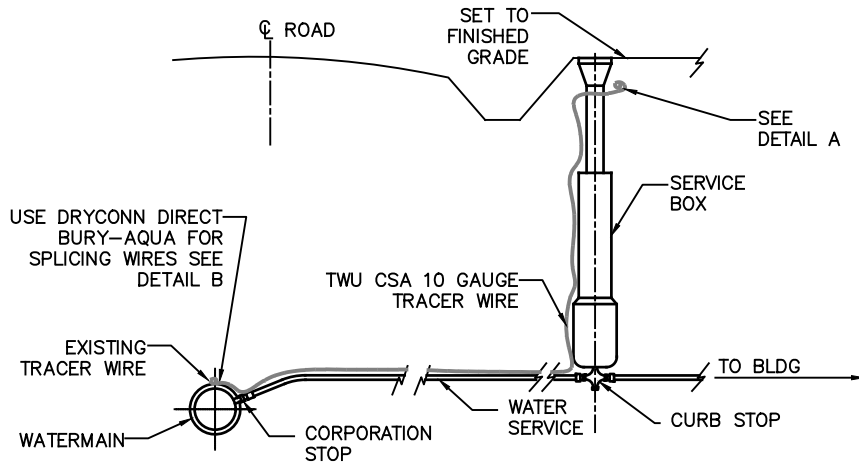


No.	DESCRIPTION	DATE	BY	CHKD
5	ADDED TRACER WIRE TEST STATION	FEB. 14/14	JW	SS
4	GENERAL REVISIONS FOR 2009	02 04 04	ML	
3	ADDED NOTE #2	MAY '07	BC	SS
2	ADDED NOTE	MAR '06	BC	SS
1	GENERAL REVISIONS	02 04 04	PSP	TG

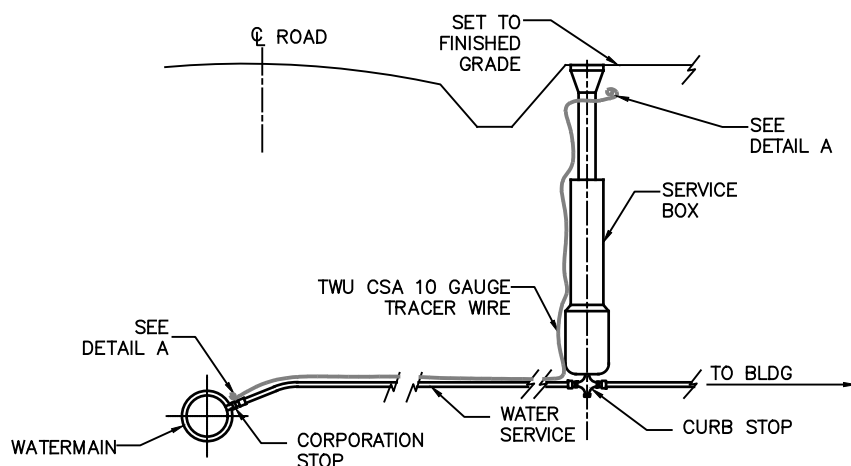
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



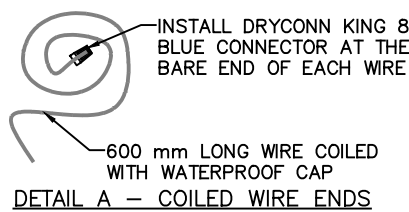
PROJECT	
<b>STANDARD TRACE WIRE DETAIL FOR PVC WATER MAIN</b>	
DRAWN J.W.	SCALE (PLAN) N.T.S
CHECKED J.D.	SCALE (PROFILE)
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. <b>HWSD - 1380</b>	



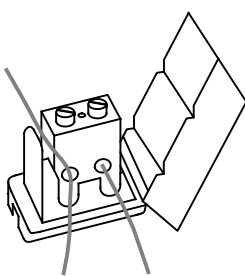
CONNECTION FROM CORPORATION STOP TO CURB STOP WITH EXISTING WIRE AT MAIN



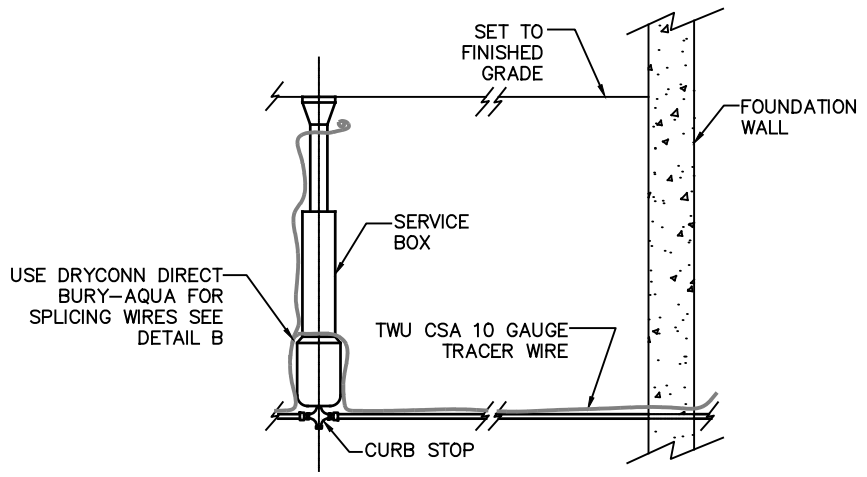
CONNECTION FROM CORPORATION STOP TO CURB STOP WITH NO TRACER WIRE AT MAIN



DETAIL A - COILED WIRE ENDS



DETAIL B - WIRE SPLICING



FUTURE CONNECTION OF TRACER WIRE TO BUILDING

No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT	
STANDARD TRACER WIRE DETAIL FOR CROSS-LINKED POLYETHYLENE (PEX <sub>a</sub> )	
DRAWN K.W.	SCALE (PLAN) N.T.S.
CHECKED J.D.	SCALE (PROFILE)
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. HWSD - 1390	

<u>UTILITY OR SERVICE</u>	<u>MINIMUM HORIZONTAL CLEARANCE (mm)</u>	<u>MINIMUM VERTICAL CLEARANCE (mm)</u>
WATERMAINS (OLD) < 14" ≥ 14"	3000 4500	300 300
WATERMAINS (NEW) < 14" ≥ 14"	2000 3500	300 300
FIRE HYDRANTS	1500	N/A
WATER VALVES	1500	N/A
WATER CURB STOPS	1500	N/A
WATER SERVICE CONNECTIONS	1500	300
MANHOLES	2000	N/A
CATCH BASIN		
• FROM FACE OF CURB (PE MAIN IN STREET)	1700	N/A
• FROM FACE OF CURB (PE MAIN BEHIND CURB)	1300	N/A
WASTEWATER / STORMWATER MAIN (WW/ SW)	1500	300
WASTEWATER / STORMWATER SERVICE CONNECTIONS (WW/ SW)	1500	300

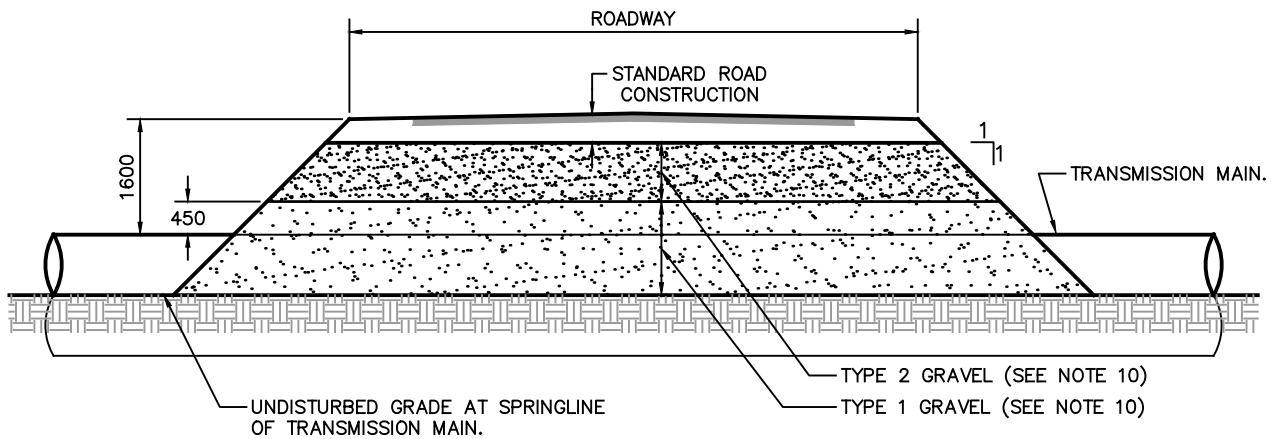
NOTES:

1. THE FOLLOWING MINIMUM CLEARANCES ARE BASED ON STANDARD BURY OF MAINS AND MAY BE CHANGED IN SITUATIONS WHERE MAINS ARE INSTALLED AT MAXIMUM ALLOWABLE DEPTHS, IN CONSULTATION WITH HERITAGE GAS AND HRWC.
2. IN SITUATIONS WHERE STEEL GAS LINES ARE INSTALLED, THE NOTED SEPARATIONS MAY BE CHANGED IN CONSULTATION WITH HERITAGE GAS AND HRWC.

WW – WASTEWATER  
SW – STORMWATER

					<p>NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>	<p>PROJECT NATURAL GAS INSTALLATION SEPARATIONS (POLYETHYLENE MAIN)</p>	
4	GENERAL REVISIONS FOR 2016	16 03 01	SS			<p>DRAWN K.W. SCALE (PLAN) N.T.S.</p> <p>CHECKED J.D. SCALE (PROFILE)</p> <p>APPROVED K.G. DATE 17/02/15</p>	
3	GENERAL REVISIONS FOR 2010	10 05 11	ML			<p>PROJECT No.</p>	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML			<p>DWG. No. HWSD – 1400</p>	
1	TITLE CHANGE	05 05 27	BC	SS			
No.	DESCRIPTION	DATE	BY	CHKD			

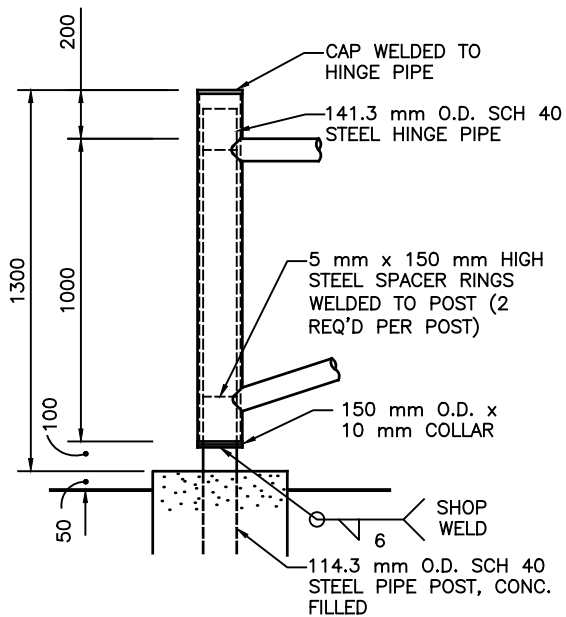
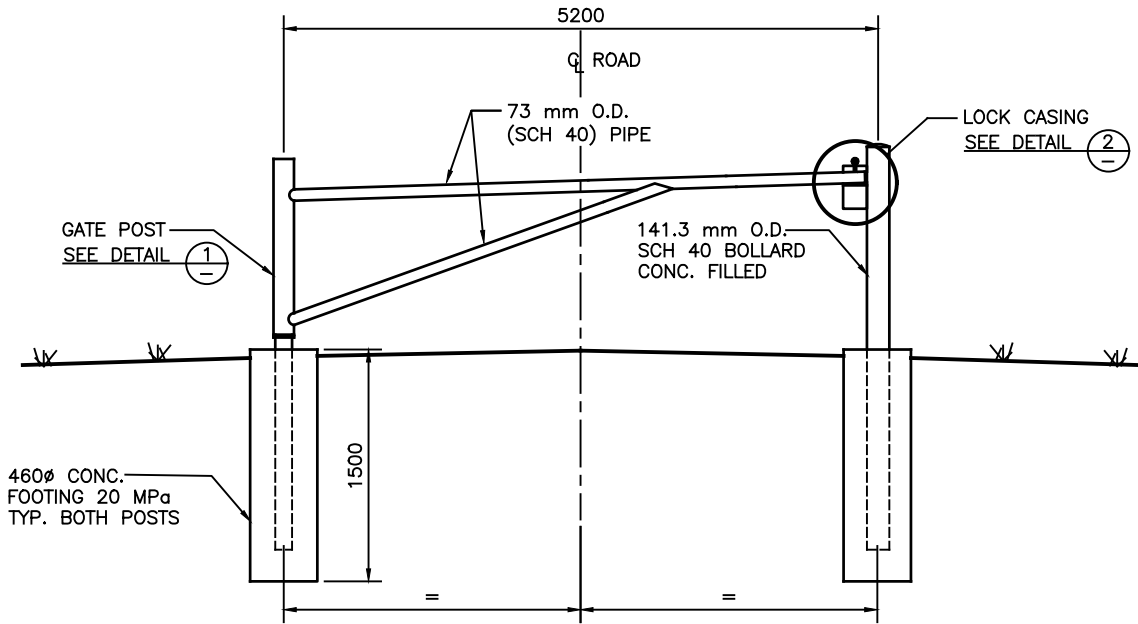




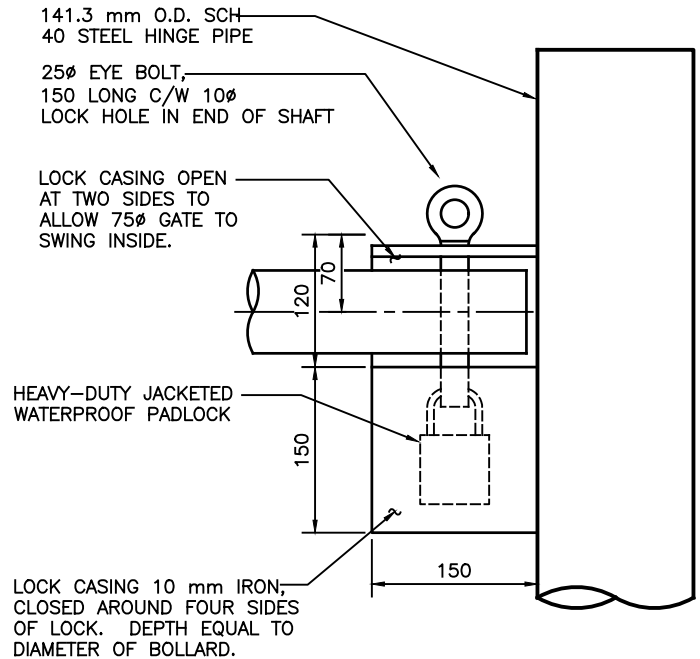
**NOTES:**

1. MAINTAIN A MINIMUM OF 1.6 m OF GROUND COVER FROM THE TOP OF EXISTING PIPE TO FINISHED GRADE.
2. MAINTAIN A MINIMUM GRADE, NOT TO EXCEED 10%, TO TRANSMISSION MAIN ACCESS ROAD.
3. PROVIDE ADEQUATE DRAINAGE FOR NEW AND EXISTING ROADS
4. PROVIDE LOCKABLE GATES ACROSS PIPELINE ROAD AT NEW STREET BOUNDARIES, AND ENSURE PIPELINE ROAD IS NOT ACCESSIBLE BY VEHICULAR TRAFFIC, EXCEPT VIA GATE STRUCTURE. (LOCKABLE GATES TO HRWC STANDARDS).
5. PROVIDE "ROAD GATE AHEAD" SIGNS 150 m FROM GATE ALONG BOTH DIRECTIONS OF TRANSMISSION MAIN ACCESS ROAD.
6. WHERE DITCH CROSSES TRANSMISSION MAIN, PROVIDE 1.6 m COVER OVER TRANSMISSION MAIN OR INSULATE FOR FROST PROTECTION. MINIMUM COVER OVER TRANSMISSION MAIN IS NOT TO BE LESS THAN 1.2 m. INSULATION TO BE 50 mm HI-40 OR EQUIVALENT.
7. PROVIDE ASPHALT TRANSITION 3 m ONTO TRANSMISSION MAIN ACCESS ROAD.
8. EXACT LOCATION OF EXISTING TRANSMISSION MAIN TO BE DETERMINED BY TEST PIT PRIOR TO FINAL APPROVAL OF ROAD CROSSING DESIGN.
9. ALL WORK AT TRANSMISSION MAIN IS TO BE INSPECTED/SUPERVISED BY HRWC REPRESENTATIVE.
10. BACKFILL TO BE IN ACCORDANCE WITH SECTION 31 20 00.

No.	DESCRIPTION	DATE	BY	CHKD	NOTE:	PROJECT
6	REVISED NOTE # 6	14 02 13	SS		ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.	TRANSMISSION MAIN CROSSING DETAIL
5	GENERAL REVISIONS FOR 2009	09 06 09	ML			
4	TITLE BLOCK CLEANUP	03 04 08	BC			DRAWN J.W. SCALE (PLAN) 1:100
3	NOTE 10 ADDED	00 03 20	M.C.			CHECKED J.D. SCALE (PROFILE)
2	BEDDING TYPE REVISED	00 03 20	M.C.			APPROVED K.G. DATE 17/02/15
1	NEW DETAIL FOR 1999 SPEC	99 02 10	M.C.			PROJECT No.
						DWG. No. HWSD - 1410



1 GATE POST  
- N.T.S.



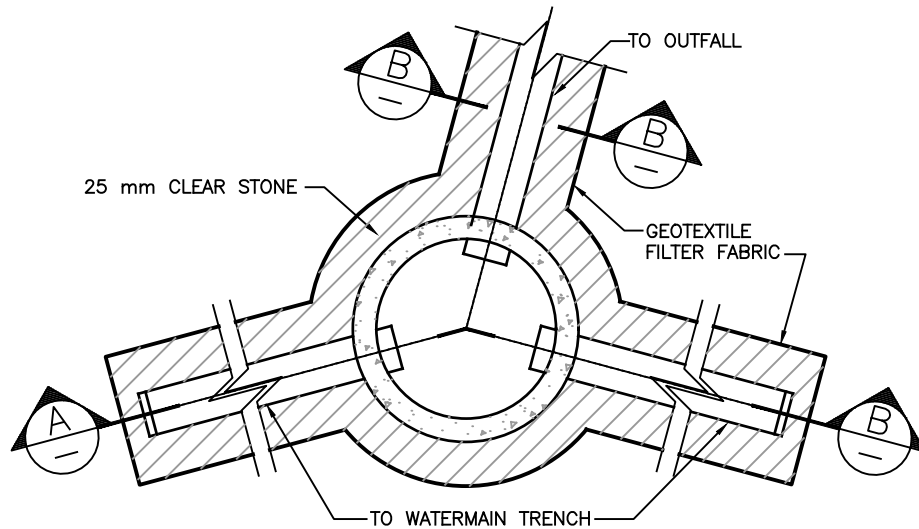
2 LOCK CASING  
- N.T.S.

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.

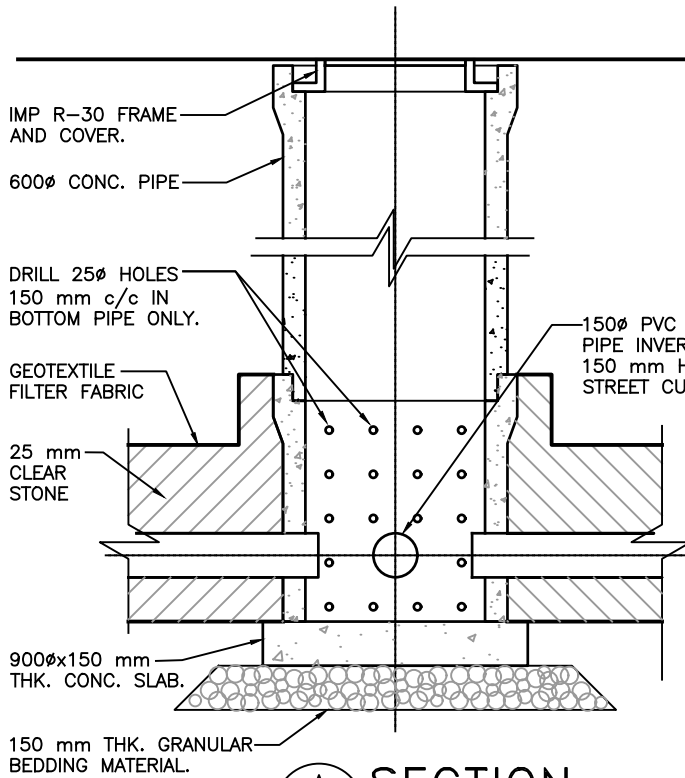


PROJECT			
ACCESS ROAD GATE			
DRAWN	J.W.	SCALE (PLAN)	AS NOTED
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1420			

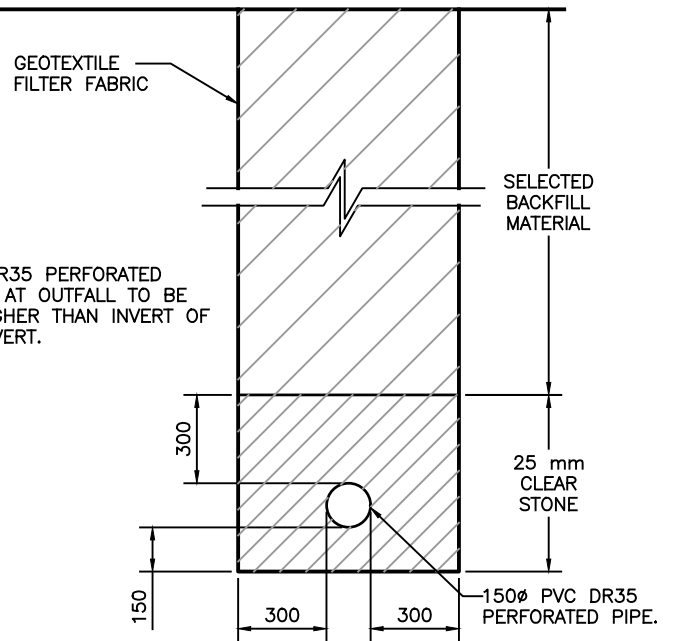
No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2009	09/06/09	ML	
2	TITLE BLOCK CLEANUP	03/04/08	BC	
1	NEW DRAWING FOR 1999 SPEC	99/02/10	MC	



**PLAN**  
1:25



**A SECTION**  
1:25



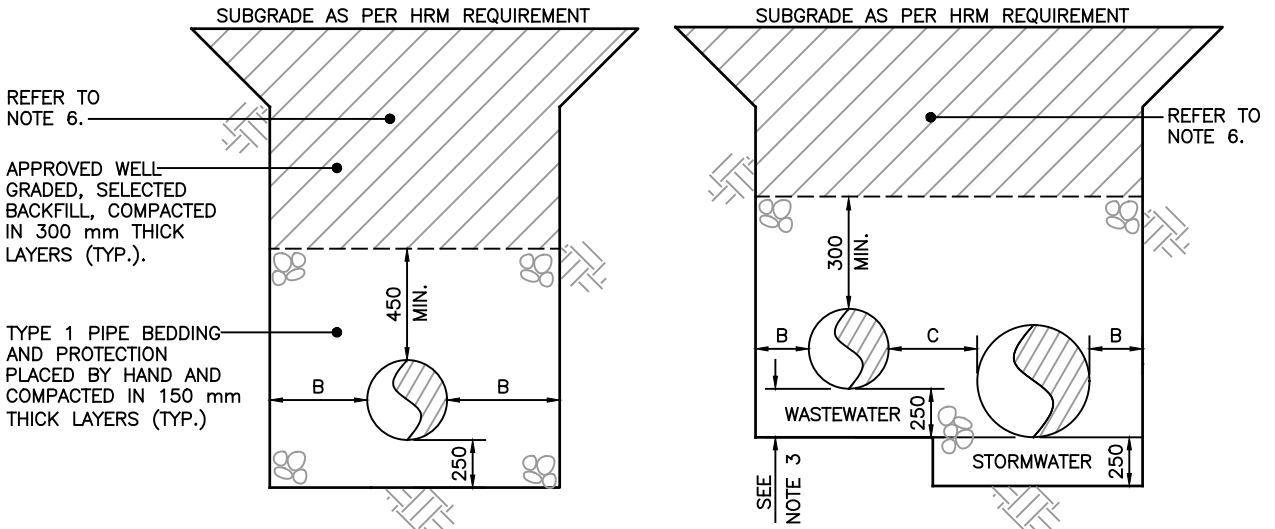
**B TRENCH SECTION**  
1:25

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		<b>TRENCH DRAINAGE RELIEF SYSTEM PLAN &amp; SECTIONS</b>	
DRAWN	K.W.	SCALE (PLAN)	1:25
CHECKED	J.D.	SCALE (PROFILE)	N/A
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1430</b>			

No.	DESCRIPTION	DATE	BY	CHKD
3	GENERAL REVISIONS FOR 2009	09 06 09	ML	
2	TITLE BLOCK CLEANUP	03 04 08	BC	
1	NEW DETAIL FOR 2000 SPEC.	00 03 31	MC	



REFER TO NOTE 6.

APPROVED WELL-GRADED, SELECTED BACKFILL, COMPACTED IN 300 mm THICK LAYERS (TYP.).

TYPE 1 PIPE BEDDING AND PROTECTION PLACED BY HAND AND COMPACTED IN 150 mm THICK LAYERS (TYP.).

PIPE SIZE NOM. DIA.	DIMENSIONS	
	B	C
UP TO 375	300	250
376 TO 500	300	300
501 TO 750	400	300
751 TO 1200	400	400
OVER 1200	SEE PROJECT DRAWINGS	

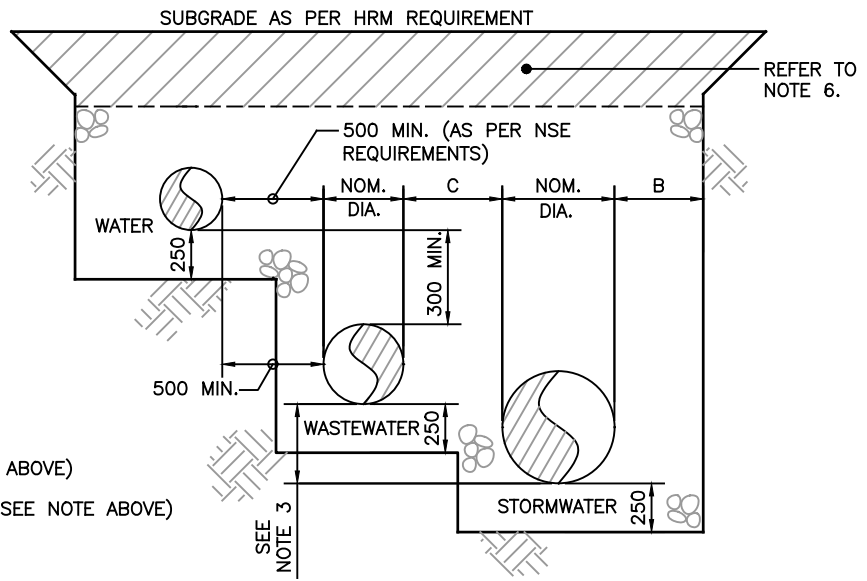
BEDDING REQUIREMENTS SHALL BE 250 mm AS PER SECTIONS.

