

July 28, 2021

The City of Kawartha Lakes
26 Francis Street
Lindsay, ON
K9V 5R8

Mayor, Council and Drainage Board,

Re: OPS 4 Drain - Eastern Branch

In accordance with your instructions, I have undertaken an examination of the OPS 4 Drain – Eastern Branch with regard to a failing Victoria Rail Trail culvert at Station 2+611 in Part of the NW ¼ of Lot 10, Concession 8, in the City of Kawartha Lakes.

The work includes preparing a new Section 78 Drain Report to address the culvert replacements complete with maintenance specifications.

Authorization under the Drainage Act

As per the request of an affected landowner, this Engineer's report has been prepared under Section 78 of the Drainage Act by M. Gerrits Consulting Inc.

Under Section 78 of the Drainage Act, Council may undertake and complete the maintenance or repair of any drainage works constructed under a bylaw passed under this Act or its predecessor. Section 78 is also to be used where it is considered expedient to change the course of the drainage works, or to make a new outlet for the whole or any part of the drainage works, or to construct a tile drain under the bed of the whole or any part of the drainage works as ancillary thereto, or to construct, reconstruct or extend embankments, walls, dykes, dams, reservoirs, bridges, pumping stations, or other protective works as ancillary to the drainage works, or to otherwise improve, extend to an outlet or alter the drainage works or to cover the whole or any part of it, or to consolidate two or more drainage works; the Council whose duty it is to maintain and repair the drainage works or any part thereof may, without a petition required under Section 4 but on the report of an Engineer appointed by it, undertake and complete the drainage works as set forth in such report.

Existing Conditions

Three reports have been authored on this drain. The first report was prepared by G. Smith in 1884, the second by D. Beauclerc in 1972 and the third by J. Kuntze in 1998.

The report G. Smith prepared was for work completed on the OPS 4 Drain between Lot 9 and Lot 14, Concession 7.

The report D. Beauclerc prepared was for incorporating private drains which were constructed outside of the Drainage Act into the OPS 4 Drain as branch drains. The report included improvements to the OPS 4 Drain and the branch drains.

The report prepared by J. Kuntze report was for work completed on the Malcom Branch and for updating maintenance schedules on all of the OPS 4 Drains. The report specified that the abandoned rail line culverts will become part of the drain. The report included specifications for routine maintenance and for maintenance related to the structural integrity of the culverts. Routine maintenance, such as cleaning shall be completed in accordance with the applicable Schedule of Maintenance and the maintenance required for the structural integrity of the culvert is the responsibility of the affected landowner.

M. Gerrits Consulting Inc. completed a site visit on April 20, 2021, and the following is a summary of the existing conditions:

- The Victoria Rail Trail culvert crossing on the OPS4 Drain - Eastern Branch consists of three culverts.
- Culvert 1 is a 1220mm (4') X 1220mm (4') concrete arch culvert and is 24m in length. The culvert was installed in 1911 and is perched. The bottom of this culvert is in poor condition and is in need of replacement.
- Culvert 2 is an 1830mm (6') X 1220mm (4') concrete box culvert and is 20m in length. The culvert was installed in 1912 and the inlet is perched. The culvert is failing and is in need of replacement.
- Culvert 3 is a 1930mm (80") X 1450mm (60") CSPA culvert and is 19m in length. The culvert was installed in 1972 and is perched. The 1972 report identified the culvert as an 80' 9" X 6' 5" CSPA which is slightly larger than the culvert that was installed.
- The channel banks, upstream and downstream of the culvert, appeared to be stable and the amount of sediment build up in the channel was minimal.

On Site Meeting

An onsite meeting was held on April 20, 2021 at the abandoned rail line crossing. The following attended the meeting:

Lucas Feitler, City of Kawartha Lakes Drainage Superintendent
Michael Gerrits, M. Gerrits Consulting Inc.

The following is a summary of the meeting:

- MG reviewed the abandoned rail line crossings with the City of Kawartha Lakes Drainage Superintendent.

