

THE CORPORATION OF THE TOWN OF AMHERSTBURG

BY-LAW NO. 2022 – 087

**By-law to provide for the Ong Drain – Bridge for 5573 Road 5 South based on the
Drainage Report by Rood Engineering Inc.**

WHEREAS a request for improvement of the Ong Drain was received under section 78 of the Drainage Act;

WHEREAS Council of the Corporation of the Town of Amherstburg appointed an engineer for the purpose of preparation of an engineer's report for the improvements of the Ong Drain under section 78 of the Drainage Act;

WHEREAS Council of the Corporation of the Town of Amherstburg has authorized Gerard Rood, P. Eng., to prepare a report and said engineer's report dated August 4, 2022, can be referenced as Schedule A, as attached hereto;

WHEREAS \$75,300.00 is the estimated cost of improving the drainage works;

AND WHEREAS the report was considered by the Amherstburg Drainage Board at the meeting held on October 18, 2022.

NOW THEREFORE the Council of the Corporation of the Town of Amherstburg hereby enacts as follows:

1. AUTHORIZATION

The attached report is adopted and the drainage works is authorized and shall be completed as specified in the report

2. BORROWING

The Corporation of the Town of Amherstburg may borrow on the credit of the Corporation the amount of \$75,300.00 being the amount necessary for the improvements of the drainage works.

3. DEBENTURE(S)

The Corporation may issue debenture(s) for the amount borrowed less the total amount of:

- (a) Grants received under section 85 of the Drainage Act;
- (b) Monies paid as allowances;
- (c) Commuted payments made in respect of lands and roads assessed with the municipality;
- (d) Money paid under subsection 61(3) of the Drainage Act; and
- (e) Money assessed in and payable by another municipality.

4. PAYMENT

Such debenture(s) shall be made payable within 5 years from the date of the debenture(s) and shall bear interest at a rate not higher than 1% more than the municipal lending rates as posted by The Town of Amherstburg's Bank's Prime Lending Rate on the date of sale of such debenture(s).

- (1) A special equal annual rate sufficient to redeem the principal and interest on the debenture(s) shall be levied upon the lands and roads and shall be collected in the same manner and at the same as other taxes are collected in each year for 5 years after the passing of this by-law.
- (2) All assessments of \$1000.00 or less are payable in the first year in which the assessments are imposed.

Read a first and second time and provisionally adopted this 25th day of October, 2022.

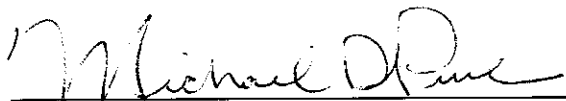


MAYOR - ALDO DICARLO




CLERK - VALERIE CRITCHLEY

Read a third time and finally passed this 23 day of Jan, ~~2022~~²⁰²³.



MAYOR - ~~ALDO DICARLO~~ Michael Prue



CLERK - ~~VALERIE CRITCHLEY~~
Kevin Fox.

ONG DRAIN

Bridge for 5573 Road 5 South

Geographic Township of Malden

(E09-2022-007)



Town of Amherstburg

**271 Sandwich Street South
Amherstburg, Ontario N9V 2A5
519-736-0012**

Rood Engineering Inc.

Consulting Engineers

9 Nelson Street

Leamington, Ontario N8H 1G6

519-322-1621

Project REI2022D005

August 4th, 2022

August 4th, 2022

Mayor and Town Council
Corporation of the Town of Amherstburg
271 Sandwich Street South
Amherstburg, Ontario
N9V 2A5

Mayor DiCarlo and Members of Council:

ONG DRAIN
Bridge for 5573 Road 5 South
E09-2022-007
Geographic Twp. of Malden
Project REI2022D005
Town of Amherstburg, County of Essex

I. INTRODUCTION

In accordance with the instructions received from you at your May 9th, 2022 meeting and confirmed by letter dated May 10th, 2022, from your Drainage Superintendent and Engineering Coordinator, Shane McVitty, P.Eng., we have prepared the following report that provides for a replacement bridge in the Ong Drain for 5573 Road 5 South. The Ong Drain extends from its outlet in the John McGee Drain, in a north easterly direction, goes under Concession Road 5 South, runs along the east side of the road until it turns east between Lots 46 & 47, Concession 5. A plan showing the Ong Drain, its approximate watershed, as well as the general location of the bridge along the drain, is included herein as part of the report.

Our appointment and the works relative to the replacement bridge in the Ong Drain, proposed under this report, is in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2021". We have performed all of the necessary survey, investigations, etcetera, for the proposed replacement bridge construction, and we report thereon as follows.

II. BACKGROUND

From our review of the information provided from the Town's drainage files we have established the following reports that we utilized as reference for carrying out this project:

- | | | |
|--------------------|--------------------------------------|-------------------------|
| 1) June 25th, 1946 | Repair and improve drain and bridges | C.G.R Armstrong, P.Eng. |
|--------------------|--------------------------------------|-------------------------|

- 2) January 27th, 1984 Updated maintenance schedule report Nick Peralta, P.Eng.

The 1946 Report by C.G.R Armstrong, P.Eng. provided for many of the culverts to be improved along the length of the drain and the latest profile for the grading of the drain. The most recent report on the drain by Nick Peralta, P.Eng. provided for an updated Maintenance Schedule of Assessment pursuant to Section 76 of the Drainage Act.

We arranged with the Town to provide us with the updated assessment roll information for the affected parcels. This information was utilized to help establish the affected areas of each parcel within the approximate watershed of the drain.

III. PRELIMINARY EXAMINATION AND ON-SITE MEETING

After reviewing all of the drainage information provided by the Town, we arranged with the Drainage Superintendent, Shane McVitty, to schedule an on-site meeting for June 14th, 2022. The following people were in attendance at said meeting: Shane McVitty (Drainage Superintendent), Adam Durham, Frank Miller, Gerald Paquette, Brad Paquette, Mark Akram (Rood Engineering) and Gerard Rood (Rood Engineering). Mr. McVitty provided an introduction. He noted that the Town had received a request from Brad Paquette (homeowner) who was concerned about his narrow bridge nearing its end of life, having a safer crossing, and needing replacement. Mr. Rood told the owners that the processing of the report could take up to a month and the construction would take up to 4 months to tender. Mr. McVitty explained that construction time may vary based on the contractor, and to call him or Mr. Rood if any questions arise. Possible delays due to E.R.C.A. was also explained to the homeowner.

Mr. McVitty explained that cost sharing is typically provided for a standard access bridge installation. Mr. Rood advised that the extra cost of any top width beyond the standard 6.1m (20 ft.) is borne by the owner.

It was noted that agricultural lands are expected to be eligible for a 1/3 grant on their total assessment if they are qualified under the Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A.) Agricultural Drainage Infrastructure Program (A.D.I.P.) policies as Farm Property Tax Class.

Mr. Rood outlined that a standard bridge top width is 6.1 metres (20 feet) for a residential or agricultural access. Bridges can be done with stacked concrete filled jute bag, sloped quarried limestone on filter cloth ends or precast concrete blocks, with the owner usually selecting the cheapest option. All pipes will be embedded in the drain bottom for 10% of their diameter in accordance with current Essex Region Conservation Authority (E.R.C.A.) and Department of Fisheries and Oceans (D.F.O.) requirements.

Mr. Paquette expressed his interest in having the new access bridge be precast concrete blocks with daylighting on roadway side with the 20' minimum top width.

After the meeting, Mr. Rood and Mr. Akram met with Brad Paquette and inspected the existing bridge at MN 5573. The owner expressed his need for a wider top width to accommodate their needs and it was observed that the concrete bridge span appears to be in mediocre condition with the top width being narrow. A 200mm steel pipe was also found outletting water into the drain that the owner explained was attached to the eavestrough and should be replaced with a 100mm H.D.P.E. Big "O". The owner confirmed that he would remove the existing guardrail-fence from the existing bridge when the Contractor is prepared to start the work and he will reinstall it if deemed necessary for the new bridge.

IV. FIELD SURVEY AND INVESTIGATIONS

Following the on-site meeting we arranged for Mr. Akram to remain at the site and perform a topographic survey, including taking the necessary levels and details to establish the design parameters for the installation of the new replacement bridge.

A bench mark was established from the March 21, 1990 Bruce D. Crozier, P.Eng. report, on the top of the south curb of the concrete culvert approximately 100 feet north of MN 5429 existing bridge. This said benchmark was utilized in establishing a correlation between the old report and new survey for the bridge. We also surveyed the drain both upstream and downstream of the proposed access bridge and picked up the existing culvert elevations in order to establish a design grade profile for the installation of the new replacement bridge. Cross sections were taken of the Ong Drain at the general location of the proposed new replacement bridge, as necessary for us to complete our design calculations, estimates and specifications.

The Town made initial submissions to the Essex Region Conservation Authority (E.R.C.A) regarding their requirements or any D.F.O. requirements for work that would be proposed to be carried out on the section of the Ong Drain to be repaired. A response from the Conservation Authority was received via email on March 29th, 2022. E.R.C.A. stated that the affected portion of the Ong Drain is located within a regulated area administered by E.R.C.A. Accordingly, a permit or approval will be required by E.R.C.A. for any repairs and/or maintenance works to the affected portion of the Ong Drain.

Former Ministry of Natural Resources & Forestry (M.N.R.F.) agreements are replaced with new legislation provisions under Ontario Regulation 242/08, Section 23.9 administered by the Ministry of Environment, Conservation and Parks (M.E.C.P.), which allows repairs, maintenance and improvements to be conducted by the Town within existing municipal drains. These works are exempt from Sections 9 and 10 of the Endangered Species Act provided that the rules in the

regulations are followed by the Town and their contractor. When eligible, the new regulations allow Municipalities to give notice to M.N.R.F. by registering their drainage activities through an online registry system.

For the purposes of establishing the watershed area upstream of the proposed bridge, and determining the pipe size required, we investigated and reviewed the 1946 Engineer's Report of C.G.R. Armstrong, P.Eng. on the Ong Drain and the 1984 report Schedule of Assessment by Nick Peralta, P.Eng.

V. FINDINGS AND RECOMMENDATIONS

We find that the profile included in the June 25th, 1946 report plans by C.G.R. Armstrong, P.Eng. provides a good fit to the bridge in the drain. Said report provided for improvements to many of the bridges and we have used the grades and other drain parameters to establish the design and work included for in this report.

The D.F.O. mapping indicates that there are no species at risk or habitat concerns at the work site. Providing mitigation requirements are implemented it was concluded that present wildlife Species at Risk will be protected from negative impacts and will not contravene with Section 9 (species protection) or Section 10 (habitat protection) of the Endangered Species Act, 2007. Based on this information we find that the Town can proceed with the eligible repairs, maintenance and improvements to the drain as they are exempt under Sections 9 and 10 of the Act, provided that they follow the rules within Ontario Regulation 242/08. To address these requirements the Town has established comprehensive mitigation measures as well as species identification guides for reference. Copies of the measures and guides shall be provided to the project bidders by the Town as part of the online tender and will be included in the tender package to the successful Tenderer for use during construction, and these documents are available for viewing by any interested parties at the Town office. The N.H.I.C. mapping indicates White Prairie Gentian, Drooping Trillium and Heart Leaved Plantain as endangered in the work area and the Contractor will be required to monitor for these and protect them as needed.

We have inspected the existing bridge affected by the section of drain to be repaired and improved and find that it requires replacement and recommend it be replaced as outlined further in this report. The proposed replacement bridge as detailed on the attached plans and in the information below will provide the standard 1:5 year storm level of service for a private access bridge with no significant adverse impacts to the drain segments upstream and downstream of the bridge. Once the replacement bridge has been constructed, we recommend that the Town keep up and maintain this bridge as part of the drainage works in the future. We recommend that standard maintenance works such as flushing and cleaning and endwall repair be carried out in accordance with the provisions of this report and the standard practice requirements and regulations at the time of the work.

We further recommend that all future maintenance work to the access bridge be carried out as provided for in this report and that the costs shall be assessed to the affected owners and upstream lands and roads in the proportions as established in this report assessment schedule.

Existing unpolluted connections to bridge pipes and enclosures will be connected to the new replacement bridge and enclosure or diverted and extended to outlet to the open drain. The Town will work with the Owner, the Health Unit, and the Ministry of the Environment and Climate Change (M.O.E.C.C.) to address any sanitary system problems. The Owners are advised that septic flows cannot be allowed to the storm drainage system pursuant to applicable legislation.

VI. ESTIMATE OF COST

Our estimate of the Total Cost of this work, including all incidental expenses, is the sum of **SEVENTY FIVE THOUSAND THREE HUNDRED (\$75,300.00)**, made up as follows:

CONSTRUCTION

Item 1)	Access Bridge: Provide all labour, equipment, and material to remove any deleterious materials encountered; remove and dispose of existing poured concrete abutments, wingwalls, and deck forming the existing bridge and install a new replacement access bridge consisting of 8.0 metres (26.25 ft.) of 1600mm diameter aluminized corrugated Hel-Cor pipe with annular ends and 125mm x 25mm corrugation profile; 9 corrugation wide aluminized bolted coupler; including Granular 'B' backfill, Granular 'A' travel surface; excavation, placement, compaction, grading; tile and swale diversion; 600mm x 600mm x 1200mm precast concrete blocks end protection with quarried limestone rip rap on filter cloth adjacent bank protection; topsoil placement, seeding and mulching, driveway restoration, silt and sediment controls, fish salvage operation, and cleanup, complete.		
	(Paquette Bridge)	Lump Sum	\$ 62,200.00
	Estimated Net H.S.T. (1.76%)		\$ 1,095.00
			<hr/>
	TOTAL FOR CONSTRUCTION		\$ 63,295.00
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Report – Ong Drain Bridge Replacement
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2022-08-04

INCIDENTALS

1) Report, Estimate, & Specifications	\$	2,500.00
2) Survey, Assistants, Expenses, and Drawings	\$	5,800.00
3) Duplication Cost of Report and Drawings	\$	500.00
4) Estimated Cost of Full-Time Supervision and Inspection During Construction (based on 2 days duration)	\$	1,500.00
7) Estimated Net H.S.T. on Items Above (1.76 %)	\$	185.00
8) Estimated Cost of E.R.C.A. Permit	\$	500.00
9) Contingency Allowance	\$	1,020.00
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TOTAL FOR INCIDENTALS	\$	12,005.00
TOTAL FOR CONSTRUCTION (brought forward)	\$	63,295.00
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TOTAL ESTIMATE	\$	75,300.00
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VII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the construction of the replacement access bridge and drain repairs and improvements. The design drawings show the subject bridge and improvement location and the details of the replacement access bridge installation, as well as the approximate location within the watershed area. The design drawings are attached to the back of this report and are labelled **Appendix “REI-E”**.

Also attached, we have prepared Specifications which set out the required construction details for the proposed access bridge and drain repairs and improvements, which also include Standard Specifications labelled therein as **Appendix “REI-C”**.

