



Section 13



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13 WATERMAINS

13.1 General Requirements

All watermains shall adhere to the County of Oxford Design Guidelines, Section 3, as well as the following modifications or additions specific to watermain infrastructure installed within the Town of Tillsonburg.

13.2 Pipe Deflection

Section 3 Item Section 1.1. c) of the County of Oxford Design Guidelines shall be amended for watermain with the Town to the following:

It is recognized that the above standards apply here straight runs are being installed. On curves, the main location may deviate slightly from the standard using a maximum of half the allowable deflection in the pipe joints. Refer to manufacturer's specifications regarding pipe deflection. A minimum number of special bends should be used.

13.3 Thrust Blocks

Section 3 Item Section 1.1. h) of the County of Oxford Design Guidelines shall be amended for infrastructure with the Town to the following:

The use of concrete thrust blocks is not permitted in the Town of Tillsonburg unless approved by the Town. All restraints shall be mechanical restraints as per Section 3 Item 1.1 h) of the Oxford County Standards.

13.4 Inspection

Town of Tillsonburg Operations staff shall be onsite for the entire duration of installation, testing and commissioning of watermain within the Town limits.

GENERAL NOTES - WATERMAIN

1. CONTRACTORS SHALL INFORM THE TOWN OF TILLSONBURG WATER/ WATSEWATER DEPARTMENT A MINIMUM OF 72 HOURS IN ADVANCE OF THEIR INTENTIONS TO PERFORM WORK ON WATER INFRASTRUCTURE.
2. OPERATION OF HYDRANTS AND VALVES ON THE POTABLE WATER SYSTEM BY OTHER THAN QUALIFIED WATER OPERATIONS STAFF IS PROHIBITED BY CURRENT BY-LAW. TOWN SERVICE FEES ARE PER THE CURRENT FEES BY-LAW. THE TOWN'S WATER OPERATIONS STAFF IS TO BE PRESENT DURING THE SWABBING, PRESSURE TESTING, CHLORINATION AND FLUSHING OF ALL NEW WATERMAINS.
3. MINIMUM COVER OVER WATERMAIN SHALL BE 1.8m. THE MINIMUM HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS SHALL BE 3.0m. WHERE WATERMAIN CONFLICTS WITH SEWER PIPES, DEFLECT WATERMAIN HORIZONTALLY OR VERTICALLY WHILE PROVIDING A MINIMUM OF 0.5m CLEARANCE BETWEEN WATERMAIN AND SEWERS. MAINTAIN MINIMUM DEPTH OF COVER AT ALL TIMES.
4. WATERMAIN SHALL BE INSTALLED IN BEDDING AS PER OPSD 802.010 (GRANULAR 'A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD 802.030 OR 802.031 CLASS 'B' (GRANULAR 'A' BEDDING MATERIAL, GRANULAR 'A' OR SELECT NATIVE COVER MATERIAL) FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY TOWN ENGINEERING. ALTERNATIVE EMBEDMENT MATERIAL - SAND MEETING GRADATION REQUIREMENTS OF OPSS.MUNI 1004.05.07 COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY IS PERMISSIBLE WHERE NOTED IN STANDARD DETAILS. GEOTECHNICAL CERTIFICATION OF MATERIAL AND COMPACTION TESTING MUST BE PROVIDED EVERY 150 METRES. THE COMPACTION TESTING MUST INCLUDE THE ENTIRE EMBEDMENT ENVELOPE (HAUNCHES, BEDDING, TOP OF PIPE AND COVER).
5. COPPER WATERMAINS AND SERVICES 25mm TO 50mm IN DIAMETER SHALL BE EMBEDDED IN SAND 100mm ABOVE AND BELOW TO CONFORM TO OPSS.MUNI 1004.05.07. COPPER WATERMAINS ARE NOT PERMITTED IN NEW CONSTRUCTION AS PER OXFORD COUNTY DESIGN GUIDELINES AND SPECIFICATIONS.
6. MECHANICAL RESTRAINTS WILL BE REQUIRED ON ALL HYDRANTS. THRUST BLOCKS, AS PER OPSD 1103.010 AND 1103.020 MAY BE REQUIRED IN ADDITION TO STANDARD MECHANICAL RESTRAINTS WHERE SOIL CONDITIONS WARRANT AT THE TOWN'S DISCRETION.
7. NEW WATERMAINS TO BE PVC DR18 CL235 MINIMUM; DUCTILE IRON CEMENT MORTAR LINED CL52 AS PER THE OXFORD COUNTY DESIGN GUIDELINES AND SPECIFICATIONS.
8. TRACING WIRE SHALL BE #12 AWG HIGH STRENGTH COPPER CLAD (HS-CSS) AND SHALL BE INSTALLED ON THE TOTAL LENGTH OF ALL WATERMAIN AND BROUGHT UP AT EACH HYDRANT AND CONNECTED TO FLANGE BOLT. ALL SPLICES TO UTILIZE CONNECTORS AS PER OXFORD COUNTY DESIGN GUIDELINES AND SPECIFICATIONS.
9. ALL WATER SERVICES SHALL BE 25mm CROSS-LINKED POLYETHYLENE OR 25mm HIGH DENSITY POLYETHYLENE (HDPE) UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEERING DEPARTMENT. WATER SERVICE SADDLES SHALL BE USED WHEN TAPPING INTO PVC WATERMAIN.
10. SERVICE TAPPINGS SHALL BE PLACED AT A MINIMUM SEPARATION OF 1.0m AND A MINIMUM OF 0.6m FROM JOINTS. (ENDS OF PIPE)
11. RISER PIPES ARE TO BE INSTALLED AS PER TSD-1340, AND REMOVED AS DIRECTED. SWABBING SCHEDULE TO BE SUPPLIED BY A WATER OPERATIONS FIELD REPRESENTATIVE. ALL RISERS ARE TO BE RESTRAINED OR THRUST BLOCKED.
12. ALL NEW CURB STOPS AND BOXES TO BE LOCATED AT PROPERTY LINE.



STANDARD DETAIL

**GENERAL NOTES
WATERMAIN**

APPROVED

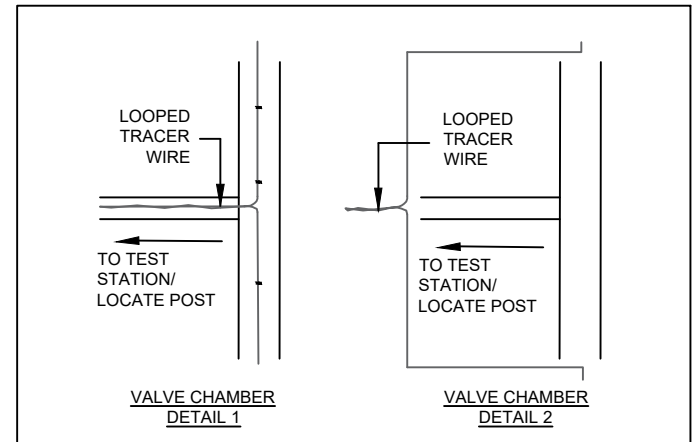
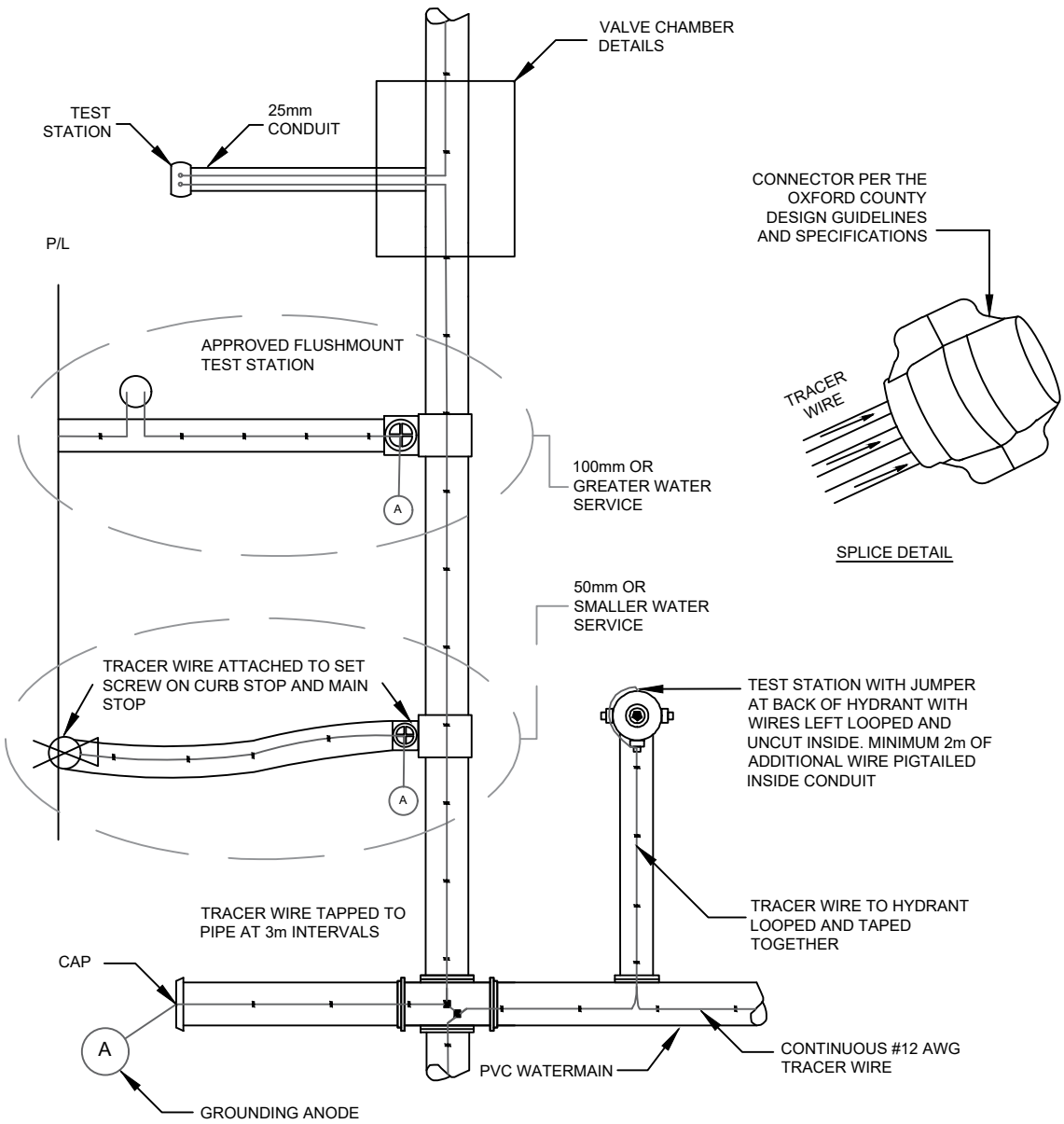
.....
MANAGER OF ENGINEERING DATE