**LEGEND**

- UNDISTURBED NATIVE SOIL
- TYPE 1 GRAVEL (SEE NOTE ABOVE)
- SELECTED SITE MATERIALS (SEE NOTE ABOVE)

**NOTES**

1. DIMENSION "C" IS GOVERNED BY THE LARGER PIPE DIAMETER.
2. SIDES OF TRENCHES TO REQUIREMENTS OF DEPARTMENT OF LABOUR.
3. IF CROWNS OF STORMWATER AND WASTEWATER PIPE ARE NOT MATCHED, THE INVERT OF THE STORMWATER PIPE MUST BE AT LEAST 100 mm BELOW THE INVERT OF THE WASTEWATER PIPE.
4. WHEN CONCRETE PIPE IS SPECIFIED FOR A WASTEWATER PIPE, A GEOTECHNICAL REPORT BY A P.ENG. MUST BE UNDERTAKEN TO ENSURE STABILITY OF SUBBASE.
5. MINIMUM GRAVEL COVER OVER WASTEWATER AND STORMWATER PIPES IS TO BE 300 mm.
6. REFER TO HRM TRENCH REINSTATEMENT DETAILS HRM 59, HRM 60 AND HRM 61 IN "HALIFAX REGIONAL MUNICIPALITY MUNICIPAL DESIGN GUIDELINES".
7. FOR CONCRETE PIPE INSTALLATION, PLEASE REFER TO HWSD - 1442.

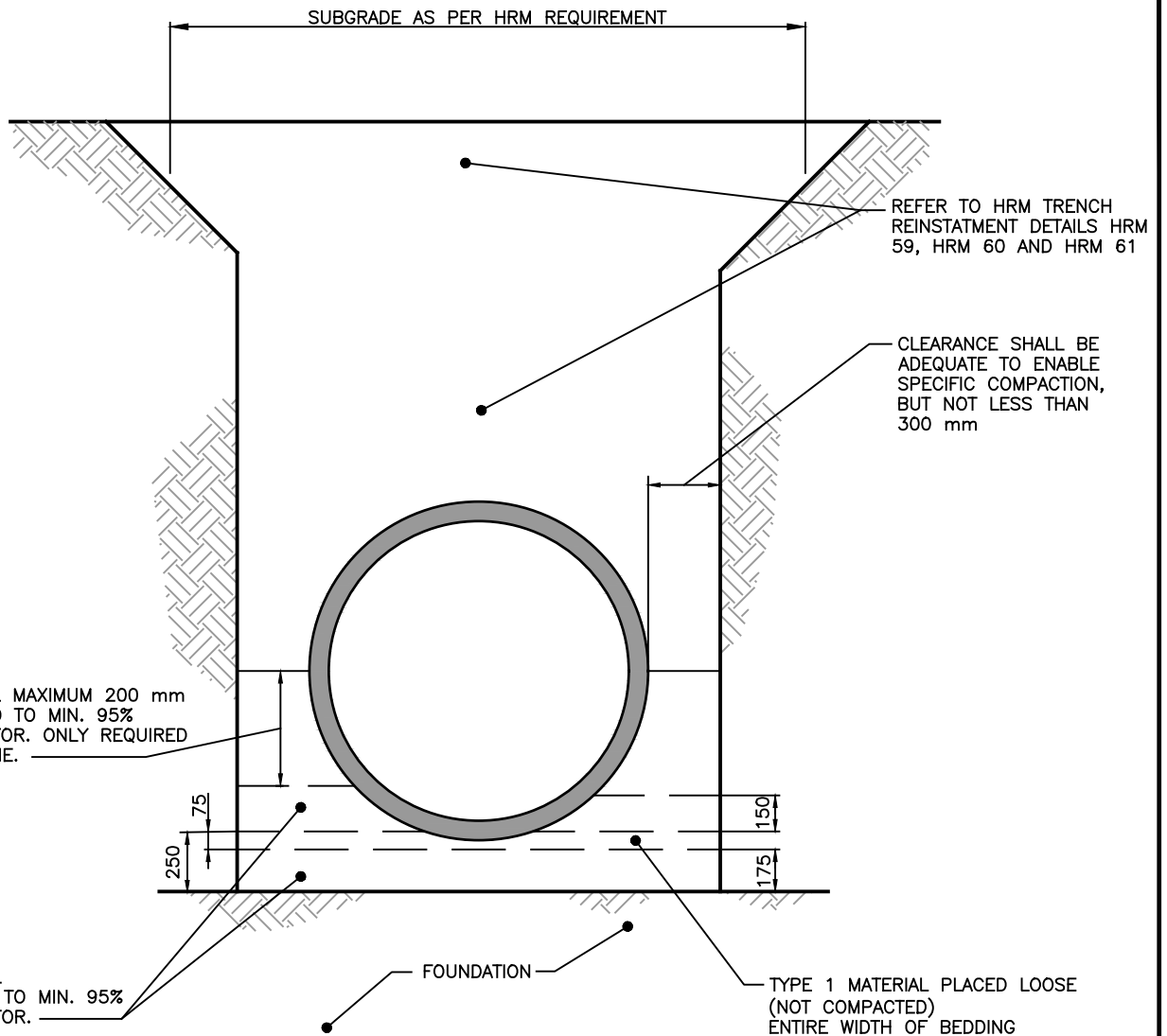


No.	DESCRIPTION	DATE	BY	CHKD
6	GENERAL REVISIONS FOR 2016	16 03 01	SS	
5	REVISED NOTES, ADDED HRM REQUIREMENTS	13 02 04	JW	
4	ADD NOTE 6	11 03 21	BDC	
3	GENERAL REVISIONS FOR 2010	10 05 13	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT	
<b>TRENCH AND BACKFILL CROSS SECTION</b>	
DRAWN K.W.	SCALE (PLAN) NTS
CHECKED J.D.	SCALE (PROFILE) NTS
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. HWSD - 1440	



NOTES:  
 DETAIL TAKEN FROM AMERICAN CONCRETE PIPE ASSOCIATION.

					<b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.	PROJECT <b>STANDARD BEDDING DETAIL          FOR CONCRETE PIPE</b>	
						DRAWN K.W.      SCALE (PLAN) NTS CHECKED J.D.      SCALE (PROFILE) APPROVED K.G.      DATE 17/02/15	
					PROJECT No.		
					DWG. No. <b>HWSD - 1442</b>		
No.	DESCRIPTION	DATE	BY	CHKD			



**MIN. ALLOWABLE DEFLECTION ANGLES FOR CONCRETE PIPE**

PIPE SIZE (mm)	MINIMUM ALLOWABLE DEFLECTION ANGLE					
	1050 M.H.	1200 M.H.	1500 M.H.	1800 M.H.	2100 M.H.	2400 M.H.
200	90	90	90	90	90	90
250	90	90	90	90	90	90
300	90	90	90	90	90	90
375	100	90	90	90	90	90
450	115	100	90	90	90	90
525	135	115	90	90	90	90
600	n/a	130	105	90	90	90
750	n/a	n/a	n/a	n/a	95	90
900	n/a	n/a	n/a	n/a	115	100
1050	n/a	n/a	n/a	n/a	130	110

**MIN. ALLOWABLE DEFLECTION ANGLES FOR P.V.C. PIPE**

PIPE SIZE (mm)	1050 M.H.	1200 M.H.	1500 M.H.	1800 M.H.	2100 M.H.	2400 M.H.
	MIN. ANGLE	MIN. ANGLE	MIN. ANGLE	MIN. ANGLE	MIN. ANGLE	MIN. ANGLE
200	90	90	90	90	90	90
250	90	90	90	90	90	90
300	90	90	90	90	90	90
375	90	90	90	90	90	90
450	95	90	90	90	90	90
525	110	95	90	90	90	90
600	n/a	110	90	90	90	90
750	n/a	n/a	n/a	n/a	95	90
900	n/a	n/a	n/a	n/a	110	90
1050	n/a	n/a	n/a	n/a	105	95

**NOTES:**

1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. CHANNELS IN DEAD END MANHOLES TO FINISH 225 mm FROM UPSTREAM WALL.
3. LIFT HOLES IN PRECAST SECTIONS TO BE GROUTED WITH CEMENT MORTAR PRIOR TO PLACING WATERPROOF MEMBRANE AND GRANULAR BACKFILL.
4. TABLES ARE ONLY PROVIDED AS A GUIDE AND NOT INTENDED FOR DESIGN PURPOSES. ALL SYSTEMS MUST BE APPROVED BY HRWC STAFF.
5. IN ADDITION TO O-RING GASKETS, JOINTS IN PRECAST SECTIONS BELOW THE CONCRETE MANHOLE COVER SHALL BE SEALED WITH 25 mm BUTYL RESIN CORD. THE CORD SHALL BE PLACED ON THE UPPER INSIDE LEDGE OF THE JOINT PRIOR TO PLACEMENT OF THE SUBSEQUENT SECTION. ALL WASTEWATER MANHOLES TO BE WRAPPED IN WATERPROOFING MEMBRANE.
6. PRECAST ECCENTRIC CONE SECTIONS NOT PERMITTED.
7. BACKFILL AROUND MANHOLES SHALL BE TYPE 2 GRAVEL EXTENDING A MIN. OF 300 mm OUTWARD FROM MANHOLE AND VERTICALLY FROM BEDDING MATERIAL TO UNDERSIDE OF ROADBED GRAVELS.
8. "A-LOK" OR APPROVED "O" RING GASKETS SHALL BE THOROUGHLY CLEANED, THEN COVERED GENEROUSLY WITH LUBRICANT SPECIFIED BY THE PIPE MANUFACTURER.

FINISHED SURFACE TO BE LEVEL WITH TOP OF FRAME AND COVER

FINAL GRADE ADJUSTMENT SHALL BE COMPLETED UTILIZING ONE OF THE FOLLOWING TWO OPTIONS:

- AIR ENTRAINED 35 MPa CONCRETE OR AN APPROVED NON-SHRINK GROUT. IF FINAL GRADE ADJUSTMENT EXCEEDS 150 mm IN HEIGHT THAN CIRCULAR 15M REBAR MUST BE INCORPORATED IN THE RAISED SECTION.
- PRE-CAST CONCRETE GRADE RINGS (MAX. 2 RINGS), WITH A MINIMUM GRADE RING SIZE OF 150 mm.

WATERPROOFING MEMBRANE TO BE APPLIED TO GRADE RINGS/SHAFT, PRECAST SECTIONS & BASE. (BAKOR BLUESKIN)

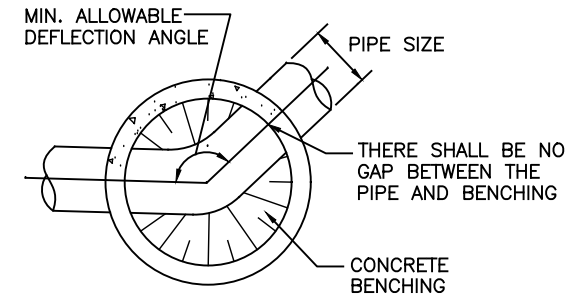
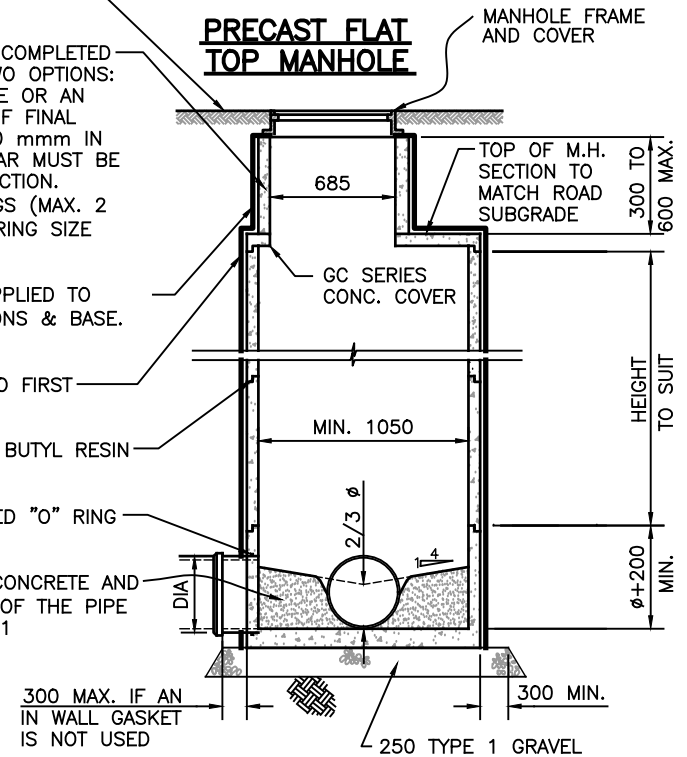
FULL BLUESKIN COVERING TO FIRST JOINT OF MANHOLE.

O-RING GASKET & 25 mm BUTYL RESIN CORD (SEE NOTE 6)

A-LOK GASKET OR APPROVED "O" RING GASKETS (TYPICAL)

BENCHING TO BE 30 MPa CONCRETE AND START AT 2/3 THE HEIGHT OF THE PIPE AND SLOPE UPWARDS AT 4:1

**PRECAST FLAT TOP MANHOLE**

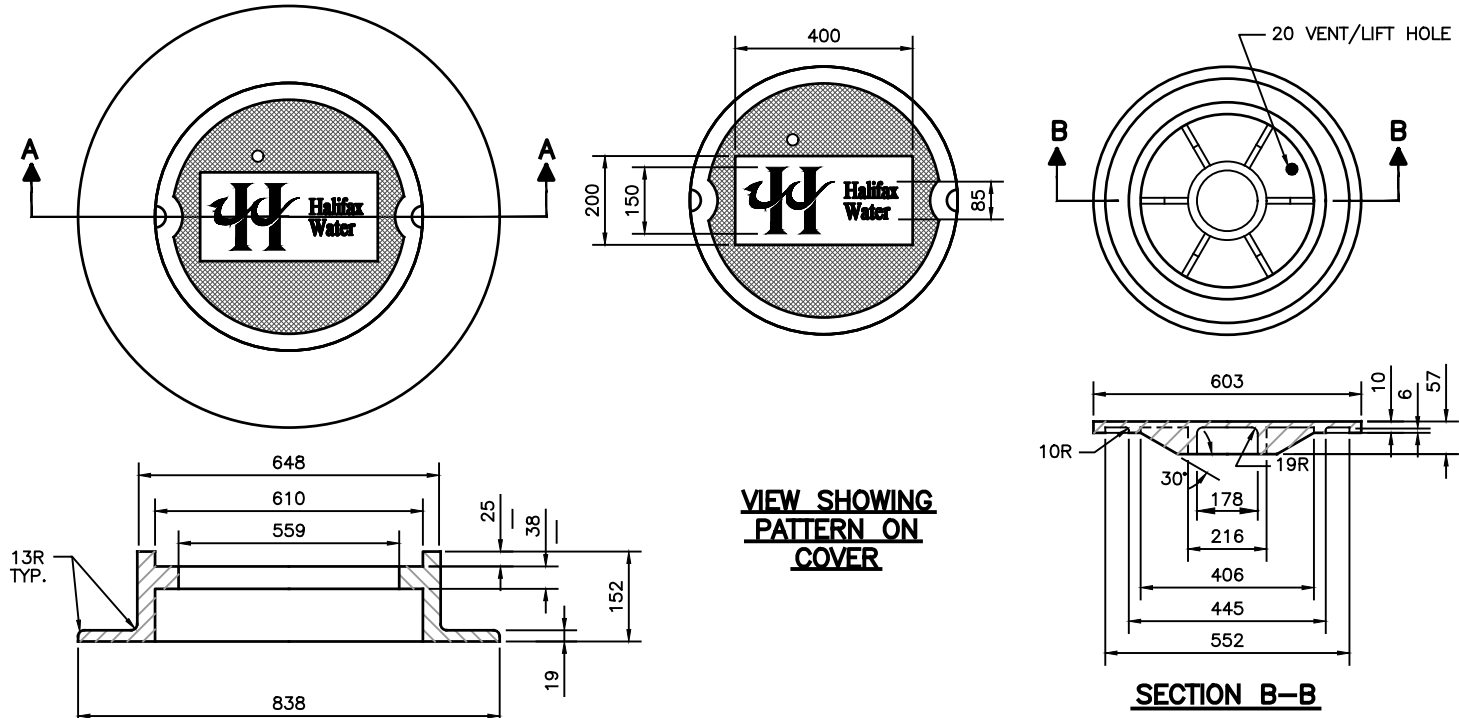


NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT		PRECAST MANHOLE	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1450			

No.	DESCRIPTION	DATE	BY	CHKD
5	REVISED SECTIONS FOR BLUESKIN WATERPROOFING.	15 02 27	SS	
4	REVISED NOTE FOR GRADE RINGS AND NO GAP BETWEEN PIPE & BENCHING	14 02 13	SS	
3	GENERAL REVISIONS FOR 2010	10 05 11	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	



**VIEW SHOWING PATTERN ON COVER**


**SECTION B-B**

**NOTES:**

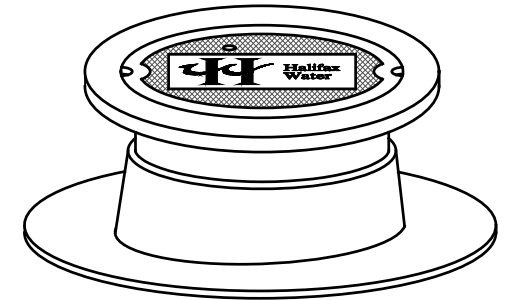
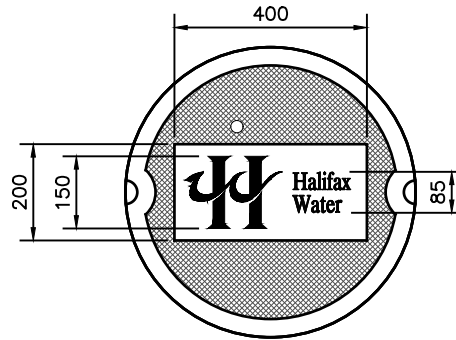
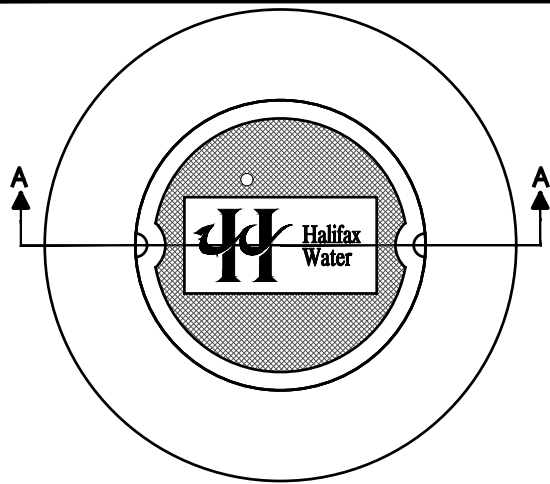
1. ALL MANHOLES ARE TO HAVE AN HRWC LOGO.
2. STANDARD MANHOLE FRAME AND COVER TO BE IMP R-10 OR EQUIVALENT.
3. MATERIAL – GRAY CAST IRON, A.S.T.M. A48/ A48M (2008).  
LOAD CAPACITY – 7250Kg.  
FRAME WEIGHT – 77.1 Kg.  
COVER WEIGHT – 68.0 Kg.
4. ALL MANHOLES NOT LOCATED IN THE STREET ARE TO HAVE AN IMP 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	

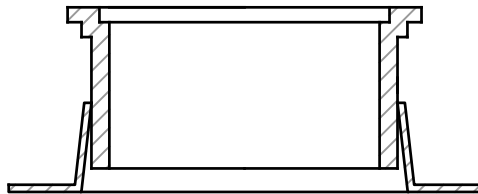
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



<b>PROJECT</b>	
<b>MANHOLE FRAME AND COVER</b>	
DRAWN K.W.	SCALE (PLAN) NTS
CHECKED J.D.	SCALE (PROFILE) NTS
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. <b>HWSD - 1460</b>	



**ISOMETRIC VIEW**



**SECTION A-A**

**NOTES:**

1. ALL MANHOLES ARE TO HAVE AN HRWC LOGO.
2. COVER TO BE IMP R-10 OR EQUIVALENT.
3. ADJUSTABLE MANHOLE FRAMES AND R10 COVERS AS PER HRWC SPECIFICATIONS SHALL BE USED IN ASPHALT SURFACES.
4. ADJUSTABLE MANHOLE FRAME & COVERS TO BE INSTALLED AS PER MANUFACTURER'S REQUIREMENTS.

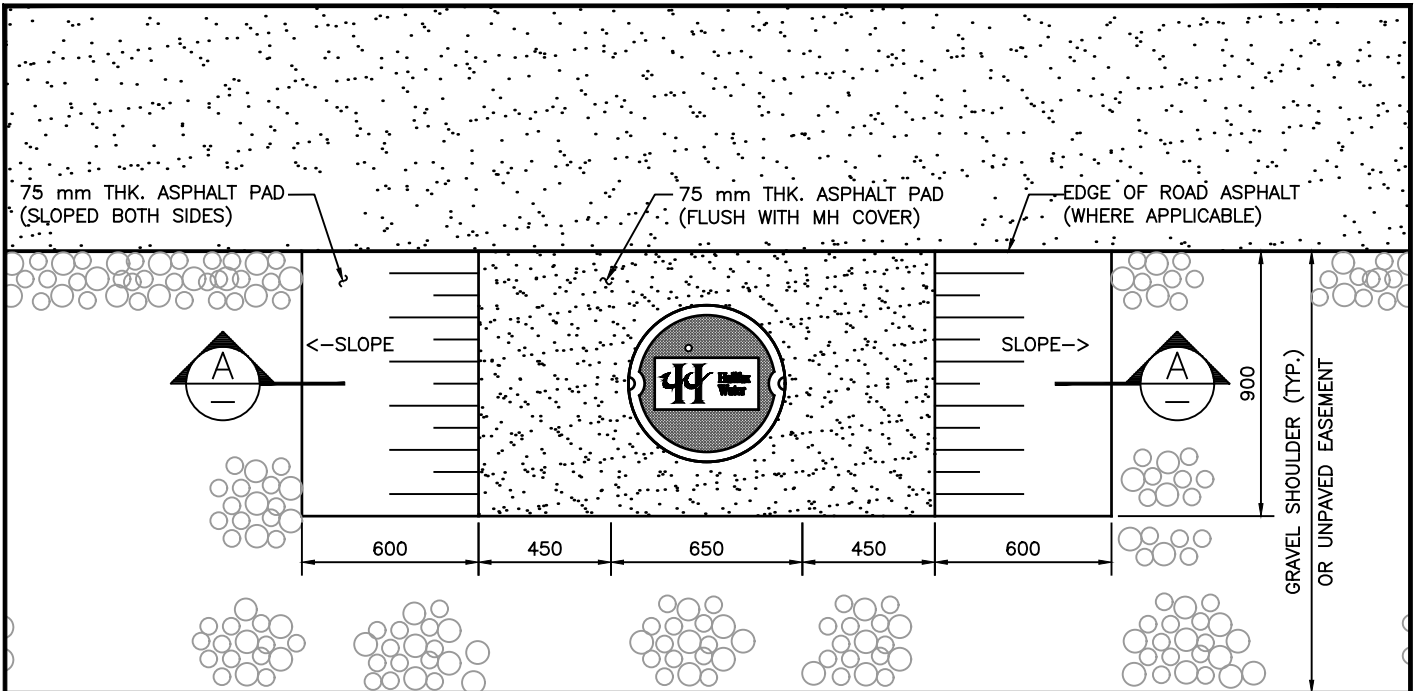
No.	DESCRIPTION	DATE	BY	CHKD
5	NEW DETAIL FOR 2019	19 06 07	ST	
4	ADDED NOTE 4.	15 02 27	SS	
3	ADDED APPROVED PRODUCTS, REVISED HALIFAX WATER LOGO	APR. 2 12	JW	
2	NEW DRAWING	NOV. 1 11	JW	
1	REVISION DETAILS	YY MM DD	XX	

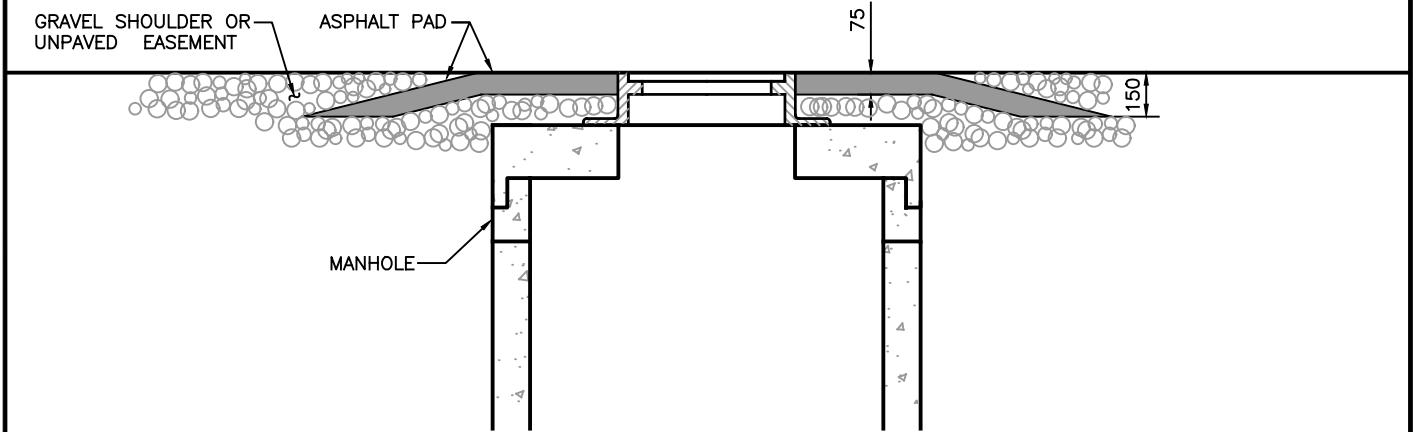
<p><b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>		<p><b>PROJECT</b> ADJUSTABLE MANHOLE FRAME AND COVER C/W COVER &amp; CONE GUIDE FRAME</p>	
<p>DRAWN K.W.</p>	<p>CHECKED J.D.</p>	<p>SCALE (PLAN) NTS</p>	<p>SCALE (PROFILE) NTS</p>
<p>APPROVED K.G.</p>	<p>DATE 17/02/15</p>	<p>PROJECT No.</p>	
<p>DWG. No. HWSD - 1462 (2019)</p>			