VIII. SCHEDULE OF ASSESSMENT

We would recommend that the Total Cost for construction of this project, including incidental costs, be charged against the lands and roads affected in accordance with the attached Schedule of Assessment. Any costs for construction and future maintenance of the bridge shall be shared with 46.1% assessed as Benefit to the parcel served by the bridge and the balance of 53.9% to be assessed to the affected upstream lands and roads on a pro-rata basis with the Outlet values in the attached schedule of assessment or any future updated reports for the drain pursuant to the Drainage Act. On September 22nd, 2005, the Ontario Ministry of Agriculture and Food (O.M.A.F.) issued Administrative Policies for the Agricultural Drainage Infrastructure Program (A.D.I.P.). This program has re-instated financial assistance for eligible costs and assessed lands pursuant to the Drainage Act. Sections 85 to 90 of the Drainage Act allow the Minister to provide grants for various activities under said Act. Sections 85 and 87 make it very clear that grants are provided at the discretion of the Minister. Based on the current A.D.I.P. policies, “lands used for agricultural purposes” may be eligible for a grant in the amount of 1/3 of their total assessment. The new policies define “lands used for agricultural purposes” as those lands eligible for the “Farm Property Class Tax Rate”. The Town Clerk provides this information to the Engineer from the current property tax roll. Properties that do not meet the criteria are not eligible for grants. In accordance with same we expect that this project will be qualified for the grant normally available for agricultural lands. The Ministry, however, is continually reviewing their policy for grants, and we recommend that the Town monitor the policies, and make application to the Ministry for any grant should same become available through the A.D.I.P. program or other available funds.

Where a bridge structure has increased top width beyond the standard 6.10 metre (20.0 ft.) top width, all of the increased costs resulting from same are assessed 100% to the Owner as provided for in the cost sharing set out in the attached Schedule of Assessment.

IX. FUTURE MAINTENANCE

We recommend that the bridge structure as identified herein, be maintained in the future as part of the drainage works. We would also recommend that the bridge, for which the maintenance costs are to be shared with the upstream lands and roads within the watershed, be maintained by the Town and that said maintenance would include works to the bridge culvert, bedding, backfill and end treatment. Should concrete, asphalt, or other decorative driveway surfaces over the bridge culvert require removal as part of the maintenance works, the surface shall also be repaired or replaced as part of the works. Likewise, if any fencing, gate, decorative walls, guardrails, or other special features exist that will be impacted by the maintenance work, they are also to be removed and restored or replaced as part of the bridge maintenance work. However, the cost of the supply and installation of any surface materials other than Granular “A” material and the cost of removal and restoration or replacement, if necessary, of any special

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features, shall be totally assessed to the benefiting adjoining Owner(s) served by said access bridge.

When the maintenance costs of the individual access bridges and enclosures are being shared with upstream lands and roads, it should be noted that the percentages to be shared with the upstream lands and roads shall be assessed as an Outlet Liability against the affected lands and roads lying upstream of the access bridge or enclosure in question, including the proportion of the abutting lands located upstream of the bridge or enclosure being maintained. The cost sharing for upstream lands and roads shall be prorated in the same proportions as the Outlet Liability values shown in the attached "Schedule of Assessment". The share to the abutting owner(s) shall be assessed as a Benefit to the owner(s) of the parcel abutting and served by the access bridge.

When future maintenance work is carried out, the assessment to the affected Owners shall be based on the actual future maintenance cost shared on a pro-rata basis with the values shown in this assessment schedule. We further recommend that the maintenance cost sharing as set out above shall remain as aforesaid until otherwise determined and re-established under the provisions of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2021".

All of which is respectfully submitted.

Rood Engineering Inc.

Gerard Rood

Gerard Rood, P.Eng.



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att.

ROOD ENGINEERING INC.

Consulting Engineers

9 Nelson Street

LEAMINGTON, Ontario N8H 1G6

SCHEDULE OF ASSESSMENT
ONG DRAIN
Town of Amherstburg

3. MUNICIPAL LANDS:

Con. or										
Parcel <u>No.</u>	Plan <u>No.</u>	Lot or Part <u>of Lot</u>	Acres <u>Owned</u>	Acres <u>Afft'd</u>	Hectares <u>Afft'd</u>	<u>Owner's Name</u>	Value of <u>Benefit</u>	Value of <u>Outlet</u>	Value of <u>Special Benefit</u>	TOTAL <u>VALUE</u>
		County Road 18		1.30	0.526	County of Essex	\$ -	\$ 339.00	\$ -	\$ 339.00
		Concession 5 South		12.35	4.998	Town of Amherstburg	\$ -	\$ 3,224.00	\$ -	\$ 3,224.00
		South Sideroad		6.30	2.551	Town of Amherstburg	\$ -	\$ 1,646.00	\$ -	\$ 1,646.00
Total on Municipal Lands.....							\$ -	\$ 5,209.00	\$ -	\$ 5,209.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Con. or										
Parcel <u>No.</u>	Plan <u>No.</u>	Lot or Part <u>of Lot</u>	Acres <u>Owned</u>	Acres <u>Afft'd</u>	Hectares <u>Afft'd</u>	<u>Owner's Name</u>	Value of <u>Benefit</u>	Value of <u>Outlet</u>	Value of <u>Special Benefit</u>	TOTAL <u>VALUE</u>
1	5	49	0.85	0.85	0.344	Bradley & Lindy Paquette	\$ 34,713.00	\$ 125.00	\$ -	\$ 34,838.00
2	5	48	1.04	1.04	0.421	Allan & Tammy Bicknell	\$ -	\$ 143.00	\$ -	\$ 143.00
3	5	48	0.84	0.84	0.340	Kim Laframboise & Joyce Pettit	\$ -	\$ 124.00	\$ -	\$ 124.00
4	5	40	0.34	0.34	0.138	Jeffrey Hallock & Crystal Crawford	\$ -	\$ 63.00	\$ -	\$ 63.00
5	4	40	0.34	0.34	0.138	David Banda & Jill Wright	\$ -	\$ 63.00	\$ -	\$ 63.00
6	4	40	10.00	4.99	2.020	Rosalee & Jill Wright	\$ -	\$ 237.00	\$ -	\$ 237.00
7	5	48	1.82	1.82	0.735	Stanley & Maureen Larabee	\$ -	\$ 47.00	\$ -	\$ 47.00
8	5	48	1.39	1.39	0.562	Angela & Elizabeth Hayes	\$ -	\$ 178.00	\$ -	\$ 178.00

Parcel No.	Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
9	5	46	0.57	0.57	0.232	Barbara Durham & Mark Dent	\$ -	\$ 93.00	\$ -	\$ 93.00
10	5	46	0.96	0.96	0.389	Jason Faucher	\$ -	\$ 137.00	\$ -	\$ 137.00
11	5	46	0.44	0.44	0.176	Stephen Hucker	\$ -	\$ 77.00	\$ -	\$ 77.00
12	5	46	1.95	1.95	0.791	Scott Jones & Corine Evola	\$ -	\$ 213.00	\$ -	\$ 213.00
13	5	46	0.57	0.57	0.231	Duane & Deborah Deslippe	\$ -	\$ 92.00	\$ -	\$ 92.00
34	5	46	0.83	0.83	0.336	Dustin Deslippe	\$ -	\$ 122.00	\$ -	\$ 122.00
14	5	46	0.46	0.46	0.186	Gary & Karen Paquette	\$ -	\$ 81.00	\$ -	\$ 81.00
15	5	46	0.30	0.30	0.120	Tracey Pillon	\$ -	\$ 56.00	\$ -	\$ 56.00
16	5	46	0.78	0.78	0.318	Donald & Katherine Laing	\$ -	\$ 119.00	\$ -	\$ 119.00
17	5	46	2.14	2.14	0.866	Marie & Raymond Burns	\$ -	\$ 223.00	\$ -	\$ 223.00
18	5	47	0.95	0.47	0.190	Gary & Susan Deslippe	\$ -	\$ 67.00	\$ -	\$ 67.00
Total on Privately Owned - Non-Agricultural Lands.....							\$ 34,713.00	\$ 2,260.00	\$ -	\$ 36,973.00

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel No.	Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
19	5	49	77.13	23.14	9.364	Bradley & Lindy Paquette	\$ -	\$ 1,098.00	\$ -	\$ 1,098.00
20	5	49	52.41	52.41	21.210	Leo Robert Paquette	\$ -	\$ 2,488.00	\$ -	\$ 2,488.00
21	5	49	51.13	50.01	20.240	Robert & Marilyn Paquette	\$ -	\$ 2,374.00	\$ -	\$ 2,374.00
22	5	48	51.59	50.01	20.240	Leo Richard & Carolyn Paquette	\$ -	\$ 2,374.00	\$ -	\$ 2,374.00
23	4	40	40.16	10.01	4.050	Richard & Carolyn Paquette	\$ -	\$ 475.00	\$ -	\$ 475.00
24	5	48	48.27	48.27	19.533	Miller Cattle & Grain Ltd.	\$ -	\$ 2,291.00	\$ -	\$ 2,291.00

Parcel No.	Plan No.	Con. or Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
25	5	46 & 47	58.96	57.75	23.370	Richard & Amy Wismer	\$ -	\$ 2,741.00	\$ -	\$ 2,741.00
26	5	46	32.81	31.73	12.840	Adam & Julia Durham	\$ -	\$ 1,506.00	\$ -	\$ 1,506.00
27	5	46 & 47	56.50	56.50	22.866	Dolores Deslippe	\$ -	\$ 2,682.00	\$ -	\$ 2,682.00
28	5	46	33.37	33.37	13.505	Daniel & Cathy Paquette	\$ -	\$ 1,584.00	\$ -	\$ 1,584.00
29	5	46	30.92	30.92	12.515	Thomas, Marie, Raymond, G. Burns & Michelle Rice	\$ -	\$ 1,468.00	\$ -	\$ 1,468.00
30	5	46	31.60	4.99	2.020	Philip & Paul Jobin	\$ -	\$ 237.00	\$ -	\$ 237.00
31	5	47	49.41	49.41	19.995	Scott & Gary Deslippe	\$ -	\$ 2,345.00	\$ -	\$ 2,345.00
32	5	47 & 48	126.12	126.12	51.039	Miller Cattle & Grain Ltd.	\$ -	\$ 5,987.00	\$ -	\$ 5,987.00
33	5	48	73.05	73.05	29.563	Paquette Farms of Malden Ltd.	\$ -	\$ 3,468.00	\$ -	\$ 3,468.00
Total on Privately Owned - Agricultural Lands (grantable).....							\$ -	\$ 33,118.00	\$ -	\$ 33,118.00
TOTAL ASSESSMENT				960.37	388.66		\$ 34,713.00	\$ 40,587.00	\$ -	\$ 75,300.00

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1 Hectare = 2.471 Acres
 Project No. REI2022D005
 August 4th, 2022

SPECIFICATIONS

ONG DRAIN

Bridge for 5573 Road 5 South (E09-2022-007)

Geographic Township of Malden

TOWN OF AMHERSTBURG

I. GENERAL SCOPE OF WORK

The Ong Drain currently comprises of an open Municipal drain. The work under this project generally comprises of construction of a replacement access bridge serving 5573 Road 5 South. The work on the bridge being replaced includes the removal of the existing concrete structure and the installation of a new culvert at the centre line of the existing bridge near Station 2+970.04; the new culvert end treatments comprising of precast concrete blocks with adjacent sloped quarried limestone on filter cloth end protection; granular approaches and backfill; and granular transition areas.

All work shall be carried out in accordance with these specifications, the plans forming part of this drainage project, as well as the Standard Details included in **Appendix "REI-C"**. The bridge new construction shall be of the size, type, depth, etcetera, as is shown in the accompanying drawings, as determined from the Benchmarks, and as may be further laid out at the site at the time of construction. All work carried out under this project shall be completed to the full satisfaction of the Town Drainage Superintendent and the Consulting Engineer.

II. E.R.C.A. AND D.F.O. CONSIDERATIONS

The Contractor will be required to implement stringent erosion and sedimentation controls during the course of the work to help minimize the amount of silt and sediment being carried downstream into the Big Creek drain. It is intended that work on this project be carried out during relatively dry weather to ensure proper site and drain conditions and to avoid conflicts with sediment being deposited into the outlet drainage system. All disturbed areas shall be restored as quickly as possible with grass seeding and mulching installed to ensure a protective cover and to minimize any erosion from the work sites subsequent to construction. The Contractor may be required to provide temporary silt fencing and straw bales as outlined further in these specifications.

All of the work shall be carried out in accordance with any permits or authorizations issued by the Essex Region Conservation Authority (E.R.C.A.) or the Department of Fisheries and Oceans

(D.F.O.), copies of which will be provided, if available, and the notes in **Appendix "REI-A"**. The Contractor is advised that no work may be carried out in the existing drain from March 15th to June 30th of any given year because the drain is directly connected to a downstream area that is classified as sensitive to impacts on aquatic life and habitat by E.R.C.A. and D.F.O.

As part of its work, the Contractor will implement the following measures that will ensure that any potential adverse effects on fish and fish habitat will be mitigated:

- a) As per standard requirements, work will not be conducted at times when flows in the drain are elevated due to local rain events, storms, or seasonal floods. Work will be done in the dry.
- b) All disturbed soils on the drain banks and within the channel, including spoil, must be stabilized immediately upon completion of work. The restoration of the site must be completed to a like or better condition to what existed prior to the works. The spoil material must be hauled away and disposed of at a suitable site or spread an appropriate distance from the top of the drain bank to ensure that it is not washed back into the drain.
- c) To prevent sediment entry into the Drain, in the event of an unexpected rainfall, silt barriers and/or traps must be placed in the channel during the works and until the site has been stabilized. All sediment and erosion control measures are to be in accordance with related Ontario Provincial Standards. It is incumbent on the proponent and their Contractors to ensure that sediment and erosion control measures are functioning properly and are maintained and upgraded as required.
- d) Silt or sand accumulated in the barrier traps must be removed and stabilized on land once the site is stabilized.
- e) All activities including maintenance procedures should be controlled to prevent the entry of petroleum products, debris, rubble, concrete, or other deleterious substances into the water. Vehicular refuelling and maintenance should be conducted away from the water.

III. M.N.R.F. – M.E.C.P. CONSIDERATIONS

The Contractor is to note that the Ministry of Natural Resources and Forestry (M.N.R.F.) and Ministry of Environment Conservation and Parks (M.E.C.P.) screening process by way of a Species at Risk (S.A.R.) review of the "Endangered Species Act, 2007" (E.S.A.) will be completed as a self-assessment by the Town pursuant to Section 23.9 of the E.S.A. prior to construction. This Section allows the Town to conduct eligible works of repair, maintenance and improvement to existing municipal drains under the Drainage Act, and exemptions from Sections 9 and 10 of the E.S.A., provided that the requirements are followed in accordance with Ontario Regulation 242/08. The results of the review will be provided to the Contractor and copies of the mitigation measures, habitat protection and identification sheets will be included within **Appendix "REI-B"**. Snake

species including Butler's Garter Snake and Eastern Foxsnake are indicated to be threatened and endangered respectively on the agreement plans for this site. In addition, turtles along with the snakes are considered sensitive to the area and are mobile. Schedule 'C' of the agreement has provisions to protect them and mitigate any impacts. A copy of the Town review and copies of the agreement mitigation will be included within **Appendix "REI-B"**.

