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April 20, 2023

The Mayor and Council
Municipality of North Middlesex
229 Parkhill Main Street
Parkhill, ON
N0M 2K0

Gentlemen and Mesdames:

Re: Jennison Drain Branch "A" & "B"

In accordance with your instructions, R. Dobbin Engineering has undertaken an examination of the W ½ of Lot 19, Concession 5 West of Centre Road with regards to the construction of a new municipal drain in order to alleviate erosion on the property.

Authorization under the Drainage Act

This Engineers Report that has been prepared under Sections 4 of the Drainage Act as per a petition and request from affected Landowners.

A petition has been received by the Municipality of North Middlesex. 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 petition was determined to be valid based on Section 4 (1) (a) and (b).

Existing Conditions

The W ½ of Lot 19 Concession 5 currently has existing low run areas that accepts water from Lots 16,17,18 and 19, Concession 5. The Landowner in W ½ of Lot 19 has an access lane running on the easterly limit of the property that tends to flood over and erode during storm events.

On-Site Meeting

A site meeting was held on November 9th, 2022.

The following were present at the meeting:

- Josh Warner (R. Dobbin Engineering)
- Dylan Krall (R. Dobbin Engineering)
- Jaden Hodgins (Municipality of North Middlesex)
- Tony Timmermans (Landowner)
- Mark Masschelein (Landowner)
- Steve Jennison (Landowner)

The following is a brief summary of the meeting:

- General discussion of the Drainage Act and Landowners rights under the Drainage Act.
- The Landowner of the W ½ of Lot 19, Concession 5 requested two branch drains be installed on his property to handle water from the upstream watersheds.
- The Landowner of the W ½ of Lot 19, Concession 5 requested that the contract for construction contain provisions that any damage done to the culvert on his property is repaired at the expense of the Contractor.
- The Landowner of the W ½ of Lot 19, Concession 5 requested large basins at the property line.

No adverse soil conditions were noted at the site meeting.

Draft Report

A draft report, dated March 9, 2023 was sent to all the affected Landowners and a meeting was held on April 20, 2023 to go over the report and address any questions and concerns related to the draft report. The following were present at the meeting:

- Josh Warner (R. Dobbin Engineering)
- Joanne Sadler (Municipality of North Middlesex)
- Tony Timmermans (Landowner)
- Karen Timmermans (Landowner)

- Corne Verheyen (Landowner)
- Rick Hodgins (Rents Jennison Farm)
- Steve Jennison (Landowner)

The following is a brief summary of the meeting:

- Steve Jennison requested that the work be done with an excavator as he believed that the existing bridge would not support the weight of a wheel machine. Josh Warner stated that he did not anticipate any increase in the cost to tender the project in this manner as the drain is short in length.
- It was discussed the option of having Branch "A" run south instead of the proposed west.
    - Josh Warner looked at this option following the meeting and determined that there would not be any substantial costs savings to warrant a re-design of the drain.
- General discussion of the Drainage Act and Landowners rights.

Approvals

The drain will require approval from the Ausable Bayfield Conservation Authority and the Department of Fisheries and Oceans. Construction cannot commence without necessary approvals.

Design

Designing Branch "A" to the current grantable standard of a 38mm/24hrs coefficient results in a 200mm diameter tile drain. R. Dobbin Engineering believes that considering the additional cost to increase the size of the tile to a 300mm diameter tile the larger pipe should be installed. The additional cost to increase the pipe size beyond the grantable coefficient has been assessed as a special benefit to the benefitting landowner. This amount shall not be considered for grant. Branch "B" has been designed to the 38mm/24hrs coefficient.

Recommendations

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

1. The construction of a new drain known as the Jennison Drain Branch "A". This will provide outlet to Lot 19 & 18, Concession 5.
2. The construction of a new drain known as the Jennison Drain Branch "B". This will provide outlet to Lot 19, 18, 17 & 16, Concession 5.

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 $45,650, including engineering of the report, attending the Meeting to Consider the Report, attending the Court of Revision, and an estimate for tendering, contract administration and inspection. Appearances before appeal bodies have not been included in the 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 their 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 for road crossings and locating and working around utilities shall be tendered separately with the actual cost plus a portion of the engineering (20% of the construction cost) being assessed to the owner of the road or public utility.

The cost of any approvals, permits or any extra work, beyond that specified in this Report that is required by any utility, 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 additional cost to provide a drainage coefficient above the 38mm/24hrs has been assessed to the W ½ of Lot 19, Concession 5 as a special benefit assessment. These costs shall be pro-rated with the rest of the drainage works but will not be eligible for grant as per OMAFRA ADIP Policies.

2. The remaining cost has generally been assessed with approx. 10% of the estimated cost assessed as a benefit assessment to the property with Roll Number 60-031, 40% of the estimated cost assessed as a benefit assessment to the property with Roll Number 60-032 and the remainder assessed as outlet assessment to the upstream lands and roads based on equivalent hectares.

