BESSETTE DRAIN

Repair and Improvement

and Maintenance Schedule of Assessment

Geographic Township of Sandwich West

TOWN OF LASALLE

Town of LaSalle
5950 Malden Road
LaSalle, Ontario N9H 1S4
519-969-7770

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

REI Project 2016D046
March 23rd, 2023

Rood
Engineering
Inc.

Consulting Engineers

March 23rd, 2023

Mayor and Municipal Council
Corporation of the Town of LaSalle
5950 Malden Road
LaSalle, Ontario
N9H 1S4

Mayor Meloche and Members of Council:

BESSETTE DRAIN
Repair and Improvement
and Maintenance Schedule of Assessment
Geographic Twp. of Sandwich West
Project REI2016D046
Town of LaSalle, County of Essex

I. INTRODUCTION

In accordance with the instructions provided from Council at their August 9th, 2016 meeting and received from the Town by letter dated August 17th, 2016, from Jonathan Osborne, P.Eng., former Manager of Engineering, we have prepared the following report that provides for an updated assessment schedule for maintenance work and includes minor repairs and improvements on the open drain. The Bessette Drain extends from the north branch of the Canard River, running northwesterly to Malden Road and then north along the east side of the road to a point just north of Pt. Lots 24 and 25 in the 2nd Concession, in the geographic township of Sandwich West, Town of LaSalle.

These investigations were initiated by the Town of LaSalle to address the need for an updated assessment schedule to properly allocate costs of any maintenance works carried out on the drain, along with any improvements or repairs to the drain or access bridges. The variation in assessment establishes a Maintenance Schedule of Assessment which shall provide a basis for levying any future maintenance costs for work to both the drain and the bridges.

Our appointment and the works relative to the report and maintenance schedule of the Bessette Drain, proposed under this report, is in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010". We have performed all of the necessary survey, investigations, etcetera, for the proposed works, and we report thereon as follows. A plan showing the Bessette Drain is included herein as part of the report.

II. BACKGROUND

The Bessette Drain is located entirely within the Town of LaSalle. The drainage basin served by the Bessette Drain consists of approximately 127.8 hectares (315.8 acres). The drain comprises of an open portion of drain that extends north from the outlet at the north branch of Canard River to just south of the enclosure serving parcel 180-02000. Travelling north from this location, the drain is enclosed.

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

1)	August 16th, 1902	By-Law 351 Bessette Drain	Wm. Newman, C.E.
2)	December 20th, 1943	By-law 1159 Bessette Drain	W.J. Fletcher, C.E.
3)	December 31st, 1945	By-law 1177 Bessette Drain	W.J. Fletcher, C.E.

The 1945 report by W.J. Fletcher, C.E. provided for general repairs and improvements to the entire length of the drain and has the latest specifications for the grading of the drain.

Following these reports, the Town of LaSalle retained Stantec Consulting Ltd. in 2010 to prepare the design for the Southwest Quadrant Watermain Replacement which included upgrades to the enclosed storm sewer on Malden Road. This enclosed portion of storm sewer from approximately Station 0+201.4 to 1+461.3 will be incorporated in this report and established as the enclosed portion of the Bessette Drain.

We have also referred to the following reports which have aided us in determining the watershed limit for the Bessette Drain:

1)	July 31st, 1984	Lepain & West Cahill Drainage Area Plan LCBA	LaFontaine, Cowie, Buratto & Associates Limited
2)	October 11th, 2011	Laurier Parkway Extension - Malden Rd. to Howard Ave. - As Built	Dillon Consulting

We arranged with the Town to provide us with the updated assessment roll information for the affected parcels. We also reviewed reports for the abutting drains and spoke to the owners to help in establishing the current watershed limit for the Bessette Drain.

III. PRELIMINARY EXAMINATION AND ON-SITE MEETING

After reviewing all of the drainage information provided by the Town, we arranged with the former Manager of Engineering Jonathan Osborne, P.Eng. to schedule an on-site meeting for July 20th, 2017. The following people were in attendance at said meeting: Anthony Campigotto, Radmila Kalinovic, Tony Marra, Reinhard Zeising, Joseph Orlando, William Horvath, Bruce Ashton, Tim & Yvette Sullivan, Jim & Carmen Smith, Catherine Gagnon, Bernard Drouillard, Giovanni DiPonio, Trish Currie-MacDonald, Mary Rocheleau, Wayne Clark, Kent Johnson, Carl James Martin, Mary Wark, Nick Lou, Chris Caza, Doug & Isabel Turgeon, John G. Lachance, Sharon Drouillard, Joyce & David Phillips, Ernest & Kaye Vegh, Wayne Clark, Ida Clark, Ed Bondy, Janice Imeson Johnson, Domenic Aversa, Jonathan Osborne (Manager of Engineering), Peter Marra (Director of Public Works), Kory Snelgrove (Rood Engineering), and Gerard Rood (Rood Engineering).

Jonathan Osbourne explained that the purpose for this meeting was to explain that the Town needs to carry out maintenance on the drain. From review of existing reports, it appears that an updated Maintenance Schedule of Assessment is needed in order to properly share the costs for

the work in accordance with Section 76 of the Drainage Act. He introduced Gerard Rood as the Engineer appointed to provide the updated report for the Bessette Drain.

Mr. Rood explained that municipal drains are a communal project that proceed in accordance with the Drainage Act. He explained the legislative process to follow under the Act and approximate timelines of activities. He referenced the previous reports and explained the location and extent of the Bessette Drain. He explained that the updated assessment schedule that will be provided in the report will allow the Town to carry out maintenance work and properly levy these costs. He said the report ensures that the proper lands affected by the drain are assessed at the appropriate rates for Benefit and Outlet liability. The report will also detail appropriate cost sharing for the bridges along the open portion of the drain. Mr. Rood explained that lands used for agricultural purposes and designated Farm Property Tax Class will be eligible for a grant in the amount of 1/3 of their total assessment from the Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A).

One home owner asked why the work done on the enclosed drain in 2010 was not assessed to home owners. Peter Marra explained that the Town of LaSalle picked up all the costs for this work through grants. He advised that this enclosed portion will be included in the report. Another owner explained that since the sidewalks had been installed in the soccer fields there has been flooding as the water runs along Golfview Dr. and outlets there. Another home owner on Kelly Road said they had put in a request for the roadside ditch to be cleaned. Jonathan noted that the County of Essex will pick up those costs and are responsible for the maintenance there. The home owner will have to notify the County.

A home owner asked why the Town of LaSalle does not pay for the cost of the maintenance works since their property taxes have tripled since the 1980's. Jonathan Osbourne explained that it is a communal project and that owners just pay for the drains they use. He explained that this is not covered under the general taxes. An owner near Snake Lane expressed the concern about the stagnant water being caused by the phragmites. She was concerned with the mosquitos. Jonathan Osbourne explained that that area of the drain is a difficult portion and that the grade is very minimal there. Peter Marra said Mr. Rood's report will cover the water in the Bessette Drain until each reaches a sufficient outlet.

Another owner shared their concern about phosphorus and other chemicals from the farms. Mr. Rood explained that with better drainage the ground has more opportunity for infiltration of these chemicals and vegetative growth. One owner asked how far the dredging of the drain will go. Mr. Rood explained that the cleaning will go to the mouth of Bessette Drain to the extent of the Canard River. He also explained that rock protection can be added to the banks for stability.

The property owner at 7390 Malden asked how the size of the pipe was determined for the enclosure completed in 2010. Jonathan Osbourne explained it was an engineered design. The owner continued to explain that since the enclosure work, there have been drainage issues at the end of Golfview Drive and Kelly Road. Another asked what the scope of the work will be for the drain. Jonathan Osbourne explained that the majority of the work will be cleaning out the drain.

Another owner asked why they are paying for these works now when they had not in the past. Jonathan Osbourne explained that was their previous procedure and that there is not enough funding to continue that way. Therefore, they are proceeding with the Drainage Act. This also allows all the ministries input (D.F.O., M.N.R.F., etcetera). He said that once the report is

complete the maintenance will be performed regularly. He explained if culverts are deteriorating, they will be replaced.

An owner asked about the phragmites. Jonathan Osbourne explained that the Conservation Authorities are working on how to address them. An owner asked if they have the right to do their own work on the drain. Mr. Rood explained that they would be liable, and that insurance coverage prohibits private owner works on roads and municipal infrastructure.

A home owner asked whether they could object to proceeding with work. Jonathan Osbourne advised that Council decides whether the report will proceed at the Consideration Meeting. He said that notification for all meetings will be provided.

Another owner explained that the fields on the west side of Malden Road used to be tiled. The watermain work that was completed raised the drain and now these tiles are submerged. Jonathan Osbourne said he will pass this information on to the County of Essex. Peter Marra explained that owners can go to the Mayor or Deputy Mayor for action from the County. He said that once the municipal drain is clear the County may take action as there will be better drainage. An owner asked about maintenance on Kelly Road. Jonathan Osbourne explained how that road is a Town of LaSalle road and therefore the Town is responsible.

Another owner asked how the volumes of water are determined for the report. Mr. Rood explained the coefficients used for runoff based on the property type. Bill Horvath expressed the interest to meet regarding his drainage issues and will coordinate with Jonathan Osbourne to schedule a meeting. Owner Wayne Clark and his son expressed their concern with phragmites. Wayne asked if they could clean only a narrow portion of the drain to leave a buffer for their land and preserve the trees. Their bank has eroded substantially from cleaning done in the past. He noted that there is about one to two feet of sediment accumulation. Mr. Rood asked the present landowners to call the Town or Rood Engineering office if there are any questions on the project.

On August 8th, 2017, a meeting took place to discuss the drainage issues brought forward by Bill Horvath during the on-site meeting regarding his property at 7390 Malden Road. The following people were in attendance: Bill Horvath, Kory Snelgrove, Gerard Rood, and Jonathan Osbourne. Bill Horvath explained the flooding he is experiencing along the south side of his property from 0.5 inches of rain. There are catch basins to the north and the south of the area mentioned. The drain in this location is a covered system under the paved walkway along Malden Road. There is a 450mm diameter offset catch basin about 20m south of the flooded area. Bill Horvath explained that there used to be a ditch along the south limit of his property. Bill has a 4 inch diameter pipe for his sump pump with the cleanout in the boulevard. An offset catch basin was discussed as a solution, but it was noted that there are steep slopes. Everyone looked at the ditch inlet catchbasin at the north limit of MN 7440. Bill said that these were provided at all existing ditches when the drain was covered except next to his property. Jonathan Osbourne explained the reason for the current works and assured Bill that the Town has been aware of concerns for some time. Bill stated that the ditch needs to be cleaned out downstream. Gerard Rood and Jonathan Osbourne explained Outlet Liability requirements for parcel owners according to the Drainage Act. Outlet Liability means that for every parcel in the watershed that outlets to the drain, a part of the cost of the construction, improvement, or maintenance of a drainage works that is required to provide or improve an outlet is assessed to the affected owners. In addition, it was explained how the runoff coefficients used in the calculations for these assessments are dependent on the land use and surface covering. It was discussed that notice for upcoming meetings will be provided. The Red Tape Reduction Act was discussed, and it was explained that

properties with assessments less than $200 can view the Drainage Report at the Town office and will not be provided with an individual copy.

On January 2nd, 2019, a request was sent to Jonathan Osbourne regarding the access culvert at 7660 Malden Rd. The owner had recently purchased this property and would like to enclose the portion of drain in front of their property. This was brought to our attention to incorporate into the drainage report. On July 23rd, 2019, Peter Marra received further feedback from the owner that the headwall on their property is deteriorating. We provided two options and estimates for the homeowner with regards to extending their culvert. Both options would result in approximately 1.3m of extra driveway width. The first option would be to use a sloped end quarried limestone endwall and would require 4.0 metres of corrugated steel pipe extension. The second option would be to extend the pipe 2.0 metres and utilize a concrete jute bag end wall. It was noted that there is a hydro pole located approximately 1.10 metres north of the existing north end of the pipe.

A Ministry of Natural Resources & Forestry (M.N.R.F.) Species at Risk review of the former 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. 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. The Town provided a copy of their Species at Risk Mitigation Plan for Drainage Works and the necessary mitigation requirements will be set out in the report specifications and Appendices.

IV. FIELD SURVEY AND INVESTIGATIONS

Subsequent to the on-site meeting we arranged for a topographic survey of the drain and bridges to be completed. In addition, the culverts in the open drain were inspected. We further arranged to get updated assessment roll information from the Town and obtained information on the tax class of each of the properties affected by the Municipal Drain.

We reviewed the E.R.C.A. and D.F.O. Species at Risk mapping for fish and mussels and the Town made initial submissions to the Essex Region Conservation Authority (E.R.C.A.) regarding their requirements or any D.F.O. (Department of Fisheries and Oceans) requirements that they were aware of for work that would be proposed to be carried out on the Bessette Drain. A response from the Conservation Authority was received by email on October 13th, 2016, and indicated that the Town must apply for a permit and follow standard mitigation requirements. In addition, it was noted that the portion of the Bessette Drain south of Martin Lane to the Canard River has a 1:100 year floodplain area. Therefore, no excavated material can be placed alongside the drain in this area. All material generated from the cleanout of this section will be required to be removed from the floodplain area. We also reviewed the Town maps for fish and mussel species at risk for this Class F drain and find that there are species at risk indicated in the vicinity of this project. The Pugnose Minnow, Silver Lamprey, Spotted Sucker, and Pugnose Shiner were all indicated on the mapping as potentially present in this area. A copy of the concerns and requirements to satisfy E.R.C.A. and D.F.O. is included in **Appendix "REI-A"** of this report.

The Ministry of Natural Resources & Forestry (M.N.R.F.) Species at Risk former Town agreement with M.N.R.F. pursuant to Section 23 of the "Endangered Species Act, 2007" expired as of June 30th, 2015. The former agreements are replaced with new regulation provisions under Ontario Regulation 242/08 administered by the Ministry of Environment, Conservation and Parks (M.E.C.P.). Section 23.9 allows repairs, maintenance, and improvements to be conducted by the Town within existing municipal drains. These works are exempt from Sections 9 and 10 of the

Endangered Species Act provided that the rules in the regulations are followed. When eligible, the new regulations allow Municipalities to give notice to M.N.R.F. by registering their drainage activities through an online registry system.

V. BRIDGE REVIEWS

As part of our investigations, we made detailed inspections of all of the bridges along the open drain. Their condition and proposed work if any are summarized as follows:

1. This bridge serves the road crossing for Snake Lane owned by the Town of LaSalle. It is composed of two adjacent 900mm diameter corrugated steel pipes. The headwall contains poured concrete with quarried limestone enclosed in wire baskets. This structure was found to be in fair condition. The headwall and roadway are in good condition. The steel pipes have significant rust throughout except along the top of the pipe. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
2. This bridge serves parcels 170-13500, 170-13700 and 170-11800 owned by Lorne & Dawn Rocheleau, Ryan & Andrea McLeod, and Kenneth & Darlene Rocheleau, respectively. The structure consists of a 1200mm diameter corrugated steel pipe with staked concrete pieces headwall on the upstream end and rip rap and concrete pieces headwall downstream. The downstream section of pipe is rusted and bent. The upstream section of pipe is in good condition. Overall, the structure is in fair condition. Both headwalls have pieces falling into the drain. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
3. This bridge serves parcel 170-12550 owned by Gerard and Kellie-Ann Drouillard. The bridge consists of a 1200mm diameter corrugated steel pipe with quarried limestone endwalls and a gravel driveway. The structure is found to be in good condition. The pipe shows minimal rusting at the spring line. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
4. This bridge serves the road crossing for Kelly Road owned by the Town of LaSalle. It is composed of a 900mm diameter corrugated steel pipe with quarried limestone end walls and asphalt roadway. The headwall on the upstream end is missing some rip rap on the west bank. The structure is found to be in good condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
5. This bridge serves parcel 180-00600 owned by Jeffrey Wiles & Tina Matuzich-Wiles. It is composed of a 900mm diameter corrugated steel pipe with stacked concrete pieces headwalls and an asphalt driveway. There is minimal rusting on the steel pipe. The structure is found to be in good condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
6. This secondary bridge serves parcel 180-00700 owned by Stephen & Sandra Pukay. It consists of a 900mm diameter corrugated steel pipe with stacked concrete pieces headwalls and a gravel driveway. The bridge is in good condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act. As this is a second access to the parcel, all future costs for work to the bridge will be borne 100% by the owners of the parcel.
7. This primary bridge serves parcel 180-00700 owned by Stephen & Sandra Pukay. It consists of a 900mm diameter corrugated steel pipe with concrete stacked pieces

headwalls and an asphalt driveway. The steel pipe has significant rust along the spring line with areas flaking off. The bridge is found to be in fair condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.

8. This bridge serves parcel 180-00750 owned by John Robert. This structure contains a 900mm diameter corrugated steel pipe with poured concrete headwalls and a gravel driveway. It has been found to be in fair condition as the steel pipe is showing initial signs of corrosion along the spring line of the pipe. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
9. This bridge serves parcel 180-00900 and is owned by David Chaborek. It consists of a 900mm diameter corrugated steel pipe with a poured concrete headwall upstream and a stacked concrete pieces headwall at the downstream end. The driveway is composed of asphalt. The poured concrete headwall is cracked and broken on the east bank. The steel pipe shows initial signs of corrosion. Overall, the structure is found to be in fair condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
10. This bridge serves parcel 180-01000 owned by Marc & Rosaire Bondy. It contains a 900mm diameter corrugated steel pipe with poured concrete headwalls and an asphalt driveway. It is found to be in good condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
11. This bridge serves parcel 180-01100 owned by Ingratta Group Inc. It is composed of a 900mm diameter corrugated steel pipe with quarried limestone endwalls and a gravel driveway. The steel pipe has significant rusting throughout and is bent inwards on the upstream end. It is found to be in poor condition and should be replaced in coordination with the Owners. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
12. This bridge serves parcel 180-01200 owned by Ingratta Group Inc. The bridge consists of a 900mm diameter corrugated steel pipe with stacked concrete piece headwalls and a gravel driveway. The downstream obvert of the pipe has rusted through. The headwalls show cracking and pieces have broken off. The structure is found to be in fair condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
13. This bridge serves parcel 180-01300 owned by Lori Boow & Justin Pare. It consists of a 900mm diameter corrugated steel pipe with stacked concrete pieces on the downstream end. On the upstream end there is a concrete box culvert abutting the steel pipe. The steel pipe and headwall are in good condition. The concrete box culvert shows deterioration in the joints and spalling on the soffit. The connection between the concrete box culvert and the steel pipe may require attention in the near future for repair due to this deterioration. The structure is in satisfactory condition. The report will provide the Town with the details needed for future work on the replacement bridge pursuant to the maintenance provisions of the Drainage Act.
14. This bridge serves parcels 180-01400 & 180-01500 owned by Karen & Fraser Lumley and Douglas & Isabella Turgeon, respectively. The bridge consists of a 900mm diameter corrugated steel pipe with concrete pieces headwalls. The driveway serving parcel 180-01400 is gravel and the driveway serving parcel 180-01500 is asphalt. The steel pipe has rusting along the spring line. The structure is in fair condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.

15. This bridge serves parcel 180-01600 & 180-01700 owned by Lloyd Johnstone and Linda Wiley, respectively. The structure consists of a 900mm diameter corrugated steel pipe with concrete stacked pieces headwalls. There is a concrete cap on the upstream east bank portion of the headwall. The driveway for the bridge is asphalt. The obvert of the pipe on the upstream end is bent in and there is rust on the spring line of the pipe. The structure is in fair condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
16. This bridge serves parcel 180-01800 owned by Kent Johnson and Janice Imeson-Johnson. The structure consists of a 900mm diameter corrugated steel pipe with large stacked concrete pieces headwalls and a gravel driveway. The pipe has rusting along the spring line. The headwalls are in fair condition but do not provide cover over the pipe. The structure is in fair condition. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.
17. This bridge serves parcel 180-01900 owned by Robert Papp and Luciana Souza Da Silva. It is composed of a 900mm diameter corrugated steel pipe with stacked concrete pieces headwall on the upstream end and a gravel driveway. The steel pipe is rusted throughout and corroded through. The connection joint between the pipes has collapsed allowing soil and granular materials to pass through. In addition, there is no headwall protection on the downstream end of the pipe. This structure is found to be in poor condition and should be replaced in coordination with the Owners. The report will provide the Town with the details needed for future work on the bridge pursuant to the maintenance provisions of the Drainage Act.

VI. FINDINGS AND RECOMMENDATIONS

Upon examination of the enclosed portion of the drain, we recommend that the watershed be separated into two sections: Bessette Drain North Portion and Bessette Drain South Portion. The Bessette Drain North Portion outlets into the Marentette Drain by means of a 750mm diameter pipe going west from Maintenance Hole 26 as shown in the included drawings for the Southwest Quadrant Watermain Replacement prepared by Stantec. The break point between the two sections in the watershed occurs at Maintenance Hole 32 just north of Meagan Street. The remaining portion of the drain south of maintenance hole 32 is included in Bessette Drain South Portion. This portion of the drain outlets into the north branch of the Canard River. Bessette Drain South Portion is composed of both open and closed portions of drain. The open portion of the drain contains seventeen access culverts that were reviewed on site to assess their condition.

As mentioned above, the Town of LaSalle retained Stantec Consulting Ltd. in 2010 to prepare the design for the Southwest Quadrant Watermain Replacement which included upgrades to the enclosed storm sewer on Malden Road. We recommend that the enclosed portion of storm sewer from approximately Station 0+078.4 to 1+461.3 in that report be incorporated in this drainage report and established as the enclosed portion of the Bessette Drain. These plans prepared by Stantec are included below in this report. Adoption of this portion of the enclosed storm sewer as part of the municipal drain allows the Town of LaSalle to conduct maintenance work on it under the Drainage Act.

In order to properly assess any maintenance works to the Bessette Drain, it will be necessary to vary the Schedule of Assessment within the current governing Engineer's Report dated December 31st, 1945 prepared by W.J. Fletcher, C.E. We recommend that the current Maintenance Schedule of Assessment be varied and same has been prepared and provided within this report. A separate Schedule of Assessment for the Bessette Drain North Portion and for the Bessette Drain South Portion has been included.

In order to establish the new Maintenance Schedule of Assessment for the Bessette Drain North Portion, an estimated value of $10,000.00 has been utilized as a basis for the future cost sharing of maintenance works. An estimated value of $100,000.00 was utilized as a basis for future cost sharing for maintenance works for the Bessette Drain South Portion as it contains a significantly greater area within the watershed. This amount was distributed amongst the lands and roads affected within the watershed. The amount utilized in the Maintenance Schedule of Assessment does not authorize expenditure of this amount but only provides an arbitrary value for the purpose of establishing a relative distribution of cost amongst the property owners and roads affected by the maintenance work.

The pipe sizing is based on minimum conveyance of a 1:2 year storm event corresponding to the capacity of upstream pipe culverts in the drain, plus an allowance for embedment of the pipe below the existing drain bottom. Included below in this report, is a summary table of the bridge design for all access culverts on the open drain for future maintenance and replacement as required. All new headwalls are to match the existing treatments. The pipe lengths are calculated based on the slope required for the headwall as shown in the details in **"Appendix "REI-C"**. Full restoration of all areas affected by the construction of this work including grading, topsoil, and seeding shall be required. Accordingly, we find that no allowances are necessary pursuant to Sections 29 and 30 of the Drainage Act for the construction work provided in this report.

Furthermore, we recommend that the entire length of the drain and all the bridge culverts be cleaned to the design grade shown on the profile in the attached drawings in **Appendix "REI-E"**. Based on our detailed survey, investigations, and discussions with the affected Owners and governing authorities, we recommend the following actions:

a) During the on-site meeting, a concern was brought forward regarding bank stability and erosion. We recommend that the Town of LaSalle assess the drain banks while conducting the drain cleaning work. In areas where the bank has eroded or there are washouts in the bank, quarried limestone shall be placed along the bank to stabilize it. This work can be conducted at the time of the drain cleaning or as the need arises. The costs for the associated work are to be included under maintenance works and distributed as a part of the updated Schedule of Assessment provided within this report.

b) The Owners for parcel 180-02400 expressed that their property experiences flooding along the south side of their lot. It is recommended that an offset catchbasin be installed at the right-of-way limit along the south property line for this parcel and be connected to the enclosed portion of the drain. This work is to be completed by the Town of LaSalle in coordination with the owner and the details can be found in the Specifications and in **Appendix "REI-C".** The costs for the associated work are to be included under maintenance works and distributed as a part of the updated Construction Schedule of Assessment provided within this report.

c) The owner of parcel 180-01700 has expressed the need to extend their culvert north to provider a greater driveway width. This is Bridge No. 15 and currently serves two parcels. Upon discussions with the owner, we recommend that 4 metres of 2.0mm thick aluminized corrugated Hel-Cor pipe with annular ends and 68mmx13mm corrugation profile be added to the north end of this bridge. The existing upstream end of the pipe will need to be cut back since it is bent. A 9 corrugation wide aluminized bolted coupler is to be used to join these sections of pipe. The upstream concrete pieces headwall will be removed, and new quarried limestone rip rap on filter cloth endwall shall be installed on the north end of this extended pipe. The work associated with this bridge extension shall follow the specifications provided in **Appendix "REI-C"**. The costs associated with

this bridge work shall be proportioned according to the bridge cost sharing included in this report.

During the course of our investigations, this drainage project was discussed and reviewed with E.R.C.A., to deal with any Authority and D.F.O. issues and comments related to this Municipal drain. In the interest of fish habitat and migration, D.F.O. requires that the invert of a new bridge culvert 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 culvert. Therefore, based on this, we have made provisions to set the inverts of the proposed culverts required for these bridge installations, at 10% of their diameter below the existing or design drain bottom, whichever is lower at the time of construction. To prevent flooding and adverse impacts upstream, the new structure needs to provide an equivalent level of service. Therefore, based on this, we have made provisions to use aluminized Ultra Flo smoothwall aluminized steel pipes for each access replacement as set out in this report.

The D.F.O. Species at Risk screening maps show that there are Species at Risk Fish or Mussels identified in this area. The maps indicate that there may be Pugnose Minnow and Pugnose Shiner present which are classified as threatened in Ontario. In addition, there may be Silver Lamprey and Spotted Sucker present which are classified as species of special concern in Ontario. The D.F.O. maps show that there is no presence of any mussel species at risk. The drain is located within the Regulated Area and is under the jurisdiction of the E.R.C.A., and therefore all work has to comply with the current mitigation provisions of the E.R.C.A. and D.F.O. Details of these mitigation measures are included in the Specifications and **Appendix "REI-A"** forming part of this report.

As is now required under the new "Endangered Species Act, 2007" provincial legislation administered by the Ministry of Environment, Conservation and Parks (M.E.C.P.), we have reviewed the former M.N.R.F. agreement with the Town and their self-assessment. The M.N.R.F. mapping has basically confirmed that snake species including Butler's Garter Snake and Eastern Fox Snake are threatened and endangered, respectively. Because turtles and snakes are mobile and indicated as sensitive and endangered in the area, we have included herein a copy of the M.N.R.F. mitigation requirements for them in **Appendix "REI-B"**.

The Town of LaSalle retained Dillon Consulting to conduct a study and analysis of the area and provide a mitigation plan for all municipal drains in LaSalle. This report is titled "Species at Risk Mitigation Plan for Drainage Works December 2017" and this report, or any updates shall be followed during all maintenance and construction activities provided for within this report. This report will address all mitigation measures to protect Species at Risk along the Bessette Drain.

In addition, E.R.C.A. has indicated that the portion of the Bessette Drain south of Martin Lane to the Canard River has a 1:100 year floodplain area. In this area, no fill and/or placement of woody material or debris should occur. All materials generated from the cleanout of this section of the drain will be required to be removed from the flood plain area and placed elsewhere or disposed of as directed by the Town of LaSalle.

Providing mitigation requirements are implemented it was concluded that present wildlife Species at Risk will be protected from negative impacts and will not contravene with Section 9 (species protection) or Section 10 (habitat protection) of the Endangered Species Act, 2007. Based on this information we find that the Town can proceed with the eligible repairs, maintenance, and improvements to the drain as they are exempt under Sections 9 and 10 of the Act, provided that they follow the rules within Ontario Regulation 242/08. To address these requirements the Town has established comprehensive mitigation measures as well as species

identification guides for reference. Copies of the measures, guides, and the Dillon Consulting "Species at Risk Mitigation Plan for Drainage Works December 2017" report shall be provided to the successful Tenderer for use during construction, and these documents are available for viewing by any interested parties at the Town office.

We would also recommend that the access bridges presently found in the drain be maintained by the Town and that said maintenance would include works to the bridge culvert, bedding, backfill and end treatment. When concrete or asphalt driveway surfaces over these bridge culverts require removal as part of the maintenance works, these surfaces shall be repaired or replaced as part of the work. Likewise, if any fencing, gate, decorative walls, guard rails or 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 the removal and restoration or replacement, if necessary, of any special features, shall be totally assessed to the benefiting adjoining owner(s) served by said access bridge. In addition, all costs beyond that required for a standard 6.1m (20') top width driveway are to be borne by the requesting parcel/owner(s).

Based on all of the above, we recommend that the drain be cleaned as shown on the profile in the attached plans in **Appendix ``REI-E``**, 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 2010".

VII. ALLOWANCES

Along the drain portion adjacent to the east side of Malden Road, all excavated materials shall be hauled away and disposed of by the Contractor to a site to be arranged by it in accordance with the Excess Soil regulations. The Contractor will be required to protect the roadway and adjacent lands and restore any damage caused to same during the progress of the work. We therefore find that no allowances are required for this reach of the drain.

We have provided that all of the open drain work will generally be completed from the northeast side of the drain for the open portions of the drain extending southeasterly from Malden Road to the Canard River. The Contractor will be required to restore any existing grassed and driveway areas damaged by the work. We recommend that any materials removed from the open drain or existing bridges, be spread on the adjacent agricultural lands to the northeast of the open drain for disposal by the Contractor, beyond the limits of any existing grass buffer or driveway access for the areas noted in the specifications. Based on all of the above we find that allowances for damages are payable pursuant to Sections 29 and 30 of the Drainage Act.

We find that the provision of access along the northeast bank of the open drain and disposal of excavated material on the abutting farm and non-residential lands requires payment for the land necessary to carry out same. We therefore recommend that the following owners be compensated for all work areas that will be impacted, including for the access to the drain and for damages to lands and crops, if any, as follows, namely:

1)	(170-121),	Owner,	Part of Lot 10, Concession 2,	$	360.00
2)	(170-12300),	Owners,	Part of Lots 10 & 11, Concession 2,	$	280.00
3)	(170-12500),	Owners,	Part of Lot 11, Concession 2,	$	100.00
TOTAL FOR ALLOWANCES AND DAMAGES				**$**	**740.00**

These values for allowances and damages are based on a strip of land parallel to and immediately adjacent to the drain or grassed buffer and driveway, for the parcels abutting the northeasterly side of the Municipal drain where fill can be spread, and are based on a value of $1,225.00 per acre ($3,027.00 per hectare) for the affected lands and crops, if any. These allowances provide for a spread depth of 150mm and are calculated using a rate per acre of $700.00 for year one, $350.00 for year two and $175.00 for the third year. The impact after 3 years is considered negligible.

We have provided for this in our estimate as is provided for under Sections 29 and 30 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010".