Recommendations

It is recommended that a new report be prepared to address the proposed and future Victoria Rail Trail (Station 2+611) culvert replacements c/w specifications.

Approvals

The OPS 4 - Eastern Branch Drain and the OPS 4 downstream of the Eastern Branch Drain are both unrated. Stoney Creek is located approximately 3,350m downstream of the proposed culvert replacements. Approval from Kawartha Conservation was obtained prior to submitting this report.

The Department of Fisheries and Oceans has no objections to the proposed works. Approval from the Department of Fisheries and Oceans was obtained prior to submitting this report.

Design

The proposed culvert replacements shall be designed to maintain water levels in the channel at the culvert crossing (Station 2+611). The design will include a modified grade line which will ensure that water does not pond immediate upstream of Culvert 2. Culvert 1 and Culvert 3 will remain perched and will serve as overflow culverts.

Estimate of Cost

It is recommended that the work be carried out in accordance with the accompanying specification of work and profile which form a part of this report. An Estimate of Cost has been prepared in the amount of \$96,470, which includes engineering fees, but does not include work beyond the preparation of the report.

A plan has been prepared, which shows the location of the work and the approximate drainage area. A profile has been prepared, which shows the depths and grades of the proposed work.

Assessment

Under Section 26 of the Drainage Act, the cost of any approvals, permits or any extra work (beyond that specified in this report), which is required by any utility or road authority shall be assessed to that organization requiring the permit, approval, or extra work.

The estimated cost of the drainage works has been assessed with 100% of the costs of the culvert replacements being assessed to the property owner.

Access and Working Area

It is proposed to utilize the existing Victoria Rail Trail property (City of Kawartha Lakes Lands) for the working area. No work will be required beyond the Victoria Rail Trail property limits.

Access to the work site shall be gained from the Victoria Rail Trail lands and shall be restricted to a width of 6m.

Maintenance

Upon completion of the work, the drainage works shall be maintained by the affected landowner.

All of the above is submitted for your consideration.

Yours truly,


July 28, 2021

Michael Gerrits, P. Eng.
M. Gerrits Consulting Inc.

OPS 4 Drain - Eastern Branch
City of Kawartha Lakes
July 28, 2021

ESTIMATE OF COST

	Quantity	Unit	Material	Labour	Total
Complete Benchmark Loop and Verify Benchmarks	1	ea	-	250	250
Brush Access	720	sq.m.	360	360	720
Brush Rail Line Embankment (Station 2+611)	750	sq.m.	375	375	750
Strip Rail Line Embankment (Station 2+611)	720	sq.m.	0	3,600	3,600
Brush Rail Line Embankment (Spoils Area) - Provisional	300	sq.m.	600	600	1,200
Strip Rail Line Embankment (Spoils Area) - Provisional	300	sq.m.	-	1,500	1,500
Seed Rail Line Embankment (Spoils Area) - Provisional	300	sq.m.	225	225	450
Culvert 1 - (Station 2+611)					
Remove Existing 1220mm X 1220mm Concrete Arch Culvert and Stockpile Excavated Material	24	m	1,200	1,200	2,400
Supply & Install 1200mm dia. CSP Culvert	20	m	12,000	6,800	18,800
Supply & Install Granular Material	80	t	1,000	1,000	2,000
Place Backfill (Stockpiled Material)	220	cu.m.	1,100	1,100	2,200
Rip Rap c/w Geotextile	40	sq.m.	1,200	1,200	2,400
Granular 'A' Victoria Rail Trail Restoration	20	t	260	260	520
Restoration	423	sq.m.	423	423	846
Silt Fence	5	lm	250	250	500
Clear Stone (Provisional)	35	t	438	438	876
Culvert 2 - (Station 2+611)					
Remove Existing 1830mm X 1220mm Concrete Box Culvert and Stockpile Excavated Material	20	m	1,000	1,000	2,000
Supply & Install 2000mm dia. CSP Culvert	20	m	22,000	6,800	28,800
Supply & Install Granular Material	110	t	1,375	1,375	2,750
Place Backfill (Stockpiled Material)	200	cu.m.	1,000	1,000	2,000
Rip Rap c/w Geotextile	40	sq.m.	1,200	1,200	2,400
Granular 'A' Victoria Rail Trail Restoration	20	t	260	260	520
Restoration	443	sq.m.	443	443	886
Silt Fence	5	lm	250	250	500
Clear Stone (Provisional)	50	t	625	625	1,250
Channel Bank Stabilization - Excavation	30	sq.m.	-	900	900
Channel Bank Stabilization - Rip Rap	15	sq.m.	450	450	900
Low Flow Diversion (Provisional)	1	L.S.	1,500	1,500	3,000
Sub Total					84,918
Construction Contingency					6,369
Engineering					5,183
Total Estimate					\$ 96,470

