Report to Civic Works Committee

To: **Chair and Members**
Civic Works Committee
From: **Kelly Scherr, P.Eng., MBA, FEC**
Deputy City Manager, Environment, and Infrastructure
Subject: **Gold Seal & Fournie Municipal Drain Improvements**
Date: **February 21, 2024**

Recommendation

That on the recommendation of Deputy City Manager, Environment and Infrastructure, the following actions **BE TAKEN** with respect to the Gold Seal & Fournie Municipal Drain Improvements:

(a) The drainage report, attached as Appendix 'A', prepared by Spriet Associates London Ltd, Consulting Engineers for the construction of the Gold Seal and Fournie Municipal Drains (2023) **BE ADOPTED,** it being noted the notice of the public meeting was provided in accordance with the provisions of Section 78 of the Drainage Act; and,

(b) the proposed by-law, attached as Appendix 'B' **BE INTRODUCED** at this meeting, and **BE GIVEN** two readings at the March 5, 2024 Council meeting to authorize the reconstruction of the Gold Seal & Fournie Municipal Drain 2023 project, it being noted that the third reading and enactments of the by-law would occur after the holding of the Court of Revision in connection with the project.

Linkage to the Corporate Strategic Plan

This recommendation supports the following 2023-2027 Strategic Plan areas of focus:

- Waterways, wetlands, watersheds, and natural areas are protected and enhanced.
    - Protect the natural environment and avoid natural hazards when building new infrastructure or development.
    - Improve the natural environment and build resiliency when replacing aging infrastructure.

Executive Summary

The Drainage report for both the Gold Seal and Fournie Drains was completed under Section 78 of the Drainage Act and initiated by the Road Authority (Ministry of Transportation). Council motioned for Spriet Associates London Ltd. to review the request and begin the process of creating new Drainage Reports. The Gold Seal and Fournie Drain Reports detail the recommendations, design criteria, cost estimates, and assessment schedule for the cost of construction and future maintenance to the Gold Seal and Fournie Municipal Drains. Accepting the By-law to adopt the drainage report will allow the design to be tendered for construction.

Analysis

1.0 Background Information

1.1 Previous Reports Related to this Matter

- Council – February 1, 1999 – A by-law to provide for a Drainage Works in the City of London (Construction of the Gold Seal Municipal Drain).

- Council – February 6, 1969 – A by-law to provide for a drainage works in the Township of Westminster, in the County of Middlesex, and for borrowing on the credit of the Municipality, the sum of 8,800.00, for completing the drainage works.

2.0 Discussion and Considerations

2.1 Purpose

To undertake the improvements to the Gold Seal and Fournie Municipal Drains, the provincial Drainage Act requires a Council resolution to adopt the drainage report and enact the related by-laws. An assessment was undertaken to review the drainage conditions and assess how to best align the drains around the new interchange design.

2.2 Context

The proposed work to reconstruct the Gold Seal and Fournie Municipal Drains was initiated by the road authority, Ontario Ministry of Transportation (MTO). Both drains provide for drainage related to the MTO's Highway 401 and Colonel Talbot Road interchange improvements. A map of the site area is attached as Appendix 'C'.

2.3 Additional Background

The Drainage Report for the Gold Seal and Fournie Municipal Drains was prepared pursuant to Section 78 of the Drainage Act. The requests for drainage improvements were studied by Spriet Associates Ltd. and are documented in the Engineer's Report (Appendix 'A'). The report includes technical specification for construction, cost estimates, and an assessment schedule indicating how future maintenance costs are to be divided amongst the benefitting landowners.

The Drainage Act requires a public meeting prior to the adoption of the Engineer's Report. This Civic Works Committee meeting will serve that purpose. All property owners within the watershed have been notified of this meeting and may be present to pose questions. There is a further opportunity to appeal the assessment schedule prior to construction through the Court of Revision to be scheduled after this meeting. Representatives from Spriet Associates Ltd will also attend the meeting to answer any questions regarding the Drainage Report.

3.0 Financial Impact/Considerations

3.1 Procurement Process

The Ministry of Transportation is responsible for the capital costs to reconstruct the Gold Seal and Fournie drains as the reconstruction work is being completed to accommodate the reconstruction of the 401 interchange. The new drainage reports include updates to the assessment schedules to property owners for future maintenance costs.

Conclusion

The drains, when reconstructed, will be of great benefit to the lands and roads through which they run and will provide improved outlets to the lands within the watersheds. Once Council approves the reconstruction of the Gold Seal and Fournie Municipal Drains 2023 project as set out in the Drainage Reports governed by the Drainage Act, a tender for these works will be issued and construction undertaken.

Prepared by:	**Shawna Chambers, DPA, P.Eng.** **Division Manager, Stormwater Engineering**
Submitted by:	**Ashley M. Rammeloo, MMSc., P.Eng.** **Director, Water, Wastewater, and Stormwater**
Recommended by:	**Kelly Scherr, P.Eng., MBA, FEC** **Deputy City Manager, Environment, and Infrastructure**

Appendix ‘A’ – By-law

Appendix ‘B’ – Engineer’s Reports

Appendix ‘C’ – Site Map

cc: Paul Titus, Program Manager, Stormwater Engineering
Jessica Trela, Drainage Superintendent, Stormwater Engineering
M. DeVos – Spriet Associates London Ltd.
A. Kruspel – Spriet Associates London Ltd.