The Contractor is to review **Appendix "REI-B"** in detail and is required to comply in all regards with the contents of said M.N.R.F. – M.E.C.P. measures, and follow the special requirements therein included during construction. Throughout the course of construction, the Contractor will be responsible to ensure that all necessary provisions are undertaken to protect all species at risk and their habitats including N.H.I.C. mapping information on endangered species including Whit Prairie Gentian, Drooping Trillium, and Heart-leaved Plantain. If a threatened or sensitive species is encountered, the Contractor shall notify the Town and M.N.R.F. – M.E.C.P. and provide all the equipment and materials stipulated by the mitigation requirements for handling the species and cooperate fully with the Town and M.N.R.F. – M.E.C.P. staff in the handling of the species.

IV. ACCESS TO WORK

The Contractor is advised that the majority of the work to be carried out on this project extends along the east side of 5th Concession South Road. The Contractor shall have access for the eastern width of the roadway abutting the proposed drainage works. The Contractor may utilize the right-of-way as necessary, to permit the completion of all of the work required to be carried out for this project. The Contractor shall also have access into the driveways as necessary to carry out the removal of the existing access bridge and to construct the new replacement access bridge, as set out on the plans and in these specifications, along with a sufficient area in the vicinity of the bridges to carry out the required construction of the removal and new structure installation and ancillary work.

The Contractor shall ensure that the traveling public is protected at all times while utilizing the roadway for its access. The Contractor shall provide traffic control, including flag persons when required. Should the Contractor have to close 5th Concession Road South for the proposed works, it shall obtain the permission of the Town Drainage Superintendent or Consulting Engineer and arrange to provide the necessary notification of detours around the site. The Contractor shall also ensure that all emergency services, school bus companies, etcetera are contacted about the disruption to access at least 48 hours in advance of same. All detour routes shall be established in consultation with the Amherstburg Works Department.

Throughout the course of the work, it is imperative that the Contractor protect as much landscaping and vegetation as possible when accessing along the drain. This will be of particular concern along the lawn areas of residential properties. Due to the extent of the work and the area for carrying out the work, the Contractor will be required to carry out all of the necessary steps to direct traffic and provide temporary diversion of traffic around work sites, including provision of all lights, signs, flag persons, and barricades required to protect the safety of the

traveling public. Any accesses or areas used in carrying out the works are to be fully restored to their original conditions by the Contractor at its cost, including topsoil placement and lawn restoration as directed by the Town Drainage Superintendent and the Consulting Engineer. Restoration shall include but not be limited to all necessary levelling, grading, shaping, topsoil, seeding, mulching, and granular placement required to make good any damage caused.

V. REMOVAL OF BRUSH, TREES AND RUBBISH

Where there is any brush, trees or rubbish along the course of the drainage works, including the full width of the work access, all such brush, trees or rubbish shall be close cut and grubbed out, and the whole shall be chipped up for recycling, burned or otherwise satisfactorily disposed of by the Contractor. The brush and trees removed along the course of the work are to be put into piles by the Contractor in locations where they can be safely chipped and disposed of, or burned by it, or hauled away and disposed of by the Contractor to a site to be obtained by it at its expense. Prior to and during the course of any burning operations, the Contractor shall comply with the guidelines prepared by the Air Quality Branch of the Ontario Ministry of the Environment; and shall ensure that the Environmental Protection Act is not violated. The Contractor will be required to notify the local fire authorities to obtain any permits and cooperate with them in the carrying out of any work. The removal of brush and trees shall be carried out in close consultation with the Town Drainage Superintendent or Consulting Engineer to ensure that no decorative trees or shrubs are disturbed by the operations of the Contractor that can be saved. It is the intent of this project to save as many trees and bushes as practical within the roadway allowances and on private lands. Where decorative trees or shrubs are located directly over drainage pipes, the Contractor shall carefully extract same and turn them over to the Owner when requested to do so; and shall cooperate with the Owner in the reinstallation of same if required.

The Contractor shall protect all other trees, bushes, and shrubs located along the length of the drainage works except for those trees that are established, in consultation with the Town Drainage Superintendent, the Consulting Engineer, and the Owners, to be removed as part of the works. The Contractor shall note that protecting and saving the trees may require the Contractor to carry out hand work around the trees, bushes, and shrubs to complete the necessary final site grading and restoration.

Following the completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which are to remain standing, and it shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition.

The Contractor shall remove all deleterious materials and rubbish along the course of the open drain in the location of the work areas and any such materials located in the bridge culverts and enclosures while carrying out its cleaning of same. All such deleterious materials and rubbish shall be loaded up and hauled away by the Contractor to a site to be obtained by it at its cost.

VI. FENCING

Where it is necessary to take down any fence to proceed with the work, the same shall be done by the Contractor across or along that portion of the work where such fence is located. The Contractor will be required to exercise extreme care in the removal of any fencing so as to cause a minimum of damage to same. The Contractor will be required to reinstall any fence that is taken down in order to proceed with the work, and the fence shall be reinstated in a neat and workmanlike manner. The Contractor will not be required to procure any new materials for rebuilding the fence provided that it has used reasonable care in the removal and replacement of same. When any fence is removed by the Contractor, and the Owner thereof deems it advisable and procures new material for replacing the fence so removed, the Contractor shall replace the fence using the new materials and the materials from the present fence shall remain the property of the Owner.

VII. DETAILS OF BRIDGE WORK

The Contractor shall provide all material, labour and equipment to remove and dispose of the existing concrete access bridge in the Ong Drain requiring work, along with the new pipe installation and endwall construction and other improvements as noted.

The existing concrete bridge slated to be removed shall be replaced with new aluminized steel Type II Hel-Cor pipe. All piping sections shall be connected by the use of 9 corrugation (9-C) aluminized bolted couplers installed around the complete circumference of the pipe in accordance with the manufacturer's recommendation. Each coupler shall be wrapped in filter cloth material around the complete circumference to ensure that there will be no soil migration through the joints and into the pipe through said connections.

The replacement new pipe installation on this project shall be set to the grades as shown on the plans or as otherwise established herein and the Town Drainage Superintendent or the Consulting Engineer may make minor changes to the bridge alignment as they deem necessary to suit the site conditions.

When completed, the new 1600mm diameter replacement access bridge along the centreline of the new culvert shall have a total top width, including the top width of the precast concrete block end walls, of approximately 8.0 metres (26.2 ft.) and a travelled driveway width of 6.78 metres (22.2 ft.). The adjacent quarried limestone on filter cloth bank protection shall be installed on a slope no steeper than 1.5 horizontal to 1.0 vertical and shall extend from the end of the new corrugated aluminized steel pipe structure to the top elevation of the east and west banks. The proposed pipe inverts are set approximately 160mm below the drain design grade. The Hel-Cor aluminized Type II corrugated steel pipe to be provided for this project is to be supplied as no more than two (2) approximately equal lengths of pipe for the bridge and joined together with a

9C (corrugation) aluminized bolted coupler with non-woven geotextile filter cloth wrapped around it, secured in accordance with the manufacturer's recommendations. The aluminized corrugated steel pipe to be utilized for this bridge installation must be a minimum of 2.0mm thick with 125mm by 25mm corrugations and shall be approved by the Town Drainage Superintendent or Engineer, prior to its placement in the drain. The Town Drainage Superintendent or the Consulting Engineer may make minor changes to the bridge alignment as they deem necessary to suit the site conditions. All work shall be carried out in general accordance with the items in the "**STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION**" attached to this report and labelled **Appendix "REI-C"**.

The Contractor shall have access to carry out the work from the road right-of-way, along with a sufficient distance along both sides of the drain upstream and downstream from the bridge to complete the access bridge installation and drain cleaning as specified. Any accesses or areas utilized in carrying out the works are to be fully restored to their original conditions by the Contractor, including topsoil placement and lawn restoration as directed by the Engineer or the Town Drainage Superintendent. Restoration shall include, but not be limited to, all necessary levelling, grading, shaping, topsoil placement, and granular required to make good any damage caused and include replacing the existing steel pipe with 100mm diameter Big 'O' as noted on the plans.

The Contractor shall also note that the placement of the new replacement access bridge culvert is to be performed totally in the dry, and it shall be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or Engineer. As part of the work, the Contractor will be required to clean out the drain along the full length of the bridge pipe and for a distance of 3.0 metres (10.0ft.) both upstream and downstream of said pipe. The design parameters of the Ong Drain at the location of this new access bridge installation consists of a 1.2m (4 ft.) bottom width, 0.40% grade, and 1.5 horizontal to 1.0 vertical sideslopes. The Contractor shall be required to cut any brush and strip the existing drain sideslopes of any vegetation as part of the grubbing operation. The Contractor shall also dispose of all excavated and deleterious materials, as well as any grubbed out materials, to a site to be obtained by it at its own expense. Material at the bridge location may be salvaged and re-used if cleaned up and able to be placed as outlined further in these specifications. The Contractor shall note that the survey indicates that the existing drain bottom is slightly above the design grade. The Contractor shall be required to provide any and all labour, material and equipment to set the pipe to the required design grades. The Contractor shall also be required to supply, if necessary, for a solid base, a minimum thickness of 100mm (4") of 20mm (3/4") clear stone bedding underneath the culvert pipe, extending from the bottom of the excavation to the culvert invert grade, all to the full satisfaction of the Town Drainage Superintendent or Engineer.

The installation of the complete length of the new access bridge culvert, including all appurtenances, shall be completely inspected by the Town Drainage Superintendent or Engineer prior to backfilling any portions of same. Under no circumstance shall the Contractor backfill same until the Town Drainage Superintendent or Engineer inspects and approves said pipe installation. The Contractor shall provide a minimum notice of 2 working days to the Town

Drainage Superintendent or Engineer prior to the commencement of this work. The installation of this new access bridge is to be performed during the normal working hours from Monday to Friday of the Town Drainage Superintendent or Engineer unless written authorization is provided by them to amend said working hours.

Once the aluminized corrugated steel pipe has been satisfactorily set in place at the site, the Contractor shall completely backfill same with granular material M.T.O. Type "B" O.P.S.S. (Ontario Provincial Standard Specification) Form 1010, with the exception of the top 305mm (12") of the backfill material for the full top width of the drain and the access bridge, which shall be granular material M.T.O. Type "A" O.P.S.S. Form 1010.

The Contractor shall also perform the necessary excavation to extend the driveway easterly from the east top bank of the drain to the west limit of the roadway pavement. This driveway approach from the existing edge of paved shoulder to approximately 1.0 metres east of the east top of bank shall consist of a minimum of 305mm (12") of granular material M.T.O. Type "A" satisfactorily compacted in place and finished with 90mm thickness of HL-4 or equivalent SuperPave asphalt. The asphalt apron shall extend for the full width of the access culvert top and include a gore section at the roadside curved protection with a 5.0m turning radius to the edge of the roadway pavement, as shown on the plans. The gravel backfill and asphalt shall also extend across the full access pipe width to approximately 1.0m beyond the east top of bank as shown on the plans. The pipe shall have a minimum of 1.7m of cover and be uniformly graded down to the existing driveway level from the existing road edge level.

Once the aluminized corrugated steel pipe has been set in place at the required location, the Contractor shall completely backfill same with granular material, and install the precast concrete block headwalls and quarried limestone on filter cloth protection on both ends of the bridge. The installation of the endwalls, as well as the backfilling of the pipe where applicable, shall be provided in compliance with Items 1, 2, 3, and 4 of the "**Standard Specifications for Access Bridge Construction**" attached within **Appendix "REI-C"** and in total compliance and in all respects with the General Conditions included in Item 4 of said Appendix. The Contractor, in all cases, shall comply with these specifications and upon completion of the precast blocks end protection installation shall restore the adjacent areas to their original conditions. All rock protection shall be 305mm (12") thick, installed on non-woven filter cloth, and shall be installed in accordance with Item 2 of the "**Standard Specifications for Access Bridge Construction**". The synthetic filter fabric to be used shall be non-woven geotextile GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products through Underground Specialties - Wolseley in Windsor, Ontario, or equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm to a maximum of 250mm, and is available from Walker Industries Amherst Quarry, in Amherstburg, Ontario, or equal.

The aluminized corrugated steel pipe for this installation shall be provided with a depth of cover measured from the top of the aluminized steel pipe to the top of the granular backfill of approximately 1.7m (5.50 ft.) for the new bridge and if the culvert is placed at its proper elevations, this should be easily achieved. If the Contractor finds that the specified cover is not being met, they

shall notify the Drainage Superintendent and the Engineer immediately so that steps can be taken to rectify the condition prior to the placement of any backfill. The cover requirement is **critical** and must be attained. In order for this new access bridge culvert to properly fit the channel parameters, all of the design grade elevations provided below must be strictly adhered to.

Also, for use by the Contractor, we have established a Benchmark near the site. This Benchmark is the “*top nut of fire hydrant located approximately 10 metres west of the design bridge across the road from MN 5573*”, with same being **Elevation 182.015 metres**. The new pipe culvert and the backfilling are to be placed on the following basis:

- i) The **North (upstream) invert** of the proposed bridge culvert is to be set at Elevation **177.918** metres.
- ii) The **South (downstream) invert** of the proposed bridge culvert is to be set at Elevation **177.886** metres.
- iii) The centreline of driveway for this bridge installation shall be set to approximately Elevation **181.400** metres at the existing gravel shoulder edge, Elevation **181.288** metres at the culvert pipe centreline, and Elevation **181.000** metres at approximately 1.0 metre east of the east top of bank and then graded to match the existing ground elevation at each end of the granular and asphalt approaches. The access bridge driveway, in all cases, shall be graded with a cross-fall from the centreline of the driveway to the outer edges of the driveway at an approximate grade of 1.50%.

As a check, all of the above design grade elevations should be confirmed before commencing to the next stage of the new replacement access bridge installation. The Contractor is also to check that the pipe invert grades are correct by referencing the Benchmark provided for the site.

The Contractor shall also be required to provide all labour, equipment and material to provide granular fill to all areas at the road as noted on the plans. The Contractor shall provide a 5.0 metre radius on the roadside approach of the drain as seen on the plans and protect any existing landscape features during the course of the work.

As part of the work provided for the construction of the access bridge, the Contractor shall be required to protect or extend any existing lateral tile ends, pipes and swales which conflict with the bridge installation. All existing lateral tile drains, pipes and swales, where required, shall be diverted and extended to the ends of the new access bridge culvert and shall be extended and installed in accordance with the “Standard Lateral Tile Detail” as shown in **Appendix “REI-C”**, unless otherwise noted. Connections shall be made using manufacturer’s couplers wherever possible. All other connections shall be completely sealed with concrete grout around the full exterior perimeter of each joint. Grouted mortar joints shall be composed of three (3) parts of clean, sharp sand to one (1) part of Portland cement and the mortar connection shall be performed to the full satisfaction of the Town Drainage Superintendent or the Engineer. The

mortar joint shall be of a sufficient mass around the full circumference of the joint to ensure a tight, solid seal.

The Contractor is to note that the granular driveway approaches extending from the existing edge of paved shoulder to the east top of bank of the drain shall consist of granular material M.T.O. Type "A" O.P.S.S. Form 1010 and is to be provided to a minimum depth of 305mm (12") and be satisfactorily compacted in place. The Contractor is to also note that all granular material being placed as backfill for this bridge installation shall be compacted in place to a minimum Standard Proctor Density of 100%, and that all native fill material to be used for the construction shall be compacted in place to a minimum Standard Proctor Density of 95%.