OPS 4 Drain - Eastern Branch
City of Kawartha Lakes
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SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)
<u>Public Lands</u>								
8	Pt Lot 10	1.91		City of Kawartha Lakes (Victoria Rail Trail)	-	96,470	-	96,470
					-	96,470	-	96,470
				Total Special Benefit	-			
				Total Benefit	96,470			
				Total Outlet	-			
				Total - Public Lands	\$ 96,470			
				Total - Public Lands	96,470			
				Total Assessment	\$ 96,470			

OPS 4 Drain – Eastern Branch
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SPECIFICATION OF WORK

1. Scope of Work

The work is to be completed in Part of the NW ¼ of Lot 10, Concession 8, in the City of Kawartha Lakes. The work includes the following:

- Clearing and grubbing of the existing Victoria Rail Trail right of way, to facilitate access to the site and construction.
- Removing and disposing of an existing 1220mm X 1220mm concrete arch culvert and an 1830mm X 1220mm concrete box culvert at Station 2+611.
- Installing 24m of 1200mm dia. CSP culvert and 20m of 2000mm dia. CSP culvert c/w bedding and end protection.

2. General

Each tenderer must inspect the site prior to submitting their tender and satisfy themselves by personal examination of the local conditions that may be encountered during this project. The Contractor shall make allowance in their tender for any difficulties which may be encountered. Quantities or any information supplied by the Engineer is not guaranteed and is for reference only.

All work and materials shall be to the satisfaction of the Drainage Superintendent who may vary these specifications but in no way decrease the proposed capacity of the drain.

The Contractor will be responsible for the notification of all utilities prior to the start of construction.

Measurement For Payment Clauses have not been included in these specifications and will be a part of the construction document. If the construction document has not identified Measurement for Payment Clauses, the Contractor must notify the City of Kawartha Lakes and request clarification 2 days prior to the pricing of the project.

3. Plans and Specifications

These specifications shall apply and be a part of the Contract along with the General Specifications for Closed Drains and the General Specifications for Open Drains. This Specification of Work shall take precedence over all Plans and General Conditions pertaining to the Contract. The Contractor shall provide all labour, equipment, and supervision necessary to complete the work as shown in the Plans and described in these specifications. Any work not described in these specifications shall be completed according with the applicable Ontario Provincial Standard Specifications and Standard Drawings.

Any reference to the Owner contained in these Contract Documents shall refer to the City of Kawartha Lakes or the Engineer authorized by the City of Kawartha Lakes to act on their behalf.

4. Health and Safety

At all times, the Contractor shall be responsible for health and safety on the worksite, which includes ensuring that all employees wear suitable personal protective equipment.

The Contractor shall be responsible to ensure that all of the procedures are followed under the Occupational Health and Safety Act. In the event of a serious or recurring problem, a notice of non-compliance will be issued. The Contractor will be responsible for reacting immediately to any deficiency and correcting any potential health and safety risk. Continuous disregard for any requirement of the Occupational Health and Safety Act could be cause for the issuance of a stop work order or even the termination of the Contract.

The Contractor shall also ensure that only competent workers are employed onsite and that appropriate training and certification is supplied to all employees.