APPENDIX 'A'

GOLD SEAL DRAIN 2023

City of London

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

Our Job No. 220279

November 30, 2023

London, Ontario
November 30, 2023

GOLD SEAL DRAIN 2023

City of London

To the Mayor and Council of
The City of London

Mayor and Council:

We are pleased to present our report on the reconstruction of a portion of the Gold Municipal Drain serving parts of Lots 56 and 57, E.N.B.T.R. (geographic Westminster) in the City of London. The tributary watershed area contains approximately 47 hectares.

AUTHORIZATION

This report was prepared pursuant to Section 78 of the Drainage Act. Instructions were received from your Municipality with respect to a motion of Council. The work was initiated by a request signed by one of the affected landowners.

HISTORY

The Gold Seal Drain was last reconstructed pursuant to a report submitted by M.P. DeVos, P. Eng. dated October 14, 1998, and consisted of a Main Drain and Branches A, B, and C. The Main Drain extends northerly through Lots 52 to 55, up to Glanworth Drive in the middle of Concession E.N.B.T.R. From there it crosses the road and continues north-easterly across Lot 56 to its head at the line between Lots 56 and 57.

EXISTING DRAINAGE CONDITIONS & REQUESTS

At a site meeting held and a field investigation and survey were completed. Upon reviewing our findings we note the following:

- that Glanworth Drive is being re-routed northerly starting at a location just east of the existing Main Drain crossing, heading north-westerly and westerly so it meets Highway 4 approximately 440 meters north of the existing intersection

- that a tee intersection with the new road alignment will be created in the vicinity of the existing drain

- the MTO requested the portion of the Main Drain affected by their construction be reconstructed using sewer pipe and that a new report be prepared to reflect these changes

DESIGN CRITERIA AND CONSIDERATIONS

The MTO has engaged Dillon Consulting to prepare a “Design-Build Ready Report” for the project. As part of that process a Municipal Drainage Management Design Report was prepared.

The report recommends that the existing Main Drain tile be replaced with a 450mm sewer pipe across the new Glanworth Drive and Tempo Road intersection with new catchbasins at the ends and that the existing catchbasin on the north side of Tempo Road (previously Glanworth) be replaced with a new catchbasin slightly north of the existing catchbasin.

RECOMMENDATIONS

We are therefore recommending the following:

- that the existing Main Drain tile be replaced with 450mm sewer pipe across the new roadway
- that catchbasins be installed in several locations to accommodate surface access and alignment drainages

SUMMARY OF PROPOSED WORK

The proposed work consists of approximately 33 lineal meters of 450mm sewer pipe including catchbasins.

SCHEDULES

Three schedules are attached hereto and form part of this report, being Schedule 'A' - Allowances, Schedule 'B' - Cost Estimate, and Schedule 'C' - Assessment for Maintenance.

Schedule 'A' - Allowances. In accordance with Section 30 of the Drainage Act, allowances are provided for damages to lands and crops along the route of the drain as defined below.

Schedule 'B' - Cost Estimate. This schedule provides for a detailed cost estimate of the report which is in the amount of $23,300.00. This estimate includes engineering, administration, and allowances associated with this project. The construction has not been included in the estimate as the work will be completed by the MTO as part of their interchange expansion project.

Schedule 'C' – Assessment for Construction and Schedule ‘D’ - Assessment for Maintenance. In accordance with Section 65(3) of the Drainage Act, these schedules outline changes to the existing Schedules of Assessment in the 1998 report and the distribution of future repair and/or maintenance costs for portions of, or the entire drainage works. Any changed property/assessment is shown in bold.

Spriet Associates Drawing No.'s 1, Job No. 220279 and Drawing No. 7, Storm Water Management, Appendix F by Dillon Consulting dated December 2021 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.

ALLOWANCES

DAMAGES: Section 30 of the Drainage Act provides for the compensation to landowners along the drain for damages to lands and crops caused by the construction of the drain. The amount granted is based on $4,787.00/ha. for open ditch work with excavated material levelled adjacent to drain. This base rate is multiplied by the hectares derived from the working widths shown on the plans and the applicable lengths.

ASSESSMENT

Due to the nature of the work, location, materials, and installation methods, the entire cost of this report shall be a Special Assessment against the Ministry of Transportation Ontario in accordance with Section 26 of the Drainage Act.

MAINTENANCE

Upon completion of construction, all owners are hereby made aware of Sections 80 and 82 of the Drainage Act which forbid the obstruction of or damage or injury to a municipal drain.

After completion, the portion of the Drain within the Tempo Road and Glanworth Drive road allowance shall be maintained by the City of London at the expense of the adjacent Road Authority until such time as the assessment is changed under the Drainage Act.