**PLAN**  
1:25



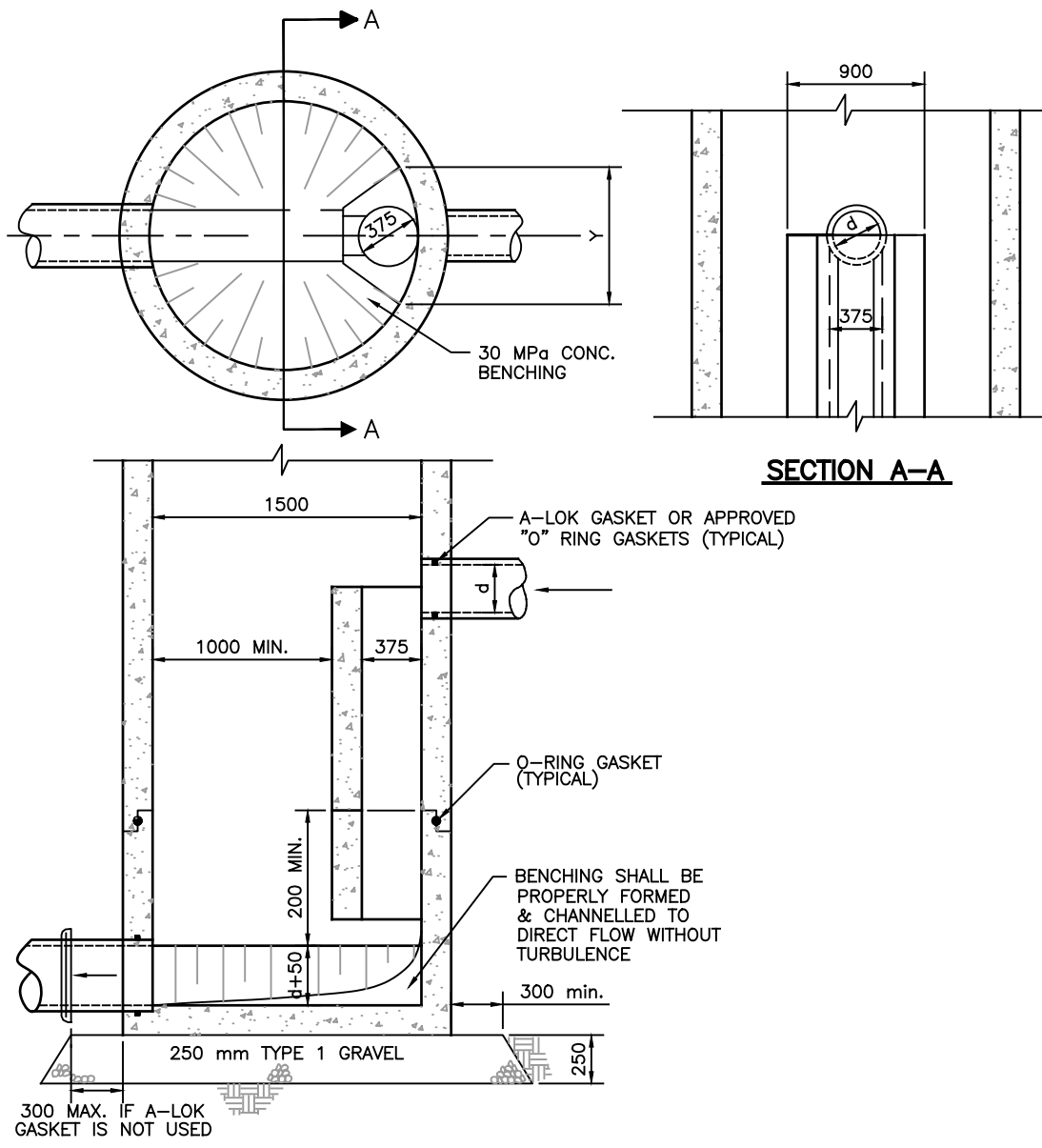
**A SECTION**

1	NEW DETAIL	14 02 13	SS	
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		<b>MANHOLE ASPHALT APRON DETAIL</b>	
DRAWN	K.W.	SCALE (PLAN)	1:25
CHECKED	J.D.	SCALE (PROFILE)	N/A
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1464</b>			



**NOTES:**

1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. INTERNAL DROP MANHOLES SHALL BE USED ONLY FOR WASTEWATER SYSTEMS.
3. DROP MANHOLES MUST BE USED WHEN THE INVERT OF THE INLET PIPE IS GREATER THAN THE INVERT OF THE OUTLET PIPE BY MORE THAN 1000 mm.
4. OUTSIDE WALL OF INCOMING PIPE MUST BE A MIN. OF 150 mm FROM NEAREST MANHOLE SECTION JOINT.
5. BACKFILL AROUND MANHOLES SHALL BE TYPE 2 GRAVEL EXTENDING A MIN. OF 300 mm OUTWARD FROM MANHOLE AND VERTICALLY FROM BEDDING MATERIAL TO UNDERSIDE OF ROADBED GRAVELS.
6. EXTERNAL DROP MANHOLE SHALL BE USED WHEN THE INLET EXCEEDS 375 mm IN DIAMETER.

4	GENERAL REVISIONS FOR 2016	16 03 01	SS	
3	GENERAL REVISIONS FOR 2010	10 05 20	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	
No.	DESCRIPTION	DATE	BY	CHKD

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT			
<b>PRECAST INTERNAL DROP MANHOLE SECTION</b>			
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1470</b>			

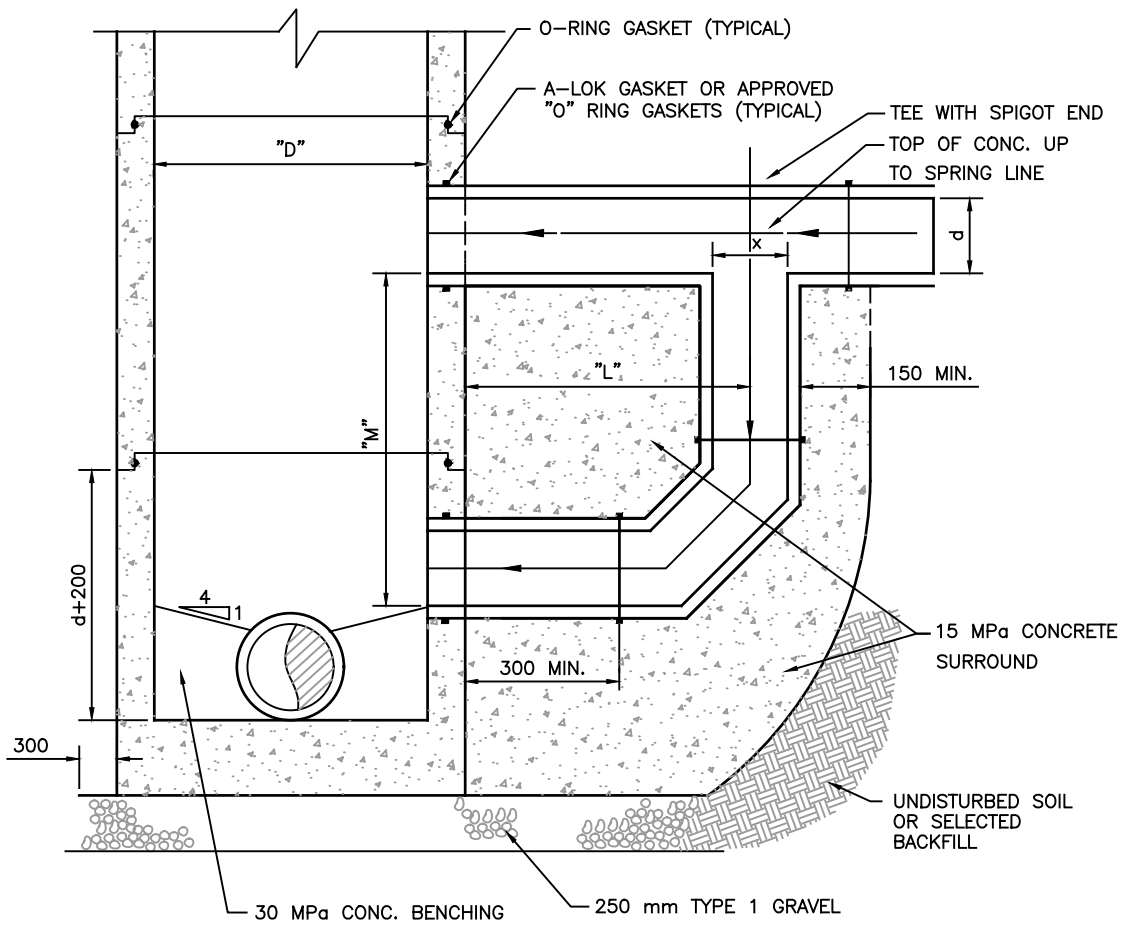


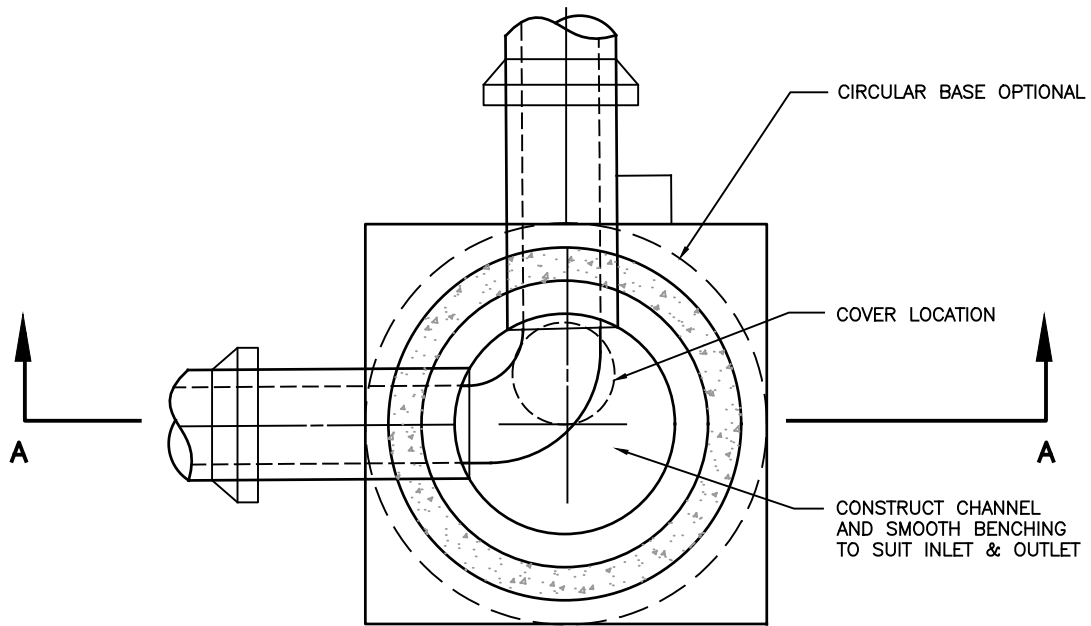
TABLE OF MINIMUM DIMENSIONS				
d	D	x	M	L
250	1050	200	900	700
300	1050	250	900	700
375	1050	300	900	700
450	1050	375	900	700
525	1200	450	975	750
600	1500	450	1075	800
750	1500	525	1275	900
900	1500	600	1500	1000
1050	1800	750	1650	1000
1200	2100	900	1650	1100
1500	*	1050	1800	1150

"D" IS BASED ON A MINIMUM ANGLE BETWEEN PIPES OF 90°.  
 \* FOR PIPES GREATER THAN 1200 mm "D" IS LEFT TO THE DISCRETION OF THE ENGINEER.

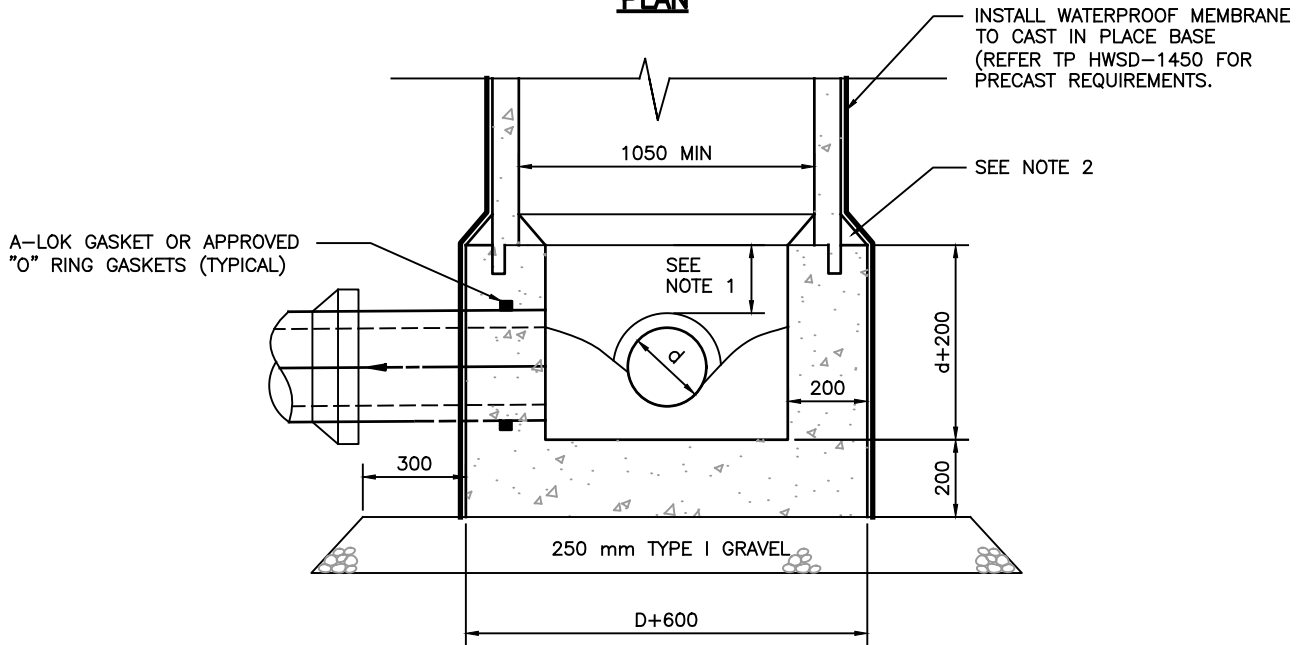
**NOTES:**

1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECS. FOR MUNICIPAL SERVICES.
2. EXTERNAL DROP MANHOLES SHALL BE USED WHEN THE INLET PIPE EXCEEDS 375 mm DIAMETER.
3. DROP MANHOLES MUST BE USED WHEN THE INVERT OF THE INLET PIPE EXCEEDS THE INVERT OF THE OUTLET PIPE BY MORE THAN 1000 mm.
4. 15 MPa CONCRETE SURROUND MUST BE PLACED BETWEEN DROP PIPE AND MANHOLE AND OTHERWISE COVER DROP PIPE 150 mm IN ALL DIRECTIONS.
5. BACKFILL AROUND MANHOLES SHALL BE TYPE 2 GRAVEL EXTENDING A MIN. OF 300 mm OUTWARD FROM MANHOLE AND VERTICALLY FROM BEDDING MATERIAL TO UNDERSIDE OF ROADBED GRAVELS.

					<b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.	PROJECT			
						PRECAST EXTERNAL DROP MANHOLE SECTION			
						DRAWN	K.W.	SCALE (PLAN)	NTS
						CHECKED	J.D.	SCALE (PROFILE)	NTS
						APPROVED	K.G.	DATE	17/02/15
					PROJECT No.				
					DWG. No. <b>HWSD - 1480</b>				
2	GENERAL REVISIONS FOR 2009	09 06 09	ML						
1	REVISION DETAILS	YY MM DD	XX						
No.	DESCRIPTION	DATE	BY	CHKD					



**PLAN**



**SECTION A-A**

**NOTES:**

1. MINIMUM OF 100 mm ABOVE LARGEST PIPE.
2. BELL END OF PRECAST SECTION TO BE FULLY EMBEDDED IN PARTIALLY SET CAST-IN-PLACE BASE. FINISH INTERFACE WITH GROUT OR CONCRETE ON INSIDE AND OUTSIDE OF MANHOLE, SLOPING UP AT 1:1 TO MEET PRECAST SECTION.
3. BACKFILL AROUND MANHOLES SHALL BE TYPE 2 GRAVEL EXTENDING A MIN. OF 300 mm OUTWARD FROM MANHOLE AND VERTICALLY FROM BEDDING MATERIAL TO UNDERSIDE OF ROADBED GRAVELS.

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT

**CAST-IN-PLACE BASE  
FOR PRECAST MANHOLE**

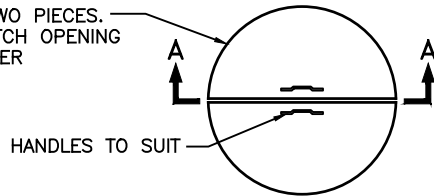
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15

PROJECT No.

DWG. No. **HWSD - 1490**

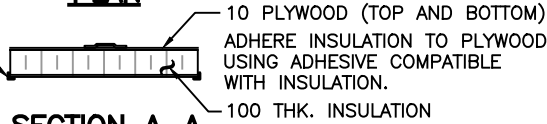
No.	DESCRIPTION	DATE	BY	CHKD
5	ADDED WATERPROOF MEMBRANE	15 02 27	SS	
1	REVISION DETAILS	YY MM DD	XX	

CONSTRUCT IN TWO PIECES.  
DIAMETER TO MATCH OPENING  
IN CHAMBER COVER



**PLAN**

25x25x6 ANGLE ALL  
AROUND OPENING  
ANCHORED TO CONCRETE.

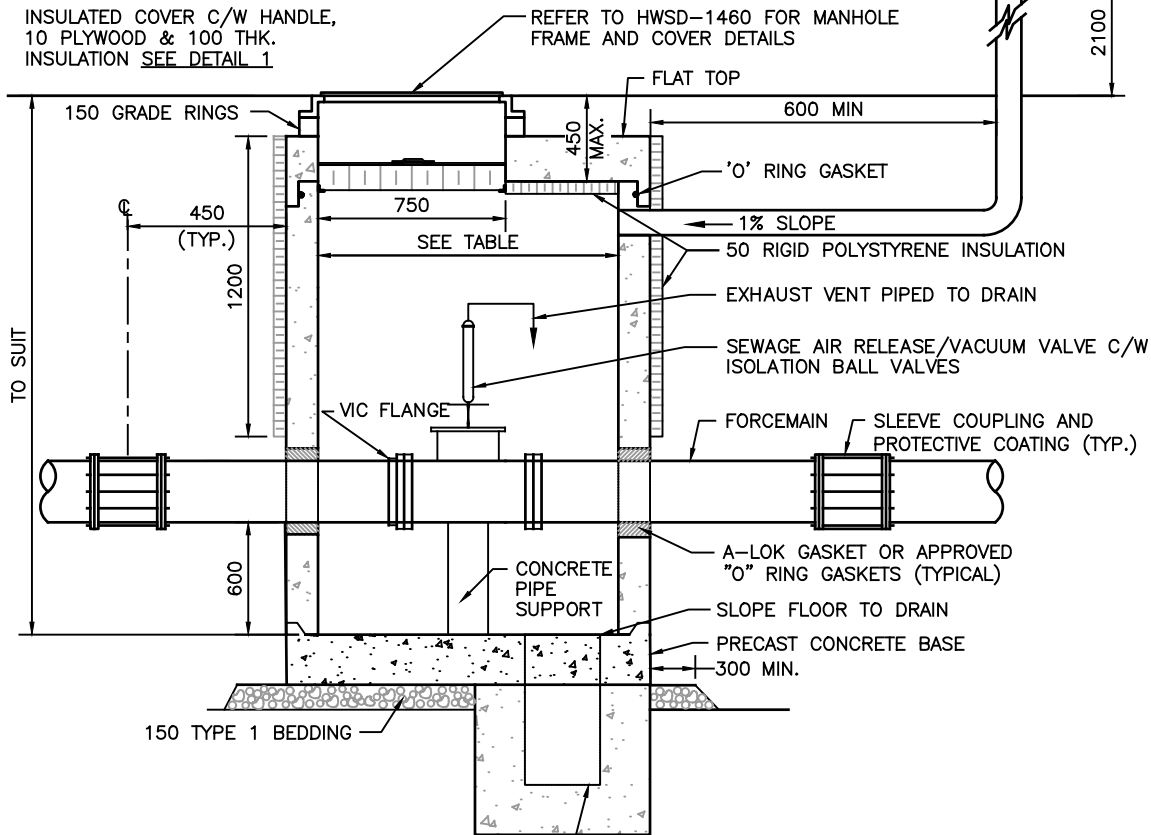


**SECTION A-A**

**1 DETAIL**  
SCALE 1:25

100Ø ALUMINUM VENT  
PIPE FINAL LOCATION TO BE  
DETERMINED IN THE FIELD  
BY ENGINEER

INSULATED COVER C/W HANDLE,  
10 PLYWOOD & 100 THK.  
INSULATION SEE DETAIL 1



300 SQUARE FLOOR DRAIN C/W BACK WATER VALVE  
MIN. DEPTH OF 100 mm BELOW FLOOR SURFACE.  
DRAIN TO BE CONNECTED TO WASTEWATER SYSTEM USING  
100Ø DR 28 PVC PIPE

1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. LIFT HOLES IN PRECAST SECTIONS TO BE GROUTED WITH CEMENT MORTAR PRIOR TO PLACING GRANULAR BACKFILL.
3. IF FINAL GRADE ADJUSTMENT EXCEEDS 150 mm IN HEIGHT, CIRCULAR 15 m REBAR MUST BE INCORPORATED IN THE RAISED SECTION.

FORCEMAIN SIZE	VALVE CHAMBER SIZE (MIN)
100 - 150	1500
200 - 300	1800
400 - 450	2100
500 -	CUSTOM SIZED TO SUIT & AS APPROVED BY ENGINEER

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		AIR RELEASE/AIR VACUUM VALVE CHAMBER (FORCE MAIN WASTEWATER SYSTEM)	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1500	

No.	DESCRIPTION	DATE	BY	CHKD
4	GENERAL REVISIONS FOR 2016	16 03 01	SS	
3	ADDED WASTEWATER TO TITLE	09 06 09	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

PRECAST CONCRETE UTILITY VAULT

150Ø ALUMINUM PIPE VENT  
MAST C/W FLANGE, 180° BEND  
RETURN & BIRD SCREEN

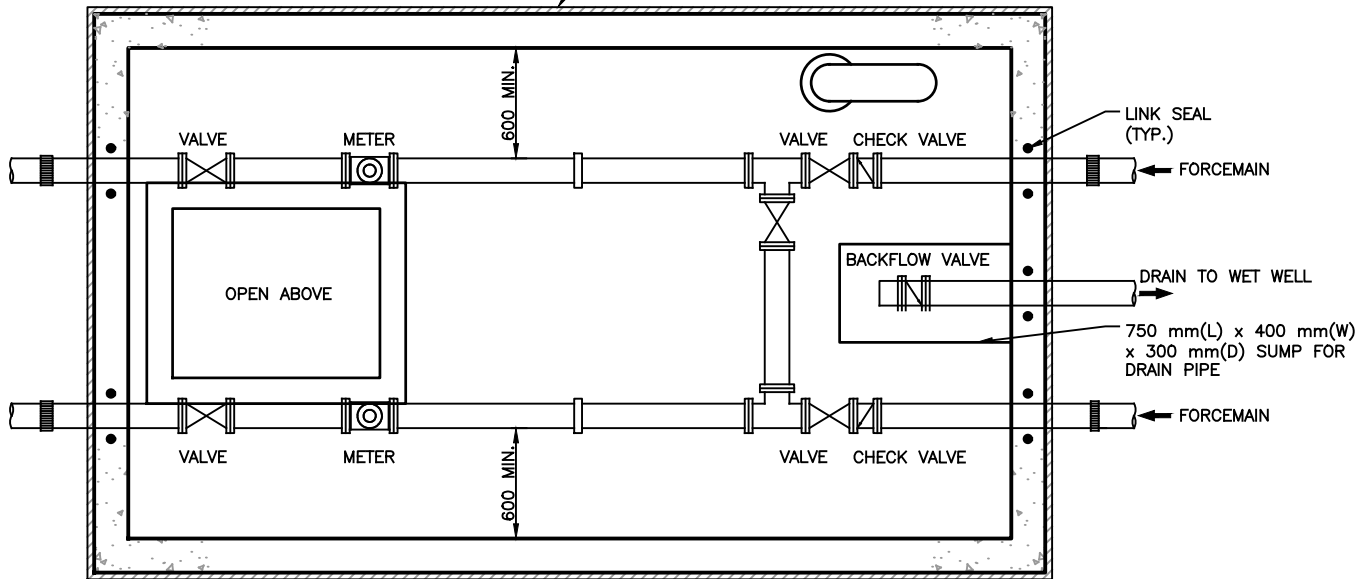
BILCO ROOF SCUTTLE (TYPE LS)  
(915 mm x 760 mm)

150 mmØ ALUMINUM FLANGED  
X P.E. C/W WALL FLANGE.  
COAT ALUMINUM PIPE WITH 2  
COATS OF ZINC CHROMATE  
PRIMER (WHERE IN CONTACT  
WITH CONCRETE)

SEE DRAWING HWSD -  
1504 FOR VALVE  
CHAMBER SECTION

150 mm x 150 mm CONCRETE  
CURB FOR BILCO HATCH ON ALL  
SIDES OF ACCESS OPENING (TYP.)

