MCDONALD DRAIN IMPROVEMENTS

(Geographic Township of Gosfield South)

TOWN OF KINGSVILLE

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division St. N., Kingsville, Ontario N9Y 1E1
Tel. (519) 733-6587

Project No. D-13-028

April 28th, 2017

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

Mayor Santos and Members of Council:

SUBJECT: MCDONALD DRAIN IMPROVEMENTS
(Geographic Township of Gosfield South)
Town of Kingsville, County of Essex
Project No. D-13-028

I. INTRODUCTION

In accordance with the instructions received by letter of October 18th, 2013, from the Drainage Superintendent, Mr. Ken Vegh, we have prepared the following report that provides for the general improvements to the McDonald Drain, along with the replacement and improvements to existing access bridges and road crossing culverts within the McDonald Drain. These investigations were initiated by a resolution passed by Council for our firm to undertake a review to evaluate the functionality of the McDonald Drain, along with the inspection of the existing culvert within said drain, and report on same in accordance with the Drainage Act. A plan showing the alignment of the McDonald Drain, the general location of all of the existing structures within the drain, and the lands affected within the general watershed area of the drain, is included herein as part of this report.

The request to provide an engineer's report to address the repair and improvements to the McDonald Drain was submitted by Triple K. Farms (390-01200).

Our appointment and the works relative to the general improvements to the McDonald Drain, along with the replacement and/or improvements to the existing structures within the McDonald Drain, proposed under this report, is in accordance with Section 78 of the “Drainage Act, R.S.O. 1990, Chapter D.17, as amended in 2010". We have performed all of the necessary survey, investigations, etc., for the McDonald Drain, and its structure improvements, and we report thereon as follows.

II. BACKGROUND AND WATERSHED CHARACTERISTICS

The McDonald Drain is an existing open municipal drain which provides drainage to the lands primarily located in Lot 10 to Lot 13, Concession 3 E.D., Lot 22 to Lot 24, Concession 4, and

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Lot 23 to Lot 24, Concession 5, within the Town of Kingsville and also in Part of Lot 1, Concession 4 in the Municipality of Leamington. The upper end of the McDonald Drain commences at the south side of the Road 5 East and extends downstream in a southerly and easterly direction through Lot 24, Concession 4 to a point where it turns southerly on the west side of County Road 31. The drain continues southerly along the west side of County Road 31 across County Road 18 and along Lot 13, Concession 3 E.D., to its outlet in the Sturgeon Creek Drain.

The McDonald Drain is predominantly located within the Colwood Fine Sandy Loam and Berrien Sandy Loam soils types. These soils are categorized as Hydrological Soil Group C and are described as poorly drained with low infiltration rate when thoroughly wetted and consists chiefly of soils with a layer that impedes downward movement of water and soil with moderately fine to fine structure. As a result, these soils require effective artificial drainage to be productive.

Additionally, the soil types within the overall watershed varies between Colwood Fine Sandy Loam, Berrien Sandy Loam, Burford Loam, Harrow Loam and Muck.

III. DRAINAGE HISTORY

A review of the Town of Kingsville's drainage records indicate that the McDonald Drain is an existing open Municipal Drain that has been repaired and improved on a number of previous occasions under the provisions of the Drainage Act.

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

a) **February 14th, 1923** engineer's report for the "McDonald Drain", prepared by J.J. Newman, C.E. was carried out under Gosfield South Drainage By-Law No. 111. The works conducted under this report generally provided for the initial construction and improvements, as petitioned for, within the entire length of the McDonald Drain. The work conducted under this report also provided for cleaning for a short distance within the Sturgeon Creek.

b) **November 20th, 1940** engineer's report for the "McDonald Drain", prepared by J.J. Newman, C.E. was carried out under Gosfield South Drainage By-Law No. 142. The works conducted under this report generally provided for drain excavation and improvements, within the entire length of the McDonald Drain. The work conducted under this report also provided for cleaning for a short distance within the Sturgeon Creek.

c) **October 1st, 1948** engineer's report for the "McDonald Drain Outlet", prepared by C.G.R. Armstrong, P.Eng., was carried out under Gosfield South Drainage By-Law No. 190. The works conducted under this report generally provided for drain excavation and improvements, along the outlet portion of the McDonald Drain and within the Sturgeon Creek.

d) **May 11th, 1951** engineer's report for the "McDonald Drain", prepared by C.G.R. Armstrong, P.Eng., was carried out under Gosfield South Drainage By-Law No. 218. The works conducted under this report generally provided for drain excavation and improvements, within the entire length of the McDonald Drain.

e) **September 19th, 1958** engineer's report for the "McDonald Drain", prepared by C.G.R. Armstrong, P.Eng., was carried out under Gosfield South Drainage By-Law No. 260. The works conducted under this report generally provided for drain relocation onto private lands to accommodate for roadway improvements along Townline Road (County Road 31), along with general improvements and access bridge replacements within the entire length of the McDonald Drain.

This report included for the initial construction of **Bridge ②**, **Bridge ④** and **Road Crossing ⑦,** as identified within this report for the McDonald Drain.

f) **May 28th, 1965** engineer's report for the "McDonald Drain", prepared by C.G.R. Armstrong, P.Eng., was carried out under Gosfield South Drainage By-Law No. 301. The works conducted under this report generally provided for drain excavation and improvements, within the entire length of the McDonald Drain. The work conducted under this report also provided for cleaning for a short distance within the Sturgeon Creek.

This report serves as the last major work of repair and improvement to the entire length of the McDonald Drain. However, this engineer's report did not provide for the wholesale replacement of any of the existing access bridges, but did make provisions for the repair of several of the headwalls. Furthermore, this report did not specifically refer to or identify any access bridges and/or enclosures which existed in the drain at that time.

g) **July 6th, 1970** engineer's report for the "McDonald Drain (Access Bridge – Nobile Pannunzio)", prepared by William J. Setterington, P.Eng., was carried out under Gosfield South Drainage By-Law No. 367. The works conducted under this report generally provided for the replacement of an access bridge located at the Northeast Part of Lot 13, Concession 3 E.D., serving the lands of Nobile Pannunzio.

The access bridge identified within the above mentioned report provides for a portion of **Enclosure ⑥**, as identified within this report for the McDonald Drain.

h) **November 30th, 1983** engineer's report for the "McDonald Drain and 4th Concession Road Branch", prepared by William J. Setterington, P.Eng., was carried out under Gosfield South Drainage By-Law No. 486. This report provided for maintenance works and included an updated Maintenance Schedule which generally provides for the reassessment of costs for the McDonald Drain and the 4th Concession Road Branch, so that costs for future maintenance works on this drain may be fairly assessed.

i) **May 6th, 1985** engineer's report for the "McDonald Drain (Bridge Structure – Chang-Chu Tu)", prepared by William J. Setterington, P.Eng., was carried out under Gosfield South Drainage By-Law No. 502. The works conducted under this report generally provided for the replacement of an access bridge located at the Northeast Part of Lot 13, Concession 3 E.D., serving the lands of Chang-Chu Tu.

The access bridge identified within the above mentioned report provides for the initial construction of **Bridge ①**, as identified within this report for the McDonald Drain.

j) **July 31st, 1990** engineer's report for the "Farm Access Bridge Over the McDonald Drain (Rita Coste)", prepared by Lou Zarlenga, P.Eng., was carried out under Gosfield South By-Law No. 61-1990. The works conducted under this report generally provided for the initial construction of an access bridge located at the Northeast Part of Lot 13, Concession 3 E.D., serving the lands of Rita Coste.

The access bridge identified within the above mentioned report provides for the initial construction of **Bridge ⑤**, as identified within this report for the McDonald Drain.

k) **April 12th, 1993** engineer's report for the "Farm Access Bridge Over the McDonald Drain (Ermy DiMenna)", prepared by Lou Zarlenga, P.Eng., was carried out under Gosfield South By-Law No. 32-1993. The works conducted under this report generally provided for the initial construction of an access bridge located at the Northeast Part of Lot 24, Concession 4 E.D., serving the lands of Ermy DiMenna.

The access bridge identified within the above mentioned report provides for the initial construction of **Bridge ⑧**, as identified within this report for the McDonald Drain.

l) **July 18th, 1994** engineer's report for the "Residential Access Bridge Over the McDonald Drain (Sam Pannunzio)",

prepared by Lou Zarlenga, P.Eng., was carried out under Gosfield South By-Law No. 52-1994. The works conducted under this report generally provided for the initial construction of an access bridge and lawn piping connected to the existing access bridge to the south, located at the Northeast Part of Lot 13, Concession 3 E.D., serving the lands of Sam Pannunzio.

The access bridge identified within the above mentioned report provides for the remaining portion of **Enclosure ⑥**, as identified within this report for the McDonald Drain.

m) **May 10th, 1996** engineer's report for the "McDonald Drain Relocation – For Mastron Enterprises Ltd. (130-010)", prepared by Nick J. Peralta, P.Eng., was carried out under Gosfield South By-Law No. 21-1996. The works conducted under this report generally provided for drain re-alignment and improvements to a portion of this drain through the lands of Mastron Enterprises Ltd, to make efficient use of their land for a proposed greenhouse development.

This report provided general design and future maintenance provisions that govern a portion of the open drain adjacent to said greenhouse development.

n) **November 22nd, 2002** engineer's report for the "New Residential Access Bridge Over the McDonald Drain (Rita Coste)", prepared by Dennis Averill, P.Eng., was carried out under Town of Kingsville By-Law No. 100-2002. The works conducted under this report generally provided for the initial construction of an access bridge for a severed parcel located within Lot 13, Concession 3 E.D., serving the lands of Rita Coste.

The access bridge identified within the above mentioned report provides for the initial construction of **Bridge ③**, as identified within this report for the McDonald Drain.

o) **February 4th, 2008** engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng., was carried out under Town of Kingsville By-Law No. 38-2008. This report provided an updated Maintenance Schedule which generally provides for the reassessment of costs for the McDonald Drain, so that costs for future maintenance works on this drain may be fairly assessed. Furthermore, this report reviewed all existing access bridges within the subject drain and provided for future cost sharing provisions for each.

The Schedule of Assessment included therein represents the current governing Schedule of Assessment for maintenance purposes for this drain, along with all access bridges.

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From our detailed research of the above listed engineer's reports we have determined that generally speaking, the May 28th, 1965 report serves as the current governing by-law for the majority of the open drain, with the exception of the works conducted within the May 10th, 1996 report, that provided improvements to a portion of the open drain for the development of the lands currently owned by Mastron Enterprises Inc. (390-00600). Collectively, these two (2) engineer's reports govern the design provisions for any future maintenance works on this open channel. Currently, the costs for such maintenance works are to be assessed against the lands and roads outlined within the February 4th, 2008 Updated Maintenance Schedule. All of the structures within the McDonald Drain have all been constructed under the above mentioned By-Laws and are all therefore, legal entities with respect to this Municipal Drain. Therefore, the identified bridge and enclosure structures are currently eligible to have the costs for their replacement and/or improvements be shared with the lands and roads within the drains watershed contributing their runoff into the drain, upstream of said structures.

III. PRELIMINARY INVESTIGATIONS AND ON-SITE MEETING

After reviewing all of the drainage information provided by the Town of Kingsville, we arranged for a site meeting to be scheduled for November 26th, 2013. The following people were in attendance at said meeting: Rita Coste, Ross Whaley, Tom Keller, Laszlo Lakotos, Bob Carder, Margo Carder, Sean Beaul, Chris Carder, Don Huber (representative of the County of Essex), Ken Vegh (Town Drainage Superintendent), and Tony Peralta (N.J. Peralta Engineering Ltd.).

Upon introductions, it was generally discussed that a written notice has been submitted by Mr. Tom Keller, on behalf of Triple K. Farms Limited (390-01200), requesting an engineer's report to review the functionality of the McDonald Drain.

Mr. Tom Keller elaborated on his concerns with respect to the McDonald Drain. He advised that his property is located at the upper end of the open drain. Since the last maintenance performed on the drain in 2008, they have found that the water has been stagnant in the open drain year round and the water level has been constantly over one (1) foot above their tile outlets. Mr. Vegh also advised that there may be concerns that some of the culverts downstream may be undersized and request that they be inspected and reviewed as part of this project.

Further to Mr. Keller's concerns, we briefly reviewed the 2008 Updated Maintenance Schedule report, prepared by our office. It was identified that this report was not intended to review the functionality of the drain, nor provide any improvements. This report was prepared to provide the reassessment of costs for the

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McDonald Drain, based on the various change within the watershed. These reassessments were made to fairly distribute costs for future maintenance on this drain. This report also provided for future cost sharing provisions for maintenance on the existing structures within the drain.

We reviewed the drain characteristics with the landowners present. Based on the governing 1965 report, the McDonald Drain comprises of extremely flat gradient (0.04%) for the majority of its length. Furthermore, this area has been known to have a high water table within sandy clay loam soils. Under these conditions, this drain is susceptible to erosion. This was evident based on our general review of the existing cross-section of the open drain relative to the original design parameters.

The ratepayers were advised that based on Mr. Keller's concerns, it would be prudent to review the drain design grades, along with each bridge and enclosure structure to determine its condition and functionality. As a result, we confirmed that the entire length of the McDonald Drain shall be surveyed as part of our investigations. This survey will help identify area of concerns and potential blockages or obstructions.

Mr. Carder identified that in his opinion, the majority of the backup of water exists as a result of the bend in the drain behind his property at 2723 County Road 31 (390-01085). He further advised that this bend has experienced a great deal of bank erosion located across from the Stormwater Management discharge pipe for Mastron Enterprises Inc. (390-00600).

The landowners were advised that in the event that blockages or obstructions were not present, further geotechnical investigations for potential ground water and/or artesian aquifer may be required to identify the issue.

The Drainage Act processes were reviewed in great length with the owners present. In response to a question about cost, the owners were advised that the final costs of the project will be related to the amount of work required. The actual assessed cost will based upon the final Tendered prices for the construction work, along with the proportional sharing of incidental costs, associated with carrying out the Engineering and Construction. The ratepayers were also advised that even though improvements may not be conducted to their individual bridges, they may be assessed for portion of the cost for other bridges and/or access bridge portion of the enclosures being improved downstream of their lands.

The landowners present were advised that the 2008 Updated Maintenance Schedule, prepared by our office, was passed through by-law for the McDonald Drain. Under this report, all bridge structures had been identified as a legal entity within the

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McDonald Drain and the information identified within that report will form as a basis for the assessments under this project.

The overall future maintenance processes, general timeframes, and grant eligibility were generally reviewed with the ratepayers. They were also advised that it was likely that the works in this drain were not to be undertaken between March 15th and June 30th, unless otherwise permitted by the Department of Fisheries and Oceans (D.F.O), Essex Conservation Authority (E.R.C.A), and the Ministry of Natural Resources and Forestry (M.N.R.F.).

The owners were also advised that the work conducted under this project would be subject to further approvals and mitigation measures of the D.F.O, E.R.C.A. and the M.N.R.F.

The ratepayers were also advised that, while we are doing extensive work within the McDonald Drain, it would be an opportune time to discuss or address any other issues within this Municipal Drain.

Further discussions ensued regarding the extent of the work required within the open drain and the current state of the ongoing erosion. The landowners advised that they were aware of the ongoing bank slumping and erosion. However, they expressed that the ongoing erosion has not posed as a major concern and advised that they would prefer that the extent of the work be limited to addressing the concerns brought forward by Mr. Keller and the review of the existing culverts. The landowners were advised that this information would be taken under advisement when conducting our review. We further discussed that we would work closely with Mr. Keller to ensure that we address his concerns.

Mr. Lakotos questioned his property’s assessment into the McDonald Drain, as outlined within the 2008 Updated Maintenance Schedule. He requested that we accompany him to his property to review his drainage patterns and assessments. With no further questions from the landowners, we proceeded to Mr. Lakotos property at 1749 County Road 18 (340-08000), to review his site drainage. Upon our review, Mr. Lakotos’ property is situated at the top end of the watershed where there is significant grade towards the McDonald Drain. Based on our review, we confirmed that the subject lands contribute to the McDonald Drain by means of a surface swales along the east limit of the property that discharges into the roadside ditch in front of his home. This roadside ditch conveys flows through a road crossing culvert that outlets to the north side of County Road 18 and into the Orchard property. This portion of the Orchard ultimately drains into the 4th Concession Branch of the McDonald Drain that ultimately discharged into the McDonald Drain. Mr. Lakotos had no further questions or concerns.

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On this note, the on-site meeting had concluded.

IV. FIELD SURVEY AND INVESTIGATIONS

Prior to conducting our survey for this drainage project, we recognized that the primary concerns and issues with the drain primarily affected the lands of Triple K. Farms Limited. As a result, we felt that it would be prudent to contact Mr. Keller to review the details of his concerns.

A walkthrough was scheduled with Mr. Keller for March 31st, 2014. We commenced our walkthrough at the top end of the drain and proceeded downstream. Through our walkthrough, it became evident that the water levels at the top end of the drain were abnormally high. The water was stagnant and the levels were within 300mm to 400mm from the top of the drain banks. As a result, all tiles within this portion of the drain were under water. We acknowledge that the drain width was considerably wider than the governing design parameters, and that the drain banks have eroded and receded over the years. Based on our visual inspections, we also noticed that there appeared to be more sediment accumulated at the bends of the drain. As part of our walkthrough, we found that the water levels along County Road 31, downstream of Mr. Keller's properties and upstream of the intersection at County Road 18, were lower but still encompassed approximately half of the drain depth. We proceeded to review the road crossing culvert at the intersection of County Road 31 and County Road 18 and found that this structure was in extremely poor condition and there was a considerable amount of sediment accumulated at the upstream end of this culvert. We found that once we proceeded past this intersection, the water levels appeared to normalize. We commenced our walkthrough to the outlet portion of the McDonald Drain, where it outlets into the Sturgeon Creek. Mr. Keller was concerned that there may be additional accumulation at the top end of the Sturgeon Creek that we should also investigate. At the conclusion of our walkthrough, we advised Mr. Keller that our topographic survey will assist in identifying all of the issues within the drain, in order to address his concerns. We advised Mr. Keller that once we have completed our survey and investigations, we will review our findings with him, prior to completing our report.

Following the on-site meeting and subsequent walkthrough with Mr. Keller, we arranged for our survey crew to attend the site and perform a topographic survey, including taking necessary levels and details, along the entire length of the McDonald Drain. Our topographic survey also included the survey of the Sturgeon Creek for a distance of approximately 100.0 metres downstream of the McDonald Drain outlet. We also took numerous cross-sections of the McDonald Drain and the Sturgeon Creek at general locations and at each access bridge, road crossing, and

enclosure as necessary, for us to complete our design calculations, estimates and specifications. Bench Marks were looped from previous work carried out on the drain in order to establish a site Bench Mark along the drain and near the location of each access bridge and enclosure.

A Ministry of Natural Resources and Forestry (M.N.R.F.) Species at Risk screening request pursuant to the Endangered Species Act, 2007, through an agreement in place with M.N.R.F. under Section 23, for Municipal Drainage Works, was submitted to the Town of Kingsville on November 28th, 2013 for this project. On December 4th, 2013, we received a response from the Town of Kingsville, on behalf of the M.N.R.F. We reviewed the E.R.C.A. and D.F.O. Species at Risk Mapping and submitted a request for review to the E.R.C.A. on November 26th, 2013 and received a preliminary response on December 4th, 2013.

For the purpose of establishing the watershed area, we investigated and reviewed all of the past Engineer's Reports on the McDonald Drain. Specifically, we utilized the Updated Maintenance Schedule Report prepared by Nick J. Peralta, P.Eng., dated February 4th, 2008 to establish the overall watershed contributing to entire system. All of the above investigations not only provided us with the correct watershed area affecting the size of the affected access bridges, but also provided us with the accurate information to assist us with the preparation of our Construction Schedule of Assessment for this project.

V. FINDINGS AND RECOMMENDATIONS

DESIGN CONSIDERATIONS AND SUPPLEMENTAL MAINTENANCE

Upon completing our detailed survey and investigations, we had reviewed the drain profile and details related to the access bridges within the McDonald Drain. Through our investigations, we confirmed that the drain had a significant build-up of sediment at various points within the existing drain. Specifically, through the upper portion of the drain and at the sharp bend at approximate Station 0+866.4. We also found that at the north end of the existing road crossing culvert at the intersection of County Road 31 and County Road 18 created a significant jump in water elevation within the drain. We also found that some of the access bridges were in poor condition and required replacement.

Upon conducting our investigations, we contacted Mr. Tom Keller and Mr. Ken Vegh to schedule a meeting to review our findings. A meeting was scheduled for September 26th, 2014. In this meeting, we had reviewed the parameters of the drain, including the existing soil characteristics and how they contribute to the erosion and sedimentation within the drain. We further reviewed the areas of significant sediment accumulation along with

identifying potential culvert replacements. We identified that by undertaking these culvert replacements, there may be an opportunity to maximize the drain grades at the downstream section, to assist with flows from the upper end of the drain. The combination of soil characteristics and the design grade at the top end having such minimal grade, we provided Mr. Keller with the following options to consider in order to address the long-term issues within said portion of drain:

1. Stabilizing the existing drain banks with erosion control measures (ie. sloped quarried limestone) on both sides of the drain for the length abutting his property, to minimize erosion and sediment deposition.

2. Provide a drain enclosure through this portion of the drain together with a conveyance swale.

3. Provide erosion control measures at each of his tile outlets and at the sharp bend in the drain immediately downstream of his property, together with initiating a more frequent maintenance program to remove blockages and obstructions created by sediment deposition and accumulation.

Mr. Keller advised that the subject lands do not provide high crop yields. Therefore, based on the information provided, Mr. Keller felt that Option 3 would be the most feasible solution, that includes the benefits of a more frequent maintenance program, which provides the most appropriate solution for his concerns.

In May of 2015, Mr. Keller had informed Mr. Vegh that the current water levels in the drain were stagnant and are causing flooding on his property. On May 11, 2015 we met with Mr. Vegh to review Mr. Keller’s concerns. With a more recent updated maintenance schedule prepared by our office in 2008, together with suitable drain parameters outlined within the governing report prepared by C.G.R. Armstrong, P.Eng., in 1965, We concluded that it would be appropriate to initiate maintenance on the upper portion of the drain, in order to provide immediate relief for Mr. Keller’s lands. As a result, maintenance was performed on the upper portion of the drain in July of 2015. The cost of which were distributed as outlined within the 2008 Updated Maintenance Schedule report.

In late 2016, Mr. Vegh received a call from Mr. Carder at 2723 County Road 31 (390-01085). Mr. Carder had informed Mr. Vegh that the drain banks had failed at the Stormwater Management (S.W.M.) pond outlet for Mastron Enterprises Inc. (390-00600) located near the sharp bend at approximately Station 0+866.4. Mr. Vegh reviewed the bank failure and initiated an emergency repair at this location.

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Based on our topographic survey; detailed investigations; discussions and review with affected landowners, Town Staff, the Essex Region Conservation Authority, the Department of Fisheries and Oceans, the Ministry of Natural Resources and Forestry, and information derived from the on-site meetings and other meetings held with respect to this project; we have proceeded to establish the required improvements to adequately address all of the drainage issues which currently exist with respect to the McDonald Drain. Our findings and recommendations are outlined in the following paragraphs.

E.R.C.A., D.F.O. and M.N.R.F. Considerations

During the course of our investigations, this drainage project was discussed and reviewed in detail with Ms. Cynthia Casagrande, of the E.R.C.A., to deal with any E.R.C.A. issues and comments related to this Municipal Drain. The McDonald Drain is located within the regulated area and is under the jurisdiction of the E.R.C.A., and therefore an E.R.C.A. Permit is required for the improvements to the McDonald Drain. Upon their request, a design proposal was submitted to the E.R.C.A. for their review and consideration. Further to the above, the E.R.C.A. provided us with their comments and concerns through email correspondence, and said email is included herein as **Appendix "A"**.

As outlined in our discussions with the E.R.C.A., and with respect to the Department of Fisheries and Oceans (D.F.O.) concerns and comments, due to the amendments to the Fisheries Act that came into effect, the partnership agreement between D.F.O. and E.R.C.A. has lapsed as of November 25th, 2013. As a result, the proposed works in the McDonald Drain was “Self-Assessed” by the Engineer, through the D.F.O. website to determine whether this project shall be reviewed by D.F.O. Based on the D.F.O. Self-Assessment website, we have determined that the project activities would not require a D.F.O. review for the works proposed under this project, so long as standard measures for fish habitat and migration are implemented. A copy of the D.F.O. “Best Management Practices – Culvert Replacements in Municipal Drains” document is included within **Appendix "A"**.

As was required in 2013, under the Species At Risk Provincial Legislation, we had prepared and submitted a request for screening to the Town of Kingsville Drainage Superintendent as an Agreement had been set in place with the Ministry of Natural Resources and Forestry (M.N.R.F.) under Section 23 of the Endangered Species Act, 2007 for Drainage Works. This overall project falls under Section 78 of the Drainage Act which consists of improvement of existing Municipal Drains; therefore, the McDonald Drain had been screened using the Ministry of Natural Resources sensitive areas maps for fish, mussels, turtles, and snakes. The M.N.R.F. screening maps identified the risk of fish, turtles and snakes in this area. A copy of the

Town of Kingsville's "Endangered Species Act Review" is included here as **Appendix "B"**.

As of June 30th, 2015, the Ministry of Natural Recourses and Forestry (M.N.R.F.) Municipal Drain agreements, under Section 23 of the Act, with the Municipality had expired. New regulation provisions have replaced these existing drain agreements under Ontario Regulation 242/08, Section 23.9 which allows the Municipality to conduct repairs, maintenance, and improvements, within existing Municipal Drains, under the Drainage Act to be exempt from Section 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.

In recognition of impacts that these species may experience as a result of the subject works, the Town of Kingsville has provided comprehensive mitigation measures as well as species identification guides for reference. These references will be provided to the successful tenderer and shall be available for viewing at the Municipal office for those interested.

Through correspondence with Cynthia Casagrande, of the E.R.C.A., the Self-Assessment through D.F.O., and the mitigation measures through the Endangered Species Act, we have provided for all of the E.R.C.A., D.F.O., and M.N.R.F. concerns and issues in our design and recommend that this drainage works be constructed in total compliance with all of the above.

The McDonald Drain Improvements

Based on our detailed survey, investigations, examinations, discussions and review with the affected owners, we offer the following findings and recommendations relative to the drainage works to be carried out within the McDonald Drain.

As part of the request for improvements on the McDonald Drain, we had reviewed and analyzed the existing design parameters as they relate to the functionality of the McDonald Drain. We find that the report prepared by C.G.R. Armstrong, P.Eng., dated May 28th, 1965 for the improvements to the entire length of the drain, together with the May 10th, 1996 engineer's report prepared by Nick J. Peralta, P.Eng., to address the drain re-alignment within the lands of Mastron Enterprises Inc. (390-00600), currently govern the design parameters of the McDonald Drain. Upon our review of these reports, we find that this drain conveys water with relatively flat grades for the majority of the drain length. We further find that drain cross-section includes a bottom width that varies between 0.91 metres (3.0 feet) to 1.22 metres (4 feet) throughout the entire length. We also find that the design side slopes vary between 1.25

Horizontal to 1.00 Vertical slope and 1.75 Horizontal to 1.00 Vertical slope throughout.

We found that the upper portion of the drain, where Mr. Keller had concerns, between Station 0+000.0 and Station 0+866.4 had pockets of accumulated sediment. This accumulation of sediment also blocked several tile outlets along both sides of the open drain. Furthermore, there was a considerable amount of sediment accumulated at the drain bend at approximately Station 0+866.4. We also found that there was a moderate amount of accumulation of sediment between Station 1+346.0 through Station 1+699.2.

The maintenance performed in July of 2015, extended from Station 0+000.0 to approximately Station 1+000.8. This maintenance work reduced the overall water levels within the upstream portion of the drain. As a result, this maintenance work provided the much needed relief for the upper portion of the McDonald Drain.

The emergency repairs to the drain banks at the drain bend performed in late 2016, at approximately Station 0+859.3 addressed the immediate concerns presented by Mr. Carder. However, upon our site visit in March of 2017, we recognized that the erosion protection at this location should be extended on both sides of the drain to help reduce future bank erosion around this bend.