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 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.

Allowances have been made, where appropriate, as per Section 29 of the Drainage Act for right-of-way and as per Section 30 of the Drainage Act for damages to lands and crops. Allowances for right of way are based on a land value of $30,000.00 per hectare. Allowances for crop loss are based on $2,000.00 per hectare for the first year, $1,000.00 for the second year ($3,000.00 per hectare total).

Access and Working Area

Access to the work site for construction and future maintenance shall be from Parkhill Drive and through the laneway in the W ½ of Lot 19, Concession 5. The access is over an existing culvert on the property. The Contractor shall be responsible for taking pictures before and after construction to ensure no damage is caused by construction access over the culvert. Any damage caused to the culvert, as determined by the Drainage Superintendent or Engineer, shall be repaired at the Contractors expense. Access shall be restricted to a width of 6m.

The working area for the construction and future maintenance 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. The working area for the construction and future maintenance of the open channel shall be restricted to a width of 10m from the top of

bank on either side of the drainage works. The working area shall extend 10m past the extents of the proposed drain.

Restrictions

No trees and shrubs shall be planted nor shall permanent structures be erected within 10m of either side of the proposed drain without prior written permission of Council.

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.

Agricultural Grant

If available, 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.

Special benefit assessments contained in this report will not be eligible for grant based on the current ADIP Policies.

Existing Private Drainage

All existing subsurface drainage encountered during the construction of the proposed tile drain or open channel shall be reconnected to the proposed tile drain or open channel. Any drains cut off by the proposed drainage works shall be plugged and sealed to the satisfaction of the Drainage Superintendent.

Maintenance

Upon completion of the work, the Jennison Drain Branch “A” and “B” shall be repaired and maintained as per the applicable Schedule of Assessment, less any Special Benefit, unless otherwise altered under provisions of the Drainage Act.

The drains shall be maintained as per the specifications and grades as shown on the Profile contained in this Engineers Report.

The additional costs as a result of a road or utility shall be assessed to the owner of the road or utility as per Section 26 of the Drainage Act.

Yours truly,

Josh Warner, P. Eng.
R. Dobbin Engineering Inc.

Jennison Drain
Municipality of North Middlesex
April 20, 2023

ALLOWANCES

Allowances have been made as per Sections 29 & 30 of the Drainage Act for Right of Way and damages to lands and crops.

Conc.	Lot or part	Roll No.	Owner	Section 29 ($) (R.O.W)	Section 30 ($) Damages	Total ($)
5	W 1/2 Lot 18 & E 1/2 Lot 19	60-031	Pork Haven Farms Ltd.	-	100	100
	W 1/2 Lot 19	60-032	S. & C. Jennison	1,060	1,610	2,670
			TOTAL ALLOWANCES	1,060	1,710	2,770

Estimate of Cost

	Quantity	Unit	Unit Cost	Total Cost
Pre-Construction Meeting	1	LS	300	300
Benchmark Loop	1	LS	500	500
Provisional: Granular "B"	20	tonne	30	600
Restoration/Seeding	1	LS	800	800
Branch "A"				
Strip and Level Topsoil and Gravel for Tile Drain (0+011 to 0+096)	87	m	10	870
300mmø HDPE Pipe c/w Bedding	87	m	80	6,960
3/4" Clearstone Bedding under Pipe at Driveways	10	t	40	400
Rodent Grate at Outlet	1	ea	300	300
Granular "A" at Driveway Location	10	t	35	350
Rip Rap at Outlet (Station 0+011)	5	t	150	750
DICB #1 (900mm x 1200mm) c/w Connections and Berm	1	LS	4,000	4,000
Locate and Connect Existing Field Tile	1	ea	100	100
Remove and Re-Install Fence	1	LS	500	500
Environmental Considerations, including Silt Fence	1	LS	400	400
Branch "B"				
Brushing and Tree Removal	1	LS	2,500	2,500
Open Channel Excavation & Levelling (0+010 to 0+022)	12	m	25	300
Strip and Level Topsoil and Gravel for Tile Drain (0+022 to 0+033)	11	m	10	110
Removal of Existing Pipe across Laneway	1	LS	600	600
525mmø HDPE Pipe	11	m	300	3,300
3/4" Clearstone Bedding under Pipe at Driveways	10	t	40	400
Rodent Grate at Outlet	1	ea	500	500
375mmø HDPE Pipe c/w connection	2	m	120	240
Granular "A" at Driveway Location	10	t	40	400

	Quantity	Unit	Unit Cost	Total Cost
Rip Rap at Outlet (Station 0+022)	10	t	150	1,500
DICB #2 (900mm x 1200mm) c/w Connections and Berm	1	LS	4,000	4,000
Environmental Considerations, including Silt Fence	1	LS	400	400

