



ENGINEER'S REPORT

MARTIN ROAD DEVELOPMENT MUNICIPAL DRAIN

Municipality of Middlesex Centre



SBM-18-0775



CIVIL • STRUCTURAL • MECHANICAL • ELECTRICAL

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The Municipality of Middlesex Centre
10227 Ilderton Road
London, Ontario N0M 2A0

15 November 2018
SBM-18-0775

Attn: Mayor Deviet and Members of Council

Re: Martin Road Development Drain

Dear Mayor Deviet and Members of Council,

Find enclosed our report on the Martin Road Development Drain, which was prepared by Strik, Baldinelli, Moniz Ltd. (SBM) under Section 4 of the Drainage Act, R.S.O. 1990. SBM was appointed by Municipal Council at its April 25, 2018 meeting in response to a petition submitted to the Clerk and was notified of Council's resolution through a May 3, 2018 letter received from the Municipality.

We trust that the information contained herein is satisfactory. Please do not hesitate to contact the undersigned if any additional information clarification is required.

Respectfully submitted,

Strik, Baldinelli, Moniz Ltd.

Civil • Structural • Mechanical • Electrical

Kevin Moniz, P.Eng.
Principal, Civil Engineering

Ben Hyland, EIT
Engineer in Training

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1 INTRODUCTION & BACKGROUND

Landowners within the Municipality of Middlesex Centre submitted a petition under Section 4 of the Drainage Act for the construction of a new Municipal Drain.

Registered Owner	Signing Official	Legal Description of Property
1748986 Ontario Corp.	Emily Pattyn	Pt. Block 16, Plan 33M399
A&M Sod Supply Ltd.	James Glover	Pt. Park Lot 15, RP33R16885, Pts. 1&2
Serrarens Kees	Anne Van Gorp	Pt. Lot 8, Plan 305, RP33R17506 Pt. 1

The petition was submitted to provide a formal outlet for future road improvements and residential developments along Martin Road. The existing road is proposed to be upgraded to an urban standard complete with curb, catch basins, and storm sewers. A total of twenty-seven (27) single family residential lots are proposed at this time, all fronting Martin Road.

The Municipality's Drainage Superintendent provided drainage reports for the area. These drains are described below and are conceptually shown on the Plan of Watershed drawing provided in Appendix D.

- The Allison Drain forms the outlet for the Cummings Drain and Mennie Drain, and outlets to the Dingman Creek. It was constructed in 1974 and consists entirely of open ditch.
- The Biggar Drain is located south and east of the Allison Drain watershed, and outlets to the Dingman Creek. It was constructed in 1975 and is composed of open ditch between its outlet and Longwoods Road, with a small portion of 300mm (12") diameter pipe.
- The Cummings Drain is located in the Allison Drain watershed. It originated in 1963 through a combination of the Harris Award Drain, the Cummings Award Drain, and new construction, and extended from the north side of Wellington St at Pt Pk Lot 15 Plan 47, southwest to cross Martin Rd, and northwest to cross Wellington St. This section of the Drain was composed of 200mm (8") field tile and Corrugated Metal Pipe (CMP) at road and lane crossings. In 1993, the portion of this Drain located west of Martin Rd was replaced with 200mm (8") diameter filtered plastic tile and CMP at road crossings. In 2003, a report was prepared under Section 76 of the Drainage Act for the reassessment of the Drain due to severances and subdivision development within the watershed. No construction was included in the 2003 report.
- The Mennie Drain is located east of the Cummings Drain watershed and west of the Biggar Drain watershed, and is located within the Allison Drain watershed. The 1978 report provided by the Municipality indicated the Drain was previously constructed under a 1957 report, however a 1957 report was not provided or available. The 1978 report indicated that the previously installed tile had deteriorated due to unstable ground conditions. The construction scope included replacing the entire Drain with approximately 433m (1,420') of 250mm (10") to 350mm (14") diameter field tile as well as a new branch running up to the west side of Carriage Rd.

2 STAKEHOLDER CONSULTATION

Owners of all properties anticipated to be affected by the Drain were notified in accordance with Section 9(1) of the Drainage Act. An on-site meeting was held on May 25, 2018. The meeting notice included background information, a comments form, and a preliminary plan of watershed. Attendees included:

Kevin Moniz, P.Eng – SBM
 Ben Hyland, EIT – SBM
 Dan Anderson – Municipality of Middlesex Centre
 Cari Ramsey – Upper Thames River Conservation Authority
 Bob Fenlon, representing Nola Developments – Plan 305, Pt. Lot 8, RP 33R17506 Pt. 1
 Emily Pattyn – Pt. Block 16, Plan 33M399
 Tim O'Callaghan – Plan 305 Pt. Lot 7 & Plan 33M399 Pt Block 16, RP 33R17161 Pt. 1

Joe Franze, representing Mike & Connie Franze – Plan M399 Lot 15
Stephanie & Paul Foran – Plan M399 Lot 12

SBM explained that the petition was necessitated by the future road improvements and subdivision development along Martin Rd and requested that landowners provide any current drainage comments and concerns.

