ENGINEER'S REPORT

(Drainage Act, RSO 1990, c. D.17)

PROJECT **Bridges Over the Cameron Road Branch of the Billings Drain**
For Maria Bakalic (610-00302)
Part of Lot 276, NTR Concession
(Geographic Township of Gosfield North)
Town of Kingsville, County of Essex
Project No. D23-096

January 5, 2024

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Peralta Engineering

PREAMBLE

MUNICIPAL DRAINS AND THE DRAINAGE ACT

The "Drainage Act" is one of the oldest pieces of legislation in Ontario, passed in 1859. It provides a democratic procedure for the construction, improvement and maintenance of drainage works. A procedure whereby the Municipality may assist in providing a legal drainage outlet for surface and subsurface waters not attainable under common law. Accordingly, provides much-needed assistance to facilitate the problems of obtaining a legal drainage outlet, engineering and cost distribution.

The Drainage Act provides a legal procedure by which an "area requiring drainage" may receive an outlet drain constructed to dispose of excess stormwater runoff to a sufficient outlet. This drainage infrastructure is otherwise known as a "Municipal Drain". Municipal Drains are identified by Municipal By-Law that adopts an Engineer's Report. The drainage engineer has the obligation to prepare an unbiased Engineer's Report based on information presented in written form, orally, and from visual inspection; in accordance with currently accepted design criteria. These reports form the legal basis for construction and management of the Municipal Drain. As such, an Engineer's Report shall contain specific details such as plans, profiles, and specifications that define the location, size and depth of the drainage infrastructure, together with establishing how costs are shared amongst all stakeholders.

Through the democratic procedure, the Engineer's Report is presented to all Stakeholders in front of Municipal Council (or a Drainage Board appointed by Council) for consideration. The Drainage Act provides an appeal process to address various aspects of Municipal Drains. These appeal bodies are the Court of Revision, the Ontario Drainage Tribunal and the Drainage Referee.

For additional information, Fact Sheets, and reference materials regarding the Drainage Act and Municipal Drains, please visit: **http://www.omafra.gov.on.ca/english/landuse/drainage.htm**

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Mayor and Municipal Council
Corporation of the Town of Kingsville
2021 Division Road North
Kingsville, Ontario N9Y 2Y9

I. INTRODUCTION

In accordance with the instructions received by email dated August 22, 2023, from the Town of Kingsville's Drainage Department, we have completed the necessary survey, examinations, investigations, etc. and have prepared the following report to provide for the installation of three (3) new access bridges within the Cameron Road Branch of the Billings Drain for the agricultural lands of Maria Bakalic (610-00302) to facilitate the creation of three (3) residential lot severances. These investigations were initiated by a resolution passed by Council, for our firm to undertake the preparation of an Engineer's Report for the works within this Municipal Drain, and in accordance with provisions of the Drainage Act. The Cameron Road Branch of the Billings Drain is generally an open drain with a number of access bridges, which were constructed under the auspices of the Drainage Act. A plan showing the alignment of the Cameron Road Branch of the Billings Drain, the general location of the affected structures and the details related to the general improvements under this project are included herein as part of this report.

Our appointment and the works relative to the Cameron Road Branch of the Billings Drain proposed under this report, are being conducted in accordance with Section 78 of the "Drainage Act, RSO 1990, Chapter D.17, as amended in 2021". We have performed all of the necessary surveys, investigations, etc., for the existing and proposed bridges, as well as the Cameron Road Branch of the Billings Drain, and we report thereon as follows.

II. BACKGROUND AND DRAINAGE HISTORY

Background

The Owner of the subject agricultural lands, Maria Bakalic (610-00302), is currently working through final approvals to sever three (3) new residential lots, from the existing farm parcel. The subject farm parcel currently has no access bridge over the Cameron Road Branch of the Billings Drain. Based on the details outlined within the Town of Kingsville's Consent Application B/01/2022, new access bridges shall be

installed to facilitate the new severances from the retained farmland. The consent application further outlines that new access shall be installed for the severed lots. Accordingly, a formal request for improvements was submitted by the property Owners to the Town of Kingsville to appoint an Engineer through the provisions of the Drainage Act.

Drainage History

From our review of the Municipality's files, we have determined that the Cameron Road Branch of the Billings Drain is an existing open municipal drainage system that has been repaired and improved on a number of previous occasions through the auspicious of the Drainage Act. The Cameron Road Branch of the Billings Drain is generally an open drain located on the north side of Cameron Sideroad East. The top end of this Municipal Drain commences approximately 100.0 metres northeast of the intersection of County Road 34 West and Cameron Sideroad and continues northeasterly along the north side of Cameron Sideroad East. This Municipal Drain extends along Cameron Sideroad East and crosses North Talbot Road to its outlet into the Billings Drain. The Cameron Road Branch of the Billings Drain provides a sufficient outlet for a mixture of agricultural and residential lands.

From our review, we have found various Engineer's Reports prepared through the provisions of the Drainage Act for this Municipal Drain. However, we have outlined the following relevant Engineer's Reports that we utilized as a reference for carrying out this project:

a) **October 24, 1949** Engineer's Report for the "Billings Drain and Branches", prepared by C.B. Allison, O.L.S., was carried out under the Township of Gosfield North Drainage By-law No. 297. The works conducted under this report generally provided for the general improvements to the Billings Drain and various branches. This report provided for the initial creation of the Cameron Road Branch of the Billings Drain by converting the existing "Goodburn Award Drain" into a Municipal Drain through the provisions of the Drainage Act.

b) **July 18, 1971** Engineer's Report for the "Part of the Billings Drain", prepared by W.J. Setterington, P.Eng., was carried out under the Township of Gosfield North Drainage By-law No. 491. The works conducted under this report generally provided for the improvements to the Cameron Road Branch of the Billings Drain to provide proper drainage for the affected lands. These works included the removal and replacement of various access culverts previously installed at improper elevations.

c) **November 27, 2014** Engineer's Report for the "Billings Drain and Branches – Bridge Maintenance Sharing", prepared by G. Rood, P.Eng., was carried out under the Town of Kingsville Drainage By-law No. 106-2014. The works conducted under this report generally provided for cost-sharing provisions for all existing access bridges within the Billings Drain drainage system. These works were provided to allocate the appropriate distribution of all future maintenance costs for each bridge structure identified within the drainage system.

Based on our review of the Cameron Road Branch of the Billings Drain drainage records, we have determined that generally speaking, the 1971 Report serves as the current governing By-law for the design parameters of the Cameron Road Branch of the Billings Drain, where the subject access structures intend to be located. We have utilized the above-mentioned 1971 report to establish the size parameters and grades

for the drain, together with the necessary details to be utilized in establishing the proposed access culvert installations. We further note that the 2014 report shall be used as a guide for establishing cost-sharing provisions for future maintenance of the proposed access bridge structures.

III. PRELIMINARY INVESTIGATIONS AND ON-SITE MEETING

After reviewing all the available drainage information and documentation provided by the Drainage Superintendent, we arranged to schedule an On-Site Meeting for October 25, 2023. The following people attended this meeting:

Name	Affiliation
Vladamir Bakalic	Representative of 406 County Road 34
Nancy Kovacs	Landowner – 11 Cameron Sideroad East
Melissa Dault-Tuffin	Landowner – 15 Cameron Sideroad East
Lu-Ann Marentette	Kingsville Drainage Superintendent
Nolan Harris, EIT	N.J. Peralta Engineering Ltd
Kiara Kirkland	N.J. Peralta Engineering Ltd
Tony Peralta, P.Eng.	N.J. Peralta Engineering Ltd.

Upon introductions, it was discussed that a written notice had been submitted by Maria Bakalic (610-00302) for the installation of new access bridges to facilitate the proposed residential severances from the existing agricultural property. Vladamir Bakalic identified himself as the representative of the Owner, Maria Bakalic. Mr. Bakalic confirmed that he has been working with the Planning Department on the severance application and confirmed that the installation of new accesses to the severed lots is a condition of the Consent Application. Mr. Bakalic advised that he could provide additional information regarding the severance details, together with documentation on the subject property. Mr. Bakalic further identified that the Consent Application was originally approved in March 2022 with a stipulation that all conditions be met by March 2024. He further identified that there was some miscommunication between himself and Town Staff on the requirements to initiate the access bridge installation process. Therefore, Mr. Bakalic expressed the urgency of completing the installation of these access bridges prior to this deadline.

Mr. Bakalic was reminded that the costs associated with the new access bridge will be assessed entirely to the subject agricultural property for the construction, together with all associated engineering and incidental costs. Mr. Bakalic indicated that he was aware of these conditions and understood that 100% of the costs are to be borne by the property.

Tony Peralta provided a general overview of the project details, process, and specifics of the new access bridges. Mr. Peralta initiated discussions on whether these properties shall be served by individual accesses or shared accesses. With the proposed severances including large residential properties, it was confirmed that individual accesses would be most appropriate for this application. Mr. Bakalic was advised that the minimum standard top width of the driveway access is 6.10 metres (20.00 ft.). Furthermore, if the Owner wishes to provide a top width wider than the standard 6.10 metres (20.00 ft.), the additional cost shall be assessed 100% to the abutting Owner for both the initial construction and future maintenance. It was established that the two (2) smaller severances would likely require the minimum standard driveway top width. However, Mr. Bakalic would like to evaluate the potential cost implications of providing a wider top

width for the larger severance. Mr. Bakalic was further provided with the options of sloped quarried limestone end treatments versus vertical concrete headwall options. Mr. Bakalic confirmed that he would prefer that the structure be installed with sloped quarried limestone end treatments. Mr. Bakalic was advised that based on the potential length, the final headwall option may be governed by the requirements of the Department of Fisheries and Oceans (DFO) and the Essex Region Conservation Authority (ERCA). Prior to finalizing the design details, it was discussed that alternative top widths with estimated costs shall be provided to Mr. Bakalic for consideration.

It was also discussed that these new access bridges are subject to the approvals and mitigation measures of the Department of Fisheries and Oceans (DFO), Essex Region Conservation Authority (ERCA), Ministry of Natural Resources and Forestry (MNRF), and the Ministry of Environment, Conservation and Parks (MECP).

The overall drainage report and future maintenance processes, general timelines, and grant eligibility were generally reviewed with the landowners. It was further outlined that it would be likely that the works in this drain were not to be undertaken between March 15 and July 15, of any given year, unless otherwise permitted by DFO, ERCA, MNRF, and the MECP.

At the conclusion of our discussions, we advised that we would reach out to Mr. Bakalic prior to the preparation of our Engineer's Report, to review the details of the new access bridges.

On this note, the On-Site Meeting had concluded.

IV. FIELD SURVEY AND INVESTIGATIONS

Following our On-Site Meeting and per the subsequent discussions with the Owner, we arranged for our Survey Crew to attend the site to perform a topographic survey, including taking all necessary levels and details, of the Cameron Road Branch of the Billings Drain related to the proposed access bridges associated with the subject property. Benchmarks were established from previous work carried out on the drain and were utilized in establishing a relative site benchmark near the location of the access bridge site. We also surveyed the drain for a considerable distance both upstream and downstream of the existing and proposed access bridge sites to establish a design grade profile for the new bridge installation. We also took cross-sections of the Cameron Road Branch of the Billings Drain at the general location of the access bridge sites, as necessary, for us to complete our design calculations, estimates and specifications.

The Ministry of Environment, Conservation and Parks (MECP) currently regulates the Endangered Species Act, 2007. New regulation provisions under Ontario Regulation 242/08, Section 23.9 allow the Municipality to conduct repairs, maintenance, and improvements, within existing Municipal Drains, under the Drainage Act and these works are exempt from Sections 9 and 10 of the Endangered Species Act, so long as the rules in the regulation are followed. If eligible, the regulatory provision allows Municipalities to give notice to the Ministry by registering their drainage activities through an online registry system.

Prior to our appointment to this project, we understand that the Town of Kingsville provided the Essex Region Conservation Authority (ERCA) with a notice advising of the proposed drainage works, as required under Section 78(2) of the Drainage Act. Based on their comments, we engaged in further correspondence with the ERCA, regarding specific requirements for the approval of the proposed bridge design.

For the purposes of establishing the watershed area upstream of the proposed access bridges, and determining the pipe size required for this application, we investigated and reviewed the past Engineer's Reports on the Cameron Road Branch of the Billings Drain. We also reviewed the watershed limits utilizing the most recent Engineer's Report and conducted a review of the contributing lands to verify the contributing watershed area in the Cameron Road Branch of the Billings Drain.

Based on our detailed survey and general findings, we found that the portion of the Cameron Road Branch of the Billings Drain, in which the new access bridge is to reside, has been considerably over-excavated relative to the design grade of the drain and the existing culvert downstream of the project site. As a result, adjustments to the proposed culvert design inverts were required to best match the existing parameters of the drain. Subsequently, due to changes in land use for the lands contributing to the open drain, together with the necessary adjustments to the design grades, the proposed culvert sizes have been increased to maintain the hydraulic characteristics of the Cameron Road Branch of the Billings Drain.

VI. FINDINGS AND RECOMMENDATIONS

Based on our topographic survey, detailed investigations, information derived from the On-Site Meeting and subsequent discussions and review with the affected landowner, together with the review and correspondence with the ERCA and other environmental government agencies; we have proceeded to establish the required details to adequately address the specified improvements within the Cameron Road Branch of the Billings Drain. Our findings and recommendations are outlined in the following paragraphs.

ERCA, DFO, and MECP Considerations

During the course of our investigations, this drainage project was discussed and reviewed in detail with Ms. Summer Locknick, of the ERCA, to deal with any of the ERCA concerns and comments related to this Municipal Drain. The Cameron Road Branch of the Billings Drain is located within the regulated area and is under the jurisdiction of the ERCA. Therefore, an ERCA Permit is required for the construction and/or improvements of the proposed access bridge structures. Further to the above, the ERCA provided us with their comments and concerns through email correspondence, and said correspondence is included herein as **Appendix "A"**.

With respect to the Department of Fisheries and Oceans (DFO) concerns and comments, the proposed works within this Municipal Drain were "self-assessed" by the Engineer, through the DFO website and the utilization of the "Guidance for Maintaining and Repairing Municipal Drains in Ontario" to determine whether this project shall be reviewed by the DFO. The section of the Cameron Road Branch of the Billings Drain where the access bridge will be installed has been established as Class 'F' by the DFO. Based on the DFO Self-Assessment website and the guidance document, we have determined that the project activities would not require a DFO review for the works proposed under this project, so long as standard measures for fish habitat and migration are implemented.

The Ministry of Natural Resources and Forestry (MNRF) has transitioned the responsibilities of the Species at Risk Provincial Legislation to the Ministry of Environment, Conservation and Parks (MECP). Section 23.9 of the Endangered Species Act, 2007 allows the Municipality to conduct eligible repair, maintenance, and improvement work under the Drainage Act that exempts these works from Sections 9 and 10 of this Act, so

long as they follow the rules within Ontario Regulation 242/08. In recognition of the impacts that these species may experience as a result of the subject works, the Town of Kingsville shall provide comprehensive mitigation measures as well as species identification guides for reference. These references shall be provided to the successful Tenderer and shall be available for viewing at the Municipal Office for those interested.

