THE CORPORATION OF THE TOWN OF AMHERSTBURG

BY-LAW NO. 2022 – 052

By-law to provide for the Bridges over the 7th Concession Drain North based on the Drainage Report by RC Spencer Associates Inc.

WHEREAS a request for improvement of the 7th Concession Drain North was received under section 78 of the Drainage Act;

WHEREAS Council of the Corporation of the Town of Amherstburg appointed an engineer for the purpose of preparation of an engineer's report for the improvements of the 7th Concession Drain North under section 78 of the Drainage Act;

WHEREAS Council of the Corporation of the Town of Amherstburg has authorized Marvel Hormiz P. Eng., to prepare a report and said engineer's report dated March 28, 2022, can be referenced as Schedule A, as attached hereto;

WHEREAS $234,700.00 is the estimated cost of improving the drainage works;

AND WHEREAS the report was considered by the Amherstburg Drainage Board at the meeting held on May 3, 2022.

NOW THEREFORE the Council of the Corporation of the Town of Amherstburg hereby enacts as follows:

1. **AUTHORIZATION**

   The attached report is adopted and the drainage works is authorized and shall be completed as specified in the report

2. **BORROWING**

   The Corporation of the Town of Amherstburg may borrow on the credit of the Corporation the amount of $234,700.00 being the amount necessary for the improvements of the drainage works.

3. **DEBENTURE(S)**

   The Corporation may issue debenture(s) for the amount borrowed less the total amount of:
   (a) Grants received under section 85 of the Drainage Act;
   (b) Monies paid as allowances;
   (c) Commuted payments made in respect of lands and roads assessed with the municipality;
   (d) Money paid under subsection 61(3) of the Drainage Act; and
   (e) Money assessed in and payable by another municipality.

4. **PAYMENT**

   Such debenture(s) shall be made payable within 5 years from the date of the debenture(s) and shall bear interest at a rate not higher than 1% more than the municipal lending rates as posted by The Town of Amherstburg's Bank's Prime Lending Rate on the date of sale of such debenture(s).

   (1) A special equal annual rate sufficient to redeem the principal and interest on the debenture(s) shall be levied upon the lands and roads and shall be collected in the same manner and at the same as other taxes are collected in each year for 5 years after the passing of this by-law.

   (2) All assessments of $1000.00 or less are payable in the first year in which the

assessments are imposed.

Read a first and second time and provisionally adopted ~~this~~ 9th day of May, 2022.

MAYOR – ALDO DICARLO

CLERK – VALERIE CRITCHLEY

Read a third time and finally passed this 11 day of ~~July~~, 2022.

MAYOR – ALDO DICARLO

~~CLERK – VALERIE CRITCHLEY~~
DEPUTY CLERK – TAMMY FOWKES

MUNICIPAL DRAINAGE REPORT

BRIDGES OVER THE 7TH CONCESSION DRAIN NORTH

IN THE TOWN OF AMHERSTBURG

RC SPENCER ASSOCIATES INC.
Consulting Engineers
Windsor: 800 University Avenue W. – Windsor ON N9A 5R9
Leamington: 18 Talbot Street W. – Leamington ON N8H 1M4
Chatham-Kent: 49 Raleigh Street – Chatham ON N7M 2M6

File No. 19-955

28 March 2022

28 March 2022

Mayor and Municipal Council
Corporation of the Town of Amherstburg
271 Sandwich St. S
Amherstburg, Ontario N9V 2A5

Re: Bridges Over the 7th Concession Drain North
In the Town of Amherstburg
Project No. 19-955

Mayor and Municipal Council:

1.0 AUTHORIZATION

In accordance with your instructions under Section 78 of the Drainage Act, we have prepared the following report that provides for the installation of two new farm and access culverts, and the replacement of three existing access culverts. We have also provided designs, specifications and assessment provisions for the remaining culverts within the 7th Concession Drain North for when their replacement is required in the future. Accordingly, the firm of RC Spencer Associates Inc. has performed all the necessary surveys, investigations, etc., and we report thereon as follows.

2.0 DRAINAGE HISTORY

The 7th Concession Drain North is an existing open municipal drain. A review of the records indicates that the last major work of repair and improvement of the 7th Concession Drain North was carried out under a report prepared by William J. Setterington dated 24 July 1981. Under that report, the entire length of the drain was repaired and improved by means of brushing and cleaning out of the accumulated sediment, as well as the replacement of two access culverts within the drain.

Prior to the 1981 report, a report was prepared by WM. J. Setterington dated 15 April 1968. That report provided for the repair and improvement of the drain by means of cleaning the drain in accordance with the accompanying plan and profile, as well as lowering a culvert to suit the profile.

Prior to the 1968 report, a report was prepared by C. G. R. Armstrong dated 31 October 1961. That report provided for the repair and improvement of the drain by means of cleaning the drain in accordance with the accompanying plan and profile, as well as lowering a culvert to suit the profile.

Prior to the 1961 report, a report was prepared by C. G. R. Armstrong dated 19 May 1952. That report provided for the repair and improvement of the drain by means of cleaning the drain in accordance with the accompanying plan and profile, as well as lowering a culvert to suit the profile. The report also recommended for the restoration of a cobble stone headwall on one of the culverts within the drain.

Prior to the 1952 report, a report was prepared by J. J. Newman dated 3 June 1940. The report provided for the repair and improvement of the drain by means of deepening the drain in accordance with the accompanying plan and profile.

Prior to the 1940 report, a report was prepared by Alex Baird dated 16 February 1918. The report provided for the repair and improvement of the drain by means of cleaning, enlarging, deepening, extending and otherwise improving the drain.

Prior to the 1918 report, a report was prepared by Alex Baird dated 23 January 1908. The report provided for the construction of the 7th Concession Drain North in accordance with the accompanying plan and profile.

3.0 SITE MEETING

After reviewing the drainage information and the previous Engineer's reports on the drain, a virtual on-site meeting was held on 29 January 2021 with the landowners in the watershed. The need for the repair and improvement of the existing culverts and new installation of culverts within the 7th Concession Drain North was discussed. A summary of the on-site meeting is included in Appendix 'C'. Any owner wishing to meet the engineer on-site after the virtual meeting were accommodated.

4.0 INSPECTION AND SURVEY

Our survey and examination along the entire length of the 7th Concession Drain North was carried out in April 2021. The survey comprised the recording of topographic data and examining all of the culverts within the drain. Various landowners were met on-site to discuss their farm or access culverts.

We commenced our survey at the most downstream culvert (Culvert No. 1), which is the road crossing under Alma Street in the Town of Amherstburg. We then proceeded upstream to the head of the drain (approximately 2730m) along the 7th Concession Road.

5.0 WATERSHED DESCRIPTION

The watershed of the 7th Concession Drain North is irregular in shape and has a drainage area of approximately 287 Ha (709 Ac) upstream of Culvert No. 1. A number of municipal drains and private tributary drains, both tile and open, convey surface and subsurface flows to the 7th Concession Drain North.

There are three different soil types within the watershed. The proportions of different soil groups within the watershed are as follows:

Burford Loam – Shallow Phase – 4%
Brookston Clay Loam – 28%
Brookston Clay – 68%

Overall, the soils within the 7th Concession Drain North watershed are categorised as Hydrologic Soil Group (HSG) 'D'. This category of soils is classified to have very slow infiltration rates when thoroughly wetted. This means that in a heavy rainfall event, the majority of storm water is conveyed as overland flow. The topography of the drainage area is generally flat, with the bottom gradient of the drain ranging between 0.07% to 0.29%. The lands in the drainage area are comprised largely of agricultural properties with several residential properties.

6.0 EXISTING CONDITIONS

All of the road crossings and access culverts were visually examined during the course of our survey. Our assessment identified the conditions of each culvert and which ones will require immediate replacement.

Specific culvert numbers have been designated for ease of reference between the report, specifications and the drawings. Stations provided for the culvert locations refer to the ends of the culvert. The locations, dimensions, condition and use of each culvert are as follows:

Culvert No. 1: Station 2+727.6 to 2+736.3 – Alma Street

Culvert No. 1 at Alma Street consists of an 8.7 m length of an open bottom cast-in-place concrete box culvert with a span of 3.02 m and a height of 3.15 m. End treatment for this culvert consists of cast-in-place headwalls. This concrete box culvert has several cracked, delaminated and spalled areas and will need to be monitored by the Municipality for future repair or replacement. The culvert provides sufficient hydraulic capacity, and its invert elevations conform to the design gradeline of the open drain.

Culvert No. 2: Station 2+343.2 to 2+351.9 – Parcel No. 19

Culvert No. 2 being an 8.7 m length (6.3 m driveway width) of 1500 mm diameter Corrugated Steel Pipe (CSP), provides access to Parcel No. 19. There is visible rusting in the bottom half of this culvert; however, the steel has not rusted through completely. There is also a deflection at the top of the pipe, which could have occurred during the installation of the culvert. The culvert is in fair structural condition and consists of stable vertical concrete jute bag end treatment. The culvert provides sufficient hydraulic capacity, and its invert elevations conform to the design gradeline of the open drain. This culvert is a legal part of the municipal drain as shown in previous historical reports.

Culvert No. 3: Station 2+253.3 to 2+261.2 – Parcel No. 18

Culvert No. 3 being a 7.9 m length (6.0 m driveway width) of 1500 mm diameter Corrugated Steel Pipe (CSP), provides access to Parcel No. 18. This culvert is in fair structural condition; however, the vertical concrete jute bag end treatment has deteriorated beyond repair. The culvert provides sufficient hydraulic capacity; however, its invert elevations are higher than the design gradeline of the open drain, causing ponding upstream. This culvert is a legal part of the municipal drain as shown in previous historical reports.

Culvert No. 5: Station 1+474.4 to 1+494.4 – County Road 18

Culvert No. 5 at County Road 18 consists of a 20.0 m length of Structural Plate Corrugated Steel Pipe Arch (CSPA) with a span of 2230 mm and height of 1700 mm. The culvert is in good structural condition and consists of stable cast-in-place headwalls. The culvert provides sufficient hydraulic capacity, and its invert elevations conform to the design gradeline of the open drain.

Culvert No. 6 (Primary Culvert): Station 0+666.8 to 0+680.0 – Parcel No. 31

Culvert No. 6 being a 13.2 m length (4.5 m driveway width) of 1000 mm diameter Corrugated Steel Pipe (CSP), with sloping rip-rap end treatment is the primary culvert that provides access to Parcel No. 31. The existing culvert provides sufficient hydraulic capacity; however, the culvert is deteriorated beyond repair and warrants replacement to current design standards. This culvert is a legal part of the municipal drain as shown in previous historical reports.

Culvert No. 7 (Secondary Culvert): Station 0+604.3 to 609.3 – Parcel No. 31

Culvert No. 7 being a 5.0 m length (4.7 m driveway width) of 750 mm diameter Corrugated Steel Pipe (CSP), is the secondary culvert that provides access to Parcel No. 31. End treatment for this culvert consists of cast-in-place headwalls. The existing culvert is undersized, in good structural condition and the invert elevations conform to the design gradeline of the open drain. This culvert is a legal part of the municipal drain as shown in previous historical reports.

Culvert No. 9: Station 0+254.4 to 0+266.6 – Parcel No. 11

Culvert No. 9 being a 12.2 m length (6.0 m driveway width) of 900 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment, provides access to Parcel No. 11. The existing culvert provides sufficient hydraulic capacity; however, the culvert is deteriorated beyond repair and warrants

replacement to current design standards. This culvert is a legal part of the municipal drain as shown in previous historical reports.

Culvert No. 10: Station 0+202.6 to 0+216.8 – Parcel No. 12

Culvert No. 10 being a 14.2 m length (9.0 m driveway width) of 900 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment, provides access to Parcel No. 12. The culvert is in good structural condition and provides sufficient hydraulic capacity. Its invert elevations conform to the design gradeline of the open drain. Our assessment of the records provided shows that this culvert has no legal status under the provisions of the Drainage Act and is not part of the 7th Concession Drain North since there has been no mention of the culvert in the historical reports.

Culvert No. 11: Station 0+035 to 0+089.3 – Parcel No. 10

Culvert No. 11 being a 54.3 m length (7.0 m driveway width) of 800 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment, provides access and lawn piping to Parcel No. 10. The culvert is in good structural condition and provides sufficient hydraulic capacity. Its invert elevations conform to the design gradeline of the open drain. The driveway culvert is a legal part of the municipal drain as shown in previous historical reports. The culvert was extended at some point after the 1981 report to enclose the drain along the property. Our assessment of the records provided shows that this lawn piping has no legal status under the provisions of the Drainage Act and is not part of the 7th Concession Drain North since there has been no mention of it in the historical reports.

7.0 LANDOWNER REQUEST

The owner of Parcel No. 31 submitted a Section 78 request for the repair and improvement of the primary culvert that provides access to their property. Discussions were held with the owner about driveway width and other culvert specifications. The on-site inspection and survey showed that the culvert has deteriorated beyond repair and is in need of replacement. This culvert has been designated as Culvert No. 6.

The owner of Parcel No. 18 indicated during the on-site meeting that the concrete jute bag headwalls are failing at the culvert providing access to their property. The on-site inspection and survey confirmed that the headwalls at this culvert are failing and require replacement. A meeting with the owners was held to discuss the sizing and replacement of their culvert. This culvert is designated as Culvert No. 3.

The owner of Parcel No. 43 has requested the installation of a new access culvert to provide access to their property. A meeting was held with the owner to discuss the sizing and location of the new culvert. The owner has elected to install the new culvert at Station 1+828 to 1+843.5. This culvert is designated as Culvert No. 4.

The owner of Parcel No. 30 has requested the installation of a new farm culvert to provide access to their property. Sizing and location of the new culvert was discussed with the property owner. The owner has elected to install the new culvert at Station 0+493.5 to 0+506.0. This culvert is designated as Culvert No. 8.

The owner of Parcel No. 11 indicated during the on-site meeting that the access culvert providing access to their property has deteriorated and requires a replacement. The on-site inspection and survey confirmed that this culvert is deteriorated beyond repair and requires replacement. This culvert is designated as Culvert No. 9.

8.0 RECOMMENDATIONS

Based on our review of the history, the information obtained during the on-site meeting, subsequent discussions with the landowners and the Town, a review of the survey data and our detailed analysis and designs, we recommend the following:

a) That proper sediment control measures be implemented during construction.

b) The provision of a schedule of assessment for the work recommended under this report on the 7th Concession Drain North.

c) The provision of a schedule of assessment for the cost of any future works of repair and/or maintenance carried out on the farm and access culverts in the 7th Concession Drain North.

d) We recommend that these works be done and the related costs be assessed under the provisions of the Drainage Act.

e) We have completed a detailed hydrological analysis of the watershed and examination of each culvert in the 7th Concession Drain North. Our findings and the works recommended at each site are as follows:

Culvert No. 1: Station 2+727.6 to 2+736.3 – Alma Street

We recommend that the 8.7 m length of an open bottom cast-in-place concrete box culvert with a span of 3.02 m and a height of 3.15 m providing for a road crossing at Alma Street remains in the drain at this time. We recommend that the culvert be monitored by the Municipality for its structural condition. When the structural condition of the culvert becomes inadequate in the future, replacement of this culvert will be carried out by the Town of Amherstburg. We recommend that the future replacement structure matches the size of the existing concrete box culvert.

Culvert No. 2: Station 2+340.0 to 2+355.5 – Parcel No. 19

We recommend that the 8.7 m length of 1500 mm diameter Corrugated Steel Pipe (CSP) providing access to Parcel No. 19 remains in the drain at this time. When the structural condition of the culvert becomes inadequate in the future, replacement of this culvert will be carried out as a work of future maintenance. We recommend that the future replacement structure, sized to a 10-year flow rate, consist of a 15.5 m length (standard 6.0 m driveway width) of 1500 mm diameter Corrugated Steel Pipe (CSP) with a 125x25 mm corrugation profile and 2.8 mm wall thickness, installed at 10% embedment with sloping rip-rap end treatment.

Culvert No. 3: Station 2+249.7 to 2+264.7 – Parcel No. 18

We recommend that the 7.9m length of 1500 mm diameter Corrugated Steel Pipe (CSP) providing access to Parcel No. 18 be replaced immediately. We recommend that the replacement structure, sized to a 10-year flow rate, consist of a 15.0 m length (standard 6.0 m driveway width) of 1500 mm diameter Corrugated Steel Pipe (CSP) with a 125x25 mm corrugation profile and 2.8 mm wall thickness, installed at 10% embedment with sloping rip-rap end treatment.

Culvert No. 4: Station 1+828 TO 1+843.5 – Parcel No. 43

We recommend that a new culvert be installed to provide access to Parcel No. 43. The owner of this access culvert requested to lengthen the culvert to provide an additional 1.5 m to the driveway width. Therefore, we recommend that the new structure, sized to a 10-year flow rate, consists of a 15.5 m length (7.5 m driveway width) of 1400 mm diameter Corrugated Steel Pipe

(CSP) with a 125x25 mm corrugation profile and 2.8 mm wall thickness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection.

Culvert No. 5: Station 1+474.4 to 1+494.4 – County Road 18

We recommend that the 20.0 m length of Structural Plate Corrugated Steel Pipe Arch (CSPA) with a span of 2230 mm and height of 1700 mm providing for a road crossing at County Road 18 remain in the drain at this time. When the structural condition of the culvert becomes inadequate in the future, replacement of this culvert will be carried out by the County of Essex. We recommend that the future replacement structure matches the size of the existing Corrugated Steel Pipe Arch.

Culvert No. 6 (Primary Culvert): Station 0+666.5 to 0+680.5 – Parcel No. 31

We recommend that the 13.2 m length of 1000 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment being the primary culvert providing access to Parcel No. 31 be removed and replaced immediately. The owner of this access culvert requested to lengthen the culvert to provide an additional 0.5 m to the driveway width. Therefore, we recommend that the replacement structure, sized to a 10-year flow rate, consist of a 14.0 m length (6.5 m driveway width) of 1000 mm diameter Corrugated Steel Pipe (CSP) with a 68x13 mm corrugation profile and 2.0 mm wall thickness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection.

Culvert No. 7 (Secondary Culvert): Station 0+604.3 to 0+609.3 – Parcel No. 31

We recommend that the 5.0m length of 750 mm diameter Corrugated Steel Pipe (CSP) with cast-in-place headwalls being the secondary culvert providing access to Parcel No. 31 remain in the drain at this time. When the structural condition of the culvert becomes inadequate in the future, replacement of this culvert will be carried out as a work of future maintenance. Should the existing 750 mm diameter CSP cause hydraulic problems and/or flooding in the future, replacement of this culvert will be carried out as a work of maintenance. When, the Drainage Superintendent is of the opinion that the culvert requires replacement for structural and/or hydraulic/flooding reasons, the Drainage Superintendent has authority to arrange for the replacement of this access culvert. We recommend that the replacement structure, sized to a 10-year flow rate, consist of a 12.5 m length (standard 6.0 m driveway width) of 1000 mm diameter Corrugated Steel Pipe (CSP) with a 68x13 mm corrugation profile and 2.0 mm wall thickness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection.

Culvert No. 8 – Station 0+493.5 to 0+506.0 – Parcel No. 30

We recommend that a new access culvert be installed to provide access to Parcel No. 30. We recommend that the new structure, sized to a 10-year flow rate, consist of a 12.5 m length (standard 6.0 m driveway width) of 1000 mm diameter Corrugated Steel Pipe (CSP) with a 68x13 mm corrugation profile and 2.0 mm wall thickness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection.

Culvert No. 9 – Station 0+254.5 to 0+267.0 – Parcel No. 11

We recommend that the 12.2 m length of 900 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment providing access to Parcel No. 11 be removed and replaced immediately. We recommend that the replacement structure, sized to a 10-year flow rate, consist of a 12.5 m length (standard 6.0 m driveway width) of 900 mm diameter smooth wall

High Density Polyethylene (HDPE) Pipe with 320 kPa pipe stiffness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection.

Culvert No. 10 – Station 0+202.5 to 0+217.5 – Parcel No. 12

We recommend that the 14.2m length of 900 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment providing access to Parcel No. 12 remain in the drain at this time. When the structural condition of the culvert becomes inadequate in the future, repair or replacement of this culvert will be carried out as a work of future maintenance. A standard replacement structure, sized to a 10-year flow rate, would consist of a 12.5 m length (6.0 m driveway width) of 900 mm diameter smooth wall High Density Polyethylene (HDPE) Pipe with 320 kPa pipe stiffness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection. If the future replacement of this structure maintains the existing 9.0 m driveway width, assessment shall be made at the blended rate shown in Section 15.0 – Future Maintenance.

Culvert No. 11 – Stations 0+035 to 0+089.3 – Parcel No. 10

We recommend that the 54.3m length of 800 mm diameter Corrugated Steel Pipe (CSP) with sloping rip-rap end treatment providing for access and lawn pipe to Parcel No. 10 remain in the drain at this time. When the structural condition of the culvert and lawn piping becomes inadequate in the future, repair or replacement will be carried out as a work of future maintenance. A standard replacement structure, sized to a 10-year flow rate, would consist of a 12.0 m length (6.0 m driveway width) of 750 mm diameter smooth wall High Density Polyethylene (HDPE) Pipe with 320 kPa pipe stiffness, installed at 10% embedment. Culvert end treatment shall consist of sloping rip-rap erosion protection. If the future replacement of this structure maintains the existing 7.0 m driveway width and lawn piping, assessment shall be made at the blended rate shown in Section 15.0 – Future Maintenance.

f) We recommend that all the culverts in the 7th Concession Drain North be formally incorporated as part of the municipal drain and be maintained by the Town of Amherstburg and the County of Essex for Culvert No. 5.

9.0 DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the proposed culvert replacement and new culvert installation. There is a set of 8 drawings showing:

a) A watershed plan indicating the drainage area boundary for the 7th Concession Drain North;
b) A profile drawing of the municipal drain;
c) Culvert No. 3 Details;
d) Culvert No. 4 Details;
e) Culvert No. 6 Details;
f) Culvert No. 8 Details;
g) Culvert No. 9 Details;
h) Future Culvert Replacements.

