

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

January 16, 2023

**Re: Desroches Drain**

In accordance with your instructions, M. Gerrits Consulting Inc. has undertaken an examination of the drainage works in Part of Lots 15 & 16, Concession 3 & 4, in the City of Kawartha Lakes (formerly Mariposa Township).

The work includes the following:

- Prepare a drain report to address the J. Desroches & Estate of Desroches, (Desroches) petition for drainage.

Authorization under the Drainage Act

As per the request of an affected landowner, this Engineer's Report has been prepared under Section 4 of the Drainage Act by M. Gerrits Consulting Inc.

Under Section 4 (1) of the Drainage Act, a landowner may request drainage improvements by means of a petition for drainage works for an area requiring drainage, as described in the petition. A petition may be filed with the Clerk of the local Municipality in which the area is situated by,

- (a) the majority in number of the owners, as shown by the last revised assessment roll of lands in the area, including the owners of any roads in the area;
- (b) the owner or owners, as shown by the last revised assessment roll, of lands in the area representing at least 60 percent of the hectareage in the area;
- (c) where a drainage works is required for a road or part thereof, the engineer, road superintendent or person having jurisdiction over such road or part, despite subsection 61(5);
- (d) where a drainage works is required for the drainage of lands used for agricultural purposes, the Director. R.S.O. 1990, c.D.17, S.4(1).

The petition was determined to be valid based on Section 4 (1) (b).

Existing Conditions

The lands owned by Desroches, Area Roll Number 110 020 09100, on the west side of Eldon Road, were recently tiled and directed the subsurface flows to an existing Eldon Road siphon, which conveys flows across Eldon Road. In order to obtain an outlet, the Desroches were required to install a private tile from the Eldon Road Siphon across the lands owned by G. & A. Little (Area Roll Number 10 020 09600), and across a portion of the lands owned by

the Board of Education Trillium Lakelands (Area Roll Number 110 020 09850). The private tile parallels an existing private tile owned by G. & A. Little (Area Roll Number 10 020 09600). The private tile installed by the Desroches, has the capacity to convey the subsurface water generated on the Desroches land. Landowners in the watershed (G. Little and G. Mark) feel the improvements completed by the Desroches, has increased the amount of water flowing onto their lands. The existing drainage system in the area consists of the following infrastructure:

- Eldon Road Crossing – The Eldon Road Crossing consists of a 600mm Corrugated Steel Pipe (CSP) centreline culvert, and a 600mm Corrugated Iron Pipe (CIP) siphon. A private 300mm dia. tile is connected to the ditch inlet catch basins on the east and west side of Eldon Road.
- Private 200mm/250mm dia. Tile – The landowner of Part of Lot 16, Concession 4 (Area Roll Number 110 020 09600), installed a private tile and High Density Polyethylene (HDPE) catch basin immediately downstream of the Eldon Road siphon. The tile collects surface flows and conveys flows downstream onto the lands owned by the Board of Education Trillium Lakelands (Area Roll Number 110 020 09850), Orsite Developments / Ltd Charter Construction Ltd. (Area Roll Number 110 020 09800) and the lands owned by G. & L. Mark (Area Roll Number 110 020 09905). The tile has approximately 0.5m cover and has an outlet elevation equal to the static water level of the downstream lands. The downstream channel is 141m in length; however, due to water levels, the channel acts more like a pond.
- Private 300mm dia. Tile – A new 300mm dia. private tile was connected to the Eldon Road crossing siphon via the ditch inlet catch basin on the west side of Eldon Road. The siphon conveys flows across Eldon Road to a ditch inlet catch basin on the east side of Eldon Road. The private tile was then connected to the ditch inlet catch basin on the east side of Eldon Road and extended to the downstream lands. The tile has approximately 0.5m cover and has an outlet elevation equal to the static water level of the downstream lands. The tile was installed in 2019, complete with 123m of open channel outlet improvements. Due to the downstream water level, the outlet improvements appeared to consist of sediment removal from the existing channel.

- Private 200mm/450mm dia. Tile – In November 2021, the landowners informed M. Gerrits Consulting Inc. that in the 1970’s an older clay tile was installed, which convey flows from Eldon Road to an outlet approximately 27m west of Little Britain Road. The tile follows the low run. The drain no longer functions as designed due to obstructions, blow outs and an insufficient outlet. When the drain was installed, it served agricultural lands; however, in recent years the sections of the land owned by Orsite Development Ltd. & Charter Construction Ltd. (Area Roll Number 110 020 09800), and Board of Education Trillium Lakelands, (Area Roll Number 110 020 09850), are no longer farmed.

### On Site Meeting

An onsite meeting was held on August 18, 2021 at the Little Britain Arena. The following is a summary of the meeting:

#### *Attendees*

- Mike Farquhar – City of Kawartha Lakes
- Richard Monaghan – City of Kawartha Lakes
- Mike Gerrits – M. Gerrits Consulting Inc.
- D. Brown – Landowner
- D. Desroches – Landowner
- J. Francis – Landowner representing the Trillium Lakeland District School Board
- R. Godfree – Representing D. Francoeur
- C. Lewis – Landowner
- C. Little – Landowner
- G. Little – Landowner
- N. Little – Landowner
- L. Little – Landowner
- S. Little – Landowner
- A. Little – Landowner
- D. Shankland – Landowner

M. Gerrits gave an overview of the Drainage Act.

M. Gerrits informed landowners that the project is being completed under Section 4 of the Drainage Act.

M. Gerrits informed landowners that he reviewed the area requiring drainage and confirm the Desroches petition for drainage was valid and met the requirements set out in Section 4 of the Drainage Act.

M. Farquhar asked M. Gerrits to clarify the Section 26 assessment for the Eldon Road Crossing. M. Gerrits clarified that upstream lands pay the equivalent costs of an open ditch across the road allowance, and that it is typically between 2% and 10% of the crossing costs.

S. Little requested the berm immediately downstream of DICB 2 be restored. M. Gerrits informed S. Little that the berm will be restored as part of the works.

D. Desroches requested the ditch immediately upstream of DICB 1 be cleaned out. M. Gerrits informed D. Desroches that the 30m of ditch will be included in the report.

S. Little informed M. Gerrits that she does not own the lands ending with the ARN 110 020 04000. M. Gerrits informed S. Little that the name will be revised to the proper landowner.

D. Desroches requested ditch inlet catch basin grate improvements as the existing herringbone cover plugs easily. M. Gerrits informed D. Desroches that a birdcage grate will be installed to promote surface drainage into the system.

### Additional Meeting

#### *April 19, 2021 Meeting*

A meeting was held on April 19, 2021 with the City of Kawartha Lakes Drainage Superintendent (Lucas Feitler), D. Desroches and G. Little. G. Little feels that the recently constructed private tile and upstream drainage improvements, installed by the Desroches in 2019, has directed more flows onto his lands. G. Little feels that since the Desroches completed the improvements to their lands, the water is flowing across Eldon Road more quickly, that the existing infrastructure cannot adequately convey the flows, and that the Little lands are experiencing flooding and erosion as a result of the increased flows. D. Desroches mentioned that there are natural springs on his lands and that prior to the recent drainage improvements, the springs outlet to grade and sheet flowed to the Eldon Road crossing.

D. Desroches requested that the existing Eldon Road ditch inlets be temporarily capped with a steel plate until this drain report is complete. This may reduce the amount of water that flows on to the downstream lands via the siphon. The Road Authority has a centreline 600mm dia. culvert immediately to the west of the siphon which conveys flows generated during larger storm events. The Road Authority approved the temporary capping of the ditch inlet on the west side of Eldon Road, provided that the steel plate was bolted to the grates, since there is a centreline culvert immediately to the west. The inlet invert of the centreline culvert is higher than the ditch inlet catch basin invert elevation and the upstream landowner was informed that capping the ditch inlet catch basin will result in flooding of their lands.

D. Desroches and G. Little have stated that although the outlet does not have freeboard, it is sufficient for drainage at this time. The issue is conveyance of water to the downstream lands. The owners are aware that the cover over the existing pipes is minimal, but stated the existing mains and tiles have not been damaged by the current farming practices.

#### *November 23, 2021 Meeting*

A meeting to discuss a draft design and report was held with the benefiting landowners on November 23, 2021, at the Little Britain Arena. The following was discussed:

M. Gerrits reviewed the draft report with the landowners.

G. Mark informed M. Gerrits that there was an existing tile that conveyed flows from the Eldon Road allowance across the lands owned by G. & A. Little, Board of Education Trillium Lakelands, Orsite Development Ltd. & Charter Construction Ltd. and the G. & L. Mark lands, to a low area approximately 27m east of Little Britain Road. G. Mark mentioned the tile was exposed at his property line and could show M. Gerrits the location after the meeting. G. Little mentioned he thought he had a plan of the private drain and, if he could locate it, would make it available to the City of Kawartha Lakes.

G. Mark requested a closed drain across his lands.

G. Little requested the topsoil be stripped prior to construction.

D. Desroches requested that the Engineer consider changing the design to have the existing siphon served as the outlet for his land. The new tile could be designed to convey the surface water only. D. Desroches felt that this would restore the flows to the pre 2019 levels. M. Gerrits informed landowners that he would review the request.

#### Recommendations

It is therefore recommended that a new drain report be prepared to convey the flows generated within the proposed watershed to the Mariposa Brook complete with the following:

- Incorporate the 2019, 300mm Dia. HDPE tile installed by the Desroches across the G. & A. Little lands into the Desroches Drain.
- Incorporate the existing Eldon Road siphon and associated structures, into the Desroches Drain.
- Install a new tile main from the west side of Eldon Road ,335m east to the proposed open channel drain.
- Install and new open channel drain from the closed drain outlet at Station 0+355 to the Mariposa Brook at Station 1+358.
- Install 2 new access culverts.

- Cleanout the Little Britain Road centreline culvert
- Provide a future maintenance specification for future culvert installations on the drain.
- Prepare Schedules of Maintenance for the drain.

### Approvals

The approval authorities were made aware that there is an existing private drain between the east limit of the Eldon Road, road allowance and the southern limit of the Little Britain road allowance. The lands were tilled until the tile no longer conveyed subsurface water.

Kawartha Conservation is aware of the project, attended the site meeting and has no objection to the proposed works. Approval from Kawartha Conservation was obtained prior to submitting this report. A permit will be prepared once the report has been passed.

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

### Design

The proposed tile drain shall be designed to accommodate a drainage coefficient of 37.5mm/24 hours. This is generally acceptable for lands used for cash crops with provision for surface water. Tile design criteria includes an assumed minimum tile depth of 700mm plus the diameter of tile in all areas which are cultivated, and 600mm plus the diameter of the tile in areas which are not cultivated. Fill over the closed drain will be required in the Board of Education Trillium Lakelands land, to ensure the minimum cover is met. During the design it was determined a closed drain of sufficient size across the G. & L. Mark land would be expensive, and that the majority of costs would be assessed to the G. & L. Mark land. Consequently, G. Mark requested an open channel with access culverts across his lands. The open channel was designed to convey the 2-year design storm.

### Estimate of Cost

It is recommended that the work be carried out in accordance with the accompanying Specification of Work and profile, which forms part of this Report. An Estimate of Cost has been prepared in the amount of \$349,123, which includes engineering, but does not include inspection during construction.

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

## Assessment

As per Section 21 of the Drainage Act, the Engineer in his report shall assess for benefit and outlet, for each parcel of land and road liable for assessment.

Lands, roads, buildings, utilities, or other structures that are increased in value, or are more easily maintained as a result of the construction, improvement, maintenance, or repair of a drainage works, may be assessed for benefit (Section 22).

Lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek, or watercourse, may be assessed for outlet. The assessment for outlet, shall be based on the volume and rate of flow of the water artificially caused to flow into the drainage works, from the lands and roads liable for such assessments (Section 23).

The Engineer may assess for special benefit, any lands for which special benefits have been provided by the drainage works (Section 24).

A Schedule of Assessment for the lands and roads affected by the Desroches Drain work, and therefore liable for the cost thereof, has been prepared as per the Drainage Act. Assessments may be made against any public utility or road authority, as per Section 26 of the Drainage Act, for any increased cost for the removal or relocation of any of its facilities and plants, that may be necessitated by the construction or maintenance of the drainage works. Items to be assessed under Section 26, shall be tendered separately, and the utility or road authority shall be assessed the actual construction costs, plus the associated overhead and engineering costs (20%).

In accordance with Section 26 of the Drainage Act, special benefit assessments have been made against the City of Kawartha Lakes, Hydro One Networks Inc., Enbridge Inc. and Bell Telephone Company of Canada Ltd. The City of Kawartha Lakes special benefit assessment includes the increased cost to the drainage work, for installing a drain across their road allowances on the Desroches Drain, due to the construction and operation of Eldon Road and Little Britain Road. The special benefit assessments to Hydro One Networks Inc., Enbridge Inc. and Bell Telephone Company of Canada Ltd., include the increased cost to the drainage work for working around a utility in the Eldon Road allowance. The special benefit assessment shall be made up of the actual cost of this work, and both the final and estimated values of the special benefit assessments are to be calculated as follows:

Description	Cost of Work	Cost of Work	Assessment Costs	Admin./Eng Costs	Net H.S.T. Costs	Assessment
Work Around Hydro Line	\$500		\$500	\$100	\$11	\$611
Work Around Gas Line	\$1,500		\$1,500	\$300	\$32	\$1,832
Work around Telephone Line	\$500		\$500	\$100	\$11	\$611
<b>Eldon Road Crossing</b>						
Supply and Install Steel Plate on DICB 1	\$525		\$525	\$105	\$11	\$641
Supply and Install DICB 3 c/w 2.5 sq.m. of Rip Rap	\$3,005		\$3,005	\$601	\$63	\$3,669
Supply and Install 500mm Dia. Steel Casing by Horizontal Jack and Bore	\$60,000	\$840	\$59,160	\$11,832	\$1,249	\$72,241
Supply and Install DICB 4 c/w 2.5 sq.m. of Rip Rap	\$3,005		\$3,005	\$601	\$63	\$3,669
Grade Road Ditch to Promote Drainage to DICB 3	\$1,050		\$1,050	\$210	\$22	\$1,282
Restore Disturbed area of Road Allowance c/w Topsoil, and Seed	\$1,600	\$375	\$1,225	\$245	\$26	\$1,496
			Total Special Benefit Eldon Road			\$82,998

The above special benefit assessments are no-pro-ratable, and shall not apply for future maintenance purposes.

