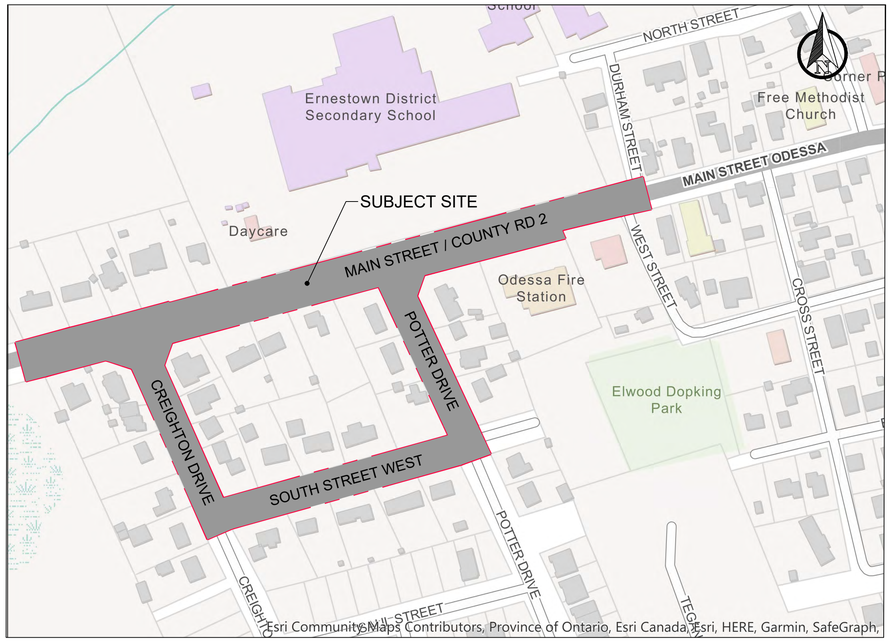
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION LOYALIST TOWNSHIP



N.T.S.

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POTTER DRIVE, CEIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION LOYALIST TOWNSHIP

ENVIRONMENTAL

While undertaking clearing, demolition, excavation or construction the Owner and their contractors shall be vigilant for the potential presence of underground fuel tanks, potentially contaminated soils or groundwater, buried wastes or abandoned water wells. If any of the above are encountered or suspected, the Owner shall ensure that:

1. Loyalist Township shall be advised if contaminates or wastes have been discovered or suspected;
2. Any soil or groundwater contamination encountered is remediated to applicable standards as defined in O. Reg. 153/04 or as revised;
3. Any wastes generated by site clean-ups are managed in accordance with applicable laws and standards;
4. Any abandoned fuel tanks encountered are decommissioned in accordance with applicable laws and standards;
5. Any unused water wells (drilled or dug) are properly abandoned in accordance with Accordance with O. Reg. 903-Wells or as revised;
6. If it appears likely that contamination extends beyond the boundaries of the subject property, the Owner notifies the local office of the Ministry of the Environment and the Loyalist Township's Engineering Division;
7. Construction wastes are not to be buried within the property that is the subject of this Agreement, and
8. That the Owner and their contractors report all spills to the Ministry of the Environment's Spills Action Centre (1-800-268-6060) and to the Municipality (613-386-7351, ext. 116) forthwith.

SEDIMENT AND EROSION CONTROL NOTES

1. All erosion and sediment controls shall be installed prior to construction and monitored and maintained by the Contractor throughout the construction process, until all disturbed areas have been revegetated, then the temporary sediment and erosion control measures must be removed once the site has been stabilized and or the site works are complete.
2. All erosion and sediment control measures shall be inspected after each rainfall to the satisfaction of Loyalist Township and the CRCA.
3. Any disturbed area not scheduled for further construction within forty-five (45) days will be provided with a suitable temporary mulch and seed cover within seven (7) days of completion of that particular phase of construction.
4. Regardless of site specific items detailed on the plans, the Contractor shall install erosion control measures to suit the proposed work methods controlling sediment runoff from discharging offsite prior to any disturbance.
5. Following construction, disturbed areas, as well as proposed grassed and vegetated surfaces, shall be reinstated as soon as practical.
6. The placement of surplus fill be placed and/or temporarily stored in accordance with the Loyalist Township Fill By-laws as amended whether within the draft plan of subdivision or elsewhere in the Township. Temporary fill sites within the Plan of Subdivision will require the approval of the Township. Fill locations, side slopes, elevations as per the Approved Drawings. Restoration to be completed during the final phase of construction.
7. All roads used to access the subdivision shall be kept clean to the satisfaction of the Engineering Manager.

GENERAL NOTES

1. All works to be installed and tested in accordance with current Loyalist Township Development Guidelines & Technical Standards, manufacturer requirements and Ontario Provincial Standard (OPS) Specifications and Drawings unless specified otherwise. Where applicable, OPS municipal Specifications as amended shall be utilized including OPSS.MUNI 100 unless specified otherwise.
2. No blasting allowed on this project.
3. Aggregates - Granular A and B. OPSS 1010 must be adhered to.
4. Existing trees to be retained and protected as directed by the Engineer. Tree protection shall be installed along the drip line of all trees to be retained prior to construction.
5. In the event that buried archaeological remains be found on the property during construction activities, the Ministry of Citizenship, Culture and Recreation shall be notified immediately.
6. In the event that human remains are encountered during construction, the Ministry of Citizenship, Culture and Recreation shall be notified immediately and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ministry of Consumer and Commercial Relations (416) 326-8392, shall be notified immediately.
7. All pipe material to be CSA certified.
8. Refer to Geotechnical Investigation dated January 2024 by Malroz Engineering.

ROADWORKS

1. Road subgrade (including fill sections) to be constructed in accordance with current Loyalist Township Site Plan Design and Development Guidelines and Technical Standards, Ontario Provincial Standard Specifications, and the Geotechnical Investigation.
2. Granular depths as per cross sections.
3. Main Street / County Road 2 asphalt to be SP19 base and SP12.5 surface.
4. Hot mix asphalt to depth as per cross section. For Main Street (County Road 2) Hot Mixed , Hot Laid Asphaltic Concrete as per OPSS 1151. Superpave Mix designs shall contain a minimum of 4.8% performance grade asphalt (PGAC) for SP19 and 5.6% PGAC for SP9.5 with a performance grade of PG58H-34. Normal crossfall on all roads to be 2%. Wear course asphalt shall not be placed in the same calendar year as the binder course or before the completion of a closed circuit T.V. inspection of both the storm and sanitary sewer systems.
5. Curb radii to be 12.0m to front of curb unless noted otherwise.
6. Concrete Curb and Gutter shall be semi-mountable type OPSD 600.020 and 600.060. Install curb at catchbasin to OPSD 610.010. Where specified barrier curb as per OPSD 600.040 or OPSD 600.011 on Main Street.
7. All materials for sidewalks shall conform to O.P.S.S. 1002, concrete is to conform to O.P.S.S. 1350 and are to be constructed as per O.P.S.S. 351. Sidewalks are to be a minimum of 1500 mm wide, 125 mm thick with 125 mm compacted Granular A bedding. Sidewalk thickness shall be increased to 200mm for all entrances other than urban residential. Sidewalk design shall be as per O.P.S.D. 310.010 and 310.050. Sidewalk ramps at intersections or road crossings shall be installed in accordance with OPSD 310.030. Concrete shall be 32 Mpa minimum 28 day strength, 19mm coarse aggregate nominal maximum size, 6.0% to 8.0% air content, normal portland type cement as per OPSS 1301, 0.45 maximum water/cement ratio, 75mm maximum slump, white pigmented curing compound as per OPSS 1315. Concrete materials and production as per OPSS 350, 351, 352 and 353, 1301, 1302 and 1350.
8. Boulevard slope shall be a minimum of 2% and a maximum of 8% within the ROW. Boulevards to be finished with 100 mm of topsoil and nursery sod unless noted otherwise.Ditches to have a maximum side slope of 3:1 unless noted otherwise.
9. Road catchbasins in areas that do not have roadbrains - to have a drainage interception surround and weep holes as per detail provided.
10. All storm and sanitary structures shall be adjusted to grade by use of Strataworks Expanded Polystyrene Adjustment Units or approved equivalent as per OPSD 704.012 and in accordance with OPSS 1854. Adjustment units and adhesives are to be installed as per manufacturers specifications. Appropriate angled forms are to be utilized to match surface grades.
11. Maintenance holes must contain ladder rungs within 450mm from the top.
12. All signage including those requiring relocation by the works shall be installed in accordance with the Ontario Traffic Manual
13. Dead end barricades to be as per OPSD 912.532 with Wa8 sign. Concrete barricades may be substituted for steel beam guide rails.
14. Traffic control to be as per Ontario Traffic Manual Book 7.
15. Soils are to be managed and reused in accordance with O. Reg. 406/19. the Contractor shall use suitable soil generated from excavation activities as fill onsite before moving it from the project area. ensure that temporary stockpiles are located and protected appropriately.unsuitable materials, deleterious materials, asphalt, concrete, pipes,etc.or excess soil shall be tested to determine the Regulation 347 waste class and removed from the project area and safely transported by a licensed hauler and disposed offsite to a licensed receiver in accordance with OPSS 180.
16. Hydro poles may require temporary support due to proximity to services.The use of a trench box may be required due to the proximity of services to hydro poles.
17. Areas in the municipal R.O.W. damaged by tracked equipment or construction traffic are to be reinstated with 100mm topsoil and sod at no extra cost

SEWERS

1. Pipe bedding and cover shall conform to OPSD 802 series. Bedding and cover shall be Granular "A".
2. All pipe and fittings supplied shall carry CSA certification to the appropriate CSA standard sewer grade. The following pipe shall be used for sewers:
   Sanitary sewer pipe materials as per:
   a. Reinforced concrete pipe per OPSS 1820 according to CSA A257.2 Class 65-D with rubber gaskets or;
   b. Type PSM polyvinyl chloride (PVC) pipe with elastomeric gasket per OPSS 1841 and CSA B182.2 M1990. Profile type pipe such as those meeting CSA 182.4 and CSA 182.6 shall not be used for sanitary sewer applications.
   c. Sanitary Mains to be DR 35 pipe
   d. Sanitary Laterals to be DR 28 pipe
   Storm sewer pipe materials as per:
   i. Reinforced concrete pipe per OPSS 1820 according to CSA A257.2 Class 65-D with rubber gaskets or
   ii. Type PSM polyvinyl chloride (PVC) pipe with elastomeric gasket per OPSS 1841 and CSA B182.2 M1990. (i) Mains - DR 35 pipe (ii) Storm Laterals - DR 35 pipe
   iii. Profile Polyvinyl Chloride (PVC) pipe with elastomeric gasketed bell and spigot type joints meeting CSA 182.4 and having a minimum stiffness of 320 kPa may be used for storm sewer applications.
   iv. ADS N-12 ST/WT sizes 100mm to 750mm corrugated dual-wall High Density Polyethylene (HDPE) pipe with elastomeric gasketed bell and spigot type joints meeting CSA 182.8 and OPSS 1840, and having a minimum stiffness of 320 kPa.
3. Sewers shall be tested for deflection as per OPSS 410. Sewers shall be flushed immediately prior to the closed circuit TV inspection.
4. Where a clearance between pipe or conduit crossings of 300mm or less cannot be avoided, there shall be concrete encasement or non-shrink backfill of the crossing extending one metre in each direction on each pipe.
5. Sanitary sewer manhole frame and cover to OPSD 401.01 Type 'A' unless otherwise noted'.
6. Storm sewer manhole frame and cover to OPSD 401.01 Type 'B' unless otherwise noted.
7. Catchbasin leads to be 300 mm unless noted otherwise.
8. Catchbasins to OPSD 705.010 with frame and cover to OPSD 400.010 (rear yard catchbasin OPSD 400.020) with 600 mm sump unless otherwise noted. Install Geotextile fabric under all catchbasin grates until construction phase is complete.
9. All manhole and catchbasin grate elevations are approximate and are subject to adjustment in the field.
10. Sanitary sewer are not to be used for dewatering purposes.
11. All sanitary sewer structure joints shall be sealed by a waterproof membrane such as Blueskin or approved equivalent, a minimum of 300mm on center of the joint allowing 150mm either side of all joints.

Sewer services

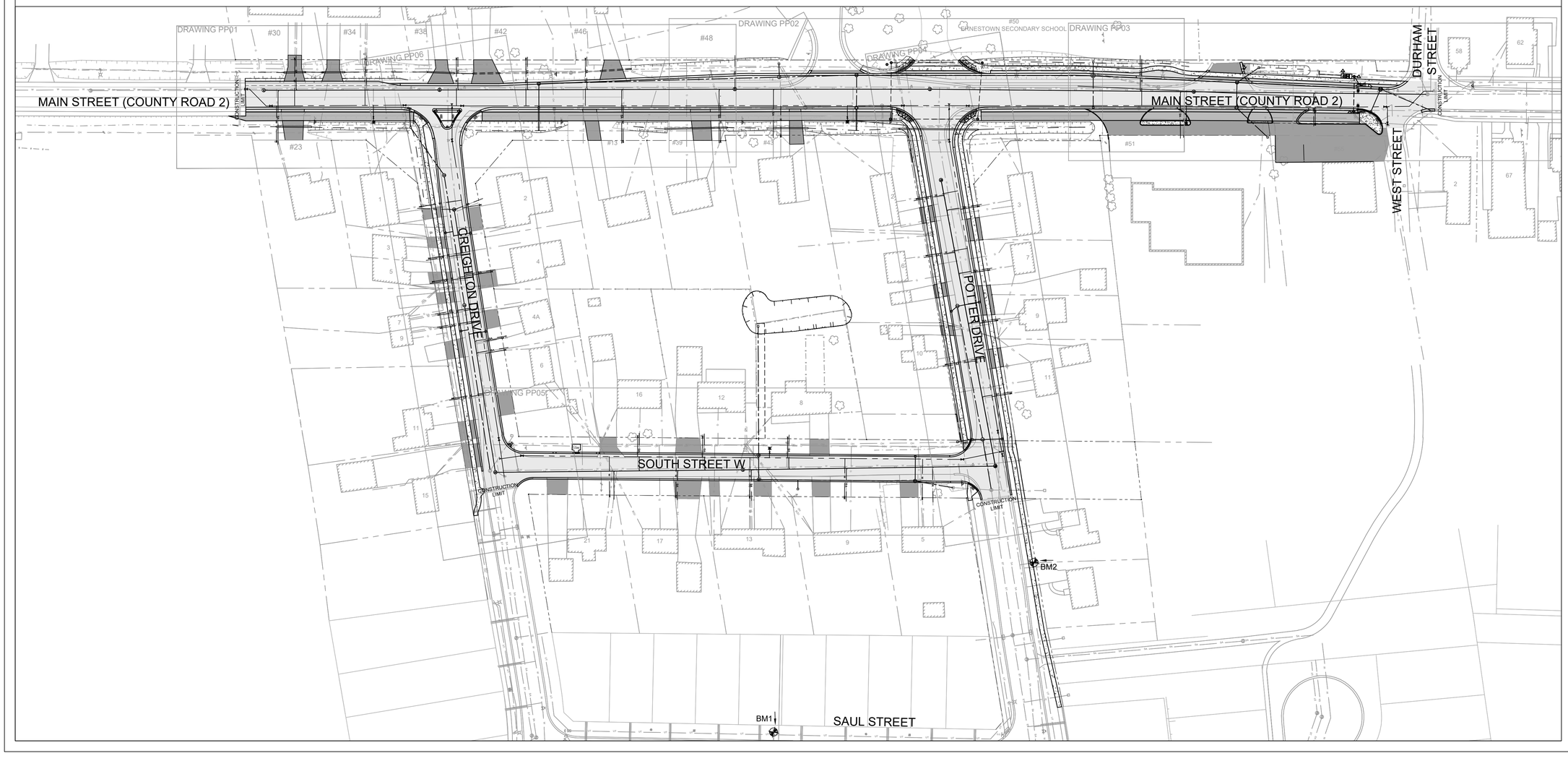
12. Water and sewer services and foundation drains may be laid in the same trench subject to the provisions of Ontario Building Code.
13. The horizontal separation between each service shall be 0.5m. All other utility services shall be separated 2.5m from water and sewer services measured from edge of structure.
14. Building sewers from the building line to the main shall be laid at a minimum of 2% from the building line to the main sewer. The first 40 building sanitary services connected to 200mm main shall be set above the spring line of the sewer main with a proper "Y" fittings and with long radius bends. Building sewers connected to larger mains may be by a tee connection with the side of the tee rotated at between 22 1/2 degrees and 45 degrees above horizontal.
15. Sanitary laterals shall be 125mm PVC SDR 28, green in colour.
16. Sanitary laterals to have a minimum 2.1m of cover at property line and a maximum 2.5m cover at the property line unless noted otherwise.
17. All laterals shall be run perpendicular into the property line or aimed towards the house. If sweeps are required to line up the service they should be located on the municipal side of the service.
18. Sanitary laterals are to extend 1.5 metres beyond the property line. The bell end is to remain on the last piece of pipe leading up to the property line and shall be 4m in length.

WATER

1. Watermain
   a. Watermains shall be C900 DR18 Class 235 psi, Molecularly Oriented Polyvinyl Chloride (PVCO) pipe to be as per AWWA C909. Ductile watermain pipe not permitted, ductile fittings permitted. Other pipe materials may be accepted by the Township at the sole discretion of the Engineering Manager based on the acceptance of technical specification for that material.
   b. Watermains shall be restrained as per OPSS 441 and the pipe manufacturer requirements at a minimum.
      i) Pipe and joint restraint shall comply with OPSD 1103.010/1103.020 or as set out herein. Assume a soil bearing strength of 100 - 199 kPa unless otherwise instructed in writing by the Engineer.
      ii) Thrust blocks shall be installed as per OPSD 1103.010 and 1103.020. All hydrant's, bend's, tee's, and dead ends require concrete thrust blocks.
      iii) Mechanical joint restraints may be used in place of thrust blocks subject to the prior approval of the Engineer.
      iv) All dead ends, bends, valves, fittings, hydrants, and reductions shall have mechanical restraints.
      v) The number of joints requiring mechanical thrust restraint shall be set by the Engineer
      vi) All joint restraint devices for PVC shall carry a water working pressure rating equivalent to the full rated pressure of the PVC pipe on which they will be installed, with a minimum factor of safety of 2:1 in any nominal pipe size. In addition, they shall meet or exceed the requirements of Uni-B-13-94 or ASTM F1674: Restraint devices shall be manufactured of high strength ductile iron, ASTM A 536, Grade 65-45-12. Bolts and connecting hardware shall be of high strength low alloy material in accordance with ANSI/AWWA C111/A21.11.
   c. Watermains shall not be used as an electrical ground in new buildings.
   d. All non-metallic watermains and water services shall require tracer wire. Tracer wire shall be strapped to the watermain every 3 meters and 2 meters along services. When connecting tracer wires Dryconn Waterproof Direct Bury connecter shall be utilized or an approved equivalent.
   e. Tracer wire to be 12 gauge 600V TWU CSA No. 75 stranded copper and plastic coated or approved equivalent.
   f. Tracer wire shall be installed as per the details on the detail sheet.
   g. Install one 7.7 kg Magnesium anode on every valve, hydrant and fitting, all thermite weld connections shall be coated with Roybond 747 primer and Royston "handy cap" or approved equivalent. Install one Zinc anode on every 1000 m of tracer wire. Anodes shall be placed at least 1.0m away from the water system and other anodes. Install 7.7 kg Magnesium anode on existing metallic watermains when they are exposed for new services in addition to the service anodes.
   h. If existing Anodes are encountered replace with 7.7 kg Magnesium anode.
   i. Service taps will include stainless steel saddle or pre-manufactured tee as recommended by pipe manufacturer and as approved by the Township.
   j. The minimum depth of cover for all watermains shall be 1.7m, or as required by the Engineering Manager or MOE. Watermain shall be evenly graded to avoid localized high points.
   k. Watermains shall cross above sewers with sufficient clearance to allow for proper bedding and structural support of the watermain and sewer main. Where it is not possible for the watermain to crossabove the sewer, the watermain shall pass under the sewer providing a minimum of 500mm vertical separation between the invert of the sewer and the crown of the watermain. The length of water pipe shall be centered on at the point of crossing so that the joints will be equal distance from the sewer.
   l. Valves shall be left hand open (counter clockwise). Valve boxes shall be Bibby or AVK type or equivalent resilient wedge valve all having an inside screw, non-rising spindle, with a 50mm square opening nut and mechanical joint and conform to ANSI/AWWA C509. Where a resilient wedge valve is not available a by-pass shall be installed.
   m. Contractor is to obtain confirmation of valve opening orientation in writing from the Township prior to ordering valves.
   n. A minimum of 48 hours written notice is required to customers prior to any scheduled shut-down of the water distribution system. A Township approved notice shall be hand delivered to all affected customers.
   o. All new watermains under construction and temporary water services shall be tested in accordance with OPS and "Loyalist Township Watermain Testing & Disinfection Guidelines - as amended".
   p. New watermains shall not be connected to the existing system without backflow prevention until such time as all testing has been completed in accordance with Loyalist Township - Water Distribution System - New Construction - Testing Requirements.
   q. Contractor to submit to Loyalist Township a "Watermain Testing, Disinfection and Final Connection Plan" for review and approval prior to testing and disinfecting of the watermain.

2. Fire hydrants
   a. Hydrant locate station to be Flush Mounted Bingham and Taylor P200 NFG Test Station. Test Station is to be set flush with top of concrete shock collar.
   b. Leads shall be a minimum of 150mm in diameter
   c. Hydrants shall be McAvity 67 or Mueller Century Model.
   d. Hydrants to be left-hand open (counter clockwise).
   e. Hydrant valves shall open in the same direction and be the same type as the mainline valves.
   f. Hydrants are to be supplied by the manufacturer as yellow.
   g. Hydrants shall have a 150 mm barrel with two 63 mm hose connections and one 100 mm Storz pumper port.
   h. Hydrant flange to be installed 100 to 150mm above finished grade and shock collar.
   i. Hydrants shall have a 1m x 1m x 150mm shock collar cast in concrete.
   j. A minimum of 2 metres clearance shall be provided around hydrants from trees, pedestals, light standards, etc.

3. Water Services
   a. Water services shall be PEX cross linked higher pressure (polyethylene pipe must be labeled CAN/CSA-B1371) and a minimum working pressure of 160 PSI @ 23°C and must be installed according to the Ontario Plumbing Code and Loyalist Township Standards. Minimum pipe size is 25mm O.D.
   b. Main stops shall be the same size as the service pipe and shall have an AWWA tapered thread inlet and a compression joint outlet, 300 psi ball style valve. Main stops shall be Mueller Canada B25008N, Ford Meter FB1000-NL or Cambridge Brass 301NL. All curb stops shall be the same size as the service pipe and shall be compression joint inlet and outlet, no lead, 300 psi ball style valve. Curb stops shall be Mueller B-25209 series, Cambridge Brass 202 series or Ford B44 series. Self-draining (stop and drain) type curb & main stops are not permitted. All PEX water services shall be installed in accordance with Township W-16 standard and include a concrete support and electrical grounding tailing nuts on both sides for the connection of the tracer wire. All materials shall be AWWA C800 and NSF 61 compliant.
   c. Bedding material shall be granular 'A' and at a minimum, be compacted to 150mm above the water service.
   d. Curb stops shall be placed 300mm beyond property line
   e. Water services to be without joints between main and property line regardless of length. There shall be no buried joints except at the streetline and at the service set.
   f. Anode to be installed as per W-16 on each service.



LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB / DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc

1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client

LOYALIST TOWNSHIP

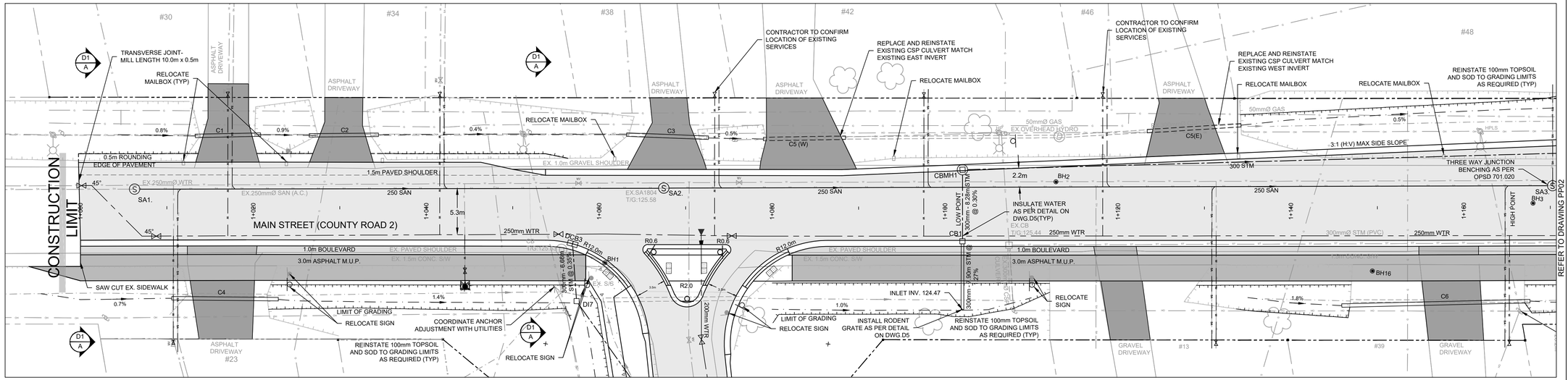
Project

POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing

GENERAL PLAN

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	GEN
Date: DECEMBER 2023		
Scale: 1:750		



REFER TO DRAWING PP06

SANITARY MAINTENANCE HOLE SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
SA1.	1+006.29	701.010	401.010 'A'	125.93		122.77 (E)
SA2.	1+067.48	701.010	401.010 'A'	125.62	122.59 (W)	122.57 (E)
SA3.	1+170.28	701.010	401.010 'A'	125.73	122.31 (W)	122.29 (E) 122.32 (N)

CATCH BASIN SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CB1	1+102.02	705.010	400.030	125.42	124.30 (S)	124.28 (N)
CBMH1	1+102.02	701.010	400.030	125.40	124.26 (S)	124.24 (E)
DCB3	4+015.74	705.010	400.030	125.64		123.42 (S)

DITCH INLET SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
DI7	4+022.36	705.030	403.010	124.38	123.40 (N)	123.39 (SE)

CULVERT TABLE

CULVERT ID	SIZE (mm)	LENGTH (m)	SLOPE	UPSTREAM INV.(m)	DOWNSTREAM INV.(m)
C1	400	7.6	0.26%	124.98	124.96
C2	400	8.0	1.25%	125.00	124.90
C3	400	9.5	0.21%	124.80	124.78

CULVERT TABLE

CULVERT ID	SIZE (mm)	LENGTH (m)	SLOPE	UPSTREAM INV.(m)	DOWNSTREAM INV.(m)
C4	400	12.3	2.03%	125.08	124.83
C5(E)	400	10.8	0.50%	124.40	124.35
C5(W)	400	9.5	0.50%	124.74	124.69
C6	400	21.8	0.28%	124.67	124.61

MAIN STREET (HIGHWAY 2) PROFILE

STATION	1+010	1+020	1+030	1+040	1+050	1+060	1+070	1+080	1+090	1+100	1+110	1+120	1+130	1+140	1+150	1+160
EX./PROP. C/L ELEV.	125.89 / 125.96	125.81 / 125.91	125.76 / 125.86	125.71 / 125.80	125.69 / 125.75	125.66 / 125.70	125.63 / 125.65	125.63 / 125.60	125.62 / 125.55	125.61 / 125.50	125.60 / 125.53	125.59 / 125.58	125.62 / 125.63	125.63 / 125.68	125.66 / 125.73	125.69 / 125.78
PROP. TOP OF WATERMAIN	123.75	123.76	123.76	123.77	123.77	123.78	123.78	123.78	123.79	123.79	123.83	123.88	123.93	123.98	124.03	124.08
PROP. STORM INVERTS										8.28m-300mm ∅ STM @ 0.30% 124.28 124.26	124.24		83.75m-300mm ∅ STM @ 0.30%			123.98
PROP. SANITARY INVERTS	122.77	61.19m-250mm ∅ SAN @ 0.30%					122.59 122.57				102.79m-250mm ∅ SAN @ 0.25%					122.31

LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
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Client

