Engineer's Report
Marr 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
MSW019344

ASSESSMENTS for CONSTRUCTION
MUNICIPALITY OF CENTRAL ELGIN

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot		Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals	*Less* 1/3 Grant	*Less* Allowances	Net Assessment
			Lands - Central Elgin								
117	Pt 13&14	*	J. White	2-011-00	0.41	50,910	30	50,940	-	1,500	49,440
117	Pt 11, 12, & D	*	Marr Block Assessment	Various (11)	6.31	-	1,710	1,710	-	-	1,710
Range 1 NLR	Pt D		Below-Me Developments Inc.	2-012-05	13.58	-	1,270	1,270	423	-	847
Range 1 NLR	Pt 15&16, Pt D	*	G-Lover Holdings Inc.	2-019-00	29.63	-	3,660	3,660	-	-	3,660
Range 1 NLR & SLR	Pt D & Pt 16	*	M. Kong	2-019-01	1.50	-	230	230	-	-	230
Range 1 SLR	Pt 15	*	2526485 Ontario Inc.	2-319-04	5.72	-	1,010	1,010	-	-	1,010
Range 1 SLR	Pt 14	*	J. & J. Back	2-890-00	17.31	-	2,620	2,620	-	-	2,620
Range 1 SLR	13 & 14	*	Lake Road Block - Residential	Various (60)	11.94	-	7,250	7,250	-	-	7,250
Range 1 SLR	15	*	Lake Road Block - 2526485 Ontario Inc.	2-319-04	5.52	-	8,370	8,370	-	-	8,370
			Total on Lands - Municipality of Central Elgin		**91.92**	**$ 50,910**	**$ 26,150**	**$ 77,060**	**$ 423**	**$ 1,500**	**$ 75,137**
			Roads - Central Elgin								
County Road No. 20		*	County of Elgin		1.00	-	540	540	-	-	540
Lake Line		*	Municipality of Central Elgin		0.28	-	120	120	-	-	120
George Street		*	Municipality of Central Elgin		1.75	-	2,120	2,120	-	-	2,120
Walter Street		*	Municipality of Central Elgin		0.02	-	30	30	-	-	30
Frederick Street		*	Municipality of Central Elgin		0.03	-	30	30	-	-	30
Meek Street		*	Municipality of Central Elgin		0.04	-	50	50	-	-	50
Charles Street		*	Municipality of Central Elgin		0.10	-	120	120	-	-	120
			Total on Roads - Municipality of Central Elgin		**3.22**	**$ -**	**$ 3,010**	**$ 3,010**	**$ -**	**$ -**	**$ 3,010**
			ALL LANDS AND ROADS - Municipality of Central Elgin		**95.14**	**$ 50,910**	**$ 29,160**	**$ 80,070**	**$ 423**	**$ 1,500**	**$ 78,147**

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 requested by the Municipality

ASSESSMENTS for CONSTRUCTION
TOWNSHIP OF SOUTHWOLD

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot		Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals	*Less* 1/3 Grant	*Less* Allowances	Net Assessment
			Lands - Southwold								
Range 1 SLR	Pt 13		Chestnut Grove Farms Ltd.	8-022-10	17.22	-	4,010	4,010	1,337	-	2,673
Range 1 NLR	Pt 13		Steve Goodhue Farms Ltd.	8-090-00	11.12	-	3,100	3,100	1,033	-	2,067
Range 1 NLR	Pt 13		Chestnut Grove Farms Ltd.	8-091-00	9.38	-	2,120	2,120	707	-	1,413
Range 1 NLR	Pt 14		Chestnut Grove Farms Ltd.	8-092-30	39.05	-	7,550	7,550	2,517	-	5,033
Range 1 & 2 NLR	Pt 14		G. & C. Goodhue	8-092-00	1.92	-	370	370	123	-	247
Range 2 NLR	Pt C	*	J. & G. Milcz	8-115-00	4.63	-	300	300	-	-	300
Range 2 NLR	Pt 12 & 13	*	Municipality of Central Elgin (Lagoons)	8-108-00	24.70	-	7,980	7,980	-	-	7,980
Range 2 NLR	Pt 12 & 13		Municipality of Central Elgin	8-108-00	3.20	-	230	230	77	-	153
Range 2 NLR	Pt 14	*	C. & P. Major	8-109-00	0.36	-	80	80	-	-	80
Range 2 NLR	Pt 14 & Pt C		Chestnut Grove Farms Ltd.	8-111-00	7.22	-	520	520	173	-	347
Range 2 NLR	Pt C	*	J. & C. Johnson	8-111-01	1.21	-	120	120	-	-	120
Range 2 NLR	Pt C		A. Gifford Estate	8-112-00	5.63	-	380	380	127	-	253
Range 2 NLR	Pt C	*	K. Gifford	8-112-01	0.31	-	70	70	-	-	70
Range 2 NLR	Pt C	*	R. Zubyk	8-113-00	0.69	-	120	120	-	-	120
Range 2 NLR	Pt C	*	J. Meeuse c/o R. Meeuse	8-114-00	0.13	-	30	30	-	-	30
Range 2 NLR	Pt C	*	D. Gilbert	8-117-00	0.71	-	100	100	-	-	100
Range 2 NLR	Pt C	*	D. & E. MacMillan	8-117-04	0.20	-	40	40	-	-	40
Range 2 NLR	Pt C	*	D. VanSeader & J. Newport	8-117-06	0.20	-	40	40	-	-	40
Range 2 NLR	Pt C	*	J. & D. Bod	8-117-08	0.20	-	40	40	-	-	40
Range 2 NLR	Pt 14	*	D. Durr	8-117-10	0.26	-	60	60	-	-	60
Range 2 NLR	Pt 14	*	J. Murray & S. Dasilva	8-117-12	0.30	-	60	60	-	-	60
Range 2 NLR	Pt 15	*	Union Gas Ltd	8-118-00	0.10	-	30	30	-	-	30
Range 2 NLR	Pt 15	*	H. Wismer	8-119-00	7.83	-	550	550	-	-	550
Range 2 NLR	Pt 15	*	S. & H. Gilgen	8-119-06	0.77	-	60	60	-	-	60
Range 2 NLR	Pt 15	*	C. Wismer & J. Hardwood	8-119-11	0.37	-	40	40	-	-	40
Range 2 NLR	Pt D	*	N. Phillips & A. Brodie	8-120-00	0.07	-	20	20	-	-	20
Range 2 NLR	Pt D	*	M. Hall	8-121-00	0.25	-	50	50	-	-	50
Range 2 NLR	Pt D	*	N. & N. Gucanin-Gazibaric	8-121-01	1.29	-	130	130	-	-	130
Range 2 NLR	Pt D	*	K. Kastelanac & R. Vuksinic	8-121-02	2.85	-	150	150	-	-	150
Range 2 NLR	Pt D	*	J. & L. Johnston	8-121-04	0.34	-	70	70	-	-	70
			Total on Lands - Township of Southwold		**142.51**	**$ -**	**$ 28,420**	**$ 28,420**	**$ 6,093**	**$ -**	**$ 22,327**

ASSESSMENTS for CONSTRUCTION
TOWNSHIP OF SOUTHWOLD

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals	*Less* 1/3 Grant	*Less* Allowances	Net Assessment
		Roads - Southwold								
Lake Line		* Township of Southwold		2.44	-	1,050	1,050	-	-	1,050
Scotch Line		* Township of Southwold		0.83	-	360	360	-	-	360
		Total on Roads - Township of Southwold		**3.27**	**$ -**	**$ 1,410**	**$ 1,410**	**$ -**	**$ -**	**$ 1,410**
		ALL LANDS AND ROADS - Township of Southwold		**145.78**	**$ -**	**$ 29,830**	**$ 29,830**	**$ 6,093**	**$ -**	**$ 23,737**

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.

ASSESSMENTS for CONSTRUCTION
ENTIRE DRAIN

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals	*Less* 1/3 Grant	*Less* Allowances	Net Assessment
		All Lands								
		Municipality of Central Elgin		91.92	50,910	26,150	77,060	423	1,500	75,137
		Township of Southwold		142.51	-	28,420	28,420	6,093	-	22,327
		Total on Lands - Entire Drain		**234.43**	**$ 50,910**	**$ 54,570**	**$ 105,480**	**$ 6,517**	**$ 1,500**	**$ 97,463**
		All Roads								
		Elgin County		1.00	-	540	540	-	-	540
		Municipality of Central Elgin		2.22	-	2,470	2,470	-	-	2,470
		Township of Southwold		3.27	-	1,410	1,410	-	-	1,410
		Total on Roads - Entire Drain		**6.49**	**$ -**	**$ 4,420**	**$ 4,420**	**$ -**	**$ -**	**$ 4,420**
		ALL LANDS AND ROADS - Entire Drain		**240.92**	**$ 50,910**	**$ 58,990**	**$ 109,900**	**$ 6,517**	**$ 1,500**	**$ 101,883**

Notes: (1) 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.

Distribution List

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5	No	No	Landowners (distributed by Municipality)
11	No	No	Landowners (distributed by Township)
1	Yes	Yes	Ontario Ministry of Agriculture, Food and Rural Affairs
1	Yes	Yes	County of Elgin
-	Yes	Yes	Department of Fisheries and Oceans
-	Yes	Yes	Ministry of Environment, Conservation and Parks
-	Yes	Yes	Kettle Creek Conservation Authority

Record of Revisions

Revision	Date	Description
0	April 21, 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:

Jeff Dickson, P.Eng.
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 Marr Drain was authorized in a letter of instruction from the Assistant Director of Physical Services 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. General repairs and improvement work to the existing drain on the property at civic address 297 Carlow Road (Elgin County Road No. 20), in the Village of Port Stanley, to include:
   - the realignment of approximately 50 m of the drain;
   - stabilize a portion of the original south drain bank; and
   - extend the length of the existing private crossing and include it as part of the drain.
2. Incorporate the watershed of the Lake Road Diversion Drain as part of the Marr Drain, as described in By-Law No. 1214 for The Corporation of the Village of Port Stanley and governed by a report dated the 12th of January, 1956 for the Lake Road Municipal Drains prepared by S.W. Archibald, O.L.S., Professional Engineer.
3. Prepare new Assessment for Maintenance and Repair schedules for the Main Drain and Branch ‘A’.

Recommendations Summary

It is recommended that the proposed improvements to the Marr Drain consist of the following items which are to be undertaken on the property located at 297 Carlow Road, in the Village of Port Stanley:

1. A “drain bottom only” cleanout and treatment of the resulting spoil on the portion of the drain from approximately Station 0+030 to Station 0+050;
2. The realignment of the drain from approximately Station 0+050 to 0+089 with a new meander including a riffle/pool structure to allow for the re-grading and stabilization of the existing steep and eroding drain bank on the south side of the existing drain on this property (see Enlargement 1, Burnside Drawing No. 2 of 4); and
3. A downstream (6 m) extension of the existing corrugated steel pipe located between approximately Station 0+089 to Station 0+095 to provide an increased top width

including the placement of riprap reinforcement at each end as well as incorporating it as part of the Drain for the purposes of future maintenance.

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	$12,400
4.	Privately owned Non-Agricultural *(incl. block assessments)*	$77,950
5.	Privately owned Agricultural	
	- grantable	$19,550
	- non-grantable	$0
6.	Special non-proratable assessments	
	- agricultural (grantable)	$0
	- agricultural (non-grantable)	$0
	- non-Agricultural (Sec. 26)	$0
7.	**Project Total**	**$109,900**

Acknowledgements

Burnside acknowledges assistance from the owner of 297 Carlow Road, 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
m^2 - square metre
m^3 - 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

Appendices

Disclaimer

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In the preparation of the various instruments of service contained herein, R.J. Burnside & Associates Limited was required to use and rely upon various sources of information (including but not limited to: reports, data, drawings, observations) produced by parties other than R.J. Burnside & Associates Limited. For its part R.J. Burnside & Associates Limited has proceeded based on the belief that the third party/parties in question produced this documentation using accepted industry standards and best practices and that all information was therefore accurate, correct and free of errors at the time of consultation. As such, the comments, recommendations and materials presented in this instrument of service reflect our best judgment in light of the information available at the time of preparation. R.J. Burnside & Associates Limited, its employees, affiliates and subcontractors accept no liability for inaccuracies or errors in the instruments of service provided to the client, arising from deficiencies in the aforementioned third party materials and documents.

R.J. Burnside & Associates Limited makes no warranties, either express or implied, of merchantability and fitness of the documents and other instruments of service for any purpose other than that specified by the contract.

1.0 Introduction

1.1 Request for Improvement

The Municipality received a “request for improvement” to the existing drain from the owner of 297 Carlow Drive, specifically the portion of the drain on Part 3, Registered Plan 11R-8229 (part of Lots 13 & 14, RP 117) identified by Roll Number 2-011-00.

1.2 Appointment under the Act

This Report for the improvement of the Marr Drain is being prepared by Burnside as a result of an appointment by the Municipality in accordance with Section 78 of the Act.

1.3 Chronology

The original impetus for this project as cited above was the result of the Municipality receiving an improvement request for the Marr Drain. An Engineer’s Report was completed and filed with the Municipality. Subsequent to the Consideration of that Report, and the dismissal of an appeal to the Court of Revision, an ensuing appeal was filed with the OMAFRA Appeal Tribunal. The Tribunal Decision was that *“The Municipality of Central Elgin shall refer the Report back to the Engineer for reconsideration pursuant to Section 57 of the Act.”*; and the appeal was dismissed.

Following the Tribunal’s referral of the report back to the engineer, additional general research of the Municipality’s drainage archives, and those relating to the Marr Drain and Lake Road Municipal Drains, was undertaken. That research confirmed the Lake Road Diversion Drain was a tributary to the Marr Drain.

The 1956 report for the Lake Road Municipal Drains predates the 1968 and the 1991 reports for the Marr Drain. Further, the Lake Road Diversion Drain was shown on the Plan contained in the 1991 Marr Drain Report as well as a watershed boundary; its outlet into the Marr Drain was shown west of the crossing under Carlow Road, upstream of Station 0+272. However, an examination of the assessment schedules in the latter two reports revealed that neither included or assessed any lands and roads within the Lake Road Diversion Drain watershed. Therefore, none of the lands and roads within its watershed had been levied assessments for any construction, improvement or maintenance of the Marr Drain.

The improvement work proposed in this Report is on the portion of the Marr Drain downstream of its confluence with the Lake Road Diversion Drain; therefore, it was deemed appropriate and necessary to include the watershed of the Lake Road Diversion Drain as part of the Marr Drain. By doing so, the lands and roads within the Lake Road Diversion Drain watershed could be assessed for part of the proposed improvements in accordance with the Act, as well as an apportionment for any future maintenance.

Burnside was consequently authorized by the Municipality to undertake the additional work required, above and beyond that required by the referral, to assess the watershed of the Lake Road Diversion Drain as part of the Marr Drain.

The tributary drain has a watershed similar in size to that of the Marr Drain, and consists of lands and roads to the south and west of the watershed of the Marr Drain. Some of those lands are residential properties along George Street in the Village of Port Stanley, as well as rural portions of Lots 13, 14 and 15 in Concession Range 1, South of Lake Road (Rng 1 S.L.R.) and in Concession Range 1, North of Lake Road (Rng 1 N.L.R.). These lands in Central Elgin and in the geographic Township are located between George Street in the south to as far north as Lake Line.

The report adopted under By-Law for the Lake Road Municipal Drains in general, and the Lake Road Diversion Drain in particular, is dated January 12, 1956. Given the age of the report, it is understandable that conditions have changed within that watershed. In fact, not only has George Street in the Village of Port Stanley been notably upgraded since 1956, several properties have also been developed along its length at the southern limit of Lots 13 and 14, Concession Rng 1 S.L.R.

As a result, the Municipality also appointed Burnside to prepare a separate report in accordance with Section 78 of the Act for an improvement to the Lake Road Diversion Drain. This separate Report was to likewise include a new Schedule of Assessment for Maintenance and Repair of the Diversion Drain for all of the lands and roads within its watershed, but in particular, for those that exist today but did not in 1956. Therefore, a similar process was undertaken for the Lake Road Diversion Drain as was required to prepare the report for the Marr Drain Improvement, with many of the same procedural matters including, but not necessarily limited to investigations, a survey of the existing conditions, data collection, stakeholder meetings, etcetera.

1.4 Engineer’s Report

After the report was referred back to the engineer, additional tasks were required and attended to including but not necessarily limited to:

- gathering, reviewing and discussing additional information and supporting documents regarding the drain;
- meeting with and informing stakeholders in the watershed of the Lake Road Diversion Drain about this project and how the two drains are associated;
- subsequent communications and meetings with Municipal staff and the owner of 297 Carlow Road involving a change to the scope of the work;
- communication with the Kettle Creek Conservation Authority (KCCA) staff and procurement of a Permit; and

- interaction with Fisheries and Oceans Canada (DFO) staff and acquiring authorization for the proposed work.

Based on these changes, the information contained herein is intended to reflect our understanding of the various discussions with respect to the improvement work and this project. The details of the proposed work for the Marr Drain Improvement are described in this Report and its Appendices, and on the various Details, Plans, Profile and Sections contained on the Drawings.

1.5 The Drainage Act, RSO 1990

This Report was prepared in accordance with Sections 57 and 78 of the Act.

2.0 Background Information

2.1 History of the Marr Drain

The Marr Drain was originally constructed for the Township under a Report prepared by A.J. DeVos, P.Eng., of A.M. Spriet & Associates Ltd., dated May 27, 1968. The Drain consisted of an open Main Drain approximately 3,200 feet (975 m) in length and a closed Branch “A” Drain approximately 1,400 feet (427 m) in length. The drain served parts of Lots 14, 15, C & D, Rng 1 & 2 N.L.R. in the Township and part of the Village of Port Stanley.

The Main Drain (open) had its outlet into Kettle Creek at Sta. 32+00, extended west of Mill Street/Carlow Road in Port Stanley and then north and east ending about 300 feet to the north of Lake Line at Sta. 0+00. Branch ‘A’ extended from its Sta 0+00 to the west from Sta. 11+00 on the Main Drain to Sta. 14+00; although originally proposed to consist of 8-inch and 10-inch tile, prior to construction Branch ‘A’ was changed to 12-inch tile as per a letter dated July 5, 1968.

A subsequent Report for the Marr Drain, pursuant to Sections 4 and 78 of the Act, was prepared by J.R. Spriet, P. Eng., of Spriet Associates London Limited, dated May 23, 1991. The work reconstructed portions of the Main Drain serving parts of Lots 15 and Clergy Lot D in Rng 1 N.L.R in the Village of Port Stanley and Lots 12 to 15, including Clergy Lot C and D, Rng 1 N.L.R. and Rng 2 N.L.R. in the Township. The work proposed consisted of approximately 1,076 lineal meters of open drain reconstruction and backfilling as well as the installation of approximately 608 lineal meters of pipe varying in diameter from 375 mm to 600 mm, plus appurtenances. Portions of the Main Drain were unimproved and there was no work on Branch ‘A’.

2.2 Existing Conditions

2.2.1 The Marr Drain

The Marr Drain is primarily located on Lots 14 and 15, as well as Lots C and D, Rng 1 & 2, N.L.R. The downstream portion is within the limits of the Village of Port Stanley, in the Municipality, and its upstream portion is in the Township; it is a combined open and closed system.

The outlet for the Marr Drain is Kettle Creek at Station 0+000 which is located on the property at civic address 295 Carlow Road. The Main Drain extends upstream in a westerly direction along the north side of the allowance for Carlow Road and crosses under Carlow Road to its confluence with the Lake Road Diversion Drain at approximately Station 0+314. It continues upstream in a northerly direction and somewhat to the west, along the rear and west limit of a residential property, the Port Stanley Arena and the Port Stanley Public School, to a bend at approximately Station 0+750; just south of this bend is the outlet of Branch 'A'. From Station 0+750, it turns about ninety degrees and continues in a more easterly direction toward the intersection of Lake Line and Carlow Road. Just south and west of this intersection, it turns north again at about Station 0+934 and passes under Lake Road. From here it continues north looping around to the west and somewhat to the south in an arc similar to the alignment of Lake Road itself; the end of the Marr (Main) Drain is at Station 2+164.

As indicated in the 1991 report, at approximately Station 0+710, the Main Drain changes from an open drain to a combined closed drain with an overland flow or surface route and this system extends upstream to approximately Station 1+060. From this point to approximately Station 1+600, it is open again; this portion of the Main Drain was unimproved under the 1991 report. An enclosed portion in combination with an overland flow route extends from approximately Station 1+600 to 1+850 with the remainder of the Main Drain from Station 1+850 to 2+164 being open. Station 2+164 and the end of the Marr Drain is also the upstream end of a surface culvert under the entrance to the property identified by Roll Number 8-122-00.

Lastly, the watershed of the Marr Drain now includes the lands and roads within its watershed, as well as the lands and roads in the Lake Road Diversion Drain watershed. The location of the Marr Main Drain, Branch 'A', and its associated watershed, as well as the location of the Lake Road Diversion Drain and its respective watershed, are delineated on the various drawings contained in this Burnside report.

2.2.2 297 Carlow Road

The portion of the Marr Main Drain proposed for improvement is located at 297 Carlow Road, in the Village of Port Stanley (see Enlargement 1, Burnside Drawing No. 2 of 4). This property is upstream of the outlet of the drain into Kettle Creek and is well treed with large mature willows mixed with other species.

This property is bounded by Kettle Creek on the north, a private property identified by Roll Number 2-009-52 with a board fence on the west, Carlow Road on the south and a private property identified by Roll Number 2-011-10 on the east. It has been confirmed by the Kettle Creek Conservation Authority (KCCA) that most of this property, particularly the lower portions, are susceptible to flooding during storm events.

The course of the Marr Drain (an open system) meanders through this property; in some areas, it is shallow with depths less than 1 meter. Most of the drain and its banks on this property are relatively stable, except for the portion of the south bank of existing drain opposite approximately Station 0+065 to Station 0+085. This bank is eroding and has become unstable (see Section A-A and B-B, Burnside Drawing No. 4 of 4).

Sediment has also accumulated in the portion of the drain downstream of Station 0+050. In the 1991 Report it was indicated that there were areas where *"a considerable amount of erosion has taken place"*, and that portions of the drain had *"silted in considerably".* The Profile specified that the gradient in the downstream 700 meters of the drain was less than 0.50%. Therefore, it is understandable that this could be an area of sediment deposition as evidenced by the accumulation in the lowest reach of the drain.

2.2.3 Outfall Sewer – Sewage Treatment Facility

Installed in approximately 1996 under the bed of, and on the same alignment of, the Marr Drain between approximately Stations 2+164 and 1+850, there is a 350 mm diameter sanitary sewer. This pipe is the extension of the outfall sewer for, and carries the discharges from, the Port Stanley Pollution Control Plant located at 37575 Scotch Line (see Enlargement 4, Burnside Drawing No. 3 of 4). It is equipped with several structures including a Valve & Drain Chamber at the east side of Scotch Line, a 1,200 mm diameter manhole in the proximity of Station 2+164, and a 1,500 mm diameter manhole in the area of Station 1+850. The sewer is connected to the Marr Drain via a manhole immediately downstream of the 900 mm x 1,200 mm DICB inlet structure installed under the 1991 report located at Station 1+850. This sewer was proposed with minimum cover of 1.2 m and should not affect maintenance of the Marr Main Drain. It is detailed in engineering record drawings prepared by Dillon dated Sept 1996 under File No. 2306–30; of particular interest is an accompanying “Plan of Survey” prepared by Donald I. Houghton, OLS, St. Thomas. Drawing No. R4 and R7 have been included in an Appendix of this report.

2.3 Location

The Village of Port Stanley is located on the north shore of Lake Erie in the extreme southwest corner of the Municipality, approximately 15 kilometres (20 minutes) south of the city of St. Thomas. The Marr Drain is located on the west side of the Village and the site of the work is at 297 Carlow Road; this portion of the drain is at the downstream end near its outlet into Kettle Creek and is only approximately 75 m in length. The location is as shown on the enclosed drawings.

2.4 Watershed Area and Land Use

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

The total watershed area contributing runoff to the Marr Drain, which includes lands and roads within the watershed of the Lake Road Diversion Drain, is approximately 240.92 hectares, and primarily consists of (but is not necessarily limited to) portions of road allowance, wooded land, agricultural land, a golf course, as well as recreational, institutional and residential properties. The exterior and interior watershed boundaries of the Marr Drain are indicated on the Master Watershed Plan and have been confirmed as part of the work undertaken in preparing this Report. To establish these boundaries, the Lake Road Diversion Drain and the Marr Drain reports were studied, aerial imagery and contour mapping were reviewed, and surveys and field investigations were completed. Furthermore, the Drainage Superintendent for the Municipality and the Township were both consulted and provided valuable assistance and local knowledge in this regard.

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

- 82.88 ha of land currently used for agriculture;
- 70.62 ha of woodlot;
- 54.73 ha of recreational, institutional or other land;
- 26.20 ha of residential land (existing and future); and
- 6.49 ha of municipal or county road ROW.

Based on Municipality and Township Drainage Maps, the Marr Drain does not share a contiguous watershed boundary with another municipal drain, only Kettle Creek to the east and a smaller tributary natural watercourse to the north.

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 within the watershed of the Marr Drain primarily consist of glaciolacustrine deposits (both fine and coarse texture) in the upper reaches and modern alluvial deposits of Kettle Creek in the lower reach. Subsoil investigations have not been undertaken on this project; however, the lower lying portions of 297 Carlow Road, being prone to flooding, are probably more saturated in the spring and the fall of the year as well as after a major runoff event. Therefore, the water table may be higher in this area of the drain and on this property where the improvement work is proposed.

3.0 Investigations and Communication

3.1 On-Site Meeting

The On-site Meeting was held at 297 Carlow Road to discuss the “request” received from the owner and to understand the possible extent of the improvement to address the drainage concerns on this property. Other upstream owners of land in the watershed were present, as well as the Municipality’s Assistant Director of Physical Services. The engineer explained projects under Section 78 of the Act, the general process to be followed to prepare a report for improvement to a drain and the public consultation.

The primary concern was the ongoing erosion of the south bank of the drain on this property; to the east of this area was a residence. An improvement was also requested to the existing ‘private’ crossing to provide safer access across it. Accordingly, and to address these concerns, the following were the suggested drain improvements:

- Removal of sediment with a bottom only clean out and disposal of resulting spoil;
- If acceptable to the approval agency(s): realign/move a portion of the drain north away from the eroded bank; fill the existing channel; stabilize, re-grade and flatten the eroded bank; topsoil, vegetate and/or seed the new slope; and
- Improve the existing drain crossing and make it part of the Marr Drain.

Although general comments were received from some of the other landowners with property upstream of 297 Carlow Road, no improvement work was requested or deemed necessary on any other part of the Main Drain or Branch ‘A’. The Township Drainage Superintendent recommended that consideration be given to the timing of the discharge (typically once in the spring and once if the fall) from the Port Stanley Pollution Control Plant; this matter was cited in the 1991 Report. The Municipality’s Assistant Director of Physical Services indicated that the KCCA would need to review and approve any proposed improvement(s) to the Marr Drain.

Before the close of the meeting, stakeholders were informed that a survey of the existing conditions of the drain at 297 Carlow Road would be undertaken. Based on that data, a

design and cost estimate would be prepared and eventually a report would be filed. Those present did not consider it necessary to hold another stakeholders meeting.

3.2 Second Meeting

A second meeting was held with the owner of 297 Carlow Road and the Manager of Transportation and Drainage to discuss the proposed design, the fisheries issues and the tentative timing for the completion of the Engineer's Report. It was agreed by all that the engineer would proceed to complete and file the report for this project.

3.3 The Lake Road Diversion Drain

Subsequent to the filing of a Report and the Court of Revision, as well as dealing with and resolving the matters with the OMAFRA Appeal Tribunal, Burnside and Municipal staff undertook additional research in the Central Elgin archives insofar as it related to documentation and reports governing the Marr Drain in particular, and in general the area of Port Stanley west of Kettle Creek and north of George Street. To that end, a 1956 report for the Lake Road Municipal Drains was located.

The report for the Lake Road Municipal Drains was prepared for the Village of Port Stanley in January of 1956. In that report, two separate drains were proposed to serve a drainage area to the west of Carlow Road on the north and south sides of George Street as far west as Lot 13, Concession Rng 1, 1 N.L.R. and S.L.R. in the geographic Township. Of particular interest is the Lake Road ***Diversion*** Drain located to the north of George Street; however, just east of the line between Lots 14 & 15, Rng 1 S.L.R., it was directed to the north to an unopened road allowance identified as Lake Road (now the approximate south limit of the Kettle Creek Golf & Country Club), then to the east along the allowance for about 1,200 feet then north and west to an outlet into what was labeled on the Plan as the Marr Drain on the west side of Carlow Road. Furthermore, it was indicated in the 1956 report that *"The owners … have agreed to a diversion of the water … to an outlet into the Marr ditch at the westerly limit of Carlow Road."* Even though the Marr was not a Drain under the Act until 1968, the 1956 Report confirms that the Lake Road Diversion Drain is a tributary to the Marr Drain.

Although the 1956 Lake Road Municipal Drains report predates both the 1968 and the 1991 report for the Marr Drain, a re-examination of the latter two reports confirmed that neither one included nor assessed any lands and roads within the Lake Road Diversion Drain watershed. Although the work proposed in the 1991 Marr Drain Report began upstream of Carlow Road, the Lake Road Diversion Drain was referenced on the Plan contained therein. The Plan showed its confluence with the Marr Drain immediately west and upstream of Carlow Road (Station 0+314) and in a similar location to that indicated on the plan in the Lake Road Municipal Drains 1956 report.

Based on this research and the documented information, and since all of the work under this Report is on the Marr Drain downstream of the Lake Road Diversion Drain, it has

been deemed appropriate and prudent to include the watershed of the Lake Road Diversion Drain as part of the Marr Drain and to therefore assess the lands and roads within its watershed as being part of the Marr Drain in accordance with the Act.

3.4 Changes to the Scope of the Marr Drain Improvement

While working in regard to a separate appointment under the Act to prepare a report for the improvement of the Lake Road Diversion Drain, the engineer was contacted by Municipal staff and advised that there was a new owner of 297 Carlow Road. This new owner was also interested in proceeding with an improvement to the Marr Drain so a meeting was held with them and Municipal staff. The owner was informed of the status of the report for the Marr Drain under the Act, as well as the proposed work. It was agreed that most of the improvements should still be undertaken; however, the new owner requested a change to the work proposed on the existing private crossing.

Following the meeting, options were presented to the new owner regarding the crossing, and over the course of a number of months, there were subsequent discussions, a conference call with Municipal staff and an exchange of emails between the Municipality, the owner and Burnside. The owner was considering the options provided and was to contact the Municipality and/or the engineer to firstly confirm there was still a desire to proceed with the improvement project, and secondly, identify the preferred change to the scope of the work proposed for the private crossing.

The result was to still realign the drain on the property as proposed; however, the owner requested the existing crossing pipe be extended to make it longer, that a wider and safer top width be created, and that each end of the crossing be stabilized with riprap. These requests have been incorporated as the proposed improvement in this Report.

3.5 Summation

Since the referral of the report back to the engineer, Burnside has undertaken and completed various tasks relating to this drain, some in collaboration with the two Drainage Superintendents. These tasks included but were not necessarily limited to the following: investigating the relationship of the Lake Road Diversion Drain as a tributary to this drain to; communicating and meeting with the (new) owner of 297 Carlow Road; inspecting and investigating the main drain watershed and its boundaries; inspecting and investigating the sub-watersheds and their boundaries including the Lake Road Diversion Drain and Branch A; meetings with the stakeholders in the watershed of the Lake Road Diversion Drain; revising the crossing design for 297 Carlow Road; revising the project cost estimate; coordinating this project and report with the improvement project and report for the Lake Road Diversion Drain; providing the Municipality with information on Block Assessments; sorting out property area issues compared to Elgin County roll areas; procuring a LOA from DFO; procuring a Permit from KCCA; preparing several new Schedules of Assessment for Maintenance; etcetera.

This time and effort have led to the compiling of the information contained in this Report for an improvement to the Marr Drain.

4.0 Design Criteria and Considerations

4.1 Drain Design

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.

The proposed realignment, including the riffle/pool structure, was designed by a Fisheries Science and Water Resources Engineer with expertise in fluvial geomorphology as requested by the KCCA. Furthermore, Aquatic Ecologists were involved and provided documentation to satisfy the requirements of DFO and KCCA; these individuals are part of the Burnside Team and assisted in the preparation of this Report.

During the various meetings with stakeholders, no concerns were expressed about the "capacity" of the Marr Drain. It is known that the portion of the drain at 297 Carlow Road is in a "flood prone" area. For all intents and purposes, and except for extreme events and/or during the spring freshet, the existing channel is presumed to be adequate in capacity to convey base flows through the property to the outlet into Kettle Creek.

Accordingly, no changes to the capacity of the Marr Drain are proposed as part of this improvement project. As for the portion of the drain proposed for relocation, the cross-sectional geometry of the existing watercourse, insofar as possible, will be duplicated as indicated in the 2011 Technical Memorandum and on the applicable drawings.

4.2 Other Work or Improvements

During the various discussions with stakeholders in this watershed, as well as during and since the meetings, no other formal requests have been made for any additional improvement to the Marr Drain; only those identified in this Report.

4.3 Utilities Investigation

All public and private utilities must be located by the Contractor prior to the start of the proposed improvement work. The contractor shall be made aware there is overhead hydro along Carlow Road and presumably there are other underground utilities and services such as buried cable(s) and watermains and services in the area.

4.4 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 extension to the crossing on 297 Carlow Road to match the existing material.

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 Main Drain on the affected property.

5.1 297 Carlow Road, Village of Port Stanley

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

- A “ditch bottom only” cleanout from approximately Station 0+030 to Station 0+050; the spoil to be placed in the portion of the drain being abandoned and filled.
- Create a new meander from approximately Station 0+050 to Station 0+089; the excavated material to be placed in the portion being abandoned and filled.
- Construct a round stone riffle/pool structure at approximately Station 0+075.
- Regrade and restore the existing drain bank offset south of approximately Station 0+065 to Station 0+085; topsoil, seed and plantings also to be installed.
- Extend the existing crossing by 6 m from approximately Station 0+095 to Station 0+089; provide an increased top width; place riprap reinforcement at each end.

