

June 24, 2025

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

Gentlemen and Mesdames:

Re: Pickering Drain (2025) and Carey Drain Extension Cleanout DRAFT

In accordance with your instructions, R. Dobbin Engineering Inc. has undertaken an examination of the Pickering Drain in the Municipality of North Middlesex.

Authorization under the Drainage Act

This Engineers Report that has been prepared under Section 78 of the Drainage Act as per a request from an affected Landowner.

R. Dobbin Engineering Inc. was appointed by council on October 16, 2024.

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

Existing Conditions

The Pickering Drain outlets into the Carey Drain Extension in Lot 30, North Boundary in the Municipality of North Middlesex. The drain continues northeasterly as an open channel to approximately 200m east of Blackbush Line in the Municipality of South Huron. It then continues as a 200mm dia. tile drain to the east limit of Lot 27, South Boundary.

Below is a summary of the condition of the existing culverts:

Culvert Number	Roll Number / Owner	Existing Culvert	Condition	Recommendation
	000-070-028 (Jerry McCann Holding Ltd.)	1200mm dia. CSP	To Be Removed by Owner. No longer required due to reroute.	
1*	000-070-029 (J C Rutten Farms Inc.)	1000mm dia. CSP	Okay. Minor Rust below waterline. Perched	Leave and Specify for Future Replacement
2	000-070-029 (J C Rutten Farms Inc.)	1000mm dia. CSP	Okay. Minor Rust below waterline. Perched	Leave and Specify for Future Replacement
3	000-050-001 (K. Knip)	900mm dia. HDPE	Good	Leave and Specify for Future Replacement
4	Mount Carmel Drive	900mm dia. HDPE	Good	Leave and Specify for Future Replacement

* denotes a secondary access culvert.

Background

Under an Engineer's report dated February 1, 1957 the Pickering Drain was constructed.

Drain Classification

The Pickering Drain is currently classified as a Class "F" Drain and the Carey Drain Extension is classified as a Class "C" Drain. This is according to the Department of Fisheries and Oceans (DFO) classification as presented by the Ontario Ministry of Agriculture, Food and Rural Affairs' Agricultural Information Atlas.

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.

On-Site Meeting

A site meeting was held on December 4th, 2024.

The following were present at the meeting:

- Josh Warner (R. Dobbin Engineering)
- Joanne Sadler (Drainage Superintendent, Municipality of North Middlesex)
- Jared Tweddle (County of Middlesex)

Due to a mail strike, some of the Landowners did not receive their notices in time for the meeting. The Landowners abutting the drain were individually called. Jerry McCann outlined that he would like to re-route the lowest portion of the drain to the east property line. He stated that he did not have any other requests on the drain. Dave McCann, John Rutten, Kalven Kip, Brent Dixon and Steven McCann were also called and no additional work was requested. The Municipality of North Middlesex requested that a new profile, Schedule of Maintenance and culvert specifications be developed for the drain south of Mount Carmel Drive.

Design

The access culverts have been designed to provide outlet for a 1 in 5-year storm event.

The County Road culvert has been designed to provide outlet for a 1 in 100-year storm event.

Recommendations

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

1. The channel on the property with Roll Number 000-070-028 shall be re-routed to the east property line. The existing Pickering Drain on this property shall be abandoned as part of the drainage works.
2. Future specifications and maintenance provisions shall be developed for the open channel and culverts within the Municipality of North Middlesex.

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 \$72,700, 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.

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. As per Section 26 of the Drainage Act, the roads and utilities have been assessed the increased cost of the drainage works caused by the existence of the works of the public utility or road. The engineering for the road crossing has been assessed with 100% of the estimated cost applied as a benefit assessment to the road authority.
2. The open channel relocation on the property with Roll Number 000-070-028 has been assessed with any cost above a standard cleanout applied to the requesting property as a benefit assessment.
3. The engineering to specify the future replacement of Culvert #1 has been assessed to the property as a special benefit assessment as it is a secondary access and will not be eligible for the 1/3 grant based on the current Agricultural Drainage Infrastructure Program (ADIP) policies.
4. The remaining cost of the drainage works has generally been assessed with 50% of the cost applied as a benefit assessment and the remainder applied as outlet assessment to the upstream lands and roads based on equivalent hectares.

All final costs included in the cost estimate of this report, except as identified above, shall be pro-rated based on the Schedule of Assessment. Any additional costs shall be assessed in a manner as determined by the Engineer in accordance with the Drainage Act.

Allowances

Under Section 29 of the Drainage Act, the Engineer in his 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.

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 \$50,000.00 per hectare (\$20,000.00 per acre). Allowances for crop loss are based on \$2,000.00 per hectare for the first year and \$1,000.00 for the second year (\$3,000.00 per hectare total).

Access and Working Area

Access to the work site for construction shall be from Mount Carmel Drive and along the east side of the property with Roll Number 000-070-028 and along the length of the drainage works. Access shall be restricted to a width of 6m. The working area shall be as identified on the detail plan and may extend a maximum of 4m onto the property with Roll Number 000-070-029 if required at the discretion of the Engineer.

Access for future culvert maintenance and channel repair on a single property shall be from the nearest road, within the properties in which the culvert and/or channel is being repaired or maintained and shall be at a location determined by the Drainage Superintendent. If maintenance is being done on multiple properties, access shall be gained from the nearest roadway and shall be along the length of the drainage works. The working area at each culvert shall extend 10 metres from the bank on both sides and for 10 metres along the channel on either side of the culvert.

The working side for future maintenance shall extend 15m past the bank on either side of the drain and shall be determined by the Drainage Superintendent.

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.

The special benefit assessment to the property with 000-070-029 will not be eligible for grant based on the on the current Agricultural Drainage Infrastructure Program (ADIP) policies.

Maintenance

The Pickering Drain within the Municipality of North Middlesex shall be maintained and repaired in the same proportions as contained in the Schedule of Maintenance.

The access culverts shall be maintained and repaired with a culvert length required to provide an 8m top width. With the culverts included in the drawings, including rip rap end walls, they shall be assessed in the following manner:

Culvert Number	Benefiting Lands	Upstream Properties Based on Equivalent Hectares as Contained in the Schedule of Maintenance
1	100% (Secondary Access)	
2, 3	50%	50%
4	100% to Road Authority, except Utility Costs	

If any owner requests an additional length of culvert beyond that required to have an 8m top width or an asphalt travel surface the extra cost shall be borne by the Landowner making the request including the future maintenance and repair. The location of the 8m top width shall be determined by the Drainage Superintendent and shall generally be in the primary access location.

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.

A secondary access on a property shall be constructed, maintained and repaired with 100% of the cost assessed to the benefitting property.

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

Pickering Drain (2025) and Carey Drain Extension Cleanout
Municipality of North Middlesex
June 24, 2025

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 (\$)	Section 30 (\$)	Total (\$)
North Boundary	Lot 29	000-070-029	J C Rutten Farms Inc	-	480	480
	Lot 30	000-070-028	Jerry Mccann Holding Ltd	-	3,600	3,600
TOTAL ALLOWANCES				\$0	\$4,080	\$4,080

Estimate of Cost

<u>Item Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Total (\$)</u>
Pre-Construction Meeting	1	LS	400	400
Brushing and Tree Removal	1	LS	400	400
Excavation of Carey Drain Extension and Placement of Material Adjacent Existing Pickering Drain (Station 0+134 to 0+286)	152	m	15	2,280
Strip Topsoil on Proposed Channel Route and Place Adjacent Existing Channel (Station 0+286 to 0+593)	307	m	10	3,070
Excavation of Open Channel and Placement of Material Adjacent Existing Channel (Station 0+286 to 0+593)	307	m	50	15,350
Rip Rap	100	t	110	11,000
Restoration/Seeding c/w Straw Matting (2,700 sq.m for side slopes)	1	LS	10,000	10,000
Silt Fence	1	LS	200	200
Contingency				2,130
	Sub Total			44,830
	Allowances			4,080
	Engineering			7,860
	Future Culvert Design			6,000
	Schedule of Maintenance and Profile Update			3,800
	Estimate for Tendering, Inspection and Contract Administration			4,500
	ABCA Fee			450
	Total Estimate excluding HST			71,520
	Non-Recoverable HST (1.76%)			1,180
	Total Estimate			\$ 72,700

SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
Municipality of South Huron								
Public Lands								
	Blackbush Line	0.59		Municipality of South Huron		-	79	79
	Mount Carmel Drive (County Road #5)	2.36		County of Huron		750	320	1,070
					-	-	399	1,149
Agricultural Lands								
South	E 1/2 Lot 25 & Lot 24	1.21	27-042	Limerick Acres 2015 Ltd		-	40	40
Boundary	W 1/2 Lot 25 & E 1/2 Lot 26	13.35	27-040	S&F McCann		-	455	455
	W 1/2 Lot 26	17.00	27-039	S. McCann / Limerick Acres 2015 Ltd.		-	575	575
	Lot 27	35.20	27-037	McCixon Farms Ltd.		-	1,193	1,193
	Lot 28	10.52	27-036	J.A McCann and Sons Ltd.		-	355	355
					-	-	2,618	2,618
Non-Agricultural Lands								
14	W Pt. Lot 3 & SW Pt. Lot 4	4.04	14-002	Municipality of South Huron		-	136	136
					-	-	136	136
				Total - Non-Agricultural Lands	136			
				Total - Public Lands	1,149			
				Total Agricultural Lands	2,618			
				Total - Municipality of South Huron	3,903			

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
Municipality of North Middlesex								
Public Lands								
	Salem Road	0.52		Municipality of North Middlesex		-	69	69
	Mount Carmel Drive (County Road #5)	2.36		County of Middlesex		750	322	1,072
					-	750	391	1,141
Agricultural Lands								
North	E 3/4 Lot 26	6.07	000-050-051	Rutten Farms Ltd		-	207	207
Boundary	W 1/4 Lot 26 & Lot 27	17.00	000-050-050	Rutten Family Farms Limited		-	575	575
	Lot 28	16.19	000-050-001	K. Knip		1,369	389	1,758
	Lot 29	12.14	000-070-029	J C Rutten Farms Inc	1,500	1,590	181	3,271
	Lot 30	1.62	000-070-028	Jerry Mccann Holding Ltd		61,845	-	61,845
					1,500	64,804	1,352	67,656
Total - Public Lands					1,141			
Total Agricultural Lands					67,656			
Total - Municipality of North Middlesex					68,797			
Total - Municipality of South Huron					3,903			
Total Assessment					\$72,700			

Estimated Net Assessment

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

Conc.	Lot or Part	Affected Hecatares	Roll No.	Owner	Total Assessment (\$)	Estimated Grant (\$)	Allowances (\$)	Estimated Net Assessment (\$)
Municipality of South Huron								
Public Lands								
	Blackbush Line	0.59		Municipality of South Huron	79			79
	Mount Carmel Drive (County Road #5)	2.36		County of Huron	1,070			1,070
Agricultural Lands								
South	E 1/2 Lot 25 & Lot 24	1.21	27-042	Limerick Acres 2015 Ltd	40	13		27
Boundary	W 1/2 Lot 25 & E 1/2 Lot 26	13.35	27-040	S&F McCann	455	152		303
	W 1/2 Lot 26	17.00	27-039	S. McCann / Limerick Acres 2015 Ltd	575	192		383
	Lot 27	35.20	27-037	McCixon Farms Ltd.	1,193	398		795
	Lot 28	10.52	27-036	J.A McCann and Sons Ltd.	355	118		237
Non-Agricultural Lands								
14	W Pt. Lot 3 & SW Pt. Lot 4	4.04	14-002	Municipality of South Huron	136			136
Municipality of North Middlesex								
Public Lands								
	Salem Road	0.52		Municipality of North Middlesex	69			69
	Mount Carmel Drive (County Road #5)	2.36		County of Middlesex	1,072			1,072
Agricultural Lands								
North	E 3/4 Lot 26	6.07	000-050-051	Rutten Farms Ltd	207	69		138
Boundary	W 1/4 Lot 26 & Lot 27	17.00	000-050-050	Rutten Family Farms Limited	575	192		383
	Lot 28	16.19	000-050-001	K. Knip	1,758	586		1,172
	Lot 29	12.14	000-070-029	J C Rutten Farms Inc	3,271	590	480	2,201
	Lot 30	1.62	000-070-028	Jerry Mccann Holding Ltd	61,845	20,615	3,600	37,630
					72,700	22,925	4,080	45,695

SCHEDULE OF MAINTENANCE

To Maintain the Pickering Drain with the Municipality of North Middlesex (Station 0+286 to 1+605)

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Eq. Ha
Municipality of South Huron								
Public Lands								
	Blackbush Line	0.59		Municipality of South Huron	-	8	8	2.36
	Mount Carmel Drive (County Road #5)	2.36		County of Huron	-	34	34	9.44
					-	42	42	
Agricultural Lands								
South	E 1/2 Lot 25 & Lot 24	1.21	27-042	Limerick Acres 2015 Ltd	-	4	4	1.21
Boundary	W 1/2 Lot 25 & E 1/2 Lot 26	13.35	27-040	S&F McCann	-	48	48	13.35
	W 1/2 Lot 26	17.00	27-039	S. McCann / Limerick Acres 2015 Ltd.	-	60	60	17.00
	Lot 27	35.20	27-037	McCixon Farms Ltd.	-	125	125	35.20
	Lot 28	10.52	27-036	J.A McCann and Sons Ltd.	-	37	37	10.52
					-	274	274	
Non-Agricultural Lands								
	14 W Pt. Lot 3 & SW Pt. Lot 4	4.04	14-002	Municipality of South Huron	-	14	14	4.04
					-	14	14	
				Total - Non-Agricultural Lands	14			
				Total - Public Lands	42			
				Total Agricultural Lands	274			
				Total - Municipality of South Huron	330			

Conc.	Lot or Part	Affected Hecatares	Roll No.	Owner	Benefit	Outlet	Total	Eq. Ha
Municipality of North Middlesex								
Public Lands								
	Salem Road	0.52		Municipality of North Middlesex	-	7	7	2.08
	Mount Carmel Drive (County Road #5)	2.36		County of Middlesex	-	34	34	9.44
					-	41	41	
Agricultural Lands								
North	E 3/4 Lot 26	6.07	000-050-051	Rutten Farms Ltd	-	22	22	6.07
Boundary	W 1/4 Lot 26 & Lot 27	17.00	000-050-050	Rutten Family Farms Limited	-	60	60	17.00
	Lot 28	16.19	000-050-001	K. Knip	163	37	200	16.19
	Lot 29	12.14	000-070-029	J C Rutten Farms Inc	221	9	230	12.14
	Lot 30	1.62	000-070-028	Jerry Mccann Holding Ltd	117	-	117	1.62
					501	128	629	
				Total - Public Lands	41			
				Total Agricultural Lands	629			
				Total - Municipality of North Middlesex	670			
				Total - Municipality of South Huron	330			
				Total Assessment	\$1,000			

Pickering Drain (2025) and Carey Drain Extension Cleanout
Municipality of North Middlesex
June 24, 2025

SPECIFICATION OF WORK

1. Location

The work in this specification is located in Lot 28, 29 and 30, North Boundary in The Municipality of North Middlesex.

2. Scope of Work

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

- 152m of Open Channel Cleanout on the Carey Drain Extension
- 307m of rerouting the open channel on the Pickering Drain
- Future open channel maintenance
- Future culvert replacements

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 and Engineer who may vary these specifications as to minor details but in no way decrease the proposed capacity of the drain.

4. Plans and Specifications

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.

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. Utilities

The Contractor is responsible for organizing locates and exposing all the utilities along the length of the drainage works. The utilities shall be located prior to the installation of any tile. If any utilities interfere with the proposed drainage works in a manner not shown on the accompanying Estimate of Cost or profile the Contractor shall notify the Drainage Superintendent and Engineer.

The Contractor is responsible for coordinating the replacement of additional utilities with the utility company if they interfere with the proposed drain. All costs for the utility to replace their services will be outside of this report and shall be borne by the utility as per Section 26 of the Drainage Act.