Attached as **Appendix 'B'** are:

a) **'Special Provisions'** for the construction which set out specifications and construction details for the various aspects of the required works to be conducted under this report;

b) **'General Specifications for Open Drains'**; and,

c) **'Environmental Protection Special Provisions'**.

Appendix 'C' contains the **'Record of On-site Meeting'**.

Appendix 'D' contains **'Correspondence'** held with the Essex Region Conservation Authority (ERCA) and the Fisheries and Oceans Canada (DFO).

10.0 DESCRIPTION OF PROPOSED WORK

The proposed work on the 7th Concession Drain North consists of the following:

1) The removal and replacement of an existing culvert (Culvert No. 3) with sloping rip-rap end treatment at Station 2+249.7 to 2+264.7.
2) The installation of a new access culvert (Culvert No. 4) with sloping rip-rap end treatment between at Station 1+828 to 1+843.5.
3) The removal and replacement of an existing culvert (Culvert No. 6) with sloping rip-rap end treatment at Station 0+666.5 to 0+680.5.
4) The installation of a new farm culvert (Culvert No. 8) with sloping rip-rap end treatment at Station 0+493.5 to 0+506.0.
5) The removal and replacement of an existing culvert (Culvert No. 9) with sloping rip-rap end treatment at Station 0+254.5 to 0+267.0.

11.0 ALLOWANCES

We have not provided any allowances under Section 29 of the Drainage Act as the culverts will be located within the limits of the existing municipal drain. Also, we have not included any allowances under Section 30 of the Drainage Act for damages to lands and crops (if any) caused by the construction and repair and improvement of the farm and access crossings and the operation of equipment as all excess materials will be hauled off-site and no crops are involved.

12.0 ESTIMATE OF COSTS

Our estimate of the total cost of the proposed work, including the cost of the engineer's report and all incidental expenses, is made up as follows:

1. Culvert No. 3 – Parcel No. 18

a) Remove and dispose of existing access culvert and end wall materials including their disposal off-site.	$	**3,000.00**
b) Earth excavation and grading.	$	**1,700.00**
c) Supply and install 15.0 m of 1500 mm diameter Aluminized (Type II) Corrugated Steel Pipe (CSP) with a 2.8 mm wall thickness and a 125 x 25 mm corrugation profile.	$	**14,475.00**
d) Supply, place and compact all 20-25 mm clear stone material for pipe bedding, being approximately 11 tonnes.	$	**385.00**

e)	Supply, place and compact all granular 'B' (Type II) backfill, being approximately 350 tonnes.	$	**10,500.00**
f)	Supply, place and compact 150mm thick granular 'A' material for driveway surface, being approximately 34 tonnes.	$	**1,020.00**
g)	Restore road, driveway and grassed areas to pre-existing conditions. Disturbed drain banks to be restored with seeding and mulching.	$	**1,500.00**
h)	Supply and install a total of approximately 70 square metres of quarried rock erosion protection (150 mm – 300 mm) on the drain banks at both ends of culvert pipe, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of Terrafix 270R or equal geotextile non-woven filter fabric.	$	**4,200.00**
i)	Traffic Control	$	**1,000.00**
j)	Construct, maintain during construction, and remove clay earth dams, bypass pump and silt fencing including dewatering.	$	**1,500.00**
	SUB TOTAL FOR CULVERT NO. 3	$	**39,280.00**

2. Culvert No. 4 – Parcel No. 43

a)	Removal of existing brush and trees (approximately 5 cedar trees) including stumps, and strip topsoil from drain banks and bottom including their off-site disposal.	$	**2,000.00**
b)	Earth excavation and grading.	$	**1,700.00**
c)	Supply and install 15.5 m of 1400 mm diameter Aluminized (Type II) Corrugated Steel Pipe (CSP) with a 2.8 mm wall thickness and a 125 x 25mm corrugation profile.	$	**13,950.00**
d)	Supply, place and compact all 20-25 mm clear stone material for pipe bedding, being approximately 11.5 tonnes.	$	**400.00**
e)	Supply, place and compact all granular 'B' (Type II) backfill material, being approximately 295 tonnes.	$	**8,850.00**
f)	Supply, place and compact 150mm thick granular 'A' material for 7.5 m wide driveway surface, being approximately 34 tonnes.	$	**1,020.00**
g)	Restore road, driveway and grassed areas to pre-existing conditions. Disturbed drain banks to be restored with seeding and mulching.	$	**1,500.00**
h)	Supply and install a total of approximately 55 square metres of quarried rock erosion protection (150 mm – 300 mm) on the drain banks at both ends of culvert pipe, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of Terrafix 270R or equal geotextile non-woven filter fabric.	$	**3,300.00**
i)	Traffic Control	$	**1,000.00**

j) Construct, maintain during construction, and remove clay earth dams, bypass pump and silt fencing including dewatering.	$	1,500.00
SUB TOTAL FOR CULVERT NO. 4	$	35,220.00

3. Culvert No. 6 – Parcel No. 31

a) Remove and dispose of existing access culvert and end wall materials including their disposal off-site.	$	3,000.00
b) Earth excavation and grading.	$	1,500.00
c) Supply and install 14.0 m of 1000 mm diameter Aluminized (Type II) Corrugated Steel Pipe (CSP) with a 2.0 mm wall thickness and a 68 x 13 mm corrugation profile.	$	9,100.00
d) Supply, place and compact all 20-25 mm clear stone material for pipe bedding, being approximately 7.5 tonnes.	$	265.00
e) Supply, place and compact all granular 'B' (Type II) backfill material, being approximately 215 tonnes.	$	6,450.00
f) Supply, place and compact all granular 'A' material for driveway surface, being approximately 25 tonnes.	$	750.00
g) Restore road, driveway and grassed areas to pre-existing conditions. Disturbed drain banks to be restored with seeding and mulching.	$	1,500.00
h) Supply and install a total of approximately 40 square metres of quarried rock erosion protection (150 mm – 300 mm) on the drain banks at both ends of culvert pipe, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of Terrafix 270R or equal geotextile non-woven filter fabric.	$	2,400.00
i) Traffic Control	$	1,000.00
j) Construct, maintain during construction, and remove clay earth dams, bypass pump and silt fencing including dewatering.	$	1,500.00
SUB TOTAL FOR CULVERT NO. 6	$	27,465.00

4. Culvert No. 8 – Parcel No. 30

a) Removal of existing brush and trees (if any) including stumps, and strip topsoil from drain banks and bottom including their off-site disposal.	$	2,000.00
b) Earth excavation and grading.	$	1,500.00
c) Supply and install 12.5 m of 1000 mm diameter Aluminized (Type II) Corrugated Steel Pipe (CSP) with a 2.0 mm wall thickness and a 68 x 13 mm corrugation profile.	$	8,750.00
d) Supply, place and compact all 20-25 mm clear stone material for pipe bedding, being approximately 7.5 tonnes.	$	265.00

e)	Supply, place and compact all granular 'B' (Type II) backfill material, being approximately 175 tonnes.	$	5,250.00
f)	Supply, place and compact all granular 'A' material for road base, being approximately 25 tonnes.	$	750.00
g)	Restore road, driveway and grassed areas to pre-existing conditions. Disturbed drain banks to be restored with seeding and mulching.	$	1,500.00
h)	Supply and install a total of approximately 40 square metres of quarried rock erosion protection (150 mm – 300 mm) on the drain banks at both ends of culvert pipe, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of Terrafix 270R or equal geotextile non-woven filter fabric.	$	2,400.00
i)	Traffic Control	$	1,000.00
j)	Construct, maintain during construction, and remove clay earth dams, bypass pump and silt fencing including dewatering.	$	1,500.00
	SUB TOTAL FOR CULVERT NO. 8	$	24,915.00

5. Culvert No. 9 – Parcel No. 11

a)	Remove and dispose of existing access culvert and end wall materials including their disposal off-site.	$	2,500.00
b)	Earth excavation and grading.	$	1,500.00
c)	Supply to site 12.5 m of 900 mm diameter Poly-tite High Density Polyethylene (HDPE) Pipe with a 320kpa pipe stiffness.	$	6,815.00
d)	Supply, place and compact all 20-25 mm clear stone material for pipe bedding, being approximately 7 tonnes.	$	245.00
e)	Supply, place and compact all granular 'B' (Type II) backfill material, being approximately 175 tonnes.	$	5,250.00
f)	Supply, place and compact all granular 'A' material for driveway surface, being approximately 25 tonnes.	$	750.00
g)	Restore road, driveway and grassed areas to pre-existing conditions. Disturbed drain banks to be restored with seeding and mulching.	$	1,500.00
h)	Supply and install a total of approximately 40 square metres of quarried rock erosion protection (150 mm – 300 mm) on the drain banks at both ends of culvert pipe, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of Terrafix 270R or equal geotextile non-woven filter fabric.	$	2,400.00
i)	Traffic Control	$	1,000.00
i)	Construct, maintain during construction, and remove clay earth dams, bypass pump and silt fencing including dewatering.	$	1,500.00
	SUB TOTAL FOR CULVERT NO. 9	$	23,460.00

SUB TOTAL FOR CONSTRUCTION	$	**150,340.00**
H.S.T. ON CONSTRUCTION (1.76% NET)	$	**2,645.00**
TOTAL FOR CONSTRUCTION – (including net H.S.T.)	$	**152,985.00**

INCIDENTALS

Survey, report, estimate, specifications and drawings	$	**49,500.00**
Contract administration and inspection	$	**20,000.00**
Cost portion of ERCA Permit fee	$	**800.00**
Contingency allowance	$	**10,000.00**
SUBTOTAL FOR INCIDENTALS	$	**80,300.00**
H.S.T. ON INCIDENTALS (1.76% NET)	$	**1,415.00**
TOTAL FOR INCIDENTALS (including net H.S.T.)	$	**81,715.00**
TOTAL ESTIMATED COST	$	**234,700.00**

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

13.0 UTILITIES

It may become necessary to temporarily or permanently relocate utilities that may conflict with the construction recommended under this report. If this occurs, in accordance with Section 26 of the Drainage Act, we assess any relocation cost against the public utility having jurisdiction. Under Section 69 of the Drainage Act, the public utility is at liberty to do the work with its own forces, but if it should not exercise this option within a reasonable length of time, the Municipality will arrange to have this work completed and the costs will be charged to the appropriate public utility.

14.0 ASSESSMENT

Under the Drainage Act, assessments against individual properties are normally comprised of three (3) assessment components:

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

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

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

We have assessed the estimated costs against the affected lands and roads as listed in Schedule 'A-1' under "Value of Special Benefit," "Value of Benefit" and "Value of Outlet." Schedule 'A-1' relates to the estimated cost of the construction recommended in this report. Schedule 'A-2' attached to this report is to be used to assess future maintenance costs and will not be levied at this time.

The Special Benefit assessments shown in Schedule 'A-1' were derived as follows:

1. Culvert No. 1 – Alma Street
   An engineering and overhead cost of $ 4,500 plus HST of $ 79 for the hydrological analysis and assessment provisions of the report for the future maintenance of Culvert No. 1 has been assessed at 100% against the Town of Amherstburg as owner of Alma Street, as shown in Schedule 'A-1'.

2. Culvert No. 2 – Parcel No. 19
   An engineering and overhead cost of $ 4,500 plus HST of $ 79 for the hydrological analysis, design and assessment provisions of the report for the future maintenance of Culvert No. 2 has been assessed at 50% as a Special Benefit against Parcel No. 19, as shown in Schedule 'A-1'. The remaining 50% has been assessed to the lands and roads upstream of this access crossing as Outlet assessments.

3. Culvert No. 3 – Parcel No. 18
   The cost of replacing Culvert No. 3 is estimated at $ 39,280 plus HST of $ 691. The engineering, inspection and overhead costs associated with this culvert replacement are $ 10,660 plus HST of $ 188. Therefore, the total estimated cost of the access culvert replacement is $ 50,819. The replacement of this access culvert is necessary as the culvert invert is above the existing drain bottom causing ponding of water and the headwalls are failing beyond repair, which poses a safety concern to the use of the access crossing. The estimated cost of this work is assessed at 50% against the adjoining property (Parcel No. 18) as a Special Benefit, as shown in Schedule 'A-1'. The remaining 50% shall be assessed as Outlet only against the lands and roads upstream of this access crossing that drain through it.

4. Culvert No. 4 – Parcel No. 43
   The cost of the installation of a new access culvert (Culvert No. 4) is estimated at $ 35,220 plus HST of $ 620. The engineering and inspection costs associated with this new access culvert installation is $ 10,660 plus HST of $ 188. Therefore, the total estimated cost of the access culvert replacement is $ 46,688. Since this access culvert is a new installation, the estimated cost of this work is assessed at 100% against the adjoining property (Parcel No. 43) as a Special Benefit, as shown in Schedule 'A-1'.

5. Culvert No. 5 – County Road 18
   An engineering and overhead cost of $ 4,500 plus HST of $ 79 for the hydrological analysis and assessment provisions of the report for the future maintenance of Culvert No. 5 has been assessed at 100% as a Special Benefit against the County of Essex as owner of County Road 18, as shown in Schedule 'A-1'.

6. Culvert No. 6 – Parcel No. 31
   The cost of replacing Culvert No. 6 is estimated at $ 27,465 plus HST of $ 483. The engineering, inspection and overhead costs associated with this culvert replacement is $ 10,660 plus HST of $ 188. Therefore, the total estimated cost of the access culvert replacement is $ 38,796. The replacement of this access culvert is necessary since it has deteriorated beyond repair. Since the owner of this culvert has chosen to widen the driveway by an extra 0.5m (6.5m driveway width total), the estimated cost of this work is assessed at 62% against the adjoining property (Parcel

No. 31) as a Special Benefit, as shown in Schedule 'A-1'. The Special Benefit was calculated based upon 60% rate for the estimated cost of a standard access culvert (6.0 m wide driveway) and 100% rate for the estimated cost of any additional length used to widen the driveway. The remaining 38% shall be assessed as Outlet only against the lands and roads upstream of this access crossing that drain through it.

7. Culvert No. 7 – Parcel No. 31
   Culvert No. 7 is the second crossing providing access to Parcel No. 31. Since this is a secondary crossing, an engineering and overhead cost of $ 4,500 plus HST of $ 79 for the hydrological analysis, design and assessment provisions of the report for the future maintenance of Culvert No. 7 has been assessed at 100% as a Special Benefit against Parcel No. 31. This cost is shown under "Section D - Privately Owned – Agricultural Lands (Non-Grantable)" of Schedule 'A-1' as per ADIP policy 2.3-h-I-i, *"For every drain, every agricultural property is entitled to one drain crossing. Any additional crossing on this property will not be eligible for grant."*

8. Culvert No. 8 – Parcel No. 30
   The cost of the installation of a new access culvert (Culvert No. 8) is estimated at $ 24,915 plus HST of $ 438. The engineering, inspection and overhead costs associated with this new access culvert installation is $ 10,660 plus HST of $ 188. Therefore, the total estimated cost of the access culvert replacement is $ 36,201. Since this access culvert is a new installation, the estimated cost of this work is assessed at 100% against the adjoining property (Parcel No. 30) as a Special Benefit. This cost is shown under "Section D - Privately Owned – Agricultural Lands (Non-Grantable)" of Schedule 'A-1' as per ADIP policy 2.3-h-I-ii, *"any new crossing required as a result of any lot severance that occurred after 28 July 2004 is not eligible for grant."*

   Outlet costs for engineering of downstream culverts and their replacements are eligible for grant. The outlet costs assessed to Parcel No. 30 are shown under "Section C - Privately Owned – Agricultural Lands (Grantable)" of Schedule 'A-1'.

9. Culvert No. 9 – Parcel No. 11
   The cost of replacing Culvert No. 9 is estimated at $ 23,460 plus HST of 413. The engineering, inspection and overhead costs associated with this culvert replacement is $ 10,660 plus HST of $ 188. Therefore, the total estimated cost of the access culvert replacement is $ 34,721. The replacement of this access culvert is necessary since it has deteriorated beyond repair. The estimated cost of this work is assessed at 60% against the adjoining property (Parcel No. 11) as a Special Benefit, as shown in Schedule 'A-1'. The remaining 40% shall be assessed as Outlet only against the lands and roads upstream of this access crossing that drain through it.

10. Culvert No. 10 – Parcel No. 12
    An engineering and overhead cost of $ 4,500 plus HST of $ 79 for the hydrological analysis, design and assessment provisions of the report for the future maintenance of Culvert No. 10 has been assessed at 60% as a Special Benefit against Parcel No. 12, as shown in Schedule 'A-1'. The remaining 40% has been assessed to the lands and roads upstream of this access crossing as Outlet assessments.

11. Culvert No. 11 – Parcel No. 10
    An engineering and overhead cost of $ 4,500 plus HST of $ 79 for the hydrological analysis, design and assessment provisions of the report for the future maintenance of Culvert No. 11 has been assessed at 60% as a Special Benefit against Parcel No. 10, as shown in Schedule 'A-1'. The remaining 40% has been assessed to the lands and roads upstream of this access crossing as Outlet assessments.

When determining "Outlet" assessments, factors such as area draining from each property, land use, impervious areas, storm water management facilities and other factors are considered. "Outlet" assessments are based upon the volume and rate of flow of the water artificially caused to flow into the drainage works from the lands and roads liable for such assessments.

We consider the engineering costs associated with sizing and design of future culverts to be non-proratable. All other items of work recommended in this report shall be pro-ratable items of work for the purposes of levying the actual final assessments.

15.0 FUTURE MAINTENANCE

All of the access culverts, farm crossings and road crossings recommended or described in this report are a part of the 7th Concession Drain North Drainage Scheme for the purpose of future maintenance of the drainage works. We recommend that the future works of repair and maintenance of the culverts be carried out by the Town of Amherstburg for Culverts No. 1 to 4 and No. 6 to 11, and by the County of Essex for Culvert No. 5. These costs are to be assessed as described in the following paragraphs.

Schedule 'A-2' represents all of the lands and roads that drain through Culvert No. 2. When calculating the outlet assessments for the cost of maintaining a particular culvert, only the properties or proportions of properties that drain through the culvert shall be assessed and the remainder of the properties shall be eliminated from the schedule prior to prorating the outlet assessments. The Outlet assessments shown in Schedule 'A-2' are each based upon an arbitrary amount of $ 10,000.

Culverts No. 2 to 4 and 6 to 11 are access culverts in the Town of Amherstburg. The cost of maintaining or replacing these culverts are assessed in the proportions outlined in the table below. Culverts No. 1 and 5 are road crossings. The cost of maintaining or replacing these culverts are assessed 100% against the respective Road Authority (Town of Amherstburg or County of Essex) as noted in the table below.

The owner of Parcel No. 43 has chosen to extend their driveway an extra 1.5 m to provide a 7.5 m wide access. Therefore, the Special Benefit is calculated as a blended rate based upon 50% rate for a standard width access culvert and 100% rate for the estimated cost of extending the culvert 1.5 m.

Parcel No. 31 has two access culverts serving this parcel of land. Culvert No. 6 is considered the primary access culvert, which the owner has chosen to extend the driveway width by an extra 0.5m (6.5m driveway width total). The costs of replacing it in this report and any future replacement or maintenance will be assessed 62% against the adjoining property (Parcel No. 31) as a Special Benefit, as shown in Schedule 'A-1'. The Special Benefit was calculated based upon 60% rate for the estimated cost of a standard access culvert (6.0 m wide driveway) and 100% rate for the estimated cost of any additional length used to widen the driveway. The remaining 38% shall be assessed as Outlet only against the lands and roads upstream of this access crossing that drain through it. Culvert No. 7 is considered to be a secondary access culvert and any costs associated with replacement and future maintenance of this access culvert will be assessed 100% as "Special Benefit" to the adjoining landowner.

Parcel No. 12 has an access culvert (Culvert No. 10) that provides for a 9.0 m wide driveway. If the owner of this parcel maintains the existing driveway width for a future maintenance or replacement, the Special Benefit shall be at the blended rate shown below. The Special Benefit was calculated based upon 60% rate for the estimated cost of a standard access culvert (6.0 m wide driveway) and 100% rate for the estimated cost of any additional length used to widen the driveway.

Parcel No. 10 has a 7.0 m wide driveway and lawn piping extending to the limits of the property. The Special Benefit is calculated as a blended rate based upon 60% rate for the estimated cost of a standard access culvert (6.0 m wide driveway) and 100% rate for the estimated cost of any additional length used for a widened driveway and lawn piping.

The division between Special Benefit and Outlet Assessment for the future maintenance of each access culvert, farm crossing or road crossing shall be as follows:

Culvert No.	Type	Owner(s) / Parcel No.	Special Benefit	Outlet
1	Road Crossing	TOWN OF AMHERSTBURG	100%	0%
2	Access Crossing	Parcel No. 19	50%	50%
3	Access Crossing	Parcel No. 18	50%	50%
4	Access Crossing	Parcel No. 43	54%	46%
5	Road Crossing	COUNTY OF ESSEX	100%	0%
6	Primary Access Crossing	Parcel No. 31	62%	38%
7	Secondary Access Crossing	Parcel No. 31	100%	0%
8	Access Crossing	Parcel No. 30	60%	40%
9	Access Crossing	Parcel No. 11	60%	40%
10	Access Crossing	Parcel No. 12	66%	34%
11	Access Crossing and Lawn Piping	Parcel No. 10	89%	11%

16.0 FISHERIES ISSUES

The Federal Fisheries Act requires that no deleterious substances be introduced to fish habitat and that there be no net loss of fish habitat as a result of any undertaking. Any activities that may introduce deleterious substances or result in loss of fish habitat may require a permit from the Minister of Fisheries, Oceans and the Canadian Coast Guard.

A self-assessment of the project has been completed and an application for a DFO review was submitted. A DFO review was completed and a copy of the DFO review response is included in Appendix 'D'. To avoid and mitigate the potential for serious harm to fish, DFO recommends implementation of the measures listed below:

- Plan in-water works, undertakings and activities to respect timing windows to protect fish and fish habitat (March 15 to July 15).
- Capture, relocate and monitor for fish trapped within isolated, or enclosed areas.
- If required, screen intakes pipes to prevent entrainment or impingement of fish. Use code of practise for water intake screens.
- If required, apply the interim code of practice for temporary cofferdams and diversion channels.
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity.