5.2 Working Spaces 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 the existing westerly most driveway to the property at 297 Carlow Road.

5.3 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)

At the onset of the project, KCCA had a Level II Fish Habitat Agreement with DFO and was the first point of contact regarding matters involving a local fishery and fish habitat. Preliminary design drawings prepared by staff with expertise in fluvial geomorphology were submitted to KCCA for review and comment; a reply letter was received by the engineer authorizing the proposed work.

However, while finalizing this Report, and as a result of changes to the Fisheries Act, DFO dissolved its Habitat Agreements with the Conservation Authorities in the province. Therefore, it became necessary to contact DFO directly regarding drainage projects and any impact they might have on a local fishery and fish habitat.

Staff at KCCA were again contacted regarding the proposed improvements; the requested 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 outlining the proposed work on the project as well as additional supporting documentation such as drawings, photos, specifications, the 2018 Aquatic Technical Memo, etcetera. Staff at KCCA completed a review of the proposed improvements to the Marr Drain and issued Permit No. P.20-026 dated October 15, 2020 (copy enclosed).

6.2 Fisheries and Oceans Canada (DFO)

As part of the completion of this Report, and based on the changes identified in the above section, DFO was contacted regarding the project. Staff at DFO required a “Request for Review“ form be completed, outlining the proposed work on the project as well as additional supporting documentation such as drawings, photos, specifications, the 2018 Aquatic Technical Memo, etcetera. Staff at DFO completed a review of the proposed improvements to the Marr Drain and issued a Letter of Advice (LOA) (file number 20-HCAA-01789) dated September 18, 2020 (copy enclosed).

6.3 Sediment Controls

Burnside has procured the necessary LOA from DFO and Permit from 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 all exposed soils have been stabilized.

Accordingly, and by following the sediment and erosion control mitigation measures reviewed and approved by DFO and KCCA, it is intended 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 values 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 working space 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."

Allowances for right-of-way (use) were provided to properties along the course of the drain in the 1968 and in the 1991 Report; accordingly, no Section 29 allowances have been provided in this Report as part of this improvement.

7.1.3 Section 30

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 10 m wide working space has been provided on the north side of the drain at 297 Carlow Road from approximately Station 0+030 to the upstream side of the existing crossing. The area on the south side of the proposed realignment and the existing unstable bank is to be filled, regraded, and as part of the work completely restored, so an allowance was not provided. An allowance was also provided for the use of the existing laneway that will serve as an access route during the proposed work.

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 – Schedules 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.

(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.

(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.

(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."

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, berms, 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. As required, 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 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 the Appendix entitled Assessments Supporting Calculations.

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 the Appendix entitled Assessments Supporting Calculations 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 the Appendix entitled Assessments Supporting Calculations.

d) **Assessment for Benefit** – 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 also 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 outlet through 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 the Appendix entitled Schedule of Assessments.

7.3.2 Appendix C4 to C7 – Schedule of Assessments for Maintenance

In accordance with Section 38 of the Act, and as requested by the Municipality, assessment schedules for the future maintenance of the Marr Main Drain and Branch 'A' have been created. Affected lands located upstream of the maintenance shall be determined by the Drainage Superintendent and assessed according to the applicable schedule contained in the Appendix entitled Schedule of Assessments.

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 shall 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 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 – Spriet 1991 Report and Outfall Sewer Drawings

The scope of the proposed improvement to the Marr Drain in this Report is limited to only the portion of the drain at 297 Carlow Road. The drawings and specifications for the remainder of the drain are contained in the Report adopted under the By-Law and as prepared by J.R. Spriet, P. Eng., of Spriet Associates London Limited, dated May 23, 1991.

Accordingly, and in order to consolidate all the documented information the Drainage Superintendent might or would require to properly maintain the Marr Drain, this Appendix is a copy of the 1991 report, including the drawings and the specifications.

The outfall sewer from the Sewage Treatment Facility is referenced in Subsections 2.2.3 and 8.2. A copy of Drawing No. R4 and R7, dated September 1996 and prepared by Dillon Consulting Engineers, are included in this Appendix.

7.9 Appendix I – Drawings

The Burnside Drawings included within this Report (four in total) consist of the following:

- Master Watershed Plan (Drawing No. 1 of 4);
- Detail Sheet and Plan Enlargements (Drawing No. 2 of 4);
- Plan Enlargements and Notes (Drawing No. 3 of 4); and
- Profile and Sections (Drawing No. 4 of 4).

All the above drawings are pertinent to the Marr Drain Improvement.

8.0 Maintenance

8.1 General

Section 74 of the Act states:

"… the construction or improvement of a drainage works by local assessment, shall be maintained and repaired by each local municipality through which it passes, to the extent that such drainage works lies within the extent of such municipality, …"

The 1991 Spriet Report indicated that after the Sewage Treatment Facility was constructed, there were twice yearly discharges; once in the spring and once in the fall for two months each. Upstream ratepayers revealed that the watercourse was reasonably stable prior to these discharges. So, portions of the 1968 drain were enclosed, and there was an upstream extension with a closed portion. Also, some of the drain in the Township was to be maintained by the Village, even though it did not lie within its extent.

Based on this precedent and given it would be logistically better if one municipality was responsible for the future maintenance of the entire drain, this was discussed with each municipality's Drainage Superintendent. It was agreed that due to the operation of the Sewage Treatment Facility that the Municipality would be responsible for and undertake any maintenance on the **"entirety"** of the Marr Drain (the Main Dain and Branch 'A'), including the portion within the Township. This approved maintenance arrangement was passed by the Council of the Township at its regular Meeting on Monday, January 11, 2021 as Resolution 2021-060; the Municipality received a copy.

Accordingly, and although the Municipality will be responsible for the maintenance of the Marr Drain after construction is complete, the landowners involved with this Drain in each municipality should make regular inspections of the portion(s) on their respective property(s), and promptly report any problems to their respective Municipality/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 of any structure(s) in a timely manner.

The sections of the Act dealing with obstruction of and damage or injury to a Municipal Drain, namely Sections 80 and 82 respectively, are also 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 (and in the previous reports) 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.

Maintenance would also include subsequent work along the entire length of the Main Drain or Branch ‘A’ to ensure that open portions, closed portions, overland flow routes (swales), sediment traps, permanent sediment control measures, outlet pipes/structures, rodent grates, trash racks, stilling basins, concrete structures & associated grates, berms & storage areas, riprapped spillways, cable concrete & chutes, surface water inlets, and the drain remains unobstructed by trash, debris or sediment and that it is cleaned on a regular basis or as needed. As well, any areas of washout, displaced riprap or cable concrete, settlement or erosion should be attended to immediately.

8.2 Sewage Treatment Facility – Semi-Annual Discharge

As indicated previously and as identified in the 1991 Report, we recommend that the Municipality continue to dedicate attention to and have consideration given to the timing of the discharge from the Port Stanley Pollution Control Plant. By considering the timing of these discharges so they do not coincide with a significant runoff event or the spring freshet, it should minimize the impact on the Marr Drain, should not overload the closed portions, should reduce the erosive impacts on the open portions and should decrease the potential for the accumulation of sediment in the lower portions of the drain.

As described in Subsection 2.2.3, the Drainage Superintendent will need to be mindful of the existing 350 mm diameter sanitary sewer pipe between Station 2+164 and 1+850, which is an extension of the outfall sewer from the Sewage Treatment Facility. This

outfall sewer is located under the bed of, and in alignment with, the Marr Drain in the location indicated; it was proposed to have 1.2 m of minimum cover.

8.3 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 Marr Drain, maintenance shall also be deemed to include minor (not major) works to preserve the drain such as but not necessarily limited to the following:

- the placement of riprap and geotextile on eroding or scouring banks of the drain;
- the re-establishment of any designated overland flow route (surface ditch or swale);
- the replacement of any cable concrete and geotextile; and
- the replacement of any outlet pipes, piping, structures and other appurtenances.

Regarding riprap, the Standard Drain Specifications and Special Provisions within this Report shall apply. Regarding cable concrete and other features constructed under the 1991 report, the applicable specifications in 1991 report, also included as an Appendix in this Report, shall govern.

8.4 Future Maintenance Assessments

After the completion of the Marr Drain Improvement, the entire drain shall be maintained by the Municipality at the expense of the lands and roads assessed and in the same relative portions until such time as they are varied in accordance with the Act as follows:

1. Maintenance of the incorporated and extended crossing located at 297 Carlow Road shall be distributed with 20% to roll number 2-011-00 (the property on which it is situated) and 80% to all of the "other" upstream lands and roads prorate using the Schedule of "Assessments for Maintenance and Repair – Sta. 0+000 to 0+314" contained in the applicable Appendix of this Report.
2. All other future maintenance costs incurred on the Marr Drain shall be distributed in accordance with the terms of the Drainage Act and at the expense of all the lands and roads assessed **using the appropriate Schedule of Assessment for Maintenance and Repair contained in applicable Appendix** and in the same relative portions until such time as they are varied in accordance with the Drainage Act. For clarity, the Schedule of Assessments for Maintenance and Repair for the Marr Drain are as follows:

    a. Main Drain – Station 0+000 to Station 0+314;

b. Main Drain – Station 0+314 to Station 0+750;
c. Main Drain – Station 0+750 to Station 2+164; and
d. Branch “A”.

3. The exception to the above is that the governing road authority shall be entirely responsible for the maintenance of the portions of the municipal drain located within the right-of-way of their respective road/street. This includes any existing culverts, road crossing pipe(s) and all concrete structures, associated grates and riprap.

8.5 Future Connections to the Marr Drain

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 fitted with a rodent grate, an appropriate amount of riprap and identified on the bank with a proper outlet maker. Further, the existing drain bank must be returned to its pre-construction condition. The direct connection of private drains to the closed or tiled portions of a drain are normally not allowed. Any such future connections to the tiled portions of the Marr Drain must be discussed with, approved by, be made using proper fittings and materials, and installed in a manner acceptable to the respective Drainage Superintendent.

Any connection to or outlet into this drain not installed as described above and causing damage to and/or erosion of the open and/or closed portions of the Marr Drain may be removed and/or upgraded at the expense of the owner of the land upon which the connection or outlet was made.

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Appendix A

Allowances

APPENDIX A1 - SUMMARY OF ALLOWANCES

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Plan	Lot	Owner	Roll No.	Right of Way (Sect.29)	Damages (Sect.30)	Totals
		Main Drain				
117 (297 Carlow Road)	Pt 13 & 14	J. White	2-011-00	-	1,500	1,500
TOTAL ALLOWANCES				**$ -**	**$ 1,500**	**$ 1,500**

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

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

$ / acre 16,200 $ / hectare 40,000

Section	Plan	Lot	Owner	Description	Sta. (m)	Sta. (m)	Length (m)	Width (m)	Factor	Allow ($)	Section Sub-Total
	Main Drain										
M1	117 (297 Carlow Road)	Pt 13&14	J. White	open drain	103	30	73	0	1.000	-	-
									GRAND TOTAL	**$**	-

Factors

Residential land	1.00
Road Allowances	0.00

NB - Allowances were provided for Right-of-Way in the previous Report in accordance with the Drainage Act.

APPENDIX A3 - SECTION 30 CALCULATIONS - Damages

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

$ / acre 6,076.57 $ / hectare 15,000.00

Section	Plan Lot	Owner	Description	Sta. (m)	Sta. (m)	Length (m)	Width (m)	Factor	Allow ($)	Section Sub-Total
	Main Drain									
M1	117 Pt 13&14 (297 Carlow Road)	J. White	north side drain	103	30	73	10	1.000	1,100	**1,100.00**
			south side drain	103	50	53	10	0.000	-	**-**
			access route						400	**400.00**
								GRAND TOTAL	**$**	**1,500.00**

Factors:

Residential land	1.000
Road Allowances	0.000

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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
A.	**Marr Drain Improvement Project**		
A1	Mobilization and Demobilization **(SP 1)**	LS	**$ 3,000**
Work on Private Property (Open Work)			
A2	Sediment Control and Drain Bottom Only Cleanout – Sta. 0+030 to 0+050 **(SP 2)**	LS	$ 2,500
A3	Drain Realignment – Sta. 0+050 to 0+088.5 **(SP 3)**	LS	$ 5,000
A4	Construct new Riffle-Pool Feature – Sta. 0+075 **(SP 4)**	LS	$ 7,200
A5	Re-grade and Restore the South Drain Bank – Sta. 0+060 to 0+090 **(SP 5)**	LS	$ 12,000
A6	Plantings **(SP 6)**	LS	$ 1,500
A7	Extend the Existing Crossing **(SP 7)**	LS	$ 8,300
Total Estimated Cost of Construction (Private Property)			**$ 36,500**
B	**CONTINGENCIES**		
B1	OPSS R50 Rip-Rap Erosion Protection **(SP 8)**	20 m^2	$ 1,500
B2	Re-Topsoiling **(SP 9)**	200 m^2	$ 1,500
B3	Re-Seeding **(SP 10)**	200 m^2	$ 500
Total Estimated Cost of Construction - Contingencies			**$ 3,500**
Total Estimated Cost of Construction			**$ 43,000**

SUMMARY OF COSTS

Total Estimated Cost of Construction		**$ 43,000**
Including On-site Aquatic Ecologist Inspection Time		
Allowances to Owners (Sections 29 & 30)		**$ 1,500**
Engineering and Preparation of Reports	**$ 45,500**	
Field survey; design; drawing set preparation; report preparation; determining allowances, construction and maintenance assessment schedules; finalize & file reports		
Aquatic and Fisheries - DFO & KCCA	**$ 3,000**	
Aquatic Inspection; Aquatic Technical Memo; DFO - LOA; KCCA - Permit; etc.		
Meetings and Procedure	**$ 5,000**	
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	**$ 1,900**	
Site reviews during construction, processing payment certificates and related administrative tasks (progress payment, substantial performance, statutory holdback, and maintenance holdback certificates included)		
Total Estimated Engineering	**$ 59,400**	
Administration, Financing, Expenses and Other Costs		**$ 6,000**
KCCA review fee; copying; printing reports; mileage, net HST (construction and engineering);		
Total Estimated Cost		**$ 109,900**

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

APPENDIX C1 - ASSESSMENTS for CONSTRUCTION
MUNICIPALITY OF CENTRAL ELGIN

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot		Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
			Lands - Central Elgin					
117	Pt 13&14	*	J. White	2-011-00	0.41	50,910	30	50,940
117	Pt 11, 12, & D	*	Marr Block Assessment	Various (11)	6.31	-	1,710	1,710
Range 1 NLR	Pt D		Below-Me Developments Inc.	2-012-05	13.58	-	1,270	1,270
Range 1 NLR	Pt 15&16, Pt D	*	G-Lover Holdings Inc.	2-019-00	29.63	-	3,660	3,660
Range 1 NLR & SLR	Pt D & Pt 16	*	M. Kong	2-019-01	1.50	-	230	230
Range 1 SLR	Pt 15	*	2526485 Ontario Inc.	2-319-04	5.72	-	1,010	1,010
Range 1 SLR	Pt 14	*	J. & J. Back	2-890-00	17.31	-	2,620	2,620
Range 1 SLR	13 & 14	*	Lake Road Block - Residential	Various (60)	11.94	-	7,250	7,250
Range 1 SLR	15	*	Lake Road Block - 2526485 Ontario Inc.	2-319-04	5.52	-	8,370	8,370
			Total on Lands - Municipality of Central Elgin		**91.92**	**$ 50,910**	**$ 26,150**	**$ 77,060**
			Roads - Central Elgin					
County Road No. 20		*	County of Elgin		1.00	-	540	540
Lake Line		*	Municipality of Central Elgin		0.28	-	120	120
George Street		*	Municipality of Central Elgin		1.75	-	2,120	2,120
Walter Street		*	Municipality of Central Elgin		0.02	-	30	30
Frederick Street		*	Municipality of Central Elgin		0.03	-	30	30
Meek Street		*	Municipality of Central Elgin		0.04	-	50	50
Charles Street		*	Municipality of Central Elgin		0.10	-	120	120
			Total on Roads - Municipality of Central Elgin		**3.22**	**$ -**	**$ 3,010**	**$ 3,010**
			ALL LANDS AND ROADS - Municipality of Central Elgin		**95.14**	**$ 50,910**	**$ 29,160**	**$ 80,070**

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 requested by the Municipality

APPENDIX C2 - ASSESSMENTS for CONSTRUCTION
TOWNSHIP OF SOUTHWOLD

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot		Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
			Lands - Southwold					
Range 1 SLR	Pt 13		Chestnut Grove Farms Ltd.	8-022-10	17.22	-	4,010	4,010
Range 1 NLR	Pt 13		Steve Goodhue Farms Ltd.	8-090-00	11.12	-	3,100	3,100
Range 1 NLR	Pt 13		Chestnut Grove Farms Ltd.	8-091-00	9.38	-	2,120	2,120
Range 1 NLR	Pt 14		Chestnut Grove Farms Ltd.	8-092-30	39.05	-	7,550	7,550
Range 1 & 2 NLR	Pt 14		G. & C. Goodhue	8-092-00	1.92	-	370	370
Range 2 NLR	Pt C	*	J. & G. Milcz	8-115-00	4.63	-	300	300
Range 2 NLR	Pt 12 & 13	*	Municipality of Central Elgin (Lagoons)	8-108-00	24.70	-	7,980	7,980
Range 2 NLR	Pt 12 & 13		Municipality of Central Elgin	8-108-00	3.20	-	230	230
Range 2 NLR	Pt 14	*	C. & P. Major	8-109-00	0.36	-	80	80
Range 2 NLR	Pt 14 & Pt C		Chestnut Grove Farms Ltd.	8-111-00	7.22	-	520	520
Range 2 NLR	Pt C	*	J. & C. Johnson	8-111-01	1.21	-	120	120
Range 2 NLR	Pt C		A. Gifford Estate	8-112-00	5.63	-	380	380
Range 2 NLR	Pt C	*	K. Gifford	8-112-01	0.31	-	70	70
Range 2 NLR	Pt C	*	R. Zubyk	8-113-00	0.69	-	120	120
Range 2 NLR	Pt C	*	J. Meeuse c/o R. Meeuse	8-114-00	0.13	-	30	30
Range 2 NLR	Pt C	*	D. Gilbert	8-117-00	0.71	-	100	100
Range 2 NLR	Pt C	*	D. & E. MacMillan	8-117-04	0.20	-	40	40
Range 2 NLR	Pt C	*	D. VanSeader & J. Newport	8-117-06	0.20	-	40	40
Range 2 NLR	Pt C	*	J. & D. Bod	8-117-08	0.20	-	40	40
Range 2 NLR	Pt 14	*	D. Durr	8-117-10	0.26	-	60	60
Range 2 NLR	Pt 14	*	J. Murray & S. Dasilva	8-117-12	0.30	-	60	60
Range 2 NLR	Pt 15	*	Union Gas Ltd	8-118-00	0.10	-	30	30
Range 2 NLR	Pt 15	*	H. Wismer	8-119-00	7.83	-	550	550
Range 2 NLR	Pt 15	*	S. & H. Gilgen	8-119-06	0.77	-	60	60
Range 2 NLR	Pt 15	*	C. Wismer & J. Hardwood	8-119-11	0.37	-	40	40
Range 2 NLR	Pt D	*	N. Phillips & A. Brodie	8-120-00	0.07	-	20	20
Range 2 NLR	Pt D	*	M. Hall	8-121-00	0.25	-	50	50
Range 2 NLR	Pt D	*	N. & N. Gucanin-Gazibaric	8-121-01	1.29	-	130	130
Range 2 NLR	Pt D	*	K. Kastelanac & R. Vuksinic	8-121-02	2.85	-	150	150
Range 2 NLR	Pt D	*	J. & L. Johnston	8-121-04	0.34	-	70	70
			Total on Lands - Township of Southwold		**142.51**	**$ -**	**$ 28,420**	**$ 28,420**
			Roads - Southwold					
Lake Line		*	Township of Southwold		2.44	-	1,050	1,050
Scotch Line		*	Township of Southwold		0.83	-	360	360
			Total on Roads - Township of Southwold		**3.27**	**$ -**	**$ 1,410**	**$ 1,410**
			ALL LANDS AND ROADS - Township of Southwold		**145.78**	**$ -**	**$ 29,830**	**$ 29,830**

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: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
		All Lands					
		Municipality of Central Elgin		91.92	50,910	26,150	77,060
		Township of Southwold		142.51	-	28,420	28,420
		Total on Lands - Entire Drain		**234.43**	**$ 50,910**	**$ 54,570**	**$ 105,480**
		All Roads					
		Elgin County		1.00	-	540	540
		Municipality of Central Elgin		2.22	-	2,470	2,470
		Township of Southwold		3.27	-	1,410	1,410
		Total on Roads - Entire Drain		**6.49**	**$ -**	**$ 4,420**	**$ 4,420**
		ALL LANDS AND ROADS - Entire Drain		**240.92**	**$ 50,910**	**$ 58,990**	**$ 109,900**

Notes: (1) 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 C4 - ASSESSMENTS for MAINTENANCE and REPAIR
MARR MUNICIPAL DRAIN - STA. 0+000 to 0+314

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Marr Drain Upstream of Outlet (Sta. 0+000)					
117	Pt 13&14	J. White	2-011-00	0.41	0.04%
117	Pt 11&12	Marr Block Assessment - 2578488 Ontario Ltd.	2-009-52	0.13	0.03%
301 Carlow Road Suite 23		Marr Block Assessment - T. Coleman	2-009-23	0.60	0.22%
117	Pt D	Marr Block Assessment - CR20 Residential	Various (7)	0.81	0.48%
Lake Road Diversion Drain Upstream of Marr Drain (Sta. 0+314)					
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	4.87	1.15%
Range 1 NLR & SLR	Pt D & Pt 16	M. Kong	2-019-01	1.50	0.22%
Range 1 SLR	Pt 15	2526485 Ontario Inc.	2-319-04	5.72	0.97%
Range 1 SLR	Pt 14	J. & J. Back	2-890-00	17.31	2.54%
Range 1 SLR	13 & 14	Lake Road Block - Residential	Various (60)	11.94	7.01%
Range 1 SLR	15	Lake Road Block - 2526485 Ontario Inc.	2-319-04	5.52	8.11%
Range 1 SLR	Pt 13	Chestnut Grove Farms Ltd.	8-022-10	17.22	3.88%
Range 1 NLR	Pt 13	Steve Goodhue Farms Ltd.	8-090-00	11.12	2.99%
Range 1 NLR	Pt 13	Chestnut Grove Farms Ltd.	8-091-00	9.38	2.06%
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	25.90	6.29%
Marr Drain Upstream of Lake Road Diversion Drain (Upstream of Sta. 0+314)					
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	24.76	7.90%
Range 1 NLR	Pt D	Marr Block Assessment - Arena	2-018-01	1.09	1.60%
Range 1 NLR	Pt D	Marr Block Assessment - TVDSB	2-018-00	3.68	2.16%
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	13.15	9.20%
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.92	1.00%
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	13.58	3.46%
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	4.63	0.81%
Range 2 NLR	Pt D	M. Hall	8-121-00	0.25	0.15%
Range 2 NLR	Pt D	J. & L. Johnston	8-121-04	0.34	0.20%
Range 2 NLR	Pt D	K. Kastelanac & R. Vuksinic	8-121-02	2.85	0.42%
Range 2 NLR	Pt D	N. Phillips & A. Brodie	8-120-00	0.07	0.04%
Range 2 NLR	Pt D	N. & N. Gucanin-Gazibaric	8-121-01	1.29	0.35%
Range 2 NLR	Pt 15	S. & H. Gilgen	8-119-06	0.77	0.17%
Range 2 NLR	Pt 15	H. Wismer	8-119-00	7.83	1.49%
Range 2 NLR	Pt 15	C. Wismer & J. Hardwood	8-119-11	0.37	0.11%
Range 2 NLR	Pt 15	Union Gas Ltd	8-118-00	0.10	0.09%
Range 2 NLR	Pt 14	J. Murray & S. Dasilva	8-117-12	0.30	0.18%
Range 2 NLR	Pt 14	D. Durr	8-117-10	0.26	0.15%
Range 2 NLR	Pt C	J. & D. Bod	8-117-08	0.20	0.12%
Range 2 NLR	Pt C	D. Gilbert	8-117-00	0.71	0.27%
Range 2 NLR	Pt C	D. VanSeader & J. Newport	8-117-06	0.20	0.12%
Range 2 NLR	Pt C	D. & E. MacMillan	8-117-04	0.20	0.12%
Range 2 NLR	Pt C	J. Meeuse c/o R. Meeuse	8-114-00	0.13	0.08%
Range 2 NLR	Pt C	K. Gifford	8-112-01	0.31	0.18%
Range 2 NLR	Pt C	A. Gifford Estate	8-112-00	5.63	1.05%
Range 2 NLR	Pt C	R. Zubyk	8-113-00	0.69	0.33%
Range 2 NLR	Pt C	J. & C. Johnson	8-111-01	1.21	0.33%
Range 2 NLR	Pt 14 & Pt C	Chestnut Grove Farms Ltd.	8-111-00	7.22	1.41%
Range 2 NLR	Pt 14	C. & P. Major	8-109-00	0.36	0.21%
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin	8-108-00	3.20	0.63%
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin (Lagoons)	8-108-00	24.70	21.77%
		TOTAL ON LANDS		**234.43**	**92.09%**

APPENDIX C4 - ASSESSMENTS for MAINTENANCE and REPAIR
MARR MUNICIPAL DRAIN - STA. 0+000 to 0+314

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Roads					
County Road No. 20		County of Elgin		1.00	1.47%
George Street		Municipality of Central Elgin		1.75	2.03%
Walter Street		Municipality of Central Elgin		0.02	0.02%
Frederick Street		Municipality of Central Elgin		0.03	0.04%
Meek Street		Municipality of Central Elgin		0.04	0.05%
Charles Street		Municipality of Central Elgin		0.10	0.12%
Lake Line		Municipality of Central Elgin		0.28	0.33%
Lake Line		Township of Southwold		2.44	2.87%
Scotch Line		Township of Southwold		0.83	0.98%
		TOTAL ON ROADS		**6.49**	**7.91%**
		ALL LANDS AND ROADS		**240.92**	**100.00%**

Municipality of Central Elgin
Township of Southwold

APPENDIX C5 - ASSESSMENTS for MAINTENANCE and REPAIR
MARR MUNICIPAL DRAIN - STA. 0+314 to 0+750

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Marr Drain Upstream of Lake Road Diversion Drain (Sta. 0+314)					
Range 1 NLR	Pt D	Marr Block Assessment - Arena	2-018-01	1.09	1.53%
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	22.16	2.74%
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	10.07	1.12%
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	0.92	0.24%
Range 1 NLR	Pt D	Marr Block Assessment - TVDSB	2-018-00	3.68	2.97%
Branch A Upstream of Marr Drain (Sta. 0+710)					
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	2.60	1.47%
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	1.05	0.64%
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	3.08	0.94%
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.00	0.95%
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	3.30	1.01%
Marr Drain Upstream of Branch A (Upstream of Sta. 0+710)					
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	12.53	7.25%
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	1.33	0.75%
Range 2 NLR	Pt D	M. Hall	8-121-00	0.25	0.34%
Range 2 NLR	Pt D	J. & L. Johnston	8-121-04	0.34	0.46%
Range 2 NLR	Pt D	K. Kastelanac & R. Vuksinic	8-121-02	2.85	0.96%
Range 2 NLR	Pt D	N. Phillips & A. Brodie	8-120-00	0.07	0.09%
Range 2 NLR	Pt D	N. & N. Gucanin-Gazibaric	8-121-01	1.29	0.81%
Range 2 NLR	Pt 15	S. & H. Gilgen	8-119-06	0.77	0.39%
Range 2 NLR	Pt 15	H. Wismer	8-119-00	7.83	3.42%
Range 2 NLR	Pt 15	C. Wismer & J. Hardwood	8-119-11	0.37	0.25%
Range 2 NLR	Pt 15	Union Gas Ltd	8-118-00	0.10	0.20%
Range 2 NLR	Pt 14	J. Murray & S. Dasilva	8-117-12	0.30	0.40%
Range 2 NLR	Pt 14	D. Durr	8-117-10	0.26	0.35%
Range 2 NLR	Pt C	J. & D. Bod	8-117-08	0.20	0.27%
Range 2 NLR	Pt C	D. Gilbert	8-117-00	0.71	0.61%
Range 2 NLR	Pt C	D. VanSeader & J. Newport	8-117-06	0.20	0.27%
Range 2 NLR	Pt C	D. & E. MacMillan	8-117-04	0.20	0.27%
Range 2 NLR	Pt C	J. Meeuse c/o R. Meeuse	8-114-00	0.13	0.18%
Range 2 NLR	Pt C	K. Gifford	8-112-01	0.31	0.42%
Range 2 NLR	Pt C	A. Gifford Estate	8-112-00	5.63	2.41%
Range 2 NLR	Pt C	R. Zubyk	8-113-00	0.69	0.76%
Range 2 NLR	Pt C	J. & C. Johnson	8-111-01	1.21	0.76%
Range 2 NLR	Pt 14 & Pt C	Chestnut Grove Farms Ltd.	8-111-00	7.22	3.25%
Range 2 NLR	Pt 14	C. & P. Major	8-109-00	0.36	0.49%
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin	8-108-00	3.20	1.44%
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin (Lagoons)	8-108-00	24.70	50.00%
		TOTAL ON LANDS		**122.00**	**90.41%**

APPENDIX C5 - ASSESSMENTS for MAINTENANCE and REPAIR
MARR MUNICIPAL DRAIN - STA. 0+314 to 0+750

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Roads					
Lake Line		Municipality of Central Elgin		0.28	0.76%
Lake Line		Township of Southwold		2.44	6.59%
Scotch Line		Township of Southwold		0.83	2.24%
		TOTAL ON ROADS		**3.55**	**9.59%**
		ALL LANDS AND ROADS		**125.55**	**100.00%**

Municipality of Central Elgin
Township of Southwold

APPENDIX C6 - ASSESSMENTS for MAINTENANCE and REPAIR
MARR MUNICIPAL DRAIN - STA. 0+750 to 2+164

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Marr Drain Upstream of Sta. 0+750					
Range 2 NLR	Pt D	M. Hall	8-121-00	0.25	0.09%
Range 2 NLR	Pt D	J. & L. Johnston	8-121-04	0.34	0.12%
Range 2 NLR	Pt D	N. Phillips & A. Brodie	8-120-00	0.07	0.04%
Range 2 NLR	Pt D	K. Kastelanac & R. Vuksinic	8-121-02	2.85	0.54%
Range 2 NLR	Pt D	N. & N. Gucanin-Gazibaric	8-121-01	1.29	0.45%
Range 2 NLR	Pt 15	S. & H. Gilgen	8-119-06	0.77	0.30%
Range 2 NLR	Pt 15	H. Wismer	8-119-00	7.83	3.67%
Range 2 NLR	Pt 15	C. Wismer & J. Hardwood	8-119-11	0.37	0.27%
Range 2 NLR	Pt 15	Union Gas Ltd	8-118-00	0.10	0.22%
Range 2 NLR	Pt 14	J. Murray & S. Dasilva	8-117-12	0.30	0.55%
Range 2 NLR	Pt 14	D. Durr	8-117-10	0.26	0.50%
Range 2 NLR	Pt C	J. & D. Bod	8-117-08	0.20	0.40%
Range 2 NLR	Pt C	D. Gilbert	8-117-00	0.71	0.94%
Range 2 NLR	Pt C	D. VanSeader & J. Newport	8-117-06	0.20	0.42%
Range 2 NLR	Pt C	D. & E. MacMillan	8-117-04	0.20	0.43%
Range 2 NLR	Pt C	J. Meeuse c/o R. Meeuse	8-114-00	0.13	0.29%
Range 2 NLR	Pt C	K. Gifford	8-112-01	0.31	0.68%
Range 2 NLR	Pt C	A. Gifford Estate	8-112-00	5.63	3.97%
Range 2 NLR	Pt C	R. Zubyk	8-113-00	0.69	1.34%
Range 2 NLR	Pt C	J. & C. Johnson	8-111-01	1.21	1.34%
Range 2 NLR	Pt 14 & Pt C	Chestnut Grove Farms Ltd.	8-111-00	7.22	5.72%
Range 2 NLR	Pt 14	C. & P. Major	8-109-00	0.36	0.86%
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin	8-108-00	3.20	2.54%
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin (Lagoons)	8-108-00	24.70	68.54%
		TOTAL ON LANDS		**59.19**	**94.22%**
Roads					
Lake Line		Municipality of Central Elgin		0.28	0.19%
Lake Line		Township of Southwold		2.44	1.64%
Scotch Line		Township of Southwold		0.83	3.95%
		TOTAL ON ROADS		**3.55**	**5.78%**
		ALL LANDS AND ROADS		**62.74**	**100.00%**

Municipality of Central Elgin
Township of Southwold

APPENDIX C7 - ASSESSMENTS for MAINTENANCE and REPAIR
MARR MUNICIPAL DRAIN - BRANCH A

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	%
Branch A (Station A0+000 to A0+427)					
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	2.60	18.41%
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	1.05	9.37%
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	3.08	23.46%
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.00	23.62%
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	3.30	25.14%
		TOTAL ON LANDS		**11.03**	**100.00%**
Roads					
		TOTAL ON ROADS		**0.00**	**0.00%**
		ALL LANDS AND ROADS		**11.03**	**100.00%**

Municipality of Central Elgin
Township of Southwold

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Assessment Supporting Calculations

FACTSHEET

Ontario Ministry of Agriculture, Food and Rural Affairs

AGRICULTURAL ENGINEERING

ORDER NO. 92-035

FEBRUARY 1992

AGDEX 557

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 hectarage. 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.

