



APPENDIX 1

Standard Detail Drawings

**Township of King
Design Criteria and Standard Detail Drawings**

APPENDIX 1 - STANDARD DETAIL DRAWINGS

<u>Township of King</u>		
<u>Drawing No.</u>	<u>Title</u>	<u>Revision Date</u>
GN	General Notes	Jan. 2026
KS-171	Typical Drop Structure for Storm Manhole	Jan. 2026
KS-174	Beehive Catchbasin - Frame and Cover	Jan. 2026
KS-175	Service Location Single Family Residential	Jan. 2026
KS-176	Service Location Semi-Detached Residential	Jan. 2026
KS-177	Storm Sewer Service Connection	Jan. 2026
KS-178	Storm Sewer Riser Connection	Jan. 2026
KS-179	Service Location Multi / Townhouse Service Connection	Jan. 2026
KS-180	Bedding Detail for Plastic Sanitary Service Connections	Jan. 2026
KS-181	Bedding Detail for Flexible Sanitary Sewers	Jan. 2026
KS-190	Sanitary Sewer House Connections	Jan. 2026
KS-191	Sanitary Sewer Riser Connections for Residential Development	Jan. 2026
KS-193	Sanitary Sewer Surface Cleanout	Jan. 2026
KS-194	Sanitary Sewer Connections for Residential Development	Jan. 2026
KS-202	20.0m Estate Residential Roadway	Jan. 2026
KS-205	20.0m Local Roadway	Jan. 2026
KS-210	26.0m Collector Roadway (incl. Bike Lanes)	Jan. 2026
KS-218	Typical Cul-De-Sac for Residential Streets	Jan. 2026
KS-219	Typical Cul-De-Sac for Industrial Streets	Jan. 2026
KS-220	Temporary Turning Circle for Residential Streets	Jan. 2026
KS-231	Concrete Sidewalk	Jan. 2026
KS-302	Precast Concrete Splash Pad Detail	Jan. 2026
KS-313	Wood Privacy Fence	Jan. 2026
KS-331	Traffic Sign Details and Pavement Markings	Jan. 2026
KS-340	Standard Driveway Culvert	Jan. 2026
KS-341	Driveway Approach Paving for Residential Driveways	Jan. 2026
KS-342	Driveway Approach Paving for ICI and Apartment Driveways	Jan. 2026
KS-346	Joint Use Utility Trench	Jan. 2026
KS-400	Typical Legend for Lot Grading Plan	Jan. 2026
KS-401	Front Lot Drainage	Jan. 2026
KS-402	Split Lot Drainage	Jan. 2026
KS-403	Rear Lot Drainage for Walkout or Back Split House	Jan. 2026
KS-405	Lot Grading Plan Requirements for Infill Lots	Jan. 2026
KS-701	Typical Pole and Luminaire (Decorative)	Jan. 2026
KS-802	Watermain Trench Detail Under Watercourse	Jan. 2026
KS-803	50mm Blow-off for Watermain with Restrained Joints	Jan. 2026
KS-804	Methods of Insulating Watermains	Jan. 2026
KS-805	Supports for Watermains and Sewers Crossing Watermain Trenches	Jan. 2026
KS-820	19mm to 25mm Water Meter Installation in Building	Jan. 2026

APPENDIX 1 - STANDARD DETAIL DRAWINGS

<u>Township of King</u>		
<u>Drawing No.</u>	<u>Title</u>	<u>Revision Date</u>
KS-830	Joint Restraining Length for P.V.C Pipe	Jan. 2026
KS-840	150mm to 250mm Gate Valve & Box	Jan. 2026
KS-841	Semi-precast Concrete Valve Chamber for 300mm Pipe or Larger	Jan. 2026
KS-843	Air Release Chamber	Jan. 2026
KS-844	Combination Air & Valve Chamber-Model	Jan. 2026
KS-845	Water Meter Installation in Chamber (For Combined Fire & Domestic)	Jan. 2026
KS-846	Water Service Connections for Single ICI Building	Jan. 2026
KS-847	Water Meter Chamber Details (50 mm Service Line)	Jan. 2026
KS-851	Water Service (20 mm to 50 mm)	Jan. 2026
KS-854	Corrosion Protection for Hydrant Cut Into an Existing D.I. or C.I Watermain	Jan. 2026
KS-860	Tracer Wire Arrangement at Valve Box for P.V.C. or C.P.P Watermain	Jan. 2026
KS-870	Corrosion Protection for Tracer Wires on P.V.C. or C.P.P Watermain	Jan. 2026
KS-871	Corrosion Protection for Valves & Fittings on Non-ferrous Pipe	Jan. 2026
KS-873	Corrosion Protection for Existing Ferrous Watermain Connected to Proposed Non-Ferrous Watermain	Jan. 2026
KS-874	Corrosion Protection for Hydrant Assembly on Non-Ferrous Pipe	Jan. 2026
KS-875	Corrosion Protection for Hydrants Off of New D.I Watermain	Jan. 2026
KS-877	Watermain Configuration for Dead End Cul-De-Sacs	Jan. 2026
KS-878	Side View of Sampling Station Installation	Jan. 2026
KS-900	Benchmark Monument Details	Jan. 2026
SD-501 (modified)	Chain Link Fence (Parks Recreation and Culture Department)	Jan. 2026

Region of York
Sanitary Sewer Standard Drawings

<u>Drawing No.</u>	<u>Title</u>	<u>Revision Date</u>
I&I-104	Waterproofing Membrane System for Maintenance Holes Within Areas Susceptible to High Groundwater or Located Within Floodplains, Areas of Concentrated Runoff	Oct. 29, 2021
I&I-105	Sewer Trench Plug	Oct. 29, 2021
I&I-106A	Sanitary Sewer Mainline to Maintenance Hole Connection for Flexible Sewer Pipe	Oct. 29, 2021
I&I-106B	Sanitary Sewer Mainline to Maintenance Hole Connection for Rigid Sewer Pipe	Oct. 29, 2021

APPENDIX 1 - STANDARD DETAIL DRAWINGS

Region of York
Sanitary Sewer Standard Drawings

<u>Drawing No.</u>	<u>Title</u>	<u>Revision Date</u>
I&I-107A	Maintenance Hole Drop Structure Type A	Oct. 29, 2021
I&I-107B	Maintenance Hole Drop Structure Type B	Oct. 29, 2021
I&I-109	Sanitary Maintenance Hole Internal Drop Structure	Oct. 29, 2021
I&I-111	Typical Steel Strap Details for Precast Maintenance Holes	Oct. 29, 2021

Toronto Region Conservation Authority
ESC Drawings and Figure

<u>Drawing / Figure No.</u>	<u>Title</u>	<u>Revision Date</u>
Fig. B2-21	Sediment Control Pond	March 2019
Dwg. 03	Sediment Fence (unfrozen conditions)	March 2019
Dwg. 04	Sediment Fence (frozen conditions)	March 2019
Dwg. 05	Mud Mat	March 2019
Dwg. 06	Sediment Trap in Earthen Ditch	March 2019

GENERAL NOTES

- 1. THE NOTES ON THIS SHEET APPLY TO ALL WORKS UNDER THIS CONTRACT UNLESS OTHERWISE NOTED ON THE PLAN AND PROFILE DRAWINGS AND/OR SPECIFIC DETAIL DRAWINGS.
2. THE STANDARD DRAWINGS OF THE TOWNSHIP OF KING, ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS (OPSS) AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) CONSTITUTE PART OF THE PLANS OF THIS CONTRACT.
3. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY TOWNSHIP OF KING STANDARD DRAWINGS, AND SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL RELEVANT STANDARD DRAWINGS AND SPECIFICATIONS AS REQUIRED FOR THIS CONTRACT.
5. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHOWN ON THE ENGINEERING DRAWINGS ARE IN METRES OR MILLIMETERS.
6. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
7. EXISTING SERVICES AND UTILITIES SHOWN ON THESE CONTRACT DRAWINGS ARE BASED ON THE BEST INFORMATION AVAILABLE AND THEIR LOCATIONS ARE NOT GUARANTEED. THE CONTRACTOR SHALL INTERPRET THIS INFORMATION AS HE WISHES WITH THE UNDERSTANDING THAT THE OWNER DISCLAIMS ALL RESPONSIBILITY FOR ITS ACCURACY AND/OR SUFFICIENCY. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.
8. ALL PRIMARY HYDRO, TELECOMMUNICATION CABLE, GAS LINES AND CABLE T.V. SHALL BE PLACED UNDERGROUND IN LOCATIONS SHOWN ON THE ROAD SECTIONS LISTED IN THE STANDARD DRAWINGS.
9. ALL SILT CONTROL AND EROSION PROTECTION DEVICES ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE AND VEGETATION HAS BEEN FULLY RE-ESTABLISHED. SILT CONTROL AND EROSION PROTECTION MEASURES SHALL BE REMOVED ONLY WHEN APPROVED BY THE TOWNSHIP.
10. NATIVE MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY, OR AS NOTED IN THE ACCEPTED GEOTECHNICAL INVESTIGATION REPORT, WHICHEVER IS MORE ASTRINGENT.
11. GRANULAR MATERIAL USED FOR BACKFILL, SHALL BE PLACED IN LAYERS 150mm IN DEPTH MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY, OR AS NOTED IN THE ACCEPTED GEOTECHNICAL INVESTIGATION REPORT, WHICHEVER IS MORE STRINGENT.
12. ALL DISTURBED AREAS ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION OR BETTER, AS DETERMINED BY THE ENGINEER. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING 200mm (MINIMUM) OF APPROVED TOPSOIL AND NURSERY SOD.
13. ALL FENCING SHALL BE CONSTRUCTED IN ACCORDANCE WITH TOWNSHIP STANDARDS.
14. THE STREET LIGHTING SYSTEM SHALL BE DESIGNED BY A QUALIFIED CONSULTING ENGINEER IN ACCORDANCE WITH THE ILLUMINATION ENGINEERING SOCIETY OF NORTH AMERICA (IESNA) LATEST EDITION STANDARDS AND APPROVED BY THE TOWN. STREET LIGHTING SYSTEMS FOR ROADWAYS IN THE TOWNSHIP OF KING SHALL MEET THE REQUIREMENTS OF HYDRO ONE.
15. ALL TRENCHING ARE TO BE IN ACCORDANCE WITH OCCUPATIONAL HEALTH AND SAFETY ACT. TRENCH SIDES SHOULD BE FLATTENED AS DIRECTED BY THE SOILS CONSULTANT
16. DECOMMISSIONING OF WELLS AND SEPTIC SYSTEMS SHALL BE IN ACCORDANCE WITH MECP GUIDELINE PROCEDURES.

ROADS

- 1. THE ROAD PAVEMENT MINIMUM STRUCTURE SHALL CONSIST OF THE FOLLOWING AND WILL BE CONFIRMED BY A SOILS CONSULTANT AND APPROVED BY THE TOWN:
LOCAL ROAD : - 40mm HL3 SURFACE COURSE ASPHALT
- 50mm HL8 BASE COURSE ASPHALT
- 150mm GRANULAR 'A' OR 19mm CRUSHER RUN LIMESTONE
- 300mm GRANULAR 'B' OR 50mm CRUSHER RUN LIMESTONE
COLLECTOR ROAD : - 40mm HL1 SURFACE COURSE ASPHALT
- 80mm HL8HS BASE COURSE ASPHALT
- 150mm GRANULAR 'A' OR 19mm CRUSHER RUN LIMESTONE
- 450mm GRANULAR 'B' OR 50mm CRUSHER RUN LIMESTONE
BOULEVARD AND DITCHES: - 200mm TOPSOIL AND SOD
2. NATIVE SUBGRADE SHALL HAVE A CROSS-FALL OF 3% AND THE MATERIAL SHALL BE APPROVED BY A SOILS CONSULTANT AND IS SUBJECT TO APPROVAL BY THE TOWN ENGINEER. NATIVE SUBGRADE TO BE COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AND SHALL BE PROOF ROLLED.
3. CONTINUOUS 150mm DIAMETER PERFORATED FILTER CLOTH WRAPPED PLASTIC CORRUGATED SUB-DRAINS WITH GRANULAR 'A' BEDDING AND BACKFILL ARE TO BE CONSTRUCTED BY TRENCHING.
4. CONCRETE CURB AND GUTTER CONFORMING TO OPSD 600.040 OR 600.070 (TWO STAGE) SHALL BE USED. CONCRETE STRENGTH IS TO BE A MINIMUM OF 32MPa AT 28 DAYS WITH 7% ± 1.5% AIR ENTRAINMENT.
5. RESIDENTIAL DRIVEWAYS AS PER TOWNSHIP STD. KS-341. THE OUTSIDE EDGE OF ALL DRIVEWAYS ARE TO BE LOCATED A MIN. 1.0m FROM STREET LIGHT AND UTILITY POLES, CATCHBASINS, WATERMAIN VALVES, WATER SERVICE BOXES, SIDE LOT LINES AND OTHER DRIVEWAYS AND A MIN. 1.5m FROM TREES AND HYDRO TRANSFORMERS AND A MIN. 3.0m FROM HYDRANTS AND COMMUNITY MAIL BOXES.
6. DRIVEWAY DEPRESSIONS SHALL BE FORMED IN THE CURB AS PER OPSD 351.010.
7. SIDEWALK CONSTRUCTION SHALL COMPLY WITH KS-231 AND SHALL BE CONSTRUCTED ON 150mm OF GRANULAR 'A' ON A COMPACTED FOUNDATION. CONCRETE STRENGTH IS TO BE A MINIMUM OF 32MPa AT 28 DAYS WITH 7% ± 1.5% AIR ENTRAINMENT.
8. SIDEWALK SHALL BE AS PER TOWNSHIP STD. KS-231. SIDEWALK RAMP PER OPSD 310.033 FOR UNSIGNALIZED INTERSECTIONS.
9. PROVIDE FROST TAPERS FOR ROAD CROSSING CULVERTS AS PER OPSD 803.030.
10. RESIDENTIAL DRIVEWAYS TO BE CONSTRUCTED WITH A MINIMUM OF 150mm GRANULAR 'A', OR AS APPROVED BY THE TOWNSHIP. DRIVEWAYS ARE TO BE PAVED WITH 80mm HL3A IN TWO LIFTS OR ALTERNATIVELY 50mm HL8 BASE ASPHALT AND 30mm TOP ASPHALT FROM STREET TO GARAGE, OR TO DWELLING. DRIVEWAY SLOPES TO BE BETWEEN 1% AND 6%.
11. ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE TOWNSHIP WORKS DEPARTMENT PRIOR TO THE COMMENCEMENT OF ANY WORK IN THEIR RESPECTIVE RIGHT-OF-WAYS. A MINIMUM 48 HOUR NOTICE IS REQUIRED.
12. ALL ASPHALT AND GRANULAR MATERIALS ARE TO BE MANUFACTURED, SUPPLIED AND PLACED IN ACCORDANCE WITH OPSS 310 AND 1150 SPECIFICATIONS. HOT MIX ASPHALT (HMA) BASE LAYERS MAY CONTAIN RECLAIMED (RAP) MATERIALS; HOWEVER, SURFACE LAYERS SHALL BE CONSTITUTED OF VIRGIN MATERIAL WITH NO ADDED RAP. THE USE OF UP TO 30% BY MASS OF RAP SHALL BE PERMITTED FOR HL4, HL8, AND MEDIUM DUTY BINDER MIXES.

STORM SEWERS AND STORM SERVICE LATERALS

- 1. STORM SEWER TO BE LOCATED TYPICALLY 1.5m TO THE WEST OR SOUTH OF CENTRELINE OF THE ROAD.
2. STORM SEWERS UP AND INCLUDING 375mm TO 300mm DIAMETER SHALL BE PVC SDR 35 CONFORMING TO C.S.A. SPECIFICATION B182.4-M1990 AND B182.4-M1992 OR LATEST REVISION THEREOF. EXTERIOR RIBBED PIPE PRODUCTS ARE NOT ACCEPTABLE.
STORM SEWER PIPES LARGER THAN 375mm DIAMETER SHALL BE REINFORCED CONCRETE CONFORMING TO C.S.A. SPECIFICATION A257.2-M1982 OR LATEST REVISION THEREOF.
PIPE JOINTS SHALL BE BY MEANS OF APPROVED RUBBER GASKETS CONFORMING TO C.S.A. SPECIFICATION A257.3-M1982 OR LATEST REVISION THEREOF.
3. STORM SERVICES SHALL BE 150mm DIAMETER PVC SDR 28, WHITE IN COLOR. A PVC CLEAN OUT IS TO BE INSTALLED AT THE STREET LINE AND THE END OF THE SERVICE. EXTENDED 1.5m INTO THE PROPERTY AND TERMINATED WITH A WATER TIGHT PLUG. A WOOD MARKER IS TO EXTEND FROM THE PLUG INVERT TO 1.2m ABOVE THE FINISHED GRADE AND PAINTED BLACK.
4. SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD 802.010, AND 802.030, UNLESS OTHERWISE SPECIFIED BY A GEOTECHNICAL CONSULTANT AND APPROVED BY THE TOWN.
5. TRENCH BACKFILL SHOULD BE PLACED IN 200mm LIFTS AND COMPACTED TO 95% SPMD.
6. ALL STORM SEWER MANHOLES TO BE BENCHED IN ACCORDANCE WITH OPSD 701.021.
7. DROP STRUCTURES SHALL CONFORM WITH TOWNSHIP STANDARD DRAWING KS-171.
8. MANHOLE TOPS ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE. FRAME AND COVER TO BE PER OPSD 401.010, TYPE 'A', GRADE AND CROSSFALL ADJUSTMENT SHALL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE. CONCRETE MODULAR ADJUSTMENT RINGS ARE TO BE USED TO ADJUST THE MANHOLE TO FINAL GRADE.
9. CATCHBASINS MUST BE OF THE PRECAST TYPE AS SHOWN ON THE OPSD DRAWINGS 705.01 OR 705.02.
10. SINGLE CATCHBASIN LEADS SHALL BE HIGH DENSITY POLYETHYLENE PIPE OR PVC SDR35 PIPE CONSTRUCTED AT A MINIMUM GRADE OF 2.0% WITH MINIMUM SIZES AS FOLLOWS:
SINGLE CATCHBASIN 250mm DIAMETER
DOUBLE CATCHBASIN 300mm DIAMETER
REAR LOT CATCHBASIN 250mm DIAMETER
11. THE FRAME AND GRATE FOR CATCHBASINS SHALL BE OPSD 400.110. CATCHBASIN GRATES ARE TO BE RAMPED USING HOT-MIX ASPHALT. CATCHBASINS AT LOW POINTS SHALL BE SET TO BASE ASPHALT AND ADJUSTED TO SURFACE COURSE.
12. REAR LOT CATCHBASIN LEADS TO BE CONCRETE ENCASED FROM THE STREET LINE TO THE CATCHBASIN. FRAME AND GRATE TO BE BEEHIVE, KS-174 STYLE.
13. WHERE CATCHBASINS ARE CONNECTED DIRECTLY TO SEWERS, PRE-MANUFACTURED TEES SHALL BE USED.
14. CATCHBASIN INLET CONTROL DEVICES AS APPROVED BY THE TOWNSHIP SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS.
15. ALL PVC STORM SEWERS SHALL BE TESTED FOR DEFLECTION WITH A SEWER MANDREL. ALL STORM SEWERS SHALL BE INSPECTED BY CCTV. ALL TESTING AND INSTALLATION OF ALL REQUIRED CATCHBASIN INLET CONTROL DEVICES SHALL BE CERTIFIED BY THE PROFESSIONAL ENGINEER PRIOR TO THE ISSUANCE OF BUILDING PERMITS. ALL STORM SEWERS SHALL ALSO BE INSPECTED BY CCTV AND THE FUNCTIONING OF ALL REQUIRED CATCHBASIN INLET CONTROL DEVICES SHALL BE CERTIFIED BY THE PROFESSIONAL ENGINEER PRIOR TO FINAL ACCEPTANCE.

GRADING

- 1. ALL LOT AND SWALE GRADES SHALL BE A MINIMUM 2.0% AND MAXIMUM 5.0% SWALE SIDESLOPES SHALL BE A MAXIMUM 3:1 (H:V).
2. SWALE DEPTH TO BE ACCORDING TO FLOW - MINIMUM 150mm, MAXIMUM 450mm.
3. WHERE SLOPES EXCEED 5.0% 3:1 SLOPES SHALL BE USED UP TO AN ELEVATION DIFFERENCE OF 1.0m AND 4:1 SLOPES SHALL BE USED FOR AN ELEVATION DIFFERENCE GREATER THAN 1.0m.
4. DRIVEWAY GRADES SHALL BE A MINIMUM 2.0% AND A MAXIMUM 6.0% MAXIMUM AS-CONSTRUCTED DRIVEWAY GRADE SHALL BE 6.0%.
5. MINIMUM SEPARATION OF 150mm SHALL BE PROVIDED BETWEEN THE BRICKLINE AND THE FINAL GROUND ELEVATION AND 200mm BETWEEN SIDINGS AND THE FINAL GROUND ELEVATION.
6. ALL ROOF DRAINS SHALL DISCHARGE ONTO SPLASH PADS TO GRASSED AREAS, OR TO A LID COLLECTOR PIPE WITH AN OVERFLOW OUTLET WHERE APPROVED BY THE TOWNSHIP.
7. ALL LOTS TO HAVE MINIMUM 150mm TOPSOIL AND No.1 NURSERY SOD.
8. THE OUTSIDE EDGE OF ALL DRIVEWAYS ARE TO BE LOCATED A MIN. 1.0m FROM STREET LIGHT AND UTILITY POLES, CATCHBASINS, WATERMAIN VALVES, WATER SERVICE BOXES, SIDE LOT LINES AND OTHER DRIVEWAYS AND A MIN. 1.5m FROM TREES AND HYDRO TRANSFORMERS AND A MIN. 3.0m FROM HYDRANTS AND COMMUNITY MAIL BOXES.
9. WHERE RETAINING WALLS ARE NECESSARY AND AGREED TO BY THE TOWNSHIP, THE STRUCTURES SHALL BE FREE STANDING GRAVITY WALLS CONSTRUCTED OF ONLY REINFORCED POURED CONCRETE, LARGE SIZE HEAVY PRE-CAST CONCRETE BLOCKS (MIN 135 KG SECTIONS) OR ARMOUR STONE, WOOD OR GABION BASKETS ARE NOT ACCEPTABLE. TIEBACK SYSTEMS ARE TO BE AVOIDED IN ALL APPLICATIONS, IF IN THE SOLE OPINION OF THE TOWNSHIP THAT TIEBACKS CAN NOT BE AVOIDED, THEY SHALL BE LOCATED ENTIRELY ON THE SAME PROPERTY AS THE RETAINING WALL. A RESTRICTIVE COVENANT WILL BE REQUIRED OVER THE CONSTRUCTED TIEBACKS TO PROTECT THE INTEGRITY OF THE STRUCTURE FROM FUTURE DISTURBANCE INCLUDING ALTERED GRADING, SWIMMING POOLS, DECKS, PLANTING OF LANDSCAPES, ETC.
10. ALL RETAINING WALLS REGARDLESS OF HEIGHT ARE TO BE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER. CERTIFICATION FROM A PROFESSIONAL ENGINEER IS REQUIRED FOR EACH WALL CONSTRUCTED CLEARLY STATING THAT THE WALL HAS BEEN DESIGNED TO SUIT THE SITE CONDITIONS, THAT CONSTRUCTION OF THE WALL HAS BEEN INSPECTED BY THE ENGINEER AND THAT IS HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN.
11. LOTS SITING PLANS WITH RETAINING WALLS ARE TO BE SUBMITTED IN GROUPS WITH NEIGHBOURING AFFECTED LOTS.
12. CLEAR STONE (19mm GRADATION) AT A MINIMUM DEPTH OF 100mm SHALL BE PLACED IN SIDE YARD AREAS BETWEEN FACE OF HOUSES WITH DISTANCE LESS THAN 2.6m INSTEAD OF SOD.
13. A TRANSITION RUN-OUT AREA TO DRAIN THE SUB-GRADE SHALL BE PROVIDED AT THE CLEARSTONE/SOD INTERFACE.
14. WHERE FENCE IS BETWEEN PRIVATE AND PUBLIC LANDS, 1.8m HIGH CHAIN LINK FENCE WITH 9 GAUGE WIRE AND NO LARGER THAN 37mm OPENING IS REQUIRED. THE POSTS ARE TO BE ON THE PRIVATE SIDE, INCLUDING THE ENTIRETY OF FOOTINGS. MESH IS TO BE ON THE PUBLIC SIDE OF THE POSTS.
15. ON SPLIT DRAINING LOTS AND WALKOUT LOTS THAT ARE BACKING ONTO ANOTHER LOT, ROOF DOWNSPOUTS SHOULD BE DIRECTED TO THE FRONT YARD AS MUCH AS POSSIBLE.

SANITARY SEWERS

- 1. SANITARY SEWERS UP TO AND INCLUDING 375 MM DIAMETER SHALL BE CONSTRUCTED OF POLYVINYL CHLORIDE (PVC) SDR 35 PIPE. PVC PIPE SHALL CONFORM WITH ASTM D3034 / F679 AND BE CERTIFIED TO CSA SPECIFICATION CSA B182.2 OR LATEST REVISIONS THEREOF. EXTERIOR RIBBED PIPE PRODUCTS ARE NOT ACCEPTABLE. PVC FITTINGS SHALL BE HEAVY WALL SDR 26 GASKETED FITTINGS. PIPES GREATER THAN 375 MM DIAMETER SHALL BE REINFORCED CONCRETE PIPE. REINFORCED CONCRETE PIPES SHALL CONFORM TO CSA SPECIFICATION A275.2 M1982 OR LATEST REVISION THEREOF, CLASS 50 D, 65 D, 100 D OR 140 D, AS REQUIRED. ALL SANITARY SEWERS AND FITTINGS SHALL HAVE GASKETED JOINTS.
2. MINIMUM BEDDING REQUIREMENTS FOR ALL SANITARY SEWER MAINS AND ALL RELATED CONNECTIONS SHALL BE CLASS "B" PER OPSD 802.010, EXCEPT WHERE OTHERWISE NOTED ON PROFILE. BEDDING MATERIAL IS SUBJECT TO RECOMMENDATIONS OF A PROFESSIONAL GEOTECHNICAL ENGINEER AND TOWNSHIP APPROVAL AND MAY INCLUDE GRANULAR 'A' (PER OPSS/MUNI 1010), 19MM CRUSHER RUN LIMESTONE (PER OPSS/MUNI 1010 GRANULAR 'A' SPECIFICATION TABLE 2), HL6 LIMESTONE (PER CSA S6 - LATEST EDITION - TABLE 7.9) AND 19MM CLEAR 100 PERCENT CRUSHED LIMESTONE (PER OPSS/MUNI 1004) AND FULLY WRAPPED IN FILTER CLOTH PER TERRAFIX 270R OR APPROVED EQUAL. THE TOWNSHIP APPROVED BEDDING IS ONLY TO BE PLACED UNDER OTHER BEDDING MATERIALS TO PROVIDE SUPPORT IN WATER BEARING SAND AND SILT. IN WATER BEARING SAND, IF EXTENSIVE Dewatering IS REQUIRED, A CLASS "A" BEDDING CONSISTING OF CONCRETE MAY BE REQUIRED.
3. SANITARY SEWER MAINTENANCE HOLES SHALL BE CONSTRUCTED OF PRECAST CONCRETE WITH A MONOLITHIC BASE CONFORMING TO CSA A257.4-M1982 AND IN ACCORDANCE WITH THE LATEST OPS SPECIFICATIONS AND STANDARD DRAWINGS. MAINTENANCE HOLES ARE TO BE PRE-BENCHED BY THE SUPPLIER. PRECAST STRUCTURES ARE TO BE GASKETED PER OPSS, MUNI 1351 AND CSA 257.3.
4. MAINTENANCE HOLES ARE TO BE WATERPROOFED PER THE REGION OF YORK SPECIFICATIONS FOR REDUCTION OF INFLOW AND INFILTRATION. ALL LIFT HOLES ARE TO BE FILLED WITH 3:1 NON-SHRINK MORTAR MIX. THE MINIMUM REQUIREMENT OF WATERPROOFING JOINTS IN PRECAST SECTIONS FROM 0.5 M ABOVE TO 0.5 M BELOW THE JOINTS IS TO BE CARRIED OUT ON ALL STRUCTURE. WHERE GROUNDWATER CONDITIONS CONSIST OF A MINIMUM 85 kPa OF WATER PRESSURE ON THE STRUCTURE OR SEASONALLY HIGH GROUNDWATER IS GREATER THAN 0.6 M ABOVE THE TOP OF THE LOWEST SEWER THE COMPLETE MAINTENANCE HOLE STRUCTURE IS TO BE WATERPROOFED PER REGION OF YORK STANDARD DRAWING I&I-104. THE STRUCTURES THAT REQUIRE COMPLETE WATERPROOFING ARE TO BE IDENTIFIED ON THE ENGINEERING DRAWINGS. WATERPROOFING IS TO CONSIST OF MAINTENANCE HOLE SURFACE PREPARATION, PRIMING IF REQUIRED, INSTALLING APPROVED WATERPROOFING MEMBRANE AND PROTECTION BOARD MATERIALS AND BACKFILLING IN ACCORDANCE WITH THE REGION OF YORK SPECIFICATIONS.
5. WATERPROOFING MEMBRANES AND PRIMER ARE TO BE SELECTED BASED ON WARM OR COLD WEATHER CONDITIONS DURING APPLICATION. APPROVED WATERPROOFING PRODUCTS INCLUDE BITHUTHENE 3000 OR LOW TEMPERATURE MEMBRANE, BLUESKIN WP200, COLPHENE 3000, MEL-ROL OR MEL-ROL LOW TEMP. OR APPROVED EQUAL BY THE TOWNSHIP. APPROVED GEOCOMPOSITE PROTECTION BOARD PRODUCTS ARE PROTECTION Q3, POLYPROPYLENE PROTECTION BOARD, PROTECTION COURSE, SOPRBOARD, OR APPROVED EQUAL BY THE TOWNSHIP.
6. FRAMES AND COVERS SHALL BE OPSD 401.010 TYPE A (CLOSED) MODIFIED WITH A SINGLE LIFT HOLE ONLY. WHERE SPECIFIED WATERTIGHT COVERS PER OPSD 410.030 SHALL BE PROVIDED.
7. ALL DOMESTIC CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TOWNSHIP STANDARD DRAWINGS AND ALL APPLICABLE OPSD DETAILS TO A MAXIMUM DEPTH OF 4.5 m. CONTROLLED SETTLEMENT JOINTS ARE REQUIRED ON ALL RISERS GREATER THAN 4.5 m DEPTH.
8. INSTALL SEWER DROP CONNECTIONS TO MANHOLES AS PER YORK REGION STANDARD DRAWINGS I&I-107A AND I&I-107B.
9. APPROVED GRANULAR BEDDING SHALL BE PLACED AROUND FLEXIBLE SEWER PIPE OUTSIDE OF MAINTENANCE HOLES IN ACCORDANCE WITH STANDARD DRAWING I&I-106A. CONCRETE BEDDING SHALL ENCASE CONCRETE SEWER PIPE TO THE FIRST JOINT OUTSIDE OF MAINTENANCE HOLES IN ACCORDANCE WITH STANDARD DRAWING I&I-106B.
10. ALL MAINTENANCE HOLE ADJUSTMENT RINGS SHALL BE MORTARED BETWEEN ALL RINGS AND FROM THE OUTSIDE OF THE STRUCTURE PRIOR BACKFILLING. MAINTENANCE HOLE JOINTS TO BE FURTHER WATERPROOFED FROM THE OUTSIDE USING APPROVED WATERPROOF MEMBRANE AND PROTECTION BOARD PRIOR TO BACKFILLING.
11. ALL SANITARY MAINTENANCE HOLES TO BE PRE-BENCHED TO THE PIPE OVERT AS PER OPSD 701.021 AND I&I-106A.
12. ALL TESTING OF THE SANITARY SYSTEM IS TO BE COMPLETED IN ACCORDANCE WITH THE "INFLOW AND INFILTRATION REDUCTION STANDARD FOR SEWERS SERVING NEW DEVELOPMENT" (FEBRUARY 2022) AS PREPARED BY THE REGION OF YORK, OR LATEST AMENDMENT THERETO.
13. FLOW MONITORING WILL BE REQUIRED AT THE DIRECTION OF THE DIRECTOR OF ENGINEERING AND PUBLIC WORKS IF DEEMED NECESSARY TO VERIFY INFILTRATION FLOWS ARE WITHIN ACCEPTABLE LEVELS.
14. TRENCH PLUGS PER STANDARD DRAWING I&I-105 SHALL BE USED IN THE TRENCH AND BE PLACED WHERE DIRECTED BY THE GEOTECHNICAL ENGINEER AT A MAXIMUM SPACING OF 80 M TO 3 METERS UPSTREAM FROM ANY MAINTENANCE HOLE WHICH IS SUSPECTED OF BEING SUSCEPTIBLE TO HIGH WATER LEVELS OF INFLOW/INFILTRATION.
15. MAINTENANCE HOLE TOPS (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE, AND THEN ADJUSTED TO FINAL GRADE WHEN TOP LIFT OF ASPHALT IS PLACED. GRADE AND CROSSFALL ADJUSTMENT SHALL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE. CONCRETE MODULAR ADJUSTMENT RINGS ARE TO BE USED TO ADJUST THE MANHOLE TO FINAL GRADE.
16. ALL SEWERS MAINS ARE TO BE TESTED FOR DEFLECTION WITH A SEWER MANDRELL. SEWER MAINS AND SERVICE CONNECTIONS ARE TO BE INSPECTED CCTV. CCTV PROCEDURES AND EVALUATIONS ARE TO BE IN ACCORDANCE WITH NASSCO GUIDELINES 7.03 EDITION, OR AS AMENDED. SEWER MAINS AND SERVICE CONNECTIONS ARE TO BE TESTED BY LOW PRESSURE AIR EXFILTRATION TESTING. MAINTENANCE HOLES ARE TO BE VISUALLY INSPECTED AND WHERE DIRECTED FURTHER TESTED BY WATER EXFILTRATION TESTING AND WATER INFILTRATION TESTING, TESTED BY NEGATIVE AIR VACUUM TESTING AND TESTING THE CHIMNEY SEAL FOR LEAKAGE IS APPLICABLE. WASTEWATER FLOW AND RAINFALL MONITORING MAYBE REQUIRED BY THE TOWNSHIP OF KING. ALL TESTING, EVALUATION OF RESULTS AND DEFICIENCIES IS TO BE CARRIED OUT AS OUTLINED IN THE REGION OF YORK "I&I REDUCTION STANDARD FOR SEWERS SERVING NEW DEVELOPMENT" (FEBRUARY 2022).
17. ALL TESTS ARE TO BE COMPLETED BY THE PROFESSIONAL ENGINEER THAT THE SANITARY SERVICING MEETS ALL TOWNSHIP REQUIREMENTS PRIOR TO THE ISSUANCE OF BUILDING PERMITS. PRIOR TO FINAL ACCEPTANCE, ALL SEWERS ARE TO BE FLUSHED AND INSPECTED BY CCTV. THE PROFESSIONAL ENGINEER SHALL CERTIFY THAT THE SANITARY SERVICING MEETS ALL TOWNSHIP REQUIREMENTS PRIOR TO THE ISSUANCE OF FINAL ACCEPTANCE.

SANITARY SERVICE LATERALS

- 1. ALL PVC SANITARY LATERAL PIPES MUST BE GREEN - 125 mm DIAMETER, SDR 28. ALL LATERALS REQUIRING RISERS SHALL BE AS PER TOWNSHIP OF KING STANDARD KS-191.
2. LOCATIONS OF SANITARY SERVICE CONNECTION ARE TO BE AS PER TOWNSHIP OF KING STANDARDS. SANITARY SERVICE CONNECTIONS TO BE INSTALLED AS SHOWN ON DRAWINGS OR AS DIRECTED BY THE ENGINEER AND THE TOWNSHIP OF KING.
3. ELEVATION OF SANITARY SERVICE CONNECTIONS AT THE STREET LINE IS TO BE 2.5m MINIMUM BELOW THE FINISHED CENTRELINE OF ROAD GRADE AND TERMINATED WITH A WATER-PROOF PLUG. LOCATION STAKED WITH A 50mm x 100mm MARKER PAINTED GREEN.
4. ALL LATERALS ARE TO BE INSPECTED BY CCTV AND AIR PRESSURE FROM THE MAINLINE TO THE STREET LINE AND CERTIFIED BY THE PROFESSIONAL ENGINEER PRIOR TO THE ISSUANCE OF BUILDING PERMITS. SERVICE LATERALS CONSTRUCTED ON PRIVATE PROPERTY FROM THE STREET LINE TO THE BUILDING FACE ARE TO BE INSPECTED BY CCTV AND AIR PRESSURE AND CERTIFIED BY THE PROFESSIONAL ENGINEER BEFORE THE ISSUANCE OF AN OCCUPANCY CERTIFICATE.
5. SURFACE CLEANOUTS ARE TO BE INSTALLED AT THE STREET LINE ON ALL SANITARY SERVICES IN ACCORDANCE WITH THE STANDARD DRAWINGS.
6. EXISTING SANITARY SERVICES TO BE DECOMMISSIONED ARE TO BE CUT AND CAPPED AT THE MAIN.

WATERMANS

- 1. WATERMAIN SHALL BE LOCATED AS SHOWN ON THE STANDARD TOWNSHIP OF KING ROADWAY CROSS SECTIONS. THIS LOCATION SHALL NORMALLY BE ON THE SOUTH AND EAST SIDE OF THE STREET. WATERMAIN SHALL BE OFFSET FROM STREET LINE AS PER STANDARD ROAD CROSS SECTION.
2. ALL WATERMAIN TO BE CLASS 235 PVC (DR18) IN ACCORDANCE WITH AWWA C900 OR PVC0 PIPE MANUFACTURED TO AWWA C909 SPECIFICATIONS. ALL PIPE TO BE INSTALLED PER OPSS/MUNI 441.
3. A MINIMUM CLEARANCE BETWEEN THE WATERMAIN AND ALL UTILITIES MUST BE KEPT, WHILE STILL MAINTAINING A MINIMUM DEPTH OF COVER AT ALL TIMES.
4. WATERMAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF 1.8m.
5. TEMPORARY DEAD-ENDS OF WATERMANS SHALL BE EQUIPPED WITH A TEMPORARY FIRE HYDRANT.
6. PVC WATERMAIN SHALL INCLUDE #12 TRACER WIRE. A TRACER WIRE SHALL BE PROVIDED ALONG THE TOP OF ALL WATERMANS. THE WIRE IS TO BE SECURED AT EVERY FITTING AND VALVE AND AT INTERVALS NOT TO EXCEED 3 METERS. ALL TRACING WIRES SHALL BE 12 GAUGE, STRANDED COPPER WIRE WITH OUTER PLASTIC COATING.
7. MECHANICAL JOINT RESTRAINTS ARE TO BE INSTALLED AT ALL TEES, HORIZONTAL AND VERTICAL BENDS, HYDRANTS, END OF MAINS AND VALVES. ALL HYDRANTS AND VALVES SHALL BE INSTALLED WITH CATHODIC PROTECTION, 175 GRAM ZINC CAPS OR APPROVED EQUIVALENT SHALL BE INSTALLED ON EACH BOLT OF ANY MECHANICAL CONNECTION. CONCRETE THRUST BLOCKS ARE NOT PERMITTED UNLESS APPROVED BY THE TOWN ENGINEER.
8. DUCTILE IRON, CEMENT-LINED MECHANICAL JOINT FITTINGS MEETING AWWA SPECIFICATIONS C110/C111 OR C153 SHALL BE USED ON PVC WATERMAIN 150 TO 300mm IN DIAMETER.
9. ALL VALVES SHALL BE RESILIENT WEDGE GATE VALVES WITH VALVE BOX UNLESS OTHERWISE APPROVED BY THE TOWN. VALVES SHALL HAVE A NON-RISING STEM AND A 50mm SQUARE OPERATING NUT, OPENING COUNTER-CLOCKWISE. ALL VALVES 300mm DIAMETER AND LARGER SHALL BE INSTALLED INSIDE VALVE CHAMBERS.
10. VALVES IN EXCESS OF 1.8m IN DEPTH SHALL REQUIRE A VALVE STEM EXTENSION.
11. FIRE HYDRANTS SHALL BE MUELLER CANADA VALVE "CENTURY" COMPRESSION TYPE COMPLETE WITH PLUMPER NOZZLE FACING THE STREET. THE SIDE PORTS SHALL BE 65mm DIAMETER WITH 100mm DIAMETER STORZ. HYDRANT TEES TO BE ANCHOR STYLE. HYDRANTS SHALL BE PAINTED IN ACCORDANCE WITH TOWNSHIP SPECIFICATIONS.
12. HYDRANT FLANGE ELEVATIONS SHALL BE SET AT A GRADE THAT WILL GIVE A FLANGE ELEVATION OF 50 mm TO 150 mm ABOVE THE FINAL GRADE.
13. ALL HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH OPSD 1105.010.
14. HYDRANTS SHALL BE LOCATED A MINIMUM OF 3.0 METRES FROM THE EDGE OF DRIVEWAYS, HOUSE WATER AND SEWER SERVICES ABOVE GROUND UTILITIES SUCH AS LIGHT STANDARDS, TRANSFORMER, STREET SIGNS AND STREET TREES. A MINIMUM HORIZONTAL SEPARATION OF 2.5m SHALL BE MAINTAINED BETWEEN THE WATERMAIN AND ANY SEWER.
15. HYDRANTS SHALL BE LOCATED ON THE PROJECTION OF A LINE AND OFFSET FROM THE STREET LINE IN ACCORDANCE WITH THE STANDARD CROSS-SECTION.
16. PIPE DEFLECTION SHOULD BE USED WHEREVER POSSIBLE TO MINIMIZE THE USE OF BENDS. WHEREVER IT IS NECESSARY TO DEFLECT FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE, THE AMOUNT OF DEFLECTION SHALL NOT EXCEED THE RECOMMENDATIONS OF THE MANUFACTURER.
17. THE MAXIMUM SIZE OF CONNECTION THAT CAN BE TAPPED INTO A 150mm DIAMETER WATERMAIN IS 50mm IN DIAMETER. WATER SERVICE CONNECTIONS 75mm IN DIAMETER AND LARGER SHALL BE MADE BY INSTALLING A TEE ON THE SUPPLY MAIN.

WATER SERVICES

- 1. EACH HOUSING UNIT SHALL HAVE SEPARATE 25mm MINIMUM DIAMETER OR AS REQUIRED BY FIXTURE COUNTS PER OBC, TYPE K COPPER OR PEX WATER SERVICE.
2. WATER SERVICES TO BE LOCATED AT THE CENTRE OF THE LOT, WITH CURB STOP AT THE STREET LINE.
3. THE MINIMUM DEPTH OF COVER IS 1.8m.
4. WATER SERVICES SHALL BE INSTALLED TO AVOID DRIVEWAY APPROACHES.
5. NO COUPLINGS WILL BE ALLOWED BETWEEN THE CURB STOP AND MAIN STOP.
6. STAINLESS STEEL SERVICE SADDLES SHALL BE USED WHEN TAPPING INTO THE PVC WATERMAIN.
7. SERVICES SHALL BE INSTALLED ACCORDING TO KS-851.
8. A WATER METER WILL BE REQUIRED ON EACH RESIDENCE. MAKE AND MODEL IS TO BE PER TOWNSHIP REQUIREMENTS COMPLETE WITH A REMOTE READER LOCATED ON AN OUTSIDE WALL, ADJACENT TO THE HYDRO METER.
9. ALL EXISTING WATER SERVICES TO BE DECOMMISSIONED ARE TO BE CUT AND CAPPED AT MAIN.
10. CURB STOPS SHALL BE INSTALLED WITH STAINLESS STEEL COTTER PINS.

LEGEND

Legend table listing symbols for existing and proposed watermain, sanitary sewer, catchbasin lead, gas main, U/G bell, U/G hydro, U/G cable television, bell pedestal, utility pole with guy wire, hydrant and valve, valve chamber, valve & box, gas valve, MH storm or sanitary, catchbasin single, catchbasin double, iron bar, standard iron bar, curb & gutter, culvert, fence, deciduous tree, coniferous tree, vegetation to be removed, sign, storm maintenance holes, catchbasin maintenance holes, sanitary maintenance holes, sewer, watermain, catchbasin, double catchbasin, catchbasin with I.C.D., hydrant & secondary valve, valve & chamber, curb & gutter & depression, sidewalk, driveway with gravel, driveway with asphalt, driveway with concrete, driveway with paving stone, elevation, existing elevation, existing structure to be removed, existing san lateral connections, connections to existing water service at prop. and ex. watermains.

Table with 4 columns: No., Revision, Date, By, Apprd. Row 1: 1, Revision, Date, By, Apprd.

Table with 2 columns: No., Elevation, Description. Row 1: 1, Elevation, Description.

Professional Engineer seal for L. Celedonio, Province of Ontario, Accepted by Township of King, Signature and Date line.



(CONSULTANTS COMPANY INFO & LOGO)

(PROJECT NAME) GENERAL NOTES

Table with 3 columns: Surveyed by, Checked by, Project No. Row 1: Surveyed by, Checked by, Project No. ??-??