All of the granular backfill and the compaction levels for same shall be provided to the full satisfaction of the Town Drainage Superintendent or the Engineer. The Contractor shall also note that any sediment being removed from the drain bottom as previously specified herein, shall not be utilized for the construction of the driveway, and shall be disposed of by the Contractor to a site to be obtained by it at its own expense. The Contractor shall be required to restore any and all drain sideslopes damaged by the access bridge installation and removal of vegetation and rock protection, utilizing the available scavenged topsoil, and shall seed and mulch over all of said topsoil areas, and restore any disturbed rock protection using new filter fabric where needed.

When all of the work for this installation has been completed, the Contractor shall ensure that positive drainage is provided to all areas and shall ensure that the site is left in a neat and workmanlike manner, all to the full satisfaction of the Municipal Drainage Superintendent or Engineer.

VIII. CORRUGATED STEEL PIPE INSTALLATION

The new corrugated steel pipe (CSP) to be installed on this project is required to be provided in the longest lengths that are available and shall not be less than 3.0 metres. Where the overall access pipe length exceeds the standard pipe lengths, the Contractor shall connect the pipe sections together by use of a manufactured 9-C bolted coupler installed in accordance with the manufacturer's recommendations. All coupler joints shall be wrapped with a layer of filter cloth around the complete circumference so that it extends a minimum of 100mm beyond the coupler on each end, to ensure a positive seal against soil migration through the joints.

The Contractor shall note that the placement of any new culvert pipe shall be performed totally in the dry and it shall be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. As part of the work, the Contractor will be required to clean out the drain along the full length of the pipe and for a distance of 3.05 metres (10 ft.) upstream and downstream of the pipe. The Contractor shall note that the pipe inverts are set at least 10% of the pipe diameter (or the pipe rise) below

the drain bottom to provide the embedment required by E.R.C.A. and D.F.O. and to meet the minimum cover requirements for the pipe.

The installation of the complete length of the new culvert pipe, including all appurtenances, shall be completely inspected by the Town Drainage Superintendent or the Consulting Engineer's Inspector prior to backfilling any portions of same. Under no circumstance shall the Contractor commence the construction or backfill of the new culvert pipe without the site presence of the Town Drainage Superintendent or the Consulting Engineer's Inspector to inspect and approve said installation. The Contractor shall provide a minimum of two (2) working days' notice to the Town Drainage Superintendent or the Consulting Engineer prior to commencement of the work. The installation of the new culvert structure is to be performed during normal working hours of the Town Drainage Superintendent and the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend said working hours.

For the access bridge installation, once the new aluminized steel type II corrugated pipe has been satisfactorily set in place, the Contractor shall completely backfill same with granular material M.T.O. Type "B" O.P.S.S. Form 1010 with the following exception. The top 305mm (12") of the backfill material for the full top width of the access, and the full top width of the drain or the excavated trench, and any approaches to the west and transitions to the east shall be granular material M.T.O. Type "A" O.P.S.S. Form 1010. All of the driveway approach areas extending from the Town roadway to the east face of the new bridge culvert shall be backfilled with compacted granular material M.T.O. Type "A" O.P.S.S. Form 1010, but only after all topsoil material has been completely removed and disposed of, and the minimum thickness of this granular material shall be 305mm (12"). All areas outside of the access driveway shall be backfilled with native material compacted to 95% of Standard Proctor Density and topped with a minimum of 50mm of topsoil and shall be seeded and mulched.

For hard surface driveway crossings, the top 305mm (12") of the backfill over the pipe below the hard surface treatment shall comprise granular material M.T.O. Type "A" O.P.S.S. Form 1010 compacted to a minimum of 100% Standard Proctor Density. The Contractor shall at all times be very careful when performing its backfilling and compaction operations so that no damage is caused to the pipe. To ensure that no damage is caused to the proposed pipe, alternative methods of achieving the required backfill compaction shall be submitted to the Consulting Engineer or the Town Drainage Superintendent for their approval prior to the commencement of this work. The Contractor shall restore the asphalt surface by placing a minimum of the existing thickness or a 90mm minimum thickness of Type HL-4 or equivalent SuperPave hot mix asphalt. The asphalt shall be supplied and placed in two (2) approximately equal lifts compacted to a value ranging from 92% to 96% of maximum relative density as per O.P.S.S. 310. For existing concrete driveways, the Contractor shall carefully remove the concrete to the nearest expansion joint. The concrete driveway shall be restored to the original length and width that was removed and include 150mm thick, 30MPa concrete, with 6% ±1% air entrainment and 6x6-6/6 welded wire fabric reinforcing installed at the midpoint of the slab. All slab surfaces shall be finished to provide an appearance approximating the finish on the existing concrete driveway abutting the replacement.

The Contractor will be responsible to restore any damage caused to the roadways at its cost. All damaged hard surface roadway areas shall be neatly saw cut and the damaged materials removed and disposed of by the Contractor prior to carrying out any restoration work. The extent of the repairs shall be established in consultation with the Town Drainage Superintendent, the Road Authority, and the Consulting Engineer and the repairs shall be completed to their full satisfaction.

The Contractor is to note that any intercepted pipes or tiles along the length of the proposed culvert are to be extended and connected at its cost to the open drain at the end of the new culvert unless otherwise noted in the accompanying drawings.

The Contractor shall also note that the placing of the new access bridge culvert shall be completed so that it totally complies with the parameters established and noted in the Bridge Details and Tables for the culvert replacement. The culvert shall be set on an even grade and the placement shall be performed totally in the dry, and the Contractor should be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor shall also be required to supply a minimum of 100mm (4") of 20mm (3/4") clear stone bedding underneath the culvert pipe extending from the bottom of the drain to the culvert invert grade, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. Furthermore, if an unsound base is encountered, it must be removed and replaced with 20mm (3/4") clear stone satisfactorily compacted in place to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor is to note that when replacing an access bridge or enclosure culvert, it shall be required to excavate a trench having a width not less than the new pipe outside diameter plus a 600mm working width on both sides of the new pipe to allow for proper installation of granular backfill and compaction of same. The Contractor shall also note that all culvert pipe installations are to be carried out with a minimum of 10% of their diameter or rise embedded below the drain design bottom, as shown and noted on the plan for each of the access bridge installations.

IX. REMOVALS

Where existing access bridges and enclosures are to be completely removed and replaced, the Contractor shall be required to excavate and completely extract the existing concrete structure or culvert pipe and the existing endwalls in their entirety, as well as any other deleterious materials that may be encountered in removing same, excluding poured concrete headwalls that are to be reused. The Contractor shall neatly saw cut any concrete or asphalt surfaces over the pipes for a sufficient width to allow for the safe removal of same or go to the nearest expansion joint panel of the concrete driveways. The Contractor shall also be required to completely dispose of all removed materials to a site to be obtained by it at its own expense. The Contractor shall note that when headwalls are shown to be left in place, the Contractor shall protect same and carry out its work for the pipe replacement as noted above and dispose of any debris resulting from the work.

All unsuitable and deleterious materials from the excavation and removal of the existing bridge and enclosure culverts and drain cleaning shall be hauled away and disposed of by the Contractor to a site to be obtained by it at its expense. Likewise, any material excavated to allow for the granular approaches to the bridge, driveway transitions, or installation of new headwalls shall also be hauled away and disposed of by the Contractor.

X. CONCRETE FILLED JUTE BAG, PRECAST CONCRETE BLOCK OR SLOPED END PROTECTION

Unless otherwise shown or noted, the Contractor is to provide new concrete filled jute bag headwalls, precast concrete block, or sloped quarried limestone on non-woven filter cloth end protection for the access bridges and enclosures being replaced or constructed on this drain.

The concrete filled jute bags are to be provided and laid out as is shown and detailed in the drawings provided by the Town and as noted in the Standard Specifications in **Appendix "REI-C"**. In all cases, the concrete filled jute bag headwalls shall be topped with a minimum 100mm (4") thick continuous concrete cap comprising 30mPa concrete with 6% \pm 1% air entrainment for the entire length of the headwalls. The headwalls shall be installed on an inward batter to be not less than 1 horizontal to 5 vertical, and under no circumstances shall this batter, which is measured from the top of the headwall to the projection of the end of the pipe, be less than 305mm (12"). From the midpoint of the pipe height down to the concrete footing, the wall shall be a double concrete filled jute bag installation. On the side by the road the walls shall be deflected as shown to provide daylighting and a better approach across the new bridge.

The installation of the concrete filled jute bag headwalls, unless otherwise specified, shall be provided in total compliance with the Items 1, 3, and 4 included in the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION"**. These are attached to the back of these specifications and labelled **Appendix "REI-C"**. The Contractor shall comply in all respects with the General Conditions included in Item 4 and the **"Typical Concrete Filled Jute Bag Headwall End Protection"** detail also shown therein.

The Contractor shall install interlocking precast concrete blocks with filter cloth backing for walls on both ends of the bridges requiring same. The blocks shall be minimum 600X600X1200mm in size as available from Underground Specialties - Wolseley, Windsor, Ontario, or equal, and installed as set out in **Appendix "REI-C"**. Vertical joints shall be staggered by use of half blocks where needed and wingwall deflections when required shall employ 45-degree angled blocks. Voids between the blocks and the pipe shall be grouted with 30mPa concrete having 6% \pm 1% air entrainment and extend for the full thickness of the wall and have a smooth uniform finish on the face that blends with the precast blocks. The installation of the endwalls, as well as the backfilling of the pipe where applicable, shall be provided in compliance with Items 1), 3), and 4) of the "Standard Specifications for Access Bridge Construction" attached within **Appendix "REI-C"** and in total compliance and in all respects with the General Conditions included in said Appendix. The Contractor shall submit shop drawings for approval of the wall installation that

includes details for a minimum 300mm thick concrete footing that extends from the pipe invert downward. The footing shall extend into the drain banks each side for the required embedment of the blocks and be constructed to ensure that the completed wall will be completely vertical or tipped slightly back towards the driveway. Where the block walls extend more than 1.8 metres in height, the supplier shall provide the Contractor with uni-axial geogrid (SG350 or equivalent) reinforcement for installation to tie the wall back into the granular backfill. The Contractor, in all cases, shall comply with these specifications and upon completion of the stacked precast concrete end protection installation shall restore the adjacent areas to their original conditions. The Contractor shall supply quarried limestone on filter cloth rock protection adjacent to the headwalls at each corner of the bridge. All rock protection shall be 1.0 metres wide and 305mm (12") thick, installed on non-woven filter cloth, and shall be installed in accordance with Item 2) of the "Standard Specifications for Access Bridge Construction". The synthetic filter mat to be used shall be non-woven geotextile GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products through Underground Specialties - Wolseley in Windsor, Ontario or equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm to a maximum of 250mm, and is available from Walker Industries Amherst Quarries, in Amherstburg, Ontario, or equal.

Where sloped end protection is specified, the top 305mm (12") of backfill material over the ends of the access pipe, from the invert of said pipe to the top of the driveway elevation of the access bridge or enclosure, shall be quarried limestone. The quarried limestone shall be provided as shown and detailed on the plans or as indicated in the Standard Specifications in **Appendix "REI-C"** and shall be graded in size from a minimum of 100mm (4") to a maximum of 250mm (10"). The quarried limestone to be placed on the sloped ends of an access bridge or enclosure shall be underlain with a synthetic **non-woven** geotextile filter fabric. The sloped quarried limestone protection is to be rounded as shown on the plan details and shall also extend along the drain side slopes to a point directly in line with the ends of the culvert pipe. The approach from the road to the entrance shall be provided with a minimum 5.0m radius at each end of the driveway entrance. All work shall be completed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer.

The installation of the sloped quarried limestone end protection, unless otherwise specified herein, shall be provided in total compliance with Item 2), 3), and 4) of the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION"**. These are attached to the back of these specifications and labelled **Appendix "REI-C"**. The Contractor shall comply in all respects with the General Conditions included in Item 4 and the **"Typical Quarried Limestone End Protection Detail"** also in **Appendix "REI-C"**.

The quarried limestone erosion protection shall be embedded into the sideslopes of the drain a minimum thickness of 305mm and shall be underlain in all cases with non-woven synthetic filter mat. The filter mat shall not only be laid along the flat portion of the erosion protection, but also contoured to the exterior limits of the quarried limestone and the unprotected slope. The width of the erosion protection shall be as established in the accompanying drawings or as otherwise directed by the Town Drainage Superintendent or the Consulting Engineer during construction.

In placing the erosion protection, the Contractor shall carefully tamp the quarried limestone pieces into place with the use of the excavator bucket so that the erosion protection when completed will be consistent, uniform and tightly laid. In no instance shall the quarried limestone protrude beyond the exterior contour of the unprotected drain sideslopes along either side of said protection. The synthetic filter mat fabric to be used shall be non-woven geotextile GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products, or equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm to a maximum of 250mm, and is available from Walker Aggregates Amherst Quarries, in Amherstburg, Ontario, or equal.

XI. BENCHMARKS

Also, for use by the Contractor, we have established Benchmarks along the course of the work and especially at the locations where existing access bridges are being replaced or new bridges are being constructed.

For each of the bridge replacements and new bridges, the plans include details illustrating the work to be carried out. For each bridge detail a Benchmark has been indicated and the Elevation has been shown and may be utilized by the Contractor in carrying out its work. The Contractor shall note that in each case a specific design elevation grade has been provided for the invert at each end of the pipe in the table accompanying each detail. The table also sets out the pipe size, materials, and other requirements relative to the installation of the culvert structure. In all cases, the Contractor is to utilize the specified drain grade to set any new pipe installation. The Contractor shall ensure that it takes note of the direction of flow and sets all pipes to assure that all grades flow from north to south to match the direction of flow within the drain. The Contractor's attention is drawn to the fact that the pipe invert grades established herein provide for the pipes to be set at least 10% of their diameter or pipe rise below the existing drain bottom or the design grade of the drain, whichever is lower.

XII. ANCILLARY WORK

During the course of any work to the bridges and enclosures along the length of the project, the Contractor will be required to protect or extend any existing tile ends or swales and connect them to the drainage works to maintain the drainage from the adjacent lands. All existing tiles shall be extended utilizing solid Big 'O' "standard tile ends" or equal plastic pipe of the same diameter as the existing tile and shall be installed in accordance with the "**Standard Lateral Tile Detail**" included in the plans, unless otherwise noted. Connections shall be made using a manufacturer's coupling where possible. Wherever possible, tiles shall be extended to outlet beyond the end of any access culverts. When required, openings into new pipes shall be neatly bored, saw cut or burned with a torch to the satisfaction of the Town Drainage Superintendent or the Consulting Engineer. All cuts to steel pipes shall be touched up with a thick coat of zinc rich paint (Galvicon or equal) in accordance with the manufacturer's recommendations. For other connections, the

Contractor shall utilize a grouted connection. Grouted mortar joints shall be composed of three (3) parts of clean, sharp sand to one (1) part of Portland cement with just sufficient water added to provide a stiff plastic mix, and the mortar connection shall be performed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The mortar joint shall be of a sufficient mass around the full circumference of the joint on the exterior side to ensure a tight, solid seal. The Contractor is to note that any intercepted pipes along the length of the existing culverts and enclosures are to be extended and connected to the open drain unless otherwise noted in the accompanying drawings.