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APPENDIX D1 - SUMMARY of AREAS and EQUIVALENT AREAS

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot	OWNER	Roll No.	Affected Area (ha)	Agri Area (ha)	Bush Area (ha)	Other Use (ha)	Equiv. Factor	Equiv. Area (ha)	Land Type
		Lands								
		Municipality of Central Elgin								
117	Pt 13&14	J. White	2-011-00	0.41	-	-	0.41	2.0	0.82	Residential
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	13.58	10.01	3.57	-	1.0/0.5	11.80	Agricultural/Bush
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	29.63	-	5.50	24.13	0.5/1.0	26.88	Bush/Other
Range 1 NLR & SLR	Pt D & Pt 16	M. Kong	2-019-01	1.50	-	1.50	-	0.50	0.75	Bush
Range 1 SLR	Pt 15	2526485 Ontario Inc.	2-319-04	5.72	-	4.82	0.90	0.50/1.0	3.31	Bush/Other
Range 1 SLR	Pt 14	J. & J. Back	2-890-00	17.31	-	17.31	-	0.5	8.66	Bush
117	Pt 11, 12, & D	Marr Block Assessment	Various (11)	6.31	-	-	6.31	2.0/5.0	15.89	Residential/School/Arena
Range 1 SLR	13, 14 & 15	Lake Road Diversion Block Assessment	Various (61)	17.46	-	-	17.46	2.0/5.0	51.48	Residential/Apartment Block
		Township of Southwold								
Range 1 SLR	Pt 13	Chestnut Grove Farms Ltd.	8-022-10	17.22	9.22	8.00	-	1.0/0.5	13.22	Agricultural/Bush
Range 1 NLR	Pt 13	Steve Goodhue Farms Ltd.	8-090-00	11.12	11.12	-	-	1.0/0.67	10.19	Agricultural/In. Infil.
Range 1 NLR	Pt 13	Chestnut Grove Farms Ltd.	8-091-00	9.38	7.47	1.91	-	1.0/0.67/0.5	7.00	Agricultural/In. Infil./Bush
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	39.05	29.37	9.68	-	1.0/0.67/0.5	31.33	Agricultural/In. Infil./Bush
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.92	-	0.30	1.62	2.0	3.39	Bush/Residential
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	4.63	-	4.33	0.30	0.5/2.0	2.77	Bush/Residential
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin (Lagoons)	8-108-00	24.70			24.70	3.0	74.10	Wastewater Lagoons
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin	8-108-00	3.20	3.20	-	-	0.67	2.13	In. Infil.
Range 2 NLR	Pt 14	C. & P. Major	8-109-00	0.36	-	-	0.36	2.0	0.72	Residential
Range 2 NLR	Pt 14 & Pt C	Chestnut Grove Farms Ltd.	8-111-00	7.22	7.22	-	-	0.67	4.81	In. Infil.
Range 2 NLR	Pt C	J. & C. Johnson	8-111-01	1.21	-	0.86	0.35	2.0	1.13	Bush/Residential
Range 2 NLR	Pt C	A. Gifford Estate	8-112-00	5.63	4.50	1.13	-	0.67/0.5	3.57	In. Infil./Bush
Range 2 NLR	Pt C	K. Gifford	8-112-01	0.31	-	-	0.31	2.0	0.62	Residential
Range 2 NLR	Pt C	R. Zubyk	8-113-00	0.69	-	0.17	0.52	0.5/2.0	1.13	Bush/Residential
Range 2 NLR	Pt C	J. Meeuse c/o R. Meeuse	8-114-00	0.13	-	-	0.13	2.0	0.26	Residential
Range 2 NLR	Pt C	D. Gilbert	8-117-00	0.71	-	0.34	0.37	0.5/2.0	0.91	Bush/Residential
Range 2 NLR	Pt C	D. & E. MacMillan	8-117-04	0.20	-	-	0.20	2.0	0.40	Residential
Range 2 NLR	Pt C	D. VanSeader & J. Newport	8-117-06	0.20	-	-	0.20	2.0	0.40	Residential
Range 2 NLR	Pt C	J. & D. Bod	8-117-08	0.20	-	-	0.20	2.0	0.40	Residential
Range 2 NLR	Pt 14	D. Durr	8-117-10	0.26	-	-	0.26	2.0	0.52	Residential
Range 2 NLR	Pt 14	J. Murray & S. Dasilva	8-117-12	0.30	-	-	0.30	2.0	0.60	Residential
Range 2 NLR	Pt 15	Union Gas Ltd	8-118-00	0.10	-	-	0.10	3.0	0.30	Gas Yard
Range 2 NLR	Pt 15	H. Wismer	8-119-00	7.83	-	7.06	0.77	0.5/2.0	5.07	Bush/Residential
Range 2 NLR	Pt 15	S. & H. Gilgen	8-119-06	0.77	0.40	0.37	-	1.0/0.5	0.59	Agricultural/Bush
Range 2 NLR	Pt 15	C. Wismer & J. Hardwood	8-119-11	0.37	0.37	-	-	1.0	0.37	Agricultural
Range 2 NLR	Pt D	N. Phillips & A. Brodie	8-120-00	0.07	-	-	0.07	2.0	0.14	Residential
Range 2 NLR	Pt D	M. Hall	8-121-00	0.25	-	-	0.25	2.0	0.50	Residential
Range 2 NLR	Pt D	N. & N. Gucanin-Gazibaric	8-121-01	1.29	-	0.92	0.37	2.0	1.20	Bush/Residential
Range 2 NLR	Pt D	K. Kastelanac & R. Vuksinic	8-121-02	2.85	-	2.85	-	0.5	1.43	Bush
Range 2 NLR	Pt D	J. & L. Johnston	8-121-04	0.34	-	-	0.34	2.0	0.68	Residential

APPENDIX D1 - SUMMARY of AREAS and EQUIVALENT AREAS

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Conc. or Plan	Lot	OWNER	Roll No.	Affected Area (ha)	Agri Area (ha)	Bush Area (ha)	Other Use (ha)	Equiv. Factor	Equiv. Area (ha)	Land Type
		Roads								
		Municipality of Central Elgin								
County Road No. 20		County of Elgin		1.00	-	-	1.00	5.0	5.00	County Road
Lake Line		Municipality of Central Elgin		0.28	-	-	0.28	4.0	1.12	Paved Road
George Street		Municipality of Central Elgin		1.75	-	-	1.75	5.0	7.00	Paved Road
Walter Street		Municipality of Central Elgin		0.02	-	-	0.02	4.0	0.08	Paved Road
Frederick Street		Municipality of Central Elgin		0.03	-	-	0.03	4.0	0.12	Paved Road
Meek Street		Municipality of Central Elgin		0.04	-	-	0.04	4.0	0.16	Paved Road
Charles Street		Municipality of Central Elgin		0.10	-	-	0.10	4.0	0.40	Paved Road
		Township of Southwold								
Lake Line		Township of Southwold		2.44	-	-	2.44	4.0	9.76	Paved Road
Scotch Line		Township of Southwold		0.83	-	-	0.83	4.0	3.32	Paved Road
		TOTALS		**240.92**	**82.88**	**70.62**	**87.42**		**316.40**	

Equivalency Factors

Agricultural Land @	1.00
Residential and Insitutional Land @	2.00
Paved Side Streets @	4.00
County Roads and Major Streets @	5.00
Community Centre and Apartment Block @	5.00
Industrial Land @	3.00
Other @	1.00
Increased Infiltration (In. Infil.) @	0.67
Upland Hardwood Bush @	0.50

APPENDIX D2 - SECTION DATA TABLE

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Section	From	To	Conc. or Plan	Lot	Owner	Roll No.	Affected Area (ha)	Equiv. Factor	Equiv. Area (ha)	Sub Totals	Equivalent Area U/S (ha)
								Total Equivalent Area			**316.40**
M1	30	103	117	Pt 13&14	J. White	2-011-00	0.41	2.0	0.82	0.82	315.58
u/s M1			117	Pt 11, 12, & D	Marr Block Assessment	Various (11)	6.31	2.0/5.0	15.89		
(Sta. 0+103 to 0+314)			County Road No. 20		County of Elgin		1.00	5.0	5.00	20.89	
u/s M1			Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	4.87	0.5/1.0	3.92		
(Lake Road MD)			Range 1 NLR & SLR	Pt D & Pt 16	M. Kong	2-019-01	1.50	0.5	0.75		
			Range 1 SLR	Pt 15	2526485 Ontario Inc.	2-319-04	5.72	0.50/1.0	3.31		
			Range 1 SLR	Pt 14	J. & J. Back	2-890-00	17.31	0.5	8.66		
			Range 1 SLR	13, 14 & 15	Lake Road Diversion Block Assessment	Various (61)	17.46	2.0/5.0	51.48		
			Range 1 SLR	Pt 13	Chestnut Grove Farms Ltd.	8-022-10	17.22	1.0/0.5	13.22		
			Range 1 NLR	Pt 13	Steve Goodhue Farms Ltd.	8-090-00	11.12	1.0/0.67	10.19		
			Range 1 NLR	Pt 13	Chestnut Grove Farms Ltd.	8-091-00	9.38	1.0/0.67/0.5	7.00		
			Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	25.9	1.0/0.67/0.5	21.40		
			George Street		Municipality of Central Elgin		1.75	5.0	7.00		
			Walter Street		Municipality of Central Elgin		0.02	4.0	0.08		
			Frederick Street		Municipality of Central Elgin		0.03	4.0	0.12		
			Meek Street		Municipality of Central Elgin		0.04	4.0	0.16		
			Charles Street		Municipality of Central Elgin		0.10	4.0	0.40	127.69	
u/s M1			Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	22.16	0.5/1.0	20.56		
(Sta. 0+314 to 0+710)			Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	10.07	1.0/0.67/0.5	8.39		
			Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	0.92	2.0	1.84	30.79	
u/s M1			Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	2.60	0.5/1.0	2.40		
(Branch A)			Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	1.05	1.0	1.05		
			Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	3.30	0.5	1.65		
			Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.00	0.5/2.0	1.55		
			Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	3.08	0.5	1.54	8.19	
u/s M1			Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	12.53	1.0/0.5	10.75		
(Sta. 0+710 to 0+934)			Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	1.33	0.5/2.0	1.12		
			Lake Line		Municipality of Central Elgin		0.28	4.0	1.12	12.98	
u/s M1			Range 2 NLR	Pt D	M. Hall	8-121-00	0.25	2.0	0.50		
(Sta. 0+934 to 2+164)			Range 2 NLR	Pt D	J. & L. Johnston	8-121-04	0.34	2.0	0.68		
			Range 2 NLR	Pt D	K. Kastelanac & R. Vuksinic	8-121-02	2.85	0.5	1.43		
			Range 2 NLR	Pt D	N. Phillips & A. Brodie	8-120-00	0.07	2.0	0.14		
			Range 2 NLR	Pt D	N. & N. Gucanin-Gazibaric	8-121-01	1.29	2.0	1.20		
			Range 2 NLR	Pt 15	S. & H. Gilgen	8-119-06	0.77	1.0/0.5	0.59		
			Range 2 NLR	Pt 15	H. Wismer	8-119-00	7.83	0.5/2.0	5.07		
			Range 2 NLR	Pt 15	C. Wismer & J. Hardwood	8-119-11	0.37	1.0	0.37		
			Range 2 NLR	Pt 15	Union Gas Ltd	8-118-00	0.10	3.0	0.30		
			Range 2 NLR	Pt 14	J. Murray & S. Dasilva	8-117-12	0.30	2.0	0.60		
			Range 2 NLR	Pt 14	D. Durr	8-117-10	0.26	2.0	0.52		
			Range 2 NLR	Pt C	J. & D. Bod	8-117-08	0.20	2.0	0.40		
			Range 2 NLR	Pt C	D. Gilbert	8-117-00	0.71	0.5/2.0	0.91		
			Range 2 NLR	Pt C	D. VanSeader & J. Newport	8-117-06	0.20	2.0	0.40		
			Range 2 NLR	Pt C	D. & E. MacMillan	8-117-04	0.20	2.0	0.40		
			Range 2 NLR	Pt C	J. Meeuse c/o R. Meeuse	8-114-00	0.13	2.0	0.26		
			Range 2 NLR	Pt C	K. Gifford	8-112-01	0.31	2.0	0.62		
			Range 2 NLR	Pt C	A. Gifford Estate	8-112-00	5.63	0.67/0.5	3.57		
			Lake Line		Township of Southwold		2.44	4.0	9.76	27.71	
u/s M1			Range 2 NLR	Pt C	R. Zubyk	8-113-00	0.69	0.5/2.0	1.13		
(u/s Sta. 2+164)			Range 2 NLR	Pt C	J. & C. Johnson	8-111-01	1.21	2.0	1.13		
			Range 2 NLR	Pt 14 & Pt C	Chestnut Grove Farms Ltd.	8-111-00	7.22	0.67	4.81		
			Range 2 NLR	Pt 14	C. & P. Major	8-109-00	0.36	2.0	0.72		
			Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin	8-108-00	3.20	0.67	2.13		
			Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin (Lagoons)	8-108-00	24.7	3.0	74.10		
			Scotch Line		Township of Southwold		0.83	4.0	3.32	87.34	

Equivalency Factors

Agricultural Land @	1.00	Industrial Land @	3.00
Residential and Institutional Land @	2.00	Other @	1.00
Paved Side Streets @	4.00	Increased Infiltration (In. Infil.) @	0.67
County Roads and Major Streets @	5.00	Upland Hardwood Bush @	0.50
Community Centre and Apartment Block @	5.00		

APPENDIX D3 - SECTION COSTS

Project: Marr Municipal Drain Improvement **Project No.: MSW019344**
Date: May 2021

Section	Open	Existing CSP	Provisional	Sub-Total Construction	Allowances	Sub-Total Cons & Allow	Admin. Costs	SECTION TOTALS
MAIN DRAIN M1 30 103	31,200	8,300	3,500	43,000	1,500	44,500	65,400	109,900
TOTALS	**$ 31,200**	**$ 8,300**	**$ 3,500**	**$ 43,000**	**$ 1,500**	**$ 44,500**	**$ 65,400**	**$ 109,900**

APPENDIX D4 - SECTIONAL ASSESSMENT WORKSHEET - Main Drain

Project: Marr Municipal Drain Improvement
Date: May 2021
Project No.: MSW019344

Section Number = **M1**
[1] Cost/Eq. Ha. from D/S = **-**
[2] Total Section Cost = $ 109,900

[3] Specific Costs

Additional Engineering to Lake Road Diversion Drain sub-watershed — w/s eq. area = 127.69 ha; $/ha = 195.79 — 25,000

Conc. or Plan	Lot	Owner	Eq. Area	Cost*
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	3.92	$770
Range 1 NLR & SLR	Pt D & Pt 16	M. Kong	0.75	$150
Range 1 SLR	Pt 15	2526485 Ontario Inc.	3.31	$650
Range 1 SLR	Pt 14	J. & J. Back	8.66	$1,690
Range 1 SLR	13 & 14	Lake Road Block - Residential	23.88	$4,680
Range 1 SLR	15	Lake Road Block - 2526485 Ontario Inc.	27.60	$5,400
Range 1 SLR	Pt 13	Chestnut Grove Farms Ltd.	13.22	$2,590
Range 1 NLR	Pt 13	Steve Goodhue Farms Ltd.	10.19	$2,000
Range 1 NLR	Pt 13	Chestnut Grove Farms Ltd.	7.00	$1,370
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	21.40	$4,180
George Street		Municipality of Central Elgin	7.00	$1,370
Walter Street		Municipality of Central Elgin	0.08	$20
Frederick Street		Municipality of Central Elgin	0.12	$20
Meek Street		Municipality of Central Elgin	0.16	$30
Charles Street		Municipality of Central Elgin	0.40	$80
			Total =	**$25,000**

*These costs have been added to the Normal Outlet column for each Owner in the summary table below.

Total Specific Costs = 25,000

Remainder to Assess = 84,900

[4] Normal Outlet — 40 %

Normal Benefit and Direct Outlet — 60 %

[5] Equiv't Area Drained = 315.58 Ha. @ $ 107.61 /Ha. for Normal Outlet = 33,960

[6] Remaining for Normal Benefit and Direct Outlet = 50,940

[7] Direct Outlet

117	Pt 13&14	J. White	297 Carlow Road uses 50 %	30

Total of Direct Outlet = 30

[8] Remaining for Normal Benefit = 50,910

SUMMARY TABLE

Conc. or Plan	Lot	Owner	Roll No.	Eq. Area (ha)	BENEFIT (Sec 22) Specific	BENEFIT (Sec 22) Normal	OUTLET (Sec 23) Direct	OUTLET (Sec 23) Normal	TOTAL
[9] In Section									
117	Pt 13&14	J. White	2-011-00	0.82	-	50,910	30	-	50,940
[10] U/S of Section									
Sta. 0+100 to 0+272									
117	Pt 11, 12, & D	Marr Block Assessment	Various (11)	15.89	-	-	-	1,710	1,710
County Road No. 20		County of Elgin		5.00	-	-	-	540	540
Lake Road Diversion MD									
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	3.92	-	-	-	1,190	1,190
Range 1 NLR & SLR	Pt D & Pt 16	M. Kong	2-019-01	0.75	-	-	-	230	230
Range 1 SLR	Pt 15	2526485 Ontario Inc.	2-319-04	3.31	-	-	-	1,010	1,010
Range 1 SLR	Pt 14	J. & J. Back	2-890-00	8.66	-	-	-	2,620	2,620
Range 1 SLR	13 & 14	Lake Road Block - Residential	Various (60)	23.88	-	-	-	7,250	7,250
Range 1 SLR	15	Lake Road Block - 2526485 Ontario Inc.	2-319-04	27.60	-	-	-	8,370	8,370
Range 1 SLR	Pt 13	Chestnut Grove Farms Ltd.	8-022-10	13.22	-	-	-	4,010	4,010
Range 1 NLR	Pt 13	Steve Goodhue Farms Ltd.	8-090-00	10.19	-	-	-	3,100	3,100
Range 1 NLR	Pt 13	Chestnut Grove Farms Ltd.	8-091-00	7.00	-	-	-	2,120	2,120
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	21.40	-	-	-	6,480	6,480
George Street		Municipality of Central Elgin		7.00	-	-	-	2,120	2,120
Walter Street		Municipality of Central Elgin		0.08	-	-	-	30	30
Frederick Street		Municipality of Central Elgin		0.12	-	-	-	30	30
Meek Street		Municipality of Central Elgin		0.16	-	-	-	50	50
Charles Street		Municipality of Central Elgin		0.40	-	-	-	120	120

SUMMARY TABLE

Conc. or Plan	Lot	Owner	Roll No.	Eq. Area (ha)	BENEFIT (Sec 22)		OUTLET (Sec 23)		TOTAL
					Specific	Normal	Direct	Normal	
Sta. 0+272 to 0+750									
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	20.56	-	-	-	2,210	2,210
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	8.39	-	-	-	900	900
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.84	-	-	-	200	200
Branch A									
Range 1 NLR	Pt 15&16, Pt D	G-Lover Holdings Inc.	2-019-00	2.40	-	-	-	260	260
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	1.05	-	-	-	110	110
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	1.65	-	-	-	180	180
Range 1 & 2 NLR	Pt 14	G. & C. Goodhue	8-092-00	1.55	-	-	-	170	170
Range 1 NLR	Pt 14	Chestnut Grove Farms Ltd.	8-092-30	1.54	-	-	-	170	170
Sta. 0+750 to 0+922									
Range 1 NLR	Pt D	Below-Me Developments Inc.	2-012-05	10.75	-	-	-	1,160	1,160
Range 2 NLR	Pt C	J. & G. Milcz	8-115-00	1.12	-	-	-	120	120
Lake Line		Municipality of Central Elgin		1.12	-	-	-	120	120
Sta. 0+922 to 2+125									
Range 2 NLR	Pt D	M. Hall	8-121-00	0.50	-	-	-	50	50
Range 2 NLR	Pt D	J. & L. Johnston	8-121-04	0.68	-	-	-	70	70
Range 2 NLR	Pt D	K. Kastelanac & R. Vuksinic	8-121-02	1.43	-	-	-	150	150
Range 2 NLR	Pt D	N. Phillips & A. Brodie	8-120-00	0.14	-	-	-	20	20
Range 2 NLR	Pt D	N. & N. Gucanin-Gazibaric	8-121-01	1.20	-	-	-	130	130
Range 2 NLR	Pt 15	S. & H. Gilgen	8-119-06	0.59	-	-	-	60	60
Range 2 NLR	Pt 15	H. Wismer	8-119-00	5.07	-	-	-	550	550
Range 2 NLR	Pt 15	C. Wismer & J. Hardwood	8-119-11	0.37	-	-	-	40	40
Range 2 NLR	Pt 15	Union Gas Ltd	8-118-00	0.30	-	-	-	30	30
Range 2 NLR	Pt 14	J. Murray & S. Dasilva	8-117-12	0.60	-	-	-	60	60
Range 2 NLR	Pt 14	D. Durr	8-117-10	0.52	-	-	-	60	60
Range 2 NLR	Pt C	J. & D. Bod	8-117-08	0.40	-	-	-	40	40
Range 2 NLR	Pt C	D. Gilbert	8-117-00	0.91	-	-	-	100	100
Range 2 NLR	Pt C	D. VanSeader & J. Newport	8-117-06	0.40	-	-	-	40	40
Range 2 NLR	Pt C	D. & E. MacMillan	8-117-04	0.40	-	-	-	40	40
Range 2 NLR	Pt C	J. Meeuse c/o R. Meeuse	8-114-00	0.26	-	-	-	30	30
Range 2 NLR	Pt C	K. Gifford	8-112-01	0.62	-	-	-	70	70
Range 2 NLR	Pt C	A. Gifford Estate	8-112-00	3.57	-	-	-	380	380
Lake Line		Township of Southwold		9.76	-	-	-	1,050	1,050
u/s Sta. 2+125									
Range 2 NLR	Pt C	R. Zubyk	8-113-00	1.13	-	-	-	120	120
Range 2 NLR	Pt C	J. & C. Johnson	8-111-01	1.13	-	-	-	120	120
Range 2 NLR	Pt 14 & Pt C	Chestnut Grove Farms Ltd.	8-111-00	4.81	-	-	-	520	520
Range 2 NLR	Pt 14	C. & P. Major	8-109-00	0.72	-	-	-	80	80
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin	8-108-00	2.13	-	-	-	230	230
Range 2 NLR	Pt 12 & 13	Municipality of Central Elgin (Lagoons)	8-108-00	74.10	-	-	-	7,980	7,980
Scotch Line		Township of Southwold		3.32	-	-	-	360	360

Municipality of Central Elgin

Township of Southwold

[11] Sub - Total = $ 109,900

[12] Cumulative Total = $ 109,900

Cumulative Cost/Eq. Ha. carried U/S = $ 107.61

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

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 Contactor 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 m^2, plus a nurse crop of Fall Rye Grain or Winter Wheat Grain at an application rate of 60 kg/10,000 m^2, 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.

BURNSIDE

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Appendix F

Special Provisions

Appendix F – Special Provisions

Marr 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 may not necessarily have a detailed associated Special Provision (SP); accordingly, for those items of the work that do NOT, please also 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 Marr Drain is located on the west side of the Village and the site is at 297 Carlow Road. The work is proposed at the downstream end of the drain near its outlet into Kettle Creek and is only approximately 75 metres in length. The location is shown on the enclosed drawings.

The work to be undertaken on the Marr Drain will be at civic address 297 Carlow Road only and generally includes the following major items:

- Drain bottom only cleanout and spoil treatment;
- Drain realignment and filling of the old drain;
- Regrading and restoration of an existing drain bank; and
- Downstream extension of an existing private crossing, including riprap.

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 the 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.

Working Space		
Station	**Max. Width (m)**	**Comments**
Sta. 0+030 to Sta. 0+103	10 m working space on north side of the drain	Access to the drain shall be from Carlow Road via the west driveway into the property at civic address 297 (Roll No. 2-011-00) and directly to the north side of the drain over the existing private crossing. The site features are shown on the accompanying drawings. The working space shall be kept to a minimum width wherever possible; a maximum 10 m working space has been provided along the north side for access with machinery. Remove and dispose of only the tree designated on Enlargement 1. No other trees are to be removed unless approved otherwise by the Contract Administrator (or the owner) and as may be required in order to allow the ease of operation of machinery.

NOTES:

(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.

(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.

(3) The Contract Administrator's approval MUST BE OBTAINED BEFORE exceeding the maximum widths indicated.

(4) Access to the working space shall be via the public road specified and must be approved by the Contract Administrator and/or the Municipality prior to construction.

3.3 Access Routes

The one access route for construction shall be from the specified location off of Carlow Road directly to the drain, as described in the Table entitled 'Working Space' and/or as shown on the drawings. The Contractor shall confirm the access route with the Contract Administrator and/or the Municipality prior to commencing any work. The width of the access route on this property shall be a maximum of 6 m. Any increase of this width shall only 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. The contractor shall be made aware there is overhead hydro along Carlow Road and presumably there are other underground utilities and services in the area, such as buried cable(s) and watermains.

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-01789 dated September 18, 2020. Some sediment control measures are described in SP 2. 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 stage the construction to ensure that the site is left at the end of each day with the appropriate and the required erosion and sediment controls in place. As part of the price bid for the various items that involve excavation and soils (some which will be excess), the Contractor shall protect any and all excavated materials and spoil areas with silt fence or other measures, as approved and/or directed by the Contract Administrator or the Municipality, to avoid erosion during construction and to 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, and/or the constructability of the drain must be brought to the attention of the Contract Administrator immediately. It is expected that clear and timely communication will exist between the Contractor and the Contract Administrator or the Municipality and that any discrepancies relating to construction of the work will be remedied immediately. Work resulting from a failure of the Contractor to seek clarification from the Contract Administrator or the Municipality 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 or the Municipality 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 may 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.20-026 dated October 15, 2020 (copy enclosed herein). 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-01789) dated September 18, 2020 (copy enclosed herein) from DFO. 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, the Municipality, DFO or the KCCA and in compliance with the (approved) Sediment Control Plan.
- Spreading and levelling of excavated material in the designated area at/on the site as directed by the Contract Administrator or the Municipality.
- Restore and rehabilitate all areas disturbed to pre-construction conditions or better.

5.1 Topsoil

Unless specified otherwise, prior to completing any other work on the new or the existing drain, the Contractor shall strip the topsoil in the proposed drain realignment area as well as the spoil

levelling area. The topsoil shall be stockpiled separately from any native subsoil and subsequently replaced over the excavated spoil. This shall be included as part of the price bid for the work under the appropriate item and no extra payment will not be made for stripping, stockpiling and replacing topsoil. All topsoil stripping, stockpiling, placement and compaction, as well as any imported topsoil, shall be in accordance with OPSS.MUNI 802.

5.2 Subsoil Conditions

Subsoil investigations have not been undertaken on this project. The Contractor shall bid the installation of any structures and the excavation of the drain on the basis of typical soil conditions. Additionally, and as 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 or the Municipality.

5.3 Restore & Cleanup 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. All restoration and site cleanup shall be to the satisfaction of the Contract Administrator and/or the Municipality and shall be completed prior to the Contractor demobilizing and departing from the site.

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:"**

Section A – Marr Drain

SP 1 Mobilization and Demobilization

Include the costs associated with the transportation and/or accommodation (meals and lodging) of labour, equipment, offices, conveniences, temporary facilities, construction plant and other items not required to form part of the permanent works and not covered by other items in the Schedule of Prices. This line item shall apply to any and all mobilization and demobilization required to fulfill the Contract. Additional mobilization/demobilization costs will not be paid.

Payment at the Lump Sum price set out in the Schedule of Prices for mobilization and demobilization will be made as follows:

- 50% payable on first Payment Certificate
- 50% payable on Substantial Performance Payment Certificate.

SP 2 Sediment Control and Drain Bottom Only Cleanout – Sta. 0+030 to 0+050

Prior to commencing any in-water work and the cleanout, the Contractor shall install a temporary sediment basin and a temporary rock flow check dam downstream of Sta. 0+030; Refer to OPSD 219.211.

Undertake a bottom-only cleanout of the existing drain for a length of approximately 20 metres from Station 0+030 to Station 0+050. The work shall be undertaken from the north/west side of the drain and the existing drain banks or side slopes are to remain undisturbed. The lump sum price bid shall also include the loading (if necessary), hauling (if necessary), and stockpiling of all resulting excavated material or spoil in the area to the south of the new drain opposite Station 0+065 to 0+085 and north of the portion of existing drain to be abandoned as indicated on the drawings and in the specifications. Once permitted, as described in SP 3, the old drain shall be backfilled with the stockpiled material.

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 surrounding drain features. 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 and/or the Municipality 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 DFO. Furthermore, all work must be in compliance with the following documents, which are included in the applicable Appendix:

- Aquatic Ecology Memorandum dated November 8, 2018;
- LOA from DFO for File No. 20-HCAA-01789 dated September 18, 2020, and
- KCCA Permit No. P.20-026 issued October 15, 2020.

SP 3 Drain Realignment – Sta. 0+050 to 0+088.5

Construct approximately 40 metres of new drain realignment in the form of a horizontal bend from approximately Station 0+050 to Station 0+088.5. The work shall include the stripping of the existing topsoil from the area above the new drain and stockpiling it in an approved location

for use elsewhere on the site; all stockpiles of topsoil shall be enclosed by approved silt fencing (see subsection 5.1). The proposed realignment will optimize the presence of existing trees and it is proposed (if possible) to remove only one tree (denoted a sumac) and its associated root wad and dispose of off-site as part of the lump sum price bid for this item. The lump sum price bid shall also include the loading (if necessary), hauling (if necessary) and stockpiling of all resulting excavated material or spoil in the area to the south of the new drain opposite Station 0+060 to 0+090 and north of the portion of existing drain to be filled and abandoned as indicated on the drawings and in the specifications. Once permitted, as described below, the old drain shall be backfilled with the stockpiled material.

The cross-section geometry of the new drain shall be with a bottom width of 1.0 m and side slopes to 2.0 H: 1.0 V. The realignment will be excavated into the existing floodplain and under "dry conditions"; a majority of the length of the new drain will be excavated leaving an earthen plug at the upstream end at approximately Station 0+088.5 and an earthen plug at the downstream end at approximately Station 0+060. Once the riffle-pool feature described under Item SP 4 has been installed and the banks are vegetated as specified (see seeding in SP 5), and with the approval of the Contract Administrator or the Municipality, the earthen plugs may then be removed transferring flow into the new drain realignment. The flow can then be blocked from entering the old drain in the area to the south of approximately Station 0+093 and the old drain can be allowed to naturally drain; any fish stranded in the old drain must be relocated.

Afterwards, the 6 m x 1,600 mm dia. CSP culvert extension and associated work described under Item SP 7 can be undertaken. Once the culvert extension work has been completed, and the old drain is essentially dry, and with the approval of the Contract Administrator or the Municipality, then an earthen plug can be installed at the downstream end of the old drain at approximately Station 0+060 effectively isolating it from the new drain. The old drain will then be backfilled with the suitable material excavated from the realignment and the spoil removed under Item SP 2.

SP 4 Construct new Riffle-Pool Feature – Sta. 0+075

With guidance from the Contract Administrator, construct a new round stone riffle-pool feature as indicated on the Riffle Detail on Drawing No. 2 of 4 at approximately Station 0+075 within the realigned portion of the new drain to the specifications and elevations described. Riffle material shall consist of a mix of 50% of 150 to 300 mm diameter rounded smooth river stone and 50% of pit run or granular "B" and shall be well compacted during installation to prevent settling. The pool area shall be excavated directly from the existing parent (native) materials; excavated material to be dealt with as indicated in other applicable items. The riffle material thickness shall be a minimum of 3 times the diameter of the largest substrate size. As noted, this item shall be installed in the dry in conjunction with Item SP 3 above.

SP 5 Re-grade and Restore the South Drain Bank – Sta. 0+060 to 0+090

Using the excavated material under Items SP 2, SP 3 and SP 4, and additional approved imported material, fill, re-grade and compact the area of the south drain bank opposite approx.

Station 0+060 to 0+090 as required, to the maximum slope indicated on the drawings. The price bid shall include any additional approved imported material required to augment the existing supply, so the maximum slope indicated on the drawings is achieved. Contractors are advised to perform their own imported material fill quantity calculations upon which to base their price.

Before ANY works are initiated on the valley slope, and as part of the price bid for this item, the new drain realignment shall be protected by the Contractor by supplying and placing silt fence along the edge of a 1 m buffer parallel to the top of the south bank of the new drain. The Contractor shall also take into consideration the existing armour stone wall along the top of the existing south bank of the drain before, during and after undertaking the work under this item.

After filling, re-grading and compacting the area, the Contractor shall restore all areas within the fill section by fine grading followed by the application of any stockpiled topsoil (see subsection 5.1). The price bid shall also include any additional approved imported topsoil, in accordance with OPSS.MUNI 802 – Construction Specification for Topsoil, required to augment the existing supply so that a minimum depth of 150 mm is placed over the entire area; Contractors are advised to perform their own topsoil quantity calculations upon which to base their price.

After the topsoil has been applied to all areas of the re-graded south drain bank, the Contractor shall then hydroseed 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 or the Municipality 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 hydroseeded without topsoil for ease of application; however, other areas require an application of topsoil as indicated in the appropriate Special Provision. Hydroseeding, in addition to the specified seed mix and matrix, 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 m^2. A certificate of seed analysis shall be provided to and approved by the Contract Administrator or the Municipality prior to being applied.

SP 6 Plantings

Plant a variety of trees and shrubs at the top of the realigned portion of the south drain bank to augment the stability and strength of the bank and to provide fish habitat (overhanging vegetation and shade). The Contractor shall plant all trees and shrubs within a 3 m buffer on the south side of the drain. The plantings shall be installed in 1 row along the designated side of the drain with the row a minimum of 1.0 m from the edge or top of the existing drain bank. There shall be a minimum spacing of 3.0 m between each of the plantings in the row. This results in 1 tree per lineal metre of drain bank.

The source/supplier of the plantings must be approved by the Contract Administrator or the Municipality and shall be from an approved local nursery that carries them in bareroot. Acceptable species include, but may not necessarily be limited to (since the availability changes year to year), the following:

- Conifers (which must have mulch blankets): White Pine, White Spruce, White Cedar, and Tamarack.
- Shrubs: ***American*** Highbush Cranberry, Nannyberry, Red Osier Dogwood, and Staghorn Sumac.

SP 7 Extend the Existing Crossing

Supply and install approximately 6 m of 1,600 mm dia. x 2.0 mm CSP (corrugation profile to match existing or as close as possible) complete with an acceptable 22.5-degree coupler to create a skewed downstream extension of the private crossing at 297 Carlow Road from approximately Station 0+094.5 to Station 0+088.5. The majority of the work shall be as per the various specifications, these special provisions, and as depicted/indicated on the drawings.