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

The estimated cost of the drainage works has been assessed in the following manner:

1. The additional costs to cross Eldon Road have been assessed as a Section 26 assessment to the Road Authority.
2. The additional costs to work around utilities within the Eldon Road allowance has been assessed as a Section 26 assessment to the affected utility.
3. The cost of the works located within the Eldon Road allowance, beyond those assessed as a special benefit assessment to extend the drain across Eldon Road, has been assessed with 100% of the costs applied as a benefit assessment to the road authority.
4. The private tile allowance for the private drain that was installed by the Desroches across the G. & A. Little lands has been assessed with 67.5% of the costs of the allowance to the Desroches land (Area Roll Number 110 020 09100), 7.5% of the costs assessed as a cut off benefit to the G. & A. Little land (Area Roll Number 110 020 09600) and the remainder assessed as outlet assessment to the upstream properties, based on equivalent hectares.
5. A cut -off benefit assessment of 7.5% has been assessed to the lands immediately downstream of the Eldon Road Allowance, G. & A. Little land (Area Roll Number 110 020 09600), for the section of drain that crosses the G. & A. Little lands.
6. Culvert 2 (Station 0+977), has been assessed with 50% of the estimated costs assessed as a benefit assessment to the adjacent landowner, and the remainder assessed as outlet assessment to the upstream properties, based on equivalent hectares.

7. Culvert 3 (Station 1+160), has been assessed with 50% of the estimated costs assessed as a benefit assessment to the adjacent landowner, and the remainder assessed as outlet assessment to the upstream properties, based on equivalent hectares.
8. The cost to engineer the future replacement of Culvert 1 and Culvert 4 has been assessed with 50% of the estimated costs assessed as a benefit assessment to the landowner whose lands the culvert is located, and the remainder assessed as outlet assessment to the upstream properties, based on equivalent hectares
9. The cost to engineer the future replacement of Culvert 5 has been assessed with 100% of the estimated costs assessed as a benefit assessment to the Road Authority.
10. The outlet works at Mariposa Brook have been assessed with 100% of the estimated costs assessed as an outlet assessment to the upstream properties, based on equivalent hectares
11. The remaining cost of the drainage works has generally been assessed with 50% of the estimated cost assessed as a benefit assessment, and the remainder assessed as outlet assessment to the upstream properties, based on equivalent hectares.

#### Agricultural Grant

Under Section 85 of the current Agricultural Drainage Infrastructure Program (ADIP) policy of OMAFRA, a grant may be available for assessments against privately owned parcels of land which are used for agricultural purposes, and eligible for the Farm Property Class Tax Rate. Section 88 of the Drainage Act directs the Municipality to make application for this grant upon certification of this drain. The Municipality will then deduct the grant from the assessments, prior to collecting the final assessments.

Culvert 3 (Station 1+160) is required for the landowner to access a portion of his lands which are cut off by the drain. OMAFRA has informed M. Gerrits Consulting Inc. that the culvert will be considered a secondary access, regardless of the drain's alignment, and will not be eligible for grant under the current policies.

#### Access and Working Area

Access to the work site shall be gained from road allowances when possible, along existing private lanes, and along the fence lines. Access to the drainage works shall be supplied through each property. Access to the working area along the private lanes and fence lines, shall be restricted to a width of 6m.

The working area for the construction of the proposed tile drain, shall be restricted to a width of 20m along the length of the drainage works normally centred on the proposed tile drain. An area shall be arranged to allow the delivery trucks to turn around.

The working area for the open channel works shall be on the same side of the drain on which the excavated material is disposed of. The working area shall extend from the top of

the eastern bank for a distance of 40m to the west, for the length of the open channel works.

Allowances

Under Section 29 of the Drainage Act, the Engineer, in his report, shall estimate and allow in money to the landowner of any land that is necessary to use for the construction or improvement of the drainage works, or for the disposal of material removed from the drainage works. This shall be considered an allowance for right-of-way. Allowances for right-of-way are based on a land value of \$12,350 per hectare for agricultural lands, and \$2,500 per hectare for vacant lands.

Under Section 30 of the Drainage Act, the Engineer shall determine the amount to be paid to persons entitled for damage, if any, to ornamental trees, lawns, fences, land and crops occasioned by the disposal of material removed from a drainage works. This shall be considered an allowance for damages. Allowances for crop loss are based on \$1,500 per hectare for the first year and \$750 for the second year (\$2,250 per hectare total).

Under Section 31 of the Drainage Act, where an existing drain that was not constructed on requisition or petition under this Act or any predecessor of this Act is incorporated in whole or in part in a drainage works, the engineer in the report shall estimate and allow in money to the owner of such drain or part the value to the drainage works of such drain or part, and shall include such sum in the estimate of the cost of the construction, improvement, repair or maintenance of the drainage works. Allowances for the existing tile main are \$10,540 and are based on 80% of the actual costs (2019) of the tile.

The following allowances are made to properties under this report.

Conc.	Lot or Part	Roll No.	Owner	Section 29 (\$)	Section 30 (\$)	Section 31 (\$)	Total (\$)
<u>Agricultural Lands</u>							
4	Pt Lot 16 & 17	110 020 09600	G. & A. Little	5490	1098		6588
	Pt Lot 15	110 020 09100	J. Desroches & Estate of Desroches			10540	10540
	Pt Lot 16	110 020 09800	Orsite Development Ltd. & Charter Construction Ltd.	3773	3395		7168
	Pt Lot 17	110 020 09905	G. & L. Mark	2010	1809		3819
<u>Non-Agricultural Lands</u>							
4	Pt Lot 16	110 020 09850	Board of Education Trillium Lakelands	3278	322		3600
	Pt Lot 17	110 020 09901	4-23 M. Whalen	698	628		1326
				\$ 15,249	\$ 7,252	\$ 10,540	\$ 33,041

Restrictions

No trees may be planted within 20m in the vicinity of the drainage works. If planted trees must be removed because they interfere with the drainage work, or with access, or other maintenance activities, they shall be removed and assessed to the lands which the work was completed on. Permanent structures are not to be erected within 20m of either side of the drainage works.

Existing Private Drainage

All existing subsurface drainage encountered during the construction, shall be restored to the original condition or better.

Maintenance

Upon completion of the work, the drainage works shall be maintained by the City of Kawartha Lakes, as per the Schedule of Assessment, less special benefits enclosed with this Report, unless otherwise altered under provisions of the Drainage Act, or as outlined below.

- The Eldon Road siphon is the outlet for the Desroches lands and shall be maintained by the City of Kawartha Lakes. Maintenance includes ditching, pipes and structures. The cost to repair or maintain the siphon, will be assessed with 100% of the cost applied as a benefit assessment to the Road Authority and.
- The cost to install a future culvert, repair, and maintain a standard access culvert with a 6m top width and rip rap end protection, will be assessed with 50% of the costs applied as a benefit assessment to the adjacent landowner, and the remainder assessed as an outlet assessment to upstream lands based on equivalent hectares. Landowners who request extra length of culvert beyond the standard length specified in this report, shall be assessed 100% of the cost of the extra length of culvert as a benefit assessment.
- The cost to repair or maintain the Little Britain Road centreline culvert with rip rap end protection, will be assessed with 100% of the costs applied as a benefit assessment to the road authority.

All of the above is submitted for your consideration.

Yours truly,

*M.R.M. Gerrits*  
JAN 13, 2023  
2020-047



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

Desroches Drain  
City of Kawartha Lakes  
January 16, 2023

## ESTIMATE OF COST

	Quantity	Unit	Unit Price	Total
Allowances:				33,041
Traffic Control	1	ls	3,500	3,500
Complete Benchmark Loop and Verify Benchmarks	1	ea	2,200	2,200
Remove and Dispose of Abandoned CSP Catch Basin	1	ea	250	250
Remove Highway Fence and Restore with Original Materials (Station 0+027)	1	ea	650	650
Remove and Stockpile DICB1 Steel Plate	1	ea	245	245
Locate Existing Tile to Confirm the Alignment (3 Locations)	3	ea	150	450
Supply and Install Steel Plate on DICB 1	1	ea	525	525
Supply and Install Steel Plate on DICB 2	1	ea	525	525
Supply and Install 500mm Dia. Steel Casing by Horizontal Jack and Bore	24	m	2,500	60,000
Supply and Install DICB 3 c/w 2.5 sq.m. of Rip Rap	1	ea	3,005	3,005
Supply and Install DICB 4 c/w 2.5 sq.m. of Rip Rap	1	ea	3,005	3,005
Supply and Install 450mm HDPE Smooth Wall Tile	312	m	127	39,624
Place Fill over Pipe to Maintain 0.6m Cover (Station 0+265 to Station 0+335)	70	m	9	608
Grade Road Ditch to Promote Drainage to DICB 3	30	m	35	1,050
Ditch Grading 1m Bottom Width (Station 0+335 to Station 0+750) c/w leveling	415	m	30	12,450
Ditch Grading 1.5m Bottom Width (Station 0+750 to Station 1+177) c/w levelin	427	m	45	19,215
Ditch Grading 2m Bottom Width (Station 1+177 to Station 1+324) c/w leveling	147	m	50	7,350
Ditch Grading 2m Bottom Width (Station 1+348 to Station 1+358) c/w leveling	10	m	50	500
Install Access Culvert 1 (Station 0+977)				
Excavation	47	cu.m.	8	376
1630mm X 1120mm Corrugated Steel Pipe Arch Culvert	10	m	1,576	15,760
Bedding Material	43	t	50	2,150
Granular 'A'	15	t	50	750
Rip Rap	14	sq.m.	150	2,100
Install Access Culvert (Station 1+160)				
Excavation	450	cu.m.	8	3,375
1200mm Dia. Corrugated Steel Pipe Culvert	16	m	1,440	23,040
Bedding Material	60	t	50	3,000
Granular 'A'	15	t	50	750
Rip Rap	25	sq.m.	150	3,750
Remove Sediment from Little Britain Road Centreline Culvert	1	ls	3,500	3,500
Rip Rap Outlet Protection (Station 0+335)	6	sq.m.	70	420
Rip Rap Existing Low Run (Station Outlet Protection (Station 0+970)	4.0	sq.m.	70	280
Rip Rap channel (Station 1+306 to Station 1+324)	128	sq.m.	70	8,960
Restore the Berm along the East Limit of the Eldon Road Right of Way c/w 30 sq.m. of Rip Rap	1	ls	2,250	2,250
Restore Disturbed area of Road Allowance c/w Topsoil, and Seed	400	sq.m.	4	1,600
Topsoil and Seed Channel Bank Slopes	3996	sq.m.	3	11,988
Light Duty Silt Fencing (Station 0+963)	5	m	100	500
Light Duty Silt Fencing (Station 1+350)	5	m	100	500
Sediment Traps (Station 1+260 to Station 1+292)	3	ea	1,000	3,000
Remove Sediment and Rip rap from Sediment Traps Once Site has Revegetated	1	ls	2,000	2,000
Work Around Hydro Line	1	ls	500	500
Work Around Gas Line	1	ls	1,500	1,500
Work around Telephone Line	1	ls	500	500
Sub Total				280,742
Construction Contingency				20,669
Engineering				44,846
Tendering Allowance				2,191
Contract Administration Allowance				675
Total Estimate				\$349,123

Desroches Drain  
City of Kawartha Lakes  
January 16, 2023

**SCHEDULE OF ASSESSMENT**

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
<u>Agricultural Lands</u>									
3	Pt Lot 15	19.38	110 020 3400	2345379 Ontario Ltd.	-	-	21,677	21,677	14.5
	Pt Lot 15	3.51	110 020 03500	D. & M. Hollinger	-	-	3,928	3,928	2.6
	Pt Lot 16	0.07	110 020 04000	E. & F. Picarelli	-	-	100	100	0.1
4	Pt Lot 15	0.34	110 020 08800	S. & N. Little	-	-	507	507	0.3
	Pt Lot 15	30.84	110 020 09100	J. Desroches & Estate of Desroches	-	7,115	43,283	50,398	30.8
	Pt Lot 16 & 17	33.04	110 020 09600	G. & A. Little	-	4,219	26,242	30,461	33.0
	Pt Lot 16	21.00	110 020 09800	Orsite Development Ltd. & Charter Construction Ltd.	-	19,762	11,545	31,307	21.0
	Pt Lot 17	3.76	110 020 09900	G. Mark	-	-	297	297	3.8
	Pt Lot 17	14.24	110 020 09905	G. & L. Mark	-	39,265	4,137	43,402	14.2
5	Pt Lot 16	0.01	110 020 15702	5-5 Orsite Development Ltd.	-	-	1	1	0.02
					-	70,361	111,717	182,078	
				Total Special Benefit	-				
				Total Benefit	70,361				
				Total Outlet	111,717				
				Total - Agricultural Lands	\$ 182,078				