As previously identified, the soils within the McDonald Drain consist of Colwood Fine Sandy Loam and Berrien Sandy Loam soils, categorized as Hydrological Soil Group C. The combination of the design grade parameters, together with saturated sandy loam soil types, create highly erodible conditions. As a result, the McDonald Drain has eroded beyond the design cross-section parameters as previously established within the governing reports.

In regards to the drain bank slumping and erosion, we recognize that without significant improvements to the drain, this issue will continue to persist over time. In order to properly address these ongoing issues, these improvements would include the benefit of bank rehabilitation with quarried limestone and/or enclosing the open drain. These improvements would result in a costly undertaking. Based on the landowner comments at the on-site meeting, they expressed that the current state of erosion and sedimentation is tolerable and requested that the works be limited to addressing the concerns of Mr. Keller. Through our discussions with the Town of Kingsville, the County of Essex and the various landowners, we understand that the drain bank erosion does not currently pose as a safety concerns. **Therefore, at this time we recommend that no major works be conducted to the open drain to address the ongoing erosion issues. However, it shall be noted that the erosion will likely continue to persist and that this matter will eventually need to be addressed. Therefore, in the interim, we strongly recommend**

that this drain be continually monitored and that drain maintenance shall be conducted on a more frequent basis.

In light of the above information, we have identified key locations that will require general erosion protection, which shall be addressed at this time. These improvements are intended to address existing drain bank failures and to help reduce future issues with erosion and sediment build-up along the upper portion of the McDonald Drain. As a result, we recommend installing general erosion protection at the six (6) tile outlet locations between Station 0+000.0 and Station 0+846.8. We would also recommend that general erosion protection be extended through the bend in the drain from Station 0+854.6 to Station 0+881.5.

In efforts to further increase conveyance and help reduce the buildup and blockages caused by sedimentation within the McDonald Drain, we further recommend that the drain be cleaned out by means of a centre channel within the bottom of the drain and prohibit any excavation of the existing drain banks. The centre channel shall be excavated with a bottom width of 0.91 metres (3.0 feet) together with 1.50 Horizontal to 1.00 Vertical side slopes, along the entire length of the drain. The centre channel will assist in maximizing conveyance of base flows and increase velocities to improve self-cleaning of debris and sedimentation.

Based on the above information, the current drain design elevations, together with the existing elevations of the retained culverts, we find that the design grades of the McDonald Drain between Station 1+770.0 through Station 2+340.0, can be further improved to provide for better conveyance of flow from the upstream, and also through the existing and proposed downstream culverts. Therefore, we recommend re-establishing the design grades through this section of the McDonald Drain to maximize the drain conveyance. It shall be noted that these improvements shall extend downstream into the upper portion of Sturgeon Creek Drain, to ensure that the runoff is conveyed to a sufficient outlet. It shall be noted that the improvements to the design grades, together with the centre channel will not result in deepening, but rather provide a consistent grade within the existing drain bottom. We had made cross checks along the entire length of the drain, to verify that these improvements would not adversely impact the drain's cross section within this Municipal Drain.

Based on the above information, we find that the new design grades, centre channel and cross-sections of the McDonald Drain provided herein shall be performed as part of this project and shall govern until otherwise modified under the provisions of the “Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010” for future maintenance purposes.

McDonald Drain Bridges, Road Crossings, and Enclosure Improvements

As part of our survey work, we also investigated all of the bridges, enclosures, and the road crossing culverts along the full length of the McDonald Drain. We find that all of the structures within the McDonald Drain were identified within the various engineer's reports previously mentioned. However, in order to establish a basis for replacement or improvement to each structure, we reviewed and analyzed each structure based on the following criteria:

1. The vintage of each structure.

2. The condition of the existing culvert and headwalls.

3. The culvert size and the capacity required for a minimum 1:2 year storm event.

4. The invert elevations of the culvert pipe relative to the design grade.

From our survey, investigations, and the criteria mentioned above, we find and recommend the following:

It shall be noted that in order to maintain consistency with the most recent Engineer's Report for the "Maintenance Schedule – McDonald Drain" dated February 4th, 2008, we have utilized the corresponding bridge reference number as outlined within this report.

Bridge ① (Michael & Donna Mastronardi, 340-10300)

The existing access bridge extending from Station 1+995.0 to Station 2+009.1, serving as the primary access to the agricultural lands of Michael & Donna Mastronardi (340-10300), within Lot 13, Concession 3 E.D., was constructed within the May 6th, 1985 engineer's report prepared by William J. Setterington, P.Eng. This access bridge was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 14.1 metres of 1800mm diameter corrugated steel pipe with bevelled ends and sloped riprap headwalls, that provides an adequate travelled top width. We find that the existing access bridge culvert to be in good condition, adequate sized and on grade relative to the new profile grades. Therefore, based on the vintage, condition and culvert size of the existing access bridge, we recommend that no improvements are required to this structure as part of this report. This structure has been labelled herein as **Bridge ①**.

Bridge ② (Bernardo & Margeretha Neufeld, 340-10200)

The existing access bridge extending from Station 1+940.4 to Station 1+947.4, serving as the primary access to the residential lands of Bernardo & Margeretha Neufeld, 340-10200), within Lot 13, Concession 3 E.D., was constructed within the September 19th, 1958 engineer's report prepared by C.G.R. Armstrong, P.Eng. This access bridge was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 7.0 metres of 1675mm diameter corrugated steel pipe with stacked concrete pieces headwalls and a tall concrete barrier curb, that provides an adequate travelled top width. We find that the existing access bridge culvert to be in poor condition. Therefore, based on the vintage and the condition of the existing access bridge, we recommend that same be entirely replaced as part of this report, and labelled herein as **Bridge ②**.

All the particulars with respect to this bridge replacement was discussed and reviewed in detail with Mr. Bernardo (Ben) Neufeld. Mr. Neufeld recognized that this access was in poor condition and generally agreed with our evaluations. We discussed that the existing access bridge top width is currently at a width of 6.10 metres (20.0 ft.) and is consistent with a standard driveway top width. Mr. Neufeld confirmed that he is comfortable with the existing top width and would like to maintain a similar top width. As part of the replacement of the existing culvert and headwalls, Mr. Neufeld was advised that the existing concrete barrier curb will be removed, together with the associated light standards attached to same. Mr. Neufeld confirmed that the existing light standards have been disconnected and no longer function. He also confirmed that he would prefer that the barrier curbs not be replaced. He further requested that the structure be shifted slightly to the north to better accommodate his current driveway configuration. After reviewing various options, we established that in order to shift the new structure to the desired location, we would need to investigate connecting the new culvert to the adjacent culvert to the north (Bridge ③), together with a catch basin to collect surface water between the two (2) driveways. We reviewed the replacement structure and determined that the replacement structure would be more cost effective utilizing sloped quarried limestone end protection over a vertical headwall system. Mr. Neufeld agreed to proceed with the more cost effective end treatment configuration.

Based on our detailed survey, investigations, examinations, and discussions with the affected property owner, we recommend that the new access bridge be connected to the south end of existing Bridge ③ at Station 1+931.7, and shall be extended to Station 1+945.7 within the McDonald Drain. As a result, the existing

culvert shall be replaced with approximately 14.0 metres of 2000mm diameter corrugated steel pipe, together with a fabricated saddle type catch basin at the north end. The south end of the new structure shall include a sloped quarried limestone end protection. This new access bridge shall be installed at the location and to the general parameters as established in our design drawings attached herein.

As a legal entity with respect to the McDonald Drain, we further recommend that the cost for the access bridge be shared by the bridge user and all lands and roads within the drain watershed, upstream of this structure. All of same has been provided for within the Construction Schedule of Assessment included within this report.

Bridge ③ (Michael & Kelly Ingratta, 340-10150)

The existing access bridge extending from Station 1+917.5 to Station 1+931.7, serving as the primary access to the residential lands of Michael & Kelly Ingratta (340-10150), within Lot 13, Concession 3 E.D., was constructed within the November 22nd, 2002 engineer's report prepared by Dennis Averill, P.Eng. This access bridge was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 14.2 metres of 1800mm diameter corrugated steel pipe with sloped riprap headwalls, that provides an adequate travelled top width. We find that the existing access bridge culvert to be in good condition, adequate sized and on grade relative to the new profile grades. Therefore, based on the vintage, condition and culvert size of the existing access bridge, we recommend that no improvements are required to this structure as part of this report. This structure has been labelled herein as **Bridge ③**.

Bridge ④ (Heinrich & Agatha Janzen, 340-10105)

The existing access bridge extending from Station 1+879.9 to Station 1+887.3, serving as the primary access to the residential lands of Heinrich & Agatha Janzen, 340-10105), within Lot 13, Concession 3 E.D., was constructed within the September 19th, 1958 engineer's report prepared by C.G.R. Armstrong, P.Eng. This access bridge was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 7.4 metres of 2200mm x 1350mm diameter corrugated steel arch pipe with stacked concrete pieces headwalls, that provides a relatively narrow travelled top width. We find that the existing access bridge culvert to be in poor condition. Therefore, based on the vintage and the condition of the existing access bridge, we

recommend that same be entirely replaced as part of this report, and labelled herein as **Bridge ④**.

All the particulars with respect to this bridge replacement was discussed and reviewed in detail with Mr. Heinrich Janzen. Mr. Janzen recognized that this access was in poor condition and generally agreed with our evaluation. We discussed that the existing access bridge top width is currently at a width of approximately 4.20 metres (13.78'). As part of the improvements, we discussed that the existing driveway access adjacent to County Road 31, shall be improved to accommodate a standard 6.10 metre (20.0ft.) driveway top width that shall be blended into the existing driveway access to a point identified within the plans. He requested that the replacement access bridge be installed at the same location. He further requested that we attempt to salvage the existing tree adjacent to the north end of the existing structure and further requested that any extension required to this access shall be extended to the south. We reviewed the replacement structure and determined that the replacement structure would be more cost effective utilizing sloped quarried limestone end protection, over a vertical headwall system. Mr. Janzen agreed to proceed with the more cost effective end treatment configuration.

Based on our detailed survey, investigations, examinations, and discussions with the affected property owner, we recommend that the new access bridge be constructed between Station 1+877.2 and Station 1+892.2 within the McDonald Drain, consisting of approximately 15.0 metres of 2000mm diameter Aluminized Steel Type II corrugated steel pipe with sloped quarried limestone end protection. This new access bridge shall be installed at the location and to the general parameters as established in our design drawings attached herein.

As a legal entity with respect to the McDonald Drain, we further recommend that the cost for the access bridge be shared by the bridge user and all lands and roads within the drain watershed, upstream of this structure. All of same has been provided for within the Construction Schedule of Assessment included within this report.

Bridge ⑤ (Rita Coste, 340-10100)

The existing access bridge extending from Station 1+827.1 to Station 1+840.1, serving as the primary access to the residential lands of Rita Coste (340-10100), within Lot 13, Concession 3 E.D., was constructed within the July 31st, 1990 engineer's report prepared by Lou Zarlenga, P.Eng. This access bridge was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 13.0 metres of 1800mm diameter corrugated

steel pipe with sloped riprap headwalls, that provides an adequate travelled top width. We find that the existing access bridge culvert to be in good condition, adequate sized and on grade relative to the new profile grades. Therefore, based on the vintage, condition and culvert size of the existing access bridge, we recommend that no improvements are required to this structure as part of this report. This structure has been labelled herein as **Bridge ⑤**.

Enclosure ⑥ (Kevin & Carmen Dick - 340-10000, Salvatore Pannunzio & Claudio Salvatore - 340-09990 and Heritage Roofing Inc. – 340-09900)

The existing enclosure extending from Station 1+699.2 to Station 1+755.0 serving as the primary access and lawn piping across the residential lands of Kevin & Carmen Dick (340-10000) and Salvatore Pannunzio & Claudio Salvatore (340-09990), along with the commercial lands of Heritage Roofing Inc. (340-09900), all within Lot 13, Concession 3 E.D. This existing enclosure has a total length of 55.8 metres. The upstream 7.0 metres was constructed under the July 6th, 1970 engineer's report prepared by William J. Setterington, P.Eng., consisting of a 1675mm (66 inch) corrugated steel pipe. The remaining 48.8 metres, connected to the downstream end of the original culvert, was constructed under the July 18th, 1994 engineer's report prepared by Lou Zarlenga, P.Eng., consisting of 1800mm diameter corrugated steel pipe. The entire structure is complete with vertical headwalls. The entire length of this enclosure was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng.

We find that original section installed under the 1970 report to be in fair condition and on the profile grades. The remaining culvert installed in 1994 is in good condition, and on grade relative to the profile grades. Overall, this enclosure conveys flows at a rate slightly less than the 1:2 year storm event. After considerable review of the existing structure, we find that the deficiencies in the culvert size do not pose as a significant obstruction to the flows within the drain. Therefore, based on the overall vintage, condition and culvert size of the existing enclosure, we recommend that no improvements are required to this structure under this report. **However, when future maintenance is performed on this structure, we recommend that it be replaced with a 2000mm diameter Aluminized Steel Type II Smoothwall Ultra-Flo pipe. This increase in culvert size will address the deficiencies in culvert capacity, to convey a minimum 1:2 year storm event.** This structure has been labelled herein as **Bridge ⑤**.

Report - McDonald Drain Improvements
(Geographic Township of Gosfield South)
Town of Kingsville - D-13-028

Road Crossing ⑦ (County Road 18, County of Essex)

The existing road crossing extending from Station 1+571.6 to Station 1+590.9, across County Road 18, was constructed within the September 19th, 1958 engineer's report prepared by C.G.R. Armstrong, P.Eng. This road crossing was further identified within the February 4th, 2008 engineer's report for the "Maintenance Schedule - McDonald Drain", prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 19.3 metres of 2200mm x 1350mm diameter corrugated steel arch pipe with stacked concrete pieces headwalls. We find that the existing road crossing culvert to be in poor condition. Therefore, based on the vintage and the condition of the existing access bridge, we recommend that same be entirely replaced as part of this report, and labelled herein as **Road Crossing ⑦**.

Upon review of the existing condition of the existing road crossing, we contacted Mr. Richard Fazecash, P.Eng. (the former Assistant County of Essex Engineer) to discuss our findings. In addition to the poor condition of the overall structure, we found that the existing culvert was undersized relative to the standard design criteria for County Roads. After considerable discussion and review, it was determined that the roadway culvert should be replaced with the appropriate culvert sizing. Mr. Fazecash further requested that the culvert be extended to the north. We also discussed that a preliminary design shall be submitted to the County of Essex for their review and comments. We provided a proposal to the County that extends the road crossing culvert beyond the limit of the 4th Concession Branch outlet into the McDonald Drain, and included an appropriately sized culvert and stub to receive the flows from same. As part of the replacement installation, Mr. Fazecash advised that the County of Essex would prefer that the asphalt be restored with a diamond shape repair. He also advised that due to the relatively small nature of roadway restoration for this project, that no asphalt and granular testing would be required under this project, as long as we have an inspector present during installation.

As part of our investigations, we had requested utility locates and found that various utilities potentially be in conflict with the proposed culvert replacement. In light of the potential conflicts, we arrange for hydro-vacuum excavations to expose and establish depths for each potential conflicting utility. Based on the information provided by the Utility Companies, along with the findings from our hydro-vacuum excavations, we determined that Union Gas and Bell Canada infrastructure will be in major conflict with the proposed road crossing culvert replacement. Furthermore, Hydro One identified that they may be required to hold the existing adjacent hydro pole, during construction. Based on our discussions, we were to arrange for coordination with Union Gas and Bell Canada to initiate the relocation of their infrastructure.

After a considerable amount of correspondence and meetings with both Union Gas and Bell Canada, we were able rectify all of the conflicts with the associated utilities. Union Gas and Bell Canada had agreed, and collaborated, to relocate all of their conflicting utilities to a sufficient depth below our proposed culvert locations and elevations. Hydro One confirmed that based on the proposed works, a "pole hold" will be required during the culvert replacement works. Based on this information, we were able to finalize our design and report.

Upon the completion of the Union Gas and Bell Canada infrastructure relocation, we had further discussion and correspondence with Mr. Peter Bziuk, P.Eng. (Manager of Design and Construction Services) to review the details of the road crossing replacement. Mr. Bziuk confirmed that the County would prefer to install the new culvert with an increased pipe thickness for additional strength and longevity, along with providing an interlocking block headwall system in lieu of concrete filled jute bag headwalls.

Based on our detailed survey, investigations, examinations, and discussions with representative of the County of Essex and Utility Companies, we recommend that the new road crossing culvert be constructed between Station 1+561.7 to Station 1+590.7 within the McDonald Drain, consisting of approximately 29.0 metres of 3300mm x 2080mm corrugated steel pipe arch with interlocking concrete block headwalls, together with an 1800mm diameter shop fabricated stub and culvert to receive flows from the 4th Concession Branch of the McDonald Drain. This new access bridge shall be installed at the location and to the general parameters as established in our design drawings attached herein.

With the replacement of the existing road crossing being provided entirely for County Road 18, all of the costs associated with said crossing are to be entirely assessed to the County of Essex. All of same has been provided for within the Construction Schedule of Assessment included within this report.

Bridge ⑧ (Mastron Enterprises Inc., 390-00600)

The existing access bridge extending from Station 1+328.6 to Station 1+346.0, serving as the primary access to the agricultural lands of Mastron Enterprises Inc. (390-00600), within Lot 24, Concession 4 E.D., was constructed within the April 12th, 1993 engineer’s report prepared by Lou Zarlenga, P.Eng. This access bridge was further identified within the February 4th, 2008 engineer’s report for the “Maintenance Schedule - McDonald Drain”, prepared by Nick J. Peralta, P.Eng. This existing culvert consists of 17.4 metres of 1800mm diameter corrugated steel pipe with sloped riprap headwalls, that

provides a travelled top width of approximately 9.14 metres (30.0 feet). We find that the existing access bridge culvert to be in fair condition, adequate sized and on grade relative to the new profile grades. Therefore, based on the vintage, condition and culvert size of the existing access bridge, we recommend that no improvements are required to this structure as part of this report. This structure has been labelled herein as **Bridge ⑧**.

Road Crossing ⑨ (Road 5 East, Town of Kingsville)

The McDonald Drain commences at the south end of the existing road crossing culvert under Road 5 East identified as Station 0+000.0. The existing road crossing culvert was not installed through the auspicious of the Drainage Act. This road crossing culvert conveys flows from within the watershed on the north side of Road 5 East into the top end of the drain. Therefore, we have included this road crossing culvert in our investigations. This existing road crossing culvert extends from Station 0+014.5 to Station 0+000.0 and consists of a culvert having a total length of 14.5 metres. The upstream portion consists of a 450mm diameter corrugated steel pipe and the downstream portion consists of a 375mm diameter corrugated steel pipe, together with sloped earthen end treatments. We find that the existing road crossing culverts to be in poor condition. Furthermore, we found that the existing gasmain on the north side of Road 5 East was bored through the centre of the road crossing culvert, which impedes the flow. Upon our review, we had contacted Andy Coghill (former Manager of Public Works) and Ken Vegh to discuss how the Town would like to address this road crossing. Through our discussion and correspondence, the Town requested that this road crossing culvert be replaced as part of the McDonald Drain improvements. Therefore, based on our discussions and the condition of the existing road crossing, we recommend that same be entirely replaced as part of this report, and labelled herein as **Road Crossing ⑨**.

In addition to the poor condition of the overall structure, we find that the existing culvert was undersized relative to the standard design criteria for Municipal Roads and the watershed contributing to this crossing. After considerable discussion and review, it was determined that the roadway culvert should be replaced with the appropriate culvert sizing.

Further to our findings, we had requested utility locates at the road crossing location. Union Gas confirmed that the gasmain located through the exiting culvert was part of their infrastructure and was live. In light of the conflicts, we arrange for hydro-vacuum excavations to expose and establish the depth and alignment of the conflicting utility. Based on our

discussions, we were to arrange for coordination with Union Gas to initiate the relocation of their infrastructure.

After a considerable amount of correspondence and meetings with Union Gas, we were able rectify the conflicts with the associated gasmain. Union Gas had agreed to relocate their conflicting gasmain to a sufficient depth below our proposed culvert locations and elevations. Based on this information, we were able to finalize our design and report.

Based on our detailed survey, investigations, examinations, and discussions with representative of the Town of Kingsville and Union Gas, we recommend that the new road crossing culvert be constructed between Station 0-014.5 and Station 0+000.0 within the McDonald Drain, consisting of approximately 14.5 metres of 800mm Aluminized Steel Type II corrugated steel pipe with interlocking concrete block headwalls. This new road crossing culvert shall be installed at the location and to the general parameters as established in our design drawings attached herein.

With the replacement of the existing road crossing being provided entirely for Road 5 East, all of the costs associated with said crossing are to be entirely assessed to the Town of Kingsville. All of same has been provided for within the Construction Schedule of Assessment included within this report.

In summary, we would recommend that the McDonald Drain be improved as detailed within the accompanying drawings and in accordance with this report and the attached specifications, which includes the replacement of existing **Bridge ②**, **Bridge ④**, **Road Crossing ⑦**, and **Road Crossing ⑨**. Furthermore, all of the works associated with this project shall be carried out in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010".

VI. ALLOWANCES AND COMPENSATION

The improvements conducted under this report are being undertaken across the right-of-way limits of Road 5 East and County Road 18, and further through private lands within the McDonald Drain. The improvements shall also be constructed entirely within the existing open McDonald Drain alignment. Where the McDonald Drain is situated within the private property, these affected lands have already been compensated for the land taken under previous Engineer's Reports and by-laws. Therefore, no further compensation for the use of these lands to conduct these improvements shall be required for this project.

We further find that each of the following Owners are entitled to and should receive the following amounts as compensation for damages to lands and crops, if any, namely:

Town of Kingsville

1)	390-01100 (Noreen & Philip Prince),	Owner,	Part Lot 24, Concession 4	$ 757.00
2)	340-10300 (Michael & Donna Mastronardi),	Owner,	Part Lot 13, Concession 3 E.D.	$ 125.00

Municipality of Leamington

3)	650-05900 (Erie Sand and Gravel Limited),	Owner,	Part Lot 1, Concession 3	$ 14.00
	Total for Damages			**$ 896.00**

These allowances are based on spreading excavated material from the drain on the abutting agricultural lands to a maximum depth of 100mm and are based on a value of $1,225.00 per acre for the affected land. At the location of all lawn areas, between Station 0+846.8 to Station 1+570.0, the excavated material shall be hauled away and all areas disturbed by this work are specified for full restoration. Therefore, no allowances have been provided to these abutting Owners for disposal of excavated material.

We have provided for these allowances in our estimate as is provided for pursuant to Section 30 of the “Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010”.

VI. ESTIMATE OF COST

Our estimate of the total cost of this work, including all incidental expenses, is the sum of **THREE HUNDRED AND TWELVE THOUSAND EIGHT HUNDRED AND TWO DOLLARS ($312,802.00)** made up as follows:

CONSTRUCTION

Item 1) **Station 0+000.0 to Station 2+310.0;** Provide all material, labour and equipment to excavate, bottom dip and remove all accumulated sediment material from the drain and carry out brush and tree removal for the complete length of the drain as

required; including leaving the excavated material in piles, spreading and levelling of the excavated material, and trucking and disposing of the excavated material, where applicable, flushing and cleaning of all accumulated sediment material within all existing remaining access culverts, cleanup and restoration, complete (approximately 2310 lineal metres), at $7.50 per metre. $ 17,325.00

Item 2) **Station 0+854.6 to Station 0+881.5;** Provide all material, labour and equipment to salvage all existing quarried limestone to be re-used; place all salvaged quarried limestone and supply and place new quarried limestone necessary to complete the erosion protection along both side slopes of the drain bend together with a 450mm wide x 450mm deep keyway along the toe of the slope, including the supply and placement of non-woven filter cloth underlay, excavation, compaction, grading and restoration, (this item shall include approximately 64.0 tonnes of new 100mm to 250mm graded quarried limestone pieces, and 124.0 square metres of filter cloth underlay), complete. Lump Sum $ 5,000.00

Item 3) **Erosion Protection at Tile Outlets;** Provide all material, labour and equipment to install sloped quarried limestone erosion protection at each tile end between Station 0+000.0 to Station 0+854.6, together with a 450mm wide x 450mm deep keyway along the toe of the slope, including the supply and placement of non-woven filter cloth underlay, excavation, compaction, grading and restoration, complete, approximately 6 units at $400 each. $ 2,400.00

Item 4) **Bridge ② (Station 1+931.7 to Station 1+945.7)**; Excavate, completely remove and dispose of existing access bridge culvert, end treatments and concrete curbs; provide all labour, equipment and materials to construct a new access bridge consisting of 14.0 metres (45.93 ft.) of 2000mm diameter, 2.8mm thick Aluminized Steel Type II Corrugated Hel-Cor pipe with

rolled annular ends and 125mm x 25mm corrugations connected to the existing culvert to the north, including a 600mm diameter, 2.8mm thick, Aluminized Steel Type II Corrugated fabricated shop welded saddle type catch basin, with a sloped quarried limestone end treatment on the south end, granular bedding and backfill, granular driveway approach and transition, select clay backfill in boulevard areas and between driveways, excavation, compaction, topsoil, seeding and mulching, cleanup and restoration, complete. $ 26,000.00

Lump Sum

Item 5) **Bridge ④ (Station 1+877.2 to Station 1+892.2)**; Excavate, completely remove and dispose of existing access bridge culvert and end treatments; provide all labour, equipment and materials to construct a new access bridge consisting of 15.0 metres (49.21 ft.) of 2000mm diameter, 2.8mm thick Aluminized Steel Type II Corrugated Hel-Cor pipe with rolled annular ends and 125mm x 25mm corrugations, including sloped quarried limestone end treatments, granular bedding and backfill, granular driveway approach and transition, granular backfill in all gore areas, excavation, compaction, topsoil, seeding and mulching, cleanup and restoration, complete.

Lump Sum $ 25,000.00

Item 6) **Road Crossing ⑦ (Station 1+561.7 to Station 1+590.7)**; Sawcut the existing asphalt pavement, excavate, completely remove and dispose of the existing roadway culvert and headwalls; provide all labour, equipment and materials to construct a new road crossing consisting of 29.0 metres (95.14 ft.) of 3300mm x 2080mm, 3.5mm thick Aluminized Steel Type II Corrugated Hel-Cor arch pipe with rolled annular ends and 125mm x 25mm corrugations, including a 1800mm diameter, 3.5mm thick, Aluminized Steel Type II Corrugated fabricated shop welded stub with 5.0 metres (16.40 ft.) of 1800mm diameter, 3.5mm thick Aluminized Steel Type II Corrugated Hel-Cor pipe with rolled annular ends and 125mm x 25mm corrugations, together with interlocking concrete block headwalls and concrete footings, sloped quarried limestone

	erosion protection, granular bedding and backfill, address abandoned utilities, pavement restoration, providing and installing all required detour routes and site signage, restoration of traffic signs, excavation, compaction, topsoil, seed and mulch, cleanup and restoration, complete.	Lump Sum	$125,000.00
Item 7)	**Road Crossing ⑨ (Station 0-014.5 to Station 0+000.0)**; Sawcut the existing asphalt pavement, excavate, completely remove and dispose of the existing roadway culvert and headwalls; provide all labour, equipment and materials to construct a new road crossing consisting of 14.5 metres (47.57 ft.) of 800mm diameter, 2.8mm thick Aluminized Steel Type II Corrugated Hel-Cor pipe with rolled annular ends and 63mm x 13mm corrugations, together with interlocking concrete block headwalls and concrete footings, sloped quarried limestone erosion protection, granular bedding and backfill, address abandoned utilities, pavement restoration, providing and installing all required detour routes and site signage, excavation, compaction, topsoil, seed and mulch, cleanup and restoration, complete.	Lump Sum	$ 27,000.00
Item 8)	Net H.S.T on Items above (1.76%)		$ 4,008.00
	TOTAL FOR CONSTRUCTION		**$231,733.00**

INCIDENTALS

1)	Report, Estimate, and Specifications	$ 30,100.00
2)	Survey, Assistants, Expenses, and Drawings	$ 29,000.00
3)	Cost of Preparing new Maintenance Schedule of Assessment	$ 2,000.00
4)	Duplication Costs of Drawings and Report	$ 1,700.00
5)	Estimated Cost of Letting the Contract including Preparation of Tender Documents, Tender Review, and Tender Advertisement in The Windsor Star	$ 1,500.00

6)	Estimated Cost for Full-Time On-Site Inspections, and Periodic Supervision and Project Management during Construction (based on a 2.5 weeks duration)	$ 12,300.00
7)	Pre-Engineering Utility Locate Charges, including Hydro-Vacuum Excavation	$ 1,400.00
8)	Net H.S.T on Items above (1.76%)	$ 1,373.00
9)	Estimated Cost for E.R.C.A. Permit (if required	$ 800.00
	TOTAL FOR INCIDENTALS	**$ 80,173.00**
	TOTAL FOR DAMAGES (brought forward)	**$ 896.00**
	TOTAL FOR CONSTRUCTION (brought forward)	**$231,953.00**
	TOTAL ESTIMATE	**$312,802.00**

VII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the McDonald Drain Improvements, consisting of Sheets 1 through 4. The design drawings show the alignment of the McDonald Drain, and the approximate location of the various access bridges and road crossings within this drain. The drawings also illustrate the affected landowners, the approximate limit of the drain watershed, and the details relative to the various replacements and improvements of the bridges and road crossing culverts, where applicable.

