



BURNSIDE

**Engineer's Report
Lake Road Diversion Drain
Improvement**

Municipality of Central Elgin

**R.J. Burnside & Associates Limited
449 Josephine Street P.O. Box 10
Wingham ON N0G 2W0 CANADA**

**May 2021
300033208.0000**



ASSESSMENTS for CONSTRUCTION ENTIRE DRAIN

Project: Lake Road Diversion Drain Improvement

Project No.: 300033208

Date: May 2021

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
Lands - Central Elgin							
Range 1 NLR	15	* G-Lover Holdings Inc.	2-019-00	4.87	22,500	1,880	24,380
Range 1 NLR & SLR	Pt. D & Pt. 16	* M. Kong	2-019-01	1.50	-	330	330
Range 1 SLR	15	* 2526485 Ontario Inc.	2-319-04	5.72	52,210	3,010	55,220
Range 1 SLR	14	* J. & J. Back	2-890-00	17.31	-	9,780	9,780
Range 1 SLR	15	* Block Assessment - 2526485 Ontario Inc.	2-319-04	5.52	-	12,270	12,270
Range 1 SLR	13, 14 & 15	* Block Assessment - upstream of Sta. 1+020	Various (60)	11.94	-	26,970	26,970
Total on Lands - Municipality of Central Elgin				46.86	\$ 74,710	\$ 54,240	\$ 128,950
Roads - Central Elgin							
George Street		* Municipality of Central Elgin		1.75	-	9,890	9,890
Walter Street		* Municipality of Central Elgin		0.02	-	70	70
Frederick Street		* Municipality of Central Elgin		0.03	-	100	100
Meek Street		* Municipality of Central Elgin		0.04	-	140	140
Charles Street		* Municipality of Central Elgin		0.10	-	340	340
Total on Roads - Municipality of Central Elgin				1.94	\$ -	\$ 10,540	\$ 10,540
ALL LANDS AND ROADS - Municipality of Central Elgin				48.80	\$ 74,710	\$ 64,780	\$ 139,490

<i>Less</i> 1/3 Grant	<i>Less</i> Allowances	Net Assessment
\$ -	\$ 16,130	\$ 8,250
\$ -	-	\$ 330
\$ -	\$ 10,970	\$ 44,250
\$ -	-	\$ 9,780
\$ -	-	\$ 12,270
\$ -	-	\$ 26,970
\$ -	\$ 27,100	\$ 101,850
\$ -	-	\$ 9,890
\$ -	-	\$ 70
\$ -	-	\$ 100
\$ -	-	\$ 140
\$ -	-	\$ 340
\$ -	\$ -	\$ 10,540
\$ -	\$ 27,100	\$ 112,390



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Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
Agricultural Lands - Southwold							
Range 1 NLR	14	Chestnut Grove Farms Ltd.	8-092-30	25.90	-	24,170	24,170
Range 1 NLR	13	Steve Goodhue Farms Ltd.	8-090-00	11.12	-	11,510	11,510
Range 1 NLR	13	Chestnut Grove Farms Ltd.	8-091-00	9.38	-	7,900	7,900
Range 1 SLR	13	Chestnut Grove Farms Ltd.	8-022-10	17.22	-	14,930	14,930
Total on Lands - Township of Southwold				63.62	\$ -	\$ 58,510	\$ 58,510
Roads - Southwold							
Total on Roads - Township of Southwold				-	\$ -	\$ -	\$ -
ALL LANDS AND ROADS - Township of Southwold				63.62	\$ -	\$ 58,510	\$ 58,510
ALL LANDS AND ROADS - Central Elgin and Southwold				112.42	\$ 74,710	\$ 123,290	\$ 198,000

<i>Less</i> 1/3 Grant	<i>Less</i> Allowances	Net Assessment
8,057	-	16,113
3,837	-	7,673
2,633	-	5,267
4,977	-	9,953
\$ 19,503	\$ -	\$ 39,007
\$ -	-	\$ -
\$ -	-	\$ -
\$ -	\$ -	\$ -
\$ 19,503	\$ -	\$ 39,007
\$ 19,503	\$ 27,100	\$ 151,397

Notes:

- (1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
- (2) It is the responsibility of the landowner to confirm whether their property is eligible for an OMAFRA grant, under ADIP policies as eligibility has not been confirmed as part of the preparation of this report.
- (3) Entries shaded in blue indicate they are part of the block assessment as directed by the Municipality

Distribution List

No. of Hard Copies	PDF	Email	Organization Name
1	Yes	Yes	Municipality of Central Elgin (Municipality)
3	Yes	Yes	Township of Southwold (Township)
4	No	No	Landowners (distributed by Municipality)
2	No	No	Landowners (distributed by Township)
1	Yes	Yes	Ontario Ministry of Agriculture, Food and Rural Affairs
0	Yes	Yes	Department of Fisheries and Oceans
0	Yes	Yes	Ministry of Environment, Conservation and Parks
0	Yes	Yes	Kettle Creek Conservation Authority

Record of Revisions

Revision	Date	Description
0	May 12, 2021	Draft Submission to Municipality and Township
1	May 25, 2021	Final Report for Municipality of Central Elgin

R.J. Burnside & Associates Limited**Report Prepared By:**

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Project Engineer
JRD/CF:tp

Report Reviewed By:

Caitlin Fergusson, P.Eng.
Project Engineer

Executive Summary

Authorization

The preparation of this Report by R.J. Burnside & Associates Limited (Burnside) for improvements to the Lake Road Diversion Drain (the drain) was authorized in a letter of instruction from the Manager of Transportation & Drainage for the Municipality of Central Elgin (Municipality) in accordance with Section 78 of the Drainage Act (Act), R.S.O. 1990, Chapter D17.

Objectives

The Objectives of this Report, are to authorize the following:

1. Repair and improvement to the existing drain at various locations along its course within the Village of Port Stanley.
2. Prepare updated Assessment Schedules for the “improvement of” as well as the “future maintenance of” the drain. Furthermore, and as directed by the Council of the Municipality, “... *group all the urban residential and commercial properties into a block assessment to the Municipality ...*” in accordance with Section 25 of the Act.

Recommendations Summary

It is recommended that the improvements to the drain be the combination of authorized work completed prior to the filing of this report as well as that to be completed after its adoption, which have been or will be undertaken on the two properties located along its course and consists of the following major items:

1. The already completed brushing of the drain corridor and one drain bank, as well as the to be completed treatment and disposal of the resulting debris and woody material, primarily on the portion of the drain on property Roll No. 2-319-04;
2. A drain bottom cleanout on property Roll No. 2-019-00 to the specified gradient including the loading, hauling and disposing of the resulting spoil; and
3. The improvement of the drain on property Roll No. 2-319-04 to have a minimum 1.0m bottom width, maximum of 1.5H:1.0V sideslopes, the specified bottom gradient including the loading, hauling and disposing of the resulting spoil, as well as any necessary bank stabilization.

Engineer's Report
May 2021

A summary of the Assessments, as estimated by the engineer (and as per column one of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) *Application for a Grant for Municipal Drain Construction or Improvement* form), for this project are as follows:

1. Canada Owned Lands	\$0
2. Ontario Lands	\$0
3. Municipal Lands	\$10,540
4. Privately owned Non-Agricultural (<i>incl. block assessment</i>)	\$128,950
5. Privately owned Agricultural	
- grantable	\$58,510
- non-grantable	\$0
6. Special non-proratable assessments	
- agricultural (grantable)	\$0
- agricultural (non-grantable)	\$0
- non-Agricultural (Sec. 26)	<u>\$0</u>
7. Project Total	\$198,000

Acknowledgements

Burnside acknowledges the participation of stakeholders in this watershed, Municipal staff, the Director of Infrastructure and Community Services, the Director of Asset Management/Development Services, and the Assistant Operations Superintendent.

Burnside also recognizes the significant contributions of the Drainage Superintendent for the Municipality as well as the Drainage Superintendent for the Township of Southwold (Township). We sincerely thank all stakeholders for their patience and understanding.

NOMENCLATURE

ac - acre (0.4047 ha)
BJB – buried junction box
CB - catchbasin
CDT - concrete drain tile
CSP - corrugated steel pipe
c/w - complete with
dia. - diameter
DICB – ditch inlet catchbasin
D/S - downstream
ea - each
FL - fence Line
FPPDT - filtered perforated plastic drainage tubing
FTCB - flat top catchbasin
H - horizontal
ha - hectare (2.471 ac)
HDPE – high density polyethylene
JB - junction box
km - kilometre
l.s. - lump sum
m - metre
mm - millimetre
m² - square metre
m³ - cubic metre
OB - observation box
O/H - overhead
O/S - offset
PDT - plastic drainage tubing
PL - property line
PPDT - perforated plastic drainage tubing
RCSP - riveted corrugated steel pipe
ROW - right of way
S & I - supply and install
SPDT - solid plastic drainage tubing
Sta. - station (chainage)
SWI - surface water inlet
SWRSP - smoothwall rigid sewer pipe
SWWSP - smoothwall welded steel pipe
T - tonne (2,205 pounds)
U/G - underground
U/S - upstream
V – vertical

Table of Contents

1.0	Introduction	1
1.1	Request for Improvement	1
1.2	Appointments under the Act.....	2
1.3	Engineer's Report	2
1.4	The Drainage Act, RSO 1990	2
2.0	Background Information.....	2
2.1	History.....	2
2.2	Existing Conditions	3
2.3	Location	3
2.4	Watershed Area and Land Use.....	4
2.5	Lot Lines and Property Boundaries.....	4
2.6	Soils	5
3.0	Investigations and Communication.....	5
3.1	On-Site Meeting	5
3.2	Brushing and Survey of the Drain	6
3.3	Interim Maintenance of the Drain.....	6
3.4	Project Scoping Meeting One	7
3.5	Project Scoping Meeting Two	8
3.6	Meetings with Developer.....	8
3.7	Summation.....	9
4.0	Design Criteria and Considerations	10
4.1	General	10
4.2	Other Work.....	10
4.3	Material Selection	10
5.0	Proposed Work.....	10
5.1	Roll No. 2-019-00 – Station 0+000 to 0+270	10
5.2	Roll No. 2-319-04 – Station 0+270 to 1+020	11
5.3	Working Space and Access Routes.....	11
5.4	Change Orders	12
6.0	Environmental and Fisheries Considerations	12
6.1	Kettle Creek Conservation Authority (KCCA).....	12
6.2	Fisheries and Oceans Canada (DFO)	12
6.3	Sediment Controls	12
7.0	Description of Appendices	13
7.1	Appendix A – Allowances	13
7.1.1	General	13
7.1.2	Section 29 – Right of Way (Use).....	13
7.1.3	Section 30 – Damages	14
7.2	Appendix B – Project Cost Estimate	14
7.3	Appendix C – Schedule of Assessments	15
7.3.1	Appendix C1 to C3 – Schedules of Assessments for Construction 15	

7.3.2	Appendix C4 – Schedule of Assessments for Maintenance.....	19
7.4	Appendix D – Assessments Supporting Calculations	20
7.5	Appendix E – Standard Drain Specifications	20
7.6	Appendix F – Special Provisions.....	20
7.7	Appendix G – Agency Documents and Approvals	20
7.8	Appendix H – Drawings	20
8.0	Maintenance.....	20
8.1	General	20
8.2	Future Maintenance Work.....	21
8.3	Future Maintenance Assessments.....	21
8.4	Future Connections to the Municipal Drain	22

Appendices

Appendix A Allowances
 Appendix B Project Cost Estimate
 Appendix C Schedules of Assessments
 Appendix D Assessment Supporting Calculations
 Appendix E Standard Drain Specifications
 Appendix F Special Provisions
 Appendix G Agency Documents and Approvals
 Appendix H Drawings

Engineer's Report
May 2021

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1.0 Introduction

1.1 Request for Improvement

The impetus for initially researching this drain was the result of the Municipality's Drainage Superintendent and the engineer determining that it is a tributary of the Marr Drain. However, based on reports for the Marr Drain, including the one adopted by By-Law, the Lake Road Diversion Drain has not been included as part of the watershed of the Marr Drain. Furthermore, the lands and the roads within its watershed (see Master Watershed Plan) have not been levied assessments for any construction, improvement or maintenance of the Marr Drain.

After it became evident that this drain was a tributary of and had a contributing watershed to the Marr Drain, research of the Municipality's archives was conducted; the investigation did not reveal any documentation that could confirm if the Diversion Drain itself has been maintained or repaired since its construction as per the January 12, 1956 report. Accordingly, it was subsequently inspected by the Municipality's Drainage Superintendent and it was evident that the drain was in a state of disrepair in that: it was overgrown with shrubs and vegetation; there were eroded, slumping and exposed drain banks; and sediment had accumulated in a number of locations. The extent of the sediment in sections of the drain had significantly obstructed culverts. Furthermore, and as it was still governed by a 1956 By-Law, there had been many (primarily) residential parcels created and developed along both sides of George Street (referred to as Road in Lieu of Lake Road in the 1956 report), especially the portion through Lots 13 & 14, Concession Range 1, South of Lake Road (Rng 1 S.L.R.). Agricultural properties had also changed in Concession Range 1, North of Lake Road (Rng 1 N.L.R.).

Based on these findings, the Municipality's Drainage Superintendent determined that the condition of the drain was beyond the scope of a maintenance project in accordance with Section 74 of the Act. Further, the conditions within the watershed had changed and circumstances had arisen to justify a variation of the assessments. Therefore, an improvement was warranted, and so the Drainage Superintendent recommend to the Council that an engineer be appointed to prepare a report in accordance with Section 78 of the Act for an improvement to the Lake Road Diversion Drain.

A staff report was presented to the Council for consideration; it appointed Burnside to prepare a report under the auspices of Section 78. Subsequent to that appointment, Burnside was to determine the necessary improvements to the drain. Accordingly, additional investigations of the drain and its watershed were conducted which included but were not necessarily limited to the following: several meetings with stakeholders within the watershed; securing permission from OMAFRA and selecting a contractor to brush the drain to allow for a survey; completing of a survey of the existing conditions of the drain as well as the upstream natural watercourse; based on the survey data,

preparing supporting documentation to procure an authorization from DFO to select a contractor to complete a remedial cleanout of the drain to remove obstructions to culverts and temporarily relieve flooding; discussions and meetings with the Developer and/or consultant for a plan of subdivision (residential) for the property identified by Roll No. 2-319-04 situated north of George Street on part of Lot 15, Rng 1 S.L.R.; and a Council resolution to assess a built-up area as a block; etcetera.

1.2 Appointments under the Act

Burnside had been appointed to prepare a report in accordance with Section 78 of the Act for improvement to the Marr Drain. Accordingly, and in order to incorporate this Drain as part of the Marr Drain, the Municipality also appointed Burnside under Section 78 of the Act to prepare a report for improvement to this drain.

Also, and in accordance with Section 25 of the Act, Burnside was directed in 2018 by the Council of the Municipality to make a Block Assessment for all of the urban residential and commercial properties within the watershed of this drain.

1.3 Engineer's Report

The proposed improvements are intended to reflect our understanding of the various discussions with the Drainage Superintendent for each of the two affected municipalities. They are also based on information gathered during the existing conditions survey, and input provided during the meetings and discussions with stakeholders. Details of the proposed work are described in this Report, its Appendices and on the Drawings.

1.4 The Drainage Act, RSO 1990

This Report was prepared in accordance with Sections 25 and 78 of the Act.

2.0 Background Information

2.1 History

The report for the Lake Road Municipal Drains dated January 12, 1956 was prepared by S.W. Archibald, O.L.S., Professional Engineer (and J.A. McKay, O.L.S.); it is governed under By-Law No. 1214 for The Corporation of the Village of Port Stanley. In the 1956 report, there were two separate drains; namely, the Lake Road Drain and the Lake Road Diversion Drain. These two drains were proposed to serve a drainage area (watershed) to the west of Carlow Road primarily to the north of George Street as far west as parts of Lot 13, Rng 1 N.L.R. and S.L.R. in the geographic Township.

Of particular interest is the Lake Road Diversion Drain. It is located north of George Street and its upstream end is on the line between Lots 14 & 15, Rng 1 S.L.R. (see the

Master Watershed Plan). This drain at this location was/is within a couple hundred feet of the upstream and westerly end of the Lake Road Drain. The 1956 Report indicated that *“the drainage installations along the natural run of the water was inadequate to satisfactorily drain the area”*. Accordingly, the *“owners of Lot 15, Rng 1 N.L.R. have agreed to a diversion of the water north-easterly as shown on the plan to an outlet in the Marr ditch at the westerly limit of Carlow Road”*. In order to divert this water, the report specified *“There shall be a dyke constructed between Sta. 30+00 and Sta. 34+86 of the Lake Road Diversion Drain on the east and south side of the ditch ...”*.

As a result of the dyke just east of lot line 14 & 15, the drain was directed north and somewhat east to an unopened and untraveled road allowance identified as the Lake Road (now the approximate south limit of the Kettle Creek Golf & Country Club). The drain turned and continued east along the alignment of that road allowance for about 1,200 feet before changing direction to the north again. A short stretch less than 300 feet near the outlet was directed east to its confluence with the Marr Drain immediately upstream of Carlow Road in Lot D, Rng 1 N.L.R. (Station 0+000 in this report); the Marr Drain eventually outlets into Kettle Creek in Port Stanley.

This open Diversion Drain was originally approximately 3,486 feet (1,062 m) in length and its watershed included parts of Lots 13, 14, 15, 16 & D, Rng 1 N.L.R. and S.L.R. in both the Township and part of the Village of Port Stanley.

2.2 Existing Conditions

As indicated on the Master Watershed Plan, the drain itself is located on Lot 15 and Lot D, Rng 1 N.L.R. and S.L.R. and entirely within the Municipality; it is (except for culverts) an open drain for its total length which is now approximately 1,020 metres. In some locations, more so at the upstream end, it is shallow with depths of approximately 1 metre; however, there are others where it is more than 3.0 metres deep. Some of the banks of existing drain are eroded and slumping and no longer vegetated in places.

When first inspected, the drain was extremely overgrown with shrubs and vegetation and there were a number of debris and log jams restricting flow in the drain. Furthermore, sediment had accumulated in various locations, especially upstream and downstream of culverts such that the pipe was almost completely obstructed and/or submerged.

2.3 Location

The watershed and the Village of Port Stanley are located near the midpoint of the County of Elgin on the north shore of Lake Erie, approximately 15 kilometres (20 minutes) south of the city of St. Thomas. The watershed of the drain is located within the geographic Township and the Municipality, specifically, the Village of Port Stanley. The drain is located on the west side of the Village; its downstream end and outlet into the Marr Drain is on the west side of Carlow Road adjacent to the north side of the

entranceway to the Kettle Creek Golf & Country Club; its upstream end is near the north east corner of the intersection of George Street and River Road. The watershed and the drain are as shown on the enclosed drawings.

2.4 Watershed Area and Land Use

The watershed for the drain extends north to almost Lake Line in the Township in the north; the approximate line between Lots 12 and 13, Rng 1 N.L.R. and S.L.R. in the Township on the west; the general alignment of George Street in the Village of Port Stanley in the south; and Carlow Road in the east.

The total watershed area contributing runoff to the drain is approximately 112.42 hectares, and primarily consists of (but is not necessarily limited to) portions of road allowance, wooded land, agricultural land, a small portion of a golf course, as well as a number of residential properties. The exterior watershed boundary of the drain is indicated on the Master Watershed Plan and has been confirmed as part of the work undertaken in preparing this Report. To establish this boundary, the 1956 report was studied, aerial imagery and contour mapping were reviewed, and surveys and field investigations were undertaken. To further assist, the Drainage Superintendent for the Township and the Municipality were both consulted and provided valuable assistance in this regard.

The watershed area for of this drain and the land use within it is divided as follows:

- 48.49 ha of agricultural land;
- 40.66 ha of woodlot;
- 3.87 ha of other land;
- 17.46 ha of built up area (Block Assessment); and
- 1.94 ha of municipal road ROW

Based on Municipality and Township Drain Maps, the drain does not share a contiguous watershed boundary with another municipal drain, however, it is a sub-watershed of the Marr Drain.

2.5 Lot Lines and Property Boundaries

Please note that the lot lines and property boundaries superimposed over the aerial photography and delineated on the various drawings and plans contained in this Report were not reproduced from a legal survey plan or obtained from an Ontario Land Surveyor. Accordingly, the location of all lot lines and property boundaries are approximate and are to be used for reference purposes only. Stakeholders concerned with the actual location of a property boundary on the ground should seek the services of a qualified Ontario Land Surveyor.

2.6 Soils

The soils mapping for this area is contained in the Soil Survey of Elgin County (Report No. 63 of the Ontario Soil Survey). The soil types in this watershed are varied and primarily consist of the following: Berrien (BE), Beverly (BV), Tuscola (TU) and Walsingham (WM). There are also areas described as Eroded Channel (ER) which encompasses a majority of the woodlot, and Valley Complex (VC) on Lot 15, Rng 1 N.L.R. and S.L.R. and the area of Roll Numbers 2-019-00 and 2-319-04.

3.0 Investigations and Communication

3.1 On-Site Meeting

The On-Site meeting was held at the upstream end of the drain just off of George Street, in Port Stanley. It was attended by approximately 20 stakeholders; most were owners of residential property on George Street and there was one agricultural property owner. Also, in attendance was the Drainage Superintendent from the Township and from the Municipality. Although staff at the local Conservation Authority were invited, there was no representative present.

After some introductions, the Municipality's Drainage Superintendent provided an explanation as to why the drain would not be maintained but needed to be repaired and improved in accordance with Section 78 of the Act.

The engineer then provided the stakeholders with some history for the Lake Road Municipal Drains that was obtained from the archives; in particular, the drain of concern being the **Lake Road Diversion Drain**. Those present were provided with the purpose of an On-Site Meeting for a project in accordance with Section 78 as well as a brief outline of the procedures under the Act.

Discussions then followed regarding the watershed in general and specifically the existing condition of the drain (also see Section 2.2). The stakeholders were provided opportunity to bring forth issues and concerns or to ask questions of the municipal staff and/or the engineer. The following were some but not necessarily all of the concerns brought forward and/or the questions asked; each one was responded to by either the municipal representative or the engineer.