All excavated material shall be loaded (if necessary), hauled (if necessary) and disposed of to the area between Station 0+060 to 0+090 and the portion of the existing drain that is to be filled and abandoned. Imported OPSS Granular 'B' shall be used for backfilling around the new pipe as part of the price bid for this item. In addition, the Contractor shall place and compact a minimum 6 m width of 300 mm granular "A" as a surface wearing course over the existing and the new (coupled and skewed) crossing pipe.

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. 4.8 lineal m downstream of the new CSP extension and approx. 3.2 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.

Any settlement or impact caused to the laneway shall be the sole responsibility of the Contractor, as per the Standard Drain Specifications. The Contract Administrator or the Municipality shall be contacted by the Contractor regarding any issues pertaining to the pipe installation on this property, prior to leaving the site. Issues shall be remedied to the satisfaction of the Contract Administrator or the Municipality. All materials shall be supplied by the Contractor.

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 and/or the Municipality.

SP 8 OPSS R50 Rip-Rap Erosion Protection

For the unit price bid per square metre, supply and install a 450 mm thickness of 150 to 300 mm (OPSS R50) diameter quarry stone rip-rap with geotextile underlay. 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. Additionally, this will include rip-rapping areas of existing drain bank where erosion or bank slumping has occurred, as directed on-site by the Contract Administrator and/or the Municipality.

SP 9 Re-Topsoiling

For the unit price bid per square metre, re-topsoil all disturbed areas where topsoil, due to extreme runoff conditions, is washed or eroded away. All re-topsoiling shall be in accordance with OPSS.MUNI 802 – Construction Specification for Topsoil; a minimum depth of 150 mm is to be placed over all disturbed areas.

SP 10 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 re-seeding shall be in accordance with OPSS.MUNI 804 – Construction Specification for Seed and Cover. Re-seeding 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 m^2.

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Appendix G

Agency Documents and Approvals

R.J. Burnside & Associates Limited 449 Josephine Street P.O. Box 10 Wingham ON N0G 2W0 Canada
telephone (519) 357-1521 **fax** (519) 357-3624 **web** www.rjburnside.com

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Technical Memorandum

Memorandum No.:	1	**File No.:**	MSW019344.0000
Project:	Marr Municipal Drain		
Date:	July 28, 2011	**Revision Date:**	
Submitted To:	Joe Gordon, Director of Operations Kettle Creek Conservation Authority		
Submitted By:	Mark Hartley, P. Eng., Fisheries Science and Water Resources Engineer		
Reviewed By:	Jeff Dickson, P. Eng., Drainage Engineer		

The Marr Municipal Drain has a catchment area of approximately 2.5 km^2 comprising primarily glaciolacustrine deposits (both fine and coarse texture) in the upper reaches and modern alluvial deposits of Kettle Creek in the lower reach. A 1,600 mm diameter corrugated steel culvert is located at the upstream end of the study area and is approximately 100 m upstream of the confluence with Kettle Creek. The watercourse currently flows along the toe of a shallow valley slope and has an average bottom width of 1.0 to 1.5 m, with side slopes ranging from approximately 1:1 to approximately 2:1. Some of the banks are exhibiting evidence of slumping which results in fine-grained material being delivered to the watercourse and subsequently being deposited downstream. The banks are sparsely vegetated with grasses and shrubs and the riparian zone contains a few medium to large trees (willow, maple and ash). The bed is fairly flat and consists of primarily coarse sand and silt with alternating accumulations of sand and gravel at the bank toe. The aquatic habitat appears to be dominated by shallow, long riffle with short runs.

In order to mitigate the impact of the fluvial erosion caused by the watercourse on the instability of the valley toe it is proposed to re-align approximately 48.7 m of the watercourse between Stations 0+050 and 0+096.7 (new alignment between Stations 0+000 and 0+048.7) as shown on the drawings. The proposed alignment will optimize the presence of existing trees and it is proposed to only remove one shrub (sumac). The cross-section geometry of the existing watercourse will be duplicated; namely a bottom width of 1.0 m and side slopes to 2:1. The bankfull depth will be approximately 0.6 m which will provide a capacity of 2.3 m^3/s (bed slope 0.014 m/m). The associated bankfull velocity and shear stress will be 1.7 m/s and 49 Pa respectively. The watercourse will be excavated into the existing floodplain and it is anticipated that the materials of the proposed bed and bank will have sufficient strength to withstand these stresses. The top of bank will be planted with shrubs to augment the bank strength and to provide fish

habitat (overhanging vegetation and shade). One round stone riffle-pool feature will be installed at 0+025.

The proposed channel will be constructed under “dry conditions”; a majority of the channel will be excavated leaving two small earthen plugs at the upstream and downstream ends. Once the riffle-pool feature has been installed and the banks vegetated with specified grasses and shrubs the earthen plugs will be removed transferring flow into the new channel. The flow will be blocked from entering the old channel at the upstream end and allowed to naturally drain. Any stranded fish in the old channel will be relocated. Then an earthen plug will be installed at the distal end of the old channel effectively isolating it from the new channel. The old channel will then be backfilled with suitable material. Before any works are to be initiated on the valley slope, the new channel will be protected by placing silt fence along the edge of a 1 m grassed buffer parallel to the top of each bank. In-stream work will take place after July 1, 2011 and before March 15, 2012 (these dates have been confirmed by KCCA).

The length, width and volume for the portion of abandoned and proposed channel will be nearly identical as summarized in the table below.

	Abandoned	Proposed
Length (m)	50	50
Top Width (m)	3.5	3.5
Cross-sectional area (m^2)	1.32	1.32
Volume (m^3)	66	66

The following fish habitat protection measures will be implemented:

1. Conduct works only during the permitted timing window of after July 1, 2011 and before March 15, 2012.
2. Install and maintain specified erosion and sediment control measures to isolate the proposed channel for the remaining work area.
3. Excavate the new channel under “dry” conditions leaving suitably large earth plugs between the existing and proposed channels to prevent flow from entering the proposed channel.
4. Remove excavated material from the work area to the staging area to prevent sediment from entering the proposed watercourse.
5. All erosion and sediment control measures and fencing will be maintained until exposed soils have been stabilized.

R.J. Burnside & Associates Limited 449 Josephine Street P.O. Box 10 Wingham ON N0G 2W0 CANADA
telephone (519) 357-1521 **fax** (519) 357-3624 **web** www.rjburnside.com

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Memorandum

Date: November 8, 2018 **Project No.:** MSW019344

Project Name: Marr Municipal Drain Aquatic Ecology Memo

Client Name: Municipality of Central Elgin

To: Andrew Sleegers – Drainage Superintendent

From: Devin Soeting, C.E.T., CAN-CISEC, Aquatic Ecologist

Introduction

The Marr Municipal Drain (the Drain) is located within the Kettle Creek Physiographic Region and has a catchment area of approximately 2.5 km^2 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.

Within the study area the Drain is classified entirely as an open, unrated drain which discharges directly to Kettle Creek. A 1,600 mm diameter corrugated steel pipe (CSP) culvert is located at the upstream end of the study area and is approximately 100 m upstream of the confluence with Kettle Creek. Aside from approximately 50 m of the Marr Municipal Drain, the entire Impact Zone (1 km downstream of the proposed works) is within Kettle Creek.

Background Information Review

In general, there is relatively little background biological information available for 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 background information for the Marr Municipal Drain included aerial imagery, Species at Risk 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 Marr Drain itself with the exception of its alignment, and the potential fish species that inhabit Kettle Creek approximately 50 m downstream of the proposed work. 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 at other small tributaries of Kettle Creek, as well as Kettle Creek itself, the possible fish assemblage within the Marr Drain potentially consists of baitfish and sportfish 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 Marr Drain 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 and visual assessment of the Drain downstream of the confluence with the Lake Road Diversion Drain to its outlet to Kettle Creek. The constructed Drain currently flows along the toe of a shallow valley slope within the study area. It has an average bottom width ranging between 1.0 m to 1.5 m, with bank slope ranging from 1:1 to approximately 2:1. The bed was relatively flat and primarily consists of coarse sand and silt, with some gravel and the aquatic habitat appeared to be dominated by shallow, long riffles with short runs. The banks were exhibiting evidence of erosion and slumping which is not unexpected given the significant sand content in the soils. This erosion results in fine-grained material being conveyed and deposited downstream. Significant slope erosion was observed adjacent to the residence at 297 County Road 20 / Carlow Road which appears to have been exacerbated by the removal of riparian trees at the top of the slope. The banks were sparsely vegetated with grasses and shrubs and the riparian zone contains a few mature trees (maple, ash, and willow species). In general, the Drain appeared capable of providing fish habitat throughout its observable length, however, the habitat is limited near the upstream limits of the study area by the relatively uniform morphology and lack of refugia habitat. The Drain is considered to be capable of providing direct fish habitat and contributes to direct fish habitat downstream in Kettle Creek. Photos of the Drain taken during the site visit are appended to the end of this document.

Proposed Design

To mitigate the impact of the ongoing fluvial erosion caused by the Drain along the valley toe, the proposed works intend to realign approximately 48 m of the Drain between Station (Sta.) 0+050 and Sta. 0+096.7 away from the eroding slopes. The proposed alignment between Sta. 0+000 and Sta. 0+046.7 will duplicate the existing cross-section geometry with a bed width

of 1.0 m and side slopes graded to 2:1. The new alignment will be excavated into the existing floodplain and it is anticipated that the materials proposed for the bed and bank will have sufficient strength to withstand these stresses. To support the strength of the new banks and contribute to fish habitat, native shrubs will be planted along the sides of the Drain. One round-stone riffle-pool feature is proposed to be installed at Sta. 0+025. The bankfull depth is proposed to be approximately 0.6 m, which will provide a capacity of 2.3 m^3/s (bed slope of 0.014 m/m). The associated bankfull velocity and shear stress will be 1.7 m/s and 49 Pa respectively.

The proposed Drain will be constructed under “dry conditions”; a majority of the new Drain will be excavated off-line, unconnected to the rest, leaving two small earthen plugs at the upstream and downstream ends. Once the riffle-pool feature has been installed and the banks vegetated with specified grasses and shrubs, the earthen plugs will be removed, transferring flow into the new Drain. The flow will be blocked from entering the old section at the upstream end and allowed to naturally drain. Any stranded fish will be relocated downstream. Then an earthen plug will be installed at the distal end of the old section effectively isolating it from the new and it will then be backfilled with suitable material. Before any works are to be initiated on the valley slope, the new channel will be protected by placing silt fence along the edge of a 1 m grassed buffer parallel to the top of each bank.

The length, width and volume for the portion of abandoned and proposed Drain will be approximately as summarized in the table below.

	Abandoned	Proposed
Length (m)	50	50
Top Width (m)	3.5	3.5
Cross-sectional area (m^2)	1.32	1.32
Volume (m^3)	66	66

The following fish habitat protection measures will be implemented:

1. In-stream work should take place between July 16th and September 30th to avoid potential impacts to spawning fish species.
2. Install and maintain specified erosion and sediment control measures to isolate the proposed Drain from the remaining work area.
3. Excavate the new Drain if possible under “dry” conditions leaving suitably large earth plugs between the existing and proposed portions to prevent flow from entering the proposed Drain.
4. Remove excavated material from the work area to the staging area to prevent sediment from entering the Drain.

All erosion and sediment control measures and fencing will be maintained until exposed soils have been stabilized.

Photo 1: Looking east, upstream of the study area. Limited potential fish habitat (April 2018).

Photo 2: Looking east, downstream of the CSP within the study area. (April 2018).

Photo 3: Looking southeast along watercourse which is proposed for realignment. (April 2018).

Photo 4: Significant erosion along slope. This section of watercourse is to be realigned. (April 2018).

Photo 5: Looking north, downstream toward Kettle Creek and the tie-in with the proposed realigned watercourse. (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)

Fisheries and Oceans Canada | Pêches et Océans Canada

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

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

Your file *Votre référence*

September 18, 2020

Our file *Notre référence*

20-HCAA-01789

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

Subject: Channel Realignment, Marr Drain, Municipality of Central Elgin (20-HCAA-01789) – 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:

- Realign approximately 50m of a drain channel, with new channel maintaining the width, depth and habitat features of the existing channel (footprint <100m^2 below the ordinary high water mark).
- Extend existing 1600mm culvert by 6m to accommodate new channel alignment; embed culvert to allow fish passage.
- Conduct all work in the dry (offline or in isolation of flowing water) 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

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;
- 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;
- Salvage, reinstate or match habitat structure (e.g., large wood debris, boulders, instream aquatic vegetation/substrate) to its initial state;
- Replace/restore any other disturbed habitat features and remediate any areas impacted by the work, undertaking or activity;
- 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,

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

CC:
Jeff Dickson, R.J. Burnside & Associates Limited, jeff.dickson@rjburnside.com
Lisa Wren, Fisheries and Oceans Canada, lisa.wren@dfo-mpo.gc.ca

Kettle Creek Conservation Authority (KCCA)
44015 Ferguson Line
St.Thomas, ON N5P 3T3
Tel: 519-631-1270 Fax: 519-631-5026
www.kettlecreekconservation.on.ca

Kettle Creek Conservation Authority

Development, Interference with Wetlands and Alterations to Shorelines and Watercourses

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

PERMIT NO.: P.20-026

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

Application #: **20-026** 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.disckson@rjburnside.com**

PR-OJECT LOCATION:

Subject Property:

297 Carlow Rd – Marr Drain Improvements

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

CONDITION OF PERMIT:

AUTHORIZATION:

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

Authorized By: Elizabeth VanHoover **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:** _____

Kettle Creek Conservation Authority (KCCA)
44015 Ferguson Line
St.Thomas, ON N5P 3T3
Tel: 519-631-1270 Fax: 519-631-5026
www.kettlecreekconservation.on.ca

Kettle Creek Conservation Authority

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 Ext. 287

City: St. Thomas, ON Postal Code: N5R 5V1

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: ALL work is at 297 Carlow Road; and accessible off of Carlow Road.
(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: Marr Drain Improvement under Section 78 of the Drainage Act = less than 50m of drain realignment c/w a new riffle (to regrade/stabilize an outside bend near a residence); project also includes a 6m culvert extension c/w riprap on each end.

List Attachments: (Details of Drawings, Plans, Reports, etc..)
2020 Drawing Set and Nov. 2018 Aquatic Ecology Memorandum
COPY of the 2011 engineer's Report; being amended to show culvert extension
COPY of the 2011 KCCA Permit (for reference ONLY)

Existing use of Land: Residential Proposed use of Land: 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: _____

Kettle Creek Conservation Authority (KCCA)
44015 Ferguson Line
St.Thomas, ON N5P 3T3
Tel: 519-631-1270 Fax: 519-631-5026
www.kettlecreekconservation.on.ca

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.

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Appendix H

Spriet 1991 Report and Outfall Sewer Drawings

MARR DRAIN

VILLAGE OF PORT STANLEY

Job No. 87086

May 23, 1991

London, Ontario
May 23, 1991

Marr Drain

Village of Port Stanley

To the Mayor and Council of
the Village of Port Stanley

Mayor and Council:

We are pleased to present our report on the reconstruction of the Marr Municipal Drain serving parts of Lots 15 and Clergy Lot D in Range 1 N.L.R. in the Village of Port Stanley and Lots 12 to 15, including Clergy Lot C and D, Range 1 N.L.R. and Range 2 N.L.R. in the Township of Southwold.

This report was prepared pursuant to Sections 4 and 78 of the Drainage Act in accordance with instructions received from your Clerk with respect to a motion of the Village Council.

The attached plan and profile Drawings No. 1 and 2, Job No. 87086, specifications and the instructions to tenderers form part of this report. They show and describe in detail the location and extent of the work to be done and the lands which are affected.

The Marr Drain was originally constructed under a report submitted by A.J. DeVos, P. Eng., dated May 27, 1968. The Drain presently exists as a Main Drain consisting of approximately 975 lineal meters of open ditch and Branch "A" which consists of approximately 427 lineal meters of 200mm and 300mm tile.

We have made an examination of the area affected and found that the portion of the open ditch between the County Road No. 20 and the Branch "A" outlet has silted in considerably and does not provide a proper surface and subsurface drainage outlet. The portion from the Carlow Road downstream is in good condition and requires no work at this time.

The upper section of the main drain from the outlet of Branch "A" to the north end of the G. Noescher property (Roll No. 8-121-04), has a steep gradient and we noted that a considerable amount of erosion has taken place both in the stream bottom and on the drain banks, particularly in the school property adjacent to the Walker lane.

The upper watershed area is presently being served by a natural watercourse extending from the top end of the main drain westerly to the east side of the Scotch Road. This watercourse also has a steep gradient and we noted that some erosion is taking place throughout its length, with the most severe erosion taking place in the W. Wismer property (Roll No. 8-119). The watercourse generally flows through the bottom of a deep ravine, which contains a dense cover of trees and brush. Parts of the ravine through the Wismer property has been partially cleared some years ago.

We also found that the Ministry of the Environment has constructed the Sewage Treatment Facility for the Village of Port Stanley in parts of Lots 12 and 13, R2N.L.R. in the Township of Southwold. The treated water from the waste stabilization ponds has been directed through a sewer into the top end of natural watercourse on the east side of the Scotch Road. This flow is discharged twice yearly, once in the spring and once in the fall for a two month duration.

Testimony from upstream ratepayers revealed that the watercourse was reasonably stable prior to the introduction of the discharge from the waste stabilization ponds. The introduction of this discharge to the watercourse has upset its natural stability with the result that a considerable amount of serious erosion is now taking place throughout the natural watercourse and the upper sections of the Marr Drain open ditch.

It is therefore our recommendation that a new closed drain be constructed adjacent to the natural watercourse in the Wismer property to carry the waste pond discharge through the most severely eroded portion of the watercourse and that this same portion of watercourse be repaired by resloping and seeding to re-establish a vegetative cover.

We also recommend that the upper portion of the Marr Drain from the north end of the Noescher property to the Branch "A" outlet be backfilled, graded and seeded so as to retain a surface drainage outlet and that a new closed sub-drain be constructed adjacent to and work in conjunction with, the proposed surface ditch.

We further recommend that the portion of the Marr Drain between the outlet of Branch "A" and County Road No. 20 be cleaned out and improved to provide a proper outlet for the drainage area.

All of the proposed construction is to be completed in accordance with the attached plan of specifications.

The proposed work consists of approximately 1076 lineal meters of open ditch reconstruction and backfilling and approximately 608 lineal meters of 375mm (15") to 600mm (24") millimeter diameter pipe and appurtenances.

In accordance with Sections 29 and 30 of the Drainage Act, we determine the allowances payable to owners entitled thereto as follows:

CONCESSION	LOT	ROLL NUMBER (OWNER)	DAMAGES AND RIGHT-OF-WAY
Village of Port Stanley			
R.1 N.L.R.	PtD	2-018(Elgin Cty. Board of Education)	$ 400.00
R.1 N.L.R.	PtD	2-01801(Recreation Centre)	$ 100.00
R.1 N.L.R.	PtD	2-017(R. & B. Whalls)	$ 100.00
R.1 N.L.R.	Pt15 & D	2-019(G. Marr)	$ 500.00
Total Allowances in the Village of Port Stanley			$ 1,100.00

CONCESSION	LOT	ROLL NUMBER (OWNER)	DAMAGES AND RIGHT-OF-WAY
Township of Southwold			
R.1 N.L.R.	PtD	8-094(E. Walker)	$ 350.00
R.2 N.L.R.	PtC	8-112(A. Gifford)	$ 50.00
R.2 N.L.R.	Pt15	8-119(H. Wismer)	$ 780.00
R.2 N.L.R.	Pt15	8-12102(C. Wismer)	$ 100.00
R.2 N.L.R.	Pt15	8-121(C. Scidmore)	$ 100.00
R.2 N.L.R.	Pt15	8-121-04(G. Noescher)	$ 120.00
Total Allowances in the Township of Southwold			$ 1,500.00
Total Allowances under Sections 29 and 30 of the Drainage Act			$ 2,600.00

We have made an estimate of the cost of the proposed work which is outlined in detail as follows:

408 meters of open ditch cleanout (approx. 450m^3)	$ 1,200.00
Hauling away of excavated material to backfill ditch	$ 1,500.00
300 meters of open ditch bank regrading. Sta.1+500 to 1+800	$ 1,700.00
Backfilling of existing ditch using imported clay fill material. Sta.0+708 to 0+922 (approx. 1600m^3 clay fill required)	$ 6,500.00
Supply, delivery and levelling of first quality topsoil over backfilled ditch and disturbed lawn areas (approx. 110m^3 topsoil required)	$ 2,200.00
Hydro seeding and mulching of backfilled ditch, exposed banks and regraded banks (approx. 3900m^2)	$ 1,700.00
Supply and place cable concrete (CC-45) rip-rap protection with geotextile at Sta.0+708 and Sta. 0+750 in accordance with details (approx. 195m^2 required)	$ 8,500.00
Supply and place quarry stone rip-rap protection on ditch bank (Sta. 0+740), as rock chute (Sta. 0+690) and at tile outlet (Sta. 1+550) with filter blanket (approx. 37m^3 quarry stone required)	$ 2,600.00

We assess the cost of this work against the lands and roads liable for assessment for benefit and outlet as shown on the annexed Schedule of Assessment.

A Special Assessment has been made against the Township of Southwold road authority for the cost of installing a new pipe under their roadway. This special assessment shall be pro-rated based on final costs but shall not apply when pro-rating future maintenance costs.

A Special Assessment has been made against the Ministry of the Environment Roll No. 8-108 for the increased cost of constructing erosion protection on the Main Drain Middle Portion because of the discharge from their lagoon upstream. The special assessment shall be pro-rated based on the final costs but shall not apply when pro-rating future maintenance costs.

A Special Assessment has been made against the Ministry of the Environment Roll No.8-108 for the increased cost of constructing erosion protection on the Main Drain Upper Portion because of the discharge from their lagoon system. The special assessment shall be pro-rated based on the final costs but shall not apply when pro-rating future maintenance costs.

After completion, the Main Drain 'Open Portion' in the Village of Port Stanley shall be maintained by the Village of Port Stanley at the expense of all the upstream lands and roads assessed in the Schedule for Maintenance in both the Village of Port Stanley and the Township of Southwold and in the same relative proportions until such time as the assessment may be changed under the Drainage Act.

The Main Drain Middle Portion shall be maintained by the Village of Port Stanley at the expense of all upstream lands and roads assessed in both the Village of Port Stanley and the Township of Southwold and in the same relative proportions, except that all benefit assessments shall be reduced by 50% prior to pro-rating, until such time as the assessment may be changed under the Drainage Act.

The Main Drain Upper Portion in the Township of Southwold shall be maintained by the Township of Southwold at the expense of all upstream lands and roads assessed in the Township of Southwold and in the same relative proortions, except that all benefit assessments shall be reduced by 50% prior to pro-rating, until such time as the assessment may be changed under the Drainage Act.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED

J.R. Spriet

J.R. Spriet, P. Eng.

SCHEDULE OF ASSESSMENT

MARR DRAIN

VILLAGE OF PORT STANLEY

Job No. 87086

May 23, 1991

CON.	LOT	APPROX. HECTARES AFFECTED	ROLL NUMBER (OWNER)	BENEFIT	OUTLET	TOTAL
Main Drain Open Portion						
Village of Port Stanley						
R1.NLR	Pt14	1.2	(J. & M. Back)		40.00	40.00
*R1.NLR	15&PtD	26.3	2-019(G. Marr)	$1,200.00	$ 790.00	$1,990.00
R1.NLR	PtD	0.09	2-012(B. & G. Stormes)		10.00	10.00
R1.NLR	PtD	0.09	2-013(R. & M. Smith)		10.00	10.00
R1.NLR	PtD	0.09	2-014(G. & S. Elliott)		10.00	10.00
R1.NLR	PtD	0.14	2-01401(M. & D. MacKinnon)		10.00	10.00
R1.NLR	PtD	0.09	2-015(J. McCarthy)		10.00	10.00
R1.NLR	PtD	0.09	2-016(S. & V. McTaggart)		10.00	10.00
R1.NLR	PtD	0.24	2-017(R. Whalls)	220.00	10.00	230.00
R1.NLR	PtD	3.7	2-018(Elgin County Board of Education)	470.00	150.00	620.00
R1.NLR	PtD	1.1	2-01801(Recreation Center)	470.00	60.00	530.00
			Total Assessment on Lands	$2,360.00	$1,110.00	$3,470.00
County Road No.20		0.8	County of Elgin	$	$ 100.00	$ 100.00
			Total Assessment on Roads	$	$ 100.00	$ 100.00
			Total Assessment in the Village of Port Stanley			$3,570.00
Township of Southwold						
*R1.NLR	Pt14	17.0	8-092(L. & W. Jones)	$	$ 510.00	$ 510.00
*R1.NLR	PtC	4.6	8-115(C. Meadley)		260.00	260.00
*R1.NLR	PtD	13.0	8-094(E. Walker)		730.00	730.00
R2.NLR	Pts12 & 13	24.7	8-108(M.O.E.-Lagoons)		1,400.00	1,400.00
R2.NLR	Pts12 & 13	3.2	8-108(M.O.E.)		180.00	180.00
*R2.NLR	Pt14	6.1	8-111(Chestnut Grove Farms)		340.00	340.00
R2.NLR	Pt14	0.14	8-109(C. & P. Major)		15.00	15.00
R2.NLR	PtC	1.2	8-11101(J. & C. Johnson)		70.00	70.00
*R2.NLR	PtC	2.2	8-112(A. Gifford)		120.00	120.00
R2.NLR	PtC	0.69	8-113(M. Gifford)		40.00	40.00
R2.NLR	PtC	0.31	8-11201(K. Gifford)		20.00	20.00
R2.NLR	PtC	0.13	8-114(E. Beattie)		15.00	15.00

Schedule of Assessment
Marr Drain
Village of Port Stanley

CON.	LOT	APPROX.HECTARES AFFECTED	ROLL NUMBER (OWNER)	BENEFIT	OUTLET	TOTAL
Township of Southwold (cont'd)						
R2.NLR	PtC	0.2	8-117-04(S. Frank)	$	$ 15.00	$ 15.00
R2.NLR	PtC	0.2	8-117-06(G. Hinschberger)		15.00	15.00
R2.NLR	PtC	0.2	8-117-08(D. & R. Pearn)		15.00	15.00
R2.NLR	PtC	0.71	8-117(D. Gilbert)		40.00	40.00
R2.NLR	Pt15	0.10	8-118(Union Gas Ltd.)		15.00	15.00
*R2.NLR	Pt15	8.0	8-119(H. Wismer)		445.00	445.00
R2.NLR	Pt15	0.20	8-120(D. & M. Zavitz)		15.00	15.00
R2.NLR	Pt15	0.25	8-121(C. Scidmore)		15.00	15.00
R2.NLR	Pt15	0.35	8-121-04(G. Noescher)		20.00	20.00
R2.NLR	Pt15	1.4	8-121-01(J. & G. Hurst)		80.00	80.00
*R2.NLR	Pt15	1.8	8-121-02(C. Wismer)		100.00	100.00
	Total Assessment on Lands			$	$4,475.00	$4,475.00
Southwold Lake Road		2.4	Township of Southwold	$	$ 340.00	$ 340.00
Scotch Road		0.8	Township of Southwold		115.00	115.00
	Total Assessment on Roads			$	$ 455.00	$ 455.00
	Total Assessment in the Township of Southwold					$4,930.00
	Total Assessment on the Main Drain Open Portion					$8,500.00
Main Drain Middle Portion (Sta.0+700 to 1+068)						
Village of Port Stanley						
*R1.NLR	15&PtD	-	2-019(G. Marr)	$ 510.00	$	$ 510.00
R1.NLR	PtD	1.0	2-018(Elgin County Board of Education)	5,200.00	90.00	5,290.00
	Total Assessment on Lands			$5,710.00	$ 90.00	$5,800.00
	Total Assessment in the Village of Port Stanley					$5,800.00

Schedule of Assessment
Marr Drain
Village of Port Stanley

CON.	LOT	APPROX.HECTARES AFFECTED	ROLL NUMBER (OWNER)	BENEFIT	OUTLET	TOTAL
Township of Southwold						
*R1.NLR	PtD	6.0	8-094(E. Walker)	$1,500.00	$ 295.00	$1,795.00
R2.NLR	Pts12&13	24.7	8-108(M.O.E. - Lagoons)		2,500.00	2,500.00
R2.NLR	Pts12&13	3.2	8-108(M.O.E.)		320.00	320.00
*R2.NLR	Pt14	6.1	8-111(Chestnut Grove Farms)		600.00	600.00
R2.NLR	Pt14	0.14	8-109(C. & P. Major)		15.00	15.00
R2.NLR	PtC	1.2	8-111-01(J. & C. Johnson)		120.00	120.00
*R2.NLR	PtC	2.2	8-112(A. Gifford)		220.00	220.00
R2.NLR	PtC	0.69	8-113(M. Gifford)		70.00	70.00
R2.NLR	PtC	0.31	8-112-01(K. Gifford)		30.00	30.00
R2.NLR	PtC	0.13	8-114(E. Beattie)		15.00	15.00
R2.NLR	PtC	0.2	8-117-04(S. Frank)		20.00	20.00
R2.NLR	PtC	0.2	8-117-06(G. Hinschberger)		20.00	20.00
R2.NLR	PtC	0.20	8-117-08(D. & R. Pearn)		20.00	20.00
R2.NLR	PtC	0.71	8-117(D. Gilbert)		70.00	70.00
R2.NLR	Pt15	0.10	8-118(Union Gas Ltd.)		15.00	15.00
*R2.NLR	Pt15	8.0	8-119(H. Wismer)		800.00	800.00
R2.NLR	Pt15	0.20	8-120(D. & M. Zavitz)		20.00	20.00
R2.NLR	Pt15	0.35	8-121-04(G. Noescher)	710.00	35.00	745.00
R2.NLR	Pt15	0.25	8-121(C. Scidmore)	710.00	25.00	735.00
R2.NLR	Pt15	1.4	8-121-01(J. & G. Hurst)		140.00	140.00
*R2.NLR	Pt15	1.8	8-121-02(C. Wismer)	450.00	180.00	630.00
	Total Assessment on Lands			$3,370.00	$5,530.00	$8,900.00
Southwold Lake Road		2.4	Township of Southwold	$1,100.00	$ 600.00	$1,700.00
Scotch Road		0.8	Township of Southwold		200.00	200.00
	Total Assessment on Roads			$1,100.00	$ 800.00	$1,900.00

Special Assessment against the Township of Southwold for the increased cost of installing a 450mm dia. pipe under the Southwold Lake Road — $1,500.00

Special Assessment against the Ministry of the Environment (Roll No. 8-108) for the increased cost of erosion protection due to flow discharge from their sewage lagoons — $33,400.00

Total Assessment in the Township of Southwold — $45,700.00

Total Assessment on the Main Drain Middle Portion — $51,500.00

Schedule of Assessment
Marr Drain
Village of Port Stanley

CON.	LOT	APPROX. HECTARES AFFECTED	ROLL NUMBER (OWNER)	BENEFIT	OUTLET	TOTAL
Main Drain Upper Portion (Sta. 1+500 to culvert)						
Township of Southwold						
R2.NLR	Pts12&13	24.7	8-108(M.O.E. - Lagoons)	$	$ 900.00	$ 900.00
R2.NLR	Pts12&13	3.2	8-108(M.O.E.)		120.00	120.00
*R2.NLR	Pt14	6.1	8-111(Chestnut Grove Farms)		210.00	210.00
R2.NLR	Pt14	0.14	8-109(C. & P. Major)		10.00	10.00
R2.NLR	PtC	1.2	8-111-01(J. & C. Johnson)		40.00	40.00
*R2.NLR	PtC	2.2	8-112(A. Gifford)	150.00	80.00	230.00
R2.NLR	PtC	0.69	8-113(M. Gifford)		30.00	30.00
R2.NLR	PtC	0.31	8-112-01(K. Gifford)		10.00	10.00
R2.NLR	PtC	0.13	8-114(E. Beattie)		10.00	10.00
R2.NLR	PtC	0.2	8-117-04(S. Frank)		10.00	10.00
R2.NLR	PtC	0.2	8-117-06(G. Hinschberger)		10.00	10.00
R2.NLR	PtC	0.2	8-117-08(D. & R. Pearn)		10.00	10.00
R2.NLR	PtC	0.71	8-117(D. Gilbert)		30.00	30.00
R2.NLR	Pt15	0.10	8-118(Union Gas Ltd.)		10.00	10.00
*R2.NLR	Pt15	6.0	8-119(H. Wismer)	3,350.00	120.00	3,470.00
Total Assessment on Lands				$3,500.00	$1,600.00	$5,100.00
Southwold Lake			Township of	$	$ 220.00	$ 220.00
Road		2.4	Southwold		80.00	80.00
Scotch Road		0.8	Township of Southwold			
Total Assessment on Roads				$	$ 300.00	$ 300.00

Special Assessment against the Ministry of the Environment (Property Roll No. 8-108) for the increased cost of erosion protection due to flow discharge from their sewage lagoons $22,000.00

Total Assessment in the Main Drain Upper Portion $27,400.00

Total Assessment on the Marr Drain $87,400.00

NOTE: All of the above lands, with the exception of the ones noted with an asterisk, are classified as non-agricultural.