VIII. ESTIMATE OF COST

Our estimate of the Total Cost of this work, including all incidental expenses, is the sum of **TWO HUNDRED SEVENTY NINE THOUSAND DOLLARS ($279,000.00),** made up as follows:

CONSTRUCTION

Item 1)	**Station 0+000 to Station 2+069**; 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 2069 metres (approximately 1,550 cubic metres).	Lump Sum	$	67,525.00
Item 2)	**Station 0+000 to Station 2+069;** Brushing and grubbing including all disposal and clean up (approximately 2069 lineal metres), removing and replacing fences, complete.	Lump Sum	$	41,375.00

Item 3)	**Station 0+000 to Station 2+069;** 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: 2 required at $250.00 each	$	500.00
	b) 3.0 metres (10') of 200mm (8") diameter pipe for 200mm diameter tiles: 2 required at $300.00 each	$	600.00
	c) 3.0 metres (10') of 250mm (10") diameter pipe for 250mm diameter tiles: 2 required at $350.00 each	$	700.00
Item 4)	**Station 0+000 to Station 2+069;** Supply and install approximately 32 lateral tile drain extensions to outlet end of damaged existing 100mm diameter lateral tiles entering the drain, including excavation, rodent grate, backfill, compaction, topsoil placement and seed and mulch, complete at $150.00 each.	$	4,800.00
Item 5)	**Station 0+000 to Station 2+069;** Supply and install approximately 40 tonnes of quarried limestone rip rap for rock chute spillways and general erosion protection, complete at $80.00 per tonne.	$	3,200.00
Item 6)	**Station 0+000 to Station 2+069;** Supply and install approximately 80 square metres of synthetic filter mat for rock chute spillways and general erosion protection, complete at $5.00 per square metre.	$	400.00
Item 7)	**Station 2+475**; Supply and install standard 600mm square precast concrete offset catch basin with cast iron frame and grate, riser rings and 150mm connection to covered drain, including all labour, equipment, materials, excavation, backfill, compaction, restoration and clean up, complete. (Parcel 180-02400) Lump Sum	$	2,200.00
Item 8)	**Station 0+000 to Station 2+069;** Spread scavenged topsoil; carry out seeding and mulching on all newly excavated side slopes including all harrowing, raking, preparation and clean up, complete, approximately 3,100 square metres at $3.50 per square metre.	$	10,850.00

Item 9)	**Bridge No. 2**; Repair broken concrete pieces headwalls as required including restacking displaced pieces and grouting to secure in place, including all labour, equipment and materials, restoration, and clean up, complete. (Parcels 170-13500 & 170-11800)	Lump Sum	$	1,500.00
Item 10)	**Bridge No. 4**; Repair quarried limestone rip rap on filter cloth endwall protection along west bank on upstream end, including all labour, equipment, materials, restoration, and clean up, complete. (Kelly Road)	Lump Sum	$	1,500.00
Item 11)	**Bridge No. 11**; Excavate drain, completely remove and dispose of the existing pipe, sediment and all endwall materials, including any other deleterious material encountered; supply and install 12 metres of 1050mm diameter, Ultra Flo smooth wall 2.0mm thick aluminized steel pipe including Granular 'B' backfill, Granular 'A' travel surface; excavation, placement, compaction, grading; 305mm thick quarried limestone on filter cloth sloped end protection; topsoil placement, seeding and mulching, and restoration and clean up, complete. (Parcel 180-01100)	Lump Sum	$	27,200.00
Item 12)	**Bridge No. 15**; Excavate drain, completely remove and dispose of the existing sediment and all endwall materials on north end, including any other deleterious material encountered; supply and install 4 metres of 900mm diameter, 2.0mm thick corrugated aluminized steel pipe to match existing including Granular 'B' backfill, Granular 'A' travel surface; excavation, placement, compaction, grading; 305mm thick quarried limestone on filter cloth sloped end protection; topsoil placement, seeding and mulching, and restoration and clean up, complete. (Parcel 180-01700)	Lump Sum	$	11,250.00
Item 13)	**Bridge No. 17**; Excavate drain, completely remove and dispose of the existing pipe, sediment and all endwall materials, including any other deleterious material encountered; supply and install 12 metres of 1050mm diameter, Ultra Flo smooth wall 2.0mm thick aluminized steel pipe including Granular 'B' backfill, Granular 'A' travel surface; excavation, placement, compaction, grading; 305mm thick quarried limestone on filter cloth			

	sloped end protection; topsoil placement, seeding and mulching, and restoration and clean up, complete. (Parcel 180-01900)	Lump Sum	$	20,100.00
Item 14)	Estimated net Harmonized Sales Tax (1.76% H.S.T.) on construction items above.	Lump Sum	$	3,410.00
Item 15)	Contingency amount for construction.	Lump Sum	$	2,890.00
	TOTAL FOR CONSTRUCTION		**$**	**200,000.00**

INCIDENTALS

1)	Report, Estimate, & Specifications	$	18,000.00
2)	Survey, Assistants, Expenses, and Drawings	$	46,500.00
3)	Duplication Cost of Report and Drawings	$	1,500.00
4)	Estimated Cost of Letting Contract	$	1,000.00
5)	Estimated Cost of Layout and Staking	$	1,200.00
6)	Estimated Cost of Part-Time Supervision and Inspection During Construction (based on 5 day duration)	$	4,500.00
7)	Net H.S.T. on Incidental Items Above (1.76%)	$	1,280.00
8)	Estimated Cost of Interim Financing	$	2,000.00
9)	Estimated Cost of E.R.C.A. Permit	$	800.00
10)	Contingency Allowance	$	1,480.00
	TOTAL FOR INCIDENTALS	**$**	**78,260.00**
	TOTAL FOR ALLOWANCES (brought forward)	**$**	**740.00**

TOTAL FOR CONSTRUCTION (brought forward)	**$**	**200,000.00**
TOTAL ESTIMATE	**$**	**279,000.00**

IX. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the maintenance of the drain. The design drawings include a profile and cross sections to provide the determined design grade for maintenance works. A watershed plan is included detailing the location of the drain and the affected parcels. The open drain design drawings are attached to the back of this report and are included in **Appendix "REI-E"**. The plans for the covered drain portions are attached in **Appendix "REI-F"** of the report.

Also attached, we have prepared Specifications which set out the required construction details for the drain repair and improvements, which also include Standard Specifications labelled therein as **Appendix "REI-C".**

X. SCHEDULE OF ASSESSMENT AND MAINTENANCE WORKS

We have prepared a Construction Schedule of Assessment to be utilized for assessing costs against the affected lands and roads for maintenance works conducted to the Bessette Drain as outlined above in the report, and the same has been attached herein. A Maintenance Schedule of Assessment has been provided for the Bessette Drain North Portion and the Bessette Drain South Portion. As previously mentioned, the assessment proportions as outlined within the Maintenance Schedule of Assessment has been established on the basis of an assumed future maintenance cost of $10,000.00 for the North Portion of the drain and $100,000.00 for the South Portion of the drain. It should be understood that the actual maintenance charges outlined in the attached Maintenance Schedule of Assessment should not be made until such time that maintenance works have been conducted and expended. Therefore, for the purposes of future maintenance on the entire length of the drain, all actual costs shall be levied against the lands and roads within the watershed in accordance with the attached Maintenance Schedules of Assessment on a pro-rata basis. The physical dimensions which control the extent of maintenance works permitted on this drain shall be limited to that which has been set out in the attached specifications and the plans in **Appendix "REI-E"**.

When any works of maintenance are required to the existing access bridges, the Town of LaSalle current policy shall be followed. This policy indicates that the owner is responsible for their share of the bridge work as set out in the Bridge Sharing Table below assessed as a Benefit to the parcel owners served by the bridge. The balance of the cost will be assessed as Outlet Liability to all upstream lands and roads proportional to the Outlet Liability assessments in the Schedule of Assessment. The current bridge replacement policy may be updated from time to time and the current Town policy at the time of the work will apply as regards to cost sharing. The Town of LaSalle allows that owners may debenture the cost of $5,000.00 or greater for the drainage work over a 5 year period to reduce the immediate cost burden of their assessment for the work.

The Drainage Act permits that each parcel is entitled to one access culvert to be cost shared in accordance with the Drainage Act and Town policy. Therefore, for a second access to a parcel, all construction and future maintenance costs for work to the bridge will be borne 100% by the owner(s) of the parcel.

When any works of maintenance are required to the existing access bridges, the following provisions shall apply as set out in the Table below. In said table the parcel class has been noted as: "G" - grantable assessment and "NG" - non-grantable assessment.

Included in the table is a summary of the bridge design for all access culverts. All pipe lengths are calculated based on the slope required to match each existing headwall treatment and to provide a minimum of 6.1m top width or match existing width if greater. All pipes are to be 2.0mm thick aluminized Ultra Flo smoothwall steel pipe with hugger band couplers.

Bessette Drain Bridge Cost Sharing Table

Bridge No.	Roll No.	Pipe Dia. & Inverts	Pipe Length & Grade	Owners	Class	% to Abutting Owners	% to Upstream Owners
1	Snake Lane	900mm(x2)	11.0 m	Town of LaSalle	NG	98.0%	2.0%
	Upstream	173.766	0.11%				
	Downstream	173.754					
2	170-13500	1200mm	10.0 m		NG	19.0%	62.0%
	170-11800		0.11%		NG	19.0%	
	Upstream	174.189					
	Downstream	174.173					
3	170-12550	1200mm	16.0 m		NG	45.4%	54.6%
	Upstream	175.344	0.08%				
	Downstream	175.316					
4	Kelly Road	1200mm	27.0 m	Town of LaSalle	NG	98.0%	2.0%
	Upstream	175.585	0.08%				
	Downstream	175.563					
5	180-00600	1050mm	8.0 m		NG	48.3%	51.7%
	Upstream	175.687	0.08%				
	Downstream	175.681					
6	180-00700	1050mm	8.0 m		NG	48.9%	51.1%
	Upstream	175.716	0.08%				
	Downstream	175.710					
7	180-00700	1050mm	8.0 m		NG	100.0%	0.0%
	Upstream	175.766	0.08%				
	Downstream	175.760					
8	180-00750	1050mm	7.0 m		NG	49.8%	50.2%
	Upstream	175.802	0.08%				
	Downstream	175.796					
9	180-00900	1050mm	7.0 m		G	50.4%	49.6%
	Upstream	175.846	0.08%				
	Downstream	175.840					
10	180-01000	1050mm	9.0 m		G	54.5%	45.5%
	Upstream	175.905	0.08%				
	Downstream	175.897					

11	180-01100	1050mm	12.0 m	G	50.7%	49.3%
	Upstream	175.934	0.08%			
	Downstream	175.924				
12	180-01200	1050mm	8.0 m	G	53.7%	46.3%
	Upstream	175.981	0.04%			
	Downstream	175.977				
13	180-01300	1050mm	12.0 m	NG	54.6%	45.4%
	Upstream	176.000	0.04%			
	Downstream	175.996				
14	180-01400	1050mm	15.0 m	G	27.5%	45.0%
	180-01500		0.04%			
	Upstream	176.015		NG	27.5%	
	Downstream	176.009				
15	180-01600	1050mm	12.0 m	NG	28.0%	44.0%
	180-01700		0.04%	NG	28.0%	
	Upstream	176.031				
	Downstream	176.027				
16	180-01800	1050mm	8.0m	G	56.8%	43.2%
	Upstream	176.045	0.04%			
	Downstream	176.041				
17	180-01900	1050mm	8.0m	NG	57.7%	42.3%
	Upstream	176.066	0.04%			
	Downstream	176.062				

XI. FUTURE MAINTENANCE

On September 22nd, 2005, the Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A.) issued Administrative Policies for the Agricultural Drainage Infrastructure Program (A.D.I.P.). This program has re-instated financial assistance for eligible costs and assessed lands pursuant to the Drainage Act. Sections 85 to 90 of the Drainage Act allow the Minister to provide grants for various activities under said Act. Sections 85 and 87 make it very clear that grants are provided at the discretion of the Minister. Based on the current A.D.I.P., “lands used for agricultural purposes” may be eligible for a grant in the amount of 1/3 of their total assessment. The new policies define “lands used for agricultural purposes” as those lands eligible for the “Farm Property Class Tax Rate”. The Town provides this information to the Engineer from the current property tax roll. Properties that do not meet the criteria are not eligible for grants. In accordance with same we expect that this project will be qualified for the grant normally available for agricultural lands. The Ministry, however, is continually reviewing their policy for grants, and we recommend that the Town monitor the policies, and make application to the Ministry for any grant should same become available through the A.D.I.P. program or other available funds.

We recommend that an application be made by the Town of LaSalle, on completion of any maintenance work, to the Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A.) in accordance with Section 88 of the "Drainage Act R.S.O. 1990, Chapter D.17, as amended 2021", for this grant.

The above provisions for the future maintenance of this drain and access bridges, being repaired, improved, and 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.

Rood Engineering Inc.

Gerard Rood

Gerard Rood, P.Eng.

att.

Rood Engineering Inc.
Consulting Engineers
9 Nelson Street
LEAMINGTON, Ontario N8H 1G6

CONSTRUCTION SCHEDULE OF ASSESSMENT
BESSETTE DRAIN SOUTH PORTION
(Geographic Township of Sandwich West)
TOWN OF LASALLE

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		County Road 3 - Malden Rd.	4.09	10.10		County of Essex	$ 5,138.00	$ 11,468.00	$ 16,606.00
		Kelly Road	0.51	1.27	4	Town of LaSalle	$ 2,528.00	$ 1,430.00	$ 3,958.00
		Snake Lane	0.14	0.36	1	Town of LaSalle	$ 182.00	$ 233.00	$ 415.00
		Martin Lane	0.41	1.00		Town of LaSalle	$ 511.00	$ 944.00	$ 1,455.00
		Kinsman Place	0.25	0.62		Town of LaSalle	$ 316.00	$ 818.00	$ 1,134.00
		Springdale Avenue	0.25	0.62		Town of LaSalle	$ 316.00	$ 818.00	$ 1,134.00
		Victory Street	0.25	0.62		Town of LaSalle	$ 316.00	$ 1,011.00	$ 1,327.00
		Agler Avenue	0.15	0.37		Town of LaSalle	$ 190.00	$ 817.00	$ 1,007.00
		Pitkin Avenue	0.15	0.37		Town of LaSalle	$ 190.00	$ 817.00	$ 1,007.00
		Dow Boulevard	0.15	0.37		Town of LaSalle	$ 190.00	$ 817.00	$ 1,007.00
		Nomaka Avenue	0.15	0.37		Town of LaSalle	$ 190.00	$ 817.00	$ 1,007.00
		Meagan Drive	0.09	0.22		Town of LaSalle	$ 111.00	$ 478.00	$ 589.00
		Manor Street	0.17	0.43		Town of LaSalle	$ 217.00	$ 936.00	$ 1,153.00
		Total on Municipal Lands.....					**$ 10,395.00**	**$ 21,404.00**	**$ 31,799.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-15300	676	302 TO 304	0.11	0.28			$ 71.00	$ 502.00	$ 573.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-15400	676	300 & 301	0.10	0.24			$ 61.00	$ 451.00	$ 512.00
130-15500	676	296 TO 299	0.08	0.21			$ 53.00	$ 345.00	$ 398.00
130-19700	676	6 TO 12	0.09	0.22			$ 55.00	$ 302.00	$ 357.00
130-19800	676	4 & 5	0.09	0.22			$ 56.00	$ 423.00	$ 479.00
130-19900	676	1, 2 & PT LOT 3	0.13	0.31			$ 79.00	$ 542.00	$ 621.00
130-20000	1	PT LOT 28	0.13	0.33			$ 84.00	$ 563.00	$ 647.00
130-20200	1	PT LOT 28	5.26	13.00			$ 3,306.00	$ 5,684.00	$ 8,990.00
130-20300	1	PT LOT 28	0.15	0.37			$ 93.00	$ 611.00	$ 704.00
130-20500	780	133 TO 137	0.15	0.37			$ 94.00	$ 615.00	$ 709.00
130-20600	780	132	0.03	0.07			$ 17.00	$ 166.00	$ 183.00
130-20700	780	131	0.03	0.07			$ 17.00	$ 166.00	$ 183.00
130-21000	780	LOT G	0.08	0.21			$ 53.00	$ 406.00	$ 459.00
130-22500	780	145 TO 150	0.05	0.12			$ 31.00	$ 205.00	$ 236.00
130-22600	780	PT LOT 139 TO 144	0.15	0.37			$ 94.00	$ 615.00	$ 709.00
130-22700	780	LOT H	0.02	0.06			$ 15.00	$ 109.00	$ 124.00
130-22800	863	129 TO 134	0.21	0.52			$ 131.00	$ 766.00	$ 897.00
130-23700	863	PT LOT 137 TO 142	0.20	0.49			$ 125.00	$ 750.00	$ 875.00
130-23800	1	PT LOT 25	0.86	2.13			$ 542.00	$ 2,045.00	$ 2,587.00
130-34600	1064	123	0.06	0.14			$ 36.00	$ 147.00	$ 183.00
130-34700	1064	125	0.07	0.17			$ 43.00	$ 165.00	$ 208.00
130-34800	1064	118 TO 122	0.14	0.36			$ 91.00	$ 289.00	$ 380.00
130-34900	1064	114 TO 117	0.12	0.29			$ 73.00	$ 236.00	$ 309.00
130-36900	1064	129 TO 137	0.26	0.64			$ 163.00	$ 436.00	$ 599.00
130-37000	1064	126 & 127	0.09	0.22			$ 56.00	$ 200.00	$ 256.00
130-37100	1064	367	0.09	0.23			$ 58.00	$ 209.00	$ 267.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-37200	1064	369 & 370	0.10	0.24			$ 61.00	$ 213.00	$ 274.00
130-37300	1064	357 TO 366	0.28	0.70			$ 178.00	$ 478.00	$ 656.00
130-38900	1064	374 TO 385	0.26	0.64			$ 164.00	$ 413.00	$ 577.00
130-39000	1064	371 & 372	0.09	0.22			$ 56.00	$ 200.00	$ 256.00
130-39100	1064	610	0.09	0.22			$ 56.00	$ 200.00	$ 256.00
130-39200	1064	612 & 613	0.20	0.49			$ 125.00	$ 357.00	$ 482.00
130-39300	1064	603 TO 609	0.20	0.50			$ 127.00	$ 353.00	$ 480.00
130-41700	1064	623 TO 625	0.09	0.21			$ 55.00	$ 195.00	$ 250.00
130-41800	1064	617 TO 622	0.17	0.43			$ 109.00	$ 328.00	$ 437.00
130-41900	1064	614 TO 616	0.14	0.34			$ 86.00	$ 274.00	$ 360.00
130-42000	1	PT LOT 20	0.27	0.66			$ 168.00	$ 451.00	$ 619.00
130-42300	1	PT LOT 20	0.35	0.87			$ 221.00	$ 556.00	$ 777.00
130-42400	1	PT LOT 19	0.22	0.55			$ 140.00	$ 387.00	$ 527.00
130-42500	1	PT LOT 19	0.22	0.54			$ 137.00	$ 380.00	$ 517.00
130-42600	1	PT LOT 19	0.29	0.72			$ 183.00	$ 476.00	$ 659.00
130-42700	1	PT LOT 19	0.12	0.29			$ 74.00	$ 239.00	$ 313.00
130-42900	1	PT LOT 18 & 19	0.16	0.40			$ 102.00	$ 314.00	$ 416.00
130-43000	1	PT LOT 18 & 19	0.13	0.33			$ 83.00	$ 264.00	$ 347.00
130-43100	1	PT LOT 18	0.13	0.33			$ 83.00	$ 264.00	$ 347.00
130-43200	1	PT LOT 18	0.13	0.33			$ 83.00	$ 264.00	$ 347.00
130-43300	1	PT LOT 18	0.18	0.45			$ 114.00	$ 344.00	$ 458.00
130-43400	1	PT LOT 18	0.13	0.32			$ 81.00	$ 265.00	$ 346.00
130-43500	1	PT LOT 18	0.13	0.31			$ 79.00	$ 257.00	$ 336.00
130-43600	1	PT LOT 18	0.14	0.34			$ 86.00	$ 274.00	$ 360.00
130-43700	1	PT LOT 18	0.16	0.40			$ 102.00	$ 314.00	$ 416.00
130-43750	1	PT LOT 18	0.16	0.39			$ 99.00	$ 306.00	$ 405.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-43800	1	PT LOT 18	0.19	0.47			$ 120.00	$ 350.00	$ 470.00
160-09500	1	PT LOT 17	0.09	0.22			$ 56.00	$ 200.00	$ 256.00
160-09600	1	PT LOT 17	0.10	0.25			$ 64.00	$ 181.00	$ 245.00
160-09650	1	PT LOT 17	0.10	0.25			$ 64.00	$ 181.00	$ 245.00
160-09700	1	PT LOT 17	0.19	0.48			$ 122.00	$ 298.00	$ 420.00
170-04600	2	PT LOT 7	0.09	0.21			$ 54.00	$ 125.00	$ 179.00
170-04700	2	PT LOT 7	0.24	0.60			$ 153.00	$ 270.00	$ 423.00
170-04800	2	PT LOT 7	0.11	0.26			$ 66.00	$ 148.00	$ 214.00
170-04900	2	PT LOT 7	0.13	0.33			$ 84.00	$ 171.00	$ 255.00
170-05000	2	PT LOT 7	0.20	0.49			$ 125.00	$ 227.00	$ 352.00
170-05100	2	PT LOT 7	1.44	3.55			$ 903.00	$ 845.00	$ 1,748.00
170-05300	2	PT LOT 6 & 7	0.08	0.21			$ 53.00	$ 125.00	$ 178.00
170-05400	2	PT LOT 6 & 7	0.08	0.19			$ 48.00	$ 113.00	$ 161.00
170-05500	2	PT LOT 6	0.15	0.36			$ 92.00	$ 186.00	$ 278.00
170-10900	2	PT LOT 6 & 7	0.51	1.27			$ 323.00	$ 387.00	$ 710.00
170-11000	2	PT LOT 7	0.40	1.00			$ 254.00	$ 397.00	$ 651.00
170-11100	2	PT LOT 7 & 8	0.72	1.79			$ 455.00	$ 675.00	$ 1,130.00
170-11200	2	PT LOT 7 & 8	0.31	0.77			$ 197.00	$ 362.00	$ 559.00
170-11250	2	PT LOT 7 & 8	0.15	0.38			$ 97.00	$ 184.00	$ 281.00
170-11300	2	PT LOT 7 & 8	0.06	0.16			$ 40.00	$ 80.00	$ 120.00
170-11600	2	PT LOT 8	1.34	3.31			$ 841.00	$ 748.00	$ 1,589.00
170-11700	2	PT LOT 8 & 9	0.40	1.00			$ 254.00	$ 390.00	$ 644.00
170-11800	2	PT LOT 8 & 9	1.73	4.27	2		$ 1,450.50	$ 1,084.00	$ 2,534.50
170-11900	2	PT LOT 9	0.16	0.38			$ 98.00	$ 104.00	$ 202.00
170-12000	2	PT LOT 9	1.57	3.87			$ 985.00	$ 1,050.00	$ 2,035.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
170-12550	2	PT LOT 11	0.37	0.92	3		$ 234.00	$ 569.00	$ 803.00
170-12600	2	PT LOT 11	0.25	0.61			$ 156.00	$ 418.00	$ 574.00
170-12700	2	PT LOT 11	0.25	0.62			$ 158.00	$ 384.00	$ 542.00
170-12800	2	PT LOT 10 & 11	0.38	0.94			$ 239.00	$ 530.00	$ 769.00
170-12900	2	PT LOT 10	0.38	0.95			$ 242.00	$ 536.00	$ 778.00
170-13000	2	PT LOT 10	0.41	1.02			$ 259.00	$ 556.00	$ 815.00
170-13100	2	PT LOT 10	0.46	1.15			$ 292.00	$ 626.00	$ 918.00
170-13200	2	PT LOT 9 & 10	0.58	1.43			$ 365.00	$ 621.00	$ 986.00
170-13300	2	PT LOT 10	0.62	1.52			$ 388.00	$ 631.00	$ 1,019.00
170-13400	2	PT LOT 9	1.80	4.45			$ 1,131.00	$ 1,130.00	$ 2,261.00
170-13500	2	PT LOT 9	0.94	2.31	2		$ 953.50	$ 823.00	$ 1,776.50
170-13700	2	PT LOT 8 & 9	1.33	3.28			$ 834.00	$ 1,000.00	$ 1,834.00
170-14000	2	PT LOT 7 & 8	1.90	4.69			$ 1,192.00	$ 1,132.00	$ 2,324.00
170-14100	2	PT LOT 8	0.30	0.73			$ 187.00	$ 299.00	$ 486.00
170-14200	2	PT LOT 7 & 8	0.64	1.57			$ 399.00	$ 521.00	$ 920.00
170-14300	2	PT LOT 7	1.00	2.46			$ 627.00	$ 619.00	$ 1,246.00
180-00400	2	PT LOT 12 & 13	5.21	12.88			$ 3,277.00	$ 2,903.00	$ 6,180.00
180-00500	2	PT LOT 12	0.73	1.80			$ 458.00	$ 1,013.00	$ 1,471.00
180-00600	2	PT LOT 12 & 13	0.73	1.80	5		$ 458.00	$ 1,013.00	$ 1,471.00
180-00700	2	PT LOT 13	0.77	1.90	6 & 7		$ 483.00	$ 1,065.00	$ 1,548.00
180-00750	2	PT LOT 13	0.70	1.72	8		$ 437.00	$ 1,049.00	$ 1,486.00
180-01300	2	PT LOT 15	0.13	0.31	13		$ 79.00	$ 429.00	$ 508.00
180-01500	2	PT LOT 15	0.15	0.37	14		$ 93.00	$ 479.00	$ 572.00
180-01600	2	PT LOT 15 & 16	0.08	0.21	15		$ 4,085.50	$ 343.00	$ 4,428.50
180-01700	2	PT LOT 16	0.08	0.21	15		$ 4,085.50	$ 343.00	$ 4,428.50
180-01900	2	PT LOT 16	0.24	0.59	17		$ 15,001.00	$ 829.00	$ 15,830.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
180-02100	2	PT LOT 16	0.19	0.46			$ 117.00	$ 744.00	$ 861.00
180-02202	2	PT LOT 17	0.29	0.72			$ 183.00	$ 1,008.00	$ 1,191.00
180-02400	2	PT LOT 19	0.22	0.54			$ 137.00	$ 802.00	$ 939.00
180-02600	2	PT LOT 19	0.13	0.33			$ 84.00	$ 563.00	$ 647.00
180-02700	2	PT LOT 19 & 25	0.11	0.27			$ 69.00	$ 495.00	$ 564.00
180-02800	2	PT LOT 19 & 20	0.30	0.73			$ 186.00	$ 1,021.00	$ 1,207.00
180-02900	2	PT LOT 19 & 20	0.14	0.35			$ 89.00	$ 153.00	$ 242.00
180-03000	2	PT LOT 20	0.20	0.50			$ 127.00	$ 766.00	$ 893.00
180-03100	2	PT LOT 20	0.23	0.57			$ 145.00	$ 848.00	$ 993.00
180-03200	2	PT LOT 20	0.37	0.92			$ 234.00	$ 1,207.00	$ 1,441.00
180-03400	2	PT LOT 20	0.28	0.69			$ 174.00	$ 990.00	$ 1,164.00
180-06800	728	450 TO 452	0.12	0.30			$ 76.00	$ 524.00	$ 600.00
180-06900	2	PT LOT 21	0.69	1.70			$ 432.00	$ 1,859.00	$ 2,291.00
180-07000	2	PT LOT 22	0.47	1.16			$ 295.00	$ 1,470.00	$ 1,765.00
180-07020	2	PT LOT 22	0.07	0.18			$ 46.00	$ 369.00	$ 415.00
180-07050	2	PT LOT 22	0.07	0.18			$ 46.00	$ 369.00	$ 415.00
180-07070	2	PT LOT 22	0.08	0.21			$ 53.00	$ 412.00	$ 465.00
Total on Privately Owned - Non-Agricultural Lands.....							**$ 53,954.00**	**$ 67,656.00**	**$ 121,610.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

130-20100	1	PT LOT 28	3.52	8.69			$ 884.00	$ 4,179.00	$ 5,063.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-20400	839	829 TO 832	25.24	62.37			$ 6,345.00	$ 27,273.00	$ 33,618.00
130-23900	1	PT LOT 24 AND 25	1.37	3.39			$ 345.00	$ 1,482.00	$ 1,827.00
130-34300	1	PT LOT 23	0.57	1.41			$ 143.00	$ 559.00	$ 702.00
130-34400	1	PT LOT 23	0.65	1.59			$ 162.00	$ 635.00	$ 797.00
130-34500	1	PT LOT 22 & 23	2.39	5.91			$ 601.00	$ 2,028.00	$ 2,629.00
130-42100	1	PT LOT 20	0.79	1.95			$ 198.00	$ 403.00	$ 601.00
130-42200	1	PT LOT 20	0.78	1.93			$ 196.00	$ 399.00	$ 595.00
130-42800	1	PT LOT 19	0.60	1.48			$ 150.00	$ 305.00	$ 455.00
170-12100	2	PT LOT 10	5.05	12.48			$ 1,269.00	$ 2,347.00	$ 3,616.00
170-12300	2	PT LOT 10 & 11	3.10	7.67			$ 780.00	$ 1,442.00	$ 2,222.00
170-12500	2	PT LOT 11 & 12	8.63	21.34			$ 2,170.00	$ 4,410.00	$ 6,580.00
170-13800	2	PT LOT 8	1.34	3.31			$ 337.00	$ 954.00	$ 1,291.00
180-00200	2	PT LOT 12 & 13	2.03	5.02			$ 510.00	$ 1,129.00	$ 1,639.00
180-00900	2	PT LOT 14	2.22	5.50	9		$ 559.00	$ 1,442.00	$ 2,001.00
180-01000	2	PT LOT 14	2.33	5.76	10		$ 586.00	$ 1,513.00	$ 2,099.00
180-01100	2	PT LOTS 14 & 15	2.18	5.39	11		$ 18,207.00	$ 1,749.00	$ 19,956.00
180-01200	2	PT LOT 15	3.34	8.26	12		$ 841.00	$ 2,837.00	$ 3,678.00
180-01400	2	PT LOT 15	2.35	5.81	14		$ 591.00	$ 1,992.00	$ 2,583.00
180-01800	2	PT LOT 15 & 16	2.54	6.27	16		$ 637.00	$ 2,319.00	$ 2,956.00
180-02000	2	PT LOT 16	3.56	8.80			$ 896.00	$ 3,849.00	$ 4,745.00
180-02200	2	PT LOT 17	5.72	14.14			$ 1,439.00	$ 6,183.00	$ 7,622.00
180-02300	2	PT LOT 18	6.06	14.97			$ 1,523.00	$ 6,545.00	$ 8,068.00
180-02500	2	PT LOT 19	3.79	9.37			$ 953.00	$ 4,097.00	$ 5,050.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
Total on Privately Owned - Agricultural Lands (grantable).....							**$ 40,322.00**	**$ 80,071.00**	**$ 120,393.00**

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

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Hectares Afft'd	Acres Afft'd	Bridge No.	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-43900	1	PT LOT 18 & 19	2.77	6.85			$ 1,742.00	$ 1,982.00	$ 3,724.00
170-11400	2	PT LOT 8	1.13	2.80			$ 713.00	$ 761.00	$ 1,474.00
Total on Privately Owned - Agricultural Lands (non-grantable).....							**$ 2,455.00**	**$ 2,743.00**	**$ 5,198.00**
TOTAL ASSESSMENT			155.46	384.14			**$ 107,126.00**	**$ 171,874.00**	**$ 279,000.00**

1 Hectare = 2.471 Acres
Project No. REI2016D046
March 23rd, 2023

MAINTENANCE SCHEDULE OF ASSESSMENT
BESSETTE DRAIN - NORTH PORTION
Town of LaSalle

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		County Road 3 - Malden Road		1.91	0.775	County of Essex	$ 682.00	$ 2,427.00	$ 3,109.00
		Mike Raymond Drive		0.31	0.127	Town of Lasalle	$ 111.00	$ 371.00	$ 482.00
		Total on Municipal Lands.....					**$ 793.00**	**$ 2,798.00**	**$ 3,591.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
180-07198	2	PT LOT 23 & 24	24.01	0.24	0.098		$ 69.00	$ 51.00	$ 120.00
180-07200	2	PT LOT 23	0.46	0.46	0.186		$ 131.00	$ 364.00	$ 495.00
180-07300	2	PT LOT 23	0.27	0.27	0.110		$ 78.00	$ 240.00	$ 318.00
180-07400	2	PT LOT 23	0.31	0.31	0.124		$ 87.00	$ 263.00	$ 350.00
180-07500	2	PT LOT 23	0.31	0.31	0.125		$ 88.00	$ 266.00	$ 354.00
180-07700	2	PT LOT 23 & 24	24.01	13.90	5.623		$ 1,754.00	$ 3,018.00	$ 4,772.00
		Total on Privately Owned - Non-Agricultural Lands.....					**$ 2,207.00**	**$ 4,202.00**	**$ 6,409.00**
		TOTAL ASSESSMENT		17.71	7.17		**$ 3,000.00**	**$ 7,000.00**	**$ 10,000.00**