.....
DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: MARCH 2020

SCALE: N.T.S.

TSD-1300



DETAIL NOTES:

1. TRACER WIRE IS NOT PERMITTED TO TERMINATE INSIDE OF A CHAMBER.
2. TRACER WIRE IS NOT PERMITTED TO RUN ON TOP OF A CHAMBER.
3. TRACER WIRE MAY RUN THROUGH A CHAMBER AT DEPTH OF THE WATERMAIN UNTIL DIRECTLY UNDER A LOCATE POST THEN BE BROUGHT UP INTO THE LOCATE POST (DETAIL 1). ALTERNATIVELY, TRACER WIRE MAY RUN AROUND THE OUTSIDE OF THE CHAMBER AT THE DEPTH OF THE WATERMAIN UNTIL DIRECTLY UNDER A LOCATE POST THEN BE BROUGHT UP INTO THE LOCATE POST (DETAIL 2).

NOTES:

1. TRACER WIRE TO BE INSTALLED AS PER TOWN OF TILLSONBURG AND OXFORD COUNTY DESIGN STANDARDS.
2. HYDRANT TEST STATION CONDUIT SHALL BE A MINIMUM OF 25mm INSTALLED TO A DEPTH OF 600mm BELOW GRADE.
3. ALL CONNECTIONS MUST BE WATERPROOFED.
4. SPLICING OF TRACER WIRE IS NOT ALLOWED UNLESS SPECIFIED OR APPROVED.



STANDARD DETAIL

TRACER WIRE DETAIL

APPROVED

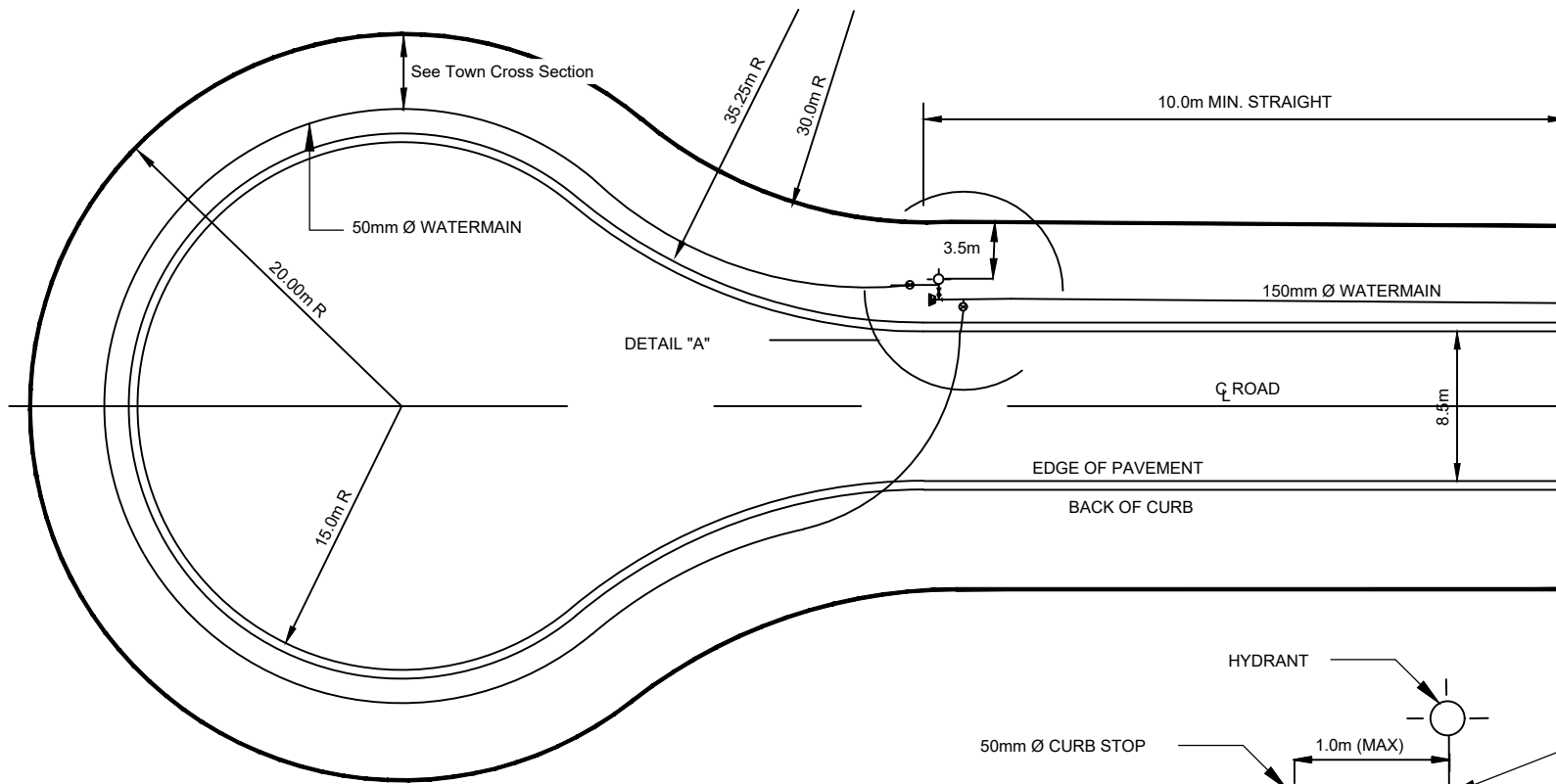
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MANAGER OF ENGINEERING DATE

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DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: MARCH 2020

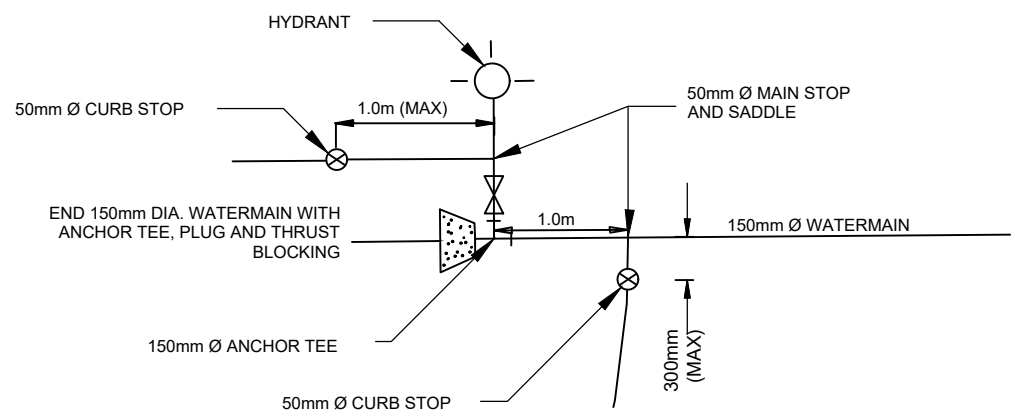
SCALE: N.T.S.