Scale: Horiz. 1:500, Vert. 1:50. Drawing No. GN. Sheet No. - OF -

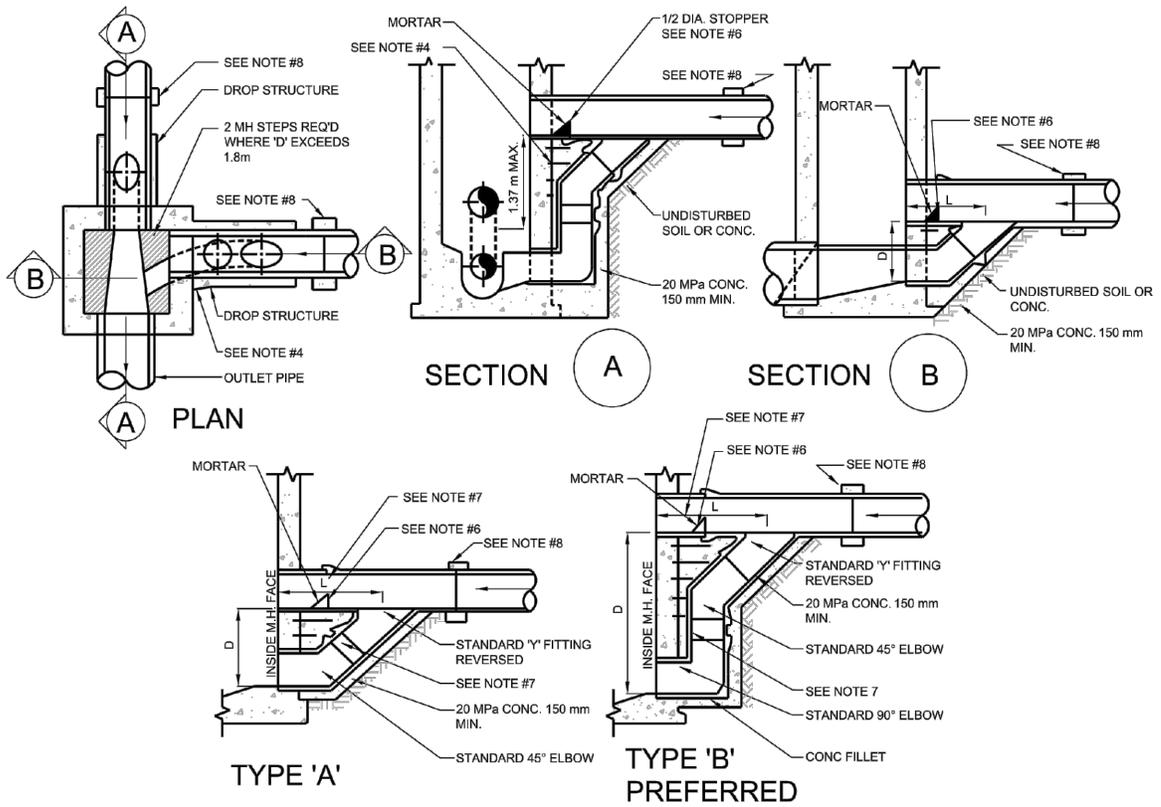


TABLE OF MINIMUM DIMENSIONS AND MAXIMUM VELOCITIES						
DROP PIPE (mm)	TYPE 'A'		TYPE 'B'		MAX. VELOCITY m/sec	
	'D'	'L'	'D'	'L'	NO STOPPER	STOPPER
200	.610	.760	1.22	1.07	1.42	3.78
250	.650	.815	1.30	1.07	1.55	4.05
300	.710	.915	1.45	1.14	1.71	4.11
375	.915	1.14	1.91	1.22	1.92	4.18
450	.990	1.22	2.06	1.30	2.16	4.27
525	1.07	1.30	2.21	1.45	2.35	4.45
600	1.14	1.37	2.44	1.52	2.53	4.60
675	1.22	1.45	2.51	1.60	2.70	4.72
750	1.30	1.52	2.67	1.68	2.83	5.00

DIMENSIONS IN METRES

NOTES:

- DROP PIPE TO BE ONE SIZE SMALLER THAN INLET UNLESS OTHERWISE NOTED. MIN= 200mm; MAX= 750mm
- DROP PIPE TO HAVE CROWN LEVEL WITH OUTLET PIPE AND BENCHED TO CROWN.
- DROP PIPE TO BLEND WITH FLOW.
- DROP STRUCTURE TO BE ENCASED IN A MINIMUM OF 150mm OF 20 MPa CONCRETE AND DOWELLED TO MAINTENANCE HOLE WITH 12mm DIA. DOWELS, 450mm LONG, EITHER SIDE OF DROP PIPE AND AT 300mm C TO C.
- MAXIMUM VELOCITIES SHOWN IN TABLE INDICATE MAXIMUM VELOCITY IN INCOMING PIPE WITH NO OVERSHOOTING.
- WHEN USED ON STORM SEWERS 375mm DIA. OR LARGER, A 1/2 DIA. CONCRETE STOPPER MAY BE INSERTED IN THE INVERT OF THE MAIN LINE AS INDICATED.
- ADJUSTMENT IN 'D' AND 'L' TO BE MADE WITH PLAIN END STRAIGHT PIPE.
- WHERE 'Y' FITTING JOINS FIRST PIPE, A 300mm WIDE BY 15mm THICK 20 MPa CONCRETE COLLAR IS TO BE CONSTRUCTED.
- ALL CONCRETE IN DROP STRUCTURE TO BE 20 MPa AT 28 DAYS.
- MINIMUM DIMENSIONS BASED ON USE OF STANDARD CONCRETE FITTINGS.
- ALL DIMENSIONS ARE SUBJECT TO MANUFACTURER'S PERMISSIBLE VARIATIONS.



TOWNSHIP OF KING

**TYPICAL DROP STRUCTURES FOR
STANDARD STORM MANHOLES**

APPROVED *[Signature]*

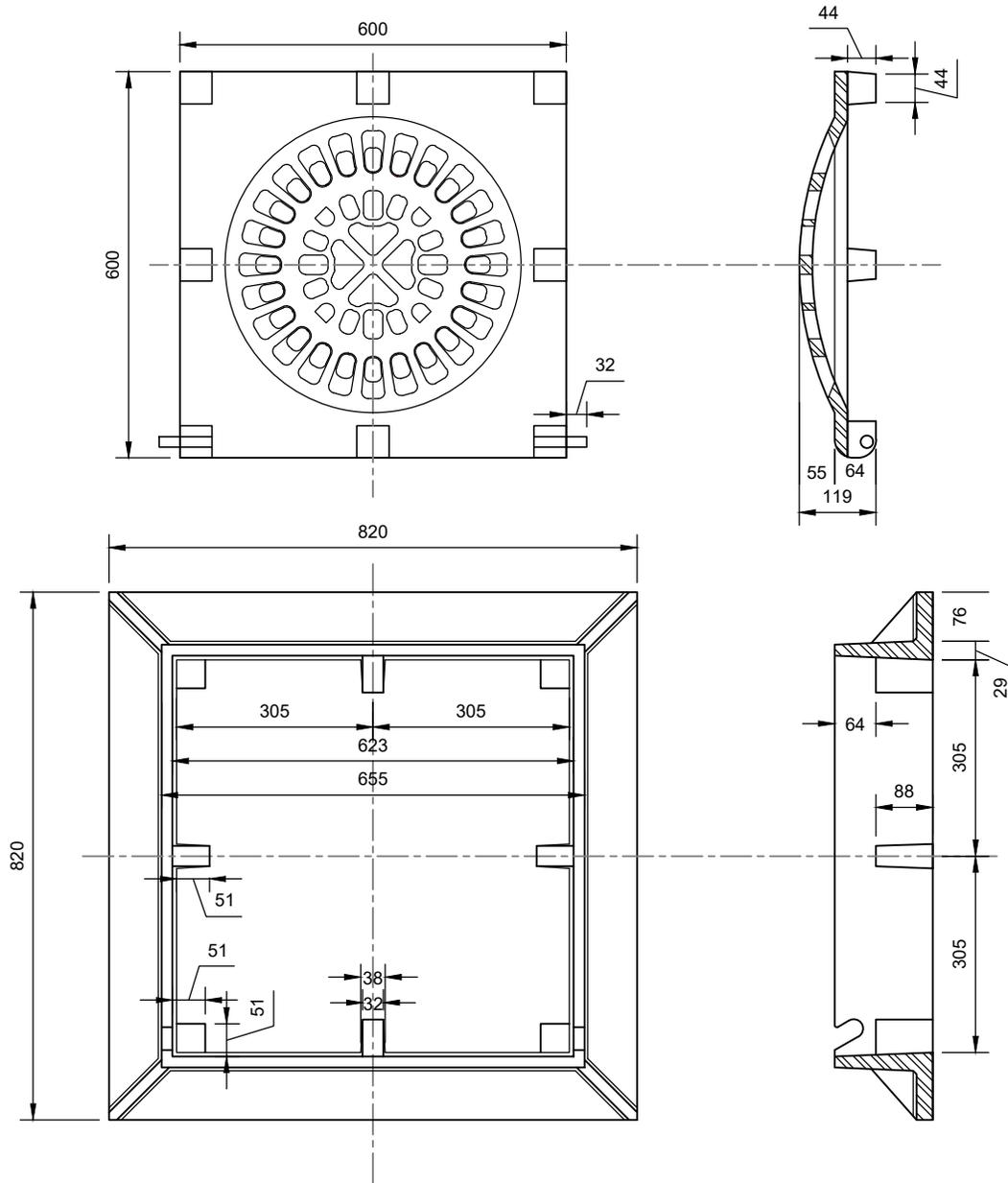
DATE OF ISSUE
FEB. 2017

REVISION

DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-171



NOTES:

1. ALLOWABLE TOLERANCE: DIMENSIONS 300mm OR LESS + 3mm
DIMENSIONS OVER 300mm UP TO AND INCLUDING 900mm +6mm
- 2.. THE INITIALS OR MARK OF THE MANUFACTURER ARE TO BE DISTINCTLY CAST IN RAISED LETTERS ON BOTH FRAME AND COVER
3. STEEL FOR HINGE PINS TO BE AS ASTM DESIGNATION A-7 OR EQUIVALENT
4. CAST IRON TO CONFORM TO ASTM DESIGNATION A-48-74 CLASS 30-C
5. DIMENSIONS IN mm EXCEPT AS NOTED



TOWNSHIP OF KING

**BEEHIVE CATCHBASIN
FRAME and COVER**

APPROVED

REVISION

DATE OF REVISION

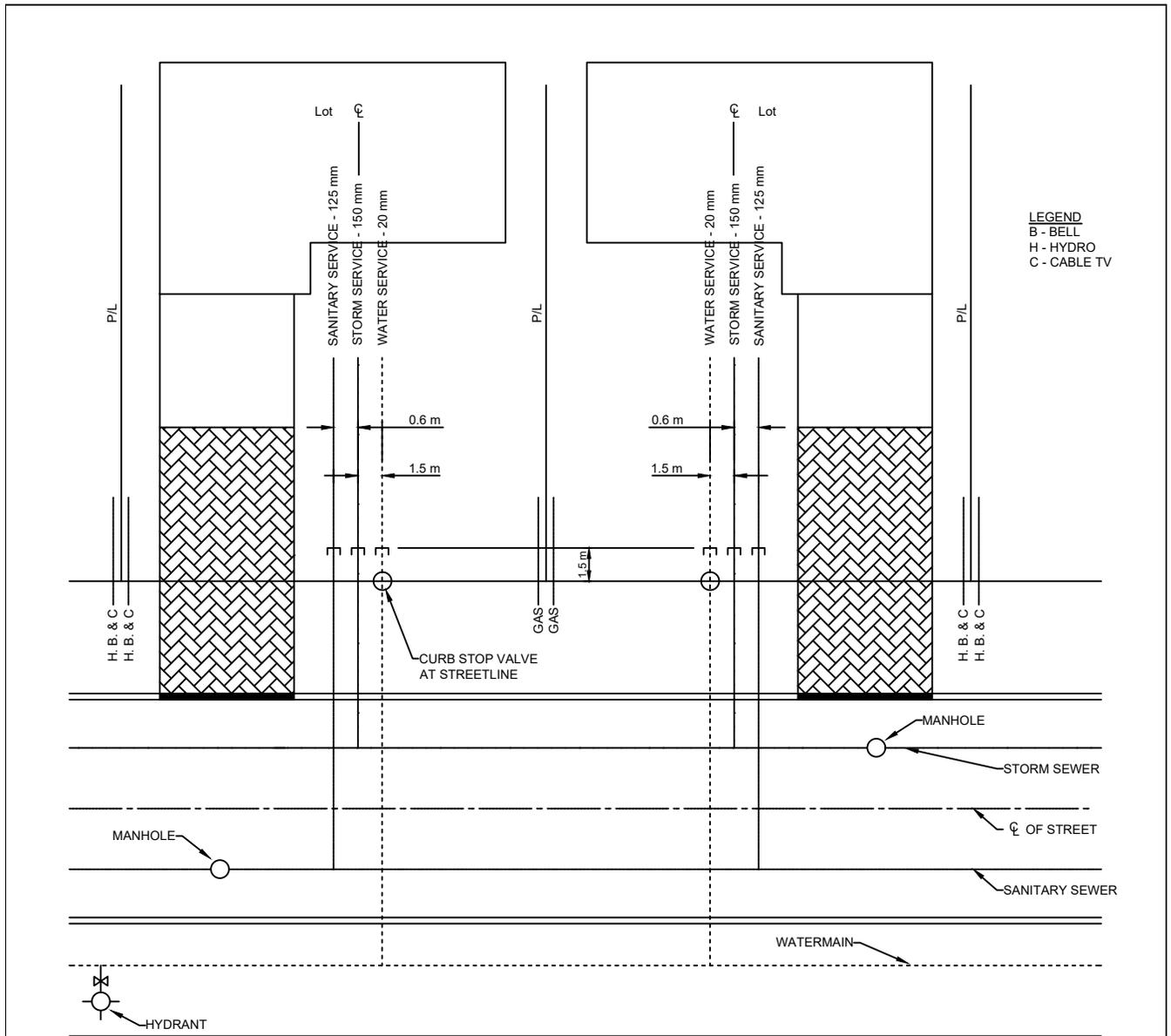
JANUARY 2026

DATE OF ISSUE

APRIL 2015

DRAWING No.

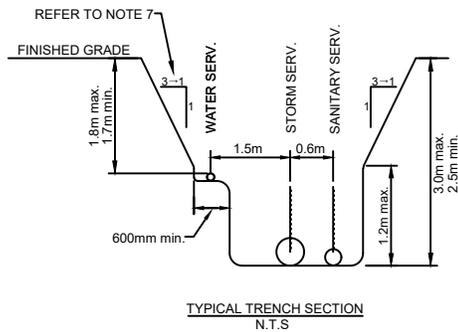
KS-174



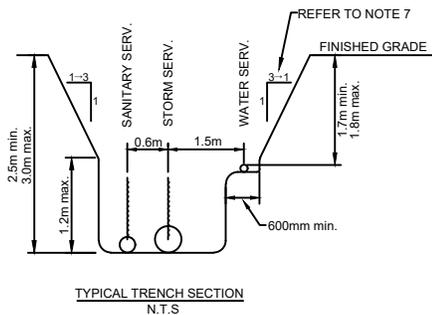
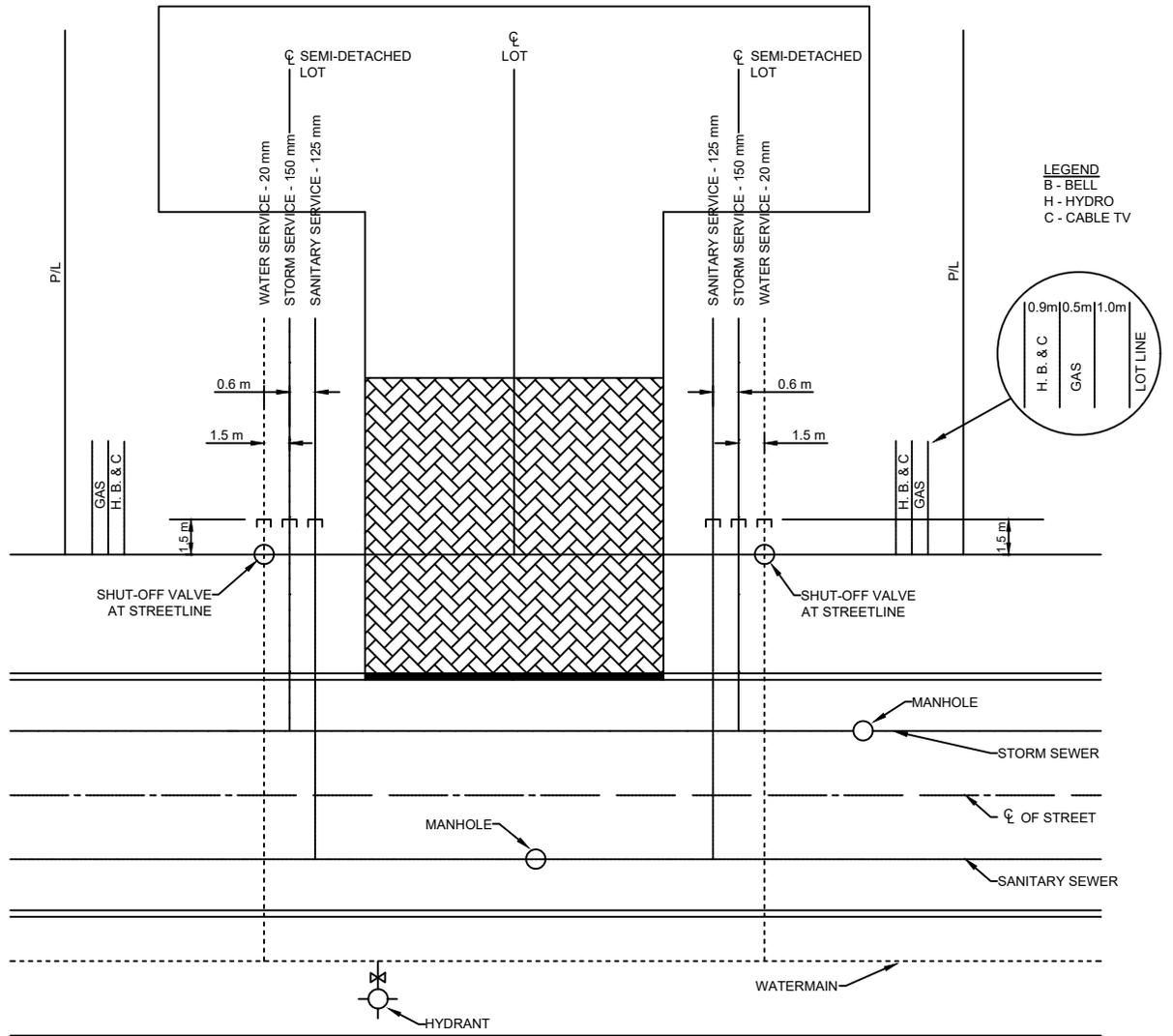
LEGEND
 B - BELL
 H - HYDRO
 C - CABLE TV

NOTES:

1. SERVICES TO EXTEND 1.5m INSIDE PROPERTY LINE AND CAPPED.
2. UNDER NO CIRCUMSTANCES SHALL SERVICES CROSS ONE ANOTHER.
3. THE MINIMUM SIZE FOR STORM DRAIN CONNECTIONS SHALL BE 150mm Ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE STORM SEWER TO THE BUILDING ENVELOPE.
4. THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 125mm Ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE.
5. ALL UNDERGROUND SERVICE CABLES TO BE PLACED A MINIMUM 1.0m BELOW FINISHED GRADE OF LOTS.
6. ALL DIMENSIONS ARE IN METRES EXCEPT WHERE NOTED.
7. TRENCH DIMENSIONS AND SLOPING OF WALLS TO BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, AS AMENDED.
8. CURB STOPS SHALL NOT BE LOCATED WITHIN DRIVEWAYS (0.6m MINIMUM OFFSET).
9. SURFACE CLEANOUTS FOR SANITARY SEWER SERVICES IN ACCORDANCE WITH STANDARD DWG. KS-193 ARE TO BE PROVIDED WHERE DIRECTED BY THE TOWNSHIP.



	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE JAN. 1990
	SERVICE LOCATION SINGLE FAMILY RESIDENTIAL	REVISION	DRAWING No. KS-175
		DATE OF REVISION JANUARY 2026	



NOTES:

1. SERVICES TO EXTEND 1.5m INSIDE PROPERTY LINE AND CAPPED
2. UNDER NO CIRCUMSTANCES SHALL SERVICES CROSS ONE ANOTHER.
3. THE MINIMUM SIZE FOR STORM DRAIN CONNECTIONS SHALL BE 150mm Ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE STORM SEWER TO THE BUILDING ENVELOPE.
4. THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 125mm Ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE.
5. ALL UNDERGROUND SERVICE CABLES TO BE PLACED A MINIMUM 1.0m BELOW FINISHED GRADE OF LOTS.
6. ALL DIMENSIONS ARE IN METRES EXCEPT WHERE NOTED.
7. TRENCH DIMENSIONS AND SLOPING OF WALLS TO BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, AS AMENDED.
8. CURB STOPS SHALL NOT BE LOCATED WITHIN DRIVEWAYS (0.6m MINIMUM OFFSET).
9. SURFACE CLEANOUTS FOR SANITARY SEWER SERVICES IN ACCORDANCE WITH STANDARD DWG. KS-193 ARE TO BE PROVIDED WHERE DIRECTED BY THE TOWNSHIP.



TOWNSHIP OF KING

**SERVICE LOCATION
SEMI DETACHED RESIDENTIAL**

APPROVED
[Signature]

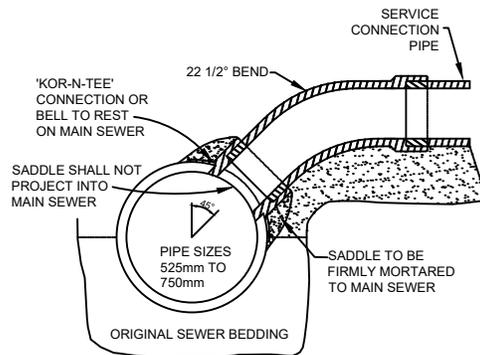
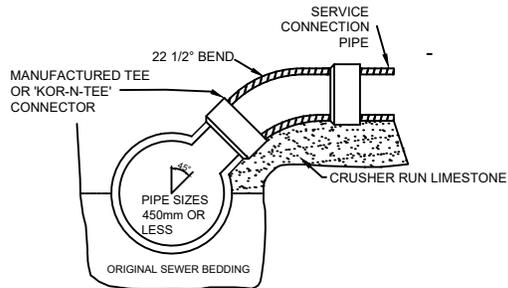
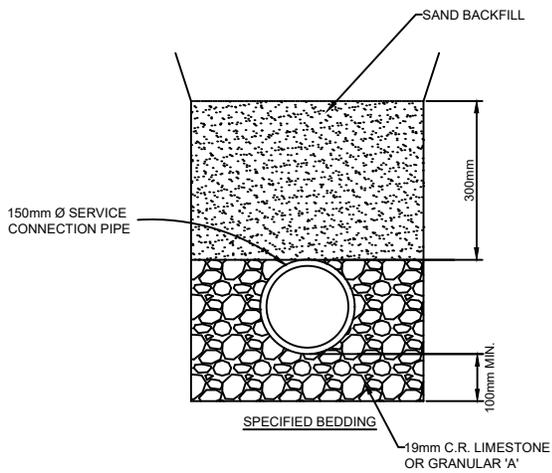
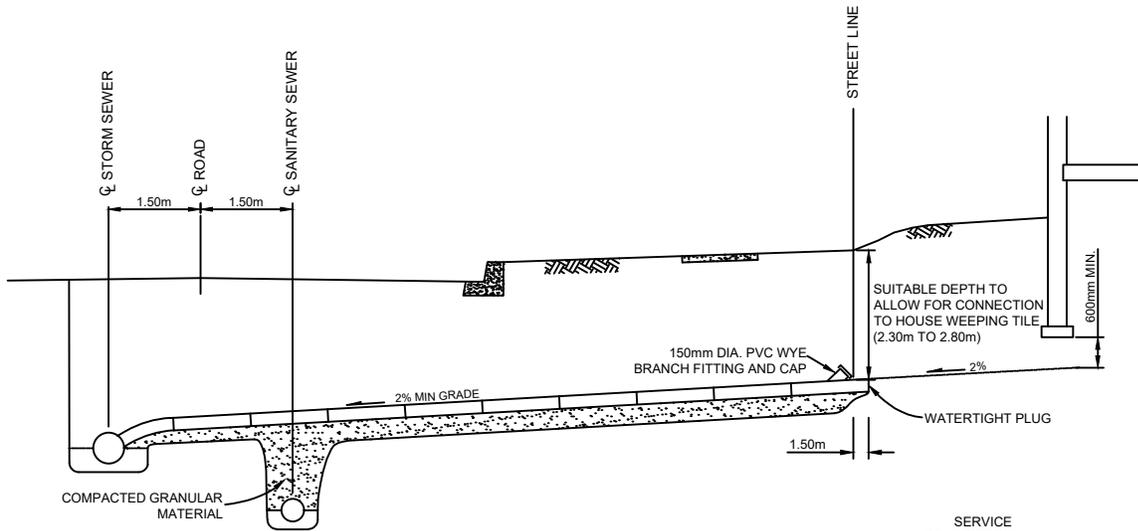
REVISION

DATE OF REVISION
JANUARY 2026

DATE OF ISSUE
JAN. 1990

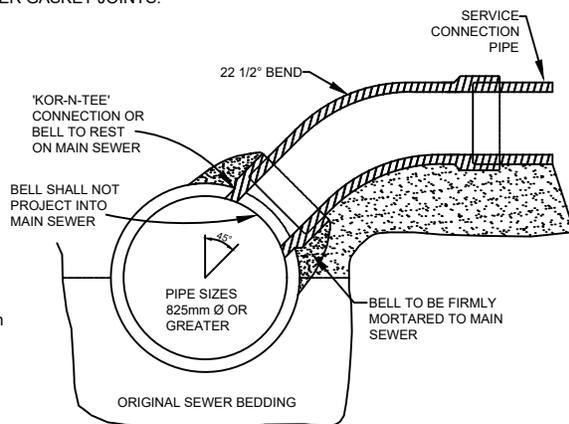
DRAWING No.

KS-176



NOTES:

1. STORM SERVICE CONNECTION PIPE TO BE FITTED WITH APPROVED RUBBER GASKET JOINTS.
2. IF CONTRACTOR TUNNELS UNDER WATERMAIN, MINIMUM LENGTH OF TUNNEL TO BE 1.8m AND ALL VOIDS TO BE FILLED WITH H.L.8 BLEND CLEAR STONE.
3. RISERS TO BE INSTALLED WHERE SPECIFIED ON THE ENGINEERING DRAWINGS OR WHEN DEPTH TO TOP OF SEWER EXCEEDS 4.5m. (SEE KS-178)
4. SERVICE CONNECTION TO BE INSTALLED IN A STRAIGHT LINE FROM SEWER TO STREETLINE. A PVC CLEANOUT IS TO BE INSTALLED AT THE STREET LINE.
5. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
6. FLOOR DRAIN CONNECTIONS WITHIN BUILDING ENVELOPE SHALL NOT BE CONNECTED TO STORM SEWER SERVICE.
7. AS AN ALTERNATIVE 'KOR-N-TEE' CONNECTORS MAY BE USED FOR 150mm AND 200mm Ø STORM DRAIN CONNECTIONS.
8. TRENCH DIMENSIONS AND SLOPING OF WALLS TO BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, AS AMENDED.



TOWNSHIP OF KING

STORM SEWER SERVICE CONNECTION

APPROVED *[Signature]*

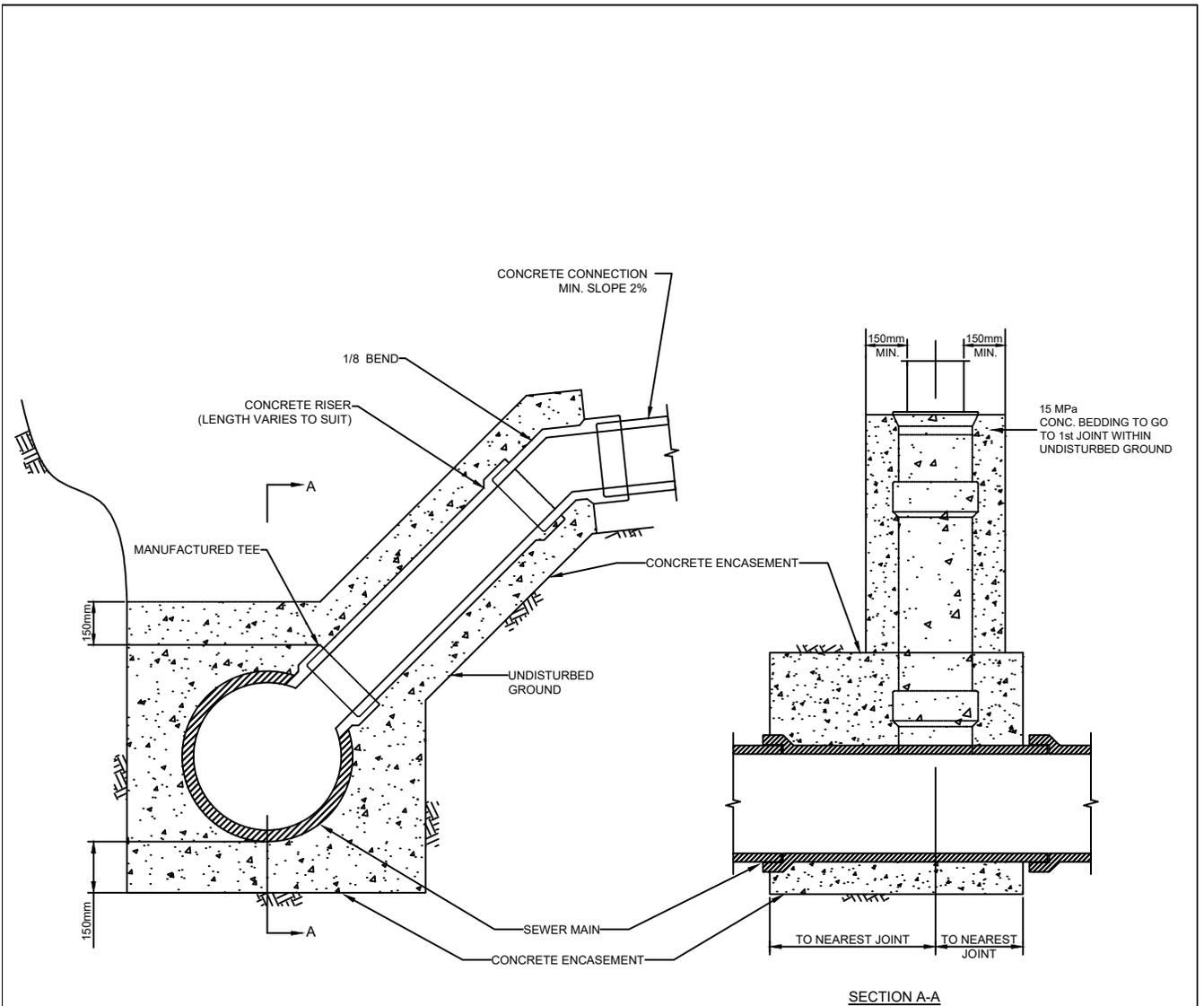
DATE OF ISSUE
FEB. 1980

REVISION

DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-177

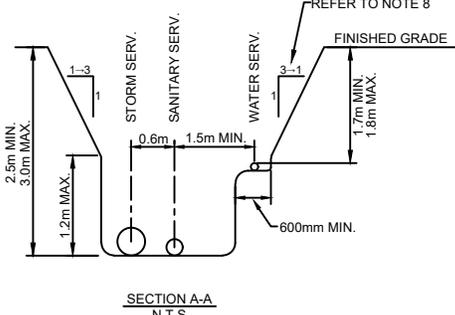
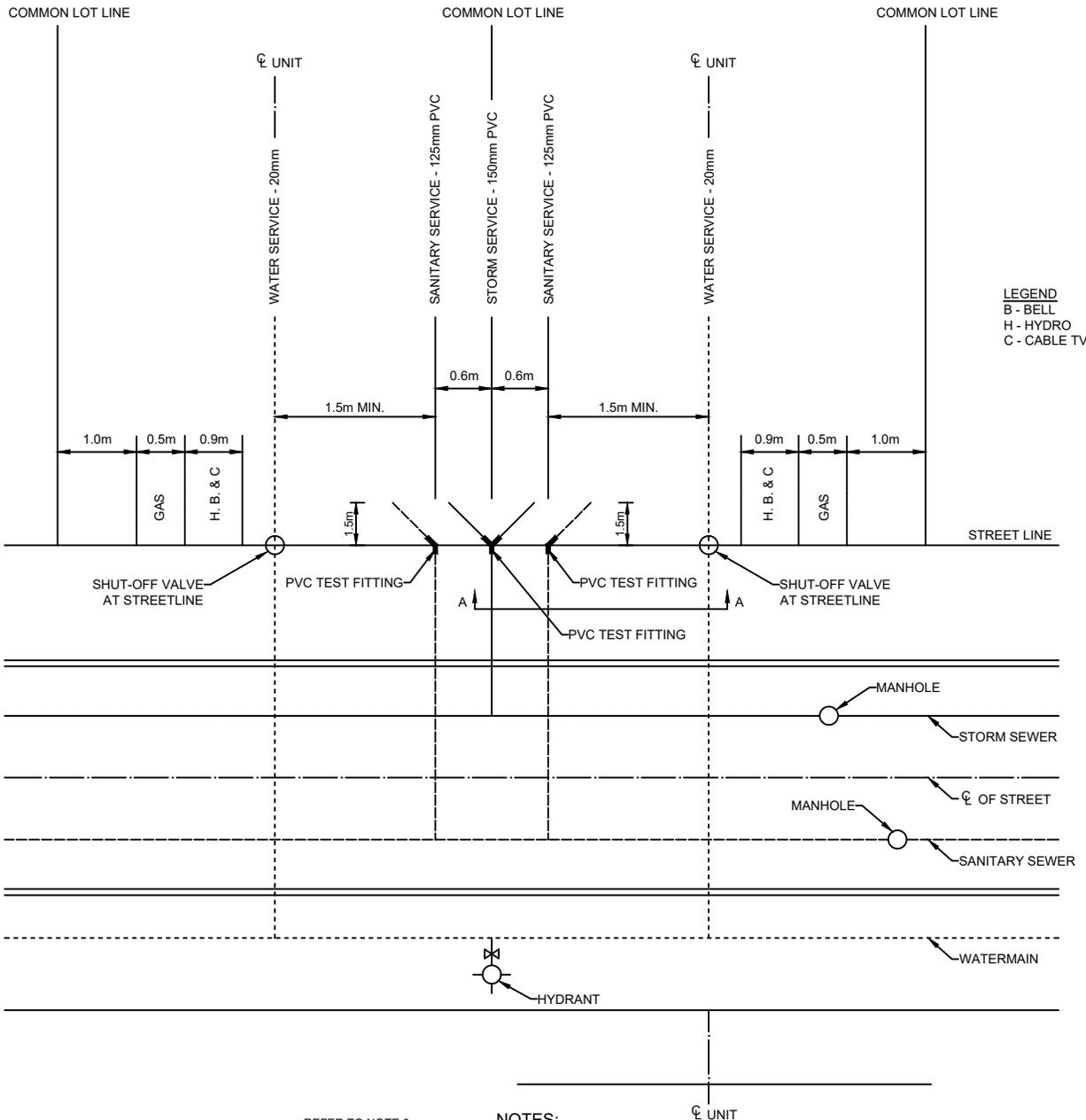


SECTION A-A

NOTES:

1. ALL CONCRETE BEDDING TO BE MINIMUM 15 MPa.
2. FOR SEWER SIZES UP TO AND INCLUDING 450mm Ø, THE CONNECTION TO THE MAIN IS TO BE MADE BY MEANS OF A MANUFACTURED TEE.
3. RISERS MUST NOT EXCEED 3.0m IN DEPTH.
4. RISER CONNECTION DETAIL MUST BE USED WHEN DEPTH TO INVERT OF SEWER MAIN EXCEEDS 4.5m.
5. ALL DIMENSIONS ARE IN MILLIMETRES AND METRES.
6. POLYVINYL CHLORIDE (SDR 28) IS AN APPROVED EQUIVALENT TO CONCRETE PIPE FOR SERVICE CONNECTIONS. WHERE P.V.C. PIPE IS USED, BEDDING MATERIAL SHALL BE HL 8 BLEND CLEAR STONE. A CONTROLLED SETTLEMENT JOINT IS TO BE USED FOR P.V.C. SEWERS EQUAL TO OR GREATER THAN 4.5m IN DEPTH. REFER TO DRAWING No. KS-198.
7. TRENCH DIMENSIONS AND SLOPING OF WALLS TO BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, AS AMENDED.

	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE FEB. 1980
	STORM SEWER RISER CONNECTION	REVISION	DRAWING No. KS-178
		DATE OF REVISION JANUARY 2026	



- NOTES:
- SERVICES TO EXTEND 1.5m INSIDE PROPERTY LINE.
 - UNDER NO CIRCUMSTANCES SHALL SERVICES CROSS ONE ANOTHER.
 - EACH HOUSE MUST BE SUPPLIED WITH A 150mm Ø STORM SEWER SERVICE LATERAL.
 - THE MINIMUM SIZE FOR STORM DRAIN CONNECTIONS SHALL BE 150mm Ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE STORM SEWER TO THE BUILDING ENVELOPE.
 - THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 125mm Ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE.
 - ALL UNDERGROUND SERVICE CABLES TO BE PLACED A MINIMUM 1.0m BELOW FINISHED GRADE OF LOTS.
 - ALL DIMENSIONS ARE IN METRES EXCEPT WHERE NOTED.
 - TRENCH DIMENSIONS AND SLOPING OF WALLS TO BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, AS AMENDED.
 - SURFACE CLEANOUTS FOR SANITARY SEWER SERVICES IN ACCORDANCE WITH STANDARD DWG. KS-193 ARE TO BE PROVIDED WHERE DIRECTED BY THE TOWNSHIP.



TOWNSHIP OF KING

SERVICE LOCATION
MULTI / TOWN HOUSE SERVICE CONNECTION

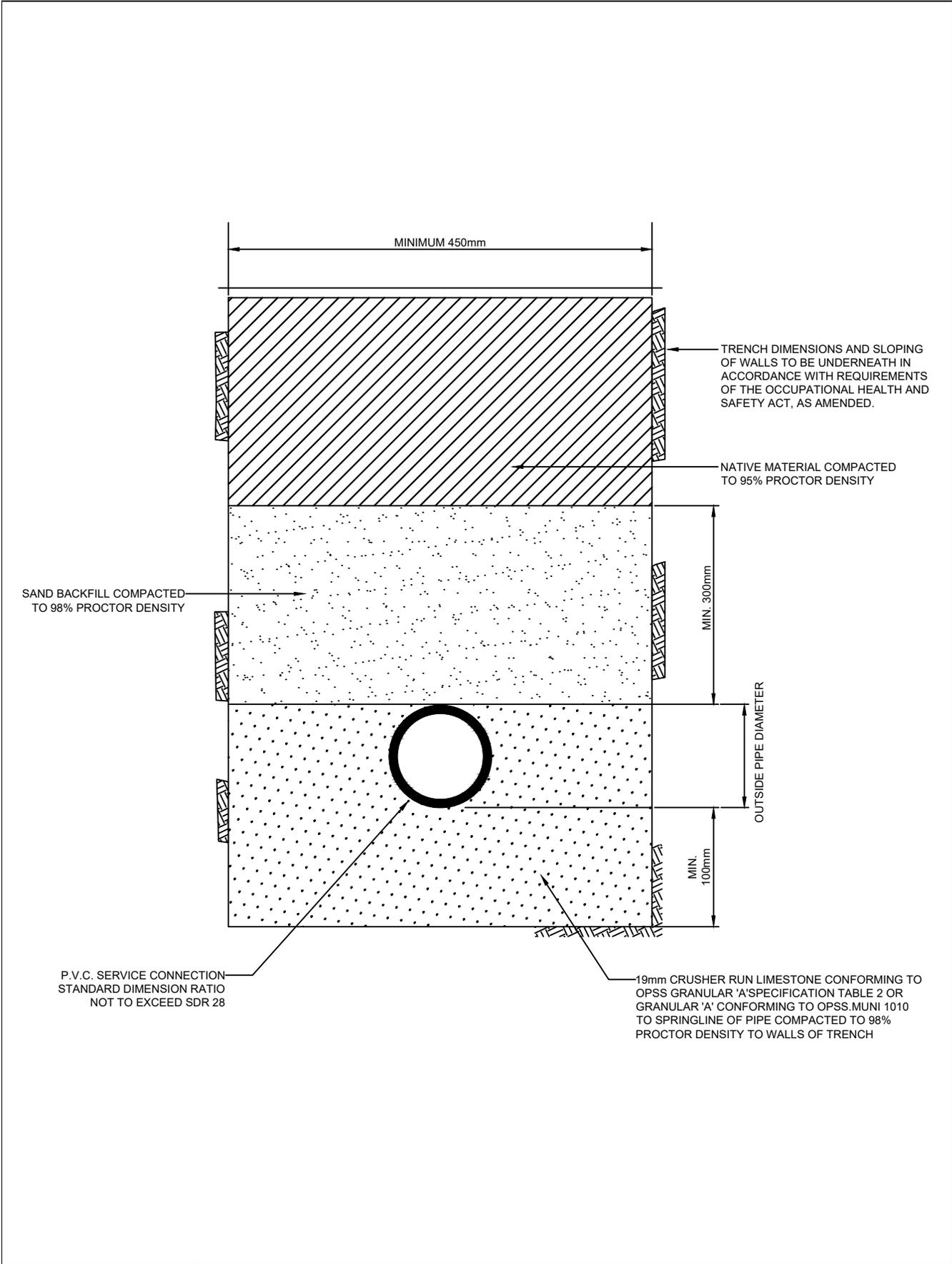
APPROVED *[Signature]*

REVISION

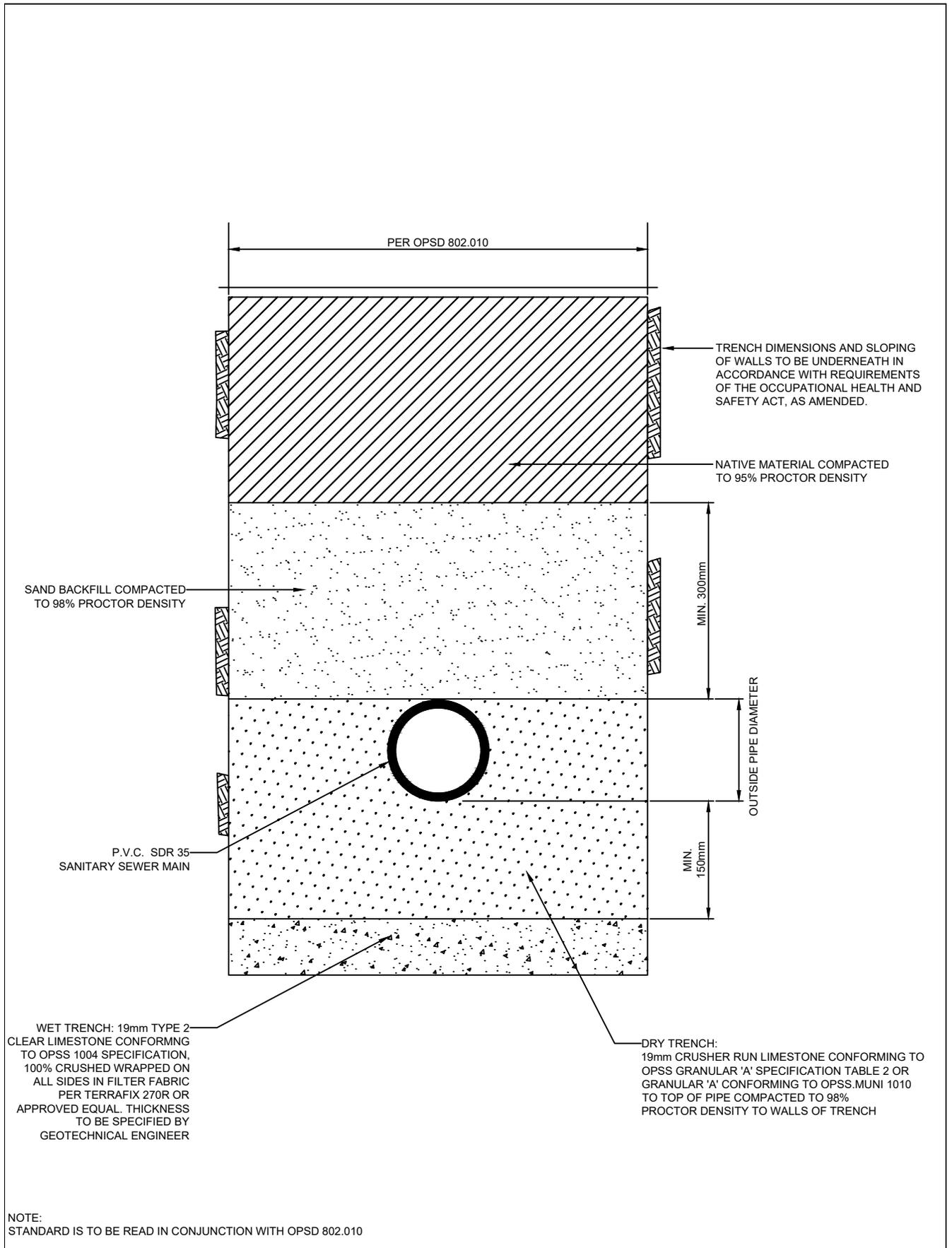
DATE OF REVISION
JANUARY 2026

DATE OF ISSUE
NOV. 2010

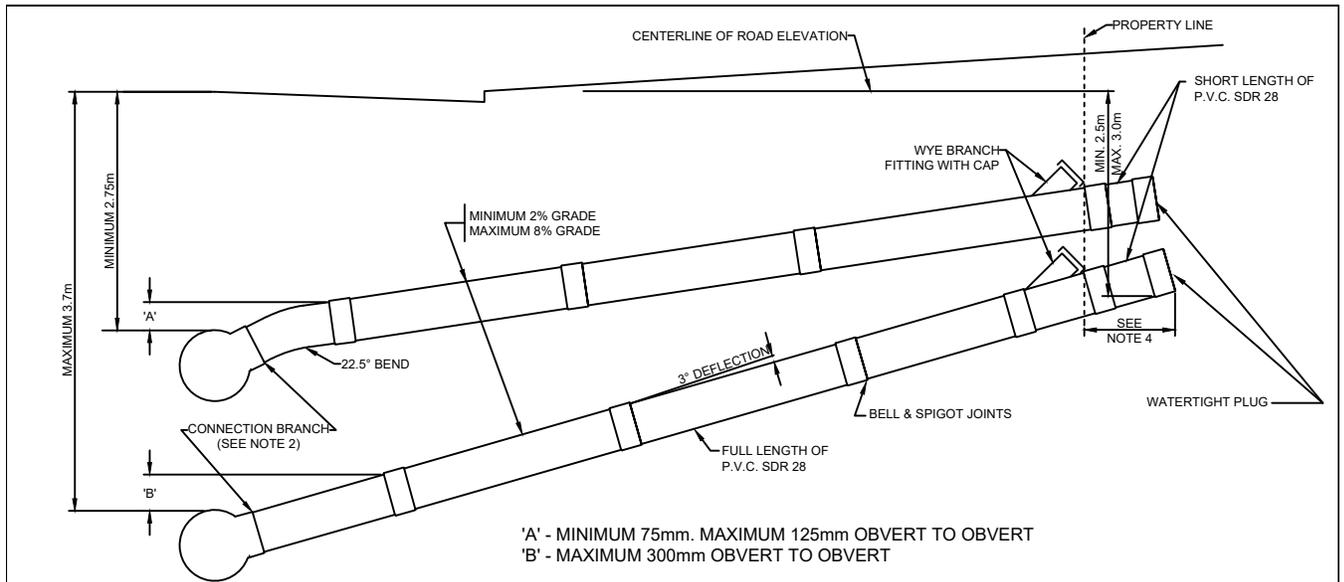
DRAWING No.
KS-179



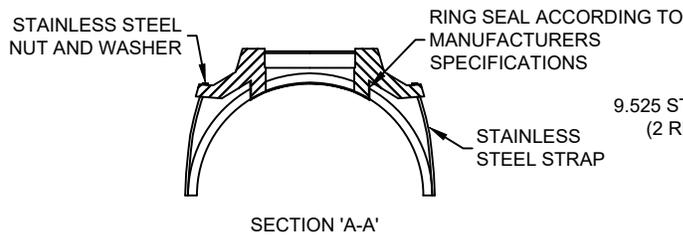
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 1990
	BEDDING DETAIL FOR PLASTIC SANITARY SEWER SERVICE CONNECTIONS	REVISION	DRAWING No. KS-180
		DATE OF REVISION JANUARY 2026	



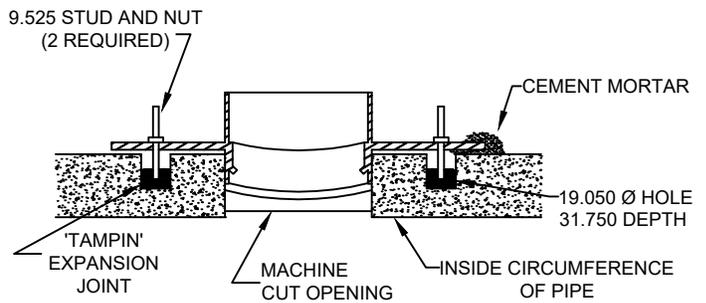
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE DEC. 2023
	BEDDING DETAIL FOR FLEXIBLE SANITARY SEWERS	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-181



'A' - MINIMUM 75mm. MAXIMUM 125mm OBVERT TO OBVERT
'B' - MAXIMUM 300mm OBVERT TO OBVERT

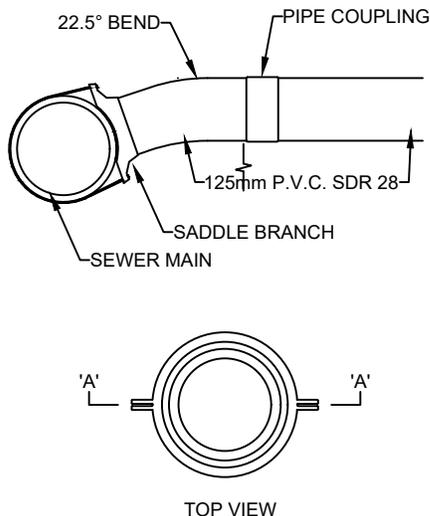


CAST IRON SADDLE BRANCH FOR CONNECTION TO EXISTING MAINS OTHER THAN P.V.C. OR A.B.S. TRUSS PIPE



NOTES:

1. IN NEW SUBDIVISIONS THE SANITARY SEWER AND WATER SERVICE CONNECTIONS ARE TO BE INSTALLED IN COMMON TRENCHES AS PER STANDARD DETAILS KS-175 AND KS-176.
2. IN NEW SUBDIVISIONS ALL CONNECTIONS TO THE SEWERS ARE TO BE MADE WITH A FACTORY MANUFACTURED TEE. FOR CONNECTIONS TO EXISTING SANITARY SEWERS, OTHER THAN P.V.C. OR A.B.S. TRUSS PIPE, A SADDLE CONNECTION MAY BE USED. MORTAR-ON SADDLES TO BE USED ON CONCRETE PIPE GREATER THAN 450mm Ø. CONNECTIONS TO EXISTING P.V.C. SEWERS ARE TO BE MADE WITH A FACTORY MANUFACTURED TEE. CONNECTIONS TO EXISTING A.B.S. PIPE ARE TO BE MADE WITH A SOLVENT WELDED SADDLE.
3. 45° STRAP ON SADDLE TO BE USED ON SEWERS OTHER THAN P.V.C. OR A.B.S. TRUSS PIPE, WHEN LATERAL INTERSECTS SEWER MAIN AT AN ACUTE ANGLE.
4. THE SEWER CONNECTION SHALL BE LAID FROM THE MAIN TO 1.5m BEYOND THE PROPERTY LINE IN NEW SUBDIVISIONS ONLY.
5. THE ENDS OF ALL SEWER PIPE MUST BE MACHINED. ALL CUTTING AND MACHINING TO BE DONE BY THE CONTRACTOR.
6. A COUPLING SHALL BE INSTALLED AT DEAD ENDS AND SHALL BE PLUGGED USING A WATER TIGHT PLUG.
7. DEFLECTIONS AT PIPE JOINTS IS NOT TO EXCEED 3° IE.
8. PIPE COUPLING TO BE 'RING-TITE' OR EQUIVALENT P.V.C. BELL AND SPIGOT JOINT WITH RUBBER GASKETS.
9. REFER TO STANDARD KS-180 FOR BEDDING REQUIREMENTS FOR P.V.C. SERVICE CONNECTIONS.
10. WHEN MORTAR-ON SADDLES ARE USED, A MACHINE CUT OPENING IS TO BE MADE IN THE SANITARY SEWER WITH A CORING MACHINE.
11. ALL DIMENSIONS ARE IN MILLIMETRES EXCEPT WHERE NOTED.
12. SURFACE CLEAOUTS IN ACCORDANCE WITH STANDARD DWG. KS-193 ARE TO BE PROVIDED WHERE DIRECTED BY THE TOWNSHIP.