  - Limit access to banks or areas adjacent to waterbodies.
  - Construct access points and approaches perpendicular to the watercourse or waterbody.
  - Re-vegetate the disturbed area with native species suitable for the site.
- Restore stream geomorphology (i.e., restore the bed and banks, gradient and contour of the waterbody) to its initial state.
- Develop and implement a Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the work, undertaking or activity.
  - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories).
  - Inspect and regularly maintain the erosion and sediment control measures and structures during all phases of the project.
  - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action.
- Do not deposit any deleterious substances in the watercourse.
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that the above measures are followed by the Contractor, DFO is of the view that the proposed work will not result in serious harm to fish or prohibited effects on listed aquatic species at risk. As such, an authorization under the Fisheries Act or a permit under the Species at Risk Act are not required.

The Contractor will be responsible to meet the other requirements of federal, provincial and municipal agencies. In addition, the Environmental Specifications attached to this report provides appropriate avoidance and mitigation measures for the Contractor to adhere to.

17.0 ENVIRONMENTAL REQUIREMENTS

Construction involved with the replacement and new installation of the farm and access culverts must comply with the "Environmental Protection Special Provisions" in Appendix 'B', the "Town of Amherstburg Mitigation Plan" and "Species at Risk Act", which will be provided during Tender period.

The Essex Region Conservation Authority has completed a preliminary review and are in support of the proposed works. Correspondence with ERCA is attached in Appendix 'D'. A permit is required from ERCA and will be provided to the Contractor prior to construction.

18.0 GRANTS

In accordance with the provisions of Sections 85, 86 and 87 of the Drainage Act, a grant in the amount of 33–1/3 percent of the assessment eligible for a grant may be made in respect to the assessment made under this report upon privately owned lands used for agricultural purposes. The assessments levied against privately owned agricultural land must also satisfy all other eligibility criteria set out in the Agricultural Drainage Infrastructure Program policies. There are assessed properties that are privately owned lands used for agricultural purposes and are eligible for grant under the A.D.I.P. policies in the 7th Concession Drain North watershed. We recommend that application be made to the Ontario Ministry of Agriculture, Food and Rural Affairs in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

Although there are agricultural properties identified as "grantable" in the assessment schedules, which may qualify for agricultural grant from the Ministry of Agriculture, Food and Rural Affairs (OMAFRA) according to current ADIP policies, it should be noted that there is no guarantee that the grant will be approved by OMAFRA or that the grants will be available in the future. Any denial of grant from OMAFRA could result in the recuperation of the grant amount from the affected lands.

All of which is respectfully submitted.

RC SPENCER ASSOCIATES INC.

PREPARED BY:

Marvel Hormiz, P.Eng.

Designated Engineer
28 March 2022

REVIEWED BY:

Dennis McCready, P. Eng.

Review Engineer
28 March 2022

APPENDIX 'A'

SCHEDULES OF ASSESSMENT

SCHEDULE A-1 - Schedule of Assessment for Construction

SCHEDULE A-2 - Schedule of Assessment for Future Maintenance of Culverts

BRIDGES OVER THE 7TH CONCESSION DRAIN NORTH

TOWN OF AMHERSTBURG

SCHEDULE A-1
SCHEDULE OF ASSESSMENT FOR CONSTRUCTION

7TH CONCESSION DRAIN NORTH
TOWN OF AMHERSTBURG

A) MUNICIPAL ROADS

PARCEL NO.	Description	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
1	South Side Road	-	0.810	Town of Amherstburg	$ -	$ 2,240.00	$ -	$ 2,240.00
2	7th Concession Road	-	6.400	Town of Amherstburg	$ -	$ 7,103.00	$ -	$ 7,103.00
4	Alma Street	-	1.078	Town of Amherstburg	$ -	$ -	$ -	$ -
3	County Road 18	-	2.536	County of Essex	$ -	$ 1,277.00	$ -	$ 1,277.00
	Total Affected Lands (Hectares)		10.824					
	Total Assessment on Municipal Roads				$ -	$ 10,620.00	$ -	$ 10,620.00

B) SPECIAL NON-PRORATABLE - MUNICIPAL ROADS

PARCEL NO.	Description	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
4	Alma Street	-	0.000	Town of Amherstburg	$ -	$ -	$ 4,579.00	$ 4,579.00
3	County Road 18	-	0.000	County of Essex	$ -	$ -	$ 4,579.00	$ 4,579.00
	Total Affected Lands (Hectares)		0.000					
	Total Assessment on Special Non-Proratable - Municipal Roads				$ -	$ -	$ 9,158.00	$ 9,158.00

C) PRIVATELY OWNED - NON-AGRICULTURAL LANDS (NON-GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
5		CON 6	PT LOT 72	1.204	1.204	PHILIP & KATHERINE FRENCH	$ -	$ 1,107.00	$ -	$ 1,107.00
6		CON 6	PT LOT 74	0.677	0.677	PAUL & ANNE McGUIRE	$ -	$ 127.00	$ -	$ 127.00
7		CON 6	PT LOT 74	0.372	0.372	RONALD & CHRISTINE McGUIRE	$ -	$ 85.00	$ -	$ 85.00
8		CON 6	PT LOT 74	0.372	0.372	GREGORY & VICKI BOYES	$ -	$ 85.00	$ -	$ 85.00
9		CON 6	PT LOT 72	0.506	0.506	RICHARD & DIANE SERRAN	$ -	$ 568.00	$ -	$ 568.00
10		CON 7	PT LOT 81	0.408	0.408	JEFFREY & KRISTIE VANCE	$ -	$ 470.00	$ -	$ 470.00
11		CON 7	PT LOT 80	0.701	0.701	LARRY & DONNA TAYLOR	$ -	$ 464.00	$ 20,832.00	$ 21,296.00
12		CON 7	PT LOT 80 & 81	0.596	0.596	JUSTIN TAYLOR	$ -	$ 563.00	$ -	$ 563.00
13		CON 7	PT LOT 78	0.187	0.187	ANTHONY & VICTORIA ROSS	$ -	$ 57.00	$ -	$ 57.00
14		CON 7	PT LOT 78	0.238	0.238	JAMES CLIFFORD JARIETT	$ -	$ 65.00	$ -	$ 65.00
15		CON 7	PT LOT 78	0.139	0.139	JAMES PAUL SEGUIN	$ -	$ 42.00	$ -	$ 42.00
16		CON 7	PT LOT 78	0.382	0.382	TIMOTHY JOHN REBIDOUX	$ -	$ 86.00	$ -	$ 86.00
17		CON 7	PT LOT 78	0.384	0.384	ANDREW & BREANNA GRANT	$ -	$ 86.00	$ -	$ 86.00
18		CON 7	PT LOT 77	0.368	0.368	PATRICK ALFRED BEADOW	$ -	$ 46.00	$ 25,409.00	$ 25,455.00
19		CON 7	PT LOT 77	1.669	1.669	CAROLYN YAKOPICH & CORY BRIDGE	$ -	$ 10.00	$ -	$ 10.00
20		CON 6	PT LOT 76	0.273	0.273	DANIEL DAVID McGUIRE, CHRISTOPHE	$ -	$ 6.00	$ -	$ 6.00
21		CON 6	PT LOT 75	0.639	0.639	JOSEPH & CONSTANCE McGUIRE	$ -	$ 122.00	$ -	$ 122.00
22		CON 7	PT LOT 77	0.813	0.813	JOSEPH & BRENDA ALLEN	$ -	$ -	$ -	$ -
			Total affected Lands (Hectares)		9.928					
			Total Assessment on Privately Owned Non-Agricultural Lands (Non-Grantable)				$ -	$ 3,989.00	$ 46,241.00	$ 50,230.00

D) SPECIAL NON-PRORATABLE - NON-AGRICULTURAL LANDS (NON-GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
10		CON 7	PT LOT 81	0.408	0.000	JEFFREY & KRISTIE VANCE	$ -	$ -	$ 2,748.00	$ 2,748.00
12		CON 7	PT LOT 80 & 81	0.596	0.000	JUSTIN TAYLOR	$ -	$ -	$ 2,748.00	$ 2,748.00
19		CON 7	PT LOT 77	1.669	0.000	CAROLYN YAKOPICH & CORY BRIDGE	$ -	$ -	$ 2,290.00	$ 2,290.00
			Total affected Lands (Hectares)		0.000					
			Total Assessment on Special Non-Proratable - Non-Agricultural Lands (Non-Grantable)				$ -	$ -	$ 7,786.00	$ 7,786.00

E) PRIVATELY OWNED - AGRICULTURAL LANDS (GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
23		CON 6	LOT 72	19.216	17.310	ALLAN & CONNIE SERRAN	$ -	$ 9,359.00	$ -	$ 9,359.00
24		CON 6	PT LOT 73	38.550	22.260	PAJOT FARMS LIMITED	$ -	$ 3,842.00	$ -	$ 3,842.00
25		CON 6	LOT 74	19.793	19.793	CLIFFORD McGUIRE	$ -	$ 1,994.00	$ -	$ 1,994.00
26		CON 6	PT LOT 74	9.824	9.824	LINDA & MICHELLE POLSINELLI	$ -	$ 990.00	$ -	$ 990.00
27		CON 6	PT LOT 74	10.093	10.093	JAMES McGUIRE	$ -	$ 1,017.00	$ -	$ 1,017.00
28		CON 6	PT LOT 73	20.704	20.704	PAJOT FARMS LIMITED	$ -	$ 6,224.00	$ -	$ 6,224.00
29		CON 7	PT LOT 81	30.708	12.950	DAVID & KAREN BAILEY	$ -	$ 7,155.00	$ -	$ 7,155.00
30		CON 7	PT LOT 80 & 81	30.030	13.860	GRONDIN FARMS LTD	$ -	$ 5,045.00	$ -	$ 5,045.00
31		CON 7	PT LOT 80	20.329	10.120	JAMES McGUIRE	$ -	$ 1,746.00	$ 24,054.00	$ 25,800.00
32		CON 7	LOT 79	20.540	20.540	JASON & ANGELA McGUIRE	$ -	$ 2,069.00	$ -	$ 2,069.00
33		CON 7	PT LOT 78	36.849	6.070	RICHARD & ELIZABETH BARRON	$ -	$ 612.00	$ -	$ 612.00
34		CON 6	PT LOT 76	19.139	19.139	CHRISTOPHER & EDWARD McGUIRE	$ -	$ -	$ -	$ -
35		CON 6	PT LOT 76	5.865	5.865	ROMAN & HANNA ARCHACKI	$ -	$ 154.00	$ -	$ 154.00
36		CON 6	LOT 75	20.111	20.111	RONALD ERNEST McGUIRE	$ -	$ 2,026.00	$ -	$ 2,026.00
37		CON 6	LOT 75	19.458	19.458	CLIFFORD McGUIRE	$ -	$ 1,960.00	$ -	$ 1,960.00
38		CON 6	LOT 75	38.905	4.050	CLIFFORD & RONALD McGUIRE	$ -	$ 408.00	$ -	$ 408.00
39		CON 6	PT LOT 76	17.418	4.050	CLIFFORD McGUIRE	$ -	$ -	$ -	$ -
40		CON 6	PT LOT 76	20.957	8.500	McGUIRE FARMS INC.	$ -	$ -	$ -	$ -
41		CON 6	PT LOT 76	11.853	11.853	CLIFFORD & RONALD McGUIRE	$ -	$ -	$ -	$ -
42		CON 7	PT LOT 77	37.428	3.237	RICHARD & ELIZABETH BARRON	$ -	$ 131.00	$ -	$ 131.00
				Total affected Lands (Hectares)	259.787					
						Total Assessment on Privately Owned - Agricultural Lands (Grantable)	$ -	$ 44,732.00	$ 24,054.00	$ 68,786.00

F) PRIVATELY OWNED - AGRICULTURAL LANDS (NON-GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
30		CON 7	PT LOT 80 & 81	30.030	0.000	GRONDIN FARMS LTD.	$ -	$ -	$ 36,201.00	$ 36,201.00
43		CON 7	PT LOT 78	10.386	6.480	RYAN & ADRIANNA CIPKAR	$ -	$ 653.00	$ 46,687.00	$ 47,340.00
				Total affected Lands (Hectares)	6.480					
						Total Assessment on Privately Owned - Agricultural Lands (Grantable)	$ -	$ 653.00	$ 82,888.00	$ 83,541.00

G) SPECIAL NON-PRORATABLE - AGRICULTURAL LANDS (NON-GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
31		CON 7	PT LOT 80	20.329	0.000	JAMES McGUIRE	$ -	$ -	$ 4,579.00	$ 4,579.00
				Total affected Lands (Hectares)	0.000					
						Total Assessment on Special Non-Proratable - Agricultural Lands (Non-Grantable)	$ -	$ -	$ 4,579.00	$ 4,579.00

TOTAL ASSESSMENT FOR SCHEDULE A-1	$ -	$ 59,994.00	$ 174,706.00	$ 234,700.00

TOTAL LANDS AFFECTED (Ha)	
A) Municipal Roads	10.824
B) Non-Agricultural Lands	9.928
C) Agricultural Lands (Grantable)	259.787
D) Agricultural Lands (Non-grantable)	6.480
Total Lands Affected:	287.019

NOTE: Assessment Values have been rounded to the nearest whole dollar for presentation purposes.

1 Hectare = 2.471 Acres

SCHEDULE A-2
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE OF CULVERTS

7TH CONCESSION DRAIN NORTH
TOWN OF AMHERSTBURG

A) MUNICIPAL ROADS

PARCEL NO.	Description	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
1	South Side Road	-	0.810	Town of Amherstburg	$ -	$ 145.00	$ -	$ 145.00
2	7th Concession Road	-	6.400	Town of Amherstburg	$ -	$ 1,011.00	$ -	$ 1,011.00
4	Alma Street	-	1.078	Town of Amherstburg	$ -	$ -	$ -	$ -
3	County Road 18	-	2.536	County of Essex	$ -	$ 455.00	$ -	$ 455.00
	Total Affected Lands (Hectares)		10.824					
	Total Assessment on Municipal Roads				$ -	$ 1,611.00	$ -	$ 1,611.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS (NON-GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
5		CON 6	PT LOT 72	1.204	1.204	PHILIP & KATHERINE FRENCH	$ -	$ 72.00	$ -	$ 72.00
6		CON 6	PT LOT 74	0.677	0.677	PAUL & ANNE McGUIRE	$ -	$ 46.00	$ -	$ 46.00
7		CON 6	PT LOT 74	0.372	0.372	RONALD & CHRISTINE McGUIRE	$ -	$ 30.00	$ -	$ 30.00
8		CON 6	PT LOT 74	0.372	0.372	GREGORY & VICKI BOYES	$ -	$ 30.00	$ -	$ 30.00
9		CON 6	PT LOT 72	0.506	0.506	RICHARD & DIANE SERRAN	$ -	$ 37.00	$ -	$ 37.00
10		CON 7	PT LOT 81	0.408	0.408	JEFFREY & KRISTIE VANCE	$ -	$ 32.00	$ -	$ 32.00
11		CON 7	PT LOT 80	0.701	0.701	LARRY & DONNA TAYLOR	$ -	$ 47.00	$ -	$ 47.00
12		CON 7	PT LOT 80 & 81	0.596	0.596	JUSTIN TAYLOR	$ -	$ 41.00	$ -	$ 41.00
13		CON 7	PT LOT 78	0.187	0.187	ANTHONY & VICTORIA ROSS	$ -	$ 20.00	$ -	$ 20.00
14		CON 7	PT LOT 78	0.238	0.238	JAMES CLIFFORD JARIETT	$ -	$ 23.00	$ -	$ 23.00
15		CON 7	PT LOT 78	0.139	0.139	JAMES PAUL SEGUIN	$ -	$ 15.00	$ -	$ 15.00
16		CON 7	PT LOT 78	0.382	0.382	TIMOTHY JOHN REBIDOUX	$ -	$ 31.00	$ -	$ 31.00
17		CON 7	PT LOT 78	0.384	0.384	ANDREW & BREANNA GRANT	$ -	$ 31.00	$ -	$ 31.00
18		CON 7	PT LOT 77	0.368	0.368	PATRICK ALFRED BEADOW	$ -	$ 30.00	$ -	$ 30.00
19		CON 7	PT LOT 77	1.669	1.669	CAROLYN YAKOPICH & CORY BRIDGE	$ -	$ 44.00	$ -	$ 44.00
20		CON 6	PT LOT 76	0.273	0.273	DANIEL DAVID McGUIRE, CHRISTOPHE	$ -	$ 25.00	$ -	$ 25.00
21		CON 6	PT LOT 75	0.639	0.639	JOSEPH & CONSTANCE McGUIRE	$ -	$ 44.00	$ -	$ 44.00
22		CON 7	PT LOT 77	0.813	0.813	JOSEPH & BRENDA ALLEN	$ -	$ -	$ -	$ -
			Total affected Lands (Hectares)		9.928					
			Total Assessment on Privately Owned Non-Agricultural Lands (Non-Grantable)				$ -	$ 598.00	$ -	$ 598.00

C) PRIVATELY OWNED - AGRICULTURAL LANDS (GRANTABLE)

PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
23		CON 6	LOT 72	19.216	17.310	ALLAN & CONNIE SERRAN	$ -	$ 621.00	$ -	$ 621.00
24		CON 6	PT LOT 73	38.550	22.260	PAJOT FARMS LIMITED	$ -	$ 799.00	$ -	$ 799.00
25		CON 6	LOT 74	19.793	19.793	CLIFFORD McGUIRE	$ -	$ 710.00	$ -	$ 710.00
26		CON 6	PT LOT 74	9.824	9.824	LINDA & MICHELLE POLSINELLI	$ -	$ 353.00	$ -	$ 353.00
27		CON 6	PT LOT 74	10.093	10.093	JAMES McGUIRE	$ -	$ 362.00	$ -	$ 362.00
28		CON 6	PT LOT 73	20.704	20.704	PAJOT FARMS LIMITED	$ -	$ 743.00	$ -	$ 743.00
29		CON 7	PT LOT 81	30.708	12.950	DAVID & KAREN BAILEY	$ -	$ 465.00	$ -	$ 465.00
30		CON 7	PT LOT 80 & 81	30.030	13.860	GRONDIN FARMS LTD	$ -	$ 497.00	$ -	$ 497.00
31		CON 7	PT LOT 80	20.329	10.120	JAMES McGUIRE	$ -	$ 363.00	$ -	$ 363.00
32		CON 7	LOT 79	20.540	20.540	JASON & ANGELA McGUIRE	$ -	$ 737.00	$ -	$ 737.00
33		CON 7	PT LOT 78	38.849	6.070	RICHARD & ELIZABETH BARRON	$ -	$ 218.00	$ -	$ 218.00
34		CON 6	PT LOT 76	19.139	19.139	CHRISTOPHER & EDWARD McGUIRE	$ -	$ -	$ -	$ -
35		CON 6	PT LOT 76	5.865	5.865	ROMAN & HANNA ARCHACKI	$ -	$ 79.00	$ -	$ 79.00
36		CON 6	LOT 75	20.111	20.111	RONALD ERNEST McGUIRE	$ -	$ 722.00	$ -	$ 722.00
37		CON 6	LOT 75	19.458	19.458	CLIFFORD McGUIRE	$ -	$ 698.00	$ -	$ 698.00
38		CON 6	LOT 75	38.905	4.050	CLIFFORD & RONALD McGUIRE	$ -	$ 145.00	$ -	$ 145.00
39		CON 6	PT LOT 76	17.418	4.050	CLIFFORD McGUIRE	$ -	$ -	$ -	$ -
40		CON 6	PT LOT 76	20.957	8.500	McGUIRE FARMS INC	$ -	$ -	$ -	$ -
41		CON 6	PT LOT 76	11.853	11.853	CLIFFORD & RONALD McGUIRE	$ -	$ -	$ -	$ -
42		CON 7	PT LOT 77	37.428	3.237	RICHARD & ELIZABETH BARRON	$ -	$ 46.00	$ -	$ 46.00
			Total affected Lands (Hectares)		259.787					
			Total Assessment on Privately Owned Agricultural Lands (Grantable)				$ -	$ 7,558.00	$ -	$ 7,558.00

D) PRIVATELY OWNED - AGRICULTURAL LANDS (NON-GRANTABLE)										
PARCEL NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AREA OWNED (Hectares)	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	(SECTION 24) VALUE OF SPECIAL BENEFIT	TOTAL ASSESSMENT
43		CON 7	PT LOT 78	10.386	6.480	RYAN & ADRIANNA CIPKAR	$ -	$ 233.00	$ -	$ 233.00
				Total affected Lands (Hectares):	6.480					
						Total Assessment on Privately Owned Agricultural Lands (Non-Grantable)	$ -	$ 233.00	$ -	$ 233.00

TOTAL ASSESSMENT FOR SCHEDULE A-1	$ -	$ 10,000.00	$ -	$ 10,000.00

TOTAL LANDS AFFECTED (Ha)	
A) Municipal Roads	10.824
B) Non-Agricultural Lands	9.928
C) Agricultural Lands (Grantable)	259.787
D) Agricultural Lands (Non-grantable)	6.480
Total Lands Affected:	287.019

NOTE: Assessment Values have been rounded to the nearest whole dollar for presentation purposes.

1 Hectare = 2.471 Acres

APPENDIX 'B'

SPECIAL PROVISIONS AND SPECIFICATIONS

BRIDGES OVER THE 7TH CONCESSION DRAIN NORTH

TOWN OF AMHERSTBURG

SPECIAL PROVISIONS

1.0 GENERAL SPECIFICATIONS

The General Specifications attached hereto are part of Appendix 'B'. It forms part of this specification and is to be read with these specifications and the Drawings contained in the report. Where there is a difference between the requirements of the Special Provisions and the General Specifications, the Special Provisions shall take precedence.