All additional costs to work around and organize replacement of the utilities not included in the estimate shall be tracked separately and the cost plus a portion of the engineering (20% of the cost) shall be borne by that utility.

7. 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. The Traffic Plan must be approved by the Municipality and County prior to the commencement of any road closures.

- 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.
- d) If work is being completed on a Road and or Road Allowance in North Middlesex, the Contractor is required to complete a Road Allowance Work Permit Application available on their website: <https://www.northmiddlesex.on.ca/media/591>. No fees are required.

8. 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.

9. Access and Working Area

Access to the work site for construction shall be from Mount Carmel Drive and along the east side of the property with Roll Number 000-070-028 and along the length of the drainage works. Access shall be restricted to a width of 6m. The working area shall be as identified on the detail plan and may extend a maximum of 4m onto the property with Roll Number 000-070-029 if required at the discretion of the Engineer.

Access for future culvert maintenance and channel repair on a single property shall be from the nearest road, within the properties in which the culvert and/or channel is being repaired or maintained and shall be at a location determined by the Drainage Superintendent. If maintenance is being done on multiple properties, access shall be gained from the nearest roadway and shall be along the length of the drainage works. The working area at each culvert shall extend 10 metres from the bank on both sides and for 10 metres along the channel on either side of the culvert.

The working side for future maintenance shall extend 15m past the bank on either side of the drain and shall be determined by the Drainage Superintendent.

10. 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.

11. Removals (Future)

Future culverts, and unsuitable excavated material shall be removed in their entirety and shall be disposed offsite at the expense of the Contractor.

12. Brushing and Tree Removal

For construction and future maintenance all brush, trees, woody vegetation, stumps etc. shall be removed within the channel cross-section and within the working area in order to facilitate construction as determined by the Drainage Superintendent or Engineer. For construction, the trees within the existing Pickering Drain, that is to be abandoned, shall remain in place and shall be removed by the Landowner.

A mechanical grinder attached to an excavator shall 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 discretion of the Drainage Superintendent or Engineer.

13. Strip and Place Topsoil

The topsoil shall be stripped along the proposed channel route. The topsoil shall be placed at the edge of the working allowance as outlined on the drawings in order to allow the Landowner to fill in the existing channel.

14. Excavation of Open Channel

For construction and future maintenance, 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.

For construction, the excavated material shall be stockpiled on the east side of the abandoned portion of the Pickering Drain. The Landowner will utilize this material to fill in the channel outside of this Contract.

For future maintenance, excavated material is to be levelled on the side it is being excavated from. Excavated material shall be cast 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 outside of the bush and shall be left in a condition suitable for cultivation. This shall include the removal of any rocks larger than 10cm in diameter and any debris/wood that could damage or plug farm equipment. Leveling shall occur when the material is dry enough to do so as determined by the Drainage Superintendent or Engineer. All high spots above grade shall be removed. The sediment shall be removed leaving a rounded bottom with the intent not to undercut the side slopes. All material unfit for placing on farmlands, as determined by the Drainage Superintendent, shall be disposed of offsite by the Contractor.

15. Installation of Culverts (Future)

The Contractor is required to notify the Landowner forty-eight (48) hours prior to the removal of a culvert.

The minimum cover is not always adequate during construction and it is the Contractors responsibility to provide additional cover to avoid damage to the pipe.

The Contractor shall supply, install, and backfill aluminized corrugated steel pipe with a minimum wall thickness of 2.8mm for all access culverts. Corrugated Steel Pipe Arches and Road Culverts shall have a minimum wall thickness of 3.5mm. All corrugation profiles shall be of helical lock seam manufacture using 68 x 13mm corrugations for 1600mm dia. pipe and smaller and 125 x 25mm corrugations for 1800mm dia. pipe and larger. Pipe with 125 x 25mm corrugations shall be used if 68 x 13mm corrugations are not available.

The culverts designated to be replaced in the future under this report shall be examined after any cleanout of the open channel as to its condition. If it is found to be in disrepair (i.e. there are holes corroded in the bottom or sides) it shall be replaced as per these specifications.

The culverts shall be installed generally in the same location or as approved by the Drainage Superintendent or Engineer. The culverts shall be installed with the invert 10% (minimum 150mm) below the original channel bottom elevation unless otherwise shown in order to achieve the minimum cover.

All culverts may have concrete block or rip rap end walls. The access culverts shall be assessed, as per the report, to provide an 8m access width. If an owner requests a longer culvert than that required to achieve an 8m top width, please refer to the report. All culvert lengths are based on utilizing rip rap end walls.

The pipes that shall be extended upstream or downstream of the proposed culvert shall be done with non-perforated HDPE agricultural tubing with a manufactured coupling, elbow and rodent grate.

Access Culverts:

The bottom of the excavation shall be excavated to a minimum of 100mm below the proposed invert. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with ¾" clear stone and wrapped in filter fabric from the bottom of the excavation to the spring line of the pipe, this shall be considered the bedding. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm so that the pipe is not displaced. The access culverts shall be backfilled from the spring line or bottom to within 150mm of finished grade with granular "B" Type II. The top 150mm shall be backfilled with OPS granular "A" material to finished grade. If asphalt is proposed, the asphalt shall be HL4 and shall match the existing thickness. In these cases, the granular "A" shall occupy 150mm below the proposed asphalt. Excavated material may be utilized to build up the adjacent access laneways to blend with the required cover height. Granular "A" shall be utilized, at the discretion of the Engineer or Drainage Superintendent, in the vicinity of the proposed culverts in order to provide a suitable finished surface.

Road Culverts:

Where there is asphalt, the asphalt shall be sawcut and milled for a thickness of 45mm and 0.30m past the joint. The milled surface shall be tack coated as per OPSS.

The bottom of the excavation shall be excavated to a minimum of 100mm below the proposed invert. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with ¾" clear stone and wrapped in filter fabric from the bottom of the excavation to the spring line of the pipe, this shall be considered the bedding. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm so that the pipe is not displaced. The pipe shall be backfilled above the clear stone with OPS Granular "A".

Asphalt Road: The asphalt shall be HL4 and HL3 at depths to match the existing thickness with a minimum thickness of 50mm for each.

Gravel Road: The top 200mm shall be OPS Granular “M”, produced from 100% crushed dolomite, and shall be mechanically compacted to 100% modified standard proctor density.

If rip rap end walls are used, they shall consist of 150mm x 300mm quarry stone or approved equal. The area to receive the rip rap shall be graded to a depth of 400mm below finished grade. Filter fabric (Mirafi P150 or approved equal) shall then be placed with any joints overlapped a minimum 600mm. 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 block end walls are used, they shall consist of concrete blocks with dimensions of approx. 600mm x 600mm x 1200mm, 600mm x 600mm x 2400mm or 300mm x 600mm x 1200mm as required. 600mm x 600mm x 2400mm concrete blocks will be paid at twice the unit price established per block, all others will be at a unit of 1. 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. 2400mm wide concrete blocks shall be used as the top block on arch and larger round pipes in order to span between the culvert top and the supporting block. The blocks shall be set at each end of the culvert so that each row of blocks will be offset approx. 100mm 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 300mm into each bank and shall extend into the drain bottom to match the pipe invert or below. Erosion protection shall be placed on the banks next to the end walls. The erosion protection shall consist of 150mm x 300mm quarry stone over filter fabric (Terrafix 270R or approved equal). It shall extend 500mm upstream or downstream and from top of bank to top of bank at each end wall.

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 end wall a finished appearance.

The future culvert replacements shall be to the following sizes, at a minimum, and may be replaced with an equivalent sized arch, round pipe or box culvert at the discretion of the Drainage Superintendent. Approved equivalents must have an equal end area or greater.

Culvert Number	Roll Number / Owner	Existing Culvert	Replacement Culvert
	000-070-028 (Jerry McCann Holding Ltd.)	1200mm dia. CSP	To Be Removed by Owner. No longer required due to reroute.