In accordance with Section 65(3) of the Drainage Act, the Assessments on the existing Gold Seal Drain for Future Maintenance to properties affected by this report have been altered to reflect the changes occurring. Therefore, the remaining existing Main Drain – Closed Portion upstream and downstream shall be maintained by the City of London at the expense of all upstream lands and roads assessed in the attached revised 1998 Schedule ‘C’ – Assessment for Construction. The Main Drain – Open Portion shall be maintained by the City of London at the expense of the lands and roads assessed in the revised attached Schedule 'D' - Assessment for Maintenance and in the same relative proportions until such time as the assessment is changed under the Drainage Act.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED

M.P. DeVos, P. Eng.

MPD:bv

SCHEDULE ' A ' - ALLOWANCES

GOLD SEAL DRAIN 2023

City of London

e with Section 30 of the Drainage Act, we determine the allowances payable to
to owners entitled thereto as follows:

CON.	LOT	ROLL NUMBER (Owner)	Section 30 Damages	TOTALS
ENBTR	W½E½ 56	80-060-021-01(806584 Ontario Ltd.)	$ 200.00	$ 200.00
ENBTR	Pt.E½ 56	80-060-033 PART 1 (1068788 Ontario Ltd.)	200.00	200.00
ENBTR	Pt.E½ 56	80-060-033 PART 2 (1068788 Ontario Ltd.)	150.00	150.00
		Total Allowances	$ 550.00	$ 550.00

TOTAL ALLOWANCES ON THE MAIN DRAIN-CLOSED PORTION **$ 550.00**

SCHEDULE 'B' - COST ESTIMATE

GOLD SEAL DRAIN 2023

City of London

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

CONSTRUCTION		
Locate and expose existing tile	$	1,010.00
Contingencies	$	350.00
Allowances under Section 30 of the Drainage Act	$	550.00
ADMINISTRATION		
Net Harmonized Sales Tax	$	660.00
Survey, Plan and Final Report	$	15,500.00
Expenses	$	230.00
Review of Construction Drawings	$	2,000.00
Supervision and Updating Final Construction Details	$	3,000.00
TOTAL ESTIMATED COST	**$**	**23,300.00**

GOLD SEAL DRAIN 1998 October 14, 1998
City of London **Revised by Section 65 (3)**
November 30, 2023

CON.	LOT	HECTARES AFFECTED	ED	ROLL No. (OWNER)	SPECIAL BENEFIT	BENEFIT	OUTLET	TOTAL
MAIN DRAIN-CLOSED PORTION								
ENBTR	Pt.S½	53	2.4	80-060-024(J. & M. Ferguson)	$	$ 2,910.00	43.00	2,953.00
ENBTR	E¼	53	5.2	80-060-025(1068788 Ontario Ltd.)		750.00	76.00	826.00
ENBTR	NWPt.	53	6.0	80-060-016(1000182402 Ontario Inc.)		11,990.00	487.00	12,477.00
ENBTR	SWPt.	54	8.9	80-060-01601(806433 Ontario Ltd.)		6,720.00	1,612.00	8,332.00
ENBTR	NWPt.	54	1.2	80-060-019(1068788 Ontario Ltd.)			146.00	146.00
ENBTR	Pt.N½	54	10.1	80-060-021-01(806584 Ontario Ltd.)		6,270.00	2,245.00	8,515.00
ENBTR	E¼	54	12.1	80-060-021-01(806584 Ontario Ltd.)			987.00	987.00
ENBTR	WPt.	55	4.7	80-060-019(1068788 Ontario Ltd.)			1,318.00	1,318.00
ENBTR	W½E½	55	20.2	80-060-021-01(806584 Ontario Ltd.)		11,580.00	5,923.00	17,503.00
ENBTR	E¼	55	14.1	80-060-022(J. & M. Ferguson)			2,350.00	2,350.00
* ENBTR	Pt.W½	56	0.55	80-060-035(Cameron Grane & Riggers Inc.)			501.00	501.00
ENBTR	**Pt.W½**	**56**	**0.8**	**80-060-03505 PART 1 (756950 Ontario Ltc**			**364.00**	**364.00**
ENBTR	**Pt.W½**	**56**	**1.6**	**80-060-03505 PART 2 (756950 Ontario Ltd.)**			**727.00**	**727.00**
ENBTR	**Pt.E½**	**56**	**32.2**	**80-060-033 PART 1 (1068788 Ontario Ltd.**		**14,240.00**	**13,579.00**	**27,819.00**
ENBTR	**Pt.E½**	**56**	**0.8**	**80-060-033 PART 2 (1068788 Ontario Ltd.)**			**337.00**	**337.00**
ENBTR	SEPt.	57	15.6	80-060-030(G. Axford)		650.00	9,639.00	10,289.00
ENBTR	NEPt.	57	6.3	80-060-031(M. Lorenzutti & F. Damico)			4,762.00	4,762.00
				TOTAL ASSESSMENT ON LANDS	$	$ 55,110.00	$ 45,096.00	$ 100,206.00
Glanworth Drive		**4.5**		**City of London**	**$**	**$ 2,270.00**	**7,383.00**	**9,653.00**
Tempo Road		**0.7**		**City of London**		**1,510.00**	**1,148.00**	**2,658.00**
				TOTAL ASSESSMENT ON ROADS	$	$ 3,780.00	$ 8,531.00	$ 12,311.00

