Drainage Board
Consideration of Report Agenda

December 12, 2023, 4:30 pm

Shaheen Room, Essex Centre Sports Complex, 60 Fairview Avenue West

Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser,
Geographic Township of Colchester South, Project REI2023D017, Town of Essex, County of Essex
Bondy No. 1 Drain, Maintenance Schedules of Assessment,
Geographic Township of Colchester South, Project No. D22-063, Town of Essex, County of Essex
Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2,
Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex

Accessible formats or communication supports are available upon request. Please contact the Clerk's Office at clerks@essex.ca or 519-776-7336 extension 1100 or 1101.

The Clerk to confirm that all notices have been sent in accordance with the Drainage Act.

Pages

1. Call to Order

2. Land Acknowledgement

We acknowledge that this land is the traditional territory of the Three Fires Confederacy of First Nations (comprised of the Ojibway, the Odawa, and the Potawatomi Peoples), and of the Huron-Wendat Peoples. We value the significant historical and contemporary contributions of local and regional First Nations and all of the Original Peoples of Turtle Island who have been living and working on the land from time immemorial.

3. Declarations of Conflict of Interest

4. Adoption of Published Agenda

4.1 Drainage Board Meeting Agenda for December 12, 2023. 1

Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser, Geographic Township of Colchester South, Project REI2023D017, Town of Essex, County of Essex; Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of Colchester South, Project No. D22-063, Town of Essex, County of Essex; Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the published agenda for the December 12, 2023, Drainage Board be adopted as presented/amended.

5. Adoption of Minutes

5.1 Adoption of Minutes for September 6, 2023 4

Hyman Drain Cost Sharing, Geographic Township of Colchester South, Project REI2023D008, Town of Essex, County of Essex.

Moved by _____

Seconded by _____

That the minutes of the Drainage Board Meeting held September 6, 2023, be adopted as circulated.

6. Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser, Geographic Township of Colchester South, ProjectREI2023D017, Town of Essex, County of Essex 8

6.1 Written Appeals Received by the Due Date

6.2 Written Appeals Received after the Due Date

6.3 Verbal Report by Gerard Rood, Professional Engineer, Rood Engineering Inc.

Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser, Geographic Township of Colchester South, Project REI2023D017, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the verbal report by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser, Geographic Township of Colchester South, Project REI2023D017, Town of Essex, County of Essex be received.

6.4 Public Delegations/Presentations (Chair to call for any)

6.5 Decision

Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser, Geographic Township of Colchester South, Project REI2023D017, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the report provided by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding Austin C. Wright Drain, Replacement Bridge for Nelner and New Bridge for Broser, Geographic Township of Colchester South, Project REI2023D017, dated November 22, 2023, Town of Essex, County of Essex be recommended for adoption and that the provisional by-law be prepared for Council's consideration and that the report proceed to a Court of Revision to be scheduled.

7. Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of ColchesterSouth, Project No. D22-063, Town of Essex, County of Essex 84

7.1 Written Appeals Received by the Due Date

7.2 Written Appeals Received after the Due Date

7.3 Verbal Report by Antonio B. Peralta, Professional Engineer, N. J. Peralta Engineering Inc.

Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of Colchester South, Project No. D22-063, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the verbal report provided by Antonio B. Peralta, Professional Engineer, N. J. Peralta Engineering Inc. regarding Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of Colchester South, Project No. D22-063, Town of Essex, County of Essex be received.

7.4 Public Delegations/Presentations (Chair tocall for any)

7.5 Decision

Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of Colchester South, Project No. D22-063, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the report provided by Antonio B. Peralta, Professional Engineer, N. J. Peralta Engineering Inc. regarding Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of Colchester South, Project No. D22-063, dated August 16, 2023, Town of Essex, County of Essex be recommended for adoption and that the provisional by-law be prepared for Council's consideration and that the report proceed to a Court of Revision to be scheduled.

8. Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex

8.1 Written Appeals Received by the Due Date

8.2 Written Appeals Received after the Due Date

8.3 Verbal Report by Gerard Rood, ProfessionalEngineer, Rood Engineering Inc.

Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the verbal report provided by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex be received.

8.4 Decision

Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex

Moved by _____

Seconded by _____

That the report provided by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex be recommended for adoption and that the provisional by-law be prepared for Council's consideration.

9. Adjournment

Moved by _____

Seconded by _____

That the meeting be adjourned at [TIME].

Consideration of Report

Notice of Meeting

December 12, 2023, 4:30 pm

Location: Shaheen Room at Essex Centre Sports Complex

60 Fairview Ave West, Essex

Austin C. Wright Drain,

Replacement Bridge for Nelner and New Bridge for Broser,

Geographic Township of Colchester South, Project REI2023D017,

Town of Essex, County of Essex

Enclosed, please find the report from Rood Engineering Inc. dated November 22, 2023, for the above referenced drainage works.

In accordance with The Drainage Act, R.S.O. 1990, the Drainage Board of the Town of Essex will consider this report at a meeting to be held in person **on December 12th, 2023, at the hour of 4:30 pm.** If you have questions or concerns about the project, please contact the Drainage Board Recording Secretary via email ttuzlova@essex.ca or phone 519-776-7336 ext 1407 or Rood Engineering Inc at 519-322-1621.

The purpose of the above meeting is to address any questions or comments with respect **to the report**. Any inconsistencies as to the acreage assessed, value of benefit, or value of outlet liability, will be dealt with at a Court of Revision to be held at a later date, of which you as an assessed owner in the land drainage area will be informed by prepaid mail within the statutory time allotted by the Municipal Drainage Act.

Joe Malandruccolo, Clerk, Town of Essex

Date of Notice: November 28, 2023

Consideration of Report

Notice of Meeting

December 12, 2023, 4:30 pm

Location: Shaheen Room at Essex Centre Sports Complex

60 Fairview Ave West, Essex

Bondy No. 1 Drain, Maintenance Schedules of Assessment, Geographic Township of Colchester South, Project No. D22-063, Town of Essex, County of Essex

Enclosed, please find the report from N. J. Peralta Engineering Ltd. dated August 16, 2023, for the above referenced drainage works.

In accordance with The Drainage Act, R.S.O. 1990, the Drainage Board of the Town of Essex will consider this report at a meeting to be held in person **on December 12th, 2023, at the hour of 4:30 pm.** If you have questions or concerns about the project, please contact the Drainage Board Recording Secretary via email ttuzlova@essex.ca or phone 519-776-7336 ext 1407 or Rood Engineering Inc at 519-322-1621.

The purpose of the above meeting is to address any questions or comments with respect **to the report**. Any inconsistencies as to the acreage assessed, value of benefit, or value of outlet liability, will be dealt with at a Court of Revision to be held at a later date, of which you as an assessed owner in the land drainage area will be informed by prepaid mail within the statutory time allotted by the Municipal Drainage Act.

Joe Malandruccolo, Clerk, Town of Essex

Date of Notice: November 28, 2023

Consideration of Report for Minor Improvement project

Notice of Meeting

December 12, 2023, 4:30 pm

Location: Shaheen Room at Essex Centre Sports Complex

60 Fairview Ave West, Essex

Richmond Drain, 5th Concession Road Bank Repair Phase 1 & 2, Geographic Township of Colchester South, Project REI2022D010, Town of Essex, County of Essex

Enclosed, please find the report from Rood Engineering Inc. dated November 15, 2023, for the above referenced drainage works.

In accordance with The Drainage Act, R.S.O. 1990, the Drainage Board of the Town of Essex will consider this report at a meeting to be held **in person on December 12th, 2023, at the hour of 4:30 pm.**

If Drainage Board adopts the report, Council will pass a provisional by-law at the following Council Meeting. The municipality will send the provisional bylaw and notice of the process to appeal to the Drainage Referee to the initiating property owner and OMAFRA.

If you have questions or concerns about the project, please contact the Drainage Board Recording Secretary via email ttuzlova@essex.ca or phone 519-776-7336 ext. 1407.

Joe Malandruccolo, Clerk, Town of Essex

Date of Notice: December 1, 2023

The Corporation of the Town of Essex

Drainage Board

Consideration of Report Minutes

September 6, 2023, 5:00 pm
Shaheen Room, Essex Centre Sports Complex, 60 Fairview Avenue West

Present:	Chair - Dougherty, Janice
	Vice Chair - Bezaire Arevalo, Daniel
	Member - Sauve, Danny
	Member - Dufour, Percy
	Member - Pocock, Tiffany
Also Present:	Lindsay Dean, Drainage Superintendent
	Tanya Tuzlova, Recording Secretary
	Shelley Brown, Deputy Clerk, Legal and Legislative Services
	Norm Nussio, Manager, Operations and Drainage

Accessible formats or communication supports are available upon request. Please contact the Clerk's Office at clerks@essex.ca or 519-776-7336 extension 1100 or 1101.
Present from general public:
for Hyman Drain Cost Sharing: Barbara and Adam Keller, 5215 County Road 11
for 14th Concession West Drain: none

1. Call to Order

The Chair called meeting to order at 5:00 PM.

2. Land Acknowledgement

We acknowledge that this land is the traditional territory of the Three Fires Confederacy of First Nations (comprised of the Ojibway, the Odawa, and the Potawatomi Peoples), and of the Huron-Wendat Peoples. We value the significant historical and contemporary contributions of local and regional First Nations and all of the Original Peoples of Turtle Island who have been living and working on the land from time immemorial.

3. Declarations of Conflict of Interest

4. Adoption of Published Agenda

4.1 Drainage Board Meeting Agenda for September 6, 2023

Hyman Drain Cost Sharing, Geographic Township of Colchester South, dated August 23, 2023, Project REI2023D008, Town of Essex, County of Essex and 14th Concession West Drain, Replacement Bridge for E.R.C.A. Greenway, Geographic Township of Colchester North, dated August 22, 2023, Project REI2023D010, Town of Essex, County of Essex

DB 23-09-001
Moved By Danny Sauve
Seconded By Daniel Bezaire Arevalo, Vice-Chair

That the published agenda for the September 6, 2023, Drainage Board be adopted as presented.

Carried

5. Adoption of Minutes

5.1 Adoption of Minutes for July 6, 2023

DB 23-09-002
Moved By Percy Dufour
Seconded By Tiffany Pocock

That the minutes of the Drainage Board Meeting held July 6, 2023, be adopted as circulated.

Carried

6. Hyman Drain Cost Sharing, Geographic Township of Colchester South, dated August 23, 2023, Project REI2023D008, Town of Essex, County of Essex

6.1 Written Appeals Received by the Due Date

Shelley Brown, Deputy Clerk, has informed that no written appeals were received by the Clerk's Office by the due date.

6.2 Written Appeals Received after the Due Date

Shelley Brown, Deputy Clerk, has informed that no written appeals were received by the Clerk's Office after the due date.

6.3 Verbal Report by Gerard Rood, Professional Engineer, Rood Engineering Inc.

Mr. Rood presented a detailed review of the report.

DB 23-09-003
Moved By Daniel Bezaire Arevalo, Vice-Chair
Seconded By Tiffany Pocock

That the verbal report by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding Hyman Drain Cost Sharing, Geographic Township of Colchester South, dated August 23, 2023, Project REI2023D008, Town of Essex, County of Essex be received.

Carried

6.4 Public Delegations/Presentations

Barbara and Adam Keller, 5215 County Road 11, had no questions.

6.5 Decision

DB 23-06-004
Moved By Daniel Bezaire Arevalo, Vice-Chair
Seconded By Danny Sauve

That the report provided by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding Hyman Drain Cost Sharing, Geographic Township of Colchester South, dated August 23, 2023, Project REI2023D008, Town of Essex,

County of Essex be recommended for adoption and that the provisional by-law be prepared for Council's consideration and that the report proceed to a Court of Revision to be scheduled.

Carried

7. 14th Concession West Drain, Replacement Bridge for E.R.C.A. Greenway, Geographic Township of Colchester North, dated August 22, 2023, Project REI2023D010, Town of Essex, County of Essex

7.1 Written Appeals Received by the Due Date

Shelley Brown, Deputy Clerk, has informed that no written appeals were received by the Clerk's Office by the due date.

7.2 Written Appeals Received after the Due Date

Shelley Brown, Deputy Clerk, has informed that no written appeals were received by the Clerk's Office after the due date.

7.3 Verbal Report by Gerard Rood, Professional Engineer, Rood Engineering, Inc.

Mr. Rood presented the detailed review of the report. Mr. Rood noted that this project is qualified as a minor improvement project as per section 78 (5) of the Drainage Act as prescribed under O. Reg 500/21.

DB 23-09-005
Moved By Daniel Bezaire Arevalo, Vice-Chair
Seconded By Tiffany Pocock

That the verbal report by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding 14th Concession West Drain, Replacement Bridge for E.R.C.A. Greenway, Geographic Township of Colchester North, dated August 22, 2023, Project REI2023D010, Town of Essex, County of Essex be received.

Carried

7.4 Public Delegations/Presentations

No members of the public were in attendance for Agenda Item 7 14th Concession West Drain, Replacement Bridge for E.R.C.A.

7.5 Decision

DB 23-09-006

That the report provided by Gerard Rood, Professional Engineer, Rood Engineering Inc. regarding 14th Concession West Drain, Replacement Bridge for E.R.C.A. Greenway, Geographic Township of Colchester North, dated August 22, 2023, Project REI2023D010, Town of Essex, County of Essex be recommended for adoption and that the provisional by-law be prepared for Council's consideration.

8. Adjournment

DB 23-09-007
Moved By Daniel Bezaire Arevalo, Vice-Chair
Seconded By Tiffany Pocock

That the meeting be adjourned at 5:24 PM.

Carried

_____

Chair

_____

Recording Secretary

AUSTIN C. WRIGHT DRAIN

Replacement Bridge for Nelner & New Bridge for Broser

Geographic Township of Colchester South

TOWN OF ESSEX
33 Talbot Street South
ESSEX, Ontario N8M 1A8
519-776-7336

Rood Engineering Inc.
Consulting Engineers
9 Nelson Street
Leamington, Ontario N8H 1G6
519-322-1621

Project REI2023D017
2023-11-22

November 22nd, 2023

Mayor and Municipal Council
Corporation of the Town of Essex
33 Talbot Street South
Essex, Ontario
N8M 1A8

Mayor Bondy and Members of Council:

AUSTIN C. WRIGHT DRAIN
Replacement Bridge for Nelner & New Bridge for Broser
Geographic Twp. of Colchester South
Project REI2023D017
Town of Essex, County of Essex

I. INTRODUCTION

In accordance with the instructions received from you on September 5th, 2023, as confirmed by the Town Drainage Superintendent, Lindsay Dean, we have prepared the following report that provides for the construction of a replacement bridge and a new access bridge in the Austin C. Wright Drain, in Part of Lot 16, Concession 5, in the Geographic Township of Colchester South. This report is intended to provide a replacement access bridge to serve the Parcel 800-00700 owned by Timothy & Cynthia Nelner for the access to the agricultural lands at MN 5862 on 5th Concession Road. The existing bridge was washed out during a severe storm event in August and emergency temporary repairs were provided. Emergency replacement was approved by the Minister of Agriculture and steps were taken for the quick construction of the "temporary" replacement bridge. Request for the new access was later added into the work scope. In addition, this report is also intended to provide a new access bridge for the Parcel 800-00750 owned by Michael & Christine Broser just west of MN 5862. The Austin C. Wright Drain is an open drain with a number of access bridges. The drain was constructed pursuant to the Drainage Act. A plan showing the Austin C. Wright Drain alignment, as well as the general location of the above-mentioned bridge, is included herein as part of the report.

Our appointment and the works related to the construction of the above-mentioned access bridges in the Austin C. Wright Drain, proposed under this report, is in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2021". We have performed all of the necessary survey, investigations, etcetera for the proposed bridges, as well as the Austin C. Wright Drain, and we report thereon as follows.

II. BACKGROUND

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

1)	September 29th, 1947	Austin C. Wright Drain	C.G.R. Armstrong, P.Eng.
2)	July 14th, 1961	Austin C. Wright Drain	C.G.R. Armstrong, P.Eng.

The 1961 report by C.G.R. Armstrong, P.Eng. provided for general repairs and improvements to the entire length of the drain and has the latest profile for the grading of the drain.

We have utilized the plans within the Armstrong report to establish the size parameters for the drain and the details to be used in establishing the replacement bridge culvert and new bridge installation. We have also used this report to establish the drain profile grades, and to assist us in establishing the design grade for the subject farm access bridge installation and new bridge installation. The Schedule of Assessment in the latest drainage report was used as a guide to establish the upstream watershed area and flows to be used in the design of the bridges.

III. PRELIMINARY EXAMINATION AND ON-SITE MEETING

After reviewing all of the available drainage information and documentation provided by the Drainage Superintendent, we arranged with Town staff to schedule an on-site meeting for September 22nd, 2023. The following people were in attendance at said meeting: Tim Nelner, Cathy Sauerwein, Connie Sivyer, Bonnie Rilett, Lindsay Dean (Town of Essex Drainage Superintendent), Akhila Chinthagumpala (Rood Engineering), and Gerard Rood (Rood Engineering).

Details of the proposed bridge work were reviewed. It was confirmed that the replacement bridge should be located at the position of the existing structure near the west edge of the lawn area and have the same width as the existing bridge to allow better access for large equipment.

Ms. Dean outlined the emergency work that had to carried out including steel plate installation, granular removal from the drain and leveling of the driveway with granular. The Town arranged for temporary repair of the structure to allow for safer access and egress to the parcel until it is replaced with the new structure. The old structure shows serious corrosion and rotted areas along the haunches of the steel pipe, and it will be abandoned and removed, and the drain bank will be stabilized as part of the work.

We advised the owner that the minimum standard top width for an access bridge is 6.10 metres (20 ft.) and that the bridge centreline location will need to be established with him. He was also advised that because the bridge is a replacement bridge, the cost of the new replacement access

bridge construction, as well as all the cost for the preparation of the Engineer's Report would be shared by the abutting owner and upstream lands and roads. Any cost for additional top width will be borne by the owner. It was established that the owner prefers a similar long pipe that will result in approximately a 10 metre (30') top width to allow for the current large agricultural equipment to access the parcel more easily. We went on to discuss that precast concrete blocks for the installation or rip rap rock on filter cloth sloped ends like those on the existing and other bridges were expected to be an economical end treatment. It is expected that the rip rap option would be used to match the existing bridge, but the Engineer would contact the owner if necessary to advise if there was any change to this. Mr. Nelner confirmed where the new bridge centreline should be located, approximately in line with the existing structure.

The overall drainage report procedure, future maintenance processes and grant eligibility were generally reviewed with the owners. They were also advised that the works will be subject to the approval of the Department of Fisheries and Oceans (D.F.O.), the Ministry of Natural Resources (M.N.R.F.), Ministry of Environment, Conservation and Parks (M.E.C.P.) and the Essex Region Conservation Authority (E.R.C.A.). We further discussed bridge maintenance, sizing, and material of the proposed bridge, suggesting that an aluminized corrugated steel pipe is expected to be employed.

Ms. Rilett asked why she was invited to the meeting when their lands are located downstream, and they won't be affected. Ms. Dean explained that the Town policy is to notify all owners within the drain watershed so that they are aware of any proposed works on the drain and to give them the opportunity to provide input at the meeting. Ms. Rilett advised that their lands at the south side of the road all drain to the south and should therefore not be assessed. Ms. Dean advised her that the road ditch along the south side would be checked for direction of flow and there would be no assessment to their parcel if going westerly and being downstream of the bridge work. She also advised her that any concerns with the road ditch should be brought to the Town Road Department. It was discussed that municipal drains are a user pay system and includes roads that are assessed for their areas contributing flows. The apportionment of costs will be set out in the drainage report. Ms. Dean explained the emergency bridge replacement process and then the drainage report process that will be followed. The Minister gave the emergency approval for the bridge work pursuant to the Drainage Act. She advised the owners that they can contact her or Mr. Rood if any questions come up.

On November 1st, 2023 we received an email from Lindsay Dean with the request for a new bridge culvert to be installed for the Broser parcel with the owners requesting a bridge similar to the Nelner bridge. The owner set out stakes for the location of the bridge on their frontage.

IV. FIELD SURVEY AND INVESTIGATIONS

Following the on-site meeting we arranged for our survey staff to perform a topographic survey, including taking the necessary levels and details to establish the design parameters for the installation of the replacement access bridge. After receiving the information on November 1st,

2023, for the new Broser bridge, we also arranged for our survey staff to perform additional topographic survey work as needed.

A benchmark was looped from previous work carried out on the drain and was utilized in establishing a site benchmark near the location of the bridges. We surveyed the drain both upstream and downstream of the proposed replacement access bridge and picked up the existing bridges and culvert elevations in order to establish a design grade profile for the installation of the replacement bridge. We also took cross-sections of the Austin C. Wright Drain at the general location of the proposed new bridge, as necessary for us to complete our design calculations, estimates and specifications.

The Town made initial submissions to the Essex Region Conservation Authority (E.R.C.A) regarding their requirements for the installation of the new replacement bridge to be constructed in the Drain. A response from the Conservation Authority was received via email on September 14th, 2023. E.R.C.A. stated that the portion of the Drain is located within a regulated area administered by E.R.C.A.. Accordingly, a permit or approval will be required by E.R.C.A. for the construction of the new replacement bridge in the affected portion of the Drain and will be issued for emergency works completed in accordance with an engineered design. Based on this information it will also be necessary to get the permit from E.R.C.A. for the new bridge.

Former Ministry of Natural Resources & Forestry (M.N.R.F.) agreements are replaced with new legislation provisions under Ontario Regulation 242/08, Section 23.9 administered by the Ministry of Environment, Conservation and Parks (M.E.C.P.), which allows repairs, maintenance and improvements to be conducted by the Municipality within existing municipal drains. These works are exempt from Sections 9 and 10 of the Endangered Species Act provided that the rules in the regulations are followed by the Municipality and their contractor. When eligible, the new regulations allow Municipalities to give notice to M.N.R.F. by registering their drainage activities through an online registry system.

For the purposes of establishing the watershed area upstream of the proposed replacement and new access bridges, and determining the bridge sizes required, we investigated and reviewed the past drainage reports on the Drain.

V. FINDINGS AND RECOMMENDATIONS

Prior to the preparation of our report, we reviewed the details of the replacement and new bridge installations including the end treatment options based on the regulatory restrictions and the cost estimates that we were to review.

Based on our detailed survey, investigations, examinations, and discussions with the affected property owners, we would recommend that the new access bridges be constructed in the Drain at the location and to the general parameters as established in our design drawings attached herein.

During the course of our investigations, this drainage project was discussed and reviewed with E.R.C.A., to deal with any Authority issues and comments related to this Municipal drain. To prevent flooding and adverse impacts upstream, the new structure needs to provide an equivalent level of service to the adjacent structures. Therefore, based on this, we have made provisions to use a corrugated steel pipe culvert for each bridge as set out below, similar to the existing structure being replaced and adjacent bridges. The Drain is located within the Regulated Area and is under the jurisdiction of the E.R.C.A., and therefore all work has to comply with the current mitigation provisions of the E.R.C.A. Details of these mitigation measures are included in the Specifications and **Appendix "REI-A"** forming part of this report.