TSD-1301



NOTES:

1. MAXIMUM SERVICE SIZE IS 25mm.
2. MAXIMUM OF 7 SERVICES OFF OF 50mm Ø.
3. RESTRAIN JOINTS WHERE REQUIRED.
4. MATERIAL SHALL BE PEX OR P.E SERIES 200.
5. ALL NON-METALLIC PIPE SHALL REQUIRE STAINLESS STEEL INSERT
6. TRACER WIRE TO BE INSTALLED AS PER OXFORD COUNTY DESIGN GUIDELINES AND SPECIFICATIONS



DETAIL "A"



STANDARD DETAIL

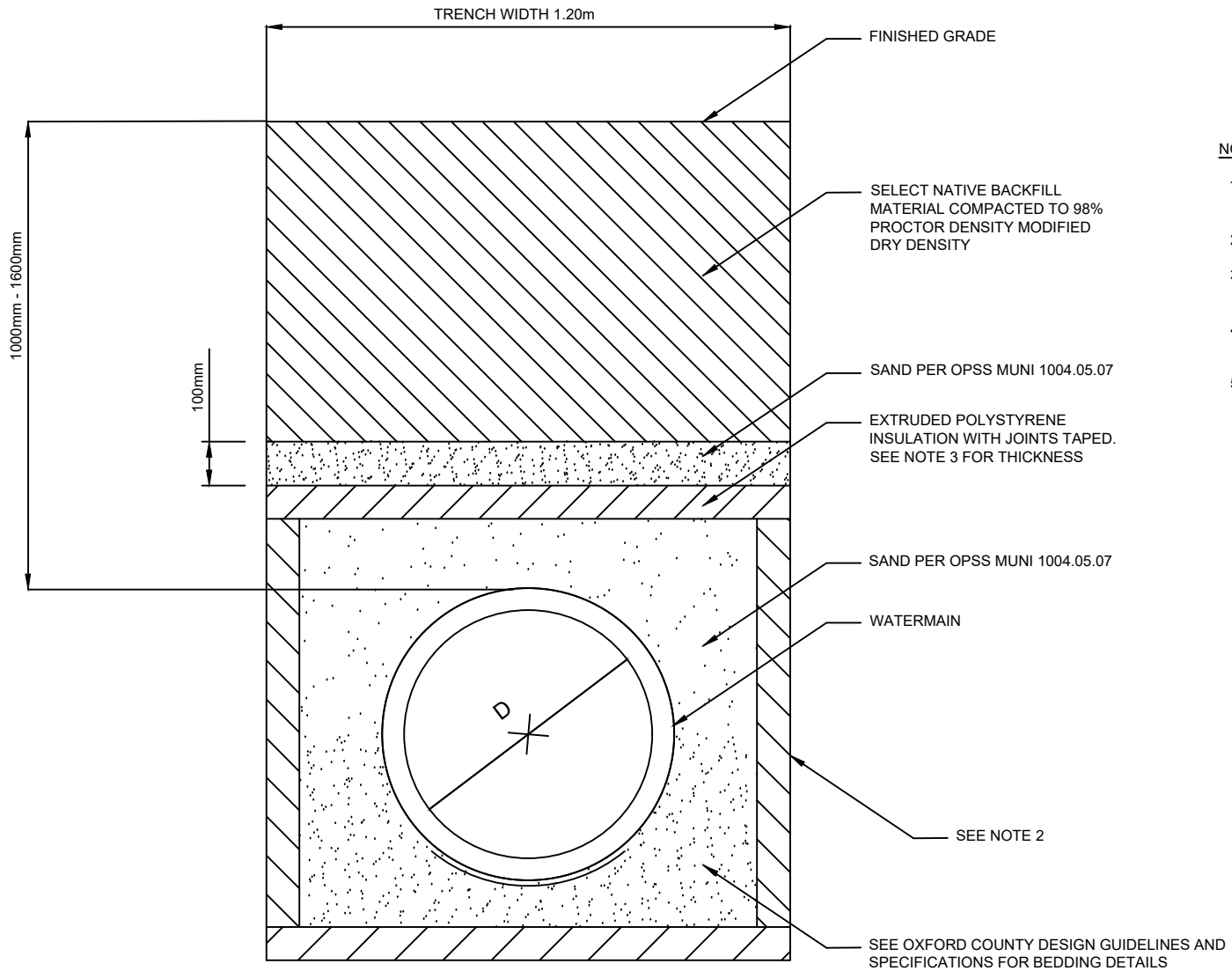
**TYPICAL CUL-DE-SAC
WATERMAIN DESIGN
(50mm DIA. LOOP)**

APPROVED

MANAGER OF ENGINEERING DATE
DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: DEC 2021
SCALE: N.T.S.

TSD-1306



NOTES:

1. TYPICAL DETAIL ONLY, THERMAL PROTECTION SHALL BE DESIGNED "SITE SPECIFIC" PER MINISTRY OF ENVIRONMENT DESIGN GUIDELINES.
2. FOR CROSSING OR UNDERGROUND STRUCTURES OR CONDUIT A "FROST BOX" IS REQUIRED.
3. IF GROUND COVER IS 1.3m -1.6m USE 50mm THICK INSULATION. IF GROUND COVER IS BETWEEN 1.0m - 1.3m USE 75mm THICK INSULATION.
4. FOR WATERMAIN AND SERVICES LOCATED 500mm OR LESS HORIZONTALLY ADJACENT TO MANHOLES OR CATCHBASIN, A MINIMUM 50mm INSULATION IS REQUIRED.
5. ALL UNITS IN MILLIMETERS UNLESS OTHERWISE NOTED.



STANDARD DETAIL

TYPICAL INSULATION DETAIL

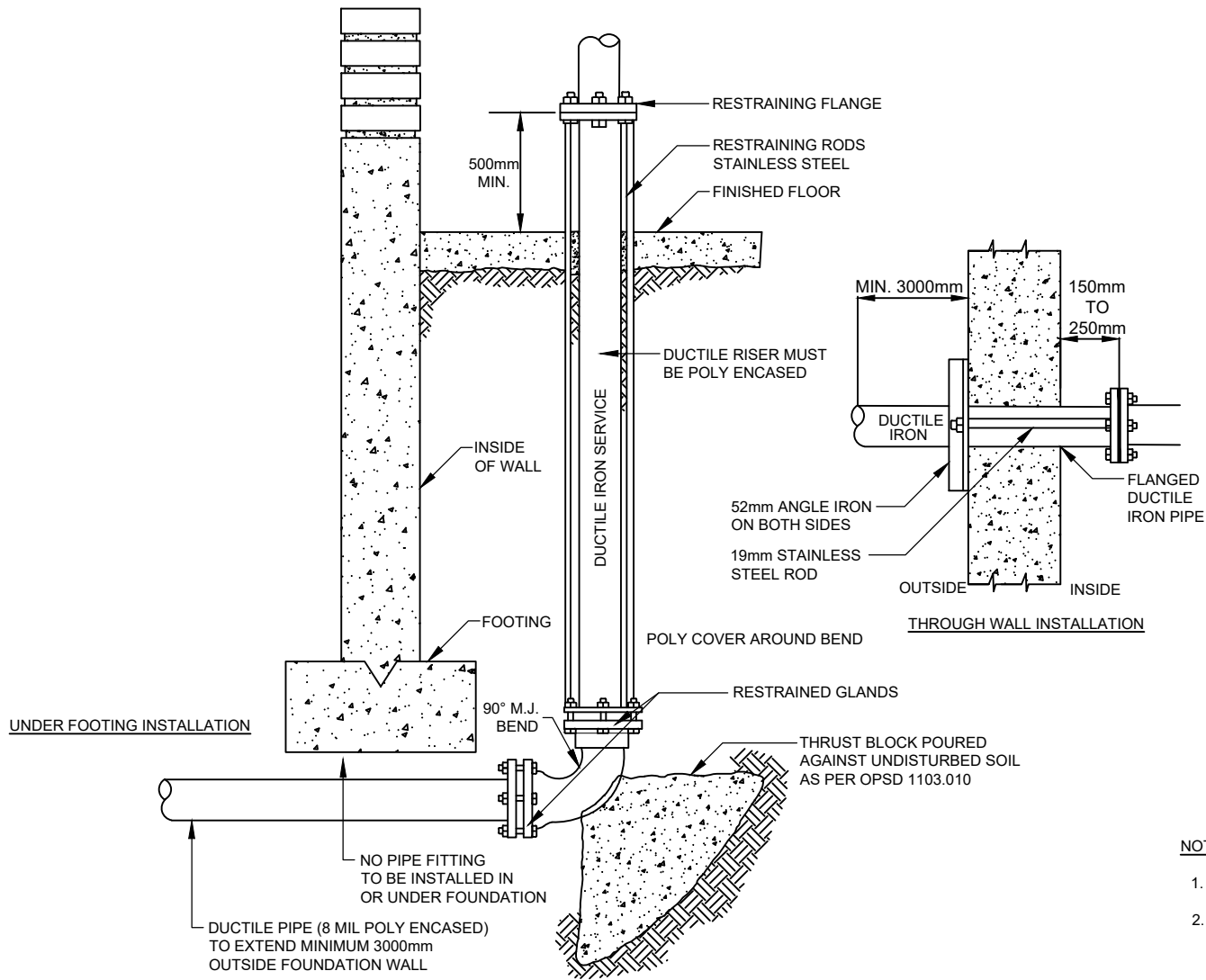
APPROVED

.....
 MANAGER OF ENGINEERING DATE

 DIRECTOR OF OPERATIONS DATE

REVISION No.	DATE: DEC 2021
	SCALE: N.T.S.

TSD-1307



NOTES:

1. INSTALLATION MUST MEET THE CURRENT NATIONAL FIRE PROTECTION ACT.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.