- Why do residential properties have to pay, and who benefits from the drain?
- A significant amount of the runoff from George Street goes through a storm sewer to an outlet at the rear of lots on the north side; this was changed about twelve years ago during a major improvement to George Street. Since this system exists and has been working, why would there be an assessment to private property instead of as general taxation – everyone benefits so shouldn't everyone pay?

- Drainage problems affecting one George Street property which have been documented and reported in the past were brought forward (photos provided). The previously mentioned storm sewer located between George Street lots is believed to be causing them. Will this project address these storm sewer outlet concerns?
- Will there be options provided for the improvements to the drain?
- Are the roads going to pay their portion by general taxes?
- What are the next steps?
- There was a report of standing water in the natural watercourse to the west (upstream) of lot line 14/15.

After the discussions, and prior to the adjournment of the On-Site Meeting, stakeholders were informed that a field survey of the existing conditions of only the Diversion Drain would be undertaken. The information collected would be analyzed and then used to prepare one or more preliminary design proposals, including preliminary cost estimates. Once these tasks have been completed, another meeting of the stakeholders would be scheduled to review the information.

3.2 Brushing and Survey of the Drain

Burnside staff attended the site of the drain to complete a topographic survey and collect existing conditions information for the drain. Unfortunately, there were many locations where the drain was so overgrown with shrubs and vegetation, it was not possible to collect the required data. Accordingly, the Drainage Superintendent for the Municipality was contacted to discuss how to remove the obstructions and possible next steps. It was decided that, with the assistance of Burnside, a Request for Quotation would be prepared and sent to at least two contracting firms for the brushing of the drain corridor for its full length as well as at least one side of the drain.

Acceptance of the proposed work was procured from OMAFRA. Two Quotes were received by the Municipality before the closing date; the brushing work was completed in 2014 and followed later by the survey of existing conditions.

3.3 Interim Maintenance of the Drain

The Municipality was contacted by a landowner who reported an obstructed private access culvert immediately west of the upstream end of the drain (Station 1+020). As a result, water was being held back and causing localized flooding. It was requested if the Municipality would consider performing a cleanout of the drain to relieve this situation while the Report for the improvement was being prepared.

At the request of the Municipality's Drainage Superintendent, Burnside reviewed the preliminary profile drawing of the drain prepared using the data collected during the

survey. It indicated that two culverts west of Station 0+962 were obstructed; therefore, some remedial work to remove the blockage would be warranted.

After discussions with staff at DFO, a "Notification of Drain Maintenance or Repair" form was completed by the Drainage Superintendent; it was accompanied by an Open Drain Remedial Clean-Out Plan and Profile drawing created by Burnside. This Form was to obtain permission from DFO to conduct the equivalent of a maintenance cleanout of the drain from 1+020 downstream until "temporary" outlet was obtained to eliminate the localized flooding and to remove obstructions downstream from the culverts. The Form and Drawing were submitted for review and approval and a Fisheries Act Authorization for a drain bottom only cleanout and spoil treatment was received. Contractor was then selected, and the work was undertaken in 2015.

3.4 Project Scoping Meeting One

After completing a preliminary design and preparing an associated preliminary cost estimate for the improvement of the drain, Project Scoping Meeting (PSM) One was convened at the Port Stanley Community Centre hall in late June 2015; stakeholders within the watershed of the drain were issued a Notice in advance of the meeting. It was attended by twelve stakeholders (many who attended the On-Site Meeting), two representatives from the Municipality, as well as the Township Drainage Superintendent. The purpose of the meeting was to update stakeholders on the progress of the project and the matters that had been attended to since the On-Site Meeting. The preliminary design and estimated costs were also presented and discussed.

Stakeholders were informed of the brushing and interim maintenance projects; a discussion followed regarding the preliminary design and estimated cost. Stakeholders were given an opportunity to bring forth issues and concerns or to ask questions; a response was provided by either the municipal representatives or the engineer.

The engineer presented information in regard to the proposed preliminary design and estimated cost for the project in two parts; namely:

- Part One for ONLY the existing municipal drain; and
- Part Two which included incorporating the approximately 1,500 metres of natural watercourse upstream of the existing municipal drain (as mentioned at the On-Site Meeting) and making part of the Drain. Stakeholders were further informed that under the Act, a petition would be required to incorporate the natural watercourse as part of the drain in order for Part Two to occur.

Prior to adjournment of this PSM, stakeholders were informed that the preliminary design and estimated costs would be updated based on the discussions. Burnside would prepare a Memorandum summarizing the discussions and forward to the

Municipality to make available to any stakeholder. Lastly, all were advised that a second PSM would be scheduled for which stakeholders would receive Notice.

3.5 Project Scoping Meeting Two

PSM Two was convened in early March 2016 at the Port Stanly Community Centre hall; stakeholders within the watershed were issued a Notice in advance of the meeting. It was attended by approximately twenty stakeholders, two representatives from the Municipality, as well as the Township Drainage Superintendent. The purpose of the meeting was to update stakeholders on the progress of the project since PSM One, as well as to present and discuss the revised preliminary design and estimated costs.

Stakeholders were informed that the Municipality had not received a petition requesting an upstream extension of the Drain; accordingly, the natural watercourse was no longer being considered as part of the project and the estimated cost had been revised to reflect that. Further, and as a result of an inspection of the entire length of the drain following PSM One, the scope of the proposed improvements to the drain had changed as had the associated estimated costs.

3.6 Meetings with Developer

In discussions with municipal staff after PSM Two, Burnside was informed that the property identified by Roll Number 2-319-04, was being proposed for a residential development. Communication would be required with the Developer to review and discuss the potential implications of this drainage project in general and the eventual work in particular; the portion of the drain upstream of Station 0+270 is on the affected property. The Development Manager was contacted, there were a number of emails, and there was an exchange of documentation and preliminary drawings.

In late 2018, a meeting was held with the Development Manager to discuss the impact of the drainage corridor and the pending project on the property, the scope of the proposed drain improvements, the location and width of the working space that would be required to undertake the improvement work, etcetera.

Most recently in early 2021, prior to finalizing this Report, additional discussions occurred as well as an exchange of emails between the Municipality, the Development Manager and Burnside. There was also a virtual meeting with: the Municipality; the Development Manager and Consultants; a representative from the KCCA; and Burnside regarding the development project and the proposed drain improvement. These discussions included but were not necessarily limited to the following:

- the proximity of the drain to the northerly most portion of the property proposed for development;

Engineer's Report
May 2021

- the working space required between the top of the south drain bank and the rear of the development between drain Stations 0+270 and 0+606 and the top of the east bank of the drain between Stations 0+606 and 1+020 for the improvement as well as future maintenance;
- an erosion hazard limit established by the developer's consultant;
- a natural heritage block that contains the drain corridor between Stations 0+270 and 1+020;
- the wooded area to the west of the drain between Stations 0+606 and 1+020;
- a proposed nature trail adjacent to the drain and a crossing of the drain;
- the slight relocation of the drain where possible to the north between Stations 0+270 and 0+606; and
- the method of treatment of the resulting spoil excavated from the drain.

3.7 Summation

Burnside has undertaken and completed many tasks relating to this Report, a number of them in collaboration with the two Drainage Superintendents. These tasks included but were not necessarily limited to the following: investigating the relationship of this drain to the Marr Drain and confirming it as a tributary; meeting with stakeholders prior to the appointment; conducting the on-site meeting; assist with the processing of an RFQ for the brushing of the drain; surveying the existing conditions of the municipal drain as well as the 1,500 metre long natural watercourse; inspecting and investigating the watershed and its boundaries, especially in the area of George Street in Port Stanley; assist with preparing a maintenance Form and supporting documents to DFO for interim maintenance of the drain; preparing preliminary designs and cost estimates; conducting the first PSM; revising the preliminary design and cost estimate; conducting the second PSM; communicating with the directly affected stakeholders; communicating and meeting with a developer; providing the Municipality with information on Block Assessments; sorting out property area issues compared to Elgin County roll areas; coordinating this project and report with the improvement project and report for the Marr Drain; procuring a Letter of Advice (LOA) from DFO; procuring a Permit from KCCA; preparing Schedules of Assessment for Maintenance; etcetera.

This time and effort have led to the composing of the information contained in this Report for an improvement to the Lake Road Diversion Drain.

4.0 Design Criteria and Considerations

4.1 General

The applicable sections of "A Guide for Engineers working under the Drainage Act in Ontario" (Publication 852), and the applicable sections of the "Drainage Guide for Ontario" (Publication 29), both of which were published by OMAFRA, have been used for the design of this Drain and will also be used for the construction.

During the various meetings and discussions with the stakeholders and municipal staff, no concerns were communicated about the "capacity" of the drain. For all intents and purposes, and except for extreme runoff events and during the spring freshet, the existing channel seems to have adequate capacity to convey flows through the property upon which it is situated, into the Marr Drain and eventually to its outlet into Kettle Creek. The proposed improvements to the drain include those described in Section 5.0.

4.2 Other Work

As indicated, there was a request for interim maintenance on the drain to relieve localized flooding; it was investigated, applied for, approved by DFO and completed. During the discussions with the stakeholders in this watershed, and while the various municipal and engineering activities were being undertaken, no other formal requests have been received for other improvement to the drain; only those identified in this Report.

4.3 Material Selection

Material selection in regard to pipes and culverts is typically made based on the most economical product that is also able to satisfy various engineering requirements. For this project, corrugated steel pipe is proposed for the crossing at Station 0+091 on the Kettle Creek Golf & Country Club property located at 320 Carlow Road.

5.0 Proposed Work

In accordance with Section 8 (1) (a) of the Act, the Specifications, Details, Plans, Profile and Sections of the proposed work are contained in the various Appendices of this Report and are intended to offer complete details of the project. This section of the Report is intended to provide only a brief description of the work along the course of the drain on the affected properties.

5.1 Roll No. 2-019-00 – Station 0+000 to 0+270

On this property, it is proposed to undertake the following work:

- Install temporary sediment controls upstream of Station 0+000 (and not in the Marr Drain).

- A drain bottom only cleanout (without disturbing any existing stable, vegetated drain banks) from approximately Station 0+010 to Station 0+270; the resulting spoil is to be loaded and hauled in accordance with O.Reg. 406/19.
- Remove the existing culvert at approx. Station 0+091; supply and install a new lower and larger 900 mm CSP culvert as specified to match the proposed drain bottom gradient; place riprap reinforcement at each end.
- An allowance has been provided in accordance with Section 30 of the Act so that the owner of this property can undertake the necessary restoration of the working space adjacent to the drain to their own satisfaction.

5.2 Roll No. 2-319-04 – Station 0+270 to 1+020

On this property, it is proposed to undertake the following work:

- Load, haul and dispose of any remaining existing brush and debris piles as described in sub-section 3.2.
- Establish a 1.0 m drain bottom and 1.5 m H:1.0 m V side slopes from approximately Station 0+270 to Station 0+962; the resulting spoil is to be loaded and hauled in accordance with the O.Reg. 406/19.
- At the designated locations in the field at the time of the work, place riprap reinforcement and geotextile on the new or existing exposed drain bank.
- Seed all exposed drain banks, disturbed areas and restore the working space on this property to the pre-construction condition.

In the future on this property, it is proposed to install a crossing of the drain at or near approximately Station 0+665. Although this future crossing will be installed by the Developer and at the expense of the Developer, it shall for the purposes of future maintenance become and form part of the Drain. The crossing in general will include:

- A 900 mm diameter pipe, with bury as required by the KCCA and/or DFO, and a gradient to match the drain bottom of 0.60%.
- A length of pipe and a top width adequate to support a future nature trail.
- Riprap reinforcement at each end.

5.3 Working Space and Access Routes

The working space being provided to the Contractor to undertake the work is described in the Special Provisions and the maximum widths are contained on the detail sheet entitled "Working Space". This working space shall also be utilized for future maintenance. Access to the working space shall be via Carlow Road or George Street.

5.4 Change Orders

If unforeseen circumstances are encountered after the adoption of this report, the engineer may issue Change Orders as required to have the works properly constructed.

6.0 Environmental and Fisheries Considerations

6.1 Kettle Creek Conservation Authority (KCCA)

Staff at the KCCA were contacted regarding the proposed improvement; an Application for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (under the Conservation Authorities Act – O. Reg. 181/06 (O.Reg. 97/04)) was completed including supporting documents such as drawings, specifications, an Aquatic Technical Memorandum, etcetera. Staff at the KCCA conducted a review of the submission and issued Permit No. P.20-027 dated October 15, 2020 (copy enclosed).

6.2 Fisheries and Oceans Canada (DFO)

When contacted about the proposed improvement, DFO staff indicated that a “Request for Review” form would need to be submitted, outlining the proposed work complete with additional support documents such as drawings, photos, specifications, an Aquatic Technical Memorandum, etcetera. Staff at the DFO conducted a review and issued a LOA (file number 20-HCAA-01790) dated October 1, 2020 (copy enclosed).

6.3 Sediment Controls

Burnside has procured the necessary LOA from the DFO and Permit from the KCCA for the improvement work proposed in this Report. As required by each agency, sediment and erosion control mitigation measures will be installed prior to construction, regularly inspected and maintained throughout. Furthermore, these measures shall not be removed until the project has been completed and only when authorized by the engineer and after a permanent vegetative cover has been established on exposed soils.

Accordingly, and by following the sediment and erosion control mitigation measures reviewed and approved by the DFO and the KCCA, it is hoped that the proposed works will not create any significant adverse environmental effects or a Harmful Alteration, Disruption or Destruction of Fish Habitat (HADD).

7.0 Description of Appendices

7.1 Appendix A – Allowances

7.1.1 General

In accordance with Section 8(1)(d) of the Act, this Appendix provides a breakdown of the allowances provided under Sections 29 and 30. Allowances will be deducted from total assessments in accordance with Section 62(3) of the Act. The land and crop rates used for these calculations were determined based on a general understanding of the values within this geographic area. A summary of the allowances provided under each Section is included in this Appendix. The detailed allowance calculations are also included in this Appendix. Details regarding the working space and any designated access routes can be found in the Special Provisions.

7.1.2 Section 29 – Right of Way (Use)

Section 29 of the Act states:

“The engineer in the report shall estimate and allow in money to the owner of any land that it is necessary to use,

(a) for the construction or improvement of a drainage works;

(b) for the disposal of material removed from drainage works;

(c) as a site for a pumping station to be used in connection with a drainage works; or

(d) as a means of access to any such pumping station, if, in the opinion of the engineer, such right of way is sufficient for the purposes of the drainage works, the value of any such land or the damages, if any, thereto, and shall include such sums in the estimates of the cost of the construction, improvement, repair or maintenance of the drainage works. R.S.O. 1990, c. D.17, s. 29.”

The right of way is defined as the footprint of the drain, of any buffer(s), and the working space for the Contractor during construction, as well as the Municipality for future maintenance. For this project, a 3m buffer has been established along the course of the drain and on each side. In addition, but only on the working side of the drain, an extra 3 m width has been specified to provide an adequate working space for excavation equipment; this total width of 6 m shall also serve as a spoil hauling route. On the property identified by Roll No. 2-319-04, it is also necessary to slightly widen the drain to establish a desired cross-section; accordingly, a full value allowance has been provided for the land taken for this widening.

The allowances for right of way (or use) were determined using the base value per hectare as indicated in the corresponding calculations and appropriate Appendix, and have been applied to the properties on which the drain is located. The value was

applied for the widths indicated along the designated side(s) of the drain; if there was a reduction, it was on the basis that the land along that side of the drain can still be utilized by the owner after the improvement work has been completed.

7.1.3 Section 30 – Damages

Section 30 of the Act states:

“The engineer shall determine the amount to be paid to persons entitled thereto for damage, if any, to ornamental trees, lawns, fences, lands and crops occasioned by the disposal of material removed from a drainage works and shall include such sums in the estimates of the cost of the construction, improvement, repair or maintenance of the drainage works. R.S.O. 1990, c. D.17, s. 30.”

The allowances for damage to lands were determined using the base value per hectare as indicated in the corresponding calculations and appropriate Appendix; it has been applied to the properties on which the drain is located and where the work has been proposed. A working space consisting of one 3m buffer plus an additional 3 m for a total width of 6 m has been designated on the east and south side of the drain from Station 0+270 to Station 0+962. The specified width is intended for an excavator to effectively operate, and to accommodate any trucks required to load, haul and dispose of the spoil excavated from the drain.

Due to the distinct operation of the property identified by Roll No. 2-019-00, there were discussions with the owner regarding the restoration of the working space. In lieu of specifying that the Contractor restore the 6m wide working space from approximately Station 0+090 to Station 0+270 as part of his contract, a lump sum damage allowance has been provided to that property. The lump sum is to compensate the owner for their own time and material to restore the working space to their satisfactory condition.

A lump sum allowance has been provided for the use of the existing driveway off of Carlow Road that will serve as an access route to the property identified by Roll No. 2-019-00. An allowance has also been provided to the property identified by Roll No. 2-319-04 for an access route to the drain off of George Street.

7.2 Appendix B – Project Cost Estimate

In accordance with Section 8(1)(b) of the Act, this Appendix provides a breakdown of the total estimated cost of the proposed work, including all labour, materials, construction, engineering, administration and allowances.

7.3 Appendix C – Schedule of Assessments

7.3.1 Appendix C1 to C3 – Schedules of Assessments for Construction

7.3.1.1 General

In accordance with Section 8(1)(c) of the Act, this Appendix shows the distribution of the total estimated project cost over the lands and roads within the watershed of the Drain in accordance with Sections 21, 22 and 23 of the Act. Affected private lands that are deemed to have an agricultural tax class rate may be eligible for any grants which may be available through OMAFRA. The engineering and administration costs have been assessed over the entire drain.

7.3.1.2 Sections 21, 22 and 23 Assessments

Section 21 of the Act states:

“The engineer in the report shall assess for benefit, outlet liability and injuring liability, and shall insert in an assessment schedule, in separate columns, the sums assessed for each opposite each parcel of land and road liable therefor. R.S.O. 1990, c. D.17, s. 21.”

Section 22 of the Act states:

“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. R.S.O. 1990, c. D.17, s.22”

Section 23 of the Act states:

“(1) 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. R.S.O. 1990, c. D.17, s. 23 (1).

(2) If, from any land or road, water is artificially caused by any means to flow upon and injure any other land or road, the land or road from which the water is caused to flow may be assessed for injuring liability with respect to a drainage works to relieve the injury so caused to such other land or road. R.S.O. 1990, c. D.17, s. 23 (2).

(3) The assessment for outlet liability and injuring liability provided for in subsections (1) and (2) 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. R.S.O. 1990, c. D.17, s. 23 (3).

(4) The owners of the lands and roads made liable to assessment only under subsection (1) or (2) shall neither count for nor against the petition required by section 4 unless within the area therein described. R.S.O. 1990, c. D.17, s. 23 (4)."

As is the case with almost every municipal drain, there are Section 22 and/or Section 23 assessments levied to most properties within the watershed of this drain. In addition, and throughout the course of the drain, there may be specific costs assigned to various lands for such items as crossings, riprap & geotextile, spoil treatment, etcetera.

7.3.1.3 Section 25 Assessments

Section 25 of the Act states:

"(1) The council of the local municipality may direct the engineer to assess as a block, a built-up area designated by the council, and the sum assessed therefor may be levied against all the rateable properties in the designated area proportionately on the basis of the assessed value of the land and buildings. R.S.O. 1990, c. D.17, s. 25 (1).

(2) Where the engineer makes a block assessment under subsection (1), the engineer shall designate the proportion of the assessment to be charged against the public roads in the designated area. R.S.O. 1990, c. D.17, s. 25 (2).24."

As "directed" by the Council of the Corporation of the Municipality, as per Resolution 100-18 dated March 26, 2018, there are Section 25 assessments for this drain. Furthermore, the Block is clearly identified and highlighted on the plans, the lands and roads have been separated, and each are delineated in the assessment schedule(s) in the appropriate Appendix(s).

7.3.1.4 The Todgham Method Explained

The estimated costs have been assessed to all affected lands and roads, in accordance with the appropriate Sections of the Act, and in general following what is commonly referred to as the "*Todgham Method*". This is a manner or system of determining assessments that is generally accepted by the drainage engineering community as being fair and equitable. The basics of this method are explained here, whereas the details of the assessments for this Drain are included in Appendix entitled Assessment Supporting Calculation.

- a) **Equivalent Areas** – In order to conform to Section 23(3) of the Act, an "equivalent area factor" is applied to all lands and roads within the drainage area. This factor is established for each parcel of land within the drainage area and is dependent on the particular characteristics of that land, the prime characteristics being land use and topography. In this way "... *the volume and rate of flow of the water artificially caused to flow ... into the drainage works ...*" is established on a relative basis for "... *the lands and roads liable for such assessments.*" The equivalent area factors for this

Drain are shown in Appendix entitled Assessment Supporting Calculation and using this information, a Section Data Table is prepared for the drainage area for each part of the Drain.