1 Hectare = 2.471 Acres
Project No.REI2016D046
March 23rd, 2023

MAINTENANCE SCHEDULE OF ASSESSMENT
BESSETTE DRAIN - SOUTH PORTION
Town of LaSalle

3. MUNICIPAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
	Malden Road (County Rd. 3)			10.83	4.383	County of Essex	$ 1,202.00	$ 4,302.00	$ 5,504.00
	Meagan Dr.			0.16	0.065	Town of LaSalle	$ 37.00	$ 71.00	$ 108.00
	Kelly Rd.			1.13	0.457	Town of LaSalle	$ 69.00	$ 418.00	$ 487.00
	Dow Blvd.			0.40	0.162	Town of LaSalle	$ 61.00	$ 172.00	$ 233.00
	Pitkin Ave.			0.35	0.142	Town of LaSalle	$ 53.00	$ 146.00	$ 199.00
	Agler Ave.			0.36	0.146	Town of LaSalle	$ 55.00	$ 151.00	$ 206.00
	Victory Street			0.64	0.259	Town of LaSalle	$ 98.00	$ 250.00	$ 348.00
	Springdale Ave			0.64	0.259	Town of LaSalle	$ 98.00	$ 251.00	$ 349.00
	Kinsman Place			0.63	0.255	Town of LaSalle	$ 96.00	$ 228.00	$ 324.00
	Snake Lane			0.33	0.134	Town of LaSalle	$ 50.00	$ 106.00	$ 156.00
	Canard Dr.			0.39	0.158	Town of LaSalle	$ 40.00	$ 125.00	$ 165.00
	Martin Lane			1.06	0.429	Town of LaSalle	$ 162.00	$ 384.00	$ 546.00
	Manor Street			0.38	0.154	Town of LaSalle	$ 82.00	$ 165.00	$ 247.00
	Nomaka Avenue			0.26	0.105	Town of LaSalle	$ 40.00	$ 112.00	$ 152.00
	Total on Municipal Lands.....						**$ 2,143.00**	**$ 6,881.00**	**$ 9,024.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-15300	676	302 TO 304	0.28	0.28	0.113		$ 34.00	$ 87.00	$ 121.00
130-15400	676	300 & 301	0.24	0.24	0.097		$ 29.00	$ 78.00	$ 107.00
130-15500	676	296 TO 299	0.21	0.21	0.084		$ 25.00	$ 71.00	$ 96.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-19700	676	6 TO 12	0.22	0.07	0.028		$ 9.00	$ 23.00	$ 32.00
130-19800	676	4 & 5	0.22	0.17	0.069		$ 21.00	$ 57.00	$ 78.00
130-19900	676	1, 2 & PT LOT 3	0.31	0.31	0.125		$ 38.00	$ 94.00	$ 132.00
130-20000	1	PT LOT 28	0.33	0.12	0.049		$ 15.00	$ 36.00	$ 51.00
130-20100	1	PT LOT 28	8.69	8.69	3.517		$ 1,062.00	$ 727.00	$ 1,789.00
130-20200	1	PT LOT 28	13.00	13.00	5.261		$ 1,589.00	$ 969.00	$ 2,558.00
130-20300	1	PT LOT 28	0.37	0.37	0.149		$ 45.00	$ 104.00	$ 149.00
130-21000	780	LOT G	0.21	0.21	0.085		$ 26.00	$ 67.00	$ 93.00
130-22500	780	145 TO 150	0.12	0.12	0.050		$ 15.00	$ 45.00	$ 60.00
130-22600	780	PT LOT 139 TO 144	0.37	0.37	0.150		$ 45.00	$ 100.00	$ 145.00
130-22700	780	LOT H	0.06	0.06	0.024		$ 7.00	$ 23.00	$ 30.00
130-22800	863	129 TO 134	0.52	0.52	0.208		$ 63.00	$ 125.00	$ 188.00
130-23700	863	PT LOT 137 TO 142	0.49	0.49	0.198		$ 60.00	$ 122.00	$ 182.00
130-23800	1	PT LOT 25	2.13	2.13	0.862		$ 260.00	$ 333.00	$ 593.00
130-23900	1	PT LOT 24 AND 25	3.39	3.39	1.373		$ 414.00	$ 459.00	$ 873.00
130-34300	1	PT LOT 23	1.41	0.64	0.259		$ 78.00	$ 118.00	$ 196.00
130-34400	1	PT LOT 23	1.59	0.65	0.263		$ 79.00	$ 111.00	$ 190.00
130-34500	1	PT LOT 22 & 23	5.91	5.91	2.390		$ 722.00	$ 584.00	$ 1,306.00
130-34600	1064	123	0.14	0.14	0.057		$ 17.00	$ 47.00	$ 64.00
130-34700	1064	118 to 122, 125, & Pt.124	0.57	0.57	0.231		$ 70.00	$ 128.00	$ 198.00
130-34900	1064	114 TO 117	0.29	0.29	0.116		$ 35.00	$ 76.00	$ 111.00
130-36900	1064	129 TO 137	0.64	0.64	0.259		$ 78.00	$ 139.00	$ 217.00
130-37000	1064	126 & 127	0.22	0.22	0.089		$ 27.00	$ 64.00	$ 91.00
130-37100	1064	367	0.23	0.23	0.093		$ 28.00	$ 67.00	$ 95.00
130-38900	1064	374 TO 385	0.64	0.64	0.261		$ 79.00	$ 140.00	$ 219.00
130-39000	1064	371 & 372	0.22	0.22	0.089		$ 27.00	$ 64.00	$ 91.00
130-39100	1064	610	0.22	0.22	0.089		$ 27.00	$ 64.00	$ 91.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-39200	1064	612 & 613	0.49	0.49	0.199		$ 60.00	$ 114.00	$ 174.00
130-39300	1064	603 TO 609	0.50	0.50	0.203		$ 61.00	$ 112.00	$ 173.00
130-41800	1064	617 TO 622	0.43	0.43	0.174		$ 53.00	$ 105.00	$ 158.00
130-41900	1064	614 TO 616	0.34	0.34	0.138		$ 42.00	$ 87.00	$ 129.00
130-42000	1	PT LOT 20	0.66	0.66	0.267		$ 81.00	$ 144.00	$ 225.00
130-42100	1	PT LOT 20	1.95	1.95	0.789		$ 238.00	$ 295.00	$ 533.00
130-42200	1	PT LOT 20	1.93	1.93	0.782		$ 236.00	$ 293.00	$ 529.00
130-42300	1	PT LOT 20	0.87	0.87	0.351		$ 106.00	$ 177.00	$ 283.00
130-42400	1	PT LOT 19	0.55	0.55	0.223		$ 67.00	$ 123.00	$ 190.00
130-42500	1	PT LOT 19	0.54	0.54	0.219		$ 66.00	$ 121.00	$ 187.00
130-42600	1	PT LOT 19	0.72	0.72	0.291		$ 88.00	$ 152.00	$ 240.00
130-42700	1	PT LOT 19	0.29	0.29	0.117		$ 35.00	$ 76.00	$ 111.00
130-42800	1	PT LOT 19	1.48	1.48	0.598		$ 181.00	$ 253.00	$ 434.00
130-43000	1	PT LOT 18 & 19	0.33	0.33	0.132		$ 40.00	$ 84.00	$ 124.00
130-43100	1	PT LOT 18	0.33	0.16	0.065		$ 20.00	$ 41.00	$ 61.00
130-43200	1	PT LOT 18	0.33	0.17	0.069		$ 21.00	$ 44.00	$ 65.00
130-43300	1	PT LOT 18	0.45	0.37	0.150		$ 45.00	$ 90.00	$ 135.00
130-43400	1	PT LOT 18	0.32	0.32	0.130		$ 12.00	$ 75.00	$ 87.00
130-43500	1	PT LOT 18	0.31	0.31	0.125		$ 31.00	$ 72.00	$ 103.00
130-43600	1	PT LOT 18	0.34	0.34	0.138		$ 21.00	$ 78.00	$ 99.00
130-43700	1	PT LOT 18	0.40	0.40	0.162		$ 24.00	$ 89.00	$ 113.00
130-43750	1	PT LOT 18	0.39	0.39	0.158		$ 55.00	$ 87.00	$ 142.00
130-43800	1	PT LOT 18	0.47	0.47	0.190		$ 287.00	$ 99.00	$ 386.00
130-43900	1	PT LOT 18 & 19	6.85	6.85	2.772		$ 837.00	$ 558.00	$ 1,395.00
160-09500	1	PT LOT 17	0.22	0.22	0.089		$ 27.00	$ 56.00	$ 83.00
160-09600	1	PT LOT 17	0.25	0.25	0.101		$ 31.00	$ 62.00	$ 93.00
160-09650	1	PT LOT 17	0.25	1.49	0.603		$ 176.00	$ 372.00	$ 548.00
160-09700	1	PT LOT 17	0.48	0.48	0.194		$ 59.00	$ 101.00	$ 160.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
170-04600	2	PT LOT 7	0.21	0.21	0.087		$ 200.00	$ 55.00	$ 255.00
170-04700	2	PT LOT 7	0.60	0.79	0.320		$ 54.00	$ 157.00	$ 211.00
170-04800	2	PT LOT 7	0.26	0.46	0.186		$ 29.00	$ 116.00	$ 145.00
170-04900	2	PT LOT 7	0.33	0.16	0.065		$ 7.00	$ 36.00	$ 43.00
170-05100	2	PT LOT 7	3.55	3.39	1.372		$ 251.00	$ 371.00	$ 622.00
170-05300	2	PT LOT 6 & 7	0.21	1.06	0.429		$ 35.00	$ 291.00	$ 326.00
170-05400	2	PT LOT 6 & 7	0.19	4.50	1.821		$ 339.00	$ 1,242.00	$ 1,581.00
170-05500	2	PT LOT 6	0.36	3.82	1.546		$ 217.00	$ 923.00	$ 1,140.00
170-10900	2	PT LOT 6 & 7	1.27	3.97	1.607		$ 276.00	$ 667.00	$ 943.00
170-11250	2	PT LOT 7 & 8	0.38	0.38	0.154		$ 46.00	$ 95.00	$ 141.00
170-11300	2	PT LOT 7 & 8	0.16	0.16	0.063		$ 19.00	$ 50.00	$ 69.00
170-11400	2	PT LOT 8	2.80	2.80	1.134		$ 342.00	$ 381.00	$ 723.00
170-11600	2	PT LOT 8	3.31	3.31	1.338		$ 107.00	$ 405.00	$ 512.00
170-11700	2	PT LOT 8 & 9	1.00	1.00	0.405		$ 101.00	$ 192.00	$ 293.00
170-11800	2	PT LOT 8 & 9	4.27	4.27	1.727		$ 325.00	$ 464.00	$ 789.00
170-11900	2	PT LOT 9	0.38	0.38	0.155		$ 99.00	$ 93.00	$ 192.00
170-12000	2	PT LOT 9	3.87	1.48	0.599		$ 152.00	$ 169.00	$ 321.00
170-12100	2	PT LOT 10	12.48	1.46	0.591		$ 148.00	$ 92.00	$ 240.00
170-12300	2	PT LOT 10 & 11	7.67	4.60	1.862		$ 418.00	$ 343.00	$ 761.00
170-12500	2	PT LOT 11 & 12	21.34	2.26	0.915		$ 162.00	$ 139.00	$ 301.00
170-12550	2	PT LOT 11	0.92	3.27	1.323		$ 228.00	$ 601.00	$ 829.00
170-12700	2	PT LOT 11	0.62	4.68	1.894		$ 365.00	$ 930.00	$ 1,295.00
170-12800	2	PT LOT 10 & 11	0.94	0.78	0.316		$ 53.00	$ 140.00	$ 193.00
170-12900	2	PT LOT 10	0.95	1.62	0.656		$ 112.00	$ 290.00	$ 402.00
170-13000	2	PT LOT 10	1.02	2.58	1.044		$ 194.00	$ 444.00	$ 638.00
170-13200	2	PT LOT 9 & 10	1.43	12.94	5.237		$ 355.00	$ 2,292.00	$ 2,647.00
170-13300	2	PT LOT 10	1.52	1.52	0.617		$ 184.00	$ 268.00	$ 452.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
170-13400	2	PT LOT 9	4.45	4.45	1.799		$ 182.00	$ 515.00	$ 697.00
170-13500	2	PT LOT 9	2.31	2.31	0.936		$ 192.00	$ 350.00	$ 542.00
170-13700	2	PT LOT 8 & 9	3.28	3.28	1.328		$ 181.00	$ 431.00	$ 612.00
170-14300	2	PT LOT 7	2.46	2.46	0.997		$ 301.00	$ 388.00	$ 689.00
180-00400	2	PT LOT 12 & 13	12.88	12.88	5.214		$ 1,574.00	$ 929.00	$ 2,503.00
180-00500	2	PT LOT 12	1.80	1.80	0.728		$ 220.00	$ 325.00	$ 545.00
180-00600	2	PT LOT 12 & 13	1.80	1.80	0.728		$ 220.00	$ 325.00	$ 545.00
180-00750	2	PT LOT 13	1.72	1.72	0.696		$ 210.00	$ 313.00	$ 523.00
180-01000	2	PT LOT 14	5.76	5.76	2.333		$ 1,057.00	$ 635.00	$ 1,692.00
180-01200	2	PT LOT 15	8.26	8.26	3.345		$ 1,515.00	$ 673.00	$ 2,188.00
180-01400	2	PT LOT 15	5.81	5.81	2.350		$ 91.00	$ 664.00	$ 755.00
180-01600	2	PT LOT 15 & 16	0.21	0.21	0.083		$ 38.00	$ 71.00	$ 109.00
180-01700	2	PT LOT 16	0.21	0.21	0.083		$ 38.00	$ 71.00	$ 109.00
180-01800	2	PT LOT 15 & 16	6.27	6.27	2.536		$ 1,148.00	$ 679.00	$ 1,827.00
180-01900	2	PT LOT 16	0.59	0.37	0.150		$ 68.00	$ 98.00	$ 166.00
180-02000	2	PT LOT 16	8.80	8.80	3.563		$ 1,614.00	$ 754.00	$ 2,368.00
180-02100	2	PT LOT 16	0.46	0.46	0.186		$ 99.00	$ 133.00	$ 232.00
180-02200	2	PT LOT 17	14.14	14.14	5.723		$ 161.00	$ 1,109.00	$ 1,270.00
180-02202	2	PT LOT 17	0.72	0.72	0.291		$ 120.00	$ 181.00	$ 301.00
180-06700	2	PT LOT 18	0.32	0.32	0.130		$ 59.00	$ 101.00	$ 160.00
180-02300	2	PT LOT 18	14.97	14.97	6.058		$ 43.00	$ 1,184.00	$ 1,227.00
180-02400	2	PT LOT 19	0.54	0.54	0.219		$ 292.00	$ 146.00	$ 438.00
180-02500	2	PT LOT 19	9.37	9.37	3.792		$ 194.00	$ 750.00	$ 944.00
180-02600	2	PT LOT 19	0.33	0.33	0.134		$ 60.00	$ 103.00	$ 163.00
180-02700	2	PT LOT 19 & 25	0.27	0.27	0.109		$ 49.00	$ 91.00	$ 140.00
180-02800	2	PT LOT 19 & 20	0.73	0.73	0.295		$ 134.00	$ 188.00	$ 322.00
		Total on Privately Owned - Non-Agricultural Lands.....					**$ 22,702.00**	**$ 31,535.00**	**$ 54,237.00**

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-20400	839	829 TO 832	62.37	3.35	1.356		$ 205.00	$ 244.00	$ 449.00
130-20500	780	133 TO 137	0.37	1.34	0.542		$ 82.00	$ 362.00	$ 444.00
130-20600	780	132	0.07	1.62	0.656		$ 99.00	$ 634.00	$ 733.00
130-20700	780	131	0.07	5.92	2.396		$ 362.00	$ 2,317.00	$ 2,679.00
130-37200	1064	369 & 370	0.24	1.78	0.720		$ 109.00	$ 504.00	$ 613.00
130-37300	1064	357 TO 366	0.70	1.99	0.805		$ 122.00	$ 433.00	$ 555.00
130-41700	1064	623 TO 625	0.21	1.52	0.615		$ 93.00	$ 441.00	$ 534.00
170-11000	2	PT LOT 7	1.00	12.82	5.188		$ 390.00	$ 2,439.00	$ 2,829.00
170-11100	2	PT LOT 7 & 8	1.79	8.00	3.238		$ 232.00	$ 1,285.00	$ 1,517.00
170-11200	2	PT LOT 7 & 8	0.77	21.56	8.725		$ 627.00	$ 4,580.00	$ 5,207.00
170-12600	2	PT LOT 11	0.61	3.33	1.348		$ 121.00	$ 668.00	$ 789.00
170-13100	2	PT LOT 10	1.15	5.16	2.088		$ 72.00	$ 1,034.00	$ 1,106.00
170-13800	2	PT LOT 8	3.31	5.68	2.299		$ 140.00	$ 752.00	$ 892.00
170-14000	2	PT LOT 7 & 8	4.69	5.69	2.303		$ 141.00	$ 639.00	$ 780.00
170-14100	2	PT LOT 8	0.73	5.67	2.295		$ 142.00	$ 1,281.00	$ 1,423.00
170-14200	2	PT LOT 7 & 8	1.57	8.38	3.391		$ 209.00	$ 1,552.00	$ 1,761.00
180-00200	2	PT LOT 12 & 13	5.02	6.00	2.428		$ 126.00	$ 646.00	$ 772.00
180-00700	2	PT LOT 13	1.90	6.32	2.558		$ 144.00	$ 1,052.00	$ 1,196.00
180-00900	2	PT LOT 14	5.50	8.85	3.582		$ 231.00	$ 971.00	$ 1,202.00
180-01100	2	PT LOTS 14 & 15	5.39	15.04	6.087		$ 493.00	$ 1,674.00	$ 2,167.00
180-01300	2	PT LOT 15	0.31	15.20	6.151		$ 555.00	$ 4,588.00	$ 5,143.00
180-01500	2	PT LOT 15	0.37	9.51	3.849		$ 318.00	$ 2,766.00	$ 3,084.00

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		Total on Privately Owned - Agricultural Lands (grantable).....					**$ 5,013.00**	**$ 30,862.00**	**$ 35,875.00**

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

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
130-42900	1	PT LOT 18 & 19	0.40	0.40	0.162		$ 24.00	$ 100.00	$ 124.00
170-05000	2	PT LOT 7	0.49	2.95	1.194		$ 118.00	$ 622.00	$ 740.00
		Total on Privately Owned - Agricultural Lands (non-grantable).....					**$ 142.00**	**$ 722.00**	**$ 864.00**
		TOTAL ASSESSMENT	416.15	168.41			**$ 30,000.00**	**$ 70,000.00**	**$ 100,000.00**

1 Hectare = 2.471 Acres
Project No.REI2016D046
March 23rd, 2023

SPECIFICATIONS

BESSETTE DRAIN

(Geographic Township of Sandwich West)

TOWN OF LASALLE

I. GENERAL SCOPE OF WORK

The Bessette Drain extends from the north branch of the Canard River, running northwesterly to Malden Road and then north along the east side of the road to a point at the north of Lot 24 in the 2nd Concession, at Maurice Street, in the geographic township of Sandwich West, Town of LaSalle.

For future maintenance work, this report provides the drain profile and design information for replacement of access bridges. The work under this project generally comprises of improvements to the open drain to provide a suitable cross section for conveyance of flows and bridge repairs and replacements. The maintenance work on the drain will extend from the outlet as noted on the plan and proceed northerly to the upstream end of the drain. Work on the open portion of the drain includes excavation and supply and installation of quarried limestone on filter cloth general erosion protection. The proposed work is intended to address the repair and improvement of the open drain and bridges, any tile end improvements, and erosion protection in accordance with current standards.

All work shall be carried out in accordance with these specifications, the plans forming part of this drainage project in **Appendix "REI-E"** and **Appendix "REI-F"**, as well as the Standard Details included in **Appendix "REI-C"**. All work carried out under this project shall be completed to the full satisfaction of the Town of LaSalle Manager of Engineering/Drainage Superintendent.

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

All of the work shall be carried out in accordance with any permits or authorizations issued by the Essex Region Conservation Authority (E.R.C.A.) or the Department of Fisheries and Oceans (D.F.O.), copies of which will be provided, if available. The standard mitigation response received from E.R.C.A. shall be followed and a copy of same is included within **Appendix "REI-A"**. The Contractor shall ensure that sediment and erosion control provisions, set out further in these specifications and in **Appendix "REI-A"**, are followed. Work shall be scheduled so that it can be completed in the dry and when there is no risk of a rain event that might exceed the capacity of the water control system that the Contractor employs. Any damming of the drain will be done in accordance with the provisions set out in **Appendix "REI-A"**. The Contractor will be required to carry out a fish salvage operation if there is water in the drain when the work is being done. Details for the fish salvage are set out in **Appendix "REI-A"**.

The Contractor is to review **Appendix "REI-A"** in detail and is required to comply in all regards with the contents of said E.R.C.A. and D.F.O. measures, and follow the special requirements therein included during construction. The Contractor is advised that no work may be carried out in the existing drain from March 15th to June 30th of any given year because the drain is directly connected to a downstream drain that is classified as sensitive to impacts on aquatic life and habitat by E.R.C.A. and D.F.O.

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

In addition, E.R.C.A. has indicated that the portion of the Bessette Drain south of Martin Lane to the Canard River has a 1:100 year floodplain area. In this area, no fill and/or placement of woody material or debris should occur. All materials generated from the cleanout of this section of the drain will be required to be removed from the flood plain area and disposed of by the Contractor at a site to be arranged by it or disposed of as directed by the Town of LaSalle.

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

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

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

The Species at Risk screening maps show there are Species at Risk Fish or Mussels identified in this area. The maps indicate that there may be Pugnose Minnow and Pugnose Shiner present which are classified as threatened in Ontario. In addition, there may be Silver Lamprey and Spotted Sucker present which are classified as species of special concern in Ontario. The maps show that there are no presence of any mussel species at risk. The drain is located within the Regulated Area and is under the jurisdiction of the E.R.C.A., and therefore all work has to comply with the current mitigation provisions of the E.R.C.A. and D.F.O. Details of these mitigation measures are included in the Specifications and **Appendix "REI-A"** forming part of this report.

The Ministry of Natural Resources & Forestry (M.N.R.F.) Species at Risk former Town agreement with M.N.R.F. pursuant to Section 23 of the "Endangered Species Act, 2007" expired as of June 30th, 2015. The former agreements are replaced with new regulation provisions under Ontario Regulation 242/08 administered by the Ministry of Environment, Conservation and Parks (M.E.C.P.). Section 23.9 allows repairs, maintenance and improvements to be conducted by the Town within existing municipal drains. These works are exempt from Sections 9 and 10 of the Endangered Species Act provided that the rules in the regulations are followed. When eligible,

the new regulations allow Municipalities to give notice to M.N.R.F. by registering their drainage activities through an online registry system.

The Town of LaSalle retained Dillon Consulting to conduct a study and analysis of the area and provide a mitigation plan for all municipal drains in LaSalle. This report is titled "Species at Risk Mitigation Plan for Drainage Works" and shall be followed during all maintenance and construction activities provided for within this report. This report will address all mitigation measures to protect Species at Risk along the Bessette Drain. The Contractor may obtain a copy of this report from the Town of LaSalle. Section 7.0 Mitigation Measures from the report is included in **Appendix "REI-B"** for reference by the Contractor and project supervisory staff.

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

IV. ACCESS TO WORK

The Contractor is advised that the work to be carried out extends from the drain outlet at the North Branch of Canard River northwest through the rear yards of the affected parcels and then along the east side of Malden Road. The Contractor shall have an 8 metre wide access along the easterly side of the open drain from the Canard River to where the drain reaches Malden Road and for the full width of the roadway abutting the proposed drainage works from that point to the upstream end. The Contractor may utilize the right-of-way as necessary, to permit the completion of all work required to be carried out for this project. The Contractor shall also have access into the driveways as necessary to carry out the removal of the existing access bridges and to construct the new replacement access bridges, as set out on the plans and in these specifications, along with a sufficient area in the vicinity of the bridges to carry out the required construction of the removal and new structure installations and ancillary work. The Contractor and the Town Manager of Engineering shall coordinate this construction with the parcel owner. The Contractor will have access to an 8.0m easement along the open drain in the rear yards of the affected parcels on the open drain portion east of Malden Road. The Contractor is not permitted to spread the excavated material from the drain on the adjacent residential properties. This material is required to be hauled off site and disposed in coordination with the Town of LaSalle and Excess Soil regulations. The Contractor is to perform its work with caution around any buildings, obstructions, etcetera and shall work around said buildings/obstructions whenever possible. Any fencing located on or within the 8.0 metre easement can be temporarily removed for the construction of the drainage works. In the event that fencing is removed, temporary fencing shall be installed adjacent to the outer working limits of the easement ensuring all yards are fenced at all times. The Contractor shall spread excavated materials on the agricultural lands adjacent to the east side of the drain from Station 0+672.7 upstream to the south limit of Parcel 32 as shown on the plans. The excavated material to be cast onto the adjoining lands shall be well and evenly spread over a sufficient area so that no portion of the excavated earth is more than 150mm in depth. The material shall be kept at least 1.2 metres clear from the finished edge of the drain, care being taken not to fill up any existing tiles, ditches, furrows or drains with the excavated material. The excavated material to be spread upon the lands shall be free from rocks, cobbles, boulders, stumps, rubble, rubbish or other similar material and these materials, if encountered, shall be hauled away by the Contractor and disposed of at a site to be obtained by it at its expense.

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

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

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 a roadway for the proposed works, it shall obtain the permission of the Town Manager of Engineering and the County of Essex, 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 Town of LaSalle Works Departments.

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

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

Following the completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which are to remain standing, and it shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition. The Contractor shall remove all deleterious materials and rubbish along the course of the open drain in the location of the work areas. All such deleterious materials and rubbish shall be loaded up and hauled away by the Contractor to a site to be obtained by it at its cost.

VI. FENCING

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

VII. DETAILS OF DRAIN WORK

The open drain shall be excavated to the lines, levels, grades, and cross-sections as shown on the accompanying drawings, or as may be further established by the Town Manager of Engineering or the Consulting Engineer at the time of the work. The drain shall be carefully excavated so as not to disturb the existing banks, rock protection and vegetation, except for those portions of the drain where widening or restoration of a stable drain bank configuration is required. The bottom width of the drain and the side slopes of the excavation shall conform to the dimensions given on the drawings.

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

Where the drain crosses any lawn, garden, orchard, roadway or driveway, etcetera, and for the portion of the drain south of Martin Lane, the excavated material for the full width of the above-mentioned areas shall be hauled away by the Contractor and disposed of to a site to be obtained by the Contractor at its expense and in coordination with the Town of LaSalle. All work at the disposal site shall be established between the Contractor and the site owner. The Contractor shall

be responsible for any permits required and shall provide copies of same to the Town and Consulting Engineer when requested.

Where there is any brush or rubbish in the course of the drain, including both side slopes of the drain, all such brush or rubbish shall be close cut and grubbed out. Where there is any brush or rubbish where the earth is to be spread, or on that strip of land between where the earth is to be spread and the edge of the drain, all such brush or rubbish shall be close cut and grubbed out. The whole is to be burned, chipped or otherwise satisfactorily disposed of by the Contractor. Any accesses or areas utilized in carrying out the works are to be fully restored to their original conditions by the Contractor, including topsoil placement and lawn restoration as directed by the Engineer or the Town Manager of Engineering. Restoration shall include, but not be limited to, all necessary levelling, grading, shaping, topsoil placement, and granular required to make good any damage caused.

The Contractor is to note that any intercepted pipes or tiles along the length of the drain are to be extended and connected at its cost to the open drain. All pipe extensions shall comprise of minimum 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 or appendices, unless otherwise noted.

Upon the direction of the Town Manager of Engineering or Consulting Engineer, the Contractor shall supply and install quarried limestone to be placed on the drain banks in areas where the bank has eroded, or wash outs have occurred. This is necessary to increase the stability of the banks and minimize further erosion. Filter cloth shall be placed on the bank in these areas prior to the quarried limestone placement.

During the course of the work, all swales, furrows, and boulevard areas are to be completely restored with topsoil, seed and mulch and the Contractor is to ensure positive drainage. In addition, all existing or newly required offset catch basins shall be maintained during construction. All new offset catch basins shall include a minimum 450mm deep sump and the 600mm square units and shall follow OPSD 705.010. The catch basin units shall be fitted with cast iron frame and grates according to OPSD 401.030. The Contractor shall note that all concrete units shall be fitted with a minimum of three and a maximum of six **High Density Poly Ethylene (H.D.P.E.)** lift rings, secured in place in accordance with the manufacturer's recommendations. Catch basin tops shall generally be set 50mm below the adjacent ground elevation and be graded to ensure positive drainage and that all flows will enter the top of the unit.

All offset catch basins shall be connected to the enclosed portion of the drain by a minimum of 200mm diameter pipe. When required, openings into existing pipes shall be neatly bored, saw cut or burned with a torch to the satisfaction of the Town Manager of Engineering or the Consulting Engineer. The Contractor shall utilize a grouted connection. Grouted mortar joints shall be composed of premixed bag material or 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 Manager of Engineering 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. Where possible, the Contractor shall employ a standard factory fitting or adapter to connect between the various units, pipes, and tiles. For offset catch basins being connected directly to the covered mainline, the Contractor shall make the connection with the use of an Inserta-Tee fitting or equal as available from "Armtec - Aqua Q". The Inserta-Tee shall be installed by coring a properly sized hole in the side of the enclosed concrete pipe and securing the fitting into the mainline pipe wall in accordance with the manufacturer's recommendations.

All work to the covered drain portions shall be carried out in accordance with the details and provisions for the drain as shown on the Stantec plans included in **Appendix "REI-F"** and as directed by the Town of LaSalle.

The Contractor shall take steps to protect all legal survey bars and markers during the course of its work. If any bars are removed or damaged, the Contractor shall arrange for a legal surveyor to replace same, all at its cost.

VIII. DETAILS OF BRIDGE WORK

The Contractor shall provide all material, labour, and equipment to conduct the required maintenance work on the drain including cleaning, repair, and replacement to the existing access bridges along the Bessette Drain, along with endwall repairs and other improvements as noted.

When the existing bridges are to be removed, they shall be replaced with 2.0mm thick aluminized Ultra Flo smooth wall steel pipe with hugger band couplers and gaskets. The pipe to be utilized for these bridge installations must be approved by the Town Manager of Engineering or Engineer, prior to its placement in the drain. Any new pipe to be installed on this drain is required to be provided in the longest lengths that are available and shall not be less than 3.0 metres. Where the overall access pipe length exceeds the standard pipe lengths, the Contractor shall connect the pipe sections together by use of a manufactured hugger band coupler installed in accordance with the manufacturer's recommendations. All coupler joints shall be wrapped with a layer of filter cloth around the complete circumference so that it extends a minimum of 100mm beyond the coupler on each end, to ensure a positive seal against soil migration through the joints. The headwalls shall be replaced with the same type as the existing headwalls.

For the extension of Bridge No. 15, 4.0m of 2.0mm thick 900mm diameter aluminized corrugated Hel-Cor pipe with annular ends and 68mmx13mm corrugation profile is to be added to the north end of this bridge. The existing upstream end of the pipe will need to be cut back since it is bent. A 9 corrugation (9-C) wide aluminized bolted coupler is to be used to join these sections of pipe, secured in accordance with the manufacturer's recommendations. The upstream concrete piece headwall will be removed and new sloped quarried limestone on filter cloth headwall shall be installed on the north end of this extended pipe. The work associated with this bridge extension shall follow the specifications provided, including all backfill and compacting requirements.