Through correspondence with ERCA, self-assessment through DFO, and the mitigation measures through the Endangered Species Act, we have provided for all of the ERCA, DFO, and MECP concerns and issues in our design and recommend that these drainage works be constructed in total compliance with all of the above.

Access Bridge Structures

Further to our discussions and instructions established at the On-Site Meeting, and per the subsequent correspondence, we have reviewed the proposed access structures within the Cameron Road Branch of the Billings Drain which pertains to the proposed residential lot severances from the subject property of Maria Bakalic (610-00302). The residential severances have been identified as Part 1, Part 2 and Part 3 of the Registered Plan 12R-29077. A copy of this Plan is included within this Report and is identified as **Appendix "B."** Prior to the completion of our Engineer's Report on this project, we had correspondence with Vladamir Bakalic, representative of the Owner, to review the particulars of the new access bridge, in detail and we report the following:

Bridge 1 – Severance #1 (from Parcel 610-00302)

As part of the overall discussions, specific bridge details were reviewed that included, but were not limited to, the potential bridge top widths, end treatment options, and the associated costs. Through these discussions, it was established that the subject access bridge would require a minimum driveway top width of 6.10 metres (20.00 ft.) top width with sloped quarried limestone end treatments. Based on these details, Mr. Bakalic was advised that we have determined from our preliminary design that the new access bridge would require approximately 12.20 metres (40.00 ft.) of 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe, together with sloped quarried limestone end protection. The culvert installation shall provide 193mm of pipe embedment from the modified design grade to address pipe cover requirements and for fish habitat and migration. The resulting travelled portion of the driveway top width would be approximately 6.10 metres (20.00 ft.), and the access centreline shall be positioned approximately 12.19 metres (40.00 ft.) south of the proposed lot line between Severance #1 and Severance #2. Based on our investigations and the information provided, a new access bridge shall be installed to serve the proposed residential Severance #1 (Part 1 of 12R-29077) from the existing agricultural lands of Maria Bakalic (610-00302). The proposed access bridge shall extend from Station 0+226.9 to Station 0+239.1 and serve as the primary access of the new Severance #1, within Lot 276, NTR Concession. This structure has further been labelled herein as **Bridge 1**.

Bridge 2 – Severance #2 (from Parcel 610-00302)

As part of the overall discussions, specific bridge details were reviewed that included, but were not limited to, the potential bridge top widths, end treatment options, and the associated costs. Through these discussions, it was established that the subject access bridge would require a minimum driveway top width of 6.10 metres (20.00 ft.) top width with sloped quarried limestone end treatments. Based on these details,

Mr. Bakalic was advised that we have determined from our preliminary design that the new access bridge would require approximately 12.20 metres (40.00 ft.) of 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe, together with sloped quarried limestone end protection. The culvert installation shall provide 146mm of pipe embedment from the modified design grade to address pipe cover requirements and for fish habitat and migration. The resulting travelled portion of the driveway top width would be approximately 6.10 metres (20.00 ft.), and the access centreline shall be positioned approximately 12.19 metres (40.00 ft.) south of the proposed lot line between Severance #2 and Severance #3. Based on our investigations and the information provided, a new access bridge shall be installed to serve the proposed residential Severance #2 (Part 2 of 12R-29077) from the existing agricultural lands of Maria Bakalic (610-00302). The proposed access bridge shall extend from Station 0+287.9 to Station 0+300.1 and serve as the primary access of the new Severance #2, within Lot 276, NTR Concession. This structure has further been labelled herein as **Bridge 2**.

Bridge 3 – Severance #3 (from Parcel 610-00302)

As part of the overall discussions, specific bridge details were reviewed that included, but were not limited to, the potential bridge top widths, end treatment options, and the associated costs. Through these discussions, it was established that the subject access bridge would require a wider top width than the minimum 6.10 metres (20.00 ft.) top width with sloped quarried limestone end treatments, to facilitate the larger residential lot. Based on these details, Mr. Bakalic was advised that we have determined from our preliminary design that the new access bridge would require approximately 18.30 metres (60.00 ft.) of 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe, together with sloped quarried limestone end protection. The culvert installation shall provide 75mm of pipe embedment from the modified design grade to address pipe cover requirements and for fish habitat and migration. Although the travelled portion of the driveway top width will maintain a 6.10-metre width, the resulting total access width would be approximately 12.38 metres (40.62 ft.). The access centreline shall be positioned approximately 21.34 metres (70.00 ft.) south of the proposed lot line between Severance #3 and the retained agricultural lands. Based on our investigations and the information provided, a new access bridge shall be installed to serve the proposed residential Severance #3 (Part 3 of 12R-29077) from the existing agricultural lands of Maria Bakalic (610-00302). The proposed access bridge shall extend from Station 0+419.0 to Station 0+437.3 and serve as the primary access of the new Severance #3, within Lot 276, NTR Concession. This structure has further been labelled herein as **Bridge 3**.

General Details and Summary

Mr. Bakalic was reminded that, as new access bridges within the Cameron Road Branch of the Billings Drain, all costs associated with these new access bridges shall be assessed entirely to the original agricultural property. Furthermore, as a result of the proposed severances, this project would likely not be eligible for the agricultural grant from the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA). As a result of these discussions, this report and the works proposed herein have been prepared on that basis.

Based on our detailed survey, investigations, examinations, and discussions with the affected property owner, we recommend that three (3) new access bridges be constructed in the Cameron Road Branch of the Billings Drain to serve as the primary access to each of the new residential lot severances from the agricultural lands of Maria Bakalic (610-00302), in Part of Lot 276, NTR Concession. These works are in accordance with this report, the attached specifications and the accompanying drawings and all works

associated with same shall be carried out in accordance with Section 78 of the "Drainage Act, RSO. 1990, Chapter D.17, as amended 2021".

VII. ALLOWANCES AND COMPENSATION

All of the work carried out under this project is located alongside and within the Cameron Sideroad East right-of-way. Furthermore, all areas disturbed by this work are specified for full restoration. Therefore, these works shall not require land to be taken, nor result in any loss of production of agricultural property or any indirect damages to the non-agricultural areas. Therefore, no allowances or compensation shall be provided for under Sections 29 and 30 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

VIII. ESTIMATE OF COST

Our estimate of the total cost of this work, including all incidental expenses, is the sum of **EIGHTY-THREE THOUSAND THREE HUNDRED TWENTY-EIGHT DOLLARS ($83,328.00)** made up as follows:

CONSTRUCTION ITEMS					
Item	Description	Est Qty	Unit	Unit Price	Total
1.	**New Bridge 1 Installation (Station 0+226.9 to Station 0+239.1);** Provide all labour, equipment and materials to construct a new access bridge consisting of 12.20 metres (40.00 ft.) of 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe, including sloped quarried limestone end treatments, granular bedding and backfill, granular approaches and transitions, granular backfill in all gore areas, excavation, compaction, topsoil, seeding and mulching, cleanup and restoration, complete.	1.0	Lump Sum	$ 17,000.00	$ 17,000.00
2.	**New Bridge 2 Installation (Station 0+287.9 to Station 0+300.1);** Provide all labour, equipment and materials to construct a new access bridge consisting of 12.20 metres (40.00 ft.) of 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe, including sloped quarried limestone end treatments, granular bedding and backfill, granular approaches and transitions, granular backfill in all gore areas, excavation, compaction, topsoil, seeding and mulching, cleanup and restoration, complete.	1.0	Lump Sum	$ 17,000.00	$ 17,000.00

3.	**New Bridge 3 Installation (Station 0+419.0 to Station 0+437.3);** Provide all labour, equipment and materials to construct a new access bridge consisting of 18.30 metres (60.00 ft.) of 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe, including sloped quarried limestone end treatments, granular bedding and backfill, granular approaches and transitions, granular backfill in all gore areas, excavation, compaction, topsoil, seeding and mulching, cleanup and restoration, complete.	1.0	Lump Sum	$ 24,000.00	$ 24,000.00
4.	Net HST for the above construction items (1.76%)				$ 1,021.00
				TOTAL FOR CONSTRUCTION =	**$ 59,021.00**

INCIDENTALS		
Item	Description	Total
1.	Report, Estimates and Specifications	$ 9,100.00
2.	Survey, Assistants, Expenses and Drawings	$ 7,400.00
3.	Duplication Costs of Report and Drawings	$ 600.00
4.	Estimated Cost of Letting the Contract including preparation of Tender Documents and Tender Review	$ 1,500.00
5.	Estimated Cost of providing supervision and Full-Time Inspection during Construction (approx. 2-day duration)	$ 4,500.00
6.	Net HST on the above items (1.76%)	$ 407.00
7.	Estimate Cost for ERCA Permit	$ 800.00
	TOTAL FOR INCIDENTALS =	**$ 24,307.00**
	TOTAL FOR CONSTRUCTION (brought forward) **=**	**$ 59,021.00**
	TOTAL ESTIMATE =	**$ 83,328.00**

IX. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached the design drawing for the construction of the new access bridges over the Cameron Road Branch of the Billings Drain. The design drawing shows the alignment of the Cameron Road Branch of the Billings Drain and the approximate locations of the proposed access bridges within this Municipal Drain. The drawing also illustrates the affected landowners and the details associated

with the proposed new access bridge installations. The design drawing is attached to the back of this report and is labelled herein as **Appendix "C".**

We have prepared Standard Specifications and Special Provisions that set out the required construction details for the various aspects of the works to be conducted under this report.

X. CONSTRUCTION SCHEDULE OF ASSESSMENT DETAILS

Construction Schedule of Assessment

We would recommend that all of the costs associated with the details identified herein be totally assessed against the retained agricultural lands of Maria Bakalic (610-00302) and in accordance with the attached **Construction Schedule of Assessment**.

It shall be noted that the attached Construction Schedule of Assessment is to be utilized for the distribution of costs related to the construction works being provided for under this report and this Construction Schedule of Assessment shall not be utilized for the sharing of any future maintenance works conducted to same.

Agricultural Grant Eligibility

The Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) has issued Administrative Policies for the Agricultural Drainage Infrastructure Program (ADIP) to provide financial assistance for assessments of eligible agricultural lands pursuant to the Drainage Act. We understand that the subject agricultural lands currently have the "Farm Tax Classification" required for the subject grant. However, the subject agricultural property is currently moving forward with a Consent Application to create three (3) residential severances from these agricultural lands. Therefore, the proposed access bridge to the subject lands will likely **not** be eligible for such a grant due to the following provisions within the ADIP policies through OMAFRA.

1. **Policy 2.3.i(ii)** – Notwithstanding (i) above, any new crossing required as a result of any lot severance that occurred after July 28, 2004, is not eligible for grant.

Since the subject access bridges are being installed as a result of a severance occurring after July 28, 2004, the cost for their installation would be ineligible for the 1/3 grant through the current ADIP Policy. Therefore, the assessments related to the construction of the access bridge to this property shall be shown in the attached Construction Schedule of Assessment under the Subheading **"5. Privately Owned – Agricultural Lands (non-grantable)"**.

Distribution of Unforeseen Costs (Special Assessments Section 26)

During construction, it may become necessary to temporarily or permanently relocate existing utilities that may conflict with the works outlined within this report. Under these circumstances, the relocation of these utilities shall be assessed for any relocation costs against the public utility having jurisdiction in accordance with Section 26 of the Drainage Act. In accordance with Section 69 of the Drainage Act, the utility company is allowed the option to carry out this work utilizing their own forces and at their own cost. However, should

they not exercise this option within a reasonable time, the Municipality may arrange to have this work completed and the costs for this work shall be charged to the appropriate public utility. Furthermore, any unforeseen construction costs directly related to the Section 26 works shall be assessed entirely, as an extra, to the applicable Road Authority or Utility.

XI. FUTURE MAINTENANCE

It should be noted that a mechanism should be provided herein so that the Town of Kingsville can undertake future maintenance works on the access bridges identified within this report so that the future maintenance costs for these structures can be properly assessed to the affected landowners. With the proposed structures being established as primary accesses to their respective properties and established as a legal entity with respect to the Cameron Road Branch of the Billings Drain, the future maintenance and/or its future replacement would be eligible for cost-sharing with all upstream lands and roads contributing to each structure. Therefore, we recommend that these structures within the Cameron Road Branch of the Billings Drain, for which future maintenance costs are to be shared with upstream lands and roads within the watershed, be maintained by the Municipality.

Should any works of maintenance be required in the future to the structures identified within this report, the following provisions with respect to cost-sharing for each of same, shall be shared by the abutting landowner and upstream affected lands and roads in accordance with the following table:

Bridge No.	Roll No.	Owner	% to Abutting Owner (Benefit)	% to Upstream Lands & Roads (Outlet)
1.	610-00302 – Part 1 (Severance #1)	Maria Bakalic	80.0%	20.0%
2.	610-00302 – Part 2 (Severance #2)	Maria Bakalic	79.3%	20.7%
3.	610-00302 – Part 3 (Severance #3)	Maria Bakalic	84.2%	15.8%

The sharing percentages between the abutting Owner and the upstream lands and roads affected by said structures have been established on the basis of where it is located relative to the entire reach of the drain. The percentages to the abutting Owner shall be assessed as a Benefit Assessment. For **Bridge 3**, the percentages above account for the bridge user share of the increased pipe length beyond the standard length available to provide the standard 6.10 metres (20.00 ft.) minimum driveway top width.

The percentage to the upstream lands and roads as established above shall be assessed as an Outlet Liability towards the lands and roads within the Cameron Road Branch of the Billings Drain watershed lying upstream of said structures. These Outlet Assessments to upstream lands shall be shared in the same proportions as the outlet assessment established within the Engineer's Report dated July 18, 1971, prepared by W.J. Setterington, P.Eng., or per subsequent amendments made thereto under the Drainage Act. The future maintenance costs for each affected structure within the drain shall be levied pro-rata on only the affected lands and roads that are situated upstream of the particular structure for which future maintenance works have been carried out.

Said maintenance work would include work to the structure, bedding and backfill, end treatment and other ancillary work. Should concrete or asphalt driveway surfaces over these access bridge driveways require removal as part of the maintenance work, these surfaces should be repaired or replaced as part of the work. Likewise, if any fencing, gate, decorative walls, guard rails 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 structure maintenance work. However, the cost of the supply and installation of any surface material other than Granular "A" material, and the cost of removal and restoration or replacement of any special features, if necessary, shall be totally assessed to the benefiting adjoining Owner served by said access bridge.

All of the above provisions for future maintenance of the above-listed bridge structures under this report shall remain as aforesaid until otherwise determined under the provisions of the "Drainage Act, RSO 1990, Chapter, D.17, as amended 2021".

All of which is respectfully submitted,

N.J. PERALTA ENGINEERING LTD.

Antonio B. Peralta, P.Eng.

