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August 23, 2021

The Mayor and Council
The Town of Tecumseh
917 Lesperance Road
Tecumseh, Ontario
N8N 1W9

Attention: Mayor and Council

Re: Proposal to Amend the Curtis Drain Engineer's Report

Circumstances have arisen that requires the Curtis Drain Report, that has received final reading, to be amended under Section 84.1 of the Drainage Act. This letter sets out the reasons for such amendments and the criteria and process to finalize the amendments under Section 9 and 10 of O.Reg.500/21. The proposed amended report is attached in Appendix A and has the proposed changes in "italics" and "red" font.

Background

The Curtis Drain report was submitted on June 1, 2020. After delays due to COVID-19, the Meeting to Consider the report was held on March 9th, 2021. The Court of Revision was held on April 13th, 2021. The Curtis Drain report proposes the replacement of culverts and a cleanout of the open channel on the east side of Howard Avenue, north of County Road Number 8. As part of the engineering work for this drain R. Dobbin Engineering exposed all of the utilities that had the potential to conflict with the proposed culvert locations. Prior to finalizing the design R. Dobbin Engineering determined that four (4) gas services would require to be relocated in order for the culverts to be installed at the proper grade line and with adequate capacity. R. Dobbin Engineering then reached out to Enbridge Gas to have them co-ordinate the gas service relocations as all costs associated with their relocation would be assessed to Enbridge Gas as per Section 26 of the Drainage Act. At that time, Enbridge Gas stated that they would have the pre-work done.

Following the adoption of the report, R. Dobbin Engineering reached out to Enbridge Gas to inquire about the status of the service relocations. After considerable correspondence with Enbridge Gas, Enbridge indicated that under the circumstances presented, that they would apply the Franchise Agreement that they currently have with the Town of Tecumseh, and that the Town of Tecumseh would be responsible for 35% of the costs of relocating the gas services. Enbridge Gas also determined, in discussion with their consultant, that the cost per service relocation would be approximately $50,000 ($200,000 for four services).

Due to the high costs of the relocations, R. Dobbin Engineering proposed a solution that would only require one (1) gas service relocation, with the remaining three (3) service conflicts being resolved through the utilization of an arched and lengthened pipes. The estimated construction cost for one (1) gas service relocation and the culvert modifications would be approximately

$75,000. Due to the substantial costs savings, it was determined that this would be the best alternative.

Since the report has received final reading, the culverts can not simply be lengthened and changed because it will not be consistent with the by-law and the assessments for construction and future maintenance can not be fairly assessed. The report therefore requires to amendments.

Criteria for Amending the Engineer's Report

In order to amend an adopted Engineer's Report, Section 9 of O.Reg.500/21 requires that the engineer prepare a supporting document that addresses four (4) criteria. As part of this supporting document, the criteria with the explanation as to how each has been met is shown below:

9.1.i. the design changes to the drainage works are necessary due to unforeseen circumstances encountered during the construction of the drainage works,

> The design changes are necessary in order to reduce the costs of the drainage works on Enbridge Gas and the Town of Tecumseh (through the Franchise Agreement) due to unforeseen high costs to relocate the gas services. In consultation with the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA), it was determined that this section was meant to relate to any drainage project that was between final reading of the by-law and the finalization of the costs rather than physically in the construction stage. R. Dobbin Engineering therefore believes the requirements of this section have been met.

9.1.ii. the existing approvals for the drainage works allow for the design change to be made without requiring amendment to the approval,

> The design changes will not affect the capacity of the drainage works and will therefore not require amendments to the approvals.

9.1.iii. the design changes will not increase the cost of the total project by more than 133 per cent,

> The costs of this work will not amount to 133% increase in the total cost of the project and all of the additional costs will be assessed to the owner of the gas services.

9.1.iv. the design changes will not impact the existing drainage capacity.

> The proposed design changes have been hydraulically evaluated and will not negatively impact the existing drainage capacity.

Since R. Dobbin Engineering is of the opinion that the requirements of 9.1 are met, we have proceeded to satisfy 9.2 and 9.3 as per O.Reg.500/21, as below:

9.2. The engineer will prepare a revised design of the drainage works that sets out the changes that are being made to the design.

9.3. As soon as reasonably possible and before the passing of the by-law that contains the final price, the engineer shall submit the supporting document and the revised design to the council of the municipality in which the drainage works is located.

The amended report is located in Appendix A of this document.

Next Steps

O.Reg.500/21 outlines the process to approve the amendments to the Engineer's Report under section 10, as below:

10. Upon receipt of a revised design and supporting document, the council of the municipality shall,

(a) approve the revised design as an addendum to the by-law;

(b) assess any additional fees or expenditures of the engineer in accordance with the assessment schedule; and

(c) provide notice of the addendum to the by-law to all persons who own property that may be affected by the drainage works.

It is noted that any additional costs (including, but not limited to, engineering and construction) as a result of the culvert extensions and the gas service relocations will be assessed to owner of the gas utility as per Section 26 of the Drainage Act.

Should you have any questions feel free to contact the under signed at 519-882-0032, ext.204.

Yours truly,

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

APPENDIX A
AMENDED CURTIS DRAIN REPORT

Dobbin Engineering Inc.
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August 23, 2021
The Mayor and Council
The Town of Tecumseh
917 Lesperance Road
Tecumseh, Ontario
N8N 1W9

Gentlemen and Mesdames:

Re: Amended Curtis Drain Report

The Curtis Drain Report, originally date June 1, 2020, is proposed to be amended under Section 84.1 of the Drainage Act as a result of high costs for gas service relocations. Due to the high costs for relocations, it is proposed to utilize an arched and lengthened pipes to avoid three (3) gas service conflicts. This will result in only one (1) gas service requiring relocation, which will be done outside of this report, and will result in substantially less costs for Enbridge Gas and the Town of Tecumseh (through the franchise agreement). All costs associated with this work will be assessed to Enbridge Gas and will not be assessed to the Landowners in the watershed. This report highlights the proposed changes in "italics" and "red" font.

In accordance with your instructions, I have undertaken an examination of the Curtis with regards to improvements to the drainage works along its length from Lot 1 to Lot 4, Concession 5.

Authorization under the Drainage Act

This Engineer's Report has been prepared under Section 78 of the Drainage Act.

Section 78 of the Drainage Act states that, where, for the better use, maintenance or repair of any drainage works constructed under a bylaw passed under this Act, or of lands or roads, 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.

Background

The Curtis Drain outlets into Merrick Creek as an open channel in the SW ¼ of Lot 1, Concession 5 and continues upstream for approximately 1978m to the north limit of the SW Pt. of Lot 4, Concession 5.

Under a report dated September 15th, 1907 the Curtis Drain was made an award drain.

Under a report dated September 9th, 1938 the open channel was cleaned.

Under a report dated September 30th, 1948 the open channel was cleaned.

Under a report dated December 10th, 1957 the drain was moved off the road to allow for a wider shoulder. Under this report, culverts now numbered No. 2, 3, 6, 10, 12-13 and 14 were installed. The size and length of these culverts were specified in the report; however, they were installed privately, and at the expense of the Windsor Suburban Roads Commission. These culverts had extended lengths due to the proximity of the new channel to the residences. This will be taken into consideration for the assessments in this report.

Under a report dated August 11th, 1964 the open channel was cleaned.

Under a report dated July 31, 1973, the drain and the culverts were cleaned and the culvert now numbered No. 9 was installed. It appears as though the culvert now numbered No. 8 was installed privately prior to this report and following the 1964 report.

In 1986, there was a report that was not adopted by council. In this report the engineer was replacing culverts now numbered No. 2, 3, 6 and 8 and cleaning the drain. It is noted, that at this time the engineer was proposing to have assessed a large portion of the culvert cost to the Windsor Suburban Roads Commission.

In 1986 the drain and culverts were cleaned under maintenance.

Under a report dated September 12th, 2002 the culvert now number No. 5 was installed.

Drain Classification

The Curtis Drain is currently classified as a class “F” drain according to the Ontario Ministry of Agriculture, Food and Rural Affairs Mapping.

Class “F” drains are intermittent or ephemeral (dry for more than two consecutive months).

Merrick Creek is currently classified as a class “C” drain according to the Ontario Ministry of Agriculture, Food and Rural Affairs Mapping.

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

On Site Meeting

An onsite meeting was held on May 1, 2019 at #6890 Howard Avenue. The following were present:

- Josh Warner (Engineer, R. Dobbin Engineering)
- Cam Hedges (Assistant Drainage Superintendent, Town of Tecumseh)
- Mark Fishleigh (County of Essex)
- Susan Curtis (Landowner at #6832 Howard Avenue)
- David Lawn (Landowner at #7300 Howard Avenue)
- Shelagh McKinley (Landowner at #7100, #7250, #7488 and now #6890 Howard Avenue)

The following is a brief summary of the onsite meeting:

- Cam Hedges stated that prior to the engineer appointment a meeting was held in September of 2018 where the state of the Curtis Drain and the Drainage Act process was discussed.
- A Public Information Centre (PIC) will be held following the report competition for Landowners to voice their concerns and questions.
- Josh Warner stated that the 1973 report will be used as the basis for the drainage area as it is the most recently adopted report. This report essentially has all the lands abutting the east side of Howard Avenue entirely draining into the Curtis Drain. No Landowners at the site meeting objected to this area.

- Landowners with contact information available will be contacted throughout the process to discuss culvert location and length.
- Culverts will be sized to a 1:5-year storm event and will typically have a length necessary to provide a 6m top width. Length requested or required beyond that will be assessed to the Landowner.
- Each property is permitted one access that will have cost sharing. Any costs associated with additional culverts will be at the cost of the individual Landowner.

Discussion

After further review of previous reports, and as stated above, in 1957 the road authority moved the ditch off to provide for a wider shoulder. The ditch move-off resulted in sections of the ditch being enclosed in front of some residences due to the close proximity. Therefore, some culverts will be required to be longer than that required to provide a 6m top width. The extended enclosure costs will be assessed to the road authority.

Existing Conditions

After reviewing the condition of the culverts and the ditch it is apparent that the ditch requires maintenance and that the majority of the culverts require replacement. Below is a summary of the condition of the existing culverts:

Roll Number	Culvert Number	Address	Condition	Recommendation
450-00300	1	#7488	Half Full of water, but appears to be in good condition	Keep
450-00400 & 450-00500	2	#7344 & #7320	Very Poor – large holes and rust throughout	Replace
450-00600	3	#7300	Poor – large holes and rust throughout	Replace
450-00640	4	#7250	Good – but culvert is perched and holds back water	Replace
450-00650	5	#7100	Good – but culvert is perched and holds back water	Replace
450-00700	6	#7030	Poor - large amount of water and sediment, but has rust throughout	Replace
450-00700	7	#7030	Poor – holes and rust to spring line, deteriorating joint	Replace
450-00800	8	#7026	Poor to Fair – holes and rust to spring line	Replace

Roll Number	Culvert Number	Address	Condition	Recommendation
450-00900	9	#6900	Poor to Fair – large amount of water, but rust above spring line	Replace
450-01050 & 450-01000	10	#6890 & Farm	Poor – large holes and rust throughout	Replace
450-01001	11	#6832	Poor to Fair – holes and rust to spring line	Replace
450-01090 & 450-01100	12-13	#6808 & #6784	Very Poor – large holes and rust throughout, bad joints	Replace
450-01100, 450-01200 & 450-01300	14	Farm, #6712 & #6650	Very Poor – large holes and rust throughout	Replace

An effort was made to contact all Landowners on the drain prior to sending out the draft reports for the Public Information Centre (PIC). This included calling all the Landowners that attended either of the meetings and sending out calling cards to the residences that we were unable to contact. Landowners that we were unable to contact or did not respond to the calling cards were never communicated with directly. The following is a brief summary of the Landowner comments regarding their culverts (NAC=Not Able to Contact):

Roll Number	Culvert Number	Address	Top Width	Location
450-00300	1	#7488	6m	Maintain Existing
450-00400	2	#7344	Maintain Existing	Maintain Existing
450-00500	2	#7320	Maintain Existing	Maintain Existing-
450-00600	3	#7300	7m (Due to asphalt width)	Align with Asphalt
450-00640	4	#7250	7m (Due to asphalt width)	Align with Asphalt
450-00650	5	#7100	7m (Due to asphalt width)	Align with Asphalt
450-00700	6, 7	#7030	NAC (6m)	NAC (Maintain Existing)
450-00800	8	#7026	NAC (6m)	NAC (Maintain Existing)
450-01000	10		NAC (6m)	NAC (Maintain Existing)
450-00900	9	#6900	6m	Maintain Existing

Roll Number	Culvert Number	Address	Top Width	Location
450-01050	10	#6890	Maintain South Limit	Maintain Existing (Encroaching on house)
450-01001	11	#6832	Maintain Existing	Maintain Existing
450-01090	12	#6808	6m	Maintain Existing
450-01100	13	#6784	6m	Maintain Existing
450-01150	None		Does not need access	
450-01400	14	#6676	Maintain Existing	Maintain Existing
450-01200	14	#6712	NAC (Maintain Existing-Encroaching on house)	NAC (Maintain Existing-Encroaching on house)
450-01300	14	#6650	Maintain Existing	Maintain Existing

It is noted that, under this report, the existing accesses with asphalt driveways are proposed to be restored with asphalt (except at #7320 Howard Avenue at the request of the Landowner) following the culvert replacement. The existing driveway to #6712 is concrete. It is not proposed to replace this concrete under this report. However, at the request of the Landowner this can be completed under this report with the costs being assessed back to the Landowner as a Special Benefit assessment. Accesses will be restored with 150mm of Granular "A" as part of the project costs, any costs for other surfaces will be assessed back to the Landowner as a special benefit assessment.