SCHEDULE OF ASSESSMENT FOR MAINTENANCE

MARR DRAIN

VILLAGE OF PORT STANLEY

Job No. 87086 May 23, 1991

CON.	LOT	APPROX. HECTARES AFFECTED	ROLL NUMBER (OWNER)	PERCENTAGE OF MAINTENANCE COSTS
Main Drain Open Portion				
Village of Port Stanley				
R1.NLR	Pt14	1.2	(J. & M. Back)	0.5
*R1.NLR	15&PtD	26.3	2-019(G. Marr)	19.0
R1.NLR	PtD	0.09	2-012(B. & G. Stormes)	0.2
R1.NLR	PtD	0.09	2-013(R. & M. Smith)	0.2
R1.NLR	PtD	0.09	2-014(G. & S. Elliott)	0.2
R1.NLR	PtD	0.14	2-01401(M. & D. MacKinnon)	0.2
R1.NLR	PtD	0.09	2-015(J. McCarthy)	0.2
R1.NLR	PtD	0.09	2-016(S. & V. McTaggart)	0.2
R1.NLR	PtD	0.24	2-017(R. Whalls)	1.6
R1.NLR	PtD	3.7	2-018(Elgin County Board of Education)	5.3
R1.NLR	PtD	1.1	2-01801(Recreation Center)	4.0
		Total Assessment on Lands		31.6%
County Road No.20		0.8	County of Elgin	1.4
		Total Assessment on Roads		1.4%
		Total Assessment in the Village of Port Stanley		33.0%
Township of Southwold				
*R1.NLR	Pt14	17.0	8-092(L. & W. Jones)	7.0
*R1.NLR	PtC	4.6	8-115(C. Meadley)	3.6
*R1.NLR	PtD	13.0	8-094(E. Walker)	10.0
R2.NLR	Pts12 & 13	24.7	8-108(M.O.E.-Lagoons)	19.0
R2.NLR	Pts12 & 13	3.2	8-108(M.O.E.)	2.4
*R2.NLR	Pt14	6.1	8-111(Chestnut Grove Farms)	4.6
R2.NLR	Pt14	0.14	8-109(C. & P. Major)	0.2
R2.NLR	PtC	1.2	8-11101(J. & C. Johnson)	1.0
*R2.NLR	PtC	2.2	8-112(A. Gifford)	1.6
R2.NLR	PtC	0.69	8-113(M. Gifford)	0.5
R2.NLR	PtC	0.31	8-11201(K. Gifford)	0.3
R2.NLR	PtC	0.13	8-114(E. Beattie)	0.2

Schedule of Assessment for Maintenance
Marr Drain
Village of Port Stanley

CON.	LOT	APPROX.HECTARES AFFECTED	ROLL NUMBER (OWNER)	PERCENTAGE OF MAINTENANCE COSTS
Township of Southwold (cont'd)				
R2.NLR	PtC	0.2	8-117-04(S. Frank)	0.2
R2.NLR	PtC	0.2	8-117-06(G. Hinschberger)	0.2
R2.NLR	PtC	0.2	8-117-08(D. & R. Pearn)	0.2
R2.NLR	PtC	0.71	8-117(D. Gilbert)	0.5
R2.NLR	Pt15	0.10	8-118(Union Gas Ltd.)	0.2
*R2.NLR	Pt15	8.0	8-119(H. Wismer)	6.0
R2.NLR	Pt15	0.20	8-120(D. & M. Zavitz)	0.2
R2.NLR	Pt15	0.25	8-121(C. Scidmore)	0.2
R2.NLR	Pt15	0.35	8-121-04(G. Noescher)	0.3
R2.NLR	Pt15	1.4	8-121-01(J. & G. Hurst)	1.1
*R2.NLR	Pt15	1.8	8-121-02(C. Wismer)	1.4
			Total Assessment on Lands	60.9%
Southwold Lake Road		2.4	Township of Southwold	4.6
Scotch Road		0.8	Township of Southwold	1.5
			Total Assessment on Roads	6.1%
			Total Assessment in the Township of Southwold	67.0%
			Total Assessment on the Main Drain Open Portion	100.0%

Revised June 28/96 See Letter of Eng

"

June 28, 1996

SPRIET ASSOCIATES
ENGINEERS & ARCHITECTS
155 York Street
London, Ontario N6A 1A8
Tel. (519) 672-4100
Fax (519) 433-9351

Mr. R.A. Pow
Clerk-Treasurer
Township of Southwold
Fingal, Ontario
N0L 1K0

Dear Mr. Pow:

Re:Assessment Splits
E4/96, E5/96 Wismer Property
Marr Drain
Our Job No. 96013

In accordance with your fax dated June 20, 1996 we have listed below the split in assessment on the above noted drain resulting from the consent to sever a portion of the Wismer property in Lot 15, Range 2 North of Lake Road.

The lines in the Schedule of Assessment for Maintenance, contained on page 11 of the report dated May 23, 1991 which now read:

*R2NLR	Pt. 15	8.0	8-119 (H. Wismer)	6.0	%
Southwold Lake Rd.		2.4	Township of Southwold	4.6	%

should be split as follows:

*R2NLR	Pt. 15	7.35	8-119 (H. Wismer)	5.3	%
R2NLR	Pt. 15	0.3	8-119-? (H. Wismer)	0.3	%
R2NLR	Pt. 15	0.3	8-119-? (H. Wismer)	0.3	%
Southwold Lake Rd.		2.45	Township of Southwold	4.7	%

* DENOTES AGRICULTURAL LANDS

If you have any questions pertaining to the preceding assessment splits, please do not hesitate to call. We have enclosed a sketch showing the property split and we recommend that a copy of this letter and the sketch be placed in the affected drain file.

We have also enclosed a copy of our invoice for work completed to date. We recommend that this amount be levied against the owner of the property requesting the severance.

It is our pleasure to be of service.

Yours truly

SPRIET ASSOCIATES LONDON LIMITED

M. P. DeVos, P. Eng.

AJD:ak

SPECIFICATIONS FOR CONSTRUCTION OF

MUNICIPAL DRAINAGE WORKS

GENERAL CONDITIONS

SCOPE

The work to be done under this specification consists of supplying all labour, materials and equipment to construct the work as outlined on the drawing(s). In some Municipalities, the Contractor shall supply all materials while in other Municipalities, he shall supply only certain materials. The Form of Tender and Agreement lists which materials are to be supplied by the Contractor.

EXAMINATION OF SITE, DRAWINGS AND SPECIFICATIONS

The tenderer must examine the premises and site to compare them with the drawings and specifications in order to satisfy himself of the existing conditions and the extent of the work to be done before submission of his tender. No allowance shall subsequently be made on behalf of the Contractor by reason of any error on his part.

Any estimates of quantities shown or indicated on the drawings or in the report are "neat" calculations and are provided for the convenience of the Tenderer. Any use made of these quantities by the Tenderer in calculating his tender shall be done at his own risk. The Tenderer for his own protection, should check these quantities for accuracy.

The Contractor shall co-operate with all authorities to ensure that services and utilities are protected from damage during the performance of the work. The Contractor will be responsible for determining the exact location and elevation where necessary, of all utilities and services. The Contractor will be held liable for any damage to overhead and underground utilities and services caused by his operations.

The Tenderer must satisfy himself that he understands the meaning and intent of the drawings and specifications before submission of his tender. The standard specifications have been separated into sections for reference purposes only. They shall be considered complementary and, where a project is controlled under one of the sections, the remaining sections will still apply for miscellaneous works. In case of any inconsistency or conflict in the Tender Documents, the following order of precedence shall apply:

- Form of Tender and Agreement
- Drawings
- General Conditions
- Standard Specifications - Open Drain, Tile Drain, Boring, Specifications for Municipal Drains Crossing County Roads
- Standard Drawings

TENDERS

Tenders are to be submitted on a lump sum basis for the complete works or a portion thereof, as set out in the Form of Tender and Agreement. A deposit in the form of a certified cheque, payable to the Treasurer of the Municipality must accompany each tender as a guarantee of good faith and shall be in the amount specified on the Form of Tender and Agreement. This deposit shall be retained until the successful Tenderer furnishes a Performance Bond for 100% of the amount of the tender or other satisfactory security, if required by the Municipality. The Performance Bond shall ensure completion of the work and maintenance of the work for a period of one year after the date of the completion certificate. The cheque deposited by the unsuccessful Tenderers will be returned without delay.

ONTARIO MUNICIPAL BOARD

The award of the contract shall be subject to the approval of the project by the Ontario Municipal Board.

COMMISSIONER

The word "Commissioner", as used hereinafter in these specifications, shall refer to a Drainage Commissioner or a Drainage Superintendent, appointed by the Municipality. The Commissioner will act as the Engineer's representative. The Commissioner shall have the power to direct the execution of the work and to make any necessary minor adjustments.

Any instructions given by the Commissioner, which changes considerably the proposed work or with which the Contractor does not agree, shall be referred to the Engineer for his decision.

PERMITS, NOTICES, LAWS AND RULES

The Contractor shall ensure that all necessary permits or licences required for the execution of the work have been obtained (but this shall not include permanent easements or rights of servitude). The Contractor shall give all necessary notices and pay all fees required by law and comply with all laws, ordinances, rules and regulations relating to the work and to the preservation of the public's health and safety and if the specifications and drawings are at variance therewith, any resulting additional expenses incurred by the Contractor shall constitute an addition to the contract price.

LIABILITY

The Contractor shall protect, indemnify and save harmless, the Municipality from all actions, suits, losses and costs by reason or on account of any failure or negligence of the Contractor. The Contractor will be held liable for any damages or expenses occasioned by his failure to prosecute the work satisfactorily, or for any claim directly or indirectly arising under the contract.

COMMENCEMENT AND COMPLETION OF WORK

The work must commence immediately after the Contractor is notified of the acceptance of his tender or at a later date, if set out as a condition of the tender, or if weather and ground conditions are unsuitable. The work must be proceeded with in such a manner as to ensure its completion at the earliest possible date consistent with first class workmanship and within the time limit set out in the tender or in the contract documents.

NOTICES RE COMMENCEMENT OF WORK

The Contractor shall give the Engineer and Commissioner a minimum of twenty-four (24) hours notice before commencement of work on any municipal drain. If the Contractor leaves the job site for a period of time after initiation of work, he shall give the Engineer and the Commissioner a minimum of twenty-four (24) hours notice prior to returning to the project.

RAILWAYS

A minimum of 48 hours notice in writing to the railway's Division Engineer, exclusive of Saturdays, Sundays and Holidays, is required by the Contractor prior to any work being performed on railway property and in the case of a pipe being installed under the tracks by open cutting, a minimum of 72 hours notice is required.

FLOODS OR CASUALTIES

The Contractor shall take all risks from floods or casualties of any kind.

LIMITATIONS OF OPERATIONS

Except for such work as may be required by the Engineer to maintain the works in a safe and satisfactory condition, the Contractor shall not carry on his operations under the contract on Sundays without permission in writing of the Municipality.

SUB-CONTRACTORS

The Contractor shall not sublet the whole or any part of the contract without the approval of the Engineer or Commissioner.

SUPERVISION

The Contractor shall give the work his constant supervision and shall keep a competent foreman in charge at the site.

WORKING AREA AND ACCESS

Unless otherwise specified on the drawings, the working area available to the Contractor to construct the drain and related works consists of those lands immediately adjacent to the course of the drain and works and shall not exceed an average width of 15 meters.

All owners of property where the drain is to be constructed shall make an access route from the nearest open road allowance to the drain available to the Contractor. The average width of the route shall not exceed 8 meters. The Contractor shall confirm the actual location of the access route with each affected owner prior to entering onto private property.

Should the specified widths become inadequate due to unusual conditions, the Contractor shall notify the Engineer immediately in order that negotiations with the affected owners can take place.

Where a Contractor exceeds the specified widths due to the nature of his operations and without authorization he shall be held responsible for the costs of all additional damages and the amount shall be deducted from his contract price and paid to the affected owners by the Municipality.

FENCES

The Contractor shall provide each property owner with 2 days notice prior to removing any fences. The property owner shall endeavour to keep all livestock clear of the construction areas until further notified. Where necessary, the Contractor will be directed to erect temporary fences. The Contractor shall be held responsible for loss or injury to livestock or damage caused by livestock, where the injury or damage is caused by his failure to notify the property owner or through negligence or carelessness on the part of the Contractor.

No earth is to be placed against fences and all fences removed by the Contractor are to be replaced by him in as good condition as found. In general, the Contractor will not be allowed to cut existing fences but shall disconnect existing fences at the nearest anchor post or other such fixed joint and shall carefully roll it back out of the way. Where the distance to the closest anchor post or fixed joint exceeds 50 meters, the Contractor will be allowed to cut and splice in

FENCES (Cont'd)

accordance with accepted methods and to the satisfaction of the owner and the Engineer, or Commissioner. Where existing fences are deteriorated to the extent that existing materials are not salvageable for replacement, the Contractor shall notify the Engineer or the Commissioner prior to dismantling. Where an open ditch clean-out takes place and the depth of material removed renders an existing fence through the ditch incapable of containing livestock, the Contractor shall install such additional posts, and strands of wire so as to make the fence secure. Fences damaged beyond salvaging by the Contractor's negligence shall be replaced with new materials, similar to those existing, at the Contractor's expense. The replacement of the fences shall be done to the satisfaction of the owner and the Engineer or Commissioner. The site examination should indicate to the Contractor such work, if any, and an allowance should be made in the tendered price.

The Contractor shall not leave any fence open when he is not at work in the immediate vicinity.

STANDING CROPS AND LIVESTOCK

The Contractor shall not be held responsible for damages to standing crops within the working area available and the access route provided as noted previously if he notifies the owner thereof in writing at least 2 days prior to the commencement of the work on that portion. Similarily, the Contractor constructing a tile drain shall not be held responsible for damages or injury to livestock occasioned by leaving trenches open for inspection by the Engineer if he notifies the owner in writing at least 2 days prior to commencement of the work on that portion. The Contractor will be held liable for such damages or injury if the backfilling of such trenches is delayed more than 1 day after acceptance by the Engineer.

INSPECTION

Final inspection by the Engineer will be made within twenty days after he has received notice in writing from the Contractor that the work is complete.

Periodic inspections by the Engineer or Commissioner will be made during the performance of the work. These interim inspections are required to check such items as location of drainage course and structures, tile grades prior to backfilling, backfilling and miscellaneous work items.

ERRORS AND UNUSUAL CONDITIONS

The Contractor shall notify the Engineer immediately of any error or unusual condition which may be found. Any attempt by the Contractor to make changes because of the error or unusual condition on his own shall be done at his own risk. Any additional cost incurred by the Contractor to remedy a wrong decision on his part shall be borne by the Contractor.

The Engineer shall make the alteration necessary to correct errors or to adjust for unusual conditions during which time it will be the Contractor's responsibility to keep his men and equipment gainfully employed elsewhere on the project.

The contract amount shall be adjusted in accordance with a fair evaluation of the work added or deleted.

ALTERATIONS AND ADDITIONS

The Engineer shall have the power to make alterations in the work shown or described in the drawings or specifications and the Contractor shall proceed to

ALTERATIONS AND ADDITIONS (Cont'd)

make such changes without causing delay. In every such case, the price agreed to be paid for the work under the contract shall be increased or decreased as the case may require according to a fair and reasonable valuation of the work added or deleted. The valuation shall be determined as a result of negotiations between the Municipality, the Contractor, and the Engineer, but in all cases, the Engineer shall maintain the final responsibility for the decision. Such alterations and variations shall in no way render void the contract. No claim for variations or alterations in the increased or decreased price shall be valid unless done in pursuance of an order from the Engineer and notice of such claims made in writing before commencement of such work. In no case shall the Contractor commence work which he considers to be extra work before receiving the Engineer's approval.

ROAD CROSSINGS

All road crossings may be made with an open cut unless otherwise noted. The exact location of the crossing shall be verified and approved by the Road Authority and the Engineer.

All surplus excavated material shall be levelled on the adjacent road allowance or disposed of, as noted on the drawings. The pipe shall be backfilled in accordance with the standard detailed drawing as noted on the drawings. The Contractor shall be responsible for the settling of the backfill. Where possible it may be advisable to let the backfill settle for a few months before replacing any surface treatment. All joints in surface treatment shall be neatly saw cut.

The Contractor should arrange with a local resident to keep the crossing in repair. A small load of gravel may be deposited at the side of the road in the event that any settlement does occur. All road crossings shall meet the approval of the Road Authority.

For County road crossings, see "Specifications for Municipal Drains Crossing County Roads".

LANEWAYS

All surface pipes under laneways shall be backfilled in accordance with the standard detailed drawing as noted on the drawings.

Where a tile drain is to be located under a laneway, that portion of the drain within the travelled portion of the lane shall be corrugated metal pipe of a size, type and length as noted on the drawings. The installation and backfilling shall be in accordance with the standard detailed drawing as noted on the drawings.

Any settling of the granular backfill shall be repaired by the Contractor as soon as required. Existing surface treatment shall be replaced to its original condition by the Contractor. All joints in surface treatment shall be neatly saw cut.

EXCESS TILE

If the tile is supplied by the Municipality, the Contractor shall stockpile all excess tile in readily accessible locations for pickup by the Municipality upon the completion of the job.

TERMINATION OF CONTRACT BY THE MUNICIPALITY

If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should refuse or fail to supply enough properly skilled workmen or proper materials after having received seven (7) days notice in writing from the Engineer to supply additional workmen or materials, or if he should fail to make prompt payment to sub-contractors or for material or labour or persistently disregarding laws, ordinances, or the instruction of the Engineer, or otherwise being guilty of a substantial violation of the provisions of the contract, then the Municipality, upon the certification of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, by giving the Contractor written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools and appliances, thereon, and complete the work by whatever method the Engineer may deem expedient, but without undue delay or expense. In such case, the Contractor shall not be entitled to receive any further payment until the work is completed. If the unpaid balance of the contract price will exceed the expense of completing the work, including compensation to the Engineer for his additional services, such excess shall be paid to the Contractor. If such expense will exceed such unpaid balance, the Contractor shall pay the difference to the Municipality. The expense incurred by the Municipality, as herein provided, shall be certified by the Engineer. Where a Contractor fails to commence work within seven (7) days of his commencement date as indicated by him on his Tender Form, and such extension of time as allowed due to poor weather or ground conditions, then the Municipality shall have the option, after providing the Contractor with seven (7) days notice of their intention to terminate the contract, award the contract to another Contractor at their discretion by retendering the project, inviting bids or by appointment. The additional costs of retendering, and all other administration costs shall be deducted from the Contractor's bid deposit and the balance, if any, returned to him.

PAYMENT

Progress payments equal to 80±% of the value of the work done and materials incorporated in the work will be made to the Contractor on the written request of the Contractor to the Engineer. An additional 17±% will be paid 37 days after the final acceptance by the Engineer and 3±% of the contract price may be reserved by the Municipality for one year. After the completion of the work, any part of this reserve may be used to correct defects which may develop within that time from faulty workmanship or material or loose backfill, provided that notice shall first be given to the Contractor and that he may promptly make good such defects, if he desires.

MAINTENANCE

The Contractor shall repair and make good any damages or faults in the drain that may appear within one year after its completion (as evidenced by the final payment certificate) as the result of imperfect or defective work done or materials furnished by the Contractor. Nothing herein contained shall be construed as in any way restricting or limiting the liability of the Contractor under the laws of the Country, Province or Locality in which the work is being done.

OPEN DRAIN

STAKES

Stakes are set along the course of the drain at intervals of 50 meters. The Contractor shall ensure that the stakes are not disturbed unless approval is obtained from the Engineer. Any stakes removed by the Contractor without the authority of the Engineer, shall be replaced at the expense of the Contractor. Any stakes which are removed or disturbed by others or by livestock, shall be replaced at the expense of the drain.

PROFILE

The profile drawing shows the depth of cuts from the ground beside the stake to the final invert of the ditch in meters and decimals of a meter and also the approximate depth of cuts from the existing bottom of the ditch to the final invert of the ditch. These cuts are established for the convenience of the Contractor; however, bench marks will govern the final elevation of the drain. Bench marks have been established along the course of the drain and their locations and elevations are noted on the profile drawing. A uniform grade shall be maintained between stakes in accordance with the profile drawing.

ALIGNMENT

The drain shall be constructed in a straight line and shall follow the course of the present drain or water run unless otherwise noted on the drawings. Where it is necessary to straighten any bends or irregularities in alignment not noted on the drawings, the Contractor shall contact the Engineer or Commissioner before commencing the work. All curves shall be made with a minimum radius of 15 meters.

CLEARING AND GRUBBING

Prior to commencement of drain construction, all trees, scrub, fallen timber and debris shall be removed from the banks of the drain and for such a distance on each side so as to eliminate any interference with the construction of the drain or the spreading of the spoilbank. The banks shall be cleared whether or not they are affected directly by the excavation. With the exception of large stumps causing damage to the drain, the banks shall not be grubbed. All other cleared areas shall be grubbed and the stumps put into piles for disposal by the owner.

All trees or limbs 150mm (6") or greater in diameter necessarily removed will be considered logs and are to be properly cut and trimmed and left for the owner. All scrub, limbs, debris, etc. smaller than 150mm (6") in diameter shall be cut in 5m lengths and put in piles separate from the logs for disposal by the owner.

In wooded or heavily overgrown areas, the scrub, debris, etc. may be pushed into piles back out of the way but shall not be pushed against any standing trees. No windrowing will be permitted. The clearing and grubbing and construction of the drain are to be carried out in two separate operations and not simultaneously at the same location.

EXCAVATION

The bottom width and the side slopes of the ditch shall be those shown on the profile drawing. Side slopes are normally one and one-half meters horizontal to one meter vertical unless otherwise noted on the profile drawing. Bottom widths will vary with the size of the drain.

EXCAVATION (Cont'd)

Unless otherwise specified on the drawings, only the existing ditch bottom is to be cleaned out and the banks are not to be disturbed. Where existing banks have collapsed, new banks are to be constructed with minimum 1½:1 side slopes and be hand seeded with an approved seed mixture. Where existing banks become unstable because of construction, the Contractor shall immediately contact the Engineer or Commissioner. Alternative methods of construction and/or methods of protection will then be determined, prior to continuing the work.

Where an existing drain is being relocated or where a new drain is being constructed, the Contractor shall, unless otherwise specified, strip the topsoil from the full width of the drain, including the location of the spoil pile. Upon completion of levelling, the topsoil shall be spread to an even depth across the full width of the spoil.

ROADS

Where an open drain is being removed from a road allowance, it must be reconstructed wholly on the adjacent lands with a minimum buffer strip, 2.00 meters in width on the roadway side of the ditch, unless otherwise noted on the drawings. The excavated material shall be used to fill the existing open ditch and any excess excavated material shall be placed and levelled on the adjacent lands. Any work done on the road allowance, with respect to excavation, disposal of materials, installation of culverts, cleaning under bridges, etc., shall be to the satisfaction of the Road Authority and the Engineer.

BRIDGES AND CULVERT PIPES

The Contractor shall excavate the drain to the full specified depth and width under all bridges. Temporary bridges may be carefully removed and left on the bank of the drain but shall be replaced by the Contractor when the excavation is completed unless otherwise specified. Permanent bridges must be left intact. All necessary care and precautions shall be taken to protect the structure. The Contractor shall notify the Engineer or Commissioner if excavation may cause the structure to undermine or collapse.

Where specified on the drawings, the existing culvert shall be carefully removed, salvaged and either left at the site for the owner or reinstalled at a new grade or location. The value of any damage caused to the culvert due to the Contractor's negligence in salvage operation will be determined and deducted from the contract price.

All pipe culverts shall be installed in accordance with the standard detailed drawing as noted on the drawings.

EXCAVATED MATERIAL

Excavated material shall be deposited on either or both sides of the drain as indicated on the drawings or as directed by the Engineer or Commissioner. In general, the material shall be deposited on the low side of the drain or opposite trees and fences. A buffer strip not less than 2 meters in width shall be left along the top edges of the drain.

No excavated material shall be placed in tributary drains, depressions, or low areas which direct water into the ditch so that water will be trapped behind the spoilbank. Beyond the buffer strip, the excavated material shall be placed and levelled to a maximum depth of 300mm, unless instructed otherwise. The edge of the spoilbank away from the ditch shall be feathered down to the existing ground; the edge of the spoilbank nearest the ditch shall have a maximum slope of 2 to 1. The

EXCAVATED MATERIAL (Cont'd)

material shall be levelled such that it may be cultivated with ordinary farm equipment without causing undue hardship on machinery and personnel. No excavated material shall cover any logs, scrub, debris, etc. of any kind.

Where it is necessary to straighten any unnecessary bends or irregularities in the alignment of the ditch, the excavated material from the new cut shall be used for backfilling the original ditch. Regardless of the distance between the new ditch and the old ditch no extra compensation will be allowed for this work and must be included in the Contractor's lump sum price for the open work.

A written statement from the owners indicating their complete satisfaction with the levelling of the spoilbank is sufficient to comply with this specification. The final decision, with respect to levelling of the spoilbank, shall be made by the Engineer or Commissioner.

TRIBUTARY OUTLETS

The Contractor shall guard against damaging the outlets of tributary drains. Prior to commencement of excavation on each property the Contractor shall contact the owner and request that all known outlet pipes be marked by the owner. All outlets so marked or visible, and subsequently damaged by the Contractor's operations will be repaired by the Contractor at his cost. All unknown outlet pipes damaged by the operations will be repaired by the Contractor and the costs will be considered an addition to the contract price.

RIP-RAP PROTECTION

The extent and type of protection shall be as specified on the drawings and shall be installed in accordance with the section "Rip-Rap Protection" set out on Page 14 of the specifications and on the detailed drawings.

COMPLETION

At the time of completion and final inspection, all work in the contract shall have the full dimensions and cross-sections specified without any allowance for caving of the banks or sediment in the bottom. All newly constructed or disturbed banks shall be hand seeded daily with an approved seed mixture. The rate of application shall be 84 kg. per ha. unless otherwise specified.

TILE DRAIN

MATERIALS

A) Tile

All tile installed under these specifications shall be sound and of first quality and shall meet all A.S.T.M. Specifications current at the time of tendering as set out in Designation C4 and C498 for Clay Tile; C412 for Concrete Tile; C14 for Concrete Sewer Pipe 450mm (18") diameter or less; and C76 for Concrete Sewer Pipe greater than 450mm (18") diameter. Where closed joints are specified, joints shall conform to the A.S.T.M. Specification C443. The Engineer shall have the right to order such tests as he deems necessary to be made upon the tile, including that of testing by an independent testing laboratory. The costs of all such tests shall be borne by the party supplying the tile.

B) Metal Pipe

Unless otherwise specified all metal pipe shall be corrugated, rivetted steel pipe with a minimum wall thickness of 1.6mm (16 gauge) and shall be fully galvanized.

STAKES

Stakes are set along the course of the drain at intervals of 50 meters. The Contractor will ensure that the stakes are not disturbed unless approval is obtained from the Engineer.

CLEARING AND GRUBBING

Prior to commencement of drain construction, all trees, scrub, fallen timber and debris shall be cleared and grubbed from the working area. Unless otherwise specified, the minimum width to be cleared and grubbed shall be 20 meters in all hardwood areas and 30 meters in all softwood areas (willow, poplar, etc.), the width being centered on the line of the drain.

All trees or limbs 150mm (6") or greater in diameter necessarily removed will be considered logs and are to be properly cut and trimmed and left for the owner. All scrub, limbs, debris, etc. smaller than 150mm (6") in diameter shall be cut in 5m lengths and put in piles separate from the logs for disposal by the owner.

In wooded or heavily overgrown areas, the scrub, debris, etc., may be pushed into piles back out of the way but shall not be pushed against any standing trees. No windrowing will be permitted. The clearing and grubbing and construction of the drain are to be carried out in two separate operations and not simultaneously at the same location.

SURFACE PREPARATION AND RESTORATION

Where the depths of cuts as shown on the profile exceed the capacity of the Contractor's tiling machine, he shall lower the surface grade in order that the machine may trench to the correct depth. Topsoil is to be stripped over a sufficient width that no subsoil will be deposited on top of topsoil. Subsoil will then be removed to the required depth and piled separately. Upon completion of backfilling the topsoil will then be replaced to an even depth over the disturbed area. The cost for this work shall be included in his tender price.

SURFACE PREPARATION AND RESTORATION (Cont'd)

Where the Contractor's tiling machine does not have the capacity to dig to the depths required or to install the size of tile specified, he may, at his cost, after obtaining the approval of the Engineer, install the drain or portions thereof using a backhoe. Areas where the drain is installed by backhoe shall first be stripped of topsoil over a sufficient width that no subsoil will be deposited on top of topsoil. Upon completion of backfilling, the topsoil will then be replaced to an even depth over the disturbed area.

LINE

Prior to stringing the tile, the Contractor shall contact the Commissioner or the Engineer in order to establish the course of the drain.

The drain shall run in as straight a line as possible throughout its length, except that at intersections of other water courses or at sharp corners, it shall run on a curve of at least a 15 meter radius. The new tile drain shall be constructed at an offset from and generally parallel with any ditch or defined watercourse in order that fresh backfill in the trench will not be eroded by the flow of surface water. The Contractor shall exercise care not to disturb any existing tile drain or drains which parallel the course of the new drain, particularly where the new and the existing tile act together to provide the necessary capacity.

PROFILE

The profile drawing shows the depth of cuts from the ground beside the stake to the final invert of the drain in meters and decimals of a meter. These cuts are established for the convenience of the Contractor; however, bench marks will govern the final elevation of the drain. Bench marks have been established along the course of the drain and their locations and elevations are noted on the profile drawing.

GRADE

The Contractor shall provide and maintain in good working condition, an approved system of establishing a grade sight line to ensure the completed works conform to the profile drawing. In order to confirm the condition of his system and to eliminate the possibility of minor errors on the drawings, he shall ensure his grade sight line has been confirmed to be correct between a minimum of two control points (bench marks) and shall spot check the actual cuts and compare with the plan cuts prior to commencement of tile installation. He shall continue this procedure from control point to control point as construction of the drain progresses. When installing a drain towards a fixed point such as a bore pipe, he shall uncover the pipe and confirm the elevation, using the sight line, a sufficient distance away from the pipe in order to allow for any necessary minor grade adjustments to be made in order to conform to the as built elevation of the bore pipe. All tile improperly installed due to the Contractor not following these procedures shall be removed and replaced entirely at the Contractor's cost.

When following the procedures and a significant variation is found, the Contractor shall immediately cease operations and advise the Engineer.

EXCAVATION

Unless otherwise specified, all trenching shall be done with a recognized farm tiling machine approved by the Engineer or Commissioner. The machine shall be capable of shaping the bottom of the trench to receive the lower segment of the tile.

EXCAVATION (Cont'd)

Where the use of a backhoe for excavation is either specified on the drawings, or approved by the Engineer upon request of the Contractor, the lower portion of the trench shall be shaped to receive the lower segment of the tile. In clay soils, all ridges in the trench bottom caused by the bucket teeth shall be removed and the lower portion of the trench shaped by hand. Alternatively, the Contractor may elect to overdig and then bring the trench bottom up to grade using granular material shaped to receive the tile. The maximum depth of granular material allowed under the tile without compaction shall be 150mm.

QUICKSAND AND ROCK

The Contractor shall immediately contact the Engineer or Commissioner if quicksand is encountered, or if boulders of sufficient size and number are encountered such that installation with a tiling machine is not possible. The Engineer shall, after consultation with the Commissioner and Contractor, determine the action necessary and a price for additions or deletions shall be agreed upon prior to further drain installation. Where directed by the Engineer, test holes are to be dug to determine the extent of the affected area. Cost of test holes shall be considered an addition to the contract price.

INSTALLATION

The tile is to be laid with close fitting joints and in regular grade and alignment in accordance with the plan and profile drawings. The tiles are to be bevelled, if necessary, to ensure close joints (in particular around curves). Where, in heavy clay soils, the width of a joint exceeds 10mm (3/8") the joint shall be wrapped with a 450mm (18") width of polyethylene. Where the width of a joint exceeds 20mm (3/4") the tile shall be removed and the joint bevelled to reduce the gap. Where a drain connects to catchbasin, ditch inlet or junction box structures, the Contractor shall include in his tender price for the supply and installation of a minimum length of 2 meters of metal pipe at each connection to the structure. The size of the metal pipe shall be such that the tile will fit inside it to provide a solid connection. The connections will then be grouted.

Where a tile drain passes through a bore pit, the Tile Contractor shall include in his tender price for the supply and placement of compacted granular bedding from the underside of the pipe down to undisturbed soil within the limits of the bore pit.

Where soil conditions warrant, the Engineer may require that each tile joint be wrapped around the full perimeter with a 450mm (18") width of synthetic filter cloth. Typical cloths meeting the requirements are: TEXEL 7607 or TERRAFIX 270R or approved equal. Any such work shall be considered as an addition to the contract price unless specified on the drawings.

BACKFILLING

As the laying of the tile progresses, partial filling is to be made at the sides sufficient to hold the tile in place. After the laying operations have been approved by the Engineer or Commissioner, the tile shall be blinded manually with topsoil as much as practical to a depth of 150mm above the top of the tile and then the remainder of the excavated material shall be used to restore and maintain the natural surface of the ground. Upon completion a minimum cover of 600mm is required over all tile.

TRIBUTARY DRAINS

Any tributary tile encountered in the course of the drain is to be carefully taken up by the Contractor and placed clear of the excavated earth. If the tributary tile drains encountered are clean or reasonably clean, they shall be connected into the new drain using a slope not greater than 3 meters horizontal to 1 meter vertical. Where existing drains are full of sediment, or contain pollutants, the decision to connect those drains to the new drain shall be left to the Engineer or Commissioner. Each tributary tile connection made by the Contractor shall be located and marked with a stake and no backfilling shall take place until the connection has been approved by the Engineer or Commissioner. The connection at the new drain shall be securely grouted.

Where an open drain is being replaced by a tile drain, existing tile outlets entering the ditch from the side opposite the new drain shall be extended to the new drain. All existing metal outlet pipes shall be carefully removed, salvaged, and left for the owner. Where the grade of the connection passes through the newly placed backfill in the ditch, the backfill material below the connection shall be thoroughly compacted and metal pipe of a size compatible with the tile outlet shall be installed so that a minimum length of 2 meters at each end is extending into undisturbed soil.

Where locations of tiles are shown on the drawings the Contractor shall include in his tender price, all costs for connecting those tiles to the new drain regardless of length.

Where tiles not shown on the drawings are encountered in the course of the drain, and are to be connected to the new drain, the Contractor shall be paid for each connection at the rate outlined in the Form of Tender and Agreement. The length of connection in excess of 3 meters will be considered an addition to the contract price.

OUTLET PROTECTION

Corrugated metal pipe shall be used to protect the tile at its outlet. It shall have a hinged metal grate with a maximum spacing between bars of 40mm. The corrugated metal pipe shall be bevelled at the end to generally conform to the slope of the ditch bank and shall be of sufficient size that the tile can be inserted into it to provide a solid connection. The connection will then be grouted.

The installation of the outlet pipe and the required rip-rap protection shall conform to the standard detailed drawing as noted on the drawing.