As part of our investigations, a D.F.O. self screening assessment of the project was carried out. The mapping indicated no species at risk or critical habitat for the area of the bridge work. In the interest of fish habitat and migration, D.F.O. requires that the invert of any new bridge be embedded below the design or existing bottom of the drain a minimum of 10% of the bridge opening height to ensure a continued path for fish migration through the access bridge. The D.F.O. Species at Risk screening maps confirm that there are no Species at Risk Fish or Mussels identified in this area. Should any species be encountered, details of required mitigation measures are included in the Specifications and **Appendix "REI-A"** forming part of this report.

As is now required under the new Endangered Species Act, 2007 Provincial Legislation administered by the Ministry of Environment, Conservation & Parks (M.E.C.P.), we have reviewed the former M.N.R.F. agreement with the Town. The M.N.R.F. mapping has basically confirmed that there are no foreseen impacts to natural heritage features or endangered or threatened species on this project; therefore, a permit or agreement under the E.S.A. 2007 is not necessary at this time. The N.H.I.C. mapping was also checked, and a list of special species is included in the Appendix. Because turtles and snakes are mobile and snakes are indicated as sensitive in the area, we have included herein a copy of the M.N.R.F. mitigation requirements for them in **Appendix "REI-B"**.

Providing mitigation requirements are implemented it was concluded that present wildlife Species at Risk will be protected from negative impacts and will not contravene with Section 9 (species protection) or Section 10 (habitat protection) of the Endangered Species Act, 2007. Based on this information we find that the Town can proceed with the eligible replacement and new bridge construction in the drain as they are exempt under Sections 9 and 10 of the Act, provided that they follow the rules within Ontario Regulation 242/08. To address these requirements the Town has established comprehensive mitigation measures as well as species identification guides for reference. Copies of the measures and guides are available for viewing by any interested parties at the Town office.

Since all of the work will be carried out at the existing and proposed driveway and is primarily from within the road allowance and limits of the drain, and because full restoration will be provided, we find that there is no requirement for damages or allowances pursuant to Sections 29 and 30 of the Drainage Act.

Based on all of the above, we recommend that a new replacement access bridge be constructed in the Drain to serve the lands of Timothy & Cynthia Nelner and a new access bridge be constructed in the Drain to serve the lands of Michael & Christine Broser, in accordance with this report, the attached specifications and the accompanying drawings, and that all works associated with same be carried out in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2021".

VI. ESTIMATE OF COST

Our estimate of the total cost of this work including all incidental expenses is the sum of **ONE HUNDRED SIX THOUSAND DOLLARS ($106,000.00),** made up as follows:

CONSTRUCTION

Item 1)	**Bridge 1 - STA 0+695;** Provide all labour, equipment and material to construct a new access bridge consisting of 17 metres (55.8 ft.) of 1800mm diameter aluminized steel culvert with 125x25mm corrugations, 2.0mm thick, including quarried limestone rip rap on filter cloth end treatments, granular bedding and backfill, granular approaches, any tile diversions, excavation, compaction, removal and disposal of existing structure and salvage of steel plates delivered to the Town, loading, hauling, cleanup, and restoration, complete.	Lump Sum	$	42,900.00
Item 2)	**Bridge 2 - STA 0+132;** Provide all labour, equipment and material to construct a new access bridge consisting of 17 metres (55.8 ft.) of 1800mm diameter aluminized steel culvert with 125x25mm corrugations, 2.0mm thick, including quarried limestone rip rap on filter cloth end treatments, granular bedding and backfill, granular approaches, any tile diversions, excavation, compaction, loading, hauling, cleanup, and restoration, complete.	Lump Sum	$	40,600.00
Item 3)	Provide all labour and equipment to remove blockage in the drain at the emergency repair bridge and restore the general drain cross section including excavation, loading, hauling, cleanup, and restoration, complete.	Lump Sum	$	1,550.00
	Estimated Net H.S.T. (1.76%) on Items Above		$	1,496.00
TOTAL FOR CONSTRUCTION			**$**	**86,546.00**

INCIDENTALS

1)	Report, Estimate, and Specifications	$	6,000.00
2)	Survey, Assistants, Expenses, Drawings, Duplication Cost of Report and Drawings, Consideration Meeting, etc.	$	8,000.00
3)	Estimated Cost of Preparing Tender Documents	$	1,000.00
4)	Estimated Cost of Construction Supervision and Inspection (based on 4 days)	$	3,200.00
5)	Estimated Net H.S.T. on Items Above (1.76%)	$	320.00
6)	Estimated Cost of E.R.C.A. permit	$	500.00
7)	Estimated Contingency Allowance	$	434.00
	TOTAL FOR INCIDENTALS	**$**	**19,454.00**
	TOTAL FOR CONSTRUCTION (brought forward)	**$**	**86,546.00**
	TOTAL ESTIMATE	**$**	**106,000.00**

VII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the construction of the replacement access bridge and the new bridge. The design drawings show the subject bridge locations and the details of the new access bridge installations. The design drawings are attached to the back of this report and are labelled **Appendix "REI-E"**.

Also attached, we have prepared Specifications which set out the required construction details for the proposed bridge installations, which also includes Standard Specifications within **Appendix "REI-C".**

VIII. SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated with the construction of the replacement access bridge, and the preparation of this Engineer's report for said work, be assessed against the Timothy & Cynthia Nelner parcel, in Part of Lot 16, Concession 5, and all upstream affected

lands and roads in the Town of Essex for the replacement bridge. The costs associated with the construction of the new bridge for the Michael & Christine Broser parcel and the preparation of this Engineer's report for said work be assessed 100% to the parcel served by the new access bridge. A Schedule of Assessment has been prepared and included herein to indicate the lands and roads assessed for the replacement access bridge and the new bridge installation. The bridge owners share is shown as a Special Benefit to the parcel of each bridge.

It has been clearly established that the replacement access bridge and the new bridge are being provided to serve as the access from the 5th Concession Road to existing parcels with them and upstream agricultural lands involved in the assessment. Pursuant to the current Agricultural Drainage Infrastructure Program (A.D.I.P.) Policies that are in place, all of the lands designated as Farm Property Tax Class should be eligible 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.

Where a bridge structure has increased top width beyond the standard 6.10 metre (20.0 ft.) top width, all of the increased costs resulting from same are assessed 100% to the Owner, as provided for in the cost sharing set out below and in the attached Schedule of Assessment. The installation of a new first-time bridge is assessed 100% to the parcel served by the bridge and future maintenance cost is shared after the bridge has been installed and becomes part of the drainage works through the drainage report. The future sharing will be a Benefit to the bridge owner and Outlet Liability to the upstream lands and roads as set out in the attached assessment schedule for future maintenance to the new bridge with values pro-rated to the actual future cost.

IX. FUTURE MAINTENANCE

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

After the completion of the construction of these access bridges, all of same shall be maintained in the future by the Town of Essex. Furthermore, if any maintenance work is required to the new access Bridge 1 in the future, we recommend that 54.6% of the future maintenance costs shall be assessed as a Benefit against the abutting property (Parcel 800-00700) being served by the access bridge, which is currently owned by Timothy & Cynthia Nelner, in Part of Lot 16,

Concession 5, and the remaining balance of 45.4% be assessed pro-rata against the upstream lands and roads based on their Outlet Liability assessment in the attached Schedule of Assessment for the construction with Special Benefit assessment removed. Similarly, we recommend that 49.5% of the future maintenance costs for Bridge 2 shall be assessed as a Benefit against the abutting property Parcel 800-00750 being served by the access bridge, which is currently owned by Michael & Christine Broser, and the remaining balance of 50.5% be assessed pro-rata against the upstream lands and roads based on their Outlet Liability assessment in the attached Schedule of Assessment for future maintenance of this bridge. This sharing reflects that the owners have requested a bridge slightly wider than the standard 6.1 metre (20 feet) top width that is normally shared between the owner and upstream affected lands and roads.

The above provisions for the future maintenance of the replacement access bridge and the new bridge being constructed 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 2021".

All of which is respectfully submitted.

***R**ood **E**ngineering **I**nc.*

Gerard Rood

Gerard Rood, P.Eng.

REGISTERED PROFESSIONAL ENGINEER
G.ROOD
2023-11-28
PROVINCE OF ONTARIO

tm

att.

ROOD ENGINEERING INC.
Consulting Engineers
9 Nelson Street
LEAMINGTON, Ontario N8H 1G6

SCHEDULE OF ASSESSMENT
AUSTIN C. WRIGHT DRAIN
(Nelner & Broser Bridges)
Town of Essex

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
		5th Concession Road	8.29	3.354		Town of Essex	$ -	$ 2,499.00	$ -	$ 2,499.00
		Total on Municipal Lands.....					**$ -**	**$ 2,499.00**	**$ -**	**$ 2,499.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
790-02801	4	16	5.249	7.00	2.833	Lise Lauzon	$ -	$ 384.00	$ -	$ 384.00
790-02802	4	16 & 17	5.269	2.50	1.012	Philip & Patricia Soucie	$ -	$ 137.00	$ -	$ 137.00
790-02850	4	16	5.220	2.50	1.012	Mark Labute & Angela Anderson-Labute	$ -	$ 137.00	$ -	$ 137.00
790-02900	4	17	1.157	2.86	1.157	Colleen Marcuzzi	$ -	$ 329.00	$ -	$ 329.00
790-02901	4	17	4.055	7.50	3.035	Norbert & Catherine Sauerwein	$ -	$ 411.00	$ -	$ 411.00
790-02902	4	17	4.055	7.50	3.035	Steven & Viktoria Bartel	$ -	$ 411.00	$ -	$ 411.00
790-02903	4	17	15.091	22.00	8.903	Rodrigue & Therese Levesque	$ -	$ 1,206.00	$ -	$ 1,206.00
790-02906	4	18	4.197	2.50	1.012	Maria Fehr	$ -	$ 137.00	$ -	$ 137.00
790-02907	4	18	4.059	1.00	0.405	Sandra Pare	$ -	$ 55.00	$ -	$ 55.00
790-02908	4	18	4.051	1.00	0.405	Robert & Bonnie Rilett	$ -	$ 55.00	$ -	$ 55.00
790-02909	4	18	4.051	1.00	0.405	Faro & Stefanie Briguglio	$ -	$ 55.00	$ -	$ 55.00
790-02940	4	17 & 18	5.229	7.00	2.833	Paul & Siobhan Finn	$ -	$ 384.00	$ -	$ 384.00
790-02950	4	18	5.168	2.50	1.012	Salvatore & Kimberly Galea	$ -	$ 137.00	$ -	$ 137.00
800-00102	4	18	5.075	12.54	5.075	James & Jeannette Sylvestre	$ -	$ 688.00	$ -	$ 688.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
800-00300	5	18	0.409	1.01	0.409	Michael & Phyllis Demarte	$ -	$ 161.00	$ -	$ 161.00
800-00550	5	17	0.291	0.72	0.291	Jacob Soucie	$ -	$ 126.00	$ -	$ 126.00
800-01200	5	17	19.886	41.00	16.592	Justin & Sara Kelley	$ -	$ 2,248.00	$ -	$ 2,248.00
800-01250	5	17	10.190	20.00	8.094	Kin Kwong	$ -	$ 1,097.00	$ -	$ 1,097.00
		Total on Privately Owned - Non-Agricultural Lands.....					**$ -**	**$ 8,158.00**	**$ -**	**$ 8,158.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
800-00100	5	18	34.601	57.42	23.238	James & Jeannette Sylvestre	$ -	$ 3,148.00	$ -	$ 3,148.00
800-00200	5	18	9.834	24.30	9.834	Bradley & Anne Anger	$ -	$ 1,332.00	$ -	$ 1,332.00
800-00400	5	18	29.955	63.99	25.896	Francine Johnson	$ -	$ 3,508.00	$ -	$ 3,508.00
800-00500	5	17	19.202	44.28	17.920	Donald & Penny Anger	$ -	$ 2,428.00	$ -	$ 2,428.00
800-00600	5	17	20.643	51.01	20.643	Nicholas & Sheri Menard	$ -	$ 2,797.00	$ -	$ 2,797.00
800-00700	5	16	19.603	4.00	1.619	Timothy & Cynthia Nelner	$ -	$ 219.00	$ 29,725.00	$ 29,944.00
800-00750	5	16	20.603	0.00	0.000	Michael & Christine Broser	$ -	$ -	$ 49,726.00	$ 49,726.00
800-01300	5	17	10.060	24.86	10.061	Jason Hicks	$ -	$ 1,363.00	$ -	$ 1,363.00
800-01600	5	19	36.871	20.00	8.094	Brenda Anger	$ -	$ 1,097.00	$ -	$ 1,097.00
		Total on Privately Owned - Agricultural Lands (grantable).....					**$ -**	**$ 15,892.00**	**$ 79,451.00**	**$ 95,343.00**
		TOTAL ASSESSMENT	440.28	178.18			**$ -**	**$ 26,549.00**	**$ 79,451.00**	**$ 106,000.00**

1 Hectare = 2.471 Acres
Project No. REI2023D017
November 22nd, 2023

SCHEDULE OF ASSESSMENT
AUSTIN C. WRIGHT DRAIN
(Broser Bridge Maintenance)
Town of Essex

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
		5th Concession Road	8.29	3.354		Town of Essex	$ -	$ 472.00	$ -	$ 472.00
		Total on Municipal Lands.....					**$ -**	**$ 472.00**	**$ -**	**$ 472.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
790-02801	4	16	5.249	7.00	2.833	Lise Lauzon	$ -	$ 72.00	$ -	$ 72.00
790-02802	4	16 & 17	5.269	2.50	1.012	Philip & Patricia Soucie	$ -	$ 26.00	$ -	$ 26.00
790-02850	4	16	5.220	2.50	1.012	Mark Labute & Angela Anderson-Labute	$ -	$ 26.00	$ -	$ 26.00
790-02900	4	17	1.157	2.86	1.157	Colleen Marcuzzi	$ -	$ 62.00	$ -	$ 62.00
790-02901	4	17	4.055	7.50	3.035	Norbert & Catherine Sauerwein	$ -	$ 77.00	$ -	$ 77.00
790-02902	4	17	4.055	7.50	3.035	Steven & Viktoria Bartel	$ -	$ 77.00	$ -	$ 77.00
790-02903	4	17	15.091	22.00	8.903	Rodrigue & Therese Levesque	$ -	$ 227.00	$ -	$ 227.00
790-02906	4	18	4.197	2.50	1.012	Maria Fehr	$ -	$ 26.00	$ -	$ 26.00
790-02907	4	18	4.059	1.00	0.405	Sandra Pare	$ -	$ 10.00	$ -	$ 10.00
790-02908	4	18	4.051	1.00	0.405	Robert & Bonnie Rilett	$ -	$ 10.00	$ -	$ 10.00
790-02909	4	18	4.051	1.00	0.405	Faro & Stefanie Briguglio	$ -	$ 10.00	$ -	$ 10.00
790-02940	4	17 & 18	5.229	7.00	2.833	Paul & Siobhan Finn	$ -	$ 72.00	$ -	$ 72.00
790-02950	4	18	5.168	2.50	1.012	Salvatore & Kimberly Galea	$ -	$ 26.00	$ -	$ 26.00
800-00102	4	18	5.075	12.54	5.075	James & Jeannette Sylvestre	$ -	$ 129.00	$ -	$ 129.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
800-00300	5	18	0.409	1.01	0.409	Michael & Phyllis Demarte	$ -	$ 30.00	$ -	$ 30.00
800-00550	5	17	0.291	0.72	0.291	Jacob Soucie	$ -	$ 24.00	$ -	$ 24.00
800-01200	5	17	19.886	41.00	16.592	Justin & Sara Kelley	$ -	$ 422.00	$ -	$ 422.00
800-01250	5	17	10.190	20.00	8.094	Kin Kwong	$ -	$ 206.00	$ -	$ 206.00
		Total on Privately Owned - Non-Agricultural Lands.....					**$ -**	**$ 1,532.00**	**$ -**	**$ 1,532.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
800-00100	5	18	34.601	57.42	23.238	James & Jeannette Sylvestre	$ -	$ 591.00	$ -	$ 591.00
800-00200	5	18	9.834	24.30	9.834	Bradley & Anne Anger	$ -	$ 250.00	$ -	$ 250.00
800-00400	5	18	29.955	63.99	25.896	Francine Johnson	$ -	$ 659.00	$ -	$ 659.00
800-00500	5	17	19.202	44.28	17.920	Donald & Penny Anger	$ -	$ 456.00	$ -	$ 456.00
800-00600	5	17	20.643	51.01	20.643	Nicholas & Sheri Menard	$ -	$ 525.00	$ -	$ 525.00
800-00700	5	16	19.603	7.00	2.833	Timothy & Cynthia Nelner	$ -	$ 72.00	$ -	$ 72.00
800-00750	5	16	20.603	3.00	1.214	Michael & Christine Broser	$ 4,950.00	$ 31.00	$ -	$ 4,981.00
800-01300	5	17	10.060	24.86	10.061	Jason Hicks	$ -	$ 256.00	$ -	$ 256.00
800-01600	5	19	36.871	20.00	8.094	Brenda Anger	$ -	$ 206.00	$ -	$ 206.00
		Total on Privately Owned - Agricultural Lands (grantable).....					**$ 4,950.00**	**$ 3,046.00**	**$ -**	**$ 7,996.00**
		TOTAL ASSESSMENT	446.28	180.61			**$ 4,950.00**	**$ 5,050.00**	**$ -**	**$ 10,000.00**

1 Hectare = 2.471 Acres
Project No. REI2023D017
November 22nd, 2023

SPECIFICATIONS

AUSTIN C. WRIGHT DRAIN

Replacement Bridge for Nelner & New Bridge for Broser

(Geographic Township of Colchester South)

TOWN OF ESSEX

I. GENERAL SCOPE OF WORK

The Austin C. Wright Drain currently comprises of an open Municipal drain generally located along the north side of 5th Concession Road and extending from its outlet in the Hicks Drain at the west side of Lot 16 easterly to its upper end near the midpoint of Lot 19, Concession 5. The work under this project generally comprises of improvements to an existing access bridge serving the Nelner and Broser lands. The work on the Broser bridge being constructed includes the installation of a new culvert at the stake placed by the owner near Station 0+132 and the work on the Nelner bridge being constructed includes the removal of the deteriorated existing corrugated steel pipe structure and the salvage of steel plates used for temporary access repair and to be returned to the Town of Essex near Station 0+695; the installation of a new culvert near Station 0+695; new culvert end treatments comprising of sloped quarried limestone on filter cloth end protection; granular approaches and backfill; and granular transition areas.

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

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

The Contractor will be required to implement stringent erosion and sedimentation controls during the course of the work to help minimize the amount of silt and sediment being carried downstream into the Cedar 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 system. All disturbed areas shall be restored as quickly as possible with grass seeding and mulching installed to ensure a protective cover and to minimize any erosion from the work site subsequent to construction. The Contractor may be

required to provide temporary silt fencing and straw bales as outlined further in these specifications.

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

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

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

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

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

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

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

III. M.N.R.F. & M.E.C.P. ENDANGERED SPECIES ACT CONSIDERATIONS

The Ministry of Natural Resources & Forestry (M.N.R.F.) Species at Risk former Town agreement with M.N.R.F. pursuant to Section 23 of the "Endangered Species Act, 2007" expired as of June 30th, 2015. The former agreements are replaced with new regulation provisions under Ontario Regulation 242/08 administered by the M.E.C.P. The Contractor is to note that the Ministry of Environment, Conservation and Parks (M.E.C.P.) screening process by way of a Species at Risk

(S.A.R.) review of the M.E.C.P. "Endangered Species Act, 2007" (E.S.A.) will be completed as a self-assessment pursuant to Section 23.9 of the E.S.A. prior to construction. This Section allows the Town to conduct eligible works of repair, maintenance, and improvements to existing municipal drains under the Drainage Act, and exemptions from Sections 9 and 10 of the E.S.A., provided that the requirements are followed in accordance with Ontario Regulation 242/08. The results of the review will be provided to the Contractor and copies of the mitigation measures, habitat protection and identification sheets will be included within **Appendix "REI-B"**. When eligible, the new regulations allow Municipalities to give notice to M.N.R.F. by registering their drainage activities through an online registry system.

The M.N.R.F. - M.E.C.P. mapping has basically confirmed that snake species including Butler's Garter Snake and Eastern Fox Snake are threatened and endangered, respectively, on this project. Because snakes are mobile and indicated as sensitive and endangered in the area, we have included herein a copy of the M.N.R.F. - M.E.C.P. mitigation requirements for them in **Appendix "REI-B"**. Providing mitigation requirements are implemented, it was concluded that present wildlife Species at Risk will be protected from negative impacts and the works will not contravene Section 9 (species protection) or Section 10 (habitat protection) of the Endangered Species Act, 2007.

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

IV. ACCESS TO WORK

The Contractor is advised that the majority of the work to be carried out on this project extends along the north side of 5th Concession Road. The Contractor shall have access for the full width of the roadway abutting the proposed drainage works. The Contractor may utilize the right-of-way as necessary, to permit the completion of all of the work required to be carried out for this project. For Bridge 1, the Contractor shall also have access into the driveway as necessary to carry out the removal of the existing access bridge and to construct the new replacement access bridge, as set out on the plans and in these specifications, along with a sufficient area in the vicinity of the bridge to carry out the required construction of the removal and new structure installation and ancillary work. For Bridge 2 the Contractor shall also have access along the roadway and into the new driveway being constructed as set out on the plans and in these specifications, along with a sufficient area in the vicinity of the new bridge to carry out the required construction, installation and ancillary work including the area required for diversion of the existing tile drain outlet as detailed on the plan.

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

Throughout the course of the work, it is imperative that the Contractor protect as much landscaping and vegetation as possible when accessing along the drain. This will be of particular concern along the lawn areas of residential properties. Due to the extent of the work and the area for carrying out the work, the Contractor will be required to carry out all of the necessary steps to direct traffic and provide temporary diversion of traffic around work sites, including provision of all lights, signs, flag persons, and barricades required to protect the safety of the traveling public. Any accesses or areas used in carrying out the works are to be fully restored to their original conditions by the Contractor at its cost, including topsoil placement and lawn restoration as directed by the Town Drainage Superintendent and the Consulting Engineer. Restoration shall include but not be limited to all necessary levelling, grading, shaping, topsoil, seeding, mulching, rip rap on filter cloth, and granular placement required to make good any damage caused.

V. REMOVAL OF BRUSH, TREES AND RUBBISH

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

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

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

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

VI. FENCING

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

VII. DETAILS OF OPEN DRAIN WORK

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 Engineer at the time of the work. The drain shall be carefully excavated so as not to 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. The bottom width of the drain and the sideslopes of the excavation shall conform to the dimensions given on the drawings.

The drain shall be of the size, type, depth, etcetera as shown on the accompanying drawings. When completed, the drain shall have a uniform and even bottom and in no case shall such bottom project above the grade line, as shown on the accompanying drawings, and as determined from the Benchmarks. The finished side slopes of the drain shall be 1.5 metres horizontal to 1.0 metre vertical with the bottom width at 0.9 metre and drain grade at 0.19%.

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 100mm in depth. The material shall be kept at least 1.2 metres 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, shall be hauled away by the Contractor and disposed of at a site to be obtained by it at its expense.