TOWNSHIP OF KING

SANITARY SEWER HOUSE CONNECTIONS
(125 & 150mm PIPE)

APPROVED
[Signature]

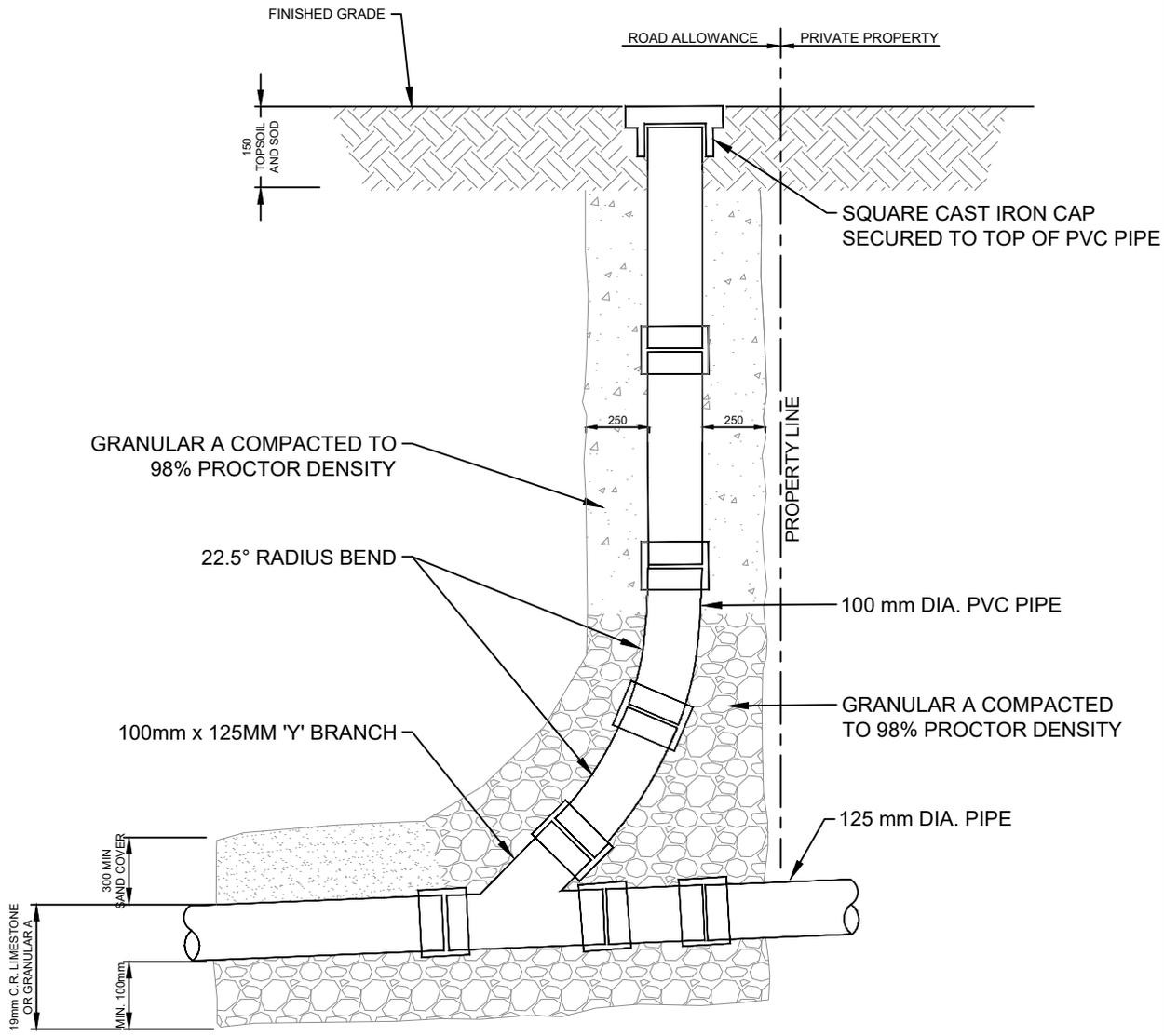
DATE OF ISSUE
JAN. 1990

REVISION

DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-190



SURFACE CLEANOUT

NOTES:

1. SURFACE CLEANOUT TO BE PROVIDED WHERE DIRECTED BY THE TOWNSHIP.
2. FITTINGS ARE TO BE PVC SDR 26
3. SURFACE CLEANOUTS SHALL NOT BE LOCATED IN DRIVEWAYS



TOWNSHIP OF KING

SANITARY SEWER SURFACE CLEANOUT

APPROVED
[Signature]

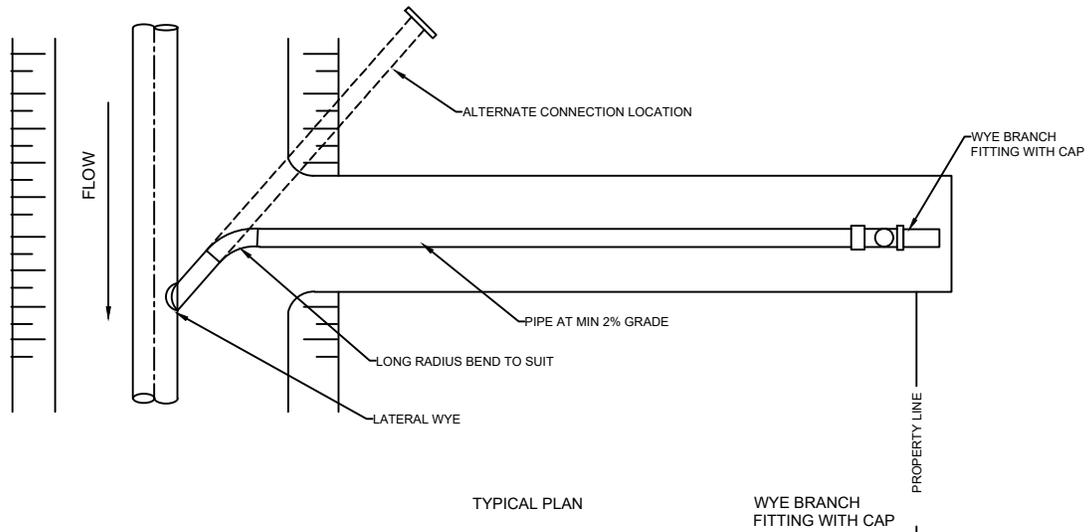
DATE OF ISSUE
JAN. 1990

REVISION

DRAWING No.

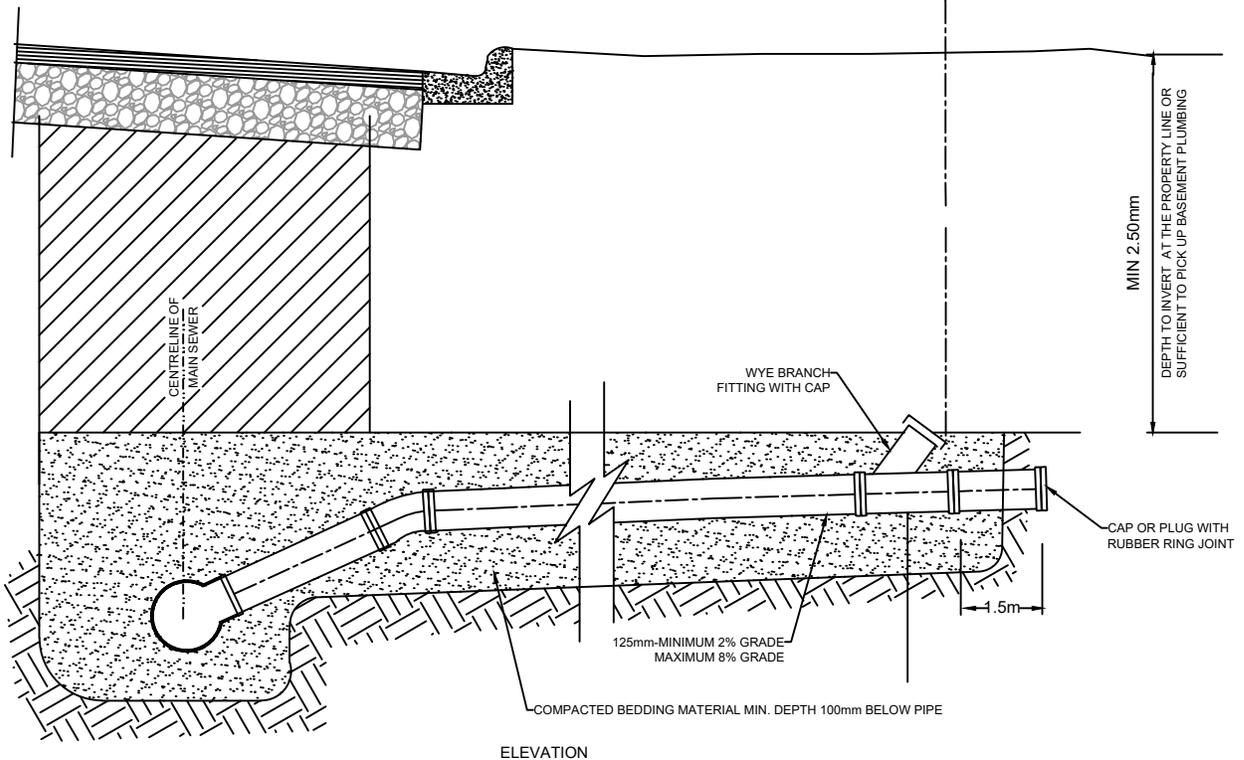
DATE OF REVISION
JANUARY 2026

KS-193



TYPICAL PLAN

WYE BRANCH FITTING WITH CAP



ELEVATION

NOTES:

1. RISER CONNECTIONS TO THE SEWER MAIN ARE TO BE USED ONLY WHERE SERVICE IS GREATER THAN 2M ABOVE WYE INVERT OR WHERE APPROVED
2. MINIMUM SERVICE CONNECTION TO BE 125mm IN DIAMETER.
3. SURFACE CLEANOUTS IN ACCORDANCE WITH STANDARD DWG. KS-193 ARE TO BE PROVIDED WHERE DIRECTED BY THE TOWNSHIP.



TOWNSHIP OF KING

SANITARY SEWER CONNECTIONS FOR RESIDENTIAL DEVELOPMENT

APPROVED *Calvin Smith*

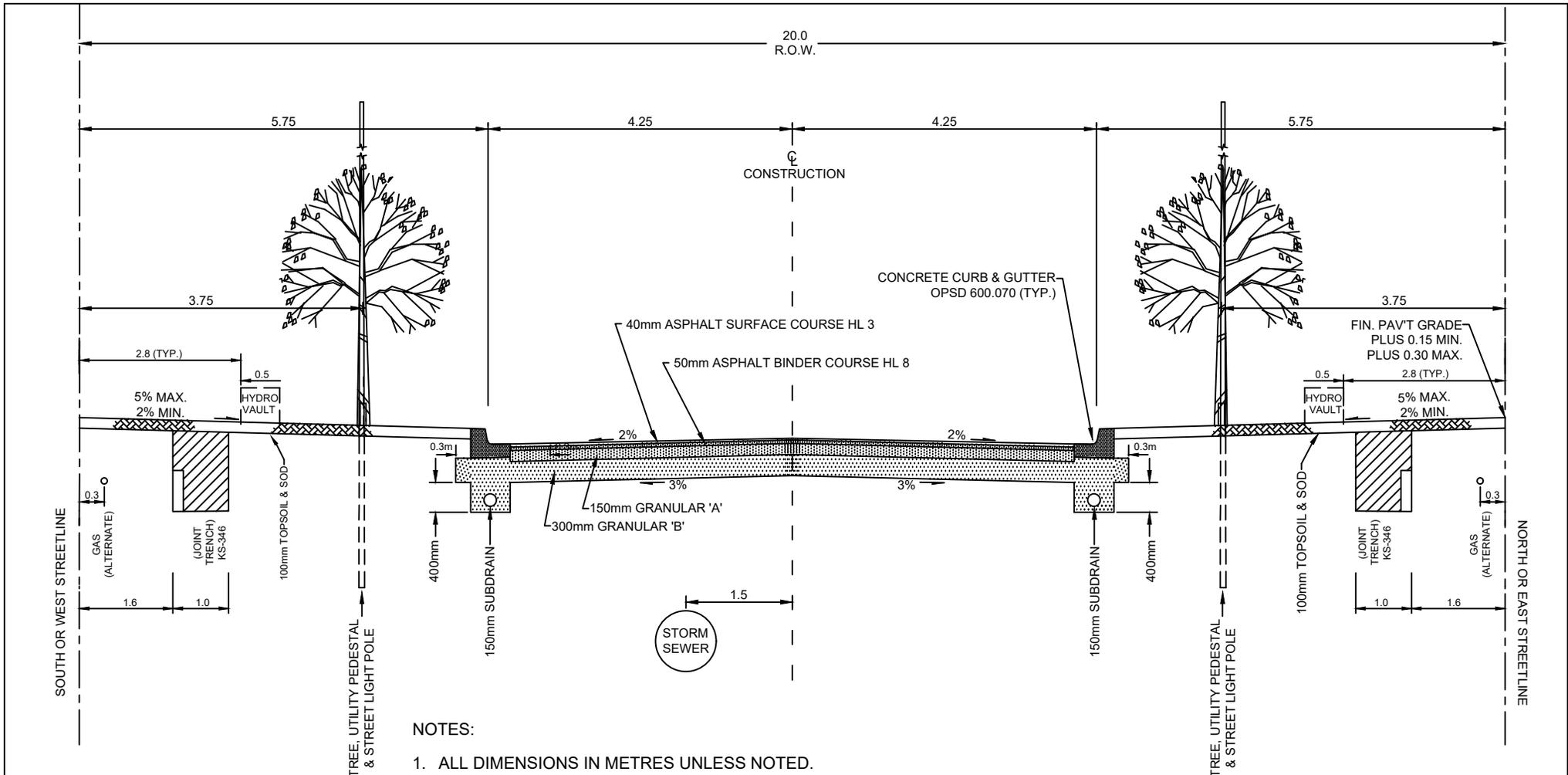
REVISION

DATE OF REVISION
JANUARY 2026

DATE OF ISSUE
JAN. 1990

DRAWING No.

KS-194



NOTES:

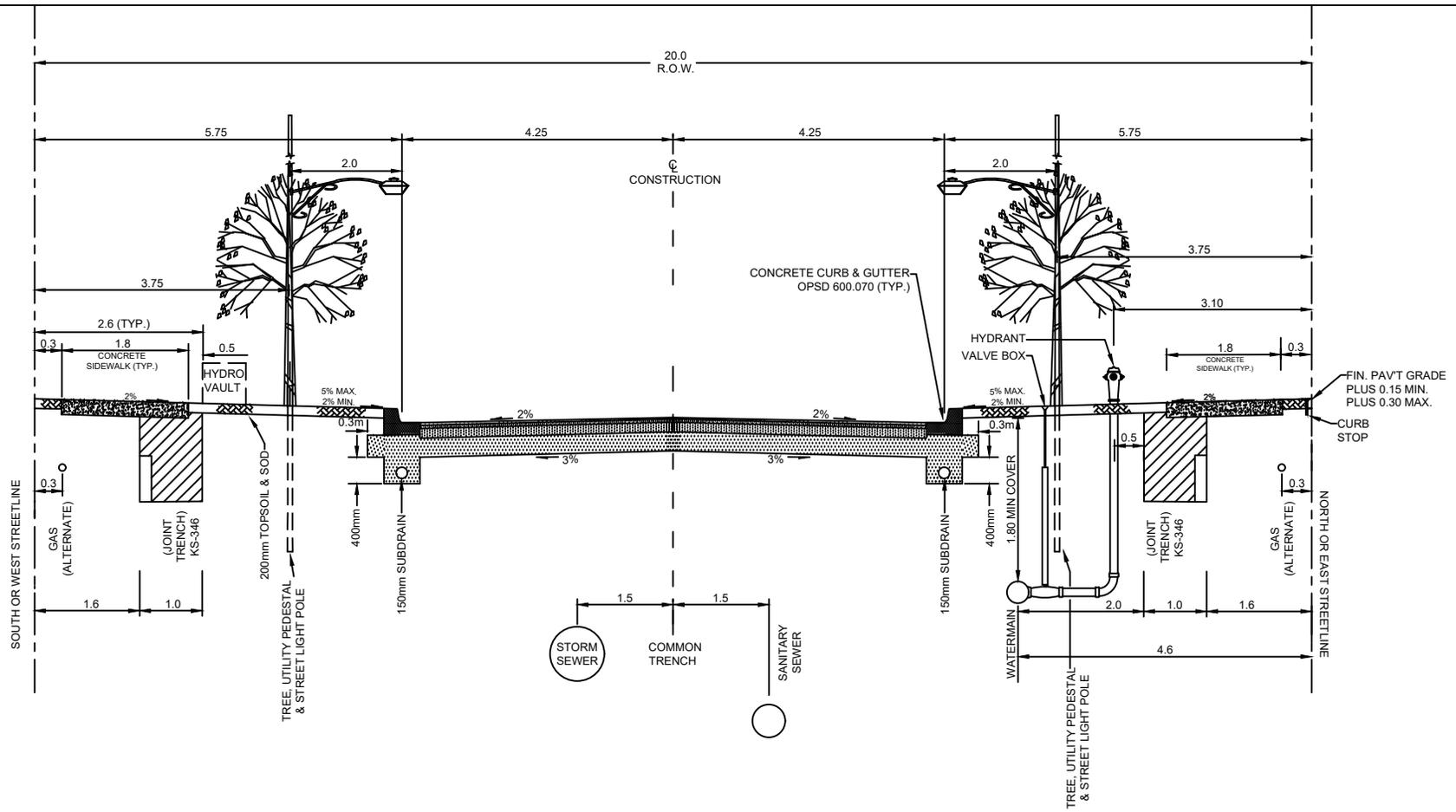
1. ALL DIMENSIONS IN METRES UNLESS NOTED.
2. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
3. ALL ASPHALT AND GRANULAR DEPTHS SPECIFIED ARE MINIMUM DEPTHS AND ARE SUBJECT TO INCREASE BASED ON SOIL CONDITIONS.
4. BELL, HYDRO, COAXIAL, AND GASMAIN TO BE LOCATED IN COMMON TRENCH. (SEE KS-346)



TOWNSHIP OF KING

20.0m ESTATE RESIDENTIAL ROADWAY
8.5m PAVEMENT WIDTH

APPROVED <i>[Signature]</i>	DATE OF ISSUE FEB. 1980
REVISION	DRAWING No. KS-202
DATE OF REVISION JANUARY 2026	



NOTES:

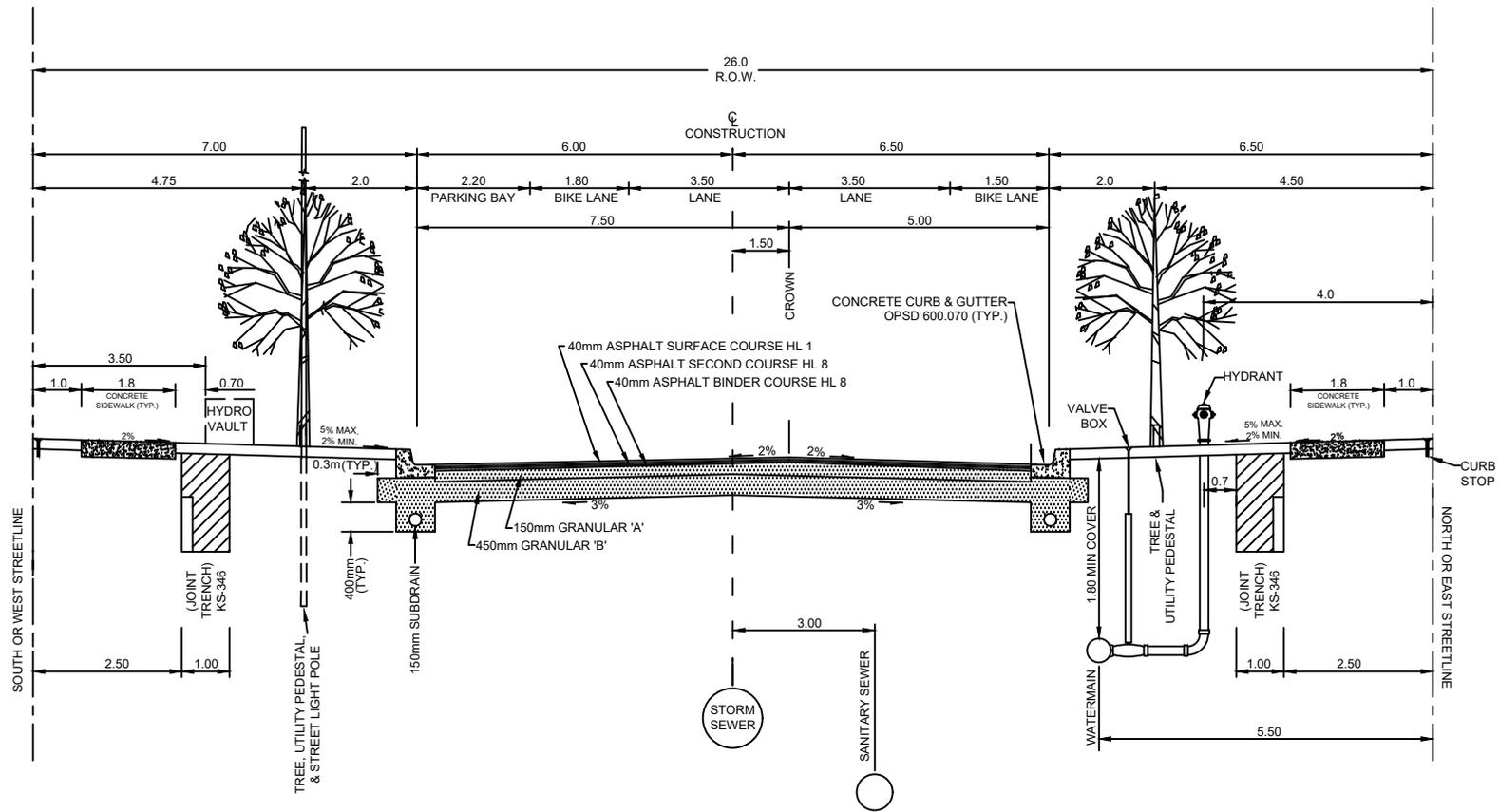
1. ALL DIMENSIONS IN METRES UNLESS NOTED.
2. SEE SECTION B OF DESIGN CRITERIA FOR MINIMUM PAVEMENT REQUIREMENTS.
3. ALL ASPHALT AND GRANULAR DEPTHS SPECIFIED ARE MINIMUM DEPTHS AND ARE SUBJECT TO INCREASE BASED ON SOIL CONDITIONS.
4. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
5. BELL, HYDRO, COAXIAL, AND GASMAIN TO BE LOCATED IN COMMON TRENCH.
(SEE KS-346)



TOWNSHIP OF KING

20.0m LOCAL R.O.W.
8.5m PAVEMENT, SIDEWALK ONE SIDE

APPROVED 	DATE OF ISSUE FEB. 1980
REVISION	DRAWING No. KS-205
DATE OF REVISION JANUARY 2026	



NOTES:

1. ALL DIMENSIONS IN METRES UNLESS NOTED.
2. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
3. ALL ASPHALT AND GRANULAR DEPTHS SPECIFIED ARE MINIMUM DEPTHS AND ARE SUBJECT TO INCREASE BASED ON SOIL CONDITIONS.
4. BELL, HYDRO, COAXIAL, AND GASMAIN TO BE LOCATED IN COMMON TRENCH. (SEE KS-346)



TOWNSHIP OF KING

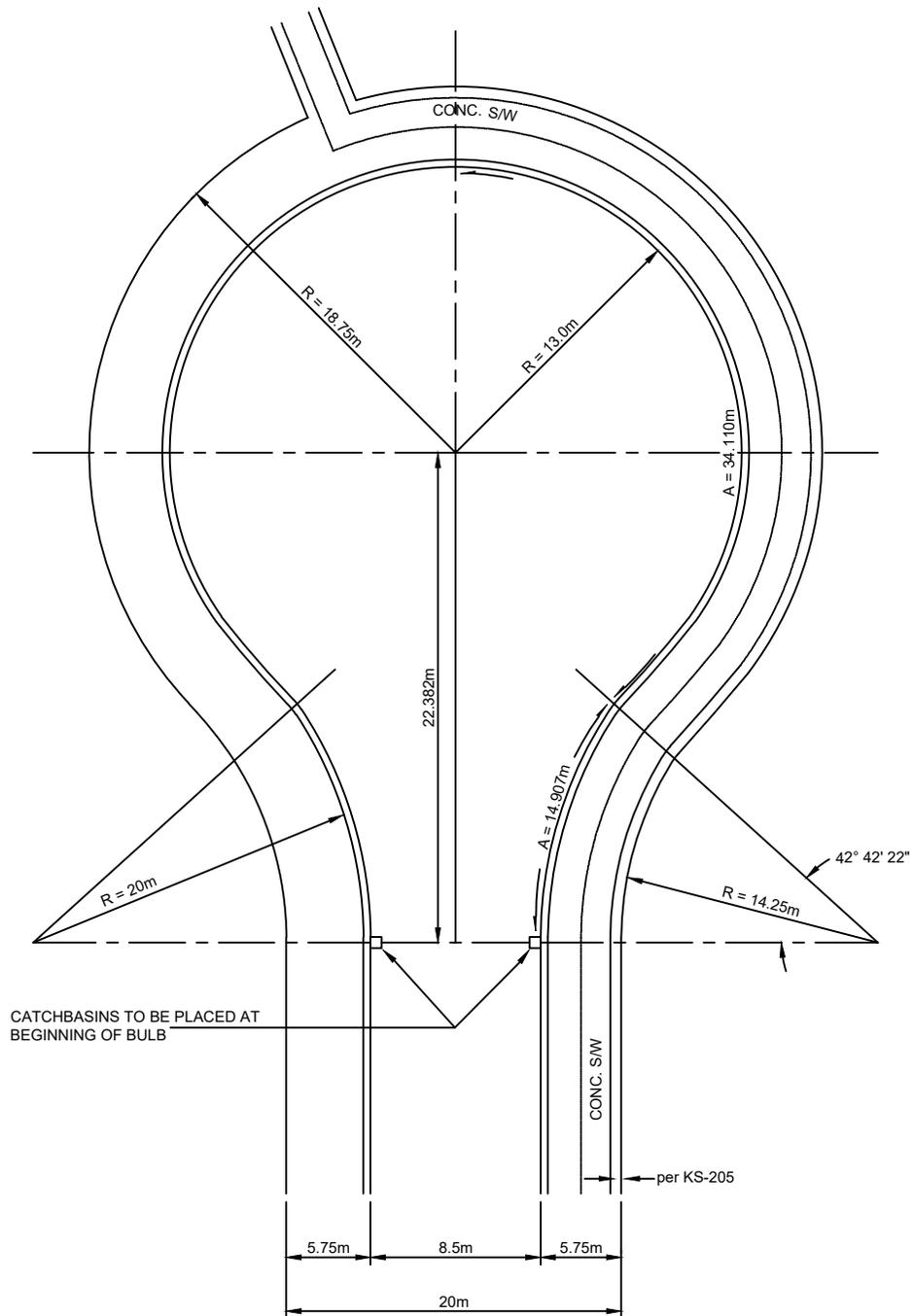
26.0m COLLECTOR ROADWAY
12.5m PAVEMENT WIDTH (BIKE LANES)

APPROVED
Calvin Clark

DATE OF ISSUE
FEB. 2017

REVISION
DATE OF REVISION
JANUARY 2026

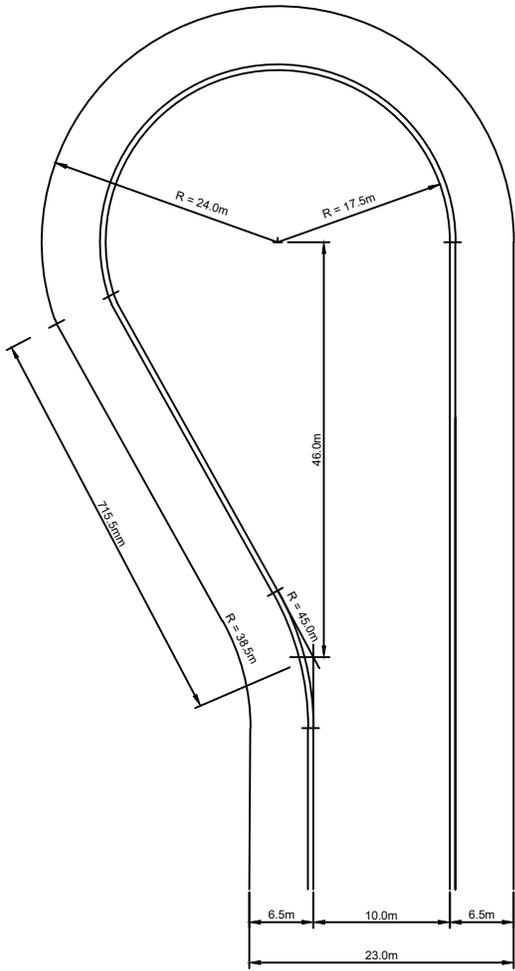
DRAWING No.
KS-210



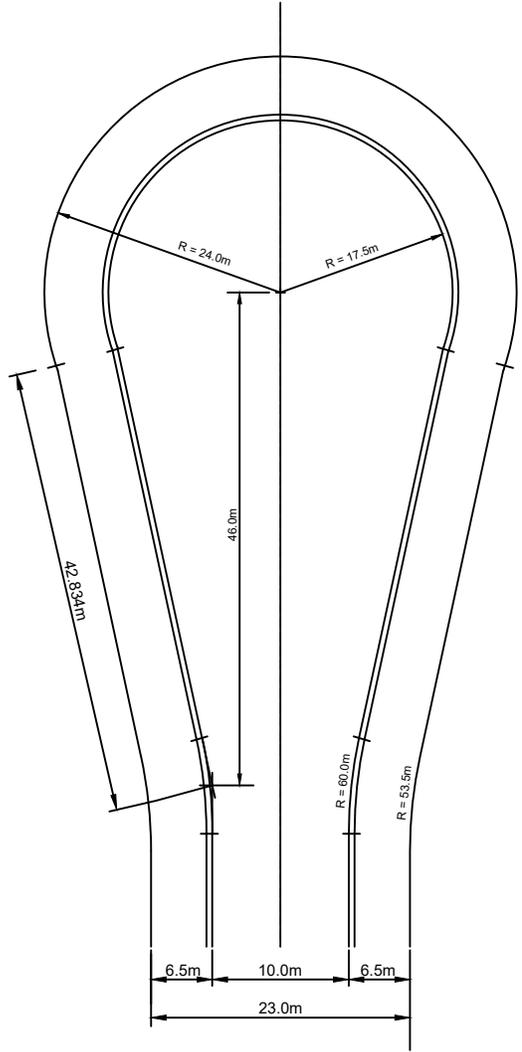
NOTES:

1. MINIMUM GUTTER SLOPE TO BE 1.00%
2. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SACS TO BE SHOWN ON PROFILE DRAWINGS.
3. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB.
4. SIDEWALKS PROVIDED FOR WALKWAY CONNECTIONS AND/OR WHERE 25 UNITS OR MORE.
5. ALL DIMENSIONS ARE IN METRES.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE FEB. 1980
	TYPICAL CUL-DE-SAC FOR RESIDENTIAL STREETS	REVISION	DRAWING No. KS-218
		DATE OF REVISION JANUARY 2026	



OFFSET



SYMMETRICAL

NOTES:

1. MINIMUM GUTTER SLOPE TO BE 1.00%
2. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SACS TO BE SHOWN ON PROFILE DRAWINGS.
3. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB.
4. ALL DIMENSIONS ARE IN METRES.



TOWNSHIP OF KING

TYPICAL CUL-DE-SAC
FOR INDUSTRIAL STREETS

APPROVED *[Signature]*

DATE OF ISSUE
FEB. 1980

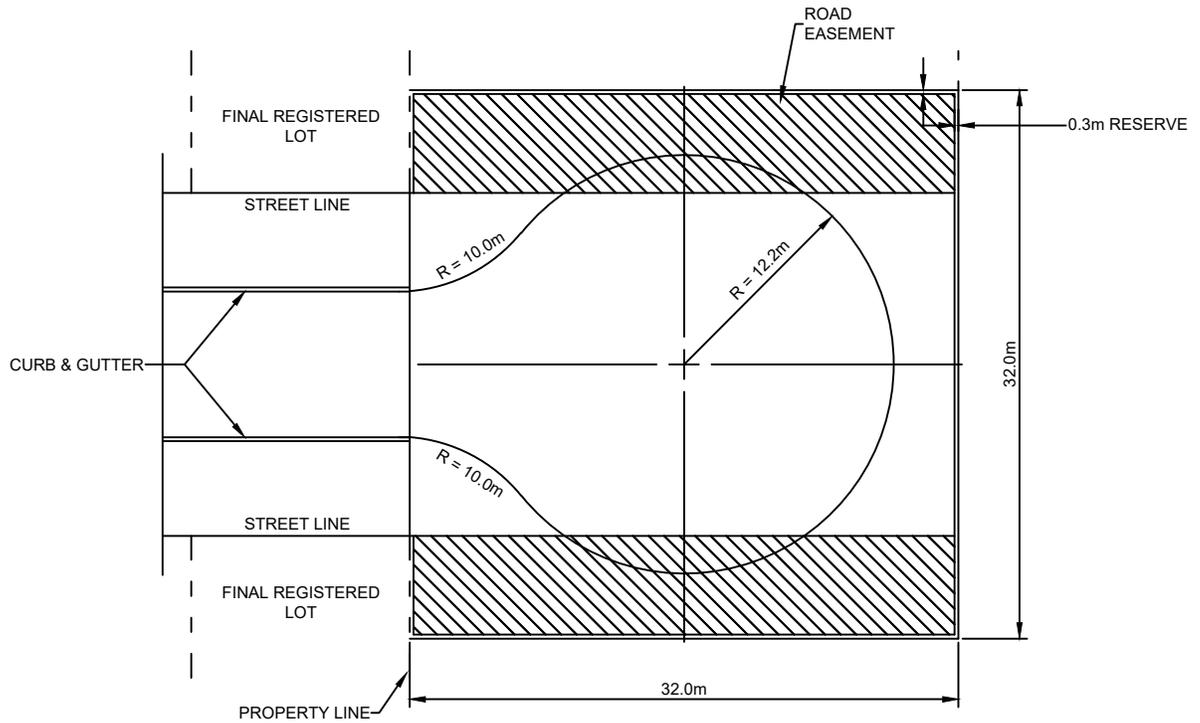
REVISION

DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-219

TURNING CIRCLE PAVEMENT DESIGN: 32mm HL3 ASPHALT SURFACE COURSE
 50mm HL8 ASPHALT BINDER COURSE
 150mm GRANULAR 'A'
 300mm GRANULAR 'B'



NOTES:

1. TEMPORARY TURNING CIRCLES SHALL BE USED ONLY FOR PHASING OF RESIDENTIAL SUBDIVISIONS, SUBJECT TO THE TOWNSHIP ENGINEER'S APPROVAL.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
3. THE SUBDIVIDER WILL DEPOSIT WITH THE TOWNSHIP AN AMOUNT WHICH THE TOWNSHIP ENGINEER CALCULATES TO BE THE COST OF REMOVING THE TURNING CIRCLE AND CONSTRUCTING THE STANDARD ROAD FROM THE START OF THE TURNING CIRCLE TO THE LIMIT OF THE SUBDIVISION.



TOWNSHIP OF KING

TEMPORARY TURNING CIRCLE
 FOR RESIDENTIAL STREETS

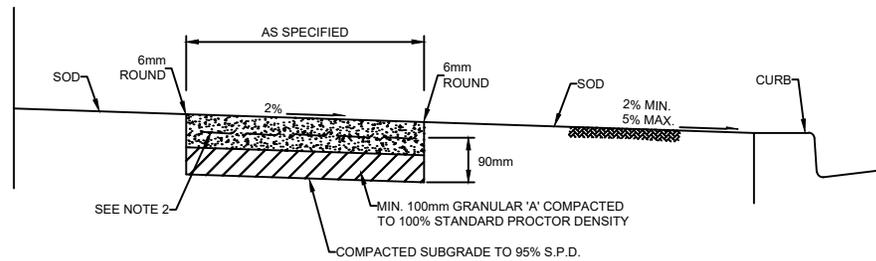
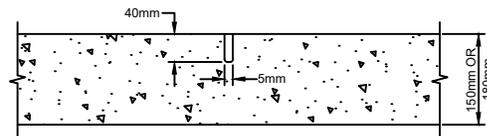
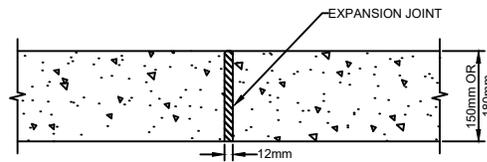
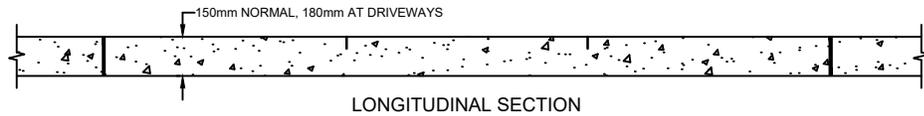
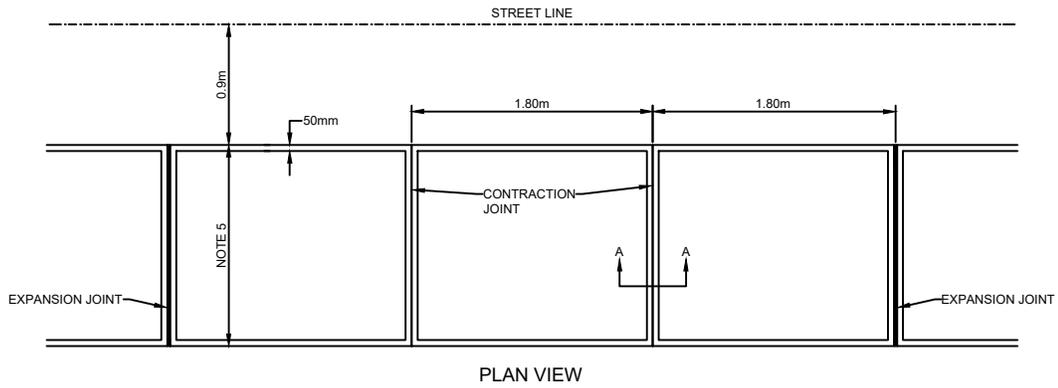
APPROVED
[Signature]

REVISION

DATE OF REVISION
 JANUARY 2026

DATE OF ISSUE
 FEB. 1980

DRAWING No.
KS-220



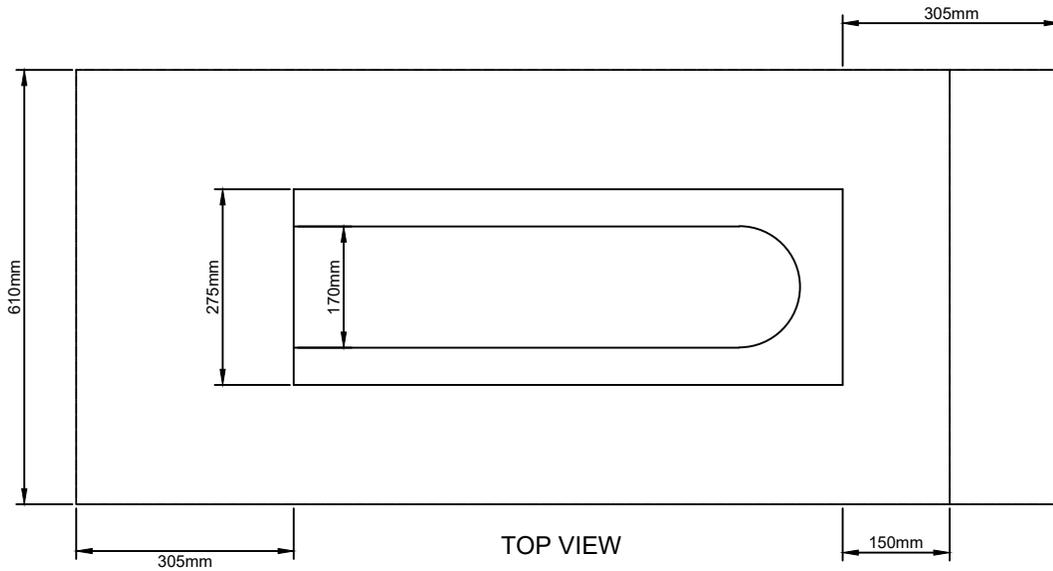
NOTES:

1. CONCRETE TO BE 32 MPa; 7% AIR ENTRAINED WITH A 20mm MAX. AGGREGATE SIZE.
2. FOR COMMERCIAL, INDUSTRIAL, AND APARTMENT DRIVEWAYS, SIDEWALK TO BE REINFORCED WITH 152 x 152 MW 18.7/18.7 METRIC WELDED WIRE.
3. EXPANSION JOINTS ARE ALSO REQUIRED WHERE THE SIDEWALK ABUTS OTHER CONCRETE STRUCTURE, WALKS, CURBS, UTILITY POLES, HYDRANTS, MANHOLES, AND AT CERTAIN LOCATIONS AT DISCRETION OF THE ENGINEER.
4. CONTRACTION JOINTS TO BE SAW CUT AFTER CONCRETE HAS SET.
5. SIDEWALKS 1.8m WIDE ON ALL ROADS.
6. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES

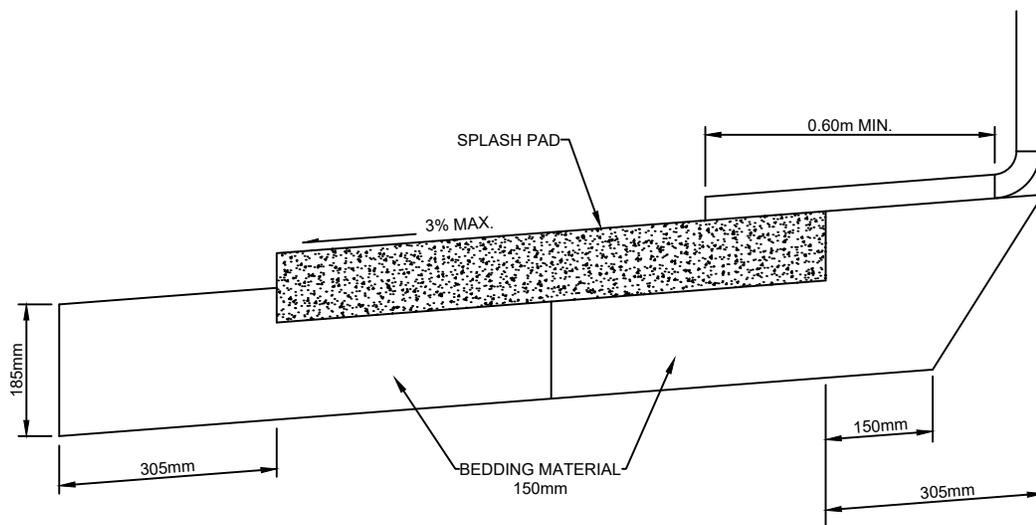
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE FEB. 1980
	CONCRETE SIDEWALK	REVISION	DRAWING No. KS-231
		DATE OF REVISION JANUARY 2026	



SIDE VIEW



TOP VIEW



TOP VIEW

NOTES:

1. MINIMUM CONCRETE STRENGTH SHALL BE 20 MPa.
2. BEDDING MATERIAL SHALL BE 19mm CLEAR STONE OR EQUIVALENT.
3. SPLASH PADS TO BE USED TO DIRECT DRAINAGE FROM ALL RAINWATER DOWNSPOUTS.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.



