

February 16, 2022

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

Re: Martin Drain

In accordance with your instructions, I have undertaken an examination of the drainage works in Part of Lot 19 and 20, Concession 12, in the City of Kawartha Lakes.

The work includes the following:

- Prepare a Drain Report to address the petition.

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

Existing Conditions

The existing drainage system in the area consists of a surface course that directs flows from a pond in the SE ¼ of Lot 19, Concession 12 (petitioning landowner lands) to Pigeon Lake. The surface course is conveyed across the Pigeon Lake Road allowance via three centreline culverts. One of the centreline culverts has reverse grade. At the time of the survey, the roadside ditch on the north side of Pigeon Lake Road, immediately upstream of the centreline culvert, was heavily vegetated and had an accumulation of sediment. The roadside ditch has since been cleaned out by the Road Authority. Although the Pigeon Lake Road ditch is not part of the proposed drain, it is located downstream of the drain's outlet. M. Gerrits Consulting informed the City of Kawartha Lakes that during high flows, water from the surface course may erode the Pigeon Lake Road embankment and that the City of Kawartha Lakes rip rap the Pigeon Lake Road ditch, to prevent erosion of the road embankment.

In 1985 the Road Authority completed drainage modifications along Pigeon Lake Road and directed water, that normally flowed in a south east direction, east to the Martin's lands. M. Gerrits Consulting Inc. completed a preliminary hydraulic model of the culverts and determined that the centreline culvert can convey the 10-year design flow before the water surcharges onto the paved portion of the road.

Meetings

M. Gerrits Consulting Inc. had discussions with the petitioning landowner and the owner of the lands ending with the Area Roll Number (ARN) 6-025-01. The discussions focused on the difference between a private agreement drain, mutual agreement drain, and a petition drain.

An onsite meeting was held on August 18, 2021 at 1899 Pigeon Lake Road. The following attended the meeting:

Mike Farquhar – City of Kawartha Lakes

Richard Monaghan – City of Kawartha Lakes

Chris Porter – City of Kawartha Lakes

Mike Gerrits – M. Gerrits Consulting Inc.

D. Dilling – Landowner

C. Haney – Landowner

A. Martin – Landowner

N. Martin – Landowner

J. Pilkey – Landowner

P. Reid – Landowner

G. Salter – Landowner

M. Schipper – Landowner

C. Tanner – Landowner

S. Tanner – Landowner

M. Wilson – Landowner

- MG – Introduced Municipal Staff and informed landowners that the City of Kawartha Lakes retained M. Gerrits Consulting Inc. to complete a report under Section 4 of the Drainage Act.
- MG – Presented a brief overview of the Drainage Act and encouraged landowners who have questions about the Drainage Act or the project to please call him.
- MG – Explained that A. & N. Martin intend on tiling their land but do not have a sufficient outlet for their tile. Under Section 4, they have the right to petition for this outlet, and it is the Engineer's responsibility to design the outlet and assess the costs out in accordance with the Drainage Act.
- MG – Explained A. & N. Martin have requested to direct 5.4ha of subsurface drainage that normally flows north to Pigeon Lake, south to Pigeon Lake via the proposed drain and downstream surface course. The flows are limited to subsurface, and will increase channel flows by 0.0078 cu.m/s. The increase is considered minimal since A. & N. Martin intend on tiling the entire parcel of land. Typically, tiled land will result in improved drainage since the tiled land continually drains after rainfall events creating storage in the soils. An analysis of the effects the additional lands will have on the culvert will be sent to the City of Kawartha Lakes after this meeting.
- MG – Explained the intention of this meeting is to inform landowners of the request, review preliminary drawings with the affected landowners, confirm the watershed boundary, and answer questions on the Drainage Act.
- MG – Informed landowners a Meeting to Consider the Report will be held and landowners can formally ask questions at this meeting with respect to the design.
- MG – Informed landowners a Court of Revision will be held where landowners can appeal their costs.
- MG – Informed landowners that there is a Tribunal where landowners can appeal the decision of the Court of Revision.
- MG – Opened the meeting to questions and concerns of all affected landowners. In general, the landowners voiced concerns over the effects the 1985 road improvements have had on the watershed. They felt these improvements directed more water to the land now owned by A. & N. Martin. The landowners felt the Engineer should review pump options, road ditch improvements and all other options to direct the water away from the natural low run on the Dilling/Reid lands. MG informed the landowners that pumps are expensive to construct and maintain and are typically used when a sufficient outlet by gravity cannot be designed. MG informed landowners that utilizing the Pigeon Lake Road ditch for an outlet would be difficult as the ditch is at a higher elevation than the low run to the north. The 1985 drawings indicated there was a Pigeon Lake Road centreline cross culvert west of the A. & N. Martin entrance and as such the water at this culvert historically flowed onto the lands owned by A. & N. Martin. Modifying the roadside ditch