50Ø THICK STYROFOAM  
INSULATION, TRAFFIC RATED,  
1200 mm FROM TOP



MINIMUM FORCEMAIN SIZE 100Ø  
VALVES TO CLOSE IN CLOCKWISE (RIGHT) DIRECTION

PIPE SUPPORTS AS REQUIRED

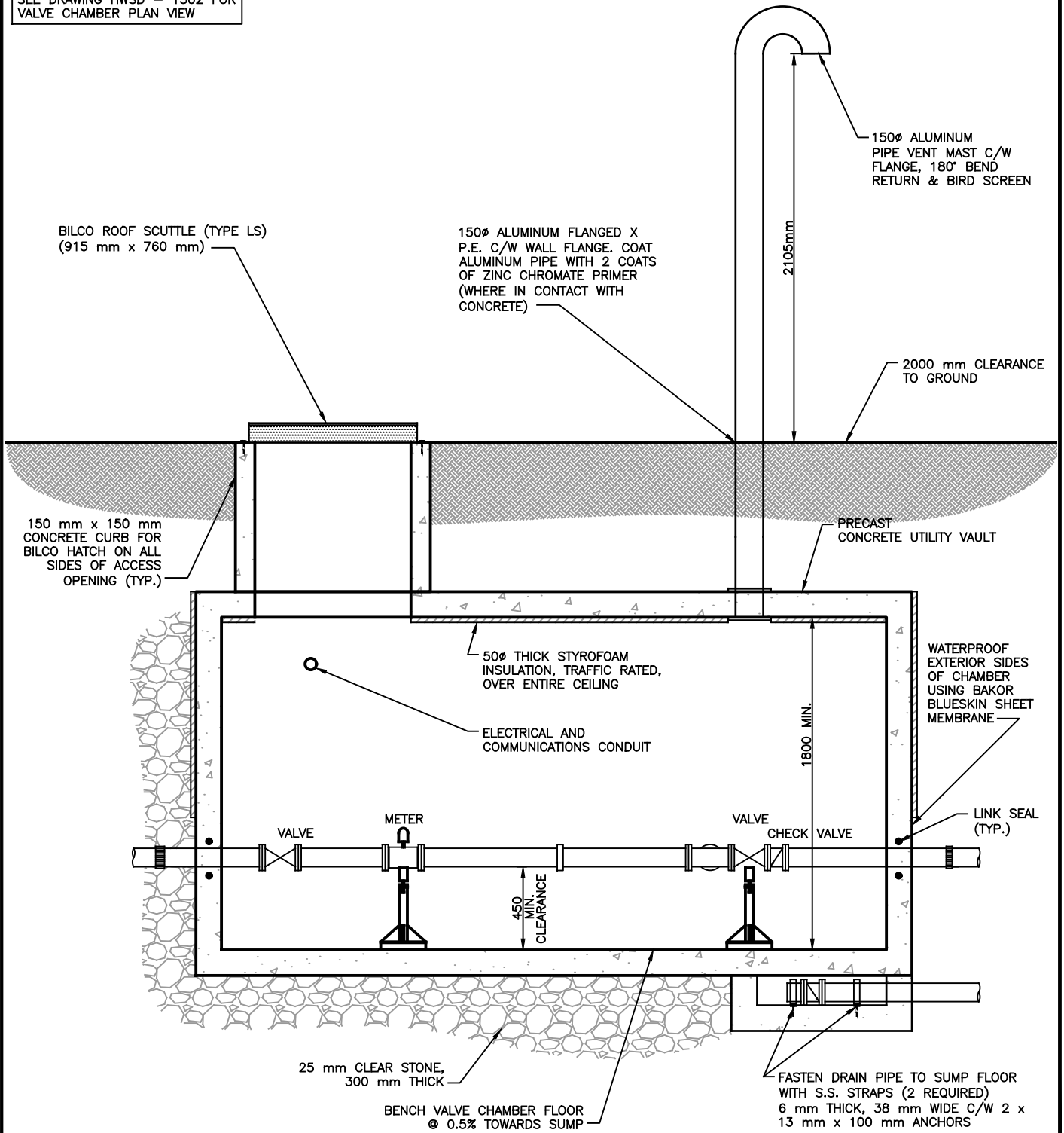
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		FORCEMAIN VALVE CHAMBER	
		- PLAN -	
DRAWN	K.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1502	

SEE DRAWING HWSO - 1502 FOR VALVE CHAMBER PLAN VIEW

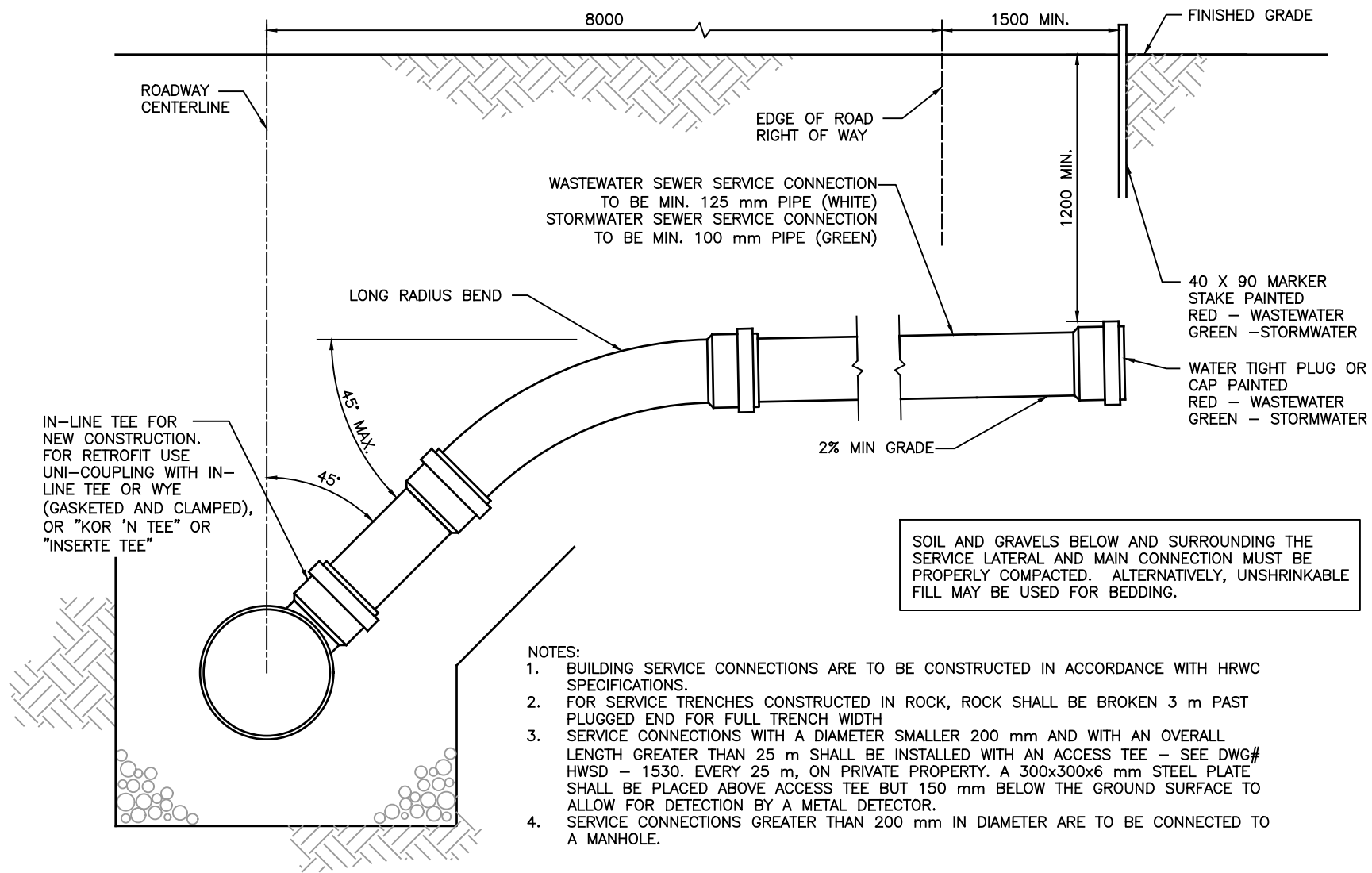


		YY/MM/DD			
No.	DESCRIPTION	DATE	BY	CHKD	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT <b>FORCEMAIN VALVE CHAMBER</b>	
- SECTION -	
DRAWN K.W.	SCALE (PLAN) N.T.S.
CHECKED J.D.	SCALE (PROFILE)
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. <b>HWSO - 1504</b>	



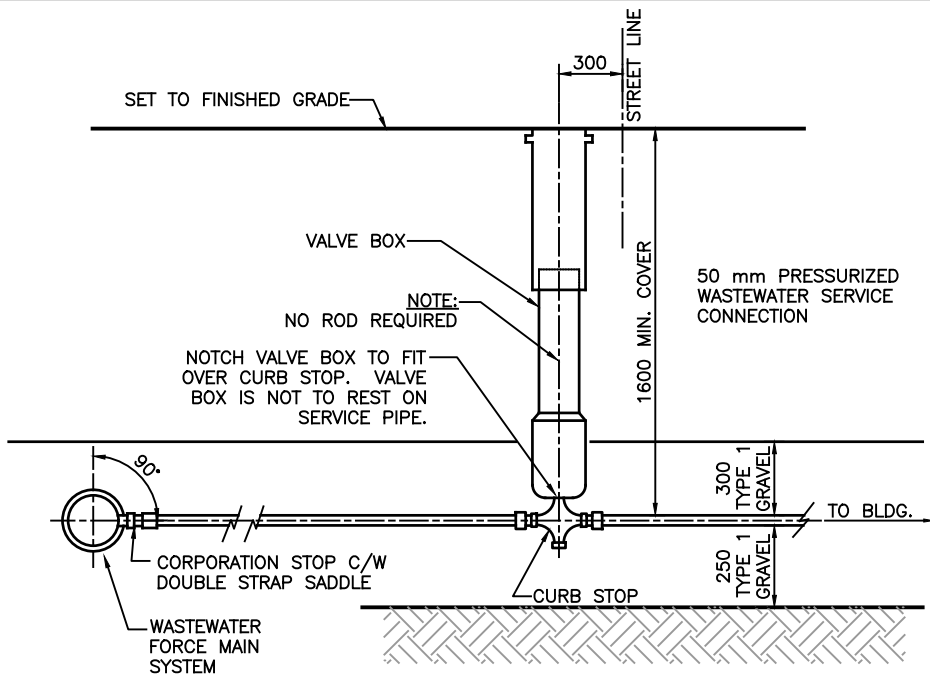
No.	DESCRIPTION	DATE	BY	CHKD
4	GENERAL REVISIONS FOR 2016	16 03 01	SS	
3	GENERAL REVISIONS FOR 2010	10 05 11	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.

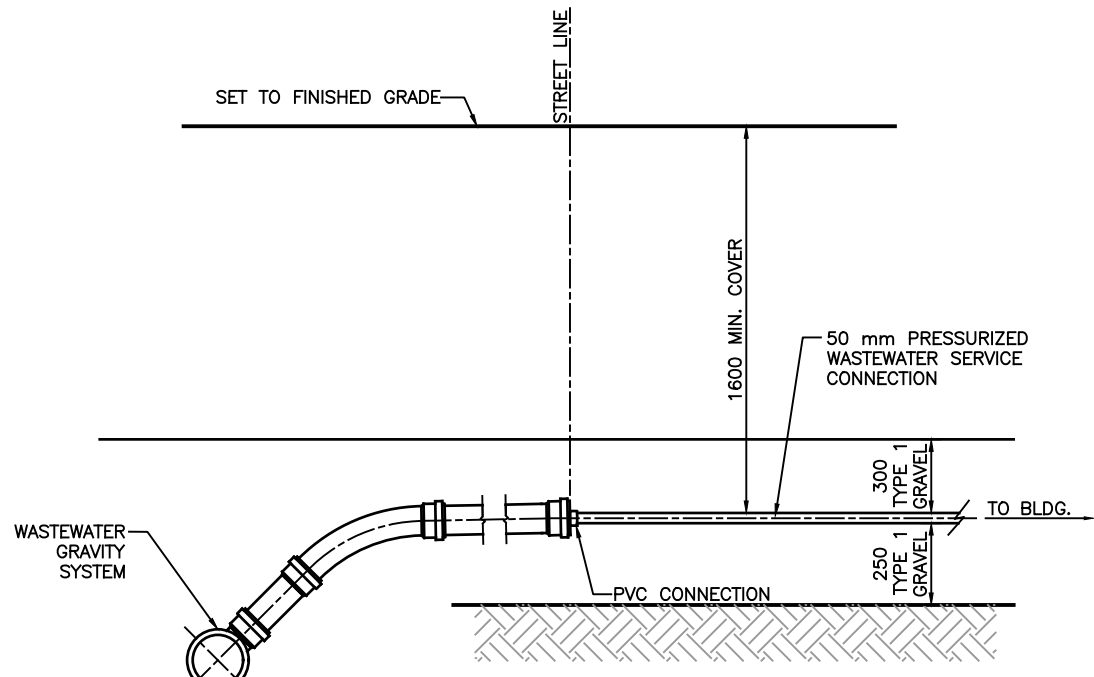


PROJECT		BUILDING SERVICE CONNECTION-PROFILE VIEW	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1510	





**CONNECTION TO WASTEWATER FORCEMAIN SYSTEM**

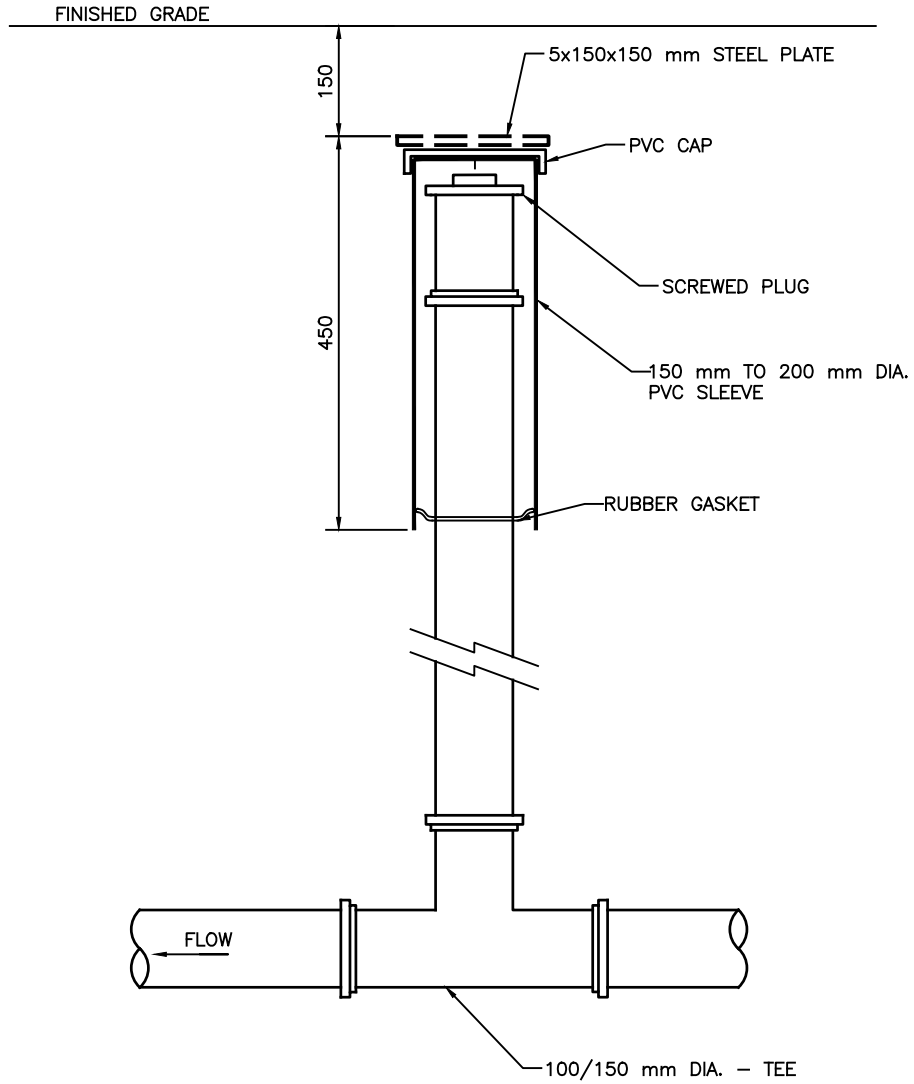


**CONNECTION TO GRAVITY WASTEWATER SYSTEM**

**NOTES:**

1. SELECT BACKFILL, (MAX. SIZE 50 mm) TO BE PLACED AROUND VALVE BOX TO SUBGRADE.
2. SERVICE SADDLE REQUIRED FOR 50 mm.
3. TRACE WIRE FOR LOCATING PURPOSES TO BE INSTALLED ON PRESSURIZED WASTEWATER SERVICE CONNECTIONS AS PER SECTION 4.6.

					<p><b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</p>	<p><b>PROJECT</b></p> <p><b>STANDARD 50 mm PRESSURIZED WASTEWATER SERVICE CONNECTION</b></p>						
						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">DRAWN K.W.</td> <td style="width: 50%;">SCALE (PLAN) N.T.S.</td> </tr> <tr> <td>CHECKED J.D.</td> <td>SCALE (PROFILE)</td> </tr> <tr> <td>APPROVED K.G.</td> <td>DATE 17/02/15</td> </tr> </table>	DRAWN K.W.	SCALE (PLAN) N.T.S.	CHECKED J.D.	SCALE (PROFILE)	APPROVED K.G.	DATE 17/02/15
DRAWN K.W.	SCALE (PLAN) N.T.S.											
CHECKED J.D.	SCALE (PROFILE)											
APPROVED K.G.	DATE 17/02/15											
					PROJECT No.							
					DWG. No.	HWSD - 1520						
No.	DESCRIPTION	DATE	BY	CHKD								
3	GENERAL REVISIONS FOR 2016	16 03 01	SS									
2	REVISED VALVE BOX LOCATION	FEB. 14/14	SS									
1	GENERAL REVIEW	11 03 21	-									



NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT

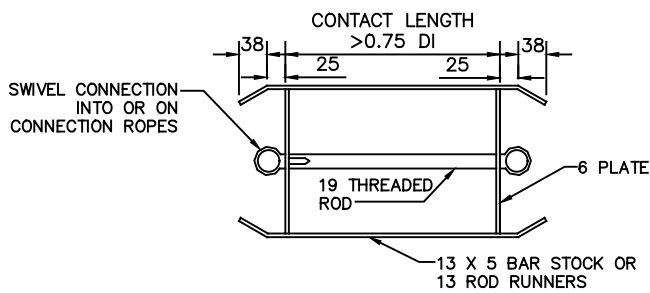
RESIDENTIAL SERVICE  
CONNECTION  
ACCESS TEE

DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15

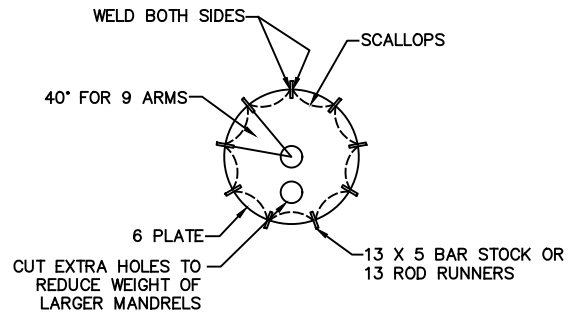
PROJECT No.

DWG. No. HWSD - 1530

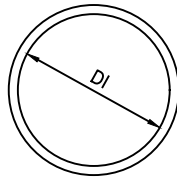
No.	DESCRIPTION	DATE	BY	CHKD
2	GENERAL REVISIONS FOR 2016	16 03 01	SS	
1	REVISION DETAILS	YY MM DD	XX	



LONGITUDINAL SECTION OF MANDREL



TRANSVERSE SECTION OF MANDREL



END VIEW OF PROVING RING

NOTE:  
MANDRELS LARGER THAN 450 mm IN DIAMETER SHALL BE CONSTRUCTED OF SPECIAL BREAKDOWN DEVICES TO FACILITATE ENTRY THROUGH ACCESS MANHOLES.

MANDREL SIZING FOR SOLID WALL SDR35 PVC PIPE (CSA B182.2)

SDR35						
NPS	AVERAGE INSIDE DIAMETER (mm)	BASE INSIDE DIAMETER (BID) (mm)	ALLOWABLE VERTICAL DEFLECTION (mm)		RADIUS OF MANDREL ARM (mm)	
			SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
			5.0%	7.5%	5.0%	7.5%
200	200.42	196.11	186.3	181.4	93.7	91.4
250	250.55	245.16	232.9	226.8	117.1	114.3
300	298.27	291.86	277.3	270.0	139.4	136.0
375	365.09	357.25	339.4	330.5	170.6	166.5
450	446.23	436.64	414.8	403.9	208.5	203.5
525	526.08	514.77	489.0	476.2	245.8	239.9
600	591.84	579.11	550.2	535.7	276.6	269.9
675	666.99	652.64	620.0	603.7	311.7	304.2
750	763.57	747.68	710.3	691.6	357.1	348.5
900	913.89	894.77	850.0	827.7	427.3	417.0
1050	1061.84	1039.51	987.5	961.5	496.4	484.5
1200	1212.14	1186.60	1127.3	1097.6	566.7	553.0

PROFILE WALL PVC PIPE (CSA B182.4)

PS 320KPa						
NPS	AVERAGE INSIDE DIAMETER (mm)	BASE INSIDE DIAMETER (BID) (mm)	ALLOWABLE VERTICAL DEFLECTION (mm)		RADIUS OF MANDREL ARM (mm)	
			SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
			5.0%	7.5%	5.0%	7.5%
200	200.41	196.11	186.3	181.4	93.7	91.4
250	250.55	245.19	232.9	226.8	117.1	114.3
300	298.13	291.75	277.2	269.9	139.4	136.0
375	365.09	357.28	339.4	330.5	170.6	166.5
450	448.31	436.70	416.8	405.8	209.5	204.5
525	527.05	515.75	490.0	477.1	246.3	240.4
600	596.9	584.17	555.0	540.4	279.0	272.3
675	673.10	659.49	626.5	610.0	314.9	307.4
750	749.30	734.14	697.4	679.1	350.6	342.1
900	901.70	883.46	839.3	817.2	421.9	411.7
1050	1054.10	1032.79	981.2	955.3	493.2	481.3
1200	1206.50	1182.12	1123.0	1093.5	564.5	550.9

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT

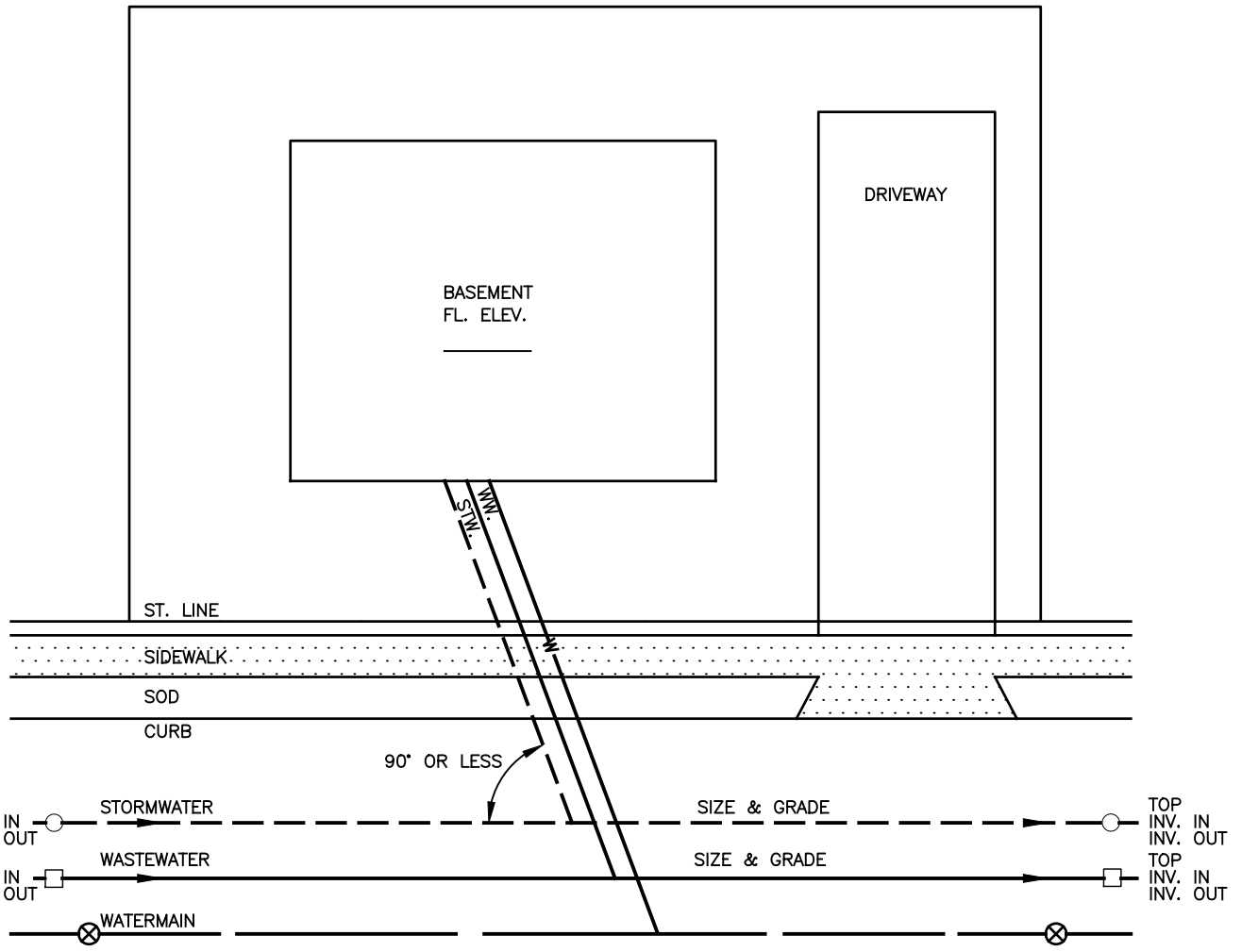
DEFLECTION GAUGE TESTING

DRAWN	K.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	17/02/15

PROJECT No.

DWG. No. HWSD - 1532

1	NEW DRAWING	12 04 02	JW	
No.	DESCRIPTION	DATE	BY	CHKD



**NOTES:**

1. SERVICE CONNECTIONS TO BE AT 2% MIN. GRADE.
2. SERVICE CONNECTIONS ARE TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE
3. SERVICE CONNECTIONS ARE TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE FROM MAIN TO BUILDING. SERVICE CONNECTIONS ARE NOT TO CROSS OVER EACH OTHER.