Public Information Centre (PIC)

A public meeting was held at Fire Hall #2 on March 4, 2020 at 5:30pm. Prior to this meeting all Landowners received the draft report. The following were present at the PIC:

- Josh Warner (Engineer, R. Dobbin Engineering)
- Sam Paglia (Drainage Superintendent, Town of Tecumseh)
- Cam Hedges (Assistant Drainage Superintendent, Town of Tecumseh)
- Mark Fishleigh (County of Essex)
- James Curtis (Landowner at #6676 Howard Avenue)
- Susan Curtis (Landowner at #6832 Howard Avenue)
- David Lawn (Landowner at #7300 Howard Avenue)
- John and Shelagh McKinley (Landowner at #7100, #7250, #7488 and now #6890 Howard Avenue)
- Jacques Caron (Landowner at #6808 Howard Avenue)
- Jeff Allen (Landowner at #6784 Howard Avenue)

The following is a brief summary of the meeting:

- Jeff Allen requested that the existing catch basins on his property be removed rather than the lead tied into the proposed open portion of the drain.
- Jeff Allen requested that the dead-end road sign be addressed in the report.
- It was noted that the report should specify that 24 hours notice should be given for the culvert replacements. This will be included in the specifications portion of the report.
- Sam Paglia requested that a buffer strip be incorporated as part of the report.

Design

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

Recommendations

It is therefore recommended that, under this report, the following work be carried out:

1. The Curtis Drain open channel shall be improved along its length with the removal of brush, phragmites and trees, a buffer strip and excavation to a new grade line.
2. The culverts along the length of the drainage works shall be replaced as required and future specifications shall be developed for the remaining culverts.

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 $665,000.00, including engineering of the report, attending the Meeting to Consider the Report, attending the Court of Revision, tendering and an allowance for inspection. *This amount does not include the additional costs related to the amendments required to accommodate the gas service conflicts.* 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 his report shall assess for benefit and outlet for each parcel of land and road liable for assessment.

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

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

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

A Schedule of Assessment for the lands and roads affected by the work and therefore liable for the cost thereof has been prepared as per the Drainage Act. Also, assessments may be made against any public utility or road authority, as per Section 26 of the Drainage Act, for any increased cost for the removal or relocation of any of its facilities and plant that may be necessitated by the construction or maintenance of the drainage works. Items to be assessed under Section 26 shall be tendered separately with the actual cost plus a portion of the engineering (25% of the cost).

All additional costs to work around utilities not included in the estimate shall be tracked separately and the cost plus a portion of the engineering (25% of the cost) shall be borne by that utility.

The cost of any approvals, permits or any extra work, beyond that specified in this report that is required by any utility, conservation authority, government ministry or organization (federal or provincial), or road authority shall be assessed to that organization requiring the permit, approval, or extra work.

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

1. The cost of reconnecting any private subsurface drainage has been assessed to the benefitting property as a benefit assessment.

2. The cost of asphalt driveways has been assessed to the benefitting property as a special benefit assessment.

3. The culverts have generally been assessed based on the average culvert cost to provide a 6m access width. This base culvert has been assessed with 65% of the cost applied as benefit assessment to the owner of the property, 13% applied as a benefit assessment to the owner of Howard Avenue (County Road 9) and the remainder to upstream lands and roads based on equivalent hectares. Portions of the drain that, if left open, pose a safety risk to the residences are proposed to be enclosed under this report. The additional costs to enclose these portions of the drain (Culverts No. 2, 10 and 14) have been assessed to the owner of Howard Avenue (County Road 9) as a result of the 1957 move off. Due to the culvert extensions, some utilities will no longer require to be lowered. This cost savings has been assessed to the corresponding utility as a benefit assessment. The remaining culverts requested to be longer have been assessed with the extra length as a benefit assessment to the Landowner. The cost to have a second access culvert on a single property has been assessed as a special benefit to the Landowner.

4. The cost of hauling away spoils at finished lawns less the cost of levelling has been assessed to the benefitting property as a special benefit assessment.

5. The remainder of the open channel improvements have generally been assessed with 10% of the cost applied as a benefit assessment to the owner of Howard Avenue (County Road 9), 60% applied as benefit assessment to the owner of the property, and the remainder of the cost has been assessed as outlet assessment to 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 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 $25,000.00 per hectare.

Allowances for crop loss are based on $1,500.00 per hectare for the first year, $750.00 for the second year ($2,250.00 per hectare total).

Access and Working Area

Access to the work site for construction and maintenance of the Curtis Drain shall be from the road allowance, across the access culverts and along the Curtis Drain. The working area for construction and maintenance shall be restricted to a width of 15m from the top of bank where the work is taking place. The excavation shall generally be done from the east (field) side of the channel except across finished lawns. Across finished lawns the excavation shall generally be done from the west (road) side with the excavated material being trucked off site.

This can be changed under direction of the Drainage Superintendent or Engineer at the time of construction.

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.

Access for the open channel construction and maintenance on the property with roll number 450-01000 shall be from culvert No. 9 and along the Curtis Drain for a width of 10m from the east top of bank. This will require the excavator tracking through a small portion of the residential property. Any damage shall be restored in accordance with the seeding/restoration specification.

Access for the open channel construction and maintenance on the properties with roll numbers 450-01400 and 450-01150 shall be from the portion of the culvert providing access to #6676 Howard Avenue and through that property alone. The width of the access shall be 6m wide and along gravel laneways where possible. Any disturbances to the gravel or field shall be restored to its original condition.

Access for installation of the access culverts and also for any future maintenance and repair shall be through individual properties along existing lanes along property limits or existing lanes.

Restrictions

No trees and shrubs shall be planted nor shall permanent structures be erected within 15m 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.

Existing Private Drainage

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

Maintenance

The open channel shall be maintained and repaired in the same relative portions as contained in the channel portion of the enclosed Schedule of Assessment less any special benefit assessments. Maintenance shall be done in accordance with the enclosed specifications and profiles unless otherwise altered under provisions of the Drainage Act. For future maintenance and repair of the open channel, the excavated material across finished lawns shall be trucked and disposed offsite by the Contractor. The cost of trucking across finished lawns less the equivalent cost of levelling, shall be assessed to the individual property. Agricultural properties that wish to have the excavated material trucked will be assessed the cost of trucking less the cost of levelling. The cost of levelling will form part of the drain maintenance cost.

The buffer strips are to extend 1.5 metres from the top of the bank on the east side of the channel. If the buffer strip extends less than this due to encroaching cropping practices, the buffer strip shall be maintained with 100% of the cost assessed to the Landowner. Otherwise, the buffer strip shall be maintained and repaired in the same relative portions as contained in the channel portion of the enclosed Schedule of Assessment less any special benefit assessments.

The culverts shall be maintained and repaired as follows:

Culvert Number	Benefitting Landowner	Howard Avenue (County Road 9)	Utilities	Outlet
1, ~~6~~, 8, 9, 11, 12, ~~13~~	65%	13%		22%
2	36% (18% per Landowner)	29%	10% Gas 6% Hydro	19%
3, 4	67%	13%		20%
5	59%	13%	16% Gas	12%
7	100%			
10	40% (20% per Landowner)	42%		18%
14	30% (10% per Landowner)	45%	7% Gas	18%
6	*39%*	*8%*	*40% Gas*	*13%*
13	*32%*	*7%*	*50% Gas*	*11%*

The cost of asphalt or concrete repair or replacement shall be borne by the benefitting Landowner.

Each property is allowed one access culvert for each municipal drain with any second culvert on the property maintained and repaired 100% by the owner.

The drain shall be maintained as per the specifications and grades as shown on the Profile contained in this Engineer's Reports.

Yours truly,

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

Curtis Drain
Town of Tecumseh
August 23, 2021

ALLOWANCES

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

Conc.	Lot or part	Roll No.	Owner	Section 29	Section 30	Total
5	Pt. NW 1/4 Lot 1	450-00400	D. & R. Hewson	140	80	220
	Pt. NW 1/4 Lot 1	450-00500	D. , M., O. & C. Ghib	90	50	140
	Pt. NW 1/4 Lot 1	450-00640	ZRMCO Enterprises	300	180	480
	Pt. NW 1/4 Lot 1	450-00650	ZRMCO Enterprises	230	140	370
	SW 1/4 Lot 2	450-00700	Morgan Young Holdings Inc.	970	750	1,720
	Pt. SW 1/4 Lot 2	450-00800	M. & D. Young	180	110	290
	Pt. NW 1/4 Lot 2	450-00900	F. Balogh	210	130	340
	Pt. NW 1/4 Lot 2	450-01050	1443059 Ontario Inc.	230	140	370
	S 1/4 W 1/2 Lot 3	450-01001	C. & S. Curtis	570	440	1,010
	Pt. SW 1/4 Lot 3	450-01090	J. & M. Caron	210	130	340
	Pt. SW 1/4 Lot 3	450-01100	J. & K. Allen	190	110	300
	Pt. NW 1/4 Lot 3	450-01200	E. Rawson	140	90	230
	Pt. NW 1/4 Lot 3	450-01300	J. Curtis	150	90	240
	SW Pt. Lot 1	450-00300	J. & S. McKinley	950	860	1,810
	NW 1/4 Lot 1	450-00600	Huron Acres (2011) Inc.	370	220	590
	NW 1/4 Lot 2	450-01000	N., R., P. & P. Jobin	720	640	1,360
	N 1/2 SW 1/4 Lot 3	450-01150	J. Curtis	170	160	330
	NW 1/4 Lot 3 & SW Pt. Lot 4	450-01400	J. & T. Curtis	1,600	1,380	2,980
			TOTAL ALLOWANCES	$7,420	$5,700	$13,120

Estimate of Cost

	Quantity	Unit		Total
Pre-Construction Meeting	1	LS		1,000
Benchmark Loop	1	LS		640
Locate and Expose All Utilities	1	LS		8,000
Traffic Control	1	LS		6,000
Obtain required County Permits	1	LS		1,000
Brushing	1	LS		8,000
Excavation of Open Channel	1583	m		15,830
Level Excavated Material	1068	m		8,010
Trucking of Excavated Material at Finished Lawns	515	m		7,730
Provisional: Re-Conncect Tile Drain Outlets	20	ea		3,200
Culvert No.2				
Removal of existing structure	1.0	LS	2,640	
Supply & install 2130x1400mm dia. CSPA	54.0	m	41,320	
Supply & install bedding material	150.0	tonne	5,950	
Place backfill	320.0	tonne	1,760	
Supply & install Granular 'A'	30.0	tonne	1,540	
Supply & install rip rap endwalls	35.0	m^2	2,280	
Work Around Gas Service	1.0	LS	500	
Work Around Hydro Service	1.0	LS	500	
200mm dia. PE c/w Connections	30.0	m	1,480	
				57,970