will not address the petition as the A. & N. Martin have requested an outlet for the low point in their lands, which cannot naturally be directed to the road ditch. The existing channel on the Dilling/Reid lands is immediately east of the land owned by A. & N. Martin is a surface course located in the low point of the land. The existing channel does not have sufficient depth to provide the land owned by A. & N. Martin with an outlet for their tiles. Overall, the landowners voiced that they do not benefit from the drainage works and that the land owned by A. & N. Martin are the only lands benefiting from the drain. Multiple landowners expressed that the land owned by A. & N. Martin should be assessed for the entire project. MG informed the landowners that lands who utilize the drain for an outlet will be assessed for outlet and that the outlet assessments are based on equivalent areas.

- DD – Asked if the lands owned by A. & N. Martin are allowed to direct more water to the drain and why do downstream landowners have to take the extra water. MG informed DD that he would review the effects to see how much extra water will be directed to their ford crossing. MG will forward DD the calculations when they are completed. A letter addressing these concerns was sent to DD on September 8, 2021.
- DD – Voiced concerns over the meeting notices and timelines. DD mentioned she was not invited to the Drainage Board meeting where the petition was accepted. MF informed DD that the meeting notices were in accordance with the Drainage Act. The meeting where the petition was accepted is not a mandatory public meeting under the Drainage Act.
- DD – Requested the 1985 Pigeon Lake Road design drawings. MF informed DD she can request them through the City's clerk.
- GS – Explained that his land only utilizes the drain during spring run off, and therefore, he should be taken out of the drainage area. DS mentioned the water from his land was altered during the 1985 Pigeon Lake Road construction. MG collected additional topographic survey info with GPS and met with him after the meeting to discuss the drain.
- MW – Informed the preliminary drainage area identified on the sketch provided at the meeting is incorrect and asked MG to meet him onsite after the meeting. MG met with MW after the meeting and confirmed the drainage area using GPS.

Recommendations

It is therefore recommended that the following work be carried out:

- Prepare a new drain report to convey the flows generated on the lands owned by A. & N. Martin to a sufficient outlet complete with drain maintenance provisions.

Approvals

Kawartha Conservation is aware of the project and completed a site visit. Kawartha Conservation has no objection to the proposed works. Approval from Kawartha Conservation was obtained prior to submitting this report.

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 open channel will be designed to accommodate the 37.5mm/24hr drainage coefficient. Channel design criteria includes an assumed minimum tile depth of 760mm, plus the diameter of tile complete with 300mm of freeboard at the petitioning landowners property line. The design ensures a sufficient outlet for the petitioning landowners lands, regardless of any downstream obstructions.

A. & N. Martin have requested to direct 5.4ha of subsurface drainage that normally flows north to Pigeon Lake, south to Pigeon Lake via the proposed drain and downstream surface course. The flows are limited to subsurface, and will increase channel flows by 0.0078 cu.m/s. The increase is considered minimal since the A. & N. Martin intend on tiling the entire parcel of land. Typically, tile land will result in improved drainage since the tiled land continually drains. This creates storage in the soils. The change in water level in the downstream Pigeon Lake Road centreline culvert, due to the increased tile water, is estimated to be between 0.01m and 0.02m. The City of Kawartha Lakes has approved the request to direct the subsurface water to the proposed drain.

