TOWN OF AMHERSTBURG
DRAINAGE BOARD
Wednesday, August 9, 2023
6:00 PM

MINUTES

PRESENT

Allan Major
Anthony Campigotto
Brad Laramie
Murray Sellars
Brian Renaud
Sam Paglia, Drainage Superintendent/Engineering Coordinator
Nicole Humber, Recording Secretary
Kevin Fox, Municipal Clerk

ABSENT

Karly Kennedy, Policy and Committee Coordinator

1. CALL TO ORDER

The Chair called the meeting to order at 6:00 p.m.

2. DISCLOSURE OF PECUNIARY INTEREST & GENERAL NATURE THEREOF

There were none.

3. The Chair read the following land acknowledgement:

"We will begin by acknowledging that the land on which we gather is the traditional territory of the Three Fires Confederacy of First Nations (comprising the Ojibway, the Odawa, and the Potawatomie Peoples), and of the Huron- Wendat and Wyandot Peoples. We recognize the land as an expression of gratitude to those whose traditional territory we reside on, and a way of honouring the Indigenous people who have been living and thriving on the land since time immemorial. We value the significant historical and contemporary contributions of local and regional First Nations and all of the Original Peoples of Turtle Island."

4. MINUTES OF PREVIOUS MEETING

Allan Major moved, Brian Renaud seconded;

That:

The minutes of the previous meeting BE ADOPTED:

1. **Drainage Board Meeting Minutes – July 4, 2023**

Motion Carried

5. CONSIDERATION OF FINAL DRAINAGE REPORT

5.1 Lakewood Drive Drain No. 3 & Pumping Scheme

Tim Oliver, P.Eng of Dillon Consulting Ltd provided an overview of the project. Mr. Oliver noted the following:

- The project was initiated through a request in 2019 from the Road Authority requiring improved drainage under Section 4 of the Drainage Act.,
- Lake Erie experienced record high lake levels in July of 2020 which continued to stay high for well over a year. The lake levels have since started to drop.
- The area requiring drainage is McLeod Ave, Ridgewood Ave and Lakewood Dr road allowances and private lands that are abutting these roads. These lands are bounded by Lake Erie to the south and by the existing pumped

drainage systems located to the west (Bar Point Pump) and to the east (Lakewood Beach Drain No. 1 Pump).

- The report is recommending significant improvements for drainage along the Lakewood Drive portion between Ridgewood Lane and McLeod Ave.
- The existing drainage system is going through three separate drainage outlets across Lakewood Drive and outlet into Lake Erie. The westerly outlet is located at the south end of Ridgewood Lane that leads to the lake, there is another outlet that is midway along Lakewood Drive that is easterly and crosses where parcel 17 & 18 are located and empties into to the lake. The third outlet is at the easterly end of Lakewood at Mcleod Ave and a drainage swale outlet that empties into the lake. The Town periodically cleans open the outlets when the lake sand fills them in, and when the lake levels are high, there is little to no outlet for the watershed.
- In the mid 1970's engineers reports were prepared at the time to look at improvements, those recommendations were not fully adopted, and there were changes made to only involve the portion who requested drainage at the time, and that area was west of Ridgewood Lane (Bar Point area).
- In the early to mid 1980's the pump station was constructed however the east side of Ridgewood Lane was intended to be part of the system, a number of landowners did not want the work resulting in the project being downsized, the pump was made smaller, and the drainage system was mainly constructed in the Bar Point area.
- In 1987, when the Bar Point drainage system was constructed on Claremont Lane a pipe that was installed was sized sufficiently for future connection for drainage of the Lakewood Drive properties to the east, however the pump was not sized appropriately for the area.
- The current recommendations are to have one system that goes east to west and interconnects the existing drains that are there that take water to the Bar Point pump, and to improve drainage along Lakewood Drive which will be called Lakewood Drain No. 3. Interconnecting the existing roadside drains and bringing the water all towards the Bar Point Pump.
- The current pump at the Bar Point Pump station is 4000 gallons per minute and the recommendation is to upgrade the pump to allow for an expanded area. The new pump would pump approximately 8000 gallons per minute. As part of these upgrades, an expanded pump house, some new electrical will be required. The discharge to the lake will remain as it is adequately sized, and an overflow to the lake which will be useful during high lake levels.
- These upgrades will help mitigate flooding and provide a better level of service to the watershed then currently exists.
- Costs are estimated just over $1,000,000.00
- The Town of Amherstburg is assessed 2/3 of the cost of the project due to the Lakewood Drive being narrow and the new drain has to go in the road.
- A percentage breakdown of the assessments was provided.

- The existing drainage system has parts that can be utilized and therefore the engineer will provide compensation. There is a credit of $25,000 credited to the users of the Bar Point pump in Schedule B-1 in the report.
- The proposed pump upgrades would be assessed 40% to Lakewood Drive residents as a benefit and the remaining 60% of the cost would be to all of the landowners.
- Schedule C-1 and C-2 show the breakdown of the assessments. Bar Point residents are not assessed for the Lakewood Drive part of the drain.
- The easterly end of Lakewood Drive landowners on the north side were provided allowances for a right of way.
- The allowances in Schedule B-1 for Bar Point was revised for a detected administrative error just after the notices and report were mailed, and will be brought forward with a notice for the next meeting. The revised Schedule was also reviewed and provided at the meeting to consider for those who wished a copy.

Sam Paglia advised that he received an email from Brian Balkwill, a resident on Lakewood Drive, and proceeded to read Mr. Balkwill's email aloud as well as his own responses to the email. Mr. Paglia asked Mr. Oliver to address Mr. Balkwill's email.

The email will form as part of these minutes.

Mr. Oliver added that he agreed with Mr. Paglia's responses, and noted his responses in the email he provided.

The email will form as part of these minutes.

The Chair asked if anyone in the gallery would like to speak.

The Board heard from:

- **Lance Huver – 136 Lakewood Drive**

Mr. Huver expressed that he is pleased with the proposed works, and advised that the outlet to the lake is next to his house. Mr. Huver asked about the pump station north of Lakewood Drive that serviced the ERCA lands, and inquired if the pump would turn on when the water level got to a certain level. Mr. Huver also inquired when payment of the assessment would be due.

Mr. Oliver explained that the main swale from the wetland's existing culvert pipe and connects to the drain, crosses the road, and goes to Lake Erie.

Mr. Oliver stated that the pump level is set to come on at the height of the culvert and not to have water to drain to the greater extent.

Mr. Paglia noted that the Town has a policy regarding drainage assessments, and if an assessment is over $1,000.00 it can be debentured over 5 years, with the interest rate being the interest rate that the Town pays. Mr. Paglia also noted that if a landowner would like an extension on the length of the debenture, the landowner has to appear before Council and ask directly.

Mr. Huver asked what would happen to the property that has the swale to the Lake in the middle of Lakewood – would it remain open and Town owned or would it be closed and the water goes to the pump from another location?

Mr. Oliver stated that the location between parcel 17 & 18 is a pipe which is on lands owned by the Town, and his report recommends disconnecting water flowing through that pipe at the roadside. Mr. Oliver further stated that once the pipe is disconnected, the pipe won't serve a drainage purpose and the Town will have to address it if there is a culvert failure in the future.

- **Dan Accetta – 125 Lakewood Drive**

Mr. Accetta asked how the assessments would be calculated, as he has torn down the home on his property and wondered if it would change his assessment or impact future development on his property.

Mr. Paglia explained the differences between special benefit, benefit, and outlet liability on schedules of assessments. Mr. Paglia stated that Mr. Accetta's property is a residential area and typically, engineers would assess that parcel at a residential rate. Mr. Paglia further explained that Outlet Liability assesses lands for the artificial water expected to flow from those lands and that coefficient is a parameter that is used to calculate assessments for each parcel in the watershed.

Mr. Accetta inquired if there would be an additional fee when he applies for a building permit due to the drain assessment.

Mr. Paglia confirmed there would be no additional fee.

Mr. Accetta asked if there was any consideration with splitting the drainage system into the two current systems, therefore eliminating the need for the combined system as proposed.

Mr. Oliver advised he looked at the infrastructure in place and what would be needed to bring the adequate amount of drainage to an outlet and any alternative to go east to existing municipal drain systems would have required a whole new drain on Lakewood Drive. Mr. Oliver added that there is already a drainage system in place on Claremont Lane west of Ridgewood Dr. that was sized accordingly and was always intended to bring in the water from Lakewood Drive, however the landowners at the time that report went through Council meetings, refused. Mr. Oliver stated that he did not know why the decision was made to still install the adequate pipe system for a future connection, but applauded the decision and noted that it was a good call. The decision is not is not documented in the report or bylaw but the pipe size was increased during construction. Mr. Oliver noted that the Lakewood Drive residents will now get the same level of service as the rest of the landowners in Bar Point, and will get a new system that should be good for at least 50 years.

- **Brian Balkwill – 148 Lakewood**

Mr. Balkwill informed the Board that he has no issues with flooding, that the road and ERCA does, and the elevations for properties that are developed are set by ERCA and comply with them, therefore there are no issues. Mr. Balkwill proceeded to ask the landowners in the gallery if they had any issues, and asked the Board when the landowners can vote if they want the project or not.

Mr. Paglia explained that if a property is within a watershed it is automatically involved in the project. Mr. Paglia further explained the legal right of drainage and proposed work is designed with a watershed approach, and is assessed to the watershed for fairness, and in this instance, the proposed works are adding an area to a pump station that is not currently pumped. Mr. Paglia stated that although some homes may not have a problem, others do and that does not exempt them from having to pay their fair share for drainage.

Mr. Balkwill stated that anyone who purchases a property can see there is drainage along Lakewood Drive, and does not understand why it was not managed and nothing is actionable over the last three decades.

Mr. Paglia explained that the Drainage Act exists for Municipal Drains that were initially petitioned by landowners, adding that the works on municipal drains are request driven and any landowner could submit a request to have a problem fixed. Mr. Paglia further added that once the Town receives a request, they are compelled to maintain and repair the drain.

- **Caroline Coughlin – 128 Elmstead Lane**

  Ms. Coughlin indicated that the work that is proposed now, was proposed back in approximately 1985 and asked why the Town refused to complete the work at that time. Ms. Coughlin also inquired when a landowner can appeal a drainage project.

  Mr. Paglia responded by stating that the drain has history and the works that were proposed in 1975 were likely appealed by landowners at that time and never adopted or constructed. Mr. Paglia stated that he assumes the same happened in 1985, but noted that the engineer's report was revised, adopted and some work was constructed with landowner's involvement. Mr. Paglia informed the landowners that all landowners have appeal rights through the Drainage Act process; and landowners can appeal to the Tribunal on technical aspects, assessments to the Court of Revision, and on the quality of construction on all municipal drain projects.

  Ms. Coughlin stressed that all the landowners pay property taxes and since the work was not completed in 1985 specifically to the Bar Point pump, there was no fairness to the landowners with regard to this proposed project.

- **Frank Kemski – On behalf of Marlene Kemski and Ryan Bondy**

  Mr. Kemski stated that he would like to have assurances in writing from the Town, ERCA, and other Government bodies involved, stating that with the new drainage system going in, should he or his neighbour wish to develop their lands, once calculated, the current setback would not change. Mr. Kemski indicated he would like the percentage of area of the whole property to remain the same and not be cut back due to the proposed easement. Mr. Kemski also wanted to know with regard to future maintenance on the drain, would there be allowances for cement driveways etc.- specifically if he develops a lot that has a cement driveway, who would pay for the repairs to the cement.

  Mr. Paglia thanked Mr. Kemski for his correspondence and indicated that Mr. Kemski's concerns are already in writing. Mr. Paglia advised that the engineer previously mentioned that the setbacks in the working corridor to construct and for future maintenance of the drain is 4.5 metres, and that typically home setbacks start at 20-25 metres, so there is no concern regarding set backs, however he would have the Town's Chief Building Official confirm in writing, that any future build is not affected by the proposed drainage easement. Mr. Paglia explained that a working

easement is not an easement on a landowner's property that is registered on its title, it is an easement within a bylaw, that is required for drainage purposes, the drainage report appended to the bylaw shows the easements and this provides the Town with access to construct and maintain infrastructure on the Municipal Drain.

Mr. Paglia indicated that the area of Mr. Kemski's property will not change and the building department will use the entire lot area owned to calculate the building envelope restrictions for any proposed buildings on the lands.

The response from the planning department was received and confirmed and is provided below.

Hi Sam,

I just listened to your voicemail, I was out of the office due to a death in the family. Did you get an answer from Janine?

Based on what you said, it sounds like the property size is not changing, therefore the building envelope/lot coverage amount should not change either.

Sarah

Sarah French
Planner
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Mr. Paglia explained that existing driveways are covered for restoration under engineer's reports, however future accesses added after the engineer's report are part of normal restoration and they would be restored back to a gravel driveway should they have to be "taken up" to construct any drainage works. Should the landowners wish to have concrete or any other hard surface, it would be the landowner's expense, as there is no mechanism for the Town to levy assessments on driveways unless provided for in the engineer's report. Mr. Paglia noted that these costs would typically be outlined in an engineer's report as a special benefit, and currently there is no means to assess the costs. Mr. Paglia clarified that the 4.5 meter working corridor for the drain is still Mr. Kemski's land, there is just a working easement for drain work.

Mr. Kemski indicated that it was not fair to the landowners, as there would be costs that landowners would have to incur if the Town chooses to complete maintenance on the drain that cuts through his property.

Mr. Oliver stated that the report takes into account for the cost for grass, lawn and driveway in the estimate of the work and the assessments are levied. Future accesses on vacant land and any future driveway would be what it takes to access your property and base costs would be a gravel driveway. There is no mechanism to assess the costs as it is not built.

- **Ryan Bondy**

  Mr. Bondy talked about restoration to his property, and the trees that he has that are within the area of the proposed works.

  Mr. Oliver confirmed the area would be restored to its condition prior to construction.

  Mr. Paglia stated that all would be restored except for the trees, as trees are not designed to exist in any drain design.

- **Jimmy Kennedy – Parcel # 88**

  Mr. Kennedy asked what the process is of the Drainage Board, and when would a decision be made on the engineer's report. Mr. Kennedy advised that with all of the discussion in the meeting he has not heard a thing about Mother Nature. Mr. Kennedy stated that his pump works, and the pump at Bar Point is fine, therefore a pump that is 8000 gallons per minute is not needed. Mr. Kennedy would like to see an alternative rather than have this project go through. Mr. Kennedy mentioned that the Town needs to survey the landowners and see how they feel; and it is buyer beware for those buying homes in an area that is known to flood.

  Mr. Campigotto explained that the Board will hear the engineer's comments on the drainage report, hear any comments from the landowners and Board members, then the Board will then make a decision to either adopt the report or refer it back to the engineer.

  Mr. Paglia went through the Drainage Act process on the meetings, and timelines.

Mr. Kennedy spoke about a Great lakes group – environmental group and pushing the problem to the lake.

Mr. Paglia explained that the Road Authority is petitioning for the drain, and whether the landowners agree or not, it is deemed a valid petition under the Drainage Act if the road petitions for drainage, and the current systems require upgrades. Mr. Paglia noted that the Drainage Act is not new legislation and has been in place since 1850. Mr. Paglia further explained that his position requires him to be the liaison for the landowners etc., and the landowners could petition to abandon the municipal drain, however, it is unlikely to be successful since it requires 80% of the watershed to sign a petition to Council, and another landowner could petition for a municipal drain and landowners would be right back in the same spot. Mr. Paglia stated that a petition to abandon the municipal drain in this case would not be successful as the Road needs drainage.

Mr. Kennedy does not agree with the project and feels the government is forcing the project on them.

Mr. Paglia stated that the Town has 240 Municipal Drains encompassing 280 kms of drain and for landowners to expect the Town to take care of the drains across the board is unrealistic. Landowners need to be aware of their responsibilities with respect to drainage, and the Town relies on requests for maintenance and improvements by landowners for municipal drains that require work

- **Bill Balkwill**

Mr. Balkwill addressed the Board again, stating that he has learned a lot during the discussion, however the Drainage Act appeal process does not seem to have a lot of weight, and no one seems to own accountability. Mr. Balkwill stated that there is a drain in front of their roadway, although a poorly designed drain, the expectation is that the Town would have maintained the drain over the years and would have planned for the future. Mr. Balkwill discussed the concern of building permits issued over the years, and when the McBride Drive area was developed the developer was responsible for water management – however he felt the Lakewood area was not held to the same standard, forcing the residents a solution they do not require.

Mr. Paglia advised he reviewed the 1985 report and land uses at that time were studied which affects the rate of flow and design systems, and the system was designed for the use then. Mr. Paglia stated that as new development occurs over the years etc. the design proposals are

reconsidered. Mr. Paglia stated that the accountability also falls on the landowners for not putting in requests for maintenance. Mr. Paglia further stated that the Town is compelled by the Drainage Referee to act on all requests.

Board Vice-Chair Allan Major asked if the project was under the jurisdiction of the Town of Amherstburg or Malden Township back in 1985.

Board Chair Anthony Campigotto confirmed that it was pre-amalgamation back in 1985 and the drain would have fell under Malden Township.

Kevin Fox, Municipal Clerk added that with any municipal drain, landowners have the right to submit a request for repair or improvement, request maintenance, or petition for a municipal drain if they feel their needs are not being met in terms of drainage.

A discussion ensued with regard the right of drainage as it relates to stormwater and how that is affected by Statute Law and Common Law.

Board Chair Anthony Campigotto asked what the driving force was behind the road reconstruction on McLeod Avenue.

Mr. Oliver indicated that the McLeod Ave reconstruction was work that was already planned and in the budget to do and the intent would be to move forward with the drainage works. Mr. Oliver added that and has no information as to why the road reconstruction was completed when it was.

Mr. Balkwill asked about the plan for McLeod Avenue, if it could be shared with the community, and scope of works.

Mr. Paglia indicated any inquiries regarding the McLeod Ave road reconstruction should be directed to the Manager of Public Works, or the Director of Infrastructure Services, as he did not have any information on it. He is only dealing with the drainage portion, as the road needs drainage.

Board Chair Anthony Campigotto asked if anyone in the gallery had any further questions.

There were none.

Board Chair Anthony Campigotto asked if the Board members had any questions.

The Board heard from:

Board Member Brian Renaud commented that the engineer on the project has done a good job on the planning of this project, and noted the pump currently installed is not sized large enough. Mr. Renaud also added that the Bar Point residents are assessed properly and fairly.

Brian Renaud moved, Murray Sellars seconded;

That:

1. **The engineer's report, prepared by Dillon Consulting Ltd. dated June 27, 2023 for the Lakewood Drive Drain No. 3 & Pumping Scheme BE RECEIVED;**

2. **The engineer's report for the Lakewood Drive Drain No. 3 & Pumping Scheme BE CONSIDERED;**

3. **The PROVISIONAL ADOPTION of By-law 2023-092 which appends the engineer's report for the Lakewood Drive Drain No. 3 & Pumping Scheme BE BROUGHT to the next Regular Council meeting for Council's consideration; and,**

4. **Administration BE DIRECTED to proceed with the scheduling of the Public Meeting of the Court of Revision for the Lakewood Drive Drain No. 3 & Pumping Scheme.**

Motion Carried

5. OPEN COURT OF REVISION

5.1 Update from the Drainage Superintendent on events subsequent to consideration / provisional adoption of report.

Mr. Paglia provided the Board with an update regarding information that was received from a landowner after the final drainage report was provisionally adopted at the meeting to consider. Mr. Paglia also indicated that he was contacted by two other landowners regarding culverts on the Bondy-Bastien Drain. In Summary, one landowner would like to remove culverts 10 & 11 and the other landowners would like to merge culverts 4 & 5. Mr. Paglia stated that another landowner who has not taken part in the meetings would like to inquire about enclosing the drain across his property. Mr. Paglia stated that it is his

recommendation to send the report back to the engineer to revise the report based on the new information and to satisfy the requests of landowners within the watershed.

6.1 Appeals – Bondy-Bastien Drain

Mr. Paglia indicated that the Town has received appeals on the Bondy-Bastien Drain and suggested that the Board hear the appeals and that the appeals to the Tribunal could possibly be rescinded until the new report is reconsidered. Mr. Paglia asked if the appellants who appealed to the Tribunal were in the audience, that it is his suggestion that they repeal their appeal until the revised report is completed and they could resubmit a new appeal when the revised report is completed.

Mr. Paglia explained that referring the report back to the engineer would be starting the process all over again, and advised all in the audience that if they wish to see something done in the report, now is the time to bring it forward.

Board Chair Anthony Campigotto asked if there was anyone in the gallery that would like to speak.

The Board heard from:

- **Nicolas Brousseau – 2023 Front Road N – Bridge 2**

Mr. Rousseau asked the Board that if he opted to remove the culvert in the future would a report be needed and would doing so eliminate the value of benefit?

Mr. Paglia advised that Mr. Rousseau could have the bridge removed from the report but now is the time, however if he did want to re-install the culvert at any point, a new engineer's report would be required and the cost would be his.

Mr. Rood indicated he did not have the information with him at that time, however he would get back to him with the information.

Mr. Paglia advised that the benefit assessment in the schedule is made up of more than one component, and Mr. Rousseau's land is adjacent to the drain.

A resident in the gallery suggested waiting to hear the appeals until after the engineer's report is revised.

Mr. Paglia agreed with the resident to hear the appeals, however stated that if an appellant is present in the gallery and wished to have their appeal heard or have a motion on their appeal to make themselves known, as the Board is obligated to hear the appeals.

The Board heard from:

- **Ed Pare – 2416 Front Road N**

Mr. Pare addressed the Board and informed them that two of the appeals were from his step sons Ronald Bondy, and Joseph Bondy (also JNM Holdings) who could not be at the meeting, however he believed they would want to defer their appeals as well.

Mr. Pare stated that he had some points to raise.

Town Clerk Kevin Fox advised that the appeals could be heard now or at a later time.

Mr. Pare advised it was not an appeal he was speaking on, that he only had some further questions and comments.

Mr. Paglia advised that this meeting was to deal with drainage assessments, therefore if the questions are related to assessments then they could be heard, however if the questions are related to technical matters, he would suggest not hearing them as the meeting to deal with those have passed and there would be opportunity at the meeting to reconsider the report or Mr. Pare could reach out to himself or the engineer. Mr. Paglia stated it was up to the board if they wish to hear Mr. Pare's comments.

Board Member Brad Laramie suggested hearing what Mr. Pare had to say as he may have some good information that would be beneficial for the revised report.

Board Chair Anthony Campigotto asked if a vote was needed with regard to hearing the appeals.

The Board decided they would wait to hear the appeals.

Mr. Pare questioned if this this report has property owners on the west side of County Road 20 that drain to the Detroit River assessed for work that will be done on the east side of County Road 20 as those properties drain to River Canard.

Mr. Paglia clarified that landowners on the west side of County Road 20 are upstream in the current bylaw, and are paying for the works in this report to create two different branches of drain, Mr. Paglia noted that there may be some parcels draining to the river, however it is illegal drainage as it is not recognized under bylaw. Mr. Paglia explained that the engineer has provided two assessment schedules in this report - one for construction of works, and one for future maintenance. Mr. Paglia further explained that the assessment schedule for future maintenance in this report has landowners on the west side of County Rd 20 paying only for works that occur downstream of their location or where their water travels. After adopting and construction the recommendations in this report, we will be creating two branch drains. So in the future, lands on the west of CR20 will only pay for the path of their water to the Detroit River, and landowners on the east side of County Rd 20 would only pay for works where their water travels.

Mr. Pare stated that he asked the same question at the on-site meeting earlier this year and the answer he got was no.

Mr. Paglia stated the answer Mr. Pare got was that the drainage assessments are assessed to upstream landowners, and although Mr. Pare may not believe he is an upstream landowner, the bylaw says he is, and until the current bylaw changes Mr. Pare is an upstream landowner and is assessed accordingly.

Mr. Pare reiterated that he was upset to find out that he was given an answer of no, and it is troubling to him to find out the answer is yes.

Mr. Paglia indicated that he could check the minutes of the on-site meeting, however he and the engineer both know the existing drain, drain bylaw, and how drainage assessments are made. Mr. Paglia stated that it may have been a misinterpretation, but at the end of the day it has been mentioned several times that only upstream landowners pay for downstream works because landowners pay for the path of their water to a sufficient outlet.

Board Member Brad Laramie stated that he would like it clarified if this drain is going to have two separate drains, and in the end would the landowners not pay for each other's drains. Mr. Laramie asked where the requesting landowner's property was located.

Mr. Paglia confirmed that after construction there will be two separate drains, and future maintenance would be assessed separately to each drain. Mr. Paglia indicated that the requesting landowner is south of the split at County Road 20 that drains southerly to River Canard. Mr. Paglia stated the engineer only has the authority under the appointment of an engineer to take the work from the point the request happens downstream to a sufficient outlet. At some point, someone or the

Town has increased the scope of the work, and Mr. Paglia guessed it was likely the Town and that is how the entire drain has been examined and is being reported on. Someone has likely realized that there was a mistake done in the 1990's and now was the time to fix it under Section 78 of the Drainage Act, to satisfy the request for drainage and also reinstate the drain to its functional design with consideration of the decision of the Tribunal, which said "landowners may seek options under the Drainage Act to make two branches" of the drain. Mr. Paglia stated he does not have the particulars nor the history however that information gives the authority to do the entire drain under one bylaw.

Mr. Campigotto wanted clarification that the current bylaw currently has the drain as one, however once the bylaw for the new report is enacted and constructed, the current drain will be split in two drains for any future maintenance on either of the two branches.

A discussion ensued regarding whether the drain was one drain or two presently.

Mr. Pare read the Board a portion of a Tribunal decision from April 14, 1991.

Mr. Paglia and Mr. Pare discussed the Tribunal decision in length and Mr. Paglia advised Mr. Pare to read further in the Tribunal decision as it states that the appeal was dismissed as the appellant was the requesting landowner.

Mr. Paglia reiterated that the report was set aside because the appellant that brought the project to the Tribunal was the requesting landowner, the Tribunal cannot say there is benefit when a benefitting landowner that made the initial request is appealing the report on the drainage assessment. Mr. Paglia noted that the report was not set aside because the community of landowners did not want it the work completed. Mr. Paglia quoted the following written in the Tribunal Decision "we are further fortified in our conclusion that the work is not cost beneficial by the fact that the proponent of the work and the largest land owner in the watershed is objecting to the assessment against his lands."

The Tribunal Decision will be included in these minutes.

A large discussion ensued regarding the Tribunal decision, water levels, and cost effectiveness of repairing the Bondy-Bastien Drain.

Brad Laramie moved; Allan Major seconded;

That:

1. **The appeals submitted written or verbally to the Court of Revision for the Bondy-Bastien Drain BE RECEIVED; and**

2. **The schedule of assessment as presented by Rood Engineering Inc. for the Bondy-Bastien Drain BE SET ASIDE, and the report for the Bondy-Bastien Drain BE SENT BACK to the Engineer so that the requests from landowners subsequent to the Meeting to Consider have caused changes to be made to the report recommendations as well as schedule of assessments.**

Motion Carried

7. CLOSE COURT OF REVISION

The Court of Revision was closed at 8:57 p.m.

8. NEW BUSINESS

8.1 Amending By-law – John Parks Drain No. 2

Mr. Paglia provided an overview of the purpose of bringing an Amending By-law before the Drainage Board. Mr. Paglia explained that when Council has elected to proceed with a petition or drainage works under the Drainage Act, Council is obligated to furnish the amount necessary to complete the drainage works. As such, any bylaw that is acted upon where more than sufficient funds or insufficient funds have been provided for the completion of or proper construction of the drainage works be amended, every such surplus of deficiency shall be applied by Council proportionately according to the assessment in the payment of rated imposed by it for the drainage works. The bylaws that are adopted by Council are based on the Engineer's estimate in the report. When the Drainage Superintendent applies for grants with the Agriculture Drainage Infrastructure Program (ADIP), it is possible that ADIP may deny granting for agricultural lands if amending bylaws are not completed once projects are complete. Mr. Paglia indicated that he would continue to bring amending bylaws before the Board, and an amending bylaw number would be completed when necessary in order to be complacent with grant submissions.

There are not a lot of municipalities that do bring amending bylaws forward, however it is a requirement of the Drainage Act under section 62, and when the project is completed, the assessments are based on actual cost. If there are insufficient or sufficient funds, the bylaw must be amended and levy the costs. The costs are reported to Council and a bylaw is amended to reflect and recover the actual costs.

An amending bylaw is project specific. At this point the drainage work is completed and the project is considered done and the grant has been filed using actual costs. A recommendation at a recent drainage conference is for municipalities to do everything that is required so that grant applications are not denied. Once an amending bylaw number is given, the Town can recover costs according to the schedule in the report. A levying bylaw is used to assessed maintenance costs, and usually goes to Council once a year.

Allan Major moved; Murray Sellars seconded;

That:

1. **The report from the Drainage Superintendent and Engineering Coordinator dated May 18, 2023 regarding the Amending By-Law(s) under Section 62(1) BE RECEIVED;**

2. **The Drainage Board recommend that Council ACCEPT the report from the Drainage Superintendent to amend the By-Law(s) in order to recover costs.**

3. **The Drainage Board recommend that an amending By-Law BE APPROVED by Council.**

Motion Carried

8.2 Engineering Appointment – Lakewood Beach Pump No. 1

Brad Laramie moved, Allan Major seconded;

That:

1. **The report from the Drainage Superintendent and Engineering Coordinator dated July 17, 2023 regarding the Lakewood Beach Pump No. 1 – Engineering Appointment BE RECEIVED;**

2. **The Drainage Board recommend that Council ACCEPT the request from the Director of Public Works and Infrastructure Services for improvements to the Lakewood Beach Pump No. 1 drainage system as per Section 78 of the Drainage Act; and,**

3. **The Drainage Board recommend that the appointment of Dillon Consulting Ltd. Represented by Mr. Tim Oliver, P.Eng., to examination and report on the repair and improvement to the Lakewood Beach Pump No. 1 drainage system BE APPROVED by Council.**

Motion Carried

8.3 Drainage Apportionments

Murray Sellars moved, Brian Renaud seconded;

That:

1. **The report from the Drainage Superintendent and Engineering Coordinator dated July 17, 2023, regarding Various Drainage Apportionments BE RECEIVED;**

2. **The drainage apportionments BE APPROVED as listed:**

    - **Consent B/36/20 - Drainage Apportionments for the Waldron Drain, 7th Concession Drain South and the Beaudoin Drain South – 8270 South Townline Road.**
    - **Consent B/21/22 – Jeths Drain – 21 Marsh.**
    - **Section 65(1) report by Tim Oliver, dated May 30, 2023 – Assessment Reapportionment for the Tremblay Drain – 7751 Howard Ave.**

3. **Administration BRING FORWARD the Drainage Board's recommendation to approve the drainage apportionments at a future Regular Council Meeting.**

Motion Carried

6. NEXT MEETING DATE

Tuesday, September 5, 2023 @ 6:00 p.m.

7. ADJOURNMENT

Murray Sellars moved, Allan Major seconded;

That:

The Board rise and adjourn at 9:05 p.m.

Motion Carried

_____
Chair – Anthony Campigotto

_____
Staff Liaison – Sam Paglia

(1)

Nicole Humber

From: Brian Balkwill [redacted]
Sent: August 8, 2023 7:53 AM
To: Drainage
Subject: Lakewood Drive Drainage Proposal / Watershed
Attachments: Lakewood Drive & ERCA Land.pptx

Follow Up Flag: Follow up
Flag Status: Flagged

To drainage@amherstburg.ca

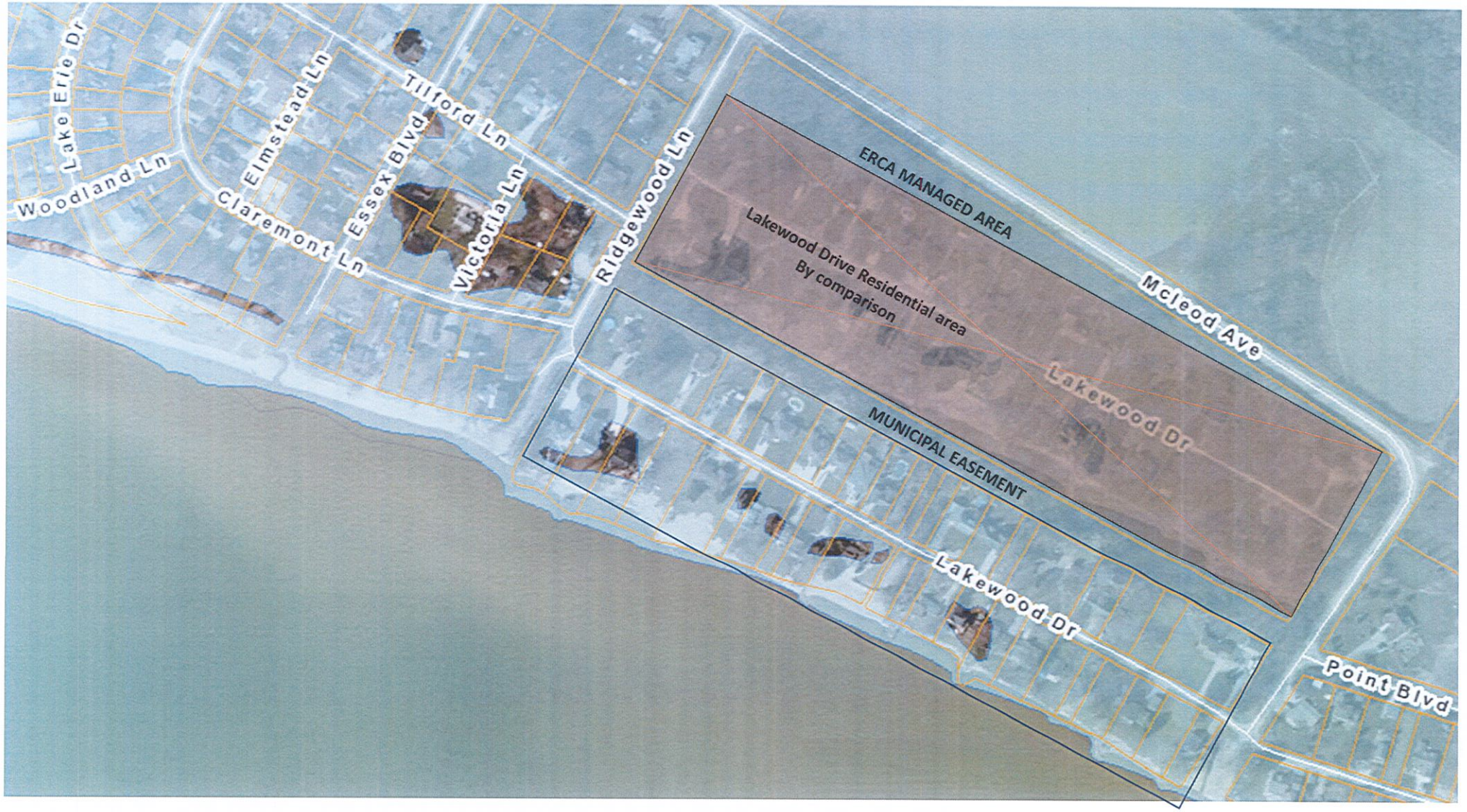
Respectfully, I am offering my input as follows.

1. Drainage history as summarized in the report sends a clear message regarding deficient drainage dating back before 1975. It is understood that existing homesteads prior to environmental management of the area would ultimately require corrective actions. Was there an actionable drainage plan going forward to support ongoing building permits and development with unsuspecting home owners.
2. In my own experience the issue was never prefaced by ERCA or Amherstburg prior to purchasing and permitting land I developed only after consulting with Amherstburg and ERCA.
3. The affected area includes ERCA managed land but does **not** include ERCA as a stakeholder, which represents the largest land mass in the area to benefit but without associated cost.
4. The **surface** water issue is not directly from Lake Erie as the outlets are frequently blocked more than functioning. However the municipal easement and ERCA managed land north of Lakewood Drive contains all of the standing water in the area.
5. Mitigation efforts can be evidenced where a newly developed property at 150 Lakewood Drive has been built to drain roof water directly toward ERCA land with no physical provision to redirect it to a municipal drain in the future. There is also a sump to ground bypass that will redirect sump water to ground if the storm drain is full.
6. As the pump and infrastructure changes are intended to service the area described in the report, is ERCA and their resources a paying stakeholder in resolving this issue?
7. Hypothetically, if a berm or barrier was built around ERCA managed land with no drain catch in order to contain its own water, what would be the size and scope of a suitable drainage plan?
8. The build permit process included compliance with ERCA directed elevation for new development. In this case there are no flooding issues that cannot be resolved individually with reference to the current example given at 150 Lakewood Drive.
9. ERCA mapping provides stark imagery based on historic data which if ever becomes a reality would render any proposed solution completely useless. The proposal offered here fails to offer a value proposition or incentive to move forward. In my view, stakeholders should include

ERCA with provincial support and a more innovative approach that challenges current by laws and limitations.

10. Reference page 19 of the report. "The Town plans to reconstruct McLeod Avenue but cannot justify the works while the drainage issues persist." A summary of the construction initiative and scope of works to be considered would be helpful to understand the future state conditions.

Attached is an image of the area. The shaded area over ERCA managed land represents the residential footprint of interest on Lakewood Drive.


Lake Erie Dr
Woodland Ln
Elmstead Ln
Claremont Ln
Essex Blvd
Tilford Ln
Victoria Ln
Ridgewood Ln
ERCA MANAGED AREA
Lakewood Drive Residential area
By comparison
Mcleod Ave
Lakewood Dr
MUNICIPAL EASEMENT
Lakewood Dr
Point Blvd

(2)

Nicole Humber

From: Drainage
Sent: August 8, 2023 10:10 AM
To: Brian Balkwill; Drainage
Cc: Oliver, Tim
Subject: RE: Lakewood Drive Drainage Proposal / Watershed
Attachments: 9. Bar Point Dr Syst - Plan, Profile, Details - Sept 2, 1981 Page 1.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hello Mr. Balkwill,

Thank you for the email. Please see comments in red below and let me know if further discussion is necessary to satisfy your concerns. I have copied the appointed Engineer for his record and comment if applicable. If any of the information below needs further clarification, please let me know.

Regards,

From: Brian Balkwill [redacted]
Sent: August 8, 2023 7:53 AM
To: Drainage <drainage@amherstburg.ca>
Subject: Lakewood Drive Drainage Proposal / Watershed

To drainage@amherstburg.ca

Respectfully, I am offering my input as follows.

1. Drainage history as summarized in the report sends a clear message regarding deficient drainage dating back before 1975. It is understood that existing homesteads prior to environmental management of the area would ultimately require corrective actions. Was there an actionable drainage plan going forward to support ongoing building permits and development with unsuspecting home owners. The 1975 request and report was never adopted or built. The pump station bylaw dates back to 1981 where the creation of the drain was for residential lands bound by Claremont Lane. In this bylaw, there exists a watershed boundary for the serviced area. The drainage plan from the 1981 report is attached for reference. Your land is not within the boundary.

   Although resources may vary from municipality to municipality, or from decade to decade within those municipalities. Today, a legal outlet for drainage is at the top of the list for

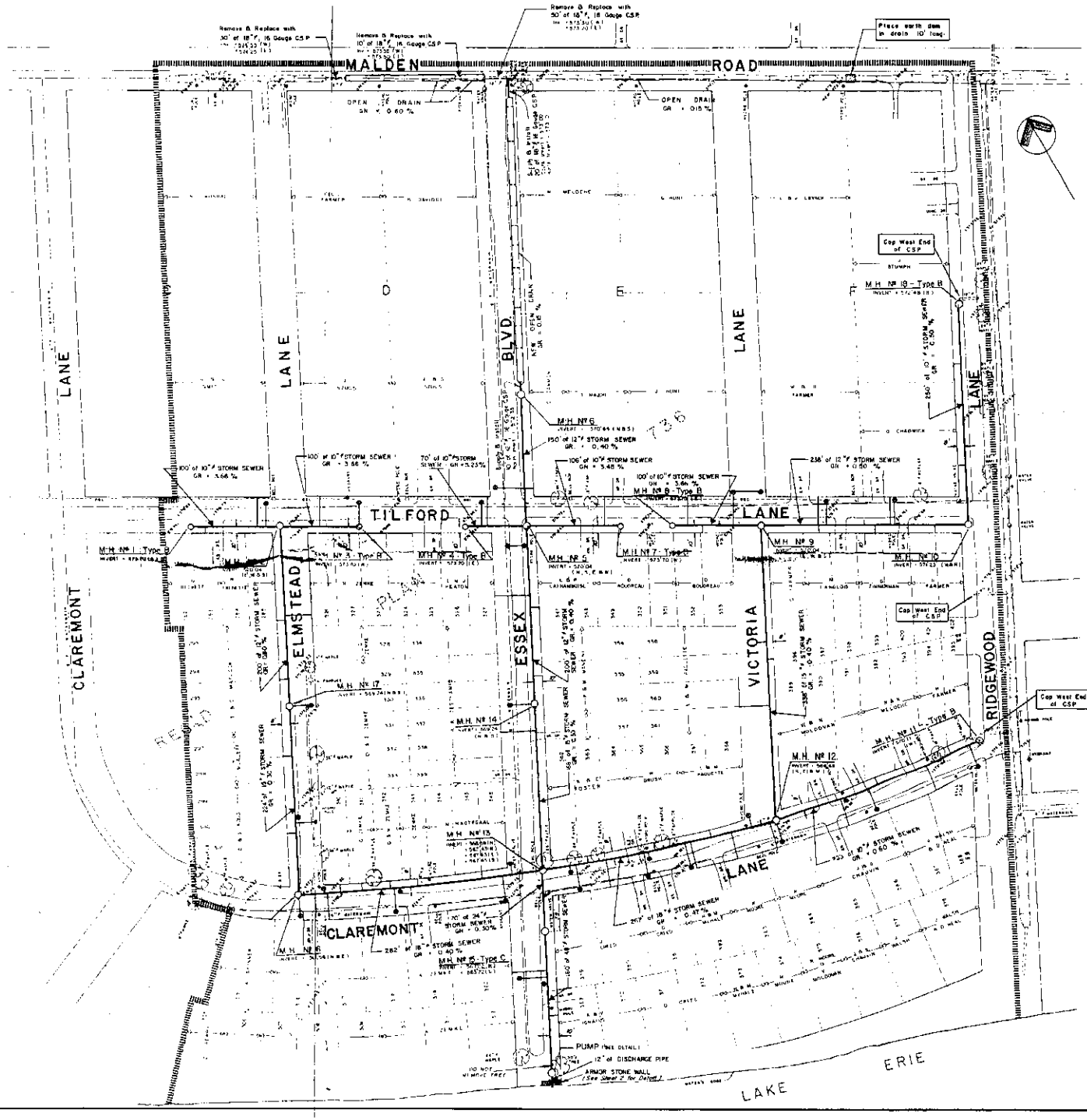
development to occur. The regulations show that there are only three ways a legal outlet for stormwater can occur.

- The Drainage Act provides a mechanism for landowners to apply and obtain a legal outlet under Statute Law for the stormwater their lands receives.
- Although altered slightly by Bill 23, a Municipality/Developer may install a drainage system within their roads through obtaining an Environmental Compliance Approval (ECA) and once that system is in, the system may accept water from surrounding lands under Common Law. That said, every landowner in Ontario is allowed a sufficient outlet. To my knowledge, an application for drainage has not been received by any of the lands in your area to establish a legal outlet.
- Riparian landowners (those lands adjacent to a Natural Watercourse).

2. In my own experience the issue was never prefaced by ERCA or Amherstburg prior to purchasing and permitting land I developed only after consulting with Amherstburg and ERCA. Refer to response above.
3. The affected area includes ERCA managed land but does **not** include ERCA as a stakeholder, The Drainage Act assesses lands regardless of who owns the land. ERCA is assessed for 7.88 Hectares in Schedule C-1 in the engineers report. They are assessed a relatively high Benefit Liability as well as the highest Outlet Liability.
    1. Benefit Liability as defined by the Act indicates a land can be assessed a Benefit Liability if the land increases in value by the existence of the drainage works.
    2. Outlet Liability is assessed to lands for the artificial water expected to flow from those lands. Engineers use run off coefficients and area of land to establish the base amount for Outlet Liability. which represents the largest land mass in the area to benefit but without associated cost.
4. The **surface** water issue is not directly from Lake Erie as the outlets are frequently blocked more than functioning. However the municipal easement and ERCA managed land north of Lakewood Drive contains all of the standing water in the area. – Lands are assessed for the artificial water expected to flow whether or not it actually does. It is up to landowners to get their water to the drainage infrastructure, so if ERCA lands are holding water, the other lands in the watershed are receiving a better level of service relating to pump capacity, but ultimately, the pump design accounts for that water. Also something interesting to note is that if other lands adjacent to ERCA are draining onto the lower lying lands, disputes are settled under Common Law.
5. Mitigation efforts can be evidenced where a newly developed property at 150 Lakewood Drive has been built to drain roof water directly toward ERCA land with no physical provision to redirect it to a municipal drain in the future. Town establishes Policies and By-Laws for the release of stormwater from downspouts There is also a sump to ground bypass that will redirect sump water to ground if the storm drain is full. Regardless of if the outlet drainage system is full, sump pumps can, and more recently, often do!, have a relief path onto surface lands. The concept deals with the "time of concentration to the system" and much like the inability fo lands to bring their water to a drainage system, this provides the surrounding landowners with an increased level of service from the drainage system as a result of the delayed time of concentration of stormwater into the system. Landowners must understand the legal implication of such a relief path for sump pumps, as they are ultimately responsible under the auspices of Common Law should a drainage dispute arise from the outlet of a sump pump.
6. As the pump and infrastructure changes are intended to service the area described in the report, is ERCA and their resources a paying stakeholder in resolving this issue? See response above.

7. Hypothetically, if a berm or barrier was built around ERCA managed land with no drain catch in order to contain its own water, what would be the size and scope of a suitable drainage plan? – this is not the case, nor could a parcel be removed from a drainage boundary simply because they are containing their own stormwater. The drainage system account for the artificial water expected to flow from lands.
8. The build permit process included compliance with ERCA directed elevation for new development. In this case there are no flooding issues that cannot be resolved individually with reference to the current example given at 150 Lakewood Drive. – The flood elevation line (plus freeboard) is set by the ERCA and periodically altered by rain data changes as experienced recently.
9. ERCA mapping provides stark imagery based on historic data which if ever becomes a reality would render any proposed solution completely useless. Preparing drainage reports is much more detailed than relying on imagery from the ERCA. The proposal offered here fails to offer a value proposition or incentive to move forward. In my view, stakeholders should include ERCA with provincial support and a more innovative approach that challenges current by laws and limitations.
10. Reference page 19 of the report. "The Town plans to reconstruct McLeod Avenue but cannot justify the works while the drainage issues persist." A summary of the construction initiative and scope of works to be considered would be helpful to understand the future state conditions. (The Town is the requesting body for this work. See opening statement of the report). Just like any other landowner, the Town has the right to apply for drainage works for its lands (Roads) to obtain a legal outlet.

Attached is an image of the area. The shaded area over ERCA managed land represents the residential footprint of interest on Lakewood Drive.



PLAN, PROFILES and DETAILS

OF THE

BAR POINT DRAINAGE SYSTEM

IN THE

TOWNSHIP OF MALDEN

IN THE

COUNTY OF ESSEX · ONTARIO

SCALE PLAN 1" = 50'

SETTERINGTON · CROZIER · PERALTA & ASSOC. LTD.
CONSULTING ENGINEERS
205 ERIE STREET SOUTH
LEAMINGTON ONTARIO
SEPTEMBER 2 1981

TOWNSHIP OF MALDEN

Reeve JOHN MANTEL
Clerk-Administrator CHARLES F. DAIGLE
Drainage Commissioner HARTLEY McLEAN

BENCH MARK

Top of Hydrant on North side of Tilford Lane
Elevation = 579.60

DENOTES DRAINAGE AREA

DENOTES CATCH WATER BASIN

DENOTES 6"ø PRIVATE CONNECTION, (location to be designated by owner at time of construction)

DENOTES EXISTING ELEVATIONS

MANHOLE TYPE B = 24" ø C.S.P.

sheet no	drawing no
1 of 2	RD - 24

Project 05 - 81 - 030

(3)

Nicole Humber

From: Oliver, Tim <toliver@dillon.ca>
Sent: August 9, 2023 11:50 AM
To: Drainage
Subject: Re: Lakewood Drive Drainage Proposal / Watershed
Attachments: ESA mapping.pdf; 2023-08-09 10_56_52-Greenshot.bmp; lake level readings and prediction.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Thanks Sam for commenting in response to Mr. Balkwill's input.

He appears to be owner of #148 Lakewood Dr. with the home being built back in 2008 according to map imagery.
He references the recent build that is beside him on #150 Lakewood Dr. which I believe was recently built in 2022-23, although not sure of his involvement in that if any given his reference to planning and ERCA reviews. Nevertheless, I believe your comments were adequate.

Not sure I see what his appeal is other than to feel the drain improvements are necessitated by poor planning and approvals from the past and is prescribing to there being a better approach than what is being recommended and at the same time hinting that ERCA and Town should take more responsibility.

It is clear to me that a forced outlet via a pumped system should be applicable for this portion of Lakewood Dr. just as it is to the east with existing lakewood Beach pumps 1 & 2 as well as Bar Point and Willow Beach pumps to the west are necessary to provide a more reliable drainage outlet and minimize flooding impacts during high lake levels for which these existing systems reference have done just that.

In terms of future development the lands north of the lakewood Dr. existing residential is ESA protected lands (as per mapping see attached).
This includes the ESA lands owned by the Town (unopened road allowance - Lakewood Blvd) situated between ERCA lands and existing residents.
It is also defined as a protected wetland by MNRF (map attached) as part of the Big Creek Marsh area so no additional drainage system was contemplated for these lands.

Rear yard property drainage systems may or may not exist or have been made mandatory for Lakewood Drive lots abutting the protected areas, however landowners will have a legal outlet established at the roadside to bring their drainage to it and they could berm the back of their properties with water stored on these protected lands having a defined outlet for overflows into the Lakewood Drain No. 3 located between Parcels No. 36 & 37 (Town owned portion of Lakewood Blvd). There are many connection points at existing or new catch basins being provided along Lakewood Dr. that are going to be connected to the new drain making it accessible for any resident that wishes to connect storm drainage directly provided they implement the necessary backwater avoidance through backwater control valves and sump pump by-passes as you had previously referenced.

ERCA was agreeable to permitting some drainage from these protected lands into the Lakewood Drain as it does now provided that water stored in the low lying areas as a part of the wetland area is not further drained by the proposed drainage improvements for which this will be the case. The proposed upgraded pumped system and new overflow pipe to Lake Erie will also not drain the prescribed wetland area. The drainage outlet presently through the existing swale and culvert crossing Lakewood Dr. and the piped outlet (300 mm dia.) to Lake Erie between Parcels No. 17 & 18 will only drain to a level that is approx. 4 feet below the road. So flooding of properties caused by the wetland marsh within the wooded area is not an issue when lake levels are down near average which they are approaching with nearly a 2 foot drop experienced already since the July 2020 record levels and they are continuing to drop.
Looking at current levels of Lake Erie, by this Fall the levels will have dropped low enough to have the designed overflow system for Lakewood Drain No. 3 be effective (opening the backwater gate) when levels drop below 174.30 m. Presently the water levels are still too high approx. 174.60 m.

With the proposed drainage works cutting off two of the three existing outlets to the lake and backwater gate control of the remaining outlet acting as an overflow, there will be very few incidences of the high lake levels causing flooding to these properties when they are built up above the road elevation which to be breached requires the lake to rise another foot higher than 2020 levels or increased from wave runoff/ offshore wind influences.
It should also be noted that the entire area is within the 100 year storm floodplain and most of the existing homes are existing below these 100 year flood levels for which ERCA acknowledges and has not imposed that properties should be raised to be better protected.

In my opinion, the proposed Lakewood Drain system will be far superior to what exists now with much of the benefits being derived from a pumped drainage system and the backwater controls to be implemented.

Regards,

Tim

On Tue, Aug 8, 2023 at 10:09 AM Drainage <drainage@amherstburg.ca> wrote:

Hello Mr. Balkwill,

Thank you for the email. Please see comments in red below and let me know if further discussion is necessary to satisfy your concerns. I have copied the appointed Engineer for his record and comment if applicable. If any of the information below needs further clarification, please let me know.

Regards,

From: Brian Balkwill [redacted]
Sent: August 8, 2023 7:53 AM
To: Drainage <drainage@amherstburg.ca>
Subject: Lakewood Drive Drainage Proposal / Watershed

ERCA was agreeable to permitting some drainage from these protected lands into the Lakewood Drain as it does now provided that water stored in the low lying areas as a part of the wetland area is not further drained by the proposed drainage improvements for which this will be the case. The proposed upgraded pumped system and new overflow pipe to Lake Erie will also not drain the prescribed wetland area. The drainage outlet presently through the existing swale and culvert crossing Lakewood Dr. and the piped outlet (300 mm dia.) to Lake Erie between Parcels No. 17 & 18 will only drain to a level that is approx. 4 feet below the road. So flooding of properties caused by the wetland marsh within the wooded area is not an issue when lake levels are down near average which they are approaching with nearly a 2 foot drop experienced already since the July 2020 record levels and they are continuing to drop.
Looking at current levels of Lake Erie, by this Fall the levels will have dropped low enough to have the designed overflow system for Lakewood Drain No. 3 be effective (opening the backwater gate) when levels drop below 174.30 m. Presently the water levels are still too high approx. 174.60 m.

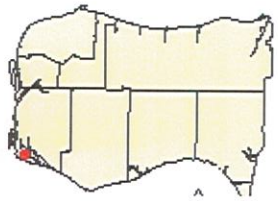
With the proposed drainage works cutting off two of the three existing outlets to the lake and backwater gate control of the remaining outlet acting as an overflow, there will be very few incidences of the high lake levels causing flooding to these properties when they are built up above the road elevation which to be breached requires the lake to rise another foot higher than 2020 levels or increased from wave runoff/ offshore wind influences.
It should also be noted that the entire area is within the 100 year storm floodplain and most of the existing homes are existing below these 100 year flood levels for which ERCA acknowledges and has not imposed that properties should be raised to be better protected.

In my opinion, the proposed Lakewood Drain system will be far superior to what exists now with much of the benefits being derived from a pumped drainage system and the backwater controls to be implemented.

Regards,

Tim

Environmentally Significant Area



Legend

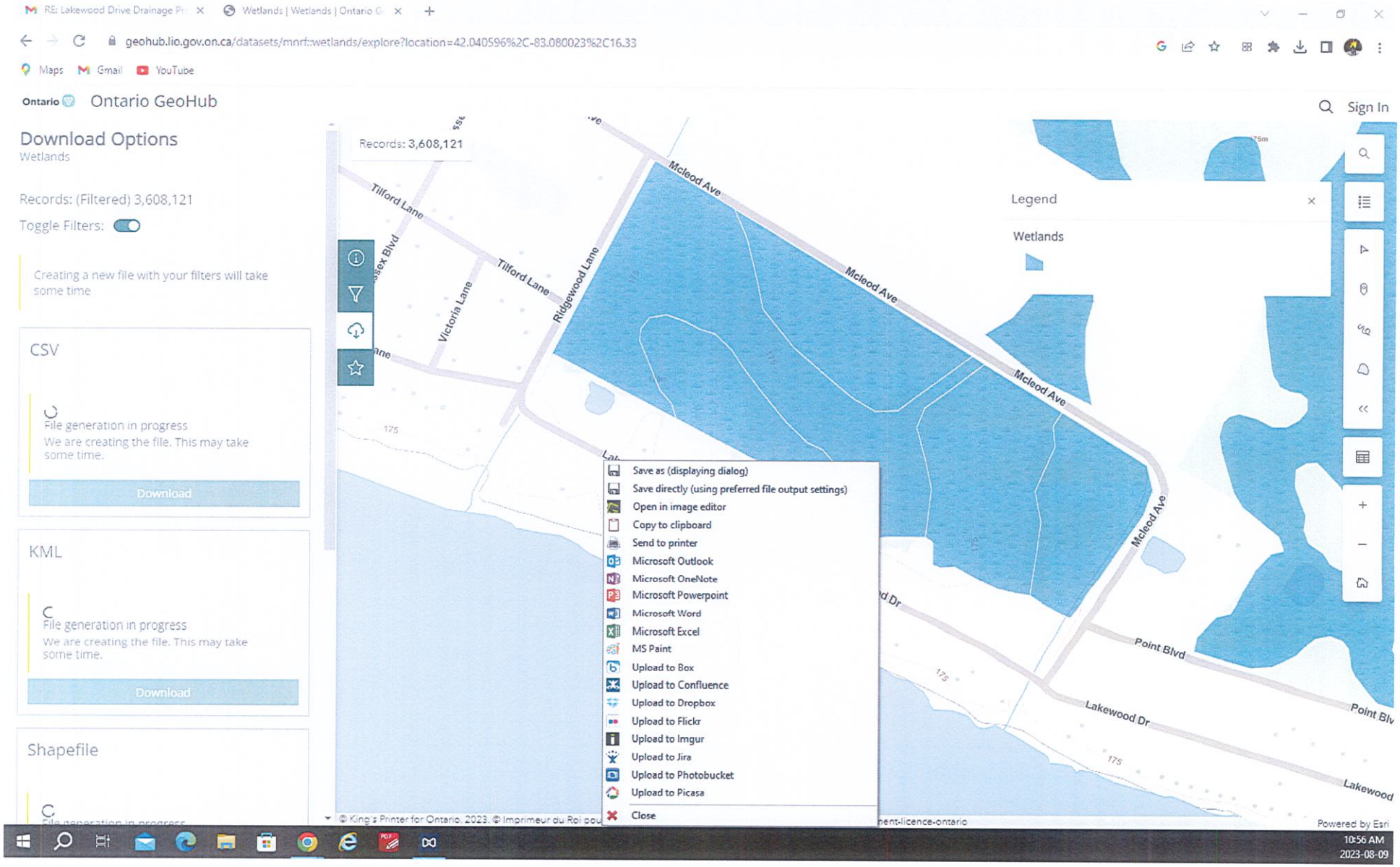
- Roads
- Road Needs
- ESA
- Parcels
- Streams and Creeks
- Essex

0.2 0 Distance / 2 0.2 Kilometers

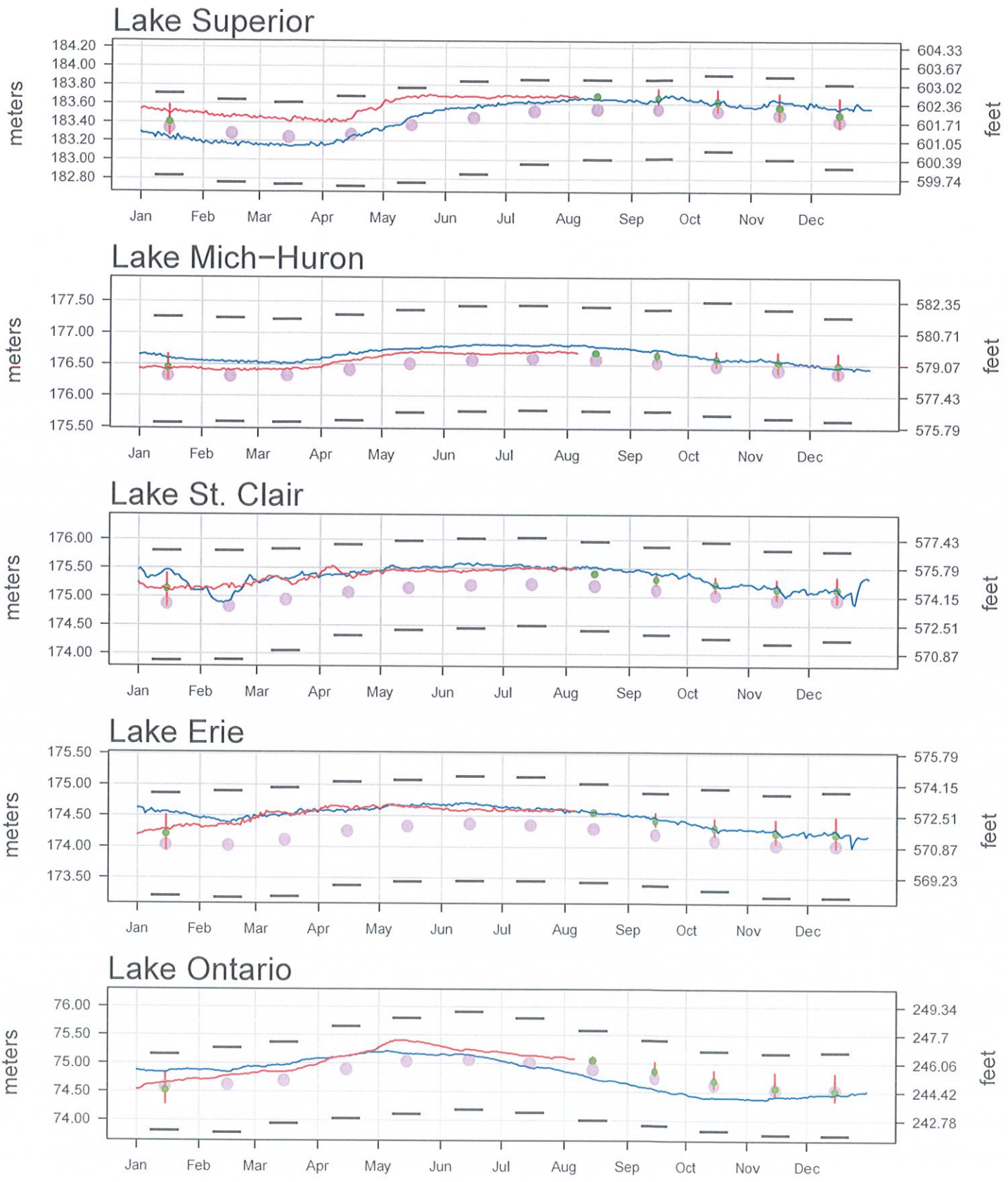
1: 3,150

Created by Amherstburg Interactive Mapping

Notes


RE: Lakewood Drive Drainage Pr
Wetlands | Wetlands | Ontario G
geohub.lio.gov.on.ca/datasets/mnrf::wetlands/explore?location=42.040596%2C-83.080023%2C16.33
Maps
Gmail
YouTube
Ontario GeoHub
Sign In
Download Options
Wetlands
Records: (Filtered) 3,608,121
Toggle Filters:
Creating a new file with your filters will take some time
CSV
File generation in progress
We are creating the file. This may take some time.
Download
KML
File generation in progress
We are creating the file. This may take some time.
Download
Shapefile
Records: 3,608,121
Tilford Lane
Mcleod Ave
Ridgewood Lane
Victoria Lane
Legend
Wetlands
Point Blvd
Lakewood Dr
Save as (displaying dialog)
Save directly (using preferred file output settings)
Open in image editor
Copy to clipboard
Send to printer
Microsoft Outlook
Microsoft OneNote
Microsoft Powerpoint
Microsoft Word
Microsoft Excel
MS Paint
Upload to Box
Upload to Confluence
Upload to Dropbox
Upload to Flickr
Upload to Imgur
Upload to Jira
Upload to Photobucket
Upload to Picasa
Close
Powered by Esri
10:56 AM
2023-08-09

Daily Great Lakes Water Levels



Lakewide average levels are based on a network of water level gages located around the lakes.
LTA and record levels are computed from a period of record of 1918 to 2022
Elevations are referenced to the International Great Lakes Datum (1985).

Updated 2023-08-07

Prof

I-9

ONTARIO DRAINAGE TRIBUNAL

IN THE MATTER OF an Appeal of Donald Bondy and others from the Report of E.O. Lafontaine, P. Eng., dated June 29, 1990 on the Bondy-Bastien Drain, in the Township of Anderdon, in the Count of Essex

DECISION

This Appeal came before the Ontario Drainage Tribunal on April 25, 1991 at the Township of Anderdon Council Chambers, 3400 Middle Sideroad, R. R. #4, Amherstburg, Ontario.

All assessed owners were served with a Notice of Hearing, as evidenced by the Affidavit of Service filed, and invited to make representations.

At that time there appeared before the Tribunal, E.O. Lafontine, P. Eng., who prepared and presented the Report dated June 29, 1990, the Appellants Donald Bondy, Vernon McCrae, Gordon Hadrien, Edward Meloche and Ronald Bondy, the Appellants Harvey Berthiaume and Ronald Standon, although duly served, did not appear and a number of other assessed owners.

The Clerk of the Township of Anderdon, Csop Toth, acted as Clerk of the Tribunal.

On hearing the evidence, the submissions, and reading the materials filed:

1. IT IS ORDERED THAT these proceedings be terminated.

2. IT IS ORDERED THAT the costs incurred to date in the proceedings be paid as follows:

(a) Ministry of Transportation of Ontario - 50%.

(b) Township of Anderdon (to be paid out of the general fund) - 25%.

(c) The assessed owners (to be pro-rated among them on the basis of their total assessment) - 25%.

3. **IT IS ORDERED THAT** there be no other Order as to costs and all parties are responsible for their own costs.

ATTENTION is drawn to s. 73 of the Drainage Act, R.S.O. 1980, c. 126.

Dated: May 14, 1991.

Bernard J. Goodal

Bernard J. Goodal, Chairman
Ontario Drainage Tribunal

ONTARIO DRAINAGE TRIBUNAL

IN THE MATTER OF an Appeal of Donald Bondy and others from the Report of E.O. Lafontaine, P. Eng., dated June 29, 1990 on the Bondy-Bastien Drain, in the Township of Anderdon, in the County of Essex

REASONS FOR DECISION

This Appeal launched by the Appellant Donald Bondy, Vernon McCrae, Gordon Hadrien, Edward Meloche, Ronald Bondy, Harvey Berthiaume and Ronald Standon pursuant to s. 48 and s. 54 of the Drainage Act, R.S.O. 1980, c. 126 (the Act) were heard on April 25, 1991.

The Appellant Harvey Berthiaume and Ronald Standon did not appear, although duly served, as evidenced by the Affidavit of Service of the Notice of Appeal filed as Exhibit #1. Their Appeals are therefore dismissed.

The Bondy-Bastien Drain attempts, by gravity, to drain lands comprising primarily marsh lands. The watershed is almost rectangular. The longer side oriented in the north south direction. It is cut in two by Highway #18 with a triangular piece of approximately 25 ha northwest of Highway #18 and a trapezoidal area of approximately 44 ha southeast of Highway #18. The drain originates at the Anderdon-Sandwich West Townline approximately 1,200 ft from the Detroit River. It flows southerly, parallel to the Detroit River, across Highway #18 in a 30" diameter corrugated steel culvert, then approximately 850 m to outlet into River Canard. The drain was constructed in 1953. Since that time, it has not been cleaned east of Highway #18. It has been cleaned two times west Highway #18. The cost of the proposed work is estimated $41,250.00. The lands when drained produce an abundance of high quality vegetables.

The drain follows an old natural stream. An assessed owner recalls hearing it said, that at one time the water was pumped by a treadmill. We have observed that the drain attempts to drain these valuable farm lands. When the water in the River Canard and the Detroit River are low it does so to a limited extent. When the waters rise,

as they have in recent years, the water backs up along the drain overtopping the banks. On March 8, 1989, when this project was initiated, the water level stood at 174.69 m, 0.25 m above the banks of the drain.

The drainage problems in the area northwest of Highway #18 are further complicated by the fact, that when Highway #18 was reconstructed the culvert installed to conduct the waters from one side of the highway to the other was located approximately 10 ft north of the drain alignment and considerably higher than the invert of the drain. As a result, the water continually ponds in the drain northwest of the highway. The Highway Department did not consult with the Township or the Engineer prior to the installation of the culvert.

It is common ground that the drain is in an extreme state of disrepair. It should be repaired. The question is, is it cost beneficial to do the work?

The request to have the drain improved and repaired was made by two of the assessed owners owning lands southeast of Highway #18. Most of the farm owners supported the application. The other group comprising of owners northwest of the highway and the residential owners opposed the proposed work.

The Engineer held many meetings and discussions with the owners. He conducted extensive investigations of the problem. He less than enthusiastically proceeded to prepare the Report upon the instructions of Council. In his opinion, "the work on the drain might not produce the benefit looked for, it is a marginal drain proposal". In his Report of May 11, 1990 he further states, "It was indicated to all parties concerned that there was some doubt as to the benefit to be derived from improving the outlet of the drain in the event that high water level recur or should persist in the Detroit River with the result that the improvements would not yield the benefits which otherwise might be expected from the expenditure for the work".

A view of the area clearly indicates that the flow in the drain is entirely dependent upon the water levels in the River Canard and the Detroit River. Under the circumstances, it is impossible to drain these lands efficiently and consistently by gravity flow. The only way to ensure that

the lands will be drained to an extent to produce crops is by pumping. A pumping scheme has been looked at, however, because of the expanse of River Canard and its location relative to the area to be drained the cost of such a proposal is prohibitive.

After the Report was submitted, in early 1990, the owners of lands northwest of Highway #18 proposed that their lands could much more efficiently be drained into the Detroit River rather than over the Bondy-Bastien Drain. In January 1990, the Township of Sandwich West had dug a drain along County Road #3 (the Anderdon-Sandwich West Townline) approximately 1,200 feet to the Detroit River. It was observed by one of the owners that the water level in the drain dug by the Township of Sandwich West was approximately 18" lower than the water standing in the Bondy-Bastien Drain on his lands. This led the owners to investigate the possibility of draining their lands directly into the Detroit River. Although they have not done much work on it, nor have they consulted with any of the members of the Township Council or sought permission to outlet into the drain installed by the Township of Sandwich West they strongly urge that they should be excluded from the Bondy-Bastien Drain and look for an outlet into the Detroit River. Unfortunately, this proposal was presented to the Engineer too late to modify the Report which he had prepared or to go in and investigate the alternate drainage route.

It seems to us, that the proposal to drain those lands directly into the Detroit River should be investigated and if feasible those lands lying northwest of Highway #18 should be drained in that direction. We are fortified in this view by the fact that the Highway #18 culvert having been placed too high has further restricted the meager propensity for the waters to flow along the Bastien Drain to outlet into River Canard.

In our view, the proposed work is not cost beneficial. The cost of the work is not commensurate with the benefits to be derived from it. It is quite clear, that even if the drain is cleaned and the monies expended the entire drainage system is controlled by the water levels in River Canard and the Detroit River. If the water levels are lower, certainly the water would tend to get away a little bit quicker. However, if the water levels are higher, whether the drain is cleaned or not cleaned will make no difference to the drainage of the area prone to flooding during high water periods. No evidence was lead as to how many acres are in that state of unstable equilibrium but from our assessment of the situation there are not

very many. The evidence of some of the owners was that if the drain is cleaned it cause a greater loss of arable land due to the erosion caused by the fluctuating water levels whenever the wind blows or during more severe storm events.

Mrs. Eva McCrae who has owned her property, originally comprising 7 ac, since 1948 states that only 3 or 4 acres remain due to the original cleaning of the drain and the continued erosion which has occurred over the past 48 years. She states, that originally the drain was 4 feet wide. They had considerable arable land on either side of the drain. The winds, rains and high waters work on the land and carry it downstream reducing their arable acerage to 4 acres. She quotes the Engineer as saying, that the original ditch ought not to have been dug and there is doubtful value in cleaning the ditch now.

We are further fortified in our conclusion that the work is not cost beneficial by the fact that the proponent of the work and the largest land owner in the watershed is objecting to the assessment against his lands. He has been assessed the sum of $220.00 per/ha for outlet for the higher lands and $120.00 per/ha for outlet for his lower lands. If the assessment as levied against him, which we feel is more than reasonable, is too high in his opinion, this can lead to no other conclusion but that the work is not cost beneficial. For these reasons, we direct this proceeding be terminated.

The issue now remaining is; who is to pay the costs incurred to date? These works were initiated by the request of some assessed farm owners, the situation created on the northwest side of Highway #18 by the installation of the highway culvert and of course Township Council directing the Engineer to proceed. There is no question that the drain is in a deplorable state of disrepair. Therefore, the request by the owners to have the drain improved was a reasonable one. Similarly Council proceeded on the request as they were bound to do. They instructed the Engineer to make a preliminary Report. However, after the preliminary Report was in and the Engineer had stated; "If the drain is cleaned, there may not necessarily be an improvement in drainage, particularly if high water levels of recent years return ..... The costs of cleaning the drain and making necessary improvements may not be commensurate with the benefits received". In our view, Council should not have proceeded any further. The misaligned and high highway

culvert to some extent prompted the investigation of the drainage problem. In our view, the expenses incurred to date should be apportioned as follows:

1. Ministry of Transportation of Ontario - 50%

2. Township of Anderdon (to be paid out of the general fund) - 25%

3. The assessed owners (to be pro-rated among them on the basis of their total assessment) - 25%.

There will be no further Order as to costs and all parties are responsible for their own costs.

Dated: May 14, 1991

ONTARIO DRAINAGE TRIBUNAL

Maurice Armstrong, P. Eng., member; Bert Rammelaere, member; Bernard J. Goodal, Chairman

DRAINAGE REPORT
FOR THE

LAKEWOOD DRIVE DRAIN NO. 3 & PUMPING SCHEME

TOWN OF AMHERSTBURG

DILLON CONSULTING

27 JUNE 2023

TIM R. OLIVER, P.ENG.

FILE No. 20-2190

File No. 20-2190

Drainage Board
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Drainage Report for the
LAKEWOOD DRIVE DRAIN NO. 3 & PUMPING SCHEME
Town of Amherstburg

Gentlemen:

Instructions

On June 13, 2019 the Municipality received a petition from the Town of Amherstburg Public Works, acting on behalf of the road authority. The petition was for a new drainage works under the Drainage Act citing that McLeod Avenue, Ridgewood Lane and Lakewood Drive are requiring improved drainage. Council accepted the petition in accordance with Section 4 of the Drainage Act and on 10th September, 2019 appointed Dillon Consulting Limited to prepare a report.

Area Requiring Drainage

The area requiring drainage is described as the McLeod Avenue, Ridgewood Lane, and Lakewood Drive road allowances and private lands that are abutting these roads. These lands are bounded by Lake Erie to the south and by the existing pumped drainage systems located to the west (Bar Point Pump) and to the east (Lakewood Beach Drain No. 1 Pump).

Existing residential comprises the primary land use, while some existing agricultural lands and provincially significant wetlands are located to the north of Lakewood Drive. Frequent flooding and slow drainage have been the problems experienced for some time and have worsened in recent years due to high water levels in Lake Erie.

The existing stormwater infrastructure and its dependency on a gravity outlet is insufficient in its operation under the prevalent high water and wind conditions affecting Lake Erie. Efforts by the Town Public Works to keep existing gravity outlets flowing to Lake Erie has proven to be inefficient and ineffective. In addition, landowners in the Lakewood Drive area have reported flooding and standing water within yards and catch basins and an overall lack of drainage.

In terms of validity of the petition, we have determined it to be valid, in accordance with Section 4(1)(c) of the Drainage Act, since the Road Authority is represented on the petition.

On-Site Meeting

We conducted an on-site meeting on 27th February 2020. A record of the meeting is provided in Schedule 'A-1', which is appended hereto.

Drainage History

While no municipal drain has been constructed along Lakewood Drive, a summary of the records relevant to the area are summarized as follows:

- **Bar Point Storm Sewer and Pumping Scheme, 26 June 1975 - M. Armstrong, P. Eng.:**

  The recommended works included construction of a new pipe drain along the north side of Lakewood Drive and a new pumping system. The report was appealed and original petitioners withdrew their names from the petition. The report was never adopted and the project was not constructed.

- **Bar Point Storm Sewer and Pumping Scheme, 2 September 1981 - Wm. J. Setterington, P. Eng.:** The recommended works included the construction of a pumping scheme to service the residential lands bounded by Claremont Lane, Lakewood Drive and McLeod Avenue. The pump was designed to have a capacity equivalent to 4320 usgpm and storm sewers were also recommended to be installed to service the residential area including Ridgewood Lane and Lakewood Drive. Some landowners within the Lakewood Drive area were opposed to being included within the proposed drainage works. The drainage report was amended to exclude storm sewers on Ridgewood Lane and Lakewood Drive, thereby providing no connection for Lakewood Drive residents to the proposed pump being situated further west at the south end of Essex Boulevard. The reconsidered report was adopted, and by-law was passed. However, additional appeals were subsequently received by the Town, and the by-law was repealed. The project was not constructed.

  Bar Point Storm Sewer and Pumping Scheme, 2 July 1987 - Ian T. Cowie, P.Eng.: In 1986, the Town decided that the drainage works previously recommended under the 1981 drainage report be completed under the Municipal Act with partial funding being obtained from the Ontario Neighbourhood Improvement Program (ONIP). ONIP provided funding for 49% of the drainage costs and the remaining costs were being shared equally between the Town (50%) and the landowners (50%) enacted under a separate by-law. A schedule of assessment was completed to provide the assessment breakdown for both construction and engineering costs being against the Town and the landowners within the watershed for the portion of costs not previously covered by ONIP. These works were completed under the Municipal Act and do not constitute as a municipal drain.

Survey

Our survey and examination of the lands, roads, and existing drainage infrastructure was carried out in May 2020. The survey comprised the recording of topographic data and examining existing stormwater infrastructure including sewers and roadside ditches. We commenced our survey at the intersection of McLeod Avenue and Lakewood Drive and then proceeded to survey the road and surrounding lands along Lakewood Drive, Ridgewood Lane, and McLeod Avenue. The boundary limits of the existing wetlands were surveyed as well as parts of the agricultural property to determine flow paths and the watershed area.

Our survey revealed the existing drainage system along Lakewood Drive comprises of three independent piped drainage systems each with their own associated outlet into Lake Erie.

independent piped drainage systems each with their own associated outlet into Lake Erie. Two of the outlets are existing shallow ditches situated at the south ends of both Ridgewood Lane and McLeod Avenue, and the remaining outlet being a piped outlet across Lakewood Drive that is approximately midway between Ridgewood Lane and McLeod Avenue. At the time of our May 2020 survey, the standing water condition was leaving existing catch basins and ditches full of water and backed up by the highwater within Lake Erie.

Design Considerations

Lakewood Drive and lands between Ridgewood Lane and McLeod Avenue rely on existing drainage infrastructure which consists of catch basins and pipe drains varying in size from 200 mm to 300 mm in diameter. During high static water levels within Lake Erie, water backs up into the existing drainage infrastructure, limiting any capacity available for draining the municipal road right-of-ways and adjacent properties.

According to soil maps provided by Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA), the soil type within the drainage area is Brookston Clay, a poorly drained soil. Agricultural lands within the northerly section of the watershed area contribute surface water that is intercepted and transported by the existing roadside ditches of McLeod Avenue and Ridgewood Lane southward to Lake Erie.

Consideration has been given to soil type, land use, topography, existing utilities, existing drainage systems, the receiving drainage system, and cost of the drainage recommendations.

Drainage of existing residential lands located to the west of the Ridgewood Lane have been adequately served by the existing Bar Point Pump and its associated piped drainage system conveying all drainage flows to the pump since 1987. The pump's capacity however is only sufficient for the lands which it serves.

Recommendations (Bar Point Pump Upgrades)

The existing Bar Point pump currently provides a drainage removal rate of approximately 78.5 mm within a 24 hour period. To provide a similar capacity for the additional watershed area from the Lakewood Drive area, the existing pump would need to be capable of pumping a minimum of 8,000 usgpm which is 85% more capacity than what is currently available. To achieve this, a number of upgrades to the pump have been recommended.

They include the full replacement of the axial flow propeller pump and motor to increase the pump station's capacity. An expansion of the pump shed is required to adhere to electrical safety standards, while most of the existing electrical equipment is generally in good repair for salvaging and reinstallation with the new pump and motor. With the new motor, it is recommended a new pump starter with combination circuit breaker and voltage soft start capability be provided to reduce wear and tear on the motor. It is also recommended the new pump be operated by a more reliable mechanical float system to start and stop pump. With a larger pump shed and pump, an expanded foundation is recommended to support the said structure on concrete piers in lieu of the steel pump well.

Both the existing asphalt coated corrugated steel pump well and intake pipe may remain in place and are both adequate to accommodate the pump upgrade, however we recommend that anti-vortexing and anti-rotation measures be added to prevent the formation of vortices from a higher capacity pump. The pump's discharge pipe is sufficient to remain in use.

We recommend these upgrades to the Bar Point Pump be incorporated as a municipal drainage works to be hereby known as Lakewood Drive Drain No. 3 & Pumping Scheme.

Recommendations (Lakewood Drive Drain No. 3)

To provide drainage to Ridgewood Lane, McLeod Avenue, Lakewood Drive and abutting lands, we recommend a new covered drain be constructed along Lakewood Drive, extending from McLeod Avenue westerly and outlet into the existing 600 mm diameter storm sewer on Claremont Lane. The size of drain varying from 375 mm diameter to 525 mm diameter.

Existing catch basins found along both sides of Lakewood Drive are recommended to be either replaced or be made to connect to the new drain. New catch basins are being added to provide adequate surface drainage to the lands and roads where no catch basins currently exist. New and existing catch basins connected to the new drain shall form part of the drainage works and shall be hereby named the Lakewood Drive Drain No. 3 and constitute a part of the Lakewood Drive Drain No. 3 and Pumping Scheme.

The Lakewood Drive Drain No. 3 shall also incorporate the existing 600 mm diameter storm sewer infrastructure on Claremont Lane and the 1630 mm x 1120 mm pipe arch culvert on Essex Boulevard that will be conveying the new drainage flows downstream towards the pump.

It is recommended that the ditch located at the south end of McLeod Avenue be filled in, and the existing storm drain pipe outlet to the lake that is located in between Mun No. 137 and Mun No. 145 be capped as to prevent backwater effects on the system from Lake Erie. We also recommend that the ditch located at the south end of Ridgewood Lane remain in place and serve as an overflow for the Lakewood Drive Drain No. 3. The new overflow outlet shall consist of a 375 mm diameter pipe complete with sliding backwater gate control. The slide gate is intended to remain open during times of lower lake levels such that during instances of large rainfall events or during times of pump failure, an overflow outlet is available.

The road side ditch located on the east side of Ridgewood Lane is recommended to be cleaned and connected to the new covered drain through a ditch inlet catch basin. Ditch cleanouts along Ridgewood Lane and McLeod Avenue are to avoid disturbance to the ditch banks adjacent to the wetland areas such that no change to the drainage condition occurs.

Utility Conflicts

The Lakewood Drive right-of-way has a width of only 9.1 m (30 feet) which is less than half the width of a typical 20 m wide right-of-way. The narrow right-of-way makes it very congested for existing utilities in close proximity to each other. In terms of utility conflicts, the new drain's vertical alignment has been considered to avoid utility conflicts, however there will be required relocations of the existing watermain in two locations and potentially several existing water and sanitary private drain connections.

The new drain's horizontal alignment is recommended to be within the travelled road surface to avoid existing utilities, service poles, driveways and grassed lawn areas, with the exception of the most upstream 106 metres in front of Municipal Nos. 160 and No. 178 where it is more practical to locate the new drain on private lands and reduce the costs of road restoration. The proposed drain alignment requires the deflection a watermain in two locations, as well as the relocation of water services and sanitary private drain connections. The proposed alignment is proposed to be on private property between Municipal No. 160 and Municipal No. 178 to avoid extensive utility relocations and reducing the cost of the new drainage infrastructure.

Allowances (Bar Point Pump Upgrades)

In accordance with Section 31 of the Drainage Act, we have determined allowances be given to the lands presently served by the existing Bar Point pump for the incorporation of the existing sewer system on Claremont Lane from Ridgewood Lane to Essex Boulevard and on Essex Boulevard, for the incorporation of the existing intake pipe heading southward to the Bar Point pump, to be part of the Lakewood Drive Drain No. 3 and Pumping Scheme, as described on the drawings attached herein. This allowance is representative of a proportionate share of the said infrastructure's value for which it was designed for, however was never connected to the Lakewood Drive drainage area. Schedule 'B-1' shows the distribution of this allowance in the total amount of $25,000.00 that we recommend be provided to the lands within the original Bar Point Pump watershed.

Allowances (Lakewood Drive Drain No. 3)

In accordance with Section 29 of the Drainage Act, we have determined allowances be given for the land used for the placement of the new drain across Municipal Nos. 160 and No. 178 in establishing the working corridor for the new drain as described further in the Specifications (Schedule 'F' herein). The working corridors provide the Municipality access onto private lands for both construction and future maintenance of the municipal drain. Schedule 'B-2' shows the distribution of the allowances in the total amount of $5,800.00.

In accordance with Section 30 of the Drainage Act, we do not anticipate any agricultural lands being damaged as a result of the proposed drainage works. Any damage resulting to existing driveways and grassed areas shall be restored to original conditions as part of the work.