ABP/kk

CONSTRUCTION SCHEDULE OF ASSESSMENT

5. PRIVATELY OWNED - AGRICULTURAL LANDS (non-grantable):

Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
610-00302	276	NTR	43.62	43.62	17.653	Maria Bakalic	$ 83,328.00	$ -	$ -	$ 83,328.00
Total on Privately Owned - Agricultural Lands (non-grantable).....							**$ 83,328.00**	**$ -**	**$ -**	**$ 83,328.00**
TOTAL ASSESSMENT				**43.62**	**17.653**		**$ 83,328.00**	**$ -**	**$ -**	**$ 83,328.00**

1 Hectare = 2.471 Acres

D23-096

January 5, 2024

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SPECIFICATIONS

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Peralta Engineering

STANDARD SPECIFICATIONS

General

(Revised January 2024)

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I. GENERAL CONDITIONS FOR SPECIFICATIONS

The specifications, together with the accompanying drawings and appendices, delineate the furnishing of all labour, equipment, materials, and supplies required for the performance of all operations relating to the construction and/or improvements of a Municipal Drain under the most recent revision of the Drainage Act and/or amendments made thereto. These specifications serve to supplement and/or amend the current Ontario Provincial Standard Specifications and Standard Drawings, adopted by the Ontario Municipal Engineers Association. "Special Provisions" are included as part of the overall document and shall be read in conjunction with these standard specifications. Where a discrepancy occurs between the requirements of the Standard Specifications and the Special Provisions, the Special Provisions shall govern. 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 (CCDC) shall govern and be used to establish the requirements of the work.

Any reference to "Drainage Superintendent" and/or "Consulting Engineer" within this document shall refer to the person (or persons) appointed by the Council of the Municipality having jurisdiction over the drainage works.

All work shall be done in a first-class and workmanlike manner, complete in all respects and including all items specified herein, or as necessary for the accomplishment of a complete, satisfactory, and approved installation.

II. REVIEW OF SITE, PLANS, AND SPECIFICATIONS

As part of the Tender process, each tenderer shall visit the site(s) and review all documentation associated with the project prior to their tender submission and satisfy themselves with the full extent of the scope of work and conditions to complete the project. The Contractor may request, at any time prior to the closing of the tender, to examine any associated information available from the Drainage Superintendent and/or Consulting Engineer. Claims that there are any misunderstandings of the terms and conditions of the Contract related to site conditions will not be permitted.

The quantities identified within the Construction Items, Drawings and/or Specifications are estimates only and are intended for the sole purpose of identifying the general extent of the proposed work. The tenderer shall be responsible to verify the quantities for accuracy prior to submitting their tender.

III. MAINTENANCE PERIOD

The successful tenderer shall guarantee and warrant the work for a period of twelve (12) months from the time that substantial completion is issued. Upon the expiry of the maintenance period, with ordinary wear and tear, the work shall remain in such condition as will meet with the approval of the Consulting Engineer, and it will be responsible for rectification in a manner satisfactory to the Consulting Engineer. The cost thereof, of any imperfect work due to or arising from materials, equipment or plant incorporated into or used in the construction thereof, or due to or arising from workmanship or methods of construction, that is discovered by any means at any time prior to the issuance of the Final Certificate. The Consulting Engineer shall decide as to the nature, extent, cause of, and responsibility for imperfect work and the necessity for and the method of rectification thereof. In the event that the Contractor fails to comply with the above and address any deficiencies, the Municipality may complete these deficiencies, with the guidance of the Consulting Engineer, to make such repairs or complete such works, and the whole costs, charges and/or expenses so incurred may be deducted from any amount due or collected from the Contractor.

IV. LIABILITY OF THE CONTRACTOR

The Contractor, its agents, workforce and/or sub-contractors, shall satisfy itself as to the exact location, nature and extent of any existing structure, utility or other objects that it may encounter during the course of the work. The Contractor will be responsible for any damage caused by it to any person, property, public utilities, and/or municipal infrastructure. The Contractor shall indemnify and save harmless, the Municipality and the Consulting Engineer for any damages which it may cause or sustain during the progress of the work. The Contractor shall not hold the Municipality or the Consulting Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.

V. GENERAL COORDINATION

The Contractor shall be responsible for the coordination with other organizations, agencies, and utility companies in connection with the works. The Contractor shall not take action against the Municipality or the Engineer for delays caused by the site being unavailable to them by the Municipality or Consulting Engineer because of the acts, omissions, conduct or misconduct of other organizations or utility companies engaged in other work.

VI. LEGAL SURVEY BARS AND MONUMENTS

The Contractor is to note that legal survey bars may exist within the work site, and it shall take whatever steps necessary to protect these features. If any iron bar or monument is damaged or removed by the Contractor, it shall arrange for an Ontario Land Surveyor licensed in the Province of Ontario to restore same, all at the Contractor's expense.

VII. MAINTAINING CONVEYANCE

The drainage works shall not be conducted at times when flows in the drain are elevated due to local rain events, storms, or seasonal floods. Work shall be completed during times when the drain is dry or frozen.

When performing excavation work, care should be taken not to interfere with, plug up, or damage any existing surface drains, swales, and lateral or main tile ends. The Contractor shall be responsible to maintain permanent flow at all times. Temporary damming of flow is permitted to conduct the necessary works. However, the Contractor is responsible to monitor and ensure no damage occurs as a result of its actions. Under no circumstances shall temporary damming be permitted for an extended period (ie. overnight, etc.) without a suitable water control plan approved by the Drainage Superintendent, Consulting Engineer and/or the Conservation Authority.

VIII. APPROVALS, PERMITTING, AND INSPECTION

The works proposed under this project is subject to the approval, inspection, regulations, and by-laws of all Municipal, Provincial, and Federal entity, or any other agency having jurisdiction associated with the drainage works established herein. The Contractor shall ensure that all applicable permits and approvals are procured from all affected authorities prior to carrying out any of the prescribed works identified within the Contract, or in the vicinity of any public utility, railway and/or road authority.

The drainage works forming part of this project, including all appurtenances, shall be completely inspected by the Town Drainage Superintendent and/or the Consulting Engineer's Inspector prior to its completion. Under no circumstance shall the Contractor commence the construction or backfill of any underground feature without the site presence of the Drainage Superintendent and/or the Consulting Engineer's Inspector to inspect and approve said installation. The Contractor shall provide a minimum of forty-eight (48) hours' notice to the Drainage Superintendent and/or the Consulting Engineer prior to the commencement of the work. All works shall be performed during normal working hours of the Drainage Superintendent and/or the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend these working hours.

Upon completion of the works and prior to the demobilization and removal of all equipment and materials from the site, the Contractor shall notify the Drainage Superintendent and/or Consulting Engineer to arrange a final inspection of the works. The final inspection is intended to ensure that all aspects of the drainage work are satisfactorily completed and/or identify any outstanding deficiencies. Any outstanding deficiencies shall be addressed expeditiously as weather permits.

IX. TRAFFIC CONTROL

The Contractor shall ensure that the travelling public is always protected while utilizing the roadway for its access. The Contractor shall be required to carry out all 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 travelling public. The Contractor shall be required to submit a Traffic Control Plan to the Consulting Engineer for approval from the governing Road Authorities. The Traffic Control Plan shall be carried out in accordance with the requirements of the Ontario Traffic Manual's Book 7 for Temporary Conditions. Should the Contractor have to close any roads for the proposed works, it shall arrange to obtain the necessary authorizations from the Municipality, County, or Provincial Roads Departments (if applicable) and distribute notification of detours around the site. The Contractor shall also ensure that all emergency services, school bus companies, etc. 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 Municipality and County Roads Department (if applicable).

Due to the extent of the work and the area for carrying out the work, the Contractor shall be required to carry out all of the necessary steps to direct traffic and provide temporary diversion of traffic around work sites, including the provision of all lights, signs, flag persons, and barricades required to protect the safety of the travelling public. Any accesses or areas used 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 Drainage Superintendent and/or the Consulting Engineer. Restoration shall include but not be limited to all necessary levelling, grading, shaping, topsoil, seeding and mulching, and granular placement required to make good any damage caused.

The Contractor shall note that any deviation from the specified access for the construction of the culvert without the explicit approval of the adjacent landowners and the Drainage Superintendent could result in the Contractor being liable for damages sustained. The value for such damage shall be determined by the Drainage Superintendent and the Consulting Engineer and be subsequently deducted from the Contract Price. Where applicable, the Contractor shall be responsible for any damage caused by them to any portion of the road right-of-way. They shall take whatever precautions are necessary to avoid damage to the roadway. Any damage to the roadway must be restored to its' original condition upon completion of the works.

X. FENCING AND/OR STRUCTURES

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

XI. BENCHMARKS

For use by the Contractor, Benchmarks have been established along the course of the work. The plans include details illustrating the available Benchmarks and the work to be carried out. Benchmarks have been indicated and the Elevations have been shown and shall be utilized by the Contractor in carrying out its work. The Contractor shall note that specific design elevations and grades have been provided for the proposed works. The plans also set out side slopes, bottom width, and other requirements relative to its installation. In all cases, the Contractor is to utilize the specified Benchmarks to establish the identified elevations and grades. The Contractor shall ensure that it takes note of the direction of flow and sets all grades to match the direction of flow within the drain.

XII. ENVIRONMENTAL CONSIDERATIONS

Prior to commencing work, the Contractor must familiarize themselves with all associated environmental approvals and mitigations. The Contractor shall review the results of any environmental reviews performed for the project, including documents for the purpose of identification of known Species at Risk within the project area and mitigation measures for species and habitat protection. It is the responsibility of the Contractor to make certain that necessary provisions are undertaken to ensure the protection of all Species at Risk and their habitats throughout the course of construction. The Contractor will be responsible for providing the necessary equipment and materials required by any mitigation plans and shall contact the Drainage Superintendent immediately if any Endangered Species are encountered during construction.

XIII. FINAL CLEANUP AND RESTORATION

The whole of the work shall be satisfactorily cleaned up, and during the course of the construction, no portion shall be left in any untidy or incomplete state before subsequent portions are undertaken. 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 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.

Any accesses or areas used 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 Drainage Superintendent and/or the Consulting Engineer. Restoration shall include, but not be limited to, all necessary levelling, grading, shaping, topsoil, seeding and mulching, and granular placement required to make good any damage caused. Any damages caused, resulting from non-compliance with the above-noted provisions, shall be restored by the Contractor to its original condition, at the Contractor's expense. All roadways, driveways and access bridges, or any other means of access onto the job site shall be fully restored to their former condition at the Contractor's expense. 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 to be deducted from any monies owing to the Contractor.

XIV. GENERAL CONDITIONS

a) The Drainage Superintendent or Consulting Engineer shall have the authority to carry out minor changes to the work where such changes do not lessen the efficiency of the work.

b) 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 with the design and project intent.

c) The Contractor will be responsible for any damage caused by it to any portion of the Municipal 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 Municipality 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 Municipality. The Contractor, upon completing the works, shall clean all debris and junk, etc., 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.

d) The Contractor will be required to submit to the Municipality, 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 Municipality, a Certificate of Clearance for the project from the Workplace Safety and Insurance Board before Final Payment is made to the Contractor.

e) 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 Owner unless otherwise established within the Tender Documents. 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 Owner 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.

f) 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 unless otherwise established in the Tender Documents, and shall name the Municipality and its' officials, and the Consulting Engineer and its staff as additional insured under the policy. The Contractor must submit a copy of this policy to both the Municipal Clerk and the Consulting Engineer prior to the commencement of work.

g) Monthly progress orders for payment shall be furnished the Contractor by the 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 Consulting Engineer and the Municipality, 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 Municipality 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.

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Peralta Engineering

STANDARD SPECIFICATIONS

FOR NEW ACCESS BRIDGE INSTALLATIONS

(Revised January 2024)

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DETAILS

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I. GENERAL INFORMATION FOR SPECIFICATIONS

These specifications, together with the accompanying drawings and appendices, delineate the furnishing of all labour, equipment, materials, and supplies required for the performance of all operations relating to the construction and/or improvements of a Municipal Drain under the most recent revision of the Drainage Act and/or amendments made thereto. These specifications serve to supplement and/or amend the current Ontario Provincial Standard Specifications and Standard Drawings, adopted by the Ontario Municipal Engineers Association. "Special Provisions" are included as part of the overall document and shall be read in conjunction with these Standard Specifications. Where a discrepancy occurs between the requirements of the Standard Specifications and the Special Provisions, the Special Provisions shall govern. 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 (CCDC) shall govern and be used to establish the requirements of the work.

Any reference to "Drainage Superintendent" and/or "Consulting Engineer" within this document shall refer to the person (or persons) appointed by the Council of the Municipality having jurisdiction over the drainage works.

All work shall be done in a first-class and workmanlike manner, complete in all respects and including all items specified herein, or as necessary for the accomplishment of a complete, satisfactory, and approved installation.

II. REMOVAL OF BRUSH, TREES, AND DEBRIS

Where there is any brush, trees, or debris along the course of the drainage works, including the full width of the access, all such brush, trees or debris shall be close-cut and grubbed out, and the whole shall be chipped up for recycling, burned, hauled away or satisfactorily disposed of by the Contractor at its expense. Prior to and during the course of the 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 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 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.

The Contractor shall protect all other trees, bushes, and shrubs located along the length of the drainage works except for those trees that are noted within the accompanying drawings or in consultation with the

Drainage Superintendent, the Consulting Engineer, and the affected Owner(s). The Contractor shall note that protecting and saving the trees may require the Contractor to carry out handwork 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 to stand, 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 debris along the course of the open drain and any such materials located in the bridge culverts while carrying out its cleaning of same. All such deleterious materials and debris shall be loaded up and hauled away by the Contractor to a site to be obtained by it at their expense.

If applicable, where identified on the drawings, and to ensure a safe separation distance is maintained, the Contractor shall install tree protection fencing at the projected limit of the excavation and beneath the drip line of the identified tree(s). The fencing shall be comprised of orange vinyl snow fencing secured at 3.00-metre intervals with iron T-posts driven 600mm into the ground and should be in place until construction work is completed. During construction, no equipment, materials, or tools shall be stored beyond the tree protection fencing.

III. UTILITIES

The Contractor will be responsible at all times for complete investigation to determine the location of all such utilities or structures known or unknown, and it shall indemnify and save harmless the Engineer and the Municipality for any responsibility, injury, or liability arising from any damage to such utilities or structures by the Contractor.

The Contractor shall protect all other services located in the vicinity of the proposed drainage works including any sanitary sewers and connections, watermains and connections, telephone and gas services, along with any private systems and services. Any damaged components shall be replaced by the Contractor, totally at its own expense and it shall fully restore the functionality of same.

The Contractor shall further contact or notify such Utility Company or Commission of its intention to carry out work in the area and cooperate with such Utility Company or Commission in the location, maintenance and preservation of all such utilities. The location of the pipes and appurtenances as shown on the drawings is approximate and may be changed by the Engineer if deemed advantageous for the progress of the work.