When completed, all new access bridges shall have a minimum travelled driveway width of 6.1 metres (20.0 ft) or to match existing width if greater than 6.1 metres. This does not include the width for the end wall treatments. The quarried limestone on filter cloth end wall protection shall be installed on a slope no steeper than 1.50 horizontal to 1.00 vertical and shall extend from the end of the new corrugated steel pipe to the top elevation of the driveway. A typical concrete piece or jute bag end wall protection shall be installed on a slope no steeper than 1.0 horizontal to 5.0 vertical, and shall extend from the end of the new corrugated steel pipe to the top elevation of the driveway. The Contractor shall supply and install any surface material other than granular "A" material for the driveway to match the existing surface (i.e. concrete or asphalt), as detailed below.

The culvert pipe replacements and new pipe installations on the drain shall be set to the grades as shown on the plans or as otherwise established by the Town Manager of Engineering or the Consulting Engineer and they may make minor changes to the bridge alignment as they deem necessary to suit the site conditions. All work shall be carried out in general accordance with the items in the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION"** attached to this report and labelled **Appendix "REI-C"**.

The Contractor shall 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 Manager of Engineering 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 to be set at least 10% of the pipe diameter (or the pipe rise) below the drain bottom to provide the embedment required by E.R.C.A. and D.F.O. and to meet the minimum cover requirements for the pipe. The Contractor shall also be required to supply, if necessary for a solid base, a minimum thickness of 150mm (6") of 20mm (3/4") clear stone bedding underneath the culvert or pipe extension, extending from the bottom of the drain to the culvert invert grade, all to the full satisfaction of the Town Manager of Engineering or Engineer.

The installation of the complete length of the new culvert pipe, including all appurtenances, shall be completely inspected by the Town Manager of Engineering 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 Manager of Engineering 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 Manager of Engineering or the Consulting Engineer prior to commencement of the work. The installation of the new culvert structure is to be performed during normal working hours of the Town Manager of Engineering and the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend said working hours.

For the access bridge installations, once the new culvert 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 Contractor is to ensure that backfilling occurs on both sides of the culvert simultaneously, or so that the fill on one side of the culvert does not exceed 500mm (19.7") to the other side of the culvert. 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 shall be granular material M.T.O. Type "A" O.P.S.S. Form 1010. All of the approach areas extending over 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 shall be backfilled with native material compacted to 96% of Standard Proctor Density and topped with a minimum of 100mm of topsoil, and shall be seeded and mulched.

For hard surface roadway and driveway crossings, the Contractor is to ensure that no backfill exceeds 305mm (12") per lift. Additionally, the top 305mm (12") of the backfill over the pipe below the hard surface treatment shall comprise granular material M.T.O. Type "A" O.P.S.S. Form 1010 compacted to a minimum of 100% Standard Proctor Density. The Contractor shall at all times be very careful when performing its backfilling and compaction operations so that no damage is caused to the pipe. To ensure that no damage is caused to the proposed pipe, alternative methods of achieving the required backfill compaction shall be submitted to the Consulting Engineer or the Town Manager of Engineering for their approval prior to the commencement of this work. The Contractor shall restore the asphalt surface by placing a minimum of the existing thickness or a 90mm minimum thickness of Type HL-4 hot mix asphalt or SuperPave equivalent. 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 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 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 Manager of Engineering, the Road Authority, and the Consulting Engineer and the repairs shall be completed to their full satisfaction. All work shall be in accordance with standard Town of LaSalle requirements and the applicable O.P.S.S. and O.P.S.D. standards.

The Contractor shall be required to protect or extend any existing lateral tile ends which conflict with bridge installations. All existing lateral tile drains, where required, shall be diverted and extended to the ends of the access bridge culvert extension and shall be extended and installed in accordance with the "Standard Lateral Tile Detail" as shown in **Appendix "REI-C"**, unless otherwise noted. Connections shall be made using manufacturer's couplers wherever possible. All connections shall be completely sealed with concrete grout around the full exterior perimeter of each joint.

The Contractor shall be required to restore any and all drain sideslopes damaged, utilizing the available scavenged topsoil, and shall seed and mulch over all of said areas. The placing and grading of any topsoil shall be carefully and meticulously carried out in accordance with Ontario Provincial Standard Specifications, Form 802 dated November 2010, or as subsequently amended, or as amended by these specifications and be readied for the seeding and mulching process. The seeding and mulching of all of the above mentioned areas shall comply in all regards to Ontario Provincial Standard Specifications, Form 803 dated November 2010 and Form 804, dated November 2013, or as subsequently amended, or as amended by these specifications. The seeding mixture shall be the Standard Roadside Mix (Canada No. 1 Lawn Grass Seed Mixture) as set out in O.P.S.S. 804. All cleanup and restoration work shall be performed to the full satisfaction of the Town Manager of Engineering or Engineer.

All materials shall be stored and handled by the Contractor at its own expense. It shall be responsible for the safe storage of all materials, for obtaining storage area, for the safe transportation and distribution of all the materials at the job site, and for inspection in order to determine defects and breakage. No additional recompense will be allowed the Contractor for any loss incurred by it in the storage and handling of the materials. Pipe, fittings, and all accessory appurtenances must be loaded and unloaded by lifting with means of a hoist or utilizing a skid so as to avoid shock or damage. Under no circumstances shall any pipe material or materials for pipe appurtenances be dropped.

Pipes shall be laid in trenches in the general location shown on the accompanying drawings or as may be specifically directed and laid out by the Engineer at the time of construction. The trench shall be located to clear all existing utilities and structures above, on, or below the ground level. The Contractor will be responsible at all times for complete investigation to determine the location of all such utilities or structures known or unknown, and it shall indemnify and save harmless the Engineer and the Town for any responsibility, injury, or liability arising from and damage to such utilities or structures by the Contractor.

The Contractor shall further contact or notify such utility company or commission of its intention to carry out work in the area and co-operate with such utility company or commission in the location, maintenance, and preservation of all such utilities. The Contractor shall note that if the trench passes in close proximity to hydro poles, it shall temporarily brace or secure such poles as it deems necessary to prevent any damage to the utility. The location of the pipes and appurtenances as shown on the drawings is approximate and may be changed by the Town Manager of Engineering or Engineer if deemed advantageous for the progress of the work.

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

IX. REMOVALS

In the future when maintenance work is carried out and where existing covered drains and access bridges are to be completely removed and replaced, the Contractor shall be required to excavate and completely extract the existing covered drain or culvert pipe and the existing endwalls in their entirety, as well as any other deleterious materials that may be encountered in removing same. 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.

All unsuitable and deleterious materials from the excavation and removal of the existing bridge 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 deleterious material excavated for removal of the headwalls shall also be hauled away and disposed of by the Contractor.

In all cases, the disposal of any trucked extra or deleterious material will be the responsibility of the Contractor and any work at the disposal site shall be established between the Contractor and the site owner. The Contractor shall ensure that any permits required for fill disposal are obtained from the appropriate authority. The Contractor will be responsible for keeping all private and public roadways free and clear of mud and debris resulting from its use of same for access and hauling purposes.

X. CONCRETE FILLED JUTE BAG AND SLOPED END PROTECTION

Unless otherwise shown or noted, the Contractor is to provide new concrete filled jute bag headwalls, precast concrete block, or sloped quarried limestone on non-woven filter cloth end protection for the access bridges and enclosures being replaced or constructed as part of future maintenance on this drain. The details for these end protections are provided in the Appendix specifications.

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 Manager of Engineering 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”.**

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

The concrete filled jute bags are to be provided and laid out as is shown and detailed in the accompanying drawings and as noted in the Standard Specifications in **Appendix "REI-C"**. In all cases, the concrete filled jute bag headwalls shall be topped with a minimum 100mm (4") thick continuous concrete cap comprising 30mPa concrete with 6% ±1% air entrainment for the entire length of the headwalls. The headwalls shall be installed on an inward batter to be not less than 1 horizontal to 5 vertical, and under no circumstances shall this batter, which is measured from the top of the headwall to the projection of the end of the pipe, be less than 305mm (12"). From the midpoint of the pipe height down to the concrete footing, the wall shall be a double concrete filled jute bag installation. On the road side the walls shall be deflected at a 45 degree angle to provide daylighting and a better approach across the new bridge.

The installation of the concrete filled jute bag headwalls, unless otherwise specified, shall be provided in total compliance with the Items 1, 3, and 4 included in the "**STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION".** These are attached to the back of 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.

As a part of the maintenance, the bridge design table provided in the report was calculated based on using the same end wall treatments as existing for each bridge. However, if there is a future request for interlocking precast concrete block end walls as an alternative to the existing end treatment, the following details will apply to the installation. The Contractor shall install interlocking precast concrete block with filter cloth backing behind the walls on both ends of the bridges requiring same. The blocks shall be 600X600X1200mm in size as available from Underground Specialties - Wolseley, Windsor, Ontario, or equal, and installed as set out in **Appendix "REI-C"**. Vertical joints shall be staggered by use of half blocks where needed and wingwall deflections when required shall employ 45 degree angled blocks. Voids between the blocks and the pipe shall be grouted with 30mPa concrete having 6% ±1% air entrainment and extend for the full thickness of the wall, and have a smooth uniform finish on the face that blends with the precast blocks. The installation of the endwalls, as well as the backfilling of the pipe where applicable, shall be provided in compliance with Items 1), 3), and 4) of the "Standard Specifications for Access Bridge Construction" attached within **Appendix "REI-C"** and in total compliance and in all respects with the General Conditions included in said Appendix. The Contractor shall submit shop drawings to the Town for approval of the wall installation that includes details for a minimum 300mm thick concrete footing that extends from the pipe invert downward. The footing shall extend into the drain banks each side for the required embedment of the blocks and be constructed to ensure that the completed wall will be completely vertical or

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

In all cases, 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 Manager of Engineering or the Consulting Engineer.

At all of the swale and furrow locations entering the drain, it is required that general quarried limestone erosion protection and rock chutes be provided on the drain slopes, at any locations indicated by the Town of LaSalle Manager of Engineering or Consulting Engineer. The rock chutes shall be V-shaped and constructed to direct all flows through the centre portion of the rock chute. 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 Manager of Engineering or Consulting Engineer.

XI. BENCH MARKS

Also, for use by the Contractor, we have established Benchmarks along the course of the work for the Bessette Drain, as shown on the plans. The Contractor shall work with the Town of LaSalle Manager of Engineering to transfer the benchmark as necessary to be used in setting the drain and pipe design grades.

In all cases, the Contractor is to utilize the specified benchmark and drain grade to control its work. The Contractor shall ensure that it takes note of the direction of flow and sets all pipes to assure that all grades flow from upstream to downstream to match the direction of flow within the drain. The Contractor's attention is drawn to the fact that the pipe invert grades established herein provide for the pipes to be set at least 10% of their diameter or pipe rise below the existing drain bottom or the design grade of the drain, whichever is lower.

Benchmark No. 1 is the top nut of the fire hydrant on the south side of Golfview Drive fronting MN 1795 and this **Benchmark No. 1** has Elevation **178.310 metres**. Benchmark No. 2 is the Standard Iron Bar for the property line between MN 8080 & MN 8090 on the east side of Malden Road approximately 2.0m south of the hydro pole that is south of the bridge serving MN 8080. **Benchmark No. 2** has Elevation **176.723 metres**. Benchmark No. 3 is the northeast corner of the concrete box culvert on the east side of Malden Road at the north end of the bridge serving MN 8190. **Benchmark No. 3** has Elevation **177.307 metres**. Benchmark No. 4 is the Iron Property Bar in the rear yards between MN 8220 & MN 8250 located approximately 20.0m south of the swale in the rear yard of MN 8220 on the west side of the Bessette Drain. **Benchmark No. 4** has Elevation **176.635 metres.** Benchmark No. 5 is the Standard Iron Bar in the rear yards between MN 8490 & MN 8520 on the west side of the drain approximately in line with the north edge of

the wood beam & wire fence on the east side of the drain. **Benchmark No. 5** has Elevation **175.370 metres.** Benchmark No. 6 is the top nut of the fire hydrant fronting MN 2020 on the north side of Snake Lane. **Benchmark No. 6** has Elevation **176.716 metres**.

XII. ANCILLARY WORK

During the course of any work to the bridges along the course of the drain, 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 manufactured coupling where possible. For other connections, the Contractor shall utilize a grouted connection. Grouted mortar joints shall be composed of premixed bag material or 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 Manager of Engineering or Consulting Engineer. The mortar joint shall be of a sufficient mass around the full circumference of the joint on the exterior side to ensure a tight, solid seal. The Contractor is to note that any intercepted pipes along the length of the existing culverts are to be extended and connected to the open drain unless otherwise noted in the accompanying drawings.

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

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

Although it is anticipated that the bridge work at each site shall be undertaken in the dry, the Contractor shall supply and install a temporary straw bale check dam in the drain bottom immediately downstream of each bridge site during the time of construction. The straw bale check dam shall be to the satisfaction of the Town Manager of Engineering and must be removed upon completion of the construction. The straw bales may be reused at each site subject to their condition. All costs associated with the supply and installation of this straw bale check dam shall be included in the cost bid for the bridge removal.

XIII. TOPSOIL, SEED AND MULCH

The Contractor will be required to protect grass buffers and driveway accesses along the top of the drain bank where they currently exist. Where any of these are damaged, they shall be fully restored including placement of topsoil and then seed and mulch placed over said areas. The Contractor shall be required to provide all the material and to cover the above mentioned

surfaces with approximately 50mm of good, clean, dry topsoil on slopes and 100mm of good, clean, dry topsoil on horizontal surfaces, fine graded and spread in place ready for seeding and mulching.

The placing and grading of any topsoil shall be carefully and meticulously carried out in accordance with Ontario Provincial Standard Specifications, Form 802 dated November 2010, or as subsequently amended, or as amended by these specifications and be readied for the seeding and mulching process. The seeding and mulching of all of the above mentioned areas shall comply in all regards to Ontario Provincial Standard Specifications, Form 803 dated November 2010 and Form 804, dated November 2013, or as subsequently amended, or as amended by these specifications. The seeding mixture shall be the Standard Roadside Mix (Canada No. 1 Lawn Grass Seed Mixture) as set out in O.P.S.S. 804. All cleanup and restoration work shall be performed to the full satisfaction of the Town Manager of Engineering or Consulting Engineer.

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

XIV. GENERAL CONDITIONS

a) The Manager of Engineering/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 LaSalle, 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 LaSalle, 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 Manager of Engineering/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, etcetera, from the roadside of the drain, and leave the site in a neat and workmanlike manner. The Contractor shall be responsible for keeping all public roadways utilized for hauling materials free and clear of mud and debris.

e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. If traffic control is required on this project,

signing is to comply with the M.T.O. Manual of Uniform Traffic Control Devices (M.U.T.C.D.) for Roadway Work Operations and Ontario Traffic Manual Book 7.

f) During the course of the work the Contractor shall be required to connect existing drainage pipes to the Municipal Drain. In the event that polluted flows are discovered, the Contractor shall delay the connection of the pipe and leave the end exposed and alert the Town, the Manager of Engineering/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 Manager of Engineering 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 Manager of Engineering 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. The Contractor will also 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 Owner. One copy of said bonds shall be bound into each of the executed sets of the Contract. Each Performance and Maintenance Bond and Labour and Material Payment Bond shall be in the amount of 100% of the total Tender Price. All Bonds shall be executed under corporate seal by the Contractor and a surety company, authorized by law to carry out business in the Province of Ontario. The Bonds shall be acceptable to the Owner in every way and shall guarantee faithful performance of the contract during the period of the contract, including the period of guaranteed maintenance which will be in effect for twelve (12) months after substantial completion of the works.

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

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 LaSalle and its officials, the County of Essex and its officials and the Consulting Engineer and its staff as additional insured under the policy. The Contractor must submit a copy of this policy to both the Municipal Clerk and the Consulting Engineer prior to the commencement of work.

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

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

ii) proof of advertising

iii) a Statutory Declaration, in a form satisfactory to the Consulting Engineer and the 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 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 Manager of Engineering 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.

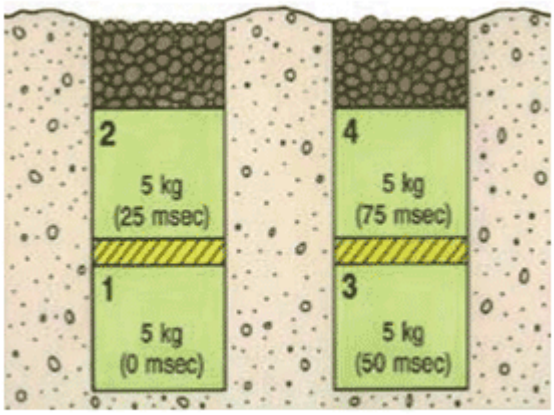
- Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has 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”

Black Oak Wetland Complex (ER 40)
PRAIRIE REMNANTS (TITCOMBE ROAD NORTH) LIFE ANSI
Devonwood
Oakwood Park Wetland (ER 34)
Ojibway Prairie Wetland Complex (ER 28)
Turkey Creek Wetlands (ER 12)
Fighting Island (ER 14)
LaSalle Woods (ER 29)
Detroit River Marshes (ER 3)
Canard River Marshes (ER 2)
Canard River Swamp Wetland Complex (ER 37)
Canard River Mouth Marsh
Canard River Scout Camp

OJIBWAY PARKWAY
MATCHETTE ROAD
SPRUCEWOOD AVENUE
MORTON DRIVE
TODD LANE
NORMANDY STREET
REAUME ROAD
BOUFFARD ROAD
LAURIER DRIVE
MICHIGAN AVENUE
VICTORY STREET
FRONT ROAD
FRONT ROAD NORTH
MALDEN ROAD
DISPUTED ROAD
NORTH TOWNLINE ROAD
ACADEMY DRIVE
DOMINION BOULEVARD
ROSELAWN DRIVE
DOUGALL AVENUE
HOWARD AVENUE
DIVISION ROAD
CABANA ROAD EAST
CABANA ROAD WEST
MOUNT ROYAL DRIVE
6TH CONCESSION ROAD
DOUGALL PARKWAY
HIGHWAY 3
COUSINEAU ROAD
NORTH TALBOT ROAD
HERITAGE DRIVE
CONCESSION ROAD 6
COUNTY ROAD 9
LAURIER PARKWAY
HURON CHURCH LINE ROAD
SOUTH TALBOT ROAD
COUNTY ROAD 8

TOWN OF LASALLE

TOWN OF LASALLE

NATURAL FEATURES
FIGURE 1

- Lower Tier Municipality
- Tallgrass Prairie Community
- Environmentally Sensitive Area
- Provincially Significant Wetland
- ANSI, Earth Science
- ANSI, Life Science
- Municipal Drain
- Water Body
- Forest

1:40,000
0 0.5 1 2 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 16-4263
STATUS: FINAL
DATE: 5/3/2017

FILE LOCATION: I:\GIS\164263 - LaSalle\mxd\Figure 2 Natural Features.mxd

6.0 Species at Risk

A review of secondary source information, including Natural Heritage Information Centre (NHIC) GIS Database records (i.e. 1 km squares that overlap the Study Area) were reviewed to gather a list of the SAR that have the potential to occur within the Town's boundaries. A total of thirty-nine (39) species listed as either endangered or threatened on the SARO list (O.Reg. 230/08) were identified to occur within the Study Area (see ***Appendix C***). Fourteen (14) Restricted Species Records were also identified in the year 2010 and included in ***Appendix A*** under records reviewed.

The habitat requirements for each of the thirty-nine (39) species was crossed referenced with habitats identified within the Study Area. A total of twenty-three (23) species listed as endangered or threatened were identified as having potential habitat within the Study Area, consisting of Turtles (2 species), Snakes (3 species), Fishes (4 species), Birds (3 species), and Plants (11 species). **Table 2** lists the SAR, preferred habitat type(s) (Agricultural, Urban, Forest, Wetland or All) and water presence (requirement for some species), and the dates during the year when the species is likely to be carrying out sensitive life processes, referred to herein as the Restricted Activity Period (RAP).

Three (3) species listed in Table 1, subsection 2, Section 23.9 of O. Reg. 242/08 were identified as having the potential to occur within the Town of LaSalle drains, these species include: Pugnose Minnow (*Opsopoeodus emiliae*) (1 fish species), Heart-leaved Plantain (*Plantago cordata*) and Scarlet Ammannia (*Ammannia robusta*) (2 plant species). Since these species are listed in Table 1, subsection 2, Section 23.9 of O. Reg. 242/08 they have not been included in **Table 2** below and permitting may be required when working in specific drains. More information on species, their habitat preferences, known distribution within the area and steps that need to be taken to determine whether a permit is required are outlined in ***Appendix D***.

Table 2: Species at Risk with Potential to Occur within the Study Area

Scientific Name	Common Name	ESA[1]	Preferred Habitat Type[2]	Restricted Activity Period
Turtles				
Emydoidea blandingii	Blanding's Turtle	THR	Wetland, Forest, Water is present	November 1 to April 30 ***Important to Note: Activities that require water level reduction cannot occur in areas when and where turtles are hibernating (paragraph 6, subsection 13, under Section 23.9 of O.Reg. 242/08).***
Apalone spinifera	Spiny Softshell	THR	Wetland, Forest, Water is present	
Snakes				
Pantherophis gloydi	Eastern Foxsnake (Carolinian population)	END	All[3]	September 20 to May 31

Scientific Name	Common Name	ESA[1]	Preferred Habitat Type[2]	Restricted Activity Period
Regina septemvittata	Queensnake	END	All[3], Water is present	
Thamnophis butleri	Butler's Gartersnake	END	All[3]	
Fishes				
Notropis anogenus	Pugnose Shiner	END	Water is present	March 15 to June 30
Lepisosteus oculatus	Spotted Gar	THR		
Percina copelandi	Channel Darter	THR		
Ammocrypta pellucida	Eastern Sand Darter	END		
Birds				
Dolichonyx oryzivorus	Bobolink	THR	Agricultural	May 1 to July 15
Sturnella magna	Eastern Meadowlark	THR	Agricultural	
Icteria virens virens	Yellow-breasted Chat	END	Agricultural	
Vascular Plants				
Aletris farinosa	Colicroot	THR	Agricultural, Forest	Not Applicable
Trillium flexipes	Drooping Trillium	END	Forest, Water is present	
Liparis liliifolia	Purple Twayblade	THR	Forest, TPC[4]	
Platanthera leucophaea	Eastern Prairie Fringed-Orchid	END	Wetland, TPC[4]	
Liatris spicata	Dense Blazing Star	THR	Agricultural, TPC[4]	
Symphyotrichum praealtum	Willowleaf Aster	THR	Agricultural, TPC[4]	
Cornus florida	Eastern Flowering Dogwood	END	Forest	
Castanea dentata	American Chestnut	END	Forest	
Gentiana alba	White Prairie Gentian	END	TPC[4]	
Juglans cinerea	Butternut	END	Forest	
Morus rubra	Red Mulberry	END	Forest	

[1]Endangered Species Act – status as defined by O.Reg. 242/08 as of April 27, 2017; [2]Preferred Habitat Types – The habitat types listed are areas where a SAR has the potential to occur. It should be noted that species have the potential to occur outside of these habitats; [3]All – Structures such as culverts, rip rap and gabion baskets have the potential to provide nesting and/or hibernaculum for snake species; [4]TPC: Tallgrass Prairie Community – SAR identified are likely to be limited to this habitat type.

7.0 Mitigation Measures

Based on the types of drainage work activities outlined above and the potential for SAR and SAR habitat within and adjacent to the drainage features, the following best practices and mitigation measures are recommended for when conducting drainage works. Prior to starting drainage works, the following steps are recommended to help determine the appropriate mitigation/management measures:

Step 1
- Determine Drainage Work Activity and Timing of Works.

Step 2
- Review **Drainage Maps** ***(Appendix B)*** and/or **KMZ File** to confirm habitat(s) the activity may impact.

Step 3
- Cross-reference **Habitat Type(s)** (determined in **Step 2**) with **Table 2** (in **Section 6.0**) to confirm which species may be impacted by activity and their RAP to determine most appropriate time to conduct activity.

Step 4
- Conduct **Site Visit** to verify Habitat Type(s). Identify potential SAR Habitat/Sensitive Natural Features and distance from activities. Confirm the presence/absence of water flow.

Step 5
- Implement recommended Mitigation Measures. Review LaSalle Checklist (***Appendix E***) and provide **Contractor Information Package** (***Appendix F***) with Species Specific Mitigation Measures (**Section 7.2**), ID cards and Activity and SAR Observation Forms (***Appendix F***).

Step 6
- Upon completion of each Drainage Work Activity collect Observation/Reporting Form from Contractors and record activity in log form (***Appendix E***) for annual reporting to MNRF.

7.1 General Mitigation Measures

The following mitigation measures are recommended to avoid or minimize impacts to the natural environment when conducting drainage works. Following this section species specific mitigation measures are provided.

When planning for drainage works, activities should be planned outside of sensitive timing windows for all wildlife species wherever possible. **Table 2** in Section 6.0 indicates the Restricted Activity Periods for the different SAR having the potential to occur within the Study Area. **Table 3** indicates sensitive timing windows for various types of wildlife (including SAR) based on habitat types. This information can be used to determine what time(s) of year may be sensitive at a particular site, based on which types of habitat and wildlife are present.

Where possible, activities are recommended to be planned outside of these sensitive time(s); otherwise additional species specific mitigation measures are recommended and/or consultation with the MNRF.

Table 3: Sensitive Timing Windows for other Wildlife Species (including SAR)

Habitat Type	Wildlife	Sensitive Timing Windows
Agricultural (Hayfields and pastures)	Migratory Birds	March through July (breeding season for most species)
Wetlands/ Waterbodies	Migratory Birds (including waterfowl)	March through Mid-August
	Turtles and Amphibians	March through Mid-August; and Mid-October through March (for overwintering wildlife, including turtles).
	Mammals	March through mid-August; and Mid-October through March (overwintering wildlife)
	Fish	In-water timing restriction for warmwater fishes March 15 to June 30.
Forest	Migratory Birds	March through mid-August
	Mammals	March through mid-August; and Mid-October through March (overwintering wildlife)
	Snakes	March through mid-August; and Mid-October through March (overwintering wildlife)
Urban	Snakes	March through mid-August; and October through March (overwintering wildlife)
	Mammals	

The following list provides general measures that are recommended when conducting any drainage work activities:

- **Bats**: The work associated with drainage maintenance covered under this management plan would typically not include the removal of trees. As such, the potential for drainage work activities to impact bat SAR is low. However, if a tree that exhibits a diameter at breast height of 25 cm or greater or a tree that exhibits loose shaggy bark requires removal for drainage works, removal should be completed between November 1 and March 1, outside of the active season for bats. If the tree removal needs to occur during the active season, removal should be completed after dusk.
- Review species specific seasonal timing windows to avoid sensitive periods for species
- Where possible, abide by regulatory timing windows and setback distances and avoid regulated habitat features
- Minimize duration of in-water work (where applicable)
- Any in-stream work should be conducted during periods of low flow
- Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation

- Conduct wildlife sweeps prior to the commencement of drainage work activities to determine if SAR (or other wildlife) are present at the site and engaged in critical life processes (e.g. nesting, etc.)
- Following the wildlife sweep, the area of activity is to be isolated with silt fencing to keep SAR and other wildlife from entering the work space area.
- Develop and implement an erosion and sediment control plan for the site that minimizes the risk of sedimentation to the drain during all phases of an activity. 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 drain of settling basin and runoff water is clear. Following the DFO's Measures to Avoid Harm (as outlined on DFO's website: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html), an erosion and sediment control plan, where applicable, is to include the following:
    - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the drain
    - 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 the drain
    - Site isolation measures, where required, to contain suspended sediment
    - Measures for containing and stabilizing waste materials generated from activities are stored away from any water bodies and prevent materials from re-entering water bodies
    - Erosion and sediment control measures are inspected and maintained on a regular basis during drainage works
    - Any damages to erosion and control measures are to be repaired immediately
    - Removal of non-biodegradable erosion and sediment control materials once site has been stabilized
- ***Phragmites*** is a non-native perennial grass species that has been observed throughout much of the province and LaSalle, developing tall dense stands that degrade wetlands and other features by outcompeting native vegetation and changing habitat. To further prevent the spread and introduction of this unwanted species in the province, the provincial government has regulated invasive *Phragmites* as restricted under the *Invasive Species Act*, 2015. Restricted species under the Act, prohibits i) the transport of species into any provincial park and conservation reserve and ii) the deposit or release of species in Ontario. For further information on the *Invasive Species Act*, 2015 please visit: www.ontario.ca/invasionON. It is recommended that care be taken when working in areas with *Phragmites* and efforts be taken to prevent further spread of species through equipment transfer. Methods to prevent the spread of *Phragmites* while conducting drainage works should include:
    - Inspection of vehicles, equipment and heavy machinery thoroughly inside and out for accumulation of dirt, plant material or snow/ice, including the underside of vehicles, radiators, spare tires, foot wells and bumpers before entering onto a site. Remove any guards, covers, plates or other easy to remove external equipment;
    - Inspections should be completed when: moving vehicles out of local area of operation; moving machinery between properties or sites within the same property where invasive species may be

present or known to occur; and using machinery along roadsides, in ditches and along watercourses.

- Vehicles, equipment and heavy machinery should be cleaned: before moving out of local area where invasive species has been identified or known to occur; and when accumulations of dirt, plant material or snow/ice has been observed.
- Clean vehicles, equipment and heavy machinery in an area where risk of contamination is low, ideally on a mud free hard surface, at least 30 m away from any watercourse, waterbody, wetland or other natural area, if possible. Where risk of runoff is high, cleaning stations should be contained by sediment fence as per standard erosion and sediment control specifications.
- Remove large accumulations of dirt, using a compressed air device, high pressure hose or other device as necessary. Clean the vehicle starting at the top and working down, with particular attention to the undersides, wheels, wheel arches, guards, chassis, engine bays, grills and other attachments.
- Clean inside vehicles by sweeping, vacuuming or using compressed air device including floor, foot wells, pedals, seats and under the seats.

Additional details on cleaning equipment and/or managing invasive species can be found in the Clean Equipment Protocol for Industry (J. Halloran, et al., 2013) and online at the Government of Ontario's website: https://www.ontario.ca/page/stop-spread-invasive-species.

7.2 Species Specific Mitigation Plans

In the event a SAR or SAR habitat has been identified within the proposed area for drainage work activity, the following information should be clearly conveyed to the on-site staff as part of the drainage works protocol, via notes or plans and on-site briefings with construction/personnel:

- Schedule for pre-construction activities such as wildlife inspections, silt fencing installation and contractor briefing.
- Description of wildlife mitigation measured to be used during drainage work activities, including:
  - Placement and specifications of required protection measures (e.g. fencing, signage)
  - Phasing and direction of site clearing activities
  - Any recommendations regarding access routes for equipment, vehicle parking, materials, stockpiling, etc.
- Guidance on what to do in the event of a wildlife encounter, including SAR and arrangements for dealing with injured or orphaned animals (as indicated in **Table 5** and ***Appendix F***). This guidance should be summarized in a handout suitable for quick reference by on-site staff, including truck drivers.
- SAR awareness training should be provided to all on-site staff.

In the Contractor Information Package (***Appendix F***) Dillon has provided SAR identification sheets for SAR with the potential to occur within the Study Area.

7.2.1 Species Specific Mitigation Measures for Snake Species

Snake species can be found in a variety of habitat types and most of the drainage work activities have the potential to encounter snakes. Particular attention should be given when conducting works on catch basins, culverts, rip rap and crossing structures, as snakes carry out sensitive life processes in structures such as these. **Table 4** shows the sensitive timing windows for snake species when carrying out life processes related to hibernation and staging.

Table 4: Sensitive Timing Windows for Snake Species

Month	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec		
Date Codes[1]	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
Hibernation																																				
Staging																																				

[1]Monthly intervals: E = Early (days 1-10); M = Middle (days 11-20); L = Late (days 21-31). Adapted from the Seasonal Timing Windows Chart in the MNRF Agreement under Section 23 of O.Reg. 242/08 made under ESA, 2007 (File #: AY-23D-009-10).