Contingency	1,400
Sub Total	32,480
Allowances	2,770
Engineering	6,910
Estimate for Tendering, Inspection and Contract Administration	2,400
ABCA Fee	350
Total Estimate excluding HST	**44,910**
Non-Recoverable HST (1.76%)	740
Total Estimate	**$ 45,650**

SCHEDULE OF ASSESSMENT - JENNISON DRAIN BRANCH "A"

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit (Non Grantable)	Benefit	Outlet	Total
Agricultural Lands								
5	W 1/2 Lot 18 & E 1/2 Lot 19	5.25	60-031	Pork Haven Farms Ltd.	-	2,381	11,899	14,280
	W 1/2 Lot 19	0.80	60-032	S. & C. Jennison	870	8,650	-	9,520
					870	11,031	11,899	23,800
				Total - Agricultural Lands	23,800			
				Total Assessment	$23,800			

SCHEDULE OF ASSESSMENT - JENNISON DRAIN BRANCH "B"

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
Agricultural Lands								
5	S 1/2 Lot 16	2.84	60-028	Pork Haven Farms Ltd.		2,184	717	2,901
	Lot 17	20.07	60-030	Cornita Farms Ltd.		-	5,074	5,074
	E 1/2 Lot 18	9.59	60-031-02	A. & K. Timmermans		-	2,424	2,424
	W 1/2 Lot 18 & E 1/2 Lot 19	10.72	60-031	Pork Haven Farms Ltd.		-	2,710	2,710
	W 1/2 Lot 19		60-032	S. & C. Jennison		8,741	-	8,741
					-	10,925	10,925	21,850
				Total - Agricultural Lands	21,850			
				Total Assessment	$21,850			

COMPOSITE SCHEDULE OF ASSESSMENT - JENNISON DRAIN BRANCH "A" AND "B"

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
Agricultural Lands								
5	S 1/2 Lot 16	2.84	60-028	Pork Haven Farms Ltd.		2,184	717	2,901
	Lot 17	20.07	60-030	Cornita Farms Ltd.		-	5,074	5,074
	E 1/2 Lot 18	9.59	60-031-02	A. & K. Timmermans		-	2,424	2,424
	W 1/2 Lot 18 & E 1/2 Lot 19	15.97	60-031	Pork Haven Farms Ltd.	-	2,381	14,609	16,990
	W 1/2 Lot 19	0.80	60-032	S. & C. Jennison	870	17,391	-	18,261
					870	21,956	22,824	45,650
				Total - Agricultural Lands	45,650			
				Total Assessment	$45,650			

ESTIMATED NET ASSESSMENT

Net assessment subject to OMAFRA ADIP Policy and actual construction costs.

Conc.		Owner	Branch A Assessment	Branch A Estimated Grant	Branch A Allowances	Branch A Net Assessment	Branch B Assessment	Branch B Estimated Grant	Branch B Allowances	Branch B Net Assessment	Total Estimated Net Assessmnet
Agricultural Lands											
5	60-028	Pork Haven Farms Ltd.	-	-		-	2,901	967		1,934	1,934
	60-030	Cornita Farms Ltd.	-	-		-	5,074	1,691		3,383	3,383
	60-031-02	A. & K. Timmermans	-	-		-	2,424	808		1,616	1,616
	60-031	Pork Haven Farms Ltd.	14,280	4,760	50	9,470	2,710	903	50	1,757	11,227
	60-032	S. & C. Jennison	9,520	2,883	1,804	4,833	8,741	2,914	866	4,961	9,794
		Total Assessment	$23,800	$7,643	$1,854	$14,303	$21,850	$7,283	$916	$13,651	$27,954

Jennison Drain Branch “A” and “B”
Municipality of North Middlesex
April 20, 2023

SPECIFICATION OF WORK

1. Location

The Jennison Drain Branch “A” and “B” are proposed to be constructed in the W ½ of Lot 19, Concession 5 in The Municipality of North Middlesex.

2. Scope of Work

The work included in this specification includes, but is not limited to, the following:

- Open channel deepening.
- Supply and installation of HDPE pipe.
- Supply and installation of catch basins structures c/w berms.

3. 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 they 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 have 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 Municipality of North Middlesex and request clarification 2 days prior to pricing the project.

4. Plans and Specifications

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.

5. 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.

6. Pre-Construction Meeting

There is a requirement for a pre-construction meeting to be held prior to any construction taking place. The meeting shall be scheduled by the Contractor. The Landowners, Engineer, and the Municipality of North-Middlesex shall be notified of the pre-construction meeting at least 48 hours prior.