A. & N. Martin have requested an outlet for their lands. A. & N. Martin did not request the drain be extended across their lands to areas where the Pigeon Lake Road ditch outlets onto their lands, this will be done privately.

Estimate of Cost

It is recommended that the work be carried out in accordance with the accompanying Specification of Work and Profile, which forms a part of this Report. An Estimate of Cost has been prepared in the amount of \$55,565, 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)

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. In 1985 the Road Authority completed drainage modifications along Pigeon Lake Road and directed additional water to the proposed Martin Drain watershed. Prior to the 1985 ditch modifications, the surface water generated on lands ending with ARN 6-002, 6-003, 6-022, 6-022-01, 6-022-05 and 6-022-10 flowed in a south east direction to Pigeon Lake and did not drain onto the lands now owned by A. & N. Martin. Once the Road Authority modified the Pigeon Lake Road ditching, this water was redirected onto the lands now owned by A. & N. Martin. The work was completed by the Road Authority outside of the Drainage Act and as such there was no landowner input into the decision to route flows out of their natural watershed. When the Road Authority completed the improvements, it took on the liability for all redirected runoff; and as such are responsible for all costs associated with the redirected runoff including any necessary downstream channel improvements related to the extra flow.
2. The drainage works between Station 0+000 and Station 0+156 have been assessed as follows:
 - A connection benefit of 50% of the drain costs between Station 0+000 and Station 0+156 has been assessed to the lands ending with ARN 6-025-02.
 - A cut-off benefit (surface water) assessment of 5% of the drain costs between Station 0+000 and Station 0+156 has been assessed to the lands ending with ARN 6-025-01.
 - The costs associated with the extra depth of the channel on the lands owned by D. Dilling and P. Reid were assessed as a benefit assessment to the road authority. The

benefit assessment to the lands owned by A. & N. Martin and D. Dilling/P. Reid were adjusted to reflect the portion of costs assessed to the road authority for this additional depth.

- The remainder of the costs has been applied as an outlet assessment to all upstream lands and roads based on equivalent hectares.
3. The drainage works between Station 0+156 and Station 0+161 have been assessed with 100% of the costs assessed as an outlet assessment to all upstream lands and roads, based on equivalent hectares.
 4. The cost for the private tile outlet protection at Station 0-005 have been assessed with 100% of the costs assessed against the lands ending with ARN 6-025-02.

Agricultural Grant

It is recommended that the 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 working area shall be gained from the lands owned by A. & N. Martin (ARN 6-025-02) and will be along the private lane and shall be restricted to a width of 6m.

The excavated material shall be placed on the north side of the drain. The working area shall be on the same side of the drain on which the excavated material is disposed of. The working area is 20m and will be measured from the adjacent finished top of bank on the north side of the channel.

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 \$3,075 per hectare for access.

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 the 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 channel 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 channel are \$1,208.

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, access, or with other maintenance activities, they shall be removed at the expense of the Property Owner. Permanent structures are not to be erected within 20m of either side of the drainage works.

Maintenance

Upon completion of the work, the drainage works shall be maintained as per the Schedule of Assessment less any assessments for special benefits.

All of the above is submitted for your consideration.

Yours truly,


FEB 16 2012



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

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ALLOWANCES

Allowances have been made, as per Sections 29, 30 and 31 of the Drainage Act, for incorporating the existing channel, damages to lands and damages to crops including future maintenance operations.

Conc.	Lot or Part	Roll No.	Owner	Section 29 (\$)	Section 30 (\$)	Section 31 (\$)	Total (\$)
<u>Agricultural Lands</u>							
12	Pt Lot 20	6-025-01	D. Dilling & P. Reid	3,181	725	1,208	5,114
	Pt Lot 19	6-025-02	A. & N. Martin	240			240
				3,421	725	1,208	5,354