Cost Estimate

Based on our review of the history, the information obtained during the site meeting and our examination and analysis of the survey data, we recommend that the Bar Point Pump upgrades in conjunction with the construction of the new Lakewood Drive Drain No. 3 as further described below respectively:

Item	Description	Amount
	BAR POINT PUMP UPGRADES	
1.	Dismantle and salvage existing electrical components prior to carefully removing pump assembly and motor, removing and disposing of pumphouse and steel support framing off site. Extreme care shall be taken not to damage the pump, motor, pump well and discharge pipe. Work to also include returning the existing pump, motor, starter and relay controls including level sensor switch to the Town of Amherstburg Public Works Yard (512 Sandwich St. South). The Contractor shall arrange for Hydro One to temporarily disconnect the power feed to the pump station and to later reconnect once the new electrical works are completed and the Electrical safety Authority inspection is completed. Any Hydro One costs where applicable to be paid by Contractor.	$10,000.00
2.	Temporary pumping with the use of portable pumps for dewatering throughout the construction period as required.	$7,500.00

Item	Description	Amount
3.	Supply and installation of a new 1800 mm wide x 350 mm high anti-vortex cruciform above pump well base consisting of A-36 steel angle (150 mm x 150 mm x 12 mm thickness) to support A-36 steel flat bar vertical cross members (254 mm high x 6 mm thickness) welded together and anchored to concrete sump floor. Works shall include the supply and installation of a 2130 mm diameter level concrete base poured in place, minimum 200 mm thickness 40 MPa concrete.	$5,000.00
4.	Supply and installation of ten (10) 450 mm diameter concrete support piers, a minimum 1.2 metres in length, poured in place consisting of 40 MPa concrete within sonotube. Work to include auger drilling excavation for each pier.	$3,500.00
5.	Supply and installation of Granular "A' base, minimum 200 mm thickness compacted to surround pump well and concrete piers and fully extending below and beyond new pumphouse steel base frame including approach ramp (2 m x 2 m) on the north side at the pumphouse door. Work to include all required excavation, removal and re-use of excavated materials for site grading, topsoil placement, fine grade and seed all disturbed areas around pumphouse.	$2,500.00
6.	Supply and installation of A-36 steel angle iron base frame for pumphouse floor (as per Specifications) to be anchored to concrete piers, complete with supply and installation of 9.5 mm thickness steel (diamond plate tread) decking welded to base frame.	$20,000.00
7.	Supply and installation of two (2) new vertical anti-rotation vanes consisting of 5.75 m long A-36 steel rectangular tube (300 mm x 50 mm x 6 mm thickness) welded to both steel base frame and anti-vortex cruciform.	$4,000.00
8.	Supply and installation of 305 mm diameter, 5.5 m long vertical stilling column consisting of galvanized Schedule 40 pipe complete with bottom plate, seepage holes and collar plate to be fastened to pump floor decking and to be strapped to anti-rotation vane with 19 mm wide SS band straps.	$4,000.00
9.	Supply and construction of a new 3.86 m x 3.86 m wood framed pump house building to be fastened to pump floor frame complete with new corrugated metal wall and roof siding and salvaged door from existing pumphouse.	$10,000.00
10.	Re-install salvaged main disconnect, meter socket, meter c/w enclosure/ indoor cabinet, red/green pump status exterior lights, splitter box, fused switch, transformer, load centre panel, light switch and receptacles including two (2) new circuits for new relay controls and pump lube solenoid.	$4,000.00

Item	Description	Amount
11.	Supply and installation of all low voltage wiring and galvanized steel electrical conduits as per specifications including ESA inspection.	$5,000.00
12.	Supply and installation of combination circuit breaker and reduced voltage soft starter c/w Nema 3R enclosure (Eaton Cutler- Hammer Class ECS95S2DAG-S811+N6N3S or approved equal), 50 Hp rating.	$9,500.00
13.	Supply and installation of ball float switch system including two SS304 ball floats (Square 'D' 9049), two SS rods (4.57 m and 2.28 m length) and two switches (Schneider Pumptrol Square 'D 9036GG, or approved equal), for both pump on/off and highwater alarm.	$3,000.00
14.	Supply and installation of heat trace system for stilling column including controller (Thermon TCM2 or approved equal), MIQ heat trace cable, cold lead, junction box and ambient sensing probe (RTD-500-3). The work shall also include supply and installation of 22 gauge stainless steel skirt 1.5 m height wrapped and secured around heat trace cable and stilling column.	$4,500.00
15.	Supply and installation of two (2) new wall mounted LED light fixtures, minimum 6000 lumens without motion sensor.	$1,000.00
16.	Supply and installation of a new 40 Hp, 575 V, 900 RPM, 3 phase electric vertical hollow shaft motor (Nidec Motors or approved equal) complete with axial flow single stage propeller pump assembly (Lo-Lift Pump Company Model #2017 or approved equal), including oil lube solenoid dripper valve, one gallon reservoir tank and grease line connection to suction bowl bushing, minimum capacity of 8,000 USGPM at 12 feet TDH.	$90,000.00
17.	Supply and installation of a new 610 mm diameter dresser Style 38 coupling to pump discharge elbow to outlet pipe.	$1,500.00
18.	Pump setup and commissioning.	$1,000.00
	SUB-TOTAL (BAR POINT PUMP UPGRADES)	**$186,000.00**
19.	Allowances under Section 31	$25,000.00
20.	Survey, Report, Assessment and Final Inspection (cost portion)	$26,000.00
21.	Construction observation and administration (cost portion)	$4,500.00
22.	Expenses and incidentals including Net HST (cost portion)	$700.00
23.	Net HST on construction and engineering costs	$3,700.00
	TOTAL – BAR POINT PUMP IMPROVEMENTS	**$245,900.00**

Item	Description	Amount
	LAKEWOOD DRIVE DRAIN No. 3	
1.	Supply and install high density polyethylene pipe (HDPE) smooth interior wall (Boss 2000, 320 kPa or approved equivalent) with bell & spigot joining system. For every third pipe length, one pipe shall be perforated HDPE pipe complete with filter sock. This work is to include clear stone pipe bedding from minimum 150 mm below pipe up to the pipe springline, Granular 'A' backfill up to underside of surface material. This work is to also include connection of existing lateral storm drains where encountered.	
	a) Sta. 0+234.5 to Sta. 0+244.5 - Supply and install 10 m of 525 mm diameter HDPE pipe.	$5,500.00
	b) Sta. 0+244.5 to Sta. 0+269 - Supply and install 24.5 m of 525 mm diameter HDPE pipe.	$10,500.00
	c) Sta. 0+269 to Sta. 0+401.5 - Supply and install 132.5 m of 525 mm diameter HDPE pipe.	$59,000.00
	d) Sta. 0+401.5 to Sta. 0+530.5 - Supply and install 129 m of 450 mm diameter HDPE pipe.	$54,000.00
	e) Sta. 0+530.5 to Sta. 0+599.5 - Supply and install 69 m of 375 mm diameter HDPE pipe.	$26,000.00
	f) Sta. 0+599.5 to Sta. 0+682.5 - Supply and install 83 m of 375 mm diameter HDPE pipe.	$31,000.00
	g) Sta. 0+682.5 to Sta. 0+689 - Supply and install 6.5 m of 375 mm diameter HDPE pipe.	$3,000.00
	h) Ridgewood Lane Ditch Overflow Outlet – Supply and install 11.5 m of 375 mm diameter HDPE pipe.	$4,000.00
2.	Supply and installation of a poured in-place concrete headwall around the 375 mm diameter emergency overflow pipe outlet at Station 1+000 (3.6 m wide x 0.9 m in high x 0.15 m thickness) complete with 15M steel reinforcement bars placed around pipe insert. This work includes the supply and installation of a 381 mm (15") diameter galvanized flat back C-10 slide gate complete with appurtenances as manufactured by Waterman (or approved equal) mounted on the headwall over the outlet of the pipe. Supply and install rodent gate inside of pipe immediately upstream of slide gate. Work also includes excavation of the ditch immediately downstream of the headwall to provide minimum 0.10 m of clearance between ditch bottom and slide gate, as well as the supply and installation of stone erosion protection of the banks (1 m wide) of the ditch, 300 mm thickness (approximately 5 m^2).	$3,700.00

Item	Description	Amount
3.	Supply and install high density polyethylene pipe (HDPE) smooth interior wall (Boss 2000, 320 kPa or approved equivalent) with bell & spigot joining system. For every third pipe length, one pipe shall be perforated HDPE pipe complete with filter sock. This work is to include Granular 'B' pipe bedding from minimum 150 mm below pipe up to the pipe springline, and native material backfill up to surface material. Top surface to be minimum 50 mm thickness layer of top soil, fine graded and seeded. This work is to also include connection of existing tile drains encountered during trenching, additional labour and materials required in locating, supporting, redirecting, and/or working around existing utilities.	
	a) Sta. 0+689 to Sta. 0+776 - Supply and install 87 m of 375 mm diameter HDPE pipe.	$27,000.00
	b) Sta. 0+776 to Sta. 0+795 - Supply and install 19 m of 375 mm diameter HDPE pipe.	$6,000.00
4.	Supply and installation of two (2) new 1500 mm diameter pre-cast concrete maintenance holes (denoted MH5 & MH6) with minimum 300 mm sump complete with cast iron frame and grate (OPSD 401.010). Work also to include the connection and grouting of all inlet pipes.	$13,850.00
5.	Supply and installation of four (4) new 1200 mm diameter pre-cast concrete maintenance holes (denoted MH7, MH8, MH9 & MH10) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work also to include the connection and grouting of all inlet pipes.	$13,750.00
6.	Supply and installation of two (2) new 600 mm x 600 mm pre-cast concrete catch basins (denoted CB11 & CB12) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work also to include the connection and grouting of all inlet pipes.	$3,450.00
7.	Supply and installation of eight (8) new 600 mm x 600 mm pre-cast concrete catch basins off-line of main drain with maximum depth of 1.2 m, complete with minimum 300 mm sump, cast iron frame and grate (OPSD 400.02), and 200 mm diameter leader pipe. This work to include grouting of all inlet pipes and connection of leader pipe to main drain.	$36,500.00

Item	Description	Amount
8.	Replace existing round catch basin near property line between Mun. No. 103 and Mun. No. 106 with a new 600 mm x 600 mm pre-cast concrete catch basin off-line of main drain, complete with minimum 300 mm sump, cast iron frame and grate (OPSD 400.02), and 200 mm diameter leader pipe. This work includes connection of all existing pipes and grouting of all inlet pipes and connection of leader pipe to main drain with pre-fabricated tee.	$5,100.00
9.	Re-connect eighteen (18) existing catch basins to new drain with new 200 mm diameter HDPE pipe and pre-fabricated tee. Work includes restoration of asphalt.	$64,500.00
10.	Temporary Silt Control Measures During Construction	$750.00
	SUB-TOTAL – EXCLUDING SECTION 26 COSTS	**$367,600.00**
11.	Survey, Report, Assessment and Final Inspection (cost portion)	$51,000.00
12.	Construction observation and administration (cost portion)	$9,000.00
13.	Expenses and incidentals (cost portion)	$2,000.00
14.	Net HST on construction and engineering costs	$7,600.00
15.	ECRA permit fee (Lakewood Drive Drain No. 3)	$800.00
	TOTAL – EXCLUDING SECTION 26 COSTS	**$438,000.00**
	SECTION 26 NON PRO-RATEABLE COSTS	
16.	Fill portion of Ridgewood Lane ditch (approximately 25 m^3) south of Lakewood Drive including trucking and compaction of material in 300 mm lifts. Prior to infilling, remove all vegetation and organic debris from the existing roadside ditch slopes. Work includes supply and placement of top soil (50 mm minimum thickness), fine graded and seeded.	$700.00
17.	Fill portion of Ridgewood Lane ditch (approximately 25 m^3) north of Lakewood Drive including trucking and compaction of material in 300 mm lifts. Prior to infilling, remove all vegetation and organic debris from the existing roadside ditch slopes. Work includes supply and placement of top soil (50 mm minimum thickness), fine graded and seeded.	$700.00

Item	Description	Amount
18.	Fill existing McLeod Avenue ditch (approximately 175 m^3) south of Lakewood Drive including trucking and compaction of material in 300 mm lifts. Prior to infilling, remove all vegetation and organic debris from the existing roadside ditch slopes. Work includes supply and placement of top soil (50 mm minimum thickness), fine graded and seeded. Work also includes supply & installation of sloping stone end treatment approximately 20 m^2 of riprap (300 mm minimum thickness) including new filter fabric underlay over south end of infilling.	$5,700.00
19.	Remove and dispose of existing corrugated steel pipe road crossing at Station 0+795. Supply and installation of a new 600 mm x 600 mm pre-cast concrete catch basins (denoted CB14) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work includes the supply and installation of 16 m long, 250 mm diameter leader pipe across Lakewood Drive and connection and grouting of all inlet pipes.	$7,100.00
20.	Supply and installation of a new 600 mm x 600 mm pre-cast concrete ditch inlet catch basin off-line of drain (DICB16), complete with minimum 300 mm sump, sloped 2:1 heavy duty galvanized steel grate, 7 m long, 300 mm diameter leader pipe, and restoration of lands with top soil (50 mm minimum thickness), fine graded and seeded. Work to include the supply and installation of approx. 5 m^2 (300 mm minimum thickness) of stone erosion protection (SEP) including new filter fabric underlay around inlet. Work also to include connection to drain and grouting of all inlet pipes.	$4,800.00
21.	Supply and installation of a new 600 mm x 600 mm pre-cast concrete catch basin (denoted CB13) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work includes the connection and grouting of all inlet pipes. Work also includes the supply and installation of 6 m long, 300 mm diameter leader pipe complete with rodent gate, backfill of existing ditch as shown on the plan herein, and restoration of land with topsoil (minimum 50 mm thickness), fine graded and seeded. Work to include the supply and installation of approx. 8 m^2 (300 mm minimum thickness) of stone erosion protection (SEP) including new filter fabric underlay around inlet.	$3,500.00
22.	Supply and installation of a new 600 mm x 600 mm pre-cast concrete catch basin (CB15), complete with minimum 300 mm sump, cast iron frame and grate (OPSD 400.01), 5 m long, 300 mm diameter leader pipe connected to new drain with pre-fabricated tee, and restoration of asphalt surface. Work also to include connection of existing drain pipe and grouting of all inlet pipes.	$3,600.00

Item	Description	Amount
23.	Brushing and bottom cleanout of Ridgewood Lane east side ditch from McLeod Avenue to DICB16, totalling approximately 226 m of ditch and approximately 50 m^3 of excavated material to be trucked and disposed of off-site.	$4,000.00
24.	Flush and clean existing 300 mm diameter culvert under McLeod Avenue in line with Ridgewood Lane east side ditch.	$700.00
25.	Fill existing 300 mm diameter and 400 mm diameter pipe crossing Lakewood Drive near Station 0+272. Work includes supply and installation of a new 300 mm diameter leader pipe from the existing maintenance hole to the new 525 mm diameter drain with pre-fabricated tee at Station 0+263 (approx.), and backfill with full Granular 'A.	$4,100.00
26.	Supply and place hot mix asphalt (80 mm HL4 base course - two lifts & 40 mm HL3 surface course-one lift) to reconstruct Lakewood Drive and Ridgewood Lane where disturbed by new drain construction.	$99,000.00
27.	Excess soils management – Trucking of excess soils off-site approximately 715 m^3	$57,200.00
28.	Traffic control as per OTM Book 7	$10,000.00
29.	Utility work(s), as follows:	
	a) Co-ordination with Town of Amherstburg to field locate existing water utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. The installation of the drainage works crosses approximately 26 existing water services and two (2) water main crossings that will require relocation under the drain pipe. Insulation to be provided by the Contractor where cover over water services is less than 1.2 m deep.	$33,000.00
	b) Co-ordination with Town of Amherstburg to field locate existing sanitary sewer utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. The installation of the drainage works crosses approximately 21 existing sanitary private drain connection services of which two (2) will require relocation (Mun No. 119 & Mun. No. 178) under the drain pipe.	$11,100.00

Item	Description	Amount
	c) Co-ordination with G-Tel to field locate existing underground Enbridge utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. The installation of the drainage works crosses approximately 18 existing gas connection services. The Contractor shall coordinate with Enbridge for providing sand bedding support of utility pipes where crossed under by new drain at the expense of the operating utility. Costs shall include third party inspection provided by Enbridge.	$12,600.00
	d) Co-ordination with G-Tel to field locate existing underground Hydro One utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. Approximately two (2) hydro poles shall require temporary partial support at the expense of the operating utility. Costs shall include any inspection or supervision provided by Hydro One.	$6,000.00
	e) Co-ordination with G-Tel to field locate existing underground Cogeco utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor.	$1,000.00
	SUB-TOTAL – SECTION 26 NON PRO-RATEABLE COSTS	**$264,800.00**
30.	Allowances under Section 29	$5,800.00
31.	Survey, Report, Assessment & Final Inspection (cost portion)	$38,500.00
32.	Construction observation and administration (cost portion)	$6,500.00
33.	Expenses & Incidentals (cost portion)	$1,600.00
34.	Net HST on construction and engineering costs (cost portion)	$5,500.00
	TOTAL – SECTION 26 NON PRO-RATEABLE COSTS	**$322,700.00**
	TOTAL - LAKEWOOD DRIVE DRAIN No. 3	**$760,700.00**
	TOTAL –LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME	**$1,006,600.00**

The estimate provided in this report was prepared according to current materials and installation prices as of the date of this report. In the event of delays from the time of filing of the report by the Engineer to the time of tendering the work, it is understood that the estimate of cost is subject to inflation. The rate of inflation shall be calculated using the Consumer Price Index applied to the cost of construction from the date of the report to the date of tendering.

Should the Road Authority elect to construct the drainage works across their road right-of-ways (Section 26.0 increased cost items) with their own forces, as per Section 69 of the Drainage Act, R.S.O., 1990, the Road Authority shall remain responsible for their allotment of costs for the preparation of this report as outlined in our estimate. Should the Road Authority elect not to undertake this work, the work items, as noted under Section 26 above, should be kept separate when tendering out the entire drainage works.

Assessment of Costs

The individual assessments are comprised of three (3) assessment components:

i. Benefit (*advantages relating to the betterment of lands, roads, buildings, or other structures resulting from the improvement to the drain).*

ii. Outlet Liability *(part of cost required to provide outlet for lands and roads).*

iii. Special Benefit *(additional work or feature that may not affect function of the drain).*

Assessment Rationale (Bar Point Pump Upgrades)

The Bar Point Pump was originally designed to serve the lands within the Bar Point area between Claremont Lane and Ridgewood Lane. The pump having a capacity of 4,320 usgpm. The recommended pump upgrades will provide a capacity of 8,000 usgpm and allow for the inclusion of the Lakewood Drive Drain No. 3 connection to the pump. There is a benefit exclusively for these additional lands, as part of the Lakewood Drain No. 3, to utilize the existing Bar Point pump with upgrades in lieu of a completely new and separate pump for the new drain only. The amount of the benefit is derived by considering the residual value remaining within the existing pump and pumphouse.

The pump and its accessory electrical components would typically have an estimated life span of approximately 50 years while the pumphouse structure and pump well would be anticipated to extend its use beyond 75 years to 100 years. Given that the existing pumping system is over 35 years old and would be pre-maturely replaced with the new pump upgrade, the residual value based on a weighted average scale would represent approximately 40% of the new pump and pumphouse costs. We have therefore assessed 40% of the overall costs for the Bar Point pump upgrades as a Benefit assessment being solely against new lands and roads being provided a connection to and a legal outlet to the pumping scheme. For the works associated with the upgrades to the Bar Point pump, we have assessed the estimated costs against the affected lands and roads as listed in Schedule 'C-1' under "Special Benefit," "Benefit," and "Outlet."

Assessment Rationale (Lakewood Drive Drain No. 3)

For the works associated with the construction the Lakewood Drive Drain No. 3, we have assessed the estimated costs against the affected lands and roads as listed in Schedule 'C-2' under "Special Benefit," "Benefit," and "Outlet." Details of Special Benefit listed in Schedule 'C-2' are provided in Schedule 'D.'

Special Benefit Assessment to Town of Amherstburg Road Authority (Pro-Ratable)

Special Benefit assessments have been levied against the Town of Amherstburg's Road Authority for a portion of the construction costs including engineering apportionment applicable to the Lakewood Drive Drain No. 3. Given the narrow right-of-way of Lakewood Drive, there is insufficient space available to locate the new drainage works within the roadway. The increased costs have been assessed as a special benefit and pro-ratable assessment as shown in Schedule 'C-2' and detailed within Schedule 'D,' as noted below:

1. We have assessed 25% of the costs of the pipe installation for the Lakewood Drive Drain against the road authority as a pro-ratable assessment.
2. We have assessed 25% of the costs of the maintenance hole installation (MH5, MH6, MH7, MH8, MH9 & MH10) for the Lakewood Drive Drain against the road authority as a pro-ratable assessment.
3. We have assessed 50% of the costs for the supply, installation and/or replacement of eight (8) new off-line catch basins against the road authority as a pro-ratable assessment.
4. We have assessed 50% of the costs for re-connection of eighteen (18) off-line catch basins to the new drain against the road authority as a pro-ratable assessment.
5. We have assessed 50% of the costs for replacing the existing catch basin between Mun. No. 103 and Mun. No. 106 including connection and re-connection to the new drain against the road authority as a pro-ratable assessment.

Special Benefit Assessment to Town of Amherstburg Road Authority (Section 26 Non Pro-Ratable)

Special Benefit assessments have been levied against the Town of Amherstburg's Road Authority for the entire portion of the increased construction costs including engineering apportionment applicable to the Lakewood Drive Drain No. 3 and the adjacent roadside drainage from Ridgewood Lane and McLeod Avenue. The costs have been assessed as a special benefit and non-pro-ratable assessment in accordance with Section 26 of the Drainage Act, as noted below:

1. We have assessed 100% of the costs for the infilling of a portion of the existing ditches along Ridgewood Lane, McLeod Avenue, and Lakewood Drive against the road authority as a non-pro-ratable assessment.
2. We have assessed 100% of the costs for brushing and cleaning of the east ditch along Ridgewood Lane against the road authority as a non-pro-ratable assessment.
3. We have assessed 100% of the costs for traffic control, apportioned 25% to Ridgewood Lane and 75% to Lakewood Drive being against the road authority as a non-pro-ratable assessment.
4. We have assessed 100% of the costs for the installation of DICB13, DICB16 and CB15 complete with associated leader pipe connections to the new drain against the road authority as a non-pro-ratable assessment.
5. We have assessed 100% of the costs to remove and dispose of existing culvert crossing Lakewood Drive at Station 0+795 and installation of a new CB14 and associated leader pipe connection to the new drain against the road authority as a non-pro-ratable assessment.

6. We have assessed 100% of the costs to cap and fill the existing culvert crossing of Ridgewood Lane and Lakewood Drive intersection apportioned 50% to each road respectively being assessed against the road authority as a non-pro-ratable assessment.
7. We have assessed 100% of the costs to flush and clean the existing culvert across McLeod Avenue at Ridgewood Lane east ditch being against the road authority as a non-pro-ratable assessment.
8. We have assessed 100% of the costs of asphalt roadway repairs and restoration against the road authority as a non-pro-ratable assessment.
9. We have assessed 100% of the costs of Section 29 allowances for land used for the drain located on private property against the road authority as a non-pro-ratable assessment.
10. We have assessed 100% of the costs of the costs for excess soils management including the trucking and disposal of excess excavated materials off-site against the road authority as a non-pro-ratable assessment.

Special Benefit Assessment to Town of Amherstburg Public Works (Section 26 Non-Pro-Ratable)

Special Benefit assessments have been levied against the Town of Amherstburg Public Works department for the entire portion of the increased construction costs including engineering costs apportionment applicable to existing sanitary and watermain servicing being crossed by the Lakewood Drive Drain No. 3. The costs have been assessed as a special benefit and non-pro-ratable assessment in accordance with Section 26 of the Drainage Act, as noted below:

1. We have assessed 100% of the costs for locating and deflecting existing water and sanitary services, and for lowering of an existing watermain in two locations against the Public Works department as a non-pro-ratable assessment.

Special Benefit Assessment to Public Utilities (Section 26 Non-Pro-Ratable)

Special Benefit assessments have been levied against the affected Public Utilities for the entire portion of the increased construction costs including engineering costs apportionment applicable to existing public utility being crossed by the Lakewood Drive Drain No. 3. The costs have been assessed as a special benefit and non-pro-ratable assessment in accordance with Section 26 of the Drainage Act, as noted below:

1. We have assessed 100% of the costs for coordinating locates, locating and supporting existing gas lines against Enbridge Gas Inc. as a non-pro-ratable assessment.
2. We have assessed 100% of the costs of coordinating locates, locating and working around existing buried communication lines against Cogeco Inc. as a non-pro-ratable assessment.
3. We have assessed 100% of the costs of coordinating locates, partial support of utility poles and guy wires against Hydro One Networks Inc. as a non-pro-ratable assessment.

Public Utilities

It may become necessary to temporarily or permanently relocate public utilities that may

conflict with the construction recommended under this report. In accordance with Section 26 of the Drainage Act, we assess any relocation cost against the public utility having jurisdiction. Under Section 69 of the Drainage Act, the public utility is at liberty to do the work with its own forces, but if it should not exercise this option within a reasonable time, the Municipality will arrange to have this work completed and the costs will be charged to the appropriate public utility.

Future Maintenance (Bar Point Pump)

Notwithstanding the Benefit assessments levied for the improvements identified herein, we recommend that future work of repair, operation costs and maintenance of the Bar Point Pump be carried out by the Municipality and the costs assessed against the affected lands and roads in the same relative proportions as an Outlet assessment only, as set out in Schedule 'C-1' under this report.

Future Maintenance (Lakewood Drive Drain No. 3)

Notwithstanding the Special Benefit assessments levied for the improvements identified herein, we recommend that future work of repair and maintenance of the Lakewood Drive Drain No. 3 be carried out by the Municipality and the costs assessed against the affected lands and roads in the same relative proportions as Benefit and Outlet assessments set out in Schedule 'C-2' under this report.

Drawings and Specifications

Attached to this report is Schedule 'F', which are Specifications setting out the details of the recommended works, and Schedule 'G', which represents the following drawings included herein:

Page 1 of 14: Overall Plan
Page 2 of 14: Landowners Information
Page 3 of 14: Plan & Profile 1
Page 4 of 14: Plan & Profile 2
Page 5 of 14: Plan & Profile 3
Page 6 of 14: Plan & Profile 4
Page 7 of 14: Plan & Profile 5
Page 8 of 14: Plan 2A
Page 9 of 14: Structure Details
Page 10 of 14: Miscellaneous Details
Page 11 of 14: Pump Details 1
Page 12 of 14: Pump Details 2
Page 13 of 14: Pump Electrical – Layout Plan
Page 14 of 14: Pump Electrical – Controls

Approvals

The construction and/or improvement to a drainage works, including repair and maintenance activities, and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced by the proposed works. Prior to any construction or maintenance works, the Municipality or proponent designated on the Municipality's behalf shall obtain all required approvals/permits and confirm any construction limitations including timing windows, mitigation/off-setting measures, standard practices or any other limitations related to in-stream works.

Page 11 of 14: Pump Details 1
Page 12 of 14: Pump Details 2
Page 13 of 14: Pump Electrical – Layout Plan
Page 14 of 14: Pump Electrical – Controls

Approvals

The construction and/or improvement to a drainage works, including repair and maintenance activities, and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced by the proposed works. Prior to any construction or maintenance works, the Municipality or proponent designated on the Municipality's behalf shall obtain all required approvals/permits and confirm any construction limitations including timing windows, mitigation/off-setting measures, standard practices or any other limitations related to in-stream works.

The Essex Region Conservation Authority (ERCA) has reviewed and accepted the proposed drainage works. Correspondence received on March 29, 2023 is included herein within Schedule 'A-2' of this report. An application for ERCA permit and associated fee payment of $800.00 will subsequently be addressed by the Town of Amherstburg, and will form part of the costs of the drainage works for the Lakewood Drive Drain No. 3.

Grants

In accordance with the provisions of Sections 85, 86 and 87 of the Drainage Act, a grant in the amount of 33–1/3 percent of the assessment eligible for a grant may be made in respect to the assessment made under this report upon privately owned lands used for agricultural purposes. The assessments levied against privately owned agricultural land must also satisfy all other eligibility criteria set out in the Agricultural Drainage Infrastructure Program policies. Most of the privately owned lands are used for agricultural purposes and are eligible under the A.D.I.P. policies. We are not aware of any lateral drains involved in this work that would not be eligible for a grant. We recommend that application be made to the Ontario Ministry of Agriculture and Food in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

Respectfully submitted,

DILLON CONSULTING LIMITED

Tim R. Oliver, P.Eng.
TRO:oem:

SCHEDULE 'A-1'

SUMMARY OF ON-SITE MEETING

February 27, 2020 @ 6:00 p.m.
Libro Centre Community Room, 3295 Meloche Road

Present:

Kristi & John Farmer	
Lance Huver	104 Lakewood Dr.
Maurice Nagtegaal	136 Lakewood Dr.
Brian & Debra Balkwill	153 Claremont Ln.
Erwin Pare	148 Lakewood Dr.
Dave Kopchek	137 Lakewood Dr.
Sheri Mayville	130 Lakewood Dr.
Frank & Gina Storino	144 Lakewood Dr.
Jim Ferrar	107 Lakewood Dr.
Sandy Kennedy	140 Ridgewood Ln.
Michael Brauss	146 Claremont Ln.
John Mitchell	103 Lakewood Dr.
Garry Fortune	175 Lakewood Dr.
Robert Smith	596 McLeod Ave.
Ashley Gyori	Essex Region Conservation Authority (ERCA)
James Bryant	ERCA
Kevin Money	ERCA
Shane McVitty	Town of Amherstburg
Tim Oliver	Dillon Consulting Limited

Introduction

Shane McVitty gave introductions and an explanation of the petition for a Municipal Drain submitted by the Town's Road Authority under Section 4 of the Drainage Act. Shane attempted to have landowners sign a petition, however did not receive sufficient signatures. The roads require improved drainage and protection from high lake levels. The Town plans to reconstruct McLeod Avenue but cannot justify the works while the drainage issues persist. The purpose of the onsite meeting was to discuss drainage issues along Lakewood Drive, McLeod Avenue and Ridgewood Lane, and to get input and or requests from the landowners.

Tim Oliver provided an overview of the drainage issues in the area and a history of the Bar Point pumping system, including how the record high water level in the Great Lakes affect drainage. In the 1970s, landowners along Lakewood Drive were opposed to being included in the Bar Point system. They were excluded from the drainage scheme and associated costs. Drainage working continued for the lands and roads in the Bar Point area only where costs of the drainage works were distributed. The existing pump does not have capacity for the lands proposed to be added. A possible solution would be to use the existing pump house and electrical, and only upgrade the motor and assembly.

Discussions with landowners was as follows:

- Corrections to the watershed plan shown were provided.
- The Vandenbrink Development would use the Willow Beach Drain pump located to the west of Bar Point.

- The land owned by ERCA is a wetland and not developable. ERCA and the Town would be in close contact regarding this project. ERCA will review the proposed solution in consultation with the landowners
- Mr. Kennedy expressed concern that he believed ERCA caused most of the flooding by making landowners raise their homes years ago, which should make ERCA responsible.
- Gary Fortune stated that the issue now is due to the lack of planning from the previous municipality, and suggested the water from Lakewood should be drained easterly.
    - A summary of the existing infrastructure along Lakewood Drive between Ridgewood Lane and beyond was provided, which includes multiple pumping stations and storm sewers (Lakewood Beach Drains No. 1 and No. 2). It was explained that these systems are municipal drain systems, paid for by the landowners that use them.
- Completed work to attempt to improve drainage were discussed.
    - The Town cleans out the existing gravity outlets and flushes the culverts, however it's ineffective in improving drainage due to the high lake level. Mr. Brauss identified that the works completed were effective.
    - Any flooding is not due to the marsh, but from the high lake levels backing up through the sewers
    - A dyke as part of the easterly pump system breached recently, and it was the pump which saved flooding in the area.
    - A drainage system along Lakewood is still required for the area in order to be effectively drained and for the drainage area to effectively utilize the pump.
    - The municipal easement struggles with flooding, but has three separate gravity outlets along Lakewood Drive.
- Costs of the project was discussed. An overview of assessments was provided and payments would invoiced following construction. Any landowners developing or entering the watershed in the future would have to 'buy-in'. Any development would require stormwater management.
- Mr. Kennedy asked for the water to be removed from the pond.
- Mr. Brauss inquired about temporarily berming up the area. Mr. Bryant advised although the idea is good, in this case it doesn't work.
- The meeting concluded with a discussion regarding available grants under ADIP, obtaining information for the report, the process of bringing the report before the Drainage Board, the different types of meetings that will be held, and the landowner's right to appeal.

The meeting summary was prepared by Tim Oliver who should be notified of any errors and/or omissions.

SCHEDULE 'A-2'

From: **Ashley Gyori** <AGyori@erca.org>
Date: Wed, Mar 29, 2023 at 9:53 AM
Subject: RE: Lakewood Drive Drain No. 3 & Pumping Scheme (Town of Amherstburg) - request for ERCA review
To: Oliver, Tim <toliver@dillon.ca>
Cc: Sam Paglia <spaglia@amherstburg.ca>

Good morning Tim,

Thank you for sending the draft proposal for the proposed works for the Lakewood Drive Drain No. 3 and the Application for Permit form. Our office has had an opportunity to review the proposal and can confirm that we are generally supportive of the design as presented, with respect to Section 28 of the *Conservation Authorities Act*. However, we do have the following additional comments to note.

While our office typically advocates for raising low-lying roads to bring them up to current access standards, our office is aware that this is not generally feasible in this area given the current infrastructure and elevation of the surrounding lands. Additionally, due to the nature of this area being below the 1:100-year water levels, it should be noted that the proposed works were to address localized flooding issues as a result of high-water levels and may not alleviate coastal flooding issues in this area.

Please note that as our office reviewed the above proposal with respect to the natural hazards under Section 28 of the *Conservation Authorities Act* only, the pump station was not reviewed for adherence to standard engineering principles.

For this project to proceed, we will require the Final Drainage Report and Drawings and for the municipality to sign the attached Application for Permit form. The Town of Amherstburg will be invoiced the Application for Permit fee of $800.00, in accordance with the ERCA Board-approved Fee Schedule.

If you have any questions, or if further clarification is required, please do not hesitate to contact me.

Essex Region Conservation Authority
the for life

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

"SCHEDULE B-1"
SCHEDULE OF ALLOWANCES (BAR POINT PUMP UPGRADES)
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
TOWN OF AMHERSTBURG

Parcel No.	Owner	Section 31 Value	Section 30 Damages	Section 29 Land	Total Allowances
	ORIGINAL LANDS SERVED BY THE BAR POINT PUMP				
46	James A. & Mary S. Ferrar	$552.00	$0.00	$0.00	$552.00
47	Paul D. Kelly	$355.00	$0.00	$0.00	$355.00
48	Suzanne, Patricia, Mara & Richard Ignatius & Linda Belkin	$158.00	$0.00	$0.00	$158.00
49	Cheryl M. Watson & Sima B. Sprackman	$394.00	$0.00	$0.00	$394.00
50	Christopher M. Chumko & Jacqueline E. Mickle	$276.00	$0.00	$0.00	$276.00
51	Stefan & Miroslawa Starczewski	$513.00	$0.00	$0.00	$513.00
52	Charles Leonard, Mary Wheeler & Joan Lentine	$592.00	$0.00	$0.00	$592.00
53	John H. W. & Kristi L. Farmer	$513.00	$0.00	$0.00	$513.00
54	Maureen O'Shea	$316.00	$0.00	$0.00	$316.00
55	Craig A. & Mary J. Wheeler	$513.00	$0.00	$0.00	$513.00
56	Jay Garner	$513.00	$0.00	$0.00	$513.00
57	John D. Garner	$136.00	$0.00	$0.00	$136.00
58	Kary M. & Shannon D. Coulson	$355.00	$0.00	$0.00	$355.00
59	Thomas G. & Valerie Wilson	$473.00	$0.00	$0.00	$473.00
60	Jody F. Gagnon	$434.00	$0.00	$0.00	$434.00
61	Patricia L. Laframboise	$237.00	$0.00	$0.00	$237.00
62	Lawrence N. & Patricia L. Laframboise	$592.00	$0.00	$0.00	$592.00
63	Rebecca L. Wigle	$552.00	$0.00	$0.00	$552.00
64	Gordon R. Hoyt & Robin Skov	$276.00	$0.00	$0.00	$276.00
66	Mathew M. Duby & Emily R. Vandenham	$513.00	$0.00	$0.00	$513.00
67	Patrick H. & Annette M. Pettypiece	$957.00	$0.00	$0.00	$957.00
68	Denis Larocque	$957.00	$0.00	$0.00	$957.00
69	Gordon R. Crawford	$513.00	$0.00	$0.00	$513.00
70	Ronald S. & Lorraine E. Rousseau	$355.00	$0.00	$0.00	$355.00
71	Leonard T. Pare	$884.00	$0.00	$0.00	$884.00
72	Daniel E. Deschamps & Cydney L.	$957.00	$0.00	$0.00	$957.00
73	Kevin. J. Racine	$957.00	$0.00	$0.00	$957.00
74	James & Judy Lennon	$750.00	$0.00	$0.00	$750.00
75	Town of Amherstburg	$552.00	$0.00	$0.00	$552.00
76	Town of Amherstburg	$454.00	$0.00	$0.00	$454.00
77	Bud J. Nagtegaal & Charity Conrad	$862.00	$0.00	$0.00	$862.00
78	Lawrence J. Bachmeier	$862.00	$0.00	$0.00	$862.00
79	David J. & Mary-Alice Beneteau,	$862.00	$0.00	$0.00	$862.00
80	Coulson Design Build	$862.00	$0.00	$0.00	$862.00
81	William & Julie Ellis	$862.00	$0.00	$0.00	$862.00

Parcel No.	Owner	Section 31 Value	Section 30 Damages	Section 29 Land	Total Allowances
82	Peter J. & Barbara Lojewski	$355.00	$0.00	$0.00	$355.00
83	Roger G. & Wendy L. Frenette	$513.00	$0.00	$0.00	$513.00
84	Brett W. & Shannon D. Coulson	$237.00	$0.00	$0.00	$237.00
85	Kathryn E McNamara & Mark J. Liedke	$237.00	$0.00	$0.00	$237.00
86	Janice E. & Kenneth R. Grice	$316.00	$0.00	$0.00	$316.00
87	James G. Kennedy	$118.00	$0.00	$0.00	$118.00
88	Michael B. & Judith A. McHale	$237.00	$0.00	$0.00	$237.00
89	Colton M. Bradt & Chelsea N. Hill	$79.00	$0.00	$0.00	$79.00
90	Charles & Lindsy MacDougall	$434.00	$0.00	$0.00	$434.00
91	Bradley B. & Caroline B. Coghlin	$237.00	$0.00	$0.00	$237.00
92	Kenneth Robson	$237.00	$0.00	$0.00	$237.00
93	Hildegard Franz & Cameron Ellis	$276.00	$0.00	$0.00	$276.00
94	Maegan A. Stephens	$316.00	$0.00	$0.00	$316.00
95	Maegan A. Stephens	$118.00	$0.00	$0.00	$118.00
96	Brent M. Charlebois	$118.00	$0.00	$0.00	$118.00
97	Maurice & Margaret A. Nagtegaal	$237.00	$0.00	$0.00	$237.00
98	Paul & Bree Tole	$434.00	$0.00	$0.00	$434.00
99	James N. & Tanya L. Sinasac	$237.00	$0.00	$0.00	$237.00
100	James N. & Tanya L. Sinasac	$355.00	$0.00	$0.00	$355.00
TOTAL ALLOWANCES		**$25,000.00**	**$0.00**	**$0.00**	**$25,000.00**

"SCHEDULE B-2"
SCHEDULE OF ALLOWANCES (LAKEWOOD DRIVE DRAIN No. 3)
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
TOWN OF AMHERSTBURG

Parcel No.	Owner	Section 30 Damages	Section 29 Land	Total Allowances
43	Marlene Kemski	$0.00	$1,350.00	$1,350.00
44	Marlene Kemski	$0.00	$1,000.00	$1,000.00
45	Ryan & Susan Bondy	$0.00	$3,450.00	$3,450.00
TOTAL ALLOWANCES		**$0.00**	**$5,800.00**	**$5,800.00**

"SCHEDULE C-1"
SCHEDULE OF ASSESSMENT (BAR POINT PUMP UPGRADES)
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
TOWN OF AMHERSTBURG

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Elmstead Lane	0.79	0.32	Town of Amherstburg	$0.00	$0.00	$5,669.00	$5,669.00
Essex Boulevard	1.26	0.51	Town of Amherstburg	$0.00	$0.00	$7,224.00	$7,224.00
Tilford Lane	0.77	0.31	Town of Amherstburg	$0.00	$0.00	$5,492.00	$5,492.00
Victoria Lane	0.30	0.12	Town of Amherstburg	$0.00	$0.00	$2,126.00	$2,126.00
Claremont Lane	0.79	0.32	Town of Amherstburg	$0.00	$0.00	$5,669.00	$5,669.00
Ridgewood Lane	1.52	0.62	Town of Amherstburg	$0.00	$3,828.00	$6,593.00	$10,421.00
McLeod Avenue	5.05	2.04	Town of Amherstburg	$0.00	$14,853.00	$19,278.00	$34,131.00
Lakewood Drive	1.17	0.47	Town of Amherstburg	$0.00	$20,143.00	$11,106.00	$31,249.00
Lakewood Boulevard	2.66	1.08 *	Town of Amherstburg	$0.00	$1,042.00	$1,149.00	$2,191.00
Total on Municipal Lands				$0.00	$39,866.00	$64,306.00	$104,172.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Parcel No.	Con.	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
				LAKEWOOD DRIVE AREA SERVED BY THE BAR POINT PUMP				
2	Marsh	0.96	0.39	Ronald, Jason, Kyle Belward	$0.00	$1,542.00	$1,700.00	$3,242.00
3	Marsh	1.43	0.58	Anthony R. Smith & Nasra Smith	$0.00	$1,762.00	$1,943.00	$3,705.00
4	Marsh	1.98	0.80	Stuart & Eugenia Smith	$0.00	$1,949.00	$2,148.00	$4,097.00
5	Marsh	19.46	7.88 *	Essex Region Conservation Authority	$0.00	$7,601.00	$8,380.00	$15,981.00
6	Marsh	0.09	0.04	Jeffery D. & Donna E. Topliffe	$0.00	$463.00	$255.00	$718.00
7	Marsh	0.13	0.05 *	Garry Fortune	$0.00	$289.00	$160.00	$449.00
8	Marsh	0.13	0.05	Garry Fortune	$0.00	$579.00	$319.00	$898.00
9	Marsh	0.13	0.05 *	Sherry A. Kemski	$0.00	$289.00	$160.00	$449.00
10	Marsh	0.07	0.03 *	Marlene Kemski	$0.00	$174.00	$96.00	$270.00
11	Marsh	0.14	0.06	Marlene Kemski	$0.00	$695.00	$383.00	$1,078.00
12	Marsh	0.14	0.06	Frank M. & Simone Y. Seres	$0.00	$695.00	$383.00	$1,078.00
13	Marsh	0.14	0.06	Peter J. Courtney & Brenda J. Turgeon	$0.00	$695.00	$383.00	$1,078.00
14	Marsh	0.15	0.06	Allan R & Cynthia S. Mickle	$0.00	$695.00	$383.00	$1,078.00
15	Marsh	0.15	0.06	Debra L. Balkwill	$0.00	$695.00	$383.00	$1,078.00
16	Marsh	0.08	0.03	James K. Baker & Rosalie M. Lemire	$0.00	$347.00	$191.00	$538.00
17	Marsh	0.10	0.04 *	Erwin R. & Carol A. Pare	$0.00	$232.00	$128.00	$360.00
18	Marsh	0.26	0.11	Erwin R. & Carol A. Pare	$0.00	$1,273.00	$702.00	$1,975.00
19	Marsh	0.16	0.06	Michelle S. & Darrin J. Lewis	$0.00	$695.00	$383.00	$1,078.00

Parcel No.	Con.	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
20	Marsh	0.08	0.03	Solace Farms Inc.	$0.00	$347.00	$191.00	$538.00
21	Marsh	0.17	0.07	Daniel & Jennifer Accetta	$0.00	$810.00	$447.00	$1,257.00
22	Marsh	0.25	0.10	Bradley S. & Sherri L. Nelson	$0.00	$1,158.00	$638.00	$1,796.00
23	Marsh	0.08	0.03	Barry Riddell	$0.00	$347.00	$191.00	$538.00
24	Marsh	0.20	0.08	Leon K. & Nella Bieszk	$0.00	$926.00	$510.00	$1,436.00
25	Marsh	0.18	0.07	Stella D. & Bruce A. Milkins	$0.00	$810.00	$447.00	$1,257.00
26	Marsh	0.19	0.08	Francesco & Gina Storino	$0.00	$926.00	$510.00	$1,436.00
27	Marsh	0.20	0.08	Erhard M. & Jennifer Brauss	$0.00	$926.00	$510.00	$1,436.00
28	Marsh	1.18	0.48	John H. W. & Kristi L. Farmer	$0.00	$3,380.00	$1,863.00	$5,243.00
29	Marsh	0.33	0.13	Daniel & Mary Lou Valleau	$0.00	$1,505.00	$829.00	$2,334.00
30	Marsh	0.16	0.06	Adrian & Joanne Harte	$0.00	$695.00	$383.00	$1,078.00
31	Marsh	0.48	0.19	Rhys E. Robb & Susan A. Dranski	$0.00	$2,199.00	$1,212.00	$3,411.00
32	Marsh	0.24	0.10	Melissa M. Beaudoin-Lloyd	$0.00	$1,158.00	$638.00	$1,796.00
33	Marsh	0.24	0.10	Jesse & Vanessa E. DiGiovanni	$0.00	$1,158.00	$638.00	$1,796.00
34	Marsh	0.24	0.10	Jason & Stefanie L. Kamrock	$0.00	$1,158.00	$638.00	$1,796.00
35	Marsh	0.24	0.10	Lance S. Huver & Kirsty L. Collins	$0.00	$1,158.00	$638.00	$1,796.00
36	Marsh	0.16	0.06 *	Erwin R. L. & Carol A. Pare	$0.00	$347.00	$191.00	$538.00
37	Marsh	0.16	0.06 *	Erwin R. L. & Carol A. Pare	$0.00	$347.00	$191.00	$538.00
38	Marsh	0.32	0.13	Jaremy & Sheri Mayville	$0.00	$1,505.00	$829.00	$2,334.00
39	Marsh	0.32	0.13	Brian & Debbie Balkwill	$0.00	$1,505.00	$829.00	$2,334.00
40	Marsh	0.16	0.06	Gabriella S. Monteleone	$0.00	$695.00	$383.00	$1,078.00
41	Marsh	0.64	0.26	Pennie L. Mitchell	$0.00	$2,709.00	$1,493.00	$4,202.00
42	Marsh	0.32	0.13	Marlene Kemski	$0.00	$1,505.00	$829.00	$2,334.00
43	Marsh	0.32	0.13 *	Marlene Kemski	$0.00	$752.00	$415.00	$1,167.00
44	Marsh	0.24	0.10 *	Marlene Kemski	$0.00	$579.00	$319.00	$898.00
45	Marsh	0.83	0.34	Ryan & Susan Bondy	$0.00	$3,017.00	$1,663.00	$4,680.00
				ORIGINAL LANDS SERVED BY THE BAR POINT PUMP				
46	Marsh	0.35	0.14	James A. & Mary S. Ferrar	$0.00	$0.00	$893.00	$893.00
47	Marsh	0.22	0.09	Paul D. Kelly	$0.00	$0.00	$574.00	$574.00
48	Marsh	0.09	0.04	Suzanne, Patricia, Mara & Richard Ignatius & Linda Belkin	$0.00	$0.00	$255.00	$255.00
49	Marsh	0.25	0.10	Cheryl M. Watson & Sima B. Sprackman	$0.00	$0.00	$638.00	$638.00
50	Marsh	0.17	0.07	Christopher M. Chumko & Jacqueline E. Mickle	$0.00	$0.00	$447.00	$447.00
51	Marsh	0.32	0.13	Stefan & Miroslawa Starczewski	$0.00	$0.00	$829.00	$829.00
52	Marsh	0.37	0.15	Charles Leonard, Mary Wheeler & Joan Lentine	$0.00	$0.00	$957.00	$957.00
53	Marsh	0.34	0.14	John H. W. & Kristi L. Farmer	$0.00	$0.00	$893.00	$893.00
54	Marsh	0.20	0.08	Maureen O'Shea	$0.00	$0.00	$510.00	$510.00

Parcel No.	Con.	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
55	Marsh	0.32	0.13	Craig A. & Mary J. Wheeler	$0.00	$0.00	$829.00	$829.00
56	Marsh	0.32	0.13	Jay Garner	$0.00	$0.00	$829.00	$829.00
57	Marsh	0.18	0.07 *	John D. Garner	$0.00	$0.00	$223.00	$223.00
58	Marsh	0.22	0.09	Kary M. & Shannon D. Coulson	$0.00	$0.00	$574.00	$574.00
59	Marsh	0.30	0.12	Thomas G. & Valerie Wilson	$0.00	$0.00	$766.00	$766.00
60	Marsh	0.26	0.11	Jody F. Gagnon	$0.00	$0.00	$702.00	$702.00
61	Marsh	0.15	0.06	Patricia L. Laframboise	$0.00	$0.00	$383.00	$383.00
62	Marsh	0.38	0.15	Lawrence N. & Patricia L. Laframboise	$0.00	$0.00	$957.00	$957.00
63	Marsh	0.34	0.14	Rebecca L. Wigle	$0.00	$0.00	$893.00	$893.00
64	Marsh	0.18	0.07	Gordon R. Hoyt & Robin Skov	$0.00	$0.00	$447.00	$447.00
66	Marsh	0.33	0.13	Richard I. Gilmour & Barbara G. Senior	$0.00	$0.00	$829.00	$829.00
67	Marsh	0.69	0.28	Mathew M. Duby & Emily R. Vandenham	$0.00	$0.00	$1,548.00	$1,548.00
68	Marsh	0.69	0.28	Patrick H. & Annette M. Pettypiece	$0.00	$0.00	$1,548.00	$1,548.00
69	Marsh	0.33	0.13	Denis Larocque	$0.00	$0.00	$829.00	$829.00
70	Marsh	0.22	0.09	Gordon R. Crawford	$0.00	$0.00	$574.00	$574.00
71	Marsh	0.59	0.24	Ronald S. & Lorraine E. Rousseau	$0.00	$0.00	$1,429.00	$1,429.00
72	Marsh	0.69	0.28	Leonard T. Pare	$0.00	$0.00	$1,548.00	$1,548.00
73	Marsh	0.69	0.28	Daniel E. Deschamps & Cydney L. Walker	$0.00	$0.00	$1,548.00	$1,548.00
74	Marsh	0.48	0.19	Kevin. J. Racine	$0.00	$0.00	$1,212.00	$1,212.00
75	Marsh	0.35	0.14	James & Judy Lennon	$0.00	$0.00	$893.00	$893.00
76	Marsh	0.56	0.23 *	Town of Amherstburg	$0.00	$0.00	$734.00	$734.00
77	Marsh	0.56	0.23	Town of Amherstburg	$0.00	$0.00	$1,394.00	$1,394.00
78	Marsh	0.56	0.23	Bud J. Nagtegaal & Charity Conrad	$0.00	$0.00	$1,394.00	$1,394.00
79	Marsh	0.56	0.23	Lawrence J. Bachmeier	$0.00	$0.00	$1,394.00	$1,394.00
80	Marsh	0.56	0.23	David J. & Mary-Alice Beneteau, Amberley & Kerry Foote	$0.00	$0.00	$1,394.00	$1,394.00
81	Marsh	0.56	0.23	Coulson Design Build	$0.00	$0.00	$1,394.00	$1,394.00
82	Marsh	0.22	0.09	William & Julie Ellis	$0.00	$0.00	$574.00	$574.00
83	Marsh	0.33	0.13	Peter J. & Barbara Lojewski	$0.00	$0.00	$829.00	$829.00
84	Marsh	0.15	0.06	Roger G. & Wendy L. Frenette	$0.00	$0.00	$383.00	$383.00
85	Marsh	0.14	0.06	Brett W. & Shannon D. Coulson	$0.00	$0.00	$383.00	$383.00
86	Marsh	0.20	0.08	Kathryn E McNamara & Mark J. Liedke	$0.00	$0.00	$510.00	$510.00
87	Marsh	0.07	0.03	Janice E. & Kenneth R. Grice	$0.00	$0.00	$191.00	$191.00
88	Marsh	0.14	0.06	James G. Kennedy	$0.00	$0.00	$383.00	$383.00
89	Marsh	0.06	0.02	Michael B. & Judith A. McHale	$0.00	$0.00	$128.00	$128.00

Parcel No.	Con.	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
90	Marsh	0.27	0.11	Colton M. Bradt & Chelsea N. Hill	$0.00	$0.00	$702.00	$702.00
91	Marsh	0.14	0.06	Charles & Lindsy MacDougall	$0.00	$0.00	$383.00	$383.00
92	Marsh	0.14	0.06	Bradley B. & Caroline B. Coghlin	$0.00	$0.00	$383.00	$383.00
93	Marsh	0.17	0.07	Kenneth Robson	$0.00	$0.00	$447.00	$447.00
94	Marsh	0.19	0.08	Hildegard Franz & Cameron Ellis	$0.00	$0.00	$510.00	$510.00
95	Marsh	0.07	0.03	Maegan A. Stephens	$0.00	$0.00	$191.00	$191.00
96	Marsh	0.07	0.03	Maegan A. Stephens	$0.00	$0.00	$191.00	$191.00
97	Marsh	0.15	0.06	Brent M. Charlebois	$0.00	$0.00	$383.00	$383.00
98	Marsh	0.28	0.11	Maurice & Margaret A. Nagtegaal	$0.00	$0.00	$702.00	$702.00
99	Marsh	0.14	0.06	Paul & Bree Tole	$0.00	$0.00	$383.00	$383.00
100	Marsh	0.22	0.09	James N. & Tanya L. Sinasac	$0.00	$0.00	$574.00	$574.00
Total on Privately-Owned - Non-Agricultural Lands.....					$0.00	$52,292.00	$76,396.00	$128,688.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

LAKEWOOD DRIVE AREA SERVED BY THE BAR POINT PUMP

1	Marsh	15.89	6.43 *	George H. & Ruth A. Vandenbrink	$0.00	$6,202.00	$6,838.00	$13,040.00
Total on Privately-Owned - Agricultural Lands (Grantable).....					$0.00	$6,202.00	$6,838.00	$13,040.00
TOTAL ASSESSMENT					**$0.00**	**$98,360.00**	**$147,540.00**	**$245,900.00**

(Acres)	(Ha.)
80.36	**32.55**

*** INDICATES A REDUCED ASSESSMENT FOR UNDEVELOPED AREAS**

"SCHEDULE C-2"
SCHEDULE OF ASSESSMENT (LAKEWOOD DRIVE DRAIN No. 3)
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
TOWN OF AMHERSTBURG

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Ridgewood Lane	0.97	0.39	Town of Amherstburg	$0.00	$6,120.00	$8,480.00	$14,600.00
McLeod Avenue	4.30	1.74	Town of Amherstburg	$0.00	$11,126.00	$33,597.00	$44,723.00
Lakewood Drive	1.17	0.47	Town of Amherstburg	$128,920.00	$61,406.00	$22,709.00	$213,035.00
Lakewood Boulevard (u	2.66	1.08 *	Town of Amherstburg	$0.00	$610.00	$2,348.00	$2,958.00
Total on Municipal Lands				$128,920.00	$79,262.00	$67,134.00	$275,316.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Parcel No.	Con.	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
2	Marsh	0.96	0.39	Ronald, Jason, Kyle Belward	$0.00	$226.00	$3,477.00	$3,703.00
3	Marsh	1.43	0.58	Anthony R. Smith & Nasra Smith	$0.00	$258.00	$3,973.00	$4,231.00
4	Marsh	1.98	0.80	Stuart & Eugenia Smith	$0.00	$285.00	$4,392.00	$4,677.00
5	Marsh	19.46	7.88 *	Essex Region Conservation Authority	$0.00	$1,113.00	$17,135.00	$18,248.00
6	Marsh	0.09	0.04	Jeffery D. & Donna E. Topliffe	$0.00	$1,360.00	$522.00	$1,882.00
7	Marsh	0.13	0.05 *	Garry Fortune	$0.00	$1,476.00	$326.00	$1,802.00
8	Marsh	0.13	0.05	Garry Fortune	$0.00	$1,645.00	$652.00	$2,297.00
9	Marsh	0.13	0.05 *	Sherry A. Kemski	$0.00	$1,476.00	$326.00	$1,802.00
10	Marsh	0.07	0.03 *	Marlene Kemski	$0.00	$755.00	$196.00	$951.00
11	Marsh	0.14	0.06	Marlene Kemski	$0.00	$1,713.00	$783.00	$2,496.00
12	Marsh	0.14	0.06	Frank M. & Simone Y. Seres	$0.00	$1,713.00	$783.00	$2,496.00
13	Marsh	0.14	0.06	Peter J. Courtney & Brenda J. Turgeon	$0.00	$1,713.00	$783.00	$2,496.00
14	Marsh	0.15	0.06	Allan R & Cynthia S. Mickle	$0.00	$1,713.00	$783.00	$2,496.00
15	Marsh	0.15	0.06	Debra L. Balkwill	$0.00	$1,713.00	$783.00	$2,496.00
16	Marsh	0.08	0.03	James K. Baker & Rosalie M. Lemire	$0.00	$856.00	$391.00	$1,247.00
17	Marsh	0.10	0.04 *	Erwin R. & Carol A. Pare	$0.00	$1,006.00	$261.00	$1,267.00
18	Marsh	0.26	0.11	Erwin R. & Carol A. Pare	$0.00	$2,923.00	$1,435.00	$4,358.00
19	Marsh	0.16	0.06	Michelle S. & Darrin J. Lewis	$0.00	$1,713.00	$783.00	$2,496.00
20	Marsh	0.08	0.03	Solace Farms Inc.	$0.00	$856.00	$391.00	$1,247.00
21	Marsh	0.17	0.07	Daniel & Jennifer Accetta	$0.00	$1,781.00	$913.00	$2,694.00
22	Marsh	0.25	0.10	Bradley S. & Sherri L. Nelson	$0.00	$1,331.00	$1,305.00	$2,636.00
23	Marsh	0.08	0.03	Barry Riddell	$0.00	$2,054.00	$391.00	$2,445.00
24	Marsh	0.20	0.08	Leon K. & Nella Bieszk	$0.00	$2,066.00	$1,044.00	$3,110.00
25	Marsh	0.18	0.07	Stella D. & Bruce A. Milkins	$0.00	$1,781.00	$913.00	$2,694.00
26	Marsh	0.19	0.08	Francesco & Gina Storino	$0.00	$1,957.00	$1,044.00	$3,001.00
27	Marsh	0.20	0.08	Erhard M. & Jennifer Brauss	$0.00	$1,957.00	$1,044.00	$3,001.00
28	Marsh	1.18	0.48	John H. W. & Kristi L. Farmer	$0.00	$5,887.00	$3,810.00	$9,697.00

Description		Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
29	Marsh	0.33	0.13	Daniel & Mary Lou Valleau	$0.00	$1,747.00	$1,696.00	$3,443.00
30	Marsh	0.16	0.06	Adrian & Joanne Harte	$0.00	$856.00	$783.00	$1,639.00
31	Marsh	0.48	0.19	Rhys E. Robb & Susan A. Dranski	$0.00	$2,603.00	$2,479.00	$5,082.00
32	Marsh	0.24	0.10	Melissa M. Beaudoin-Lloyd	$0.00	$1,319.00	$1,305.00	$2,624.00
33	Marsh	0.24	0.10	Jesse & Vanessa E. DiGiovanni	$0.00	$1,319.00	$1,305.00	$2,624.00
34	Marsh	0.24	0.10	Jason & Stefanie L. Kamrock	$0.00	$1,319.00	$1,305.00	$2,624.00
35	Marsh	0.24	0.10	Lance S. Huver & Kirsty L. Collins	$0.00	$1,319.00	$1,305.00	$2,624.00
36	Marsh	0.16	0.06 *	Erwin R. L. & Carol A. Pare	$0.00	$755.00	$391.00	$1,146.00
37	Marsh	0.16	0.06 *	Erwin R. L. & Carol A. Pare	$0.00	$755.00	$391.00	$1,146.00
38	Marsh	0.32	0.13	Jaremy & Sheri Mayville	$0.00	$1,747.00	$1,696.00	$3,443.00
39	Marsh	0.32	0.13	Brian & Debbie Balkwill	$0.00	$1,747.00	$1,696.00	$3,443.00
40	Marsh	0.16	0.06 *	Gabriella S. Monteleone	$0.00	$856.00	$783.00	$1,639.00
41	Marsh	0.64	0.26	Pennie L. Mitchell	$0.00	$3,405.00	$3,053.00	$6,458.00
42	Marsh	0.32	0.13	Marlene Kemski	$0.00	$1,747.00	$1,696.00	$3,443.00
43	Marsh	0.32	0.13	Marlene Kemski	$0.00	$1,526.00	$848.00	$2,374.00
44	Marsh	0.24	0.10	Marlene Kemski	$0.00	$1,149.00	$652.00	$1,801.00
45	Marsh	0.83	0.34	Ryan & Susan Bondy	$0.00	$4,149.00	$3,401.00	$7,550.00
Total on Privately-Owned - Non-Agricultural Lands					$0.00	$71,645.00	$73,424.00	$145,069.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

Parcel No.	Con.	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
1	Marsh	15.89	6.43 *	George H. & Ruth A. Vandenbrink	$0.00	$3,633.00	$13,982.00	$17,615.00
Total on Privately-Owned - Agricultural Lands (Grantable)					$0.00	$3,633.00	$13,982.00	$17,615.00

SECTION 26 (NON PRO-RATABLE)

Roll No.	Con.	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Ridgewood Lane		Town of Amherstburg Road Authority	$21,048.00	$0.00	$0.00	$21,048.00
McLeod Avenue		Town of Amherstburg Road Authority	$20,273.00	$0.00	$0.00	$20,273.00
Lakewood Drive		Town of Amherstburg Road Authority	$205,414.00	$0.00	$0.00	$205,414.00
Lakewood Drive		Town of Amherstburg Public Works	$52,591.00	$0.00	$0.00	$52,591.00
Public Utility		Enbridge Gas Inc.	$15,026.00	$0.00	$0.00	$15,026.00
Public Utility		Cogeco	$1,193.00	$0.00	$0.00	$1,193.00
Public Utility		Hydro One Networks Inc.	$7,155.00	$0.00	$0.00	$7,155.00
Total Section 26 (Non Pro-ratable)			$322,700.00	$0.00	$0.00	$322,700.00
TOTAL ASSESSMENT			**$451,620.00**	**$154,540.00**	**$154,540.00**	**$760,700.00**

(Acres)	(Ha.)
58.62	**23.72**

*** INDICATES A REDUCED ASSESSMENT FOR UNDEVELOPED AREAS**

"SCHEDULE D"
DETAILS OF SPECIAL BENEFIT (LAKEWOOD DRIVE DRAIN No. 3)
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
TOWN OF AMHERSTBURG

SPECIAL BENEFIT ASSESSMENT
(PRO-RATABLE)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
Lakewood Drive	Town of Amherstburg Road Authority	Increased cost to pipe installation due to presence of the road (25%)	$48,250.00	$9,240.00	$57,490.00
		Increased cost to maintenance hole installation due to presence of the road (25%)	$6,900.00	$1,321.00	$8,221.00
		Supply, installation and/or replacement of eight (8) new off-line catch basins (50%)	$18,250.00	$3,495.00	$21,745.00
		Re-connection of eighteen (18) existing off-line catch basins to the new drain, including restoration work (50%)	$32,250.00	$6,176.00	$38,426.00
		Replace existing catch basin between Mun. No. 103 & Mun. No. 106 including new leader pipe connection to new drain (50%)	$2,550.00	$488.00	$3,038.00
		Total Special Benefit - Lakewood Drive	$108,200.00	$20,720.00	$128,920.00
TOTAL SPECIAL BENEFIT ASSESSMENT (PRO-RATABLE)			**$108,200.00**	**$20,720.00**	**$128,920.00**

SPECIAL BENEFIT ASSESSMENT
(SECTION 26 NON PRO-RATABLE)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
Ridgewood Lane	Town of Amherstburg Road Authority	Costs associated with the infilling of east side ditch along Ridgewood Lane (100%).	$700.00	$135.00	$835.00
		Brushing and bottom cleanout of east side ditch including trucking of excavated materials (100%)	$4,000.00	$770.00	$4,770.00
		Traffic Control (25%)	$2,500.00	$481.00	$2,981.00
		Supply and installation of CB15 and 5 m long 300 mm dia. Lead and connection to new drain (100%)	$3,600.00	$693.00	$4,293.00
		Costs associated with the supply & installation of DICB16 including leader pipe and SEP (100%)	$4,800.00	$924.00	$5,724.00
		Costs associated capping and filling the existing pipe crossing at intersection of Ridgewood Lane & Lakewood Drive with grout and for connecting the EXHM to the new drain (50%)	$2,050.00	$395.00	$2,445.00
		Total Special Benefit - Ridgewood Lane	$17,650.00	$3,398.00	$21,048.00

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
McLeod Avenue	Town of Amherstburg Road Authority	Costs associated with the infilling of the ditch along McLeod Avenue (100%).	$5,700.00	$1,097.00	$6,797.00
		Supply and installation of DICB13 and 6 m long 300 mm dia. Lead c/w rodent gate (100%)	$3,500.00	$674.00	$4,174.00
		Costs associated with the removal and disposal existing CSP near Sta. 0+795 and the supply & installation of CB14 including leader pipe across road (100%)	$7,100.00	$1,367.00	$8,467.00
		Flush and clean existimg 300 mm dia. road culvert cross McLeoad Avenue (100%)	$700.00	$135.00	$835.00
		Total Special Benefit - McLeod Avenue	$17,000.00	$3,273.00	$20,273.00
Lakewood Drive	Town of Amherstburg Road Authority	Costs associated with the infilling of the ditch along Lakewood Drive (100%).	$700.00	$135.00	$835.00
		Costs associated capping and filling the existing pipe crossing at intersection of Ridgewood Lane & Lakewood Drive with grout and for connecting the EXHM to the new drain (50%)	$2,050.00	$395.00	$2,445.00
		Supply & installation of asphalt (100%)	$99,000.00	$19,060.00	$118,060.00
		Section 29 allowances provided for situating the drain on private property (100%)	$5,800.00	$1,117.00	$6,917.00
		Traffic Control (75%)	$7,500.00	$1,444.00	$8,944.00
		Excess soils management	$57,200.00	$11,013.00	$68,213.00
		Total Special Benefit - Lakewood Drive	$172,250.00	$33,164.00	$205,414.00
Lakewood Drive	Town of Amherstburg Public Works	Coordination with the Town of Amherstburg for locates of water services and deflections (approx. 26), as well as the lowering of watermains (two locations) (100%)	$33,000.00	$6,354.00	$39,354.00
		Coordination with the Town of Amherstburg for locates of sanitary services and lowerings (approx. 16) (100%)	$11,100.00	$2,137.00	$13,237.00
		Total Special Benefit - Lakewood Drive	$44,100.00	$8,491.00	$52,591.00
Public Utility	Enbridge Gas Inc.	Coordination with G-Tel for locates of gas lines (approx. 15) (100%)	$12,600.00	$2,426.00	$15,026.00
Public Utility	Cogeco Inc.	Coordination with G-Tel for locates of Cogeco cables and additional cost to work around crossings (100%)	$1,000.00	$193.00	$1,193.00
Public Utility	Hydro One Networks Inc.	Coordination with G-Tel & Hydro-One and partial support of approx. 5 hydro poles/guys wires (approx. 2) (100%)	$6,000.00	$1,155.00	$7,155.00
TOTAL SPECIAL BENEFIT ASSESSMENT (SECTION 26 NON PRO-RATABLE)			**$270,600.00**	**$52,100.00**	**$322,700.00**
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT					**$451,620.00**

SPECIAL PROVISIONS - GENERAL

1.0 GENERAL SPECIFICATIONS

The General Specifications attached hereto is part of "Schedule F." It also forms part of this specification and is to be read with it, but where there is a difference between the requirements of the General Specifications and those of the Special Provisions which follow, the Special Provisions will take precedence.

2.0 DESCRIPTION OF WORK

The work to be carried out under this Contract includes, but is not limited to, the supply of all **labour, equipment and materials** to complete the following items:

Bar Point Pump Upgrades

- Dismantle and salvage existing electrical components prior to carefully removing pump assembly and motor, removing and disposing of pumphouse and steel support framing off site. Extreme care shall be taken not to damage the pump, motor, pump well and discharge pipe. Work to also include returning the existing pump, motor, starter and relay controls including level sensor switch to the Town of Amherstburg Public Works Yard (512 Sandwich St. South). The Contractor shall arrange for Hydro One to temporarily disconnect the power feed to the pump station and to later reconnect once the new electrical works are completed and the Electrical safety Authority inspection is completed. Any Hydro One costs where applicable to be paid by Contractor.
- Temporary pumping with the use of portable pumps for dewatering throughout the construction period as required.
- Supply and installation of a new 1800 mm wide x 350 mm high anti-vortex cruciform above pump well base consisting of A-36 steel angle (150 mm x 150 mm x 12 mm thickness) to support A-36 steel flat bar vertical cross members (254 mm high x 6 mm thickness) welded together and anchored to concrete sump floor. Works shall include the supply and installation of a 2130 mm diameter level concrete base poured in place, minimum 200 mm thickness 40 MPa concrete.
- Supply and installation of ten (10) 450 mm diameter concrete support piers, a minimum 1.2 metres in length, poured in place consisting of 40 MPa concrete within sonotube. Work to include auger drilling excavation for each pier.
- Supply and installation of Granular "A' base, minimum 200 mm thickness compacted to surround pump well and concrete piers and fully extending below and beyond new pumphouse steel base frame including approach ramp (2 m x 2 m) on the north side at the pumphouse door. Work to include all required excavation, removal and re-use of excavated materials for site grading, topsoil placement, fine grade and seed all disturbed areas around pumphouse.
- Supply and installation of A-36 steel angle iron base frame for pumphouse floor (as per Specifications) to be anchored to concrete piers, complete with supply and installation of 9.5 mm thickness steel (diamond plate tread) decking welded to base frame.
- Supply and installation of two (2) new vertical anti-rotation vanes consisting of 5.75 m long A-36 steel rectangular tube (300 mm x 50 mm x 6 mm thickness) welded to both steel base frame and anti-vortex cruciform.

- Supply and installation of 305 mm diameter, 5.5 m long vertical stilling column consisting of galvanized Schedule 40 pipe complete with bottom plate, seepage holes and collar plate to be fastened to pump floor decking and to be strapped to anti-rotation vane with 19 mm wide SS band straps.
- Supply and construction of a new 3.86 m x 3.86 m wood framed pump house building to be fastened to pump floor frame complete with new corrugated metal wall and roof siding and salvaged door from existing pumphouse.
- Re-install salvaged main disconnect, meter socket, meter c/w enclosure/ indoor cabinet, red/green pump status exterior lights, splitter box, fused switch, transformer, load centre panel, light switch and receptacles including two (2) new circuits for new relay controls and pump lube solenoid.
- Supply and installation of all low voltage wiring and galvanized steel electrical conduits as per specifications including ESA inspection.
- Supply and installation of combination circuit breaker and reduced voltage soft starter c/w Nema 3R enclosure (Eaton Cutler- Hammer Class ECS95S2DAG-S811+N6N3S or approved equal), 50 Hp rating.
- Supply and installation of ball float switch system including two SS304 ball floats (Square 'D' 9049), two SS rods (4.57 m and 2.28 m length) and two switches (Schneider Pumptrol Square 'D 9036GG, or approved equal), for both pump on/off and highwater alarm.
- Supply and installation of heat trace system for stilling column including controller (Thermon TCM2 or approved equal), MIQ heat trace cable, cold lead, junction box and ambient sensing probe (RTD-500-3). The work shall also include supply and installation of 22 gauge stainless steel skirt 1.5 m height wrapped and secured around heat trace cable and stilling column.
- Supply and installation of two (2) new wall mounted LED light fixtures, minimum 6000 lumens without motion sensor.
- Supply and installation of a new 40 Hp, 575 V, 900 RPM, 3 phase electric vertical hollow shaft motor (Nidec Motors or approved equal) complete with axial flow single stage propeller pump assembly (Lo-Lift Pump Company Model #2017 or approved equal), including oil lube solenoid dripper valve, one gallon reservoir tank and grease line connection to suction bowl bushing, minimum capacity of 8,000 USGPM at 12 feet TDH.
- Supply and installation of a new 610 mm diameter dresser Style 38 coupling to pump discharge elbow to outlet pipe.
- Pump setup and commissioning.

Lakewood Drive Drain No. 3

- Supply and install high density polyethylene pipe (HDPE) smooth interior wall (Boss 2000, 320 kPa or approved equivalent) with bell & spigot joining system. For every third pipe length, one pipe shall be perforated HDPE pipe complete with filter sock. This work is to include clear stone pipe bedding from minimum 150 mm below pipe up to the pipe springline, Granular 'A' backfill up to underside of surface material. This work is to also include connection of existing lateral storm drains where encountered.
    - Sta. 0+234.5 to Sta. 0+244.5 - Supply and install 10 m of 525 mm diameter HDPE pipe.
    - Sta. 0+244.5 to Sta. 0+269 - Supply and install 24.5 m of 525 mm diameter HDPE pipe.
    - Sta. 0+269 to Sta. 0+401.5 - Supply and install 132.5 m of 525 mm diameter HDPE pipe.
    - Sta. 0+401.5 to Sta. 0+530.5 - Supply and install 129 m of 450 mm diameter HDPE pipe.
    - Sta. 0+530.5 to Sta. 0+599.5 - Supply and install 69 m of 375 mm diameter HDPE pipe.
    - Sta. 0+599.5 to Sta. 0+682.5 - Supply and install 83 m of 375 mm diameter HDPE pipe.
    - Sta. 0+682.5 to Sta. 0+689 - Supply and install 6.5 m of 375 mm diameter HDPE pipe.
    - Ridgewood Lane Ditch Overflow Outlet – Supply and install 11.5 m of 375 mm diameter HDPE pipe.
- Supply and installation of a poured in-place concrete headwall around the 375 mm diameter emergency overflow pipe outlet at Station 1+000 (3.6 m wide x 0.9 m in high x 0.15 m thickness) complete with 15M steel reinforcement bars placed around pipe insert. This work includes the supply and installation of a 381 mm (15") diameter galvanized flat back C-10 slide gate complete with appurtenances as manufactured by Waterman (or approved equal) mounted on the headwall over the outlet of the pipe. Supply and install rodent gate inside of pipe immediately upstream of slide gate. Work also includes excavation of the ditch immediately downstream of the headwall to provide minimum 0.10 m of clearance between ditch bottom and slide gate, as well as the supply and installation of stone erosion protection of the banks (1 m wide) of the ditch, 300 mm thickness (approximately 5 m^2).
- Supply and install high density polyethylene pipe (HDPE) smooth interior wall (Boss 2000, 320 kPa or approved equivalent) with bell & spigot joining system. For every third pipe length, one pipe shall be perforated HDPE pipe complete with filter sock. This work is to include Granular 'B' pipe bedding from minimum 150 mm below pipe up to the pipe springline, and native material backfill up to surface material. Top surface to be minimum 50 mm thickness layer of top soil, fine graded and seeded. This work is to also include connection of existing tile drains encountered during trenching, additional labour and materials required in locating, supporting, redirecting, and/or working around existing utilities.
    - Sta. 0+689 to Sta. 0+776 - Supply and install 87 m of 375 mm diameter HDPE pipe.
    - Sta. 0+776 to Sta. 0+795 - Supply and install 19 m of 375 mm diameter HDPE pipe.
- Supply and installation of two (2) new 1500 mm diameter pre-cast concrete maintenance holes (denoted MH5 & MH6) with minimum 300 mm sump complete with cast iron frame and grate (OPSD 401.010). Work also to include the connection and grouting of all inlet pipes.
- Supply and installation of four (4) new 1200 mm diameter pre-cast concrete maintenance holes (denoted MH7, MH8, MH9 & MH10) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work also to include the connection and grouting of all inlet pipes.

- Supply and installation of two (2) new 600 mm x 600 mm pre-cast concrete catch basins (denoted CB11 & CB12) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work also to include the connection and grouting of all inlet pipes.
- Supply and installation of eight (8) new 600 mm x 600 mm pre-cast concrete catch basins off-line of main drain with maximum depth of 1.2 m, complete with minimum 300 mm sump, cast iron frame and grate (OPSD 400.02), and 200 mm diameter leader pipe. This work to include grouting of all inlet pipes and connection of leader pipe to main drain.
- Replace existing round catch basin near property line between Mun. No. 103 and Mun. No. 106 with a new 600 mm x 600 mm pre-cast concrete catch basin off-line of main drain, complete with minimum 300 mm sump, cast iron frame and grate (OPSD 400.02), and 200 mm diameter leader pipe. This work includes connection of all existing pipes and grouting of all inlet pipes and connection of leader pipe to main drain with pre-fabricated tee.
- Re-connect eighteen (18) existing catch basins to new drain with new 200 mm diameter HDPE pipe and pre-fabricated tee. Work includes restoration of asphalt.
- Temporary Silt Control Measures During Construction
- Fill portion of Ridgewood Lane ditch (approximately 25 m^3) south of Lakewood Drive including trucking and compaction of material in 300 mm lifts. Prior to infilling, remove all vegetation and organic debris from the existing roadside ditch slopes. Work includes supply and placement of top soil (50 mm minimum thickness), fine graded and seeded.
- Fill portion of Ridgewood Lane ditch (approximately 25 m^3) north of Lakewood Drive including trucking and compaction of material in 300 mm lifts. Prior to infilling, remove all vegetation and organic debris from the existing roadside ditch slopes. Work includes supply and placement of top soil (50 mm minimum thickness), fine graded and seeded.
- Fill existing McLeod Avenue ditch (approximately 175 m^3) south of Lakewood Drive including trucking and compaction of material in 300 mm lifts. Prior to infilling, remove all vegetation and organic debris from the existing roadside ditch slopes. Work includes supply and placement of top soil (50 mm minimum thickness), fine graded and seeded. Work also includes supply & installation of sloping stone end treatment approximately 20 m^2 of riprap (300 mm minimum thickness) including new filter fabric underlay over south end of infilling.
- Remove and dispose of existing corrugated steel pipe road crossing at Station 0+795. Supply and installation of a new 600 mm x 600 mm pre-cast concrete catch basins (denoted CB14) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work includes the supply and installation of 16 m long, 250 mm diameter leader pipe across Lakewood Drive and connection and grouting of all inlet pipes.
- Supply and installation of a new 600 mm x 600 mm pre-cast concrete ditch inlet catch basin off-line of drain (DICB16), complete with minimum 300 mm sump, sloped 2:1 heavy duty galvanized steel grate, 7 m long, 300 mm diameter leader pipe, and restoration of lands with top soil (50 mm minimum thickness), fine graded and seeded. Work to include the supply and installation of approx. 5 m^2 (300 mm minimum thickness) of stone erosion protection (SEP) including new filter fabric underlay around inlet. Work also to include connection to drain and grouting of all inlet pipes.

- Supply and installation of a new 600 mm x 600 mm pre-cast concrete catch basin (denoted CB13) with minimum 300 mm sump, complete with cast iron frame and grate (OPSD 401.010). Work includes the connection and grouting of all inlet pipes. Work also includes the supply and installation of 6 m long, 300 mm diameter leader pipe complete with rodent gate, backfill of existing ditch as shown on the plan herein, and restoration of land with topsoil (minimum 50 mm thickness), fine graded and seeded. Work to include the supply and installation of approx. 8 m^2 (300 mm minimum thickness) of stone erosion protection (SEP) including new filter fabric underlay around inlet.
- Supply and installation of a new 600 mm x 600 mm pre-cast concrete catch basin (CB15), complete with minimum 300 mm sump, cast iron frame and grate (OPSD 400.01), 5 m long, 300 mm diameter leader pipe connected to new drain with pre-fabricated tee, and restoration of asphalt surface. Work also to include connection of existing drain pipe and grouting of all inlet pipes.
- Brushing and bottom cleanout of Ridgewood Lane east side ditch from McLeod Avenue to DICB16, totalling approximately 226 m of ditch and approximately 50 m^3 of excavated material to be trucked and disposed of off-site.
- Flush and clean existing 300 mm diameter culvert under McLeod Avenue in line with Ridgewood Lane east side ditch.
- Fill existing 300 mm diameter and 400 mm diameter pipe crossing Lakewood Drive near Station 0+272. Work includes supply and installation of a new 300 mm diameter leader pipe from the existing maintenance hole to the new 525 mm diameter drain with pre-fabricated tee at Station 0+263 (approx.), and backfill with full Granular 'A.
- Supply and place hot mix asphalt (80 mm HL4 base course - two lifts & 40 mm HL3 surface course-one lift) to reconstruct Lakewood Drive and Ridgewood Lane where disturbed by new drain construction.
- Excess soils management – Trucking of excess soils off-site approximately 715 m^3
- Traffic control as per OTM Book 7
- Utility work(s), as follows:
    - Co-ordination with Town of Amherstburg to field locate existing water utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. The installation of the drainage works crosses approximately 26 existing water services and two (2) water main crossings that will require relocation under the drain pipe. Insulation to be provided by the Contractor where cover over water services is less than 1.2 m deep.
    - Co-ordination with Town of Amherstburg to field locate existing sanitary sewer utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. The installation of the drainage works crosses approximately 21 existing sanitary private drain connection services of which two (2) will require relocation (Mun No. 119 & Mun. No. 178) under the drain pipe.

- Co-ordination with G-Tel to field locate existing underground Enbridge utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. The installation of the drainage works crosses approximately 18 existing gas connection services. The Contractor shall coordinate with Enbridge for providing sand bedding support of utility pipes where crossed under by new drain at the expense of the operating utility. Costs shall include third party inspection provided by Enbridge.
- Co-ordination with G-Tel to field locate existing underground Hydro One utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor. Approximately 2 hydro poles shall require temporary partial support at the expense of the operating utility. Costs shall include any inspection or supervision provided by Hydro One.
- Co-ordination with G-Tel to field locate existing underground Cogeco utilities. Utility relocation works where required as a result of the drainage works (including civil works and reconnection of the facility) are at the expense of the operating utility as per Section 26 of the Drainage Act. This excludes repair costs of existing utility if damaged by Contractor.

3.0 ACCESS TO THE WORK

Access to the drain shall be municipal road right-of-ways including Ridgewood Lane, Lakewood Drive, and McLeod Avenue. Access to the pump works shall be from the Essex Boulevard road right-of-way. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All road areas and grass lawn areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING AREA

Bar Point Pump

For the upgrades to the Bar Point pump at the south end of Essex Boulevard, the working corridor shall be within the respective road allowance.

Lakewood Drive Drain No. 3

For the construction of the Lakewood Drive Drain No. 3 and associated ditch cleaning and infilling along Lakewood Drive, Ridgewood Lane and McLeod Avenue, the working corridor shall be within the respective road allowances. Where the centerline of the new drain is on private property to be located at a 1.5 m distance away from the Lakewood Drive road allowance, from Station 0+689 to Station 0+795, the working corridor shall extend a width of 4.5 metres beyond the road allowance.

For the installation of new catch basins on private property to be located 1 m beyond the Lakewood Drive road allowance both north and south sides, the working corridor shall be a 2 m x 2 m area centered with each catch basin. A location for equipment, staging, and temporary placement of excavating materials is to be arranged by the Contractor. One lane of Lakewood Drive shall remain open during the construction period and traffic control (found in General Specifications) maintained at all times. Any damages to lands and/or roads from the Contractor's work within the working area shall be rectified to pre-existing conditions.

5.0 PUMP BUILDING REMOVALS (SALVAGING PUMP, MOTOR & ELECTRICAL)

Prior to any removals for the Bar Point pump station that are associated with dismantling the building, the Contractor shall provide advance notice to Hydro One Networks for arranging the temporary disconnect of the existing power supply to the pump station. The items for removal and disposal off site include the wood framed pump shed and steel base frame within the exception of the entrance door that may be salvaged for re-use. Prior to doing so, most of the electrical panel boxes and accessories are to be carefully removed for salvage and re-use, unless otherwise specified within the specifications.

For the existing pump, motor, starter and level control, these components shall be returned to the Town of Amherstburg via delivery to the Public Works Yard, or as otherwise instructed by Town staff.