	Quantity	Unit		Total
Culvert No.3				
Removal of existing structure	1.0	LS	1,320	
Removal of Concrete at Tile Oultets	1.0	LS	880	
Supply & install 2130x1400mm dia. CSPA	15.0	m	11,380	
Supply & install bedding material	50.0	tonne	2,130	
Place backfill	80.0	tonne	880	
Truck Excess Excavated Material	1.0	LS	1,500	
Supply & install Granular 'A'	20.0	tonne	880	
Supply & install rip rap endwalls	30.0	m^2	2,080	
Provisional: Work Around Water Services	2.0	ea.	1,000	
Work Around Hydro Service	1.0	LS	500	
Co-ordinate with Hydro One and Supply and Install Duct for Hydro Service Relocation	1.0	ea.	10,000	
Extend Tile Outlets	2.0	ea.	1,280	
Asphalt Driveway	50.0	m^2	2,500	
				36,330
Culvert No.4				
Removal of existing structure	1.0	LS	880	
Supply & install 1600mm dia. CSP	15.0	m	8,080	
Supply & install bedding material	45.0	tonne	2,010	
Place backfill	100.0	tonne	440	
Supply & install Granular 'A'	20.0	tonne	880	
Supply & install rip rap endwalls	10.0	m^2	1,720	
Asphalt Driveway	50.0	m^2	2,500	
				16,510
Culvert No.5				
Removal of existing structure	1.0	LS	880	
Supply & install 1880x1260mm dia. CSPA	15.0	m	9,880	
Supply & install bedding material	45.0	tonne	2,010	
Place backfill	80.0	tonne	440	
Supply & install Granular 'A'	20.0	tonne	880	
Supply & install rip rap endwalls	10.0	m^2	1,720	
Work Around Gas Service	1.0	LS	500	
Asphalt Driveway	50.0	m^2	2,500	
				18,810

	Quantity	Unit		Total
Culvert No.6				
Removal of existing structure	1.0	LS	2,200	
Supply & install 1600mm dia. CSP	14.0	m	7,600	
Supply & install bedding material	45.0	tonne	2,010	
Place backfill	60.0	tonne	440	
Truck Excess Excavated Material	1.0	LS	1,500	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	25.0	m^2	1,880	
Provisional: Work Around Gas Service	1.0	LS	500	
				16,900
Culvert No.7				
Removal of existing structure	1.0	LS	1,100	
Supply & install 1500mm dia. CSP	14.0	m	7,180	
Supply & install bedding material	45.0	tonne	1,570	
Place backfill	70.0	tonne	880	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	25.0	m^2	1,880	
				13,380
Culvert No.8				
Removal of existing structure	1.0	LS	1,100	
Supply & install 1500mm dia. CSP	13.0	m	6,730	
Supply & install bedding material	45.0	tonne	1,570	
Place backfill	70.0	tonne	880	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	25.0	m^2	1,880	
Asphalt Driveway	50.0	m^2	2,500	
				15,430
Culvert No.9				
Removal of existing structure	1.0	LS	1,100	
Supply & install 1200mm dia. HDPE	13.0	m	8,030	
Supply & install bedding material	30.0	tonne	1,190	
Place backfill	50.0	tonne	880	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	20.0	m^2	1,680	
Asphalt Driveway	50.0	m^2	2,500	
				16,150

	Quantity	Unit		Total
Culvert No.10				
Removal of existing structure	1.0	LS	2,640	
Supply & install 1200mm dia. HDPE	64.0	m	37,840	
Supply & install bedding material	120.0	tonne	3,880	
Place backfill	120.0	tonne	1,320	
Supply & install Granular 'A'	50.0	tonne	1,980	
Supply & install rip rap endwalls	20.0	m^2	1,680	
Provisional: Work Around Gas Service	1.0	LS	800	
Provisional: Work Around Water Service	1.0	LS	800	
200mm dia. PE c/w Connections	60.0	m	2,960	
				53,900
Culvert No.11				
Removal of existing structure	1.0	LS	1,100	
Supply & install 1200mm dia. HDPE	13.0	m	8,030	
Supply & install bedding material	30.0	tonne	1,190	
Place backfill	55.0	tonne	880	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	20.0	m^2	1,680	
				13,650
Culvert No.12				
Removal of existing structure	1.0	LS	2,640	
Supply & install 1200mm dia. HDPE	13.0	m	8,470	
Supply & install bedding material	30.0	tonne	1,630	
Place backfill	70.0	tonne	880	
Truck Excess Excavated Material	1.0	LS	750	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	20.0	m^2	1,680	
Work Around Hydro Service	1.0	LS	500	
Co-ordinate with Hydro One and Supply and Install Duct for Hydro Service Relocation	1.0	ea.	10,000	
Provisional: Work Around Gas Service	1.0	LS	500	
Remove Existing Catch Basins	2.0	ea.	600	
				28,420

	Quantity	Unit		Total
Culvert No.13				
Supply & install ~~1200mm dia. HDPE~~ 1390x970mm CSPA	13.0	m	8,470	
Supply & install bedding material	25.0	tonne	1,510	
Place backfill	50.0	tonne	880	
Truck Excess Excavated Material	1.0	LS	750	
Supply & install Granular 'A'	15.0	tonne	770	
Supply & install rip rap endwalls	20.0	m^2	1,680	
Provisional: Work Around Gas Service	1.0	LS	500	
Remove Existing Catch Basin	1.0	ea.	300	
Asphalt Driveway	50.0	m^2	2,500	
				17,360
Culvert No.14				
Removal of existing structure	1.0	LS	4,400	
Supply & install 1200mm dia. HDPE	132.0	m	76,120	
Supply & install bedding material	240.0	tonne	8,200	
Place backfill	400.0	tonne	1,760	
Supply & install Granular 'A'	35.0	tonne	1,650	
Supply & install rip rap endwalls	20.0	m^2	1,680	
Work Around Gas Service	1.0	LS	500	
200mm dia. PE c/w Connections	80.0	m	3,360	
				97,670
Work Around Overhead Hydro	1.0	LS		4,000
Work Around Telecom Utility	1.0	LS		2,000
Remove and Re-Install Fences	800.0	m		6,400
Remove and Re-Install Signs	1.0	LS		500
Restoration / Seeding	1.0	LS		16,320
Buffer Strip	1640	m^2		3,760
Silt Fence	1.0	LS		600
Contingency				20,000
			Sub Total	515,470
			Allowances	13,120
			Engineering	90,350
			Locate and Expose Utilities	4,000
			Inspection (Estimate)	30,000
			ERCA Fee	800
			Total Estimate excluding HST	**653,740**
			Non-Recoverable HST (1.76%)	11,260
			Total Estimate	**$665,000**

	Quantity	Unit	Unit Price	Total
Extension of Culvert No. 6				
Extension of Culvert No. 6 with 1600mm dia. CSP	*15*	*m*	*773*	*11,595*
Engineering (25% of Construction Cost as per Report)	*1*	*LS*	*2,899*	*2,899*
Culvert No. 10				
Coordination with Gas to have Service lowered during construction	*1*	*LS*	*1,500*	*1,500*
Extension of Culvert No. 13				
Extension of Culvert No. 13 with 1390x1170mm dia. CSPA	*21*	*m*	*895*	*18,795*
Extend 150mm dia. Tile Downstream	*8*	*m*	*50*	*400*
Subtract Removal of Catch Basin	*1*	*LS*	*-300*	*(300)*
Engineering (25% of Construction Cost as per Report)	*1*	*LS*	*4,724*	*4,724*
			Total Additional Cost	39,613

SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hecatares	Roll No.	Owner	Culverts			Channel			Total	Equivalent Ha
					Special Benefit	Benefit	Outlet	Special Benefit	Benefit	Outlet		
Municipal Lands												
	Howard Ave. (County Road 9)	3.90		County of Essex	-	115,843	17,256	-	15,875	7,671	156,645	3.71
				Total Municipal Lands	-	115,843	17,256	-	15,875	7,671	156,645	
Non-Agricultural Lands												
5	Pt. NW 1/4 Lot 1	0.29	450-00400	D. & R. Hewson	-	13,777	2	30	190	114	14,113	0.15
	Pt. NW 1/4 Lot 1	0.14	450-00500	D. , M., O. & C. Ghib	-	13,777	1	23	131	55	13,987	0.07
	Pt. NW 1/4 Lot 1	1.36	450-00640	ZRMCO Enterprises	2,500	13,757	374	495	1,581	466	19,173	0.57
	Pt. NW 1/4 Lot 1	1.02	450-00650	ZRMCO Enterprises	2,500	13,937	297	353	1,138	358	18,583	0.43
	SW 1/4 Lot 2	19.83	450-00700	Morgan Young Holdings Inc.	17,100	13,037	6,787	645	8,186	7,089	52,844	8.33
	Pt. SW 1/4 Lot 2	0.42	450-00800	M. & D. Young	2,500	13,037	184	255	830	208	17,014	0.21
	Pt. NW 1/4 Lot 2	0.34	450-00900	F. Balogh	2,500	13,037	161	323	1,039	189	17,249	0.17
	Pt. NW 1/4 Lot 2	0.20	450-01050	1443059 Ontario Inc.	-	15,997	103	90	420	95	16,705	0.08
	S 1/4 W 1/2 Lot 3	10.40	450-01001	C. & S. Curtis	-	13,037	5,325	420	3,385	4,164	26,331	3.64
	Pt. SW 1/4 Lot 3	0.58	450-01090	J. & M. Caron	-	13,637	504	323	1,039	360	15,863	0.29
	Pt. SW 1/4 Lot 3	0.53	450-01100	J. & K. Allen	2,500	13,337	469	278	900	337	17,821	0.27
	Pt. NW 1/4 Lot 3	0.16	450-01200	E. Rawson	-	14,157	1,084	-	111	137	15,489	0.08
	Pt. NW 1/4 Lot 3	0.15	450-01300	J. Curtis	-	14,157	1,016	-	117	130	15,420	0.08
				Total Non-Agricultural Lands	29,600	178,681	16,307	3,235	19,067	13,702	260,592	

Conc.	Lot or Part	Affected Hecatares	Roll No.	Owner	Culverts			Channel			Total	Equivalent Ha
					Special Benefit	Benefit	Outlet	Special Benefit	Benefit	Outlet		
Agricultural Lands (Eligible for Available Grants)												
5	SW Pt. Lot 1	2.03	450-00300	J. & S. McKinley	-	1,571	2	-	5,997	514	8,084	0.71
	NW 1/4 Lot 1	16.82	450-00600	Huron Acres (2011) Inc.	2,500	15,637	2,804	630	2,000	5,581	29,152	7.06
	NW 1/4 Lot 2	19.70	450-01000	N., R., P. & P. Jobin	-	13,037	6,332	-	4,581	6,926	30,876	6.90
	N 1/2 SW 1/4 Lot 3	9.28	450-01150	J. Curtis	-	-	8,821	-	1,146	4,224	14,191	3.25
	NW 1/4 Lot 3 & SW Pt. Lot 4	33.89	450-01400	J. & T. Curtis	-	14,157	37,969	-	11,938	18,336	82,400	11.86
				Total Agricultural Lands	2,500	44,402	55,928	630	25,662	35,581	164,703	
Utilities												
	Hydro Utility			Hydro One	25,485	4,000	-	3,175	-	-	32,660	
	Telecom Utility			Bell	3,997	-	-	1,588	-	-	5,585	
	Water Utility			Town of Tecumseh	6,562	-	-	4,763	-	-	11,325	
	Gas Utility			Enbridge Gas	10,150	16,990	-	6,350	-	-	33,490	
				Total - Utilities	46,194	20,990	-	15,876	-	-	83,060	
				Total - Utilities	83,060							
				Total Municipal Lands	156,645							
				Total Non-Agricultural Lands	260,592							
				Total Agricultural Lands	164,703							
				Total Assessment	$665,000							

Additional Section 26 Assessment to Enbridge Gas due to Amendment $ 39,613

Curtis Drain
Town of Tecumseh
August 23, 2021

SPECIFICATION OF WORK

1. Scope of Work

The Curtis Drain exists between Lot 1 and Lot 4, Concession 5 in the Town of Tecumseh. Under this report, culverts are to be replaced and the open channel is to be improved along its length.