Where the drain crosses any lawn, garden, orchard, parking, roadway or driveway areas, the excavated material for the full width of the above-mentioned areas shall be hauled away by the Contractor and disposed of to a site to be obtained by the Contractor at its expense. All work at the disposal site shall be established between the Contractor and the site owner. The Contractor shall be responsible for any permits required and shall provide copies of same to the Town and Consulting Engineer when requested.

Where there is any brush or rubbish in the course of the drain, including both side slopes of the drain, all such brush or rubbish shall be close cut and grubbed out. Where there is any brush or rubbish where the earth is to be spread, or on that strip of land between where the earth is to be spread and the edge of the drain, all such brush or rubbish shall be close cut and grubbed out. The whole is to be burned, chipped or otherwise satisfactorily disposed of by the Contractor.

VIII. DETAILS OF BRIDGE WORK

The Contractor shall provide all material, labour and equipment to repair and improve the existing access bridge in the Austin C. Wright Drain requiring work, and install the new access bridge along with endwall repairs or construction and other improvements as noted.

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

The culvert pipe replacement and new pipe installation on this project shall be set to the grades as shown on the plans or as otherwise established herein and the Town Drainage Superintendent

or the Consulting Engineer may make minor changes to the bridge alignment as they deem necessary to suit the site conditions. All work shall be carried out in general accordance with the items in the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION"** attached to this report and labelled **Appendix "REI-C"**.

IX. CORRUGATED STEEL PIPE INSTALLATION

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

The Contractor shall note that the placement of any new culvert pipe shall be performed totally in the dry and it shall be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. As part of the work, the Contractor will be required to clean out the drain along the full length of the pipe and for a distance of 3.05 metres (10 ft.) upstream and downstream of the pipe. The design parameters of the Austin C. Wright Drain at the location of the replacement access bridge and at new bridge installation consist of a 0.91m (3.0 ft.) bottom width, the 0.19% grade shown on the profile, and 1.5 horizontal to 1.0 vertical sideslopes. The Contractor shall note that the pipe inverts are set at least 10% of the pipe diameter (or the pipe rise) below the drain bottom to provide the embedment required by E.R.C.A. and D.F.O. and to meet the minimum cover requirements for the pipe.

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

For the access bridge installation, once the new aluminized steel type II corrugated pipe has been satisfactorily set in place, the Contractor shall completely backfill same with granular material M.T.O. Type "B" O.P.S.S. Form 1010 with the following exception. The top 305mm (12") of the backfill material for the full top width of the access, and the full top width of the drain or the

excavated trench, and any approaches to the south and transitions to the north shall be granular material M.T.O. Type "A" O.P.S.S. Form 1010. All of the driveway approach areas extending from the Town roadway to the south face of the new bridge culvert shall be backfilled with compacted granular material M.T.O. Type "A" O.P.S.S. Form 1010, but only after all topsoil material has been completely removed and disposed of, and the minimum thickness of this granular material shall be 305mm (12"). All areas outside of the access driveway shall be backfilled with native material compacted to 96% of Standard Proctor Density and topped with a minimum of 50mm of topsoil and shall be seeded and mulched.

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

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

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

The Contractor shall also note that the placing of the new access bridge culvert shall be completed so that it totally complies with the parameters established and noted in the Bridge Details and Tables for the culvert replacement. The culvert shall be set on an even grade and the placement shall be performed totally in the dry, and the Contractor should be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor shall also be required to supply a minimum of 100mm (4") of 20mm (3/4") clear stone bedding underneath the culvert pipe

extending from the bottom of the drain to the culvert invert grade, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. Furthermore, if an unsound base is encountered, it must be removed and replaced with 20mm (3/4") clear stone satisfactorily compacted in place to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor is to note that when replacing an access bridge or enclosure culvert, it shall be required to excavate a trench having a width not less than the new pipe outside diameter plus a 600mm working width on both sides of the new pipe to allow for proper installation of granular backfill and compaction of same. The Contractor shall also note that all culvert pipe installations are to be carried out with a minimum of 10% of their diameter or rise embedded below the drain design bottom, as shown and noted on the plan for each of the access bridge installations.

X. REMOVALS

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

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

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

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

The concrete filled jute bags are to be provided and laid out as is shown and detailed in the drawings provided by the Town and as noted in the Standard Specifications in **Appendix "REI-C"**. In all cases, the concrete filled jute bag headwalls shall be topped with a minimum 100mm (4") thick continuous concrete cap comprising 30mPa concrete with 6% ±1% air entrainment for the

entire length of the headwalls. The headwalls shall be installed on an inward batter to be not less than 1 horizontal to 5 vertical, and under no circumstances shall this batter, which is measured from the top of the headwall to the projection of the end of the pipe, be less than 305mm (12”). From the midpoint of the pipe height down to the concrete footing, the wall shall be a double concrete filled jute bag installation. On the roadside the walls shall be deflected as shown to provide daylighting and a better approach across the new bridge.

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

The Contractor shall install interlocking precast concrete blocks with filter cloth backing for walls on both ends of the bridges requiring same. The blocks shall be minimum 600X600X1200mm in size as available from Underground Specialties - Wolseley, Windsor, Ontario, or equal, and installed as set out in **Appendix "REI-C"**. Vertical joints shall be staggered by use of half blocks where needed and wingwall deflections when required shall employ 45-degree angled blocks. The block supplier shall provide shop drawings of the headwall block layout for review by the Engineer that includes blocks shaped for a close fit around the bridge pipe. Voids between the blocks and the pipe shall be grouted with 30mPa concrete having 6% ±1% air entrainment and extend for the full thickness of the wall and have a smooth uniform finish on the face that blends with the precast blocks. The installation of the endwalls, as well as the backfilling of the pipe where applicable, shall be provided in compliance with Items 1), 3), and 4) of the "Standard Specifications for Access Bridge Construction" attached within **Appendix "REI-C"** and in total compliance and in all respects with the General Conditions included in said Appendix. The Contractor shall submit shop drawings for approval of the wall installation that includes details for a minimum 300mm thick reinforced precast concrete footing that extends from the pipe invert downward. The reinforced precast footing shall extend for the full bottom width of the drain and into the drain banks each side for the required 400mm of embedment of the blocks and be constructed and installed to ensure that the completed wall will be completely vertical or tipped slightly back towards the driveway. Where the block walls extend more than 1.8 metres in height, the supplier shall provide the Contractor with uni-axial geogrid (SG350 or equivalent) reinforcement for installation to tie the wall back into the granular backfill. The Contractor, in all cases, shall comply with these specifications and upon completion of the stacked precast concrete end protection installation shall restore the adjacent areas to their original conditions. The Contractor shall supply quarried limestone on filter cloth rock protection adjacent to the headwalls at each corner of the bridge. All rock protection shall be 1.0 metres wide and 305mm (12”) thick, installed on non-woven filter cloth, and shall be installed in accordance with Item 2) of the "Standard Specifications for Access Bridge Construction". The synthetic filter mat to be used shall be non-woven geotextile GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products through Underground Specialties - Wolseley in Windsor, Ontario or equal. The quarried limestone to be used shall be graded in size from a minimum of

100mm to a maximum of 250mm, and is available from Walker Industries Amherst Quarries, in Amherstburg, Ontario, or equal.

Where sloped end protection is specified, the top 305mm (12") of backfill material over the ends of the access pipe, from the invert of said pipe to the top of the driveway elevation of the access bridge or enclosure, shall be quarried limestone. The quarried limestone shall be provided as shown and detailed on the plans or as indicated in the Standard Specifications in **Appendix "REI-C"** and shall be graded in size from a minimum of 100mm (4") to a maximum of 250mm (10"). The quarried limestone to be placed on the sloped ends of an access bridge or enclosure shall be underlain with a synthetic **non-woven** geotextile filter fabric. The sloped quarried limestone protection is to be rounded as shown on the plan details and shall also extend along the drain side slopes to a point directly in line with the ends of the culvert pipe. The roadside 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 installation of the sloped quarried limestone end protection, unless otherwise specified herein, shall be provided in total compliance with Item 2), 3), and 4) of the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION"**. These are attached to the back of these specifications and labelled **Appendix "REI-C"**. The Contractor shall comply in all respects with the General Conditions included in Item 4 and the **"Typical Quarried Limestone End Protection Detail"** also in **Appendix "REI-C"**.

The quarried limestone erosion protection shall be embedded into the sideslopes of the drain a minimum thickness of 305mm and shall be underlain in all cases with non-woven synthetic filter mat. The filter mat shall not only be laid along the flat portion of the erosion protection, but also contoured to the exterior limits of the quarried limestone and the unprotected slope. The width of the erosion protection shall be as established in the accompanying drawings or as otherwise directed by the Town Drainage Superintendent or the Consulting Engineer during construction. In placing the erosion protection, the Contractor shall carefully tamp the quarried limestone pieces into place with the use of the excavator bucket so that the erosion protection when completed will be consistent, uniform and tightly laid. In no instance shall the quarried limestone protrude beyond the exterior contour of the unprotected drain sideslopes along either side of said protection. The synthetic filter mat fabric to be used shall be non-woven geotextile GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products, or equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm to a maximum of 250mm, and is available from Walker Aggregates Amherst Quarries, in Amherstburg, Ontario, or equal.

XII. BENCHMARKS

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

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

XIII. ANCILLARY WORK

During the course of any work to the bridges and enclosures along the length of the project, the Contractor will be required to protect or extend any existing tile ends or swales and connect them to the drainage works to maintain the drainage from the adjacent lands. All existing tiles shall be extended utilizing solid Big 'O' "standard tile ends" or equal plastic pipe of the same diameter as the existing tile and shall be installed in accordance with the **"Standard Lateral Tile Detail"** included in the plans, unless otherwise noted. Connections shall be made using a manufacturer's coupling where possible. Wherever possible, tiles shall be extended to outlet beyond the end of any access culverts. When required, openings into new pipes shall be neatly bored, saw cut or burned with a torch to the satisfaction of the Town Drainage Superintendent or the Consulting Engineer. All cuts to steel pipes shall be touched up with a thick coat of zinc rich paint (Galvicon or equal) in accordance with the manufacturer's recommendations. For other connections, the Contractor shall utilize a grouted connection. Grouted mortar joints shall be composed of three (3) parts of clean, sharp sand to one (1) part of Portland cement with just sufficient water added to provide a stiff plastic mix, and the mortar connection shall be performed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The mortar joint shall be of a sufficient mass around the full circumference of the joint on the exterior side to ensure a tight, solid seal. The Contractor is to note that any intercepted pipes along the length of the existing culverts and enclosures are to be extended and connected to the open drain unless otherwise noted in the accompanying drawings.

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

All granular backfill for the bridge and enclosure installations shall be satisfactorily compacted in place to a minimum Standard Proctor Density of 98% by means of mechanical compaction equipment. All other good, clean, native fill material or topsoil to be utilized, where applicable,

shall be compacted in place to a minimum Standard Proctor Density of 95%. All of the backfill material, equipment used, and method of compacting the backfill material shall be provided and performed to the full satisfaction of the Town Drainage Superintendent or Consulting Engineer.

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

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

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

Although it is anticipated that the culvert installation at each site shall be undertaken in the dry, the Contractor shall supply and install a temporary straw bale or silt curtain check dam in the drain bottom immediately downstream of each culvert site during the time of construction. The straw bale or silt curtain check dam shall be to the satisfaction of the Town Drainage Superintendent or Consulting Engineer and must be removed upon completion of the construction. The check dam materials may be reused at each site subject to their condition. All costs associated with the supply and installation of this straw bale or silt curtain check dam shall be included in the cost bid for the bridge replacements.

XIV. TOPSOIL, SEED AND MULCH

The Contractor shall be required to restore all existing grassed areas and drain side slopes damaged by the structure replacements, construction or cutting of the drain cross section, by placing topsoil, and then seed and mulch over said areas including any specific areas noted on the bridge details. The Contractor shall be required to provide all the material and to cover the above mentioned surfaces with approximately 50mm of good, clean, dry topsoil on slopes and 100mm of good, clean, dry topsoil on horizontal surfaces, fine graded and spread in place ready for seeding and mulching. The placing and grading of any topsoil shall be carefully and meticulously carried out in accordance with Ontario Provincial Standard Specifications, Form 802

dated November 2010, or as subsequently amended, or as amended by these specifications and be readied for the seeding and mulching process. The seeding and mulching of all of the above mentioned areas shall comply in all regards to Ontario Provincial Standard Specifications, Form 803 dated November 2010 and Form 804, dated November 2013, or as subsequently amended, or as amended by these specifications. The seeding mixture shall be the Standard Roadside Mix (Canada No. 1 Lawn Grass Seed Mixture) as set out in O.P.S.S. 804. All cleanup and restoration work shall be performed to the full satisfaction of the Town Drainage Superintendent or Engineer.

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

XV. SPECIAL PROVISIONS FOR REPLACEMENT, REPAIR AND IMPROVEMENTS

The Contractor shall provide for the construction and improvements to the access bridges along the 5th Concession Road Drain East, for the structures noted, as follows:

Existing Bridge

The Contractor shall completely remove the existing C.S.P. bridge and any end protection that currently exists. The steel plates used for temporary access shall be carefully removed, salvaged and turned over to the Town. The Contractor will then be required to restore the drain cross section at the former bridge location to match the upstream and downstream drain cross sections. All disturbed areas shall be restored with topsoil, seed and mulch as set out above. The Contractor shall protect the existing water service near the east end of the bridge and the fire hydrant at the west end of the bridge that are crossing the drain and any other utilities that are present.

New Replacement Bridge

The Contractor shall completely remove the existing topsoil and vegetation in the area of the proposed new replacement bridge and clean out the drain bottom. The Contractor will then be required to install the new aluminized steel pipe as set out in the chart forming part of the details for the bridge at MN 5862 (Roll No. 800-00700) on the plans. The Contractor shall install sloped quarried limestone on filter cloth protection on each end. The Contractor shall protect any tile outlets on the banks at each end of the structure and divert and extend same as necessary to accommodate the replacement culvert. All work shall be carried out in accordance with these specifications and the requirements in **Appendix "REI-C"**.

New Bridge

The Contractor shall completely remove the existing topsoil and vegetation in the area of the proposed new bridge and clean out the drain bottom. The Contractor will then be required to install the new aluminized steel pipe as set out in the chart forming part of the details for the bridge at Roll No. 800-00750 on the plans. The Contractor shall install sloped quarried limestone on filter cloth protection on each end. The Contractor shall protect any tile outlets on the banks at each end of the structure and divert and extend same as necessary to accommodate the new culvert. All work shall be carried out in accordance with these specifications and the requirements in **Appendix "REI-C"**.

XVI. 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 Essex and the Consulting Engineer and their representatives for any damages which it may cause or sustain during the progress of the work. It shall not hold the Town of Essex or the Consulting Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.

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

d) The Contractor will be responsible for any damage caused by it to any portion of the Town road system, especially to the travelled portion. When excavation work is being carried out and the excavation equipment is placed on the travelled portion of the road, the travelled portion shall be protected by having the excavation equipment placed on satisfactory timber planks or timber pads. If any part of the travelled portion of the road is damaged by the Contractor, the Town shall have the right to have the necessary repair work done by its' employees and the cost of all labour and materials used to carry out the repair work shall be deducted from the Contractor's contract and credited to the Town. The Contractor, upon completing the works, shall clean all debris and junk, etcetera, from the roadside of the drain, and leave the site in a neat and workmanlike manner. The Contractor shall be responsible for keeping all public roadways utilized for hauling materials free and clear of mud and debris.

e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health

and Safety Act, and latest amendments thereto. If traffic control is required on this project, signing is to comply with the M.T.O. Manual of Uniform Traffic Control Devices (M.U.T.C.D.) for Roadway Work Operations and Ontario Traffic Manual Book 7.

f) During the course of the work the Contractor shall be required to connect existing drainage pipes to the Municipal Drain. In the event that polluted flows are discovered, the Contractor shall delay the connection of the pipe and leave the end exposed and alert the Town, the Drainage Superintendent and the Consulting Engineer so that steps can be taken by the Town to address the concern with the owner and the appropriate authorities. Where necessary the Contractor shall cooperate with the Town in providing temporary measures to divert the drain or safely barricade same. Should the connection be found acceptable by the authorities, the Contractor shall complete the connection of the drain as provided for in the specifications, at no extra cost to the project.

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

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

i) During the course of the project the Contractor shall deal with any excess soil management from the project in accordance with Ontario Reg 406/19 pursuant to the Environmental Protection Act, R.S.O. 1990, c. E.19 and any subsequent amendments to same.

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

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

l) The Contractor shall furnish a Performance and Maintenance Bond along with a separate Labour and Material Payment Bond within ten (10) days after notification of the execution of the Agreement by the Town. One copy of said bonds shall be bound into each of the executed sets of the Contract. Each Performance and Maintenance Bond and Labour and

Material Payment Bond shall be in the amount of 100% of the total Tender Price. All Bonds shall be executed under corporate seal by the Contractor and a surety company, authorized by law to carry out business in the Province of Ontario. The Bonds shall be acceptable to the Town in every way and shall guarantee faithful performance of the contract during the period of the contract, including the period of guaranteed maintenance which will be in effect for twelve (12) months after substantial completion of the works.

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

m) The Contractor shall be required, as part of this Contract, to provide Comprehensive Liability Insurance coverage for not less than $5,000,000.00 on this project; and shall name the Town of Essex and its' officials and the Consulting Engineer and their staff as additional insured under the policy. The Contractor must submit a copy of this policy to both the Town Clerk and the Consulting Engineer prior to the commencement of work.

n) Monthly progress orders for payment shall be furnished the Contractor by the Town Drainage Superintendent. Said orders shall be for not more than 90% of the value of the work done and the materials furnished on the site. The paying of the full 90% does not imply that any portion of the work has been accepted. The remaining 10% will be paid 60 days after the final acceptance and completion of the work and payment shall not be authorized until the Contractor provides the following:

i) a Certificate of Clearance for the project from the Workplace Safety and Insurance Board

ii) proof of advertising

iii) a Statutory Declaration, in a form satisfactory to the Engineer and the Town, that all liabilities incurred by the Contractor and its Sub-Contractors in carrying out the Contract have been discharged and that all liens in respect of the Contract and Sub-Contracts thereunder have expired or have been satisfied, discharged or provided for by payment into Court.

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

o) In the event that the Specifications, Information to Tenderers, or the Form of Agreement do not apply to a specific condition or circumstance with respect to this project, the applicable section or sections from the Canadian Construction Documents Committee C.C.D.C.2 shall govern and be used to establish the requirements of the work.

p) Should extra work be required by the Town Drainage Superintendent or Consulting Engineer, and it is done on a time and material basis, the actual cost of the work will be paid to the Contractor with a 15% markup on the total actual cost of labour, equipment and materials needed to complete the extra work.

q) The Contractor shall provide shop drawings of the proposed wall for decorative precast concrete block headwalls for approval by the Drainage Superintendent or Engineer prior to construction.

APPENDIX “REI-A”

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

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

1. 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.

2. 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.

3. 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 the related Ontario Provincial Standards. It is incumbent on the proponent and Contractors to ensure that sediment and erosion control measures are functioning properly and maintained/upgraded as required.

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

5. 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.

6. Any drain banks trimmed outside of the July 1st to September 15th timing window will require bio-degradable erosion control blankets to be installed to promote re-vegetation and to protect the slope from erosion in the interim.

Measures to Avoid Causing Harm to Fish and Fish Habitat

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

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

Measures

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

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

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

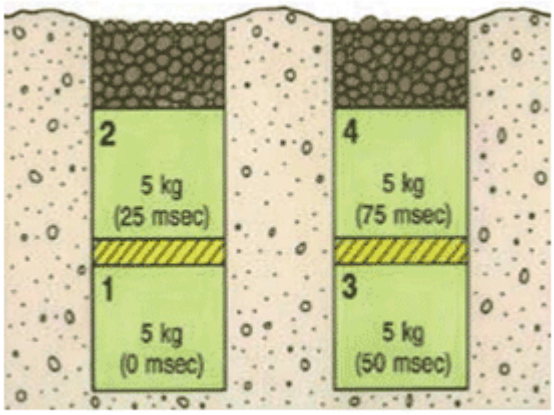
- Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:
    - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
    - Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
    - Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).
    - Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
    - Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
    - Repairs to erosion and sediment control measures and structures if damage occurs.
    - Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

- Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.
- Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
- Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
- Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
- If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
- Remove all construction materials from site upon project completion.

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

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

Figure 1: Sample Blasting Arrangement



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

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

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

Date modified:

2013-11-25

SECTION II

SPECIFICATIONS

FOR FISH SALVAGE

GENERAL
SECTION 201

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

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

MATERIALS
SECTION 202

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

CONSTRUCTION
SECTION 203

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

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

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

MEASUREMENT AND PAYMENT
SECTION 204

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

APPENDIX "REI-B"

SCHEDULE C

MITIGATION PLAN

The Municipality shall undertake measures to minimize adverse effects on species at risk in accordance with the general conditions described in Part B and taxa-specific conditions described in Part C, and the monitoring and reporting requirements described in Part D of this Mitigation Plan.

PART A. DEFINITIONS

1. Definitions:

1.1. In this Schedule, the following words shall have the following meanings:

"DFO" means Fisheries and Oceans Canada;

"MNR" means the Aylmer District Office of the Ministry of Natural Resources;

"Contact" means to contact the MNR in accordance with the notification/contact schedule provided to the Municipality by the MNR Designated Representative from time to time;

"Holding Tub" means a large, light-coloured container fitted with a non-airtight latchable lid approved by the MNR for the temporary storage of captured snakes, turtles, amphibians, birds or eggs;

"Interagency Notification Form" means the form issued by DFO, available at www.dfo-mpo.gc.ca, which is required to be completed when a drain is being maintained or constructed;

"Monitoring and Reporting Form" means the document that must be completed by the Municipality in accordance with Part D to this Schedule and will be provided to the Municipality;

"Ontario Operational Statement" means one of the documents issued by DFO, available at www.dfo-mpo.gc.ca, that sets out the conditions and measures to be incorporated into a project in order to avoid negative impacts to fish and fish habitat in Ontario, as modified from time to time;

"Process Charts" means the charts attached as Part E to this Schedule which describe the steps set out in this Mitigation Plan;

"Seasonal Timing Windows Chart" means the chart attached as Part G to this schedule which describes the Sensitive Periods applicable to each Taxonomic Group;

"Sensitive Area" means a geographic area in the Municipality where additional mitigation measures are required to be undertaken for one or more Taxonomic Groups;

"Sensitive Areas Map" means any one of the maps attached as Part F to this schedule which sets out the applicable Sensitive Areas;

"Sensitive Period" means a time of year set out in the Seasonal Timing Windows Chart during which taxa-specific mitigation measures are required to be undertaken for a Taxonomic Group because of ambient air/water temperatures, water-levels or important life-history stages;

"Taxonomic Group" means the distinct group comprising one or more Species based on their taxonomic relationship and common approaches to mitigating adverse effects (i.e., fish, mussels, turtles, snakes, amphibians, birds or plants); and

"Work Zone" means the geographic area in the Municipality where an Activity in respect of one of the Drainage Works is being conducted.

1.2. For greater certainty, any defined terms that are not defined in section 1.1 have the same meanings as in the Agreement.

