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June 3, 2019

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

Mayor, Council and Drainage Board:

Re: Webster Drain

In accordance with your instructions, I have undertaken an examination of Part of Lot 11, Concession 5, and Part of Lot 10, Concession 5 with regards to providing the lots with a legal outlet for subsurface water generated on the properties.

The Lake Simcoe Regional Conservation Authority has approved the May 8, 2019 design of the Webster Drain. The design presented in this report is the same design that has been approved.

Summary of Work

The work includes the following:

- Prepare an Engineers Report under the Drainage Act to address the petitions (2).
- Replace the Glenarm Road centreline culvert.
- Replace the Prospect Road centreline culvert.
- Construct an open channel across the W1/2 of Lot 10, Concession 5 and complete a ditch cleanout and deepening for 310m west of Prospect Road on the S1/2 of Lot 10, Concession 4 and Lot 9, Concession 4.
- Allowances have been made to Pt. Lot 11 and W1/2 L Lot 10, Concession 5 and to S1/2 L Lot 10 and Lot 9, Concession 4.
- The estimated costs are estimated to be $256,450 which includes engineering, tendering and an allowance for inspection.

Authorization under the Drainage Act

The City of Kawartha Lakes received two petitions for drainage, one on September 13, 2017 from Victor Webster Farms Ltd and a second petition from Ella Webster on July 12, 2018. This Engineers Report has been prepared under Section 4 of the Drainage Act as per the petitions received by the City of Kawartha Lakes. Section 4 (1) of the Drainage Act states:

A petition for the drainage by means of a drainage works of an area requiring drainage as described in the petition may be filed with the Clerk of the local Municipality in which the area is situate 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 per cent of the hectarage 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 petitions were determined to be valid based on Section 4 (1) (b).

Existing Conditions

There exists an open channel in Lot 9, Concession 4 that extends in a north-easterly direction to the east edge of the S1/2 Lot 10, Concession 4. It then extends in a north-easterly direction 820m to its head in the W1/2 Lot 10, Concession 5.

North of the open channel exists a small surface course that crosses Glenarm Road, approximately 360m east of Prospect Road.

At the time of site visits the lands east of the low run were cleared and appeared to be cropped. The clearing extended to the west of the low run.

The Lake Simcoe Region Conservation Authority provided mapping with the following information.

- The Lands in Lot 10, Concession 5 were labelled as wetland.
- The catchment area is located within a regulated area.
- The low run from Station 0+150 to 1+302 was considered a watercourse.
- The low run from Station 0+150 to 1+302 was considered a meanderbelt (erosion limit).

On Site Meetings

An onsite meeting was held on November 1, 2017. The following is a summary of the meeting:

- The City of Kawartha Lakes received a petition for outlet of sub-surface water on L11, Concession 5.
- The petition was determined to be valid.
- R. Dobbin Engineering will need to do a detailed topographic survey for the alignment and to determine the drainage area.

A second meeting was held on June 6, 2018. The purpose of the second meeting was to update the Landowners and answer any questions with respect to the alignment, grades and the length of works required for a sufficient outlet. After some discussion, some Landowners expressed an interest in signing a petition for drainage. The following is a summary of the subsequent meeting:

- The City of Kawartha Lakes received a petition for outlet of sub-surface water on L10, Concession 5.
- The petition was determined to be valid.
- R. Dobbin Engineering will need to do a detailed topographic survey for the alignment and to determine the drainage area.
- The Landowner of Part of Lot 11, Concession 5 and the Landowner of the W1/2 of Lot 10, Concession 5 were contacted separately by telephone to discuss the petition.

Recommendations

Based on our knowledge of the drain and discussions at the November 1, 2017 and June 6, 2018, meetings it is therefore recommended that the following work be carried out:

1. A new drain called the Webster Drain will be constructed following the existing lowlands to provide an outlet for surface and subsurface water in Part of Lot 11, Concession 5.

Design

The proposed open channel drain shall be designed to accommodate a drainage coefficient of 37 mm/24 hours. This is generally acceptable for lands used for cash crops with provisions for surface water. Open channel design criteria includes an assumed minimum tile depth of 600mm plus diameter of tile and a minimum 100 mm freeboard to the design flow elevation.

Culvert design criteria includes rural road crossing be designed to accommodate the 1 in 10 year storm event and County roads be designed to accommodate the 1 in 25 year storm event.

The design has included an open channel rather than a closed tile. This will maintain the general overall drainage patterns in the area and maintain a surface flow route thorough the regulated area. The backslopes in earth cuts will be to 3H:1V to help minimize bank erosion.

The drain's alignment includes a section of land that is regulated by the Lake Simcoe Regional Conservation Authority. Prior to submitting the report a meeting was held with the Lake Simcoe Regional Conservation Authority to review the design to ensure a permit would be provided by the Lake Simcoe Regional Conservation Authority. At the request of the Lake Simcoe Regional Conservation Authority the working areas were added to the overall plan. Standard erosion and sediment control measures have been implemented into the design. The Lake Simcoe Regional Conservation Authority has confirmed a permit will be issued once the Court of Revisions appeal period has ended and if applicable, when the Tribunal appeal period has ended.

Estimate of Cost

It is recommended that the work be carried out in accordance with the accompanying Specification of Work and Profile that forms part of this Report. There has been prepared an Estimate of Cost in the amount of $271,850, including engineering of the report, attending the Meeting to Consider the Report, attending the Court of Revision, preparing a tender document for distribution by the City of Kawartha Lakes and an allowance for inspection. Appearances before appeal bodies have not been included in this cost estimate.

A plan has been prepared showing the location of the work and the approximate drainage area. A profile is included 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 work and therefore liable for the cost thereof will be prepared as per the Drainage Act. Also, 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 plant that may be necessitated by the construction or maintenance of the drainage works. Items to be assessed under Section 26 shall be the actual cost plus a portion of the engineering (25% of the cost).

The cost of any approvals, permits or any extra work, beyond that specified in this report that is required by any utility, conservation authority, government ministry or organization (federal or provincial), 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 in the following manner:

1. The costs of the Glenarm Road road crossing have generally been assessed with 95% of the costs assessed to the Road Authority and the remainder assessed as an outlet assessment on upstream lands based on equivalent hectares.
2. The costs of the Prospect Road road crossing have generally been assessed with 73% of the costs assessed to the Road Authority and the remainder assessed as an outlet assessment on upstream lands based on equivalent hectares.
3. The Landowner of the W1/2 of L10, Concession 5 has agreed to compensation in lieu of an access culvert. 50% of the estimated cost of the access culvert has been assessed as an outlet assessment on upstream lands based on equivalent hectares.
4. The remaining cost of the drainage works have been assessed with approx. 60% 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

It is recommended that application for subsidy be made for eligible agricultural properties. Any assessments against non-agricultural properties are shown separately in the Schedule of Assessment.