2. General

Each tenderer must inspect the site prior to submitting their tender and satisfy themselves by personal examination as to the local conditions that may be encountered during this project. The Contractor shall make allowance in their tender for any difficulties which 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 Town of Tecumseh and request clarification 2 days prior to pricing the project.

3. Plans and Specifications

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

Any reference to the Owner contained in these Contract Documents shall refer to the Town of Tecumseh or the Engineer authorized by The Town of Tecumseh to act on its behalf.

4. Health and Safety

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

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

The Contractor shall be responsible to ensure that all procedures are followed under the Occupational Health and Safety Act to ensure that work sites are safe and that accidents are prevented. In the event of a serious or recurring problem, a notice of non-compliance will be issued. The Contractor will be responsible for reacting immediately to any deficiency and correcting any potential health and safety risk. Continuous disregard for any requirement of the Occupational Health and Safety Act could be cause for the issuance of a stop work order or even termination of the Contract.

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

5. Workplace Safety and Insurance Board

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

6. 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 Town of Tecumseh shall be notified of the pre-construction meeting at least one week prior.

7. Utilities

The Contractor is responsible for organizing locates and exposing all the utilities along the length of the drainage works. Considering the number of utilities, it is recommended that this be done by Hydrovac. 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. It is intended that the utilities, other than Hydro One's services, that interfere with the proposed design be re-located prior to construction taking place. This will be organized by the Engineer. The Contractor will be responsible for organizing the Hydro One service relocations.

The duct and associated work shall be done in co-ordination with Hydro One and shall conform to Hydro One's Trench Detail and related drawings as attached in Appendix A. Notes in addition to the attached drawings and specifications are listed below:

- Table 1B often calls for a 300mm separation – if possible, achieve 1m separation between HONI and other utilities.
- As the new underground path will have bends as a result, any bends in the duct must have a minimum radius of 0.9m (3').
- If concrete needs to be poured around an underground duct, typically they are mechanically separated by Styrofoam or another medium.
- All trench installations to be installed as per the preferred (main) option – prior permission from Hydro One is required if an alternative installation ('D1' or 'D2') is to be used.

The Contractor is responsible for coordinating the replacement of additional utilities with the utility company if they interfere with the proposed culverts. 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.

The Telecom Utility in the area, owned by Bell, has not given any information that services cross the open channel or culverts. The line item in the estimate is therefore only to work around the main line and existing pedestals and poles. Any time required or lost to work around, replace or coordinate the replacement of telecom conduit, buried cable or services shall be tracked separately. The cost plus a portion of the engineering (25% of the cost) shall be borne by the Telecom Utility.

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

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 (25% of the cost) shall be borne by that utility.

8. 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 of the culvert.

The Contractor is required to complete a benchmark loop prior to construction to verify the benchmarks. If discrepancies exist the Contractor must notify the Drainage Superintendent and Engineer prior to completing any work.

9. 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 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 Drainage 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.

10. Access and Working Area

Access to the work site for construction and maintenance of the Curtis Drain shall be from the road allowance, across the access culverts and along the Curtis Drain. The working area for construction and maintenance shall be restricted to a width of 15m from the top of bank where the work is taking place. The excavation shall generally be done from the east (field) side of the channel except across finished lawns. Across finished lawns the excavation shall generally be done from the west (road) side with the excavated material being trucked off site.

This can be changed under direction of the Drainage Superintendent or Engineer at the time of construction.

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.

Access for the open channel construction and maintenance on the property with roll number 450-01000 shall be from culvert No. 9 and along the Curtis Drain for a width of 10m from the east top of bank. This will require the excavator tracking through a small portion of the residential property. Any damage shall be restored in accordance with the seeding/restoration specification.

Access for the open channel construction and maintenance on the properties with roll numbers 450-01400 and 450-01150 shall be from the portion of the culvert providing access to #6676 Howard Avenue and through that property alone. The width of the access shall be 6m wide and along gravel laneways where possible. Any disturbances to the gravel or field shall be restored to its original condition.

Access for installation of the access culverts and also for any future maintenance and repair shall be through individual properties along existing lanes along property limits or existing lanes.

11. Removals

The Contractor is required to notify the Landowner twenty-four (24) hours prior to the removal of an access culvert. The existing culverts shall be removed in their entirety from the open channel. The culvert, the concrete rubble and any deleterious material shall be disposed offsite at the expense of the Contractor. Suitable backfill shall be stockpiled adjacent to the site for reuse during installation of the proposed culvert. The existing rip rap, at the Discretion of the Drainage Superintendent or Engineer, can be re-used for end protection. It is noted that Culverts No. 4 and No. 5 have rip rap that may be salvageable.

The catch basins and leads at culverts now number 12 and 13 shall be removed in their entirety and disposed of off site at the expense of the Contractor. The holes shall be filled with the additional material from the removal of the culvert at this location and area shall be restored in accordance with the restoration and seeding specification. Any additional fill from the removal of the extended culvert at this location shall be disposed of off site at the expense of the Contractor.

The Contractor shall work around the existing fences, boulders and signs if they are able to. If the existing fences, boulders and signs require to be removed, they shall be installed in the same location with the existing materials. The dead-end road sign at the intersection of Howard Avenue and Huron Church Line Road shall be removed and re-installed on the road side of the open channel.

12. Brushing and Tree Removal

All brush, trees, woody vegetation, stumps etc. shall be removed in order to facilitate construction, as determined by the Drainage Superintendent or Engineer, and disposed offsite by the Contractor in accordance with OPSS 201.

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.

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

For future maintenance it is recommended that, if necessary, appropriate spray be applied to the brush, and after-growth for two years following construction to maintain brush control.

13. 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 generally be cast on the side it is being excavated from, except across finished lawns where the excavated material shall be trucked. 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 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.

Where, determined by the Drainage Superintendent or Engineer, the banks are unstable due to the removal of the trees and brush, the banks shall be re-sloped to 1.775:1.

14. Trucking of Excavated Material

The excavated material at finished lawns shall be trucked and disposed offsite by the Contractor. The cost of trucking will form part of the cost of the drainage works and be assessed as per the Schedule of Assessment. Trucking of the excavated material shall generally be between the following chainages:

0+254 to 0+557 (#7344, #7320, #7300, #7250 and #7100 Howard Avenue)
0+702 to 0+863 (Residence portion of #7030 and #7026 Howard Avenue)
1+045 to 1+161 (#6900 and #6890 Howard Avenue)
1+252 to 1+427 (Residence portion of #6832, #6808 and #6784 Howard Avenue)
1+583 to 1+714 (#6712, residence portion of #6676 and #6650 Howard Avenue)

If a Landowner requests that the excavated material, other than those specified above, be trucked, the additional cost to have the excavated material trucked instead of levelled will be assessed as a special benefit to that Landowner.

15. Installation of Access Culverts

The Contractor is required to notify the Landowner twenty-four (24) hours prior to the removal of an access culvert.

The Contractor shall supply, install, and backfill aluminized corrugated steel pipe with a minimum wall thickness of 2.8mm in all cases. 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 high-density polyethylene (HDPE) smooth wall pipe (320 kPa) shall be with bell and spigot joints. Future culvert replacements shall be to these same specifications.

The culvert 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 access culverts shall be installed generally in the same location or as approved by the Engineer or Drainage Superintendent. If the Landowner requests a different location, they shall contact the Engineer. The culverts shall be installed with the invert 150mm below the proposed channel bottom elevation as shown on the profile.

If an owner requests a longer culvert than specified, please refer to the report. The culvert lengths are based on using rip rap ends. If concrete block ends are to be utilized, the culverts shall be shortened proportionate to the sloped ends (1.5:1.0). Any tile outlets extended as a result of a culvert shall be extended at the Landowner's expense. 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. An estimate of the length of the extensions has been included in the estimate as an item.

The bottom of the excavation shall be excavated to a minimum of 100mm below the proposed invert. The pipe shall be bedded with 18-20mm clear stone. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with granular or clear stone from the bottom of the excavation to the spring line of the pipe. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm so that the pipe is not displaced. The access culverts shall be backfilled from the spring line to within 150mm of finished grade with excavated material. If extra backfill material is required, it shall be supplied by the Contractor at the expense of the drainage works. The top 150mm shall be backfilled with compacted 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 compacted granular "A" shall occupy 150mm below the proposed asphalt.

Culvert No. 10 does not currently have a gravel access. This access shall be south of the residence, the exact location shall be determined at the time of construction by the Drainage Superintendent and Engineer in coordination with the Landowner.

All backfill shall be free from deleterious material. Any excess granular material shall be placed at the surface on the travel portion of the access culvert. All granular bedding material shall be mechanically compacted to 95% modified standard proctor density. All backfill material above the spring line shall be mechanically compacted using appropriate compaction equipment. The Contractor shall supply any extra backfill material required above the spring line. Excess native backfill shall be trucked off site or used as backfill for other culverts if found suitable.

Note that if excavated material is found unsuitable for backfill purposes under accesses, then granular material will be required as backfill. Unit prices shall be established in any tender for the disposal of the excavated material and the import of approved granular material at the expense of the drainage works.

The rip rap end walls shall consist of 100mm x 250mm 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 (Terrafix 250R 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. The top of the culvert shall govern block elevation. The correct block shall be set with the top of the block equal to the top of the culvert. The blocks shall be set at each end of the culvert so that each row of blocks will be offset approx. 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.

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.

16. Culvert Maintenance

The Contractor shall be responsible for maintenance of the access culverts for a period of one year after their installation. This will include repairing any settlement areas on the travel surface with granular “A” and/or HL3 asphalt.

17. Subsurface Drainage

Landowners are required to mark field tile prior to construction.

All existing subsurface drains encountered during construction of the open channel 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. Manufactured fittings shall connect the PE tile to the existing

drain. 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.

Tile outlets larger than 150mm in diameter, or as determined by the Drainage Superintendent or Engineer at the time of construction, require erosion protection. The erosion protection made up of rip rap and filter fabric shall be installed on the embankment slope from 0.3m above the tile obvert to the channel invert. The erosion protection shall be 0.5m wide. Rip rap shall be made up of 100mm to 250mm quarry stone or approved equal. The area to receive the rip rap shall first be graded to allow the placement of the rip below finished grade. After grading, a layer of filter fabric (Mirafi P270 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. Buffer Strip

A grassed buffer strip shall be incorporated into the drainage works. The buffer strip shall extend 1.5 metres from the top of the bank on the east side. The seed mixture shall be as specified in the Seeding/Restoration specification.

19. Seeding/Restoration

The side slopes of the channel, road right of way, buffer strip and finished lawns, where disturbed by construction, shall be topped with 100mm of topsoil and hydroseeded in the spring or fall following construction. The time of application shall be approved by the Drainage Superintendent or Engineer.

Hydraulic seed and mulch in accordance with OPSS 804. Seed mixture, fertilizer and application rates are as follows:

- Primary seed (85 kg/ha.) consisting of 50% red fescue, 40% perennial rye-grass and 5% white clover.
- Nurse crop consisting of Italian (annual) rye-grass at 25% of total weight.
- Fertilizer (300 kg/ha.) consisting of 8-32-16.
- Hydraulic mulch (2,999 kg/ha.) type “B” and water (52,700 litres/ha.).

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

20. 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.
- The work shall be completed outside of the spring restricted activity timing window (March 15 to July 15)
- Erosion and sediment control measures must be installed prior to construction to prevent sediment from entering the water body.
- Material shall not be placed 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.