Furthermore, Bench Marks were established therein for each structure detail. The drawings attached herein have been reduced in size and the scale therefore varies; however, full scale drawings can be viewed at the Kingsville Municipal Office, if required.

Also attached, we have prepared Specifications which set out the required construction details for the various aspects of the works to be conducted under this report. We have also included Standard Specifications related to the intended works, labelled herein as **Appendix "C"**.

VIII. CONSTRUCTION SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated with the construction of the improvements to the McDonald Drain,

including the improvements for the drain access bridges and roadway crossings, be assessed in accordance with the attached **Construction Schedule of Assessment**.

On September 22nd, 2005, the Ontario Ministry of Agriculture, Food, and Rural Affairs (O.M.A.F.R.A.) issued Administrative Policies for the Agricultural Drainage Infrastructure Program (A.D.I.P.). This program has re-instated financial assistance for eligible costs and assessed lands pursuant to the Drainage Act. Sections 85 to 90 of the Drainage Act allow the Minister to provide grants for various activities under said Act. Sections 85 and 87 make it very clear that grants are provided at the discretion of the Minister. Based on the current A.D.I.P., "lands used for agricultural purposes" may be eligible for a grant in the amount of 1/3 of their total assessment. The new policies define "lands used for agricultural purposes" as those lands eligible for either the "Farm Property Class Tax Rate", the "Managed Forest Tax Incentive Program", or the "Conservation Land Tax Incentive Program". The Municipal Clerk has provided this information to the Engineer from the current property tax roll. Properties that meet the criteria for "lands used for agricultural purposes" are shown in the attached Assessment Schedule under the subheading "**5. PRIVATELY OWNED – AGRICULTURAL LANDS (grantable)**" and are expected to be eligible for the 1/3 grant from O.M.A.F.R.A. In accordance with same, we expect that this project will qualify for the grant normally available for agricultural lands. We would therefore, recommend that the Town of Kingsville make an application, on their behalf, for a Grant from the Ontario Ministry of Agriculture, Food, and Rural Affairs (O.M.A.F.R.A.) in the amount of 1/3 of their total assessment for this project, in accordance with the provisions of Sections 85 and 88 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010". Even though it is our opinion that certain lands shall likely be eligible for grants, there is no guarantee that these lands will qualify or that grants may be available in the future.

During our investigations, we determined that some agricultural lands, which are actually being used for agricultural purposes, are not eligible for grant primarily because they do not have a Farm Tax Classification. These lands are as follows:

340-09000 - 1859293 Ontario Limited

400-00300 - Jason Adamson

These lands, in the Construction Schedule of Assessment have been categorized and listed under the heading "**5. PRIVATELY OWNED – AGRICULTURAL LANDS (non-grantable)**" which means that said properties would not be eligible for the O.M.A.F.R.A. grant. If these lands, which are obviously being used for agricultural purposes had a Farm Tax Classification, they would have been eligible for grant. From our research into how the

Report - McDonald Drain Improvements
(Geographic Township of Gosfield South)
Town of Kingsville - D-13-028

Farm Tax Classifications are determined, and from further discussions with Sid Vander Veen, P.Eng. from O.M.A.F.R.A. regarding same, we determined that in order for a property to gain a Farm Tax Classification, the owner would need to meet the following criteria.

1) make a minimum gross income of $7,000.00.

2) must be a member, or be registered with, a farm organization or group.

For the agricultural lands currently listed under the heading "**5. PRIVATELY OWNED – AGRICULTURAL LANDS (non-grantable)**" Item 2 above is likely the reason why they are not eligible for the O.M.A.F.R.A. grant. We therefore encourage these landowners, which make a minimum gross income of $7,000.00, to become a member, or be registered with a farm organization or group so that they may also become eligible for said grant.

As previously identified within the **May 10th, 1996** engineer's report for the "McDonald Drain Relocation – For Mastron Enterprises Ltd. (130-010)", prepared by Nick J. Peralta, P.Eng., the work conducted under this report was provided to facilitate the most efficient layout for the proposed greenhouse development. This report further outlines that, as a result of the greenhouse development, the excavated material can no longer be spread on the lands and that the removal of bottom sediment shall be trucked away. As outlined within the Specifications, all bottom sediment removed for the drain, between Station 0+846.8 to Station 1+570.0 be trucked away and that Mastron Enterprises Inc. (390-00600) be assessed the additional costs to haul this material away from the site versus casting and spreading the material onto the adjoining lands. The estimated net increase in cost to the project, to accommodate the trucking of material within this section of the drain including all necessary appurtenances, together with all related incidental costs is **$4,489.00**. It shall be noted that based on the Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A.) current administrative policies for Agricultural Drainage Infrastructure Program (A.D.I.P.), we have reviewed the trucking of spoil material as it relates to grant eligibility. Based on the current O.M.A.F.R.A. A.D.I.P. Policy Section 1.3(j);

> "The increased cost to a drainage project for hauling away of spoil material is not be eligible for grant."

Based on the above information, the trucking of the spoil material is not eligible for the 1/3 grant through the current A.D.I.P. Policy. Therefore, the assessments related to the trucking of the spoil material, shall be shown in the attached Construction Schedule of Assessment under the Subheading **"5. PRIVATELY OWNED – AGRICULTURAL LANDS (non-grantable)"**.

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(Geographic Township of Gosfield South)
Town of Kingsville - D-13-028

As part of this project, we have provided a separate Maintenance Schedule of Assessment for the McDonald Drain. It should be noted that the preparation of a new Maintenance Schedule of Assessment under Section 76 of the Drainage Act is not normally eligible for grant; however, pursuant to Section 1.3(e) of the "Agricultural Drainage Infrastructure Program: Administrative policies", where the cost of developing a new Assessment Schedule is less than 25% of the engineering costs for the total project, the engineering cost expended towards the preparation of same shall be eligible for grant. Since the engineering costs for the preparation of Maintenance Schedules of Assessment included herein are **less** than 25% of the overall engineering costs, we would expect that all of the agricultural assessments associated with the preparation of the new maintenance schedule **shall** be eligible for grant.

We would therefore recommend that all of the costs associated to the preparation of the new Maintenance Schedule of Assessment, along with establishing Future Maintenance Provisions for all access bridges within this Municipal Drain, be charged against the lands and roads affected in accordance with the attached Construction Schedule of Assessment included herein. Lands which are used for agricultural purposes have been listed in the Construction Schedule of Assessment under Subheading **"5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable)"**.

The attached Construction Schedule of Assessment also reflects sharing of the bridge repair and improvement costs, partially as a Benefit to the lands served by the access bridge, with remaining costs assessed as an Outlet Liability charged to all of the upstream lands and roads affected by each bridge. The costs for the bridges were shared by the abutting landowner and upstream lands in accordance with the percentages shown in the following table:

TABLE SHOWING COST SHARING FOR ACCESS BRIDGES

BRIDGE NO.	ROLL NUMBER	OWNERS	% TO ABUTTING OWNER	% TO UPSTREAM LANDS AND ROADS
2.	340-10200	Bernardo & Margeretha Neufeld	41.0%	59.0%
4.	340-10105	Heinrich & Agatha Janzen	42.0%	58.0%

The sharing percentages between the bridge user and the upstream lands and roads affected by said bridges have been established on the basis of where it is located relative to the entire reach of the drain.

Report - McDonald Drain Improvements
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Special Assessments (Section 26)

1. We determined that a Special Assessment should be charged to the **County of Essex** for the extra costs to the project caused by the existence of the **County Road 18** in accordance with Section 26 of the Drainage Act. This extra **non pro-ratable** cost pursuant to Section 26 is related to the construction of **Road Crossing** ⑦ between Station 1+561.7 to Station 1+590.7 within the McDonald Drain. The construction of Road Crossing ⑦ generally consists of all of the work being provided in Construction Item 6 within this report. The estimated net increase in cost to the project, to accommodate the construction of Road Crossing ⑦, including all necessary appurtenances, together with all related incidental costs is **$174,385.00**.

   The above estimated Special Assessment to the County of Essex for the construction of Road Crossing ⑦, pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be non pro-ratable. The incidental costs portion associated with the above estimate consists of an amount of **$47,185.00**.

   Once the construction work is complete, the County of Essex shall be assessed for the **actual construction costs** for Road Crossing ⑦ included in Construction Item 6 within the Tender, together with their share of the project incidental costs associated with same, in the amount of **$47,185.00**. This amount represents the actual Special Assessment amount to be assessed to the County of Essex for this work and shall replace the estimated amount in Section 6 of the Construction Schedule of Assessment, when charging out the works to the affected landowners and road. Under Section 69 of the Drainage Act, the County of Essex may elect to carry out the works using their own forces. However, representatives of the County of Essex have indicated that they will not exercise this option and they have requested that these works be tendered as part of this project.

2. We determined that a Special Assessment should be charged to the **Town of Kingsville** for the extra costs to the project caused by the existence of the **Road 5 East** in accordance with Section 26 of the Drainage Act. This extra **non pro-ratable** cost pursuant to Section 26 is related to the construction of **Road Crossing** ⑨ between Station 0-014.5 to Station 0+000.0 within the McDonald Drain. The construction of Road Crossing ⑨ generally consists of all of the work being provided in Construction Item 7 within this report. The estimated net increase in cost to the project, to accommodate the construction of Road Crossing ⑨ including all necessary appurtenances, together with all related incidental costs is **$36,870.00**.

The above estimated Special Assessment to the Town of Kingsville for the construction of Road Crossing ⑨, pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be non pro-ratable. The incidental costs portion associated with the above estimate consists of an amount of **$9,395.00**.

Once the construction work is complete, the Town of Kingsville shall be assessed for the **actual construction costs** for Road Crossing ⑨ included in Construction Item 7 within the Tender, together with their share of the project incidental costs associated with same, in the amount of **$9,395.00**. This amount represents the actual Special Assessment amount to be assessed to the Town of Kingsville for this work and shall replace the estimated amount in Section 6 of the Construction Schedule of Assessment, when charging out the works to the affected landowners and road. Under Section 69 of the Drainage Act, the Town of Kingsville may elect to carry out the works using their own forces. However, representatives of the Town of Kingsville have indicated that they will not exercise this option and they have requested that these works be tendered as part of this project.

These non pro-rateable assessments to the Town of Kingsville and the County of Essex do not include for any unforeseen costs that may arise during construction, nor does it include for any potential costs for appeals to the Tribunal or Referee. Any unforeseen construction costs directly related to this Section 26 works shall be assessed entirely, as an extra, to the applicable Road Authority. Any costs to the project associated to dealing with any appeals to the Tribunal and/or the Referee shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 non pro-ratable assessments, including the Special Benefit Assessments, on a pro-rata basis.

It should also be noted that the attached Construction Schedule of Assessment is to be utilized only for the sharing of all of the costs related to the works being provided for under this report. Therefore, this Construction Schedule of Assessment should not be utilized in any way for the sharing of any future maintenance works conducted to any part of the Municipal Drains established herein.

IX. FUTURE MAINTENANCE

As previously identified, the Engineer’s Report prepared by Nick J. Peralta, P.Eng., dated February 4th, 2008 provided an updated Maintenance Schedule, along with future cost sharing provisions for all access bridge within the McDonald Drain. Upon review of the existing lands within the watershed, it was determined that

there has been additional lots created, along with other parcels of land that have been altered since the last report. Therefore, we have updated the Maintenance Schedule of Assessment for the McDonald Drain to reflect these changes.

After completion of all of the works associated with this engineer's report, we recommend that the McDonald Drain be kept up and maintained in the future by the Town of Kingsville. As part of this project, we have provided a separate **Maintenance Schedule of Assessment** for distributing costs for future maintenance in the McDonald Drain. The Maintenance Schedule of Assessment is included herein as **Appendix "D"**.

For the Maintenance Schedule of Assessment, the assessment proportions as outlined therein have been established on the basis of an estimated future maintenance cost of **$20,000.00**. It should be clearly understood that the amounts shown within this Schedule is only for pro rating future maintenance costs for the drain and do not form part of the current cost for the work.

Within this report, the specifications and the accompanying drawings, we have provided profiles, details, dimensions, grades, working corridors, disposal of materials and other particulars that shall establish the necessary provisions for future maintenance within the McDonald Drain.

It should be noted that the previously mentioned 2008 report also provided a mechanism for the Municipality to undertake future maintenance works on the access bridges and road crossing culverts, so that the future maintenance costs for same can be properly assessed to the affected land owners. We find that these provisions still govern and we would therefore, recommend that all of these structures within the McDonald Drain, for which future maintenance costs are to be shared with upstream lands and roads within the watershed, be maintained by the Municipality per the recommendations under said report.

However, the road crossing labelled herein as Road Crossing ⑨, crossing under Road 5 East, was not identified within the above noted Updated Maintenance Schedule report. Therefore, we recommend that when maintenance is required on Road Crossing ⑨, it shall be maintained in the future entirely at the expense of the Town of Kingsville Roads Department.

It shall be noted that said maintenance work would include works to the access bridge and enclosure culverts, bedding and backfill, end treatment and other ancillary work. Should concrete, asphalt or other decorative driveway surfaces over these bridge culverts require removal as part of the maintenance works, these surfaces should also be repaired or replaced as part of the works. 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 bridge 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, if necessary, of any special features, shall be totally assessed to the benefiting adjoining owner served by said access bridge.

All of the above provisions for future maintenance under this report, shall remain as aforesaid until otherwise determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17, as amended 2010".

All of which is respectfully submitted.

N. J. PERALTA ENGINEERING LTD.

ANTONIO B. PERALTA, P.ENG.

ABP/sa
Att.

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division Street North
KINGSVILLE, Ontario
N9Y 1E1

CONSTRUCTION SCHEDULE OF ASSESSMENT

McDONALD DRAIN IMPROVEMENTS

(Geographic Township of Gosfield South)

TOWN OF KINGSVILLE

TOWN OF KINGSVILLE

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Road 5 East				4.60	1.862	Town of Kingsville	$ 126.00	$ 1,781.00	$ -	$ 1,907.00
County Road 18				8.90	3.602	County of Essex	$ 168.00	$ 3,154.00	$ -	$ 3,322.00
County Road 31				5.80	2.347	County of Essex	$ 285.00	$ 1,926.00	$ -	$ 2,211.00
Total on Municipal Lands.....							**$ 579.00**	**$ 6,861.00**	**$ -**	**$ 7,440.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-08205	3	11	0.88	0.88	0.356	Kevin & Barbara Fischer	$ 5.00	$ 179.00	$ -	$ 184.00
340-08250	3	11	1.08	0.78	0.316	John & Honorina Pavao	$ 4.00	$ 171.00	$ -	$ 175.00
340-08400	3	11	0.22	0.22	0.089	George Whaley & Sons Limited	$ 1.00	$ 59.00	$ -	$ 60.00
340-08401	3	11	0.41	0.41	0.166	Barbara Stewart	$ 2.00	$ 90.00	$ -	$ 92.00
340-08410	3	11	1.15	0.35	0.142	Stephanie Pavao & Tyler Clark	$ 2.00	$ 77.00	$ -	$ 79.00
340-08420	3	11	1.15	0.35	0.142	Abe & Tina Giesbrecht	$ 2.00	$ 77.00	$ -	$ 79.00
340-08430	3	11	1.41	0.43	0.174	Gilberto & Lucy Oliveira	$ 2.00	$ 94.00	$ -	$ 96.00
340-08700	3	12	34.14	2.50	1.012	County of Essex	$ 36.00	$ 1,084.00	$ -	$ 1,120.00
340-08900	3	12	3.05	3.05	1.234	Johan & Eva Klassen	$ 43.00	$ 460.00	$ -	$ 503.00
340-09490	3	13	0.93	0.93	0.376	Carmela Ingratta	$ 23.00	$ 190.00	$ -	$ 213.00
340-09600	3	13	0.46	0.46	0.186	Edward & Janet Hancharyk	$ 23.00	$ 115.00	$ -	$ 138.00
340-09700	3	13	3.6	3.60	1.457	Peter & Marie Costa	$ 176.00	$ 396.00	$ -	$ 572.00
340-09705	3	13	1.43	1.43	0.579	Maria Costa	$ 70.00	$ 202.00	$ -	$ 272.00
340-09800	3	13	1.64	1.64	0.664	Bernard & Helen Friesen	$ 80.00	$ 257.00	$ -	$ 337.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-09900	3	13	1.6	1.60	0.648	Heritage Roofing Inc.	$ 78.00	$ 497.00	$ -	$ 575.00
340-09990	3	13	0.47	0.47	0.190	Salavatore Pannunzio & Claudio Salvatore	$ 23.00	$ 138.00	$ -	$ 161.00
340-10000	3	13	0.98	0.98	0.397	Kevin & Carmen Dick	$ 48.00	$ 192.00	$ -	$ 240.00
340-10100	3	13	7.72	7.72	3.124	Rita Coste	$ 236.00	$ 647.00	$ -	$ 883.00
340-10105	3	13	0.85	0.85	0.344	Heinrich & Agatha Janzen	$ 14,104.00	$ 160.00	$ -	$ 14,264.00
340-10150	3	13	0.82	0.82	0.332	Michael & Kelly Ingratta	$ 40.00	$ 122.00	$ -	$ 162.00
340-10200	3	13	0.54	0.54	0.219	Bernardo & Margeretha Neufeld	$ 14,302.00	$ 44.00	$ -	$ 14,346.00
390-00800	4	24	1.44	1.44	0.583	Mastron Enterprises Ltd.	$ 35.00	$ 770.00	$ -	$ 805.00
390-00850	4	24	0.4	0.40	0.162	Mastron Enterprises Ltd.	$ 10.00	$ 214.00	$ -	$ 224.00
390-00900	4	24	0.27	0.27	0.109	Hydro One Networks Inc.	$ 7.00	$ 101.00	$ -	$ 108.00
390-01085	4	24	2.28	2.28	0.923	Margo Carder	$ 112.00	$ 386.00	$ -	$ 498.00
390-01095	4	24	1.09	1.09	0.441	Henry & Elena Peters	$ 53.00	$ 326.00	$ -	$ 379.00
390-01305	4	24	0.46	0.46	0.186	Jacobo & Helen Guenther	$ 11.00	$ 131.00	$ -	$ 142.00
390-01310	4	24	0.46	0.46	0.186	William & Sharon Bennett	$ 11.00	$ 131.00	$ -	$ 142.00
390-01315	4	24	0.46	0.46	0.186	Sean & Anna Beaul	$ 11.00	$ 131.00	$ -	$ 142.00
390-01320	4	23 & 24	0.46	0.46	0.186	Beatrice & David Sanders	$ 11.00	$ 131.00	$ -	$ 142.00
390-01325	4	23	0.46	0.46	0.186	Antonio & Joanne DeSantis	$ 11.00	$ 131.00	$ -	$ 142.00
390-01330	4	23	0.46	0.46	0.186	Edward & Charlene Bonyai	$ 11.00	$ 131.00	$ -	$ 142.00
390-01335	4	23	0.46	0.46	0.186	Johan & Abigail Froese	$ 11.00	$ 131.00	$ -	$ 142.00
390-01350	4	23	0.48	0.48	0.194	Steven & Jennifer Damore	$ 12.00	$ 139.00	$ -	$ 151.00
390-01500	4	23	0.57	0.57	0.231	John & Katharina Wall	$ 7.00	$ 167.00	$ -	$ 174.00
390-01600	4	23	1.21	1.21	0.490	Frederick & Elsie Sharp	$ 15.00	$ 252.00	$ -	$ 267.00
390-01700	4	23	0.77	0.77	0.312	Johan Leowen & Margaretha Friesen	$ 9.00	$ 161.00	$ -	$ 170.00
390-01800	4	23	1.75	1.75	0.708	Donald & Jill Ryall	$ 10.00	$ 366.00	$ -	$ 376.00
400-00100	5	24	20.52	3.00	1.214	Sterling Acre Farms Limited	$ 37.00	$ 454.00	$ -	$ 491.00
400-00200	5	24	30.07	0.30	0.121	538269 Ontario Limited	$ 4.00	$ 113.00	$ -	$ 117.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
400-00400	5	23	25.29	0.90	0.364	Erie Sand and Gravel Limited	$ 6.00	$ 136.00	$ -	$ 142.00
400-00405	5	23	0.46	0.36	0.146	Tammy Lapensee	$ 4.00	$ 109.00	$ -	$ 113.00
Total on Privately Owned - Non-Agricultural Lands.....							**$ 29,698.00**	**$ 9,862.00**	**$ -**	**$ 39,560.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-08000	3	10	19.98	2.98	1.206	Laszlo Lakatos & Krisztina Szabo	$ 8.00	$ 936.00	$ -	$ 944.00
340-09100	3	12	17	8.00	3.238	Basil & Santina Mariotti	$ 58.00	$ 627.00	$ -	$ 685.00
340-09200	3	12	16	9.00	3.642	Vito & Louise Coppola	$ 65.00	$ 848.00	$ -	$ 913.00
340-09300	3	12	16	9.00	3.642	Jacob & Eva Schmitt	$ 65.00	$ 791.00	$ -	$ 856.00
340-09400	3	13	43.71	35.84	14.504	Carmela Ingratta	$ 439.00	$ 1,490.00	$ -	$ 1,929.00
340-10300	3	13	15.4	12.40	5.018	Michael & Donna Mastronardi	$ 303.00	$ 195.00	$ -	$ 498.00
390-00400	4	22 & 23	266.88	139.53	56.467	George Whaley & Sons Limited	$ 683.00	$ 9,192.00	$ -	$ 9,875.00
390-00600	4	24	91.73	91.73	37.123	Mastron Enterprises Inc.	$ 2,245.00	$ 9,027.00	$ -	$ 11,272.00
390-01100	4	24	49.35	49.35	19.970	Noreen & Philip Prince	$ 1,208.00	$ 3,580.00	$ -	$ 4,788.00
390-01200	4	24	44.55	44.55	18.029	Triple K Farms Limited	$ 1,090.00	$ 3,232.00	$ -	$ 4,322.00
390-01300	4	23 & 24	152.27	136.72	55.330	Erie Sand and Gravel Limited	$ 909.00	$ 9,484.00	$ -	$ 10,393.00
Total on Privately Owned - Agricultural Lands (grantable).....							**$ 7,073.00**	**$ 39,402.00**	**$ -**	**$ 46,475.00**

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

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-09000	3	12	11	11.00	4.452	1859293 Ontario Limited	$ 80.00	$ 761.00	$ -	$ 841.00
400-00300	5	24	9.75	9.75	3.946	Jason Adamson	$ 60.00	$ 921.00	$ -	$ 981.00
390-00600	4	24	91.73	0.00	0.000	Mastron Enterprises Inc.	$ 4,500.00	$ -	$ -	$ 4,500.00
Total on Privately Owned - Agricultural Lands (non-grantable).....							**$ 4,640.00**	**$ 1,682.00**	**$ -**	**$ 6,322.00**

6. SPECIAL NON PRO-RATEABLE ASSESSMENTS (non-agricultural (Sec.26)):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Road 5 East				0.00	0.000	Town of Kingsville	$ 36,870.00	$ -	$ -	$ 36,870.00
County Road 18				0.00	0.000	County of Essex	$ 174,385.00	$ -	$ -	$ 174,385.00
**Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26))..... **							**$ 211,255.00**	**$ -**	**$ -**	**$ 211,255.00**
TOTAL ASSESSMENT -TOWN OF KINGSVILLE							**$ 253,245.00**	**$ 57,807.00**	**$ -**	**$ 311,052.00**

MUNICIPALITY OF LEAMINGTON

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
County Road 18				0.60	0.243	County of Essex	$ 29.00	$ 218.00	$ -	$ 247.00
County Road 31				0.44	0.178	County of Essex	$ 22.00	$ 160.00	$ -	$ 182.00
**Total on Municipal Lands..... **							**$ 51.00**	**$ 378.00**	**$ -**	**$ 429.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
660-01510	4	1	0.90	0.90	0.364	Dominic & Filomena Zaccardi	$ 44.00	$ 174.00	$ -	$ 218.00
**Total on Privately Owned - Non-Agricultural Lands..... **							**$ 44.00**	**$ 174.00**	**$ -**	**$ 218.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
660-01600	4	1	9.10	9.10	3.683	Z.D.S. Farms Limited	$ 223.00	$ 880.00	$ -	$ 1,103.00
Total on Privately Owned - Agricultural Lands (grantable).....							**$ 223.00**	**$ 880.00**	**$ -**	**$ 1,103.00**
TOTAL ASSESSMENT -MUNICIPALITY OF LEAMINGTON							**$ 318.00**	**$ 1,432.00**	**$ -**	**$ 1,750.00**
TOTAL ASSESSMENT -TOWN OF KINGSVILLE (brought forward)							**$ 253,245.00**	**$ 57,807.00**	**$ -**	**$ 311,052.00**
TOTAL ASSESSMENT			638.24	258.290			**$ 253,563.00**	**$ 59,239.00**	**$ -**	**$ 312,802.00**

1 Hectare = 2.471 Acres
D-13-028
April 28th, 2017

SPECIFICATIONS

MCDONALD DRAIN IMPROVEMENTS

(Geographic Township of Gosfield South)

TOWN OF KINGSVILLE

I. GENERAL SCOPE OF WORK

The McDonald Drain comprises of an open Municipal Drain generally located west of County Road 31 and commences at its upper end at the south side of Road 5 East. This drain continues downstream southerly and easterly, through Lot 24, Concession 4 E.D. to a point where it turns southerly along the west side of County Road 31, and across County Road 18. It then continues southerly within Lot 13, Concession 3 E.D. to its outlet into the upper end of the Sturgeon Creek. The work under this project generally comprises of drain improvements along the entire length of the open drain, together with the removal and replacement of two (2) existing access bridges and two (2) existing road crossing culverts under County Road 31 and Road 5 East. These works include the removal of existing culverts and headwalls, the installation of new culvert pipes, new end protection comprising of sloped quarried limestone end protection or interlocking precast concrete block headwalls and concrete footings, sloped quarried limestone erosion protection, granular bedding, granular approach and backfill, granular transition areas, and all ancillary work related thereto including cleanup and restoration. The proposed work is intended to address the cleaning of the open drain and the replacement of deteriorated structures in accordance with the current standards. The Contractor is advised that the existing culverts that are not being improved shall be cleaned out as part of the work under this project.

All work shall be carried out in accordance with these specifications, and shall comply in all regards with **Appendix "A"** and **Appendix "B"**, as well as the Standard Specifications included in **Appendix "C"**. The works shall also be carried out in accordance with the plans labelled herein as **Appendix "E"**. The open drain and structures shall be of the size, type, depth, etc., as is shown in the accompanying drawings, as determined from the **Bench Mark**, and as may be further laid out at the site at the time of construction. All work carried out under this project shall be completed to the full satisfaction of the Municipal Drainage Superintendent or the Consulting Engineer.

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

The Contractor will be required to implement stringent erosion and sedimentation controls during the course of the work to minimize the amount of silt and sediment being carried downstream into the Sturgeon Creek. It is intended that work on this project be carried out during relatively dry weather to ensure proper site and drain conditions and to avoid conflicts with sediment being deposited into the outlet drainage systems.

