

MUNICIPAL DRAINAGE REPORT

**FOR THE
REPAIR AND IMPROVEMENT
OF PART OF THE
MORLEY WIGLE DRAIN**

**IN THE
TOWN OF KINGSVILLE**



RC SPENCER ASSOCIATES INC.
Consulting Engineers

Windsor: 800 University Avenue W. – Windsor ON N9A 5R9

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File No. 14-424

14 January 2022

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

Re: Repair and Improvement of Part of the Morley Wigle Drain
Town of Kingsville
Project No. 14-424

Mayor and Members of Council:

1.0 AUTHORIZATION

In accordance with your instructions, we have prepared the following report that provides for the repair and improvement of the portion of the Morley Wigle Drain from Heritage Road upstream to the stormwater management pond (Dieppe Estates Pond) on Town property (Roll No. 270-31573). The Morley Wigle Drain is located in Lots 4, 5 and 6, Con. 1 (W.D.).

The Municipality has instructed our firm to carry out the necessary repair and improvements to this drain under the provisions of the Drainage Act. Our appointment and the works relating to repair and improvement of the drain are in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17". The repair and improvement of the drain was requested to allow for future residential development of the property with Roll No. 270-31200 (Municipal No. 150 County Rd. 50). Accordingly, the firm of RC Spencer Associates Inc. has performed all of the necessary surveys, investigations, etc., and we report thereon as follows.

2.0 CURRENT DRAINAGE REPORT AND HISTORY

The Morley Wigle Drain was originally constructed under the Ditches and Watercourses Act and that drain appears to be a 250 mm diameter clay tile drain. The drain was maintained according to the award of the Engineer prepared at that time. A review of the records indicates this award drain was brought under the provisions and authority of the Drainage Act by way of a report prepared by C. G. Russell Armstrong dated May 28, 1947. The most recent history of Engineer's reports for the Morley Wigle Drain is as follows:

- The original Morley Wigle Drain was incorporated under the provisions of the Drainage Act under a report dated May 28, 1947, prepared by C. G. Russell Armstrong. The report also provided for the repair and improvement of the drain by the construction of a second tile drain referred to as a relief drain. A new 250 mm diameter clay tile drain was constructed along the north side of the County Road 20 and a 300 mm clay diameter tile drain was constructed from County Road 20 downstream to the north side of the Heritage Road. Six new catch basins were constructed on the tile drain. The original 250 mm diameter clay tile constructed under the Ditches and Watercourses Act is presently a part of the Morley Wigle Drain and the 1947 report provides for its ongoing maintenance as part of the Morley Wigle Drain.
- A report dated October 16, 1962, prepared by C. G. Russell Armstrong, provided for the relocation of the portion of the drain located along the north side of County Road 20 to meet future plans of the Ontario Department of Highways. A 300 mm diameter tile drain was installed at the location further north to replace the existing 250 mm diameter tile drain. Downstream of County Road 20, a portion of the drain was relocated on an alignment further west than the existing drain for length of approximately 87 m. This was done to provide a deeper outlet at County Road 20. The report also provided for the construction of a new 375 mm diameter highway culvert where the drain crosses County Road 20.
- A report dated June 19, 2001, prepared by D. A. Joudrey, provided for the relocation of part of the Morley Wigle drain to accommodate for a proposed 106 lot subdivision. The construction consisted of the installation of a 386.2 m of 600mm dia. BOSS 1000 pipe (corrugated inside wall). The work commenced on the south side of the Chrysler Greenway and proceeded downstream, southerly, on the east side of the line between Lots 5 and 6, for a distance of 321.6 m. Then, the work proceeded easterly for a distance of 64.6 m to connect to the Morley Wigle Drain downstream of the existing stormwater management pond serving Dieppe Estates subdivision.
- Under a report dated December 2010, prepared by D. A. Joudrey, the natural watercourse which served as an outlet to the Morley Wigle Drain was incorporated as part of the Morley Wigle Drain to extend the drain downstream to a sufficient outlet. Improvements were made to the outlet which involved the installation of approximately 115m of storm sewer including the installation of a ditch inlet catch basin, manhole structures, and remediation of the existing open drain.

3.0 INSPECTION AND SURVEY

Topographic survey data was gathered on the alignment of the portion of the Morley Wigle Drain being considered for realignment. The drainage system was inspected for working condition and effectiveness of the existing tiles and structures.

We commenced our survey of the Morley Wigle Drain at Heritage Road (County Road 50) where a section of 900mm diameter corrugated steel pipe discharging into the roadside ditch ties into a catch basin at the north end of the pipe (Station 0+000).

Two separate clay tiles outlet from the north into the catch basin at Station 0+000. The two clay tiles extend northerly along different routes to a catch basin at Station 0+641.8. The 300mm diameter clay tile was installed under the 1947 report on the Morley Wigle Drain and appears to be functioning. The 250mm diameter clay tile was installed prior to 1947 under the Ditches and Watercourses Act. The condition and degree of functionality of this tile drain is unknown. Frequent repairs are required on both clay tile drains.

We followed the 300mm diameter clay tile installed under the 1947 report on the Morley Wigle Drain to its upstream limit at the catch basin manhole found at Station 0+637.5. The catch basin manhole structure was installed in 2016 as part of the subdivision development. There are two pipes discharging into this structure. The first pipe entering from the northeast is a 200mm diameter BOSS 1000 pipe. Its origin and function is unknown. The second pipe entering from the northwest is a 300mm diameter PVC pipe that connects to another catch basin manhole located upstream at Station 0+641.8.

The catch basin manhole at Station 0+641.8 has standing water to the same level as the outlet pipe. This catch basin manhole contains two inlet pipes which include a 600mm diameter BOSS 1000 pipe entering from the west and a 250mm diameter PVC entering from the north. The 600mm diameter BOSS 1000 was installed under the 2001 report on the Morley Wigle Drain. The 250 mm diameter PVC pipe is the outlet sewer for the stormwater management pond. The flow rate from this pipe is controlled by an orifice plate located at the catch basin. These inlet pipes are considerably lower than the outlet pipe and as a result are completely submerged under water.

4.0 WATERSHED DESCRIPTION

The watershed area of the Morley Wigle Drain is irregular in shape and serves a drainage area of approximately 73.65 hectares (182.0 acres). The soil maps of Essex County indicate that the lands in the watershed are Caistor Clay Loam, Harrow Sandy Loam and Brookston Clay Sand Spot Phase. The topography of the watershed area is relatively flat and mildly sloping.

5.0 EXISTING CONDITIONS

Currently, there are two clay tile drains between the existing catch basins at Stations 0+000 and 0+641.8 which are draining the upstream watershed. The 300 mm diameter clay tile was installed under the 1947 report and the 250 mm diameter clay tile was installed prior to 1947. The tiles are receiving flows from two sources; the storm water management pond and the 600mm diameter BOSS 1000 pipe.

The storm water management pond was constructed in 2002 to provide a controlled released rate for the subdivision known as “Dieppe Estates”. Due to the poor condition and limited capacity of two clay tile drain downstream of the pond that constitute the Morley Wigle Drain, the release rate of the pond was reduced to less than predevelopment flows by installing a 100mm orifice in the pond’s outlet structure.

In addition to the water discharging from the storm water management pond, there is an existing 600mm diameter BOSS 1000 pipe that was installed through a drainage report prepared by Stantec in 2001. This pipe was sized to handle flows coming from the upstream agricultural, residential and commercial lands. BOSS 1000 pipe has a corrugated profile inside the pipe and less capacity than BOSS 2000 pipe which has a smooth interior wall.

6.0 DESIGN CONSIDERATIONS

The Town of Kingsville had requested Dillon Consulting to undertake a review of the Dieppe Estates pond in 2013 to determine if the pond could provide for additional storage. It was calculated that if improvements were made to the downstream sections of the Morley Wigle Drain, the release rate of the pond could be increased to predevelopment flows ($0.035\text{m}^3/\text{s}$) which will allow for additional storage within the pond. This will require enlarging the steel 100mm diameter orifice in the pond's outlet structure.

Considerations were given when sizing the proposed HDPE pipe to handle the following:

- the increased discharge rate of the Dieppe Estates pond (35 liters/second).
- the existing 600mm diameter BOSS 1000 pipe (corrugated interior wall) at a grade of 0.30% (208 liters/second).
- 37.5 mm (1½ inch) of surface and sub-surface runoff per day from 13.43 Ha on Roll No. 270-00600 (59 liters/second).
- 12.5 mm (½ inch) of sub-surface runoff per day from the lands located downstream of the Dieppe Estates pond (65 liters/second).

Our calculations show that a 525mm diameter HDPE pipe having a smooth interior wall will have enough capacity (367 liters/second) to handle these flows.

7.0 RECOMMENDATIONS

Based on our review of the history, the information obtained during the site meetings, subsequent discussions with the landowners and the Municipality, a review of the survey data, and our detailed analyses and designs, we recommend that the Morley Wigle Drain be repaired and improved as described below.

The downstream catch basin at Station 0+000 is in poor condition and we recommend that it shall be replaced with a precast 900x1200mm catch basin structure with a birdcage catch basin grate. This catch basin will act as a sediment control measure and we recommend the contractor regularly maintain the catch basin sump to prevent migration of sediment downstream of the catch basin. We also recommend that the contractor install a silt fence downstream of the catch basin wherever necessary. Refer to Environmental Protection Special Provisions for other work required of the contractor.

We recommend that any farm properties being affected by the construction shall be restored by salvaging existing top soil and reapplying to top layer where applicable. Further, any lawn or grassed areas disturbed by the operation of equipment shall also be repaired to preconstruction conditions. We recommend that the contractor implement traffic control measures during construction where needed.

We recommend that approximately 641m of 525mm diameter High Density Polyethylene (HDPE) pipe with a material stiffness of 320kPa be installed across the agricultural lands in Lot 5, Concession 1 W.D. Granular bedding material extending 100mm below the pipe will be provided throughout and native backfill material to be used for trench backfill. The excess native material be hauled and disposed off site at the contractor's expense.

We recommend that a new 900x1200mm catch basin structure with a birdcage catch basin grate be constructed at property line at Station 0+239.3.

We recommend that the existing catch basin manhole 'B' be disconnected and removed at Station 0+637.5. The proposed 525mm HDPE pipe is to be tied into the existing catch basin manhole 'A' at Station 0+641.8. We also recommend that the 200mm BOSS 1000 outletting into catch basin manhole 'B' be rerouted and tied into catch basin manhole 'A'.

We recommend that the existing 300mm clay tile installed as part of the Morley Wigle Drain under the 1947 report, be removed and the tile materials disposed of off-site. Any lateral tiles that are found connected to 300 mm diameter clay tile drain are to be extended to the new 525mm diameter HDPE pipe and be connected to it. End plugs must be installed where appropriate. Any lateral tiles that are intercepted by the new 525mm diameter HDPE drain shall be connected to it.

We recommend that the existing 250mm tile drain (most easterly municipal tile drain) that was installed under the Ditches and Watercourses Act (pre 1947) be cut and capped at its upstream end (Station 0+637.5). We recommend that the contractor avoid interfering or damaging this existing tile drain and that the downstream end be connected to the new 900x1200mm catch basin along with the 525mm HDPE pipe at Station 0+000.

Both of the existing municipal clay tile drains are formally abandoned under this report and will no longer be a part of the Morley Wigle Drain.