Table 5 below outlines the recommended mitigation measures to avoid impacts to snake species during and outside of RAP. Photographs of habitat observed within and adjacent to drains that have the potential to support SAR snakes, have been included in ***Appendix G*** (Photographs #1 - 4).

Table 5: Mitigation Measures for Snake Species

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Snakes in Study Area

Eastern Foxsnake (Carolinian population)
 	
Queensnake
 	
Butler's Gartersnake
	• Preconstruction planning that includes review for potential habitat.
	• During site visit, verify if attributes of regulated habitat occur and delineate where possible.
	• Establish constraints for activities, where possible, that abide by timing windows and setback distances and avoid regulated habitat features
	• Narrow construction footprint if possible.
	• Flag or fence off environmentally sensitive areas prior to drainage work activity. Bury fencing minimum of 10 – 20 cm and vertical height of at least 60 cm. Note, stakes should be installed on the activity side to prevent snake use of stakes to climb fence.
	• Complete wildlife sweep within the exclusion area following fence installation to ensure no trapped wildlife.
	• Staff/workers conducting drainage works should be trained in snake species identification and procedures if encountered (review and sign off form in Contractor Information Package)
	• One staff member/worker or qualified biologist should be trained in proper snake handling procedures and protocols outlined in Section 2 of the *Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders* (Included in the Contractor Information Package). This person should be onsite at all times (when required) for the potential capture, temporary holding, transfer and release of any snakes encountered during construction. A minimum of two holding tubs and cotton sacks should be onsite at all times.
	• Prior to commencement of daily drainage work activity, the area should be cleared of snakes through machinery inspections (e.g. wheels, engine compartment) each morning and after machinery is left idle for more than one (1) hour if left on site during the snake active season.
	• If a nest is uncovered during drainage work activity:
	  ○ Collect any displaced or damaged eggs and transfer them to a holding tub
	  ○ Capture and transfer all injured dispersing juveniles of that species into a light-coloured drawstring cotton sack
	  ○ Place all cotton sacks with the captured injured individuals into a holding tub out of direct sunlight
	  ○ Immediately contact the MNRF to seek direction and to arrange for transfer of the injured individuals
	  ○ Immediately stop any disturbance to the next site and loosely cover exposed portions with soil or organic material to protect the integrity of the remaining individuals
	  ○ Do not drive over the nest site of conduct any activities within 5 m of the nest site
	  ○ Do not place any dredged materials removed from drainage works on top of the nest site
	  ○ 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
	  ○ Where there are no collected eggs or captured individuals, contact the MNRF within 24 hours to provide information on the location of the nest
	• Any injured captured snakes should be stored outside of direct sunlight and the MNRF should immediately be contacted to seek direction and to arrange for transfer. MNRF may require transfer to the nearest MNRF authorized Wildlife Rehabilitator. Contact Information for Authorized Wildlife Rehabilitator can be found in ***Appendix F*** and on SAR Information Sheets (***Appendix F***).
	• If conducting drainage works during a species sensitive timing window and one or more individuals belonging to a snake species is encountered or active hibernacula is discovered:
	  ○ Trained staff/worker or qualified biologist shall capture and transfer all injured and uninjured individual snakes of that species into individual light-coloured, drawstring cotton sacks
	  ○ Place cotton sacks into a holding tub
	  ○ Ensure that the holding tub with captured individuals is stored at a cool temperature to protect snakes from freezing until the individuals can be retrieved or transferred
	  ○ If an active hibernacula is uncovered cease all work and immediately
	  ○ Contact the MNRF immediately to seek advice and arrange for transfer and/or removal
	• If conducting drainage works outside of a species sensitive timing window and one or more individuals belonging to a snake species is encountered:
	  ○ Briefly stop the activity for a reasonable period of time to allow any uninjured individual snakes of that species to leave the work area
	  ○ If the individuals do not leave the work area after the activity is briefly stopped, trained staff/worker or qualified biologist shall capture all uninjured individuals and release them in accordance with the methods outlined below
	  ○ 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 into a holding tub which shall be stored out of direct sunlight for a maximum of 24 hours before releasing them in accordance with the methods outlined below
	  ○ Capture and transfer any individuals injured as a result of conducting drainage works into a holding tub separate from any holding tub containing uninjured individuals
	  ○ Store all captured injured individuals out of direct sunlight and immediately contact the MNRF to seek direction and to arrange their transfer

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Snakes in Study Area

Butler's Gartersnake *(con'd)*	• Uninjured individuals captured during drainage works, are to be released within 24 hours of capture, in an area immediately adjacent to the drainage works with natural vegetation cover within 50 m and out of harm's way (as per subsections 2.3 and 2.4 of Handling Manual included in the Contractor Information Package).
	• Where one or more individuals belonging to a snake species is killed as a result of drainage work activity, or a person finds a deceased individual of a snake species, the following measures should be followed:
	  ○ Collect and transfer any dead individuals into a holding tub outside of direct sunlight; and,
	  ○ Contact the MNRF within 72 hours to seek direction and to arrange for the transfer of the carcasses of the deal individuals.
	• If the methods of handling snakes outlined in subsection 2.3 and 2.4 of the Handling Manuals are not applicable due to a snake's injuries, use a shovel or flat object to pick up the snake, ensuring that injured areas are supported and place in a large plastic bin or bucket with a lid with air holes. Immediately transport the turtle to an MNRF authorized veterinarian or wildlife rehabilitator and contact the MNRF. Contact Information for Authorized Wildlife Rehabilitator can be found in ***Appendix F*** and on SAR Information Sheets (***Appendix F***).
	• **Complete a SAR Encounter Reporting Form included in Contractor Information Package.**

7.2.2 Species Specific Mitigation Measures for Turtle Species

Turtles can generally be found associated with large wetlands and shallow lakes with abundant aquatic vegetation. For nesting, turtles prefer moist well drained, loose soils for digging and on a gradual typically south facing slope. Species such as Blanding's Turtle hibernate underwater in permanent waterbodies. Sensitive timing windows for turtle species includes the nesting period and has been provided in **Table 6.**

When conducting drainage works where there is potential for turtle species to be hibernating, water level **cannot be reduced** as per Paragraph 6 of subsection 13 of Section 23.9 of O.Reg. 242/08.

Table 6: Restricted Activity Period for Turtle Species

Month	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec		
Date Codes[1]	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
Hibernation																																				

[1]Monthly intervals: E = Early (days 1-10); M = Middle (days 11-20); L = Late (days 21-31). Adapted from the Seasonal Timing Windows Chart in the MNRF Agreement under Section 23 of O.Reg. 242/08 made under ESA, 2007 (File #: AY-23D-009-10).

In **Table 7** below, the recommended mitigation measures to avoid impacts to turtle species during and outside sensitive timing windows and what to do when encountering turtle nests are provided. Photographs of habitat observed within and adjacent to drains that have the potential to support SAR Turtles, have been included in **Appendix G** (Photographs #5 - 6).

Table 7: Mitigation Measures for Turtle Species

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Turtles within the Study Area
Blanding's Turtle	• Preconstruction planning that includes review for potential habitat. • During site visit, verify if attributes of regulated habitat occur and delineate where possible. • Establish constraints for activities, where possible, that abide by timing windows and setback distances and avoid regulated habitat features. • Narrow construction footprint if possible. • Flag or fence off environmentally sensitive areas prior to drainage work activity. Bury fencing minimum of 10 – 20cm and vertical height of at least 60 cm. • Complete wildlife sweep within the exclusion/construction area following fence installation to ensure no trapped wildlife. • Staff/workers conducting drainage works should be trained in turtle species identification and procedures if encountered (Review and sign off form in the Contractor Information Package). • One staff member/worker or qualified biologist should be trained in proper turtle handling procedures and protocols outlined in Section 1 of the Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (provided in the Contractor Information Package). This person should be onsite at all times (when required) for the potential capture, temporary holding, transfer and release of any turtles encountered during construction. A minimum of two holding tubs and cotton sacks should be onsite at all times. • If construction is planned to commence during the turtle nesting period, prior to site preparation a turtle nesting search should be completed to identify turtle nests. If nests are encountered, the MNRF must be consulted immediately. Nests should be relocated to an appropriate facility for incubation with MNRF approval. Contact information for MNRF Authorized Wildlife Rehabilitator can be found in ***Appendix F*** and on SAR Information Sheets (***Appendix F***). • Drainage work activity related to excavation of sediment or disturbance to banks should be avoided during the sensitive timing windows for turtles. • During turtle hibernation periods, water in drains or ditches cannot be reduced. • Prior to commencement of daily activity, the area should be cleared of turtles and turtle nests by a specially trained staff member or qualified biologist.

Spiny Softshell	• Do not disturb a turtle encountered laying eggs and do not conduct activities within 20 m of the turtle while it is laying eggs.
	• If conducting drainage works during a species sensitive timing window and one or more individuals belonging to a turtle species is encountered:
	  ○ Trained staff/worker or qualified biologist shall capture and transfer all injured and uninjured individual of that species to a holding tub
	  ○ Capture and transfer all individuals injured as a result of the drainage work activity into a holding tub separate from any holding tub containing uninjured individuals
	  ○ Ensure that the holding tub with captured individuals is stored at a cool temperature to protect turtles from freezing until the individuals can be retrieved or transferred
	  ○ Contact the MNRF immediately to seek advice and arrange for transfer and/or removal
	• If a nest is uncovered during construction, immediately stop all activity near the nest. Cover the nest with soil or organic material. Do not drive within 5 m of the nest and contact the MNRF within 24 hours if no eggs or individuals were captured/collected.
	• Isolate material stockpile areas with fencing.
	• Any injured captured turtles should be stored outside of direct sunlight and the MNRF should immediately be contacted to seek direction and to arrange for transfer.
	• Machinery should be inspected each morning (e.g. under vehicles) for presence of turtles.
	• Uninjured individuals captured during drainage works, are to be released within 1 hour of capture, out of harm's way no more than 125 m of where it was found, unless absolutely necessary. If it is not possible to relocate the turtle within 125 m of the capture location, contact the MNRF for further direction. MNRF may require transport of turtle(s) to MNRF Authorized Rehabilitator or Veterinarian. Contact information can be found in ***Appendix F***.
	• If the methods of handling turtles outlined in subsection 1.3 of the Handing Protocol are not possible due to a turtle's injuries, use a shovel or flat object to pick up the turtle, ensuring that injured areas are supported and place in a large plastic bin or bucket with a lid with air holes. Immediately transport the turtle to an MNRF authorized veterinarian or wildlife rehabilitator and contact the MNRF. Contact Information for Authorized Wildlife Rehabilitator can be found in ***Appendix F*** and on SAR Information Sheets (***Appendix F***). See subsection 1.7 of the Handling Manual (included in the Contractor Information Package) for more details.
	• **Complete a SAR Encounter Reporting Form included in the Contractor Information Package.**

APPENDIX “REI-C”

STANDARD SPECIFICATIONS
FOR ACCESS BRIDGE CONSTRUCTION

1. PRECAST CONCRETE BLOCK & CONCRETE FILLED JUTE BAG HEADWALLS

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

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

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

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

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

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

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

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

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

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

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

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

2. QUARRIED LIMESTONE ENDWALLS

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

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

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

3. BRIDGE BACKFILL

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

4. GENERAL

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

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

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

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

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

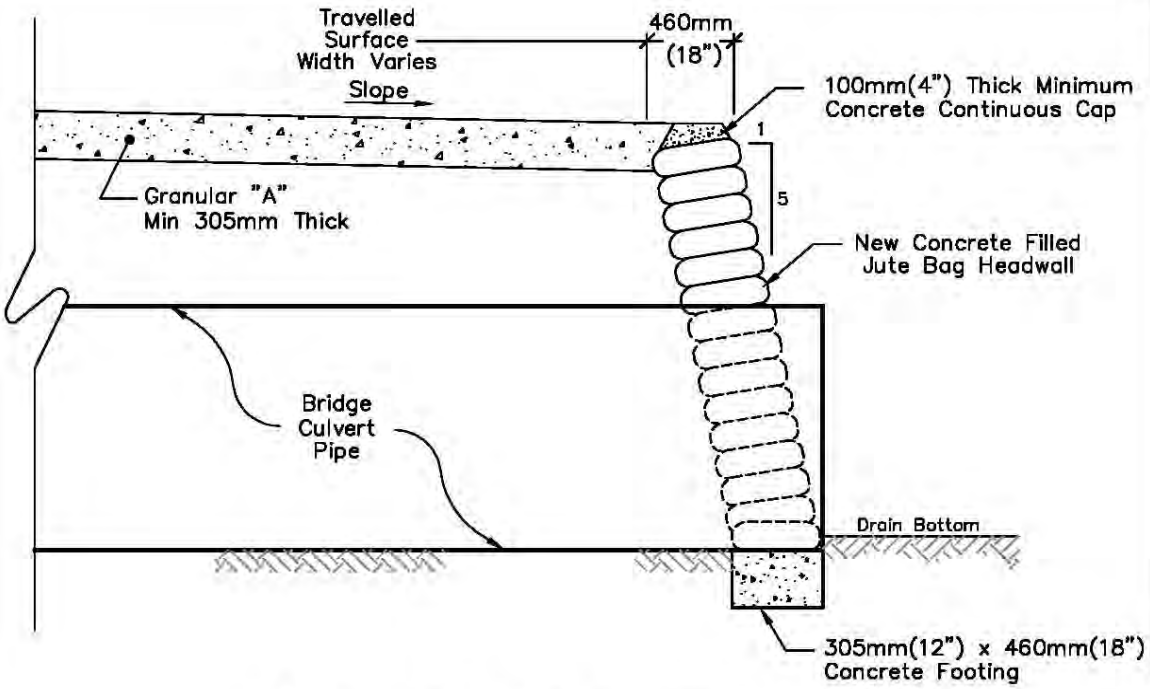
Where applicable, the Contractor and/or landowner constructing the new bridge shall be responsible for any damage caused by them to any portion of the Town road right-of-way. They shall take whatever precautions are necessary to cause a minimum of damage to same and must restore the roadway to its original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

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

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

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

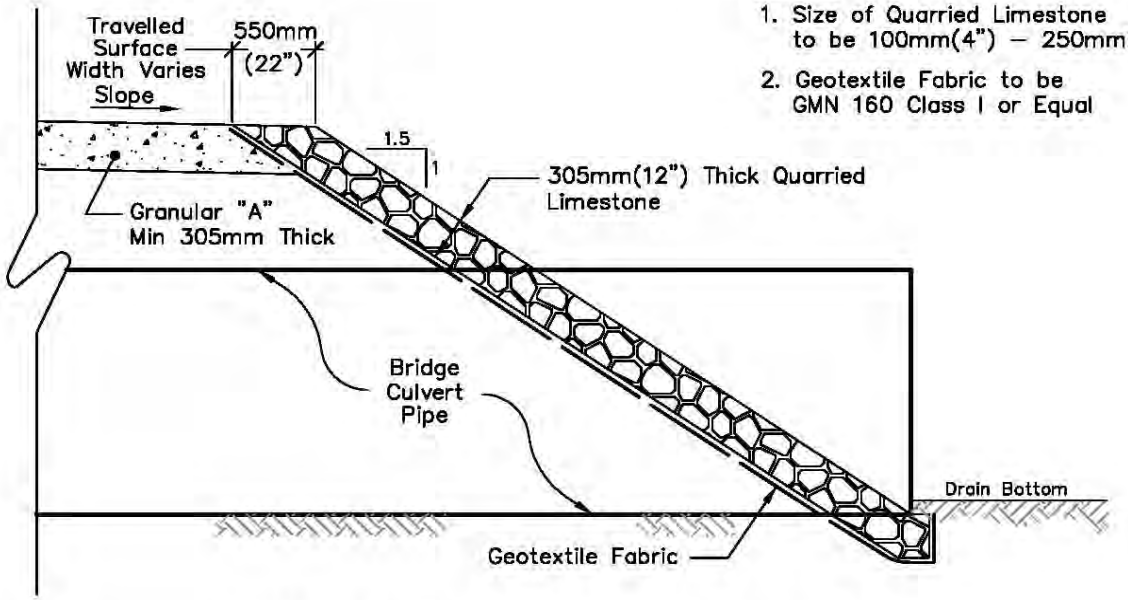
All of the excavation, installation procedures, and parameters as above mentioned are to be carried out and performed to the full satisfaction of the Drainage Superintendent and Engineer.



Typical Jute Bag Headwall

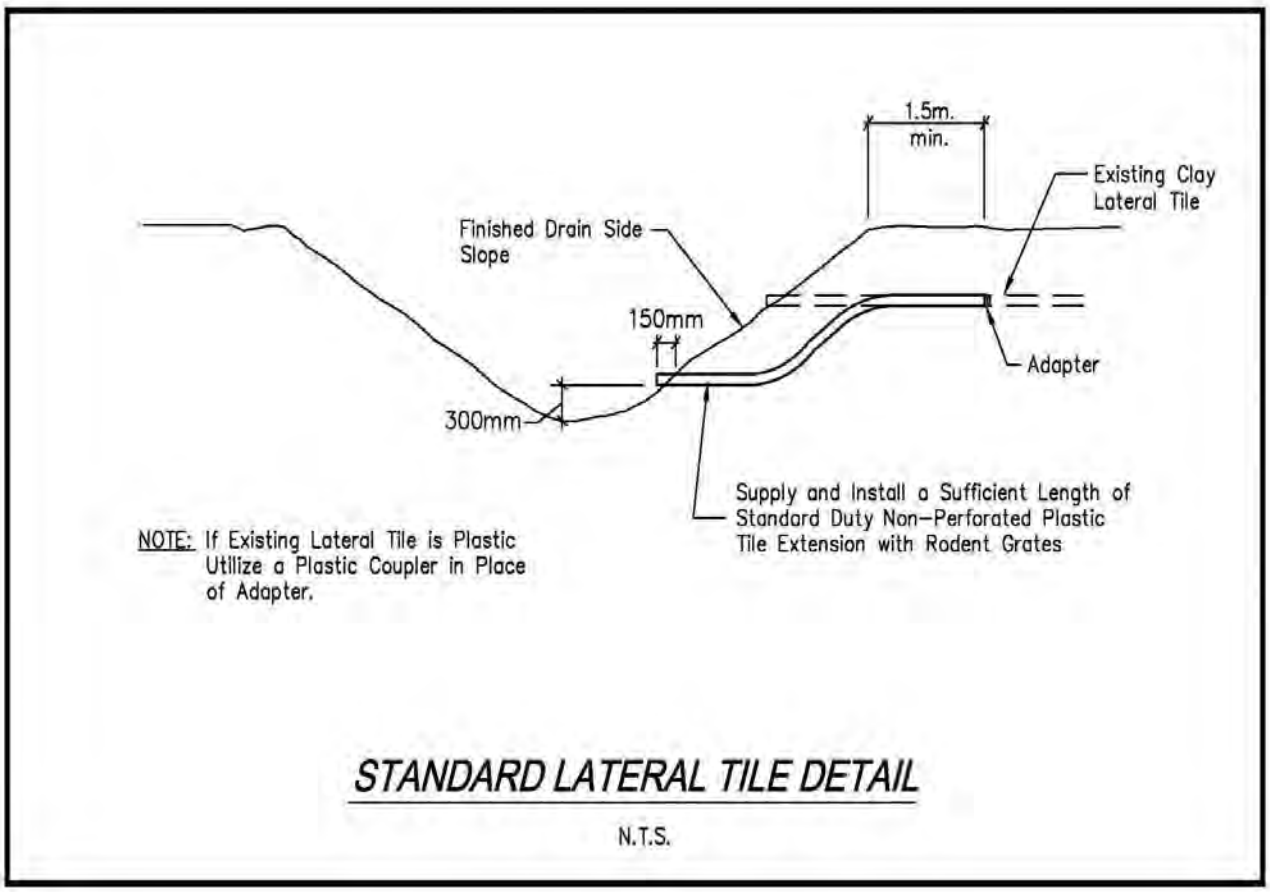
NOTE:

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



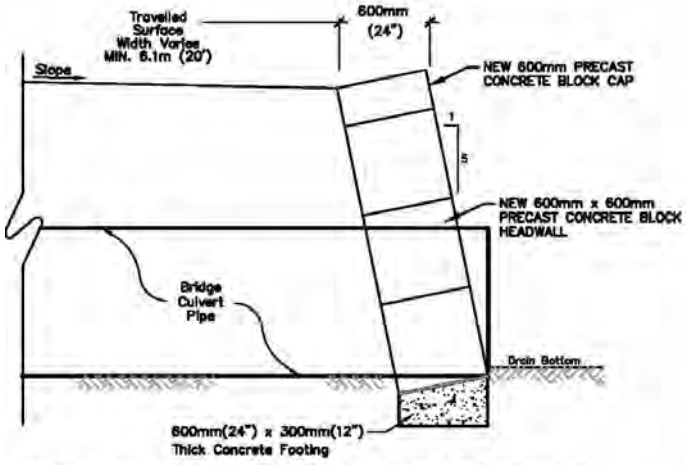
Typical Quarried Limestone End Protection

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



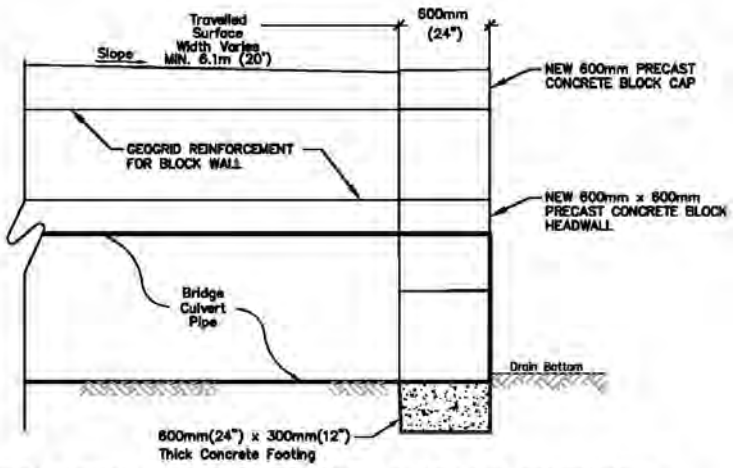
STANDARD LATERAL TILE DETAIL

N.T.S.



TYPICAL PRECAST CONCRETE BLOCK END PROTECTION

Scale = N.T.S.



TYPICAL VERTICAL PRECAST CONCRETE BLOCK END PROTECTION

Scale = N.T.S.

APPENDIX “REI-D”

Appendix D – General Conditions and Specifications not required.

APPENDIX “REI-E”

WATERSHED PLAN

OF THE

BESSETTE DRAIN

(Geographic Township of Sandwich West)

IN THE

TOWN OF LASALLE

IN THE

COUNTY OF ESSEX • ONTARIO

GERARD ROOD, P.ENG.

REGISTERED PROFESSIONAL ENGINEER G.ROOD 2023-03-27 PROVINCE OF ONTARIO

ROOD ENGINEERING INC.

CONSULTING ENGINEERS
Leamington, Ontario
519-322-1621

DATE: March 23rd, 2023

TOWN OF LASALLE

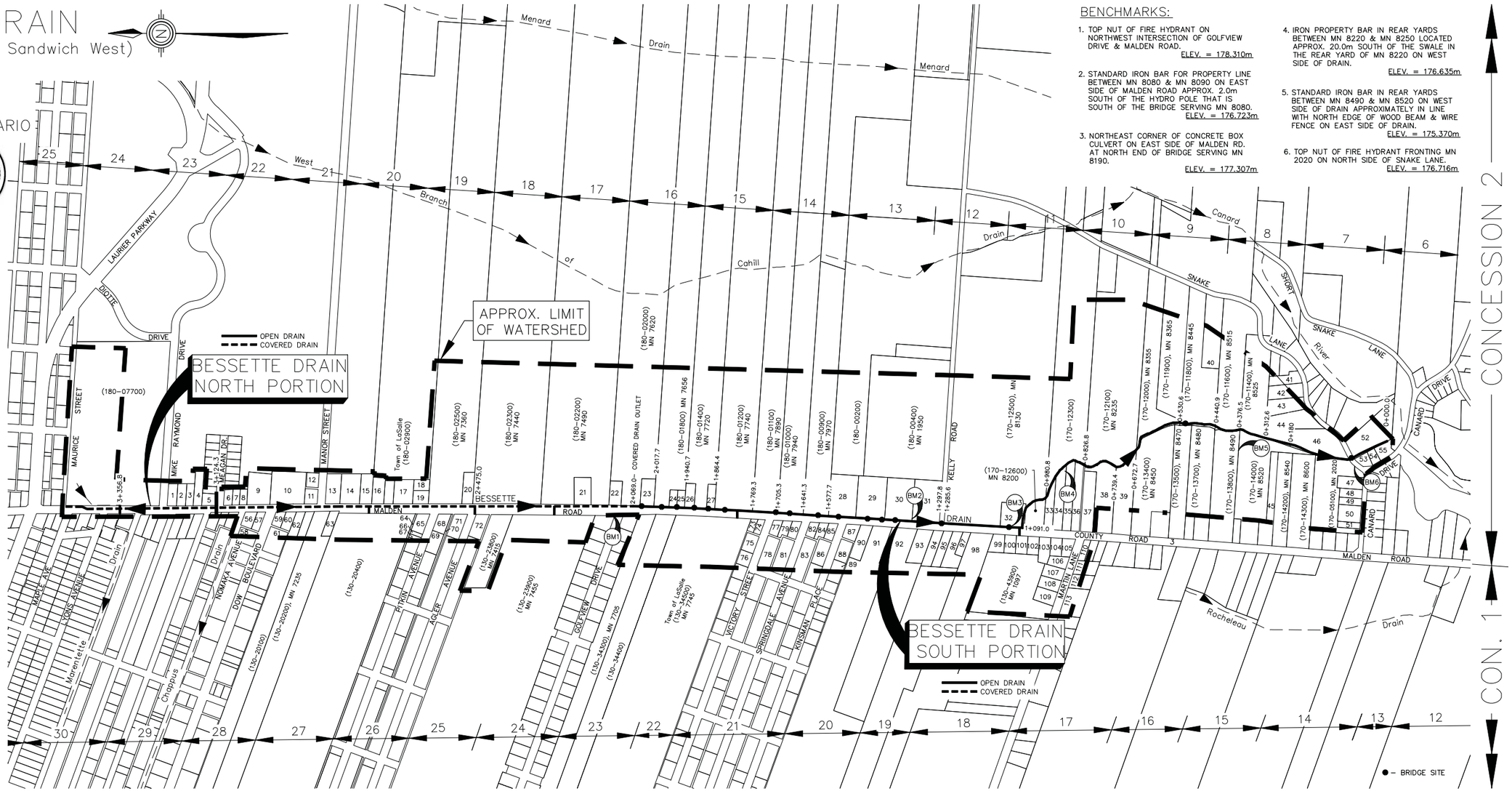
MAYOR: Crystal Meloche
CLERK: Jennifer Astrologo
DRAINAGE SUPERINTENDENT: Michael Cappucci, P.Eng.

BENCHMARKS:

1. TOP NUT OF FIRE HYDRANT ON NORTHWEST INTERSECTION OF GOLFVIEW DRIVE & MALDEN ROAD. ELEV. = 178.310m
2. STANDARD IRON BAR FOR PROPERTY LINE BETWEEN MN 8080 & MN 8090 ON EAST SIDE OF MALDEN ROAD APPROX. 2.0m SOUTH OF THE HYDRO POLE THAT IS SOUTH OF THE BRIDGE SERVING MN 8080. ELEV. = 176.723m
3. NORTHEAST CORNER OF CONCRETE BOX CULVERT ON EAST SIDE OF MALDEN RD. AT NORTH END OF BRIDGE SERVING MN 8190. ELEV. = 177.307m
4. IRON PROPERTY BAR IN REAR YARDS BETWEEN MN 8220 & MN 8250 LOCATED APPROX. 20.0m SOUTH OF THE SWALE IN THE REAR YARD OF MN 8220 ON WEST SIDE OF DRAIN. ELEV. = 176.635m
5. STANDARD IRON BAR IN REAR YARDS BETWEEN MN 8490 & MN 8520 ON WEST SIDE OF DRAIN APPROXIMATELY IN LINE WITH NORTH EDGE OF WOOD BEAM & WIRE FENCE ON EAST SIDE OF DRAIN. ELEV. = 175.370m
6. TOP NUT OF FIRE HYDRANT FRONTING MN 2020 ON NORTH SIDE OF SNAKE LANE. ELEV. = 176.716m

ROLL INFORMATION:

1. (180-07500), MN 7120
2. (180-07400), MN 7130
3. (180-07300), MN 7140
4. (180-07200), MN 7150
5. (180-07198), MN 1810
6. (180-07070), MN 7210
7. (180-07050), MN 7220
8. 180-07020), MN 7230
9. (180-07000), MN 7240
10. (180-06900),MN 7250
11. (180-06800), MN 7290
12. (180-06700)
13. (180-03400), MN 7296
14. (180-03200), MN 7300
15. (180-03100), MN 7310
16. (180-03000), MN 7320
17. (180-02800), MN 7340
18. (180-02700), MN 7346
19. (180-02600), MN 7350
20. (180-02400), MN 7390
21. (180-02202), MN 7530
22. (180-02100), MN 7600
23. (180-01900), MN 7650
24. (180-01700), MN 7660
25. (180-01600), MN 7670
26. (180-01500), MN 7710
27. (180-01300), MN 7730
28. (180-00750), MN 8030
29. (180-00700), MN 8050
30. (180-00600), MN 8080
31. (180-00500), MN 8090
32. (170-12550), MN 8190
33. (170-12700), MN 8210
34. (170-12800), MN 8220
35. (170-12900), MN 8250
36. (170-13000), MN 8260
37. (170-13100), MN 8300
38. (170-13200), MN 8330
39. (170-13300), MN 8350
40. (170-11700), MN 8475
41. (170-11300), MN 8585
42. (170-11250), MN 8595
43. (170-11200), MN 8605
44. (170-11100), MN 8615
45. (170-14100), MN 8530
46. (170-11000), MN 8645
47. (170-05000), MN 2010
48. (170-04900), MN 1970
49. (170-04800), MN 1960
50. (170-04700), MN 1940
51. (170-04600), MN 1930
52. (170-10900)
53. (170-05300), MN 2040
54. (170-05400), MN 2050
55. (170-05500), MN 2060
56. (130-15300), MN 7175
57. (130-15400)
58. (130-15500)
59. (130-19800), MN 7205
60. (130-19900), MN 7215
61. (130-19700), MN 1475
62. (130-20000), MN 7225
63. (130-20300), MN 7245
64. (130-21000)
65. (130-20500), MN 7355
66. (130-20600)
67. Town of LaSalle (130-20700)
68. (130-22600), MN 7375
69. (130-22500)
70. (130-22700)
71. (130-22800),MN 7385
72. (130-23700), MN 7405
73. (130-34600), MN 7865
74. (130-34700), MN 7875
75. (130-34800)
76. (130-34900)
77. (130-37000), MN 7925
78. (130-36900)
79. (130-37100), MN 7931
80. (130-37200), MN 7935
81. (130-37300)
82. (130-39000), MN 7945
83. (130-38900)
84. (130-39100), MN 7955
85. (130-39200), MN 7965
86. (130-39300)
87. (130-41900), MN 8005
88. (130-41800)
89. (130-41700)
90. (130-42000), MN 8065
91. (130-42100), MN 742
92. (130-42200), MN 635
93. (130-42300), MN 8125
94. (130-42400), MN 8145
95. (130-42500), MN 8151
96. (130-42600), MN 8155
97. (130-42700), MN 8165
98. (130-42800), MN 505
99. (130-42900), MN 8225
100. (130-43000), MN 8235
101. (130-43100), MN 8245
102. (130-43200), MN 8255
103. (130-43300), MN 8265
104. (130-43400), MN 8275
105. (130-43500), MN 8285
106. (130-43600), MN 1139
107. (130-43700), MN 1129
108. (130-43750), MN 1119
109. (130-43800), MN 1109
110. (160-09500), MN 8315
111. (160-09600), MN 1120
112. (160-09650), MN 1110
113. (160-09700), MN 1100