LOYALIST TOWNSHIP

Project

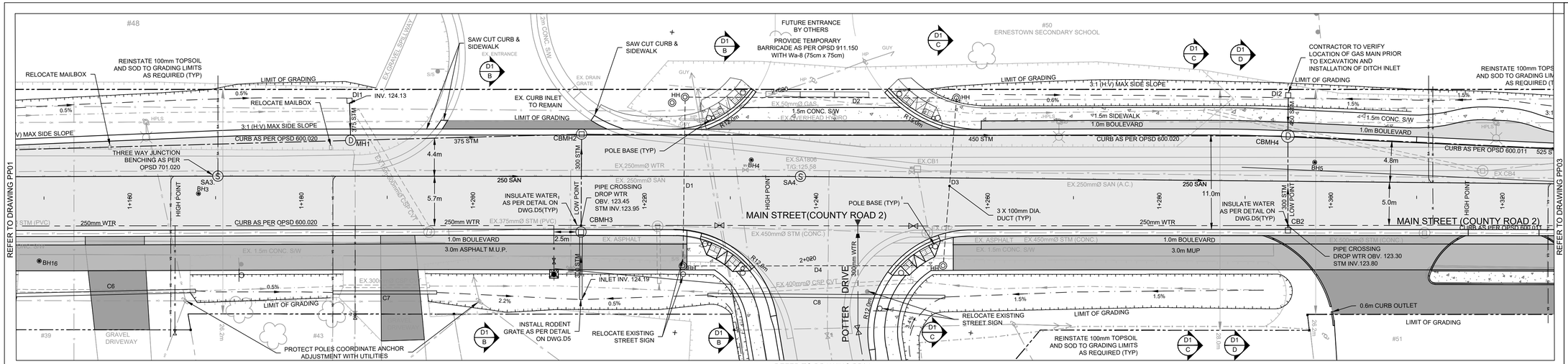
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing

MAIN STREET (HIGHWAY 2) PLAN AND PROFILE 1+000.00 TO 1+160.00

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	PP01
Date: DECEMBER 2023		

Scale: 0 5 10 m (H=1:250, V=1:25) 0 0.5 1.0



LEGEND

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- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

SANITARY MAINTENANCE HOLE SCHEDULE							
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
SA3.	1+170.28	701.010	401.010 'A'	125.73	122.31 (W)	122.29 (E) 122.32 (N)
SA4.	1+238.20	701.010	401.010 'A'	125.61	122.12 (W)	122.10 (E)

STORM MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
MH1	1+185.76	701.010	401.010 'B'	125.38	123.98 (W) 124.12 (N)	123.91 (E)

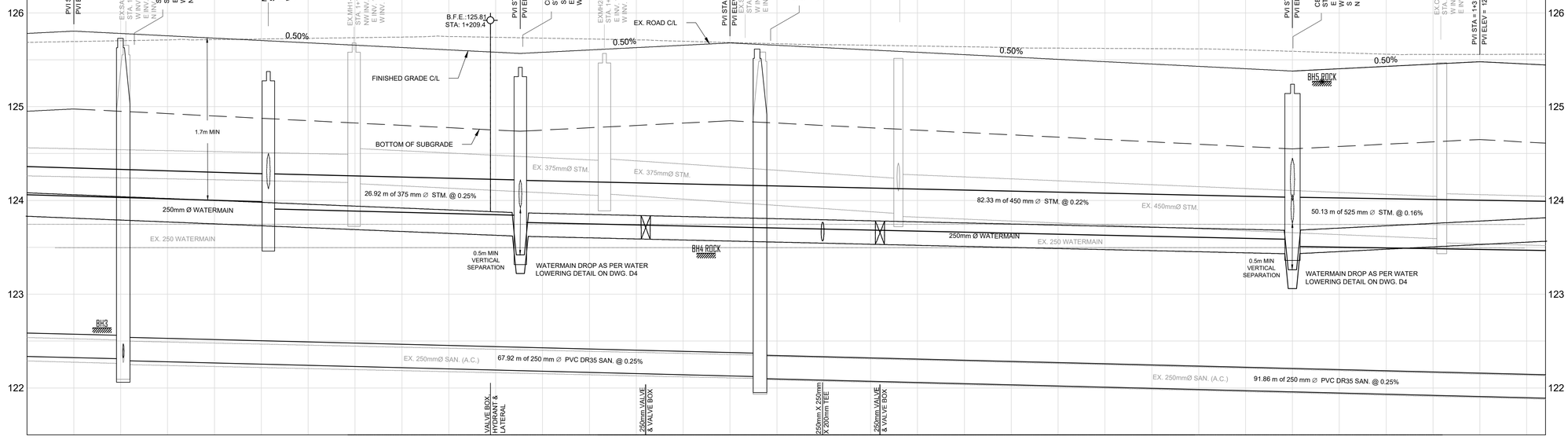
CATCH BASIN SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CBMH2	1+212.64	701.010	400.030	125.42	123.92 (S) 123.84 (W)	123.76 (E)
CBMH3	1+212.61	701.010	400.030	125.49	123.95 (S)	123.95 (N)

CATCH BASIN SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CB2	1+295.00	705.010	400.030	125.30		123.80 (N)
CBMH4	1+295.00	701.011	400.030	125.24	123.58 (W) 123.76 (S) 124.00 (N)	123.51 (E)

DITCH INLET SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
DI1	1+185.64	705.030	403.010	124.67		124.13 (S)

CULVERT TABLE					
CULVERT ID	SIZE (mm)	LENGTH (m)	SLOPE	UPSTREAM INV.(m)	DOWNSTREAM INV.(m)
C6	400	21.8	0.28%	124.67	124.61
C7	400	12.1	0.25%	124.41	124.38
C8	400	27.6	0.90%	124.50	124.25

MAIN STREET (HIGHWAY 2) PROFILE



STATION	1+170	1+180	1+190	1+200	1+210	1+220	1+230	1+240	1+250	1+260	1+270	1+280	1+290	1+300	1+310	1+320	+322
EX./PROP. C/L ELEV.	125.70 / 125.78	125.72 / 125.73	125.73 / 125.68	125.74 / 125.63	125.74 / 125.58	125.72 / 125.60	125.70 / 125.65	125.67 / 125.65	125.66 / 125.60	125.64 / 125.55	125.62 / 125.50	125.62 / 125.45	125.61 / 125.40	125.58 / 125.40	125.56 / 125.45	125.56 / 125.45	125.44
PROP. TOP OF WATERMAIN	124.04	124.00	123.96	123.92	123.88	123.85	123.83	123.81	123.78	123.76	123.74	123.71	123.69	123.70	123.75	123.75	123.74
PROP. STORM INVERTS	124.24	83.75m-300mm ∅ STM @ 0.30%	123.98 / 123.91	26.92m-375mm ∅ STM @ 0.25%	123.84 / 123.76	82.33m-450mm ∅ STM @ 0.22%								123.58 / 123.51	50.13m-525mm ∅ STM @ 0.16%		123.43
PROP. SANITARY INVERTS	122.57	102.79m-250mm ∅ SAN @ 0.25%	122.31 / 122.29	67.92m-250mm ∅ SAN @ 0.25%				122.12 / 122.10	91.86m-250mm ∅ SAN @ 0.25%								121.87

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc

1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

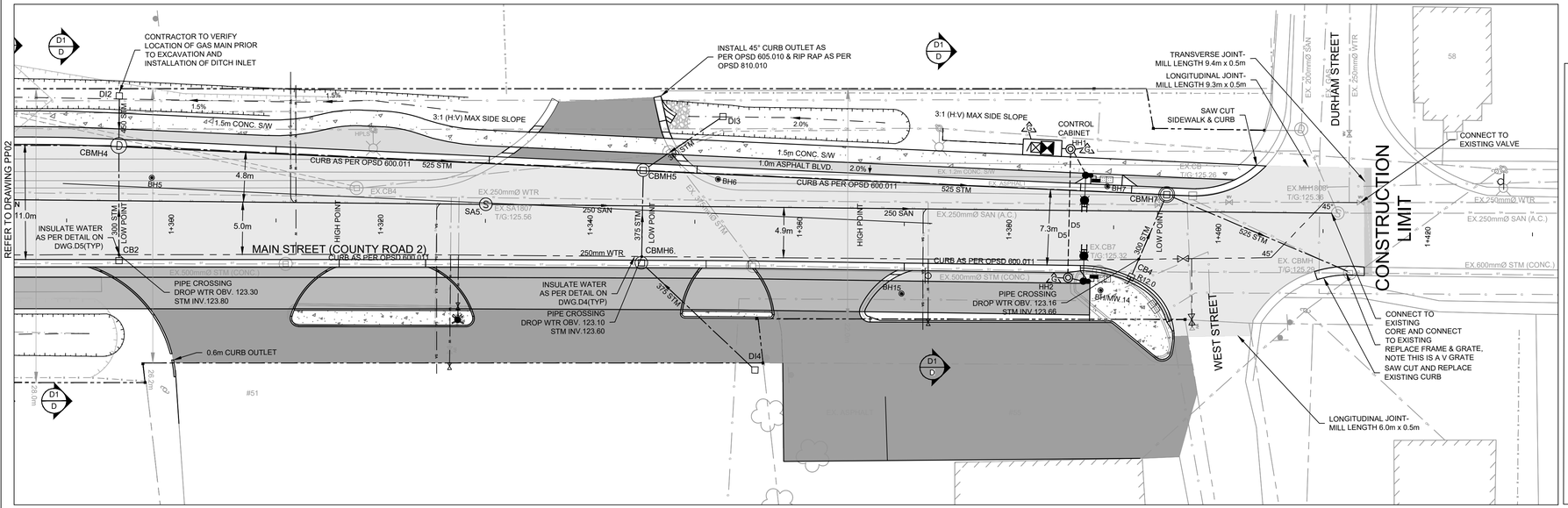
Client: LOYALIST TOWNSHIP

Project: POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing: MAIN STREET (HIGHWAY 2) PLAN AND PROFILE 1+160.00 TO 1+320.00

Drawn by:	Checked by:	Project No.
CDD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	PP02
Date: DECEMBER 2023		

Scale: 0 5 10 m H=1:250 V=1:25; 0 0.5 1.0

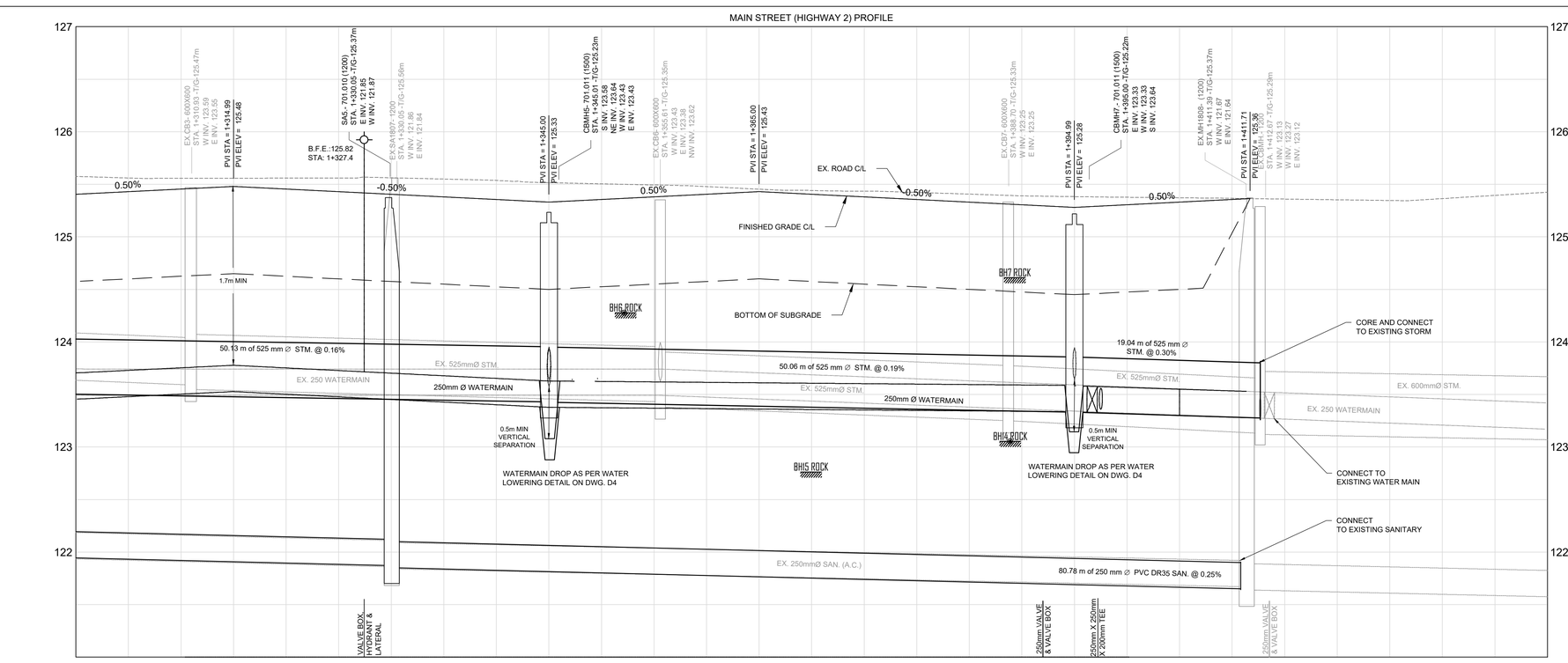


SANITARY MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
SA5.	1+330.05	701.010	401.010 'A'	125.37	121.87 (W)	121.85 (E)

STORM MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CBMH4	1+295.00	701.011	401.010 'B'	125.24	123.58 (W) 123.76 (S) 124.00 (N)	123.51 (E)
CBMH5	1+345.01	701.011	401.010 'B'	125.23	123.58 (S) 123.64 (NE) 123.43 (W)	123.43 (E)
CBMH7.	1+395.00	701.011	401.010 'B'	125.22	123.33 (W) 123.64 (S)	123.33 (E)

CATCH BASIN SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CB2	1+295.00	705.010	400.030	125.30		123.80 (N)
CB4	1+391.76	705.010	400.030	125.17		123.67 (N)

DITCH INLET SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
DI3	1+352.55	705.030	403.010	125.08		124.04 (SW)
DI4	1+355.91	705.030	403.010	125.21		123.66 (NW)



STATION	1+310	1+320	1+330	1+340	1+350	1+360	1+370	1+380	1+390	1+400	1+410	1+420	1+430	1+440
EX./PROP. C/L ELEV.	125.56 / 125.45	125.56 / 125.45	125.56 / 125.40	125.54 / 125.35	125.50 / 125.36	125.48 / 125.41	125.44 / 125.41	125.42 / 125.36	125.39 / 125.31	125.38 / 125.31	125.37 / 125.36	125.35	125.36	125.42
PROP. TOP OF WATERMAIN	123.75	123.75	123.70	123.65	123.62	123.62	123.61	123.60	123.59	123.57	123.53			
PROP. STORM INVERTS	123.51	50.13m-525mm ∅ STM @ 0.16%		123.43 / 123.43	50.06m-525mm ∅ STM @ 0.19%			123.33 / 123.33	19.04m-525mm ∅ STM @ 0.30%		123.28			
PROP. SANITARY INVERTS	122.10	91.86m-250mm ∅ SAN @ 0.25%		121.87 / 121.85	80.78m-250mm ∅ SAN @ 0.25%						121.65			

LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc

1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client

LOYALIST TOWNSHIP

Project

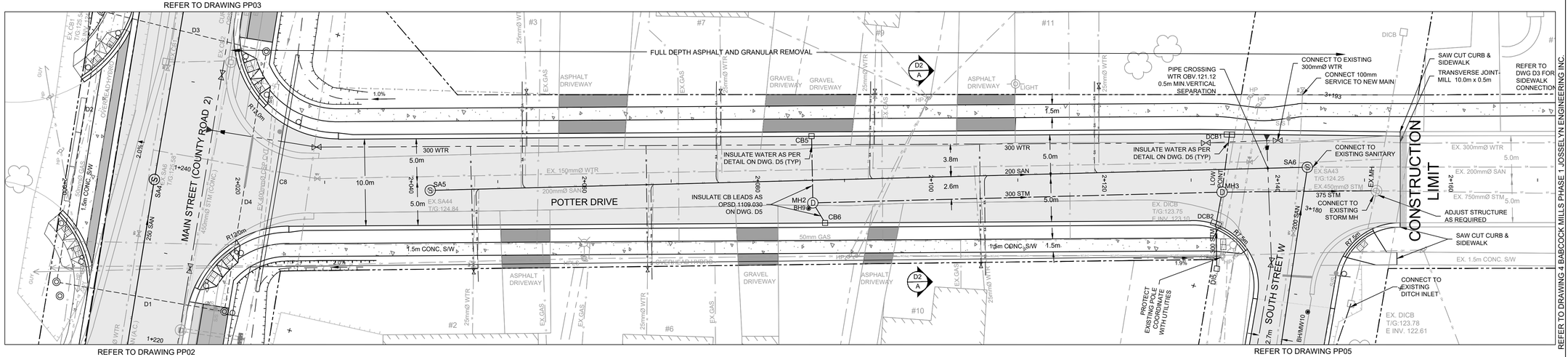
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing

MAIN STREET (HIGHWAY 2) PLAN AND PROFILE 1+300.00 TO 1+440.00

Drawn by:	Checked by:	Project No.
CDD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	PP03
Date: DECEMBER 2023		

Scale: 0 5 10 m 1V=1.250 1V=1.25 0 0.5 1.0



SANITARY MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
SA5	2+042.19	701.010	401.010 'A'	124.76		122.02 (SE)
SA6	2+143.42	701.010	401.010 'A'	124.25	121.60 (W) 121.60 (NW)	121.58 (SE)

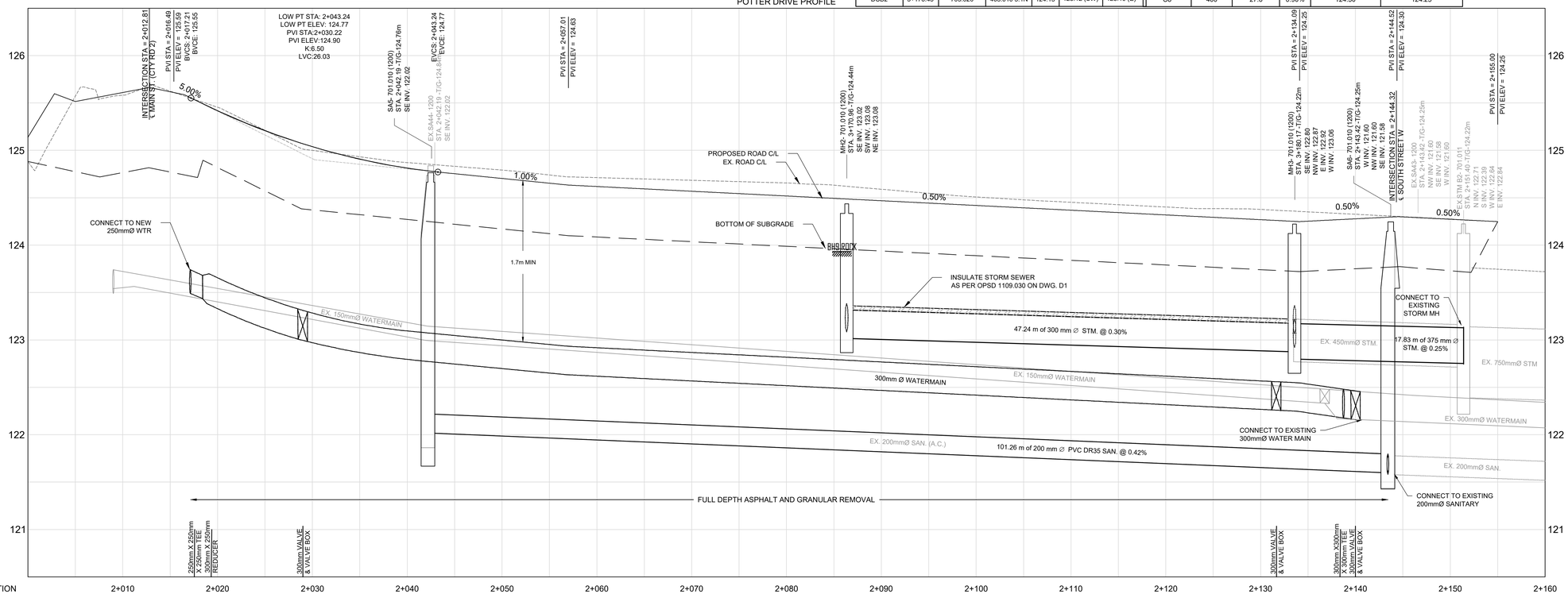
STORM MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
MH2	3+170.96	701.010	401.010 'B'	124.44	123.08 (SW) 123.08 (NE)	123.02 (SE)
MH3	3+180.17	701.010	401.010 'B'	124.22	122.87 (NW) 122.92 (E) 123.06 (W)	122.80 (SE)

CATCH BASIN SCHEDULE							
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET	
CB5	3+178.52	705.010	403.010 3:1N	124.39		123.29 (SW)	
CB6	3+168.92	705.010	403.010 3:1N	124.38		123.13 (NE)	
DCB1	3+186.84	705.020	403.010 3:1N	124.14		122.94 (W)	
DCB2	3+176.45	705.020	403.010 3:1N	124.15	123.12 (SW)	123.10 (E)	

DITCH INLET SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
DI5.	3+171.36	705.030	403.010 HOR	124.00		123.14 (NE)

CULVERT TABLE					
CULVERT ID	SIZE (mm)	LENGTH (m)	SLOPE	UPSTREAM INV.(m)	DOWNSTREAM INV.(m)
C8	400	27.6	0.90%	124.50	124.25

POTTER DRIVE PROFILE



STATION	2+010	2+020	2+030	2+040	2+050	2+060	2+070	2+080	2+090	2+100	2+110	2+120	2+130	2+140	2+150	2+160
EX./PROP. C/L ELEV.	125.58	125.46 / 125.42	125.00 / 125.04	124.87 / 124.81	124.79 / 124.70	124.71 / 124.62	124.68 / 124.57	124.66 / 124.52	124.59 / 124.47	124.51 / 124.42	124.45 / 124.37	124.40 / 124.32	124.38 / 124.27	124.33 / 124.28	124.27 / 124.27	
PROP. TOP OF WATERMAIN		123.62	123.21	123.10	123.00	122.92	122.87	122.82	122.77	122.72	122.67	122.62	122.57	122.46		
PROP. STORM INVERTS									123.02	47.24m-300mm ∅ STM @ 0.30%			122.87 / 122.80	17.83m-375mm ∅ STM @ 0.25%	122.75 / 122.71	
PROP. SANITARY INVERTS				122.02	101.26m-200mm ∅ SAN @ 0.42%									121.60 / 121.55		

LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

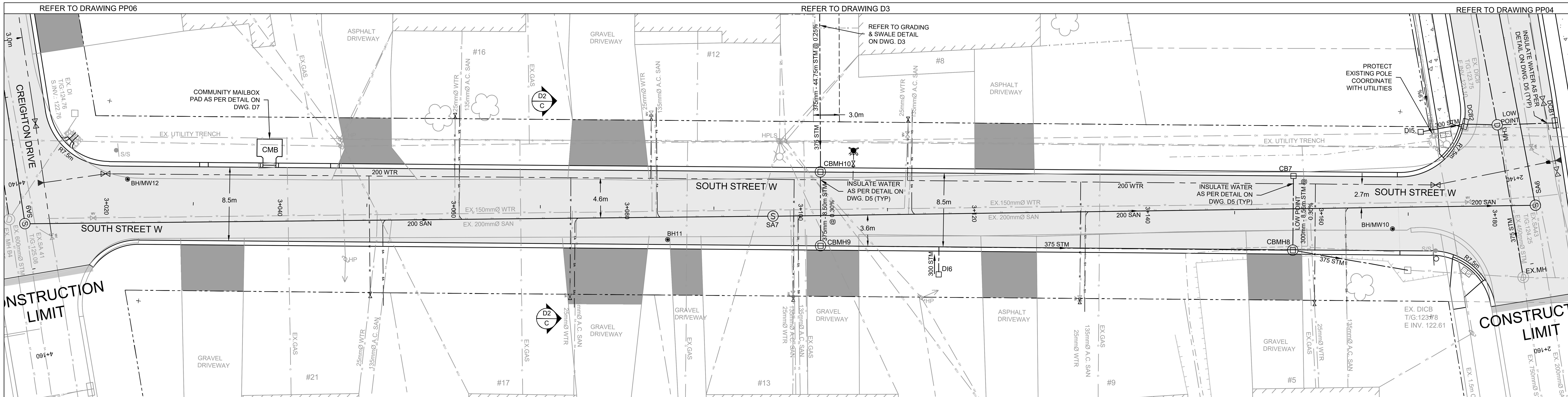
Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
POTTER DRIVE
PLAN AND PROFILE
2+000.00 TO 2+160.00

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	PP04
Date: DECEMBER 2023		

Scale: 0 5 10 m H=1:250 V=1:25; 0 0.5 1.0

REFER TO DRAWING PP06 | REFER TO DRAWING D3 | REFER TO DRAWING PP04



REFER TO DRAWING 4 BABCOCK MILLS PHASE 1 JOSSELYN ENGINEERING INC. | REFER TO DRAWING 4 BABCOCK MILLS PHASE 1 JOSSELYN ENGINEERING INC.