SPECIAL ASSESSMENT against the City of London for the increased cost of boring a 406mm (16") smooth wall pipe under Glanworth Drive on the Main Drain $ 6,480.00

SPECIAL ASSESSMENT against Union Gas for the administration and construction costs of locating their gas line on Glanworth Drive and any modifications to the drainage works if required $ 300.00

TOTAL ASSESSMENT ON THE MAIN DRAIN-CLOSED PORTION $ 119,297.00

GOLD SEAL DRAIN 1998
City of London

October 14, 1998
Job No. 97226 **Revised by Section 65**
November 30, 2023

	CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
	MAIN DRAIN-OPEN PORTION				
	City of London		(Former Township of Westminster)		
*	ENBTR	WPt. 49	0.3	80-060-003(1188165 Ontario Ltd.)	0.02 %
*	ENBTR	Pt.W½ 50	1.4	80-060-004(CRM Properties Inc..)	0.09
*	ENBTR	Pt.W½ 50	1.7	80-060-00402(Laidlaw Carriers Bulk GP Inc.)	0.11
*	ENBTR	Pt.W½ 50	5.9	80-060-00410(Laidlaw Carriers Bulk GP Inc.)	1.48
*	ENBTR	Pt.W½ 50	1.8	80-060-00401(Badger Daylighting Inc.)	1.31
	ENBTR	Pt.W½ 50	5.4	80-060-00403(C. & K. Wodrich)	0.33
	ENBTR	SPt. 51	16.8	80-060-008(R. & I. Orr)	3.47
*	ENBTR	SPt. 51	0.1	80-060-008(R. & I. Orr)	0.01
	ENBTR	NWPt. 51	17.4	80-060-010(J. & R. Baker)	5.47
	ENBTR	Pt.51&Pt. 52	25.4	80-060-011(J. Burtwistle)	9.70
	ENBTR	NW¼ 52	6.1	80-060-013(1068788 Ontario Ltd.)	0.74
	ENBTR	NE¼ 52	16.2	80-060-024(J. & M. Ferguson)	5.14
	ENBTR	SW¼ 53	1.2	80-060-015(S. Peake)	0.15
	ENBTR	Pt.S½ 53	8.1	80-060-024(J. & M. Ferguson)	1.69
	ENBTR	E¼ 53	13.7	80-060-025(1068788 Ontario Ltd.)	5.04
	ENBTR	NWPt. 53	6.0	80-060-016(1000182402 Ontario Inc.)	2.05
	ENBTR	SWPt. 54	8.9	80-060-01601(806433 Ontario Ltd.)	3.04
	ENBTR	NWPt. 54	1.2	80-060-019(1068788 Ontario Ltd.)	0.20
	ENBTR	Pt.N½ 54	10.1	80-060-021-01(806584 Ontario Ltd.)	3.45
	ENBTR	E¼ 54	12.1	80-060-021-01(806584 Ontario Ltd.)	4.13
	ENBTR	WPt. 55	4.7	80-060-019(1068788 Ontario Ltd.)	1.25
	ENBTR	W½E½ 55	20.2	80-060-021-01(806584 Ontario Ltd.)	6.90
	ENBTR	E¼ 55	14.1	80-060-022(J. & M. Ferguson)	4.82
*	ENBTR	Pt.W½ 56	0.55	80-060-035(Cameron Grane & Riggers Inc.)	0.29
	ENBTR	**Pt.W½ 56**	**0.8**	**80-060-03505 PART 1 (756950 Ontario Ltd.)**	**0.27**
	ENBTR	**Pt.W½ 56**	**1.6**	**80-060-03505 PART 2 (756950 Ontario Ltd.)**	**0.56**
	ENBTR	**Pt.E½ 56**	**32.2**	**80-060-033 PART 1 (1068788 Ontario Ltd.)**	**10.75**
	ENBTR	**Pt.E½ 56**	**0.8**	**80-060-033 PART 2 (1068788 Ontario Ltd.)**	**0.28**
	ENBTR	SEPt. 57	15.6	80-060-030(G. Axford)	4.35
	ENBTR	NEPt. 57	6.3	80-060-031(M. Lorenzutti & F. Damico)	2.15
	WNBTR	Pt.NE¼ 49	13.6	80-060-176(Oegema Grains Ltd.)	2.77
*	WNBTR	Pt.NE¼ 49	1.0	80-060-17610(Oegema Grains Ltd.)	0.01
	WNBTR	S½ 50	17.4	80-060-175(Thomas Brothers Produce Inc.)	3.34
	WNBTR	N½ 50	17.0	80-060-174(Thomas Brothers Produce Inc.)	1.95
	WNBTR	SEPt. 51	20.2	80-060-173(Thomas Brothers Produce Inc.)	0.89

			TOTAL ASSESSMENT ON LANDS		88.20 %

	Colonel Talbot Rd.		2.8	City of London	1.90 %
	Orr Drive		2.5	City of London	1.03
	Tempo Road		**0.7**	**City of London**	**1.40**
	Glanworth Drive		**4.5**	**City of London**	**5.80**