WATERSHED PLAN

Scale=1: 5,000

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

DRAWN BY: K.S.
PLOT CODE: 1:1
COMPUTER FILE: REI2016D046.DWG

FILE No.: REI2016D046

SHEET No.: 1 OF 6

PLAN, PROFILE AND CROSS SECTIONS

OF THE

BESSETTE DRAIN

(Geographic Township of Sandwich West)

IN THE

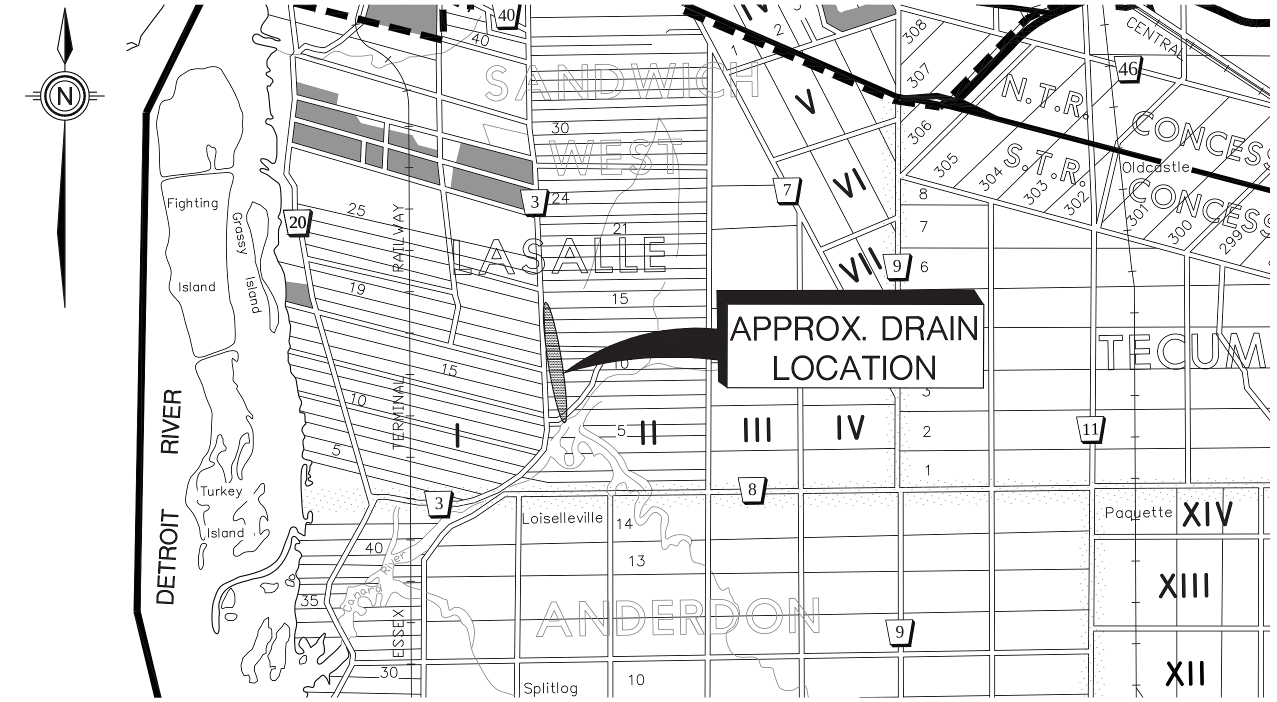
TOWN OF LASALLE

IN THE

COUNTY OF ESSEX • ONTARIO

BENCHMARKS:

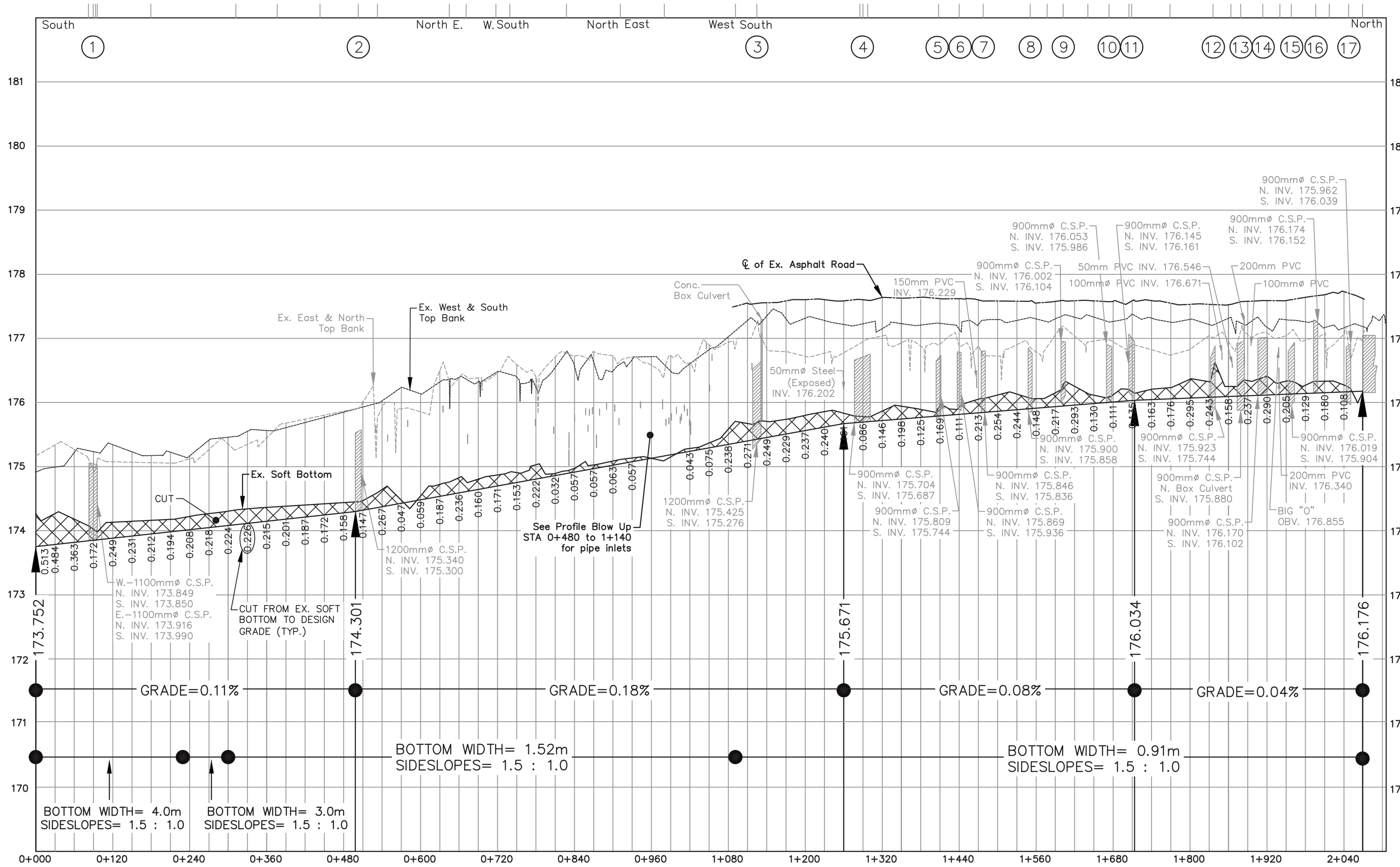
1. TOP NUT OF FIRE HYDRANT ON NORTHWEST INTERSECTION OF GOLFVIEW DRIVE & MALDEN ROAD.
   ELEV. = 178.310m
2. STANDARD IRON BAR FOR PROPERTY LINE BETWEEN MN 8080 & MN 8090 ON EAST SIDE OF MALDEN ROAD APPROX. 2.0m SOUTH OF THE HYDRO POLE THAT IS SOUTH OF THE BRIDGE SERVING MN 8080.
   ELEV. = 176.723m
3. NORTHEAST CORNER OF CONCRETE BOX CULVERT ON EAST SIDE OF MALDEN RD. AT NORTH END OF BRIDGE SERVING MN 8190.
   ELEV. = 177.307m
4. IRON PROPERTY BAR IN REAR YARDS BETWEEN MN 8220 & MN 8250 LOCATED APPROX. 20.0m SOUTH OF THE SWALE IN THE REAR YARD OF MN 8220 ON WEST SIDE OF DRAIN.
   ELEV. = 176.635m
5. STANDARD IRON BAR IN REAR YARDS BETWEEN MN 8490 & MN 8520 ON WEST SIDE OF DRAIN APPROXIMATELY IN LINE WITH NORTH EDGE OF WOOD BEAM & WIRE FENCE ON EAST SIDE OF DRAIN.
   ELEV. = 175.370m
6. TOP NUT OF FIRE HYDRANT FRONTING MN 2020 ON NORTH SIDE OF SNAKE LANE.
   ELEV. = 176.716m



KEY PLAN

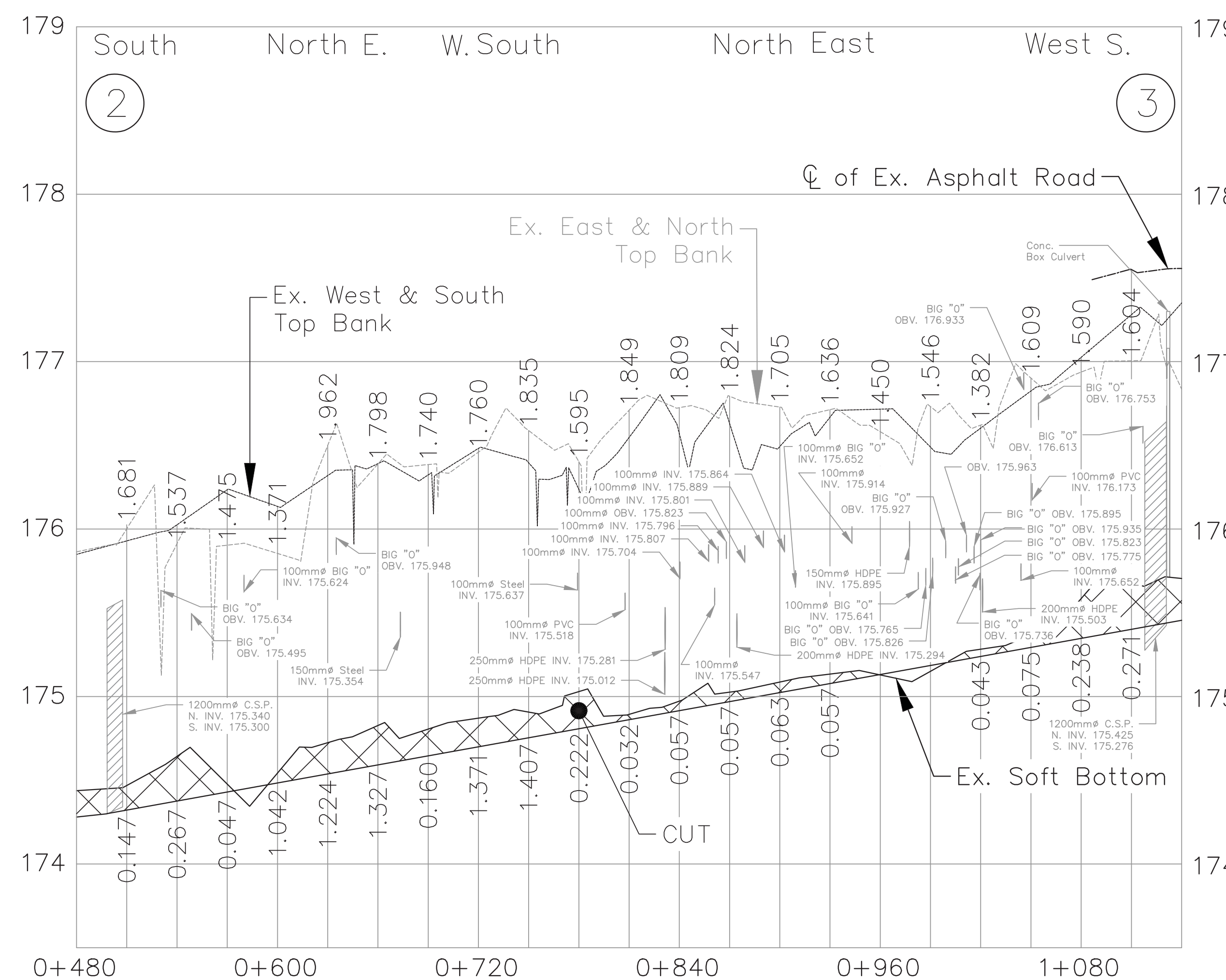
Scale=1:50,000

0+082.6 R.O.W. Limit for Snake Lane
0+089.5 2 Barrels–11.0m–1100mmø C.S.P.
0+093.6 R.O.W Limit for Snake Lane
0+180.0 ℄ for Parcels 170–11100 & 170–11000
0+312.6 ℄ for Parcels 170–11100 & 170–11400
0+376.5 ℄ for Parcels 170–11400 & 170–11600
0+440.9 ℄ for Parcels 170–11600 & 170–11800
0+502.9 10.0m–1200mmø C.S.P.
0+530.6 ℄ for Parcels 170–11800 & 170–12000
0+645.0 Drain Bends Westerly
0+672.7 ℄ for Parcels 170–12100 & 170–12000
0+727.6 Drain Bends Northerly
0+739.4 ℄ for Parcels 170–13200 & 170–13300
0+826.8 ℄ for Parcels 170–12100 & 170–12300
0+911.6 Drain Bends Westerly
0+980.8 ℄ for Parcels 170–12300, 170–12500, 170–12600 & 170–12700
1+091.0 Drain Bends Northerly
1+124.5 12.0m–1200mmø C.S.P.
1+285.6 R.O.W. Limit for Kelly Road & ℄ for Parcel 170–12500
1+290.0 24.0m–900mmø C.S.P
1+297.8 R.O.W. Limit for Kelly Road & ℄ for Parcel 180–00500
1+407.8 7.0m–900mmø C.S.P.
1+440.0 6.0m–900mmø C.S.P.
1+477.5 6.2m–900mmø C.S.P.
1+550.7 6.0m–900mmø C.S.P.
1+577.7 ℄ for Parcels 180–00750 & 180–00900
1+602.2 6.3m–900mmø C.S.P.
1+641.3 ℄ for Parcels 180–00900 & 180–01000
1+673.8 8.0m–900mmø C.S.P.
1+705.3 ℄ for Parcels 180–01000 & 180–01100
1+709.0 8.5m–900mmø C.S.P.
1+769.3 ℄ for Parcels 180–01100 & 180–01200
1+835.8 6.5m–900mmø C.S.P.
1+864.4 ℄ for Parcels 180–01200 & 180–01300
1+879.1 10.7m–900mmø C.S.P./ Conc. Box Culvert
1+913.5 14.5m–900mmø C.S.P.
1+940.7 ℄ for Parcels 180–01500 & 180–01600
1+958.0 9.3m–900mmø C.S.P.
1+995.9 6.0m–900mmø C.S.P.
2+017.7 ℄ for Parcels 180–01800 & 180–01900
2+047.2 6.5m–900mmø C.S.P.
2+069.0 900mmø H.D.P.E. Drain Enclosure



PROFILE - BESSETTE DRAIN SOUTH OPEN PORTION

SCALE=1:5000 hor.
1:50 vert.

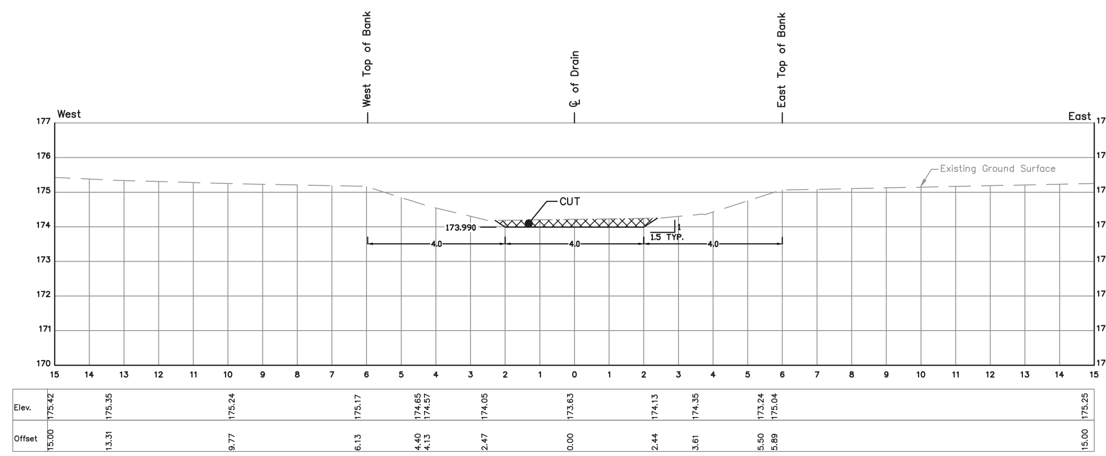


PROFILE BLOW UP - STA 0+480 TO 1+140

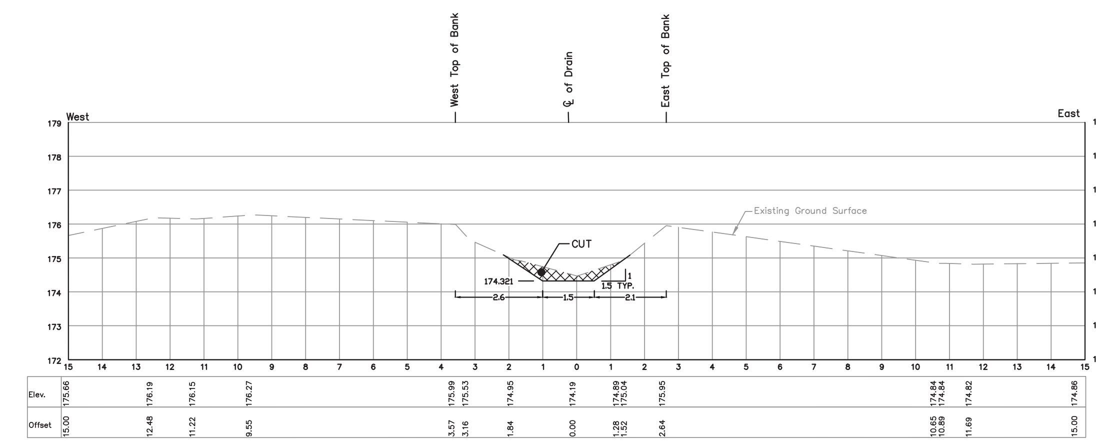
SCALE=1:2000 hor.
1:20 vert.

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

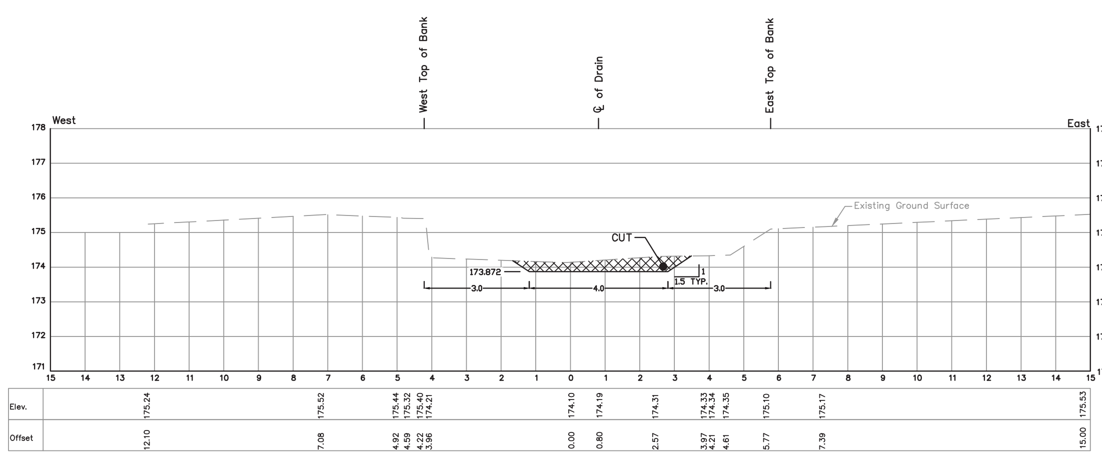
DRAWN BY: L.V & S.M
PLOT CODE: 1:1
COMPUTER FILE: REI2016D046.DWG
FILE No.: REI2016D046
SHEET No.: 2 of 6



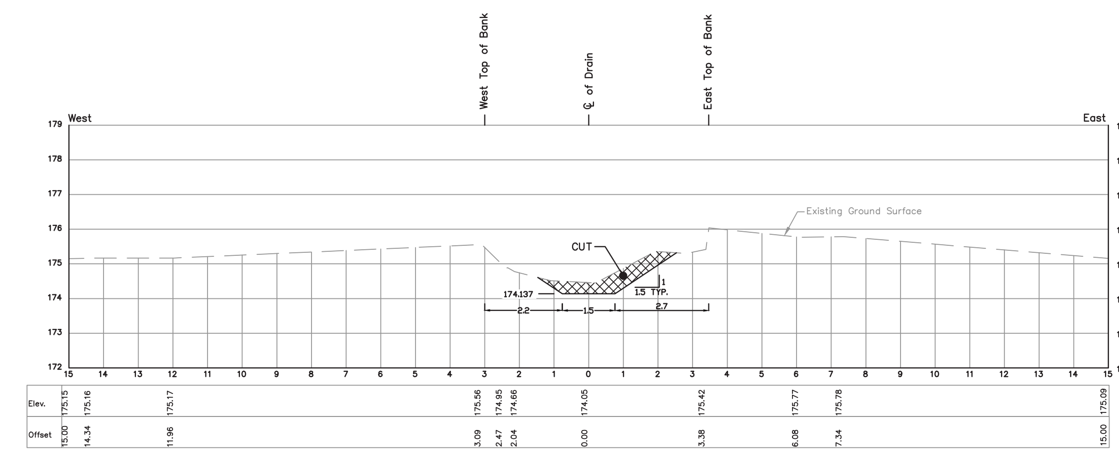
STA. 0+216.7
Scale = 1:100



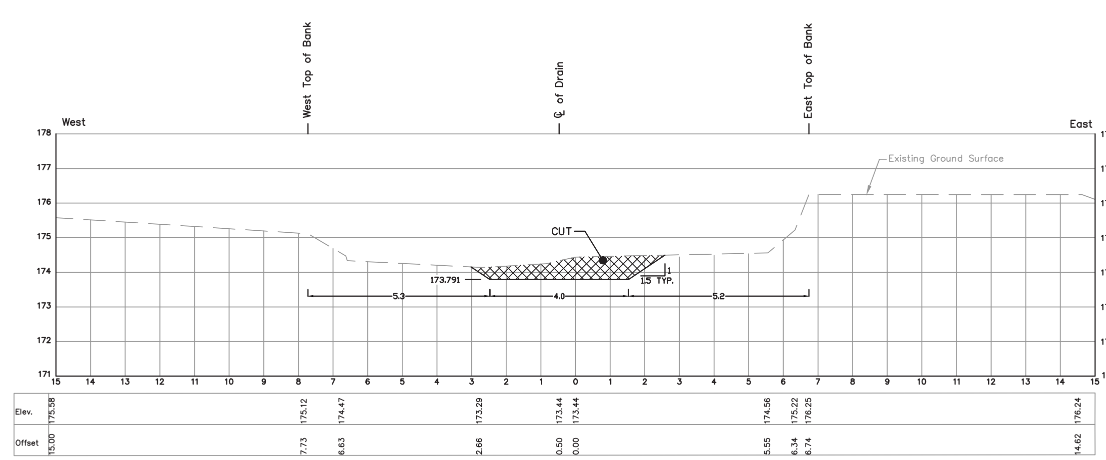
STA. 0+510.0
Scale = 1:100



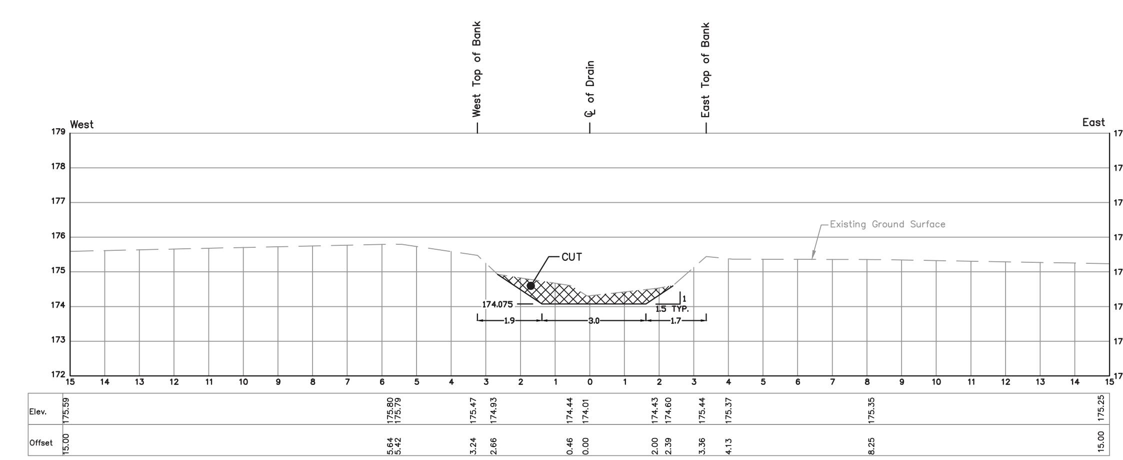
STA. 0+109.4
Scale = 1:100



STA. 0+349.6
Scale = 1:100



STA. 0+035.4
Scale = 1:100

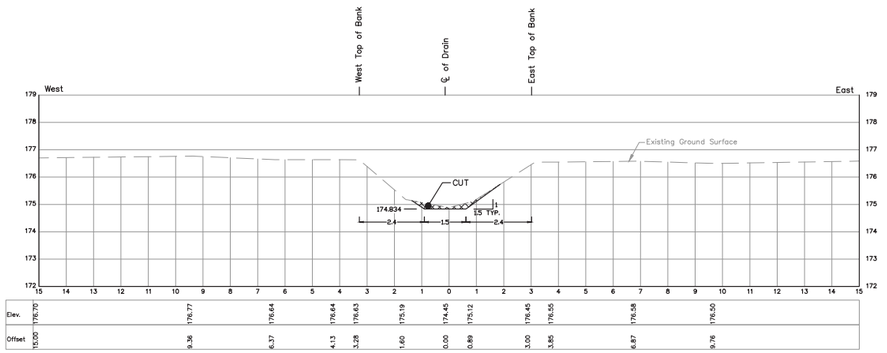


STA. 0+293.9
Scale = 1:100

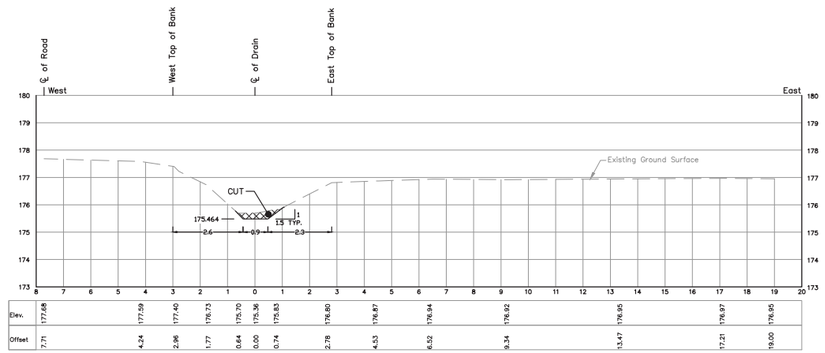
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

DRAWN BY: L.V & S.M
PLOT CODE: 1:1
COMPUTER FILE: REI2016D046.DWG

FILE No.:	SHEET No.:
REI2016D046	3 of 6



STA. 0+794.7
Scale = 1:100



STA. 1+145.0
Scale = 1:100

STA. 0+727.6
Scale = 1:100

STA. 1+068.0
Scale = 1:100

STA. 0+636.6
Scale = 1:100

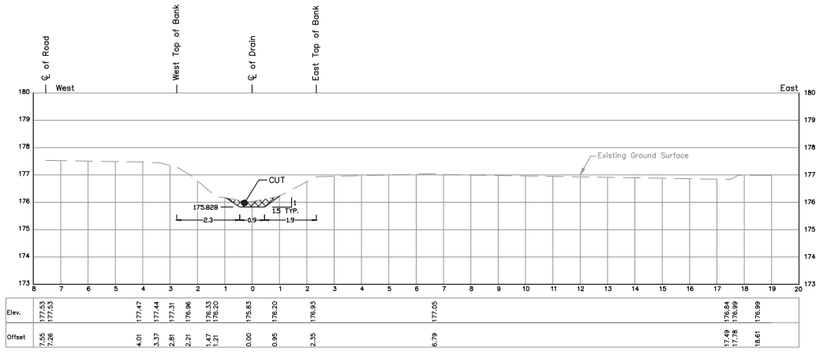
STA. 0+911.6
Scale = 1:100

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

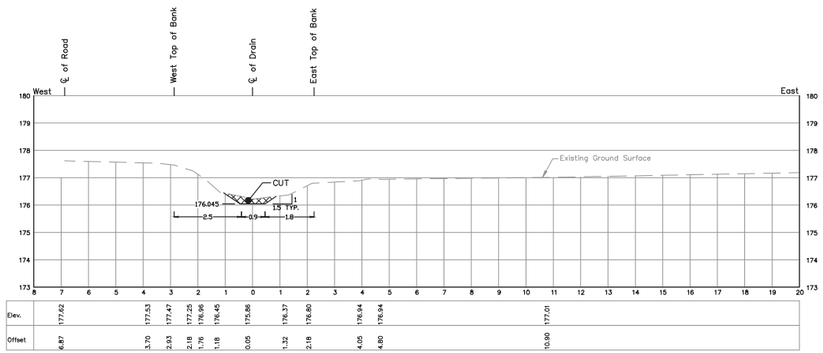
DRAWN BY: L.V & S.M
PLOT CODE: 1:1
COMPUTER FILE: REI2016D046.DWG

FILE No.: REI2016D046

SHEET No.: 4 of 6



STA. 1+455.4
Scale = 1:100



STA. 1+740.0
Scale = 1:100

STA. 1+340.2
Scale = 1:100

STA. 1+643.0
Scale = 1:100

STA. 1+242.8
Scale = 1:100

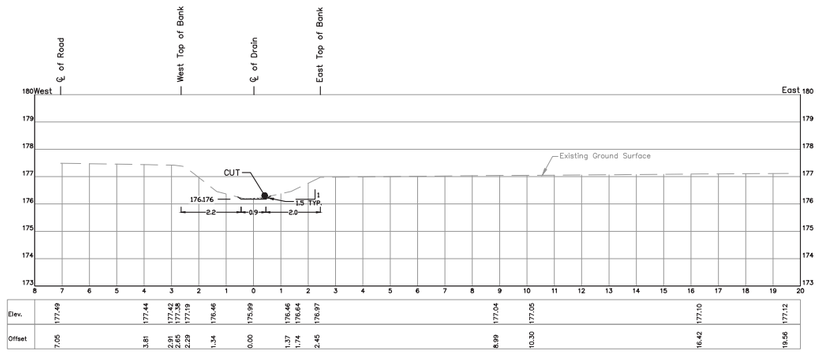
STA. 1+519.2
Scale = 1:100

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

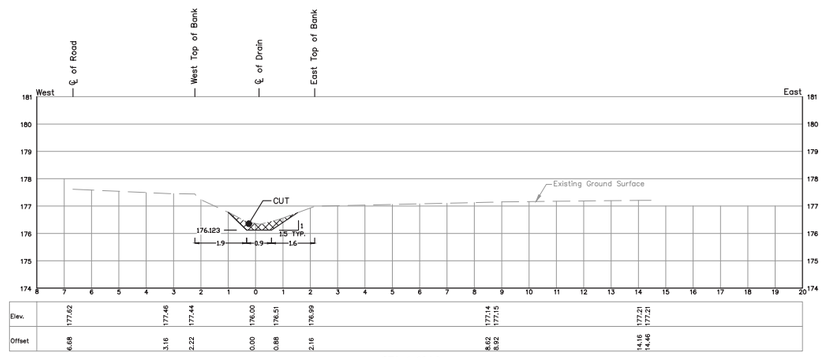
DRAWN BY: L.V & S.M
PLOT CODE: 1:1
COMPUTER FILE: REI2016D046.DWG