7. Benchmarks

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

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. Traffic Control

Access and driveways to private properties shall not be obstructed longer than the minimum time necessary for the work and shall be reinstated as soon as possible all to the satisfaction of the Engineer. The contractor shall schedule any obstruction of existing

driveways with the owners at least two full working days in advance. Roads must be kept open to local traffic and all obstructions and diversions of traffic must be approved by the Engineer or Drainage Superintendent and Roads Superintendent at least two (2) full working days in advance.

a) The Contractor shall supply, erect and maintain all detour signs and special signs necessary for detours to divert traffic from the area under construction as directed by the Road Superintendent or Engineer. All this work shall be at the Contractor's expense.

b) The Contractor shall be responsible for supplying, erecting and maintaining all signs, supports, barricades, flashers, cones, etc. in the construction area and at the boundaries of the work as part of the above detours, all to the satisfaction of the Engineer or Drainage Superintendent. All this work shall be done by the Contractor at their own expense.

c) The Contractor shall not be allowed to proceed with construction activities unless proper signage and flagmen are present. Flagging procedures, signage and detours shall conform to the recommendations of Book 7, Temporary Conditions, Ontario Traffic Manual, issued by the Ministry of Transportation. Conformance shall be enforced by the Ministry of Labour Inspector.

9. Access and Working Area

Access to the work site for construction and future maintenance shall be from Parkhill Drive and through the laneway in the W ½ of Lot 19, Concession 5. The access is over an existing culvert on the property. The Contractor shall be responsible for taking pictures before and after construction to ensure no damage is caused by construction access over the culvert. Any damage caused to the culvert, as determined by the Drainage Superintendent or Engineer, shall be repaired at the Contractors expense. Access shall be restricted to a width of 6m.

The working area for the construction and future maintenance 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. The working area for the construction and future maintenance of the open channel shall be restricted to a width of 10m from the top of bank on either side of the drainage works. The working area shall extend 10m past the extents of the proposed drain.

10. Removals

The existing tile along the length of the improvements and as identified in the estimate of cost and tender shall be removed in their entirely and shall be disposed offsite at the expense of the Contractor. Any leads, unless otherwise specified on the drawings or

specifications, shall be plugged with concrete and wrapped with filter fabric or covered with 100mm concrete blocks and wrapped with filter fabric.

11. Brushing and Tree Removal

All brush, trees, woody vegetation, stumps etc. shall be removed for a width of 20 metres along the tile drain. They shall be removed in their entirety including stumps. Removal of all brush, trees, woody vegetation, stumps etc. in order to facilitate the excavation of the open channel shall be removed at the discretion of the Drainage Superintendent or Engineer and shall be included as part of this item.

It is recommended that a mechanical grinder attached to an excavator be used for the removal of brush and trees. Any brush and trees too large to grind shall be close cut. The Contractor shall stockpile the trees and brush in a single pile on the property in which they were removed or dispose of the trees and brush offsite. The Contractor is responsible for the burning of the trees and brush. The Contractor is responsible for obtaining all necessary permits for any disposal sites. Burning of the trees and brush is subject to local bylaws and guidelines of the Ministry of the Environment Conservation and Parks.

Certain trees may be left in place at the direction of the Drainage Superintendent.

12. Strip and Place Topsoil and Gravel

The Contractor shall strip the topsoil and gravel for a width of 6m normally centered on the proposed drain. The topsoil and gravel shall be stockpiled at the edge of the working allowance for the duration of the tile installation. Once the tile is installed, the Contractor shall level the topsoil and gravel over the drain to their pre-construction condition.

13. Installation of Tile

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

HDPE shall be CSA Approved smooth wall gasketed pipe with bell and spigot joints (320 kPa) and shall include clear stone bedding to the spring line under gravel driveways and accesses. Driveways shall be restored with Granular “A” as determined by the Drainage Superintendent or Engineer.

It is intended that the proposed drains run in the locations shown on the plan. The tile drain shall run in the low runs at property lines in order maximize the surface water captured by the in-line catch basins with berms. This may require the extension of the tile connections to the proposed mains near the property lines. The exact location of tile can be changed under the direction of the Drainage Superintendent or Engineer.

The trenching and laying of the concrete tile shall be done by wheel machine or excavator. An excavator must be used in areas of soil instability, unless approved by the Engineer. All tile joints shall be wrapped with a minimum 300mm width of Mirafi P150 (or 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 or 25m.

Where approved by the Engineer (or specified) concrete tile may be laid in tighter curves by saw cutting joints. The maximum deflection of one concrete tile joint shall be 22 degrees. Turns of greater than 22 degrees shall require the use of manufactured bends (PE smooth wall).

Laser control shall be used to ensure proper grades. The grades calculated on the Profile are to 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 ground level to the invert of the pipe 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.

The tile shall be installed with an excavator. The tile must be installed as per the manufacturer's recommendations **complete with bedding to the spring line**. Prior to backfilling, the tile shall be covered manually to a depth of approx. 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 offsite. The Landowners are responsible for stones after that. The material shall be left windrowed over the trench to allow for settlement.