PART B. GENERAL MEASURES TO MINIMIZE ADVERSE EFFECTS

2. Process Charts

2.1. The general steps set out in this Part B are visually described in the Process Charts (Part E).

3. Review of Documentation

3.1. Prior to conducting any Activities in respect of the Drainage Works the Municipality shall determine if conditions apply to the place, time or manner in which the Municipality wishes to pursue them by reviewing:

(a) the Sensitive Areas Maps (Part F) to determine if the Work Zone for the proposed Activities will occur within a Sensitive Area;

(b) the DFO Reference Guide for Fish and Mussel Species at Risk Distribution Maps: A Referral Review Tool for Projects Affecting Aquatic Species at Risk;

(c) the Seasonal Timing Windows Chart (Part G) to determine if the proposed Activities will occur during a Sensitive Period for one or more of the Taxonomic Groups; and

(d) the Process Charts to determine if prior notification is required;

(e) the mitigation measures for each applicable Taxonomic Group in Part C to determine what additional site-specific mitigation measures, if any, are required.

3.2. The Municipality shall document the results of the review undertaken in accordance with section 3.1 using the Monitoring and Reporting Form.

4. Sensitive Areas Maps

4.1. The Sensitive Areas Maps contain sensitive information about the distribution of species at risk, are provided for the sole purpose of informing this Agreement and are not to be copied or distributed for any other purposes or to any other party without the prior written authorization of the MNR Designated Representative.

5. Prior Notification to Seek Direction

5.1. If, after completing the review of documents described in section 3.1, the Municipality determines that the proposed Activities will be undertaken:

(a) in a place;

(b) at a time; or

(c) in a manner,

that requires prior notification in accordance with the Process Charts, the Municipality shall provide prior notification to the MNR in order for the MNR to determine if the Municipality must undertake additional site-specific or Species-specific mitigation

measures to minimize adverse effects on the Species and, if applicable, to identify such measures.

5.2. The prior notification under section 5.1 shall include a completed Interagency Notification Form:

(a) in respect of maintenance/repair where the proposed Activities are being undertaken pursuant to subsection 3(18) or section 74 of the *Drainage Act*; or

(b) in respect of construction/improvement where the proposed Activities are being undertaken pursuant to section 77 or 78 of the *Drainage Act*.

5.3. Where an Activity is undertaken in accordance with section 124 of the *Drainage Act* and would otherwise have required prior notification under section 5.1, the Municipality shall Contact the MNR by email prior to the commencement of the Activity, and complete and submit the applicable Interagency Notification Form within one week of the Activity's completion, unless otherwise directed in writing by the MNR Designated Representative.

6. General Mitigation Measures

6.1. Notwithstanding that prior notification or additional mitigation measures may be required in accordance with this schedule, in undertaking any Activity at any time in respect of the Drainage Works the Municipality shall:

(a) undertake the mitigation measures for sediment control and for erosion control and bank stabilization set out in The Drain Primer (Cliff Evanitski 2008) published by DFO (ISBN 978-0-662-48027-3), unless otherwise authorized in writing by the MNR Designated Representative;

(b) use net free, 100% biodegradable erosion control blanket for all erosion control or bank stabilization done in conjunction with their Activities or, if authorized in writing by the MNR Designated Representative, alternative erosion control blankets that provide equal or greater protection to individual Species; and

(c) where applicable, follow the guidelines set out in the following Ontario Operational Statements:

(i) Beaver Dam Removal;

(ii) Bridge Maintenance;

(iii) Culvert Maintenance;

(iv) Isolated Pond Construction;

(v) Maintenance of Riparian Vegetation in Existing Right of Ways; and

(vi) Temporary Stream Crossing.

PART C. TAXA-SPECIFIC MEASURES TO MINIMIZE ADVERSE EFFECTS

ADDITIONAL MITIGATION MEASURES FOR MUSSEL SPECIES

7. Activities undertaken in Sensitive Areas for Mussels

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

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 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

8. Training and Required On Site Materials for Turtles

8.1. 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.

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

9.1. Subject to section 9.2, 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.

9.2. Section 9.1 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.

10. Measures for Encounters with Turtles During a Sensitive Period

10.1. 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.

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

11.1. 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.

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

12.1. 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 13.1;

(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 13.1;

(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.

13. Release of Captured Individuals Outside of a Sensitive Period

13.1. Where uninjured individuals are captured under section 12.1, 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.

13.2. Following a release under section 13.1, 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.

14. Measures for Dead Turtles

14.1. 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

15. Training and Required On Site Materials for Snakes

15.1. 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.

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

16.1. 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.

16.2. 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 20.1; and

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

16.3. 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.

17. Measures for Encounters with Snakes During a Sensitive Period

17.1. 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.

18. Measures for Encounters with Snake Nests

18.1. 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.

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

19.1. 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 15;

(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 20.1;

(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 20.1;

(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.

20. Release of Captured Individuals Outside of a Sensitive Period

20.1. Where uninjured individuals are captured under section 19.1, 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.

20.2. Following a release under section 20.1, 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.

21. Measures for Dead Snakes

21.1. 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

22. Activities Undertaken in Sensitive Areas for Herbaceous Plants

22.1. 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

23. Additional Measures for Butternut

23.1. 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,

(iii) avoiding compacting and/or disturbing the soil by keeping excavation and other heavy equipment a minimum of 2 metres away from the main stem of retained individuals to avoid damaging roots and stems,

(iv) placing excavated materials on areas not within 2 metres of the main stem of retained individuals; and

(v) where branches are required to be removed to allow for safe operation of equipment, removing them using appropriate equipment, such as pruning saws, chain saws or lopping shears, in accordance with good forestry practices.

24. Measures for Other Trees

24.1. Where Kentucky Coffee-tree, Common Hoptree, Eastern Flowering Dogwood and American Chestnut may exist in a Work Zone and may be affected by an Activity, the Municipality shall:

(a) identify and mark all individual Kentucky Coffee-tree, Common Hoptree, Eastern Flowering Dogwood and American Chestnut within the Work Zone during work planning site visits;

(b) avoid disturbance to all individuals identified under (a) above, 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 where any of the individuals occur,

(ii) working around trees,

(iii) avoiding compacting and/or disturbing the soil by keeping excavation and other heavy equipment a minimum of 2 metres away from the main stem of retained individuals to avoid damaging roots and stems, and

(iv) placing excavated materials on areas not within 2 metres of the main stem of retained individuals; and

(d) where branches are required to be removed to allow for safe operation of equipment, remove them using appropriate equipment, such as pruning saws, chain saws or lopping shears, in accordance with good forestry practices.

PART D. MONITORING AND REPORTING REQUIREMENTS

25. Compliance Monitoring.

25.1. The Municipality shall inspect the undertaking of the Activities at the locations described in Part F of this Schedule C, and shall record the results of the inspections in the Monitoring and Reporting Form.

25.2. The Municipality shall record all encounters with Species and the resulting mitigation measures taken by the Municipality in the Monitoring and Reporting Form.

26. Reporting

26.1. Prior to March 31 of each year the Mitigation Plan is in effect, the Municipality shall submit a completed Monitoring and Reporting Form containing all of the information collected under sections 25.1 and 25.2 during the previous twelve months to the MNR Designated Representative.

27. Review

27.1. Within six months of the expiry of this Mitigation Plan but no later than three months from the time of its expiry, the Parties shall meet to review the measures and actions taken and the Activities undertaken during its term and to discuss the terms and conditions of the next Mitigation Plan.

NHIC Data

Austin C Wright Drain - Essex 2023-09-26
REI2023D017

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
702412	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17LG4758	
702412	SPECIES	American Burying Beetle	Nicrophorus americanus	SH	EXP	EXP	17LG4758	
702412	SPECIES	Climbing Prairie Rose	Rosa setigera	S2S3	SC	SC	17LG4758	
702412	SPECIES	Squarrose Sedge	Carex squarrosa	S2			17LG4758	
702412	SPECIES	Massasauga (Carolinian population)	Sistrurus catenatus pop. 2	S1	END	END	17LG4758	

APPENDIX “REI-C”

STANDARD SPECIFICATIONS
FOR ACCESS BRIDGE CONSTRUCTION

1. PRECAST CONCRETE BLOCK & CONCRETE FILLED JUTE BAG HEADWALLS

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

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

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

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

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

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

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

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

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

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

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

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

2. QUARRIED LIMESTONE ENDWALLS

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

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

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

3. BRIDGE BACKFILL

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

4. GENERAL

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

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

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

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

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

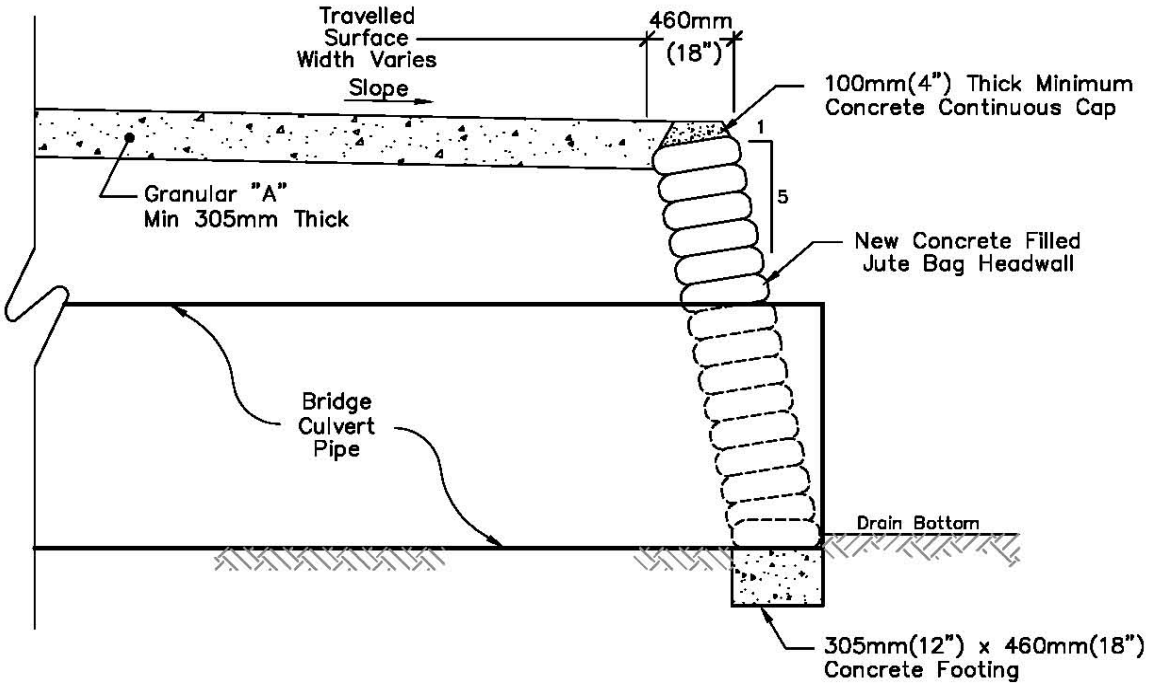
Where applicable, the Contractor and/or landowner constructing the new bridge shall be responsible for any damage caused by them to any portion of the Town road right-of-way. They shall take whatever precautions are necessary to cause a minimum of damage to same and must restore the roadway to its original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

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

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

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

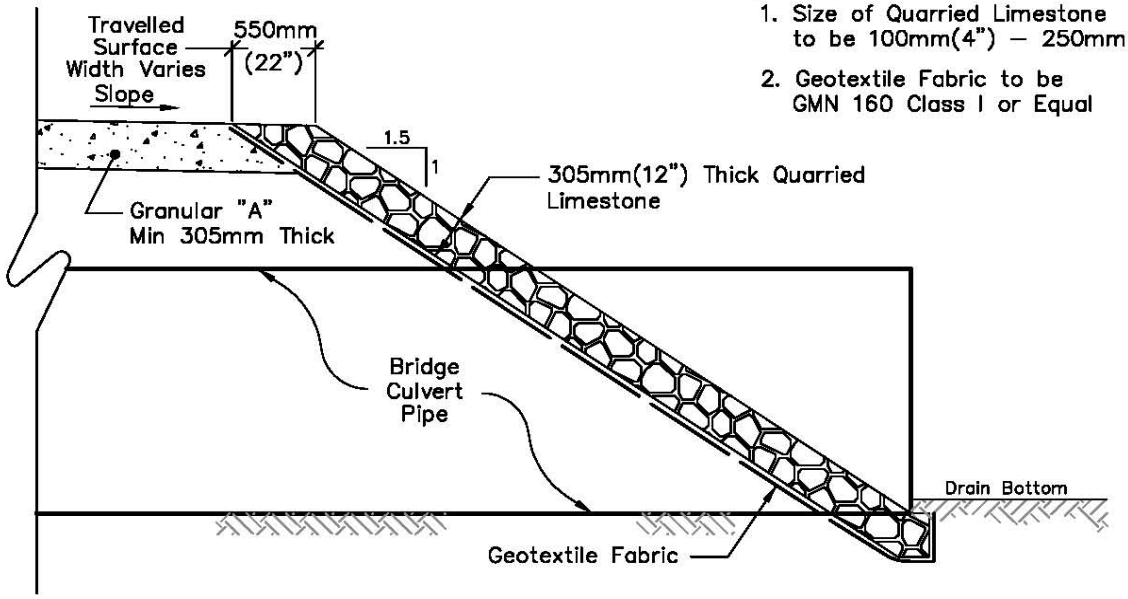
All of the excavation, installation procedures, and parameters as above mentioned are to be carried out and performed to the full satisfaction of the Drainage Superintendent and Engineer.



Typical Jute Bag Headwall

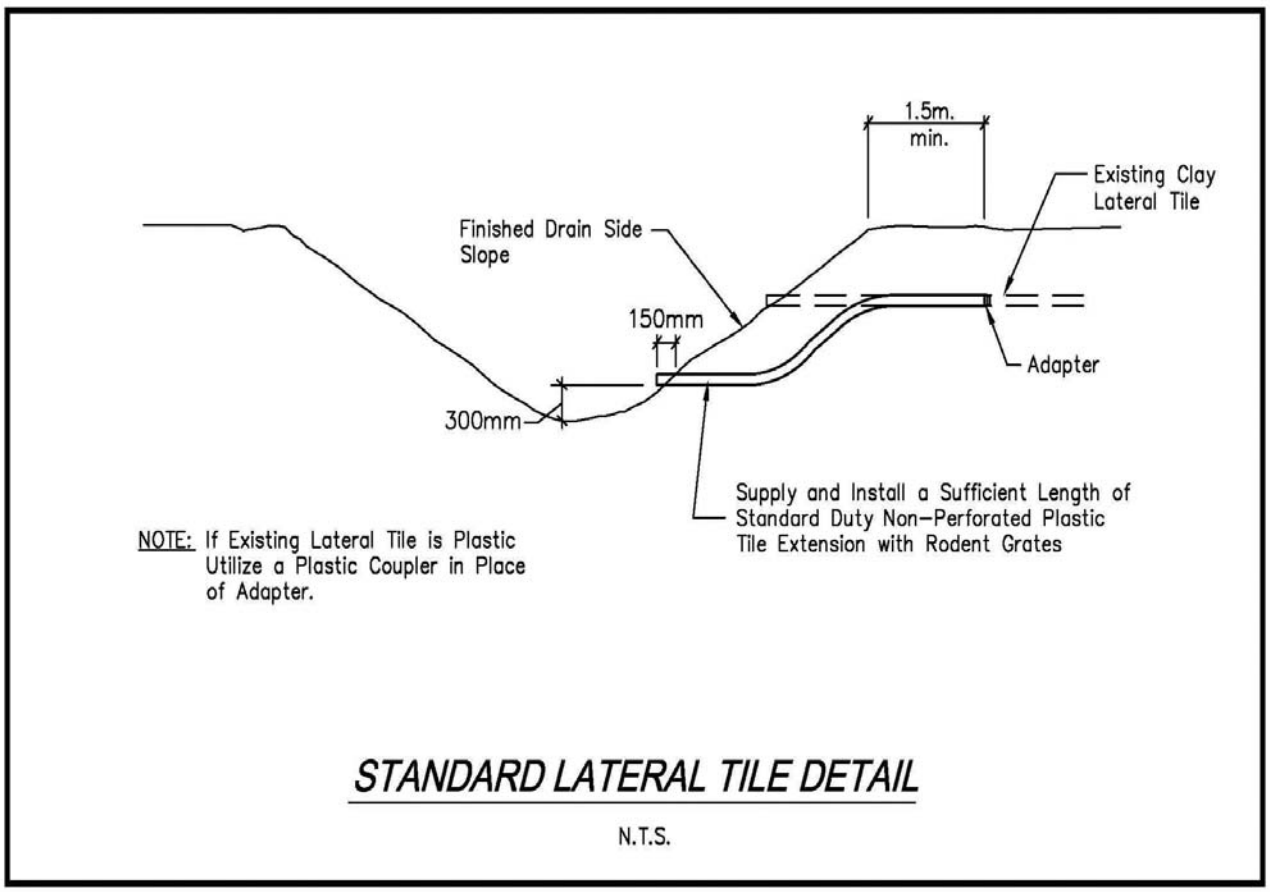
NOTE:

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



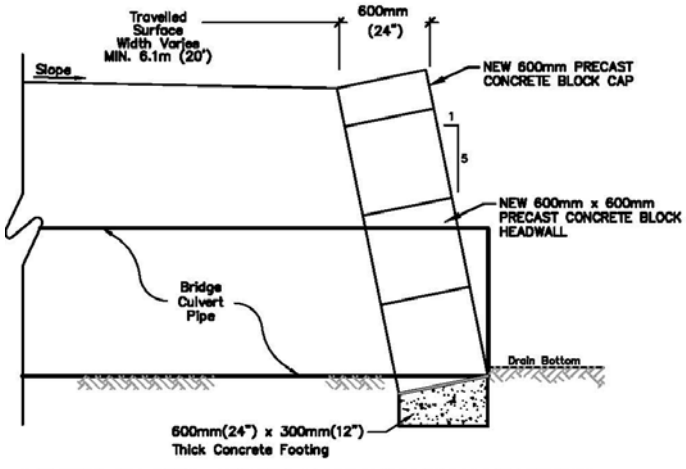
Typical Quarried Limestone End Protection

Rood Engineering Inc.
Consulting Engineers
9 Nelson Street
Leamington, Ontario N8H 1G6
519-322-1621



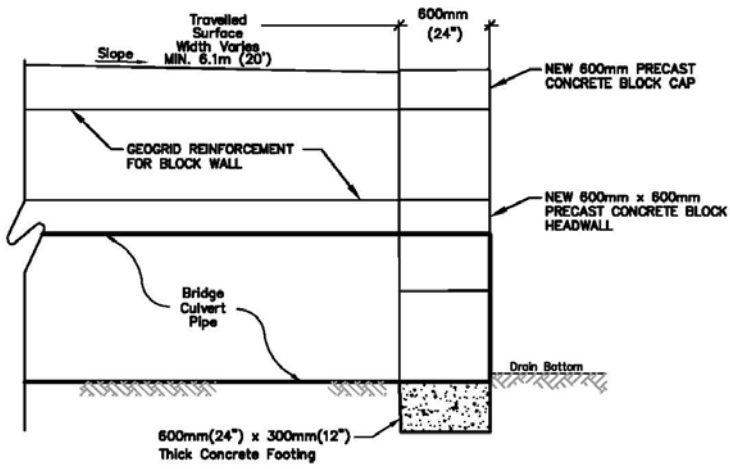
STANDARD LATERAL TILE DETAIL

N.T.S.



TYPICAL PRECAST CONCRETE BLOCK END PROTECTION

Scale = N.T.S.



TYPICAL VERTICAL PRECAST CONCRETE BLOCK END PROTECTION

Scale = N.T.S.

APPENDIX “REI-D”

General Conditions and Specifications not required

APPENDIX “REI-E”

WATERSHED, KEY & BRIDGE PLAN, & CROSS-SECTIONS
OF THE

AUSTIN C. WRIGHT DRAIN

(Geographic Township of Colchester South)
IN THE
TOWN OF ESSEX
IN THE
COUNTY OF ESSEX • ONTARIO

REGISTERED PROFESSIONAL ENGINEER G.ROOD 2023-11-21 PROVINCE OF ONTARIO

Gerard Rood
GERARD ROOD, P.ENG.

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

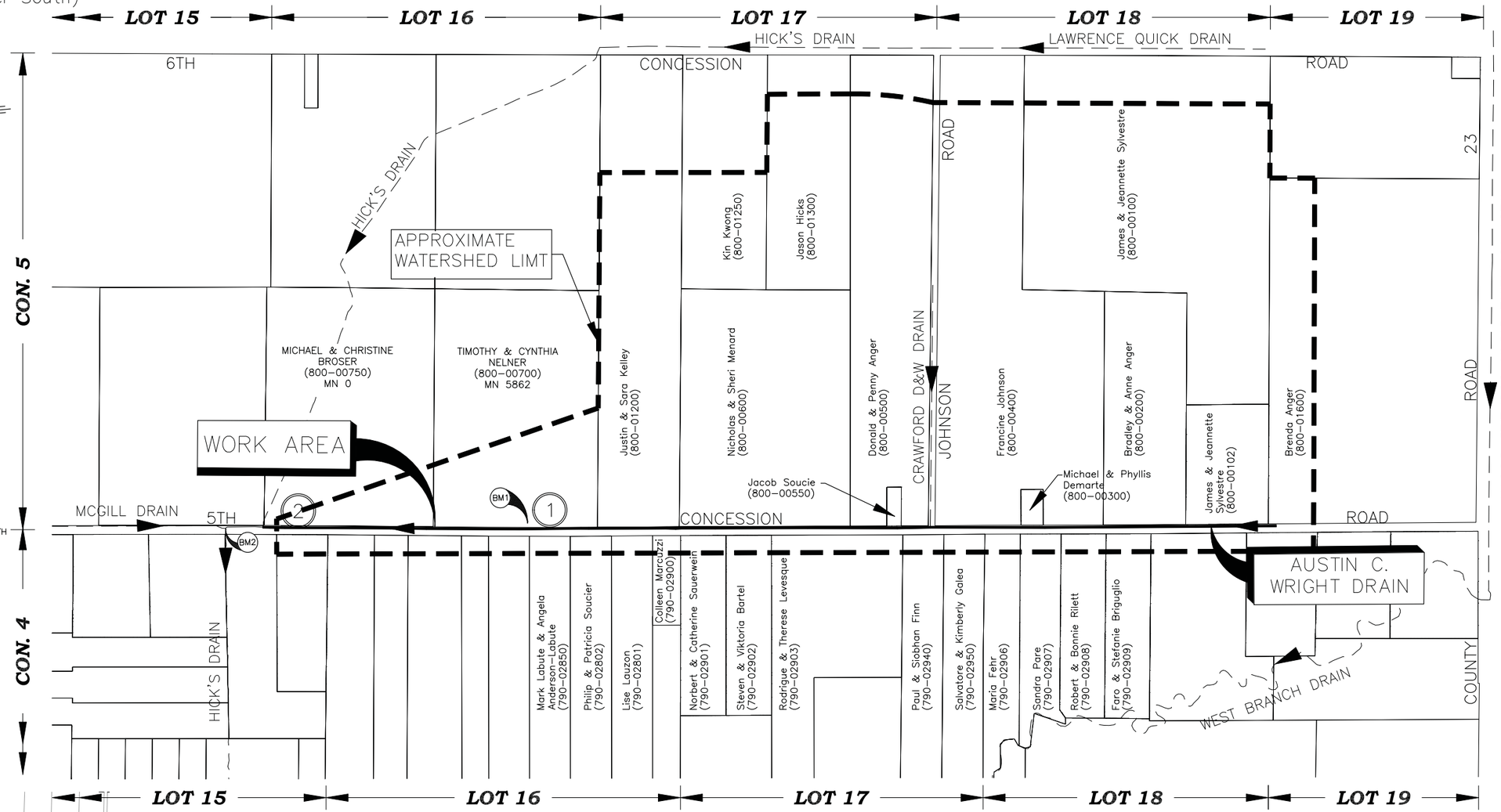
DATE: NOVEMBER 22ND, 2023

TOWN OF ESSEX
MAYOR: Sherry Bondy
CLERK: Joe Malandruccolo
DRAINAGE SUPERINTENDENT: Lindsay Dean, B.Sc.