When applicable, the Contractor shall be responsible for traffic control as per the Ontario Traffic Manual Book 7 – Temporary Conditions (latest revision).

5. Workplace Safety and Insurance Board

The Contractor hereby certifies that all employees and officers working on the project are covered by benefits provided by the Contractor. The WSIB Clearance Certificate must be furnished prior to the execution of the Contract and updated every 90 days.

6. Geotechnical Investigation

A geotechnical investigation has not been undertaken within the project limits.

7. Access and Working Area

It is proposed to utilize the existing Victoria Rail Trail property (City of Kawartha Lakes Lands) for the working area. No work will be required beyond the Victoria Rail Trail property limits.

Access to the work site shall be gained from the Victoria Rail Trail lands and shall be restricted to a width of 6m.

It is proposed to utilize the existing Victoria Rail Trail property (City of Kawartha Lakes Lands) for the working area. No work will be required beyond the Victoria Rail Trail property limits.

Access to the work site shall be gained from the Victoria Rail Trail lands and shall be restricted to a width of 6m.

8. Benchmarks

The benchmarks are based on geodetic elevations (GVD28:78).

The primary benchmark for this project is a brass cap (256.455m). The brass cap is located at the northwest corner of Culvert 2. Elevations and secondary benchmarks are identified on the profile drawings.

The brass cap will be removed as part of this Contract and it is the responsibility of the Contractor to maintain their own control for the duration of construction.

Prior to construction, the Contractor is required to complete a benchmark loop to verify the secondary benchmark identified on the drawings. If discrepancies exist, the Contractor must notify the Drainage Superintendent and Engineer prior to completing any work.

9. Removals

The existing culvert shall be removed in their entirety and shall be disposed offsite at the expense of the Contractor. Suitable backfill shall be stockpiled adjacent to the site for reuse during installation of the proposed culverts. Any material not suitable for use shall be disposed of along the abandoned rail line embankment in a designated spoils disposal location. The spoil location shall be determined with the Drainage Superintendent or Engineer prior to construction. No spoils shall leave the site.

Removals shall be in accordance with OPSS 510.

10. Brushing and Tree Removal

All brush, trees, woody vegetation, etc., shall be removed from the side slopes of the existing rail line embankment within the working area and any spoil storage areas using a mechanical grinder mounted on an excavator. Larger trees, brush and stumps shall be burned onsite, subject to municipal bylaws and MOE guidelines. The Contractor shall be responsible for obtaining all necessary burning permits.

The Victoria Rail Trail is cleared; however, the Contractor may be required to remove additional trees to facilitate the mobilization of equipment and material to the working area.

Brushing and clearing shall be in accordance with OPSS MUNI 201.

11. Strip Existing Embankment

The existing embankment and any required spoil disposal areas shall be stripped of organic matter. Topsoil shall be stockpiled onsite, and the material must be used as part of the final restoration.

Stripping shall be in accordance with OPSS 206.

12. Excavation

Excavation shall be to the depths and grades identified on the drawings which are contained in this drain report. The excavation shall be completed to the proper depth using a laser, or a similar approved device, with a labourer onsite to ensure the grade is correct.

All excavated materials which are excess to the requirements of the Contract, shall be leveled within the Victoria Rail Trail lands. Material is not permitted to be hauled off the lands. Suitable organic material can be used for restoration.

If contaminated soils are encountered during excavation of the abandoned rail line embankment, all work in the area should stop immediately and the Drainage Superintendent, Engineer, and Kawartha Regional Conservation Authority shall be contacted immediately.

Restoration shall be in accordance with the restoration specification.

Excavation shall be in accordance with OPSS 206.

13. Installation of Culverts

The Contractor shall supply, install, and backfill pipe culverts. Corrugated Steel Pipe (CSP) culverts shall be aluminized corrugated steel pipes with a minimum wall thickness of 2.8mm in all cases. All corrugation profiles shall be of helical lockseam manufacturing, using 125mm x 25mm corrugations. Future culvert replacements shall be to the same specifications.