If the land level must be lowered in order to carry out trenching operations, then it is up to the Contractor to determine if it is necessary and include any extra cost involved. They shall first strip the topsoil to its full depth and stockpile it along one side of the working width and then grade the area to allow the trenching to be carried out. All excavated material shall be windrowed on the side opposite the trench that the topsoil is stockpiled. After trenching and backfilling operations are complete, the topsoil shall be spread to its original depth.

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 trucks or 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 warned 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.

Future replacements shall conform to these specifications.

14. Catch Basins

Structure	Station	Type (mm)	Inlet Elev. (m)	Outlet Pipe Elev. (m)	Inlet Pipe Elev. (m)
DICB #1 c/w Berm	0+096	900x1200	183.93 (E)	182.25 (W) 300	182.27 (E) 300
DICB #2 c/w Berm	0+033	900x1200	183.41 (E)	182.38 (W) 525	182.40 (E) 375

The catch basins shall be square precast concrete structures as noted above and shall have a birdcage type grate. The ditch inlet catch basins shall have a 2:1 sloped top. The direction in the inlet elevation column denotes the direction the low side of the ditch inlet catch basins shall face. The catch basins shall be located with the backside at the property line and at the locations identified on the Plans. The catch basin elevations shall be 50mm above grade. When specified the catch basins shall have a berm constructed on the downstream property. The top of the berm shall be 0.60m above the inlet elevation. The berm shall have a 2:1 front slope and 5:1 back slope with a 1m wide top. The height and back slopes can be increased under the direction of the Drainage Superintendent in order to reduce erosion and facilitate farming. Care shall be taken to ensure this does not negatively impact upstream lands. The berms shall be constructed using excess materials on site. If more material is required it shall be supplied at the expense of the drainage works.

The 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 300mm sump. Birdcage grates shall be manufactured with a bar spacing no larger than 50mm.

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

The tile at the connection to the 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.

The Drainage Superintendent or Engineer may change a birdcage type grate on a catch basin to a concrete lid or sloped birdcage grate at the request of a Landowner.

15. Subsurface Drainage

All existing subsurface drains encountered during construction of the tile drain shall be connected to the proposed tile drain unless otherwise noted on the drawings or as directed by the Drainage Superintendent. The downstream end shall be plugged to the satisfaction of the Drainage Superintendent.

For 100mm and 150mm subsurface drains, the upstream end of the subsurface drain shall be connected to the tile drain at a 45-degree angle. A suitable length of equivalent sized PE agricultural tubing shall be used to connect the drains. Manufactured fittings shall connect the PE tile to the existing drain and to the concrete tile. The connections shall be carefully backfilled to ensure there is adequate support under the pipe and large clumps of clay do not displace the tile. It is recommended that clear stone be used under the connections at the tile drain.

Where an existing subsurface drain needs to cross the existing open channel to tie into the proposed tile the open channel shall be excavated to its hard bottom. Drainage stone shall be used to bed the pipe from the bottom of the channel to the spring line of the tile.

16. Outlet Works

The outlet works for both drains shall consist of a manufactured rodent rotating grate. It shall be installed at the outlet to the open channel.

Erosion protection made up of rip rap and filter fabric shall be installed on the channel side slope from the bottom of the channel to the top of the bank and for a distance of 1m on either side of the outlet pipe. Rip rap shall be made up of 150mm to 300mm quarry stone or approved equal. The area to receive the rip rap shall first be graded to allow the placement of the rip rap to a depth of 400mm below finished grade. After grading, a layer of filter fabric (Mirafi P150 or approved equal) is to be placed with any joints overlapped 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.

17. Excavation of Open Channel

The open channel shall be excavated and maintained to the depths and grades as per the profile and drawings as 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 correctness of grade and to confirm location of tile ends.

The excavated material shall be cast on the working side of the channel at least 1.5 metres clear of the bank. Excavated material shall not be placed in low runs or swales out letting surface water to the channel. The excavated material shall be levelled to a maximum depth of 150mm and left in a condition suitable for cultivation. All high spots above grade shall be removed. The sediment shall be removed leaving a rounded bottom with the intent not to undercut the existing side slopes.

If a Landowner requests that excavated material be trucked off site, the cost of trucking shall be at the Landowners expense and will be outside of this contract.

18. Seeding/Restoration

The side slopes of the channel, road right of way, grassed waterway and finished lawns, and all areas where disturbed by construction, shall be hand seeded on a daily basis or hydroseeded immediately following construction in accordance with the seed mixture, fertilizer and application rate as shown below. Spreading of the seed shall be by use of a mechanical spreader.

If the hand seed or hydroseed has not germinated, at the discretion of the Engineer or Drainage Superintendent, prior to the one-year maintenance period, 100mm of topsoil shall be placed on the side slopes of the channel, road right of way, grassed waterway and finished lawns, where disturbed by construction, and shall be hydroseeded in accordance with the seed mixture, fertilizer and application rate as shown below.