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
<u>Non-Agricultural Lands</u>									
3	Pt Lot 15	0.28	110 021 03501	3-1 T. Coleman	-	-	419	419	0.3
	Pt Lot 16	0.28	110 021 04010	3-2 D. Francoeur	-	-	295	295	0.2
	Pt Lot 16	0.07	110 021 04002	3-3 D. Cherry	-	-	73	73	0.1
4	Pt Lot 16	0.05	110 021 05600	4-8 S. & C. Lepage	-	-	7	7	0.1
	Pt Lot 16	0.05	110 021 05700	4-9 D. Twigger & M. Herbert	-	-	7	7	0.1
	Pt Lot 16	0.05	110 021 05800	4-10 P. & M. Wardlaw	-	-	7	7	0.1
	Pt Lot 16	0.06	110 021 05900	4-11 M. & M. Richardson	-	-	10	10	0.1
	Pt Lot 16	0.06	110 021 06000	4-12 D. Majury & R. Comiskey	-	-	10	10	0.1
	Pt Lot 16	0.05	110 021 06100	4-13 N. Cadieux	-	-	7	7	0.1
	Pt Lot 16	0.10	110 021 06200	4-14 B. & L. Byleveld	-	-	16	16	0.2
	Pt Lot 16	0.05	110 021 06300	4-15 P. & K. Teel	-	-	7	7	0.1
	Pt Lot 16	0.08	110 021 06400	4-16 L. Phillips	-	-	12	12	0.2
	Pt Lot 16	0.03	110 021 06600	4-17 S. & C. Davidson	-	-	5	5	0.1
	Pt Lot 16	0.08	110 021 07000	4-18 1000165716 Ontario Ltd.	-	-	12	12	0.2
	Pt Lot 15	0.14	110 021 09000	4-1 D. & S. Shankland	-	-	419	419	0.3
	Pt Lot 15	0.08	110 021 09002	4-2 J. & P. Grant	-	-	236	236	0.2
	Pt Lot 15	0.19	110 021 09101	4-3 L. Slute	-	-	567	567	0.4
	Pt Lot 15	0.26	110 021 09200	4-4 J. Brown	-	-	776	776	0.5
	Pt Lot 16	0.26	110 021 09400	4-6 J. Woods	-	-	183	183	0.1
	Pt Lot 16	0.24	110 021 09500	4-7 B. & M. Finlay	-	-	170	170	0.1
	Pt Lot 16	0.24	110 021 09701	4-5 T. & J. Hughson	-	-	85	85	0.1
	Pt Lot 16	0.83	110 020 09801	City of Kawartha Lakes	-	-	968	968	1.2
	Pt Lot 16	8.04	110 020 09850	Board of Education Trillium Lakelands	-	6,232	5,840	12,072	8.0
	Pt Lot 16	0.12	110 021 11200	4-19 B. Slack	-	-	19	19	0.2
	Pt Lot 16	0.08	110 021 11100	4-20 City of Kawartha Lakes	-	-	12	12	0.2
	Pt Lot 16	0.23	110 021 11000	4-21 R. & S. Fox	-	-	37	37	0.5
	Pt Lot 16	0.23	110 021 11005	4-22 B. Carley	-	-	37	37	0.5
	Pt Lot 17	0.83	110 020 09901	4-23 M. Whalen	-	4,329	218	4,547	1.2
	Pt Lot 17	0.46	110 020 09910	4-24 M. Whalen	-	-	55	55	0.7

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
5	Pt Lot 16	0.01	110 021 07300	5-1 531631 Ontario Inc.	-	-	1	1	0.02
	Pt Lot 16	0.16	110 021 10700	5-2 D. & D. MacDonald	-	-	26	26	0.3
	Pt Lot 16	0.02	110 021 10800	5-3 C. & N. Moore	-	-	4	4	0.0
	Pt Lot 16	0.03	110 020 15700	5-4 D. & A McGilvray	-	-	5	5	0.1
	Pt Lot 16	0.02	110 020 15701	5-6 C. & J. Schenk	-	-	4	4	0.0
	Pt Lot 16	0.04	110 020 15800	5-7 J. Somers and A. Taylor	-	-	6	6	0.1
	Pt Lot 16	0.04	110 020 15900	5-8 L. Moss	-	-	6	6	0.1
	Pt Lot 16	0.03	110 020 1600	5-9 K. & C. Lunney	-	-	5	5	0.1
					-	10,561	10,566	21,127	
Total Special Benefit					-				
Total Benefit					10,561				
Total Outlet					10,566				
Total - Non-Agricultural Lands					\$ 21,127				
<u>Public Lands</u>									
	Ranch Road	1.35	City of Kawartha Lakes		-	-	6,276	6,276	4.1
	Eldon Road	2.99	City of Kawartha Lakes		82,998	32,997	15,465	131,460	12.0
	Little Britain Road	2.06	City of Kawartha Lakes		-	4,595	533	5,128	8.2
	Overhead Hydro		Hydro One Networks		611	-	-	611	
	Undeground Gas		Enbridge Inc.		1,832	-	-	1,832	
	Underground Telephone		Bell Telephone Company of Canada Ltd.		611	-	-	611	
					86,052	37,592	22,274	145,918	
Total Special Benefit					86,052				
Total Benefit					37,592				
Total Outlet					22,274				
Total - Public Lands					\$ 145,918				
Total - Agricultural Lands					182,078				
Total - Non-Agricultural Lands					21,127				
Total - Public Lands					145,918				
Total Assessment					\$ 349,123				

Desroches Drain  
City of Kawartha Lakes  
January 16, 2023

**SCHEDULE OF MAINTENANCE - SECTION 1**  
**(Station 0+024 to Station 0+335)**

For maintaining the closed drain between Station 0+024 and Station 0+355.

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
<u>Agricultural Lands</u>								
3	Pt Lot 15	19.38	110 020 3400	2345379 Ontario Ltd.	-	597	597	14.5
	Pt Lot 15	3.51	110 020 03500	D. & M. Hollinger	-	108	108	2.6
	Pt Lot 16	0.07	110 020 04000	E. & F. Picarelli	-	3	3	0.1
4	Pt Lot 15	0.34	110 020 08800	S. & N. Little	-	14	14	0.3
	Pt Lot 15	30.84	110 020 09100	J. Desroches & Estate of Desroches	-	1,267	1,267	30.8
	Pt Lot 16 & 17	33.04	110 020 09600	G. & A. Little	272	70	342	33.0
<u>Non-Agricultural Lands</u>								
3	Pt Lot 15	0.28	110 021 03501	3-1 T. Coleman	-	11	11	0.3
	Pt Lot 16	0.28	110 021 04010	3-2 D. Francoeur	-	8	8	0.2
	Pt Lot 16	0.07	110 021 04002	3-3 D. Cherry	-	3	3	0.1
	Pt Lot 15	0.14	110 021 09000	4-1 D. & S. Shankland	-	11	11	0.3
	Pt Lot 15	0.08	110 021 09002	4-2 J. & P. Grant	-	7	7	0.2
	Pt Lot 15	0.19	110 021 09101	4-3 L. Slute	-	15	15	0.4
	Pt Lot 15	0.26	110 021 09200	4-4 J. Brown	-	21	21	0.5
	Pt Lot 16	0.26	110 021 09400	4-6 J. Woods	-	6	6	0.1
	Pt Lot 16	0.24	110 021 09500	4-7 B. & M. Finlay	-	5	5	0.1
	Pt Lot 16	0.24	110 021 09701	4-5 T. & J. Hughson	-	3	3	0.1
	Pt Lot 16	8.04	110 020 09850	Board of Education Trillium Lakelands	149	-	149	8.0
<u>Public Lands</u>								
	Ranch Road	1.35	City of Kawartha Lakes		-	185	185	4.1
	Eldon Road	2.99	City of Kawartha Lakes		1,601	339	1,940	12.0
	Little Britain Road	2.06	City of Kawartha Lakes		-	-	-	8.2
					2,022	2,673	4,695	

Desroches Drain  
City of Kawartha Lakes  
January 16, 2023

**SCHEDULE OF MAINTENANCE - SECTION 2**  
**(Station 0+335 to Station 1+324)**

For maintaining the open channel between Station 0+355 and Station 1+324.

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
<u>Agricultural Lands</u>								
3	Pt Lot 15	19.38	110 020 3400	2345379 Ontario Ltd.	-	1,023	1,023	14.5
	Pt Lot 15	3.51	110 020 03500	D. & M. Hollinger	-	185	185	2.6
	Pt Lot 16	0.07	110 020 04000	E. & F. Picarelli	-	5	5	0.1
4	Pt Lot 15	0.34	110 020 08800	S. & N. Little	-	24	24	0.3
	Pt Lot 15	30.84	110 020 09100	J. Desroches & Estate of Desroches	-	2,172	2,172	30.8
	Pt Lot 16 & 17	33.04	110 020 09600	G. & A. Little	-	1,903	1,903	33.0
	Pt Lot 16	21.00	110 020 09800	Orsite Development Ltd. & Charter Construction Ltd.	3,773	407	4,180	21.0
	Pt Lot 17	14.24	110 020 09905	G. & L. Mark	2,010	55	2,065	14.2
5	Pt Lot 16	0.01	110 020 15702	5-5 Orsite Development Ltd.	-	1	1	0.02
<u>Non-Agricultural Lands</u>								
3	Pt Lot 15	0.28	110 021 03501	3-1 T. Coleman	-	20	20	0.3
	Pt Lot 16	0.28	110 021 04010	3-2 D. Francoeur	-	14	14	0.2
	Pt Lot 16	0.07	110 021 04002	3-3 D. Cherry	-	4	4	0.1
	Pt Lot 15	0.14	110 021 09000	4-1 D. & S. Shankland	-	20	20	0.3
	Pt Lot 15	0.08	110 021 09002	4-2 J. & P. Grant	-	12	12	0.2
	Pt Lot 15	0.19	110 021 09101	4-3 L. Slute	-	27	27	0.4
	Pt Lot 15	0.26	110 021 09200	4-4 J. Brown	-	37	37	0.5
	Pt Lot 16	0.26	110 021 09400	4-6 J. Woods	-	9	9	0.1
	Pt Lot 16	0.24	110 021 09500	4-7 B. & M. Finlay	-	7	7	0.1
	Pt Lot 16	0.24	110 021 09701	4-5 T. & J. Hughson	-	4	4	0.1
	Pt Lot 16	0.83	110 020 09801	City of Kawartha Lakes	-	76	76	1.2
	Pt Lot 16	8.04	110 020 09850	Board of Education Trillium Lakelands	938	417	1,355	8.0
	Pt Lot 17	0.83	110 020 09901	4-23 M. Whalen	563	3	566	1.2
<u>Public Lands</u>								
	Ranch Road	1.35	City of Kawartha Lakes		-	285	285	4.1
	Eldon Road	2.99	City of Kawartha Lakes		-	841	841	12.0
					7,284	7,551	14,835	

Desroches Drain  
City of Kawartha Lakes  
January 16, 2023

**SCHEDULE OF MAINTENANCE - SECTION 3**  
**Station 1+348 to Station 1+358**

For maintaining the open channel between Station1+348 and Station 1+358.

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
<u>Agricultural Lands</u>								
3	Pt Lot 15	19.38	110 020 3400	2345379 Ontario Ltd.	-	180	180	14.5
	Pt Lot 15	3.51	110 020 03500	D. & M. Hollinger	-	33	33	2.6
	Pt Lot 16	0.07	110 020 04000	E. & F. Picarelli	-	1	1	0.1
4	Pt Lot 15	0.34	110 020 08800	S. & N. Little	-	4	4	0.3
	Pt Lot 15	30.84	110 020 09100	J. Desroches & Estate of Desroches	-	382	382	30.8
	Pt Lot 16 & 17	33.04	110 020 09600	G. & A. Little	-	409	409	33.0
	Pt Lot 16		110 020 09800	Orsite Development Ltd. & Charter Construction Ltd.	-	260	260	21.00
		21.00						
	Pt Lot 17	3.76	110 020 09900	G. Mark	-	47	47	3.76
	Pt Lot 17	14.24	110 020 09905	G. & L. Mark	-	176	176	14.24
5	Pt Lot 16	0.01	110 020 15702	5-5 Orsite Development Ltd.	-	1	1	0.02
<u>Non-Agricultural Lands</u>								
3	Pt Lot 15	0.28	110 021 03501	3-1 T. Coleman	-	3	3	0.3
	Pt Lot 16	0.28	110 021 04010	3-2 D. Francoeur	-	3	3	0.2
	Pt Lot 16	0.07	110 021 04002	3-3 D. Cherry	-	1	1	0.1
4	Pt Lot 16	0.05	110 021 05600	4-8 S. & C. Lepage	-	1	1	0.1
	Pt Lot 16	0.05	110 021 05700	4-9 D. Twigger & M. Herbert	-	1	1	0.1
	Pt Lot 16	0.05	110 021 05800	4-10 P. & M. Wardlaw	-	1	1	0.1
	Pt Lot 16	0.06	110 021 05900	4-11 M. & M. Richardson	-	1	1	0.1
	Pt Lot 16	0.06	110 021 06000	4-12 D. Majury & R. Comiskey	-	1	1	0.1
	Pt Lot 16	0.05	110 021 06100	4-13 N. Cadieux	-	1	1	0.1
	Pt Lot 16	0.10	110 021 06200	4-14 B. & L. Byleveld	-	2	2	0.2

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit (\$)	Outlet (\$)	Total (\$)	Equivalent Ha.
4	Pt Lot 16	0.05	110 021 06300	4-15 P. & K. Teel	-	1	1	0.1
	Pt Lot 16	0.08	110 021 06400	4-16 L. Phillips	-	2	2	0.2
	Pt Lot 16	0.03	110 021 06600	4-17 S. & C. Davidson	-	1	1	0.1
	Pt Lot 16	0.08	110 021 07000	4-18 1000165716 Ontario Ltd.	-	2	2	0.2
	Pt Lot 15	0.14	110 021 09000	4-1 D. & S. Shankland	-	3	3	0.3
	Pt Lot 15	0.08	110 021 09002	4-2 J. & P. Grant	-	2	2	0.2
	Pt Lot 15	0.19	110 021 09101	4-3 L. Slute	-	5	5	0.4
	Pt Lot 15	0.26	110 021 09200	4-4 J. Brown	-	6	6	0.5
	Pt Lot 16	0.26	110 021 09400	4-6 J. Woods	-	2	2	0.1
	Pt Lot 16	0.24	110 021 09500	4-7 B. & M. Finlay	-	1	1	0.1
	Pt Lot 16	0.24	110 021 09701	4-5 T. & J. Hughson	-	1	1	0.1
	Pt Lot 16	0.83	110 020 09801	City of Kawartha Lakes	-	15	15	1.2
	Pt Lot 16	8.04	110 020 09850	Board of Education Trillium Lakelands	-	100	100	8.0
	Pt Lot 16	0.12	110 021 11200	4-19 B. Slack	-	3	3	0.2
	Pt Lot 16	0.08	110 021 11100	4-20 City of Kawartha Lakes	-	2	2	0.2
	Pt Lot 16	0.23	110 021 11000	4-21 R. & S. Fox	-	6	6	0.5
	Pt Lot 16	0.23	110 021 11005	4-22 B. Carley	-	6	6	0.5
	Pt Lot 17	0.83	110 020 09901	4-23 M. Whalen	-	15	15	1.2
	Pt Lot 17	0.46	110 020 09910	4-24 M. Whalen	-	9	9	0.7
5	Pt Lot 16	0.01	110 021 07300	5-1 531631 Ontario Inc.	-	1	1	0.02
	Pt Lot 16	0.16	110 021 10700	5-2 D. & D. MacDonald	-	4	4	0.3
	Pt Lot 16	0.02	110 021 10800	5-3 C. & N. Moore	-	1	1	0.0
	Pt Lot 16	0.03	110 020 15700	5-4 D. & A McGilvray	-	1	1	0.1
	Pt Lot 16	0.02	110 020 15701	5-6 C. & J. Schenk	-	1	1	0.0
	Pt Lot 16	0.04	110 020 15800	5-7 J. Somers and A. Taylor	-	1	1	0.1
	Pt Lot 16	0.04	110 020 15900	5-8 L. Moss	-	1	1	0.1
	Pt Lot 16	0.03	110 020 1600	5-9 K. & C. Lunney	-	1	1	0.1
<u>Public Lands</u>								
	Ranch Road	1.35	City of Kawartha Lakes		-	50	50	4.1
	Eldon Road	2.99	City of Kawartha Lakes		-	148	148	12.0
	Little Britain Road	2.06	City of Kawartha Lakes		-	101	101	8.2
						-	2,000	2,000

Desroches Drain  
City of Kawartha Lakes  
January 16, 2023

## **SPECIFICATION OF WORK**

### **1. Scope of Work**

The work is to be completed in Part of Lot 16, Concession 4, in the City of Kawartha Lakes. The work includes the following:

- 24m of tile installed by horizontal bore across Eldon Road c/w structures.
- 311m of 450mm HDPE smooth wall tile.
- 846m of open channel construction.
- 133m of open channel cleanout.