6.0 ANTI VORTEX CRUCIFORM & CONCRETE BASE FOR PUMPWELL FLOOR

The Contractor shall dewater the pumpwell and thoroughly remove all sediment accumulated within the pumpwell sump. A minimum 200 mm thickness of 40 MPa concrete shall be poured in place to establish a concrete sump floor. The Contractor shall supply and install a new 1800 mm wide x 350 mm high anti-vortex cruciform consisting of A-36 steel angle (150 mm x 150 mm x 12 mm) in two (2) lengths each 900 mm long and one (1) length 1800 mm long each welded together to form an "x" shape and centred directly below the pump. The cruciform shall be fastened to the pumpwell floor using 12 mm diameter galvanized lag bolts, 100 mm length to be placed at a maximum 500 mm spacing. The cruciform shall have a vertical height of 350 mm consisting of two (2) lengths each 900 mm long x 254 mm high x 12 mm thickness steel plate and one (1) length 1800 mm long x 254 mm high x 12 mm thickness steel plate each welded to the steel angle base members. The Contractor shall pre-assemble and install the anti-vortex cruciform inside the pump chamber prior to installing the pump. All steel surfaces shall be applied with a rust inhibitor black enamel paint, a minimum of two coats.

7.0 NEW PUMPHOUSE BASE FRAME & SUPPORTS

The Contractor shall construct ten (10) 450 mm diameter concrete pier supports that extend a minimum depth of 1.2 m below the existing ground surface for which the steel base frame shall be mounted to as outlined on the drawings. The top of the concrete piers to be set level and to same elevation as the top of the existing CSP pumpwell. The excavation for the piers shall be completed by drill auger method. The poured in place concrete shall be contained inside a sonotube form having a minimum compressive strength of 40 MPa. The Contractor to provide a minimum 72 hours curing time prior to mounting the base frame.

Following construction of concrete piers, the Contractor shall excavate the area around the existing pump well and extending out to the concrete pier supports perimeter followed by supply and placement of a 200 mm thickness of Granular 'A' base compacted to fully encompass area of steel base frame including a 2 m x 2 m entrance ramp area on south side for new pump shed doorway. The work shall also include top soil placement around stone base, fine graded and seeded and disposal of excess excavated materials.

The Contractor shall supply and install a shop fabricated steel base frame consisting of two A-36 steel angles (150 mm x 150 mm x 12 mm) being welded together to form a 150 mm x 150 mm C channel for the base frame's perimeter including all the associated steel angle internal cross support and bracing members as shown on the drawings. As part of the shop fabrication, the outside of the C channel frame shall have a continuous A-36 steel angle (100 mm x 100 mm x 10 mm) welded to it. The top of the base frame shall include A-36 steel plate deck (diamond pattern) to be fastened to it, a minimum 9.5 mm thickness and including two (2) removable loose deck plates on each side of pump floor opening. The full assembled base frame shall be mounted to each of the concrete support piers using 19 mm x 205 mm galvanized steel lag bolts, with two (2) bolts for each middle pier and three (3) bolts for corner piers.

All steel surfaces shall be applied with a rust inhibitor black enamel paint, a minimum of two coats.

8.0 ANTI-ROTATION VANES

The Contractor shall supply and install two (2) anti-rotation vanes consisting of 5.75 m long, 300 mm x 50 mm rectangular A-36 steel tubing to stand vertically inside pump well with each end aligned and welded to the mid brace on base frame and to anti-vortex cruciform as shown on the drawings. The vanes shall be placed within a maximum 100 mm from the pump well. All steel surfaces shall be applied with a rust inhibitor black enamel paint, a minimum of two coats

9.0 STILLING COLUMN

The Contractor shall supply and install a 5.5 m long, 305 mm outside diameter galvanized steel pipe (Schedule 40) vertically and securely attached to the anti-rotation vane using 19 mm stainless steel banding straps

complete with a steel base plate collar (355mm x 355mm x 6mm) welded to stilling column and to pump floor. The bottom of the stilling column shall be fitted with a galvanized steel base plate compete with 25 mm diameter drain hole in centre, and within the lower 300 mm length portion of the pipe, the drilling of a minimum of nine (9) 12 mm diameter seepage holes to be evenly spaced around the pipe perimeter.

10.0 PUMP SHED

The Contractor shall construct a new 3.86 m x 3.86 m wood framed pump shed as shown on the drawings. It shall be complete with 68 mm x 12 mm, 28 gauge, corrugated metal siding to be used for exterior walls and roof (Vicwest Pre-painted one side galvanized WeatherXL series or approved equal) with exterior walls painted dark green and the roof and fascia painted white. The interior walls shall include a 19 mm thick SPF plywood backing of sufficient coverage for mounting all electrical panels, boxes and lighting. The pump shed to be secured to the steel base frame using zinc plated Grade 5 hex bolts and washers placed at a maximum 1219 mm spacing continuously around the building perimeter. The existing door from the old pump house shall be salvaged and new building framed to suit using same locking mechanism.

11.0 INSTALLATION OF SALVAGED ELECTRICAL COMPONENTS

As outlined on the drawings, the Contractor shall reinstall the salvaged electrical inside the new pump shed and to be arranged similar to existing pump shed with all boxes mounted to plywood backing. The salvaged electrical includes the 100A main disconnect, hydro meter complete with socket, exterior enclosure and interior cabinet, 100A splitter box, 30A fusible switch, 3kVA distribution transformer, 100A load centre panel, pump status exterior lights, light switch and receptacles. New conduit and wiring shall be provided to reconnect in accordance with minimum wire and conduit sizes specified on the electrical power plan drawings. The panel boxes on the interior wall shall be arranged such that a minimum 1 m clearance is provided from the pump base plate and motor.

12.0 COMBINATION CIRCUIT BREAKER & SOFT START

The Contractor shall supply and install a solid state starter of size, type and rating as indicated on the drawings and specifications herein to be housed within a NEMA 3R enclosure with components as follows:

- Fully solid state control for soft start and soft stop of pumps.
- Integral fully rated bypass contactor selectable soft start or bypass mode
- Digital interface module mounted on door with control, monitoring and programming functions
- Motor overload protection in each phase, manually reset from outside of enclosure
- Hand-off-auto selector switch with auxiliary contact for remote indication
- One N.O. contact for time delay relay, one N.C. contact for fault indication relay and one N.O. contact for pump running indication relay
- Combination soft start with circuit breaker - Eaton, Cutler Hammer soft starter enclosure class ECS95S2DAG-S811+N66N3S, 50Hp rating including option C400T12D-K complete with internal 24VDC power supply.

13.0 PUMP LEVEL CONTROL & HIGHWATER ALARM FLOAT SWITCHES

The Contractor shall supply a new 'Square D' ball float level system to be complete with two float switches (Schneider Electric 9036GG or approved equal) and mounting bracket, stainless steel rods and 175 mm diameter ball floats (Schneider 9049 or approved equal). The floats system shall be fitted and arranged inside the 300 mm diameter steel stilling tube, as shown of the drawings, and the levels set for both control of the pump start and stop operation as well as highwater alarm.

The recommended levels for pump operation to be set as follows:

Pump "START" at elevation 174.45 m
Pump "STOP" at elevation 172.50 m
Highwater alarm at elevation 175.00 m

The pump start/stop and highwater alarm float switches shall be connected to 120V power supply from the load centre panel (Circuit #4) with Float switch No. 1 activating the pump start/stop which shall also be provided with time delay relay, normally open and timed to close contact with adjustable timer ranging from 0 to 10 minutes. The float switch shall be wired to both the existing "green" status light to be mounted on the pump shed's exterior wall and the 120V "green" panel light on the pump starter panel indicating pump running.

Float switch No. 2 being the highwater alarm switch shall be wired to the pump fault indicator relay normally closed contact to activate the existing "red" status light to be mounted on the pump shed's exterior wall and the 120V "red" panel light on the pump starter panel for indicating either highwater level, pump non-start or a pump fault.

14.0 HEAT TRACE FOR STILLING COLUMN

The Contractor shall supply and install the heat trace system for the stilling column with connection to the 120V power supply from the load centre panel (Circuit #3). The heat trace system comprised of heat trace controller (Thermon Type TCM2-1-SSR30A/2R-120-1-1P2-0-1-P/2 or approved equal) complete with single pole solid state relay, ground fault protection within Nema 4X fiberglass enclosure and ambient sensing thermostat RTD-500-3. The heat trace system shall be connected to 120V power supply from the load centre panel (Circuit # 3).

The heat trace cable shall be Thermon Type MIQ insulated cable B/MIQ-20E1H-I5/28/378/120/16/12/6 or approved equal) complete with cold lead and MIQ junction box model MIQ-PJBRP-TB-4 wall mounted. The heater cable of 8.5 m (28 feet) shall be arranged as shown on the drawings with a 4s trace ratio spacing covering 1.5 m height of column above the pump stop water level and enclosed with a 22 gauge stainless steel sheet wrapped entirely around pipe perimeter and secured with stainless steel banding straps.

15.0 PUMP SHED INDOOR LIGHTING & RECEPTACLES

The Contractor shall supply and install two (2) wall mounted light fixtures to be arranged in the locations specified on the drawings and to be connected to the 120V power supply from the load centre panel (Circuit #1). Each light shall be LED wall mounted and toggle switch operated without the use of a motion sensor and providing a minimum 6000 lumens of brightness from each light. The existing light switch may be salvaged or otherwise the Contractor may choose to replace at their own expense. The two existing receptacles shall be connected to 120V power supply from the load centre panel (Circuit # 2).

16.0 NEW BAR POINT PUMP & MOTOR

The new pump and motor shall consist of a vertical hollow shaft single stage propeller pump capable of discharging 505 L/sec (8,000 USGPM) of water against a total dynamic head of 3.6 m (12 feet) at a pump speed of 880 rpm. The approved pump model shall be the Lo-Lift Pump Company No. 2017 with 610 mm diameter plain end discharge or approved equal.

The pump shall be driven by a 40 Hp, 575V, 3 phase, 60Hz direct drive electric motor modified for a rated speed of 900 RPM complete with non-reverse ratchet stop as per US Motors (Nidec Motor Corporation) or approved equal.

The pump shall be an oil lubricated design with provision of a 1gallon oil reservoir tank to be fitted with a 120V operated solenoid and needle valve for line shaft bearing and upper discharge bowl bearing lubrication. The lube solenoid shall be wired in series with the pump start/stop float switch such that the needle valve will open when the switch is activated without the time delay. The pump start shall be delayed to permit pre-lubrication with an adjustable setting ranging from 0 to 10 minutes. A minimum of 5 minutes start delay is recommended. The lube solenoid shall be connected to 120V power supply from the load centre panel (Circuit # 6).

The pump shall also be provided with grease line to the suction bowl bushing to permit manual lubrication using grease gun.

The 600 mm diameter pump discharge shall be joined to the existing 600 mm diameter discharge pipe using a Style 38 dresser coupling.

The pump shall be installed as per the manufacturer's recommendations and to the satisfaction of the Engineer and Drainage Superintendent. Commissioning and testing by the pump supplier shall also be required.

17.0 BRUSHING (RIDGEWOOD LANE - EAST DITCH)

Brushing shall be carried out on the existing roadside ditch on the east side of Ridgewood Lane north of Lakewood Drive where required and as specified herein. **All** brush located within the drain side slopes shall be cut parallel to the side slopes, as close to the ground as practicable. Small branches and limbs are to be disposed of by the Contractor along with the other brush. Tree stumps, where removed to facilitate the drain excavation and reshaping of the drain banks, may be burned by the Contractor where permitted; otherwise, they shall be disposed of, off the site. The Contractor shall make every effort to preserve mature trees which are beyond the drain side slopes, and the working corridors. If requested to do so by the Drainage Superintendent, the Contractor shall preserve certain mature trees within the designated working corridors (see Section 4.0). All brush, other obstructions and deleterious materials that interfere with the ditch cleanout, as encountered along the course of the ditch are to be removed from the drain by the Contractor and shall be disposed of by the Contractor off the site.

18.0 DITCH CLEANING (RIDGEWOOD LANE - EAST DITCH)

18.1. Excavation of Existing Road Ditch

In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades. **THE CONTRACTOR SHALL NOT EXCAVATE DEEPER THAN THE GRADELINES SHOWN ON THE DRAWINGS.** Should over-excavation of the drain bank occur, the Contractor will **not** be permitted to repair with native material packed into place by the excavator and reshaped. Should over-excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item. All excavated material shall be handled as specified in Section 18.2. All excavation work shall be done in such a manner as to not harm any vegetation or trees, not identified in this report or by the Drainage Superintendent for clearing.

The bottom of ditch shall be excavated at the gradeline, as shown on the profile, which gradeline is governed by the benchmarks. The profile shows, for the convenience of the Contractor and others, the approximate depth of cut from both the existing drain bottom and from the easterly top of bank to the design bottom of the ditch, at the 50 metre intervals. Benchmarks, which have been established along the course of the drain, shall govern the final elevation of the drain. The locations and elevations of the benchmarks are shown on the drawings. The bottom of the ditch shall be a minimum 0.60 wide and the side slopes for the excavated cut below the existing bottom be no steeper than 1:1 (Horizontal to Vertical) with minimal disturbance to the upper drain bank side slopes above the bottom cleanout.

18.2. Trucking of Excavated Materials

Unless otherwise stated, all material excavated from the ditch cleanout abutting the east side of Ridgewood Lane shall be hauled and disposed of off-site at an approved location. Where the excavated soils are free of debris, the Contractor may elect to use as fill material within the existing portions of east ditch to be enclosed on Ridgewood Lane and McLeod Avenue south of Lakewood Drive intersection.

19.0 STONE EROSION PROTECTION (SEP)

The Contractor shall supply and install the required quantities of graded stone rip-rap erosion protection materials where specified. All stone to be used for erosion protection shall be 125 - 250 mm clear **quarried rock** or OPSS 1001 placed over a non-woven filter fabric Terrafix 270R or approved equivalent. The minimum thickness requirement of the erosion stone layer is 300 mm with no portion of the filter fabric to be exposed.

20.0 DRAINAGE PIPE CONSTRUCTION

20.1. Setting Out

The Engineer shall provide the Contractor in writing with benchmarks and points of reference. From these benchmarks and points of reference, the contractor will do his own setting out. The setting out by the Contractor shall include but shall not be limited to the preparation of grade sheets, the installation of centerline stakes, grade stakes, offsets, and sight rails.

If, during the setting out, the contractor finds an error in the benchmarks or points of reference provided by the Engineer or is uncertain as to the interpretation of the information provided or the work intended, he shall notify the Engineer immediately for additional verification or clarification before proceeding with construction.

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work.

The Contractor shall be responsible to ensure that the alignment selected results in a minimum depth of cover of 600 mm over the top of the drainage pipe to be installed within the roadway.

If, at any time during the progress of the works, an error shall appear or arise in the position, levels, dimensions or alignment of any part of the works, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer.

20.2. Alignment

The drainage pipe for the Lakewood Drive Drain shall be laid on the alignment as described on the drawings attached herein. The Contractor shall tie-in the existing storm drains at associated catch basins as the work progresses upstream with lead pipe connections as specified. After the existing catch basin pipe leads have been removed, they shall be disposed of off-site at an approved disposal location. Existing storm drain pipes and associated catch basins that run along both north and south sides of Lakewood Drive shall be maintained and be reconnected to the new drainage works as specified herein.

20.3. Profile

The drainage pipe shall be laid so that its invert shall be at the gradeline shown on the profile, which gradeline is governed by the benchmarks. The profile shows, for the convenience of the Contractors and others, the approximate depth of cut from the surface of the ground at 50 metre intervals, to the final invert of the drainage pipe in metres and decimals of a metre. Benchmarks, which have been established along the course of the drain, shall govern the final elevation of the drain. The locations and elevations of the benchmarks are shown on the drawings.

A variation in grade may be tolerated where the actual capacity of the drain exceeds the required capacity. The as-constructed invert of the drainage pipe shall not deviate from the specified gradeline more than 10% of the internal diameter of the drainage pipe. These deviations are allowable, provided they are gradual over a distance of not less than 10 m. No reverse grade shall be allowed.

20.4. Location of New Drain

The new drain shall be installed as shown on the Drawings attached hereto.

20.5. Drainage Pipe Materials

20.5.1. H.D.P.E. Pipe

Tile Drain (Sta. 0+234.5 to Sta. 0+401.5)	*New 525 mm (21") diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.*
Tile Drain (Sta. 0+401.5 to Sta. 0+530.5)	*New 450 mm (18") diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.*
Tile Drain (Sta. 0+530.5 to Sta. 0+795)	*New 375 mm (15") diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.* *Joined using (soil tight) "gasketed bell & spigot" Ultra Stab joining system (as manufactured by Armtec Limited or approved equal), supplied by the pipe manufacturer and conforming to ASTM D3350, CSA 182.8-02 and OPSS 1840.*

Drain within Roadways & Driveways

Pipe Bedding Under Pipe	*20-25 mm clear stone conforming to OPSS Division 10.*
Backfill up to Pipe Springline	*20-25 mm clear stone conforming to OPSS Division 10.*
Backfill Up to Underside of Road subsurface	*Granular 'A' conforming to OPSS Division 10.*
Roadway Subsurface	*Granular 'A' conforming to OPSS Division 10.*
Roadway Surface	*Premium HL3 and HL4 hot mix asphalt surface.*

Drain Beyond Roadways & Driveways

Pipe Bedding Under Pipe	*Granular 'B' conforming to OPSS Division 10. Alternatively, Granular 'A' conforming to OPSS Division 10.*
Backfill up to Pipe Springline	*Granular 'B' conforming to OPSS Division 10. Alternatively, Granular 'A' conforming to OPSS Division 10.*
Native Backfill Up to Existing Conditions	*Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.*

20.6. Excavating the Trench

Construction of the trench shall normally start at the outlet and proceed upstream and be by excavator. A trench box shall be used to support side walls of trench where the drainage pipe is laid and not moved until the pipe bedding and backfill are placed.

Minimum width of trench, measured at the top of the drainage pipe, shall be equal to the outside diameter of the drainage pipe plus approximately half of the outside pipe diameter on both sides of the pipe, to permit proper granular material bedding placement and compaction of the granular materials where specified around the drainage pipe.

Where the trench excavation falls within the existing roadway and it is confined with the use of a trench box, clear stone bedding for the pipe has been specified in place of granular materials where it cannot be properly compacted. The confined trench limits the amount of granular backfill materials required for backfill above the pipe bedding and avoids disturbance to and interference with existing buried utilities adjacent thereto.

The bottom of the trench shall be cut to a minimum of 150 mm below the gradeline to allow for the stone bedding materials. Any additional excavated material not required for backfilling purposes shall be disposed of off-site.

20.7. Laying Drainage Pipe (Within Roadway)

The Contractor shall supply and install clear stone material for bedding, placed to a depth of 150 mm below the design invert of the pipe and shaped to receive the pipe. After pipe placement, clear stone shall backfill shall be placed to an elevation equal to the spring line of the pipe. Above the spring line of the pipe, Granular 'A' backfill material shall be placed and compacted to the underside of the roadway surface material.

Laying of the drainage pipe shall normally begin at the lower end of the drain and progress upstream. All soil or debris in the drainage pipe shall be removed before installation. All drainage pipes shall be free from clinging wet or frozen material that would hinder the laying of the drainage pipe on grade.

Before work is suspended for the day, all drainage pipe laid in trenches shall be blinded and any open ends closed. Care must be taken in handling plastic drain pipe in cold weather to avoid causing damage. Plastic drain pipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

20.8. Laying Drainage Pipe (Outside of Roadway)

The Contractor shall supply and install Granular 'B' material for bedding, placed to a depth of 150 mm below the design invert of the pipe and shaped to receive the pipe. After pipe placement, Granular 'B' backfill shall be placed and compacted to the spring line of the pipe throughout its entire length. Above the springline of the pipe, native material shall be placed and compacted to the underside of the topsoil layer. Laying of the drainage pipe shall normally begin at the lower end of the drain and progress upstream.

All soil or debris in the drainage pipe shall be removed before installation. All drainage pipes shall be free from clinging wet or frozen material that would hinder the laying of the drainage pipe on grade. Before work is suspended for the day, all drainage pipe laid in trenches shall be blinded and any open ends closed. Care must be taken in handling plastic drain pipe in cold weather to avoid causing damage. Plastic drain pipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

20.9. Connections

Existing drains shall be inspected by the Drainage Superintendent and if found to be in working order, they shall be connected to the new system. Drains carrying sewage or farmstead wastes shall not be connected to the drainage system. Plastic tubing connections to rigid drainage pipe shall be made with the use of manufactured plastic adapters. Directional changes in plastic tubing may be made without the use of fittings provided that the centre line radius of the bend is not less than five times the tubing diameter. Manufactured "T", "Y", or elbow fittings shall be used for connections at the junction of two drains. All connections shall be carried out by the Contractor as part of his work. The cost of connections shall be an expense of the drain.

20.10. Driveway/Laneway Restoration

The Contractor shall restore the driveway and laneway approaches as shown on the attached drawings. The driveway and laneway top width at each location shall match the existing drivable top width. The work shall include excavation, grading and compaction of the Granular "A" (crushed limestone) material, and salvage & re-laying of interlocking brick driveways where disturbed.

21.0 PRECAST CONCRETE MAINTENANCE HOLES

OPSS Form 407 and OPSD 701.010 shall apply and govern except as extended or amended herein. The Contractor shall supply and install precast concrete maintenance holes complete with frames, covers, ladder rungs and adjustment rings. All maintenance holes shall be installed with precast flat cap and shall be supplied with a minimum of one (1) to a maximum of three (3) adjustment units each 50 mm in height as per OPSD 704.010 installed on top of the structure so that future adjustments can be made. The flat top maintenance holes shall be supplied cast iron round frame and cover as per OPSD 401.010.

Maintenance holes shall be placed on 300 mm compacted Granular 'A' material and shall be backfilled around with approved granular materials in maximum 300 mm lifts to 98% standard proctor density. All maintenance holes shall come equipped with a minimum 300 mm deep sump unless noted otherwise. Structures that are identified to be replaced shall be removed and disposed of by the Contractor.

22.0 PRECAST CONCRETE CATCH BASINS

The Contractor shall arrange for the supply and installation of concrete catch basins at the locations and elevations as shown on the Drawings attached herein. The Contractor shall install all precast structures plumb and true to line and grade. Precast bases shall be set to the specified grade, shall be level, and shall have uniform overall contact with the underlying soil. Precast concrete catch basins shall conform to the requirements of OPSD 705.01 & OPSD 705.03. The floor elevation shall be at least 300 mm below the invert of the outlet pipe in the wall of the catch basins. Off-line catch basins shall be supplied and installed complete with 200 mm diameter high density polyethylene (HDPE) catch basin lead pipes connected to the new drain with standard pre-manufactured tees.

Ditch inlet catch basins shall be 600 mm x 1200 mm in dimension, as per OPSD 705.04 Type 'A'. Sloped top shall be 2H:1V complete with honeycomb galvanized steel grating as per OPSD 403.010 Type B including fastener tabs to secure to the catch basin. All catch basins installed shall meet the dimensions and locations outlined in the drawings. The Contractor shall supply and place an apron of stone erosion protection around every ditch inlet catch basin according to Section 7.0, as shown on the plans herein.

Pipe placed in the walls for inlet and outlet connections shall extend through the wall a sufficient distance to allow for connections. The pipes shall be trimmed flush with the inside wall and shall be securely sealed into place using grout. All catch basins shall be supplied with a minimum of one (1) to a maximum of three (3) adjustment units each 50 mm in height as per OPSD 704.010 installed on top of the structure so that future adjustments can be made. The 600 mm x 600 mm flat top catch basins shall be supplied cast iron square frame and cover as per OPSD 400.010. Structures that are identified to be replaced shall be removed and disposed of by the Contractor.

23.0 BACKWATER GATE ARRANGEMENT, CULVERT & CONCRETE HEADWALL

A backwater gate will be used to prevent water from Lake Erie from entering the drainage scheme, but also allow for an emergency overflow should the pump fail. The backwater gate shall consist of a 375 mm diameter Waterman Model C-10 slide gate or approved equal. The slide gate shall be fastened in proper alignment with the 375 mm diameter high density polyethylene (HDPE) overflow pipe in accordance with manufacturer's recommendations. The concrete headwall shall be constructed to minimum dimensions of 3600 mm wide x 900 mm high x 150 mm thickness complete with 15M reinforcing steel bars to be placed around pipe insert in accordance with OPSD 804.03.

24.0 DITCH INFILLING, RESTORATION AND SEEDING

The Contractor will be required to infill sections of roadside ditch along Ridgewood Lane, Lakewood Drive, and McLeod Avenue. The works include clearing and grubbing of brush and vegetation, filling in of the existing ditches with clean clay fill and re-grading areas to direct flows to either a catch basin or ditch as shown on the plans herein. Prior to the infilling of the ditches, the Contractor shall remove all vegetation, organic debris and topsoil from the existing ditches. The native materials used to fill the drain shall be placed in maximum 250 mm loose lifts and compacted to 95% of the maximum standard proctor density or better.

The work includes restoration of the roadside ditch along Ridgewood Lane including any additional reshaping and reseeding following the bottom cleanout. In addition, the Contractor will be required to restore any area of the grassed road shoulder or road disturbed by his operations, as directed by the Drainage Superintendent and he will be required to clean up all debris resulting from his construction operations.

The disturbed grassed areas resulting from the new drainage works shall be seeded as specified herein. The existing ground surface to be seeded shall be loosened to a depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface area over the backfilled trench shall be finely graded to match the original grade. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of.

Grass seed shall be Canada No. 1 lawn seed mixture meeting the requirements of a Sun/Shade mixture as supplied by OSC Turf or approved equal, as follows:

Creeping Red Fescue	*45%*
Annual Ryegrass	*30%*
Perennial Ryegrass	*15%*
Kentucky Bluegrass	*10%*

Bags shall bear the label of the supplier indicating the content by species, grade and mass. Other grass seed mixtures will be considered with approval of Engineer and Drainage Superintendent. Seed shall be applied at a rate of 250 kg per 10,000 m².

Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m². It shall be in granular form, dry, free from lumps and in bags bearing the label of the manufacturer, indicating mass and analysis.

The seeding shall be deemed "Completed by the Contractor" when the seed has established in all areas to the satisfaction of the Engineer. Re-seeding and/or other methods required to establish the grass will be given consideration in order to achieve the end result and the costs shall be incidental to the works.

GENERAL SPECIFICATIONS

1.0 AGREEMENT AND GENERAL CONDITIONS

The part of the Specifications headed "Special Provisions" which is attached hereto forms part of this Specification and is to be read with it. Where there is any difference between the requirements of this General Specification and those of the Special Provisions, the Special Provisions shall govern.

Where the word "Drainage Superintendent" is used in this specification, it shall mean the person or persons appointed by the Council of the Municipality having jurisdiction to superintend the work.

Tenders will be received and contracts awarded only in the form of a lump sum contract for the completion of the whole work or of specified sections thereof. The Tenderer agrees to enter into a formal contract with the Municipality upon acceptance of the tender. The General Conditions of the contract and Form of Agreement shall be those of the Stipulated Price Contract CCDC2-Engineers, 1994 or the most recent revision of this document.

2.0 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Each tenderer must visit the site and review the plans and specifications before submitting his/her tender and must satisfy himself/herself as to the extent of the work and local conditions to be met during the construction. Claims made at any time after submission of his/her tender that there was any misunderstanding of the terms and conditions of the contract relating to site conditions, will not be allowed. The Contractor will be at liberty, before bidding to examine any data in the possession of the Municipality or of the Engineer.

The quantities shown or indicated on the drawings or in the report are estimates only and are for the sole purpose of indicating to the tenderers the general magnitude of the work. The tenderer is responsible for checking the quantities for accuracy prior to submitting his/her tender.

3.0 MAINTENANCE PERIOD

The successful Tenderer shall guarantee the work for a period of one (1) year from the date of acceptance thereof from deficiencies that, in the opinion of the Engineer, were caused by faulty workmanship or materials. The successful Tenderer shall, at his/her own expense, make good and repair deficiencies and every part thereof, all to the satisfaction of the Engineer. Should the successful Tenderer for any cause, fail to do so, then the Municipality may do so and employ such other person or persons as the Engineer may deem proper to make such repairs or do such work, and the whole costs, charges and expense so incurred may be deducted from any amount due to the Tenderer or may be collected otherwise by the Municipality from the Tenderer.

4.0 GENERAL CO-ORDINATION

The Contractor shall be responsible for the coordination between the working forces of other organizations and utility companies in connection with this work. The Contractor shall have no cause of action against the Municipality or the Engineer for delays based on the allegation that the site of the work was not made available to him by the Municipality or the Engineer by reason of the acts, omissions, misfeasance or non-feasance of other organizations or utility companies engaged in other work.

5.0 RESPONSIBILITY FOR DAMAGES TO UTILITIES

The Contractor shall note that overhead and underground utilities such as hydro, gas, telephone and water are not necessarily shown on the drawings. It is the Contractor's responsibility to contact utility companies for information regarding utilities, to exercise the necessary care in construction operations and to take other precautions to safeguard the utilities from damage. All work on or adjacent to any utility, pipeline, railway, etc., is to be carried out in accordance with the requirements of the utility, pipeline, railway, or other, as the case may be, and its specifications for such work are to be followed as if they were part of this specification. The Contractor will be liable for any damage to utilities.

6.0 CONTRACTOR'S LIABILITY

The Contractor, his/her agents and all workmen or persons under his/her control including sub-contractors, shall use due care that no person or property is injured and that no rights are infringed in the prosecution of the work. The Contractor shall be solely responsible for all damages, by whomsoever claimable, in respect to any injury to persons or property of whatever description and in respect of any infringement of any right, privilege or easement whatever, occasioned in the carrying on of the work, or by any neglect on the Contractor's part.

The Contractor, shall indemnify and hold harmless the Municipality and the Engineer, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the contract.

7.0 PROPERTY BARS AND SURVEY MONUMENTS

The Contractor shall be responsible for marking and protecting all property bars and survey monuments during construction. All missing, disturbed or damaged property bars and survey monuments shall be replaced at the Contractor's expense, by an Ontario Land Surveyor.

8.0 MAINTENANCE OF FLOW

The Contractor shall, at his/her own cost and expense, permanently provide for and maintain the flow of all drains, ditches and water courses that may be encountered during the progress of the work.

9.0 ONTARIO PROVINCIAL STANDARDS

Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) shall apply and govern at all times unless otherwise amended or extended in these Specifications or on the Drawing. Access to the electronic version of the Ontario Provincial Standards is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web go to http://www.mto.gov.on.ca/english/transrd/. Under the title Technical Manuals is a link to the Ontario Provincial Standards. Users require Adobe Acrobat to view all pdf files.

10.0 APPROVALS, PERMITS AND NOTICES

The construction of the works and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced in this Contract. The Contractor shall obtain all approvals and permits and notify the affected authorities when carrying out work in the vicinity of any public utility, power, underground cables, railways, etc.

11.0 SUBLETTING

The Contractor shall keep the work under his/her personal control, and shall not assign, transfer, or sublet any portion without first obtaining the written consent of the Municipality.

12.0 TIME OF COMPLETION

The Contractor shall complete all work on or before the date fixed at the time of tendering. The Contractor will be held liable for any damages or expenses occasioned by his/her failure to complete the work on time and for any expenses of inspection, superintending, re-tendering or re-surveying, due to their neglect or failure to carry out the work in a timely manner.

13.0 TRAFFIC CONTROL

The Contractor will be required to control vehicular and pedestrian traffic along roads at all times and shall, at his/her own expense, provide for placing and maintaining such barricades, signs, flags, lights and flag persons as may be required to ensure public safety. The Contractor will be solely responsible for controlling traffic and shall appoint a representative to maintain the signs and warning lights at night, on weekends and holidays and at all other times that work is not in progress. All traffic control during construction shall be strictly in accordance with the **Occupational Health and Safety Act** and the current version of the **Ontario Traffic Manuals**. Access to the electronic version of the **Ontario Traffic Manual** is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web go to

http://www.mto.gov.on.ca/english/transrd/, click on "Library Catalogue," under the "Title," enter "Ontario Traffic Manual" as the search. Open the applicable "Manual(s)" by choosing the "Access Key," once open look for the "Attachment," click the pdf file. Users require Adobe Acrobat to view all pdf files.

Contractors are reminded of the requirements of the Occupational Health and Safety Act pertaining to Traffic Protection Plans for workers and Traffic Control Plan for Public Safety.

14.0 SITE CLEANUP AND RESTORATION

As part of the work and upon completion, the Contractor shall remove and dispose of, off-site any loose timber, logs, stumps, large stones, rubber tires, cinder blocks or other debris from the drain bottom and from the side slopes. Where the construction works cross a lawn, the Contractor shall take extreme care to avoid damaging the lawn, shrubs and trees encountered. Upon completion of the work, the Contractor shall completely restore the area by the placement and fine grading of topsoil and seeding or sodding the area as specified by the Engineer or Drainage Superintendent.

15.0 UTILITY RELOCATION WORKS

In accordance with Section 26 of the Drainage Act, if utilities are encountered during the installation of the drainage works that conflict with the placement of the new culvert, the operating utility company shall relocate the utility at their own costs. The Contractor however will be responsible to co-ordinate these required relocations (if any) and their co-ordination work shall be considered incidental to the drainage works.

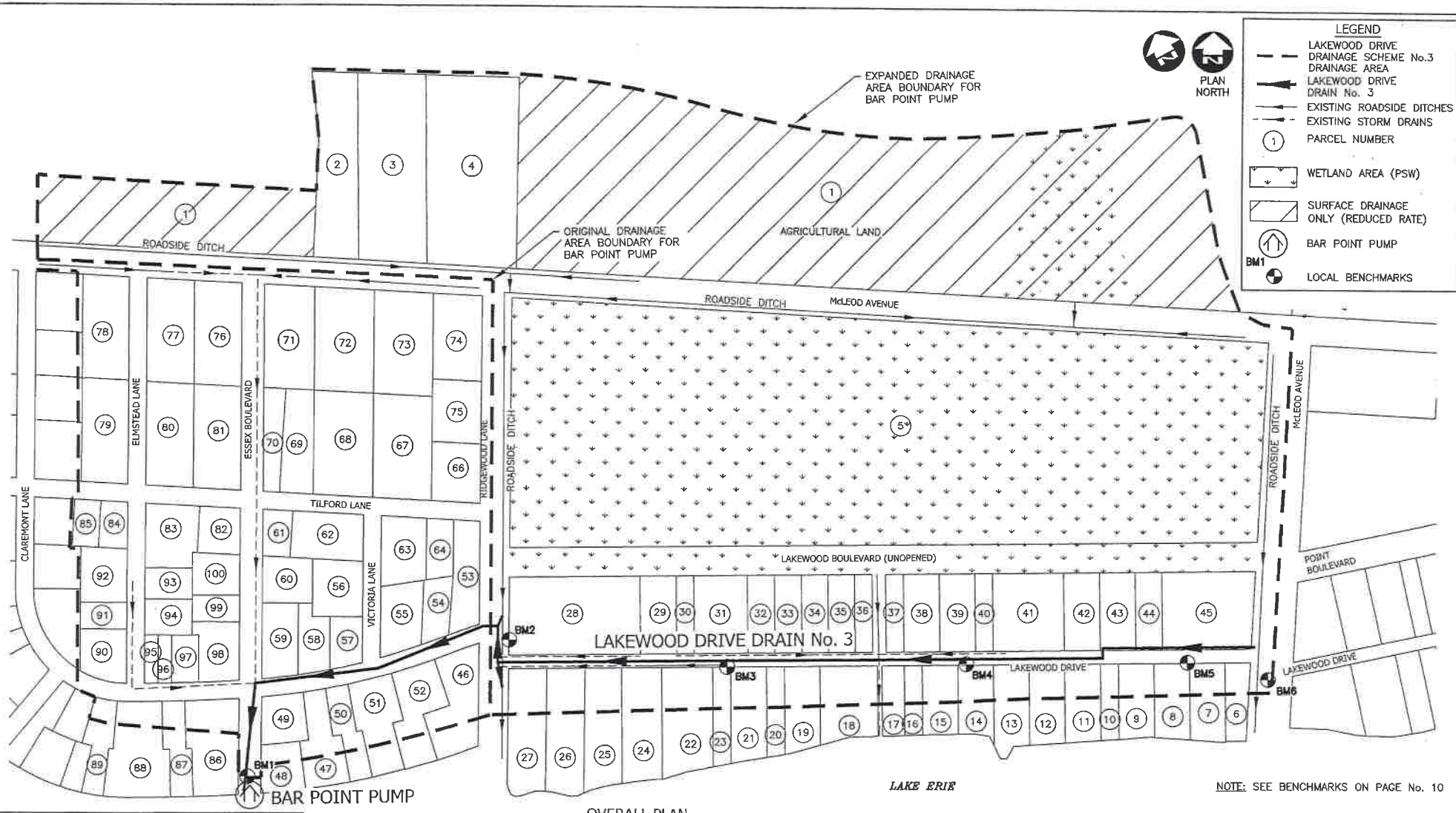
16.0 FINAL INSPECTION

All work shall be carried out to the satisfaction of the Drainage Superintendent for the Municipality, in compliance with the specifications, drawings and the Drainage Act. Upon completion of the project, the work will be inspected by the Engineer and the Drainage Superintendent. Any deficiencies noted during the final inspection shall be immediately rectified by the Contractor.

Final inspection will be made by the Engineer within 20 days after the Drainage Superintendent has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

17.0 FISHERIES CONCERNS

Standard practices to be followed to minimize disruption to fish habitat include embedment of the culvert a minimum 10% below grade, constructing the work 'in the dry' and cutting only trees necessary to do the work (no clear-cutting). No in-water work is to occur during the timing window unless otherwise approved by the appropriate authorities.



OVERALL PLAN
SCALE=1:2,500

NOTE: SEE BENCHMARKS ON PAGE No. 10

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DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE G'

Drainage Report for the
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE: OVERALL PLAN
PAGE NO.: 1 of 14

Jun 30, 2023 - 11:36am C:\pw working directory\projects 2020\33tro\dma054868\202190-03-DRN-CON.dwg

LAKEWOOD DRIVE AREA (NEW LANDS ADDED TO THE BAR POINT PUMPING SCHEME)	
PARCEL No.	LANDOWNER(S)
1	GEORGE H. & RUTH A. VANDENBRINK
2	RONALD BELWARD
3	ANTHONY R. & NASRA SMITH
4	STUART & EUGENIA SMITH
5	ESSEX REGION CONSERVATION AUTHORITY
6	JEFFERY D. & DONNA E. TOPLIFFE
7	GARRY FORTUNE
8	GARRY FORTUNE
9	SHERRY A. KEMSKI
10	MARLENE KEMSKI
11	MARLENE KEMSKI
12	FRANK M. & SIMON Y. SERES
13	PETER J. COURTNEY & BRENDA J. TURGEON
14	ALLAN R. & CYNTHIA S. MICKLE
15	DEBRA L. BALKWILL
16	JAMES K. BAKER & ROSALIE M. LEMIRE
17	ERWIN R. & CAROL A. PARE
18	ERWIN R. & CAROL A. PARE
19	MICHELLE S. & DARRIN J. LEWIS
20	SOLACE FARMS INC.
21	DANIEL & JENNIFER ACCETTA
22	BRADLEY S. & SHERRI L. NELSON
23	BARRY RIDDELL
24	LEON K. & NELLA BIESZK
25	STELLA D. & BRUCE A. MILKINS
26	FRANCESCO & GINA STORINO
27	ERHARD M. & JENNIFER BRAUSS
28	JOHN H. W. & KRISTI L. FARMER
29	DANIEL & MARY LOU VALLEAU
30	ADRIAN & JOANNE HARTE
31	RHYS E. ROBB & ANNE S. DRANSKI
32	MELISSA M. BEAUDOIN-LLOYD
33	JESSE & VANESSA E. DIGIOVANNI
34	JASON & STEFANIE L. KAMROCK
35	LANCE S. HUVER & KRISTY L. COLLINS
36	ERWIN R. L. & CAROL A. PARE
37	ERWIN R. L. & CAROL A. PARE
38	JAREMY & SHERI MAYVILLE
39	BRIAN & DEBBIE BALKWILL
40	GABRIELLA S. MONTELEONE
41	PENNIE L. MITCHELL
42	MARLENE KEMSKI
43	MARLENE KEMSKI
44	MARLENE KEMSKI
45	RYAN & SUSAN BONDY

EXISTING LANDS WITHIN THE BAR POINT PUMPING SCHEME	
PARCEL No.	LANDOWNER(S)
46	JAMES A. & MARY S. FERRAR
47	PAUL D. KELLY
48	SUZANNE, PATRICIA, MARA & RICHARD IGNATIUS & LINDA BELKIN
49	CHERYL M. WATSON & SIMA B. SPRACKMAN
50	CHRISTOPHER M. CHUMKO & JACQUELINE E. MICKLE
51	STEFAN & MIROSLAWA STARCZEWSKI
52	CHARLES LEONARD, MARY WHEELER & JOAN LENTINE
53	JOHN H. W. & KRISTI L. FARMER
54	MAUREEN O'SHEA
55	CRAIG A. & MARY J. WHEELER
56	JAY GARNER
57	JOHN D. GARNER
58	KARY M. & SHANNON D. COULSON
59	THOMAS G. & VALERIE WILSON
60	JODY F. GAGNON
61	PATRICIA L. LAFRAMBOISE
62	LAWRENCE N. & PATRICIA L. LAFRAMBOISE
63	REBECCA L. WIGLE
64	GORDON R. HOYT & ROBIN SKOV
66	RICHARD I. GILMOUR & BARBARA G. SENIOR
67	MATHEW M. DUBY & EMILY R. VANDENHAM
68	PATRICK H. & ANNETTE M. PETTYPIECE
69	DENIS LAROCQUE
70	GORDON R. CRAWFORD
71	RONALD S. & LORRAINE E. ROUSSEAU
72	LEONARD T. PARE
73	DANIEL E. DESCHAMPS & CYDNEY L. WALKER
74	KEVIN J. RACINE
75	JAMES & JUDY LENNON
76	TOWN OF AMHERSTBURG
77	TOWN OF AMHERSTBURG
78	BUD J. NAGTEGAAL & CHARITY CONRAD
79	LAWRENCE J. BACHMEIER
80	DAVID J. & MARY-ALICE BENETEAU
81	COULSON DESIGN BUILD
82	WILLIAM & JULIE ELLIS
83	PETER J. & BARBARA LOJEWSKI
84	ROGER G. & WENDY L. FRENETTE
85	BRETT W. & SHANNON D. COULSON
86	KATHRYN E. McNAMARA & MARK J. LIEDKE
87	JANICE E. & KENNETH R. GRICE
88	JAMES G. KENNEDY
89	MICHAEL B. & JUDITH A. McHALE
90	COLTON M. BRADT & CHELSEA N. HILL
91	CHARLES & LINDSY MacDOUGALL
92	BRADELY B. & CAROLINE. B. COGHLIN
93	KENNETH ROBSON
94	HILDEGARD FRANZ & CAMERON ELLIS
95	MAEGAN A. STEPHANS
96	MAEGAN A. STEPHANS
97	BRENT M. CHARLEBOIS
98	MAURICE & MARGARET A. NAGTEGAAL
99	PAUL & BREE TOLE
100	JAMES N. & TANYA L. SINASAC

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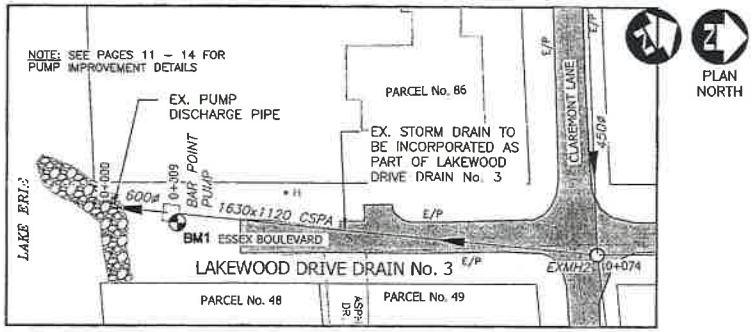
Drainage Report for the
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE	LANDOWNERS INFORMATION
PAGE NO	2 of 14

LEGEND

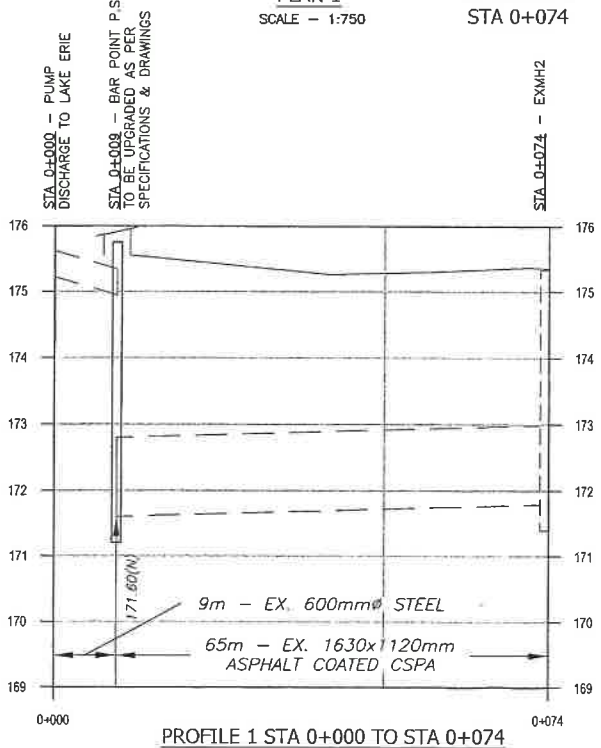
- 525ø — PROPOSED DRAIN
- 300ø — EXISTING DRAINS
- MH9 — NEW MAINTENANCE HOLE
- EXMH — EX. MAINTENANCE HOLE
- CB — NEW/REPLACE CATCH BASIN
- CB — EXISTING CATCH BASIN
- SAN — EX. SANITARY SEWER
- W — EX. WATERMAIN
- G — EX. GASLINE
- C — EX. COMMUNICATIONS UTILITY
- BM1 — LOCAL BENCHMARKS



PLAN 1
SCALE – 1:750

SEE PLAN 2
STA 0+074

NOTES:
1. DRAINAGE INFRASTRUCTURE BETWEEN STA. 0+000 AND STA. 0+234.5 TO BE INCORPORATED UNDER DRAINAGE WORKS
2. FOR ELEVATION CONTROL, REFER TO SITE BENCHMARKS ON PAGE 10



PROFILE 1 STA 0+000 TO STA 0+074
SCALE – HORZ.=1:750
VERT.=1:75

SEE PROFILE 2

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SHEET TITLE: PLAN & PROFILE 1
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PAGE NO. 3 of 14

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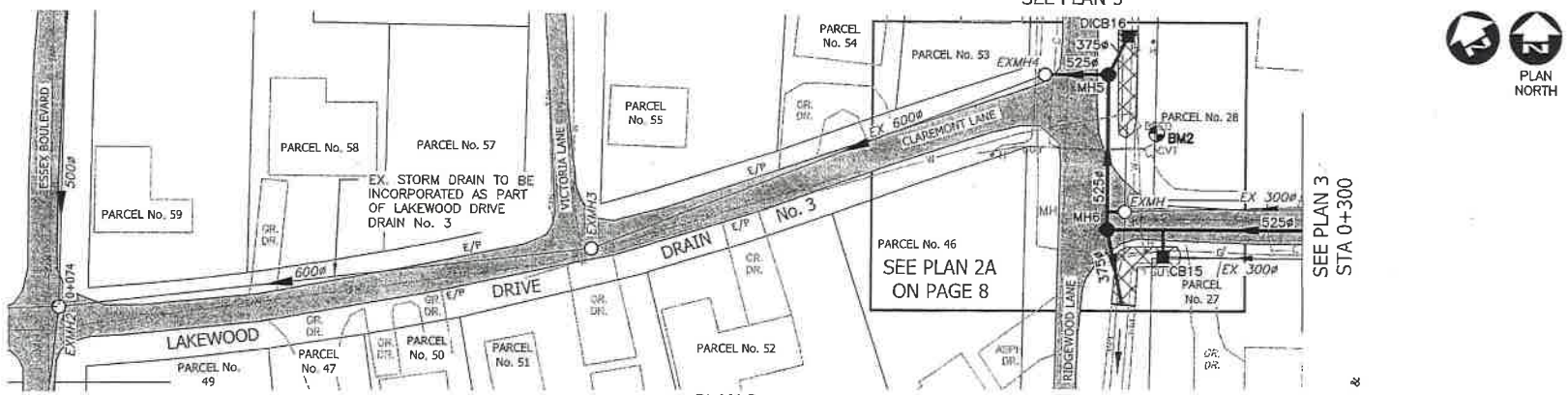
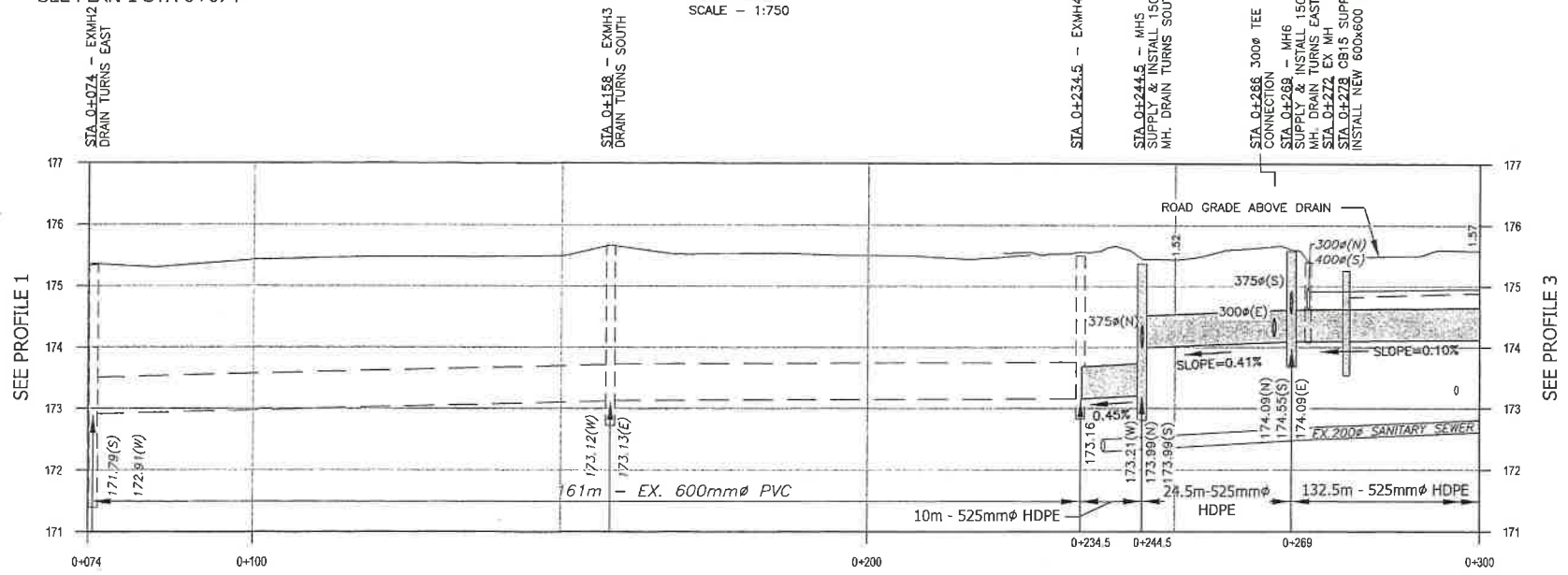


PLAN 2

SCALE – 1:750



PROFILE 2 STA 0+074 TO STA 0+300

SCALE – HORZ.=1:750
VERT.=1:75

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Drainage Report for the
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE: PLAN & PROFILE 2

PAGE NO. 4 of 14

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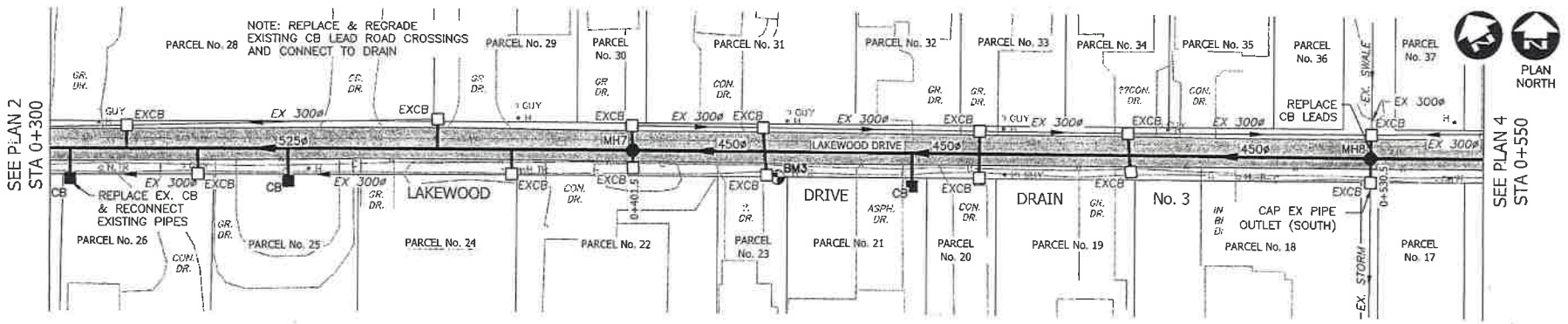
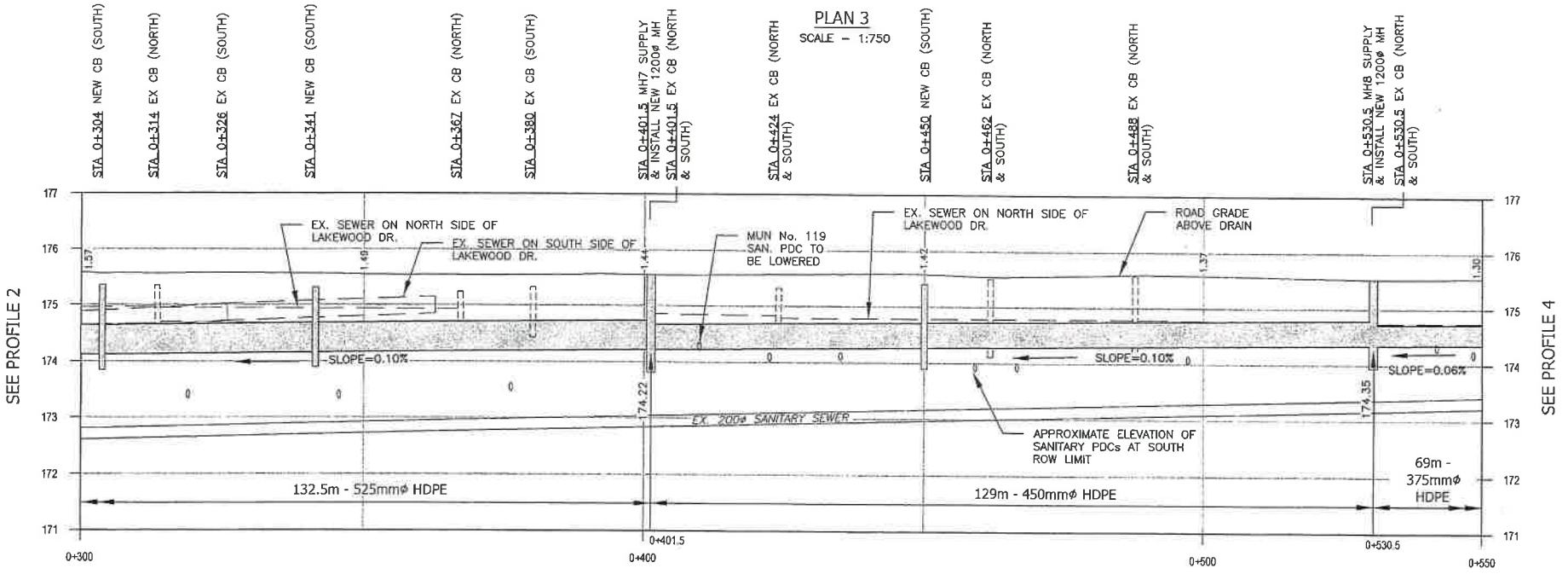


PLAN 3
SCALE – 1:750



PROFILE 3 STA 0+300 TO STA 0+550
SCALE – HORZ.=1:750
VERT.=1:75

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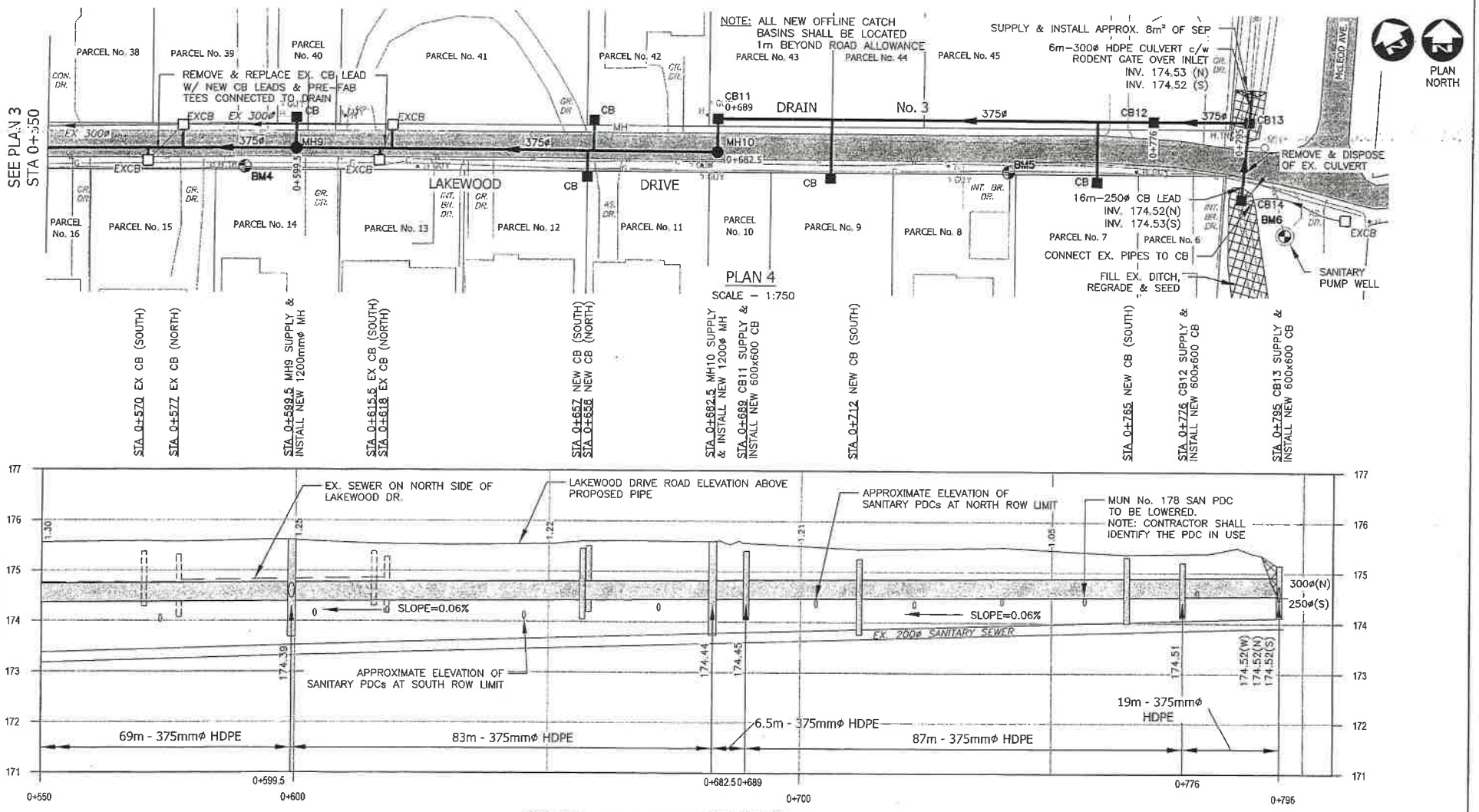
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE: PLAN & PROFILE 3

PAGE NO. 5 of 14

Jun 30, 2023 – 12:46pm C:\pw working directory\projects 2020\33ro\dma05486\202190-03-DRN-DES.dwg



PROFILE 4 STA 0+250 TO STA 0+560

SCALE – HORZ.=1:750
VERT.=1:75

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Drainage Report for the
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE	PLAN & PROFILE 4
PAGE NO	6 of 14

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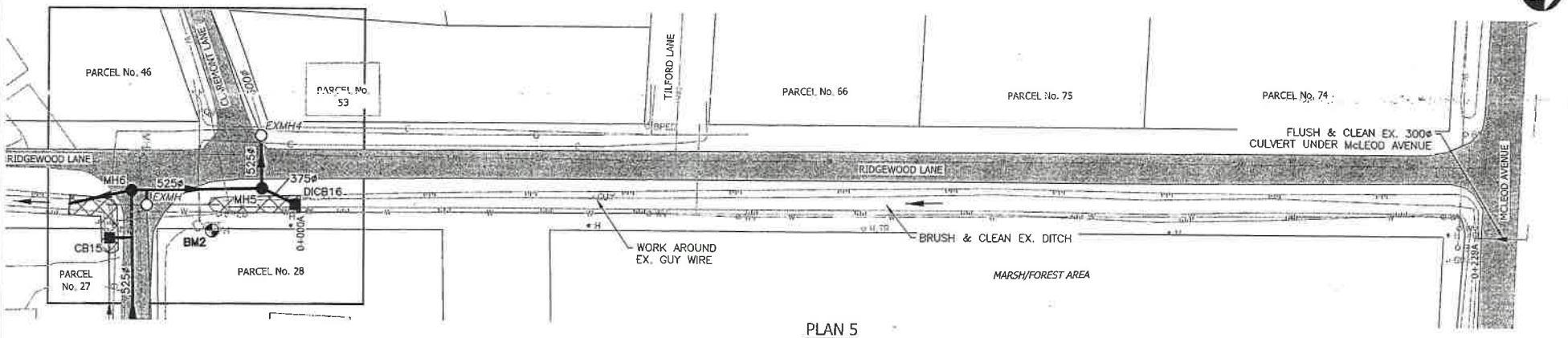
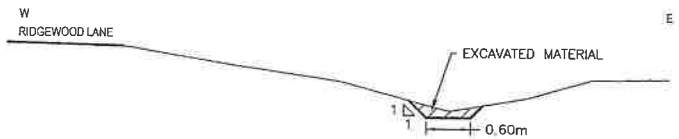
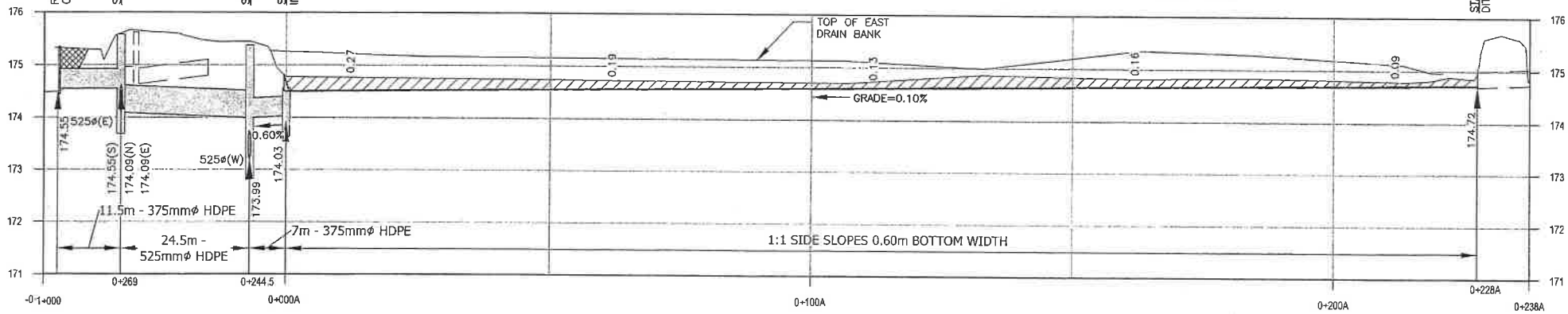
SEE PLAN 2A
ON PAGE 8



PLAN 5
SCALE – 1:750



RIDGEWOOD LANE DITCH SECTION
SCALE – N.T.S.



PROFILE 5 RIDGEWOOD LANE DITCH
SCALE – HORZ.=1:750
VERT.=1:75

'SCHEDULE G'

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Drainage Report for the
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Town of Amherstburg

SHEET TITLE: PLAN & PROFILE 5

PAGE NO. 7 of 14

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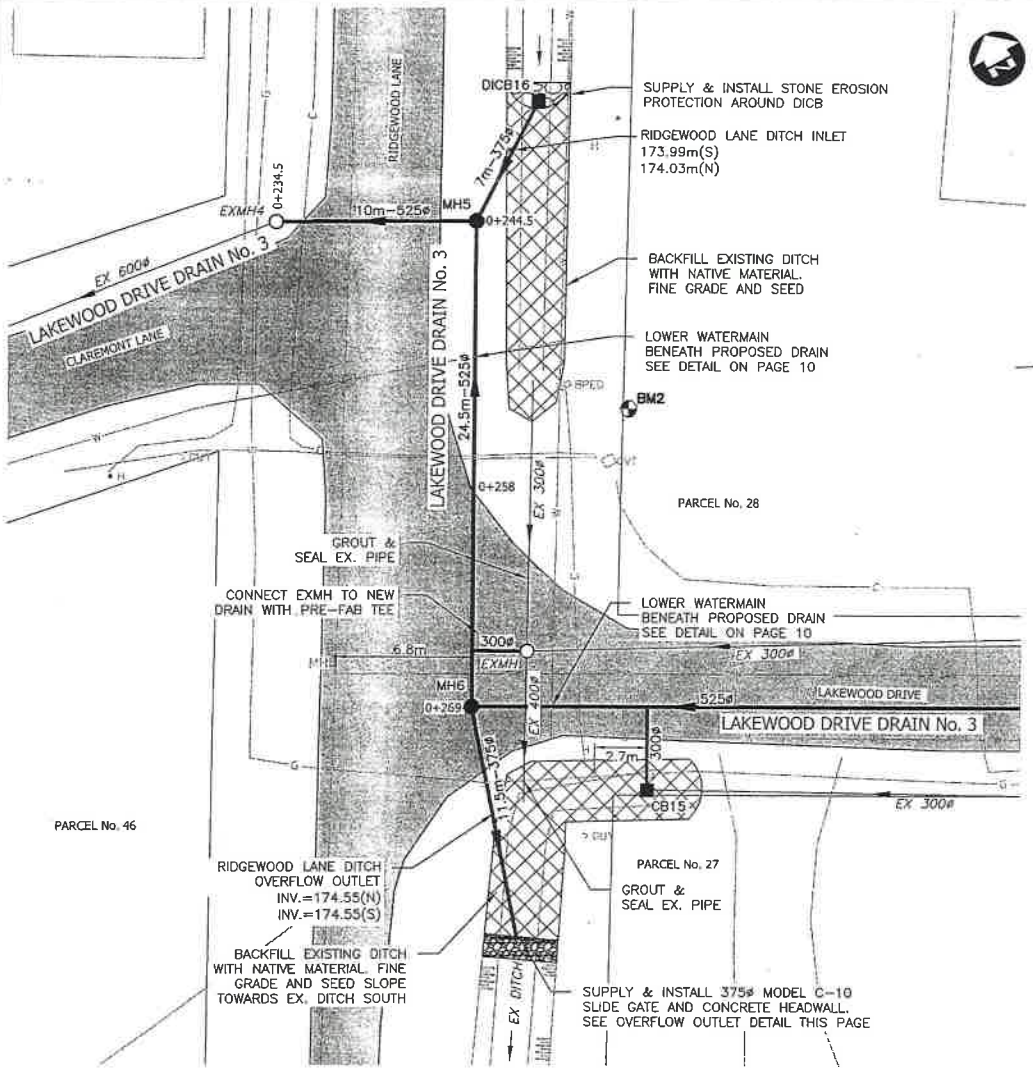
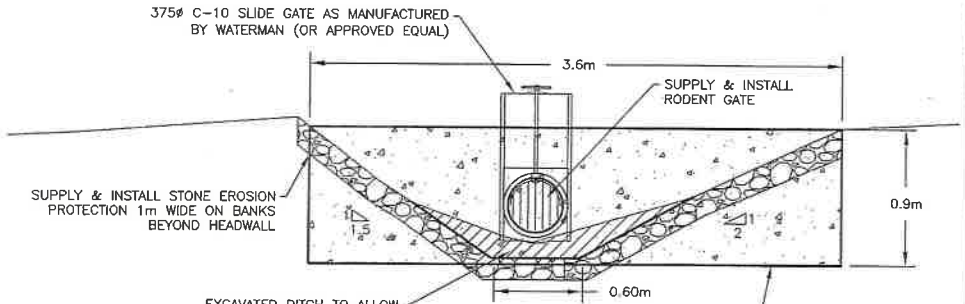


PLAN NORTH

PLAN 2

SCALE – 1:250



OVERFLOW OUTLET DETAIL

SCALE – N.T.S.

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Drainage Report for the
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Town of Amherstburg

SHEET TITLE: PLAN 2A

PAGE NO. 8 of 14

Jun 30, 2023 - 12:57pm C:\pw working directory\projects 2020\33ha\dms8548651\202190-03-DRN-DES.dwg

TABLE 1 - STRUCTURE DETAILS

STRUCTURE No.	STATION (m)	SIZE (mm)	RIM ELEVATION (m)	OFFSET FROM ROAD EP (m)	INVERT ELEVATION (m) INLETS	OUTLETS
MH5	0+244.5	1500ø	175.37	1.8	N. INV 173.99 (375ø)	W. INV 173.21 (525ø)
					W. INV 173.99 (525ø)	
MH6	0+269	1500ø	175.57	N/A	E. INV 174.09 (525ø)	N. INV 174.09 (525ø)
						S. INV 174.55 (375ø)
MH7	0+401.5	1200ø	175.56	1.9	E. INV 174.22 (450ø)	W. INV 174.22 (525ø)
					N. INV 174.45 (200ø)	
					S. INV 174.45 (200ø)	
MH8	0+530.5	1200ø	175.53	1.9	E. INV 174.35 (375ø)	W. INV 174.35 (450ø)
					N. INV 174.35 (200ø)	
					S. INV 174.35 (200ø)	
MH9	0+599.5	1200ø	175.61	1.7	E. INV 174.39 (375ø)	W. INV 174.39 (375ø)
					N. INV 174.39 (200ø)	
MH10	0+682.5	1200ø	175.58	1.5	N. INV 174.44 (375ø)	W. INV 174.44 (375ø)
CB11	0+689	600x600	175.40	8.1	E. INV 174.45 (375ø)	S. INV 174.45 (375ø)
CB12	0+776	600x600	175.25	8.6	E. INV 174.51 (375ø)	W. INV 174.51 (375ø)
CB13	0+795	600x600	175.20	10.8	N. INV 174.52 (300ø)	W. INV 174.52 (375ø)
					S. INV 174.52 (250ø)	
CB14	0+795	600x600	175.46	4.6	E. INV 175.00 (150ø)	N. INV 174.53 (250ø)
					E. INV 174.90 (150ø)	
CB15	0+278	600x600	175.25	2.6	E. INV 174.49 (300ø)	N. INV 174.26 (300ø)
DICB16	0+000A	600x1200 TYPE 'B'	174.50	4.7	–	S. INV 174.03 (375ø)

NOTES:
- OFFSET FROM ROAD EP (m) MEASUREMENT IS FROM RIDGEWOOD LANE EAST EDGE OF PAVEMENT
- OFFSET FROM ROAD EP (m) MEASUREMENT IS FROM LAKEWOOD DRIVE SOUTH EDGE OF PAVEMENT
- SEE TIE–IN DIMENSIONS ON PLAN 2A (PAGE 8) FOR STRUCTURE LOCATION

TABLE 2 - OFFSET CATCH BASIN DETAILS

STATION	SIZE (mm)	LOCATION	TOP ELEV. (m)	INV. (m) HDPE LEAD PIPE @ CB
0+304	600x600	SOUTH SIDE	175.30	174.30 (200mmø)
0+341	600x600	SOUTH SIDE	175.30	174.34 (200mmø)
0+450	600x600	SOUTH SIDE	175.40	174.45 (200mmø)
0+599.5	600x600	NORTH SIDE	175.45	174.55 (200mmø)
0+657	600x600	SOUTH SIDE	175.45	174.58 (200mmø)
0+658	600x600	NORTH SIDE	175.50	174.58 (200mmø)
0+712	600x600	SOUTH SIDE	175.25	174.62 (200mmø)
0+765	600x600	SOUTH SIDE	175.30	174.65 (200mmø)

NOTES:
- CBs AS PER OPSD 705.010 WITH MINIMUM 300mm SUMP AND HEAVY DUTY GALVANIZED GRATING
- CATCH BASIN LEADER PIPES TO BE 200ø HDPE BOSS 2000 (OR APPROVED EQUAL) UNLESS OTHERWISE NOTED
- DICB TO HAVE 2:1 SLOPED GRATES
- DICB AS PER OPSD 705.030 & 705.040 TYPE 'B'
- MHs AS PER OPSD 701.010 WITH 300mm SUMP AND FLAT CAP TOPS AS PER OPSD 701.030. FRAME & GRATE AS PER OPSD 401.010 TYPE B
- OFFSET CB RIM ELEVATIONS TO MATCH EXISTING GRADE
- OFFSET CBs TO BE 1m OFFSET OF PROPERTY LINE OUTSIDE OF LAKEWOOD DRIVE RIGHT–OF–WAY
- TRENCH BOX TO BE USED DURING PIPE INSTALLATION EXCEPT WHERE UTILITY CROSSINGS PREVENT ITS USE, OTHER MEANS OF TRENCH SUPPORT WILL BE REQUIRED.

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1	CLIENT REVIEW	20 APR 23	TRO

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DRAWN: OEM | CHECKED BY: LRO
DATE: June 27, 2023
SCALE: AS SHOWN
DRAWING SCALES BASED ON A 11"X 17" SHEET

DILLON CONSULTING

PROJECT NO. 20-2190

'SCHEDULE G'

Drainage Report for the LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE: STRUCTURE DETAILS

PAGE NO. 9 of 14

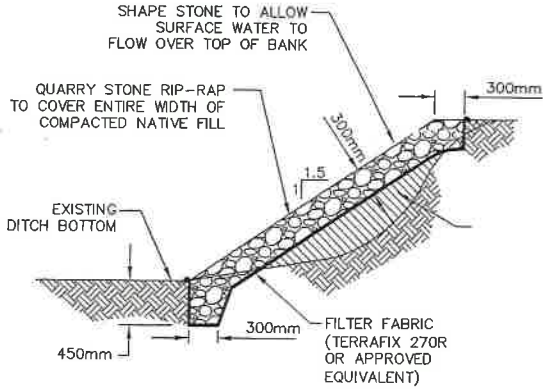
Jun 30, 2023 - 11:38am C:\pw working directory\projects 2020\35tro\dma05488\202190-03-DRN-CON.dwg

SITE BENCHMARKS

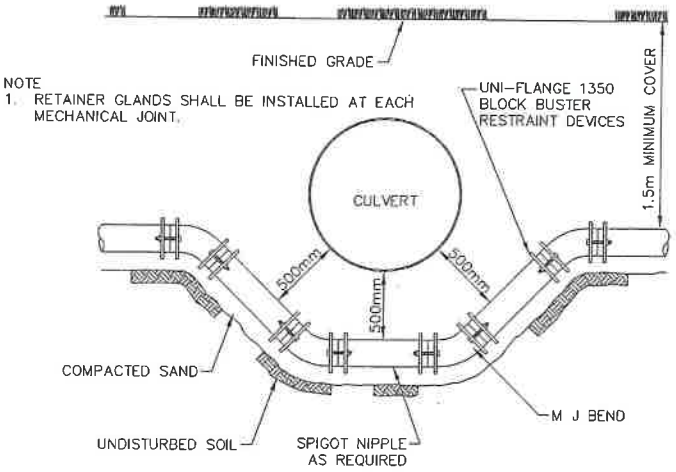
BM1–NORTH EAST CORNER OF FINISHED FLOOR OF PUMPHOUSE.
ELEVATION=176.50m
BM2–TOP OF OPERATING NUT ON FIRE HYDRANT ON PROPERTY MUNICIPAL No. 104 LAKEWOOD DRIVE
ELEVATION=176.21m
BM3–TOP OF OPERATING NUT ON FIRE HYDRANT ON PROPERTY MUNICIPAL No. 121 LAKEWOOD DRIVE
ELEVATION=176.372m
BM4–TOP OF OPERATING NUT ON FIRE HYDRANT ON PROPERTY MUNICIPAL No. 149 LAKEWOOD DRIVE
ELEVATION=176.375m
BM5–TOP OF OPERATING NUT ON FIRE HYDRANT ON PROPERTY MUNICIPAL No. 175 LAKEWOOD DRIVE
ELEVATION=176.430m
BM6–CENTRE OF SANITARY PUMP CHAMBER LID.
ELEVATION=176.352m

NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.

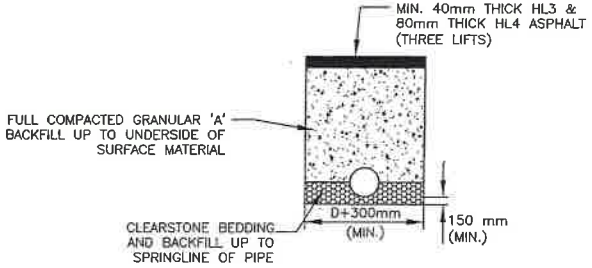
NOTES:
1. FOR DESIGN INFORMATION ON CATCH BASINS AND MAINTENANCE HOLES, SEE TABLES 1 & 2 ON PAGE 9
2. CONTRACTOR TO RESTORE ALL LANDSCAPING DISTURBED FROM CONSTRUCTION
3. CONTRACTOR SHALL ARRANGE TO HAVE ALL UTILITY LOCATES COMPLETED ONSITE PRIOR TO ANY EXCAVATION WORK. DILLON CONSULTING LIMITED DOES NOT GUARANTEE THE ACCURACY OF THE EXISTING UTILITIES SHOWN ON THE DRAWINGS. CONTRACTOR IS TO VERIFY THE LOCATION PRIOR TO COMMENCING WORK



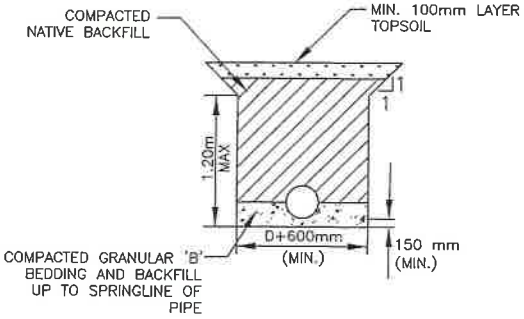
TYPICAL DITCH BANK WASHOUT DETAIL w/ BACKFILLING & RIP-RAP
SCALE – NTS



TYPICAL WATERMAIN LOWERING DETAIL
SCALE – NTS



TYPICAL TRENCH DETAIL: WITHIN ROADWAYS & DRIVEWAYS
SCALE – NTS



TYPICAL TRENCH DETAIL: BEYOND ROADWAYS & DRIVEWAYS
SCALE – NTS

'SCHEDULE G'

LICENSED PROFESSIONAL ENGINEER
T. R. OLIVER
100046433
27/06/23
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OEM	LRO
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DILLON CONSULTING

PROJECT NO. 20-2190

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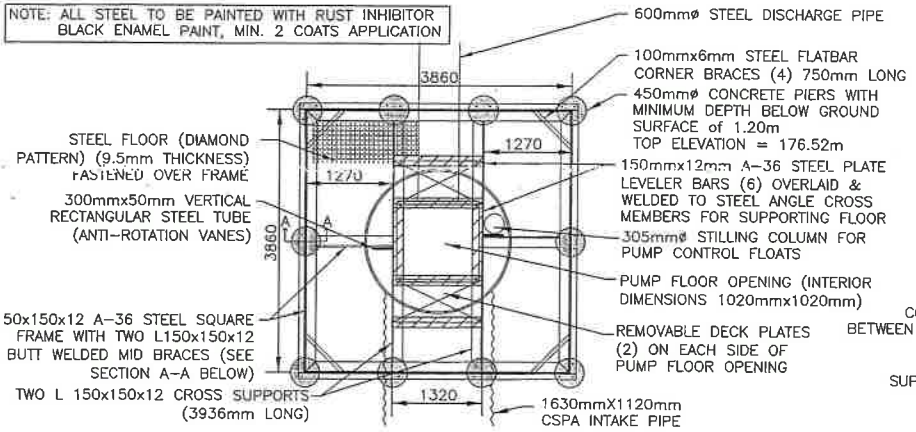
Drainage Report for the LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE MISCELLANEOUS DETAILS

PAGE NO. 10 of 14

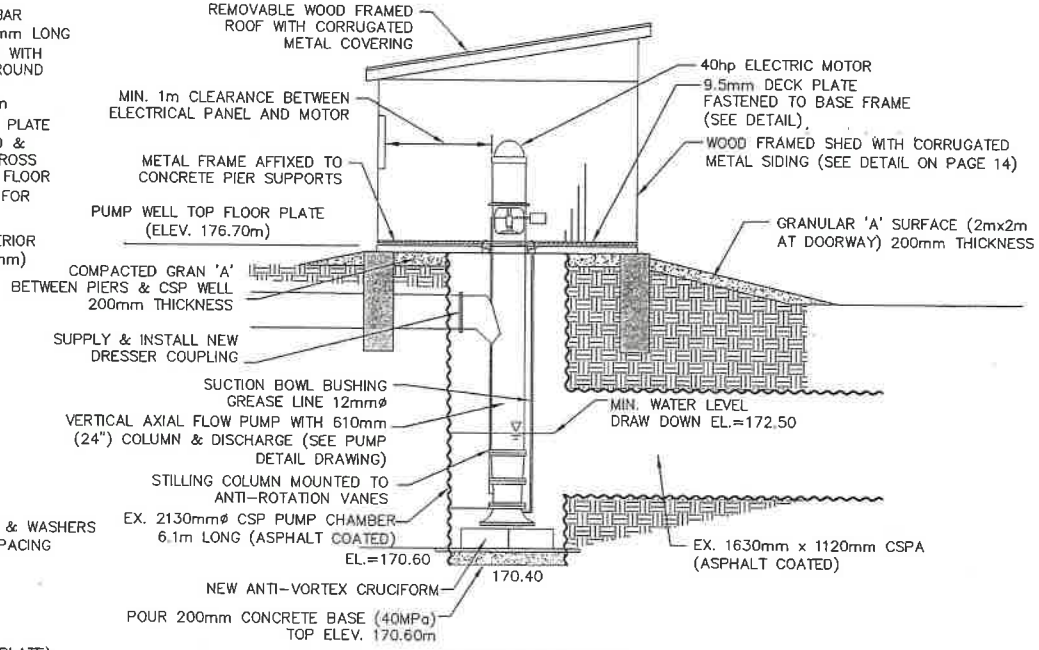
Jun. 30, 2023 - 11:41am C:\pw working directory\projets 2020\33tro\dms05468\202190-03-DRN-CON.dwg

NOTE: ALL STEEL TO BE PAINTED WITH RUST INHIBITOR BLACK ENAMEL PAINT, MIN. 2 COATS APPLICATION



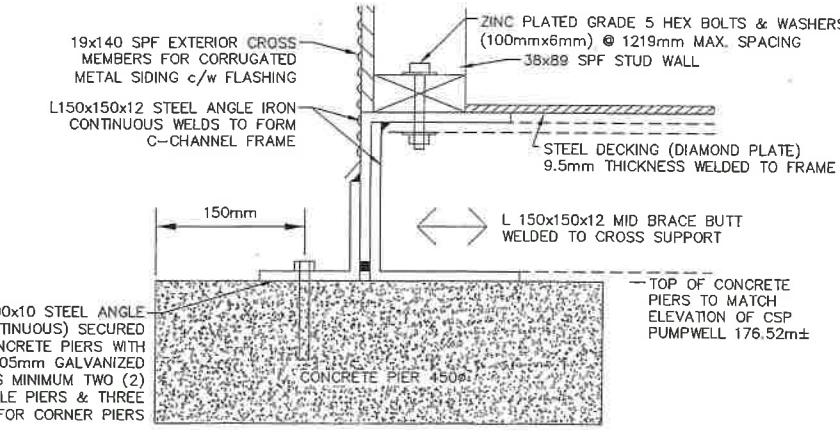
PUMP FLOOR FRAMING DETAIL

SCALE – NTS



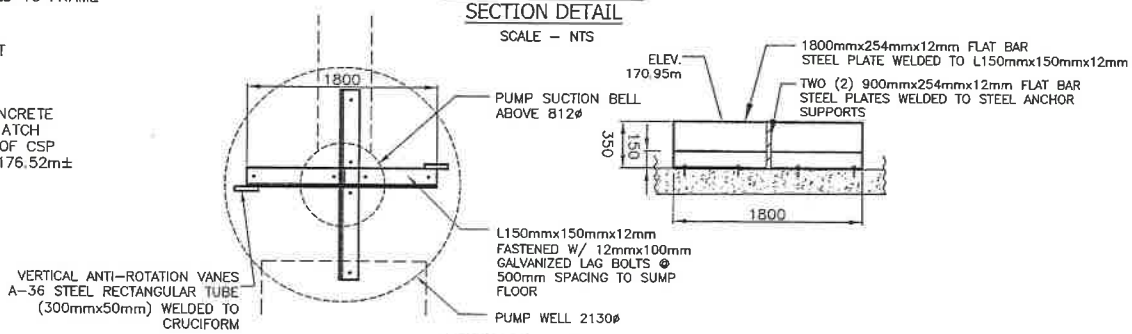
PUMP LONGITUDINAL SECTION DETAIL

SCALE – NTS



PUMP BUILDING FOUNDATION DETAIL - SECTION A-A

SCALE – NTS



ANTI-VORTEX CRUCIFORM DETAIL

SCALE – NTS

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Drainage Report for the
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

SHEET TITLE: PUMP DETAILS 1

PAGE NO. 11 of 14

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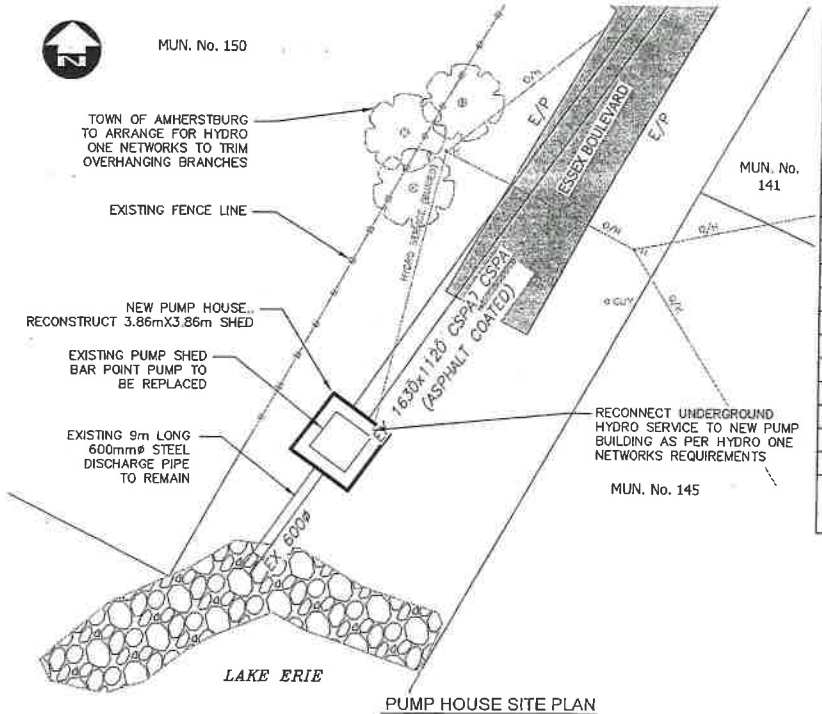
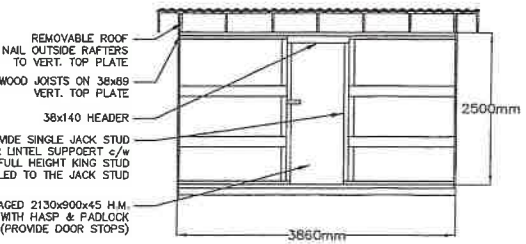


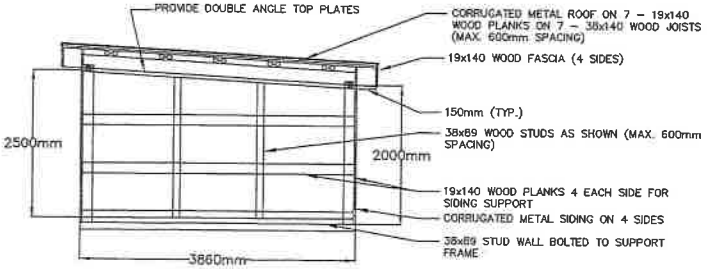
PUMP HOUSE SITE PLAN
N.T.S.