Tim O'Callaghan indicated he had no stormwater drainage issues.

Joe Franze provided written comments from Mike & Connie Franze, which stated they had no stormwater drainage issues.

Stephanie & Paul Foran indicated they had no concerns with stormwater drainage on their property.

Cari Ramsey reviewed the area and indicated the UTRCA had no immediate concerns with the proposed Drain but would review the proposal during the detailed design stage.

Following the on-site meeting, SBM examined the area requiring stormwater drainage. It was determined that the total watershed area was approximately 10.18 ha.

The contributing land area represented on the petition is approximately 7.71 ha, which is 75.7% of the overall watershed. In accordance with Section 9 (2) of the Drainage Act, it was determined that the petition complies with Section 4 (1)(b) of the Drainage Act in that a minimum 60.0% of the hectarage in the area is represented on the petition.

Several affected properties were not represented at the meeting but were contacted following the meeting. Mike Turek (Pt. Lot 2, RP 33R17506) indicated he had no stormwater drainage issues. Paul and Nancy Swinkels (Part Park Lot 15 Plan 47) have a pond located in the vicinity of the proposed Drain alignment and requested that, if possible, the pond remain. They also noted the access immediately west of their pond should remain.

3 DESIGN & RECOMMENDATIONS

The Drain has been designed to accommodate anticipated stormwater runoff from the proposed municipal sewers and contributing area. The proposed municipal sewers upstream will discharge directly into the Drain, therefore the Drain has been designed to provide the same hydraulic capacity as the proposed municipal sewers.

Considering the hydraulic capacity of the proposed municipal sewers as well as comments received from affected landowners, the following design is proposed. Refer to the design drawings provided in Appendix D for more information.

Installation of:

- ±90m of HDPE storm pipe (CSA B182.2)
- Two (2) concrete storm maintenance holes
- One (1) concrete headwall at the outlet
- Rip-rap on geotextile for erosion control at the outlet

4 COST ESTIMATE

The total cost of the drainage works has been estimated at **\$91,777.34 (incl net HST)**. A detailed cost estimate is included in Appendix A as per Section 8 (1)(b) of the Drainage Act. This cost estimate generally represents the value of the non-construction costs and construction work itemized thereon, however, the unit rates used to estimate the value of work are assumed based on recent industry rates and are subject to change with market conditions. Non-construction costs are estimated and cannot be determined until project completion.

5 ENVIRONMENTAL APPROVAL

This report and the attached design drawings have been submitted to the UTRCA for review and comment. Initial comments received at the on-site meeting indicated that the UTRCA was generally not opposed to the proposed work. Formal permit application will be undertaken prior to construction.

6 ALLOWANCES

The Drainage Act permits the engineer to determine and quantify compensation to be paid to the owner of any land, infrastructure, or other item affected by the Drain as determined from Sections 29-33. These sections are described below.

Section 29 – Allowances for right of way, etc.: Used where it is necessary to use land for the construction of the drainage works, typically limited to open ditches and pumping stations that inhibit the use of the land by the owner.

Section 30 – Amount of damage to ornamental trees, etc.: Used where ornamental trees, lawns, fences, lands and crops are anticipated to be damaged by the work.

Section 31 – Allowance for existing drains: Used where the Drain is reduced in length or scope due to the incorporation of an existing private drain into the drainage works.

Section 32 – Allowance for damage due to insufficient outlet: Used where the costs of continuing a drain to a sufficient outlet or constructing a drain to have adequate capacity will exceed the amount of injury likely to be caused to low-lying lands.

Section 33 – Allowance for loss of access: Used where an owner loses access to a part or parts of his or her property as a result of the Work, and is typically used where open ditches are constructed without crossings.

No allowances are considered applicable to the scope of work proposed as part of this report.

5 ASSESSMENTS

Section 21 of the Drainage Act requires the engineer to assess the total cost of the Work upon the affected lands. These assessments are divided into several categories, further described below. All properties within the drainage area are assessed a portion of the total cost of the Work.

Section 22 – Assessment for benefit.: Used where lands, roads, buildings, utilities or other structures are increased in value or are more easily maintained as a result of the Work. For this project, assessment through Section 22 is considered applicable for the proposed road improvements, subdivided lands, and lands considered developable due to the Work, as the Drain is required as an outlet for the proposed municipal storm sewer system.