BENCHMARKS:

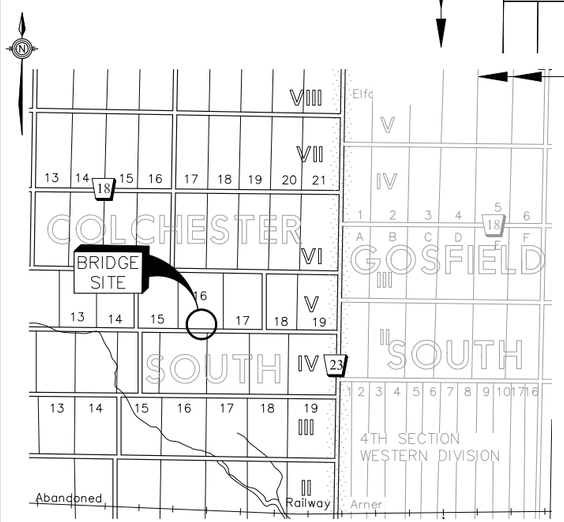
1] NORTH OF EXISTING CULVERT, TOP CENTER NUT OF FIRE HYDRANT
ELEV: 186.382m

2] TOP OF EAST CORNER OF CONCRETE HEADWALL LOCATED NORTH OF 5TH CONCESSION ROAD AT DOWNSTREAM END OF DRAIN, APPROX. 120.0m WEST OF PROPOSED BRIDGE.
ELEV: 185.257m



WATERSHED PLAN

SCALE = 1:5,000

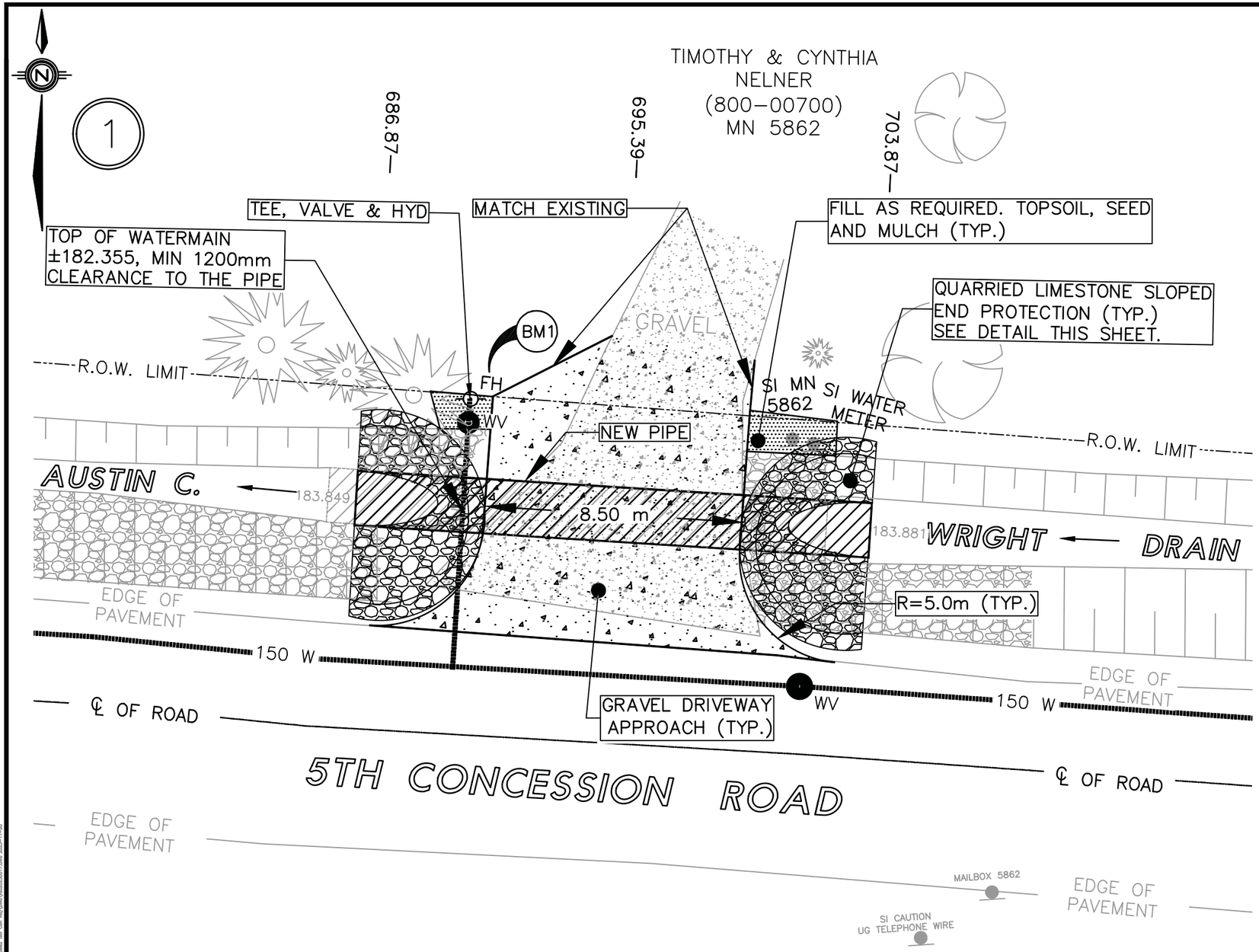


KEY PLAN

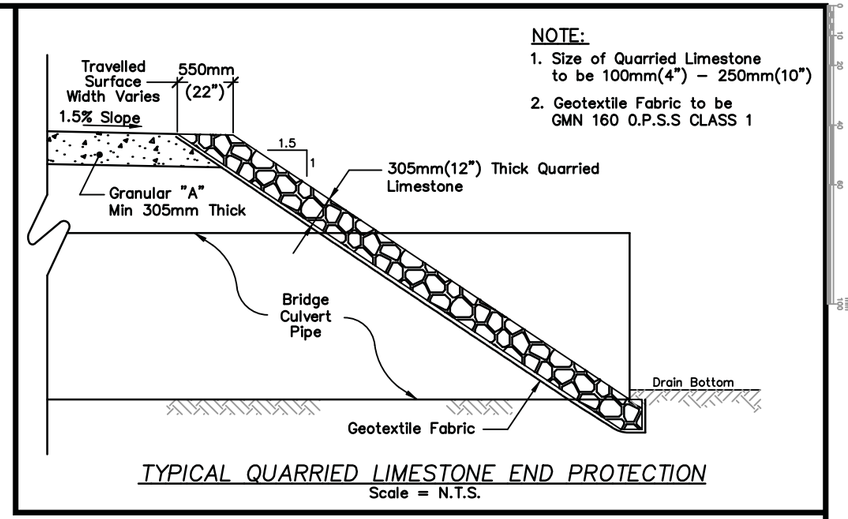
Scale = 1:50,000

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

DRAWN BY: A.C.
PLOT CODE/DATE:
COMPUTER FILE: REI2023D017.DWG
FILE No.: REI2023D017
SHEET No.: 1 OF 4



BRIDGE PLAN
SCALE = 1:150



TYPICAL QUARRIED LIMESTONE END PROTECTION
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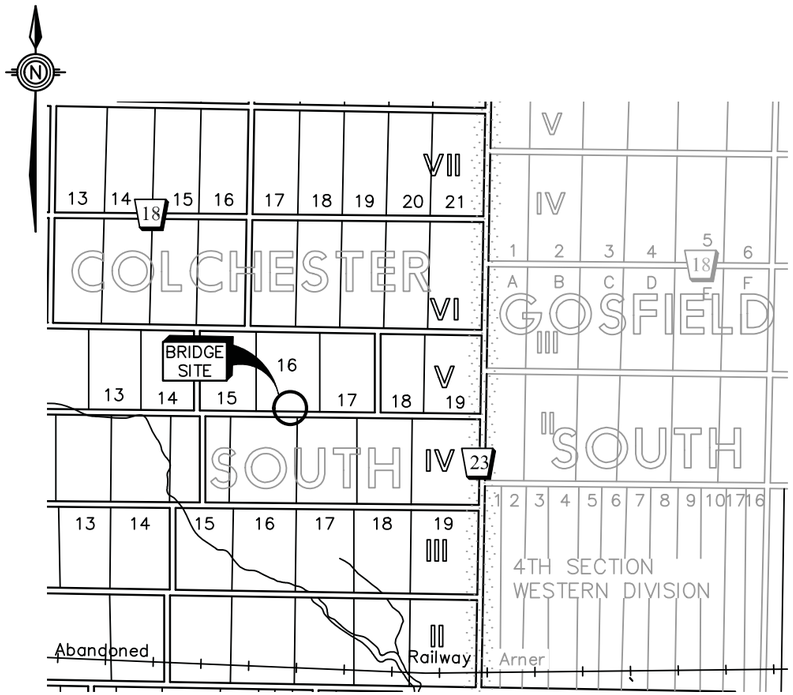


KEY PLAN
Scale = 1:75,000

BENCHMARK:

BM 1– NORTH OF EXISTING CULVERT, TOP CENTER NUT OF FIRE HYDRANT

ELEV: 186.382m

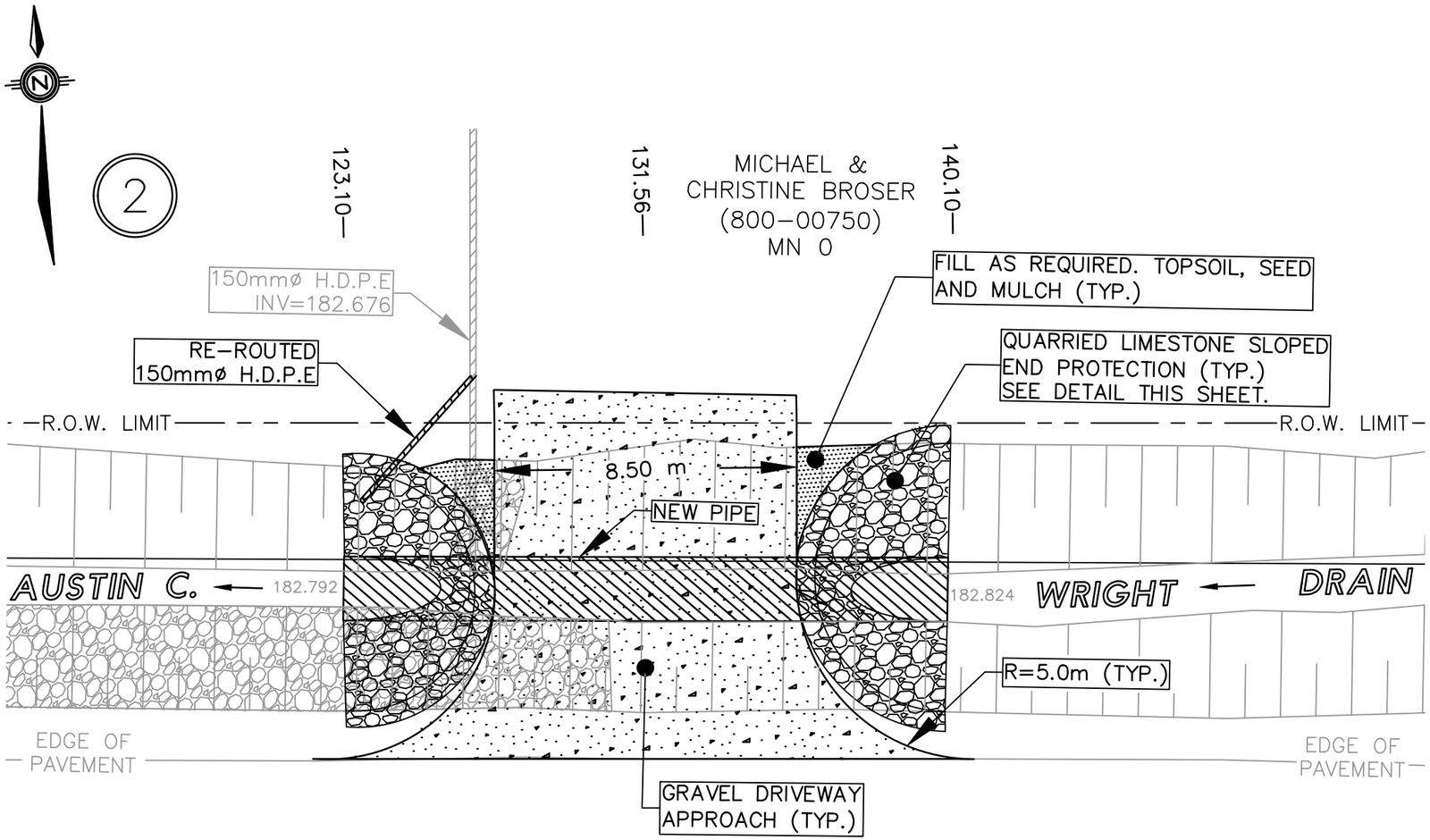
PIPE DIAMETER:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	DESIGN ELEVATIONS:
1800mm	17.0m (55.77 ft)	2.0mm	125mm x 25mm	C.S.P. ALUMINIZED TYPE II	UPSTREAM INV. (E) =183.701m DOWNSTREAM INV. (W) =183.669m ℄ TOP OF DRIVEWAY =185.905m DRAIN GRADE = 0.19%

AUSTIN C. WRIGHT DRAIN

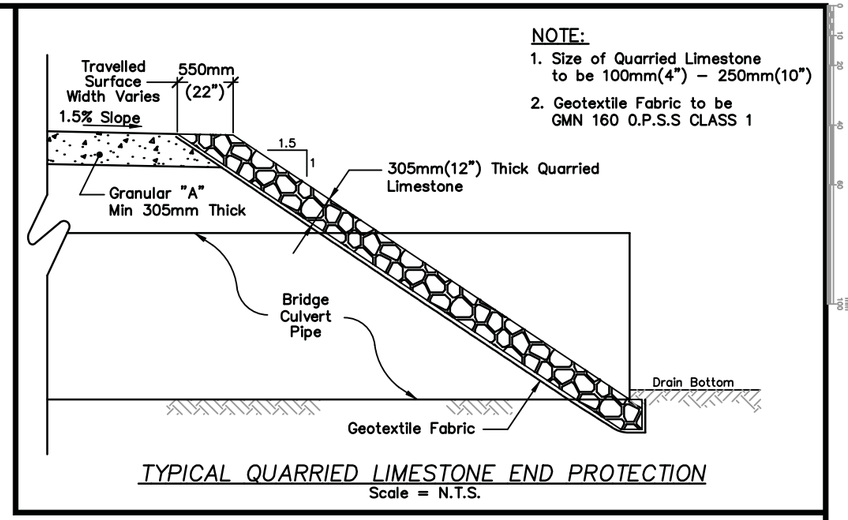
EMERGENCY BRIDGE REPLACEMENT FOR 5862 5TH CONCESSION ROAD (800–00700)
(Geographic Township of Colchester South)
IN THE
TOWN OF ESSEX
IN THE
COUNTY OF ESSEX • ONTARIO

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

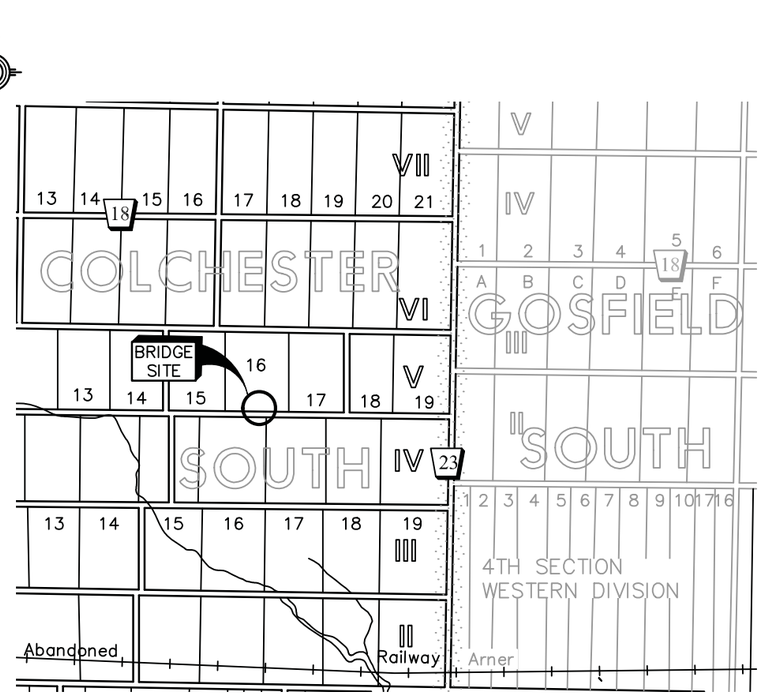
FILE No.:	DRAWN BY: A.C. PLOT CODE: 1:1 FILE:	DATE:	SHEET NO:
REI2023D017	REI2023D017.DWG	2023–11–22	2 OF 4



BRIDGE PLAN
SCALE = 1:150



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



KEY PLAN
Scale = 1:75,000

BENCHMARK:

BM 2 – TOP OF EAST CORNER OF CONCRETE HEADWALL LOCATED NORTH OF 5TH CONCESSION ROAD AT DOWNSTREAM END OF DRAIN, APPROX. 120.0m WEST OF PROPOSED BRIDGE.

ELEV: 185.260m

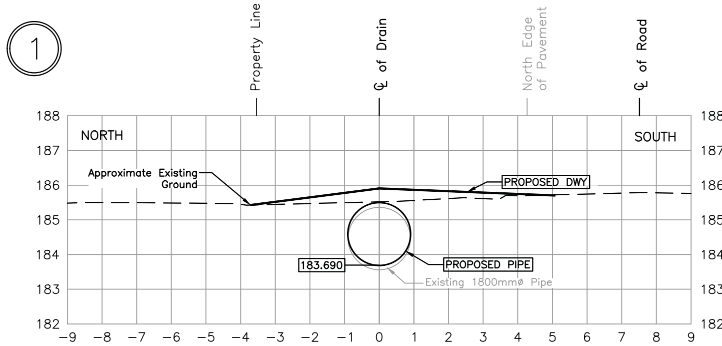
PIPE DIAMETER:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	DESIGN ELEVATIONS:
1800mm	17.0m (55.77 ft)	2.0mm	125mm x 25mm	C.S.P. ALUMINIZED TYPE II	UPSTREAM INV. (E) =182.644m DOWNSTREAM INV. (W) =182.612m ℄ TOP OF DRIVEWAY =184.900m DRAIN GRADE = 0.19%

AUSTIN C. WRIGHT DRAIN

NEW BRIDGE FOR 0 5TH CONCESSION ROAD (800-00750)
(Geographic Township of Colchester South)
IN THE
TOWN OF ESSEX
IN THE
COUNTY OF ESSEX • ONTARIO

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

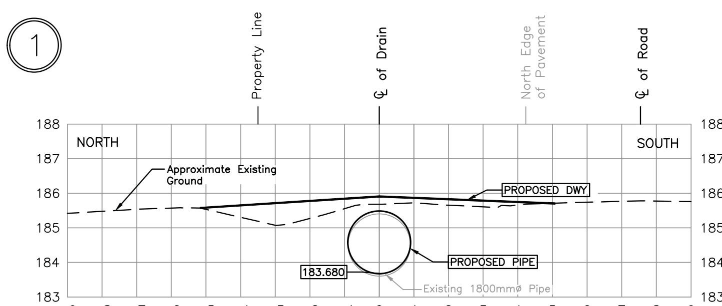
FILE No.:	DRAWN BY: A.C. PLOT CODE: 1:1 FILE:	DATE:	SHEET NO:
REI2023D017	REI2023D017.DWG	2023-11-22	3 OF 4



Elevation	185.5	185.5	185.5	185.5	185.5	185.5	185.6	185.6	185.7	185.8
Offset	9.2	8.3	5.0	4.2	0.0	0.4	2.4	3.3	4.3	7.5

EAST END OF DRIVEWAY – STA. 0+699.08

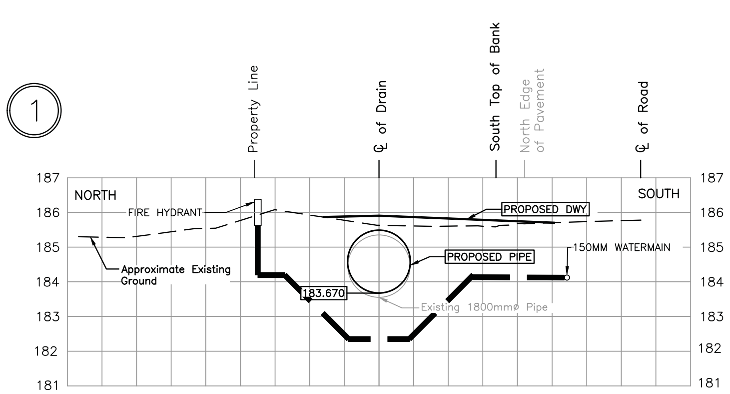
SCALE = 1:100



Elevation	185.5	185.6	185.6	185.1	185.4	185.7	185.7	185.7	185.7	185.6	185.7	185.7	185.8
Offset	6.9	5.7	5.2	3.0	1.6	0.7	0.0	1.0	1.8	3.3	3.9	5.5	7.5

℄ OF PROPOSED CULVERT – STA. 0+695.39

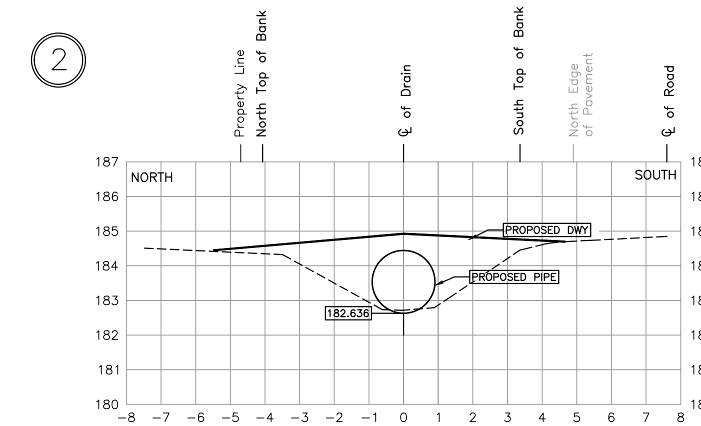
SCALE = 1:100



Elevation	185.3	185.5	185.5	186.1	185.6	185.6	185.6	185.6	185.6	185.7	185.8
Offset	7.6	5.3	4.7	3.0	0.1	1.5	2.9	3.4	3.8	6.3	7.6