1	000-070-029 (J C Rutten Farms Inc.)	1000mm dia. CSP	1400mm dia. CSP
2	000-070-029 (J C Rutten Farms Inc.)	1000mm dia. CSP	1400mm dia. CSP
3	000-050-001 (K. Knip)	900mm dia. HDPE	1400mm dia. CSP
4	Mount Carmel Drive	900mm dia. HDPE	1800mm dia. CSP

Bold Culverts Represents those proposed to be replaced or removed under this report

16. Seeding/Restoration

All areas disturbed by construction shall be restored to their pre-construction state.

All grass areas disturbed by construction, shall be restored with 50mm of screened topsoil and hydro seeded. The side slopes of the open channel shall be restored with double straw matting and hydroseed. The timing of the seeding shall be approved by the Drainage Superintendent or Engineer.

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.

17. Rip Rap

Erosion protection made up of rip rap and filter fabric shall be installed in the locations outlined on the detailed plan and as determined by the Drainage Superintendent or Engineer at the time of construction.

All rip rap shall consist of 150mm x 300mm quarry stone or approved equal. The area to receive the rip rap shall be graded to a depth of 400mm below finished grade. After grading, a layer of filter fabric (Terrafix 270 R 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.

18. Subsurface Drainage

All existing subsurface drains encountered during construction shall be reconnected to the open channel unless otherwise noted on the drawings or as directed by the Drainage Superintendent.

A suitable length of equivalent sized PE agricultural tubing shall be used to connect the drain to the open channel and tile drain. 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.

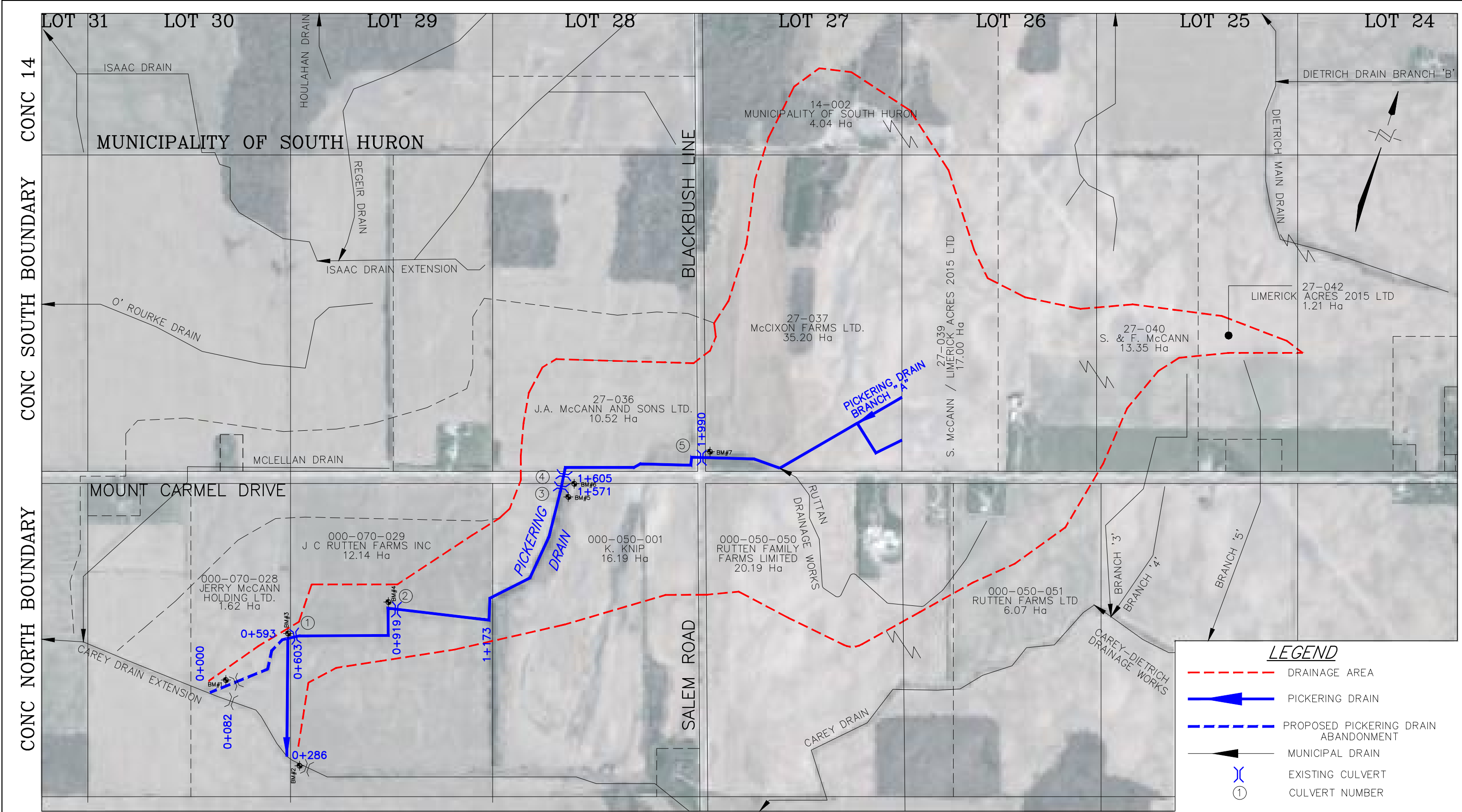
19. Environmental Considerations

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

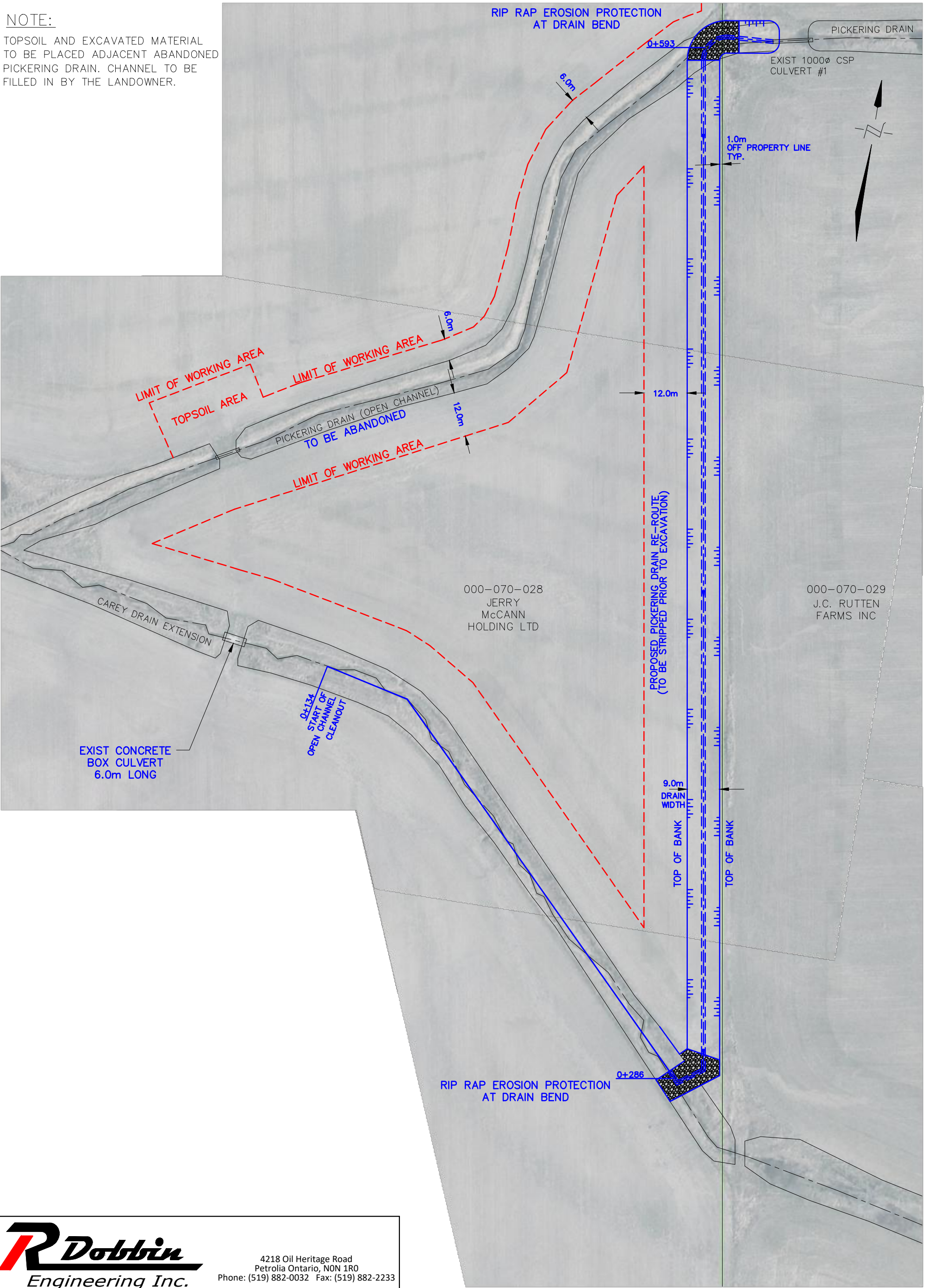
- Operate machinery in a manner that minimizes disturbance to the banks of the watercourse.
- Erosion and sediment control measures must be installed prior to construction to prevent sediment from entering the water body.
- Material shall not be in areas regulated by the Conservation Authority or Ministry 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 construction is complete.