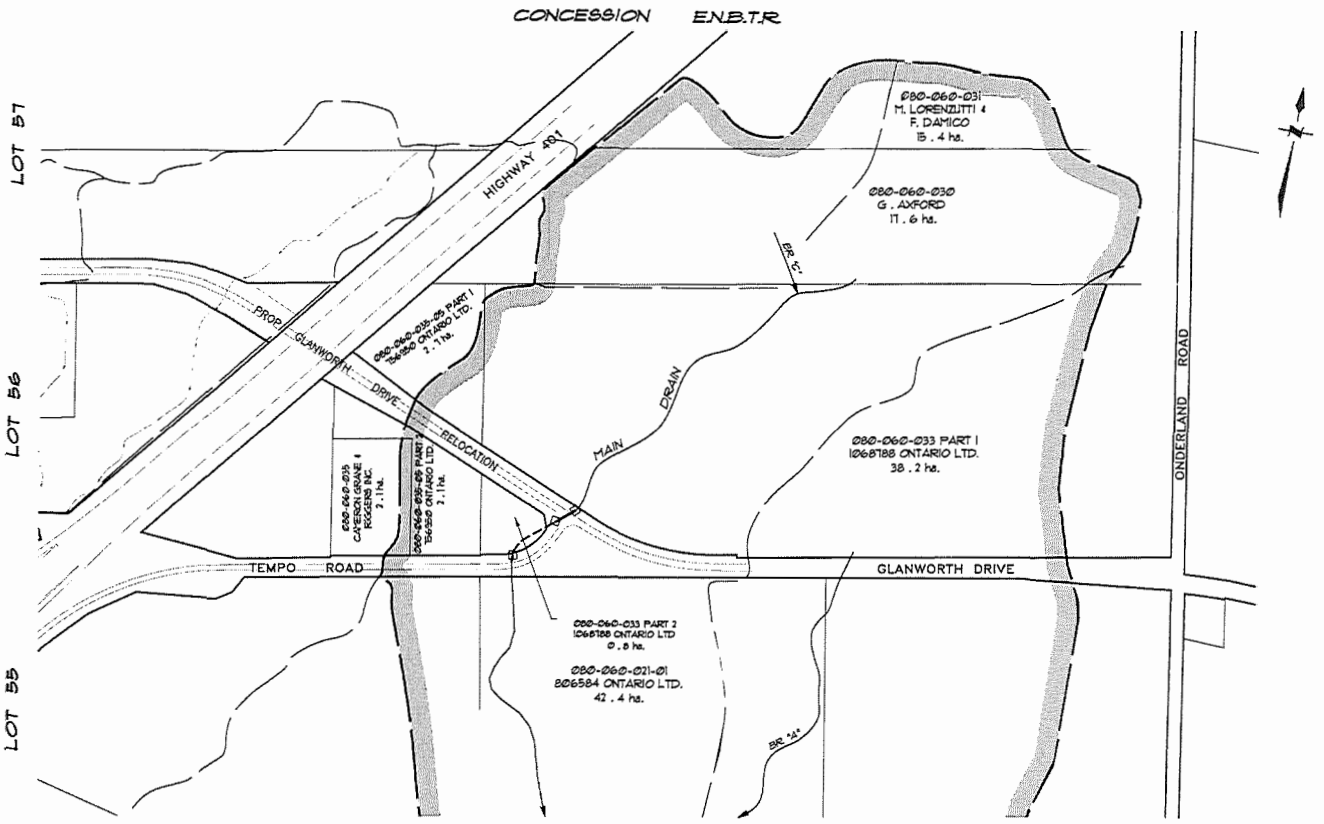
			TOTAL ASSESSMENT ON ROADS		10.13 %

			TOTAL ASSESSMENT IN THE CITY OF LONDON		**98.33 %**

GOLD SEAL DRAIN 1998
City of London

CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
MAIN DRAIN-OPEN PORTION (Continued) **Township of Southwold**				
County Road No. 18		0.8	County of Elgin	1.67 %
		TOTAL ASSESSMENT ON ROADS		1.67 %
		TOTAL ASSESSMENT IN TOWNSHIP OF SOUTHWOLD		**1.67 %**
		TOTAL ASSESSMENT FOR MAINTENANCE ON THE MAIN DRAIN-OPEN PORTION		**100.00 %**

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



PLAN SCALE 1:5,000

GENERAL NOTES

1/ THE NEW 450mm STORM SEWER PIPE TO BE INSTALLEDTO REPLACE THE EXISTING MAIN DRAIN TILE UNDER THE NEW GLANWORTH DRIVE & TEMPO ROAD INTERSECTION AND THE NEW CATCHBASIN CONNECTION ON THE NORTH SIDE OF TEMPO ROAD (INCLUDING NEW CATCHBASINS) ARE TO BE ARE TO BE INCORPORATED AS PART OF THE MAIN DRAIN AND THE GOLD SEAL DRAIN 2022 FOR FUTURE MAINTENANCE PURPOSES .