Section 23 – Assessment for liability – Outlet liability: Used where an improved outlet is provided either directly or indirectly for lands and roads. Assessment for outlet liability is based on the volume and rate of flow of runoff from the lands and road. All areas within the drainage boundary of the Drain are considered to outlet to the Drain and are therefore assessed through this section. For this project, outlet liability was based on the contributing areas of properties within the drainage boundary, as well as runoff coefficients provided in the post-development storm catchment area plan for the proposed municipal sewers.

Refer to the Schedule of Estimated Construction Assessments in Appendix B. Note that these assessments are estimated only based on the cost estimate contained within this report – final assessments will be based on the actual construction cost.

Assessments on agricultural lands may be eligible for provincial grants through the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA). A grant application will be submitted following completion of construction.

6 MAINTENANCE

Following construction, the Drain shall be maintained and repaired by the Municipality at the expense of all the upstream lands and roads in any way assessed for the construction or improvement of the drainage works in the proportion determined by the then current by-law pertaining thereto under Section 74 of the Drainage Act.

7 LIMITATIONS

This report was prepared by Strik, Baldinelli, Moniz Ltd. for the Municipality of Middlesex Centre for the purpose expressed in this report. Use of this report by any third party, or any reliance upon its findings, is solely the responsibility of that party. Strik, Baldinelli, Moniz Ltd. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this report. Third party use of this report, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this report are based on site conditions as they appeared during the period of the investigation. This report is not intended to be exhaustive in scope. It should be recognized that the passage of time may alter the opinions, conclusions, and recommendations provided herein.

The design was limited to the documents referenced herein and Strik, Baldinelli, Moniz Ltd. accepts no responsibility for the accuracy of the information provided by others. All designs and recommendations presented in this report are based on the information available at the time of the review.

This document is deemed to be the intellectual property of Strik, Baldinelli, Moniz Ltd. in accordance with Canadian copyright law.

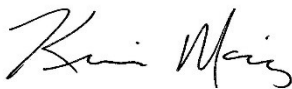
8 CLOSURE

We trust this report meets your satisfaction. Should you have any questions or require further information, please do not hesitate to contact us.

Respectfully submitted,

Strik, Baldinelli, Moniz Ltd.

Civil • Structural • Mechanical • Electrical



Kevin Moniz, P.Eng.
Principal, Civil Engineering



Ben Hyland, EIT
Engineer in Training

APPENDIX A

Cost Estimate



Cost Estimate
Martin Road Development Drain
SBM-18-0775

COST ESTIMATE

ITEM	DESCRIPTION	ESTIMATED QTY	UNIT	UNIT PRICE	TOTAL					
'A' - General										
A1	Mobilization / demobilization	1	LS	\$ 3,000.00	\$ 3,000.00					
A2	Construction layout	1	LS	\$ 2,500.00	\$ 2,500.00					
A3	Bonding (50% Labour & Materials, 50% Performance)	1	LS	\$ 3,000.00	\$ 3,000.00					
Sub-Total of 'A' =					\$ 8,500.00					
'B' - Site Preparation										
B1	Remove existing trees as indicated on the drawings, including clearing & grubbing, and disposal off-site	1	LS	\$ 18,000.00	\$ 18,000.00					
B2	Locally remove existing wood fence as required for construction	1	LS	\$ 300.00	\$ 300.00					
B3	Locally remove existing wire fence as required for construction	1	LS	\$ 300.00	\$ 300.00					
B4	Strip and stockpile topsoil where present	1	LS	\$ 1,500.00	\$ 1,500.00					
Sub-Total of 'B' =					\$ 20,100.00					
'C' - Storm System										
C1	Supply and install drain pipe incl. excavation, groundwater control, type 1 bedding, fittings/appurtenances, backfilling with approved native material to subgrade or pregrade, compaction, connection to MH's, etc.									
	FROM MH	TO MH	Size (mm)	Depth (m) (approx)	Class & Type	Bedding Material				
1	STMH-A	STMH-B	525	2.0	HDPE CSA	Bedding Sand	22.0	m	\$ 205.00	\$ 4,510.00
2	STMH-B	HEADWALL	525	2.0	B182.2		68.0	m	\$ 205.00	\$ 13,940.00
C2	Supply and install new storm maintenance hole incl. frame & lid, excavation, bedding, backfill with approved native material to finished grade elevation, compaction, groundwater control, benching, parging, appurtenances, compaction, ladder rungs, etc.									
			Size (mm)	Depth (m) (approx)	Notes					
a.	STMH-A		1200	1.9	Set to finished grade		1	LS	\$ 3,100.00	\$ 3,100.00
b.	STMH-B		1200	3.3	Set to finished grade		1	LS	\$ 3,500.00	\$ 3,500.00
C3	Supply and install new concrete headwall incl. grate to OPSD 804.050, excavation, bedding, backfill with approved native material to finished grade elevation, compaction, groundwater control, parging									
							1	ea	\$ 3,500.00	\$ 3,500.00
C4	Rip-Rap Type B open ditch c/w geotextile, including excavation. 300mm thick handlaid rip rap									
							25	m ²	\$ 50.00	\$ 1,250.00
C5	Cleaning, flushing, video inspection, and deflection testing									
							1	LS	\$ 2,000.00	\$ 2,000.00
C6	Provisional - 19mm crushed stone bedding in lieu of bedding sand									
							50	t	\$ 25.00	\$ 1,250.00
C7	Provisional - geotextile fabric surround (per linear metre of pipe)									
							50	m	\$ 10.00	\$ 500.00
C8	Provisional - trench subexcavation including disposal offsite									
							50	m ³	\$ 12.00	\$ 600.00
Sub-Total of 'C' =					\$ 34,150.00					