NOTE:
TOPSOIL AND EXCAVATED MATERIAL
TO BE PLACED ADJACENT ABANDONED
PICKERING DRAIN. CHANNEL TO BE
FILLED IN BY THE LANDOWNER.





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

DRAWING NAME:
Pickering Drain Detail Plan

PROJECT No.
2024-1686

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	JUNE 24, 2025	CS
B. VAN RUITENBURG	SCALE: 1:1000 0 50 100 150m			
DRAWN				
C. SAUNDERS				

MUNICIPALITY OF NORTH - MIDDLESEX

PICKERING DRAIN
DETAIL PLAN

Last Updated: June 12, 2025

GENERAL NOTES

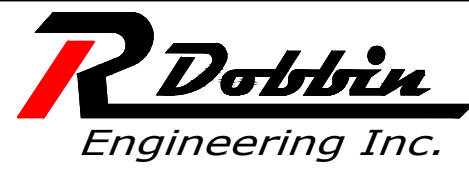
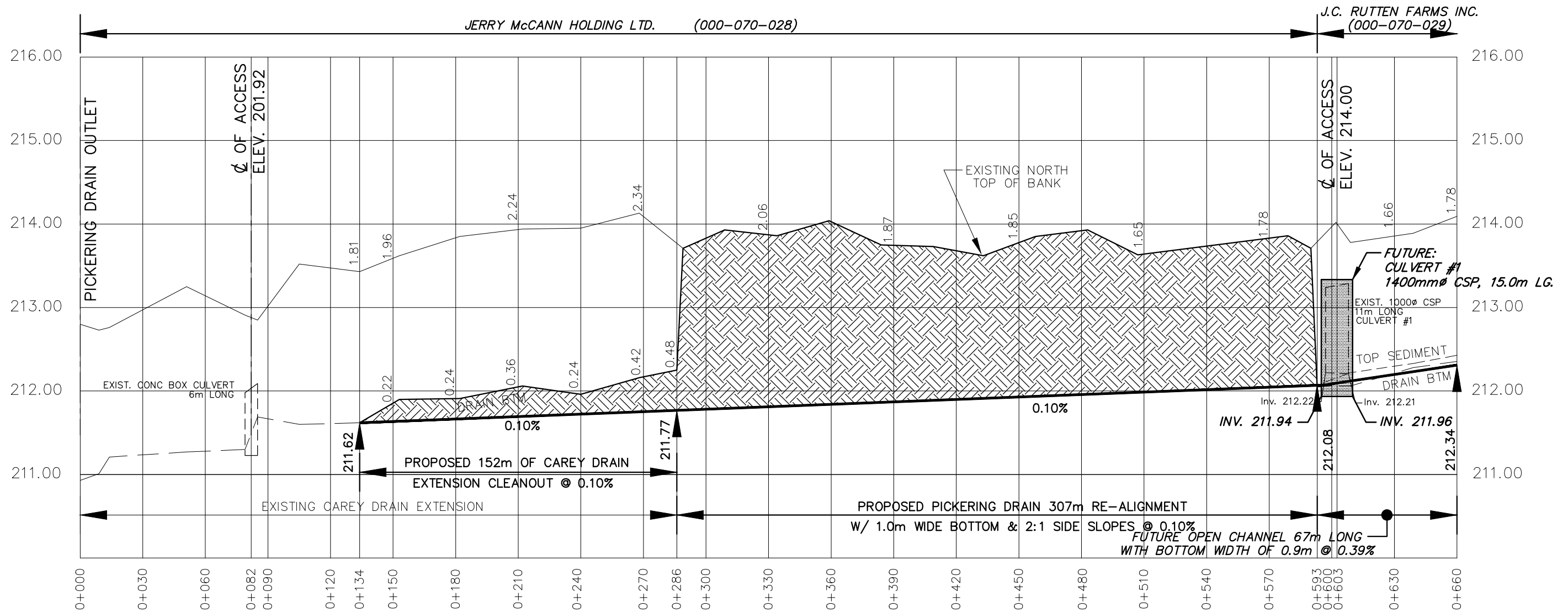
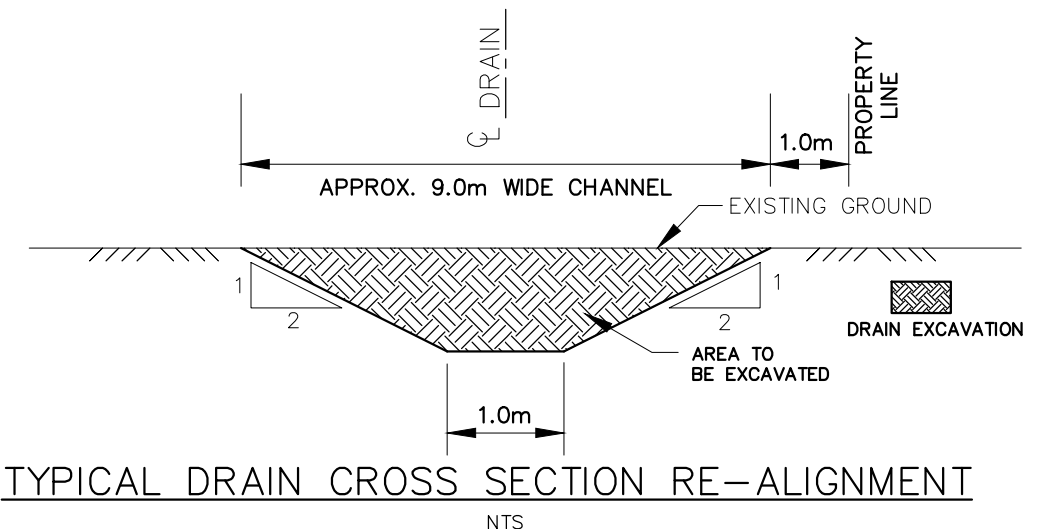
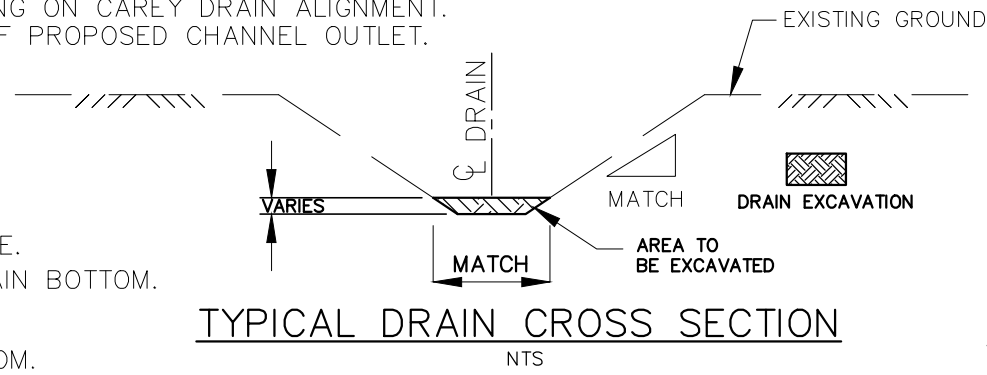
1. BENCHMARK No.1 ELEV. 212.89

TOP OF SOUTH END OF EXISTING 1200ø CSP CROSSING ON EXISTING PICKERING DRAIN +/- 60.0m FROM OUTLET.
- BENCHMARK No.2 ELEV. 214.03

TOP OF WEST END OF EXISTING 1500ø CSP CROSSING ON CAREY DRAIN ALIGNMENT. EAST OF PROPOSED CHANNEL OUTLET.
- BENCHMARK No.3 ELEV. 213.24

TOP OF WEST END OF EXISTING 1000ø CSP CROSSING ON PICKERING DRAIN ALIGNMENT. AT ST. 0+603
2. UPPER NUMBERS ARE DEPTH FROM GROUND TO BOTTOM OF PROPOSED DRAIN RE-ROUTE. AND FROM TOP OF NORTH BANK TO PROPOSED DRAIN BOTTOM.