WEST END OF DRIVEWAY – STA. 0+690.58

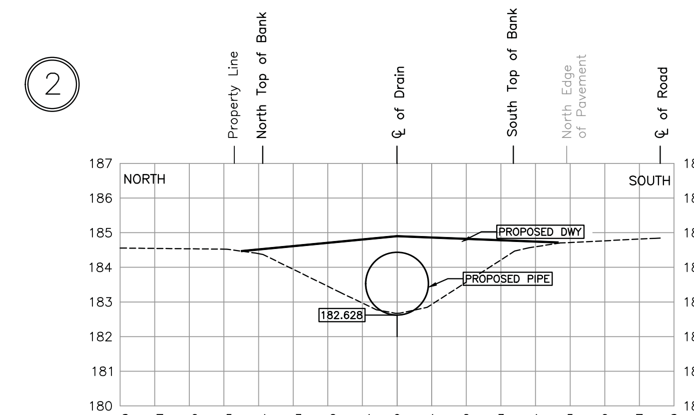
SCALE = 1:100



Elevation	184.3	182.7	182.7	182.8	183.1	184.5	184.6	184.7	184.7	184.8
Offset	3.5	0.6	0.0	0.9	1.3	3.4	4.1	4.7	5.4	7.6

EAST END OF DRIVEWAY – STA. 0+135.81

SCALE = 1:100



Elevation	184.6	184.5	184.4	183.3	182.8	182.7	182.8	184.5	184.6	184.7	184.8
Offset	8.0	4.9	4.1	1.6	0.6	0.0	0.9	3.4	3.8	4.7	7.5

℄ OF PROPOSED CULVERT – STA. 0+131.56

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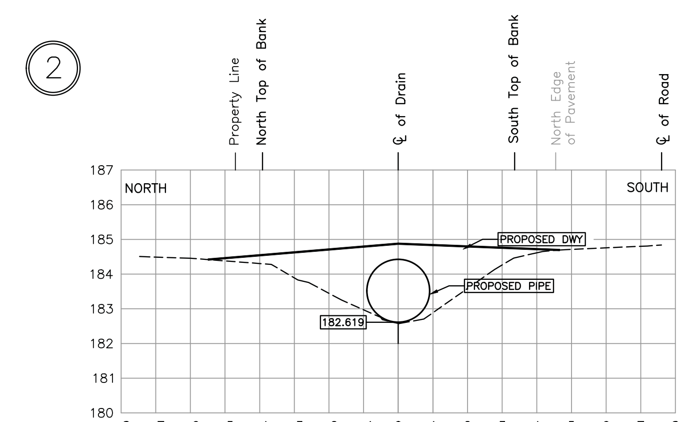

Elevation	184.5	184.3	183.8	183.3	182.8	182.6	182.7	184.1	184.5	184.6	184.7	184.8
Offset	6.0	3.7	2.9	1.6	0.5	-0.0	0.7	2.8	3.3	4.0	4.7	7.2

WEST END OF DRIVEWAY – STA. 0+127.31

SCALE = 1:100

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

DRAWN BY: A.C.
PLOT CODE: 1:1
COMPUTER FILE: REI2023D017.DWG

4 OF 4

ENGINEER'S REPORT

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

PROJECT **Bondy No. 1 Drain**
Maintenance Schedules of Assessment
(Geographic Township of Colchester South)
Town of Essex, County of Essex
Project No. D22-063

August 16, 2023

N.J. Peralta Engineering Ltd.
45 Division Street North
Kingsville, ON N9Y 1E1
519-733-6587
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MUNICIPAL DRAINS AND THE DRAINAGE ACT

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

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

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

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

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Peralta Engineering

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APPENDICES

Appendix "A" – Maintenance Schedules of Assessment

Appendix A-1 – Entire Drain
Appendix A-2 – Upstream Portion (Station 0+000 to Station 1+399.3)
Appendix A-3 – Downstream Portion (Station 1+399.3 to Station 1+992.7)

Appendix "B" – Watershed Plan for the Bondy No. 1 Drain

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PROJECT **Bondy No. 1 Drain**
Maintenance Schedules of Assessment
(Geographic Township of Colchester South)
Town of Essex, County of Essex
Project No. D22-063

August 16, 2023

Mayor and Municipal Council
Corporation of the Town of Essex
33 Talbot Street South
Essex, Ontario, N8M 1A8

I. INTRODUCTION

In accordance with the instructions received by email on June 23, 2022, from the Town of Essex's Clerk, Robert Auger, we have undertaken a review of the existing drainage works and the drainage area served by the Bondy No. 1 Drain. This investigation was initiated by a resolution passed by Council appointing our firm to prepare an Engineer's Report for the variation of the assessments on the Bondy No. 1 Drain, so that the cost of any future maintenance works to the Bondy No. 1 Drain may be fairly assessed. These instructions, our investigations, and this assessment report are all in accordance with Section 76 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

II. BACKGROUND

The Bondy No. 1 Drain has been established as a Municipal Drain with the downstream portion consisting of an open drain configuration and the upstream portion consisting of a tiled drainage system. This Municipal Drain provides drainage to the lands and roads located solely within the Town of Essex. The Bondy No. 1 Drain commences from its top end at the east end of Lot 90, at Station 0+000.0, and continues downstream as a tiled drain in a southwesterly direction through private lands to the north side of County Road 50. The Municipal Drain continues downstream in a southwesterly direction through private lands as an open drain, where it crosses Levergood Drive and Erie Shores Drive to its outlet into Lake Erie, at Station 1+992.7. The tiled portion of this drain also includes a second auxiliary drain, along with erosion control measures by way of berms and grassed waterways (ie. Water and Sediment Control Structures - WASCoBs). The watershed of the Bondy No. 1 Drain is irregularly shaped and provides a sufficient outlet for the various contributing lands. The topography of the associated lands is relatively mild and the natural land gradient appears to be in a southwesterly direction. The Bondy No. 1 Drain provides a drainage outlet for a mix of residential and agricultural lands. This Municipal Drain is predominantly located within the Perth Clay Loam and Wauseon Sandy Loam soil types. These soils are categorized as Hydrological Soil Group C and are described as poorly drained with a low infiltration rate when thoroughly wetted and consist chiefly of soils with a layer that impedes the downward movement of water and soil with moderately fine to fine structure. As a result, these soils require effective artificial drainage to be productive.

III. DRAINAGE HISTORY

A review of the Town of Essex drainage records indicates that the Bondy No. 1 Drain is an existing Municipal Drain that has been repaired and improved on numerous occasions through the auspices of the Drainage Act. From our review, we have found several Engineer's Reports prepared through the provisions of the Drainage Act for the Bondy No. 1 Drain. However, we have outlined the following relevant Engineer's Reports that we utilized as a reference for carrying out this project:

a) **January 19, 1949,** Engineer's Report for the "Bondy No. 1 Drain", prepared by C.G.R. Armstrong, P.Eng., was carried out through the Township of Colchester South By-Law No. 656. The improvements completed under this report included the installation of a concrete tile drain within Lot 90 and Lot 93. These works also included the excavation, brushing and grubbing of the open drain from Lot 93 to its outlet into Lake Erie within R.P. 1057. These works were conducted to provide adequate drainage to the affected lands and roads within the watershed.

b) **July 26, 1968,** Engineer's Report for the "Lower Portion of the Bondy No. 1 Drain", prepared by C.G.R. Armstrong, P.Eng., was carried out through the Township of Colchester South By-Law No. 1164. The improvements completed under this report included the installation of a concrete tile drain within Lot 94, upstream of County Road 50. These works also included the excavation, brushing and grubbing of the open drain from Lot 94 to its outlet into Lake Erie within R.P. 1057. These works were conducted to provide adequate drainage to the affected lands and roads within the watershed, by providing additional depth to safely convey runoff to the outlet.

c) **September 20, 1977,** reconsidered Engineer's Report for the "Auxilliary Drain to Bondy Drain No. 1", prepared by M. Armstrong, P.Eng., was carried out through the Township of Colchester South By-Law 1440. The improvements completed under this report included the installation of an auxiliary plastic tile drain within Lots 91 through 93, installed parallel to the existing tile drain. These works were conducted to address excessive erosion and insufficient drainage for the affected lands and roads within the watershed.

d) **January 30, 1987,** Engineer's Report for the "Bondy No. 1 Drain Outlet", prepared by N.J. Peralta, P.Eng., was carried out through the Township of Colchester South By-Law No. 1863. The improvements completed under this report included the extension of the existing road crossing culvert under Erie Shores Drive and the improvements to the open channel into Lake Erie. These works were conducted to control the runoff, address the accumulation of sand at the outlet, and reduce the occurrence of blockages.

e) **January 10, 1997,** Engineer's Report for the " Bondy No. 1 Drain ", prepared by N.J. Peralta, P.Eng. and G. Rood, P.Eng, was carried out through the Township of Colchester South By-Law No. 2412. The improvements completed under this report included the installation of water and sediment control structures (berms, grassed waterways, and inlet structures) within Lots 90 through 94, together with extending the existing auxiliary drain upstream through Lot 90. These works were conducted to address excessive surface erosion over the tiled portion of the drainage system.

f) **February 11, 2010,** Engineer's Report for the " Bondy No. 1 Drain Crossings (for Harrow Wind Farm Drainage)", prepared by G. Rood, P.Eng., was carried out through the Town of Essex By-Law No. 1011. The improvements completed under this report included the replacement of the drainage tiles and improvements to the existing berms to be altered by the installation of new access roads facilitating the Wind Farm construction.

From our detailed research of the above Engineer's Reports, we have determined that generally speaking, portions of the Municipal Drain are still defined and governed by the portions of 1949, 1968, 1977, 1987, 1997, and the 2010 Engineer's Reports and By-Laws, extending over the entire length from Station 0+000.0 to Station 1+992.7. Collectively, these Engineer's Reports govern the design provisions for any future maintenance works over the entire reach of the drain. Currently, the costs for such maintenance works are to be assessed against the lands and roads outlined within these reports. We find that the 1987 and 1997 reports generally identify the latest watershed boundary limits contributing flows to the Bondy No.1 Drain. As such, these reports were utilized as a starting point in establishing the area of land contributing to the proposed improvements.

IV. PURPOSE OF REPORT

The Town of Essex is proposing to undertake maintenance works on the Bondy No. 1 Drain. The intended maintenance works consist of cutting brush and trees along the side slopes, together with the removal of accumulated sediment along the open drain portion of the Bondy No. 1 Drain, and any other maintenance works required to provide a sufficient outlet.

Since the completion of the 1987 and 1997 Engineer's Reports and By-Laws, various changes have taken place within the drainage area and around the watershed boundaries. In general, many properties have been subdivided and/or merged, drainage patterns have been altered, and land uses have changed. All of the above changes are not properly reflected by the Schedule of Assessment contained within the governing By-Laws and it is necessary to prepare a new Maintenance Schedule of Assessment to properly account for all of the lands and roads affected by the entire length of the Bondy No. 1 Drain.

V. ON-SITE MEETING

With the intention of performing maintenance on the Bondy No. 1 Drain, along with the need for a new Maintenance Schedule of Assessment to distribute costs for this work, it was determined that an On-Site Meeting would be conducted to introduce both matters at the same time.

Upon reviewing all pertinent drainage information, together with the discussions with the Town of Essex staff, we arranged to schedule the required On-Site Meeting. The On-Site Meeting was scheduled for August 17, 2022, located near 118 Levergood Drive, and the following stakeholders were in attendance at said meeting:

Name	Property
Laurie & Jim Freeman	Landowners – 792 Erie Shores Drive
Leslie Leroux and Terry Bains	Landowners – 107 Levergood Court
Lisa Durocher	Landowner – 728 County Road 50 West
Robin Martin and Ken Laird	Landowners – 796 Erie Shores Drive
John Kay	Landowner – 155 Crystal Beach Road
Jill Kennedy	Landowner – 709 County Road 50 West
Jean Stewart	Landowner – 161 Crystal Beach Road
Bernard Gorski	Landowner
Joe Gorski	Landowner
Rick Levergood	Landowner – 788 County Road 50 West
Dave & Donna Couvillon	Landowners – 815 Erie Shores Drive
Terry & Sherry Barris	Landowners – 790 Erie Shores Drive
Catherine Deslippe	Landowner – 789 Erier Shores Drive
Velo Todorovski	Landowner – 791 Eire Shores Drive
Brian Sadai	Landowner – 743 County Road 50 West
Terry Bale	Landowner – 718 Levergood Drive
Gary Freisinger	Landowner – 794 Erie Shores Drive
Liz Carreira	Landowner – 798 Levergood Court
Wayne Campbell	Landowner – 801 Erie Shores Drive
Mark Fishleigh	County of Essex
Percy Dufour	Town of Essex Drainage Board
Lindsay Dean	Town of Essex Drainage Superintendent
Tony Peralta, P.Eng.	N.J. Peralta Engineering Ltd.
Matthew Shiha, EIT	N.J. Peralta Engineering Ltd.

At the onset of this meeting, Lindsay Dean made introductions and generally advised that the Town of Essex is proposing to undertake maintenance works on the Bondy No. 1 Drain, based on the request of affected landowners. Upon review of the governing By-Laws for this drain, the Municipality has found that the governing Schedules of Assessment were insufficient for the purposes of assessing the costs of any future maintenance work within the Bondy No. 1 Drain.

Tony Peralta provided additional information that pertains to the status of this Municipal Drain and the financial responsibilities of the stakeholders through the Drainage Act. It was further explained that several reports prepared over the years had identified various improvements within the drainage system and the general cost distribution of these improvements to the affected stakeholders. Since the completion of these reports, there have been significant changes to the overall watershed limit and the use of land within this watershed. However, the technical details outlined within these governing reports provide an adequate drain profile and working corridor provisions for the Town of Essex to conduct maintenance on the Bondy No. 1 Drain.

As a result of the above information, the Municipality initiated the preparation of the Engineer's Report for the reassessment of costs for the Bondy No. 1 Drain, through Section 76 of the Drainage Act. The

landowners were further advised that the maintenance works would likely be conducted following the approval and adoption of the new Maintenance Schedule of Assessment under Municipal By-Law.

The landowners were further advised that the scope of this report will focus solely on the reassessment of costs for the Bondy No. 1 Drain and will not make recommendations to include any physical improvements to the drain. It was emphasized that no improvements will be recommended under this report unless there is a change in scope through instruction from the Municipality.

It was also noted that the costs related to the preparation of this Report and said engineering fees are likely to be assessed to all landowners within the drain's watershed that benefit and/or contribute to the Bondy No. 1 Drain. The proportion of costs shall be distributed based on the new Maintenance Schedule of Assessment prepared under this report. The landowners were further advised that the work to prepare the new Maintenance Schedule Report would not be eligible for grants through the current policies set by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). However, the actual costs associated with the maintenance works are likely eligible for such a grant for those properties that meet the requirements.

The landowners were further advised of the Drainage Act processes with respect to the Report submission. The Municipality will further circulate the report to the affected landowners, with a notice of the Consideration Meeting, followed by the Court of Revision. The landowners were further reminded of their rights to appeal to the appropriate governing bodies.

Various landowners raised general concerns and questioned the initiation of the intended report. Tony Peralta provided scenarios to help illustrate the need to update the current distribution of cost by identifying properties that would not be assessed any costs based on the governing schedules of assessment for the Bondy No. 1 Drain. Once the affected landowners had a better understanding of the scope and scale of the Updated Maintenance Schedule Report, the landowners further questioned the extent of the forthcoming maintenance works. It was determined that a separate maintenance meeting will likely be conducted following the adoption of the Engineer's Report. Further discussion ensued regarding future land developments and other matters outside the scope of this project.

At the conclusion of the meeting, the landowners were advised that, as part of the Engineer's review of the watershed, individual property Owners may be contacted to review the drainage patterns of their lands, in order for the Engineer to accurately assess the affected lands within the watershed. Otherwise, landowners that continue to form part of this drainage scheme are likely to receive further notices of upcoming meetings going forward.

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

VI. INVESTIGATIONS AND FINDINGS

In order to confirm the watershed areas for the Bondy No. 1 Drain, we reviewed and investigated all of the latest Engineer's Reports on this drain, its tributary branches and all neighbouring drains in its vicinity. As such, we reviewed the latest Engineer's Report for the Bondy No. 2 Drain, Langlois-Arner Drain, Crystal Beach Drainage System, Bellcreft Beach Drainage System, and the West Townline Drain. Furthermore, we utilized current LiDAR information to cross-check the watershed limits at various locations throughout the

watershed. Through these investigations, we find that additional lands, not formerly assessed, contribute to this drainage system and have been included within this watershed. Furthermore, we found that since the last Engineer's Report was created, various lands have been created through severances that have not been accounted for in the governing By-Laws. All of the above investigations not only provided us with the correct watershed area but also provided us with accurate information to assist us with the preparation of our Maintenance Schedules of Assessment for this project. Therefore, we recommend that the Town of Essex add copies of this Report to all applicable drainage folders, for reference when future drainage reports are prepared on said drains so that changes caused by this new Maintenance Schedule of Assessment can be accounted for in those future reports.

Generally speaking, the Municipal Drain extends from its top end at Station 0+000.0 commencing at a catch basin located at the east end of Lot 90, where it meanders in a southwesterly direction as a twinned drainage tile connected by various inlet structures. The twinned drainage tile is accompanied by water and sediment erosion control structures at various locations, where this system extends to the north side of County Road 50. From the north side of County Road 50, the Municipal Drain continues as an open drain, crossing County Road 50, Levergood Drive, and Erie Shores Drive, where it terminates at its outlet into Lake Erie, at approximately Station 1+992.7. The past improvements conducted on the Bondy No. 1 Drain were cumulative and specific to the needs of the watershed at that time. As such, no one By-Law governs over the entire length of this Municipal Drain. As a result, the various engineer's reports prepared over the years independently govern the various components of the drainage system.

VII. RECOMMENDATIONS

Maintenance Schedule of Assessment

Through our review of the governing reports for this Municipal Drain, we found that various reports were prepared over the years that provided specific improvements and/or additions to the drainage infrastructure within the Bondy No. 1 Drain. As a result, the distribution of costs for each report was specific to the improvements provided in each report. Therefore, when future maintenance is required on multiple components of the drainage infrastructure, no one governing assessment schedule could effectively be utilized for the distribution of future maintenance costs. Our investigations further confirm the need for an updated maintenance schedule of assessment for holistic maintenance works on the primary portions of the Bondy No. 1 Drain. Therefore, in order to properly assess any future maintenance works to the Bondy No. 1 Drain, we recommend that the updated Maintenance Schedules of Assessment be provided as attached herein and labelled **Appendix "A**".

When future maintenance works are performed on the Bondy No. 1 Drain, we recommend that it be maintained in the future by the Town of Essex. Based on the parameters of the Bondy No. 1 Drain, this Municipal Drain has two (2) primary configurations that convey runoff to its outlet. The upstream portion of the drain consists of a twinned drain tile configuration and the downstream portion of this drain consists of an open drain configuration into Lake Erie. Therefore, in addition to providing an updated maintenance schedule of assessment for the overall length of the Bondy No. 1 Drain, we have identified two (2) distinct sections of this drain where maintenance provisions have been established and the cost distribution of these portions shall be shared on the following basis:

1. Entire Drain Length (Station 0+000.0 to Station 1+992.7)

When future maintenance works are performed over the entire length of the Bondy No. 1 Drain, we recommend that the cost for these works of future maintenance shall be shared by the abutting landowners and upstream affected lands and roads, following the same proportions established within the **Future Maintenance Schedule of Assessment #1: Bondy No. 1 Drain – Entire Drain (Station 0+000 to Station 1+992.7)** attached herein. This Schedule of Assessment has been developed based on an assumed cost of **$50,000.00** and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are adjacent to and situated upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **$50,000.00** worth of future maintenance work is expended on the entire length of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment. It should be clearly understood that the amounts shown within this Schedule are only for prorating future maintenance costs for the drain and do not form part of the current cost for the work.

2. Upstream Portion (Station 0+000.0 to Station 1+399.3)

When future maintenance works are performed strictly between Station 0+000.0 and Station 1+399.3 within the Bondy No.1 Drain, we recommend that it be maintained in the future by the Town of Essex. This reach of the Municipal Drain extends as a twinned drainage tile, together with various water and sediment erosion control structures, from the top end and continuing southwesterly through private property to the north side of County Road 50. The cost for these works of future maintenance shall be shared by the abutting landowner and upstream affected lands and roads, following the same proportions established within the **Future Maintenance Schedule of Assessment #2: Bondy No. 1 Drain – Upstream Portion (Station 0+000.0 to Station 1+399.3)** attached herein. This Schedule of Assessment has been developed based on an assumed cost of **$30,000.00** and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **$30,000.00** worth of future maintenance work is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment. It should be clearly understood that the amounts shown within this Schedule are only for prorating future maintenance costs for the drain and do not form part of the current cost for the work.

The attached Future Maintenance Schedule of Assessment for this upstream portion of the Bondy No. 1 Drain shall be utilized only for the maintenance of the twinned drainage tile, the associated drainage structures, together with the water and sediment erosion control structures that form part of the drainage system. The maintenance work would include the drainage tiles, all associated catchbasins, the erosion control berms, any quarried limestone erosion protection, together with the clay backfill, topsoil topping, granular driveways and grassed waterway construction. If spot maintenance is performed within the specified area of the drain, it is recommended that only those lands adjacent and upstream of the maintenance site be assessed for any future costs.

3. Downstream Portion (Station 1+399.2 to Station 1+992.7)

When future maintenance works are performed strictly between Station 1+399.2 and Station 1+992.7 within the Bondy No.1 Drain, we recommend that it be maintained in the future by the Town of Essex. This reach of the Municipal Drain extends as an open drain configuration from the north side of County Road 50, continuing in a southwesterly direction through private lands and across Levergood Drive and Erie Shores Drive to its outlet into Lake Erie. The cost for these works of future maintenance shall be shared by the abutting landowner and upstream affected lands and roads, following the same proportions established within the **Future Maintenance Schedule of Assessment #3: Bondy No. 1 Drain – Downstream Portion (Station 1+399.2 to Station 1+992.7)** attached herein. This Schedule of Assessment has been developed based on an assumed cost of **$30,000.00** and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **$30,000.00** worth of future maintenance work is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment. It should be clearly understood that the amounts shown within this Schedule are only for prorating future maintenance costs for the drain and do not form part of the current cost for the work.

The attached Future Maintenance Schedule of Assessment for this downstream portion of the Bondy No. 1 Drain shall be utilized only for the maintenance of the open drain and outlet, together with the flushing of sediment material within any existing municipal roadway crossing structures in the drain. If spot maintenance is performed within the specified area of the open drain, it is recommended that only those lands adjacent and upstream of the maintenance site be assessed for any future costs. It shall be noted that this schedule shall not be utilized for any other maintenance and repair works being conducted to any of the roadway crossing structures. These existing structures are to be assessed in a different fashion, as outlined below.