Where the bridge or enclosure installation interferes with the discharge of an existing swale, the Contractor shall re-grade the existing swales to allow for the surface flows to freely enter the drain. Any disturbed grass areas shall be fully restored with topsoil, seed and mulch.

All granular backfill for the bridge and enclosure installations shall be satisfactorily compacted in place to a minimum Standard Proctor Density of 98% by means of mechanical compaction equipment. All other good, clean, native fill material or topsoil to be utilized, where applicable, shall be compacted in place to a minimum Standard Proctor Density of 95%. All of the backfill material, equipment used, and method of compacting the backfill material shall be provided and performed to the full satisfaction of the Town Drainage Superintendent or Consulting Engineer.

Where the Contractor removes concrete or asphalt hard surfaces over the pipes, the Contractor shall restore the hard surfaces as previously outlined. The Contractor will be responsible to restore any damage caused to these driveways at its cost. All damaged hard surface driveway areas shall be neatly saw cut and the damaged materials removed and disposed of by the Contractor prior to carrying out any restoration work.

The new corrugated aluminized steel type II pipes for these installations are to be provided with a minimum depth of cover measured from the top of the pipe of 305mm (12") for a round pipe and 500mm for a pipe arch. If the bridge culvert pipes are placed at their proper elevations, same should be achieved. If the Contractor finds that the minimum cover is not being met, they shall notify the Town Drainage Superintendent and the Consulting Engineer immediately so that steps can be taken to rectify the condition prior to the placement of any backfill. The minimum cover requirement is **critical** and must be attained. In order for these new access bridge culverts to properly fit the channel parameters, **all of the design grade elevations must be strictly adhered to.**

As a check, all of the above access bridge and enclosure culvert design grade elevations should be confirmed before commencing to the next stage of the access bridge or enclosure installation. The Contractor is also to check that the pipe invert grades are correct by referencing the Benchmark.

Although it is anticipated that the culvert installation at each site shall be undertaken in the dry, the Contractor shall supply and install a temporary straw bale or silt curtain check dam in the drain bottom immediately downstream of each culvert site during the time of construction. The straw bale or silt curtain check dam shall be to the satisfaction of the Town Drainage

Superintendent or Consulting Engineer and must be removed upon completion of the construction. The check dam materials may be reused at each site subject to their condition. All costs associated with the supply and installation of this straw bale or silt curtain check dam shall be included in the cost bid for the bridge replacements.

XIII. TOPSOIL, SEED AND MULCH

The Contractor shall be required to restore all existing grassed areas and drain side slopes damaged by the structure replacements, construction or cutting of the drain cross section, by placing topsoil, and then seed and mulch over said areas including any specific areas noted on the bridge details. The Contractor shall be required to provide all the material and to cover the above mentioned surfaces with approximately 50mm of good, clean, dry topsoil on slopes and 100mm of good, clean, dry topsoil on horizontal surfaces, fine graded and spread in place ready for seeding and mulching. The placing and grading of any topsoil shall be carefully and meticulously carried out in accordance with Ontario Provincial Standard Specifications, Form 802 dated November 2010, or as subsequently amended, or as amended by these specifications and be readied for the seeding and mulching process. The seeding and mulching of all of the above mentioned areas shall comply in all regards to Ontario Provincial Standard Specifications, Form 803 dated November 2010 and Form 804, dated November 2013, or as subsequently amended, or as amended by these specifications. The seeding mixture shall be the Standard Roadside Mix (Canada No. 1 Lawn Grass Seed Mixture) as set out in O.P.S.S. 804. All cleanup and restoration work shall be performed to the full satisfaction of the Town Drainage Superintendent or Engineer.

When all of the work for this installation has been completed, the Contractor shall ensure that positive drainage is provided to all areas; and shall ensure that the site is left in a neat and workmanlike manner, all to the full satisfaction of the Town Drainage Superintendent or Engineer.

XIV. SPECIAL PROVISIONS FOR REPLACEMENT, REPAIR AND IMPROVEMENTS

The Contractor shall provide for the construction and improvements to the access bridge along the Ong Drain, for the structure noted, as follows:

New Replacement Bridge

The Contractor shall completely remove and dispose of the existing bridge structure, topsoil, and vegetation in the area of the proposed new replacement bridge and clean out the drain bottom. The Contractor will then be required to install the new aluminized steel pipe with precast concrete block headwalls with roadside daylight corners as set out on the plans and in the chart forming part of the details for the bridge on the plans. The Contractor shall install sloped quarried limestone on filter cloth protection on each end adjacent to the precast concrete block endwalls. The Contractor shall protect the tile outlets on the banks at each end of the structure and divert

and extend same as necessary to accommodate the replacement culvert. All work shall be carried out in accordance with these specifications and the requirements in **Appendix "REI-C"**.

XV. GENERAL CONDITIONS

- a) The Town Drainage Superintendent or Consulting Engineer shall have authority to carry out minor changes to the work where such changes do not lessen the efficiency of the work.
- b) The Contractor shall satisfy itself as to the exact location, nature and extent of any existing structure, utility, or other object which it may encounter during the course of the work. The Contractor shall indemnify and save harmless the Town of Amherstburg and the Consulting Engineer and their representatives for any damages which it may cause or sustain during the progress of the work. It shall not hold the Town of Amherstburg or the Consulting Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.
- c) The Contractor shall provide a sufficient number of layout stakes and grade points so that the Drainage Superintendent and Consulting Engineer can review same and check that the work will generally conform to the design and project intent.
- d) The Contractor will be responsible for any damage caused by it to any portion of the Town road system, especially to the travelled portion. When excavation work is being carried out and the excavation equipment is placed on the travelled portion of the road, the travelled portion shall be protected by having the excavation equipment placed on satisfactory timber planks or timber pads. If any part of the travelled portion of the road is damaged by the Contractor, the Town shall have the right to have the necessary repair work done by its' employees and the cost of all labour and materials used to carry out the repair work shall be deducted from the Contractor's contract and credited to the Town. The Contractor, upon completing the works, shall clean all debris and junk, etcetera, from the roadside of the drain, and leave the site in a neat and workmanlike manner. The Contractor shall be responsible for keeping all public roadways utilized for hauling materials free and clear of mud and debris.
- e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. If traffic control is required on this project, signing is to comply with the M.T.O. Manual of Uniform Traffic Control Devices (M.U.T.C.D.) for Roadway Work Operations and Ontario Traffic Manual Book 7.
- f) During the course of the work the Contractor shall be required to connect existing drainage pipes to the Municipal Drain. In the event that polluted flows are discovered, the Contractor shall delay the connection of the pipe and leave the end exposed and alert the Town, the Drainage Superintendent, and the Consulting Engineer so that steps can be taken by the

- Town to address the concern with the owner and the appropriate authorities. Where necessary the Contractor shall cooperate with the Town in providing temporary measures to divert the drain or safely barricade same. Should the connection be found acceptable by the authorities, the Contractor shall complete the connection of the drain as provided for in the specifications, at no extra cost to the project.
- g) Following the completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which are to remain standing, and it shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition.
 - h) The whole of the work shall be satisfactorily cleaned up, and during the course of the construction, no work shall be left in any untidy or incomplete state before subsequent portions are undertaken.
 - i) During the course of the project the Contractor shall deal with any excess soil management from the project in accordance with Ontario Reg 406/19 pursuant to the Environmental Protection Act, R.S.O. 1990, c. E.19 and any subsequent amendments to same.
 - j) All driveways, laneways and access bridges, or any other means of access on to the job site shall be fully restored to their former condition at the Contractor's expense. Before authorizing Final Payment, the Town Drainage Superintendent and the Consulting Engineer shall inspect the work in order to be sure that the proper restoration has been performed. In the event that the Contractor fails to satisfactorily clean up any portion of these accesses, the Consulting Engineer shall order such cleanup to be carried out by others and the cost of same be deducted from any monies owing to the Contractor.
 - k) The Contractor will be required to submit to the Town, a Certificate of Good Standing from the "Workplace Safety and Insurance Board" prior to the commencement of the work and the Contractor will be required to submit to the Town, a Certificate of Clearance for the project from the "Workplace Safety and Insurance Board" before Final Payment is made to the Contractor.
 - l) The Contractor shall furnish a Performance and Maintenance Bond along with a separate Labour and Material Payment Bond within ten (10) days after notification of the execution of the Agreement by the Town. One copy of said bonds shall be bound into each of the executed sets of the Contract. Each Performance and Maintenance Bond and Labour and Material Payment Bond shall be in the amount of 100% of the total Tender Price. All Bonds shall be executed under corporate seal by the Contractor and a surety company, authorized by law to carry out business in the Province of Ontario. The Bonds shall be acceptable to the Town in every way and shall guarantee faithful performance of the contract during the period of the contract, including the period of guaranteed maintenance which will be in effect for twelve (12) months after substantial completion of the works.

The Tenderer shall include the cost of bonds in the unit price of the Tender items as no additional payment will be made in this regard.

- m) The Contractor shall be required, as part of this Contract, to provide Comprehensive Liability Insurance coverage for not less than \$5,000,000.00 on this project; and shall name the Town of Amherstburg and its' officials and the Consulting Engineer and their staff as additional insured under the policy. The Contractor must submit a copy of this policy to both the Town Clerk and the Consulting Engineer prior to the commencement of work.
- n) Monthly progress orders for payment shall be furnished the Contractor by the Town Drainage Superintendent. Said orders shall be for not more than 90% of the value of the work done and the materials furnished on the site. The paying of the full 90% does not imply that any portion of the work has been accepted. The remaining 10% will be paid 60 days after the final acceptance and completion of the work and payment shall not be authorized until the Contractor provides the following:
 - i) a Certificate of Clearance for the project from the Workplace Safety and Insurance Board
 - ii) proof of advertising
 - iii) a Statutory Declaration, in a form satisfactory to the Engineer and the Town, that all liabilities incurred by the Contractor and its Sub-Contractors in carrying out the Contract have been discharged and that all liens in respect of the Contract and Sub-Contracts thereunder have expired or have been satisfied, discharged, or provided for by payment into Court.

The Contractor shall satisfy the Consulting Engineer or Town that there are no liens or claims against the work and that all of the requirements as per the Construction Act, 2018 and its' subsequent amendments have been adhered to by the Contractor.

- o) In the event that the Specifications, Information to Tenderers, or the Form of Agreement do not apply to a specific condition or circumstance with respect to this project, the applicable section, or sections, from the Canadian Construction Documents Committee C.C.D.C.2 shall govern and be used to establish the requirements of the work.
- p) Should extra work be required by the Town Drainage Superintendent or Consulting Engineer, and it is done on a time and material basis, the actual cost of the work will be paid to the Contractor with a 15% markup on the total actual cost of labour, equipment and materials needed to complete the extra work.

APPENDIX "REI-A"

From: Ashley Gyori <AGyori@erca.org>
Sent: Tuesday, March 29, 2022 8:29 AM
To: Shane McVitty
Subject: RE: Notification of Request for Drainage Works
Attachments: 220315 - LETTER - CA Notification of Drainage Works.pdf

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Good morning Shane,

Thank you for providing the Section 78 Notice for the Ong Drain and the additional information. I've reviewed the information and the location of the proposed works and can provide the following information.

A review of our floodplain mapping for the Ong Drain indicates that this drain is located within an area that is under the jurisdiction of the Essex Region Conservation Authority (ERCA) (Section 28 of the *Conservation Authorities Act*). Prior to undertaking works, a permit is required from this office.

Based on the information provided below, there is an existing clear span bridge that has deteriorated and requires replacement. It should be noted that if a proponent requests that a replacement culvert be smaller than the original, the appointed drainage engineer will need to undertake an assessment to confirm that the proposed structure will meet the required level of service that is consistent with the expected function of the drain and will not result in any negative impacts upstream or downstream.

We also kindly ask that the appointed engineer provide our office with the opportunity to review a draft design prior to scheduling a meeting of consideration so that any ERCA concerns can be addressed as early as possible.

Please note that ERCA does not review applications on behalf of external agencies. It is the proponent's responsibility to ensure that all applicable legislation is adhered to and that all authorizations have been obtained.

If you have any questions, please do not hesitate to contact me.

Kind regards,



ASHLEY GYORI
Regulations Analyst
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6
agyori@erca.org • essexregionconservation.ca

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**** Please note that the ERCA office is closed to the public; however, staff are continuing to respond to inquiries and review applications in a modified capacity. We appreciate your understanding and patience at this time.****

From: Shane McVitty <smcvitty@amherstburg.ca>
Sent: Tuesday, March 15, 2022 8:41 AM
To: Regs <regs@ERCA.org>; Ashley Gyori <AGyori@erca.org>
Subject: Notification of Request for Drainage Works

Good Morning Ashley,

Please find attached a letter notifying the Essex Region Conservation Authority of a request that the Town of Amherstburg has received for an improvement to the Ong Drain. In general, a landowner has requested the replacement of an existing, concrete span bridge. The existing bridge is quite narrow, and is in a deteriorated state of repair. The subject bridge is located in the Ong Drain, at 5573 Concession Rd 5S, Concession 5, part of Lot 49, in the former Geographic Township of Malden.

If you have any questions or concerns, please do not hesitate to contact myself directly.

Regards,
Shane

Shane McVitty

Drainage Superintendent / Engineering Coordinator
Town of Amherstburg
512 Sandwich St. South, Amherstburg, ON, N9V 3R2
Tel: 519-736-3664 x2318 Fax: 519-736-7080 TTY: 519-736-9860



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RE: Ong Drain (MN 5573 Rd 5 South) - Amherstburg E09-2022-007 - REI2022D005

1 message

Ashley Gyori <AGyori@erca.org>
To: Gerard Rood <gerard@roodengineering.ca>
Cc: Shane McVitty <smcvitty@amherstburg.ca>

Fri, Jul 29, 2022 at 11:06 AM

Good morning Gerard,

Thank you for the draft submission for the Ong Drain. I've had the opportunity to review the draft report and can confirm that based on your confirmation that the design does not result in adverse impacts upstream or downstream, the preliminary design, as presented, is something that this office can support. During our review, the following comments were noted; however, these are minor in nature and do not affect the draft design of the proposal.

- Page 17 of the PDF references Mersea Road 1.
- Page 25 mentions that "the contractor shall ensure that all grades flow from west to east to match the direction of flow within the drain". The drain at the proposed bridge location is flowing north to south.

We look forward to receiving the signed and sealed final report and drawings. An Application for Permit form, signed by the municipality will also be required.

If you have any questions, please do not hesitate to contact this office.

Kind regards,



ASHLEY GYORI
Regulations Analyst
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 Essex, Ontario N8M 1Y6
agyori@erca.org essexregionconservation.ca

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From: Gerard Rood <gerard@roodengineering.ca>
Sent: Thursday, July 14, 2022 2:22 PM
To: Ashley Gyori <AGyori@erca.org>; Shane McVitty <smcvitty@amherstburg.ca>
Subject: Ong Drain (MN 5573 Rd 5 South) - Amherstburg E09-2022-007 - REI2022D005

Good afternoon Ashley and Shane:

Please find attached our draft copy of the report for this project for ERCA review as requested in their initial email to the Town. We appreciate your time and help to review the report and look forward to hearing from you with any comments, suggestions, or requirements.