TABLE 1 – PUMP DESIGN INFORMATION

DESCRIPTION	PUMP SPECIFICATIONS
PUMP MANUFACTURER	LO–LIFT
PUMP MODEL NO.	#2017
DISCHARGE SIZE	0.610m (24")
COLUMN SIZE	0.610m (24")
PUMP BOWL SIZE	0.508m (20")
COLUMN & DISCHARGE PIPE THICKNESS	---
MIN. CAPACITY (USGPM)@3.66m (12') TDH	8000
RPM	900
BHP	32
PROPELLER PITCH NO.	0.80P
DISCHARGE & SUCTION BOWL MATERIAL	CAST IRON CL–30
PROPELLER MATERIAL	BRONZE
BUSHINGS & BEARINGS MATERIAL	BRONZE
LINE SHAFT MATERIAL	C–1045 STEEL
SHAFT BEARING MATERIAL	BRONZE
BOWL SHAFT MATERIAL	416 STAINLESS STEEL
LUBRICATION	OIL LUBE INCL. STAINLESS STEEL GREASE LINE TO SUCTION BOWL BEARING

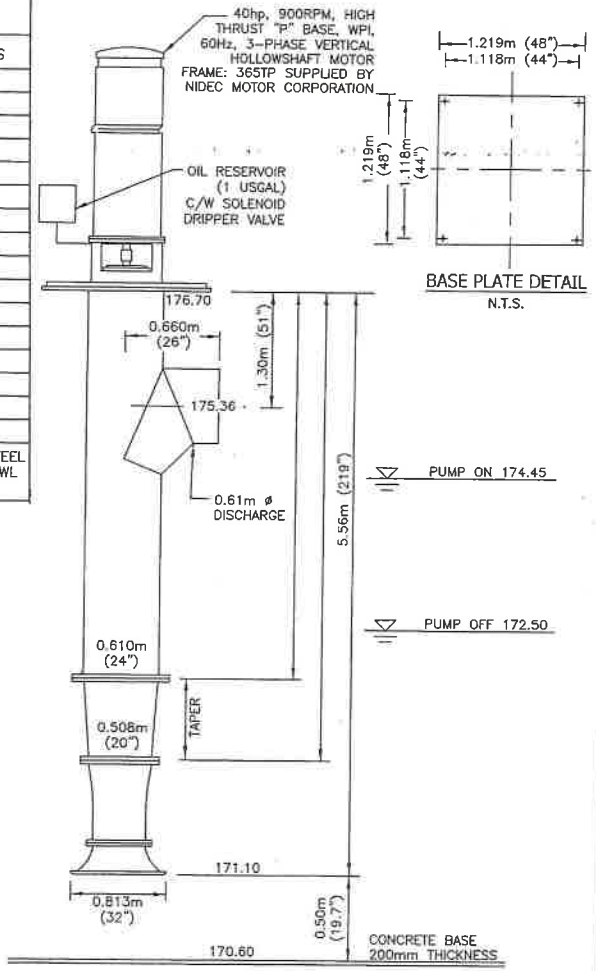


PUMPHOUSE NORTH ELEVATION
N.T.S.



PUMPHOUSE WEST ELEVATION
N.T.S.

PROVIDE 19mm PLYWOOD BACKER BOARD FOR ELECTRICAL PANEL BOXES & CONTROLS



BASE PLATE DETAIL
N.T.S.

PUMP DETAIL
N.T.S.

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'SCHEDULE G'

Drainage Report for the
LAKEWOOD DRIVE DRAIN No. 3 & PUMPING SCHEME
Town of Amherstburg

PROJECT NO. 20-2190

SHEET TITLE: PUMP DETAILS 2

DRAWING SCALES BASED ON A 11" X 17" SHEET

PAGE NO: 12 of 14

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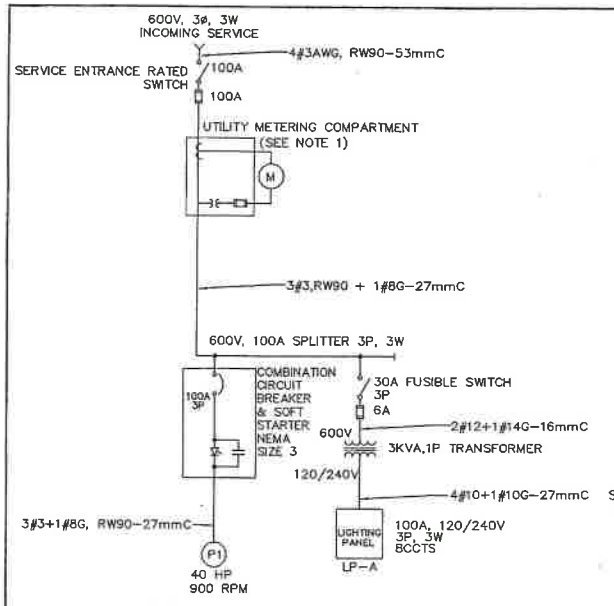
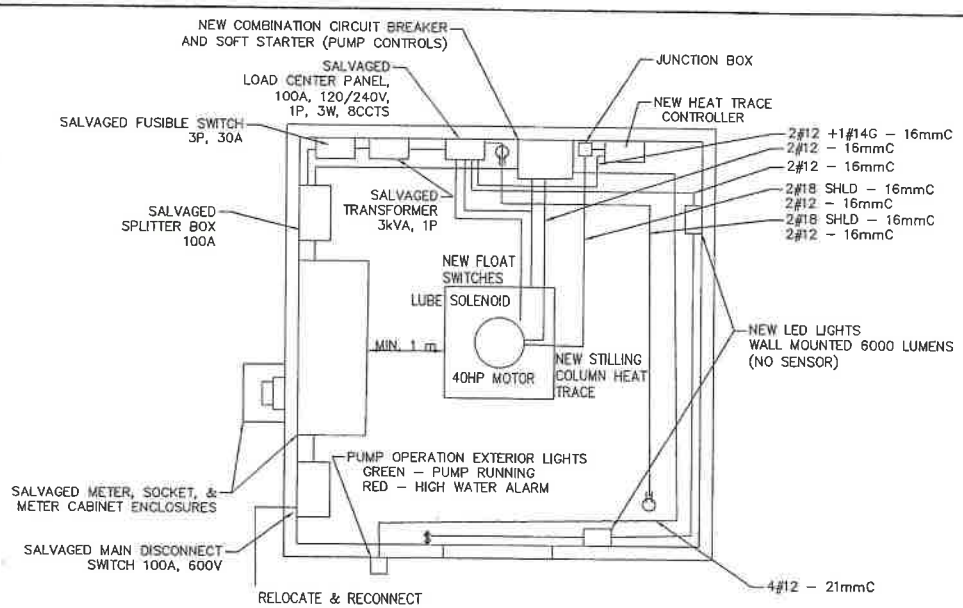


ONE LINE DIAGRAM

SCALE – NTS

NOTES:

1. COORDINATE METERING REQUIREMENTS WITH HYDRO ONE
2. RATING OF SOFT STARTERS TO BE CONFIRMED BASED ON FINAL PUMP FULL LOAD PRIOR TO ORDERING.

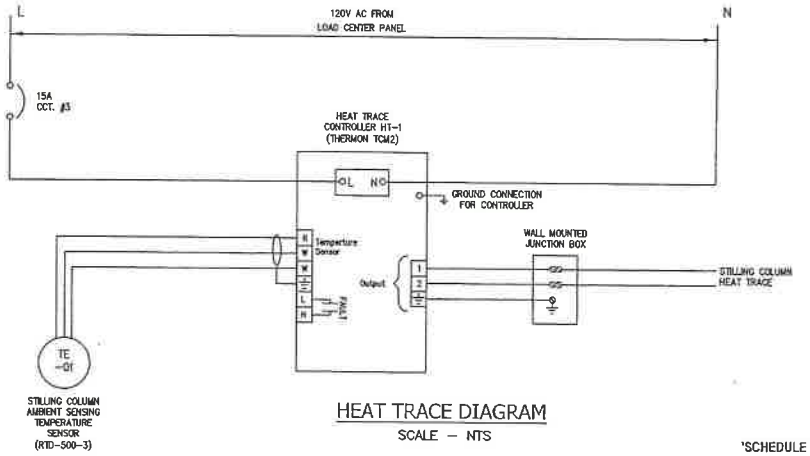


PUMPHOUSE PLAN - POWER

SCALE – NTS

LOAD CENTER PANEL 100A, 120/240V, 1PH, 3W 8 CCTS.					
LOAD	DESCRIPTION	100A		DESCRIPTION	LOAD
	INDOOR LIGHTING	1 — 15A	15A — 2	RECEPTACLES	
	HEAT TRACE	3 — 15A	15A — 4	FLOAT SWITCHES	
	EXTERIOR LIGHTS/CONTROLS	5 — 15A	15A — 6	LUBE SOLENOID	
	SPARE	7 — 15A	15A — 8	SPARE	

* ALL LIGHTING AND RECEPTACLE SWITCHES TO BE CLEARLY LABELED.



HEAT TRACE DIAGRAM

SCALE – NTS

'SCHEDULE G'

GEN. NOTES AND SPECIFICATIONS

1. WIRE AND CABLE
   - POWER WIRES SHALL BE STRANDED COPPER WITH 600V INSULATION TYPE RW90, T90 NYLON (#12 AWG MINIMUM).
   - CONTROL WIRES SHALL BE STRANDED COPPER WITH 600V INSULATION TYPE T90 NYLON (#14 AWG MINIMUM).
   - INSTRUMENTATION WIRES SHALL BE TWISTED PAIR(S) STRANDED COPPER WITH 300V INSULATION, INDIVIDUAL SHIELDS, OVERALL SHIELD, TINNED DRAIN WIRE AND PVC JACKET (#18 AWG MINIMUM).
2. BOXES AND ENCLOSURES
   - ALL EEMAC 12 INDOORS AND EEMAC 4X SS OUTDOORS
   - PULL BOXES AND JUNCTION BOXES SHALL BE CODE GAUGE SHEET STEEL OF WELDED CONSTRUCTION WITH SCREW-ON COVER.
3. CONDUIT AND FITTINGS
   - ALL CONDUIT SHALL BE RIGID HOT DIPPED GALVANIZED STEEL WITH TAPERED THREADS UNLESS OTHERWISE NOTED.
   - CONDUIT FITTINGS SHALL BE CAST FERALLOY OR FERROUS ALLOY CADMIUM PLATED. COVERS SHALL BE OIL-RESISTANT SYNTHETIC GASKETS.
   - CONDUIT AND ALL FITTINGS SHALL BE THREADED FIVE FULL TURNS – RUNNING THREADS NOT PERMITTED.
   - FLEXIBLE CONDUIT FOR FINAL CONNECTIONS TO EQUIPMENT OR MOTORS SHALL BE SEALTITE PVC-COVERED WITH SEPARATE GROUND WIRE.
4. DISCONNECT SWITCHES (SALVAGED)
   - HEAVY-DUTY INDUSTRIAL TYPE, QUICK-MAKE, QUICK-BREAK WITH PROVISION FOR 3 PADLOCKS. EATON 100A, 600V
5. FUSES
   - FOR FEEDERS, USE EEMAC 1, CLASS R, HRC, BUSSMANN FUSETRON FRS OR APPROVED EQUAL.
   - FOR MOTOR STARTERS, USE NON-RENEWABLE HIGH INTERRUPTING (100,000 AMPS MIN.) DUAL-ELEMENT BUSSMANN FUSETRON OR AS REQUIRED BY MANUFACTURER.
6. DISTRIBUTION TRANSFORMER (SALVAGED)
   - WESTINGHOUSE 3KVA, DRY TYPE, TOTALLY ENCLOSED, 600V PRIMARY, 120/240V SECONDARY, 1-PHASE, 3-WIRE, 60 HZ.
7. LIGHTING PANEL (SALVAGED)
   - 100A MAINS, 120/240V, 1-PHASE, 3-WIRE, 60HZ, BOLT-ON BRANCH BREAKERS (MINIMUM 10,000A INTERRUPTING RATING SYMMETRICAL), SURFACE MOUNTED WITH TRIM AND HINGED LOCKING DOOR. NEMA 1, WITH DRIP SHIELD. SQUARE 'D' TYPE NQOB.
8. REDUCED VOLTAGE SOFT STARTERS
   - SOLID STATE STARTER OF SIZE, TYPE AND RATING AS INDICATED IN NEMA 3R ENCLOSURE WITH COMPONENTS AS FOLLOWS:
     1 FULLY SOLID STATE CONTROL FOR SOFT START AND SOFT STOP OF PUMPS
     .2 INTEGRAL FULLY RATED BYPASS CONTACTOR SELECTABLE SOFT-START OR BYPASS MODE
     .3 DIGITAL INTERFACE MODULE MOUNTED ON DOOR WITH CONTROL, MONITORING AND PROGRAMMING FUNCTIONS
     .4 MOTOR OVERLOAD PROTECTION IN EACH PHASE, MANUALLY RESET BUTTON FROM OUTSIDE OF ENCLOSURE
     .5 HAND-OFF-AUTO SELECTOR SWITCH WITH AUXILARY CONTACT FOR REMOTE INDICATION
     .6 ONE N.O. CONTACT FOR TIME DELAY RELAY, ONE N.C. CONTACT FOR FAULT INDICATION (RED PILOT LIGHT) AND ONE N.O. CONTACT FOR RUNNING INDICATION (GREEN PILOT LIGHT).
     .7 COMBINATION SOFT START WITH CIRCUIT BREAKER

   APPROVED MANUFACTURERS: EATON, CUTLER-HAMMER OR APPROVED EQUAL SOFT STARTER ENCLOSURE CLASS ECS9552DAG-SB11+N66N3S, INCL. OPTION C400T120-K c/w INTERNAL 24VDC POWER SUPPLY
9. HEAT TRACE
   - HEAT TRACE CONTROLLER SHALL BE THERMON TYPE TCM2 WITH SINGLE POLE SOLID STATE RELAY, GROUND FAULT PROTECTION, 120V, IN NEMA 4X FIBREGLASS ENCLOSURE THERMON CAT# TCM2-1-SSR30A/2R-120-1-1P2-0-1-P/2 OR APPROVED EQUAL, C/W AMBIENT SENSING RTD-500-3
   - HEAT TRACE CABLE SHALL BE THERMON TYPE MIO MINERAL INSULATED CABLE S/MIQ-20EIH-15/28/378/120/16/12/6 OR APPROVED EQUAL MIQ JUNCTION BOX MODEL MIQ-PJBRP-TB-4 WALL MOUNTED
10. LUBE SOLENOID
    - 120V SOLENOID VALVE C/W INTEGRAL SIGHT FEED (NORMALLY CLOSED VALVE) CONNECT ACROSS DRIVE LINE OR START SWITCH
    - GRAVITY FLOW C/W KNURLED ADJUSTMENT, 1/8" COPPER TUBING

LICENSED PROFESSIONAL ENGINEER
T. R. OLIVER
100046433
27/06/23
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Town of Amherstburg

SHEET TITLE: PUMP ELECTRICAL - LAYOUT PLAN

PAGE NO: 13 of 14

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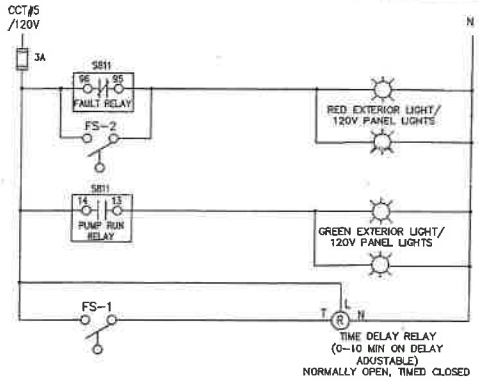
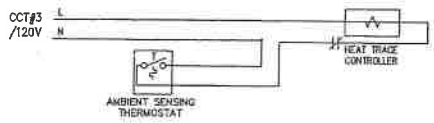


FLOAT SWITCH RELAY SCHEMATIC

N.T.S.

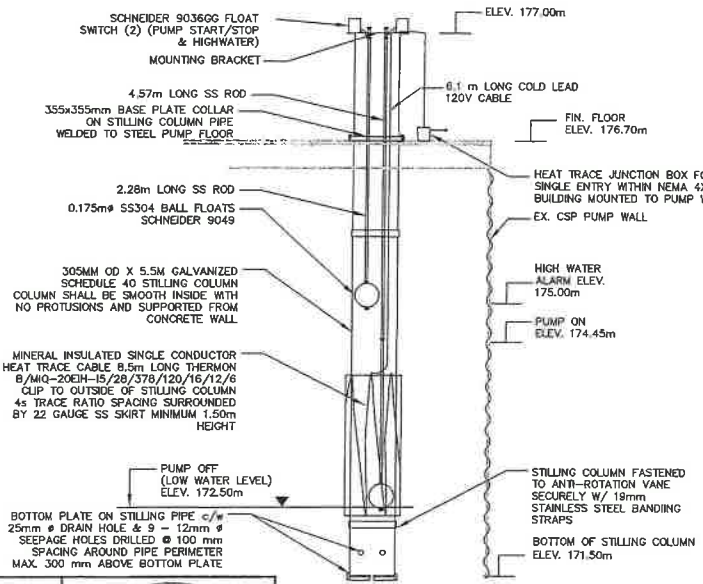


HEAT TRACE SCHEMATIC

N.T.S.

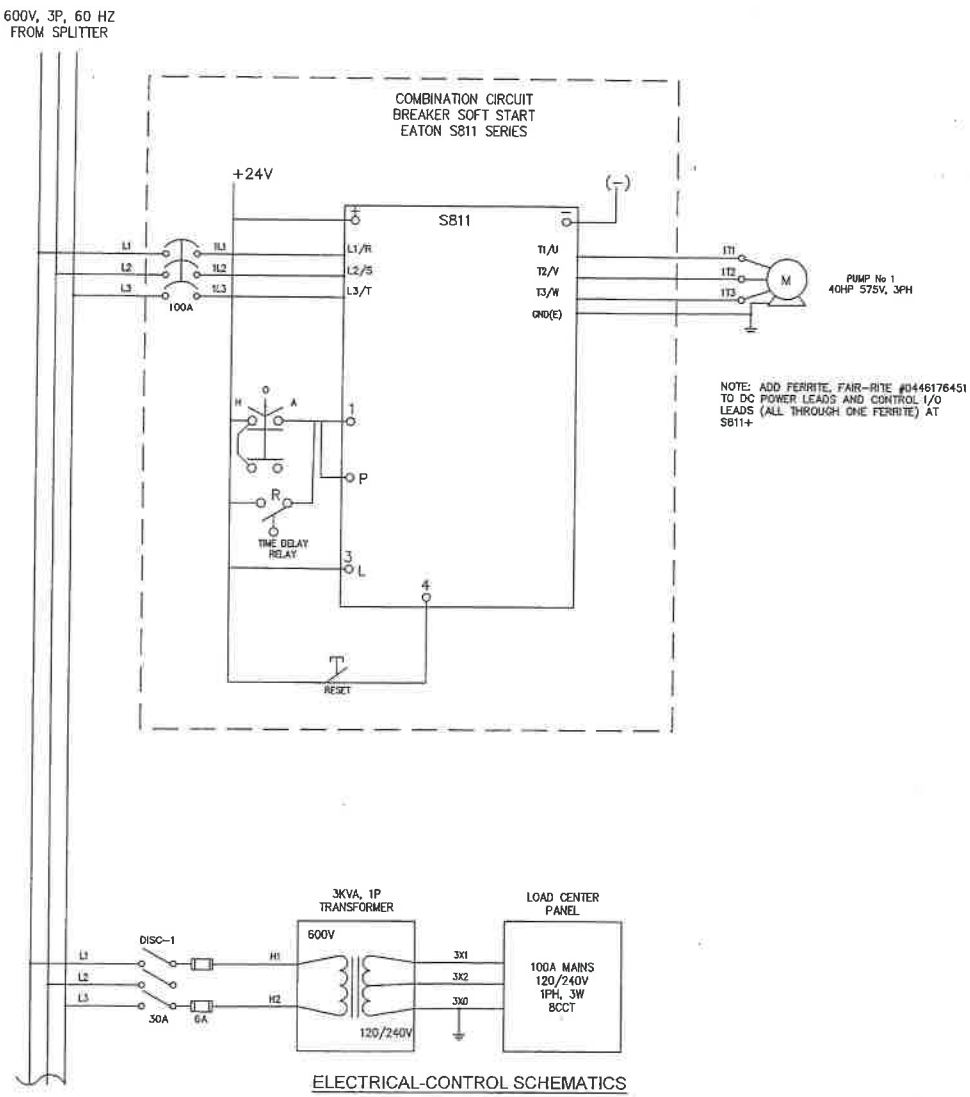
SOLENOID RELAY SCHEMATIC

N.T.S.



STILLING COLUMN (FLOAT CONTROLS)

N.T.S.



ELECTRICAL-CONTROL SCHEMATICS

N.T.S.

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T. R. OLIVER
100046433
27/06/23
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PROJECT NO 20-2190

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LAKEWOOD DRIVE DRAIN No. 3 &
PUMPING SCHEME
Town of Amherstburg

SHEET TITLE PUMP ELECTRICAL - CONTROLS

PAGE NO 14 of 14

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BONDY-BASTIEN DRAIN

(Geographic Township of Anderdon)

(PWD-MD-2011-039)

Town of Amherstburg

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

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

REI Project 2012D018
May 12th, 2023

May 12th, 2023

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

Mayor Prue and Members of Council:

BONDY-BASTIEN DRAIN
PWD-MD-2011-039
Project No. REI2012D018
Town of Amherstburg, County of Essex

I. INTRODUCTION

In accordance with the instructions received from you by letter of August 16th, 2012, from Lou Zarlenga, P.Eng., your former Director of Engineering & Infrastructure, we have prepared the following report that provides for the repair and improvement of the Bondy-Bastien Drain. The proposed work includes bridge replacements that are intended to provide new residential and farm accesses for the lands along the course of the drain, in Part of Lots 36 to 42, Front Concession, in the geographic township of Anderdon. It extends from the Townline Road southerly to County Road 20, crosses the road and then continues southerly for an approximate total length of 1372 metres (4500') to outlet into the Canard River at the back of the lots of M.N. 1993, 1999 and 2005. The Bondy-Bastien Drain is an open drain with eighteen existing access bridges. The drain was constructed pursuant to the Drainage Act. Plans showing the Bondy-Bastien Drain alignment, as well as the general location of the above-mentioned bridges, is included herein as part of the report.

Our appointment and the works related to the repair and improvement of the Bondy-Bastien 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 repair and improvement of the Bondy-Bastien Drain, and we report thereon as follows.

II. BACKGROUND

From our review of the Town drainage files, we have determined that the Bondy-Bastien Drain was last fully repaired and improved under an Engineer's Report dated January 15th, 1959

prepared by C.G.R. Armstrong, P.Eng. Said report noted that the drain was constructed under his report dated September 19th, 1940. The improvements included in the 1959 report consisted of drain cleaning and improvement, brushing and grubbing of the open drain and lowering of access bridges.

The January 17th, 1979 report by Ed LaFontaine, P.Eng. did the upper 640 metres (2100') of the drain stopping near the south limit of the first parcel crossed by the drain on the east side of County Road 20. The report included one (1) bridge replacement for Ron Bondy near Station 2+50 using 750mm (30") dia. corrugated steel pipe (C.S.P.) and cleaning of three (3) other culverts and lowering of one (1) of these culverts. Excavation material was placed on the east side of the drain.

A 1990 report by Ed LaFontaine, P.Eng. was never adopted because it was set aside by an appeal to the Tribunal and there was no further action taken on the report.

We have utilized the plans within said reports to establish the size parameters for the drain and the details to be used in establishing the replacement bridge culvert installations. We have also used these Engineers' reports to establish the drain profile grades, and to assist us in establishing the design grade for the subject access bridge installations. We have also reviewed the assessment schedules in the reports and the affected areas set out in said reports were used in confirming the watershed and sizing of the replacement bridges.

III. PRELIMINARY EXAMINATION AND ON-SITE MEETING

After reviewing the available drainage information and documentation provided by the Drainage Superintendent, we arranged with Town staff to schedule an on-site meeting for September 5th, 2012. The following people were in attendance at said meeting: John Orton, Gord Hadrian, Jan Standon, Mike Speller, Barb & Ed Pare, George Bousaba, Matt Chappus, Barbara Halls, Lucille Bondy, Eric Chamberlain (Manager Public Works & Municipal Drainage) and Gerard Rood (Rood Engineering). Mr. Chamberlain did an introduction and noted that the current governing reports are the January 15th, 1959 report by C.G.R. Armstrong, P.Eng. for the entire drain and the report dated January 17th, 1979 by Ed LaFontaine, P.Eng. that did the upper 2100 feet (640 metres) of the drain. He noted that bridges are failing and there are owner concerns with drainage of agricultural lands.

Mr. Hadrian commented that a lot of owners had done some filling of the drain in order to cross to the other side. He paid for the culvert in front of his lands. He has observed that the Canard River is choked at the County Road 20 crossing and weeds are choking the drain. To offset some of the concern with drainage another outlet has been opened at the north end.

Mr. Chappus expressed concerns with others who have raised their lands and caused more flooding on his lands. Both the road and private lands contribute to flows so that his land is under

water now. He was also concerned about the embankment of the roadway. There was discussion of the road and road ditch improvements. Mr. Hadrian commented that the last cleanout of the drain caused flooding. Mr. Chamberlain responded that during the last meeting on the site, they walked a portion of the drain, and a blockage was discovered and subsequently removed. Another owner commented that the Canard River end of the drain needs to be dug out. Digging the drain outlet helped out the drainage last time and if the end is not cleaned out the drain won't function. Mr. Hadrian said that an owner near the outlet wanted to dig out the drain for irrigation and that crops were lost until the drain was opened up to the Detroit River.

Mr. Chappus questioned what would happen if the pipe under the County Road collapsed. One of the owners responded that Sandwich West (Town of LaSalle) had opened up the drain behind them along the Townline Road. Mr. Hadrian observed that the drain on the west side of the road is relatively dry while water sits in the portion east of the County Road. Mr. Chappus asked if the drain could now be split, and Mr. Hadrian replied that the County seldom responds. Mr. Chamberlain explained that the County can petition or put in a notice for drainage works. He pointed out that the County is only responsible for the water from their roadway. Mr. Hadrian stated that before the Ministry of Transportation Ontario (M.T.O.) raised the road there were no standing water problems.

Mr. Chappus asked about lawyer involvement with the project. Mr. Pare responded that the lawyers were at the Tribunal hearing for the last report. His feeling is that if the drain were cleaned it would work better. He went on to state that the 1959 report is outdated because of the bridge installed over the Canard River, the raising of many lands and the large number of new houses. Mr. Chamberlain reminded the owners that the 1979 report only did the upstream portion and no work since then. Mr. Pare commented that the drain has changed especially with Sandwich West (Town of LaSalle) opening up the drain along the Townline Road. As a result, the Pare and Hadrian lands now drain west to the Detroit River. Mr. Chamberlain advised that he and the engineer can meet with those owners after the on-site meeting to review this condition.

Alternatives for the repair and improvement of the drain were discussed. Mr. Rood asked if the owners were considering a pump and Mr. Hadrian responded that this was discussed at the Tribunal hearing. Mr. Pare stated that Eric Chamberlain had been contacted about back up from the Detroit River. The area on the north side of the Townline Road was discussed and the owners stated that there were various dykes and berms in place. Mr. Chamberlain suggested that the drain needs to be dammed off so that flows cannot come south through the drain. Mr. Hadrian stated that they do not want the drain dug out as it may bring flows from the Canard River north to flood them. He has seen the Canard often flood the adjacent fields and owners can't raise them because of the wetlands in the area. It was suggested by Mr. Hadrian that the drain needs to be cleaned out and also the Canard River downstream to the Detroit River. He noted that the drainage of the two large parcels owned by Hadrian and Pare has been taken north to the Townline Road to outlet westerly to the Detroit River. This was done around 1990. Mr. Rood asked about installing a flap gate at the south outlet to control backflows, but no interest was

expressed in this. There were concerns about the culverts under the highway being too low and not working and filling in of the road ditches when the watermain was installed. Three years ago, the drain used to be dry along the road, but now there is standing water near the road all the time. The Hadrian and Pare parcels to the north now have a dry drain and no mosquito problems since the connection to the Townline Road drainage.

It was suggested by Mr. Chappus that the drain should be blocked off at the roadway. He had concerns with a flap gate at the Canard River outlet being a constant maintenance problem and believes that isolating the two drain sections at the road would be more effective in relieving some of the concerns.

Mr. Chamberlain suggested that a draft report be prepared. The levels in the drain and the bridges would be checked. The report would be discussed with the owners and then a final report prepared to submit to Council for consideration at a public meeting. He asked if there were any tiles to be addressed through the proposed works. None of the owners were aware of any tiles on the farms. It was noted that the culvert serving the Bousaba property at MN 2065 has partially collapsed and a portion was removed to try and restore some of the drainage.

The owners were advised 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 each owner. The parcel served by the bridge and the upstream lands and roads would each be required to pay for part of the cost of the replacement access bridge construction, as well as all the cost for the preparation of the Engineer's Report. The future sharing of the bridge maintenance would be established in the Report with any extra length beyond the standard required for a 6.1 metre top width to be borne by the owner.

The overall drainage report procedure, future maintenance processes and grant eligibility were generally reviewed with the owners. Debentures were discussed and some clarification provided on the cost sharing for the bridge work. The owners 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 and Forestry (M.N.R.F.), and the Essex Region Conservation Authority (E.R.C.A.). Owners are advised now that the Ministry of Environment, Conservation and Parks (M.E.C.P.) is also involved in regulations and biology requirements for works in regulated areas. The timing window restriction from March 15th to June 30th prohibiting in-water work was discussed. We further discussed bridge maintenance, sizing, and material of the proposed replacement bridges. We explained that the Town of Amherstburg standard for pipe material is high density polyethylene (H.D.P.E.) for pipes 900mm diameter and smaller and galvanized corrugated steel pipe for larger sizes, but we recommended that aluminized steel pipe should be used to extend the service life of the steel pipes.

Following the meeting, Mr. Chamberlain and Mr. Rood met with Gord Hadrian, Ed Pare and John Orton at the Hadrian driveway crossing of the drain. The owners pointed out where the drain had

been dug from the driveway north to the Townline Road in 1990 using plans that showed the required levels. Mr. Hadrian and Mr. Pare offered to replace their culverts at their own cost. It was pointed out that the road ditch flows westerly along the driveway to the drain and there are two other ditches that convey water westerly to the drain, and the water then flows north and west to the Detroit River. The owners observed that the water level in the Detroit River is usually lower than the level in the Canard River because of its shallow depth, narrow bridge and weed obstructions. After the last cleaning of the Municipal drain, the Canard River flooded back upstream, and they lost their crops. Subsequent to the Tribunal Hearing, the owners worked with the Town of LaSalle to connect the drain to the ditch along the Townline Road.

Mr. Pare suggested that they did not want the existing Municipal drain. Mr. Chamberlain pointed out that they could use the Municipal drain and it could be updated to outlet north and west to the Detroit River. Mr. Pare asked about doing a private drain. Mr. Chamberlain pointed out that this would require an agreement between all the owners in order to do any work and the County Road 20 drainage has to be considered as well. The Drainage Act provides the most convenient method of handling the drainage for the area. Mr. Pare reiterated that they do not want water from the east side of the roadway. Mr. Hadrian believes that portion of the drain has more severe problems than the portion serving their lands.

The drain was inspected across the Hadrian and Pare lands as well as the portion along the Townline Road extending to the Detroit River. Mr. Pare pointed out that he had raised his lands with a permit from E.R.C.A. to reduce the risk of flooding. The owners were advised that the drain along the Townline Road would be surveyed out to the Detroit River as part of the work. The design will give consideration to damming or blocking off the north portion from the south portion at the road crossing. The owners were advised that some survey work will be done along the road and the line ditches to establish flow patterns.

Mr. Chamberlain and Mr. Rood then went on to inspect the Bousaba bridge and checked the drain outlet at the Canard River. The south end of the drain was dry and choked with phragmites, even though the drain at the east side of the County Road 20 crossing had standing water.

IV. FIELD SURVEY AND INVESTIGATIONS

Following the on-site meeting we arranged for our survey crew to attend at the site and perform a topographic survey, including taking the necessary levels and details to establish the design parameters for the installation of the replacement access bridges.

A bench mark was looped from previous work carried out on the drain and was utilized in establishing site bench marks near the location of each bridge. We surveyed the drain both upstream and downstream of the proposed access bridge replacements and picked up the existing bench marks and culvert elevations in order to establish a design grade profile for the

installation of the replacement bridges. We also took cross-sections of the Bondy-Bastien Drain at the general location of the proposed bridge replacements and along the complete length, as necessary for us to complete our design calculations, cost estimates and specifications. The survey work was carried out from the outlet in the Canard River, northerly along the drain and across County Road 20 to the Townline Road, and thence westerly to the outlet of the Townline Road ditch into the Detroit River.

A Ministry of Natural Resources (M.N.R.F.) Species at Risk review of the Town agreement with M.N.R.F. pursuant to the Endangered Species Act, 2007 was carried out for this project. We reviewed the E.R.C.A. requirements and D.F.O. Species at Risk mapping for fish and mussels and submitted a request to E.R.C.A. for review and comment on any matters related to E.R.C.A. requirements.

For the purposes of establishing the watershed area upstream of the proposed bridge replacements, and determining the pipe sizes required, we investigated and reviewed the Engineer's Report of C.G.R. Armstrong on the Bondy-Bastien Drain dated January 15th, 1959, which included a Schedule of Assessment. We also reviewed the report by E.O. LaFontaine dated January 17th, 1979.

Biology investigations revealed Pugnose Minnow as a threatened species and its habitat as concerns at the outlet of the drain to the Canard River. We then worked with former Town Drainage Superintendent Shane McVitty and biology consultants to establish how to address this in order to carry out the drain repairs and improvements in consultation with the Ministry of Environment, Conservation and Parks (M.E.C.P.). Mitigation measures and procedures were established and Permit #SW-C-002-19 was issued to the Town by M.E.C.P. for proceeding with the works.

Due to the delays in getting the M.E.C.P. permit, there have been some changes to the drainage works. We coordinated with Town Drainage Superintendent Sam Paglia to set up a second on-site meeting on March 17th, 2023. The following people were in attendance: John Palesh, Eddie & Barb Pare, Simon Bondy, Jon Ashe, Walter Afanasiew, Marc Bond (representing Elizabeth Durocher), Don Hearn, Matt Bridgen, Joe Bondy, Ron Bondy, M. Chappus, Kuodor Elsaghir, Sam Soucie, Mark Fishleigh (County of Essex), Sam Paglia (Drainage Superintendent), Tina Mailloux (Rood Engineering), and Gerard Rood (Rood Engineering). Mr. Paglia did introductions and explained that this was a courteous meeting for getting updates to and from the owners. He noted that the owners are responsible for the project costs with drainage works being a community project. The works are governed by the Drainage Act and the Town has to maintain municipal drains. The drainage report and by-law provide authorization for the work that needs to be done and roads will also be assessed. There are charges for Outlet Liability as all lands need to take their flows to a sufficient outlet. Mr. Rood did a summary of the proposed works and the procedures that had to be followed to get the M.E.C.P. approval.

Mr. Paglia advised that Bridge 9 and 10 sizing needs to be confirmed as the pipe was removed to reduce blockage and upstream ponding. Mr. Rood explained that a "temporary" bridge replacement can typically be proceeded with. Mr. Paglia elaborated on the procedures for this. The split of the drain was clarified and explained with the pipe under County Road 20 to be blocked off and the drain to the east side flowing south to the Canard River and the drain to the west side of the road flowing north and west to the Detroit River. The report will provide an assessment schedule for future maintenance to the drain. The construction assessment schedule will include Benefit, Outlet Liability and Special Benefit costs to affected parcels and roads. The assessment for Benefit was explained based on the Drainage Act definition. Outlet Liability was explained with the value based on the runoff factor of a parcel and its location along the drain.

An owner advised that their yard is flooded, and Mr. Paglia explained that each owner is responsible for bringing their drainage to the outlet that is available and the drain that takes the flows to a sufficient outlet. Mr. Rood explained that the phragmites will be removed along the drain. Mr. Paglia elaborated on the assessment schedule that will be included in the drainage report. Owners can appeal their assessment to the Drainage Board and upstream lands typically have somewhat higher assessments. An owner stated that the parcel at the southeast side of the drain near Malden Road – County Road 8 has no County Road outlet. Mr. Paglia explained that an owner can connect to the drain with surface water being able to access the drain. If there is an ongoing problem, the owner can petition for a municipal drain. Past records are used for establishing flows that need to be handled and the watershed of a drainage system. An owner needs permission to change the watershed outlet that is being used.

Timeline information was requested by an owner. Mr. Paglia explained the work schedule and that the drainage report is near the end of being prepared. The Town acts when the drainage report is received. Copies are sent out to the owners or distributed as required. The report is considered at a Drainage Board meeting and owners can challenge the work details. When the report is accepted, a provisional by-law is prepared. The Court of Revision is typically scheduled approximately 40 days after that. The Court can address any appeals that are made, and owners can ask for clarifications. An owner asked if they have to pay directly for the work invoice and Mr. Paglia explained that a debenture is available to spread the cost over 5 years. They can also apply to Council for a 10 year debenture if desired. An owner asked for a paper copy and Mr. Paglia explained that the report size allows for downloads from their website or a hard copy on request. There was a question from an owner on bridge works being done and Mr. Rood explained that the details for maintenance are provided in the report. Mr. Paglia explained hydrology and the engineered design for proper flow handling. He explained the tender process that is used to get the best pricing for works. The engineer tries to provide the best estimate possible in the drainage report, but construction cost can vary. He explained that 33% escalation in cost above the report estimate requires another meeting with owners to review the tender.

An owner asked about the 2012 assessment. Mr. Paglia noted that we have to establish the current scope of work and cost estimate. This drain has not been maintained for years and costs

were only charged when work was done. Owners will be notified if the tender cost exceeds 133% of the report estimate. Notice of the works starting is sent out to affected owners. After the work is done, the drain is checked for any deficiencies and owners can advise the Town of any deficiencies. There is a 1 year maintenance warrantee on the works. Agricultural lands are eligible for a 1/3 grant on their total assessment. The bill sent out will have the grant removed from the total cost. The billing time frame was discussed, and grant applications were explained. The Agricultural Drainage Infrastructure Program (A.D.I.P.) was explained.

Following the meeting, Mr. Paglia and Rood staff made inspections of Bridges 15 and 16 and it was noted that there were changes made since the original survey work and arrangements would be made to resurvey the bridges to update the plans. Bridge 7 was also inspected and appears to still be the original pipe that was surveyed, and the final report will include the same works for repair and improvement as established in the draft drainage report that was prepared to get environmental approvals.

V. FINDINGS AND RECOMMENDATIONS

Prior to the preparation of our report, we reviewed the details of the bridge installations including the end treatment options based on the regulatory restrictions and the cost estimates that we were to review. Through our investigations, it was determined that the existing bridges were all in a very poor state with rotted bottoms, sinkholes, collapsed sections and narrow top widths. E.R.C.A. recently advised the Town that the Parcel 500-39900 had replaced the Bridge 15 wooden foot bridge picked up in our original survey with a newer plastic pipe just to the north. We surveyed this new bridge and find that the pipe is a bit short and does not meet the minimum top width requirement of 6.1 metres. Review of online aerial mapping has also indicated possible changes to the access Bridge 7 for Parcel 500-33800, and we have inspected the bridge and confirmed the required updated design for a new bridge. Representatives for Parcel 500-39800 and Bridge 14 have investigated possible severances for the parcel, and we have provided for the required accesses for the parcel based on information from the Town Planning Department, E.R.C.A. and the County that was provided.

Based on our detailed survey, investigations, examinations, and discussions with the affected property owners, we would recommend that new replacement access bridges be constructed in the Bondy-Bastien Drain at the locations 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. The Pugnose Minnow fish was identified as an endangered species and the diverse habitat and existing vegetation indicated the potential for other aquatic and terrestrial threatened or endangered species to be a concern. As a consequence of this, a Natural Heritage Report

biological study was carried out to establish the potential concerns and methods for offsetting, mitigating and minimizing impacts along the course of the work. In the interest of fish habitat and migration, D.F.O. requires that the invert of the new bridge culverts be embedded below the design or existing bottom of the drain a minimum of 10% of the pipe height to ensure a continued path for fish migration through the bridge culverts. Therefore, based on this, we have made provisions to set the invert of the proposed replacement culverts required for the bridge repair and improvements, at the required depth below the drain bottom design grade. The D.F.O. Species at Risk screening maps confirm that there are Species at Risk Fish identified in this area. The Bondy-Bastien 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. and the D.F.O. Details of these mitigation measures are included in the Specifications and **Appendix "REI-A"** forming part of this report. An application for E.R.C.A. permit and fee submission will be required before construction proceeds.

As is now required under the new Endangered Species Act, 2007 Provincial Legislation, 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 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 necessary at this time. The necessary information was provided to M.E.C.P. who now administer the E.S.A. 2007 and through ongoing communications steps were taken to get Permit #SW-C-002-19 issued for the project. A copy of the permit is included in **Appendix "REI-B"** and all work shall be carried out in compliance with the permit and the Town will be required to monitor the works subsequent to the completion of construction. Because turtles and snakes are mobile and 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"** as well as offsetting and compensation measures in the design and specifications for the project.

Based on all of the above, we recommend that the drain be repaired and improved including an extension to outlet into the Detroit River at the north end, as well as construction of replacement access bridges in the Bondy-Bastien Drain to serve the lands in Part of Lots 36 to 42, Front Concession, in the geographic township of Anderdon. We further recommend that the existing bridge pipe under County Road 20 be plugged off with grout as set out further in the report and that the bridge pipe and existing works at the re-aligned drain areas be abandoned after this work pursuant to Section 19 of the Drainage Act. We recommend that all work be completed 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. ALLOWANCES AND COMPENSATION

We further find that the following Owners are entitled to and should receive the following amount as compensation for the Value of Land Taken, in order to accommodate the construction of the relocated drainage works, namely:

1) DBS-Hearn Inc.	$ 10.00
2) Elizabeth Durocher	$ 10.00
3) Town of LaSalle (Townline Road)	$ 10.00
4) Town of Amherstburg (Townline Road)	$ 10.00
TOTAL FOR LAND TAKEN (RELOCATED DRAIN)	**$ 40.00**

We have provided for this land taken compensation in our estimate, as is provided for under Section 29 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2021".

This compensation shall allow for all of the land necessary to construct the relocated Municipal drain along the private parcels and unopened road allowance, as well as access across the lands for the future maintenance and upkeep of the drainage system, and for the existing drain along the Townline Road. The land taken shall comprise a 10.0m (33') wide strip of land for the drain, measured perpendicular to and overtop of the drain and adjacent to its west and south bank along its complete length across the parcels. Backfilling of the existing drain segments where the re-alignment is provided must not exceed the elevation of 175.200 metres CGVD28:78 (Canadian Geodetic Vertical Datum) to maintain the current function of wetlands so that there will be no negative impacts to the downstream areas as a result of the drain segments being re-aligned.

A nominal value has been used to reflect that the parcels and unopened roadway already had the drain located on the lands. The allowance provided shall establish the legal right for constructing the relocated Municipal drainage system in its proposed location across the Parcel 500-33800 lands, the Parcel 500-39800 lands, and along the unopened Townline Road and establish the right for the Town to access along the drain for future maintenance.

We further find that the following Owners are entitled to and should receive the following amounts as compensation for the land taken to construct the works and maintain them in the future, including buffer areas and damages to lands and crops, if any:

1) Ronald Cooney	$ 1,659.00

2) John & Judy Palesh	$ 768.00
3) Barbara & Stephen Halls and Amy Lee	$ 3,362.00
4) Nicolas Brousseau	$ 2,373.00
5) Matthew Bridgen	$ 1,127.00
6) Janice Waldron	$ 2,136.00
7) Jeffrey VanderHorst	$ 1,053.00
8) George & Mantoura Bousaba	$ 3,342.00
9) DBS-Hearn Inc.	$ 6,404.00
10) Matthew Pawluk	$ 2,176.00
11) Sam Soucie & Robert Soucie	$ 2,752.00
12) 1164841 Ontario Ltd.	$ 5,203.00
13) 1164841 Ontario Ltd.	$ 4,903.00
14) Lee Xoly & Lor Mai Nhia	$ 1,974.00
15) Elizabeth Durocher	$ 3,224.00
16) Noel Meloche & Jamie Clarke	$ 3,692.00
17) Louis & Tracy Calsavara	$ 3,259.00
18) Sean & Veronica Hadrian	$ 8,786.00
19) Joseph Bondy	$ 5,346.00
TOTAL FOR VALUE OF DAMAGES	**$ 63,539.00**

We further find that as a result of the repair and improvement of the drain it is expected that there will be an impact on the adjacent lands and we have allowed a value of $19,920.00 per acre ($49,223.00 per hectare) for land taken and damages to lands and crops, if any. The allowance encompasses a 10m (33') wide strip of land along the open drain, encompassing the full width provided for access to repair and improve the drain from both sides in addition to the existing access corridor included in past drainage reports. Spoil material shall be spread to a maximum thickness of 100mm. These allowances are provided pursuant to Sections 29 and 30 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010". Filling works for the re-alignments does not imply that any future development can occur within the Provincially Significant Wetlands (PSW) boundaries or on the sites.

VI. ESTIMATE OF COST

Our estimate of the total cost of this work including all incidental expenses is the sum of **EIGHT HUNDRED FIFTEEN THOUSAND EIGHT HUNDRED DOLLARS ($815,800.00)**, made up as follows:

CONSTRUCTION

Item 1)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810**; Carry out excavation of the drain to remove accumulated sediment and restore the drain to the profile grade shown on the plans, including all disposal, hauling and leveling of material, approximately 1,922 lineal metres (approximately 4,200 cubic metres), including filling abandoned portion of drain at west side of County Road 20 with compacted material.	Lump Sum	$	113,900.00
Item 2)	**Bridge No. 1**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 14.0 metres (45.9 ft.) of 1000mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (Barbara & Stephen Halls and Amy Lee	Lump Sum	$	23,600.00
Item 3)	**Bridge No. 2**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (39.4 ft.) of 1000mm diameter, 2.0mm thick, aluminized steel Ultra39 Flo smooth			

wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. Lump Sum $ 19,400.00
(Nicolas Brousseau

Item 4) **Bridge No. 3**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (39.4 ft.) of 1000mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. Lump Sum $ 18,300.00
(Matthew Bridgen

Item 5) **Bridge No. 4**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (39.4 ft.) of 900mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. Lump Sum $ 17,300.00
(Janice Waldron

Item 6) **Bridge No. 5**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (36.1 ft.) of 900mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. Lump Sum $ 14,700.00
(Jeffrey VanderHorst

Item 7) **Bridge No. 6**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access

bridge consisting of 13.0 metres (42.7 ft.) of 900mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete.

Lump Sum $ 20,600.00

(George & Mantoura Bousaba

Item 8) **Bridge No. 7**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 11.0 metres (36.1 ft.) of 825mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete.

Lump Sum $ 14,200.00

(DBS-Hearn Inc.

Item 9) **Bridge No. 8**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 13.0 metres (42.7 ft.) of 825mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete.

Lump Sum $ 19,200.00

(Matthew Pawluk

Item 10) **Bridge No. 9**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 9.5 metres (31.2 ft.) of 800mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete.

Lump Sum $ 17,100.00

(Sam & Robert Soucie

Item 11)	**Bridge No. 10**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 9.5 metres (31.2 ft.) of 800mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including bend, quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (1164841 Ontario Ltd. (c/o Walter Afanasiew)	Lump Sum	$	15,800.00
Item 12)	**Bridge No. 11**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 11.0 metres (36.1 ft.) of 800mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (1164841 Ontario Ltd. (c/o Walter Afanasiew)	Lump Sum	$	14,700.00
Item 13)	**Bridge No. 12**; Provide all labour, equipment and material to clean out existing pipe and install approximately 40 cubic metres of concrete grout, including pumping and placing grout, forming up pipe ends to retain grout, cleanup and restoration, complete. (County of Essex)	Lump Sum	$	25,800.00
Item 14)	**Bridge Enclosure No. 13**; Provide all labour, equipment and material to remove existing pipe and backfill trench with native materials, including all excavation, disposal, compaction, topsoil, seeding and mulching, cleanup and restoration, complete. (Lee Xoly & Lor Mai Nhia	Lump Sum	$	3,800.00
Item 15)	**Bridge No. 14**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 11.0 metres (36.1 ft.) of 750mm diameter,			

	2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (Elizabeth Durocher Drain access easement)	Lump Sum	$ 11,700.00
Item 16)	**Bridge No. 14A**; Provide all labour, equipment and material to clear drain and construct a new access bridge consisting of 18.0 metres (59.1 ft.) of 750mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (Elizabeth Durocher access for 2 lots)	Lump Sum	$ 21,400.00
Item 17)	**Bridge No. 15**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (39.4 ft.) of 900mm diameter, 320 kPa H.D.P.E. smooth wall pipe with standard corrugation profile and wrap couplers with filter cloth, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (Noel Meloche & Jamie Clarke	Lump Sum	$ 16,200.00
Item 18)	**Bridge No. 16**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (39.4 ft.) of 750mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. (Louis & Tracy Calsavara	Lump Sum	$ 18,100.00

Item 19)	**Bridge No. 17**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 12.0 metres (39.4 ft.) of 800mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. Lump Sum (Sean & Veronica Hadrian	$	18,800.00
Item 20)	**Bridge No. 18**; Provide all labour, equipment and material to remove existing pipe and construct a replacement access bridge consisting of 13.0 metres (42.7 ft.) of 900mm diameter, 2.0mm thick, aluminized steel Ultra Flo smooth wall pipe with standard corrugation profile and hugger band couplers, including quarried limestone on filter cloth end protection, granular bedding and backfill, granular driveway approach, excavation, compaction, cleanup and restoration, complete. Lump Sum (Joseph Bondy	$	22,300.00
Item 21)	**Station 0+000 to Station 2+810;** Supply and install new heavy duty H.D.P.E. plastic tile main extensions, including connections, rodent grate, removal of any deleterious materials, excavation, backfill, compaction and restoration, complete: a) 3.0 metres (10') of 150mm (6") diameter pipe for 150mm diameter tiles: 1 required at $300.00 each	$	300.00
Item 22)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Supply and install approximately 160 square metres of synthetic filter mat for rock chute spillways and general erosion protection, complete at $5.00 per square metre.	$	800.00
Item 23)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Supply and install approximately 80 tonnes of quarried limestone rip rap for rock chute spillways and general erosion protection, complete at $85.00 per tonne.	$	6,800.00

Item 24)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Supply and install fascines at 8 locations, comprising rope shaped bundles of live vegetation, groups of 3 bundles each approximately 2.4 metres long, embedded 80% into the drain bank at the water's edge including stakes to secure each bundle, complete at $1,200.00 per grouping.		$	9,600.00
Item 25)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Supply and install approximately 20 tonnes of 100mm to 150mm size gabion stone on filter cloth for 3 instream riffles, including all excavation, placement, compaction, and clean up, complete at $150.00 per tonne.		$	3,000.00
Item 26)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Supply and install eddy rocks at 3 locations, comprising groupings of 4 rocks each, that are approximately 250mm in diameter each, embedded 1/3 into the drain bottom, complete at $500.00 per grouping.		$	1,500.00
Item 27)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Brushing and grubbing, all clean up and disposal of materials including phragmites, approximately 1920 lineal metres, complete.	Lump Sum	$	38,400.00
Item 28)	**Station 0-057.6 to Station 1+054.2 and Station 2+000 to Station 2+810;** Topsoil placement, fine grading, seeding, and mulching, approximately 11,520 square metres at $5.00 per square metre, complete.		$	57,600.00
Item 29)	Final restoration and site cleanup, complete.	Lump Sum	$	4,000.00
Item 30)	Contingency amount.	Lump Sum	$	10,000.00
	Sub-total for Construction			**$ 578,900.00**
	Estimated Net H.S.T. (1.76%) for Construction		$	10,190.00
	TOTAL FOR CONSTRUCTION		**$**	**589,090.00**

INCIDENTALS

1)	Report, Estimate, & Specifications	$	39,000.00
2)	Survey, Assistants, Expenses, and Drawings	$	55,000.00
3)	Duplication Cost of Report and Drawings	$	2,500.00
4)	Estimated Cost of Letting Contract	$	1,200.00
5)	Estimated Cost of Layout and Staking	$	2,000.00
6)	Estimated Cost of Biology Consultants	$	19,875.00
7)	Estimated Cost of Full-Time Supervision and Inspection During Construction (based on 3 week duration)	$	15,500.00
8)	Estimated Cost for Biology Consultant Monitoring	$	3,000.00
9)	Estimated Net H.S.T. on Items Above (1.76 %)	$	2,430.00
10)	Estimated Cost of E.R.C.A. Permit	$	800.00
11)	Estimated Cost of Interim Financing	$	2,500.00
12)	Contingency Allowance	$	19,326.00
	TOTAL FOR INCIDENTALS	**$**	**163,131.00**
	TOTAL FOR LAND TAKEN (drain relocation) (brought forward)	**$**	**40.00**
	TOTAL FOR LAND TAKEN AND DAMAGES (brought forward)	**$**	**63,539.00**
	TOTAL FOR CONSTRUCTION (brought forward)	**$**	**589,090.00**
	TOTAL ESTIMATE	**$**	**815,800.00**

VII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the repair and improvement of the drain and construction of the new replacement access bridges. The design drawings show the subject bridge locations and the details of the replacement access bridge installation. The design drawings are attached to the back of this report and are included in **Appendix "REI-E"**.

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

VIII. CONSTRUCTION SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated with the construction of the repairs and improvements of the drain including the replacement access bridges, and the preparation of this Engineer's report, be assessed against the affected lands and roads. A Schedule of Assessment has been prepared and included herein to indicate the lands and roads assessed for the work provided for under this report.

It has been established that agricultural lands are affected for this project. Pursuant to the current Agricultural Drainage Infrastructure Program (A.D.I.P.) Policies that are in place, it is anticipated that these lands will 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 if they meet the requirements for classification as Farm Property Tax Class.

IX. FUTURE MAINTENANCE

After the completion of the construction of the replacement access bridges, all of same shall be maintained in the future by the Town of Amherstburg. Furthermore, if any maintenance work to the access bridges is completed, we recommend that the costs be shared as set out in **TABLE A** below. The share to the abutting owners shall be assessed as a Benefit to the parcel and the balance shall be assessed to the upstream lands and roads based on their outlet liability assessment within the attached Maintenance Schedule of Assessment for each Branch in **Appendix "REI-D"** on a pro-rata basis.

After the completion of all of the works included within this report, all existing access bridges and enclosures within the Bondy-Bastien Drain shall be maintained in the future by the Town of Amherstburg and should any maintenance works be required to any of same, all costs are to be

shared by the abutting landowner, and upstream affected lands and roads in accordance with the percentages shown in the table which follows herein. We have also noted in the table whether a parcel is eligible for grant (G) or is non grantable (NG).

TABLE A
MAINTENANCE SHARING
FOR ACCESS BRIDGES

BRIDGE NO.		OWNERS	CLASS	% TO ABUTTING OWNER	% TO UPSTREAM OWNERS
1		Barbara & Stephen Halls and Amy Lee	(G)	35.90%	64.10%
2		Nicolas Brousseau	(NG)	39.10%	60.90%
3		Matthew Bridgen	(NG)	46.70%	53.30%
4		Janice Waldron	(NG)	44.10%	55.90%
5		Jeffrey VanderHorst	(NG)	45.30%	54.70%
6		George & Mantoura Bousaba	(G)	48.40%	51.60%
7		DBS-Hearn Inc.	(G)	57.50%	42.50%
8		Matthew Pawluk	(NG)	62.00%	38.00%
9		Sam & Robert Soucie	(G)	66.80%	33.20%
10		1164841 Ontario Ltd.	(G)	59.90%	40.10%
11		1164841 Ontario Ltd.	(G)	64.90%	35.10%
12	County Road 20	County of Essex	(NG)	98.00%	2.00%
13		Lee Xoly & Lor Mai Nhia	(NG)	83.00%	17.00%
14		Amherstburg (drain easement access)	(NG)	78.40%	21.60%
14A		Elizabeth Durocher	(NG)	78.40%	21.60%

15	Noel Meloche & Jamie Clarke	(NG)	70.30%	29.70%
16	Louis & Tracy Calsavara	(G)	68.30%	31.70%
17	Sean & Veronica Hadrian	(NG)	56.30%	43.70%
18	Joseph Bondy	(G)	49.80%	50.20%

When the maintenance costs of the individual access bridges and enclosures are being shared with upstream lands and roads, it should be noted that the percentages to be shared with the upstream lands and roads shall be assessed as an Outlet Liability against the affected lands and roads lying upstream of the access bridge or enclosure in question, including the proportion of the abutting lands located upstream of the bridge or enclosure being maintained. The cost sharing for upstream lands shall be in the same proportions as the values shown in the attached "Maintenance Schedule of Assessment", included in **Appendix "REI-D"** at the end of this report for each Branch of the drain. The share to the abutting owner shall be assessed as a Benefit to the owners of the parcel abutting the access bridge or enclosure.

The "Maintenance Schedule of Assessment" values in **Appendix "REI-D"** are strictly for the purposes of properly allocating future maintenance costs. The assessment schedules in **Appendix "REI-D"** are based on a future estimated cost of $5,000.00; however, when future maintenance work is carried out, the assessment to the affected Owners shall be based on the actual future maintenance cost shared on a pro-rata basis with the values shown in these assessment schedules. We further recommend that the maintenance cost sharing as set out above shall remain as aforesaid until otherwise determined and re-established under the provisions of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2021".

We recommend that the replacement bridge structures as identified herein, be maintained in the future as part of the drainage works. We would also recommend that these legal access bridges newly constructed in the drain, for which the future maintenance costs are to be borne by the abutting affected landowners and upstream affected lands and roads, 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 should also be repaired or replaced as part of the works. Likewise, if any fencing, gate, decorative walls, guard rails or other special features exist that will be impacted by the maintenance work, they are also to be removed and restored or replaced as part of the bridge maintenance work. However, the cost of the supply and installation of any surface material other than Granular "A" material, and

the cost of removal and restoration or replacement, if necessary, of any special features, shall be totally assessed to the benefiting adjoining owner served by said access bridge.

The above provisions for the future maintenance of the replacement access bridges, 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.

att.

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

CONSTRUCTION SCHEDULE OF ASSESSMENT

BONDY-BASTIEN DRAIN & BRIDGES

(Geographic Township of Anderdon)

Town of Amherstburg

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
		County Road 20	2.12	5.25	County of Essex	$ 49,908.00	$ 39,805.00	$ -	$ 89,713.00
		North Townline Road (unopened)	0.51	1.25	Town of Amherstburg	$ 6,875.00	$ 4,314.00	$ -	$ 11,189.00
		Total on Municipal Lands.....				**$ 56,783.00**	**$ 44,119.00**	**$ -**	**$ 100,902.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 42	0.58	1.44	Racheal Gagnier & Jonathan Ashe	$ -	$ 5,512.00	$ -	$ 5,512.00
	1	Pt. Lot 42	0.18	0.44	Clarence Dumouchelle	$ -	$ 2,397.00	$ -	$ 2,397.00
	1	Pt. Lots 41 & 42	0.46	1.14	Jonathan & Melissa Wood	$ -	$ 4,868.00	$ -	$ 4,868.00
	1	Pt. Lot 41	0.31	0.77	Daniel McDonald	$ -	$ 3,627.00	$ -	$ 3,627.00
	1	Pt. Lot 41	0.63	1.56	Octavious & Lauren Griffiths	$ -	$ 6,705.00	$ -	$ 6,705.00
	1	Pt. Lot 39	0.33	0.82	Gary & Corinne Boughner	$ -	$ 3,709.00	$ -	$ 3,709.00
	1	Pt. Lot 39	0.66	1.63	Zachary Binder & Tarah Fountain	$ -	$ 5,626.00	$ -	$ 5,626.00
	1	Pt. Lot 39	0.25	0.61	Khodr El Saghir	$ -	$ 5,690.00	$ -	$ 5,690.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 39	0.21	0.51	Khodr El Saghir	$ -	$ 6,745.00	$ -	$ 6,745.00
	1	Pt. Lot 38	0.20	0.50	Samuel Soucie	$ -	$ 7,961.00	$ -	$ 7,961.00
	1	Pt. Lot 38	0.20	0.50	Franklin & Michelle Dow	$ -	$ 2,006.00	$ -	$ 2,006.00
	1	Pt. Lot 38	0.20	0.50	Erin & James King	$ -	$ 2,079.00	$ -	$ 2,079.00
	1	Pt. Lot 38	0.19	0.46	DBS-Hearn Inc.	$ -	$ 1,901.00	$ -	$ 1,901.00
	1	Pt. Lot 37	0.99	2.44	Jeffrey VanderHorst	$ 6,601.00	$ 5,156.00	$ -	$ 11,757.00
	1	Pt. Lot 37	1.06	2.63	Matthew Bridgen	$ 8,197.00	$ 5,034.00	$ -	$ 13,231.00
	1	Pt. Lot 36	0.51	1.25	John & Judy Palesh	$ -	$ 2,848.00	$ -	$ 2,848.00
	1	Pt. Lot 36	1.01	2.50	Ronald Cooney	$ -	$ 4,385.00	$ -	$ 4,385.00
	1	Pt. Lot 39	0.15	0.38	Christian Pedersen	$ -	$ 2,277.00	$ -	$ 2,277.00
	1	Pt. Lot 39	0.15	0.38	Tricia Sisson	$ -	$ 2,277.00	$ -	$ 2,277.00
	1	Pt. Lot 39	0.18	0.45	Theresa Meloche	$ -	$ 2,626.00	$ -	$ 2,626.00
	1	Pt. Lot 39	0.12	0.30	Patrick Wilson & Jaimie Biglow	$ -	$ 2,482.00	$ -	$ 2,482.00
	1	Pt. Lot 39	0.10	0.25	John & Danielle Demitroff	$ -	$ 2,582.00	$ -	$ 2,582.00
	1	Pt. Lot 39	0.16	0.39	John & Wanda-Lee Meloche	$ -	$ 3,065.00	$ -	$ 3,065.00
	1	Pt. Lot 41	0.19	0.48	Derek & Patricia Vaillancourt	$ -	$ 1,400.00	$ -	$ 1,400.00
	1	Pt. Lot 41	0.19	0.48	Robert & Shannon Coghill	$ -	$ 1,363.00	$ -	$ 1,363.00
	1	Pt. Lot 41	0.19	0.48	Kevin & Victoria Bannagan	$ -	$ 1,363.00	$ -	$ 1,363.00
	1	Pt. Lot 41	0.19	0.48	Gregory & Lori West	$ -	$ 1,363.00	$ -	$ 1,363.00
	1	Pt. Lots 41 & 42	0.40	0.98	Randy Standon	$ -	$ 2,526.00	$ -	$ 2,526.00
	1	Pt. Lot 42	0.18	0.45	J.M. Bondy Holdings Inc.	$ -	$ 1,408.00	$ -	$ 1,408.00
	1	Pt. Lot 42	0.25	0.61	Barbara & Eddie Bondy-Pare	$ -	$ 1,787.00	$ -	$ 1,787.00
	1	Pt. Lot 42	0.22	0.54	Ronald Bondy	$ -	$ 1,622.00	$ -	$ 1,622.00
	1	Pt. Lot 42	0.20	0.50	Matthew & Yvonne Chappus	$ -	$ 1,479.00	$ -	$ 1,479.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Total on Privately Owned - Non-Agricultural Lands.....						**$ 14,798.00**	**$ 105,869.00**	**$ -**	**$ 120,667.00**
5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):									
1		Pt. Lot 41	1.66	4.10	2564735 Ontario Limited	$ -	$ 6,035.00	$ -	$ 6,035.00
1		Pt. Lot 41	1.62	4.00	Ann Bondy	$ -	$ 5,890.00	$ -	$ 5,890.00
1		Pt. Lots 39 & 40	7.76	19.18	1164841 Ontario Ltd.	$ 24,221.00	$ 28,235.00	$ -	$ 52,456.00
1		Pt. Lot 39	2.18	5.39	1164841 Ontario Ltd.	$ 18,454.00	$ 7,442.00	$ -	$ 25,896.00
1		Pt. Lots 38 & 39	2.82	6.98	Sam & Robert Soucie	$ 20,842.00	$ 8,795.00	$ -	$ 29,637.00
1		Pt. Lot 37	2.78	6.86	George & Mantoura Bousaba	$ 15,895.00	$ 7,132.00	$ -	$ 23,027.00
1		Pt. Lot 36	2.02	5.00	Barbara & Stephen Halls and Amy Lee	$ 11,188.00	$ 3,940.00	$ -	$ 15,128.00
1		Pt. Lot 41	2.43	6.00	Louis & Tracy Calsavara	$ 35,771.00	$ 5,400.00	$ -	$ 41,171.00
1		Pt. Lot 42	4.82	11.90	Joseph Bondy	$ 49,692.00	$ 9,154.00	$ -	$ 58,846.00
Total on Privately Owned - Agricultural Lands (grantable).....						**$ 176,063.00**	**$ 82,023.00**	**$ -**	**$ 258,086.00**
5. PRIVATELY OWNED - AGRICULTURAL LANDS (non-grantable):									
1		Pt. Lot 42	0.63	1.55	Jeffrey & Nora Johnston and Robert Meloche	$ -	$ 2,509.00	$ -	$ 2,509.00
1		Pt. Lot 38	2.23	5.50	Matthew Pawluk	$ 20,308.00	$ 7,860.00	$ -	$ 28,168.00
1		Pt. Lots 37 & 38	4.27	10.54	DBS-Hearn Inc.	$ 24,100.00	$ 11,943.00	$ -	$ 36,043.00
1		Pt. Lot 37	2.50	6.18	Janice Waldron	$ 14,023.00	$ 8,007.00	$ -	$ 22,030.00
1		Pt. Lot 37	1.08	2.67	Nicolas Brousseau	$ 35,786.00	$ 3,448.00	$ -	$ 39,234.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 39	2.34	5.79	Raymond Meloche	$ -	$ 9,134.00	$ -	$ 9,134.00
	1	Pt. Lot 40	1.62	4.00	Lee Xoly & Lor Mai Nhia	$ 21,661.00	$ 7,459.00	$ -	$ 29,120.00
	1	Pt. Lot 40	1.62	4.00	Elizabeth Durocher	$ 51,767.00	$ 6,066.00	$ -	$ 57,833.00
	1	Pt. Lot 40	2.43	6.00	Noel Meloche & Jamie Clarke	$ 27,685.00	$ 6,998.00	$ -	$ 34,683.00
	1	Pt. Lots 41 & 42	6.73	16.64	Sean & Veronica Hadrian	$ 62,104.00	$ 15,287.00	$ -	$ 77,391.00
	Total on Privately Owned - Agricultural Lands (non-grantable).....					**$ 257,434.00**	**$ 78,711.00**	**$ -**	**$ 336,145.00**
TOTAL ASSESSMENT			67.03	165.63		**$ 505,078.00**	**$ 310,722.00**	**$ -**	**$ 815,800.00**

1 Hectare = 2.471 Acres
Project No. REI2012D018
May 12th, 2023

SPECIFICATIONS

BONDY-BASTIEN DRAIN

(Geographic Township of Anderdon, PWD-MD-2011-039)

TOWN OF AMHERSTBURG

I. GENERAL SCOPE OF WORK

The Bondy-Bastien Drain currently comprises of an open drain generally located along the west and east side of County Road 20 (Front Road North) and extending from the south side of the Amherstburg – LaSalle Townline Road southerly to its south outlet in the Canard River. The work under this project generally comprises of improvements to the open drain to provide a suitable cross section for conveyance of flows, along with major improvements to all of the eighteen (18) access bridges along the course of the drain. The work on bridges being improved includes the removal of existing pipes and endwalls; the installation of new culverts; new culvert end treatments comprising of sloped quarried limestone on filter cloth end protection; granular approaches and backfill; granular transition areas; hard surface driveway repairs; general quarried limestone erosion protection and rock chute inlets and blocking off of the County Road 20 pipe by filling it with grout. The proposed work is intended to address the improvement of the open drain to the west and east of the County Road, including drain re-alignment where shown, cleaning of the existing ditch along the Townline Road to make it part of the Municipal drain, and the construction of erosion protection in accordance with current standards, with enhancements to offset the impacts of the work to the natural heritage features and endangered species. Work also includes improvement of the outlet portion of the drain along the Townline Road out to the Detroit River, along with ancillary work including loading, hauling and disposing of materials excavated in the flood plain area at the south end by the Canard River.

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 shall be of the size, type, depth, etcetera, as is shown in the accompanying drawings, as determined from the Bench Marks, 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, Biological Consultant 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 Canard River and the Detroit River. 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 systems. All disturbed areas shall

be restored as quickly as possible with grass seeding and mulching installed to ensure a protective cover and to minimize any erosion from the work sites subsequent to construction. The Contractor will 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 July 15th of any given year because the drain is directly connected to downstream water bodies that are classified as sensitive to impacts on aquatic life and habitat by E.R.C.A. and D.F.O. The Pugnose Shiner fish has been identified as an endangered species and special measures are required to protect the species and its habitat at the outlet of the drain to the Canard River.

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

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

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

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

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

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

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

The Contractor is to note that this project has gone through the Ministry of Natural Resources (M.N.R.F.) and M.E.C.P. screening process by way of a Species at Risk (S.A.R.) Town former Agreement review, and submission of a Draft Report to D.F.O. and M.N.R.F. and Ministry of Environment, Conservation and Parks (M.E.C.P.). A copy of the relevant information that was provided by them is included herein as part of **Appendix "REI-B"**. Arrangements were also made for a Natural Heritage Report to be prepared by terrestrial and aquatic biologists. Pertinent information and sources of materials to carry out offsetting and mitigation measures are also included with **Appendix "REI-B"**.

The Contractor is to review **Appendix "REI-B"** in detail and is required to comply, in all regards, with the contents of said M.N.R.F., M.E.C.P. and biological information, or any future requirements, and follow the special requirements therein included, during construction. Any threatened or provincially significant plant species that fall within the disturbed areas of construction are to be relocated to the perimeter of the working areas as directed by the Drainage Superintendent, Biological Consultant or the Consulting Engineer. The Contractor will have all their site staff participate in a training course set up by the Town with a qualified biological consultant to review the requirements of the M.E.C.P. permit that has been issued. The training is expected to be an online meeting with an estimated time of approximately 2 hours for the presentation.

Notwithstanding the above, the Contractor is advised that the Town has signed an **Agreement** with the Ministry of Natural Resources and Forestry (M.N.R.F.) regarding the maintenance operations on Municipal drains and the Endangered Species Act, 2007 (E.S.A.). The Drainage Superintendent has reviewed the endangered species maps and any concerns will be provided in **Appendix "REI-B"**. Certain species such as turtles and snakes are mobile and may be encountered during construction. Therefore, the "**SCHEDULE C MITIGATION PLAN"** of the **Agreement** (pages 13 through 23) has been included in **Appendix "REI-B"** in its entirety for further information and use by the Contractor. The Town has also received a permit from the M.E.C.P. for proceeding with the works and a copy of same is included in the Appendix and the Contractor shall follow all requirements for the work set out in the permit and particularly protection of the Pugnose Minnow and its habitat at the Canard River.

The Contractor shall contact the Drainage Superintendent if an endangered species is encountered during construction. The Contractor shall be responsible for providing the necessary equipment and materials outlined in the "**SCHEDULE C MITIGATION PLAN"** to address the handling of any endangered species encountered during the course of the construction work. The Contractor shall cooperate fully and assist the Drainage Superintendent or M.N.R.F. or M.E.C.P. staff in the proper handling of the endangered species as outlined in the "**MITIGATION PLAN"**, and as may be further directed by the Drainage Superintendent or the M.N.R.F. or M.E.C.P. staff or the biological consultant and shall govern all its operations accordingly.

IV. EXCAVATION, TIMING WINDOW AND ACCESS TO WORK

The Contractor is advised that the majority of the work to be carried out on this project will have to be done from July 16th to March 14th of any given year for the work as outlined in the M.E.C.P. permit in **Appendix "REI-B"**. Other time periods lead to concerns with terrestrial and aquatic species. The Contractor shall review the input from E.R.C.A., D.F.O., M.N.R.F. and M.E.C.P. as included in the Appendices to determine the limitations on various components of the work. All scheduling shall be carried out in close consultation with the Drainage Superintendent, Biological Consultant and the Consulting Engineer.

The Contractor is advised that the majority of the work to be carried out on this project extends along the west side of the drain. The Contractor shall have access for a minimum width of 6.1 metres (20 feet) along the top of the west bank on the north-south portion of the drain and along the south bank at the Townline Road, along with the full width of the roadway where it is abutting the drainage works. Along the north-south portions of the drain, the Contractor shall also have access to an additional 3.1 metres (10') to carry out relocation of threatened plant species and for removal of all phragmites located in said work areas on both sides of the drain. The portions of the drain being abandoned at the re-alignment locations shall be backfilled with compacted native material and the top elevation of the fill shall not exceed elevation 175.200 metres CGVD28:78 (Canadian Geodetic Vertical Datum). The Contractor may use the entire width of the County Road 20 right-of-way where needed. The Contractor may utilize the right-of-way as necessary, to permit the completion of all of the work required to be carried out for this project. The Contractor shall also have access into and along the private lanes and driveways as necessary to carry out the replacement of the existing access bridges and enclosure pipes, and for hauling materials where necessary, as set out on the plans and in these specifications, along with a sufficient area in the vicinity of the bridges and enclosures to carry out the required removals, construction of the replacement structures and ancillary work. The Contractor may have to provide mats for equipment access on the portion of the drain south and downstream of Bridge 1 with all materials having to be removed and disposed of outside the 1:100 year flood plain area. When carrying out the excavation of the drain and leveling of spoil materials along the drain, the Contractor may need to provide silt fencing along the drain bank to ensure that no silt or sediment enters the drain from the placed material as set out in the M.E.C.P. permit. Once the vegetation of the disturbed areas has been re-established, the Contractor shall remove all silt fencing and carry out any final restoration and cleanup of the work that is required.

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 County Road 20 for the proposed works, it shall obtain the permission of the County of Essex, the Town Drainage Superintendent and 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 County of Essex and the Amherstburg Public 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 placement, seeding, mulching, and granular placement required to make good any damage caused.

V. REMOVAL OF BRUSH, TREES AND RUBBISH

Where there is any brush, trees or rubbish including phragmites along the course of the drainage works, including the full width of the work access on the westerly and southerly side and 3 metres on the opposite side, 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, Biological Consultant or Consulting Engineer to ensure that no threatened plant species, 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 threatened plant species, 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, Biological Consultant, 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 and any such materials located in the bridge culverts and enclosures while carrying out its cleaning of same. This work shall include hauling all excavated material taken from the drain in the stretch from the Canard River outlet upstream to approximately Station 2+526, which falls within the wetland area. 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 and in accordance with the Excess Soil Regulation.

In order to reduce the dominance and spread of common reed and phragmites in the project area, special care must be taken by the Contractor to pick up and remove vegetative parts of the plants while brushing and grubbing. All such materials shall be collected and removed from the project area so that they do not flow to downstream areas. The vegetative parts should be placed in a pile located on a dry area and preferably a hard surface and be burned outside of any natural areas. Any new growth shall be sprayed with a herbicide during the construction and the one (1) year maintenance period. Following the maintenance period, the Town shall carry out maintenance spraying to limit the regrowth of the common reed and phragmites until it is eradicated.

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 restored 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 restoration of same. When any fence is removed by the Contractor, and the Owner thereof deems it advisable and procures new material for replacing the fence so removed, the Contractor shall replace the fence using the new materials and the materials from the present fence shall remain the property of the Owner.

VII. DETAILS OF BRIDGE WORK

The Contractor shall provide all material, labour and equipment to repair and improve the existing access bridges in the Bondy-Bastien Drain requiring work, along with endwall repairs and other improvements as noted.

The Contractor shall also, prior to the installation of any new bridges, be required to supply and install silt fencing and carry out fish salvage operations in accordance with the requirements in **Appendix "REI-B"** included within these Specifications. The Contractor shall also supply clay berm cut-offs upstream and downstream of the bridge sites with filter cloth erosion protection and include a temporary flow by-pass culvert when needed as outlined in **Appendix "REI-B"** to allow for dewatering of the site so that all of the work can be carried out in the dry. The Contractor will be required to keep up and maintain the temporary by-pass and dewatering throughout the course of the work. In the case of an unexpected rainfall event the Contractor shall ensure that the drain bottom is clean in case of overtopping of the clay berms, and subsequent to the rainfall event shall dewater the site in accordance with the provisions set out in **Appendix "REI-B"** at no additional cost to the project. The Contractor shall carefully coordinate its installation work to minimize the risk of a rainfall event causing flooding and submergence of the project site after it has been dried by the approved dewatering methods. Prior to restoring the flow in the channel, the Contractor shall ensure that all demolition materials and deleterious substances have been removed from the drain bottom between the clay berms. Only when the drain bottom has been cleaned up to the satisfaction of the Drainage Superintendent and the Consulting Engineer shall the Contractor arrange to remove the clay berms and temporary flow by-pass. Throughout the course of the work the Contractor shall maintain the silt fence both upstream and downstream of the site. All of said work shall be carried out in full compliance with any stipulations provided in the Essex Region Conservation Authority (E.R.C.A.) Permit and as set out in the Appendices forming part of these Specifications.

Where noted, all existing corrugated steel and other pipes slated to be removed for the existing bridges and enclosures shall be replaced with new aluminized steel Type II Ultra Flo or 320 kPa H.D.P.E. smooth wall pipe. All piping sections shall be connected by the use of hugger band bolted couplers or wrap 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 replacements 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"**.

VIII. ALUMINIZED ULTRA FLO SMOOTH STEEL & H.D.P.E. PIPE INSTALLATION

The new aluminized Ultra Flo steel pipes and H.D.P.E. pipes to be installed on this project are required to be provided in the longest lengths that are available. Where the overall access pipe length exceeds the standard pipe lengths, the Contractor shall connect the pipe sections together by use of a manufactured hugger band or wrap 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 that extends a minimum of 100mm beyond the coupler on each end, to ensure a positive seal against soil migration through the joints.

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

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 structures 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 replacements, once the new aluminized steel type II Ultra Flo or H.D.P.E. 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 each side of the bridge shall be granular material M.T.O. Type "A" O.P.S.S. Form 1010. All of the driveway approach areas extending from the Municipal roadway to the opposite 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, seed and mulch.

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 culvert pipe. To ensure that no damage is caused to the proposed culvert 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 any asphalt surface by placing a minimum of the existing thickness

or a 90mm minimum thickness of Type HL-4 or Superpave equivalent 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 shall protect existing concrete headwalls wherever possible. The Contractor shall carefully extract the existing pipe from the wall, cautiously enlarge the opening as required, and install the new replacement pipe through the salvaged wall. The new pipe shall be thoroughly grouted in place for the full thickness of each headwall, with the surface finish of the grout blended to match to the existing concrete headwall finish, as closely as possible. Grout used for the wall repair shall be in pre-mixed bags or shall comprise 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 grouted mortar connection shall be performed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor is to note that any intercepted pipes along the length of the existing culverts are to be extended and diverted into the rock end protection or connected at its cost to the new pipe unless otherwise noted in the accompanying drawings.

The Contractor shall also note that the placing of the new access bridge culverts shall be completed so that they totally comply with the parameters established and noted in the Bridge Details and Tables for each culvert replacement. These culverts shall be set on an even grade and the placement shall be performed totally in the dry, and the Contractor should be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor shall also be required to supply a minimum of 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 the 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 pipe installations

are to be carried out with approximately 10% of their diameter embedded below the drain design bottom, as shown and noted on the plan and profiles for each of the access bridge installations.

IX. REMOVALS

Where existing access bridges and enclosures are to be completely removed and replaced, the Contractor shall be required to excavate and completely extract the existing culvert pipe and the existing endwalls in their entirety, excluding poured concrete headwalls that are to be reused, as well as any other deleterious materials that may be encountered in removing same. 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 any headwalls that are shown to remain in place shall be protected, and the Contractor shall carry out its work for the pipe replacement as noted above and dispose of any debris resulting from the work.

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

X. CONCRETE FILLED JUTE BAG HEADWALL AND SLOPED END PROTECTION

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

The concrete filled jute bags are to be provided and laid out as is shown and detailed in the accompanying drawings and as is 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 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").