Finally, we recommend that a designated working corridor be established that shall have a width of 15m centred on the alignment of the new drain. The contractor is responsible for restoration of the corridor and for damages to any ornamental trees, bushes, structures, etc.

8.0 DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings for the proposed covered drain. There is a set of 5 drawings:

- Sheet 1:** drawing showing the location of the Morley Wigle Drain and the approximate limits of the watershed area;
- Sheet 2:** drawing showing a blow-up of the subdivision section;
- Sheet 3:** drawing showing a site plan;
- Sheet 4:** drawing showing a plan and profile of the proposed drain;
- Sheet 5:** blow-up details at Station 0+000 and Station 0+641.8

Also attached as **Appendix 'B'** are:

- a) **'Special Provisions'** for the covered drain 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 Covered Drains'**; and
- c) **'Environmental Protection Special Provisions'**.

9.0 **ALLOWANCES**

Throughout the length of the work, the operation of construction equipment will result in damages on the properties affected by the work. In accordance with Section 30 of the Drainage Act, we determine the amounts to be paid to the owners of the lands along the course of work for damages to the lands and crops, if any, occasioned by the construction of the new covered drain. The allowance for damages is calculated at a rate of \$1,977 per hectare (\$800 per acre). The distribution of these allowances is shown in the following Schedule of Allowances under the heading "Damage Allowances".

The alignment of the new tile drain is in close proximity to the existing tile drain. No land will be lost to production as a result of the construction of this tile. However, a nominal allowance in the amount of \$100 will be given to each property under Section 29 of the Drainage Act to acknowledge the presence of the drain. The distribution of these allowances is shown in the following Schedule of Allowances under the heading "Land Allowances".

Schedule of Allowances

Roll No.	Con	Lot or Part	Owner	Damage Allowances	Land Allowances	Total
270-31100	1 W.D.	5	Anne Marie Dick	\$ 1,260	\$ 100	\$ 1,360
270-30800	1 W.D.	5	James Stewart Malott	\$ 690	\$ 100	\$ 790
TOTAL				\$ 1,950	\$ 200	\$ 2,150

10.0 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:

CONSTRUCTION ITEMS

1. **Covered Drain Construction**

- a) Supply and install solid (non-perforated) high-density polyethylene pipe (HDPE) smooth interior wall (Boss 2000 or approved equivalent) with bell and gasket joining system. This work is to include trenching, backfilling, re-grading and restoration of all disturbed areas with salvaged topsoil and new grass seed wherever required. 20-25mm clear stone bedding extending 100mm below the pipe is required with native backfill material for trench backfill.
 - i. Sta. 0+000 to Sta 0+641.8 – Supply and install 641m of 525mm diameter HDPE pipe with a material stiffness of 320kPa. \$ 160,000.00
- b) Supply and install a new 900mm x 1200mm pre-cast concrete catch basins, complete with minimum 600mm sumps and bird cage style catch basin grates. This work to include parging of all pipes.
 - i. Sta. 0+000 \$ 3,500.00
 - ii. Sta. 0+239.3 \$ 3,500.00
- c) Remove existing CB/MH 'B' at Sta 0+637.5 and dispose off-site. \$ 2,500.00
- d) Excavate and remove approximately 655m of existing 300mm diameter municipal clay tile drain and dispose off-site. Mark location of all 100 mm diameter lateral tile drains connected to the 300 mm diameter clay tile. \$ 30,000.00
- e) Connect all existing 100mm diameter lateral tile drains found connected to the old 300 mm diameter clay tile, to new 525mm diameter HDPE pipe. \$ 10,000.00
- f) Cut and cap north end of existing 250mm diameter clay tile to remain in service. See Detail 'A' on Sheet 5 of the drawings. \$ 500.00
- g) Existing 200mm diameter BOSS 1000 pipe connected to CB/MH 'B' shall be rerouted and tied into CB/MH 'A'. (Price to include knockout to connect into structure, brick and parging, etc.) \$ 1,500.00

h)	Break into CB/MH 'A' and connect proposed 525mm HDPE pipe. (Price to include brick and parging. Modify manhole interior as required)	\$	1,500.00
i)	Remove Trees as required for the installation of new 525mm HDPE pipe. Price to include off-site disposal or salvaging of lumber as requested by owner.	\$	10,000.00
j)	Supply, install and maintain silt fence for duration of project.	\$	1,000.00
SUBTOTAL FOR CONSTRUCTION		\$	224,000.00
H.S.T. ON CONSTRUCTION (1.76% NET)		\$	3,940.00
TOTAL FOR CONSTRUCTION (including H.S.T.)		\$	227,940.00
<u>INCIDENTALS</u>			
	Allowances under Section 29 & 30	\$	2,150.00
	Survey, report, estimate, specifications and drawings.	\$	60,000.00
	Contract administration and inspection.	\$	20,000.00
	Contingency Allowance (if required)	\$	25,000.00
SUBTOTAL FOR INCIDENTALS		\$	107,150.00
H.S.T. ON INCIDENTALS (1.76%)		\$	1,885.00
TOTAL FOR INCIDENTALS		\$	109,035.00
TOTAL ESTIMATED COST		\$	336,975.00

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

11.0 UTILITIES

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

arrange to have this work completed and the costs will be charged to the appropriate public utility.

12.0 ASSESSMENT

12.1 General Information, Definitions and Authority to Assess Costs

Under the Drainage Act, assessments against individual properties are normally comprised of three (3) assessment components. These are “Benefit”, “Outlet” and “Special Benefit”.

The following terms related to assessments are defined and described in the Drainage Act as follows:

- **Benefit** – means the advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works, such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water or any other advantages relating to the betterment of lands, road, buildings or other structures.

Assessment for Benefit is provided for under Section 22 of the Act wherein lands, roads, buildings, utilities or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance or repair of a drainage works may be assessed for benefit.

- **Outlet Liability** – means the part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved outlet.

Assessment for Outlet Liability is provided for under Section 23(1) of the Act wherein lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek or watercourse, may be assessed for outlet liability. The assessment amount is provided for under Section 23(3) of the Act wherein the assessment for outlet liability shall be based upon the volume and rate of flow of the water artificially caused to flow upon the injured land or road or into the drainage works from the lands and roads liable for such assessments.

- **Special Benefit** – means any additional work or feature included in the construction, repair or improvement of a drainage works that has no effect on the functioning of the drainage works. No such work is involved with this project and no Special Benefit assessments are shown in the attached Schedule of Assessment.

Two schedules of assessment are attached to this report. We have assessed the above estimated costs against the affected lands and roads as listed in Schedule ‘A-1’ under “Value of Benefit” and “Value of Outlet.” Schedule A-1 relates to the estimated cost of the construction recommended in this report. The costs of any maintenance work that is carried out on the drain in the future, shall be levied using Schedule A-2.

12.2 Determination of Assessments

For the purpose of preparing the Schedule of Assessment, Schedule A-1, attached to this report, the following criteria have been used:

The cost of performing the drainage improvement and overhead costs are estimated at \$336,975. This amount is assessed as Benefit and Outlet assessments and is divided as 70% Benefit (\$235,883) and 30% Outlet (\$101,092). The Benefit and Outlet assessments were made as follows:

- a) Total Value of Benefit for the Morley Wigle Drain was calculated to be \$235,883. The Benefit assessments shown in Schedule A-1 were proportioned relative to our estimation of the amount of benefit that each property will receive from the recommended work. The Benefit assessments have been proportioned as follows:

Roll No. 270-308	1.00%
Roll No. 270-311	3.00%
Roll No. 270-312	70.00%
Roll No. 270-31573	2.00%
Total for Roads	6.19%
119 Residential Properties	<u>17.81%</u>
	100.00%

- b) Total Value of Outlet Liability for the Morley Wigle Drain was calculated to be \$101,092 which sum was assessed to all affected lands and roads in the drainage basin that are situated upstream of the work, at a maximum rate of \$1,215.95 per equivalent hectare of agricultural land for those lands that use the entire length of the work. Lands that use only a portion of the work are assessed at a lower rate.

The Outlet assessments calculated were based on the property land use which has an affect on the volume and rate of flow of storm runoff from the lands. Road properties are multiplied by a factor of 5 to determine equivalent agricultural hectares. Residential lands are multiplied by varying factors up to a maximum of 3 to determine equivalent agricultural hectares. Reduced rates were applied to the properties draining into the storm water management pond.

12.3 Proratable versus Non-proratable Items

We consider all of the items of work recommended in this report to be proratable items. All of the assessments are proratable based upon the actual total cost of the project. Should additional costs be incurred to deal with utilities and roads under Section 26 of the Drainage Act, those costs are non-proratable and the actual costs of that work will be assessed directly to the public utility or road.

13.0 FUTURE MAINTENANCE

After completion, the work carried out under this report from Station 0+000 to Station 0+641.8, shall be maintained and repaired in the future by the Town of Kingsville. All maintenance costs shall be levied against the affected lands and roads in the watershed of the Morley Wigle Drain, pro-rata to the assessments contained in "Schedule A-2" attached to this report which is based upon an arbitrary maintenance cost of \$10,000. Future maintenance costs shall be levied pro-rata only upon the affected lands and roads that are located upstream of the maintenance works.

The existing 300 mm diameter clay tile installed under the 1947 report on the Morley Wigle Drain will be removed during construction. It is hereby formally abandoned as a part of the Morley Wigle Drain. The 250 mm diameter clay tile drain constructed under the Ditches and Watercourses Act and brought under the provisions of the Drainage Act under the 1947 report will be left in place but is hereby formally abandoned as a part of the Morley Wigle Drain. The Town will no longer be responsible for maintaining these clay tile drains in the future as they will no longer be a part of the Morley Wigle Drain. The remaining clay tile drain shall become the property of the landowner who will be responsible for maintaining it, replacing it or removing it in the future.

The remainder of the Morley Wigle Drain located both upstream and downstream of the portion of the drainage works repaired and improved under this report, shall be maintained in accordance with the most current bylaw or bylaws governing the portion of the drain being maintained.

Furthermore, all of the above provisions for the future maintenance of these works remain as noted above until otherwise determined under the provisions of the 'Drainage Act RSP 1990 Chapter D. 17'.

14.0 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. To reduce administration and time spent evaluating relatively simple projects that have easily predicted impacts that are easily mitigated, the Department of Fisheries and Oceans Canada (DFO) has instituted a self-assessment process. This means that certain activities or activities within certain types of water bodies may be undertaken by the proponent without contacting DFO, provided that appropriate avoidance and mitigation measures are followed.

A self-assessment of the project has been completed. The DFO list of types of water bodies and activities that do not require review by their office have been reviewed. The project activities and water bodies involved fall within those categories and this project can be self assessed. The Environmental Specifications attached to this report provides appropriate avoidance and mitigation measures for the Contractor to adhere to.

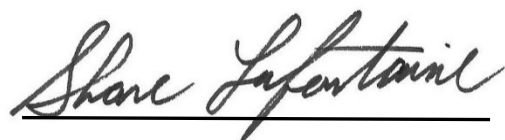
15.0 GRANTS

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. Some of the privately-owned lands are used for agricultural purposes and are eligible under the A.D.I.P. policies. We are not aware of any lateral drains involved in this work that would not be eligible for a grant. We recommend that application be made to the Ontario Ministry of Agriculture and Food in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

All of which is respectfully submitted.

RC SPENCER ASSOCIATES INC.