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ESTIMATE OF COST

	Quantity	Unit	Material	Labour	Total
Allowances					5,354
Complete Benchmark Loop and Verify Benchmarks	1	ea		150	150
Remove Page Wire Fence and Restore With New Wire (Station 0+005)	20	m		500	500
Remove and Dispose of Wooden Fence	1	l.s		900	900
Brush Channel and Stockpile Material in One Location	0.2	ha		1,500	1,500
Strip Channel and Stockpile Topsoil Material for Restoration	180	m		1,350	1,350
Ditch Excavation (Station 0+000 to Station 0+156)	156	m		6,240	6,240
Ditch Bottom Channel Cleanout (Station 0+156 to Station 0+161)	5	m		150	150
Level Spoils	180	m		1,170	1,170
Load, Haul and Level Excess Spoils Generated between Station 0+000 and Station 0+070	250	cu.m.		1,875	1,875
Rip Rap Protection - Tile Outlets (Station 0-005)	5	sq.m.	158	158	316
Rock Check Dams (Station 0+090 and Station 0+161)	2	ea	1,000	1,000	2,000
Topsoil, Hydroseed, Mulch Channel Bank Slopes (Station 0+000 to Station 0+156)	364	sq.m.	2,366	1,274	3,640
New 2.4m Steel Fence Post (Provisional)	3	ea	75	150	225
Sub Total					25,370
Construction Contingency					2,250
Engineering					25,020
KRCA Permits					500
Tendering Allowance					1,750
Contract Administration Allowance					675
Total Estimate					55,565

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SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hect.		Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)	Eq. Ha.
<u>Agricultural Lands</u>										
12	Pt Lot 19	19.2	**	6-025-02	A. & N. Martin	793	17,376	4,478	22,647	16
12	Pt Lot 20	3.6	**	6-025-01	D. Dilling & P. Reid	-	1,798	990	2,788	3.6
11	Lot 17	6.3	*	6-002-00	R. Pilkey	-	-	2,080	2,080	3.2
						<u>793</u>	<u>19,174</u>	<u>7,548</u>	<u>27,515</u>	
Total Special Benefit						793				
Total Benefit						19,174				
Total Outlet						<u>7,548</u>				
Total - Agricultural Lands						<u>27,515</u>				

Conc.	Lot or Part	Affected Hect.		Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)	Eq. Ha.
<u>Non-Agricultural Lands</u>										
11	Pt Lot 19	0.6		6-005-00	M. Schipper	-	-	370	370	0.6
12	Pt Lot 19	7.1		6-024-00	S. & C. Haney	-	-	3,531	3,531	5.3
11	Pt Lot 18	14.8	*	6-003-00	G. & S. Salter	-	-	6,353	6,353	9.6
12	Pt Lot 18	0.6	*	6-022-00	J. Hong	-	-	594	594	0.9
12	Pt Lot 18	0.3	*	6-022-05	S. & C. Tanner	-	-	409	409	0.6
12	Pt Lot 18	0.2	*	6-022-10	B. Paish	-	-	264	264	0.4
12	Pt Lot 18	0.7	*	6-022-01	B. Wilson	-	-	327	327	0.5
12	Pt Lot 19	4.5	*	6-024-00	S. & C. Haney	-	-	2,214	2,214	3.4
						-	-	14,062	14,062	
Total Special Benefit						-				
Total Benefit						-				
Total Outlet						14,062				
Total - Non-Agricultural Lands						14,062				

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit (\$)	Benefit (\$)	Outlet (\$)	Total (\$)	Eq. Ha.
<u>Public Lands & Liability Assessment</u>									
Settlement Road		0.9		City of Kawartha Lakes	-	-	1,743	1,743	2.6
Rabbit Run Road		1.1		City of Kawartha Lakes	-	-	2,773	2,773	4.2
Pigeon Lake Road		4.1	***	City of Kawartha Lakes	-	1,350	8,122	9,472	12.3
					-	1,350	12,638	13,988	
				Total Special Benefit	-				
				Total Benefit	1,350				
				Total Outlet	12,638				
				Total - Public Lands	13,988				
				Total - Agricultural Lands	27,515				
				Total - Non-Agricultural Lands	14,062				
				Total - Public Lands	13,988				
				Total Assessment	55,565				

See Page 5 of the Engineers Report for Assessment Rational

* Assessment to be paid by the Road Authority for redirecting water to the drain

** Portion of Benefit Assessment transfer to the Road Authority for redirecting water to the drain causing extra depth in the outlet channel.