IV. NOTICE OF PROJECT COMMENCEMENT AND HOURS OF OPERATION

The Contractor shall provide a minimum of forty-eight (48) hours' notice to the Drainage Superintendent and/or the Consulting Engineer prior to the commencement of the work. The installation of the culvert structure is to be performed during normal working hours of the Drainage Superintendent and/or the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend such working hours.

V. PIPE INSTALLATION

The new pipe shall be set in the alignment and to the grade elevations established in the accompanying drawings. The same shall not be altered unless otherwise directed by the Drainage Superintendent or Consulting Engineer prior to construction of same. Any changes relative to the culvert must be approved by the Consulting Engineer prior to proceeding with construction.

The Contractor shall lay the culvert pipe to the lines, levels, and grades as shown in the accompanying drawings or as may be laid out and established by the Engineer prior to the time of construction. The Contractor shall be held responsible for said lines, levels and grades of the pipe and should the Engineer determine that the Contractor has not satisfactorily adhered to such lines, levels and grades, it may direct the Contractor to take up and re-lay any portion of the drain which does not conform to such lines, levels and grades.

Laser control must be provided to maintain drain lines and grades, and the Contractor shall have a qualified Operator to set up and operate the equipment. In some instances, but only at the discretion of the Engineer, an approved system of batter boards may be utilized for this purpose; However, the cost of placing grade stakes and determining the cut information shall be provided by or paid for entirely by the Contractor.

The Contractor should note that, because the pipe is being installed with an excavator, it is expected that they will provide a minimum of 150mm (6") of either compacted MTO Granular "A", Granular "B" (Type II) or 20mm (3/4") clear stone bedding material, as outlined within OPSS Form 1010 The Contractor shall ensure that a good firm base is provided under the drain pipe, and they shall provide for this item as part of their tender price.

HDPE Pipe Installation

When HDPE plastic pipes are specified, they shall be joined together with the use of a water-tight bell and gasket joining system, secured in accordance with the Manufacturer's recommendations. The minimum length of a continuous pipe section shall be no less than 6.10 metres (20.00 ft.). The HDPE plastic pipe for this installation must be of the length, size, and strength identified in the Drawings, Special Provisions, and approved by the Drainage Superintendent and the Consulting Engineer prior to its placement in the drain.

For new smoothwall HDPE culvert pipes that are shown on the Drawings to have sloped quarried limestone erosion protection at their ends, both ends of the pipe shall be securely anchored against floatation utilizing two (2) steel T-bar fence posts having a minimum length of 1.80 metres (6.00 ft.) or approved equal, on each side of the pipe, together with heavy steel galvanized wire secured between them across the top of the pipe. The top of each post shall be set no higher than the top of the proposed culvert. Pipe anchors shall be installed in accordance with the "**Floatation Anchor Details**" outlined herein.

Aluminized Steel Pipe Installation

When Aluminized Steel Corrugated Hel-Cor pipe and/or Aluminized Steel Type II UltraFlo pipe is specified, the culvert shall be installed with a minimum number of couplers and longer pipe sections are to be utilized whenever possible. Under no circumstances shall the culvert sections be less than 4.00 metres in length. All pipe lengths shall be of the size and gauge noted in the drawings and shall be coupled together with Aluminized Steel Type II 10C having a thickness consistent with the culvert pipe material. The overall pipe for this installation

must be of the length, size, and thickness as identified in the Drawings, Special Provisions, and approved by the Drainage Superintendent and/or the Consulting Engineer prior to its placement in the drain.

General Pipe Installation

The Contractor shall be required to provide all labour, equipment, and materials to set the pipe to the required design grades. Where couplers are required, the Contractor shall utilize the appropriate coupler provided by and per the specifications of the Manufacturer. The Contractor shall supply all material and labour to provide a non-woven filter cloth wrap around the full circumference of the coupler joint connection, as part of their tender price. The filter cloth wrap connection shall be a minimum of 250mm (10") wider than the width of the proposed coupler and shall overlap a minimum of 200mm (8"), as available from Underground Specialties Inc., of Windsor, Ontario, or equal. The specific type to be utilized shall be approved by the Drainage Superintendent and/or the Consulting Engineer prior to its placement. The installation of all joints must be inspected and approved by the Drainage Superintendent or Consulting Engineer prior to any backfilling of same.

The Contractor shall also note that the placement of the 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 satisfaction of the Drainage Superintendent and/or Consulting Engineer. The installation of the complete length of pipe, including all appurtenances, shall be completely inspected by the Drainage Superintendent and/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 pipe without the site presence of the Drainage Superintendent and/or the Consulting Engineer's Inspector to inspect and approve said installation.

All pipe materials shall be stored and handled by the Contractor at its own expense. It shall be responsible for the safe storage of all materials, for obtaining storage areas, for the safe transportation and distribution of all the materials at the job site, and for inspection in order to determine defects and breakage. No additional recompense will be allowed to the Contractor for any loss incurred by it in the storage and handling of the materials.

Pipe, fittings, and all accessory appurtenances must be loaded and unloaded by lifting with means of a hoist or a skid to avoid shock or damage. Under no circumstances shall any drain material or materials for drain appurtenances be dropped.

If the culvert is laid in freezing weather, the Contractor shall take all the necessary precautions to prevent damage to the pipe or to any of the materials used in the construction of the work. In addition, the Contractor shall take care that no frozen ground or backfill is placed in the trench backfilling adjacent to the culvert. All pipe and the various other materials used in the placing of said pipe shall be installed in strict compliance with the Manufacturer's recommendations.

The installation of the complete length of the new culvert pipe, including all appurtenances, shall be completely inspected by the Drainage Superintendent and/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 culvert pipe without the site presence of the Drainage Superintendent and/or the Consulting Engineer's Inspector to inspect and approve the said installation.

VI. DRAINAGE STRUCTURE INSTALLATION

Where required, all materials for the catch basins shall comply with Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) with respect to materials, qualities, and installation details. The catch basins and maintenance holes shall be founded on a good, dry, firm, undisturbed earth base for its entire bottom surface area, or 20mm (3/4") clear stone bedding, if necessary. Corrections in depth of excavation caused by the Contractor excavating to an extent greater than that required for the structures shall be backfilled to the proper grade elevation by embedding the catch basin maintenance holes floor area with 20mm (3/4") clear stone granular bedding. A sump is to be provided in each structure which shall be a minimum of 450mm deep measured from the proposed invert of the covered drain or connection to the proposed concrete floor elevation of the structure. The structure shall be set to allow for connection of all of the inlet and outlet pipes and shall be installed as shown and detailed on the Drawings. The top elevation of the structure shall be installed to the elevations noted on the Drawings or as further directed by the Drainage Superintendent or the Consulting Engineer. All structure sections and adjustment units shall be joined together with standard gasket material, caulking, or grout as required by the Manufacturer, or as set out in the applicable OPSS and OPSD.

All structures, where applicable, shall include a minimum of two (2) adjustment units in accordance with OPSD 704.011. All work shall be completed as shown and detailed on the Drawings.

The Contractor shall connect all covered drains and connections in the catch basin maintenance holes with the use of a mortar joint or standard rubber boot cast into the units by the Manufacturer. Said mortar joint shall be provided at the internal and exterior of the catch basin maintenance holes wall for the full circumference of the covered drain and be of a sufficient mass to produce a sealed joint, all to be performed to the satisfaction of the Drainage Superintendent or the Consulting Engineer. Where possible, the Contractor shall employ a standard factory fitting or adapter to connect between the various pipes, tiles, and catch basin maintenance holes, otherwise a mortar joint connection can be utilized.

VII. CULVERT BACKFILL

Where the new culvert pipe is located under the driveway, the Contractor shall backfill the entire trench for the width of the driveway with Granular Type II "B" or Granular "A", or locally approved equivalent compacted in place to a minimum 98% of Standard Proctor Density with the exception of the top 300mm which should be backfilled with Granular "A" material also compacted in place to a Standard Proctor Density of 100%. Where the new culvert pipe is located along the lawn area, the Contractor shall be required to backfill the entire trench with good clean native backfill material with the exception of the top 100mm which shall be good clean black loamy topsoil readied for seeding and mulching. It should be noted that if there is a shortage of native backfill material available, the Contractor shall supply same all at its own expense. The Contractor should also note that prior to commencing its excavation that all existing topsoil should be scavenged for reuse on the project; if there is a shortage, the Contractor shall be required to supply the balance of the topsoil needed, all at its own expense. All of the native backfill material shall be compacted in place to a minimum Standard Proctor Density of 96%.

All backfill material shall be placed in compacted in maximum lifts of approximately 300mm thick. The Contractor is required to provide whatever mechanical equipment necessary, such as jumping jack and/or plate tamper, in order to achieve the necessary compaction levels, especially along the haunches of the new

pipe. All areas shall be graded in accordance with the profile and cross-sections shown in the accompanying drawings, including provision of cross-fall on boulevard areas as shown and detailed in accordance with the **"Typical Driveway Crossing Backfill Detail**" outlined herein.

VIII. BRIDGE END PROTECTION

Sloped Quarried Limestone Erosion Protection

When specified, the Contractor shall install sloped quarried limestone end protection at both ends of the pipe, or where shown, on a slope no steeper than 1.50 horizontal to 1.00 vertical and shall extend from the end of the new pipe to the top elevation shown. The top 305mm (12") of backfill material over the ends of the pipe, from the invert of said pipe to the top of the driveway elevation of the culvert, shall be quarried limestone. The quarried limestone to be placed on the sloped ends of the culvert 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. All work shall be completed to the satisfaction of the Drainage Superintendent and/or the Consulting Engineer.

The quarried limestone shall be provided as shown and detailed and shall vary in size from a minimum of 100mm (4") to a maximum of 250mm (10"). The quarried limestone pieces shall be carefully tamped into place with the use of a shovel bucket so that, when complete, the quarried limestone erosion protection shall be consistent, uniform, and tightly laid in place. Prior to placing the quarried limestone, the Contractor shall place non-woven geotextile filter fabric "MacTex MX140" conforming to OPSS 1860 Class 1 or approved equal, as an underlay underneath all areas to be covered in quarried limestone erosion protection. The Contractor shall take extreme care not to damage the geotextile filter fabric when placing the quarried limestone. The placement of the geotextile filter fabric and the quarried limestone, and the completion of the quarried limestone erosion protection shall be conducted to the satisfaction of the Drainage Superintendent and/or Consulting Engineer. Sloped quarried limestone erosion protection shall be installed in accordance with the "**Typical Quarried Limestone End Protection Detail"** outlined herein.

Precast Interlocking Concrete Block Headwalls

When precast interlocking concrete block headwalls are specified, the concrete blocks shall be rectangular in shape with square corners and be a minimum size of 600mm x 600mm x 1200mm (2' x 2' x 4'), as available from Underground Specialties Inc./Wolseley Inc. (Canada) or approved equal. Blocks with modified lengths may be utilized to fill in staggered sections of the block wall. All blocks shall be cast in one pour with no cold joints and shall have a minimum compression strength of 20MPa at 28 days. All precast concrete blocks shall be formed with interlocking pockets and tenons and each block shall be assembled in a staggered formation to prevent sliding at the interface between blocks. All precast concrete blocks shall be uniform in size with relatively smooth and consistent joints and shall have a stone exterior finish. Each block shall be fitted with a lifting ring that will not interfere with the assembly of the block wall once they are set in place. Cap blocks shall be utilized on the top course of the wall with the top of the cap blocks having a stone exterior finish. The precast interlocking concrete block headwalls are available from Underground Specialties Inc./Wolseley Inc. (Canada) or approved equal.

Precast interlocking blocks that abut the pipe shall be cast as one solid piece and shall be cut and shaped to fit closely around the perimeter of the pipe. The face of the wall shall not extend beyond the end of the pipe. All

minor gaps between the blocks and the pipe shall be sealed with no shrink grout for the full depth of the blocks. At the base of the wall, a base block shall be used at the bottom of the interlocking block wall. The base block shall be founded on a firm solid base. When necessary, the Contractor shall provide a minimum of 200mm thickness of level compacted granular bedding, or a lean concrete footing, as a firm foundation for the blocks. The base block shall be set level and shall convey a vertical projection throughout its full height and shall include filter cloth behind the wall for the full height of the blocks to prevent soil migration through any joints. Filter cloth fabric shall be non-woven geotextile material and be minimum "MacTex MX140"meeting OPSS Class I. Both headwalls shall be assembled concurrently with a continuous uni-axial geogrid SG350, or equal, installed across the entire structure at every second course of blocks, to tie each headwall to the other. In the event that the distance between headwalls exceeds 10.00 metres (32.81 ft.), the Contractor shall install the uni-axial geogrid for a distance of 3.00 metres (9.84 ft.) inward from each headwall and at every second course. Both the non-woven filter cloth and the uni-axial geogrid are available from Armtec Construction Products or approved equal.

The blocks shall extend up from the pipe invert and cross the full width of the drain and be embedded a minimum of 500mm into the drain banks. Where required for the top of the block wall to match the height of the completed driveway, the Contractor shall embed the bottom course of blocks into the drain bottom at the appropriate depth to achieve the required top elevation of the wall.

The Contractor shall arrange for the Supplier to provide interlocking block layout drawings outlining block assembly of the proposed headwall to the Consulting Engineer for approval prior to proceeding with fabrication and assembly of same. The Contractor shall arrange with the Supplier for technical assistance with the assembly of the structure on-site in full accordance with the requirements of the Supplier. All assembly installation shall be carried out to avoid any damage to the pipe and shall follow the Supplier's recommendation in every respect to ensure a proper and safe installation.

The precast interlocking concrete block headwalls shall be installed vertically and shall extend from the end of the new pipe to the top elevation of the driveway. Under no circumstances shall the interlocking block wall be installed with an outward projection. When complete, the outside face of the headwall shall be installed flush with the end of the proposed culvert. The precast interlocking concrete block headwall shall be installed perpendicular to the drain banks. Headwalls are to be installed so that daylighting is provided off the travelled roadway if required. The daylighting is to be designed to deflect outwardly from approximately the extreme roadside face of the new culvert to a point just beyond the top bank of the drain. The outward projection of the new headwalls shall be deflected at approximately a 45-degree angle, and the maximum outward deflection shall not be greater than shown on the accompanying Drawings, parallel to the projection of the straight portion of the finished wall. The straight portion of the precast interlocking concrete block headwall shall be installed perpendicular to the drain banks. The Contractor shall also be required to backfill the area behind the new headwall with granular fill.

The Contractor shall also be required to satisfactorily backfill the area in behind the new headwall with granular fill as already specified in the preceding paragraphs for backfilling of the bridge culvert. The top elevation of the headwalls, opposite the travelled roadway, are to be set no less than 75mm (3"), below the existing ground elevation unless shown on the drawings. The alignment of these headwalls shall be performed to the satisfaction of the Drainage Superintendent or the Consulting Engineer. Block Headwalls shall be installed in accordance with the **"Precast Interlocking Concrete Block Headwall End Protection Details"** outlined herein.