Access and Working Area

Access to the worksite and the working area shall generally be from Glenarm Road, Prospect Road and along the drainage works.

The working area between station 0+150 and Prospect Road shall be from the north side of the existing channel and shall extend 20 metres from the top of bank with a 2 m wide strip on the southerly side.

The working area between Prospect Road and Glenarm Road shall be from the east side of the proposed channel and the south side of the existing and shall extend 30 metres east or south from the top of bank with a 2 m wide strip on the northerly and westerly sides.

Allowances

Under Section 29 of the Drainage Act, the Engineer in the report shall estimate and allow in money to the Owner of any land that it is necessary to use for the construction or improvement of a drainage works or for the disposal of material removed from drainage works. This shall be considered an allowance for right-of-way.

Under Section 30 of the Drainage Act, the Engineer shall determine the amount to be paid to persons entitled thereto 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. Section 30 allowances for drain replacement will be paid at the crop rate regardless of the land use.

Under Section 33 of the Drainage Act, the Engineer can provide and allowance for loss of access to an Owner instead of providing for the construction of an access.

Allowances for right-of-way are based on a land value of $12,350.00 per hectare. Allowances for crop loss are based on $1,500.00 per hectare for the first year and $750.00 for the second year (total $2,250.00 per hectare). Allowances for loss of access are $5,280.00 and are based on 50% of the cost of the required access.

Restrictions

No trees may be planted within the working area. If trees must be removed because they interfere with the drainage work or with access or other maintenance activities, they shall be removed at the expense of the Landowner. Permanent structures are not to be erected within 10 metres of either side of the drainage works.

Attention is also drawn to Sections 80 and 82 of the Drainage Act, which refer to the removal of obstructions in a drain and damage caused to a drain.

Existing Private Drainage

All existing subsurface drainage encountered during the construction of the proposed drains shall be reconnected to the proposed open channel.

Maintenance

Upon completion of the work, the drainage works shall be maintained as per the Schedule of Maintenance unless otherwise altered under provisions of the Drainage Act or as outlined below.

- The costs of the Glenarm Road road crossing shall be maintained with 95% of the costs assessed to the Road Authority and the remainder assessed as an outlet assessment on upstream lands based on equivalent hectares.
- The costs of the Prospect Road road crossing shall be maintained with 73% of the costs assessed to the Road Authority and the remainder assessed as an outlet assessment on upstream lands based on equivalent hectares.
- The channel shall be maintained as per the specifications and to the depths and grades as shown on the drawings contained in this Engineers Report.

All of the above is submitted for your consideration.

Yours truly,

Michael Gerrits, P. Eng.
R. Dobbin Engineering Inc.

City of Kawartha Lakes
Webster Drain
June 3, 2019

ALLOWANCES

Allowances have been made as per Sections 29, 30 & 33 of the Drainage Act for damages to lands and crops and loss of access.

Conc.	Lot or part	Roll No.	Owner	Section 29	Section 30	Section 33	Total
4	N 1/2 Lot 9	10-161	R. Graves	3,800	690	-	4,490
	S 1/2 Lot 10	10-162-10	C. Jackson	4,450	810	-	5,260
5	W 1/2 Lot 10	10-200	E. Wechsel	20,400	3,720	5,280	29,400
	Pt Lot 11	10-206	Victor Webster Farms Ltd.	-	200	-	200
			TOTAL ALLOWANCES	$ 28,650	$ 5,420	$ 5,280	$ 39,350

Estimate of Cost

	Quantity	Unit	Material	Labour	
Allowances:					39,350
Brushing	0.11	Ha	-	1,120	1,120
Excavation of Drain	3036	cu.m	-	22,770	22,770
Levelling of Excavated Material	1120	m	-	5,600	5,600
Rock Excavation c/w Shatter & Vibration Monitoring	649	cu.m	-	63,300	63,300
Prospect Road					
Remove Existing 600ø & 900mmø CSPs	2	ea	-	960	
1600mmø CSP (Open Cut)	18	m	7,620	1,600	
Bedding Material	74	t	1,480	640	
Granular "B"	82	t	820	640	
Place Backfill	60	t	-	640	
Granular "A"	30	t	600	320	
Rip Rap Culvert Inlet and Outlet	30	sq.m	1,500	1,500	
Fence Removal and Reconstrction	40	m	200	960	
Traffic Control	1	LS	450	400	
Restoration	1	LS	600	500	
			13,270	8,160	21,430
Glenarm Road					
Remove Existing 600mmø CSP	1	ea	-	640	
1400mmø CSP (Open Cut)	26	m	9,210	2,240	
Bedding Material	100	t	2,000	960	
Granular "B"	154	t	1,540	1,280	
Place Backfill	150	t	-	640	
Granular "A"	42	t	840	480	
Rip Rap Endwall	45	sq.m	2,250	2,250	
Traffic Control	1	LS	600	1,200	
90 mm Asphalt (50mm HL8 & 40 mm HL4)	80	sq.m	2,400	720	
Fence Removal and Reconstrction	20	m	100	480	
Restoration	1	LS	600	500	
			19,540	11,390	30,930
Silt Fence	1	ea	250	-	250
Miscellaneous					13,610
				Sub Total	198,360
				Engineering	48,740
				Tendering	2,500
				Conservation Review Fee	470
				Inspection Allowance (Estimate)	21,780
				Total Estimate	**$271,850**

SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total	Equivalent Ha.
Agricultural Land									
4	N 1/2 Lot 9	2.0	10-161	R. Graves	-	7,590	262	7,852	2.0
	S 1/2 Lot 10	5.7	10-162-10	C. Jackson	-	5,675	1,482	7,157	5.7
	Pt N 1/2 Lot 10	1.6	10-163	D. Brown	-	-	941	941	1.6
5	W 1/2 Lot 10	44.3	10-200	E. Wechsel	-	57,314	28,462	85,776	44.3
	Pt E 1/2 Lot 10	28.8	10-204	T. Bottan	-	-	19,073	19,073	28.8
	Pt Lot 11	53.6	10-206	Victor Webster Farms Ltd.	-	5,675	44,370	50,044	53.6
	Pt Lot 12	3.5	10-207	S. Panu	-	-	2,887	2,887	3.5
					-	76,253	97,477	173,730	
				Total Special Benefit	-				
				Total Benefit	76,253				
				Total Outlet	97,477				
				Total - Agricultural	173,730				
Non-Agricultural Lands									
4	Pt N 1/2 Lot 10	0.4	10-163-01	J. McFeeters	-	-	232	232	0.4
	Pt. Lot 11	0.5	10-206-01	T. Bottan	-	-	608	608	0.7
	Pt. Lot 12	0.4	10-207-01	L. Swailes	-	-	678	678	0.8
6	Pt. Lot 11	0.2	20-023	W. Allison	-	-	364	364	0.4
	Pt. Lot 11	0.3	20-023-10	S. Charles	-	-	414	414	0.5
	Pt Lot 11	0.7	20-028	CSI GP Glenarm Ltd.	-	-	579	579	0.7
					-	-	2,876	2,876	
				Total Special Benefit	-				
				Total Benefit	-				
				Total Outlet	2,876				
				Total - Non-Agricultural	2,876				

SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total	Equivalent Ha.
Public Lands									
5	Pt E 1/2 Lot 10	1.2	10-204-01	City of Kawartha Lakes	-	-	2,623	2,623	3.6
Prospect Road		1.8		City of Kawartha Lakes	28,436	-	1,047	29,482	5.4
Glenarm Road		4.6		City of Kawartha Lakes	45,714	-	14,348	60,062	18.2
Sandringham Road		1.2		City of Kawartha Lakes	-	-	3,078	3,078	3.7
					74,150	-	21,095	95,245	
				Total Special Benefit	74,150				
				Total Benefit	-				
				Total Outlet	21,095				
				Total - Public Lands	95,245				
				Total - Public Lands	95,245				
				Total Non-Agricultural Lands	2,876				
				Total Agricultural Lands	173,730				
				Total Assessment	$ 271,850				

NOTE NET ASSESSMENTS = TOTAL ASSESSMENT LESS AVAILABLE GRANTS LESS ALLOWNACES

SCHEDULE OF MAINTENANCE

For Maintenance of the open channel portion of the drain from Station 0+150 to Station 1+302.
Road crossings will be maintained as per the Engineers Report.

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha.
Agricultural Land								
4	N 1/2 Lot 9	2.0	10-161	R. Graves	332	1	333	2.0
4	S 1/2 Lot 10	5.7	10-162-10	C. Jackson	255	27	282	5.7
	Pt N 1/2 Lot 10	1.6	10-163	D. Brown	-	11	11	1.6
5	W 1/2 Lot 10	44.3	10-200	E. Wechsel	2,484	300	2,784	44.3
	Pt E 1/2 Lot 10	28.8	10-204	T. Bottan	-	303	303	28.8
	Pt Lot 11	53.6	10-206	Victor Webster Farms Ltd.	255	1,170	1,425	53.6
	Pt Lot 12	3.5	10-207	S. Panu	-	76	76	3.5
					3,326	1,889	5,215	
			Total Benefit		3,326			
			Total Outlet		1,889			
			Total - Agricultural		5,215			
Non-Agricultural Lands								
4	Pt N 1/2 Lot 10	0.4	10-163-01	J. McFeeters	-	3	3	0.4
	Pt. Lot 11	0.5	10-206-01	T. Bottan	-	16	16	0.7
	Pt. Lot 12	0.4	10-207-01	L. Swailes	-	18	18	0.8
6	Pt. Lot 11	0.2	20-023	W. Allison	-	10	10	0.4
	Pt. Lot 11	0.3	20-023-10	S. Charles	-	11	11	0.5
	Pt Lot 11	0.7	20-028	CSI GP Glenarm Ltd.	-	15	15	0.7
					-	72	72	
			Total Benefit		-			
			Total Outlet		72			
			Total - Non-Agricultural		72			

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha.
Public Lands								
5	Pt E 1/2 Lot 10	1.2	10-204-01	City of Kawartha Lakes	-	79	79	3.6
Prospect Road		1.8		City of Kawartha Lakes	-	14	14	5.4
Glenarm Road		4.6		City of Kawartha Lakes	-	398	398	18.2
Sandringham Road		1.2		City of Kawartha Lakes	-	81	81	3.7
					-	573	573	

Total Benefit	-
Total Outlet	573
Total - Public Lands	573
Total - Public Lands	573
Total Non-Agricultural Lands	72
Total Agricultural Lands	5,215
Total Assessment	$ 5,860

Webster Drain
City of Kawartha Lakes
June 3, 2019

SPECIFICATION OF WORK

1. Scope of Work

The work to be included in this specification includes the deepening of an existing channel and the excavation of a new channel to be incorporated as the Webster Drain from the Part of L9, Concession 4, through the S1/2 of L10, Concession 4, through the W1/2 of L10, Concession 5 to its top end at the S Pt of L11, Concession 5 in the City of Kawartha Lakes.

2. General

Each tenderer must inspect the site prior to submitting their tender and satisfy themselves by personal examination as to the local conditions that may be encountered during this project. The Contractor shall make allowance in their tender for any difficulties which he may encounter. 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.

Measurement for Payment Clauses has not been included in these specifications and will be 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 pricing the project.

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 to the 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.

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

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 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 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.

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. Benchmarks

The benchmarks are based on geodetic elevations. Elevations are available at the locations shown on the drawings. Where these elevations are on existing structures to be replaced, they shall be transferred by the Contractor prior to the removal of the culvert.

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.

7. Access and Working Area

Access to the worksite and the working area shall generally be from Glenarm Road, Prospect Road and along the drainage works.

The working area between station 0+150 and Prospect Road shall be from the north side of the existing channel and shall extend 20 metres from the top of bank with a 2 m wide strip on the southerly side.

The working area between Prospect Road and Glenarm Road shall be from the east side of the proposed channel and the south side of the existing and shall extend 30 metres east or south from the top of bank with a 2 m wide strip on the northerly and westerly sides.

8. Removal of Existing Culverts

The existing road culverts shall be removed in their entirety. The steel culvert 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 culvert.

9. Brushing and Tree Removal

All brush, trees, woody vegetation, etc. shall be removed from the working area/allowance of the drain. Other brush and trees may be removed from the side the equipment is operating to allow access for the equipment. Trees and brush shall be removed in their entirety including stumps and piled and burnt by the Contractor. Trees and brush on the side slopes shall be close cut. A stump killer pesticide manufactured for the purpose shall be applied to stumps according to manufacturer's specifications.

Brush can be cut with a chainsaw. A mechanical tree shear mower can be used on brush smaller than 35 mm in diameter. The Contractor shall be responsible for obtaining all necessary burning permits.