PREPARED BY:

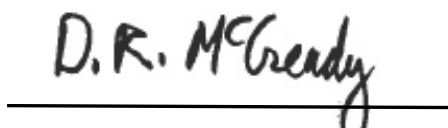


Shane LaFontaine, M. Eng., P. Eng.

Designated Engineer

January 14, 2022

REVIEWED BY:



Dennis R. McCready, P. Eng.

January 14, 2022



APPENDIX 'A'

SCHEDULES OF ASSESSMENT

SCHEDULE A-1 - Schedule of Assessment for Construction

SCHEDULE A-2 - Schedule of Assessment for Future Maintenance

**FOR THE
MORLEY WIGLE DRAIN
IN THE
TOWN OF KINGSVILLE
COUNTY OF ESSEX**

SCHEDULE 'A-1'
SCHEDULE OF ASSESSMENT FOR CONSTRUCTION
MORLEY WIGLE DRAIN
TOWN OF KINGSVILLE

A) MUNICIPAL LANDS						
ENTRY NO.	Description	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
1	Heritage Road	0.390 *	County of Essex	\$ 2,395.00	\$ 1,418.00	\$ 3,813.00
2	James Avenue	0.450 *	Town of Kingsville	\$ 2,760.00	\$ 1,642.00	\$ 4,402.00
3	Dieppe Crescent	0.920 *	Town of Kingsville	\$ 5,642.00	\$ 3,356.00	\$ 8,998.00
4	Normandy Avenue	0.620 *	Town of Kingsville	\$ 3,802.00	\$ 2,262.00	\$ 6,064.00
5	County Road 20	2.300	County of Essex	\$ -	\$ 13,984.00	\$ 13,984.00
6	Roll No. 270-31573, RP 12M477, Blk 82	1.271 *	Town of Kingsville	\$ 4,718.00	\$ 1,545.00	\$ 6,263.00
Total Affected Lands (Hectares)		5.951				
Total Assessment on Municipal Lands				\$ 19,317.00	\$ 24,207.00	\$ 43,524.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
7	010-01500	CON 1 WD	Pt Lot 5	0.263		\$ -	\$ 837.00	\$ 837.00
8	020-01810	CON 1 WD	Pt Lots 4 and 5 RP	0.502		\$ -	\$ 1,244.00	\$ 1,244.00
9	270-00200	CON 1 WD	Pt Lot 5	0.167		\$ -	\$ 609.00	\$ 609.00
10	270-00300	CON 1 WD	Pt Lot 5	0.259		\$ -	\$ 831.00	\$ 831.00
11	270-30900	CON 1 WD	Pt Lot 4 & 5	0.785		\$ -	\$ 589.00	\$ 589.00
12	270-31000	CON 1 WD	Pt Lot 4 RP	0.118		\$ -	\$ 168.00	\$ 168.00
13	270-31200	CON 1 WD	Pt Lot 4	2.695 *		\$ 165,118.00	\$ 6,554.00	\$ 171,672.00
14	270-31202	CON 1 WD	Pt Lot 4 RP	0.077 *		\$ 472.00	\$ 187.00	\$ 659.00
15	270-31203	CON 1 WD	Pt Lot 4 RP	0.087 *		\$ 534.00	\$ 212.00	\$ 746.00
16	270-31300	CON 1 WD	Pt Lot 4 RP	0.143 *		\$ 877.00	\$ 348.00	\$ 1,225.00
17	270-31302	CON 1 WD	Pt Lot 4 RP	0.138 *		\$ 846.00	\$ 336.00	\$ 1,182.00
18	270-31400	CON 1 WD	Pt Lot 4	0.140 *		\$ 859.00	\$ 340.00	\$ 1,199.00
19	270-31401	CON 1 WD	Pt Lot 4 RP	0.103 *		\$ 632.00	\$ 250.00	\$ 882.00
20	270-31403	12M477	PT Lot 1 S/T Ease	0.075 *		\$ 460.00	\$ 182.00	\$ 642.00
21	270-31405	12M477	Lot 2	0.073 *		\$ 448.00	\$ 178.00	\$ 626.00
22	270-31407	12M477	Lot 3	0.071 *		\$ 435.00	\$ 173.00	\$ 608.00
23	270-31409	12M477	Lot 4	0.069 *		\$ 423.00	\$ 168.00	\$ 591.00
24	270-31411	12M477	Lot 5	0.065 *		\$ 399.00	\$ 158.00	\$ 557.00
25	270-31413	12M477	Lot 6	0.065 *		\$ 399.00	\$ 158.00	\$ 557.00
26	270-31415	12M477	Lot 7	0.066 *		\$ 405.00	\$ 161.00	\$ 566.00
27	270-31417	12M477	Lot 8	0.066 *		\$ 405.00	\$ 161.00	\$ 566.00
28	270-31419	12M477	Lot 9	0.067 *		\$ 411.00	\$ 163.00	\$ 574.00
29	270-31420	12M477	Pt Lot 10 RP	0.034 *		\$ 209.00	\$ 83.00	\$ 292.00
30	270-31421	12M477	Pt Lot 10 RP	0.034 *		\$ 209.00	\$ 83.00	\$ 292.00
31	270-31422	12M477	Pt Lot 11 RP	0.034 *		\$ 209.00	\$ 83.00	\$ 292.00
32	270-31423	12M477	Pt Lot 11 RP	0.034 *		\$ 209.00	\$ 83.00	\$ 292.00
33	270-31424	12M477	Pt Lot 12 RP	0.034 *		\$ 209.00	\$ 83.00	\$ 292.00
34	270-31425	12M477	Pt Lot 12 RP	0.035 *		\$ 215.00	\$ 85.00	\$ 300.00
35	270-31426	12M477	Pt Lot 13 RP	0.035 *		\$ 215.00	\$ 85.00	\$ 300.00
36	270-31427	12M477	Pt Lot 13 RP	0.035 *		\$ 215.00	\$ 85.00	\$ 300.00
37	270-31428	12M477	Pt Lot 15 RP	0.039 *		\$ 239.00	\$ 95.00	\$ 334.00
38	270-31429	12M477	Pt Lot 14 RP	0.038 *		\$ 233.00	\$ 92.00	\$ 325.00
39	270-31430	12M477	Pt Lot 14 RP	0.039 *		\$ 239.00	\$ 95.00	\$ 334.00
40	270-31431	12M477	Pt Lot 15 RP	0.040 *		\$ 245.00	\$ 97.00	\$ 342.00
41	270-31432	12M477	Pt Lot 16 RP	0.053 *		\$ 325.00	\$ 129.00	\$ 454.00
42	270-31433	12M477	Pt Lot 16 RP	0.078 *		\$ 478.00	\$ 190.00	\$ 668.00
43	270-31434	12M477	Pt Lot 17 RP	0.058 *		\$ 356.00	\$ 141.00	\$ 497.00
44	270-31435	12M477	Pt Lot 17 RP	0.052 *		\$ 319.00	\$ 126.00	\$ 445.00
45	270-31436	12M477	Pt Lot 18 RP	0.035 *		\$ 215.00	\$ 85.00	\$ 300.00
46	270-31437	12M477	Pt Lot 18 RP	0.035 *		\$ 215.00	\$ 85.00	\$ 300.00
47	270-31438	12M477	Pt Lot 19 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
48	270-31439	12M477	Pt Lot 19 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
49	270-31440	12M477	Pt Lot 20 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
50	270-31441	12M477	Pt Lot 20 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
51	270-31442	12M477	Pt Lot 21 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
52	270-31443	12M477	Pt Lot 21 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
53	270-31444	12M477	Pt Lot 22 RP	0.036 *		\$ 221.00	\$ 88.00	\$ 309.00
54	270-31445	12M477	Pt Lot 22 RP	0.036 *		\$ 221.00	\$ 88.00	\$ 309.00
55	270-31447	12M477	Pt Lot 23 RP	0.048 *		\$ 294.00	\$ 117.00	\$ 411.00
56	270-31448	12M477	Pt Lot 23 RP	0.063 *		\$ 386.00	\$ 153.00	\$ 539.00
57	270-31449	CON 1 WD	Pt Lot 4 RP	0.103 *		\$ 632.00	\$ 250.00	\$ 882.00
58	270-31450	CON 1 WD	Pt Lot 4 RP	0.095 *		\$ 583.00	\$ 231.00	\$ 814.00
59	270-31451	CON 1 WD	Pt Lot 4 RP	0.091 *		\$ 558.00	\$ 221.00	\$ 779.00
60	270-31452	12M477	Pt Lot 24 RP	0.084 *		\$ 515.00	\$ 204.00	\$ 719.00
61	270-31453	12M477	Pt Lot 24 RP	0.065 *		\$ 399.00	\$ 158.00	\$ 557.00
62	270-31454	12M477	PT Lot 25 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
63	270-31455	12M477	PT Lot 25 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
64	270-31456	12M477	Pt Lot 26 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
65	270-31457	12M477	Pt Lot 26 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
66	270-31458	12M477	Pt Lot 27 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
67	270-31459	12M477	Pt Lot 27 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
68	270-31460	12M477	Pt Lot 28 RP	0.032 *		\$ 196.00	\$ 78.00	\$ 274.00
69	270-31461	12M477	Pt Lot 28 RP	0.043 *		\$ 264.00	\$ 105.00	\$ 369.00
70	270-31463	12M477	Lot 29	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
71	270-31465	12M477	Lot 30	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
72	270-31467	12M477	Lot 31	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
73	270-31469	12M477	Lot 32	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
74	270-31471	12M477	Lot 33	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
75	270-31473	12M477	Lot 34	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
76	270-31475	12M477	Lot 35	0.079 *		\$ 484.00	\$ 192.00	\$ 676.00
77	270-31477	12M477	Lot 36	0.078 *		\$ 478.00	\$ 190.00	\$ 668.00
78	270-31479	12M477	Lot 37	0.082 *		\$ 503.00	\$ 199.00	\$ 702.00
79	270-31481	12M477	Lot 38	0.073 *		\$ 448.00	\$ 178.00	\$ 626.00
80	270-31483	12M477	Lot 39	0.073 *		\$ 448.00	\$ 178.00	\$ 626.00
81	270-31485	12M477	Lot 40	0.073 *		\$ 448.00	\$ 178.00	\$ 626.00
82	270-31487	12M477	Lot 41	0.073 *		\$ 448.00	\$ 178.00	\$ 626.00
83	270-31489	12M477	Lot 42	0.073 *		\$ 448.00	\$ 178.00	\$ 626.00
84	270-31491	12M477	Lot 43	0.074 *		\$ 454.00	\$ 180.00	\$ 634.00
85	270-31493	12M477	Lot 44	0.064 *		\$ 393.00	\$ 156.00	\$ 549.00
86	270-31495	12M477	Lot 45	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
87	270-31497	12M477	Lot 46	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
88	270-31499	CON 1 WD	Pt Lot 4 RP	0.144 *		\$ 883.00	\$ 350.00	\$ 1,233.00
89	270-31503	12M477	Lot 47	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
90	270-31505	12M477	Lot 48	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
91	270-31507	12M477	Lot 49	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
92	270-31509	12M477	Lot 50	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
93	270-31511	12M477	Lot 51	0.051 *		\$ 313.00	\$ 124.00	\$ 437.00
94	270-31513	12M477	Lot 52	0.052 *		\$ 318.00	\$ 126.00	\$ 444.00
95	270-31515	12M477	Lot 53	0.071 *		\$ 435.00	\$ 173.00	\$ 608.00
96	270-31517	12M477	Lot 54	0.057 *		\$ 350.00	\$ 139.00	\$ 489.00
97	270-31519	12M477	Lot 55	0.060 *		\$ 368.00	\$ 146.00	\$ 514.00
98	270-31521	12M477	Lot 56	0.063 *		\$ 386.00	\$ 153.00	\$ 539.00
99	270-31523	12M477	Lot 57	0.061 *		\$ 374.00	\$ 148.00	\$ 522.00
100	270-31525	12M477	Lot 58	0.061 *		\$ 374.00	\$ 148.00	\$ 522.00
101	270-31527	12M477	Lot 59	0.062 *		\$ 380.00	\$ 151.00	\$ 531.00
102	270-31529	12M477	Lot 60	0.061 *		\$ 374.00	\$ 148.00	\$ 522.00
103	270-31531	12M477	Lot 61	0.063 *		\$ 386.00	\$ 153.00	\$ 539.00
104	270-31533	12M477	Lot 62	0.068 *		\$ 417.00	\$ 165.00	\$ 582.00
105	270-31535	12M477	Lot 63	0.071 *		\$ 435.00	\$ 173.00	\$ 608.00
106	270-31537	12M477	Lot 64	0.068 *		\$ 417.00	\$ 165.00	\$ 582.00
107	270-31539	12M477	Lot 65	0.068 *		\$ 417.00	\$ 165.00	\$ 582.00
108	270-31541	12M477	Lot 66	0.067 *		\$ 411.00	\$ 163.00	\$ 574.00
109	270-31543	12M477	Lot 67	0.066 *		\$ 405.00	\$ 161.00	\$ 566.00
110	270-31545	12M477	Lot 68	0.072 *		\$ 442.00	\$ 175.00	\$ 617.00
111	270-31547	12M477	Lot 69	0.070 *		\$ 429.00	\$ 170.00	\$ 599.00
112	270-31549	12M477	Lot 70	0.068 *		\$ 417.00	\$ 165.00	\$ 582.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
113	270-31551	12M477	Lot 71	0.076 *		\$ 466.00	\$ 185.00	\$ 651.00
114	270-31552	12M477	Pt Lot 72 RP	0.055 *		\$ 337.00	\$ 134.00	\$ 471.00
115	270-31553	12M477	Pt Lot 72 RP	0.050 *		\$ 307.00	\$ 122.00	\$ 429.00
116	270-31554	12M477	Pt Lot 73 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
117	270-31555	12M477	Pt Lot 73 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
118	270-31556	12M477	Pt Lot 74 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
119	270-31557	12M477	Pt Lot 74 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
120	270-31558	12M477	Pt Lot 75 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
121	270-31559	12M477	Pt Lot 75 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
122	270-31560	12M477	Pt Lot 76 RP	0.036 *		\$ 221.00	\$ 88.00	\$ 309.00
123	270-31561	12M477	Pt Lot 76 RP	0.047 *		\$ 288.00	\$ 114.00	\$ 402.00
124	270-31562	12M477	Pt Lot 79 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
125	270-31563	12M477	Pt Lot 77 RP	0.047 *		\$ 288.00	\$ 114.00	\$ 402.00
126	270-31564	12M477	Pt Lot 77 RP	0.036 *		\$ 221.00	\$ 88.00	\$ 309.00
127	270-31565	12M477	Pt Lot 78 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
128	270-31566	12M477	Pt Lot 78 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
129	270-31567	12M477	Pt Lot 79 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
130	270-31568	12M477	Pt Lot 80 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
131	270-31569	12M477	Pt Lot 80 RP	0.033 *		\$ 202.00	\$ 80.00	\$ 282.00
132	270-31571	12M477	Lot 81	0.088 *		\$ 540.00	\$ 214.00	\$ 754.00
133	320-00700	CON 1 WD	Pt Lot 6 RP 12R8335	0.332		\$ -	\$ 955.00	\$ 955.00
134	320-00900	CON 1 WD	Pt Lot 7 RP 12R4945	0.800		\$ -	\$ 1,946.00	\$ 1,946.00
Total Affected Lands (Hectares)				12.772				
Total Assessment on Privately Owned Non-Agricultural Lands (Not Grantable)						\$ 207,131.00	\$ 30,395.00	\$ 237,526.00