SANITARY MAINTENANCE HOLE SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
SA6	2+143.42	701.010	401.010 'A'	124.25	121.60 (W) 121.60 (NW)	121.58 (SE)
SA7	3+096.81	701.010	401.010 'A'	124.39	122.02 (W)	121.95 (E)
SA9	4+144.71	701.010	401.010 'A'	125.07	122.38 (NW)	122.36 (E)

CATCH BASIN SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CBMH8	3+156.74	701.010	403.010 3:1N	124.03	122.80 (W) 122.88 (N)	122.80 (E)
CBMH9	3+102.32	701.010	403.010 3:1N	124.30	123.11 (N)	123.10 (E)
CBMH10	3+102.24	701.010	403.010 3:1N	124.30	123.14 (N)	123.13 (S)

CATCH BASIN SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CB7	3+156.74	705.010	403.010 3:1N	124.03		122.90 (S)

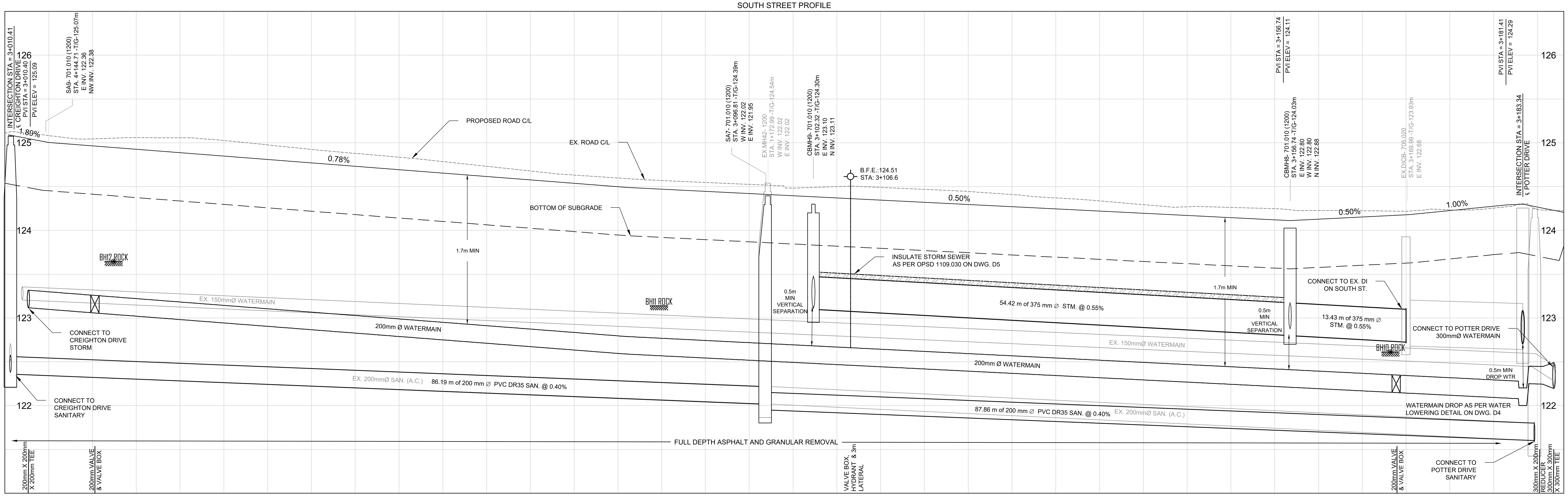
REAR YARD CATCH BASIN SCHEDULE

STRUCTURE	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
RYCB1	705.030	400.010	123.80		123.25 (S)

DITCH INLET SCHEDULE

STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
DI5.	3+171.36	705.030	403.010 HOR	124.00		123.14 (NE)
DI6	3+115.96	705.030	403.010 HOR	124.10		123.15 (N)

SOUTH STREET PROFILE



STATION		3+020		3+030		3+040		3+050		3+060		3+070		3+080		3+090		3+100		3+110		3+120		3+130		3+140		3+150		3+160		3+170		3+180	3+188
EX./PROP. C/L ELEV.	125.04	124.96	125.06	124.89	124.98	124.81	124.88	124.73	124.79	124.65	124.68	124.58	124.60	124.50	124.55	124.45	124.48	124.40	124.49	124.35	124.44	124.30	124.37	124.25	124.29	124.20	124.26	124.15	124.23	124.13	124.22	124.18	124.25	124.28	124.22
PROP. TOP OF WATERMAIN		123.26		123.18		123.10		123.03		122.95		122.87		122.79		122.74		122.69		122.64		122.59		122.54		122.49		122.44		122.39		122.34		122.29	
PROP. STORM INVERTS	123.10 (3+102.32); 54.42m-375mm ∅ STM @ 0.55%; 122.80 / 122.80 (3+156.74); 13.43m-375mm ∅ STM @ 0.55%; 122.72 (3+170)																																		
PROP. SANITARY INVERTS	122.36 (3+010); 86.19m-200mm ∅ SAN @ 0.40%; 122.02 / 121.95 (3+096.81); 87.86m-200mm ∅ SAN @ 0.40%; 121.60 (3+184)																																		

LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
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- STRAW BALE
- EXISTING ELEVATION
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PRELIMINARY
NOT FOR
CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc

1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

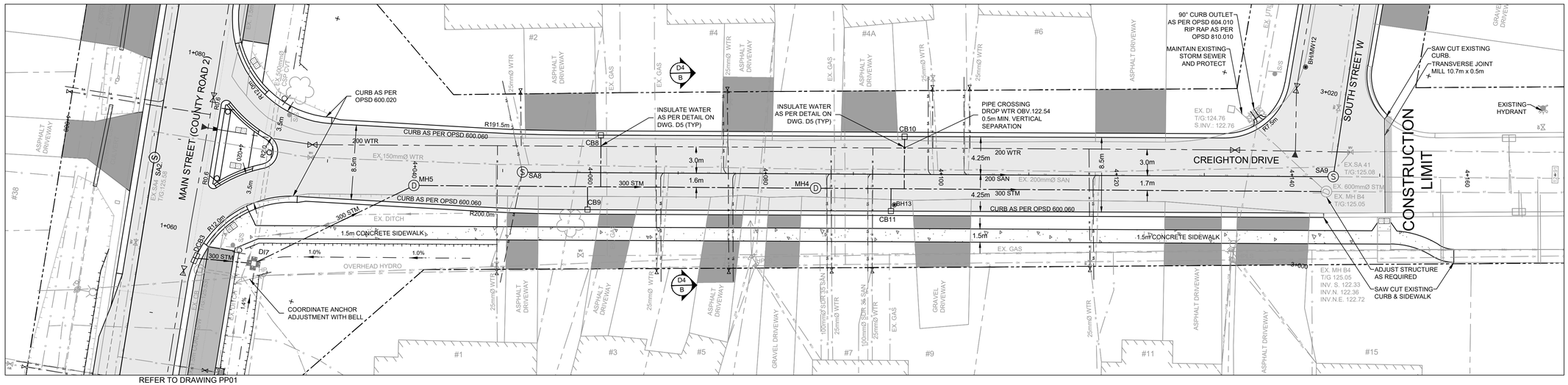
Drawing
SOUTH STREET W
PLAN AND PROFILE
3+010.00 TO 3+190.00

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	**Approved by:**	**Drawing No.**
KMN	KMN	PP05

Date: DECEMBER 2023

Scale: 0 5 10 m H=1:250; 0 0.5 1.0 V=1:25

PP05



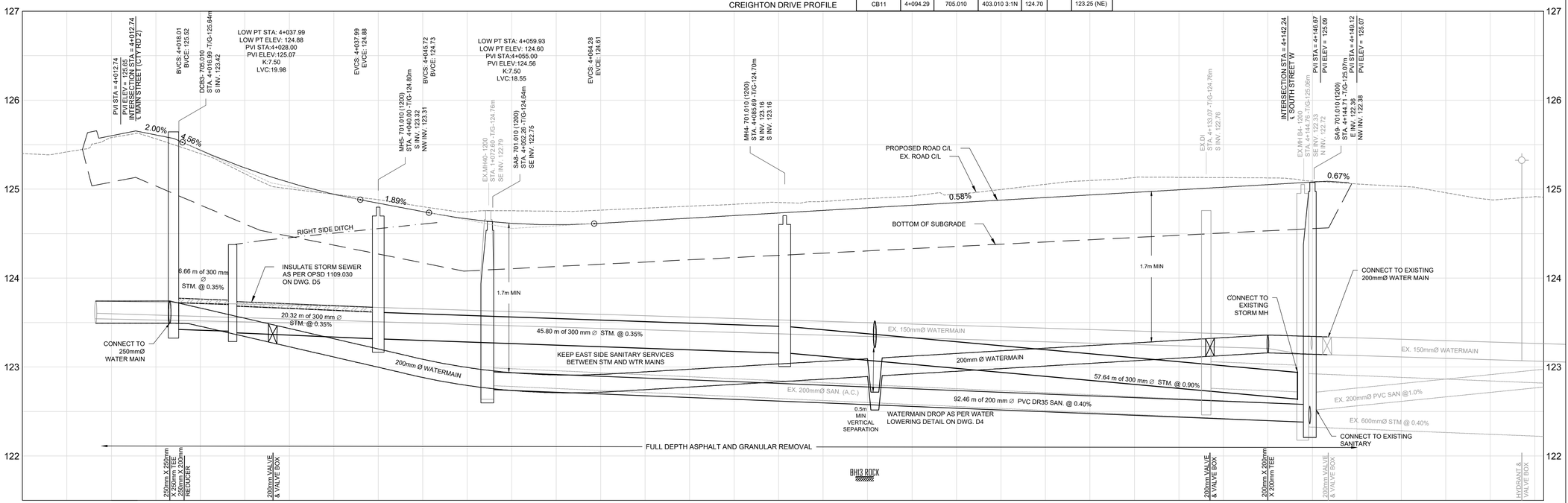
SANITARY MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
SA8	4+052.26	701.010	401.010 'A'	124.64		122.75 (SE)
SA9	4+144.71	701.010	401.010 'A'	125.07	122.38 (NW)	122.36 (E)

STORM MAINTENANCE HOLE SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
MH4	4+085.69	701.010	401.010 'B'	124.70	123.16 (N)	123.16 (S)
MH5	4+040.00	701.010	401.010 'B'	124.80	123.31 (NW)	123.32 (S)

CATCH BASIN SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
CB8	4+061.19	705.010	403.010 3:1N	124.52		123.32 (SW)
CB9	4+059.70	705.010	403.010 3:1N	124.51		123.01 (NE)
CB10	4+095.82	705.010	403.010 3:1N	124.71		123.21 (W)
CB11	4+094.29	705.010	403.010 3:1N	124.70		123.25 (NE)

DITCH INLET SCHEDULE						
STRUCTURE	STATION	STRUCTURE OPSD	GRATE OPSD	T/G	INLET	OUTLET
DI7	4+023.63	705.030	3:1 W	124.38	123.40 (N)	123.39 (SE)
EX.DI	4+133.07	705.040	3:1 W	124.76		122.76 (S)

CREIGHTON DRIVE PROFILE



STATION	4+000	4+010	4+020	4+030	4+040	4+050	4+060	4+070	4+080	4+090	4+100	4+110	4+120	4+130	4+140	4+150	4+160	4+170	4+171
EX./PROP. C/L ELEV.	125.40	125.58	125.40	125.44	125.00	125.07	124.88	124.84	124.74	124.66	124.75	124.60	124.79	124.64	124.83	124.70	124.86	124.76	124.92	124.82	125.00	124.88	125.10	124.93	125.13	124.99	125.13	125.05	125.06	124.96	124.91	124.91
PROP. TOP OF WATERMAIN		123.74		123.66		123.43		123.20		123.00		122.91		122.95		123.01		123.06		123.12		123.18		123.24		123.30		123.36				
PROP. STORM INVERTS		6.66m-300mm ∅ STM @ 0.35% 123.42 123.40						123.32		45.80m-300mm ∅ STM @ 0.35%						123.16 123.16		57.64m-300mm ∅ STM @ 0.90%										122.64 122.36				
PROP. SANITARY INVERTS				20.32m-300mm ∅ STM @ 0.35% 123.39 123.31						122.75								92.46m-200mm ∅ SAN @ 0.40%										122.38 122.36				

Benchmark
BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092
BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
RI	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client: LOYALIST TOWNSHIP

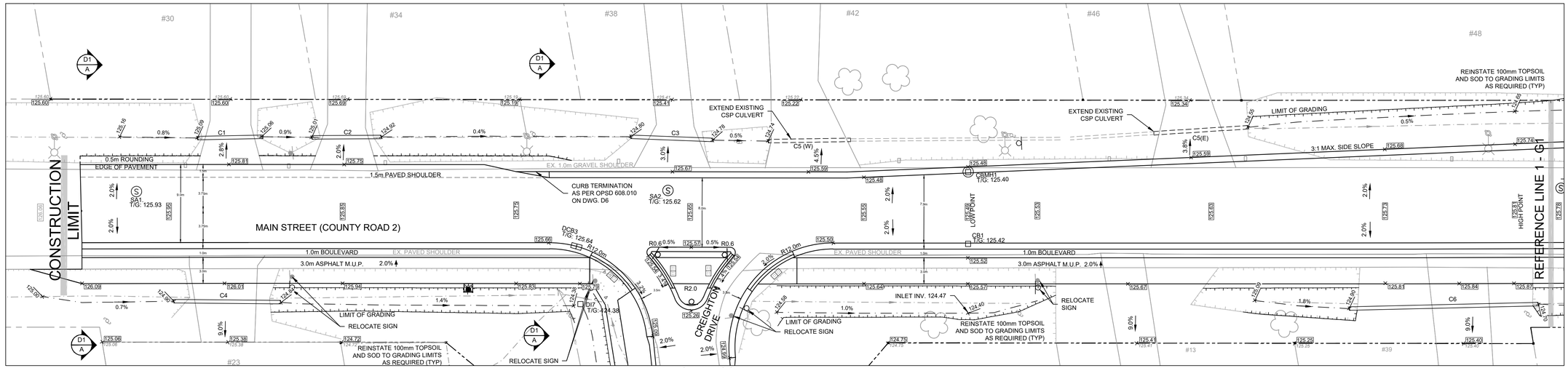
Project: POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

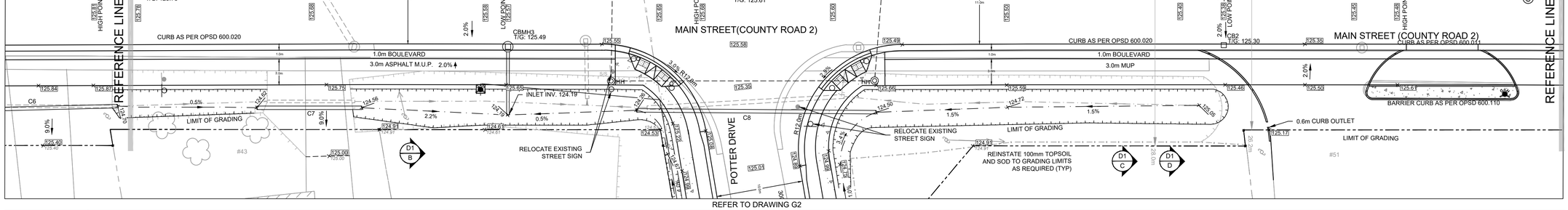
Drawing: CREIGHTON DRIVE PLAN AND PROFILE 4+000.00 TO 4+171.00

Drawn by:	Checked by:	Project No.
CDD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	PP06
Date: DECEMBER 2023		

Scale: H=1:250, V=1:25

PRELIMINARY NOT FOR CONSTRUCTION





LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
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Client

LOYALIST TOWNSHIP

Project

POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

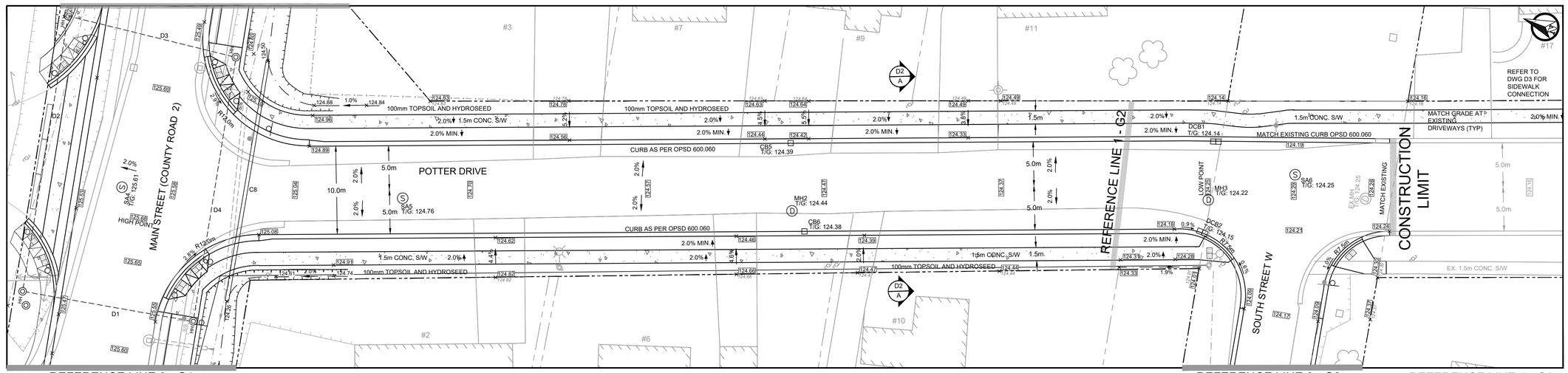
Drawing

GRADING PLAN I

Drawn by:	Checked by:	Project No.
CDD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	G1
Date: DECEMBER 2023		

Scale: 1:250

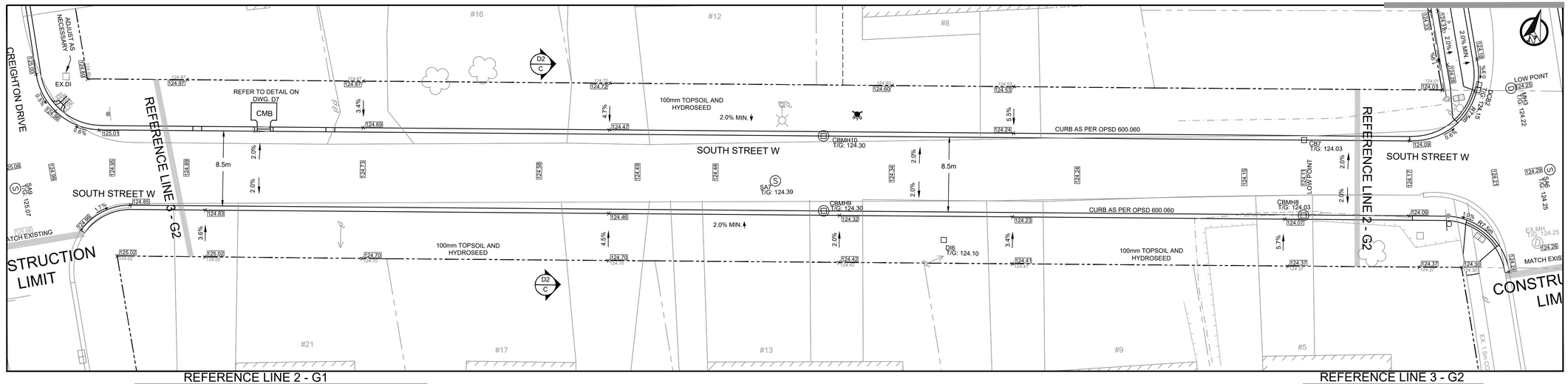
REFERENCE LINE 4 - G1



REFERENCE LINE 3 - G1

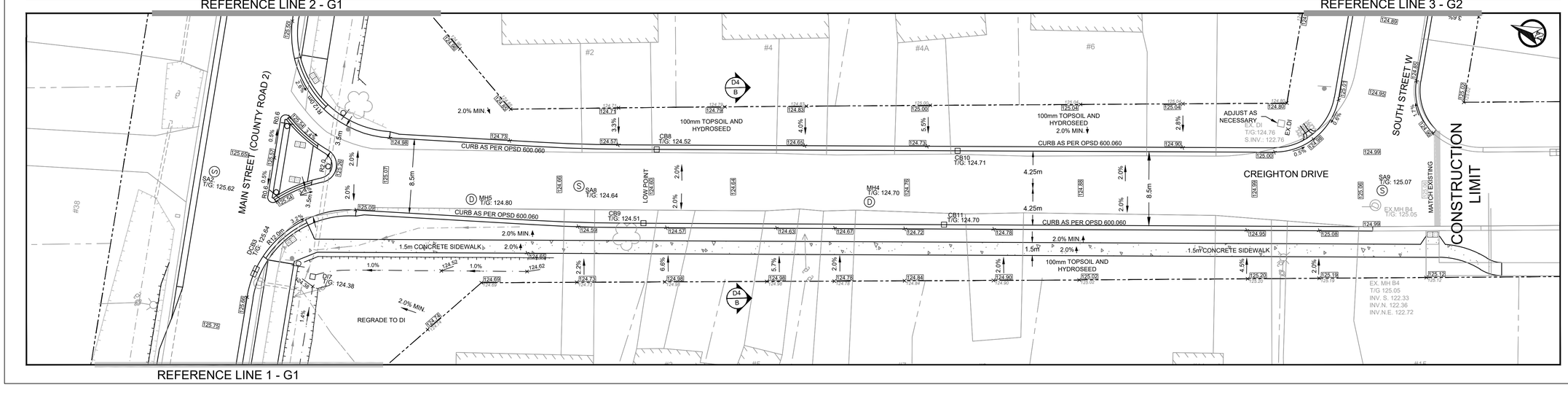
REFERENCE LINE 2 - G2

REFERENCE LINE 1 - G2



REFERENCE LINE 2 - G1

REFERENCE LINE 3 - G2



REFERENCE LINE 1 - G1

LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
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- BENCHMARK
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- STOP SIGN / AS NOTED
- STREET SIGN
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- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

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No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

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Client

LOYALIST TOWNSHIP

Project

POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing

GRADING PLAN 2

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	G2
Date: DECEMBER 2023		

Scale: 0 5 10 m 1H=1:250

STORM SEWER DESIGN CALCULATIONS

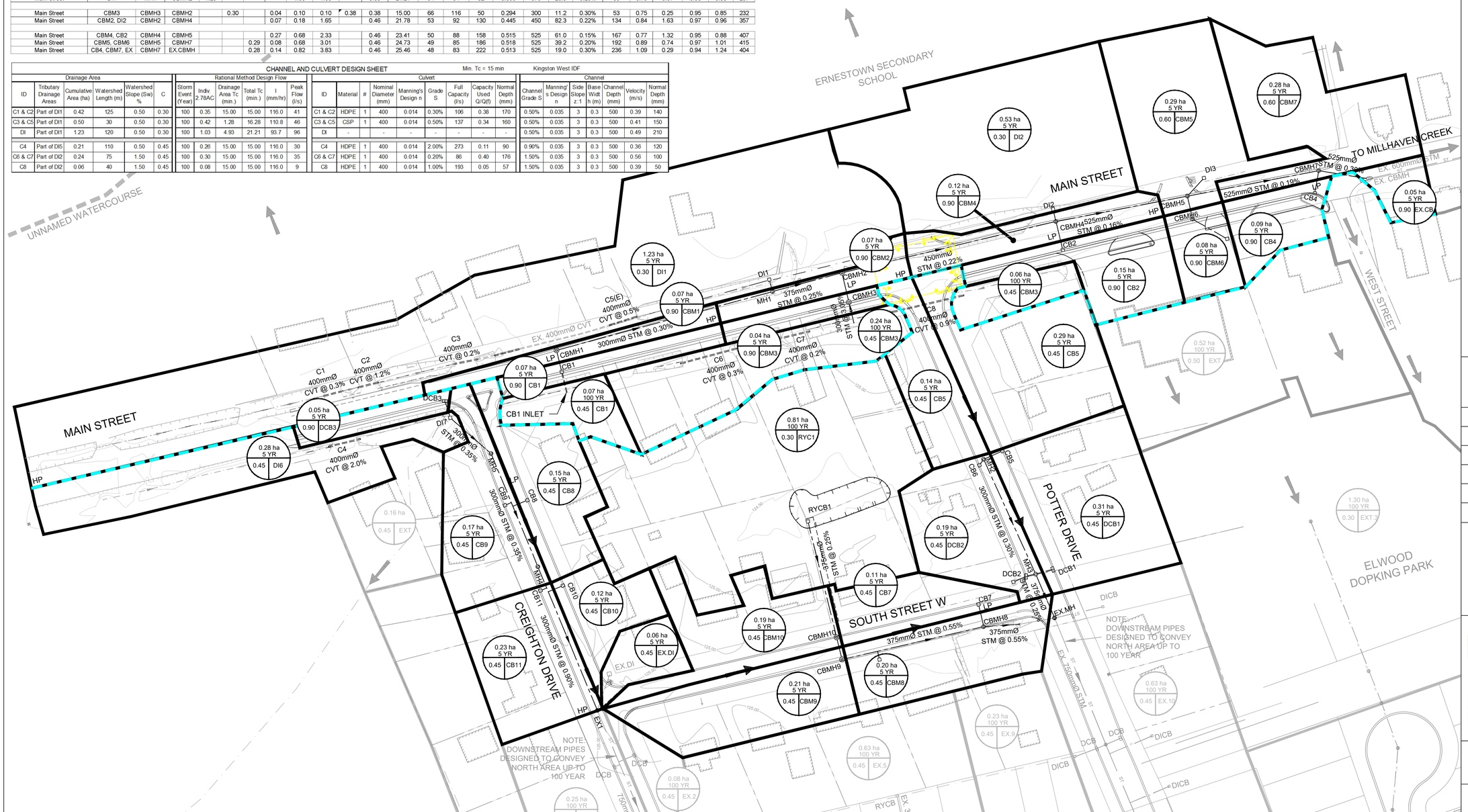
DESIGN FREQUENCY 5 100 Kingston West IDF

LOCATION					DRAINAGE AREA =			3.44 ha				RUNOFF				PIPE SELECTION							
Street	INLET	FROM MH#	TO MH#	R = 0.30 ha	Res. R = 0.45 ha	Res. R = 0.60 ha	Res. R = 0.90 ha	5 Year Indiv. 2.78AC ha	5 Year Accum. 2.78AC ha	100 Year Indiv. 2.78AC ha	100 Year Accum. 2.78AC ha	Time of Conc. min	Intensity I 5 yr mm/hr	Intensity I 100 yr mm/hr	Peak Flow Q L/s	Required Pipe Diameter D m	Nominal Diameter D mm	Pipe Length m	Grade S	Full Capacity L/s	Full V m/s	Time of Flow min	Capacity Used Q/Qf	Actual Velocity m/s	Normal Depth mm
Main Street	CB1	CB1	CBMH1		0.07		0.07	0.18	0.18	0.09	0.09	15.00	66	116	22	0.214	300	8.3	0.30%	53	0.75	0.18	0.41	0.71	133
Main Street	CBM1	CBMH1	MH1				0.07	0.18	0.35		0.09	15.18	65	116	33	0.251	300	83.8	0.30%	53	0.75	1.86	0.62	0.79	171
Main Street	DI1	MH1	CBMH2	1.23				1.03	1.38		0.09	21.21	54	94	82	0.366	375	26.9	0.25%	88	0.79	0.57	0.93	0.90	287
Main Street	CBM3	CBMH3	CBMH2		0.30		0.04	0.10	0.10	0.38	0.38	15.00	66	116	50	0.294	300	11.2	0.30%	53	0.75	0.25	0.95	0.85	232
Main Street	CBM2, DI2	CBMH2	CBMH4				0.07	0.18	1.65		0.46	21.78	53	92	130	0.445	450	82.3	0.22%	134	0.84	1.63	0.97	0.96	357
Main Street	CBM4, CB2	CBMH4	CBMH5				0.27	0.68	2.33		0.46	23.41	50	88	158	0.515	525	61.0	0.15%	167	0.77	1.32	0.95	0.88	407
Main Street	CBM5, CBM6	CBMH5	CBMH7			0.29	0.08	0.68	3.01		0.46	24.73	49	85	186	0.518	525	39.2	0.20%	192	0.89	0.74	0.97	1.01	415
Main Street	CB4, CBM7, EX	CBMH7	EX.CBMH			0.28	0.14	0.82	3.83		0.46	25.46	48	83	222	0.513	525	19.0	0.30%	236	1.09	0.29	0.94	1.24	404

CHANNEL AND CULVERT DESIGN SHEET

Min. Tc = 15 min Kingston West IDF

Drainage Area						Rational Method Design Flow						Culvert								Channel						
ID	Tributary Drainage Areas	Cumulative Area (ha)	Watershed Length (m)	Watershed Slope (Sw) %	C	Storm Event (Year)	Indiv. 2.78AC	Drainage Area Tc (min.)	Total Tc (min.)	I (mm/hr)	Peak Flow (l/s)	ID	Material	#	Nominal Diameter (mm)	Manning's Design n	Grade S	Full Capacity (l/s)	Capacity Used Q/Q(f)	Normal Depth (mm)	Channel Grade S	Manning's Design n	Side Slope z:1	Base Widt h (m)	Channel Depth (mm)	Velocity (m/s)	Normal Depth (mm)
C1 & C2	Part of DI1	0.42	125	0.50	0.30	100	0.35	15.00	15.00	116.0	41	C1 & C2	HDPE	1	400	0.014	0.30%	106	0.38	170	0.50%	0.035	3	0.3	500	0.39	140
C3 & C5	Part of DI1	0.50	30	0.50	0.30	100	0.42	1.28	16.28	110.8	46	C3 & C5	CSP	1	400	0.014	0.50%	137	0.34	160	0.50%	0.035	3	0.3	500	0.41	150
DI	Part of DI1	1.23	120	0.50	0.30	100	1.03	4.93	21.21	93.7	96	DI	-	-	-	-	-	-	-	-	0.50%	0.035	3	0.3	500	0.49	210
C4	Part of DI5	0.21	110	0.50	0.45	100	0.26	15.00	15.00	116.0	30	C4	HDPE	1	400	0.014	2.00%	273	0.11	90	0.90%	0.035	3	0.3	500	0.36	120
C6 & C7	Part of DI2	0.24	75	1.50	0.45	100	0.30	15.00	15.00	116.0	35	C6 & C7	HDPE	1	400	0.014	0.20%	86	0.40	176	1.50%	0.035	3	0.3	500	0.56	100
C8	Part of DI2	0.06	40	1.50	0.45	100	0.08	15.00	15.00	116.0	9	C8	HDPE	1	400	0.014	1.00%	193	0.05	57	1.50%	0.035	3	0.3	500	0.39	50