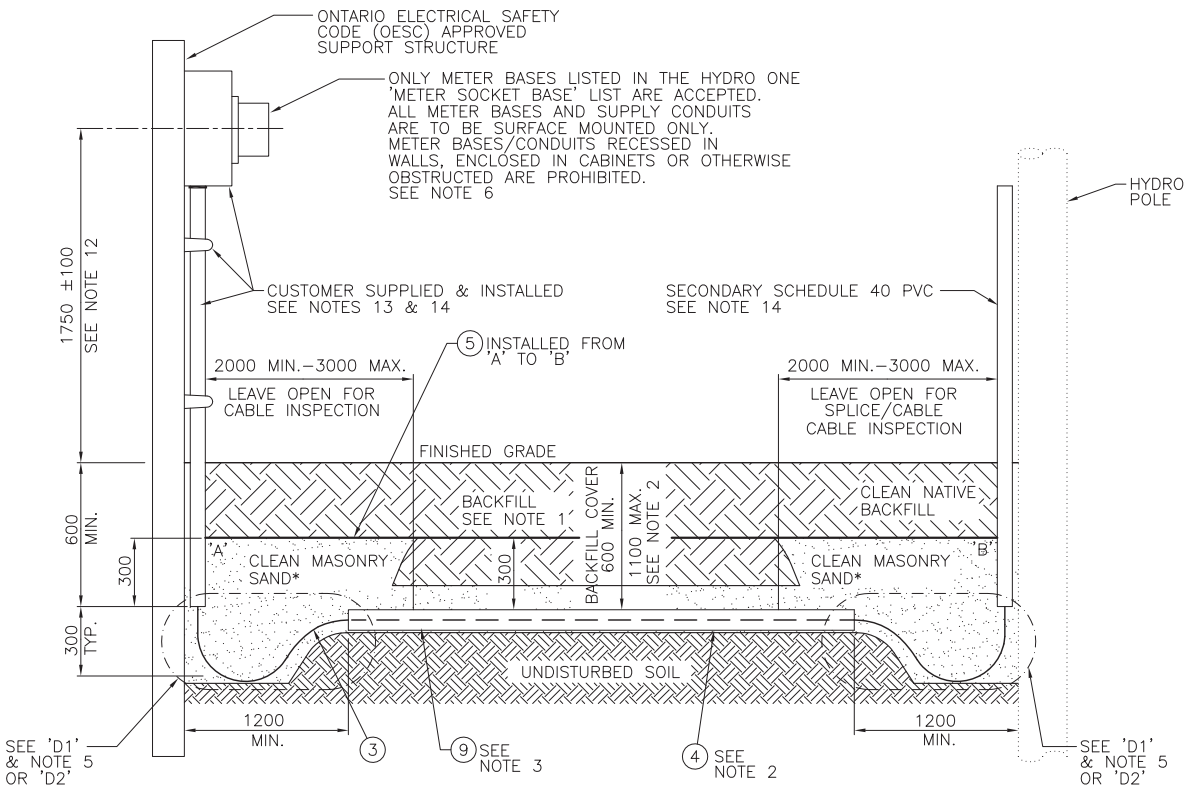
The Department of Fisheries and Oceans Letter of Advice is attached in Appendix B of this report.

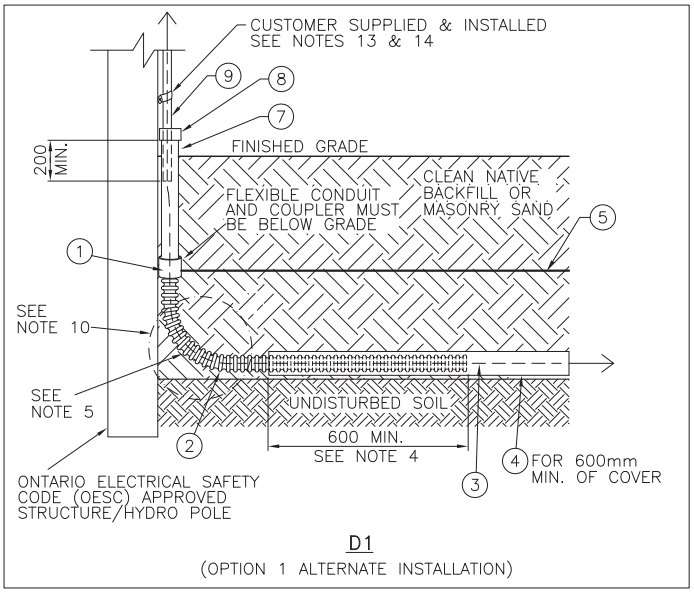
21. Silt Fence

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 805 and OPSD 219.110. The light duty silt fencing shall be removed once the disturbed area has been re-vegetated.

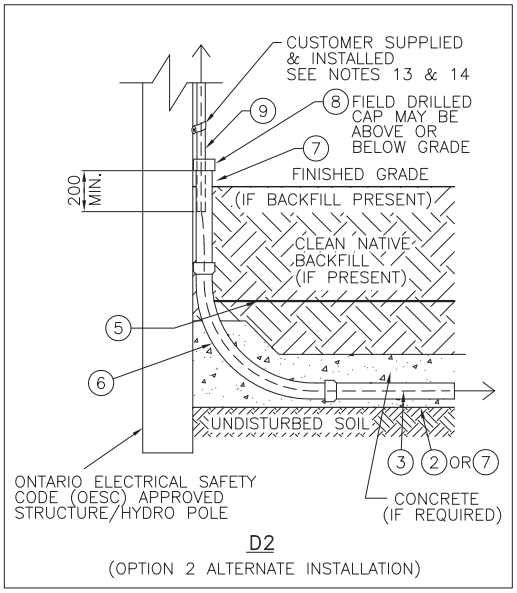
APPENDIX A
HYDRO ONE TRENCH DETAIL





D1

(OPTION 1 ALTERNATE INSTALLATION)



D2

(OPTION 2 ALTERNATE INSTALLATION)

FOR SHEET 2 OF THIS DRAWING SEE DU–03–209.1–0501
FOR SHEET 3 OF THIS DRAWING SEE DU–03–209.1–0502

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

Rev No.	Date	Revision Particulars	dwn	ckd	des	app
04	AUG 2019	REMOVED 2" OPTION, UNIVERSAL SIZE. MODIFIED PARTS 1, 2 & 8. MODIFIED NOTES 1, 2 & 4. ADDED NEW NOTES 12, 13 & 14. REMOVED PREVIOUS PART 9 (STRAPS). INTRODUCED GENERIC SUPPORT STRUCTURE FOR CUSTOMER INSTALLATION.	PC/LS	SJ	SJ	MM
03	SEP 2018	GENERAL UPDATES. CHANGED TO NEW DWG. & NUMBERING FORMAT. FOR PREVIOUS REVISIONS REFER TO DU–03–209.1–R2.	SO	PC	AS	PS

hydro one **Hydro One Networks Inc.**

Drawn By:	Checked By:	Designed By:	Design Approved By:
L.SEQUEIRA			
Scale: N.T.S.	Date: (yyyy/mm/dd) 2012/08/30	Pole ID:	

Title: TRENCH DETAIL – SECONDARY SERVICE CABLE FROM DIP POLE TO METER BASE

Drawing No. DU–03–209.1–0500 Rev. No. 04

A4 (210 x 297) millimetres 0 10 50

Sheet Number: 1 / 3

TITLE BLOCK REV 02 – AUGUST 2014

NOTES:

1. BACKFILL: ENSURE DB2 CONDUIT IS ENVELOPED WITH MASONRY SAND UPON INSTALLATION (75mm MINIMUM BELOW AND 150mm MINIMUM ABOVE). REMAINDER OF BACKFILL MUST BE CLEAN AND FREE OF DEBRIS TO PREVENT DAMAGE TO THE DUCT. BACKFILL SHALL BE WELL TAMPED.
2. STRAIGHT DUCT SHALL BE EMPLOYED IN THE TRENCH TO HOUSE THE CABLE. IT SHALL BE 100mm (4") DIAMETER PVC TYPE DB2 CONDUIT. THE ENDS OF THE DUCT SHALL BE CAPPED OR BAGGED TO PREVENT DEBRIS AND MOISTURE FROM ENTERING THE DUCT PRIOR TO CABLE INSTALLATION. IF OPEN TRENCH ENDS MUST BE LEFT UNATTENDED AFTER CABLE INSTALLATION, SEE DU–03–209.1–0500 OPTION 1, WITH A LENGTH OF FLEXIBLE CONDUIT TO MAKE 90° TRANSITION.

   SEE OPTION 2 FOR ALTERNATE METHODS.
3. PULL TAPE: A 1/2" WIDE POLYESTER PULLING TAPE MUST BE INSTALLED THROUGH THE ENTIRE LENGTH OF THE DUCT.
4. INSERT 3" FLEXIBLE CONDUIT 600mm IN THE DB2 CONDUIT.
5. RADIUS MUST BE GREATER THAN THE SPECIFIED CABLE MINIMUM BENDING RADIUS.
6. INSTALL METER COMPARTMENT AS PER ONTARIO ELECTRICAL SAFETY CODE (OESC), USE ONLY HYDRO ONE APPROVED METER BASES LISTED IN THE HYDRO ONE 'METER SOCKET BASE' LIST. METER BASE TO MAINTAIN 1M MINIMUM CLEARANCE FROM DISCHARGE OF ANY COMBUSTIBLE GAS RELIEF DEVICE OR VENT.
7. TELECOMMUNICATION PLANT MAY SHARE SERVICE TRENCH BUT MUST BE INSTALLED IN ITS OWN CONDUIT.
8. PREFERRED ROUTING FOR GAS SERVICE SHALL BE ON OPPOSITE SIDE OF THE BUILDING THAN THAT OF THE ELECTRICAL SERVICE. IF COMMON TRENCHING IS UNAVOIDABLE, 300mm MINIMUM CLEAR SEPARATION SHALL BE MAINTAINED IN ALL DIRECTIONS BETWEEN GAS SERVICE AND ELECTRICAL SUPPLY CABLE.
9. CLEARANCES, DEPTHS, SEPARATIONS AND FORMS OF MECHANICAL PROTECTION OF THE CABLE ARE MINIMUM REQUIREMENTS. INCREASED CLEARANCES AND OR ADDITIONAL FORMS OF MECHANICAL PROTECTION ARE CONSIDERED POSITIVE DEVIATIONS AND ARE ALLOWED.
10. IF FURTHER TRENCHING ALONG ROAD ALLOWANCE IS REQUIRED, IT SHALL BE CONSTRUCTED PER HYDRO ONE STANDARD TRENCH PROFILES.
11. RISER CONDUIT TO BE EASILY REMOVED BY HYDRO ONE FOR CABLE INSTALLATION PURPOSES.
12. FINAL METER BASE HEIGHT IN REFERENCE TO FINISHED GRADE.
13. CUSTOMER SUPPLIED AND INSTALLED CONDUIT, METER BASE, CLAMPS AND ASSOCIATED HARDWARE INSTALLED PER ONTARIO ELECTRICAL SAFETY CODE (OESC).
14. THE METER BASE AND DIP POLE CONDUITS WILL VARY IN SIZE DEPENDING ON CONDUCTOR SIZE (i.e. 2" DIAMETER FOR 3/0, 3" FOR 250Kcmil OR 500Kcmil CONDUCTOR). FLEXIBLE CONDUIT WILL BE 3" FOR ALL CONDUCTOR SIZES FOR TEMPORARY PROTECTION OF TRENCH ENDS PER OPTION 1 AND 4" FOR ALL CONDUCTOR SIZES IF USED AS MAIN CONDUIT PER OPTION 2. APPROPRIATELY SIZE COUPLERS (SHOWN AND LISTED IN THE PARTS LIST) SHALL BE USED TO CONNECT THE SCHEDULE 40 PVC TO THE FLEXIBLE CONDUIT.