2/ FOR FURTHER CONSTRUCTION DETAILS (INCLUDING PROFILES & ELEVATIONS) REFER TO THE "GLANWORTH DRIVE UNDERPASS REPLACEMENT" DRAWING NO. 7, STORM WATER MANAGEMENT, APPENDIX F, BY DILLON CONSULTING

3/ WHERE THE STORM SEWER OR APPURTENANCE IS LOCATED ON THE ROAD ALLOWANCE, THE WORKING WIDTH SHALL BE CONFINED TO THE ROAD ALLOWANCE. OTHERWISE THE WORKING WIDTH SHALL BE 20m

PLAN LEGEND

- LIMIT OF WATERSHED AREA
- PROPOSED DRAINAGE WORKS
- EXTERIOR OR INTERIOR WATERSHED
- EXIST. MUNICIPAL DRAIN
- EXIST. MUNICIPAL DRAIN TO BE INCLUDED

10 - 025 ASSESSMENT ROLL NUMBER
J. SMITH OWNERS NAME
48.3 ha. HECTARES OWNED

GOLD SEAL DRAIN 2023

City of London

Drainage Technologist
JESSICA TRELA
519-661-2489 EXT. 5953

No.	REVISIONS	DATE

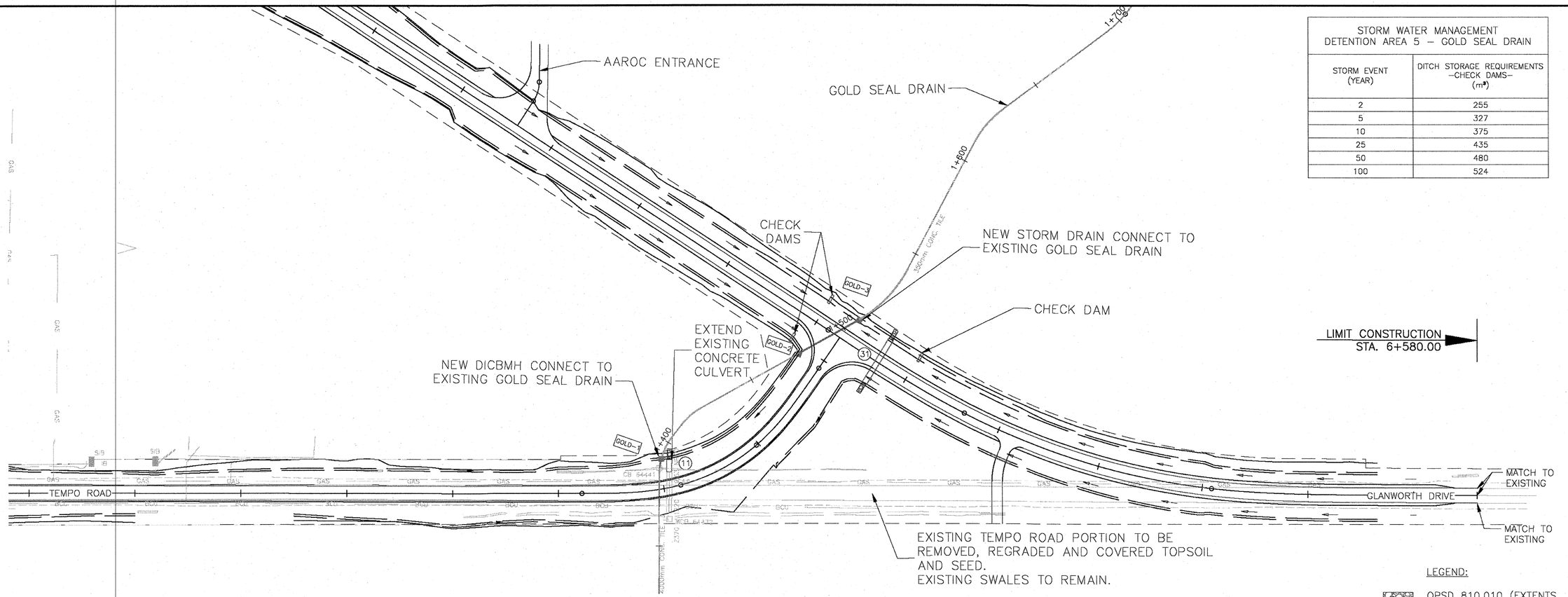
LICENSED PROFESSIONAL ENGINEER — Nov. 30/23 — M. P. DeROS — PROVINCE OF ONTARIO

Drawn By: ak	Field Book	JOB No.	Drawing No.
Date: NOV. 30, 2023	N/A	220279	1

PLAN

SPRIET ASSOCIATES
LONDON LIMITED
CONSULTING ENGINEERS
155 YORK STREET — LONDON (519) 672-4100 — N6A 1A8

STORM WATER MANAGEMENT DETENTION AREA 5 – GOLD SEAL DRAIN	
STORM EVENT (YEAR)	DITCH STORAGE REQUIREMENTS –CHECK DAMS– (m^3)
2	255
5	327
10	375
25	435
50	480
100	524