TOWNSHIP OF KING

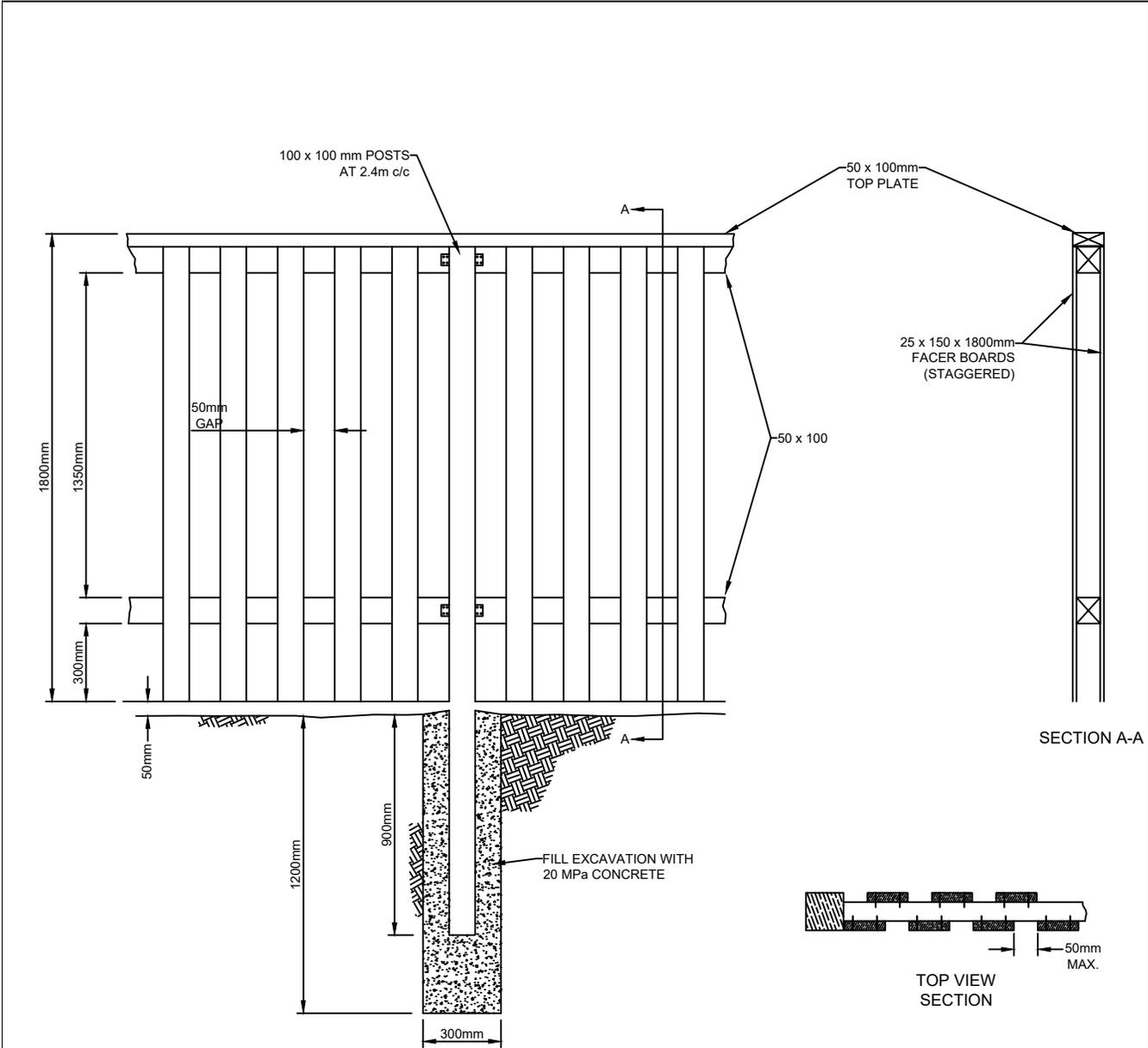
**PRECAST CONCRETE
SPLASH PAD DETAIL**

APPROVED *[Signature]*

DATE OF ISSUE
FEB. 1980

REVISION
DATE OF REVISION
JANUARY 2026

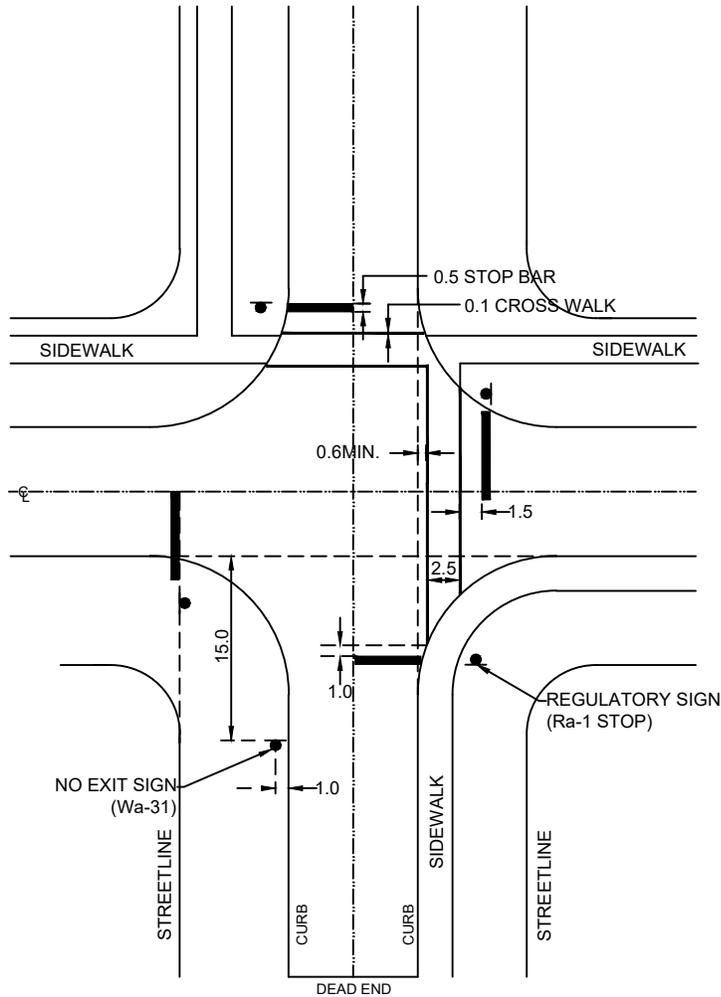
DRAWING No.
KS-302



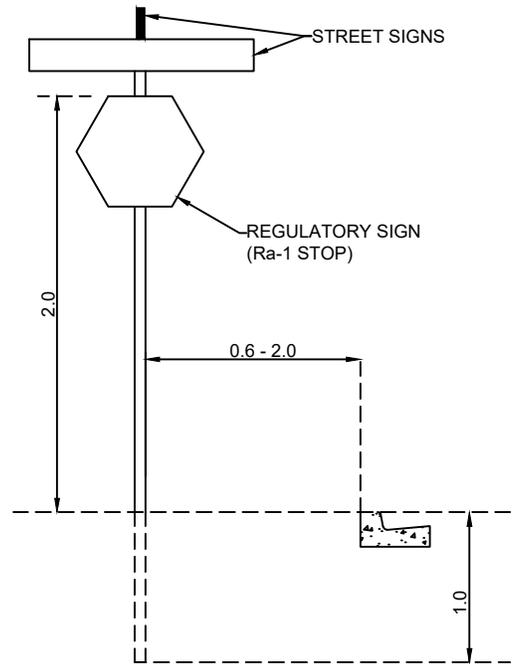
NOTES:

1. USE CONSTRUCTION GRADE CEDAR, CALIFORNIA RED WOOD OR PRESSURE TREATED LUMBER ONLY. DO NOT USE SPRUCE OR HEMLOCK.
2. ALL FASTENERS AND HANGERS TO BE GALVANIZED.
3. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JUNE, 1993
	WOOD PRIVACY FENCE	REVISION	DRAWING No. KS-313
		DATE OF REVISION JANUARY 2026	



LOCATION PLAN



INSTALLATION DETAIL

NOTES:

1. REGULATORY/WARNING SIGNS AS PER OHTA REG. 615/616 OR AMENDMENTS THEREOF.
2. STOP SIGNS (Ra-1) POSTS SHALL BE 75mm x 3.66m ALUMINUM COMPLETE WITH TOP CAP.
3. STOP SIGNS SHALL BE Banded TO THE POST WITH MINIMUM 12.7mm x .76mm STAINLESS STEEL BANDING AND FLARED LEG STAINLESS STEEL BRACKETS (BANDRIT BRACKETS OR EQUIVALENT).
4. ALL OTHER REGULATORY/WARNING SIGNS SHALL BE MOUNTED ON 3.66M 80,000psi U-FLANGE POSTS WHICH HAVE THE TOP 1200mm PUNCHED ON 50mm CENTRES WITH 11mm HOLES.
5. ALL REGULATORY SIGNS SHALL CONFORM WITH THE CURRENT VERSION OF THE ONTARIO TRAFFIC MANUAL (O.T.M).
6. ALL WARNING SIGNS AND INSTALLATIONS SHALL CONFORM WITH THE CURRENT VERSION OF THE O.T.M
7. ALL WARNING AND REGULATORY SIGNS SHALL BE MOUNTED A MINIMUM OF 2.0M ABOVE FINISHED GROUND ELEVATION.
8. ALL REGULATORY AND WARNING SIGN BLANKS SHALL BE ALUMINUM AND BE HIGH DENSITY REFLECTORIZED SURFACES.

ALL DIMENSIONS ARE EXPRESSED IN METRES (m) UNLESS OTHERWISE NOTES.



TOWNSHIP OF KING

**TRAFFIC SIGN DETAILS
& PAVEMENT MARKINGS**

APPROVED

[Signature]

DATE OF ISSUE

FEB. 1980

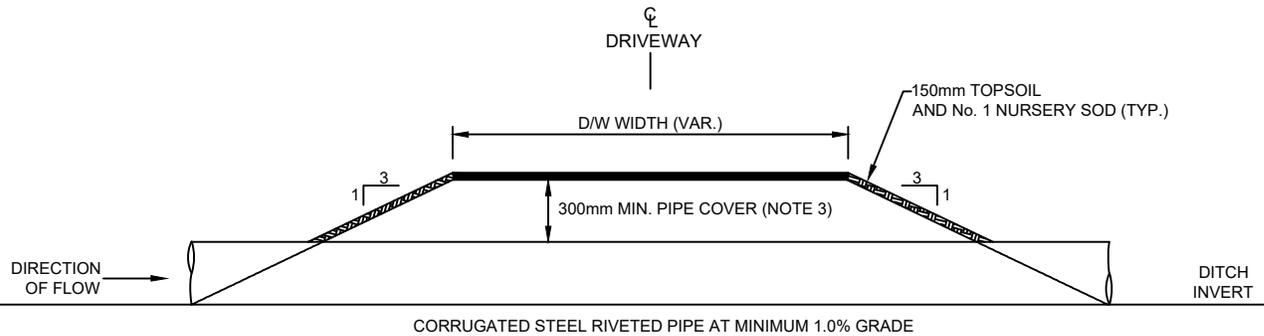
REVISION

DRAWING No.

DATE OF REVISION

JANUARY 2026

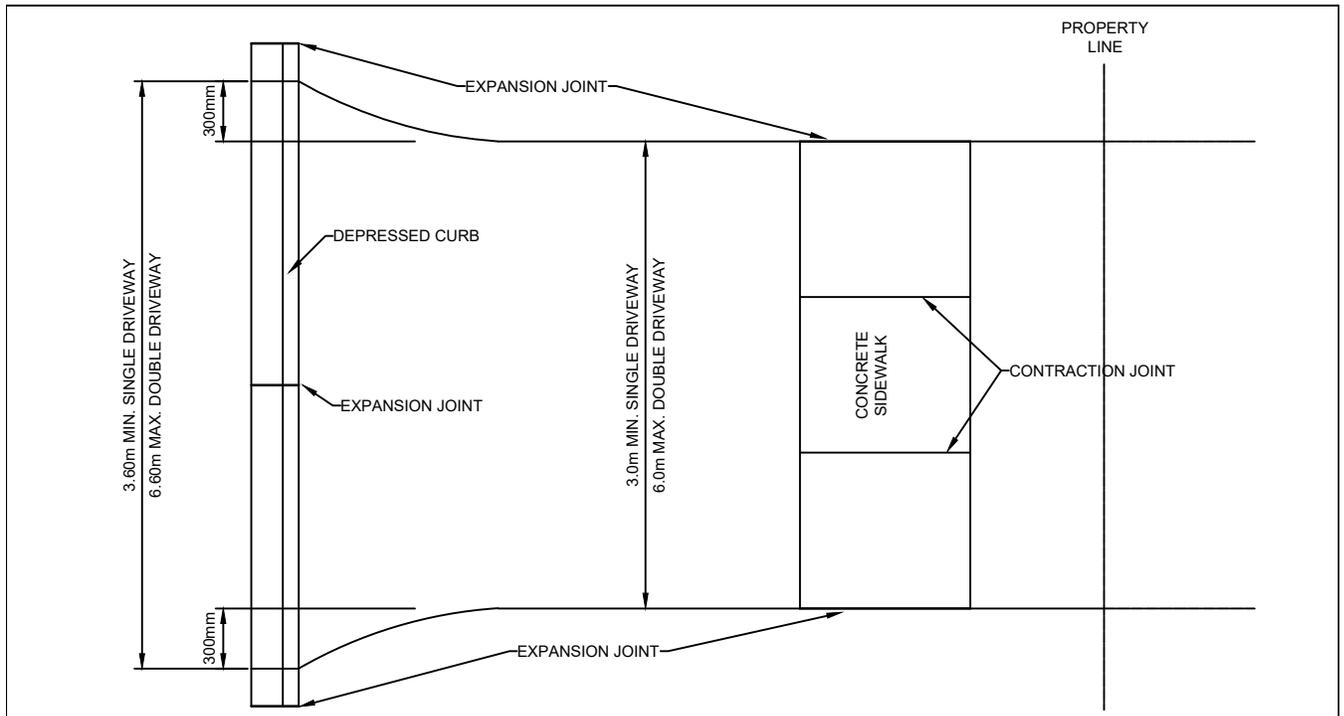
KS-331



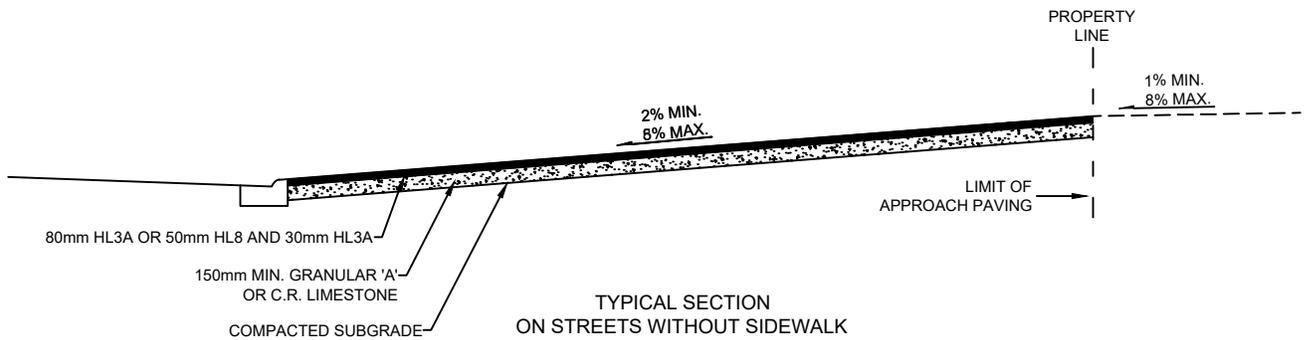
NOTES:

1. BARREL LENGTH TO BE D/W WITH PLUS 5.0m. MINIMUM LENGTH SHALL BE 8.5m.
2. MINIMUM DIAMETER SHALL BE 400mm AND THE MINIMUM METAL THICKNESS SHALL BE 1.6mm.
3. THE MINIMUM DEPTH OF COVER SHALL BE 300mm OR DIAMETER OF C.S.P. CULVERT DIVIDED BY 6.0, WHICHEVER IS GREATER.
4. BEDDING FOR C.S.P. CULVERTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH O.P.S.D. 802.04. GRANULAR 'A' BACKFILL SHALL BE PLACED AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
5. CORRUGATED STEEL PRODUCTS SHALL CONFORM WITH OPSS.MUNI 1801 AND THE REQUIREMENTS OF CSA 3-G401.
6. HELICAL C.S.P. CULVERTS ARE NOT APPROVED FOR USE IN THE TOWNSHIP OF KING.
7. ALL NEW DRIVEWAYS ARE TO BE STAKED AS TO THEIR PROPOSED LOCATION AND APPROVED BY THE TOWNSHIP.
8. HOMEOWNERS ARE RESPONSIBLE TO LOCATE ALL UNDERGROUND SERVICE AND UTILITY PLANTS IN THE AREA OF THE DRIVEWAY ENTRANCES, PRIOR TO INSTALLATION.

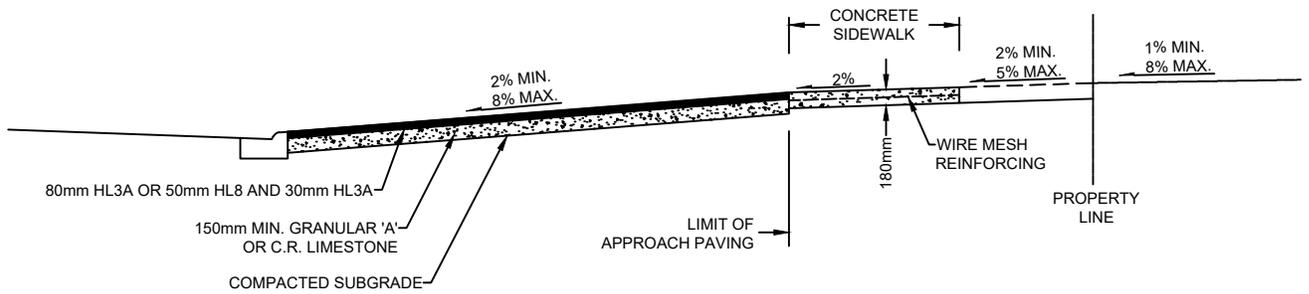
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 1990
	STANDARD DRIVEWAY CULVERT	REVISION	DRAWING No. KS-340
		DATE OF REVISION JANUARY 2026	



PLAN VIEW



TYPICAL SECTION ON STREETS WITHOUT SIDEWALK

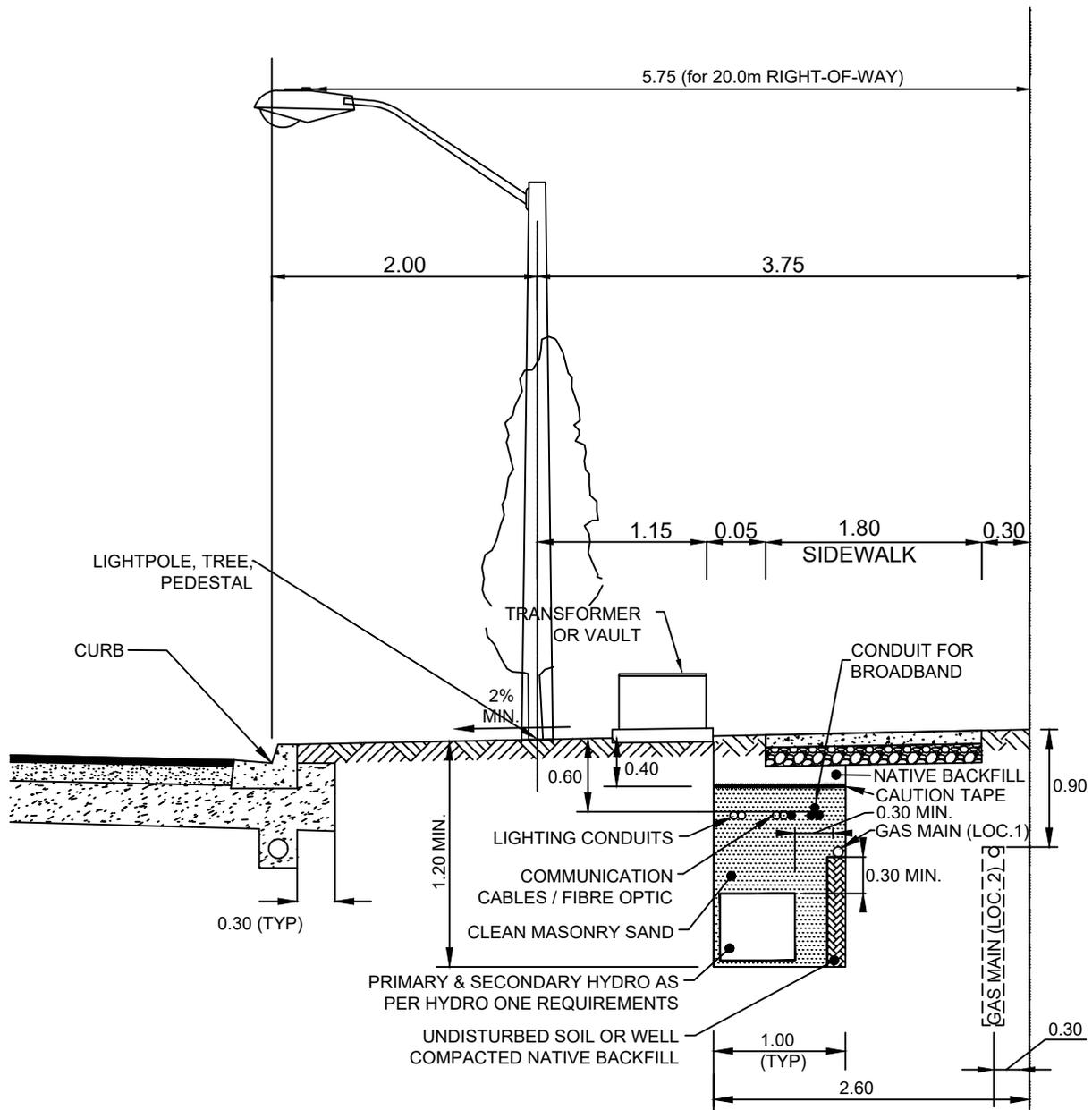


TYPICAL SECTION ON STREETS WITH SIDEWALK

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
2. THE OUTSIDE EDGE OF ALL DRIVEWAYS ARE TO BE LOCATED A MIN. 1.0m FROM STREET LIGHT AND UTILITY POLES, CATCHBASINS, WATERMAIN VALVES, WATER SERVICE BOXES, SIDE LOT LINES AND OTHER DRIVEWAYS AND A MIN. 1.5m FROM TREES AND HYDRO TRANSFORMERS AND A MIN. 3.0m FROM HYDRANTS AND COMMUNITY MAIL BOXES.
3. THE NUMBER OF DRIVEWAY LANES SHALL NOT EXCEED THE NUMBER OF GARAGE LANES (i.e. SINGLE CAR GARAGE/SINGLE DRIVEWAY: DOUBLE CAR GARAGE/DOUBLE DRIVEWAY) TO THE MAXIMUM WIDTH NOTED ON THE ABOVE PLAN VIEW.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE FEB. 1980
	DRIVEWAY APPROACH PAVING FOR RESIDENTIAL DRIVEWAYS	REVISION	DRAWING No. KS-341
		DATE OF REVISION JANUARY 2026	



NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL SEPARATIONS TO BE AS PER OPSD 2101.01.
3. STREETLIGHT WIRE DUCT MAY BE INSTALLED AT A REDUCED DEPTH UP TO A MINIMUM DEPTH OF 600mm.
4. GAS MAIN TO BE INSTALLED IN LOC. 1 SUBJECT TO AGREEMENT AND APPROVAL BY THE TOWNSHIP AND GAS UTILITY.
5. CONDUIT FOR FUTURE BROADBAND SHALL BE 75mm DIA. RIGID PVC WITH A WALL THICKNESS OF 5.5mm.
6. FOR ROAD ALLOWANCE WIDTH THAT ARE NOT 20.0m, DESIGNER IS TO PREPARE A DETAIL BASED ON SIMILAR CONFIGURATION FROM THIS DRAWING.



TOWNSHIP OF KING

JOINT USE UTILITY TRENCH
Including conduit for broadband fibre

APPROVED
[Signature]

DATE OF ISSUE
DEC 2015

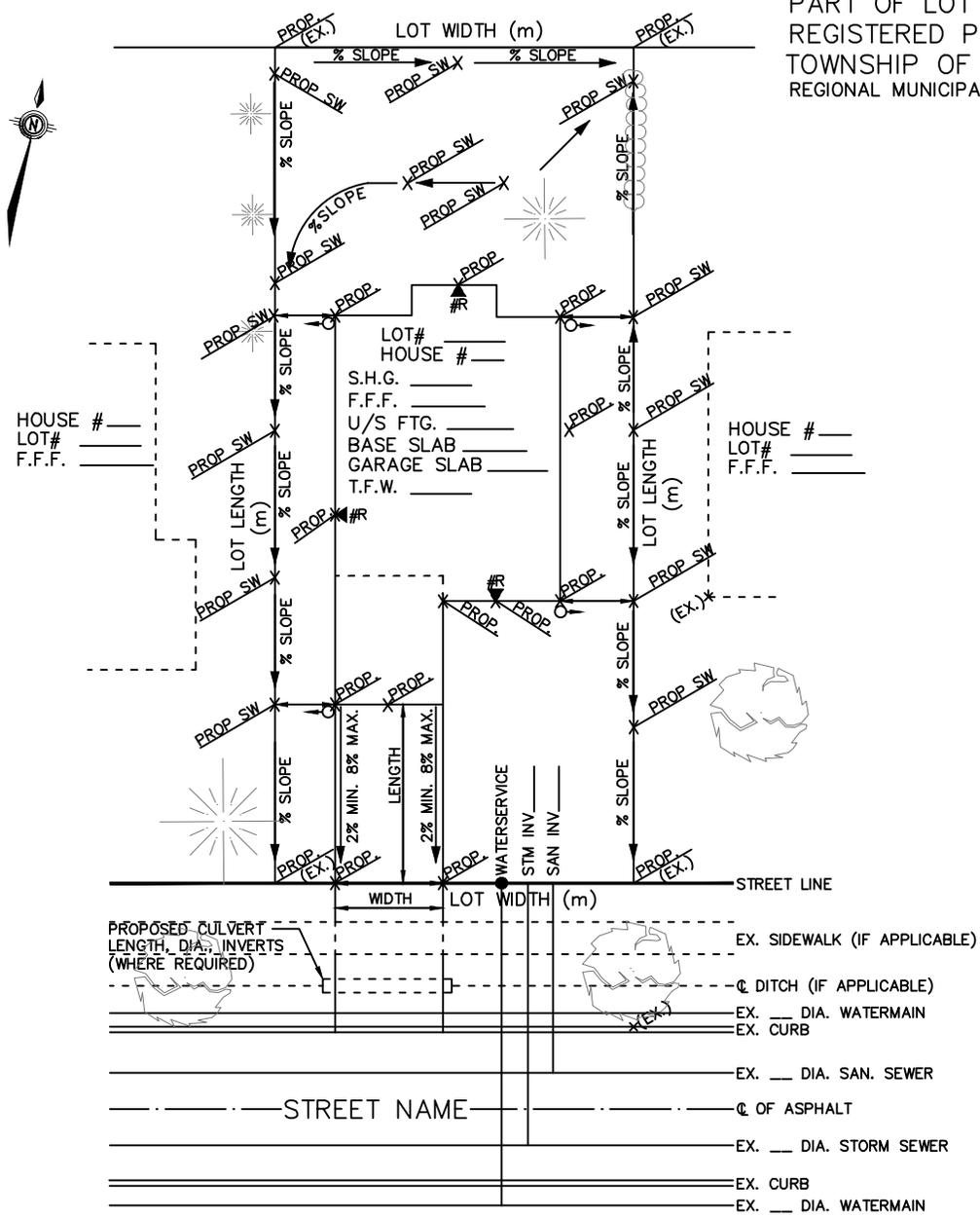
REVISION

DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-346

PLAN OF
PART OF LOT _____
REGISTERED PLAN _____
TOWNSHIP OF KING
REGIONAL MUNICIPALITY OF YORK



HOUSE # _____
LOT# _____
F.F.F. _____

HOUSE # _____
LOT# _____
F.F.F. _____

2% MIN. 8% MAX.
LENGTH
2% MIN. 8% MAX.

PROPOSED CULVERT
LENGTH, DIA., INVERTS
(WHERE REQUIRED)

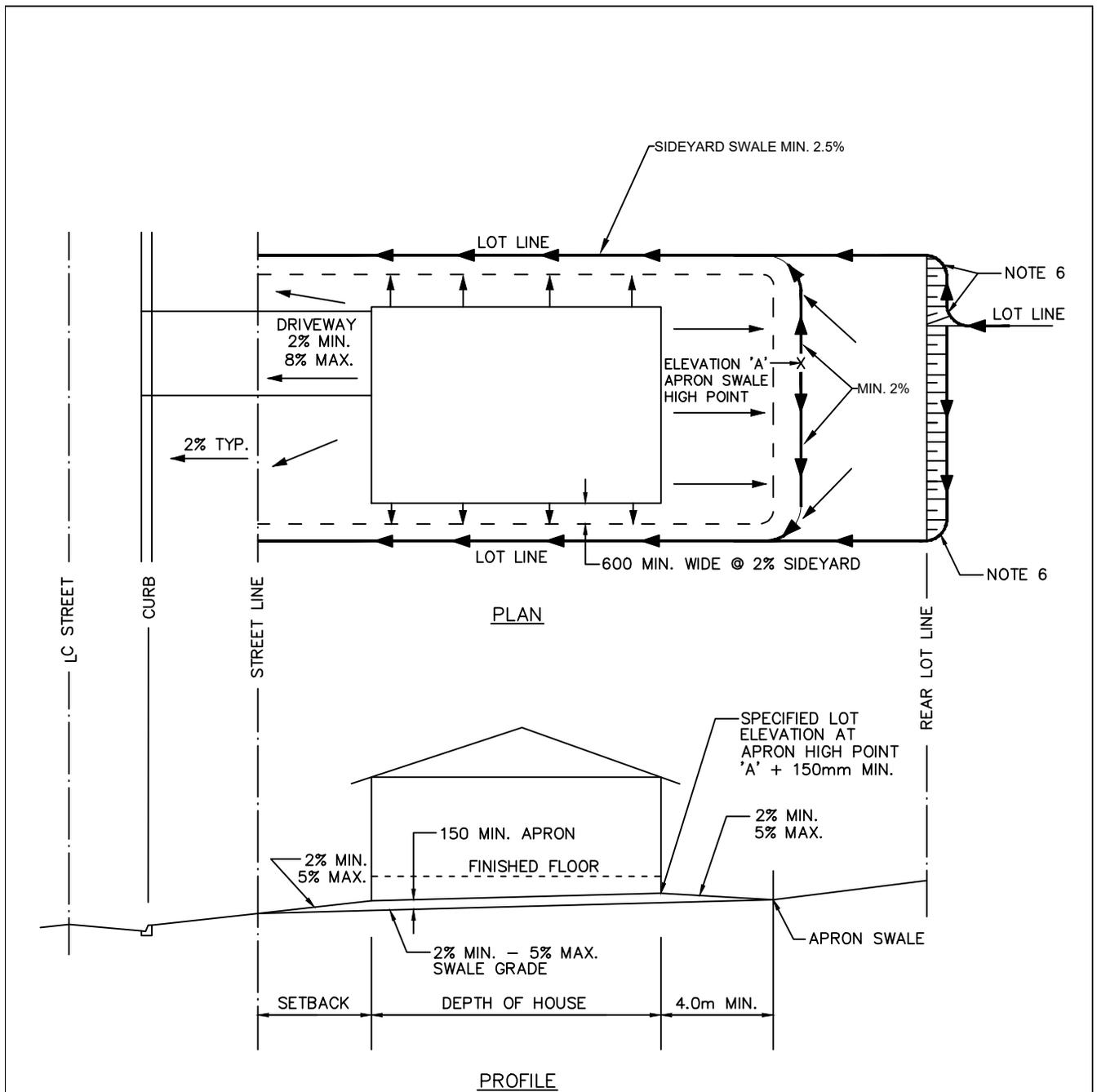
NOTES:

1. GRADING PLANS SHALL BE DRAWN AT 1:250 SCALE.
2. GRADING DESIGN SHALL BE CONSISTENT WITH THE APPROVED SUBDIVISION GRADING PLAN
3. REFER TO DRAWINGS KS-401, KS-402 AND KS-403 FOR DETAILED LOT GRADING SPECIFICATIONS.
4. ALL ABOVE GROUND SEWER AND WATER SERVICES, POLES, SERVICE BOXES AND UTILITIES FRONTING THE LOT ARE TO BE SHOWN ON THE PLAN
5. EDGE OF DRIVEWAY SHALL MINIMUM 1.0m FROM LIGHT POLES, CATCHBASINS, WATERMAIN VALVES, TELEPHONE MANHOLES, UTILITY JUNCTION BOXES, WATER SERVICE VALVE BOXES, SIDE LOT LINES AND OTHER DRIVEWAYS, AND MINIMUM 1.5m FROM BOULEVARD TREES AND HYDRO TRANSFORMERS, AND 3.0m FROM HYDRANTS AND COMMUNITY MAILBOXES.

LEGEND

- ROOF WATER LEADER TO SPLASHPAD
- EXISTING ELEVATION REQUIRED
- PROPOSED ELEVATION REQUIRED
- PROPOSED SWALE ELEVATION REQUIRED
- FINISHED FIRST FLOOR ELEVATION REQUIRED
- SPECIFIED HOUSE GRADE (FROM ENGINEER DRAWINGS)
- TOP OF FOUNDATION WALL
- EXTENDED UNDERSIDE OF FOOTING
- BASEMENT SLAB ELEVATION REQUIRED
- GARAGE SLAB ELEVATION REQUIRED
- ¢ OF PROPOSED SWALE & FLOW DIRECTION
- SWALE GRADIENT REQUIRED
-
- x (EX.)
- x PROP.
- x PROP SW
- F.F.F.
- S.H.G.
- T.F.W.
- U/S FTG.
- BASE SLAB
- GARAGE SLAB
-
- % SLOPE

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE FEB. 1980
	LOT GRADING PLAN REQUIREMENTS FOR SUBDIVISION LOTS	REVISION	DRAWING No. KS-400
		DATE OF REVISION JANUARY 2026	

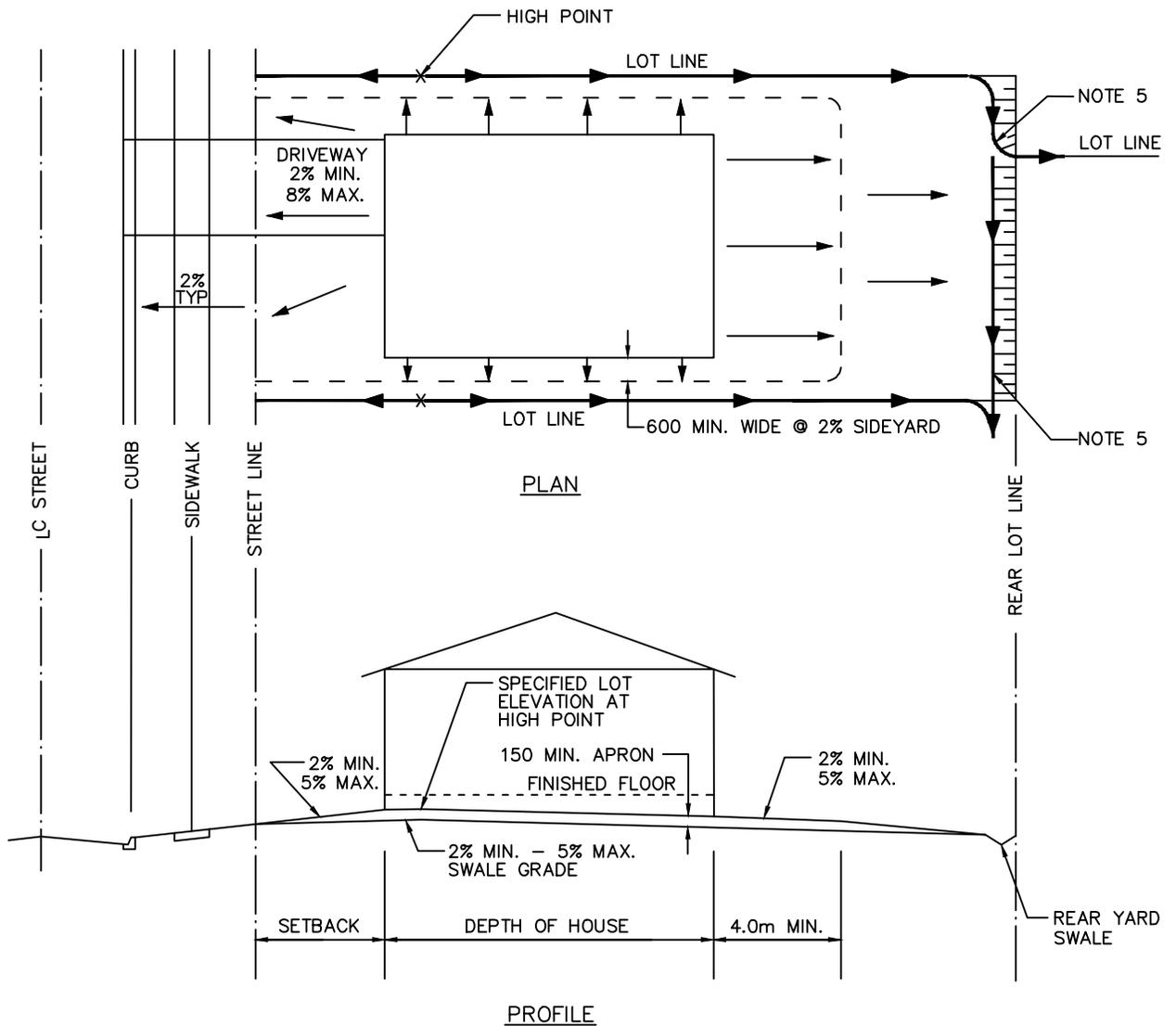


NOTES:

1. DRIVEWAY SHALL NOT EXCEED THE WIDTH OF THE GARAGE.
2. ALL EMBANKMENTS SHALL BE 3:1 MAX.
3. SIDEWALKS MAY BE PERMITTED IF THE ADJACENT LOT TO THE REAR IS ALSO A REAR TO FRONT DRAINING LOT
4. ALL DOWNSPOUTS SHALL DISCHARGE ON TO CONCRETE SPLASH PADS.
5. DRIVEWAYS SHALL NOT BE USED FOR OUTLETS FROM SIDEYARD SWALES.
6. DRAINAGE FROM REAR ADJOINING LOTS SHALL BE CONVEYED BY SWALES TO SIDE LOT LINES.

ALL DIMENSIONS ARE EXPRESSED IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE FEB. 1980
	FRONT LOT DRAINAGE	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-401

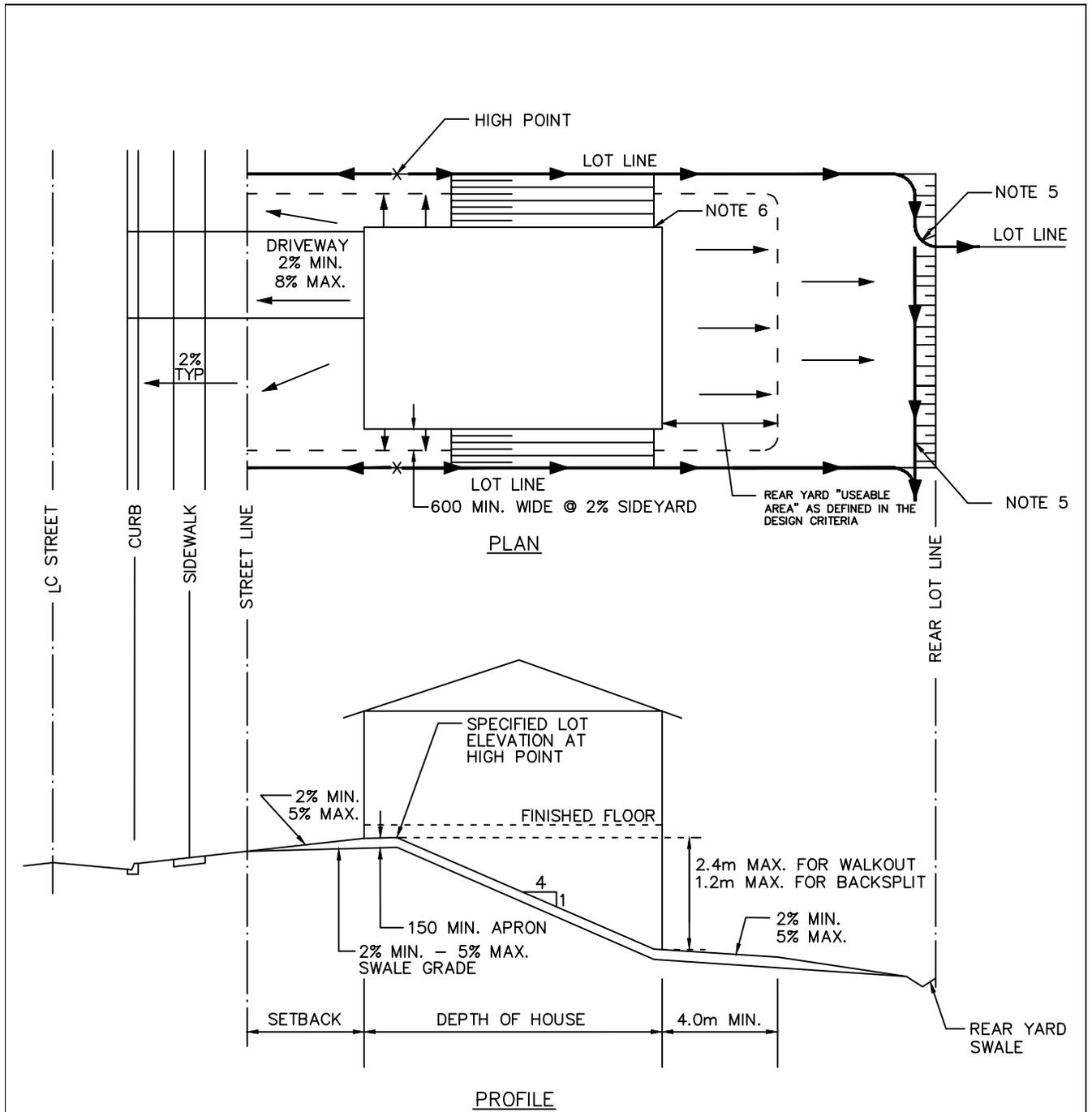


NOTES:

1. DRIVEWAY SHALL NOT EXCEED THE WIDTH OF THE GARAGE
2. ALL EMBANKMENTS SHALL BE 3:1.
3. ALL DOWNSPOUTS SHALL DISCHARGE ONTO CONCRETE SPLASH PADS.
4. DRIVEWAYS SHALL NOT BE USED FOR OUTLETS FOR SIDEYARD SWALES.
5. DRAINAGE TO REAR ADJOINING LOTS SHALL BE CONVEYED BY SWALES TO THE SIDE LOTS LINES
6. A MINIMUM OF 50% OF THE ROOF SHALL DRAIN TO THE FRONT OF THE LOT, AS MUCH AS PRACTICALLY POSSIBLE.

ALL DIMENSIONS ARE EXPRESSED IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.