STANDARD DETAIL

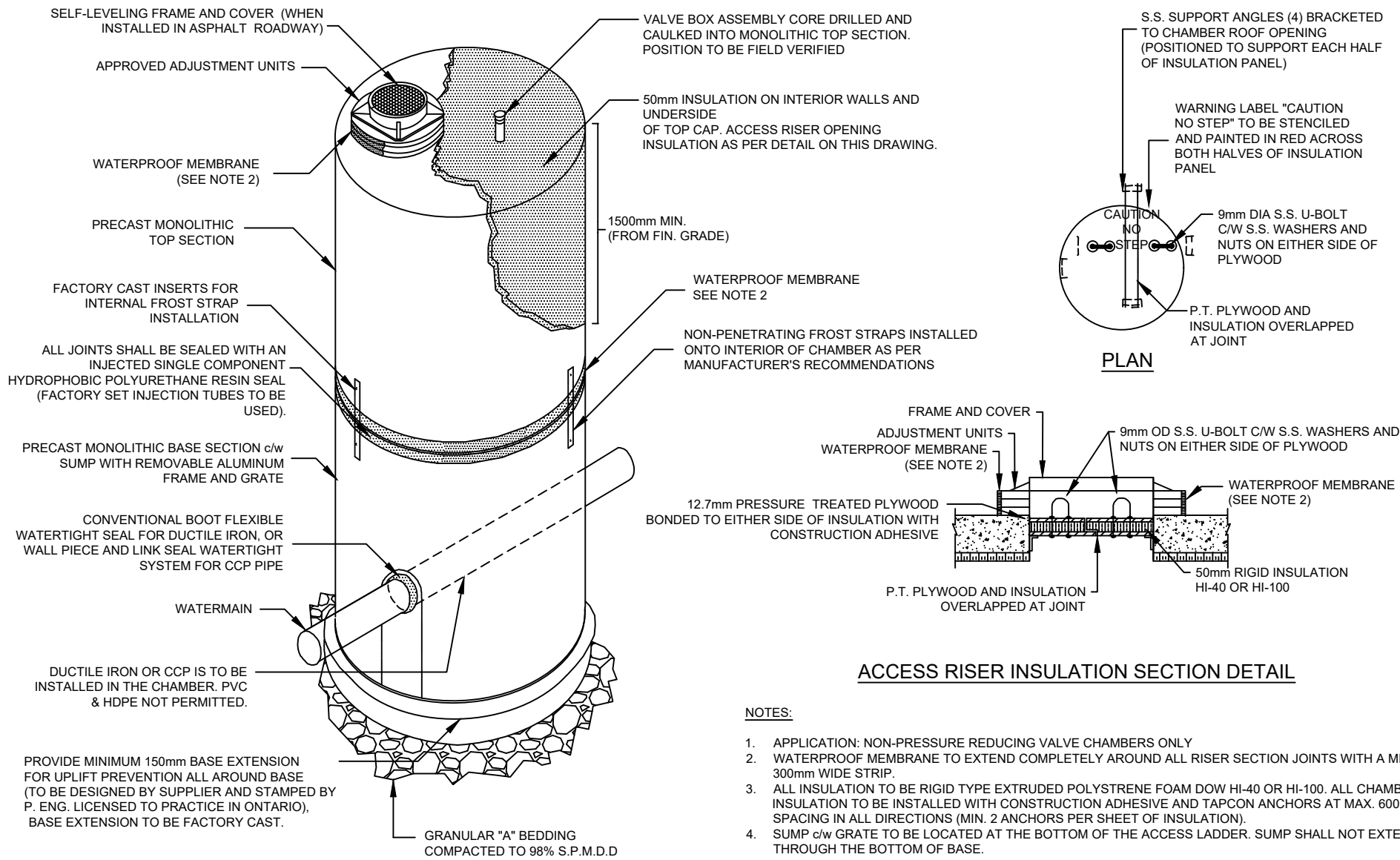
TYPICAL SERVICE ENTRY 100mm TO 300mm DIAMETER PIPE

APPROVED

MANAGER OF ENGINEERING DATE
DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: MARCH 2020
SCALE: N.T.S.

TSD-1320



ACCESS RISER INSULATION SECTION DETAIL

NOTES:

1. APPLICATION: NON-PRESSURE REDUCING VALVE CHAMBERS ONLY
2. WATERPROOF MEMBRANE TO EXTEND COMPLETELY AROUND ALL RISER SECTION JOINTS WITH A MINIMUM 300mm WIDE STRIP.
3. ALL INSULATION TO BE RIGID TYPE EXTRUDED POLYSTYRENE FOAM DOW HI-40 OR HI-100. ALL CHAMBERS INSULATION TO BE INSTALLED WITH CONSTRUCTION ADHESIVE AND TAPCON ANCHORS AT MAX. 600mm SPACING IN ALL DIRECTIONS (MIN. 2 ANCHORS PER SHEET OF INSULATION).
4. SUMP c/w GRATE TO BE LOCATED AT THE BOTTOM OF THE ACCESS LADDER. SUMP SHALL NOT EXTEND THROUGH THE BOTTOM OF BASE.



**TYPICAL TWO PIECE
CIRCULAR CHAMBER DETAILS
FOR WATERMAIN**

APPROVED

REVISION No. DATE: MARCH 2020

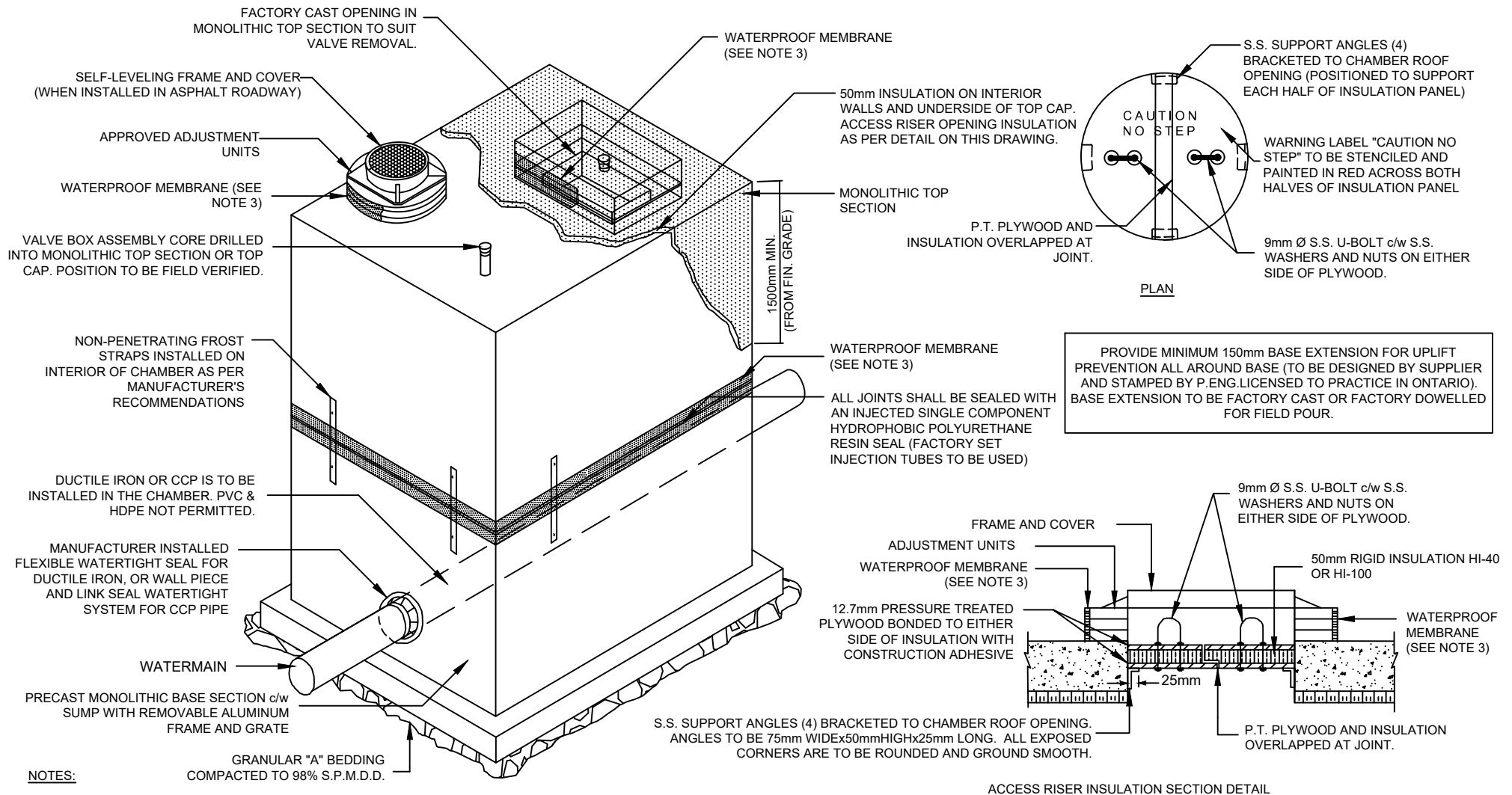
SCALE: N.T.S.