Thanks for your attention to this. We look forward to hearing from both of you.

Regards,

Gerard Rood, P.Eng.

ROOD ENGINEERING INC.

9 Nelson Street
Leamington, Ontario
N8H 1G6

Phone: 519-322-1621

Fax: 519-322-1979

This email is confidential and shall not be distributed without the express authorization of Rood Engineering Inc. If you have received this message in error please notify us and delete all copies immediately.



x-rpt draft Ong Dr REI2022D005.pdf

2346K

STANDARD E.R.C.A. AND D.F.O.
MITIGATION REQUIREMENTS

As part of its work, the Contractor will implement the following measures that will ensure that any potential adverse effects on fish and fish habitat will be mitigated:

- Work will not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods. In-water works will not be undertaken between March 15th and June 30th.
- New culverts are to be installed with a minimum 10 % embedment below the existing bottom or design bottom of the drain (whichever is lower).
- All new culverts must provide for fish passage. Typically, culvert lengths that do not exceed 15.0 metres do not create an obstruction to fish passage. Depending on the proposed culvert diameter, however, longer lengths may be allowed. Concerns with longer culverts relate to velocity, loss of riparian habitat, etc. (Note: IF longer culvert lengths are proposed, we recommend that they be reviewed with this office prior to finalizing the engineer's report. Ultimately, it is the proponent's responsibility to undertake the necessary studies to confirm that the proposed length will not be a barrier to fish passage.)
- All disturbed soils on both banks and within the channel, including spoil, must be stabilized immediately upon completion of work. The restoration of the site must be completed to a like or better condition to what existed prior to the works. The spoil material must be spread an appropriate distance from the top of the drain bank to ensure that it is not washed back into the drain.
- To prevent sediment entry into the drain, in the event of an unexpected rainfall, silt barriers and/or traps must be placed in the channel during the works and until the site has been stabilized. All sediment and erosion control measures are to be in accordance with related Ontario Provincial Standards. It is incumbent on the proponent and his/her contractors to ensure that sediment and erosion control measures are functioning properly and are maintained/upgraded as required.
- Silt or sand accumulated in the barriers/traps must be removed and stabilized on land once the site is stabilized.
- All activities, including maintenance procedures, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the water. Vehicular refueling and maintenance should be conducted away from the water.

SECTION II
SPECIFICATIONS
FOR FISH SALVAGE

GENERAL
SECTION 201

The Work shall include the capture, salvage and release of fish that are trapped or stranded as the result of the Contractor's operations, at locations identified in the Fish Salvage Plan, and in co-operation with the Essex Region Conservation Authority (E.R.C.A.).

Fish capture shall be performed prior to dewatering, and in such manner that will minimize the injury to the fish.

MATERIALS
SECTION 202

All materials required for fish capture, salvage and release shall be supplied by the Contractor.

CONSTRUCTION
SECTION 203

The Contractor shall not commence any fish capture, salvage and release work until the Fish Salvage Plan has been accepted by the Consultant and the Conservation Authority. All work shall be performed in accordance with the Fish Salvage Plan unless otherwise determined by the Consultant or the Conservation Authority.

The Contractor shall ensure an ice-free pool is maintained throughout all fish capture and release operations.

All fish shall be captured within the area specified, and released at an acceptable location in the downstream water body. Fish shall be captured by electro fishing, netting, seining, trapping, or other method acceptable to the Consultant and/or the Conservation Authority.

MEASUREMENT AND PAYMENT
SECTION 204

Payment for this Work will be made at the lump sum price bid for "Fish Capture and Release". The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.

Measures to Avoid Causing Harm to Fish and Fish Habitat

If you are conducting a project near water, it is your responsibility to ensure you avoid causing [serious harm to fish](#) in compliance with the *Fisheries Act*. The following advice will help you avoid causing harm and comply with the *Act*.

PLEASE NOTE: This advice applies to all project types and replaces all “Operational Statements” previously produced by DFO for different project types in all regions.

Measures

- Time work in water to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.
- Minimize duration of in-water work.
- Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
- Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

- Design and plan activities and works in waterbody such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
- Design and construct approaches to the waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or the built structures.
- Undertake all instream activities in isolation of open or flowing water to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse.

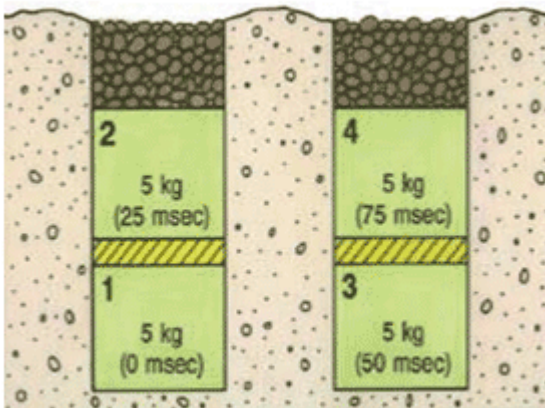
- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the watercourse.
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.

- Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:
 - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
 - Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).
 - Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
 - Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
 - Repairs to erosion and sediment control measures and structures if damage occurs.
 - Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
- Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.
- Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
- Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
- Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
- If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
- Remove all construction materials from site upon project completion.

- Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- Retain a qualified environmental professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
- Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
 - In freshwater, follow these measures for design and installation of intake end of pipe fish screens to protect fish where water is extracted from fish-bearing waters:
 - Screens should be located in areas and depths of water with low concentrations of fish throughout the year.
 - Screens should be located away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
 - The screen face should be oriented in the same direction as the flow.
 - Ensure openings in the guides and seals are less than the opening criteria to make “fish tight”.
 - Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
 - Structural support should be provided to the screen panels to prevent sagging and collapse of the screen.
 - Large cylindrical and box-type screens should have a manifold installed in them to ensure even water velocity distribution across the screen surface. The ends of the structure should be made out of solid materials and the end of the manifold capped.
 - Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where there is debris loading (woody material, leaves, algae mats, etc.). A 150 mm (6 in.) spacing between bars is typical.
 - Provision should be made for the removal, inspection, and cleaning of screens.
 - Ensure regular maintenance and repair of cleaning apparatus, seals, and screens is carried out to prevent debris-fouling and impingement of fish.
 - Pumps should be shut down when fish screens are removed for inspection and cleaning.
- Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.
 - If explosives are required as part of a project (e.g., removal of structures such as piers, pilings, footings; removal of obstructions such as beaver dams; or preparation of a river or lake bottom for installation of a structure such as a dam or water intake), the potential for impacts to fish and fish habitat should be minimized by implementing the following measures:

- Time in-water work requiring the use of explosives to prevent disruption of vulnerable fish life stages, including eggs and larvae, by adhering to appropriate fisheries [timing windows](#).
- Isolate the work site to exclude fish from within the blast area by using bubble/air curtains (i.e., a column of bubbled water extending from the substrate to the water surface as generated by forcing large volumes of air through a perforated pipe/hose), cofferdams or aquadams.
- Remove any fish trapped within the isolated area and release unharmed beyond the blast area prior to initiating blasting
- Minimize blast charge weights used and subdivide each charge into a series of smaller charges in blast holes (i.e., decking) with a minimum 25 millisecond (1/1000 seconds) delay between charge detonations (see Figure 1).
- Back-fill blast holes (stemmed) with sand or gravel to grade or to streambed/water interface to confine the blast.
- Place blasting mats over top of holes to minimize scattering of blast debris around the area.
- Do not use ammonium nitrate based explosives in or near water due to the production of toxic by-products.
- Remove all blasting debris and other associated equipment/products from the blast area.

Figure 1: Sample Blasting Arrangement



Per Fig. 1: 20 kg total weight of charge; 25 msecs delay between charges and blast holes; and decking of charges within holes.

- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.

- Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
- Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
- Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
- Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

Date modified:
2013-11-25

APPENDIX "REI-B"

Town of Amherstburg mitigation measures will be provided to project bidders and included in the tender document and contract for construction of the work. Copies of the information are available from the Town office for anyone that needs to review them.

APPENDIX "REI-C"

STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION

1. PRECAST CONCRETE BLOCK & CONCRETE FILLED JUTE BAG HEADWALLS

After the Contractor has set the endwall foundations and the new pipe in place, it shall completely backfill same and install new precast concrete blocks or concrete filled jute bag headwalls at the locations and parameters indicated on the drawing. All concrete used for headwalls shall be a minimum of 30 mPa at 28 days and include 6% +/- 1% air entrainment.

Precast concrete blocks shall be interlocking and have a minimum size of 600mmX600mmX1200mm. Half blocks shall be used to offset vertical joints. Cap blocks shall be a minimum of 300mm thick. A foundation comprising minimum 300mm thick poured concrete or precast blocks the depth of the wall and the full bottom width of the drain plus 450mm embedment into each drain bank shall be provided and placed on a firm foundation as noted below. The Contractor shall provide a levelling course comprising a minimum thickness of 150mm Granular "A" compacted to 100% Standard Proctor Density or 20mm clear stone, or a lean concrete as the base for the foundation. The base shall be constructed level and flat to improve the speed of installation. Equipment shall be provided as required and recommended by the block supplier for placing the blocks such as a swift lift device for the blocks and a 75mm eye bolt to place the concrete caps,. The headwall shall extend a minimum of 150mm below the invert of the access bridge culvert with the top of the headwall set to match the finished driveway grade, unless a 150mm high curb is specified at the edge of the driveway. To achieve the required top elevation, the bottom course of blocks and footing may require additional embedment into the drain bottom. The Contractor shall provide shop drawings of the proposed wall for approval by the Drainage Superintendent or Engineer prior to construction.

Blocks shall be placed so that all vertical joints are staggered. Excavation voids on the ends of each block course shall be backfilled with 20mm clear stone to support the next course of blocks above. Walls that are more than 3 courses in height shall be battered a minimum of 1 unit horizontal for every 5 units of vertical height. The batter shall be achieved by careful grading of the footing and foundation base, or use of pre-battered base course blocks. Filter cloth as specified below shall be placed behind the blocks to prevent the migration of any fill material through the joints. Backfill material shall be granular as specified below. Where the wall height exceeds 1.8 metres in height, a uni-axial geogrid SG350 or equivalent shall be used to tie back the walls and be installed in accordance with the manufacturer's recommendations. The wall face shall not extend beyond the end of the access bridge pipe. Non-shrink grout shall be used to fill any gaps between the blocks and the access bridge pipe for the full depth of the wall. The grout face shall be finished to match the precast concrete block walls as closely as possible.

When constructing the concrete filled jute bag headwalls, the Contractor shall place the bags so that the completed headwall will have a slope inward from the bottom of the pipe to the top of the finished headwall. The slope of the headwall shall be one unit horizontal to five units vertical. The Contractor shall completely backfill behind the new concrete filled jute bag headwalls with Granular "B" and Granular "A" material as per O.P.S.S. Form 1010 and the granular material shall be compacted in place to a Standard Proctor Density of 100%. The placing of the jute bag headwalls and the backfilling shall be performed in lifts simultaneously. The granular backfill shall be placed and compacted in lifts not to exceed 305mm (12") in thickness.

The concrete filled jute bag headwalls shall be constructed by filling jute bags with concrete. All concrete used to fill the jute bags shall have a minimum compressive strength of 25 MPa in 28 days and shall be provided and placed only as a wet mix. Under no circumstance shall the concrete to be used for filling the jute bags be placed as a dry mix. The jute bags, before being filled with concrete, shall have a dimension of 460mm (18") x 660mm (26"). The jute bags shall be filled with concrete so that when they are laid flat, they will be approximately 100mm (4") thick, 305mm (12") to 380mm (15") wide and 460mm (18") long.

The concrete jute bag headwall to be provided at the end of the bridge pipe shall be a single or double bag wall construction as set out in the specifications. The concrete filled bags shall be laid so that the 460mm (18") dimension is parallel with the length of the new pipe. The concrete filled jute bags shall be laid on a footing of plain concrete being 460mm (18") wide, and extending for the full length of the wall, and 305mm (12") thick extending below the bottom of the culvert pipe.

All concrete used for the footing, cap and bags shall have a minimum compressive strength of 30 mPa at 28 days and shall include 6% ± 1% air entrainment.

Upon completion of the jute bag headwall the Contractor shall cap the top row of concrete filled bags with a layer of plain concrete, minimum 100mm (4") thick, and hand trowelled to obtain a pleasing appearance. If the cap is made more than 100mm thick, the Contractor shall provide two (2) continuous 15M reinforcing bars set at mid-depth and equally spaced in

the cap. The Contractor shall fill all voids between the concrete filled jute bags and the corrugated steel pipe with concrete, particular care being taken underneath the pipe haunches to fill all voids.

The completed jute bag headwalls shall be securely embedded into the drain bank a minimum of 450mm (18") measured perpendicular to the sideslopes of the drain.

As an alternate to constructing a concrete filled jute bag headwall, the Contractor may construct a grouted concrete rip rap headwall. The specifications for the installation of a concrete filled jute bag headwall shall be followed with the exception that broken pieces of concrete may be substituted for the jute bags. The concrete rip rap shall be approximately 460mm (18") square and 100mm (4") thick and shall have two (2) flat parallel sides. The concrete rip rap shall be fully mortared in place using a mixture composed of three (3) parts of clean sharp sand and one (1) part of Portland cement.

The complete placement and backfilling of the headwalls shall be performed to the full satisfaction of the Drainage Superintendent and the Engineer.

2. QUARRIED LIMESTONE ENDWALLS

The backfill over the ends of the corrugated steel pipe shall be set on a slope of 1-½ units horizontal to 1 unit vertical from the bottom of the corrugated steel pipe to the top of each end slope and between the drain banks. The top 305mm (12") in thickness of the backfill over the ends of the corrugated steel pipe shall be quarried limestone. The quarried limestone shall also be placed on a slope of 1-½ units horizontal to 1 unit vertical from the bottom of the corrugated steel pipe to the top of each bank of the drain adjacent each end slope. The quarried limestone shall have a minimum dimension of 100mm (4") and a maximum dimension of 250mm (10"). The end slope protection shall be placed with the quarried limestone pieces carefully tamped into place with the use of a shovel bucket so that, when complete, the end protection shall be consistent, uniform, and tightly laid in place.

Prior to placing the quarried limestone end protection over the granular backfill and on the drain banks, the Contractor shall lay non-woven geotextile filter fabric "GMN160" conforming to O.P.S.S. 1860 Class I or approved equal. The geotextile filter fabric shall extend from the bottom of the corrugated steel pipe to the top of each end slope of the bridge and along both banks of the drain to a point opposite the ends of the pipe.

The Contractor shall take extreme care not to damage the geotextile filter fabric when placing the quarried limestone on top of the filter fabric.

3. BRIDGE BACKFILL

After the corrugated steel pipe has been set in place, the Contractor shall backfill the pipe with Granular "B" material, O.P.S.S. Form 1010 with the exception of the top 305mm (12") of the backfill. The top 305mm (12") of the backfill for the full width of the excavated area (between each bank of the drain) and for the top width of the driveway, shall be Granular "A" material, O.P.S.S. Form 1010. The granular backfill shall be compacted in place to a Standard Proctor Density of 100% by means of mechanical compactors. All of the backfill material, equipment used, and method of compacting the backfill material shall be inspected and approved and meet with the full satisfaction of the Drainage Superintendent and Engineer.