STANDARD CATCHBASINS AND DITCH INLET CATCHBASINS

Unless otherwise noted, catchbasins shall be constructed using a minimum 20 MPa concrete with inside dimensions 600mm square, walls and floors 150mm thick and the bottom 600mm below the invert of the lowest tile. The catchbasin top shall be a substantial iron grate, easily removable for cleaning.

Where a catchbasin is located on a road allowance, the type of catchbasin and grate to be used and its proposed location and elevation shall be approved by the Road Authority or the Engineer. The drawings shall designate whether the catchbasin is to be on the drain or offset. Catchbasins offset from the drain shall have metal pipe leads of 200mm diameter unless otherwise noted and the leads shall have a minimum of 600mm of cover. The leads shall be securely grouted at the structures and the drain.

Standard catchbasins and ditch inlet catchbasins located on Provincial Highways shall be in accordance with the current M.T.C. Standards for the size and type of structure, and for the grating.

STANDARD CATCHBASINS AND DITCH INLET CATCHBASINS (Cont'd)

All catchbasins shall be backfilled with granular backfill material placed to a minimum width of 300mm on all sides. The material shall be satisfactorily tamped.

Where the Contractor has over excavated or where ground conditions warrant, the structure shall be installed on a compacted granular base.

The Contractor shall include in his tender price for the construction of a berm behind all ditch inlet structures. The berm shall be constructed of earth and be seeded unless otherwise specified. The Contractor shall also include for regrading, shaping and seeding of ditches for a maximum of 10 meters each away from all ditch inlet structures and standard catchbasins.

JUNCTION BOXES

Junction boxes shall be constructed of 20 MPa concrete. The sides and bottom shall have a minimum thickness of 150mm and the top shall be designed to accept an H20 loading. The inside dimensions of the box shall be a minimum of 100mm larger than the outside diameter of the largest pipe being connected. The minimum cover over the junction box shall be 600mm. All connections shall be securely grouted.

BLIND INLET CATCHBASINS

Where specified on the drawings, blind inlet catchbasins shall be installed along the course of the drain. Blind inlet catchbasins shall be constructed to conform to the standard detailed drawing as noted on the drawings.

RIP-RAP PROTECTION

Prior to placement of protection the base shall be adequately compacted and shaped so that the finished surface of the rip-rap will be at the specified slope and flush with adjacent surfaces. The base shall be constructed such that; the lower limit of rip-rap is keyed into the toe of slope 300mm; the outside limits are situated on 600mm of undisturbed base and the upper limit is keyed into the top of the slope 300mm. The area to be protected shall be covered with approved synthetic filter material. Where the type of protection does not allow drainage to pass through, weep holes shall be provided at regular intervals. The weep holes shall consist of 37mm (1½") diameter pipe and shall extend from the filter material through the protection. (See standard detailed drawings).

(a) Sacked Concrete

The bags shall be manufactured of burlap with nominal dimensions of 450mm x 400mm x 150mm when filled with concrete. The concrete shall have a minimum compressive strength of 15MPa and shall be deposited into the bags in a homogenous state and may be either site mixed or supplied "ready-mixed". The bags shall be placed with the largest dimensions in a horizontal plane with each row set back to provide the specified slope. The bags shall be placed with staggered vertical joints.

(b) Field Stone or Quarry Stone

Stone shall consist of random size material with a minimum nominal size of .014m^3 (½ cu. ft.) installed to a thickness of 300mm. Larger material shall be installed in the key way at the toe of slope and in the lower portion of the slope. The surface shall be chinked with smaller material to eliminate voids and where specified, shall be covered with wet concrete.

BORING

SCOPE OF WORK

Where boring is a requirement of the contract, the Contractor shall include in his lump sum price for the supply of all labour and equipment to complete the work as specified. The responsibility for supplying the bore pipe shall be as set out on the Form of Tender and Agreement and the Contractor is cautioned to ensure he is aware of who is to supply the material.

LOCATION

Specified notice shall be given to the Engineer and the owning authority so that the exact location of the bore can be established.

MATERIAL

The bore pipe shall consist of new, smooth wall steel pipe, meeting the requirements of H20 loading for road crossings and E80 loading for railway crossings. The minimum size, wall thickness and length shall be as shown on the drawings. Where welding is required, the entire circumference of any joint shall be welded using currently accepted welding practices.

SITE PREPARATION AND EXCAVATION

Where necessary, fences shall be carefully taken down as specified in the General Conditions.

Prior to any excavation taking place, all areas which will be disturbed shall be stripped of topsoil. The topsoil is to be stockpiled in locations away from the bore operation, off the line of future tile placement and out of existing water runs or ditches. The bore pit shall be located at the upstream end of the bore unless otherwise specified.

INSTALLATION

The pipe shall be installed in specified line and grade by a combination of boring and jacking.

Upon completion of the operations, both ends of the bore pipe shall be left uncovered until the elevation has been confirmed by the Engineer or Commissioner.

The ends of the bore pipe shall be securely blocked off and the location marked by means of a stake extending from the pipe invert to 300mm above the surrounding ground surface.

QUICKSAND OR ROCK

The Contractor shall contact the Engineer immediately should quicksand be encountered or if boulders of sufficient size and number to warrant concern are encountered. Any bore pipe partially installed shall be left in place until alternative methods or techniques are determined by the Engineer after consultation with the Contractor, the Commissioner and the owning authority.

TILE CONNECTIONS

Prior to commencement of backfilling, all tile encountered in excavations shall be reconnected using material of a size comparable to the existing material. Where the excavation is below the tile grade, a compacted granular base is to be placed prior to laying the tile. Payment for each connection will be made at the rate outlined in the Form of Tender and Agreement.

BACKFILL

Unless otherwise specified, all excavation shall be backfilled with on site material and left slightly higher than the surrounding ground. Surplus material from the boring operation shall be removed from the site at the Contractor's expense.

RESTORATION

The entire affected area shall be shaped and graded to original lines and grades, the topsoil replaced, and the area seeded down at the rate of 84 kg. per ha. unless otherwise specified.

Fences shall be restored to their original condition in accordance with the General Conditions.

Where a project includes the connection of a tile drain to or from the bore pipe, it shall be the tile Contractor's responsibility to carry out the specified restoration over areas disturbed by the boring contractor and which coincide with his working areas.

SPECIFICATIONS FOR MUNICIPAL DRAINS CROSSING COUNTY ROADS

1. These specifications supplement the conditions outlined in the Specifications for the Construction of Municipal Drainage Works, but in no way limit the County's Specifications and Regulations governing the construction of drains on the County's Road Allowance.

2. The County will supply no labour, equipment or materials for the construction of the road crossing.

3. Before proceeding with any work on County Road property, the Contractor shall ensure a road crossing permit has been obtained and he shall notify the County Engineer and the Drainage Engineer or Commissioner, a minimum of 48 hours in advance (exclusive of Saturdays, Sundays and Holidays). A site meeting shall be held with the affected parties to review in detail the crossing and/or its related works. The County Inspector and the Drainage Engineer will inspect the work while in progress to ensure that the work is done in strict accordance with the specifications.

4. Unless otherwise specified, the Contractor shall keep the road open to traffic at all times. The Contractor shall provide suitable warning signs and/or flagmen to the satisfaction of the County Engineer to notify the motorists of work on the road ahead. Where the Contractor is permitted to close the road to through traffic, the Contractor shall provide for and adequately sign the detour route.

5. The drawings will specify the type of crossing which is to be constructed i.e. by boring or by open cut.

6. Boring shall be carried out in accordance with the section of the Specifications for the Construction of Municipal Drainage Works entitled "Boring" except that:

   - Bore pits shall be kept back at least 1 meter from the edge of pavement and where bore pits are made in any portion of the shoulder, the excavated material shall be disposed of off the road allowance and the pit backfilled with thoroughly compacted Granular "A" for its entire depth.

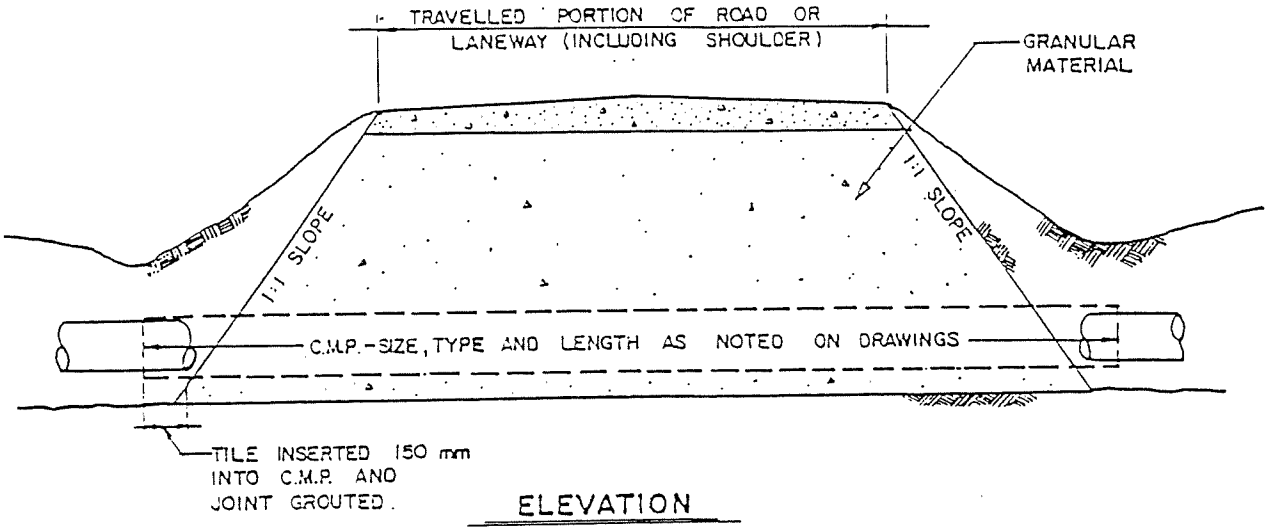
   - Bore pits and excavations outside of the shoulder area may be backfilled with native material compacted to a density of 95% Standard Proctor. All disturbed areas shall be neatly shaped, have the topsoil replaced and seeded with a good quality grass mixture.

7. Open Cut shall be carried out in accordance with the section of the Specifications for the Construction of Municipal Drainage Works entitled "General Conditions" sub-section "Road Crossings" except that:

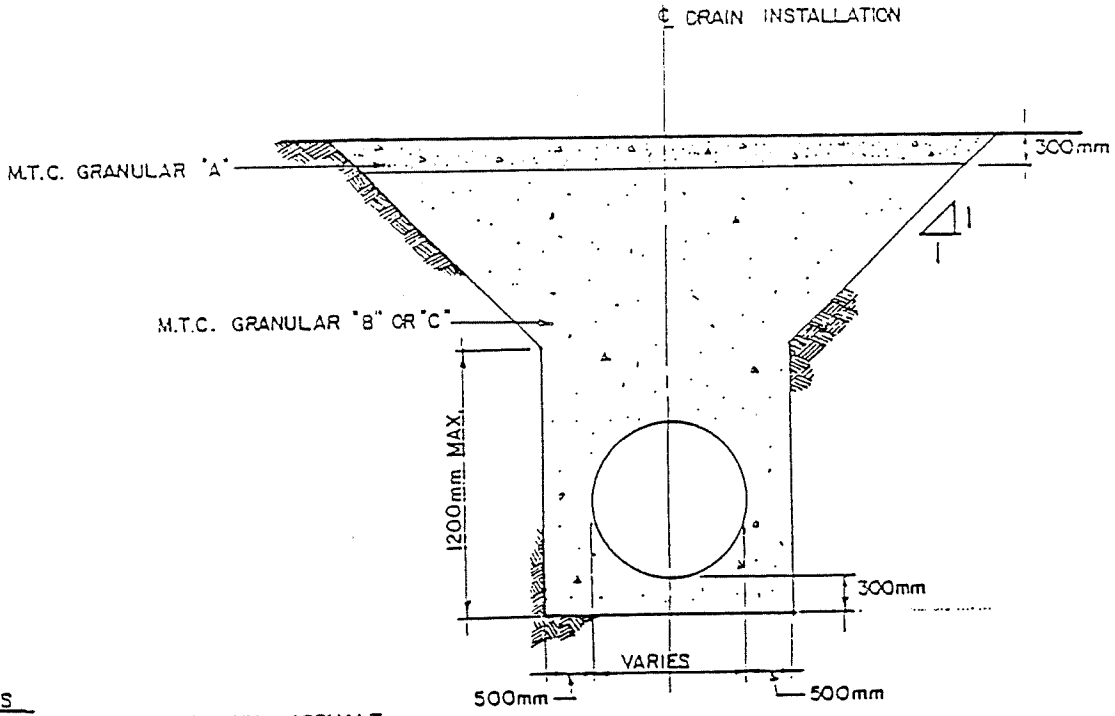
   - the excavated material removed from the travelled portion of the road and the full width of the shoulder shall be removed and disposed of off the road allowance.

   - backfill material for the excavation on the travelled portion and shoulders shall be as follows: -

     a) from the bottom of the excavation to a level 300mm below the road grade - the material shall meet the requirements for M.T.C. Granular B or C. The backfill shall be placed in lifts not exceeding 300mm in thickness and each lift shall be thoroughly compacted to produce a density of 100% Standard Proctor.



ELEVATION



SECTION

NOTES

1) CONTRACTOR TO REPLACE ANY ASPHALT PAVEMENT OR OTHER SURFACE TREATMENT.
2) ALL GRANULAR MATERIAL TO BE PLACED IN LIFTS NOT EXCEEDING 300mm IN DEPTH AND SHALL BE THOROUGHLY COMPACTED WITH AN APPROVED TYPE MECHANICAL VIBRATING COMPACTOR TO PRODUCE A DENSITY OF 100% STANDARD PROCTOR.
3) REMAINING BACKFILL MATERIAL SHALL BE APPROVED ON SITE MATERIAL COMPACTED TO A DENSITY OF 95% STANDARD PROCTOR.

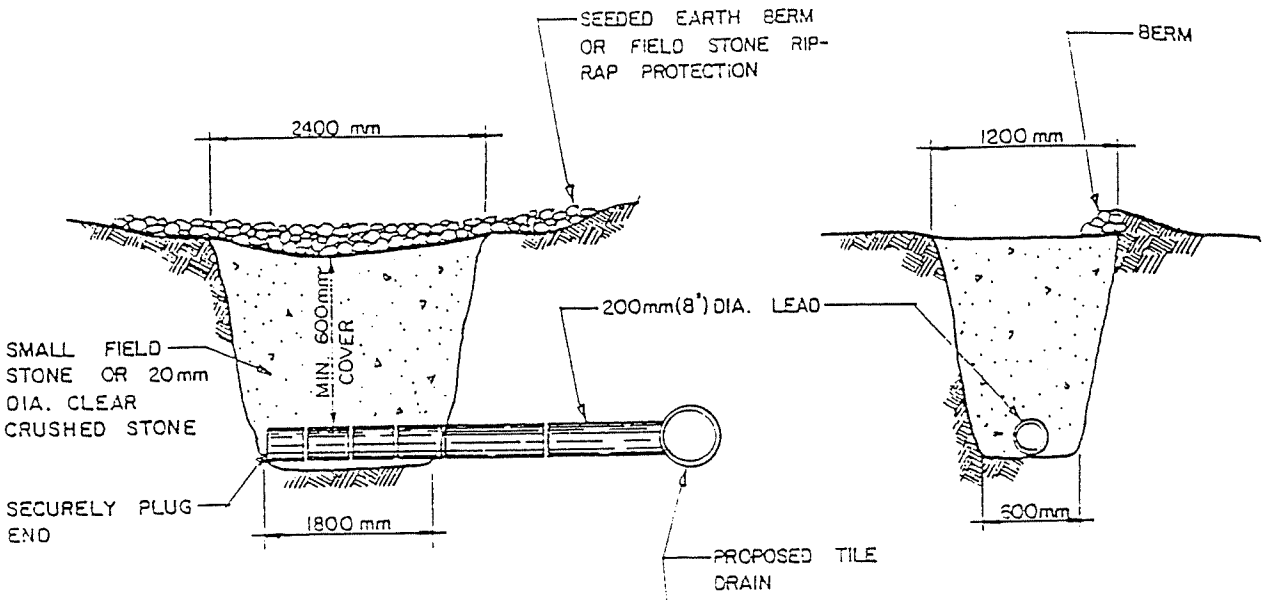
TYPICAL INSTALLATION DETAIL FOR TILE DRAINS UNDER ROADS & ACCESS LANES
(EXCEPT PROVINCIAL OR COUNTY ROADS)

SCALE: N.T.S.	APPROVED BY:	JOB NO.	DRAWN BY: BAKER
DATE: JAN. 1983			REVISED

ELEVATION & SECTION

STANDARD DETAILED DRAWING NO. 03

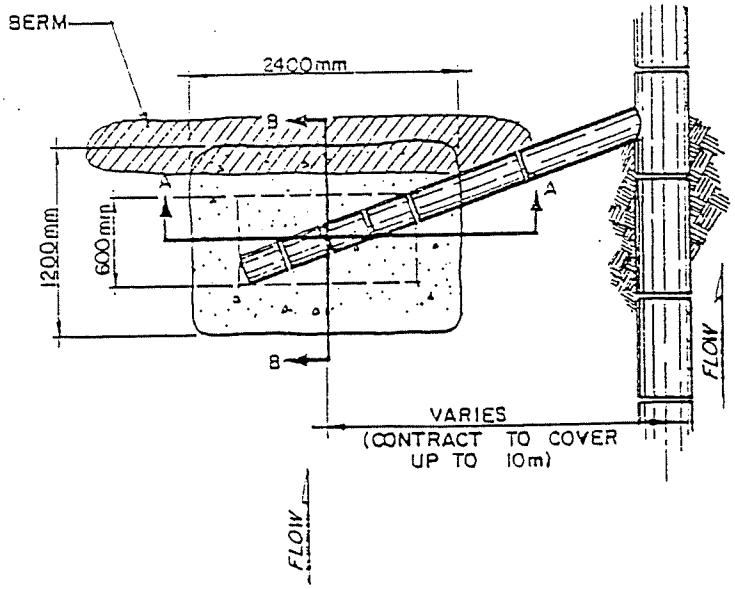
SPRIET ASSOCIATES LONDON LIMITED
CONSULTING ENGINEERS



SECTION A-A

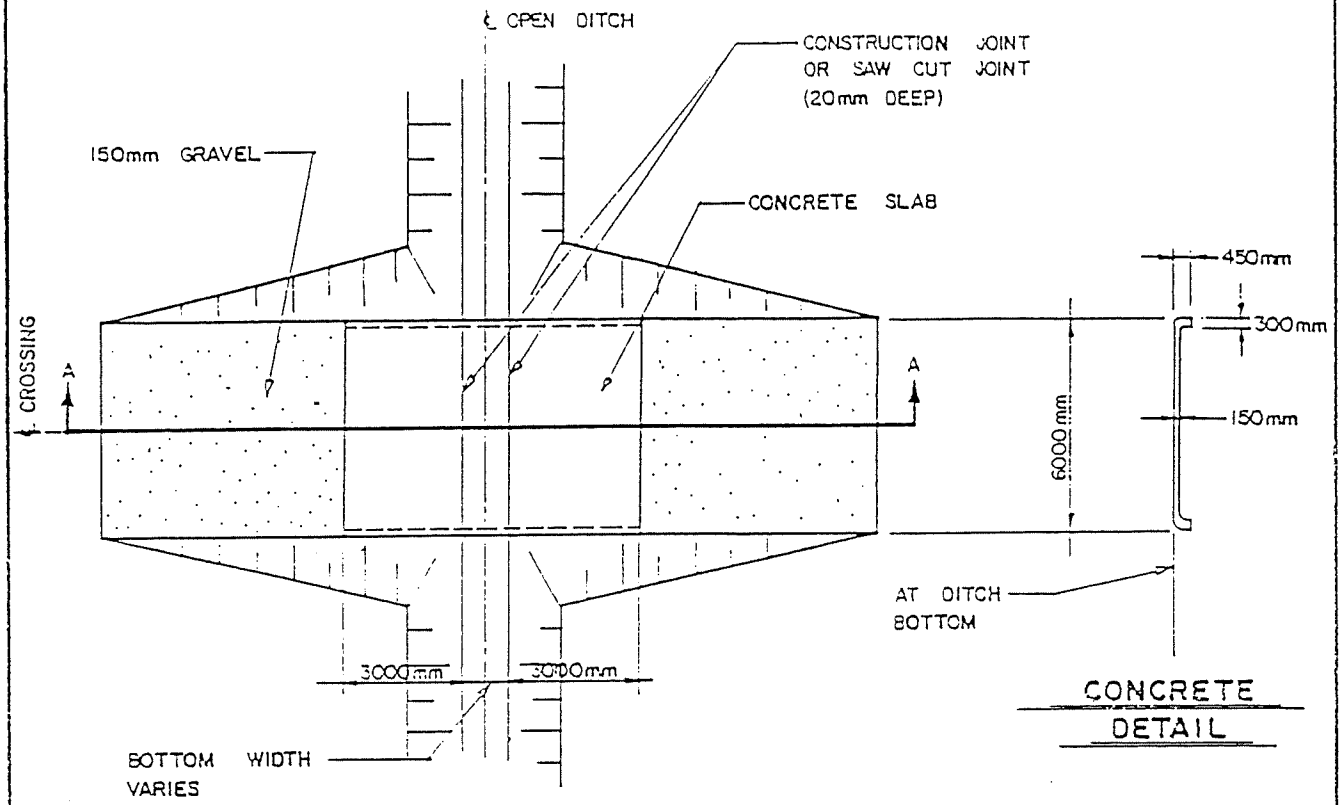
SECTION B-B

NOTE: TILE TO BE CUT IN 300mm LENGTHS AND INSTALLED WITH 10 mm GAP.



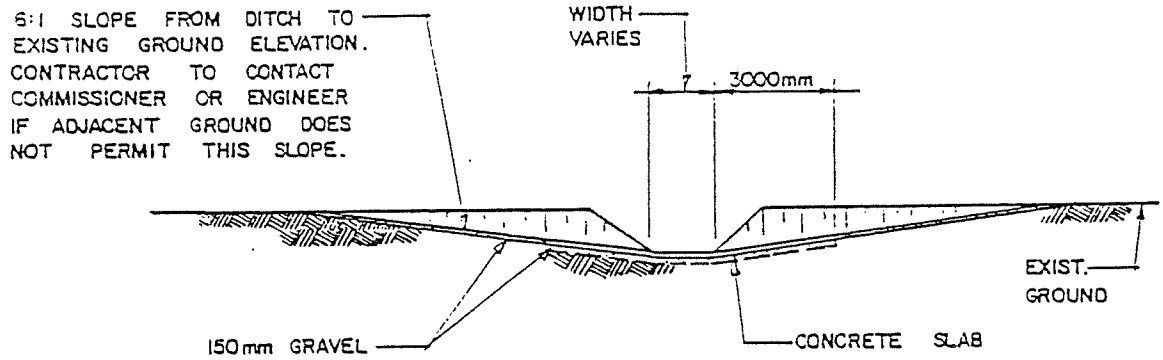
PLAN

TYPICAL OFF - SET BLIND INLET CATCHBASIN			
SCALE: N.T.S.	APPROVED BY:	JOB NO.	DRAWN BY SDJCR
DATE: JAN. 1983			REVISED
PLAN & SECTIONS			STANDARD DETAILED DRAWING No. 06
SPRIET ASSOCIATES LONDON LIMITED CONSULTING ENGINEERS			



CONCRETE DETAIL

PLAN

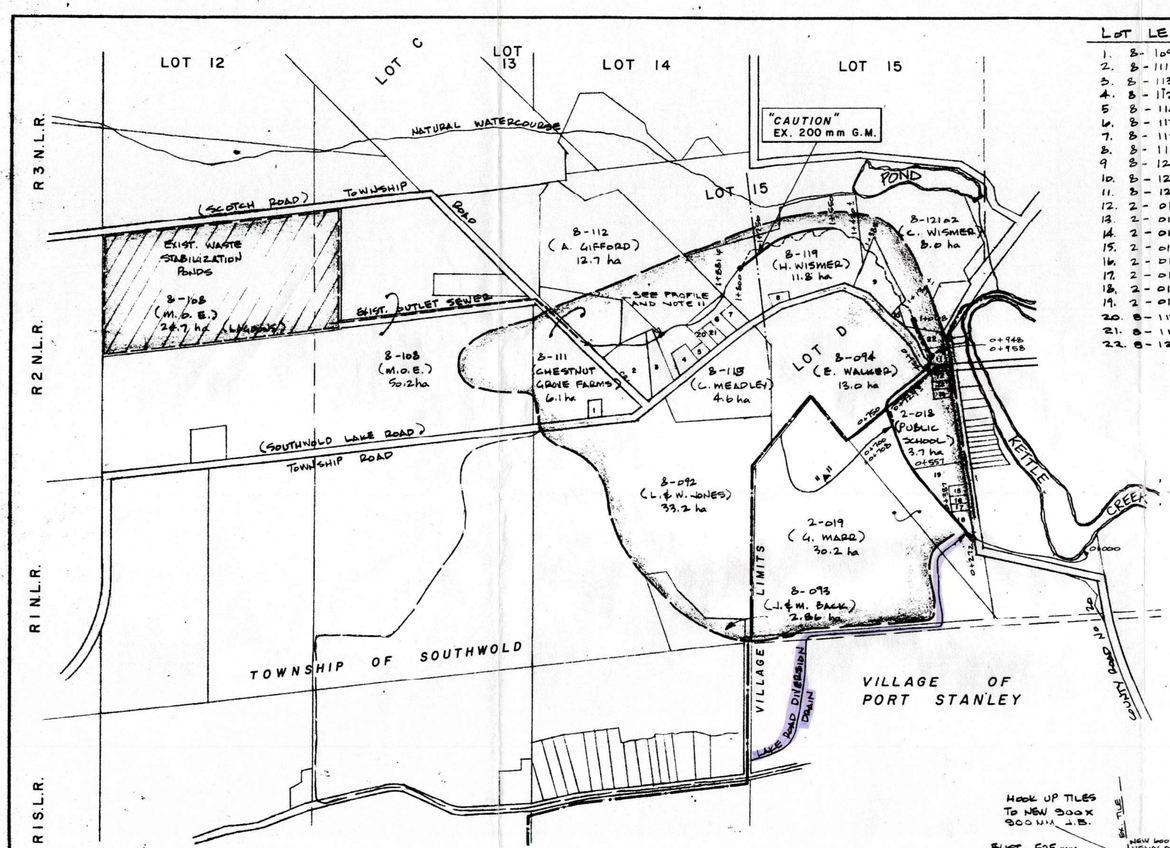


SECTION A-A

NOTES

1) GRAVEL TO BE M.T.C. GRANULAR "A"
2) CONCRETE TO BE 20 MPa

TYPICAL LOW GRADE CROSSING			
SCALE: N.T.S.	APPROVED BY:	JOB NO.	DRAWN BY BRUCE
DATE: JAN. 1983			REVISED
PLAN & SECTION			STANDARD DETAILED DRAWING No. 07
SPRIET ASSOCIATES LONDON LIMITED CONSULTING ENGINEERS			



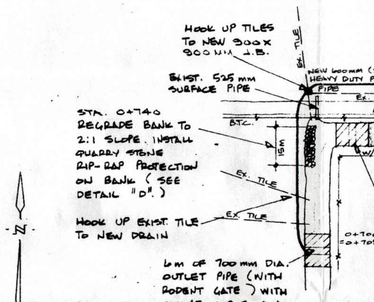
PLAN
SCALE 1:7500

LOT LEGEND

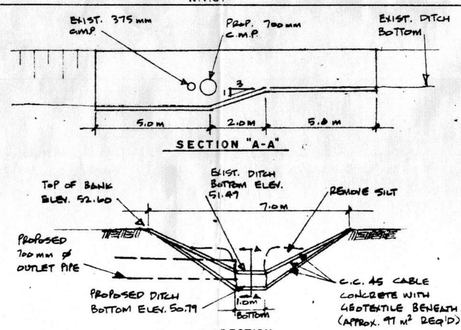
1.	B-109	C. & P. MAJOR	0.14 ha
2.	B-11101	J. & C. JOHNSON	1.20 ha
3.	B-113	M. GIFFORD	0.69 ha
4.	B-11201	K. GIFFORD	0.31 ha
5	B-114	E. BEATTIE	0.13 ha
6.	B-117	D. GILBERT	0.71 ha
7.	B-11708	D & R PEARN	0.20 ha
8.	B-118	UNION GAS LTD.	0.10 ha
9	B-12101	J. & G. HURST	1.40 ha
10.	B-120	D. & M. ZANITZ	0.20 ha
11.	B-121	C. SCIDMORE	0.25 ha
12.	2-012	B. & G. STORMES	0.09 ha
13.	2-013	R. & M. SMITH	0.09 ha
14.	2-014	G. & S. ELLIOTT	0.09 ha
15.	2-01401	M. & D. MACKINNON 330	0.14 ha
16.	2-015	J. MCCARTHY 328	0.09 ha
17.	2-016	S. & V. METALLGART 326	0.09 ha
18.	2-017	R. WALLS 324	0.24 ha
19.	2-01801	RECREATION CENTRE	1.10 ha
20.	B-11704	S. FRANK	0.20 ha
21.	B-11706	G. HINSCHBERGER	0.20 ha
22.	B-12104	G. NOESCHER	0.35 ha

GENERAL NOTES

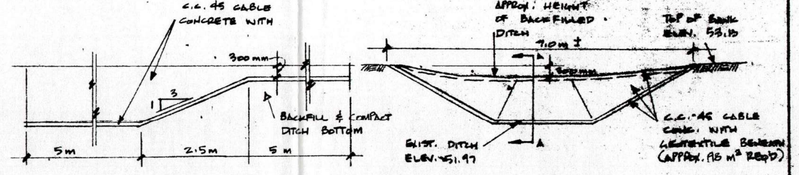
1. OUR SPECIFICATIONS DATED JANUARY 1983 APPLY TO THIS PROJECT.
2. ALL OWNERS OF LANDS WHERE THE DRAIN IS TO BE CONSTRUCTED SHALL MAKE AN ACCESS ROUTE AVAILABLE FROM THE NEAREST ROAD ALLOWANCE TO THE DRAIN LOCATION. THE AVERAGE WIDTH OF THIS ROUTE SHALL NOT EXCEED 8 METERS.
3. THE WORKING WIDTH AVAILABLE TO THE CONTRACTOR TO CONSTRUCT THE DRAIN AND CONNECTIONS CONSISTS OF THOSE LANDS IMMEDIATELY ADJACENT TO THE COURSE OF THE DRAIN AND CONNECTIONS AND SHALL NOT EXCEED AN AVERAGE WIDTH OF 15 METERS FOR TILING AND 15 METERS FOR BACKFILLING AND REGRADING.
4. CATCHBASINS TO BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH OUR SPECIFICATIONS. EXACT LOCATION AND ELEVATION OF CATCHBASINS TO BE CONFIRMED BY ENGINEER OR DRAINAGE SUPERINTENDENT PRIOR TO CONSTRUCTION.
5. ALL TREES, BRUSH SCRUB ETC. TO BE CLEARED IN ACCORDANCE WITH OUR SPECIFICATIONS. ALL TREES AND BRUSH TO BE REMOVED FROM BACKFILLED DITCH.
6. ALL QUARRY STONE TO RANGE IN SIZE FROM 100 mm TO 300 mm EVENLY DISTRIBUTED AND PLACED TO A 300 mm THICKNESS ON AN APPROVED GEOTEXTILE.
7. EXACT LOCATION OF NEW CLOSED DRAINS TO BE CONFIRMED BY ENGINEER OR DRAINAGE SUPERINTENDENT PRIOR TO CONSTRUCTION.
8. BACKFILLED DITCHES AND REGRADED DITCH BANKS TO BE HYDRO SEEDED AND MULCHED AT A RATE OF 65 kg/ha WITH THE FOLLOWING GRASS SEED MIXTURE:
   - CREEPING RED FESCUE 40%
   - KENTUCKY BLUE GRASS 20%
   - RED TOP 10%
   - TIMOTHY 20%
   - LADINO 10%
9. CABLE CONCRETE TO BE C.C.-45 AS MANUFACTURED BY WEST LORNE PRECAST AND TO BE INSTALLED WITH GEOTEXTILE ATTACHED TO UNDERSIDE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
10. CONTRACTOR TO NOTIFY UNION GAS CO. 72 HRS. PRIOR TO CROSSING GAS LINE.
11. CONTRACTOR TO SUPPLY & INSTALL QUARRY STONE RIP-RAP WITH FILTER BLANKET ON GIFFORD PROPERTY STA. 2+030



DETAIL "A"
N.T.S.



DETAIL "B" N.T.S.



DETAIL "C"
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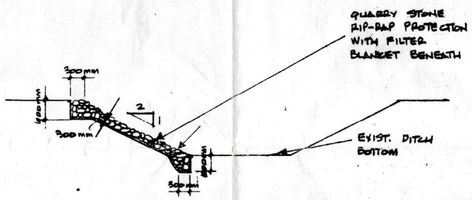

DETAIL "D"
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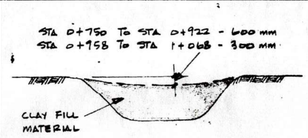
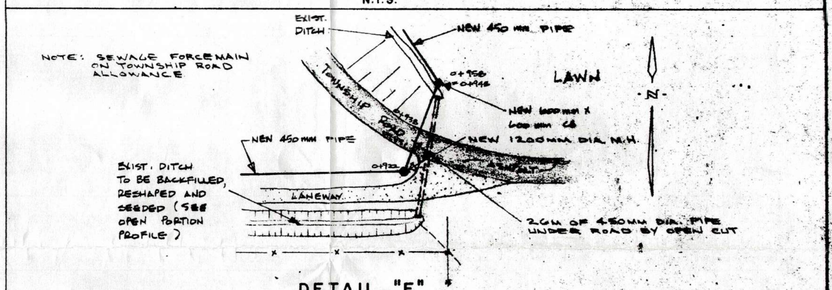


NOTES

1. EXIST. DITCH TO BE BACKFILLED USING IMPORTED CLAY FILL MATERIAL (APPROX. 1100 m³ LOOSE FILL REQ'D) DITCH TO BE BACKFILLED AND COMPACTED WITH DOZER IN APPROXIMATELY 150 mm LAYERS.
2. IMPORTED TOPSOIL TO BE LEVELLED OVER CLAY FILL MATERIAL TO A THICKNESS OF 50 mm (APPROX. 110 m³ REQ'D)
3. BACKFILLED DITCH TO BE HYDRO SEEDED AND MULCHED WITH AN APPROVED GRASS SEED MIXTURE AT A RATE OF 84 kg/ha [75 lbs/ac (Approx. 1100 m² seeding req'd)]

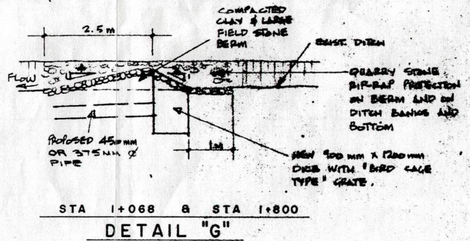
TYPICAL BACKFILLED DITCH SECTION
DETAIL "E"
N.T.S.