### **2. General**

Each tenderer must inspect the site prior to submitting their tender and satisfy themselves by personal examination, as to the local conditions which 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 as to minor details, but in no way decrease the proposed capacity of the drain.

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

All costs associated with completing the work must be included in the applicable unit price item. Measurement For Payment Clauses have not been included in these specifications and, if necessary, will be a part of the Construction document.

### **3. Plans and Specifications**

These specifications shall apply and be 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 its behalf.

#### **4. Health and Safety**

The Contractor, at all times, shall be responsible for health and safety on the worksite, including ensuring that all employees wear suitable personal protective equipment, including safety boots and hard hats.

The Contractor shall be responsible to ensure that all procedures are followed under the Occupational Health and Safety Act, to ensure that work sites are safe, and that accidents are prevented. In the event of a serious or recurring problem, a notice of noncompliance 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 the cause for a stop work order to be issued, or even termination of the Contract.

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

The Contractor shall be responsible for traffic control as per the Ontario Traffic Manual Book 7 – Temporary Conditions (latest revision) when working on public road allowances

#### **5. Workplace Safety and Insurance Board**

If applicable, the Contractor hereby certifies that all employees and officers working on the project are covered by the Contractor's benefits. 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**

Access to the work site shall be gained from road allowances when possible, along existing private lanes, and along the fence lines. Access to the drainage works shall be supplied through each property. Access to the working area along the private lanes and fence lines, shall be restricted to a width of 6m.

The working area for the construction of the proposed tile drain, shall be restricted to a width of 20m along the length of the drainage works normally centred on the proposed tile drain. An area shall be arranged to allow the delivery trucks to turn around.

The working area for the open channel works shall be on the same side of the drain on which the excavated material is disposed of. The working area shall extend from the top of the eastern bank for a distance of 40m to the west, for the length of the open channel works.

## **8. Benchmarks**

The benchmark locations are identified on the profile drawing. The Contractor is required to complete a benchmark loop, prior to construction, to verify the benchmarks. If discrepancies exist, the Contractor must notify the Drainage Superintendent and Engineer prior to completing any work.

## **9. Removals**

The existing steel plates on DICB 1 and DICB 2 shall be removed and stockpiled immediately upstream of the DICB 1 on the lands ending with the ARN 110 020 09100 for pick up by the landowner.

The highway fence wire and posts shall be removed for the duration of construction and restored using the existing materials.

Remove and dispose of the abandoned CSP catch basin.

Removals shall be in accordance with OPSS 510.

## **10. Expose Existing Drain**

The Contractor shall locate the existing 300mm dia. drain in three locations (Station 0+050, Station 0+120 and Station 0+280) prior to construction in order to determine its location.

## **11. Excavation**

The open channel shall be excavated and maintained to the depths and grades as per the profile and drawings which are contained in this Engineer's Report. The channel shall be excavated to the proper depth using a laser or similar approved device with a labourer on site to ensure that the grade is correct.

A ditch widening and deepening of the existing channel between Station 0+335 and Station 0+458 and between Station 1+348 and Station 1+358 will be completed under this report. The minimum side slopes shall be 2H:1V. The existing topsoil in the area of the channel excavation and working area, shall be stripped and stockpiled within the working area and used for restoration of the working area. The centre of the channel shall be in the same location as the existing surface course.

A new channel will be constructed between Station 0+458 and Station 1+324. The minimum side slopes shall be 2H:1V. The existing topsoil in the area of the channel excavation and working area, shall be stripped and stockpiled within the working area and used for restoration of the working area.

Any spoils shall be levelled within the working area. Spoils shall be placed at a minimum of 1.5m back from the top of the bank. The excavated material shall be placed and levelled to a maximum depth of 300mm, and shall not impede overland drainage or cultivation of the land using farm machinery. After the excavated material has been levelled, the topsoil shall be spread and left in a condition suitable for cultivation. The excavated material shall be placed and levelled to a maximum depth of 300mm and shall not impede the overland drainage.

Minor ditch grading around DICB 1 will be completed to promote drainage to both DICB 1 and DICB 3.

The earthen berm immediately downstream of DICB 2 and DICB 4 shall be restored. The bank backslopes shall be 2H:1V. Any required material will be generated from the banks of the existing berm on either side of the DICB's. A berm cross section is shown on drawing 5 of 6. The berm will have a 7m weir with a maximum elevation of 258.25m.

Where the existing 200mm dia./250mm dia. private drain enters the open channel, the existing private drain shall be directed to the new drain. The drain shall have rip rap end protection plugged with concrete and wrapped with filter fabric or covered with 100mm concrete blocks and wrapped with filter fabric.

Where the existing private tile drain is located within the open channel excavation the tile drain shall be removed as part of the excavation works, crushed into smaller pieces and disposed of within the working area.

The sideslopes of the new channel shall be seeded as soon as the final grading is completed.

Restoration shall be in accordance with the restoration specification.

Excavation shall be in accordance with OPSS 206.

## **12. Installation of the Road Crossing**

The Contractor shall supply and install steel pipe casing by boring and jacking to the depths and grades as shown on the profile, and in accordance with the accompanying details including connections to structures. All work shall be completed in accordance with OPSS 416. The steel casing will be schedule 40, have a minimum wall thickness of 8.74mm, and be 24m in length. Cathodic protection is not required.

The steel casing specified shall be a minimum of 500mm in diameter (nominal pipe size). The steel pipe shall be installed in the general location indicated on the drawings.

With approval from the Drainage Superintendent, the proposed steel casing can be installed by open cut construction methods provided the crossing is installed in accordance with *Installation of Culverts Specification* and the tile is a 500mm Dia. high density polyethylene (HDPE) smooth wall pipe.

### **13. Installation of the Tile**

The Contractor shall supply, install, connect to structures, and backfill to the specified sizes of tile, and pipe, to the depths and grades as shown on the drawings.

HDPE shall be smooth wall gasketed pipe with bell and spigot joints (320 kPa)/coupler joint (320 kPa).

The drain alignment between Station 0+024 and Station 0+270 shall be approximately 2m west of the 300mm dia. drain; however, where the specified minimum cover of 0.7m cannot be maintained along this alignment the drain alignment can be altered to maintain the 0.70m cover.

The trenching and laying of the tile shall be done by a wheel machine or plow, unless otherwise approved in writing by the Engineer. An excavator must be used in areas of soil instability, unless approved by the Engineer. All non-gasketed tile joints shall be wrapped with a minimum 300mm width of Terrafix 270R (or an approved equal) filter fabric. The filter fabric shall be overlapped by 450mm at the top of the tile. The tile shall be laid in straight lines, or on smooth gradual curves with a minimum radius of 25m.

Laser control shall be used to ensure the proper grades. The grades calculated on the profile, are the invert of the tile and pipe with allowances to be made by the Contractor for the wall thickness of the tile and pipe. The depths shown and figured, are from the ground level to the invert of the pipe, and along the line of the proposed drain. Should an error appear in the figured depth at any station or stations, the grade shall be made to correspond with that shown on the profile without extra charge.

When tile is installed with an excavator, the tile must be installed as per the manufacturer's recommendations and will require granular bedding. Agricultural tubing cannot be installed by an excavator without written approval from the pipe manufacturer guaranteeing the structural integrity of the tile will not be compromised by the method of installation. Prior to backfilling, the tile shall be covered manually to a depth of approximately 100mm over the pipe to ensure that the tile and pipe are not displaced by large clumps of earth. The trench shall be backfilled with excavated material free of stones, broken tile or other deleterious material. All stones larger than 100mm in diameter, evident immediately after construction, shall be picked up by the Contractor and disposed of offsite. The landowners are responsible for the remainder of stones. The material shall be left windrowed over the trench to allow for settlement.

The Contractor will be required to place native fill over the drain between Station 0+270 and 0+335 to ensure that the drain has a minimum of 0.6m of cover.

All areas disturbed by construction, except the material windrowed over the trench, shall be left in a condition suitable for cultivation. Final levelling, or the removal of excess material, shall be the responsibility of the landowner.

The Contractor shall not operate any trenching or backfill equipment, delivery truck, equipment, pickup trucks, or other vehicles along or over the trench during or after construction. The Contractor shall be responsible for any damage caused by any equipment or vehicles operated over the trench. If the Contractor must cross the trench, he will do so in one area.

The landowners are also advised not to operate farm equipment over the trench or along the length of the trench for 1 year after construction in order to protect the tile.

**14. Ditch Inlet Catch Basins**

The ditch inlet catch basins shall be installed to the elevations and in the locations shown on the drawings as follows:

Structure	Station	Type (mm)	Top Elev. (m)	Outlet Pipe Elev. (m)	Inlet Pipe Elev. (m)
EXDICB 1	0+000			256.88 (300mm)	
DICB 3	0+000	900 X 1200	257.90	256.88 (500mm)	
DICB 4	0+024	900 X 1200	257.54	256.08 (450mm)	256.42 (500mm)

The ditch inlet catch basins shall be square precast concrete structures as noted above. The ditch inlet shall have a 2:1 sloped top with birdcage type grate. DICB 3 shall be located in the backslopes (road side) of the roadside ditch and at the location identified on the plans. DICB 4 shall be located in the backslopes (road allowance side) of the berm and at the location identified on the plans. When the ditch inlet is located within a road allowance, the inlet side or low side of the ditch inlet will face the road. The high side of the ditch inlet catch basin will face away from the road so the inlet side aligns with the roadside ditch, or slightly farther away from the travel portion of the road allowance.

The ditch inlet catch basins shall be made with the top sections separate from the base sections in order to allow riser sections to be installed or removed as necessary (i.e. the base section shall not extend for more than 150mm above the top of the highest opening in the base section). The wall thickness of all structures shall be 115mm and each shall have a 600mm sump. Birdcage grates shall be manufactured with a bar spacing no larger than 50mm.

The ditch inlet catch basins shall be set at the final elevations as directed by the Drainage Superintendent. The ditch inlet shall be set on a layer of clear stone. The clear stone shall be extended up to the springline of the inlet and outlet pipe connections.

The tile at the connection to the ditch inlet catch basins, shall be concreted on both the inside and outside prior to backfilling. Any pipe or tile shall not protrude more than 50mm inside the wall.

A 12.7mm (1/2") steel plate shall be installed on DICB 1 and DICB 2. The steel plate shall cover the entire grate and shall be bolted to the existing frame and grate to ensure it does not dislodge under heavy flows.

There is a known gas line conflict at DICB 3. Enbridge Gas is aware of the conflict. The Contractor will be required to Contact Enbridge Gas when working around the line. If possible, the line will be lowered by Enbridge Gas or with approval the line will be encased in non shrinkable grout. With Approval from the Drainage Superintendent, DICB 3 can be reversed to the opposite side of the ditch to avoid the conflict providing the change does not affect the existing road embankment backslopes.

#### **15. Installation of Culverts**

Corrugated Steel Pipe (CSP) access culverts and siphon shall be aluminized corrugated steel pipe with a minimum wall thickness of 2.8mm in all cases. All corrugation profiles shall be of a helical lockseam manufacture using 25mm x 75mm or 25mm x 125mm corrugations. Any future extension or replacement of the culvert shall be to equivalent specifications. Upon approval from the Drainage Superintendent, high density polyethylene (HDPE) smooth wall pipe material shall be (320 kPa) Boss 2000 or approved equal with bell and spigot joints may be substituted for CSP material.

Corrugated Steel Pipe Arch (CSPA) culverts shall be aluminized corrugated steel pipe with a minimum wall thickness of 2.8mm in all cases. All corrugation profiles shall be of a helical lockseam manufacture using 125mm x 25mm corrugations. Any future extension or replacement of the culvert shall be to equivalent specifications.

The culvert lengths are based on using rip rap end protection (1.5H:1.0V). If concrete block walls are to be utilized in a future replacement, the culvert length shall be reduced to accommodate the standard 6m top width plus, the width of the concrete block headwalls.

Culverts shall be installed with the invert 10% below the original channel bottom. The location of the culvert shall be in the general location as the existing culvert.

All granular bedding and backfill material including any required fill below the culvert invert shall be mechanically compacted to 95% standard proctor maximum dry density. The top 300mm of Granular "B" material or suitable approved native backfill 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.

Pipe culverts shall be constructed to the depths and grades as shown on the drawings. The bottom of the excavation shall be excavated to the required depth. Any over excavation will be backfilled with granular material or clear stone. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with 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.

Agricultural access pipe culverts can be backfilled with suitable free draining native material, or Granular "B" material. The backfill shall be placed from the top of the bedding, to within 150mm of the finished grade. Unless otherwise specified, the top width will be based on the width of the existing gravel, plus 1m on each side. The top 150mm of the lane shall be restored with Granular "A" material for a sufficient distance, to match the existing access road width. The location of the agricultural access culverts may be moved a short distance upstream or downstream as necessary, to avoid existing tile outlets, subject to the approval of the Drainage Superintendent or Engineer. If a tile outlet cannot be avoided, the tile outlet shall be extended upstream or downstream to an outlet. Any tile outlets extended as a result of extra length requested by an Owner, shall be extended at the Owner's expense.