C) PRIVATELY OWNED - AGRICULTURAL LANDS (NON-GRANTABLE)								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
135	270-00800	CON 1 WD	Pt Lot 7 RP12R5076	1.595		\$ -	\$ 2,912.00	\$ 2,912.00
136	270-30800	CON 1 WD	Pt Lots 4 & 5 RP	5.560		\$ 2,359.00	\$ 415.00	\$ 2,774.00
Total Affected Lands (Hectares)				7.155				
Total Assessment on Privately Owned Agricultural Lands (Not Grantable)						\$ 2,359.00	\$ 3,327.00	\$ 5,686.00

D) PRIVATELY OWNED - AGRICULTURAL LANDS (GRANTABLE)								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
137	010-00200	CON 1 WD	Pt Lot 5	0.50		\$ -	\$ 608.00	\$ 608.00
138	020-01800	CON 1 WD	Pt Lot 5	1.040		\$ -	\$ 1,265.00	\$ 1,265.00
139	270-00100	CON 1 WD	Pt Lot 5	4.824		\$ -	\$ 5,866.00	\$ 5,866.00
140	270-00600	CON 1 WD	Pt Lot 6	13.430		\$ -	\$ 16,330.00	\$ 16,330.00
141	270-00701	CON 1 WD	Pt Lot 7 RP 12R5076	1.797		\$ -	\$ 2,185.00	\$ 2,185.00
142	270-31100	CON 1 WD	Pt Lot 4 & 5	14.870		\$ 7,076.00	\$ 3,157.00	\$ 10,233.00
143	320-00600	CON 1 WD	Pt Lot 5 RP	1.970		\$ -	\$ 2,395.00	\$ 2,395.00
144	320-00702	CON 1 WD	Pt Lot 6 RP 12R8335	3.800		\$ -	\$ 4,621.00	\$ 4,621.00
145	320-00800	CON 1 WD	Pt Lot 6	4.010		\$ -	\$ 4,876.00	\$ 4,876.00
146	320-01100	CON 1 WD	PT Lot 7 RP	1.530		\$ -	\$ 1,860.00	\$ 1,860.00
Total Affected Lands (Hectares)				47.771				
Total Assessment on Privately Owned Agricultural Lands (Grantable)						\$ 7,076.00	\$ 43,163.00	\$ 50,239.00

TOTAL ASSESSMENT FOR SCHEDULE A-1 (SECTIONS A, B, C & D)	\$ 235,883.00	\$ 101,092.00	\$ 336,975.00
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TOTAL LANDS AFFECTED (Ha)	
A) Municipal Lands	5.951
B) Non-Agricultural Lands	12.772
C) Agricultural Lands (Non-Grantable)	7.155
D) Agricultural Lands (Grantable)	47.771
Total Lands Affected:	73.649