The installation of the concrete filled jute bag headwalls, unless otherwise specified, shall be provided in total compliance with the Items included in the "**STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION". T**hese are attached to the back of this report 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.

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 road side approach to the entrance shall be provided with a minimum 5.0m radius at each end of the driveway entrance. All work shall be completed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer.

The installation of the sloped quarried limestone end protection, unless otherwise specified herein, shall be provided in total compliance with Item 2, Item 3, and Item 4 of the "**STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION".** 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".**

XI. GENERAL QUARRIED LIMESTONE EROSION PROTECTION

At all of the swale and furrow locations entering the drain from either side, it is required that general quarried limestone erosion protection and rock chutes be provided on the drain slopes, at the locations indicated, and to the widths generally shown within the details and notes included in the accompanying drawings. The rock chutes shall be V-shaped and constructed to direct all flows through the centre portion of the rock chute. Where bank erosion exists along the face of existing or new headwalls, the Contractor shall install a strip of rock on filter cloth protection 305mm thick along the face of the headwall extending along the full length of the slope and for a width of 1.0 metres from the face of the headwall. Where the drain banks are showing erosion or slumping and distress, the Contractor shall provide quarried limestone on filter cloth general erosion protection as outlined below. Protection locations shall be as established in consultation with the Town Drainage Superintendent and Consulting Engineer.

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 general 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 an 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 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 Industries Amherst Quarries, in Amherstburg, Ontario, or equal.

XII. BENCH MARKS

Also, for use by the Contractor, we have established Bench Marks along the course of the work and especially at the locations where existing access bridges and enclosure structures are being replaced.

For each of the bridge and enclosure replacements, the plans include details illustrating the work to be carried out. For each bridge detail a Bench Mark 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 to match the direction of flow within the drain. The Contractor's attention is drawn to the fact that the pipe invert grades established herein provide for the pipes to be set approximately 10% of their diameter below the existing drain bottom or the design grade of the drain, whichever is lower.

XIII. ANCILLARY WORK

During the course of any repair or improvements to the bridges and enclosures along the course of the work, 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 new pipe 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 100% 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 96%. 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 smooth wall aluminized steel type II or H.D.P.E. pipes for these installations are to be provided with a minimum depth of cover measured from the top of the pipe of 305mm (12"). 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 Bench Mark.

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 check dam or silt curtain shall be to the satisfaction of the Town Drainage

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

As part of the work on the drain the Contractor shall provide offsetting measures along the course of the drain in consultation with the Drainage Superintendent, Biological Consultant and Consulting Engineer. These offsetting measures are outlined in the schedule of items and prices and indicated in the Appendices and shall include the supply of all equipment, labour and materials for installation of:

1. Fascines
2. Rip rap riffles
3. Eddy rocks
4. Refuge pools

Details for the installation of these features are included in **Appendix "REI-B"**. All work shall be carried out in accordance with any requirements stipulated be E.R.C.A., D.F.O., M.N.R.F. and M.E.C.P. A refuge pool is to be provided on the upstream side of each riffle that is to be constructed along the drain. The pool is to be constructed in the drain bottom by deepening the drain bottom by 300mm for 3 metres with 1 to 1 side slopes around the perimeter of the pool without disturbing the drain banks. Work shall be meticulously done and completed to the full satisfaction of the Drainage Superintendent, Biological Consultant, and Consulting Engineer.

XIV. TOPSOIL, SEED AND MULCH

The Contractor will be required to construct grass buffers along the top of the westerly and southerly drain bank where there are currently open field areas and areas along the opposite side of the drain where phragmites removal is required. The grass buffer shall extend from the top of the bank to provide a 3.0m wide strip of grass between the cultivated field or natural areas and the drain, measured perpendicular to the drain. The topsoil shall be prepared for seeding as noted further in these specifications. Should the existing topsoil be treated to prevent grass growth, the Contractor shall strip the existing topsoil material back and spread it on the adjacent field and supply 50mm thick imported topsoil, or topsoil material scavenged from the drain banks at rock protection locations, that is suitable for growing grass.

The Contractor shall be required to restore all existing grassed areas and drain side slopes damaged by the structure replacements and 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 all topsoil shall be carefully carried out according to Ontario

Provincial Standard Specifications, Form 570, dated November 2007, or as subsequently amended or as amended by these Specifications.

Once the topsoil has been properly placed and fine graded, the Contractor shall seed and mulch the area. Seeding and mulching operations shall be carried out according to Ontario Provincial Standard Specifications, Form 572, dated November 2003, or as subsequently amended or as amended by these Specifications. The seeding mixture shall be a riparian seed mix hand broadcast at 30 kg./ha. and consist of a mix of the following plant species: Canada Wild Rye, Riverbank Rye, Virginia Wild Rye, soft stem bulrush, Bebb's sedge, Fox sedge, soft rush, Switch grass, dark green bulrush, Canada bluejoint, Woolgrass bulrush, white beardtongue, swamp milkweed, marsh hibiscus, blue vervain, and southern blue flag iris. Seed must be grown and collected from Ontario Ministry of Natural Resources and Forestry Zones 37 or 38. Sources for the seed mix are included in **Appendix "REI-B"**. The seed mix shall be hand placed at the end of each day on all newly excavated drain side slopes and any excavated fill material that has been spread and fine graded adjacent to the drain where permitted.

Where hand seeding is unable to be completed at the end of each day, the Contractor will arrange for prompt completion of the disturbed areas using conventional seed and mulch methods. As part of the seeding and mulching operation, the Contractor will be required to provide either a hydraulic mulch mix or straw mulch with adhesive binder in accordance with O.P.S.S. 1103.05.03 dated November 2007, or as subsequently amended, to ensure that the grass seed will be protected during germination and provide a thick, uniform cover to minimize erosion, where necessary. All work shall be completed to the full satisfaction of the Town Drainage Superintendent and the Consulting Engineer.

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

XV. SPECIAL PROVISIONS FOR REPLACEMENT, REPAIR AND IMPROVEMENTS

The Contractor shall provide for the construction and improvements to the access bridges and enclosures along the Bondy-Bastien Drain, for the structures noted, as follows:

Bridge No. 12 (County of Essex, Road 20)

The Contractor is advised that backfill material is migrating from around the pipe due to the rotted condition near the bottom. The Contractor shall carefully flush and clean out the entire length of the pipe. The Contractor shall then supply and install concrete grout pumped into the pipe to fill same, including filling all existing voids due to previous material migration. The Contractor shall provide for any forming needed to contain the grout within the pipe and shall ensure that the entire pipe is full using appropriate pumping or other methods. Once the grout is set, the Contractor shall remove all forms and leave the site in a neat and tidy condition. All

work shall be carried out in accordance with these specifications, the plans and the requirements in **Appendix "REI-C"**.

Bridge Enclosure No. 13 (Parcel 500-39700)

The Contractor shall completely remove the existing corrugated steel and any other pipes and material along with any end protection that currently exists. The Contractor will then be required to backfill the excavation with compacted native material, install topsoil and seed and mulch on all backfilled and disturbed areas. The final elevation of the fill shall not exceed 175.200 metres CGVD28:78. All work shall be carried out in accordance with these specifications and the requirements in **Appendix "REI-C"**.

General Bridge and Drain Work

For all bridges not being replaced, the Contractor shall clean through the existing structures, to remove all sediment and accumulated materials, and provide for the drain cross section as shown on the profiles and plans. All cleaning and flushing work shall be carried out to the complete satisfaction of the Town Drainage Superintendent or the Consulting Engineer. The Contractor will be required to remove all material taken out of the access culverts and drains and haul away and dispose of same, at a site to be obtained by it, at its own expense.

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 Amherstburg, the County 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 Amherstburg, the County 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 Municipal road system, especially to the travelled portion. When excavation work is being carried out and the excavation equipment is placed on the travelled portion of the road, the travelled portion shall be protected by having the excavation equipment placed on

satisfactory timber planks or timber pads. If any part of the travelled portion of the road is damaged by the Contractor, the Town shall have the right to have the necessary repair work done by its' employees and the cost of all labour and materials used to carry out the repair work shall be deducted from the Contractor's contract and credited to the Town. The Contractor, upon completing the works, shall clean all debris and junk, etc., from the roadside of the drain, and leave the site in a neat and workmanlike manner. The Contractor shall be responsible for keeping all public roadways utilized for hauling materials free and clear of mud and debris.

e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. If traffic control is required on this project, signing is to comply with the M.T.O. Manual of Uniform Traffic Control Devices (MUTCD) for Roadway Work Operations.

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

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

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

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

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

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

l) The Contractor shall furnish a Performance and Maintenance Bond along with a separate Labour and Material Payment Bond within ten (10) days after notification of the execution of the Agreement by the Town. One copy of said bonds shall be bound into each of the executed sets of the Contract. Each Performance and Maintenance Bond and Labour and Material Payment Bond shall be in the amount of 100% of the total Tender Price. All Bonds shall be executed under corporate seal by the Contractor and a surety company, authorized by law to carry out business in the Province of Ontario. The Bonds shall be acceptable to the Town in every way and shall guarantee faithful performance of the contract during the period of the contract, including the period of guaranteed maintenance which will be in effect for twelve (12) months after substantial completion of the works.

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

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

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

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

ii) proof of advertising

iii) a Statutory Declaration, in a form satisfactory to the Engineer and the Town, that all liabilities incurred by the Contractor and its Sub-Contractors in carrying out the Contract have been discharged and that all liens in respect of the Contract and Sub-

Contracts thereunder have expired or have been satisfied, discharged, or provided for by payment into Court.

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

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

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

APPENDIX “REI-A”

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

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

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

SECTION II

SPECIFICATIONS

FOR FISH SALVAGE

GENERAL
SECTION 201

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

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

MATERIALS
SECTION 202

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

CONSTRUCTION
SECTION 203

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

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

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

MEASUREMENT AND PAYMENT
SECTION 204

Payment for this Work will be 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.

Measures to Avoid Causing Harm to Fish and Fish Habitat

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

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

Measures

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

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

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

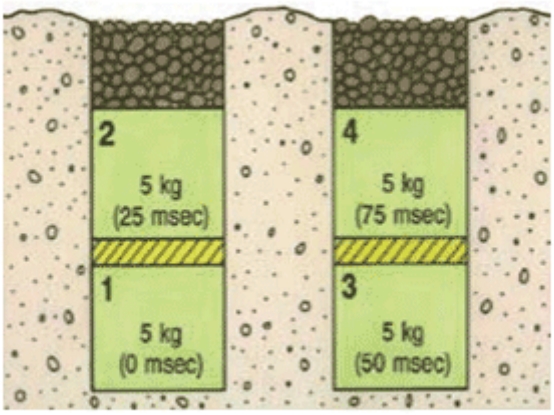
- Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has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

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

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

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

Figure 1: Sample Blasting Arrangement



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

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

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

Date modified:

2013-11-25

APPENDIX “REI-B”

Ontario

Ministry of the Environment, Conservation and Parks

Ministère de l'Environnement, de la Protection de la nature et des Parcs

PERMIT UNDER ss.17 (1) in accordance with the criteria in clause 17(2)(c) of the ENDANGERED SPECIES ACT, 2007

Permit #: SW-C-002-19

Issued to:	The Corporation of the Town of Amherstburg (the "**Proponent**") 512 Sandwich Street South Amherstburg, Ontario N9V 3R2
Effective Date:	This permit comes into force on the date it is issued and expires when all conditions have been completed.
Project Description:	Repair and improvements to Bondy Bastien Drain (the "**Project**").

1. **Authority:** This permit is issued to the Proponent under subsection 17(1) of the *Endangered Species Act, 2007* ("**ESA**") in accordance with the criteria in clause 17(2)(c) of that Act.

2. **Application to Species:** This permit applies to Pugnose Minnow (*Opsopoeodus emiliae*), which is a species listed as threatened in O. Reg. 230/08: Species at Risk in Ontario List, and its habitat, which is protected under the ESA.

3. **Authorization**: This permit authorizes the Proponent to carry out the following activities at the Site that would otherwise be prohibited by sections 9 and 10 of the ESA for the purpose of carrying out the Project or fulfilling the conditions of this permit:

   (a) capture, collect, harm, harass, possess and transport Pugnose Minnow; and
   (b) damage or destroy up to 2829 m^2 of Pugnose Minnow habitat.

4. **Conditions:** Pursuant to subsection 17(6) of the ESA, authorizations in section 3 of this permit do not apply unless the Proponent complies with the requirements imposed by conditions in this permit.

5. **Compliance:** Section 36 of the ESA provides that non-compliance with the prohibitions in subsections 9(1) and 10(1) of that Act or any provision of this permit constitutes an offence.

6. Schedules: The following schedules form part of this permit:

- Schedule A: Conditions
- Schedule B: Site
- Schedule C: Phragmites Control
- Schedule D: Improvements to Protected Species Habitat
- Schedule E: Refuge Pools, Rocks and Riffles
- Schedule F: Monitoring Report Specifications

Pursuant to subsection 17(1) of the ESA and in accordance with the criteria in clause 17(2)(c) of the ESA, I hereby issue this permit authorizing the activities described above, subject to the conditions set out herein.

David Piccini
Minister of the Environment, Conservation and Parks

Date of Issuance: 21/04/2022
(dd/mm/yy)

SCHEDULE A: CONDITIONS

Definitions

1. In this permit,

"Certified Inspector of Sediment and Erosion Control" means an individual who is a CAN-CISEC registrant;

"Ministry" or "MECP" means the Ministry of the Environment, Conservation and Parks;

"Overall Benefit Activities" means the activities described in condition 21;

"Project Activities" means activities associated with undertaking the Project or fulfilling the conditions of this permit which may impact the Protected Species or its habitat, including site preparation, sedimentation removal, invasive species removal, removal and replacement of culverts and bridges, realignment of drain sections and site restoration;

"**Proponent**" means the "The Corporation of the Town of Amherstburg";

"**Protected Species**" means Pugnose Minnow;

"Qualified Professional" means a person who has the education, training, experience and expertise to undertake the requirements of this permit that are to be undertaken or overseen by that person;

"**Sediment and Erosion Control Measures**" means the measures required under condition 14 (a);

"Site" means the area identified in the map in Schedule B, which is located in the general area of part of lots 36 to 42 in the geographic township of Anderdon, Town of Amherstburg, County of Essex; and

"Spill Prevention and Response Plan" means the plan required under condition 14 (d).

General

2. The Proponent shall retain one or more Qualified Professional(s) to:

(a) undertake the activities that this permit requires to be undertaken by a Qualified Professional, and

(b) supervise and assist with other activities required by this permit that are within the purview of a Qualified Professional.

3. The Proponent shall keep a copy of this permit on the Site and ensure that a copy of this permit is accessible at all times by any person engaging in an activity that is authorized by or required by this permit.

4. The Proponent shall:

a) give a copy of this permit to every Qualified Professional working on the Site; and

b) ensure that a copy of this permit is carried by any person who transports a Protected Species individual under the authority of this permit.

7. The Proponent shall act with due diligence to prevent killing, harming or harassing individuals of the Protected Species while carrying out Project Activities and while fulfilling the conditions of this permit.

8. The first time Project Activities are commenced, the Proponent shall notify the MECP within 24 hours by emailing SAROntario@ontario.ca, referencing the number of this permit.

9. At the request of MECP staff and on reasonable notice, the Proponent shall provide MECP staff and others accompanying them with access to the Site and any other areas for the purposes of observing the Site and any activities undertaken in relation to this permit. If access is requested to an area not on the Site and not owned or controlled by the Proponent, the Proponent shall make reasonable efforts to obtain the requested access. For greater certainty, this condition does not affect the powers of an enforcement officer under the ESA.

10. The Proponent shall notify MECP immediately by email at SAROntario@ontario.ca, referencing the number of this permit, if the Proponent's name or address changes or if the Proponent:

(a) becomes bankrupt, becomes insolvent or makes an assignment for the benefit of creditors;

(b) has a receiver appointed in respect of it;

(c) takes a step toward dissolution or is amalgamated;

(d) undergoes a change in control or ownership;

(e) takes or is subject to any other thing which adversely affects the Proponent's ability to satisfy the conditions of this permit; or

(f) is unable to satisfy any of the conditions of this permit.

Awareness and Training

11. Education and Awareness Before any person engages in Project Activities, the Proponent shall ensure that a Qualified Professional provides education and awareness training to the person that addresses:

(a) the existence and identification of Protected Species and its habitat at the Site;

(b) the requirements of this permit;

(c) potential threats posed by the activity to the Protected Species and its habitat; and

(d) mitigation efforts that must be taken to minimize harming the Protected Species, and to avoid damaging or destroying its habitat.

12. **Record of training**: The Proponent shall keep a record of any training conducted in accordance with condition 11 and that record shall include:

(a) the name of each Qualified Professional who conducted the training;

(b) the names of all persons trained, and declaration signed by each trainee certifying that they have been trained in accordance with the requirements under condition 11;

(c) the date(s) of the training;

(d) the manner in which the training was provided; and

(e) a copy of the training materials.

Mitigation Measures

13. The Proponent shall ensure the Project Activities and Overall Benefit Activities are carried out in accordance with the following:

(a) Protected Species habitat shall be identified and staked prior to commencing Project Activities;

(b) existing riparian vegetation shall be maintained, where possible, to stabilize soils and filter contaminants;

(c) any Project Activities or Overall Benefit Activities that may impact the Protected Species or its habitat shall be conducted between July 16 and March 14 of any year this permit is in effect;

(d) construction access routes and staging areas shall be clearly marked in the field with appropriate flags or stakes, prior to the start of Project Activities, to minimize the disturbance and removal of existing vegetation;

(e) prior to carrying out any Project Activities or Overall Benefit Activities, the Proponent shall ensure that a Qualified Professional removes and transfers any Protected Species in accordance with fish handling methods set out in condition 18, and immediately release them downstream of the area of Project Activities or Overall Benefit Activities;

(f) any stockpiled materials shall be stored and stabilized a minimum of 30 metres away from any water;

(g) excavated spoils shall be thinly spread out (four to six inches deep) a minimum of five metres from the top of the bank and sediment and erosion

control fencing shall be placed along the vegetated buffer and remain in place until the banks are suitably restored;

(h) all construction materials and equipment used for the purpose of carrying out the Project Activities or Overall Benefit Activities shall be stored and used/operated in a way that prevents deleterious substances (e.g. sediment laden water) from entering any water;

(i) all vehicles and equipment used for the purpose of carrying out the Project Activities and Overall Benefit Activities shall be operated in a manner that minimizes disturbances to the banks of watercourses;

(j) all vehicle and equipment re-fueling or maintenance shall be conducted at least 30 metres away from water and any vehicle or equipment, before entering the water, shall be free of fluid leaks and externally cleaned or degreased to prevent deleterious substances from entering the water;

(k) any water removed from the Site shall be pumped to a filtration system located at least 30 metres from any water and shall be discharged into a well vegetated area; and

(l) all exposed soils or areas disturbed as a result of Project Activities or Overall Benefit Activities shall be stabilized using topsoil and native plant materials upon completion of the Project Activities and at any other locations at the Site as necessary to stabilize exposed soils.

Sediment and Erosion Control Measures

14. The Proponent shall carry out the following to manage sediment and erosion at the Site:

(a) prior to beginning Project Activities and Overall Benefit Activities, install the following sediment and erosion control measures to prevent the migration of sediment and deleterious substances into natural areas adjacent to the Site or any water:

(i) install a double row of non-woven sediment control fencing with straw bales staked in-between (or Ministry approved equivalent) at locations on the site as necessary; and

(ii) install all other measures for controlling sediment and erosion as necessary.

(b) maintain all Sediment and Erosion Control Measures in effective working order until all disturbed soils have been stabilized;

(c) immediately upon observation, report any release of sediment or other deleterious substance into water to the Ministry by email at SAROntario@ontario.ca referencing the number of this permit;

(d) keep on the Site at all times a Spill Prevention and Response Plan which includes procedures for responding to spills, instructions on where to find necessary equipment for responding and emergency contact numbers;

(e) ensure that each person before working on the Site receives training on the location, contents and procedures in the Spill Prevention and Response Plan and where to find the plan in the event of a spill; and

(f) implement the Spill Prevention and Response Plan in the event of a spill.

For greater clarity, requirements under this condition are in addition to any requirements specified under the *Environmental Protection Act* (EPA) and regulations made under said act or any other obligations prescribed by law in relation to spills, including the reporting requirements under s. 92 of the EPA and O. Reg. 675/98.

15. The proponent shall ensure that:

(a) no exposed soils or areas disturbed within the Protected Species habitat are left for more than 30 days without effectively stabilizing the soils or areas using appropriate measures to prevent the migration of sediment and deleterious substances from the Site into adjacent natural areas of water; and

(b) no sediment or deleterious substances enter the water at any time.

Inspection of Sediment and Erosion Control Measures

16. Until the Site is stabilized and the Sediment and Erosion Control Measures are removed, the Proponent shall ensure that a Certified Inspector of Sediment and Erosion Control inspects the Sediment and Erosion Control Measures in accordance with CAN/CSA-W202-18 and as follows:

(a) daily when any Project Activities or Overall Benefit Activities are being conducted**;**

(b) once every two weeks after Project Activities or Overall Benefit Activities have been completed within Protected Species habitat; and

(c) before and after every significant rainfall and/or snowmelt event.

If there is a conflict between the timing of inspections required by CAN/CSA-W202-18 and the timing required by this condition, whichever one offers the greatest protection to the Protected Species prevails.

17. Within 24 hours of an inspection conducted pursuant to condition 16, the Proponent shall remedy any deficiencies in the Sediment and Erosion Control

Measures identified during the inspection. The Proponent shall immediately report to the MECP any deficiencies not remedied within 24 hours of the inspection by email at SAROntario@ontario.ca, referencing the number of this permit.

Fish Relocation

18. The proponent shall carry out all Protected Species relocations under the authority of or required by this permit in accordance with the following:

(a) at least 24 hours in advance of undertaking Protected Species relocation, notify the Ministry of the proposed activity by email at SAROntario@ontario.ca, referencing the number of the permit;

(b) Protected Species relocation shall be carried out only by a Qualified Professional competent in fish identification or directly under the supervision of such a Qualified Professional;

(c) all persons handling Protected Species shall be trained in proper fish handling procedures prior to first handling them;

(d) all persons using netting equipment for capturing Protected Species shall be trained in the use of that equipment prior to using it on the Site;

(e) all persons using electrofishing equipment for capturing Protected Species shall have, at a minimum, a current Class 2 Backpack Electrofishing certification obtained from the Ministry of Northern Development, Mines, Natural Resources and Forestry or an authority under the *Conservation Authorities Act*;

(f) all captured Protected Species shall be handled as little as possible and in a manner that minimizes stress;

(g) all captured Protected Species shall be immediately placed in an appropriate container for the purpose of relocation;

(h) after placing Protected Species in the container and before releasing them, a photograph shall be taken of the fish illustrating key identifying features of the species;

(i) release all captured Protected Species into appropriate habitat in a timely manner; and,

(j) within one week following completion of Protected Species relocation submit a copy of the Fish Collection Record form, available through a Licence to Collect Fish for Scientific Purposes issued under the *Fish and Wildlife Conservation Act*, *1997*, and any photographs taken pursuant to condition 18 (h) to the Ministry by email at SARontario@ontario.ca, referencing this permit number.

19. In the event that there are any Protected Species mortalities associated with the activities authorized by this permit, the Proponent shall:

(a) immediately report all mortalities to the Ministry by email at SAROntario@ontario.ca, referencing the number of this permit.

20. Within 24 hours of any incidental capture of a species listed in O. Reg. 230/08 (Species at Risk in Ontario List), other than the Protected Species, the Proponent shall report capture to the Ministry by email at SAROntario@ontario.ca, referencing the number of this permit.

Overall Benefit Activities

21. Prior to December 31, 2027, the Proponent shall complete the following for the purpose of providing overall benefit to the Protected Species in consultation with a Qualified Professional:

(a) remove Phragmites populations in Protected Species habitat in areas identified in Schedule C, each year, for a period of five (5) years following Project completion in accordance with the following:

(i) at minimum an area of 16,830 m^2 of Phragmites shall be controlled through mowing, brush cutting or herbicide application in the re-vegetated area; and

(ii) re-seed excavated channel banks with native plantings and cover with appropriate erosion protection measures.

(b) improve Protected Species habitat in areas identified in Schedule D, by completing the following:

(i) realign the south section of the drain east of County Road 20 to remove the sharp bend and restore to a minimum 0.9 metre bottom with a 2:1 slope;

(ii) realign the north portion of the drain west of County Road 20 through the removal of the covered portion of the drain and accumulated sediment and restore to an open drain with a minimum 0.9 metre bottom with a 2:1 slope;

(iii) decommission bridge 12 by:

(a) removing any accumulated sediment and debris; and

(b) filling pipe with low strength concrete grout;

(iv) remove bridge 13 by:

(a) backfilling with compacted clay; and

(b) stabilizing with topsoil, seed and mulch;

(v) restore bridge crossings 1 through 11 and 14 through 18 by carrying out the following:

(a) install standard rock on filter cloth;

(b) install sloped end protection;

(c) ensure functionality and proper flow conveyance; and

(d) restore any disturbed areas with topsoil, seed and mulch where necessary to ensure the area is stabilized;

(vi) regrade the west section of the drain located northwesterly of County Road 20 from Bridge 12 to Townline Road through the restoration of the drain to a minimum 0.9 metre bottom and 2:1 slope, and

(vii) improve the outlet to the Detroit River located along the south side of the unopened Townline Road allowance through the restoration of the roadside ditch to a minimum 0.9 metre bottom with a 2:1 slope.

(c) create the following habitat features for the Protected Species in areas identified in Schedule E:

(iii) a minimum of three foreshore areas (riffles) that have, at a minimum, a combined area of at least 54.6 m^2;

(iv) a vegetated aquatic corridor with a minimum area of 16,830 m^2;

(v) a minimum of three refuge pools that have, at a minimum, a combined area of 62.9 m^2; and

(vi) a minimum of three groupings of eddy rocks that have, at a minimum, a combined area of 68.6 m^2.

Corrective Actions

22. On an ongoing basis from the start of Project Activities or Overall Benefit Activities until all other conditions of this permit are satisfied, the Proponent shall take corrective actions, including repairing Sediment and Erosion Control Measures, stabilizing the Site as necessary to prevent deleterious substances from entering the water and replacing vegetation that does not survive.

Monitoring

23. On an annual basis, the Proponent shall conduct monitoring of all activities undertaken in accordance with this permit for the period beginning with the issuance of the permit and ending five (5) years following completion of Project Activities and Overall Benefit Activities. This monitoring shall be sufficient to result in the collection or development of information specified in Schedule F.

Annual Report

24. The Proponent shall submit an annual report by January 31 following each year when monitoring is required under condition 23 to the Ministry by email at SAROntario@ontario.ca, referencing the number of this permit.

25. The annual reports required under condition 24 shall include a description of the actions taken in relation to condition 22 and all the information described in Schedule F related to the Site, Project Activities, and Overall Benefit Activities for the year of report.

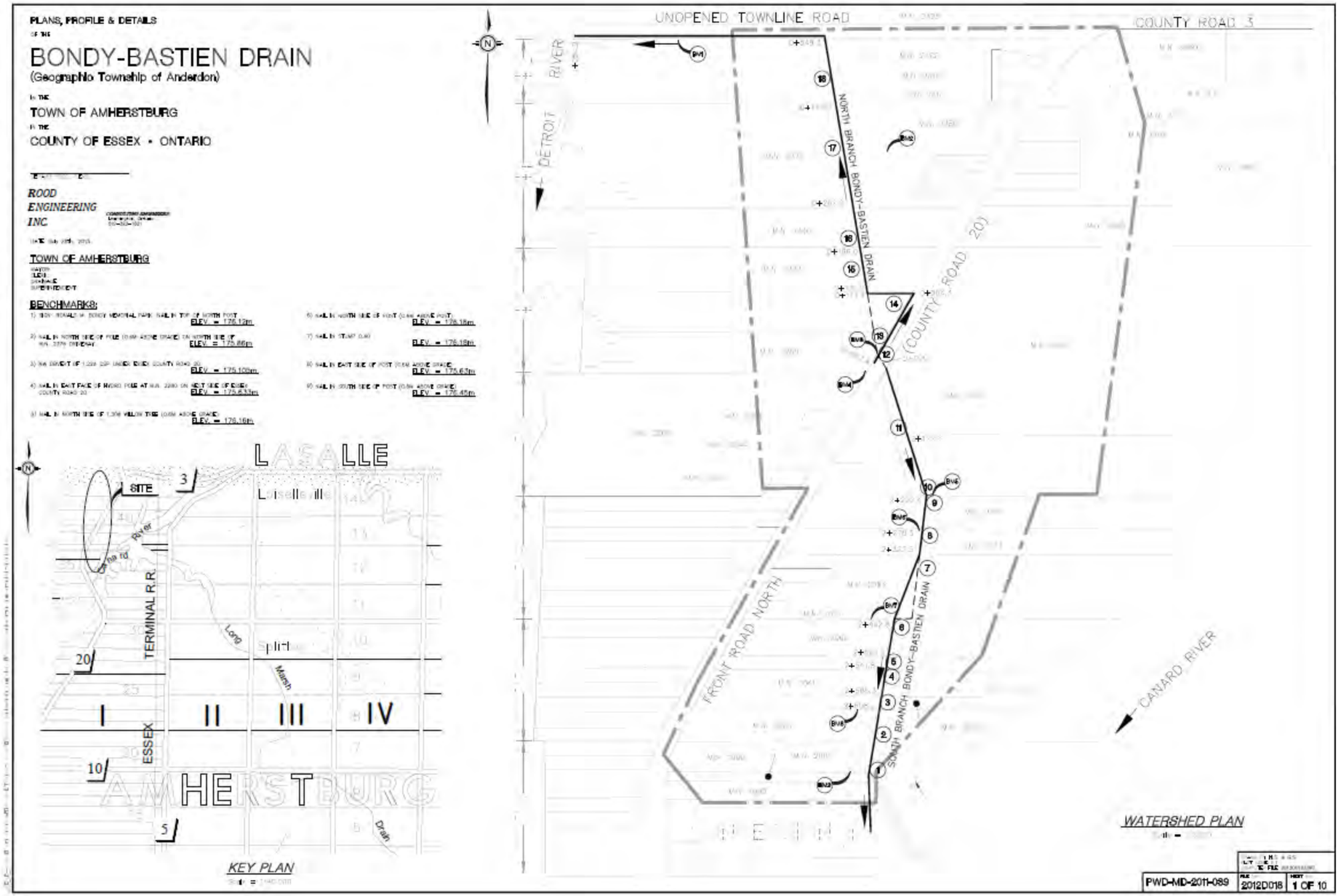
Final Report

26. By January 31 of the year following the last year of monitoring required under condition 23, the Proponent shall submit a final report to the Ministry by email at SAROntario@ontario.ca, referencing the number of this permit, and this final report shall include:

(a) A summary of all of the information in the annual reports submitted under condition 24 for all years; and

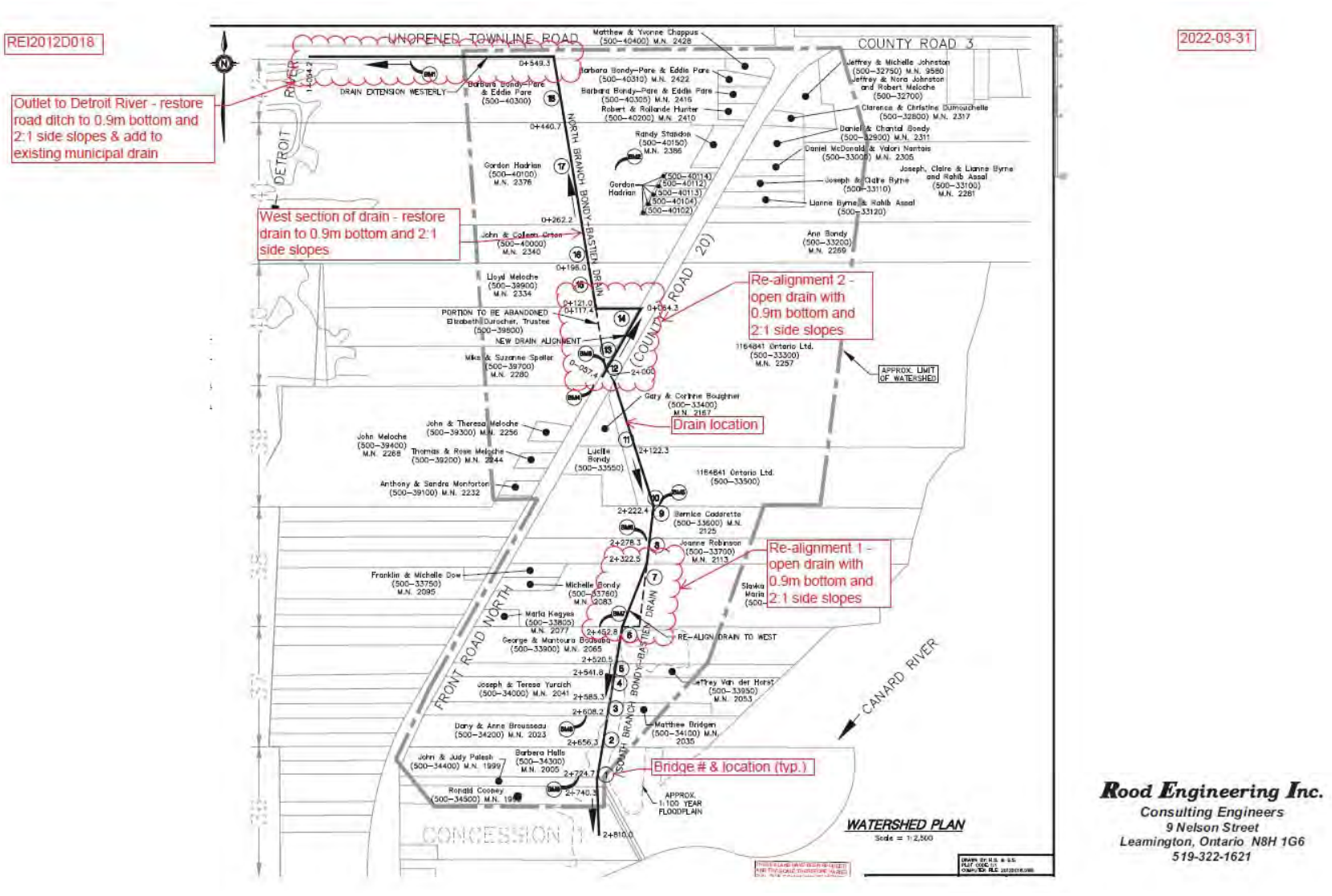
(b) A final analysis of the effectiveness of Overall Benefit Activities.

Schedule B: Site



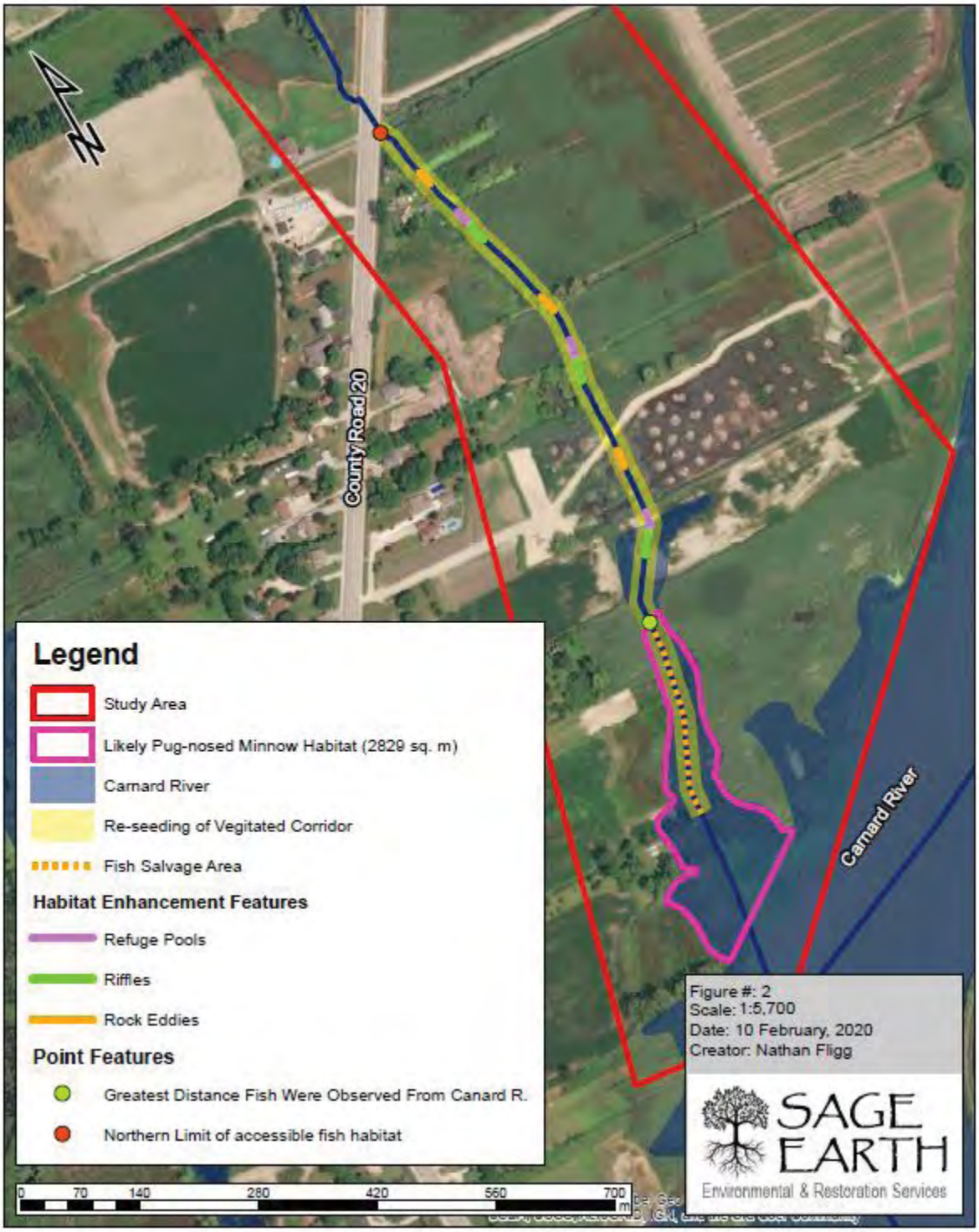
Schedule C: Phragmites Control

Schedule D: Improvements to Protected Species Habitat



Schedule E: Refuge Pools, Rocks and Riffles

Figure 2: Location of Habitat Features and Fish Salvage



Schedule F: Monitoring Report Specifications

At a minimum, the annual monitoring reports required by Condition 24 shall contain all the information described under the headings below. Additional information required in relation to monitoring may be outlined in Schedule A or requested by the Ministry.

Site Conditions

- Submit photographs and a description of the Site prior to commencing Project Activities and Overall Benefit Activities;
- Document the extent and condition of Protected Species habitat currently present at the Site for the current reporting year;
- Document and discuss all conditions following Project completion:
    - discuss whether the Project that was authorized has been undertaken in accordance with the specifications of the permit;
    - justify and explain any deviations from the authorization provided and describe any corrective actions taken;
- Include the results of any and all monitoring conducted, including;
    - viability/survival rates of any planted vegetation
    - stability, integrity, and condition of all constructed and/or natural features;
- Survey of the current condition of all habitat impacted by activities taken under the permit, to identify any erosion issues or other problems that may be resulting in negative impacts to the habitat; and
- Provide documentation detailing any encounters of species listed in O.Reg. 230/08 (Species at Risk in Ontario List) during the reporting year.

Awareness and Training

- Summary of any training conducted in accordance with condition 11.

Mitigation Measures

- Document how successful (or unsuccessful) the actions taken during construction were in mitigating impacts to the Protect Species and/or its habitat;
- If applicable, discuss any modifications to the actions that were implemented during the current reporting year, as well as a rationale for the modifications;
- Provide a summary of any incidents that occurred during the current reporting year (e.g. sediment spills) and provide a description of the actions that were taken to remediate the issues;
- Include a summary and rationale describing any requested amendments or extensions that resulted in a change to the permit; and
- If applicable, identify any significant problems encountered and remedial actions taken or proposed to correct those problems.

Overall Benefit

- Document the Overall Benefit Activities that were implemented during the reporting year and describe how they were completed/constructed as per this permit, including documentation on the effectiveness of restoration strategies,

water quality and invasive species presence/absence, planting success, and photographs where relevant;

- If applicable, describe any modifications and/or changes made to the Overall Benefit Activities in this permit, as well as a rationale for the modifications; and
- Document and discuss if the Overall Benefit Activities are functioning as intended.

The Corporation of the
Town of Amherstburg
512 SANDWICH STREET SOUTH
AMHERSTBURG, ONTARIO
N9V 3R2
www.amherstburg.ca

PUBLIC WORKS DEPARTMENT
Tel (519) 736-3664
Fax (519) 736-7080

LOU ZARLENGA, P.ENG.
Director of Engineering and Infrastructure

July 11, 2013

Gerard Rood, P.Eng
Rood Engineering Inc.
9 Wilkinson Drive
Leamington, Ontario
N8H 1A1

Attention: **Gerard Rood, P.Eng.**

Subject: **Endangered Species Act Review**
Bondy Bastien Drain – Improvements

File No. **PWD-MD-2011-032**

Dear Gerard:

The Town of Amherstburg has reviewed your firm's request to complete the screen of the Endangered Species Act Agreement for the proposed improvements to the Bondy Bastien Drain. Accordingly, the Public Works Department provides the following comments for your consideration and attention.

A. BACKGROUND:

The Bondy Bastien Drain is located in Lot 36 to 42, Concession 1 and crosses to County Road 20 south of County Road 3 (Malden Road). The proposed work is as follows:

- Replacement of existing culverts
- Brushing and grubbing of the drain bottom and side slopes
- Sediment removal

B. ENDANGERED SPECIES ACT MUNICIPAL AGREEMENT

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

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

Since the proposed work on the Bondy Bastien Drain will be completed under section 78 of Drainage Act, please be advised that the Town of Amherstburg has completed the review of the endangered species under the Endangered Species Act. The following is the list of endangered species which may be encountered at this project site.

1. Fish Species

PWD review of the Sensitive Areas Map for Fish Species at Risk showed presence of endangered fish species in the proposed construction site. Based on the agreement, the municipality must contact the MNR to seek further direction.

2. Mussels Species

PWD review of the Sensitive Areas Map for Mussels Species at Risk showed presence of endangered mussel species at the proposed northerly outlet in the Detroit River.

3. Bird Species

PWD review of the Sensitive Areas Map for bird Species at Risk showed no presence of endangered bird species in the proposed construction site.

4. Turtle Species

PWD review of the Sensitive Areas Map for Turtle Species at Risk identifies the presence of endangered turtle species. The Endangered Species Agreement identifies the Spotted Turtle as endangered and the Spiny Softshell, Blanding's Turtle and Eastern Musk Turtle as threatened. Attached is the turtle mitigation plan that must be followed. Also attached is a Turtles of Ontario Identifier Guide for further information.

5. Snake Species

PWD review of the Sensitive Areas Map for Snake Species at Risk identifies the presence of endangered snake species. The Endangered Species Act agreement identifies the Bulter's Garter Snake as threatened. Attached is the snake mitigation plan that must be followed. Also attached is a Snakes of Ontario Identifier Guide for further information.

C. EXECUTIVE SUMMARY:

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

a) The Endangered Species Agreement identifies the presence of fish species protected under the Species at Risk Act. Further review must be completed be Department of Fisheries and Oceans.
b) The Endangered Species Agreement identifies the presence of fish species protected under the Species at Risk Act. Further review must be completed be Department of Fisheries and Oceans.
c) The Endangered Species Agreement identifies the Spotted Turtle as endangered and the Spiny Softshell, Blanding's Turtle and Eastern Musk Turtle as threatened. The mitigation plan and MNR Factsheet for turtles is attached.
d) The Endangered Species Agreement identifies the Bulter's Garter Snake as threatened under the Endangered Species Act. The mitigation plan and MNR Factsheet for turtles is attached.

Further consultation with Department of Fisheries and Ocean and Essex Region Conservation Authority will be required regarding the possibility of endangered fish and mussels presence. The mitigation plans and Ontario Identifier Guides for turtles and snakes that are included with this letter must be included in the engineer's report and tender documents. The Contractor will be responsible for providing the necessary equipment and materials required in the mitigation plans. The Contractor shall contact the Town of Amherstburg Drainage Superintendent immediately if any endangered species are encountered during construction.

If you have any questions please contact Eric Chamberlain, Engineering Coordinator / Drainage Superintendent at (519) 736-3664

Respectfully yours,

Eric Chamberlain, C.E.T.
Engineering Coordinator/Drainage Superintendent

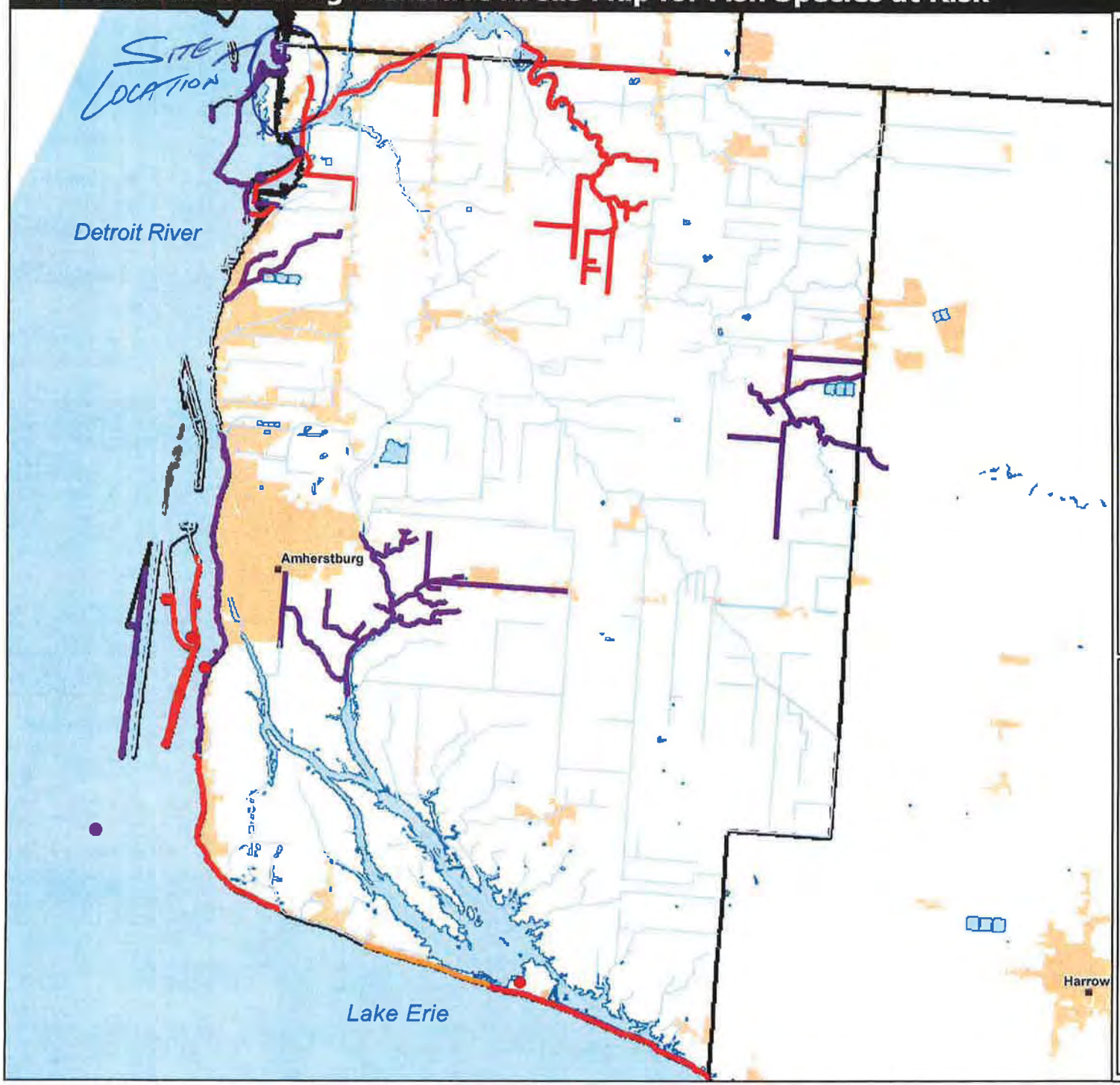
EC/

Attachments:

- Turtles of Ontario Identifier Guide
- Snakes of Ontario Identifier Guide
- Town of Amherstburg – Additional Mitigation Measures for Turtle Species
- Town of Amherstburg – Additional Mitigation Measures for Snake Species

Cc: Kathryn Markham, MNR Biologist
John Henderson, ERCA Regulations Officer
Cynthia Casagrande, ERCA Regulations Officer

Town of Amherstburg: Sensitive Areas Map for Fish Species at Risk



LEGEND

Ontario

Sensitive Areas for Fish SAR

DFO Data (valid until May 2010)

- *SARA Protected (EX, EN, TH)*
- *To be listed in 1yr+ (EN, TH)*
- *All SC (Sch 1, 3, newly listed)*

MNR/NHIC Data

- *EXP, END, THR*
- *SC*

Conservation Authority

Essex Region

- Subwatershed Boundaries
- Municipal Boundaries
- First Nations Territories
- Urban Area

N

SCALE: 1:100,000

0 1 2 4

Kilometres

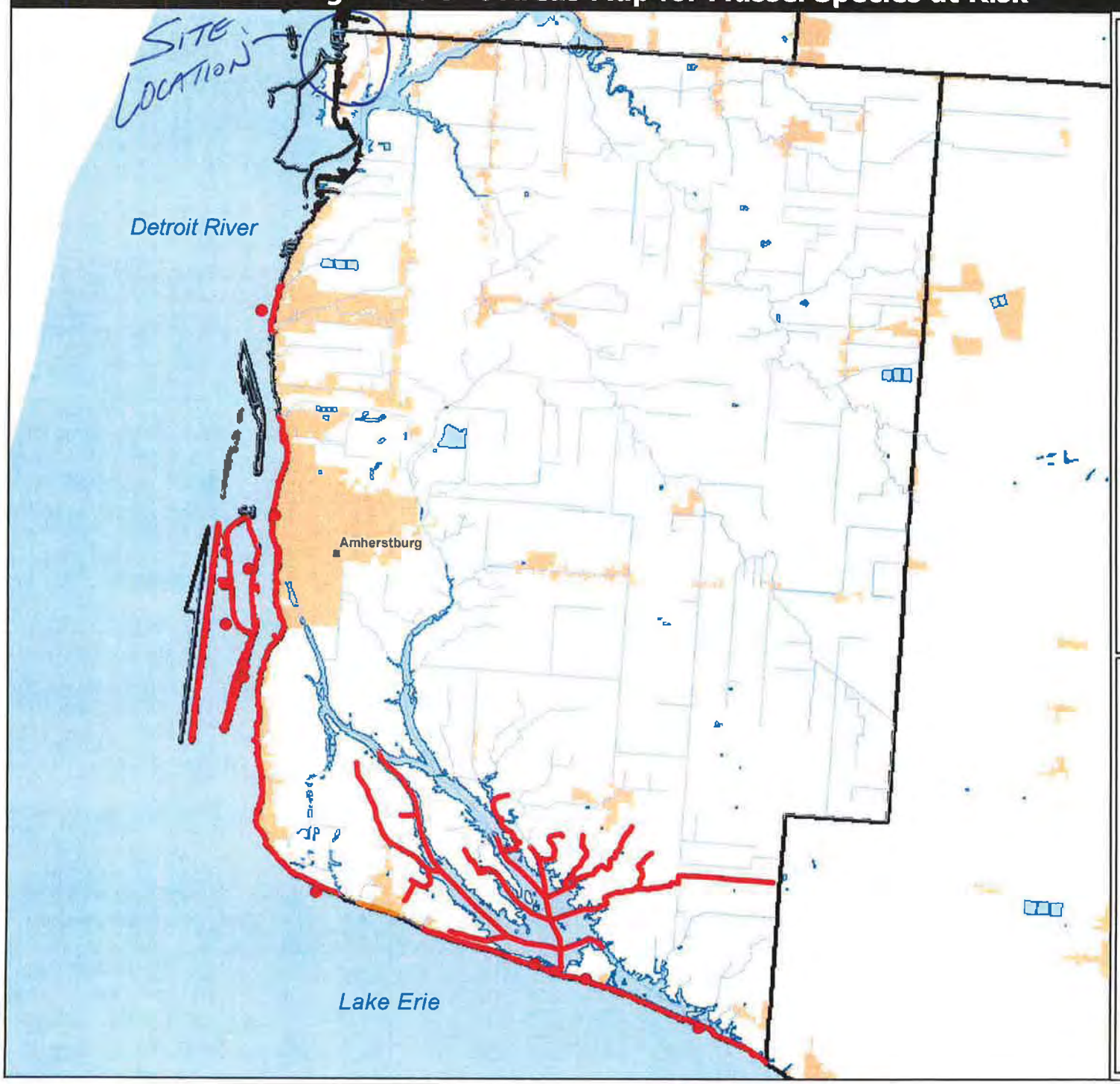
UTM NAD83 CNT Zone 17.

Base data derived from the Natural Resource Values Information System (NRVIS). Element Occurrence & Observation Data provided by Natural Heritage Information Centre (NHIC). Colour-coded stream segments provided by Fisheries & Oceans Canada, 2009. Subwatershed Boundaries provided by Conservation Authorities.

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

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

Town of Amherstburg: Sensitive Areas Map for Mussel Species at Risk



LEGEND

Ontario

Sensitive Areas for Mussel SAR

DFO Data (valid until May 2010)

- *SARA Protected (EX, EN, TH)*
- *To be listed in 1yr+ (EN, TH)*
- *All SC (Sch 1, 3, newly listed)*

MNR/NHIC Data

- *EXP, END, THR*
- *SC*

Conservation Authority

Essex Region

- Subwatershed Boundaries
- Municipal Boundaries
- First Nations Territories
- Urban Area

N

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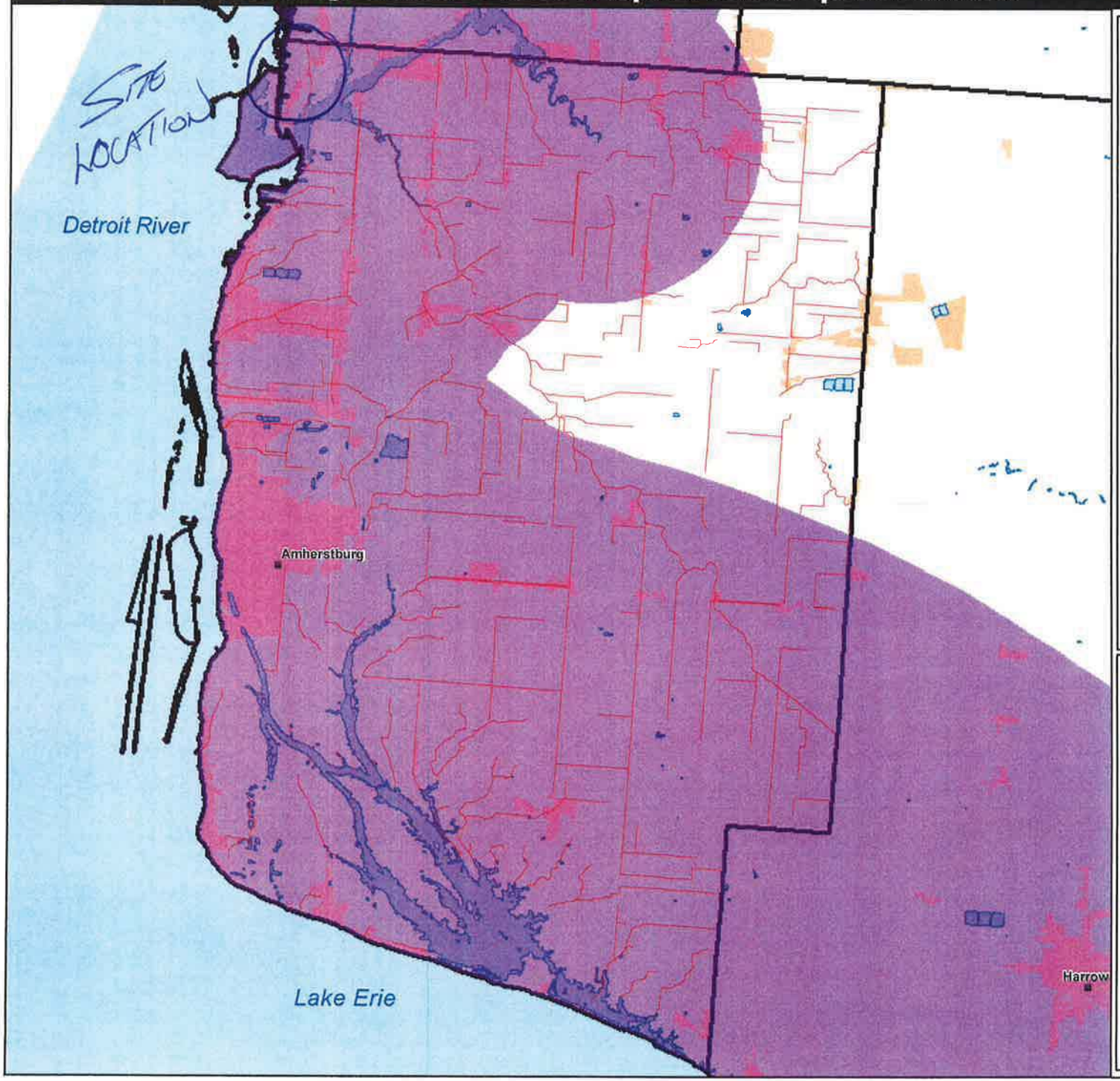
Town of Amherstburg: Sensitive Areas Map for Turtle Species at Risk



LEGEND

Ontario

- Sensitive Areas for Turtle SAR
- Municipal Drains

Conservation Authority

Essex Region

- Subwatershed Boundaries
- Municipal Boundaries
- First Nations Territories
- Urban Area

N

SCALE: 1:100,000

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Kilometres

UTM NAD83 CNT Zone 17.

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

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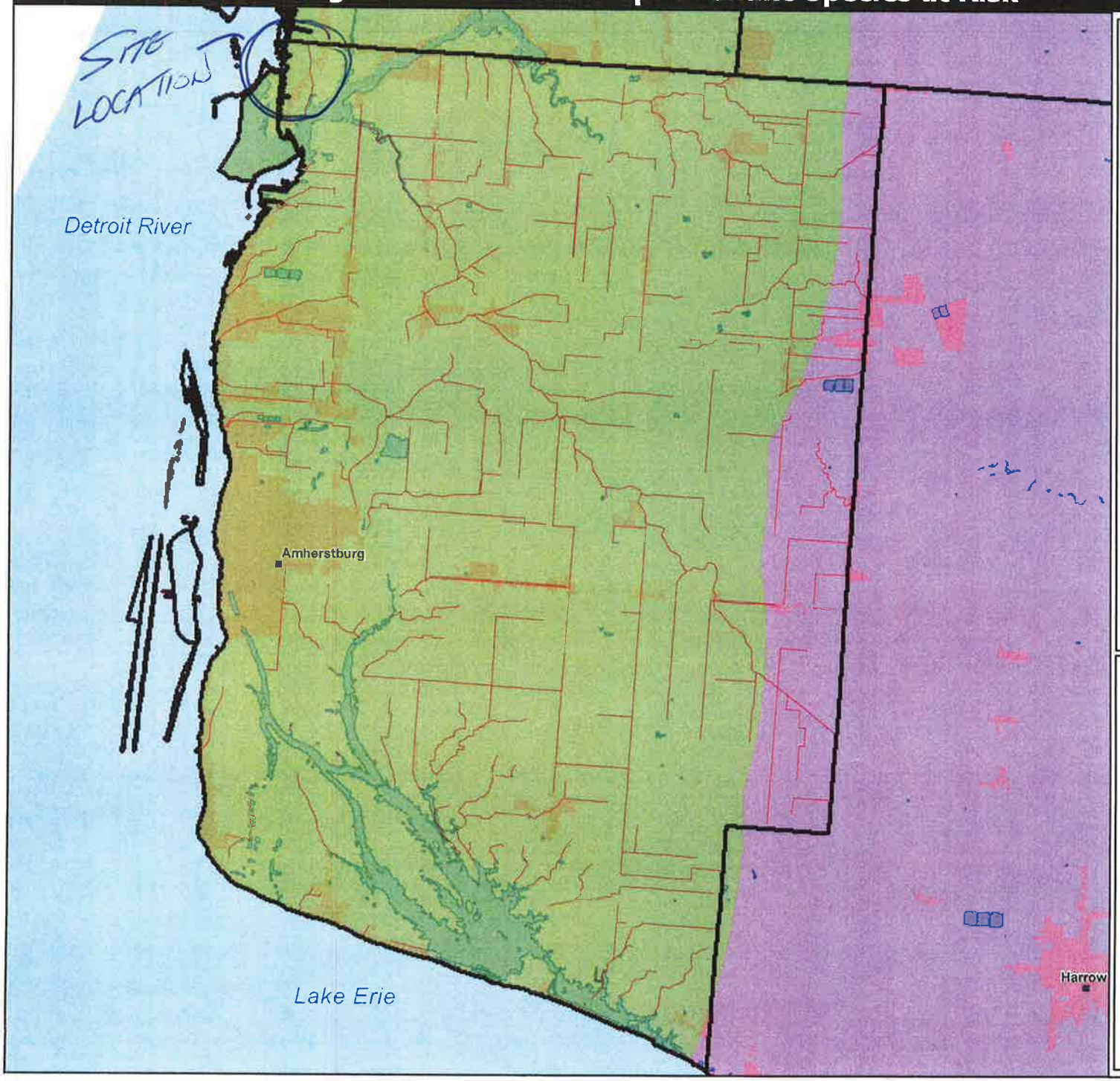
Town of Amherstburg: Sensitive Areas Map for Snake Species at Risk



LEGEND

Ontario

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

Conservation Authority

Essex Region

- Subwatershed Boundaries
- Municipal Boundaries
- First Nations Territories
- Urban Area

N

SCALE: 1:100,000

0 1 2 4

Kilometres

UTM NAD83 CNT Zone 17.

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

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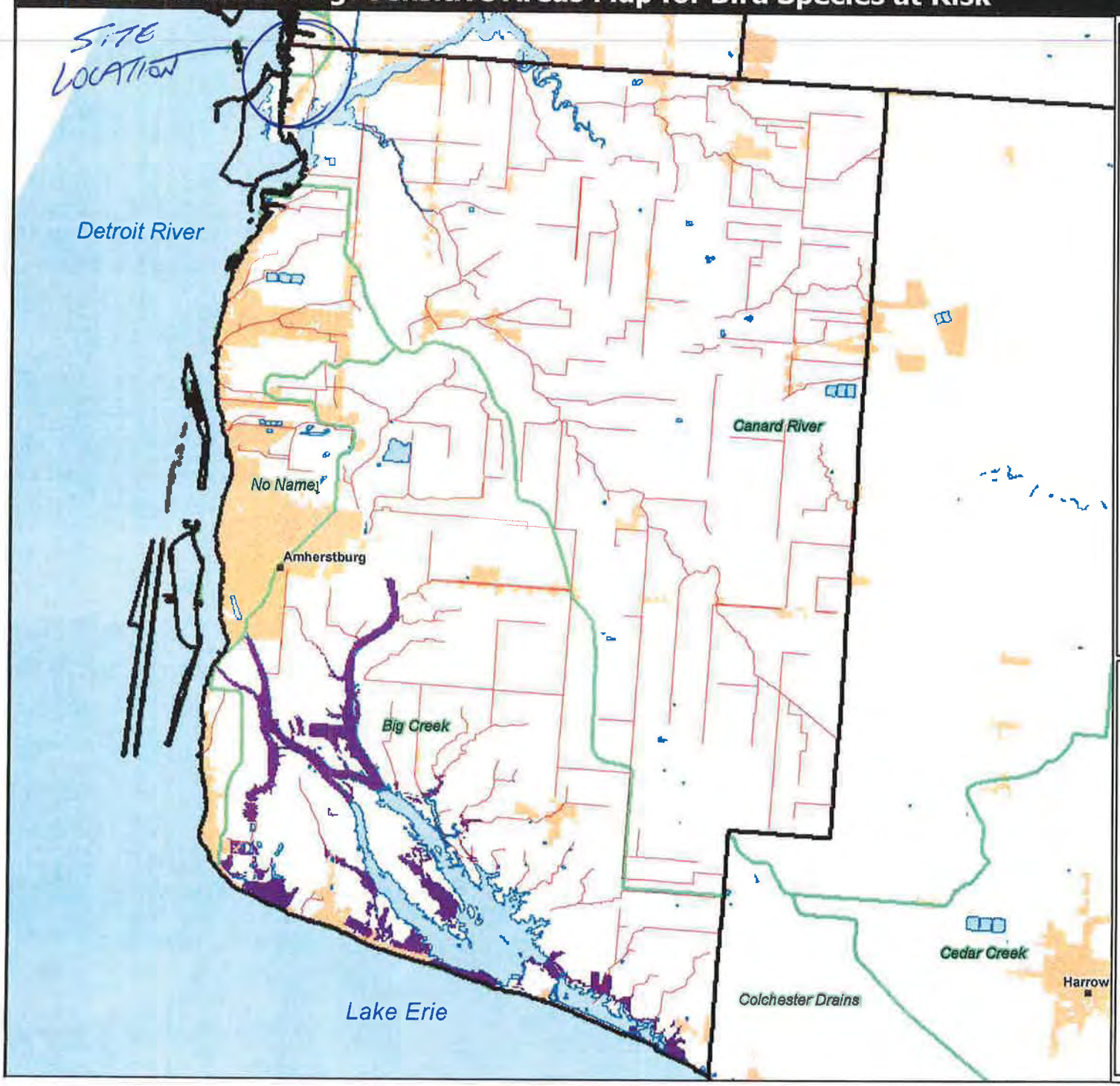
Town of Amherstburg: Sensitive Areas Map for Bird Species at Risk



LEGEND

Ontario

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

N

SCALE: 1:100,000

0 1 2 4

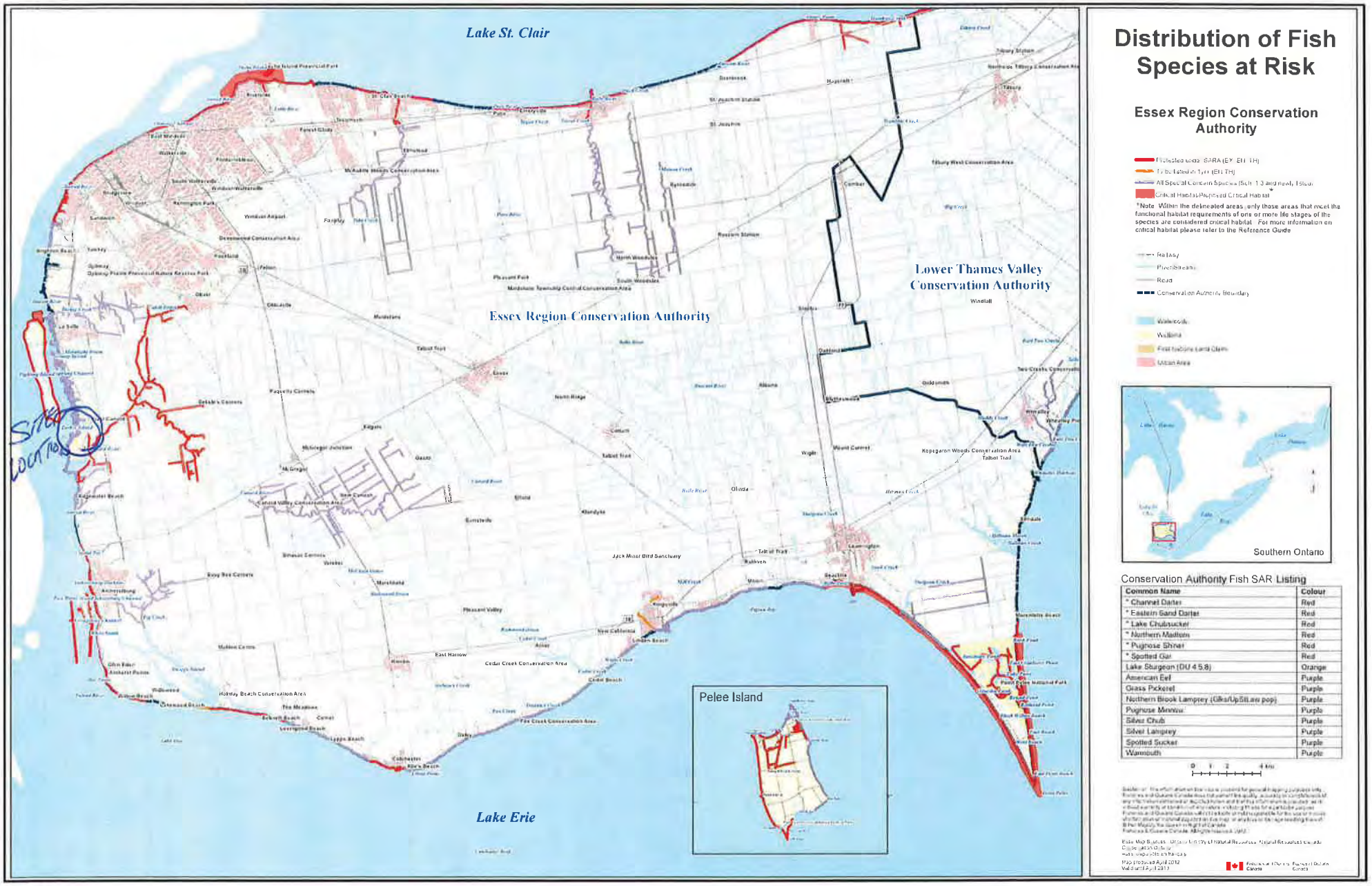
Kilometres

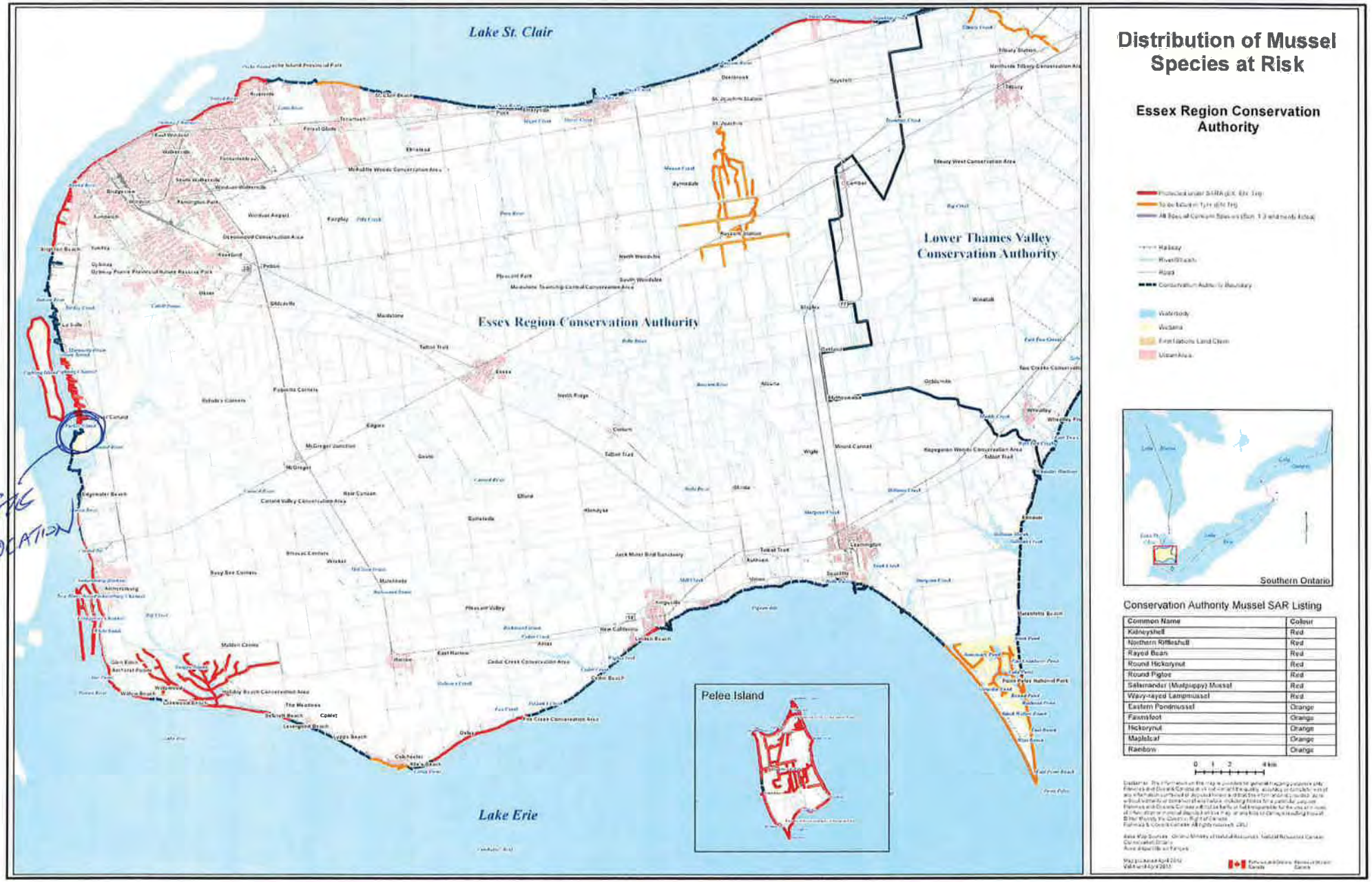
UTM NAD83 CNT Zone 17.

Base data derived from the Natural Resource Values Information System (NRVIS). Element Occurrence & Observation Data provided by Natural Heritage Information Centre (NHIC). Colour-coded stream segments provided by Fisheries & Oceans Canada, 2009. Subwatershed Boundaries provided by Conservation Authorities.

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

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


Lake St. Clair
Lower Thames Valley Conservation Authority
Essex Region Conservation Authority
Lake Erie
Pelee Island
Distribution of Fish Species at Risk
Essex Region Conservation Authority
Southern Ontario
Conservation Authority Fish SAR Listing
Common Name | Colour
* Channel Darter | Red
* Eastern Sand Darter | Red
* Lake Chubsucker | Red
* Northern Madtom | Red
* Pugnose Shiner | Red
* Spotted Gar | Red
Lake Sturgeon (DU 4 5 8) | Orange
American Eel | Purple
Grass Pickerel | Purple
Northern Brook Lamprey (Gilks/UpStLaw pop) | Purple
Pugnose Minnow | Purple
Silver Chub | Purple
Silver Lamprey | Purple
Spotted Sucker | Purple
Wannouth | Purple



Distribution of Mussel Species at Risk

Essex Region Conservation Authority

Southern Ontario

Conservation Authority Mussel SAR Listing

Common Name	Colour
Kidneyshell	Red
Northern Riffleshell	Red
Rayed Bean	Red
Round Hickorynut	Red
Round Pigtoe	Red
Salamander (Mudpuppy) Mussel	Red
Wavy-rayed Lampmussel	Red
Eastern Pondmussel	Orange
Fawnsfoot	Orange
Hickorynut	Orange
Mapleleaf	Orange
Raccoon	Orange

0 1 2 4 km

16. Training and Required On Site Materials for Snakes

16.1. The Municipality will ensure any person:

(a) involved in the capture, temporary holding, transfer and release of any snake Species has received training in proper snake handling procedures; and
(b) who undertakes an Activity has a minimum of two Holding Tubs and cotton sacks on site at all times.

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

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

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

(a) erect effective temporary snake barriers approved by the MNR that will not pose a risk of entanglement for snakes and that shall be secured so that individual snakes may not pass over or under the barrier or between any openings to enter or re-enter the Work Zone;
(b) inspect the temporary snake barriers daily during periods when snakes are active, capture any individuals incidentally encountered within the area bounded by the snake barrier and release the captured individuals in accordance with section 21.1; and
(c) remove the temporary snake barriers immediately upon completion of the Activity.

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

18. Measures for Encounters with Snakes During a Sensitive Period

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

(a) capture and transfer all injured and uninjured individual snakes of that Species into individual light-coloured, drawstring cotton sacks;
(b) place all cotton sacks filled with the captured individuals into a Holding Tub;
(c) ensure that the Holding Tub with the captured individuals is stored at a cool temperature to protect the snakes from freezing until the individuals can be retrieved or transferred;
(d) if an active hibernacula is uncovered, cease all Activities at the hibernacula site; and
(e) immediately Contact the MNR to seek direction and to arrange for the transfer and/or retrieval.

19. Measures for Encounters with Snake Nests

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

(a) collect any displaced or damaged eggs and transfer them to a Holding Tub;
(b) capture and transfer all injured dispersing juveniles of that Species into a light coloured drawstring cotton sack;
(c) place all cotton sacks with the captured injured individuals into a Holding Tub**;**
(d) ensure that the Holding Tub with the captured injured individuals is stored out of direct sunlight;
(e) immediately Contact the MNR to seek direction and to arrange for the transfer of the injured individuals;
(f) immediately stop any disturbance to the nest site and loosely cover exposed portions with soil or organic material to protect the integrity of the remaining individuals;
(g) not drive any equipment over the nest site or conduct any Activities within 5 metres of the nest site;
(h) not place any dredged materials removed from the Drainage Works on top of the nest site;
(i) mark out the physical location of the nest site but not by any means that might increase the susceptibility of the nest to predation or poaching; and
(j) where there are no collected eggs or captured individuals, Contact the MNR within 72 hours to provide information on the location of the nest site.

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

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

(a) follow the requirements in section 16;
(b) briefly stop the Activity for a reasonable period of time to allow any uninjured individual snakes of that Species to leave the Work Zone;
(c) if the individuals do not leave the Work Zone after the Activity is briefly stopped in accordance with (b) above, capture all uninjured individuals and release them in accordance with section 21.1;
(d) where circumstances do not allow for the immediate release of captured uninjured individuals, they may be transferred into individual, light-coloured, drawstring cotton sacks before placing them in a Holding Tub which shall be stored out of direct sunlight for a maximum of 24 hours before releasing them in accordance with section 21.1;
(e) capture and transfer any individuals injured as a result of conducting the Activities into a Holding Tub separate from any Holding Tub containing uninjured individuals; and
(f) store all captured injured individuals out of direct sunlight and immediately Contact the MNR to seek direction and to arrange for their transfer.

21. Release of Captured Individuals Outside of a Sensitive Period

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

(a) within 24 hours of capture;
(b) in an area immediately adjacent to the Drainage Works where there is natural vegetation cover;
(c) in an area that will not be further impacted by the undertaking of any Activity; and
(d) not more than 250 metres from the capture site.

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

22. Measures for Dead Snakes

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

(a) collect and transfer any dead individuals into a Holding Tub outside of direct sunlight; and
(b) Contact the MNR within 72 hours to seek direction and to arrange for the transfer of the carcasses of the dead individuals.

9. Training and Required On Site Materials for Turtles

9.1. The Municipality will ensure any person:

(a) involved in the capture, temporary holding, transfer and release of any turtle Species has received training in proper turtle handling procedures; and
(b) who undertakes an Activity has a minimum of two Holding Tubs and cotton sacks on site at all times.

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

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

(a) not undertake any Activities that include the excavation of sediment or disturbance to
banks during the applicable Sensitive Period unless otherwise authorized;
(b) undertake Activities in accordance with any additional site-specific measures provided in writing by the MNR Designated Representative;
(c) avoid draw-down and de-watering of the Sensitive Area during the applicable Sensitive Period; and
(d) if authorized by the MNR Designated Representative under (a) above to undertake Activities that include excavation of sediment or disturbance of banks, in addition to any other measures required under (b) above, ensure any person undertaking an Activity has at least two Holding Tubs on site at all times.

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

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

11. Measures for Encounters with Turtles During a Sensitive Period

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

(a) capture and transfer all uninjured individuals of that Species into a Holding Tub;
(b) capture and transfer all individuals injured as a result of the Activities into a Holding Tub separate from any Holding Tub containing uninjured individuals;
(c) ensure that the Holding Tubs with the captured individuals are stored at a cool temperature to prevent freezing until the individuals can be transferred; and
(d) immediately Contact the MNR to seek direction and to arrange for the transfer of the individual turtles.

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

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

(a) not disturb a turtle encountered laying eggs and not conduct any Activities within 20 metres of the turtle while it is laying eggs;
(b) collect any displaced or damaged eggs and capture any injured dispersing juveniles and transfer them to a Holding Tub;
(c) store all captured injured individuals and collected eggs out of direct sunlight;
(d) immediately Contact the MNR to seek direction and to arrange for the transfer of any injured individuals and eggs;
(e) immediately stop any disturbance to the nest site and recover exposed portions with soil or organic material to protect the integrity of the remaining individuals;
(f) not drive any equipment over the nest site or conduct any Activities within 5 metres of the nest site;
(g) not place any dredged materials removed from the Drainage Works on top of the nest site;
(h) mark out the physical location of the nest site for the duration of the project but not by any means that might increase the susceptibility of the nest to predation or poaching; and
(i) where there are no collected eggs or captured individuals, record relevant information and Contact the MNR within 72 hours to provide information on the location of the nest site.

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

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

(a) briefly stop the Activity for a reasonable period of time to allow any uninjured individual turtles of that Species to leave the Work Zone;
(b) where individuals do not leave the Work Zone after the Activity is briefly stopped in accordance with (a) above, capture all uninjured individuals and release them in accordance with section 14.1;
(c) where circumstances do not allow for their immediate release, transfer captured uninjured individuals for a maximum of 24 hours into a Holding Tub which shall be stored out of direct sunlight and then release them in accordance with section 14.1;
(d) capture and transfer any individuals that have been injured into a Holding Tub separate from any Holding Tub containing uninjured individuals; and
(e) store all captured injured individuals out of direct sunlight and immediately Contact the MNR to seek direction and to arrange for their transfer.

14. Release of Captured Individuals Outside of a Sensitive Period

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

(a) within 24 hours of capture;
(b) in an area immediately adjacent to the Drainage Works;
(c) in an area that will not be further impacted by the undertaking of any Activity; and
(d) not more than 250 metres from the capture site.

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

15. Measures for Dead Turtles

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

(a) place any dead turtles in a Holding Tub outside of direct sunlight; and
(b) Contact the MNR within 72 hours to seek direction and to arrange for the transfer of the dead individuals.

SNAKES OF ONTARIO IDENTIFIER

An identification guide to the Massasauga Rattlesnake and other Ontario snakes.

Recovery through education and conservation.
This guide will help you identify the Massasauga Rattlesnake and other snakes in Ontario. The Massasauga is one of five Ontario snakes with blotches. Snakes on this identifier are grouped by appearance (blotched, striped and no pattern). When you see a snake, look at its size and pattern. Does it have blotches, stripes, or no pattern?