Certain trees may be left in place at the direction of the Drainage Superintendent. Any trees to be salvaged by the individual landowners shall be removed by the landowners with all resulting brush and branches cleaned up prior to the start of construction. If the Contractor agrees to remove any trees and set them aside for a landowner, the landowner will be responsible for any cleanup as above.

10. Excavation of Channel

The proposed channel shall have a 1.0 m wide bottom and a minimum of 3:1 side slopes. In areas where there is exposed rock the side slopes can be increased to 1:1. The existing topsoil in the area of the excavation shall be stripped and stockpiled within the working area. The centre of the channel shall be in the same location as the existing channel.

The side slopes of the new channel shall be seeded as soon as the final grading is completed. The channel shall be excavated to the proper depth using a laser or similar approved device with a labourer onsite to ensure correctness of grade and to confirm location of tile ends.

Any spoils shall be levelled within the working area. Spoils shall be placed a minimum 1.5m back from the top of the bank. The excavated material shall be placed and levelled to a maximum depth of two hundred millimetres (200 mm) and shall not impede overland drainage or cultivation of the land using farm machinery. If the spoils have sub-soil in them, the topsoil shall be windrowed along the edge of the working corridor prior to placing the sub-soil. After the excavated material has been levelled, the topsoil shall be spread to its original depth and left in a condition suitable for cultivation.

If Landowners request the spoils be disposed of outside the working area, a sign-off from the receiving property must be obtained. Costs associated with disposing of spoils outside the working area are the responsibility of the contactor. No additional payment will be made for disposing of spoils outside the working area.

Restoration shall be in accordance with the restoration specification.

11. Rock Excavation (Provisional)

Rock excavation may be required to complete the open channel and culvert installations. If the Contractor chooses to drill and blast rock within the project limits the Contractor will be required to adhere to the monitoring and vibration control portion of this specification. **The monitoring and vibration control portion of this specification does not apply to rock excavation with a hammer or excavator.** The items described are to be carried out to the provisions of OPSS 120 – General Specification For the Use of Explosives and OPSS 206 - Construction Specification for Grading.

Excavated rock shall be used to fill in the side slopes throughout the open channel as directed by the Drainage Superintendent or otherwise disposed offsite at the Contractors expense.

A slight grade change of up to 0.15 m may be permitted if the rock grade is within the excavated area. However all grade raises must be approved in writing by the Engineer prior to any grade changes. Standing water within the channel is not permitted.

The Contractor will only be permitted to blast between 8:00 am and 6:00 pm.

The following utilities and agencies shall be notified at least 72 hours prior to blasting. Additional requirements as described in OPSS 120 shall be followed.

- City of Kawartha Lakes
- Hydro One
- Bell Canada

The Contractor, through the services of a Blasting Consultant, shall monitor the vibration levels at the closest building and/or service to the blast site during each blast. The monitoring equipment shall meet the requirements of the Pre-Condition Survey and Vibration Monitoring.

The Contract must also meet all conditions of the applicable utility companies.

The following will apply when excessive vibration readings are measured:

Should any two (2) consecutive readings fall between 50 and 80 mm/s PPV, the Blasting Contractor shall cease all further blast hole loading other than those required for a 'third' reading. Should this third reading be below 50 mm/s PPV, the loading of the blast holes may continue. Should the third reading be in excess of 50 mm/s PPV, the Blasting Contractor shall cease all blasting in the area and move to a new area and continue blasting. The Blasting Contractor shall then submit a revised loading pattern as approved by the Blasting Consultant to the Contract Administrator for the area where blasting was discontinued.

Should any one (1) reading be in excess of 80 mm/s PPV, the Blasting Contractor shall cease all further blast hole loading other than those required for one subsequent reading. Should this reading fall below 50 mm/s PPV, blasting may continue. Should this reading be in excess of 50 mm/s PPV, the Blasting Contractor shall cease all blasting in the area and move to a new area and continue blasting. The Blasting Contractor shall then submit a revised loading pattern as approved by the Blasting Consultant to the Contract Administrator for the area where blasting was discontinued.

After blasting, the Blasting Contractor must perform a site condition survey of buildings and services to determine if any damage has resulted upon completion of blasting or immediately

following the receipt of a complaint. Any damage must be reported in writing immediately to the Contract Administrator.

A blast report summarizing the results of the vibration and air blast levels shall be submitted to the Contract Administrator at the end of each work day in which blasting is carried out. Copies of the seismic records shall be made available if requested.

12. Installation of Road Crossings

The Contractor shall supply, install, and backfill aluminized corrugated steel pipe with a minimum wall thickness of 2.8 mm in all cases. All corrugation profiles shall be of helical lockseam manufacture using 68 x 13 mm corrugations for 1600 mm dia. pipe and smaller and 125 x 25 mm corrugations for 1800 mm dia. pipe and larger. Pipe with 125 x 25 mm corrugations shall be used if 68 x 13 mm corrugations are not available. Future culvert replacements shall be to the same specifications.

The proposed culverts shall be installed in the same general location as the existing culverts. The location of the culvert may be moved a short distance if approved by the Engineer or Drainage Superintendent in writing.

The bottom of the excavation for both the culvert and tile shall be excavated to the required depth with any over excavation backfilled with granular material or 19mm clear stone. When the culvert has been installed to the proper grade and depth, the excavation shall be backfilled with granular or 19mm 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 300 mm so that the pipe is not displaced. Within the road allowance the pipe and culvert shall be backfilled from the springline to finished grade with compacted granular “B” material within 150 mm of finished grade. Granular B material shall be mechanically compacted to 98% modified standard proctor density. Outside the road allowance excavated material can be used. The top 150 mm of Granular “A” material shall be mechanically compacted to 100% modified standard proctor density. Payment for additional material shall be at the unit price specified in the Contract documents. Asphalt shall be HL4 and have a minimum thickness of 50 mm and shall match the existing road.

It is the Contractors responsibility to locate and expose any utilities prior to the installation of any culvert or tile. If there is a conflict with the tile elevation, the Contractor is required to notify the Engineer.

Rip rap ends are to be used with 1.5:1 side slopes. The rip rap shall consist of 100 mm x 250 mm quarry stone or approved equal. The area to receive the rip rap shall be graded to a depth of 400 mm below finished grade. Filter fabric (Terrafix 270R or approved equal) shall then

be placed with any joints overlapped a minimum 600 mm. The quarry stone shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

If concrete blocks are used, the culvert shall be shortened to accommodate the difference in length. The concrete blocks shall have dimensions of approx. 600 mm x 600 mm x 1200 mm, 600 mm x 600 mm x 2400 mm or 300 mm x 600 mm x 1200 mm as required. The top of the culvert shall govern block elevation. The correct block shall be set with the top of the block equal to the top of the culvert. The blocks shall be set at each end of the culvert so that each row of blocks will be offset approx. 100 mm from the row below. The bottom row shall consist of one block placed parallel to the culvert. The blocks shall be imbedded a minimum of 300 mm into each bank and shall extend into the drain bottom to match the pipe invert or below.