Seed mixture, fertilizer and application rates are as follows:

- Canada Wild Rye (Elymus Canadensis), Virginia Wild Rye (Elymus virginicus), or Indian grass (Sorghastrum nutans)
- Fertilizer (300 kg/ha.) consisting of 8-32-16.
- Hydraulic mulch (2,999 kg/ha.) type “B” and water (52,700 litres/ha.) in accordance with OPSS 572 (hydroseed).

The above seed mixture shall apply unless otherwise approved by the Drainage Superintendent or Engineer.

19. Environmental Considerations

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

- Operate machinery in a manner that minimizes disturbance to the banks of the watercourse.

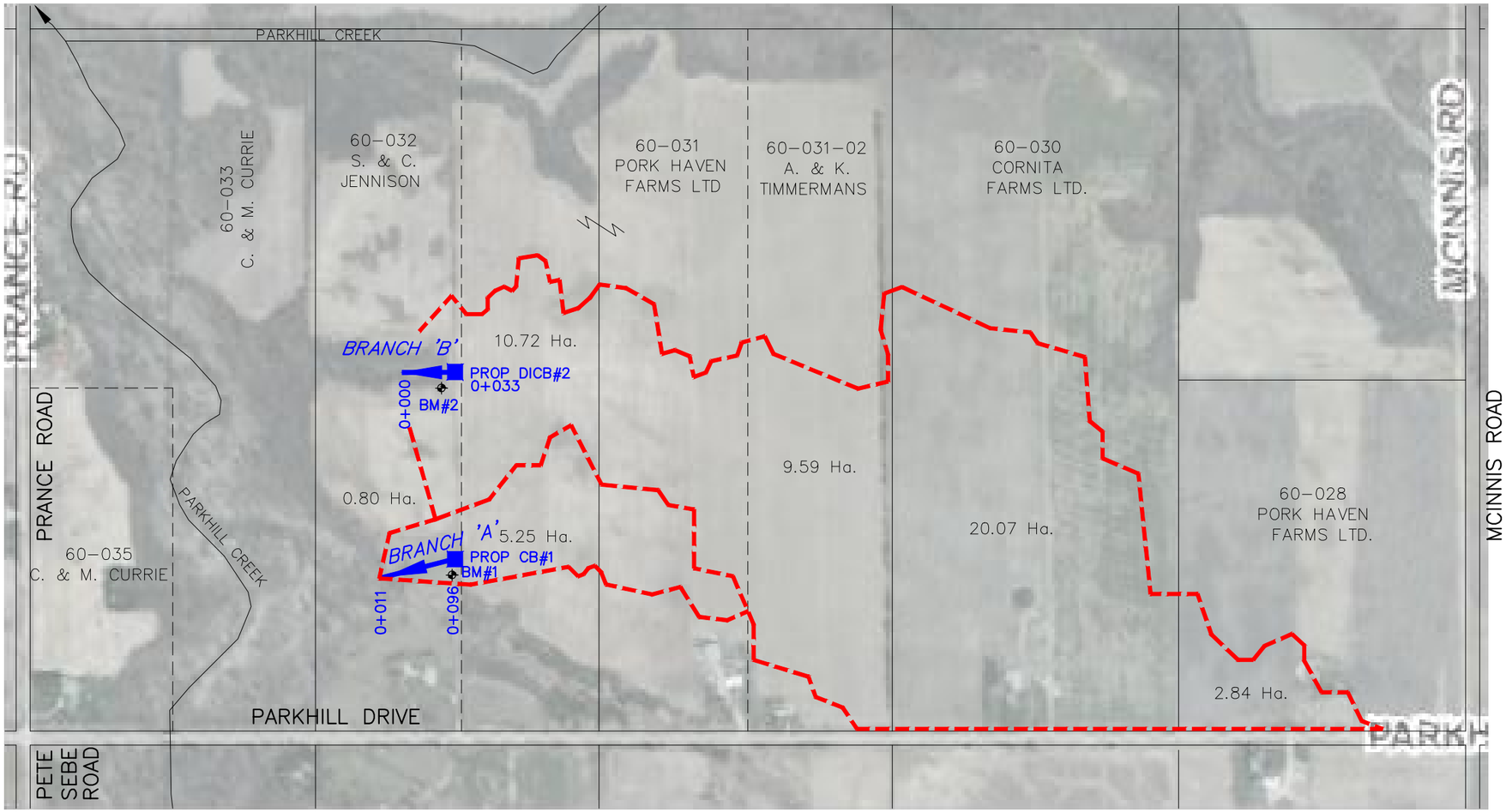
- Erosion and sediment control measures must be installed prior to construction to prevent sediment from entering the water body.
- Material shall not be in areas regulated by the Conservation Authority or Ministry of Natural Resources.
- All granular and erosion control materials shall be stockpiled a minimum of 3.0m from the top of the bank or excavation. Material shall not be placed in surface water runs or open inlets that enter the channel.
- 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.
- When possible, all construction within the open channel shall be carried out during periods of low flow or in dry conditions.
- The Contractor shall conduct regular inspections and maintain erosion and sediment control measures and structures during the course of construction.
- The Contractor shall repair erosion and sediment control measures and structures if damage occurs.
- The Contractor shall remove non-biodegradable erosion and sediment control materials once site is stabilized.
- Remove all construction materials from site upon project completion.