Snakes are illustrated at quarter-life size. These snakes are not found in all Ontario regions. Consult a field guide for maps of snakes in your area. The size of snakes includes U.S. populations as listed in 'Conant, Roger and Joseph T. Collins. 1991 *A Field Guide to Reptiles and Amphibians of Eastern and Central North America.* 3rd edition. Houghton Mifflin Co. Boston'

toronto ZOO

For information on the Toronto Zoo's Rattlesnake Workshop write to:

Toronto Zoo - Rattlesnakes
361-A Old Finch Ave.
Scarborough, ON, CANADA M1B 5K7
email: alentini@torontozoo.ca
Visit the Massasauga Rattlesnake Recovery Team website: www.massasauga.ca

Milk

Lampropeltis triangulum

- 61-90 cm; record 132.1 cm
- Cream, tan, or light grey with red or dark brown black-bordered blotches or rings on back alternating with blotches along each side
- Young have red blotches bordered in black
- Blotch on neck may appear Y or V shaped
- Belly whitish with black checkerboard pattern
- Scales smooth; anal scale single
- Lays eggs
- SPECIAL CONCERN (COSEWIC); SPECIAL CONCERN (OMNR)

Green/Brown Phase

Blotched Phase

Eastern Hog-nosed

Heterodon platirhinos

- 51-84 cm; record 115.6 cm
- Large dark blotches down back alternating with smaller blotches along sides
- When threatened, spreads neck to display darker neck pattern and will roll over to play dead
- Can be blotched phase, plain grey, green-brown or even black
- Heavy-bodied
- Flat head with upturned snout
- Belly yellow-grey with greenish grey pattern
- Underside of tail lighter colour than body
- Scales keeled; anal scale divided
- Lays eggs
- THREATENED (COSEWIC); THREATENED (OMNR)

Northern Water

Nerodia sipedon sipedon

- 61-106.7 cm; record 140.5 cm
- Well patterned individuals have reddish brown squarish blotches down back with row of alternating blotches along each side
- At front of body, some blotches extend as saddles over back and on to sides
- Pattern on older individuals may be obscured and they appear black or brown
- Usually found in or near water
- Belly cream with irregular rows of reddish half moon crescents
- Scales keeled; anal scale divided
- Gives birth to live young

Lake Erie Water

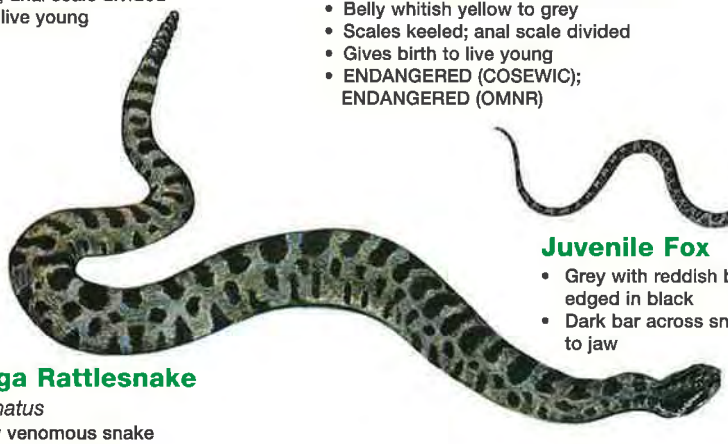
Nerodia sipedon insularum

- 61-106.7 cm; record 140.5 cm
- A sub-species of the more wide spread Northern Water snake
- Range from uniformly grey with no markings to dark grey-brown with some banding
- Only found at western end of Lake Erie and on Pelee and surrounding islands
- Belly whitish yellow to grey
- Scales keeled; anal scale divided
- Gives birth to live young
- ENDANGERED (COSEWIC); ENDANGERED (OMNR)

Eastern Fox

Elaphe gloydi

- 91-137 cm; record 179.1 cm (large snake)
- Yellow-brown with large brown or black blotches on back that alternate with smaller blotches along sides
- May have red-brown head
- Belly yellow with black checkerboard pattern
- Scales weakly keeled; anal scale divided
- Lays eggs
- THREATENED (COSEWIC); THREATENED (OMNR)



Juvenile Fox

- Grey with reddish brown blotches edged in black
- Dark bar across snout and from eye to jaw

Massasauga Rattlesnake

Sistrurus catenatus

- Ontario's only venomous snake
- 47.2-76 cm; record 100.3 cm
- Grey to brownish grey with darker blotches along back and several rows of alternating blotches along sides; blotches edged in white
- Black snakes with no pattern, very rare
- Pit on each side of head between eye and nostril
- Distinct segmented rattle
- Tail thick, squarish; does not taper to a point like all others
- Does not always rattle a warning; relies on pattern and remaining motionless to go undetected
- Heavy bodied; often found coiled
- Belly black
- Scales keeled; anal scale single
- Gives birth to live young
- THREATENED (COSEWIC); THREATENED (OMNR)

DeKay's Brown

Storeria dekayi

- 23-33 cm; record 49.2 cm (small snake)
- Light grey-brown to red-brown
- Two rows of spots along light coloured stripe on back
- Rows of spots may be joined by narrow lines
- Dark downward bar on side of head
- Juveniles have three yellowish spots on neck
- Belly cream or pinkish
- Scales keeled; anal scale divided
- Gives birth to live young

Northern Red-bellied

Storeria occipitomaculata occipitomaculata

- 20.3-25.4 cm; record 40.6 cm (small snake)
- Reddish brown to grey-brown in colour
- Three light brown or yellow spots on neck
- Orange-red belly; few dark spots may be present
- Scales keeled; anal scale divided
- Gives birth to live young

Smooth Green

Opheodrys vernalis

- 30.3-51 cm; record 66 cm
- Bright green and shiny
- Belly white or yellow
- Scales smooth; anal scale divided
- Lays eggs

Ring-necked

Diadophis punctatus

- 25.4-38 cm; record 70.6 cm
- Shiny steel blue, slate or brown in colour
- Neck ring and belly orange-yellow
- Scales adjacent to neck ring darker
- Belly has interrupted row of small black spots
- Scales smooth; anal scale divided
- Lays eggs

Eastern Ribbon

Thamnophis sauritus

- 45.7-66 cm; record 96.5 cm
- Black with 3 yellow stripes
- Lateral stripes on scale rows 3 and 4
- Distinct white half-moon spot in front of eye
- May have brown colour along each side of belly
- Belly yellow-green
- Scales keeled; anal scale single
- Gives birth to live young
- SPECIAL CONCERN (COSEWIC); SPECIAL CONCERN (OMNR)

Stripe on scale rows three and four

Queen

Regina septemvittata

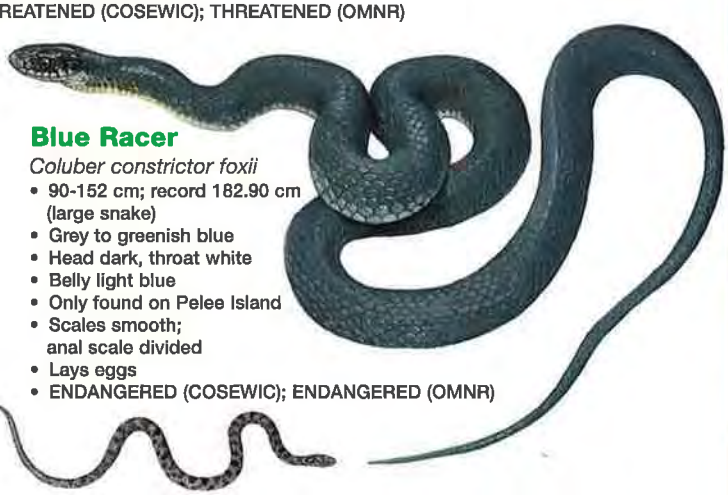
- 38-61 cm; record 92.1cm
- Yellow-brown with yellow stripe along lower flank
- 3-5 dark stripes may be found on back
- Belly cream-yellow; brown stripes may be visible
- Usually found near rivers and marshes
- Scales keeled; anal scale divided
- Gives birth to live young
- THREATENED (COSEWIC); THREATENED (OMNR)

Eastern Garter

Thamnophis sirtalis sirtalis

- 45.7-66 cm; record 123.8 cm
- Black, green or brown with three yellow or yellow-green stripes
- Stripes may be orange or reddish in some parts of range
- Some snakes may be all black with no stripes (melanistic)
- Lateral stripes on scale rows 2 and 3
- May have dark scales or spots between stripes giving it a checkered pattern
- Belly yellowish green
- Scales keeled; anal scale single
- Gives birth to live young

Stripe on scale rows two and three



Blue Racer

Coluber constrictor foxii

- 90-152 cm; record 182.90 cm (large snake)
- Grey to greenish blue
- Head dark, throat white
- Belly light blue
- Only found on Pelee Island
- Scales smooth; anal scale divided
- Lays eggs
- ENDANGERED (COSEWIC); ENDANGERED (OMNR)

Red-sided Garter

Thamnophis sirtalis parietalis

- 41-66 cm; record 124.1 cm
- Black-brown with 3 yellow stripes
- Red bars between stripes and reddish wash on sides between scales
- Lateral stripes on scale rows 2 and 3
- Belly green-black
- In Ontario, only found along the Manitoba border
- Scales keeled; anal scale single
- Gives birth to live young

Juvenile Blue Racer

- Grey with central row of dark grey-brown blotches
- Few or no blotches on brown or grey tail
- Side of head speckled white and black

Butler's Garter

Thamnophis butleri

- 38-51 cm; record 69.2 cm
- Black or brown-green with 3 yellow stripes
- Stripes may be orange
- Lateral stripes on scale row 3 extending onto row 2 below and 4 above
- Towards back of body lateral stripe on scale rows 2 and 3
- Smallish head
- Belly green-yellow
- Only found in SW Ontario
- Scales keeled; anal scale single
- Gives birth to live young
- THREATENED (COSEWIC); THREATENED (OMNR)

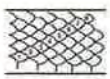
Eastern Rat

Elaphe obsoleta

- 106.7-183 cm; record 256.5 cm (large snake)
- In some, faint blotched pattern may be seen
- Throat white
- Belly grey-brown wash
- Scales weakly keeled; anal scale divided
- Lays eggs
- THREATENED (COSEWIC); THREATENED (OMNR)

Juvenile Eastern Rat

- Light grey with grey-brown blotches on body and tail
- Dark bar across snout and from eye to jaw



How to count scale rows on a snake

Smooth Scales

Keeled Scales

Divided Anal Scale

Single Anal Scale

TURTLES OF ONTARIO IDENTIFIER

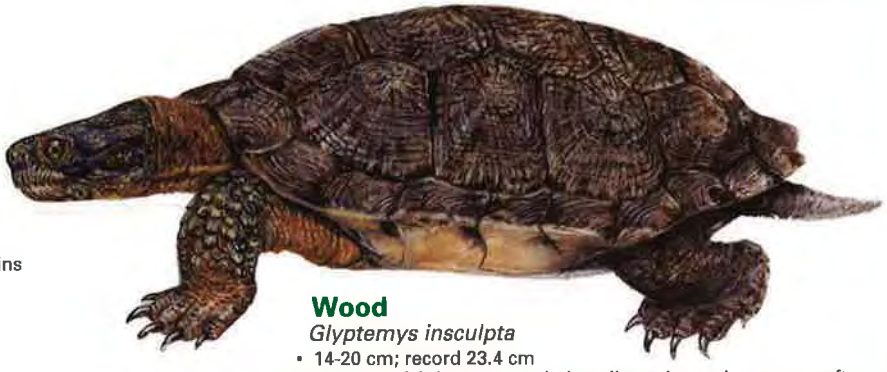
Illustrations are half life size.

www.torontozoo.com/adoptapond

toronto ZOO
361A Old Finch Ave.
Toronto,ON, Canada M1B 5K7
www.torontozoo.com

Midland painted
Chrysemys picta marginata

- 11.5-14 cm; record 19.5 cm
- Females larger than males
- Smooth, olive to brownish-grey carapace with orange-red margins
- Yellow plastron with dark central blotch
- Neck, legs and tail striped with red and yellow; yellow blotch behind each eye
- Males have very long nails on front feet
- Often seen basking on logs
- Lays 3-14 oval, white, smooth-shelled eggs



Wood
Glyptemys insculpta

- 14-20 cm; record 23.4 cm
- Brown or greyish-brown, rough, heavily sculptured carapace, often with a central keel or ridge and raised concentric growth rings on each scute
- Rear margin of carapace serrated
- Plastron is yellow with black squares
- Head black; skin brown; adults with orange or yellow on neck and legs
- Found on land (the most terrestrial turtle in Ontario) and in or near streams and wet meadows
- Lays 4-12 oval, white, thin-shelled eggs
- THREATENED (COSEWIC); ENDANGERED (OMNR)

Stinkpot
Sternotherus odoratus

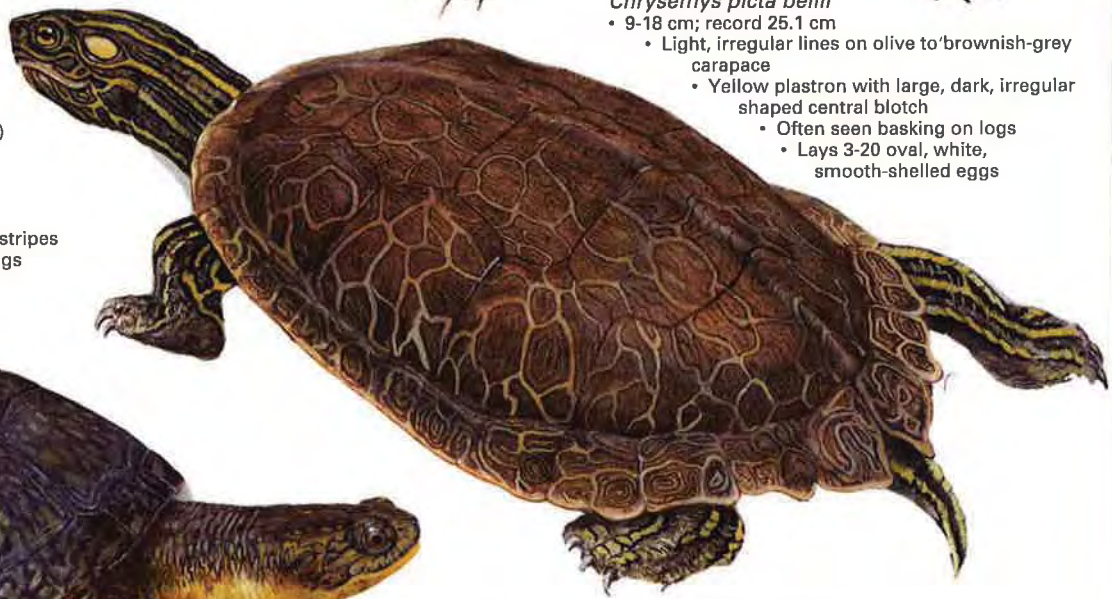
- 5.1-11.5 cm; record 13.7 cm
- Small turtle with smooth, light olive to black, high-domed, narrow carapace
- Plastron is small, yellow-brown and gives little protection to legs; a hinge runs across the front of the plastron allowing it to close upward to protect the head
- Two light stripes on each side of the head
- Barbels (fleshy projections) on chin and throat
- Named for musky odour produced when handled (also known as musk turtle)
- Lays 2-5 oval, white, hard-shelled eggs
- THREATENED (COSEWIC); THREATENED (OMNR)

Western painted
Chrysemys picta bellii

- 9-18 cm; record 25.1 cm
- Light, irregular lines on olive to brownish-grey carapace
- Yellow plastron with large, dark, irregular shaped central blotch
- Often seen basking on logs
- Lays 3-20 oval, white, smooth-shelled eggs

Map
Graptemys geographica

- Male 9-15.9 cm; Female 18-27.3 cm
- Males much smaller than females
- Numerous fine yellow lines on olive green to brownish carapace, resembling a map; may be less obvious in older turtles
- Rear margin of carapace serrated
- Carapace has a slight raised area (or keel) down centre of shell
- Yellow plastron
- Yellow spot, variable in size and shape, behind each eye
- Head and limbs may have light and dark stripes
- Lays 10-16 oblong, parchment-shelled eggs
- SPECIAL CONCERN (COSEWIC); SPECIAL CONCERN (OMNR)



Blanding's
Emydoidea blandingii

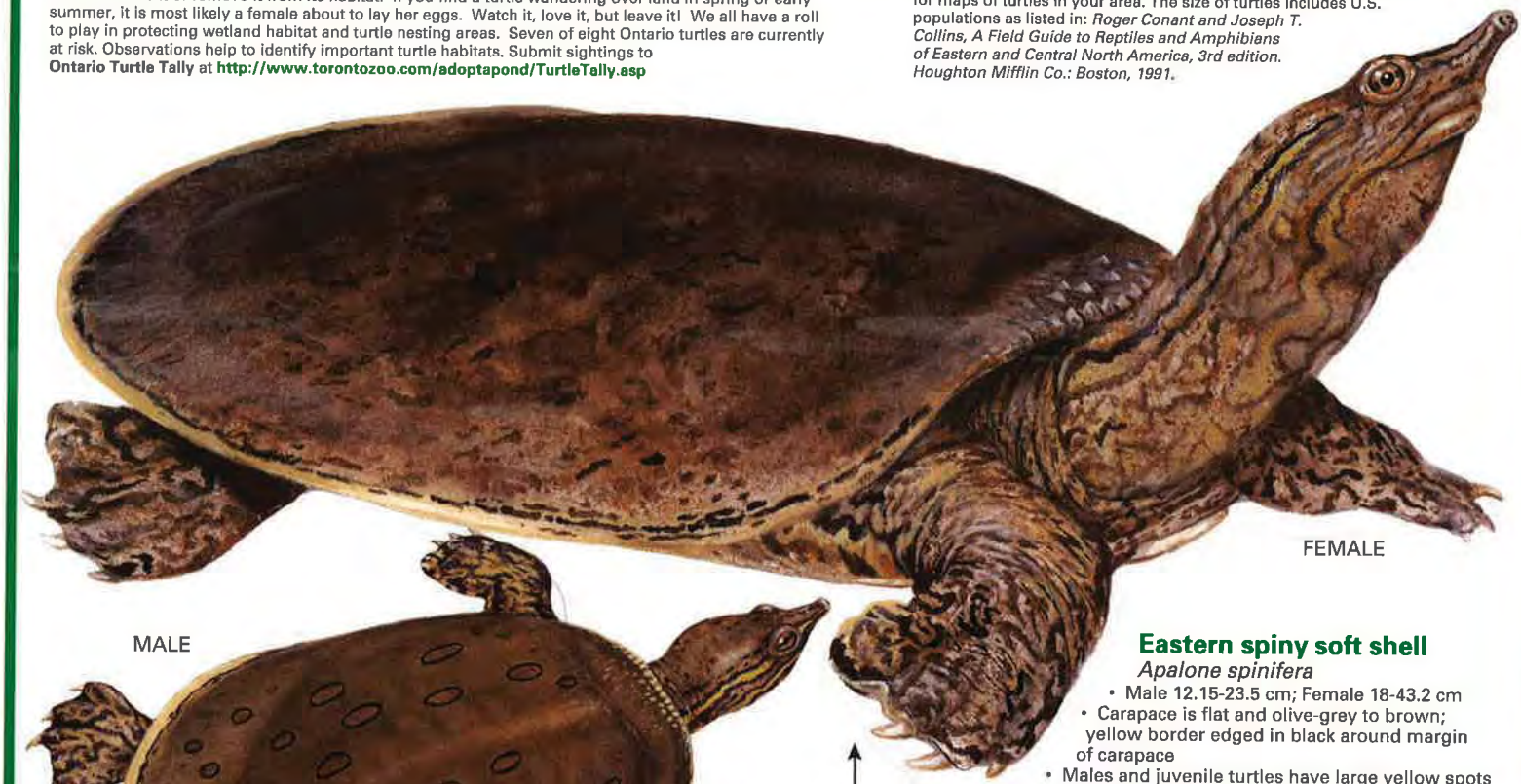
- 12.5-18 cm; record 27.4 cm
- Carapace black to greyish-brown with numerous yellowish spots or streaks
- Plastron has a flexible grooved hinge that allows lower shell to close upward to protect head and legs
- Bright yellow on chin and throat
- Protruding eyes
- Domed shell obvious while basking on logs, rocks, or clumps of vegetation
- Lays 6-11 oval, dull white, hard-shelled eggs
- THREATENED (COSEWIC); THREATENED (OMNR)

Spotted
Clemmys guttata

- 9-11.5 cm; record 12.7 cm
- Smooth black carapace with bright yellow or orange spots; spots fade in older turtles
- Plastron yellow-orange with large black blotch on each scute
- Males have tan chin and brown eyes; females have yellow chin and orange eyes
- Head, neck, limbs and tail are grey to black with yellow spots; inside of legs washed with orange
- Lays 3-8 oval, leathery textured eggs
- ENDANGERED (COSEWIC); ENDANGERED (OMNR)

Turtles in Ontario are protected under the Fish and Wildlife Conservation Act. If you find a turtle please do not disturb it or remove it from its habitat. If you find a turtle wandering over land in spring or early summer, it is most likely a female about to lay her eggs. Watch it, love it, but leave it! We all have a roll to play in protecting wetland habitat and turtle nesting areas. Seven of eight Ontario turtles are currently at risk. Observations help to identify important turtle habitats. Submit sightings to **Ontario Turtle Tally** at **http://www.torontozoo.com/adoptapond/TurtleTally.asp**

These turtles are not found in all Ontario regions. Consult a field guide for maps of turtles in your area. The size of turtles includes U.S. populations as listed in: *Roger Conant and Joseph T. Collins, A Field Guide to Reptiles and Amphibians of Eastern and Central North America, 3rd edition. Houghton Mifflin Co.: Boston, 1991.*



FEMALE

MALE

same species

Eastern spiny soft shell

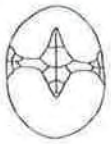
Apalone spinifera

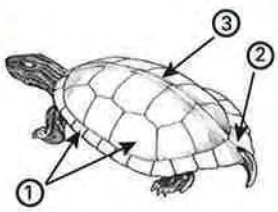
- Male 12.15-23.5 cm; Female 18-43.2 cm
- Carapace is flat and olive-grey to brown; yellow border edged in black around margin of carapace
- Males and juvenile turtles have large yellow spots outlined in black; females have brownish blotches
- Small tubercles or spines on edge of shell above neck
- Two dark bordered, light yellow lines on each side of head
- Very long neck; tubular "pig like" snout
- Often buries in sand or mud
- Lays 12-18 round, white, hard-shelled eggs
- THREATENED (COSEWIC); THREATENED (OMNR)

Snapping

Chelydra serpentina

- 20.3-36 cm; record 49.4 cm
- 4.5-16 kg; record 32 kg snapping turtle once lived at Toronto Zoo
- Carapace is light brown to black
- Young turtles have three longitudinal keels, older turtles almost smooth
- Plastron is yellowish, small, and cross-shaped; legs and skin not well protected
- Large head, two barbels on chin; rounded tubercles on neck
- Head, limbs and tail are brown
- Tail is long, same length or longer than carapace with "dinosaur-like" triangular scales projecting from the upper side
- Lays 20-40 round, ping-pong ball-like eggs
- SPECIAL CONCERN (COSEWIC)





Red-eared slider

(not illustrated)

Trachemys scripta elegans

The red-eared slider is often sold in pet stores, but is not native to Ontario. **Do not release pet turtles to the wild.** They may carry diseases that threaten our native turtles, and are not likely to survive.

① -scutes
② -serrated marginal scute
③ -longitudinal keel
④ -hinge on plastron

OHIO STREAM MANAGEMENT GUIDE

Gravel Riffles Provide In-Stream Structure

Guide No. 22

Gravel riffles consist of gravel and cobble-sized stone arranged at distinct intervals in shallow streams. Gravel riffles promote the formation of stable substrate in channels that have been modified or otherwise heavily impacted by development. Gravel substrate provides productive habitat for aquatic organisms and areas for fish to spawn.

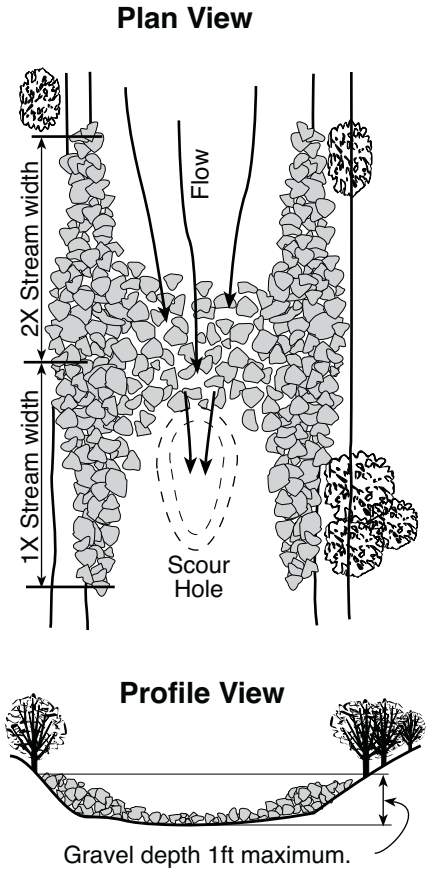


Figure 1. A gravel riffle

Many streams in Ohio have been modified to improve their capacity to convey stormwater. This has most often been achieved by straightening the channel alignment and lowering the streambed to increase channel slope and flow velocity. Although these practices greatly improve the efficiency with which stormwater can be carried away, this kind of channel modification degrades the stream's water quality and destroys aquatic habitat.

Reducing channel roughness removes much of the in-stream structure that provides habitat for fish and other aquatic life. Restoring some of this structure through biotechnical practices (methods that use vegetation and natural materials to restore channel roughness) provides additional hiding, spawning and feeding areas for fish. This also increases the substrate suitable for benthic (bottom dwelling) organisms to become established which supports a healthier, more diverse aquatic ecosystem. Other biotechnical practices, such as establishing streamside vegetation to enhance in-stream structure, can vastly improve a stream's value as an aquatic habitat while maintaining much of its ability to convey runoff.

The purpose of this Ohio Stream Management Guide is to describe the site conditions suitable for gravel riffles, their design and installation. The guidelines listed herein are a compilation of specifications from agencies in other states and from field experience here in Ohio. As with any construction project that takes place within a stream, the Ohio Department of Natural Resources recommends you consult with the applicable local, state, and federal authorities listed in Guide 06, Permit Checklist for Stream Modification Projects, prior to construction. The extent of permit requirements will depend on the location and design of your project

WHERE TO USE GRAVEL RIFFLES

The use of gravel riffles should be considered if a coarse gravel substrate was an original characteristic of the stream, but has been removed. This situation is common in deepened, modified, or relocated channels. It may also occur where the bedload sediment supply has been interrupted by the construction of an instream pond or by the enclosure of the upstream channels in a storm drain system. Constructed gravel riffles are usually of greatest value in small channels. The bedload of larger streams is more likely to supply adequate coarse material to maintain natural riffles. A stream's natural condition can further be enhanced when gravel riffles are supplemented with the addition of forested riparian corridors.

Gravel riffles should be used to augment natural channel formation. Supplies of gravel and cobble introduced into a channel will not force a channel into a desired shape but can mimic what will eventually accumulate from natural deposition of bedload sediment.

DESIGN AND INSTALLATION

The length of gravel riffles should range from one to two times the channel width. The thickness of the gravel should generally be less than one foot and not more than the depth of the water at normal stage flow so that it doesn't extend out of the water and back up a significant pool or otherwise act as a dam. To concentrate lower stream flows, the gravel should be placed so that it is slightly lower in the middle of the channel and higher along the streambanks as illustrated in figure 1.

Gravel size is best determined by examining the substrate and any gravel bars in the existing stream channel. Gravel should be sized so that it is stable at low and medium flows but erodible at high or bankfull flows. This typically ranges from one to four inches in diameter. Several methods (or criteria) can be used to determine the appropriate placement of gravel riffles as shown if figure 2 including: placing them where existing riffles are already forming; plac-

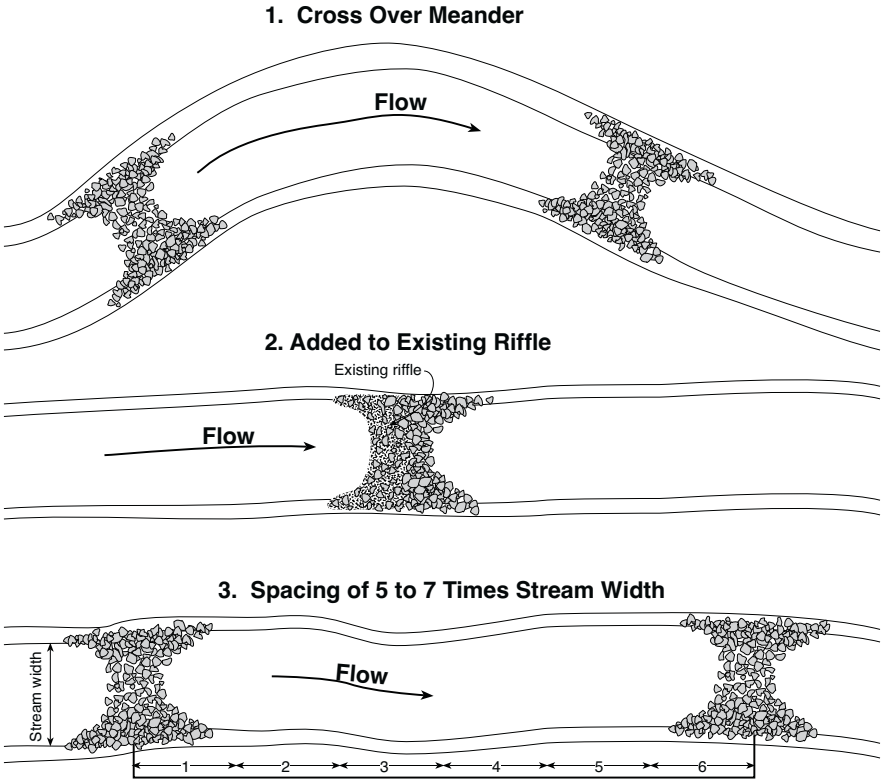


Figure 2. Gravel riffle placement and spacing

ing them to match the spacing of riffles in a similar undisturbed portion of the stream (not illustrated); placing them at the crossovers between meanders; or placing them spaced approximately five to seven stream widths apart.

EQUIPMENT NEEDED

Equipment used may vary based on the specific site's accessibility and limitations. The equipment most commonly used includes dump trucks, backhoes, waders, shovels and wheelbarrows.

MAINTENANCE

Inspect the gravel riffles after high-water events during the first year and once a year thereafter. Look along the streambanks near the gravel riffles for any erosion that may be occurring. If it is determined that the riffles are redirecting the stream's energy into the adjacent bank, the riffles will need to be modified in order to avoid further streambank erosion.

This guide is one of several biotechnical practices described in the Ohio Stream Management Guides series available online at the Ohio Department of Natural Resources' website. These practices use vegetation or other natural materials to achieve the desired stream management objectives. One of the primary advantages of biotechnical practices is how they help restore natural stream features such as in-stream habitat and streambank vegetation. Guide No. 10, Biotechnical Projects in Ohio, provides an overview of biotechnical practices, maps more than 50 project sites, and lists contacts that can arrange for site visits. No project should be undertaken without some understanding of the functions of stream energy and the source of the problem that needs to be corrected. Guide No. 03, Stream Management and the Stream Natural Processes, provides an overview of stream dynamics. Technical assistance about stream dynamics can also be obtained at your Soil & Water Conservation District, which is listed under county government in the local phone directory.

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This guide is one of a series of guides covering a variety of watershed and stream management issues. For more information please see Guide 05 Index of Titles or call the ODNR Division of Soil and Water Resources at 614/265-6740. All Guides are available from the Ohio Department of Natural Re-sources. Single copies are available free of charge and may be reproduced. Please contact:

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Prepared by the Ohio Department of Natural Resources, Mark Ervin, Division of Forestry and Margo Fulmer, Division of Soil and Water Resources, co- authors. Input from staff of several ODNR divisions, state and federal agencies are used in the development of the Ohio Stream Management Guides.

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OHIO STREAM MANAGEMENT GUIDE

Eddy Rocks and the Importance of In-Stream Structure

Guide No. 20

Eddy rocks, as illustrated in Figure 1, are groupings of large rocks placed in a stream channel to improve the habitat structure. As the stream flows over the rocks, the diversion of the current scours holes in the channel bottom, this adds oxygen to the water and creates a more diverse habitat for fish.

Many streams in Ohio have been modified to increase their capacity to convey stormwater. This has most often been achieved by straightening the channel alignment and lowering the bed to increase channel slope and velocity. An increase in velocity and in the stream's capacity to transport additional sediment and suspended load can, over time, straighten the channel and reduce its roughness. Although these practices greatly improve the efficiency with which stormwater can be carried away, this kind of channel modification degrades the stream's natural value, destroys aquatic habitat and degrades water quality.

Reducing channel roughness removes much of the in-stream structure that provides habitat for fish and other aquatic life. Reinstalling some of this structure through biotechnical practices (methods that use vegetation and natural materials to restore channel roughness) provides hiding, spawning and feeding areas for fish. This also increases the substrate suitable for benthic (bottom dwelling) organisms to become established and support a healthier, more diverse aquatic ecosystem. Other biotechnical practices, such as establishing streamside vegetation to enhance in-stream structure, can vastly improve a stream's value as an aquatic habitat while maintaining much of its ability to convey runoff.

The purpose of this Ohio Stream Management Guide is to describe the generally suitable site conditions, design and installation of eddy rocks. The guidelines listed herein are a compilation of specifications from agencies in other states and from field experience here in Ohio.

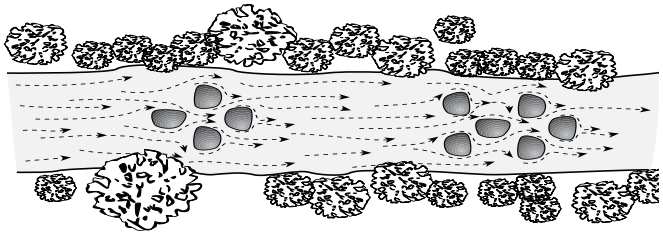

Figure 1. Eddy Rocks During Low Flow Conditions

DESIGN

Eddy rocks provide substrate for benthic organisms, aerate the water and create scour holes. The scour holes provide cover for fish and serve as mini-pools to preserve aquatic life during periods of low flow. Eddy rocks also dissipate high-energy flow and improve the appearance of channels.

The rocks as described herein, are best utilized in small streams or modified channels that have a uniform shape and little canopy cover. They are useful where erosive forces should be reduced, where habitat should be enhanced, and where the appearance of a channel could be restored to a more natural condition.

The placement of the Eddy Rocks is critical for optimal results. The objective is to place each rock so that high streamflows tumble over it, creating an eddy effect as shown in Figure 2. This current will cause the water to scour a hole downstream of the rock.

Selecting rocks of the appropriate size is critical so that they resist being moved by high streamflows. If the channel bottom is stable, a rock two feet in diameter (about 1,000 pounds) will resist movement in streamflow velocities up to 10 feet per second. A rock four feet in diameter will be stable in velocities up to about 13 feet per second. The maximum rock size in its largest dimension should not be greater than one-fifth the width of the channel. In small channels with a gradient of more than three percent, rocks may be up to one-third the channel width. If rocks of sufficient size are not available or accessible to the site, root wads may be substituted. Root wads, however, must be anchored securely to the streambed with cable fastened to a duck bill, or other suitable anchors. Refer to Guide 12, Evergreen Revetments, for a discussion of anchors and anchoring.

INSTALLATION PROCEDURE

1. Eddy rocks should be larger than 2 ft. in diameter except in small channels where they should be no more than

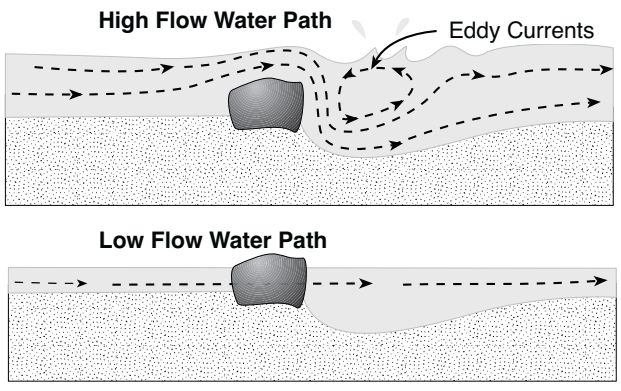

Figure 2. Effects of Flow Levels on Eddy Currents

one-third the width of the channel

2. Groups of three to seven rocks should be placed in a staggered pattern so current deflected around one rock then flows into another.
3. Eddy rocks should be placed in the center half of a channel in straight runs where they would be in swift current during high flow. However, they should not be placed in existing riffles.
4. Rocks should be placed with their longest dimension perpendicular to the flow, not angled to one bank or the other.
5. Rocks should be placed so they will project above the surface during low flows and be submerged during high flows. Also, they should be placed in an excavation so that they are at least one-third buried in the channel-bed.

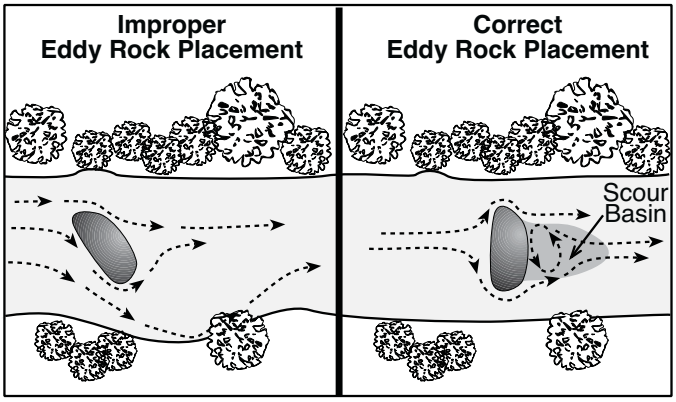

Figure 3. Effects of Eddy Rock Placement

MAINTENANCE

Inspect the eddy rocks after high water events during the first year and once a year thereafter. Displacement of a rock may require a deeper excavation into the streambed before placing it back into position. Look along the streambanks around the eddy rocks for any erosion that may be occurring. If it is determined that the rocks are redirecting the stream's energy into the adjacent bank, the rocks will need to be rearranged in order to avoid further streambank erosion.

As with any construction project in a stream, the Ohio Department of Natural Resources recommends you consult with the applicable local, state, and federal authorities listed in Guide 06, Permit Checklist for Stream Modification Projects, prior to construction. The extent of permit requirements will depend on the location and design of your project

The installation of eddy rocks is one of several biotechnical practices described in the series of Ohio Stream Management Guides available online at the Ohio Department of Natural Resources' website. These practices use vegetation or other natural materials to achieve stream management objectives. One of the chief advantages of biotechnical practices is that they help restore natural stream features such as in-stream habitat and streambank vegetation. Guide No. 10, Biotechnical Projects in Ohio, provides an overview of biotechnical practices, maps over 50 project sites, and lists contacts who can arrange site visits. No project should be undertaken without some understanding of the functions of stream energy and the source of the problem to be corrected. Guide No. 03, Stream Management and the Stream's Natural Processes, provides an overview of stream dynamics. Technical assistance about stream dynamics can also be obtained at your local Soil & Water Conservation District, which is listed under county government in local phone directories.

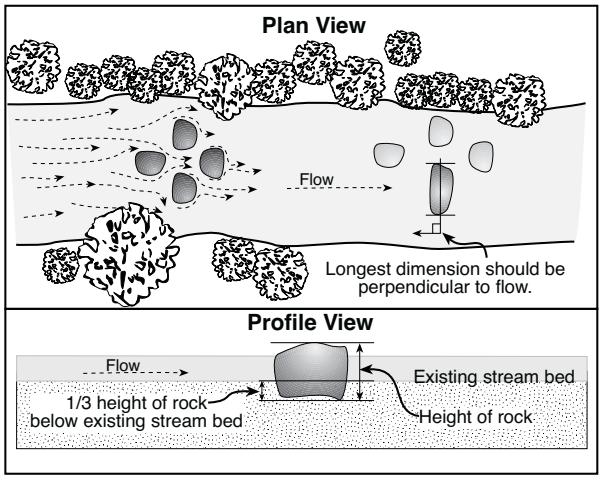

Figure 4. Placement Depth and Angle

REFERENCES

Mecklenburg, Dan, 1996, Rainwater and Land Development, Ohio's Standards for Storm Water Management, Land Development, and Urban Stream Protection, Second Edition, Ohio Department of Natural Resources, Division of Soil & Water Conservation in cooperation with the Natural Resources Conservation Service and the Ohio Environmental Protection Agency, Co-

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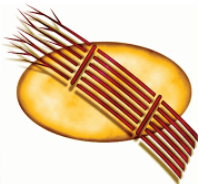
Prepared by the Ohio Department of Natural Resources Leonard Black and Jason Remich of the Division of Soil and Water Resources. Input from staff of several ODNR divisions, and local, state and federal agencies are used in the development of the Ohio Stream Management Guides. Funding for the production of the Ohio Stream Management Guides is provided in part through a grant under Section 319 of the federal Clean Water Act.

Fact sheet are available on-line at: http://www.ohiodnr.gov/soilandwater/

Fascines



Description

Fascines can be best described as a rope-shaped bundle of live cuttings, lashed together with twine. Fascines have many other names including brush wattles, faggots, wattles, wattling bundles, and live fascines. Fascines grow rapidly when constructed from live materials. The resulting root systems work well to secure soils and to hold the fascine in place. They are simple and effective, require little time to build and can be installed with little site disturbance.

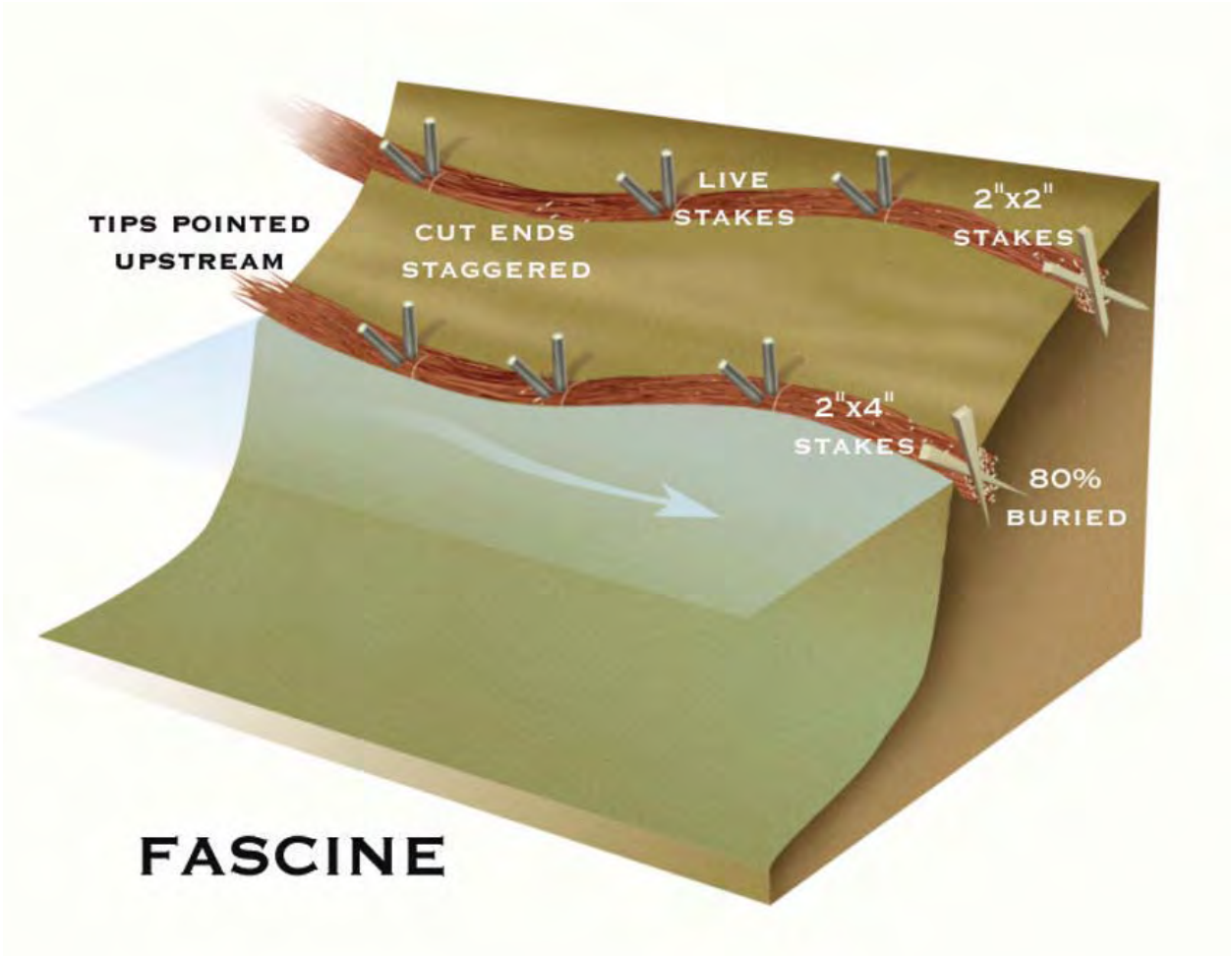
Purpose

Fascines can be used to perform a wide variety of functions. They can be used on their own to provide erosion protection on small streams, and to bench eroded slopes or gullies. They are very effective in preventing surface erosion. They can also be used in conjunction with many other soil bioengineering techniques, habitat improvement measures or conventional methods of erosion control. Structurally, fascines can provide immediate protection once installed. This feature is enhanced once the fascine begins to grow.

Application

When used on their own as a streambank erosion control measure, fascines are placed in a shallow trench excavated at the waters edge, typically along the outside bends of small streams. Fascines can be used to stabilize slopes where the toe or base of the slope is stable or protected. In this case the fascines would be installed across the slope to reduce runoff and trap sediment. Fascines can also be used as drains to conduct runoff or bank seeps.

When used on stream banks, fascines should be restricted to sites that are experiencing surface erosion (shallow sloughing of soil) **NOT** mass wasting (mass wasting is when large, deep sections of a slope shift, or fail at the same time). Nor should they be used in situations where they would experience rapid undercutting, such as along the outside bends of deep pools cut into soils that are highly erosive. This method is best suited to small streams less than 5 metres wide with bank heights less than 1.5 metres. Fascines in this function can be used in most channel types. In conjunction with other methods, fascines can be used to protect the toe of brush mattresses, and the top leading edge of cribwalls. They can also be used to "soften" existing rock rip-rap, gabion baskets, or concrete blocks, by placing them along the top edge of the stone, or if possible, along the waters edge.



Construction Guidelines

Make sure the toe is stable when using fascines on slopes. If the toe is not stable, erosion can move up the slope, undermining the fascines and causing failure. Should the toe be experiencing erosion, you will need to remedy the situation by using one of the other appropriate methods in this manual. Once this has been addressed, you can then place the fascines on the slope. The following steps should be followed when placing fascines on slopes:

- install the first fascine at the bottom of the slope.
- move upslope, placing fascines using the recommended spacing of 1 metre for 1:1 slopes (height:vertical), 1.5 metre for 2:1, 2 metres for 3:1, and 3 metres for 4:1 slopes.
- on dry slopes fascines can be placed level or on contour.
- on wet slopes fascines can be placed on slight angles to facilitate drainage of runoff.
- place long straw on the slope between fascines (on slopes 1.5:1 or flatter), steeper

slopes would require the use of an erosion control fabric. This fabric would be anchored in place by tucking the leading edge into the trench, and staking the fascine on top.

To build a fascine:

1. Harvest and stockpile an assortment (being different species, ages and lengths) of live, dormant cuttings. Fascines can be built from a wide range of cuttings, but are best built from slim relatively unbranched cuttings (coppice) because they are the easiest to work with and produce the densest fascines. If the cuttings have multiple, hard to bend side branches, prune them, being sure to use the trimmings

2. Fascines are easier to build in a set of saw horses. Lay the cuttings on the sawhorses, with the growing tips facing in the same direction, and with the cut ends staggered throughout.

3. Tightly tie the fascines together tight with rope or twine. The distance between ties can vary. You should be able to carry, bend, and not be able to pull apart, a properly tied fascine. If your first attempt fails, make sure the cut ends are staggered, and that the ties are tight, and frequent. Fascines can be constructed in varying lengths and diameters, but work best if they are tied so they are dense.

To install a fascine:

1. Dig a shallow trench, slightly less wide and deep than the diameter of the fascine. The fascine should be approximately 20% exposed once installed.

2. Place the fascine in the trench, and stake into place. The growing tips should point upstream, or if placed on angles on slopes, pointed uphill. There are several methods of staking. Livestakes are recommended as they will grow, providing extra strength in the long run for the structure. In compact soils such as clays and clay/shales, UNTREATED 2"x2" stakes, or 2"x4"s cut on a diagonal work well. Place the stakes every 1-1.5 metres. You should not be able to lift the fascine out of the trench.

3. Care should be taken to make sure the upstream end of the fascine is "returned" to the streambank. This means tucking the upstream end into the bank, and staking it securely so that the current cannot dislodge it. If the upstream end of the fascine is pulled away the entire structure could fail.

4. Bury the fascine by placing soil around and on top of it, tamping gently into place. Make sure you fill in all of the air spaces. Large air spaces around the fascine should be avoided, as they will promote desiccation of the live material.

Materials

- rope or twine, strong enough to tie the fascines together, and resilient enough to

last 1 year. Hemp rope, heavy bailer twine, or plastic utility cord are good examples.

- ample quantities of live cuttings, for example a 4 m long fascine 25 cm in diameter will use approximately 5 bundles of cuttings (bundles being 20-30 cm in diameter, and 2 m long). Fascines should be constructed with a minimum of 2 different species. This will optimize the chances of successful growth.

  Recommended species:
  Small streams - Heartleaf willow, Sandbar willow, Shining willow, Pussy willow, all of the dogwoods.
  Large streams - Black willow, Peachleaf willow, Pussy willow, Sandbar willow, Heartleaf willow, Carolina poplar, Balsam poplar, all of the dogwoods.

- shovels, rakes, deadblow and sledge hammers, pruning shears, utility knife, sawhorses.
- stakes, depending upon the application, from live stakes, to untreated 2"x2"s, to 2"x4"s cut into wedges.
- straw (for mulching on slopes), or an erosion control blanket (jute, coir, or a straw mix).

Cost and Maintenance Needs

Fascines cost very little, especially if the live materials are cut for free. Costs can be reduced even further if livestakes are used to anchor the fascine. The main expense is the time required to harvest live cuttings, transport them, and construct the fascines. Time required to install varies from 0.5 - 1 hour per linear metre. Fascines should be inspected periodically in the first year. Once the fascine is growing, they require little maintenance.

Integration

Fascines can be easily integrated into many types of projects such as:

- brush mattresses
- live crib walls
- log/brush shelters
- rock rip-rap
- joint planting
- native material revetment

Demonstrations

This type of habitat structure has been applied in the following demonstration projects:

- Project #15, Black Ash Creek Rehabilitation Project
- Project #24, Brault Property

- Project #42, Soper Park - Mill Creek
- Project #44, Strausberg Creek
- Project #46, Kolb Creek
- Project #47, Schneider Creek
- Project #50, Colonial Creek
- Project #51, Bechtel Park
- Project #64, Highland Creek Rehabilitation Project
- Project #91, Tioga Wildlife Area - Pine River
- Project #93, Glen Huron
- Project #94, Martin Property - MacIntyre Creek
- Project #100, Scott's Plains Park
- Project #113, Harvey Brown's
- Project #114, Curcio's Bypass
- Project #115, Dixon Hill Tributary
- Project #117, Harding Property
- Project #121, Christian Blind Mission

For more information

Please refer to the following authors and their respective publications located in the bibliography:

Gray and Sotir, 1996
Schiechtl and Stern, 1996
210-EFH, 1992

GROWERS LIST – NATIVE PLANTS

Native Plant Suppliers

This guide provides a listing of suppliers of native plant materials in Ontario.

The Society for Ecological Restoration – Ontario Chapter has formed guidelines which outline ethical practices that promote successful restoration efforts without sacrificing the health of existing populations of our native species. Suppliers who follow these guidelines are indicated as such in the listing. See the SERO Grower and Buyer Guidelines on the SERO website: www.serontario.org.

Suppliers who follow the Forest Gene Conservation Association's (FGCA) Ontario's Natural Selections Program, which certifies source-identified woody plant material, are also identified. See the article Ontario's Natural Selections for more information.

Tuliptree
Legend

	Suppliers that follow the Native Plant Growers Guidelines
	Suppliers that follow FGCA Ontario's Natural Selections
F	Free
W	On Website
E	Electronic
PL	Plant List
PR	Price List
b&b	Ball & Burlap

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types				Climate Zones *(origin of material)*	Plant Types			Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
			Wetland	Meadow	Forest	Urban		Aquatic	Herbaceous	Woody					
Acorus Restoration Native Plant Nursery & Ecological Consulting *Paul Morris*	#722 6th Concession Rd R.R. 1 Walsingham, ON N0E 1X0	**Tel:** (519) 586-2603 **Fax:** (519) 586-2447 **Email:** acoruspaul@yahoo.ca **Website:** www.AcorusRestoration.com	X	X	X	X	MNR tree seed zones 32, 34, 37,38; Carolinian Zone	X	X	X	seed, cuttings, seedlings container, bareroot, potted	100	F	Ecological consulting. Surveys, Design, Installation, Management and monitoring, Education, Tours, Interpretive trails, Display gardens, Workshops	
Arboretum, The *see University of Guelph*															
The Backyard Ark *Leslie Work*	158 Grove Street Guelph, ON N1E 2W7	**Tel:** (519) 823-9882 **Email:** leswork@gto.net										95			
Baker Forestry Services, Nursery & Consulting *Bob Baker*	R.R. 5 Georgetown, ON L7G 4S8	**Tel:** (905) 877-9390 **Email:** bakerforestryservices@hughes.net		X	X	X	MNR tree seed zones 32, 34, 37; Carolinian Zone		X	X	seed, cuttings, seedlings container, bareroot, potted, b&b	85	PL	Certified Seed Collector, Forestry consulting, Tree care	
Baker Nursery Ltd. *Susan Lehnen*	R.R. 2 Bayfield, ON N0M 1G0	**Tel:** (519) 482-9995 **Fax:** (800) 361-2299 **Email:** susan.lehnen@gmail.com	X	X	X	X	MNR tree seed zones 32, 33, 34, 36, 37, 38 & international sources; Carolinian Zone			X	cuttings, seedlings container, bareroot, potted, b&b	50+		Contract growing. Buys seed from Certified Seed Collectors	
Brinkman & Associates Reforestation	286 Hearst North Bay, ON P1B 8Z1	**Tel:** (705) 497-3100 **Fax:** (705) 497-3982 **Email:** brinkmnn@brinkman.ca **Website:** www.brinkmanforest.com	X	X	X	X	Will collect for any climate zone; Carolinian Zone	X	X	X	seed cuttings	100		Contract seed collection, Certified Seed Collector, Nursery design & support, Pest control, Landscape, Plantation management, Stand inventory	
Cooks Mills Farms – Native Trees & Shrubs *Paul Robertson*	13130 McKenney Rd R.R. 1 Welland, ON L3B 5N4	**Tel:** (905) 384-0789 **Fax:** (905) 384-0790 **Email:** paul@treesunlimited.ca **Website:** www.treesunlimited.ca								X					
Connon Nurseries Neil Vanderkruk Holding Inc. *Rick Vanderkruk*	P.O. Box 200 Waterdown, ON L0R 2H0	**Tel:** (905) 628-0112 **Fax:** (905) 628-3155 **Email:** mail@connonnurseries.com	X	X	X	X	All Canadian Plant Hardiness zones in Ontario up to 3b; Carolinian Zone	X	X	X	seedlings, container, bareroot, potted, b&b	10+	F	Do not sell directly to the public.	
Earthgen International Ltd. *Adam Koziol*	5312 Turney Drive Mississauga, ON L5M 4Y7	**Tel:** (905) 542-1100 **Email:** info@earthgen.ca	X	X	X	X	1 to 7; Carolinian Zone			X	potted	98	W		
Eco-Logic Nursery *Rick Cornelissen*	48811 Brook Line R.R. 5 Aylmer, ON N5H 2R4	**Tel:** (519) 765-3467 **Email:** ecologic2001@gmail.com **Website:** http://www.ecologicnursery.com/		X	X	X	Carolinian Zone		X	X			Website	Landscaping, pruning, tree planting, on-site evaluations	
EcoMedic Ecosystem Restoration Services *Sandy Agnew*	1305 Scarlett Line R.R. 2 Elmsvale, ON K0G 1J0	**Tel:** (877) 835-6824 **Tel:** (705) 835-6824 **Email:** bluebird@mid.igs.net	X	X			MNR seed zone Simcoe County	X	X		potted, bailed	100	E, W	Managed forest plans, Property restoration and management plans, Subwatershed restoration plans, Large pond and wildflower garden planting plans, Project implementation and management	

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types				Climate Zones *(origin of material)*	Plant Types			Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
			Wetland	Meadow	Forest	Urban		Aquatic	Herbaceous	Woody					
Ecology Park Plant Nursery *Cathy Dueck*	c/o Peterborough Green-Up 378 Aylmer St. N., Unit 4 Peterborough, ON K9H 3V8	**Tel:** (888) 745-3238 **Tel:** (705) 745-3238 ext. 212 **Fax:** (705) 745-4413 **Email:** cathy@cogeco.net **Website:** www.ecologypark.greenup.on.ca	X	X	X	X	Peterborough and Northumberland Counties, MNR tree seed zone 31		X	X	potted	80	Website	Display gardens, educational programs, tours, speakers, factsheets	
Evergreen Gardens *Claire Ellenwood*	Don Valley Brickworks Bayview Avenue Toronto, ON	**Email:** Claire@evergreen.ca												New native plant nurseries at Downsview Park and Phyllis Rawlinson Park	
Ferguson Forest Centre *Ed Patchell*	275 County Road 44 R.R. 4 Kemptville, ON K0G 1L0	**Tel:** (888) 791-1103 **Tel:** (613) 258-0110 **Fax:** (613) 258-0207 **Email:** info@seedlingnursery.com **Website:** www.seedlingnursery.com	X	X	X	X	MNR tree seed zones 35 &36, some stock in 29, 30, 34			X	cuttings, seedlings, bareroot, container, limited amount of potted & b&b	95	F	Weed control products on preorder Extension notes Custom orders(weddings, etc) Contract production Certified Seed Collector and Tree Nursery	
ForestCare *see St. Williams Nursery & Ecology Centre*							Carolinian Zone								
Forever Green Consulting *Brian Swaile*	7742 County Road 56 R.R. 1 Utopia, ON L0M 1T0	**Tel:** (705) 424-5378 **Cell:** (705) 794-5378 **Fax:** (705) 424-3681 **Email:** bnamswaile@hotmail.com	X	X	X	X	MNR tree seed zones-Southcentral Ontario		X	X	seed	80		Contract seed collection, Seed collection consulting services, Certified Seed Collector	
Friends of Ojibway Prairie, The *Ojibway Nature Center*	5200 Machettte Road Windsor, ON N9C 4E8	**Tel:** (519) 966-5852 **Fax:** (519) 966 9658 **Email:** ojibway@city.windsor.on.ca					Windsor in Essex County, *tallgrass, prairie*; Carolinian Zone		X		seed	100	F	Planting guide	
Fuller Native and Rare Plants *Peter Fuller*	175 Airport Parkway R.R. 6 Belleville, ON K8N 4Z6	**Tel:** (613) 968-4643 **Email:** petefullz@gmail.com **Website:** www.fullerplants.com	X	X	X	X	Eastern Ontario, Zones 4/5	X	X	X	Seedlings, plugs, containers	80	Website	**Opening May 1 2010** Wetland, Meadow, Woodland and Rock Demonstration Gardens	
Gardens North *Kristi Walek*	P.O. Box 370 Annapolis Royal, NS B0S 1A0	**Fax:** (902) 532-7949 **Email:** seed@gardensnorth.com **Website:** www.gardensnorth.com	X	X	X	X	Cndn Plant Hardiness Zones 2 to 5 (to 10)	X	X	X	seed, bareroot, potted	75	W	Custom seed collection, Gibberelic acid (GA3), Envelopes for seed collection, Gardening products	
Gauld Nurseries Ltd. *David Leigh*	8865 Mountain Road (at Garner) Niagara Falls, ON L2E 6S4	**Tel:** (905) 354-2392 **Fax:** (905) 374-1906 **Email:** info@gauldnurseries.com **Website:** http://gauldnurseries.com/	X	X	X	X	Carolinian Zone	X	X	X				Evergreen trees, shade trees, flowering shrubs, privacy shrubs	
Grand Moraine Growers *Paul Shepherd*	7369 12th Line Rd. N. Alma, ON N0B 1A0	**Tel:** (519) 638-1101 **Fax:** (519) 638-1124 **Email:** info@grandmorainegrowers.ca **Website:** http://grandmorainegrowers.ca	X	X	X	X	Cndn Plant Hardiness Zones 5a & b, MNR Tree Seed Zones 32-34 & 37		X	X	containers	100	W	Custom growing, Demonstration plantings, Educational services, Wholesale and Retail, Certified Seed Collector	
Grand River Conservation Authority	P.O. Box 729 400 Clyde Road Cambridge, ON N1R 5W6	**Tel:** (519) 621-2761 **Fax:** (519) 621-4945 **Website:** www.grandriver.ca	X	X	X	X	MNR Tree Seed Zones 32,-34 &37			X	cuttings, seedlings, bareroot, potted, b&b	90	PL	Source of native American Chestnut, Certified Seed Collectors and Nursery	

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types				Climate Zones *(origin of material)*	Plant Types			Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
			Wetland	Meadow	Forest	Urban		Aquatic	Herbaceous	Woody					
Grimo Nut Nursery *Ernie Grimo*	R.R. 3 979 Lakeshore Road Niagara-on-the-Lake, ON L0S 1J0	**Tel:** (905) 934-6887 **Fax:** (905) 935-6887 **Email:** nuttrees@grimonut.com **Website:** www.grimonut.com	X	X	X	X	Zones 3-7			X	bareroot	30		Harvesting tools, Nut cracking machines	
Grow Wild! *Paul Heydon*	3784 Highway 7 Omemee, ON K0L 2W0 **By appointment only**	**Tel:** (705) 799-2619 **Cell:** (416) 735-7490 **Email:** info@grow-wild.com **Website:** www.grow-wild.com	X	X	X	X	Mostly plants from the Toronto to Peterborough area	X	X	X	potted	100	W, F	Ecological Restoration, Contract Growing, Invasive Weed Control, Landscaping and Biological/Ecological Consulting	
H. Richardson Farms	4825 R.R. 9 East Kendal, ON L0A 1E0	**Tel:** (905) 797-2801 **Tel:** (888) 226-6344 **Fax:** (905) 797-3405 **Email:** info@hrichardsonfarms.com **Website:** www.hrichardsonfarms.com													
Hortico Inc. *John. M. Vanderkruk*	723 Robson Road R.R. 1 Waterdown, ON L0R 2H1	**Tel:** (905) 689-6984/3002 **Fax:** (905) 689-6566 **Email:** sales@hortico.com **Website:** www.hortico.com	X	X	X	X	Southern Ontario	X	X	X	cuttings, seedlings, grafts, container, bareroot, potted, b&b, wire basket		F	Natural pesticides & fertilizers. Much of our plant material is organically grown	
Humber Nurseries Ltd. *Frans Peters*	8386 Highway 50 R.R. 8 Brampton, ON L6T 0A5	**Tel:** (416) 798-8733 **Tel:** (905) 794-0555 **Fax:** (905) 794-1311 **Email:** humber@gardencentre.com **Website:** www.humbernurseries.com	X	X	X	X	Southern and Central Ontario; Carolinian Zone	X	X	X	seeds, seedlings, potted, b&b	20	Website	Ontario's largest garden centre & butterfly conservatory, Contract growing, Landscape design, Retail/wholesale	
Hyde Park Garden Centre Inc.	1331 Hyde Park Road London, ON N6H 5M5	**Tel:** (519) 471-3358 **Website:** http://www.hydeparkgarden.com/			X	X	Southern Ontario, Carolinian Zone			X			Website		
Kayanase *Six Nations of the Grand River Territory*	Head Office: P.O. Box 820 16 Sunrise Crt, Suite 401 Ohsweken, ON N0A 1M0 Greenhouses: 2676 Fourth Line Ohsweken, ON N0A 1M0	**Tel:** (519) 445-0013 **Fax:** (519) 445-4285 **Email:** kbomberry@kayanase.ca **Website:** www.kayanase.ca/NPS.html													
Keith Somers Trees Limited	Office 10 Tillson Avenue Tillsonburg, ON Farm Centre Concession #8, off Elgin Road 44, Eden, ON	**Tel:** (519) 842-5148			X		Carolinian Zone			X					
Kimdale Lane Tree Nursery *Carl Kimmett*	106 Golden Mile Road R.R. 5 Lindsay, ON K9V 4R5	**Tel:** (705) 324-0479 **Fax:** (705) 324-5611 **Email:** carl.kimmett@sympatico.ca		X	X	X	Cndn Plant Hardiness Zones 5, pt of 4 *native grasses*			X	seedlings, cuttings, container, bareroot	50		Certified Seed Collector	
Little Otter Tree Farm *Jeff Scott*	R.R. 6 Tillsonburg, ON N4G 4G9	**Tel / Fax:** (519) 842-2419 **Email:** litotter@execulink.com **Website:** www.littleotter.com			X		MNR Tree Seed Zone 37			X	seedlings and transplants, bareroot	99		Certified Seed Collector	

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types				Climate Zones *(origin of material)*	Plant Types			Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
			Wetland	Meadow	Forest	Urban		Aquatic	Herbaceous	Woody					
McGuire Evergreen *Lana McGuire*	339 Angling Road R.R. 1 Waterford, ON N0E 1Y0	**Tel:** (519) 443-4444 **Fax:** (519) 443-4445 **Email:** www.mcguireevergreen.com **Website:** www.promotionalseedlings.com	X		X	X	MNR zones 28, 29, 32, 34, 37			X	bareroot, plug seedlings, cuttings, whips, 1 to 7 g pots	80	F	Promotional seedlings (gifts), Seed collection, Contract growing, Wholesale & Retail	
Native Ontario Trees *Arthur Meier*	12 Deer Run Cr. Bradford, ON L3Z 1N2	**Tel:** (905) 577-5074 **Email:** armeier@rogers.com	X	X	X	X	Zones 4-6			X	seedlings, potted	95			
Native Plant Nurseries *Leah Sevigny*	12965 R.R. 39 P.O. Box 169 Zephyr (Uxbridge), ON L0E 1T0	**Tel:** (905) 473-2743 **Email:** nativeplantnurseries@hotmail.com	X	X	X	X	All Ontario seed sources; Carolinian Zone	X	X	X	seeds, potted (4"), plugs	100	F	Contract seed collection, Natural landscape design, Consulting and contract growing, Delivery of plant material offered	
Native Plant Source *Jeff Thompson*	318 Misty Crescent Kitchener, ON N2B 3V5	**Tel:** (519) 748-2298 **Fax:** (519) 748-2788 **Email:** info@nativeplantsource.com **Website:** www.naturalplantsource.com	X	X		X	Zones 32-34 & 37 *prairie*			X	potted, bareroot	90		Non-native species removal, Landscape design services, Controlled Prescribed Burns	
Native Plants in Claremont *Karen Abrahams*	4965 Westney Road Pickering (Claremont), ON L1Y 1A2	**Tel:** (905) 649-8176 **Email:** info@nativeplants.ca **Website:** www.nativeplants.ca		X		X	Southern Ontario		X	X	Potted	100			
Native Trees & Plants Nursery	629 Dalhousie Amherstburg, ON N9V 2M2	**Tel:** (519) 736-4695 **Email:** vbernyk@sympatico.ca												We specialize in wildflowers, ferns, grasses, vines, shrubs and trees native to the Carolinian Zone.	
Natural Themes *Beate Heissler*	P.O. Box 738 Frankford, ON K0K 2C0	**Tel:** (613) 398-7971 **Fax:** (613) 398-7585 **Email:** bheissler@kos.net **Website:** www.naturalthemes.com	X	X	X	X	4,5 & 6	X	X	X	plugs, potted	100	W	Consulting, Natural History Tours, Power Point Presentations	
Nith River Native Plants	4265 Wilmot Easthope Rd New Hamburg, ON ***Please call ahead before visiting***	**Tel:** (519) 831-0953 – Orders **Tel:** (519) 272-3393 – Nursery **Email:** info@nithriverplants.com **Website:** www.nithriverplants.com	X	X	X	X	MNR seed zones 38, 37, 32		X	X	seeds, potted plants	95		Landscape Planning, Invasive Species Control, Plant Inventory and Management Planning	
North American Native Plant Society	P.O. Box 84, Station D Etobicoke, ON M9A 4X1	**Tel:** (416) 631-4438 **Email:** nanps@nanps.org **Website:** http://www.nanps.org/index.php			X		Southern Ontario, Carolinian Zone								
NTEC's EcoGardens (Sassafras Farms)	120 Canby Street P.O. Box 190 Port Robinson, ON L0S 1K0	**Tel:** (905) 384-9491 **Fax:** (905) 384-2691 **Website:** http://ntec.ntec-nss.com/page/ecogardens	X	X	X	X	Carolinian Zone	X	X	X				specializes in native plant identification, propagation, ecological restoration, design and project implementation	
Old Field Wildflower Nursery *Philip Fry*	2935 Porter Road R.R. 1 Oxford Station, ON K0G 1T0	**Tel:** (613) 258-7945 **Email:** wildflowers@npnet.com **Website:** www.oldfieldgarden.on.ca	X	X	X	X	Eastern Ontario	X	X		Mature plants	100	Request current list	On-site consulting, contract growing, restoration projects, native plant workshops	
Pineneedle Farms *Paul Richardson*	423 Highway #35 P.O. Box 220 Pontypool, ON L0A 1K0	**Tel:** (705) 277-9993 **Tel:** (888) 621-8980 **Fax:** (705) 277-3861 **Website:** www.pineneedlefarms.ca													

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types: Wetland	Meadow	Forest	Urban	Climate Zones *(origin of material)*	Plant Types: Aquatic	Herbaceous	Woody	Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
Pterophylla Native Plants and Seeds	*see St. Williams Nursery & Ecology Centre*						Carolinian Zone								
Rhora's Nut Farm & Nursery *Charles A. Rhora*	R.R. #1 33083 Wills Road Wainfleet, ON L0S 1V0	**Tel / Fax:** (905) 899-3508 **Email:** rhoras@nuttrees.com **Website:** http://www.nuttrees.com/			X	X	Zone 4; Carolinian Zone			X				Growers of nut trees and rare Carolinian trees	
Rockwood Forest Nurseries *Marc Quellet*	437 Mark Road R.R. 1 Cameron, ON K0M 1G0	**Tel:** (888) 833-0473 **Tel:** (705) 374-4700 **Fax:** (705) 374-4730 **Email:** hort@rockwoodforest.com **Email:** marc@rockwoodforest.com **Website:** www.rockwoodforest.com	X	X	X	X	Cndn Hardiness Zones 2-9		X	X	seed, seedlings, grafts, container, bareroot, potted, b&b, wire basket	40	F	Environmental consulting, Custom growing, Member LO & CNTA	
Rural Lambton Steward-ship Network's Ontario Tallgrass Nursery	P.O. Box 1168 Chatham, ON N7M 5L8	**Tel:** (519) 354-1588 **Fax:** (519) 354-0313 **Email:** wendy.kubinec@mnr.gov.on.ca	X	X	X	X			X	X	seed, plugs	100	F	Contract growing, Habitat creation, site remediation, Over ten years experience	
Sassafras Farms *Chris DiRaddo*	270 Humberstone Road Welland, ON L3B 6H1	**Tel:** (905) 658-8907 **Email:** cdiraddo@sassafrasfarms.ca **Website:** www.sassafrasfarms.ca	X	X	X	X	Southern Ontario, mostly Carolinian		X	X	seeds, plugs, bioengineering material, liners, potted plants	80	Price list, plant list	Bulk seed mixes, Ecological restoration consulting and installation, Contract growing, Conservation and reclamation products, Design and installation of rain gardens, Invasive species removal and post-restoration management, Marsh monitoring, Pond management, Soil restoration	
Somerville Seedlings *Carl Mansfield*	5884 Country Road #13 P.O. Box 1485 Everett, ON L0M 1J0	**Tel:** (877) 708-7337 **Tel:** (705) 435-6258 **Fax:** (705) 435-6259 **Email:** trees@treeseedlings.com **Website:** www.treeseedlings.com	X	X	X	X	MNR tree seed zones 32, 34, 37, limited 31, 33, 35, 36			X	seedlings &transplants	85	F	Certified seed collectors, Christmas tree wholesaler, Landscape nursery stock, Contract growing	
South Coast Gardens and Consulting	1634 Front Road R.R. 2 St. Williams, ON N0E 1P0	**Tel:** (519) 586-9361 **Tel:** (647) 408-9361 **Email:** southcoast@kwic.com **Website:** www.southcoastgardens.ca		X	X	X	Southwestern Ontario, Eastern Canada		X	X	Containers, some b&b	30	Website	Landscape Planning and Design, Garden Installation, Plant Inventory and Consultation, Display Gardens at Nursery, Restricted Hours of Operation	
St. Williams Nursery and Ecology Centre	PO Box 150 885 Highway 24 St. Williams, ON N0E 1P0	**Tel:** (866) 640-8733 **Tel:** (519) 586-9116 **Fax:** (519) 586-9118 **Email:** info@stwilliamsnursery.com **Website:** www.stwilliamsnursery.com	X	X	X	X	MNR Seed Zones 32, 34, 37, 38 limited in 9, 13, 23, 29 South and Central Ontario; Carolinian Zone	X	X	X	all materials source-identified, seed, bare root, plugs, pots, cuttings, bioengineering materials, fascines	99	Website	Ecological restoration projects, Design build, Custom growing, Promotional gift seedlings, Bioengineering, Custom seed-collecting, Ecological consulting, Tassau Protective Tree Collars, Tubex Tree Shelters	
Toronto Region Conservation Authority	5 Shoreham Drive North York, ON M3N 1S4	**Tel:** (905) 851-2809 **Fax:** (905) 851-9610 **Website:** trees@trca.on.ca	X	X	X	X	MNR tree seed zones 33-35, Cndn Plant hardiness zones 5a & 5b	X		X	seed, rooted hardwood cuttings, seedlings, container, bareroot, b&b wire baskets	100	PR, PL	Certified seed collectors, Dormat hardwood canes for bioengineering, Planting and installations	

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types				Climate Zones *(origin of material)*	Plant Types			Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
			Wetland	Meadow	Forest	Urban		Aquatic	Herbaceous	Woody					
Trees for Tomorrow *Jamie and Margaret Huntley*	R.R. 3 3992 Baseline Road Sutton West, ON L0E 1R0	Tel: (905) 722-5038	X	X	X	X	MNR Tree Seed Zones 34 and beyond		X	X	seed	75+		Contact for specialty seed collection, Certified Seed Collector, specializing in tree, shrub and small fruit spp (wildberry jam products), 40 years experience	
University of Guelph Arboretum *Ric Jordan*	50 Stone Road East Guelph, ON N1G 2W1	**Tel:** (519) 824-4120 ext. 53587 **Fax:** (519) 763-9598 **Email:** arbor@uoguelph.ca **Website:** www.uoguelph.ca/arboretum			X	X	Southcentral Ontario- all source identified- limited quantities		X	X	uncommon species seedlings potted	60	Website (available annually by mid August)	Plants only sold at September Plant Sale. Workshops year round. Please check website for up to date listings.	
Urban Forest Associates Inc. *Stephen Smith*	331 Linsmore Cr. Toronto, ON M4J 4M1	**Tel / Fax:** (416) 423-3387 **Email:** restore@ufora.ca **Website:** www.ufora.ca	X		X		MNR Tree Seed Zones 34, 36, 37		X	X	seed, cuttings, seedlings, bareroot, potted	100	W	Certified Seed Collector, Seed collection, Contract Growing, Planting, Consulting, Certified Arborists, Designated Buttemut Assessor	
Uxbridge Nurseries Ltd. *Harry Worsley*	P.O. Box 400 Uxbridge, ON L69 1M8	**Tel:** (905) 655-3379 **Tel:** (877) 655-3379 **Fax:** (905) 655-8544 **Email:** sales@uxbridgenurseries.com **Website:** www.uxbridgenurseries.com	X	X	X	X	Ontario sources		X	X	cuttings, seedlings, container, bareroot, potted, b&b	50	F	Wholesale only, Will consider contract growing	
Van Den Nest Nursery *Julie Van Den Nest*	9594 Somers Road Eden, ON N0J 1H0	**Tel:** (519) 866-5269 **Fax:** (519) 866-5507 **Email:** edentree@amtelecom.net **Website:** www.amtelecom.net/~edentree			X	X	Cndn Plant Hardiness Zones 4-6 MNR Tree Seed Zone 37		X	X	seedlings, bareroot, b&b, potted	100	F	Mail order trees up to 125 cm tall School/community plantings	
Verbinnen's Nursery Ltd. *John Verbinnen*	1504 Brock Road R.R. 4 Dundas, ON L9H 5E4	**Tel:** (905) 659-7072 **Fax:** (905) 659-3294 **Email:** jverbinnen@verbinnens.com **Website:** www.verbinens.com	X	X	X	X	4b to 6a			X	seed, bareroot, live stakes, potted	95	E		
V. Kraus Nurseries Ltd.	1380 Centre Road Carlisle, ON L0R 1H0	**Tel:** (905) 689-4022 **Fax:** (905) 689-8080 **Email:** irene@krausnurseries.com		X	X	X	2, 3, 4, 5, 6, 9		X	X			Website	planting, pruning	
Wheatley Woods Native Plant Nursery & Garden Centre *Marjan & Craig Willett*	2448 Essex Road 14 P.O. Box 765 Wheatley, ON N0P 2P0	**Tel:** (519) 825-4217 **Fax:** (519) 825-7239 **Email:** sales@wheatley-woods.com **Website:** www.wheatleywoods.com	X	X	X	X	Southwestern Ontario		X	X	Bareroot, container, fibre pots, ball and burlap, wire basket	95	Website	Design, installation, consultation, contract growing, certified seed collector, habitat restoration, garden centre tours	
Whitehouse Perennials *Suzanne Patry*		**Email:** suzanne@whitehouseperennials.com													
Wildflower Farm *Paul Jenkins*	10195 Highway 12 W. R.R. 2 Coldwater, ON L0K 1E0	**Tel:** (705) 327-2828 **Email:** info@wildflowerfarm.com **Website:** www.wildflowerfarm.com	X	X	X	X	Zone 4 Coldwater, ON- all hardy to Zone 3		X		seed, potted	100	W	Eco-Lawn-low maintenance turf grass seed	
Wild Ginger Native Plant Nursery *Emony Nicholls*	6752 Perrytown Road Port Hope, ON L1A 3V5	**Tel:** P (705) 740-2276 **Fax:** F (705) 312-2276 **Email:** wildgingernpn@yahoo.ca **Website:** www.wildgingernursery.ca	X	X	X	X	Kawartha, Northumberland/ Rice Lake regions		X	X	seed, potted, plugs	100		*Temporarily closed to the public, reopening in 2011/2012* Consultation, Garden design, Wholesale growing contracts	

Grower's List

Company *Contact*	Address	Contact Information	Habitat Types: Wetland	Habitat Types: Meadow	Habitat Types: Forest	Habitat Types: Urban	Climate Zones *(origin of material)*	Plant Types: Aquatic	Plant Types: Herbaceous	Plant Types: Woody	Stock Types	% Native (approx)	Catalogue	Additional Products and Services	Native Plant Grower Guidelines/ FGCA *Ontario's Natural Selections* Seed Source Certification Program
Windover Nurseries Inc.	3662 Petrolia Line Petrolia, ON N0N 1R0	**Tel:** (519) 882-0120 **Tel:** (519) 882-0158 **Fax:** (519) 882-3886 **Website:** http://www.windovernurseries.com/		X	X	X	Southern Ontario, Carolinian Zone		X	X			Website	Nursery and landscaping services	
Winkelmolen Nursery Ltd. *Jan Winkelmolen*	148 Lynden Road P.O. Box 190 Lynden, ON L0R 1T0	**Tel:** (519) 647-3912 **Fax:** (519) 647-3720 **Email:** ans@winkelmolen.com **Website:** www.winkelmolen.com	X	X	X	X	MNR Tree Seed Zones 36, 37			X	whips and trees, bareroot, container		Free, On website, Electronic version available, Plant list, Price list	Wholesale tree nursery (now wholesale only)	

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.

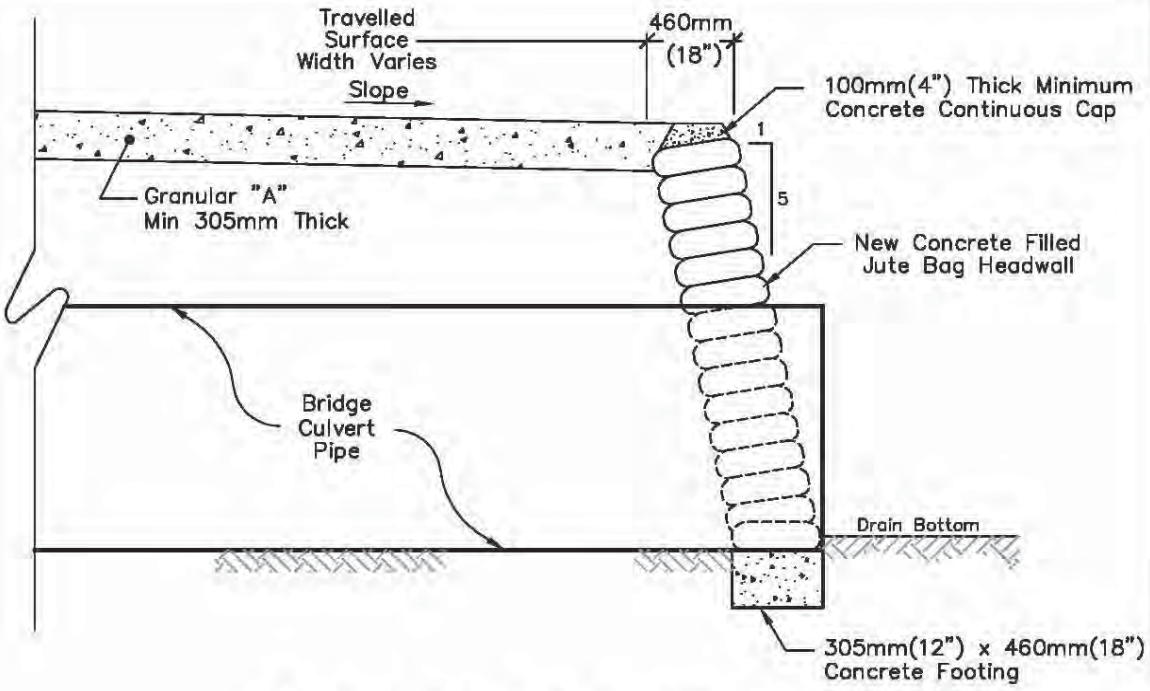
Where applicable, the Contractor and/or landowner constructing the new bridge shall be responsible for any damage caused by them to any portion of the Town road right-of-way. They shall take whatever precautions are necessary to cause a minimum of damage to same and must restore the roadway to its original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

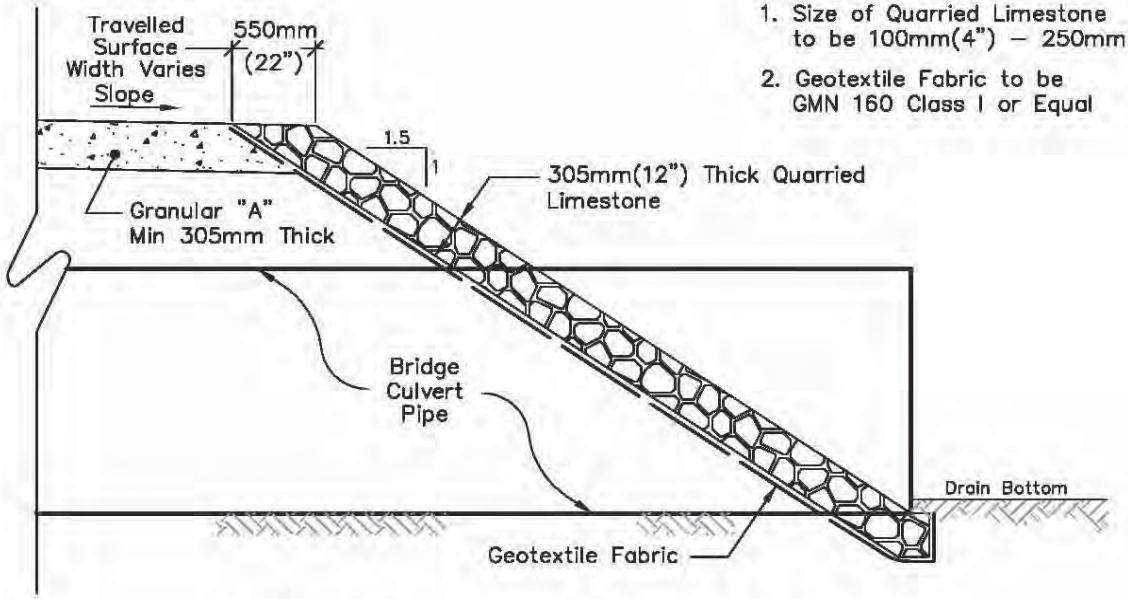
Once the bridge installation has been completed, the drain sideslopes directly adjacent the new headwalls and/or endwalls are to be completely restored including revegetation, where necessary.

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.