The blocks shall be placed over a layer of filter fabric (Terrafix 270R or approved equal). The culvert shall be backfilled in conjunction with the placement of the blocks. The gaps between the culvert and the blocks shall be filled with concrete cinder blocks/bricks and mortar to give the endwall a finished appearance.

Restoration shall occur in accordance with Specification 16.

13. Subsurface Drainage

The landowners are responsible to mark all tile outlets entering the drain. The landowner is responsible for all costs to maintain private tile outlets. Any washouts along the channel banks caused by surface or subsurface water entering the channel through private facilities shall be repaired at the direction of the Drainage Superintendent with the costs assessed to the benefiting landowner.

Tile ends shall be repaired with equivalent sized non perforated HDPE agricultural tubing with a manufactured coupling and rodent grate. In the case of concrete or clay tile, the tile end shall be excavated into the bank a minimum of 3 metres. Any washouts from surface water or at tile ends shall be repaired with rip rap (100 mm x 250 mm quarry stone or gabion stone) and filter fabric (Terrafix 270R or approved equal).

The area to receive rip rap shall be graded to a minimum depth of 300 mm. If the washout is greater than 300 mm then excavated or fill material shall be placed to sub-grade. The filter fabric shall then be placed with any joints overlapped a minimum of 600 mm. The rip rap shall then be placed to a depth of 300 mm and 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 placed to allow any surface water directed to this area to be allowed to enter the channel over the rip rap. The rip

rap shall generally be keyed to a depth of 600 mm at the top of the bank. Any native material that has washed into the channel shall be removed and spread on the adjacent property.

There are no known sub-surface drains entering the channel.

14. Outlet Works

When light duty silt fencing has been specified it shall be constructed immediately downstream of any outlet works for the duration of construction.

The light duty silt fencing shall be supplied and installed 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. Fencing

The Contractor shall remove any cross fences necessary to carry out construction operations. Upon completion of the work, the fences shall be reconstructed using existing materials.

16. Restoration

Road restoration shall be in accordance with the following:

- Excavation in accordance with OPSS 206.
- Compaction in accordance with OPSS 501 (Prov.).
- 150 mm of Granular 'A' and 300 mm of Granular 'B'. Granular in accordance with OPSS 1010.
- Disturbed areas within the road right-of-way shall be restored in accordance with the contract drawings and include roadside ditching, 100 mm of native topsoil and seed. Topsoil in accordance with OPSS 802. Seed in accordance with OPSS 804.

Seeding Application rates are as follows:

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

17. Environmental Considerations

The Contractor shall take care to 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 and all surface water runs and open inlets that enter the drain.

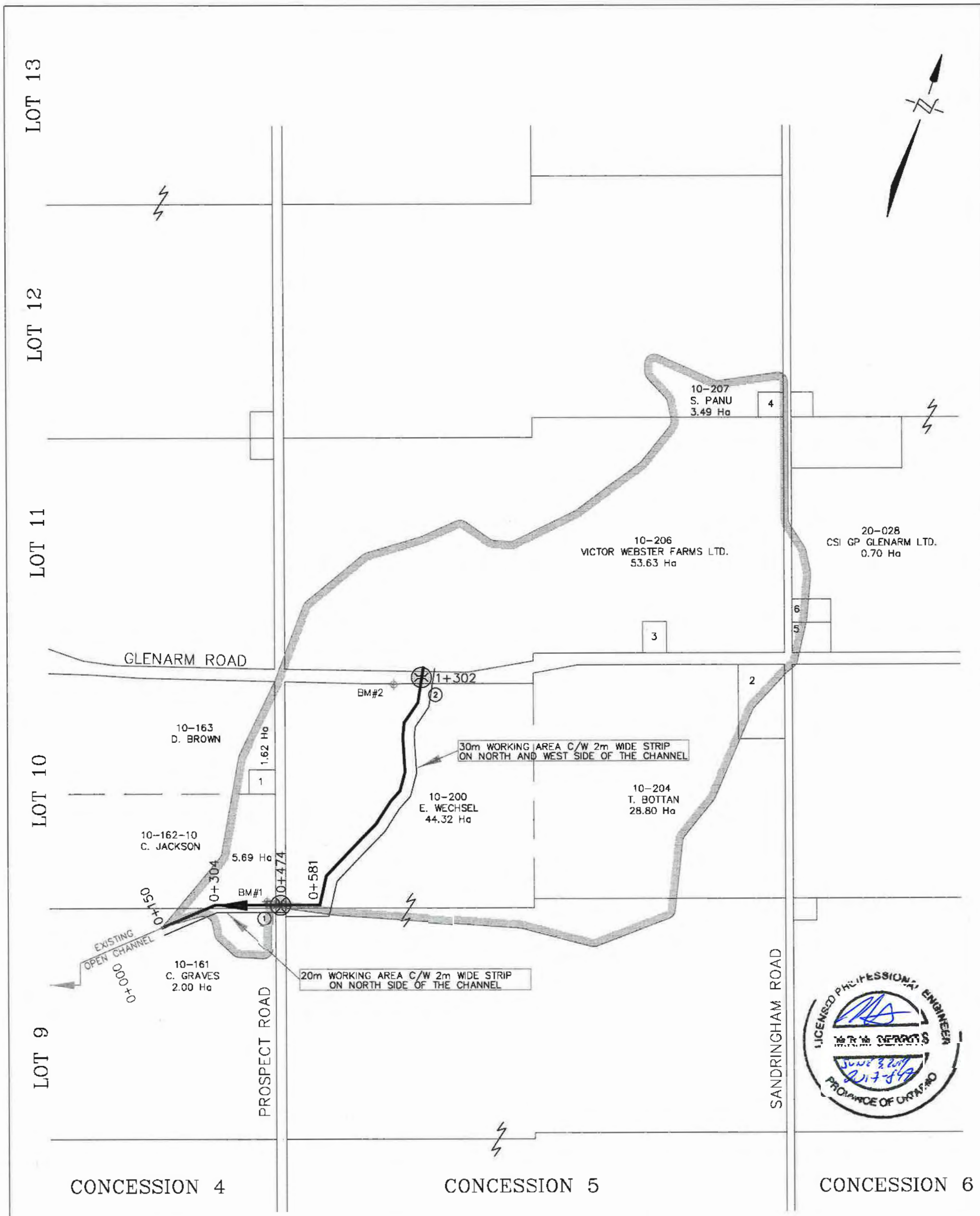
- The Contractor shall install a silt fence downstream of the work area. The silt fence shall consist of filter fabric or manufactured silt fence supported with posts. The silt fence shall be removed once all construction is completed.