- b) **Sections of the Drain** – Based on sub-drainage areas and property lines, the subject Drain or Drains are divided into various Sections for assessment purposes, normally with Section 1 being at the downstream end. These Sections are shown on the Section Data Table. The equivalent areas within and upstream of each Section are also determined and are shown on this Table.
- c) **Costs for Each Section** – A total cost for each Section is calculated and includes all costs, such as materials, construction, allowances, engineering and administration. The total of these sectional costs must equal the total project cost including any special assessments made in accordance with Sections 24 and 26 of the Act. The Section Costs table for this project is shown in Appendix entitled Assessment Supporting Calculation.
- d) **Benefit Assessment** – To completely understand the assessment process, the reader must be aware of the definition of “benefit” contained in Section 1 of the Act. Standard practice is to make an assessment for benefit only to those properties upon which the work is actually done or to the properties adjacent to where the work is actually done, when the drain is located on or near the boundary between one or more properties.
- e) **Outlet Liability Assessment** – An understanding of “outlet liability”, as defined in Section 1 of the Act, is also required to comprehend the assessment process. Standard practice is to make an assessment for outlet liability to any and all lands and roads that are within the drainage area since, in some manner, runoff from those lands will use all or part of the drain as an outlet.
- f) **Direct Outlet Assessment** – This term is used to describe the assessment for outlet made to those lands within each section of the drain that outlet directly into that section. For example, if there are 15 equivalent hectares within the sub-drainage area of Section 3 of the drain, these 15 equivalent hectares gain direct outlet to the drain somewhere within the length of Section 3 and shall be assessed for the outlet obtained within that section. This assessment is not separately defined in the Act and is usually included with benefit when assessments are calculated.
- g) **Variation of Assessments throughout the Length of the Drain** – When engineers calculate assessments, they must decide; (1) what portion of the cost of each section will be assessed as benefit and direct outlet to the land upon which the drain is being constructed, and (2) what portion will be assessed as outlet to the lands and roads upstream of that section. It is generally accepted that the benefit and direct outlet portion of a downstream section is comparatively low, since most of the capacity of the drain is being provided as outlet for the upstream lands. Conversely then, the benefit and direct outlet portion of an upstream section is normally high, since most of

the capacity there is being provided for the land upon which the drain is being constructed. Normally; therefore, for a downstream section of the drain, the portion of the cost assessed as benefit and direct outlet is low and the portion assessed as outlet is high; while, for an upstream section of the drain, the portion of the cost assessed as benefit and direct outlet is high, and the portion assessed as outlet is low. Taken to the extreme, that is to the last upstream property in the drainage area, all of the cost of any work done on that property would be assessed to it as benefit and direct outlet, since there are no other lands upstream thereof that can be assessed for outlet.

- h) **Actual Assessment Calculations for a Typical Section of the Drain** – The process used for the calculation of the assessments for each section of the drain is generally the same. A brief description of this process follows. Reference to a typical “Sectional Assessment Worksheet” should assist the reader with this description by matching the numbers in the square brackets (i.e. [#]).
- [1] **Cost/Eq. Ha. from D/S** – This figure is the cumulative outlet assessment per equivalent hectare that is brought forward from the previous section (where applicable).
 - [2] **Total Section Cost** – This is the total sectional cost, as previously explained.
 - [3] **Specific Costs** – These are costs for specific items that are considered to apply only to a particular property or road and not to all the lands within the drainage area. These costs can be Section 24 Assessments, Section 26 Assessments or “specific” benefit assessments. The total of all specific costs is calculated and deducted from the Total Section Cost to leave the “Remainder to Assess”. These specific assessments are then posted to the particular property or road in the Summary Table.
 - [4] **Normal Outlet** – At this point in the process, the engineer uses professional judgement and experience to establish the percentage of this “Remainder to Assess” that should be assessed as Normal Outlet to the lands and roads upstream of this section. The balance will then be the amount to be assessed as Normal Benefit and Direct Outlet to the lands and roads in this section.
 - [5] **Equivalent Area Drained** – This is the equivalent area that is upstream of the subject section of the drain. The portion of the cost that has been determined to be assessed as outlet for this section is then divided by this equivalent area. This results in the amount per equivalent hectare that is to be assessed as outlet to those upstream lands and roads for this section. This amount is then transferred to the “Cumulative Cost/Eq. Ha. carried U/S” item at the bottom of the worksheet.
 - [6] **Remaining for Normal Benefit and Direct Outlet** – This figure is the amount remaining to be assessed after subtracting the outlet assessment amount.

- [7] **Direct Outlet** – At this stage, the engineer uses professional judgement and experience to establish the length of this section of the drain that is used by each parcel of land within the section. The calculation, as shown on the worksheet, is then made to determine the “Direct Outlet” assessment for each of these parcels. These “Direct Outlet” assessments are then transferred to the Summary Table. The “Total of Direct Outlet” amount is then subtracted from the previous sub-total to provide the amount “Remaining for Normal Benefit”.
- [8] **Remaining for Normal Benefit** – This figure is the Normal Benefit assessment levied against the lands within this section. It is then transferred to the appropriate location in the Summary Table.
- [9] **Summary Table – In Section** – This is the listing of the parcels of land within this section of the drain. The assessments determined for each of these parcels are posted in this table.
- [10] **Summary Table – U/S of Section** – This is where the properties that use only this section of the drain, and those downstream, are listed and the outlet assessments applicable to each are posted. These assessments are calculated by multiplying the equivalent area of each property listed by the Cumulative Cost/Eq. Ha. carried U/S.
- [11] **Sub-Total** – This is the total of the assessments levied within this section of the drain.
- [12] **Cumulative Total** – This is the total of all the assessments levied to this point on the drain.
- i) **Initial Reconciliation of Total Assessments** – When all sectional assessments have been completed, they are reconciled, and the totals established per property.
- j) **Final Fairness Test** – The engineer then reviews the reconciled totals from above, comparing each one with all of the others, to ensure that, in his/her opinion, each property has been dealt with fairly as compared with every other property. If any unfairness appears, this is adjusted out until the engineer is satisfied that all assessments are fair and in balance, having in mind the actual conditions in the field.
- k) **Schedule of Assessments** – When the engineer is satisfied with the final assessments, the Schedule of Assessments is prepared. Each Schedule of Assessments for Construction is included in an Appendix entitled Schedule of Assessments.

7.3.2 Appendix C4 – Schedule of Assessments for Maintenance

In accordance with Section 38 of the Act, an assessment schedule for future maintenance of the proposed drain has been created. Affected lands located upstream of the maintenance shall be determined by the Drainage Superintendent and assessed according to this schedule.

7.4 Appendix D – Assessments Supporting Calculations

The various calculations performed using the Todgham Method and the details of the assessments for this Drain are included in this Appendix.

7.5 Appendix E – Standard Drain Specifications

The Standard Drain Specifications have been provided in this Appendix and govern the work described herein.

7.6 Appendix F – Special Provisions

Special Provisions have been provided in this Appendix which are specific directions to the Contractor for this project, and detail those requirements not encompassed by the Standard Drain Specifications. Special Provisions take precedence over Standard Drain Specifications where a conflict between the two documents may exist.

7.7 Appendix G – Agency Documents and Approvals

In addition to an Aquatic Ecology Technical Memorandum, a copy of the LOA published by DFO and the Permit issued by KCCA has been provided in this Appendix.

7.8 Appendix H – Drawings

Drawings included within this report (two in total) consist of the following:

- Master Watershed Plan (Drawing No. 1 of 2); and
- Profiles, Sections, Details and Notes (Drawing No. 2 of 2).

All the above drawings are pertinent to the Lake Road Diversion Drain Improvement.

8.0 Maintenance

8.1 General

While the Municipality shall be responsible for the maintenance of the Lake Road Diversion Drain after the improvement construction is complete, the sections of the Act dealing with obstruction of and damage or injury to a municipal drain, namely Sections 80 and 82 respectively, are brought to the attention of the landowners. As can be seen from these Sections, both the landowners and the Municipality have responsibilities to ensure that a municipal drain is properly maintained and not abused.

Proper maintenance of the existing and proposed works described herein will be necessary to ensure that all parts continue to function properly. The maintenance and integrity of open drains are especially important since these conduits often provide an

outlet for either the closed portions of a Municipal Drain and/or for private drainage systems. It will also be necessary to maintain any permanent sediment control measures that form part of the drainage works.

This maintenance should include regular inspections and necessary work along the entire length of the drain and should ensure that all open drains, sediment traps, permanent sediment control measures, outlet pipes/structures, rodent grates, trash racks, and stilling basins remain unobstructed by trash, debris or sediment and that they are cleaned on a regular basis. As well, any areas of washout, displaced riprap, settlement or erosion should be attended to immediately.

Landowners involved with this Drain should make regular inspections of the portion(s) on their respective property(s), and promptly report any problems to the Municipality or Drainage Superintendent so that the proper action can be taken. Such regular inspections by the landowners are especially important prior to and after heavy rainfall events and during the spring snowmelt; these inspections can help ensure that ice or snow or other material has not obstructed the culverts and inlets. Landowners can also provide a valuable service and assistance to the Drainage Superintendent by clearing any debris from the inlet side of any culvert(s) in a timely manner.

8.2 Future Maintenance Work

Under Definitions, Section 1 of the Act states:

“... “maintenance” means the preservation of a drainage works; ...” and “ ... “repair” means the restoration of a drainage works to its original condition; ...”.

Accordingly, this (and Section 74) provides the Municipality and its Drainage Superintendent with a mechanism to maintain the drain without the need to invoke other Sections of the Act that may require the preparation of a report or the involvement of an engineer, etcetera. To that end, and for the purposes of the Lake Road Diversion Drain, maintenance shall also be deemed to include works to preserve the drain such as but not necessarily limited to the supply and placement of riprap and geotextile on eroding or scouring banks of the drain. The Standard Drain Specifications and Special Provisions within this report shall apply to any such riprap.

Only the Municipality shall be responsible for any costs related to the future maintenance of the 900 mm diameter nature trail crossing at or near approximately Station 0+665 including the riprap reinforcement at each end.

8.3 Future Maintenance Assessments

After the completion of the Lake Road Diversion Drain Improvement, the entire drain shall be maintained by the Municipality at the expense of the lands and roads assessed.

Engineer's Report
May 2021

All future maintenance costs incurred on the Drain shall be distributed in accordance with the terms of the Drainage Act **using the Schedule of Assessments for Maintenance contained in applicable Appendix** and in the same relative portions until such time as they are varied in accordance with the Drainage Act.

The exceptions to the above are that:

1. Roll No. 2-019-00 shall be responsible for the increased cost over and above what would be required to level the spoil adjacent to the drain (as is typical for most open drains) to load, haul and dispose of any spoil resulting from any cleanout or maintenance of the drain on this property from Station 0+000 to 0+270; and
2. Roll No. 2-319-04 shall be responsible for the increased cost over and above what would be required to level the spoil adjacent to the drain (as is typical for most open drains) to load, haul and dispose of any spoil resulting from any cleanout or maintenance of the drain on this property from Station 0+270 to 1+020.

8.4 Future Connections to the Municipal Drain

After construction, future private drains may be installed and outlet directly into the open portions of the Drain, provided each is installed with an approved outlet pipe, complete with rodent grate, an appropriate amount of riprap and identified on the bank with a proper outlet marker. Any outlet not installed as described and causing damage to or erosion of the Drain may be upgraded and/or removed and at the expense of the owner of the land upon which the connection or outlet was made.



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Appendix A

Allowances

Summary of Allowances	A1
Section 29 Calculations	A2
Section 30 Calculations	A3

APPENDIX A1 - SUMMARY OF ALLOWANCES

Project: Lake Road Diversion Drain Improvement

Date: May 2021

Project No.: 300033208

Conc.	Lot	Owner	Roll No.	Right of Way (Sect.29)	Damages (Sect.30)	Totals
		<u>Main Drain</u>				
Range 1 NLR	15	G-Lover Holdings Inc.	2-019-00	3,630	12,500	\$ 16,130
Range 1 SLR	15	2526485 Ontario Inc.	2-319-04	10,570	400	\$ 10,970
TOTAL ALLOWANCES				\$ 14,200	\$ 12,900	\$ 27,100

APPENDIX A2 - SECTION 29 CALCULATIONS - Right-of-Way

Project: Lake Road Diversion Drain Improvement

Date: May 2021

Project No.: 300033208

\$ / acre \$ 16,200

\$ / hectare \$ 40,000

Section	Conc.	Lot	Owner	Description	Station (m)	Station (m)	Length (m)	Width (m)	Factor	Allow (\$)	Section Sub-Total										
M1	Range 1 NLR	15	G-Lover Holdings Inc.	Existing drain	0	270	270	6	0.00	-	3,630										
					0 to 270 = entrance & along Hole 10	Widen drain	0	270	270	0		1.00	-								
							2 x 3m buffers	0	270	270		6	0.33	2,140							
								add'l width for a spoil haul route	40	270		230	3	0.33	900						
									driveway access	75			6	0.33	590						
										Existing drain		270	606	336	6	0.00	-	4,660			
												Widen drain	270	606	336	0.5	1.00		670		
													2 x 3m buffers	270	606	336	6		0.33	2,660	
														add'l width for a spoil haul route	270	606	336		3	0.33	1,330
															Existing drain	606	1020		414	5	0.00
Widen drain	606	1020	414	0.5							1.00					830					
	2 x 3m buffers	606	1020	414	6	0.33					3,280										
		add'l width for a spoil haul route	606	962	356	3	0.33				1,400										
			access off George St.	50			6	0.33			400										
				GRAND TOTAL \$ 14,200																	

Factors

OPEN DRAIN

Golf Course Land	drain	0.00
	widening	1.00
	buffers	0.33
	work space/haul route	0.33
	access	0.33

Development Land	drain	0.00
	widening	1.00
	buffers	0.33
	work space/haul route	0.33
	access	0.33

APPENDIX A3 - SECTION 30 CALCULATIONS - Damages

Project: Lake Road Diversion Drain Improvement

Date: May 2021

Project No.: 300033208

\$ / acre \$ 1,000

\$ / hectare \$ 2,500

Section	Conc.	Lot	Owner	Description	Station (m)	Station (m)	Length (m)	Width (m)	Factor	Allow (\$)	Section Sub-Total
M1	<u>Main Drain</u>		G-Lover Holdings Inc.								12,500
	Range 1 NLR 0 to 270 = entrance & along Hole 10	Existing drain		0	270	270	6	0.00	-		
		Widen drain		0	270	270	0	0.00	-		
		1 x 3m buffer		0	270	270	3	0.00	-		
		add'l width for a spoil haul route		40	270	230	3	0.00	-		
		Restore east buffer & haul route		0	270	270	3	lump sum	12,000		
		access off Carlow Road				75	6	lump sum	500		
M2	Range 1 SLR 270 to 606 = between bends	2526485 Ontario Inc.	Existing drain	270	606	336	6	0.00	-	160	
			Widen drain	270	606	336	0.5	0.00	-		
			1 x 3m buffer	270	606	336	3	0.33	80		
			add'l width for a spoil haul route	270	606	336	3	0.33	80		
M3	Range 1 SLR 606 to 1020 = in/along wooded corridor	2526485 Ontario Inc.	Existing drain	606	1020	414	5	0.00	-	240	
			Widen drain	606	962	356	0.5	0.00	-		
			1 x 3m buffer	606	962	356	3	0.33	100		
			add'l width for a spoil haul route	606	962	356	3	0.33	100		
			access off George St.			60	6	0.33	40		
GRAND TOTAL \$ 12,900											

Factors

OPEN DRAIN

Golf Course Land

drain 0.00
widening 0.00
buffers 0.00
work space/haul route 0.00
access lump Sum

Development Land

drain 0.00
widening 0.00
buffers 0.33
work space/haul route 0.33
access 0.33



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Appendix B

Project Cost Estimate

APPENDIX B - PROJECT COST ESTIMATE

The estimate of the cost of all labour, equipment and material required to construct this project is as follows:

Note **SP** refers to the **Special Provisions** (see appropriate Appendix) to reference for additional details of work.

Item	Description	Approx. Quantity	Cost Estimate
<u>Previous Authorized Remedial Work</u>			
	Clearing	LS	\$ 24,300
	Ditchbottom Only Cleanout	LS	\$ 3,000
Total Cost of Previous Work (Private Property)			\$ 27,300
<u>A. Lake Road Diversion Drain Improvement Project</u>			
<u>Work on Private Property (Open Work)</u>			
A1	Sediment Control and Drain Bottom Only Cleanout – Sta. 0+040 to 0+270 (SP 1)	LS	\$ 4,900
A2	Remove and Replace existing crossing – Sta. 0+091 (SP 2)	LS	\$ 6,500
A3	Brush and Debris Removal and Disposal – Sta. 0+270 to 1.020 (SP 3)	LS	\$ 2,000
A4	Drain Cleanout and Bank Re-Grading – Sta. 0+270 to 1+020 (SP 4)	LS	\$ 15,800
Total Estimated Cost of Construction (Private Property)			\$ 29,200
<u>B Contingencies</u>			
B1	OPSS R50 Rip-Rap Erosion Protection (SP 5)	40 m ²	\$ 2,800
B2	Tile Outlets (SP 6)	3	\$ 900
B3	Re-seeding (SP 7)	175 m ²	\$ 700
Total Estimated Cost of Construction - Contingencies			\$ 4,400
<u>Total Estimated Cost of Construction</u>			<u>\$ 60,900</u>

SUMMARY OF COSTS

Total Estimated Cost of Construction	\$ 60,900
Including Previous Authorized Remedial Work	
Allowances to Owners (Sections 29 & 30)	\$ 27,100
Engineering and Preparation of Reports	\$ 71,500
Field survey; design; drawing set preparation; report preparation; determining allowances, construction and maintenance assessment schedules; finalize & file reports	
Natural Watercourse Investigation (NWC)	\$ 7,500
Field survey of 1,500 m NWC; add to Plan & Profile drawing set; calculate preliminary allowances and construction costs; discuss at PSM One; etc.	
Brushing and Interim Maintenance	\$ 5,000
Assist Municipality and prepare, distribute and review a "Request For Quotation" for the brushing of the drain; etc.; assist Municipality and prepare supporting documentation including a Remedial Clean-Out Plan & Profile drawing to accompany the DFO "Notification Form"; etc.	
Aquatic and Fisheries - DFO & KCCA	\$ 3,000
Aquatic Inspection and Technical Memo; DFO LOA; KCCA Permit; etc.	
Meetings and Procedure	\$ 6,000
On-site meetings; prepare for and attend watershed meetings; prepare for and attend the consideration meetings; etc.	
Tendering	\$ 4,000
Prepare and distribute Tender; review Tenders; prepare letter of recommendation for Council; etc.	
Contract Administration	\$ 2,500
Site reviews during construction, processing payment certificates and related administrative tasks (progress payment, substantial performance, statutory holdback, and maintenance holdback certificates included)	
<u>Total Estimated Engineering</u>	<u>\$ 99,500</u>
Administration, Financing, Expenses and Other Costs	\$ 10,500
KCCA review fee; copying; printing reports; mileage, net HST (construction and engineering);	
<u>Total Estimated Cost</u>	<u>\$ 198,000</u>

Note:

The above summary contains cost estimates only. It is emphasized that these estimates do NOT include costs to defend the Drainage Report and procedures if appeals are filed with the Court of Revision, or the OMAFRA Appeal Tribunal, or the Ontario Drainage Referee. Unless otherwise directed, additional costs to defend the report are typically distributed in a pro rata fashion over the assessments contained in the Construction Assessment Schedule(s), excluding any Special Assessments.

Also, and in addition to the work included in the above estimate, should repairs, replacements, underpinning or other alterations be required for existing bridges, culverts, overflow culverts or any other structure necessary to conduct overflow water, or water in open channels under or across a road allowance, as affected by this drainage work, the work and cost thereof, including any necessary expenses incidental thereto, and if not determined otherwise, shall be the responsibility of and shall be assessed against the authority having control of such road or road allowance.



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Appendix C

Schedules of Assessments

For Construction – Municipality of Central Elgin	C1
For Construction – Township of Southwold	C2
For Construction – Entire Drain	C3
For Maintenance and Repair – Entire Drain	C4



APPENDIX C1 - ASSESSMENTS for CONSTRUCTION MUNICIPALITY OF CENTRAL ELGIN

Project: Lake Road Diversion Drain Improvement
Date: May 2021

Project No.: 300033208

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
Lands - Central Elgin							
Range 1 NLR	15	* G-Lover Holdings Inc.	2-019-00	4.87	22,500	1,880	24,380
Range 1 NLR & SLR	Pt. D & Pt. 16	* M. Kong	2-019-01	1.50	-	330	330
Range 1 SLR	15	* 2526485 Ontario Inc.	2-319-04	5.72	52,210	3,010	55,220
Range 1 SLR	14	* J. & J. Back	2-890-00	17.31	-	9,780	9,780
Range 1 SLR	15	* Block Assessment - 2526485 Ontario Inc.	2-319-04	5.52	-	12,270	12,270
Range 1 SLR	13, 14 & 15	* Block Assessment - upstream of Sta. 1+020	Various (60)	11.94	-	26,970	26,970
Total on Lands - Municipality of Central Elgin				46.86	\$ 74,710	\$ 54,240	\$ 128,950
Roads - Central Elgin							
George Street		* Municipality of Central Elgin		1.75	-	9,890	9,890
Walter Street		* Municipality of Central Elgin		0.02	-	70	70
Frederick Street		* Municipality of Central Elgin		0.03	-	100	100
Meek Street		* Municipality of Central Elgin		0.04	-	140	140
Charles Street		* Municipality of Central Elgin		0.10	-	340	340
Total on Roads - Municipality of Central Elgin				1.94	\$ -	\$ 10,540	\$ 10,540
ALL LANDS AND ROADS - Municipality of Central Elgin				48.80	\$ 74,710	\$ 64,780	\$ 139,490

Notes:

- (1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
- (2) It is the responsibility of the landowner to confirm whether their property is eligible for an OMAFRA grant, under ADIP policies as eligibility has not been confirmed as part of the preparation of this report.
- (3) Entries shaded in blue indicate they are part of the block assessment as directed by the Municipality



APPENDIX C2 - ASSESSMENTS for CONSTRUCTION TOWNSHIP OF SOUTHWOLD

Project: Lake Road Diversion Drain Improvement
Date: May 2021

Project No.: 300033208

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
Agricultural Lands - Southwold							
Range 1 NLR	14	Chestnut Grove Farms Ltd.	8-092-30	25.90	-	24,170	24,170
Range 1 NLR	13	Steve Goodhue Farms Ltd.	8-090-00	11.12	-	11,510	11,510
Range 1 NLR	13	Chestnut Grove Farms Ltd.	8-091-00	9.38	-	7,900	7,900
Range 1 SLR	13	Chestnut Grove Farms Ltd.	8-022-10	17.22	-	14,930	14,930
Total on Lands - Township of Southwold				63.62	\$ -	\$ 58,510	\$ 58,510
Roads - Southwold							
Total on Roads - Township of Southwold				-	\$ -	\$ -	\$ -
ALL LANDS AND ROADS - Township of Southwold				63.62	\$ -	\$ 58,510	\$ 58,510

Notes:

- (1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
- (2) It is the responsibility of the landowner to confirm whether their property is eligible for an OMAFRA grant, under ADIP policies as eligibility has not been confirmed as part of the preparation of this report.