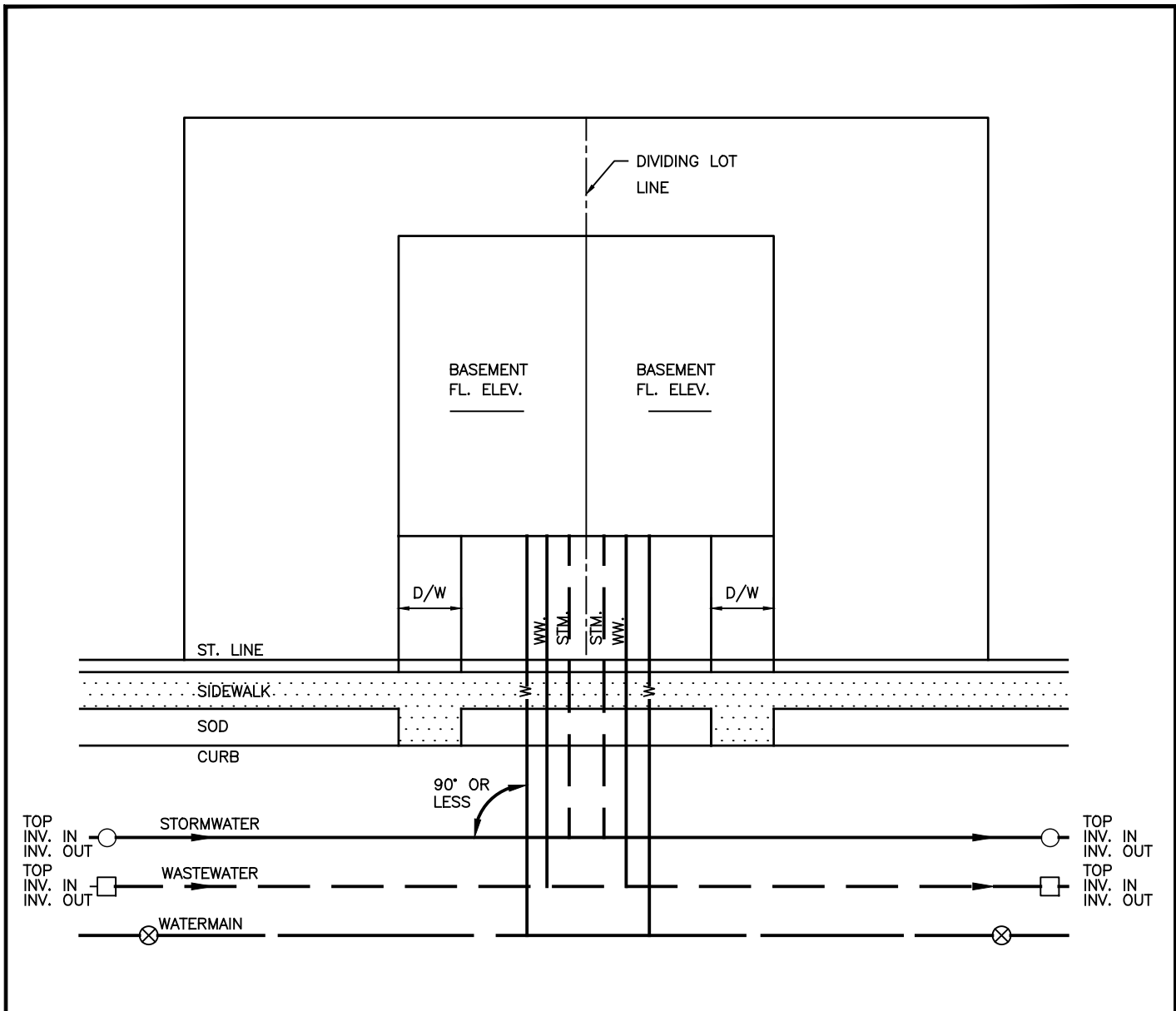
WW. = WASTEWATER  
 STW. = STORMWATER  
 W = WATER

No.	DESCRIPTION	DATE	BY	CHKD
6	GENERAL REVISIONS FOR 2016	16 03 01	SS	
5	REVISED NOTES	FEB. 14/14	JW	SS
4	REVISED NOTES	12 12 17	JW	SS
3	GENERAL REVISIONS FOR 2010	10 05 11	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

**NOTE:**  
 ALL DIMENSIONS SHOWN IN MILLIMETERS,  
 UNLESS OTHERWISE NOTED.



PROJECT		
SERVICE CONNECTIONS FOR SINGLE FAMILY DWELLING, OVER & UNDER DUPLEX		
DRAWN	K.W.	SCALE (PLAN) NTS
CHECKED	J.D.	SCALE (PROFILE) NTS
APPROVED	K.G.	DATE 17/02/15
PROJECT No.		
DWG. No. HWSD - 1540		



**NOTES:**

1. SERVICE CONNECTIONS TO BE AT 2% MIN. GRADE.
2. MINIMUM DISTANCE FROM DIVIDING LOT LINE TO NEAREST SERVICE CONNECTION SHALL BE 500 mm.
3. SERVICE CONNECTIONS ARE TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE FROM MAIN TO BUILDING. SERVICE CONNECTIONS ARE NOT TO CROSS OVER EACH OTHER.

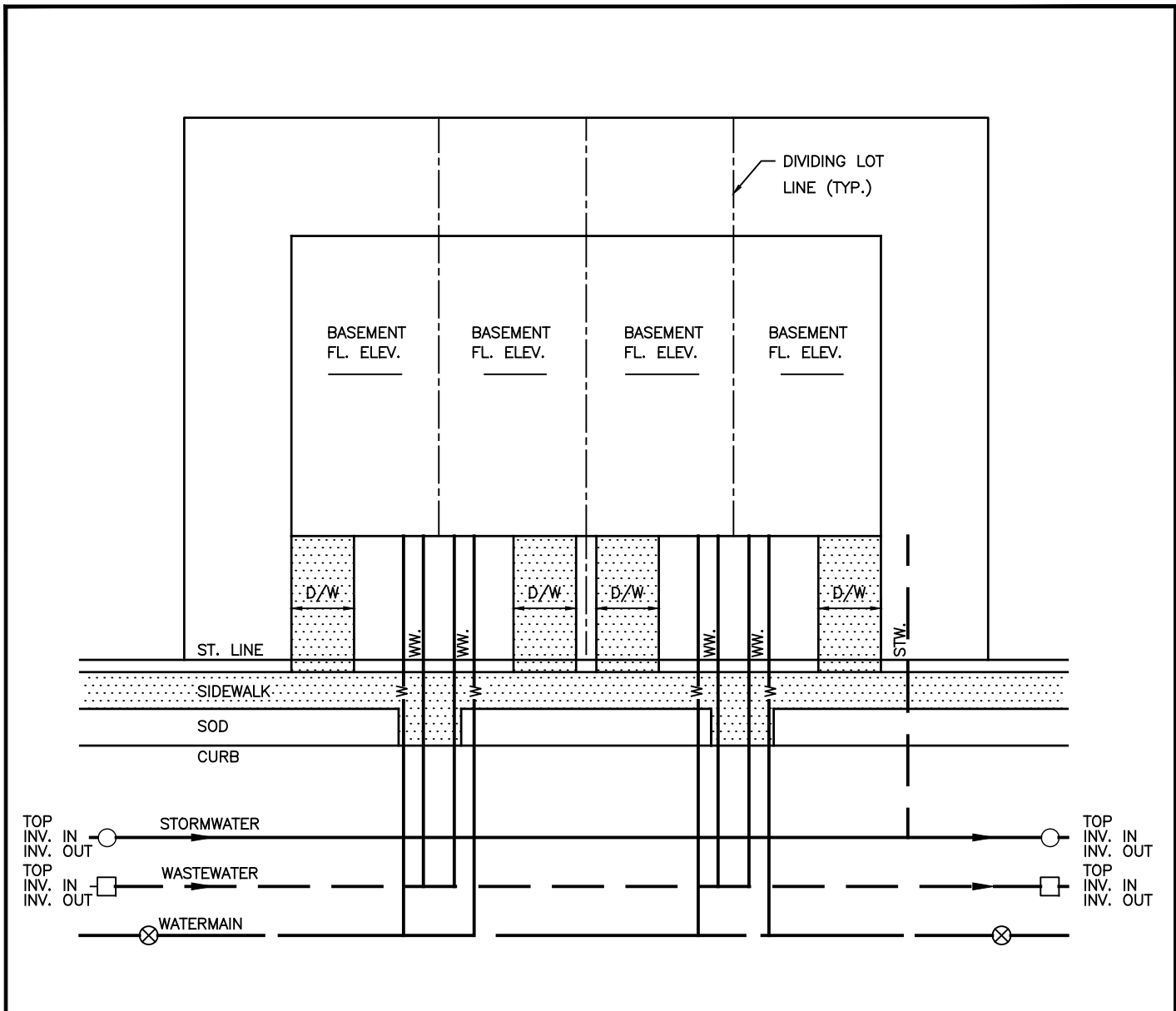
WW. = WASTEWATER  
 STW. = STORMWATER  
 W = WATER

7	GENERAL REVISIONS FOR 2016	16 03 01	SS	
6	REVISED NOTES	14 04 03	SS	
5	REVISED NOTES, LATERAL ALIGNMENT	12 04 02	JW	
4	REVISED NOTES	12 04 02	JW	
3	GENERAL REVISIONS FOR 2010	10 05 11	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	
No.	DESCRIPTION	DATE	BY	CHKD

**NOTE:**  
 ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT		<b>SERVICES CONNECTIONS FOR SIDE BY SIDE DUPLEX</b>	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1550</b>			

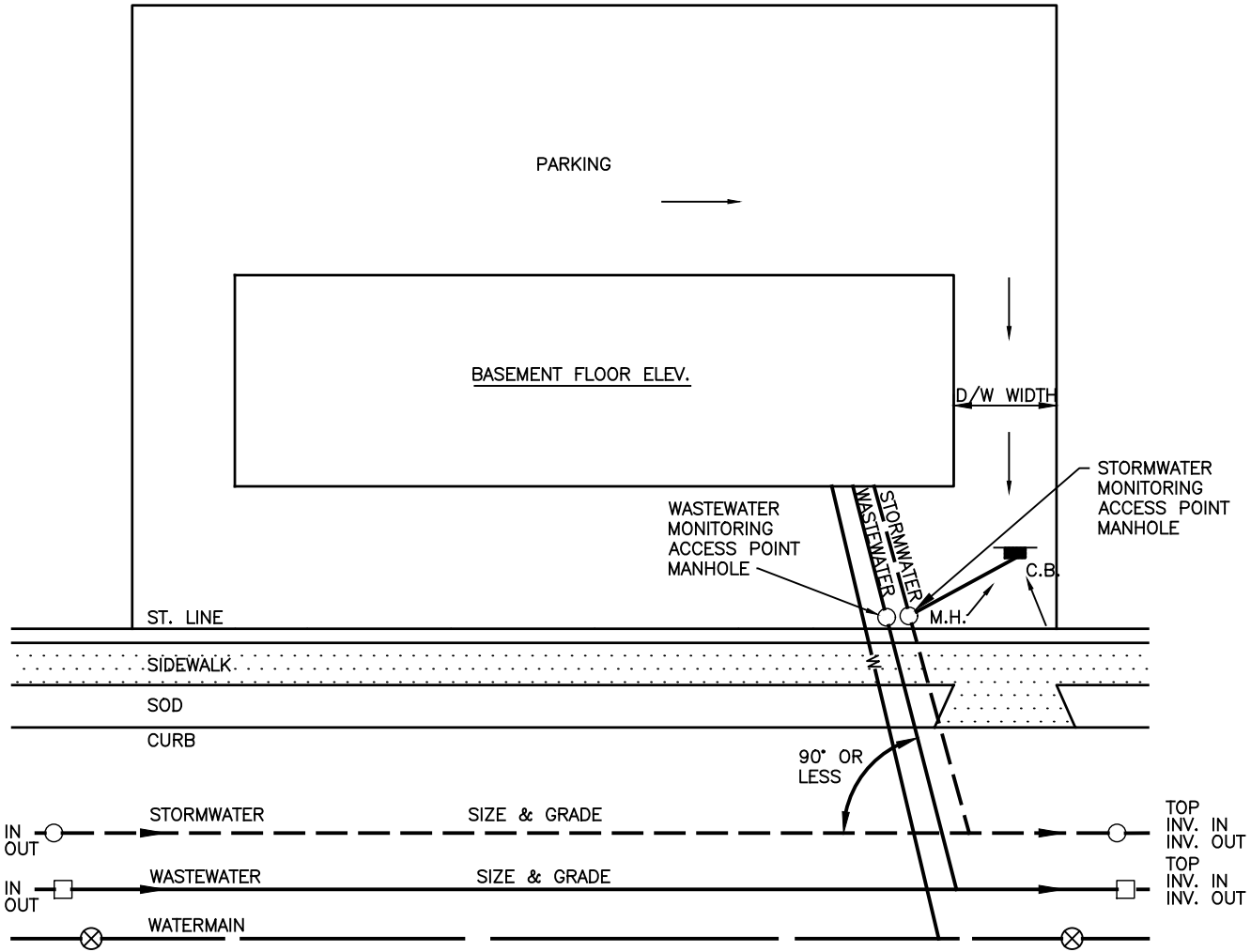


**NOTES:**

1. SERVICE CONNECTIONS TO BE AT 2% MIN. GRADE.
2. MINIMUM DISTANCE FROM DIVIDING LOT LINE TO NEAREST LATERAL SHALL BE 500 mm.
3. SERVICE CONNECTIONS TO BE INSTALLED AND EXTENDED IN A STRAIGHT LINE.
4. STORMWATER LATERAL LOCATION CAN BE VARIED DUE TO SITE GRADING & TOPOGRAPHY.
5. SERVICE CONNECTIONS ARE TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE FROM MAIN TO BUILDING. SERVICE CONNECTIONS ARE NOT TO CROSS OVER EACH OTHER.

WW. = WASTEWATER  
 STW. = STORMWATER  
 W = WATER

					<p><b>NOTE:</b>          ALL DIMENSIONS SHOWN IN MILLIMETERS,          UNLESS OTHERWISE NOTED.</p>	<p><b>PROJECT</b>          SERVICE CONNECTIONS          FOR TOWNHOUSE          DWELLINGS</p>								
							<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">DRAWN K.W.</td> <td style="width: 50%;">SCALE (PLAN) NTS</td> </tr> <tr> <td>CHECKED J.D.</td> <td>SCALE (PROFILE) NTS</td> </tr> <tr> <td>APPROVED K.G.</td> <td>DATE 17/02/15</td> </tr> </table>		DRAWN K.W.	SCALE (PLAN) NTS	CHECKED J.D.	SCALE (PROFILE) NTS	APPROVED K.G.	DATE 17/02/15
DRAWN K.W.	SCALE (PLAN) NTS													
CHECKED J.D.	SCALE (PROFILE) NTS													
APPROVED K.G.	DATE 17/02/15													
					<p>PROJECT No.</p>									
					<p>DWG. No. <b>HWSD - 1552</b></p>									
No.	DESCRIPTION	DATE	BY	CHKD										
3	GENERAL REVISIONS FOR 2016	16 03 01	SS											
2	REVISED NOTES	14 02 14	JW	SS										
1	REVISION DETAILS	YY MM DD	XX											



**NOTES:**

1. CATCHBASIN LEAD IS TO BE A MINIMUM OF 200 mm DIAMETER.
2. SERVICE CONNECTIONS TO BE AT 2% MIN. GRADE.
3. SERVICE CONNECTIONS ARE TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE FROM MAIN TO BUILDING. SERVICE CONNECTIONS ARE NOT TO CROSS OVER EACH OTHER.
4. SIZE OF CATCHBASIN TO BE A MINIMUM OF 1050 DIAMETER.
5. SIZE OF MANHOLE TO BE A MINIMUM OF 1050 DIAMETER.

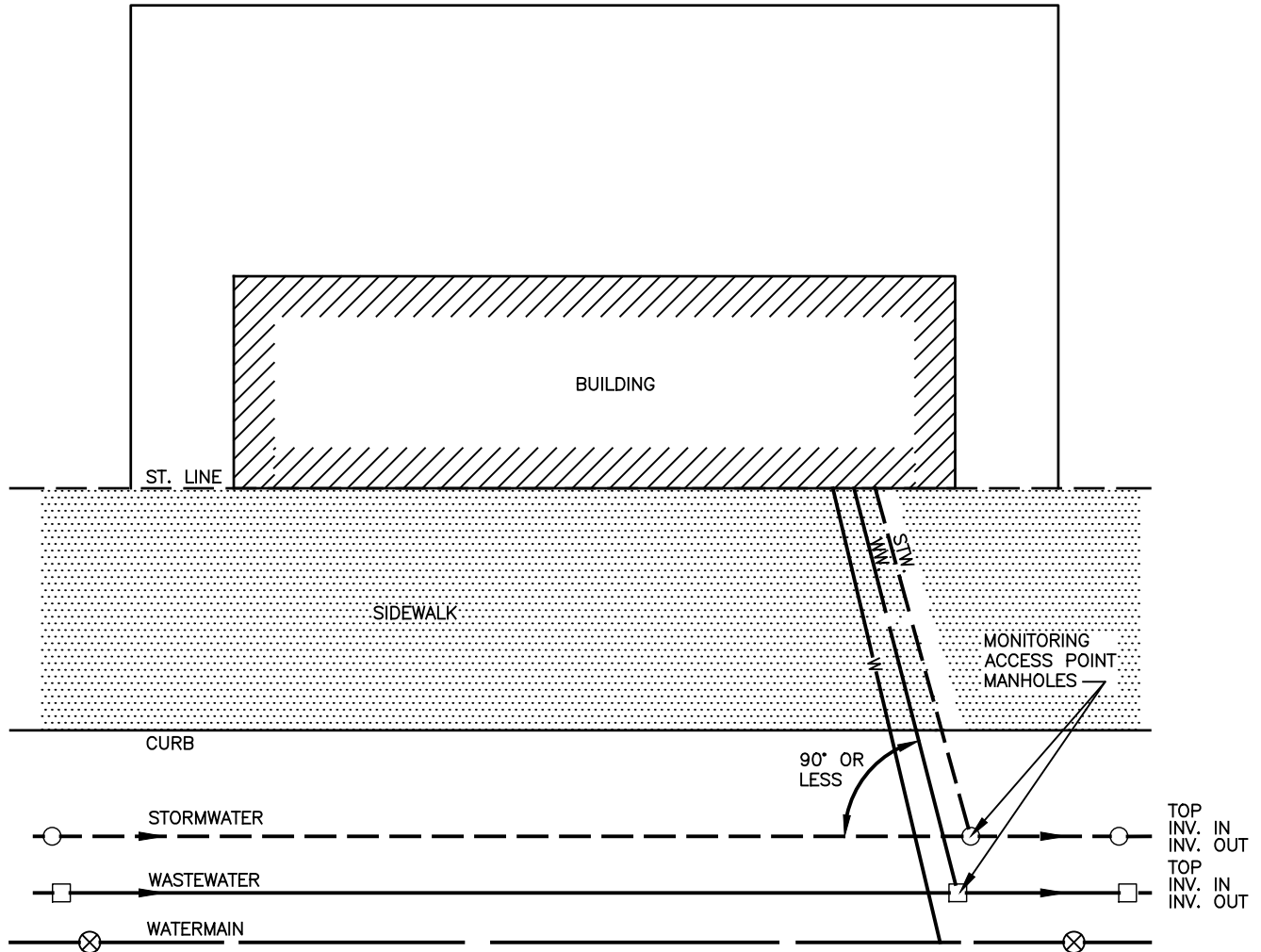
WW. = WASTEWATER  
 STW. = STORMWATER  
 W = WATER

No.	DESCRIPTION	DATE	BY	CHKD
8	GENERAL REVISIONS FOR 2016	16 03 01	SS	
7	ADDED "MONITORING ACCESS POINT" LABELS	15 02 27	SS	
6	REVISED NOTES	14 04 03	SS	
5	REVISED NOTES	12 12 12	JW	
4	REVISED NOTES	12 04 02	JW	
3	GENERAL REVISIONS FOR 2010	10 05 11	ML	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

**NOTE:**  
 ALL DIMENSIONS SHOWN IN MILLIMETERS,  
 UNLESS OTHERWISE NOTED.



PROJECT			
<b>SERVICE CONNECTIONS FOR ICI BUILDINGS</b>			
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1560</b>			



**NOTES:**

1. REFER TO SECTION 4.6 FOR SERVICE CONNECTION REQUIREMENTS.
2. MANHOLE FRAMES AND COVERS IN ACCORDANCE TO HWS-1460/1462.
3. MONITORING ACCESS MANHOLES INSTALLED IN THE STREET R.O.W. SHALL BE OWNED AND MAINTAINED BY HALIFAX WATER.
4. SIZE OF MANHOLE TO BE A MINIMUM OF 1050 DIAMETER. REFER TO HWS-1450.

WW. = WASTEWATER  
 STW. = STORMWATER  
 W = WATER

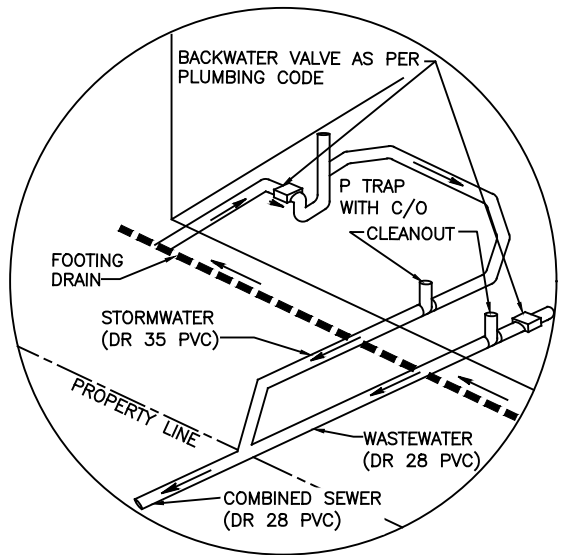
No.	DESCRIPTION	DATE	BY	CHKD
1	GENERAL REVISIONS FOR 2016	16 03 01	SS	
0	REVISION DETAILS	YY MM DD	XX	

**NOTE:**  
 ALL DIMENSIONS SHOWN IN MILLIMETERS,  
 UNLESS OTHERWISE NOTED.

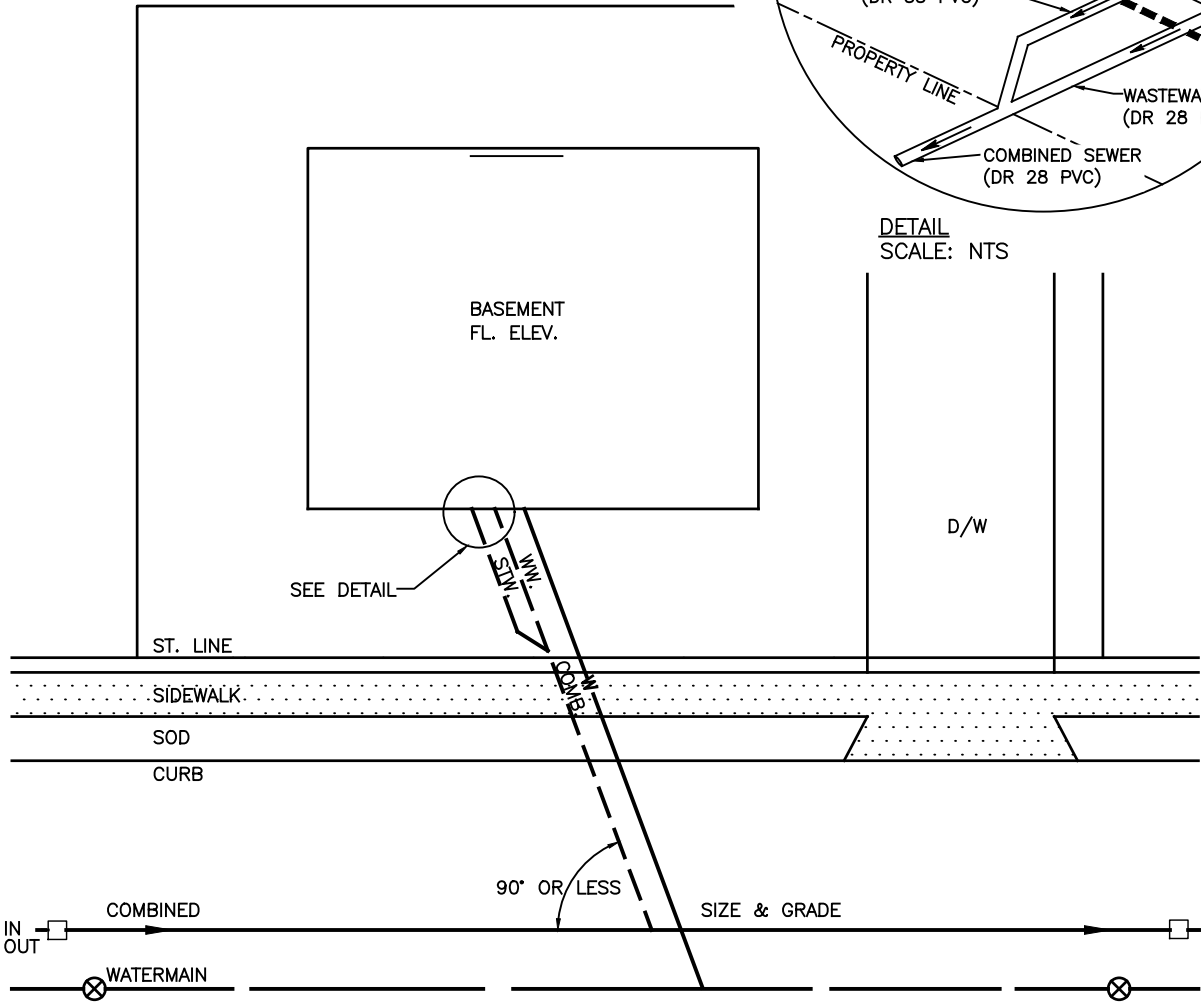


<b>PROJECT</b>		SERVICE CONNECTIONS FOR ICI BUILDINGS ZERO SETBACK	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1562			





DETAIL  
SCALE: NTS



**NOTES:**

1. SERVICE CONNECTIONS TO BE AT 2% MIN. GRADE.
2. SERVICE CONNECTIONS TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE.
3. SERVICE CONNECTIONS ARE NOT TO CROSS OVER EACH OTHER.