1 Hectare = 2.471 Acres
 * - Denotes Lands Draining into Pond

SCHEDULE 'A-2'
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE
MORLEY WIGLE DRAIN
TOWN OF KINGSVILLE

A) MUNICIPAL LANDS						
ENTRY NO.	Description	AREA AFFECTED (Hectares)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
1	Heritage Road	0.390 *	County of Essex	\$ 108.00	\$ 75.00	\$ 183.00
2	James Avenue	0.450 *	Town of Kingsville	\$ 124.00	\$ 97.00	\$ 221.00
3	Dieppe Crescent	0.920 *	Town of Kingsville	\$ 253.00	\$ 199.00	\$ 452.00
4	Normandy Avenue	0.620 *	Town of Kingsville	\$ 171.00	\$ 134.00	\$ 305.00
5	County Road 20	2.300	County of Essex	\$ -	\$ 830.00	\$ 830.00
6	Roll No. 270-31573, RP 12M477, Blk 82	1.271 *	Town of Kingsville	\$ 237.00	\$ 93.00	\$ 330.00
Total Affected Lands (Hectares)		5.951				
Total Assessment on Municipal Lands				\$ 893.00	\$ 1,428.00	\$ 2,321.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
7	010-01500	CON 1 WD	Pt Lot 5	0.263		\$ -	\$ 50.00	\$ 50.00
8	020-01810	CON 1 WD	Pt Lots 4 and 5 RP	0.502		\$ -	\$ 74.00	\$ 74.00
9	270-00200	CON 1 WD	Pt Lot 5	0.167		\$ -	\$ 36.00	\$ 36.00
10	270-00300	CON 1 WD	Pt Lot 5	0.259		\$ -	\$ 49.00	\$ 49.00
11	270-30900	CON 1 WD	Pt Lot 4 & 5	0.785		\$ -	\$ 35.00	\$ 35.00
12	270-31000	CON 1 WD	Pt Lot 4 RP	0.118		\$ -	\$ 10.00	\$ 10.00
13	270-31200	CON 1 WD	Pt Lot 4	2.695 *		\$ 741.00	\$ 389.00	\$ 1,130.00
14	270-31202	CON 1 WD	Pt Lot 4 RP	0.077 *		\$ 21.00	\$ 11.00	\$ 32.00
15	270-31203	CON 1 WD	Pt Lot 4 RP	0.087 *		\$ 24.00	\$ 13.00	\$ 37.00
16	270-31300	CON 1 WD	Pt Lot 4 RP	0.143 *		\$ 39.00	\$ 21.00	\$ 60.00
17	270-31302	CON 1 WD	Pt Lot 4 RP	0.138 *		\$ 38.00	\$ 20.00	\$ 58.00
18	270-31400	CON 1 WD	Pt Lot 4	0.140 *		\$ 39.00	\$ 20.00	\$ 59.00
19	270-31401	CON 1 WD	Pt Lot 4 RP	0.103 *		\$ 28.00	\$ 15.00	\$ 43.00
20	270-31403	12M477	PT Lot 1 S/T Ease	0.075 *		\$ 21.00	\$ 11.00	\$ 32.00
21	270-31405	12M477	Lot 2	0.073 *		\$ 20.00	\$ 11.00	\$ 31.00
22	270-31407	12M477	Lot 3	0.071 *		\$ 20.00	\$ 10.00	\$ 30.00
23	270-31409	12M477	Lot 4	0.069 *		\$ 19.00	\$ 10.00	\$ 29.00
24	270-31411	12M477	Lot 5	0.065 *		\$ 18.00	\$ 9.00	\$ 27.00
25	270-31413	12M477	Lot 6	0.065 *		\$ 18.00	\$ 9.00	\$ 27.00
26	270-31415	12M477	Lot 7	0.066 *		\$ 18.00	\$ 10.00	\$ 28.00
27	270-31417	12M477	Lot 8	0.066 *		\$ 18.00	\$ 10.00	\$ 28.00
28	270-31419	12M477	Lot 9	0.067 *		\$ 18.00	\$ 10.00	\$ 28.00
29	270-31420	12M477	Pt Lot 10 RP	0.034 *		\$ 9.00	\$ 5.00	\$ 14.00
30	270-31421	12M477	Pt Lot 10 RP	0.034 *		\$ 9.00	\$ 5.00	\$ 14.00
31	270-31422	12M477	Pt Lot 11 RP	0.034 *		\$ 9.00	\$ 5.00	\$ 14.00
32	270-31423	12M477	Pt Lot 11 RP	0.034 *		\$ 9.00	\$ 5.00	\$ 14.00
33	270-31424	12M477	Pt Lot 12 RP	0.034 *		\$ 9.00	\$ 5.00	\$ 14.00
34	270-31425	12M477	Pt Lot 12 RP	0.035 *		\$ 10.00	\$ 5.00	\$ 15.00
35	270-31426	12M477	Pt Lot 13 RP	0.035 *		\$ 10.00	\$ 5.00	\$ 15.00
36	270-31427	12M477	Pt Lot 13 RP	0.035 *		\$ 10.00	\$ 5.00	\$ 15.00
37	270-31428	12M477	Pt Lot 15 RP	0.039 *		\$ 11.00	\$ 6.00	\$ 17.00
38	270-31429	12M477	Pt Lot 14 RP	0.038 *		\$ 10.00	\$ 5.00	\$ 15.00
39	270-31430	12M477	Pt Lot 14 RP	0.039 *		\$ 11.00	\$ 6.00	\$ 17.00
40	270-31431	12M477	Pt Lot 15 RP	0.040 *		\$ 11.00	\$ 6.00	\$ 17.00
41	270-31432	12M477	Pt Lot 16 RP	0.053 *		\$ 15.00	\$ 8.00	\$ 23.00
42	270-31433	12M477	Pt Lot 16 RP	0.078 *		\$ 21.00	\$ 11.00	\$ 32.00
43	270-31434	12M477	Pt Lot 17 RP	0.058 *		\$ 16.00	\$ 8.00	\$ 24.00
44	270-31435	12M477	Pt Lot 17 RP	0.052 *		\$ 14.00	\$ 8.00	\$ 22.00
45	270-31436	12M477	Pt Lot 18 RP	0.035 *		\$ 10.00	\$ 5.00	\$ 15.00
46	270-31437	12M477	Pt Lot 18 RP	0.035 *		\$ 10.00	\$ 5.00	\$ 15.00
47	270-31438	12M477	Pt Lot 19 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
48	270-31439	12M477	Pt Lot 19 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
49	270-31440	12M477	Pt Lot 20 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
50	270-31441	12M477	Pt Lot 20 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
51	270-31442	12M477	Pt Lot 21 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
52	270-31443	12M477	Pt Lot 21 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
53	270-31444	12M477	Pt Lot 22 RP	0.036 *		\$ 10.00	\$ 5.00	\$ 15.00
54	270-31445	12M477	Pt Lot 22 RP	0.036 *		\$ 10.00	\$ 5.00	\$ 15.00
55	270-31447	12M477	Pt Lot 23 RP	0.048 *		\$ 13.00	\$ 7.00	\$ 20.00
56	270-31448	12M477	Pt Lot 23 RP	0.063 *		\$ 17.00	\$ 9.00	\$ 26.00
57	270-31449	CON 1 WD	Pt Lot 4 RP	0.103 *		\$ 28.00	\$ 15.00	\$ 43.00
58	270-31450	CON 1 WD	Pt Lot 4 RP	0.095 *		\$ 26.00	\$ 14.00	\$ 40.00
59	270-31451	CON 1 WD	Pt Lot 4 RP	0.091 *		\$ 25.00	\$ 13.00	\$ 38.00
60	270-31452	12M477	Pt Lot 24 RP	0.084 *		\$ 23.00	\$ 12.00	\$ 35.00
61	270-31453	12M477	Pt Lot 24 RP	0.065 *		\$ 18.00	\$ 9.00	\$ 27.00
62	270-31454	12M477	PT Lot 25 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
63	270-31455	12M477	PT Lot 25 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
64	270-31456	12M477	Pt Lot 26 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
65	270-31457	12M477	Pt Lot 26 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
66	270-31458	12M477	Pt Lot 27 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
67	270-31459	12M477	Pt Lot 27 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
68	270-31460	12M477	Pt Lot 28 RP	0.032 *		\$ 9.00	\$ 5.00	\$ 14.00
69	270-31461	12M477	Pt Lot 28 RP	0.043 *		\$ 12.00	\$ 6.00	\$ 18.00
70	270-31463	12M477	Lot 29	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
71	270-31465	12M477	Lot 30	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
72	270-31467	12M477	Lot 31	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
73	270-31469	12M477	Lot 32	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
74	270-31471	12M477	Lot 33	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
75	270-31473	12M477	Lot 34	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
76	270-31475	12M477	Lot 35	0.079 *		\$ 22.00	\$ 11.00	\$ 33.00
77	270-31477	12M477	Lot 36	0.078 *		\$ 21.00	\$ 11.00	\$ 32.00
78	270-31479	12M477	Lot 37	0.082 *		\$ 23.00	\$ 12.00	\$ 35.00
79	270-31481	12M477	Lot 38	0.073 *		\$ 20.00	\$ 11.00	\$ 31.00
80	270-31483	12M477	Lot 39	0.073 *		\$ 20.00	\$ 11.00	\$ 31.00
81	270-31485	12M477	Lot 40	0.073 *		\$ 20.00	\$ 11.00	\$ 31.00
82	270-31487	12M477	Lot 41	0.073 *		\$ 20.00	\$ 11.00	\$ 31.00
83	270-31489	12M477	Lot 42	0.073 *		\$ 20.00	\$ 11.00	\$ 31.00
84	270-31491	12M477	Lot 43	0.074 *		\$ 20.00	\$ 11.00	\$ 31.00
85	270-31493	12M477	Lot 44	0.064 *		\$ 18.00	\$ 9.00	\$ 27.00
86	270-31495	12M477	Lot 45	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
87	270-31497	12M477	Lot 46	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
88	270-31499	CON 1 WD	Pt Lot 4 RP	0.144 *		\$ 40.00	\$ 21.00	\$ 61.00
89	270-31503	12M477	Lot 47	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
90	270-31505	12M477	Lot 48	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
91	270-31507	12M477	Lot 49	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
92	270-31509	12M477	Lot 50	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
93	270-31511	12M477	Lot 51	0.051 *		\$ 14.00	\$ 7.00	\$ 21.00
94	270-31513	12M477	Lot 52	0.052 *		\$ 14.00	\$ 8.00	\$ 22.00
95	270-31515	12M477	Lot 53	0.071 *		\$ 20.00	\$ 10.00	\$ 30.00
96	270-31517	12M477	Lot 54	0.057 *		\$ 16.00	\$ 8.00	\$ 24.00
97	270-31519	12M477	Lot 55	0.060 *		\$ 17.00	\$ 9.00	\$ 26.00
98	270-31521	12M477	Lot 56	0.063 *		\$ 17.00	\$ 9.00	\$ 26.00
99	270-31523	12M477	Lot 57	0.061 *		\$ 17.00	\$ 9.00	\$ 26.00
100	270-31525	12M477	Lot 58	0.061 *		\$ 17.00	\$ 9.00	\$ 26.00
101	270-31527	12M477	Lot 59	0.062 *		\$ 17.00	\$ 9.00	\$ 26.00
102	270-31529	12M477	Lot 60	0.061 *		\$ 17.00	\$ 9.00	\$ 26.00
103	270-31531	12M477	Lot 61	0.063 *		\$ 17.00	\$ 9.00	\$ 26.00
104	270-31533	12M477	Lot 62	0.068 *		\$ 19.00	\$ 10.00	\$ 29.00
105	270-31535	12M477	Lot 63	0.071 *		\$ 20.00	\$ 10.00	\$ 30.00
106	270-31537	12M477	Lot 64	0.068 *		\$ 19.00	\$ 10.00	\$ 29.00
107	270-31539	12M477	Lot 65	0.068 *		\$ 19.00	\$ 10.00	\$ 29.00
108	270-31541	12M477	Lot 66	0.067 *		\$ 18.00	\$ 10.00	\$ 28.00
109	270-31543	12M477	Lot 67	0.066 *		\$ 18.00	\$ 10.00	\$ 28.00
110	270-31545	12M477	Lot 68	0.072 *		\$ 20.00	\$ 10.00	\$ 30.00
111	270-31547	12M477	Lot 69	0.070 *		\$ 19.00	\$ 10.00	\$ 29.00
112	270-31549	12M477	Lot 70	0.068 *		\$ 19.00	\$ 10.00	\$ 29.00

B) PRIVATELY OWNED - NON-AGRICULTURAL LANDS								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
113	270-31551	12M477	Lot 71	0.076 *		\$ 21.00	\$ 11.00	\$ 32.00
114	270-31552	12M477	Pt Lot 72 RP	0.055 *		\$ 15.00	\$ 8.00	\$ 23.00
115	270-31553	12M477	Pt Lot 72 RP	0.050 *		\$ 14.00	\$ 7.00	\$ 21.00
116	270-31554	12M477	Pt Lot 73 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
117	270-31555	12M477	Pt Lot 73 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
118	270-31556	12M477	Pt Lot 74 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
119	270-31557	12M477	Pt Lot 74 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
120	270-31558	12M477	Pt Lot 75 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
121	270-31559	12M477	Pt Lot 75 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
122	270-31560	12M477	Pt Lot 76 RP	0.036 *		\$ 10.00	\$ 5.00	\$ 15.00
123	270-31561	12M477	Pt Lot 76 RP	0.047 *		\$ 13.00	\$ 7.00	\$ 20.00
124	270-31562	12M477	Pt Lot 79 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
125	270-31563	12M477	Pt Lot 77 RP	0.047 *		\$ 13.00	\$ 7.00	\$ 20.00
126	270-31564	12M477	Pt Lot 77 RP	0.036 *		\$ 10.00	\$ 5.00	\$ 15.00
127	270-31565	12M477	Pt Lot 78 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
128	270-31566	12M477	Pt Lot 78 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
129	270-31567	12M477	Pt Lot 79 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
130	270-31568	12M477	Pt Lot 80 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
131	270-31569	12M477	Pt Lot 80 RP	0.033 *		\$ 9.00	\$ 5.00	\$ 14.00
132	270-31571	12M477	Lot 81	0.088 *		\$ 24.00	\$ 13.00	\$ 37.00
133	320-00700	CON 1 WD	Pt Lot 6 RP 12R8335	0.332		\$ -	\$ 57.00	\$ 57.00
134	320-00900	CON 1 WD	Pt Lot 7 RP 12R4945	0.800		\$ -	\$ 115.00	\$ 115.00
Total Affected Lands (Hectares)				12.772				
Total Assessment on Privately Owned Non-Agricultural Lands (Not Grantable)						\$ 2,627.00	\$ 1,814.00	\$ 4,441.00

C) PRIVATELY OWNED - AGRICULTURAL LANDS (NON-GRANTABLE)								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
135	270-00800	CON 1 WD	Pt Lot 7 RP12R5076	1.595		\$ -	\$ 173.00	\$ 173.00
136	270-30800	CON 1 WD	Pt Lots 4 & 5 RP	5.560		\$ 120.00	\$ 25.00	\$ 145.00
Total Affected Lands (Hectares)				7.155				
Total Assessment on Privately Owned Agricultural Lands (Not Grantable)						\$ 120.00	\$ 198.00	\$ 318.00