A Light duty silt fencing shall be installed down-gradient of the work 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 re-vegetated.

LOT 20 LOT 19 LOT 18 LOT 17 LOT 16

CONCESSION 5
WEST OF CENTRE ROAD



DRAWING NORTH

TRUE NORTH

LICENSED PROFESSIONAL ENGINEER
J. H. WARNER
100520016
APR. 20, 2022
PROVINCE OF ONTARIO

LEGEND

- DRAINAGE AREA
- JENNISON DRAIN
- MUNICIPAL DRAIN

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

DRAWING NAME: Jennison Drain Plan

PROJECT No. 2022–1448

APPROVED J. WARNER

CHECKED B. VAN RUITENBURG

DRAWN C. SAUNDERS

NO.	REVISIONS	DATE	BY
1	FINAL REPORT	APR. 20, 2023	CS

SCALE: 1:7500
0 100 200 300m

MUNICIPALITY of NORTH MIDDLESEX

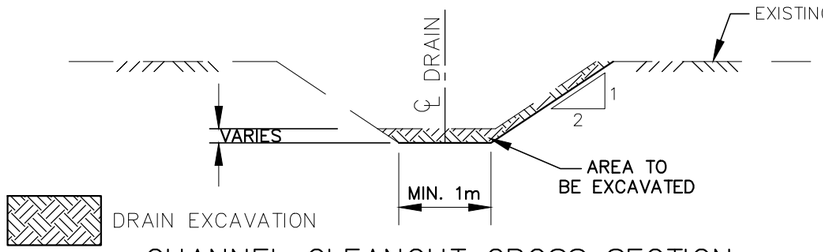
JENNISON DRAIN
PLAN

1 OF 2

Last Updated: February 17, 2023

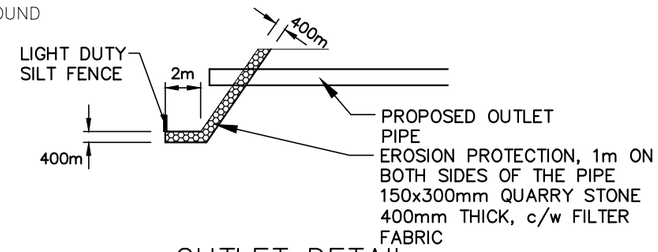
GENERAL NOTES

1. BENCHMARK No.1 FOR BRANCH 'A'. ELEV. 184.270
   TOP OF WOOD STAKE NEAR PROPOSED WORKS.
2. BENCHMARK No. 2 FOR BRANCH 'B'. ELEV. 184.530
   TOP OF WOOD STAKE NEAR PROPOSED WORKS.
3. UPPER NUMBERS ARE DEPTH FROM EXISTING GROUND TO INVERT OF PROPOSED TILE.



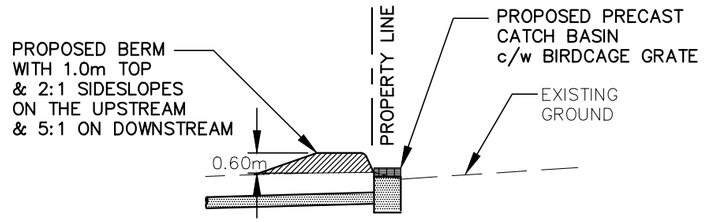
CHANNEL CLEANOUT CROSS SECTION STATION 0+010 TO 0+022 'BRANCH 'B'