2. LOWER NUMBERS ARE DEPTH FROM EXISTING DRAIN BOTTOM TO PROPOSED DRAIN BOTTOM.



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

DRAWING NAME: Carey Drain Extension and Pickering Drain Profile 1
PROJECT No. 2024-1686

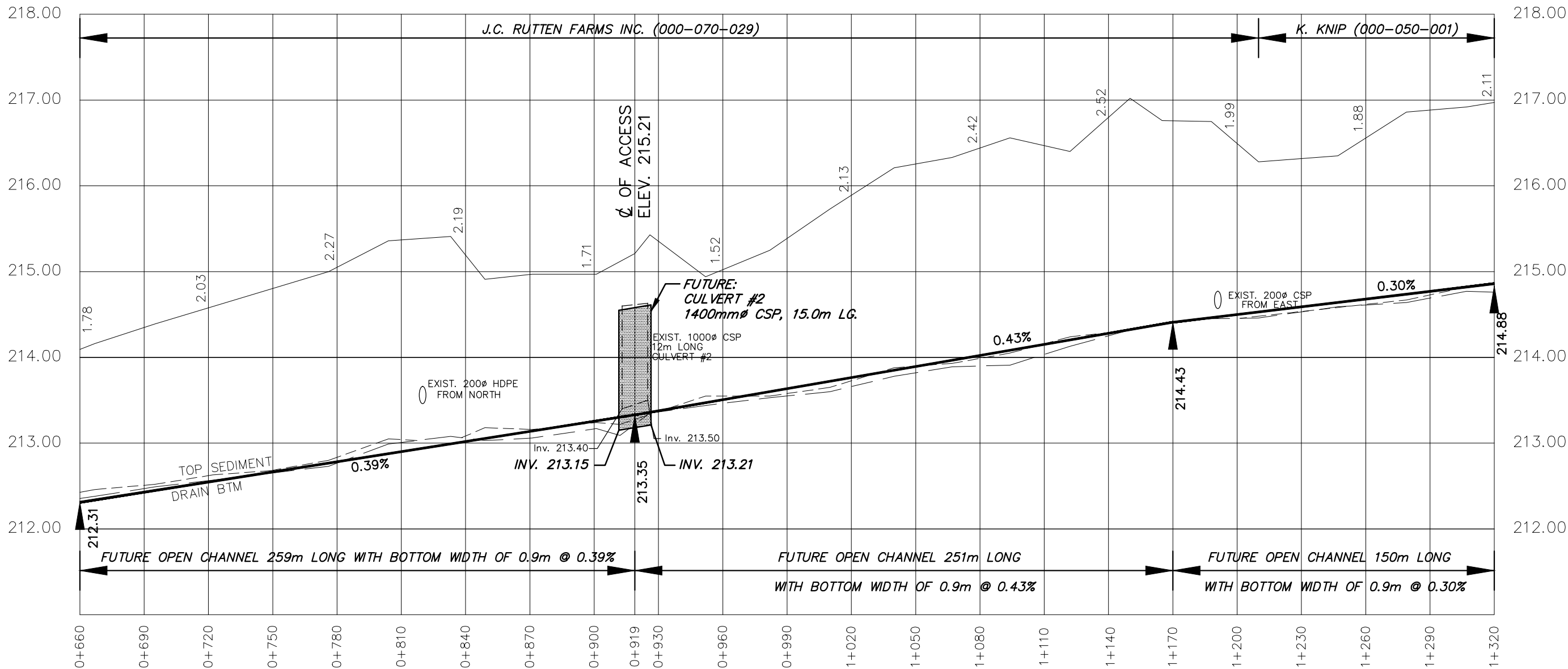
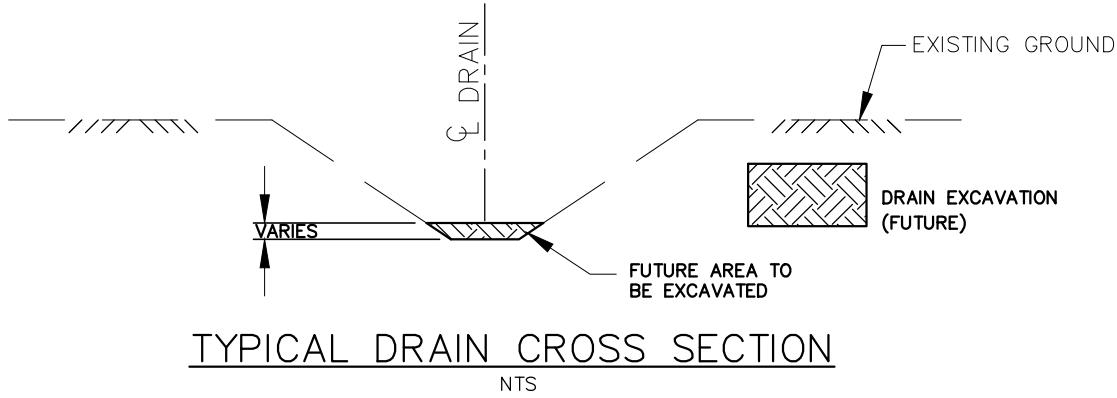
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	JUNE 24, 2025	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

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

MUNICIPALITY OF NORTH - MIDDLESEX
PICKERING DRAIN AND CAREY DRAIN EXTENSION
PROFILE

GENERAL NOTES

- 1. BENCHMARK No.4 ELEV. 214.60
TOP OF WEST END OF EXISTING 1000Ø CSP
ON THE PICKERING DRAIN.
AT ST. 0+919
- 2. UPPER NUMBERS ARE DEPTH FROM
GROUND TO BOTTOM OF PROPOSED DRAIN RE-ROUTE.
AND FROM TOP OF NORTH BANK TO PROPOSED DRAIN BOTTOM.