Cost Estimate
Martin Road Development Drain
SBM-18-0775

COST ESTIMATE

ITEM	DESCRIPTION	ESTIMATED QTY	UNIT	UNIT PRICE	TOTAL
'D' - Restoration					
D1	Restore wood fence to original condition or better	1	LS	\$ 500.00	\$ 500.00
D2	Restore wire fence to original condition or better	1	LS	\$ 500.00	\$ 500.00
D3	Spread stockpiled topsoil	1	LS	\$ 1,000.00	\$ 1,000.00
D4	Hydroseed topsoiled areas	1	LS	\$ 1,500.00	\$ 1,500.00
Sub-Total of 'D' =					\$ 3,500.00
'E' - Non-Construction Costs					
E1	Estimated engineering fees including on-site meeting, topographic survey, preparation of report and design drawings, and presentation to Council	1	LS	\$ 14,500.00	\$ 14,500.00
E2	Estimated engineering fees including tendering, construction/contract administration, and grant application	1	LS	\$ 4,000.00	\$ 4,000.00
E3	Upper Thames River Conservation Authority - Application Fee (estimated)	1	LS	\$ 150.00	\$ 150.00
E4	Carrying costs (estimated at 3% of construction)	1	LS	\$ 1,990.00	\$ 1,990.00
Sub-Total of 'E' =					\$ 20,640.00

SUMMARY

'A' - General	\$	8,500.00
'B' - Site Preparation	\$	20,100.00
'C' - Storm System	\$	34,150.00
'D' - Restoration	\$	3,500.00
Subtotal 'A' to 'D' =	\$	66,250.00
Contingency (±5% of Construction) =	\$	3,300.00
'E' - Non-Construction Costs	\$	20,640.00
Subtotal =	\$	90,190.00
Net HST (1.76%) =	\$	1,587.34
TOTAL (HST Inclusive) =	\$	91,777.34

APPENDIX B

Schedule of Estimated Construction Assessments



Schedule of Estimated Construction Assessments
Martin Road Development Drain
SBM-18-0775