DETAIL "F"
N.T.S.

NOTES

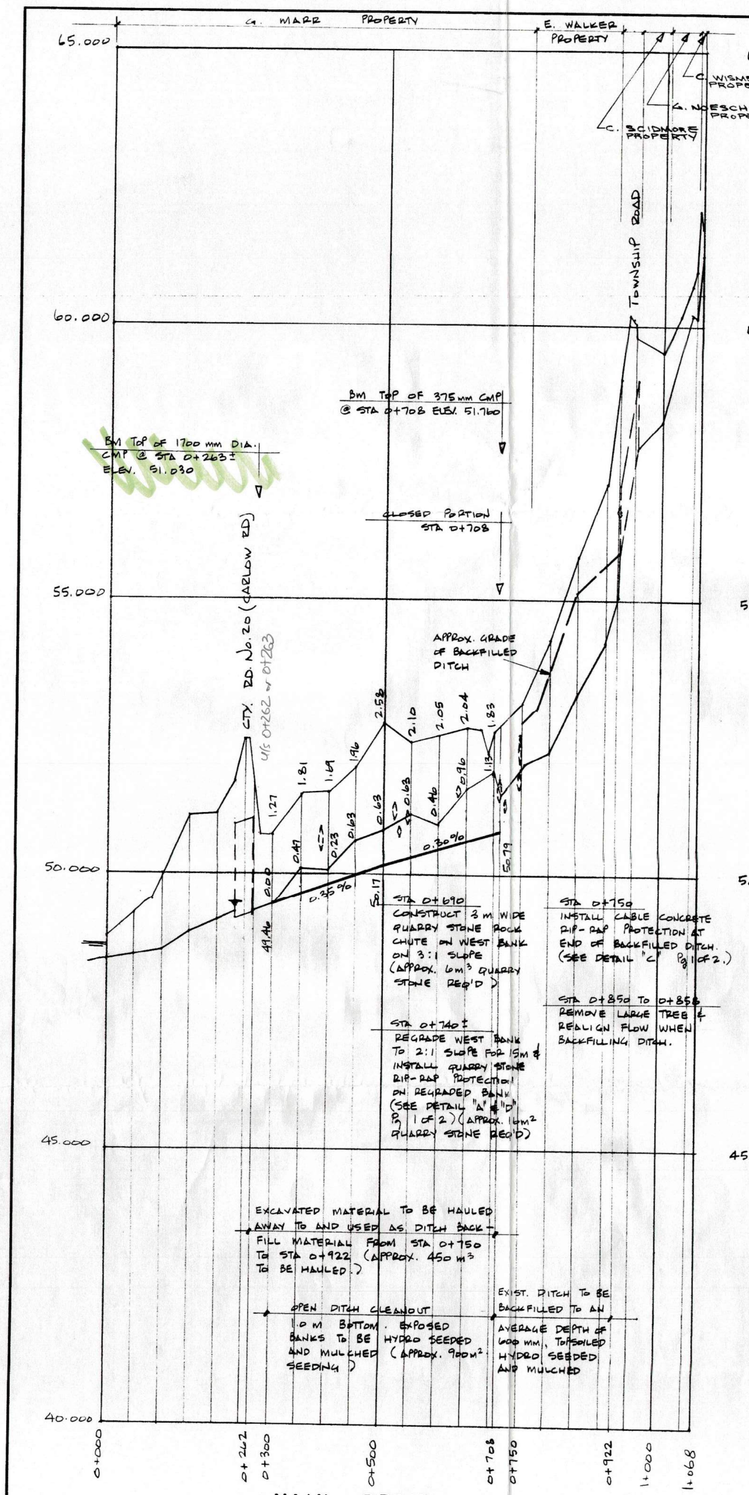
1. BERM TO BE CONSTRUCTED WITH IMPORTED CLAY FILL MATERIAL MIXED WITH LARGE FIELD STONE TO A 50% - 50% RATIO.
2. ENDS OF BERM TO BE 150 mm LOWER THAN ELEV. AT D.I.B. LOCATION



STA 1+068 & STA 1+800
DETAIL "G"
N.T.S.

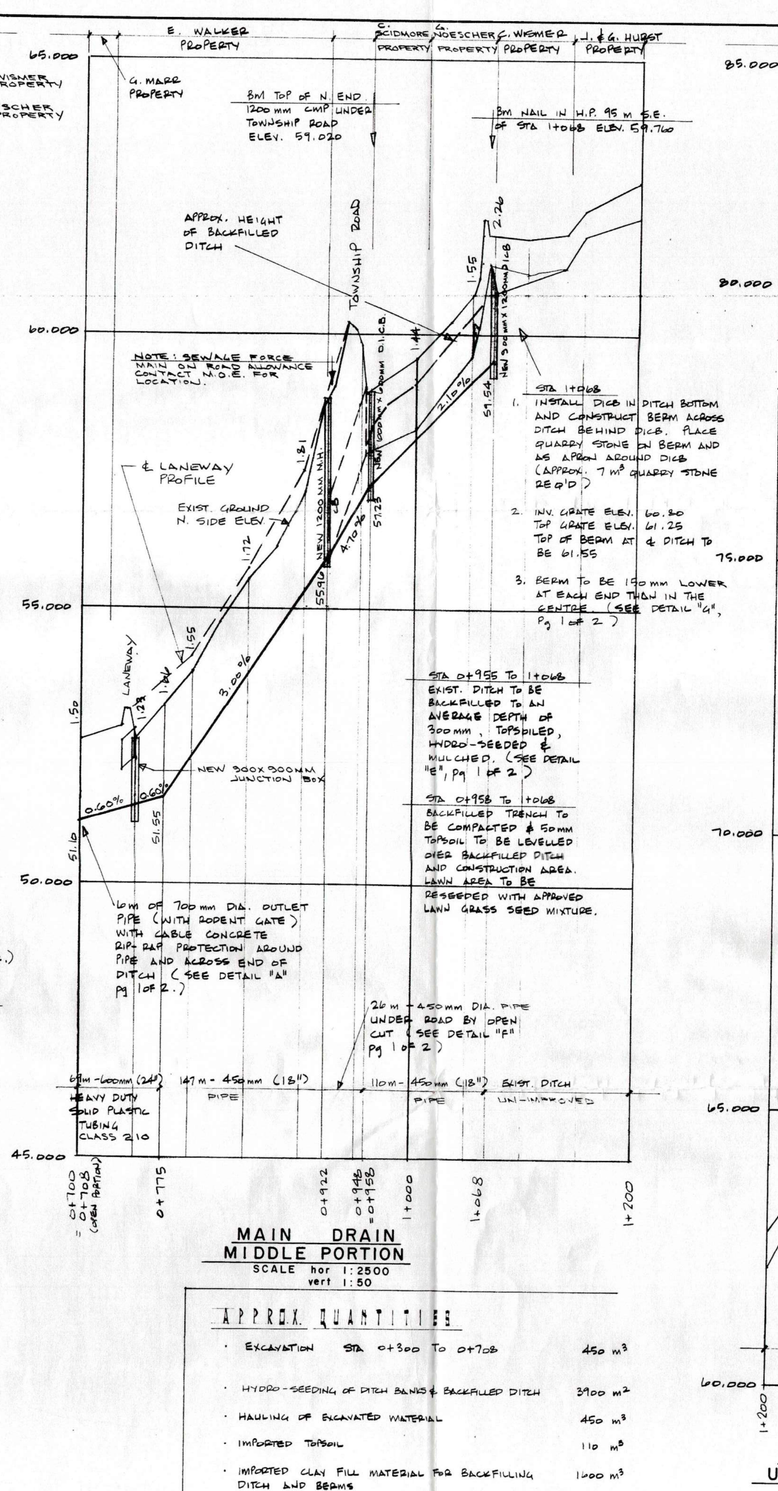
J. R. SPRIET — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

MARR DRAIN			
VILLAGE OF PORT STANLEY			
Scale: AS SHOWN	Approved By: J.R.S.	JOB NO. 87086	Drawn By: MD, AD
Date: MAY 23, 1991	F.B. D-142, 146		Revised:
PLAN & DETAILS			
SPRIET ASSOCIATES CONSULTING ENGINEERS	LONDON SUDBURY	Drawing Number 1 of 2	



MAIN DRAIN OPEN PORTION

SCALE hor 1:5000
vert 1:50

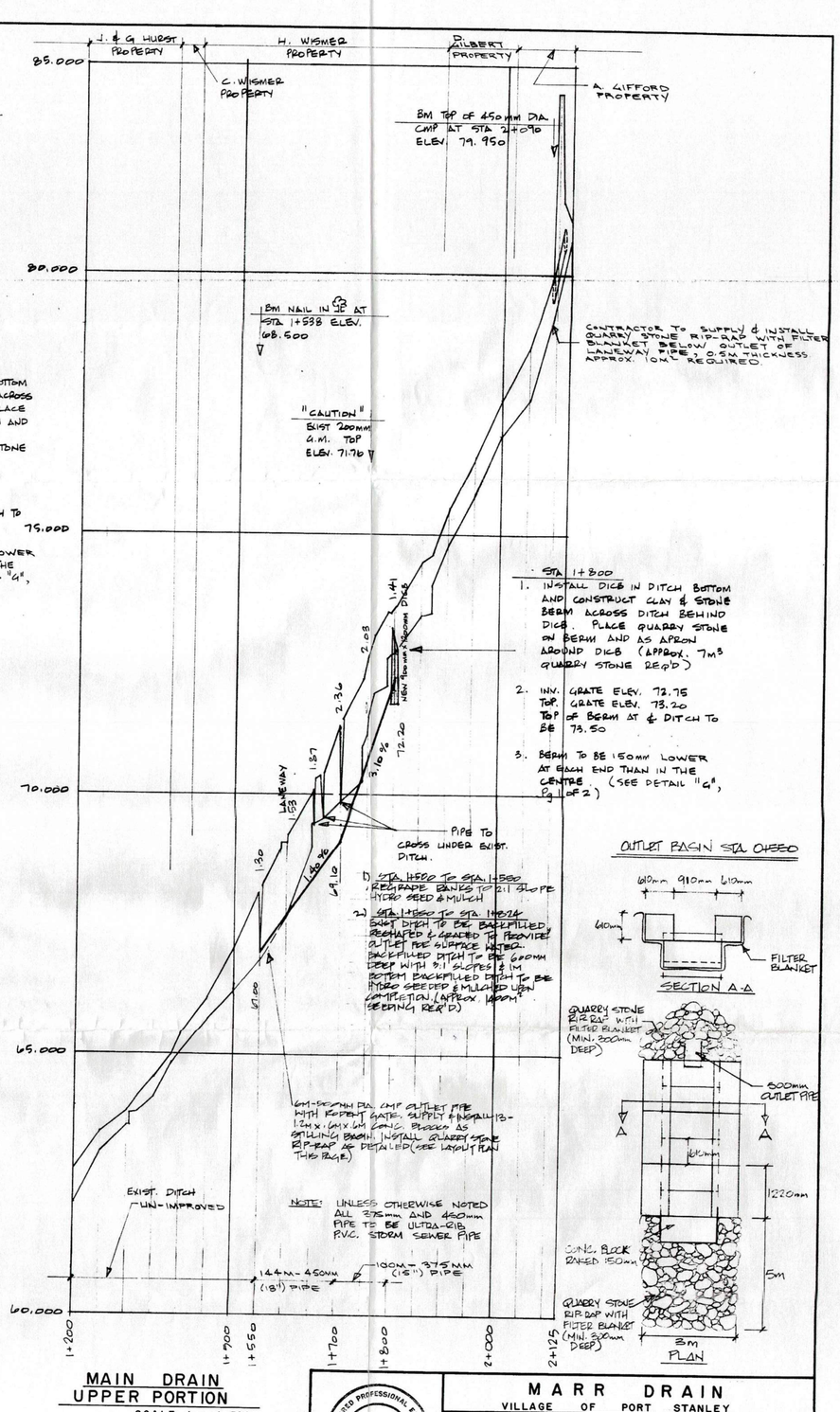


MAIN DRAIN MIDDLE PORTION

SCALE hor 1:2500
vert 1:50

APPROX. QUANTITIES

· EXCAVATION STA 0+300 TO 0+708	450 m³
· HYDRO-SEEDING OF DITCH BANKS & BACKFILLED DITCH	3900 m²
· HAULING OF EXCAVATED MATERIAL	450 m³
· IMPORTED TOPSOIL	110 m³
· IMPORTED CLAY FILL MATERIAL FOR BACKFILLING DITCH AND BERMS	1600 m³
· QUARRY STONE RIP-RAP PROTECTION	56 m³
· FILTER BLANKET	170 m²
· CABLE CONCRETE C.C.-45 (INCLUDING GEOTEXTILE)	195 m²



MAIN DRAIN UPPER PORTION

SCALE hor 1:5000
vert 1:50

OUTLET BASIN STA 0+850

J. R. SPRIET
PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

MARR DRAIN

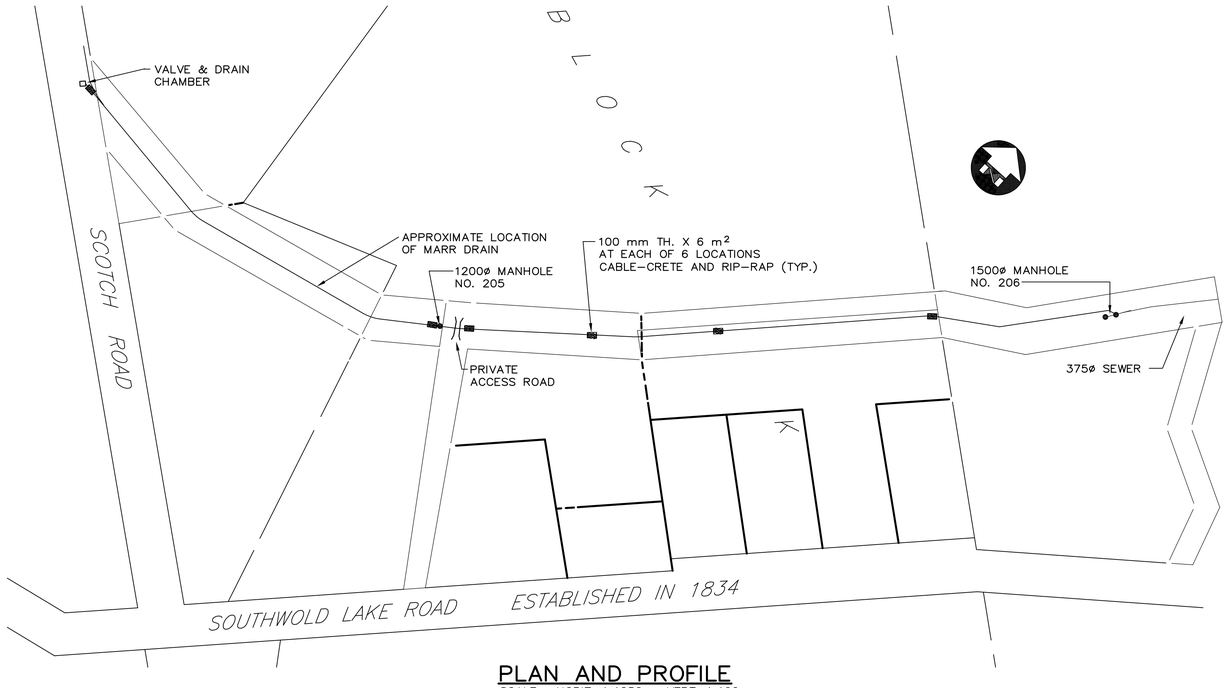
VILLAGE OF PORT STANLEY

Scale: AS SHOWN	Approved By: F.B. D-142,146	JOB NO. 87086	Drawn By: M.D., A.D.
Date: MAY 23, 1991			Revised:

PROFILES

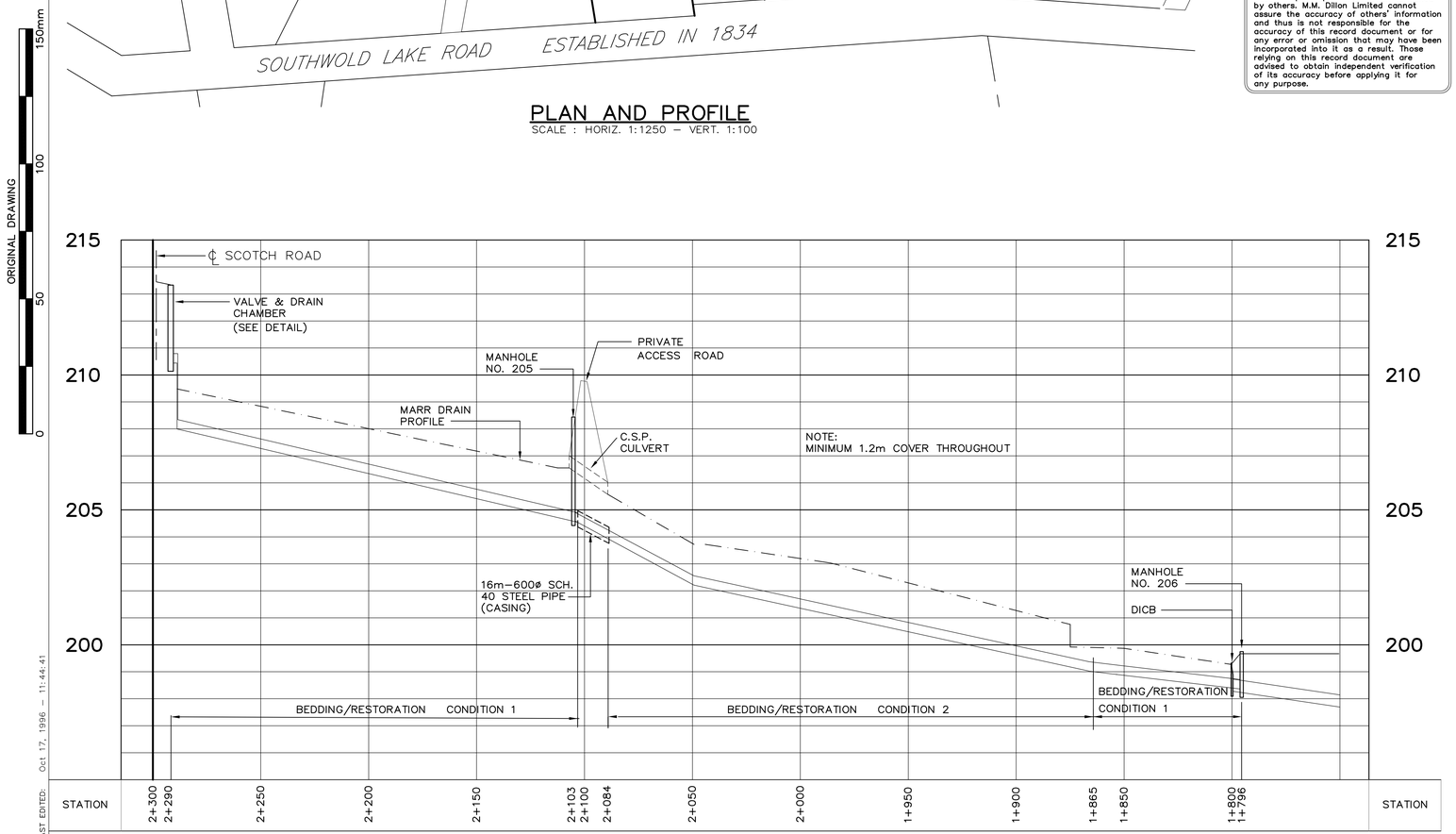
SPRIET ASSOCIATES
CONSULTING ENGINEERS
LONDON SUDBURY

Drawing Number 2 of 2



PLAN AND PROFILE

SCALE : HORIZ. 1:1250 – VERT. 1:100



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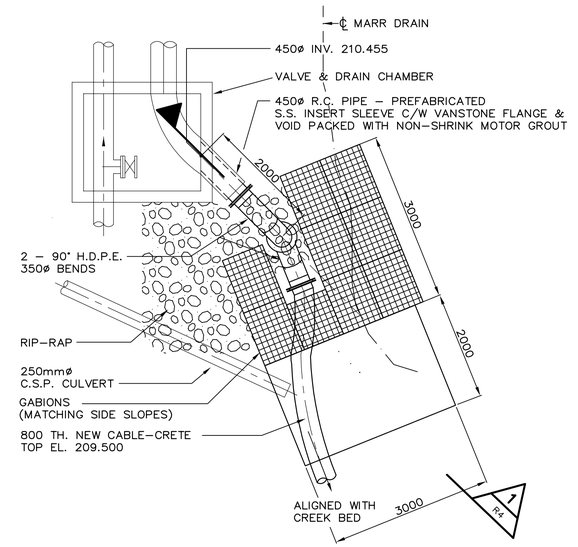
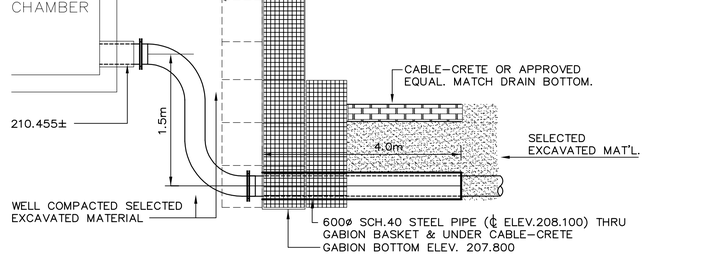


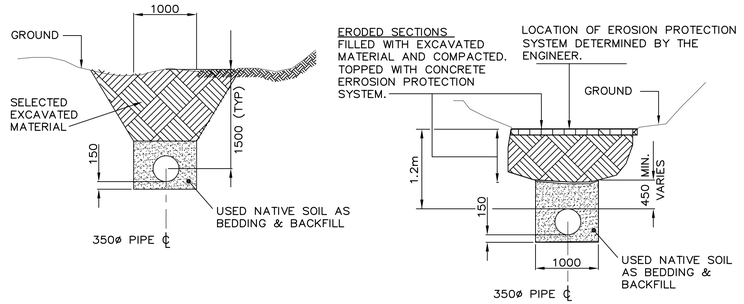
PLAN AT VALVE & DRAIN CHAMBER

SCALE 1:50



SECTION 1/R4

SCALE 1:50



BEDDING/RESTORATION CONDITION 1 **BEDDING/RESTORATION CONDITION 2**

MARR DRAIN BEDDING/RESTORATION DETAILS

SCALE NOT TO SCALE

NOTE: SEE SPECIFICATIONS FOR WORK COVERED UNDER CASH ALLOWANCE

ORIGINAL DRAWING 0 50 100 150mm

LAST EDITED: Oct 17, 1996 – 11:44:41

ACAD12 NAME: 2306R04A.DWG

PRINT RECORD FOR APPROVALS

NO.	DATE
1	3/95

VILLAGE OF PORT STANLEY

DILLON Consulting Engineers · Planners Environmental Scientists

NO.	REVISIONS	DATE	BY
2	RECORD DRAWING	SEPT 96	HNS
1	ISSUED FOR TENDERING	MAY 95	HNS

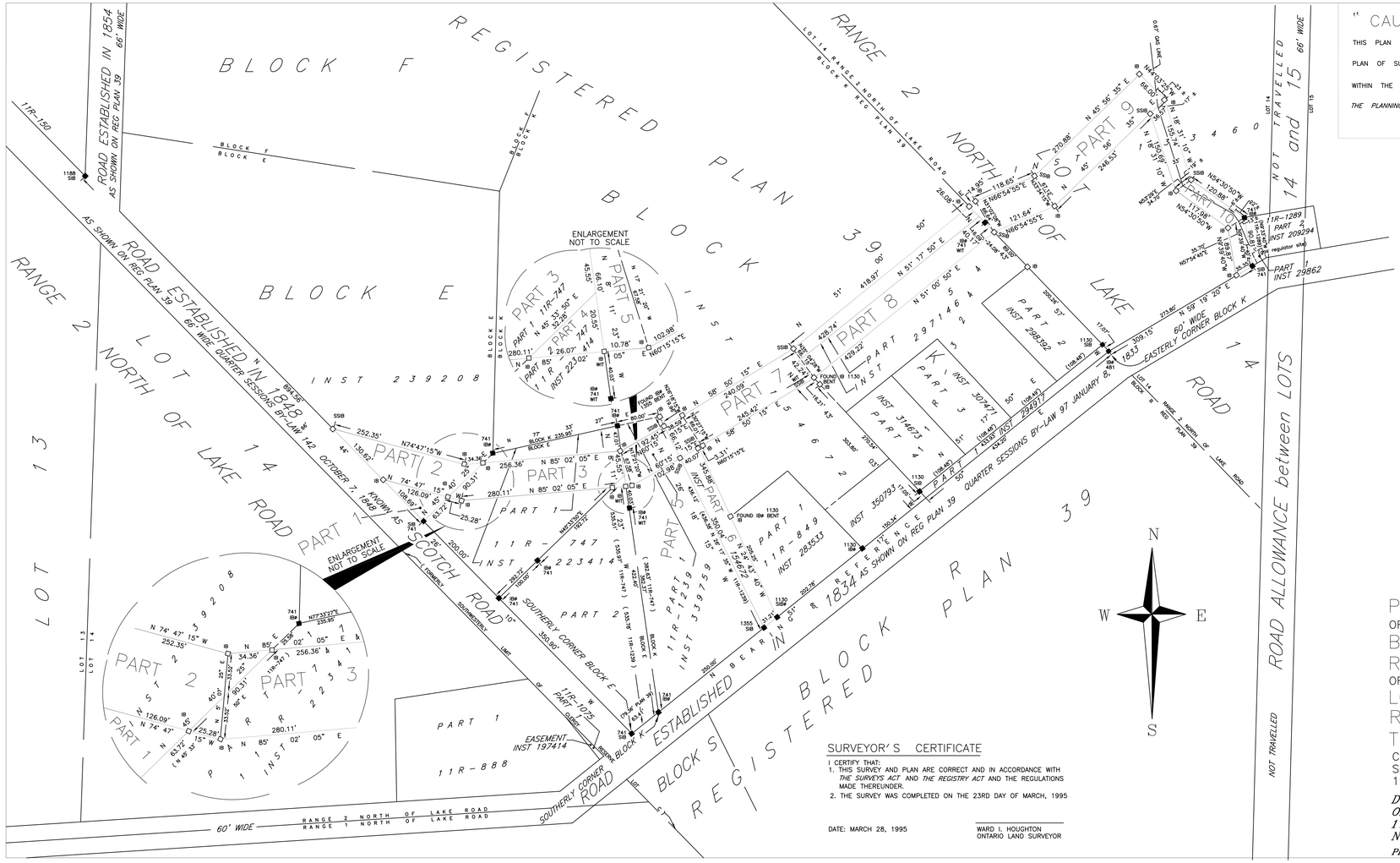
DESIGN WEM
DRAWN WEM
CHECKED HNS
APPROVED
DATE SEPT./94
SCALE AS NOTED

SEWAGE TREATMENT FACILITY EXPANSION

MARR DRAIN PLAN, PROFILE AND DETAILS

FILE NO 2306–30

DRAWING NO R4



SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH *THE SURVEYS ACT* AND *THE REGISTRY ACT* AND THE REGULATIONS MADE THEREUNDER.
2. THE SURVEY WAS COMPLETED ON THE 23RD DAY OF MARCH, 1995

DATE: MARCH 28, 1995

WARD I. HOUGHTON
ONTARIO LAND SURVEYOR

'' CAUTION ''

THIS PLAN IS NOT A PLAN OF SUBDIVISION WITHIN THE MEANING OF *THE PLANNING ACT.*

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER *THE REGISTRY ACT.*
DATE: MARCH 28, 1995

DONALD I. HOUGHTON
ONTARIO LAND SURVEYOR

PLAN 11R–
RECEIVED AND DEPOSITED
DATE:

LAND REGISTRAR
FOR THE REGISTRY DIVISION OF ELGIN, No.11

SCHEDULE

PART	LOCATION	INST. No.	AREA IN ACRES
1	PART OF BLOCK E REGISTERED PLAN 39	239208	0.080
2	PART OF BLOCK E REGISTERED PLAN 39	239208	0.309
3	PART OF BLOCK E REGISTERED PLAN 39	223414	0.443
4	PART OF BLOCK E REGISTERED PLAN 39	223414	0.006
5	PART OF BLOCK K REGISTERED PLAN 39	339759	0.156
6	PART OF BLOCK K REGISTERED PLAN 39	154672	0.281
7	PART OF BLOCK K REGISTERED PLAN 39	154672	0.668
8	PART OF BLOCK K REGISTERED PLAN 39	297146	0.404
9	PART OF LOT 14 RANGE 2 NORTH OF LAKE ROAD	133460	0.613
10	PART OF LOT 14 RANGE 2 NORTH OF LAKE ROAD	133460	0.275
TOWNSHIP OF SOUTHWOLD			

BEARING REFERENCE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE NORTHWESTERLY LIMIT OF THE ROAD ESTABLISHED IN 1834 QUARTER SESSIONS BY-LAW No. 97 AS SHOWN ON REG PLANS 11R–1239 AND 11R–3244 HAVING A BEARING OF N 51° 17' 50" E

LEGEND

■	–	DENOTES SURVEY MONUMENT FOUND
□	–	" SURVEY MONUMENT PLANTED
SIB	–	" STANDARD IRON BAR
SSIB	–	" SHORT STANDARD IRON BAR
RIB	–	" ROUND IRON BAR
IB	–	" SQUARE IRON BAR
INST	–	" INSTRUMENT
WIT	–	" WITNESS
REG	–	" REGISTERED
481	–	" F A BELL, OLS
741	–	" DONALD I HOUGHTON, OLS
1130	–	" J G RUPERT, OLS
1188	–	" C A SEXTON, OLS
1355	–	" B VAUGHAN, OLS

PLAN OF SURVEY
OF PARTS OF
BLOCKS E AND K
REGISTERED PLAN 39
OF PARTS OF
LOT 14
RANGE 2 NORTH of LAKE ROAD
TOWNSHIP OF SOUTHWOLD
COUNTY OF ELGIN
SCALE 1" = 100'
1995

DONALD I. HOUGHTON
ONTARIO LAND SURVEYOR
17 HINCKS STREET, ST. THOMAS, ONT.
N5R 3N5
PH. (519) 631–2212 *FAX (519) 631–1343*

D: L14RNLRX

ORIGINAL DRAWING 150mm 100 50 0

ACAD12 NAME: 2306R07A.DWG LAST EDITED: Apr. 28, 1995 – 12:52:39

PRINT RECORD FOR DATE

NO.	REVISIONS	DATE	BY
1	ISSUED FOR TENDERING	MAY 95	HNS

VILLAGE OF PORT STANLEY

DILLON
Consulting Engineers · Planners
Environmental Scientists

DESIGN
DRAWN
CHECKED
APPROVED
DATE APR/95
SCALE NO SCALE

SEWAGE TREATMENT FACILITY EXPANSION

INFORMATION DRAWING

FILE NO 2306–30

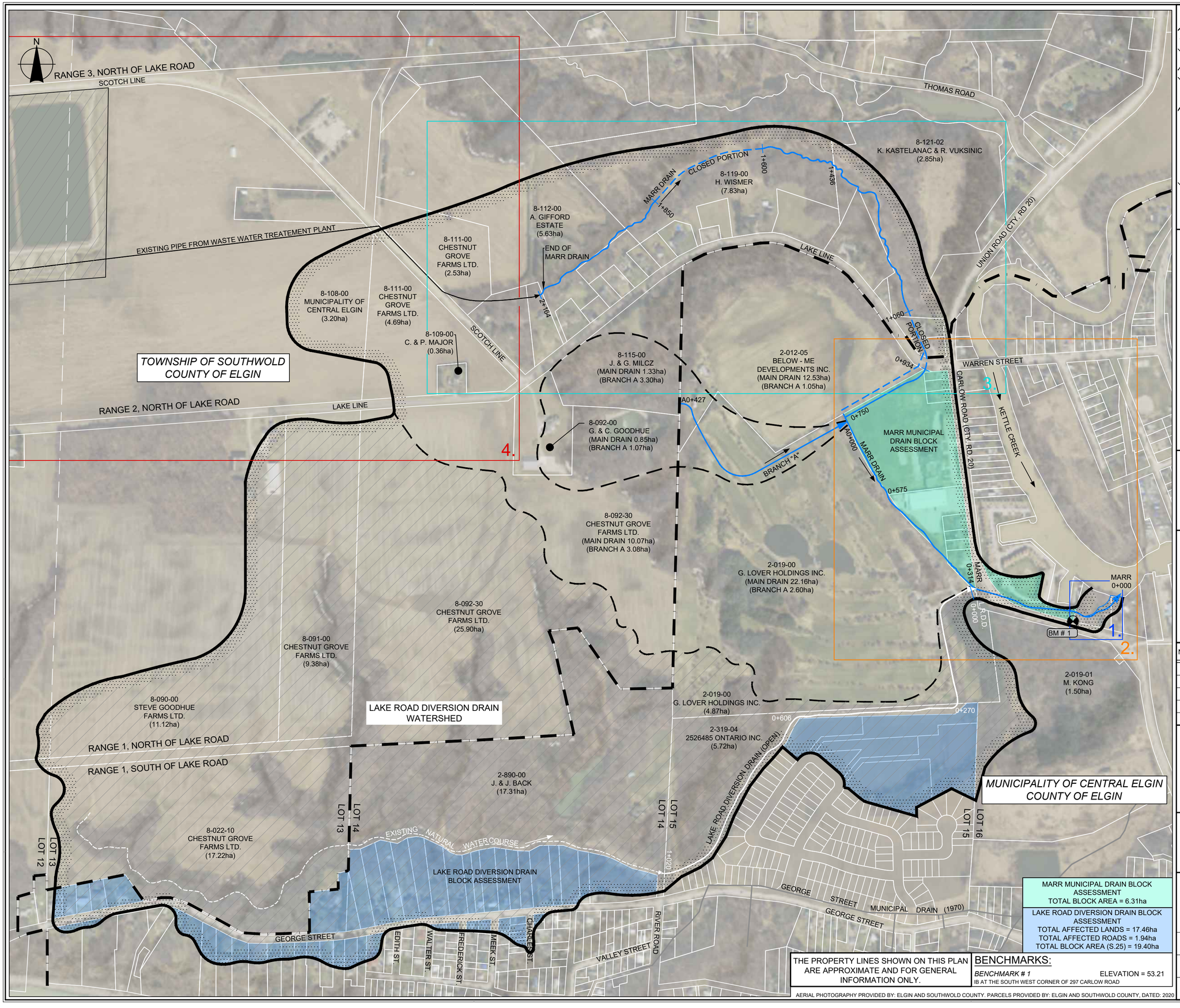
DRAWING NO R7

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix I

Drawings



MARR MUNICIPAL DRAIN BLOCK ASSESSMENT
TOTAL BLOCK AREA = 6.31ha

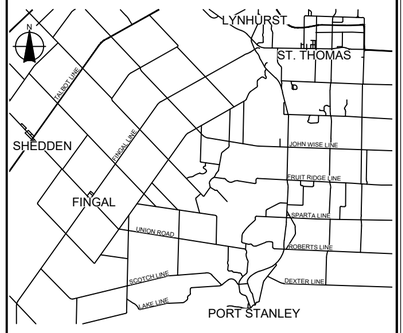
LAKE ROAD DIVERSION DRAIN BLOCK ASSESSMENT
TOTAL AFFECTED LANDS = 17.46ha
TOTAL AFFECTED ROADS = 1.94ha
TOTAL BLOCK AREA (S.25) = 19.40ha

THE PROPERTY LINES SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR GENERAL INFORMATION ONLY.