Specifications - McDonald Drain Improvements
(Geographic Township of Gosfield South)
Town of Kingsville - D-13-028

All disturbed areas shall be restored as quickly as possible with grass seeding and mulching installed to ensure a protective cover and to minimize any erosion from the work sites subsequent to construction. The Contractor may be required to provide temporary silt fencing and straw bales as outlined further in these specifications.

All of the work shall be carried out in accordance with any permits or authorizations issued by the Essex Region Conservation Authority (E.R.C.A.) or the Department of Fisheries and Oceans (D.F.O.), copies of which will be provided, if available. The Contractor is advised that no work shall be carried out in the existing drain from March 15th to June 30th, of any given year, because the drain is directly connected to a downstream drain that is classified as sensitive to impacts on aquatic life and habitat by E.R.C.A. and D.F.O.

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

a) As per standard requirements, work will not be conducted at times when flows in the drain are elevated due to local rain events, storms, or seasonal floods. Work will be done in the dry.

b) All disturbed soils on the drain banks and within the channel, including spoil, must be stabilized immediately upon completion of work. The restoration of the site must be completed to a like or better condition to what existed prior to the works. The spoil material must be hauled away and disposed of at a suitable site, or spread an appropriate distance from the top of the drain bank to ensure that it is not washed back into the drain.

c) To prevent sediment entry into the Drain, in the event of an unexpected rainfall, silt barriers and/or traps must be placed in the channel during the works and until the site has been stabilized. All sediment and erosion control measures are to be in accordance with related Ontario Provincial Standards. It is incumbent on the proponent and their Contractors to ensure that sediment and erosion control measures are functioning properly and are maintained and upgraded as required.

d) Silt or sand accumulated in the barrier traps must be removed and stabilized on land once the site is stabilized.

e) All activities including maintenance procedures should be controlled to prevent the entry of petroleum products, debris, rubble, concrete, or other deleterious substances into the water. Vehicular refuelling and maintenance should be conducted away from the water.

Not only shall the Contractor comply with all of the above, it shall also be required to further comply with notes included within the email from Cynthia Casagrande, of the E.R.C.A. Furthermore, the Contractor shall also review and comply with the "Best Management Practices – Culvert Replacements in Municipal Drains" document prepared by the D.F.O. Both of which have been included within **Appendix "A"**.

III. M.N.R.F. CONSIDERATIONS

Under the Species at Risk Provincial Legislation, set in place with the Ministry of Natural Resources and Forestry (M.N.R.F.), 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.

The Town of Kingsville has completed an "Endangered Species Act Review" for the McDonald Drain. A copy of the Town of Kingsville's "Endangered Species Act Review" is included herein as **Appendix "B"**, including Town 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 Town of Kingsville Drainage Superintendent immediately if any endangered species are encountered during construction.

IV. ACCESS TO WORK AND TRAFFIC CONTROL

The Contractor is advised that the majority of the work to be carried out on this project extends along the west side of County Road 31, and along the course of the existing open Municipal Drain within private lands. The Contractor shall have access for the full width of the roadway abutting the proposed drainage works. The Contractor may use the entire width of County Road 31 and Road 5 East right-of-ways as necessary to permit the completion of the work required to be carried out for this project.

When conducting work on the open drain, the Contractor shall gain access to the McDonald Drain from Road 5 East and County Road 31. The Contractor shall also have the means of accessing onto private lands by utilizing existing access bridges and culverts where deemed necessary, provided that they shall be responsible for any damage caused to same by their operations.

The Contractor shall ensure that the travelling public is protected at all times while utilizing the roadway for its access. The Contractor shall provide traffic control, including flag persons when required. 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. Under no circumstances shall the Contractor arrange to close Road 5 East, County Road 31 or County Road 18 for the proposed works, unless requested and subsequently authorized by the Town of Kingsville and/or the County of Essex. The Contractor shall also ensure that all emergency services, school bus companies, etc. are contacted about any disruption at least 48 hours in advance of same. Any and all detour routes shall be established in consultation with the Town of Kingsville and County of Essex Roads Departments.

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

V. WORKING CORRIDORS AND OPEN DRAIN MAINTENANCE PROVISIONS

When future maintenance is performed along the McDonald Drain, from Station 0+000.0 to Station 2+310.0, the Contractor is only required to excavate a centre channel within the bottom of the drain and no bank excavation is expected, as the material shall be mostly sediment accumulation.

Once access is obtained onto the site, the Contactor shall be expected to keep the construction equipment and forces within the following areas, and execute the specified provisions:

1) From Station 0+000.0 to Station 0+846.8: The Contactor shall utilize the east side of the McDonald Drain for a distance of 6.0 metres, measured from the east top of drain bank, for the excavation and levelling of spoil materials.

2) From Station 0+846.8 to Station 1+592.6: The Contactor shall utilize the south and west side of the McDonald Drain for a distance of 6.0 metres, measured from the west top of drain bank, for the excavation of the spoil material. All material within this area shall be trucked away and disposed of by the Contractor to a site to be obtained by it at its own expense. Under no circumstances, shall the disposal of fill or leveling of material be permitted within this working corridor, without the explicit direction of the adjacent landowner.

3) From Station 1+592.6 to Station 1+966.4: The Contactor shall utilize the east side of the McDonald Drain, within the boulevard of County Road 31, for the excavation of the spoil material. All material within this area shall be trucked away and disposed of by the Contractor to a site to be obtained by it at its own expense. Under no circumstances, shall the disposal of fill or leveling of material be permitted within this working corridor.

4) From Station 1+966.4 to Station 2+282.6: The Contactor shall utilize the west side of the McDonald Drain for a distance of 6.0 metres, measured from the west top of drain bank, for the excavation and levelling of spoil materials.

5) From Station 2+282.6 to Station 2+310.0: The Contactor shall utilize the south side of the Sturgeon Creek for a distance of 6.0 metres, measured from the south top of drain bank, for the excavation and levelling of spoil materials.

In the event that a landowner owns property on both sides of the drain, the landowner can choose which side of the drain to place the spoil. The landowner shall notify the Drainage Superintendent of their preference of spoil placement prior to the commencement of the works on the drain.

Any damages caused, resulting from non-compliance of the above noted provisions, shall be restored by the Contractor to its original condition, at the Contractor’s expense.

VI. EXCAVATION AND DISPOSAL OF FILL

The open drain shall be excavated to the lines, levels, grades and cross sections as shown on the accompanying drawings or as may be further established by the Town Drainage Superintendent or the Consulting Engineer at the time of the work. The drain shall be carefully excavated so as to not disturb the existing banks, rock protection, and vegetation, except for those portions of the drain where widening or restoration of a stable drain bank configuration is required. Where existing rock protection has to be removed to provide the proposed bank protection, the Contractor shall salvage the rock and use same to carry out the required bank protection as outlined further in

these specifications. The bottom width of the drain and the side slopes of the excavation shall conform to the dimensions given on the drawings. In no case shall the drain bottom project above the grade line as shown on the accompanying drawings, and as determined from the Bench Marks. The finished side slopes of the drain shall be no steeper than 1.5 horizontal to 1.0 vertical on both the roadside and on the landward side. The Contractor shall be very careful to not unnecessarily deepen the drain. In the event that over-excavation of the drain has occurred, and drain banks have been compromised, the Contractor will not be permitted to place native fill compacted into place and reshaping. In this case, the Contractor will be required to obtain a Licensed Professional Engineer, at its own expense, to prepare a repair detail to ensure that long-term stability is maintained. Such repairs shall be subject to approval of the Town Drainage Superintendent and/or the Consulting Engineer. No extras shall be charged to the project for over-excavation repairs.

The Contractor is advised that all excavated material from the work along residential and lawn areas shall be hauled away and disposed of by the Contractor at its own expense. In all cases the disposal of any trucked material will be the responsibility of the Contractor, and any work at the disposal site shall be established between the Contractor and the site owner. The Contractor shall ensure that any permits required for fill disposal are obtained from the appropriate authority. The Contractor will be responsible for keeping all private and public roadways free and clear of mud and debris resulting from its use of same for access and hauling purposes. Along the course of the agricultural lands abutting the drain, the Contractor shall excavate and dispose of the materials from the drain on the abutting adjacent lands.

The excavated material to be cast onto the adjoining lands shall be well and evenly spread over a sufficient area so that no portion of the excavated earth is more than 300mm (12 in.) in depth. The material shall be kept at least 1.2 metres (4.0 ft.) clear from the finished edge of the drain, care being taken not to fill up any existing tiles, ditches, furrows or drains with the excavated material. The excavated material to be spread upon the lands shall be free from rocks, cobbles, boulders, stumps, rubble, rubbish or other similar material and these materials. If encountered, these deleterious materials shall be hauled away by the Contractor and disposed of at a site to be obtained by it at its expense.

The Contractor should visit the drain site and confirm for itself the extent of trucking required on this project. All culverts, bridges, and enclosures, along the drain being maintained on this project are to be flushed out and cleaned to the same grades and widths as the design parameters provided and attached herein for the drains and the cleaning out of all of same shall be performed to the full satisfaction of the Town Drainage Superintendent and/or Consulting Engineer. All of the

excavated material within existing culverts and across the full width of the municipal roadways, including all of the sediment material cleaned from within the structures shall be completely trucked away by the Contractor and disposed of at its own expense. All areas disturbed by these works shall be fully restored to their original condition at the Contractor's expense.

VII. REMOVAL OF BRUSH, TREES AND RUBBISH

Where there is any brush, trees or rubbish along the course of the drainage works, including the full width of the access, all such brush, trees or rubbish shall be close cut and grubbed out, and the whole shall be chipped up for recycling, burned or otherwise satisfactorily disposed of by the Contractor. The Contractor shall also pay particular attention to protecting all of the existing decorative trees and shrubs, especially where the works are being carried out along the frontage of a residential grassed area. The only decorative trees and shrubs to be removed and replaced of are those that are referred to within the accompanying drawings and the specifications. The Contractor shall remove all stumps and associated tree roots in areas where the existing structures are being replaced, and as identified within the plans.

The brush and trees removed along the course of the work are to be put into piles by the Contractor in locations where they can be safely chipped and disposed of, or burned by it, or hauled away and disposed of by the Contractor to a site to be obtained by it at its expense. Prior to and during the course of any burning operations, the Contractor shall comply with the guidelines prepared by the Air Quality Branch of the Ontario Ministry of the Environment, and shall ensure that the Environmental Protection Act is not violated. The Contractor will be required to notify the local fire authorities and co-operate with them in the carrying out of any work. The removal of brush and trees shall be carried out in close consultation with the Town Drainage Superintendent and/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 established, in consultation with the Town Drainage Superintendent, the Consulting Engineer, and the Owners, to be removed as part of the works. The Contractor shall note that protecting and saving the trees may require the Contractor to carry out hand work around the trees, bushes, and shrubs to complete the necessary final site grading and restoration.

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

Any trees that need to be removed shall be cut and cleared to a maximum height of 75mm (3”). Brush and bushes shall be cut to ground level. Once all of the trees have been cut to the required level by the use of a chainsaw or other acceptable mechanical equipment, the Contractor may utilize a flail machine. The flail machine may be used to cut and trim all remaining brush and trees which are smaller than 100mm (4”) in diameter along either side slope of the drain and the access area. The removal of rubbish and bulrushes or other debris shall be included in the Contractor’s rate of payment for excavation. No excavation shall occur until after brush clearing and close cutting is completed.

The Contractor shall be required to remove any and all tree roots or stumps which obviously cause obstructions to the flow of water in the drain. If encountered, and directed by the Town Drainage Superintendent or the Consulting Engineer, they shall be removed and be chipped or burned together with the rest of the trees and brush at no extra cost to the project.

In no case will brush or trees be allowed to be buried in the spoil bank or within the excavated material. The Contractor will be required to brush-rake the excavated material to remove said brush and trees from the spoil, if so instructed by the Town Drainage Superintendent or the Consulting Engineer.

VIII. FENCING

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

IX. DETAILS OF BRIDGES AND ROAD CROSSING WORK

The Contractor shall provide all material, labour and equipment to replace the existing access bridges and road crossings within the McDonald Drain requiring work, as outlined on the plans, the Schedule of items, and in these specifications.

The existing culvert pipes slated to be removed from the existing access bridge and road crossings along the McDonald Drain, shall be replaced with new Aluminized Steel Type II Corrugated Hel-Cor Pipe with rolled annular ends with all pipes having the minimum thickness and corrugation profiles as shown. All culvert pipes within this project shall be set to the grades as shown on the plans or as otherwise established herein and the Town Drainage Superintendent or the Consulting Engineer may make minor changes to the bridge alignment as they deem necessary to suit the site conditions. All work shall be carried out in general accordance with the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENT, BACKFILLING AND INSTALLATION PROCEDURES"** attached to this report and labelled **Appendix "C"**.

X. ALUMINIZED STEEL PIPE INSTALLATION

The new Aluminized Steel Type II Corrugated Hel-Cor pipe to be installed on this project 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 6.00 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 10C (Corrugation) bolted couplers with similar thickness as the associated culvert pipe, unless otherwise noted in the accompanying drawings. The Aluminized Steel Type II Corrugated pipe for this installation must be inspected and approved by the Town Drainage Superintendent or the Consulting Engineer prior to its placement in the drain.

The Contractor shall note that the placement of any new culvert pipe shall be performed totally in the dry and it shall be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer.

The new Aluminized Steel pipes for these installations are to be provided with a minimum depth of cover from the top of the pipe of 300mm (12"). If the bridge culvert structures are placed at their proper elevations, same should be achieved. If the Contractor finds that the minimum cover is not being met, they shall notify the 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 structures to properly fit the channel parameters, **all of the design grade elevations must be strictly adhered to**.

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

The installation of the complete length of the culvert pipes, including all appurtenances, shall be completely inspected by the Town Drainage Superintendent or the Consulting Engineer's Inspector prior to backfilling any portions of same. Under no circumstance shall the Contractor commence the construction or backfill of the new culvert pipe without the site presence of the Town Drainage Superintendent or the Consulting Engineer's Inspector to inspect and approve said installation. The Contractor shall provide a minimum of forty-eight (48) hours notice to the Town Drainage Superintendent or the Consulting Engineer prior to commencement of the work. The installation of the new culvert structures are to be performed during normal working hours of the Town Drainage Superintendent and the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend said working hours.

Where the new culvert pipe is being installed across County Road 18, the Contractor shall backfill same with Granular "B" Type II compacted in place to a minimum 98% of Standard Proctor Density topped with a minimum 450mm thickness of Granular "A" compacted in place to a minimum 100% of Standard Proctor Density and same shall be provided and placed as shown and detailed in the **"Roadway Crossing Backfill Detail"** on Sheet 2 of the accompanying drawings. Where the new pipe is located under an existing driveway, the Contractor shall backfill the entire trench for the width of the driveway with Granular "B" Type II backfill compacted in place to a minimum 98% of Standard Proctor Density with the exception of the top 300mm which shall be backfilled with Granular "A" material also compacted in place to a minimum Standard Proctor Density of 98%. Where the new pipe is located within the boulevard and along a 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 once the existing culverts are removed, the Contractor shall supply same all at its own cost. 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 cost. All of the native backfill material and the topsoil shall be compacted in place to a minimum Standard Proctor Density of 96%. A **"Typical Backfill Detail for Boulevard Areas"** has been prepared and is included on Sheet 2 of the accompanying drawings, and the Contractor shall comply to same wherever possible.

All native backfill material shall be placed in compacted lifts 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 boulevard areas shall be graded to provide positive drainage towards any catch basin or endwall as shown in the accompanying drawings.

The Contractor shall provide a shop fabricated aluminized steel welded stubs and saddle type catch basin at the location and to the size and invert elevation established in the accompanying drawings. The shop fabricated aluminized steel welded stubs being provided as part of the culvert are present in order to connect the 4th Concession Branch of the McDonald Drain into said culvert. The connection between the shop fabricated aluminized steel welded stub shall be connected utilizing a Aluminized Steel 10C (Corrugation) bolted couplers with similar thickness as the associated culvert pipe, unless otherwise noted in the accompanying drawings. The shop fabricated aluminized steel welded saddle type catch basin shall be fabricated in total compliance with the **"Bridge ② Saddle Type Catchbasin Detail"** shown on Sheet 4 of the accompanying drawings.

The Contractor shall also note that the placing of the replacement culverts shall be completed so that they totally comply with the parameters established and noted in the Bridge Details. These culverts shall be set on an even grade and the placement shall be performed totally in the dry, and the Contractor should be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor shall also be required to supply a minimum of 150mm (6") of 20mm (3/4") clear stone bedding underneath the culvert pipe extending from the bottom of the drain to the culvert invert grade, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. Furthermore, if an unsound base is encountered, it must be removed and replaced with 20mm (3/4") clear stone satisfactorily compacted in place to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor is to note that when replacing the existing structures, it shall be required to excavate a trench having a width not less than the new pipe outside diameter plus a 600mm working width on both sides of the new pipe.

XI. ASPHALT PAVEMENT

Where the work encroaches on the existing asphalt roadway at Road 5 East and the County Road 18/ County Road 18 intersection, the Contractor shall neatly saw cut the asphalt and same shall be restored with fully compacted Granular "A" backfill and a minimum of 100mm thick hot mix asphalt, to be placed in a

minimum two (2) equal lifts, or to the existing asphalt thickness if greater, to match the existing roadway elevation. All road asphalt shall be saw cut to a point 150mm beyond the trench limits and shall be restored as shown in the **"Road Crossing Backfill Detail"** on Sheet 2 of the accompanying drawings. The Contractor shall be required to dispose of all removed asphalt material, and shall compact the Granular "A" as well as the hot mix asphalt to 100% of Standard proctor Density, and complete all of the roadway restoration to the full satisfaction of the County of Essex Roads Department, the Town Drainage Superintendent, and the Consulting Engineer.

The Contractor shall supply and place hot-mix asphaltic concrete pavement, conforming to OPSS Form 310, base course Type Superpave 19 and Superpave 12.5 surface course. The Contractor shall supply asphaltic mix designs to the Engineer for approval prior to any asphalt being laid.

All equipment used for placing and compacting the asphalt shall be approved by the Engineer. A paver shall be used for spreading and initial compaction of the asphalt. It shall be equipped with a distributing screw in front, adjustable screeds and be capable of spreading the mixture without segregation, in thickness from 12.5mm to 75mm and in width from a minimum of 1.8m to a maximum width of 4.0m, in increments of 0.15m. It shall also be equipped with a 3.0m straight edge for detecting variations from horizontal of 3.8mm in 3.0 metres.

The Contractor shall spread and compact the course of asphaltic concrete on a dry and solid base. The asphaltic concrete pavement delivered shall have a minimum temperature of 118 degrees Celsius (245 degrees F) and a maximum temperature of 150 degrees Celsius (300 degrees F) after spreading and prior to initial rolling. The Engineer shall reject any material which does not meet temperature requirements.

The Contractor shall hand spread asphaltic concrete at base widening, deep or irregular sections, intersections, turnouts, etc.

The asphaltic concrete shall be rolled in accordance with OPSS Form 310. The contractor shall compact the asphaltic concrete until 97% of the density achieved in the laboratory has been reached. Hand tampers shall be used to compact asphaltic concrete in areas where machines have no access.

All joints, curbs, gutters, manholes, catch water basins and other structures at the point of contact with the asphaltic concrete, shall be painted with SS-1 Emulsion, OPSS Form 1102 or approved equal. The Contractor shall repair any faulty work under the Engineer's supervision.

XII. REMOVALS

Where existing culverts are to be replaced, the Contractor shall completely remove and dispose of all broken concrete slab pieces, concrete filled jute bags of the existing headwalls and decorative concrete curbs, as well as the deteriorated pipe and any deleterious materials that may be encountered in removing same. Furthermore, all unsuitable or deleterious materials from the excavation and removal of existing culverts, the granular approaches to the bridge or installation of new headwalls shall be hauled away and disposed of by the Contractor to a site to be obtained by it at its own expense. Likewise, where indicated in the plans, or in the Schedule of Items, or in the Specifications, the Contractor shall remove the existing culvert pipe and dispose of all of same at a site to be obtained by it at its own expense. In all cases, the disposal of any trucked material with be the responsibility of the Contractor and it shall ensure that any permits required for fill disposal are obtained from the appropriate authority. The Contractor will be responsible for keeping all private and public roadways free and clear of mud and debris resulting from its use of same for access and hauling purposes.

The Contractor shall divert existing swales and tiles or pipes where they are impacted by the new bridge structures. The Contractor shall remove and dispose of unsuitable existing tile and extend and divert the tile with the same size Big ‘O’ Boss 2000 or equal material in general conformance with the **“Lateral Tile Outlet Detail”** on Sheet 4 of the accompanying drawings.

XIII. GENERAL EROSION PROTECTION

At the locations indicated on the plans, the Contractor shall protect the drain bank utilizing general erosion protection. Once the Contractor has cut and shaped the drain bank, the Contractor shall supply all material and labour to place general erosion protection on the banks of the drain as determined by the Town Drainage Superintendent or the Consulting Engineer during construction.

At the locations identified within the plans, the general erosion protection is to be embedded into the side slopes of the drain a minimum thickness of 305mm (12”) and same shall be underlain in all cases with a non-woven synthetic filter mat. The Contractor shall protect the existing rock protection or restore all disturbed rock protected areas. For all other general erosion protection installations, the rock protection is to be embedded into the side slopes of the drain a minimum thickness of 305mm (12”) and same shall be underlain in all cases with a non-woven synthetic filter mat. As part of the erosion protection, the Contractor shall also construct a 450mm (18”) thick and 450mm (18”) wide keyway along the toe of the slope of the drain, as illustrated within the **“Standard Erosion Protection Detail”** on Sheet 4 of the plans. Furthermore, all

rock material shall be underlain with a non-woven synthetic filter mat. The synthetic filter mat shall not only be laid along the flat portions of the quarried limestone protection, but is also to be contoured to the exterior limits of same between the quarried limestone and the unprotected drain side slope. The Contractor, in placing the general erosion protection, shall carefully tamp the quarried limestone pieces into place with the use of the excavator bucket so that said protection, when completed, will be consistent, uniform, and tightly laid, and in no instance shall the quarried limestone pieces protrude beyond the exterior contour of the unprotected drain side slopes along either side of the drain. The general erosion protection shall be installed so that it extends up on the drain side slope as shown and detailed on the cross sections included within the plans. The synthetic filter mat to be used shall be non-woven, Geotextile GMN 160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products, or equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm (4") to a maximum of 250mm (10"). Said rock is available from Amherst Quarries Ltd. in Amherstburg, Ontario, or equal.

XIV. SLOPED QUARRIED LIMESTONE END PROTECTION

Once the new aluminized steel corrugated pipe has been set in place, the Contractor shall install sloped quarried limestone end protection at both ends of each access, where identified within the accompanying drawings. The top 305mm (12”) of backfill material over the ends of the corrugated steel pipe, from the invert of said pipe to the top of the driveway elevation of the access bridge, shall be quarried limestone. The quarried limestone shall be provided as shown and detailed on the plans or as indicated in the Standard Specifications in **Appendix “C”**. The quarried limestone to be placed on the sloped ends of the access bridge or enclosure shall be underlain with a synthetic **non-woven** geotextile filter fabric. The sloped quarried limestone protection is to be rounded as shown on the plan details and shall also extend along the drain side slopes to a point directly in line with the ends of the culvert pipe. The road side approach to the entrance shall be provided with a minimum 5.0m radius at each end of the driveway entrance. All work shall be completed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer.

The quarried limestone shall be provided as is 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 “GMN160” conforming to O.P.S.S. 1860 Class 1 or approved equal, as an underlay. 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 full satisfaction of the Town Drainage Superintendent or Consulting Engineer.

The installation of the sloped quarried limestone end protection, unless otherwise specified herein, shall be provided in total compliance with Item 2, Item 3, and Item 4 of the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENT, BACKFILLING AND INSTALLATION PROCEDURES".** These are attached to the back of these specifications and labelled **Appendix "C"**. The Contractor shall comply in all respects with the General Conditions included in Item 4 and the **"Typical Quarried Limestone End Protection"** detailed within the accompanying drawings.

XV. PRECAST INTERLOCKING CONCRETE BLOCK HEADWALLS

Once the new aluminized steel corrugated pipe has been set in place, the Contractor shall construct precast interlocking concrete block headwalls at both ends of the access, where identified within the accompanying plans. The precast interlocking concrete block headwalls are to be provided and laid out as is shown and detailed in the accompanying drawing, and as is noted in the Standard Specifications in **Appendix "C"**.

The standard precast interlocking 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., or 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. All precast concrete blocks shall have a relatively smooth and consistent exterior finish for all blocks above the invert of the culvert. 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 smooth, uniform finish.

Precast interlocking blocks that abut the culvert pipe 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 non-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 150mm 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 badder of 1 unit horizontal for every 5 units of vertical distance throughout its full height and shall include filter cloth behind the wall for the full height of the blocks to prevent soil migration though any joints. Filter cloth fabric shall be non-woven geotextile material and be minimum GMN-160 meeting O.P.S.S. Class I. The non-woven filter cloth are available from Armtec Construction Products, or 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 the appropriate depth to achieve the required top elevation of the wall.

The Contractor shall arrange for the supplier to provide an 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 culvert 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 on an inward slope no steeper than the specified badder, and shall extend from the end of the Aluminized Steel Corrugated Hel-Cor Pipe to the top elevation of the driveway. The precast interlocking concrete block headwall shall be installed perpendicular to the drain banks. The top elevation of the headwalls, opposite the travelled roadway, are to be set no less than 75mm (3"), below the existing ground elevation. The alignment of these headwalls shall be performed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer.

The installation of the precast interlocking concrete block headwalls and the placement of the backfill shall be carried out at the same time and shall be provided in total compliance with Item 1, Item 3, and Item 4 of the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENT, BACKFILLING AND INSTALLATION PROCEDURES".** These are attached to the back of these specifications and labeled **Appendix "C"**. The Contractor shall also comply in all respects with the General Conditions included in Item 4 and the **"Typical Precast Interlocking Concrete Block Headwall End Protection Detail"** shown on Sheet 2 of the accompanying drawings. The installation

of the precast interlocking concrete block headwalls shall also comply with the "Block Headwall Installation Instructions for Culverts" provided by Underground Specialties Inc., as outlined in **Appendix "C"**.

XVI. BENCHMARKS

Also, for use by the Contractor, we have established Benchmarks along the course of the work and especially at the locations where structures are being replaced.

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

XVII. ANCILLARY WORK

During the course of any repair or improvements to the structures, the Contractor will be required to protect or extend any existing tile ends and connect them to the drainage works to maintain the drainage from the adjacent lands. All existing tiles shall be extended utilizing solid standard duty High Density Polyethylene (H.D.P.E.) or equal plastic pipe of the same diameter as the existing tile and shall be installed in accordance with the **"Standard Lateral Tile Detail"** included in the plans, unless otherwise noted. Connections shall be made using a manufacturer's coupling wherever possible. For other connections, the Contractor shall utilize a grouted connection. Grouted mortar joints shall be composed of three (3) parts of clean, sharp sand to one (1) part of Portland cement with just sufficient water added to provide a stiff plastic mix, and the mortar connection shall be performed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The mortar joint shall be of a sufficient mass around the full circumference of the joint on the exterior side to ensure a tight, solid seal. The Contractor is to note that any intercepted pipes along the length of the existing culverts are to be extended and diverted to the downstream end of the new

culvert unless otherwise noted in the accompanying drawings. All cuts or nicks to steel structures shall be touched up with a thick coat of zinc rich paint (Galvicon or equal) in accordance with the manufacturer's recommendations.

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

The Contractor, when doing his 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 full satisfaction of the Town Drainage Superintendent and the Consulting Engineer.

Each driveway access shall have a minimum top width of 6.10 metres (20.0ft.) and the roadside approach entrance shall be provided with a minimum 5.0 metre radius starting at the edge of the gravel shoulder, as shown and detailed in the plans. The Contractor shall provide a minimum of 300mm thick of compacted Granular "A" for the full width of the driveway access and shall be transitioned to the existing driveway width as outlined within the accompanying drawings.

Although it is anticipated that the bridge structure installation at each site 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 each culvert site during the time of construction. The straw bale check dam shall be to the satisfaction of the Town Drainage Superintendent or Consulting Engineer and must be removed upon completion of the construction. The straw bales may be reused at each site subject to their condition. All costs associated with the supply and installation of this straw bale check dam shall be included in the cost bid for the bridge and enclosure replacements.