APPENDIX C3 - ASSESSMENTS for CONSTRUCTION ENTIRE DRAIN

Project: Lake Road Diversion Drain Improvement
Date: May 2021

Project No.: 300033208

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
Lands - Central Elgin							
Range 1 NLR	15	* G-Lover Holdings Inc.	2-019-00	4.87	22,500	1,880	24,380
Range 1 NLR & SLR	Pt. D & Pt. 16	* M. Kong	2-019-01	1.50	-	330	330
Range 1 SLR	15	* 2526485 Ontario Inc.	2-319-04	5.72	52,210	3,010	55,220
Range 1 SLR	14	* J. & J. Back	2-890-00	17.31	-	9,780	9,780
Range 1 SLR	15	* Block Assessment - 2526485 Ontario Inc.	2-319-04	5.52	-	12,270	12,270
Range 1 SLR	13, 14 & 15	* Block Assessment - upstream of Sta. 1+020	Various (60)	11.94	-	26,970	26,970
Total on Lands - Municipality of Central Elgin				46.86	\$ 74,710	\$ 54,240	\$ 128,950
Roads - Central Elgin							
George Street		* Municipality of Central Elgin		1.75	-	9,890	9,890
Walter Street		* Municipality of Central Elgin		0.02	-	70	70
Frederick Street		* Municipality of Central Elgin		0.03	-	100	100
Meek Street		* Municipality of Central Elgin		0.04	-	140	140
Charles Street		* Municipality of Central Elgin		0.10	-	340	340
Total on Roads - Municipality of Central Elgin				1.94	\$ -	\$ 10,540	\$ 10,540
ALL LANDS AND ROADS - Municipality of Central Elgin				48.80	\$ 74,710	\$ 64,780	\$ 139,490
Agricultural Lands - Southwold							
Range 1 NLR	14	Chestnut Grove Farms Ltd.	8-092-30	25.90	-	24,170	24,170
Range 1 NLR	13	Steve Goodhue Farms Ltd.	8-090-00	11.12	-	11,510	11,510
Range 1 NLR	13	Chestnut Grove Farms Ltd.	8-091-00	9.38	-	7,900	7,900
Range 1 SLR	13	Chestnut Grove Farms Ltd.	8-022-10	17.22	-	14,930	14,930
Total on Lands - Township of Southwold				63.62	\$ -	\$ 58,510	\$ 58,510
Roads - Southwold							
Total on Roads - Township of Southwold				-	\$ -	\$ -	\$ -
ALL LANDS AND ROADS - Township of Southwold				63.62	\$ -	\$ 58,510	\$ 58,510
ALL LANDS AND ROADS - Central Elgin and Southwold				112.42	\$ 74,710	\$ 123,290	\$ 198,000

Notes:

- (1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
- (2) It is the responsibility of the landowner to confirm whether their property is eligible for an OMAFRA grant, under ADIP policies as eligibility has not been confirmed as part of the preparation of this report.
- (3) Entries shaded in blue indicate they are part of the block assessment as directed by the Municipality



APPENDIX C4 - ASSESSMENTS for MAINTENANCE and REPAIR LAKE ROAD DIVERSION DRAIN

Project: Lake Road Diversion Drain Improvement

Project No.: 300033208

Date: May 2021

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Upstream of Outlet (Station 0+000)					
Range 1 NLR	15	G-Lover Holdings Inc.	2-019-00	4.87	1.41%
Range 1 NLR & SLR	Pt. D & Pt. 16	M. Kong	2-019-01	1.50	0.19%
Range 1 SLR	15	Block Assessment - 2526485 Ontario Inc.	2-319-04	5.52	7.31%
Range 1 SLR	15	2526485 Ontario Inc.	2-319-04	5.72	2.31%
Upstream of Station 1+020					
Range 1 SLR	14	J. & J. Back	2-890-00	17.31	8.20%
Range 1 SLR	13, 14 & 15	Block Assessment - upstream of Sta. 1+020	Various (60)	11.94	22.63%
Range 1 NLR	14	Chestnut Grove Farms Ltd.	8-092-30	25.90	20.28%
Range 1 NLR	13	Steve Goodhue Farms Ltd.	8-090-00	11.12	9.66%
Range 1 NLR	13	Chestnut Grove Farms Ltd.	8-091-00	9.38	6.63%
Range 1 SLR	13	Chestnut Grove Farms Ltd.	8-022-10	17.22	12.53%
TOTAL ON LANDS				110.48	91.15%
Roads					
George Street		Municipality of Central Elgin		1.75	8.31%
Walter Street		Municipality of Central Elgin		0.02	0.06%
Frederick Street		Municipality of Central Elgin		0.03	0.09%
Meek Street		Municipality of Central Elgin		0.04	0.11%
Charles Street		Municipality of Central Elgin		0.10	0.28%
TOTAL ON ROADS				1.94	8.85%
ALL LANDS AND ROADS				112.42	100.00%

	Municipality of Central Elgin
	Township of Southwold



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Appendix D

Assessment Supporting Calculations

Understanding Drainage Assessments Factsheet	
Summary of Areas and Equivalent Areas	D1
Section Data Table	D2
Section Costs	D3
Sectional Assessment Worksheets	D4

FACTSHEET



ORDER NO. 92-035

FEBRUARY 1992

AGDEX 557



Ontario

Ministry of Agriculture,
Food and Rural Affairs

AGRICULTURAL
ENGINEERING

UNDERSTANDING DRAINAGE ASSESSMENTS

Agriculture and Rural Division
(Reprinted March 1997)

The *Drainage Act* provides a legal procedure by which an "area requiring drainage" may have an outlet drain constructed to dispose of excess water.

The drainage work is initiated by interested individuals within an "area requiring drainage" who will benefit from the construction of the drain. A petition form, obtained from the municipal clerk, is signed by interested landowners. In order to be valid or sufficient, the petition must be signed by the majority of the owners in the "area requiring drainage" or by owners that represent at least 60% of the lands in this area. The "area requiring drainage" is usually described by lot and concession, or other legal land description. By taking this action, it is presumed that the owners signing the petition have made a decision that the drain will be of benefit to them and that the probable cost will be lower than the anticipated benefits. The initial benefit-cost decision is made at this point by the landowners, not the engineer or Council.

The petition is presented to and considered by Council. If the petition represents a proper "area requiring drainage", that is a real drainage basin, and appears to be valid, the Council may decide to proceed. Council then notifies each of the petitioners of this decision as well as any other municipality affected and the local Conservation Authority and the Ministry of Natural Resources.

Council then appoints an engineer. The engineer is an employee of Council, hired to design this specific drain. Under *The Drainage Act*, Section 9(2), the engineer is required to hold an on-site meeting to determine (1) the area requiring drainage, (2) if the petition is valid, (3) the drainage needs of the area. The engineer is then required "to make an examination of the area requiring drainage as described in the petition and to prepare a report which shall include:

- (a) plans, profiles and specifications of the drainage works;
- (b) a description of the area requiring drainage;
- (c) an estimate of the total cost thereof;
- (d) an assessment of the amount or proportion of the cost of the works to be assessed against every parcel of land and road for benefit, outlet liability and injuring liability;

- (e) allowances, if any, to be paid to the owners of land affected by the drainage works and
- (f) such other matters as are provided for under this Act."

The engineer's report is presented to Council, who then notifies all persons assessed and calls a special meeting where the report is considered. General objections to the report may be raised at this time. At this meeting signatures may be added or removed from the petition and this determines if the project will continue. Unresolved problems, depending on the subject, may be appealed to the Court of Revision, the Ontario Drainage Tribunal or the Drainage Referee. Details on appeal procedures may be found in *The Drainage Act** or in Ontario Ministry of Agriculture, Food and Rural Affairs Factsheet, Drainage Legislation.

The engineer's report includes two important items:

1. The estimated cost of the work — No matter how individual assessments are arrived at, this total estimated cost must always be equal to the total amount assessed, otherwise the work cannot proceed.
2. The assessment liability — This may be spread over several pages if an owner owns several parcels of land and if there are branch drains. It may be summarized.

Let us examine the obligations regarding this assessment.

RESPONSIBILITIES UNDER COMMON LAW

A natural watercourse is defined generally as a stream of water which flows along a defined channel, with bed and banks, for a sufficient time to give it substantial existence. This may include streams that dry up periodically.

**The Drainage Act may be found in the Revised Statutes of Ontario 1980, Chapter 126, available in most public libraries. Individual copies may be purchased from the Ontario Government Bookstore, 1-800-668-9938.*

A riparian landowner (owner of lands that abut upon a natural watercourse) has the right to drain his or her lands into the natural stream, but may not bring water in from another watershed. He or she can collect water in ditches and drains and discharge it into the watercourse even though it results in an increase in volume and rate of flow.

Where a natural watercourse becomes a part of a drain, it is no longer a natural watercourse. When this occurs, the riparian rights, as described earlier, are lost.

Surface water not flowing in a natural watercourse (i.e. not having discernible bed and banks) has no right of drainage. An owner of lower land may, at his or her own choice, either allow the water from higher land to flow over it or by dams or banks, keep such water off his or her property. No owner has the right to collect such surface water by ditches or drains and discharge it on lands of another. He or she has a responsibility to take this water to a sufficient outlet, i.e., a natural watercourse or a drain constructed under *The Drainage Act*.

Since there is no right to drain surface water, the owner of each parcel of land in the watershed is generally assessed for "outlet liability". In other words, his or her Common Law liability is removed by paying for the increased size or cost of the drain due to the volume of water which is discharged from his or her property, even though the drain may not provide a direct outlet for this water. The authority for this liability is set out in Section 23(1).

Since, through Common Law, a landowner is also liable for any damage he or she may cause from water which he or she collects in drains and discharges on other land without a sufficient outlet, he or she may be assessed for relief from such "injuring liability" if the new drain serves as an outlet for his or her drains and prevents this injury from occurring. The authority for this liability is set out in Section 23(2).

Injuring liability is frequently difficult to distinguish from outlet liability, consequently many engineers' reports do not contain such an item.

The assessment for outlet liability and injuring liability is based on the volume and rate of flow of the water artificially caused to flow from an owner's property. Generally, the assessment is based upon a unit value per hectare. Owners at higher elevations on a watershed may have a higher unit charge than those owners near the outlet since the water from their land makes use of a greater length of drain. A difference may be made in the unit outlet charge due to varying types of soil or land use, or the distance to the drain.

RESPONSIBILITY UNDER THE DRAINAGE ACT

In addition to the Common Law responsibility, an owner may also be assessed for benefit.

Benefit will vary between different lands, according to their differences of elevation, quantity of water to be drained from each, distance of undrained land from the course of the proposed ditch, and the presence or absence of existing drains, and other like factors.

To consider whether a parcel of land will receive any benefit from the construction, it is proper to consider whether any enhanced financial value will accrue to it as a result of the drain construction. This may occur through the increased productive power of the land or by rendering it more salable and at a better price, or by preventing water from entering on to it.

If the proposed drainage works can be of no possible benefit to the owner, or is of no commercial or agricultural value, the Act does not authorize a contribution for benefit.

Sometimes, an owner has an undeveloped area that he or she intends to leave in this condition. The owner may feel that he or she should not be assessed since the drain will be of no benefit. However, the property could change hands and the new owner might want to drain and develop it. It is with this in mind that the engineer must make an assessment, regardless of the present owner's intentions.

It is the duty of the engineer to determine whether or not a parcel of land will benefit from the project. When appealing a benefit assessment, the landowner must prove that the land does not benefit from the drain.

An owner has no responsibility for work done upstream from his or her property unless the work provides a benefit by "cutting off" a harmful flow of water across the property.

In some instances, a "special benefit assessment" may be levied against the property. This value usually represents the difference in cost between that which was originally designed and the increased level of design requested by a landowner. Examples include a closed or tile drain where open ditches would ordinarily suffice, or the construction of ponds beside the drain, or other special requests by a landowner specifically for this benefit. The authority for this liability is set out in Section 24.

ENGINEER'S REPORT

The Engineer's report should contain a plan and profile of the drain, as well as details on the drain design and the assessment schedule.

The plan shows the location of drains and the limits of the watershed. The profile shows ground elevations along the drain and the present and proposed drain bottom. The specifications give details on how the drain is to be constructed.

The Schedule of Assessment contains several columns. The first group contains the names of owners with a description of each parcel of land assessed.

The hectarage shown in the schedule for which an owner is assessed is only approximate. No survey is made to accurately establish the watershed boundary or farm areas. Any minor error in hectarage assessed is not a valid basis for appeal nor does it greatly affect the assessment. The other columns in the Schedule set forth the assessment liability for each drain and/or branch drain. These values are only estimates. The final value will not be known until the construction work is finished. The assessment will then be prorated to recover the actual cost.

Allowances to lands injured by the work are set out in a separate schedule by the engineer as authorized in Sections 29 to 33 of *The Drainage Act*.

Damage to crops during construction and disposal of waste material will vary depending on the time of year that the work is constructed. Crop damage due to spreading the spoil on the banks is based on a decreasing yearly loss of crop over several years. All or part of the cost of access bridges from a public road to the property may be assessed to the property owner.

Farm bridges are constructed as a part of the work. In certain circumstances a severance allowance may be paid instead of building the bridge. The allowance will depend upon the value of the land severed, or the cost of the bridge that would be required. The cost, or part of the cost of farm bridges or the severance allowance may be assessed across the property.

Where private drains are incorporated into the new drain, a nominal allowance may be paid based on any saving that may result from using the private drain. These allowances may not be included in the Summary of Assessments but are usually shown in a separate Schedule of Allowances.

RELEVANT OMAFRA FACTSHEETS

Drainage Legislation.

This Factsheet was authored by **Sid Vander Veen, P.Eng.**, Resources Management Branch.

POD

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(commande n° 92-065)



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APPENDIX D1 - SUMMARY of AREAS and EQUIVALENT AREAS

Project: Lake Road Diversion Drain Improvement
Date: May 2021

Project No.: 300033208

Conc.	Lot	Owner	Roll No.	Affected Area (ha)	Agri Area (ha)	Bush Area (ha)	Other Use (ha)	Equiv. Factor	Equiv. Area (ha)	Land Type
<u>Lands</u>										
<u>Municipality of Central Elgin</u>										
Range 1 NLR	15	G-Lover Holdings Inc.	2-019-00	4.87	-	1.90	2.97	0.5/1.0	3.92	Bush / Other
Range 1 NLR & SLR	Pt. D & Pt. 16	M. Kong	2-019-01	1.50	-	1.50	-	0.5	0.75	Bush
Range 1 SLR	15	2526485 Ontario Inc.	2-319-04	5.72	-	4.82	0.90	0.5/1.0	3.31	Bush / Other
Range 1 SLR	14	J. & J. Back	2-890-00	17.31	-	17.31	-	0.5	8.66	Bush
Range 1 SLR	13, 14 & 15	Residential Properties (Block Assessment)	Various (61)	17.46	-	-	17.46	2.0/5.0	51.48	Residential / Apartment
<u>Agricultural Lands</u>										
<u>Township of Southwold</u>										
Range 1 NLR	14	Chestnut Grove Farms Ltd.	8-092-30	25.90	20.68	5.22	-	1.0/0.67/0.5	21.40	Agri. / In. Infil. / Bush
Range 1 NLR	13	Chestnut Grove Farms Ltd.	8-091-00	9.38	7.47	1.91	-	1.0/0.67/0.5	7.00	Agri. / In. Infil. / Bush
Range 1 NLR	13	Steve Goodhue Farms Ltd.	8-090-00	11.12	11.12	-	-	1.0/0.67/0.5	10.19	Agri. / In. Infil.
Range 1 SLR	13	Chestnut Grove Farms Ltd.	8-022-10	17.22	9.22	8.00	-	1.0/0.5	13.22	Agri. / Bush
<u>Roads</u>										
<u>Municipality of Central Elgin</u>										
George Street		Municipality of Central Elgin		1.75	-	-	1.75	5.0	8.75	Paved Major Street
Walter Street		Municipality of Central Elgin		0.02	-	-	0.02	3.0	0.06	Paved Side Street
Frederick Street		Municipality of Central Elgin		0.03	-	-	0.03	3.0	0.09	Paved Side Street
Meek Street		Municipality of Central Elgin		0.04	-	-	0.04	3.0	0.12	Paved Side Street
Charles Street		Municipality of Central Elgin		0.10	-	-	0.10	3.0	0.30	Paved Side Street
TOTALS				112.42	48.49	40.66	23.27		129.25	

Equivalency Factors

County Roads and Major Streets @	5.00
Apartment Block @	5.00
Paved Side Streets @	3.00
Residential Lands @	2.00
Agricultural Land (Agri.) @	1.00
Other @	1.00
Increased Infiltration (In. Infil.) @	0.67
Upland Hardwood Bush @	0.50

APPENDIX D2 - SECTION DATA TABLE

Project: Lake Road Diversion Drain Improvement
Date: May 2021

Project No.: 300033208

Section	From	To	Conc.	Lot	Owner	Roll No.	Affected Area (ha)	Equiv. Factor	Equiv. Area (ha)	Sub Totals	Equivalent Area U/S (ha)
Total Equivalent Area											129.25
M1	0	270	Range 1 NLR	15	G-Lover Holdings Inc.	2-019-00	2.67	0.5/1.0	2.17	2.17	127.08
u/s M1			Range 1 NLR & SLR	Pt. D & Pt. 16	M. Kong	2-019-01	1.50	0.5	0.75		
			Range 1 SLR	15	Block Assessment - 2526485 Ontario Inc.	2-319-04	5.52	5.0	27.60	28.35	
M2	270	606	Range 1 SLR	15	2526485 Ontario Inc.		0.55	1.0	0.55	0.55	98.18
u/s M2			Range 1 NLR	15	G-Lover Holdings Inc.		2.20	0.5/1.0	1.76	1.76	
M3	606	1020	Range 1 SLR	15	2526485 Ontario Inc.	2-319-04	5.17	0.5/1.0	2.76	2.76	93.67
u/s M3			Range 1 SLR	14	J. & J. Back	2-890-00	17.31	0.50	8.66		
			Range 1 NLR	14	Chestnut Grove Farms Ltd.	8-092-30	25.90	1.0/0.67/0.5	21.40		
			Range 1 NLR	13	Chestnut Grove Farms Ltd.	8-091-00	9.38	1.0/0.67/0.5	7.00		
			Range 1 NLR	13	Steve Goodhue Farms Ltd.	8-090-00	11.12	1.0/0.67/0.5	10.19		
			Range 1 SLR	13	Chestnut Grove Farms Ltd.	8-022-10	17.22	1.0/0.5	13.22		
			Range 1 SLR	13, 14 & 15	Block Assessment - upstream of Sta. 1+020	Various (60)	11.94	2.0	23.88		
			George Street		Municipality of Central Elgin		1.75	5.0	8.75		
			Walter Street		Municipality of Central Elgin		0.02	3.0	0.06		
			Frederick Street		Municipality of Central Elgin		0.03	3.0	0.09		
			Meek Street		Municipality of Central Elgin		0.04	3.0	0.12		
			Charles Street		Municipality of Central Elgin		0.10	3.0	0.30	93.67	

Equivalency Factors

County Roads & Major Streets @	5.00	Agricultural Land @	1.00
Apartment Block @	5.00	Other @	1.00
Paved Side Streets @	3.00	Increased Infiltration @	0.67
Residential Lands @	2.00	Upland Hardwood Bush @	0.50

APPENDIX D3 - SECTION COSTS

Project: Lake Road Diversion Drain Improvement
Date: May 2021

Project No.: 300033208

Section	Construction	Contingency	Sub-Total Construction	Allowances	Sub-Total Cons & Allow	Admin. Costs	SECTION TOTALS
Main							
M1							
0 270	17,800	1,390	19,190	16,130	35,320	44,150	79,470
M2							
270 606	17,300	1,350	18,650	4,820	23,470	29,340	52,810
M3							
606 1020	21,400	1,660	23,060	6,150	29,210	36,510	65,720
TOTALS	\$ 56,500	\$ 4,400	\$ 60,900	\$ 27,100	\$ 88,000	\$ 110,000	\$ 198,000

APPENDIX D4 - SECTIONAL ASSESSMENT WORKSHEET

Project: Lake Road Diversion Drain Improvement
 Date: May 2021
 Project No.: 300033208

Section Number = M1
 [1] Cost/Eq. Ha. from D/S = -
 [2] Total Section Cost = \$ 79,470

[3] Specific Costs	
Remove, Lower and Replace Crossing at Sta. 0+091 to Roll No. 2-019-00	6,500
Administration	8,100
Increased cost to Load, Haul and Dispose of Spoil (compared to levelling) to Roll No. 2-109-00	2,100
Total Specific Costs =	
	16,700

Remainder to Assess = 62,770

[4] Normal Outlet	90 %
Normal Benefit and Direct Outlet	10 %

[5] Equiv't Area Drained = 127.08 Ha. @ \$ 444.52 per Eq. Ha. for Normal Outlet = 56,490

[6] Remaining for Normal Benefit and Direct Outlet = 6,280

[7] Direct Outlet				
Range 1 NLR	15	G-Lover Holdings Inc.	uses 50%	480
Total of Direct Outlet =				480

[8] Remaining for Normal Benefit = 5,800

SUMMARY TABLE									
CONC.	LOT	OWNER	EQ. AREA (ha)	BENEFIT (Sec 22)		Sec 24/26	OUTLET (Sec 23)		TOTAL
				Specific	Normal		Direct	Normal	
[9] In Section									
Range 1 NLR	15	G-Lover Holdings Inc.	2.17	16,700	5,800	-	480	-	22,980
[10] U/S of Section									
Lands									
Range 1 NLR & SLR	Pt. D & Pt. 16	M. Kong	0.75	-	-	-	-	330	330
Range 1 SLR	15	Block Assessment - 2526485 Ontario Inc.	27.60	-	-	-	-	12,270	12,270
Roads									