Schedule of Estimated Construction Assessments

Roll No.	Legal Description	Owner Name	Affected Area		Factored Area		Tax Status	Benefit (Section 22)	Outlet (Section 23)	Section 24 & 26	Total	Allowances	Net
			(ha)	(ac)	(ha)	(ac)							
20-033-00	Plan 305 N Pt Lot 6	A & W Geerts	0.5523	1.3648	0.1270	0.3139	RT	\$ -	\$ 385.15	\$ -	\$ 385.15	\$ -	\$ 385.15
20-034-00	Plan 305 Pt Lot 7 & Plan 33M399, Pt Blk 16, RP33R17161 Pt 1	T. O'Callaghan & N. Forestell	0.3816	0.9430	0.0878	0.2169	RT	\$ -	\$ 266.12	\$ -	\$ 266.12	\$ -	\$ 266.12
20-035-00	Plan 305, Pt Lot 8, RP 33R17506, Pt 1	K & R Serrarens	0.8000	1.9769	0.3452	0.8531	RT	\$ 14,003.43	\$ 1,046.78	\$ -	\$ 15,050.21	\$ -	\$ 15,050.21
20-035-60	Plan 305, Pt Lot 8, RP 33R17506, Pt 2	M. Turek & L. Lukas	0.0140	0.0345	0.0028	0.0069	RT	\$ -	\$ 8.46	\$ -	\$ 8.46	\$ -	\$ 8.46
20-042-00	Plan 47, Pt Park Lot 15	H. & N. Swinkels	0.0103	0.0256	0.0021	0.0051	R/C	\$ -	\$ 6.27	\$ -	\$ 6.27	\$ -	\$ 6.27
20-044-50	Plan 47, Pt Park Lot 15, RP33R16885, Pts 1 & 2	1748986 Ontario Corp.	2.8256	6.9821	1.0049	2.4832	RT	\$ 33,251.28	\$ 3,046.97	\$ -	\$ 36,298.24	\$ -	\$ 36,298.24
20-045-00	Pt Blk 16, Plan 33M399	A & M Sod Supply Ltd	4.0811	10.0846	1.3376	3.3052	FT	\$ 33,509.35	\$ 4,055.52	\$ -	\$ 37,564.87	\$ -	\$ 37,564.87
20-045-48	Plan M399, Lot 15	J & K Woolsey	0.1347	0.3328	0.0310	0.0766	RT	\$ -	\$ 93.93	\$ -	\$ 93.93	\$ -	\$ 93.93
20-045-50	Plan M399, Lot 14	M. Franze	0.1350	0.3336	0.0311	0.0767	RT	\$ -	\$ 94.14	\$ -	\$ 94.14	\$ -	\$ 94.14
20-045-72	Plan M399, Lot 13	G & B Heard	0.1377	0.3403	0.0317	0.0783	RT	\$ -	\$ 96.03	\$ -	\$ 96.03	\$ -	\$ 96.03
20-045-74	Plan M399, Lot 12	P & S Foran	0.1430	0.3534	0.0329	0.0813	RT	\$ -	\$ 99.72	\$ -	\$ 99.72	\$ -	\$ 99.72
	Martin Road	Municipality of Middlesex Centre	0.8272	2.0440	0.4723	1.1672	-	\$ -	\$ 1,432.11	\$ -	\$ 1,432.11	\$ -	\$ 1,432.11
	Harris Road	Municipality of Middlesex Centre	0.1430	0.3534	0.0329	0.0813	-	\$ -	\$ 382.07	\$ -	\$ 382.07	\$ -	\$ 382.07
Totals			10.1855	25.1689	3.5392	8.7456		\$ 80,764.06	\$ 11,013.28	\$ -	\$ 91,777.34	\$ -	\$ 91,777.34

APPENDIX C

Schedule of Assessments for Future Maintenance



**Schedule of Maintenance Assessments
Martin Road Development Drain
SBM-18-0775**

Schedule of Future Maintenance Assessments

Roll No.	Legal Description	Owner Name	Affected Area		Factored Area		Total
			(ha)	(ac)	(ha)	(ac)	
20-033-00	Plan 305 N Pt Lot 6	A & W Geerts	0.5523	1.3648	0.1270	0.3139	3.59%
20-034-00	Plan 305 Pt Lot 7 & Plan 33M399, Pt Blk 16, RP33R17161 Pt 1	T. O'Callaghan & N. Forestell	0.3816	0.9430	0.0878	0.2169	2.48%
20-035-00	Plan 305, Pt Lot 8, RP 33R17506, Pt 1	K & R Serrarens	0.8000	1.9769	0.3452	0.8531	9.75%
20-035-60	Plan 305, Pt Lot 8, RP 33R17506, Pt 2	M. Turek & L. Lukas	0.0140	0.0345	0.0028	0.0069	0.08%
20-042-00	Plan 47, Pt Park Lot 15	H. & N. Swinkels	0.0103	0.0256	0.0021	0.0051	0.06%
20-044-50	Plan 47, Pt Park Lot 15, RP33R16885, Pts 1 & 2	1748986 Ontario Corp.	2.8256	6.9821	1.0049	2.4832	28.39%
20-045-00	Pt Blk 16, Plan 33M399	A & M Sod Supply Ltd	4.0811	10.0846	1.3376	3.3052	37.79%
20-045-48	Plan M399, Lot 15	J & K Woolsey	0.1347	0.3328	0.0310	0.0766	0.88%
20-045-50	Plan M399, Lot 14	M. Franze	0.1350	0.3336	0.0311	0.0767	0.88%
20-045-72	Plan M399, Lot 13	G & B Heard	0.1377	0.3403	0.0317	0.0783	0.89%
20-045-74	Plan M399, Lot 12	P & S Foran	0.1430	0.3534	0.0329	0.0813	0.93%
	Martin Road	Municipality of Middlesex Centre	0.8272	2.0440	0.4723	1.1672	13.35%
	Harris Road	Municipality of Middlesex Centre	0.1430	0.3534	0.0329	0.0813	0.93%
Totals			10.1855	25.1689	3.5392	8.7456	100%