GENERAL CONSTRUCTION PROVISIONS

The Contractor is to note that several legal survey bars exist within the work area and it is to take whatever steps necessary to protect all of same. If any iron bars are 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 its cost.

The alignment of drains throughout shall be to the full satisfaction of the Municipal Drainage Superintendent. The whole of the work shall be done in a neat, thorough and workmanlike manner to the full satisfaction of the Municipal Drainage Superintendent.

The Contractor shall satisfy itself as to the exact location, nature and extent of any existing structure, utility or other object that it may encounter during the course of the work. The Contractor shall indemnify and save harmless, the Municipality and the 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 Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.

All of the work required towards the installation and improvements to all access bridges 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 full satisfaction of the Town Drainage Superintendent and the Consulting Engineer.

XVIII. UTILITIES

All pipe shall be laid in trenches in the general location shown on the accompanying drawings or as may be specifically directed and laid out by the Engineer at the time of construction. The trench shall be located to clear all existing utilities and structures above, on, or below the ground level. 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, hydro 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 co-operate 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.

Should the Contractor discover any conflicts with existing utilities during the course of the work, the Contractor shall

give that utility the opportunity to make adjustments to their plant if required. This work shall be done at the expense of the utility pursuant to Section 26 of the Drainage Act.

XIX. TOPSOIL, SEED AND MULCH

As part of the project, all disturbed and newly filled areas shall be covered with approximately 100mm of scavenged topsoil, fine graded and readied for the seeding and mulching process. If there is a shortage of scavenged topsoil material, the Contractor shall supply the balance of the topsoil needed, all at its own expense. Along the frontage of residential properties, the lawn areas shall be restored by the placement of good quality OSECO Lawn Seed Mixture Canada No. 1 or equal. All existing roadway grass boulevard areas and open drain side slopes shall be restored utilizing a seed and mulch mixture which shall thoroughly restore same to their pre-construction conditions, or better. The placing and grading of all topsoil shall be carefully and meticulously carried out according to Ontario Provincial Standard Specifications, Form 570, dated November 2007, or as subsequently amended or as amended by these Specifications.

The Contractor is advised that control of erosion and sedimentation is a major requirement of this project. The Contractor will be expected to implement control measures including, but not limited to, utilizing silt fences and straw bales in the swale and drain bottoms to reduce the amount of sediment escaping downstream into the receiving water bodies. Said work shall be carried out in general conformance with Ontario Provincial Standard Specifications, Form 577, dated November 2006, or as subsequently amended or as amended by these Specifications. As an integral part of the sedimentation control, the Contractor will be required to carry out seeding and mulching on a timely basis so that no portion of the new swales or newly filled areas or open drain restored areas are left exposed for an extended period of time.

The 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.

As part of the seeding and mulching operation, the Contractor will be required to provide either a hydraulic mulch mix or spread straw mulch with an adhesive binder in accordance with O.P.S.S. 1103.05.03, dated November 2007, 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. The Contractor shall provide for the watering of newly seeded areas in accordance with O.P.S.S. requirements, and as part of the work, the Contractor must provide a full one (1) year guarantee on all seeding and mulching work, and will be required to repair all areas that erode or where the grass cover fails to catch. All work shall be meticulously done and completed

in a good and workmanlike manner to the complete satisfaction of the Town Drainage Superintendent and the Consulting Engineer.

XX. SPECIAL PROVISIONS FOR REPLACEMENT AND IMPROVEMENTS

The Contractor shall provide for the construction and improvements to the structures along the McDonald Drain. We are providing below not only the general description of the works being carried out for each structure, but also detailed information regarding any special provisions also being provided as part of the structure improvements, as follows:

Bridge ② (Bernardo & Margeretha Neufeld, 340-10200)

The Contractor shall completely remove the existing corrugated steel pipe and end treatments and dispose of same as outlined previously in these specifications. In addition to the culvert pipe and headwalls, the Contractor shall also remove and dispose of the existing decorative concrete curb on both headwalls. The existing light fixtures attached to the existing curbs shall be removed and returned to the bridge owner. The Contractor shall then supply and install a new pipe as set out in the chart forming part of the details for **Bridge ②** on the plans. The Contractor shall note that the replacement culvert shall be shifted to the north and connected to the upstream culvert to the north, as identified within the plans. This connection shall include a shop fabricated aluminized steel welded saddle type catch basin and shall be fabricated in total compliance with the **"Bridge ② Saddle Type Catchbasin Detail"** shown on Sheet 4 of the accompanying drawings. The new access bridge shall be backfilled according to the preceding specifications, with the exception of the area between the new driveway and the existing driveway to the north. This area shall be backfilled according to the **"Typical Backfill Detail for Boulevard Areas"** included on Sheet 2 of the accompanying drawings.

The Contractor shall also note that the existing hedges north of the existing access bridge shall be removed in order to facilitate the new driveway location. These hedges shall be removed and re-planted to a location established by the Owner. The Contractor shall also protect all other existing trees located adjacent to the proposed driveway. All utility services shall be protected, with the exception of the hydro service connected to the existing light fixtures on the existing decorative concrete curbs. Furthermore, the existing mailbox, north of the existing driveway shall be relocated to the north end of the new driveway location. The Contractor shall provide a sloped quarried limestone end treatment at the south end of the new culvert installation, and extend same to the existing erosion protection already present. A gravel transition shall be installed from the new driveway topwidth to the existing driveway at a point approximately 10.50 metres west of the right-of-way limit. All works shall carried out in accordance with these specifications and the accompanying drawings.

Bridge ④ (Heinrich & Agatha Janzen, 340-10105)

The Contractor shall completely remove the existing corrugated steel pipe and end treatments and dispose of same as outlined previously in these specifications. The Contractor shall then supply and install a new pipe as set out in the chart forming part of the details for **Bridge ④** on the plans. The existing driveway top width is approximately 4.00 metres (13.12 ft.) wide. The replacement access bridge shall be installed with a standard 6.10 metres (20.00 ft.) driveway top width. As a result, the existing driveway shall be widened to the south to accommodate the new driveway top width. The Contractor shall protect all existing trees located adjacent to the existing driveway immediately north of the proposed existing structure. The Contractor shall further protect the existing utility services crossing the replacement access bridge. The Contractor shall provide sloped quarried limestone end treatments at each end the new culvert installation. A gravel transition shall be installed from the new driveway top width to the existing driveway at a point approximately 10.0 metres south of the property limit. All works shall carried out in accordance with these specifications and the requirements in **Appendix "C"**.

Road Crossing ⑦ (County Road 18, County of Essex)

The Contractor shall completely remove the existing corrugated steel pipe and headwalls, and dispose of same as outlined previously in these specifications. The Contractor shall then supply and install a new pipe as set out within profile that form part of the details for **Road Crossing ⑦** of the plans. The Contractor shall note that the new culvert shall be fabricated with a welded stub, together with approximately 5.0 metres of 1800mm diameter aluminized steel Type II CSP extension, to receive flows from the 4th Concession Branch of the McDonald Drain. The Contractor shall provide interlocking concrete block headwalls, together with slope quarried limestone erosion protection, at each end of the new culvert installation. The interlocking concrete block headwalls shall be installed as per the configurations outlined within the preceding paragraphs and the accompanying detail.

The Contractor's attention is specifically drawn to the existing utilities located at the County Road 18/County Road 31 intersection. Union Gas and Bell Canada has recently relocated and lowered the existing gasmain and HDSL Cable that was in conflict with the existing road crossing culverts, along the north side of County Road 18. However, the abandoned infrastructure will conflict with the replacement of the road crossing culverts. Therefore, it is the Contractor's responsibility to coordinate with Union Gas and Bell Canada for 3rd party supervision by each Utility Company, to confirm whether the utility is “Dead or Alive”. The Contractor shall note that when the abandoned line has been confirmed, the abandoned utility shall be removed within the trench width, pinched off and abandoned.

It shall also be noted that the existing Bell cables on the south side of the County Road 18/County Road 31 intersection may partially conflict with the installation of the new road crossing culvert. It is anticipated that this conflict can be addressed by providing measures to partially expose a portion of these cables and carefully raise said cables above the new road crossing culvert. Any works to these cables shall be coordinated with Bell Canada for 3rd party supervision.

The Contractor shall also note that the existing hydro pole located at the south end of the County Road 18 road crossing culvert replacement will require the attention of Hydro One. The Contractor shall make arrangements with Hydro One to schedule a "Pole Hold" to ensure that the hydro pole is protected during the culvert replacement. Hydro One has specifically requested that the coordination shall be scheduled a minimum of 2 months prior to commencement of the road crossing replacement, and through the Consulting Engineer.

The Contractor's attention shall also be drawn to the existing watermain located on the south side of the County Road 18/County Road 31 intersection. This watermain shall be located and exposed prior to the replacement of the proposed road crossings culvert, to ensure that the structure will not conflict with same.

In the event that the existing utilities are still found to be in direct conflict with any of the new culvert pipes, then the Contractor is to immediately notify the Town Drainage Superintendent and/or the Consulting Engineer, together with the affected Utility Company, so that the necessary arrangements can be made to avoid conflict with the new culvert pipe. The Contractor shall not in any way perform any work on the utility without explicit permission and supervision from the Utility Company.

The Contractor shall also be required to carry out boulevard widening and improvements adjacent to the proposed headwalls. The Contractor shall also neatly sawcut, remove and restore the existing asphalt with the use of a minimum 100mm thick or match existing thickness of asphalt, with compacted hot mix asphalt placed in minimum two (2) 50mm thick lifts. The existing asphalt shall be carefully saw cut and disposed of. The placement of the new asphalt shall be in a diamond shape as illustrated within the accompanying plans and shall be placed as outlined within the preceding paragraphs.

The Contractor is to note that legal survey bars exist near each end of this road crossing and it is to take steps to protect same. If this iron bar is damaged by the Contractor in any way, it shall arrange for an Ontario Land Surveyor licensed in the Province of Ontario to restore same, all at its cost. Furthermore, all signs removed for the replacement of the existing road crossing culvert shall be replaced and restored to its original location.

All the work associated with **Road Crossing** ⑦ replacement and improvements shall be carried out to the full satisfaction of the Town Drainage Superintendent, the Consulting Engineer, and the County of Essex Roads Department. All works shall also be carried out in accordance with these specifications, the backfill detail identified on Sheet 2, and the requirements within **Appendix "C"**.

Road Crossing ⑨ (Road 5 East, Town of Kingsville)

The Contractor shall completely remove the existing corrugated steel pipe and headwalls, and dispose of same as outlined previously in these specifications. The Contractor shall then supply and install a new pipe as set out within profile that form part of the details for **Road Crossing** ⑨ on the plans. The Contractor shall provide interlocking concrete block headwalls, together with slope quarried limestone erosion protection, at each end of the new culvert installation. The interlocking concrete block headwalls shall be installed as per the configurations outlined within the preceding paragraphs and the accompanying detail.

The Contractor's attention is specifically drawn to the existing gasmain located along the north side of Road 5 East. Union Gas has recently relocated and lowered the existing gas main that was in conflict with the existing road crossing culvert. However, the abandoned infrastructure is still in conflict with the replacement of the road crossing culvert. Therefore, it is the Contractor's responsibility to coordinate with Union Gas for 3rd party supervision, to confirm whether the utility is “Dead or Alive”. The Contractor shall note that when the abandoned line has been confirmed, the abandoned utility shall be removed within the trench width, pinched off and abandoned.

In the event that the existing utilities are still found to be in direct conflict with the new culvert pipes, then the Contractor is to immediately notify the Town Drainage Superintendent and/or the Consulting Engineer, together with the affected Utility Company, so that the necessary arrangements can be made to avoid conflict with the new culvert pipe. The Contractor shall not in any way perform any work on the utility without explicit permission and supervision from the Utility Company.

The Contractor shall also be required to carry out boulevard widening and improvements adjacent to the proposed headwalls. The Contractor shall also neatly sawcut, remove and restore the existing asphalt with the use of a minimum 100mm thick or match existing thickness of asphalt, with compacted hot mix asphalt placed in minimum two (2) 50mm thick lifts.

All the work associated with **Road Crossing** ⑨ replacement and improvements shall be carried out to the full satisfaction of the Town Drainage Superintendent, the Consulting Engineer, and the Town Public Works Department. All works shall also be

carried out in accordance with these specifications, the backfill detail identified on Sheet 2, and the requirements within **Appendix "C"**.

XXI. GENERAL CONDITIONS

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

b) The Contractor shall satisfy itself as to the exact location, nature and extent of any existing structure, utility or other object which it may encounter during the course of the work. The Contractor shall indemnify and save harmless the Town of Kingsville and the Consulting Engineer and its' representatives for any damages which it may cause or sustain during the progress of the work. It shall not hold the Town of Kingsville or the Consulting Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.

c) The Contractor shall provide a sufficient number of layout stakes and grade points so that the Drainage Superintendent and Consulting Engineer can review same and check that the work will generally conform with the design and project intent.

d) 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 Town shall have the right to have the necessary repair work done by its' employees and the cost of all labour and materials used to carry out the repair work shall be deducted from the Contractor's contract and credited to the Town. The Contractor, upon completing the works, shall clean all debris and junk, 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.

e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. A Traffic Control Plan is required on this project. The Traffic Control Plan is to comply with The Ontario Traffic Manual’s Book 7 for Temporary Conditions. A suitable Traffic Control Plan must be submitted to the Consulting Engineer,

the Town and/or the County of Essex for approval, where applicable.

f) 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.

g) 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.

h) All driveways, laneways and access bridges, or any other means of access on to the job site shall be fully restored to their former condition at the Contractor's expense. Before authorizing Final Payment, the Town Drainage Superintendent and the Consulting Engineer shall inspect the work in order to be sure that the proper restoration has been performed. In the event that the Contractor fails to satisfactorily clean up any portion of these accesses, the Consulting Engineer shall order such cleanup to be carried out by others and the cost of same be deducted from any monies owing to the Contractor.

i) The Contractor will be required to submit to the Town, a Certificate of Good Standing from the Workplace Safety and Insurance Board prior to the commencement of the work and the Contractor will be required to submit to the Town, a Certificate of Clearance for the project from the Workplace Safety and Insurance Board before Final Payment is made to the Contractor.

j) 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.

k) 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 Town of Kingsville 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 Town Clerk and the Consulting Engineer prior to the commencement of work.

l) Monthly progress orders for payment shall be furnished the Contractor by the Town Drainage Superintendent. Said orders shall be for not more than 90% of the value of the work done and the materials furnished on the site. The paying of the full 90% does not imply that any portion of the work has been accepted. The remaining 10% will be paid 45 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 Town, that all liabilities incurred by the Contractor and its Sub-Contractors in carrying out the Contract have been discharged and that all liens in respect of the Contract and Sub-Contracts thereunder have expired or have been satisfied, discharged or provided for by payment into Court.

   The Contractor shall satisfy the Consulting Engineer or Town that there are no liens or claims against the work and that all of the requirements as per the Construction Lien Act, 1983 and its' subsequent amendments have been adhered to by the Contractor.

m) 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.

APPENDIX “A”

E.R.C.A.
CORRESPONDENCE

Subject: RE: McDonald Drain Improvements - Town of Kingsville - D13-028
From: Cynthia Casagrande <CCasagrande@erca.org>
Date: 1/18/2017 2:42 PM
CC: John Henderson <JHenderson@erca.org>
To: Tony Peralta <tony@peraltaengineering.com>

Dear Tony:

We have had an opportunity to review the preliminary information contained in your email below regarding proposed improvements to the McDonald Drain and the 4 culvert replacements. We find this preliminary information acceptable. We look forward to receiving a draft report for our review and comment.

If further information or clarification is required, please do not hesitate to contact this office.

Yours truly,

Cynthia Casagrande
Regulations Coordinator
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311
Essex ON N8M 1Y6
(519) 776-5209, Ext. 349

From: Tony Peralta [mailto:tony@peraltaengineering.com]
Sent: Wednesday, January 11, 2017 4:28 PM
To: Cynthia Casagrande <CCasagrande@erca.org>; John Henderson <JHenderson@erca.org>
Subject: Re: McDonald Drain Improvements - Town of Kingsville - D13-028

Cynthia and John;

My apologies for not including the attachment in my original email. Attached is the 2008 Updated Maintenance Schedule plan, as previously referenced.

Thank you for your time and attention to this matter.

Regards,

Tony Peralta, P.Eng.

N.J. Peralta Engineering Ltd.
45 Division Street North
Kingsville, ON
N9Y 1E1
(519)733-6587 office
(519)733-6588 fax

-------- Original Message --------
Subject: Re: McDonald Drain Improvements - Town of Kingsville - D13-028
From: Tony Peralta <tony@peraltaengineering.com>
To: Cynthia Casagrande <CCasagrande@erca.org>

Cc: John Henderson <JHenderson@erca.org>, Ken Vegh <kvegh@kingsville.ca>, Diane Broda <dbroda@kingsville.ca>
Date: Wed Jan 11 2017 16:21:50 GMT-0500 (Eastern Standard Time)

Good afternoon Cynthia;

Further to the information you have provided below, and based on your request, we are providing you with the preliminary design proposals for the above noted project.

As identified in our previous correspondence, we were appointed by the Town of Kingsville, under Section 78 of the Drainage Act, to investigate the cause of water backup within the upper portion of the McDonald Drain. As part of these investigations we have determined that this drain is subject to significant sediment accumulation due to the erosive soil conditions and extremely flat drain grade (0.04%). Through discussions with the affected upstream landowner (who submitting the request), at this time we do not intend on performing any major improvements to the open channel of the McDonald Drain, other than implementing a more frequent drain maintenance program. However, through our investigations, we have found that there are access bridges and road crossings culverts that are in very poor condition and require replacement. With the replacement of these structures, the new culverts can be lowered to provide improvements to the design grades and the carrying capacity of the drain, near the downstream section of the drain.

As a result of the above, we will be replacing two (2) existing access bridges and two (2) road crossing culverts, along with providing new design profile grades for the entire length of the above noted drain. Please note that the following bridge numbers are consistent with the 2008 Updated Maintenance Schedule for the McDonald Drain prepare by our office. A copy of the 2008 plan is attached for your reference.

Bridge #2 - Bernardo & Margeretha Neufeld (340-10200), 2477 County Road 31 - The existing access bridge for the subject residential lands currently consists of a 7.0m long 1700mm+/- CSP with stacked concrete pieces headwall. Immediately upstream of this bridge (approx. 10.0m) is a newer 14.0m long 1800mm dia CSP access bridge, with sloped quarried limestone end protection. Immediately downstream of this bridge (approx. 48.0m) is a 14.0m long 1800mm dia CSP access bridge with sloped quarried limestone end protection. Based on our evaluation, we propose to install a 2000mm dia. CSP pipe, embedded approximately 200mm below the design grade of the drain.

Bridge #4 - Heinrich & Agetha Janzen (340-10105), 2481 County Road 31 - The existing access bridge for the subject residential lands currently consists of a 7.4m long 2200x1350mm CSP Arch with stacked concrete pieces headwall. Immediately upstream of this bridge (approx. 38.0m) is a 13.0m long 1800mm dia CSP sloped quarried limestone end protection. Immediately downstream of this bridge (approx. 48.0m) is a newer 14.0m long 1800mm dia CSP access bridge, with sloped quarried limestone end protection. Based on our evaluation, we propose to install a 2000mm dia. CSP pipe, embedded approximately 200mm below the design grade of the drain.

Road Crossing #7 - County Road 18 Road Crossing (County of Essex) - The existing road crossing culvert currently consists of a 19.2m long 2200x1350mm CSP Arch with stacked concrete pieces headwall. Approximately 225.0m upstream of this bridge is a 17.4m long 1800mm dia CSP sloped quarried limestone end protection. Approximately 108.0m downstream of this bridge is an enclosure consisting of 55.8m long 1800mm dia CSP access bridge, with vertical headwalls. Based on our evaluation and the sizing requirements for a road crossing, we

propose to install a 3300x2080mm CSP Arch pipe, embedded approximately 300mm below the design grade of the drain. Based on our discussions with the County of Essex, we are proposing to extend the north end of the road crossing culvert beyond the 4th Concession Branch of the McDonald Drain and provide an outlet stub for this intersecting drain. This culvert is being extended in order to provide for a safer intersection.

Road 5 East Road Crossing (Town of Kingsville) - The existing road crossing culvert currently consists of a 14.5m long 375mm/450mm CSP pipe with earthened end treatments. This crossing is serves as an outlet for the roadside ditch on the north side of Road 5 East. Therefore, there are no culverts upstream of said road crossing. Approximately 1329m downstream of this road crossing is a bridge consisting of 17.4m long 1800mm dia CSP sloped quarried limestone end protection. Based on our evaluation, we propose to install a 700mm dia. CSP pipe across Road 5 East.

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 the the Endangered Species Act, we have contacted the Town of Lakeshore 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 contact us at your earliest opportunity as we intend on moving towards the final design stage and finalizing this report as soon as possible.

Regards,

Tony Peralta, P.Eng.

N.J. Peralta Engineering Ltd.
45 Division Street North
Kingsville, ON
N9Y 1E1
(519)733-6587 office
(519)733-6588 fax

-------- Original Message --------
Subject: Re: McDonald Drain Improvements - Town of Kingsville - D13-028
From: Cynthia Casagrande <CCasagrande@erca.org>
To: Tony Peralta <tony@peraltaengineering.com>, John Henderson <JHenderson@erca.org>
Cc: "Ken Vegh" <kvegh@kingsville.ca>, "Diane Broda" <dbroda@kingsville.ca>
Date: Wed Dec 04 2013 16:59:44 GMT-0500 (Eastern Standard Time)

> Dear Tony:
>
> Thank you for providing the preliminary information below with respect to this proposed project.
>
> A review of our floodplain mapping for the McDonald Drain indicates that this drain is located within an area that is under the jurisdiction of the Essex Region Conservation Authority (ERCA) (Section 28 of the *Conservation Authorities Act.*) Prior to undertaking

works, a permit is required from this office.

At this time, we do not expect that there will be any extraneous comments or concerns with respect to this project. However, we cannot be more specific in this regard without an actual proposal to review.

With respect to the DFO concerns and comments, as of November 25, 2013 due to the amendments of the *Fisheries Act* coming into effect, the existing partnership agreements between DFO and CAs are null and void. DFO is providing all Conservation Authority staff information on the amended Act and DFO's new policies on December 10th. Once this office has received the revised information, we will then be able to provide direction and clarification on the processes involved to you.

We look forward to working with you to get this project going. If further information or clarification is required, please do not hesitate to contact this office.

Yours truly,

40logo.jpg

Cynthia Casagrande
Regulations Technician
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311
Essex ON N8M 1Y6
(519) 776-5209, Ext. 349

From: Tony Peralta [mailto:tony@peraltaengineering.com]
Sent: Wednesday, November 27, 2013 3:36 PM
To: John Henderson
Cc: Cynthia Casagrande; Ken Vegh; Diane Broda
Subject: McDonald Drain Improvements - Town of Kingsville - D13-028

Good afternoon John;

We have been appointed by the Town of Kingsville, under Section 78 of the Drainage Act, to investigate and provide an engineer's report for the McDonald Drain. The McDonald Drain is located along the west side of County Road 18 and outlets into the top end of the Sturgeon Creek Drain. Attached is a plan illustrating the general location and the watershed limits of the McDonald Drain.

The request was to investigate the cause of water backup within the upper end of the McDonald Drain. As part of our investigations, we intend on surveying the drain and bridges within the entire length of the drain. As a result, we may be required to do some drain improvements and possibly some access bridge replacements. However, at this stage, it is too premature to identify the extents of the work.

At this time, we would appreciate ERCA/DFO comments, concerns or considerations that may impact this project. We understand that we are at the early stages of this project and the works required is not yet identified. However, we intend on maintaining close consultation with your office to address our findings and recommendations.

We have also contacted the Town of Kingsville regarding MNR screening process under Section 23 of the Endangered Species Act, 2007. We intend on incorporating the MNR mitigation measures, as required, as part of our report.

Thank you for your time and attention to this matter. We look forward to your response.
--

Regards,

Tony Peralta, P.Eng.

N.J. Peralta Engineering Ltd.
45 Division Street North
Kingsville, ON
N9Y 1E1
(519)733-6587 office
(519)733-6588 fax

D.F.O.
BEST MANAGEMENT PRACTICES – CULVERT REPLACEMENTS IN MUNICIPAL DRAINS

Best Management Practices – Culvert Replacements in Municipal Drains

This document describes the conditions on which one may proceed with a culvert replacement in a municipal drain without DFO approval/notification. All municipal, provincial, or federal legislation that applies to the work being proposed must be respected. If the conditions/requirements below cannot be met, please complete the drain notification form and submit it to the Fisheries Protection Program form review at: FisheriesProtection@dfo-mpo.gc.ca.

Potential Impacts to Fish Habitat

- Infilling fish habitat by encroachment of the water crossing footprint or channel realignment to accommodate culvert
- Harmful substrate alteration of fish habitat (e.g. blockage of groundwater upwellings, critical SAR habitat, spawning areas)
- Removal of riparian vegetation and cover along the banks of the municipal drain
- Removal of edge habitat (e.g. undercut bank, shallower areas with lower velocity, aquatic vegetation) creation of barriers to fish movement (e.g. perched crossings, velocity barriers, alteration of the natural stream gradient)
- Alteration of channel flow velocity and/or depth (e.g. oversized culvert resulting in insufficient depth for fish passage at low flow or undersized culvert resulting in a flow velocity barrier at high flow)
- Alteration of channel morphology and sediment transport processes caused by the physical structure of the crossing resulting in upstream and downstream sediment aggradation/erosion
- Re-entry of sediment that was removed/stockpiled into the watercourse
- Erosion downstream from sudden release of water due to the failure of site isolation
- Stranding of fish in isolated ponds following de-watering of the site
- Impingement or entrainment of fish when de-watering pumps are used
- Short term or chronic transport of deleterious substances, including sediment, into fish habitat from construction or road drainage

Requirements

The following requirements must be met:

- There are no aquatic Species at Risk present in the work zone or impact zone. To confirm there are no aquatic Species at Risk present, refer to the document, A Guide for Interpreting Fish and Mussel Species at Risk Maps in Ontario which can be found at: http://www.dfo-mpo.gc.ca/Library/356763.pdf. Links for Ontario Conservation Area specific fish and mussel maps that include critical habitat extents and a list of aquatic Species at Risk found within the conversation authority boundary can be found on Page 5 of A Guide for Interpreting Fish and Mussel Species at Risk Maps in Ontario.
- The culvert is embedded into the streambed and must allow for the free passage of fish.
- The work involves like-for-like replacements of existing road or private access culverts on all drain types without SAR.
- On C and F Drains only, this can also include replacements with extensions and end walls for the purposes of providing the property or road with safe access, but the project permanent footprint will not increase more than 250 m^2 below the high water mark.
- The project does not involve replacing a bridge or arch with one or more culverts installed in parallel or a larger-diameter culvert with more than one culvert installed in parallel.

- The project does not involve building more than one culvert installed in parallel on a single watercourse crossing site (e.g. twin culvert).
- The project does not involve temporarily narrowing the watercourse to an extent or for a duration that is likely to cause erosion, structural instability or fish passage problems.
- The municipal drain has no flow/low flow or is frozen to the bottom at the time of the replacement.
- In-water work is scheduled to respect timing windows (Tables 1 and 2) to protect fish, including their eggs, juveniles, spawning adults, and/or the organisms upon which they feed.
- The work can be conducted using the Culvert Removal Method described below and Standard Measures to Avoid Causing *Serious Harm to Fish* will be implemented when required.

Note: If your project must be conducted without delay in response to an emergency (e.g. the project is required to address an emergency that poses a risk to public health or safety or to the environment or property), you may apply for an Emergency Authorization (http://www.dfo-mpo.gc.ca/asp/forceDownload.asp?FilePath=/pnw-ppe/reviews-revues/Emergency-Authorizations-Autorisations-Urgences-eng.pdf).