FOR SHEET 1 OF THIS DRAWING SEE DU–03–209.1–0500
FOR SHEET 3 OF THIS DRAWING SEE DU–03–209.1–0502

ALL DIMENSIONS IN MILLIMETRES
UNLESS OTHERWISE STATED

PARTS LIST

PART No.	MM No.	DESCRIPTION	QTY.
1	30031161 30030236 30031918	COUPLER KIT, 3" FLEX TO 2" RIGID COUPLER KIT, 3" FLEX TO 3" RIGID COUPLER KIT, 4" FLEX TO 4" RIGID	A/R
2	30030235 30031917	CONDUIT, FLEX, 3" CONDUIT, FLEX, 4"	A/R
3	30005908 30005915 30005959	SERVICE CABLE, 3/0 AWG, 3–COND., AL. SERVICE CABLE, 250Kcmil, 3–COND., AL. SERVICE CABLE, 500Kcmil, 3–COND., AL.	A/R
4	30007710	CONDUIT, PVC, 4", DB2	A/R
5	20002181	CAUTION TAPE, BURIED ELECTRIC LINE	A/R
6	30007687	SWEEP, 4" x 16" RADIUS, SCHEDULE 40, PVC	A/R
7	30007583	CONDUIT, 4", SCHEDULE 40, PVC	A/R
8	30031602	CAP, 4", SCHEDULE 40, PVC	A/R
9	20000007	TAPE, PULLING, 1/2" WIDE, POLYESTER	A/R

MM# = REFER TO SECTION 16 ONLY | A/R = AS REQUIRED

* = SUPPLIED BY CUSTOMER

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hydro one **Hydro One Networks Inc.**

Drawn By:	Checked By:	Designed By:	Design Approved By:
L.SEQUEIRA			
Scale: N.T.S.	Date: (yyyy/mm/dd) 2012/08/30	Pole ID:	

Title: TRENCH DETAIL – SECONDARY SERVICE CABLE FROM DIP POLE TO METER BASE

Drawing No. DU–03–209.1–0501 Rev. No. 04

TITLE BLOCK REV 02 – AUGUST 2014

A4 (210 x 297) millimetres 0 10 50

Hydro One trenching guidelines:
Secondary service trench with supply taken from dip pole
per Hydro One Networks Inc. standard drawing DU–03–209.1–0500

The installation options listed below explain Hydro One Networks' Standard (DU–03–209.1–0500) for the installation of Hydro One owned single–phase secondary underground cables. Regardless of who installs the cable, the trench **must** be constructed per DU–03–209.1–0500/0501. **Note: Options described below will allow the cable installer crew to perform their work without a coordinated site visit with the trench installer.**

For most installations, either Option 1 or Option 2 can be selected by the customer (Option 2 calls for increased mechanical protection via more rigorous conduit); however, Option 2 must be selected for installations where a minimum cover of 600mm is not possible.

Option 1 (requires minimum cover of 600mm): Direct buried cable encapsulated in masonry sand at trench ends as shown in DU–03–209.1–0500

- The trench can be backfilled, excluding open pit area, at either end of trench prior to cable installation.
- The trench must be backfilled with clean masonry sand in areas indicated in DU–03–209.1–0500 and clean native backfill to finished grade immediately after installation of cable.

If the trench end(s) is(are) temporarily left open (i.e. if backfilling cannot occur immediately after cable installation), a length of flexible conduit (specified by Hydro One and listed in DU–03–209.1–0500) shall be applied between the horizontal DB2 conduit and the vertical Schedule 40 PVC at both the meter base and the source pole to provide temporary protection of the cable. See 'D1' in DU–03–209.1–0500. The flexible conduit shall be inserted inside the 100mm DB2 duct a minimum of 600mm.

Option 2 (reduced cover): Schedule 40 PVC / flexible conduit, and sweeps

- In areas of poor soil conditions (e.g. rocky) and where installing straight lengths of Schedule 40 PVC is impossible, flexible conduit can be installed at the sole discretion of Hydro One. This flexible conduit, as listed in DU–03–209.1–0500, shall be 100mm diameter electrical grade corrugated flexible conduit. Flexible drainage pipe or thin wall conduit is **NOT** acceptable.
- In a case where 600mm of cover is not possible, the secondary cable may be installed in Schedule 40 PVC or in a continuous length of flexible conduit (see above for details on flexible conduit) at a minimum cover of 300mm.
- In a case where 300mm of cover is not possible, such as on bald rock, Schedule 40 PVC (or alternatively the flexible conduit as mentioned above) will be covered in a minimum thickness of 3" (75mm) of concrete wherever reduced cover is encountered. The concrete shall cover the conduit at all points until the vertical component of the sweep is reached. If flexible conduit is employed, it shall not permanently extend beyond the concrete and be left exposed.
- Schedule 40 PVC sweeps shall be used at the trench ends to make the transition to the meter base and dip pole conduits. See 'D2' in DU–03–209.1–0500.

NOTE: If any discrepancies between this document and the referenced standard are found, the standard shall prevail. It is **the customer's responsibility to ensure compliance** to the standard. Not complying with the standard will result in Hydro One not completing their work and an "extra trip charge" being applied.

FOR SHEET 1 OF THIS DRAWING SEE DU–03–209.1–0500
FOR SHEET 2 OF THIS DRAWING SEE DU–03–209.1–0501

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hydro one **Hydro One Networks Inc.**

Drawn By:	Checked By:	Designed By:	Design Approved By:
L.SEQUEIRA			
Scale: N.T.S.	Date: (yyyy/mm/dd) 2012/08/30	Pole ID:	

Title: TRENCH DETAIL – SECONDARY SERVICE CABLE FROM DIP POLE TO METER BASE

Drawing No. DU–03–209.1–0502 Rev. No. 04

TITLE BLOCK REV 02 – AUGUST 2014

A4 (210 x 297) millimetres 0 10 50

R04 ➤

Table 1B

MINIMUM HORIZONTAL CLEARANCES
Between HONI Distribution Equipment (<50 kV) & Other Plant/Structures

Other Plant/Structures		Separation (mm)					
		Underground			Overhead		
		Primary & Secondary Cables/Ducts	Pad-mounted Equipment (Foundation)		Pole (below grade)	Conductor 0-0.75kV (note 3)	Conductor 0.751-50kV (note 3)
			Access side	Non-access Sides			
Water Plant	Water Line	300	300	300	600	-	-
	Valve Box / Chamber	300	300[1]	300[1]	600	-	-
	Hydrant	300	3000	1000	1000	-	-
Sewer Plant	Sewer Line	300	300	300	600	-	-
	Catch Basin	300	300[1]	300[1]	600	-	-
	Manhole	300	300[1]	300[1]	600	-	-
Gas	Gas Line	300[4]	300	300	600	-	-
Traffic / Street Lighting	Pole/Mast/Pillar	600	3000	1000	3000	1000	1000
	Cable or Duct	300	300	300	600	-	-
	Joint Use Pole	600	3000	1000	3000	1000	1000
	U/G Vault / Hand-hole	300	300[1]	300[1]	1000	-	-
	Control Pedestal	300	3000	150[5]	1000	-	-
Comm.	Pedestal	300	3000	150[5]	1000	-	-
	Cable (Direct Buried / Joint-Use Trench)	300 / 0[2]	300	300	600	-	-
	U/G Vault / Hand-hole	300	300[1]	300[1]	1000	-	-
Misc.	Tree (Direct Buried / Duct)	1000 / 300	3000	3000	3000	10	1000
	Building/Structure Foundation[6]	300	3000	1000	5000	-	-

[1] The specified clearance is to the outside of the ground grid of the pad-mounted equipment.
[2] Only applicable in a joint-use trench when there is 300 mm of vertical separation between the communication and supply cables.
[3] Overhead conductors are in full position of horizontal swing as calculated in DL6-109.
[4] Zero horizontal separation is allowed during cable crossing if there is 300 mm vertical clearance.
[5] Communication pedestals located within 3 m of pad-mounted supply equipment shall be bonded to the ground grid. See DU-03-214 for details.
[6] Measured from the nearest extent of the structure including footings and any associated drainage components.

Note: The clearances are measured from the surface of the listed equipment to the closest surface of the other.

APPENDIX B

DEPARTMENT OF FISHERIES AND OCEANS LETTER OF ADVICE

Fisheries and Oceans Canada | Pêches et Océans Canada

Central & Arctic Region
Fish and Fish Habitat
Protection Program
867 Lakeshore Road
Burlington, ON L7S 1A1

Région du Centre et de l'Arctique
Programme de la protection
du poisson et de son habitat
867 Lakeshore Road
Burlington, ON L7S 1A1

April 28, 2020

Our file *Notre référence*

20-HCAA-00024

Town of Tecumseh
Attention: Sam Paglia
917 Lesperance Road
Tecumseh, ON
N8N 1W9

Subject: New Drainage Report, Curtis Drain, Class F, Town of Tecumseh Windsor– Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Sam Paglia:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on January 9, 2020. We understand that you propose to:

- Complete a bottom only cleanout of 2000 linear metres (2000 square metres) of the Curtis Drain.
- Replace 14 culverts on the Curtis Drain resulting in an overall length reduction of 44 linear metres of culvert.

Our review considered the following information:

- Request for Revie package submitted to DFO, via email, by J. Warner.
- Correspondence between J. Warner and DFO.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Complete the works outside of the spring restricted activity timing window (March 15 to July 15).
- Complete the proposed works in the dry.
- Develop and implement an erosion and sediment control plan.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations.*

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html).

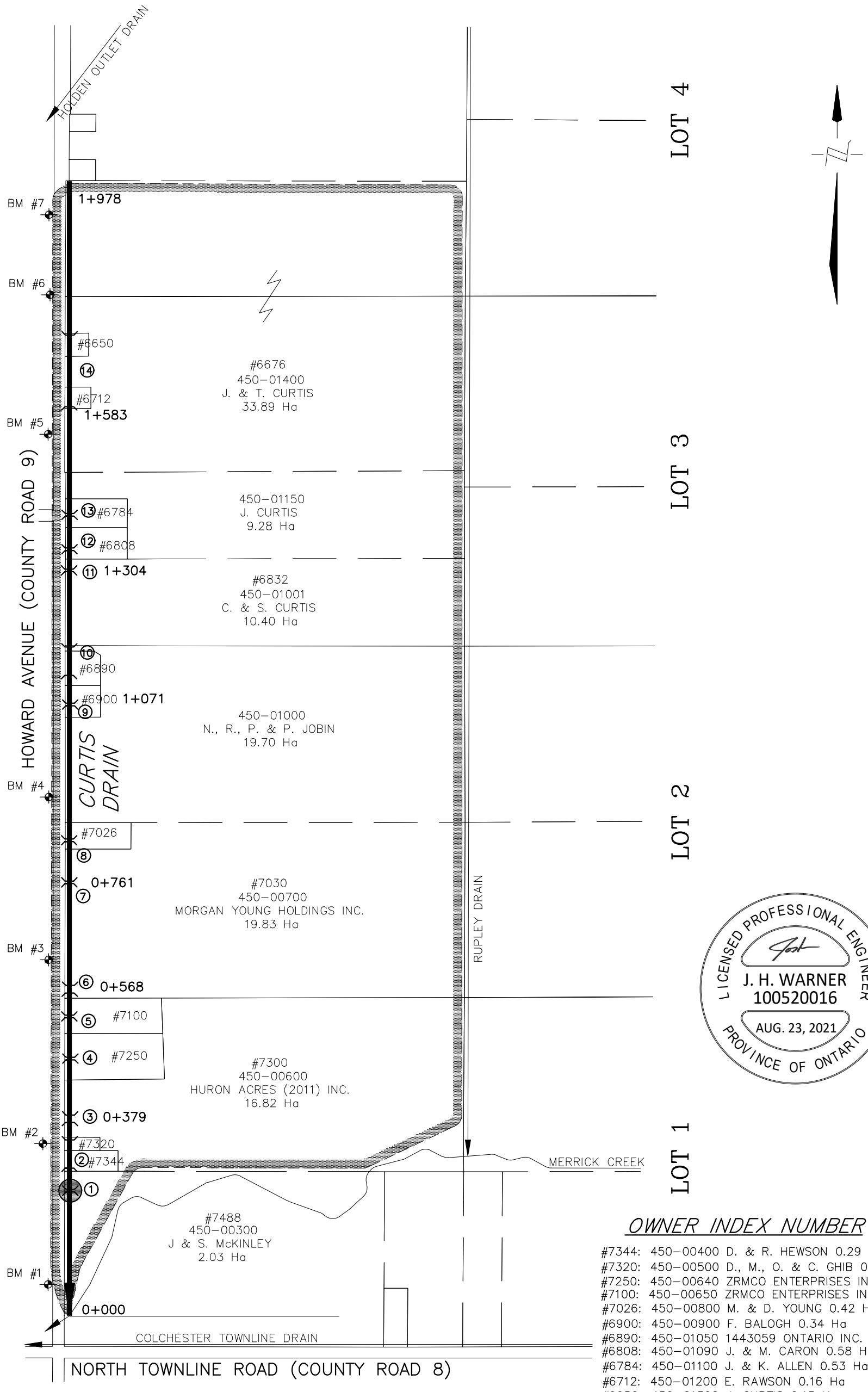
We recommend that you notify this office at least 10 days before starting your project and that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Christopher Biberhofer at our at 905-336-4510 or by email at Christopher.Biberhofer@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Steve Cho
A/Senior Biologist