APPENDIX D

Schedule of Assessments for Future Maintenance – Future Subdivided Land

Schedule of Future Maintenance Assessments - Future Subdivided Land

Roll No.	Legal Description	Owner Name	Affected Area		Factored Area		Total
			(ha)	(ac)	(ha)	(ac)	
20-033-00	Plan 305 N Pt Lot 6	A & W Geerts	0.5523	1.3648	0.1270	0.3139	2.40%
20-034-00	Plan 305 Pt Lot 7 & Plan 33M399, Pt Blk 16, RP33R17161 Pt 1	T. O'Callaghan & N. Forestell	0.3816	0.9430	0.0878	0.2169	1.66%
20-035-00	Plan 305, Pt Lot 8, RP 33R17506, Pt 1	K & R Serrarens	0.18260	0.4512	0.3452	0.8531	6.52%
20-035-60	Plan 305, Pt Lot 8, RP 33R17506, Pt 2	M. Turek & L. Lukas	0.0140	0.0345	0.0028	0.0069	0.05%
20-042-00	Plan 47, Pt Park Lot 15	H. & N. Swinkels	0.0103	0.0256	0.0021	0.0051	0.04%
20-044-50	Plan 47, Pt Park Lot 15, RP33R16885, Pts 1 & 2	1748986 Ontario Corp.	1.35674	3.3526	1.0049	2.4832	18.99%
20-045-00	Pt Blk 16, Plan 33M399	A & M Sod Supply Ltd	2.60248	6.4308	1.3376	3.3052	25.28%
20-045-48	Plan M399, Lot 15	J & K Woolsey	0.1347	0.3328	0.0310	0.0766	0.59%
20-045-50	Plan M399, Lot 14	M. Franze	0.1350	0.3336	0.0311	0.0767	0.59%
20-045-72	Plan M399, Lot 13	G & B Heard	0.1377	0.3403	0.0317	0.0783	0.60%
20-045-74	Plan M399, Lot 12	P & S Foran	0.1430	0.3534	0.0329	0.0813	0.62%
FUT	39T-MC1201, Plan 33M-399, Lot 1	1748986 Ontario Corp.	0.1367	0.3377	0.0683	0.1689	1.29%
FUT	39T-MC1201, Plan 33M-399, Lot 2	1748986 Ontario Corp.	0.1369	0.3382	0.0684	0.1691	1.29%
FUT	39T-MC1201, Plan 33M-399, Lot 3	1748986 Ontario Corp.	0.1363	0.3369	0.0682	0.1685	1.29%
FUT	39T-MC1201, Plan 33M-399, Lot 4	1748986 Ontario Corp.	0.1376	0.3400	0.0688	0.1700	1.30%
FUT	39T-MC1201, Plan 33M-399, Lot 5	1748986 Ontario Corp.	0.1370	0.3386	0.0685	0.1693	1.29%
FUT	39T-MC1201, Plan 33M-399, Lot 6	1748986 Ontario Corp.	0.1371	0.3387	0.0685	0.1694	1.30%
FUT	39T-MC0601, Plan 33M-399, Block 12	Municipality of Middlesex Centre	0.1136	0.2807	0.0568	0.1403	1.07%
FUT	39T-MC1201, Plan 33M-399, Lot 7	1748986 Ontario Corp.	0.1684	0.4161	0.0842	0.2081	1.59%
FUT	39T-MC1201, Plan 33M-399, Lot 8	1748986 Ontario Corp.	0.1369	0.3382	0.0684	0.1691	1.29%
FUT	39T-MC1201, Plan 33M-399, Lot 9	1748986 Ontario Corp.	0.1141	0.2818	0.0570	0.1409	1.08%
FUT	39T-MC1201, Plan 33M-399, Lot 10	1748986 Ontario Corp.	0.1144	0.2827	0.0572	0.1413	1.08%
FUT	39T-MC1202, Plan 33M-399, Lot 1	K & R Serrarens	0.1235	0.3051	0.0617	0.1526	1.17%
FUT	39T-MC1202, Plan 33M-399, Lot 2	K & R Serrarens	0.1235	0.3051	0.0617	0.1526	1.17%
FUT	39T-MC1202, Plan 33M-399, Lot 3	K & R Serrarens	0.1235	0.3051	0.0617	0.1526	1.17%
FUT	39T-MC1202, Plan 33M-399, Lot 4	K & R Serrarens	0.1235	0.3051	0.0617	0.1526	1.17%
FUT	39T-MC1202, Plan 33M-399, Lot 5	K & R Serrarens	0.1235	0.3051	0.0617	0.1526	1.17%
FUT	39T-MC0603, Plan 33M-399, Lot 1	A & M Sod Supply Ltd	0.1000	0.2471	0.0500	0.1236	0.94%
FUT	39T-MC0603, Plan 33M-399, Lot 2	A & M Sod Supply Ltd	0.1000	0.2471	0.0500	0.1236	0.94%
FUT	39T-MC0603, Plan 33M-399, Lot 3	A & M Sod Supply Ltd	0.1000	0.2471	0.0500	0.1236	0.94%
FUT	39T-MC0603, Plan 33M-399, Lot 4	A & M Sod Supply Ltd	0.1000	0.2471	0.0500	0.1236	0.94%
FUT	39T-MC0603, Plan 33M-399, Lot 5	A & M Sod Supply Ltd	0.1000	0.2471	0.0500	0.1236	0.94%
FUT	39T-MC0603, Plan 33M-399, Lot 6	A & M Sod Supply Ltd	0.1000	0.2471	0.0500	0.1236	0.94%
FUT	39T-MC0603, Plan 33M-399, Lot 7	A & M Sod Supply Ltd	0.1258	0.3109	0.0629	0.1555	1.19%
FUT	39T-MC0603, Plan 33M-399, Lot 8	A & M Sod Supply Ltd	0.1300	0.3212	0.0650	0.1606	1.23%
FUT	39T-MC0603, Plan 33M-399, Lot 9	A & M Sod Supply Ltd	0.1138	0.2813	0.0569	0.1406	1.08%
FUT	39T-MC0603, Plan 33M-399, Lot 10	A & M Sod Supply Ltd	0.1237	0.3056	0.0618	0.1528	1.17%
FUT	39T-MC0603, Plan 33M-399, Lot 11	A & M Sod Supply Ltd	0.1236	0.3055	0.0618	0.1527	1.17%
FUT	39T-MC0603, Plan 33M-399, Lot 12	A & M Sod Supply Ltd	0.1617	0.3994	0.0808	0.1997	1.53%
FUT	Street 'A'	Municipality of Middlesex Centre	0.1000	0.2471	0.0200	0.0494	0.38%
	Martin Road	Municipality of Middlesex Centre	0.8272	2.0440	0.4723	1.1672	8.93%
	Harris Road	Municipality of Middlesex Centre	0.1430	0.3534	0.0329	0.0813	0.62%
		Totals	10.1855	25.1689	5.2917	13.0759	100%