4. GENERAL

Prior to the work commencing, the Drainage Superintendent and Engineer must be notified, and under no circumstances shall work begin without one of them being at the site. Furthermore, the grade setting of the pipe must be checked, confirmed, and approved by the Drainage Superintendent or Engineer prior to continuing on with the bridge installation.

The alignment of the new bridge culvert pipe shall be in the centreline of the existing drain, and the placing of same must be performed totally in the dry.

Prior to the installation of the new access bridge culvert, the existing sediment build-up in the drain bottom must be excavated and completely removed. This must be done not only along the drain where the bridge culvert pipe is to be installed, but also for a distance of 3.05 metres (10 ft.) both upstream and downstream of said new access bridge culvert. When setting the new bridge culvert pipe in place it must be founded on a good undisturbed base. If unsound soil is encountered, it must be totally removed and replaced with 20mm (3/4") clear stone, satisfactorily compacted in place.

When doing the excavation work or any other portion of the work relative to the bridge installation, care should be taken not to interfere with, plug up, or damage any existing surface drains, swales, and lateral or main tile ends. Where damage is encountered, repairs to correct same must be performed immediately as part of the work.

The Contractor and/or landowner performing the bridge installation shall satisfy themselves as to the exact location, nature and extent of any existing structure, utility or other object that they may encounter during the course of the work. The Contractor shall indemnify and save harmless the Town, or the Municipality, the Engineer, and their staff from any damages which it may cause or sustain during the progress of the work. It shall not hold them liable for any legal action arising out of any claims brought about by such damage caused by it.

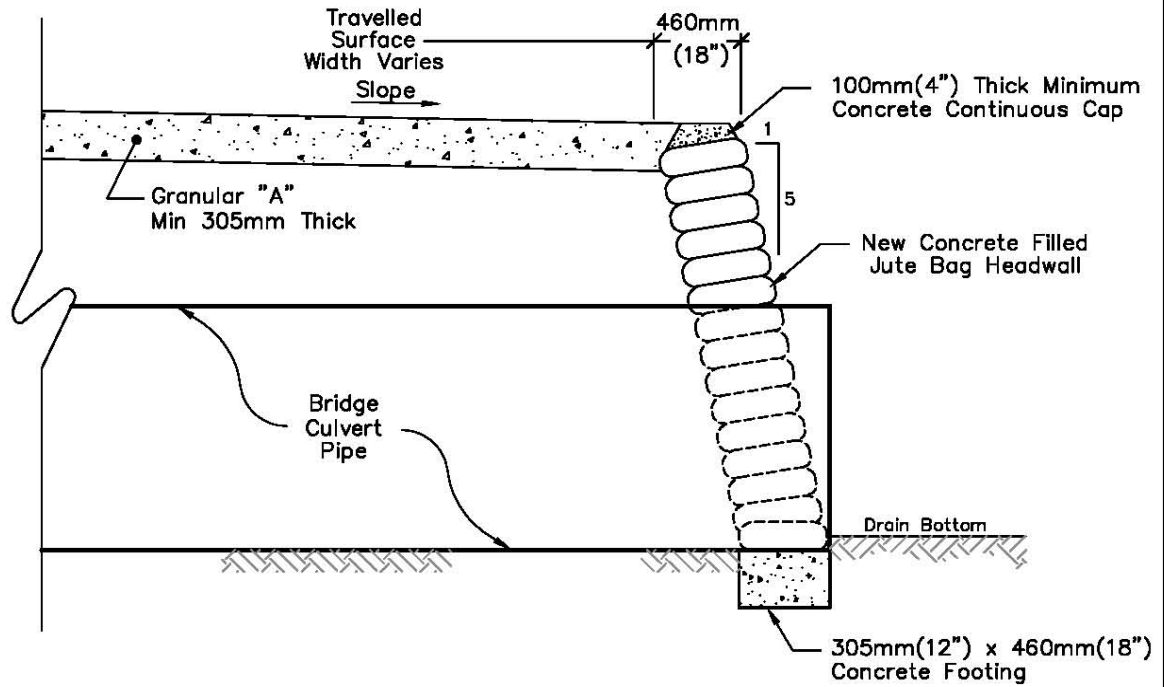
Where applicable, the Contractor and/or landowner constructing the new bridge shall be responsible for any damage caused by them to any portion of the Town road right-of-way. They shall take whatever precautions are necessary to cause a minimum of damage to same and must restore the roadway to its original condition upon completion of the works.

When working along a municipal roadway, the Contractor shall provide all necessary lights, signs, barricades and flagpersons as required to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. If traffic control is required on this project, it is to comply with the M.T.O. Traffic Control Manual for Roadway Work Operations and Ontario Traffic Manual Book 7.

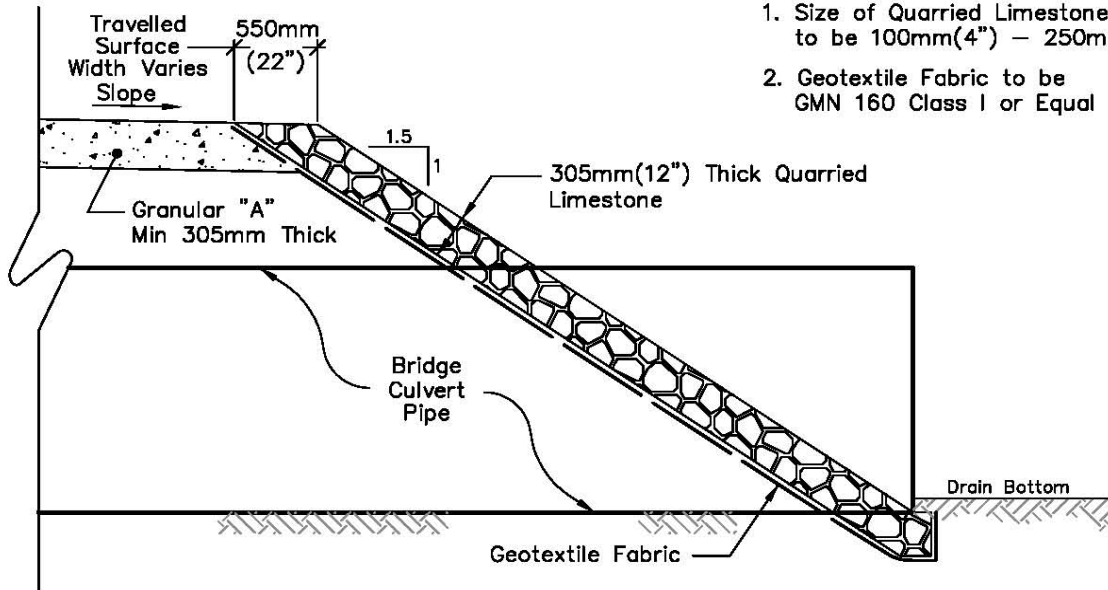
Once the bridge installation has been completed, the drain sideslopes directly adjacent the new headwalls and/or endwalls are to be completely restored including revegetation, where necessary.

All of the work required towards the installation of the bridge shall be performed in a neat and workmanlike manner. The general site shall be restored to its' original condition, and the general area shall be cleaned of all debris and junk, etc. caused by the work

All of the excavation, installation procedures, and parameters as above mentioned are to be carried out and performed to the full satisfaction of the Drainage Superintendent and Engineer.



Typical Jute Bag Headwall



NOTE:

1. Size of Quarried Limestone to be 100mm(4") – 250mm(10")
2. Geotextile Fabric to be GMN 160 Class I or Equal

Typical Quarried Limestone End Protection

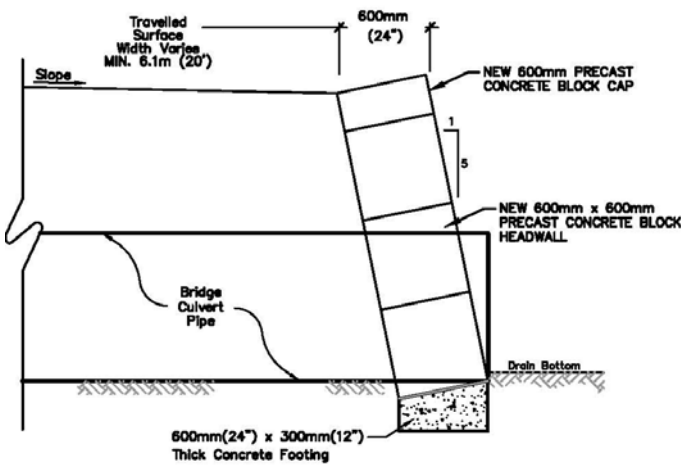
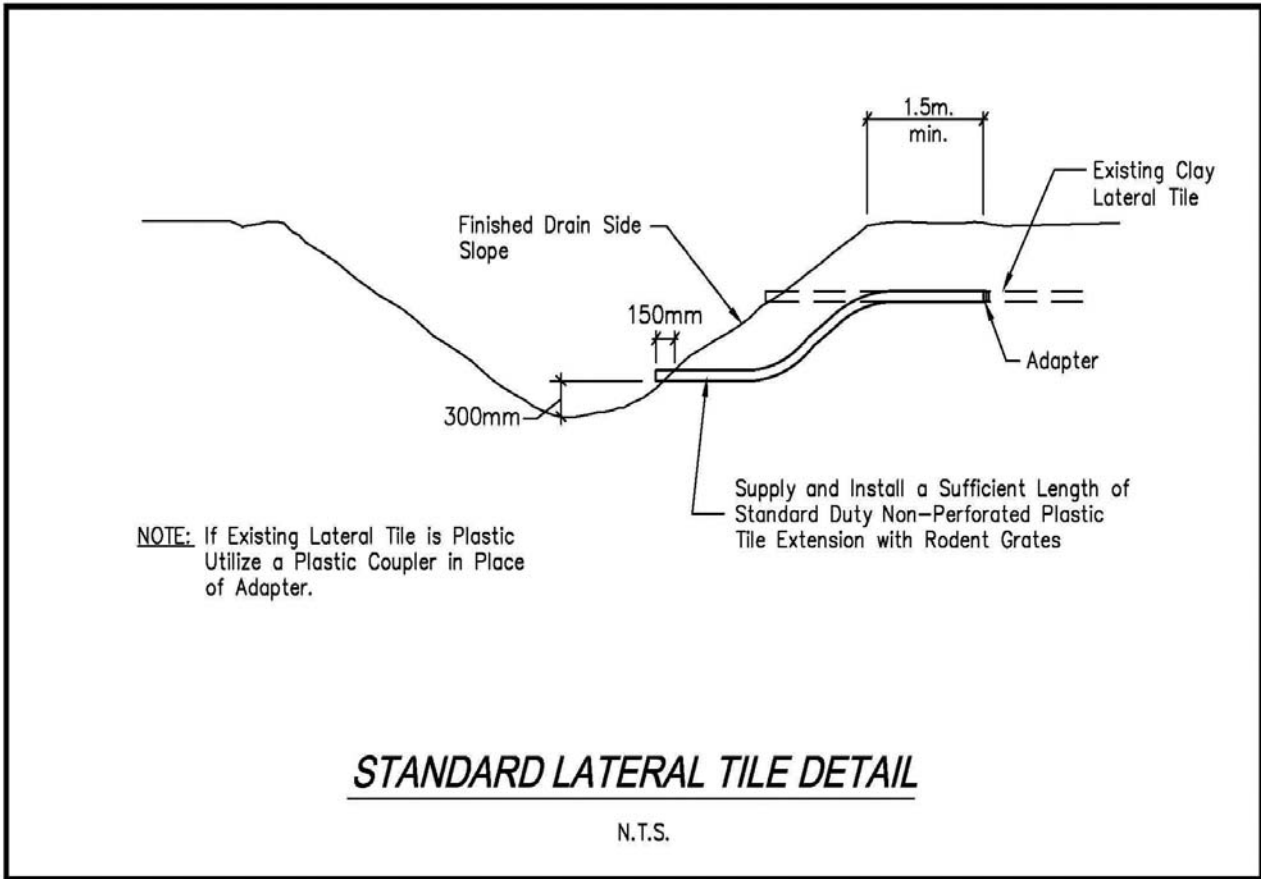
Rood Engineering Inc.

Consulting Engineers

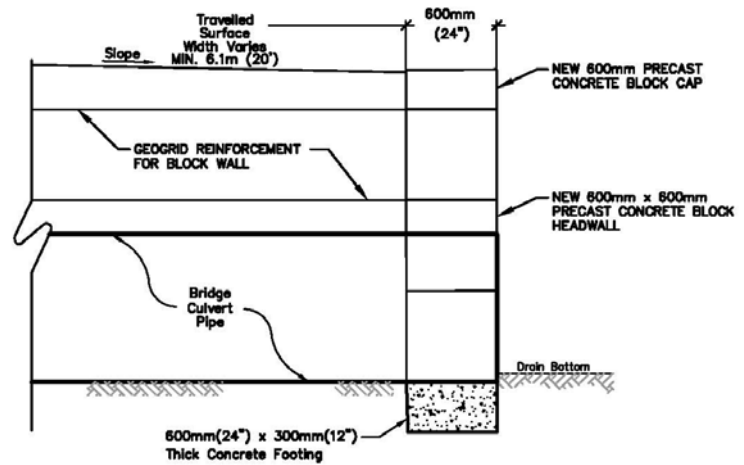
9 Nelson Street

Leamington, Ontario N8H 1G6

519-322-1621



TYPICAL PRECAST CONCRETE BLOCK END PROTECTION
Scale = N.T.S.



TYPICAL VERTICAL PRECAST CONCRETE BLOCK END PROTECTION
Scale = N.T.S.

APPENDIX "REI-D"

Appendix D – General Conditions and Specifications

not required.

APPENDIX "REI-E"

WATERSHED
OF THE
ONG DRAIN
Replacement Bridge for Bradley & Lindy Paquette
(Parcel 1)
(Geographic Township of Malden)

IN THE
TOWN OF AMHERSTBURG
IN THE
COUNTY OF ESSEX • ONTARIO

Gerard Rood
GERARD ROOD, P.ENG.
ROOD ENGINEERING INC.
CONSULTING ENGINEERS
Leamington, Ontario
519-322-1621



DATE: August 4th, 2022

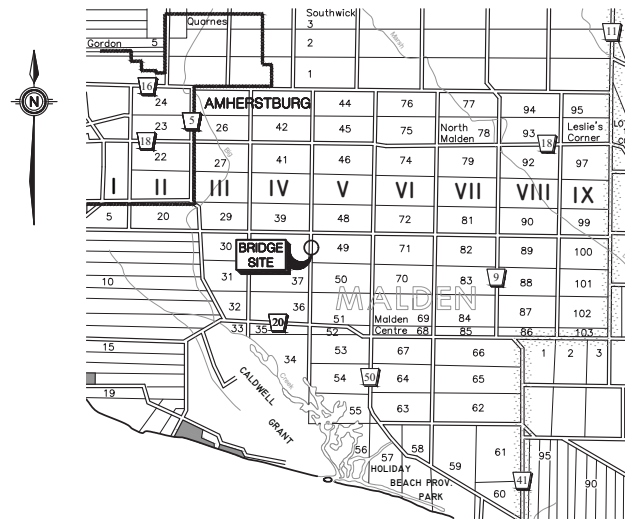
TOWN OF AMHERSTBURG

MAYOR: Aldo DiCarlo
CLERK: Valerie Critchley
DRAINAGE SUPERINTENDENT: Shane McVitty, P.Eng.