Upon completion of the headwall installation, the Contractor shall also provide sloped quarried limestone erosion protection adjacent and along all of the new concrete headwalls, at the general locations and to the widths shown within the details included therein. Furthermore, the installation of the quarried limestone shall adhere to the parameters outlined in **Section IX. Sloped Quarried Limestone Erosion Protection – Concrete Block Headwalls.**

Concrete-Filled Jutebag Headwalls

When specified, the Contractor shall install new concrete jute bag headwalls at the locations and parameters indicated on the drawing. When constructing the concrete jute bag headwalls, the Contractor shall place the bags so that the completed headwall will have an inward batter from the bottom of the pipe to the top of the finished headwall. The slope of the headwall shall be one (1) unit horizontal to five (5) units vertical. The Contractor shall satisfactorily backfill behind the jutebag headwalls with granular material similar to the rest of the structure, and the same compaction levels specified herein for backfilling the adjacent culvert. 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 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 21MPa 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 completed jute bag headwalls shall be securely embedded a minimum of 500mm (20") measured perpendicular to the side slopes of the drain.

If indicated on the Drawings, daylighting may be installed off the travelled roadway, and the same are designed to deflect outwardly. The outward deflection shall be deflected at the specified angle to the straight portion of the finished headwall. The top elevations of the daylighted headwalls are to be set no less than 75mm (3″) below the existing ground elevation unless otherwise designed. The alignment of these headwalls shall be performed to the satisfaction of the Drainage Superintendent or Consulting Engineer.

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 150mm (6″) thick, and hand trowelled to obtain a brushed finish appearance. If the cap is made more than 150mm thick, the Contractor shall provide two (2) continuous 15M reinforcing bars (or equivalent mesh) 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. All concrete used for the footing, cap and bags shall have a minimum compressive strength of 21MPa in 28 days and include 6% ± 1% air entrainment. Concrete-filled jute bag headwalls shall be installed in accordance with the **"Typical Concrete Filled Jute Bag Headwall End Protection Details"** outlined herein.

IX. SLOPED QUARRIED LIMESTONE EROSION PROTECTION FOR VERTICAL HEADWALLS

The sloped quarried limestone erosion protection shall be embedded into the side slopes of the drain at a minimum thickness of 305mm and shall be underlain in all cases with a 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 and slope of the general erosion protection shall be as established in the accompanying drawing or as otherwise directed by the Drainage Superintendent and/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 a shovel 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 side slopes along either side of said protection. The synthetic filter mat to be used shall be **non-woven** geotextile MacTex MX140 conforming to OPSS 1860 Class I, as available from Armtec Construction Products, or approved equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm (4") to a maximum of 250mm (10"), and is available from Walker Aggregates, in Amherstburg, Ontario, or approved equal. Sloped quarried limestone erosion protection shall be installed in accordance with the "**Typical Quarried Limestone End Protection Detail"** outlined herein.

X. ANCILLARY WORK

During the course of any repair or improvements, the Contractor will be required to protect or extend any existing tile ends or swales to maintain the drainage from the adjacent lands. All existing tiles within the proposed alignment shall be extended utilizing Boss 1000 or equal plastic pipe of the same diameter as the existing tile and shall be installed in accordance with the **"Standard Lateral Tile Detail"** outlined herein unless otherwise noted. Connections shall be made using a Manufacturer's coupling wherever possible. Openings into new pipes shall be neatly saw-cut to the satisfaction of the Drainage Superintendent and/or the Consulting Engineer. 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. The mortar joint shall be of 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 pipes are to be extended and diverted to the downstream end of the new pipe unless otherwise noted in the accompanying drawings.

Where the culvert 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. The Contractor shall also be required as part of the culvert replacement to excavate and widen the drain bottom where required to fit the new pipes in order to provide a smooth transition between the new culvert installation and the existing drain.

The Contractor, when doing their excavation or any other portion of the work, shall be very careful not to interfere with, plug up or damage, any existing surface drains, swales and lateral or main tile ends. If it is found that said existing drains are interfered with in any way, the Contractor will be required to unplug or repair said drains immediately, at no extra cost to the project. If it is found that any existing lateral tiles or main tile drains or tile ends have been cut off or damaged in any way during the course of the work, the Contractor will be required to either repair or replace same, to the satisfaction of the Drainage Superintendent and the Consulting Engineer.

The Contractor shall take steps to protect all legal survey bars during the course of its work. If any bars are removed or damaged, the Contractor shall arrange for an Ontario Land Surveyor licensed in the Province of Ontario to replace same, all at its cost.

All of the work required towards the installation and improvements to all structures shall be performed in a neat and workmanlike manner and the general site shall be restored to its' original condition, and all of same is to be performed to the satisfaction of the Drainage Superintendent and the Consulting Engineer.

XI. TOPSOIL, SEED AND MULCH

During the course of its excavation operations, the Contractor will be required to salvage all available topsoil. Where necessary, this material shall be stockpiled by the Contractor in order to avoid contamination and shall be utilized in carrying out the topsoil placement along all specified newly excavated and filled or disturbed areas, in preparation for the seeding and mulching operation to be carried out as part of the restoration works. The Contractor shall be required to use the scavenged topsoil stripped from the drain banks. The balance of the topsoil required shall be obtained by the Contractor at its own expense.

The Contractor shall be required to restore all existing grassed areas and drain side slopes damaged or disturbed by the structure installation and/or removal, and place topsoil and seed and mulch over said areas including any specific areas noted on the Drawings. The Contractor shall be required to provide all the material and to cover the above-mentioned surface areas 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 Contractor is to note that prior to fine grading the topsoil over the backfilled areas, positive drainage is to be provided off of these areas and into the swales, and the Contractor shall also be required to make minor changes where necessary to ensure same. The Contractor shall be required to restore all existing grassed areas and roadway boulevard areas damaged by the culvert work and shall provide topsoil and seed and mulch over all of these areas. The placing and grading of all topsoil shall be carefully carried out according to Ontario Provincial Standard Specifications, Form 802, dated November 2010, or as subsequently amended or as amended by these Specifications. Once the topsoil has been properly placed and fine-graded, the Contractor shall seed and mulch the area. Seeding and mulching operations shall be carried out according to Ontario Provincial Standard Specifications, Form 572, dated November 2003, or as subsequently amended or as amended by these Specifications. The seeding mixture shall be OSECO Seed Mixture Canada No. 1, as available from Morse Growers Supply in Leamington, or equal. As part of the seeding and mulching operation, the Contractor will be required to provide either a hydraulic mulch mix or a spread straw mulch with an adhesive binder in accordance with OPSS 1103.05.03 dated November 2016, or as subsequently amended, to ensure that the grass seed will be protected during germination and provide a thick, uniform cover to protect against erosion, where necessary. All work shall be completed to the satisfaction of the Drainage Superintendent or the Consulting Engineer.

All of the work relative to the placement of topsoil and the seeding and mulching operation shall be meticulously done and completed in a good and workmanlike manner all to the satisfaction of the Drainage Superintendent or Consulting Engineer.

XII. FINAL CLEANUP AND RESTORATION

The whole of the work shall be satisfactorily cleaned up, and during the course of the construction, no portion shall be left in any untidy or incomplete state before subsequent portions are undertaken.

All roadways, driveways and access bridges, or any other means of access onto the job site shall be fully restored to their former condition at the Contractor's expense. Before authorizing Final Payment, the Drainage Superintendent or 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 to be deducted from any monies owing to the Contractor.