BENCHMARKS:

BENCHMARK # 1 ELEVATION = 53.21
IB AT THE SOUTH WEST CORNER OF 297 CARLOW ROAD

AERIAL PHOTOGRAPHY PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY. PARCELS PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY, DATED: 2020



KEY PLAN
SCALE: N.T.S.

LEGEND

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

Notes
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FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
J. R. DICKSON
MAY 25/2021
PROVINCE OF ONTARIO

No.	Issue / Revision	Date	Auth.
1	ISSUED FOR PRELIMINARY CA REVIEW	JUN 22, 2011	JRD
2	DRAWINGS FOR FINAL CA REVIEW	JUL 27, 2011	JRD
3	ISSUED FOR ENGINEERS REPORT	SEPT 8, 2011	JRD
4	MUNICIPAL REVIEW OF "DRAFT" REVISED DRAWINGS	MAY 5, 2020	JRD
5	ISSUED FOR ENGINEER'S REPORT	MAY 25, 2021	JRD

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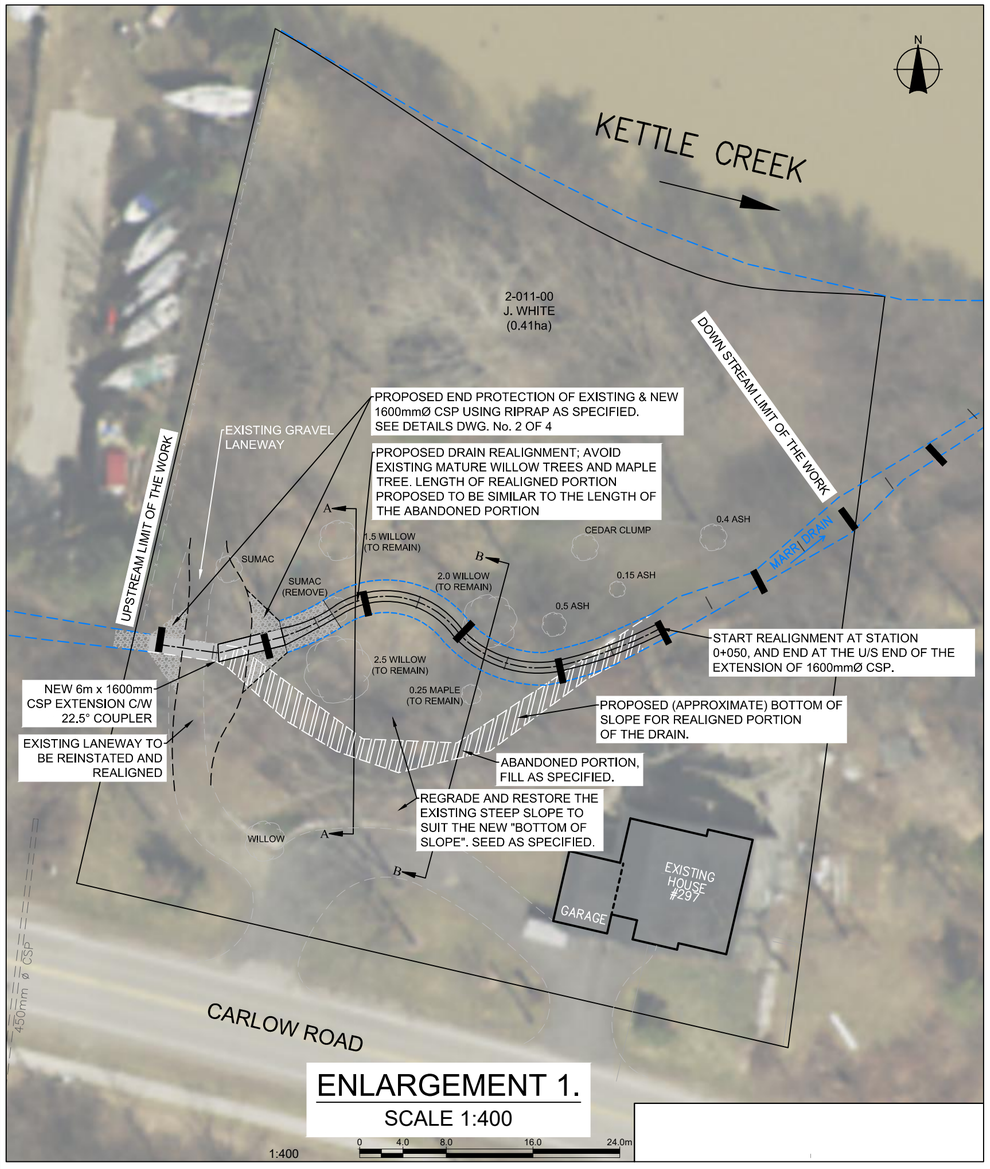
449 Josephine St., P.O. Box 10
Wingham, Ontario, N0G 2W0
telephone (519) 357-1521 **fax** (519) 357-3624
web www.rjburnside.com

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

Drawing Title
MARR DRAIN IMPROVEMENT
MASTER WATERSHED PLAN

Designed	Checked	Drawn	Checked	Drawing No.
JD	JD	SBC	JD	1 of 4
Date		Project No.		
		MSW019344.2019		
Scale 1:5,000		0 50 100 200 300m		

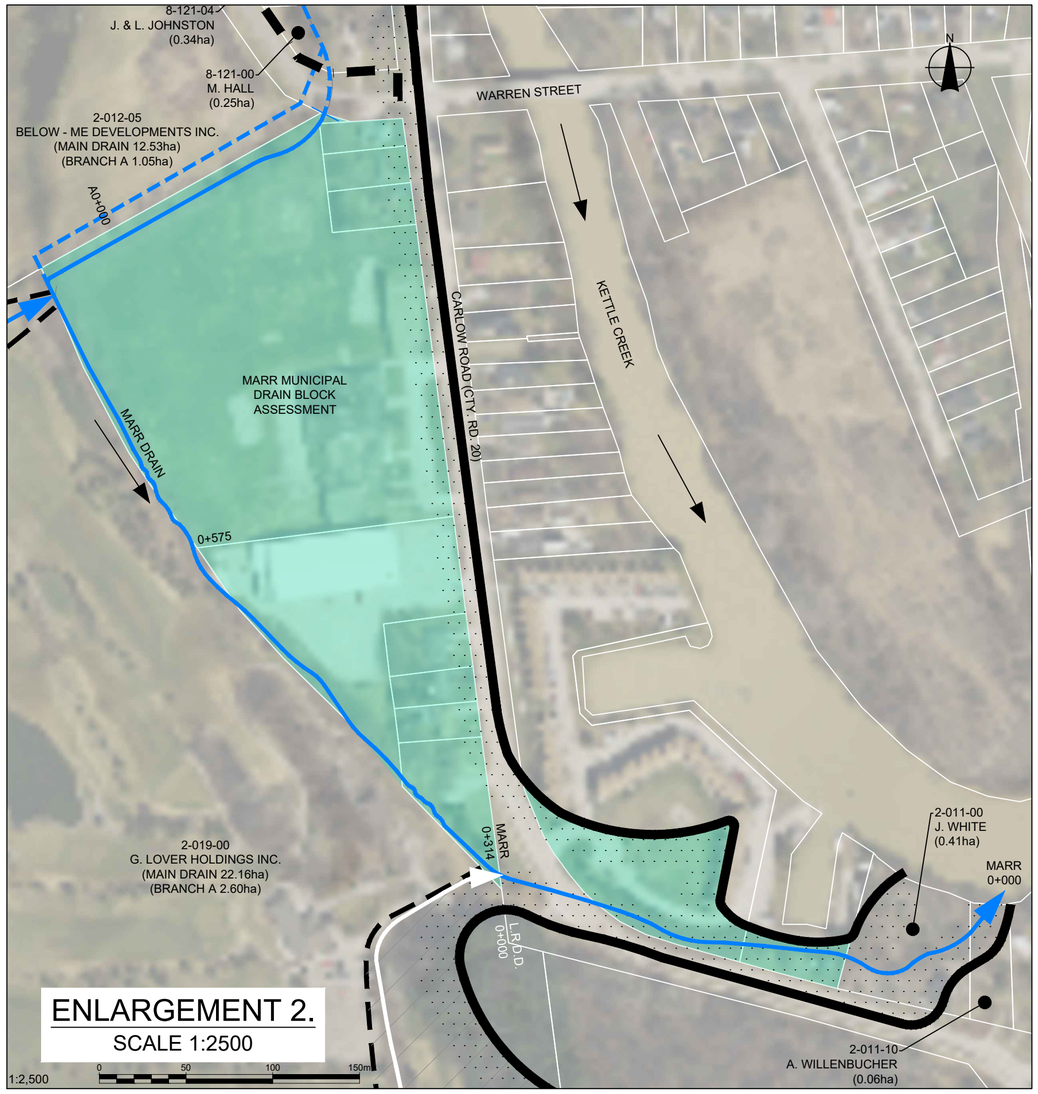
File: \\shelrdcks\shared work areas\Mar Drain\05_Production\Dwg\MSW019344 WATERSHED PLAN good.dwg Date Plotted: May 18, 2021 - 3:35 PM



ENLARGEMENT 1.

SCALE 1:400

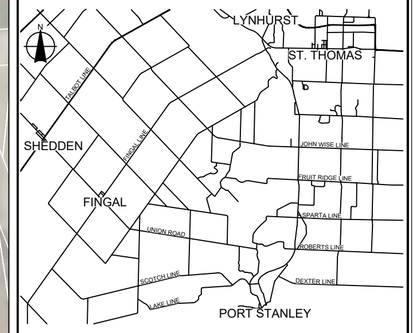
1:400 0 4.0 8.0 16.0 24.0m



ENLARGEMENT 2.

SCALE 1:2500

1:2,500 0 50 100 150m



KEY PLAN

SCALE: N.T.S.

LEGEND

- WATERSHED BOUNDARY
- SUB WATERSHED BOUNDARY
- DRAIN LOCATION AND DIRECTION — DRAIN NAME
- MUNICIPAL BOUNDARY
- PROPERTY LINE
- BENCHMARK LOCATION
- BENCHMARK NUMBER — BM #

ROLL # X-XXX-XX
OWNER NAME L. OWNER
AREA IN HECTARES (XX.XXha)

Notes

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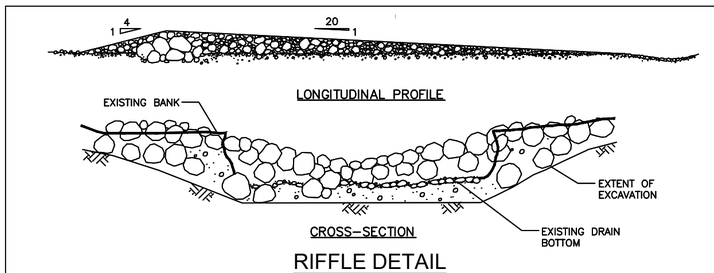
FOR CONSTRUCTION



NOTE:
1. APPROVED GEOTEXTILE MUST BE PLACED BETWEEN RIPRAP AND ANY NATIVE SOIL, OR BACKFILL.

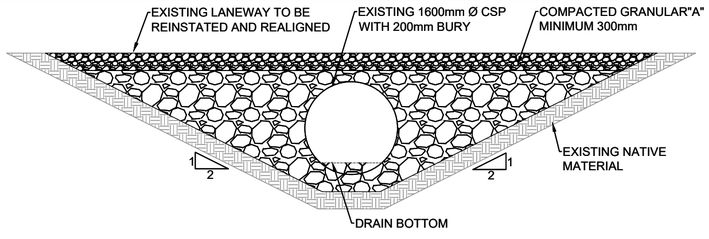
CULVERT SECTION VIEW

N.T.S

THE PROPERTY LINES SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR GENERAL INFORMATION ONLY.

RIFFLE DETAIL

N.T.S



CULVERT ELEVATION VIEW

N.T.S

AERIAL PHOTOGRAPHY PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY. PARCELS PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY, DATED: 2020

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3	ISSUED FOR ENGINEERS REPORT	SEPT 8, 2011	JRD
4	MUNICIPAL REVIEW OF "DRAFT" REVISED DRAWINGS	MAY 5, 2020	JRD
5	ISSUED FOR ENGINEER'S REPORT	MAY 25, 2021	JRD

LICENSED PROFESSIONAL ENGINEER J. R. DICKSON MAY 25/2021 PROVINCE OF ONTARIO

BURNSIDE

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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

MARR DRAIN IMPROVEMENT

DETAIL SHEET AND PLAN ENLARGEMENTS

Designed	Checked	Drawn	Checked	Drawing No.
JD	JD	SBC	JD	2 of 4
Date		Project No. MSW019344.2019		
Scale 1:5,000		0 50 100 200 300m		

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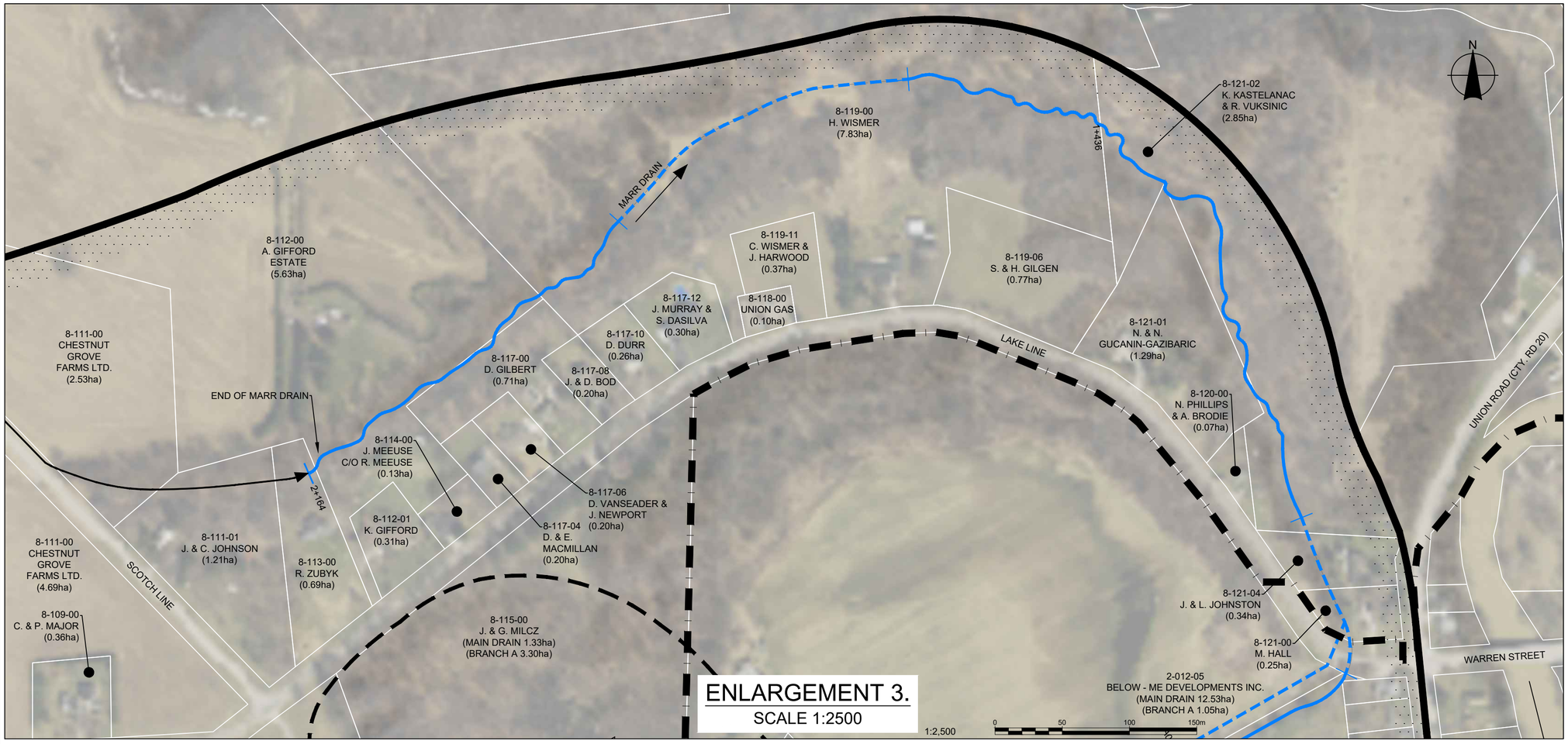
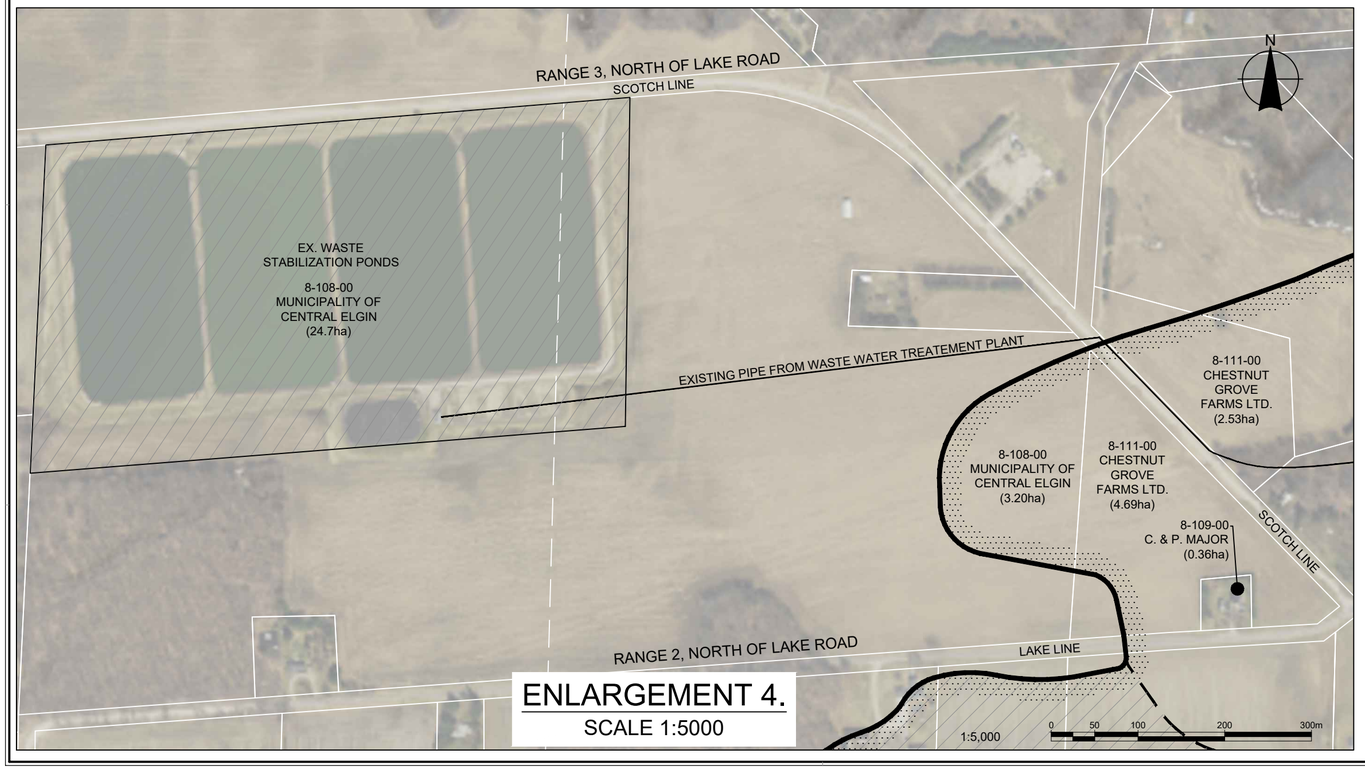
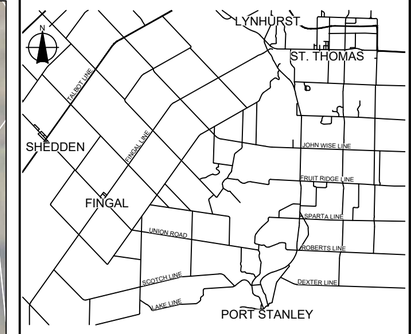


ENLARGEMENT 3.
SCALE 1:2500



ENLARGEMENT 4.
SCALE 1:5000



KEY PLAN
SCALE: N.T.S.

LEGEND

- WATERSHED BOUNDARY
- SUB WATERSHED BOUNDARY
- DRAIN LOCATION AND DIRECTION — DRAIN NAME
- MUNICIPAL BOUNDARY
- PROPERTY LINE
- BENCHMARK LOCATION
- BENCHMARK NUMBER — BM #
- ROLL # / OWNER NAME / WATERSHED AREA IN HECTARES — X-XXX-XX / L. OWNER / (XX.XXha)

Notes
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FOR CONSTRUCTION

CONSTRUCTION NOTES:

1) THE AREA FOR THE REALIGNED PORTION OF THE DRAIN SHALL BE STRIPPED OF TOPSOIL AND IT SHALL BE STOCKPILED IN AN APPROVED LOCATION ON THE SITE FOR REUSE AS DIRECTED BY THE ENGINEER OR DRAINAGE SUPERINTENDENT. ALL STOCKPILES OF TOPSOIL SHALL BE ENCLOSED BY APPROVED SILT FENCING AS PER THE OPSD 219.110.

2) THE MATERIAL EXCAVATED FROM THE REALIGNED PORTION OF THE DRAIN (APPROXIMATELY 145m³) SHALL BE PLACED WHEN AND AS DIRECTED BY THE ENGINEER OR THE DRAINAGE SUPERINTENENT IN THE PORTION OF THE EXISTING DRAIN PROPOSED FOR ABANDONMENT.

3) ADDITIONAL IMPORTED MATERIAL (MINIMUM 500m³) WILL BE REQUIRED IN THE AREA OF THE SITE BETWEEN THE (EXISTING) TOP OF SLOPE AND THE (PROPOSED) BOTTOM OF SLOPE WHICH, ONCE THE NEW DRAIN HAS BEEN CONSTRUCTED, SHALL BE REGRADED AND RESTORED TO SUIT AS DIRECTED BY THE ENGINEER OR THE DRAINAGE SUPERINTENENT.

4) 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

5) END TREATMENT OF THE EXISTING 1600mmØ CSP CROSSING AND EXTENSION SHALL BE AS PER THE APPROPRIATE DETAILS.

6) MINIMUM DRAIN GEOMETRY:
BOTTOM = 1.0m
SIDESLOPE = 2H:1V
GRADIENT = AS SPECIFIED

7) CONDUCT NO IN-WATER WORK BETWEEN MARCH 15 AND JULY 15.

8) INSTALL AND MAINTAIN SPECIFIED EROSION AND SEDIMENT CONTROL MEASURES TO ISOLATE THE PROPOSED DRAIN FROM THE REMAINING WORK AREA.

9) EXCAVATE THE NEW DRAIN IN THE 'DRY', LEAVING SUITABLE LARGE EARTH PLUGS BETWEEN THE EXISTING AND PROPOSED DRAIN TO PREVENT FLOW FROM ENTERING UNTIL DIRECTED TO REMOVE THE PLUGS BY THE ENGINEER OR THE DRAINAGE SUPERINTENDENT.

10) REMOVE EXCAVATED MATERIAL FROM THE WORK AREA TO THE STAGING AREA TO PREVENT SEDIMENT FROM ENTERING THE DRAIN.

11) ALL EROSION AND SEDIMENT CONTROL MEASURES AND FENCING 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.

12) THE PROPOSED RIFFLE TO BE LOCATED AT STATION 0+075 AND WITH THE ELEVATION OF THE CREST BEING 48.39m (0.22m ABOVE DRAIN BOTTOM).

13) ALL WORK MUST COMPLY WITH THE LOA FROM DFO AND THE PERMIT FROM KCCA

THE PROPERTY LINES SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR GENERAL INFORMATION ONLY.

AERIAL PHOTOGRAPHY PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY. PARCELS PROVIDED BY: ELGIN AND SOUTHWOLD COUNTY, DATED: 2020

LICENSED PROFESSIONAL ENGINEER
J. R. DICKSON
MAY 25/2021
PROVINCE OF ONTARIO

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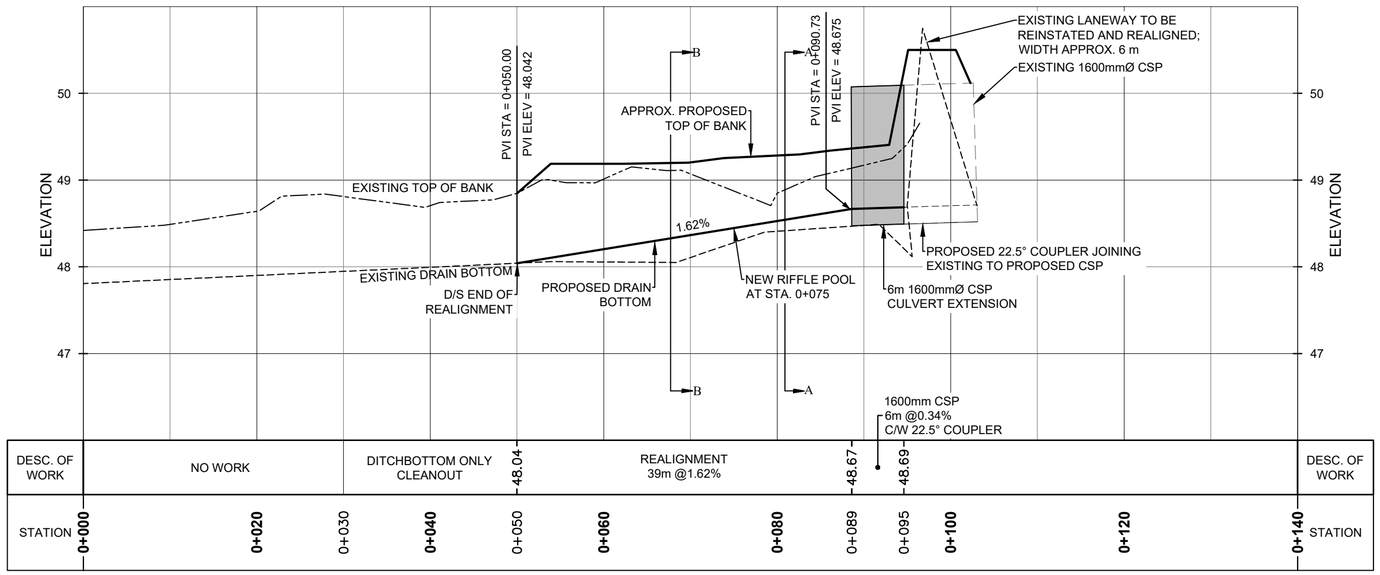
Client
MUNICIPALITY OF CENTRAL ELGIN
450 SUNSET DRIVE, 1ST FLOOR
ST. THOMAS ON
N5R 5V1

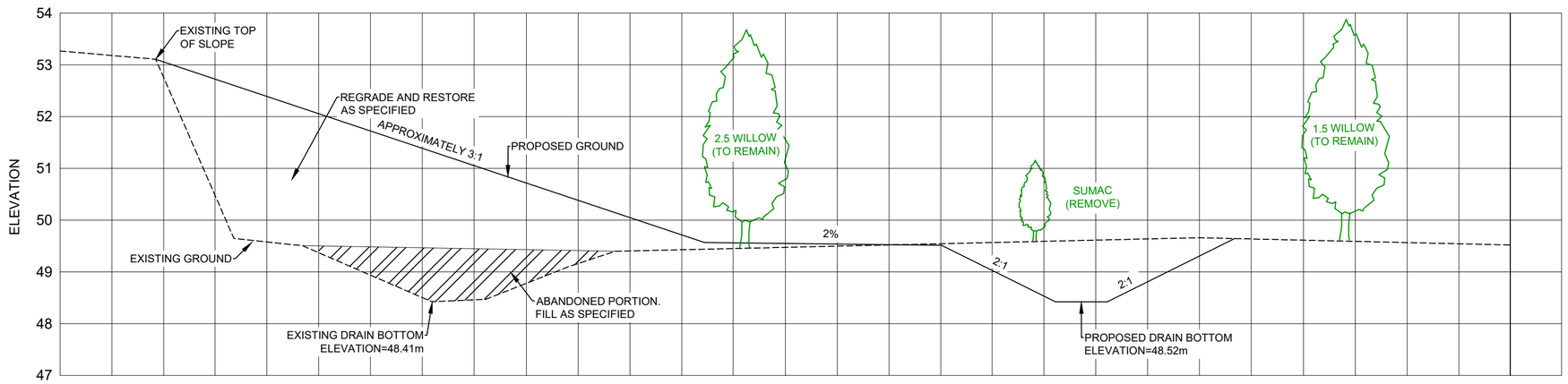
Drawing Title
MARR DRAIN IMPROVEMENT
PLAN ENLARGEMENTS AND NOTES

Designed	Checked	Drawn	Checked	Drawing No.
JD	JD	SBC	JD	3 of 4
Date		Project No.		
		MSW019344.2019		

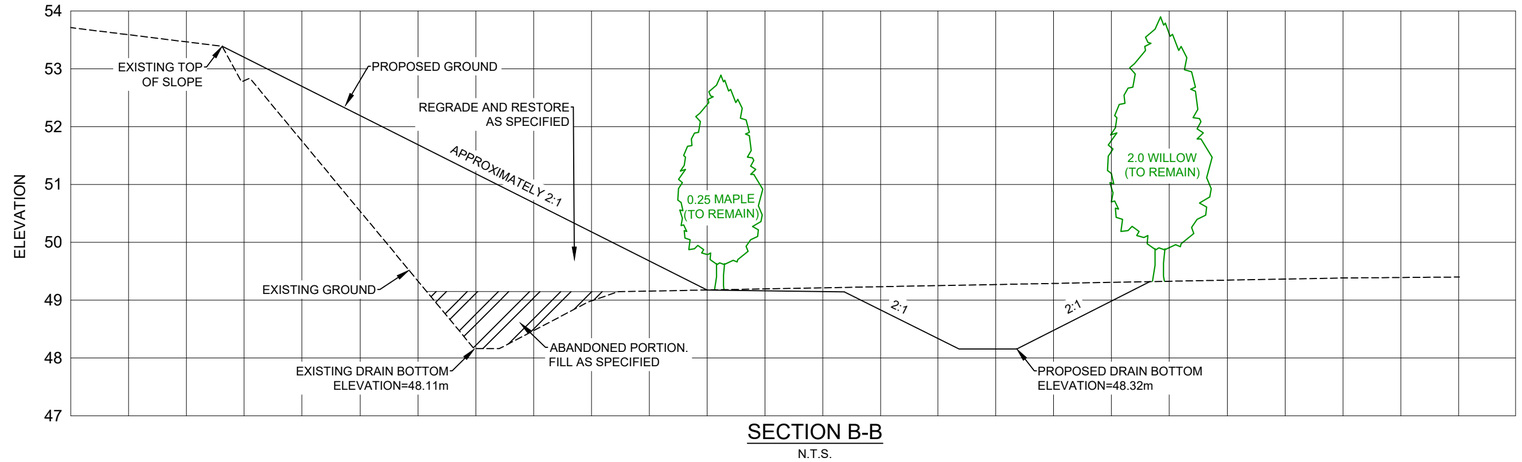
Scale
AS NOTED



PROFILE
SCALE AS NOTED



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

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4. All property lines are approximate and for information purposes only.

FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
J. R. DICKSON
MAY 25/2021
PROVINCE OF ONTARIO

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

Drawing Title
MARR DRAIN IMPROVEMENT

PROFILE AND SECTIONS

Designed	Checked	Drawn	Checked	Drawing No.
JD	JD	SBC	JD	**4 of 4**
Date		Project No.		
YY/MM/DD		MSW019344.2019		

Scale
Horizontal 1:500 — 0 5.0 10.0 20.0 30.0m
Vertical 1:50 — 0 1.0 2.0 3.0m