STORM SEWER DESIGN CALCULATIONS

DESIGN FREQUENCY 5 100 Kingston West IDF

LOCATION					DRAINAGE AREA =			29.24 ha				RUNOFF				PIPE SELECTION							
Street	INLET	FROM MH#	TO MH#	R = 0.30 ha	Res. R = 0.45 ha	Res. R = 0.50 ha	Res. R = 0.90 ha	5 Year Indiv. 2.78AC ha	5 Year Accum. 2.78AC ha	100 Year Indiv. 2.78AC ha	100 Year Accum. 2.78AC ha	Time of Conc. min	Intensity I 5 yr mm/hr	Intensity I 100 yr mm/hr	Peak Flow Q L/s	Required Pipe Diameter D m	Nominal Diameter D mm	Pipe Length m	Grade S	Full Capacity L/s	Full V m/s	Time of Flow min	Capacity Used Q/Qf	Actual Velocity m/s	Normal Depth mm
South Street W	RYC1	RYCB1	CBMH10	0.810						0.675	0.675	15.00	66	116	78	0.359	375	44.8	0.25%	88	0.79	0.94	0.89	0.90	276
South Street W	CBM10	CBMH10	CBMH9		0.190			0.238	0.238		0.675	15.94	64	112	91	0.367	375	8.5	0.30%	96	0.87	0.16	0.94	0.99	290
South Street W	CBM9	CBMH9	CBMH8		0.210			0.263	0.500		0.675	16.10	63	111	107	0.348	375	54.4	0.55%	130	1.18	0.77	0.82	1.31	258
South Street W	CBM8, CB7	CBMH8	EX.DICB		0.310			0.388	0.888		0.675	16.87	62	108	128	0.373	375	13.4	0.55%	130	1.18	0.19	0.98	1.34	302
South Street W	EX.DICB	EX.MH							0.888		0.675	17.06	61	108	127	0.372	375	13.4	0.55%	130	1.18	0.19	0.98	1.34	299
Potter Drive	CB5. CB6	MH2	MH3		0.430			0.538	0.538			15.00	66	116	35	0.258	300	47.3	0.30%	53	0.75	1.05	0.67	0.80	179
Potter Drive	DCB1, DCB2	MH3	EX.MH		0.500			0.625	1.163			16.05	63	112	74	0.351	375	17.8	0.25%	88	0.79	0.37	0.84	0.89	262
Creighton Drive	DCB3	DCB3	DI5				0.050	0.125	0.125			15.00	66	116	8	0.145	300	6.7	0.35%	57	0.81	0.14	0.14	0.57	76
Creighton Drive	DI5	DI5	MH4		0.280			0.35	0.48			15.14	65	116	31	0.239	300	20.3	0.35%	57	0.81	0.42	0.54	0.82	157
Creighton Drive	CB8, CB9	MH4	MH3		0.320			0.40	0.88			15.56	65	114	56	0.299	300	45.8	0.35%	57	0.81	0.94	0.99	0.92	242
Creighton Drive	CB10, CB11, EX. DI	MH3	EX.1		0.410			0.51	1.39			16.50	62	110	87	0.294	300	57.6	0.90%	92	1.30	0.74	0.94	1.48	232

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Benchmark

Forefront Engineering Inc
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1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
PROPOSED CATCHMENT AREAS

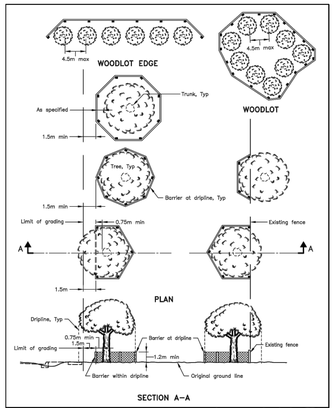
Drawn by:	Checked by:	Project No.
PB	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	STM
Date: DECEMBER 2023		
Scale: 1:750		

SEDIMENT AND EROSION CONTROL NOTES

1. All erosion and sediment controls shall be installed prior to construction and monitored and maintained by the Contractor throughout the construction process, until all disturbed areas have been revegetated, then the temporary sediment and erosion control measures must be removed once the site has been stabilized and or the site works are complete.
2. All erosion and sediment control measures shall be inspected after each rainfall to the satisfaction of Loyalist Township and the Cataraqui Region Conservation Authority.
3. Any disturbed area not scheduled for further construction within forty-five (45) days will be provided with a suitable temporary mulch and seed cover within seven (7) days of completion of that particular phase of construction.
4. Regardless of site specific items detailed on the plans, the Contractor shall install erosion control measures to suit the proposed work methods controlling sediment runoff from discharging offsite prior to any disturbance.
5. Following construction, disturbed areas, as well as proposed grassed and vegetated surfaces, shall be reinstated as soon as practical.
6. The placement of surplus fill to be placed and/or temporarily stored in accordance with O.Reg.148/06 where applicable. Temporary fill sites within the Plan of Subdivision will require the approval of Loyalist Township. Fill locations, side slopes, elevations as per the Approved Drawings. Restoration to be completed during the final phase of construction.
7. All roads used to access the subdivision shall be kept clean to the satisfaction of the Director of Engineering Services.
8. Temporary sediment fabric and stone filter at the catch basin inlet grates for sediment control as per detail on dwg. ER.

MAINTENANCE

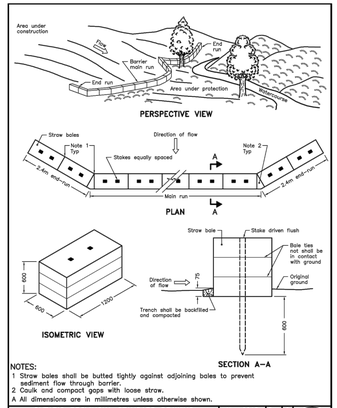
1. Roadside ditches should be inspected twice annually by Loyalist Township to remove trash and debris, mow grass to heights of 75mm min, inspect ground cover of 80%min and remediate any erosion.
2. During construction, inspections of sediment and erosion control measures should be conducted weekly or after every storm rainfall event in excess of 25mm. All sediment control measures will be maintained to ensure their performance.



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2019 | Rev 1

BARRIER FOR TREE PROTECTION

OPSD 220.010

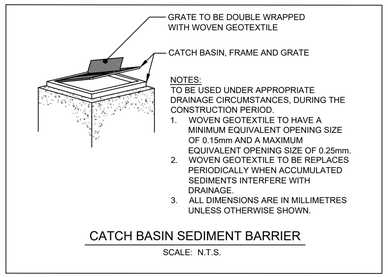


NOTES:
1 Straw bales shall be butted tightly against adjoining bales to prevent sediment flow through barrier.
2 Caulk and compact gaps with loose straw.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

LIGHT–DUTY STRAW BALE BARRIER

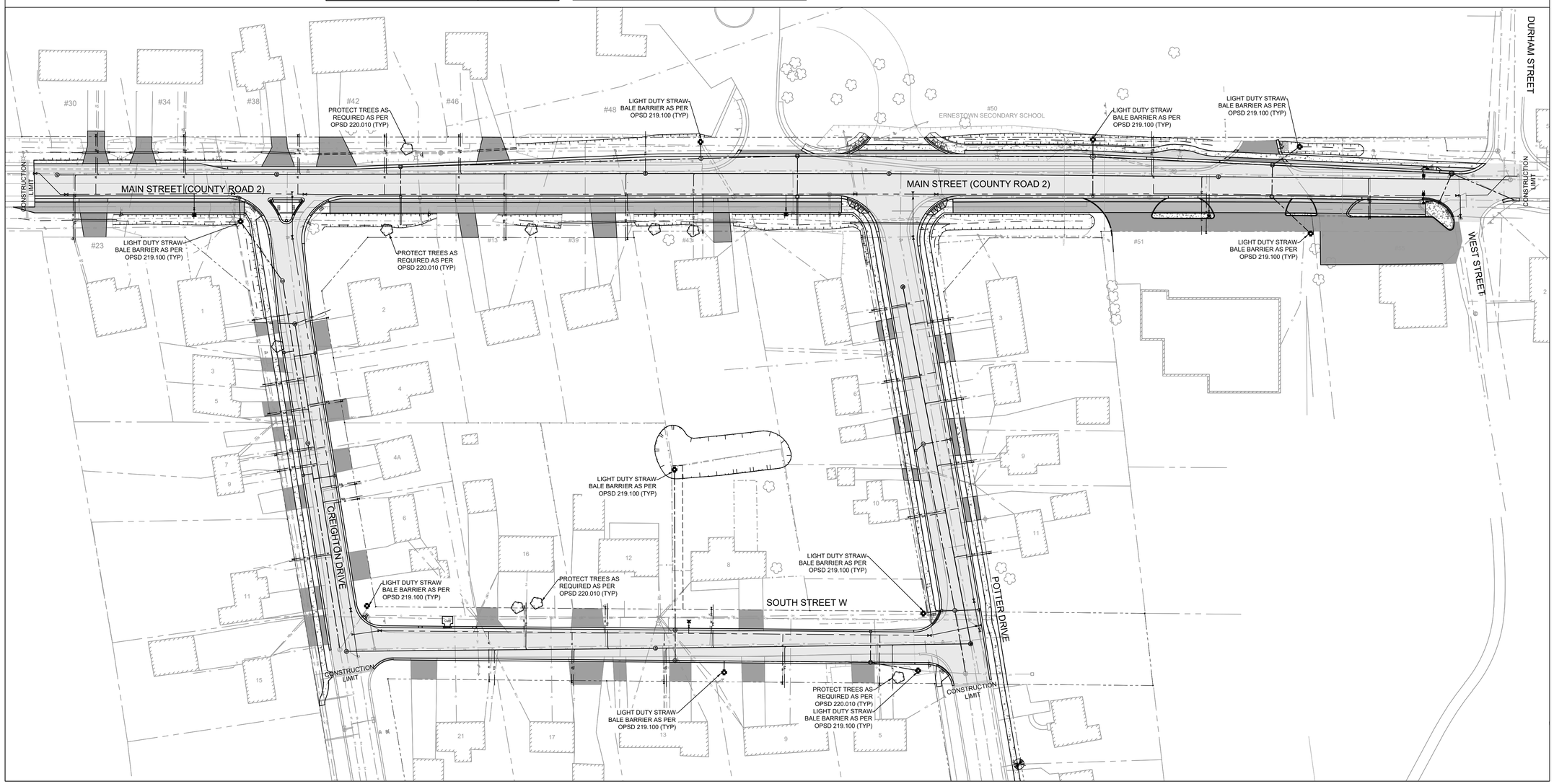
OPSD 219.100



NOTES:
TO BE USED UNDER APPROPRIATE DRAINAGE CIRCUMSTANCES, DURING THE CONSTRUCTION PERIOD.
1. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm.
2. WOVEN GEOTEXTILE TO BE REPLACES PERIODICALLY WHEN ACCUMULATED SEDIMENTS INTERFERE WITH DRAINAGE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

CATCH BASIN SEDIMENT BARRIER

SCALE: N.T.S.



LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- W — EXISTING WATERMAIN
- SA — EXISTING SANITARY SEWER
- ST — EXISTING STORM SEWER
- OH — EXISTING OVERHEAD HYDRO
- G — EXISTING GAS
- BCU — EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
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- DICB — DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
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- VEGETATION REMOVAL
- STRAW BALE
- 123.00 — EXISTING ELEVATION
- 123.00 — PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

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No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc

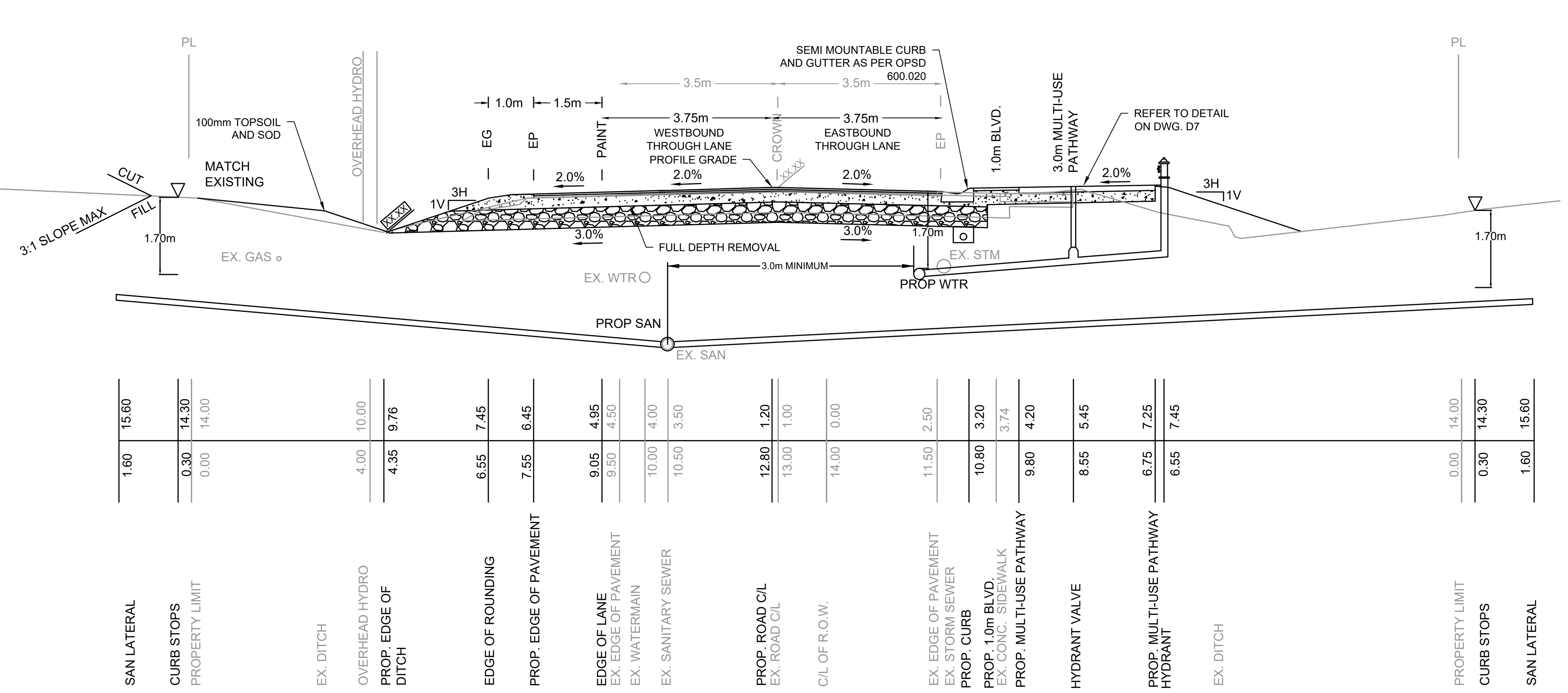
1329 Gardiners Road, Suite 210
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Client: LOYALIST TOWNSHIP

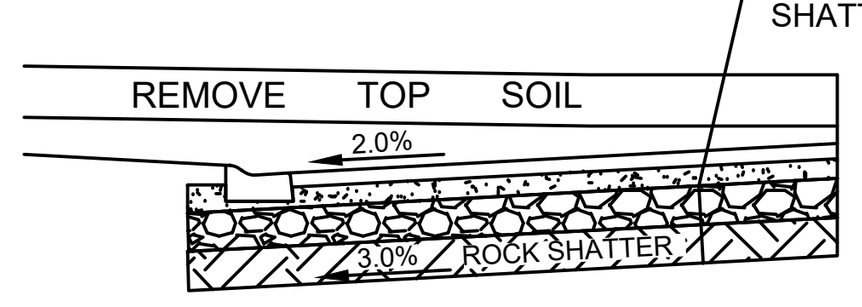
Project: POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing: SEDIMENT AND EROSION CONTROL AND TREE PRESERVATION PLAN

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	ER
Date: DECEMBER 2023		
Scale: 1:600		



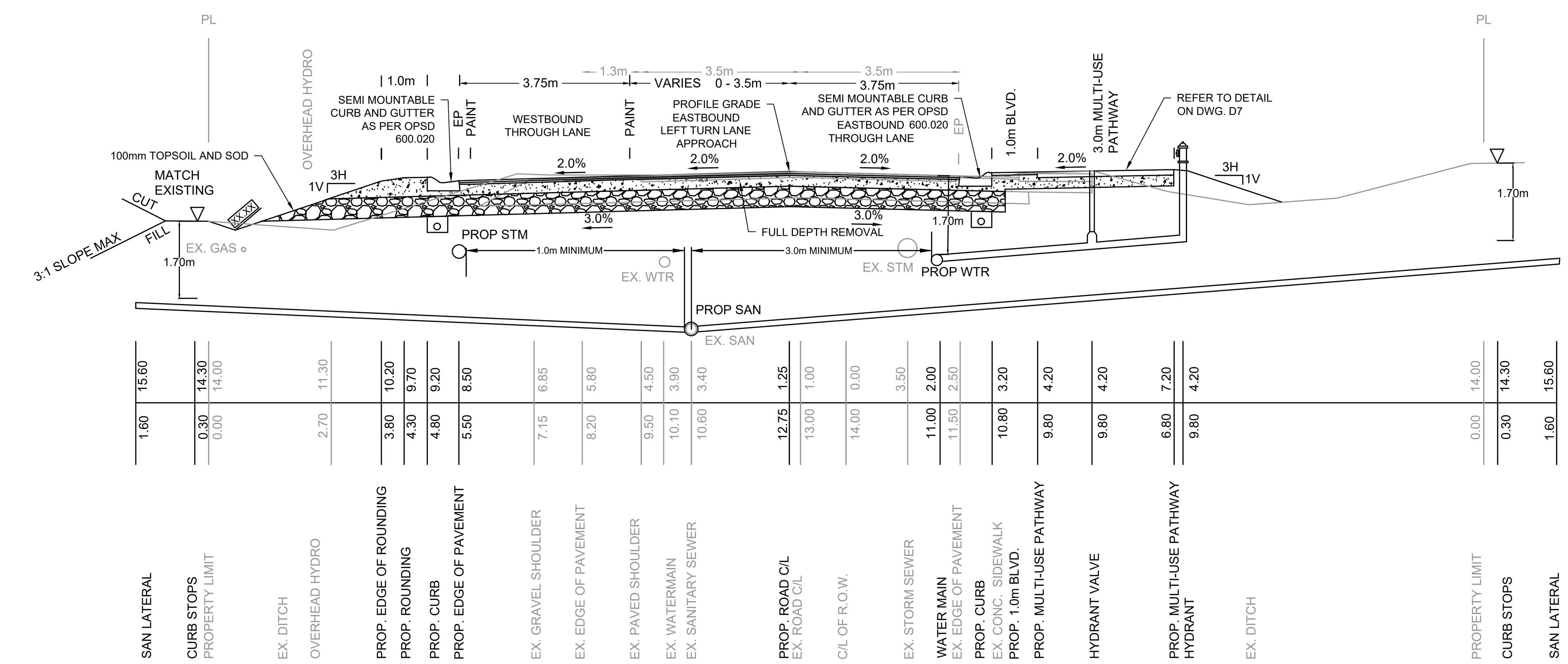
D1 / A — MAIN STREET (HIGHWAY 2)
STATION 1+000.0 TO 1+053.8



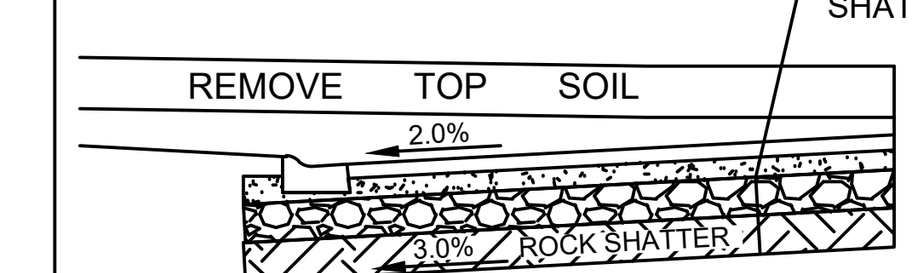
ROAD BASE CONSTRUCTION	
ROCK SHATTER OR ROCK / FILL SUBGRADE	EARTH SUBGRADE
250mm GRANULAR 'A' MINIMUM 300mm ROCK SHATTER OR ROCK FILL	250mm GRANULAR 'A' 450mm GRANULAR 'B'

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON TO BE SODDED ON 100mm OF TOPSOIL BASE
5. WHERE VERTICAL FACES ARE ENCOUNTERED (I.E. CURBS, PAVING JOINTS), THEY SHALL BE TACK COATED PRIOR TO HOT MIX PAVING WITH SS-1 OR SS-1H EMULSIFIED ASPHALT, DILUTED WITH AN EQUAL VOLUME OF WATER APPLIED AT A RATE OF 0.35 KG/M².
6. MAINTAIN A MINIMUM 3.0m HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS, 1.5m SEPARATION BETWEEN SANITARY AND STORM SEWERS.
7. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
8. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
9. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
7. ASPHALT THICKNESS AT WIDENING
   - MIN. 50mm SP12.5 SURFACE COURSE
   - MIN. 80mm SP19.0 BASE COURSE
   - ASPHALT CEMENT ON MAIN STREET (COUNTY ROAD 2) SHALL BE MSCR GRADE 58H-34
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT



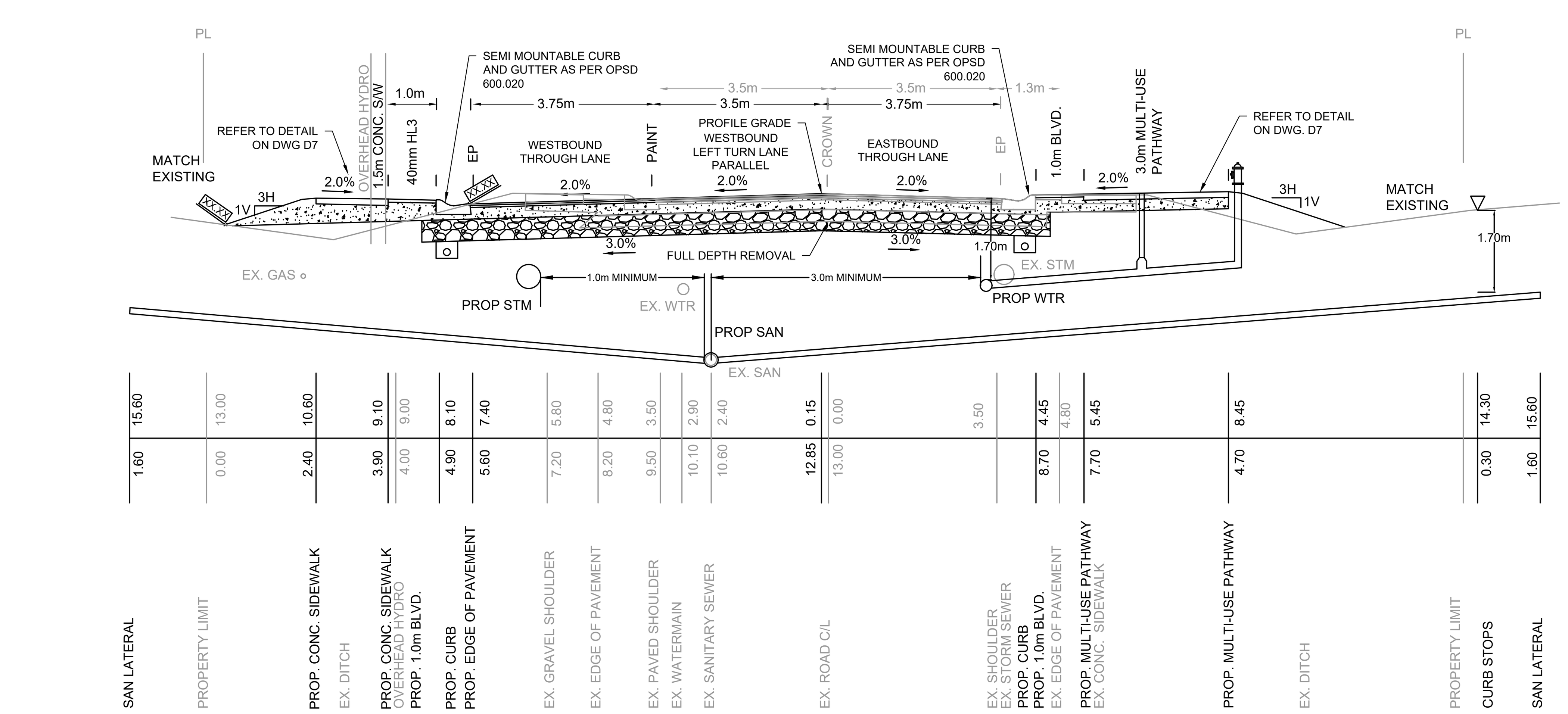
D1 / B — MAIN STREET (HIGHWAY 2)
STATION 1+053.0 TO 1+252.0



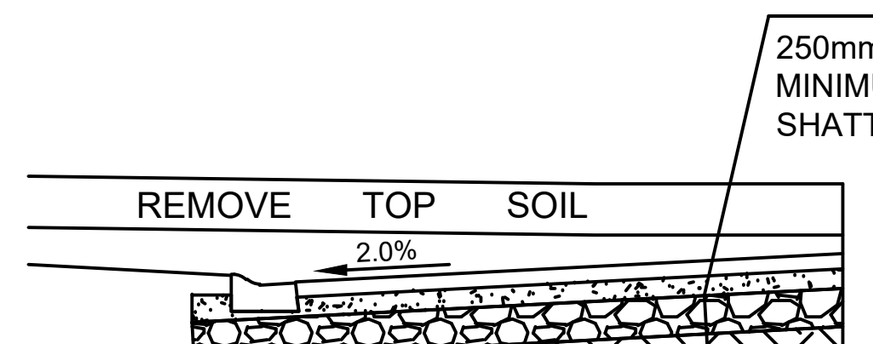
ROAD BASE CONSTRUCTION	
ROCK SHATTER OR ROCK / FILL SUBGRADE	EARTH SUBGRADE
250mm GRANULAR 'A' MINIMUM 300mm ROCK SHATTER OR ROCK FILL	250mm GRANULAR 'A' 450mm GRANULAR 'B'

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON TO BE SODDED ON 100mm OF TOPSOIL BASE
5. WHERE VERTICAL FACES ARE ENCOUNTERED (I.E. CURBS, PAVING JOINTS), THEY SHALL BE TACK COATED PRIOR TO HOT MIX PAVING WITH SS-1 OR SS-1H EMULSIFIED ASPHALT, DILUTED WITH AN EQUAL VOLUME OF WATER APPLIED AT A RATE OF 0.35 KG/M².
6. MAINTAIN A MINIMUM 3.0m HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS, 1.5m SEPARATION BETWEEN SANITARY AND STORM SEWERS.
7. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
8. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
9. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
7. ASPHALT THICKNESS AT WIDENING
   - MIN. 50mm SP12.5 SURFACE COURSE
   - MIN. 80mm SP19.0 BASE COURSE
   - ASPHALT CEMENT ON MAIN STREET (COUNTY ROAD 2) SHALL BE MSCR GRADE 58H-34
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT



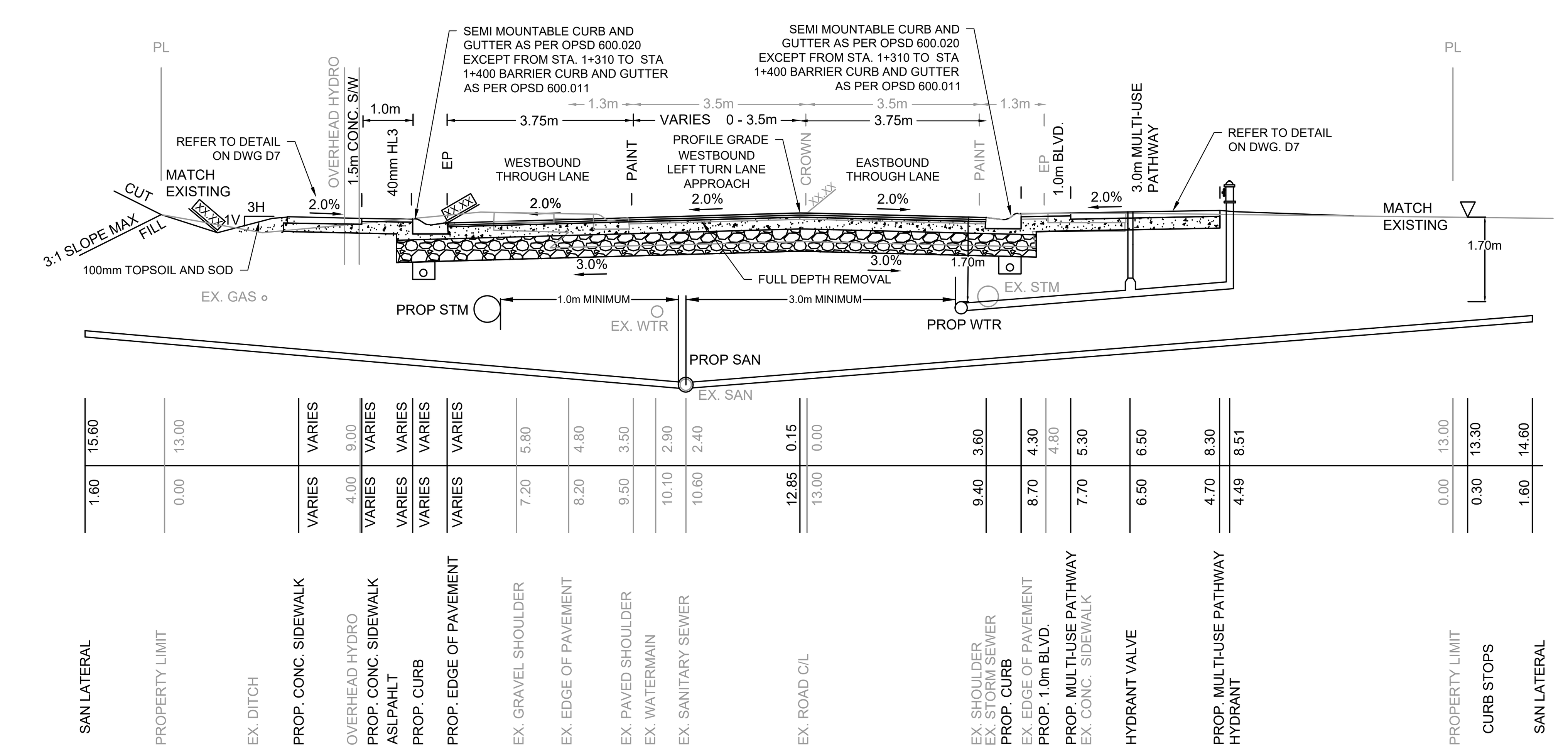
D1 / C — MAIN STREET (HIGHWAY 2)
STATION 1+252.0 TO 1+267.0