- The Contractor shall maintain a dry working area during construction.

- All construction in the channel shall be carried out during periods of low flow.

18. Miscellaneous

When crossing utilities the Contractor is responsible to co-ordinate construction with the affected companies and complete construction in accordance with the affected company requirements.



LICENSED PROFESSIONAL ENGINEER
M. GERRITS
JUNE 3, 2019
PROVINCE OF ONTARIO

LEGEND

- EXISTING CULVERT
- (2) CULVERT LOCATION
- EXISTING CULVERT TO BE REPLACED
- WEBSTER DRAIN
- DRAIN
- DRAINAGE AREA

OWNER INDEX NUMBER

1. 10-163-01 J. McFEETERS 0.40 Ha
2. 10-204-01 CITY OF KAWARTHA LAKES 1.21 Ha
3. 10-206-01 T. BOTTAN 0.49 Ha
4. 10-207-01 L. SWAILES 0.41 Ha
5. 20-023 W. ALLISON 0.22 Ha
6. 20-023-10 S. CHARLES 0.25 Ha

Dobbin Engineering Inc.
4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME: Webster Drain Plan

PROJECT No. 2017-847

APPROVED M. GERRITS

CHECKED B. VAN RUITENBERG

DRAWN J. WARNER

SCALE: 1:10,000
0 100 200 300m

NO.	REVISIONS	DATE	BY
2	FINAL REPORT	JUNE 3, 2019	MG
1	FOR CA APPROVAL	JAN. 18, 2019	JW

CITY of KAWARTHA LAKES

WEBSTER DRAIN
PLAN

GENERAL NOTES

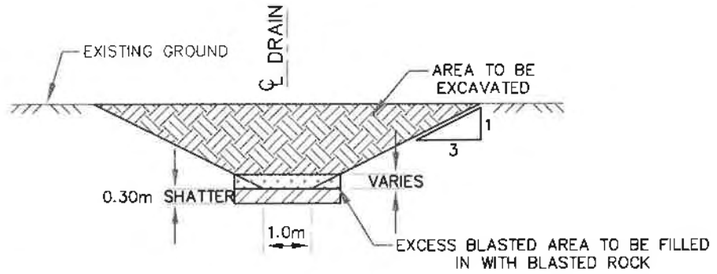
1. BENCHMARK No.1 ELEV. 286.07
   TOP WEST END OF EXISTING 900mmø
   CSP, STATION 0+474

2. UPPER NUMBERS ARE DEPTH FROM GROUND/
   TOP OF BANK TO BOTTOM OF NEW CHANNEL.

DRAIN EXCAVATION

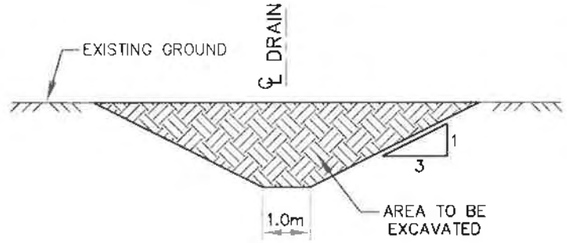
ROCK BLASTING

ROCK SHATTER



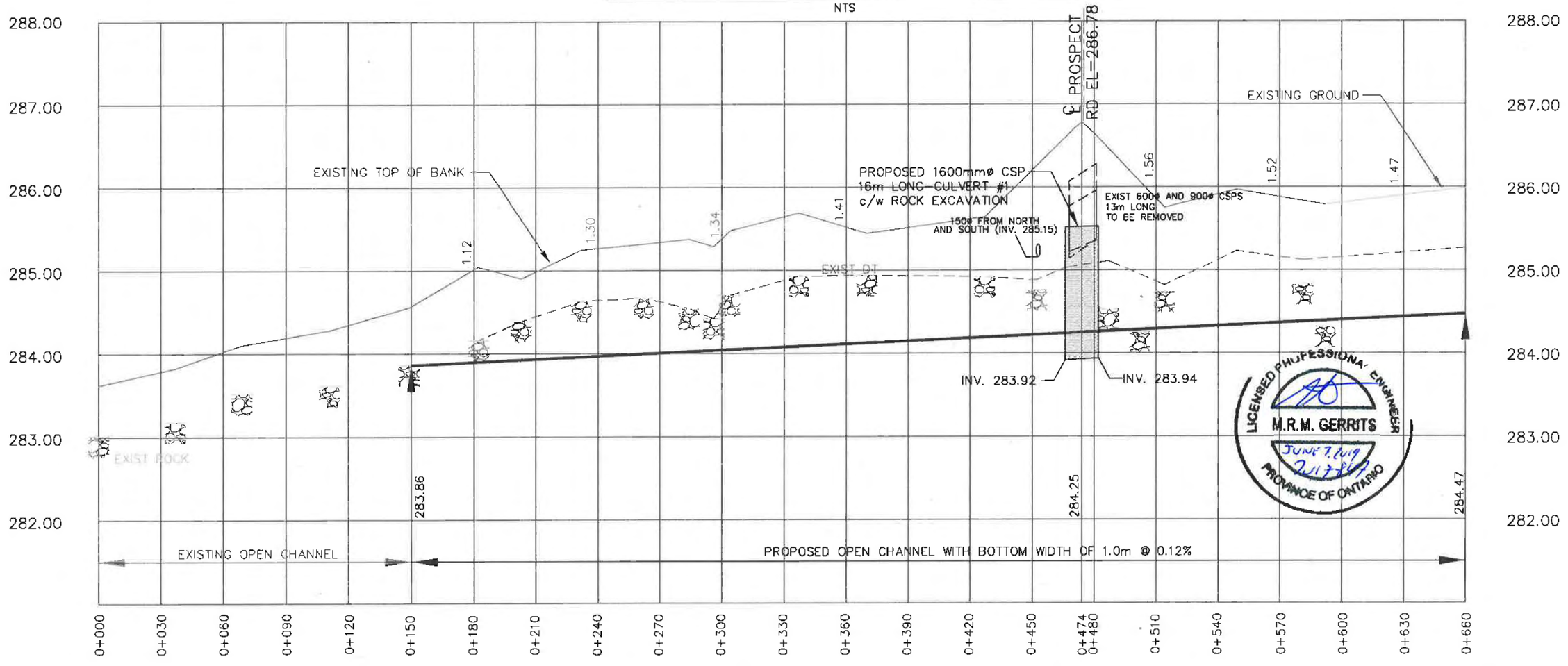
TYPICAL DRAIN CROSS SECTION IN EARTH AND ROCK

NTS



TYPICAL DRAIN CROSS SECTION IN EARTH

NTS



LICENSED PROFESSIONAL ENGINEER
M.R.M. GERRITS
JUNE 7, 2019
PROVINCE OF ONTARIO

Dobbin Engineering Inc.