	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE FEB. 1980
	SPLIT LOT DRAINAGE	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-402

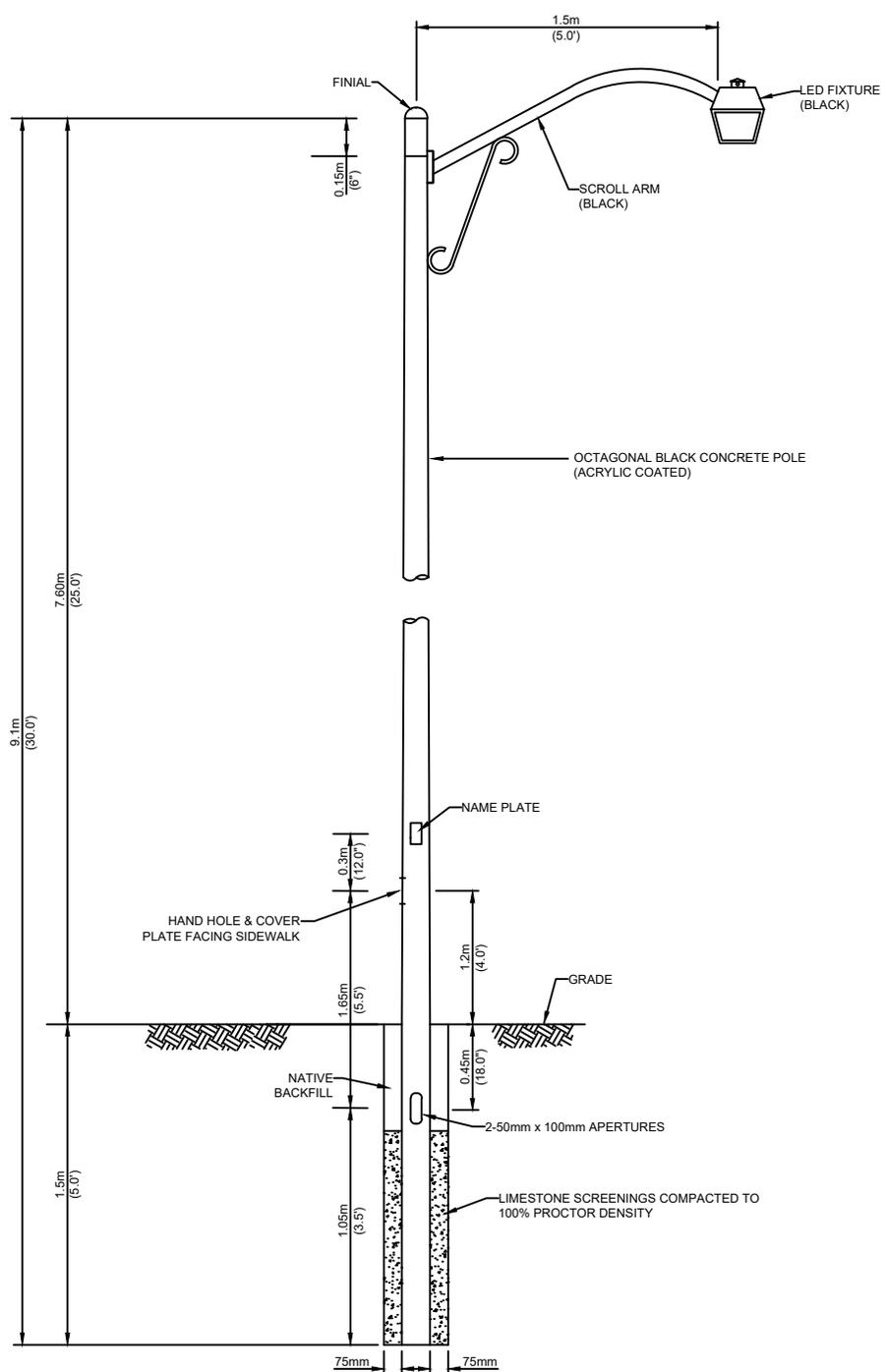


NOTES:

1. DRIVEWAY SHALL NOT EXCEED THE WIDTH OF THE GARAGE
2. ALL EMBANKMENTS SHALL BE 4:1.
3. ALL DOWNSPOUTS SHALL DISCHARGE ONTO CONCRETE SPLASH PADS.
4. DRIVEWAYS SHALL NOT BE USED FOR OUTLETS FOR SIDEYARD SWALES.
5. DRAINAGE TO REAR ADJOINING LOTS SHALL BE CONVEYED BY SWALES TO THE SIDE LOTS LINES.
6. SIDEYARD 4:1 SLOPES SHALL NOT EXTEND BEYOND REAR FACE OF DWELLING.
7. A MINIMUM OF 50% OF THE ROOF SHALL DRAIN TO THE FRONT OF THE LOT, AS MUCH AS PRACTICALLY POSSIBLE.

ALL DIMENSIONS ARE EXPRESSED IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.

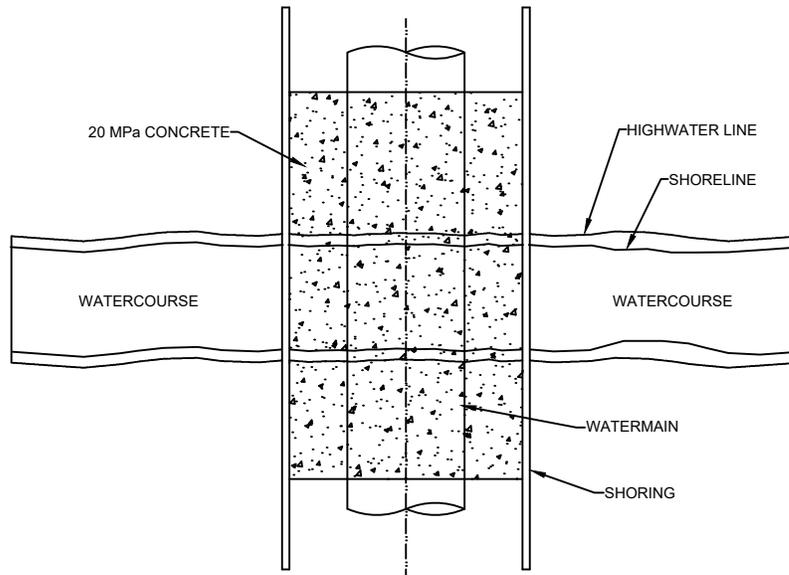
	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE FEB. 1980
	LOT DRAINAGE FOR WALKOUT AND BACKSPLIT DWELLINGS	REVISION	DRAWING No. KS-403
		DATE OF REVISION JANUARY 2026	



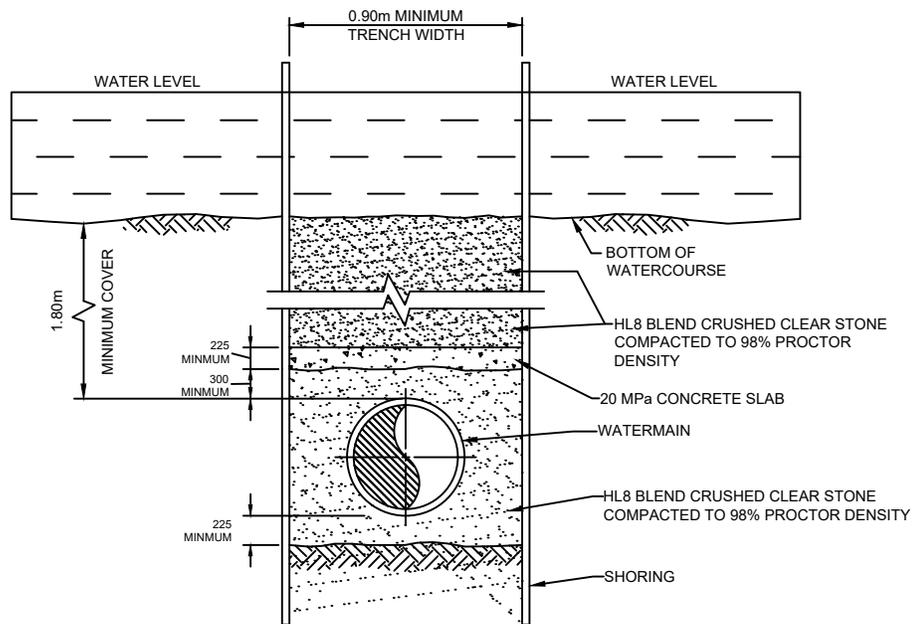
NOTES:

1. DIMENSIONS ARE TYPICAL AND SUBJECT TO ADJUSTMENT TO SUIT SPECIAL LIGHTING DESIGN.
2. SEE SECTION J FOR DETAILS AND SPECIFICATIONS

	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE AUG. 1981
	TYPICAL POLE & LUMINAIRE (DECORATIVE)	REVISION	DRAWING No. KS-701
		DATE OF REVISION JANUARY 2026	



PLAN



ELEVATION

NOTES:

1. ALL SLOPING MUST BE CUT OFF AT CREEK BED WHEN CONSTRUCTION IS COMPLETED.
2. VALVES WILL BE PROVIDED AT BOTH ENDS OF WATER CROSSING ABOVE THE HIGHWATER LINE AT THE DISCRETION OF THE TOWNSHIP ENGINEER.
3. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.



TOWNSHIP OF KING

**WATERMAIN TRENCH DETAIL
UNDER WATERCOURSE**

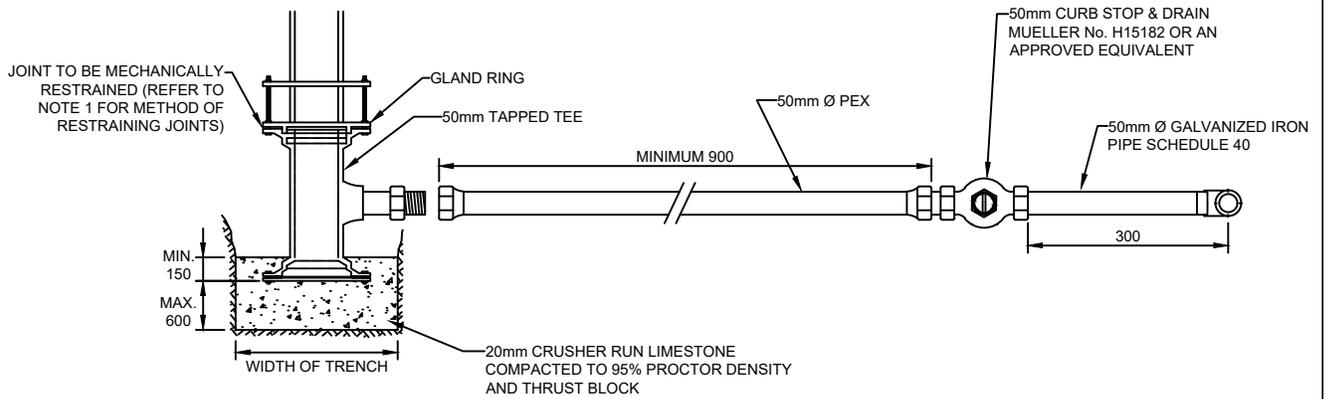
APPROVED *[Signature]*

DATE OF ISSUE
FEB. 1980

REVISION

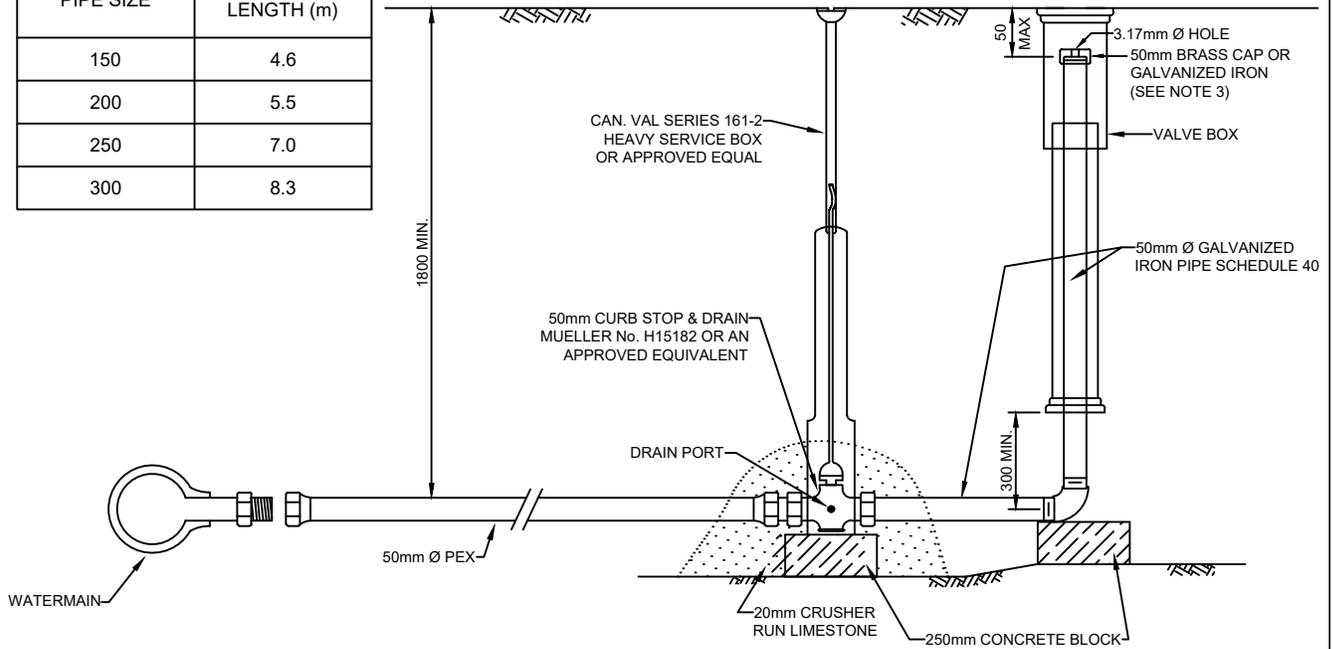
DRAWING No.
KS-802

DATE OF REVISION
JANUARY 2026



PLAN

PIPE SIZE	MIN. RESTRAINED LENGTH (m)
150	4.6
200	5.5
250	7.0
300	8.3



ELEVATION

NOTES:

1. JOINTS ON PVC MAIN ARE TO BE RESTRAINED USING UNI-FLANGE SERIES 1300 RESTRAINER (OR APPROVED EQUAL).
2. ALL JOINTS ENCOUNTERED WITHIN THE SPECIFIED RESTRAINING LENGTH ON TABLE 1, FROM THE FIRST RESTRAINED JOINT SHALL BE RESTRAINED.
3. THREADS ON CAP TO BE GREASED AND CAP TO BE INSTALLED LOOSELY.
4. BLOW-OFF AND TAPPED TEE TO BE COMPLETELY BACKFILLED WITH HL8 STONE.
5. ALL DIMENSIONS ARE IN MILLIMETRES.



TOWNSHIP OF KING

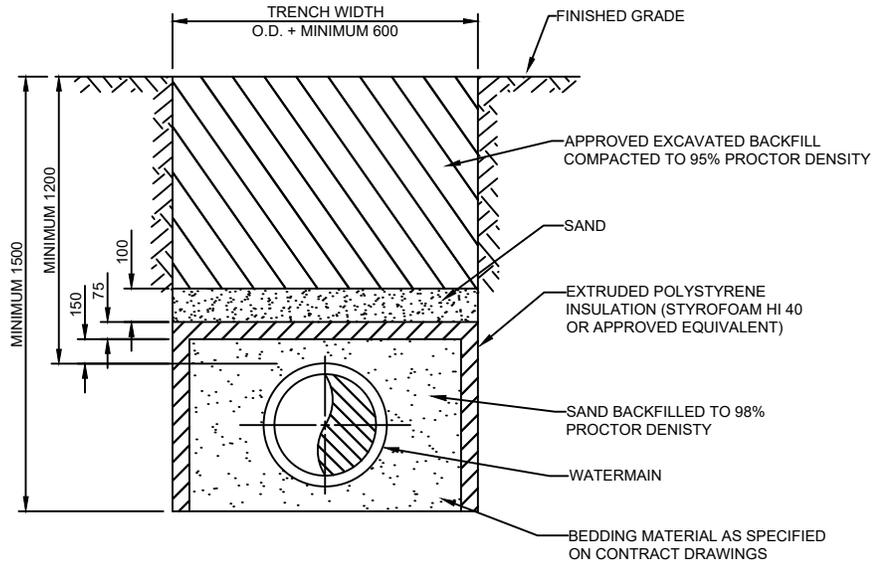
50mm BLOWOFF FOR WATERMAIN WITH MECHANICALLY RESTRAINED JOINTS

APPROVED *[Signature]*

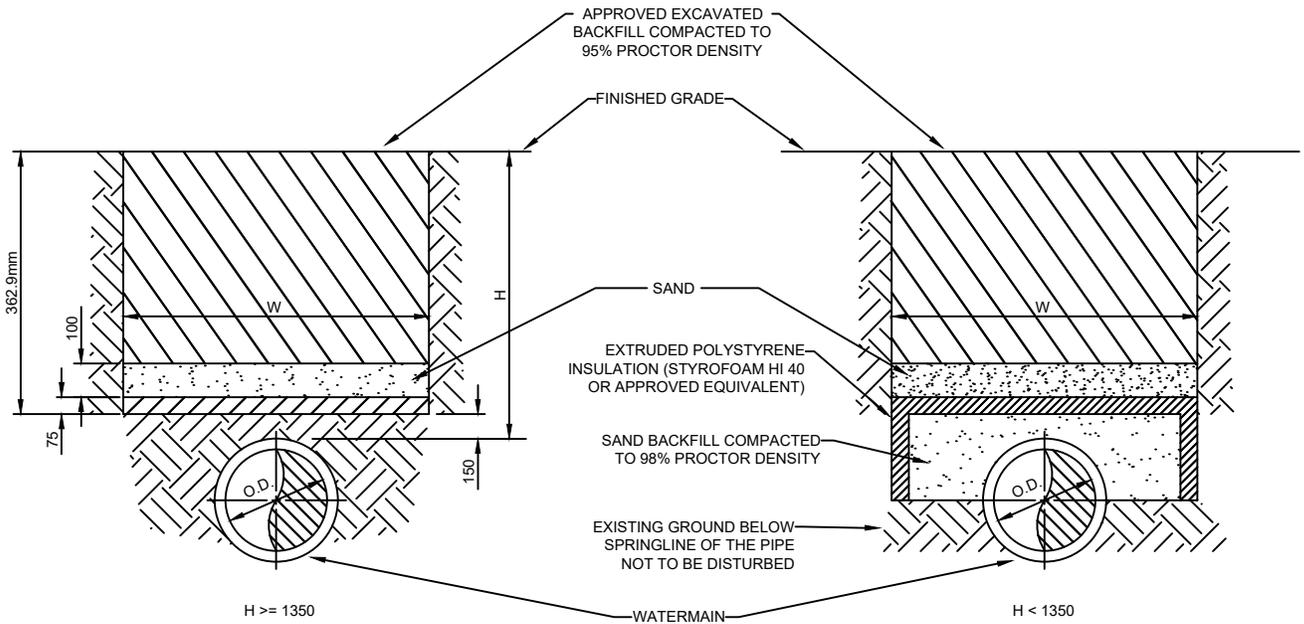
DATE OF ISSUE
FEB. 1980

REVISION
DATE OF REVISION
JANUARY 2026

DRAWING No.
KS-803



INSULATION OF NEW SERVICES



INSULATION OF EXISTING SERVICES

$W = O.D. + 2(1500-H)$ OR $O.D. + 600mm$ WHICHEVER IS GREATER
 WHERE: W = INSULATION WIDTH
 O.D. = OUTSIDE DIAMETER OF PIPE TO BE INSULATED
 H = DEPTH OF PIPE TO BE INSULATED
 (MINIMUM = 1200mm)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.



TOWNSHIP OF KING

METHODS OF INSULATING WATERMAINS

APPROVED *[Signature]*

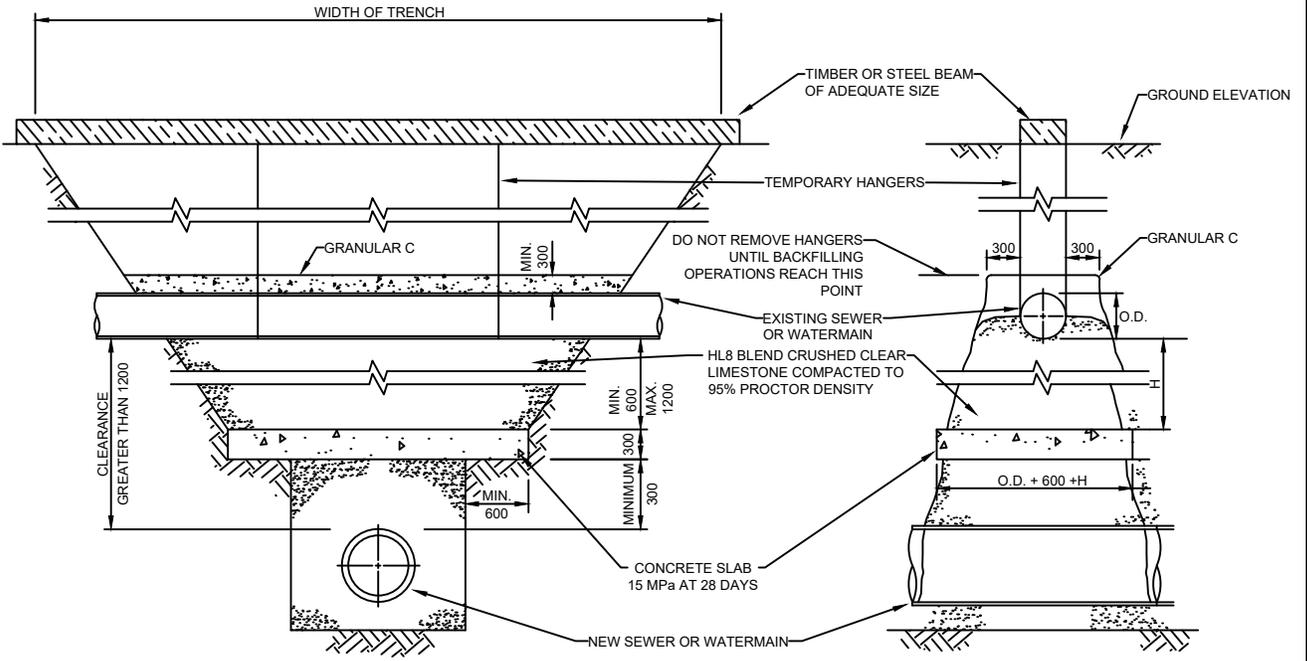
DATE OF ISSUE
JAN. 1990

REVISION

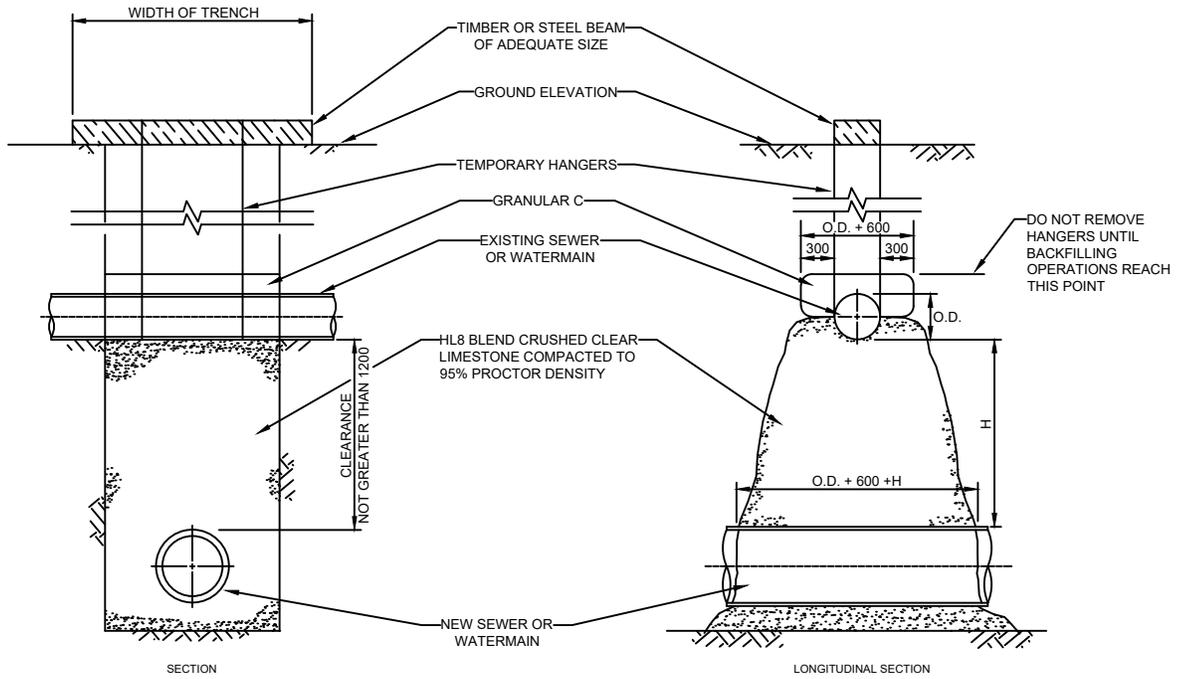
DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-804



CLEARANCE GREATER THAN 1200



CLEARANCE NOT GREATER THAN 1200

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.



TOWNSHIP OF KING

**SUPPORTS FOR WATERMAINS AND SEWERS
CROSSING WATERMAIN TRENCHES**

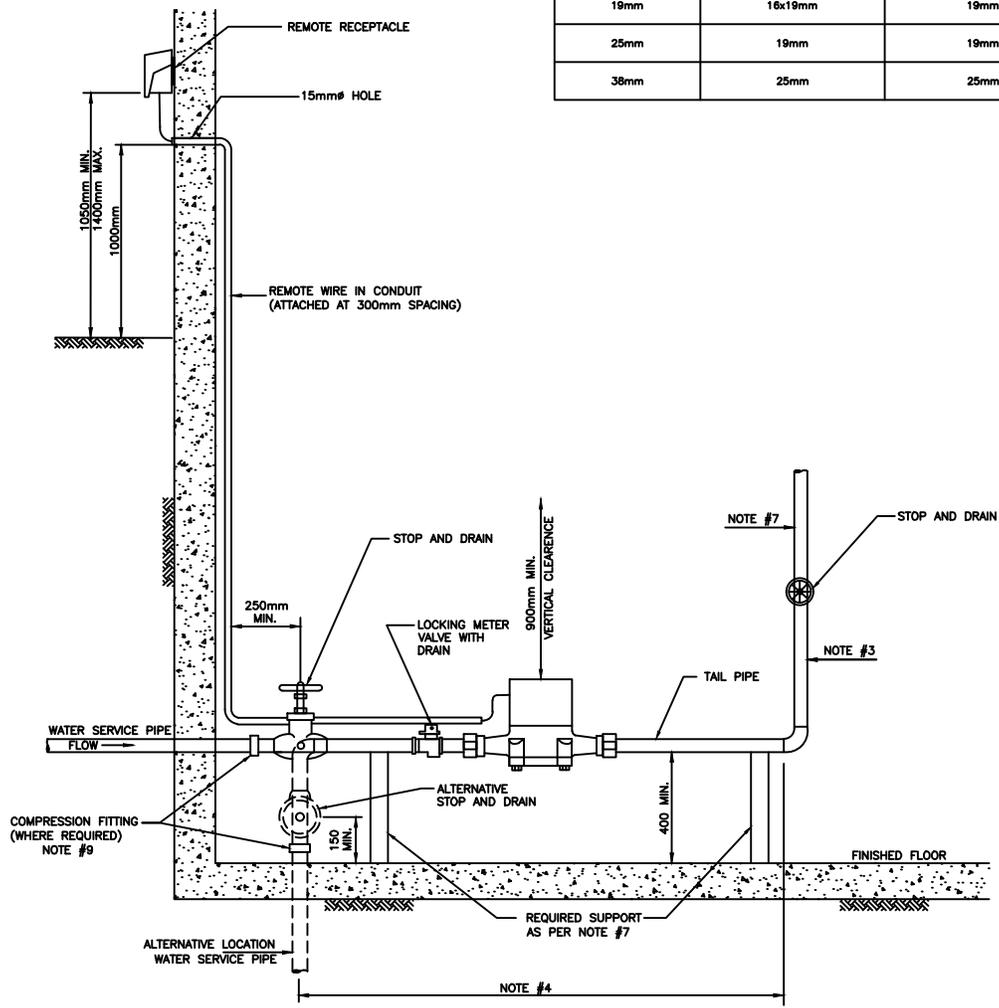
APPROVED
[Signature]

DATE OF ISSUE
JAN. 1990

REVISION
DATE OF REVISION
JANUARY 2026

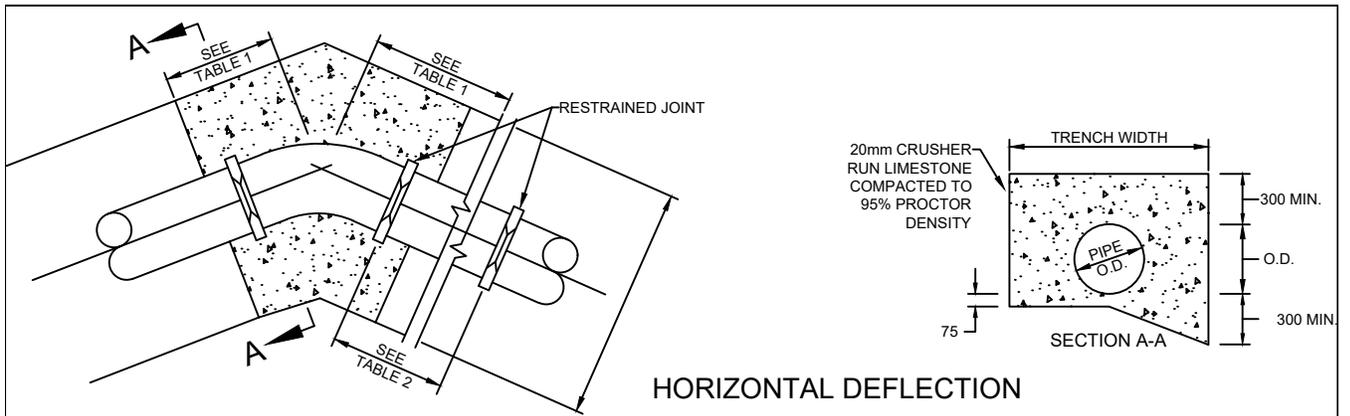
DRAWING No.
KS-805

TABLE		
PIPE SIZE IN	METER SIZE	PIPE SIZE OUT
19mm	16x19mm	19mm
25mm	19mm	19mm
38mm	25mm	25mm

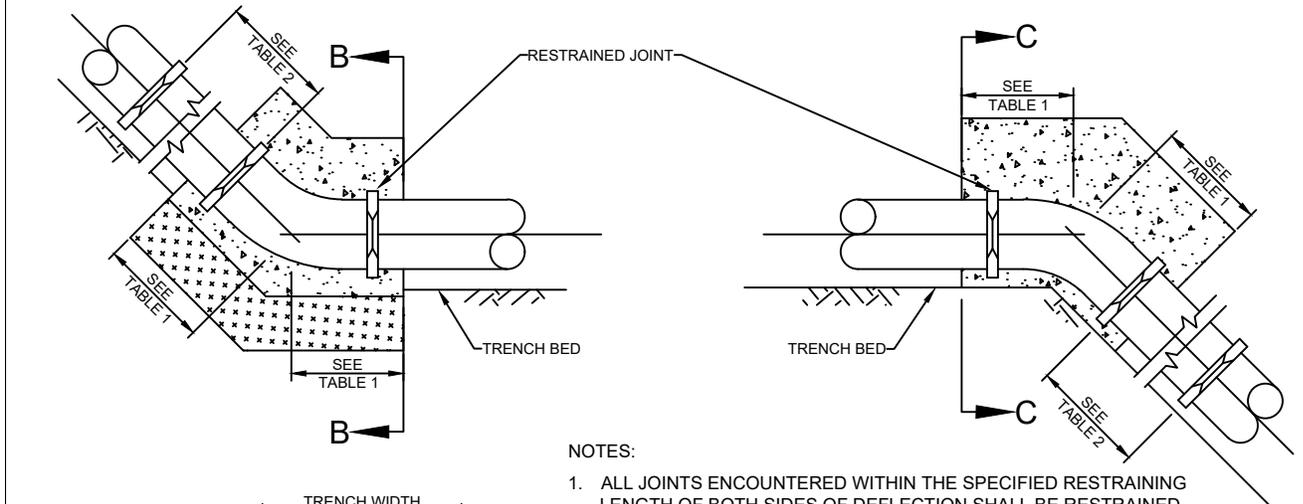


- NOTES:
- 175mm MINIMUM CLEARANCE BETWEEN WALL AND C/L OF PIPE AND 75mm HORIZONTAL CLEARANCE BETWEEN WALL AND METER.
 - STOP AND DRAIN TO BE THE SAME SIZE AS INCOMING PIPE; VALVE TO BE PER BUILDING CODE.
 - MAINTAIN SERVICE PIPE DIAMETER TO CONNECTION AT HOT WATER TANK (OBC 7.6.3.4).
 - ALL COPPER PIPING AFTER THE STOP AND DRAIN SHALL BE TYPE "L" COPPER. PIPING FOR METER TO BE RUN HORIZONTALLY & METER TO BE INSTALLED ON HORIZONTAL PIPING ONLY.
 - METER MUST NOT BE LOCATED BEHIND FURNACES, PARTITION WALLS, WATER TANKS, ETC.
 - WHERE REQUIRED, DUAL CHECK VALVE BACKFLOW PREVENTER IS TO BE INSTALLED DOWNSTREAM OF THE METER.
 - IF PLUMBING RISER/WATER SERVICE IS PLASTIC, SUPPORTS SHALL BE REQUIRED FOR METER ASSEMBLY AREA. TO AVOID INSTALLING SUPPORTS, RISER SHALL BE COPPER AND ATTACHED TO LOWER FLOOR LEVEL JOISTS.
 - METER AND TOUCHPAD TO BE SUPPLIED BY KING TOWNSHIP.
 - COMPRESSION FITTING TO BE SUFFICIENTLY STAYED, CLAMPED, ANCHORED OR BUTTRESSED IN ACCORDANCE WITH 7.3.4.8 OF THE OBC.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 2017
	19mm to 25mm WATER METER INSTALLATION IN BUILDING	REVISION	DRAWING No. KS-820
		DATE OF REVISION JANUARY 2026	

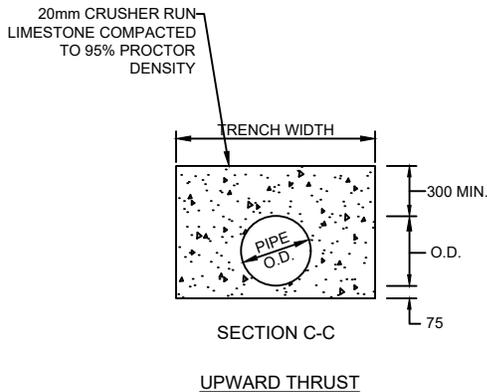


HORIZONTAL DEFLECTION



DOWNWARD THRUST

VERTICAL DEFLECTION



UPWARD THRUST

NOTES:

1. ALL JOINTS ENCOUNTERED WITHIN THE SPECIFIED RESTRAINING LENGTH OF BOTH SIDES OF DEFLECTION SHALL BE RESTRAINED.
2. REFER TO OPSD FOR JOINT RESTRAINING DETAIL.
3. GRANULAR THRUST BLOCKS SHALL BE FULLY EXTENDED AND COMPACTED AGAINST TRENCH WALLS.
4. GRANULAR THRUST BLOCKS SHALL BE ENCLOSED WITH FILTER FABRIC IF GROUND WATER TABLE IS ABOVE THE TRENCH BED OR IF GROUND WATER IS SEEPING THROUGH TRENCH WALLS.
5. IF THE BEARING CAPACITY OF TRENCH BED RESISTING DOWNWARD THRUST IS LESS THAN 100 KN/m², CLEAR STONE FOUNDATION SHALL BE PROVIDED AS REQUIRED.
6. CORROSION PROTECTION SHALL ALSO BE PROVIDED.
7. ALL DIMENSIONS IN MILLIMETRES.

DEFLECTION ANGLE	PIPE DIAMETER			
	150	200	250	300
11.25°	400	500	550	600
22.5°	400	500	550	600
45°	450	550	600	650
90°	600	700	750	850

PIPE DATA	MINIMUM RESTRAINING LENGTH (m)									
	VERTICAL DEFLECTION						HORIZONTAL DEFLECTION			
	DOWNWARD THRUST			UPWARD THRUST						
	11.25°	22.5°	45°	11.25°	22.5°	45°	11.25°	22.5°	45°	90°
150	1.2	2.1	4.0	4.8	7.6	9.2	1.2	2.1	4.0	6.0
200	1.5	3.0	4.9	6.7	9.7	11.3	1.5	3.0	4.9	7.9
250	1.8	3.6	6.4	9.0	12.2	14.0	1.8	3.6	6.4	9.0
300	2.1	4.3	7.3	10.9	14.7	16.6	2.1	4.3	7.3	11.9



TOWNSHIP OF KING

**JOINT RESTRAINING LENGTH
(IN COMBINATION WITH GRANULAR THRUST BLOCK)
FOR P.V.C. PIPE**

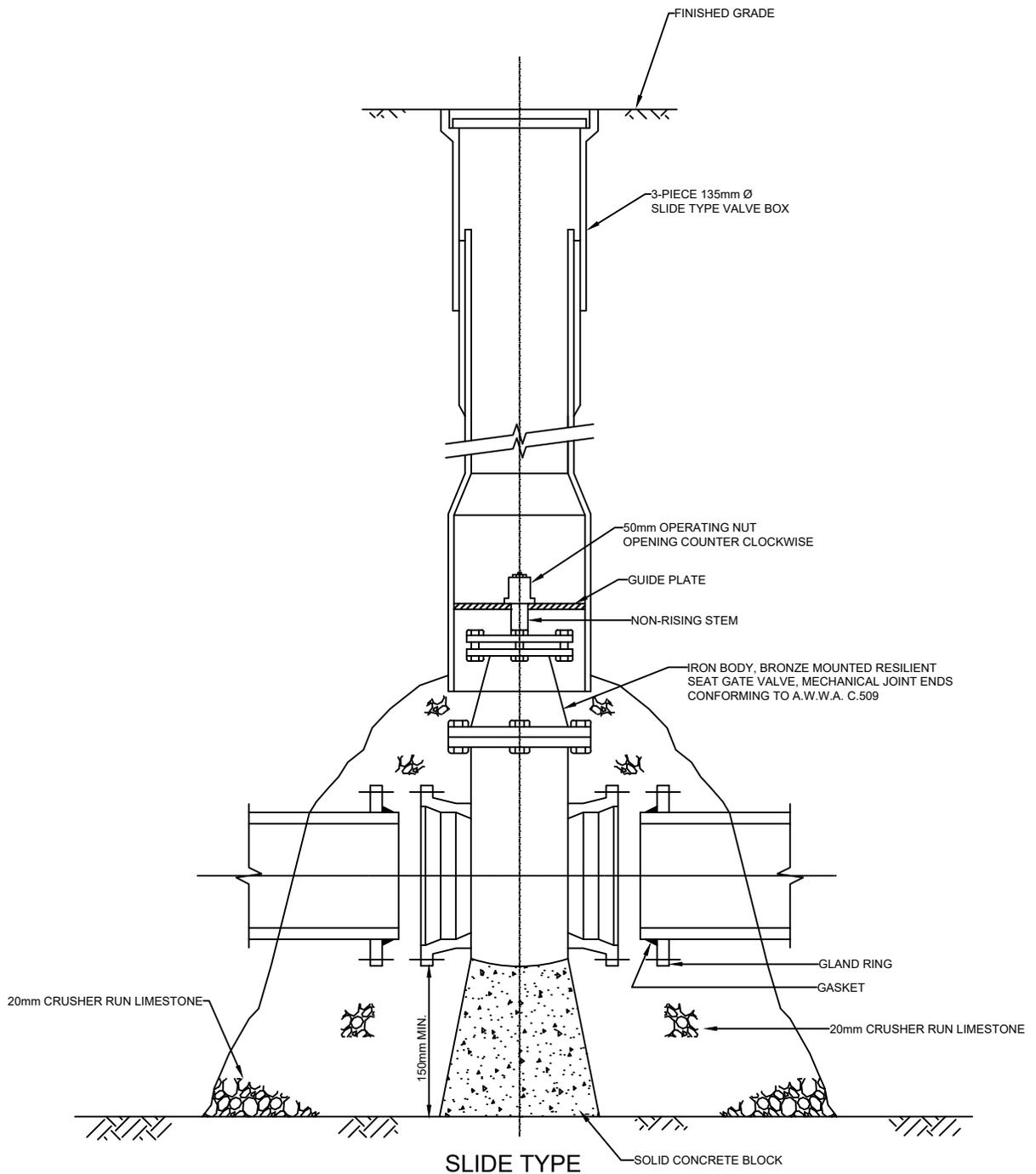
APPROVED: *[Signature]*

DATE OF ISSUE
JAN. 1990

REVISION

DATE OF REVISION
JANUARY 2026

DRAWING No.
KS-830



NOTES:

1. VALVE BOX TO BE ADEQUATELY BRACED WHILE BACKFILLING AND MUST REMAIN PLUMB.
2. VALVE BOX EXTENSION TO BE USED ONLY IF REQUIRED.
3. A 50x100x1500 MARKER STAKE PAINTED BLUE SHALL BE INSTALLED BESIDE EACH VALVE AT THE TIME OF INSTALLATION.
4. ALL DIMENSIONS ARE IN MILLIMETRES.
5. VALVE TO BE COMPLETELY BACKFILLED WITH 20mm CRUSHER RUN LIMESTONE.
6. CORROSION PROTECTION SHALL ALSO BE PROVIDED.