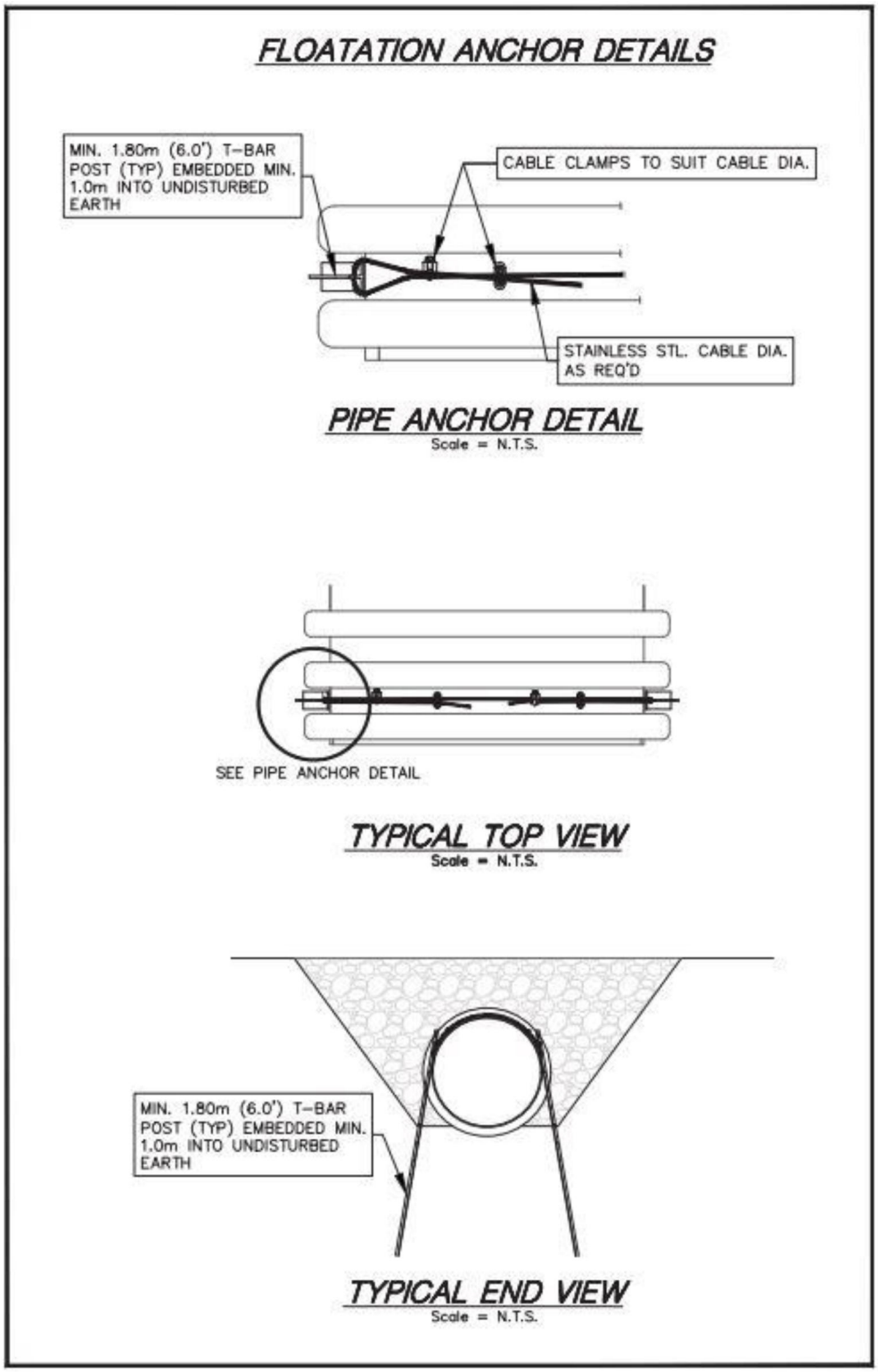

Figure 1 - Flotation Anchor Details

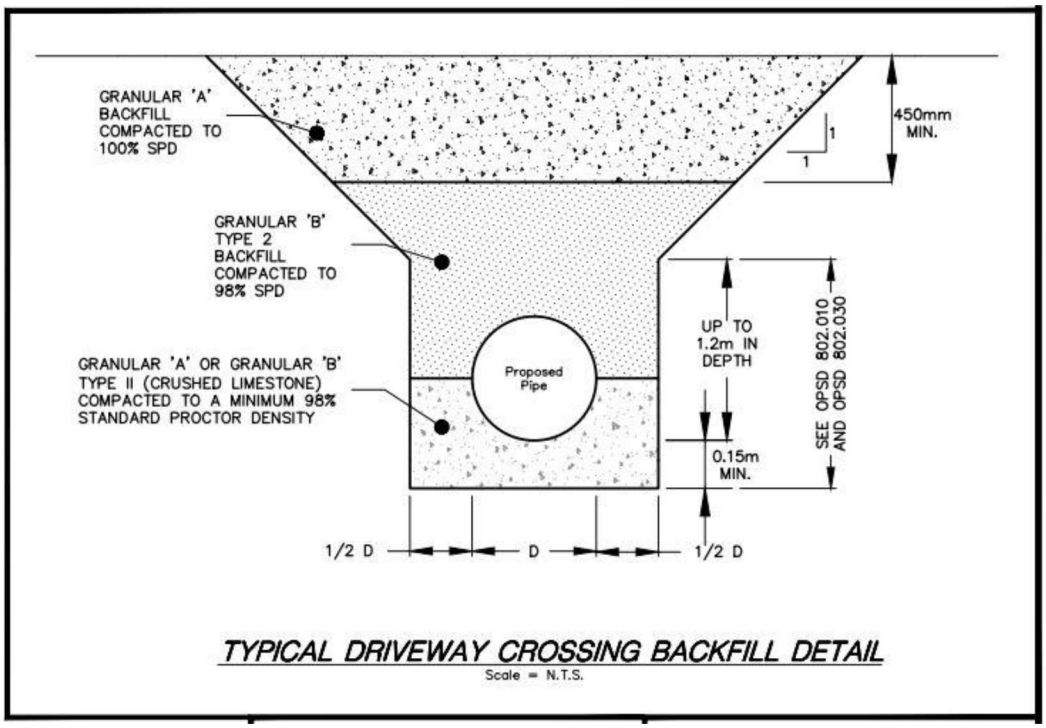

Figure 2- Typical Driveway Crossing Backfill Detail

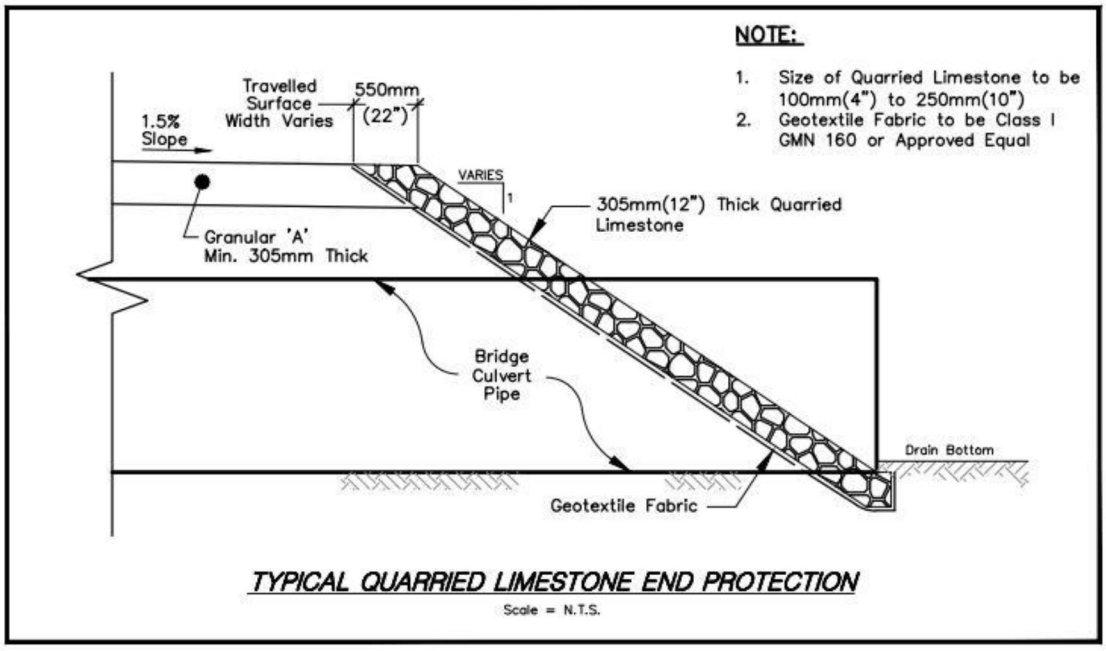

Figure 3 - Typical Quarried Limestone End Protection Detail

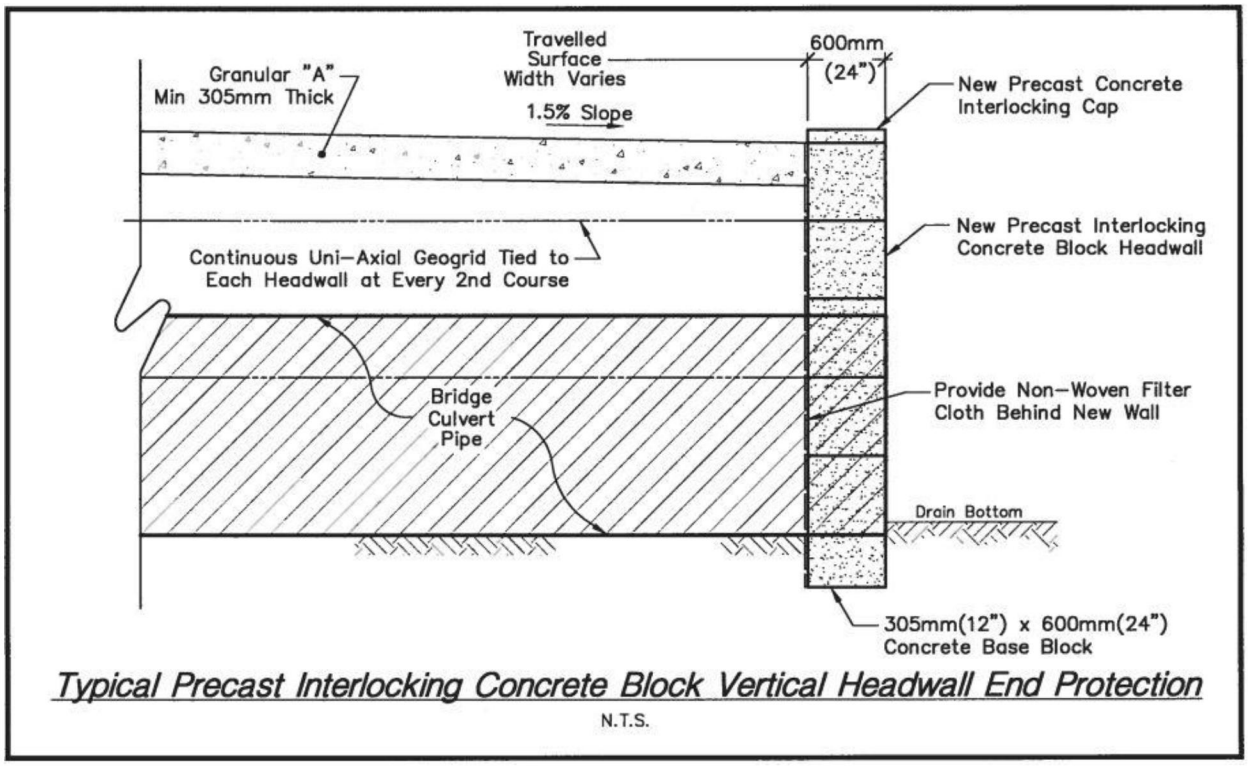

Figure 4 - Typical Precast Interlocking Concrete Block Vertical Headwall End Protection Detail

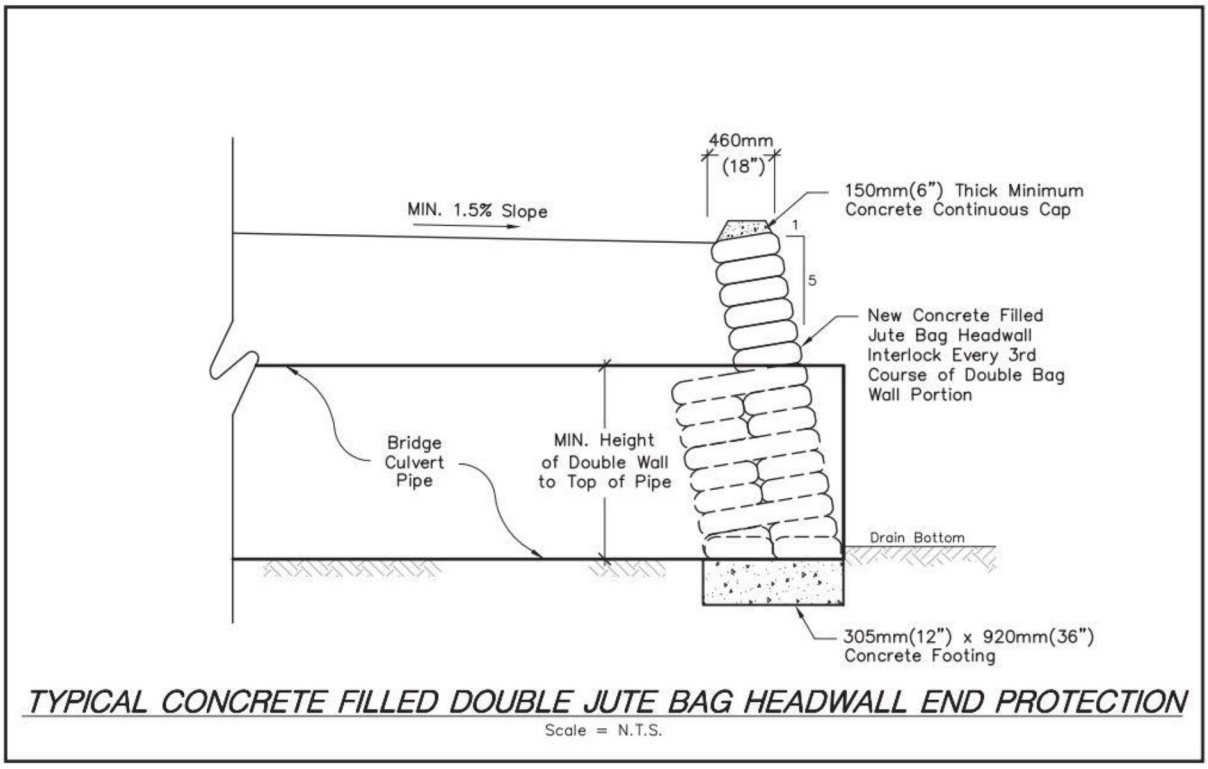

Figure 5 - Typical Concrete Filled Double Jute Bag Headwall End Protection Detail

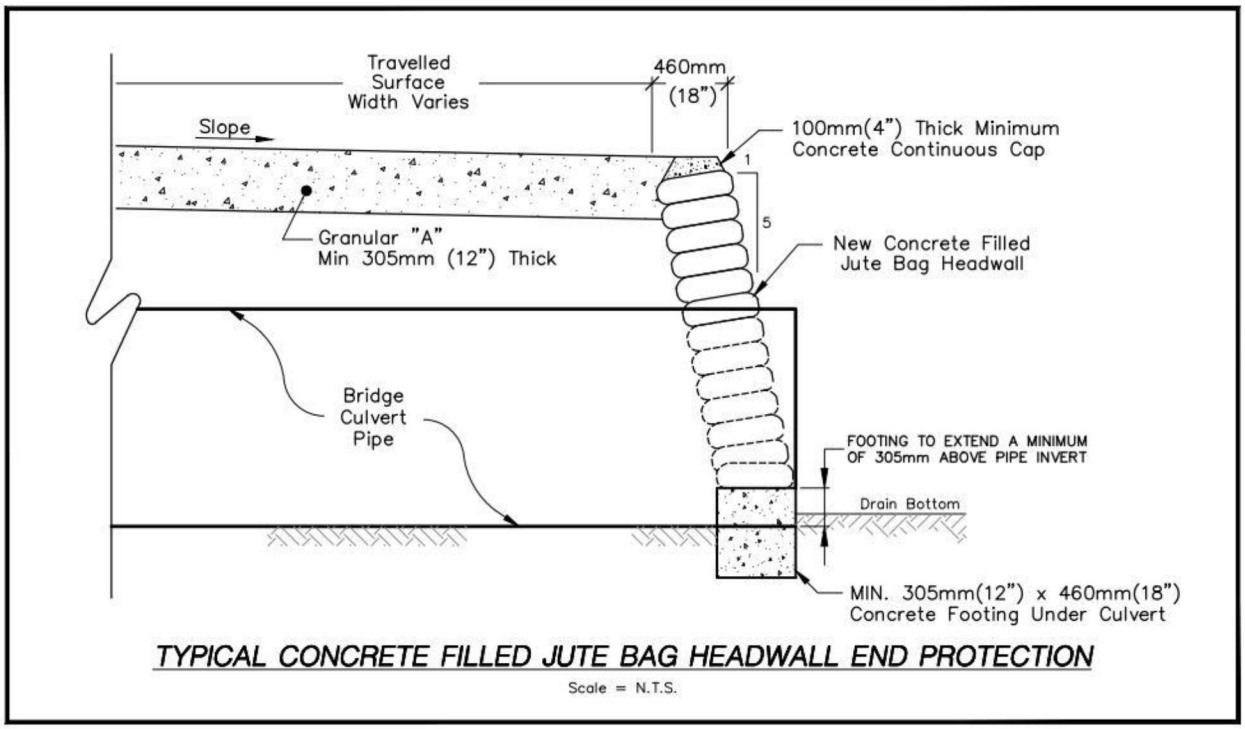

Figure 6 - Typical Concrete Filled Jute Bag Headwall End Protection Detail

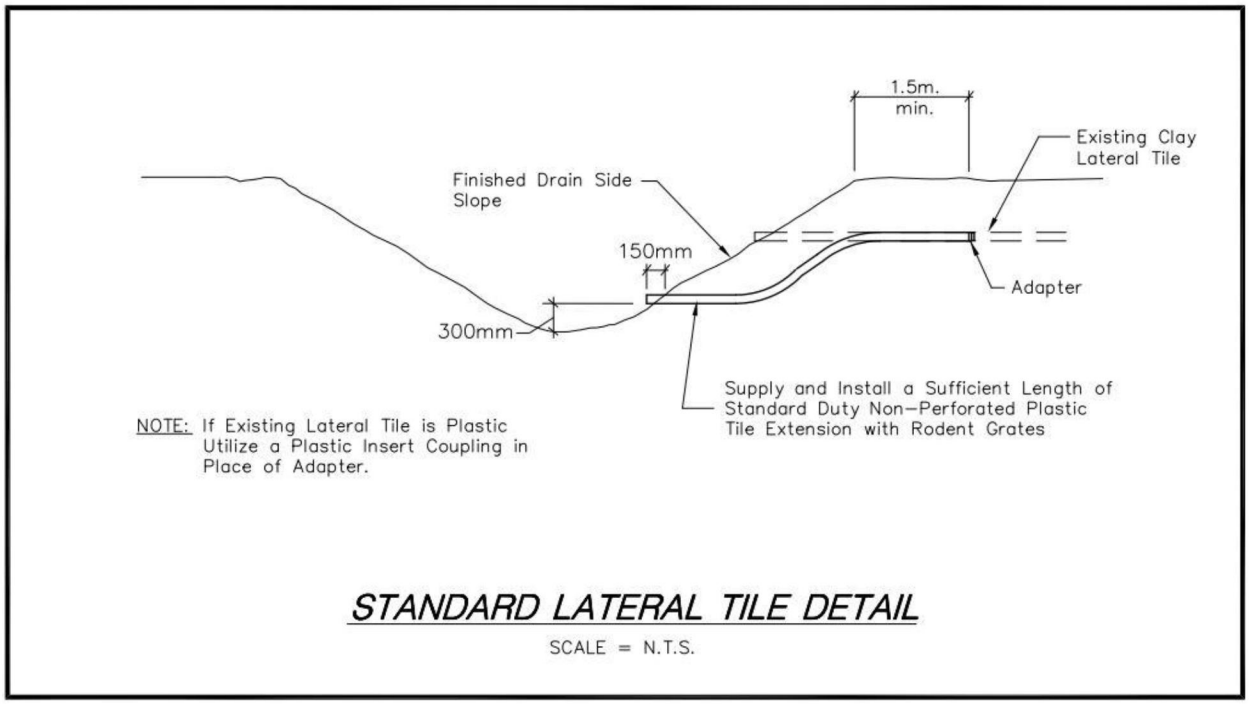

Figure 7 - Standard Lateral Tile Detail

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SPECIAL PROVISIONS

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Peralta Engineering

SPECIAL PROVISIONS

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PROJECT **Bridges Over the Cameron Road Branch of the Billings Drain**
For Maria Bakalic (610-00302)
Part of Lot 276, NTR Concession
(Geographic Township of Gosfield North)
Town of Kingsville, County of Essex
Project No. D23-096

I. GENERAL SCOPE OF WORK

These specifications, along with the Report, Appendices, Standard Specifications and the accompanying drawings, consider the furnishings of all labour, equipment and materials required for the performance of all operations related to the installation of three (3) new access bridges within the Cameron Road Branch of the Billings Drain for Maria Bakalic (610-00302), Lot 276, NTR Concession, within the Geographic Township of Gosfield North. The Cameron Road Branch of the Billings Drain is an open Municipal Drain located along the north side of Cameron Sideroad East, extending from its outlet in the Billings Drain southwesterly to its upper end at a point 100.0 metres northeasterly of the intersection of County Road 34 and Cameron Sideroad.

The Contractor shall provide all labour, equipment and materials to install a new 320kPa Smoothwall High Density Polyethylene (HDPE) pipes, new end treatments comprising of sloped quarried limestone erosion protection on non-woven geotextile fabric, granular bedding, granular approach and backfill within the driveway limits, topsoil, seeding and mulching, and all ancillary work related thereto including cleanup and restoration.

All work shall be carried out in accordance with these Special Provisions and Standard Specifications that serve to supplement and/or amend the current Ontario Provincial Standard Specifications and Standard Drawings, adopted by the Ontario Municipal Engineers Association. The Contractor shall review the information outlined within **Appendix "A"**. The works shall be further carried out in accordance with these Special Provisions and Specifications and shall comply in all regards with the accompanying drawings labelled herein as **Appendix "B"**. The new access bridges shall be of the size, type, depth, etc., as is shown in the accompanying drawings, as determined from the **Benchmark**, 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 satisfaction of the Drainage Superintendent or the Consulting Engineer.