2.0 DESCRIPTION OF WORK

The accompanying Engineer's report deals with the replacement of Culverts No. 3, 6 and 9 and new installation of Culverts No. 4 and 8. The work to be carried out under this Contract generally comprises the supply of all materials, equipment and labour required to construct these new access crossings with rip-rap end treatment, granular bedding, backfill and road surface. The work also includes the removal of existing culverts that are being replaced and removal of all brush, trees and surplus materials required to complete new culvert installation and replacement. This material shall be removed and disposed off-site at an approved disposal site at the Contractor's expense. Where drain banks and grassed areas are disturbed, the areas will be restored to pre-existing conditions with screened topsoil and hydroseed.

The contractor shall also clean out the drain bottom 3.0 m upstream and downstream of the newly installed and replaced culverts.

Dewatering, Silt Control and Traffic Control measures will be implemented during construction.

Tile outlet pipes will be replaced if required and as designated by the Drainage Superintendent in the field.

3.0 STATIONING

The reference stations are measured along the existing course of the municipal drain in metres. Station 0+000 is set at the upstream end of the 7th Concession Drain North and proceeds downstream to Station 2+834 at the outlet of the 7th Concession Drain North into the Long Marsh Drain.

4.0 WORKING AREA

The working area at the culvert shall have a width of 10 m located along the east side of the drain and extend 15 m both upstream and downstream of the centerline of the access crossings.

Any damages to lands and/or roads from the Contractor's work within the working areas shall be rectified to pre-existing conditions at the Contractor's expense.

5.0 CULVERT CONSTRUCTION

5.1 Location of Access Culvert

In general, the centreline of the new access culvert shall be installed on the alignment shown on the drawings attached to the Engineer's report. Prior to installation, the Contractor shall contact the Drainage Superintendent to confirm the exact location for the new culvert. The

Drainage Superintendent, in consultation with the property owner, shall establish the exact location for the new culvert in the field.

5.2 Reference Specifications

The contractor shall supply all materials, labour and equipment necessary for the proper completion of the work, unless otherwise stated in the Specifications or the Tender documents.

Materials shall be as follows:

Corrugated Steel Pipe (CSP)

All corrugated steel pipes to have Aluminized Type II coating for rust protection and conform to OPSS 1801. CSP culverts shall be joined using standard annular corrugated bolted couplers.

High Density Polyethylene (HDPE) Pipe

All high-density polyethylene pipe to be 320 kPa pipe stiffness and conform to OPSS 1854. Pipe joints shall be bell and gasketed (Poly-tite) system.

Erosion Stone for Sloping End Protection

All stone to be used for erosion protection shall be 150-300 mm clear quarried rock or OPSS 1004, minimum 300 mm thickness. Round field stone is not acceptable.

Bedding Below Culvert Pipe Invert

20-25mm clear stone conforming to OPSS Division 10.

Backfill Material

Granular 'B' (Type II) conforming to OPSS Division 10.

Driveway Surface Material

Granular 'A' conforming to OPSS Division 10.

Filter Fabric

"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC or approved equivalent.

5.3 Dry Culvert Installation

Suitable dykes shall be constructed in the drain so that the installation of the pipe can be accomplished in the dry. The drain bottom shall be cleaned, prepared, shaped and compacted to suit the new culvert configuration, as shown on the drawings. Granular materials shall be compacted to 100% of their maximum dry density.

5.4 Sloping Stone End Protection

Endwalls shall be constructed of quarry stone rip rap material, as shown on the Drawings. Each endwall shall extend from the invert of the new culvert to the top of the proposed lane. The endwalls shall be sloped to a minimum of 1 vertical to 1.5 horizontal unless stated otherwise with a filter fabric underlay surrounding the pipe and spanning across the entire width of the drain, wrapping around the drain banks to align with the ends of the new pipe culvert. The minimum thickness requirement of the erosion stone layer is 300 mm with no portion of the filter fabric to be exposed to sunlight.

5.5 Lateral Tile Drains

Should the Contractor encounter any lateral tiles within the proposed culvert limits as shown and also those not shown on the attached drawings, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new culvert. **Tile drain outlets through the wall of the new culvert pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense.

5.6 Silt Control

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

5.7 Removal of Existing Culverts

The existing culverts (Culverts No. 3,6 & 9) and end wall materials shall be removed and disposed off-site at an approved disposal site.

5.8 Seeding

The disturbed grassed areas resulting from the construction or replacement of the access and farm crossings shall be seeded as specified herein. Topsoil shall be placed to a depth of 100 mm at the disturbed areas. The existing ground surface to be seeded shall be loosened to a depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface area over the backfilled trench shall be finely graded to match the original grade. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of.

Grass seed shall be Canada No. 1 grass seed mixture meeting the requirements of a Waterway Slough Mixture as supplied by Growmark or approved equal, as follows:

Creeping Red Fescue	*20%*
Meadow Fescue	*30%*
Tall Fescue	*30%*
Timothy	*10%*
White Clover	*10%*

Bags shall bear the label of the supplier indicating the content by species, grade and mass. Other grass seed mixtures will be considered with approval of Engineer and Drainage Superintendent. Seed shall be applied at a rate of 200 kg per 10,000 m^2.
Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m^2. It shall be in granular form, dry, free from lumps and in bags bearing the label of the manufacturer, indicating mass and analysis.

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

6.0 MAINTENANCE OF FLOWS

Should rainfall events generate flows in the drain, the contractor is responsible for maintaining the flows in the open drain so that flooding does not occur and for maintaining flows in the covered drains so that subsurface drainage is maintained.

7.0 ENVIRONMENTAL REQUIREMENTS

The Contractor shall comply with the requirements of the attached "Environmental Protection Special Provisions" in Appendix 'B', the "Town of Amherstburg Mitigation Plan" and "Species at Risk Act", which will be provided during Tender period. The Contractor shall also comply with the approval requirements of the Fisheries and Oceans Canada and the Essex Region Conservation Authority.

To avoid and mitigate the potential for serious harm to fish, DFO recommends implementation of the measures listed below:

- Plan in-water works, undertakings and activities to respect timing windows to protect fish and fish habitat (March 15 to July 15).
- Capture, relocate and monitor for fish trapped within isolated, or enclosed areas.
- If required, screen intakes pipes to prevent entrainment or impingement of fish. Use code of practise for water intake screens.
- If required, apply the interim code of practice for temporary cofferdams and diversion channels.
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity.
    - Limit access to banks or areas adjacent to waterbodies.
    - Construct access points and approaches perpendicular to the watercourse or waterbody.
    - Re-vegetate the disturbed area with native species suitable for the site.
- Restore stream geomorphology (i.e., restore the bed and banks, gradient and contour of the waterbody) to its initial state.
- Develop and implement a Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the work, undertaking or activity.
    - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories).
    - Inspect and regularly maintain the erosion and sediment control measures and structures during all phases of the project.
    - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action.
- Do not deposit any deleterious substances in the watercourse.
- Develop and implement a response plan to avoid a spill of deleterious substances.

GENERAL SPECIFICATION FOR OPEN DRAINS

(Revised 2016 11 25)

SECTION 1 - AGREEMENT AND GENERAL CONDITIONS

(1) Payment for the work shall be on a lump sum basis unless otherwise indicated. The Contractor agrees to enter into a formal contract with the Municipality upon acceptance of the tender. The General Conditions of the contract shall be those of the Stipulated Price Contract CCDC2-Engineers, 2008 or the most recent revision of this document. The form of agreement between Owner and Contractor shall be that of the previously stated document or a form of agreement specifically prepared by the Municipality for this purpose.

(2) All work shall be in first class condition, comply fully with the report, Special Provisions, General Specifications and the Drainage Act, and be carried out to the satisfaction and approval of the Drainage Superintendent for the Municipality. Upon completion of the project, the work will be inspected by the Engineer and the Drainage Superintendent. Any deficiencies noted during the final inspection shall be immediately rectified by the Contractor. Final inspection will be made by the Engineer within 20 days after the Drainage Superintendent has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

(3) The Contractor shall complete all work on or before the date fixed at the time of tendering. The Contractor will be held liable for any damages or expenses occasioned by his/her failure to complete the work on time and for any expenses of inspection, superintending, re-tendering or re-surveying, due to their neglect or failure to carry out the work satisfactorily or in a timely manner. Any such expenses or damages may be deducted by the Drainage Superintendent from the amount of the contract or may be recovered by the Municipality from the Contractor and his sureties.

(4) The Contractor shall be required to submit to the Municipality a Certificate of Good Standing from the Workplace Safety and Insurance Board prior to the commencement of the work and the Contractor shall be required to submit to the Municipality a Certificate of Clearance for the project from the Workplace Safety and Insurance Board before final payment is made to the Contractor.

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

SECTION 2 - EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

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

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

SECTION 3 - CONTRACTOR'S LIABILITY

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

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

SECTION 4 – ONTARIO PROVINCIAL STANDARDS

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

SECTION 5 – APPROVALS, PERMITS AND NOTICES

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

SECTION 6 – NOTIFICATION OF WORK

(1) Prior to commencing any work of installing any new bridge or removing any existing structures, the Contractor shall inform the Municipal Drainage Superintendent of his intent to commence work at least 48 hours prior to commencing any work. The Owner or Contractor shall endeavor to install and complete the new structure without delay once the work has commenced. If for any reason the work does not proceed continuously then the Owner or Contractor shall notify the Drainage Superintendent in advance of any backfilling operation or headwall construction so that he may schedule inspection of same

SECTION 7 – CONSTRUCTION SAFETY

(1) The Contractor shall comply with all the requirements of the Occupational Health and Safety Act, 2013, and the regulations passed in connection therewith, as administered by the Ontario Ministry of Labour and all subsequent amendments of the said Act.

(2) The Contractor shall exercise all possible precaution against injury to persons or property resulting from his work. The Contractor shall leave no trenches, pits, holes or excavations uncovered, without providing sufficient protection at all times. The Contractor shall install, erect and provide barricades, signs, traffic cones, flashers, lights, plates, warning and other devices, materials and personnel as may be required at his own expense in order to provide for the safe passage and control of traffic and to ensure public safety. All traffic control shall be in accordance with the latest standards of the Ministry of Transportation.

SECTION 8 – TRAFFIC CONTROL

(1) The Contractor shall not perform excavation operations from the travelled portion of the roadway nor close a road or reduce the width or number of traffic lanes available for traffic except as specified in the contract documents or approved by the Engineer.

(2) The Contractor will be required to control vehicular and pedestrian traffic along roads at all times and shall, at his/her own expense, provide for placing and maintaining such barricades, signs, flags, lights and flag persons as may be required to ensure public safety. The Contractor will be solely responsible for controlling traffic and shall appoint a representative to maintain the signs and warning lights at night, on weekends and holidays and at all other times that work is not in progress. The costs associated with provision of proper signage, barricades, lights and flag persons shall be considered incidental to the works to remove the old bridge and complete the new bridge installation.

(3) **During all phases of the project, adjoining public roadways shall remain open to through traffic with at least one lane being open to through traffic at all times.**

(4) All traffic control during construction shall be strictly in accordance with the **Occupational Health and Safety Act** and the current version of the **Ontario Traffic Manuals**. Access to the electronic version of the **Ontario Traffic Manual** is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web, go to http://www.mto.gov.on.ca/english/transrd/, click on "Library Catalogue", under the "Title", enter "Ontario Traffic Manual" as the search. Open the applicable "Manual(s)" by choosing the "Access Key", once open look for the "Attachment", click the PDF file. Users require Adobe Acrobat to view all PDF files.

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

SECTION 9 – GENERAL CO-ORDINATION

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

SECTION 10 – STATIONS AND BENCHMARKS

(1) Reference Stations measured in meters, are indicated on the drawings and represent stations along the course of the work. Stationing is shown along the profile at 25 m intervals numbered consecutively, 0+000, 0+025, 0+050, 0+075, etc. Where cut depths are shown on the profile, they represent the approximate depth, in meters, of the finished drain as measured from the surface of the ground to the design gradeline for the bottom of the open drain. Where excavation depths are shown on the profile, they represent the approximate depth, in meters, from the existing drain bottom down to the design gradeline for the bottom of the open drain.

(2) The Contractor will be held responsible during the progress of the work for the preservation of all reference stakes, benchmarks and survey markers which fall within the limits of the work. The cost of replacing any benchmark or survey marker defaced or destroyed by the Contractor as a result of his work will be deducted from any monies due the Contractor.

SECTION 11 - ALIGNMENT

(1) Except where specified otherwise, the excavation will follow as nearly as possible the course of the existing drain with sloping and widening carried out on each bank as required to produce the specified cross-section. Wherever sharp or irregular bends occur, all sloping and widening is to be done on that side of the drain that will tend to reduce the curve and improve the alignment of the channel.

(2) Where one drain bank adjoins the travelled part of any roadway or laneway, all sloping and widening is to be done on that side of the drain farthest from the roadway unless otherwise directed by the Engineer.

(3) Where the drain bank adjoins an existing fence which is not specified for removal or relocation all required sloping and widening shall be carried out on that side of the drain farthest from the fence.

(4) Where a drain is to be moved off a road allowance and onto adjoining lands, the top edge of the nearest finished drain bank is to be not closer than 1 metre to the limit of the road allowance or top edge of the abandoned channel. The centreline of the new channel is to be as straight as possible even though this 1 metre dimension is exceeded in places.

(5) Where a new drain is constructed, its centre line will be as straight as possible and any changes in direction shall be in the form of smooth, regular bends.

(6) Where a new drain is to be constructed adjoining an existing fence line, the Contractor shall lay out a suitable centre line such that the top edge of the adjacent drain bank, at its widest point, will not be closer than 1 metre to the fence and the Contractor shall use this centre line to establish the drain location.

(7) The Contractor must lay out the proposed centre line in the field for approval by the Drainage Superintendent prior to construction.

SECTION 12 - PROFILE

(1) The excavation of the drain must be at least to the depth intended by the grade line shown on the Profile, which grade line is governed by the benchmarks. The Profile shows, for the convenience of the Contractors and others, the approximate depth of excavation from the surface of the ground to the final invert of the channel in metres and decimals of a metre and also the approximate depth of excavation from the bottom of the existing channel to the final invert of the channel. Benchmarks, which have been established along the course of the drain, shall govern the final elevation of the drain. The location and elevation of the benchmarks are shown on the Drawings.

SECTION 13 - BOTTOM WIDTH AND SIDE SLOPES

(1) The bottom widths and the side slopes of the various sections of the finished drain are to be true to line and grade as shown on the Profile.

(2) Contractors will not be restricted to the exact dimensions specified but must excavate clear of the specified cross-sections and may excavate such additional depth or width as may be required to accommodate the use of suitable excavating equipment or to allow for minor sedimentation prior to final inspection provided that at no place are the side slopes of the excavation to be cut steeper than the slope specified on the Profile. The Contractor is not to excavate the drain bottom so much deeper than the grade line as to result in the formation of pockets in the drain bottom that will cause water to stand in pools along the drain. Should over-excavation of the drain bank occur, the Contractor will **not** be permitted to repair with native material packed into place by the excavator and reshaped. Should over-excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

SECTION 14 - OBSTRUCTIONS

(1) All brush, timber, logs, stumps, stones, or other obstructions encountered within the limits of the channel along the course of the drain are to be removed by the Contractor. Timber, logs and stumps are to be dealt with in the same manner as specified for brush and trees. Large stones and other similar materials are to be piled near the limit of the spread area so as not to interfere with the spreading of the excavated material. The disposal of this material shall be the owner's responsibility.

SECTION 15 - BRUSH AND TREES

(1) Brushing shall be carried out on the entire drain within the above identified sections of the drain where required and as specified herein. **All** brush and trees located within the drain side slopes shall be cut parallel to the side slopes, as close to the ground as practicable. Tree branches that overhang the drain shall be trimmed. Small branches and limbs are to be disposed of by the Contractor along with the other brush. Tree stumps, where removed to facilitate the drain excavation and reshaping of the drain banks, may be burned by the Contractor where permitted; otherwise, they shall be disposed of, off the site. All thorn trees shall be disposed of off-site.

(2) Where the existing bottom widths and side slopes of the drain are sufficient to permit the specified deepening of the drain without disturbing the existing banks above the present drain bottom, the Contractor will be required to cut the brush and trees on the sloping banks flush with the surface of the banks but he will not be required to remove their roots and stumps unless they will obviously create obstructions to the flow of water in the drain.

(3) Where it is necessary to widen the drain and excavate material from the sloping banks, all brush and trees within the limits of the channel and within 1 metre of the top of the drain banks and within the spread area are to be cut and those roots and stumps in the drain bottom and on the banks where the widening takes place shall be completely removed unless the Drainage Superintendent permits the Contractor to cut the roots and stumps flush with the surface of the finished banks.

(4) The Contractor shall make every effort to preserve mature trees which are beyond the drain side slopes, and the working corridors. If requested to do so by the Drainage Superintendent, the Contractor shall preserve certain mature trees within the designated working corridors.

(5) Where there is a fence adjoining the drain, he will be required to cut the brush in the fence line and on the side of the fence opposite the drain only if the excavating equipment will be operated from this side or excavated material is to be placed and levelled on this side.

(6) The Contractor shall cut off flush with the ground all brush and trees having a diameter of 150 mm or less from the disposal area. Should the Contractor find it necessary to remove trees having a diameter of 150 mm or larger from the disposal area in order to permit the efficient excavation of the drain or spreading of excavated material, he will be at liberty to do so only on permission of the Drainage Superintendent in charge of the work.

(7) All trees over 200 mm in diameter that are cut are to be trimmed of branches, and the trunks, along with branches over 200 mm in diameter, are to be cut up into log lengths and piled for the use of the adjoining owner unless the owner advises the Drainage Superintendent he does not want them, in which case they are to be disposed of by the Contractor along with the other brush. Small branches and limbs are to be disposed of by the Contractor along with the other brush. Tree stumps may be burned by the Contractor where permitted; otherwise, they shall be disposed of by him away from the site of the work.

(8) Following completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which remain standing, disposing of the branches cut off along with other brush and leaving the trees in a neat and tidy condition.

(9) Brush and trees removed from the drain and banks thereof and from the disposal area are to be put into piles by the Contractor, in locations where they can be safely burned, and are to be burned by the Contractor after obtaining the necessary permits, as required. If, in the opinion of the Drainage Superintendent, any of the piles are too wet or green to be burned, he will so advise the Contractor who may then arrange, to the Drainage Superintendent's satisfaction, an agreement in writing, with the owners where the piles are located, for them to burn the material when dry enough. If a satisfactory agreement cannot be made, the Contractor to haul away the unburned materials to an approved dump site.

(10) Since the trees and brush that are cut off flush with the earth surface may sprout new growth later, it is strongly recommended that the Municipality make arrangements for spraying this new growth at the appropriate time so as to kill the trees and brush.

(11) Prior to and during the course of 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.
(12) In no case will brush or trees be buried in the spoil bank or within the excavated material.
(13) The Contractor will be required to brush rake the excavated material to remove brush and trees from the spoil if so instructed by the Drainage Superintendent.
(14) As part of this work, the Contractor shall remove any loose timber, logs, stumps, large stones or other debris from the drain bottom and from the side slopes. Timber, logs, stumps, large stones or other debris shall be disposed of off-site.

SECTION 16 – EXCAVATION OF DRAIN

(1) All excavated material shall be handled as specified in the following section. Materials deposited on the farmlands shall be within the working corridors, at least 2.0 m from the top of the drain bank, or as specified on the drawings. Upon allowing drying of excavated materials (if necessary) and as approved by the Drainage Superintendent, the Contractor shall level excavated materials as specified. Excavated material shall not be placed on dykes, in ditches, tiles or depressions intended to conduct water into the drain.
(2) Seeding of the disturbed drain banks shall be completed immediately following drain construction as specified in the Special Provisions.
(3) All excavation work shall be done in such a manner as to not harm any vegetation or trees, not identified in this report or by the Drainage Superintendent for clearing. Any damages to trees or vegetation caused by the Contractors work shall be rectified to the satisfaction of the Drainage Superintendent.
(4) The Contractor shall exercise caution around existing tile inlets and shall confirm with the property owners that all tiles have been located and tile ends repaired as specified.

SECTION 17 - DISPOSAL OF EXCAVATED MATERIAL

(1) Where a part of the drain is being relocated, the Contractor shall strip the topsoil from the alignment of the new course and stockpile it for re-use following the completion of the subsoil operations. Subsoil excavated from the new course is to be used first to fill the existing course which is to be abandoned. Where the Contractor can conveniently do so, he may deposit the material in the old course as he excavates it from the new course but where the distance separating the new course from the old course is too great to permit this the excavated material must be loaded onto trucks, hauled to the abandoned drain and placed in the old channel. The material shall be placed in the abandoned channel in layers no greater than 300 mm in thickness. Each layer shall be thoroughly compacted with the levelling equipment available at the site prior to the placement of the subsequent layers. The abandoned channel shall be filled to an elevation at least 300 mm higher than the adjacent natural ground elevation to allow for settlement. If insufficient material is available to fill the old course, the surface of the material shall be graded so as to eliminate any low areas that would collect water.
(2) Excess excavated material not required for the filling of an abandoned channel or material excavated from the drain under normal construction, repair, or improvement shall be deposited and spread on the immediately adjoining farmlands in the locations set out in the Special Specifications. The material shall be deposited and spread no closer than 2 metres from the top edge of the adjacent drain bank and at least 1 metre clear of all fences.
(3) Where the excavated material is deposited in bush land, it is to be spread and levelled in the form of a spoil bank over at least the full width of the strip that has been cleared to permit the passage of excavating equipment but in no case is the top surface to be left more than 600 mm above the natural ground level even though this may require additional clearing to produce a sufficient disposal area. On completion, the spoil bank is to be left so that it is smooth enough to drive an ordinary farm vehicle along it.
(4) Where the adjoining land is sufficiently clear to permit cultivation, the Contractor shall deposit the excavated material on the property and spread the material over a width that, after spreading, the excavated material will generally have a thickness of approximately 150 mm. The Contractor shall utilize a minimum spread width of 6 metres and a maximum spread width of 20 metres even though this results in a depth of material in excess of 150 mm. The material shall be thoroughly spread and levelled with suitable equipment and left in a condition which permits cultivation with ordinary farm equipment without causing undue hardship on farm machinery and personnel.
(5) After the excavated material has been spread and levelled, any stockpiled topsoil is to be spread over it to a depth of no more than 100 mm.
(6) No excavated material is to be placed on lawns or ornamental shrubbery but is to be deposited on either or both sides of the lawn on the farmlands immediately adjacent to the lawn.
(7) Excavated material or topsoil shall not be placed in ditches, tiles or depressions intended to conduct water into the drain.
(8) The material shall be sufficiently levelled to allow further working by agricultural implements.
(9) All stones and other debris removed from the drain, which may interfere with agricultural implements, shall be disposed of off-site.
(10) The Drainage Superintendent in charge will be the sole judge as to the proper disposal of material under the contract and this specification

SECTION 18 - FENCES

(1) Where it is necessary to remove any fences which parallel the course of the drain in order to permit the excavation of the drain or the disposal of excavated material the Contractor shall remove the fence. An allowance will be made to the owners of the properties to compensate them for damages to fences which are considered capable of restraining cattle. The Contractor shall notify the owner of his intentions to remove the fence at least 7 days prior to doing so. Any owner has the option to salvage his fencing materials but must do so sufficiently in advance of the Contractor's operations so as to cause no unnecessary delays to him. If the owner does not remove his fences, the Contractor shall carefully take down the fence and leave the materials neatly placed beyond the limit of the spread area for disposal or reconstruction by the owner. The owner will be responsible to construct and maintain any temporary fencing during the progress of the work. The landowners and not the Contractor will be

responsible for the control of livestock in the adjoining field during the period of construction. Unless otherwise specified, the Contractor will not be required to reconstruct the fences following the completion of the work of excavation and levelling.