** Benefit Assessment reflects extra depth of channel due to additional water being redirected to the drain.

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SPECIFICATION OF WORK

1. Scope of Work

The work is to be completed in Part of Lot 19 and 20, Concession 12, in the City of Kawartha Lakes. The work includes the following:

- 161m of channel excavation c/w clearing and grubbing

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

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

4. Health and Safety

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

The Contractor shall be responsible to ensure that all of the procedures are followed under the Occupational Health and Safety Act 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 the termination of the Contract.

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

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

5. Workplace Safety and Insurance Board

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

6. Access and Working Area

Access to the working area shall be gained from the lands owned by A. & N. Martin (ARN 6-025-02) and will be along the private lane and shall be restricted to a width of 6m.

The excavated material shall be placed on the north side of the drain. The working area shall be on the same side of the drain on which the excavated material is disposed of. The working area is 20m and will be measured from the adjacent finished top of bank.

7. Benchmarks

The primary benchmark for this project is a nail on the north side of a hydro pole which is located 50m west of Station 0+000. Elevations and secondary benchmarks are located on the profile drawings.

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.

8. Removals

The existing page wire fence at Station 0+005 shall be removed and disposed of offsite. The posts are in poor shape and will not be replaced under this Contract. The Contractor is required to restore the fence using the existing posts and a section of new page wire fence. The fence is a boundary fence and is not used to contain livestock. If the post cannot be used new metal T posts will be installed under the provisional fence post unit price item.

The wood fence shall be removed and stockpiled for burning on the north side of the channel at Station 0+010 (Lot 20, Concession 12).

Removals shall be in accordance with OPSS 510.

Fence wire shall be in accordance with OPSS 771.

9. Brushing and Tree Removal

All brush, trees, woody vegetation, etc., shall be removed from the working area and side slopes of the existing channel and stockpiled in one pile. The pile will be located on the north side of the channel at Station 0+010 (Lot 20, Concession 12).

All trees, brush and stumps shall be burned onsite, subject to Municipal bylaws, and MOE guidelines. The Contractor shall be responsible for obtaining all necessary burning permits.

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

10. Excavation of Channel

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

The proposed channel shall have a 1.0m wide bottom, and a minimum of 1.5H:1V side slopes. 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.

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 two hundred millimeters (200mm), 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 area, 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.

All excavated materials, which are excess to the requirements of the Contract, shall be moved downstream to a section of the working area where it can be properly leveled.

All stones, rocks, branches, and debris shall be picked up by the Contractor and disposed of offsite.

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

Restoration shall be in accordance with the restoration specification.

Excavation shall be in accordance with OPSS 206.

11. Outlet Works

The proposed tile outlet works consist of rip rap and filter fabric, and shall be installed on the channel side slopes, from the bottom of the channel to the top of the bank for a distance of 1m on either side of the outlet pipes. The proposed channel rip rap shall be installed on the channel bottom and channel side slopes, from the bottom of the channel 1.5m up the bank. Rip rap shall be made up of 200mm nominal 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 300mm 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 in the gaps and voids to give it a uniform appearance.

12. Rock Flow Check Dams

Rock flow check dams will be installed at Station 0+090 and Station 0+161. The check dams will remain part of the drain and will be cleaned out during regular channel maintenance.

The rock flow check dams shall be in accordance with OPSS 805 and OPSD 219.211. The Contractor will remove all accumulated sediment from the rock flow check dams once the channel banks have been hydroseeded.

13. Restoration

Restoration shall be in accordance with the following:

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

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.

Seeding shall be applied by hydroseed and mulch on all affected areas once construction is complete at the application rates shown above.

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

14. Environmental Considerations

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

- All work is to be completed in accordance with the Kawartha Regional Conservation Authority email dated, December 7, 2021 and the Department of Fisheries and Oceans Canada email, dated October 26, 2021.
- All work shall be completed between July 15 and September 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.