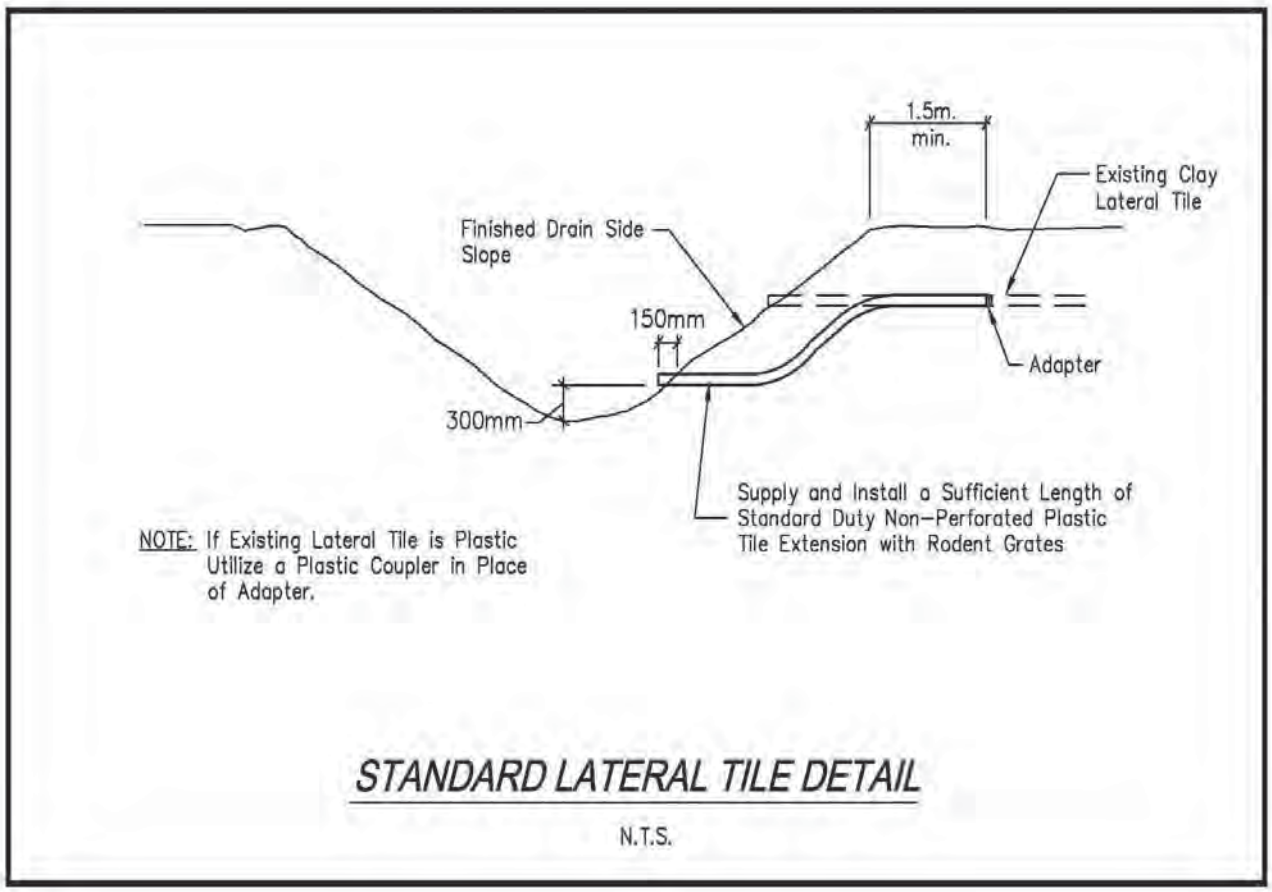


Typical Jute Bag Headwall



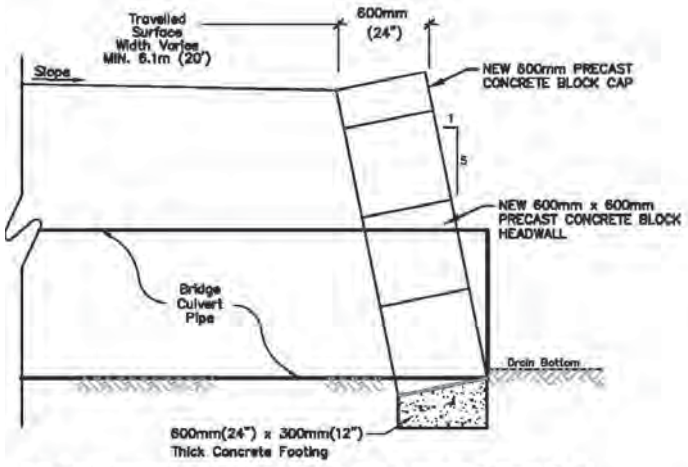
Typical Quarried Limestone End Protection

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



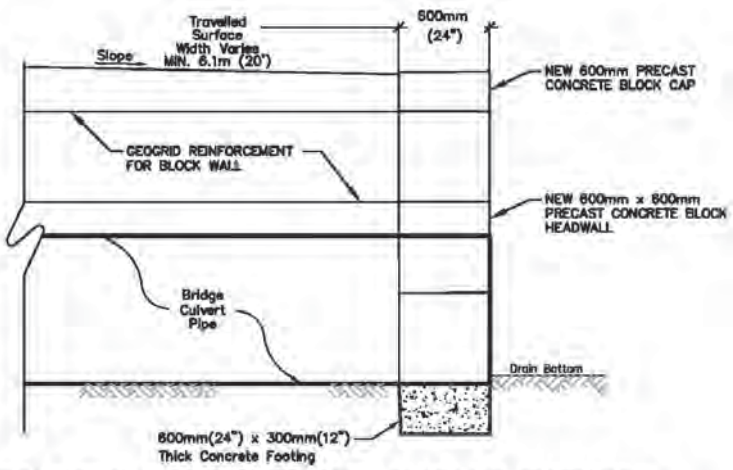
STANDARD LATERAL TILE DETAIL

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”

MAINTENANCE SCHEDULE OF ASSESSMENT
BONDY-BASTIEN DRAIN (NORTH BRANCH)
TOWN OF AMHERSTBURG
PWD-MD-2011-039

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
County Road 20			2.10	0.850	County of Essex	$ 513.00	$ 293.00	$ -	$ 806.00
North Townline Road (unopened)			1.25	0.506	Town of Amherstburg	$ 122.00	$ 56.00	$ -	$ 178.00
Total on Municipal Lands.....						**$ 635.00**	**$ 349.00**	**$ -**	**$ 984.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 39	0.38	0.154	Christian Pedersen	$ -	$ 41.00	$ -	$ 41.00
	1	Pt. Lot 39	0.38	0.154	Tricia Sisson	$ -	$ 41.00	$ -	$ 41.00
	1	Pt. Lot 39	0.45	0.182	Theresa Meloche	$ -	$ 47.00	$ -	$ 47.00
	1	Pt. Lot 39	0.30	0.121	Patrick Wilson & Jaimie Biglow	$ -	$ 31.00	$ -	$ 31.00
	1	Pt. Lot 39	0.25	0.101	John & Danielle Demitroff	$ -	$ 25.00	$ -	$ 25.00
	1	Pt. Lot 39	0.39	0.158	John & Wanda-Lee Meloche	$ -	$ 40.00	$ -	$ 40.00
	1	Pt. Lot 40	4.00	1.619	Lee Xoly & Lor Mai Nhia	$ 332.00	$ 133.00	$ -	$ 465.00
	1	Pt. Lot 40	4.00	1.619	Elizabeth Durocher	$ 332.00	$ 119.00	$ -	$ 451.00
	1	Pt. Lot 40	6.00	2.428	Noel Meloche & Jamie Clarke	$ 343.00	$ 158.00	$ -	$ 501.00
	1	Pt. Lots 41 & 42	16.64	6.734	Sean & Veronica Hadrian	$ 966.00	$ 416.00	$ -	$ 1,382.00
	1	Pt. Lot 41	0.48	0.194	Derek & Patricia Vaillancourt	$ -	$ 47.00	$ -	$ 47.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 41	0.48	0.194	Robert & Shannon Coghill	$ -	$ 33.00	$ -	$ 33.00
	1	Pt. Lot 41	0.48	0.194	Kevin & Victoria Brannagan	$ -	$ 33.00	$ -	$ 33.00
	1	Pt. Lot 41	0.48	0.194	Gregory & Lori West	$ -	$ 33.00	$ -	$ 33.00
	1	Pt. Lots 41 & 42	0.98	0.397	Randy Standon	$ -	$ 73.00	$ -	$ 73.00
	1	Pt. Lot 42	0.45	0.182	J.M. Bondy Holdings Inc.	$ -	$ 41.00	$ -	$ 41.00
	1	Pt. Lot 42	0.61	0.247	Barbara & Eddie Bondy-Pare	$ -	$ 49.00	$ -	$ 49.00
	1	Pt. Lot 42	0.54	0.219	Ronald Bondy	$ -	$ 45.00	$ -	$ 45.00
	1	Pt. Lot 42	0.50	0.202	Matthew & Yvonne Chappus	$ -	$ 41.00	$ -	$ 41.00
Total on Privately Owned - Non-Agricultural Lands.....						**$ 1,973.00**	**$ 1,446.00**	**$ -**	**$ 3,419.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 41	6.00	2.428	Louis & Tracy Calsavara	$ -	$ 155.00	$ -	$ 155.00
	1	Pt. Lot 42	11.90	4.816	Joseph Bondy	$ -	$ 279.00	$ -	$ 279.00
Total on Privately Owned - Agricultural Lands (grantable).....						**$ -**	**$ 434.00**	**$ -**	**$ 434.00**

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

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 39	5.79	2.343	Raymond Meloche	$ -	$ 163.00	$ -	$ 163.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Total on Privately Owned - Agricultural Lands (non-grantable).....						**$ -**	**$ 163.00**	**$ -**	**$ 163.00**
TOTAL ASSESSMENT			64.83	26.236		**$ 2,608.00**	**$ 2,229.00**	**$ -**	**$ 5,000.00**

1 Hectare = 2.471 Acres
Project No. REI2012D018
May 12th, 2023

MAINTENANCE SCHEDULE OF ASSESSMENT
BONDY-BASTIEN DRAIN (SOUTH BRANCH)
TOWN OF AMHERSTBURG
PWD-MD-2011-039

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
County Road 20			2.10	0.850	County of Essex	$ 503.00	$ 190.00	$ -	$ 693.00
Total on Municipal Lands.....						**$ 503.00**	**$ 190.00**	**$ -**	**$ 693.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 42	1.55	0.627	Jeffrey & Nora Johnston and Robert Meloche	$ -	$ 31.00	$ -	$ 31.00
	1	Pt. Lot 42	1.44	0.583	Racheal Gagnier & Jonathan Ashe	$ -	$ 68.00	$ -	$ 68.00
	1	Pt. Lot 42	0.44	0.178	Clarence Dumouchelle	$ -	$ 30.00	$ -	$ 30.00
	1	Pt. Lots 41 & 42	1.14	0.461	Jonathan & Melissa Wood	$ -	$ 60.00	$ -	$ 60.00
	1	Pt. Lot 41	0.77	0.312	Daniel McDonald	$ -	$ 45.00	$ -	$ 45.00
	1	Pt. Lot 41	0.82	0.332	Octavious & Lauren Griffiths	$ -	$ 46.00	$ -	$ 46.00
	1	Pt. Lot 39	0.82	0.332	Gary & Corinne Boughner	$ -	$ 46.00	$ -	$ 46.00
	1	Pt. Lot 39	1.63	0.660	Zachary Binder & Tarah Fountain	$ -	$ 71.00	$ -	$ 71.00
	1	Pt. Lot 39	0.61	0.247	Khodr El Saghir	$ -	$ 30.00	$ -	$ 30.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 39	0.51	0.206	Khodr El Saghir	$ -	$ 25.00	$ -	$ 25.00
	1	Pt. Lot 38	0.50	0.202	Samuel Soucie	$ -	$ 24.00	$ -	$ 24.00
	1	Pt. Lot 38	0.50	0.202	Franklin & Michelle Dow	$ -	$ 29.00	$ -	$ 29.00
	1	Pt. Lot 38	0.50	0.202	Erin & James King	$ -	$ 28.00	$ -	$ 28.00
	1	Pt. Lot 38	0.46	0.186	DBS-Hearn Inc.	$ -	$ 28.00	$ -	$ 28.00
	1	Pt. Lot 37	2.44	0.987	Jeffrey VanDerHorst	$ 41.00	$ 82.00	$ -	$ 123.00
	1	Pt. Lot 37	2.63	1.064	Matthew Bridgen	$ 46.00	$ 86.00	$ -	$ 132.00
	1	Pt. Lot 36	1.25	0.506	John & Judy Palesh	$ -	$ 51.00	$ -	$ 51.00
	1	Pt. Lot 36	2.50	1.012	Ronald Cooney	$ -	$ 79.00	$ -	$ 79.00
Total on Privately Owned - Non-Agricultural Lands.....						**$ 87.00**	**$ 859.00**	**$ -**	**$ 946.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
	1	Pt. Lot 41	4.10	1.659	2564735 Ontario Limited	$ -	$ 75.00	$ -	$ 75.00
	1	Pt. Lot 41	4.00	1.619	Ann Bondy	$ -	$ 73.00	$ -	$ 73.00
	1	Pt. Lots 39 & 40	19.18	7.762	1164841 Ontario Ltd.	$ 309.00	$ 349.00	$ -	$ 658.00
	1	Pt. Lot 39	5.39	2.181	1164841 Ontario Ltd.	$ 223.00	$ 94.00	$ -	$ 317.00
	1	Pt. Lots 38 & 39	6.98	2.825	Sam & Robert Soucie	$ 223.00	$ 119.00	$ -	$ 342.00
	1	Pt. Lot 37	6.86	2.776	George & Mantoura Bousaba	$ 154.00	$ 110.00	$ -	$ 264.00
	1	Pt. Lot 36	5.00	2.023	Barbara & Stephen Halls & Amy Lee	$ 91.00	$ 76.00	$ -	$ 167.00
Total on Privately Owned - Agricultural Lands (grantable).....						**$ 1,000.00**	**$ 896.00**	**$ -**	**$ 1,896.00**

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
5. PRIVATELY OWNED - AGRICULTURAL LANDS (non-grantable):									
	1	Pt. Lot 38	5.50	2.226	Matthew Pawluk	$ 206.00	$ 112.00	$ -	$ 318.00
	1	Pt. Lots 37 & 38	10.54	4.265	DBS-Hearn Inc.	$ 326.00	$ 174.00	$ -	$ 500.00
	1	Pt. Lot 37	6.18	2.501	Janice Waldron	$ 429.00	$ 99.00	$ -	$ 528.00
	1	Pt. Lot 37	2.67	1.081	Nicolas Brousseau	$ 57.00	$ 62.00	$ -	$ 119.00
Total on Privately Owned - Agricultural Lands (non-grantable).....						**$ 1,018.00**	**$ 447.00**	**$ -**	**$ 1,465.00**
TOTAL ASSESSMENT			100.26	40.575		**$ 2,608.00**	**$ 2,392.00**	**$ -**	**$ 5,000.00**

1 Hectare = 2.471 Acres
Project No. REI2012D018
May 12th, 2023

APPENDIX “REI-E”

PLANS, PROFILE & DETAILS

OF THE

BONDY–BASTIEN DRAIN

(Geographic Township of Anderdon)

IN THE

TOWN OF AMHERSTBURG

IN THE

COUNTY OF ESSEX • ONTARIO

GERARD ROOD, P.ENG.

ROOD ENGINEERING INC.

CONSULTING ENGINEERS
Leamington, Ontario
519–322–1621

REGISTERED PROFESSIONAL ENGINEER
G.ROOD
2023-06-13
PROVINCE OF ONTARIO

DATE: MAY 12th, 2023

TOWN OF AMHERSTBURG

MAYOR: MICHAEL PRUE
CLERK: KEVIN FOX
DRAINAGE SUPERINTENDENT: SAM PAGLIA, P.ENG.

BENCHMARKS:

1) SIGN: RONALD M. BONDY MEMORIAL PARK, NAIL IN TOP OF NORTH POST
ELEV. = 176.12m

2) NAIL IN NORTH SIDE OF POLE (0.6M ABOVE GRADE) ON NORTH SIDE OF M.N. 2376 DRIVEWAY
ELEV. = 175.86m

3) NW OBVERT OF 1.22ø CSP UNDER ESSEX COUNTY ROAD 20
ELEV. = 175.105m

4) NAIL IN EAST FACE OF HYDRO POLE AT M.N. 2280 ON WEST SIDE OF ESSEX COUNTY ROAD 20
ELEV. = 175.633m

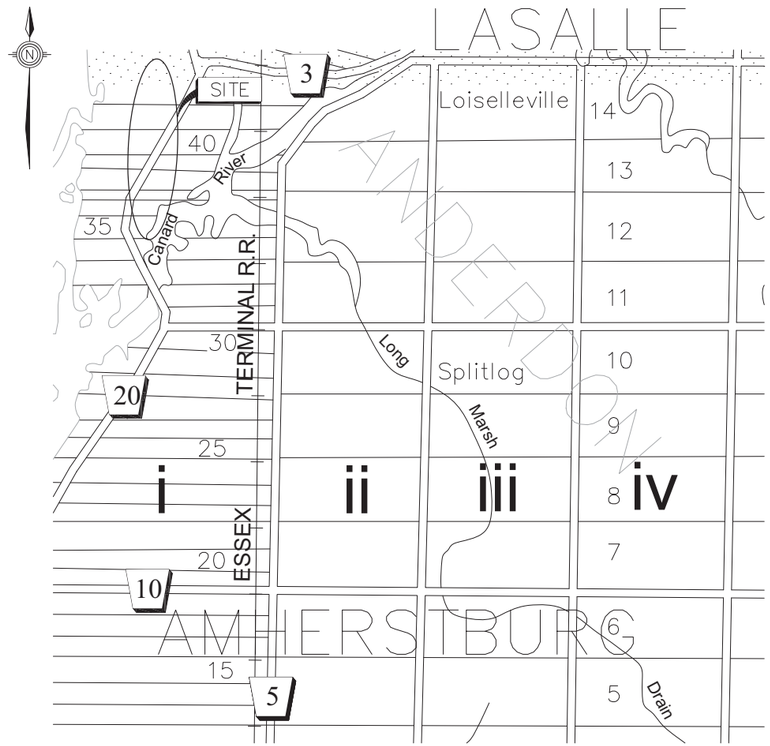
5) NAIL IN NORTH SIDE OF 1.30ø WILLOW TREE (0.6M ABOVE GRADE)
ELEV. = 176.16m

6) NAIL IN NORTH SIDE OF POST (0.6M ABOVE POST)
ELEV. = 176.16m

7) NAIL IN STUMP 0.40
ELEV. = 176.18m

8) NAIL IN EAST SIDE OF POST (0.6M ABOVE GRADE)
ELEV. = 175.63m

9) NAIL IN SOUTH SIDE OF POST (0.6M ABOVE GRADE)
ELEV. = 176.45m



KEY PLAN
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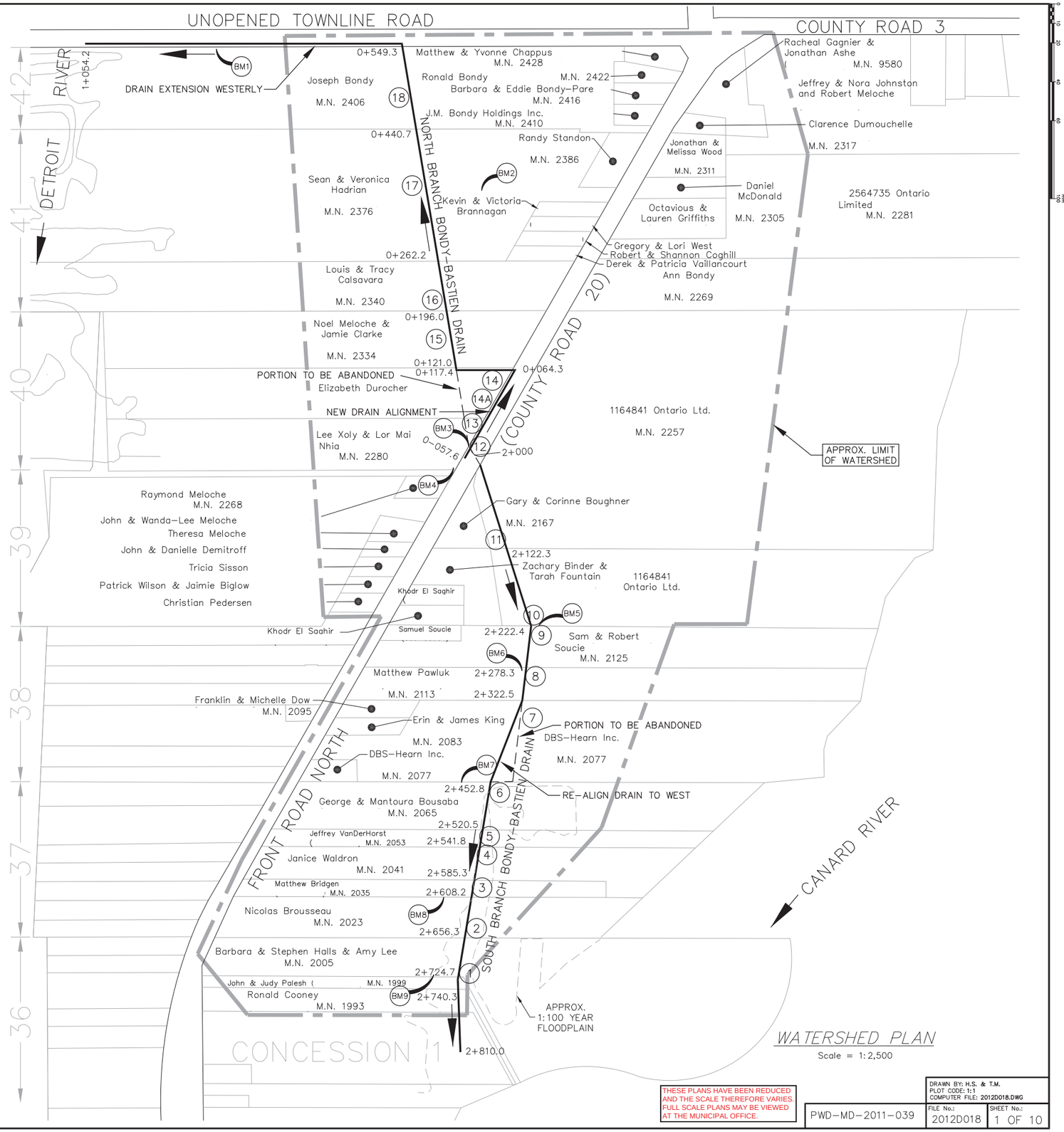


WATERSHED PLAN
Scale = 1:2,500

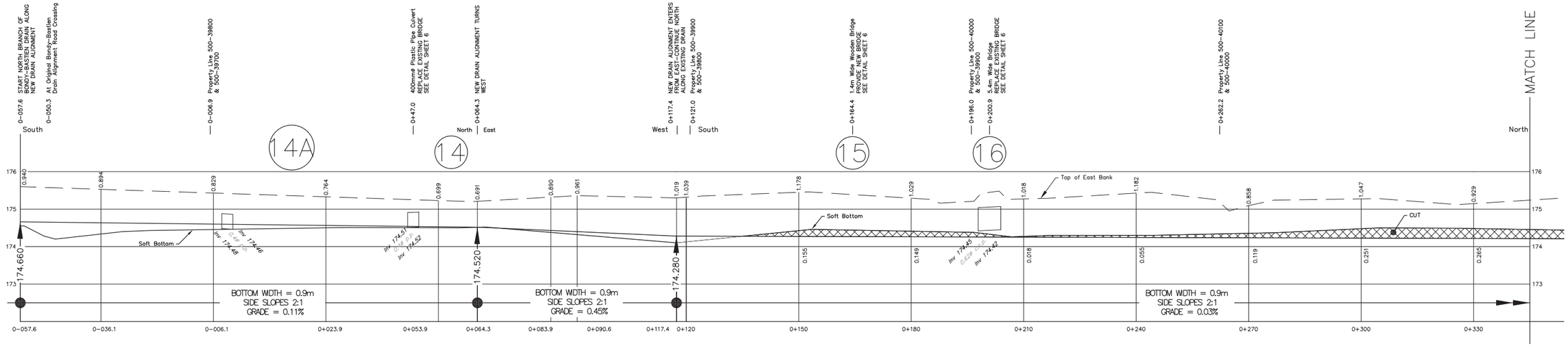
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

DRAWN BY: H.S. & T.M.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

PWD–MD–2011–039

FILE No.: 2012D018

SHEET No.: 1 OF 10



PROFILE 'A' (North Branch Bondy-Bastien Drain)

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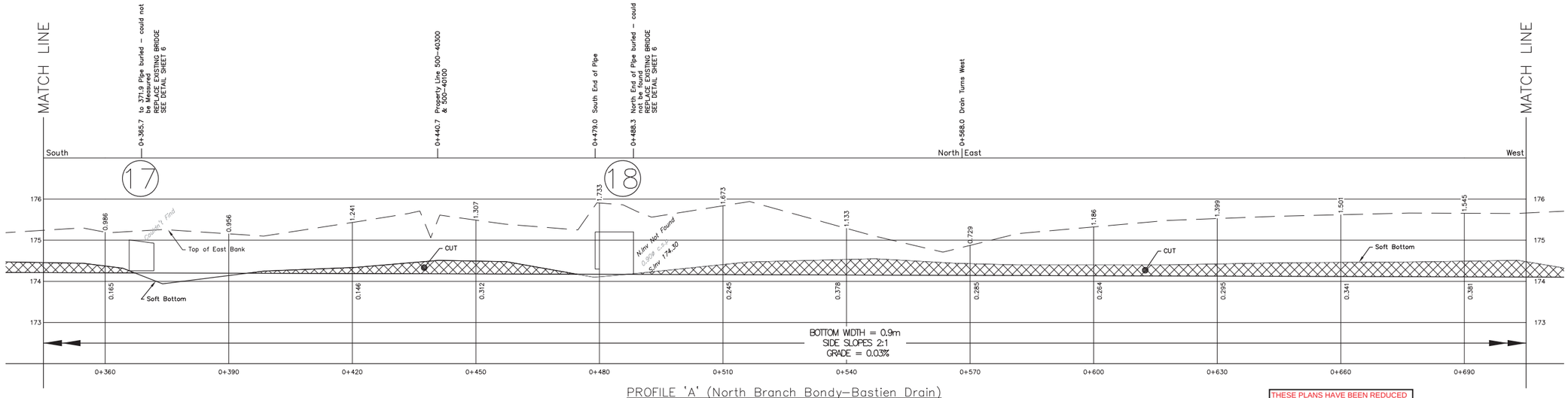


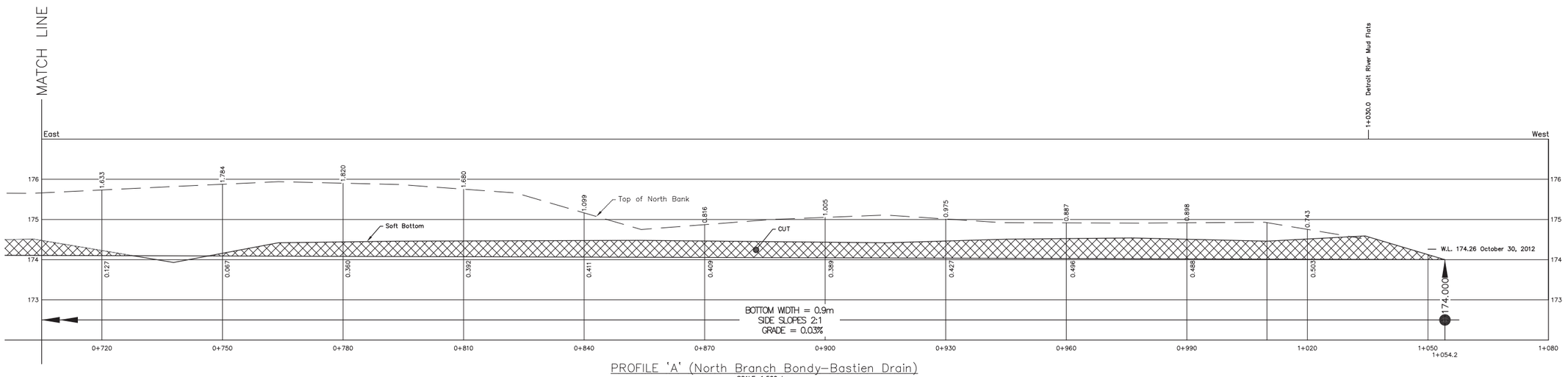
PROFILE 'A' (North Branch Bondy-Bastien Drain)

SCALE=1:500 hor.
1:50 vert.

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

DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

PWD-MD-2011-039 | FILE No.: 2012D018 | SHEET No.: 2 OF 10



PROFILE 'A' (North Branch Bondy–Bastien Drain)
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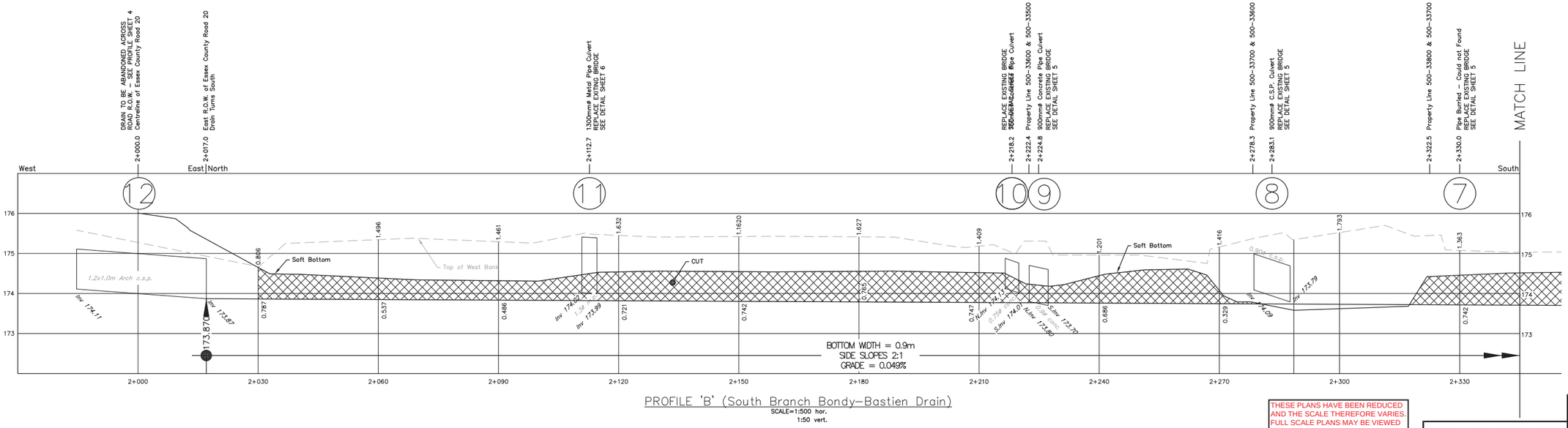
1:50 vert.

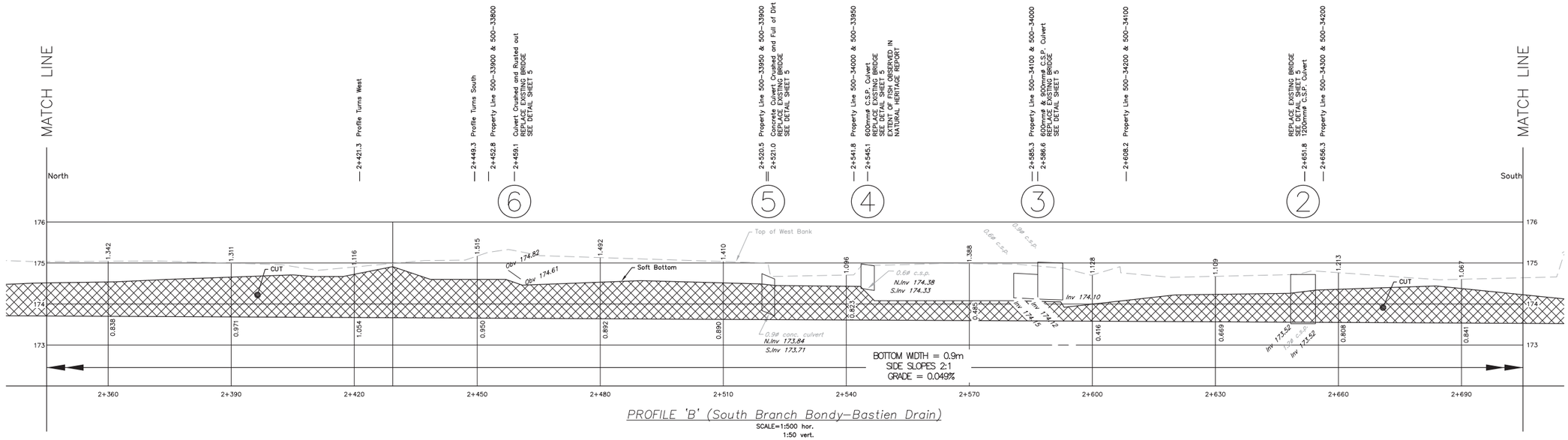


PROFILE 'B' (South Branch Bondy–Bastien Drain)
SCALE=1:500 hor.
1:50 vert.

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

DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

PWD–MD–2011–039 | FILE No.: 2012D018 | SHEET No.: 3 OF 10



PROFILE 'B' (South Branch Bondy–Bastien Drain)

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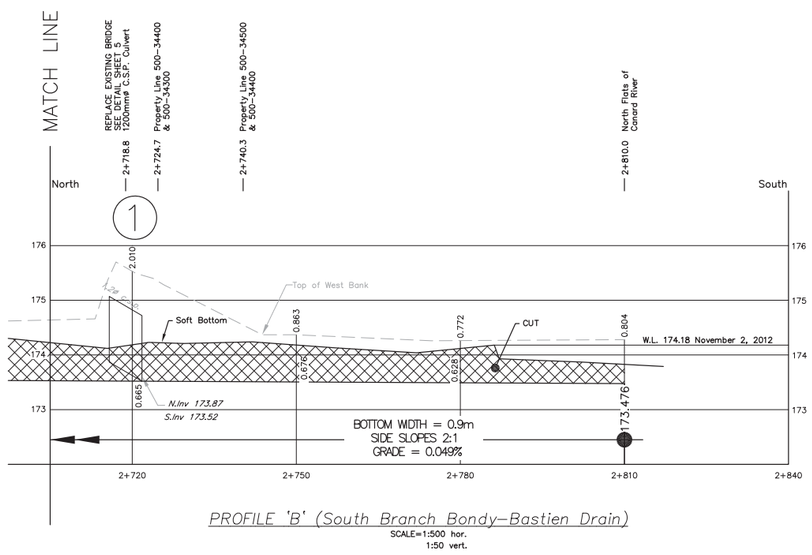
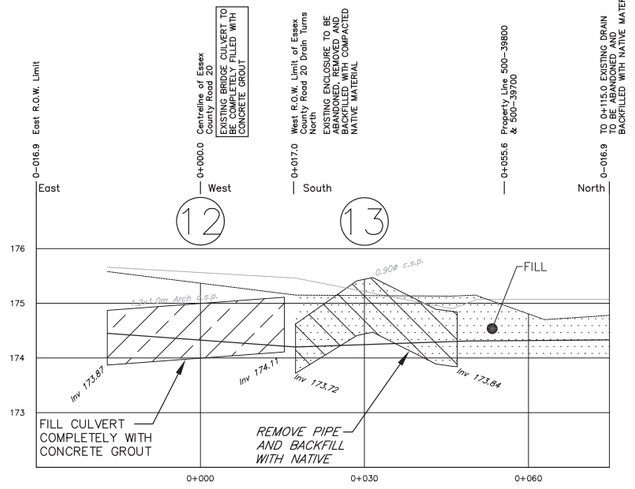


PROFILE 'B' (South Branch Bondy–Bastien Drain)

SCALE=1:500 hor.
1:50 vert.



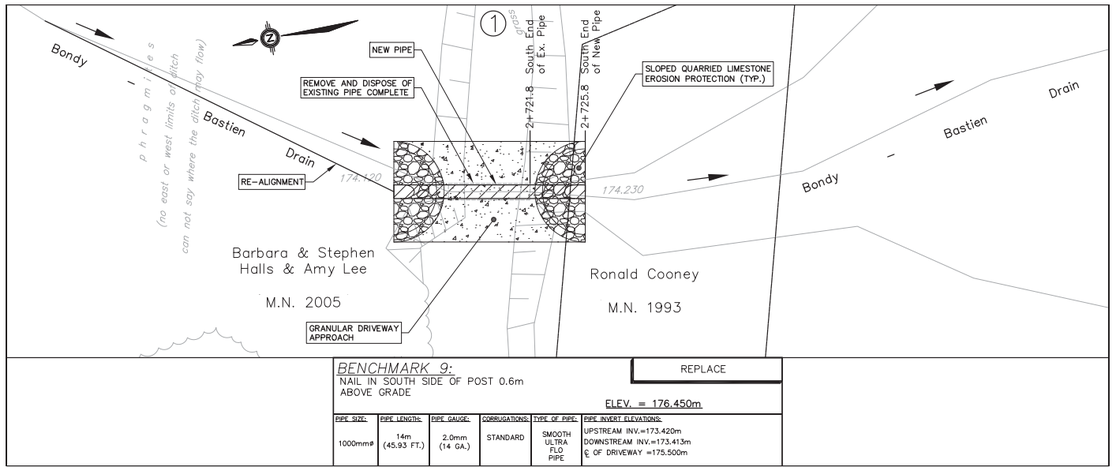
PROFILE 'A' Abandoned Portion
(Bondy–Bastien Drain Across and West of Road 20)

SCALE=1:500 hor.
1:50 vert.

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

DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

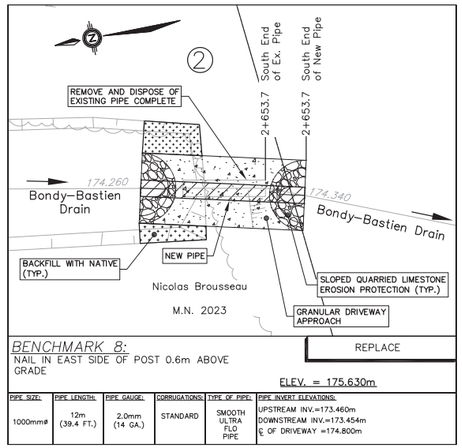
PWD–MD–2011–039 | FILE No.: 2012D018 | SHEET No.: 4 OF 10



BENCHMARK 9:
NAIL IN SOUTH SIDE OF POST 0.6m ABOVE GRADE
REPLACE
ELEV. = 176.450m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
1000mmø	14m (45.93 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.420m DOWNSTREAM INV.=173.413m ℄ OF DRIVEWAY =175.500m

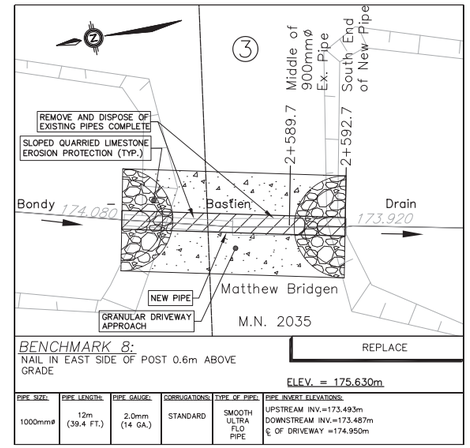
BRIDGE #1 PLAN
SCALE = 1:200



BENCHMARK 8:
NAIL IN EAST SIDE OF POST 0.6m ABOVE GRADE
REPLACE
ELEV. = 175.630m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
1000mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.460m DOWNSTREAM INV.=173.454m ℄ OF DRIVEWAY =174.800m

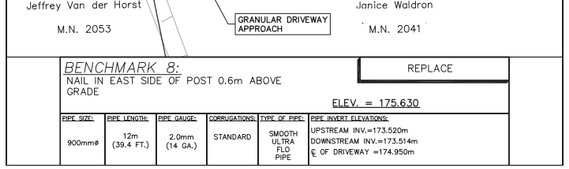
BRIDGE #2 PLAN
SCALE = 1:200



BENCHMARK 8:
NAIL IN EAST SIDE OF POST 0.6m ABOVE GRADE
REPLACE
ELEV. = 175.630m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
1000mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.493m DOWNSTREAM INV.=173.487m ℄ OF DRIVEWAY =174.950m

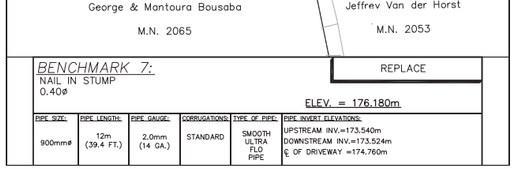
BRIDGE #3 PLAN
SCALE = 1:200



BENCHMARK 8:
NAIL IN EAST SIDE OF POST 0.6m ABOVE GRADE
REPLACE
ELEV. = 175.630

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
900mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.520m DOWNSTREAM INV.=173.514m ℄ OF DRIVEWAY =174.950m

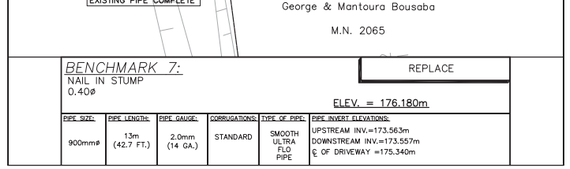
BRIDGE #4 PLAN
SCALE = 1:200



BENCHMARK 7:
NAIL IN STUMP 0.40ø
REPLACE
ELEV. = 176.180m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
900mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.540m DOWNSTREAM INV.=173.524m ℄ OF DRIVEWAY =174.760m

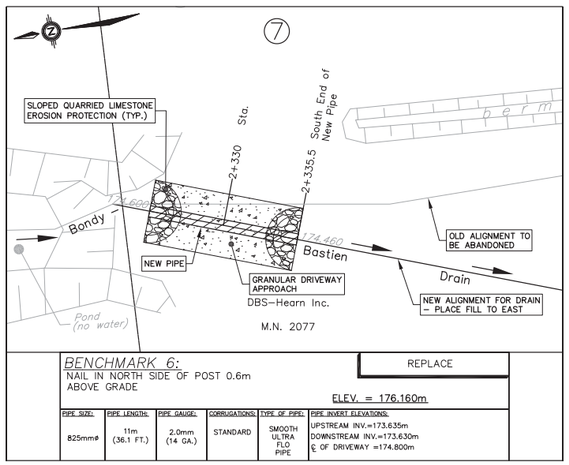
BRIDGE #5 PLAN
SCALE = 1:200



BENCHMARK 7:
NAIL IN STUMP 0.40ø
REPLACE
ELEV. = 176.180m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
900mmø	13m (42.7 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.563m DOWNSTREAM INV.=173.557m ℄ OF DRIVEWAY =175.340m

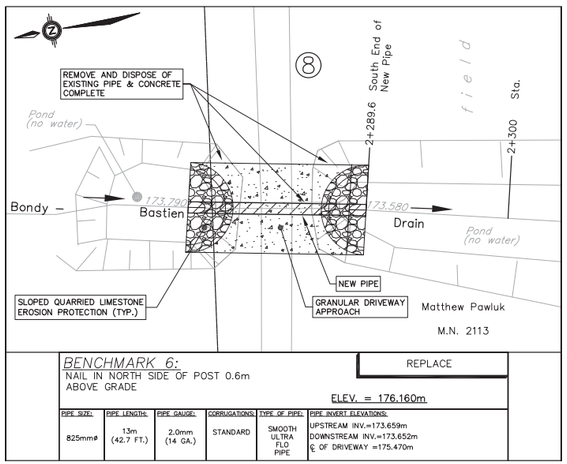
BRIDGE #6 PLAN
SCALE = 1:200



BENCHMARK 6:
NAIL IN NORTH SIDE OF POST 0.6m ABOVE GRADE
REPLACE
ELEV. = 176.160m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
825mmø	11m (36.1 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.635m DOWNSTREAM INV.=173.630m ℄ OF DRIVEWAY =174.800m

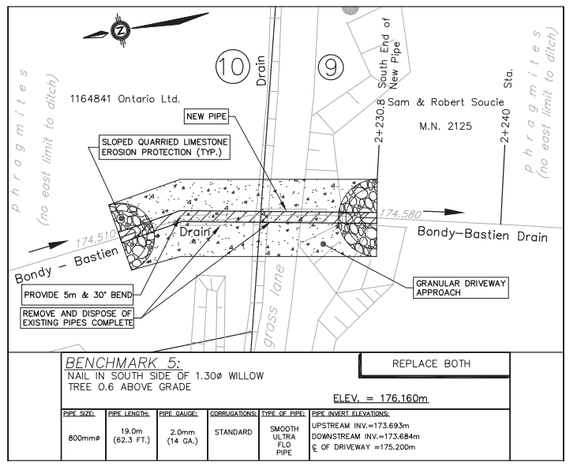
BRIDGE #7 PLAN
SCALE = 1:200



BENCHMARK 6:
NAIL IN NORTH SIDE OF POST 0.6m ABOVE GRADE
REPLACE
ELEV. = 176.160m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
825mmø	13m (42.7 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.659m DOWNSTREAM INV.=173.652m ℄ OF DRIVEWAY =175.470m

BRIDGE #8 PLAN
SCALE = 1:200



BENCHMARK 5:
NAIL IN SOUTH SIDE OF 1.30ø WILLOW TREE 0.6 ABOVE GRADE
REPLACE BOTH
ELEV. = 176.160m

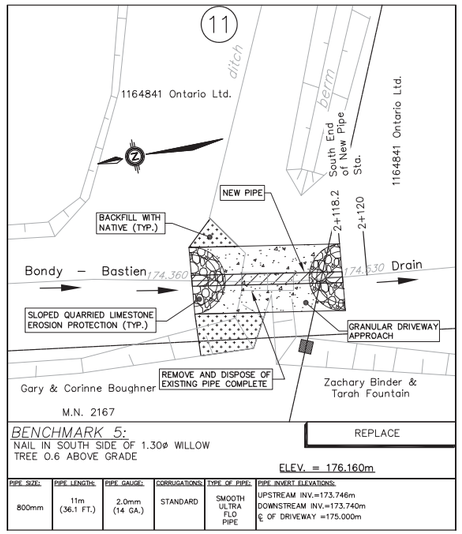
PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
800mmø	19.0m (62.3 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.693m DOWNSTREAM INV.=173.684m ℄ OF DRIVEWAY =175.200m

BRIDGE #9 & #10 PLAN
SCALE = 1:200

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

DRAWN BY: G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

PWD–MD–2011–039
FILE No.: 2012D018
SHEET No.: 5 OF 10



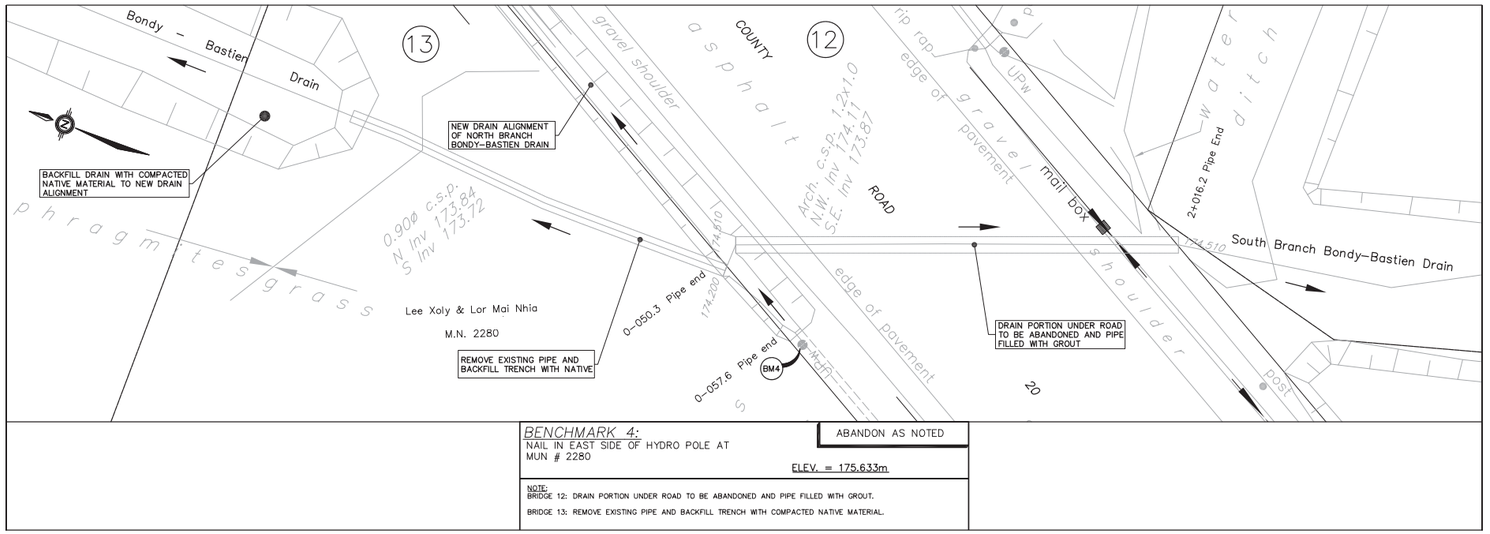
BENCHMARK 5:
NAIL IN SOUTH SIDE OF 1.30ø WILLOW TREE 0.6 ABOVE GRADE

REPLACE

ELEV. = 176.160m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
800mm	11m (36.1 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=173.746m DOWNSTREAM INV.=173.740m ℄ OF DRIVEWAY =175.000m

BRIDGE #11 PLAN
SCALE = 1:200



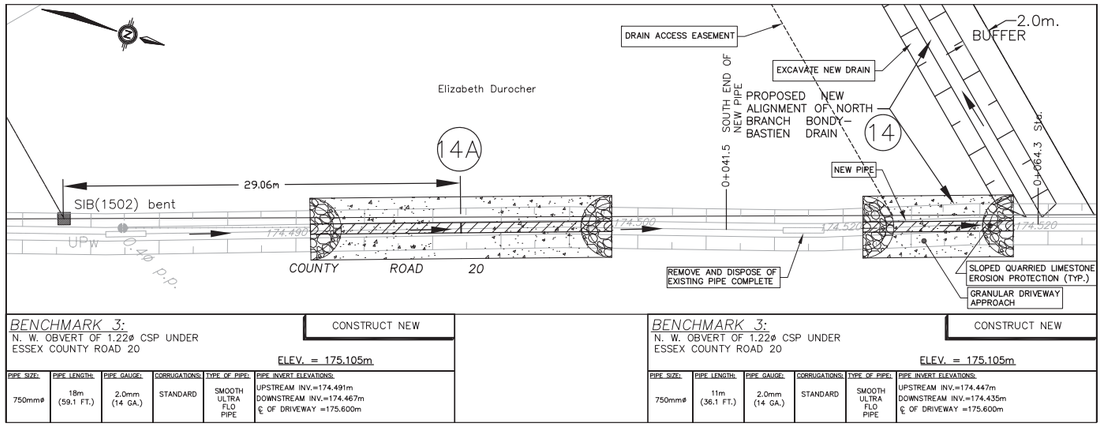
BENCHMARK 4:
NAIL IN EAST SIDE OF HYDRO POLE AT MUN # 2280

ABANDON AS NOTED

ELEV. = 175.633m

NOTE:
BRIDGE 12: DRAIN PORTION UNDER ROAD TO BE ABANDONED AND PIPE FILLED WITH GROUT.
BRIDGE 13: REMOVE EXISTING PIPE AND BACKFILL TRENCH WITH COMPACTED NATIVE MATERIAL.

BRIDGE #12 & #13 PLAN
SCALE = 1:200



BENCHMARK 3:
N. W. OBVERT OF 1.22ø CSP UNDER ESSEX COUNTY ROAD 20

CONSTRUCT NEW

ELEV. = 175.105m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
750mmø	18m (59.1 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=174.491m DOWNSTREAM INV.=174.467m ℄ OF DRIVEWAY =175.600m

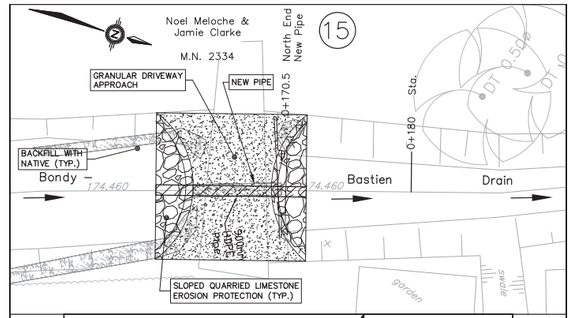
BENCHMARK 3:
N. W. OBVERT OF 1.22ø CSP UNDER ESSEX COUNTY ROAD 20

CONSTRUCT NEW

ELEV. = 175.105m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
750mmø	11m (36.1 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=174.447m DOWNSTREAM INV.=174.435m ℄ OF DRIVEWAY =175.600m

BRIDGE #14 PLAN
SCALE = 1:200



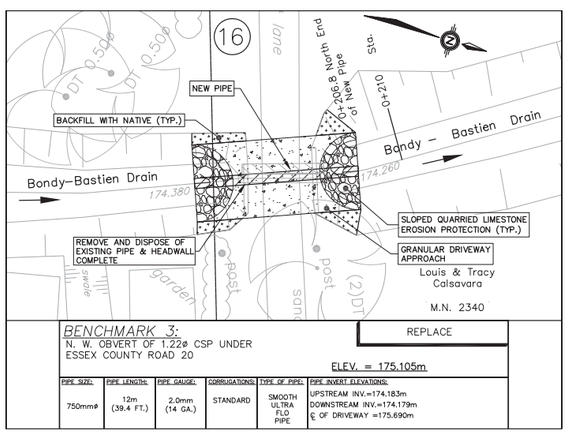
BENCHMARK 3:
N. W. OBVERT OF 1.22ø CSP UNDER ESSEX COUNTY ROAD 20

REPLACE

ELEV. = 175.105m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
900mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH WALL HDPE PIPE	UPSTREAM INV.=174.183m DOWNSTREAM INV.=174.179m ℄ OF DRIVEWAY =175.690m

BRIDGE #15 PLAN
SCALE = 1:200



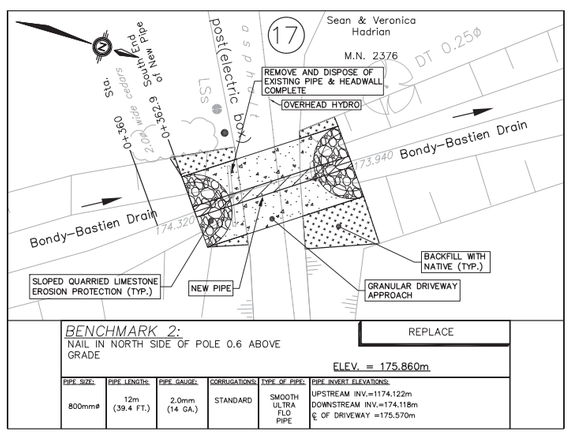
BENCHMARK 3:
N. W. OBVERT OF 1.22ø CSP UNDER ESSEX COUNTY ROAD 20

REPLACE

ELEV. = 175.105m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
750mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=174.183m DOWNSTREAM INV.=174.179m ℄ OF DRIVEWAY =175.690m

BRIDGE #16 PLAN
SCALE = 1:200



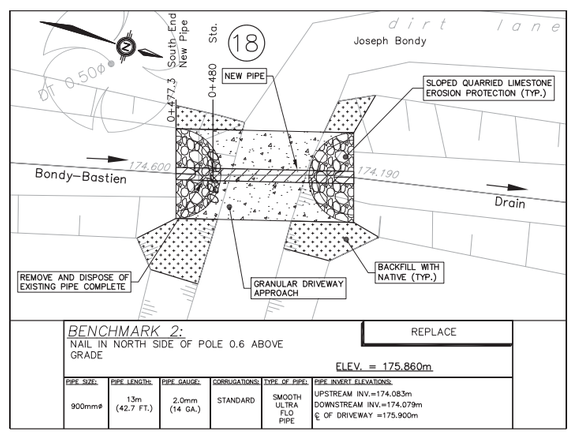
BENCHMARK 2:
NAIL IN NORTH SIDE OF POLE 0.6 ABOVE GRADE

REPLACE

ELEV. = 175.860m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
800mmø	12m (39.4 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=174.122m DOWNSTREAM INV.=174.118m ℄ OF DRIVEWAY =175.570m

BRIDGE #17 PLAN
SCALE = 1:200



BENCHMARK 2:
NAIL IN NORTH SIDE OF POLE 0.6 ABOVE GRADE

REPLACE

ELEV. = 175.860m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:	PIPE INVERT ELEVATIONS:
900mmø	13m (42.7 FT.)	2.0mm (14 GA.)	STANDARD	SMOOTH ULTRA FLO PIPE	UPSTREAM INV.=174.083m DOWNSTREAM INV.=174.079m ℄ OF DRIVEWAY =175.900m

BRIDGE #18 PLAN
SCALE = 1:200

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

DRAWN BY: G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

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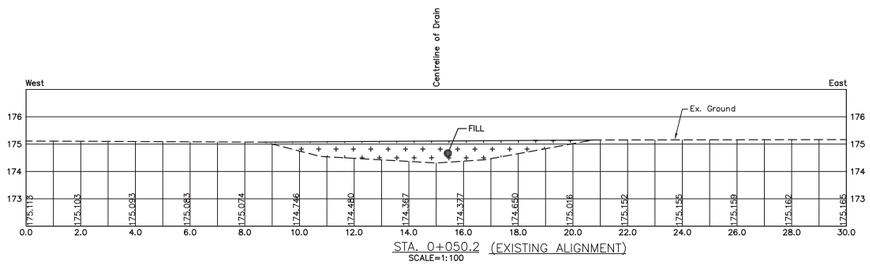

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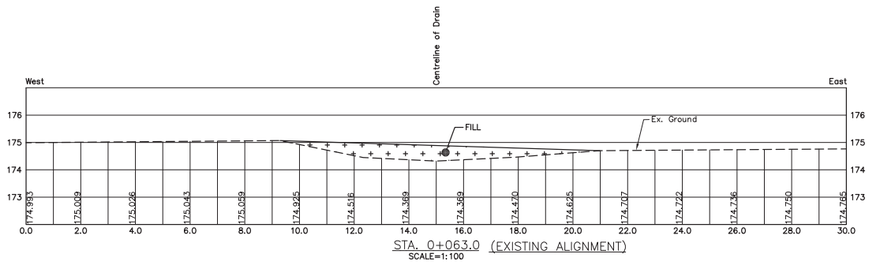

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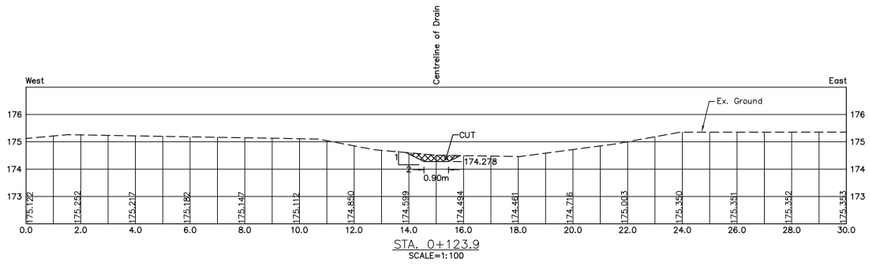

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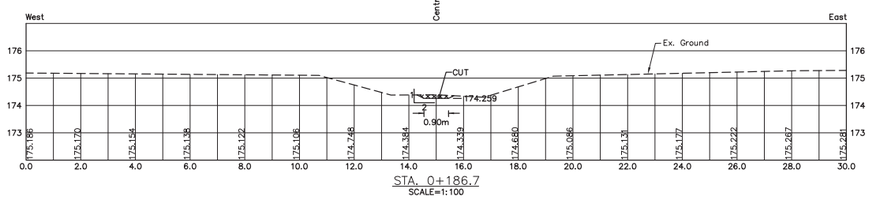

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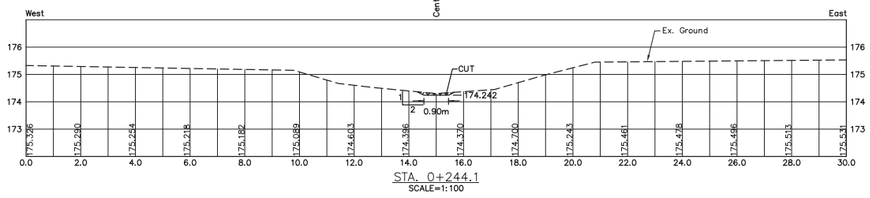

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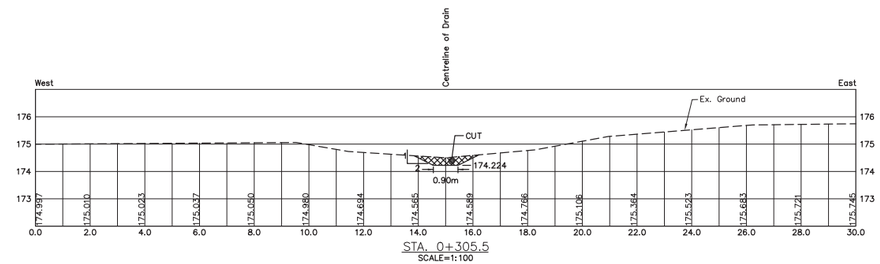
SCALE=1:100



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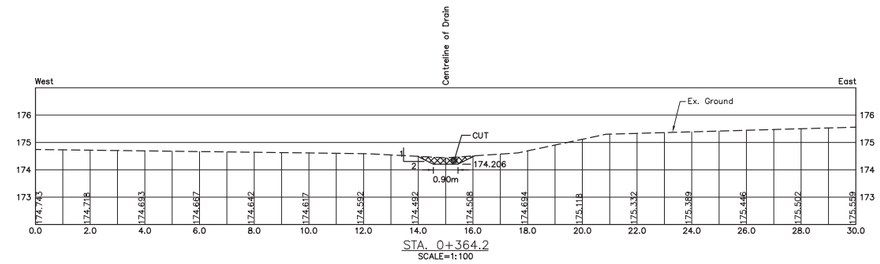

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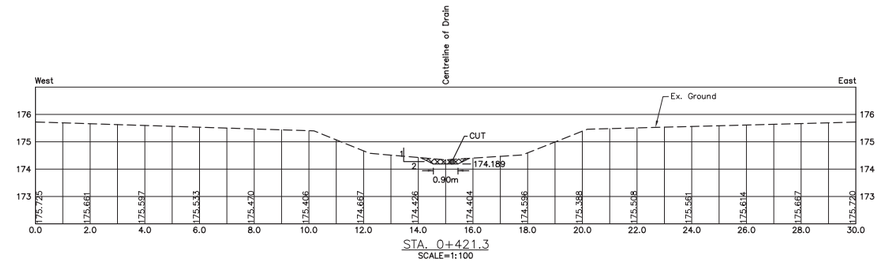

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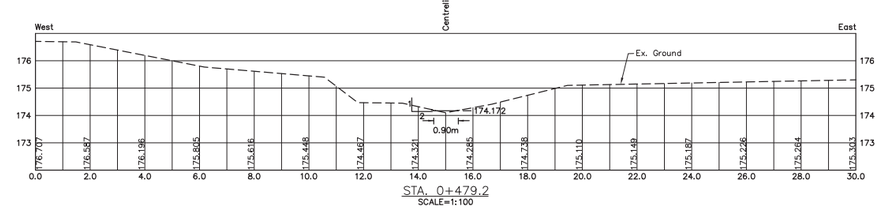

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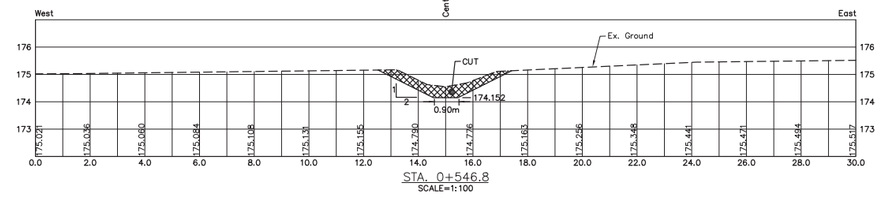


STA. 0+546.8
SCALE=1:100

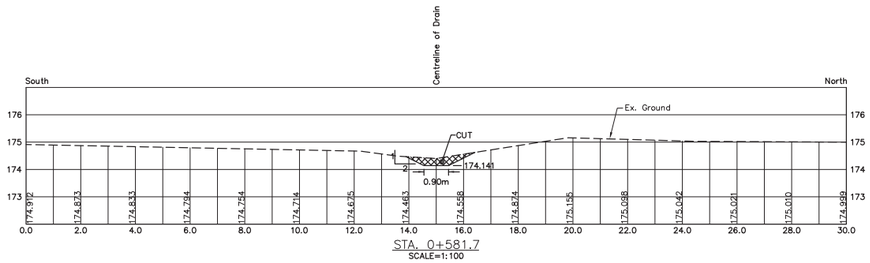
Sections West of Road 20

NORTH BRANCH BONDY–BASTIEN DRAIN

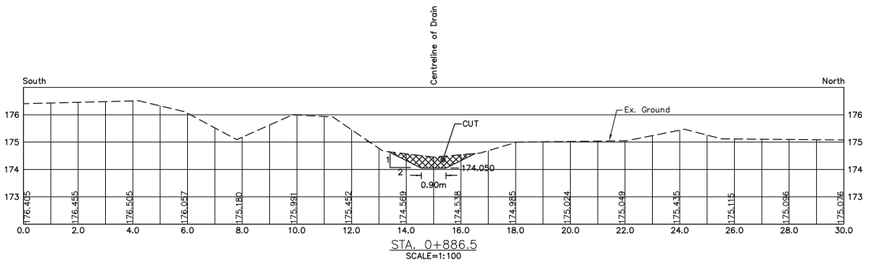
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

PWD–MD–2011–039 | FILE No.: 2012D018 | SHEET No.: 7 OF 10



STA. 0+581.7
SCALE=1:100



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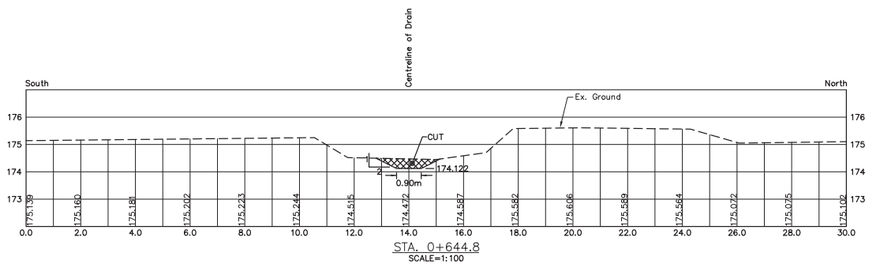

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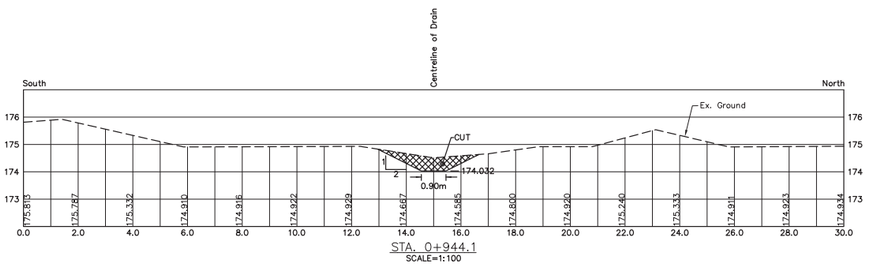

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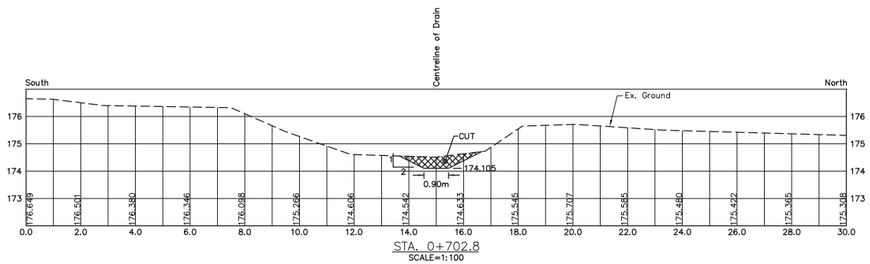

STA. 0+702.8
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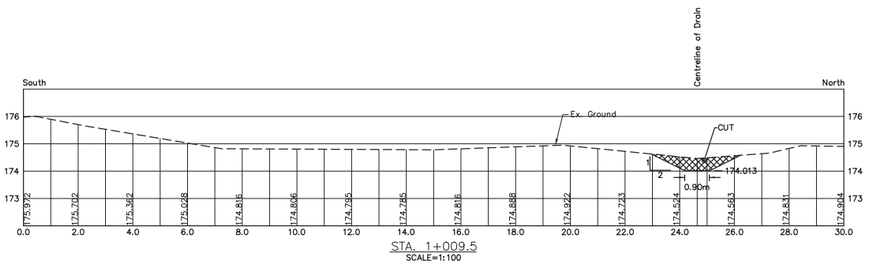

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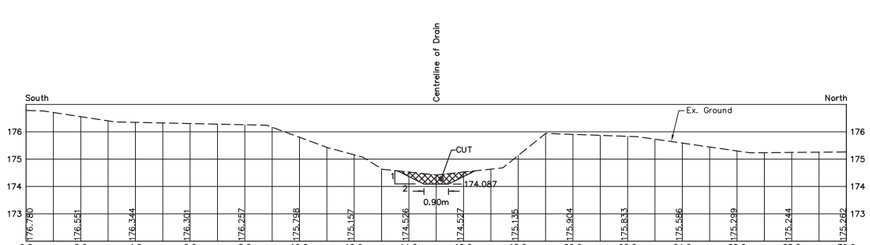

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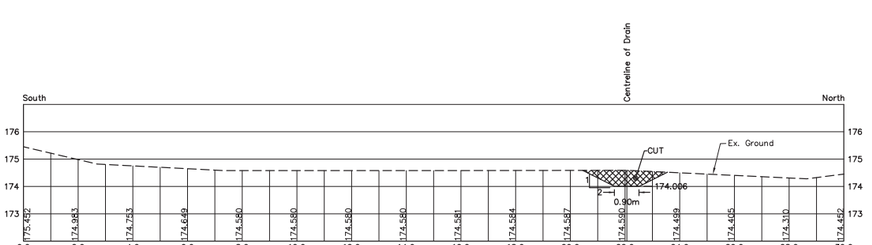

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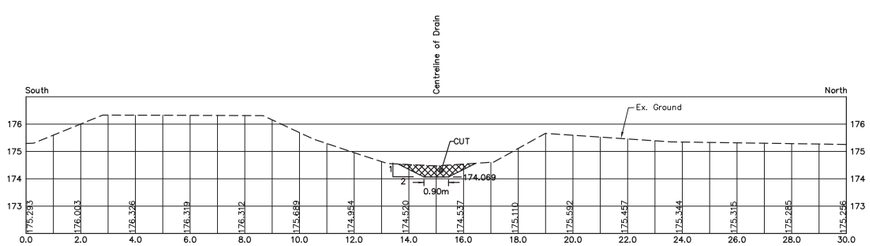


STA. 0+823.8
SCALE=1:100

Sections West of Road 20

NORTH BRANCH BONDY-BASTIEN DRAIN

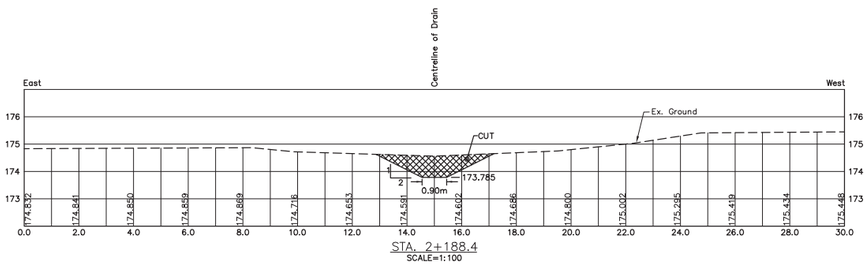
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

PWD-MD-2011-039

FILE No.: 2012D018

SHEET No.: 8 OF 10



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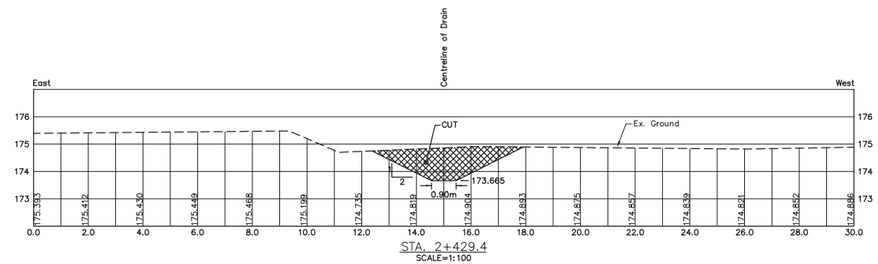

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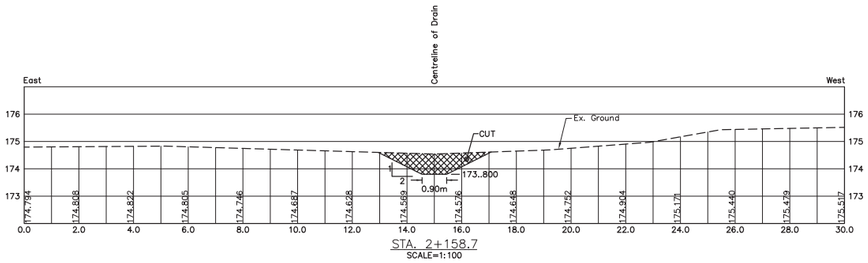

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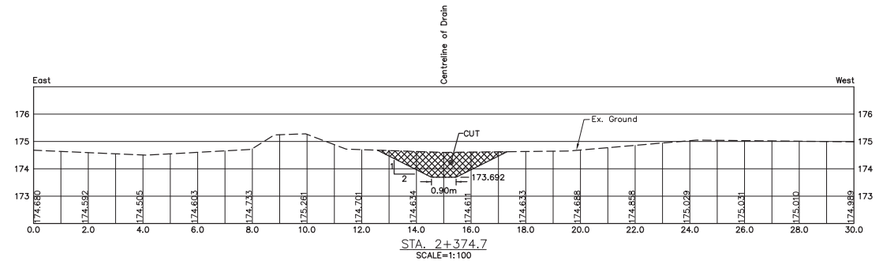

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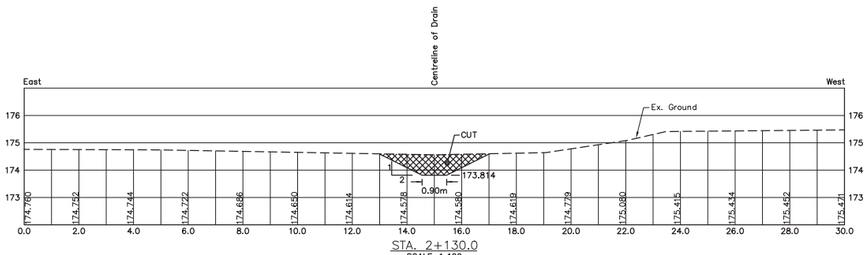

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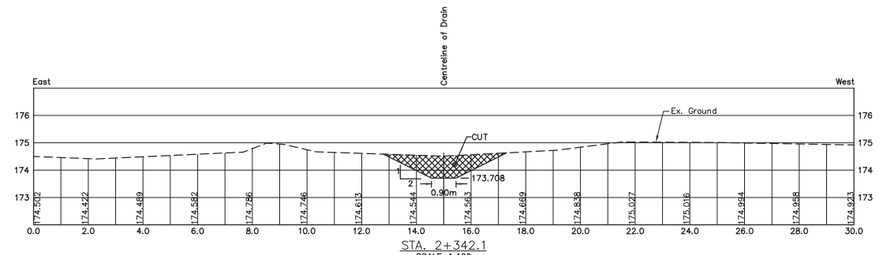

STA. 2+342.1
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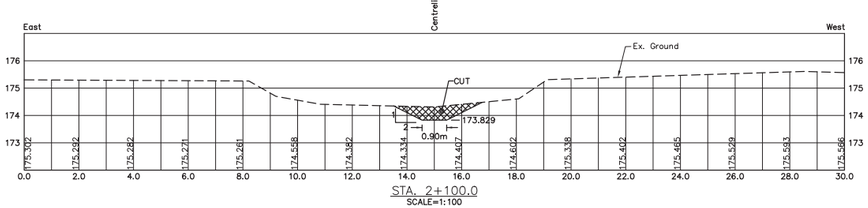

STA. 2+100.0
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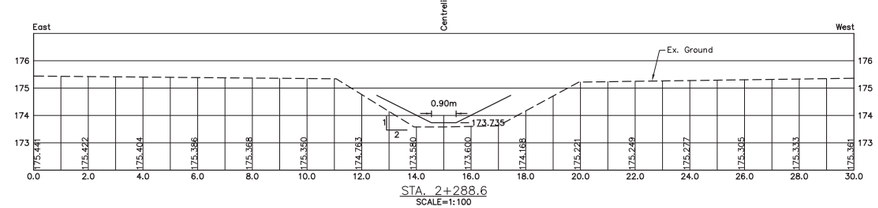

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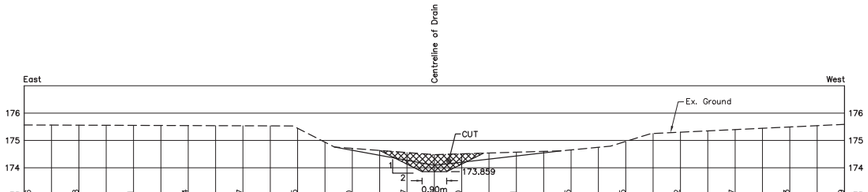

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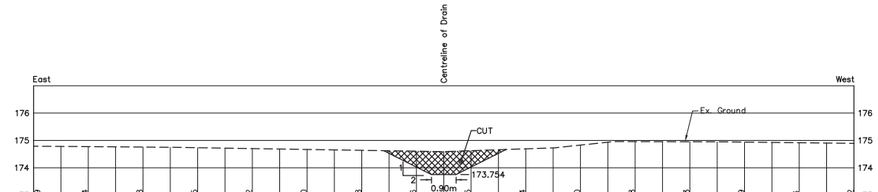


STA. 2+251.3
SCALE=1:100

Sections East of Road 20

SOUTH BRANCH BONDY–BASTIEN DRAIN

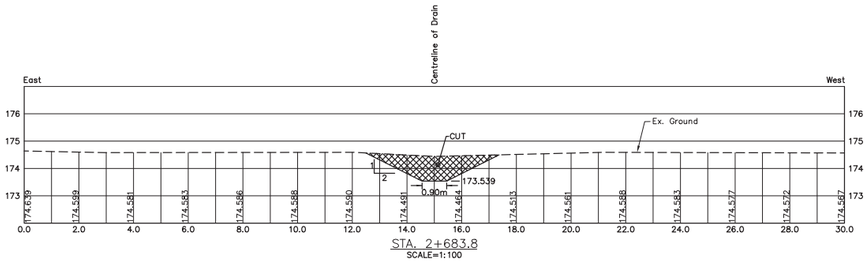
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

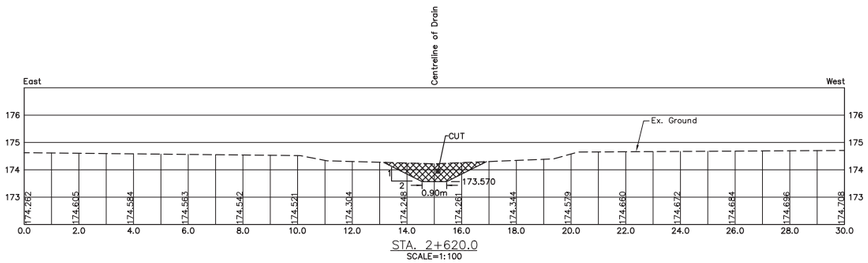
DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D018.DWG

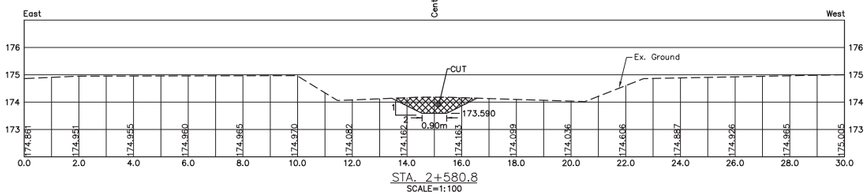
PWD–MD–2011–039

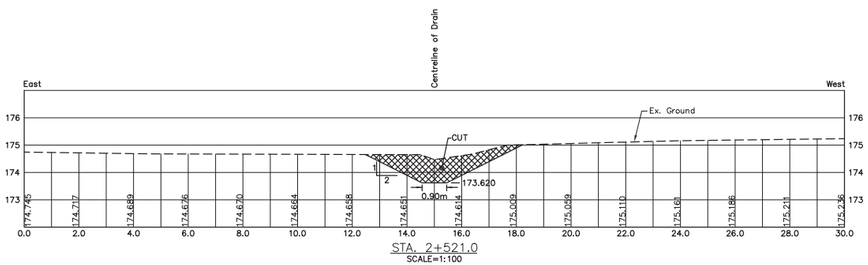
FILE No.: 2012D018

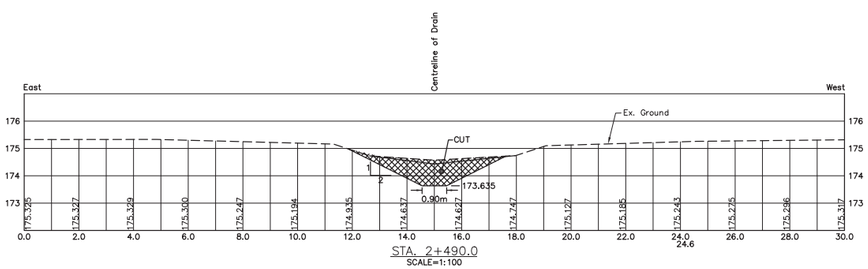
SHEET No.: 9 OF 10

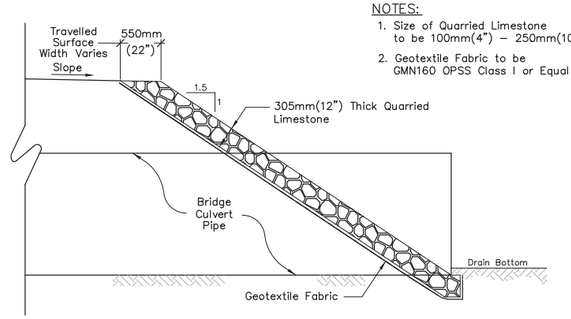




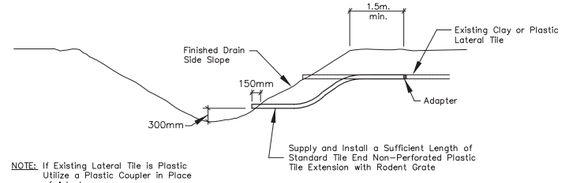




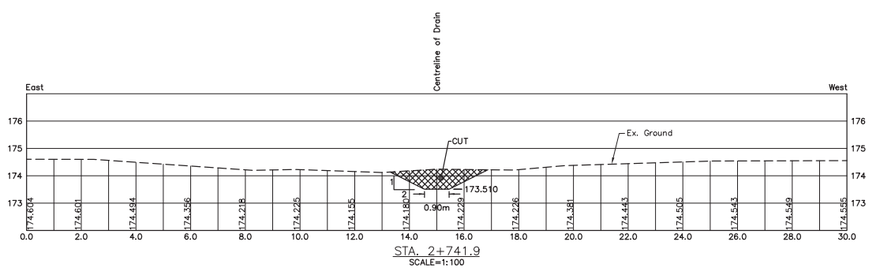




TYPICAL QUARRIED LIMESTONE END PROTECTION
Scale = N.T.S.



STANDARD LATERAL TILE DETAIL
N.T.S.



Sections East of Road 20
SOUTH BRANCH BONDY–BASTIEN DRAIN

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

DRAWN BY: H.S./G.S.
PLOT CODE: 1:1
COMPUTER FILE: 2012D2018.DWG

PWD–MD–2011–039

FILE No.: 2012D018

SHEET No.: 10 OF 10

Notice of Appeal to Court of Revision

Drainage Act, R.S.O. 1990, c. D.17, subs. 52(1) and 76(4)

To: The Clerk of the Corporation of the Town of Amherstburg

Re: Bondy - Bastien Drain
(Designation of drainage works)

Take notice that I/we, an owner or owners of land assessed for the above-mentioned drainage works, appeal to the Drainage Court of Revision under:

- ☐ **Section 52 (1) for the construction or improvement of a drain;** or
- ☑ **Section 76 (4) for the development of a new assessment schedule for the drain on the grounds that:**
  - ☑ **My/our land has been assessed too high;**
  - ☐ **My/our land has been assessed too low;**
  - ☐ **Other land or road has been assessed too high;**
  - ☐ **Other land or road has been assessed too low;**
  - ☐ **Other land or road that should have been assessed has not been assessed;**
  - ☐ **Due consideration has not been given as to type of use of land.**

Include Details of Appeal (attach additional pages if needed):

Property Owners Appealing to Court of Revision

- Your municipal property tax bill will provide the property description and parcel roll number.
- In rural areas, the property description should be in the form of (part) lot and concession and civic address.
- In urban areas, the property description should be in the form of street address and lot and plan number, if available.
- If appealing to Court of Revision regarding multiple properties, attach additional page with property information.