Culvert Removal Methodology

- Plan/manage the work site in a manner that prevents sediment from entering the municipal drain by installing sediment and erosion control materials where required. Ensure that a sediment and erosion control plan is developed and modified as necessary for the site.
- Where required, install effective erosion and sediment control measures before starting work to prevent sediment from entering the municipal drain.
- Implement site isolation measures when in-water work is required.
    - Install an impervious barrier upstream of the work area (Figure 1). If possible, install a secondary barrier upstream of the work area for added protection.
    - Attempt to drive out the fish from the work area and then install the impervious barrier downstream of the work area. This may reduce or eliminate the need for a fish salvage.
    - When the drain is flowing, maintain downstream flows (e.g. bypass water around the work site using pumps or flume pipes; Figure 2). Provide temporary energy dissipation measures (e.g. rip-rap) at discharge point of the hose or temporary outlet pipe when required. Routinely inspect bypass pump and hose or pipe to ensure proper operation. Inspect discharge point for erosion and reposition hose/pipe or install additional temporary energy dissipation material as needed.
    - Dewater the isolated work area. The hose for a pump may discharge along the top of the bank into existing vegetation; however, the area should be monitored for signs of erosion. Reposition the hose or install additional temporary energy dissipation material as needed.
    - A fish screen with openings no larger than 2.54 mm (0.10 inches) should be equipped on any pump used during the operation. Note: Additional information regarding fish screens can be found in the DFO Freshwater Intake End-of-Pipe Fish Screen Guideline document (http://www.dfo-mpo.gc.ca/Library/223669.pdf).
    - Collect any fish present in the isolated work area and relocate them downstream.
    - Fish salvage operations must be conducted under a license issued by the Ontario Ministry of Natural Resources and Forestry (MNRF). The MNRF should be contacted well in advance of any work to obtain the required fish collection license.
- Install the culvert so that it is embedded into the streambed; ensure the culvert remains passable (e.g. does not become perched) by fish and wildlife.

- Decommission the site isolation in a manner that minimizes the introduction of sediment. The downstream isolation barrier shall gradually be removed first, to equalize water levels inside and outside of the isolated area and to allow suspended sediments to settle.
- Stabilize and remove waste from the site.
- Where required, maintain effective erosion and sediment control measures until complete re-vegetation of disturbed areas is achieved.

Figure 2. Isolation of Site

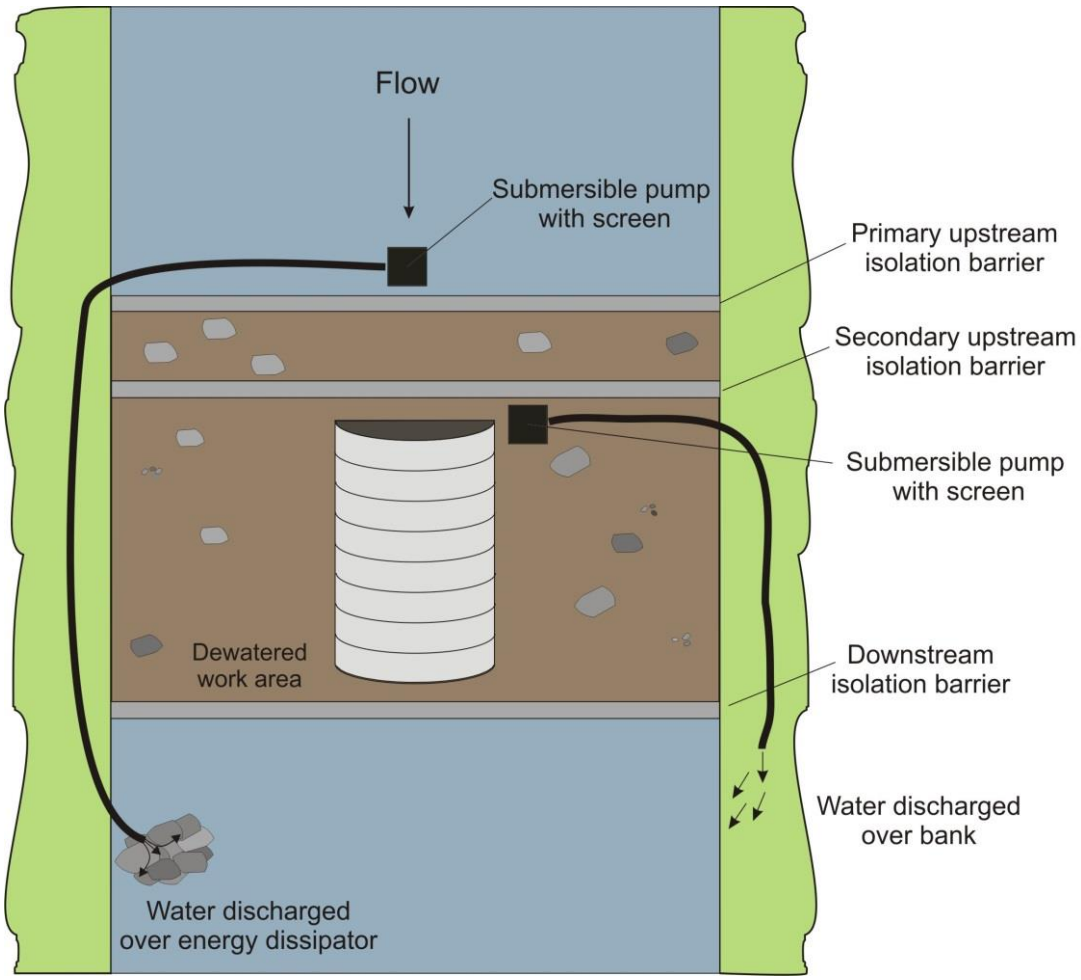


Figure 3. Isolation and Bypass Diversion when Working In-Water

Timing Windows

Figure 1 and Tables 1 and 2 can be used to determine the Restricted Activity period for the drain based on its classification. Note: Timing windows identified on Conservation Authority permits or Ministry of Natural Resources (Government of Ontario) work permits may differ and take precedence.

Figure 1. Ontario's Northern and Southern Region boundaries for determining application of restricted activity timing windows.

Table 1. Restricted Activity timing windows for the protection of spawning fish and developing eggs and fry in the Northern Region. Dates represent when work should be avoided.

Drain Type	Restricted Activity Period
A	September 1 to July 15
B	September 1 to July 15
C	April 1 to July 15
D	September 1 to July 15
E	April 1 to July 15

Table 2. Restricted Activity timing windows for the protection of spawning fish and developing eggs and fry in the Southern Region. Dates represent when work should be avoided.

Drain Type	Restricted Activity Period
A	September 15 to July 15
B	March 15 to July 15
C	March 15 to July 15
D	October 1 to July 15
E	March 15 to July 15

Standard Measures to Avoid Causing *Serious Harm to Fish*

When implementing a culvert removal project in a municipal drain, the *Fisheries Act* still requires an individual/company to ensure they avoid causing *serious harm to fish* during any activities in or near water. The following advice will help one avoid causing harm and comply with the *Act* (for additional information see http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html).

1. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
2. Whenever possible, operate machinery on land above the high water mark or on ice and in a manner that minimizes disturbance to the banks and bed of the municipal drain.
    - Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks.
    - Limit machinery fording of the municipal drain to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the municipal drain are required, construct a temporary crossing structure.
    - Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
    - Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
3. Install effective sediment and erosion control measures before starting work to prevent sediment from entering the municipal drain. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
4. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the municipal drain and runoff water is clear.
5. Undertake all in-water activities in isolation of open or flowing water while maintaining the natural flow of water downstream and avoid introducing sediment into the municipal drain.
6. Ensure applicable permits for relocating fish are obtained and relocate any fish that become trapped in isolated pools or stranded in newly flooded areas to the main channel of the watercourse.
7. Ensure that the water that is being pumped/diverted from the site is filtered (sediment remove) prior to being released (e.g. pumping/diversion of water to a vegetated area).
8. Implement measures for containing and stabilizing waste material (e.g. dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
9. Stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
10. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
11. Remove all construction materials from site upon project completion.

APPENDIX "B"

Note: The Endangered Species Act Review attachments have not been included herein. However, these attachments shall be included as part of the Tender Documents for use by the Contractor, during construction. A copy of these attachments shall be available for viewing at the Municipal Office for those interested.

CORPORATION OF THE TOWN OF KINGSVILLE

2021 Division Road North
Kingsville, Ontario N9Y 2Y9
Phone: (519) 733-2305 FAX: (519) 733-8108
kvegh@kingsville.ca

Subject: Endangered Species Act Review

Dear: Tony

The Town of Kingsville has completed a review of works completed at the above-noted site. Provisions of the Endangered Species Act may apply at this site. Accordingly, the Drainage Department has provided the following comments for your consideration and attention.

A. BACKGROUND:

In accordance with Section 78 of the Drainage Act the following works have been proposed for the McDonald Drain within the Town of Kingsville.

Work to be completed: Investigate possible solutions to improve the functionality of the drain

It is anticipated that the project will take 14 days to complete with improvements beginning fall/winter, 2014.

B. ENDANGERED SPECIES ACT MUNICIPAL AGREEMENT:

Please be advised that the Town of Kingsville has entered into an agreement with the Ministry of Natural Resources under Section 23 of the Ontario Regulation 242/08 of the Endangered Species Act. This noted agreement allows the municipality to review drainage projects under the following sections of the Drainage Act to determine potential impact on Endangered Species identified as existing within the Town of Kingsville:

a) Section 3(18) of the Drainage Act – Maintenance of a ditch constructed under the former Ditches and Watercourses Act;
b) Section 74 of the Drainage Act – Maintenance and repairs of existing drains;
c) Section 77 & 78 of the Drainage Act – Improvement of existing drains;
d) Section 124 of the Drainage Act – Emergency work

Since the proposed work on the McDonald Drain will be completed under Section 78 of the Drainage Act, please be advised that the Town of Kingsville has completed the review of the endangered species under the Endangered Species Act.

The following is a list of the endangered species which may be encountered at the project site.

1. **Fish Species**

   Drainage Department review of the Sensitive Areas Map for Fish Species at Risk showed no presence of endangered fish species in the proposed construction site.

2. **Mussels Species**

   Drainage Department review of the Sensitive Areas Map for Mussels Species at Risk showed no presence of endangered mussel species in the proposed construction site.

3. **Turtle Species**

   Drainage Department review of the Sensitive Areas Map for Turtle Species at Risk showed no presence of endangered turtle species in the proposed construction site.

4. **Snake Species**

   Drainage Department review of the Sensitive Areas Map for Snake Species at Risk identifies the presence of endangered snake SPECIES. The Endangered Species Act agreement identifies the Butler's Garter Snake as threatened and the Eastern Foxsnake as endangered. Attached is a Snake's for Ontario Identifier Guide for further information.

   Or

   Drainage Department review of the Sensitive Areas Map for Snake Species at Risk showed no presence of endangered snake species in the proposed construction site.

C. **EXECUTIVE SUMMARY:**

Based on the review of the Endangered Species Act Municipal Agreement, please be aware of the following endangered species that may be present during construction:

a) The Endangered Species Agreement identifies the proposed work area as an area that is sensitive for turtles and snakes as threatened under the Endangered Species Act. The mitigation plan and MNR Factsheet for snakes and turtles is attached.

The Contractor must be familiar with the mitigation plans and the Ontario Identifier Guides for turtles and snakes that are included with this letter. The Contractor will be responsible for providing the necessary equipment and materials required in the mitigation plans. The Contractor shall contact the Town of Kingsville Drainage Superintendent immediately if any endangered species are encountered during construction.

If you have any questions please contact Ken Vegh, Drainage Superintendent at (519) 733-2305 Ext. 267.

Respectfully yours,

Ken Vegh
Drainage Superintendent/Weed Inspector

Attachments:

- Species Identification Sheets

PART C. TAXA-SPECIFIC MEASURES TO MINIMIZE ADVERSE EFFECTS

ADDITIONAL MITIGATION MEASURES FOR FISH SPECIES

7. Activities undertaken in Sensitive Areas for Fish

7.1. Subject to section 7.2, where a proposed Activity will occur in a Sensitive Area for a fish Species, the Municipality shall contact the MNR to seek further direction.

7.2. Section 7.1 does not apply where the applicable Drainage Works are:

(a) in a naturally dry condition;

(b) classified as a Class F drain under DFO's *Class Authorization System for the Maintenance of Agricultural Municipal Drains in Ontario* (ISBN 0-662-72748-7); or

(c) a closed drain.

ADDITIONAL MITIGATION MEASURES FOR MUSSEL SPECIES

8. Activities undertaken in Sensitive Areas for Mussels

8.1. Subject to section 8.2, where a proposed Activity will occur in a Sensitive Area for a mussel Species, the Municipality shall contact the MNR to seek further direction.

8.2. Section 8.1 does not apply where the applicable Drainage Works are:

(a) in a naturally dry condition;

(b) classified as a Class F drain in DFO's *Class Authorization System for the Maintenance of Agricultural Municipal Drains in Ontario* (ISBN 0-662-72748-7); or

(c) a closed drain.

ADDITIONAL MITIGATION MEASURES FOR TURTLE SPECIES

9. Training and Required On Site Materials for Turtles

9.1. The Municipality will ensure any person:

(a) involved in the capture, temporary holding, transfer and release of any turtle Species has received training in proper turtle handling procedures; and

(b) who undertakes an Activity has a minimum of two Holding Tubs and cotton sacks on site at all times.

10. Activities undertaken in Sensitive Areas and Sensitive Periods for Turtles

10.1. Subject to section 10.2, where a proposed Activity will occur in a Sensitive Area for any turtle Species and during a Sensitive Period for that Species, the Municipality shall:

(a) not undertake any Activities that include the excavation of sediment or disturbance to banks during the applicable Sensitive Period unless otherwise authorized;

(b) undertake Activities in accordance with any additional site-specific measures provided in writing by the MNR Designated Representative;

(c) avoid draw-down and de-watering of the Sensitive Area during the applicable Sensitive Period; and

(d) if authorized by the MNR Designated Representative under (a) above to undertake Activities that include excavation of sediment or disturbance of banks, in addition to any other measures required under (b) above, ensure any person undertaking an Activity has at least two Holding Tubs on site at all times.

10.2. Section 10.1 does not apply where the applicable Drainage Works are:

(a) in a naturally dry condition;

(b) classified as a Class F drain in DFO's *Class Authorization System for the Maintenance of Agricultural Municipal Drains in Ontario* (ISBN 0-662-72748-7); or

(c) a closed drain.

11. Measures for Encounters with Turtles During a Sensitive Period

11.1. Where one or more individuals belonging to a turtle Species is encountered in the undertaking of an Activity in any part of a Work Zone (including, but not limited to, a Sensitive Area) during a Sensitive Period for that Species, the Municipality shall:

(a) capture and transfer all uninjured individuals of that Species into a Holding Tub;

(b) capture and transfer all individuals injured as a result of the Activities into a Holding Tub separate from any Holding Tub containing uninjured individuals;

(c) ensure that the Holding Tubs with the captured individuals are stored at a cool temperature to prevent freezing until the individuals can be transferred; and

(d) immediately Contact the MNR to seek direction and to arrange for the transfer of the individual turtles.

12. Measures for Encounters with Turtles Laying Eggs or Nest Sites

12.1. Where one or more individuals belonging to a turtle Species laying eggs, or an active ~~nest site of any turtle Species, is encountered in undertaking an Activity in a Work Zone,~~ the Municipality shall:

(a) not disturb a turtle encountered laying eggs and not conduct any Activities within 20 metres of the turtle while it is laying eggs;

(b) collect any displaced or damaged eggs and capture any injured dispersing juveniles and transfer them to a Holding Tub;

(c) store all captured injured individuals and collected eggs out of direct sunlight;

(d) immediately Contact the MNR to seek direction and to arrange for the transfer of any injured individuals and eggs;

(e) immediately stop any disturbance to the nest site and recover exposed portions with soil or organic material to protect the integrity of the remaining individuals;

(f) not drive any equipment over the nest site or conduct any Activities within 5 metres of the nest site;

(g) not place any dredged materials removed from the Drainage Works on top of the nest site;

(h) mark out the physical location of the nest site for the duration of the project but not by any means that might increase the susceptibility of the nest to predation or poaching; and

(i) where there are no collected eggs or captured individuals, record relevant information and Contact the MNR within 72 hours to provide information on the location of the nest site.

13. Measures for Encounters with Turtles Outside of a Sensitive Period

13.1. Where one or more individuals belonging to a turtle Species is encountered while undertaking an Activity in any part of a Work Zone (including, but not limited to, a Sensitive Area) but outside of any Sensitive Period for that Species, the Municipality shall:

(a) briefly stop the Activity for a reasonable period of time to allow any uninjured individual turtles of that Species to leave the Work Zone;

(b) where individuals do not leave the Work Zone after the Activity is briefly stopped in accordance with (a) above, capture all uninjured individuals and release them in accordance with section 14.1;

(c) where circumstances do not allow for their immediate release, transfer captured uninjured individuals for a maximum of 24 hours into a Holding Tub which shall be stored out of direct sunlight and then release them in accordance with section 14.1;

(d) capture and transfer any individuals that have been injured into a Holding Tub separate from any Holding Tub containing uninjured individuals; and

(e) store all captured injured individuals out of direct sunlight and immediately Contact the MNR to seek direction and to arrange for their transfer.

14. Release of Captured Individuals Outside of a Sensitive Period

14.1. Where uninjured individuals are captured under section 13.1, they shall be released:

(a) within 24 hours of capture;

(b) in an area immediately adjacent to the Drainage Works;

(c) in an area that will not be further impacted by the undertaking of any Activity; and

(d) not more than 250 metres from the capture site.

14.2. Following a release under section 14.1, the Municipality shall Contact the MNR within 72 hours of the release to provide information on the name of the Drainage Works, the location of the encounter and the location of the release site.

15. Measures for Dead Turtles

15.1. Where one or more individuals of a turtle Species is killed as a result of an Activity in a Work Zone, or if a person undertaking an Activity finds a deceased individual of a turtle Species within the Work Zone, the Municipality shall:

(a) place any dead turtles in a Holding Tub outside of direct sunlight; and

(b) Contact the MNR within 72 hours to seek direction and to arrange for the transfer of the dead individuals.

ADDITIONAL MITIGATION MEASURES FOR SNAKE SPECIES

16. Training and Required On Site Materials for Snakes

16.1. The Municipality will ensure any person:

(a) involved in the capture, temporary holding, transfer and release of any snake Species has received training in proper snake handling procedures; and

(b) who undertakes an Activity has a minimum of two Holding Tubs and cotton sacks on site at all times.

17. Activities undertaken in Sensitive Areas and Sensitive Periods for Snakes

17.1. Where a proposed Activity involves physical infrastructure (e.g., culverts, pump houses, etc.) and will occur in a Sensitive Area for any snake Species and during a *Sensitive Period – Hibernation* for that Species, the Municipality shall undertake the Activity outside of the Sensitive Period, unless otherwise authorized by and in accordance with any site-specific measures provided in writing by the MNR Designated Representative.

17.2. Where a proposed Activity will occur at or adjacent to a known hibernacula (as identified by the MNR) for any snake Species and during a *Sensitive Period – Staging* for that Species, the Municipality shall:

(a) erect effective temporary snake barriers approved by the MNR that will not pose a risk of entanglement for snakes and that shall be secured so that individual snakes may not pass over or under the barrier or between any openings to enter or re-enter the Work Zone;

(b) inspect the temporary snake barriers daily during periods when snakes are active, capture any individuals incidentally encountered within the area bounded by the snake barrier and release the captured individuals in accordance with section 21.1; and

(c) remove the temporary snake barriers immediately upon completion of the Activity.

17.3. Where a proposed Activity that does not involve physical infrastructure will occur in a Sensitive Area for any snake Species and during a *Sensitive Period – Staging* for that Species, the Municipality shall undertake the Activity outside of the Sensitive Period, unless otherwise authorized by and in accordance with any site-specific measures provided in writing by the MNR Designated Representative.

18. Measures for Encounters with Snakes During a Sensitive Period

18.1. Where one or more individuals belonging to a snake Species is encountered, or should an active hibernacula be uncovered, while conducting an Activity in any part of a Work Zone (including, but not limited to, a Sensitive Area) during a Sensitive Period for that Species, the Municipality shall:

(a) capture and transfer all injured and uninjured individual snakes of that Species into individual light-coloured, drawstring cotton sacks;

(b) place all cotton sacks filled with the captured individuals into a Holding Tub;

(c) ensure that the Holding Tub with the captured individuals is stored at a cool temperature to protect the snakes from freezing until the individuals can be retrieved or transferred;

(d) if an active hibernacula is uncovered, cease all Activities at the hibernacula site; and

(e) immediately Contact the MNR to seek direction and to arrange for the transfer and/or retrieval.

19. Measures for Encounters with Snake Nests

19.1. Where an active nest of any of the snake Species is encountered and disturbed while undertaking an Activity in any part of a Work Zone, the Municipality shall:

(a) collect any displaced or damaged eggs and transfer them to a Holding Tub;

(b) capture and transfer all injured dispersing juveniles of that Species into a light-coloured drawstring cotton sack;

(c) place all cotton sacks with the captured injured individuals into a Holding Tub;

(d) ensure that the Holding Tub with the captured injured individuals is stored out of direct sunlight;

(e) immediately Contact the MNR to seek direction and to arrange for the transfer of the injured individuals;

(f) immediately stop any disturbance to the nest site and loosely cover exposed portions with soil or organic material to protect the integrity of the remaining individuals;

(g) not drive any equipment over the nest site or conduct any Activities within 5 metres of the nest site;

(h) not place any dredged materials removed from the Drainage Works on top of the nest site;

(i) mark out the physical location of the nest site but not by any means that might increase the susceptibility of the nest to predation or poaching; and

(j) where there are no collected eggs or captured individuals, Contact the MNR within 72 hours to provide information on the location of the nest site.

20. Measures for Encounters with Snakes Outside of a Sensitive Period

20.1. Where one or more individuals belonging to a snake Species is encountered while undertaking an Activity in any part of a Work Zone (including, but not limited to, a Sensitive Area) but outside of any Sensitive Period for that Species, the Municipality shall:

(a) follow the requirements in section 16;

(b) briefly stop the Activity for a reasonable period of time to allow any uninjured individual snakes of that Species to leave the Work Zone;

(c) if the individuals do not leave the Work Zone after the Activity is briefly stopped in accordance with (b) above, capture all uninjured individuals and release them in accordance with section 21.1;

(d) where circumstances do not allow for the immediate release of captured uninjured individuals, they may be transferred into individual, light-coloured, drawstring cotton sacks before placing them in a Holding Tub which shall be stored out of direct sunlight for a maximum of 24 hours before releasing them in accordance with section 21.1;

(e) capture and transfer any individuals injured as a result of conducting the Activities into a Holding Tub separate from any Holding Tub containing uninjured individuals; and

(f) store all captured injured individuals out of direct sunlight and immediately Contact the MNR to seek direction and to arrange for their transfer.

21. Release of Captured Individuals Outside of a Sensitive Period

21.1. Where uninjured individuals are captured under section 20.1, they shall be released:

(a) within 24 hours of capture;

(b) in an area immediately adjacent to the Drainage Works where there is natural vegetation cover;

(c) in an area that will not be further impacted by the undertaking of any Activity; and

(d) not more than 250 metres from the capture site.

21.2. Following a release under section 21.1, the Municipality shall Contact the MNR within 72 hours of the release to provide information on the name of the Drainage Works, the location of the encounter and the location of the release site.

22. Measures for Dead Snakes

22.1. Where one or more individuals belonging to a snake Species is killed as a result of an Activity in a Work Zone, or if a person undertaking an Activity finds a deceased individual of a snake Species within the Work Zone, the Municipality shall:

(a) collect and transfer any dead individuals into a Holding Tub outside of direct sunlight; and

(b) Contact the MNR within 72 hours to seek direction and to arrange for the transfer of the carcasses of the dead individuals.

ADDITIONAL MITIGATION MEASURES FOR HERBACEOUS PLANTS

23. Activities Undertaken in Sensitive Areas for Herbaceous Plants

23.1. Where a proposed Activity will occur that involves physical disturbance to vegetated banks or the killing and/or removal of vegetation through chemical or mechanical means in a Sensitive Area for any herbaceous plant Species, the Municipality shall:

(a) undertake the Activity outside of the Sensitive Period, unless otherwise authorized;

(b) limit equipment access and operations to the side of the Drainage Works that will minimize disturbances where any of the plant Species occur;

(c) locate temporary storage sites for excavated sediments or bank materials on areas of open soil away from where any of the plant Species are likely to occur;

(d) not use any broad spectrum herbicides in Sensitive Areas; and

(e) undertake Activities in accordance with any additional site-specific measures provided in writing by the MNR Designated Representative.

ADDITIONAL MITIGATION MEASURES FOR TREE SPECIES

24. Additional Measures for Butternut

24.1. Where Butternuts may exist in a Work Zone and may be affected by an Activity, the Municipality shall:

(a) identify and mark as retainable trees all individual Butternut trees within the Work Zone during work planning site visits unless the individual Butternut has been assessed as a non-retainable tree due to infection by Butternut canker by a person designated by the Minister as a Butternut Health Assessor;

(b) retain and avoid disturbance to all individuals identified under (a) above that have been identified as retainable trees or that have not been assessed, unless otherwise authorized in writing by the MNR Designated Representative;

(c) conduct Activities by:

(i) limiting equipment access and operations to the side of the Drainage Works that will minimize disturbance to where any of the individual Butternut trees occur,

(ii) working around trees,

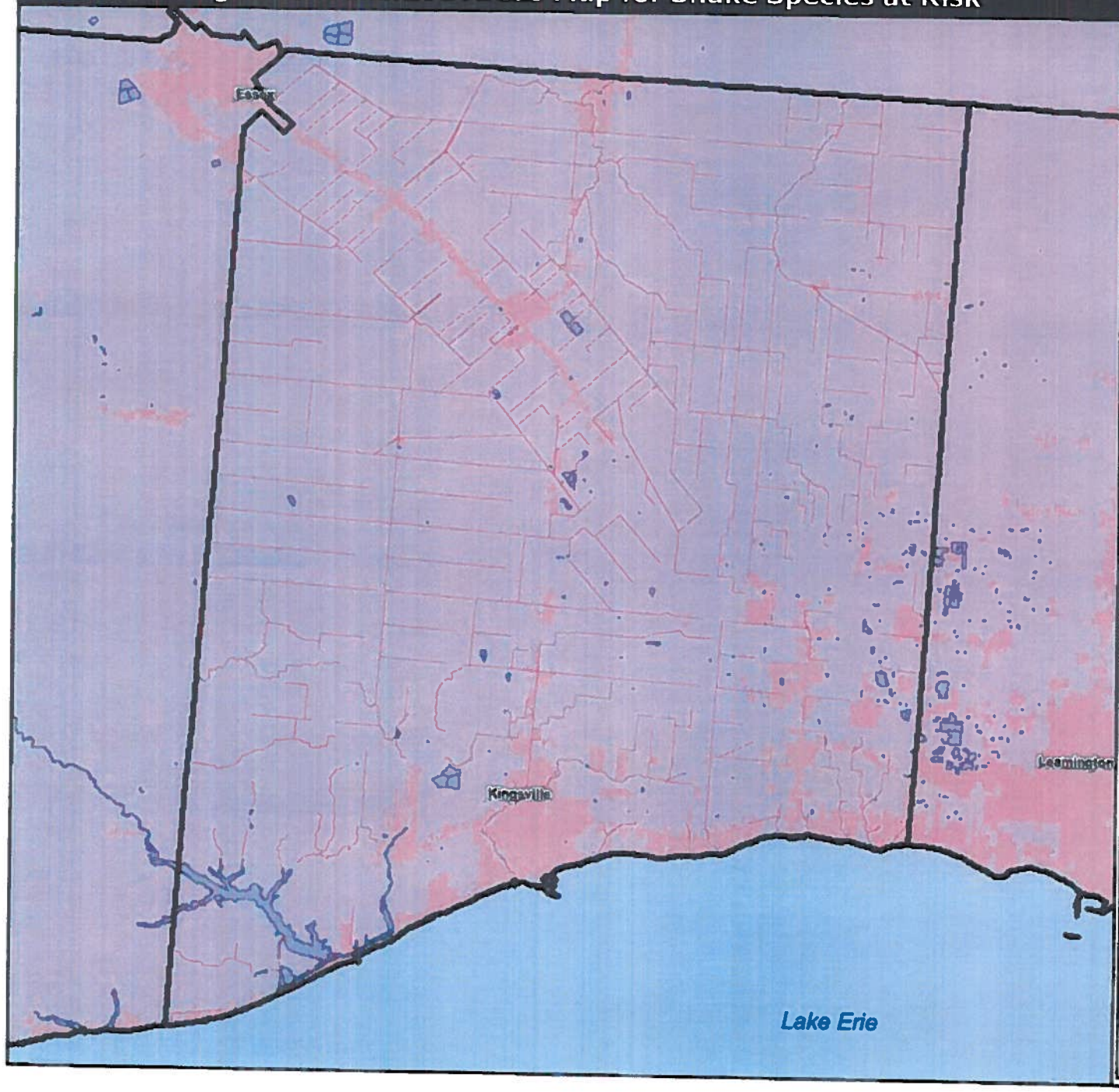
Seasonal Timing Windows Chart

Date Codes	Monthly Intervals: E=Early(days 1-10); M=Middle(days 11-20); L=Late(days 21-31)																							
Dates	Jan		Feb		Mar			Apr			May			Jun			Jul			Aug			Sept			Oct			Nov	Dec
					E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L		
Taxa/Common Name																														
Aquatic Species																														
Fish	IF in a Sensitive Area Identified on Maps THEN Prior Notification to the MNR is required (regardless of time of year)																													
Mussels	IF in a Sensitive Area Identified on Maps THEN Prior Notification to the MNR is required (regardless of time of year)																													
Turtles																														
Fowler's Toad																														
Jefferson Salamander																														
Terrestrial Species																														
Snakes - Hibernation																														
Snakes - Staging																														
Butler's Gartersnake - Hibernation																														
Butler's Gartersnake - Staging																														
Herbaceous Plants																														
Birds																														

NOT a Sensitive Time	IF **NO** Sensitive Areas Identified on Maps THEN **NO** Prior Notification to the MNR is required
Sensitive Time	IF in a Sensitive Area Identified on Maps THEN Prior Notification to the MNR is required
On-site Consultation	IF in a Highly Sensitive Area (e.g., a known hibernacula) THEN On-site consultation with the MNR is required

Staging refers to the time just after emergence from hibernation in the spring and the aggregation of individuals in the fall just prior to entering into hibernation sites.