FILE No.: REI2016D046

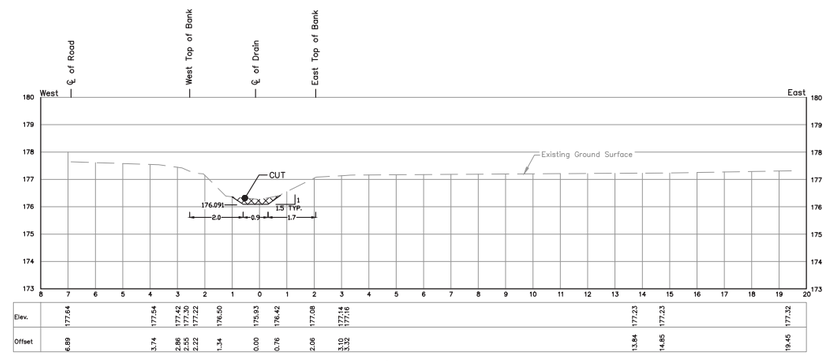
SHEET No.: 5 of 6



STA. 2+068.6
Scale = 1:100



STA. 1+934.8
Scale = 1:100



STA. 1+854.6
Scale = 1:100

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

DRAWN BY: L.V & S.M
PLOT CODE: 1:1
COMPUTER FILE: REI2016D046.DWG

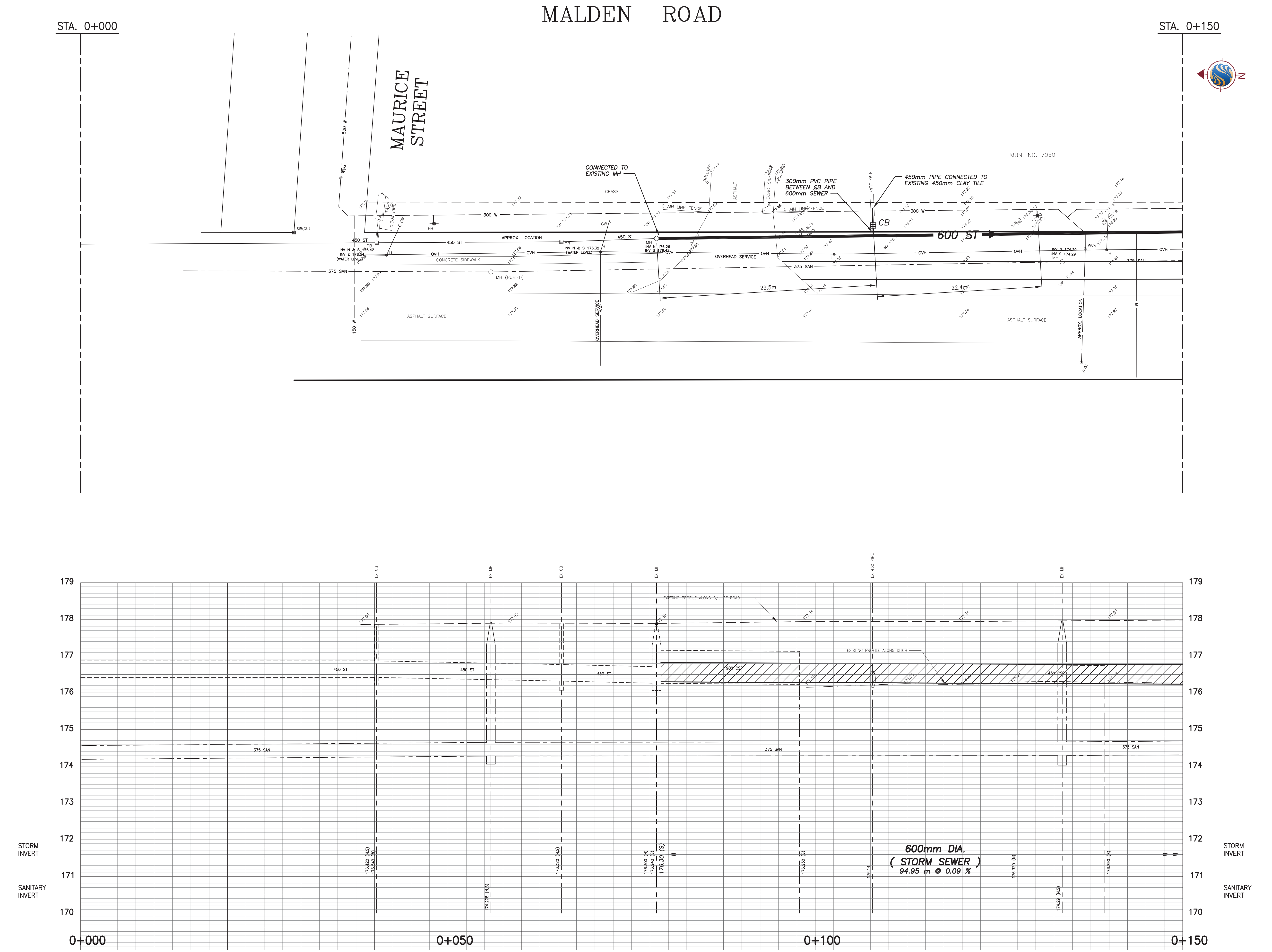
FILE No.: REI2016D046

SHEET No.: 6 of 6

APPENDIX “REI-F”

REI2016D046 - BESSETTE DRAIN

APPENDIX "REI-F" 2023-03-23



Stantec

Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision	By	Appd.	YY.MM.DD
5. RECORD	M.T.J.	M.T.J.	2012.04.30
4. CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3. TENDER	M.T.J.	C.R.G.J.	2010.04.13
2. MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1. TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued	By	Appd.	YY.MM.DD

File Name: 165601160C-169-178	K.F.F.	C.R.G.J.	M.T.J.	2010.03.22
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10 Issue: Tender Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+000 TO STA. 0+150

Project No. 165601160

Scale 1:250H 1:50V

Drawing No. C-169

Sheet

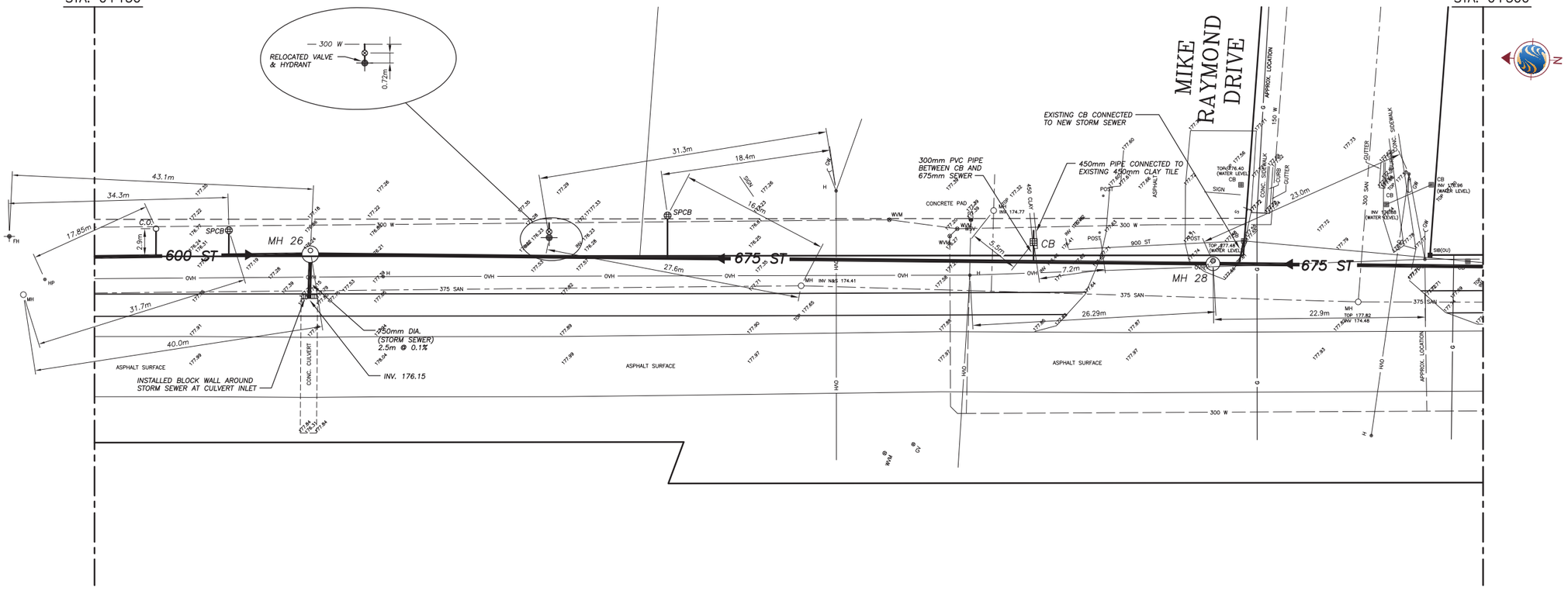
Revision

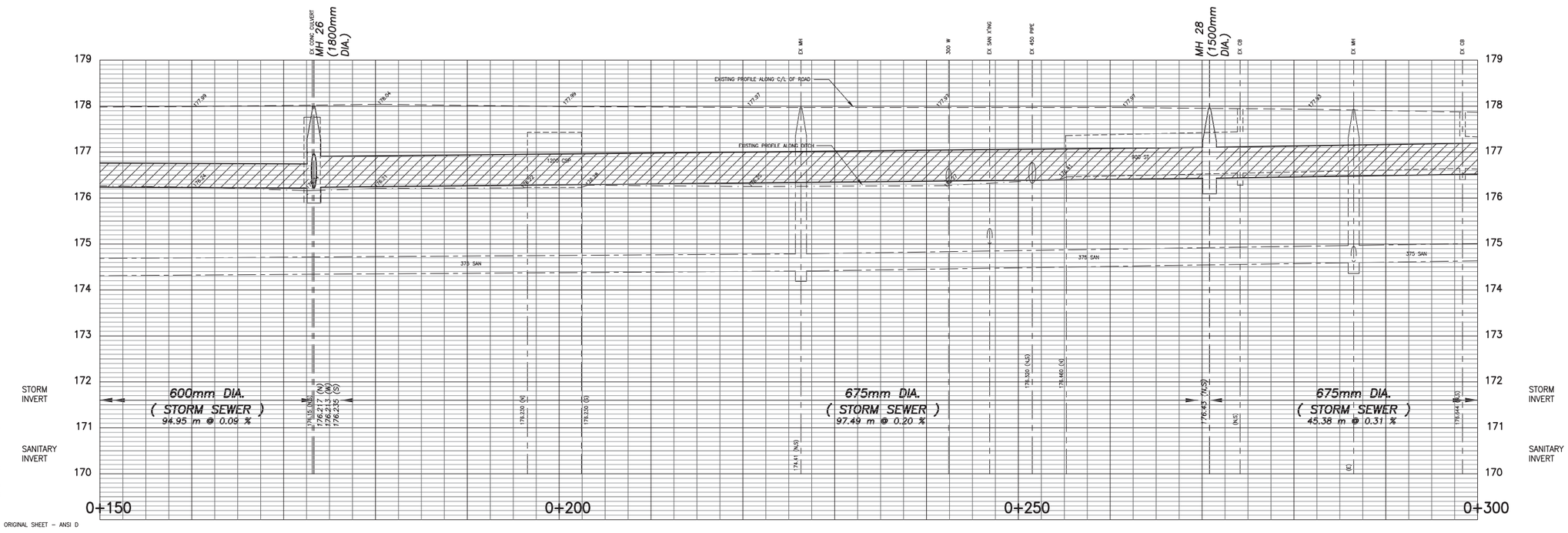
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

MALDEN ROAD

STA. 0+150

STA. 0+300





W:\active\165601160_lasalle_southwest_quadrant_watermain_replacement\construction\msl\sent\town\2012.04.30\165601160C-169-178.dwg
2012-4-30 11:41am BY: tmuir

ORIGINAL SHEET - ANSI D

Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.80 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision		By	Appd.	YY.MM.DD
5.	RECORD	M.T.J.	M.T.J.	2012.04.30
4.	CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3.	TENDER	M.T.J.	C.R.G.J.	2010.04.13
2.	MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1.	TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued		By	Appd.	YY.MM.DD
File Name: 165601160C-169-178		K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. Dsgn.	2010.03.22 YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10 Issue: Tender Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+150 TO STA. 0+300

Project No. 165601160

Scale 1:250H 1:50V

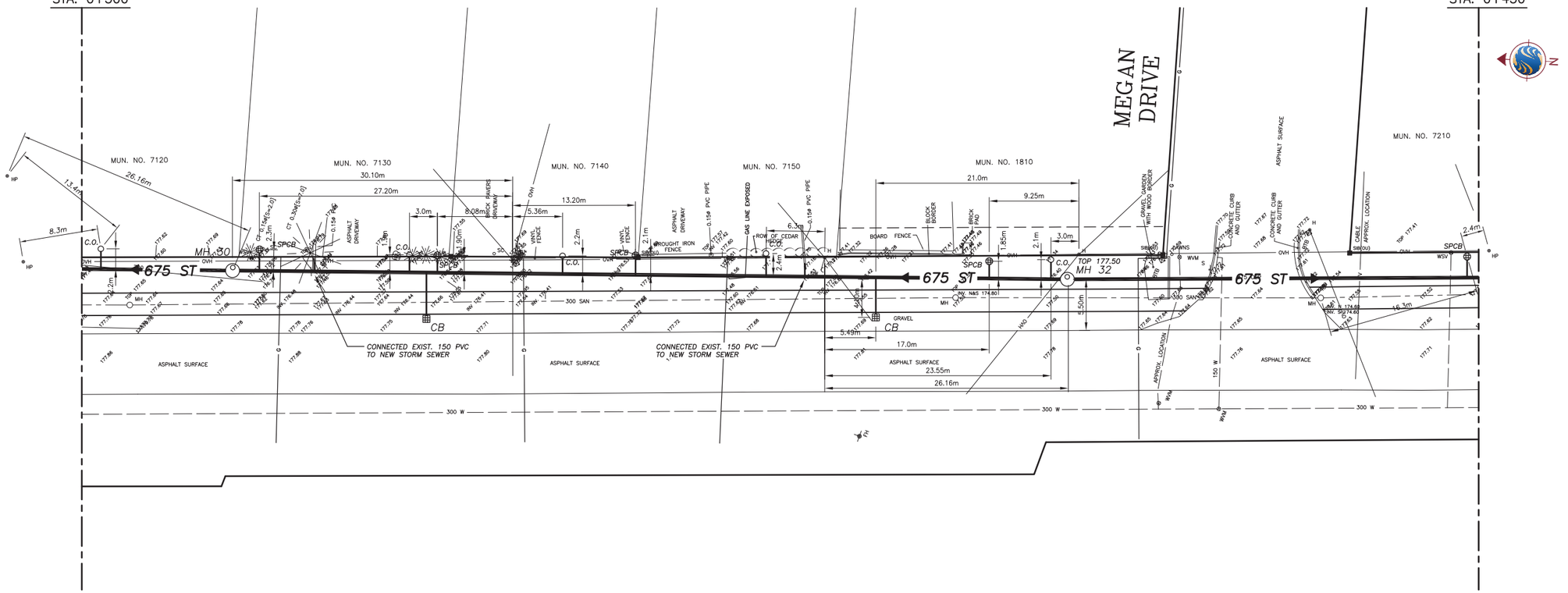
Drawing No. C-170

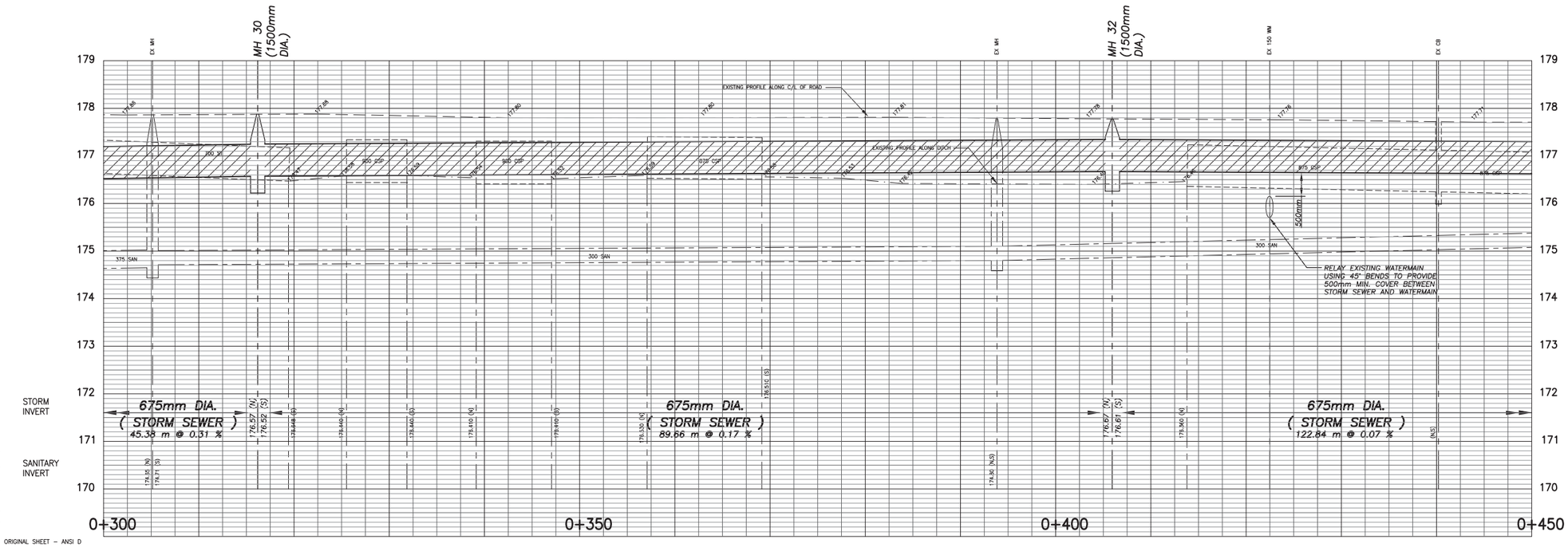
Sheet

Revision

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

MALDEN ROAD





Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.60 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision	By	Appd.	YY.MM.DD
5. RECORD	M.T.J.	M.T.J.	2012.04.30
4. CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3. TENDER	M.T.J.	C.R.G.J.	2010.04.13
2. MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1. TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued	By	Appd.	YY.MM.DD
File Name: 165601160C-169-178	K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. 2010.03.22 Dsgn. YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10 Issue: Tender Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+300 TO STA. 0+450

Project No. 165601160

Scale 1:250H 1:50V

Drawing No. C-171

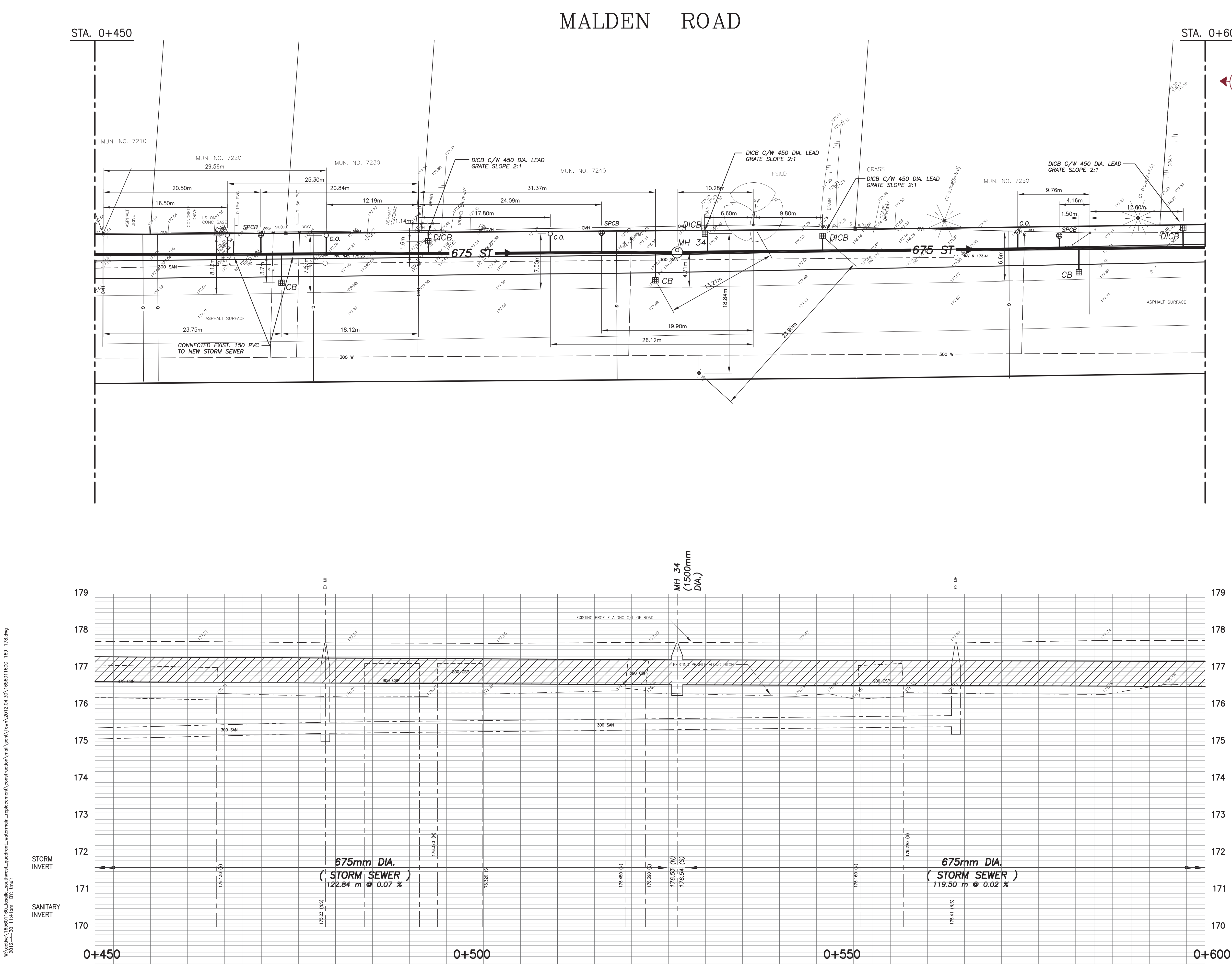
Sheet

Revision

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

W:\active\165601160_lasalle_southwest_quadrant_watermain_replacement\construction\msw\sent\town\2012.04.30\165601160C-169-178.dwg
2012-4-30 11:41am By: tmuir

ORIGINAL SHEET – ANSI D



Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision	By	Appd.	YY.MM.DD
5. RECORD	M.T.J.	M.T.J.	2012.04.30
4. CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3. TENDER	M.T.J.	C.R.G.J.	2010.04.13
2. MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1. TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued	By	Appd.	YY.MM.DD

File Name: 165601160C-169-178	K.F.F.	C.R.G.J.	M.T.J.	2010.03.22
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10 Issue: Tender Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+450 TO STA. 0+600

Project No. 165601160

Scale 1:250H 1:50V

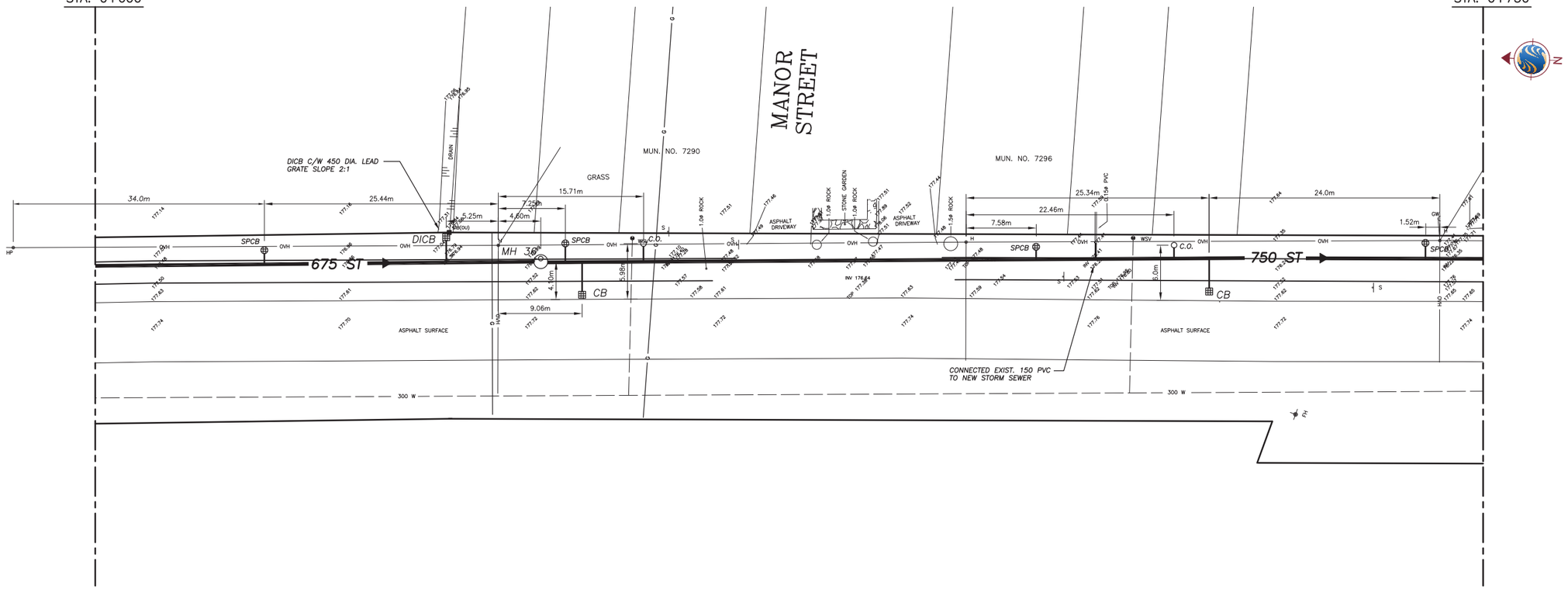
Drawing No. C-172

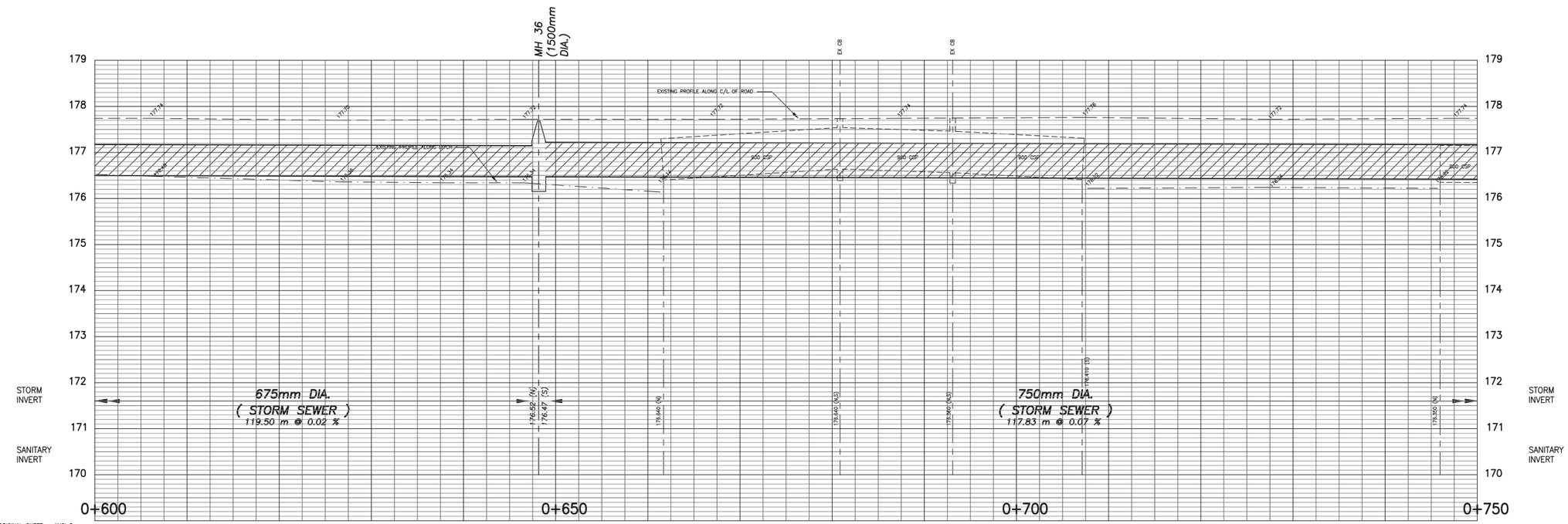
Sheet

Revision

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

MALDEN ROAD





ORIGINAL SHEET - ANSI D

Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.60 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision		By	Appd.	YY.MM.DD
5.	RECORD	M.T.J.	M.T.J.	2012.04.30
4.	CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3.	TENDER	M.T.J.	C.R.G.J.	2010.04.13
2.	MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1.	TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued		By	Appd.	YY.MM.DD
File Name: 165601160C-169-178		K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. Dsgn. 2010.03.22 YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10
Issue: Tender
Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+600 TO STA. 0+750