MANAGER OF ENGINEERING DATE

DIRECTOR OF OPERATIONS DATE

TSD-1326

STANDARD DETAIL



NOTES:

1. MINIMUM CHAMBER SIZE 1800mmx2400mm
2. APPLICATION:NON-PRESSURE REDUCING VALVE CHAMBERS ONLY
3. WATERPROOF MEMBRANE TO EXTEND COMPLETELY AROUND RISER SECTION JOINTS WITH A MINIMUM OF 300mm WIDE STRAP.
4. ALL INSULATION TO BE RIGID TYPE EXTRUDED POLYSTYRENE FOAM HI-40 OR HI-100. ALL CHAMBER INSULATIONS TO BE INSTALLED WITH CONSTRUCTION ADHESIVE AND TAPCON ANCHORS AT MAX. 600mm SPACING IN ALL DIRECTIONS (MIN. 2 ANCHORS PER SHEET OF INSULATION).
5. SUMP c/w GRATE TO BE LOCATED AT THE BOTTOM OF THE ACCESS LADDER. SUMP SHALL NOT EXTEND THROUGH THE BOTTOM OF BASE.



STANDARD DETAIL

TYPICAL TWO PIECE RECTANGULAR CHAMBER DETAILS FOR WATERMAIN

APPROVED

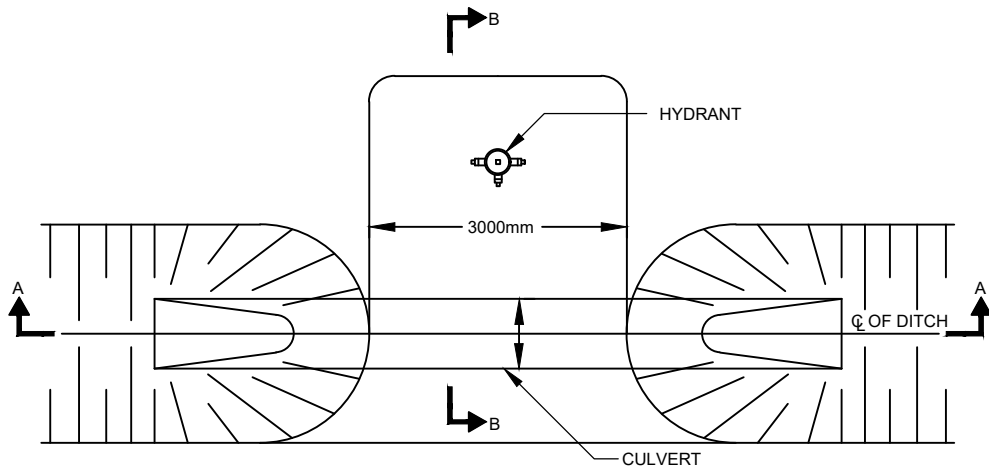
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MANAGER OF ENGINEERING DATE

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DIRECTOR OF OPERATIONS DATE

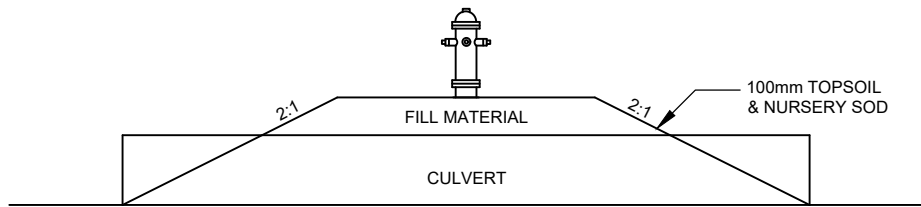
REVISION No. DATE: MARCH 2020

SCALE: N.T.S.

TSD-1327



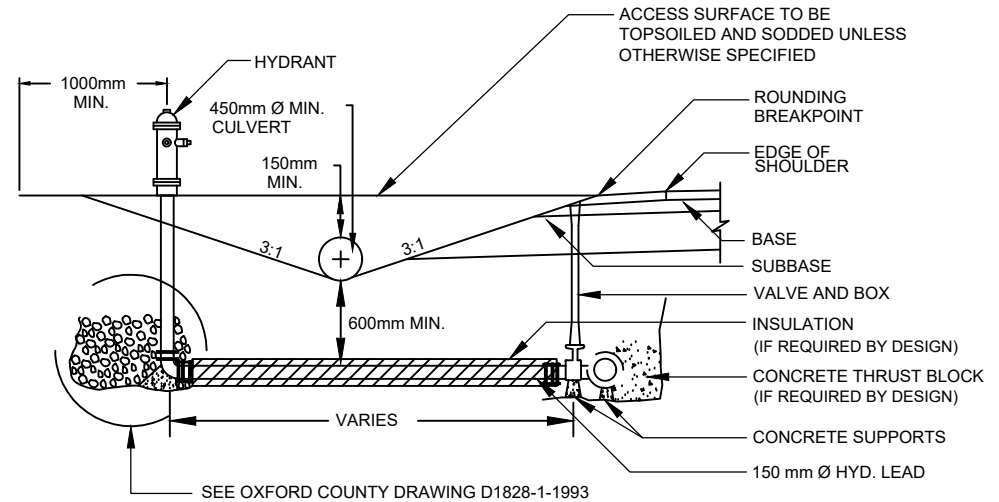
PLAN



SECTION A - A

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.



SECTION B - B



STANDARD DETAIL

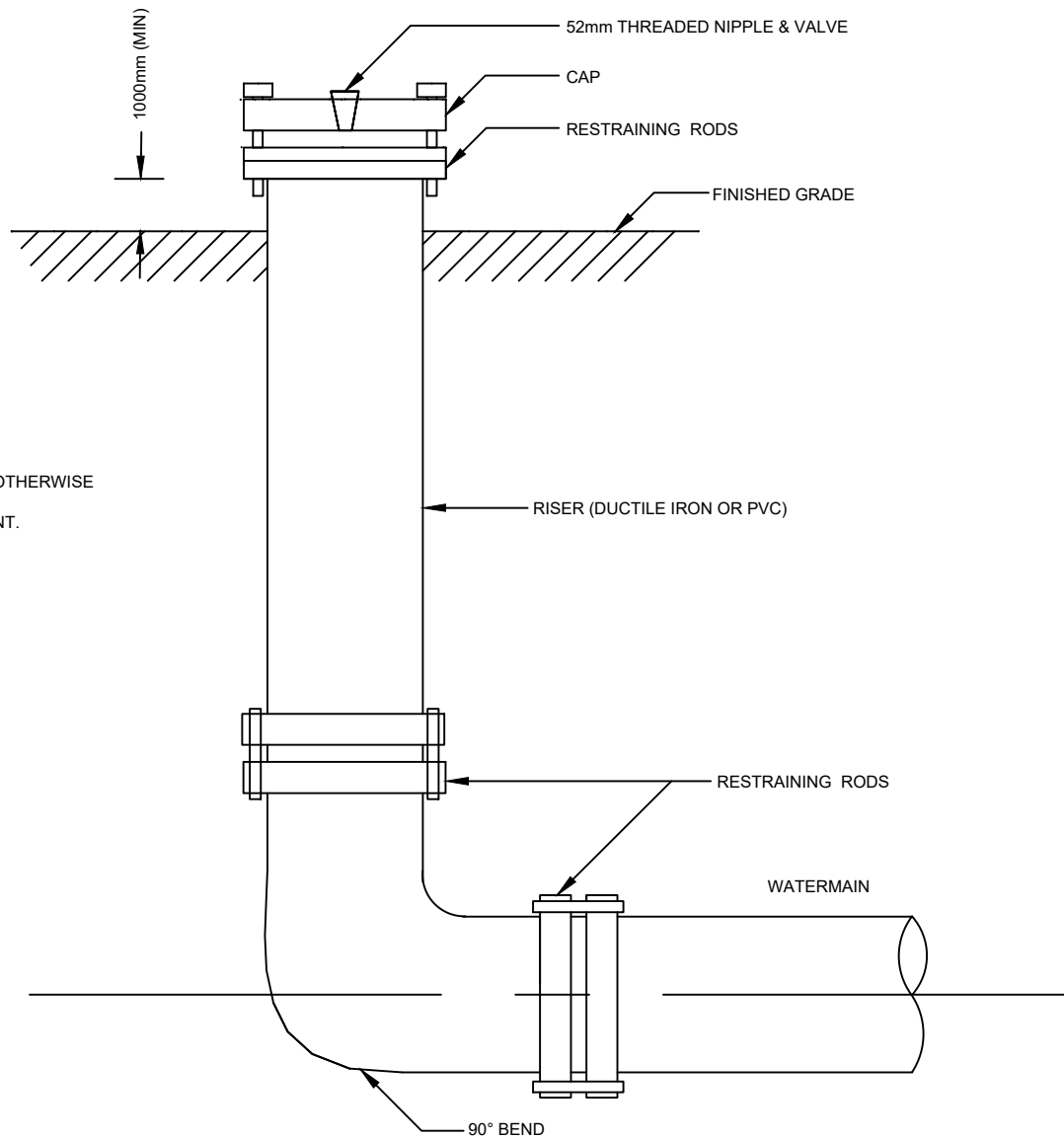
HYDRANT PLATFORM DETAIL

APPROVED

MANAGER OF ENGINEERING DATE
 DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: DEC 2021
 SCALE: N.T.S.

TSD-1331



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. RESTRAINING RODS TO BE USED FOR RESTRAINT.