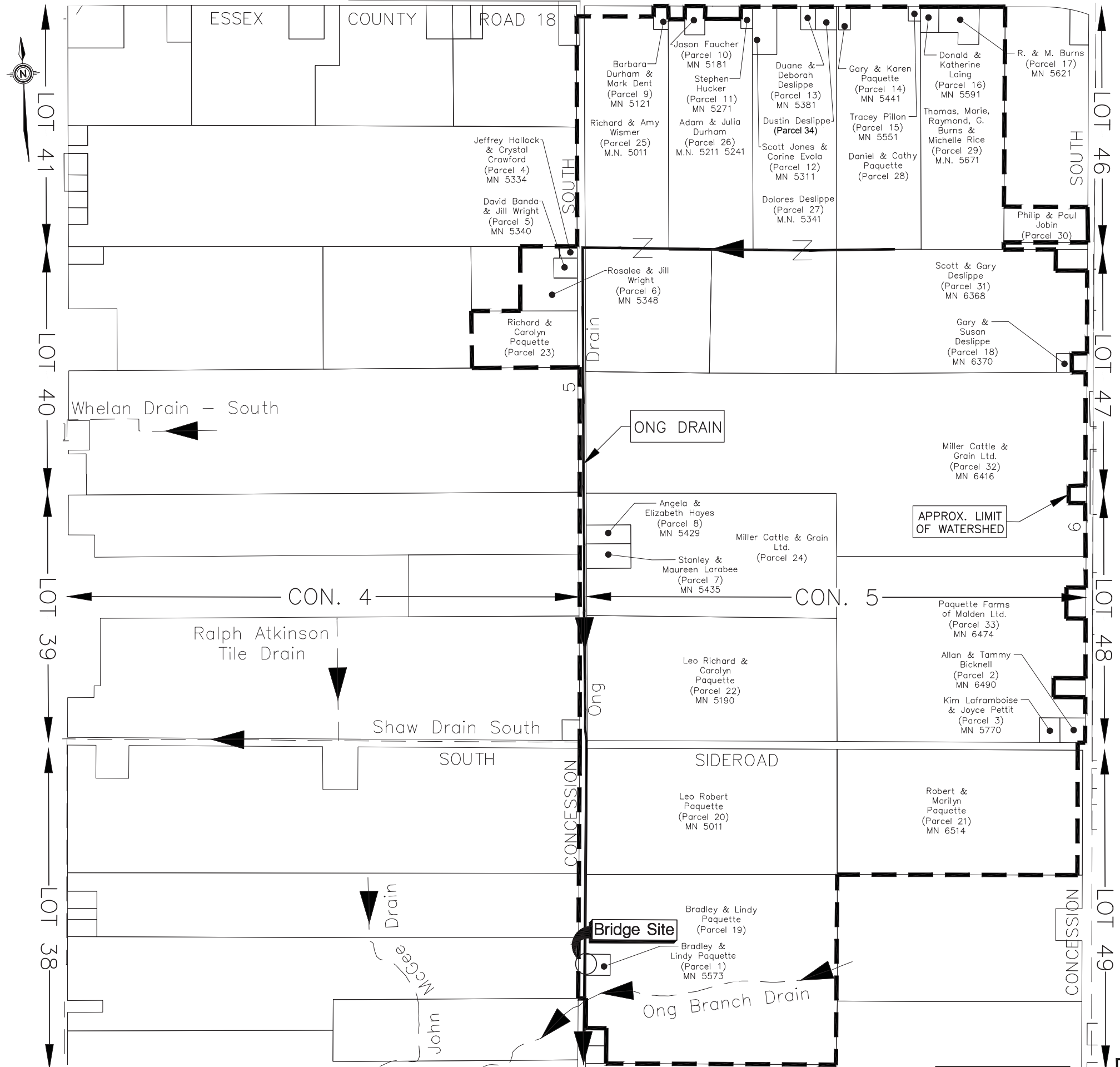
BENCHMARKS:

TOP OF NUT OF FH LOCATED APPROXIMATELY 10 METRES WEST OF THE DESIGN BRIDGE, ACROSS THE ROAD FROM MN 5573.

ELEV: 182.015m



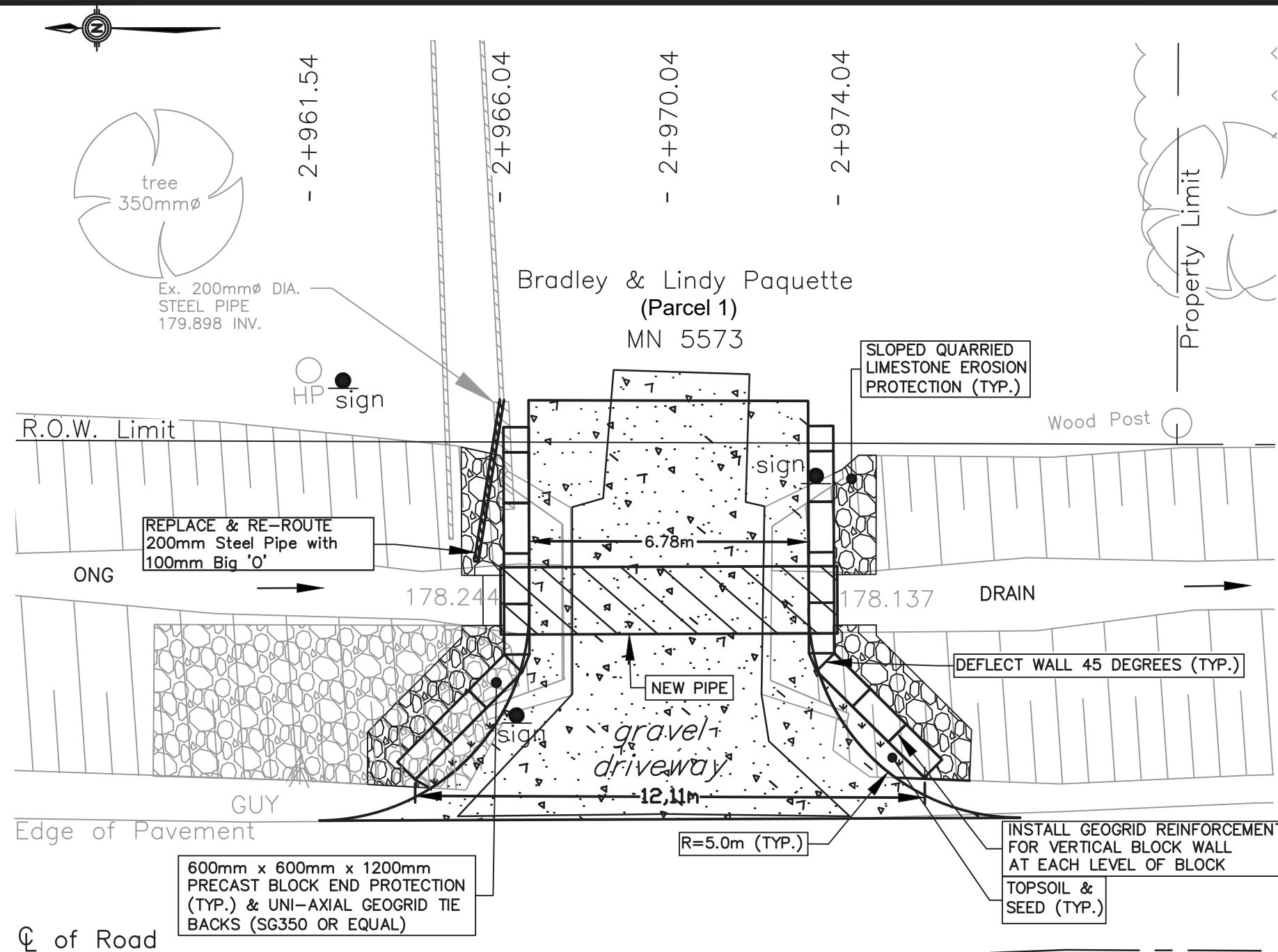
KEY PLAN
Scale = 1:75,000



WATERSHED PLAN

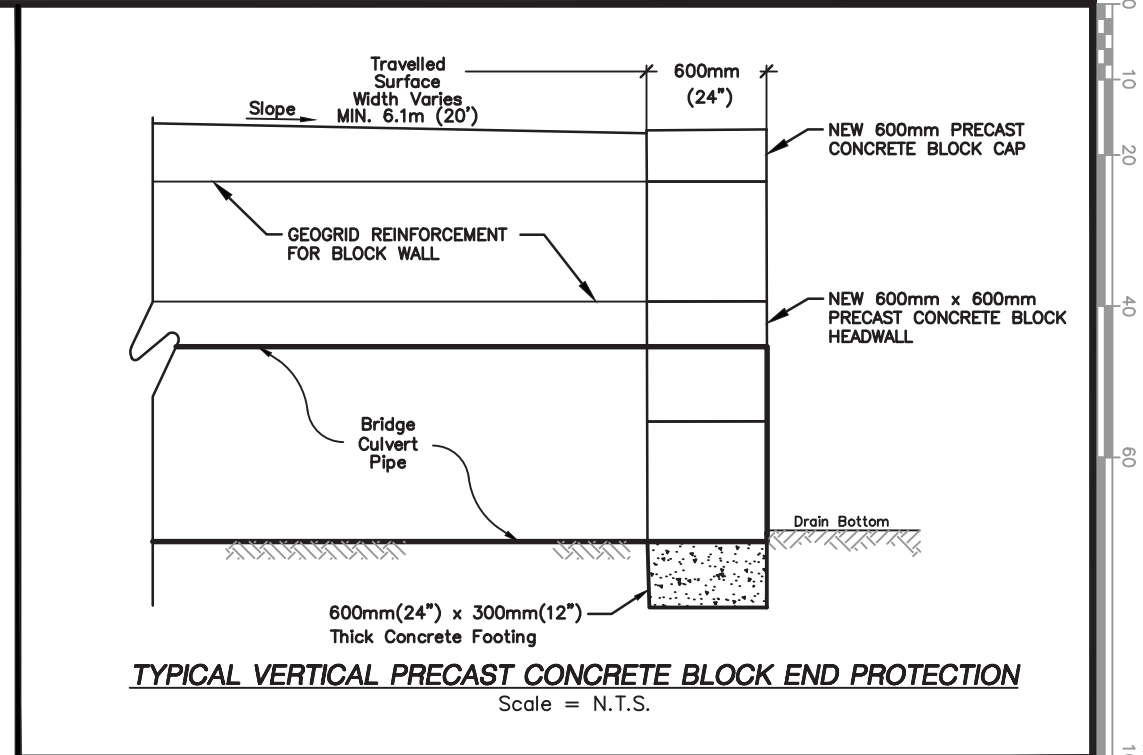
SCALE = 1:5000

THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

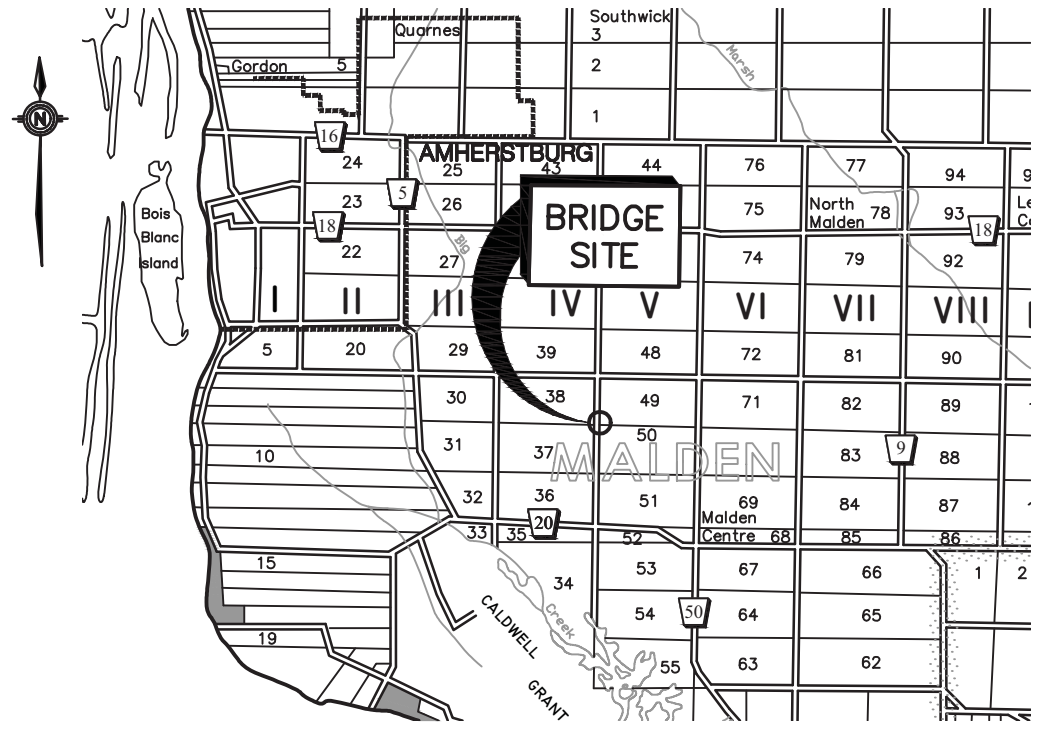


5TH CONCESSION SOUTH ROAD

BRIDGE PLAN
SCALE = 1:125



TYPICAL VERTICAL PRECAST CONCRETE BLOCK END PROTECTION
Scale = N.T.S.



KEY PLAN
Scale = 1:100,000

BENCHMARK:
TOP OF NUT OF FH LOCATED APPROXIMATELY 10 METRES WEST OF THE DESIGN BRIDGE, ACROSS THE ROAD FROM MN 5573.
ELEV: 182.015m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	DESIGN ELEVATIONS:
1600mm	8.0m (26.25 FT.)	2.0mm (14 GA.)	125X25mm	ALUMINIZED C.S.P.	UPSTREAM INV. (N) = 177.918 DOWNSTREAM INV. (S) = 177.886 ℄ TOP OF DRIVEWAY = 181.288 DRAIN GRADE = 0.40%

ONG DRAIN
BRIDGE FOR BRADLEY & LINDY PAQUETTE
(GEOGRAPHIC TOWNSHIP OF MALDEN)
IN THE
TOWN OF AMHERSTBURG
IN THE
COUNTY OF ESSEX • ONTARIO



ROOD ENGINEERING INC.
CONSULTING ENGINEERS
Leamington, Ontario
519-322-1621

FILE No.: **2022D005**
DRAWN BY: M.A.
PLOT CODE: 1:1
FILE: REI2022D005.DWG

DATE: 2022-08-04
APPENDIX 'E'
2 OF 2