D) PRIVATELY OWNED - AGRICULTURAL LANDS (GRANTABLE)								
ENTRY NO.	TAX ROLL NO.	CON. OR PLAN NO.	LOT OR PART OF LOT	AFFECTED AREA (Ha)	OWNER	(SECTION 22) VALUE OF BENEFIT	(SECTION 23) OUTLET LIABILITY	TOTAL ASSESSMENT
137	010-00200	CON 1 WD	Pt Lot 5	0.50		\$ -	\$ 36.00	\$ 36.00
138	020-01800	CON 1 WD	Pt Lot 5	1.040		\$ -	\$ 75.00	\$ 75.00
139	270-00100	CON 1 WD	Pt Lot 5	4.824		\$ -	\$ 348.00	\$ 348.00
140	270-00600	CON 1 WD	Pt Lot 6	13.430		\$ -	\$ 969.00	\$ 969.00
141	270-00701	CON 1 WD	Pt Lot 7 RP 12R5076	1.797		\$ -	\$ 130.00	\$ 130.00
142	270-31100	CON 1 WD	Pt Lot 4 & 5	14.870		\$ 360.00	\$ 187.00	\$ 547.00
143	320-00600	CON 1 WD	Pt Lot 5 RP	1.970		\$ -	\$ 142.00	\$ 142.00
144	320-00702	CON 1 WD	Pt Lot 6 RP 12R8335	3.800		\$ -	\$ 274.00	\$ 274.00
145	320-00800	CON 1 WD	Pt Lot 6	4.010		\$ -	\$ 289.00	\$ 289.00
146	320-01100	CON 1 WD	PT Lot 7 RP	1.530		\$ -	\$ 110.00	\$ 110.00
Total Affected Lands (Hectares)				47.771				
Total Assessment on Privately Owned Agricultural Lands (Grantable)						\$ 360.00	\$ 2,560.00	\$ 2,920.00

TOTAL ASSESSMENT FOR SCHEDULE A-2 (SECTIONS A, B, C & D)	\$ 4,000.00	\$ 6,000.00	\$ 10,000.00
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TOTAL LANDS AFFECTED (Ha)	
A) Municipal Lands	5.951
B) Non-Agricultural Lands	12.772
C) Agricultural Lands (Non-Grantable)	7.155
D) Agricultural Lands (Grantable)	47.771
Total Lands Affected:	73.649

1 Hectare = 2.471 Acres
 * - Denotes Lands Draining into Pond

APPENDIX 'B'

SPECIAL PROVISIONS AND SPECIFICATIONS

**FOR THE
REPAIR AND IMPROVEMENT
OF PART OF THE
MORLEY WIGLE DRAIN**

**IN THE
TOWN OF KINGSVILLE
COUNTY OF ESSEX**

SPECIAL PROVISIONS

1.0 GENERAL SPECIFICATIONS

The “**General Specifications for Covered Drains**” and the “**Environmental Special Provisions**” attached hereto are part of Appendix ‘B’. It forms part of this specification and is to be read with these Special Provisions and the Drawings attached to this 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

- a) The installation of a new 900x1200mm precast concrete catch basin at Station 0+000 with a birdcage style frame and grate.
- b) The installation of a new 900x1200mm precast concrete catch basin at Station 0+239.3 with a birdcage style frame and grate.
- c) The installation of a new non-perforated 525mm diameter High Density Polyethylene (HDPE) pipe with a material stiffness of 320kPa from Station 0+000 to 0+641.8. This work is to include brick and parging of the pipe at all catch basins and manhole structures. 20-25mm clear stone bedding extending 100mm below the pipe is required with trench backfill material being select native excavated material.
- d) Removal and disposal of existing 300mm municipal clay tile drain including trenching, backfilling and compaction.
- e) Any lateral tile drains found connected to the existing 300 mm diameter municipal tile drain while it is being removed and any lateral tile drains that are intercepted by the installation of new 525 mm diameter HDPE pipe shall be extended to the new drain using perforated, corrugated plastic farm tubing and be connected to it using a manufactured insert tee fitting. All connections shall be made with manufactured fitting or couplers and be wrapped with a filter cloth to prevent any entry of soil.
- f) The removal and disposal of existing Catch Basin Manhole ‘B’ at Station 0+637.5. Contractor is to cut and cap the existing 250mm clay tile drain that outlets from the south/east side of the structure.
- g) Contractor is to connect existing 200mm BOSS 1000 pipe (inletting into catch basin manhole ‘B’) to Catch Basin Manhole ‘A’ at Station 0+641.8.
- h) Supply and place seeding and mulching of all disturbed areas (drain banks, lawns).
- i) Silt control.
- j) Traffic control.

3.0 ACCESS TO THE WORK

Access to the drain shall be from Normandy Ave and in through the pond property (Roll No. 270-31573). Through traffic must be maintained at all times along all municipal roads. All required traffic control is as per Section 8 in the General Specifications. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All road areas and grass lawn areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING AREA

Along the length of the Morley Wigle Drain where the new 525mm diameter HDPE pipe will be installed, a 15m wide working corridor will be established centred on the alignment set for the new covered drain.

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

5.0 DRAINAGE PIPE CONSTRUCTION

5.1 Setting Out

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

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

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

The Contractor shall be responsible to ensure that the alignment selected results in a minimum depth of cover of 750 mm over the top of the drainage pipe to be installed.

If at any time during the progress of the works an error shall appear or arise in the position, levels, dimensions or alignment of any part of the works, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Engineer.

5.2 Alignment and Removal of Existing Tile Drain & Catch Basins

Prior to commencing the work, the contractor is to locate the course of the existing 300mm diameter clay tile drain that was installed under the 1947 report on the Morley Wigle Drain tile. This is the most westerly of the two municipal clay tile drains. The Contractor shall mark it in the field at 30m intervals before establishing the alignment for the proposed work.

The drainage pipe shall be laid on a different alignment than the existing 300 mm diameter tile drain as shown on the drawings. After the new 525mm diameter HDPE pipe has been installed, the Contractor shall excavate a trench along the existing 300 mm diameter clay tile drain from Station 0+000 to Station 0+641.8 and completely remove it. The tile materials shall be completely separated from the excavated material and shall be disposed of off-site.

During the trenching operation, the contractor shall carefully locate any existing lateral tile drains that are connected to the tile main being removed and clearly mark them in the field. These lateral tile drains are to be extended to the new 525 mm diameter HDPE pipe and be connected to it as set out under Section 5.9 . Where the Contractor removes the existing tile and catch basins they shall be disposed of off site at an approved disposal location.

During the trenching operation, the topsoil shall be separated from the subsoil. While backfilling the trench, the subsoil shall first be placed and compacted, then the topsoil shall be replaced as the top layer. Backfilling and compaction shall be carried out in accordance with Section 5.11 .

5.3 Profile

The drainage pipe shall be laid so that its invert shall be at the grade line shown on the profile, which grade line is governed by the bench marks.

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

5.4 Obstructions

All brush, timber, logs, stumps, stones or other obstructions that interfere with the construction of the drain, encountered 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 material are to be piled near the limit of the working corridor and the disposal of this material will be the responsibility of the Owner.

5.5 Location of New Tile Drain

The new tile drain shall be installed as shown on the Drawings attached hereto. From Stations 0+239.3 to Station 0+641.8, the drain shall be installed on an alignment parallel to the line between Lots 5 and 6 or the westerly limit of the property.

5.6 Drainage Pipe Materials

5.6.1 H.D.P.E. Pipe

Covered Drain (Sta. 0+000 to Sta. 0+662) *New 525 mm (21") diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.*

Joined using (soil tight) "gasketed bell and spigot" joining system (gasketed bell and spigot manufactured by Armtec Limited or approved equal), supplied by the pipe manufacturer and conforming to ASTM D3350, CSA 182.8-02 and OPSS 1840.

Plastic Farm Tile *Corrugated plastic tubing shall meet the specifications as adopted by the Canadian Government Specifications Board 41-GP-29 (Corrugated plastic drainage tubing).*

Native Backfill Up to Existing Conditions *Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.*

Pipe Bedding *20-25mm clear stone pipe bedding shall be placed extending 100mm below the pipe.*

5.7 Excavating the Trench

Construction of the trench shall normally start at the outlet and proceed upstream by excavator or trenching machine. Trench excavation shall conform to the requirements of the latest edition of the "Occupational Health and Safety Act of Ontario".

Minimum width of trench, measured at the top of the drainage pipe, shall be equal to the outside diameter of the drainage pipe plus approximately half of the outside pipe diameter on both sides of the pipe, to permit proper soil placement around the drainage pipe.

Any additional excavated subsoil material not required for backfilling purposes shall be disposed of off site.

The topsoil is to be separated from the subsoil and during the backfilling operation it shall be replaced as the top layer. No topsoil shall be removed from the site.

5.8 Laying Drainage Pipe

The high density polyethylene (H.D.P.E.) pipe is to be installed in accordance with the manufacturer's recommendations and OPSS 410.

Laying of the drainage pipe shall normally begin at the lower end of the drain and progress upstream.

All soil or debris in the drainage pipe shall be removed before installation.

All drainage pipes shall be free from clinging wet or frozen material that would hinder the laying of the drainage pipe on grade.

Before work is suspended for the day, all drainage pipe laid in trenches shall be blinded and any open ends closed.

Care must be taken in handling plastic drain pipe in cold weather to avoid causing damage.

Plastic drain pipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

5.9 Connections

Any private lateral tile drains found connected to the existing 300 mm diameter municipal tile drain while it is being removed and any lateral tile drains that are intercepted by the installation of new 525 mm diameter HDPE pipe shall be extended to the new drain using perforated, corrugated plastic farm tubing and be connected to it using a manufactured insert tee fitting. All connections shall be made with manufactured fitting or couplers and be wrapped with a filter cloth to prevent any entry of soil.

Existing drains shall be inspected by the Drainage Superintendent and if found to be in working order, they shall be connected to the new system. Drains containing very little sediment shall be directly connected and drains containing substantial quantities of sediment shall be indirectly connected through filter material.

Drains carrying sewage or farmstead wastes shall not be connected to the drainage system.

Plastic tubing connections to rigid drainage pipe shall be made with manufactured plastic adapters.

Directional changes in plastic tubing may be made without the use of fittings provided that the centre line radius of the bend is not less than five times the tubing diameter.

Manufactured "T", "Y", or elbow fittings shall be used for connections at the junction of two drains.

All connections shall be carried out by the Contractor as part of his work. The cost of connections shall be an expense of the drain.

The contractor shall plug the existing tile in the wall of the trench, on the opposite side on which the connection is made, if the tile extends across the trench. The contractor shall provide a list each day, showing the number, stations and location of connections which shall be confirmed and verified daily by the Drainage Superintendent in charge of the work. The work shall be carried out to the satisfaction of the Drainage Superintendent.

5.10 Bedding and Cover Material

20-25mm clear stone bedding to a depth of 100mm below the pipe is required.

5.11 Backfilling

After the Drainage Superintendent has inspected the laying of the drainage pipe, earth excavated from the trench shall be used as backfill material above the pipe. Surplus soil shall be hauled and disposed off-site. Topsoil shall then be replaced over the native backfill for a minimum depth of 150mm.

Backfilling and compaction shall be carried out in accordance with the requirements of OPSS 410. Backfill material shall be placed in uniform layers not exceeding 300mm loose depth for the full width of the trench and each layer shall be compacted to a minimum of 95% of the maximum dry density. Native backfill material is to be graded and levelled to the satisfaction of the Drainage Superintendent so that after the 150mm layer of topsoil is placed and graded, the resulting contours match the existing contours.