The culvert lengths are based on the existing length, complete with rip rap end protection (1.5:1.0).

Culvert 1 shall be installed to the existing invert elevations. The culvert is perched and will serve as an overflow culvert. The location of the culvert will be in the general location of the existing culvert.

Culvert 2 shall be installed with the invert of 10% (minimum 150mm) below the original channel bottom. The location of the culvert will be in the general location of the existing culvert.

All granular bedding and backfill material shall be mechanically compacted to 95% standard proctor maximum dry density. The top 300mm of native backfill or imported Granular "B" material shall be mechanically compacted to 98% standard proctor maximum dry density, and the top 150mm of Granular "A" material shall be mechanically compacted to 100% standard proctor maximum dry density. The Contractor shall supply any extra backfill material required above the springline. Payment for the additional material shall be specified in the Contract Documents.

Pipe culverts will be constructed to the depths and grades as shown on the drawing. The bottom of the excavation shall be excavated to the required depth with any over excavation backfilled with compacted Granular "A" material or clear stone. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with compacted Granular "A" or clear stone from the bottom of the excavation to the springline of the pipe. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm, so that the pipe is not displaced.

The culverts shall be backfilled with native material, free of stones or with Granular "B" material from the top of the bedding to within 150mm of the finished grade. The top 150mm of the lane shall be restored with Granular "A" material for a distance of 5.5m on either side of the culvert.

End protection shall consist of rip rap. The rip rap shall consist of 100mm x 250mm quarry stone or an approved equal. The area to receive the rip rap shall be graded to a depth of 400mm below the finished grade. Filter fabric (Terrafix 250R or an approved equal) shall be placed with any joints overlapped at a minimum of 600mm. The quarry stone shall then be placed with the smaller pieces in the gaps and voids to give it a uniform appearance.

The outlet end protection at Culvert 2 shall extend to the west edge of Culvert 1 and will require excavation to create a 1.5H:1V backslope. Spoils generated from stabilizing the slope shall be disposed within the Victoria Rail Trail lands.

The Contractor shall maintain a dry working area during construction. The Contractor shall install a silt fence immediately downstream of the work area. After the completion

of construction, the temporary dams and any collected sediment will be removed. The final removal will be the silt fence.

CULVERTS TO BE REPLACED

Culvert 1 consists of 24m of a 1220mm X 1220mm concrete arch culvert with rip rap end protection. The culvert is in poor condition. It is to be replaced with a 24m, 1200mm dia. corrugated steel pipe culvert.

Culvert 2 consists of 20m of an 1830mm X 1220mm concrete box culvert with rip rap end protection. The culvert is failing. It is to be replaced under this report with a 20m, 2000mm dia. corrugated steel pipe culvert.

CULVERTS TO BE REPLACED IN THE FUTURE

Culvert 3 consists of a 19m of a 1930mm X 1450mm CSPA culvert with rip rap end protection. The culvert is in good condition. It is to be replaced in the future with a 19m, 1930mm X 1450mm CSPA culvert or an approved equal.

Restoration is in accordance with the restoration specification.

14. Silt Fence

Light duty silt fencing shall be installed immediately downstream of any channel works for the duration of construction. The silt fence shall consist of filter fabric, or a manufactured silt fence supported with posts.

Light duty silt fencing shall be in accordance with OPSS 577 and OPSD 219.110. The light duty silt fencing shall be removed once the disturbed area has been revegetated.

15. Restoration

Restoration shall be in accordance with the following:

The Victoria Rail Trail shall be restored with a gravel surface course. The alignment of the gravel portion of the trail may be shifted south to allow for a 2m (min) buffer between the northern edge of the trail and the top of the bank. The trail is 4m in width and will have a 150mm Granular 'A' cap for a distance of 5.5m either side of the culvert.

When the Contactor utilizes the Victoria Rail Trail embankment for the leveling of excess spoils, the spoils must be distributed in an even layer. The embankment slopes must be maintained to ensure that the slopes remain stable. The Contractor and Drainage Superintendent or Engineer will measure the amount to area required to spread the excess spoils. All of the disturbed areas are to be seeded.