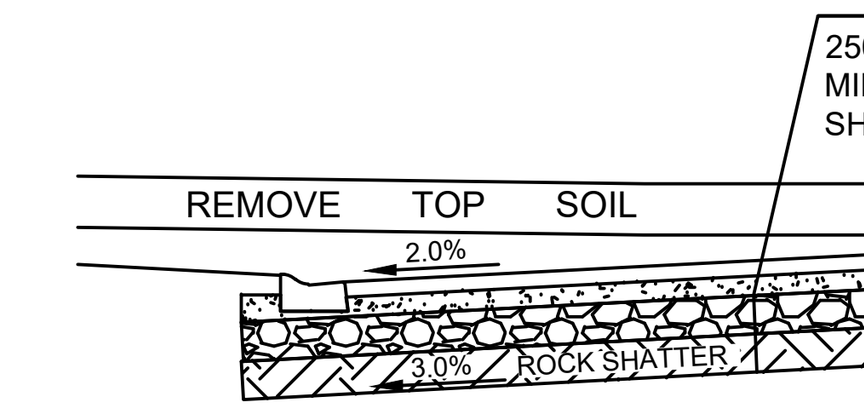
ROAD BASE CONSTRUCTION	
ROCK SHATTER OR ROCK / FILL SUBGRADE	EARTH SUBGRADE
250mm GRANULAR 'A' MINIMUM 300mm ROCK SHATTER OR ROCK FILL	250mm GRANULAR 'A' 450mm GRANULAR 'B'

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON TO BE SODDED ON 100mm OF TOPSOIL BASE
5. WHERE VERTICAL FACES ARE ENCOUNTERED (I.E. CURBS, PAVING JOINTS), THEY SHALL BE TACK COATED PRIOR TO HOT MIX PAVING WITH SS-1 OR SS-1H EMULSIFIED ASPHALT, DILUTED WITH AN EQUAL VOLUME OF WATER APPLIED AT A RATE OF 0.35 KG/M².
6. MAINTAIN A MINIMUM 3.0m HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS, 1.5m SEPARATION BETWEEN SANITARY AND STORM SEWERS.
7. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
8. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
9. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
7. ASPHALT THICKNESS AT WIDENING
   - MIN. 50mm SP12.5 SURFACE COURSE
   - MIN. 80mm SP19.0 BASE COURSE
   - ASPHALT CEMENT ON MAIN STREET (COUNTY ROAD 2) SHALL BE MSCR GRADE 58H-34
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT



D1 / D — MAIN STREET (HIGHWAY 2)
STATION 1+267.0 TO 1+385.0



ROAD BASE CONSTRUCTION	
ROCK SHATTER OR ROCK / FILL SUBGRADE	EARTH SUBGRADE
250mm GRANULAR 'A' MINIMUM 300mm ROCK SHATTER OR ROCK FILL	250mm GRANULAR 'A' 450mm GRANULAR 'B'

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON TO BE SODDED ON 100mm OF TOPSOIL BASE
5. WHERE VERTICAL FACES ARE ENCOUNTERED (I.E. CURBS, PAVING JOINTS), THEY SHALL BE TACK COATED PRIOR TO HOT MIX PAVING WITH SS-1 OR SS-1H EMULSIFIED ASPHALT, DILUTED WITH AN EQUAL VOLUME OF WATER APPLIED AT A RATE OF 0.35 KG/M².
6. MAINTAIN A MINIMUM 3.0m HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS, 1.5m SEPARATION BETWEEN SANITARY AND STORM SEWERS.
7. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
8. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
9. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
7. ASPHALT THICKNESS AT WIDENING
   - MIN. 50mm SP12.5 SURFACE COURSE
   - MIN. 80mm SP19.0 BASE COURSE
   - ASPHALT CEMENT ON MAIN STREET (COUNTY ROAD 2) SHALL BE MSCR GRADE 58H-34
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT
9. BARRIER CURB AS PER OPSD 600.011 FROM STA. 1+310 TO STA. 1+400 EXCEPT THROUGH ENTRANCES

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark
- BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092
- BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

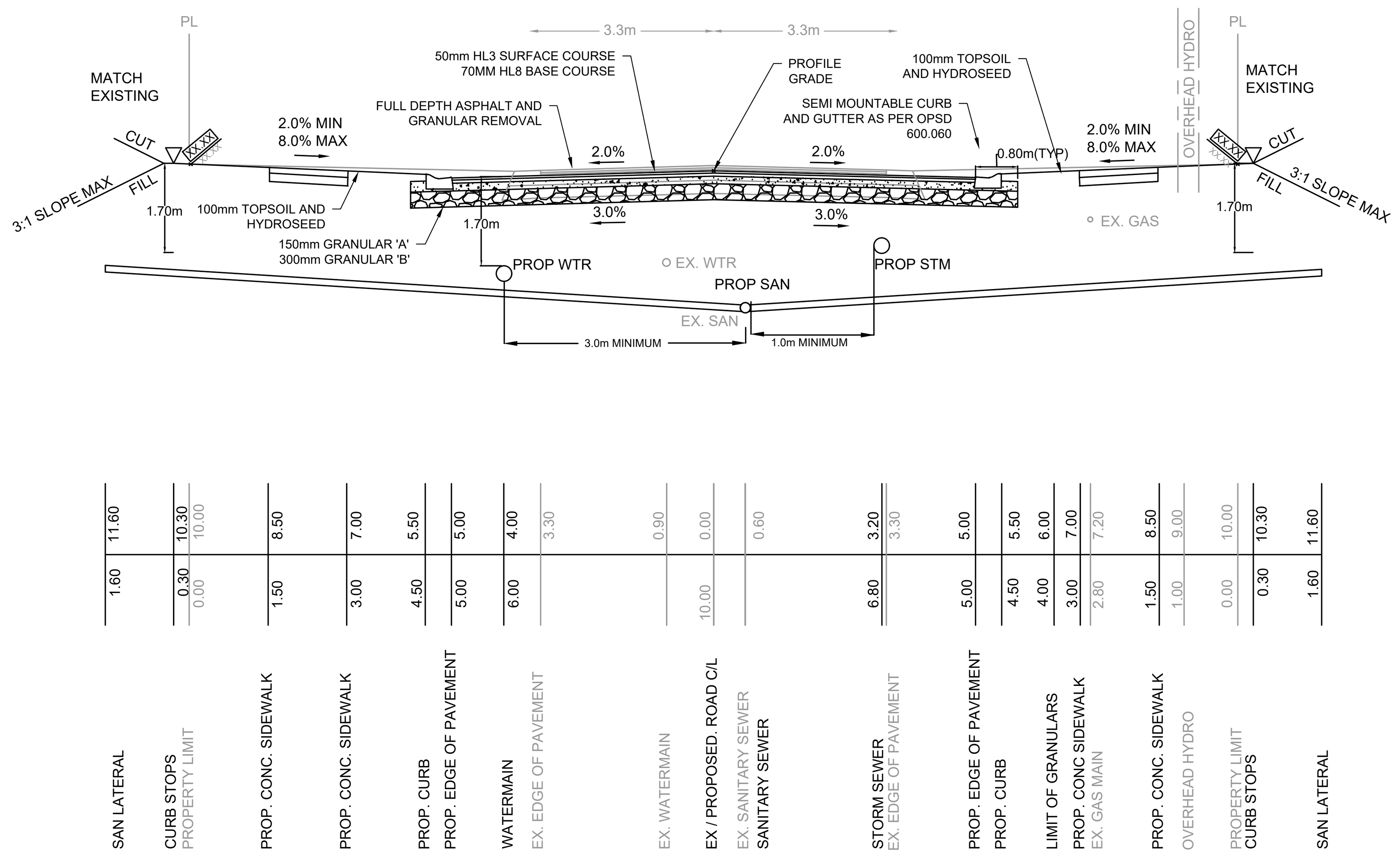
Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
DETAILS 1 TYPICAL CROSS SECTIONS 1

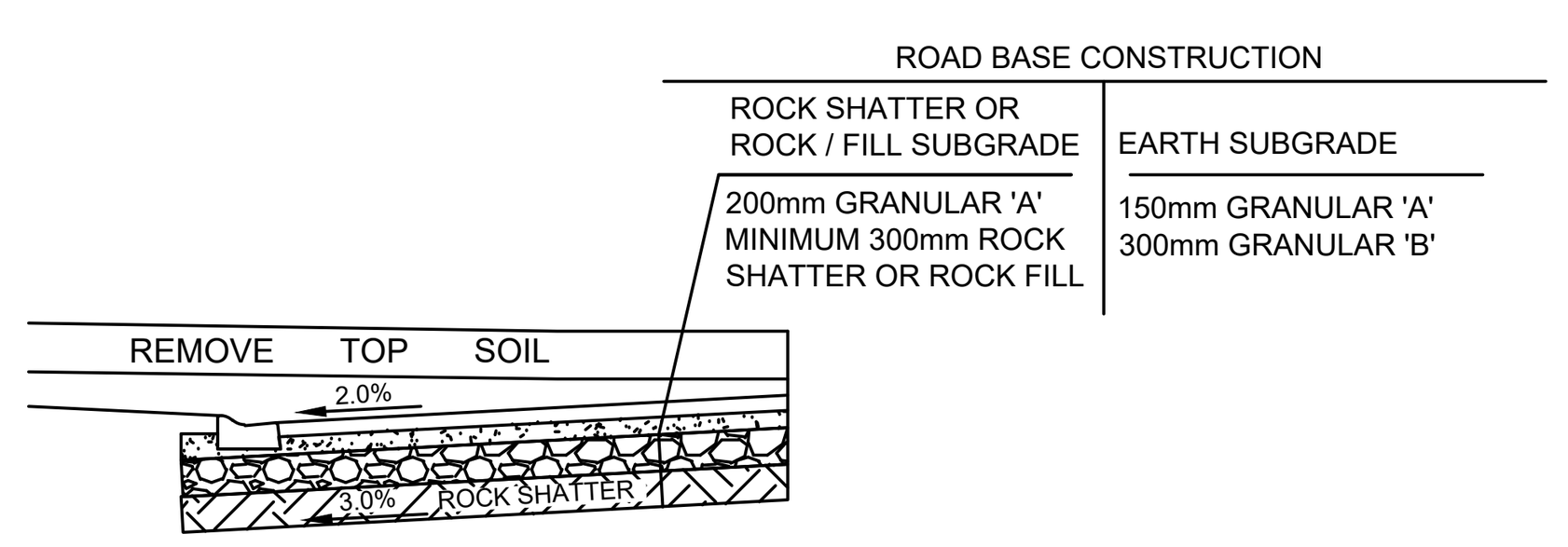
Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D1
Date: DECEMBER 2023		
Scale: N.T.S.		

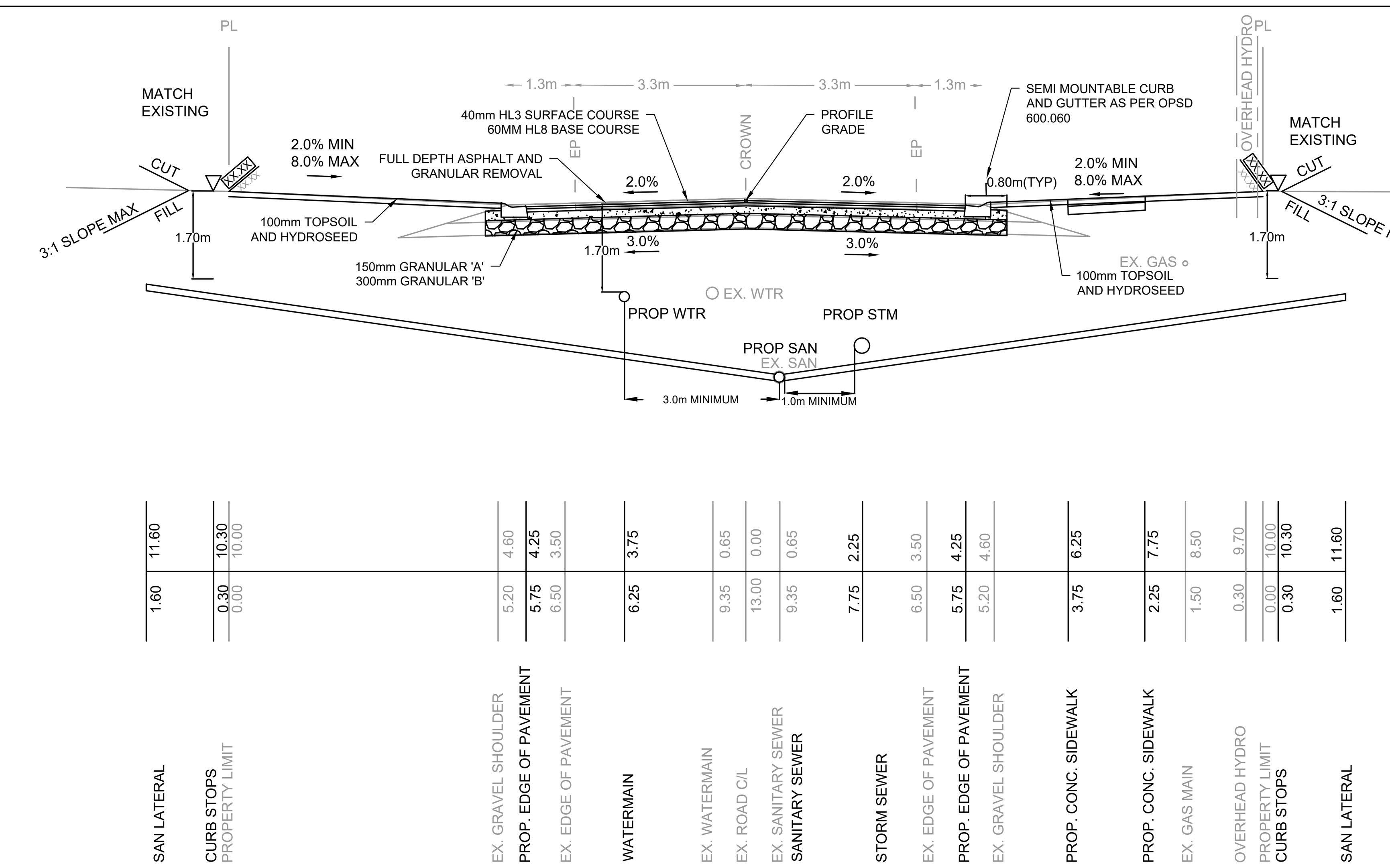


D3 / A POTTER DRIVE
STATION 2+017.0 TO 2+152.0

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON POTTER DRIVE TO BE SEEDED ON 100mm OF TOPSOIL BASE
5. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
6. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
7. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
8. ASPHALT THICKNESS
   - 50mm HL3 SURFACE COURSE
   - 70mm HL8 BASE COURSE
   - ASPHALT CEMENT ON POTTER DRIVE TO BE PERFORMANCE GRADE PG 58-28
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT
9. SIDEWALK AS PER OPSD 310.010

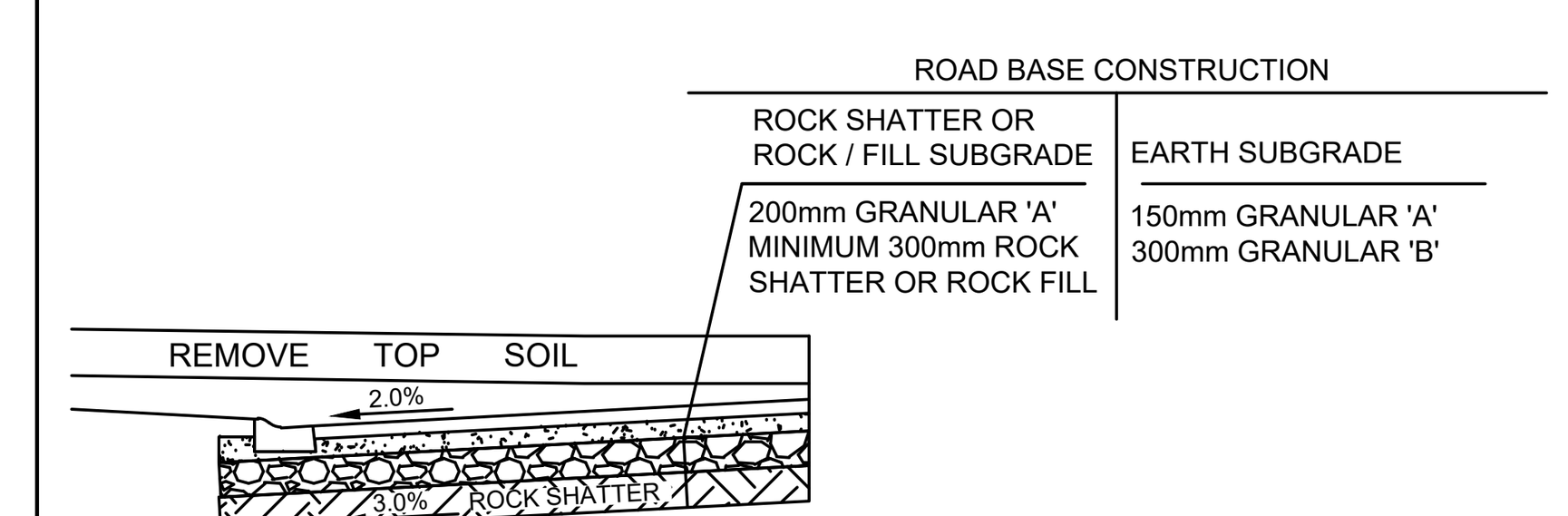


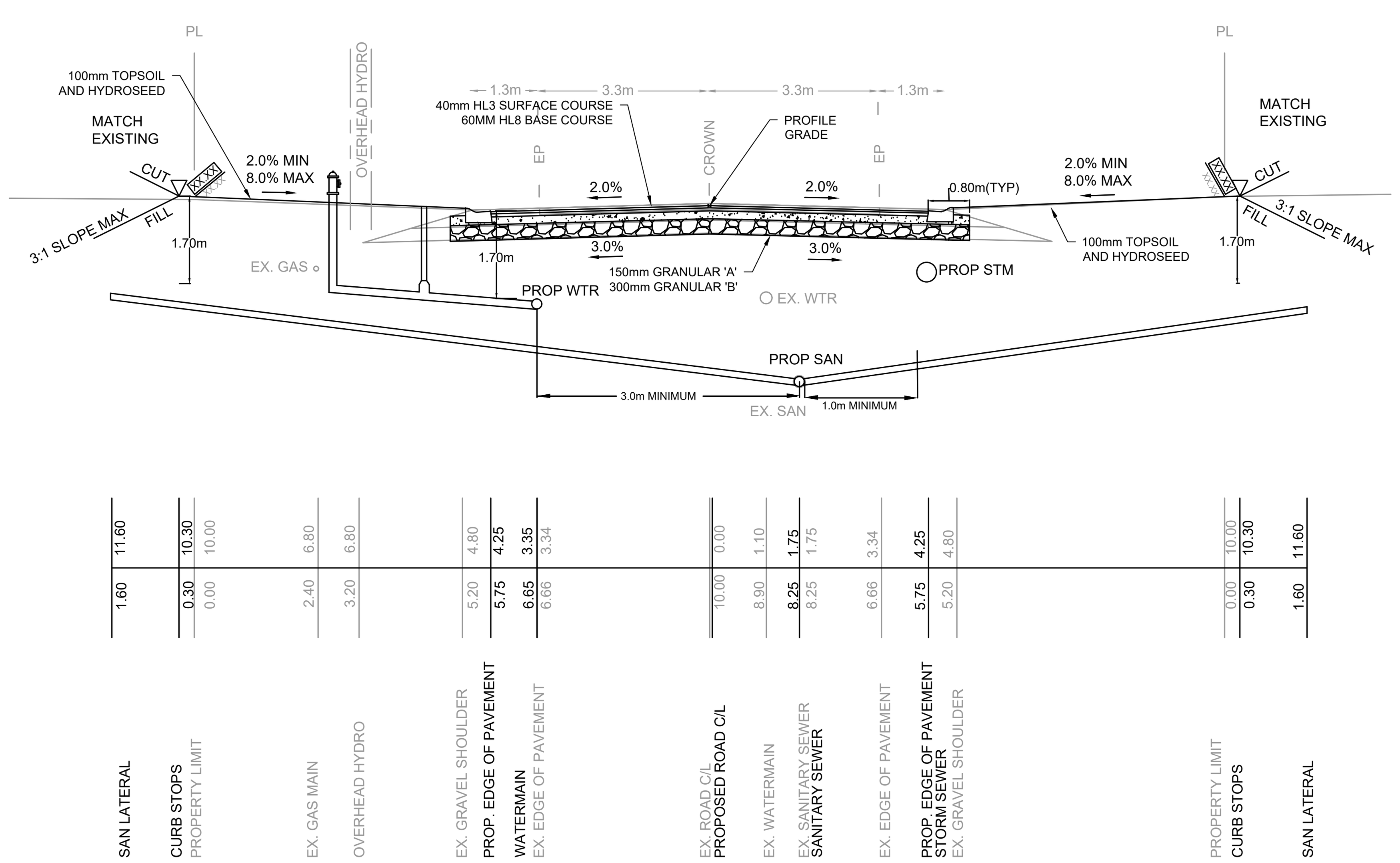


D3 / B CREIGHTON DRIVE
4+000.00 TO 4+150.00

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON TO BE SEEDED ON 100mm OF TOPSOIL BASE
5. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
6. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
7. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
8. ASPHALT THICKNESS
   - 40mm HL3 SURFACE COURSE
   - 60mm HL8 BASE COURSE
   - ASPHALT CEMENT TO BE PERFORMANCE GRADE PG 58-28
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT
9. SIDEWALK AS PER OPSD 310.010

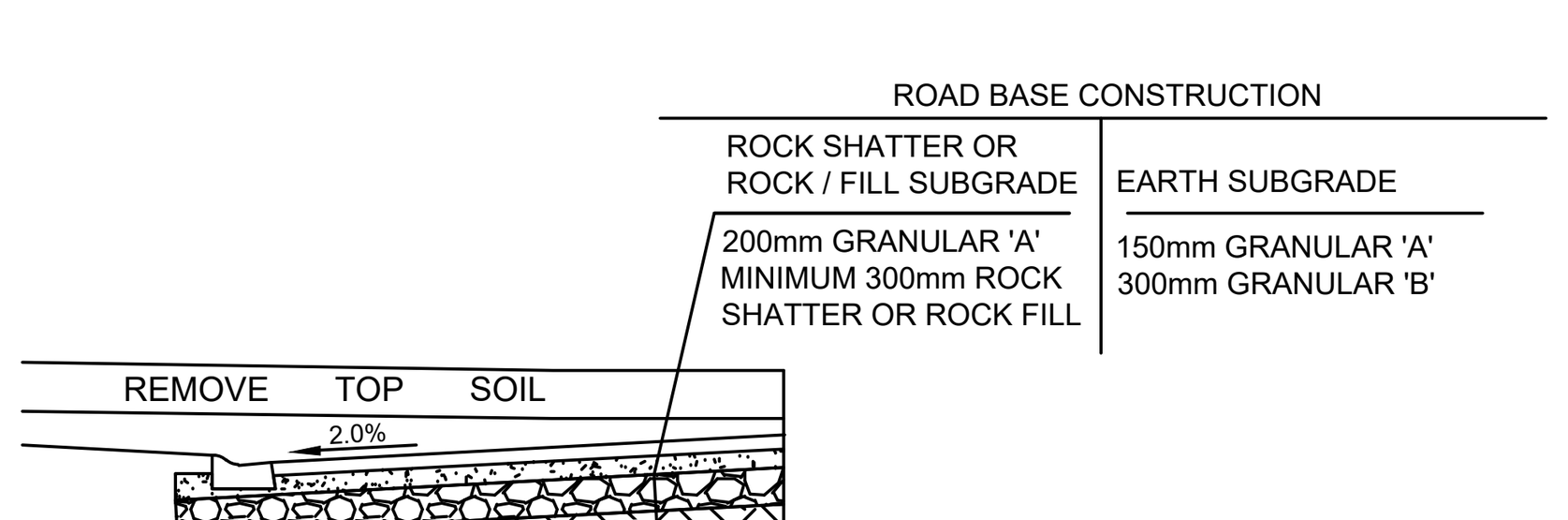




D3 / C SOUTH STREET
3+000.00 TO 3+180.00

NOTES:

1. THE CONTRACTOR IS TO CHECK, VERIFY AND BE RESPONSIBLE FOR ALL UNDERGROUND SERVICES, STRUCTURES AND UTILITIES. ALL EXISTING UNDERGROUND STRUCTURES AND PIPES, CONDUITS, ETC. TO BE EXPOSED PRIOR TO ANY CONSTRUCTION AND ANY POTENTIAL CONFLICTS TO BE REPORTED TO THE ENGINEER.
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
3. ALL THICKNESS DIMENSIONS REPRESENT CONSOLIDATED THICKNESS.
4. BOULEVARDS ON TO BE SEEDED ON 100mm OF TOPSOIL BASE
5. CONSTRUCTION TO BE IN ACCORDANCE WITH SOILS REPORT BY MALROZ ENGINEERING DATED JANUARY 2024.
6. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 98% S.P.M.D.D.
7. SIGNS TO BE 1200mm BEHIND E/P. REFER TO D6 FOR SIGN DETAILS
8. ASPHALT THICKNESS
   - 40mm HL3 SURFACE COURSE
   - 60mm HL8 BASE COURSE
   - ASPHALT CEMENT TO BE PERFORMANCE GRADE PG 58-28
8. DRIVEWAYS TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE AND 50mm HL3 ASPHALT



PRELIMINARY NOT FOR CONSTRUCTION

Benchmark
BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092
BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

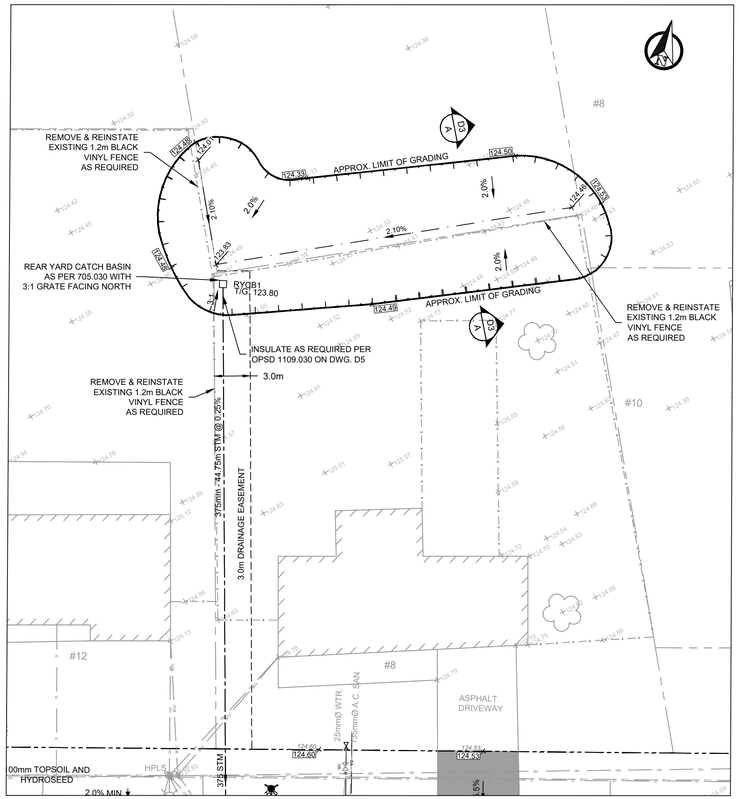
Client
LOYALIST TOWNSHIP

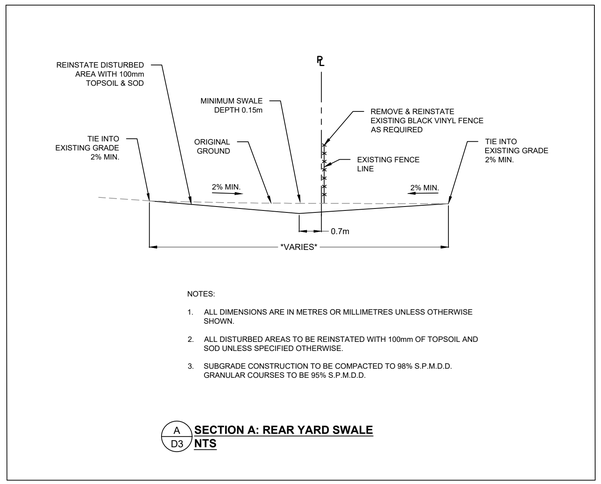
Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
DETAILS 2 TYPICAL SECTIONS II

Drawn by: CGD	Checked by: JH	Project No.
Designed by: KMN	Approved by: KMN	Drawing No. D2
Date: DECEMBER 2023		
Scale: N.T.S.		