Town of Kingsville: Sensitive Areas Map for Snake Species at Risk



LEGEND Ontario

- Sensitive Areas for all Snake SAR
- Sensitive Areas for Butler's Garter Snake
- Municipal Drains

Conservation Authority

- *Essex Region*
- Subwatershed Boundaries
- Municipal Boundaries
- First Nations Territories
- Urban Area

SCALE: 1:110,000

0 1 2 4

Kilometres

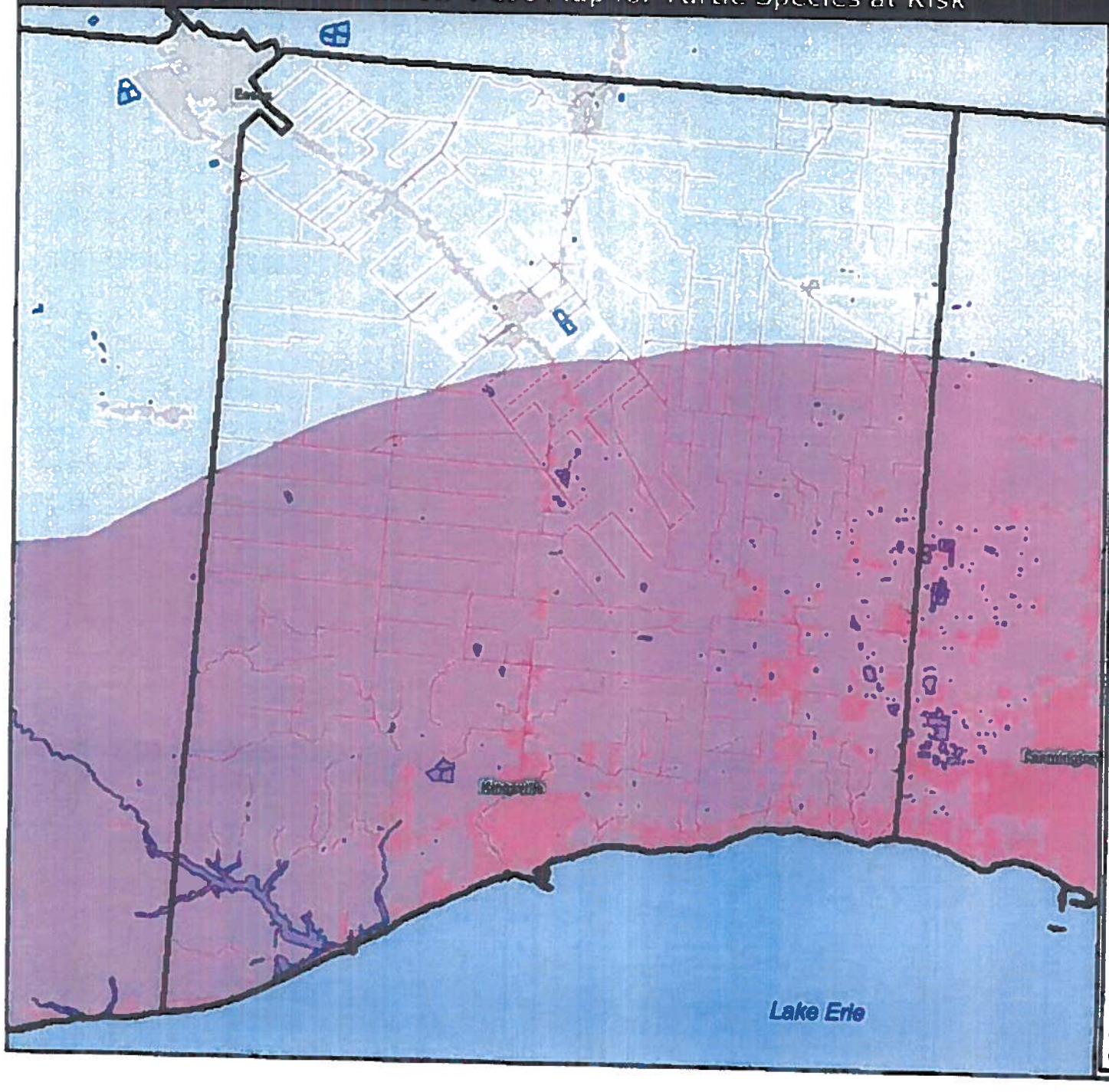
UTM NAD83 CNT Zone 17

Base data derived from the Natural Resource Values Information System (NRVIS). Sensitive Areas based on data from NHIC. Subwatershed Boundaries provided by Conservation Authorities.

This map was produced by the Aylmer District Office GIS Unit, Ministry of Natural Resources.

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources (OMNR) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

Town of Kingsville: Sensitive Areas Map for Turtle Species at Risk



LEGEND Ontario

- Sensitive Areas for Turtle SAR
- Municipal Drains
- Conservation Authority
  - *Essex Region*
- Subwatershed Boundaries
- Municipal Boundaries
- First Nations Territories
- Urban Area

SCALE: 1:110,000

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APPENDIX “C”

STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENT, BACKFILLING AND INSTALLATION PROCEDURES

1. CONCRETE FILLED JUTE BAG HEADWALLS

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

The concrete 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 21 MPa in 28 days and shall be provided and placed only as a wet mix. Under no circumstance shall the concrete to be used for filling the jute bags be placed as a dry mix. The jute bags, before being filled with concrete, shall have a dimension of 460mm (18") x 660mm (26"). The jute bags shall be filled with concrete so that when they are laid flat, they will be approximately 100mm (4") thick, 305mm (12") to 380mm (15") wide and 460mm (18") long.

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

All concrete used for the footing, cap and bags shall have a minimum compressive strength of 21 Mpa in 28 days and include 6% ± 1% air entrainment.

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

The completed jute bag headwalls shall be securely embedded a minimum of 500mm (20") measured perpendicular to the sideslopes of the drain.

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

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

2. QUARRIED LIMESTONE ENDWALLS

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

Prior to placing the quarried limestone end protection over the granular backfill, the Contractor shall lay non-woven geotextile filter fabric "GMN160" conforming to O.P.S.S. 1860 Class I or approved equal. The geotextile filter fabric shall extend from the bottom of the corrugated steel pipe to the top of each sideslope of the drain and between both sideslopes of the drain.

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

3. BRIDGE BACKFILL

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

4. GENERAL

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

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

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

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

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

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

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

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

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

All of the excavation, installation procedures, and parameters as above mentioned under this sub-heading, are to be carried out and performed to the full satisfaction of the Town Drainage Superintendent.

Block Headwall Installation Instructions for Culverts

1. A swift lift device will be required to place the blocks. A 75mm eye bolt will be required to place the caps.
2. The bottom course of blocks shall be founded on a firm solid base. The contractor shall provide a minimum levelling course of 150mm of compacted 3/4" Clear Stone, or a 100% compacted granular A, or lean concrete as a foundation base.
3. Ensure that the base is level and flat as this will greatly improve speed of installation.
4. On new culverts a minimum of 150mm of block wall will extend below the culvert to prevent scouring under the culvert.
5. The bottom course of blocks shall be embedded into the drain bottom to achieve the desired top elevation of the wall.
6. Blocks shall extend from the pipe invert across the full height and width of the drain and be imbedded a minimum of 300mm into the drain banks. Where possible the top of the block wall will match the height of the completed driveway.
7. Blocks shall be placed such that all joints are staggered.
8. Any excavation voids on the ends of block walls below subsequent block layers shall be filled with ¾" Clear Stone.
9. Where block walls extend beyond three blocks in height, they should be battered a minimum of 1 unit horizontal for every 10 units vertical throughout the wall's full height and width. This can be achieved using pre-battered base blocks, or by careful preparation of the base.
10. Filter cloth (270R or equivalent) should be placed behind the wall to prevent the migration of fill material through the joints.
11. The walls should be backfilled with a free draining granular fill.
12. A uni-axial geogrid (SG350 or equivalent) should be used to tie back the headwalls where walls extend beyond 1.8m in height.
13. The face of the block wall shall not extend beyond the end of the pipe culvert.
14. Any gaps between the blocks and culvert shall be sealed with non-shrink grout for the full depth of the block.

APPENDIX “D”

MAINTENANCE SCHEDULE OF ASSESSMENT

McDONALD DRAIN IMPROVEMENTS

(Geographic Township of Gosfield South)

TOWN OF KINGSVILLE

TOWN OF KINGSVILLE

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Road 5 East				4.60	1.862	Town of Kingsville	$ 90.00	$ 459.00	$ -	$ 549.00
County Road 18				8.90	3.602	County of Essex	$ 121.00	$ 574.00	$ -	$ 695.00
County Road 31				5.80	2.347	County of Essex	$ 204.00	$ 468.00	$ -	$ 672.00
Total on Municipal Lands.....							**$ 415.00**	**$ 1,501.00**	**$ -**	**$ 1,916.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-08205	3	11	0.88	0.88	0.356	Kevin & Barbara Fischer	$ 4.00	$ 34.00	$ -	$ 38.00
340-08250	3	11	1.08	0.78	0.316	John & Honorina Pavao	$ 3.00	$ 32.00	$ -	$ 35.00
340-08400	3	11	0.22	0.22	0.089	George Whaley & Sons Limited	$ 1.00	$ 11.00	$ -	$ 12.00
340-08401	3	11	0.41	0.41	0.166	Barbara Stewart	$ 2.00	$ 17.00	$ -	$ 19.00
340-08410	3	11	1.15	0.35	0.142	Stephanie Pavao & Tyler Clark	$ 1.00	$ 14.00	$ -	$ 15.00
340-08420	3	11	1.15	0.35	0.142	Abe & Tina Giesbrecht	$ 1.00	$ 14.00	$ -	$ 15.00
340-08430	3	11	1.41	0.43	0.174	Gilberto & Lucy Oliveira	$ 2.00	$ 18.00	$ -	$ 20.00
340-08700	3	12	34.14	2.50	1.012	County of Essex	$ 26.00	$ 202.00	$ -	$ 228.00
340-08900	3	12	3.05	3.05	1.234	Johan & Eva Klassen	$ 31.00	$ 86.00	$ -	$ 117.00
340-09490	3	13	0.93	0.93	0.376	Carmela Ingratta	$ 16.00	$ 35.00	$ -	$ 51.00
340-09600	3	13	0.46	0.46	0.186	Edward & Janet Hancharyk	$ 16.00	$ 22.00	$ -	$ 38.00
340-09700	3	13	3.60	3.60	1.457	Peter & Marie Costa	$ 127.00	$ 74.00	$ -	$ 201.00
340-09705	3	13	1.43	1.43	0.579	Maria Costa	$ 50.00	$ 38.00	$ -	$ 88.00
340-09800	3	13	1.64	1.64	0.664	Bernard & Helen Friesen	$ 58.00	$ 48.00	$ -	$ 106.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-09900	3	13	1.60	1.60	0.648	Heritage Roofing Inc.	$ 56.00	$ 90.00	$ -	$ 146.00
340-09990	3	13	0.47	0.47	0.190	Salavatore Pannunzio & Claudio Salvatore	$ 17.00	$ 24.00	$ -	$ 41.00
340-10000	3	13	0.98	0.98	0.397	Kevin & Carmen Dick	$ 34.00	$ 34.00	$ -	$ 68.00
340-10100	3	13	7.72	7.72	3.124	Rita Coste	$ 170.00	$ 125.00	$ -	$ 295.00
340-10105	3	13	0.85	0.85	0.344	Heinrich & Agatha Janzen	$ 30.00	$ 32.00	$ -	$ 62.00
340-10150	3	13	0.82	0.82	0.332	Michael & Kelly Ingratta	$ 29.00	$ 32.00	$ -	$ 61.00
340-10200	3	13	0.54	0.54	0.219	Bernardo & Margeretha Neufeld	$ 19.00	$ 19.00	$ -	$ 38.00
390-00800	4	24	1.44	1.44	0.583	Mastron Enterprises Ltd.	$ 25.00	$ 144.00	$ -	$ 169.00
390-00850	4	24	0.40	0.40	0.162	Mastron Enterprises Ltd.	$ 7.00	$ 40.00	$ -	$ 47.00
390-00900	4	24	0.27	0.27	0.109	Hydro One Networks Inc.	$ 5.00	$ 19.00	$ -	$ 24.00
390-01085	4	24	2.28	2.28	0.923	Margo Carder	$ 80.00	$ 86.00	$ -	$ 166.00
390-01095	4	24	1.09	1.09	0.441	Henry & Elena Peters	$ 38.00	$ 87.00	$ -	$ 125.00
390-01305	4	24	0.46	0.46	0.186	Jacobo & Helen Guenther	$ 8.00	$ 36.00	$ -	$ 44.00
390-01310	4	24	0.46	0.46	0.186	William & Sharon Bennett	$ 8.00	$ 36.00	$ -	$ 44.00
390-01315	4	24	0.46	0.46	0.186	Sean & Anna Beaul	$ 8.00	$ 36.00	$ -	$ 44.00
390-01320	4	23 & 24	0.46	0.46	0.186	Beatrice & David Sanders	$ 8.00	$ 36.00	$ -	$ 44.00
390-01325	4	23	0.46	0.46	0.186	Antonio & Joanne DeSantis	$ 8.00	$ 36.00	$ -	$ 44.00
390-01330	4	23	0.46	0.46	0.186	Edward & Charlene Bonyai	$ 8.00	$ 36.00	$ -	$ 44.00
390-01335	4	23	0.46	0.46	0.186	Johan & Abigail Froese	$ 8.00	$ 36.00	$ -	$ 44.00
390-01350	4	23	0.48	0.48	0.194	Steven & Jennifer Damore	$ 8.00	$ 37.00	$ -	$ 45.00
390-01500	4	23	0.57	0.57	0.231	John & Katharina Wall	$ 5.00	$ 39.00	$ -	$ 44.00
390-01600	4	23	1.21	1.21	0.490	Frederick & Elsie Sharp	$ 11.00	$ 60.00	$ -	$ 71.00
390-01700	4	23	0.77	0.77	0.312	Johan Leowen & Margaretha Friesen	$ 7.00	$ 38.00	$ -	$ 45.00
390-01800	4	23	1.75	1.75	0.708	Donald & Jill Ryall	$ 7.00	$ 86.00	$ -	$ 93.00
400-00100	5	24	20.52	3.00	1.214	Sterling Acre Farms Limited	$ 26.00	$ 123.00	$ -	$ 149.00
400-00200	5	24	30.07	0.30	0.121	538269 Ontario Limited	$ 3.00	$ 31.00	$ -	$ 34.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
400-00400	5	23	25.29	0.90	0.364	Erie Sand and Gravel Limited	$ 4.00	$ 37.00	$ -	$ 41.00
400-00405	5	23	0.46	0.36	0.146	Tammy Lapensee	$ 3.00	$ 30.00	$ -	$ 33.00
Total on Privately Owned - Non-Agricultural Lands.....							**$ 978.00**	**$ 2,110.00**	**$ -**	**$ 3,088.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-08000	3	10	19.98	2.98	1.206	Laszlo Lakatos & Krisztina Szabo	$ 6.00	$ 175.00	$ -	$ 181.00
340-09100	3	12	17.00	8.00	3.238	Basil & Santina Mariotti	$ 42.00	$ 117.00	$ -	$ 159.00
340-09200	3	12	16.00	9.00	3.642	Vito & Louise Coppola	$ 47.00	$ 158.00	$ -	$ 205.00
340-09300	3	12	16.00	9.00	3.642	Jacob & Eva Schmitt	$ 47.00	$ 148.00	$ -	$ 195.00
340-09400	3	13	43.71	35.84	14.504	Carmela Ingratta	$ 315.00	$ 420.00	$ -	$ 735.00
340-10300	3	13	15.40	12.40	5.018	Michael & Donna Mastronardi	$ 218.00	$ 135.00	$ -	$ 353.00
390-00400	4	22 & 23	266.88	139.53	56.467	George Whaley & Sons Limited	$ 490.00	$ 1,931.00	$ -	$ 2,421.00
390-00600	4	24	91.73	91.73	37.123	Mastron Enterprises Inc.	$ 1,612.00	$ 1,874.00	$ -	$ 3,486.00
390-01100	4	24	49.35	49.35	19.970	Noreen & Philip Prince	$ 867.00	$ 910.00	$ -	$ 1,777.00
390-01200	4	24	44.55	44.55	18.029	Triple K Farms Limited	$ 783.00	$ 822.00	$ -	$ 1,605.00
390-01300	4	23 & 24	152.27	136.72	55.330	Erie Sand and Gravel Limited	$ 652.00	$ 2,222.00	$ -	$ 2,874.00
Total on Privately Owned - Agricultural Lands (grantable).....							**$ 5,079.00**	**$ 8,912.00**	**$ -**	**$ 13,991.00**

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

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
340-09000	3	12	11.00	11.00	4.452	1859293 Ontario Limited	$ 57.00	$ 142.00	$ -	$ 199.00
400-00300	5	24	9.75	9.75	3.946	Jason Adamson	$ 43.00	$ 250.00	$ -	$ 293.00
390-00600	4	24	91.73	0.00	0.000	Mastron Enterprises Inc.	$ -	$ -	$ -	$ -
Total on Privately Owned - Agricultural Lands (non-grantable).....							**$ 100.00**	**$ 392.00**	**$ -**	**$ 492.00**

6. SPECIAL NON PRO-RATEABLE ASSESSMENTS (non-agricultural (Sec.26)):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Road 5 East				0.00	0.000	Town of Kingsville	$ -	$ -	$ -	$ -
County Road 18				0.00	0.000	County of Essex	$ -	$ -	$ -	$ -
Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26))							**$ -**	**$ -**	**$ -**	**$ -**
TOTAL ASSESSMENT -TOWN OF KINGSVILLE							**$ 6,572.00**	**$ 12,915.00**	**$ -**	**$ 19,487.00**

MUNICIPALITY OF LEAMINGTON

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
County Road 18				0.60	0.243	County of Essex	$ 21.00	$ 43.00	$ -	$ 64.00
County Road 31				0.44	0.178	County of Essex	$ 15.00	$ 31.00	$ -	$ 46.00
Total on Municipal Lands							**$ 36.00**	**$ 74.00**	**$ -**	**$ 110.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
660-01510	4	1	0.90	0.90	0.364	Dominic & Filomena Zaccardi	$ 32.00	$ 35.00	$ -	$ 67.00
Total on Privately Owned - Non-Agricultural Lands							**$ 32.00**	**$ 35.00**	**$ -**	**$ 67.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
660-01600	4	1	9.10	9.10	3.683	Z.D.S. Farms Limited	$ 160.00	$ 176.00	$ -	$ 336.00
Total on Privately Owned - Agricultural Lands (grantable).....							**$ 160.00**	**$ 176.00**	**$ -**	**$ 336.00**
TOTAL ASSESSMENT -MUNICIPALITY OF LEAMINGTON							**$ 228.00**	**$ 285.00**	**$ -**	**$ 513.00**
TOTAL ASSESSMENT -TOWN OF KINGSVILLE (brought forward)							**$ 6,572.00**	**$ 12,915.00**	**$ -**	**$ 19,487.00**
TOTAL ASSESSMENT			638.24	258.290			**$ 6,800.00**	**$ 13,200.00**	**$ -**	**$ 20,000.00**

1 Hectare = 2.471 Acres
D-13-028
April 28th, 2017

APPENDIX “E”

PLAN, PROFILE, SECTIONS & DETAILS

OF THE

McDONALD DRAIN IMPROVEMENTS

IN THE

TOWN OF KINGSVILLE (Geographic Township of Gosfield South)

IN THE

COUNTY OF ESSEX • ONTARIO

ANTONIO B. PERALTA, P.ENG.

N. J. PERALTA ENGINEERING LTD.
45 DIVISION STREET NORTH
KINGSVILLE, ONTARIO
N9Y 1E1

DATE: APRIL 28th, 2017

TOWN OF KINGSVILLE

MAYOR: NELSON SANTOS
CLERK: JENNIFER ASTROLOGO
DRAINAGE SUPERINTENDENT: KEN VEGH

BENCHMARKS:

1. TOP NUT OF EXISTING FIRE HYDRANT (#K201) LOCATED ON THE NORTH SIDE OF ROAD 5 EAST, APPROXIMATELY 130.0m EAST OF THE TOP END OF THE McDONALD DRAIN.
   ELEV. = 215.221m
2. TOP OF NORTH SIDE OF CONCRETE PUMP STATION, LOCATED AT THE SOUTHEAST CORNER OF EXISTING GREENHOUSE STORMWATER MANAGEMENT POND NEAR STA. 0+867.0.
   ELEV. = 212.890m
3. TOP NUT OF EXISTING FIRE HYDRANT (#K450) LOCATED ON THE WEST SIDE OF COUNTY ROAD 31, LOCATED AT THE NORTH LIMIT OF M.N. 2723, APPROXIMATELY 55.0m NORTH OF THE BEND AT STA. 1+100.8.
   ELEV. = 214.001m
4. TOP NUT OF EXISTING FIRE HYDRANT LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF COUNTY ROAD 31 AND COUNTY ROAD 18.
   ELEV. = 213.478m
5. TOP NUT OF EXISTING FIRE HYDRANT (#K451) LOCATED ON THE WEST SIDE OF COUNTY ROAD 31, LOCATED BETWEEN M.N. 2481 AND M.N. 2503, AT APPROXIMATELY STA. 1+847.0.
   ELEV. = 213.344m
6. TOP OF NAIL SET THROUGH A PENNY LOCATED ON THE WEST CURB OF THE EXISTING CONCRETE SPAN BRIDGE CROSSING COUNTY ROAD 31, APPROXIMATELY 50.0m NORTH OF THE INTERSECTION OF COUNTY ROAD 31 AND M.T.O. HIGHWAY #3.
   ELEV. = 212.473m

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

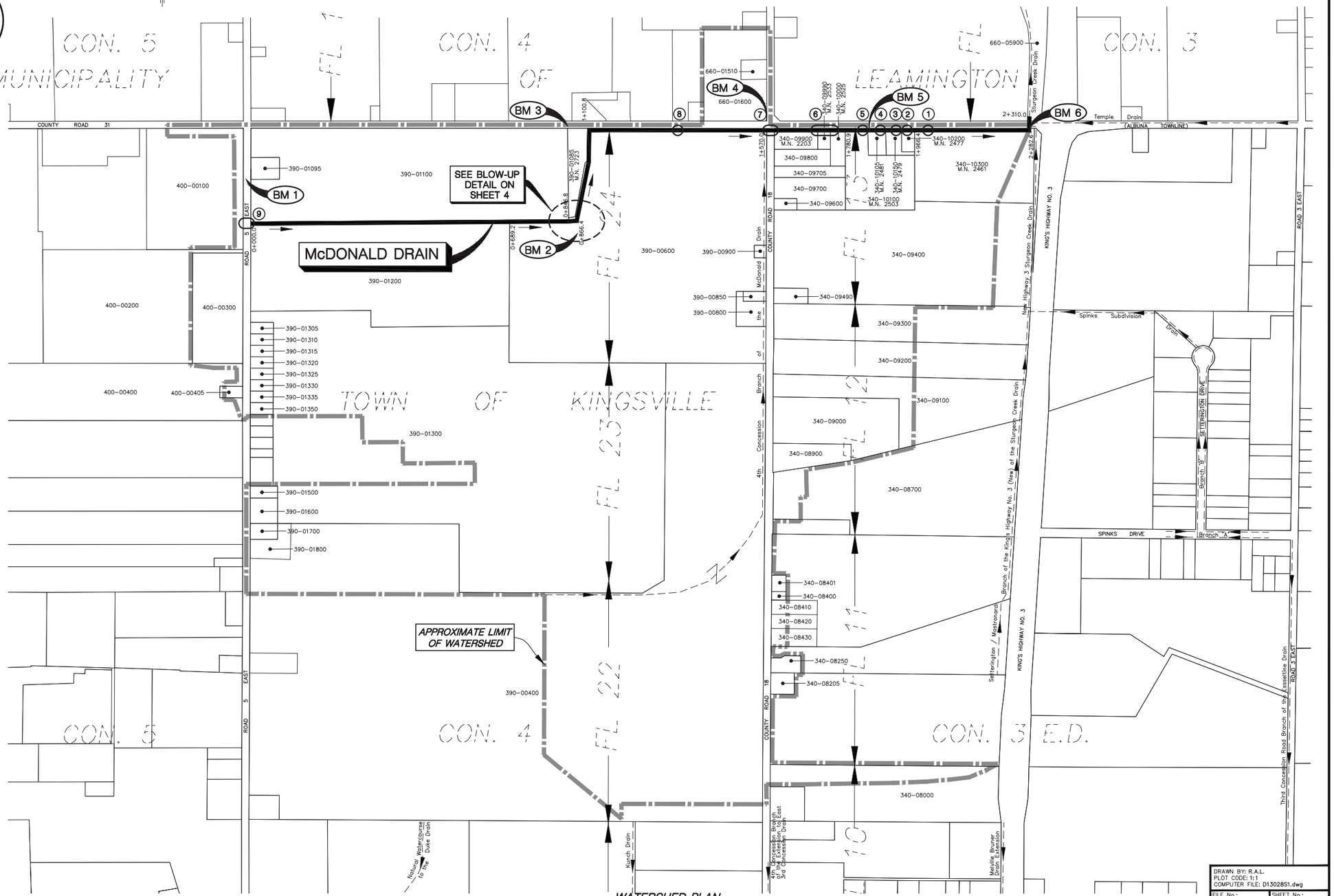
ROLL INFORMATION

KINGSVILLE

340–08000 Laszlo Lakatos & Krisztina Szabo	340–09400 Carmela Ingratta	390–00400 George Whaley & Sons Limited	390–01325 Antonio & Joanne Desantis
340–08205 Kevin & Barbara Fischer	340–09490 Carmela Ingratta	390–00600 Mastron Enterprises Inc.	390–01330 Edward & Charlene Bonyai
340–08250 John & Honorina Pavao	340–09600 Edward & Janet Hancharyk	390–00800 Mastron Enterprises Ltd.	390–01335 Johan & Abigail Froese
340–08400 George Whaley & Sons Limited	340–09700 Peter & Marie Costa	390–00850 Mastron Enterprises Ltd.	390–01350 Steven & Jennifer Damore
340–08401 Barbara Stewart	340–09705 Maria Costa	390–00900 Hydro One Networks Inc.	390–01500 John & Katharina Wall
340–08410 Stephanie Pavao & Tyler Clark	340–09800 Bernard & Helen Friesen	390–01085 Margo Carder	390–01600 Frederick & Elsie Sharp
340–08420 Abe & Tina Giesbrecht	340–09900 Heritage Roofing Inc.	390–01095 Henry & Elena Peters	390–01700 Johan Loewen & Margaretha Friesen
340–08430 Gilberto & Lucy Oliveira	340–09990 Pannunzio & Claudio Salvatore	390–01100 Noreen & Philip Prince	390–01800 Donald & Jill Ryall
340–08700 County of Essex	340–10000 Kevin & Carmen Dick	390–01200 Triple K Farms Limited	400–00100 Sterling Acre Farms Limited
340–08900 Johan & Eva Klassen	340–10100 Rita Coste	390–01300 Erie Sand & Gravel Limited	400–00200 538269 Ontario Limited
340–09000 1859293 Ontario Limited	340–10105 Heinrich & Agatha Janzen	390–01305 Jacobo & Helen Guenther	400–00300 Jason Adamson
340–09100 Basil & Santina Mariotti	340–10150 Michael & Kelly Ingratta	390–01310 William & Sharon Bennett	400–00400 Erie Sand & Gravel Limited
340–09200 Vito & Louise Coppola	340–10200 Bernardo & Margeretha Neufeld	390–01315 Sean & Anna Beaul	400–00405 Tammy Lapensee
340–09300 Jacob & Eva Schmitt	340–10300 Michael & Donna Mastronardi	390–01320 Beatrice & David Sanders	