Disturbed embankment and channel banks shall be restored with topsoil and seed. Topsoil will be native soil generated onsite.

The application rates are as follows:

- a. Primary seed (85 kg/ha.) consisting of 50% red fescue, 40% perennial ryegrass, and 5% white clover.
- b. Nurse crop consisting of Italian (annual) ryegrass at 25% total weight.
- c. Fertilizer (300 kg/ha.) consisting of 8-32-16.

The seed shall be hand spread on the affected areas on a daily basis with the seed mixture, fertilizer and application rate as shown above.

Excavation shall be in accordance with OPSS 206.

Compaction shall be in accordance with OPSS 501 (Prov.).

Topsoil shall be in accordance with OPSS 802.

Seed shall be in accordance with OPSS 804.

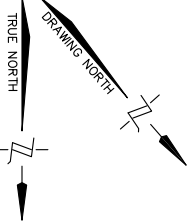
Granular shall be in accordance with OPSS 1010.

16. Environmental Considerations

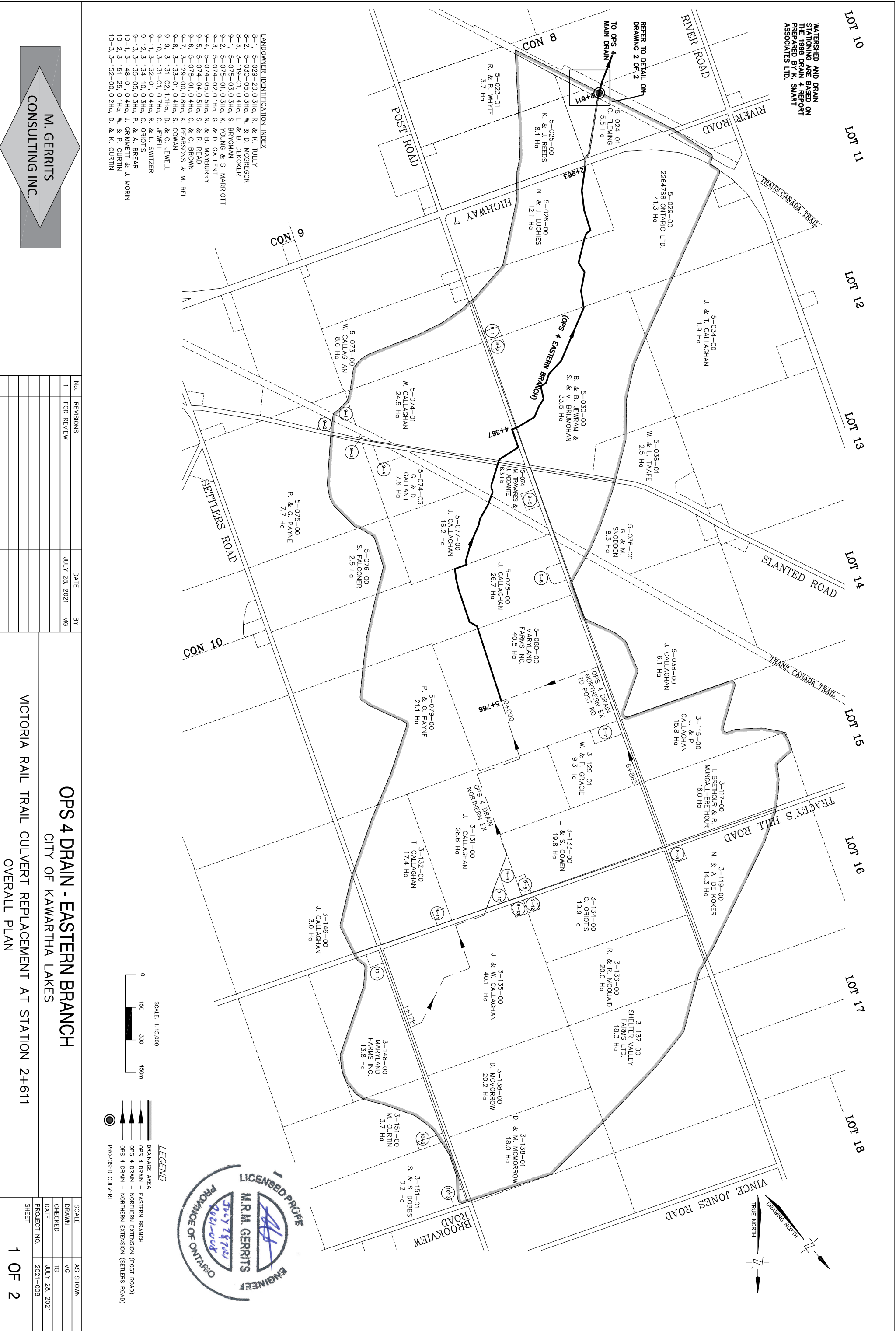
The Contractor will adhere to the following considerations:

- All activities, including maintenance procedures, shall be controlled to prevent the entry of petroleum products, debris, rubble, concrete, or other deleterious substances into the water. Vehicle and equipment refuelling and maintenance shall be conducted away from the channel, any surface water runs, or open inlets. All waste materials shall be stockpiled well back from the top of the bank, all surface water runs and open inlets that enter the drain.
- When possible, the Contractor shall maintain a dry working area during construction.
- All construction in the channel shall be carried out during periods of low flow. If work cannot be carried out during a period of low flow the Contractor will be required to divert the drain flows through the remaining CSPA.

WATERSHED AND DRAIN
STATIONING ARE BASED ON
THE 1998 DRAIN 4 REPORT
PREPARED BY K. SMART
ASSOCIATES LTD.



- LANDOWNER IDENTIFICATION INDEX
- 8-1, 5-029-20,0.3Ha, R. & K. TULLY
 - 8-2, 5-030-05,0.3Ha, W. & D. MCGREGOR
 - 8-3, 3-119-01, 0.4Ha, L. & B. DEKOKER
 - 9-1, 5-075-03,0.3Ha, S. BRYGMAN
 - 9-2, 5-075-01,0.3Ha, K. YOUNG & S. MARRIOTT
 - 9-3, 5-074-02,0.1Ha, G. & D. GALLENT
 - 9-4, 5-074-05,0.5Ha, N. & B. MAYBURY
 - 9-5, 5-074-04,0.5Ha, S. & R. READ
 - 9-6, 3-078-01,0.4Ha, C. & C. BROWN
 - 9-7, 3-129-00,0.8Ha, K. PEARSONS & M. BELL
 - 9-8, 3-133-01, 0.4Ha, S. COWAN
 - 9-9, 3-131-02, 1.1Ha, D. & C. JEWELL
 - 9-10, 3-131-01, 0.7Ha, C. JEWELL
 - 9-11, 3-132-01, 0.4Ha, R. & L. SWITZER
 - 9-12, 3-134-10, 0.3Ha, C. ORIOTIS
 - 9-13, 3-135-05,0.3Ha, P. & A. BREAR
 - 10-1, 3-148-01, 0.4Ha, J. GRIMMETT & J. MORIN
 - 10-2, 3-151-25, 0.1Ha, W. & P. CURTIN
 - 10-3, 3-152-00, 0.2Ha, D. & K. CURTIN



REVISIONS			
No.		DATE	BY
1	FOR REVIEW	JULY 28, 2021	MG

OPS 4 DRAIN - EASTERN BRANCH

CITY OF KAWARTHA LAKES

VICTORIA RAIL TRAIL CULVERT REPLACEMENT AT STATION 2+611

OVERALL PLAN

SCALE	AS SHOWN
DRAIN	MG
CHECKED	TG
DATE	JULY 28, 2021
PROJECT NO.	2021-008
SHEET	1 OF 2