The Eldon Road siphon and Little Britain Road centreline pipe culverts shall be backfilled with Granular 'B' material under the travelled portion and suitable free draining native material under the non-travelled portion of the road. The backfill shall be placed 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.

Rip rap end protection shall have a minimum 1.5H:1V sideslopes. The rip rap shall consist of 150mm - 300mm 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 270R or an approved equal) shall then be placed with any joints overlapped at a minimum of 600mm. The quarry stone shall be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

The Contractor shall maintain a dry working area during construction. The Contractor shall install a silt fence downstream of the work area (at the bottom end of the channel improvement if all work is completed at the same time).

After completion of construction, the sediment and erosion control measures shall be removed. The final removal shall be the silt fence.

**CULVERTS TO BE INSTALLED:**

Culvert 2 (Station 0+977) – Pt Lot 17, Concession 4 (Area Roll Number 110 020 09905) – The culvert shall be a 10m, 1630mm X 1120mm CSPA with rip rap end protection.

Culvert 3 (Station 1+160) – Pt Lot 17, Concession 4 (Area Roll Number 110 020 09905) – The culvert shall be a 16m, 1200mm Dia. CSP with rip rap end protection.

**CULVERTS TO BE REPLACED IN THE FUTURE:**

Eldon Road Crossing (*Station 0+012*) – The siphon is to be replaced in the future under this report with a 24m, 600mm diameter HDPE pipe or CSP culvert with a ditch inlet catch basin at each end. All tiles that are connected to the ditch inlet must be reconnected to the new structure. All work to be approved by the Road Authority prior to replacing the structure.

Culvert 1 – Pt Lot 16, Concession 4 (Area Roll Number 110 020 09800) –The culvert shall be a 10m, 1630mm X 1120mm CSPA with rip rap end protection. The location of the culvert on the plan is for illustration purposes only, and the actual location will be determined in the field at the time of the installation, in conjunction with the landowner.

Culvert 4 – Pt Lot 17, Concession 4 (Area Roll Number 110 020 09901) –The culvert shall be a 12m, 1200mm Dia. CSP with rip rap end protection. The location of the culvert on the plan is for illustration purposes only, and the actual location will be determined in the field at the time of the installation, in conjunction with the landowner.

Culvert 5 – Little Britain Road Centreline Culvert (*Station 1+336*) – The culvert is to be replaced under this report with a 24m (min), 3100mmx1980mm CSPA with rip rap end protection. All work to be approved by the Road Authority prior to replacing the structure.

**16. Subsurface Drainage (Provisional)**

Any surface courses or exiting tiles ends, shall be rip rapped with 100mm X 250mm quarry stone or gabion stone) and filter fabric (Terrafix 270R or an approved equal).

The area to receive rip rap shall be graded to a minimum depth of 300mm. If the washout is greater than 300mm, then excavated or fill material shall be placed to sub-grade. The filter fabric will then be placed with all joints overlapped with a minimum of 600mm. The rip rap will then be placed to a minimum depth of 300mm from the base of the side slope to the top of the bank with the smaller pieces being placed in the gaps and voids to give it a uniform appearance. The area to receive rip rap shall be graded, and the rip rap is placed to allow any surface water directed to this area to enter the channel over the rip rap. The rip rap shall generally be keyed to a depth of 600mm at

the top of the bank. Any native material that has washed into the channel, shall be removed and spread on the adjacent property.

#### **17. Outlet Works & Channel Protection**

The proposed outlet works and channel protection consists of rip rap and filter fabric, and shall be installed on the channel side slope, from the bottom of the channel to the top of the bank, for a distance of 1m on either side of the outlet pipes. Rip rap shall be made up of 150mm - 300mm quarry stone or an approved equal. The area to receive the rip rap shall be graded first to allow the placement of the rip rap to a depth of 400mm above the obvert of the tile. After grading, a layer of filter fabric (Terrafix 270R or an approved equal) shall be placed with any joints overlapping a minimum of 600mm. Rip rap shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

#### **18. 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 manufactured silt fence supported with posts.

Silt fencing shall be installed at immediately downstream of the Little Britain Road centreline culvert (Station 1+350), and at Station 0+963.

The 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.

#### **19. Sediment Traps**

Sediment traps shall be installed between Station 1+260 and 1+292 as per the contract drawings.

The sediment trap shall be in accordance with OPSS 577 and OPSD 219.220.

Accumulated sediment and the rip rap portion of the trap shall be removed once the seed has taken and the disturbed areas have been revegetated. All rip rap shall be hauled off site and disposed of by the Contractor. The removal of sediment and rip rap will require the Contractor to Remobilize to the site.

## **20. Restoration**

Restoration shall be in accordance with the following:

Disturbed channel banks and the road allowance shall be restored with topsoil and seed. Topsoil will be native soil generated on site.

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% of total weight.
- c. Fertilizer (300 kg/ha.) consisting of 8-32-16.

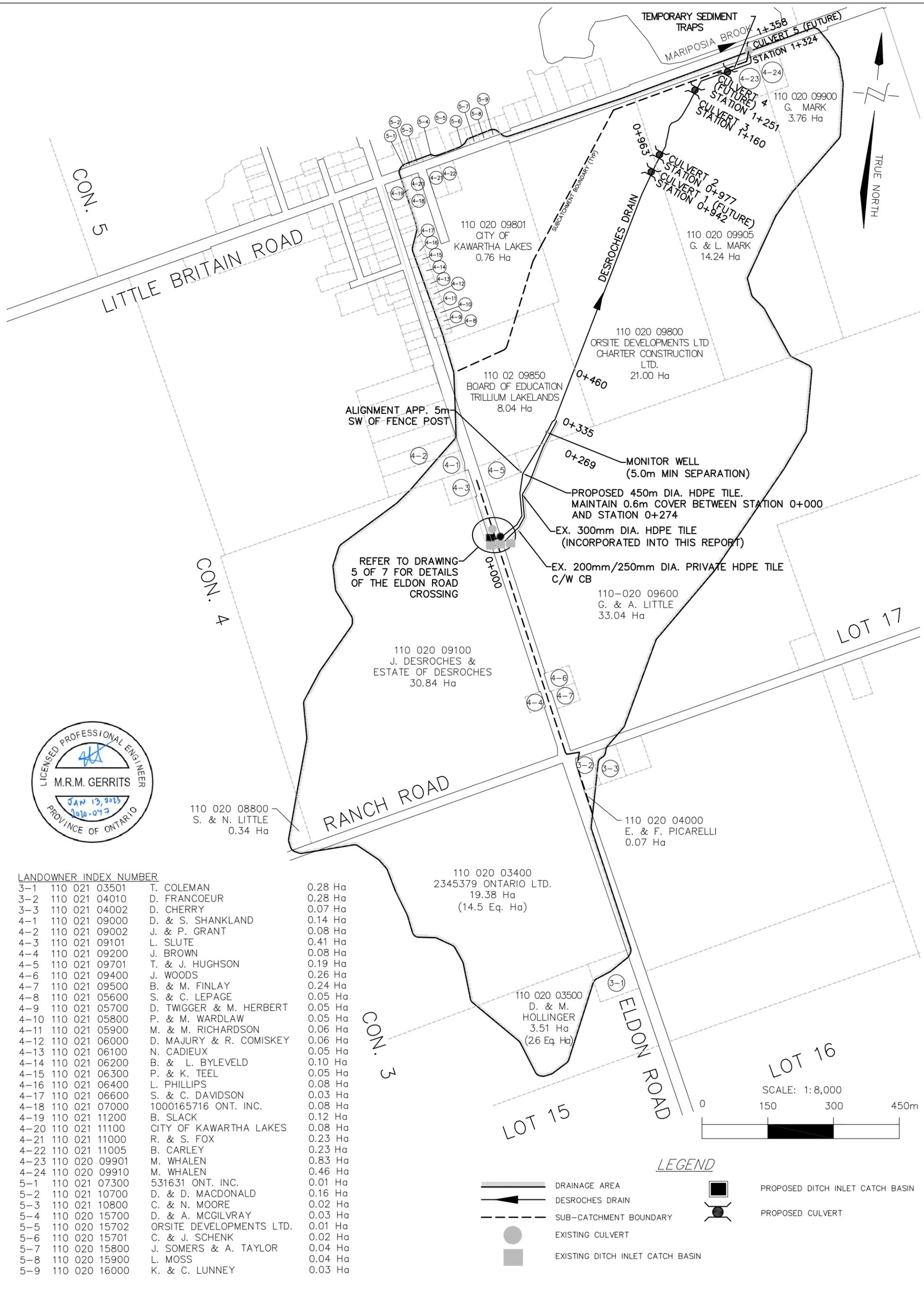
Hand seeding shall be spread on the affected areas on a daily basis with the seed mixture, fertilizer, 50mm of topsoil, and straw mulch and application rates as shown above. 50mm (min) of topsoil to be placed on channel slopes. 25mm-50mm of straw mulch is to be placed on the slopes once seeding is completed.

Topsoil is to be placed in accordance with OPSS 802. Seed is to be supplied and placed in accordance with OPSS 804.

## **21. Environmental Considerations**

The Contractor shall take care to adhere to the following considerations:

- All work is to be completed in accordance with the KRCA Department of Fisheries and Oceans Canada, June 1, 2021, Letter of Advice (21-HCAA-0073).
- No in-water work will be permitted between March 15 and July 15 of any calendar year.
- 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, and all surface water runs and open inlets that enter the drain.
- The Contractor shall maintain a dry working area during construction.
- All construction in the channel shall be carried out during periods of low flow.



LANDOWNER	INDEX NUMBER	AREA (Ha)
3-1	110 021 03501 T. COLEMAN	0.28 Ha
3-2	110 021 04010 D. FRANCOEUR	0.28 Ha
3-3	110 021 04002 D. CHERRY	0.07 Ha
4-1	110 021 09000 D. & S. SHANKLAND	0.14 Ha
4-2	110 021 09002 J. & P. GRANT	0.08 Ha
4-3	110 021 09101 L. SLUTE	0.41 Ha
4-4	110 021 09200 J. BROWN	0.08 Ha
4-5	110 021 09701 T. & J. HUGHSON	0.19 Ha
4-6	110 021 09400 J. WOODS	0.26 Ha
4-7	110 021 09500 B. & M. FINLAY	0.24 Ha
4-8	110 021 05600 S. & C. LEPAGE	0.05 Ha
4-9	110 021 05700 D. TWIGGER & M. HERBERT	0.05 Ha
4-10	110 021 05800 P. & M. WARDLAW	0.05 Ha
4-11	110 021 05900 M. & M. RICHARDSON	0.06 Ha
4-12	110 021 06000 D. MAJURY & R. COMISKEY	0.06 Ha
4-13	110 021 06100 N. CADIEUX	0.05 Ha
4-14	110 021 06200 B. & L. BYLEVELD	0.10 Ha
4-15	110 021 06300 P. & K. TEEL	0.05 Ha
4-16	110 021 06400 L. PHILLIPS	0.08 Ha
4-17	110 021 06600 S. & C. DAVIDSON	0.03 Ha
4-18	110 021 07000 1000165716 ONT. INC.	0.08 Ha
4-19	110 021 11200 B. SLACK	0.12 Ha
4-20	110 021 11100 CITY OF KAWARTHA LAKES	0.08 Ha
4-21	110 021 11000 R. & S. FOX	0.23 Ha
4-22	110 021 11005 B. CARLEY	0.23 Ha
4-23	110 020 09901 M. WHALEN	0.83 Ha
4-24	110 020 09910 M. WHALEN	0.46 Ha
5-1	110 021 07300 531631 ONT. INC.	0.01 Ha
5-2	110 021 10700 D. & D. MACDONALD	0.16 Ha
5-3	110 021 10800 C. & N. MOORE	0.02 Ha
5-4	110 020 15700 D. & A. MCGILVRAY	0.03 Ha
5-5	110 020 15702 ORSITE DEVELOPMENTS LTD.	0.01 Ha
5-6	110 020 15701 C. & J. SCHENK	0.02 Ha
5-7	110 020 15800 J. SOMERS & A. TAYLOR	0.04 Ha
5-8	110 020 15900 L. MOSS	0.04 Ha
5-9	110 020 16000 K. & C. LUNNEY	0.03 Ha



LEGEND	
	DRAINAGE AREA
	DESROCHES DRAIN
	SUB-CATCHMENT BOUNDARY
	EXISTING CULVERT
	EXISTING DITCH INLET CATCH BASIN
	PROPOSED DITCH INLET CATCH BASIN
	PROPOSED CULVERT