SOUTH STREET REAR YARD GRADING DETAILS



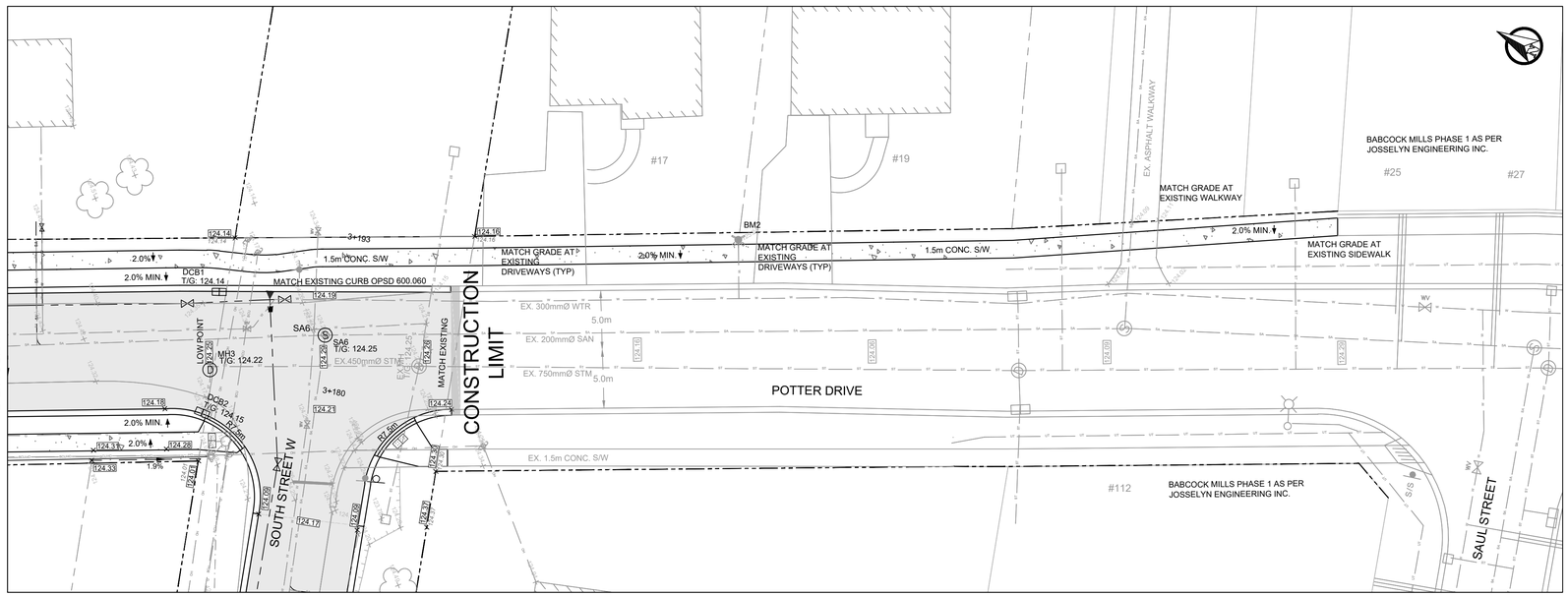


NOTES:

1. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL DISTURBED AREAS TO BE REINSTATED WITH 100mm OF TOPSOIL AND SOD UNLESS SPECIFIED OTHERWISE.
3. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 95% S.P.M.D.D.

A / D3 SECTION A: REAR YARD SWALE
NTS

POTTER DRIVE SIDEWALK CONNECTION DETAILS



LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

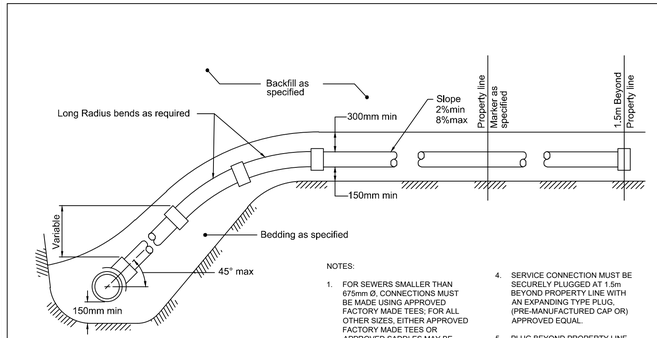
Client: LOYALIST TOWNSHIP

Project: POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing: DETAILS 3 GRADING DETAILS

Drawn by:	Checked by:	Project No.
CDD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D3
Date: DECEMBER 2023		

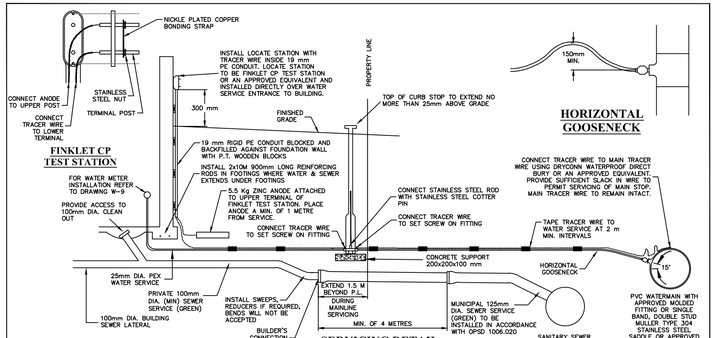
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NOTES:

1. FOR SEWERS SMALLER THAN 675mm Ø, CONNECTIONS MUST BE MADE USING APPROVED FACTORY MADE TEES; FOR ALL OTHER SIZES, EITHER APPROVED FACTORY MADE TEES OR APPROVED SADDLES MAY BE USED.
2. SADDLES MUST BE INSTALLED ON THE MAIN PIPE BEFORE THAT PIPE IS LAID.
3. LATERAL IS TO EXTEND 1.5m BEYOND PROPERTY LINE. THE BELL END IS TO REMAIN ON THE LAST PEICE OF PIPE LEADING UP TO THE PROPERTY LINE AND SHALL BE 4m IN LENGTH.
4. SERVICE CONNECTION MUST BE SECURELY PLUGGED AT 1.5m BEYOND PROPERTY LINE WITH AN EXPANDING TYPE PLUG, (PRE-MANUFACTURED CAP OR) APPROVED EQUAL.
5. PLUG BEYOND PROPERTY LINE SHALL BE ADEQUATELY BRACED TO WITHSTAND TESTING PRESSURES.
6. SANITARY SEWER SERVICE PIPE TO BE GREEN IN COLOUR.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

SEWER SERVICE CONNECTIONS FOR FLEXIBLE PIPE

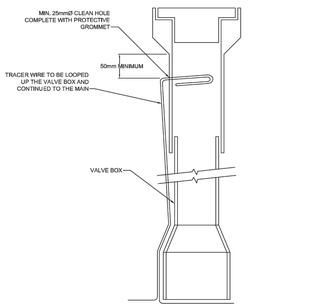


SERVICING DETAIL

Notes:

1. Minimum diameter of cross-linked polyethylene (PEX) water service shall be 25 mm O.D.
2. All compression connections require an approved stainless steel insert in order to provide structure integrity at compression fitting.
3. No water service unions or reducers will be permitted unless approved by the Director of Engineering Services. Where a fitting is approved couplings must be permanently protected using polyethylene heat shrink sleeves or other approved protective wrap. The sleeve must extend a minimum of 2 inches beyond the coupling to secure the repair and installed as per the pipe manufacturer's recommendations.
4. All water services to be installed 90° to the longitudinal axis of the watermain.
5. The grounding of a building's electrical system to the municipal water service is not permitted under any circumstances.
6. Any retrofit of a property utilizing an existing water service as a ground must be outfitted with ground rods/plates as per current Electrical Safety Code and inspected by ESA.
7. PEX water services are not permitted in soils contaminated with hydro carbons, chemicals or other potential hazards.
8. PEX water services shall be protected from extended exposure to ultraviolet light.
9. Kinked, buckled, gouged or otherwise damaged tubing shall not be used.
10. All PEX water service connections should leave the main between 10 and 20 degrees above horizontal.
11. Minimum cover over water service shall be 1.7 metres with a maximum cover of 2.0 metres.
12. To accommodate thermal expansion/contraction, snake the tubing along the bottom of the trench as per the Manufacturer's recommendations.
13. All compression nuts to be specified with electrical connectors for tracer wire connection.
14. All materials to be CSA approved.
15. All tracer wires within the Municipal right of way to be 12 gauge stranded copper (plastic coated), T.W.U. 75 C 600V or approved equal.

LOYALIST TOWNSHIP ENGINEERING DEPARTMENT	P.O. BOX 70, 263 MAIN ST., ODESSA, ONTARIO K0H 2H0 (613) 386-7351 Ext. 115
TITLE:	25 TO 50 mm CROSS-LINKED POLYETHYLENE WATER SERVICE
DATE:	APRIL 2, 2015
SCALE:	N.T.S.
DRAWN BY:	A. SCOTT
CHECKED BY:	L. McFARLAND
DRAWING NO.:	W-16

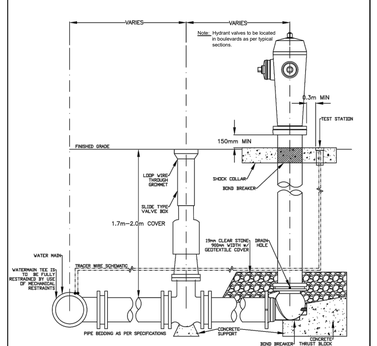


NOTES:

1. TRACER WIRE - #12 GUAGE SOLID C.S.A. TYPE T.W.M.
2. TRACER WIRE SHOULD BE LOOPED UP THE OUTSIDE OF ALL MAIN VALVE BOXES AND EXTENDED INTO THE VALVE BOX BY AT LEAST 150mm THROUGH HOLE 50mm BELOW THE BOTTOM OF THE COVER BELL.
3. CONNECTIONS USED FOR SPLICING TRACER WIRE SHALL BE WING NUT TYPE WITH NYLON SHELL AND NON-CORROSIVE STEEL WIRE SPRING.

TRACER WIRE ARRANGEMENT AT VALVE BOX FOR PVC OR CPP WATERMAIN

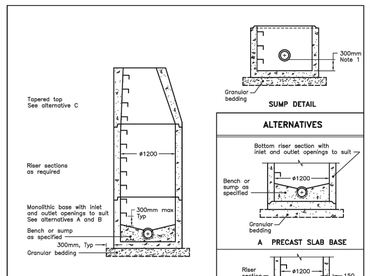
Utilities Kingston	
Revision:	Feb 26,2007
Scale:	NTS
Drawing No.:	W03-03-105



Notes:

1. All trace wire splice connections are to be utilize 3M Splice Kit or Dryconn Waterproof Direct Bury Lug by King Innovation or an approved equivalent.
2. Tracer Wire to be interconnected at all tee's and crosses with a continuous wire.
3. Tracer wire shall be looped up to locate station. Locate station shall be P2000PS Bicphoric & Tiplar with Blue cap or approved equivalent and be offset a minimum of 0.3m from the hydrant flange.
4. Tracer wire shall be offset to all water mains and services at 0.3m.
5. For other service installation materials and details refer to Loyalist Township Drawing W-9.
6. This detail derived from OPSD 1105.010
6. Tracer wire shall be 12/1 AWG blue in colour, SuperTrac HS-COIL, HDPE 30 mm Insulation and HMWPE jacket.
7. Cathodic protection for tracer wire to consist of a 2.3kg Zinc anode per valve.
8. All compression nuts to be specified with electrical connectors for tracer wire connection.
9. Tracer wire shall be looped to be placed against undisturbed ground. Mechanical restraints shall be used on all flange connections.
10. Bond breaker to be used between concrete and plow/fittings.
11. Studs and nuts for flange to flange fittings are to be stainless steel.
12. Concrete shock collar to be 1.0m x 1.0m x 0.15m, breaded edge trowelled finish.
13. Tracer wire to be looped up outside of all valve boxes and enter box using factory grommet.

LOYALIST TOWNSHIP ENGINEERING DEPARTMENT	P.O. BOX 70, 263 MAIN ST., ODESSA, ONTARIO K0H 2H0 (613) 386-7351 Ext. 115
TITLE:	LOYALIST TOWNSHIP HYDRANT INSTALLATION DETAIL
DATE:	Rev. JUNE 2020
SCALE:	N.T.S.
DRAWN BY:	C.GRANT
CHECKED BY:	J.CAMPBELL
DRAWING NO.:	W-18

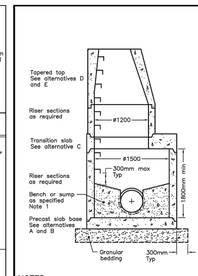


NOTES:

1. The sump is measured from the lowest invert.
- A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
- B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
- C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
- D Pipe support according to OPSD 708.020.
- E For benching and pipe opening details, see OPSD 701.021.
- F For adjustment unit and frame installation, see OPSD 704.010.
- G All dimensions are nominal.
- H All dimensions in millimetres unless otherwise shown.

ALTERNATIVES

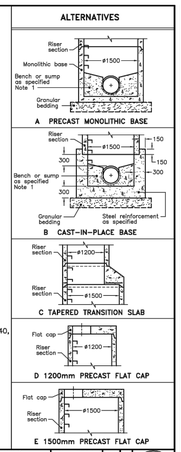
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev	5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER			
	OPSD 701.010		



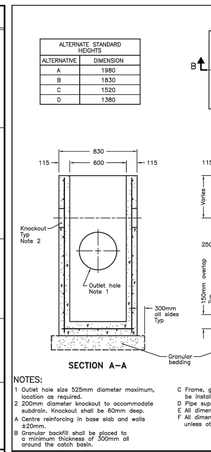
NOTES:

1. For sump detail, see OPSD 701.010.
- A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
- B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.040, 701.041, 703.011, 703.021, and 706.010.
- C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020 or 404.021.
- D Pipe support shall be according to OPSD 708.020.
- E For benching and pipe opening details, see OPSD 701.021.
- F For adjustment unit and frame installation, see OPSD 704.010.
- G All dimensions are nominal.
- H All dimensions in millimetres unless otherwise shown.

ALTERNATIVES



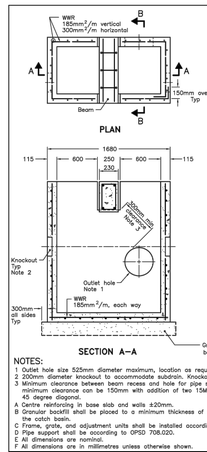
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev	5
PRECAST CONCRETE MAINTENANCE HOLE 1500mm DIAMETER			
	OPSD 701.011		



NOTES:

1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
A Centre reinforcing in base slab and walls ±20mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 708.020.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev	4
PRECAST CONCRETE CATCH BASIN 600x600mm			
	OPSD 705.010		

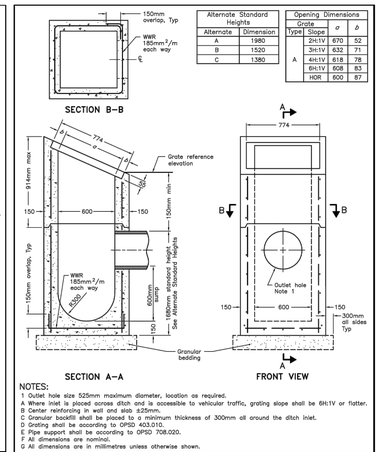


NOTES:

1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
3 Minimum clearance between bean recess and hole for pipe shall be 300mm or minimum clearance can be 150mm with addition of two 15M size rebar on 45 degree diagonal.
A Centre reinforcing in base slab and walls ±20mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ALTERNATE STANDARD HEIGHTS	
ALTERNATIVE	DIMENSION
A	1980
B	1830
C	1680

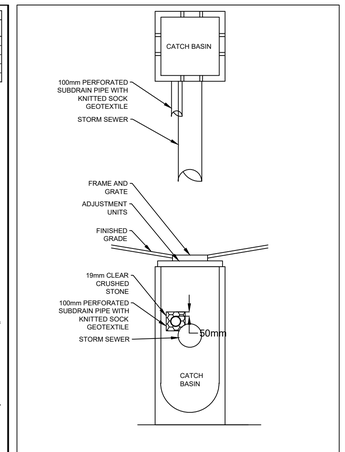
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev	4
PRECAST CONCRETE TWIN INLET CATCH BASIN 600 x 1450mm			
	OPSD 705.020		



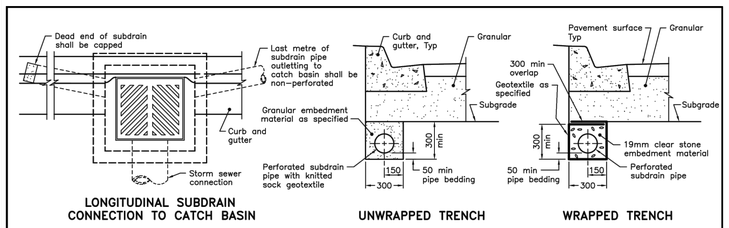
NOTES:

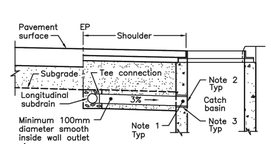
1 Outlet hole size 525mm maximum diameter, location as required.
A Where inlet is placed across ditch and is accessible to vehicular traffic, grating slope shall be 6H:1V or flatter.
B Center reinforcing in wall and slab ±25mm.
C Granular backfill shall be placed to a minimum thickness of 300mm all around the ditch inlet.
D Grating shall be according to OPSD 403.010.
E Pipe support shall be according to OPSD 708.020.
F All dimensions are nominal.
G All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev	4
PRECAST CONCRETE DITCH INLET 600 x 600mm			
	OPSD 705.030		



TYPICAL SUBDRAIN CONNECTION TO CATCHBASIN
N.T.S.



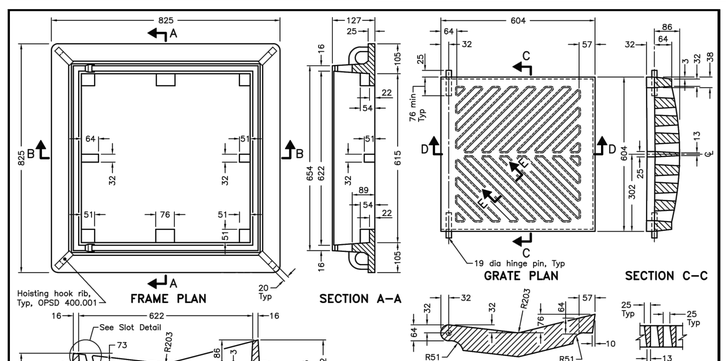


NOTES:

1 Core hole diameter to allow outlet pipe into structure.
2 Install outlet pipe flush with inside face of catch basin.
3 Annular space around pipe shall be filled with non–shrink grout.

- A Use compatible manufactured fittings for all connectors, couplings, and caps.
- B Trench dimensions shown to accommodate 100 or 150mm diameter subdrain pipe.
- C Longitudinal subdrain pipe shall be installed parallel to the grade of the gutter.
- D All dimensions are in millimetres unless otherwise shown.

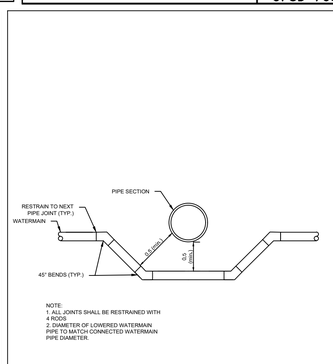
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev	3
SUBDRAIN PIPE CONNECTION AND OUTLET URBAN SECTION			
	OPSD 216.021		



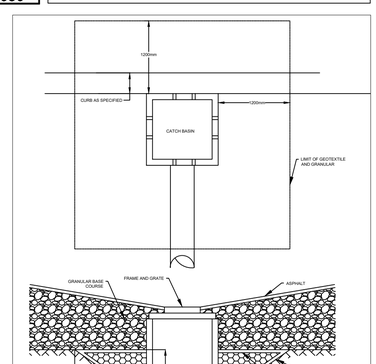
NOTE:

A This OPSD shall be read in conjunction with OPSD 610.010.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev	3
CAST IRON, SQUARE FRAME WITH SQUARE V GRATE FOR CATCH BASINS, HERRING BONE OPENINGS			
	OPSD 400.030		



WATERMAIN LOWERING



TYPICAL DRAINAGE INTERCEPTION SURROUND FOR CATCH BASIN
NTS

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

No.	Revision/Issue	Date
RI	ISSUED FOR TENDER	MAR. 20, 2024

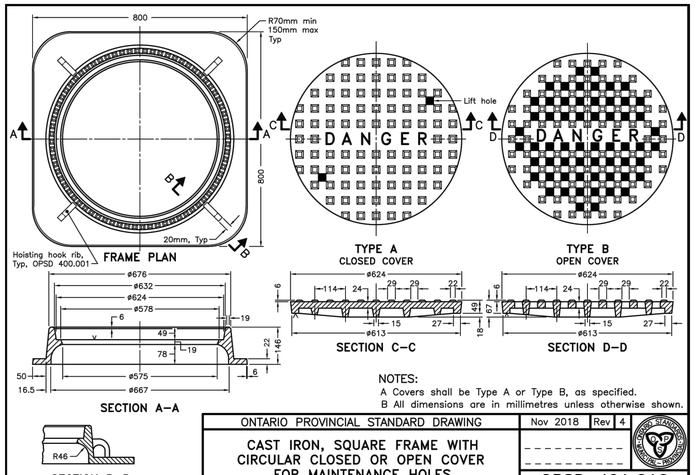
Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

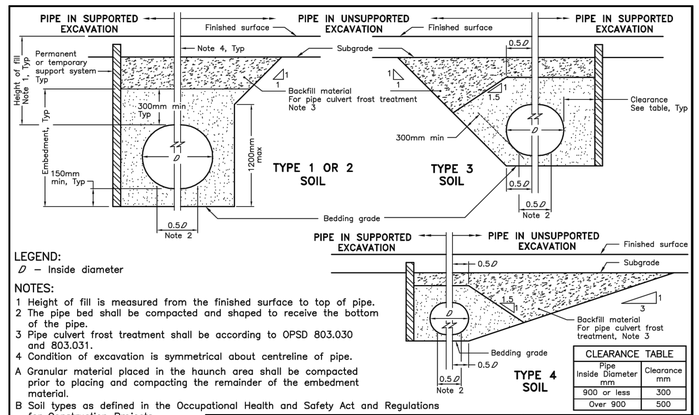
Drawing
DETAILS 4
WATER & SEWER DETAILS

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D4
Date: DECEMBER 2023		
Scale: N.T.S.		



NOTES:
A Covers shall be Type A or Type B, as specified.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES		
		OPSD 401.010

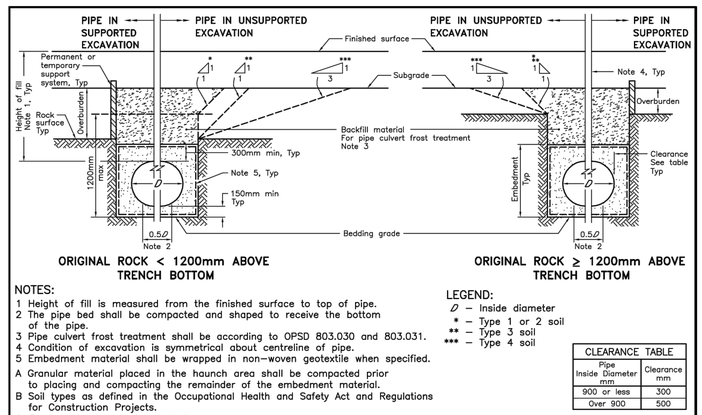


LEGEND:
Ø – Inside diameter

NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		
		OPSD 802.010

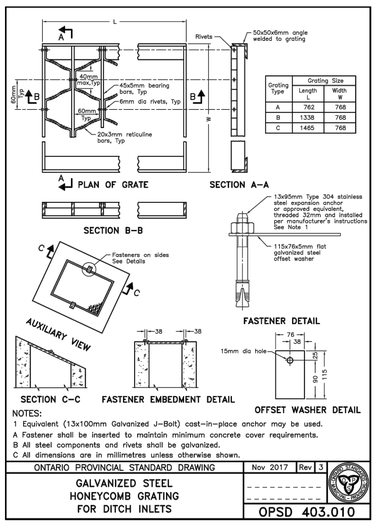


NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
5 Embedment material shall be wrapped in non–woven geotextile when specified.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C Fractured rock shall be treated as Type 1 soil.
D All dimensions are in metres unless otherwise shown.

LEGEND:
Ø – Inside diameter
* – Type 1 or 2 soil
** – Type 3 soil
*** – Type 4 soil

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL ROCK EXCAVATION		
		OPSD 802.013

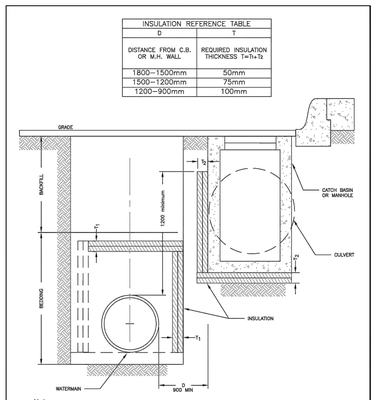


Grating Type	Grating Size Length	Width
A	762	768
B	1338	768
C	1465	768

FASTENER DETAIL
1.3x95mm Type 304 stainless steel expansion anchor with 12mm diameter stainless threaded 32mm and installed per manufacturer's instructions See Note 1
115x76x5mm flat galvanized steel offset washer

NOTES:
1 Equivalent (13x100mm Galvanized J–Bolt) cast–in–place anchor may be used.
A Fastener shall be inserted to maintain minimum concrete cover requirements.
B All steel components and rivets shall be galvanized.
C All dimensions are in millimetres unless otherwise shown.

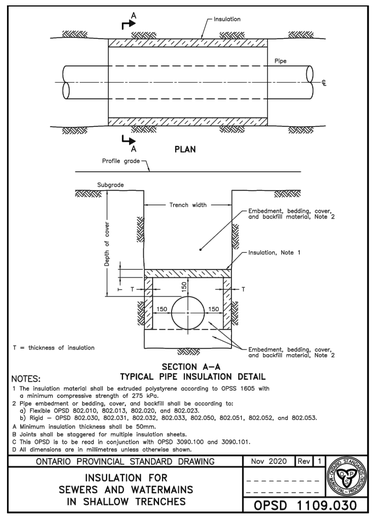
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev 3
GALVANIZED STEEL HONEYCOMB GRATING FOR DITCH INLETS		
		OPSD 403.010



INSULATION REFERENCE TABLE	
D	T
DISTANCE FROM C.B. OR M.H. WALL	REQUIRED INSULATION THICKNESS T=T1+T2
1800–1500mm	50mm
1500–1200mm	75mm
1200–900mm	100mm

Note:
1) Insulation shall extend 1000mm each way from the ends of the structure, paralleled to the watermain.
2) Stagger joints of multiple sheets.
3) All dimensions are in millimeters unless otherwise shown.
4) Insulation can be at either location or both.