6.0 NEW CATCH BASINS (CB)

The price bid for the catch basin construction shall include all material, equipment and labour necessary to complete the construction. The catch basins shall have inside dimensions of 900 mm x 1200 mm as specified. The catch basins shall be supplied in accordance with the Ontario Provincial Standard Drawing OPSD-705.010. The catch basins shall be supplied from a source approved by the Drainage Superintendent. All work shall be carried out to the satisfaction of the Drainage Superintendent in charge. The proposed location for all catch basins shall be staked by the contractor in the field, for approval by the Drainage Superintendent, prior to construction. The cost of the catch basin construction shall include the cost of making all connections and cross-connections required.

All catch basins are to have a 150 mm riser section installed on top of them so that future adjustments can be made. The catch basins shall be supplied with heavy duty galvanized steel bird cage style grates as manufactured by Coldstream Concrete or approved equal. The floor elevations of all catch basins shall be at least 600 mm below the invert of the outlet pipe in the wall of the structure. The elevation of the top surface of the catch basin grates is to be determined by the Drainage Superintendent. The catch basins are to be such as to permit the entry of surface water into the catch basins unless otherwise directed. Pipes are to be securely grouted into the structures. The structures are to have compacted granular backfill for a minimum of 300 mm on all sides and are to be installed on a compacted granular base. All work shall be carried out to be to the satisfaction of the Drainage Superintendent in charge.

The work required is as follows:

- a) **Station 0+000:** See Detail 'B' on Drawing Sheet No. 5. Remove existing 600x1200mm catch basin and install new 900x1200mm precast concrete catch basin. Reconnect existing east 250mm diameter clay tile drain and 850mm corrugated steel outlet pipe at their existing invert elevations. Install new

525mm diameter HDPE pipe and connect to new catch basin at an invert elevation of 179.790. A 900x1200mm birdcage style catch basin grate to be installed at this location.

- b) **Station 0+239.3:** Install a new standard 900x1200mm precast concrete catch basin and connect new 525mm diameter HDPE pipe at the invert elevations shown on the drawings. A 900x1200mm birdcage style catch basin grate to be installed at this location.
- c) **Station 0+641.8:** Remove CBMH 'B' and dispose of off-site. Remove existing 200mm diameter BOSS 1000 and reconnect to CBMH 'A' as shown on Detail 'A' on Drawing Sheet No. 5. Remove and plug existing 250mm clay tile as shown on Detail 'A'. Connect new 525mm diameter HDPE pipe to CBMH 'A'.

7.0 SEEDING OF DISTURBED GRASSED AREAS

Any lawn or grassed areas disturbed by the operation of equipment and construction shall also be repaired to preconstruction conditions. Hydraulic seeding and mulching shall be carried out in accordance with OPSS 804 using a "Standard Roadside Mix" and as modified below.

The grass seed mixture shall be M.T.O. Standard Canada No. 1 lawn seed. The nurse crop shall be rye grain, Canada No. 1 seed. The application rates per hectare are:

M.T.O. Grass Seed Mix	100 kg
Nurse Crop Seed	60 kg
Fertilizer 8-32-16	350 kg

The hydraulic 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.

8.0 SEDIMENT CONTROL

The contractor shall supply, install, maintain and remove a temporary water permeable filter fence (silt fence) to remove suspended particulars from the water passing through it. At the commencement of construction, the contractor shall install a silt fence across the outlet of the drain. The silt fence shall be constructed of a minimum 1.0 m wide geotextile securely fastened to steel posts. The geotextile shall be attached to the up-gradient side of the posts. Where required, wire or any other type of support may be constructed between the geotextile and the posts in order to improve the load carrying capacity of the silt fence. The geotextile may be a woven or a non-woven material that has a minimum tensile strength of 100 lbs., permittivity of at least 90 gal/min/ft² and an apparent opening size of US Sieve No. 30.

Steel posts of sufficient strength to support the silt fence shall be used. The maximum post spacing shall be approximately 2 m. Every effort must be made to ensure that the bottom edge of the silt fence is in continuous contact with the bottom of the channel.

The silt fence shall remain in place until the project is complete. The contractor shall maintain the silt fence until it is removed. Upon removal, the silt accumulation upstream of the fence shall also be removed. The cost of supply, installation, maintenance and removal of the silt fence shall be included in the Lump Sum price bid for this item.

9.0 ENDANGERED SPECIES ACT

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).

GENERAL SPECIFICATION FOR COVERED DRAINS

(Revised 2017 02 14)

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 covered drain as measured from the surface of the ground to the design gradeline for the invert of the covered drain.
- (2) The Contractor will be held responsible during the progress of the work for the preservation of all reference stakes, bench marks and survey markers which fall within the limits of the work. The cost of replacing any bench mark 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) The covered drain shall follow the course shown on the plan and marked on the ground by the numbered stakes.
- (2) A change in the horizontal direction may be made by: a gradual curve in the trench on a radius of curvature that the trenching machine can dig and still maintain grade; a gradual curve on a radius of curvature such that the joint spacings do not exceed those specified in Section 14; the use of manufactured bends and fittings, the use of catch basins or junction boxes.
- (3) The Contractor must lay out the proposed centre line of construction in the field for approval by the Drainage Superintendent prior to construction.

SECTION 12 - SETTING OUT

- (1) The Engineer shall provide the Contractor in writing with bench marks and points of reference. From these bench marks and points of reference, the contractor will do his own setting out. The setting out by the Contractor shall include but shall not be limited to the preparation of grade sheets, the installation of centreline stakes, grade stakes, offsets, and sight rails.
- (2) If, during the setting out, the contractor finds an error in the bench marks or points of reference provided by the Engineer or is uncertain as to the interpretation of the information provided or the work intended, he shall notify the Engineer immediately for additional verification or clarification before proceeding with construction.
- (3) The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work.
- (4) The Contractor shall be responsible to ensure that the alignment selected results in a minimum depth of cover of 600 mm over the top of the drainage pipe to be installed.
- (5) If at any time during the progress of the works an error shall appear or arise in the position, levels, dimensions or alignment of any part of the works, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer.

SECTION 13 - PROFILE

- (1) The drainage pipe shall be laid so that its invert shall be at the grade line shown on the Profile, which grade line is governed by the bench marks. The Profile shows, for the convenience of the Contractors and others, the approximate depth of cut from the surface of the ground at the points where the numbered stakes are set to the final invert of the drainage pipe in metres and decimals of a metre. Bench marks, which have been established along the course of the drain, shall govern the final elevation of the drain. The locations and elevations of the bench marks are shown on the Profile.
- (2) A variation in grade may be tolerated where the actual capacity of the drain exceeds the required capacity. The as-constructed invert of the drainage pipe shall not deviate from the specified grade line more than 15% of the internal diameter for drainage pipe sizes 200 mm or less, or 10% of the internal diameter for sizes greater than 200 mm. These deviations are allowable, provided they are gradual over a distance of not less than 10 m. No reverse grade shall be allowed.

SECTION 14 - OBSTRUCTIONS

- (1) All brush, timber, logs, stumps, stones or other obstructions that interfere with the construction of the drain, encountered 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 material are to be piled near the limit of the working corridor and the disposal of this material will be the responsibility of the Owner.

SECTION 15 - BRUSH AND TREES

- (1) All brush and small trees having a diameter less than 150 mm, growing within 5 m on each side of the drain are to be cut off flush with the ground surface and all of their roots within 3 m of the covered drain are to be grubbed out.
- (2) 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.
- (3) 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.
- (4) Brush and trees removed from the working area are to be put into piles by the Contractor, in locations where they can be safely burned, and are to be burned by him. If, in the opinion of the Drainage Superintendent, any of the piles are too wet or green to be burned, he shall 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.
- (5) Prior to and during the course of burning operations the Contractor shall comply with the current 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.
- (6) 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.

SECTION 16 - FENCES

- (1) Where the Contractor finds it necessary to remove any fences in order to permit the installation of the drain or the removal of brush and the grubbing of roots, he shall be required to use reasonable care in handling the fencing material and will reconstruct the fences in as good condition as that in which they are found, or as the old material permits.
- (2) The Contractor is not to leave any fences open when he is not at work in the immediate vicinity.

SECTION 17 - DRAINAGE PIPE MATERIALS

- (1) Unless otherwise specified, all drainage pipe material is to be furnished to the site of the work by the Municipality.
- (2) Clay and concrete drain tile shall be smooth and circular in cross-section. Ends shall be square and inside surfaces smooth. All pipe materials must be free of deformation, cracks, broken pieces and checks which may decrease the strength of the drain.
- (3) Standard clay drain tile, extra quality drain tile and heavy duty tile shall meet all the current American Society for Testing Materials specifications as set out in Designation C4 (Clay drain tile) and Designation C498 (Perforated clay drain tile).
- (4) Concrete drain tile shall meet all the current specifications as set out in the American Society for Testing Materials Designation C412 (Drain Tile).
- (5) Corrugated plastic tubing shall meet the specifications as adopted by the Canadian Government Specifications Board 41-GP-29 (Corrugated plastic drainage tubing).
- (6) Corrugated steel pipe products shall meet the current specifications of CSPI Specification 501-78 Metric.

SECTION 18 - EXCAVATION OF TRENCH

- (1) Construction of the trench shall normally start at the outlet and proceed upgrade.
- (2) Minimum width of trench, measured at the top of the drainage pipe, shall be equal to the outside diameter of the drainage pipe plus approximately 200 mm, to permit proper soil placement around the drainage pipe or it shall be embedded in a 120-degree circular groove.
- (3) The bottom of the trench shall be cut accurately to the grade line. It shall be smooth with a groove along the bottom centre line to guide the alignment of the drainage pipe. If a circular groove is used, it shall conform closely in shape to the outside diameter of the drainage pipe.
- (4) If the trench is excavated below grade for any reason, it shall be filled above the grade line with gravel or well-pulverized soil, tamped to provide a firm foundation. Then, the bottom of the trench shall be reshaped to the proper grade line.
- (5) When rock is encountered at grade level, the trench shall be excavated approximately 75 mm below grade level and filled to the proper grade line as described in paragraph (4).
- (6) Where the depth of the drain exceeds the working depth of the trenching machine, the Contractor shall excavate the top portion of the trench to a suitable depth and width so that the trenching machine can be operated within its depth range. The topsoil is to be separated from the subsoil and during the backfilling operation it shall be replaced as the top layer.

SECTION 19 - LAYING DRAINAGE PIPE

- (1) When the trench bottom is unstable, a stabilizing material as specified in Section 17 shall be placed before laying the drainage pipe.
- (2) Laying of the drainage pipe shall normally begin at the lower end of the drain and progress up grade. It is preferable that the drainage pipe be laid inside the shoe casing of the drainage machine during the trenching operation.
- (3) Drain tile shall be laid in the groove with close joints on a firm bed, free of loose soil and to the grade line of the profile.
- (4) All soil or debris in the drainage pipe shall be removed before installation.
- (5) All drainage pipe shall be free from clinging wet or frozen material that would hinder the laying of the drainage pipe on grade.
- (6) The upper end of all drainage pipe runs shall be closed tightly with an end plug.
- (7) Before work is suspended for the day, all drainage pipe laid in trenches shall be blinded and any open ends closed.
- (8) Care must be taken in handling plastic tubing in cold weather to avoid causing damage to the tubing.
- (9) Plastic tubing shall be held in position on planned grade immediately after installation by careful placement of either blinding or backfill material.
- (10) Plastic tubing shall not be stretched more than 3% of its normal length to ensure adequate structural strength.
- (11) Where lengths of plastic tubing are to be joined, the ends shall be cut square and all burred edges removed. A coupling manufactured for that purpose shall be used to secure the ends of the tubing in proper alignment and prevent the joints from separating during installation.