LEAMINGTON

660–01510 Dominic & Filomena Zaccardi
660–01600 Z.D.S. Farms Limited
650–05900 Erie Sand and Gravel Limited



WATERSHED PLAN
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FILE No.: D13-028
SHEET No.: 1 OF 4

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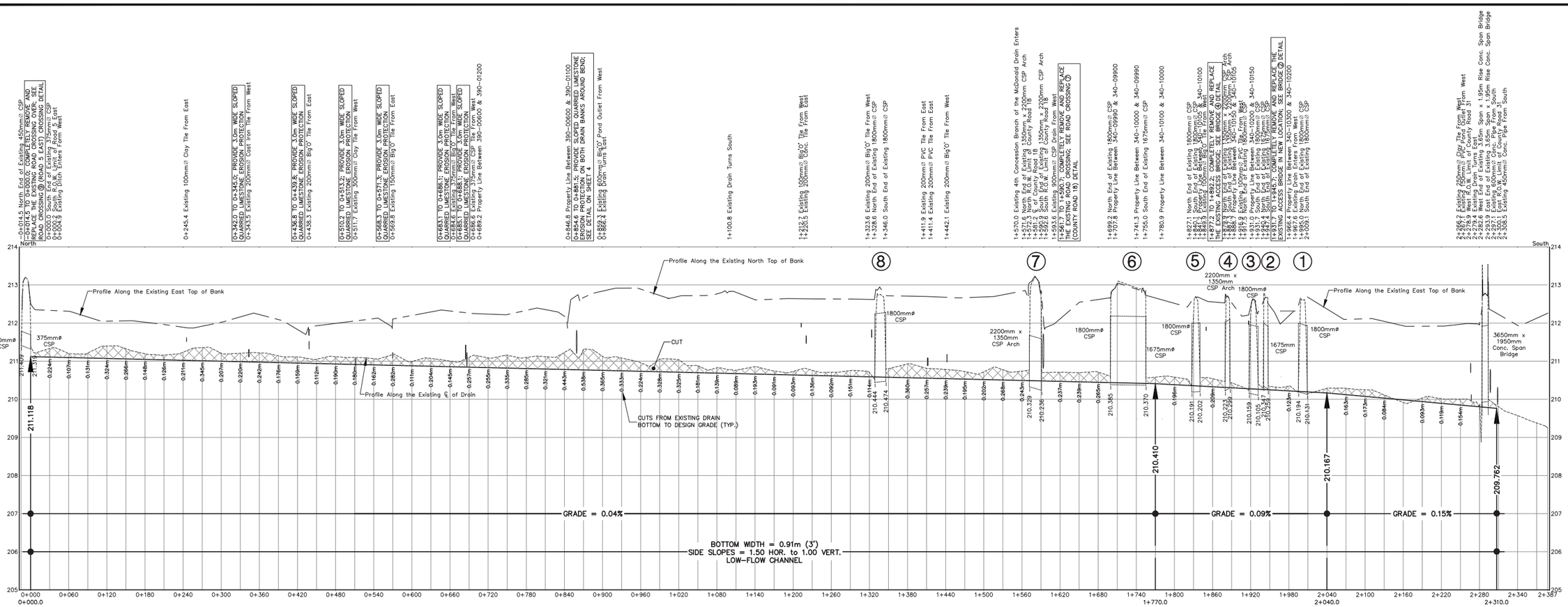
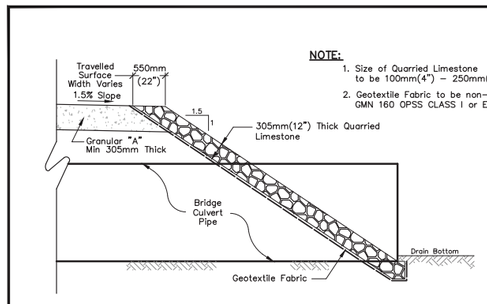


McDONALD DRAIN PROFILE

Scale = 1:3000 Hor.
1:50 Vert.



TYPICAL QUARRIED LIMESTONE END PROTECTION

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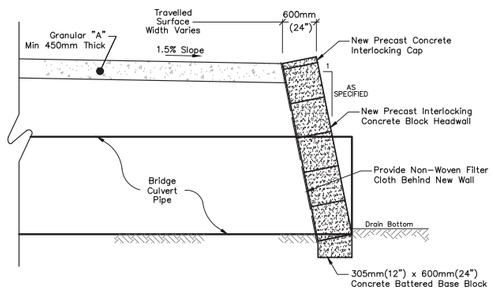

TYPICAL PRECAST INTERLOCKING CONCRETE BLOCK HEADWALL END PROTECTION

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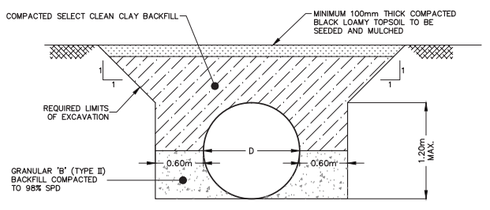

TYPICAL BACKFILL DETAIL FOR BOULEVARD AREAS

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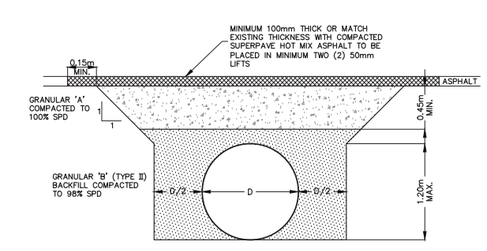

ROADWAY CROSSING BACKFILL DETAIL

Scale = N.T.S.

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

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100136883
2017-09-29
PROVINCE OF ONTARIO

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PLOT CODE: 1:1
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FILE No.: D13-028

SHEET No.: 2 OF 4

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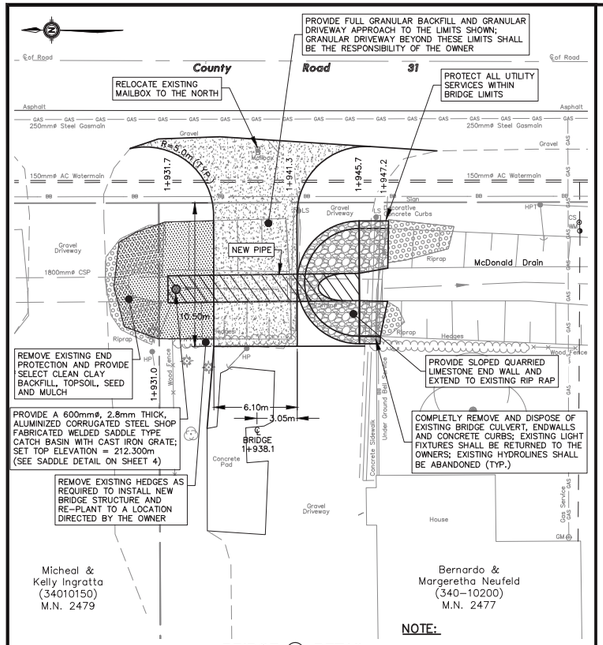


BRIDGE ② DETAIL

Scale = 1:200

NOTE:

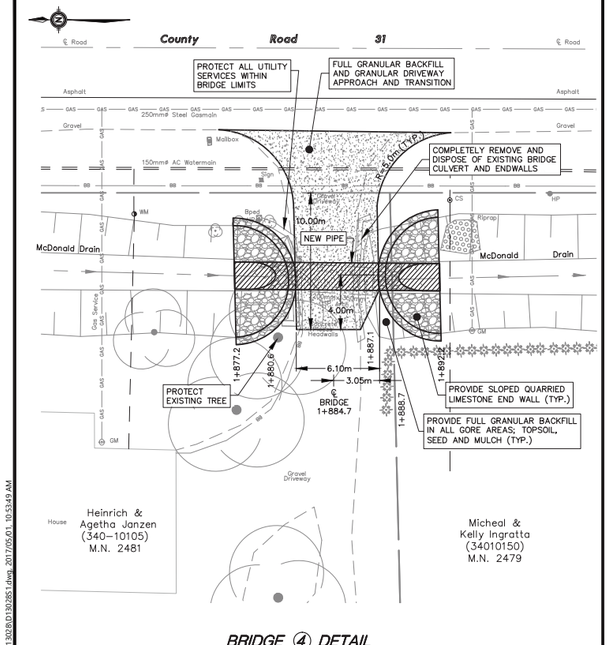
EXISTING SERVICE HYDRO POLE TO SUBJECT PROPERTY SHALL BE REMOVED/RELOCATED BY HYDRO ONE, PRIOR TO CONSTRUCTION

BENCHMARK #5:
TOP NUT OF EXISTING FIRE HYDRANT (#K451) LOCATED ON THE WEST SIDE OF COUNTY ROAD 31, LOCATED BETWEEN M.N. 2481 AND M.N. 2503, AT APPROXIMATELY STA. 1+847.0.

ELEV. = 213.344m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:
2000mmø	14.0m	2.8mm (12 GA.)	125mm x 25mm (5.0" x 1.0")	ALUMINIZED STEEL TYPE II CORRUGATED HEL-COR PIPE

PIPE & DRIVEWAY ELEVATIONS:
UPSTREAM INV. (N) = 210.064m
DOWNSTREAM INV. (S) = 210.051m
DESIGN GRADE = 0.09%
℄ OF DRIVEWAY AT PAVEMENT EDGE = 212.766m
℄ OF ACCESS AT PIPE CENTRELINE = 212.720m
℄ OF ACCESS 10.5m WEST OF PROPERTY LIMIT = 212.700m
DRIVEWAY CROSSFALL FROM CENTRELINE TO TOP OUT END OF END WALL = 1.50%



BRIDGE ④ DETAIL

Scale = 1:200

BENCHMARK #5:
TOP NUT OF EXISTING FIRE HYDRANT (#K451) LOCATED ON THE WEST SIDE OF COUNTY ROAD 31, LOCATED BETWEEN M.N. 2481 AND M.N. 2503, AT APPROXIMATELY STA. 1+847.0.

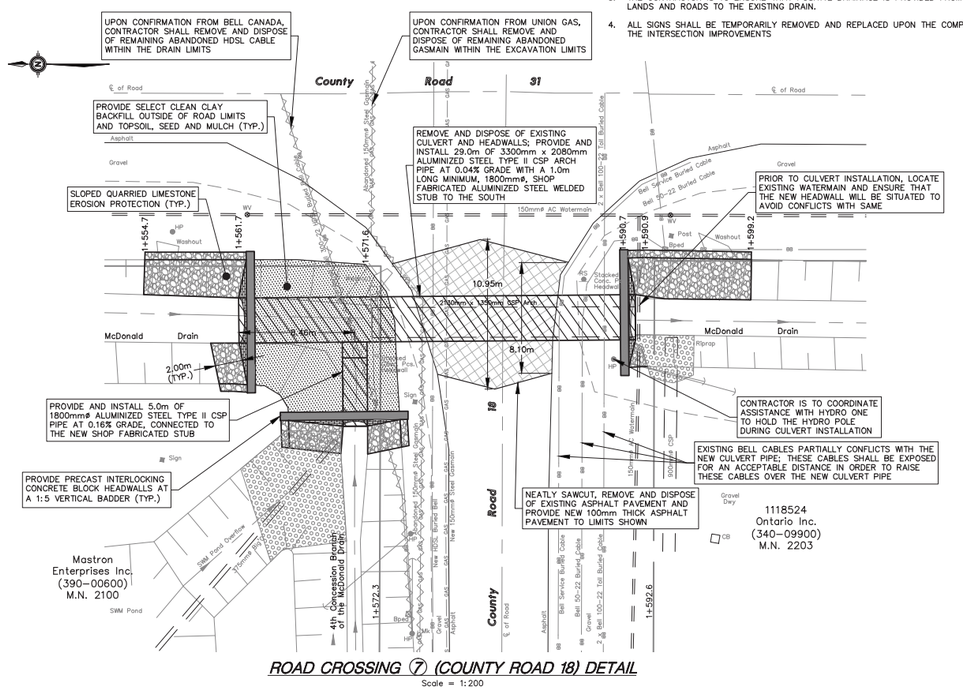
ELEV. = 213.344m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:
2000mmø	15.0m	2.8mm (12 GA.)	125mm x 25mm (5.0" x 1.0")	ALUMINIZED STEEL TYPE II CORRUGATED HEL-COR PIPE

PIPE & DRIVEWAY ELEVATIONS:
UPSTREAM INV. (N) = 210.114m
DOWNSTREAM INV. (S) = 210.100m
DESIGN GRADE = 0.09%
℄ OF DRIVEWAY AT PAVEMENT EDGE = 212.788m
℄ OF ACCESS AT PIPE CENTRELINE = 212.725m
℄ OF ACCESS 10.0m WEST OF PROPERTY LIMIT = 212.706m
DRIVEWAY CROSSFALL FROM CENTRELINE TO TOP OUT END OF END WALL = 1.50%

GENERAL NOTES:

1. THE ACCURACY OF THE UTILITIES SHOWN ON THESE DRAWINGS ARE NOT GUARANTEED BY THE OWNER OR N. J. PERALTA ENGINEERING LTD. OTHER UTILITIES MAY BE PRESENT OR THE UTILITIES SHOWN MAY DIFFER IN SIZE OR LOCATION SHOWN.
2. ALL DIMENSIONS SHOWN IN METRES UNLESS NOTED OTHERWISE. PROPERTY LINES ARE APPROXIMATE AND ARE BASED ON THE TOWN OF KINGSVILLE GIS AND FIELD INFORMATION.
3. THE CONTRACTOR IS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM ADJACENT LANDS AND ROADS TO THE EXISTING DRAIN.
4. ALL SIGNS SHALL BE TEMPORARILY REMOVED AND REPLACED UPON THE COMPLETION OF THE INTERSECTION IMPROVEMENTS



ROAD CROSSING ⑦ (COUNTY ROAD 18) DETAIL

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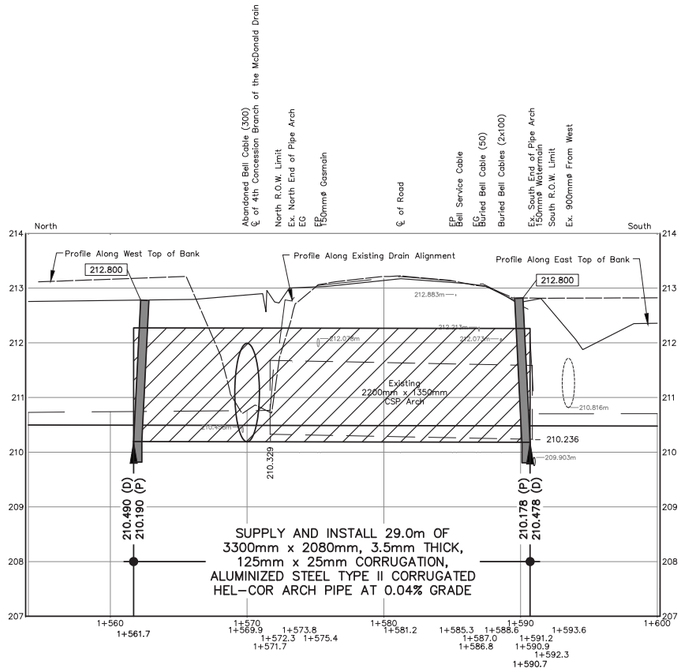

ROAD CROSSING ⑦ (COUNTY ROAD 18) PROFILE

Scale = 1:200 Hor.
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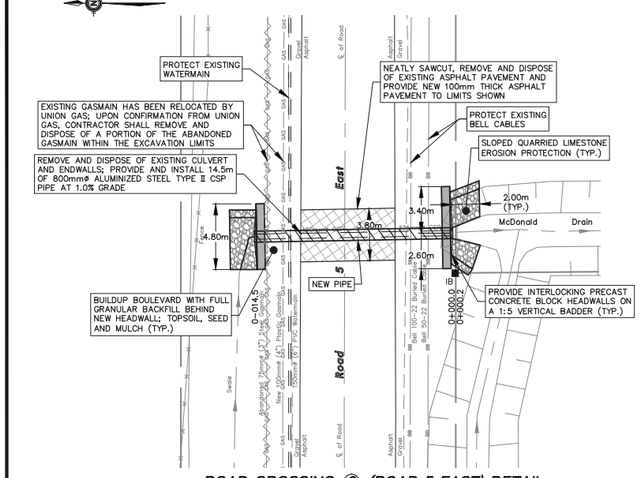
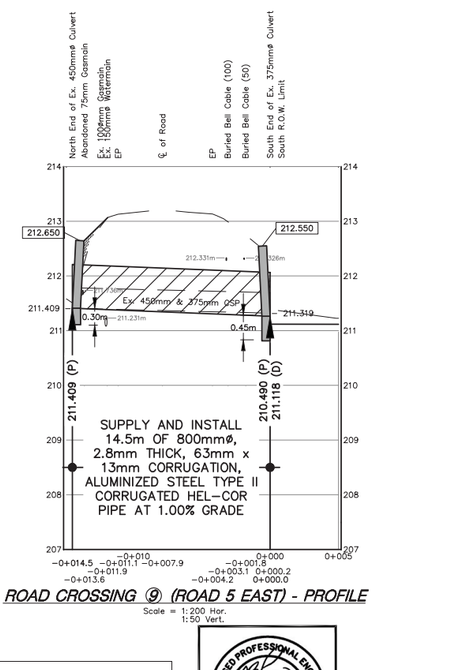


ROAD CROSSING ⑨ (ROAD 5 EAST) DETAIL

Scale = 1:200



ROAD CROSSING ⑨ (ROAD 5 EAST) - PROFILE

Scale = 1:200 Hor.
1:50 Vert.

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

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2017-09-27
PROVINCE OF ONTARIO

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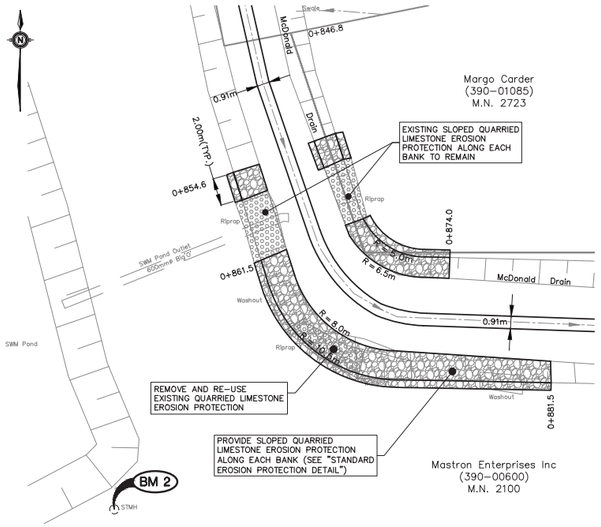

BLOW-UP DETAIL

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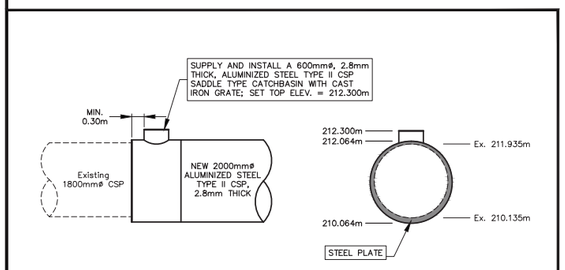

BRIDGE ② SADDLE TYPE CATCHBASIN DETAIL

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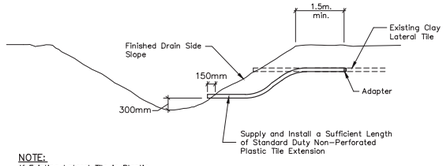
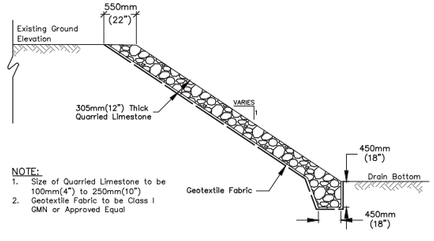


NOTE:
If Existing Lateral Tile is Plastic Utilize a Plastic Coupler in Place of Adapter.

STANDARD LATERAL TILE DETAIL

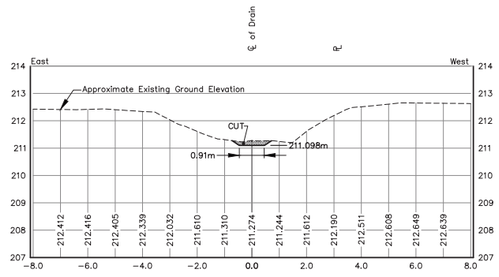
Scale = N.T.S.



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

STANDARD EROSION PROTECTION DETAIL

Scale = N.T.S.



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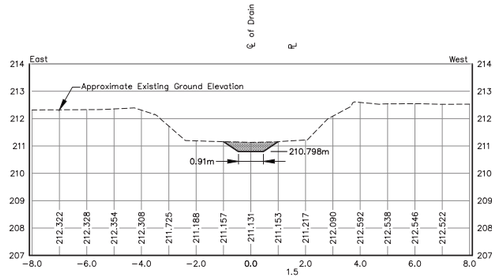

STA. 0+800

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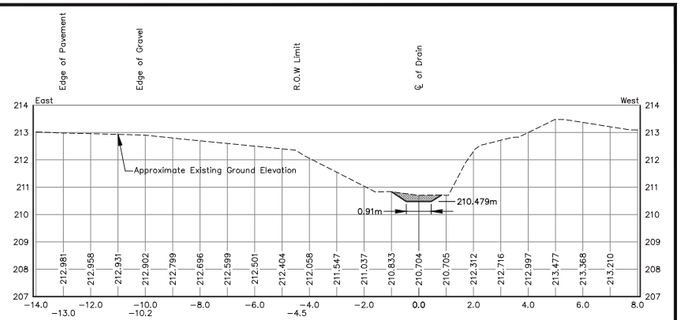
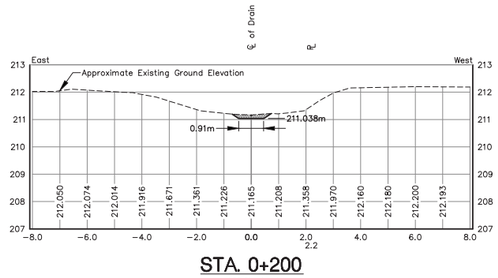


STA. 1+600

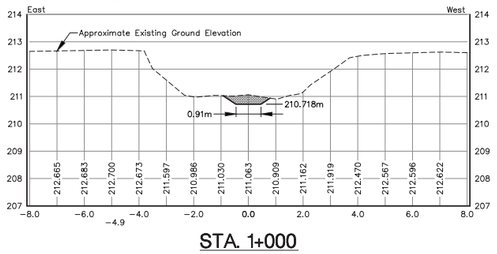
Scale: 1:100

NOTE:
PROPOSED CENTRE CHANNEL SHALL HAVE A MINIMUM BOTTOM WIDTH OF 0.91m (3') AND 1.5 HORIZONTAL TO 1.0 VERTICAL SIDE SLOPE



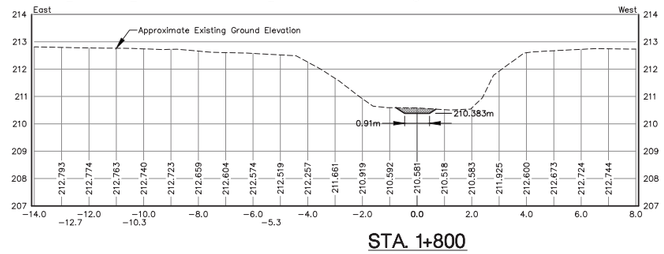
STA. 0+200

Scale: 1:100



STA. 1+000

Scale: 1:100



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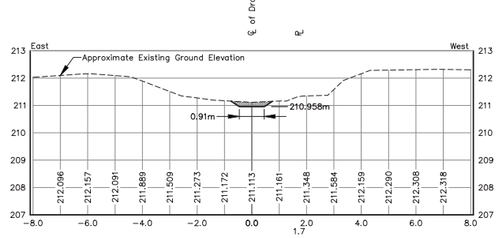
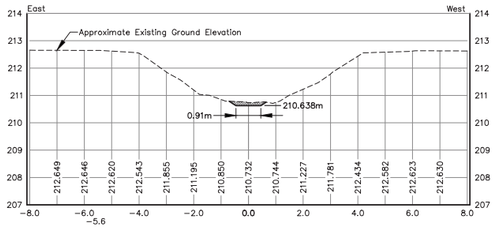


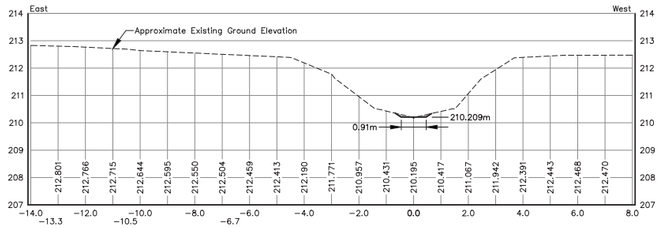
STA. 0+400

Scale: 1:100



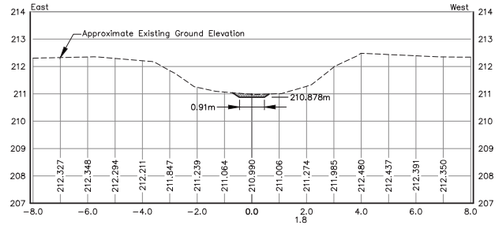
STA. 1+200

Scale: 1:100



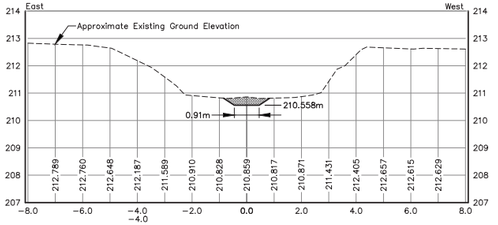
STA. 2+000

Scale: 1:100



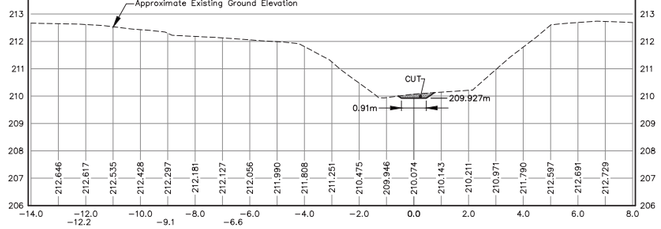
STA. 0+600

Scale: 1:100



STA. 1+400

Scale: 1:100



STA. 2+200

Scale: 1:100

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

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100136883
2017-04-24
PROVINCE OF ONTARIO

DRAWN BY: R.A.L.
PLOT CODE: 1:1
COMPUTER FILE: D13028S1.dwg

FILE No.: D13-028

SHEET No.: 4 OF 4

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