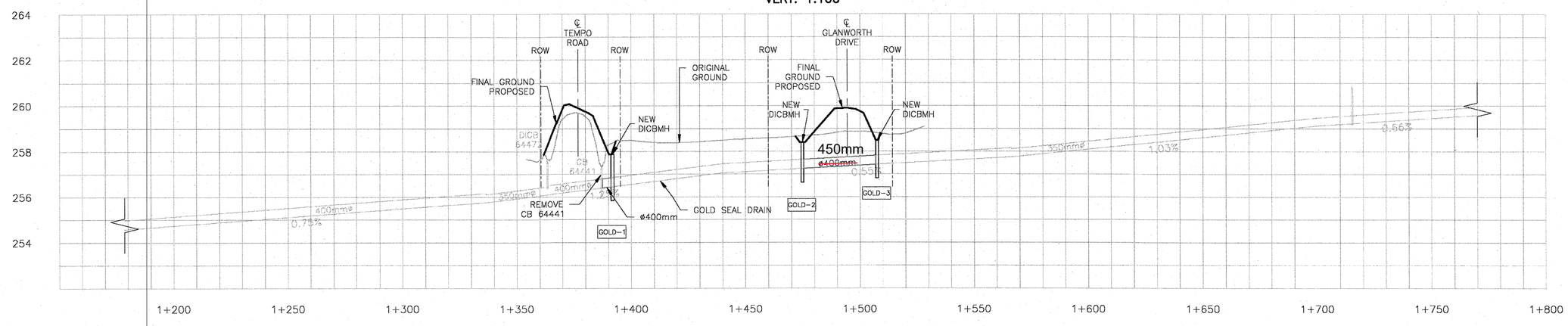


LEGEND:

OPSD 810.010 (EXTENTS TO BE DETERMINED DURING DETAILED DESIGN).

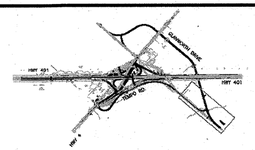
GOLD SEAL DRAIN

HORIZ: 1:1000
VERT: 1:100



MEGA EA ASSIGNMENT 1A, GWP 3030-11-00
HIGHWAY 401/HIGHWAY 4 (COLONEL TALBOT ROAD) INTERCHANGE IMPROVEMENT AND COLONEL TALBOT ROAD UNDERPASS AND GLANWORTH DRIVE UNDERPASS REPLACEMENT

Ontario



THE DETAILS SHOWN ON THIS DRAWING ARE PRELIMINARY AND ARE PROVIDED FOR INFORMATION ONLY

20m 0 40m
Horizontal

CREATED BY: JCR
CHECKED BY: BGH
PROJECT No. 12-7110
DATE: DEC 2021

DILLON CONSULTING

STORM WATER MANAGEMENT

ULTIMATE IMPROVEMENTS
PLAN & PROFILE
APPENDIX F

DATE PLOTTED: 1/28/2022 5:57:29 PM
FILE LOCATION: G:\CAD\12711O\Assignment#1 (3011-E-0046)\GWP 3030-11-00\03-Drainage\01-Contract\3030-11-00 Municipal Drain Design.dwg

FOURNIE DRAIN 2023

City of London

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

Our Job No. 220278

December 20, 2023

London, Ontario
December 20, 2023

FOURNIE DRAIN 2023

City of London

To the Mayor and Council of
The City of London

Mayor and Council:

We are pleased to present our report on the reconstruction of parts of the Fournie Municipal Drain serving parts of Lots 51 to 57, Concessions WNBTR and ETR (geographic Westminster) in the City of London and parts of Lots 52 to 55, Concession WNBTR (geographic Delaware) in the Municipality of Middlesex Centre. The total watershed area affected by the proposed work contains approximately 150 hectares.

AUTHORIZATION

This report was prepared pursuant to Section 78 of the Drainage Act. Instructions were received from your Municipality with respect to a motion of Council. The work was initiated by a request signed by the Road Authority.

HISTORY

The portion of Fournie Drain downstream of Tempo Road was last reconstructed pursuant to a report submitted by A.J. DeVos, P. Eng. dated February 6, 1969. It consisted of an open ditch extending downstream from Tempo Road, across Lots 54 and 53, Concession E.N.B.T.R., Highway 4, and Lots 53 through 51, Concession W.N.B.T.R.

The drain was later extended upstream pursuant to a report submitted by J.P. McIntyre, P.Eng., dated August 26, 1981. It consisted of an open ditch extending upstream from the head of the existing drain across Tempo Road, then along the north side of said road for approximately 350 meters. It then turned and crossed Highway 401 to its north side and then north-easterly and northerly crossing Glanworth Drive a short distance west of the overpass. The portion across Glanworth Drive was a closed drain consisting of 300mm pipe.

The drain was later partially relocated in Lots 53 and 54, and a new Super Truck Branch constructed pursuant to a report submitted by D.W. Pletch, P.Eng., dated June 6, 1990. The relocation included a new culvert and the Branch consisted of 450mm sewer pipe and a maintenance hole.