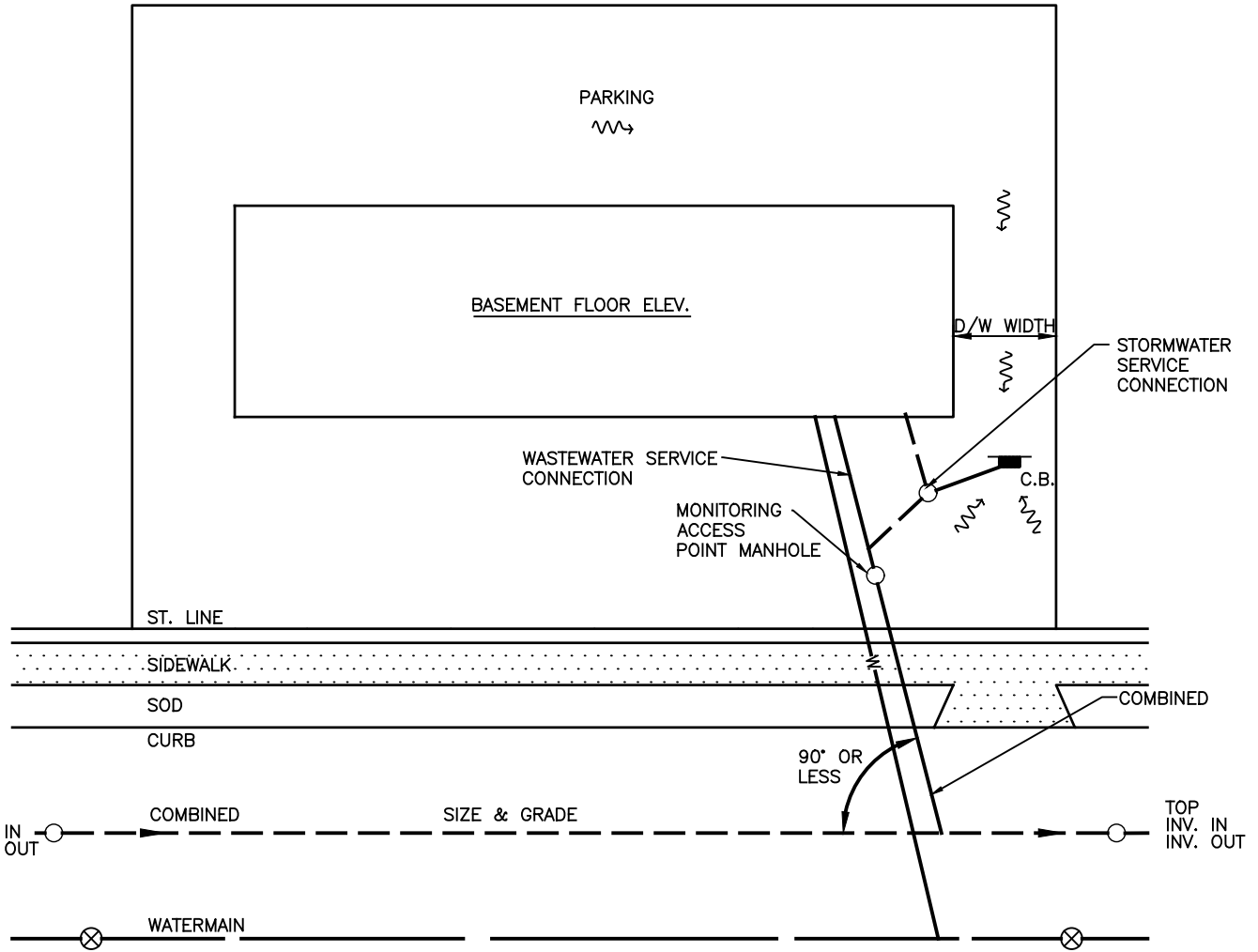
COMB. = COMBINED WASTEWATER & STORMWATER  
W = WATER, WW = WASTEWATER, STW = STORMWATER

No.	DESCRIPTION	DATE	BY	CHKD
5	GENERAL REVISIONS FOR 2016	16 03 01	SS	
4	ADDED SECOND BACKWATER VALVE ON DETAIL	16 01 28	SS	
3	CHANGED DRAWING # FROM 1562 TO 1564	15 02 27	SS	
2	REVISED NOTES	14 04 03	SS	
1	REVISION DETAILS	YY MM DD	XX	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		COMBINED SERVICES CONNECTION DETAIL OVER & UNDER DUPLEX SINGLE FAMILY DWELLING	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1564	

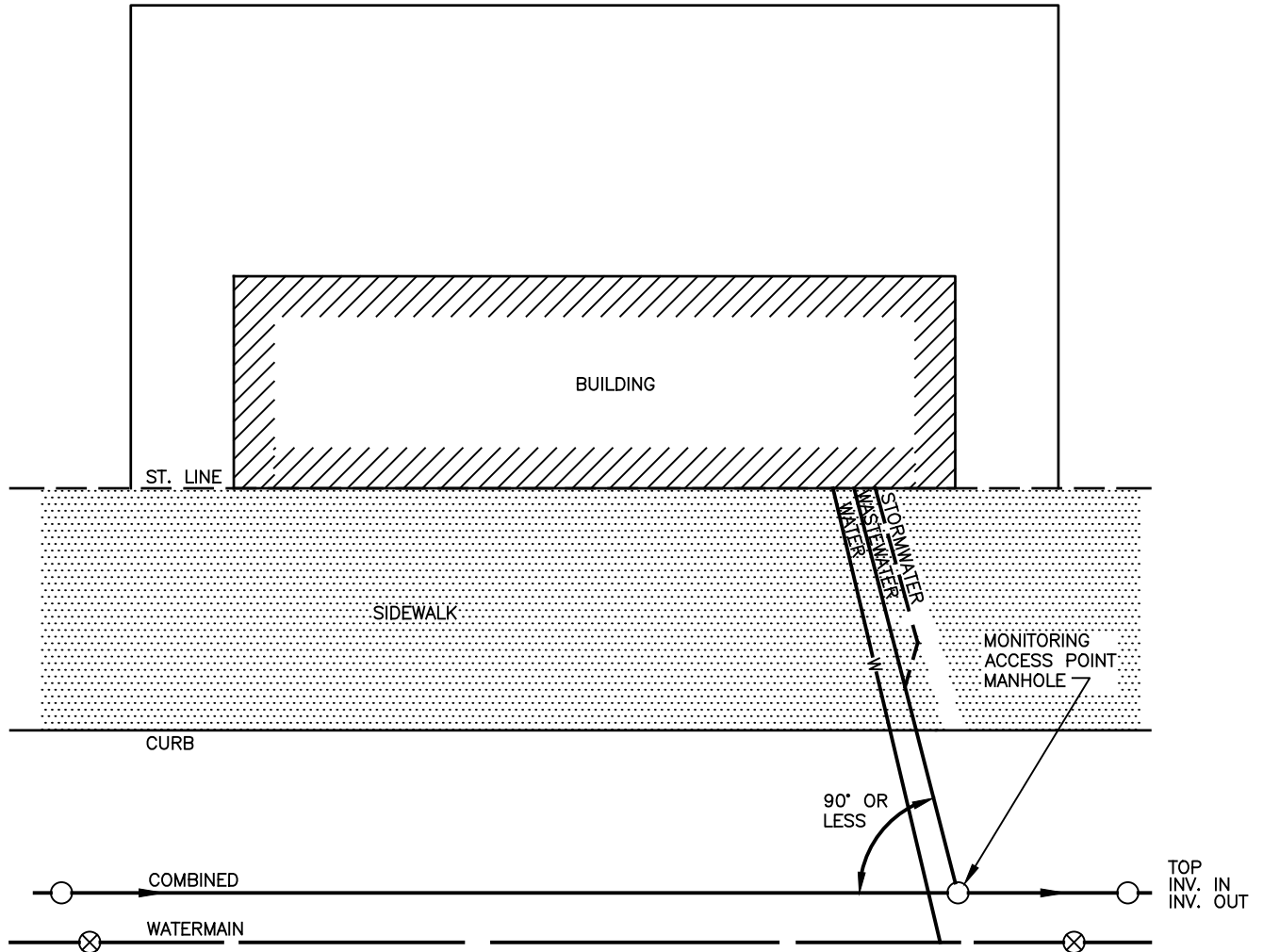


**NOTES:**

1. CATCHBASIN LEAD IS TO BE A MINIMUM OF 200 mm DIAMETER.
2. SERVICE CONNECTIONS TO BE AT 2% MIN. GRADE.
3. SERVICE CONNECTIONS ARE TO BE INSTALLED AND CONSTRUCTED IN A STRAIGHT LINE FROM MAIN TO BUILDING. SERVICE CONNECTIONS ARE NOT TO CROSS OVER EACH OTHER.
4. SIZE OF CATCHBASIN TO BE A MINIMUM OF 1050 DIAMETER.
5. SIZE OF MANHOLE TO BE A MINIMUM OF 1050 DIAMETER.
6. COMBINED SEWER LATERAL GREATER THAN 200 mm REQUIRES MH AT COMBINED SEWER MAIN CONNECTION.

W = WATER  
 COMB. = COMBINED WASTEWATER & STORMWATER

						<p><b>NOTE:</b>          ALL DIMENSIONS SHOWN IN MILLIMETERS,          UNLESS OTHERWISE NOTED.</p>	<p><b>PROJECT</b>  <b>COMBINED SERVICES CONNECTION          DETAIL FOR ICI          BUILDINGS</b></p>						
4	GENERAL REVISIONS FOR 2016	16 03 01	SS				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">DRAWN K.W.</td> <td style="width: 50%;">SCALE (PLAN) NTS</td> </tr> <tr> <td>CHECKED J.D.</td> <td>SCALE (PROFILE) NTS</td> </tr> <tr> <td>APPROVED K.G.</td> <td>DATE 17/02/15</td> </tr> </table>	DRAWN K.W.	SCALE (PLAN) NTS	CHECKED J.D.	SCALE (PROFILE) NTS	APPROVED K.G.	DATE 17/02/15
DRAWN K.W.	SCALE (PLAN) NTS												
CHECKED J.D.	SCALE (PROFILE) NTS												
APPROVED K.G.	DATE 17/02/15												
3	CHANGED DRAWING # FROM 1564 TO 1566	15 02 27	SS				PROJECT No.						
2	REVISED NOTES	14 04 03	SS			DWG. No. <b>HWSD - 1566</b>							
1	REVISION DETAILS	YY MM DD	XX										
No.	DESCRIPTION	DATE	BY	CHKD									



**NOTES:**

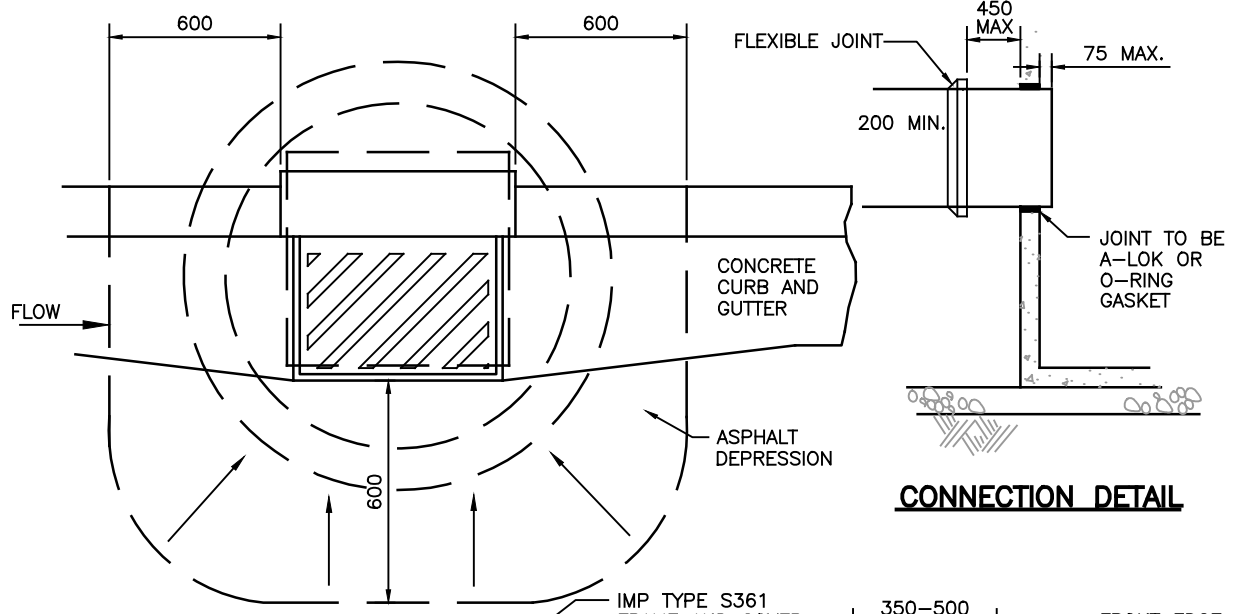
1. REFER TO SECTION 4.6.5 FOR SERVICE CONNECTION REQUIREMENTS.
2. MANHOLE FRAMES AND COVERS IN ACCORDANCE TO HWS-1460/1462.
3. MONITORING ACCESS MANHOLES INSTALLED IN THE STREET R.O.W. SHALL BE OWNED AND MAINTAINED BY HALIFAX WATER.
4. SIZE OF MANHOLE TO BE A MINIMUM OF 1050 DIAMETER. REFER TO HWS-1450.

No.	DESCRIPTION	DATE	BY	CHKD
1	GENERAL REVISIONS FOR 2016	16 03 01	SS	
0	REVISION DETAILS	YY MM DD	XX	

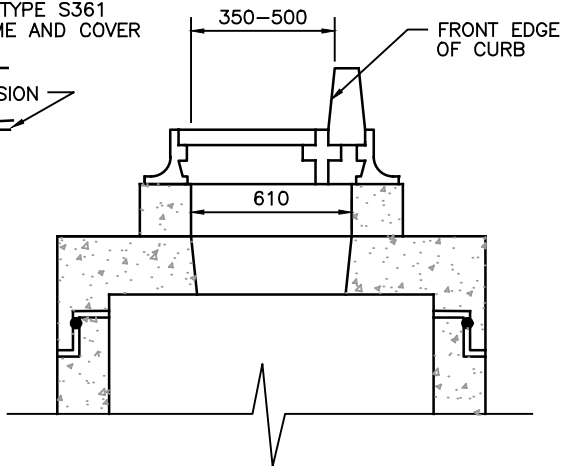
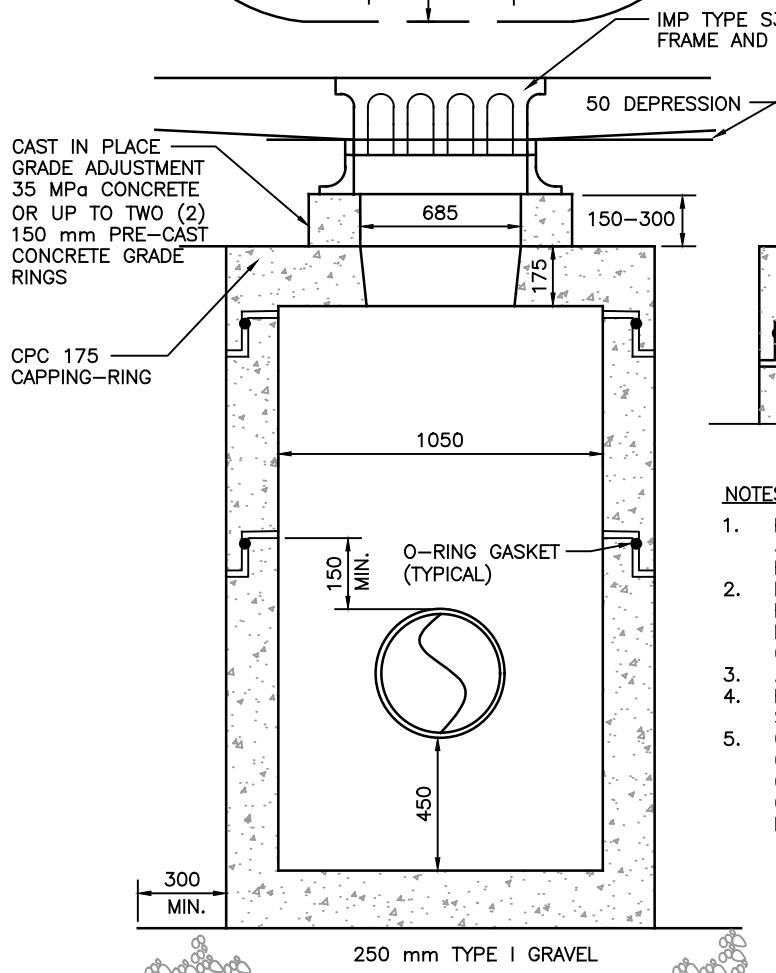
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



<b>PROJECT</b>		<b>COMBINED SERVICES CONNECTION DETAIL FOR ICI BUILDINGS ZERO SETBACK</b>	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1568</b>			



**CONNECTION DETAIL**



**NOTES:**

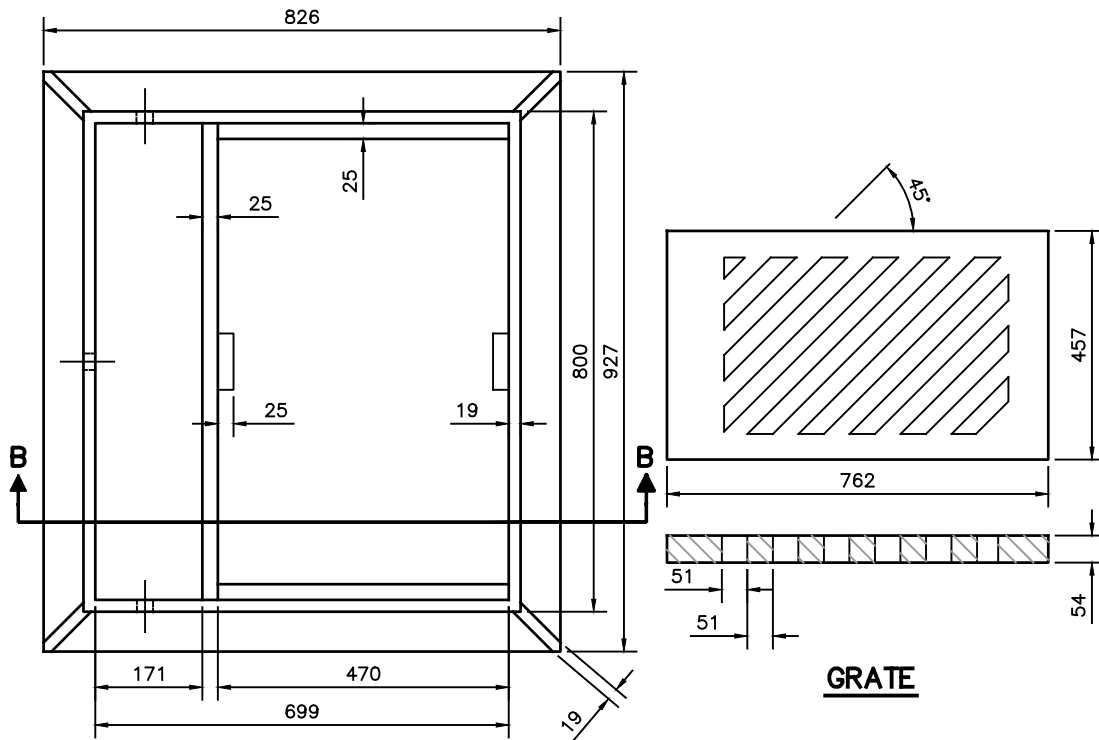
1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. IF FINAL GRADE ADJUSTMENT EXCEEDS 300 mm HEIGHT, CIRCULAR 15M REBAR MUST BE INCORPORATED IN THE RAISED SECTION AND CAST IN PLACE ADJUSTMENT ONLY IS PERMITTED. ANGLE GRATE TO DIRECT WATER TOWARDS CURB.
3. FOR DOUBLE GRATE INSTALLATIONS A CPC 175D SHALL BE REQUIRED.
4. CATCH BASIN FRAME AND GRATE MUST BE CENTERED OVER OPENING IN CAPPING RING AND GRADE ADJUSTMENT. THERE SHALL BE NO OBSTRUCTION TO THE CATCH BASIN THAT WOULD LIMIT FLOW OR ACCESS FOR MAINTENANCE.

8	GENERAL REVISIONS FOR 2022	22 03 14	ST	JC
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

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.

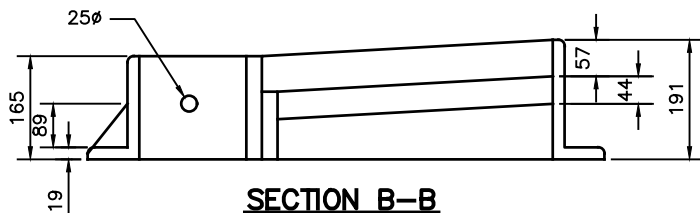


PROJECT			
<b>1050 mm PRECAST CATCHBASIN</b>			
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1570</b>			

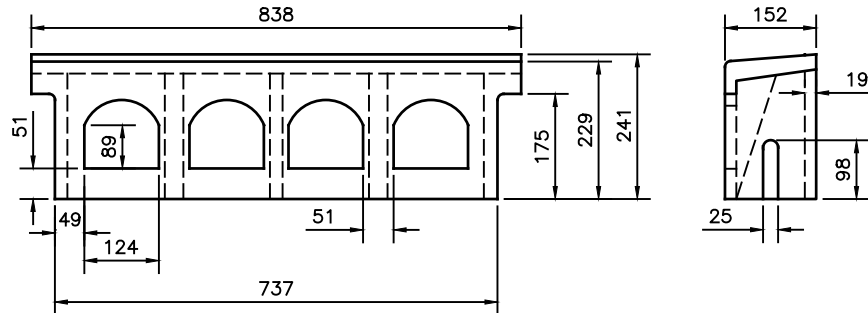


**FRAME**

**GRATE**



**SECTION B-B**



**CURB**

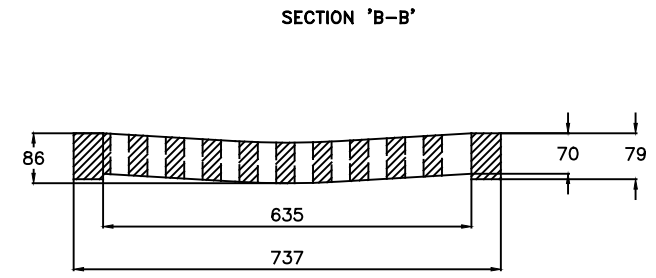
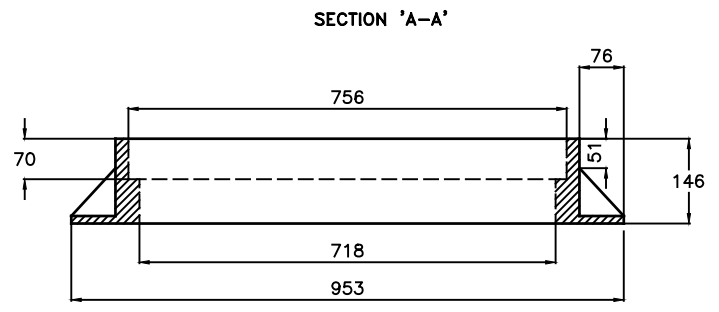
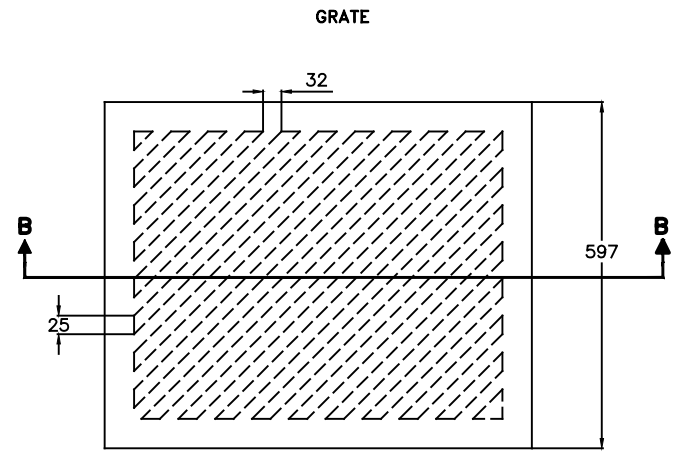
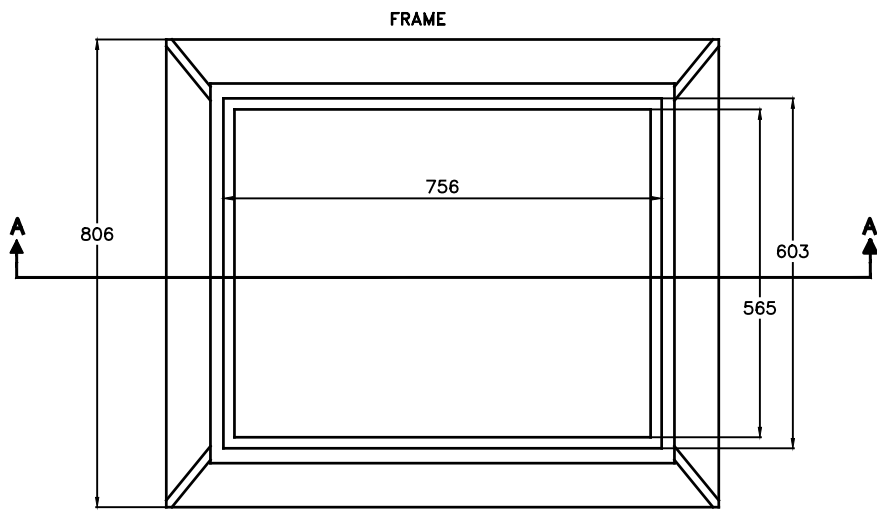
1. STANDARD CATCHBASIN FRAME AND GRATE SHALL BE IMP S361 OR EQUIVALENT.
2. MATERIAL GREY CAST IRON, A.S.T.M. A48/A48M (2008)
  - GRATE WEIGHT 86 kg
  - FRAME WEIGHT 143 kg
  - CURB WEIGHT 54 kg
  - LOAD CAPACITY 7260 kg
  - GRATE WATER FLOW 1342 cm<sup>2</sup> OPENING
  - CURB WATER FLOW 629 cm<sup>2</sup> OPENING

NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



PROJECT		
<b>CATCHBASIN FRAME AND GRATE FOR CURB AND GUTTER INSTALLATIONS</b>		
DRAWN	K.W.	SCALE (PLAN) NTS
CHECKED	J.D.	SCALE (PROFILE) NTS
APPROVED	K.G.	DATE 17/02/15
PROJECT No.		
DWG. No. <b>HWSD - 1580</b>		

No.	DESCRIPTION	DATE	BY	CHKD
3	REVISED TITLE BLOCK	12 12 14	JW	SS
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	



**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 CM<sup>2</sup> OPENING

**NOTE:**

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

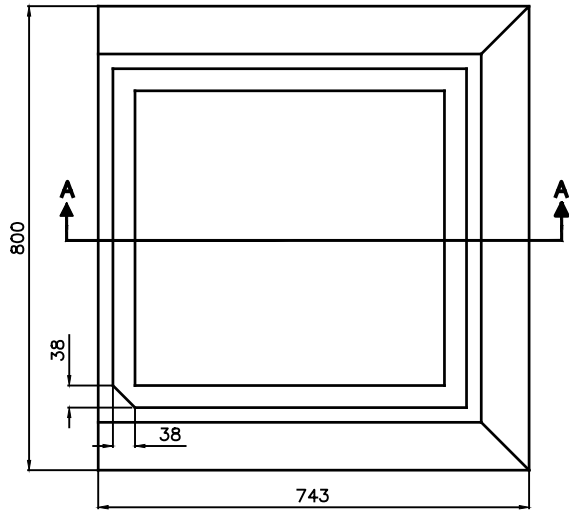
**NOTE:**  
 ALL DIMENSIONS SHOWN IN MILLIMETERS,  
 UNLESS OTHERWISE NOTED.