Should concrete, asphalt or other special surfaces over the drainage system require removal as part of the maintenance work, these surfaces shall be repaired or replaced as part of the work. Likewise, if any fencing, gate, decorative walls 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 maintenance work. However, the cost of the supply and installation of any special surface material other than select imported clay, topsoil topping and granular driveways, along with any special feature, where applicable, shall be assessed entirely to the benefiting owner.

Future Maintenance on Existing Drain Crossings

In order to establish a mechanism by which the Municipality can undertake maintenance works on the existing drain crossings, we recommend that said existing structures as identified herein, be maintained in the future as part of the drainage works. From our review of the existing structures within the Bondy No. 1 Drain, the following structures were noted and a mechanism shall be provided herein so that the Municipality can undertake future maintenance works on the identified structures and allocated future maintenance costs for same can be properly assessed to the affected landowners. These structures are as follows:

Bridge 1 - County of Essex for County Road 50

The existing road crossing extending from Station 1+405.7 to Station 1+419.7 serves as access across County Road 50 and was identified within the 1949 and 1968 Engineer's Reports. Therefore, this structure is considered a legal entity with respect to the Bondy No. 1 Drain. This existing road crossing culvert and end treatments facilitates the use of County Road 50 and is under the jurisdiction of the County of Essex.

Bridge 2 - Town of Essex for Levergood Drive

The existing road crossing extending from Station 1+683.0 to Station 1+699.2 serves as access across Levergood Drive and was identified within the 1949 and 1968 Engineer's Reports. Therefore, this structure is considered a legal entity with respect to the Bondy No. 1 Drain. This existing road crossing culvert and end treatments facilitates the use of Levergood Drive and is under the jurisdiction of the Town of Essex.

Bridge 3 - Town of Essex for Erie Shores Drive

The existing road crossing extending from Station 1+882.8 to Station 1+904.2 serves as access across Erie Shores Drive and was identified within the 1949 and 1968 Engineer's Reports, and was further improved as part of the 1987 Engineer's Report. Therefore, this structure is considered a legal entity with respect to the Bondy No. 1 Drain. This existing road crossing culvert and end treatments facilitates the use of Levergood Drive and is under the jurisdiction of the Town of Essex.

As noted above, each road crossing structure within the Bondy No. 1 Drain is within or under the jurisdiction of a road authority or public utility. Therefore, under no circumstances shall any of the costs for the maintenance or replacement of these structures be assessed to any upstream lands within the drain's watershed. Furthermore, when future maintenance is required to these structures, each governing road authority or public utility may elect to carry out the future works on these structures using their own forces, through Section 69 of the Drainage Act, if they choose to do so. If these structures are to be replaced under an Engineer's Report through the provisions of the Drainage Act, it is recommended that Section 26 be utilized for the increased cost to the project as a result of their existence.

Pedestrian Footbridges

It shall be noted that "pedestrian footbridges" currently span over the existing Municipal Drain. These footbridges currently do not hinder or alter the flows within the Bondy No. 1 Drain. As such, these structures shall be considered private structures and shall not form part of this Municipal Drain. Therefore, the maintenance and upkeep of these structures shall be the sole responsibility of the adjacent Owner(s)/Occupant(s). However, in the event that these structures become an obstruction to the flows within the drain, or cause damage to the Municipal Drain, these obstructions must be addressed and/or removed through Sections 80(1) and 80(2) of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

VIII. ASSESSMENT SCHEDULES AND MAINTENANCE WORKS

We have prepared a Schedule of Assessment to be utilized for assessing costs against the affected lands and roads for any future maintenance works conducted to the Bondy No. 1 Drain and same has been attached herein. As previously mentioned, the assessment proportions as outlined within the Maintenance

Schedules of Assessment has been established on the basis of an assumed future maintenance cost assigned to each portion of the Municipal Drain, and it should be understood that the maintenance charges outlined in the attached Maintenance Schedule of Assessment should not be made until such time that maintenance works have been conducted and expended. The actual cost of maintenance work on the open drain shall be assessed against the lands and roads in the same relative proportions as shown herein, subject to any future variations that may be made under the authority of the Drainage Act.

Assessment Components

The total individual assessments within the Maintenance Schedule of Assessment, comprises of two (2) separate assessment components, including:

i. Benefit *is defined as advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures, as it relates to Section 22 of the Drainage Act.*

ii. Outlet Liability *is defined as part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved outlet, as it relates to Section 23 of the Drainage Act.*

Assessment Rationale

Benefit Assessment - The removal of trees, brush and debris, along with the excavation of accumulated sediment within the open channel will drastically improve the flow of water through the drainage system. The improvements to the drain will enhance the hydraulic capacity of the channel and provide a sufficient outlet for the drainage system. As a result, the properties located close to the Municipal Drain channel/tile benefit from the improvements to the open drain, reducing the backup of flood water and potential damages to their property. Therefore, the Benefit Assessment shown within the Construction Schedule of Assessment is levied against those properties that reside in close proximity to the drain, based on the definition provided above.

Outlet Assessment – According to the parameters set within Section 23 of the Drainage Act, all lands which utilize the Bondy No. 1 Drain as a drainage outlet may be assessed for Outlet Liability. As further outlined within Section 23(3) of the Drainage Act, the Outlet Assessment is *"...based on the volume and rate of flow of the water artificially caused to flow..."*. Based on the characteristics of the lands that contribute flow to the Municipal Drain, runoff factors have been applied based on the land use of each property to reflect the actual amount of water that is artificially collected and discharged into the drain. Therefore, developed lands (residential, commercial lots and roads) have an increased run-off factor applied to their assessment. Contrarily, lands which have surface (or subsurface) runoff that exit the watershed or contain woodlots would have a decreased run-off factor applied to their assessment.

Open-Drain Maintenance Works

For the purposes of future maintenance on the entire length of the drain, all costs shall be levied against the lands and roads within the watershed in accordance with the attached Maintenance Schedules of

Assessment. The physical dimensions and parameters which control and facilitate the extent of maintenance works permitted on this Municipal Drain shall be limited to that which had been set out and constructed as part of the following Engineer's Reports:

i. From Station 0+000.0 to Station 1+399.3 – These works extend within private lands from its top end at the east limit of Lot 90, downstream to the north limit of County Road 50. These works are collectively governed by the 1949, 1968, 1977, 1997, and the 2010 Engineer's Reports.

ii. From Station 1+399.3 to Station 1+992.7 – These works extend from the north side of County Road 50, downstream through private lands and crossing Levergood Drive and Erie Shores Drive, to its outlet into Lake Erie. These works are collectively governed by the 1968 and 1997 Engineer's Reports.

IX. SPECIAL CONSIDERATIONS

Future Developments

The assessments derived within the Schedules of Assessments have been evaluated based on the current conditions and existing developments. It is anticipated that additional areas within the Bondy No. 1 Drain watershed are slated for future residential developments. These future developments will create higher runoff from each site and will result in increased flows into the Bondy No. 1 Drain. Therefore, if the Town of Essex is prepared to approve the increased total flow volumes from the future developments (through Stormwater Management provisions or a free discharge), we recommend that an update to the "Outlet Assessments" shall be established for each future development site, through Section 65 or Section 76 of the Drainage Act.

X. DRAWINGS

Attached, as part of this report, we have provided a plan that illustrates the Bondy No. 1 Drain watershed and sub-watershed areas, the location of the drain and its structures, as well as a listing of the affected landowners. The plan has been reduced in scale and attached to herein and labelled as **Appendix "B"**. However, full scale drawings can be viewed at the Town of Essex Municipal Offices, if required.

XI. GRANTS

It should be understood that no grant is available to privately owned agricultural lands used for the preparation of the Engineer's Report conducted under Section 76 of the Drainage Act. However, in accordance with the provisions of Section 85 through Section 90 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021", when maintenance works are conducted to the Bondy No. 1 Drain in the future, a grant up to the amount of 1/3 of the assessments eligible for a grant, may be made in respect of the maintenance assessments made upon privately owned lands used for agricultural purposes. Based on the current Agricultural Drainage Infrastructure Program (ADIP), "lands used for agricultural purposes" may be eligible for a grant in the amount of up to 1/3 of their total assessment. The policy defines "lands used for agricultural purposes" as those lands eligible for the "Farm Property Class Tax Rate". The Municipal Clerk

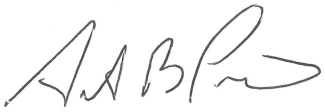
has provided this information to the Engineer from the current property tax roll and the Engineer has further confirmed this information with the AGMaps Geographic Information Portal Services through OMAFRA. Properties that meet the criteria for "lands used for agricultural purposes" are shown in the attached Assessment Schedules under the subheading "**5. PRIVATELY OWNED – AGRICULTURAL LANDS (grantable)**" and are expected to be eligible for the 1/3 grant from OMAFRA.

XII. REPORT COSTS

We would also recommend that all engineering costs and expenses related to the preparation, distribution, and consideration of this report be included as an expense to the drainage works and assessed in the same proportions as set out in the new **Future Maintenance Schedule of Assessment #1: Bondy No. 1 Drain-Entire Drain (Station 0+000 to Station 1+992.7)**, attached herein.

All of which is respectfully submitted,

N.J. PERALTA ENGINEERING LTD.



Antonio B. Peralta, P.Eng.

ABP/kk

APPENDIX "A"

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APPENDIX A-1

Future Maintenance Schedule of Assessment #1
Entire Drain

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FUTURE MAINTENANCE SCHEDULE OF ASSESSMENT #1

Bondy No. 1 Drain - Entire Drain (Station 0+000 to Station 1+992.7)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
	Erie Shores Drive				2.09	0.846	Town of Essex	$ 468.00	$ 131.00	$ 599.00
	Levergood Court				0.33	0.134	Town of Essex	$ 103.00	$ 20.00	$ 123.00
	Levergood Drive				2.39	0.967	Town of Essex	$ 596.00	$ 220.00	$ 816.00
	Crystal Beach Road				1.11	0.449	Town of Essex	$ 174.00	$ 151.00	$ 325.00
	County Road 50				2.30	0.931	County of Essex	$ 508.00	$ 410.00	$ 918.00
	Total on Municipal Lands							**$ 1,849.00**	**$ 932.00**	**$ 2,781.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
4	670-02550	1	95	1.14	0.73	0.295	Bruce Ferriss and Kimberly Dufour	$ 124.00	$ 84.00	$ 208.00
5	670-02600	1	94	0.73	0.73	0.295	David & Lisa Durocher	$ 171.00	$ 70.00	$ 241.00
6	670-02650	1	94	0.67	0.67	0.271	David & Lisa Durocher	$ 157.00	$ 51.00	$ 208.00
8	670-02750	1	94	0.33	0.33	0.134	Andrew & Wendy Quick	$ 39.00	$ 47.00	$ 86.00
9	670-02800	1	94	1.53	1.53	0.619	Ronald & Patricia Deschaine	$ 134.00	$ 134.00	$ 268.00
13	670-28300	R.P. 1392	69	0.09	0.09	0.036	Kenneth & Vicki Kyle	$ 4.00	$ 10.00	$ 14.00
14	670-28400	R.P. 1392	Pt. 64 & 65 to 68	0.42	0.42	0.170	Donna Dunsmore	$ 20.00	$ 33.00	$ 53.00
15	670-28500	R.P. 1392	63 & Pt. 64	0.10	0.10	0.040	Herbert Alfaro	$ 5.00	$ 11.00	$ 16.00
16	670-28600	R.P. 1392	62	0.09	0.09	0.036	Margaret Malone	$ 4.00	$ 10.00	$ 14.00
17	670-28700	R.P. 1392	60 to 61	0.17	0.17	0.069	Robert Arquette and Willy Renard	$ 8.00	$ 15.00	$ 23.00
18	670-28705	R.P. 1392	59 to 58	0.17	0.17	0.069	Mickal Menogue	$ 8.00	$ 15.00	$ 23.00
19	670-28800	R.P. 1392	53, 54, Pt. 55, 56-59	0.40	0.40	0.162	Jill Jimmerfield and Ronald Kennedy	$ 19.00	$ 34.00	$ 53.00
20	670-28900	R.P. 1392	Pt. 49 to 52	0.39	0.39	0.158	John Weir	$ 18.00	$ 34.00	$ 52.00
21	670-29000	R.P. 1392	Pt. 49 & 46 to 48	0.30	0.30	0.121	John & Gloria Stewart	$ 14.00	$ 26.00	$ 40.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: Continued

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
22	670-29100	R.P 1392	Pt. 43, 44 & 45	0.24	0.24	0.097	Tamara Deneau	$ 11.00	$ 21.00	$ 32.00
23	670-29300	R.P. 1392	Pt. 43 & 40 to 42	0.28	0.28	0.113	Sharon Boehk	$ 13.00	$ 24.00	$ 37.00
24	670-29400	R.P. 1392	37 to 39	0.26	0.26	0.105	Stephen & Laura Hasulo	$ 12.00	$ 27.00	$ 39.00
25	670-29500	R.P. 1392	34 to 36	0.26	0.26	0.105	Kenneth Chapman	$ 12.00	$ 27.00	$ 39.00
27	670-31000	R.P. 1466	Pt. Blk 'A'	0.49	0.49	0.198	Daniel & Jenny Jenner	$ 60.00	$ 40.00	$ 100.00
28	670-31001	R.P. 1466	Pt. Blk 'A'	2.06	2.06	0.834	Kyle & Sara Morency	$ 340.00	$ 106.00	$ 446.00
29	670-31003	1	95	3.00	3.00	1.214	Terry Bale	$ 695.00	$ 184.00	$ 879.00
30	670-31007	1	95	0.98	0.98	0.397	Dwayne & Lucy Barris	$ 198.00	$ 54.00	$ 252.00
31	670-31009	1	95	0.49	0.49	0.198	Brian Sadai, Mary St. Pierre and	$ 57.00	$ 40.00	$ 97.00
32	670-31010	1	95	0.64	0.64	0.259	BCE (Essex) Inc.	$ 110.00	$ 46.00	$ 156.00
33	670-31012	1	95	2.59	2.59	1.048	Daniel & Diane Hannigan	$ 604.00	$ 159.00	$ 763.00
34	670-31050	R.P. 1466	Pt. Blk 'A'	1.42	1.42	0.575	Michael McNamara	$ 162.00	$ 73.00	$ 235.00
35	670-31075	1	95	0.90	0.90	0.364	Robert, Suzanne, Julianne and John	$ 106.00	$ 59.00	$ 165.00
36	670-31100	R.P. 1466	Pt. 9 &10	0.22	0.11	0.045	Sheryl & Robert Sloan	$ 13.00	$ 6.00	$ 19.00
37	670-31200	R.P. 1466	Pt. 9 & 8	0.25	0.13	0.051	Jillian Yost & Norman Barton	$ 15.00	$ 7.00	$ 22.00
38	670-31300	R.P. 1466	Pt. 6 &7	0.23	0.11	0.046	Michael, Jane, David & Katherine	$ 13.00	$ 6.00	$ 19.00
39	670-31400	R.P. 1466	Pt. 6 & 5	0.22	0.11	0.044	Michael McNamara	$ 13.00	$ 6.00	$ 19.00
40	670-31500	R.P. 1466	4	0.14	0.07	0.028	Robert & Joan Nagle and Victoria	$ 8.00	$ 3.00	$ 11.00
41	670-31600	R.P. 1466	3	0.14	0.07	0.028	Robert & Joan Nagle and Victoria	$ 8.00	$ 3.00	$ 11.00
42	670-31700	R.P. 1466	2	0.18	0.09	0.037	Ronald & Murray Inverarity	$ 11.00	$ 4.00	$ 15.00
43	670-31800	R.P. 1466	1	0.18	0.09	0.037	Mcnamara Michael	$ 11.00	$ 4.00	$ 15.00
44	670-31900	R.P. 1057	19 & 20	0.17	0.08	0.034	Tyson Joseph and Deborah Sissons-	$ 20.00	$ 4.00	$ 24.00
45	670-32000	R.P. 1057	18	0.11	0.06	0.024	Deslippe Catherine	$ 14.00	$ 3.00	$ 17.00
46	670-32100	R.P. 1057	17	0.12	0.06	0.024	Velo & Victoria Todorovski	$ 14.00	$ 3.00	$ 17.00
47	670-32200	R.P. 1057	16	0.12	0.06	0.025	George Bolton	$ 14.00	$ 3.00	$ 17.00
48	670-32300	R.P. 1057	15	0.12	0.06	0.025	George & Bonnie Ioanidis	$ 14.00	$ 3.00	$ 17.00
49	670-32400	R.P. 1057	13 & 14	0.22	0.11	0.045	Andre & Kristine Bezaire	$ 26.00	$ 8.00	$ 34.00
50	670-32500	R.P. 1057	12	0.11	0.05	0.022	Charlene Atkins	$ 13.00	$ 2.00	$ 15.00
51	670-32600	R.P. 1057	11	0.11	0.05	0.022	Wayne Campbell	$ 13.00	$ 2.00	$ 15.00
52	670-32700	R.P. 1057	8, 9 & 10	0.28	0.17	0.069	Jospeh & Lisa Brochu	$ 40.00	$ 10.00	$ 50.00
53	670-32750	R.P. 1057	6 & 7	0.11	0.09	0.036	Orrie Levergood	$ 21.00	$ 1.00	$ 22.00
54	670-32900	R.P. 1057	4 & 5	0.15	0.10	0.040	Leslie Leroux and Terrence Baines	$ 23.00	$ 4.00	$ 27.00
55	670-33000	R.P. 1057	3	0.10	0.05	0.021	Gregory Bolton	$ 12.00	$ 2.00	$ 14.00
56	670-33100	R.P. 1057	2	0.10	0.05	0.021	James Johnstone and Gloria Lemieux	$ 12.00	$ 2.00	$ 14.00
57	670-33300	1	96	0.44	0.44	0.178	Sawyer Grant and Ryan Tilson	$ 103.00	$ 22.00	$ 125.00
58	670-33400	1	96	0.71	0.71	0.287	Elizabeth Carreira	$ 167.00	$ 20.00	$ 187.00
59	670-33500	R.P. 1057	28	0.11	0.11	0.045	Ralph Carreira	$ 26.00	$ 9.00	$ 35.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: Continued

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
60	670-33600	R.P. 1057	27	0.09	0.09	0.036	Robin Martin	$ 21.00	$ 7.00	$ 28.00
61	670-33700	R.P. 1057	24 & 25	0.09	0.09	0.036	Gary Freisinger and Judith Seagull	$ 21.00	$ 7.00	$ 28.00
62	670-33800	R.P. 1057	24 & 25	0.18	0.18	0.073	Laurie Freeman	$ 42.00	$ 10.00	$ 52.00
63	670-33900	R.P. 1057	23	0.09	0.09	0.036	Terrence & Sherri-Lynne Barris	$ 21.00	$ 7.00	$ 28.00
64	670-34000	R.P. 1057	21 & 22	0.18	0.18	0.073	Chelsea, Shawn & Krsiti Couture	$ 42.00	$ 10.00	$ 52.00
65	670-34200	R.P. 1057	34 & 35	0.15	0.15	0.061	Terrance Baines and Leslie Leroux	$ 35.00	$ 6.00	$ 41.00
66	670-34300	R.P. 1057	33	0.09	0.09	0.036	Gary & Judith Freisinger	$ 21.00	$ 6.00	$ 27.00
67	670-34400	R.P. 1057	32	0.09	0.09	0.036	Gary & Judith Freisinger	$ 21.00	$ 6.00	$ 27.00
68	670-34500	R.P. 1057	31	0.09	0.09	0.036	Gary Freisinger and Judith Seagull	$ 21.00	$ 6.00	$ 27.00
69	670-34600	R.P. 1057	30	0.09	0.09	0.036	Shaun & Felicia Miller	$ 21.00	$ 6.00	$ 27.00
70	670-34700	R.P. 1057	29	0.55	0.55	0.223	Elizabeth Carreira and Bart Atkins	$ 129.00	$ 22.00	$ 151.00
71	670-34800	R.P. 1057	36 to 39	0.36	0.36	0.146	Marc Bechard	$ 84.00	$ 13.00	$ 97.00
72	670-34900	1	96	0.66	0.66	0.267	Jihad Mitri	$ 34.00	$ 47.00	$ 81.00
	Total on Privately Owned - Non-Agricultural Lands							**$ 4,242.00**	**$ 1,724.00**	**$ 5,966.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
1	660-22700	1	88 & 89	95.19	75.00	30.352	Thomas Lypps	$ 1,966.00	$ 6,615.00	$ 8,581.00
2	670-00100	1	90 & 91	139.60	80.39	32.533	Gorski Land Holdings Inc.	$ 5,715.00	$ 6,905.00	$ 12,620.00
3	670-02500	1	95	67.94	4.09	1.655	Thaddeus & Catherine Gorski	$ 456.00	$ 127.00	$ 583.00
7	670-02700	1	94	112.45	44.50	18.009	Gyori Farms Inc.	$ 2,746.00	$ 3,700.00	$ 6,446.00
10	670-02900	1	93	93.50	44.20	17.887	Gorski Land Holdings Inc.	$ 3,222.00	$ 2,164.00	$ 5,386.00
11	670-03100	1	92	106.86	34.39	13.917	Gorski Land Holdings Inc.	$ 2,195.00	$ 2,215.00	$ 4,410.00
12	670-03300	1	91	89.80	1.00	0.405	Gorski Land Holdings Inc.	$ 156.00	$ 67.00	$ 223.00
26	670-30900	R.P. 1466	11 to 20, Pt. Blk 'A'	14.66	13.00	5.261	Trustees of Bouf's Mutual Benefit Association	$ 1,145.00	$ 387.00	$ 1,532.00
73	670-35000	1	96	22.40	11.87	4.804	Richard & Barbara Levergood	$ 1,308.00	$ 164.00	$ 1,472.00
	Total on Privately Owned - Agricultural Lands (grantable)							**$ 18,909.00**	**$ 22,344.00**	**$ 41,253.00**
	TOTAL ASSESSMENT				**342.15**	**138.466**		**$ 25,000.00**	**$ 25,000.00**	**$ 50,000.00**

1 Hectare = 2.471 Acres

D22-063

August 16, 2023

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APPENDIX A-2

Future Maintenance Schedule of Assessment #2
Upstream Portion (Station 0+000 to Station 1+399.3)