STANDARD DETAIL

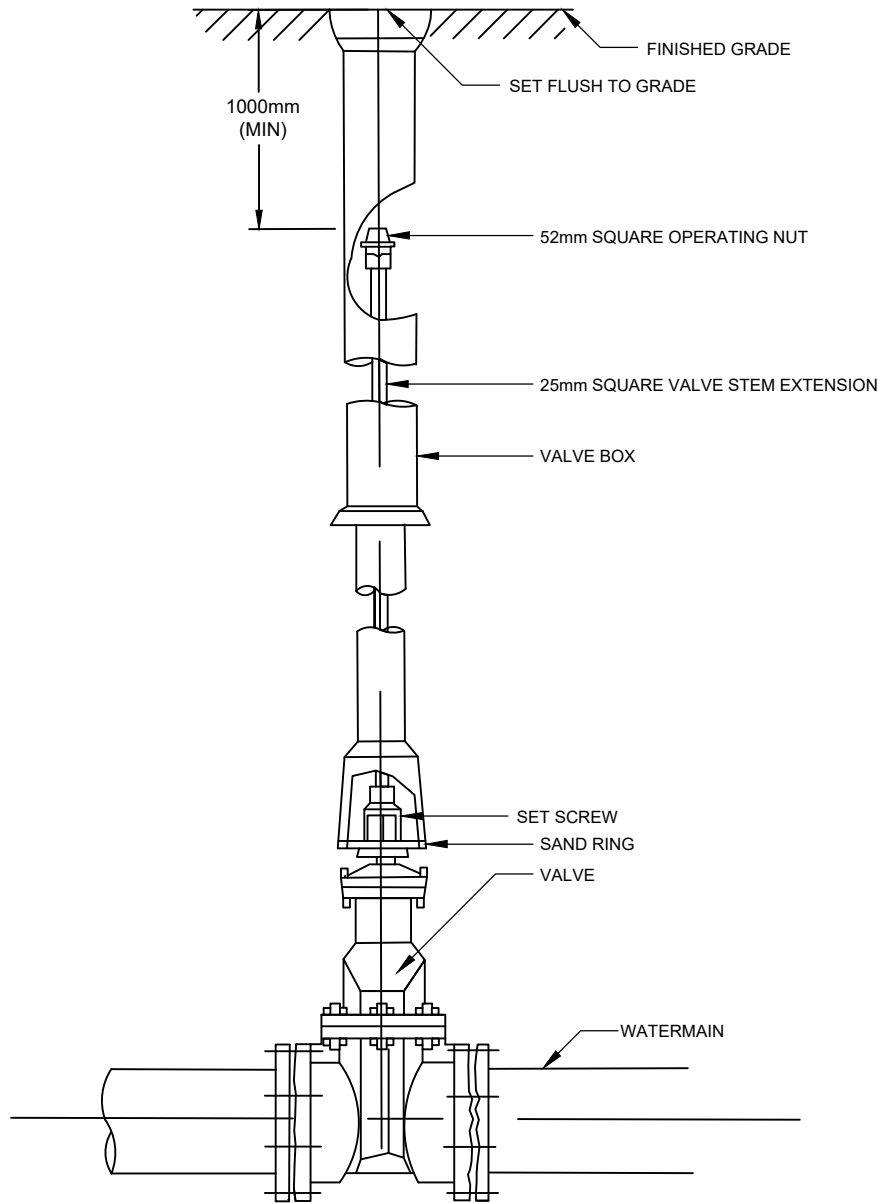
TEMPORARY RISER INSTALLATION

APPROVED

MANAGER OF ENGINEERING DATE
 DIRECTOR OF OPERATIONS DATE

REVISION No.	DATE: MARCH 2020
	SCALE: N.T.S.

TSD-1340



NOTES:

1. EXTENSION REQUIRED WHEN DISTANCE FROM THE TOP OF VALVE TO FINISHED GRADE IS MORE THAN 1.8m.



STANDARD DETAIL

VALVE STEM EXTENSION IN VALVE BOX

APPROVED

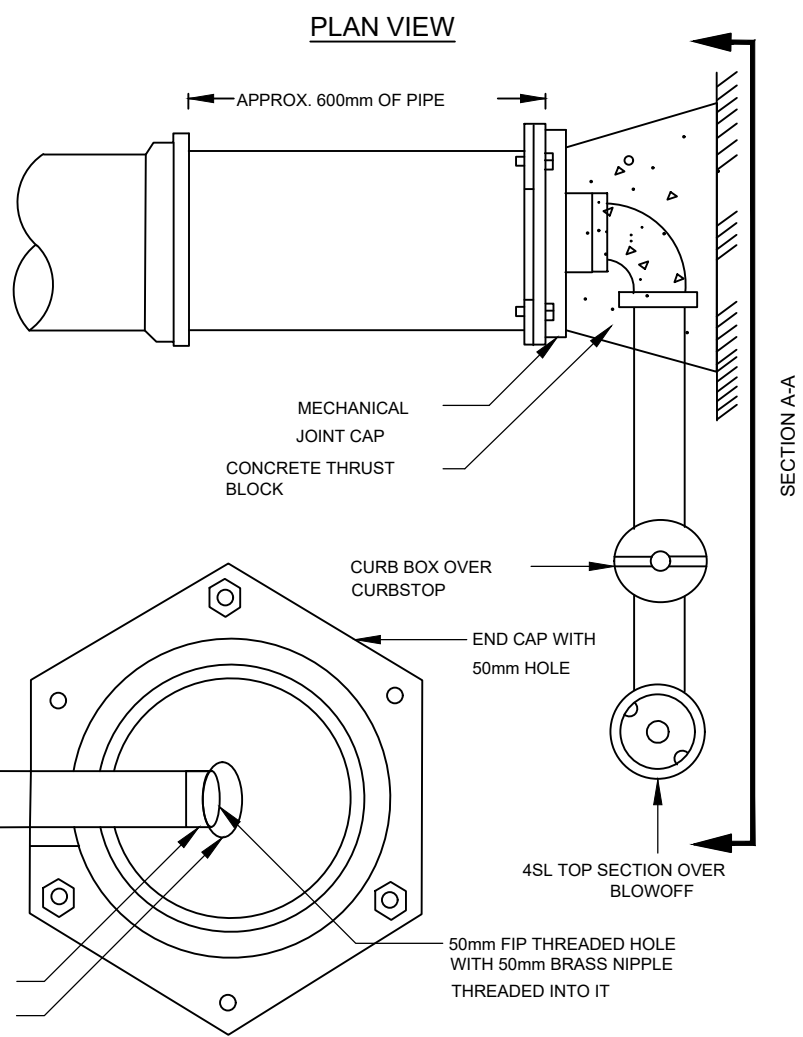
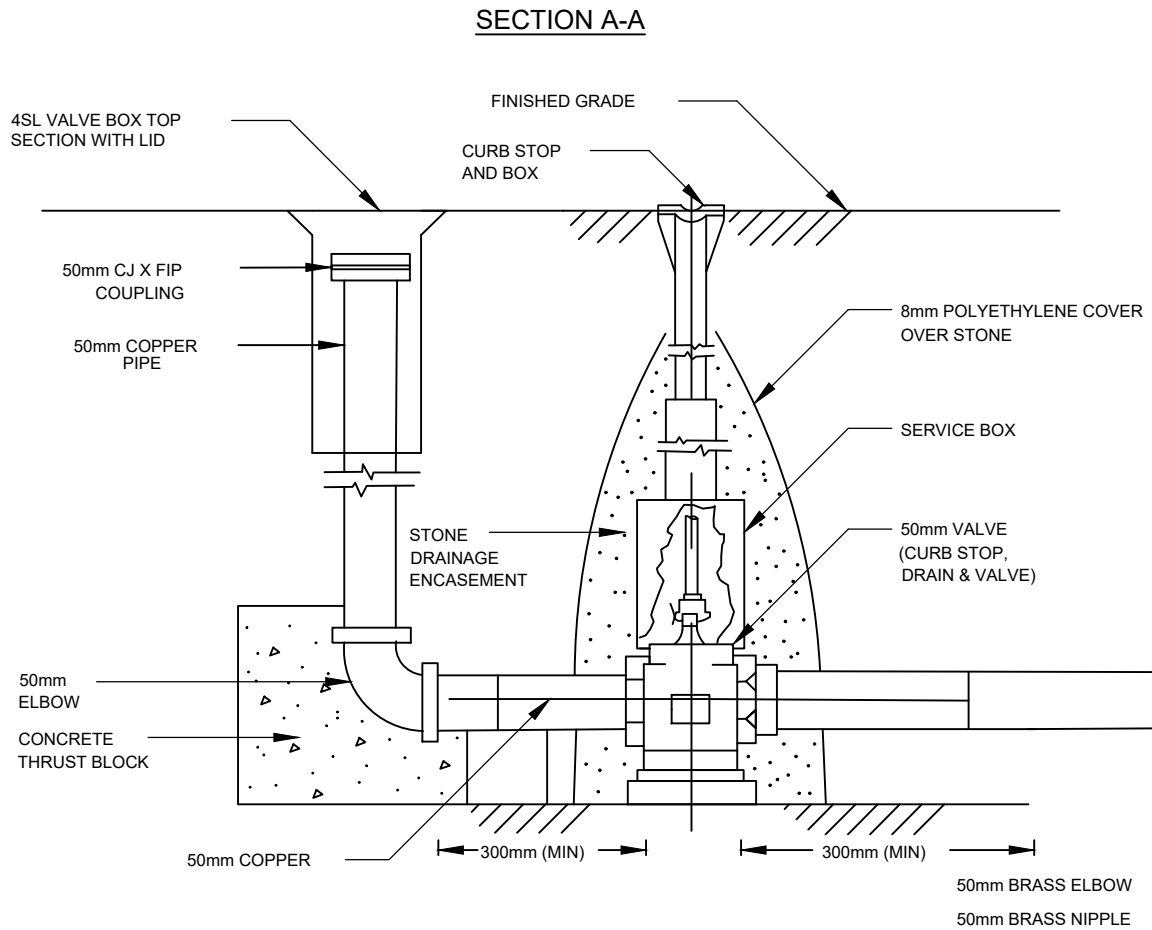
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MANAGER OF ENGINEERING DATE

.....
DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: MARCH 2020

SCALE: N.T.S.