(2) No permanent fencing shall be constructed or reconstructed without the approval of the Drainage Superintendent. Any fences that are constructed or reconstructed along the course of the drain are to be kept at least 1 metre clear of the top edge of the adjacent drain bank.

(3) Where the Contractor finds it necessary to remove any fences which cross the drain, he shall remove the fencing materials in a careful, workmanlike manner. Unless otherwise directed the Contractor shall reconstruct the cross fences in as good a condition as the old material permits.

SECTION 19 - ROAD CROSSINGS

(1) Where the drain crosses the travelled part of a road through a bridge, the Contractor shall excavate the drain to its specified dimensions through the bridge opening, using care to avoid damaging it. If after the drain has been excavated at any bridge structure it appears to the Drainage Superintendent that repairs or replacement may be required, he shall so advise the Road Authority having jurisdiction over the particular bridge.

(2) Where a new bridge is required or where any underpinning, strengthening or repairs is rendered necessary by the work, it is to be carried out by the Road Authority at its own expense.

(3) Where the drain crosses the travelled part of a road through a pipe that does not have to be replaced or lowered, the Contractor shall clean the pipe to its full cross-sectional area using care to avoid damaging it.

(4) Where the existing pipe is of sufficient size and is in a good state of repair but requires to be lowered, the Contractor shall carefully remove it, clean it to its full cross-sectional area and replace it in the drain as specified herein.

(5) Where the existing pipe must be replaced, the Contractor shall carefully remove it from the drain, clean it to its full cross-sectional area, and leave it beside the drain for removal by the Road Authority. Unless otherwise instructed he shall install the new road culvert as supplied by the Road Authority. All backfill material shall be compacted granular material supplied by the Road Authority, unless otherwise specified.

(6) The Contractor shall notify the Road Authority having jurisdiction over the structure under construction at least 72 hours in advance of any construction activities.

SECTION 20 - FARM AND ACCESS CULVERTS

(1) Where a farm or access culvert or bridge does not have to be replaced or lowered, the Contractor shall clean it to its full cross-sectional area using care to avoid causing damage to it in the process.

(2) Where a pipe culvert is to be lowered, the Contractor shall carefully remove it, clean it to its full cross-sectional area and replace it in the drain with its invert set 10% of the pipe diameter below the grade line.

(3) Where a culvert is to be replaced, the Contractor shall carefully remove it from the drain, clean it to its full cross-sectional area and leave it on the drain bank. If the pipe was originally supplied and installed by the property owner, it shall be left for disposal by the owner. If the pipe was installed under the provisions of The Drainage Act, it shall be disposed of as directed by the Drainage Superintendent and any salvage value from the sale of the pipe shall be credited to the drain. Wooden or concrete farm or access bridges which must be removed from the drain shall be disposed of in the same manner.

(4) Where a pipe culvert is to be installed in the drain, all materials shall be supplied by the Drainage Superintendent as an expense to the drain. The Contractor shall install the pipe in the location directed by the Drainage Superintendent in accordance with the specifications governing the installation.

(5) Where a new culvert is to be installed, the owner may request the Drainage Superintendent to have it placed in a different location from the existing one and this will be permitted so long as the relocation does not result in an increase in the area draining through the culvert. Adequate notice of the change must be given to the Contractor. In no case may the existing culvert be left in the drain when it has been specified that it is to be removed.

SECTION 21 - FARM AND ACCESS PIPE CULVERT INSTALLATION

21.1 - Location and Elevation of Access Culvert or Farm Culvert

(1) In general, the new access or farm culvert shall be installed as shown on the drawings attached to the engineer's report. Prior to installation, the Contractor shall contact the Drainage Superintendent to confirm the exact location for the new culvert. The Drainage Superintendent, in consultation with the property owner, shall establish the exact location for the new culvert in the field.

(2) The invert (inside bottom) bottom of the pipe shall be set according to the elevations shown on the accompanying plans. For the purpose of construction, the benchmark indicated on the accompanying plans shall be used to determine the elevation of the proposed enclosure.

21.2 Dry Culvert Installation

(1) Suitable dykes shall be constructed in the drain so that the installation of the pipe can be accomplished in the dry. The Contractor shall perform the excavation, placement of bedding, pipe and backfill in a dry condition and shall provide all required pumps and/or equipment to enable the work to proceed in the dry.

21.3 Pipe Installation

(1) The required pipe shall be set in the drain to the dimensions shown on the accompanying drawings and the Contractor shall carry out all required excavation to install the pipe and specified rip-rap end treatment. The drain bottom shall be cleaned, prepared, shaped and compacted to suit the new culvert configuration, as shown on the drawings. The Contractor shall excavate sufficient material from the drain banks and bottom to permit placement of the pipe and backfill material. The minimum trench width as shown on the drawings, shall be provided from the face of the pipe to the excavated trench wall along each bank to provide working room to compact the backfill material.

(2) The surface on which the culvert is to be laid shall be true to grade and alignment and shaped to accept the materials to be placed. The pipe shall be laid to the alignment and grade shown in the report but may not be placed on a bed containing frozen materials.
(3) The end protection to each end of the pipe structure shall be as specified in the Special Provisions and on the Drawings and in accordance with the following applicable specifications.
(4) All newly excavated portions of the drain bank shall be seeded.
(5) The Contractor shall dispose of all surplus excavated material at an approved disposal site at his expense.
(6) Riveted corrugated steel pipe shall be laid with the inside circumferential laps pointing in the direction of the flow. The longitudinal laps shall be located in the upper half of the pipe.
(7) All helical corrugated steel pipe shall be supplied with re-rolled annular ends and shall be installed so that the helix angle is constant for the total length of the installation and each pipe section shall be installed next to the previous section such that the lock-seam forms a continuous helix.
(8) Corrugated steel pipe sections shall be joined together by means of plant fabricated couplers having a minimum wall thickness of 1.6 mm and a 10 c width. The couplers shall be installed to lap approximately equal portions of the pipe sections being connected, such that the corrugations or projections of the coupler properly engage the pipe corrugations.
(9) Where fabrication of structural plate structures by the Contractor is specified, they must be assembled in the trench or at the side of the excavation. If the assembled structure has to be moved to its final position, it shall be moved in such a manner that no damage or distortion is caused to the structure. The materials shall be assembled and handled in accordance with the manufacturer's specifications and directions.
(10) The whole of the work shall be done in a neat, thorough and workmanlike manner such that the alignment of the bridge pipe at each location meets the full satisfaction of the drainage superintendent.

21.4 Backfilling and Compaction

(1) Backfill and cover material on each side of the culvert pipe shall be carefully placed simultaneously on each side of the pipe so that damage to or movement of the pipe is avoided. At no time shall the levels on each side differ by more than the 300 mm uncompacted layer. Then, a 300mm thick layer of Granular 'A' material, O.P.S.S. Spec 1010 shall be constructed as a road base. All backfill materials shall be placed in layers not exceeding 300mm (12") in thickness, loose measurement. Each layer shall be thoroughly compacted in place to a Standard Proctor Density of 100% by means of mechanical compactors. The Contractor shall provide sufficient water to the granular material such that optimum compaction levels are achieved. The equipment used and method of compacting the backfill material shall be to the full satisfaction of the Drainage Superintendent.

SECTION 22 – LATERAL TILE DRAINS

(1) Should the Contractor encounter any lateral tiles within the proposed culvert limits as shown and also those not shown on the attached drawings, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new culvert. **Tile drain outlets through the wall of the new culvert pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense. Care must be taken in handling plastic drain pipe in cold weather to avoid causing damage.
(2) Plastic drain pipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

SECTION 23 – CULVERT END PROTECTION - SLOPING RIP-RAP

(1) Where specified, the Contractor shall install quarried rip-rap erosion protection materials on the slopes at both ends of the pipe. The backfill and quarried rip-rap protection over the ends of the pipe shall be sloped at 1.5 horizontal to 1 vertical or to a flatter slope specified on the drawings. All stone used for rip-rap culvert end protection shall be 125-225 mm clear quarried rock or OPSS.MUNI 1004 and be placed with a minimum thickness of 300mm thickness. Prior to placing rip-rap materials on the backfill materials, the Contractor shall lay a non-woven geotextile filter fabric equal to a "Terrafix 270R" or approved equal. The geotextile filter fabric shall extend from the bottom of the pipe to the top of each side slope of the drain and between both side slopes of the drain. No portion of the filter fabric shall remain exposed to sunlight. The Contractor shall take extreme care to not damage the geotextile filter fabric when placing the rip-rap on top of the filter fabric. The geotextile filter fabric and quarried stone shall be placed to the complete satisfaction of the Drainage Superintendent. **Concrete rip-rap or round stone will not be permitted.**
(2) Where a clay layer is specified beneath the Rip-Rap End Protection, it shall be a 500 mm thick layer of cohesive clay material that is dry select earth material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances. It shall be placed and shaped before the filter fabric layer is placed.

SECTION 24 - BAGGED CONCRETE HEADWALLS – SINGLE BAG THICKNESS

(1) Sacked concrete end walls that do not exceed 1.8 m in height shall be constructed of a single row of sacked concrete. The installation of the end wall shall be governed by the drawings. The end wall treatment shall extend to the same elevation as the finished travelled surface and fit to the top of bank elevation on both banks and in any event be a minimum of 300 mm above the crown of the pipe.
(2) Where specified and after the Contractor has set in place the new pipe and partially backfilled same, he shall install new concrete filled jute bag headwalls at each end of the pipe. When constructing the concrete jute bag headwalls, the Contractor shall place the bags so that the completed headwall will have a slope inward from the bottom of the pipe to the top of the finished headwall, the slope of the headwall shall be one unit horizontal to five units vertical.
(3) The Contractor shall completely backfill in behind the new concrete jute bag headwalls with granular material, Granular "B" per O.P.S.S. 1010, and the granular material shall be compacted in place with 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 300mm (12") in thickness.

(4) The concrete jute bag headwalls shall be constructed by filling jute bags with concrete. All concrete used to fill the jute bags shall have a minimum compressive strength of 20 MPa in 28 days and shall be provided and placed only as a wet mix. Under no circumstances 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 x 660mm (18" x 26"). The jute bags shall be filled with concrete so that when they are laid flat, they will be approximately 100mm (4") thick, 300mm (12") to 380mm (15") wide and 460mm (18") long.

(5) The concrete jute bag headwall to be provided at the end of the pipe shall be of single bag wall construction or as specified otherwise. The concrete filled bags shall be laid so that the 460mm (18") dimension is parallel with the longitudinal length of the new pipe. The concrete filled bags shall be laid on a footing of plain concrete being 460mm (18") wide or as otherwise specified, extending for the full length of the wall, and from 0.3 metres (1.0') below the bottom of the corrugated pipe to the bottom of the culvert pipe. All concrete used for the footing shall have a minimum compressive strength of 20 MPa in 28 days.

(6) The completed jute bag headwalls shall be securely embedded a minimum of 0.50m (20") into the side slopes of the drain. At the roadside of the bridge the Contractor shall flair outwards each headwall approximately 1.5m (5.0') as directed by the Drainage Superintendent.

(7) Upon completion of the jute bag headwall the Contractor shall cap the top row of concrete filled bags with a layer of plain concrete, 150mm (6") thick, and hand trowelled to obtain a pleasing appearance. The concrete cap shall be the same width as the bagged wall and excess concrete will not be allowed to be placed on the cap area. The concrete cap shall not overhang the bagged wall on the driveway side of the wall.

(8) 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.

SECTION 25 – BAGGED CONCRETE HEADWALLS – DOUBLE BAG THICKNESS

(1) Sacked concrete end walls that exceed 1.8 m in height shall be constructed of double rows of sacked concrete.

(2) The concrete filled bags are to be laid so that the 460mm (18") dimension is perpendicular (at right angles) to the longitudinal length of the new pipe. Therefore, the long dimension of the bag will be visible when the headwall is complete.

SECTION 26 – GROUTED CONCRETE RIP-RAP WALL

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

SECTION 27 – PRECAST CONCRETE HEADWALLS

(1) Where specified as an alternative, the Contractor may supply and install precast concrete headwalls. Said precast headwalls shall be a custom-made product, manufactured by Underground Specialties (Windsor) or similar provider.

(2) The precast concrete headwall or precast blocks or modules shall be of the shape, size and dimensions shown on the drawings.

(3) Precast provider to provide stamped engineering drawing for precast headwall and Geotextile restrainers for approval.

(4) Excavation for the headwalls shall be in conformance with O.P.S.S. Section 902.

(5) The supply and placement of concrete shall be in conformance with O.P.S.S. Section 904. All concrete shall have a strength of 33 MPa after 28 days. All concrete shall be air entrained to an air content of 6% $\pm$ 1.5% by volume for 19mm maximum size of aggregate. Minimum cover for concrete shall be 40mm (1 ½").

(6) The supply and placement of reinforcing steel shall be in conformance with O.P.S.S. Section 905. The reinforcing steel shall be grade 400 and shall be of the size and type shown on the drawings.

(7) The Contractor shall place the precast headwall so that it is straight and plumb. The method of backfilling the side slope trenches shall be such that no voids remain under the haunches of the sloping concrete headwall. The Contractor's method of achieving this shall be approved prior to start of construction.

(8) The Contractor shall provide a sufficient opening in the headwalls so that when the headwalls are set and plumb the corrugated steel pipe may be inserted or adjusted to grade. The void between the corrugated steel pipe and opening in the headwall shall be fully mortared in place using a mixture composed of three parts of clean, sharp sand to one part of Portland Cement.

(9) After the corrugated steel pipe has been set and partially backfilled with Granular "B" per O.P.S.S. 1010 and compacted to 100% Standard Proctor Density, geotextile tie backs to the precast concrete headwalls in accordance to approved stamped headwall and restraining devices.

SECTION 28 - TILE OUTLET PIPES AND ROAD DRAINS

(1) Where existing tile outlet pipes of cast iron, asbestos cement, corrugated steel or other rigid material are encountered along the course of the drain, and where they will be removed or rendered useless by the work, the Contractor, as part of his work, shall reinstall the outlet pipes in the re-graded bank.

(2) Where, in the course of the grading operation tile drains having no outlet pipe are encountered or the existing outlet pipe is not suitable for re-installation, the Contractor shall install an outlet pipe manufactured for that purpose. The outlet pipe shall be one size larger than the diameter of the tile, 3 metres in length, and supplied by the Drainage Superintendent as an expense to the drain.

(3) All outlet pipes installed shall be at least 3 metres long and shall be embedded 2.5 metres into the bank of the drain and shall protrude 0.5 metres beyond its face. The outlet end shall be fitted with a removable wire rodent guard.

(4) Where a drain adjoining a road is relocated, the Drainage Superintendent shall arrange to have all existing private and road drains which cross beneath the road extended across the old course of the drain to the drain in its new location. The cost of all pipe materials to extend these drains together with the installation costs will be borne by the Road Authority having jurisdiction.

SECTION 29 – RIP-RAP EROSION PROTECTION

(1) The Contractor shall supply and install the required quantities of graded stone rip-rap erosion protection materials where specified All stone used for rip-rap culvert end protection shall be 125-225 mm clear quarried rock or OPSS.MUNI 1004 and be placed with a minimum thickness of 300mm thickness. Prior to placing rip-rap materials on the backfill materials, the Contractor shall lay a non-woven geotextile filter fabric equal to a "Terrafix 270R" or approved equal. No portion of the filter fabric shall remain exposed to sunlight. The Contractor shall take extreme care to not damage the geotextile filter fabric when placing the rip-rap on top of the filter fabric. The geotextile filter fabric and quarried stone shall be placed to the complete satisfaction of the Drainage Superintendent. **Concrete rip-rap or round stone will not be permitted.**

SECTION 30 – LOCATION OF STRUCTURES, ETC.

(1) The Contractor shall satisfy himself as to the exact location, nature and extent of any existing structure, utility or other object which he may encounter during the course of the work. The Contractor shall indemnify and save harmless the Municipality and the Engineer for any damages which he may cause or sustain during the progress of the work. He shall not hold the Municipality or the Engineer liable for any legal action arising out of any claims brought about by such damage caused by him.

SECTION 31 - LAWN RESTORATION

(1) Where the construction works cross a lawn, the Contractor shall take extreme care to avoid damaging the lawn, shrubs and trees encountered. Upon completion of the work, the Contractor shall completely restore the area by the placement and fine grading of topsoil and seeding or sodding the area as specified by the Engineer or Drainage Superintendent.

SECTION 32 – PROPERTY BARS AND SURVEY MONUMENTS

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

SECTION 33 - CLEAN UP AND RESTORATION

(1) The Contractor shall leave the whole of the site of the work in a neat, thorough and workmanlike appearance to the full satisfaction of the Drainage Superintendent. He shall haul away any excess earth from the site. He shall haul to the site, at his own expense, sufficient earth to fill any depressions caused by his work. All debris and waste materials specified for disposal by others shall be left in a neat condition. All materials to be disposed of under this contract shall be removed by the Contractor and the site left in a neat and tidy condition. The site shall be left, as closely as possible, in the same condition it was in prior to the commencement of the work.

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

SECTION 34 - UTILITIES, RAILWAYS, ETC.

(1) The Contractor shall note that overhead and underground utilities such as hydro, gas, telephone and water are not necessarily shown on the drawings. Before commencing work, the Contractor will investigate the location of any and all railways, utility lines, wires, pipes, poles, towers, cables, etc. which may interfere with the proposed work. He will take all necessary steps to avoid damaging these. The Contractor will be liable for any damage to utilities and should any damage result to them from his operations, he will be completely responsible for these damages and will save harmless the Municipality and the Engineer from any legal actions which may arise as a result of such damage.

(2) If permits are required to allow the work to be carried out on or adjacent to any utilities, pipelines, railways, etc., the Contractor shall obtain these at his own expense.

(3) All work on or adjacent to any utility, pipeline, railway, etc., is to be carried out in accordance with the requirements of the utility, pipeline, railway, or other, as the case may be, and its specifications for such work form part of this specification and apply.

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

SECTION 35 – DAMAGE TO TRAVELLED PORTION OF MUNICIPAL ROADS

(1) The Contractor shall be responsible for any damage caused by him 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 a road, the travelled portion shall be protected by having the excavation equipment placed on satisfactory timber planks or timber pads. If any parts of the travelled portion of the road are damaged by the Contractor, the Municipality shall have the right to have the necessary repair work done by its employees and the cost of all labour and materials used to carry out the repair work shall be deducted from the Contractor's contract and credited to the Municipality.

SECTION 36 – MAINTAINING FLOWS

(1) The Contractor shall maintain the flow of any drainage works encountered in the progress of the work at no expense to the Owner. The Contractor shall obtain written approval from the Engineer in charge to stop up any drain and if necessary, provide pumping equipment, build necessary by-passes, etc. at no expense to the Owner.

SECTION 37 – MAINTENANCE

(1) The successful Tenderer shall guarantee the work for a period of one (1) year from the date of acceptance (as evidenced by the final inspection report), thereof from deficiencies that, in the opinion of the Engineer, were caused by faulty workmanship or materials. The successful Tenderer shall, at his/her own expense, make good and repair deficiencies and every part thereof, all to the satisfaction of the Engineer. Should the successful Tenderer for any cause, fail to do so, then the Municipality may do so and employ such other person or persons as the Engineer may deem proper to make such repairs or do such work, and the whole costs, charges and expense so incurred may be deducted from any amount due to the Tenderer or may be collected otherwise by the Municipality from the Tenderer. Nothing herein contained shall be construed as in any way restricting or limiting the liability of the Contractor under the appropriate laws under which the work is being done.

SECTION 38 - DRAINAGE SUPERINTENDENT

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

(2) The Drainage Superintendent will be permitted to make minor variations in the, work so long as these variations will result in either a more satisfactory drain or a more economical one. These variations, however, must not be such as to change the intent of the work performed nor are they to reduce the standard of quality.

SECTION 39 - SPECIAL PROVISIONS

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

RC SPENCER ASSOCIATES INC.
Windsor, Leamington & Chatham, Ontario

ENVIRONMENTAL PROTECTION SPECIAL PROVISIONS

(Revised 2016 11 25)

SECTION 1 – GENERAL

(1) These Environmental Protection Special Provisions shall apply and form part of this Contract. All costs associated to confirming with these Special Provisions shall be included in the Tender prices bid.

SECTION 2 - FIRES

(1) Fires and burning of rubbish on site will be permitted only with special approval from the Municipality.