[11] Sub - Total = \$ 35,580

[12] Cumulative Total = \$ 35,580

Cumulative Cost/Eq. Ha. carried U/S = \$ 444.52

APPENDIX D4 - SECTIONAL ASSESSMENT WORKSHEET

Project: Lake Road Diversion Drain Improvement
 Date: May 2021
 Project No.: 300033208

Section Number = **M2**
[1] Cost/Eq. Ha. from D/S = 444.52
[2] Total Section Cost = \$ 52,810

[3] Specific Costs	
Increased cost to Load, Haul and Dispose of Spoil (compared to levelling) to Roll No. 2-319-04	3,100
Total Specific Costs = 3,100	

Remainder to Assess = 49,710

[4] Normal Outlet	70 %
Normal Benefit and Direct Outlet	30 %

[5] Equiv't Area Drained = 98.18 Ha. @ \$ 354.44 per Eq. Ha. for Normal Outlet = 34,800

[6] Remaining for Normal Benefit and Direct Outlet = 14,910

[7] Direct Outlet	
Range 1 SLR	100
2526485 Ontario Inc. uses 50%	
Total of Direct Outlet = 100	

[8] Remaining for Normal Benefit = 14,810

SUMMARY TABLE									
CONC.	LOT	OWNER	EQ. AREA (ha)	BENEFIT (Sec 22)		Sec 24/26	OUTLET (Sec 23)		TOTAL
				Specific	Normal		Direct	Normal	
[9] In Section									
Range 1 SLR	15	2526485 Ontario Inc.	0.55	3,100	14,810	-	100	240	18,250
[10] U/S of Section Lands									
Range 1 NLR	15	G-Lover Holdings Inc.	1.76	-	-	-	-	1,400	1,400
Roads									

[11] Sub - Total = \$ 19,650

[12] Cumulative Total = \$ 55,230

Cumulative Cost/Eq. Ha. carried U/S = **\$ 798.96**

APPENDIX D4 - SECTIONAL ASSESSMENT WORKSHEET

Project: Lake Road Diversion Drain Improvement
 Date: May 2021
 Project No.: 300033208

Section Number = **M3**
[1] Cost/Eq. Ha. from D/S = 798.96
[2] Total Section Cost = \$ 65,720

[3] Specific Costs	
Increased cost to Load, Haul and Dispose of Spoil (compared to levelling) to Roll No. 2-319-04	3,800
Total Specific Costs = 3,800	

Remainder to Assess = 61,920

[4] Normal Outlet	50 %
Normal Benefit and Direct Outlet	50 %

[5] Equiv't Area Drained = 93.67 Ha. @ \$ 330.53 per Eq. Ha. for Normal Outlet = 30,960

[6] Remaining for Normal Benefit and Direct Outlet = 30,960

[7] Direct Outlet	
Range 1 SLR 15 2526485 Ontario Inc. uses 50%	460
Total of Direct Outlet = 460	

[8] Remaining for Normal Benefit = 30,500

SUMMARY TABLE									
CONC.	LOT	OWNER	EQ. AREA (ha)	BENEFIT (Sec 22)		Sec 24/26	OUTLET (Sec 23)		TOTAL
				Specific	Normal		Direct	Normal	
[9] In Section									
Range 1 SLR	15	2526485 Ontario Inc.	2.76	3,800	30,500	-	460	2,210	36,970
[10] U/S of Section									
Lands									
Range 1 SLR	14	J. & J. Back	8.66	-	-	-	-	9,780	9,780
Range 1 NLR	14	Chestnut Grove Farms Ltd.	21.40	-	-	-	-	24,170	24,170
Range 1 NLR	13	Steve Goodhue Farms Ltd.	10.19	-	-	-	-	11,510	11,510
Range 1 NLR	13	Chestnut Grove Farms Ltd.	7.00	-	-	-	-	7,900	7,900
Range 1 SLR	13	Chestnut Grove Farms Ltd.	13.22	-	-	-	-	14,930	14,930
Range 1 SLR	13, 14 & 15	Block Assessment - upstream of Sta. 1+020	23.88	-	-	-	-	26,970	26,970
Roads									
George Street		Municipality of Central Elgin	8.75	-	-	-	-	9,890	9,890
Walter Street		Municipality of Central Elgin	0.06	-	-	-	-	70	70
Frederick Street		Municipality of Central Elgin	0.09	-	-	-	-	100	100
Meek Street		Municipality of Central Elgin	0.12	-	-	-	-	140	140
Charles Street		Municipality of Central Elgin	0.30	-	-	-	-	340	340

[11] Sub - Total = \$ 142,770

[12] Cumulative Total = \$ 198,000

Cumulative Cost/Eq. Ha. carried U/S = **\$ 1,129.50**



BURNSIDE

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Appendix E

Standard Drain Specifications

E.2.1 GENERAL DRAIN SPECIFICATIONS

E.2.1.1 SCOPE OF SPECIFICATIONS

This specification covers the general conditions governing the construction of a Municipal Drain under the most recent revision of The Drainage Act and amendments. All work shall be done in accordance with current and applicable Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD).

E.2.1.2 BENCHMARKS

Benchmarks shall be set at intervals along the course of the work at locations shown on the accompanying plan and/or profile. The Contractor or landowner shall be held liable for the cost of re-establishing benchmarks destroyed. Attention is drawn to Section 13 of The Drainage Act.

E.2.1.3 STAKES/FLAGS/MARKERS

Stakes, flags or markers are typically set at intervals throughout the course of the work, at all fences and property lines. The Contractor or landowner shall be held liable for the cost of replacing any stakes removed or destroyed.

E.2.1.4 PROFILE

The drain is to be excavated or installed to regular gradient lines as shown on the profile(s). These gradients show the bottom of the finished drain (open or closed) and are governed entirely by the benchmarks. In the case of closed drains, the gradient is that of the invert of the tile. The profile(s) shows the approximate depth from the surface of the ground to the invert of the tile or drain bottom at the point where the stations are set and from the average bottom of the open drain as taken at the time of survey. Open drains shall be brought to an even gradient in the bottom to prevent standing water. For closed drains, a variation of 25 mm (unless specified otherwise) from the gradient may be deemed sufficient reason for the work to be rejected and required to be rebuilt.

E.2.1.5 CLEARING

Clearing means the cutting of all standing trees, brush, bushes and other vegetation to a maximum height of 300 mm above original ground level as well as the removal of felled materials and windfalls. Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents.

The work shall consist of clearing all areas of earth excavation, earth surfaces to be covered by embankments up to and including 1.2 m in height, and any other areas specified in the Contract Documents.

No trees, brush or bushes are to be left inside the slopes of the drain, whether they are located within the limits of the excavation or not. Brush cleared in accordance with the above shall be piled in a location and in a manner satisfactory to the Engineer for burning by the Owner. Unless otherwise specified or directed, these piles shall be a minimum of 100 m apart and shall contain only cleared material. All work shall be done in accordance with OPSS 201.

E.2.1.6 CLOSE CUT CLEARING

Close Cut Clearing means the cutting of all standing trees, stumps, brush, bushes and other vegetation at original ground level and the removal of felled materials and windfalls. Grubbing means the removal of all stumps, roots, embedded logs, debris and secondary growth. Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents.

The work shall consist of close cut clearing all earth surfaces to be covered by embankments greater than 1.2 m in height, and any other areas specified in the Contract Documents.

No trees, stumps, brush or bushes are to be left inside the slopes of the drain whether they are located within the limits of the excavation or not. Brush cleared in accordance with the above shall be piled in a location and in a manner satisfactory to the Engineer for burning by the Owner. Unless otherwise specified or directed, these piles shall be a minimum of 100 m apart and shall contain only cleared material. All work shall be done in accordance with OPSS 201.

E.2.1.7 BRUSHING

Brushing means the grinding or chipping to ground level of vegetation in the working space under 150 mm in diameter by means of a hydraulic brushing attachment used with an excavator or approved equivalent. This includes grinding or chipping all standing trees, stumps, brush, bushes and other vegetation to original ground level.

Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

E.2.1.8 GRUBBING

Grubbing means the removal of all stumps, roots, embedded logs, debris and secondary growth.

The work shall consist of grubbing all areas of earth excavation, earth surfaces to be covered by embankments up to and including 1.2 m in height and any other areas specified in the Contract Documents.

Grubbing is not required in swamps. Mechanical stump cutters are permitted, provided the entire root structure is removed. Depressions remaining after grubbing shall be backfilled with suitable earth material and compacted to avoid settlement. When clearing has been previously completed by others, all secondary growth, brush and debris shall be removed.

Piled boulders and surface boulders that are not specified in the Contract Documents for removal and lie within areas to be grubbed shall be removed. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

E.2.1.9 REMOVAL OF SURFACE BOULDERS & REMOVAL OF PILED BOULDERS

Piled Boulders means any cobbles, boulders or rock fragments that have been placed in fence rows or piles.

Rock means rock as defined in OPSS 206.

Surface Boulder means any boulder or rock fragment that measures 200 mm or greater in any one dimension, extends a minimum of 200 mm above original ground and can be removed without excavation.

The work shall consist of the removal of surface boulders and removal of piled boulders within the areas specified in the Contract Documents. Depressions remaining after removal shall be backfilled with suitable earth material and compacted to avoid settlement. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

E.2.1.10 FENCES

The Contractor will be permitted to remove fences to the extent necessary to allow the construction of the drain and to dispose of any excess material according to the specifications. Any such fences shall be carefully handled so as to cause no unnecessary damage. Unless allowance has been provided, such fences shall be replaced by the Contractor in as good a condition as found. The Contractor shall supply all material necessary to properly reconstruct any fences. The Contractor shall not leave any fence open when he is not at work in the immediate area and shall replace the fence in a timely manner, all to the satisfaction of the Engineer.

E.2.1.11 STANDING CROPS AND LIVESTOCK

Should a property owner wish to harvest any crop along an access route or within the construction working space as set out in the Engineer's Report, then it shall be the responsibility of the property owner to do so prior to construction. Provisions for the loss of, or damage to, crops along the access route or in the construction area ("Working Space") have been made in the Report and such loss or damage shall not be the liability of the Contractor.

The Contractor shall contain construction operations to the working space and width specified. As long as the construction operations are contained within the specified working space, the Contractor shall not be responsible for damages to crops along the course of the drain.

It shall be the responsibility of the property owners to keep their livestock clear of the construction area upon receiving 24 hours advance notice by the Contractor. After receiving proper notice, the Owner of the property upon which a drain is being constructed shall be liable for any loss or damage to livestock, the drain, drain materials or the Contractor's equipment caused by their livestock.

E.2.1.12 NOTIFICATION OF AGENCIES

The Contractor shall notify the appropriate agency before performing any work affecting the land or property of the MTO, railway, telephone, pipeline or public utility or regulatory agency. The Contractor shall further agree to perform the work affecting such lands or property in accordance with the specifications and approval/permit of the applicable agency.

E.2.1.13 FINAL INSPECTIONS

After substantial completion of the work, but prior to demobilization and final removal of all equipment and materials from the site, the Contractor MUST arrange an on-site FINAL Inspection of the work with the engineer to ensure all aspects of the work have been satisfactorily completed and/or that arrangements have been made to expedite the completion of any outstanding "minor" items or deficiencies. All the work included in the contract, at the time of the Final Inspection, must have the full dimensions and cross-sections called for in the plans and specifications. Notification to the Engineer of this Final Inspection shall be provided at least 5 days prior and it shall be completed as soon as possible or as soon thereafter as weather conditions permit.

E.2.2 SPECIFICATIONS FOR OPEN DRAINS

E.2.2.1 GEOMETRY

The drain shall have the full bottom width, at the gradient, specified or shown on the accompanying plan(s), profile(s) and detail sheet(s).

E.2.2.2 ALIGNMENT

The drain shall run in straight lines throughout each course except at intersections, where it shall run on a minimum curve of 15 m radius unless otherwise specified. If the work consists of the improvement of an existing open drain, then the centre line of the existing drain may be the centre line of the finished work unless otherwise specified.

E.2.2.3 EXCAVATED MATERIAL

A clear buffer of at least 3 m shall be left between the top edge of the open drain and the excavated material. Excavated material shall be placed on the side specified or, if not specified, on the lower side of the drain or on the side opposite trees or fences. No excavated material is to be left in any low runs intended to conduct water into the open drain. It shall be deposited, spread and leveled to a maximum depth of 150 mm, unless specified otherwise and left in a manner such that the lands on which it is spread may be cultivated with adjacent lands by use of ordinary farm machinery. Material excavated in land that is timbered, may be spread to the depth specified or to a maximum depth of 300 mm, which ever is greater. In cultivated areas, the Contractor shall remove stones and boulders on the surface greater than 100 mm diameter from the excavated material and dispose of in an approved location. Treatment of excavated material shall be to the satisfaction of the Engineer. After the excavated material has been spread and leveled, it shall be seeded as specified.

E.2.2.4 SURFACE WATER INLETS

Surface water inlets to the drain shall be provided through the leveled spoil on each property at obvious natural low runs or at other locations as specified by the Engineer on site at the time of construction. No excavated material shall be left in, or any damage done to a ditch, furrow, pipe, tile or depression that is intended to conduct water into an open drain. The drain bank at all such inlets shall be riprapped as directed by the Engineer and reimbursed under the appropriate contract item.

E.2.2.5 OUTLETS

During the construction of an open drain, the Contractor shall guard against damaging the outlet of any tributary drain or pipes encountered. The Contractor will be reimbursed for damage to unmarked outlet pipes under the appropriate contract item.

E.2.2.6 ACCESS CULVERTS

All culverts shall be installed with the invert a minimum of 10% of its diameter or as specified below the gradient and the firm bottom of the drain.

All pipes installed under these specifications shall be carefully bedded so as to ensure uniform bearing throughout its entire length.

Except where requiring concrete cradle or encasement, all pipes shall be bedded on granular fill as specified or as shown on the contract drawings. Bedding shall be hand placed, tamped and consolidated throughout. Granular fill and bedding shall be gravel or crushed stone having no particles over 20 mm in size, except where otherwise specified.

Concrete cradle and concrete encasement shall be placed as shown on the drawings, and the concrete shall be minimum 25 MPa.

From the top of the bedding material to a point 150 mm below the existing grade of the laneway, backfill material shall be clean pit run gravel meeting O.P.S.S. Granular "B" or approved equivalent. The material shall be placed in lifts not to exceed 300 mm in depth and all granular materials shall be compacted to 100 % SPMDD and all subsoil or previously excavated material to 95 % SPMDD.

The final 150 mm of the excavation shall be filled with clean crushed gravel conforming to O.P.S.S. Granular "A" specifications. The material shall be placed in lifts not exceeding 150 mm in depth and shall be thoroughly compacted to 100 % SPMDD.

E.2.2.7 EXCAVATION AT BRIDGE SITES

The excavation at bridge sites shall be to the full depth of the drain and as nearly as possible the full width of the drain as specified for the bridge location. The excavation at a bridge site shall be made in a manner to protect the structural integrity of any permanent bridge. A temporary bridge may be carefully removed to allow excavation. The removal of a bridge is to be done in such a manner so as to cause no damage to the bridge components. Temporary bridges removed to allow excavation shall be replaced in as good a condition as found, so far as material allows. Replacing of such bridges shall be to the satisfaction of the Engineer. The Contractor shall immediately notify the Engineer if it becomes apparent that excavating to a specified gradient will endanger or underpin any culvert or bridge. The Contractor shall cease excavation at the bridge or culvert site until the Engineer instructs the Contractor to proceed.

E.2.2.8 SEEDING

Unless indicated otherwise in the Special Provisions, the Contractor shall seed all disturbed areas which includes newly excavated drain banks and leveled spoil (where

specified) with the OPSS (MTO) Standard Roadside Seed Mix, consisting of 55% Creeping Red Fescue, 27% Kentucky Bluegrass, 15% Perennial Ryegrass and 3% White Clover, at an application rate of 100 kg/10,000 m², plus a nurse crop of Fall Rye Grain or Winter Wheat Grain at an application rate of 60 kg/10,000 m², at the end of each working day.

E.2.2.9 TEMPORARY SEDIMENT CONTROLS

Unless indicated otherwise in the Special Provisions, the Contractor shall install an approved sediment control measure at the downstream end of the open drain excavation and at any other locations specified. The Contractor shall remove any accumulated sediment at regular intervals or as directed by the Engineer. The Contractor shall then remove these temporary measures, and any accumulated sediment therein, after the new open drain has stabilized and only after authorized by the Engineer or the Drainage Superintendent.

E.2.2.10 PERMANENT SEDIMENT/STILLING BASINS

The Contractor shall construct and maintain sediment control or stilling basins as specified in the Special Provisions.

E.2.2.11 RIP RAP & NON-WOVEN GEOTEXTILE

Rip Rap – The Contractor shall supply and install a 450 mm thickness of 150 mm to 300 mm (R-50) diameter quarry stone rip rap with filter cloth underlayment for culvert and pipe outlets. This will include areas of the existing bank where erosion or bank slumping has occurred, as directed on-site by the Engineer. For the area surrounding catchbasins, unless noted otherwise, the contractor shall supply and install a 300 mm thickness of 100 to 150 mm (R-10) diameter quarry stone rip rap with filter cloth underlayment.

Non-Woven Geotextile - All geotextile used for tile wrapping under these specifications shall be non-woven Terrafix 200R (or equivalent). All geotextile used under these specifications for heavy duty applications such as under rip-rap surrounding catchbasins, and at tile outlets into drains shall be non-woven Terrafix 270R (or equivalent).

E.2.3 SPECIFICATIONS FOR ROAD CROSSING (OPEN CUT METHOD)

E.2.3.1 GENERAL

When a drainage works crossing of a Road is to be carried out by the open cut method, the following specifications shall apply as well as OPSS 401 and 410. Under these specifications, the Contractor shall supply all labour, equipment and material unless specified otherwise in the Special Provisions.

E.2.3.2 EXCAVATED MATERIAL

All excavated material removed from the traveled portion of the road and 1.3 m or the full width of the gravel shoulder, whichever is greater, on each side of the traveled portion shall be disposed of off the site by the Contractor in a location approved by the Engineer or the Municipality. No excavated material shall be spread on the right-of-way without the written consent of the Engineer or the Municipality. The excavated material from a trench beyond a point 1.3 m from the traveled portion or beyond the outside edge of the gravel shoulder may be placed in the trench in the case of covered drains.

E.2.3.3 BEDDING

All pipes installed under these specifications shall be carefully bedded so as to ensure uniform bearing throughout its entire length.

Except where requiring concrete cradle or encasement, all pipes shall be bedded on granular fill as specified or as shown on the contract drawings. Bedding shall be hand placed, tamped and consolidated throughout. Granular fill and bedding shall be gravel or crushed stone having no particles over 20 mm in size, except where otherwise specified.

Concrete cradle and concrete encasement shall be placed as shown on the drawings, and the concrete shall be minimum 25 MPa.

E.2.3.4 BACKFILLING

The material and the method for backfilling the excavated area on the traveled portion of the right-of-way and for 1.3 m or the full shoulder width on each side shall conform to the following specifications, or as directed by the Engineer or Municipality.

From the top of the bedding material to a point 300 mm below the existing grade of the road, backfill material shall be clean pit run gravel meeting O.P.S.S. Granular "B" or approved equivalent. The material shall be placed in lifts not to exceed 300 mm in depth and all granular materials shall be compacted to 100 % SPMDD and all subsoil or previously excavated material to 95 % SPMDD.

The final 300 mm of the excavation shall be filled with clean crushed gravel conforming to O.P.S.S. Granular "A" specifications. The material shall be placed in lifts not exceeding 150 mm in depth and shall be thoroughly compacted to 100 % SPMDD.

E.2.3.5 PRECAST CONCRETE STRUCTURES

The type, location and the elevation of all structures in the right-of-way shall be as specified by the Engineer, and as indicated on the "Structures Table".

E.2.3.6 NOTICE

Before commencing work on any right-of-way, the Contractor shall furnish at least 7 days notice in writing to the Engineer and Road Authority having jurisdiction over said right-of-way. A copy of this notice shall also be sent to the Municipality's Drainage Engineer.

E.2.3.7 MAINTENANCE

The Contractor shall maintain the road surface at the road crossing until the Engineer or Road Authority has approved the work. Such maintenance shall include keeping the road surface free from pot-holes and the application of calcium chloride at the rate of two pounds per square meter to the finished surface for the entire width of the excavation.

The Contractor shall give the Engineer or Road Authority four days notice in writing that the work has been completed, and if the work has approved, the Contractor will no longer be responsible for maintenance of the said portion of the right-of-way.

E.2.3.8 PERMITS & TRAFFIC

The Contractor shall be responsible for providing the Road Authority at least 7 days notice in writing before commencing any work on any right-of-way. If the crossing is on a right-of-way that requires a Municipal or Provincial Permit, the Contractor shall ensure that the Permit is obtained before any work commences.

The Contractor shall be responsible for providing, erecting, maintaining and removing all signage and traffic control in accordance with the Ontario Traffic Manual (OTM) and the OTM Book 7 Temporary Conditions - Field Edition as noted in Document D of the Tender/Contract.



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Appendix F

Special Provisions

Appendix F – Special Provisions

Lake Road Diversion Drain Improvement

These **Special Provisions** are specific instructions for this project and detail the requirements not encompassed by the **Standard Drain Specifications**. **Special Provisions** shall take precedence over the **Standard Drain Specifications** where a conflict between them may exist.

All items of the work do not necessarily have a detailed associated Special Provision (SP); accordingly, for those items of the work that do NOT, please refer to the appropriate Standard Drain Specification in the appropriate Appendix for additional information.

1.0 Standard Drain Specifications

All work for this project shall also be governed by the **Standard Drain Specifications**. The Contractor is fully responsible for a reasonable, prudent and thorough review of these Standard Specifications to have a complete and clear understanding of the scope and nature of the work.