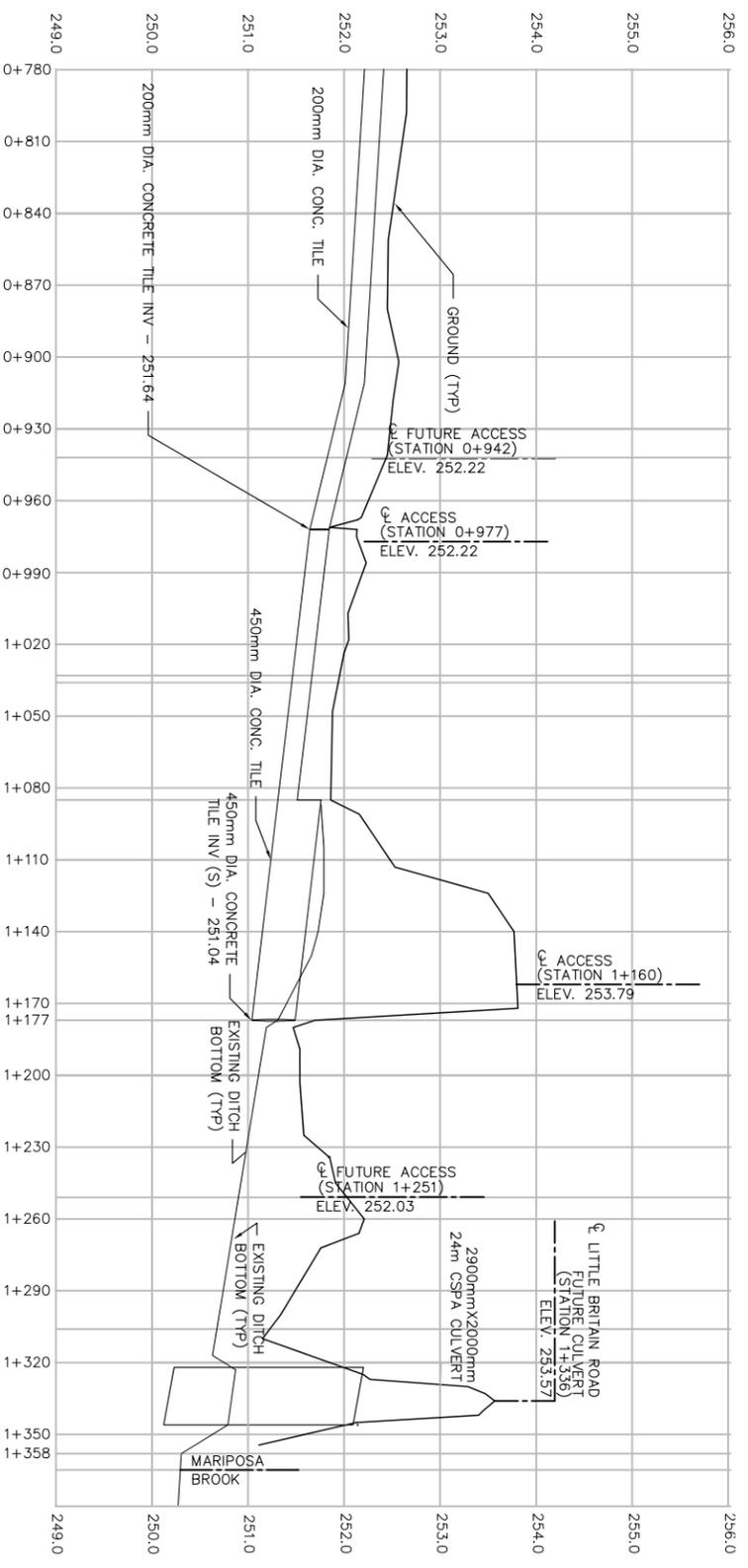
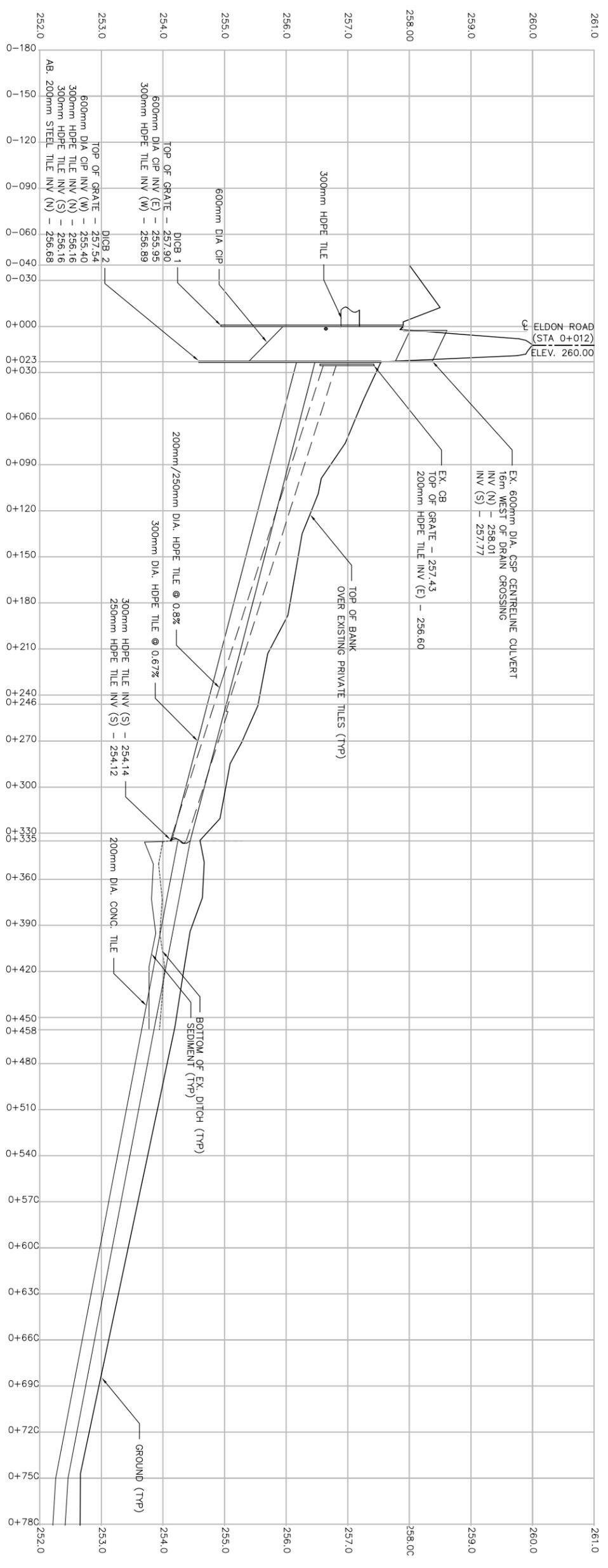


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1	FOR APPROVAL REVIEW	AUGUST 30, 2021	MG
2	FOR REPORT	JANUARY 16, 2023	MG

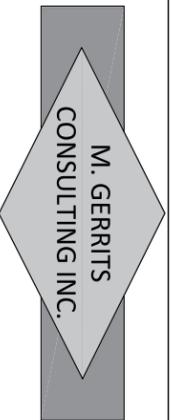
**DESROCHES DRAIN**  
CITY OF KAWARTHA LAKES

**OVERALL PLAN**

DRAWN	MG
CHECKED	TG
DATE	JANUARY 16, 2023
PROJECT NO.	2020-047
SHEET	<b>1 OF 7</b>



HORIZONTAL SCALE 1:3000  
VERTICAL SCALE 1:800



No.	REVISIONS	DATE	BY
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2	FOR REPORT	JANUARY 16, 2023	MG

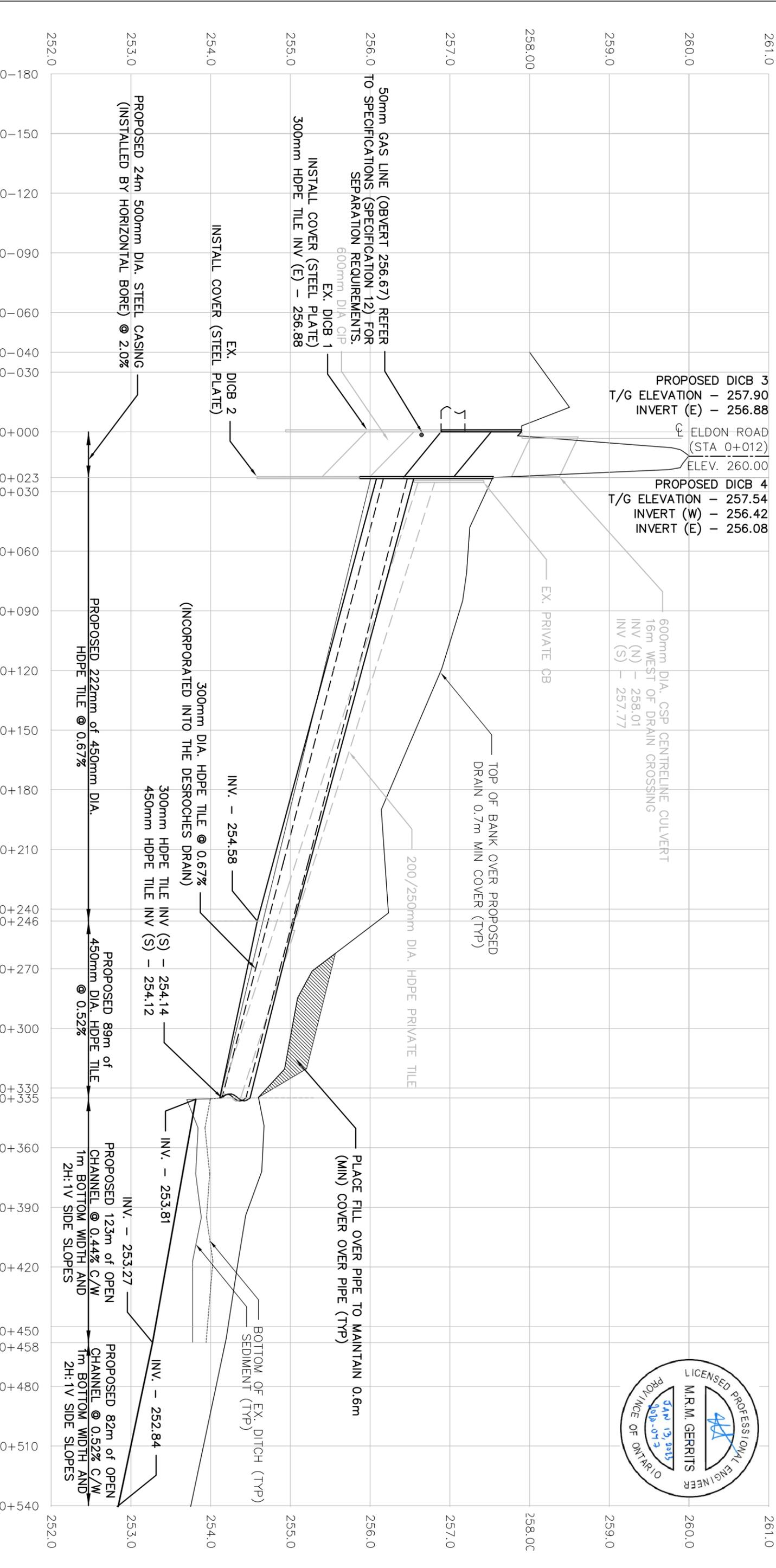
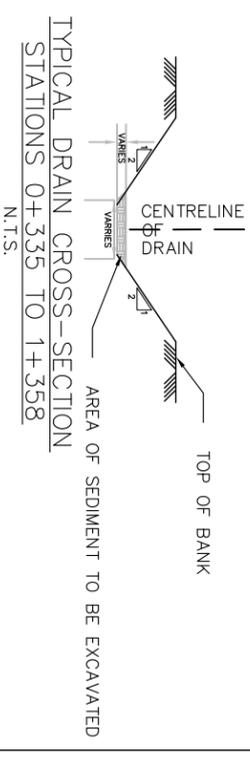
**DESROCHES DRAIN**  
CITY OF KAWARTHA LAKES

DRAWN	MG
CHECKED	TG
DATE	JANUARY 16, 2023
PROJECT NO.	2020-047
SHEET	2 OF 7

PROFILE - EXISTING CONDITIONS

**GENERAL NOTES**

- CONTRACTOR TO COMPLETE A BENCHMARK CONTROL LOOP PRIOR TO CONSTRUCTION. PRIMARY BENCHMARK #1 ELEV. 252.28
- TOP OF RIB ON THE OBVERT OF THE SOUTH END OF THE LITTLE BRITAIN ROAD CENTRELINE CULVERT AT STATION 1+324.
- BENCHMARK #2 ELEV. 258.71 NAIL IN THE WEST SIDE OF A HYDRO POLE ON THE SOUTH SIDE OF ELDON ROAD, 30m EAST OF DICB 1.
- BENCHMARK #3 ELEV. 258.36 NAIL IN THE SOUTH SIDE OF A HYDRO POLE ON THE NORTH SIDE OF ELDON ROAD, 30m WEST OF DICB 1.
- BENCHMARK #4 ELEV. 252.33 NAIL IN THE WEST SIDE OF A HYDRO POLE ON THE SOUTH SIDE OF LITTLE BRITAIN ROAD AT STATION 1+200.

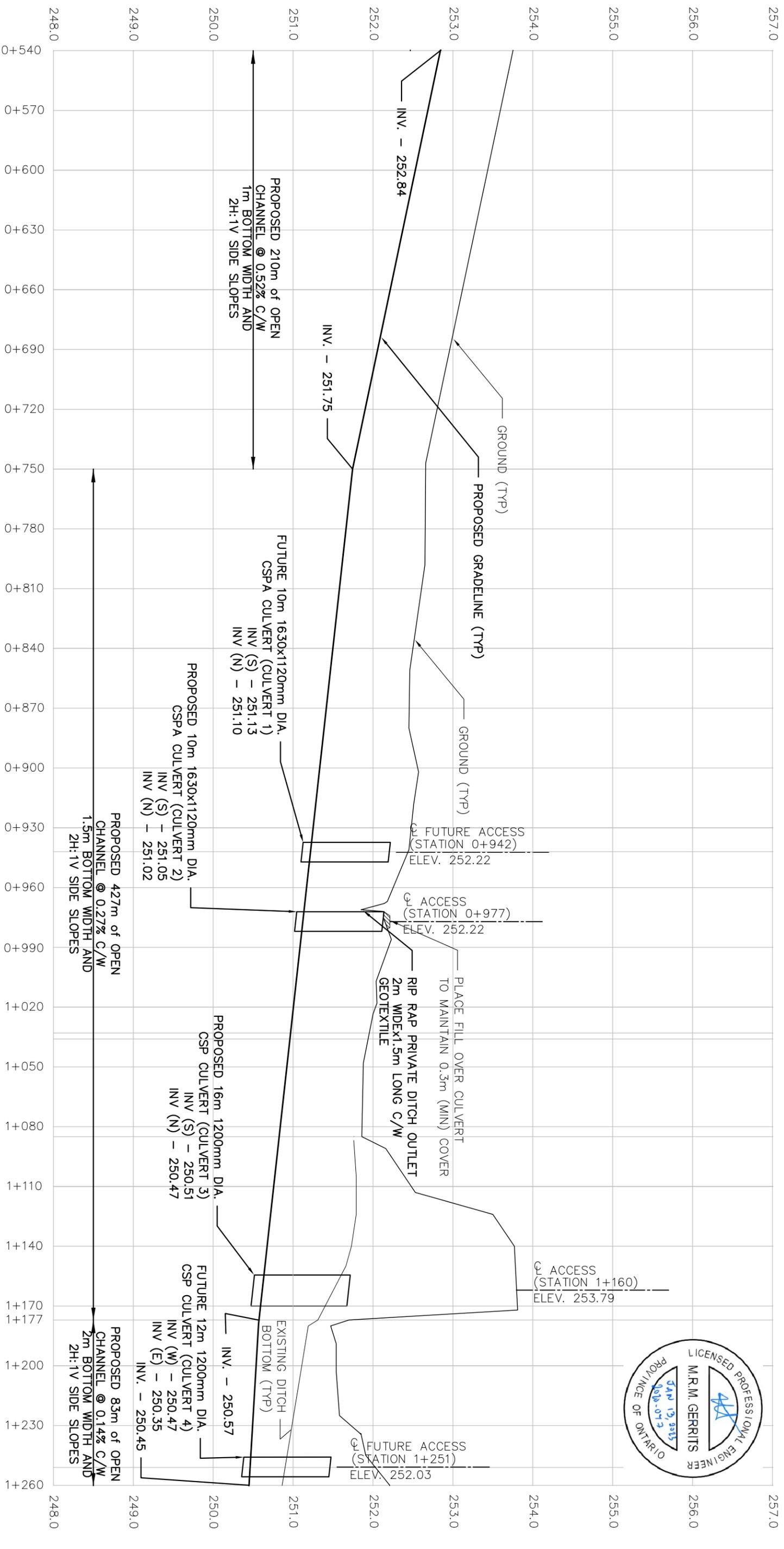
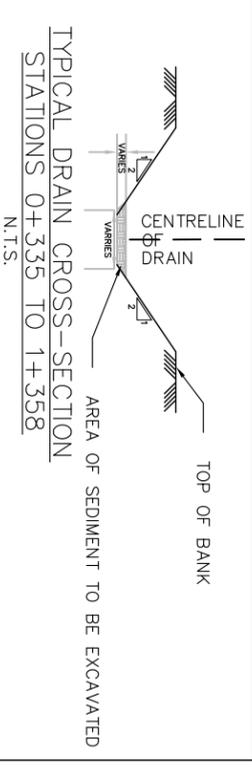