APPENDIX E

Drawings

APPENDIX F

Special Provisions

APPENDIX F

Special Provisions

SECTION A - GENERAL**A1 Mobilization / Demobilization**

- .1 This item shall include all costs relating to transporting equipment, materials, and personnel to/from the site as necessary to complete the Work, except those costs already included in separate items.
- .2 Portable washroom facilities shall be provided by the Contractor for the duration of construction and are included in this item.
- .3 Included in this item is the cost for maintaining the work in a safe and tidy condition.
- .4 Progress payments for this item shall be proportional to the overall progress of the Work. The first progress payment shall be a minimum of 40% of the lump sum bid price.

A2 Construction Layout

- .1 The lump sum bid price will be considered full compensation for all labour, equipment and material necessary to provide construction layout.

A3 Bonding

- .1 The lump sum bid price will be considered full compensation for the cost to provide the specified bonding.
- .2 This item shall be paid at 100% on the first progress payment.

SECTION B – SITE PREPARATION**B1 Remove Existing Trees, Clearing and Grubbing**

- .1 The work for the applicable items covers the supply of all labour and equipment necessary to remove the vegetation indicated on the Contract Drawings. The contractor is to comply with the general requirements of OPSS 201, OPSS 801 and additional requirements as specified herein.
- .2 All removals must be felled by an ISA Certified Arborist using proper methods to limit damage to adjacent trees and property.
- .3 The removals are to be completed outside of the bird nesting season from April 1st to August 31st unless the trees have been reviewed and cleared as nest free by a qualified bird specialist.
- .4 The lump sum price for this item shall be full compensation for all labour, Equipment and Materials necessary, including the removal and disposal off site of trees (including stumps) required for construction.

B2/B3 Locally Remove Existing Wire/Wood Fence

- .1 The lump sum bid price will be considered full compensation for all labour, equipment and material necessary to locally remove the existing wire/wood fences as required for construction. Removed material shall be stockpiled for reuse.

B4 Strip and Stockpile Topsoil

- .1 The lump sum bid price will be considered full compensation for all labour, equipment and material necessary to strip the topsoil (where present) for a 6m working width along the drain alignment.
- .2 Stripped topsoil shall be stockpiled in locations to be determined by the Contract Administrator and/or agreed to by the associated property owner.