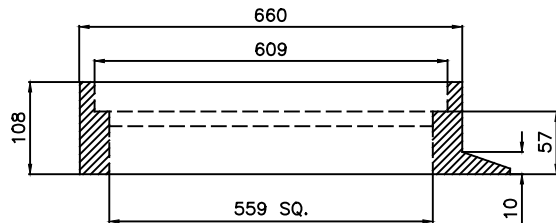
PROJECT		S - 441 CATCHBASIN FRAME & GRATE	
DRAWN	K.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N/A
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1590	

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

**FRAME**



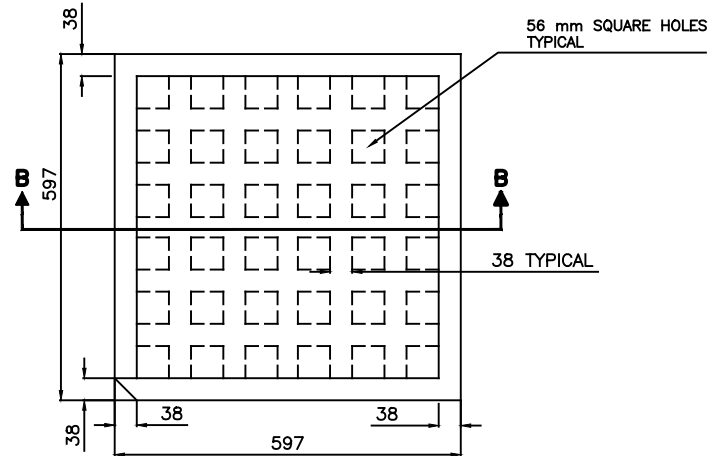
**SECTION 'A-A'**



**NOTE:**

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

**GRATE**



**SECTION 'B-B'**



**NOTE:**

SQUARE OPENING AREA = APPROX. 1113 CM<sup>2</sup>  
 MATERIAL - GRAY CAST IRON, A.S.T.M. A48-74, CLASS 30.  
 COVER WEIGHT - 90.72 KG  
 S 411 FRAME WT. - 97.52 KG  
 LOAD CAPACITY - 7,257 KG

**NOTE:**  
 ALL DIMENSIONS SHOWN IN MILLIMETERS,  
 UNLESS OTHERWISE NOTED.



**PROJECT**

**S - 401  
 CATCH BASIN  
 FRAME & GRATE**

<b>DRAWN</b>	K.W.	<b>SCALE (PLAN)</b>	N.T.S.
<b>CHECKED</b>	J.D.	<b>SCALE (PROFILE)</b>	N/A
<b>APPROVED</b>	K.G.	<b>DATE</b>	17/02/15

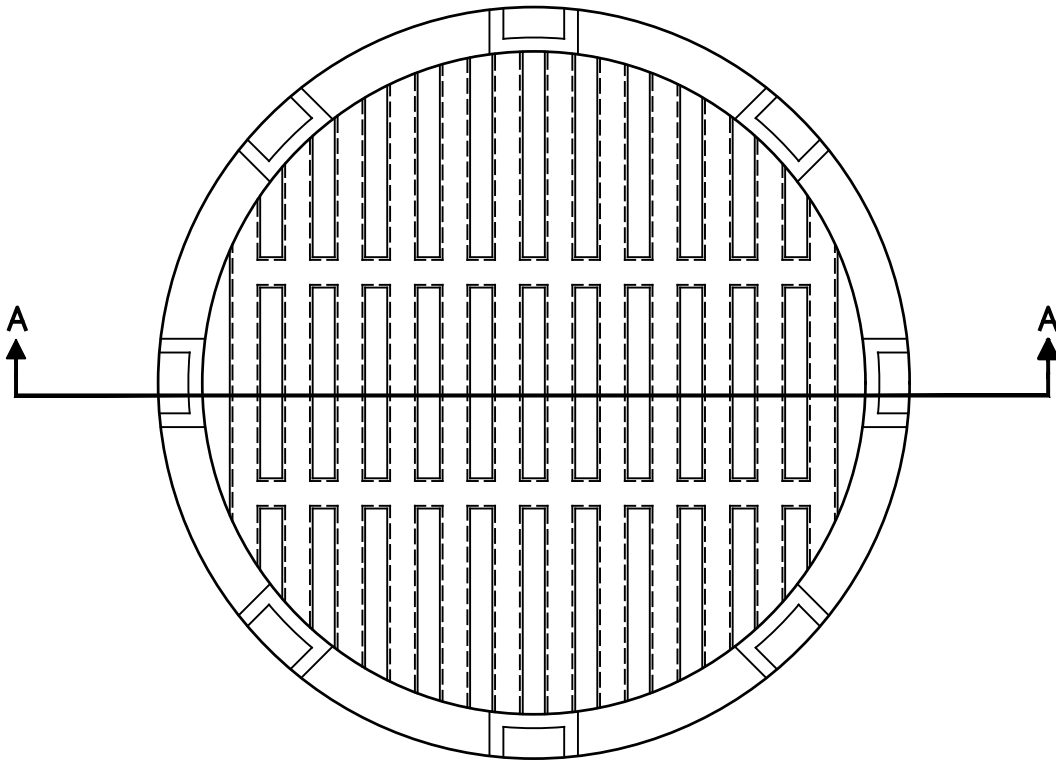
**PROJECT No.**

**DWG. No.**

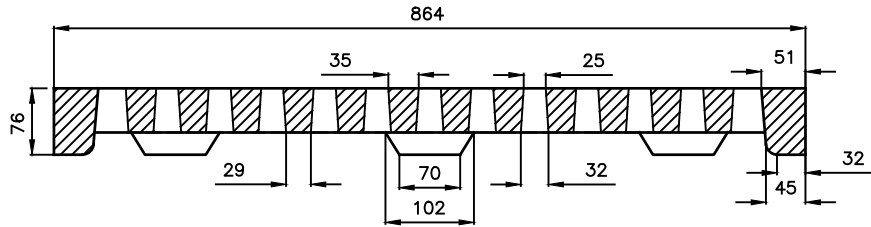
**HWSD - 1592**

No.	DESCRIPTION	DATE	BY	CHKD
2	REVISED DIMENSIONS	FEB. 14/14	JW	SS
1	NEW DRAWING	12 12 14	JW	SS

GRATE



SECTION 'A-A'



NOTE:  
 MATERIAL - GRAY CAST IRON, A.S.T.M. A 48-74, CLASS 30.  
 GRATE WEIGHT - 138.8 KG  
 LOAD CAPACITY - 7,257 KG.

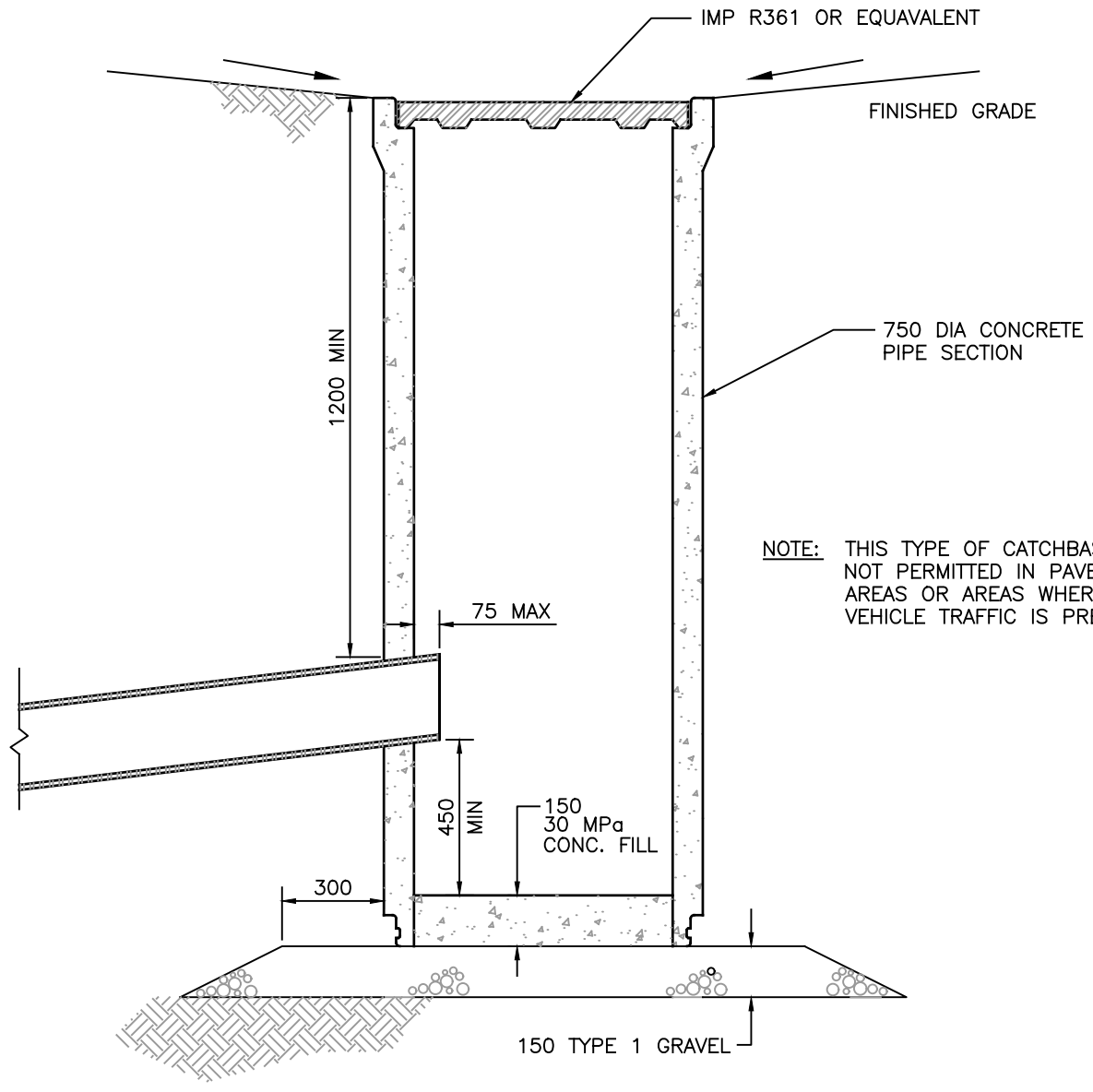
No.	DESCRIPTION	DATE	BY	CHKD
2	NEW DRAWING	12 12 17	JW	SS
1	REVISION DETAILS	YY MM DD	XX	

NOTE:  
 ALL DIMENSIONS SHOWN IN MILLIMETERS,  
 UNLESS OTHERWISE NOTED.



PROJECT		R - 361 GRATING (FOR BELL END OF 750Ø PIPE)	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1594			






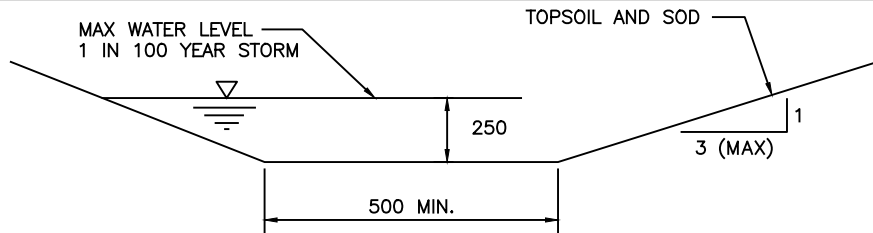
**NOTE:** THIS TYPE OF CATCHBASIN IS NOT PERMITTED IN PAVED AREAS OR AREAS WHERE VEHICLE TRAFFIC IS PRESENT.

No.	DESCRIPTION	DATE	BY	CHKD
3	REVISED TITLE	16 01 28	SS	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

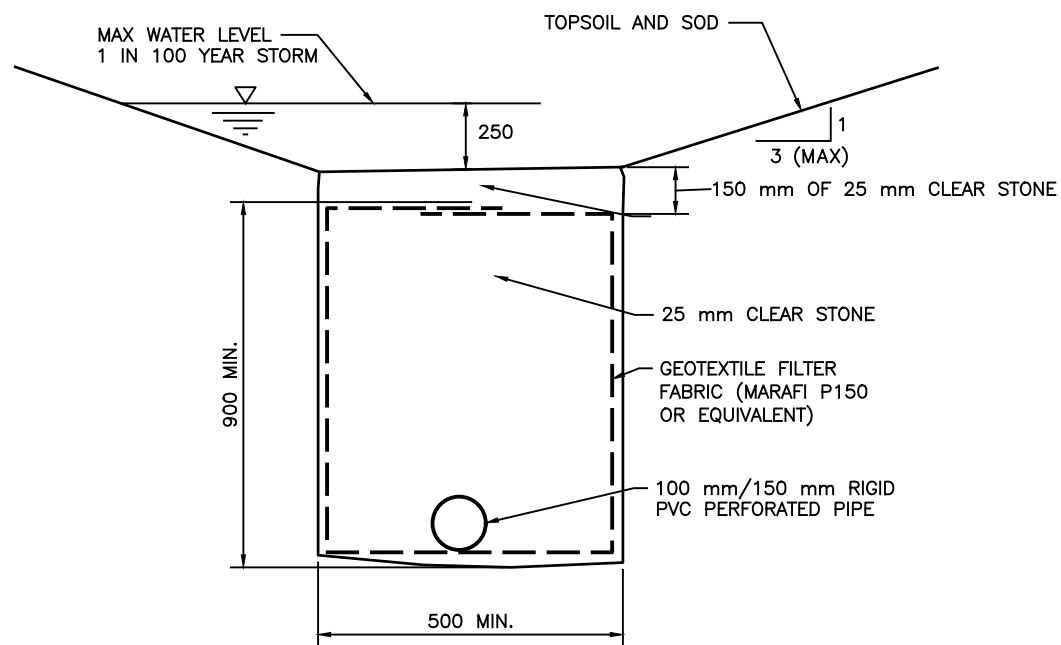
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



<b>PROJECT</b>	
PRIVATE 750 mm $\varnothing$ CONCRETE OFF STREET CATCHBASIN	
DRAWN K.W.	SCALE (PLAN) NTS
CHECKED J.D.	SCALE (PROFILE) NTS
APPROVED K.G.	DATE 17/02/15
PROJECT No.	
DWG. No. HWSD - 1600	



SWALE CROSS SECTION  
NTS



SWALE AND UNDERDRAIN CROSS SECTION  
NTS

NOTES:

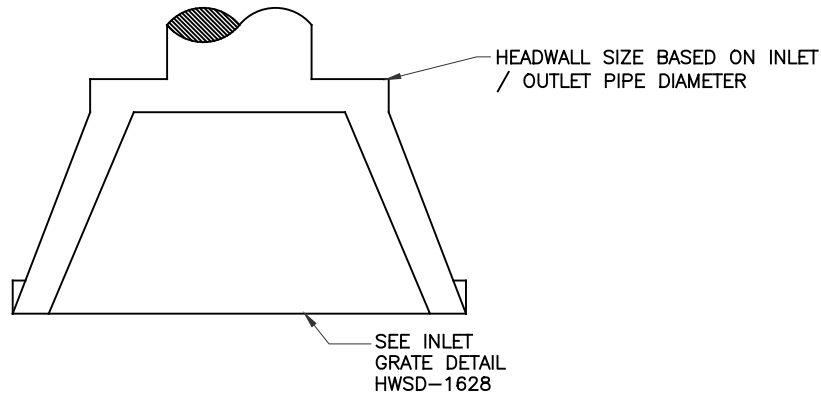
1. OFF STREET UNDERDRAINS SHALL NOT BE CONNECTED TO THE BACK OR SIDES OF AN ON-STREET CATCH BASIN.
2. OFF STREET UNDERDRAINS SHALL CONNECT TO THE STORMWATER MAIN VIA A STORMWATER SERVICE CONNECTION OR TO A STORMWATER MANHOLE LOCATED IN THE STREET RIGHT OF WAY.
3. A MANHOLE WILL BE REQUIRED TO BE INSTALLED ON THE SERVICE CONNECTION PRIOR TO THE STREET RIGHT-OF-WAY. REFER TO HWSD-1450 FOR MANHOLE DETAILS.
4. OFF STREET UNDERDRAINS MAY BE CONSIDERED, THROUGH THE VARIANCE PROCESS TO CONNECT TO AN OFF STREET CATCH BASIN (AS PER HALIFAX GUIDELINES)

No.	DESCRIPTION	DATE	BY	CHKD
3	ADDED NOTES, CHANGED TITLE	16 01 28	SS	
2	GENERAL REVISIONS FOR 2009	09 06 09	ML	
1	REVISION DETAILS	YY MM DD	XX	

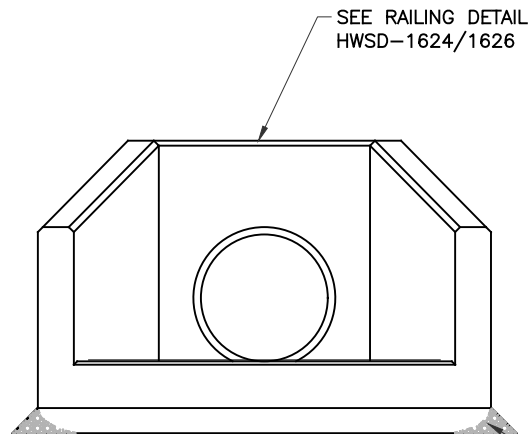
**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



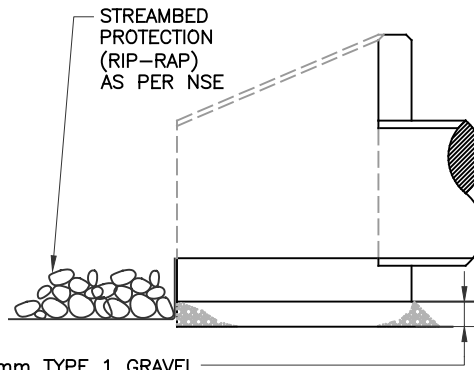
PROJECT		<b>PRIVATE SWALE AND UNDERDRAIN DETAILS</b>	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. <b>HWSD - 1610</b>			



PLAN VIEW



FRONT VIEW



SECTION VIEW

**NOTES:**

1. INLET / OUTLET STRUCTURE SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH NSE AND DFO REGULATIONS AS REQUIRED. THE PROFESSIONAL ENGINEER SHALL TAKE INTO ACCOUNT LOCAL SITE CONDITIONS, DEPTH OF COVER, SLOPE STABILIZATION AND EROSION CONTROL MEASURES FOR INSTALLATION AND FUTURE MAINTENANCE.
2. PRE-CAST HEADWALLS ARE TO BE MANUFACTURED AS ONE PIECE. WHERE MULTIPLE PIPES ENTER AND EXIT A HEADWALL, THE HEADWALL STRUCTURE SHALL BE CUSTOM MANUFACTURED TO SUIT THE DESIGN.
3. SHOP DRAWINGS FOR INLET / OUTLET STRUCTURES TO BE SUBMITTED TO ENGINEER PRIOR TO FABRICATION.
4. ALL MEASUREMENTS IN MILLIMETERS UNLESS OTHERWISE NOTED.
5. THE NOTED INLET / OUTLET HEADWALL ARRANGEMENT IS PROVIDED AS A SAMPLE GUIDE.
6. DESIGN FEATURES INTENDED TO MINIMIZE FLOW THROUGH BEDDING MATERIALS ARE TO BE INDICATED ON DESIGN (EG. CLAY PLUG, CUTOFF WALL, ETC.).
7. FOR PRE-CAST CONCRETE DRIVEWAY HEADWALL SEE HWSD - 1622

No.	DESCRIPTION	DATE	BY	CHKD
2	EDITS FOR 2018	2/16/18	S.T.	
1	NEW DRAWING	1/14/16	S.S.	

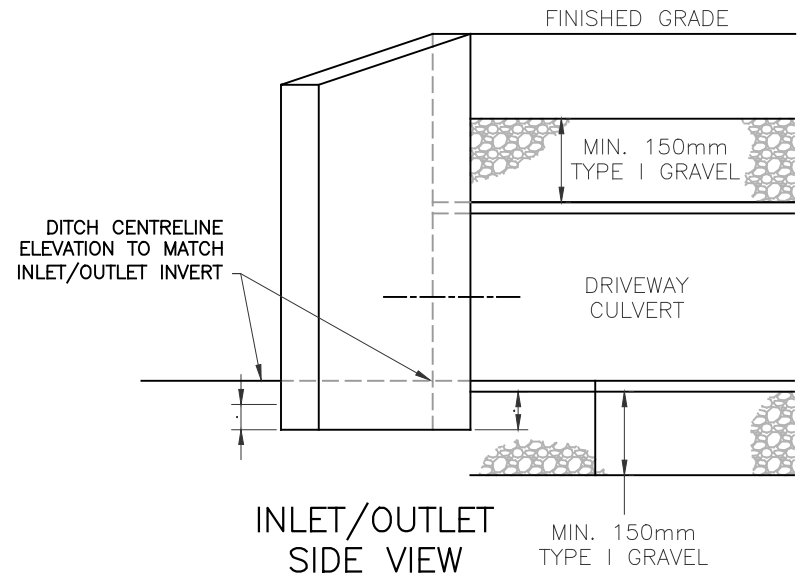
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



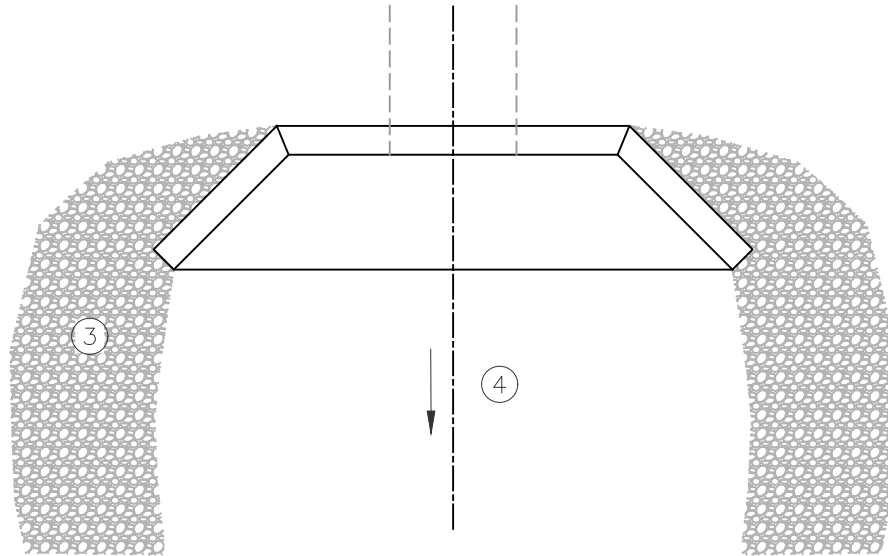
PROJECT		INLET / OUTLET PRE-CAST CONCRETE HEADWALL	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1620	

**NOTES:**

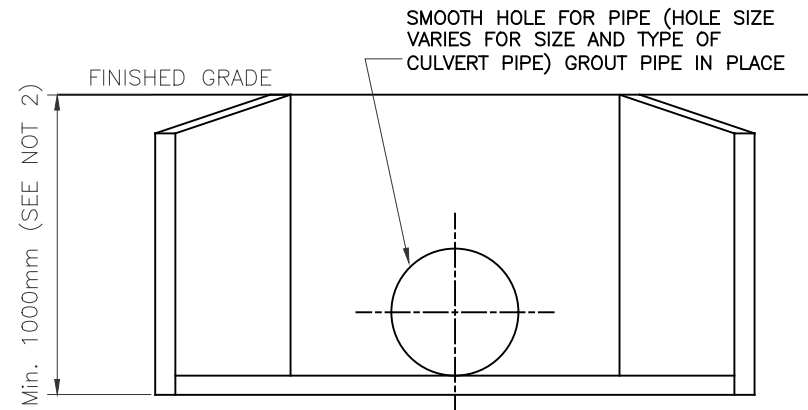
1. DRIVEWAY HEADWALLS SHALL BE INSTALLED SUCH THAT THE TOP HEADWALL IS FLUSH WITH THE DRIVEWAYS FINISHED GRADE.
2. DRIVEWAY HEADWALL HEIGHT SHALL BE DETERMINED BY ROADSIDE DITCH DESIGN ELEVATIONS. MINIMUM HEIGHT OF HEADWALL SHALL BE 1000mm AS PER HWS-1630.
3. RIP RAP SHALL BE INSTALLED ON THE DITCH SIDE SLOPES ADJACENT TO THE HEADWALL FOR SLOPE STABILIZATION AS REQUIRED.
4. RIP RAP SHALL BE INSTALLED AT THE INLET AND OUTLET APRON FOR DITCH CHANNEL STABILIZATION AS REQUIRED.
5. HEADWALL SHALL BE GROUTED AT THE INLET AND OUTLET CULVERT PIPE.
6. DITCH ELEVATION TO MATCH THE CULVERT INLET AND OUTLET ELEVATION.



**INLET/OUTLET SIDE VIEW**



**PLAN VIEW**



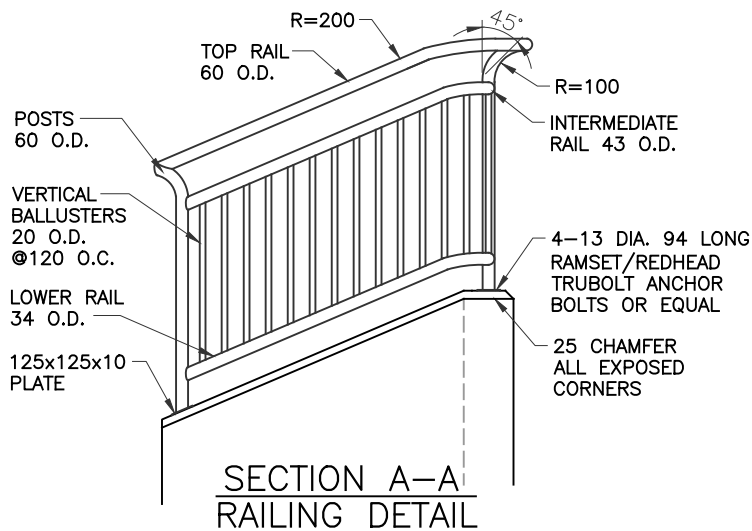
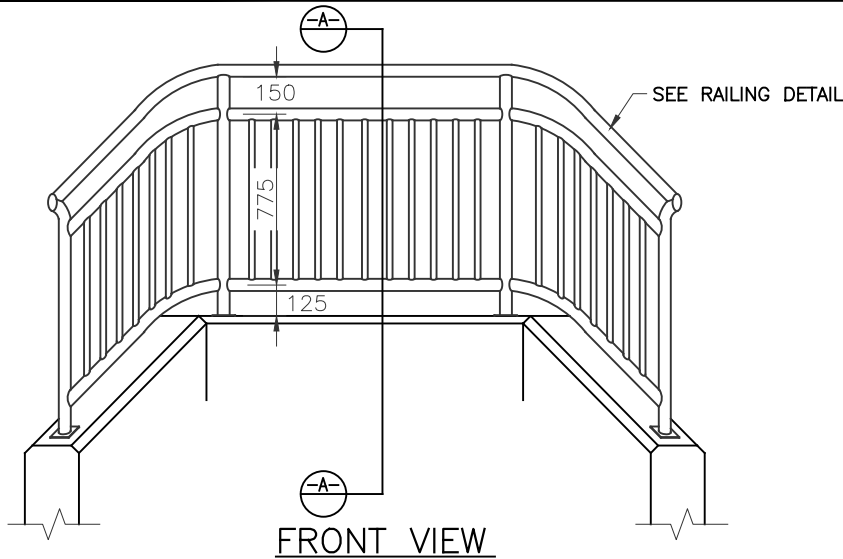
**ELEVATION VIEW**

No.	DESCRIPTION	DATE	BY	CHKD
6	NEW DETAIL FOR 2022	03/14/22	S.T.	
5	NEW DETAIL FOR 2019	13/06/19	S.T.	
4	2018 EDITS	16/02/18	S.T.	
3	RENUMBERED	16 03 01	S.S.	
2	ADDED NOTE 3	15 02 17	S.S.	
1	NEW DRAWING	11 03 08		

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.