SHOREVIEW RD

SETTLEMENT RD

RABBIT RUN RD

6-002-
R. PILKEY
6.3 Ho

6-003
G. & S. SALTER
14.8 Ho

6-022-10-
B. PAISH
0.2 Hq

6-022-C
B. WILSON
0.7 Ha

6-025-02
A. & N. MARTIN
19.2 Hq
(13.8 Hq SURFACE
5.4 Hq SUBSURFACE)

6-025-01
D. DILLING & P. REID
3.6 Ha

S. & C. TANNER
0.3 Ha

6-022
J. HONG
0.6 Hq

6-024
S. & C. HANEY
11.6 Hq

6-005
M. SCHIPP
0.6 Ha

PIGEON LAKE RD

PERDUE RD

PERDUE RD

LOT 16

LOT 17

LOT 18

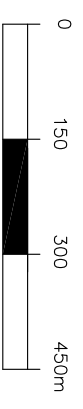
LOT 19

LOT 20

LOT 21

- (E) AREA OF EXISTING BANK EROSION
- (ES) AREA OF EXISTING ROAD SHOULDER EROSION
- (O) EARTH OBSTRUCTION

SCALE: 1:10,000



LEGEND

DRAINAGE AREA

MARTIN DRAIN

(E) AREA OF EXISTING BANK EROSION

AREA OF EXISTING ROAD SHOULDER EROSION

⓪ EARTH OBSTRUCTION

A circular professional engineer seal. The outer ring contains the text "LICENSED PROFESSIONAL ENGINEER" at the top and "M.R.M. GERRITS" at the bottom. In the center is a semi-circle containing a stylized blue signature.