CC: Josh Warner, R. Robbin Engineering
Christopher Biberhofer, DFO



OWNER INDEX NUMBER

#7344: 450–00400 D. & R. HEWSON 0.29 Ha
#7320: 450–00500 D., M., O. & C. GHIB 0.14 Ha
#7250: 450–00640 ZRMCO ENTERPRISES INC. 1.36 Ha
#7100: 450–00650 ZRMCO ENTERPRISES INC. 1.02 Ha
#7026: 450–00800 M. & D. YOUNG 0.42 Ha
#6900: 450–00900 F. BALOGH 0.34 Ha
#6890: 450–01050 1443059 ONTARIO INC. 0.20 Ha
#6808: 450–01090 J. & M. CARON 0.58 Ha
#6784: 450–01100 J. & K. ALLEN 0.53 Ha
#6712: 450–01200 E. RAWSON 0.16 Ha
#6650: 450–01300 J. CURTIS 0.15 Ha

LEGEND

- DRAINAGE AREA
- CURTIS DRAIN
- MUNICIPAL DRAIN
- CULVERT TO REMAIN
- CULVERT TO BE REPLACED
- ③ CULVERT NUMBER

LICENSED PROFESSIONAL ENGINEER
J. H. WARNER
100520016
AUG. 23, 2021
PROVINCE OF ONTARIO

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

DRAWING NAME: Curtis Drain Plan
PROJECT No. 2019–1037

APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	AMENDED	AUG. 23, 2021	JW
	1	FINAL REPORT	JUNE 1, 2020	JW
DRAWN J. WARNER	SCALE: 1:7500 0 100 200 300m			

TOWN of TECUMSEH

CURTIS DRAIN

PLAN

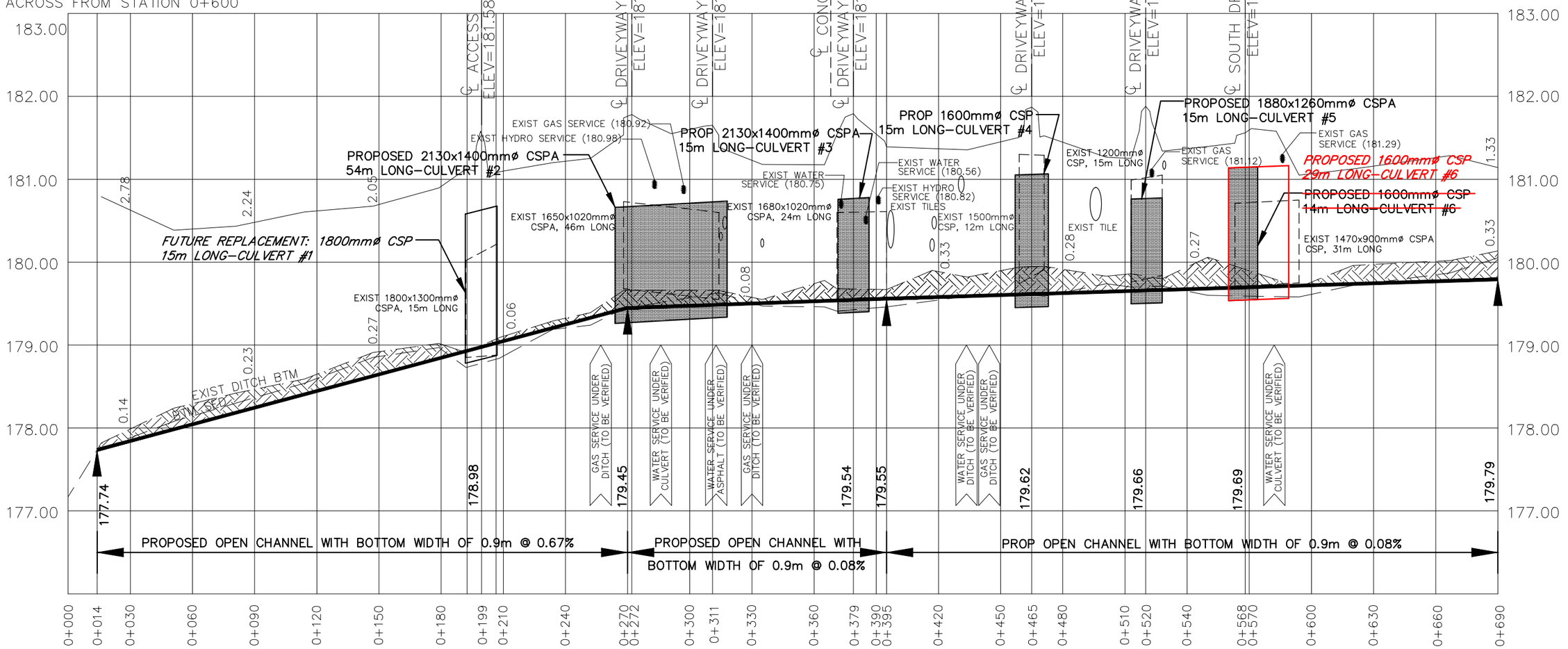
1

OF 5

Last Updated: January 2, 2020

GENERAL NOTES

1. BENCHMARK No.1 ELEV. 181.74
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 0+030
   BENCHMARK No.2 ELEV. 182.18
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 0+296
   BENCHMARK No.3 ELEV. 182.11
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 0+600
2. UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO BOTTOM OF NEW CHANNEL.
3. LOWER NUMBERS ARE DEPTH OF EXCAVATION.
4. ALL CULVERT INVERTS SHALL BE BURIED 150mm BELOW THE CHANNEL BOTTOM AS PER THE CULVERT INVERT TABLE.



LICENSED PROFESSIONAL ENGINEER
J. H. WARNER
100520016
AUG. 23, 2021
PROVINCE OF ONTARIO

Dobbin Engineering Inc.

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

DRAWING NAME: Curtis Drain Profile 1

PROJECT No. 2019-1037

APPROVED	J. WARNER
CHECKED	B. VAN RUITENBURG
DRAWN	J. WARNER

NO.	REVISIONS	DATE	BY
2	AMENDED	AUG. 23, 2021	JW
1	FINAL REPORT	JUNE 1, 2020	JW

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

TOWN of TECUMSEH

CURTIS DRAIN

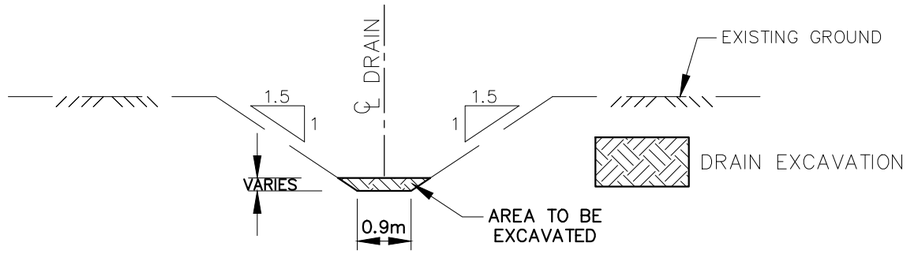
PROFILE

Last Updated: August 18, 2021

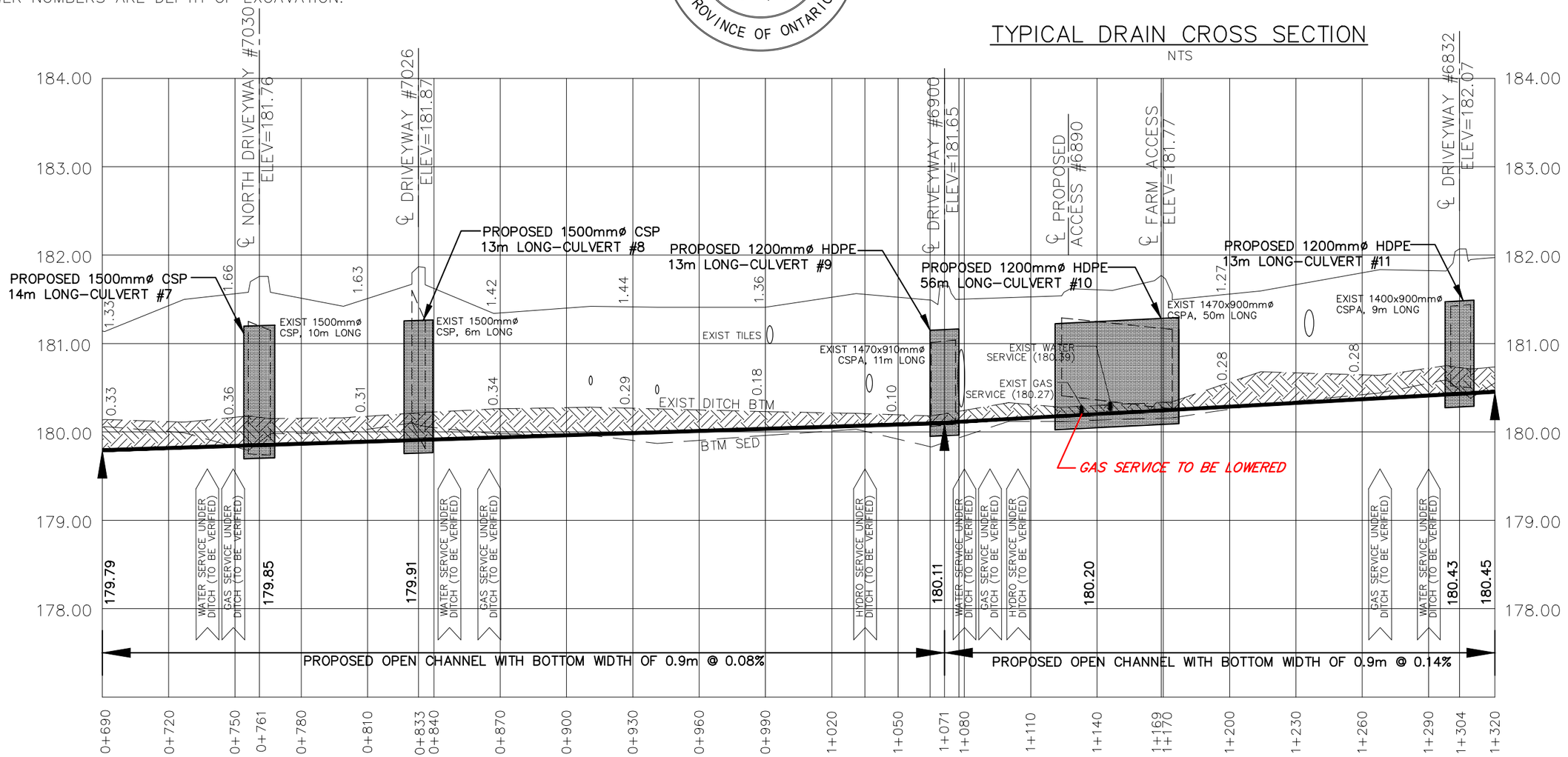
GENERAL NOTES

1. BENCHMARK No.4 ELEV. 182.25
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 0+911
2. UPPER NUMBERS ARE DEPTH FROM
   TOP OF BANK TO BOTTOM OF NEW CHANNEL.
3. LOWER NUMBERS ARE DEPTH OF EXCAVATION.
4. ALL CULVERT INVERTS SHALL BE BURIED
   150mm BELOW THE CHANNEL BOTTOM
   AS PER THE CULVERT INVERT TABLE.