II. CONSERVATION AUTHORITY AND DFO CONSIDERATIONS

The Contractor shall be required to implement stringent erosion and sedimentation controls during the course of the work to minimize the amount of silt and sediment being carried downstream. It is intended that work on this project be carried out during relatively dry weather to ensure the proper site and drain conditions and to avoid conflicts with sediment being deposited into the outlet drainage systems. 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 site 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 Conservation Authority or the Department of Fisheries and Oceans (DFO), copies of which shall be provided, if available. The Contractor is advised that no work shall be carried out in the existing drain from March 15 to July 15, of any given year.

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

a) As per standard requirements, work shall not be conducted at times when flows in the drain are elevated due to local rain events, storms, or seasonal floods. Work shall 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 than 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 its contractors to ensure that sediment and erosion control measures are functioning properly and are maintained/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.

Not only shall the Contractor comply with all of the above, but it shall also be required to further comply with any mitigation measures included within the email correspondence with the Conservation Authority.

III. MECP CONSIDERATIONS

Under the Species at Risk Provincial Legislation, set in place with the Ministry of Environment, Conservation and Parks (MECP), Section 23.9 of the Endangered Species Act, 2007, allows the Municipality to conduct eligible repair, maintenance, and improvement work under the Drainage Act that exempts these works from Sections 9 and 10 of this Act, so long as they follow the rules within Ontario Regulation 242/08.

Prior to commencing work, the Municipality will complete an "Endangered Species Act Review" for the subject drain and will provide the Contractor with the results of said review, including documents for the purpose of identification of known Species at Risk within the project area and mitigation measures for

species and habitat protection. It is the responsibility of the Contractor to make certain that necessary provisions are undertaken to ensure the protection of all Species at Risk and their habitats throughout the course of construction.

The Contractor will be responsible for providing the necessary equipment and materials required by the mitigation plans and shall contact the Drainage Superintendent immediately if any Endangered Species are encountered during construction.

IV. ACCESS TO WORK

The Contractor is advised that the majority of the work to be carried out on this project extends along the north side of Cameron Sideroad East. The Contractor shall have access to the full length of the roadway abutting the proposed drainage works. The Contractor may use the entire width of the right-of-way as necessary to permit the completion of the work required to be carried out for this project. Furthermore, in order to perform the necessary work identified within this project, the Contractor shall have access to the subject private lands north of the Cameron Sideroad East right-of-way limit for a distance of 8.00 metres, necessary to perform the new access bridge installation. Under no circumstances shall the Contractor utilize other private lands.

V. DETAILS OF BRIDGE WORK

The Contractor shall provide all labour, equipment, and materials to install new access bridges for the agricultural lands of Maria Bakalic (610-00302), within the Cameron Road Branch of the Billings Drain, according to the Drawings, the Schedule of Items, and in these Specifications. The Drainage Superintendent and/or the Consulting Engineer shall have the authority to carry out minor changes to the work where such changes do not lessen the efficiency of the work.

Bridge 1 and 2 – Severance #1 and #2 (from Parcel 610-00302)

The Contractor shall supply and install a new access bridge as set out in the chart forming part of the details for **Bridge 1 and 2** on the plans. The Contractor shall provide sloped quarried limestone end treatments at each end of the new culvert installation.

The Contractor shall supply and install 12.20 metres (40.00 ft.) of new 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe. When complete, the access bridge portion along the centreline of the new culvert shall have a total top width, including the top width of the sloped quarried limestone end treatments and gored areas, of approximately 7.20 metres (23.62 ft.) and a travelled driveway width of 6.10 metres (20.00 ft.). The quarried limestone end treatments shall be installed on a slope no steeper than 1.50 horizontal to 1.00 vertical and shall extend from the end of the new diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe.

Bridge 3 – Severance #3 (from Parcel 610-00302)

The Contractor shall supply and install a new access bridge as set out in the chart forming part of the details for **Bridge 3** on the plans. The Contractor shall provide sloped quarried limestone end treatments at each end of the new culvert installation.

The Contractor shall supply and install 18.30 metres (60.00 ft.) of new 750mm diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe. When complete, the access bridge portion along the centreline of the new culvert shall have a total top width, including the top width of the sloped quarried limestone end treatments and gored areas, of approximately 13.48 metres (44.23 ft.) and an overall top width of 12.38 metres (40.62 ft.). The travelled driveway top width shall be 6.10 metres (20.00 ft.). The quarried limestone end treatments shall be installed on a slope no steeper than 1.50 horizontal to 1.00 vertical and shall extend from the end of the new diameter, 320kPa Smoothwall High Density Polyethylene (HDPE) pipe.

VI. BRIDGE CONSTRUCTION

Once the new pipe has been satisfactorily set in place, the Contractor may commence with the backfilling operations per the Standard Specifications. As part of the culvert installation works, the Contractor shall also perform the necessary excavation to extend the width of the driveway from the existing edge of the pavement to a point beyond the right-of-way limit of Cameron Sideroad East, as shown in the accompanying plans. This driveway approach for the entire length and width shall consist of a minimum of 300mm (12") of granular material MTO Type "A" satisfactory compacted in place. The gravel apron shall extend for the full width of the driveway portion of the access bridge and extend to the edge of the pavement, with a minimum of 5.0m turning radii.

The new pipe, for this installation, is to be provided with a minimum depth of cover measured from the top surface of the driveway to the top of the pipe as outlined above. If the bridge culvert is placed at its proper elevation, sufficient cover should be achieved. If the Contractor finds that the minimum cover is not being met, they shall notify the 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**.

Although it is anticipated that the culvert installation shall be undertaken in the dry, the Contractor shall supply and install a temporary Straw Bale Check Dam in the drain bottom immediately downstream of the culvert site during the time of construction. The straw bale check dam shall be to the satisfaction of the Drainage Superintendent and/or Consulting Engineer and must be removed upon completion of the Construction. All costs associated with the supply and installation of this Straw Bale Check Dam shall be included in the cost bid for the bridge installation.

VII. HIGH DENSITY POLYETHYLENE (HDPE) PIPE INSTALLATION

As outlined within the accompanying Drawings and the Construction Items, the new access bridge culvert shall consist of 320kPa smoothwall interior HDPE pipe materials. The new HDPE pipe intended to be installed shall be provided with equal lengths of pipe coupled together with the use of a water-tight bell

and gasket joining system, secured in accordance with the Manufacturer's recommendations. The culvert for this installation must be of the length, size, and stiffness as identified in the plans and approved by the Drainage Superintendent and/or the Consulting Engineer prior to its placement in the drain. Furthermore, the installation of HDPE pipe shall further be installed per the provisions established within the attached Standard Specifications.

VIII. BRIDGE END TREATMENTS

As outlined within the accompanying Drawings and the Construction Items, sloped quarried limestone end treatments shall be utilized for this application. The installation of quarried limestone end treatment shall further be installed per the provisions established within the attached Standard Specifications.

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APPENDIX "A"

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Kiara Kirkland

From: Summer Locknick <SLocknick@erca.org>
Sent: January 5, 2024 1:49 PM
To: Tony Peralta
Cc: Lu-Ann Marentette; Laura Anthony
Subject: RE: Bridges Over the Cameron Road Branch of the Billings Drain
Attachments: 20240102 - PRELIMINARY - Bridges Over the Cameron Road Branch of the Billings Drain (D23-096).pdf

Good afternoon Tony,

Thank you for providing the attached Preliminary Drawings for the Cameron Road Branch of the Billings Drain, Project No. D23-096. I've had an opportunity to review the preliminary drawings and the available information and can confirm that this proposal, as presented in the preliminary stages, is something that this office can support.

We look forward to receiving the Final Drainage Report and Drawings. A completed Application for Permit form will be required from the municipality.

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

Kind regards,

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

From: Tony Peralta <tony@peraltaengineering.com>
Sent: Tuesday, January 2, 2024 2:21 PM
To: Summer Locknick <SLocknick@erca.org>; Drainage <drainage@ERCA.org>
Cc: Lu-Ann Marentette <lmarentette@kingsville.ca>; Laura Anthony <lanthony@kingsville.ca>
Subject: Bridges Over the Cameron Road Branch of the Billings Drain

Good Afternoon Summer,

As you may be aware, our office was appointed under Section 78 of the Drainage Act for the installation of three (3) new access bridges over the Cameron Road Branch of the Billings Drain. The request for new access bridges is a direct result of three (3) residential lot severances proceeding through the Town of Kingsville Consent Application process (B/01/2022). The proposed residential lots are being severed from the existing agricultural lands of Maria Bakalic (610-00302).

We have not been provided with any initial comments from ERCA. However, as typically required, we wish to provide you with the preliminary design proposal for the above-noted project. Attached you will find preliminary design drawings for your review. Based on our preliminary design, we have determined the following details:

- The three (3) proposed access bridges are being installed along the frontage of Cameron Sideroad East. Currently, the subject agricultural lands are without an access bridge over the Cameron Road Branch of the Billings Drain.
- Immediately upstream of the proposed severances, are existing residential lots located east of the intersection of County Road 34 and Cameron Sideroad. Along the frontage of these lots, the Cameron Road Branch of the Billings Drain is enclosed, consisting of an enclosure having 145.1m of 450mm (18") CSP pipe.
- Downstream of the proposed severances and approximately 130.0m downstream of the subject property, is an existing culvert having 9.0m of 600mm (24") diameter CSP pipe.
- As part of our review of the existing Municipal Drain, the portion of the open drain (between the culverts identified above) has been over-excavated. As such, the existing drain bottom is well below the design grade of the open channel.
- In order to maintain sufficient drain gradient and hydraulics, together with maintaining a similar level of service for the open drain, the proposed culverts have been increased in size relative to the existing culverts upstream and downstream within the drain. As a result, all three (3) new access bridge culverts shall consist of 750mm diameter HDPE plastic pipes set below the design grade of the drain while maintaining the capacity to handle a 1:5-year storm event. Each access bridge shall be accompanied by sloped quarried limestone end protection.

We have reviewed the DFO website as it relates to the Fisheries Act and have performed a "Self Assessment" for this project. Also, as it relates to the Endangered Species Act, we have contacted the Town of Kingsville to ensure that this project is covered under the new ESA Regulation 242/08.

We trust that this information is satisfactory. However, if you have any concerns or require additional information, please feel free to contact us at your earliest opportunity as we intend to finalize this report as soon as practical.

Regards,

Peralta Engineering

Tony Peralta, P.Eng.
tony@peraltaengineering.com | 519-733-6587 x 122
N.J. Peralta Engineering Ltd. - Consulting Engineers
45 Division St. N., Kingsville ON N9Y 1E1
peraltaengineering.com

IMPORTANT: We have temporarily relocated to Unit 1-38 Erie Street North, Leamington ON N8H 2Z3 during the construction of the new office building at our Kingsville location.

APPENDIX "B"

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PARTS SCHEDULE				
PART	LOT	CONCESSION	P.I.N.	AREA
1	PART OF LOT 276	CONCESSION NORTH TALBOT ROAD	PART OF 75157-0267	1.000 Acres.
2				1.000 Acres.
3				2.347 Acres.

PLAN 12R-29077

Received and deposited

July 7th, 2022

Phyllis Kennedy

Fischer

Representative for the Land Registrar for the Land Titles Division of Essex (No.12)

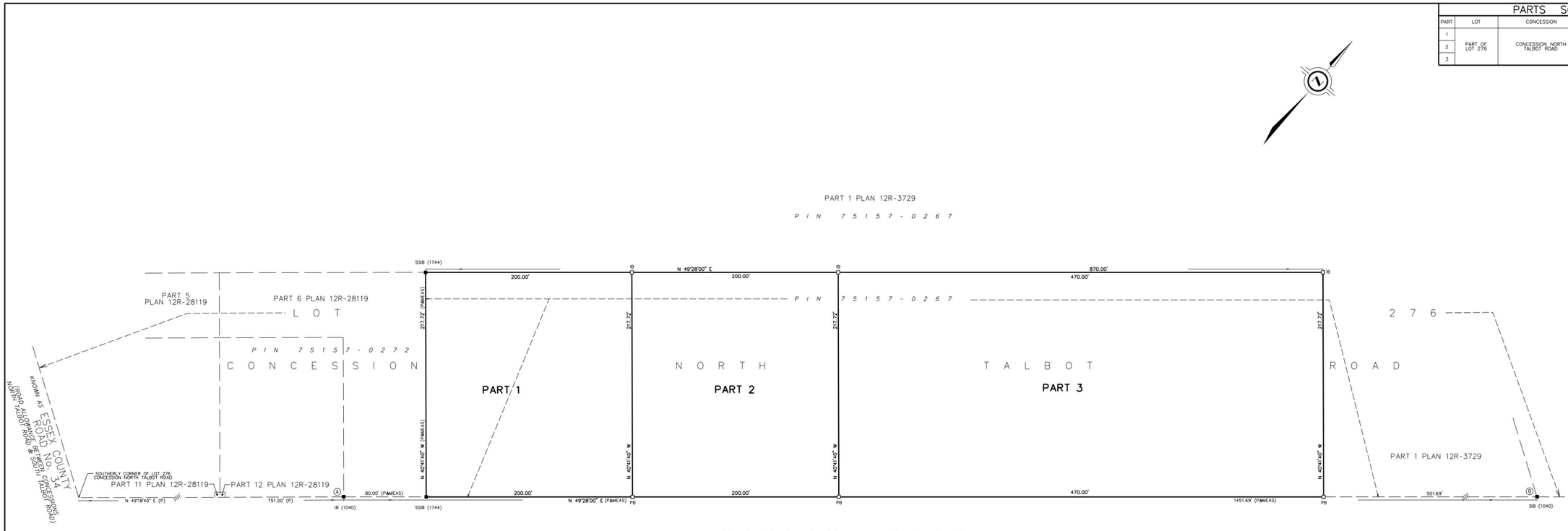
PLAN OF SURVEY OF
PART OF LOT 276
CONCESSION NORTH TALBOT ROAD
GEOGRAPHIC TOWNSHIP OF GOSFIELD NORTH
NOW IN THE
TOWN OF KINGSVILLE
COUNTY OF ESSEX

VERHAEGEN LAND SURVEYORS - A DIVISON OF JD BARNES LIMITED

SCALE 1"=40'

20 0 20 40 60 80 100 120 FEET

THE INTENDED PLOT SIZE OF THIS PLAN IS 45" IN WIDTH BY 18" IN HEIGHT WHEN PLOTTED AT A SCALE OF 1"=40'



LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PIB	DENOTES	PLASTIC BAR
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
1040	DENOTES	WILLIAM J. SETTERINGTON, O.L.S.
1744	DENOTES	VERHAEGEN LAND SURVEYORS, O.L.S.
P	DENOTES	PLAN 12R-28119

ALL SET SSIB AND PIB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON MAY 20th, 2022.