SECTION 3 - DISPOSAL OF WASTES

(1) The Contractor shall not bury rubbish and waste materials on site unless approved by the Engineer and all applicable approving authorities. The site shall be maintained free of accumulated waste and rubbish. All waste materials should be disposed of in a legal manner at a site approved by all local approving authorities and the Engineer.
(2) The Contractor shall not allow deleterious substances, waste or volatile materials such as mineral spirits, or paint thinner, to enter into waterways, storm or sanitary sewers.
(3) The disposal of dredge material where applicable shall be in accordance with the above.

SECTION 4 - POLLUTION CONTROL

(1) The Contractor shall maintain under this Contract temporary erosion, sediment and pollution control features installed.
(2) The Contractor shall control emissions from equipment and plant to local authority's emission requirements.
(3) The Contractor shall not cause excessive turbidity when performing in-water work. The Contractor shall not allow any debris, fill or other foreign matter to enter into the waterway. The Contractor shall remove from the waterway, all extraneous materials resulting from in-water work.
(4) The Contractor shall abide by local noise By-Laws for the duration of the Contract.
(5) Spills of deleterious substances into waterways and on land shall be immediately contained by the Contractor and the Contractor shall cleanup in accordance with Provincial regulatory requirements. All spills shall be reported to the Ontario Spills Action Centre (1-800-268-6060), local authorities having jurisdiction and the Engineer. To reduce the risk of fuel entering the waterway, refuelling of machinery must take place a safe distance from the waterway. The Contractor shall note that the Engineer or the Owner takes no responsibility for spills, this shall be the sole responsibility of the Contractor.

SECTION 5 - WHMIS

(1) The Contractor shall comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labelling and the provision of material safety data sheets acceptable to Labour Canada.

SECTION 6 - DRAINAGE

(1) The Contractor shall not pump water containing suspended materials into waterways, sewers or drainage systems. The Contractor shall be solely responsible for the control, disposal or runoff of water containing suspended materials or other harmful substances in accordance with these specifications, and local authority requirements. The Contractor shall provide temporary drainage and pumping as necessary to keep excavations and the site free from water.
(2) The Contractor shall install and maintain sediment control devices as indicated on the Contract Drawing and as director by the Engineer.

SECTION 7 - PROTECTION OF VEGETATION

(1) The Contractor shall exercise the utmost caution to ensure that existing trees and plants on-site and on adjacent properties are not damaged or disturbed unless noted otherwise in the Removals Special Provisions of this Contract. The Contractor shall restrict tree removal to areas indicated on the Contract Drawings and/or designated on-site. No trees or shrubs shall be removed without the approval of the Engineer.

SECTION 8 - DUST CONTROL

(1) The Contractor will be solely responsible for controlling dust nuisance resulting from his operations, both on the site and within adjacent rights-of-way.
(2) Water and calcium chloride shall be applied to areas on or adjacent to the site as authorized by the Engineer as being necessary and unavoidable for the prevention of dust nuisance or hazard to the public. No payment will be made for dust control unless otherwise specified in the Special Provisions.

SECTION 9 - RESTRICTIONS FOR IN-WATER WORKS

(1) The Contractor shall only perform in-water works during times when conditions permit reasonable production rates to be achieved. The Contractor shall be required to adopt good housekeeping practices that minimize disturbance to the site and the adjacent waterway.
(2) The Contractor shall note that this Project is subject to approval from the Essex Region Conservation Authority and as such, any possible turbidity caused by the construction of shore protection works is of key importance.
(3) The Contractor shall minimize the turbidity (sedimentation) produced by any in-water works construction or operations. The Contractor will be ordered to cease operations if, in the opinion of the Engineer or authorities having jurisdiction, the in-water work is producing unacceptable amounts of turbidity in the waterway. Based on this, the Contractor shall either adjust his operation(s) to produce lower turbidity levels, wait for more favourable conditions before operations will be allowed to continue, or undertake approved mitigating measures (e.g., sediment control, etc.). All costs associated with the above will be the sole responsibility of the Contractor, and no claims for extras or delays will be considered.

SECTION 10 - FISH HABITAT

No work shall be undertaken when there is likelihood of adverse effects on fish spawning or fish habitat in downstream waters. The Contractor shall implement the following measures to avoid causing harm to fish and fish habitat:

10.1 - Site Selection

(1) Design and plan activities and works in the water body such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
(2) Design and construct approaches to the water body such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
(3) 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.

10.2 - Standard Practices

(1) Work will not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods. Construct the work 'in the dry' and cut only trees necessary to do the work (no clear-cutting) and as specified in the Construction Specifications. All disturbed areas and all disturbed soils on both banks and within the channel, including spoil, must be stabilized immediately, and upon completion of work returned to a pre-disturbed state or better as soon as conditions allow.

10.3 - Timing Windows

(1) For spring spawning fish in southwestern Ontario, the timing window for construction, is July 15 to March 15. This covers all warm water fish species, which is the type of fish that will be found in essentially all the small watercourses and drains in southwestern Ontario. Do not carry out in-water work and any work affecting fish or fish habitat outside of the timing window without prior authorization from the appropriate authorities for emergency situations affecting public safety.

10.4 - Contaminant and Spill Management

(1) Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete, or other chemicals do not enter the watercourse. All activities should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the water.
(2) 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.
(3) 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.

10.5 - Erosion and Sediment Control

(1) Develop and implement an 'Erosion and Sediment Control Plan' for the site that minimizes risk of sedimentation of the water body 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 water body 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 into the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a water body. For example, pumping/diversion of water to a vegetation 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, culvert work). 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.
- Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, uprooted or cut aquatic plants, accumulated debris) above the high-water mark of nearby water bodies 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. Sediment in the barriers/traps must be removed and stabilized on land to prevent entry of sediment into the water. Removal of non-biodegradable erosion and sediment control materials once the site is stabilized.

10.6 - Fish Protection

(1) Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
(2) Retain a qualified 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.
(3) 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.
(4) Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish's swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.

10.7 - Operation of Machinery

(1) Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds. 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.
(2) 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 water body.
(3) To cross a municipal drain or watercourse, use the existing crossing structures within the designated working corridors or construct temporary crossing structures approved by the Engineer. Fording will not be permitted unless approved by the Engineer and carried out by the Contractor according to the requirements determined by the Engineer.

10.8 - Culvert Work

(1) It is important to apply the relevant mitigation measures outlined above, to ensure that no deleterious materials reach fish habitat and that there are no detrimental impacts to physical fish habitat.
(2) Existing culverts may be repaired, replaced, and removed, and debris may be removed from them, without contacting DFO. Important things to consider are:
    - the timing window, which will be July 15 to March 15 for almost 100% of projects;
    - that fish passage must not be obstructed;
    - that the channel cannot be realigned;
    - that culverts are designed for a minimum embedment of 10% below grade;
    - that new material placed below the high-water mark must be properly stabilized and protected from erosion;
    - that the channel must not be narrowed; and
    - that work must be done when there is no flowing water.
(3) It is best to time work when stream flows are at a minimum, but contingency measures should be in place in the event that a heavy rain occurs. Coffer dams or other features should be used above the area of construction and water above it should be pumped into the stream channel downstream of the construction. If the initial dewatering strands fish, they should be captured and placed downstream in the wetted area. It may be necessary to get a permit from MNRF to move the fish.

SECTION 11 - ENDANGERED SPECIES ACT

(1) All work must comply with the current version of the Ontario Endangered Species Act, 2007, S.O. 2007, c.6; O. Reg.230/08: (Species at Risk in Ontario); and O. Reg. 242/08: (General).
(2) The Municipality shall obtain the most current Endangered Species information available from MNRF and other sources. A designated persons employed by the Municipality will be responsible for reviewing habitat maps to determine if registration of prescribed activities or full review and approval by MNRF and other agencies is required.
(3) Prior to the start of any construction activities, the Contractor shall meet with the Municipal Designate to obtain a copy of specific mitigation procedures for dealing with endangered species should they be encountered anytime during construction.

APPENDIX 'C'

RECORD OF ON-SITE MEETING

RC SPENCER ASSOCIATES INC.
Consulting Engineers

30th ANNIVERSARY RC SPENCER ASSOCIATES INC.

5 February 2021
File No. 19-955

Town of Amherstburg
271 Sandwich St. South,
Amherstburg, ON
N9V 2A5

Attention: **Mr. Shane McVitty, P.Eng.**
Drainage Superintendent & Engineering Coordinator

Re: **Record of Virtual On-Site (Zoom) Meeting,**
Held on January 29, 2021
7th Concession Road Drain North

Municipal Representatives: Shane McVitty, P.Eng., Drainage Superintendent
Nicole Humber, Office Clerk

Engineer's Representatives: Dennis McCready, P.Eng., RC Spencer Associates Inc.
Marvel Hormiz, P.Eng., RC Spencer Associates Inc.

Culvert Reference Numbers:

For reference purposes, culvert numbers have been assigned to the existing culverts in the drain and a proposed new culvert, as follows:

Culvert No.	Parcel No.	Owners
1	(Alma Street)	Town of Amherstburg
2	19	Cory Bridgen & Carolyn Yakopich
3	18	Patrick Beadow
5	(County Rd 18)	County of Essex
6	31	James McGuire
7	31	James McGuire
9	11	Larry Taylor & Donna Taylor
8	30	Joe Grondin (future owner)
10	12	Justin Taylor
11	10	Jeffrey Vance & Kristie Vance

Introduction:

Shane McVitty – Drainage Superintendent

The purpose of the meeting is to discuss the request received from the landowner James McGuire, back in October 2019. Mr. McGuire asked for the repair and replacement of an existing access bridge over the 7th Concession Road Drain under Section 78 of the Drainage Act.

As well, Larry Taylor has indicated that his access crossing is in rough shape.

Section 78 of the Drainage Act involves a new engineering report. The first step in the process is to have an on-site meeting. At the on-site meeting what we try to do is outline the scope of the work, figure out what issues people may have, and to give the engineer a sense of what he needs to do moving forward with the project. The residents can discuss what the issues are and make the Engineer aware of what work they would like included in the engineering report.

Our appointed engineer is Dennis McCready from RC Spencer. He was appointed back in December of 2019 to complete a report under Section 78 of the Drainage Act in response to the request for repair and improvement. An on-site meeting was scheduled back on 7 April 2020, but Covid caused the meeting to be cancelled. On-site meetings under Section 78 of the Drainage Act are a requirement of the Act. This is the first on-site meeting that we have done since the pandemic took control of things. If you would rather speak personally you can always call us at the public works office and our engineer is also going to be available for discussions, which I would encourage as well.

There are seven bridges and two road crossings currently in the 7th Concession Road Drain. The intention is to have the engineer evaluate all of the bridges and provide maintenance provisions and suggested replacement provisions if needed.

Dennis McCready – RC Spencer Assoc. Inc.

There has been a request put in to look at replacing one failing access culvert. There have been 6 reports on the drain from 1918 up to 1981. The 1981 report is the latest Engineer's report prepared by William Setterington on July 24, 1981. A that time, the entire length of the drain was cleaned out.

Today, there are seven access culverts in the drain and two road crossings. Under the 1981 report, three of the access culverts were replaced with CSP (Culverts No. 2, 5 & 7) and another three culverts (Culverts No. 3, 6 & 9) were cleaned and left in place. The culvert serving Parcel No. 12 (Culvert No. 8) was installed sometime after the 1981 work was completed. It is a private culvert and has no status under the Drainage Act, unless it is incorporated as part of the new drainage report.

The 1981 report also provided that the drain be maintained at the expense of the entire watershed. There were no specific provisions set out for the assessment of culvert replacement or maintenance costs. If an access culvert were replaced under maintenance, the only mechanism the Municipality would have, is to assess the cost against all of the lands in the watershed proportionate to the 1981 assessment schedule. This would not be a fair and equitable way to assess the culvert costs. Under more recent drainage reports what the engineers have been doing is assessing part of the cost against adjoining property that is served by the access culvert, with the remaining portion of the cost being assessed to the upstream watershed as outlet assessments. Normally, the split between the special benefit to the owner and the outlet assessments to the upstream lands are somewhere in the order of 50% for "Special Benefit" and 50% for "Outlet Liability".

In addition to the culvert installed after the 1981 report, serving Parcel No. 12. There is a culvert serving Parcel No. 10 (Culvert No. 9) and the portion of the existing culvert across the driveway is a part of the Municipal Drain. Sometime after the 1981 report, the culvert was extended to enclose the lawn area with CSP pipe and this is not currently a part of the municipal drain.

Any information that the property owners can share with us about any drainage problems and any other issues would be most helpful to us. We would like to know what shape the existing access culverts are in and if they should be replaced in the near future. If you are aware of any watershed changes that would increase or reduce your acreage assessment into the drain please let us know.

Comments and Requests of Owners in Attendance:

1. **Larry Taylor – Parcel No. 11 – (Culvert No. 9)**

   Mr. Taylor pointed out to Shane back in 2019, that his bridge is the same as Jim McGuire's where it has rotted right down the middle on both sides. The upper part of the culvert has kind of collapsed on the lower half and it is still holding up. There are no holes in the deck. The ditch was cleaned a few years ago. There is a good flow of water through it and flows north with even as little as two inches of water in it. Mr. Taylor wanted to know exactly how much land is assessed to see if anything has changed.

   Mr. McCready indicated that his property is assessed 14.98 hectares (37 acres) under the 1981 report.

   Mr. McVitty indicated that the Engineer is going to examine all of the culverts and decide what kind of condition they are in and whether they have got any life left in them.

2. **Brian Renaud – County Road 18 in W1/2 Con 8**

   Mr. Brian Renaud indicated that he has no subsurface water going to the drain whatsoever. He is all tiled westerly to the 6th Concession Drain. He wondered what he could expect for an assessment.

   Mr. McCready indicated that his lot is not close to the drain, so Benefit assessment would not apply. The engineer's plan from 1981 shows the watershed cutting across the north east corner of his property. However, the property was not assessed in the 1981 Schedule of Assessment. We need to visit his property to see if any water makes it to the 7th Concession Road Drain.

   Mr. Renaud is in the process of getting his property retiled. They are going to have to pump some water into the 6th Concession Drain. They looked at going into the 7th Concession Drain, however, it is not possible because of the elevations so everything is going to be tile drained towards the 6th Concession Drain.

3. **Jason McGuire – Parcel No. 32**

   Mr. McGuire indicated that the drain is working well after it was cleaned out. He has no access culvert in the drain. If other properties need bridge replacement so be it.

4. **Joe Grondin – Parcel No. 30 – (Culvert No. 8)**

Larry Taylor currently Parcel No. 11. A residential lot will be severed at the existing house and Access Culvert No. 9 located north of Parcel No. 11. Larry Taylor will keep the house and the Access Culvert No. 9. The severed farmland (most of the property) will be purchased by Joe Grondin. Joe Grondin needs a new access crossing (Culvert No. 8) and will be assessed 100% of the construction cost as a result of the severance. Future assessment would be approximately 50%-50%.

Call Joe Grondin and Larry Taylor before the survey so that they can attend that day.

Mr. Grondin wants a new access culvert included in the drainage report for the severed farm property somewhere along the frontage. He is not sure which side of Taylor's house he wants the culvert installed and it will have to be discussed with the engineer.

Mr. McVitty confirmed with Mr. Grondin that he has purchased a portion of Larry Taylor`s farm and one of the conditions of severance is to have a new access provided into the severed farm property. The Engineer will have to reach out to Mr. Grondin and figure out where exactly he wants that bridge to be included as part of the new report.

Larry Taylor confirmed that he is going to retain his house with the existing access culvert (Culvert No. 9), and the farmland is going to be severed off and transferred to Joe Grondin.

5. **Patrick Beadow – Parcel No. 18 – (Culvert No. 3)**

Mr. Beadow wondered if he would be assessed the entire cost of the work on his culvert. His sacked concrete headwalls are failing. The culvert is in pretty good condition. It does not seem like the metal culvert itself is failing at all. It is rusted at the bottom but he cannot find any holes in it.

The last time the drain was cleaned out, Mr. Beadow pointed out that his bridge seems to be the high point between the north and south as this is the way the property lays. It seems like after they cleaned it out the last time, it is holding a little bit of water back towards the south but it is draining fairly well to the north. The floor of the bridge at Alma Street (Town Line Road) was broken years ago. When the drain was cleaned out last time, they put rock rubble in there and it holds water back a little bit. Everything seems to be draining fine from his bridge downstream.

Mr. Grondin asked about his assessment. Mr. McCready indicated that if there is no cleanout of the ditch and if his culvert pipe is in good condition, then his assessment would be approximately half of the cost of the end walls and you would also be assessed some outlet assessments for the Culvert No. 2 located downstream of his property.

He says that the only thing he has going into the drain is his sump pump and the downspouts on the south side of my house.

Mr. Beadow wondered what the new endwalls would be like. Since his culvert is only 7 metres long, we would look at vertical end walls like stacked concrete blocks. He does not want anything fancy.

APPENDIX 'D'

CORRESPONDENCE

Fisheries and Oceans
Canada

Ontario and Prairie Region
Fish and Fish Habitat Protection Program
867 Lakeshore Road
Burlington, ON L7S 1A1

Pêches et Océans
Canada

Région de l'Ontario et des Prairies
Programme de la protection du poisson et de son habitat
867 Lakeshore Road
Burlington, ON L7S 1A1

December 17, 2021

Our file *Notre référence*

21-HCAA-02598

RC Spencer Associates Inc.
Attention: Marvel Hormiz
800 University Avenue West
Windsor, ON, N9A 5R9

Subject: Culvert Replacements and Installation, 7th Concession Drain North, Hanow – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Marvel Hormiz:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on December 1, 2021. We understand that you propose to:

- Replace three existing access culverts, as well as install two new access culverts, within 7th Concession Drain North resulting in approximately 50 square meters (m^2) footprint below the High Water Mark;
    - Replace culverts at locations 3, 6, and 9 with like-for-like structures (culvert 9 will be a HDPE culvert rather than CSP);
    - Install a new 1400mm diameter by 15.5m CSP culvert at location 4;
    - Install a new 1000mm diameter by 12.5m CSP culvert at location 8;
    - Stabilize culvert headslopes by constructing riprap aprons at the inlet and outlet of each structure;
- Embed culvert to allow for fish passage; and,
- Work in isolation of flow or open water to avoid sedimentation of the watercourse.

Our review considered the following information:

- Request for Review and supporting documents received on December 1, 2021.
- Correspondence between DFO and RC Spencer Associates Inc. on December 10, 2021.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and

- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures outlined in your plan(s), in addition to the following listed below:

- Plan in-water works, undertakings and activities to respect timing windows to protect fish and fish habitat;
- Capture, relocate and monitor for fish trapped within isolated, or enclosed areas;
- If required, screen intake pipes to prevent entrainment or impingement of fish;
    - Use the code of practice for water intake screens;
- If required, apply the interim code of practice for temporary cofferdams and diversion channels;
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity;
    - Limit access to banks or areas adjacent to waterbodies;
    - Construct access points and approaches perpendicular to the watercourse or waterbody;
    - Re-vegetate the disturbed area with native species suitable for the site;
- Restore stream geomorphology (i.e., restore the bed and banks, gradient and contour of the waterbody) to its initial state;
- Develop and implement a Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the work, undertaking or activity;
    - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories);
    - Inspect and maintain regularly the erosion and sediment control measures and structures during all phases of the project;
    - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action;
- Do not deposit any deleterious substances in the water course; and,
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, and the *Species at Risk Act*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to FisheriesProtection@dfo-mpo.gc.ca or 1-855-852-8320 (http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html).

We recommend that you notify this office at least 10 days before starting your project and that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Tyler Peat at (613) 213-0293 or by email at tyler.peat@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Tyler Peat
Biologist, Triage and Planning
Fish and Fish Habitat Protection Program

CC: Shane McVitty – Town of Amherstburg

mhormiz@rcspencer.ca

From: Ashley Gyori <AGyori@erca.org>
Sent: December 10, 2021 12:48 PM
To: mhormiz@rcspencer.ca
Cc: rcspencer@rcspencer.ca; 'Shane McVitty'
Subject: RE: 7th Concession Road Drain North
Attachments: 19-955 - 7th Conc Drain Report.pdf; 19-955 - Drawings.pdf

Good afternoon Marvel,

Thank you for providing the attached Preliminary Drawings for the proposed works to the 7th Concession Road Drain, Project No. 19-955. I've had an opportunity to review the preliminary drawings and the available information and can confirm that this office can support this proposal, as presented in the preliminary stages.

The only comment that I have to note is that on Page 9, it specifies that existing Culvert No. 8 is to be removed and replaced; however, this is one of the new culvert installations. Additionally, just below this, it states that Culvert No. 10 is to be a new culvert installation. It's my understanding that the culvert to be replaced is Culvert No. 9.

We look forward to receiving the final stamped and signed drainage report and drawings. A completed Application for Permit form will be required from the municipality.

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

Kind regards,

Essex Region Conservation Authority
sustaining the place for life

ASHLEY GYORI
Regulations Analyst
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6
P. 519-776-5209 x 247 • F. 519-776-8688
agyori@erca.org • essexregionconservation.ca

*** Please note that I will be away from the office from Monday, December 20th, 2021 until January 4th, 2022.****

**** Please note that the ERCA office is closed to the public; however, staff are continuing to respond to inquiries and review applications in a modified capacity. We appreciate your understanding and patience at this time.****

From: mhormiz@rcspencer.ca <mhormiz@rcspencer.ca>
Sent: Wednesday, December 1, 2021 2:39 PM
To: Ashley Gyori <AGyori@erca.org>

Cc: rcspencer@rcspencer.ca
Subject: FW: 7th Concession Road Drain North

Hi Ashley,

Further to my email yesterday, I have attached a draft copy of our drawings and report for your review. If you need anything further, please let me know.

Kind regards,

Marvel Hormiz, P.Eng.
Project Engineer
RC SPENCER ASSOCIATES INC.
Office: (519) 946-1122 Ext. 1128

From: mhormiz@rcspencer.ca <mhormiz@rcspencer.ca>
Sent: November 30, 2021 4:23 PM
To: 'AGyori@erca.org' <AGyori@erca.org>
Cc: 'rcspencer@rcspencer.ca' <rcspencer@rcspencer.ca>
Subject: 7th Concession Road Drain North

Hi Ashley,

RC Spencer was appointed to complete a drainage report for the assessment of all the culverts within the 7th Concession Drain North in the Town of Amherstburg. We have assessed all the culverts and have recommended the replacement of three culverts within the drain and completed the design for the installation of two new culverts.