LICENSED PROFESSIONAL ENGINEER
J. H. WARNER
100520016
AUG. 23, 2021
PROVINCE OF ONTARIO



TYPICAL DRAIN CROSS SECTION
NTS



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

DRAWING NAME: Curtis Drain Profile 2

PROJECT No. 2019–1037

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
	2	AMENDED	AUG. 23, 2021	JW
CHECKED	1	FINAL REPORT	JUNE 1, 2020	JW
B. VAN RUITENBURG		SCALE: 1:2,000		
DRAWN		0 20 40 60m		
J. WARNER				

TOWN of TECUMSEH
CURTIS DRAIN
PROFILE

Last Updated: August 18, 2021

GENERAL NOTES

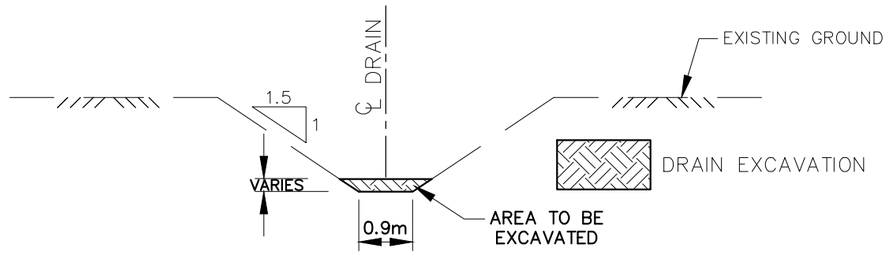
1. BENCHMARK No.5 ELEV. 182.85
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 1+541

   BENCHMARK No.6 ELEV. 183.30
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 1+770

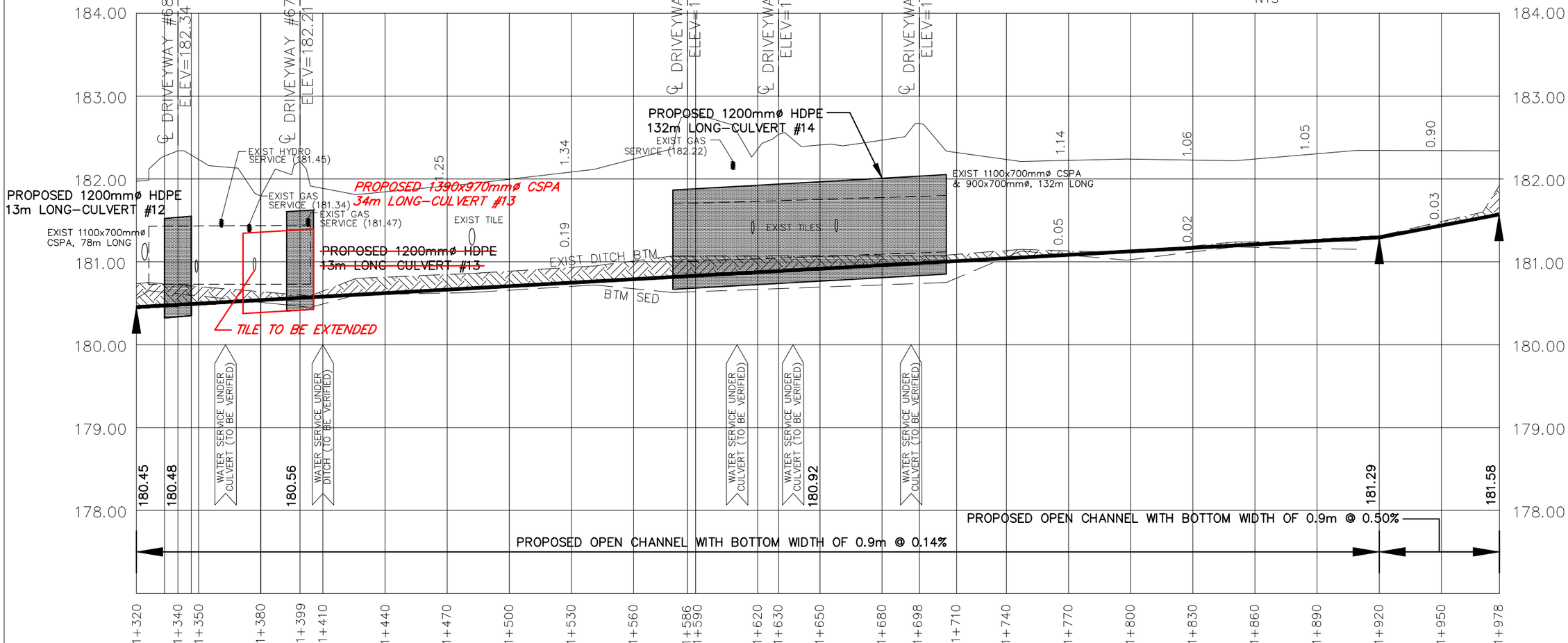
   BENCHMARK No.7 ELEV. 183.54
   TOP SPINDLE OF FIRE HYDRANT
   ON WEST SIDE OF HOWARD AVENUE
   ACROSS FROM STATION 1+920

2. UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO BOTTOM OF NEW CHANNEL.
3. LOWER NUMBERS ARE DEPTH OF EXCAVATION.
4. ALL CULVERT INVERTS SHALL BE BURIED 150mm BELOW THE CHANNEL BOTTOM AS PER THE CULVERT INVERT TABLE.

LICENSED PROFESSIONAL ENGINEER
J. H. WARNER
100520016
AUG. 23, 2021
PROVINCE OF ONTARIO



TYPICAL DRAIN CROSS SECTION
NTS



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

DRAWING NAME: Curtis Drain Profile 3

PROJECT No. 2019–1037

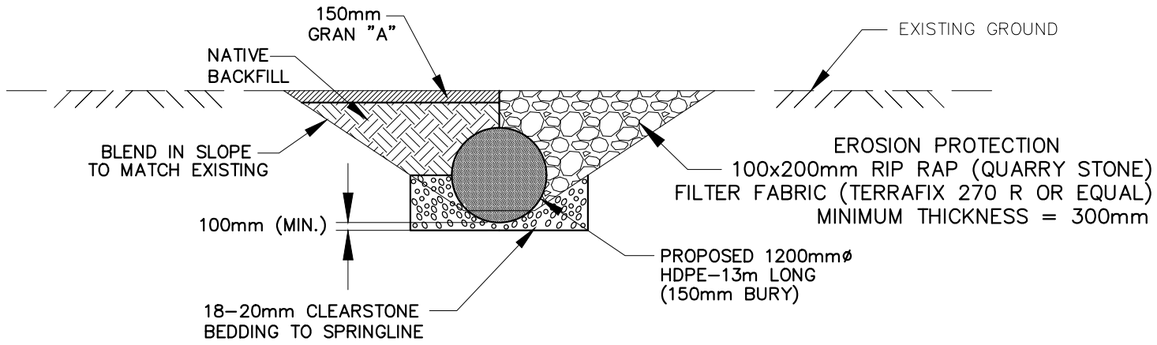
APPROVED	J. WARNER
CHECKED	B. VAN RUITENBURG
DRAWN	J. WARNER

NO.	REVISIONS	DATE	BY
2	AMENDED	AUG. 23, 2021	JW
1	FINAL REPORT	JUNE 1, 2020	JW

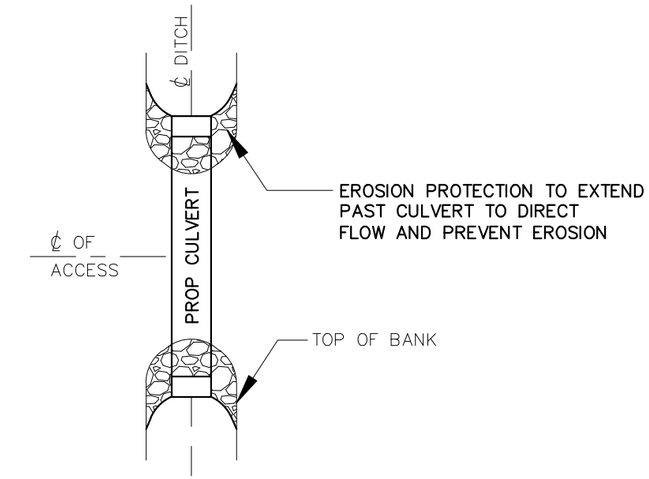
SCALE: 1:2,000
0 20 40 60m

TOWN of TECUMSEH
CURTIS DRAIN
PROFILE

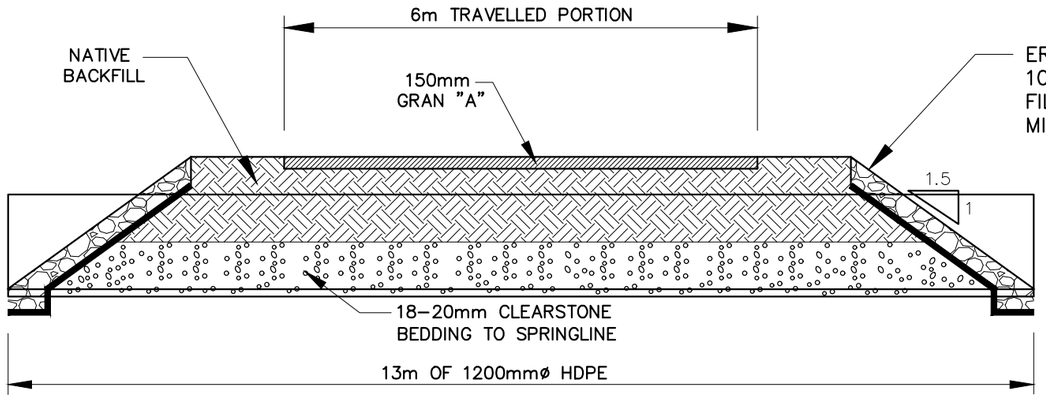
Last Updated: August 18, 2021



PROPOSED PIPE END SECTION
CULVERT NO. 11



PROPOSED PLAN
TYPICAL CULVERT
NTS



PROPOSED CROSS–SECTION
CULVERT NO. 11

NOTE:
ALL GRANULARS COMPACTED
TO 98% MODIFIED PROCTOR DENSITY

CULVERT NO.	SOUTH INV.	NORTH INV.
1	178.78	178.88
2	179.26	179.34
3	179.38	179.40
4	179.45	179.46
5	179.50	179.51
6	179.54	179.55
7	179.70	179.71

CULVERT NO.	SOUTH INV.	NORTH INV.
8	179.75	179.77
9	179.95	179.96
10	180.02	180.09
11	180.27	180.29
12	180.32	180.35
13	180.41	180.43
14	180.67	180.85

CULVERT INVERT TABLE

LICENSED PROFESSIONAL ENGINEER
J. H. WARNER
100520016
AUG. 23, 2021
PROVINCE OF ONTARIO

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

DRAWING NAME:
Curtis Drain Typical Culvert Detail

PROJECT No.
2019–1037

APPROVED
J. WARNER

CHECKED
B. VAN RUITENBURG

DRAWN
J. WARNER

NO.	REVISIONS	DATE	BY
2	AMENDED	AUG. 23, 2021	JW
1	FINAL REPORT	JUNE 1, 2020	JW

SCALE 1:75
0 2m

TOWN of TECUMSEH
CURTIS DRAIN
TYPICAL CULVERT DETAIL

5
OF 5

Last Updated: January 3, 2019