4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
Webster Drain Profile 1

PROJECT No.
2017-847

APPROVED	NO.	REVISIONS	DATE	BY
M. GERRITS				
	2	FINAL REPORT	JUNE 3, 2019	MG
CHECKED	1	FOR CA APPROVAL	JAN. 18, 2019	JW
B. VAN RUITENBURG				
DRAWN				
J. WARNER				

SCALE: 1:2,000
0 20 40 60m

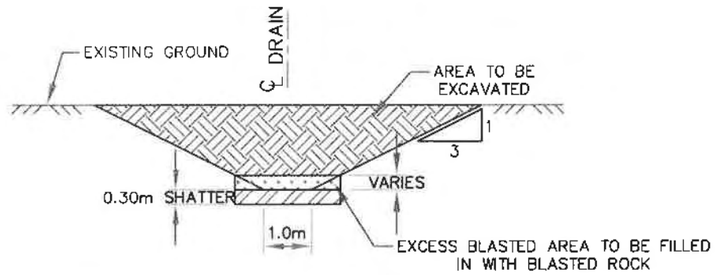
CITY of KAWARTHA LAKES

WEBSTER DRAIN
PROFILE

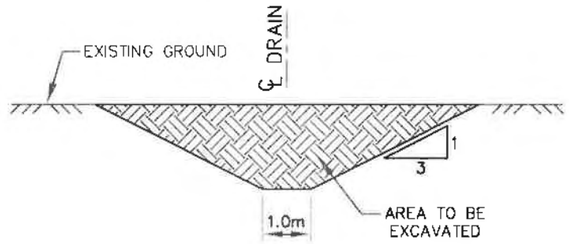
GENERAL NOTES

1. BENCHMARK No.2 ELEV. 287.57
   TOP OF NAIL ON HYDRO POLE ON THE SOUTH SIDE OF GLENARM ROAD APPROXIMATELY 75m WEST OF PROPOSED DRAINAGE WORKS (STA. 1+291)
2. UPPER NUMBERS ARE DEPTH FROM GROUND TO BOTTOM OF NEW CHANNEL.

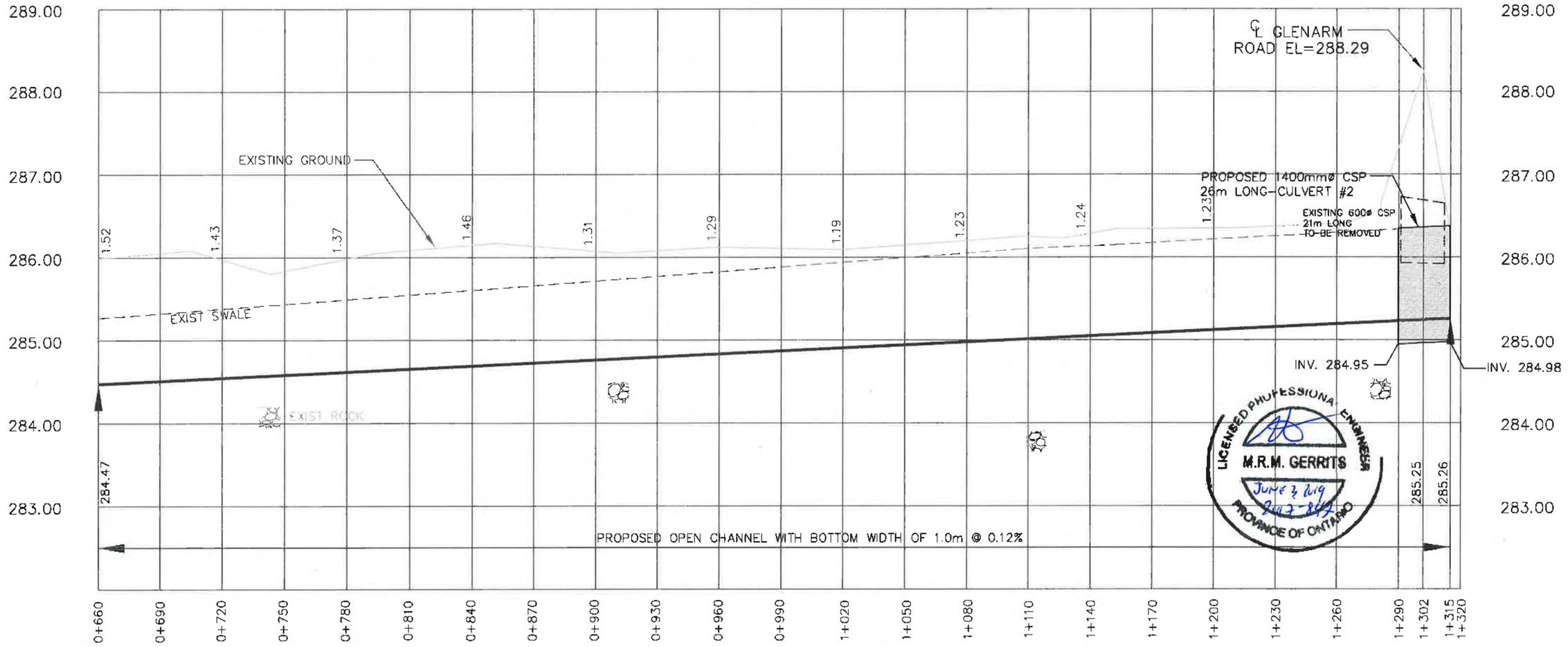
DRAIN EXCAVATION
ROCK BLASTING
ROCK SHATTER