2.0 Description and Location

The Village of Port Stanley is located on the north shore of Lake Erie in the extreme southwest corner of the Municipality of Central Elgin, approximately 15 kilometres (20 minutes) south of St. Thomas. The watershed of the drain is located within the geographic Township of Southwold and the Municipality of Central Elgin, specifically, the Village of Port Stanley. The drain is located on the west side of the Village; its downstream end and outlet into the Marr Drain is on the west side of Carlow Road adjacent to the north side of the entranceway to the Kettle Creek Golf & Country Club; its upstream end is near the north east corner of the intersection of George Street and River Road. The watershed and the drain are as shown on the enclosed drawings.

The work to be undertaken on the drain is along its entire course and generally includes the following major items:

- Remove and replace a culvert with a new larger and lower culvert c/w riprap;
- Drain bottom only cleanout c/w spoil treatment (Station 0+000 to 0+270);
- Load, haul and dispose of existing brush and debris Station 0+270 to 1+020;
- Establish a 1.0 m drain bottom c/w 1.5H:1.0V side slopes and spoil treatment (Station 0+270 to Station 1+020; and
- Place riprap and geotextile on exposed banks.

3.0 Instructions and Process

3.1 Pre-Construction Meeting

The Contractor **MUST** arrange an on-site Pre-Construction Meeting with the Contract Administrator, the Municipality (i.e. the Drainage Superintendent) and affected landowner(s)

before any equipment or materials are moved onto the site and before any work is commenced. Further, the Contractor shall also notify (as required) Fisheries and Oceans Canada (DFO) and the Kettle Creek Conservation Authority (KCCA) of the commencement of any in-water work, or to any other applicable agency(s), at least ten (10) working days prior to the commencement of that in-water work.

3.2 Working Space

The locations and widths being provided for the proposed construction as well as for the future maintenance are specified in the Table below.

<u>Working Space</u>		
Station	Max. Width (m)	Comments
Sta. 0+010 to Sta. 0+085	6 m working space on north side of the drain	Access to the drain shall be from Carlow Road via the <u>driveway</u> onto the property at civic address 320 identified by Roll No. 2-019-00, directly to the drain and then along the north side of the drain (refer to the accompanying drawings). Even though a 6 m width has been provided, the working space shall be kept to a minimum; where possible, do not conduct work on the existing pavement.
Sta. 0+085 to Sta. 0+097	6 m working space on west side of the drain	The culvert work around Station 0+091 shall be from the east edge of the parking lot (the west side of the drain crossing).
Sta. 0+097 to Sta. 0+150	6 m working space on west side of the drain	Cleanout of the drain from Station 0+097 to 0+150 shall be from the east side of the parking lot (the top of the west drain bank) for the excavator and the truck(s) to load and haul spoil.
Sta. 0+085 to Sta. 0+150	6 m working space on east side of the drain	<u>ONLY</u> the excavator shall use the east side of the drain between Station 0+085 and 0+150 as an access to get to Station 0+150 for the remaining work.
Sta. 0+150 to Sta. 0+270	6 m working space on east side of the drain	The excavator and truck(s) shall use the east side of the drain between Station 0+150 and 0+270; however, the truck(s) used to load and haul spoil shall only back down along the drain from the south at Station 0+270 to the north to Station 0+150, get loaded, and then exit back to the south at Station 0+270. <u>There will be absolutely no turning around of trucks or excavator in this section of the working space.</u>

Sta. 0+270 to Sta. 0+606	6 m working space on south side of the drain	The excavator and the truck(s) shall use the south side of the drain from Station 0+270 to 0+606.
Sta. 0+606 to Sta. 1+020	6 m working space on east side of the drain	The excavator and the truck(s) shall use the east side of the drain from Station 0+606 to 1+020. Access to the drain shall be from George Street onto the property identified by Roll No. 2-319-04, directly to the drain and then along the south and/or east side of the drain (refer to the accompanying drawings).
<p><u>NOTES:</u></p> <p>(1) The Contractor shall contain their construction operations to as narrow a width as possible, to prevent damage to lands, trees, etcetera and shall not exceed the widths indicated.</p> <p>(2) The Contractor shall be entirely responsible for any damage to lands, trees, etcetera, beyond the widths and locations of both the access route and the working spaces specified, caused by the Contractor, Subcontractors or employees while undertaking the work.</p> <p>(3) The Contract Administrator's approval MUST BE OBTAINED BEFORE exceeding the maximum widths indicated.</p> <p>(4) Access to the working space shall be via the public road specified and must be approved by the Contract Administrator and/or the Drainage Superintendent prior to construction.</p>		

3.3 Access Routes

The access route for the north end of the drain near Station 0+000 shall be off of Carlow Road via the driveway onto the property at civic address 320 identified by Roll No. 2-019-00 and directly to the north side of the drain between Station 0+010 and 0+085 (refer to the drawings).

The access route for south and west end of the drain near Station 1+020 shall be off of George Street onto the property identified by Roll No. 2-319-04 and directly to the south side of the drain via either Block 155 or 156 (but NOT through a residential lot; refer to the drawings).

The Contractor shall confirm each access route with the Contract Administrator and/or the Municipality prior to commencing any work. The width of the access route on each property shall be a maximum of 6 m. Any change to or increase of this width shall be at the discretion of and only with the permission of the Contract Administrator.

3.4 Utilities Investigation

The Contractor shall locate all utilities prior to construction.

3.5 Erosion and Sediment Controls

The Contractor shall develop and provide the Contract Administrator and the Municipality with a “**Sediment Control Plan**” in compliance with and as required by the DFO – Letter of Advice (LOA) for File No. 20-HCAA-01790 dated October 1, 2020. Some sediment control measures are described in SP 1. This Plan must be approved by the Contract Administrator and the Municipality prior to the commencement of any in-water work by the Contractor, Subcontractors or employees while undertaking the work.

The Contractor shall ensure that the site is left at the end of each day with the appropriate and the required erosion and sediment controls in place. The Contractor shall protect any and all excavated materials and prevent them from being washed into the drain. All in-water works shall be completed during periods of low or no flow. Only additional erosion measures shall be paid for as extra items on an as directed basis.

3.6 Construction Document Errors

Any issues during construction with respect to errors or omissions with the design drawings or documents, the constructability of the drain must be brought to the attention of the Contract Administrator immediately. It is expected that a clear communication channel will exist between the Contractor and the Contract Administrator and that any discrepancies relating to construction of the work will be remedied immediately. Work resulting from failure to seek clarification with the Contract Administrator by the Contractor will be the responsibility of the Contractor to remedy at no extra charge to the project and must be completed to the satisfaction of the Contract Administrator prior to demobilization.

3.7 Final Inspection

After substantial completion of the work and prior to demobilization and removal of equipment and materials from the site, the Contractor **MUST** arrange an on-site FINAL inspection of the work with the Contract Administrator and the Municipality. This is to ensure all aspects of the work have been satisfactorily completed and/or that arrangements have been made to expedite the completion of any outstanding minor items or deficiencies. Notification to the Contract Administrator and the Municipality of this Final Inspection shall be provided at least 2 days prior.

3.8 Deficiencies

Deficient items such as, additional rip-rap, topsoil, seed, etc. shall be remedied by the Contractor during the warranty period and paid at the Contract price. If the Contractor fails to complete the work within a reasonable timeframe in the opinion of the Contract Administrator and/or the Municipality, the work shall be completed by a Contractor of the Contract Administrator's and/or the Municipality's choosing and the cost of the work deducted from the Contract holdback.

4.0 Agency Approvals and Requirements

4.1 Kettle Creek Conservation Authority (KCCA)

Attention is drawn to the KCCA Permit No. P.20-027 dated October 15, 2020 (copy enclosed). All work must be done in accordance with the terms of conditions in this permit and the mitigation practices described herein.

4.2 Ministry of Environment, Conservation, and Parks (MECP)

No terrestrial Species at Risk (SAR) are anticipated within the working area. Regardless, the Contractor will still be responsible to ensure that during construction no extirpated, endangered, threatened, or special concern species or their habitats are adversely affected.

4.3 Fisheries and Oceans Canada (DFO)

Attention is drawn to the LOA (file number 20-HCAA-01790) dated October 1, 2020 (copy enclosed). All work must be done in accordance with the terms and conditions in this LOA and the mitigation practices described herein.

5.0 General Construction

The following general conditions and requirements apply to this project:

- Install, maintain and remove any temporary sediment control measures as specified and/or directed by the Contract Administrator, Drainage Superintendent, DFO or the KCCA and in compliance with the (approved) Sediment Control Plan.
- All loading, hauling and disposing of excess excavated material and soil shall be conducted in accordance with O. Reg. 406/19.
- Restore and rehabilitate all areas disturbed to pre-construction conditions or better.

5.1 Subsoil Conditions

Subsoil investigations have not been undertaken on this project. The Contractor shall bid the installation of any channel structures and the excavation of the existing channel on the basis of typical soil conditions. Additionally, if specified in the Contingency Items, the Contractor shall provide a unit price for rip-rap bank erosion protection for use as directed on-site by the Contract Administrator.

5.2 Excess Soils

In accordance with Ontario Regulation (O. Reg.) 406/19; namely, Onsite and Excess Soil Management, it is tentatively proposed that the material excavated from the drain shall be

loaded, hauled and disposed of on the property identified by Roll No. 2-319-04. The actual use of this property shall be confirmed at the time when the work is “let”; if this property is the Re-Use Site, the location of the disposal site must be confirmed with the owner prior to any work being undertaken.

In regards to O. Reg. 406/19, the following shall apply: as owner of the drainage infrastructure, the Municipality of Central Elgin shall be considered the Project Leader; the Contractor which will eventually complete the work shall be considered the Operator; and the tentatively proposed Re-Use site shall be the property identified by Roll. No. 2-319-04. Furthermore, and although O. Reg. 406/19 takes precedence, and regardless that OPSS.MUNI 180 is now outdated and being updated, it shall continue to be used for and apply to this project.

5.3 Restore and Cleanup of the Entire Site

The Contractor shall re-grade any areas that were disturbed at 297 Carlow Road for the construction of the works, etcetera. Also included shall be the complete restoration and cleanup of the site, the working spaces and the access route; namely the existing westerly most driveway access off of Carlow Road. All disturbed areas must be seeded as specified, taking into consideration the average gradient or slope of the area.

6.0 Description of Work

The following Special Provisions are to supplement the brief descriptions in the Project Cost Estimate Appendix and/or the Standard Drain Specifications Appendix. The number of each item references the corresponding item in the Project Cost Estimate and/or the Schedule of Prices. Each Item shall be tendered on the basis of **“For the lump sum price bid, unless indicated otherwise, the Contractor shall:”**

Please Note – the survey of existing conditions of the drain was completed some time ago. Furthermore, remedial work was done in 2015 when an interim maintenance cleanout of the drain was conducted from the outlet of the existing 900 mm dia. culvert at Station 0+962 downstream until temporary freeboard was obtained; it was required to eliminate localized flooding and remove obstructions. Accordingly, the information contained on the Profile, Drawing 2 of 2, regarding the “Depth of Excavation” as well as the true elevation/location of the “Existing Sediment” line has changed; mainly in the upper reach of the drain (estimated to be approx. 300 m in length). The proposed drain bottom gradient and the proposed drain bottom elevations (based on the Benchmarks) on the Profile shall govern the work in general, and specifically SP 1, SP 2 and SP 4 below.

Section A – Lake Road Diversion Drain

SP 1 Drain Bottom Only Cleanout – Sta. 0+010 to 0+270

Prior to commencing any in-water work and the cleanout, the Contractor shall install a temporary sediment control basin and a temporary rock flow check dam in the drain downstream of Sta. 0+033 but upstream of the Marr Drain; refer to OPSD 219.211.

Undertake a drain bottom-only cleanout of the existing drain for a maximum length of approximately 260 metres from Station 0+010 to Station 0+270. The work shall be undertaken from the side of the drain as indicated in the Table entitled Working Space in sub-section 3.2; the existing drain banks or side slopes on this property and within this reach of the drain are to remain undisturbed. The lump sum price bid shall also include the loading, hauling, and disposing of all resulting excavated material or spoil to the designate Re-Use Site in accordance with O. Reg. 406/19 as described in Sub-Section 5.2 above.

After the completion of the work and when so instructed by the Contract Administrator or the Municipality, the rock flow check dam shall be removed, and the excess stone incorporated into the existing replaced crossing centered at Station 0+091. When necessary during the project, or when instructed by the Contract Administrator or the Municipality, and at the completion of the project, the Contractor shall remove and dispose of any accumulated sediment in the manner described above.

Quality Assurance

The Contractor and/or Contract Administrator will inspect the in-water works on a daily basis. Any evidence of failure of the works or potential for failure shall be immediately rectified by the Contractor at no extra cost.

No in-water work can be conducted or will take place between March 15 and July 15 of the calendar year as indicated in the LOA from the DFO. Furthermore, all work must be in compliance with the following documents, which are included in applicable Appendix:

- Aquatic Ecology Memorandum dated November 8, 2018;
- LOA from DFO for File No. 20-HCAA-01790 dated October 1, 2020, and
- KCCA Permit No. P.20-027 issued October 15, 2020.

SP 2 Remove and Replace the existing Crossing – Sta. 0+091

Remove and dispose of (off site) the exiting 750 mm dia. CSP crossing centered at approx. Station 0+091; supply and install a new larger 900 mm dia. CSP culvert at a lower elevation as specified; place riprap reinforcement at each end.

The crossing from Station 0+085 to Station 0+097 shall be completed using the Open Cut Method, as per the Standard Drain Specifications in the appropriate Appendix. The Contractor shall supply and install approximately 12 m of 900 mm dia. X 2.0 mm CSP (68 x 13 mm

corrugation profile) centered at Station 0+091 and as depicted in Detail A on the drawings; the new CSP shall be installed at the specified gradient complete with a minimum of 100 mm of bury below the proposed drain bottom at this location. The new pipe shall be installed on a minimum 150 mm depth of 19 mm dia. clear crushed stone or suitably compacted granular material with no particles greater than 20 mm in size; this imported granular backfill shall continue to the spring-line of the pipe at a minimum. Select native material may be used for backfill within the crossing if it is deemed to be suitable granular material by the Contract Administrator at the time of construction. All unsuitable excavated material shall be removed and disposed of off-site by the Contractor in the manner indicated in SP 2. If native material is NOT acceptable, imported OPSS Granular 'B' shall be used for backfill and paid for as a contingency item. A minimum depth of 300 mm OPSS Granular 'A' material shall be used as the base for the travelled portion of the crossing and shall be included as part of this item. All granular material shall be compacted to a minimum 98% SPDD.

Note: Any settlement or impact caused to the crossing shall be the sole responsibility of the Contractor, per the Standard Drain Specifications. Attention to and the repair of any voids surrounding the pipe appearing post construction under the warranty period shall be included with the cost of this Item. Prior to leaving the site, issues shall be remedied to the satisfaction of the Contract Administrator and the Owner.

The Contractor shall also supply and install 150 to 300 mm (OPSS R50) diameter quarry stone rip-rap with a min. 450 mm thickness and geotextile underlay at the culvert outlet and at the culvert inlet; and approx. 2.7 lineal m downstream of the new CSP extension and approx. 1.8 lineal m upstream of the existing pipe from the top of one bank, on and down the drain bank, across drain bottom, on and up other drain bank to opposite top of bank; Contractors are advised to perform their own riprap quantity calculations upon which to base their price.

SP 3 Brush & Debris Removal and Disposal – Sta. 0+270 to 1+020

Load, haul and dispose of any and all existing debris and brush piles along this portion of the existing drain for a length of approximately 750 metres between Stations 0+270 and 1+020. The work shall be undertaken from the side of the drain as indicated in the Table entitled Working Space in sub-section 3.2.

SP 4 Drain Cleanout and Bank Re-Grading – Sta. 0+270 to 0+962

Undertake a cleanout of the existing drain for a length of approximately 692 metres from Station 0+270 to Station 0+962. The work shall be undertaken from the side of the drain as indicated in the Table entitled Working Space in sub-section 3.2. The cross-section geometry of this portion of the drain shall have a minimum bottom width of 1.0 m. Furthermore, any existing unstable drain banks or side slopes on this property and within this reach of the drain that are bare and void of vegetation, disturbed, eroded or slumping and which are steeper than 1.5m H : 1.0m V. shall be re-graded to this slope as part of this item. Stable and vegetated banks are not to be disturbed. The lump sum price bid shall also include the loading, hauling, and disposing of all resulting excavated material or spoil to the designate Re-Use Site in accordance with O. Reg.

406/19 as described in Sub-Section 5.2 above. Any existing drain banks or side slopes on this property and within this reach of the drain that are exceptionally unstable **and** disturbed may require riprap as specified under another applicable Special Provision.

The Contractor shall also include with this item the seeding of ALL disturbed areas and ALL excavated and exposed drain banks which are bare and void of vegetation, with the specified mix (see note on applicable drawing) at the designated rate to restore the site and the drain banks to a condition satisfactory to the Contract Administrator of the Drainage Superintendent unless detailed under another section of these Special Provisions. All work shall be in accordance with OPSS.MUNI 804 – Construction Specification for Seed and Cover. The excavated and exposed drain banks can be seeded without topsoil for ease of application. Seeding, in addition to the specified seed mix, shall also include an annual nurse crop seed of Fall Rye Grain or Winter Wheat Grain which shall be applied at an application rate of 60 kg/10,000 m². Upon request, a certificate of seed analysis shall be provided to and approved by the Contract Administrator prior to being applied.

Section B – Contingency Items

This section covers work that may be required for this project. These items shall apply only as and when approved by the Contract Administrator or the Drainage Superintendent.

SP 5 OPSS R50 Rip-Rap Erosion Protection

For the unit price bid per square metre, the Contractor shall supply and install a 450 mm thickness of 150 to 300 mm (OPSS R50) diameter quarry stone rip-rap with geotextile underlay. This will include riprapping those areas of the existing drain banks which are bare and void of vegetation, disturbed, eroded or slumping **and** which are steeper than 1.5m H : 1.0m V as referenced in SP 4 and/or as directed on-site by the Contract Administrator or the Drainage Superintendent. Additionally, this unit price shall be used for payment for any rip-rap installed in addition to those quantities already specified in other items and for credit for any quantities of rip-rap deleted from other items.

SP 6 Replacement of Outlet Pipes for Existing Private Tiles

For the unit price bid for each the Contractor shall replace any existing outlet pipe for private tile drains encountered during construction. Included in this price shall be all labour, equipment and material required to support the replacement. This shall consist of compacted backfill or clear stone bedding and connection of the tile using a solid 4 m length of dual-wall HDPE (320 kPa) pipe (or approved equal) with a rodent grate. The unit price bid for this item shall also include 1 m² of R50 riprap for erosion protection at the pipe outlet (300 mm thickness with geotextile underlay). The construction and installation of the outlet and erosion protection shall be to the satisfaction of the Contract Administrator or the Drainage Superintendent.

Outlet pipes missed during construction shall be completed by the Contractor during the warranty period and paid at the Contract price. If the Contractor fails to complete the

replacement within a reasonable timeframe, in the opinion of the Engineer and/or the Drainage Superintendent, the work shall be completed by a Contractor of the Engineer's or Drainage Superintendent's choosing and the cost of the work deducted from the Contract holdback. Please refer to the Standard Drain Specifications for additional information.

SP 7 Re-Seeding

For the unit price bid per square metre, re-seed all disturbed areas where the original nurse crop or seed does not germinate or where, due to extreme runoff conditions, seed is washed away. All references to seed in SP 4 shall also be applicable to this contingency item.



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Appendix G

Agency Documents and Approvals

Aquatic Technical Memorandum	G1
DFO Letter of Advice	G2
KCCA Permit	G3



Memorandum

Date: November 8, 2018 **Project No.:** 300032208
Project Name: Lake Road Diversion Drain Aquatic Ecology Memo
Client Name: Municipality of Central Elgin
To: Andrew Slegers – Drainage Superintendent
From: Devin Soeting, C.E.T., CAN-CISEC, Aquatic Ecologist

Introduction

The Lake Road Diversion Drain (the Drain) is located within the Kettle Creek Physiographic Region and has a catchment area of approximately 1.23 km² comprised primarily of glaciolacustrine deposits (both fine and coarse texture) in the upper reaches and modern alluvial deposits of Kettle Creek in the lower reach. This lower reach is characterized by a flat floored sand plain within a steep-sided valley. The sand plain has been marked by many gullies which convey water toward Kettle Creek and eventually Lake Erie.

The study area stretches from just north of the intersection of River Road and George Street (to the west) and the downstream end of the Lake Road Diversion Drain near County Road 20 / Carlow Road, to the east. Within the study area, the subject Drain is classified entirely as an open, unrated drain which discharges to a section of the Marr Municipal Drain near the County Road 20 / Carlow Road crossing. Aside from approximately 300 m of the Marr Municipal Drain, the entire Impact Zone (1 km downstream of the proposed works) is within Kettle Creek.

The proposed improvement work includes a full-length clean-out and treatment of resulting spoil to remove deposited sediment and abundant woody debris which has impeded flow through the Drain.

Background Information Review

In general, there is relatively little biological information known about unrated drains. In order to provide an ecological context to the proposed drainage improvement work, a desk-top aquatic assessment was conducted to review relevant background information and characterize existing conditions in the Drain. The reviewed information included aerial imagery, Species at Risk (SAR) mapping (DFO, 2017), Ministry of Natural Resources and Forestry (MNRF) Aquatic Resource Area (ARA) mapping, as well as Land Information Ontario mapping from the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). The reviewed data provided

relatively little information regarding the Drain with the exception of its alignment, and the potential fish species that inhabit Kettle Creek. Since no records of fish presence sampling / surveying were reviewed, a potential fish species presence list could not be generated for the subject Drain. However, based on a review of fish species captured during fish presence surveys on other small tributaries of Kettle Creek, the potential fish assemblage within the Lake Road Diversion Drain likely consists of baitfish species that prefer a warm to cool water thermal regime. Kettle Creek is considered to be a warm to cool water fishery containing a diverse assemblage of sport and baitfish. It should be noted that Rainbow Trout (*Oncorhynchus mykiss*) have been captured in some tributaries of Kettle Creek, north of the watercourse and the species is considered to seasonally inhabit Kettle Creek (within the Impact Zone). Several species identified as inhabiting Kettle Creek (Northern Pike, Golden Redhorse, and Rainbow Trout) are listed as a sensitive fish species in the DRAFT Guidance for Maintaining and Repairing Municipal Drains in Ontario (DFO, 2017), however, no work is planned for that area (Impact Zone).