Project No. 165601160

Scale 1:250H 0 2.5 7.5 12.5m
1:50V 0 0.5 1.5 2.5m

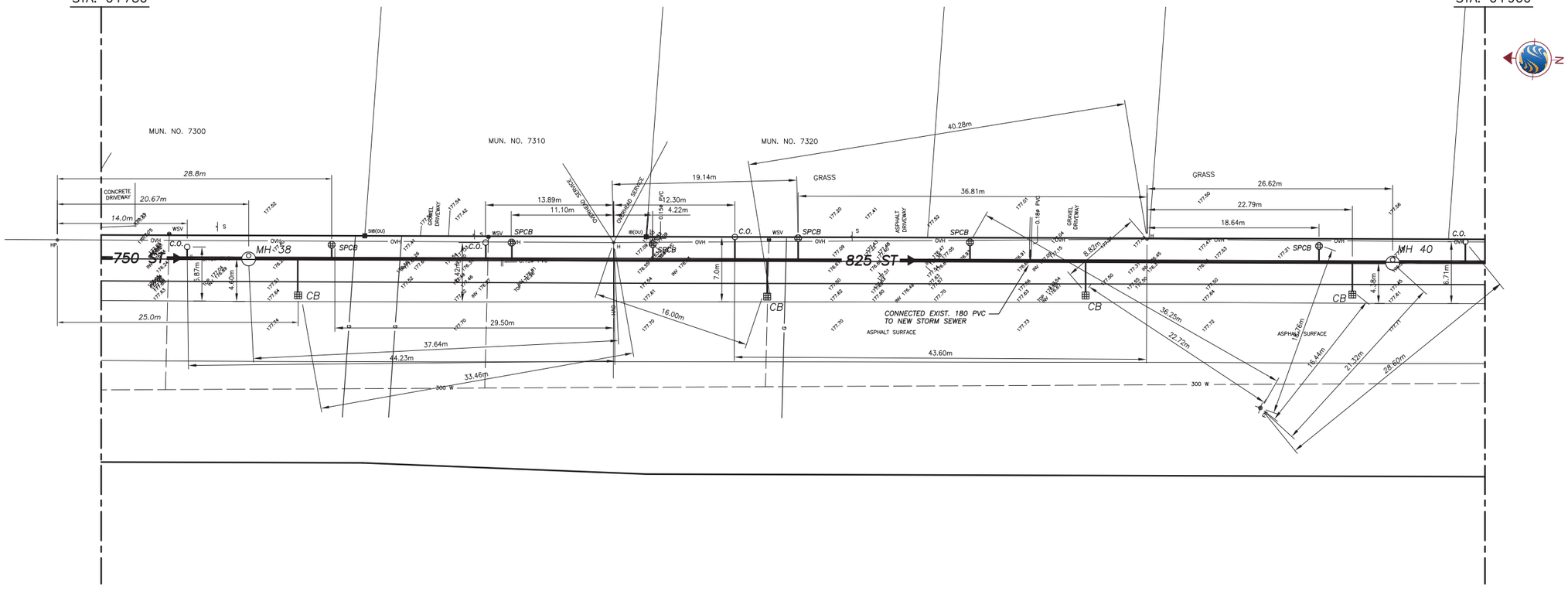
Drawing No. C-173

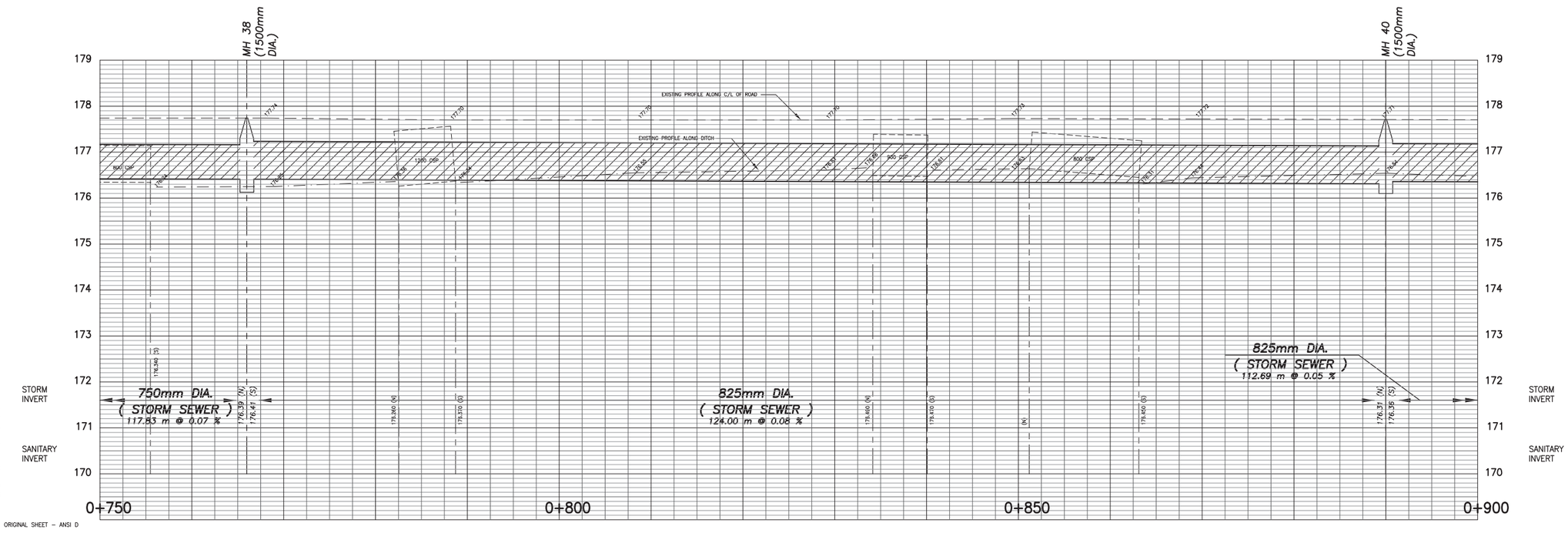
Sheet Revision

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

MALDEN ROAD

STA. 0+750 — STA. 0+900





W:\active\165601160_lasalle_southwest_quadrant_watermain_replacement\construction\msl\sent\Town\2012.04.30\165601160C-169-178.dwg
2012-4-30 11:41am BY: tmuir

ORIGINAL SHEET - ANSI D

Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.80 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision		By	Appd.	YY.MM.DD
5.	RECORD	M.T.J.	M.T.J.	2012.04.30
4.	CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3.	TENDER	M.T.J.	C.R.G.J.	2010.04.13
2.	MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1.	TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued		By	Appd.	YY.MM.DD
File Name: 165601160C-169-178		K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. Dsgn. 2010.03.22 YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10 Issue: Tender Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+750 TO STA. 0+900

Project No. 165601160

Scale 1:250H 1:50V (0, 2.5, 7.5, 12.5m; 0, 0.5, 1.5, 2.5m)

Drawing No. C-174

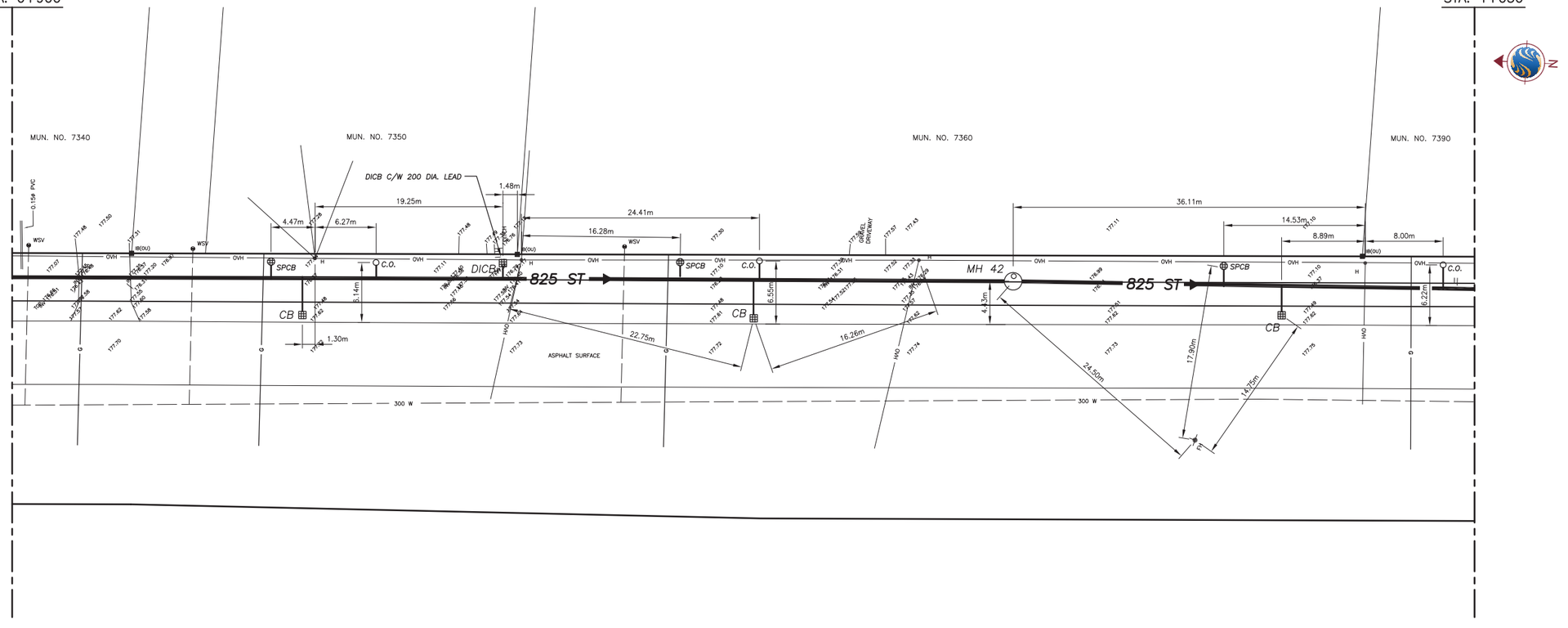
Sheet

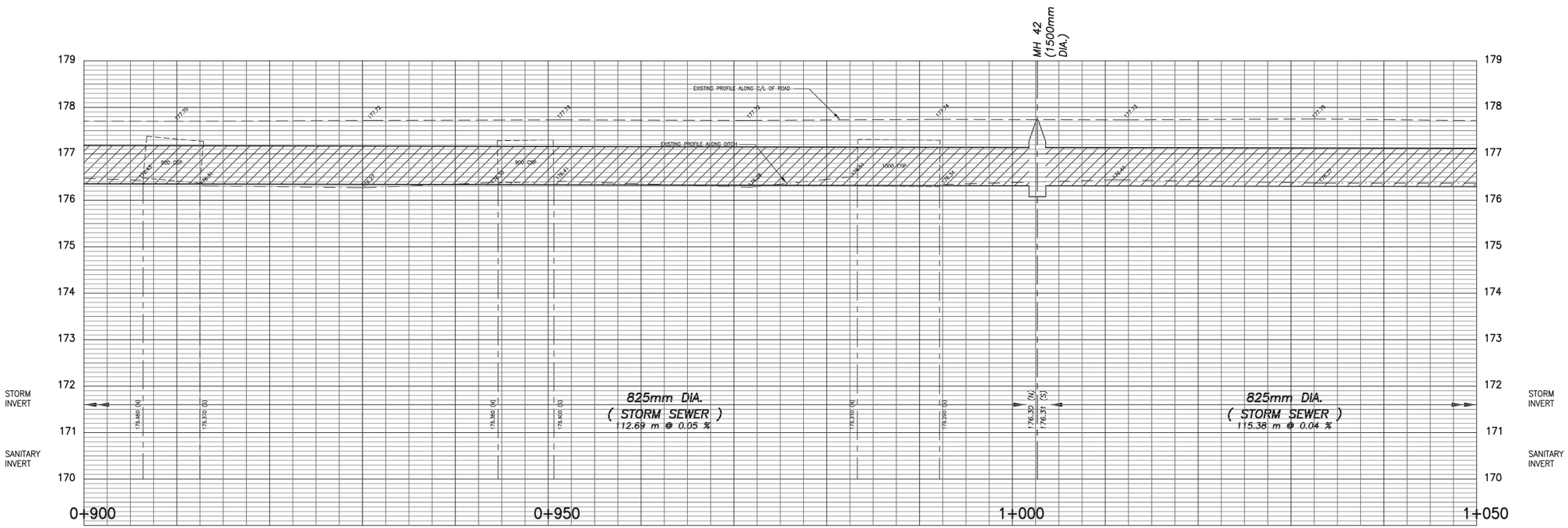
Revision

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

MALDEN ROAD

STA. 0+900 — STA. 1+050





Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.80 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision		By	Appd.	YY.MM.DD
5.	RECORD	M.T.J.	M.T.J.	2012.04.30
4.	CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3.	TENDER	M.T.J.	C.R.G.J.	2010.04.13
2.	MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1.	TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued		By	Appd.	YY.MM.DD
File Name: 165601160C-169-178		K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. 2010.03.22 Dsgn. YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10 Issue: Tender Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT
WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 0+900 TO STA. 1+050

Project No. 165601160

Scale 1:250H 0 2.5 7.5 12.5m; 1:50V 0 0.5 1.5 2.5m

Drawing No. C-175

Sheet

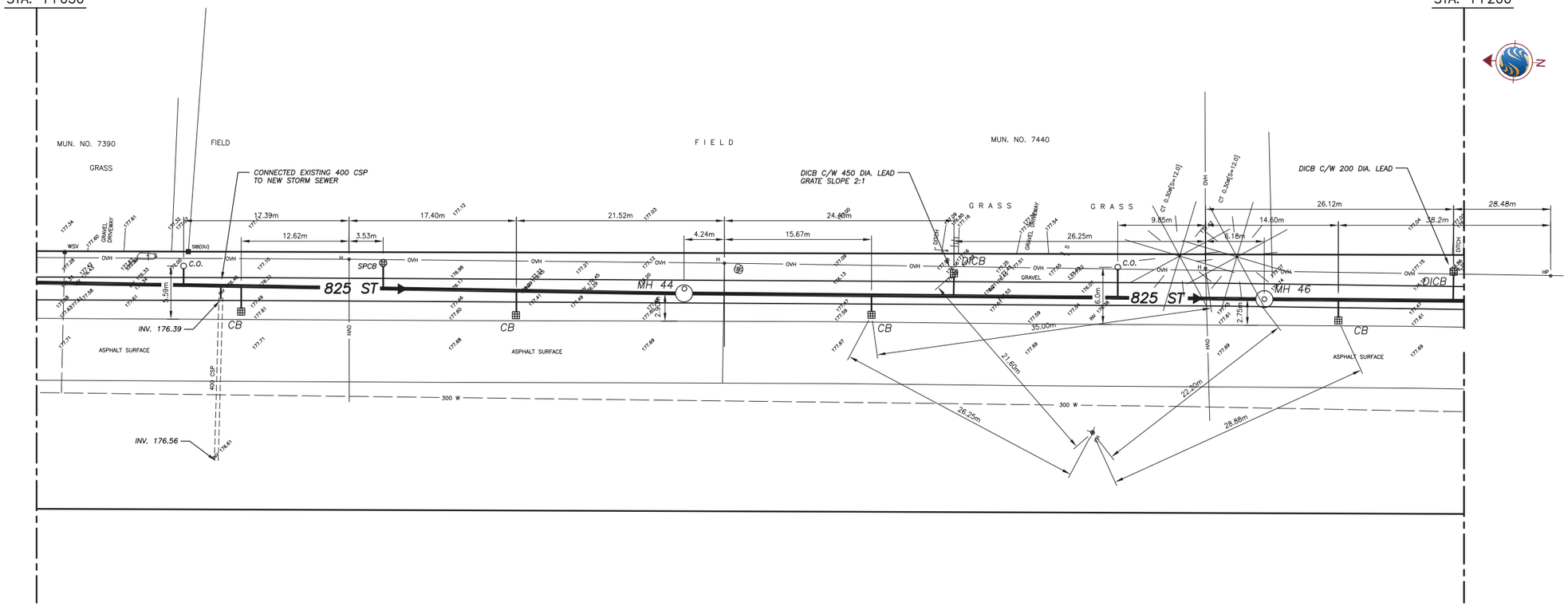
Revision

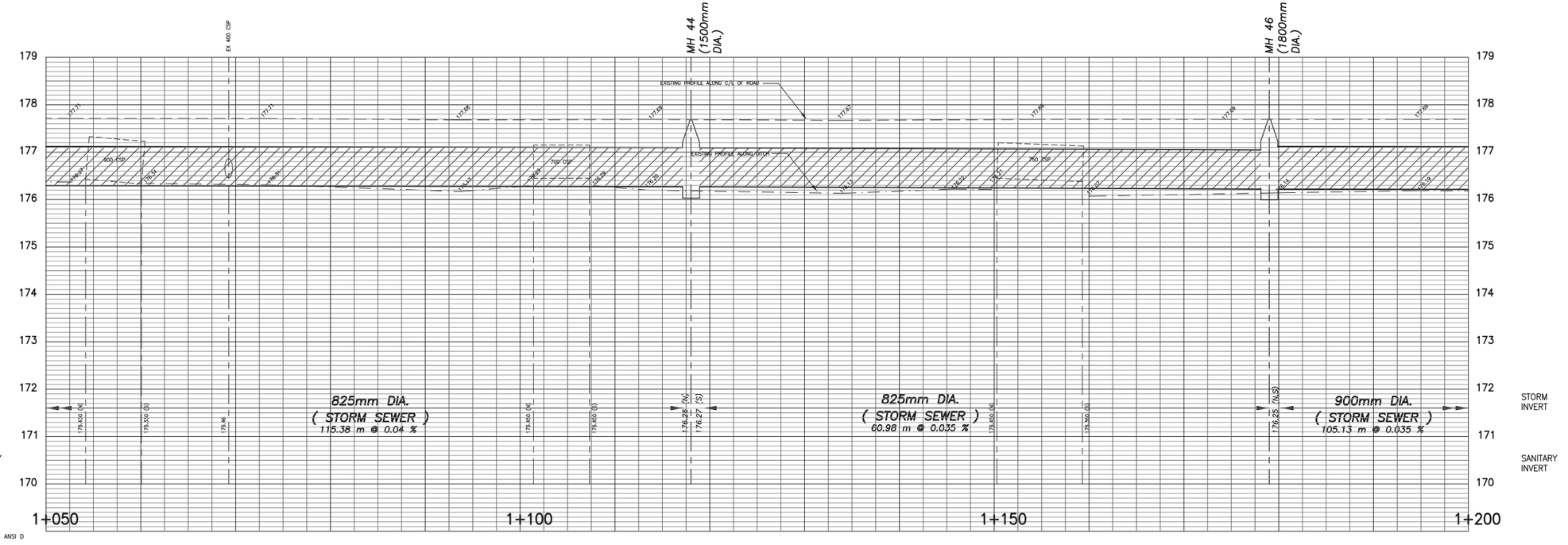
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

W:\active\165601160_lasalle_southwest_quadrant_watermain_replacement\construction\msh\user\Town\2012.04.30\165601160C-169-178.dwg
2012-4-30 11:41:am By: tmuir

ORIGINAL SHEET – ANSI D

MALDEN ROAD





W:\active\165601160_locate_southwest_quadrant_watermain_replacement\construction\mail\sent\Town\2012.04.30\165601160C-169-178.dwg
2012-4-30 11:41am BY: tmuir

ORIGINAL SHEET - ANSI D

Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.60 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision	By	Appd.	YY.MM.DD
5. RECORD	M.T.J.	M.T.J.	2012.04.30
4. CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3. TENDER	M.T.J.	C.R.G.J.	2010.04.13
2. MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1. TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued	**By**	**Appd.**	**YY.MM.DD**
File Name: 165601160C-169-178	K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. 2010.03.22 Dsgn. YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10
Issue: Tender
Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 1+050 TO STA. 1+200

Project No. 165601160

Scale 1:250H 0 2.5 7.5 12.5m; 1:50V 0 0.5 1.5 2.5m

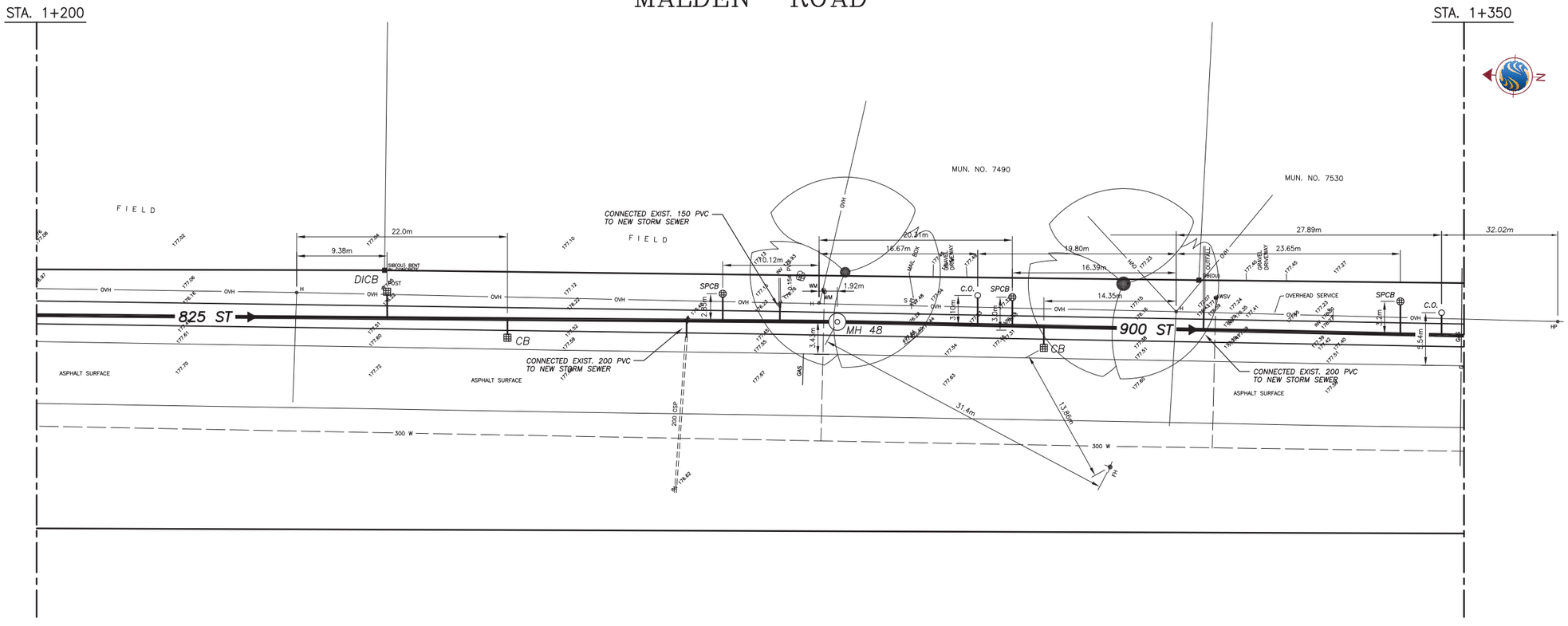
Drawing No. C-176

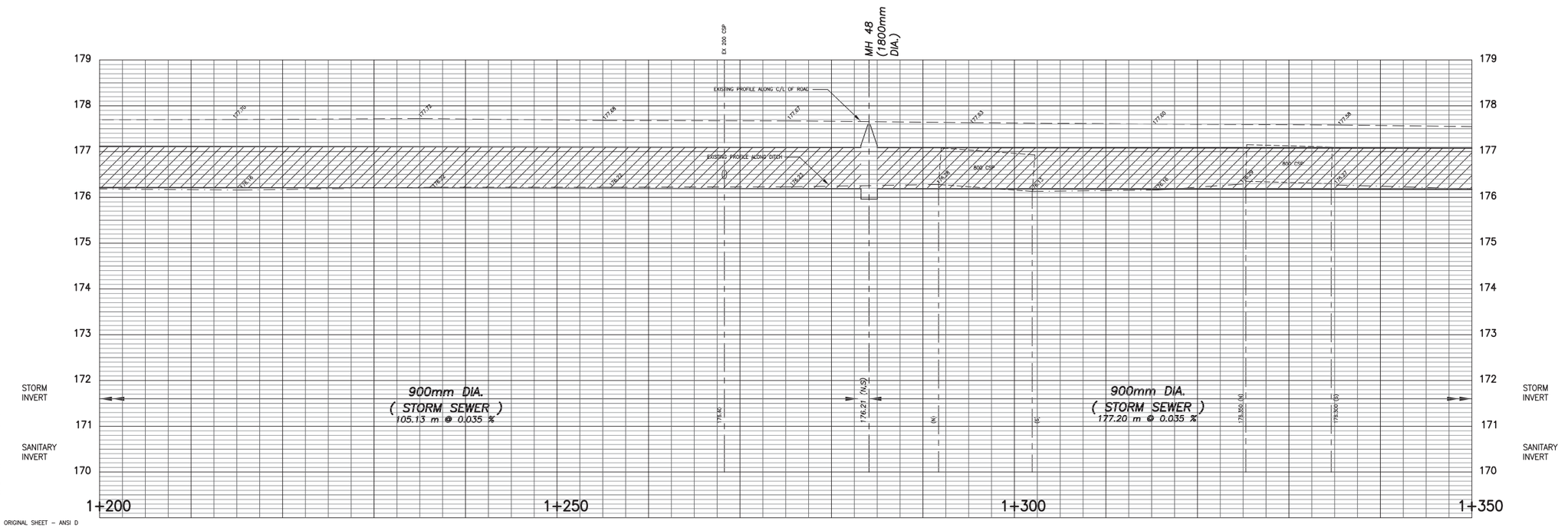
Sheet

Revision

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

MALDEN ROAD





Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.80 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

Revision	By	Appd.	YY.MM.DD
5. RECORD	M.T.J.	M.T.J.	2012.04.30
4. CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3. TENDER	M.T.J.	C.R.G.J.	2010.04.13
2. MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1. TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26

Issued	By	Appd.	YY.MM.DD
File Name: 165601160C-169-178	K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. Dsgn. 2010.03.22

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10
Issue: Tender
Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 1+200 TO STA. 1+350

Project No. 165601160

Scale 1:250H 0 2.5 7.5 12.5m; 1:50V 0 0.5 1.5 2.5m

Drawing No. C-177

Sheet

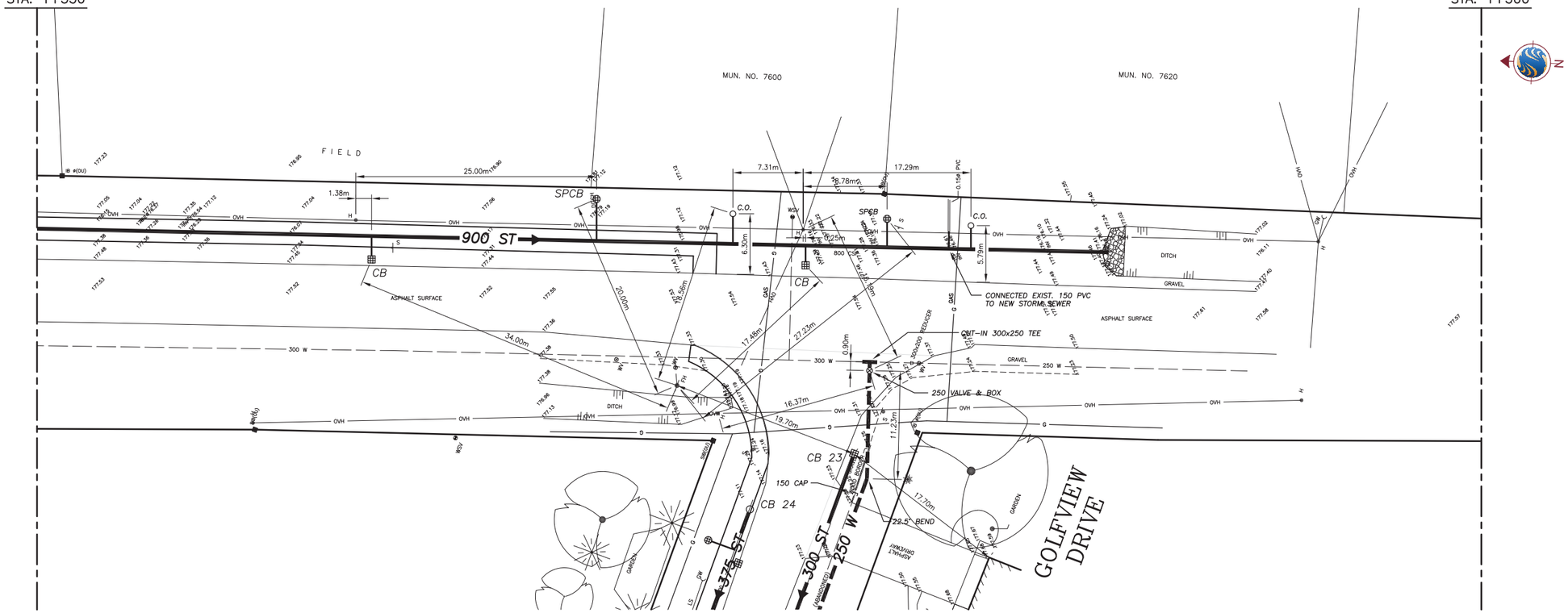
Revision

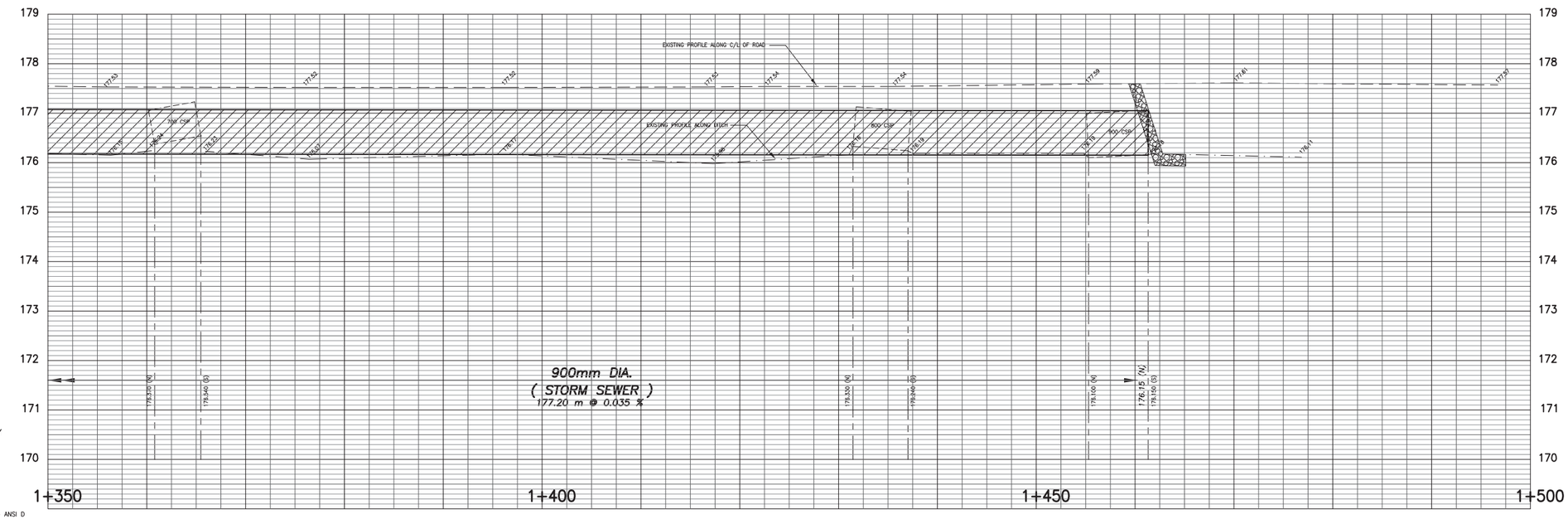
THESE PLANS HAVE BEEN REDUCED AND THE SCALE THEREFORE VARIES. FULL SCALE PLANS MAY BE VIEWED AT THE MUNICIPAL OFFICE.

ORIGINAL SHEET – ANSI D

MALDEN ROAD

STA. 1+350 — STA. 1+500





W:\active\165601160_lasalle_southwest_quadrant_watermain_replacement\construction\msl\sheet\Town\2012.04.30\165601160C-169-178.dwg
2012-4-30 11:41am BY: tmuir

ORIGINAL SHEET - ANSI D

Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON Canada
N8X 1L9
Tel. 519.966.2250
Fax. 519.966.5523
www.stantec.com

Legend

- STORM SEWER IN PROFILE – NORTH SIDE
- STORM SEWER IN PROFILE – SOUTH SIDE
- x177.60 EXISTING ELEVATION

Notes

1. HYDRANT LEADS UNDER EXISTING WATERMAIN AS PER DETAIL CDM 244 (SEE SHEET C-501)
2. MINIMUM 2.5m HORIZONTAL CLEARANCE BETWEEN NEW WATERMAIN, STORM AND SANITARY SEWERS.
3. ALL DRIVEWAYS BACKFILLED WITH APPROVED GRANULAR MATERIAL COMPACTED TO 100% SPMDD
4. STORM MANHOLES HAVE 600mm DEEP SUMP (TYPICAL).

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, STANTEC CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

Revision	By	Appd.	YY.MM.DD
5. RECORD	M.T.J.	M.T.J.	2012.04.30
4. CONSTRUCTION	M.T.J.	M.T.J.	2010.05.26
3. TENDER	M.T.J.	C.R.G.J.	2010.04.13
2. MOE APPROVAL	M.T.J.	C.R.G.J.	2010.04.10
1. TOWN REVIEW	M.T.J.	C.R.G.J.	2010.03.26
Issued	By	Appd.	YY.MM.DD
File Name: 165601160C-169-178	K.F.F. Dwn.	C.R.G.J. Chkd.	M.T.J. Dsgn. 2010.03.22 YY.MM.DD

Permit-Seal

Original Sealed by C.R.G.JUBENVILLE On 2010 April 10
Issue: Tender
Revision: 0

Client/Project

TOWN OF LASALLE

SOUTHWEST QUADRANT WATERMAIN REPLACEMENT

Town of LaSalle, ON Canada

Title

MALDEN ROAD
STA. 1+350 TO STA. 1+500

Project No. 165601160

Scale 1:250H 0 2.5 7.5 12.5m; 1:50V 0 0.5 1.5 2.5m

Drawing No. C-178

Sheet — Revision

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