<b>PROJECT</b>			
PRE-CAST CONCRETE DRIVEWAY HEADWALL			
<b>DRAWN</b>	S.T.	<b>SCALE (PLAN)</b>	NTS
<b>CHECKED</b>	J.C.	<b>SCALE (PROFILE)</b>	NTS
<b>APPROVED</b>	K.G.	<b>DATE</b>	17/02/15
<b>PROJECT No.</b>			
<b>DWG. No.</b> HWSD - 1622			



**NOTES:**

1. ALL STEEL TO BE HOT DIP GALVANIZED AFTER FABRICATION.
2. CLEAR COVER FOR CONCRETE REINFORCEMENT SHALL BE 50 mm.
3. SHOP DRAWINGS FOR RAILINGS TO BE SUBMITTED TO ENGINEER PRIOR TO FABRICATION.
4. ALL MEASUREMENTS IN MILLIMETERS UNLESS OTHERWISE NOTED.
5. ALL STEEL PIPE TO BE "STANDARD WEIGHT" (SCHEDULE 40) UNLESS OTHERWISE NOTED.
6. A HANDRAIL IS NOT REQUIRED FOR DRIVEWAY CULVERTS.
7. STAINLESS STEEL FASTENERS ARE REQUIRED TO CONNECT HANDRAIL TO CONCRETE STRUCTURE.
8. LENGTH OF RAILING SECTIONS TO BE DETERMINED BY SIZE OF HEADWALL STRUCTURE.

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.

PROJECT  
HEADWALL RAILING DETAIL FOR  
ON STREET INSTALLATIONS  
(INSIDE STREET R.O.W.)

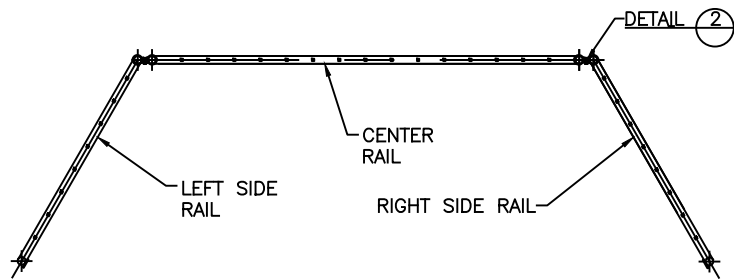
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15

PROJECT No.

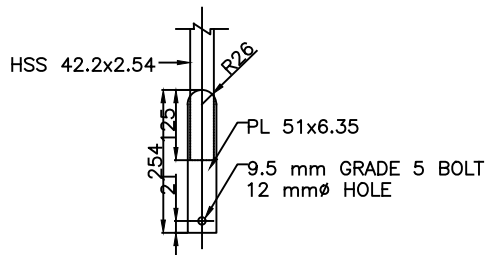
DWG. No. HWSD - 1624



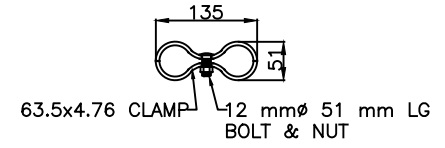
No.	DESCRIPTION	DATE	BY	CHKD
1	NEW DRAWING	16/01/14	S.S.	



PLAN

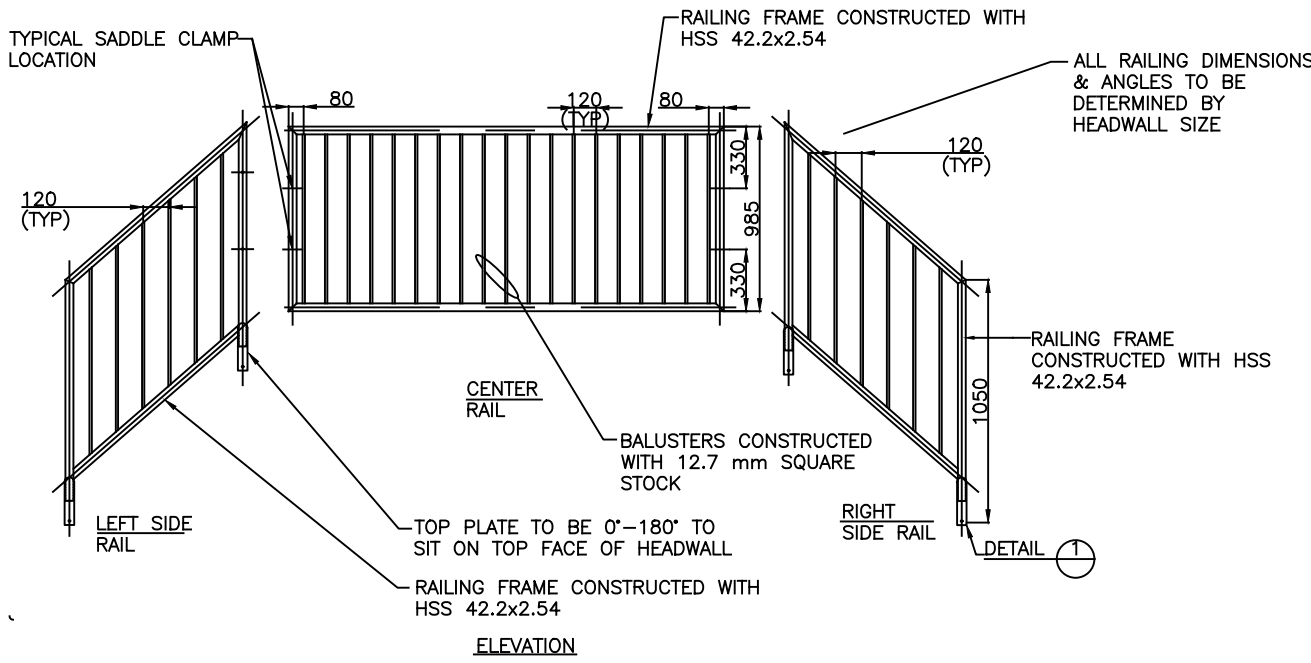


1 SIDE RAIL ANCHOR PLATE



2 SADDLE CLAMP

DETAILS



ELEVATION

NOTES:

1. ALL RAILING STEEL COMPONENTS TO BE GALVANIZED.
2. REQUIRED HOLES TO BE CUT / DRILLED PRIOR TO HOT DIP GALVANIZING.
3. SHOP DRAWINGS FOR RAILINGS TO BE SUBMITTED TO ENGINEER PRIOR TO FABRICATION.
4. ALL MEASUREMENTS IN MILLIMETERS UNLESS OTHERWISE NOTED.
5. ALL CONNECTIONS TO BE 3 mm FILLET WELD.
6. CENTER RAIL SHALL BE ATTACHED TO LEFT AND RIGHT SIDE RAILS WITH SADDLE CLAMP.
7. A HANDRAIL IS NOT REQUIRED FOR DRIVEWAY CULVERTS.
8. STAINLESS STEEL FASTENERS ARE REQUIRED TO CONNECT HANDRAIL TO CONCRETE STRUCTURE.
9. LENGTH OF RAILING SECTIONS TO BE DETERMINED BY SIZE OF HEADWALL STRUCTURE.

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.

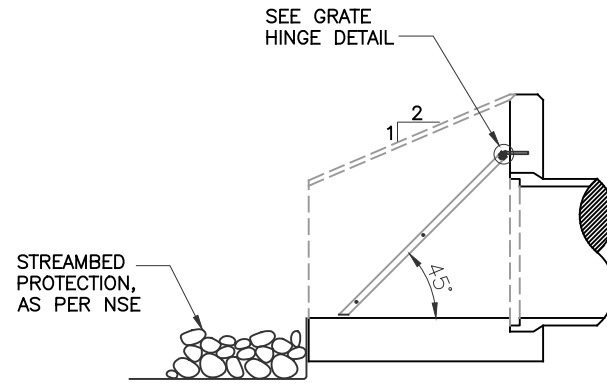
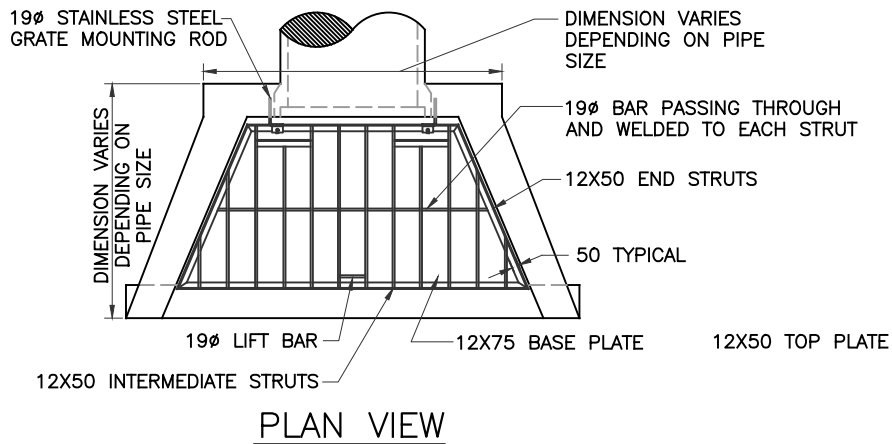
PROJECT  
HEADWALL RAILING DETAIL FOR  
OFF STREET INSTALLATIONS  
(OUTSIDE STREET R.O.W.)



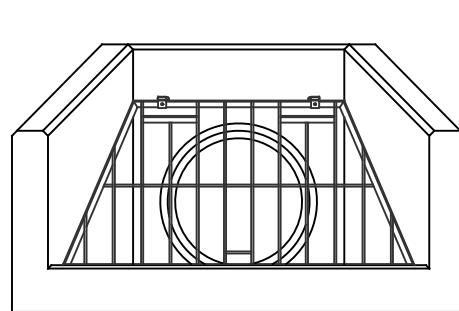
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15

PROJECT No.  
DWG. No. HWSD - 1626

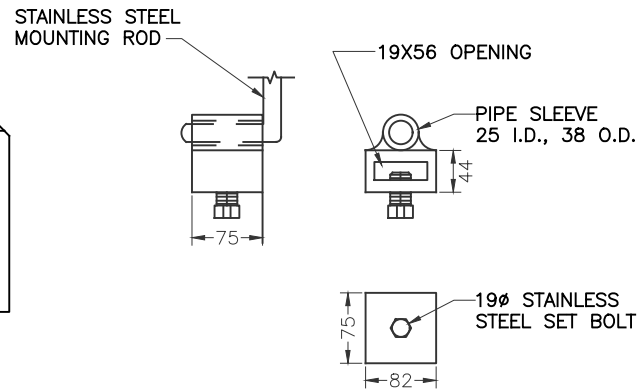
1	NEW DRAWING	01/14/2016	S.S.	
No.	DESCRIPTION	DATE	BY	CHKD



SECTION



FRONT VIEW



HINGE DETAIL

NOTES:

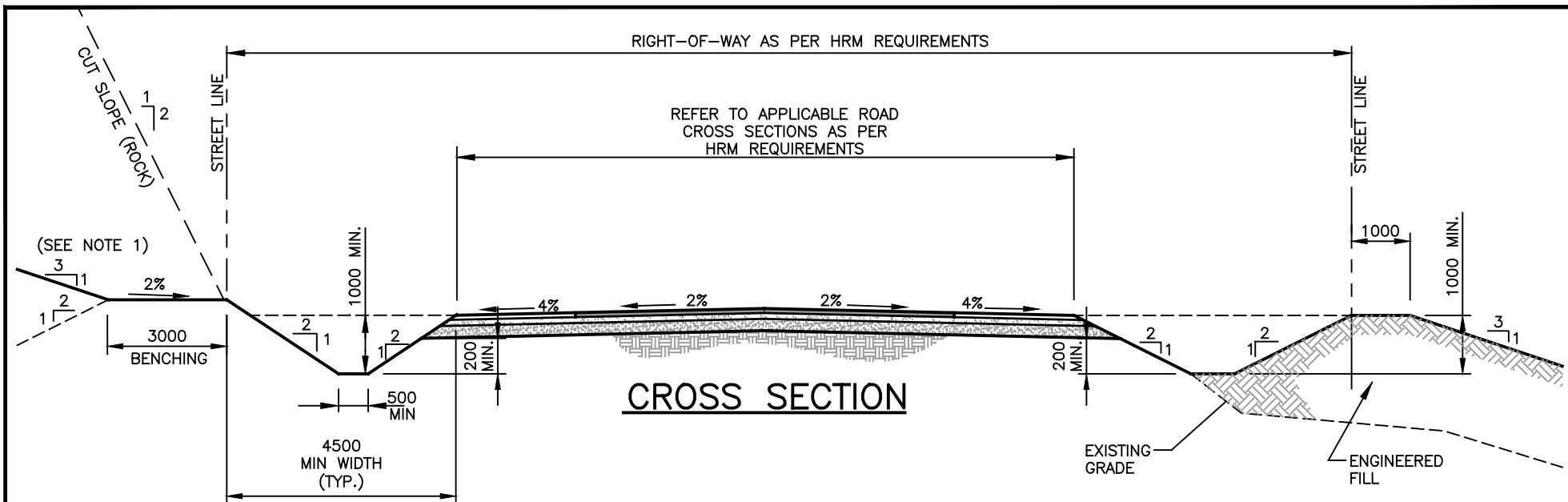
1. ALL STEEL TO BE HOT DIP GALVANIZED AFTER FABRICATION.
2. CLEAR COVER FOR CONCRETE REINFORCEMENT SHALL BE 50 mm.
3. SHOP DRAWINGS FOR GRATES TO BE SUBMITTED TO ENGINEER PRIOR TO FABRICATION.
4. ALL MEASUREMENTS IN MILLIMETERS UNLESS OTHERWISE NOTED.

1	NEW DRAWING	01/14/2016	S.S.	
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



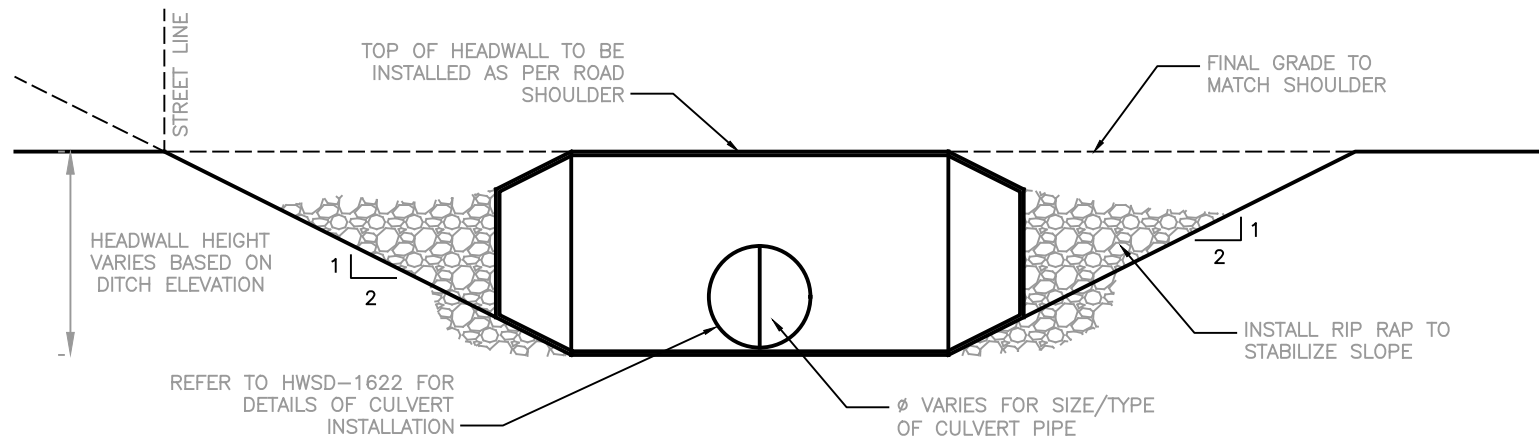
PROJECT		INLET GRATE DETAIL	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1628	



**CROSS SECTION**

**NOTES:**

1. REFER TO HRM SPECIFICATIONS FOR REQUIRED RIGHT OF WAY REQUIREMENTS AND ROAD CROSS SECTION REQUIREMENTS.
2. ENGINEERED FILL LOCATIONS SHALL BE DESIGNED AND CERTIFIED BY A GEO-TECHNICAL ENGINEER.
3. DITCH TO BE STABILIZED UTILIZING HYDRO-SEED, SURGE RIP-RAP AND/OR SOD.



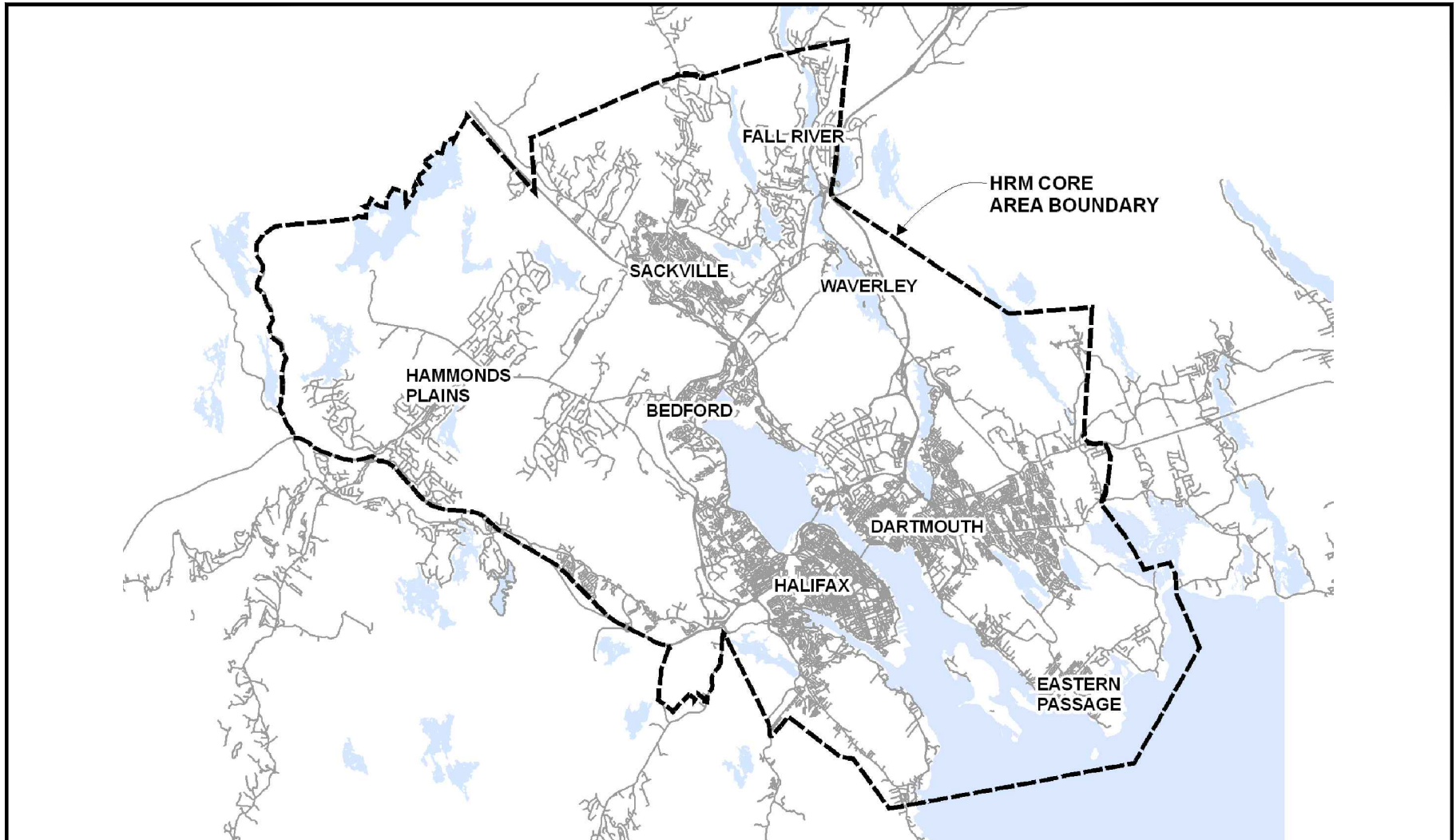
No.	DESCRIPTION	DATE	BY	CHKD
3	NEW DETAIL FOR 2019	6/01/29	S.S.	
2	ADDED NOTE #3.	6/01/29	S.S.	
1	REVISION DETAILS	YY/MM/DD	XX	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		TYPICAL DITCH CROSS SECTION	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No. HWSD - 1630 (2019)			



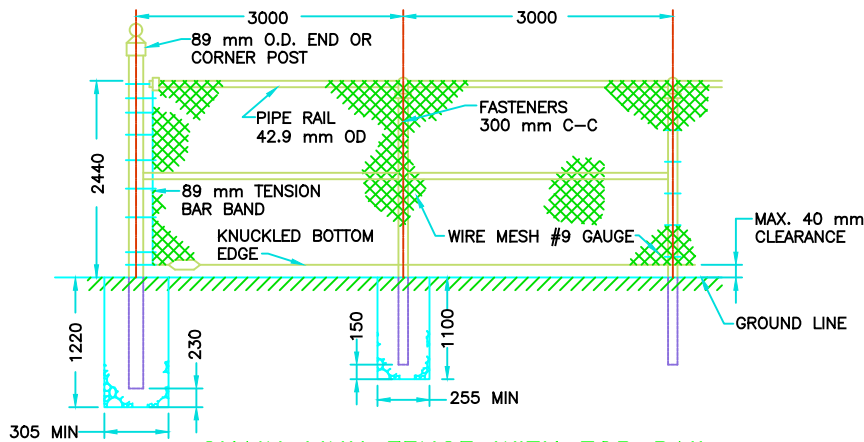


1	REVISION DETAILS		YY MM DD	XX	
No.	DESCRIPTION		DATE	BY	CHKD

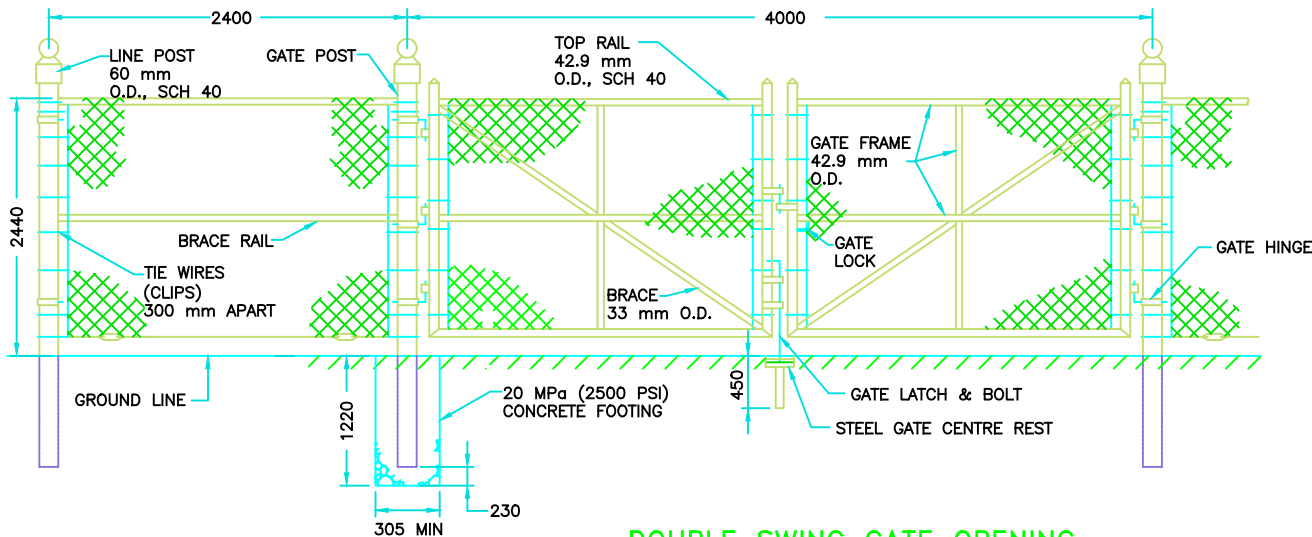
NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		HRM CORE BOUNDARY MAP	
DRAWN	K.W.	SCALE (PLAN)	NTS
CHECKED	J.D.	SCALE (PROFILE)	NTS
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1640	



**CHAIN LINK FENCE WITH TOP RAIL**



**DOUBLE SWING GATE OPENING**

**NOTES:**

1. RUNS FOR FENCE MORE THAN 150 m ARE TO HAVE A 89 mm O.D. INTERMEDIATE STRAINING POST WITH 42.9 mm O.D. BRACES, SIMILAR TO THOSE USED AT ENDS AND CORNER POSTS IN TWO DIRECTIONS. ONE OF THESE STRAINING POSTS WITH BRACES SHALL BE INSTALLED FOR EVERY 150 m OR FRACTION THEREOF.
2. TIE WIRES - #9 GAUGE HARD ALUMINUM. REFERENCE # 5052H18ASTMB211. FASTENERS - #16 GAUGE GALVANIZED BAG TIES. SINGLE STRAND TENSION WIRE #6 GAUGE FASTENERS 457 mm C-C.
3. SCHEDULE 40 PIPE OR HIGH STRENGTH HOLLOW STRUCTURAL SECTION 2.54 mm WALL WITH MECHANICAL PROPERTIES SIMILAR TO A.S.T.M. SPECIFICATION A-36. NO TUBING, CONDUIT OR OPEN SEAM MATERIAL WILL BE PERMITTED.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. THE END POST TO BE INSET 75 mm FROM PROPERTY LINE.
6. MESH FACES OUTWARD FROM DETENTION POND.
7. 50 mm WIRE MESH #9 GAUGE, GALVANIZED.

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		<b>STANDARD FENCE &amp; DOUBLE SWING GATE DETAIL</b>	
DRAWN	K.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	N/A
APPROVED	K.G.	DATE	17/02/15
PROJECT No.			
DWG. No.		HWSD - 1650	

1	NEW DRAWING	12 12 13	JW	SS
No.	DESCRIPTION	DATE	BY	CHKD