Due to the generally unknown ecologic conditions of unrated drains, a conservative in-water activity window exists when work can be conducted. The in-water activity window when work should be conducted for unrated drains is July 16th to September 30th as provided in the DRAFT Guidance for Maintaining and Repairing Municipal Drains in Ontario (DFO, 2017).

Site Conditions

The site visit took place on April 9, 2018 and included a walking tour of the entire Drain between River Road (to the west) and the downstream end of the Lake Road Diversion Drain near County Road 20 / Carlow Road, to the east. The upstream limit of the Drain is located near the toe-slope of the valley, with a relatively steep-sided valley wall adjacent to the north. The constructed Drain is relatively linear in nature and generally flows from southwest to northeast. The Drain is located adjacent to a treed area, agricultural land, and the Kettle Creek Golf & Country Club. Upstream of the Drain, the watercourse is naturalized and is aligned from west to east through a treed area. This upstream section conveys the flow of several first and second order watercourses that drain agricultural fields.

The subject Drain receives flow from adjacent agricultural fields through overland flow and tile under-drainage and is connected to a large drainage area, west of River Road through a corrugated steel pipe culvert (approximately 1.1 m diameter). This culvert was observed to be perched approximately 0.1 m above the water level in the Drain. A plunge pool was observed at the base of the perched culvert and contained large concrete pieces underlain by a sand and gravel substrate. Downstream of the pool, the substrate was comprised of sand and active erosion was evident along both the northern and southern banks. In some areas, the banks were observed to be relatively steep, reaching a 1:1 slope in some areas. Widespread bank undercutting and slumping was also observed at locations upstream of the Kettle Creek Golf & Country Club. It should be noted that groundwater contributions to the Drain were observed flowing from the valley side, north of the Drain. This reach contained relatively uniform conditions and had a bottom width between approximately 0.8 m and 1.0 m, and a mean wetted

depth of approximately 0.05 m. This section was also characterized by laminar flow and a sand substrate, with little to no in-water vegetation or woody debris.

Where the Drain flows east between the Kettle Creek Golf & Country Club and the agricultural field, the conditions were visibly different. Within this reach, the banks were significantly shallower and were vegetated with various shrub species including red osier dogwood, rose and sumac species. The Drain channel itself was narrow (approximately 0.5 m), while the mean wetted width was approximately 0.2 m. The Drain was noted to be gently meandering within the broader channel and contained areas of dense in-channel vegetation and downed woody debris. In many instances, the downed woody debris formed impassible barriers to potential fish migration. The presence of the wood had also diversified the morphology of the Drain through the creation of deeper pools and changes to velocity.

Near the downstream extent of the Drain adjacent to the Kettle Creek Golf & Country Club property, the gradient became steeper with several debris dams and a small set of rapids that further restricted potential fish movement within the Drain. The corrugated steel pipe (CSP) culverts within this area were noted to be damaged and may need to be replaced to suitably convey flow downstream. The low water levels and lack of refuge areas limit the potential fish habitat throughout this section. Prior to flowing downstream of the Kettle Creek Golf & Country Club and into the Marr Drain, the Drain flows into a deeper pool immediately upstream of the CSP culvert beneath County Road 20 / Carlow Road. This pool was observed to contain a sand substrate overlain by boulders and cobble, providing potential fish habitat.

In general, the Drain appeared capable of only providing marginal fish habitat throughout its observable length. The habitat is limited by the relatively uniform morphology, numerous barriers to fish movement and lack of refugia habitat. No fish were observed throughout the Drain despite an intensive search, and many potential barriers to fish movement were identified. Though the subject Drain is potentially capable of providing marginal direct fish habitat, it is considered to contribute to direct fish habitat downstream.

Proposed Design

The planned works includes a full cleanout and will remove accumulated sediment and debris within the Drain. Appropriate sediment controls are planned at strategic locations throughout the work zone to slow the water flow and mitigate potential downstream impacts from sedimentation. Work is proposed to be conducted during low water level, within the approved activity window and will attempt to avoid periods of precipitation. Photos of the Drain are shown below.



Photo 1: Looking west at the outlet of the CSP culvert within the Lake Road Diversion Drain. Note the perched culvert, restricting potential fish migration. (April 2018).



Photo 2: Looking east, Looking east, downstream near the upstream extent of the watercourse. Note the undercut and eroded banks, and shallow, flat watercourse (April 2018).



Photo 3: Evidence of bank sloughing in section of Drain before bending east beside golf course. (April 2018).



Photo 4: Looking east, downstream adjacent to the Kettle Creek Golf & Country Club. (April 2018).



Photo 5: Looking South, Downstream of the 12th Line Crossing. (April 2018).



Photo 6: A debris dam, one of several observed along this reach of the Drain adjacent to the golf course. (April 2018).

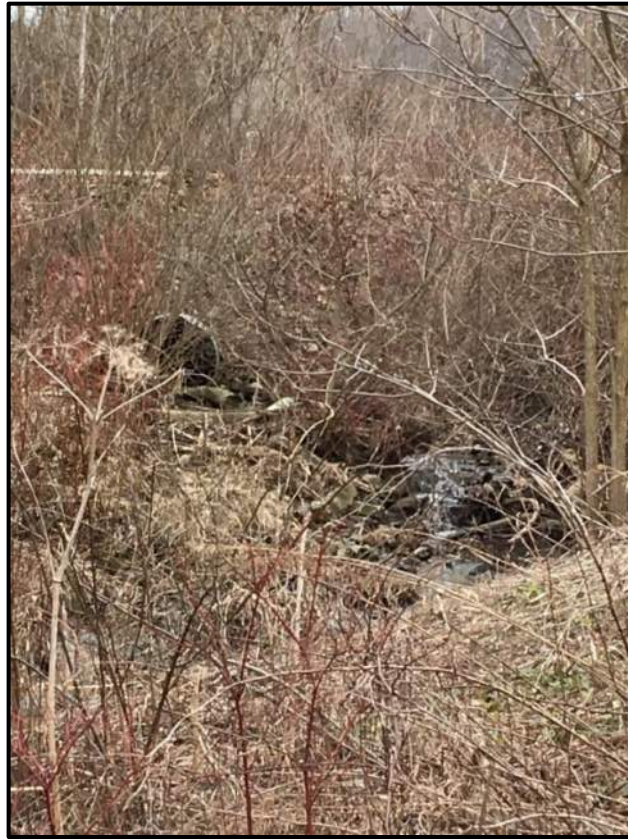


Photo 7: Looking west, toward the rapids adjacent to the golf course driveway. The driveway culvert can also be observed to the left of the rapids. (April 2018).

cc: Lloyd Perrin, Municipality of Central Elgin (Via: Email)
Geoff Brooks, Municipality of Central Elgin (Via: Email)
Jeff Dickson, Burnside (Via: Email)
Amy Bobby, Burnside (Via: Email)
Chris Pfohl, Burnside (Via: Email)

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Fisheries and Oceans
Canada

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

Pêches et Océans
Canada

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

October 1, 2020

Your file

Votre référence

Our file

Notre référence

20-HCAA-01790

Sean Waterman, Drainage Superintendent
Municipality of Central Elgin
450 Sunset Drive, 1st Floor
St. Thomas, ON N5R 5V1

Subject: Drain Maintenance, Lake Road Diversion Drain, Municipality of Central Elgin (20-HCAA-01790) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Sean Waterman:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on August 28, 2020. We understand that you propose to:

- Conduct a bottom-only cleanout on 930m of an unrated drain channel.
- Replace existing 0.75x1.1m culvert with new 0.9x1.1m culvert and install rip rap aprons at the culvert ends; embed culvert to allow fish passage.
- Install effective erosion and sediment control measures to prevent sedimentation of the watercourse.

Our review considered the following information:

- Request for Review form and supporting documents submitted by Jeff Dickson, R.J. Burnside & Associates Limited via email on August 28, 2020.
- Additional information submitted by Jeff Dickson, R.J. Burnside & Associates Limited via email on June 8, 2020 and October 1, 2020.

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

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and,
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

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

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Plan in-water works, undertakings and activities to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate;
 - Conduct no in-water work between March 15 and July 15;
- Capture, relocate and monitor for fish trapped within isolated, enclosed, or dewatered areas;
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity;
 - Re-vegetate the disturbed area with native species suitable for the site;
- Conduct in-water undertakings and activities during periods of low water levels;
- Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water) for the protection of fish and fish habitat;
- Develop and implement a Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the work, undertaking or activity;
 - Conduct all in-water works, undertakings or activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse;
 - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories);
 - Operate machinery on land in stable dry area;
 - Regularly monitor the watercourse for signs of sedimentation during all phases of the work, undertaking or activity and take corrective action;
 - Dispose and stabilize all dredged material above the high water mark of nearby waterbodies to prevent entry in the water; and,
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries Act*, the *Aquatic Invasive Species Regulations* or the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, avoid prohibited effects on listed aquatic species at risk, any part of their critical habitat or the residences of their individuals, and prevent the introduction of non-indigenous species.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of

fish habitat. Such notifications should be directed to FisheriesProtection@dfo-mpo.gc.ca or 1-855-852-8320.

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

If you have any questions with the content of this letter, please contact Deborah Silver at our Burlington office at 905-315-5249 or deborah.silver@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Deborah Silver', is positioned above the printed name.

Deborah Silver
Biologist, Triage and Planning
Fish and Fish Habitat Protection Program

CC:

Jeff Dickson, R.J. Burnside & Associates Limited, jeff.dickson@rjburnside.com

Chris Biberhofer, Fisheries and Oceans Canada, christopher.biberhofer@dfo-mpo.gc.ca

Lisa Wren, Fisheries and Oceans Canada, lisa.wren@dfo-mpo.gc.ca

Development, Interference with Wetlands and Alterations to Shorelines and Watercourses

Conservation Authorities Act - Ontario Regulation 181/06 (O.Reg.97/04)

PERMIT NO.: P.20-027

This Permit is issued on the merits of the information and attachments thereto of:

Application #: **20-027** Application Date: **09/10/2020**

APPLICANT INFORMATION:

Name of Applicant:	Applicant Mailing Address:
Municipality of Central Elgin	c/o Sean Waterman
Tel. Home:	450 Sunset Rd
	St. Thomas, ON N5R 5V1
Tel. Other:	swaterman@centralelgin.org
519-631-4860 ext. 287	
Agent: (if applicable)	
Jeff Dickson (RJ Burnside & Assoc)	Jeff.dickson@rjburnside.com

PROJECT LOCATION:

Subject Property:	
Lake Road Diversion Drain	320 Carlow Rd/Kettle Creek Golf
Municipality:	Community:
Municipality of Central Elgin	Port Stanley

CONDITION OF PERMIT:

--

AUTHORIZATION:

Permit Issued: **10/15/2020** Permit Expires: **10/15/2022**

Authorized By:  Witness: 

APPLICANT ACKNOWLEDGEMENT:

By signing this permit, I/we, the applicant, acknowledge and agree to fully comply with the conditions of this Permit as set out by the Kettle Creek Conservation Authority.

Applicant: _____ Witness: _____

**APPLICATION for Development, Interference with Wetlands
and Alterations to Shorelines and Watercourses**
Conservation Authorities Act - Ontario Regulation 181/06 (O.Reg.97/04)

APPLICATION #:

Section A - Applicant Information

Name of Landowner: Municipality of Central Elgin Tel. Home: _____
Mailing Address: 450 Sunset Drive, 1st Floor Tel. Other: 519-631-4860
City: St. Thomas, ON Postal Code: N5R 5V1 Ext. 287
Email: SWaterman@centralelgin.org

If an Agent is authorized to act on behalf of the Landowner, complete the following:

Name of Agent: Jeff Dickson, P.Eng. Organization: R.J. Burnside & Associates
Mailing Address: 449 Josephine St., P.O. Box 10 Tel. Bus: 226-476-3113
City: Wingham, ON Postal Code: N0G 2W0 Tel. Other: _____
Email: jeff.dickson@rjburnside.com

Section B - Project Location

Property Location: Part of the work is on land at 320 Carlow Road - Kettle Creek Golf & Country Club, and part is on other lands currently used for agricultural purposes.
(Street and Number (911) or Lot and Concession or Lot and Plan)

Municipality: Municipality of Central Elgin Community: Village of Port Stanley

Section C -- Project Details

Description of Project: Lake Road Diversion Drain Improvement (a tributary to the Marr Drain) under Section 78 of the Drainage Act
= approx. 930m drain "bottom only" clean-out and spoil treatment; remove & replace an 11m x 750mm crossing (at the Golf & Country Club) c/w riprap on each end.
List Attachments: (Details of Drawings, Plans, Reports, etc..) 2020 Drawing Set and Nov. 2018 Aquatic Ecology Memorandum
(N.B. the section 78 engineer's report is being prepared)

Existing use of Land: Kettle Creek Golf & Country Club; and lands use for agriculture Proposed use of Land: KC Golf & Country Club; and future Residential.
Proposed Start Date: July 1, 2021 Completion Date: September 30, 2021

Are Planning Act or Municipal Approvals required? (eg. Zoning, Severance, Building Permit, etc...)

☒ No

☐ Yes (provide details) _____

I/we the undersigned hereby certify to the best of my/our knowledge and belief that all of the above noted and attached information is correct and true. I/we further solemnly declare that I/we have read and fully understand the contents of this application and specifically the Submission Requirements, Terms and Conditions, and Declaration which are written on Page 2 of this Application.

Signature of Applicant: _____

Date: September 10, 2020

KCCA OFFICE USE ONLY

Application Fee: _____ Cash or Cheque No: _____
Date Received: _____ Received By: _____
Application Complete: _____ Initial: _____

SUBMISSION REQUIREMENTS: *(One copy of all project drawings, unless otherwise requested)*

As set out in O.Reg.181/06, an application must be accompanied by the following:

Permission to Develop:

- Detailed Site Plan showing existing site conditions and proposed works including location and dimensions of all existing structures.
- Elevations of existing buildings, if any, and grades and the proposed elevations of buildings and grades after development
- Drainage details before and after development
- Complete description of the type, volume and location of fill proposed to be placed or dumped
- Such other technical studies or plans requested by the Authority

Permission to Alter:

- Plan View and cross-section details of the proposed alteration
- Description of methods to be used in carrying out the alteration
- A statement of the purpose of the alteration
- Such other studies or plans requested by the Authority

All Permissions:

- Appropriate fee as noted on KCCA's Application Fee Schedule.
- KCCA Landowner Authorization Form, if an agent is submitting an application on behalf of the landowner. *(landowner Authorization form available at www.kettlecreekconservation.on.ca)*
- Technical studies/plans as required subject to KCCA staff review of this project *(NOTE: this is dependant on the proposed extent of intrusion into the regulated area and/or associated potential negative impacts)*
- Structural drawings, certified by a qualified professional engineer, subject to KCCA staff review of this project. *(eg. flood-proofing, geotechnical requirements, etc...)*

Authority staff must deem an application complete before it can be processed. When all the information listed above is received in a form satisfactory to Authority staff, and a pre-consultation or site assessment is conducted as necessary, an application will then be deemed to be complete.

TERMS AND CONDITIONS:

1. Permission granted by the Conservation Authority is not transferrable and is issued to the current owner of the property only.
2. Permission granted by the Conservation Authority does not replace any other permit and/or approval issued through municipal offices or other levels of government. A permit under Ontario Regulation 181/06 does not constitute KCCA approval of any related Planning Act applications.
3. The Conservation Authority may at any time withdraw any permission granted if, in the opinion of the Conservation Authority, the representations contained in the application for permission are not carried out, are untrue or incorrect, or the conditions/requirements of the permission are not complied with.
4. If revisions to the design of the project are required subsequent to granted permission of the Conservation Authority, plans/documents reflecting the changes must be submitted to the Conservation Authority for further review and approval prior to undertaking the redesigned works. A subsequent application may be required for the redesigned works.
5. Permission granted by the Conservation Authority shall not release the Applicant from any legal liability or obligation and remains in force subject to all limitations, requirements and liabilities imposed by law.
6. This application and supporting documents will be considered as public documents and available to the public upon written requests under the Freedom of Information and Protection of Privacy Act.

DECLARATION:

I/we acknowledge that it is our responsibility to ensure that a valid KCCA permission is in effect at the time the works are undertaken.

I/we agree to allow representatives of the Kettle Creek Conservation Authority and other persons as required by KCCA, to access the property for the purpose of obtaining information relevant to this application.

I/we further agree to undertake or obtain, at my own expense, further information, studies, reports, etc... prepared by others, if such is required by the Conservation Authority to properly review the application.

I/we the applicants, agree to indemnify and save harmless the Kettle Creek Conservation Authority and its officers, employees, or agents from and against all damages, loss, costs, claims, demands, actions and proceedings, arising out of or resulting from any act or omission of the Owner and/or Applicant or any of their agents, employees or contractors relating to any particulars, terms or conditions of permission granted by the Conservation Authority.



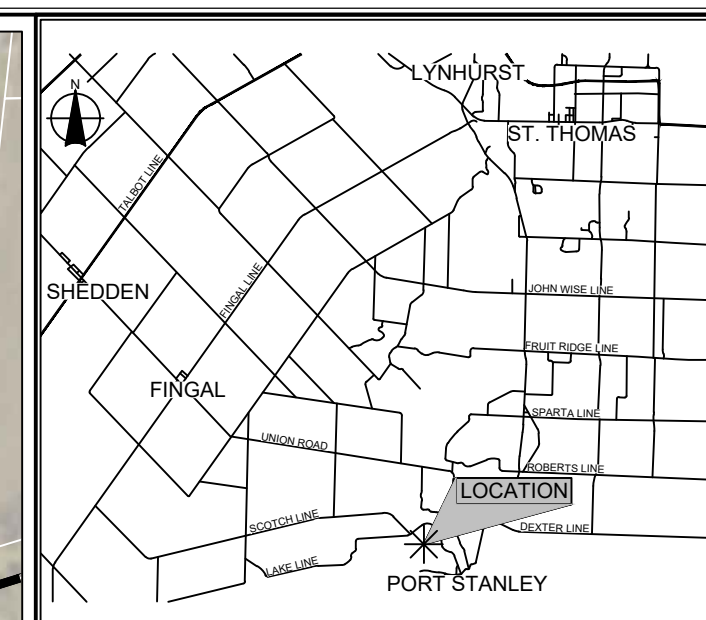
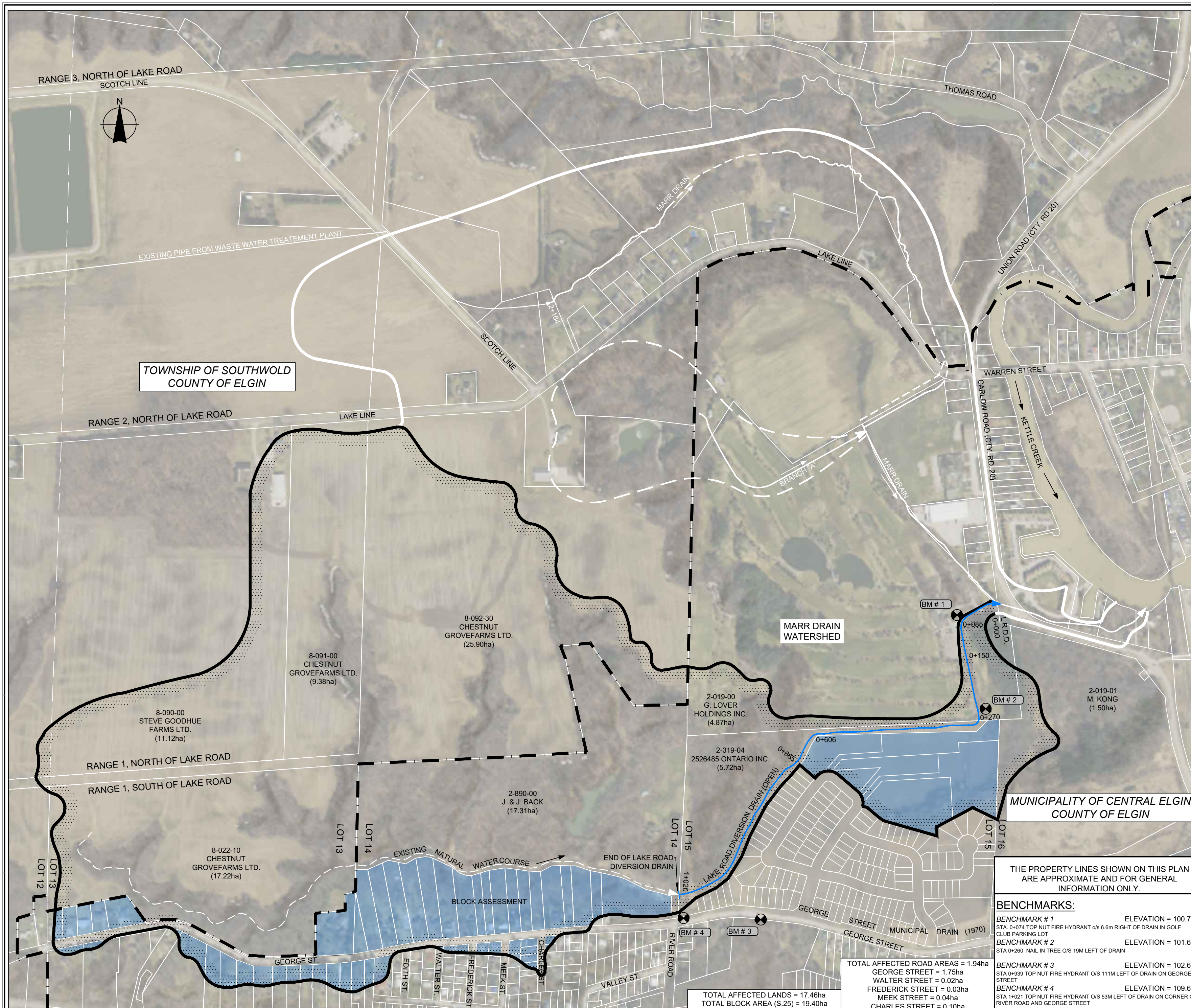
BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix H






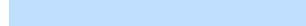




Drawings

Master Watershed Plan	1 of 2
Profiles, Sections, Details and Notes	2 of 2



KEY PLAN
SCALE: N.T.S.