Property Description	
RTP	
Ward or Geographic Township	**Parcel Roll Number**
Town of Amherstburg	[redacted]

If property is owned in partnership, all partners must be listed. If property is owned by a corporation, list the corporation's name and the name and corporate position of the authorized officer. Only the owner(s) of the property may appeal to the Court of Revision.

Select Ownership Type

Enter the mailing address and primary contact information of property owner below:

Last Name	First Name	Middle Initial
Brousseau	Nicolas	D

Mailing Address

Unit Number	Street/Road Number	Street/Road Name	PO Box
	[redacted]	Front Rd North	

City/Town	Province	Postal Code
Amherstburg	Ontario	N9V 3R3

Telephone Number	Cell Phone Number (Optional)	Email Address (Optional)
	[redacted]	

  Disponible en français

To be completed by recipient municipality:

Notice filed this 27 day of July 20 23.

Name of Clerk (Last Name, First Name)	Signature of Clerk
Sabihuddin, Sarah	Sarah Sabihuddin

RECEIVED

JUL 27 2023

Town of Amherstburg

Ontario

Notice of Appeal to Court of Revision

Drainage Act, R.S.O. 1990, c. D.17, subs. 52(1) and 76(4)

To: The Clerk of the Corporation of the Town of Amherstburg

Re: Bondy - Bastien Drain
(Designation of drainage works)

Take notice that I/we, an owner or owners of land assessed for the above-mentioned drainage works, appeal to the Drainage Court of Revision under:

- [x] **Section 52 (1) for the construction or improvement of a drain;** or
- [x] **Section 76 (4) for the development of a new assessment schedule for the drain on the grounds that:**
  - [x] **My/our land has been assessed too high;**
  - [ ] **My/our land has been assessed too low;**
  - [ ] **Other land or road has been assessed too high;**
  - [ ] **Other land or road has been assessed too low;**
  - [ ] **Other land or road that should have been assessed has not been assessed;**
  - [ ] **Due consideration has not been given as to type of use of land.**

Include Details of Appeal (attach additional pages if needed):
Construction will not improve the flow of the drain.

Property Owners Appealing to Court of Revision

- Your municipal property tax bill will provide the property description and parcel roll number.
- In rural areas, the property description should be in the form of (part) lot and concession and civic address.
- In urban areas, the property description should be in the form of street address and lot and plan number, if available.
- If appealing to Court of Revision regarding multiple properties, attach additional page with property information.

Property Description
Concession: CON 1 PT LOT 40

Ward or Geographic Township	Parcel Roll Number
	[redacted]

If property is owned in partnership, all partners must be listed. If property is owned by a corporation, list the corporation's name and the name and corporate position of the authorized officer. Only the owner(s) of the property may appeal to the Court of Revision.

Select Ownership Type

Enter the mailing address and primary contact information of property owner below:

Last Name	First Name	Middle Initial
Xay Lee, Mai Nhia Lor		

Mailing Address

Unit Number	Street/Road Number	Street/Road Name	PO Box
	[redacted]	FRONT ROAD NORTH	

City/Town	Province	Postal Code
AMHERSTBURG	ONTARIO	N9V 3R3

Telephone Number	Cell Phone Number (Optional)	Email Address (Optional)
[redacted]		

To be completed by recipient municipality:

Notice filed this 28 day of July 20 23

Name of Clerk (Last Name, First Name)	Signature of Clerk
Fox, Kevin	

Ontario

RECEIVED

JUL 25 2023

Town of Amherstburg

Notice of Appeal to Court of Revision

Drainage Act, R.S.O. 1990, c. D.17, subs. 52(1) and 76(4)

To: The Clerk of the Corporation of the TOWN of AMHERSTBURG

Re: BONDY - BASTIEN DRAIN
(Designation of drainage works)

Take notice that I/we, an owner or owners of land assessed for the above-mentioned drainage works, appeal to the Drainage Court of Revision under:

☐ **Section 52 (1) for the construction or improvement of a drain;** or

☒ **Section 76 (4) for the development of a new assessment schedule for the drain on the grounds that:**

- ☒ **My/our land has been assessed too high;**
- ☐ **My/our land has been assessed too low;**
- ☐ **Other land or road has been assessed too high;**
- ☐ **Other land or road has been assessed too low;**
- ☐ **Other land or road that should have been assessed has not been assessed;**
- ☐ **Due consideration has not been given as to type of use of land.**

Include Details of Appeal (attach additional pages if needed): WE FEEL THAT OUR ASSESMENT IS INCORRECT. THEY ARE 2 SEPARATE DRAINS, ONE FLOWS TO RIVER CANARD and OURS FLOWS TO DETROIT RIVER ON WEST SIDE OF C.R. 20. OUR CULVERT IS ONLY TWELVE YEARS OLD AND IN PERFECT SHAPE AND WIDE ENOUGH TO CROSS ANY EQUIPMENT OVER. MOST OF THE WORK IS ON EAST SIDE OF C.R. 20

Property Owners Appealing to Court of Revision

- Your municipal property tax bill will provide the property description and parcel roll number.
- In rural areas, the property description should be in the form of (part) lot and concession and civic address.
- In urban areas, the property description should be in the form of street address and lot and plan number, if available.
- If appealing to Court of Revision regarding multiple properties, attach additional page with property information.

Property Description

PART OF LOT 40 CONC. 1

Ward or Geographic Township	Parcel Roll Number
AMHERSTBURG	37 29 500 000 39400

If property is owned in partnership, all partners must be listed. If property is owned by a corporation, list the corporation's name and the name and corporate position of the authorized officer. Only the owner(s) of the property may appeal to the Court of Revision.

Select Ownership Type

Enter the mailing address and primary contact information of property owner below:

Last Name	First Name	Middle Initial
MELOCHE	NOEL	L

Mailing Address

Unit Number	Street/Road Number	Street/Road Name	PO Box
	[redacted]	FRONT ROAD NORTH RR#3	

City/Town	Province	Postal Code
AMHERSTBURG	ONTARIO	N9V 3R3

Telephone Number	Cell Phone Number (Optional)	Email Address (Optional)
	[redacted]	[redacted]

JULY 24 2023

To be completed by recipient municipality:

Notice filed this 25th day of July 20 23.

Name of Clerk (Last Name, First Name)	Signature of Clerk
Fox, Kevin	

Ontario

Notice of Appeal to Court of Revision

Drainage Act, R.S.O. 1990, c. D.17, subs. 52(1) and 76(4)

To: The Clerk of the Corporation of the TOWN of AMHERSTBURG

Re: BY-LAW NO. 2023-083 BONDY-BASTIEN DRAIN
(Designation of drainage works)

Take notice that I/we, an owner or owners of land assessed for the above-mentioned drainage works, appeal to the Drainage Court of Revision under:

- [x] **Section 52 (1) for the construction or improvement of a drain;** or
- [x] **Section 76 (4) for the development of a new assessment schedule for the drain on the grounds that:**
  - [x] **My/our land has been assessed too high;**
  - [ ] **My/our land has been assessed too low;**
  - [x] **Other land or road has been assessed too high;**
  - [ ] **Other land or road has been assessed too low;**
  - [ ] **Other land or road that should have been assessed has not been assessed;**
  - [ ] **Due consideration has not been given as to type of use of land.**

Include Details of Appeal (attach additional pages if needed):

SEE ATTACHED BONDY-BASTIEN DRAIN IS 2 SEPARATE, INDEPENDENT LEGAL DRAINS. ALL ASSESSMENTS INCORRECT.

Property Owners Appealing to Court of Revision

- Your municipal property tax bill will provide the property description and parcel roll number.
- In rural areas, the property description should be in the form of (part) lot and concession and civic address.
- In urban areas, the property description should be in the form of street address and lot and plan number, if available.
- If appealing to Court of Revision regarding multiple properties, attach additional page with property information.

Property Description [redacted] FRONT RD N CON 1 PT LOT 42 RP 12R 20445; REG PLAN: PART 3; IRREG AC 110.74 FR 303.33 D

Ward or Geographic Township	Parcel Roll Number
AMHERSTBURG	[redacted]

If property is owned in partnership, all partners must be listed. If property is owned by a corporation, list the corporation's name and the name and corporate position of the authorized officer. Only the owner(s) of the property may appeal to the Court of Revision.

Select Ownership Type PARTNERSHIP BARBARA BONDY PARÉ & EDDIE PARÉ

Enter the mailing address and primary contact information of property owner below:

Last Name	First Name	Middle Initial
PARÉ	EDDIE	R

Mailing Address

Unit Number	Street/Road Number	Street/Road Name	PO Box
	[redacted]	FRONT RD. N., R3	

City/Town	Province	Postal Code
AMHERSTBURG	ON	N9V 3R3

Telephone Number	Cell Phone Number (Optional)	Email Address (Optional)
	[redacted]	[redacted]

  Dispo [redacted]

To be completed by recipient municipality:

Notice filed this 27 day of July 2023

Name of Clerk (Last Name, First Name)	Signature of Clerk
Sabihuddin, Sarah	Sarah Sabihuddin

RECEIVED

JUL 27 2023

Town of Amherstburg

Ontario

By-law No. 2023-083 Bondy Bastien drain

From: [redacted]

To: [redacted]

Date: Wednesday, July 26, 2023 at 07:17 p.m. EDT

Per the Drainage Tribunal decision dated May 14th, 1991, it references that in January 1990 the Township of Sandwich West (LaSalle) dug a drain along County Road #3 (the Anderdon-Sandwich West Townline) approximately 1,200 feet to the Detroit River. This was done under their Private Member's Bill and not under the Drainage Act. This allowed them to do the work without requiring a consulting engineer's report nor a By-Law. Their action created 2 separate, independent and legal drains with the properties (approximately 25 hectares per Drainage Tribunal decision) west of County Road 20 draining to the Detroit River and those lands (44 hectares) east of County Road 20 draining to River Canard. Also per Drainage Tribunal decision it states the drainage problems in the area northwest of Highway 18 (County Road 20) are further complicated by the fact, that when Highway 18 was reconstructed the culvert installed to conduct the waters from one side of the highway to the other was located 10 feet north of the drain alignment and considerably higher then the invert of the drain. As a result, the water continually ponds in the drain northwest of the highway. The Highway Department did not consult with the Township or Engineer prior to the installation of the culvert. Nobody should be assessed for rectifying this negligence.

You are assessing property owners, whose lands drain into the Detroit River, for work done on the portion of a different drain that flows to River Canard. You are also assessing property owners whose land drain into River Canard for work done on a portion of a different drain that flows to the Detroit River. This is not allowed under the Drainage Act.

Barbara Bondy Pare Eddie Pare

Barbara Bondy-Pare and Eddie Pare

By-law No. 2023-083

From: [redacted]

To: [redacted]

Date: Wednesday, July 26, 2023 at 03:52 p.m. EDT

We are requesting, the Council of the Town of Amherstburg, to amend By-law No. 2023-083 for improvement of the Bondy-Bastien Drain to only include Item 13 Bridge No. 12 on page 15 of Rood Engineering Inc. report REI Project 2012D018 dated May 12th, 2023.

Per the Drainage Tribunal decision dated May 14th, 1991 it references that in January 1990, the Township of Sandwich West (LaSalle) dug a drain along County Road #3 (the Anderdon-Sandwich West Townline) approximately 1,200 feet to the Detroit River. This was done under their Private Member's Bill and not under the Drainage Act. This allowed them to do the work without requiring a consulting engineer's report nor a By-law. Their action created 2 separate, independent and legal drains with the properties (approximately 25 Hectares per Drainage Tribunal Decision) west of County Road 20 draining to the Detroit River and those (44 hectares) east of County Road 20 draining to River Canard. Also per Drainage Tribunal Decision it states the drainage problems in the area northwest of Highway 18 (County Road 20) are further complicated by the fact, that when Highway 18 was reconstructed the culvert installed to conduct the waters from one side of the highway to the other was located approximately 10 feet north of the drain alignment and considerably higher than the invert of the drain. As a result , the water continually ponds in the drain northwest of the highway. The Highway Department did not consult with the Township or the Engineer prior to the installation of the culvert.

If you approve the reading of this By-law, as is, for the third and final time, you will are assessing property owners, whose lands drain into the Detroit River for work done on the portion of a different drain that flows to River Canard. This is not allowed under the Drainage Act.

I will personally deliver a copy, to the Town Hall, of the Ontario Tribunal Decision, dated May 14th, 1991, for each Council Member, the Clerk and the CAO.

Yours truly

Barbara Bondy-Pare Eddie Pare

Barbara Bondy-Pare and Eddie Pare

[redacted]

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JUL 27 2023

Town of Amherstburg

ATTACH C) P 1 of 7

ONTARIO DRAINAGE TRIBUNAL

IN THE MATTER OF an Appeal of Donald Bondy and others from the Report of E.O. Lafontaine, P. Eng., dated June 29, 1990 on the Bondy-Bastien Drain, in the Township of Anderdon, in the Count of Essex

DECISION

This Appeal came before the Ontario Drainage Tribunal on April 25, 1991 at the Township of Anderdon Council Chambers, 3400 Middle Sideroad, R. R. #4, Amherstburg, Ontario.

All assessed owners were served with a Notice of Hearing, as evidenced by the Affidavit of Service filed, and invited to make representations.

At that time there appeared before the Tribunal, E.O. Lafontine, P. Eng., who prepared and presented the Report dated June 29, 1990, the Appellants Donald Bondy, Vernon McCrae, Gordon Hadrien, Edward Meloche and Ronald Bondy, the Appellants Harvey Berthiaume and Ronald Standon, although duly served, did not appear and a number of other assessed owners.

The Clerk of the Township of Anderdon, Csop Toth, acted as Clerk of the Tribunal.

On hearing the evidence, the submissions, and reading the materials filed:

1. **IT IS ORDERED THAT** these proceedings be terminated.

2. **IT IS ORDERED THAT** the costs incurred to date in the proceedings be paid as follows:

(a) Ministry of Transportation of Ontario - 50%.

(b) Township of Anderdon (to be paid out of the general fund) - 25%.

ATTACH c) P 2 of 7

(c) The assessed owners (to be pro-rated among them on the basis of their total assessment) - 25%.

3. **IT IS ORDERED THAT** there be no other Order as to costs and all parties are responsible for their own costs.

ATTENTION is drawn to s. 73 of the Drainage Act, R.S.O. 1980, c. 126.

Dated: May 14, 1991.

Bernard J. Goodal

Bernard J. Goodal, Chairman
Ontario Drainage Tribunal

ATTACH C) R 3 of 7

ONTARIO DRAINAGE TRIBUNAL

IN THE MATTER OF an Appeal of Donald Bondy and others from the Report of E.O. Lafontaine, P. Eng., dated June 29, 1990 on the Bondy-Bastien Drain, in the Township of Anderdon, in the County of Essex

REASONS FOR DECISION

This Appeal launched by the Appellant Donald Bondy, Vernon McCrae, Gordon Hadrien, Edward Meloche, Ronald Bondy, Harvey Berthiaume and Ronald Standon pursuant to s. 48 and s. 54 of the Drainage Act, R.S.O. 1980, c. 126 (the Act) were heard on April 25, 1991.

The Appellant Harvey Berthiaume and Ronald Standon did not appear, although duly served, as evidenced by the Affidavit of Service of the Notice of Appeal filed as Exhibit #1. Their Appeals are therefore dismissed.

The Bondy-Bastien Drain attempts, by gravity, to drain lands comprising primarily marsh lands. The watershed is almost rectangular. The longer side oriented in the north south direction. It is cut in two by Highway #18 with a triangular piece of approximately 25 ha northwest of Highway #18 and a trapezoidal area of approximately 44 ha southeast of Highway #18. The drain originates at the Anderdon-Sandwich West Townline approximately 1,200 ft from the Detroit River. It flows southerly, parallel to the Detroit River, across Highway #18 in a 30" diameter corrugated steel culvert, then approximately 850 m to outlet into River Canard. The drain was constructed in 1953. Since that time, it has not been cleaned east of Highway #18. It has been cleaned two times west Highway #18. The cost of the proposed work is estimated $41,250.00. The lands when drained produce an abundance of high quality vegetables.

The drain follows an old natural stream. An assessed owner recalls hearing it said, that at one time the water was pumped by a treadmill. We have observed that the drain attempts to drain these valuable farm lands. When the water in the River Canard and the Detroit River are low it does so to a limited extent. When the waters rise,

ATTACH C) P 4 of 7

as they have in recent years, the water backs up along the drain overtopping the banks. On March 8, 1989, when this project was initiated, the water level stood at 174.69 m, 0.25 m above the banks of the drain.

The drainage problems in the area northwest of Highway #18 are further complicated by the fact, that when Highway #18 was reconstructed the culvert installed to conduct the waters from one side of the highway to the other was located approximately 10 ft north of the drain alignment and considerably higher than the invert of the drain. As a result, the water continually ponds in the drain northwest of the highway. The Highway Department did not consult with the Township or the Engineer prior to the installation of the culvert.

It is common ground that the drain is in an extreme state of disrepair. It should be repaired. The question is, is it cost beneficial to do the work?

The request to have the drain improved and repaired was made by two of the assessed owners owning lands southeast of Highway #18. Most of the farm owners supported the application. The other group comprising of owners northwest of the highway and the residential owners opposed the proposed work.

The Engineer held many meetings and discussions with the owners. He conducted extensive investigations of the problem. He less than enthusiastically proceeded to prepare the Report upon the instructions of Council. In his opinion, "the work on the drain might not produce the benefit looked for, it is a marginal drain proposal". In his Report of May 11, 1990 he further states, "It was indicated to all parties concerned that there was some doubt as to the benefit to be derived from improving the outlet of the drain in the event that high water level recur or should persist in the Detroit River with the result that the improvements would not yield the benefits which otherwise might be expected from the expenditure for the work".

A view of the area clearly indicates that the flow in the drain is entirely dependent upon the water levels in the River Canard and the Detroit River. Under the circumstances, it is impossible to drain these lands efficiently and consistently by gravity flow. The only way to ensure that

the lands will be drained to an extent to produce crops is by pumping. A pumping scheme has been looked at, however, because of the expanse of River Canard and its location relative to the area to be drained the cost of such a proposal is prohibitive.

After the Report was submitted, in early 1990, the owners of lands northwest of Highway #18 proposed that their lands could much more efficiently be drained into the Detroit River rather than over the Bondy-Bastien Drain. In January 1990, the Township of Sandwich West had dug a drain along County Road #3 (the Anderdon-Sandwich West Townline) approximately 1,200 feet to the Detroit River. It was observed by one of the owners that the water level in the drain dug by the Township of Sandwich West was approximately 18" lower than the water standing in the Bondy-Bastien Drain on his lands. This led the owners to investigate the possibility of draining their lands directly into the Detroit River. Although they have not done much work on it, nor have they consulted with any of the members of the Township Council or sought permission to outlet into the drain installed by the Township of Sandwich West they strongly urge that they should be excluded from the Bondy-Bastien Drain and look for an outlet into the Detroit River. Unfortunately, this proposal was presented to the Engineer too late to modify the Report which he had prepared or to go in and investigate the alternate drainage route.

It seems to us, that the proposal to drain those lands directly into the Detroit River should be investigated and if feasible those lands lying northwest of Highway #18 should be drained in that direction. We are fortified in this view by the fact that the Highway #18 culvert having been placed too high has further restricted the meager propensity for the waters to flow along the Bastien Drain to outlet into River Canard.

In our view, the proposed work is not cost beneficial. The cost of the work is not commensurate with the benefits to be derived from it. It is quite clear, that even if the drain is cleaned and the monies expended the entire drainage system is controlled by the water levels in River Canard and the Detroit River. If the water levels are lower, certainly the water would tend to get away a little bit quicker. However, if the water levels are higher, whether the drain is cleaned or not cleaned will make no difference to the drainage of the area prone to flooding during high water periods. No evidence was lead as to how many acres are in that state of unstable equilibrium but from our assessment of the situation there are not

ATTACH C) P6 of 7

very many. The evidence of some of the owners was that if the drain is cleaned it cause a greater loss of arable land due to the erosion caused by the fluctuating water levels whenever the wind blows or during more severe storm events.

Mrs. Eva McCrae who has owned her property, originally comprising 7 ac, since 1948 states that only 3 or 4 acres remain due to the original cleaning of the drain and the continued erosion which has occurred over the past 48 years. She states, that originally the drain was 4 feet wide. They had considerable arable land on either side of the drain. The winds, rains and high waters work on the land and carry it downstream reducing their arable acerage to 4 acres. She quotes the Engineer as saying, that the original ditch ought not to have been dug and there is doubtful value in cleaning the ditch now.

We are further fortified in our conclusion that the work is not cost beneficial by the fact that the proponent of the work and the largest land owner in the watershed is objecting to the assessment against his lands. He has been assessed the sum of $220.00 per/ha for outlet for the higher lands and $120.00 per/ha for outlet for his lower lands. If the assessment as levied against him, which we feel is more than reasonable, is too high in his opinion, this can lead to no other conclusion but that the work is not cost beneficial. For these reasons, we direct this proceeding be terminated.

The issue now remaining is; who is to pay the costs incurred to date? These works were initiated by the request of some assessed farm owners, the situation created on the northwest side of Highway #18 by the installation of the highway culvert and of course Township Council directing the Engineer to proceed. There is no question that the drain is in a deplorable state of disrepair. Therefore, the request by the owners to have the drain improved was a reasonable one. Similarly Council proceeded on the request as they were bound to do. They instructed the Engineer to make a preliminary Report. However, after the preliminary Report was in and the Engineer had stated; "If the drain is cleaned, there may not necessarily be an improvement in drainage, particularly if high water levels of recent years return ..... The costs of cleaning the drain and making necessary improvements may not be commensurate with the benefits received". In our view, Council should not have proceeded any further. The misaligned and high highway

ATTACH c) P 7 of 7

culvert to some extent prompted the investigation of the drainage problem. In our view, the expenses incurred to date should be apportioned as follows:

1. Ministry of Transportation of Ontario - 50%

2. Township of Anderdon (to be paid out of the general fund) - 25%

3. The assessed owners (to be pro rated among them on the basis of their total assessment) - 25%.

There will be no further Order as to costs and all parties are responsible for their own costs.

Dated: May 14, 1991

ONTARIO DRAINAGE TRIBUNAL

Maurice Armstrong, P. Eng., member; Bert Rammelaere, member; Bernard J. Goodal, Chairman

Notice of Appeal to Court of Revision

Drainage Act, R.S.O. 1990, c. D.17, subs. 52(1) and 76(4)

To: The Clerk of the Corporation of the Town of amherstburg

Re: Bondy - Bastien drain
(Designation of drainage works)

Take notice that I/we, an owner or owners of land assessed for the above-mentioned drainage works, appeal to the Drainage Court of Revision under:

☐ **Section 52 (1) for the construction or improvement of a drain;** or

☒ **Section 76 (4) for the development of a new assessment schedule for the drain on the grounds that:**

- ☒ **My/our land has been assessed too high;**
- ☐ **My/our land has been assessed too low;**
- ☒ **Other land or road has been assessed too high;**
- ☐ **Other land or road has been assessed too low;**
- ☐ **Other land or road that should have been assessed has not been assessed;**
- ☐ **Due consideration has not been given as to type of use of land.**

Include Details of Appeal (attach additional pages if needed):

Property 2406 Front Rd North and Adrian property are assessed TO high They are at the end of the drain & accomidates everyones water 2 Properties paying 16% of The Project cost. Also ~~the~~ each side of the drain should be costed seperate, They have been draining seperately For decades!!!

Property Owners Appealing to Court of Revision

- Your municipal property tax bill will provide the property description and parcel roll number.
- In rural areas, the property description should be in the form of (part) lot and concession and civic address.
- In urban areas, the property description should be in the form of street address and lot and plan number, if available.
- If appealing to Court of Revision regarding multiple properties, attach additional page with property information.

Property Description

[redacted] Front Rd N Ff 54,2900 con 1 PT lot 42 RP 12R20445 RP Part 2

Ward or Geographic Township	Parcel Roll Number
Anderdon / AMHERSTBURG	3729 500 000 40310.0000

If property is owned in partnership, all partners must be listed. If property is owned by a corporation, list the corporation's name and the name and corporate position of the authorized officer. Only the owner(s) of the property may appeal to the Court of Revision.

Select Ownership Type

Enter the mailing address and primary contact information of property owner below:

Last Name	First Name	Middle Initial
Bondy	Ronald	E

Mailing Address

Unit Number	Street/Road Number	Street/Road Name	PO Box
	[redacted]	Front Rd N.	

City/Town	Province	Postal Code
Amherstburg	ON	N9V3R3

Telephone Number	Cell Phone Number (Optional)	Email Address (Optional)
	[redacted]	[redacted]

  Disponible en français

To be completed by recipient municipality:

Notice filed this 27 day of July 20 23

Name of Clerk (Last Name, First Name)	Signature of Clerk
Sabihuddin, Sarah	Sarah Sabihuddin

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JUL 27 2023

Town of Amherstburg

Ontario

THE CORPORATION OF THE TOWN OF AMHERSTBURG

OFFICE OF ENGINEERING AND PUBLIC WORKS

MISSION STATEMENT: Committed to delivering cost-effective and efficient services for the residents of the Town of Amherstburg with a view to improve and enhance their quality of life.

Author's Name: Sam Paglia	**Report Date: July 24, 2023**
Author's Phone: 519 736-3664 ext. 2318	**Date to Drainage Board: August 9, 2023**
Author's E-mail: spaglia@amherstburg.ca	**Resolution #: N/A**

To: **Members of the Drainage Board**

Subject: **Amending By-Law – John Parks No. 2 Drain**

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1. RECOMMENDATION:

It is recommended that:

1. The report from the Drainage Superintendent and Engineering Coordinator dated July 24, 2023 regarding the Amending By-Law(s) under Section 62(1) **BE RECEIVED**;

2. The Drainage Board recommend that Council **ACCEPT** the report from the Drainage Superintendent to amend the By-Law(s) in order to recover costs.

3. The Drainage Board recommend that an amending By-Law **BE APPROVED** by Council.

2. BACKGROUND:

When Council has elected to proceed with the petition or request for drainage works under the Drainage Act (Act), Council is mandated under Section 75(2) to furnish the amount necessary to complete the drainage works.

The Act provides that for any By-Law that is acted upon, where lands and roads are assessed for their contribution for any drainage works, where more than sufficient funds or where insufficient funds have been provided for the completion of or proper construction of the drainage works be amended, and every such surplus or deficiency

shall be applied by the council of the municipality proportionately according to the assessment in payment of rates imposed by it for the drainage works.

Amendment of by-law

62 (1) Any by-law for the assessment upon the lands and roads liable to contribute for any drainage works that has been acted upon by the completion of the drainage works in whole or in part shall, where more than sufficient funds or where insufficient funds have been provided for the completion of or proper contribution towards the drainage works or for the redemption of the debentures authorized to be issued thereunder as they become payable, be amended*, and, if lands and roads in any other municipality are assessed for the drainage works, the surplus or deficiency of money shall be divided proportionately among the contributing municipalities, and every such surplus or deficiency shall be applied by the council of the municipality proportionately according to the assessment in payment of the rates imposed by it for the drainage works. R.S.O. 1990, c. D.17, s. 62 (1).*

3. DISCUSSION:

There are 5 Capital Drainage projects completed for which an Amending By-Law in accordance with Section 62 of the Act is required. The amending By-Law provides the application mechanism to recover the actual cost related to each project that Council was obligated to raise, and forms the final grant application to the Ministry of Agriculture, Food and Rural Affairs, and the final assessment to lands and roads liable for contribution in accordance with the ratios provided for in the Schedule of Assessment for Construction in the original By-Law and in respect to the drainage report and recommendations that are appended to the adopted By-Law.

While further reports for amending bylaws are forthcoming, the first of five (5) is the following project.

E09-2019-008 - John Parks No. 2 Drain - The estimate amount provided for in the engineers report for construction appended to By-Law 2022-062 was $128,964. This project experienced two (2) tender calls.

The first tender call was held in June 2021 and produced the lowest bid of three submissions that was 155% greater than the engineers estimate and a meeting with landowners was held to consider the contract price under Section 59 of the Act. The Drainage Board with landowners decided to administer a second tender call.

The second tender call was held in November of 2021 and produced the lowest bid of four submissions that was 189% greater than the engineers estimate and also required a meeting with landowners under Section 59 of the Act. The Board with landowners elected to proceed to construction. The Town awarded the contract to the lowest bidder.

There were no change orders during construction, and sufficient funds were provided for the awarded contract price of $244,900. This tendered amount was reduced to $222,696.45 as a result of the elimination of provisional items and only using 95% of the allowable contingency amount provided for in the contract.

Summary:

- By-Law 2022-062 estimated construction and incidental costs to be $195,182
- First tender call of June, 2021 yielded an estimated $267,178

- Second tender call of November 2021 yielded an estimated project cost $244,900.00
- Final cost - $294,617.98

The final project costs include incidentals, postage and printing costs, Non-recoverable HST and the accrued interest to fund the project.

The Schedule of assessment assesses 290,450.91 as pro-ratable costs, where $170,248.61 is assessed to Privately Owned Agricultural Lands with an eligible grant in the estimated amount of $56,749.54.

Description	Assessed
Non Agricultural Lands	$ 74,869.87
Agricultural Lands (Grantable)	$170,248.61
County of Essex	$ 31,631.30
Town of Amherstburg	$ -
S. 26 Costs	$ 17,868.21
	$294,617.98

4. RISK ANALYSIS:

There is always a risk that The Agricultural Drainage Infrastructure Program (ADIP) Policies may deny granting for agricultural lands. Amending By-laws assure transparency and accuracy. The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) has indicated in past drainage conferences of the Drainage Superintendents Association of Ontario, that as funding may become less and less available, it is good practice and recommended that municipalities include the amending By-Law once projects are completed. The review process for grant applications checks if municipalities are in accordance with the requirements of the Act.

5. FINANCIAL MATTERS:

The cost to the Town for its share of drainage assessment for the John Parks Drain No. 2 project is zero as the Town does not have lands or roads within the watershed.

Aside from the grant paid for employing a Drainage Superintendent and the interest, postage and printing fees spent by the Town for each project, the cost to administer the Drainage Act is non-recoverable.

6. CONSULTATIONS: N/A

7. CONCLUSION:

It is recommended that:

1. The report from the Drainage Superintendent and Engineering Coordinator dated July 24, 2023 regarding the Amending By-Law(s) under Section 62(1) **BE RECEIVED**;

2. The Drainage Board recommend that Council **ACCEPT** the report from the Drainage Superintendent to amend the By-Law(s) in order to recover costs.

4. The Drainage Board recommend that an amending By-Law **BE APPROVED** by Council.

_____

Sam Paglia, P.Eng.,
Drainage Superintendent and Engineering Coordinator

Attachment(s): None

THE CORPORATION OF THE TOWN OF AMHERSTBURG

OFFICE OF ENGINEERING AND PUBLIC WORKS

MISSION STATEMENT: Committed to delivering cost-effective and efficient services for the residents of the Town of Amherstburg with a view to improve and enhance their quality of life.

Author's Name: Sam Paglia	**Report Date: July 17, 2023**
Author's Phone: 519 736-3664 ext. 2318	**Date to Drainage Board: August 9, 2023**
Author's E-mail: spaglia@amherstburg.ca	**Resolution #: N/A**

To: **Members of the Drainage Board**

Subject: **Lakewood Beach Pump No. 1 – Engineering Appointment**

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1. RECOMMENDATION:

It is recommended that:

1. The report from the Drainage Superintendent and Engineering Coordinator dated July 17, 2023 regarding the Lakewood Beach Pump No. 1 – Engineering Appointment **BE RECEIVED**;

2. The Drainage Board recommend that Council **ACCEPT** the request from the Director of Public Works and Infrastructure Services for improvements to the Lakewood Beach Pump No. 1 drainage system as per Section 78 of the Drainage Act; and,

3. The Drainage Board recommend that the appointment of Dillon Consulting Ltd. Represented by Mr. Tim Oliver, P.Eng., to examination and report on the repair and improvement to the Lakewood Beach Pump No. 1 drainage system **BE APPROVED** by Council.

2. BACKGROUND:

The Lakewood Drive area and drainage system was first petitioned for, and established as a pumping system in 1972 under report by C.G.R. Armstrong, P.Eng. The instruction to examine the drainage system came from the Council of the Former Township of Malden. The examination and report indicated that "the drainage is badly needed in this area and that it can only effectively be obtained by means of the installation of a

pumping system". The report was adopted under By-Law No. 1787 and the Lakewood Drive Drainage System was constructed. The Township Roads were assessed their share of 21.5% of the project with the affected lands assessed the balance of cost under Benefit and Outlet Liability.

In January of 2000, Town Council instructed Bruce D. Crozier to produce a report for the improvements to the drainage system to allow them to be incorporated with sanitary works occurring on Lakewood Drive, and notice was given to landowners in September of 2000 for the repair and improvement to the system and In order to provide for timely reconstruction of the storm drain and the sanitary sewer construction, town council further instructed that the repair and improvements of the Municipal Drain proceed under Section 77(2) and 77(3) of the Drainage Act and that subsequent to the works, a report would be produced under Section 78 of the act to incorporate the alterations. The report included a schedule of maintenance for future maintenance of the Drain, but the Town elected to pay for 100% of the costs associated with the works since they were completed under Section 77 of the Act. Council passed a resolution to extend the time for filing of the drainage report for Lakewood Beach Drain No. 1 until after the completion of the construction works. It is unclear if a bylaw was ever adopted after the completion of the works and the current bylaw for the drain remains to be bylaw 1878, adopted in 1972 to assess annual costs on the pump station which is outdated and in need of updates to include parcels that are not being assessed, and account for the changes in land use within the watershed.

On January 10, 2023, Public Works staff notified the Drainage Superintendent of a sink hole that was occurring at the Lakewood Beach Pump No. 1 station located at 271 Lakewood Drive with Roll No. 372954000003000 owned by the Town. A chronology of events is included here subsequent to the notification of the sink hole.

- January – The Drainage Superintendent visually inspected the sink hole and had PWD cover the hole and place safety cones for public safety in the area.

- February 21, 2023 – Attended the pump site with PWD to dewater and take photos of the interior of the intake pipe from both directions and pump well. It was noted that the deteriorated condition of the pipe at its connection to the well suggested that there was a connection issue. It was unclear how bad from the pictures.

- February 23, 2023 – Consulted Tim Oliver, P.Eng. of Dillon Consulting to review the pictures and to potentially assist with the repair works.

- On May 11, 2023, the Town conducted an onsite meeting with landowners. (Approximately 50 people, which included some members of Council) to apprise them of the failure and to obtain information on any other concerns within the watershed.

- Landowners were informed that the condition of the pump well is deteriorated and requires more investigation. If the work extends to the well, we will likely require a new pump house due to Electrical Safety Regulations that make the current pump house deficient.

- May 23, 2023 – Arranged for Heaton Sanitation to dewater and send a rover through the pipe and obtain a video of the interior condition of the intake pipe as well as the pump well condition.

- May 24, 2023 - Sent the video to Mr. Oliver for a professional opinion.

- May 31, 2023 – Discussed possible solutions for the repair and reviewed the Towns authority under maintenance to replace “like for like” under the Act.

- In reviewing the current bylaws on Pump No. 1 and Pump No. 2, we discovered that there are approximately 6 parcels of land that use the Lakewood Pump No. 1 pumping scheme, but are assessed in the schedule of assessment for the Lakewood Beach Pump No. 2 scheme and bylaw. This would allow the engineer to complete a Section 76 (Variation in assessment) if there were no repairs to be completed, or the repairs to be completed were like for like. In conclusion, we would need to complete a Section 78 (Improvements) to not only recommend the improvements, but to update the current by-law (with other revisions to Lakewood Pump #2 bylaw).For Lakewood Pump No. 2 bylaw, the engineer would prepare a smaller report under Section 65(4) for a subsequent disconnection from the Lakewood Pump No. 1 bylaw.

- June 9, 2023 – All of the above was discussed at the debriefing meeting resulting in a Request for Improvement signed by the Town under Section 78 of the Act to not only have the failure repaired, but to inspect the pump well and station for any required repairs.

3. DISCUSSION:

The current bylaw does not provide a mechanism to fairly assess lands for the required maintenance on the pump station. The Town is restricted under maintenance to only perform repairs where the items being repaired or replaced are “like for like”. There is no mechanism that allows the Town to improve the drain under maintenance.

4. RISK ANALYSIS:

It is Council’s responsibility to maintain and repair Municipal Drains and in doing so, must also maintain the Engineers report that is appended to each By-law for the respective Municipal Drains. For the benefit of all lands including the Town, the current engineers report on the Lakewood Pump No. 1 is outdated and does not accurately reflect the liabilities of various lands within the watershed, nor does it include the entire watershed in its assessment schedule. If Council does not keep drains under good repair, they become liable.

We should not delay the repairs and the investigation as these lands solely rely on this pump station to outlet the rain that their lands receives. Should the pump station or

connection fail, there will likely be extensive costs in maintaining an outlet for these lands.

5. FINANCIAL MATTERS:

The financial implications will be determined by the appointed engineer and will be provided in the schedule of assessment within the engineer's drainage report for the improvements to the Lakewood Pump No. 1 System. The Town is currently assessed for its roads and lands within the watershed for approximately 25% of the works, but this can change under a report by an engineer. All of the affected lands in the watershed share the cost of the project in the ratios set out in the report by the appointed engineer.

6. CONSULTATIONS:

N/A

7. CONCLUSION:

Administration is recommending that the appointment of the firm of Dillon Consulting Ltd. for the repair and improvement to the Lakewood Pump No. 1 Drainage system, be brought to the Regular Council meeting of September 11, 2023, for Council's consideration pursuant to the provisions of the Drainage Act.

Sam Paglia, P.Eng.,
Drainage Superintendent and
Engineering Coordinator

Attachment(s):

- Request for Improvement submitted by the Town

The Corporation of The Town of Amherstburg

MAJOR IMPROVEMENT of a MUNICIPAL DRAIN

(Section 78 (1.1) of the Ontario Drainage Act)

FROM: Antonietta Giofu - Director of Public Works

DRAIN: Lakewood Beach Pump No. 1

In accordance with section 78 (1.1) of the *Drainage Act*, take notice that I/We, as owner of land affected, request that the above mentioned drain be improved.

a) ☒ Repair/Improvements upon Examination and Report of Engineer (Section 78)

b) ☐ New Access Bridge Section 78 (1.1)

☐ Residential Bridge ☐ Agricultural Bridge

The work being requested is (check all appropriate boxes):

☐ - Changes the course of drainage works;
☐ - Making a new outlet for the whole or any part of the drainage works;
☒ - Constructing a tile under the bed of the whole or any part of the drainage works;
☐ - Constructing, reconstructing or extending bridges or culverts;
☐ - Extending the drainage works to an outlet;
☐ - Improving or altering the drainage works if the drainage works is located on more than one property;
☒ - Covering all or part of the drainage works;
☐ - Consolidating two or more drainage works; and/or
☒ - Any other activity to improve the drainage works, other than an activity prescribed by the Minister as a major improvement.

Provide a more specific description of the proposed drain major improvement you are requesting.

Video camera footage indicates that th pump intake pipe has a breach and is failing. Improvements are required to the intake pipe and potentially the pump well that are beyond the scope of work for a Section 74. The Drainage Superintendent also noted that there are six(6) parcels to be added to the watershed from the current By-Law.

Property Owners

- Your municipal property tax bill will provide the property description and parcel roll number.
- In Rural areas, the property description should be in the form of (part), lot, concession and civic address.
- In Urban areas, the property description should be in the form of street address and lot and plan number, if available.

PROPERTY DESCRIPTION Lakewood Beach Pump No. 1	
GEOGRAPHIC TOWNSHIP Town of Amherstburg	PARCEL ROLL NUMBER 372954000003000

Website: www.amherstburg.ca
271 SANDWICH ST. SOUTH, AMHERSTBURG, ONTARIO N9V 2A5
Phone: (519) 736-0012 Fax: (519) 736-5403 TTY: (519)736-9860

If the property is owned in partnership, all partners must be listed. If the property is owned by a Corporation, list the Corporation's name and the name and corporate position of the authorized officer. **ONLY THE OWNER OF THE PROPERTY MAY REQUEST A DRAIN IMPROVEMENT.**

Please select the ownership Type and complete the applicable information box below;

☐ **- SOLE OWNERSHIP: If the land is owned solely by you, please complete the following**

Owner Name: (Last, First)	Signature:	Date: (yyyy/mm/dd)
Enter the mailing address		
Unit Number:	Street Number:	Street Name:
City/Town:	Province:	Postal Code:
Telephone Number:	Cell phone:	Email address: (optional)

☐ **- PARTNERSHIP: If the land is owned by a Partnership, please complete the following**

Names of Owners: (Last, First)	Signature:	Date: (yyyy/mm/dd)
Enter mailing address and primary contact information		
Last Name:	First Name:	
Unit Number:	Street Number:	Street Name:
City/Town:	Province:	Postal Code:
Telephone Number:	Cell phone:	Email address: (optional)

☒ **- CORPORATION: If the land is owned by a Corporation, please complete the following**

Name of Signing Officer: (Last, First)	Name of Corporation:	
Giofu, Antonietta	Town of Amherstburg	
I have the authority to bind the Corporation. Signature: AGiofu	Position Title: Director of Engineering and Public Works	Date: (yyyy/mm/dd) 2023/06/12
Enter the mailing address of the primary contact		
(Name , Last): Giofu	(Name, First): Antonietta	
Unit Number:	Street Number: 512	Street Name: Sandwich St. S
City/Town Amherstburg	Province: Ontario	Postal Code: N9V 3R2
Telephone Number: 519-736-3664	Cell phone:	Email address (optional) agiofu@amherstburg.ca

To be completed by the Clerk of the Corporation of the Town of

Amherstburg. Notice filed this __17___ day of _June_____ 2023.

Fox, Kevin
Name of Clerk: (Last, First)

Signature of Clerk

THE CORPORATION OF THE TOWN OF AMHERSTBURG

OFFICE OF ENGINEERING AND PUBLIC WORKS

MISSION STATEMENT: Committed to delivering cost-effective and efficient services for the residents of the Town of Amherstburg with a view to improve and enhance their quality of life.

Author's Name: Sam Paglia	**Report Date: July 17, 2023**
Author's Phone: 519 736-3664 ext. 2318	**Date to Drainage Board: August 9, 2023**
Author's E-mail: spaglia@amherstburg.ca	**Resolution #: N/A**

To: **Members of the Drainage Board**

Subject: Various Drainage Apportionments

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1. RECOMMENDATION:

It is recommended that:

1. The report from the Drainage Superintendent and Engineering Coordinator dated July 17, 2023, regarding Various Drainage Apportionments **BE RECEIVED**;

2. The drainage apportionments **BE APPROVED** as listed:

    - **Consent B/36/20 -** Drainage Apportionments for the Waldron Drain, 7th Concession Drain South and the Beaudoin Drain South – 8270 South Townline Road.
    - **Consent B/21/22** – Jeths Drain – 21 Marsh.
    - **Section 65(1) report by Tim Oliver, dated May 30, 2023** – Assessment Reapportionment for the Tremblay Drain – 7751 Howard Ave.

3. Administration **BRING FORWARD** the Drainage Board's recommendation to approve the drainage apportionments at a future Regular Council Meeting.

2. BACKGROUND:

Under the provisions of the Drainage Act, when lands that are assessed for drainage are subsequently divided by a change of ownership of any part, the respective drainage assessments should be accounted for. The Town must take steps to apportion the assessments to reflect the division of the lands as well as maintain a functional

assessment schedule for the benefit of the entire watershed for the affected drainage schemes.

This report deals with two (2) drainage apportionments, each of which are associated with separate, individual conditions of severance.

3. DISCUSSION:

Section 65 of the Drainage Act discusses the obligation of the Town to apportion existing drainage assessments when lands are subsequently sub-divided. And speaks to Council authority to permit lands to subsequently connect or disconnect from a drainage works. In this case, specifically, Section 65(2) provides the Town with the necessary provisions to complete assessment apportionments when landowners of the subdivided lands agree on the shares of the assessment.

> **Agreement on share of assessment**
> *65. (2) If the owners of the subdivided land mutually agree on the share of the drainage assessment that each should pay, they may enter into a written agreement and file it with the clerk of the local municipality and, if the agreement is approved by the council by resolution, no engineer need be instructed under subsection (1). 2010, c. 16, Sched. 1, s. 2 (26).*

Section 65(1) of the Drainage Act provides the Town with the option of instructing an engineer to complete the drainage apportionments:

> **Subsequent subdivision of land**
> *65. (1) If, after the final revision of an engineer's assessment of land for a drainage works, the land is divided by a change in ownership of any part, the clerk of the local municipality in which the land is situate shall instruct an engineer in writing to apportion the assessment among the parts into which the land was divided, taking into account the part of the land affected by the drainage works. 2010, c. 16, Sched. 1, s. 2 (26).*

An engineer was not instructed under Section 65(1) of the Act. In the case of the land divisions and severances being considered under this report, apportionments were completed by the Drainage Superintendent and Engineering Coordinator. Assessment schedules for drains that were affected by each land severance were analysed by area and land use, and apportioned accordingly based on the volume of water expected to flow from those lands.

Once completed, all affected landowners were contacted and provided a letter that described the apportionments. If the landowners were in agreement with the apportionments, an "*Agreement between Property Owners for Drain Apportionments due to Land Severance or Sale"* was signed by the affected property owners in accordance with Section 65(2) of the Act.

It is important to note that an apportionment does not set new values. The ratio in the current bylaw for the affected lands is apportioned to the affected lands in the severance accordingly. When several apportionments are completed on one particular drain, the assessment to lands not affected by severance becomes more and more unfair as more apportionments are completed. Therefore, S65 apportionments are only valid until such

time as an engineer is appointed by Council on the respective drains, where the engineer is obligated to assess all lands and roads in the watershed. Any lands affected by apportionment will likely be re-assessed a different value determined by the appointed engineer, and in an unbiased nature within the schedule of assessments in that report which becomes the new bylaw for the drain.

In the case of the following severances, agreement letters were signed by all affected property owners and are attached:

- **Consent B/36/20 -** Drainage Apportionments for the Waldron Drain, 7th Concession Drain South and the Beaudoin Drain South – 8270 South Townline Road.
- **Consent B/21/22** – Jeths Drain – 21 Marsh.
- **Section 65(1) report by Tim Oliver, dated May 30, 2023** – Assessment Reapportionment for the Tremblay Drain – 7751 Howard Ave.

Apportionment agreements, once accepted by the Drainage Board and approved by Council through resolution, will be reflected in the assessments of all future works of maintenance on any of the affected drains listed above.

4. RISK ANALYSIS:

Under the provisions of the Drainage Act, when lands that are assessed for drainage are subsequently divided by a change of ownership of any part, it is the Towns obligation to take steps to apportion the assessments to reflect the liability of drainage assessments related to the division of those lands. Failing to do so could lead to unfair assessments of drain maintenance costs that do not accurately reflect the accurate ownership of lands within drainage watersheds. This could lead to conflicts between the Town and landowners over drainage assessments and potentially, the denial of agricultural grants from the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

5. FINANCIAL MATTERS:

An administration fee of $500.00 is charged by the Planning Department to an owner of land that wishes to sever a portion of his or her lands.

6. CONSULTATIONS: - N/A

7. CONCLUSION:

Administration is recommending that the drainage apportionments be approved as listed and that said apportionments be approved by Council resolution:

Sam Paglia, P.Eng.,
Drainage Superintendent and Engineering Coordinator

Attachment(s):

- **Consent B/36/20 -** Drainage Apportionments for the Waldron Drain, 7th Concession Drain South and the Beaudoin Drain South – 8270 South Townline Road.
- **Consent B/21/22** – Jeths Drain – 21 Marsh.
- **Section 65(1) report by Tim Oliver, dated May 30, 2023** – Assessment Reapportionment for the Tremblay Drain – 7751 Howard Ave.

The Corporation of The Town of Amherstburg

February 10, 2022

RE: Section 65 Drainage Apportionment – Consent B/36/20

Dear Homeowner:

This letter is to advise you of changes to the drainage assessment for your property for the parcel located at [redacted] South Townline Road, Part Lot 86, Concession 8, in the former Geographic Township of Malden. This is in relation to the Application for Consent B/36/20, which proposes to sever a 0.094 acre (0.038 hectare) parcel of land from the existing residential lands (Roll No. [redacted] for the purpose of a lot addition to merge with [redacted] South Townline Road (Roll No. [redacted]. In addition, this letter addresses previous land severances from the agricultural parcel Roll No. [redacted] whereby the parcels at 8270 and 8310 South Townline Road were formed.

The re-apportionment of the drainage assessments for the lands described above proposed under this letter is in accordance with Section 65(2) of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended in 2010."

Administration for the Town of Amherstburg has performed all of the necessary investigations to complete the re-apportionments of drainage assessments for the subject lands. Said lands are located in the watersheds of the following municipal drains constructed by bylaw under the Drainage Act:

1. **Waldron Drain** – Report by S. McVitty, P.Eng., dated May 27, 2014, by-law 2015-80.
2. **7th Concession Drain South** – Report by W. Setterington, P.Eng., dated June 5, 1987, by-law 87-15.
3. **Beaudoin Drain South** – Report by L. Zarlengs, P.Eng., dated Sept. 8, 1992, by-law 93-16.

If you are in agreement with the new breakdown of your property listed in the attached chart(s), please have all registered owners of your property sign the attached form and return to the Infrastructure Services Department at 512 Sandwich St South. Under Section 65(2) of the Drainage Act, if the agreement is approved by Council by resolution, no engineer will need to be instructed to complete a re-apportionment.

Should you have any questions or require further clarification, please feel free to contact myself at (519) 736-3664 ext 2318.
Sincerely,

Shane McVitty, P.Eng.
Drainage Superintendent and Engineering Coordinator
Attach.

Administration has created the following new breakdown for the affected properties:

1. WALDRON DRAIN

Waldron Drain							
Existing Assessment – S. McVitty, P.Eng., May 27, 2014							
Conc.	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
8	PT Lot 86	0.550	[redacted]	S&B Cipkar	$ 14.00	$ 42.00	$ 56.00
8	PT Lot 86	0.538		J&C Cipkar	$ 14.00	$ 41.00	$ 55.00

Waldron Drain							
Reapportionment – Application for Consent B/36/20							
Conc.	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
8	PT Lot 86	0.550	[redacted]	S&B Cipkar	$ 14.00	$ 39.00	$ 53.00
8	PT Lot 86	0.538		J&C Cipkar	$ 14.00	$ 44.00	$ 58.00

2. 7th CONCESSION DRAIN SOUTH

7th Concession Drain South							
Existing Assessment – W. Setterington, P.Eng., June 5, 1987 (Revised by CoR)							
Conc.	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
8	PT Lot 86	16.19	[redacted]	S Cipkar	$ 35.00	$ 99.00	$ 134.00

7th Concession Drain South							
Reapportionment – Application for Consent B/36/20							
Conc.	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
8	PT Lot 86	15.101	[redacted]	Cipkar Farms LTd	$ 33.00	$ 82.00	$ 115.00
8	PT Lot 86	0.550		S&B Cipkar	$ 1.00	$ 8.00	$ 9.00
8	PT Lot 86	0.538		J&C Cipkar	$ 1.00	$ 9.00	$ 10.00

CORPORATION OF THE TOWN OF AMHERSTBURG

Agreement between Property Owners for Drain Apportionment due to Land Severance or Sale

WALDRON DRAIN

Agreement between Betty Cipkar and John + Christine Cipkar for cost apportionment due to severance or sale of land in the Waldron Drain drainage watershed or system.

I, (we) agree to the drainage apportionment as listed below that the Town of Amherstburg has calculated for our property, and hereby petition the Council of the Town of Amherstburg to fix these new apportionments by resolution.

Waldron Drain								
Reapportionment – Application for Consent B/36/20								
Property	Conc.	Lot	Affected Area (HA)	Roll No.	Owner	Benefit Assessment	Outlet Assessment	TOTAL
B	8	PT Lot 86	0.550	[redacted]	S&B Cipkar	$ 14.00	$ 39.00	$ 53.00
C	8	PT Lot 86	0.538		J&C Cipkar	$ 14.00	$ 44.00	$ 58.00

BETTY CIPKAR — Property B - Owner 1 (printed)
6-12-23 — Date
Betty Cipkar — Property B - Owner 1 (signature)

Property B - Owner 2 (printed)
Date
Property B - Owner 2 (signature)

JOHN CIPKAR — Property C - Owner 1 (printed)
6-12-23 — Date
Property C - Owner 1 (signature)

CHRISTINE CIPKAR — Property C - Owner 2 (printed)
7-01-23 — Date
Christine A. Cipkar — Property C - Owner 2 (signature)

3. BEAUDOIN DRAIN SOUTH

Beaudoin Drain South							
Existing Assessment – Report by L. Zarlenga, P.Eng., Sept. 8, 1992							
Conc.	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
8	PT Lot 86	16.19	[redacted]	S Cipkar	$ 0.00	$ 880.00	$ 880.00

Beaudoin Drain South							
Reapportionment – Application for Consent B/36/20							
Conc.	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
8	PT Lot 86	15.101	[redacted]	Cipkar Farms LTd	$ 0.00	$ 761.00	$ 761.00
8	PT Lot 86	0.550		S&B Cipkar	$ 0.00	$ 56.00	$ 56.00
8	PT Lot 86	0.538		J&C Cipkar	$ 0.00	$ 63.00	$ 63.00

CORPORATION OF THE TOWN OF AMHERSTBURG

Agreement between Property Owners for Drain Apportionment due to Land Severance or Sale

7th CONCESSION ROAD DRAIN SOUTH

Agreement between _____ and _____ for cost apportionment due to severance or sale of land in the **7th Concession Road Drain South** drainage watershed or system.

I, (we) agree to the drainage apportionment as listed below that the Town of Amherstburg has calculated for our property, and hereby petition the Council of the Town of Amherstburg to fix these new apportionments by resolution.

7th Concession Drain South								
Reapportionment – Application for Consent B/36/20								
Property	**Conc.**	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
A	8	PT Lot 86	15.101	[redacted]	Cipkar Farms LTd	$ 33.00	$ 82.00	$ 115.00
B	8	PT Lot 86	0.550		S&B Cipkar	$ 1.00	$ 8.00	$ 9.00
C	8	PT Lot 86	0.538		J&C Cipkar	$ 1.00	$ 9.00	$ 10.00

CIPKAR FARMS LTD _____ 6-12-23 _____
Property A - Owner 1 (printed) Date Property A - Owner 1 (signature)

_____ _____ _____
Property A - Owner 2 (printed) Date Property A - Owner 2 (signature)

BETTY CIPKAR _____ 6-12-23 _____
Property B - Owner 1 (printed) Date Property B - Owner 1 (signature)

_____ _____ _____
Property B - Owner 2 (printed) Date Property B - Owner 2 (signature)

Website: www.amherstburg.ca
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Phone: (519) 736-0012 Fax: (519) 736-5403 TTY: (519)736-9860

7th CONCESSION ROAD DRAIN SOUTH

JOHN CIPKAR — Property C - Owner 1 (printed)

6-12-23 — Date

Property C - Owner 1 (signature)

CHRISTINE CIPKAR — Property C - Owner 2 (printed)

7-01-23 — Date

Property C - Owner 2 (signature)

Website: www.amherstburg.ca
271 SANDWICH ST. SOUTH, AMHERSTBURG, ONTARIO N9V 2A5
Phone: (519) 736-0012 Fax: (519) 736-5403 TTY: (519)736-9860

CORPORATION OF THE TOWN OF AMHERSTBURG

Agreement between Property Owners for Drain Apportionment due to Land Severance or Sale

BEAUDOIN DRAIN SOUTH

Agreement between _____ and _____ for cost apportionment due to severance or sale of land in the **Beaudoin Drain South** drainage watershed or system.

I, (we) agree to the drainage apportionment as listed below that the Town of Amherstburg has calculated for our property, and hereby petition the Council of the Town of Amherstburg to fix these new apportionments by resolution.

Beaudoin Drain South								
Reapportionment – Application for Consent B/36/20								
Property	**Conc.**	**Lot**	**Affected Area (HA)**	**Roll No.**	**Owner**	**Benefit Assessment**	**Outlet Assessment**	**TOTAL**
A	8	PT Lot 86	15.101	[redacted]	Cipkar Farms LTd	$ 0.00	$ 761.00	$ 761.00
B	8	PT Lot 86	0.550		S&B Cipkar	$ 0.00	$ 56.00	$ 56.00
C	8	PT Lot 86	0.538		J&C Cipkar	$ 0.00	$ 63.00	$ 63.00

CIPKAR FARMS LTD _____ _____ _____
Property A - Owner 1 (printed) Date Property A - Owner 1 (signature)

_____ _____ _____
Property A - Owner 2 (printed) Date Property A - Owner 2 (signature)

BETTY CIPKAR 6-12-23 _____
Property B - Owner 1 (printed) Date Property B - Owner 1 (signature)

_____ _____ _____
Property B - Owner 2 (printed) Date Property B - Owner 2 (signature)

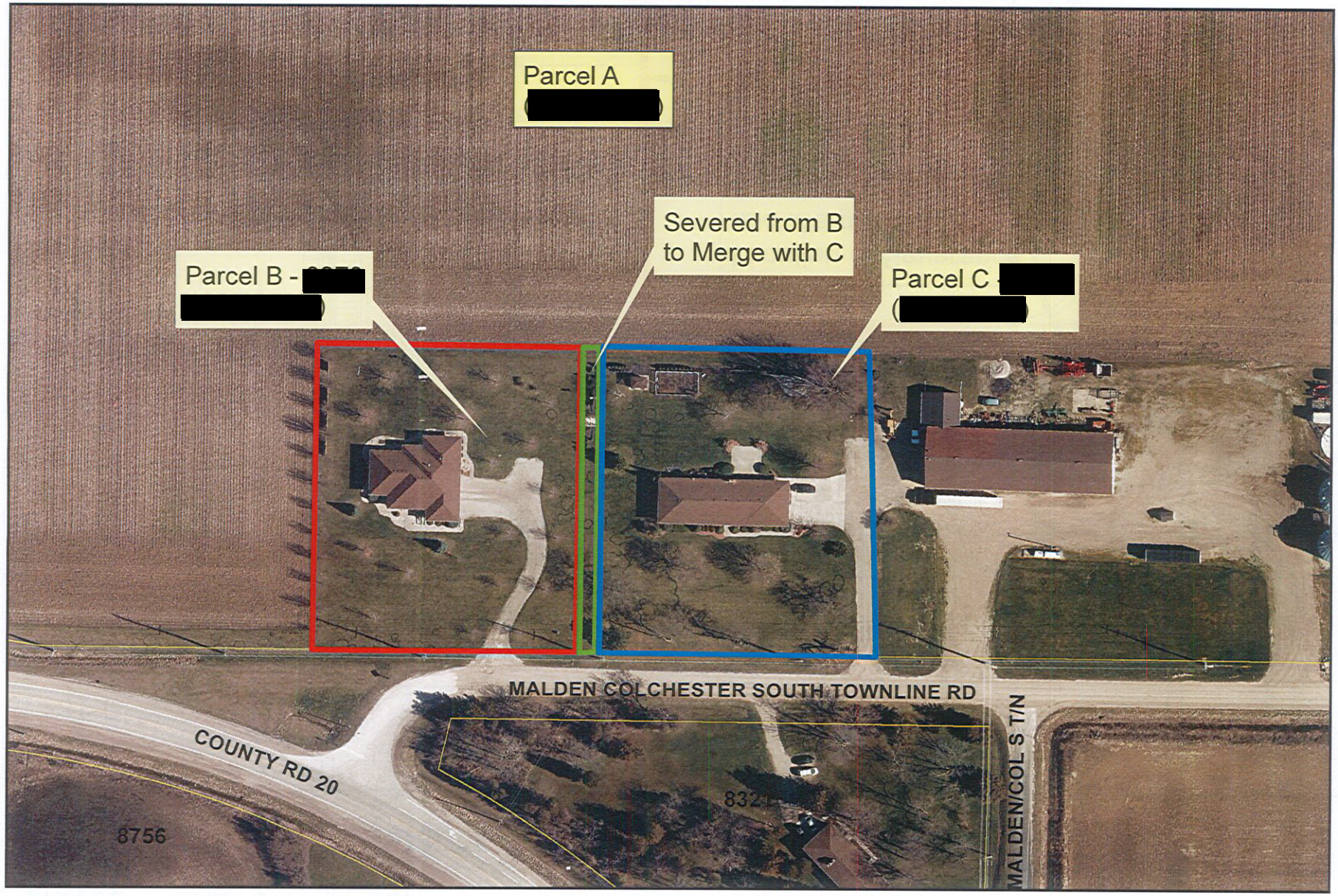
BEAUDOIN DRAIN SOUTH

JOHN CIPKAR	6-12-23	
Property C - Owner 1 (printed)	Date	Property C - Owner 1 (signature)
CHRISTINE CIPKAR	7-01-23	Christine A. Cipkar
Property C - Owner 2 (printed)	Date	Property C - Owner 2 (signature)

Website: www.amherstburg.ca
271 SANDWICH ST. SOUTH, AMHERSTBURG, ONTARIO N9V 2A5
Phone: (519) 736-0012 Fax: (519) 736-5403 TTY: (519)736-9860

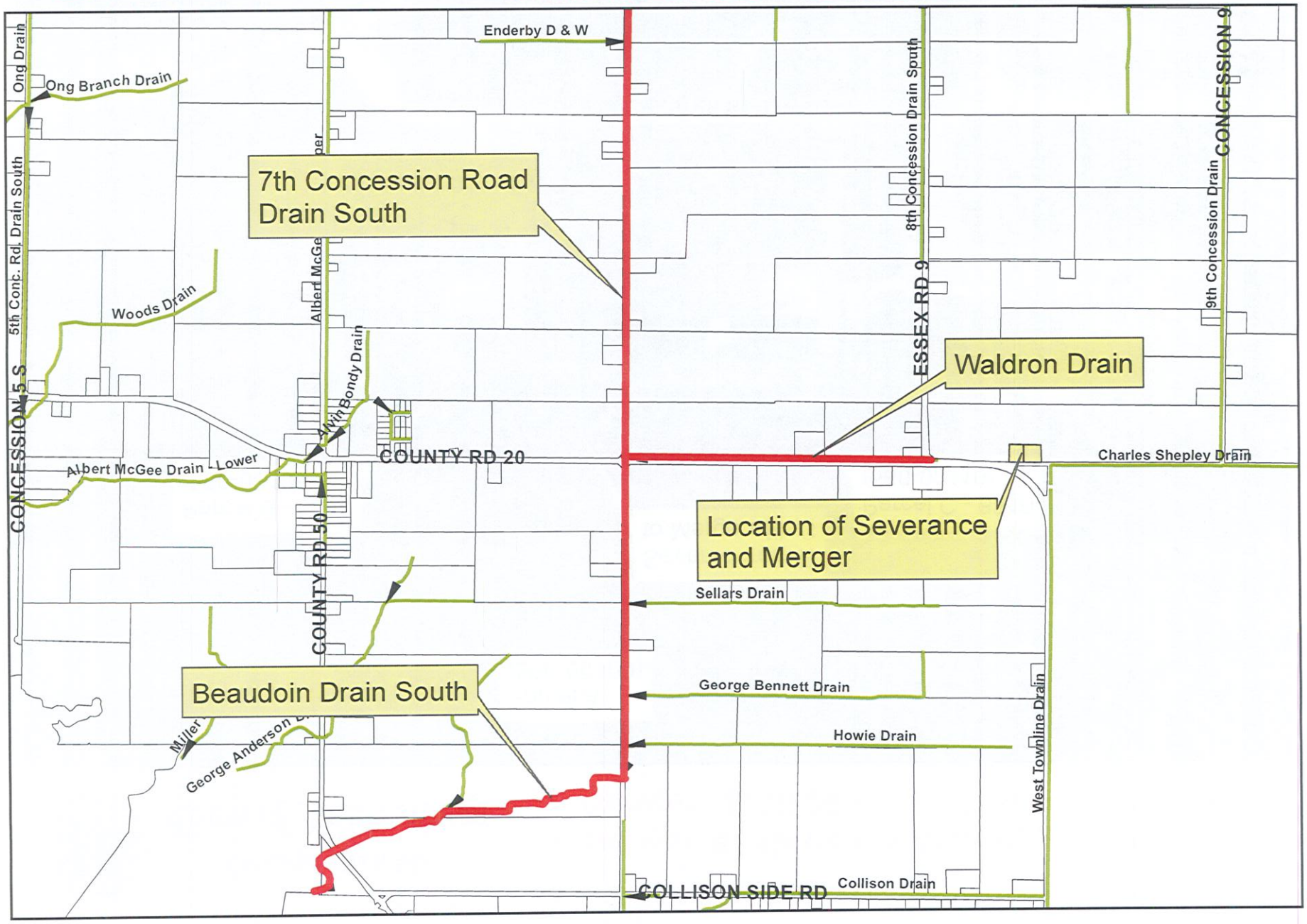
The Corporation of The
Town of Amherstburg

Section 65 Drainage Apportionment
Consent B/36/20 - 8270 South Townline Rd



The Corporation of The
Town of Amherstburg

Section 65 Drainage Apportionment
Consent B/36/20 - 8270 South Townline Rd



The Corporation of The Town of Amherstburg

April 20, 2023

RE: Section 65 Drainage Apportionment – Application B/21/22

Dear Landowner(s):

This agreement is provided to you in order to meet the condition of severance under application B/21/22 for changes to the drainage assessment related to the affected parcels legally known as PLAN 12M323 LOT 4 PLAN 13 PT, LOTS 3 4 14 AND 15 RP, 12R27807 PART 2 with Roll [redacted] and current owners, Franco and Assunta Simone (Identified in this agreement as Parcel No. 1), and a proposed severed parcel with Roll No. TBD, with owners, Casey and Nicholas Martin (Identified in this agreement as Parcel No. 2). The application for severance proposes to sever a parcel of land with an area of 1.35 acres from the current parcel of land known above with 2.87 acres of land for the purpose of a lot addition from Parcel No. 1 to establish Parcel No. 2.

Irrespective of whether or not the stormwater from any parcel above flows to the respective drainage works below, it is not the intention of this agreement to subsequently connect or disconnect any of the lands to or from any specific drainage works. Section 65(2) apportions the obligation set in the respective bylaws, and can only be apportioned to maintain the current bylaws in order for the Town to recover costs associated with drainage works.

The re-apportionments within are to be used by the Town, and are payable by the lands upon execution of this agreement and Council Resolution, and furthermore, are valid until such time as Council appoints an Engineer to re-examine, apportion and/or change the assessments to any specific parcel of land on the drain and produce an updated bylaw for any lands within the drainage area for the affected drain(s).

The re-apportionment of the drainage assessments for the lands described above proposed under this agreement are in accordance with Section 65(2) of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended in 2010.", and provide for the re-apportionment of drainage assessment ratios for the following Drainage Systems/Drainage Assessment Schedules;

1. **Jeths Drain – By-Law 2022-059**

   a. Schedule of Assessment for - Culvert/Enclosures (downstream liability):
   b. Schedule of Assessment for - Channel Work
   c. Schedule of Assessment for - Future Maintenance Work.

The Jeths Drain design provides capacity and conveyance for a minimum 2-year design storm, and serves a watershed area of approximately 24 Hectares. The land use of the watershed is mainly privately owned non-agricultural lands and one road authority (CR20), for which the County of Essex has liability. The Corporation of the Town of Amherstburg currently, does not own lands or roads for which it is liable on the Jeths Drain.

The Benefit and Outlet Liabilities derived in the current By-Laws are in respect to the definitions within Section 1 of the Drainage Act and are related to the betterment of lands, roads, buildings, or other structures. These liabilities apply to this agreement, and are relative to Parcel No. 1 and Parcel No. 2 after severance. The re-apportioned amounts were calculated using the areas involved along with the estimated percentage of stormwater artificially expected to flow

from those lands, which are typically set by their land use. The re-apportionments have considered the current bylaw for the Jeths Drain, but have referenced past bylaws on the Jeths Drain in order to fairly apportion these lands.

Note Bene: ***There is a currently an active project on the Jeths Drain under By-Law 2022-059. The project is in its construction phase and is expected to reach substantial completion by the fall of 2023. Upon execution of this agreement, and resolution of Council, the landowners in this agreement agree that the current liability for works occurring under By-law 2022-059 for the Jeths drain, shall be assessed to the lands in this agreement and in the proportions herein once the project is completed and the Town invoices all lands and roads for cost recovery.***

Administration has performed all of the necessary investigations to complete the re-apportionment of drainage assessments for the subject lands and hereby apportions these lands a 53% and 47% cost split to Parcel No. 1 and Parcel No. 2 respectively for the Jeths Drain under the auspices the Drainage Act as follows;

1. **Jeths Drain – Culvert/Enclosures (Downstream liability):**

a. The current Engineers' Report dated August 12, 2022 by M. Gerrits Consulting Inc. appended to By-Law 2022-059, assesses 2.84 acres (1.15 hectares) for the cost sharing of all estimated downstream culvert works in the report. The By-Law assesses this land a Benefit amount of **$590** of $4,644 Benefit Liability assessed to all lands for a project total estimated Benefit liability of $12,351. (4.7%). In the future, this liability ratio is used to assess these lands for to actual cost of downstream culvert works, and will be invoiced to the lands in this agreement, in the ratios set out herein, when the Town invoices lands and roads for the recovery of the final costs to administer the current project.

i.) Jeths Drain - Culvert / Enclosure Schedule of Assessment - Bylaw 2022-059								
Apportioned Assessment - August 12, 2022 report by Michael Gerrits P.Eng.								
		Affected Area Acres (Hectares)						
Conc.	Lot.	Acres	Hectares	Roll	Owner	Benefit Liability	Outlet Liability	Total
1	10	2.87	1.16	[redacted]	Franco and Assunta Simone	$ 590.00	$ 0	$ 590.00
Note that area in the bylaw is listed as 2.48 acres, but for the apportionment percentages, is corrected to the area identified in application B/21/22.								

i.) Jeths Drain - Culvert / Enclosure Schedule of Assessment - Bylaw 2022-059								
Re-apportioned Assessment - April 21, 2023 B/21/22.								
		Affected Area Acres (Hectares)						
Conc.	Lot.	Acres	Hectares	Roll	Owner	Benefit Liability	Outlet Liability	Total
1	10	1.52	0.62	Parcel No. 1	Franco and Assunta Simone	$ 312.70		$ 312.70
1	10	1.35	0.55	Parcel No. 2	Casey and Nicholas Martin	$ 277.30		$ 277.30
								$ 590.00

2. **Jeths Drain - Channel Work**

The current By-law and active project assesses the un-severed lands for Benefit and Outlet Liability on the value of the estimated works recommended for constructed in the report. $574 and $4548, respectively for Benefit and Outlet Liability for a total assessment of $5,122 on an estimated $100,185 of channel work assessed to Benefit and Outlet to all lands (5.1%).

ii) Jeths Drain - Apportioned Channel works - August 12,2022 - Bylaw No. 2022-059								
		Affected Area Acres (Hectares)						
Conc.	Lot.	Acres	Hectares	Roll	Owner	Benefit Liability	Outlet Liability	Total
1	10	2.48	1.15	[redacted]	Franco and Assunta Simone	574	$ 4,548.00	$ 5,122.00

ii) Jeths Drain - Re-apportioned Channel works - April 21, 2023 - B/21/22								
		Affected Area Acres (Hectares)						
Conc.	Lot.	Acres	Hectares	Parcel No.	Owner	Benefit Liability	Outlet Liability	Total
1	10	0.97	0.39	1	Franco & Assunta Simone	$ 304.22	$ 2,410.44	$ 2,714.66
1	10	39.59	16.02	2	Casey and Nicholas Martin	$ 269.78	$ 2,137.56	$ 2,407.34
Total		40.56	16.41					$ 5,122.00

3. **Jeths Drain - Future Maintenance Work.**

The current By-law assesses the un-severed lands $104 for Future Maintenance Liability on the drain on the arbitrary value in the schedule of $1,890 (5.5%).

iii) Jeths Drain - Apportioned Future Maintenance - August 12,2022 - Bylaw No. 2022-059							
		Affected Area Acres (Hectares)					
Conc.	Lot.	Acres	Hectares	Roll	Owner	Future Maintenance Liability	Total
1	10	2.48	1.15	[redacted]	Franco and Assunta Simone	$ 104.00	$ 104.00

iii) Jeths Drain - Re-apportioned Future Maintenance - April 21, 2023 - B/21/22							
		Affected Area Acres (Hectares)				Future Maintenance	
Conc.	Lot.	Acres	Hectares	Parcel No.	Owner	Liability	Total
1	10	0.97	0.39	1	Franco & Assunta Simone	$ 55.12	$ 55.12
1	10	39.59	16.02	2	Casey and Nicholas Martin	$ 48.88	$ 48.88
Total		40.56	16.41				$ 104.00

We, the parties of this agreement, do hereby agree that the current total assessment represented as a percentage of total pro-ratable Outlet Liabilities as per the current By-Laws listed above along with any implied Special Benefit Liability reflects the just apportionment for each affected land and are to be used for any ongoing and/or future maintenance for the respective drains, and the owners of land at the time of billing, are liable to pay the apportioned amount according to this agreement, and in the ratios herein.

If you are in agreement with the new breakdown of your property listed in the attached chart(s), please have all registered owners of the parcel, or if a corporation, the person who has signing authority to bind the corporation sign the attached form and return to the Planning Department at Town Hall at 271 Sandwich St. South.

Should you have any questions or require further clarification, please feel free to contact myself at (519) 736-3664 extension 2318.

Sincerely,

Sam Paglia, P.Eng.
Drainage Superintendent and Engineering Coordinator.

CORPORATION OF THE TOWN OF AMHERSTBURG

Agreement between Property Owners for Drain Apportionment Due to Land Severance or Sale

Agreement between Franco and Assunta Simone and owners of Parcel No. 2 for cost apportionment due to severance or sale of land in the drainage watersheds or system for the Jeths Drain.

ii) Jeths Drain - Apportioned Future Maintenance - August 12,2022 - Bylaw No. 2022-059					
Schedule	Parcel	Benefit Liability	Outlet Liability	Future Maintenance Liability	Total
Culvert/Enclosures	[redacted]	$ 590.00			$ 590.00
Channel Work		$ 574.00	$ 4,548.00		$ 5,122.00
Future Maintenance				$ 104.00	$ 104.00
		$ 1,164.00	**$ 4,548.00**	**$ 104.00**	**$ 5,816.00**
REAPPORTIONMENT RATIOS FOR CONSENT B/21/22					
Culvert/Enclosures					
	Parcel No. 1	$ 312.70			$ 312.70
	Parcel No. 2	$ 277.30			$ 277.30
Channel Work					
	Parcel No. 1	$ 304.22	$ 2,410.44		$ 2,714.66
	Parcel No. 2	$ 269.78	$ 2,137.56		$ 2,407.34
Future Maintenance					
	Parcel No. 1			$ 55.12	$ 55.12
	Parcel No. 2			$ 48.88	$ 48.88
Totals	Parcel No. 1	**$ 616.92**	**$ 2,410.44**	**$ 55.12**	**$ 3,082.48**
	Parcel No. 2	**$ 547.08**	**$ 2,137.56**	**$ 48.88**	**$ 2,733.52**
		$ 1,164.00	**$ 4,548.00**	**$ 104.00**	**$ 5,816.00**

I, (we) agree to the drainage apportionment as listed below in relation to drainage works performed on the listed drains and the liability of our land to the drainage maintenance and repair, and hereby petition the Council of the Town of Amherstburg to fix these new ratios to the current drain assessment schedule by resolution.

Parcel No. 1:

FRANCO SIMONE	June/11/23	
Franco Simone owner 1 (printed)	Date	Franco Simone owner 1 (signature)
ASSUNTA SIMONE.	June/11/23	
Assunta Simone owner 2 (printed)	Date	Assunta Simone owner 2 (signature)

Parcel No. 2:

CASEY MARTIN	5/2/2023	
Casey Martin owner 1 (printed)	Date	Casey Martin owner 1 (signature)
NICHOLAS MARTIN	5/2/2023	
Nicholas Martin owner 2 (printed)	Date	Nicholas Martin owner 2 (signature)

File No. 18-7476

Corporation of the Town of Amherstburg
512 Sandwich Street South
Amherstburg, Ontario
N9V 3R2

Attention: Todd Hewitt
Manager of Engineering and Operations

Section 65(1) Assessment Reapportionment Tremblay Drain
For 7751 Howard Avenue
Lot 11, Concession 7, Former Twp. of Anderdon
Town of Amherstburg

Dear Todd:

Instructions

As per the instructions received from the Municipality on May 5, 2023, we hereby submit our report addressing the reapportionment of the assessment among the parts onto which the land was divided, in accordance with Section 65(1) of the Drainage Act.

Watershed Description

The property in question is Roll No. 470-004-00, (7751 Howard Avenue) which is located in Lot 11, Concession 7 within the former Township of Anderdon, and having an area of 10.241 hectares (25.30 acres). The said land was recently subdivided into four (4) parcels and subsequently, will be used for industrial development. Each of the land parcels, in their entirety, drain into the Tremblay Drain via a new lateral mutual agreement drain that was constructed in accordance with Section 2 of the Drainage Act. The mutual agreement drain is situated along the northerly limit of the said parcels and flows from east to west.

Drainage History

The recent history of Engineer's reports for the Tremblay Drain follows:

- **2 October 2019 by Gerard Rood, P. Eng.:** The recommended work included a report to increase assessments for property Roll No. 470-004-00 to include an additional 1.071 hectares (2.65 acres) from the said property to legally drain to the Tremblay Drain bringing the total assessed area to 10.241 hectares (25.30 acres). The report being in accordance with Section 65(3) for a subsequent connection for the increased flow volumes, and further establishes a maximum release rate of **110 litres/second** which represents the 1:2 year pre-development runoff rate for the entire property.

DILLON CONSULTING

10 Fifth Street South
Chatham, Ontario
Canada
N7M 4V4
Telephone
519.354.7802
Fax
519.354.2050

Dillon Consulting Limited

- **14 March 1984 by Mike Horan, P. Eng.:** The recommended work includes the most recent improvements for the lower portion of the Tremblay Drain that is situated along the east side of Howard Avenue. This report serves as the governing report and by-law for future maintenance of the drain thereof.

Allowable Release Rates and Storm Water Management

The storm water management systems for each parcel shall ensure that the allowable release rates into the mutual agreement drain prior to entering the Tremblay Drain, combined will not exceed **110 litres/second.** This release rate is for all runoff events up to and including the 1:100 year storm. This maximum release rate was established in the 2019 Rood report. All drainage flows and runoff shall be directed to and be fully captured within the storm water management facilities before being released into the mutual agreement drain at the controlled rates. It is recommended that the maximum flow rate permitted for each new parcel shall be assigned on an area basis and are stipulated as follows:

Parcel No. 1 – 13 litres/second

Parcel No. 2 – 13 litres/second

Parcel No. 3 – 26 litres/second

Parcel No. 4 – 58 litres/second

Proper storm water management facilities restricting the flows to the allowable release rates, as noted above for each parcel, will ensure that the subsequent flows will have no adverse effect on the capacity of the Tremblay Drain.

Assessment Reapportionment

The governing report for the Tremblay Drain for future maintenance works is the 1984 Horan report for which the assessment to property Roll No. 470-004-00 was subsequently increased in accordance with S. 65(3) under a 2019 Rood report. The total updated assessment amount for Roll No. 470-004-00, as determined under the 2019 Rood report was $1,743.00, and is based on an updated total assessment of $15,948.00, representing all lands and roads assessed in the Tremblay Drain watershed.

With the subdividing of 7751 Howard Avenue into four (4) parcels, in accordance with Section 65(1) of the Drainage Act, we recommend the new drainage assessment reapportionments as follows:

Description	Area affected (Hectares)	Total Assessment Value
Parcel 1	1.203	$205.00
Parcel 2	1.203	$205.00
Parcel 3	2.438	$415.00
Parcel 4	5.397	$918.00
Total	**10.241**	**$1,743.00**

Drawings

Attached to this report is Schedule 'A' which represents the following drawing:

Page 1 of 1: Plan

The costs associated with the preparation of this report we recommend be hereby assessed 100% against property Roll No. 470-004-00, being owned by 2402592 Ontario Inc.

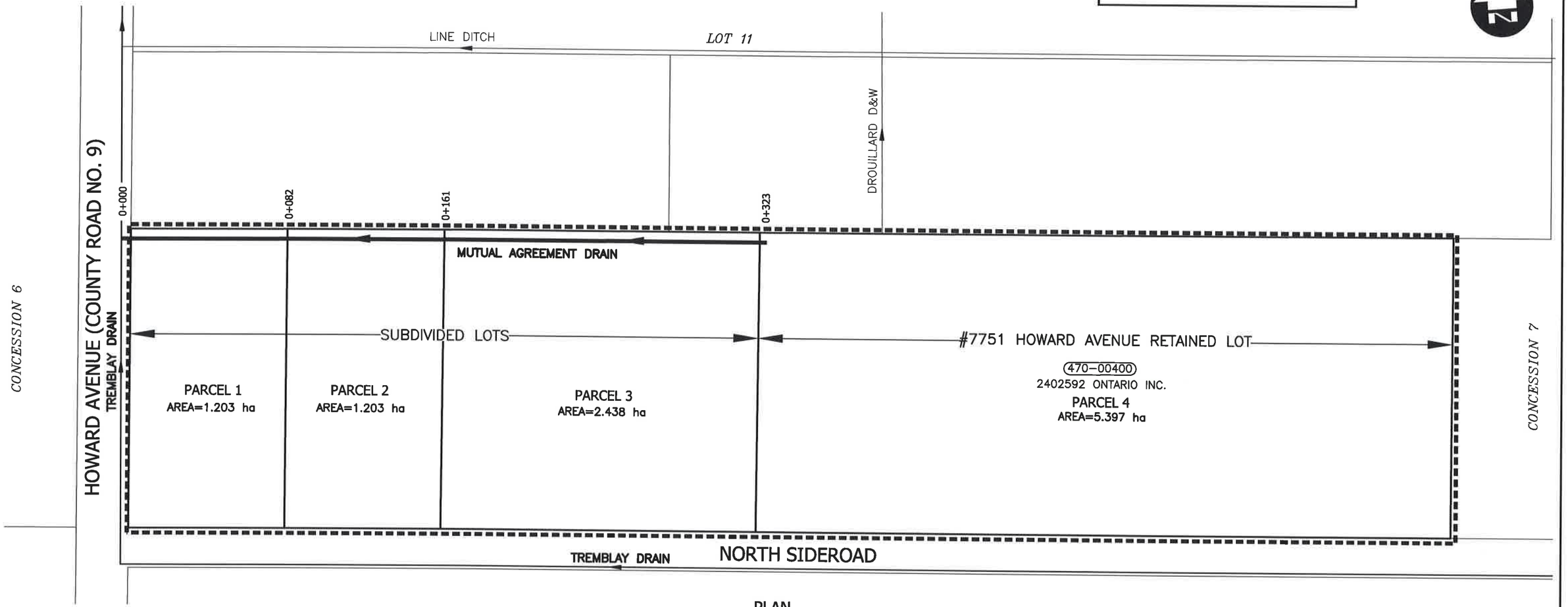
Respectfully submitted,

DILLON CONSULTING LIMITED
Tim R. Oliver, P.Eng.
TRO:wlb

cc: Sam Paglia, Drainage Superintendent

MAXIMUM ALLOWABLE RELEASE RATE
(STORM WATER RUNOFF)

PARCEL 1 – 13 L/s
PARCEL 2 – 13 L/s
PARCEL 3 – 26 L/s
PARCEL 4 – 58 L/s



PLAN
SCALE–1:2,000

LEGEND

- MUTUAL AGREEMENT DRAIN
- EXISTING DRAINS
- DRAINAGE AREA

DRAFT

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

No.	ISSUED FOR	DATE	BY
1	CLIENT REVIEW	MAY 30/23	TRO

DESIGN TRO	REVIEWED BY MDH
DRAWN WLB	CHECKED BY RF
DATE May 30, 2023	
SCALE AS SHOWN	

DILLON CONSULTING

PROJECT NO. 18-7476

DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE A'

S. 65(3) ASSESSMENT REAPPORTIONMENT TREMBLAY DRAIN FOR 7751 HOWARD AVENUE
Town of Amherstburg

SHEET TITLE PLAN

PAGE NO. 1 of 1

May 30, 2023 – 12:32pm C:\pw working directory\projects 2018\33wlb\d0107370\187476-03-DRN-CON S65.dwg