TOWNSHIP OF KING

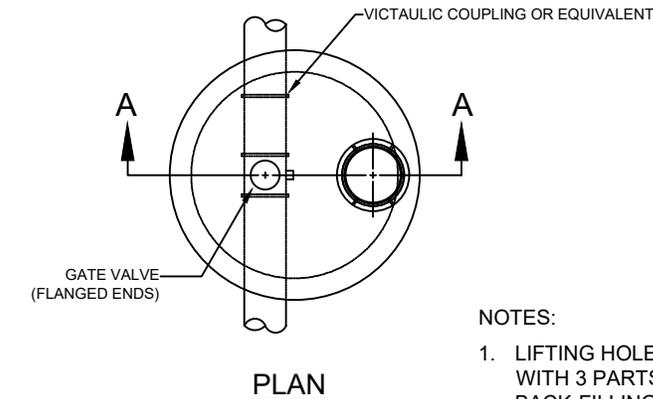
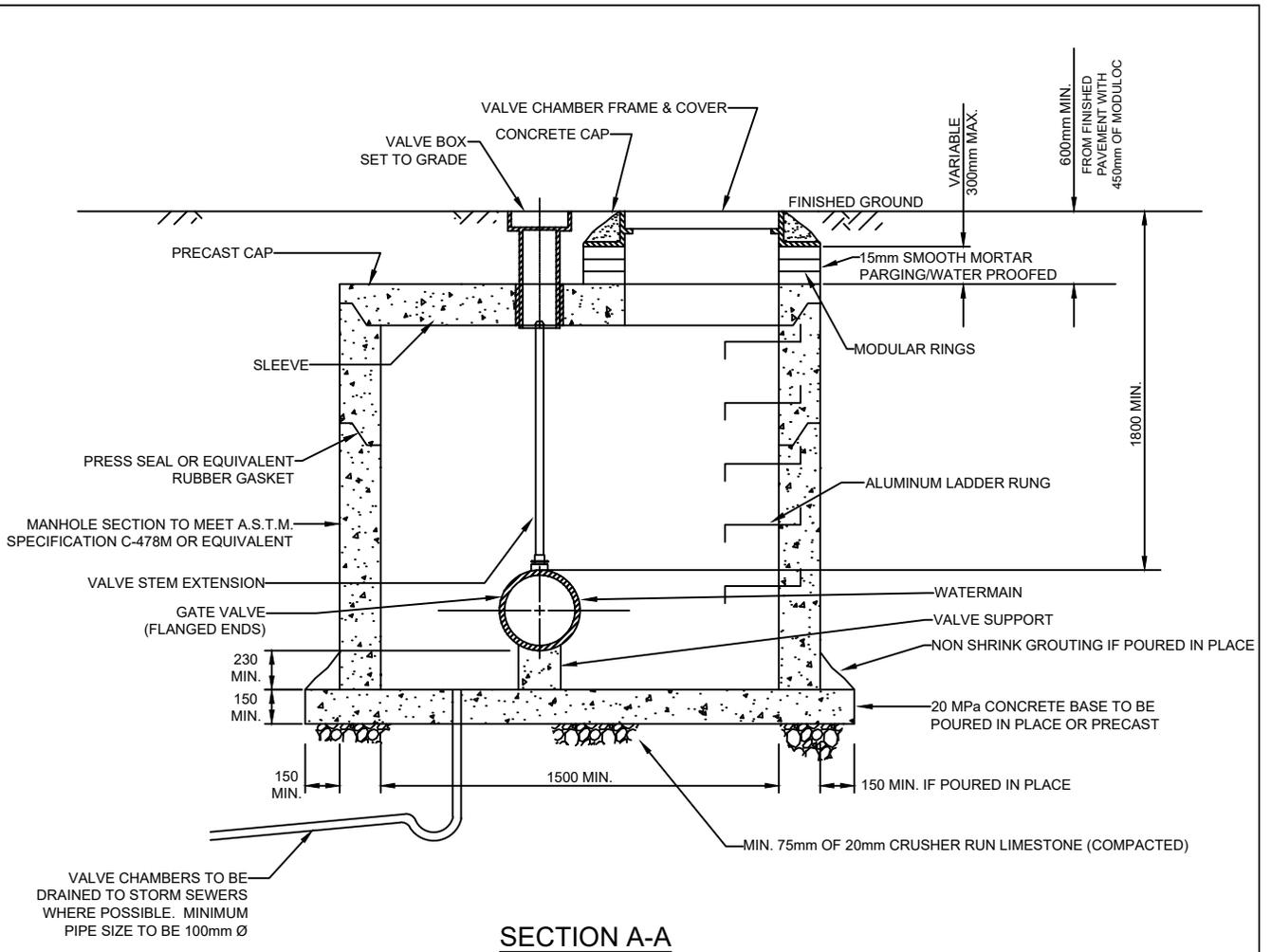
150mm TO 250mm DIAMETER
GATE VALVE & BOX

APPROVED: *[Signature]*

DATE OF ISSUE
FEB. 1980

REVISION
DATE OF REVISION
JANUARY 2026

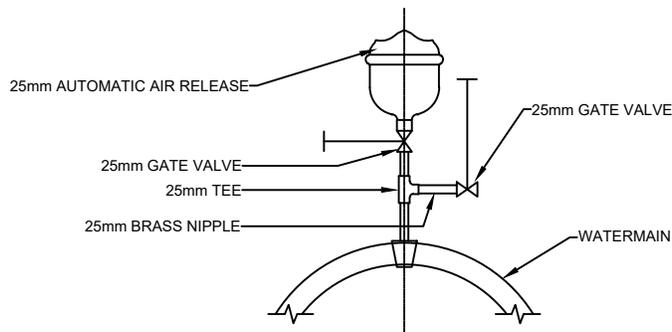
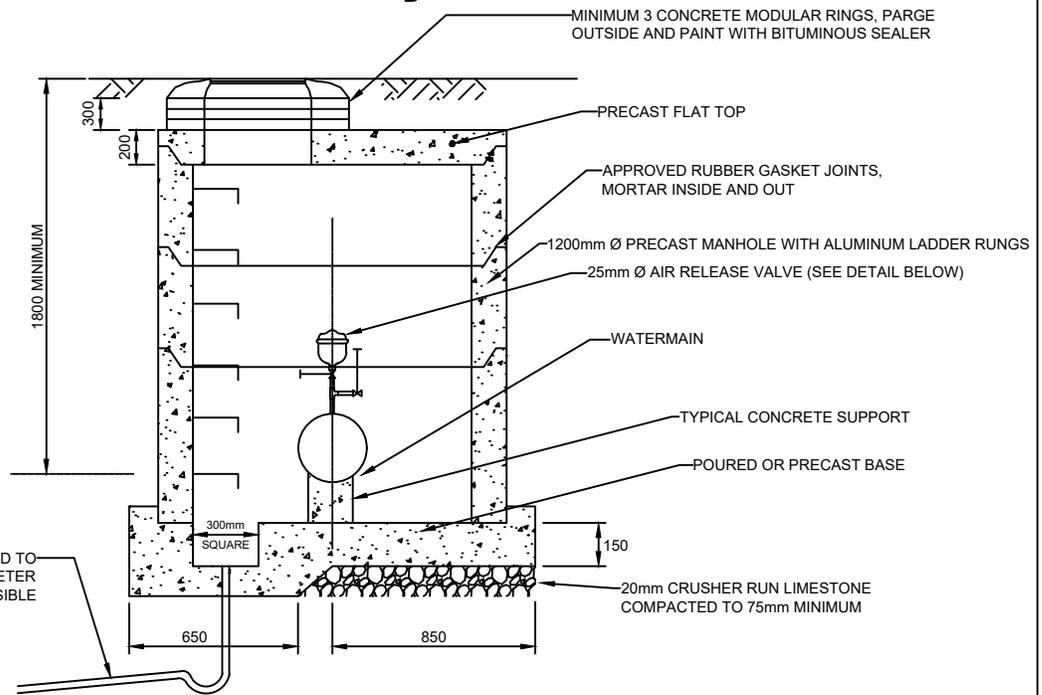
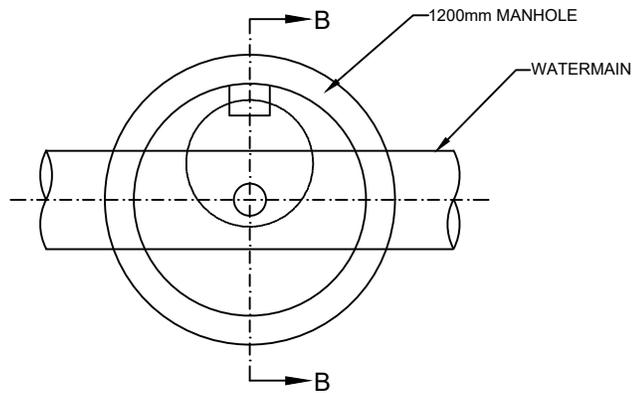
DRAWING No.
KS-840



NOTES:

1. LIFTING HOLES IN PRECAST SECTIONS TO BE COMPLETELY FILLED WITH 3 PARTS SAND, 1 PART CEMENT MORTAR AND POINTED BEFORE BACK-FILLING.
2. FIRST MANHOLE STEP TO BE 75mm BELOW FRAME. LAST STEP TO BE 300mm ABOVE CHAMBER FLOOR.
3. GASKET TO BE PLACED AS PER SPECIFICATIONS.
4. VALVE CHAMBER TO HAVE A MAXIMUM OF 300mm MODULAR RINGS.
5. ALL DIMENSIONS ARE IN MILLIMETRES.
6. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. ALL VALVE CHAMBERS ARE TO BE WATERPROOFED.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE FEB. 1980
	SEMI-PRECAST CONCRETE VALVE CHAMBER FOR 300mm DIA. PIPE OR LARGER	REVISION	DRAWING No. KS-841
		DATE OF REVISION JANUARY 2026	



NOTES:

1. ALL FITTINGS TO BE BRASS.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
3. SEE APPROVED MATERIAL LISTING FOR AIR RELEASE VALVE



TOWNSHIP OF KING

AIR RELEASE CHAMBER

APPROVED

REVISION

DATE OF REVISION

JANUARY 2026

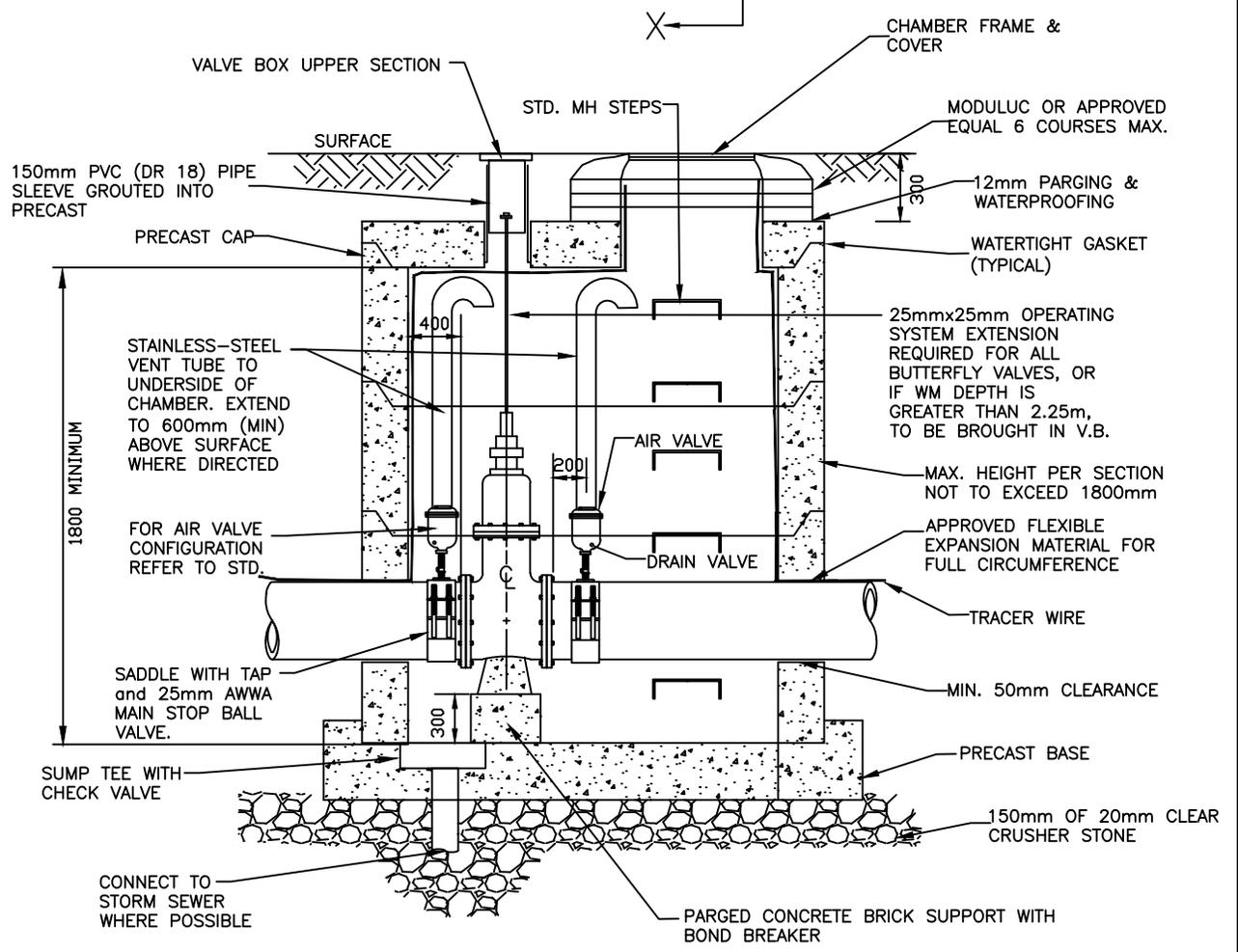
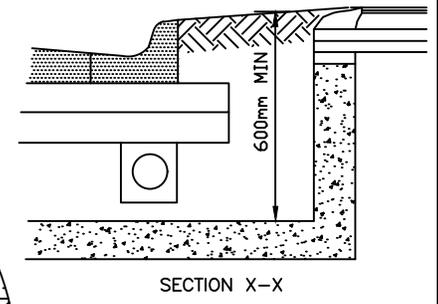
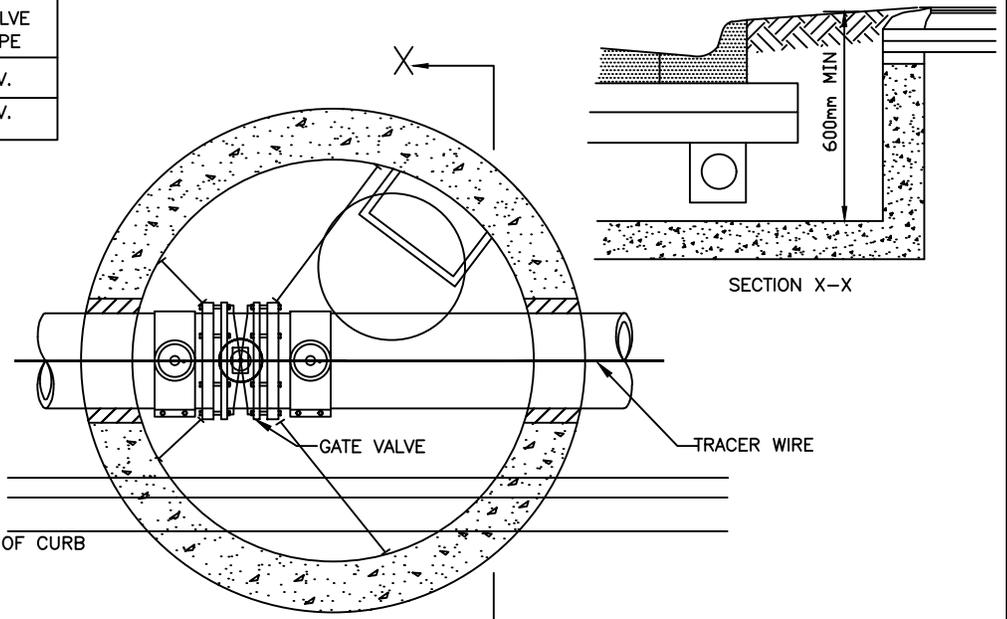
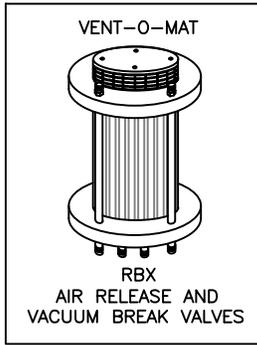
DATE OF ISSUE

JAN. 1990

DRAWING No.

KS-843

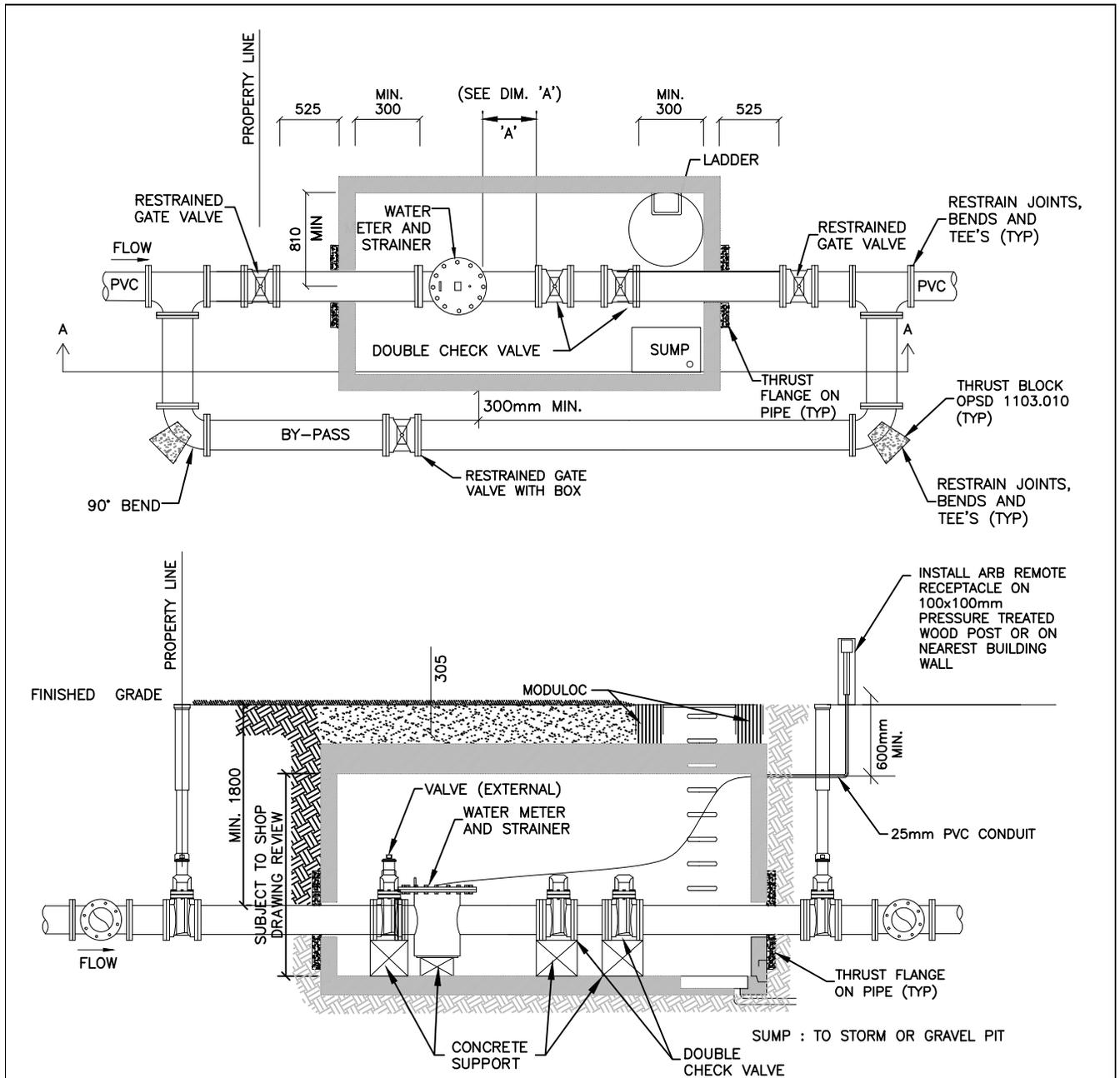
VALVE SIZE	CHAMBER I.D.	VALVE TYPE
100-300	1500	G.V.
400	1800	G.V.



GENERAL NOTES:
 ALL RESTRAINTS IN ACCORDANCE WITH
 MANUFACTURERS SPECIFICATIONS

ALL DIMENSION ARE IN MILLIMETRES
 UNLESS OTHERWISE SHOWN

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE OCT. 2010
	COMBINATION AIR AND VALVE CHAMBER	REVISION	DRAWING No. KS-844
		DATE OF REVISION JANUARY 2026	



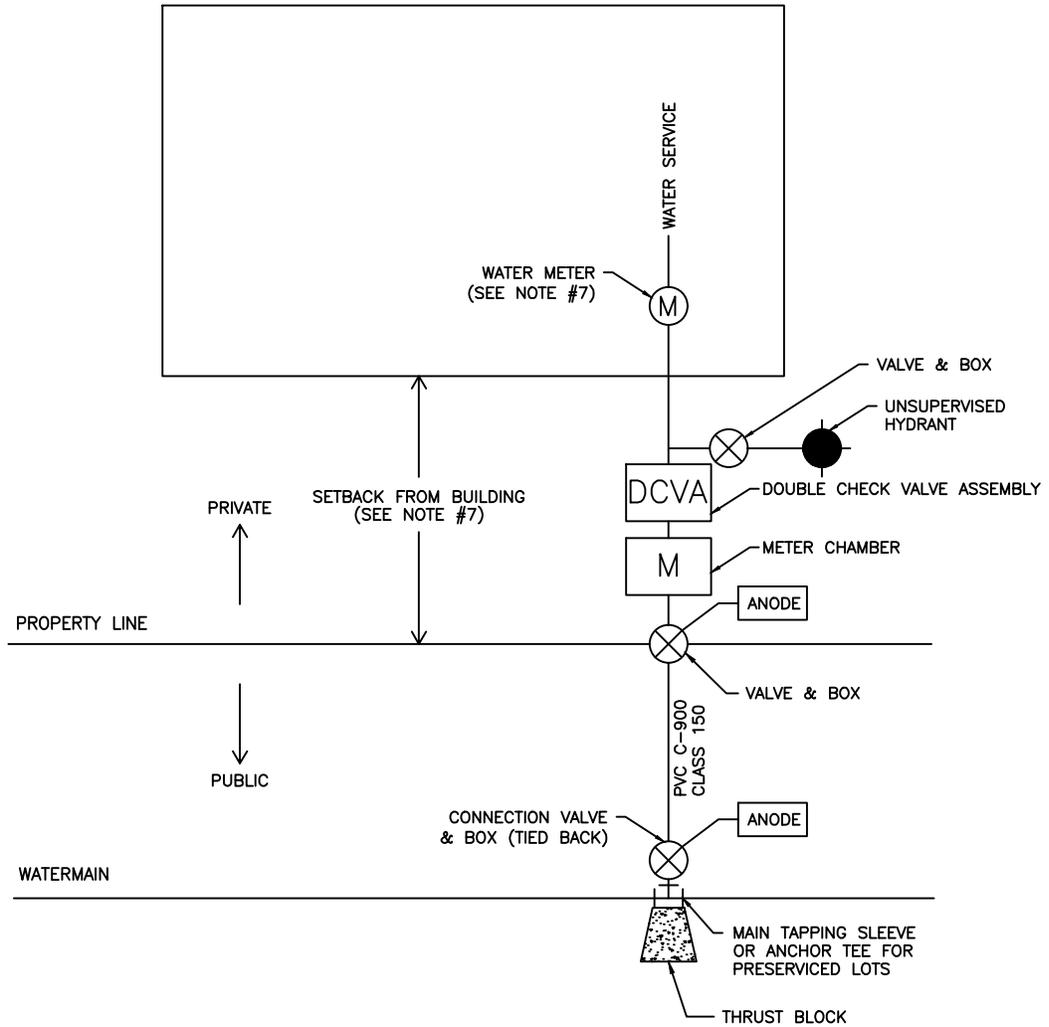
NOTES:

1. CONCRETE TO BE 40MPa COMPRESSIVE STRENGTH.
2. MAINTAIN MINIMUM SEPARATION BETWEEN METER AND CHECK VALVE PER DIMENSION 'A'.
3. 25mm PVC OR GALVANIZED METAL CONDUIT TO BE INSTALLED FROM WATER METER TO A SUITABLE LOCATION.
4. DIMENSIONS OF THE CHAMBER, THE WATER METER APPROVED BY THE TOWNSHIP AND THE CHECK VALVE SHALL BE VERIFIED BEFORE INSTALLATION. A SHOP DRAWING PREPARED BY A PROFESSIONAL ENGINEER IS TO BE SUBMITTED TO THE TOWNSHIP FOR APPROVAL.
5. ALL VALVE CHAMBER CUT-OUTS TO BE FILLED WITH CONCRETE BRICKS AND MORTAR THEN PARGED INSIDE AND OUTSIDE WITH 1:3 MORTARS MIX.
6. POURED BASE SHOULD BE TROWEL FINISHED.
7. ALL PIPE JOINTS INSIDE METER CHAMBER SHALL BE FLANGE TO FLANGE.
8. BACKFLOW PREVENTION SHALL BE BY DOUBLE CHECK VALVE ASSEMBLY (DCVA) APPROVED BY THE TOWNSHIP MEETING REQUIREMENTS OF OBC AND CSA-B64.10, WITH ALL TEST PORTS PLUGGED.

SECTION A-A

CHAMBER OPSD	METER SIZE	DIM. A
1101.012 (1800 X 2400mm)	100mm	410mm
1101.016 (2400 X 3000mm)	150mm	610mm
1101.040 (3600 X 3000mm)	200mm	820mm

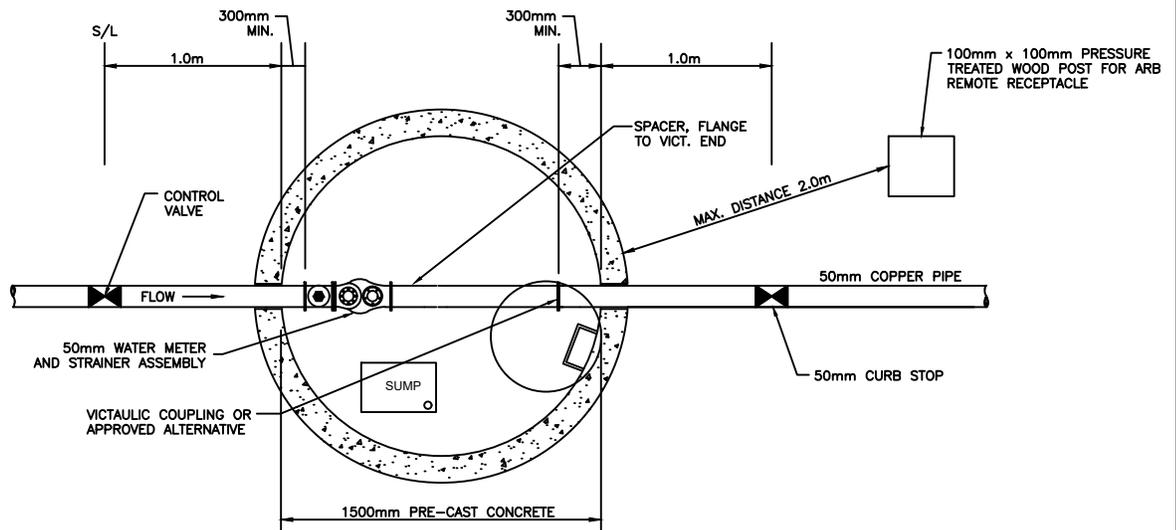
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JULY 2012
	WATER METER INSTALLATION IN CHAMBER (FOR COMBINED FIRE & DOMESTIC)	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-845



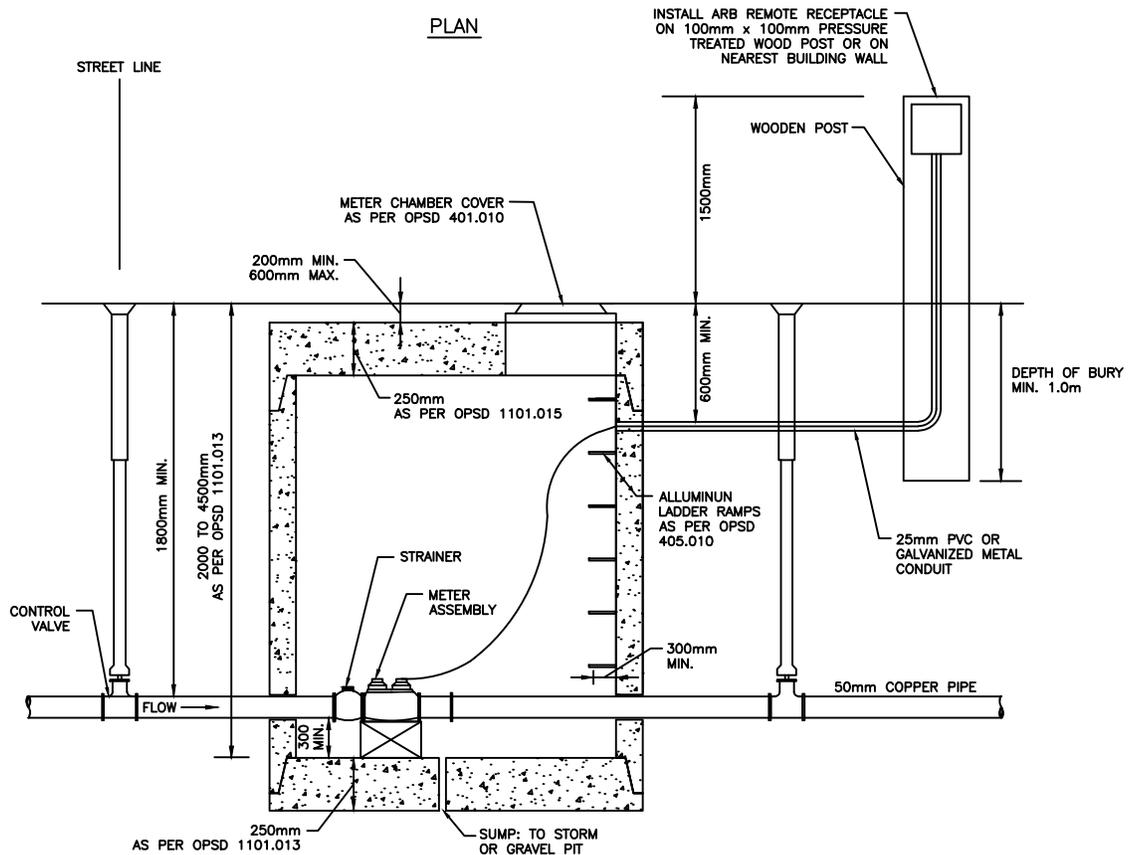
NOTES:

1. REFER TO WATERWORKS MATERIAL SPECIFICATIONS.
2. ANODES TO BE PROVIDED ON ALL IRON FITTINGS.
3. ALL FITTINGS TO BE PROTECTED WITH CORROSION COATINGS.
4. VALVE AT MAIN MUST BE RESTRAINED.
5. TRACER WIRE TO COME UP AT STREET LINE VALVE BOX/CHAMBER.
6. FOR APPROVED WATER METER AND DOUBLE CHECK VALVE ASSEMBLY (DCVA) EQUIPMENT, CONTACT THE WATERWORKS DEPARTMENT.
7. THE SEPARATION DISTANCE BETWEEN THE OUTLET OF A WATER METER AND THE INLET OF A DCVA SHALL MEET MANUFACTURER'S SPECIFICATIONS HOWEVER SHALL BE NO LESS THAN 4 PIPE DIAMETERS.
8. METER AND DCVA CHAMBER SIZES ARE TO BE DETERMINED BY THE DESIGNER AND ARE SUBJECT TO TOWNSHIP APPROVAL. INSTALLATIONS ARE TO BE BASED ON OPSD FOR VALVE CHAMBERS AND ARE TO MEET SITE SPECIFIC CONDITIONS AND MANUFACTURER'S SPECIFICATIONS. DETAILS FOR EACH CHAMBER ARE TO BE INCLUDED ON THE DESIGN DRAWINGS.
9. FOR BUILDINGS WITH MINIMAL SETBACK, THE BACKFLOW PREVENTOR & METER MAY BE LOCATED INSIDE THE BUILDING ACCORDING TO THE BUILDING CODE, AT THE DISCRETION OF THE DIRECTOR.
10. WATER CONNECTIONS ON PRIVATE SIDE ARE GOVERNED BY BUILDING CODES AND ARE SUBJECT TO REQUIREMENTS FROM THE DIRECTOR.

	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE
	WATER SERVICE CONNECTIONS FOR SINGLE ICI / COMMON ELEMENT CONDOMINIUM BUILDING	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-846



PLAN

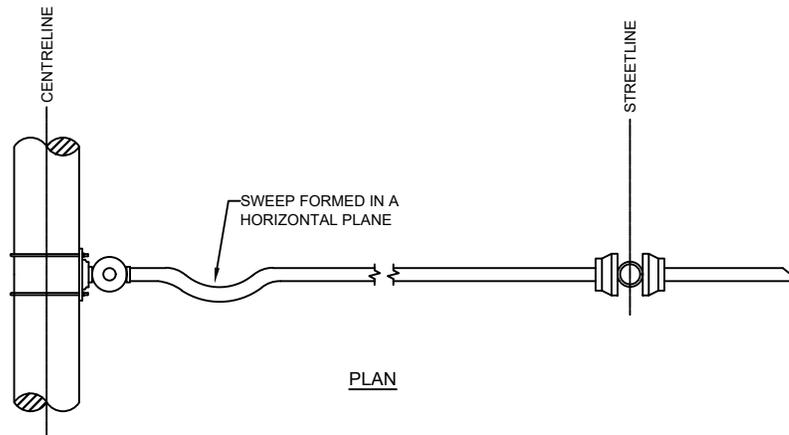


SECTION

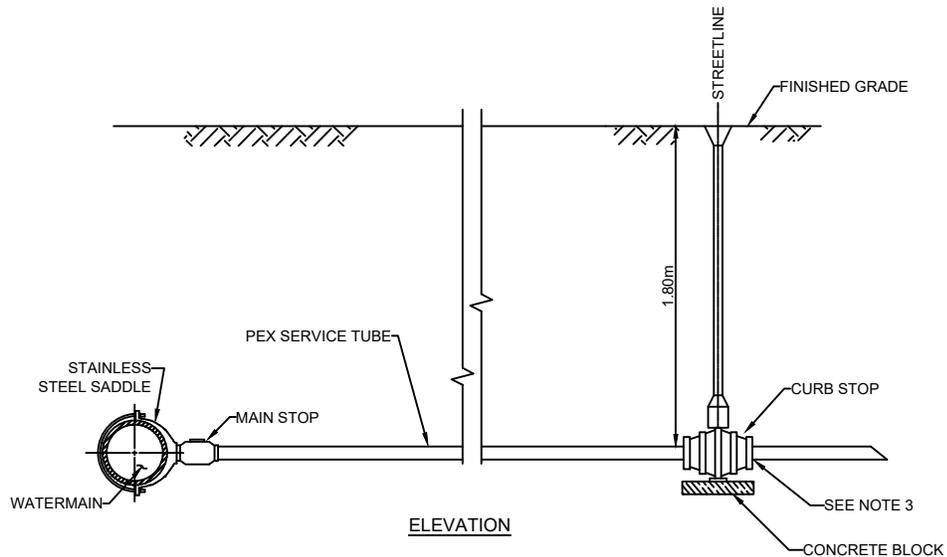
NOTES:

1. ALL PIPE JOINTS INSIDE THE METER CHAMBER SHALL BE FLANGE TO FLANGE UNLESS NOTED OTHERWISE.
2. CONTACT THE WATERWORKS DEPARTMENT FOR APPROVED WATER METER EQUIPMENT.
3. THE CHAMBER SIZING AND DESIGN IS SUBJECT TO THE TOWNSHIP'S APPROVAL OF A STAMPED SHOP DRAWING PREPARED BY THE DESIGN ENGINEER SHOWING THE LAYOUT OF THE APPROVED METER EQUIPMENT.
4. CONCRETE RISER SECTIONS TO BE 32MPa COMPRESSIVE STRENGTH.
5. Poured base should be trowel finished.
6. BACKFLOW PREVENTION SHALL BE PROVIDED IN A SEPARATE CHAMBER BY A DOUBLE CHECK VALVE ASSEMBLY (DCVA) HAVING AWWA CERTIFICATION AND MEETING REQUIREMENTS OF OBC AND CSA-B64.10, WITH ALL TEST PORTS PLUGGED USING A MEANS THAT IS WATER-TIGHT. CONTACT WATERWORKS DEPARTMENT FOR APPROVED DCVA EQUIPMENT.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE MAY 2015
	WATER METER CHAMBER DETAILS (50mm SERVICE LINE)	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-847



PLAN



ELEVATION

NOTES:

1. ALL SERVICES TO BE AT 90° TO WATER MAIN UNLESS OTHERWISE SPECIFIED.
2. SERVICE DEPTH TO MEET MINIMUM COVER AS SPECIFIED BY DESIGN STANDARDS.
3. INSTALL 'FORD' SERVICE INSULATOR OR APPROVED EQUAL BETWEEN THE CURB STOP AND THE STREET LINE ONLY IF THE SERVICED BUILDING IS LOCATED 7.6m OR MORE FROM THE STREETLINE.
4. NO DIRECT TAPPING OF PVC WATER MAINS. ALL CONNECTIONS TO PVC PIPE TO BE MADE USING AN APPROVED WIDE BAND SERVICE SADDLE.
5. TRACER WIRE FOR PEX PIPE SHALL BE PROVIDED PER SECTION D6.02 OF THE DESIGN CRITERIA INCLUDING CONNECTIONS BY A SET SCREW AT EACH MAIN STOP AND CURB STOP AND BRINGING THE WIRE TO THE SURFACE AT EACH WATER BOX.
6. CATHODIC PROTECTION TO BE PROVIDED PER SECTION D7 OF THE DESIGN CRITERIA.
7. COPPER SERVICES ARE TO BE TYPE K SOFT COPPER MATERIAL.



TOWNSHIP OF KING

WATER SERVICE
(20mm - 50mm DIAMETER)

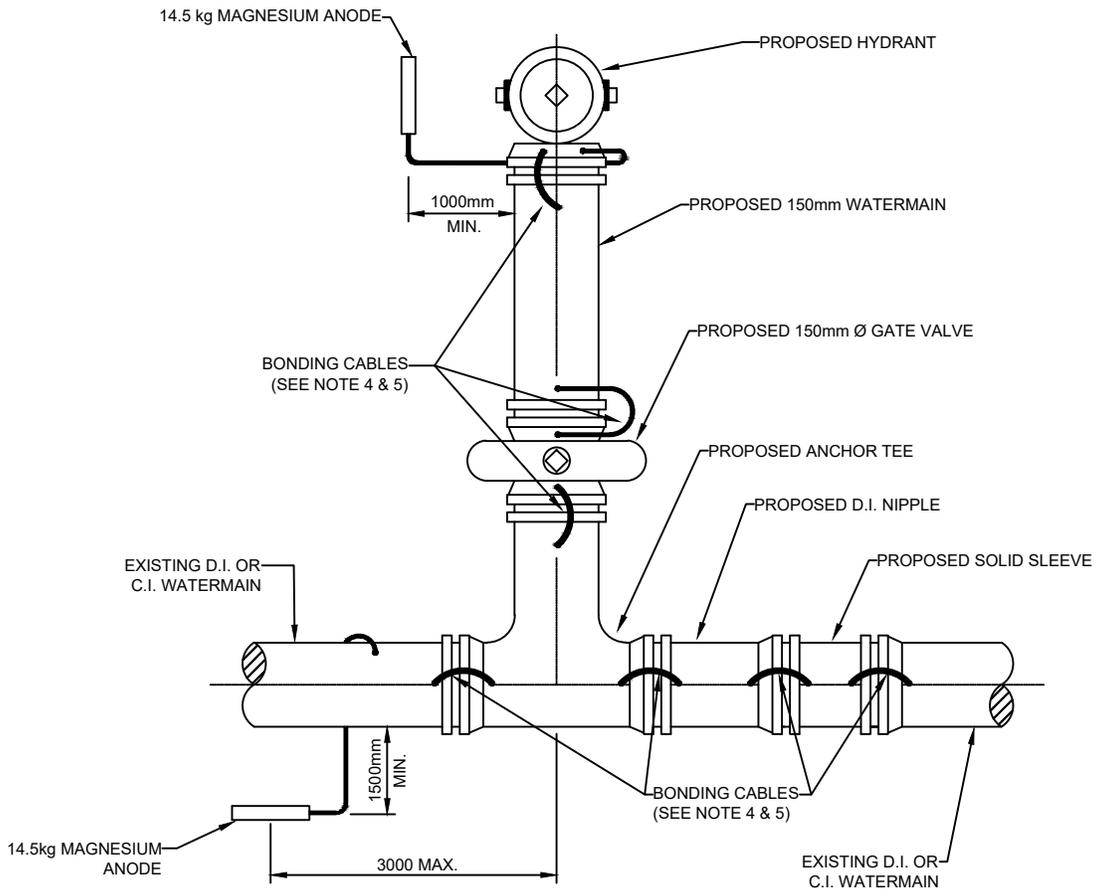
APPROVED
[Signature]

REVISION

DATE OF REVISION
JANUARY 2026

DATE OF ISSUE
JAN. 1990

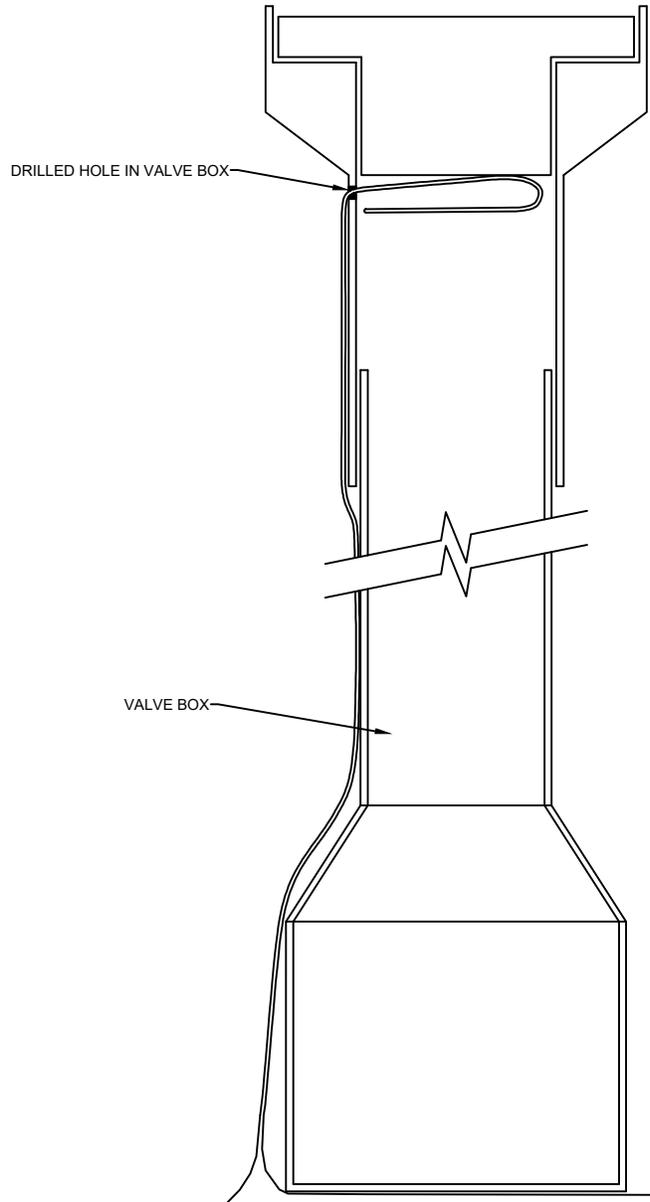
DRAWING No.
KS-851



NOTES:

1. ANODE TO BE PLACED AT LEAST 1.0m AWAY FROM THE FITTINGS AND AS DEEP AS THE BOTTOM OF THE FITTINGS. MINIMUM DISTANCE BETWEEN ANODES TO BE 1.0m.
2. ALL FITTINGS TO BE COATED WITH BITUMINOUS SEALER ON SITE.
3. PROVIDE 0.20mm POLYETHYLENE BOND BREAKER BETWEEN CONCRETE AND FITTINGS.
4. ALL THERMITE WELD CONNECTIONS TO BE COATED WITH "ROYBOND 747" PRIMER AND ROYSTON "HANDY CAP" OR APPROVED EQUAL.
5. BONDING CABLE TO BE NO. 6, SEVEN STRAND COATED COPPER WIRE, CAD WELD TO FITTINGS.

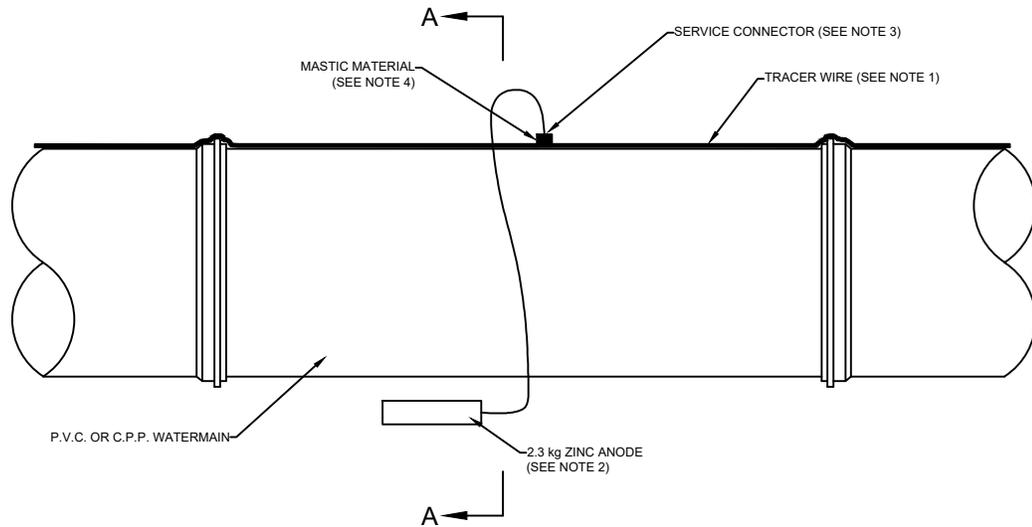
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 1990
	CORROSION PROTECTION FOR HYDRANT CUT INTO AN EXISTING D.I. OR C.I. WATERMAIN	REVISION	DRAWING No. KS-854
		DATE OF REVISION JANUARY 2026	



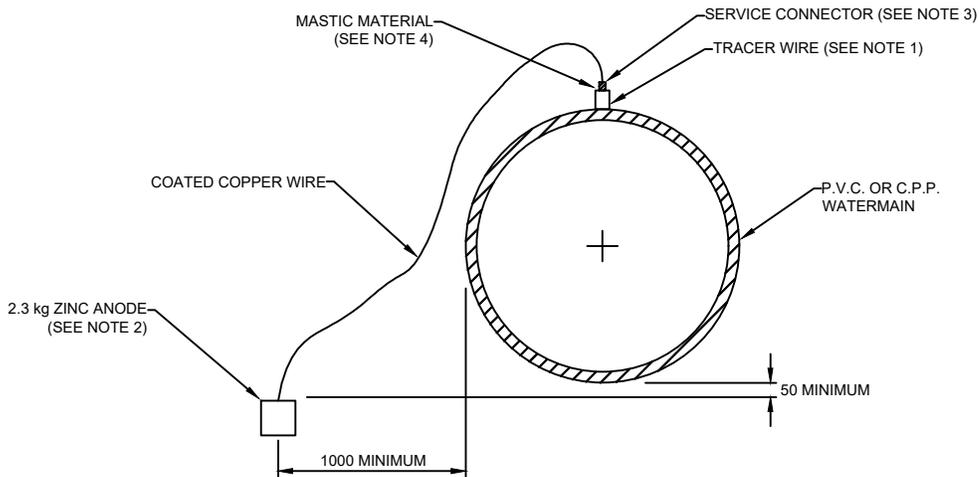
NOTES:

1. TRACER WIRE - #12 GAUGE STRANDED, C.S.A. TYPE T.W.H.
2. TRACER WIRE TO BE INSTALLED OUTSIDE LOWER VALVE BOX AND BROUGHT INTO UPPER SECTION OF VALVE BOX AND LOOPE AT TOP. LOOP TO BE A MINIMUM 450mm IN LENGTH.
3. CONNECTORS USED FOR SPLICING TRACER WIRE SHALL BE WING NUT TYPE, WITH NYLON SHELL AND NON-CORROSIVE STEEL WIRE SPRING.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 1990
	TRACER WIRE ARRANGEMENT AT VALVE BOX FOR P.V.C OR C.P.P. WATERMAIN	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-860



ELEVATION



SECTION A-A

NOTES:

1. TRACER WIRE - #12 GAUGE STRANDED, C.S.A. TYPE T.W.H.
2. ONE 2.3 kg ZINC ANODE TO BE SUPPLIED AND INSTALLED IN A MANNER APPROVED BY THE TOWNSHIP ENGINEER FOR EVERY 500m OF TRACER WIRE INSTALLED.
3. SERVICE CONNECTOR TO BE A 'BURNDY SERVIT' TYPE K.S. MODEL KS20 COPPER OR APPROVED EQUAL.
4. CONNECTOR SPLICE TO BE WRAPPED WITH 'SCOTCHFILL' ELECTRICAL PUTTY OR APPROVED EQUAL.
5. ALL DIMENSIONS ARE IN MILLIMETRES.
6. THE LOCATION OF EACH TRACER WIRE ANODE MUST BE DETAILED ON THE CONTRACT DRAWINGS.



TOWNSHIP OF KING

CORROSION PROTECTION FOR TRACER WIRES ON P.V.C. OR C.P.P. WATERMAINS

APPROVED *[Signature]*

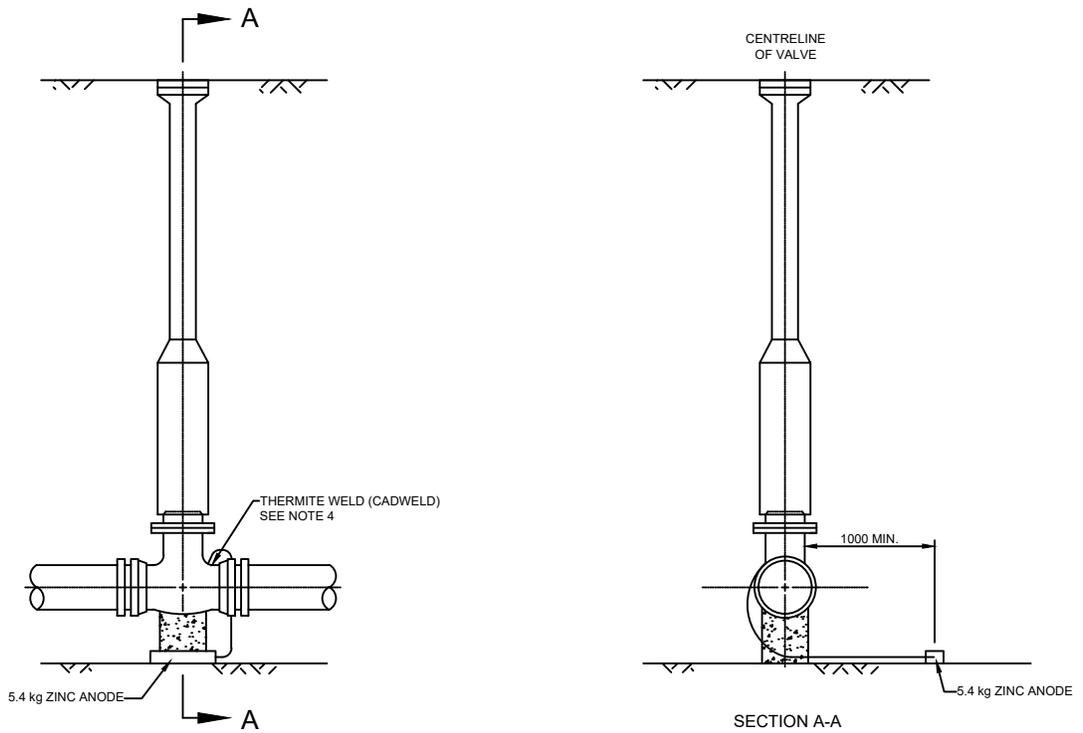
DATE OF ISSUE
JAN. 1990

REVISION

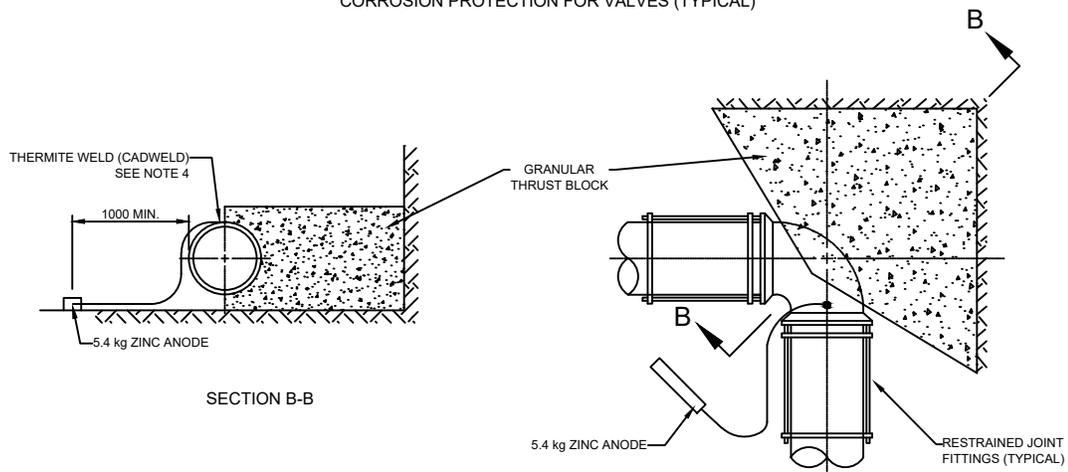
DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-870



CORROSION PROTECTION FOR VALVES (TYPICAL)



CORROSION PROTECTION FOR FITTINGS (TYPICAL)

NOTES:

1. ANODE TO BE PLACED AT LEAST 1.0m FROM THE FITTING AND AS DEEP AS THE BOTTOM OF THE FITTINGS. MINIMUM DISTANCE BETWEEN ANODES TO BE 1.0m.
2. ALL VALVES AND FITTINGS TO BE COATED WITH BITUMINOUS SEALER PRIOR TO INSTALLATION ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES.
4. PROVIDE 0.2m POLYETHYLENE BOND BREAKER BETWEEN CONCRETE AND FITTINGS.
5. ALL THERMITE WELD CONNECTIONS TO BE COATED WITH 'ROYBOND 747' PRIMER AND ROYSTON 'HANDY CAP' OR APPROVED EQUAL.