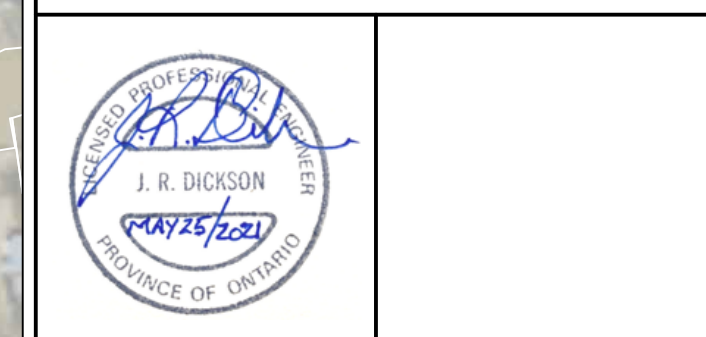
LEGEND

WATERSHED BOUNDARY	
MARR WATERSHED BOUNDARY	
DRAIN LOCATION AND DIRECTION	
MUNICIPAL BOUNDARY	
PROPERTY LINE	
BLOCK ASSESSMENTS	
BENCHMARK NUMBER	  
BENCHMARK LOCATION	
ROLL #	X-XXX-XX
OWNER NAME	L. OWNER
WATERSHED AREA IN HECTARES	(XX.XXha)

Notes

1. This drawing is the exclusive property of R. J. Burnside & Associates Limited. The reproduction of any part without prior written consent of this office is strictly prohibited.
2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.
3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

FOR CONSTRUCTION



No.	Issue / Revision	Date	Auth
1	PROJECT SCOPING MEETING	JUN 26, 2015	JRD
2	MUNICIPAL STAFF MEETING	MAR 9, 2018	JRD
3	COUNCIL BLOCK ASSESSMENT	MAR 21, 2018	JRD
4	MUNICIPAL REVIEW OF "DRAFT" DRAWINGS	MAY 29, 2020	JRD
5	ISSUED FOR ENGINEER'S REPORT	MAY 25, 2021	JRD



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449 Josephine St., P.O. Box 10
Wingham, Ontario, N0G 2W0
telephone (519) 357-1521 **fax** (519) 357-3624
web www.rjburnside.com

Client
MUNICIPALITY OF CENTRAL ELGIN

450 SUNSET DRIVE, 1ST FLOOR
ST. THOMAS ON
N5R 5V1


Drawing Title

**LAKE ROAD DIVERSION DRAIN
IMPROVEMENT**

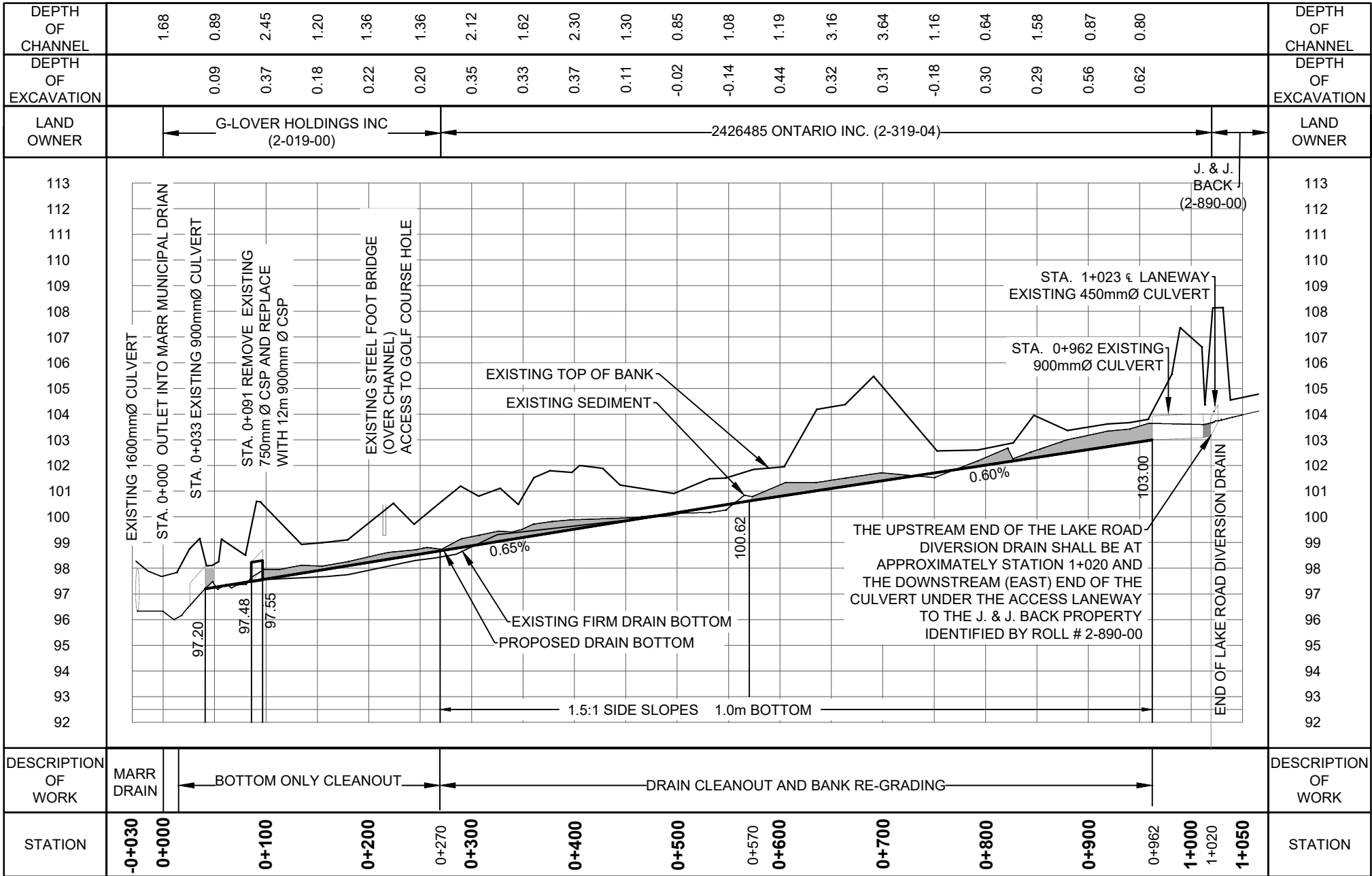
MASTER WATERSHED PLAN

8	Designed JD	Checked JD	Drawn SBC/AB	Checked JD	Drawing No. <div>1 of 2</div>
1 OF	Date MAY 29, 2020		Project No. 300033208		

Scale
1:5,000

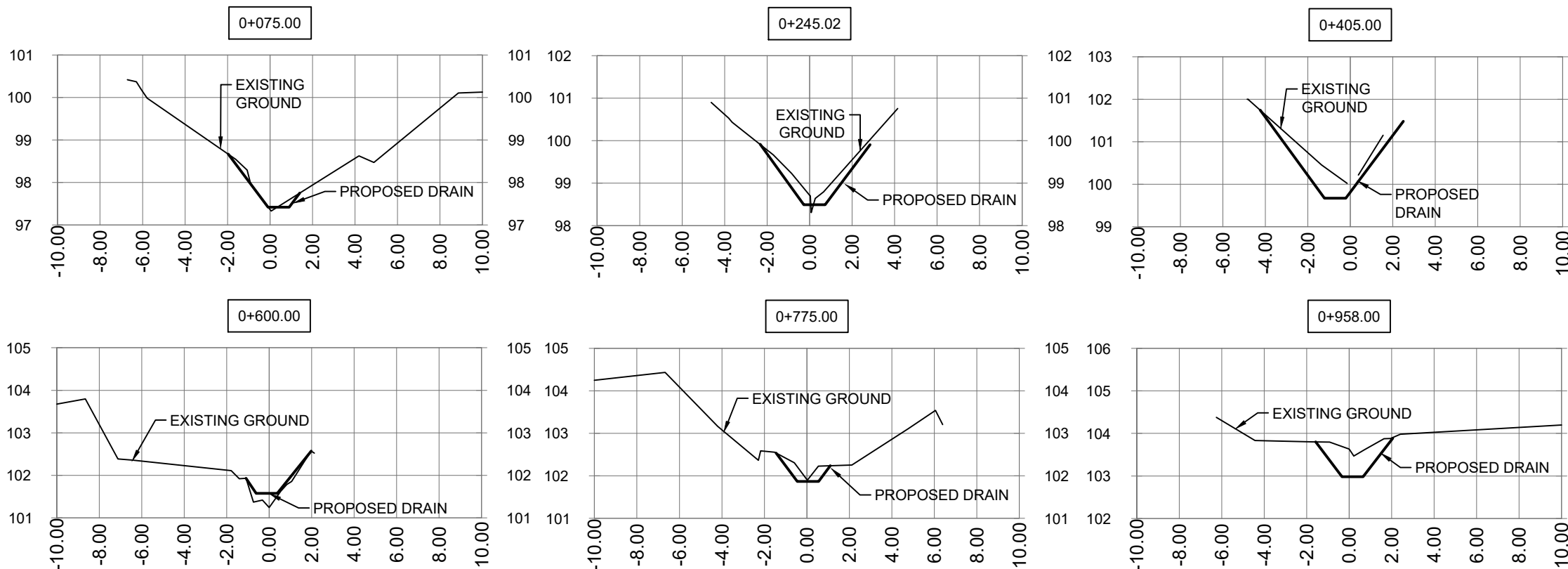
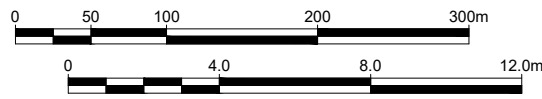


AERIAL PHOTOGRAPHY PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY. PARCELS PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY, DATED: 2015

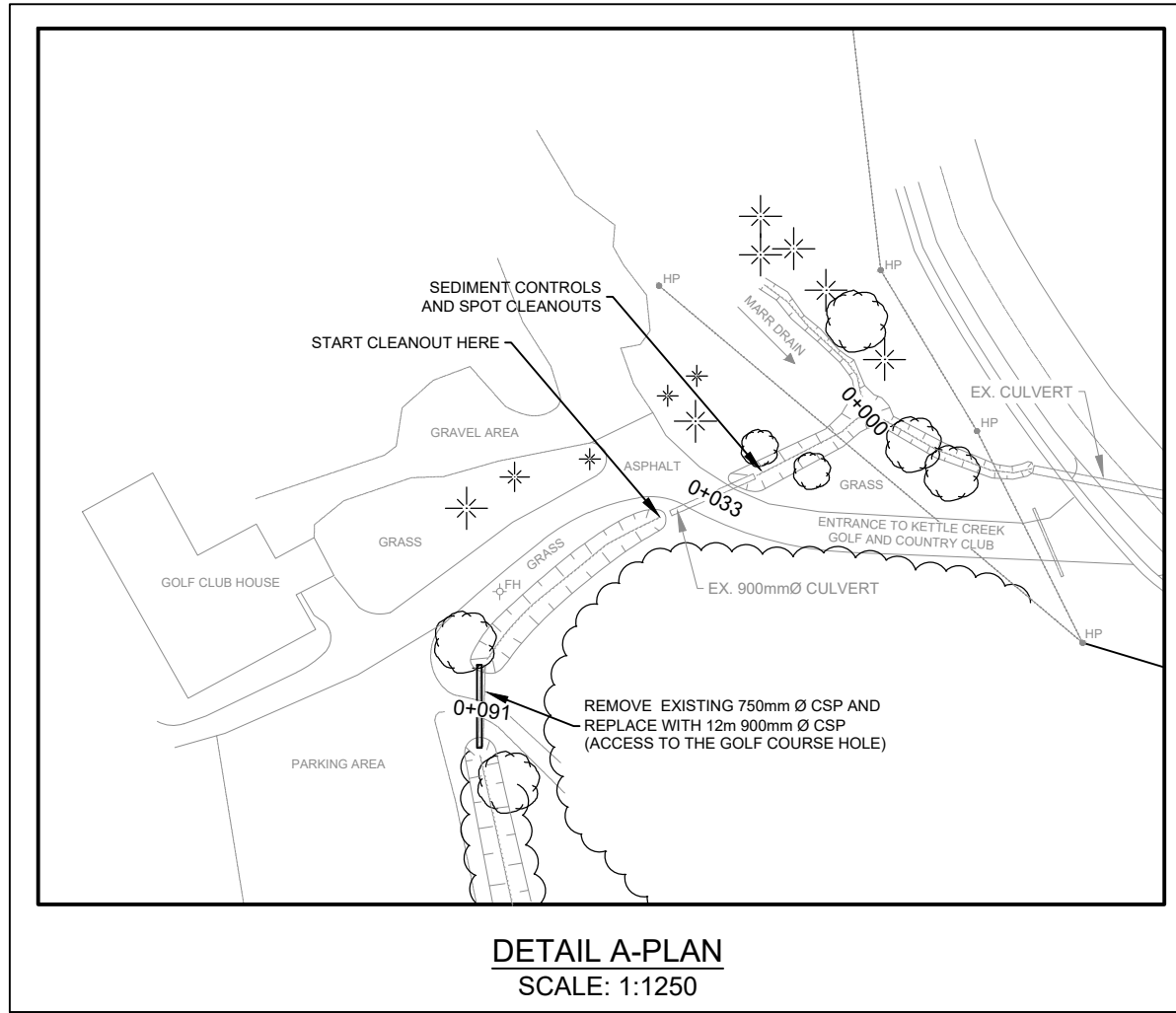


PROFILE

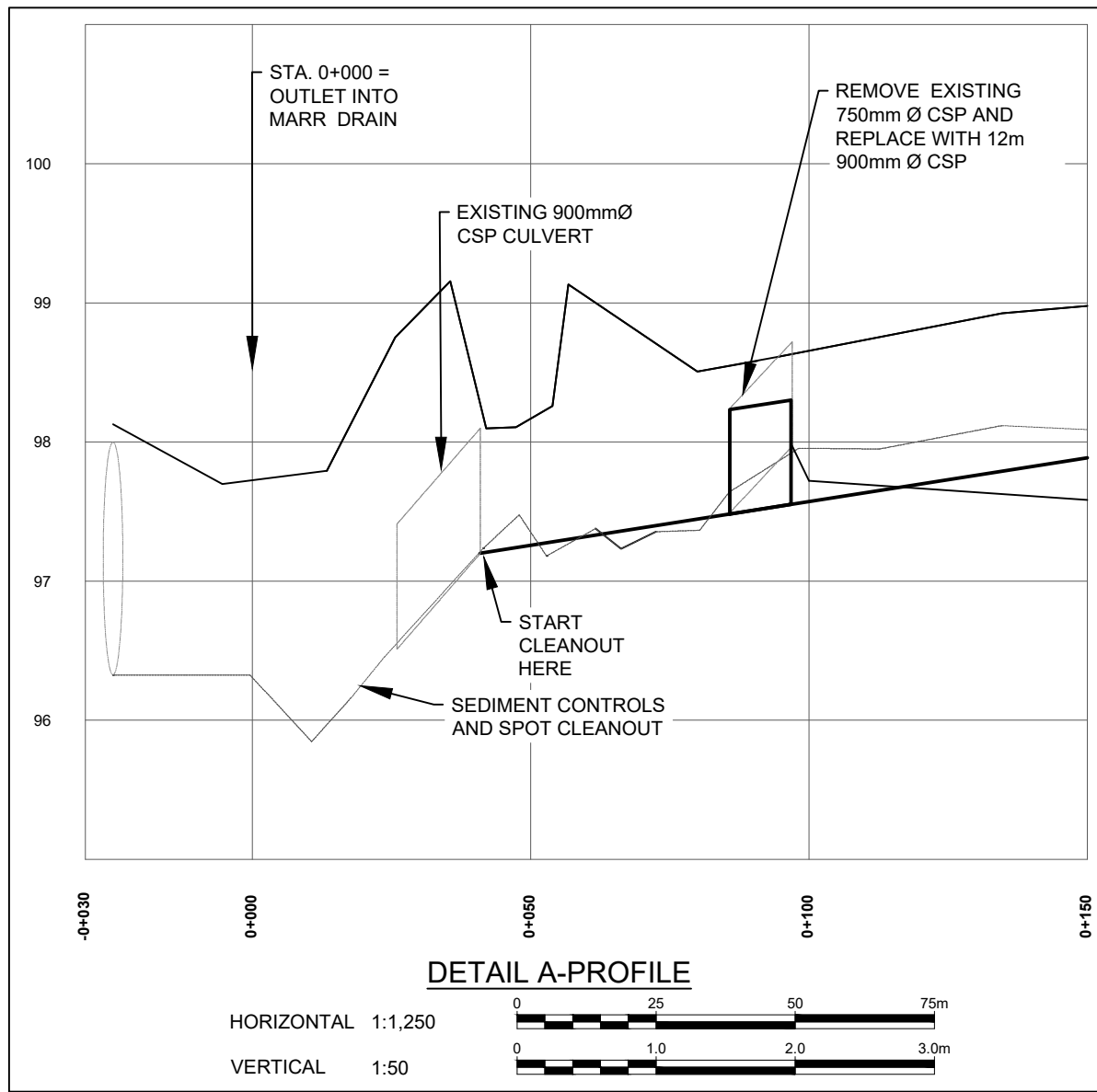
HORIZONTAL 1:5,000
VERTICAL 1:200



SECTIONS

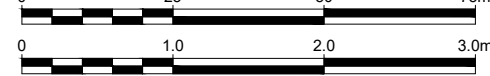


DETAIL A-PLAN
SCALE: 1:1250



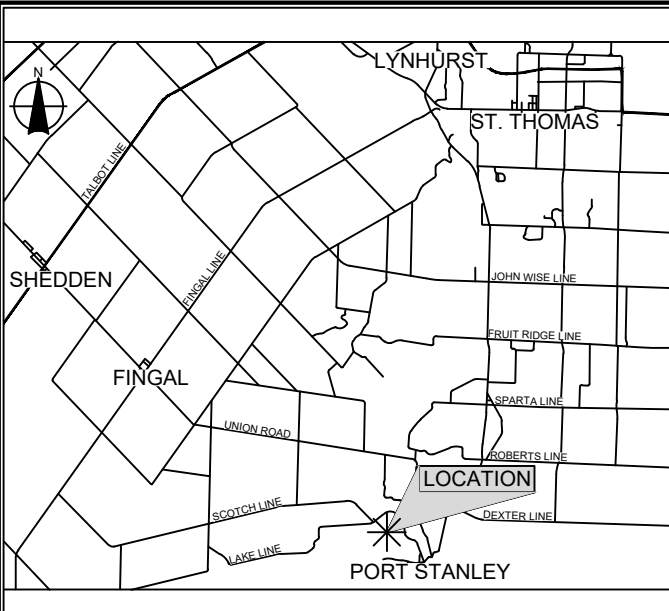
DETAIL A-PROFILE

HORIZONTAL 1:1,250
VERTICAL 1:50



CONSTRUCTION NOTES:

- THE MATERIAL EXCAVATED FROM THE DRAIN SHALL BE TREATED AS SPECIFIED OR AS DIRECTED BY THE ENGINEER OR THE DRAINAGE SUPERINTENDENT.
- ALL DISTURBED AREA MUST BE SEEDED USING AN APPROVED SEED MIXTURE AS FOLLOWS:
(a) FLATTER AREA WITH LESS THAN 10% GRADIENT -- STANDARD ROADSIDE MIX AS PER OPSS MUNI 804
(b) SLOPED AREAS WITH GREATER THAN 10% GRADIENT -- CROWN VETCH MIX AS PER OPSS MUNI 804
- END TREATMENT OF ANY EXISTING CULVERTS SHALL BE AS SPECIFIED.
- MINIMUM DRAIN GEOMETRY:
BOTTOM = 1.0m
SIDESLOPE = 1.5H:1.0V
GRADIENT = AS SPECIFIED
- CONDUCT WORK ONLY DURING THE PERMITTED TIMING WINDOW AND AS AUTHORIZED BY DFO.
- INSTALL AND MAINTAIN SPECIFIED EROSION AND SEDIMENT CONTROL MEASURES TO ISOLATE THE LAKE ROAD DIVERSION DRAIN FROM THE MARR DRAIN AND KETTLE CREEK.
- ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE MAINTAINED AND SHALL REMAIN IN PLACE UNTIL EXPOSED SOILS ARE STABLE. A PERMANENT VEGETATIVE COVER HAS BEEN ESTABLISHED AND THE CONTRACTOR IS DIRECTED TO REMOVE THEM BY THE ENGINEER OR THE DRAINAGE SUPERINTENDENT.



KEY PLAN
SCALE: N.T.S.

LEGEND

- WATERSHED BOUNDARY
- SUB WATERSHED BOUNDARY
- DRAIN LOCATION AND DIRECTION
- MUNICIPAL BOUNDARY
- PROPERTY LINE
- BENCHMARK NUMBER
- BENCHMARK LOCATION

- Notes
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 - All property lines are approximate and for information purposes only.

NOT FOR CONSTRUCTION



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Client
MUNICIPALITY OF CENTRAL ELGIN
450 SUNSET DRIVE, 1ST FLOOR
ST. THOMAS ON
N5R 5V1

Drawing Title
**LAKE ROAD DIVERSION DRAIN
IMPROVEMENT**
PROFILES, SECTIONS, DETAILS AND NOTES

Designed JD	Checked JD	Drawn SBC/AB	Checked JD	Drawing No. 2 of 2
Date YY/MM/DD	Project No. 300033208			
Scale Horizontal AS NOTED	Vertical AS NOTED			