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

DRAWING NAME:
Pickering Drain Profile 2

PROJECT No.
2024-1686

APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	JUNE 24, 2025	CS
DRAWN C. SAUNDERS	SCALE: 1:2,000 0 20 40 60m			

MUNICIPALITY OF NORTH - MIDDLESEX

PICKERING DRAIN
PROFILE

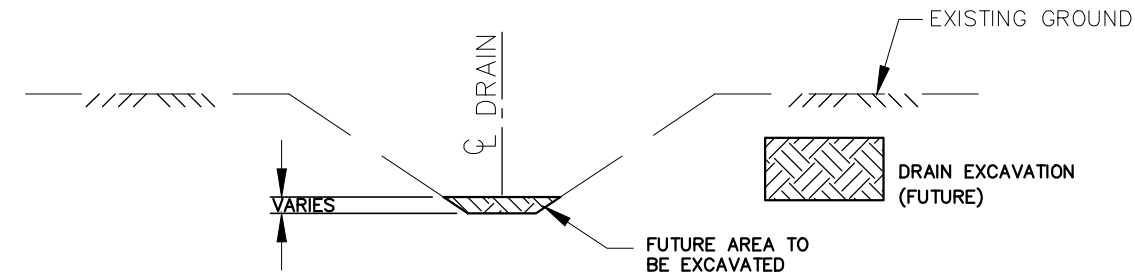
4
OF 7

Last Updated: June 12, 2025

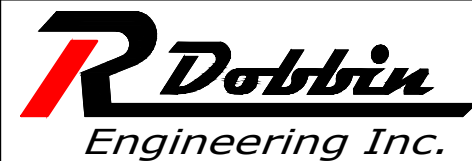
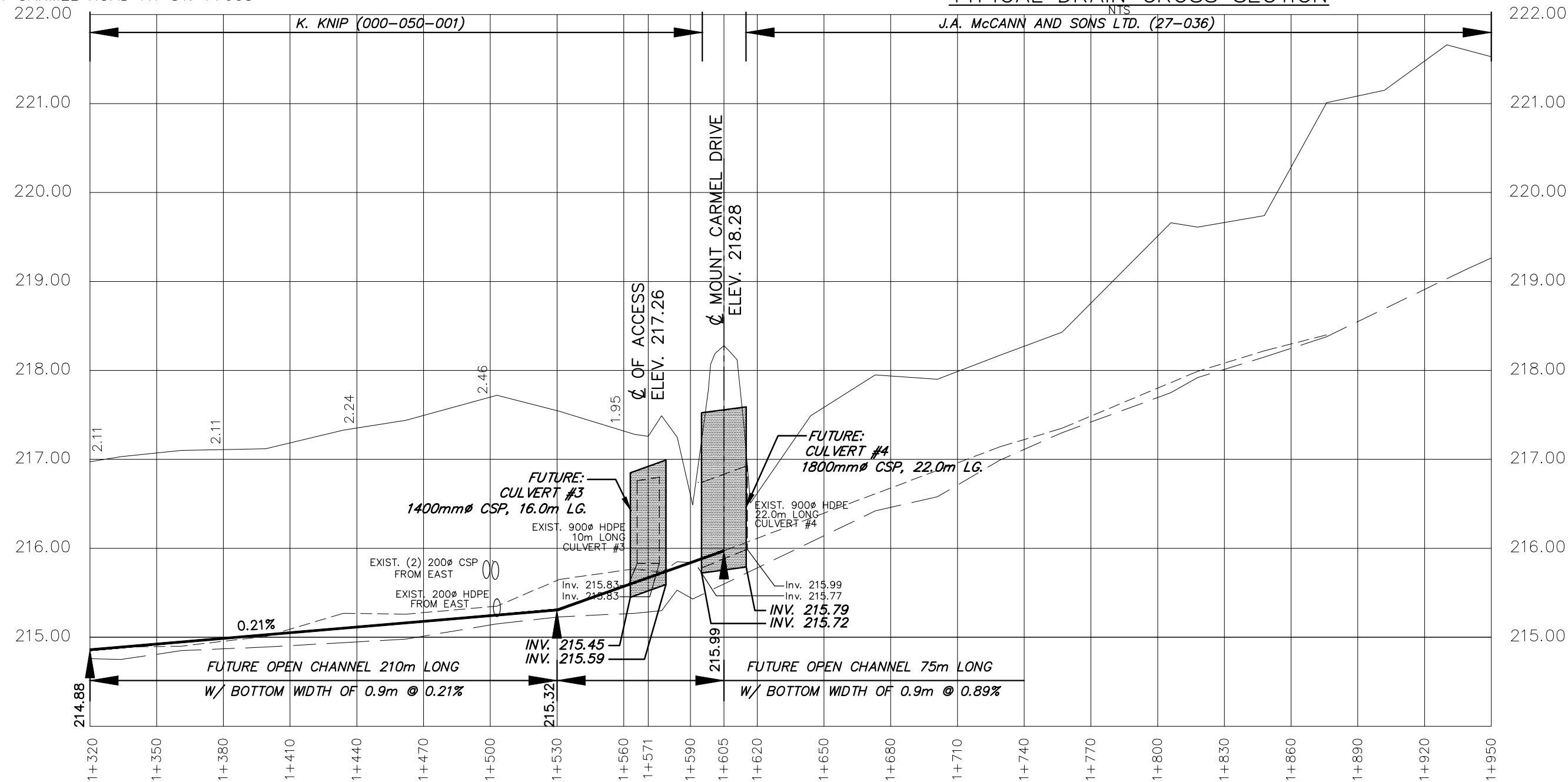
GENERAL NOTES

1. BENCHMARK No.5 ELEV. 216.76
TOP OF SOUTH END OF EXISTING 900Ø HDPE
ON THE PICKERING DRAIN CROSSING
AT ST. 1+571

BENCHMARK No.6 ELEV. 216.74
TOP OF SOUTH END OF EXISTING 900Ø HDPE
ON THE PICKERING DRAIN CROSSING
MOUNT CARMEL ROAD AT ST. 1+605



TYPICAL DRAIN CROSS SECTION



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

DRAWING NAME:
Pickering Drain Profile 3

PROJECT No.
2024-1686

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	JUNE 24, 2025	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

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

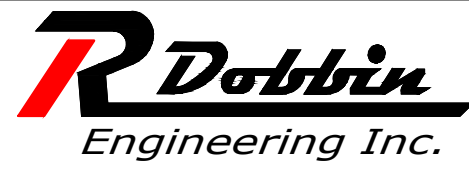
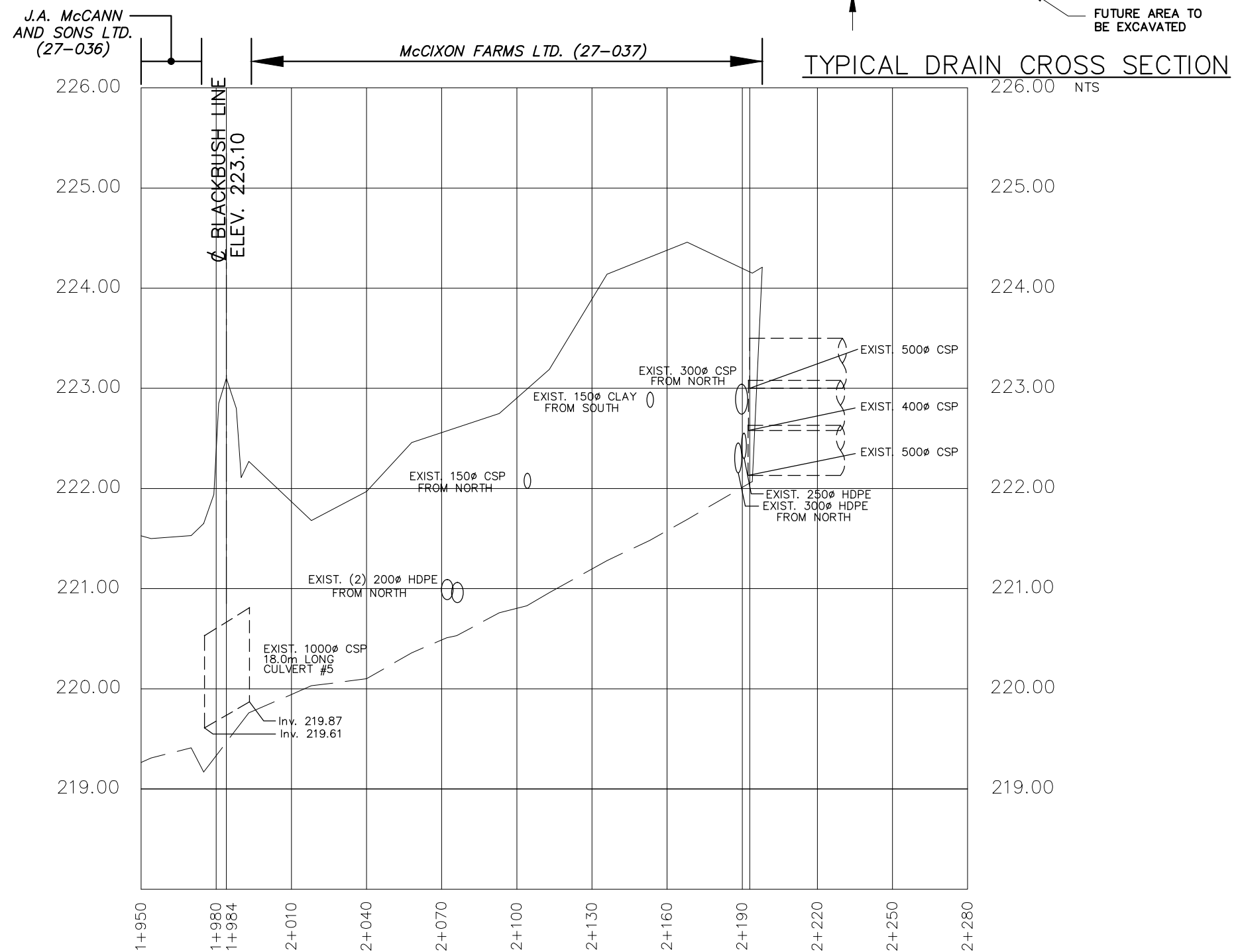
MUNICIPALITY OF NORTH - MIDDLESEX
PICKERING DRAIN
PROFILE