CON 12

CON 11

M. GERRITS
CONSULTING INC.

MARTIN DRAIN

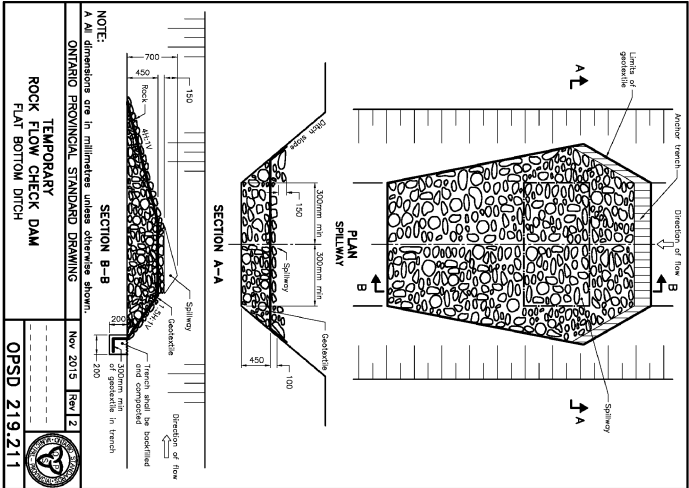
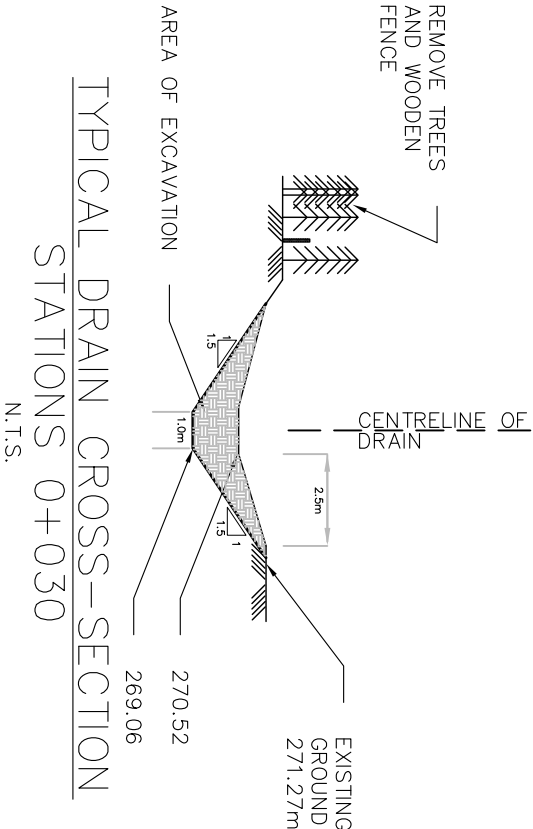
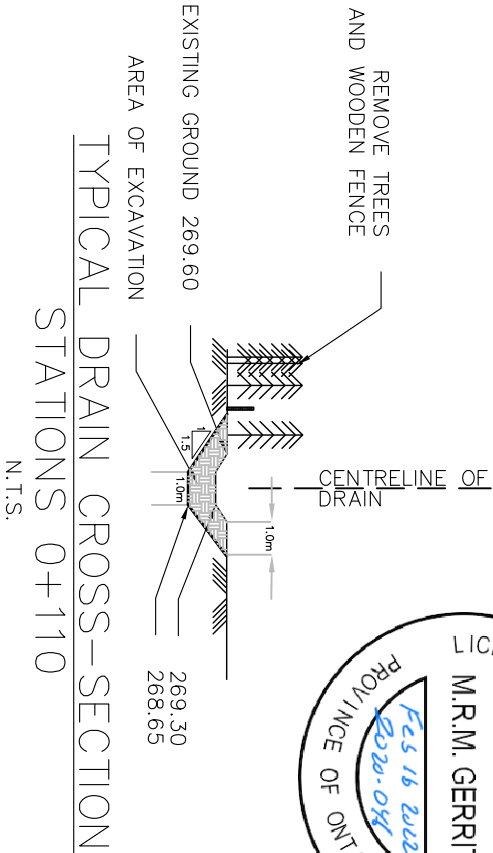
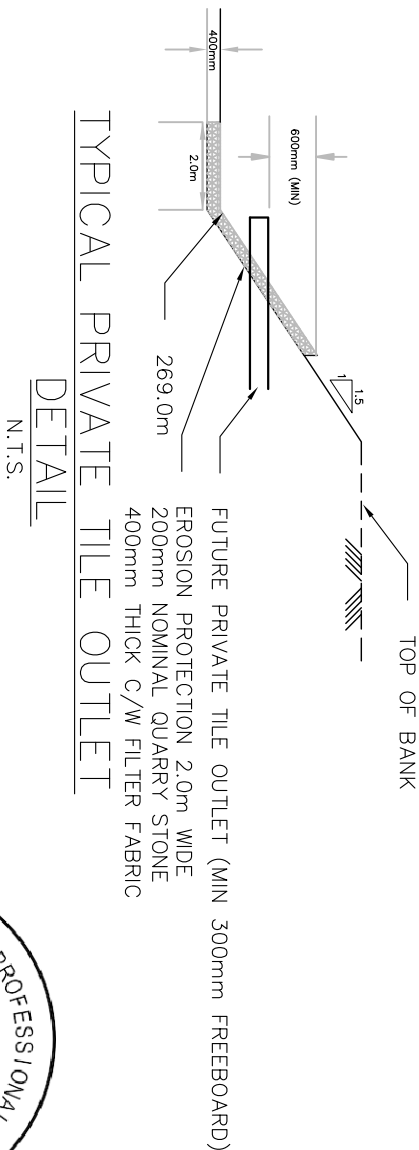
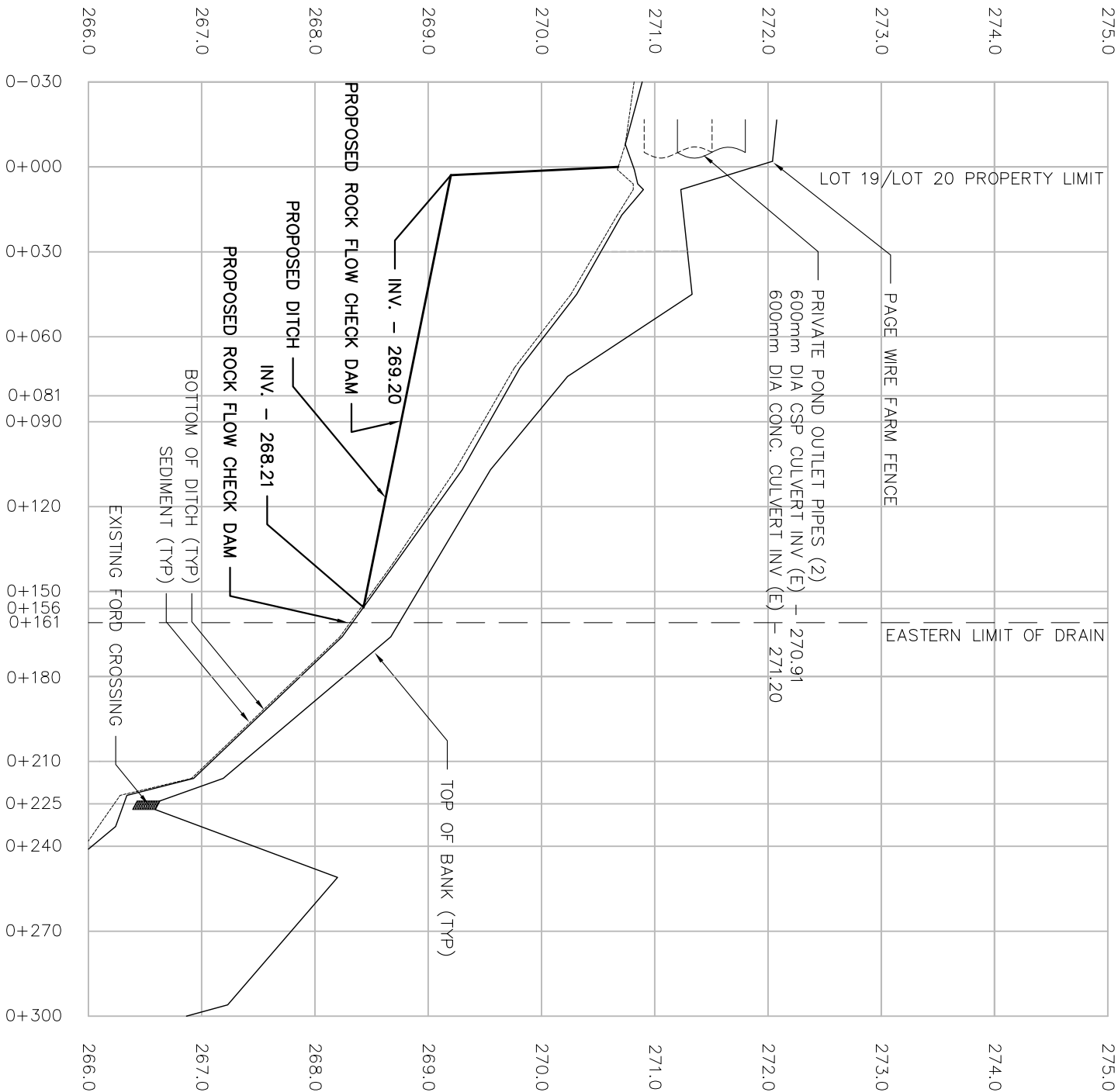
CITY OF KAWARTHA LAKES

DRAINAGE PLAN

SHEET
1 OF 2

GENERAL NOTES

1. BENCHMARK #1 ELEV. 271.98
NAIL IN THE NORTH SIDE OF THE HYDRO POLE WHICH
IS LOCATED 50m WEST OF STATION 0+000.
2. BENCHMARK #2 ELEV. 271.78
OVBERT OF THE WEST END OF A 600mm DIA.
CULVERT WHICH IS LOCATED 15m WEST OF STATION 0+000.



M. GERRITS
CONSULTING INC.

No.	REVISIONS	DATE	BY
1	FOR REPORT	FEB. 16, 2022	MG

MARTIN DRAIN
CITY OF KAWARTHA LAKES

PROFILE AND DETAILS

DRAWN	MG
CHECKED	TG
DATE	FEB. 16, 2022
PROJECT NO.	2020-046
SHEET	2 OF 2