I would just like to know what you require for review of the project. Please let me know and I will send it over asap.

Kind regards,

Marvel Hormiz, P.Eng.
Project Engineer
RC SPENCER ASSOCIATES INC.
Office: (519) 946-1122 Ext. 1128

From: Shane McVitty <smcvitty@amherstburg.ca>
Sent: January 29, 2021 8:34 AM
To: Dennis McCready (dmccready@rcspencer.ca) <dmccready@rcspencer.ca>; Marvel Hormiz <mhormiz@rcspencer.ca>
Subject: FW: Notice of Site Meeting - 7th Concession Road Drain North

Good Morning,

Please see attached correspondence from ERCA for your information.

Regards,
Shane

Shane McVitty
Drainage Superintendent / Engineering Coordinator
Town of Amherstburg
512 Sandwich St. South, Amherstburg, ON, N9V 3R2
Tel: 519-736-3664 x2318 Fax: 519-736-7080 TTY: 519-736-9860

From: Ashley Gyori <AGyori@erca.org>
Sent: January 29, 2021 8:25 AM
To: Shane McVitty <smcvitty@amherstburg.ca>
Subject: Notice of Site Meeting - 7th Concession Road Drain North

Good morning Shane,

This office acknowledges receipt of the attached Notice of Site Meeting for the proposed repair and improvements on the 7th Concession Road Drain North. We will not be in attendance at this meeting.

A review of our floodplain mapping for the above noted property indicates that the 7th Concession Road Drain North is located within an area that is under the jurisdiction of the Essex Region Conservation Authority (ERCA) (Section 28 of the *Conservation Authorities Act*). Prior to undertaking works, a permit is required from this office.

Please note that the 7th Concession Road Drain North outlets into the Long Marsh Drain, which is a modelled waterway. As such, please find attached the 1:100 year floodline mapping for the Long Marsh Drain at this location. As we are unaware of the scope and scale of the proposed repairs and improvements, it should be noted that any proposed works to the 7th Concession Road Drain must not adversely impact the flow regime for all storms up to and including the 1:100 year event. The proposed works cannot change the 1:100 year flood elevations of the Long Marsh Drain. We cannot be more specific in this regard without an actual proposal to review.

With respect to Department of Fisheries and Oceans (DFO) concerns and comments, the proposed works to the drain will need to be self-assessed by you, the proponent, through the DFO website at http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html. Through the self-assessment process, you will be able to determine if these works require a formal authorization under the *Fisheries Act*.

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

Kind regards,

Essex Region Conservation Authority
sustaining the place for life

ASHLEY GYORI
Regulations Analyst
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6
P. 519-776-5209 x 247 • F. 519-776-8688
agyori@erca.org • essexregionconservation.ca

**** Please note that the ERCA office is closed to the public; however, staff are continuing to respond to inquiries and review applications in a modified capacity. We appreciate your understanding and patience at this time.****

-----Original Message-----
From: Lisa Pavan <LPavan@erca.org>
Sent: Tuesday, January 26, 2021 9:33 AM
To: Ashley Gyori <AGyori@erca.org>
Subject: Drainage Notification

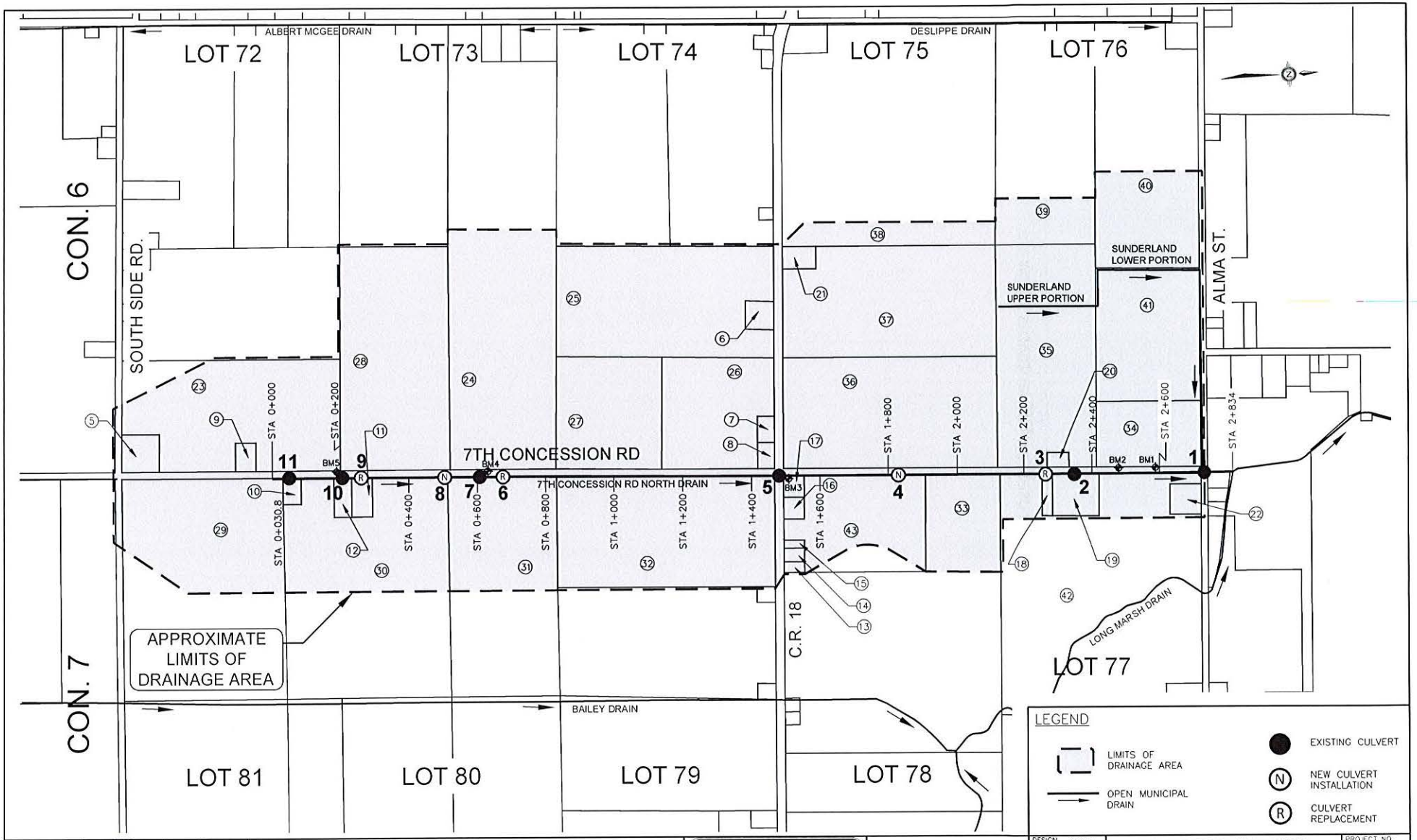
LISA PAVAN
Administrative Associate, Corporate Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 Essex, Ontario N8M 1Y6
P. 519-776-5209 x 346 F. 519-776-8688
lpavan@erca.org www.essexregionconservation.ca See the light in others, and treat them as if that is all you see. -Dr Wayne Dyer

-----Original Message-----
From: Ricoh@erca.org <Ricoh@erca.org>

Sent: Monday, January 25, 2021 1:45 PM
To: Lisa Pavan <LPavan@erca.org>
Subject: Message from "RicohC6003"

This E-mail was sent from "RicohC6003" (MP C6003).

Scan Date: 01.25.2021 13:44:37 (-0500)
Queries to: Ricoh@erca.org



SITE BENCHMARKS:

1) NAIL IN HP @ STA 2+588	ELEV=	185.16
2) T.O.N. ON F.H. FRONTING MUN. 7048 7TH CONC. ROAD	ELEV=	185.71
3) T.O.N. ON F.H. @ N/E CORNER OF C.R.18 AND 7TH CONC. ROAD	ELEV=	187.36
4) T.O.N. ON F.H. FRONTING MUN. 7359 7TH CONC. ROAD	ELEV=	186.63
5) T.O.N. ON F.H. FRONTING MUN. 7405 7TH CONC. ROAD	ELEV=	187.44

R.C. SPENCER ASSOCIATES INC.
Consulting Engineers
Professional Engineers Ontario

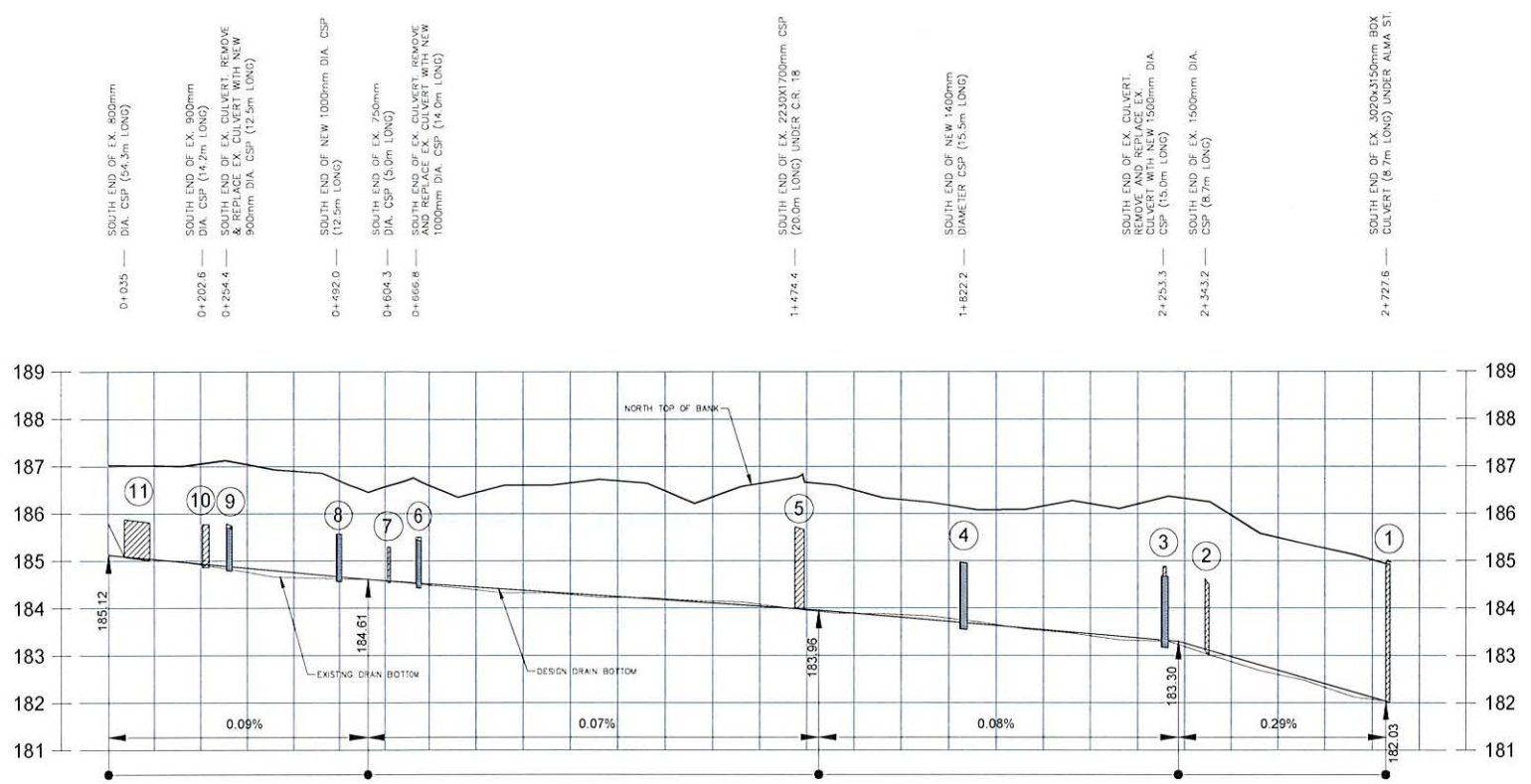
DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	1:10,000

7TH CONCESSION DRAIN NORTH

DRAINAGE AREA PLAN

PROJECT NO. 19-955

SHEET NO. 1 OF 8



DRAIN STATIONS	EXISTING NORTH TOP OF BANK	EXISTING DRAIN BOTTOM
0+000	187.02	185.78
0+100	187.00	185.03
0+200	187.05	184.92
0+300	187.03	184.76
0+400	186.89	184.65
0+500	186.68	184.62
1+560	186.57	184.55
0+600	186.58	184.48
0+700	186.44	184.39
0+800	186.60	184.32
0+900	186.65	184.28
1+000	186.69	184.23
1+100	186.47	184.20
1+200	186.35	184.15
1+300	186.63	184.08
1+400	186.65	183.95
1+500	186.49	183.89
1+524	186.29	183.86
1+600	186.17	183.78
1+700	186.07	183.65
1+800	186.16	183.52
1+900	186.20	183.41
2+000	186.20	183.32
2+100	186.31	183.19
2+200	185.95	182.87
2+256	185.48	182.60
2+300	185.26	182.32
2+400	185.02	182.07
2+500	184.98	182.08
2+600		
2+700		
2+727.8		

RC SPENCER ASSOCIATES INC.
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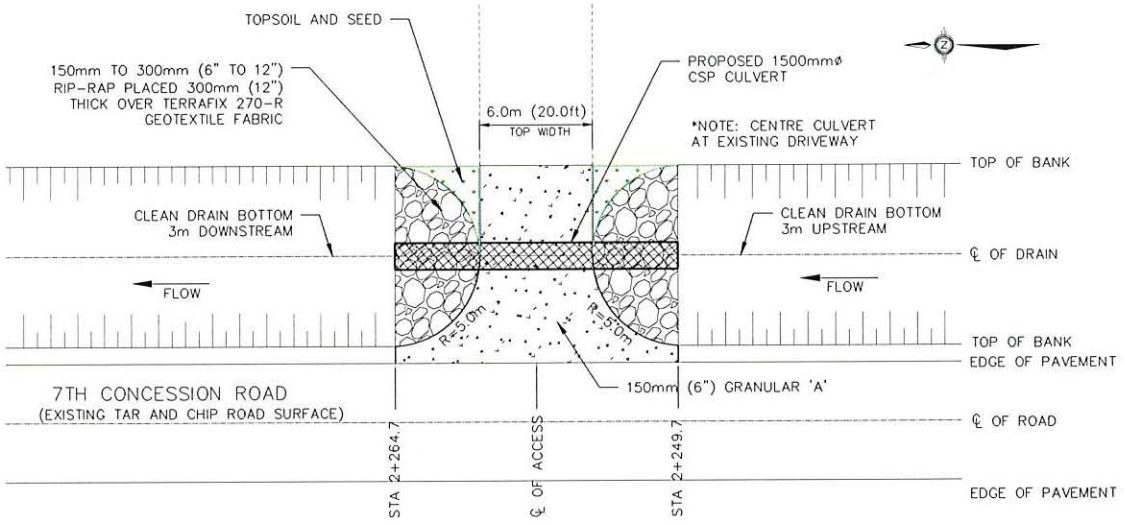
DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	V: 1:100 H: 1:10,000

7TH CONCESSION DRAIN NORTH

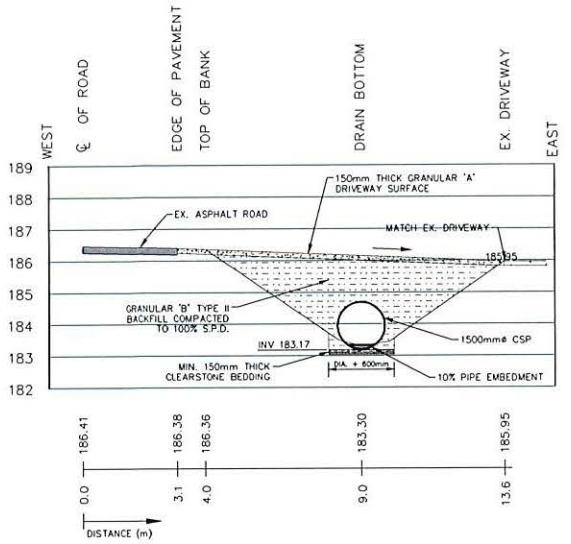
PROFILE

PROJECT NO. 19-955

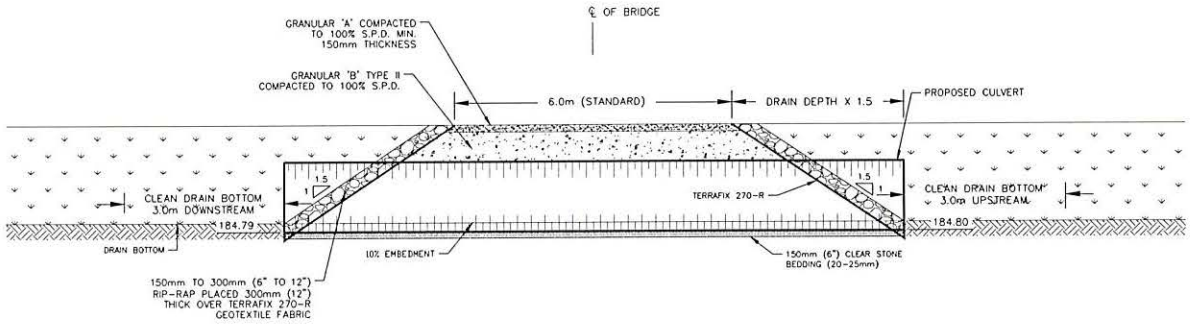
SHEET NO. 2 OF 8



PLAN VIEW
SCALE: N.T.S.



CROSS-SECTION DETAIL
SCALE: 1:150



LONGITUDINAL SECTION
SCALE: N.T.S.

CULVERT NO. 3 – PARCEL NO. 18 (CULVERT REPLACEMENT) STATION 2+249.7 TO 2+264.7	
PIPE SIZE	1500mm DIAMETER
PIPE LENGTH	15.0m
DRIVABLE TOP WIDTH	6.0m
PIPE GAUGE	2.8mm
CORRUGATION PROFILE	125 x 25mm
TYPE OF PIPE	ALUMINIZED TYPE II CORRUGATED STEEL PIPE (BOLTED COUPLER JOINTS)
UPSTREAM PIPE INVERT	183.18
DOWNSTREAM PIPE INVERT	183.17
PIPE GRADE	0.08%

M.M. HERAUZ 100136749 PROVINCE OF ONTARIO

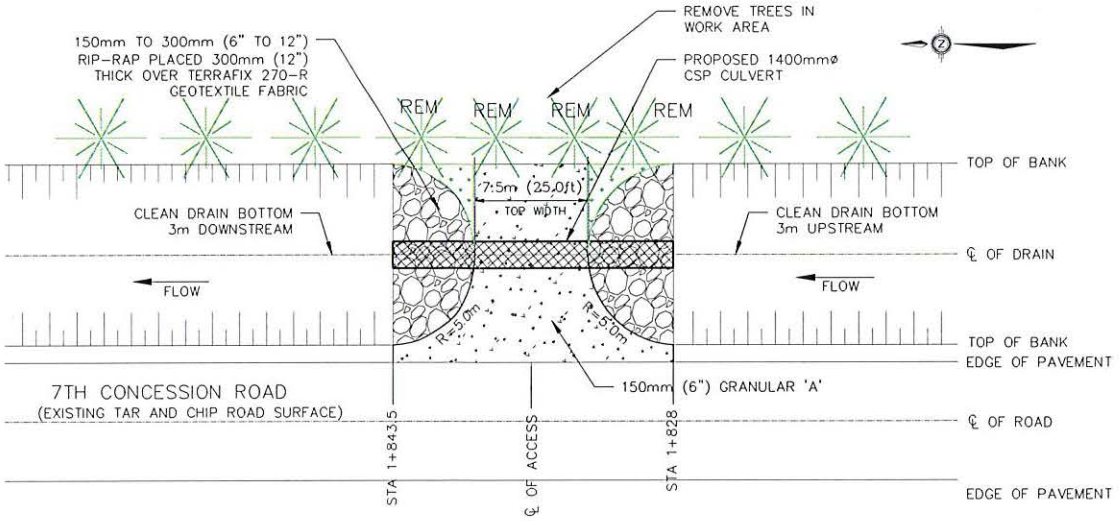
D.R. McGRADY 28 MARCH 2022 PROVINCE OF ONTARIO

R.C. SPENCER ASSOCIATES INC. Consulting Engineers
Professional Engineers Ontario

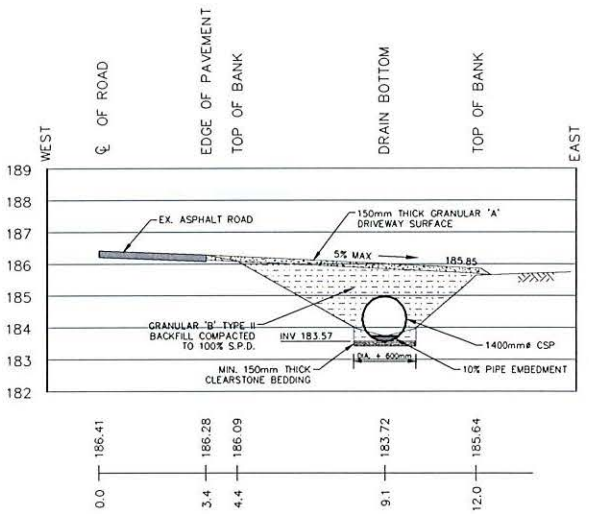
DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	AS SHOWN

7TH CONCESSION DRAIN NORTH
CULVERT NO. 3
(REPLACED IMMEDIATELY UNDER THIS REPORT)

PROJECT NO. 19-955
SHEET NO. 3
OF 8



PLAN VIEW
SCALE: N.T.S.