TYPICAL DRAIN CROSS SECTION IN EARTH AND ROCK
NTS



TYPICAL DRAIN CROSS SECTION IN EARTH
NTS



LICENSED PROFESSIONAL ENGINEERS
M.R.M. GERRITS
JUNE 3, 2019
PROVINCE OF ONTARIO

Dobbin Engineering Inc.
4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

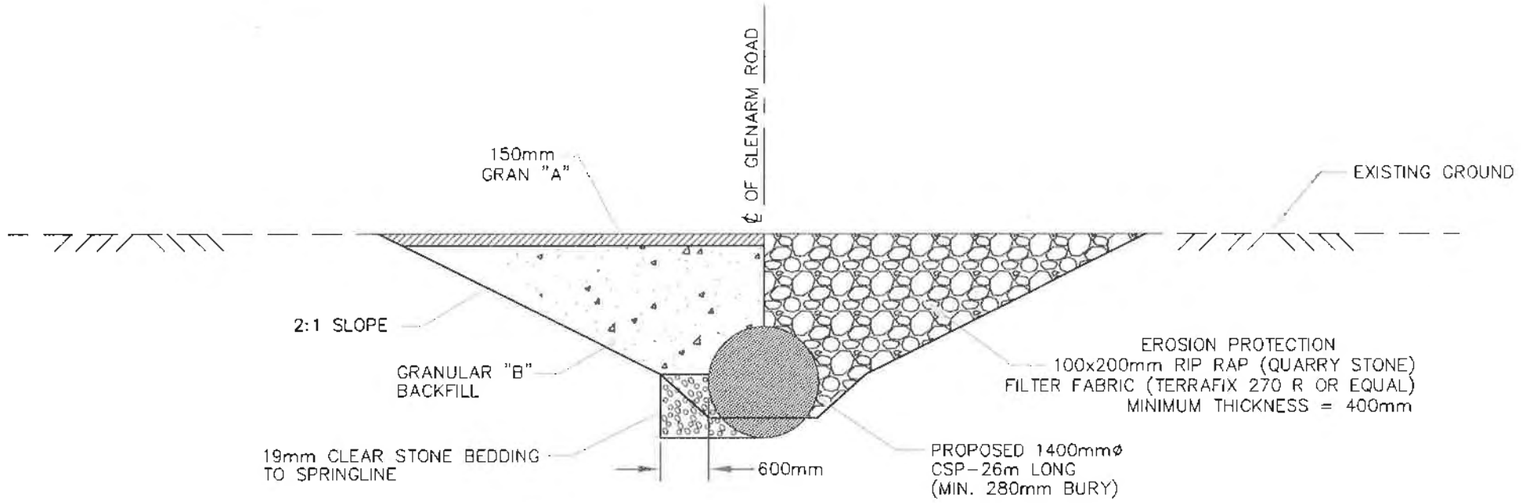
DRAWING NAME: Webster Drain Profile 2
PROJECT No. 2017-847

APPROVED	NO.	REVISIONS	DATE	BY
M. GERRITS				
	2	FINAL REPORT	JUNE 3, 2019	MG
CHECKED	1	FOR CA APPROVAL	JAN. 18, 2019	JW
B. VAN RUITENBURG				
DRAWN				
J. WARNER				

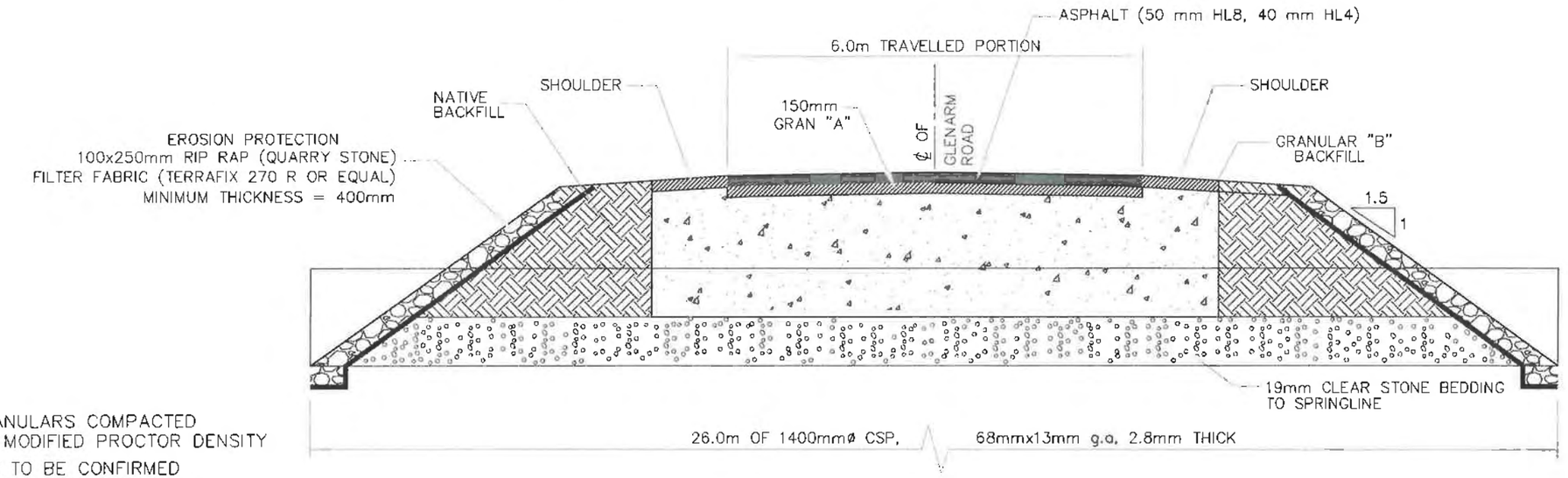
SCALE: 1:2,000
0 20 40 60m

CITY of KAWARTHA LAKES

WEBSTER DRAIN
PROFILE



PROPOSED PIPE END SECTION
CULVERT #2
(NON TRAVELLED PORTION)



NOTE:
1. ALL GRANULARS COMPACTED TO 98% MODIFIED PROCTOR DENSITY
2. INVERTS TO BE CONFIRMED AT TIME OF CONSTRUCTION
3. CULVERT #1 DOES NOT REQUIRE ASPHALT LIFT.

PROPOSED CROSS-SECTION
CULVERT #2

LICENCED PROFESSIONAL ENGINEER
M.R.M. GERRITS
JUNE 3, 2019
2017-847
PROVINCE OF ONTARIO

Dobbin Engineering Inc.
4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME: Webster Drain Culvert Detail

PROJECT No. 2017-847

APPROVED	NO.	REVISIONS	DATE	BY
R. DOBBIN				
	2	FINAL REPORT	MAY 8, 2019	MG
CHECKED	1	FOR CA APPROVAL	JAN. 18, 2019	JW
B. VAN RUITENBURG	SCALE 1:75			
DRAWN	0 2m			
J. WARNER				

CITY of KAWARTHA LAKES
WEBSTER DRAIN
ROAD CULVERT DETAIL