2022-05-20
DATE

ALEC S. MANTHA
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER 2193303

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999839.

INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (2010.0).

COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
ORP (A)	1 159 414.13'	15 315 752.23'
ORP (B)	1 160 517.28'	15 316 695.51'

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

THESE DRAWINGS HAVE BEEN REDUCED IN SIZE AND THE SCALE THEREFORE VARIES.
FULL SCALE DRAWINGS CAN BE VIEWED AT THE MUNICIPAL OFFICES IF REQUIRED.

VERHAEGEN LAND SURVEYORS A Division of J. D. Barnes Limited — SURVEYING MAPPING GIS
187 TALBOT ST E, LEAMINGTON, ON, N8H 1L8
T: (519) 322-2375 F: (519) 322-0675 www.jdbarnes.com

DRAWN BY: AM	CHECKED BY: AM
CAD Date: MAY 20th, 2022	REFERENCE NO.: 19-48-150-03
CAD File: 19-48-150-03.dwg	FILE NO.: E-GOSFIELD NORTH-N.T.R.-276

APPENDIX "C"

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PLANS & DETAILS

OF THE

BRIDGES OVER THE CAMERON ROAD BRANCH OF THE BILLINGS DRAIN

IN THE

TOWN OF KINGSVILLE (Geographic Township of Gosfield North)

IN THE

COUNTY OF ESSEX • ONTARIO

TOWN OF KINGSVILLE

MAYOR: DENNIS ROGERS
CLERK: PAULA PARKER
DRAINAGE SUPERINTENDENT: LU-ANN MARENTETTE

BENCHMARKS:

1) TOP OF NAIL SET IN NORTH FACE OF EXISTING HYDRO POLE LOCATED ON THE SOUTH SIDE OF CAMERON SIDEROAD EAST AND IN FRONT OF M.N. 12, APPROXIMATELY 21.0m SOUTH OF BRIDGE CENTERLINE.
ELEV. 195.368m

2) TOP OF NAIL SET IN WEST FACE OF EXISTING HYDRO POLE LOCATED ON THE SOUTH SIDE OF CAMERON SIDEROAD EAST AND IN FRONT OF M.N. 22, APPROXIMATELY 5.0m NORTH OF BRIDGE CENTERLINE.
ELEV. 195.157m

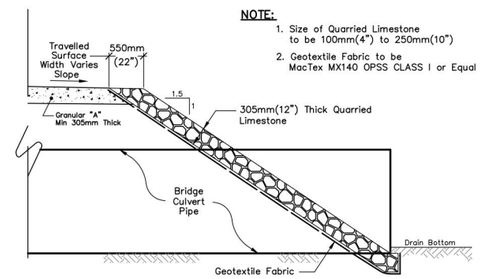
3) TOP OF NAIL SET IN NORTH FACE OF EXISTING HYDRO POLE LOCATED ON THE SOUTH SIDE OF CAMERON SIDEROAD EAST AND IN FRONT OF MN 26, APPROXIMATELY 42.0m SOUTH OF BRIDGE CENTERLINE.
ELEV. 195.186m

4) TOP SOUTH END OF EXISTING 1067mm (42") DIAMETER CORRUGATED STEEL CULVERT CROSSING NORTH TALBOT ROAD AT STATION 1+266.8
ELEV. 193.462m

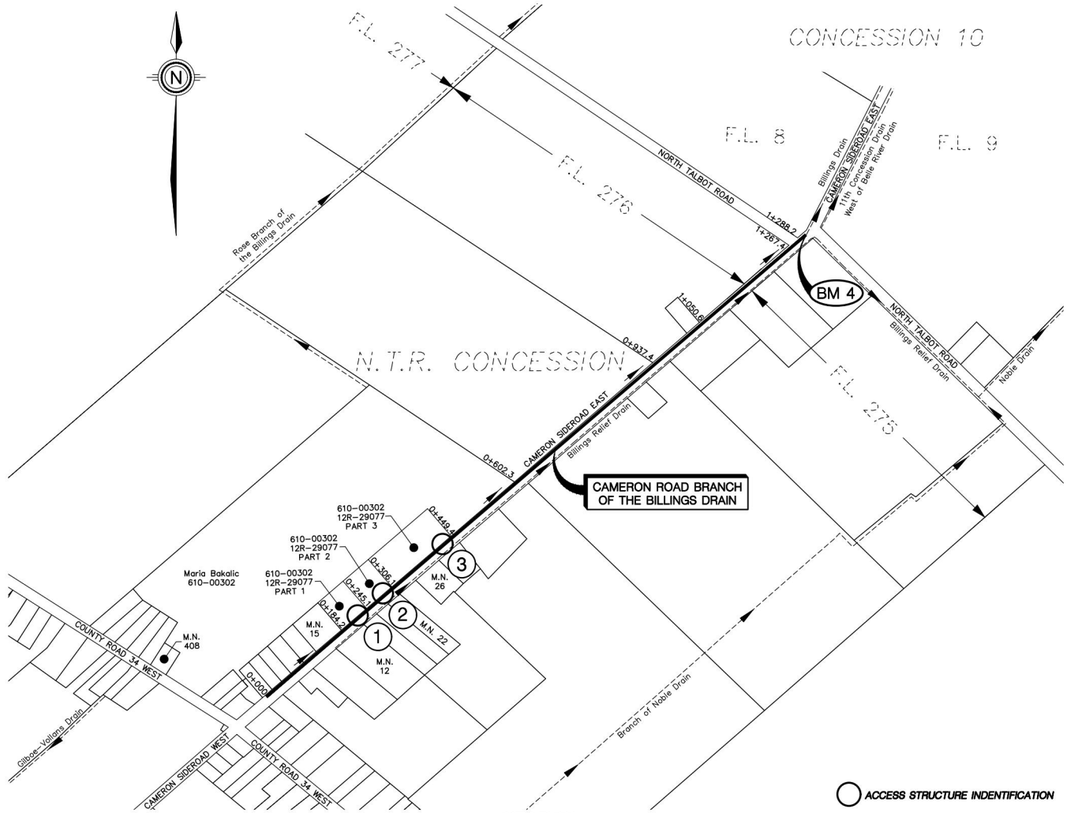
THESE DRAWINGS HAVE BEEN REDUCED IN SIZE AND THE SCALE THEREFORE VARIES.
FULL SCALE DRAWINGS CAN BE VIEWED AT THE MUNICIPAL OFFICES IF REQUIRED.

GENERAL NOTES:

1. THE ACCURACY OF THE UTILITIES SHOWN ON THESE DRAWINGS ARE NOT GUARANTEED BY THE OWNER OR PERALTA ENGINEERING LTD. OTHER UTILITIES MAY BE PRESENT OR THE UTILITIES SHOWN MAY DIFFER IN SIZE OR LOCATION SHOWN.
2. ALL DIMENSIONS SHOWN IN METERS UNLESS NOTED OTHERWISE. PROPERTY LINES ARE APPROXIMATE AND ARE BASED ON 12R-29077 PLAN, THE TOWN OF KINGSVILLE GIS, AND FIELD INFORMATION.
3. THE CONTRACTOR IS RESPONSIBLE TO RECEIVE ALL NECESSARY PERMITS AND AUTHORIZATIONS ISSUED BY THE ESSEX REGION CONSERVATION AUTHORITY AND THE TOWN OF KINGSVILLE.
4. CONTRACTOR IS TO PROVIDE FULL DEPTH GRANULAR BACKFILL AND GRANULAR DRIVEWAY APPROACH AND TRANSITIONS AS SHOWN.
5. THE OWNER SHALL BE RESPONSIBLE FOR ALL GRANULAR ACCESS AND LOT GRADING BEYOND THE LIMITS SHOWN.



TYPICAL QUARRIED LIMESTONE END PROTECTION
Scale = N.T.S.



KEY PLAN
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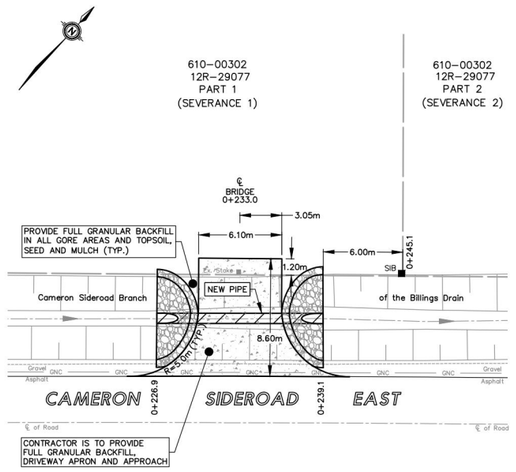

BRIDGE ① PLAN
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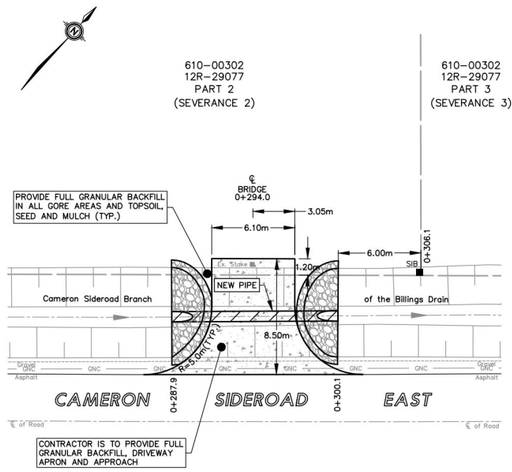

BRIDGE ② PLAN
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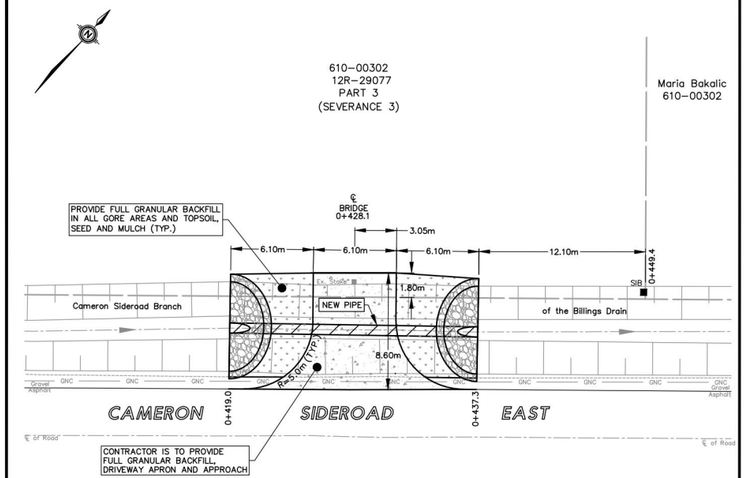
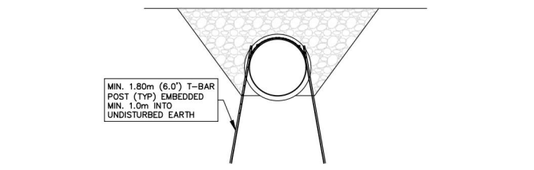
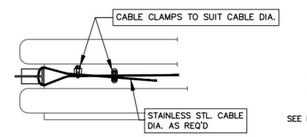


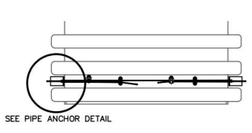
BRIDGE ③ PLAN
Scale = 1:200



TYPICAL END VIEW
Scale = N.T.S.



PIPE ANCHOR DETAIL
Scale = N.T.S.



TYPICAL TOP VIEW
Scale = N.T.S.

FLOTATION ANCHOR DETAILS

BENCHMARK #1:
TOP OF NAIL SET IN NORTH FACE OF EXISTING HYDRO POLE LOCATED ON THE SOUTH SIDE OF CAMERON SIDEROAD EAST AND IN FRONT OF M.N. 12, APPROXIMATELY 21.0m SOUTH OF BRIDGE CENTERLINE.
ELEV. 195.368m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:
750mmø	12.2m (40.0 FT.)	320 kPa	SMOOTHWALL INTERIOR	H.D.P.E.

PIPE & DRIVEWAY ELEVATIONS:
UPSTREAM INV. (S) = 193.740m
DOWNSTREAM INV. (N) = 193.729m
DESIGN GRADE = 0.09%
℄ OF DRIVEWAY AT ROADWAY EDGE = 195.591m
℄ OF DRIVEWAY AT PIPE CENTRELINE = 195.558m
℄ OF DRIVEWAY 1.20m WEST OF R.O.W. LIMIT = 195.527m
DRIVEWAY CROSSFALL FROM CENTRELINE TO TOP OUT END OF END WALL = 1.50%

BENCHMARK #2:
TOP OF NAIL SET IN WEST FACE OF EXISTING HYDRO POLE LOCATED ON THE SOUTH SIDE OF CAMERON SIDEROAD EAST AND IN FRONT OF MN 22, APPROXIMATELY 5.0m NORTH OF BRIDGE CENTERLINE.
ELEV. 195.157m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:
750mmø	12.2m (40.0 FT.)	320 kPa	SMOOTHWALL INTERIOR	H.D.P.E.

PIPE & DRIVEWAY ELEVATIONS:
UPSTREAM INV. (S) = 193.733m
DOWNSTREAM INV. (N) = 193.721m
DESIGN GRADE = 0.09%
℄ OF DRIVEWAY AT ROADWAY EDGE = 195.565m
℄ OF DRIVEWAY AT PIPE CENTRELINE = 195.552m
℄ OF DRIVEWAY 1.20m WEST OF R.O.W. LIMIT = 195.538m
DRIVEWAY CROSSFALL FROM CENTRELINE TO TOP OUT END OF END WALL = 1.50%

BENCHMARK #3:
TOP OF NAIL SET IN NORTH FACE OF EXISTING HYDRO POLE LOCATED ON THE SOUTH SIDE OF CAMERON SIDEROAD EAST AND IN FRONT OF MN 26, APPROXIMATELY 42.0m SOUTH OF BRIDGE CENTERLINE.
ELEV. 195.186m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:
750mmø	18.3m (60.0 FT.)	320 kPa	SMOOTHWALL INTERIOR	H.D.P.E.

PIPE ELEVATIONS:
UPSTREAM INV. (S) = 193.686m
DOWNSTREAM INV. (N) = 193.670m
DESIGN GRADE = 0.09%

DRIVEWAY ELEVATIONS:
TOP OF CONCRETE HEADWALL = 195.282m
℄ OF DRIVEWAY AT PIPE CENTRELINE = 195.282m
℄ OF DRIVEWAY 1.8m WEST OF R.O.W. LIMIT = 195.282m

DRIVEWAY CROSSFALL FROM CENTRELINE TO TOP OUT END OF END WALL = 1.50%

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138883
PROVINCE OF ONTARIO

DATE: JANUARY 5, 2024

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT No.:	SHEET No.:
A.B.P.	N.D.H	A.B.P.	D23-096	1 OF 1

Peralta Engineering
N.J. Peralta Engineering Ltd.
Consulting Engineers
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N9Y 1E1 Canada
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F: 519-733-6588
peraltaengineering.com

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