CROSS-SECTION DETAIL
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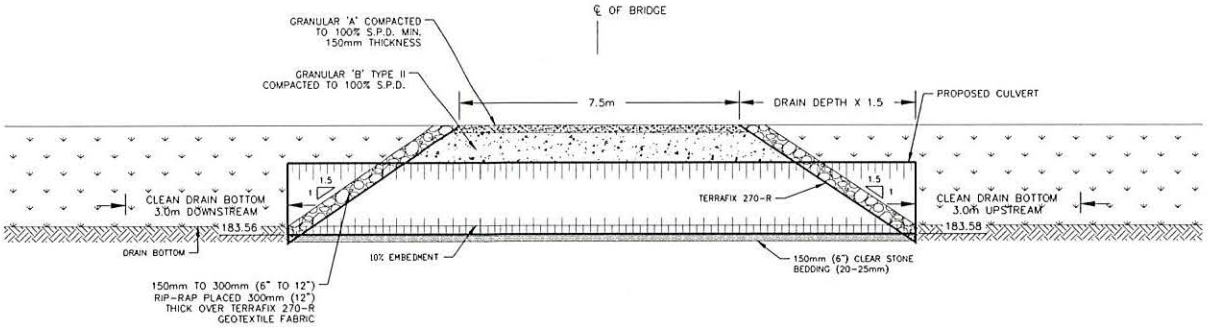


LONGITUDINAL SECTION
SCALE: N.T.S.

CULVERT NO. 4 – PARCEL NO. 43 (NEW CULVERT INSTALLATION) STATION 1+828.0 TO 1+843.5	
PIPE SIZE	1400mm DIAMETER
PIPE LENGTH	15.5m
DRIVABLE TOP WIDTH	7.5m
PIPE GAUGE	2.8mm
CORRUGATION PROFILE	125 x 25mm
TYPE OF PIPE	ALUMINIZED TYPE II CORRUGATED STEEL PIPE (BOLTED COUPLER JOINTS)
UPSTREAM PIPE INVERT	183.58
DOWNSTREAM PIPE INVERT	183.56
PIPE GRADE	0.10%

M. M. HAYWARD 100139743 SIGNATURE APR 28, 2022 PROVINCE OF ONTARIO

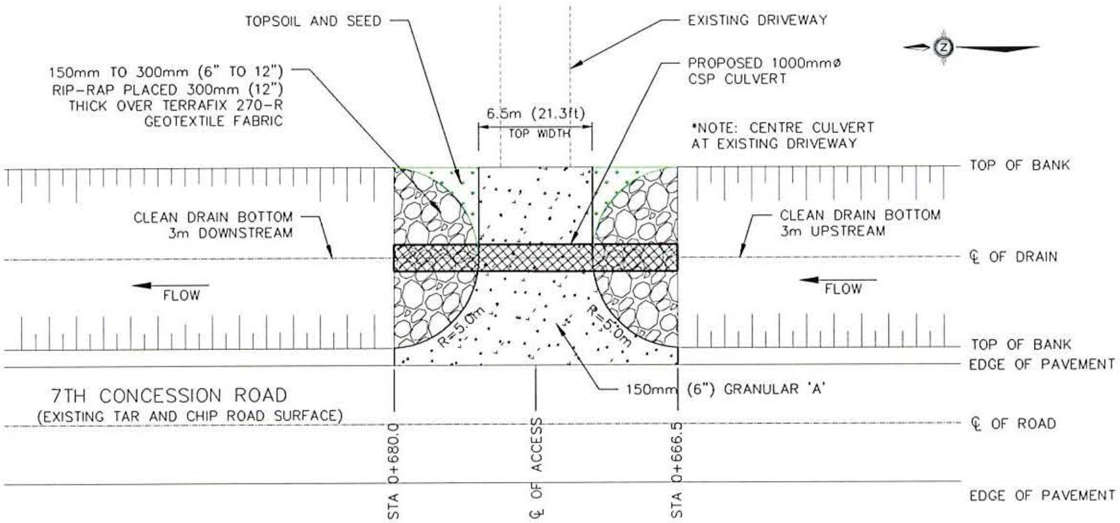
D. R. McGRADY SIGNATURE APR 28, 2022 PROVINCE OF ONTARIO

R.C. SPENCER ASSOCIATES INC. Consulting Engineers
Professional Engineers Ontario

DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	AS SHOWN

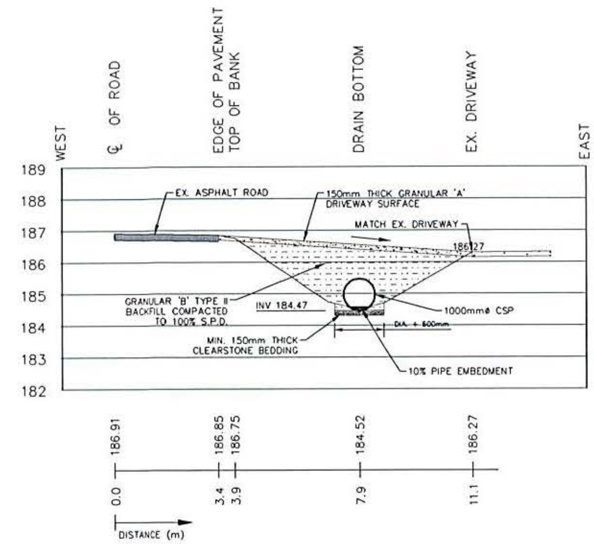
7TH CONCESSION DRAIN NORTH
CULVERT NO. 4
(INSTALLED IMMEDIATELY UNDER THIS REPORT)

PROJECT NO. 19-955
SHEET NO. 4
OF 8



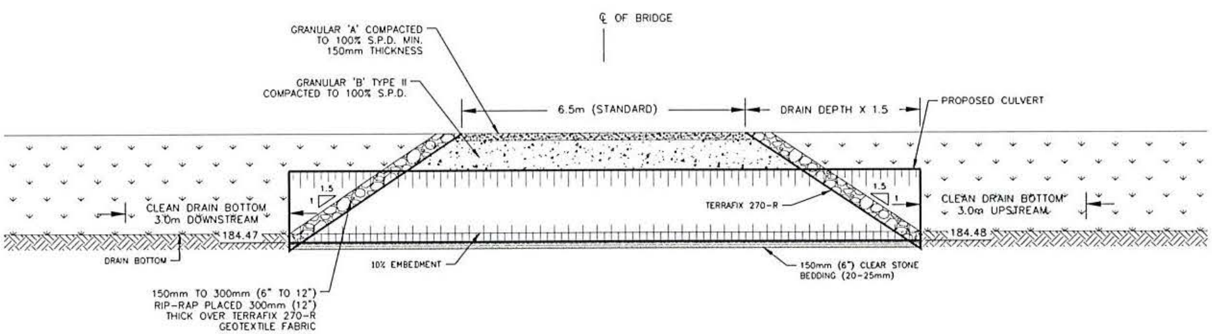
PLAN VIEW

SCALE: N.T.S.



CROSS-SECTION DETAIL

SCALE: 1:150



LONGITUDINAL SECTION

SCALE: N.T.S.

CULVERT NO. 6 – PARCEL NO. 31 (CULVERT REPLACEMENT) STATION 0+666.5 TO 0+680.5	
PIPE SIZE	1000mm DIAMETER
PIPE LENGTH	14.0m
DRIVABLE TOP WIDTH	6.0m
PIPE GAUGE	2.0mm
CORRUGATION PROFILE	68 x 13mm
TYPE OF PIPE	ALUMINIZED TYPE II CORRUGATED STEEL PIPE (BOLTED COUPLER JOINTS)
UPSTREAM PIPE INVERT	184.48
DOWNSTREAM PIPE INVERT	184.47
PIPE GRADE	0.08%

D. R. McCREADY
MARCH 28 2022

RC SPENCER ASSOCIATES INC.
Consulting Engineers

Professional Engineers Ontario

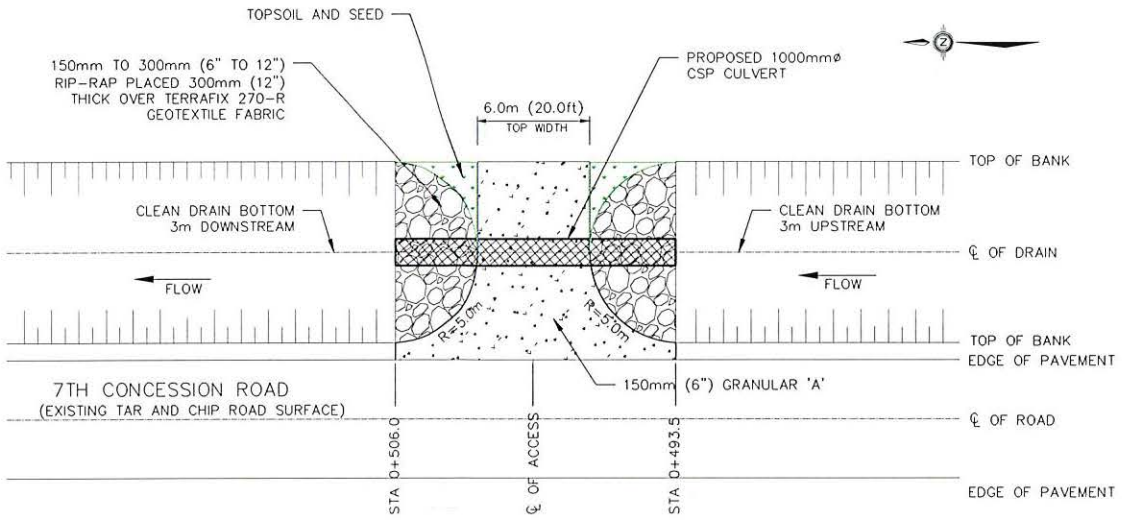
DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	AS SHOWN

7TH CONCESSION DRAIN NORTH

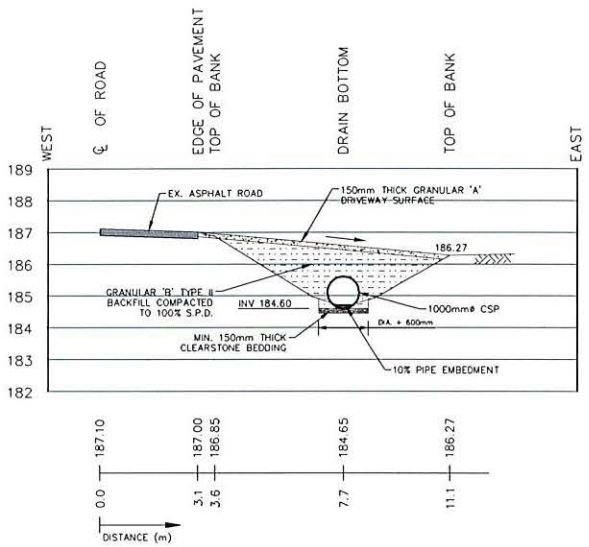
CULVERT NO. 6
(REPLACED IMMEDIATELY UNDER THIS REPORT)

PROJECT NO. 19-955

SHEET NO. 5 OF 8



PLAN VIEW
SCALE: N.T.S.



CROSS-SECTION DETAIL
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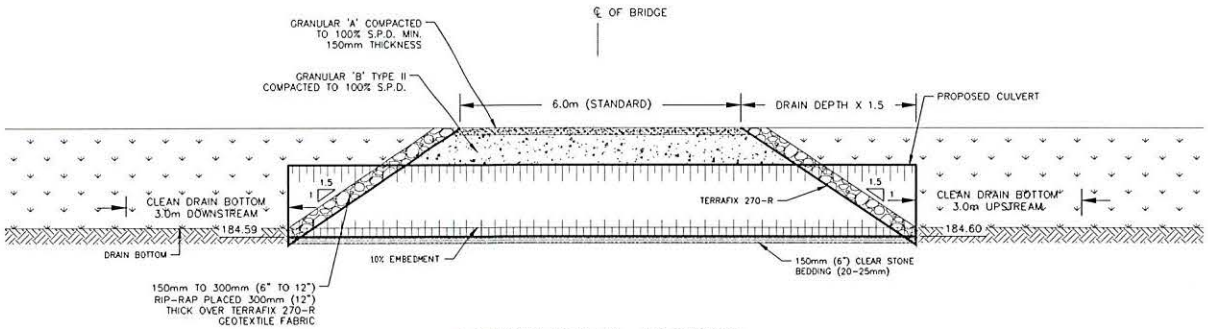


LONGITUDINAL SECTION
SCALE: N.T.S.

CULVERT NO. 8 – PARCEL NO. 30 (NEW CULVERT INSTALLATION) STATION 0+493.5 TO 0+506.0	
PIPE SIZE	1000mm DIAMETER
PIPE LENGTH	12.5m
DRIVABLE TOP WIDTH	6.0m
PIPE GAUGE	2.0 mm
CORRUGATION PROFILE	68 x 13mm
TYPE OF PIPE	ALUMINIZED TYPE II CORRUGATED STEEL PIPE (BOLTED COUPLER JOINTS)
UPSTREAM PIPE INVERT	184.60
DOWNSTREAM PIPE INVERT	184.59
PIPE GRADE	0.08%

M.M. HERIVEL 100139249 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

D. R. McCREADY PROFESSIONAL ENGINEER PROVINCE OF ONTARIO MARCH 28, 2022

R.C. SPENCER ASSOCIATES INC. Consulting Engineers

Professional Engineers Ontario

DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	AS SHOWN

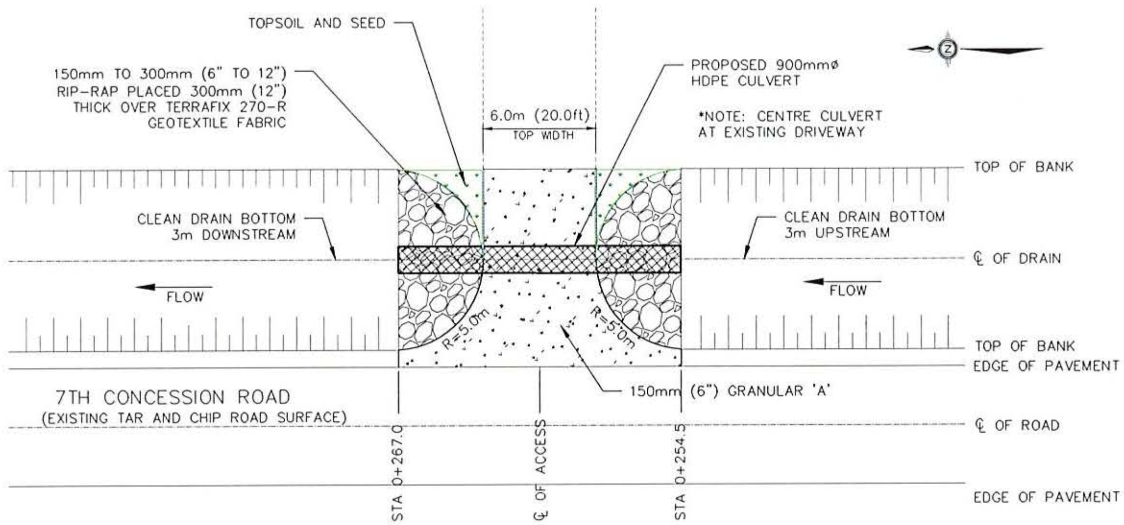
7TH CONCESSION DRAIN NORTH

CULVERT NO. 8 (INSTALLED IMMEDIATELY UNDER THIS REPORT)

PROJECT NO. 19-955

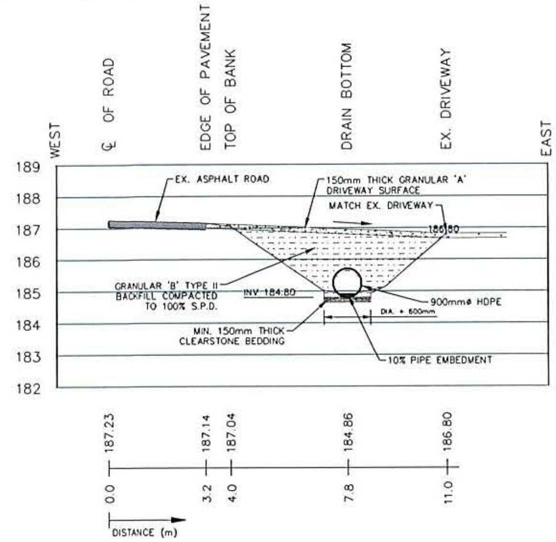
SHEET NO. 6

OF 8



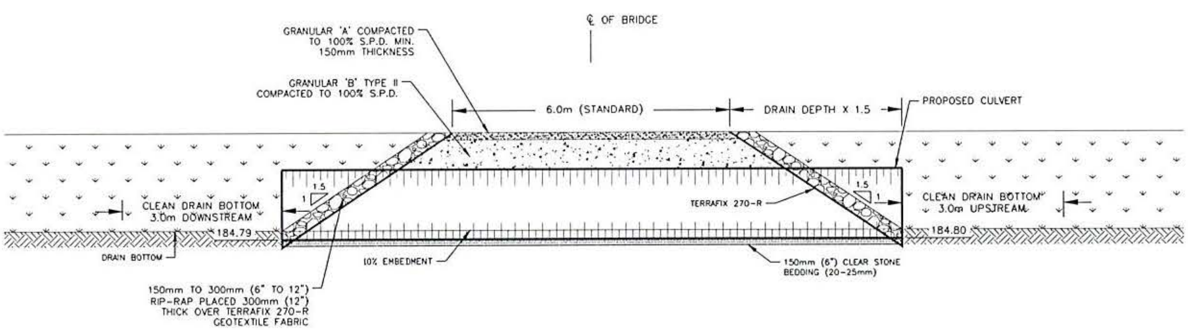
PLAN VIEW

SCALE: N.T.S.



CROSS-SECTION DETAIL

SCALE: 1:150



LONGITUDINAL SECTION

SCALE: N.T.S.

CULVERT NO. 9 – PARCEL NO. 11 (CULVERT REPLACEMENT) STATION 0+254.5 TO 0+267.0	
PIPE SIZE	900mm DIAMETER
PIPE LENGTH	12.5m
DRIVABLE TOP WIDTH	6.0m
PIPE STIFFNESS	320kPa
CORRUGATION PROFILE	–
TYPE OF PIPE	POLY-TITE HIGH DENSITY POLYETHYLENE (HDPE) (POLY-TITE JOINTS)
UPSTREAM PIPE INVERT	184.80
DOWNSTREAM PIPE INVERT	184.79
PIPE GRADE	0.08%

RC SPENCER ASSOCIATES INC.
Consulting Engineers

DESIGN	M.M.H.	7TH CONCESSION DRAIN NORTH	PROJECT NO. 19-955
CHECKED	D.R.M.	CULVERT NO. 9 (REPLACED IMMEDIATELY UNDER THIS REPORT)	SHEET NO. 7
DRAWN	M.M.H.		OF 8
CHECKED	D.R.M.		
DATE	28 MAR. 2022		
SCALE	AS SHOWN		

CULVERT NO. 2 – PARCEL NO. 19 (FUTURE CULVERT REPLACEMENT) STATION 2+340.0 TO 2+355.5	
PIPE SIZE	1500mm DIAMETER
PIPE LENGTH	15.5m
DRIVABLE TOP WIDTH	6.0m
PIPE GAUGE	2.8mm
CORRUGATION PROFILE	125 x 25mm
TYPE OF PIPE	ALUMINIZED TYPE II CORRUGATED STEEL PIPE (BOLTED COUPLER JOINTS)
UPSTREAM PIPE INVERT	182.99
DOWNSTREAM PIPE INVERT	182.95
PIPE GRADE	0.23%

CULVERT NO. 7 – PARCEL NO. 31 (FUTURE CULVERT REPLACEMENT) STATION 0+600.6 TO 613.1	
PIPE SIZE	1000mm DIAMETER
PIPE LENGTH	12.5m
DRIVABLE TOP WIDTH	6.0m
PIPE GAUGE	2.0mm
CORRUGATION PROFILE	68 x 13mm
TYPE OF PIPE	ALUMINIZED TYPE II CORRUGATED STEEL PIPE (BOLTED COUPLER JOINTS)
UPSTREAM PIPE INVERT	184.48
DOWNSTREAM PIPE INVERT	184.47
PIPE GRADE	0.08%

CULVERT NO. 10 – PARCEL NO. 12 (FUTURE CULVERT REPLACEMENT) STATION 0+202.5 TO 0+217.5	
PIPE SIZE	900mm DIAMETER
PIPE LENGTH	15.0m
DRIVABLE TOP WIDTH	9.0m
PIPE STIFFNESS	320kPa
CORRUGATION PROFILE	–
TYPE OF PIPE	POLY-TITE HIGH DENSITY POLYETHYLENE (HDPE) (POLY-TITE JOINTS)
UPSTREAM PIPE INVERT	184.85
DOWNSTREAM PIPE INVERT	184.84
PIPE GRADE	0.08%

CULVERT NO. 11 – PARCEL NO. 10 (FUTURE CULVERT REPLACEMENT) STATION 0+035 TO 0+089.3	
PIPE SIZE	750mm DIAMETER
PIPE LENGTH	54.3m
DRIVABLE TOP WIDTH	7.0m
PIPE STIFFNESS	320kPa
CORRUGATION PROFILE	–
TYPE OF PIPE	POLY-TITE HIGH DENSITY POLYETHYLENE (HDPE) (POLY-TITE JOINTS)
UPSTREAM PIPE INVERT	185.01
DOWNSTREAM PIPE INVERT	184.96
PIPE GRADE	0.09%

M.M. HORVAT 100134242 PROVINCE OF ONTARIO

D. R. McGRADY MARCH 28, 2022 PROVINCE OF ONTARIO

R.C. SPENCER ASSOCIATES INC. Consulting Engineers

Professional Engineers Ontario

DESIGN	M.M.H.
CHECKED	D.R.M.
DRAWN	M.M.H.
CHECKED	D.R.M.
DATE	28 MAR. 2022
SCALE	

7TH CONCESSION DRAIN NORTH

FUTURE CULVERT REPLACEMENTS

PROJECT NO. 19-955

SHEET NO. 8 OF 8