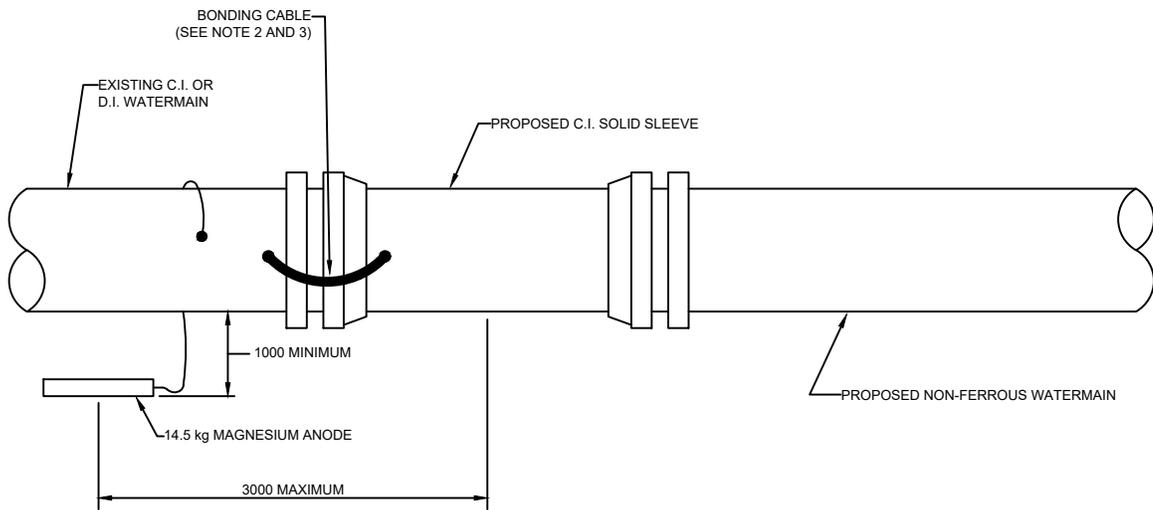
TOWNSHIP OF KING

CORROSION PROTECTION FOR VALVES & FITTINGS ON NON-FERROUS PIPE

APPROVED *[Signature]*
 REVISION
 DATE OF REVISION
 JANUARY 2026

DATE OF ISSUE
 JAN. 1990

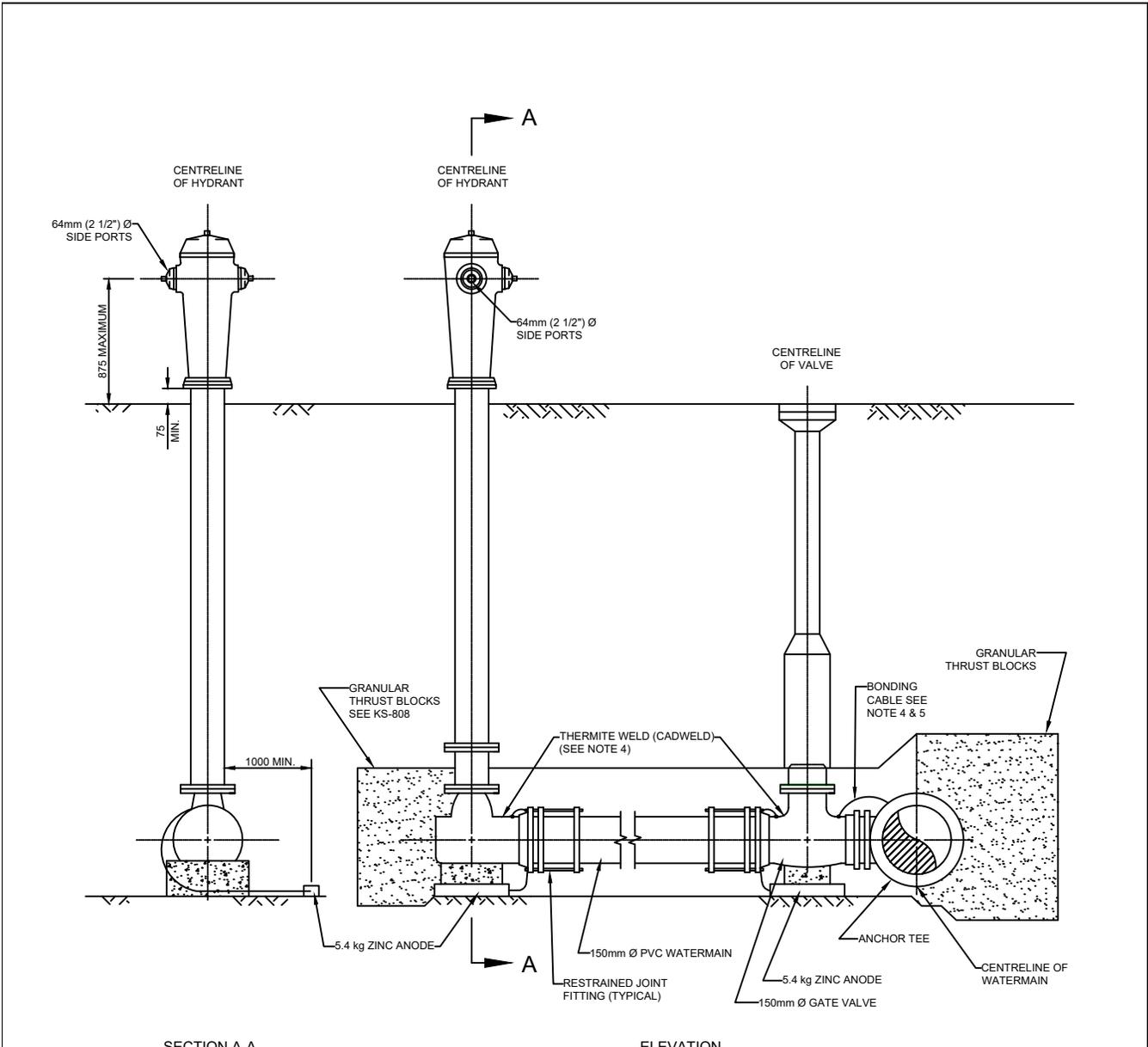
DRAWING No.
KS-871



NOTES:

1. ANODE TO BE PLACED AT LEAST 1.0m AWAY FROM THE FITTING AND AS DEEP AS THE BOTTOM OF THE FITTINGS. MINIMUM DISTANCE BETWEEN ANODES TO BE 1.0m.
2. ALL THERMITE WELD CONNECTIONS TO BE COATED WITH 'ROYBOND 747' PRIMER AND ROYSTON 'HANDY CAP' OR APPROVED EQUAL.
3. BONDING CABLE TO BE No. 6 SEVEN STRAND COATED COPPER WIRE, CADWELDED TO FITTINGS.
4. ALL DIMENSIONS IN MILLIMETRES.

	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 1990
	CORROSION PROTECTION FOR EXISTING FERROUS WATERMAIN CONNECTED TO PROPOSED NON-FERROUS WATERMAIN	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-873



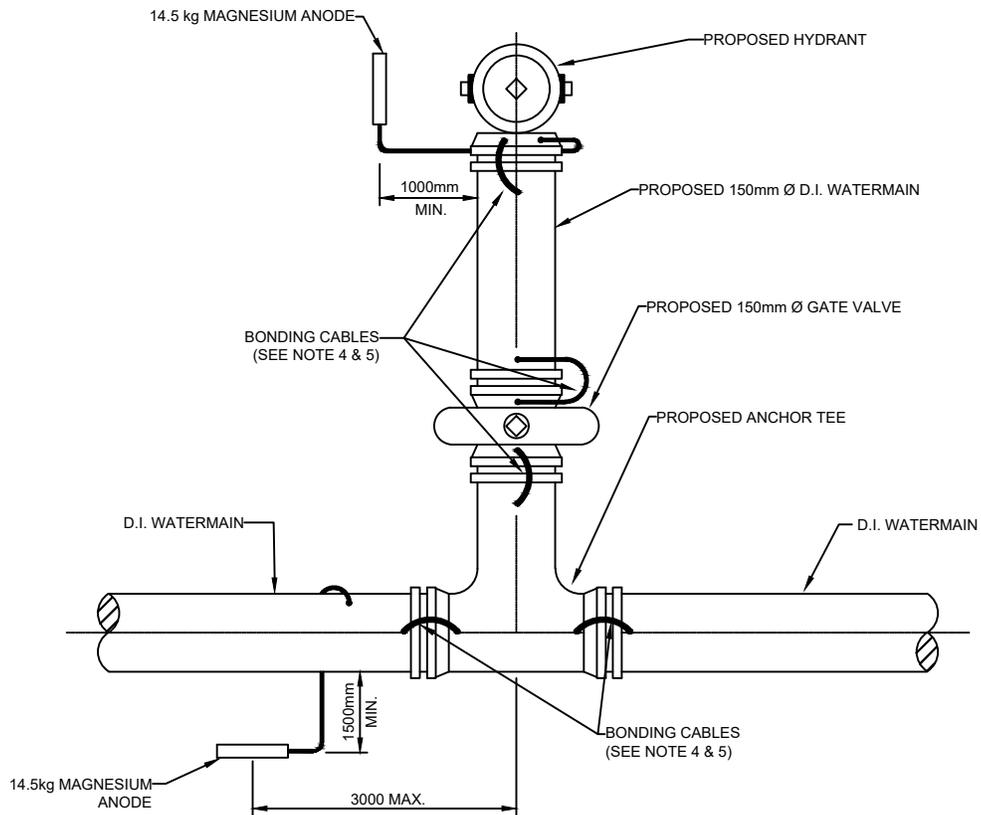
SECTION A-A

ELEVATION

NOTES:

1. ANODE TO BE PLACED AT LEAST 1.0m AWAY FROM THE FITTINGS AND AS DEEP AS THE BOTTOM OF THE FITTINGS. MINIMUM DISTANCE BETWEEN ANODES TO BE 1.0m
2. ALL FITTINGS TO BE COATED WITH BITUMINOUS SEALER ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES.
4. ALL THERMITE WELD CONNECTIONS TO BE COATED WITH 'ROYBOND 747' PRIMER AND ROYSTON 'HANDY CAP' OR APPROVED EQUAL.
5. BONDING CABLE TO BE No. 6 SEVEN STRAND COATED COPPER WIRE, CADWELDED TO FITTINGS.

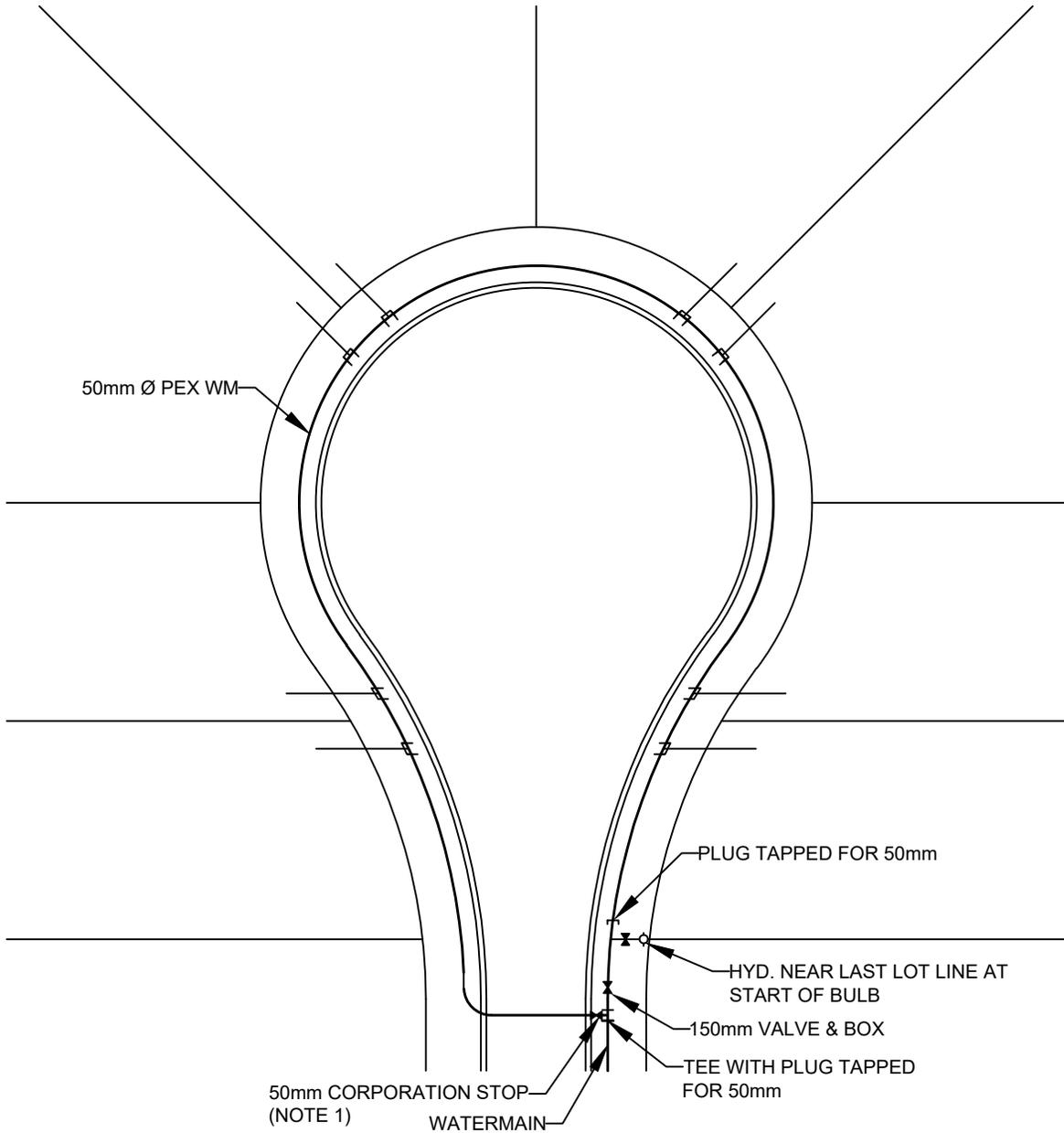
	TOWNSHIP OF KING	APPROVED 	DATE OF ISSUE JAN. 1990
	CORROSION PROTECTION FOR HYDRANT ASSEMBLY ON NON-FERROUS PIPE	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-874



NOTES:

1. ANODE TO BE PLACED AT LEAST 1.0m AWAY FROM THE FITTINGS AND AS DEEP AS THE BOTTOM OF THE FITTINGS. MINIMUM DISTANCE BETWEEN ANODES TO BE 1.0m
2. ALL FITTINGS TO BE COATED WITH BITUMINOUS SEALER ON SITE.
3. PROVIDE 0.20mm POLYETHYLENE BOND BREAKER BETWEEN CONCRETE AND FITTINGS.
4. ALL THERMITE WELD CONNECTIONS TO BE COATED WITH "ROYBOND 747" PRIMER AND ROYSTON "HANDY CAP" OR APPROVED EQUAL.
5. BONDING CABLE TO BE No. 6, SEVEN STRAND COATED COPPER WIRE, CAD WELD TO FITTINGS.

	TOWNSHIP OF KING	APPROVED <i>[Signature]</i>	DATE OF ISSUE JAN. 1990
	CORROSION PROTECTION FOR HYDRANTS OFF OF D.I. WATERMAINS	REVISION	DRAWING No.
		DATE OF REVISION JANUARY 2026	KS-875



- NOTES:
1. VALVE AND BOX IS NOT TO BE LOCATED WITHIN TRAVELED PORTION OR ROAD.



TOWNSHIP OF KING

**WATERMAIN CONFIGURATION FOR
DEAD END CUL-DE-SACS**

APPROVED *[Signature]*

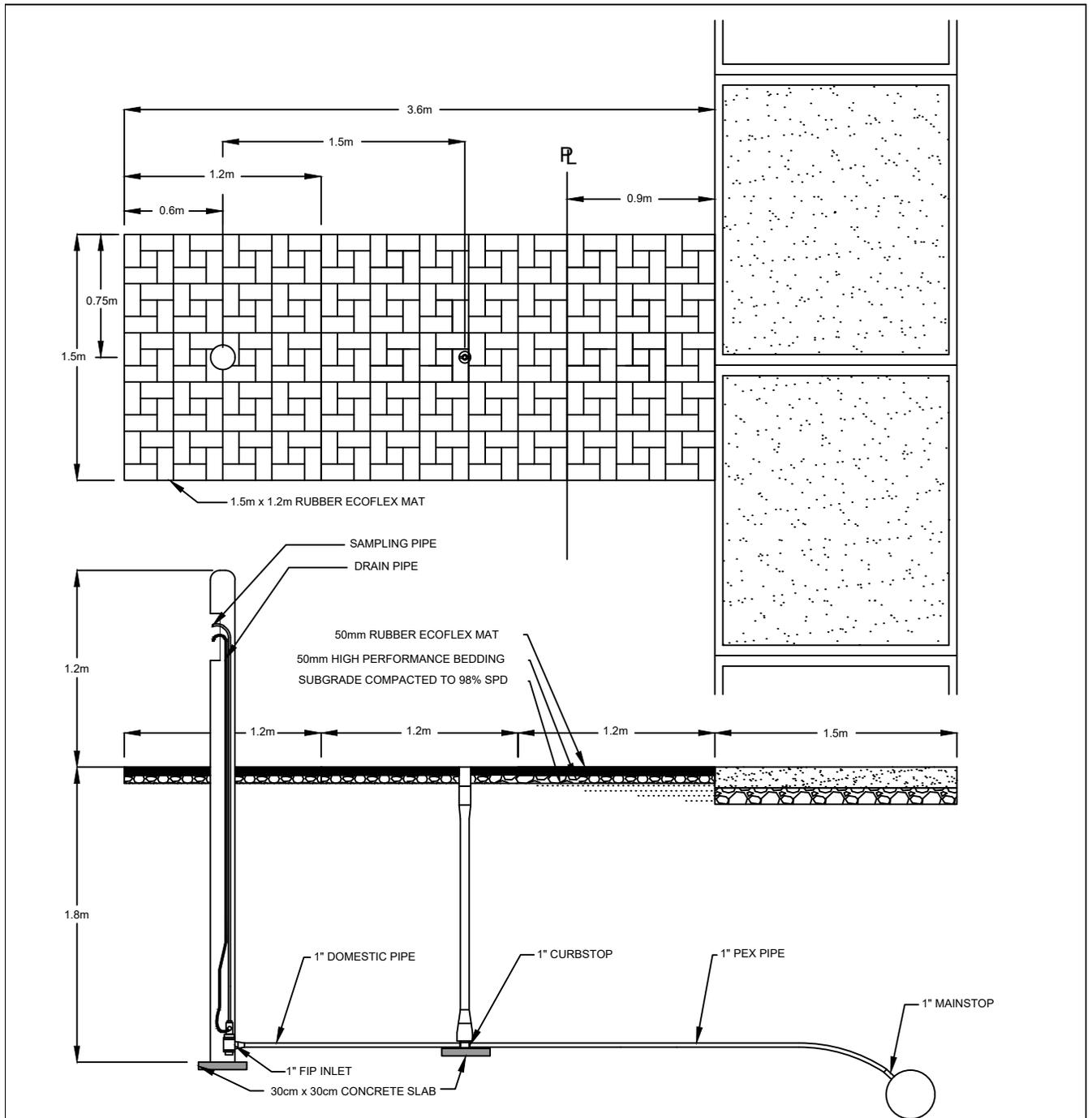
DATE OF ISSUE

REVISION

DRAWING No.

DATE OF REVISION
JANUARY 2026

KS-877



NOTES:

1. SAMPLING STATIONS TO BE WITH 'TEST TAP' (CROMER), OR EQUIVALENT.
2. SAMPLING STATION INSTALLATION SHALL BE WITH A 25mm FIP INLET AND 12.5mm UNTHREADED BLOW OFF AND SAMPLING BIB.
3. STATION SHALL INCLUDE A LOCKABLE CAST ALUMINUM ENCLOSURE WITH HINGED OPENINGS AND A CAST ALLUMINUM PEDESTAL ALL GREEN IN COLOUR.
4. THE STATION SHALL NOT REQUIRE A KEY FOR OPERATION ONCE THE ENCLOSURE IS OPEN.
5. ALL OPERATIONAL COMPONENTS AND WETTED MATERIALS OF THE STATION SHALL BE STAINLESS STEEL AND OPERATIONAL AND REPLACEABLE FROM THE GROUND SURFACE WITHOUT EXCAVATION.
6. GASKET AVAILABLE FROM THE SUPPLIER IS TO BE INSTALLED BETWEEN THE CONCRETE SURFACE AND THE PEDESTAL BASE.
7. CONFIRM WITH SUPPLIER AND INCLUDE WITH THE INSTALLATION A 100mm DIA. PVC PIPE FOR THE ENCLOSURE BASE CLAMP WHERE REQUIRED.
8. CORROSION PROTECTION OF BURIED PIPE COMPONENTS IS REQUIRED PRIOR TO INSTALLATION PER MANUFACTURER'S SPECIFICATIONS USING BITUMINOUS SPRAY TAR OR APPROVED EQUAL.
9. NO LEAD FITTINGS (MAINSTOP, CURBSTOP ETC.) ARE TO BE USED.



TOWNSHIP OF KING

**SIDE VIEW OF SAMPLING
STATION INSTALLATION**

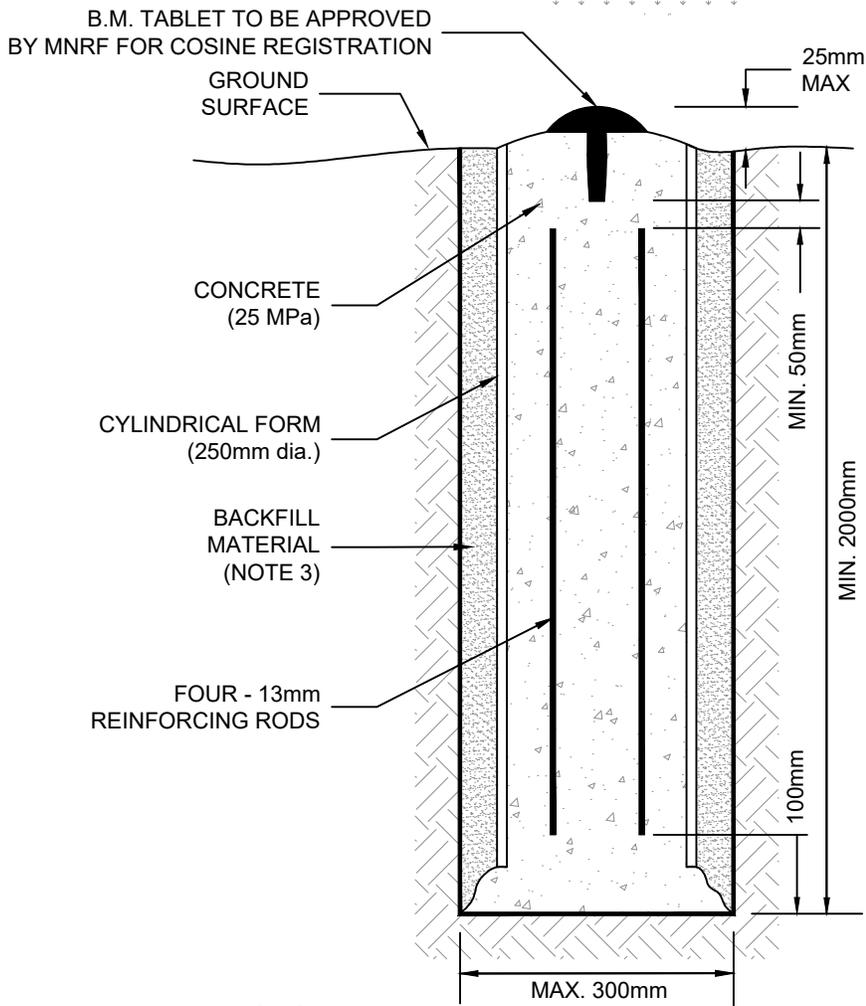
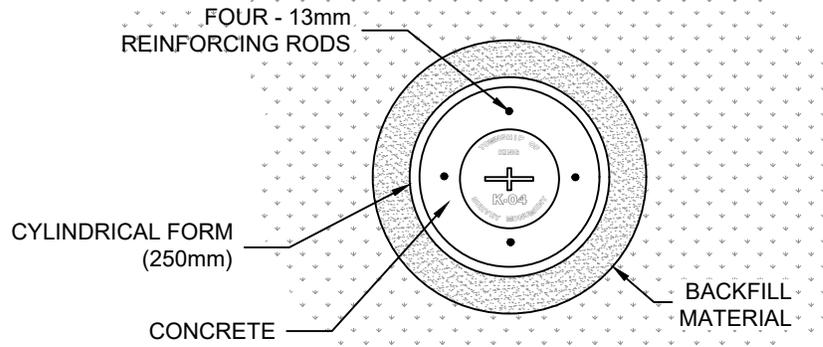
APPROVED *[Signature]*

DATE OF ISSUE
FEB. 2010

REVISION

DRAWING No.
KS-878

DATE OF REVISION
JANUARY 2026



NOTES:

- 1) CONTACT THE TOWNSHIP OF KING FOR SUBMISSION REQUIREMENTS AND FOR LOCATION OF BENCHMARK MONUMENT
- 2) NOTIFY THE TOWNSHIP OF KING FOR INSPECTION PRIOR TO POURING OF CONCRETE.
- 3) BENCH MARK (B.M.) NUMBER MUST BE PUNCHED BY INSTALLER ON THE TABLET PRIOR TO INSTALLATION
- 4) BACKFILL MATERIAL TO BE LIMESTONE SCREENING OR FINE GRAVEL AND REQUIRED TO BE WELL TAMPED



TOWNSHIP OF KING

**BENCHMARK MONUMENT
DETAILS**

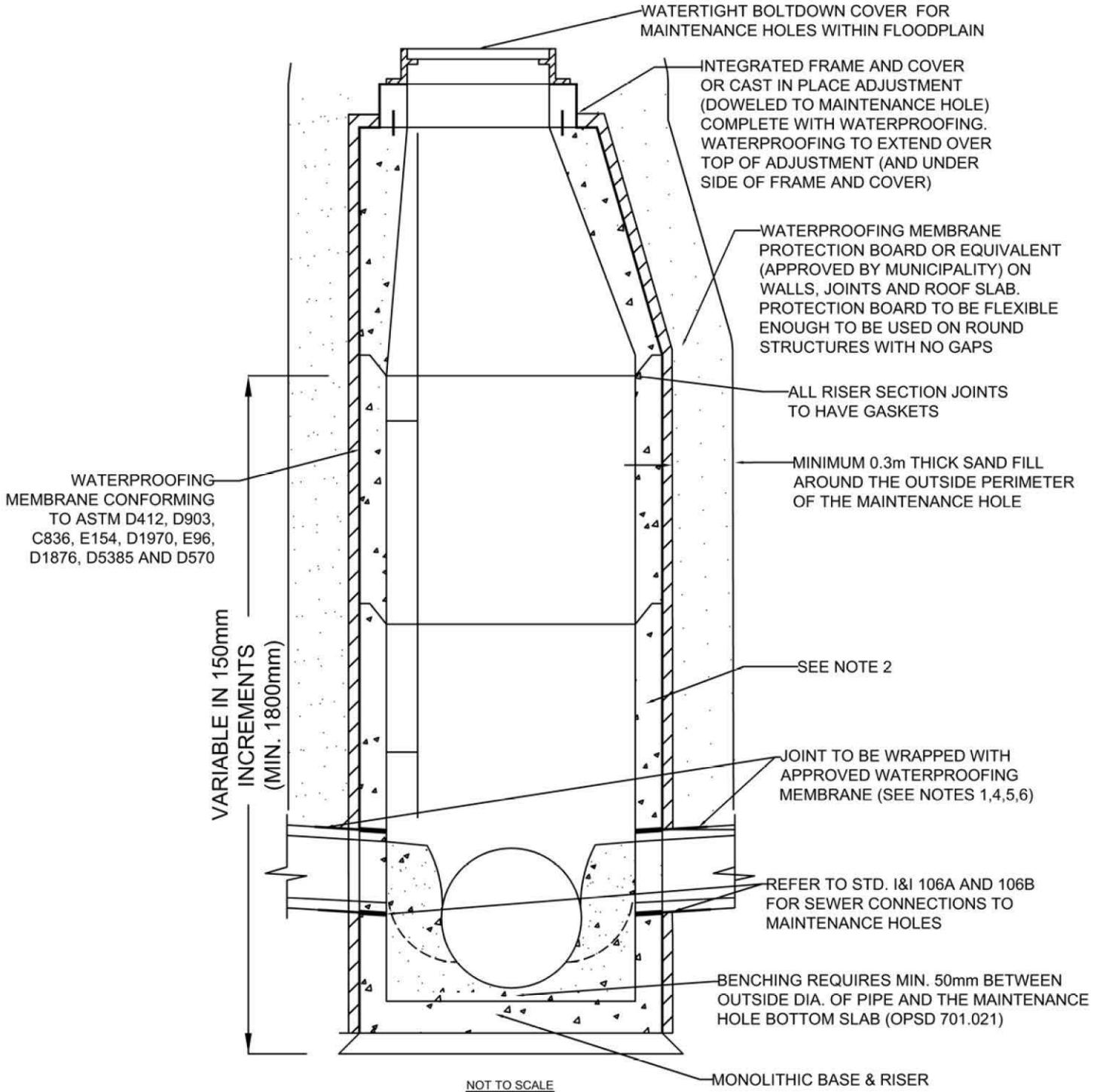
APPROVED *Calvin Kirk*

REVISION

DATE OF REVISION
JANUARY 2026

DATE OF ISSUE
NOV. 2007

DRAWING No.
KS-900



NOTES:

1. MAINTENANCE HOLES LOCATED WITHIN FLOODPLAINS AND/OR AREAS WITH HIGH GROUNDWATER, DEFINED AS, HYDROSTATIC ORESSURE GREATER THAN 85 KPA AND/OR WHERE THE SEWER OBVERT IS 0.5M OR MORE BELOW THE SEASON HIGH GROUNDWATER TABLE ARE TO BE FULLY WATERPROOFED. THE ENTIRE EXTERNAL SURFACE AREA OF THE MAINTENANCE HOLE, INCLUDING ALL WALLS, JOINTS, ADJUSTMENT SECTIONS AND ROOF SLAB SHALL BE WRAPPED IN A WATERPROOFING MEMBRANE. WACH WATERPROOFING MEMBRANE LAYER SHALL OVERLAP A MINIMUM OF 0.15M.
2. MAXIMUM RISER HEIGHT AS PRACTICAL SHALL BE USED TO ALLEVIATE INFILTRATION THROUGH RISER SEGMENT JOINTS
3. REFER TO STANDARDS NO. I&I-106A/B FOR MAINLINE TO MAINTENANCE HOLE CONNECTIONS
4. FLEXIBLE SEWER PIPE CONNECTIONS TO NEW MAINTENANCE HOLES SHALL HAVE FACTORY INSTALLED RESILIENT CONNECTORS IN THE STRUCTURE OPENINGS
5. FLEXIBLE SEWER PIPE CONNECTIONS TO EXISTING MAINTENANCE HOLES SHALL HAVE WATER STOPS INSTALLED AND THE ANNULAR SPACE FILLED WITH PRE-PACKAGED NON-SHRINK GROUT FLUSH WITH THE EXTERNAL WALLS OF THE MAINTENANCE HOLES. WATERPROOFING MEMBRANE SHALL BE INSTALLED AND EXTEND 0.3m BEYOND THE POINT OF CONNECTION AROUND THE PIPE AND ON THE MAINTENANCE HOLES EXTERNAL WALLS
6. RIGID SEWER PIPE MAINLINE CONNECTIONS TO MAINTENANCE HOLES SHALL BE WITH A RESILIENT CONNECTOR FOR NEW INSTALLATIONS WHERE PIPE SIZES PERMIT. THE ANNULAR SPACE SHALL BE MORTARED WITH PRE-PACKAGED NON-SHRINK GROUT WHERE A RESILIENT CONNECTOR CANNOT BE INSTALLED OR FOR CONNECTIONS TO EXISTING MAINTENANCE HOLES. WATERPROOFING MEMBRANE SHALL BE INSTALLED AND EXTEND 0.3M BEYOND THE POINT OF CONNECTION AROUND THE PIPE AND ON THE MAINTENANCE HOLE EXTERNAL WALL.
7. BENCHING DETAILS REFER TO OPSD 701.021
8. REFER TO OTHER MAINTENANCE HOLE STANDARDS FOR SIZING, CONFIGURATIONS AND STRUCTURAL ELEMENTS

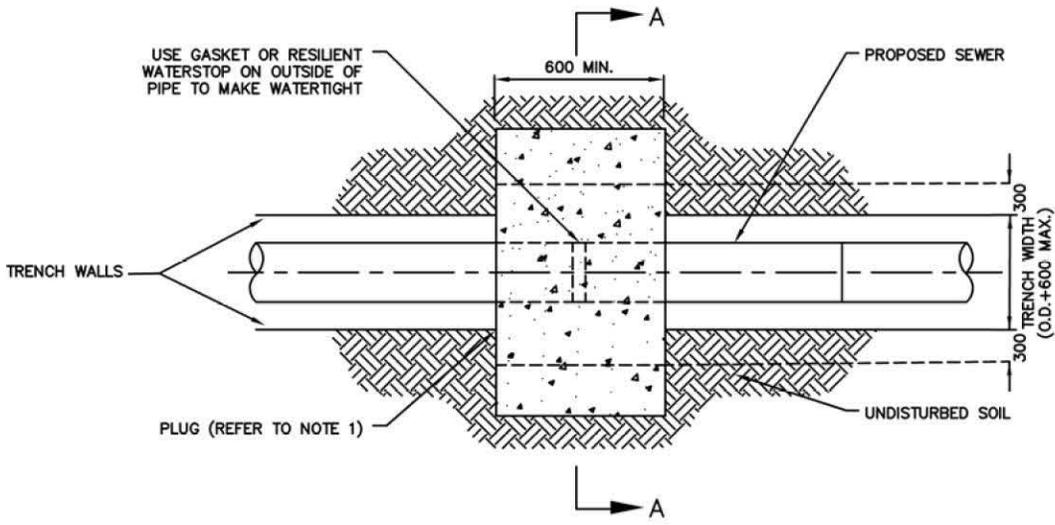
Calvin

WATERPROOFING MEMBRANE SYSTEM FOR MAINTENANCE HOLES WITHIN AREAS SUSCEPTIBLE TO HIGH GROUNDWATER OR LOCATED WITHIN FLOODPLAINS, AREAS OF CONCENTRATED RUNOFF

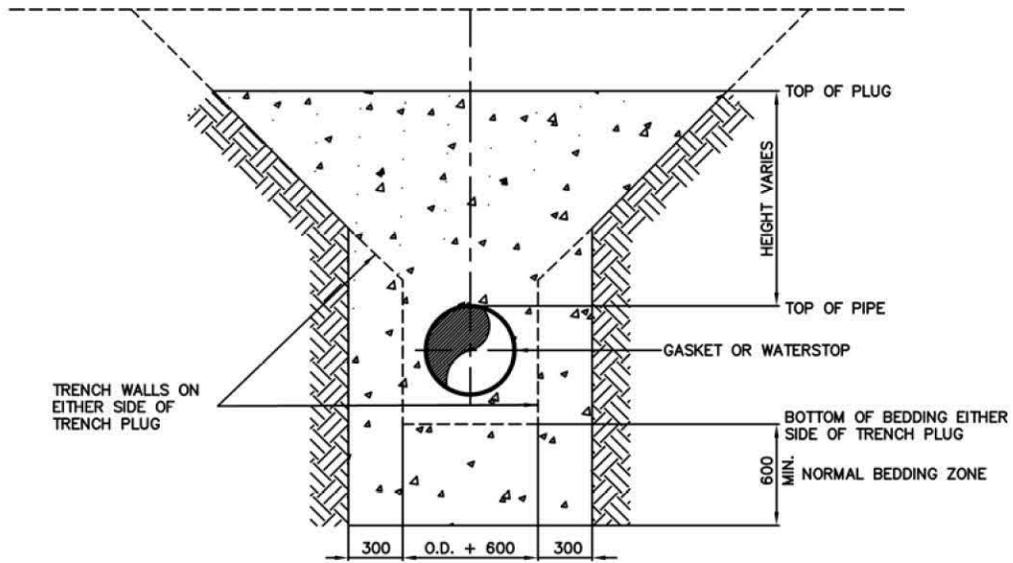
DRAWN-BY

DATE 10 - 29 - 21

STANDARD NO. I&I - 104



PLAN



SECTION A-A

LEGEND: O.D. = OUTSIDE DIAMETER
SDR = STANDARD DIMENSION RATIO

NOT TO SCALE

NOTES:

1. TRENCH PLUGS SHALL BE CONSTRUCTED OF A BENTONITE MIXTURE, IMPORTED OR NATIVE CLAYS, O.REG. 153/04 AS APPROVED BY A GEOTECHNICAL ENGINEER. ALL NATIVE AND IMPORTED MATERIAL TO MEET MECP SOIL, GROUNDWATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA TABLE 1 CRITERIA.
2. PLUGS SHALL EXTEND 300mm INTO UNDISTURBED GROUND ON SIDES OF TRENCH WHETHER OPEN CUT OR VERTICAL TRENCH.
3. TRENCH PLUGS SPACING AND HEIGHT AS PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
4. LOCATIONS OF PLUGS MAY BE ADJUSTED TO AVOID OBSTACLES.
5. ALL DIMENSIONS IN mm

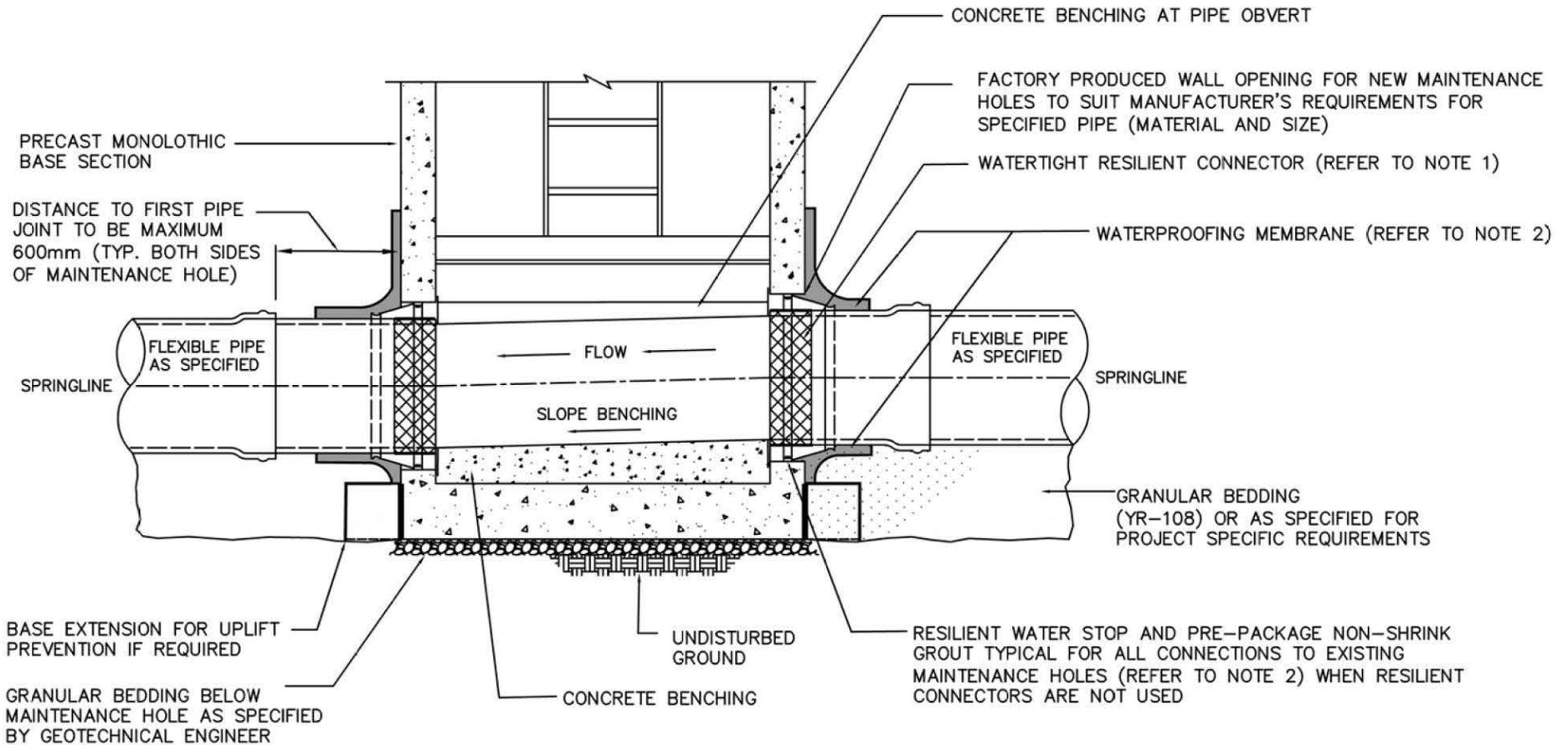
Calvin Smith

SEWER TRENCH PLUG

DRAWN-BY

DATE 10 - 29 - 21

STANDARD NO. I&I - 105



NOTES:

1. FLEXIBLE SEWER PIPE CONNECTIONS TO NEW MAINTENANCE HOLES SHALL HAVE FACTORY INSTALLED RESILIENT CONNECTORS IN STRUCTURE OPENING.
2. FLEXIBLE SEWER PIPE CONNECTIONS TO EXISTING MAINTENANCE HOLES SHALL HAVE RESILIENT WATER STOPS INSTALLED AND ANNULAR SPACE FILLED WITH PRE-PACKAGED NON-SHRINK GROUT FLUSH WITH EXTERNAL AND INTERNAL WALLS OF MAINTENANCE HOLES. WATERPROOFING SHALL BE INSTALLED AND EXTEND 0.3m BEYOND THE POINT OF CONNECTION AROUND THE PIPE
3. RESILIENT CONNECTORS AND WATERSTOPS SHALL CONFORM TO ASTM C923
4. PRE-PACKAGED NON-SHRINK GROUT SHALL CONFORM TO ASTM C1107
5. WATERPROOFING MEMBRANE SHALL CONFORM TO ASTM D412, D903, C836, E154, D1970, E96, D1876, D5385 AND D570
6. BENCHING DETAILS REFER TO OPSD 701.021