Thermal Insulation of Watermains at Open Structures	Utilities Kingston	
	RH	July 2015	SCALE NTS
	DWG. W03–03–128	

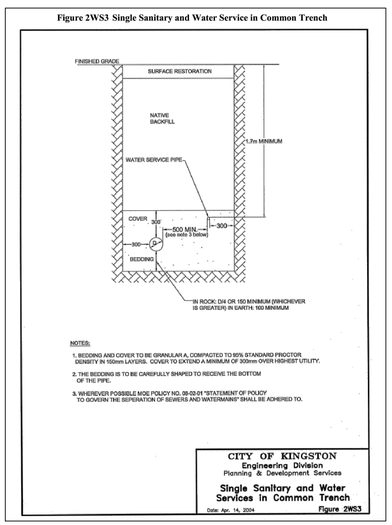


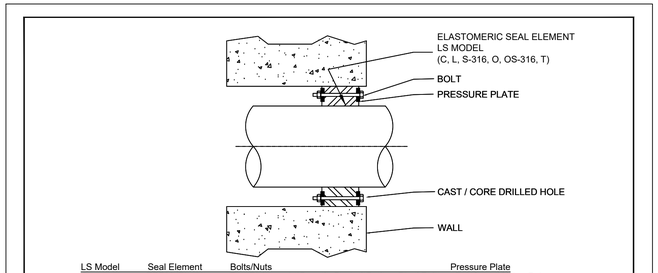
TYPICAL PIPE INSULATION DETAIL

NOTES:
1 The insulation material shall be extruded polystyrene according to OPSS 1605 with a minimum compressive strength of 275 kPa.
2 Pipe embedment or bedding, cover, and backfill shall be according to:
a) Flexible OPSD 802.010, 802.013, 802.020, and 802.023.
b) Rigid – OPSD 802.030, 802.031, 802.032, 802.033, 802.050, 802.051, 802.052, and 802.053.
A Minimum insulation thickness shall be 50mm.
B Joints shall be staggered for multiple insulation sheets.
C This OPSD is to be read in conjunction with OPSD 3090.100 and 3090.101.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2020	Rev 1
INSULATION FOR SEWERS AND WATERMAINS IN SHALLOW TRENCHES		
		OPSD 1109.030

Figure 2WS3 Single Sanitary and Water Service in Common Trench





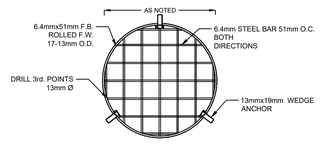
LS Model	Seal Element	Bolts/Nuts	Pressure Plate
C	EPDM (Black)	Zinc Dichromate/Organic Coated Carbon Steel Bolt	Reinforced Nylon Polymer
L	EPDM (Blue)	Zinc Dichromate/Organic Coated Carbon Steel Bolt	Reinforced Nylon Polymer
O	Nitrile	Zinc Dichromate/Organic Coated Carbon Steel Bolt	Reinforced Nylon Polymer
T	Silicone	Zinc Dichromate/Organic Coated Carbon Steel Bolt	Steel Zinc Dichromate
(C,L,O)+S-316	(see model options)	316 Stainless Steel	Reinforced Nylon Polymer

Sleeve Model	Description	Material
CS	Century-Line Sleeve	HDPE
WS	Steel Wall Sleeve	Steel

For more Material Property Information, see literature at www.linkseal.com

NOTE: ENSURE THAT THE BOLTS ARE ADJUSTABLE FROM INSIDE THE MAINTENANCE HOLE

LOYALIST TOWNSHIP ENGINEERING DEPARTMENT	TITLE: LINK-SEAL FOR A CAST/CORED HOLE	DATE: JAN. 14, 2010
P.O. BOX 70, 263 MAIN ST., ODESSA, ONTARIO K0H 2H0 (613) 386-7351 Ext. 115		SCALE: N.T.S.
		DRAWN BY: A. SCOTT
		CHECKED BY: D. THOMPSON
		DRAWING NO.: S-4



NOTE:
ALL STEEL GALVANIZE G-164M AFTER FABRICATION.
ALL FASTENERS ZINC GRADE 5.

TYPICAL RODENT GRATE DETAIL
N.T.S.

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

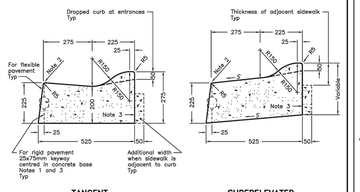
Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
DETAILS 5
WATER & SEWER DETAILS

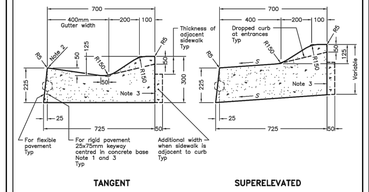
Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D5
Date: DECEMBER 2023		
Scale: N.T.S.		



LEGEND:
S – Rate of pavement superelevation in percent, %.

NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

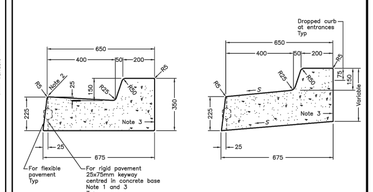
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE SEMI–MOUNTABLE CURB WITH STANDARD GUTTER		OPSD 600.060



LEGEND:
S – Rate of pavement superelevation in percent, %.

NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

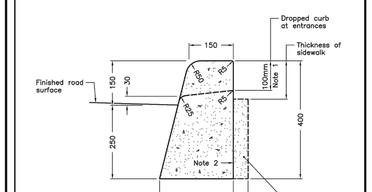
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE SEMI–MOUNTABLE CURB WITH WIDE GUTTER		OPSD 600.020



LEGEND:
S – Rate of pavement superelevation in percent, %.

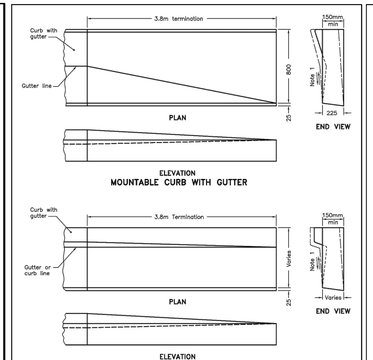
NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this OPSD shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.
A The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
B This OPSD shall be read in conjunction with OPSD 912.450, 912.451, and 912.452.
C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 0
CONCRETE BARRIER CURB WITH WIDE GUTTER AND WIDE BACK		OPSD 600.011



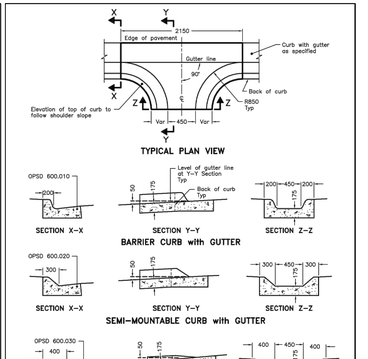
NOTES:
1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110



NOTES:
1 Slope shall match existing shoulder.
A This drawing shall be read in conjunction with OPSD 600 series curb with gutter drawings.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
METHOD OF TERMINATION FOR CONCRETE CURB WITH GUTTER		OPSD 608.010



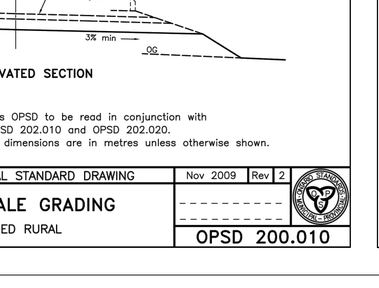
NOTES:
A For asphalt spillway details refer to OPSD 605.040.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
90° CONCRETE OUTLET FOR CONCRETE CURB WITH GUTTER		OPSD 604.010

Install 1m x 1m triangle panel where the sidewalk changes direction at 90° bends where indicated on plans.
Install 150mm x 150mm steel wire mesh reinforcement 1/3 below finished grade at bends.

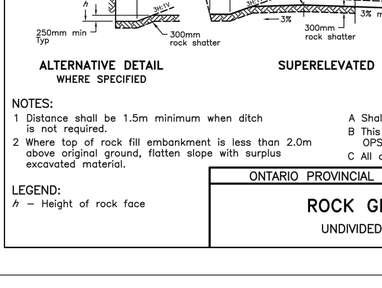
NOTES:
1 Sidewalk thickness at residential driveways and adjacent to curb shall be 150mm. At commercial and industrial driveways, the thickness shall be 200mm.
2 Sidewalk width shall be wider when specified.
3 This OPSD shall be read in conjunction with OPSD 310.030, 310.031, 310.033, and 310.039.
4 Contraction Joint may be tooled or sawcut.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 3
CONCRETE SIDEWALK		OPSD 310.010



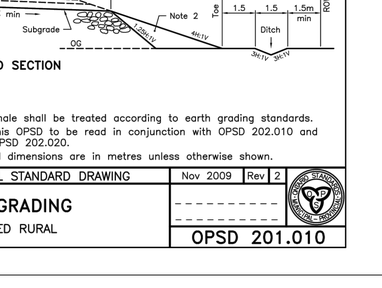
NOTES:
1 Slope of ramp shall not exceed 8%.
2 Cross slope of ramp shall not exceed 2% in either direction.
3 Cross slope of flared side of ramp shall not exceed 8%.
4 Dropped curb at ramp shall be modified to eliminate 30 mm step at gutter line.
5 Minimum thickness of ramp is 200mm. Minimum thickness of sidewalk and flared sides adjacent to ramp is 150mm.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 1
CONCRETE SIDEWALK RAMPS AT UNSIGNALIZED INTERSECTIONS		OPSD 310.033



NOTES:
1 Slope of ramp shall not exceed 8%.
2 Cross slope of ramp shall not exceed 2% in either direction.
3 Cross slope of flared side of ramp shall not exceed 8%.
4 Dropped curb at ramp shall be modified to eliminate 30 mm step at gutter line.
5 Accessible pedestrian signal to have tactile arrow that aligns with direction of crosswalk.
6 Minimum thickness of ramp is 200mm. Minimum thickness of sidewalk and flared sides adjacent to ramp is 150mm.
A All dimensions are in millimetres unless otherwise shown.

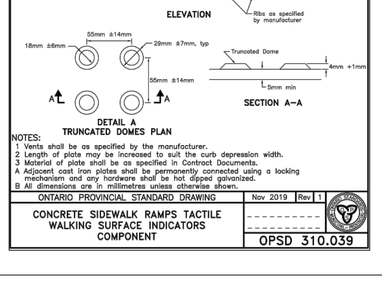
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 0
CONCRETE SIDEWALK RAMPS AT SIGNALIZED INTERSECTIONS WITH INTERSECTING CROSSWALKS		OPSD 310.031



DRIVEWAY DIMENSIONS				
LAND USE	WIDTH m			
	Single		Double	
	min	max	min	max
Residential	3.0	4.3	6.0	7.3

NOTES:
1 Maximum upgrade shall be 10%.
2 Maximum downgrade shall be 8%.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 2
URBAN RESIDENTIAL ENTRANCE		OPSD 351.010



CURB with GUTTER Type	D m	R m
Barrier	1.9	2.1
Semi–Mountable	2.5	2.8
Mountable	2.9	2.9

NOTES:
A For asphalt spillway details refer to OPSD 605.040.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
45° CONCRETE OUTLET FOR CONCRETE CURB WITH GUTTER		OPSD 605.010

NOTES:
1 Cut slope shall be 3H:1V or steeper when specified.
2 Fill slope shall be 3H:1V or flatter when specified.
3 Distance shall be 1.5m minimum when ditch is not required.
A This OPSD to be read in conjunction with OPSD 202.010 and OPSD 202.020.
B All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2009	Rev 2
EARTH/SHALE GRADING UNDIVIDED RURAL		OPSD 200.010

NOTES:
1 Distance shall be 1.5m minimum when ditch is not required.
2 Where top of rock fill embankment is less than 2.0m above original ground, flatten slope with surplus excavated material.
A Shale shall be treated according to earth grading standards.
B This OPSD to be read in conjunction with OPSD 202.010 and OPSD 202.020.
C All dimensions are in metres unless otherwise shown.

LEGEND:
h – Height of rock face

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2009	Rev 2
ROCK GRADING UNDIVIDED RURAL		OPSD 201.010

NOTES:
1 Vents shall be as specified by the manufacturer.
2 Length of plate may be increased to suit the curb depression width.
3 Material of plate shall be as specified in Contract Documents.
A Adjacent cast iron plates shall be permanently connected using a locking mechanism and any hardware shall be hot dipped galvanized.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 1
CONCRETE SIDEWALK RAMPS TACTILE WALKING SURFACE INDICATORS COMPONENT		OPSD 310.039

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

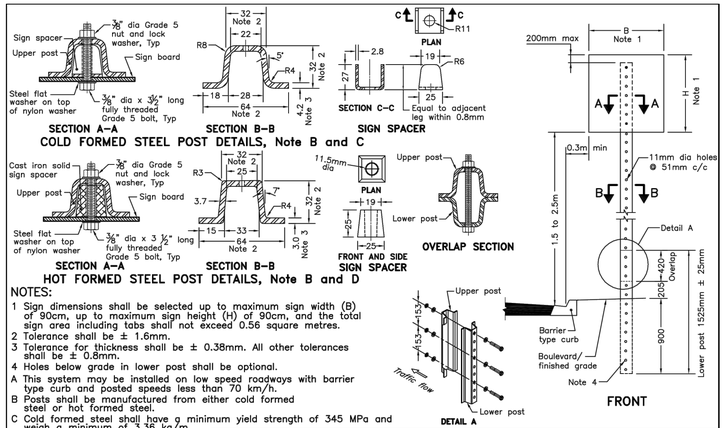
Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
DETAILS & MISCELLANEOUS DETAILS

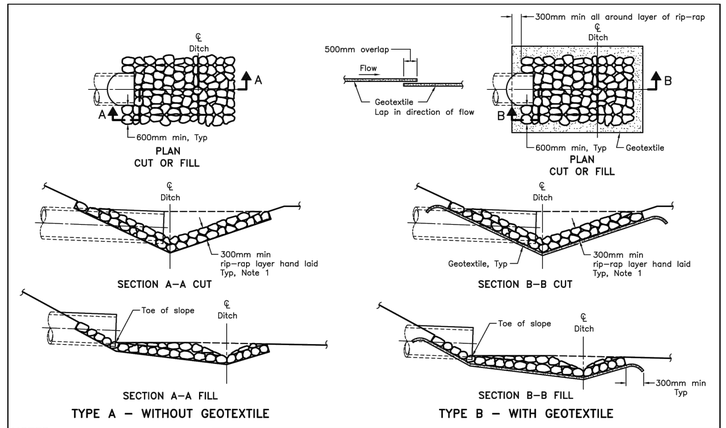
Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D6
Date: DECEMBER 2023		
Scale: N.T.S.		



NOTES:

1 Sign dimensions shall be selected up to maximum sign width (B) of 90cm, up to maximum sign height (H) of 90cm, and the total sign area including tabs shall not exceed 0.56 square metres.
2 Tolerance shall be ± 1.6mm.
3 Tolerance for thickness shall be ± 0.38mm. All other tolerances shall be ± 0.8mm.
4 Holes below grade in lower post shall be optional.
A This system may be installed on low speed roadways with barrier type curb and posted speeds less than 70 km/h.
B Posts shall be manufactured from either cold formed steel or hot formed steel.
C Cold formed steel shall have g minimum yield strength of 345 MPa and weigh a minimum of 3.36 kg/m.
D Hot formed steel shall have a minimum yield strength of 380 MPa and weigh a minimum of 3.02 kg/m.
E Post and hardware shall be hot dip galvanized after fabrication.
F All dimensions are in millimetres unless otherwise shown.

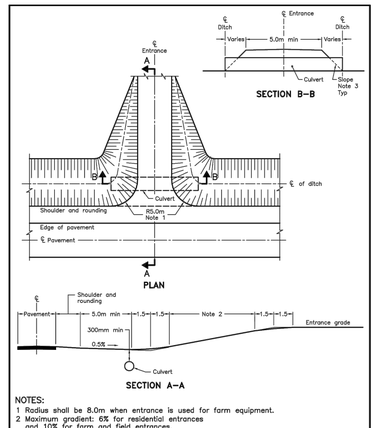
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 1
SMALL SIGN SUPPORT SYSTEM NON–BREAKAWAY U–FLANGE POST SYSTEM INSTALLATION–SINGLE POST ASSEMBLY		OPSD 990.110



NOTES:

1 The thickness of the rip–rap layer shall be at least 1.5 times the rip–rap mean diameter.
A All dimensions are in millimetres unless otherwise shown.

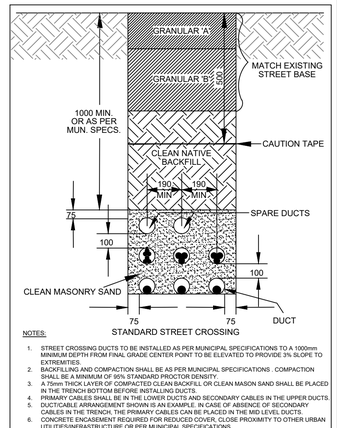
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
GENERAL RIP–RAP LAYOUT FOR SEWER AND CULVERT OUTLETS		OPSD 810.010



NOTES:

1 Radius shall be 8.0m when entrance is used for farm equipment.
2 Maximum gradient: 6% for residential entrances and 10% for farm and field entrances.
3 Slope shall be 3H:1V or flatter when specified.
A All dimensions are in metres unless otherwise shown.

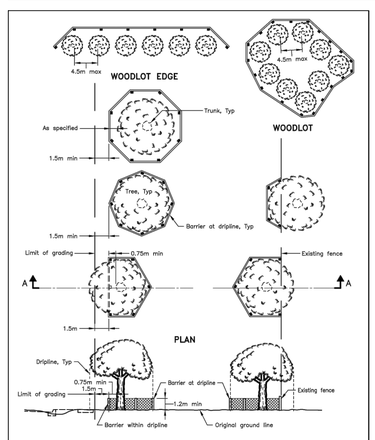
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2010	Rev 2
RURAL ENTRANCES TO ROADS IN EARTH CUT		OPSD 301.020



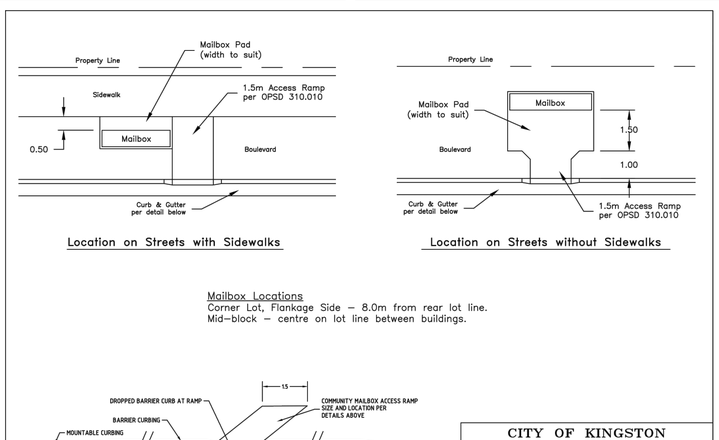
NOTES:

1. STREET CROSSING DUCTS TO BE INSTALLED AS PER MUNICIPAL SPECIFICATIONS TO A 1000mm MINIMUM DEPTH FROM FINAL GRADE CENTER POINT TO BE ELEVATED TO PROVIDE 3% SLOPE TO EXTREMITIES.
2. BACKFILLING AND COMPACTION SHALL BE AS PER MUNICIPAL SPECIFICATIONS . COMPACTION SHALL BE A MINIMUM OF 95% STANDARD PROCTOR DENSITY
3. A 75mm THICK LAYER OF COMPACTED CLEAN BACKFILL OR CLEAN MASON SAND SHALL BE PLACED IN THE TRENCH BOTTOM BEFORE INSTALLING DUCTS.
4. PRIMARY CABLES SHALL BE IN THE LOWER DUCTS AND SECONDARY CABLES IN THE UPPER DUCTS. DUCT/CABLE ARRANGEMENT SHOWN IS AN EXAMPLE. IN CASE OF ABSENCE OF SECONDARY CABLES IN THE TRENCH, THE PRIMARY CABLES CAN BE PLACED IN THE MID-LEVEL DUCTS.
5. CONCRETE ENCASEMENT REQUIRED FOR REDUCED COVER, CLOSE PROXIMITY TO OTHER URBAN UTILITIES/INFRASTRUCTURE OR PER MUNICIPAL SPECIFICATIONS.
6. ALL DUCTS TO BE MANDRELLED AND CLEANED. AFTER INSTALLATION, ALL DUCTS TO HAVE ¼" POLYESTER PULLING TAPE INSTALLED.
7. NUMBER OF CABLES/DUCTS AS WELL AS THEIR ARRANGEMENT WITHIN THE DUCT BANK AS SHOWN IS REPRESENTATIVE ONLY. DUCTS/CABLES MAY BE ADDED/OMITTED AND/OR RE-ARRANGED AS REQUIRED, PROVIDED THAT CLEARANCES AND SEPARATIONS ARE MAINTAINED. OVERALL TRENCH WIDTH TO CONFORM TO MUNICIPALITY REQUIREMENTS.

STANDARD STREET CROSSING DETAIL



ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 1
BARRIER FOR TREE PROTECTION		OPSD 220.010

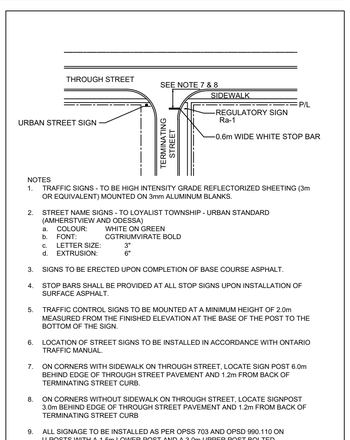


Mailbox Locations
Corner Lot, Flankage Side – 8.0m from rear lot line.
Mid–block – centre on lot line between buildings.

CITY OF KINGSTON
Engineering Department

Typical Details for Canada Post Mailboxes

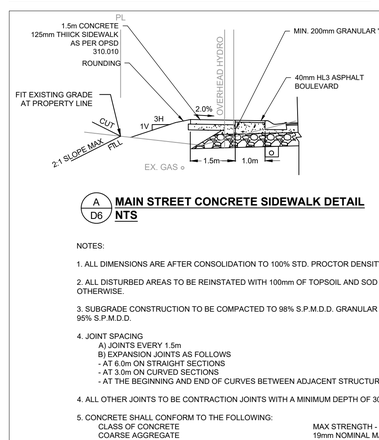
Date: 6 Apr 00 — Figure 1A8



NOTES

1. TRAFFIC SIGNS - TO BE HIGH INTENSITY GRADE REFLECTORIZED SHEETING (3m OR EQUIVALENT) MOUNTED ON 3mm ALUMINUM BLANKS.
2. STREET NAME SIGNS - TO LOYALIST TOWNSHIP - URBAN STANDARD (AMHERSTVIEW AND ODESSA)
   a. COLOUR: WHITE ON GREEN
   b. FONT: CGTRIUMVIRATE BOLD
   c. LETTER SIZE: 3"
   d. EXTRUSION: 6"
3. SIGNS TO BE ERECTED UPON COMPLETION OF BASE COURSE ASPHALT.
4. STOP BARS SHALL BE PROVIDED AT ALL STOP SIGNS UPON INSTALLATION OF SURFACE ASPHALT.
5. TRAFFIC CONTROL SIGNS TO BE MOUNTED AT A MINIMUM HEIGHT OF 2.0m MEASURED FROM THE FINISHED ELEVATION AT THE BASE OF THE POST TO THE BOTTOM OF THE SIGN.
6. LOCATION OF STREET SIGNS TO BE INSTALLED IN ACCORDANCE WITH ONTARIO TRAFFIC MANUAL.
7. ON CORNERS WITH SIDEWALK ON THROUGH STREET, LOCATE SIGN POST 6.0m BEHIND EDGE OF THROUGH STREET PAVEMENT AND 1.2m FROM BACK OF TERMINATING STREET CURB.
8. ON CORNERS WITHOUT SIDEWALK ON THROUGH STREET, LOCATE SIGNPOST 3.0m BEHIND EDGE OF THROUGH STREET PAVEMENT AND 1.2m FROM BACK OF TERMINATING STREET CURB
9. ALL SIGNAGE TO BE INSTALLED AS PER OPSS 703 AND OPSD 990.110 ON U-POSTS WITH A 1.5m LOWER POST AND A 3.0m UPPER POST BOLTED TOGETHER.

SIGN PLACEMENT DETAIL



A / D6 **MAIN STREET CONCRETE SIDEWALK DETAIL**
NTS

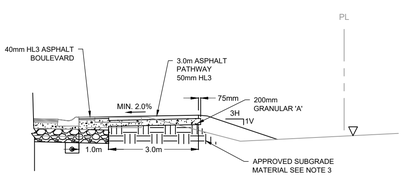
NOTES:

1. ALL DIMENSIONS ARE AFTER CONSOLIDATION TO 100% STD. PROCTOR DENSITY.
2. ALL DISTURBED AREAS TO BE REINSTATED WITH 100mm OF TOPSOIL AND SOD UNLESS SPECIFIED OTHERWISE.
3. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 95% S.P.M.D.D.
4. JOINT SPACING
   A) JOINTS EVERY 1.5m
   B) EXPANSION JOINTS AS FOLLOWS
   - AT 6.0m ON STRAIGHT SECTIONS
   - AT 3.0m ON CURVED SECTIONS
   - AT THE BEGINNING AND END OF CURVES BETWEEN ADJACENT STRUCTURES
4. ALL OTHER JOINTS TO BE CONTRACTION JOINTS WITH A MINIMUM DEPTH OF 30mm
5. CONCRETE SHALL CONFORM TO THE FOLLOWING:

CLASS OF CONCRETE	MAX STRENGTH - 30MPA AT 28 DAYS
COARSE AGGREGATE	19mm NOMINAL MAXIMUM SIZE
AIR CONTENT	6.0% TO 8.0%
WATER	O.P.S.S 1302
AGGREGATE CEMENT - NORMAL PORTLAND TYPE ACCEPTED)	O.P.S.S. 1301 (SLAG CEMENT NOT
MAXIMUM WATER / CEMENT RATIO	0.45
MAXIMUM SLUMP	75mm
CURING COMPOUND - WHITE PIGMENTED	O.P.S.S1315

6. HEAVY DUTY SIDEWALK TO BE CONTINUOUS THROUGH ENTRANCES, INCLUDES 150mm X 150mm STEEL MESH REINFORCEMENT PLACED 1/3 FROM TOP OF SIDEWALK, 200mm CONCRETE THICKNESS AND HANDICAPPED ACCESSIBLE.

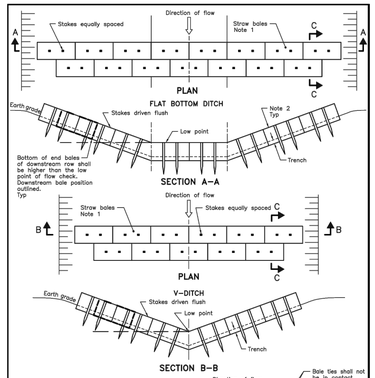
Duct Number	1	2	3	4	5
Traffic Light	2	2	2	2	2
Spare	1	1	1	1	1
Total	3	3	3	3	3



B / D6 **MAIN STREET MULTI-USE PATHWAY DETAIL**
NTS

NOTES:

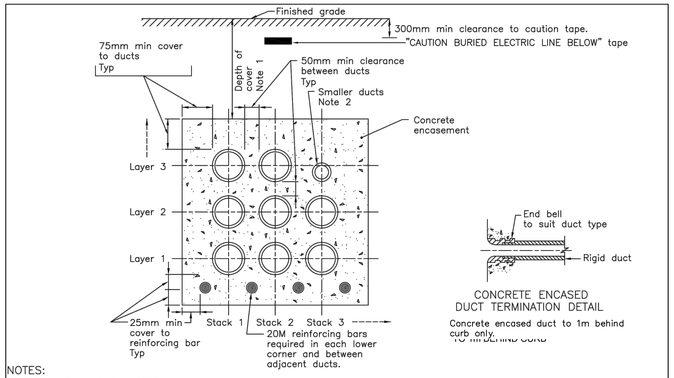
1. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL DISTURBED AREAS TO BE REINSTATED WITH 100mm OF TOPSOIL AND SOD UNLESS SPECIFIED OTHERWISE.
3. SUBGRADE CONSTRUCTION TO BE COMPACTED TO 98% S.P.M.D.D. GRANULAR COURSES TO BE 95% S.P.M.D.D.
4. ASPHALT WALKWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH OPSD 310.010.