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FUTURE MAINTENANCE SCHEDULE OF ASSESSMENT #2

Bondy No. 1 Drain - Upstream Portion (Station 0+000 to Station 1+399.3)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
	County Road 50				1.15	0.465	County of Essex	$ 112.00	$ 140.00	$ 252.00
	Total on Municipal Lands							**$ 112.00**	**$ 140.00**	**$ 252.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
4	670-02550	1	95	1.14	0.73	0.295	Bruce Ferriss and Kimberly Dufour	$ 109.00	$ 57.00	$ 166.00
5	670-02600	1	94	0.73	0.73	0.295	David & Lisa Durocher	$ 150.00	$ 47.00	$ 197.00
6	670-02650	1	94	0.67	0.67	0.271	David & Lisa Durocher	$ 138.00	$ 34.00	$ 172.00
8	670-02750	1	94	0.33	0.33	0.134	Andrew & Wendy Quick	$ 34.00	$ 32.00	$ 66.00
	Total on Privately Owned - Non-Agricultural Lands							**$ 431.00**	**$ 170.00**	**$ 601.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
1	660-22700	1	88 & 89	95.19	75.00	30.352	Thomas Lypps	$ 1,727.00	$ 4,459.00	$ 6,186.00
2	670-00100	1	90 & 91	139.60	80.39	32.533	Gorski Land Holdings Inc.	$ 5,021.00	$ 4,655.00	$ 9,676.00
3	670-02500	1	95	67.94	4.09	1.655	Thaddeus & Catherine Gorski	$ 400.00	$ 86.00	$ 486.00
7	670-02700	1	94	112.45	44.50	18.009	Gyori Farms Inc.	$ 2,413.00	$ 2,494.00	$ 4,907.00
10	670-02900	1	93	93.50	44.20	17.887	Gorski Land Holdings Inc.	$ 2,831.00	$ 1,458.00	$ 4,289.00
11	670-03100	1	92	106.86	34.39	13.917	Gorski Land Holdings Inc.	$ 1,928.00	$ 1,493.00	$ 3,421.00
12	670-03300	1	91	89.80	1.00	0.405	Gorski Land Holdings Inc.	$ 137.00	$ 45.00	$ 182.00
	Total on Privately Owned - Agricultural Lands (grantable)							**$ 14,457.00**	**$ 14,690.00**	**$ 29,147.00**
	TOTAL ASSESSMENT				**342.15**	**138.466**		**$ 15,000.00**	**$ 15,000.00**	**$ 30,000.00**

1 Hectare = 2.471 Acres
D22-063
August 16, 2023

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APPENDIX A-3

Future Maintenance Schedule of Assessment #3
Downstream Portion (Station 1+399.3 to Station 1+992.7)

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FUTURE MAINTENANCE SCHEDULE OF ASSESSMENT #3

Bondy No. 1 Drain - Downstream Portion (Station 1+399.2 to Station 1+992.7)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
	Erie Shores Drive				2.09	0.846	Town of Essex	$ 1,063.00	$ 63.00	$ 1,126.00
	Levergood Court				0.33	0.134	Town of Essex	$ 235.00	$ 9.00	$ 244.00
	Levergood Drive				2.39	0.967	Town of Essex	$ 1,354.00	$ 105.00	$ 1,459.00
	Crystal Beach Road				1.11	0.449	Town of Essex	$ 396.00	$ 73.00	$ 469.00
	County Road 50				2.30	0.931	County of Essex	$ 1,142.00	$ 199.00	$ 1,341.00
	Total on Municipal Lands							**$ 4,190.00**	**$ 449.00**	**$ 4,639.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
4	670-02550	1	95	1.14	0.73	0.295	Bruce Ferriss and Kimberly Dufour	$ -	$ 41.00	$ 41.00
5	670-02600	1	94	0.73	0.73	0.295	David & Lisa Durocher	$ -	$ 33.00	$ 33.00
6	670-02650	1	94	0.67	0.67	0.271	David & Lisa Durocher	$ -	$ 24.00	$ 24.00
8	670-02750	1	94	0.33	0.33	0.134	Andrew & Wendy Quick	$ -	$ 22.00	$ 22.00
9	670-02800	1	94	1.53	1.53	0.619	Ronald & Patricia Deschaine	$ -	$ 64.00	$ 64.00
13	670-28300	R.P. 1392	69	0.09	0.09	0.036	Kenneth & Vicki Kyle	$ 10.00	$ 5.00	$ 15.00
14	670-28400	R.P. 1392	Pt. 64 & 65 to 68	0.42	0.42	0.170	Donna Dunsmore	$ 45.00	$ 16.00	$ 61.00
15	670-28500	R.P. 1392	63 & Pt. 64	0.10	0.10	0.040	Herbert Alfaro	$ 11.00	$ 5.00	$ 16.00
16	670-28600	R.P. 1392	62	0.09	0.09	0.036	Margaret Malone	$ 10.00	$ 5.00	$ 15.00
17	670-28700	R.P. 1392	60 to 61	0.17	0.17	0.069	Robert Arquette and Willy Renard	$ 18.00	$ 7.00	$ 25.00
18	670-28705	R.P. 1392	59 to 58	0.17	0.17	0.069	Mickal Menogue	$ 18.00	$ 7.00	$ 25.00
19	670-28800	R.P. 1392	53, 54, Pt. 55, 56-59	0.40	0.40	0.162	Jill Jimmerfield and Ronald Kennedy	$ 43.00	$ 17.00	$ 60.00
20	670-28900	R.P. 1392	Pt. 49 to 52	0.39	0.39	0.158	John Weir	$ 42.00	$ 16.00	$ 58.00
21	670-29000	R.P. 1392	Pt. 49 & 46 to 48	0.30	0.30	0.121	John & Gloria Stewart	$ 32.00	$ 12.00	$ 44.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: Continued

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
22	670-29100	R.P 1392	Pt. 43, 44 & 45	0.24	0.24	0.097	Tamara Deneau	$ 26.00	$ 10.00	$ 36.00
23	670-29300	R.P. 1392	Pt. 43 & 40 to 42	0.28	0.28	0.113	Sharon Boehk	$ 30.00	$ 12.00	$ 42.00
24	670-29400	R.P. 1392	37 to 39	0.26	0.26	0.105	Stephen & Laura Hasulo	$ 28.00	$ 13.00	$ 41.00
25	670-29500	R.P. 1392	34 to 36	0.26	0.26	0.105	Kenneth Chapman	$ 28.00	$ 13.00	$ 41.00
27	670-31000	R.P. 1466	Pt. Blk 'A'	0.49	0.49	0.198	Daniel & Jenny Jenner	$ 136.00	$ 19.00	$ 155.00
28	670-31001	R.P. 1466	Pt. Blk 'A'	2.06	2.06	0.834	Kyle & Sara Morency	$ 774.00	$ 51.00	$ 825.00
29	670-31003	1	95	3.00	3.00	1.214	Terry Bale	$ 1,581.00	$ 88.00	$ 1,669.00
30	670-31007	1	95	0.98	0.98	0.397	Dwayne & Lucy Barris	$ 451.00	$ 26.00	$ 477.00
31	670-31009	1	95	0.49	0.49	0.198	Brian Sadai, Mary St. Pierre and	$ 131.00	$ 19.00	$ 150.00
32	670-31010	1	95	0.64	0.64	0.259	BCE (Essex) Inc.	$ 249.00	$ 22.00	$ 271.00
33	670-31012	1	95	2.59	2.59	1.048	Daniel & Diane Hannigan	$ 1,373.00	$ 76.00	$ 1,449.00
34	670-31050	R.P. 1466	Pt. Blk 'A'	1.42	1.42	0.575	Michael McNamara	$ 369.00	$ 35.00	$ 404.00
35	670-31075	1	95	0.90	0.90	0.364	Robert, Suzanne, Julianne and John	$ 240.00	$ 28.00	$ 268.00
36	670-31100	R.P. 1466	Pt. 9 & 10	0.22	0.11	0.045	Sheryl & Robert Sloan	$ 30.00	$ 3.00	$ 33.00
37	670-31200	R.P. 1466	Pt. 9 & 8	0.25	0.13	0.051	Jillian Yost & Norman Barton	$ 33.00	$ 3.00	$ 36.00
38	670-31300	R.P. 1466	Pt. 6 & 7	0.23	0.11	0.046	Michael, Jane, David & Katherine	$ 30.00	$ 3.00	$ 33.00
39	670-31400	R.P. 1466	Pt. 6 & 5	0.22	0.11	0.044	Michael McNamara	$ 29.00	$ 3.00	$ 32.00
40	670-31500	R.P. 1466	4	0.14	0.07	0.028	Robert & Joan Nagle and Victoria	$ 19.00	$ 1.00	$ 20.00
41	670-31600	R.P. 1466	3	0.14	0.07	0.028	Robert & Joan Nagle and Victoria	$ 19.00	$ 1.00	$ 20.00
42	670-31700	R.P. 1466	2	0.18	0.09	0.037	Ronald & Murray Inverarity	$ 24.00	$ 2.00	$ 26.00
43	670-31800	R.P. 1466	1	0.18	0.09	0.037	Mcnamara Michael	$ 25.00	$ 2.00	$ 27.00
44	670-31900	R.P. 1057	19 & 20	0.17	0.08	0.034	Tyson Joseph and Deborah Sissons-	$ 45.00	$ 2.00	$ 47.00
45	670-32000	R.P. 1057	18	0.11	0.06	0.024	Deslippe Catherine	$ 32.00	$ 2.00	$ 34.00
46	670-32100	R.P. 1057	17	0.12	0.06	0.024	Velo & Victoria Todorovski	$ 32.00	$ 2.00	$ 34.00
47	670-32200	R.P. 1057	16	0.12	0.06	0.025	George Bolton	$ 33.00	$ 2.00	$ 35.00
48	670-32300	R.P. 1057	15	0.12	0.06	0.025	George & Bonnie Ioanidis	$ 33.00	$ 2.00	$ 35.00
49	670-32400	R.P. 1057	13 & 14	0.22	0.11	0.045	Andre & Kristine Bezaire	$ 59.00	$ 4.00	$ 63.00
50	670-32500	R.P. 1057	12	0.11	0.05	0.022	Charlene Atkins	$ 29.00	$ 1.00	$ 30.00
51	670-32600	R.P. 1057	11	0.11	0.05	0.022	Wayne Campbell	$ 29.00	$ 1.00	$ 30.00
52	670-32700	R.P. 1057	8, 9 & 10	0.28	0.17	0.069	Jospeh & Lisa Brochu	$ 91.00	$ 5.00	$ 96.00
53	670-32750	R.P. 1057	6 & 7	0.11	0.09	0.036	Orrie Levergood	$ 48.00	$ -	$ 48.00
54	670-32900	R.P. 1057	4 & 5	0.15	0.10	0.040	Leslie Leroux and Terrence Baines	$ 53.00	$ 2.00	$ 55.00
55	670-33000	R.P. 1057	3	0.10	0.05	0.021	Gregory Bolton	$ 27.00	$ 1.00	$ 28.00
56	670-33100	R.P. 1057	2	0.10	0.05	0.021	James Johnstone and Gloria Lemieux	$ 27.00	$ 1.00	$ 28.00
57	670-33300	1	96	0.44	0.44	0.178	Sawyer Grant and Ryan Tilson	$ 235.00	$ 11.00	$ 246.00
58	670-33400	1	96	0.71	0.71	0.287	Elizabeth Carreira	$ 379.00	$ 10.00	$ 389.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: Continued

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
59	670-33500	R.P. 1057	28	0.11	0.11	0.045	Ralph Carreira	$ 59.00	$ 4.00	$ 63.00
60	670-33600	R.P. 1057	27	0.09	0.09	0.036	Robin Martin	$ 48.00	$ 3.00	$ 51.00
61	670-33700	R.P. 1057	24 & 25	0.09	0.09	0.036	Gary Freisinger and Judith Seagull	$ 48.00	$ 3.00	$ 51.00
62	670-33800	R.P. 1057	24 & 25	0.18	0.18	0.073	Laurie Freeman	$ 96.00	$ 5.00	$ 101.00
63	670-33900	R.P. 1057	23	0.09	0.09	0.036	Terrence & Sherri-Lynne Barris	$ 48.00	$ 3.00	$ 51.00
64	670-34000	R.P. 1057	21 & 22	0.18	0.18	0.073	Chelsea, Shawn & Krsiti Couture	$ 96.00	$ 5.00	$ 101.00
65	670-34200	R.P. 1057	34 & 35	0.15	0.15	0.061	Terrance Baines and Leslie Leroux	$ 80.00	$ 3.00	$ 83.00
66	670-34300	R.P. 1057	33	0.09	0.09	0.036	Gary & Judith Freisinger	$ 48.00	$ 3.00	$ 51.00
67	670-34400	R.P. 1057	32	0.09	0.09	0.036	Gary & Judith Freisinger	$ 48.00	$ 3.00	$ 51.00
68	670-34500	R.P. 1057	31	0.09	0.09	0.036	Gary Freisinger and Judith Seagull	$ 48.00	$ 3.00	$ 51.00
69	670-34600	R.P. 1057	30	0.09	0.09	0.036	Shaun & Felicia Miller	$ 48.00	$ 3.00	$ 51.00
70	670-34700	R.P. 1057	29	0.55	0.55	0.223	Elizabeth Carreira and Bart Atkins	$ 293.00	$ 10.00	$ 303.00
71	670-34800	R.P. 1057	36 to 39	0.36	0.36	0.146	Marc Bechard	$ 192.00	$ 6.00	$ 198.00
72	670-34900	1	96	0.66	0.66	0.267	Jihad Mitri	$ 76.00	$ 23.00	$ 99.00
	Total on Privately Owned - Non-Agricultural Lands							**$ 8,234.00**	**$ 827.00**	**$ 9,061.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
1	660-22700	1	88 & 89	95.19	75.00	30.352	Thomas Lypps	$ -	$ 3,175.00	$ 3,175.00
2	670-00100	1	90 & 91	139.60	80.39	32.533	Gorski Land Holdings Inc.	$ -	$ 3,314.00	$ 3,314.00
3	670-02500	1	95	67.94	4.09	1.655	Thaddeus & Catherine Gorski	$ -	$ 61.00	$ 61.00
7	670-02700	1	94	112.45	44.50	18.009	Gyori Farms Inc.	$ -	$ 1,776.00	$ 1,776.00
10	670-02900	1	93	93.50	44.20	17.887	Gorski Land Holdings Inc.	$ -	$ 1,038.00	$ 1,038.00
11	670-03100	1	92	106.86	34.39	13.917	Gorski Land Holdings Inc.	$ -	$ 1,063.00	$ 1,063.00
12	670-03300	1	91	89.80	1.00	0.405	Gorski Land Holdings Inc.	$ -	$ 32.00	$ 32.00
26	670-30900	R.P. 1466	11 to 20, Pt. Blk 'A'	14.66	13.00	5.261	Trustees of Bouf's Mutual Benefit Association	$ 2,602.00	$ 186.00	$ 2,788.00
73	670-35000	1	96	22.40	11.87	4.804	Richard & Barbara Levergood	$ 2,974.00	$ 79.00	$ 3,053.00
	Total on Privately Owned - Agricultural Lands (grantable)							**$ 5,576.00**	**$ 10,724.00**	**$ 16,300.00**
	TOTAL ASSESSMENT				**342.15**	**138.466**		**$ 18,000.00**	**$ 12,000.00**	**$ 30,000.00**

1 Hectare = 2.471 Acres
D22-063
August 16, 2023

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APPENDIX "B"

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WATERSHED PLAN

OF THE

BONDY DRAIN No. 1

IN THE

TOWN OF ESSEX
(Geographic Township of Colchester South)

IN THE

COUNTY OF ESSEX • ONTARIO

TOWN OF ESSEX

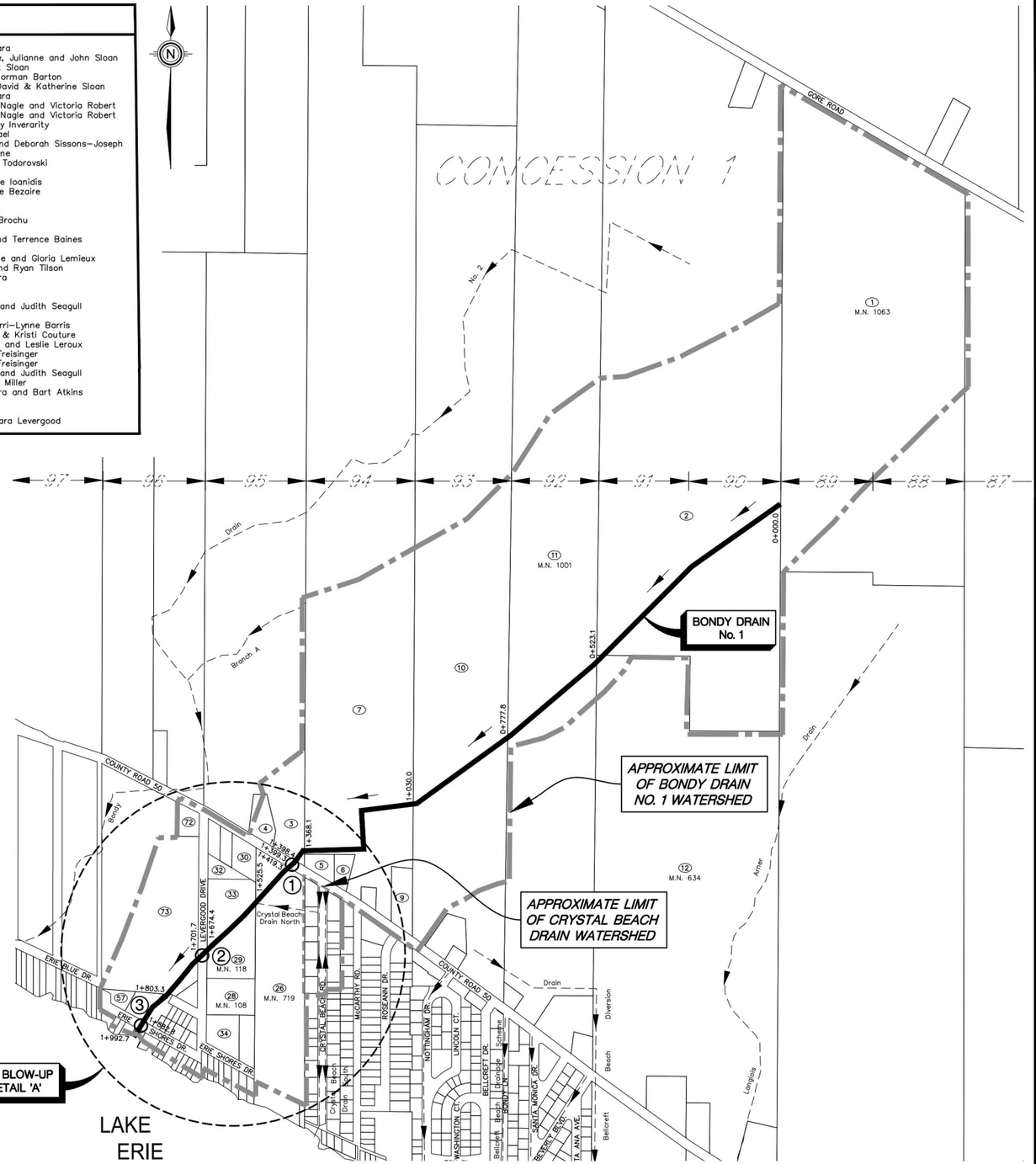
MAYOR: SHERRY BONDY
CLERK: JOSEPH MALANDRUCCOLO
DRAINAGE SUPERINTENDENT: LINDSAY DEAN

PARCEL I.D.	ROLL #	OWNER
1	660–22700	Thomas Lypps
2	670–00100	Gorski Land Holdings Inc.
3	670–02500	Thaddeus & Catherine Gorski
4	670–02550	Bruce Ferriss and Kimberly Dufour
5	670–02600	David & Lisa Durocher
6	670–02650	David & Lisa Durocher
7	670–02700	Gyori Farms Inc.
8	670–02750	Andrew & Wendy Quick
9	670–02800	Ronald & Patricia Deschaine
10	670–02900	Gorski Land Holdings Inc.
11	670–03100	Gorski Land Holdings Inc.
12	670–03300	Gorski Land Holdings Inc.
13	670–28300	Kenneth & Vicki Kyle
14	670–28400	Donna Dunsmore
15	670–28500	Herbert Alfaro
16	670–28600	Margaret Malone
17	670–28700	Robert Arquette and Willy Renard
18	670–28705	Mickal Menogue
19	670–28800	Jill Jimmerfield and Ronald Kennedy
20	670–28900	John Weir
21	670–29000	John & Gloria Stewart
22	670–29100	Tamara Deneau
23	670–29300	Sharon Boehk
24	670–29400	Stephen & Laura Hasulo
25	670–29500	Kenneth Chapman
26	670–30900	Trustees of Bouf's Mutual Bene
27	670–31000	Daniel & Jenny Jenner
28	670–31001	Kyle & Sara Morency
29	670–31003	Terry Bale
30	670–31007	Dwayne & Lucy Barris
31	670–31009	Brian Sadai, Mary St. Pierre and Andrea Toth
32	670–31010	BCE (Essex) Inc.
33	670–31012	Daniel & Diane Hannigan

PARCEL I.D.	ROLL #	OWNER
34	670–31050	Michael McNamara
35	670–31075	Robert, Suzanne, Julianne and John Sloan
36	670–31100	Sheryl & Robert Sloan
37	670–31200	Jillian Yost & Norman Barton
38	670–31300	Michael, Jane, David & Katherine Sloan
39	670–31400	Michael McNamara
40	670–31500	Robert & Joan Nagle and Victoria Robert
41	670–31600	Robert & Joan Nagle and Victoria Robert
42	670–31700	Ronald & Murray Inverarity
43	670–31800	Mcnamara Michael
44	670–31900	Tyson Joseph and Deborah Sissons–Joseph
45	670–32000	Desilippe Catherine
46	670–32100	Velo & Victoria Todorovski
47	670–32200	George Bolton
48	670–32300	George & Bonnie Ioanidis
49	670–32400	Andre & Kristine Bezaire
50	670–32500	Charlene Atkins
51	670–32600	Wayne Campbell
52	670–32700	Jospeh & Lisa Brochu
53	670–32750	Orrie Levergood
54	670–32900	Leslie Leroux and Terrence Baines
55	670–33000	Gregory Bolton
56	670–33100	James Johnstone and Gloria Lemieux
57	670–33300	Sawyer Grant and Ryan Tilson
58	670–33400	Elizabeth Carreira
59	670–33500	Ralph Carreira
60	670–33600	Robin Martin
61	670–33700	Gary Freisinger and Judith Seagull
62	670–33800	Laurie Freeman
63	670–33900	Terrence & Sherri–Lynne Barris
64	670–34000	Chelsea, Shawn & Kristi Couture
65	670–34200	Terrance Baines and Leslie Leroux
66	670–34300	Gary & Judith Freisinger
67	670–34400	Gary & Judith Freisinger
68	670–34500	Gary Freisinger and Judith Seagull
69	670–34600	Shaun & Felicia Miller
70	670–34700	Elizabeth Carreira and Bart Atkins
71	670–34800	Marc Bechard
72	670–34900	Jihad Mitri
73	670–35000	Richard & Barbara Levergood

BLOW UP DETAIL 'A'

Scale = 1:2,000



DENOTES OVERALL WATERSHED LIMITS

DENOTES SUB-WATERSHED LIMITS

(XX) - DENOTES PARCEL IDENTIFICATION NUMBER

(X) ○ - DENOTES BRIDGE IDENTIFICATION NUMBER AND LOCATION

WATERSHED PLAN

Scale = 1:5,000

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
2023-08-16
PROVINCE OF ONTARIO

DATE: AUG 16, 2023

Peralta Engineering
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Consulting Engineers
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Kingsville, ON
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peraltaengineering.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT No.:	SHEET No.:
M.J.S./A.B.P.	M.J.S.	A.B.P.	D22-08	1 of 1