SECTION C – STORM SYSTEM**C1 Supply and Install Drain Pipe**

- .1 All drain pipe installation shall conform to Municipal Standards and the Contract Drawings.
- .2 The unit price shall include all equipment, material and labour necessary to install the drain pipe to Municipal standards, including excavation, pipe, fittings, caps, bedding, and backfill.

C2 Supply and Install Precast Concrete Maintenance Holes

- .1 The unit price for this item shall include the supply and installation of new precast concrete maintenance holes, including excavation, bedding, pipe connections, parging, risers, adjustment units, frame, grate, and backfill. Lids shall be set to finished grade elevation.
- .2 The pipe(s) shall be trimmed flush with the inside face of the manhole and parged including all annular spaces to ensure a smooth transition between the benching and the sewers. Benching is included in this item.
- .3 Backfill and compaction shall be as per OPSS 501 and the Geotechnical Engineer's recommendation.
- .4 Contractor to provide project specific shop drawings for all maintenance holes prior to fabrication. Shop drawings will be reviewed for design only, i.e. inverts, cover, and location of sewers. It is the Contractor's and Supplier's responsibility to ensure the structure and components meet all specifications.
- .5 Confined Space Procedures will be required as per the Occupational Health and Safety Act.

C3 Supply and Install Precast Concrete Headwall

- .1 The unit price for this item shall include the supply and installation of new precast concrete headwall, including excavation, bedding, pipe connections, parging, grate, and backfill.

C4 Supply and Install Rip-Rap Open Ditch

- .1 The unit price for this item shall include all equipment, material and labour necessary to install the rip-rap as specified on the Contract Drawings including excavation, geotextile, and rip-rap.

C5 Cleaning, Flushing, Video Inspection, and Deflection Testing

- .1 Immediately prior to video inspection, all drain pipe is to be flushed and cleaned.
- .2 Deflection testing shall be completed a minimum of 30 days following installation of all flexible pipe sewers as per OPSS 410.07.16.05 and shall be witnessed by the Contract Administrator. Any sections of sewer that do not pass shall be repaired and retested at the Contractor's expense.
- .3 A minimum of 30 days following completion of sewer installation, the Contractor shall flush sewers and conduct a video inspection. The lump sum bid price shall include the supply of digital (DVD or USB) video files and a hard copy of the report outlining the condition of the sewers and connections.
- .4 The Contract Administrator shall review the video files and report and direct the Contractor to correct deficiencies, if any, and resubmit digital video files and the report. All costs associated with correcting deficiencies and repeating the video inspection are the responsibility of the Contractor.
- .5 The lump sum bid price shall include all equipment, labour, and materials to flush the sewers, perform the video inspection and reporting, and perform the deflection testing.

C6 Provisional – 19mm crushed stone bedding in lieu of bedding sand

- .1 Supply and install clear stone in trenches as bedding / cover material in lieu of bedding sand in locations authorized by the Contract Administrator upon request by the Contractor due to wet ground conditions.
- .2 Measurement for this item shall be by the lineal metre of trench where the bedding has been substituted from design specification and shall be full credit for all labour, equipment and material to do the work.
- .3 This provisional item shall only be used under prior written authorization of the Contract Administrator.

C7 Provisional – Geotextile Fabric Surround

- .1 The unit price for this provisional item shall include all equipment, material and labour necessary to install geotextile fabric around the outside of the bedding and cover material.
- .2 This provisional item shall only be used under prior written authorization of the Contract Administrator.

C8 Provisional – Trench Subexcavation including disposal offsite

- .1 The unit price for this provisional item shall include all equipment, material and labour necessary to install the bedding in lieu of Type 1 bedding.
- .2 This provisional item shall only be used under prior written authorization of the Contract Administrator where, under request by the Contractor, the bottom of the trench is not deemed suitable to receive the bedding and backfill.

SECTION D – RESTORATION**D1/D2 Restore Wood/Wire Fence to Original Condition or Better**

- .1 The lump sum price shall include all equipment, material and labour necessary to re-install the wood and wire fences (previously locally removed for construction) original condition or better, including excavation for posts, hand-mixed concrete for post base, backfill, hardware, and reinstallation of salvaged material. If existing material is damaged through the Contractor's negligence, the Contractor shall supply replacement material at his own cost.

D3 Spread Stockpiled Topsoil

- .1 The lump sum price shall include all equipment, material and labour necessary to re-install the topsoil previously stockpiled.

D4 Hydroseed Topsoiled Areas

- .1 The lump sum price shall include all equipment, material and labour necessary to hydroseed topsoiled areas per OPSS 804.