HORIZONTAL SCALE 1:2000  
VERTICAL SCALE 1:50

<p style="text-align: center;"><b>M. GERRITS CONSULTING INC.</b></p>		<p style="text-align: center;"><b>DESROCHES DRAIN</b> CITY OF KAWARTHA LAKES</p>		<p style="text-align: center;">PROFILE STATION 0+000 TO STATION 0+540</p>		
		No.	REVISIONS	DATE	BY	DATE
1	FOR APPROVAL REVIEW	AUGUST 30, 2021	MG			
2	FOR REPORT	JANUARY 16, 2023	MG			
DRAWN		MG				
CHECKED		TG				
DATE		JANUARY 16, 2023				
PROJECT NO.		2020-047				
SHEET		3 OF 7				

**GENERAL NOTES**

- CONTRACTOR TO COMPLETE A BENCHMARK CONTROL LOOP PRIOR TO CONSTRUCTION. PRIMARY BENCHMARK #1 ELEV. 252.28 TOP OF RIB ON THE OVERTOP OF THE SOUTH END OF THE LITTLE BRITAIN ROAD CENTRELINE CULVERT AT STATION 1+324.
- BENCHMARK #2 ELEV. 258.71 NAIL IN THE WEST SIDE OF A HYDRO POLE ON THE SOUTH SIDE OF ELDON ROAD, 30m EAST OF DICB 1.
- BENCHMARK #3 ELEV. 258.36 NAIL IN THE SOUTH SIDE OF A HYDRO POLE ON THE NORTH SIDE OF ELDON ROAD, 30m WEST OF DICB 1.
- BENCHMARK #4 ELEV. 252.33 NAIL IN THE WEST SIDE OF A HYDRO POLE ON THE SOUTH SIDE OF LITTLE BRITAIN ROAD AT STATION 1+200.



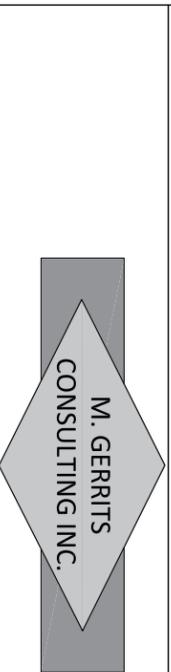
HORIZONTAL SCALE 1:2000  
VERTICAL SCALE 1:50

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2	FOR REPORT	JANUARY 16, 2023	MG

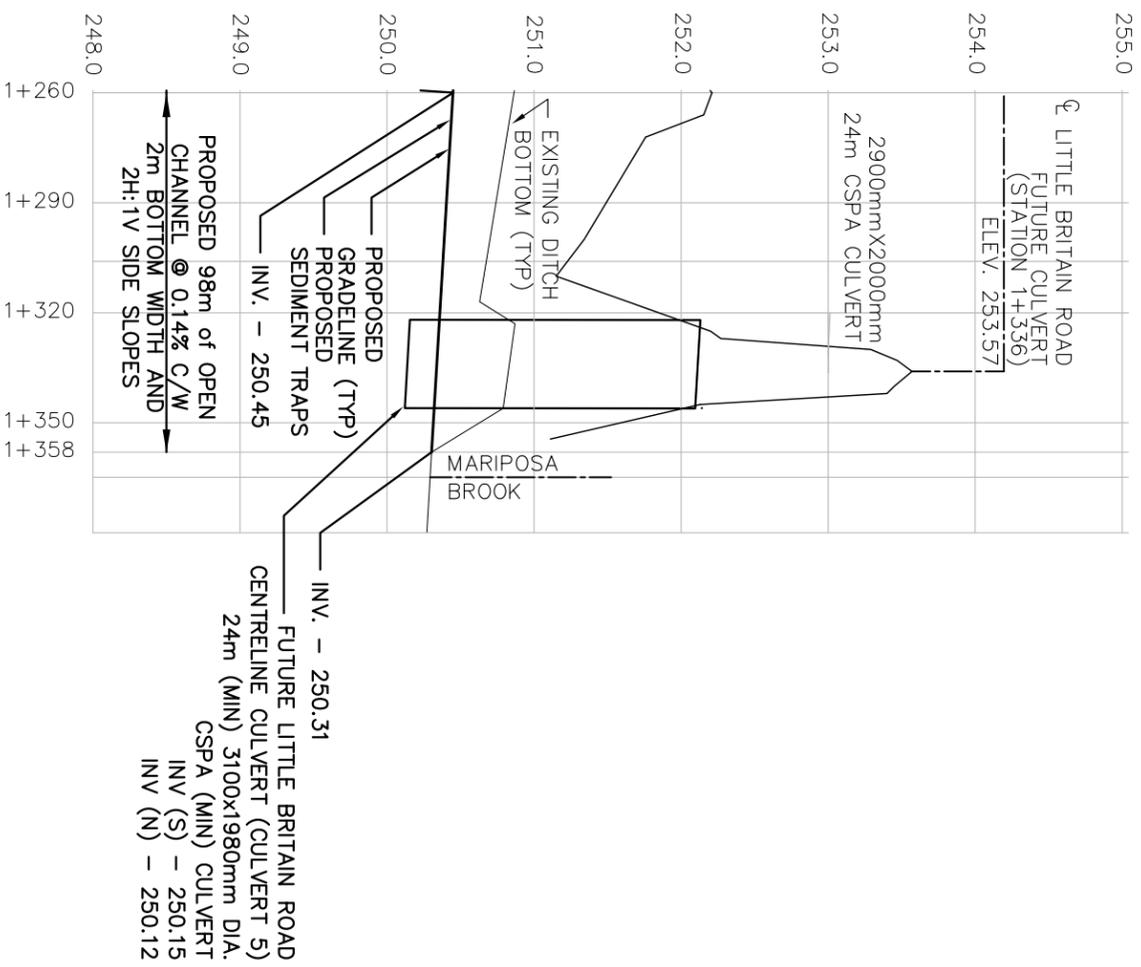
  

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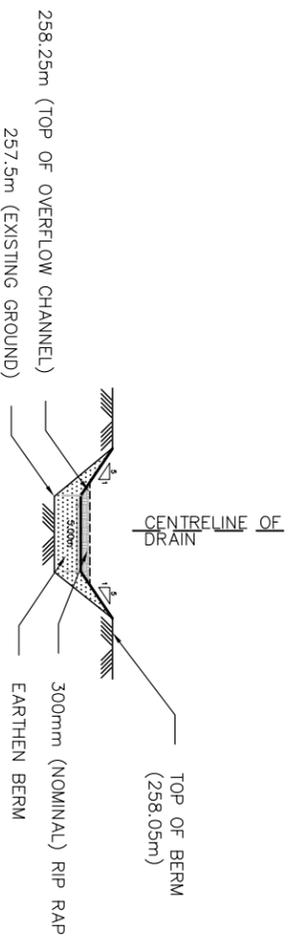
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PROJECT NO.: 2020-047



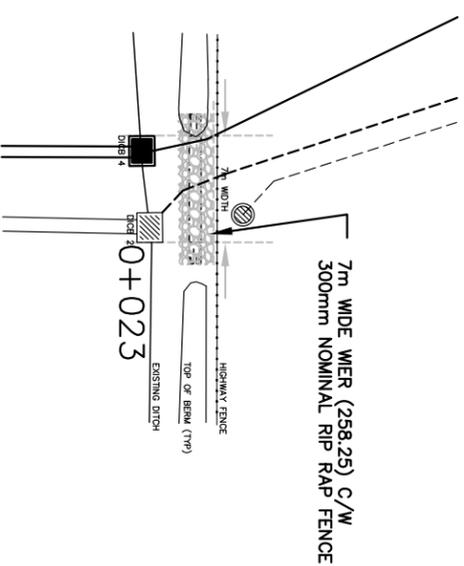
**DESROCHES DRAIN**  
CITY OF KAWARTHA LAKES  
PROFILE  
STATION 0+540 TO STATION 1+260  
SHEET **4 OF 7**



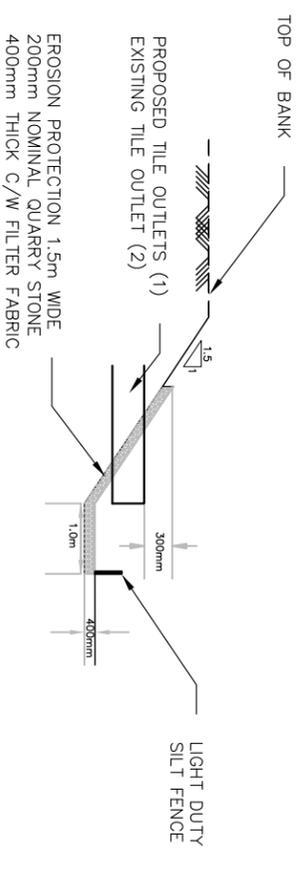
**PROFILE**  
 STATION 1+260 TO 1+358  
 HORIZONTAL SCALE 1:2000  
 VERTICAL SCALE 1:50



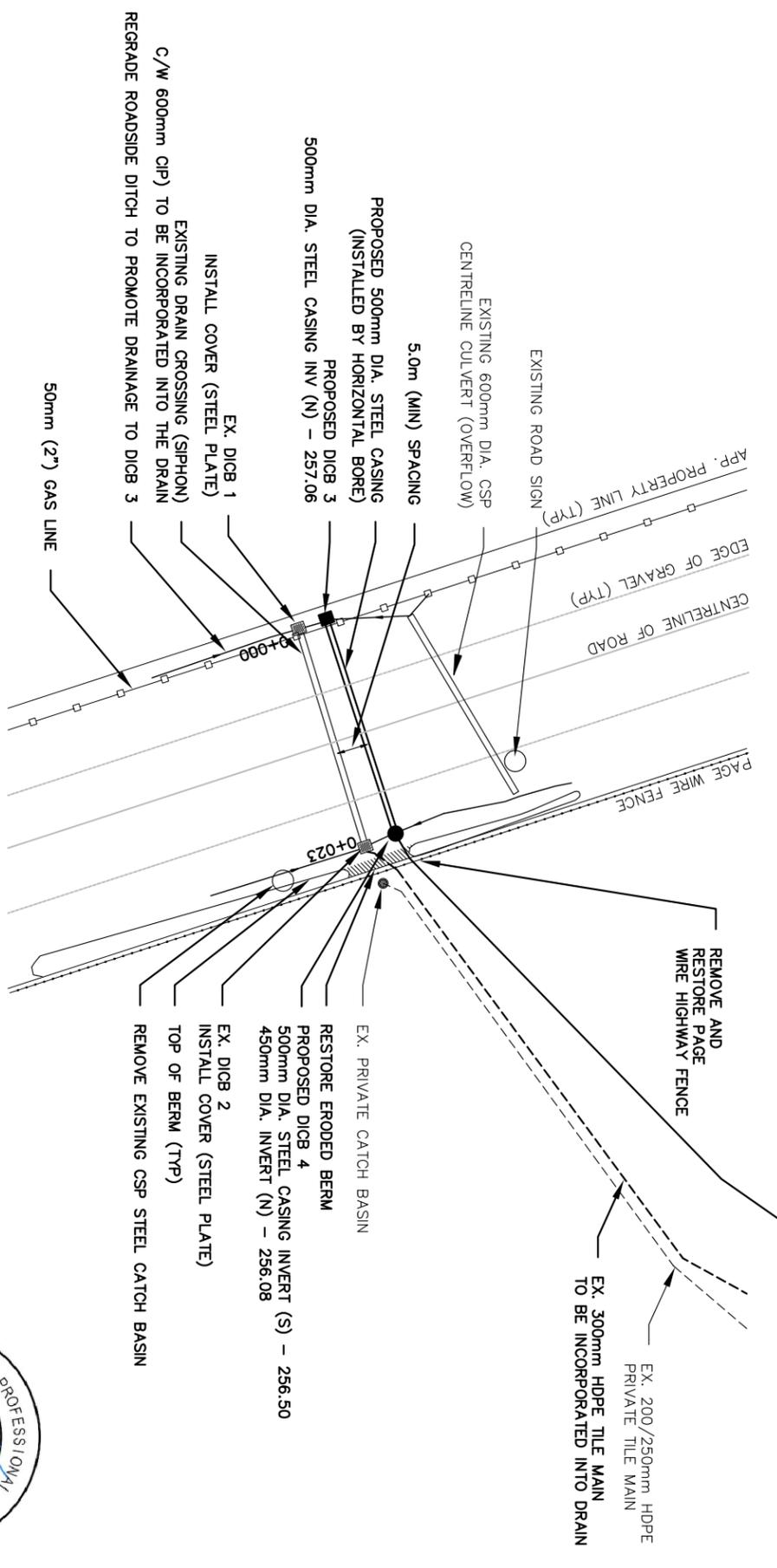
**TYPICAL BERM CROSS-SECTION**  
 STATION 0+025  
 N.T.S.