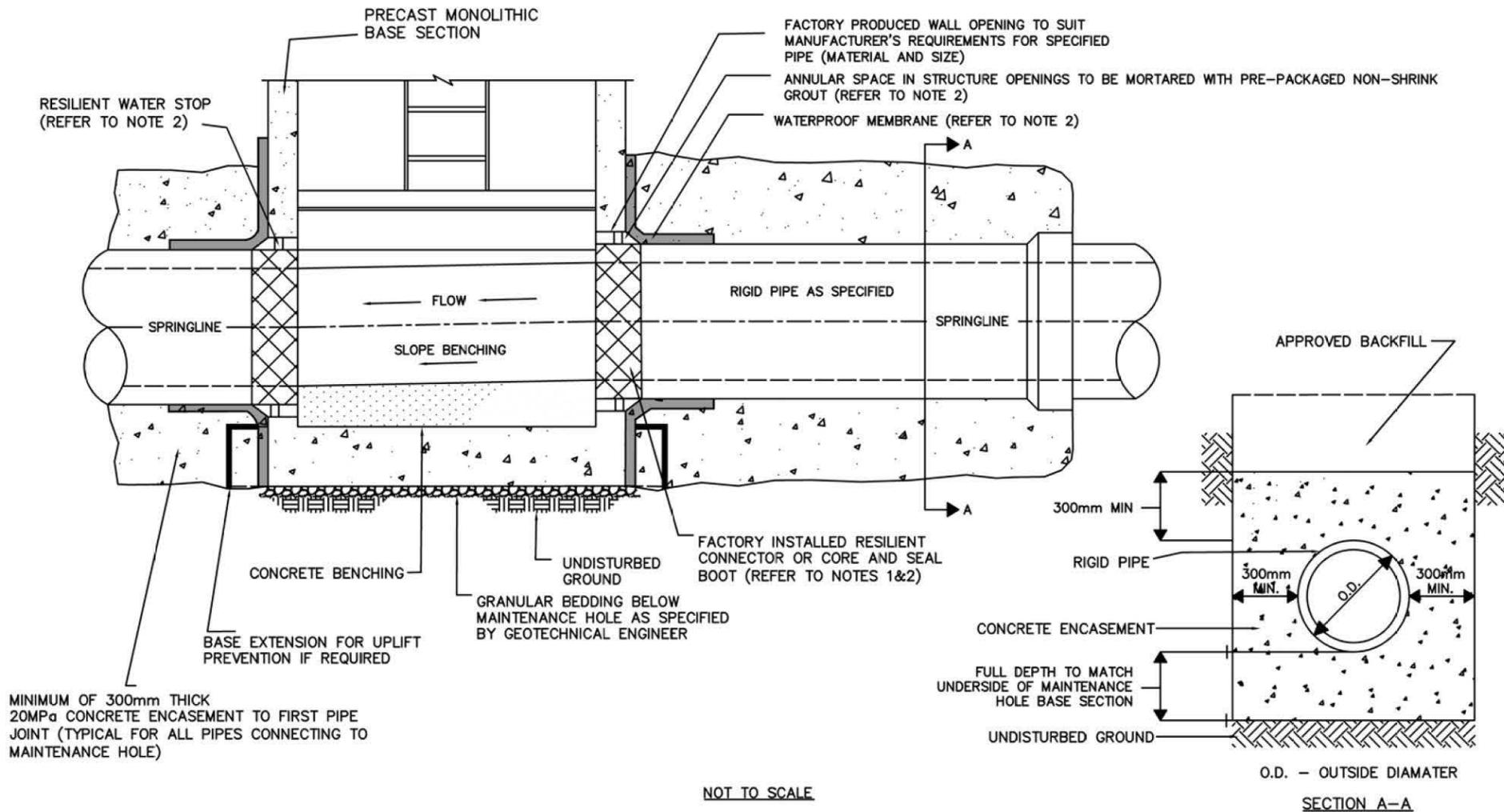
Calvin Clark

SANITARY SEWER MAINLINE TO
MAINTENANCE HOLE CONNECTION
FOR FLEXIBLE SEWER PIPE

DRAWN-BY

DATE 10-29-21

STANDARD NO. |&|-106A



NOTES:

1. RIGID SEWER PIPE MAINLINE CONNECTIONS TO MAINTENANCE HOLES SHALL BE MADE WITH A RESILIENT CONNECTOR FOR NEW INSTALLATIONS WHERE PIPE SIZES PERMIT. THE ANNULAR SPACE SHALL BE MORTARED WITH PRE-PACKAGED NON-SHRINK GROUT WHERE A RESILIENT CONNECTOR CANNOT BE INSTALLED OR FOR CONNECTIONS TO EXISTING MAINTENANCE HOLES. THE WATERPROOFING MEMBRANE SHALL BE INSTALLED AND EXTEND 0.3m BEYOND THE POINT OF CONNECTION AROUND THE PIPE AND ON THE MAINTENANCE HOLE EXTERNAL WALL.
2. RIGID SEWER PIPE CONNECTIONS TO EXISTING MAINTENANCE HOLES AND SHALL HAVE RESILIENT WATER STOPS OR CORE AND SEAL BOOTS
3. RESILIENT CONNECTORS AND WATERSTOPS SHALL CONFORM TO ASTM C923
4. PRE-PACKAGED NON-SHRINK GROUT SHALL CONFORM TO ASTM C1107
5. WATERPROOFING MEMBRANE SHALL CONFORM TO ASTM D412, D903, C836, E154, D1970, E96, D1876, D5385 AND D570
6. BENCHING DETAILS REFER TO OPSD 701.021

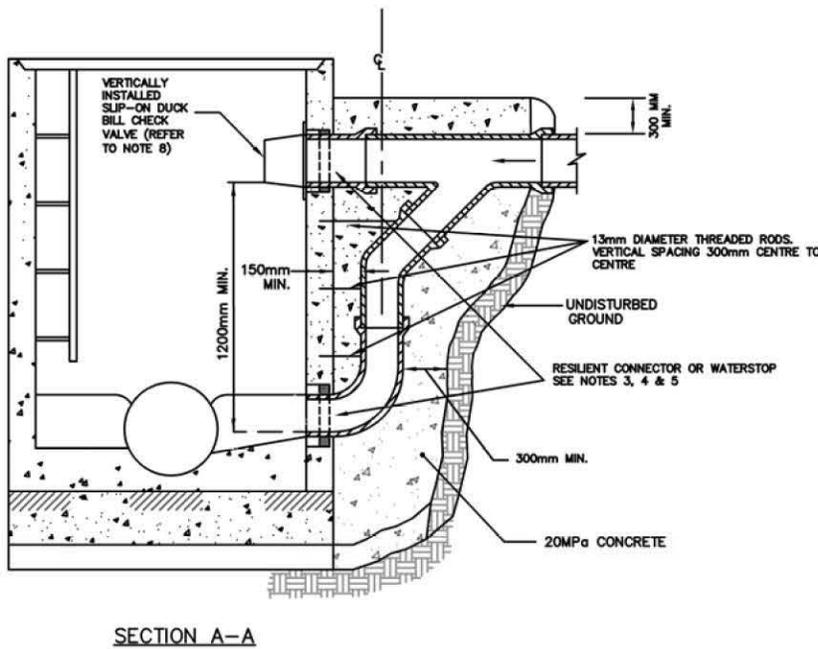
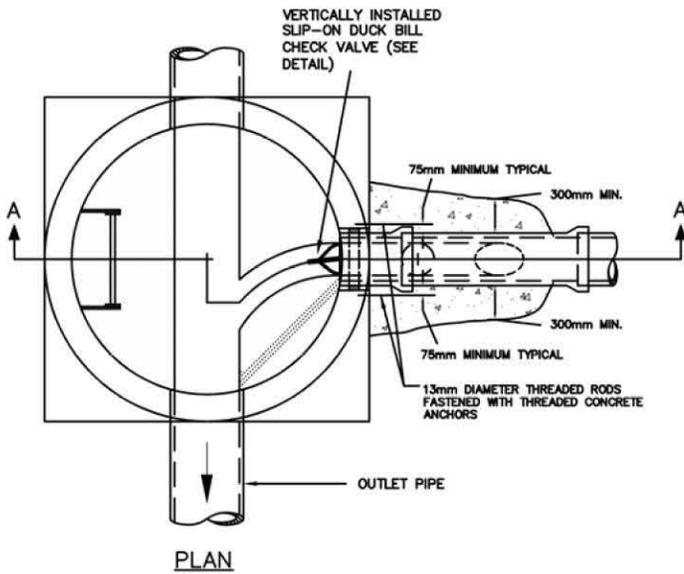
Calvin Clark

SANITARY SEWER MAINLINE TO
MAINTENANCE HOLE CONNECTION
FOR RIGID SEWER PIPE

DRAWN-BY

DATE 10-29-21

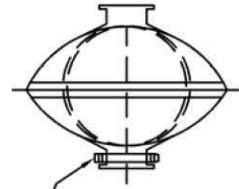
STANDARD NO. I&I-106B



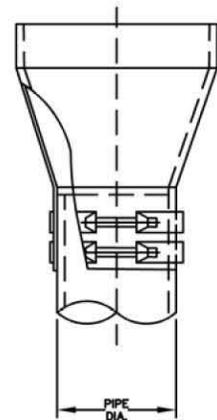
NOT TO SCALE

DETAIL

SLIP-ON DUCK BILL CHECK VALVE



FRONT VIEW



SIDE VIEW

NOTES:

1. DROP STRUCTURE TO BE COMPLETELY ENCASED IN 300mm OF 20MPa CONCRETE AND SECURED TO THE MAINTENANCE HOLE WITH 450mm LONG, 13mm ϕ THREADED STAINLESS STEEL OR GALVANIZED RODS AND DRILLED EXPANSION ANCHORS DOWN BOTH SIDES OF THE DROP PIPE AT 300mm CENTRE TO CENTRE.
2. DROP PIPE TO BE ONE SIZE SMALLER THAN INCOMING MAIN LINE. DROP PIPE MINIMUM DIAMETER 200mm AND MAXIMUM DIAMETER 450mm.
3. FLEXIBLE SEWER PIPE DROP STRUCTURE CONNECTIONS TO NEW MAINTENANCE HOLES SHALL HAVE FACTORY INSTALLED RESILIENT CONNECTORS IN MAINTENANCE HOLE OPENINGS.
4. FLEXIBLE SEWER PIPE CONNECTIONS TO EXISTING MAINTENANCE HOLES SHALL HAVE RESILIENT WATERSTOPS INSTALLED AND ANNULAR SPACE FILLED WITH PRE-PACKAGED NON-SHRINK GROUT FLUSH WITH EXTERNAL WALLS OF MAINTENANCE HOLES. RESILIENT WATERSTOPS SHALL CONFORM TO ASTM C923.
5. RIGID SEWER PIPE DROP STRUCTURE CONNECTIONS TO MAINTENANCE HOLES SHALL BE MADE WITH A RESILIENT CONNECTOR FOR NEW INSTALLATIONS WHERE PIPE SIZES PERMIT. THE ANNULAR SPACE SHALL BE MORTARED WITH PRE-PACKAGED NON-SHRINK GROUT WHERE A RESILIENT CONNECTOR CANNOT BE INSTALLED OR FOR CONNECTIONS TO EXISTING MAINTENANCE HOLES. PRE-PACKAGED NON-SHRINK GROUT SHALL CONFORM TO ASTM C1107.
6. FOR ITEMS 4 AND 5 ABOVE, WATERPROOFING MEMBRANE SHALL BE INSTALLED AT THE CONNECTION OF THE PIPE TO THE MAINTENANCE HOLE EXTERNAL WALL. THE WATERPROOFING MEMBRANE SHALL EXTEND 0.3M BEYOND THE POINT OF CONNECTION AROUND THE PIPE AND ON THE MAINTENANCE HOLE EXTERNAL WALL.
7. MAINTENANCE HOLES LOCATED WITHIN AREAS SUSCEPTIBLE TO HIGH GROUND WATER OR FLOOD PLAINS SHALL HAVE WATERPROOFING MEMBRANES INSTALLED AT ALL SECTION JOINTS OR WHEN SPECIFIED, THE ENTIRE MAINTENANCE HOLE PER STD I&I-104.
8. OVERFLOW PIPE TO PROTRUDE SUFFICIENTLY BEYOND THE MAINTENANCE HOLE INTERNAL WALL FACE TO FACILITATE FULL INSERTION OF DUCK BILL CHECK VALVE.
9. PRE-CAST DROP STRUCTURES INTEGRAL WITH MAINTENANCE HOLE RISER SECTIONS ARE PERMITTED. WATERPROOFING MEMBRANE SHALL BE INSTALLED PER ITEM 6.
10. BENCHING DETAILS REFER TO OPSD 701.021

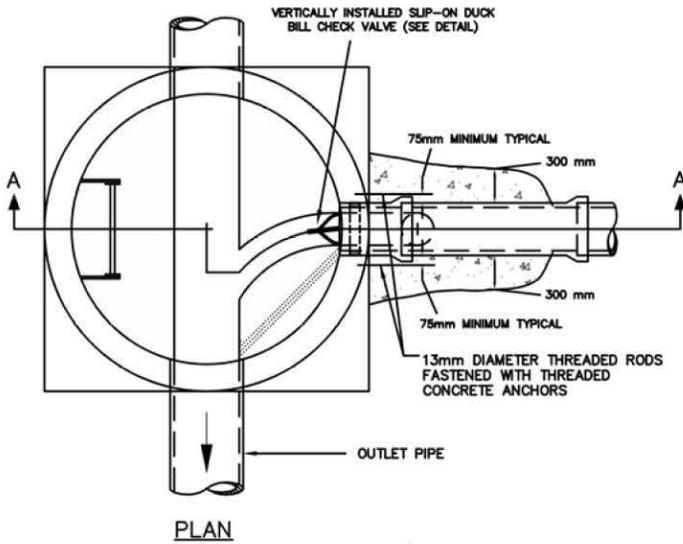
Calvin Sork

MAINTENANCE HOLE
DROP STRUCTURE
TYPE A

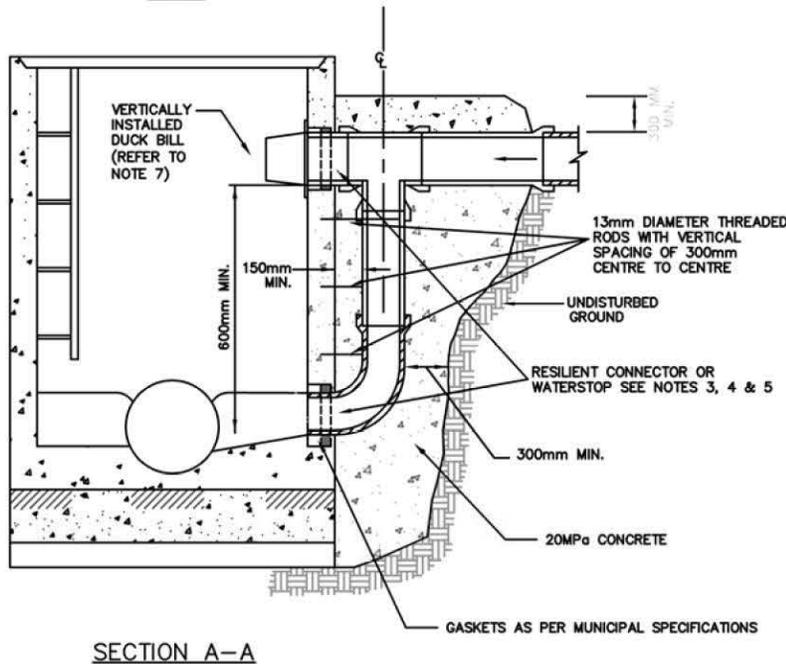
DRAWN-BY

DATE 10-29-21

STANDARD NO. I&I-107A



PLAN

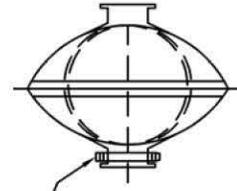


SECTION A-A

NOT TO SCALE

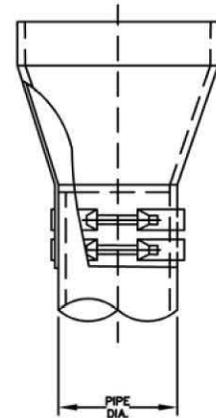
DETAIL

SLIP-ON DUCK BILL CHECK VALVE



304 STAINLESS STEEL PIPE CLAMPS

FRONT VIEW



SIDE VIEW

NOTES:

1. DROP STRUCTURE TO BE COMPLETELY ENCASED IN 300mm OF 20MPa CONCRETE AND SECURED TO THE MAINTENANCE HOLE WITH 450mm LONG, 13mm Ø THREADED RODS AND DRILLED EXPANSION ANCHORS DOWN BOTH SIDES OF THE DROP PIPE AT 300mm CENTRE TO CENTRE.
2. DROP PIPE TO BE ONE SIZE SMALLER THAN INCOMING MAIN LINE. DROP PIPE MINIMUM DIAMETER 200mm AND MAXIMUM DIAMETER 450mm.
3. FLEXIBLE SEWER PIPE DROP STRUCTURE CONNECTIONS TO NEW MAINTENANCE HOLES SHALL HAVE FACTORY INSTALLED RESILIENT CONNECTORS IN MAINTENANCE HOLE OPENINGS.
4. FLEXIBLE SEWER PIPE CONNECTIONS TO EXISTING MAINTENANCE HOLES SHALL HAVE RESILIENT WATERSTOPS INSTALLED AND ANNULAR SPACE FILLED WITH PRE-PACKAGED NON-SHRINK GROUT FLUSH WITH EXTERNAL WALLS OF MAINTENANCE HOLES. RESILIENT WATERSTOPS SHALL CONFORM TO ASTM C923.
5. RIGID SEWER PIPE DROP STRUCTURE CONNECTIONS TO MAINTENANCE HOLES SHALL BE MADE WITH A RESILIENT CONNECTOR FOR NEW INSTALLATIONS WHERE PIPE SIZES PERMIT. THE ANNULAR SPACE SHALL BE MORTARED WITH PRE-PACKAGED NON-SHRINK GROUT WHERE A RESILIENT CONNECTOR CANNOT BE INSTALLED OR FOR CONNECTIONS TO EXISTING MAINTENANCE HOLES. PRE-PACKAGED NON-SHRINK GROUT SHALL CONFORM TO ASTM C1107.
6. FOR ITEMS 4 AND 5 ABOVE, WATERPROOFING MEMBRANE SHALL BE INSTALLED AT THE CONNECTION OF THE PIPE TO THE MAINTENANCE HOLE EXTERNAL WALL. THE WATERPROOFING MEMBRANE SHALL EXTEND 0.3M BEYOND THE POINT OF CONNECTION AROUND THE PIPE AND ON THE MAINTENANCE HOLE EXTERNAL WALL.
7. MAINTENANCE HOLES LOCATED WITHIN AREAS SUSCEPTIBLE TO HIGH GROUND WATER OR FLOOD PLAINS SHALL HAVE WATERPROOFING MEMBRANES INSTALLED AT ALL SECTION JOINTS OR WHEN SPECIFIED, THE ENTIRE MAINTENANCE HOLE PER STD I&I-104.
8. OVERFLOW PIPE TO PROTRUDE SUFFICIENTLY BEYOND THE MAINTENANCE HOLE INTERNAL WALL FACE TO FACILITATE FULL INSERTION OF DUCK BILL CHECK VALVE.
9. PRE-CAST DROP STRUCTURES INTEGRAL WITH MAINTENANCE HOLE RISER SECTIONS ARE PERMITTED. WATERPROOFING MEMBRANE SHALL BE INSTALLED PER ITEM 6.
10. BENCHING DETAILS REFER TO OPSD 701.021

Calvin Turk

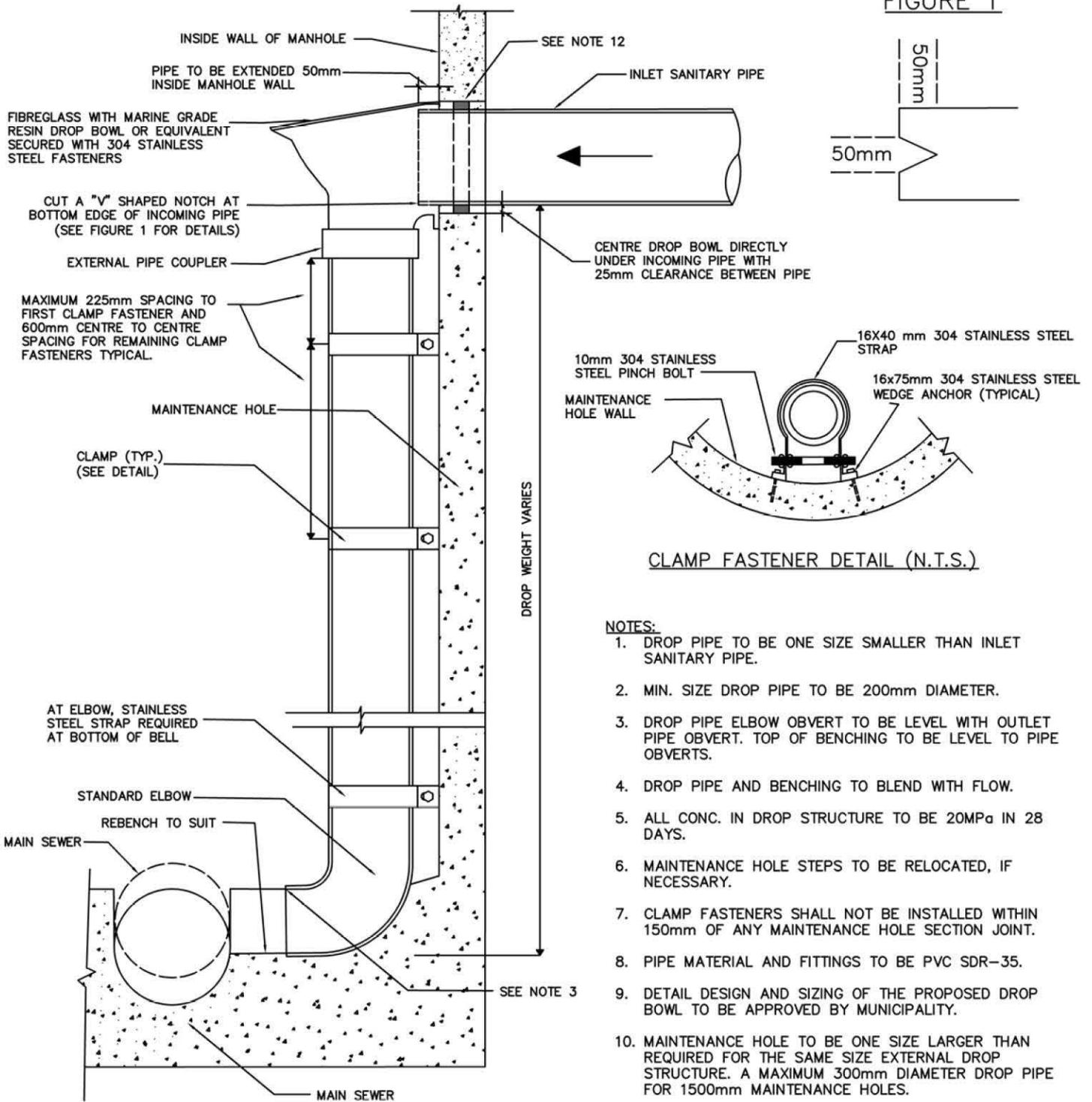
MAINTENANCE HOLE
DROP STRUCTURE
TYPE B

DRAWN-BY

DATE 10-29-21

STANDARD NO. I&I-107B

FIGURE 1



CLAMP FASTENER DETAIL (N.T.S.)

NOTES:

1. DROP PIPE TO BE ONE SIZE SMALLER THAN INLET SANITARY PIPE.
2. MIN. SIZE DROP PIPE TO BE 200mm DIAMETER.
3. DROP PIPE ELBOW OBVERT TO BE LEVEL WITH OUTLET PIPE OBVERT. TOP OF BENCHING TO BE LEVEL TO PIPE OBVERTS.
4. DROP PIPE AND BENCHING TO BLEND WITH FLOW.
5. ALL CONC. IN DROP STRUCTURE TO BE 20MPa IN 28 DAYS.
6. MAINTENANCE HOLE STEPS TO BE RELOCATED, IF NECESSARY.
7. CLAMP FASTENERS SHALL NOT BE INSTALLED WITHIN 150mm OF ANY MAINTENANCE HOLE SECTION JOINT.
8. PIPE MATERIAL AND FITTINGS TO BE PVC SDR-35.
9. DETAIL DESIGN AND SIZING OF THE PROPOSED DROP BOWL TO BE APPROVED BY MUNICIPALITY.
10. MAINTENANCE HOLE TO BE ONE SIZE LARGER THAN REQUIRED FOR THE SAME SIZE EXTERNAL DROP STRUCTURE. A MAXIMUM 300mm DIAMETER DROP PIPE FOR 1500mm MAINTENANCE HOLES.
11. ONLY ONE INTERNAL DROP STRUCTURE PER MAINTENANCE HOLE.
12. REFER TO STANDARDS NO. I&l-106A AND 106B FOR INLET SANITARY SEWER PIPE CONNECTION TO MAINTENANCE HOLE.
13. VORTEX FLOW UNITS SHALL BE INSTALLED FOR DROP HEIGHTS EXCEEDING 5.0m.

NOT TO SCALE

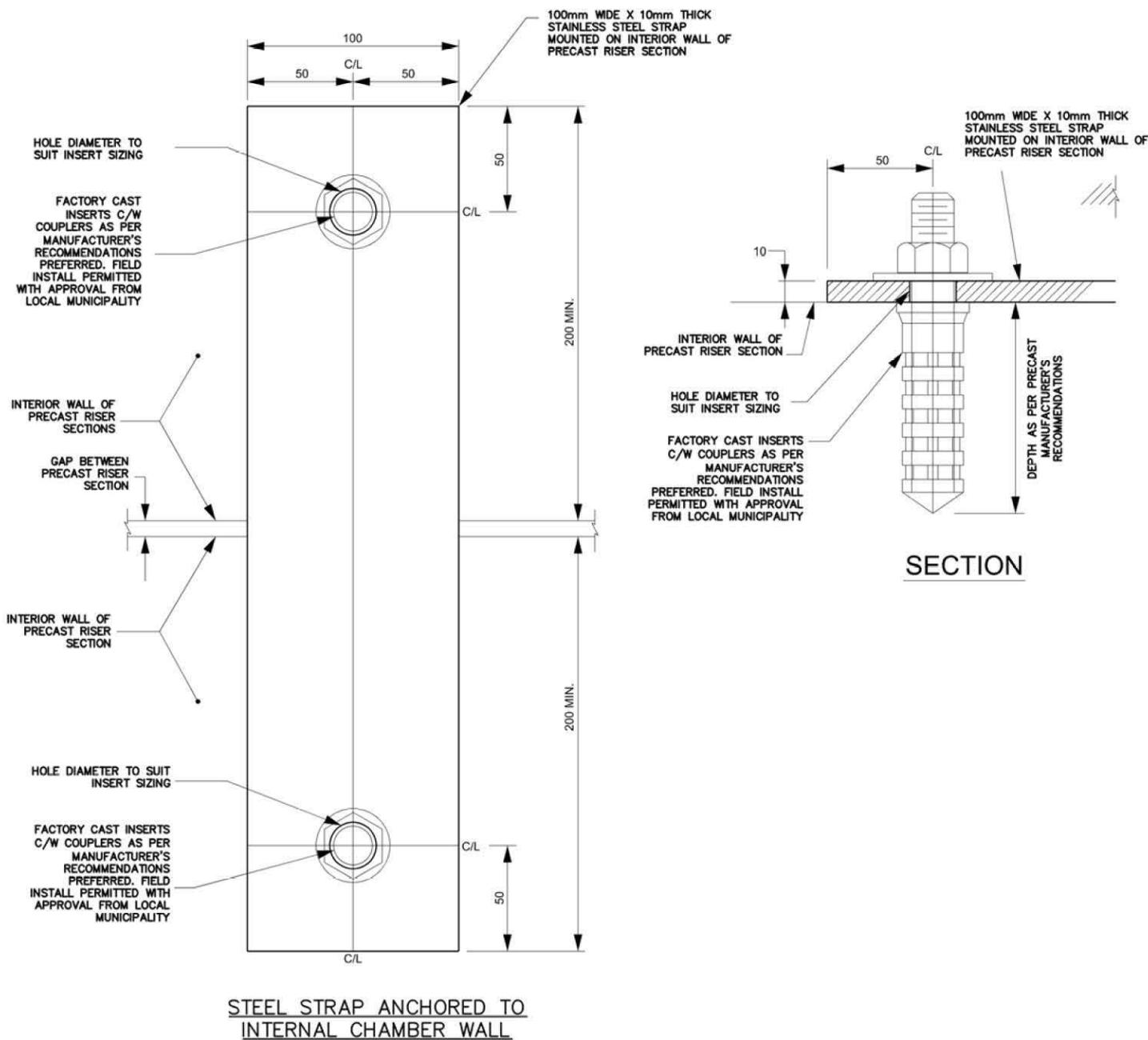
Calvin Kirk

SANITARY MAINTENANCE
HOLE INTERNAL DROP
STRUCTURE

DRAWN-BY

DATE 10-29-21

STANDARD NO. I&l-109



NOT TO SCALE

NOTES:

1. ALL MATERIALS TO BE 304 STAINLESS STEEL
2. FOR REHABILITATION APPLICATION ONLY, INSERTS CAN BE FIELD INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS

Calvin Clark

TYPICAL STEEL STRAP
DETAILS FOR PRECAST
MAINTENANCE HOLES

DRAWN-BY

DATE 10-29-21

STANDARD NO. |&l|-111

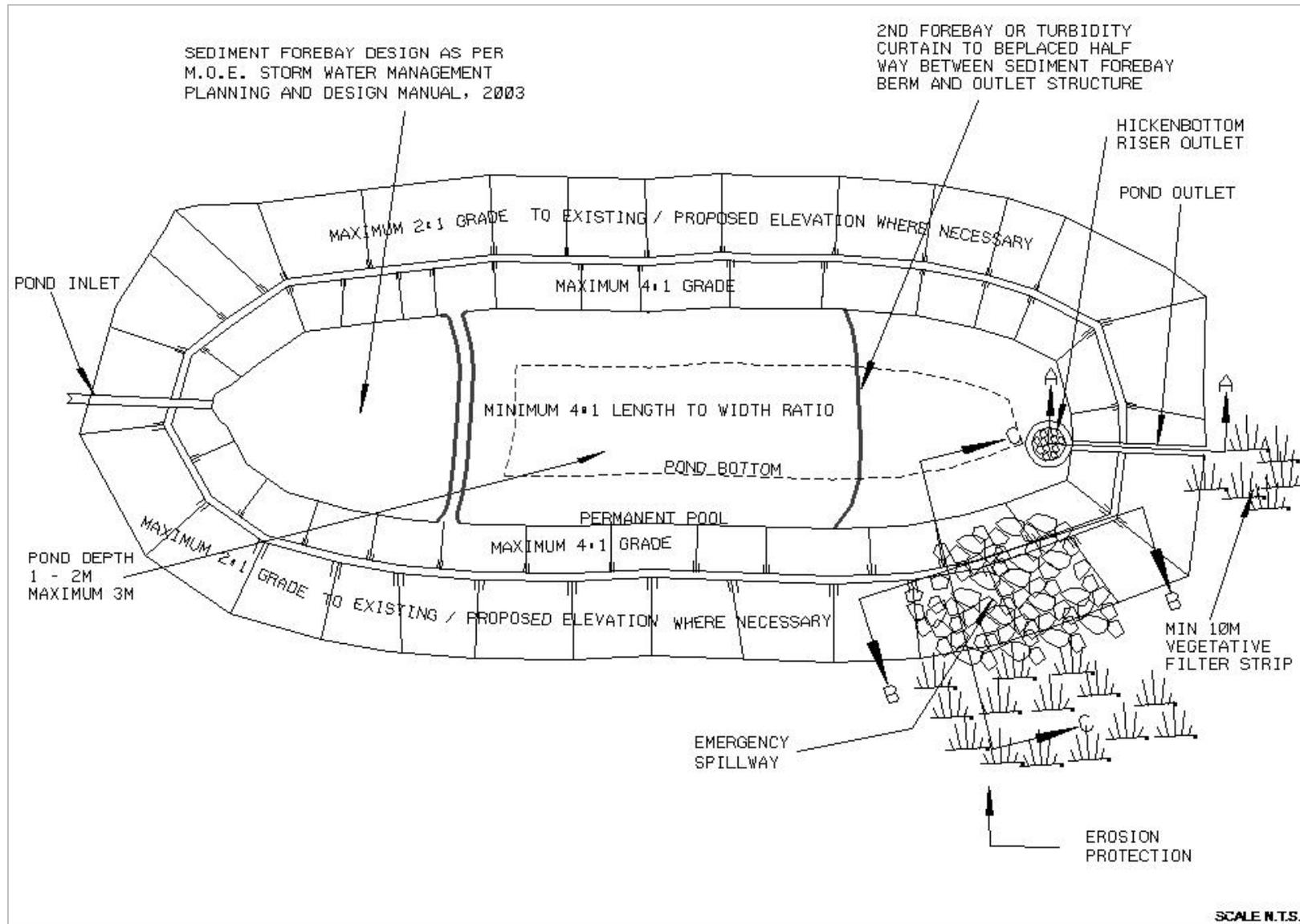


Figure B2-21: Plan view depiction of sediment control pond design specifications

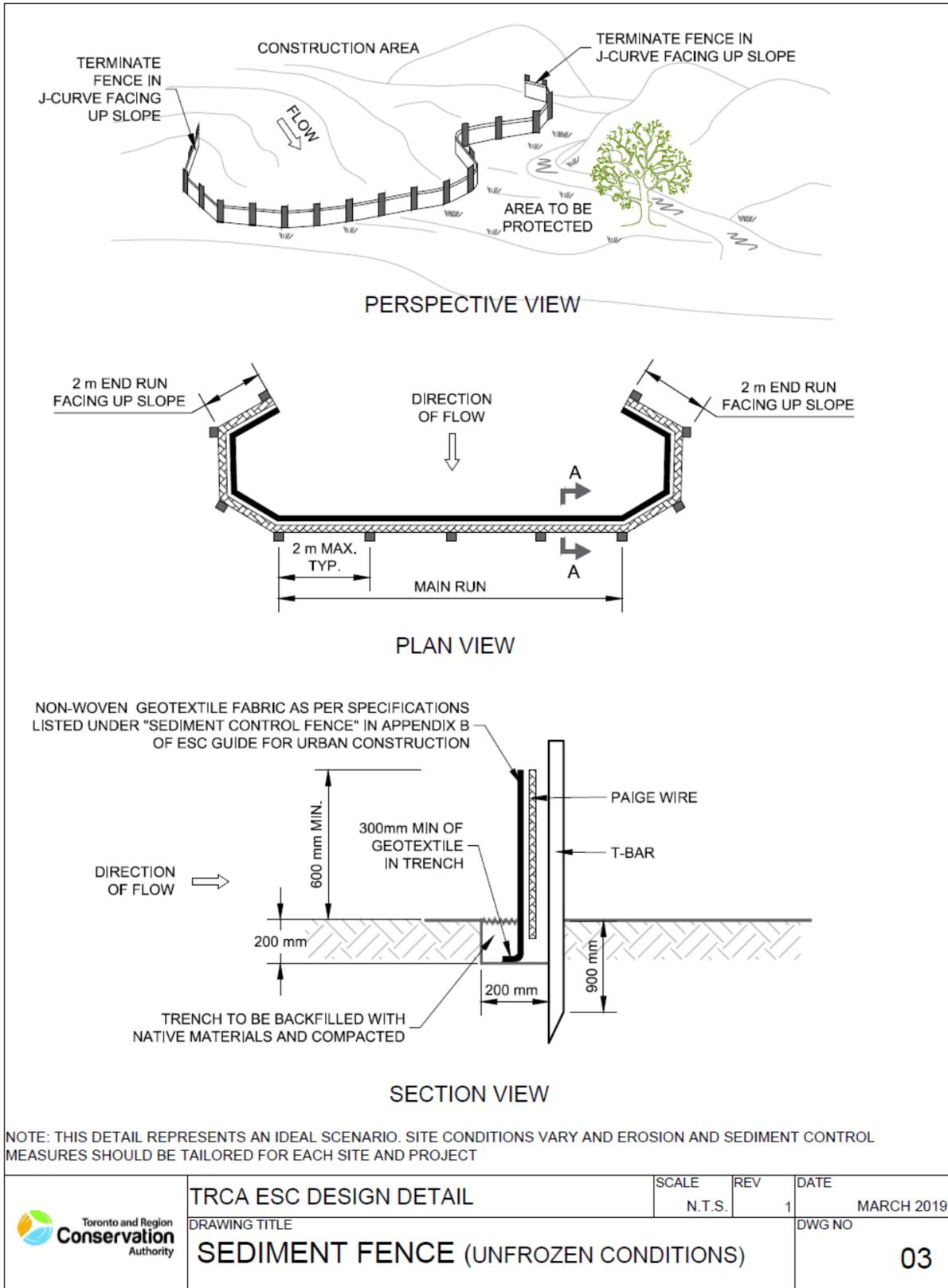


Figure B2-3a: Design detail for sediment control fence (unfrozen conditions).

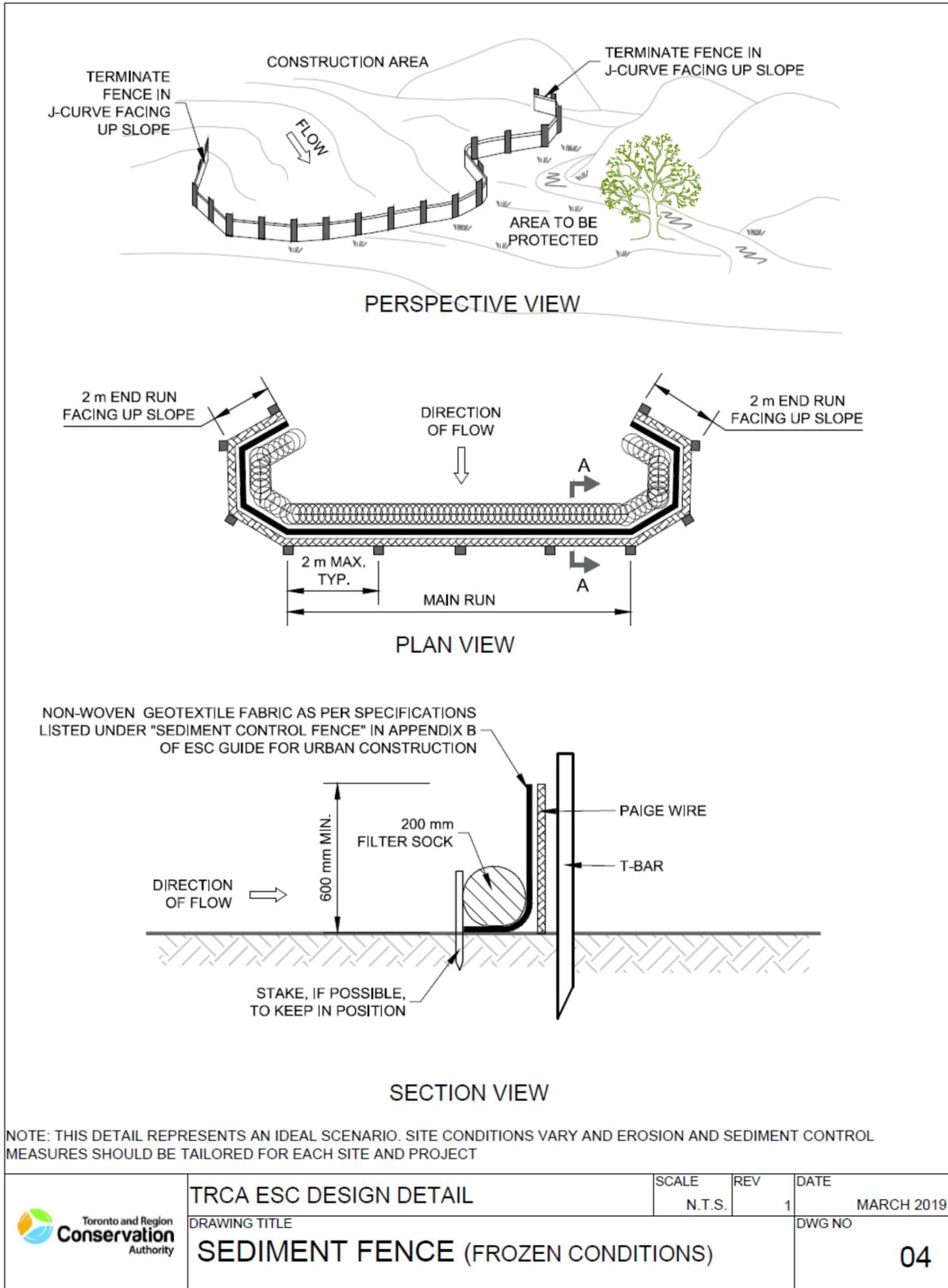


Figure B2-3b: Design detail for sediment control fence (frozen conditions).

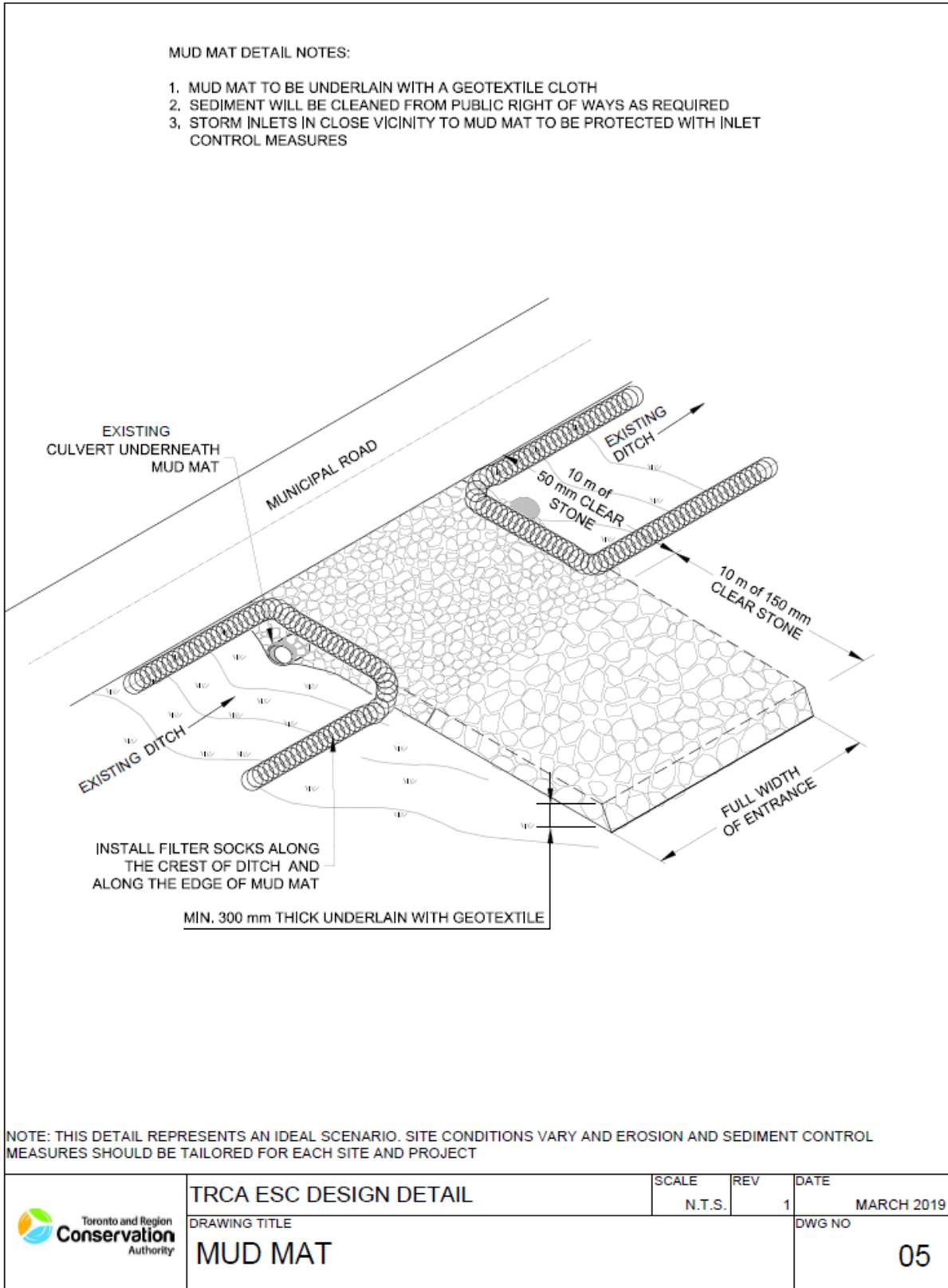


Figure B2-29: Design detail for mud mat for construction site vehicle access

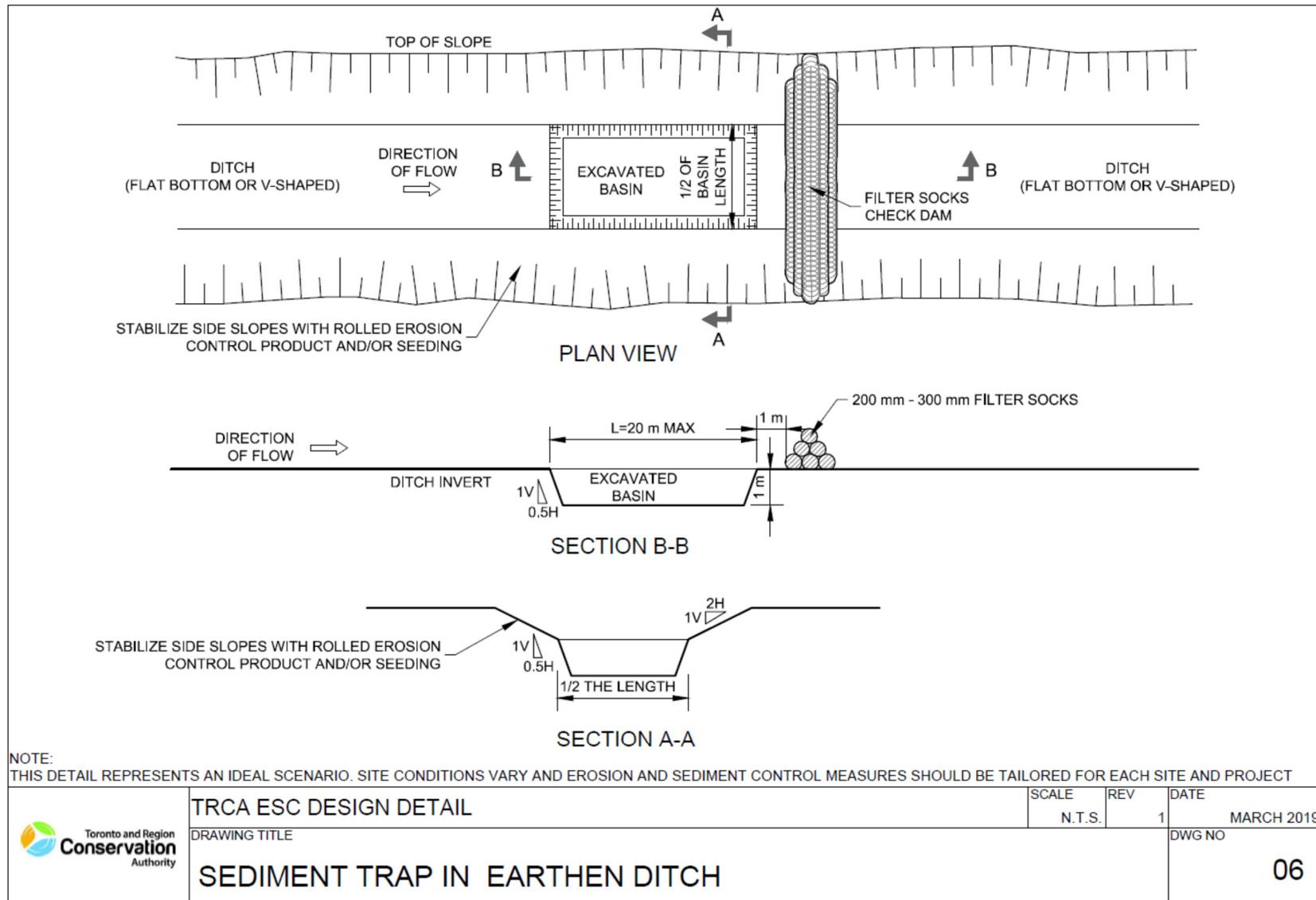


Figure B2-18: Design detail for sediment trap within an earthen ditch