5
OF 7

Last Updated: June 12, 2025

GENERAL NOTES

1. BENCHMARK No.7 ELEV. 220.53
TOP OF EAST END OF EXISTING 1000Ø CSP
ON THE PICKERING DRAIN CROSSING
BLACKBUSH LINE AT ST. 1+984



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

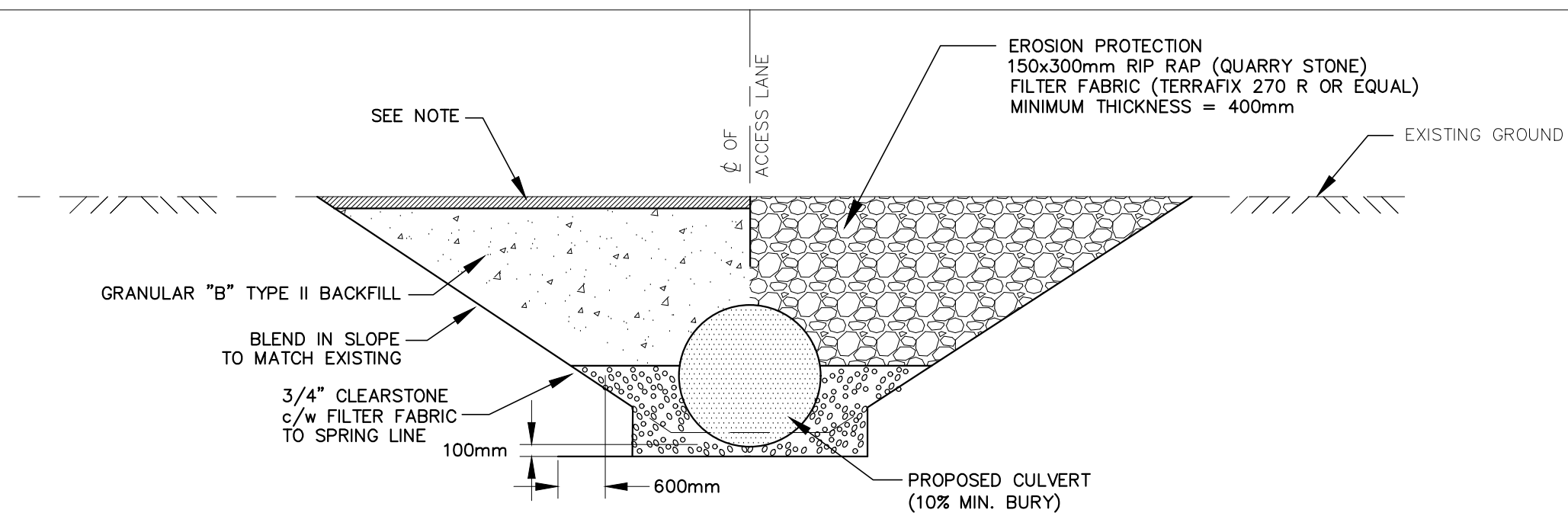
DRAWING NAME:
Pickering Drain Profile 4

PROJECT No.
2024-1686

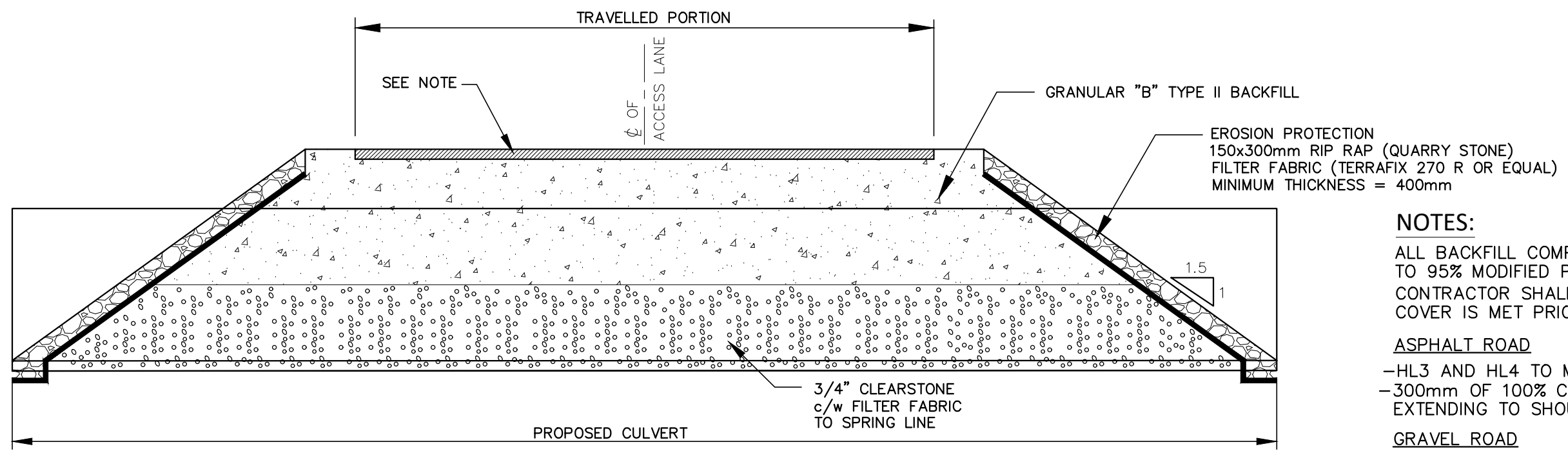
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	JUNE 24, 2025	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

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

MUNICIPALITY OF NORTH - MIDDLESEX
PICKERING DRAIN
PROFILE

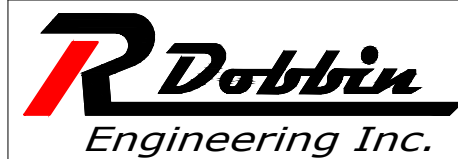


PROPOSED PIPE END SECTION



PROPOSED CROSS-SECTION

- NOTES:**
- ALL BACKFILL COMPACTED TO 95% MODIFIED PROCTOR DENSITY
 - CONTRACTOR SHALL ENSURE MINIMUM COVER IS MET PRIOR TO CROSSING
 - ASPHALT ROAD
 - HL3 AND HL4 TO MATCH EXISTING THICKNESS
 - 300mm OF 100% CRUSHED GRAN "A" EXTENDING TO SHOULDER
 - GRAVEL ROAD
 - 200mm OF OPS GRANULAR "M" (CRUSHED DOLOMITE SOURCE) TO MATCH EXISTING ROAD WIDTH
 - ACCESS CULVERT
 - 150mm OF 100% CRUSHED GRANULAR "A"



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

APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	JUNE 24, 2025	CS
DRAWN C. SAUNDERS	SCALE 1: 75			
	<div>0<div></div>2m</div>			

MUNICIPALITY of NORTH MIDDLESEX

PICKERING DRAIN

TYPICAL CULVERT DETAIL