NTS



OUTLET DETAIL

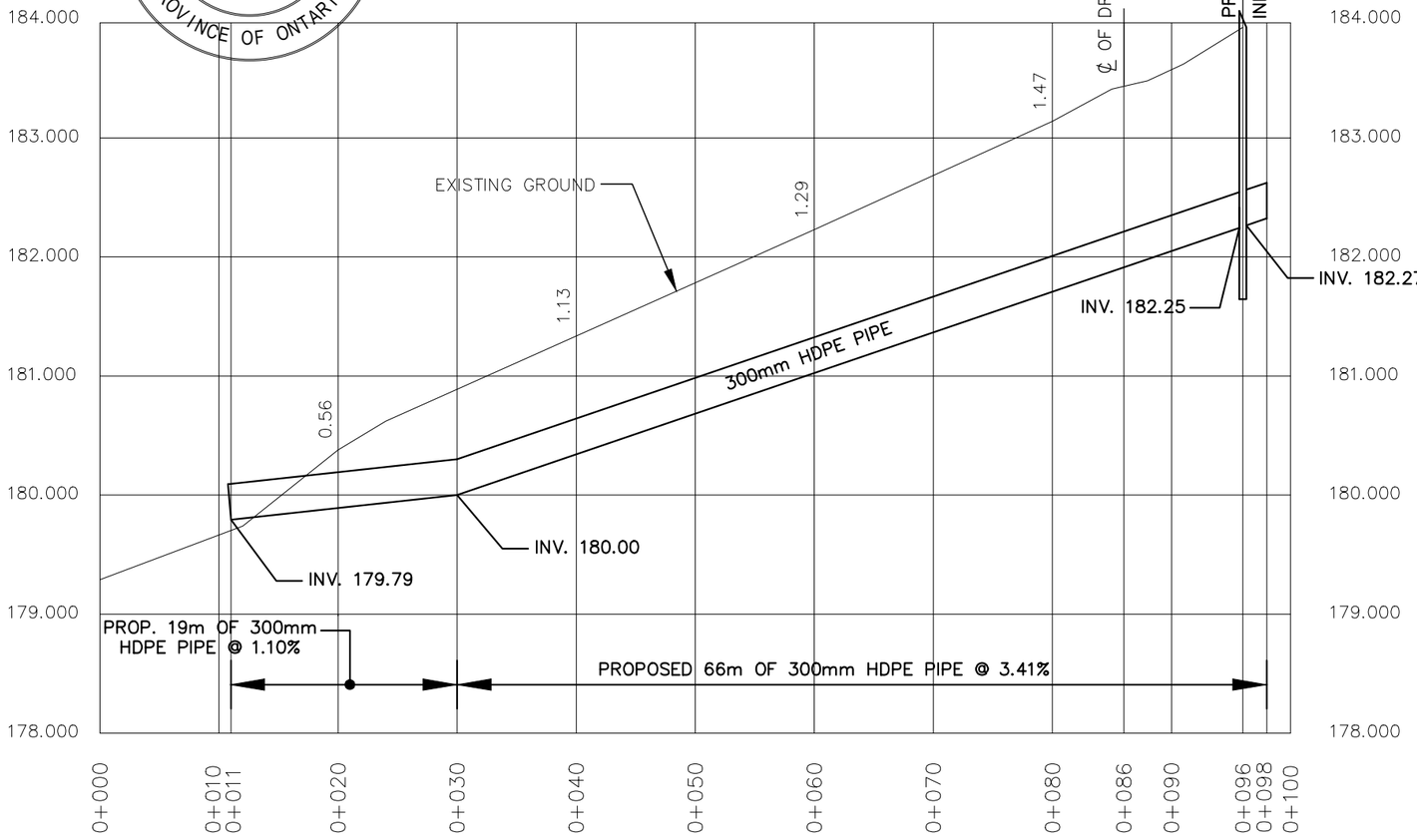
NTS



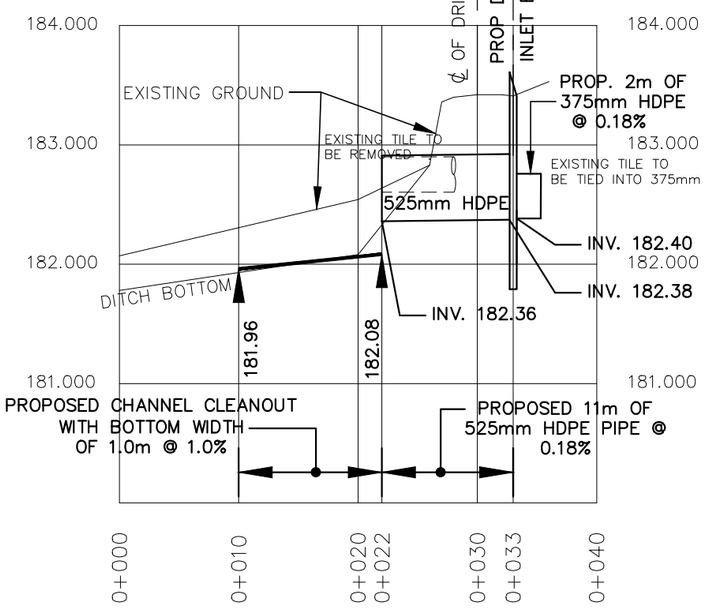
TYPICAL BERM DETAIL

NTS

BRANCH 'A'



BRANCH 'B'



Dobbin Engineering Inc.

4218 Oil Heritage Road
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Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME: Jennison Drain Profile & Details

PROJECT No. 2022-1448

APPROVED J. WARNER

CHECKED B. VAN RUITENBURG

DRAWN C. SAUNDERS

NO.	REVISIONS	DATE	BY
1	FINAL REPORT	APR. 20, 2023	CS

SCALE: 1:500
0 4 8 12m

MUNICIPALITY of NORTH MIDDLESEX

JENNISON DRAIN

PROFILE

2 OF 2

Last Updated: February 17, 2023