NOTES:

1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A Fill and compact gaps with loose straw.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
STRAW BALE FLOW CHECK DAM		OPSD 219.180



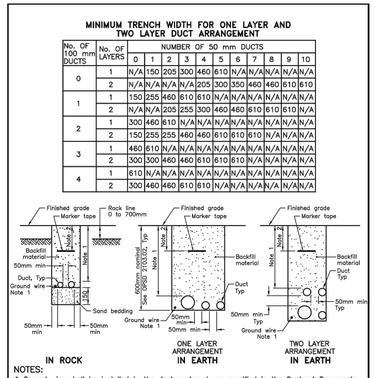
NOTES:

1 Minimum Cover shall be 1000mm in Earth and 600mm in Rock
2 Smaller ducts shall be installed in uppermost layers.
3 Deviation from these maximum values may be specified or approved by Contract Administration to suit site conditions.
A Max number of layer = 4.(NOTE3) max number of stack = 4.(NOTE3)
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Date	Nov. 2015	Rev	UK2
RIGID DUCTS ENCASED IN CONCRETE	Date 2016_01_01			OPSD – 2100.06M

MINIMUM TRENCH WIDTH FOR ONE LAYER AND TWO LAYER DUCT ARRANGEMENT

No. OF 100 mm DUCTS	No. OF LAYERS	NUMBER OF 50 mm DUCTS									
		0	1	2	3	4	5	6	7	8	9	10
0	1	N/A	150	205	300	460	610	N/A	N/A	N/A	N/A	N/A
	2	N/A	N/A	N/A	N/A	205	300	350	460	460	610	610
1	1	150	255	460	610	610	N/A	N/A	N/A	N/A	N/A	N/A
	2	N/A	N/A	205	255	300	460	460	610	610	610	N/A
2	1	300	460	610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2	150	255	255	460	460	610	610	610	N/A	N/A	N/A
3	1	460	610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2	300	300	460	460	610	610	610	N/A	N/A	N/A	N/A
4	1	610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2	300	460	460	610	610	N/A	N/A	N/A	N/A	N/A	N/A



NOTES:

1 Ground wire shall be installed in the duct or trench as specified in the Contract Documents.
2 Depth of marker tape shall be as specified in the Ontario Electrical Safety Code.
A Cable brick or concrete slab shall be installed where specified in the Contract Documents. See OPSD 2100.050.
B This OPSD shall be read in conjunction with OPSD 2103.02.
C Contractor has the option of installing one or two layer duct arrangement.
D N/A – Not Applicable, undesirable or exceeding equipment limits.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 1
DUCT INSTALLATION IN TRENCHES		OPSD 2101.01

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

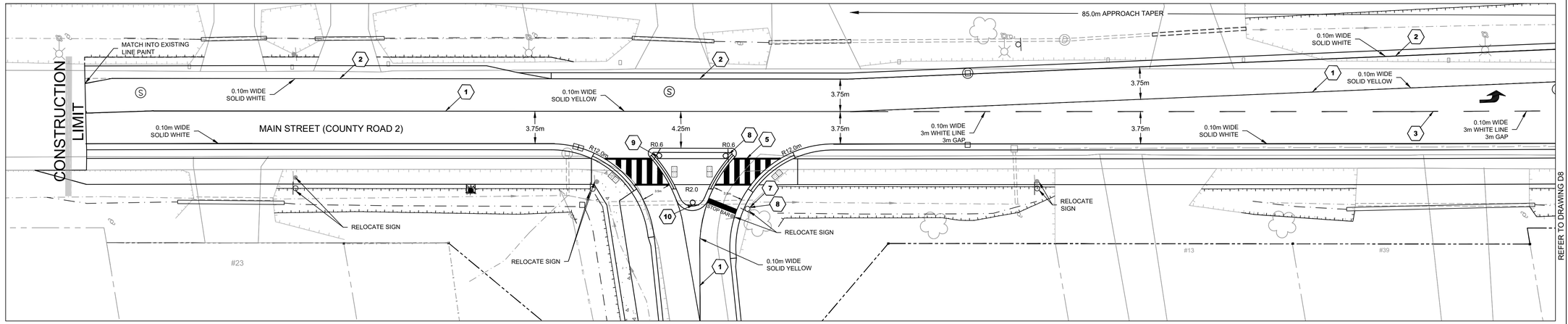
Forefront Engineering Inc
1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

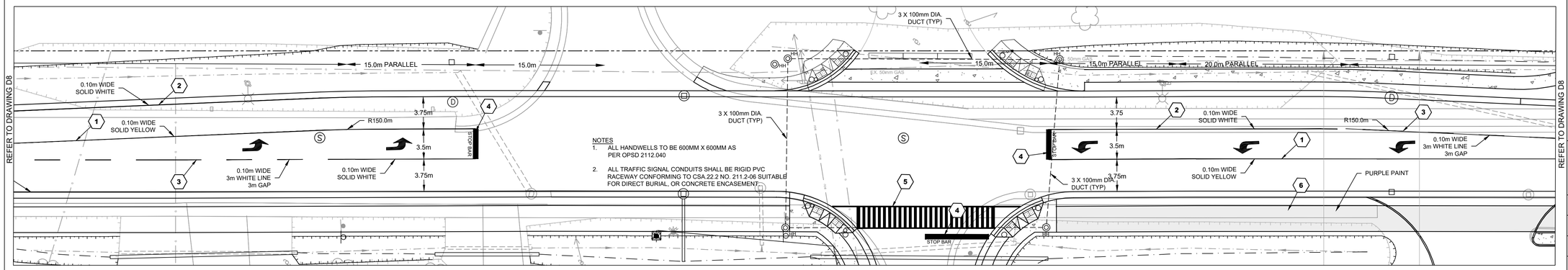
Client
LOYALIST TOWNSHIP

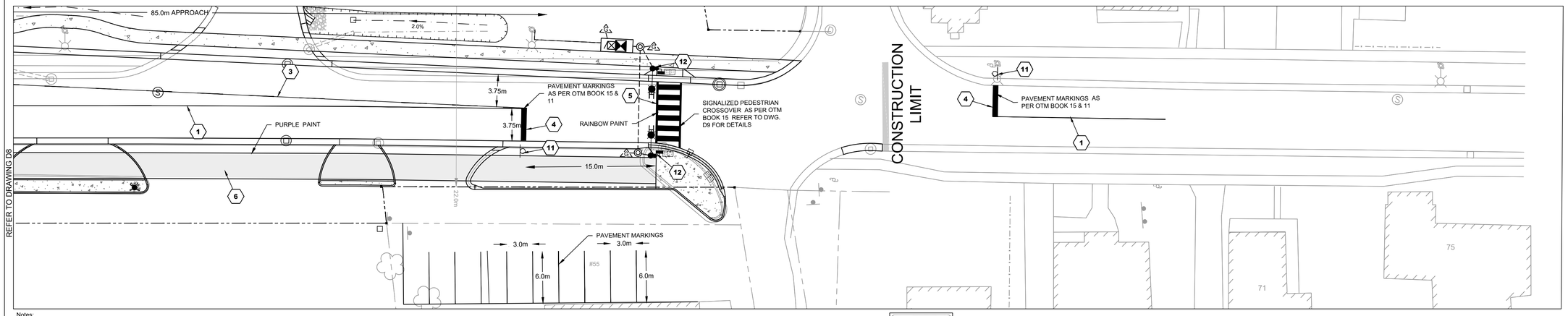
Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
DETAILS 7 MISCELLANEOUS DETAILS

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D7
Date: DECEMBER 2023		
Scale: N.T.S.		







Notes:
1. Centrelines, lane lines, edge lines and turning lanes shall be marked using water borne traffic paint conforming to O.P.S.S. 1716 with glass beads conforming to O.P.S.S. 1750.
2. Stop bar lines, crosswalks, and turning arrows shall be marked using durable pavement markings conforming to O.P.S.S. 1713 or 1714 with glass beads conforming to O.P.S.S. 1750.
3. All pavement markings and arrow symbols shall conform to the Ontario Traffic Manual Book 11 Pavement, Hazard and Delineation Markings
4. Purple Paint to be Durable Liquid Pavement Markings (DLPM) and to include epoxy and Methyl Methacrylate (MMA)

7 — STOP Sign (Ra-1)
Ra-1 600 mm x 600 mm
Font Highway Gothic C
Colour
Legend & Border – White Reflective
Background – Red Reflective

8 — NO LEFT TURN Sign (Rb-12)
Rb-12 600 mm x 600 mm
Font N/A
Colour Interdictory Symbol – Red Reflective
Legend & Border – Black
Background – White Reflective
Minimum Sheeting Type III or IV

9 — OBJECT MARKER Sign (Wa-33L/R)
Wa-33L/R 450 mm x 900 mm
Font N/A
Colour Legend & Border – Black
Background – Yellow Reflective
Minimum Sheeting Type III or IV

10 — KEEP RIGHT Sign (Rb-25R)
Rb-25R 600 mm x 750 mm
Font N/A
Colour Legend & Border – Black
Background – White
Reflective
Minimum Sheeting Type III or IV if sign is not illuminated, Type I if sign is illuminated

11 — STOP HERE ON RED SIGNAL Sign (Rb-78)
Rb-78 600 mm x 900 mm
Font Highway Gothic C, D
Colour Legend & Border – Black
Background – White Reflective

12 — PEDESTRIAN PUSHBUTTON Symbol Sign (Ra-12)
Ra-12 130 mm x 200 mm
Font N/A
Colour Legend & Border – Black
Background – White Reflective

OBJECT MARKER Sign (Wa-33L)
Wa-33L 300 mm x 900 mm
Font N/A
Colour Legend & Border – Black
Background – Yellow Reflective
Minimum Sheeting Type III or IV

TAG	LINE PAINT DESCRIPTION
1	Solid Yellow, 100mm
2	Solid White , 100mm
3	3-3-3 Broken White, 100mm
4	Solid White Stop Bar, 600mm
5	Ladder crosswalk (OTM) (Rainbow line paint @ Signalized Crossing)
6	Purple Paint

TAG	SIGNAGE DESCRIPTION
7	Ra-1 (OTM) 600mm x 600mm Stop sign
8	Rb-12 (OTM) 600mm x 600mm No left turn sign
9	Wa-33L/R (OTM) 450mm x 900mm Object marker sign
10	Rb-25R(OTM) 600mm x 750mm Keep Right sign w/ marker
11	Rb-78 (OTM) 600mm x 900mm Stop Here on Red Signal
12	Ra-12 (OTM) 130mm x 200mm Pedestrian Pushbutton

LEGEND
- PROPOSED LINE PAINTING
- PROPOSED PURPLE PAINT
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark
BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092
BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
R1	ISSUED FOR TENDER	MAR. 20, 2024

Forefront Engineering Inc
1329 Gardiners Road, Suite 210
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Client
LOYALIST TOWNSHIP

Project
POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing
LINE PAINTING PLAN

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D8

Date: DECEMBER 2023
Scale: 1:250

NOTES

General

1. All construction traffic signals infrastructure must meet with current OPS, OPSD, ESA and all other governing authorities.
2. Non frangible bases to be used for traffic signals
3. All ducts to be finished as specified in contract documents
4. There must be ground plates located in the hand holes in all corners of the intersection along the power supply disconnect.
5. All hand holes to be 600mm x 600mm as per OPSD 2112.04
6. Contractor will be responsible for verifying all quantities
7. Pedestrian heads to be countdown type.
8. All traffic signal conduits shall be rigid PVC raceway conforming to CSA C22.2 No. 211.2-06 suitable for direct burial, concrete encasement or surface mounting.
9. Feed to power supply to be coordinated with hydro one.

Traffic Signal Cables

10. The Contractor shall supply and install sufficient fourteen (14) gauge colour coded traffic signal runner and riser cable, to accommodate all equipment and installation operations specified in this Contract.
11. The buried traffic signal cable shall meet the requirements of OPSS 2409.
12. All traffic signal cable shall be installed in the underground conduit system in the location shown on the Drawings. Runner cables for vehicle signal heads shall have 19 solid conductors. Runner cables for pedestrian signal heads shall have 12 solid conductors.
13. Each riser cable inside the pole, for the traffic signal head(s) and pedestrian head(s), shall be five (5) conductor and four (4) conductor respectively. Riser cables shall have stranded conductors.
14. The Contractor shall supply and install sufficient two (2) conductor, #14 AWG, extra low voltage cable, with shielded cover, from the pedestrian pushbutton(s) to the controller, through the underground conduit system.

Ground Wire

15. The Contractor shall supply and install a continuous #6 AWG TWU green, stranded copper ground wire through the entire main conduit system, including connection to the service. The ground wire shall be connected to all steel poles, the junction boxes on wood poles, the ground lug attached to the cover and frame in the handwells and the proposed ground rods in the handwells, in the location shown on the Drawings. The ground wire is not required outside the main conduit system where there are no low voltage cables in the ducts. All ground wire splices shall be made with Thermit Weld connections or copper compression ground tap figure "C" connectors.
16. There shall be a separate continuous #6 AWG TWU green stranded copper ground wire from the controller to the service. The controller shall not be connected to the system ground.
17. A continuous #6 AWG TWU green, stranded copper ground wire shall be installed from the ground lug in the pole to the ground rod located adjacent to this pole.
18. This item shall include a continuous 2/0 bare, stranded copper ground wire which shall be installed from the service enclosure to the four ground rods located adjacent to this pole.
19. The green/yellow conductor in the traffic signal head and pedestrian signal head riser cable shall be connected to the system ground in a pole handhole and/or a junction box. A green conductor used as ground shall be tagged "ground" in the pole handhole and/or junction box.
20. A continuous #12 AWG TWU green, stranded copper ground wire shall be installed from the proposed luminaire fixture to the ground lug in the luminaire pole.

Ground Rods

21. The Contractor shall supply and install a 20 mm x 3.0 m copper clad ground rod in the location shown on the Drawings. The ground rod shall be driven into the bottom of the concrete handwell and into the ground adjacent to the service pole. The ground rod driven into the ground shall be buried so that the top of the ground rod is 300 mm below the finished grade and it shall be left uncovered until it has been inspected by the Contract Administrator. Connection to the ground rod shall be made with a Thermit Weld connector.

Push Button Station

22. The Contractor shall supply and install an Accessible Pedestrian Signal Station as manufactured by Polara Engineering Incorporated, Model EN25BNO-PY, complete with mounting hardware.

10.7m Octagonal Steel Combination Traffic Signal/ Luminaire Pole and Arm

23. The Contractor shall supply and install a Valmont West Coast Engineering, 8535 Series pole or an approved equal, in the location shown on the Drawings. The pole shall be octagonal hot dipped galvanized steel and shall be supplied complete with a pole cap and base plate.

24. The Contractor shall supply and install an Emergi-Lite/Powerlite Inc., Catalogue No. TR SMA-81 aluminium single member arm (or an approved equal) complete with all attachments and fittings for mounting on a metal. The mast arm shall be mounted as shown on the Drawings and in accordance with OPSD 2501.02.

25. The Contractor shall supply and install a 1.8 metre long elliptical aluminium luminaire mast arm. It shall be Utility Supply Specialists Manufacturing, TER-6-MA, with a minimum wall thickness of 0.188 inches or a SENTINEL Pole & Traffic Equipment Limited, RE-6-4188.

Concrete Pole Base

26. The Contractor shall construct a 762 mm diameter concrete pole base with anchorage assembly in the locations shown on the Drawings and in accordance with OPSD 220.01.

27. The Contractor shall verify the bolt spacing with the pole manufacturer prior to construction of the base.

Traffic Signal Head (all 300mm lenses) Reflectorized

28. The Contractor shall supply and install a yellow/grey backed, polycarbonate, highway type, LED traffic signal head with a reflectorized backboard, cowl visors, 300 mm diameter red, amber and green LED signal lamps. All modules shall be labelled "ITE compliant" and labelled as such. The top entry hub shall be plugged with the device made for this purpose complete with a gasket. The bottom entry hub shall be plugged with the device made for this purpose but omitting the gasket.

29. The traffic signal head shall be Federal Standard 595a, colour chip 13538 yellow and ASA-70 grey.

30. The reflectorized backboard shall be a yellow/grey backed, polycarbonate vehicle signal head backboard. Federal Standard 595a, colour chip 13538 yellow and ASA-70 grey backboards to be flexible poly and shall be provided with knock-out to allow installation with plumbizer. A 75mm reflective sheeting to be applied to the backboard along the perimeter of the front of the backboard in accordance with all manufacturer's recommendations.

31. The 75mm reflective sheeting shall be as follows: 3M Diamond grade DG3 Reflective Sheeting Series 4000, product code 4081 (fluorescent yellow).

32. A traffic signal head with single point mounting (i.e., cushion hanger or plumbizer) must have stainless steel reinforcement plates. Cushion hanger mounting reinforcement shall be on the inside and outside of the red section. Plumbizer mounting reinforcement shall be in accordance with the manufacturer's specifications (i.e., inside and outside of the amber section or outside of the red and amber sections).

Pedestrian Signal Head

33. The Contractor shall supply and install a yellow two section polycarbonate Automatic Signal/Eagle Signal LED countdown pedestrian signal head with a 300 mm square lens complete with cutaway visors and a minimum 260 mm high numeric display, or an approved equal.

34. The top lens shall be a GELcore square, bimodal LED pedestrian signal, Model Number D12PAC MS:4 or an approved equal. The bottom lens shall be a GELcore square, LED countdown signal, Model Number D12PAD MS.4 or an approved equal.

35. The LED countdown signal display shall be set up to operate during the pedestrian clearance interval.

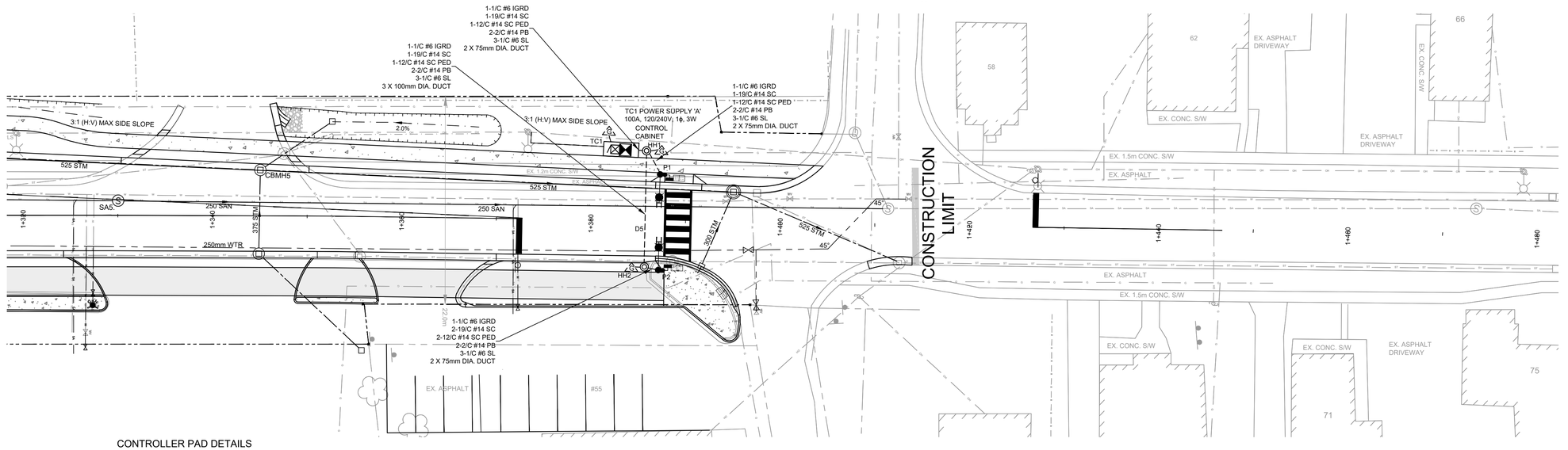
36. The LED countdown pedestrian signal head shall be installed in the location shown on the Drawings.

SIGNALS LEGEND

- TRAFFIC CONTROLLER AND POWER SUPPLY
- GROUND PLATE
- ELECTRICAL HANDHOLE
- TRAFFIC POLE
- PEDESTRIAN PUSH BUTTON
- PEDESTRIAN SIGNAL HEAD (COUNTDOWN TYPE)
- LIGHT FIXTURE
- HIGHWAY SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 300mm LENSES)

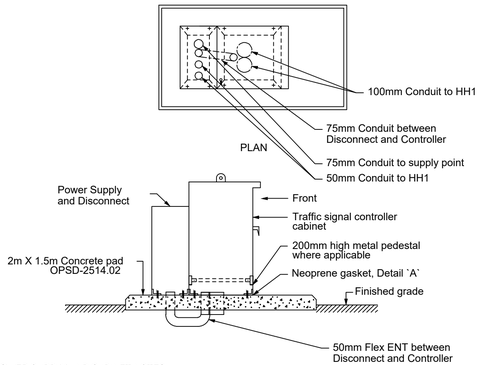
WIRING REQUIREMENTS

Traffic signal cable (19/C # 14 SC)
Traffic signal heads (5/C # 14 RISER)
Pedestrian heads (4/C # 14 RISER)
Pedestrian push buttons (2/C # 14 SHIELDED), extra low voltage cross-linked polyethylene cable (OPSS 623)
Ground wire (1/C # 6) (OPSS 609)
Power (1/C # 6) Low Voltage Single Conductor RWU90
Street lighting (1/C # 6) Low Voltage Single Conductor RWU90



CONTROLLER PAD DETAILS

THIS DETAIL TO BE USED IN CONJUNCTION WITH OPSD'S



POLE OR STRUCTURE NO.	LOCATION	OFFSET FROM E/P	DESCRIPTION	BOLT CIRCLE DIA. OF POLE BASE	FOOTING DEPTH	STANDARDS	COMMENTS
P1	MAIN STREET	1.1m	6.1m BASE MOUNTED STEEL POLE	406m	2.60m	OPSD 2200.01, 2210.010, 2215.02, 2215.03, 2220.01, 2501.01, 2501.02, 2505.010	
P2	MAIN STREET	1.1m	10.5m BASE MOUNTED STEEL POLE	406m	2.60m	OPSD 2200.01, 2210.010, 2215.02, 2215.03, 2220.01, 2501.01, 2501.02, 2505.010	INSTALL LED LUMINAIRE ON 2.4m BRACKET
HH1	MAIN STREET	4.0m	600mm x 600mm			OPSD 2112.04, 2117.02, 2123.03	INSTALL GROUND PLATE
HH2	MAIN STREET	1.2m	600mm x 600mm			OPSD 2112.04, 2117.02, 2123.03	INSTALL GROUND PLATE
TC1/PS 'A'	MAIN STREET	3.1m	ECONOLITE TRAFFIC SIGNAL CONTROLLER AND POWER SUPPLY WITH DISCONNECT ON CONCRETE PAD			OPSD 2514.02	INSTALL GROUND PLATE AT PS 'A'

POWER SUPPLY AND CABINET NOTES

The Contractor shall supply and install equipment for the power supply on the service pole in the location shown on the Drawings and in accordance with OPSD 2130.011, 2440.010, 2440.030, 2440.04, 2440.050, 2440.060, and 2440.061.

The power supply cabinet assembly shall be Type 1, 120/240 volt, 100A, 1 Phase, complete with:

- 100 Amp main circuit breaker
- 60 Amp traffic signal circuit breaker
- 15 Amp relamp breaker
- 4 - 15 Amp branch breakers

The Contractor shall coordinate the hydro feed cable with the Local Hydro Authority.

The Contractor shall also supply and install the hydro feed cable for the traffic signals from the proposed power supply to the proposed controller through the underground conduit system. The feed cable shall be single conductor, stranded copper, low voltage cable, rated 600 volts. Low voltage cables shall meet the requirements of OPSS 604. The cable shall be sized so as to satisfy the voltage drop requirements of the electrical/electronic equipment and shall not exceed 5%.

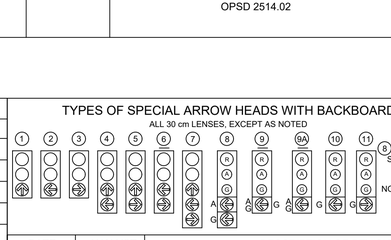
The Contractor shall supply and install an 8 phase Econolite cabinet, to Loyalist Township specifications. The Contractor shall install an 8-phase solid state microprocessor-based controller with a 12 position back panel set up to operate on 2, 4, 6, 8 phases and in a semi actuated mode. Phases 1, 3, 5, 7 will not be used for the initial installation. The controller shall provide for pedestrian timing on 2 phases and vehicle timing on 4 phases. The controller shall be programmable to start up in Phase 2 and Phase 6 amber.

Pedestrain signal timing to be configured for Walk Interval (W) of 7 seconds and Flashing Don't Walk Interval (FDW) of 10 seconds for a complete Pedestiran Signal Cycle of 17 seconds.

TRAFFIC SIGNAL HEADS				HEAD	ARM LENGTH	MANUFACTURER		
TYPE	SIZE	BACKBOARD		MOUNTING HT.	POLE OFFSET	HEAD	MATERIAL	LIGHT
PRIMARY	HWY	YES		5.0m	WB 3.0m EB 3.0m	Econolite	Polycarbonate	LED Swarco
SECONDARY	HWY	YES		5.0m	WB 3.0m EB 3.0m	Econolite	Polycarbonate	LED Swarco
AUXILIARY								
SEPARATE LT TURN ARROWS	PRIMARY							
	SECONDARY							
PRIMARY								
SECONDARY								
AUXILIARY								
SEPARATE LT TURN ARROWS	PRIMARY							
	SECONDARY							

TYPES OF SPECIAL ARROW HEADS WITH BACKBOARD

ALL 30 cm LENSES, EXCEPT AS NOTED



(8) (9) AMBER ARROW MUST BE USED IN A PROTECTED/PERMISSIVE SIMULTANEOUS LEFT TURN OPERATION.

NOTE: FOR SPECIAL ARROW HEADS (8) (9) (10) AND (11), 20 cm AMBER BALL AND 20 cm GREEN BALL LENSES SHOULD BE USED.

DATE	ANALYST	DESCRIPTION OF REVISIONS	RECOMMENDED BY

LEGEND

- PROPOSED ASPHALT
- PROPOSED MUP ASPHALT
- PROPOSED DRIVEWAY REINSTATEMENT
- PROPOSED CONCRETE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD HYDRO
- EXISTING GAS
- EXISTING UNDERGROUND BELL
- EXISTING SWALE C/L
- PROPOSED SWALE C/L
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- BENCHMARK
- CATCH BASIN
- DOUBLE CATCH BASIN
- DICB DITCH INLET CATCH BASIN
- STOP SIGN / AS NOTED
- STREET SIGN
- EXISTING VEGETATION
- VEGETATION REMOVAL
- STRAW BALE
- EXISTING ELEVATION
- PROPOSED ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION

Benchmark

BM1 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 122 / 120 SAUL STREET. ELEVATION 126.092

BM2 - TOP OF HYDRANT NUT IN FRONT OF CIVIC 17 / 19 POTTER DRIVE. ELEVATION 125.259

No.	Revision/Issue	Date
RI	ISSUED FOR TENDER	MAR. 20, 2024

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Client

LOYALIST TOWNSHIP

Project

POTTER DRIVE, CREIGHTON DRIVE, SOUTH AND MAIN STREETS RECONSTRUCTION

Drawing

PEDESTRIAN TRAFFIC SIGNALS DETAIL

Drawn by:	Checked by:	Project No.
CGD	JH	
Designed by:	Approved by:	Drawing No.
KMN	KMN	D9
Date: DECEMBER 2023		

Scale: 0 5 10 m H=1:250 V=1:25; 0 0.5 1.0