**TYPICAL BERM PLAN VIEW**  
 STATION 0+023  
 N.T.S.



**TYPICAL OUTLET DETAIL**  
 STATION 0+335  
 N.T.S.



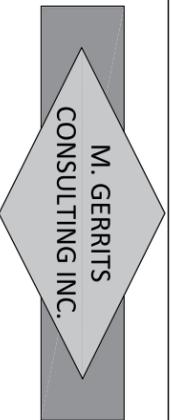
**ELDON ROAD CROSSING**  
 PLAN VIEW  
 N.T.S.



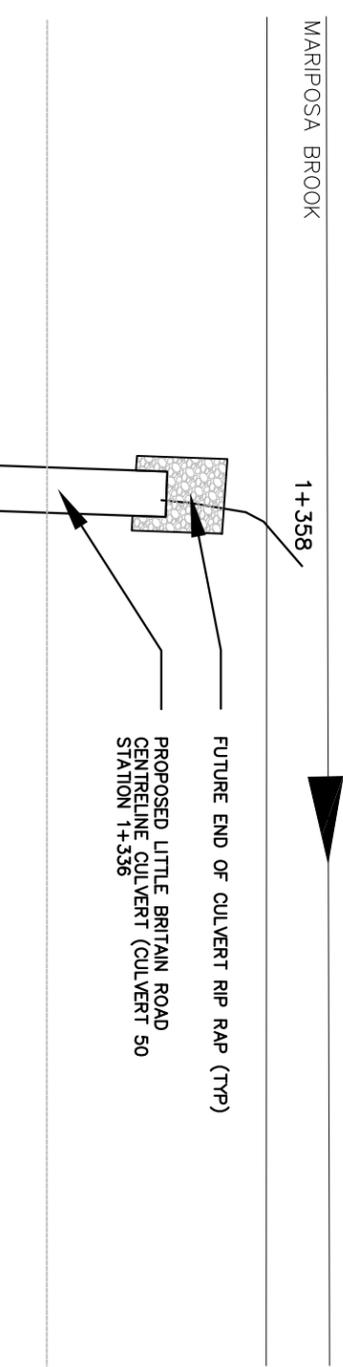
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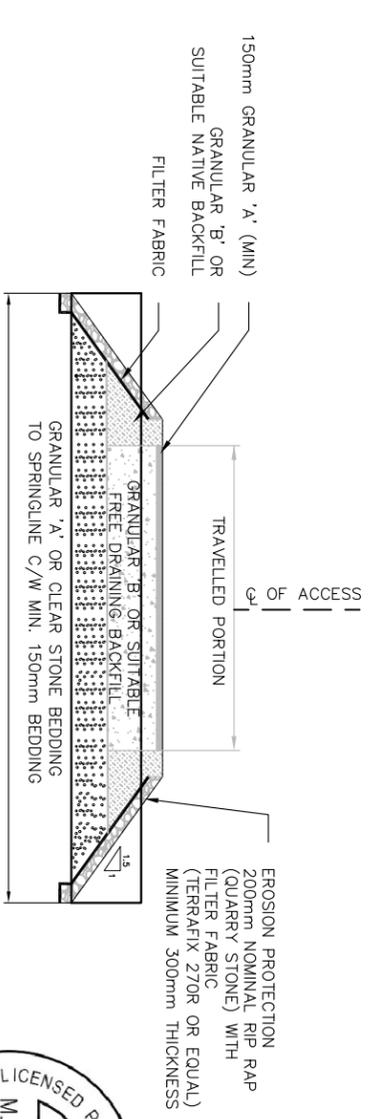
DESROCHES DRAIN	MG
CITY OF KAWARTHA LAKES	TG
DATE	JANUARY 16, 2023
PROJECT NO.	2020-047
SHEET	5 OF 7



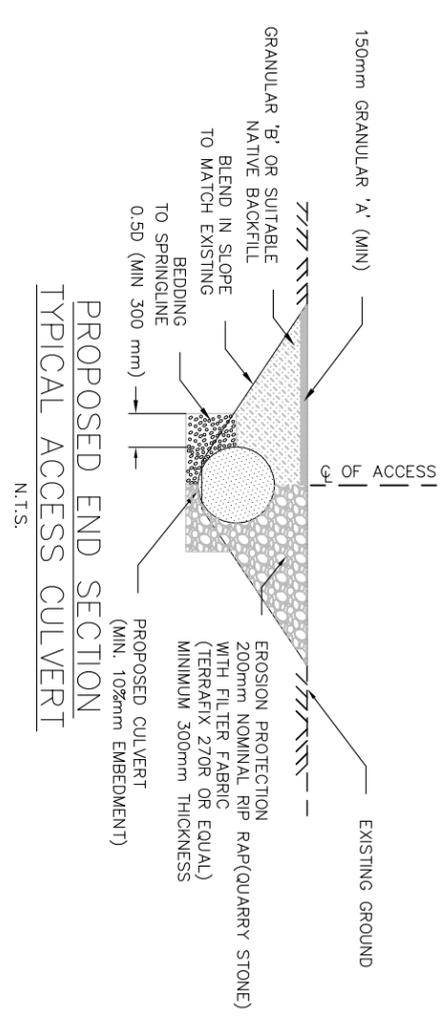
**PROFILE - STATION 1+260 TO STATION 1+358**  
**CULVERT AND OUTLET DETAILS**



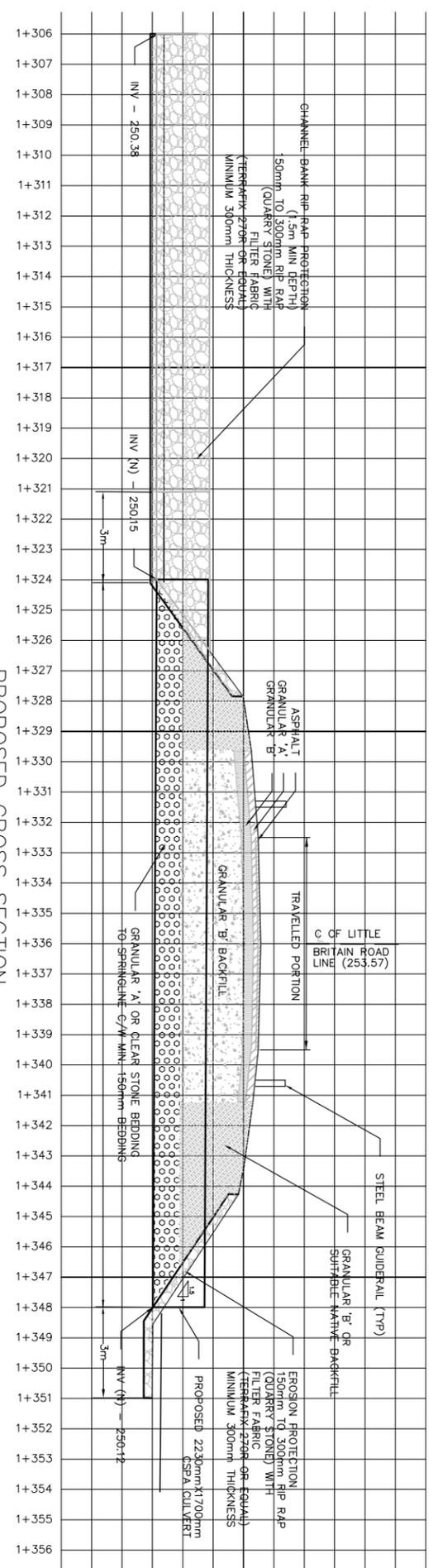
LITTLE BRITAIN ROAD CROSSING  
PLAN VIEW  
N.T.S.



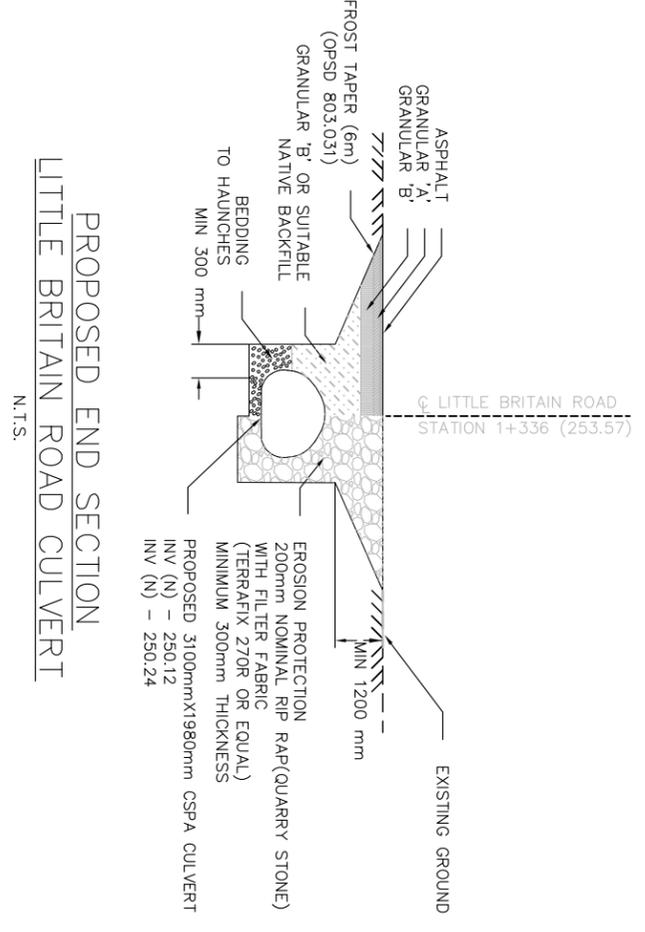
PROPOSED CROSS SECTION  
TYPICAL ACCESS CULVERT  
N.T.S.



PROPOSED END SECTION  
TYPICAL ACCESS CULVERT  
N.T.S.

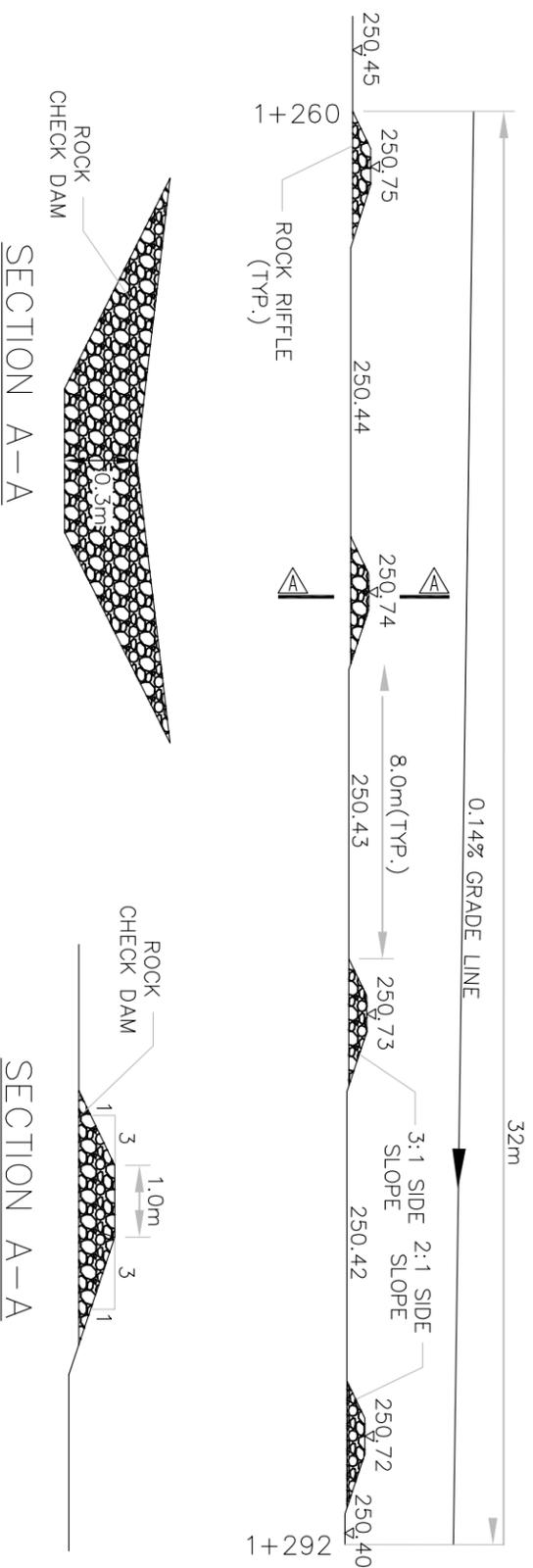


PROPOSED CROSS SECTION  
LITTLE BRITAIN ROAD CULVERT  
1:200



PROPOSED END SECTION  
LITTLE BRITAIN ROAD CULVERT  
N.T.S.

<p style="text-align: center;"><b>M. GERRITS</b> CONSULTING INC.</p>		<p style="text-align: center;"><b>DESROCHES DRAIN</b> CITY OF KAWARTHA LAKES</p>		<p>PROJECT NO. 2020-047</p>
		<p style="text-align: center;"><b>LITTLE BRITAIN ROAD AND DRAIN CROSS SECTION DETAILS</b></p>		<p>SHEET 6 OF 7</p>
No.	REVISIONS	DATE	BY	DRAWN
1	FOR APPROVAL REVIEW	AUGUST 30, 2021	MG	MG
2	FOR REPORT	JANUARY 16, 2023	MG	TG



TEMPORARY SEDIMENT TRAPS  
NTS



No.	REVISIONS	DATE	BY
1	FOR APPROVAL REVIEW	AUGUST 30, 2021	MG
2	FOR REPORT	JANUARY 16, 2023	MG

DESROCHES DRAIN	
CITY OF KAWARTHA LAKES	
SEDIMENT TRAP DETAILS	

DRAWN	MG
CHECKED	TG
DATE	JANUARY 16, 2023
PROJECT NO.	2020-047
SHEET	7 OF 7