TSD-1350



NOTES:

1. POLYETHYLENE COVER IS TO BE USED BETWEEN STONE AND BACKFILL.
2. BLOW OFFS ARE TO BE SELF DRAINING.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.



STANDARD DETAIL

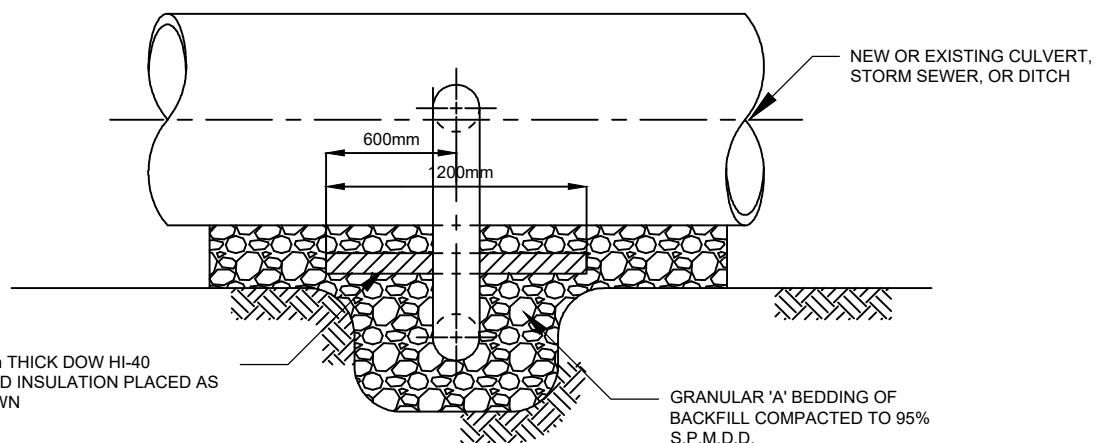
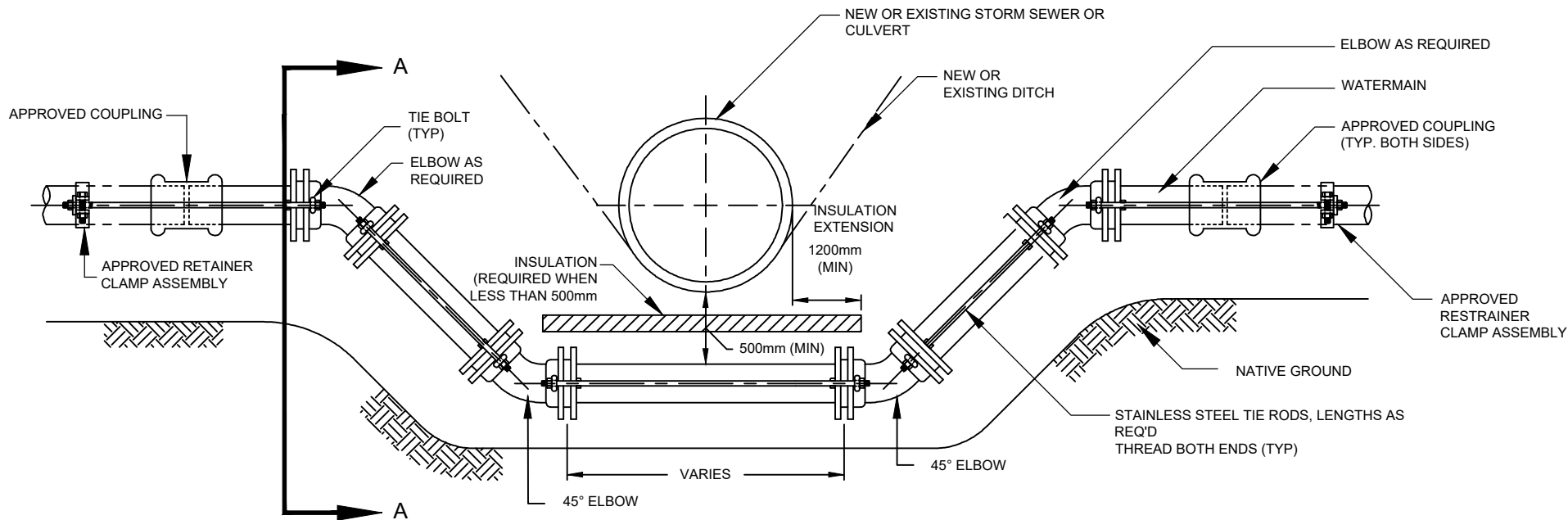
50mm BLOW OFF DETAIL

APPROVED

MANAGER OF ENGINEERING DATE
 DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: MARCH 2020
 SCALE: N.T.S.

TSD-1360



NOTES:

1. MATERIAL FOR LOWERING SHALL BE DUCTILE IRON IF EXISTING MATERIAL IS METALLIC.
2. UNITS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. THIS DETAIL IS USED FOR OFFSET ON 100, 150, & 200mm DIA MAINS. OFFSETS ON LARGER MAY REQUIRE INDIVIDUAL APPROVAL.
4. ALL JOINTS TO BE MECHANICALLY RESTRAINED, INCLUDING JOINTS ON EXISTING WATERMAIN.
5. IF OFFSET IS INSTALLED IN HORIZONTAL OR INVERTED POSITIONS, MINIMUM COVER TO BE DECIDED BY THE ENGINEER.
6. COVER TIE BOLT ASSEMBLY WITH PETROLATUM SYSTEM.
7. INSULATION MAY BE REQUIRED AS PER OXFORD COUNTY DESIGN GUIDELINES AND SPECIFICATIONS

SECTION A - A



STANDARD DETAIL

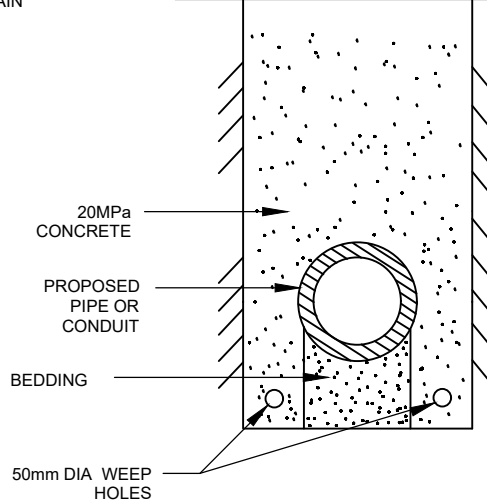
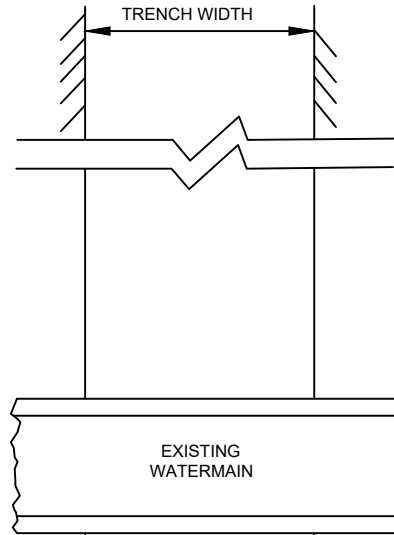
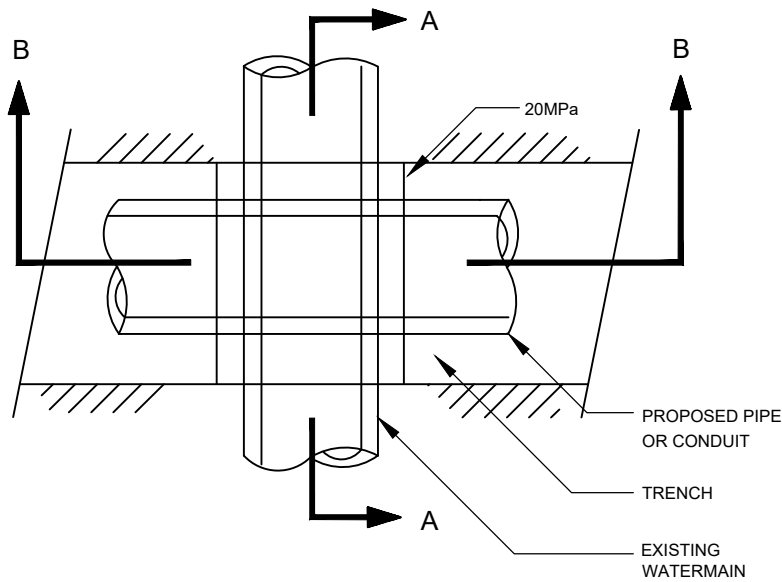
**WATERMAIN LOWERING
DETAIL FOR STORM SEWER
OR DITCH CROSSING**