SECTION 20 - WATER INLET AREA

- (1) Joint spacing between adjacent pieces of drain tile shall not exceed 3 mm.
- (2) Perforated drainage pipe shall be laid with the greatest number of perforations closest to the bottom of the drain.
- (3) Where joint spaces between adjacent pieces of drain tile exceed acceptable limits as on the outer side of a curve, the joints shall be covered with a protective material.
- (4) The shape, number, spacing and area of water inlets in plastic tubing shall meet the requirements of the current Canadian Government Specification Board Standard 41-GP-29 for corrugated plastic tubing.

SECTION 21 - CONNECTIONS

- (1) Intercepted lateral drainage pipe shall be connected with the main drainage pipe so that their centre lines intersect.
- (2) Existing drains shall be inspected by the Drainage Superintendent and if found to be in working order, they shall be connected to the new system. Drains containing very little sediment shall be directly connected and drains containing substantial quantities of sediment shall be indirectly connected through filter material.
- (3) Drains carrying sewage or farmstead wastes shall not be connected to the drainage system.
- (4) Plastic tubing connections to rigid drainage pipe and plastic tubing shall be made with manufactured plastic adapters.
- (5) Directional changes in plastic tubing may be made without the use of fittings provided that the centre line radius of the bend is not less than five times the tubing diameter.
- (6) Manufactured "T", "Y", or elbow fittings shall be used for connections at the junction of two drains.
- (7) All connections shall be carried out by the Contractor as part of his work. Payment for connections shall be as specified in the tender documents.

SECTION 22 - CONSTRUCTION IN SANDY SOIL

- (1) Where fine sandy soils are encountered and the trench bottom is stable, the Contractor shall employ the following practices:
The joint spacings in drain tile shall not exceed 1 mm. The upper two-thirds of the drain shall be covered with a synthetic filter material, or other durable material, to prevent soil fines from entering the drain. This material shall be supplied by the Drainage Superintendent and the installation shall be undertaken by the Contractor at a negotiated price.
Drainage pipe shall be laid in the trench and the trench backfilled as quickly as possible after inspection by the Drainage Superintendent.

SECTION 23 - CONSTRUCTION IN UNSTABLE SOIL CONDITIONS

- (1) Where unstable soil conditions are encountered and the trench bottom or sides are unstable (e.g. quicksand) extreme care shall be taken to keep soil from entering the drain and to provide a firm foundation for the pipe. The Contractor may be directed to carry out one or more of the following practices:
 - Construct the drain when the soil is in its driest condition.
 - Use a trenchless method (drainage plow) of installing the drainage pipe.
 - Use a drainage plow to install a small diameter drainage pipe near the alignment of the proposed main in order to drain the area prior to installing the main drain.
 - Use a stabilizing material such as crushed stone in the trench.
 - Use a synthetic filter material to cover the water inlet area.
 - Use a perforated continuous pipe.
- (2) The Drainage Superintendent or Engineer may instruct the Contractor to carry out one or more of these practices. All additional materials shall be supplied by the Municipality. The Contractor shall undertake to perform the extra works so ordered and be paid a negotiated price for this work.

SECTION 24 - BLINDING

- (1) As the laying of drainage pipe progresses, the drainage pipe shall be blinded by placing crumbly soil, preferably topsoil, around the pipe to a minimum depth of 75 mm above the top of pipe. Where the drainage pipe may be subject to frost before being backfilled, the minimum depth of blinding shall be 150 mm.
- (2) Any required drain pipe protection materials such as filters or envelopes shall be installed before blinding.
- (3) Drainage pipe laid in open trenches shall be blinded by the end of each day.
- (4) Large stones and frozen lumps of soil shall not be permitted in the blinding material.
- (5) On steep grades, or where the topsoil contains fine sand, loam or clay soil (if available from the sides of the trench) shall be used as blinding material.

SECTION 25 - BACKFILLING

- (1) After the Drainage Superintendent has inspected the laying of the drainage pipe, earth excavated from the trench shall be used as backfill material and shall be heaped above the trench to avoid depressions following settlement.
- (2) Large stones, roots, broken pipe and other material likely to impede or damage field equipment shall be removed from the backfill and placed in a suitable disposal area by the Contractor.
- (3) To avoid the danger of damaging the drainage pipe, large stones and lumps of frozen earth may not be placed in the trench during the backfill operation.
- (4) Where plastic tubing is not blinded in a separate operation, a backfilling method shall be used that permits backfill material to roll into the trench and provide uniform soil placement around tubing, immediately after installation.
- (5) Surplus soil shall be spread over the adjacent field.
- (6) Except at laneways and road crossings, backfill material shall not be compacted; compaction shall be allowed to occur naturally.

SECTION 26 - TRENCHLESS METHOD

- (1) The trenchless method, using a drainage plow to install flexible plastic drainage tubing, can be used. Except for practices specifically applicable to the trenching method of construction only, all other practices relating to flexible plastic tubing apply to the trenchless method.
- (2) The drainage plow equipment shall construct a smooth bottomed opening in the soil, and maintain the opening until the flexible tubing has been properly installed.
- (3) The size of opening in the soil shall conform closely to the outside diameter of the tubing.
- (4) If an object, such as a large stone or ledge rock, causes an adverse deviation in grade, the point of deviation shall be marked in the field. The drain shall then be excavated at this point and the grade corrected.
- (5) All drain repairs shall be made in accordance with the recommended practice for construction by the trenching method.

SECTION 27 - LANE AND DRIVEWAY CROSSINGS

- (1) When called for in the Special Provisions, the Drainage Superintendent shall supply, at the expense of the drain, corrugated steel pipe in place of clay, concrete or plastic drainage pipe for installation beneath farm lanes and private driveways. The Contractor shall place the pipe as part of his work.
- (2) The pipe shall be laid in the trench with its invert at the grade line of the drain. Each end shall be connected to the drainage pipe in a water-tight manner.
- (3) Unless otherwise specified, the bedding and backfill to the pipe shall be native earth from the excavation. However, where driveways have a gravel surface, the Drainage Superintendent shall supply granular materials for the Contractor to place as the upper layer of backfill to restore the driveway to its original condition.
- (4) The backfill shall be carefully placed in the trench so as not to disturb the pipe. It shall be carried to the top of the trench in thoroughly compacted 200 mm layers.

SECTION 28 - ROAD CROSSING

- (1) At road crossings, the Drainage Superintendent shall supply, at the expense of the drain, corrugated steel pipe for installation beneath the travelled part of the road. The Drainage Superintendent shall also supply, at the expense of the drain, all necessary granular materials for bedding and backfill. The Contractor shall install the pipe, complete, as part of his work.
- (2) The trench shall be excavated true to line and grade and be of sufficient width to provide free working space and to permit compacting backfill material around the pipe but the width of the trench shall not exceed the inside diameter of the barrel of the pipe plus 300 mm.
- (3) The bottom of the trench shall be so shaped that at least the lower third of the circumference of the pipe shall be in contact with the bottom of the trench. For excavations in rock or hardpan, the trench shall be excavated to a depth at least 200 mm below the grade line and this excess depth shall be filled with thoroughly compacted granular material.
- (4) The pipe shall be laid with its invert at the grade line. Pipes of lap joint construction shall be laid with the inner laps downstream and sections shall be securely fastened with the couplers supplied by the manufacturer.
- (5) Across the travelled width of the roadway and shoulders, the trench shall be filled with granular backfill. The granular backfill shall be placed in layers not exceeding 150 mm in depth when compacted. Care shall be taken to ensure that the backfill is placed under the haunches and around the pipe. The granular material shall be used to complete the backfilling to the top of the trench.
- (6) Native earth shall be permitted for backfill in the trench beyond the limits of the shoulders of the travelled road.

SECTION 29 - EXISTING MAIN COVERED DRAINS

- (1) Where the new covered drain follows the course of an existing covered main drain, the Contractor shall locate the existing drainage pipe before commencing the work and clearly mark it. The Contractor shall avoid causing damage to the existing covered main drain. Any damage done to the existing drain by the Contractor shall be repaired by him at his expense.
- (2) Where the new covered drain intersects the course of an existing covered main drain, the Drainage Superintendent shall inspect the condition of the existing main and authorize the connection to the new drain if the condition warrants.
- (3) When, at the time of construction, it appears that the recommendations of the Special Provisions concerning connections of existing main drains into the new drain are inappropriate to suit the field condition, the Engineer and Drainage Superintendent may modify the recommendations to suit the field condition. All extra work by the Contractor shall be paid for by the Municipality at a negotiated price.

SECTION 30 - TILE OUTLET

- (1) Where a drain discharges into an open outlet, the Contractor shall install a length of steel pipe supplied by the Drainage Superintendent at the expense of the drain. The Drainage Superintendent shall also supply for installation by the Contractor a removable wire mesh rodent grate to be attached to the end of the pipe. Grate openings shall not exceed 25 mm.
- (2) The outlet pipe shall be installed as soon as the trench is excavated and shall extend to the toe of the slope of the open ditch.
- (3) Backfill for the outlet pipe shall be suitable excavated material placed and compacted in 150 mm layers up to the level of the adjoining ground.

- (4) The joint between the drainage pipe and the outlet pipe shall be sealed with concrete in a water-tight manner.

SECTION 31 - NEW CATCH BASINS

- (1) The Drainage Superintendent shall arrange for the supply and installation of concrete catch basins, at the expense of the drain, at the locations and elevations as shown on the plan and profile and as set out in the Special Provisions.
- (2) The Contractor shall install poured-in-place structures plumb and true to line and grade. The placing, finishing, curing and protection of concrete for structures shall be in accordance with the current Ministry of Transportation and Communications Specification Form 904.
- (3) The Contractor shall install all precast structures plumb and true to line and grade. Precast bases shall be set to the specified grade, shall be level, and shall have uniform overall contact with the underlying soil.
- (4) The elevation of the top surface of the catch basin cover is to be determined by the Drainage Superintendent and is to be such as to permit the entry of surface water into the basin, unless otherwise specified.
- (5) Unless otherwise specified, all catch basins installed shall have a minimum inside dimension of 600 mm x 600 mm. Cast-in-place catch basins shall have a minimum wall thickness of 230 mm. Precast concrete catch basins shall conform to the requirements of M.T.C. Specification Form 1351. The floor elevation shall be at least 600 mm below the invert of the outlet pipe in the wall of the catch basin.
- (6) Pipe placed in the walls for inlet and outlet connections shall extend through the wall a sufficient distance to allow for connections. The pipes shall be trimmed flush with the inside wall and shall be securely sealed into place using grout.
- (7) The Drainage Superintendent shall arrange for the fabrication of a removable steel or cast iron grating which shall be installed on the catch basin by the Contractor.

SECTION 32 – 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 33 - PROTECTION OF PUBLIC

- (1) Where the Contractor is working on or adjoining a traveled roadway, it is the Contractor's responsibility to maintain traffic within, entering and leaving the construction zone. The Contractor shall supply, erect and maintain such signs, delineators, barricades, lanterns and flashing lights as are required by the road authority for proper notification and protection of the public.
- (2) Where a road crossing is being installed, and it is necessary to close the road to through traffic, the Contractor shall arrange

SECTION 34 – 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 35 - 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 36 – 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 37 - 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 38 - 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 39 – 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 40 – 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 41 – 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 42 - 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 43 - 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 directed 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 right-of-ways.
- (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 warmwater 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. Cofferdams 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.

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