APPROVED

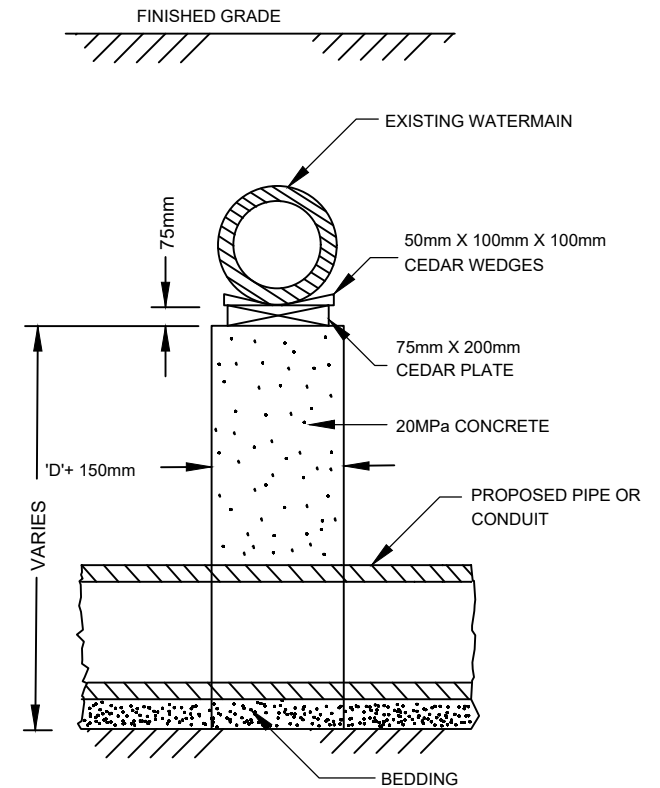
MANAGER OF ENGINEERING DATE
DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: FEB 2022
SCALE: N.T.S.

TSD-1366



SECTION A-A



SECTION B-B

NOTES:

1. CONCRETE ENCASED MAINS SHALL BE SUPPORTED WITH CONCRETE TO UNDERSIDE OF MAIN. BOND BREAKER IS TO BE USED BETWEEN THE TWO SURFACES.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.



STANDARD DETAIL

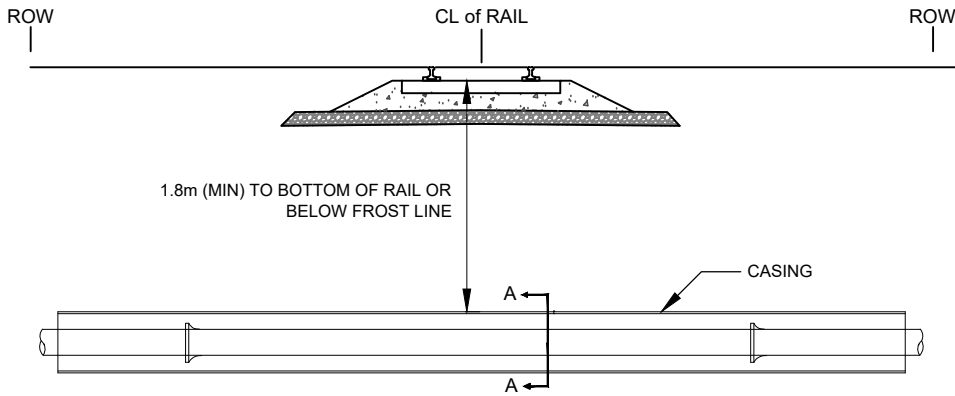
SUPPORT FOR WATERMAINS LARGER THAN 300mm DIA.

APPROVED

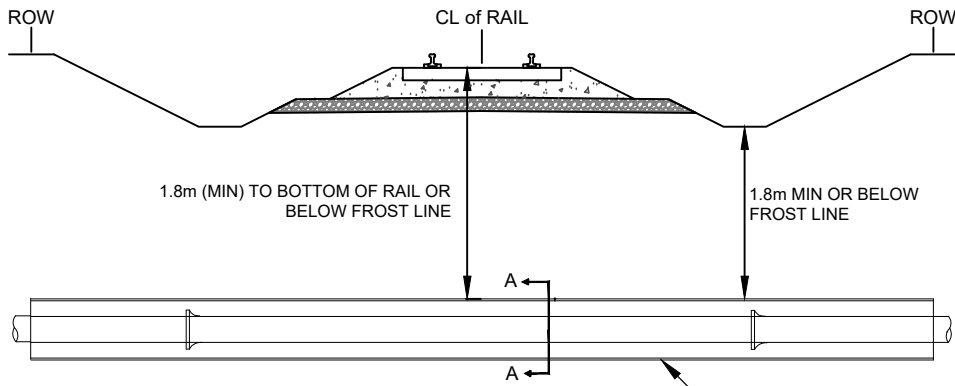
MANAGER OF ENGINEERING DATE
DIRECTOR OF OPERATIONS DATE

REVISION No.	DATE: MARCH 2020
	SCALE: N.T.S.

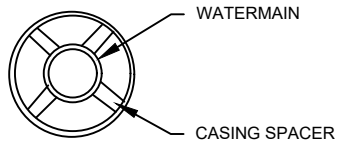
TSD-1367



PLAN (THROUGH ROADWAY)



PLAN (OUTSIDE ROADWAY)



SECTION A-A

NOTES:

1. RAILWAY CROSSING DRAWINGS SHALL BE SUBMITTED TO TOWN ENGINEERING AND SHALL SHOW THE FOLLOWING INFORMATION:
 - DRAWINGS MUST BE TO SCALE AND HAVE ALL DIMENSIONS SHOWN
 - RAILWAY MILEAGE AND SUBDIVISION
 - INDICATED DIRECTION OF FLOW AND NEAREST SHUT-OFF VALVES
 - PROVIDE A PROFILE INDICATING DEPTH OF INSTALLATION
 - PROVIDE INFORMATION AS PER CHART BELOW
 - INCLUDE SECTION 'A-A', OR NOTE THAT CARRIER SHALL BE HELD CLEAR OF CASING BY PROPER SUPPORTS
 - NOTE WARNING MARKERS TO BE INSTALLED AT LIMITS OF RAIL R.O.W., AS APPLICABLE
 - NOTE PROPOSED METHOD OF INSTALLATION
 - NOTE LOCATION OF PROPOSED JACKING AND RECEIVING PITS RELATIVE TO GAUGE (INSIDE) SIDE OF NEAREST RAIL
 - INCLUDE THE CAPTION "CONSTRUCTION AND MAINTENANCE TO BE IN ACCORDANCE WITH THE CANADIAN TRANSPORTATION AGENCY GENERAL ORDER E-10"
2. ENSURE WALL THICKNESS OF CARRIER AND CASING PIPES CONFORM TO TRANSPORT CANADA REQUIREMENTS (COOPER E-90 LOADING).
3. NO EXTERNAL LOADS WILL BE TRANSMITTED TO THE CARRIER PIPE BY USE OF APPROVED PIPE LINE SPACERS.
4. DEPTH OF BURIAL FROM THE BASE OF RAIL TO BE A MINIMUM 1.8m OR BELOW THE FROST LINE.
5. CASING SHALL EXTEND THE FULL WIDTH OF THE RAILWAY R.O.W.
6. THE CASING SHALL BE INSTALLED SO AS TO PREVENT THE FORMATION OF A WATERWAY UNDER THE RAILWAY, WITH AN EVEN BEARING THROUGHOUT ITS LENGTH, AND SHALL SLOPE TO ONE END (EXCEPT FOR LONGITUDINAL OCCUPANCY).
7. THE CASING PIPE SHALL BE CONSTRUCTED AS TO PREVENT LEAKAGE OF ANY SUBSTANCE FROM THE CASING THROUGHOUT ITS LENGTH EXCEPT AT THE ENDS WHERE FREE FLOW MUST BE MAINTAINED.
8. GROUTING OF THE SPACE BETWEEN THE CARRIER AND CASING WILL NOT BE PERMITTED.
9. THE ENDS OF THE CASING PIPE SHALL NOT BE SEALED BY ANY LOAD TRANSFERRING MATERIAL.
10. SPACERS AND END SEALS SHALL FOLLOW AS PER OXFORD COUNTY'S DESIGN GUIDELINE AND SPECIFICATIONS.
11. DESIGN SHOP DRAWING REQUIRED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN ONTARIO.
12. SITE SPECIFIC SHOP DRAWINGS REQUIRED AS PER CURRENT OCCUPATIONAL HEALTH AND SAFETY.

CASING PIPE SPECIFICATION

OUTSIDE DIA.: _____
 INSIDE DIA.: _____
 WALL THICKNESS: _____
 PIPE SPECIFICATION: _____
 LENGTH: _____
 MATERIAL: _____
 CATHODIC PROTECTION: _____

CARRIER PIPE SPECIFICATION

INSIDE DIA.: _____
 WALL THICKNESS: _____
 PIPE SPECIFICATION: _____
 MATERIAL: _____
 OPER./MAX. PRESSURE _____
 CATHODIC PROTECTION: _____



STANDARD DETAIL

**WATERMAIN RAIL CROSSING
DETAIL**

APPROVED

MANAGER OF ENGINEERING DATE

DIRECTOR OF OPERATIONS DATE

REVISION No. DATE: DEC 2021

SCALE: N.T.S.

TSD-1368