EXISTING DRAINAGE CONDITIONS & REQUESTS

At a site meeting held with respect to the project and through later discussions, the owners reported the following:

- that the Ontario Ministry of Transportation (MTO) is completing improvements to the interchange where Highway 4 crosses Highway 401
- that the improvements require alterations of the intersection of Highway 4 and Tempo Road
- that the improvements also include the relocation of the Glanworth Drive overpass
- it was requested that a new report be prepared to reflect the required changes to the Fournie Drain as a result of the above road works
- that the MTO has engaged Dillon Consulting to prepare a “Design-Build Ready Report” for the project. As part of that process a Municipal Drainage Management Design Report was prepared. The report provides the design of the alterations to the drain along with stormwater management to address water quantity and quality

A field investigation and survey were completed to confirm the new design in relation to the existing drain grades and features.

A draft report including drawings, cost estimates, and assessment information was prepared and reviewed with affected landowners to review the findings and preliminary proposals. Further input and requests were provided by the affected owners at that time and at later dates. This included expanding the work to include the relocation of the drain from Sta. 0+500 to Sta. 0+710.

DESIGN CRITERIA AND CONSIDERATIONS

As part of the MTO design process for the interchange improvements, the Stormwater Management Report recommends that ponds be constructed/improved to reduce release flows to the Fournie Drain. Two ponds are proposed, northeast of the Highway 4 bridge, which outlet directly into the Fournie Drain. One pond is proposed northwest of the bridge, with low-flow release directly to the Fournie Drain. A further detention area is proposed in the south road ditch, southwest of the interchange, which ultimately outlets to a private drain in Lot 53. Additionally, overbank storage has been provided directly along the portion of Fournie Drain between the two new culverts under Tempo Road.

For the culverts being replaced/added under this project, the MTO designed these for a minimum of 1 in 50-year storm, including freeboard provision and analyzed up to above the 1 in 100-year storm.

The capacity of a typical open channel agricultural drain would be designed in accordance with the rational method to a design frequency of a 1 in 2-year storm. The MTO design criteria for any of the changed area is higher than this.

RECOMMENDATIONS

Through the MTO design this report recommends the following:

MAIN DRAIN:

- that the existing ditch be partially cleaned out and relocated from the existing culvert under Highway 4 upstream for approximately 240 meters to the new Tempo Road intersection
- that the existing entrance culvert at Sta. 0+120 be replaced to accommodate the relocation of the ditch
- that a new culvert under the relocated Tempo Road at Sta. 0+260 be constructed matching to the existing drain alignment on the upstream side
- no excavation in the ditch bottom is required between Tempo Road culverts (Sta. 0+270 to Sta. 0+450) but overbank storage will be provided by widening the upper part of the drain
- that a new culvert at the relocated Tempo Road crossing (Sta. 0+470) be constructed in the existing drain location
- that the existing ditch be relocated westerly adjacent to the Tempo Road road allowance between Sta. 0+500 and Sta. 0+710 across the adjacent farm property
- that the existing road culvert at Sta. 0+740 be replaced to accommodate the road alignment change in this location
- that a minor change to the ditch alignment be completed between Sta. 0+760 and Sta. 1+120 to accommodate eastbound on-ramp improvements
- that the existing culvert under Highway 401 be extended on the south side to accommodate the above
- that the existing ditch be relocated on the north side of the 401 to the proposed Stormwater Management Facility (SWMF2) to accommodate westbound off-ramp improvements (Sta. 1+195 to Sta. 1+350)
- that the existing 300mm sub-surface piped road crossing under the old Glanworth Drive ramp be removed and replaced with an open ditch directed into SWMF2
- that a rodent gate and quarry stone rip-rap be installed around the end of the pipe termination (approximately 3 meters downstream of the existing catchbasin)
- that the two existing catchbasins (and pipe between) on the upstream side of the old Glanworth Drive crossing be included as part of this report for future maintenance purposes

RECOMMENDATIONS (cont'd)

- that the outlet of Pond 2 (on the Fournie Drain) consists of a 450mm low-release flow pipe and overflow weir set at an elevation below the upstream inlet Fournie Drain open ditch

- that the M.T.O. complete the work as part of their intersection improvement project with the exception of the portion from Sta. 0+500 to Sta. 0+710 which shall be completed by the City one construction season after the M.T.O. work

SUPER TRUCK BRANCH:

- that the existing Super Truck Branch (450mm dia.) and existing road storm pipe across Colonel Talbot Road be replaced with new 9,800mm dia. pipe

- that the existing SWMF pipe outlet be cut off and protected with a rodent gate and quarry stone rip-rap

- that the existing SWMF pipe, upstream of the existing maintenance hole, be replaced and extended to the new property line with a 600mm dia. sewer pipe, connecting to the new outlet for the relocated private SWMF

ENVIRONMENTAL CONSIDERATIONS AND MITIGATION MEASURES

This report is being completed to facilitate the MTO project described previously. The MTO will be completing the final drain contract administration and environmental approvals. Their project initially went through the Class EA process however it should be noted that this drain is shown on mapping to be a Class C drain and may be subject to timing windows for in-drain work.

SUMMARY OF PROPOSED WORK

The proposed work consists of approximately 1,400 lineal meters of open ditch cleanout and reconstruction including quarry stone rip-rap bank protection and road culverts, and the replacement/incorporation of 15 lineal meters of 300mm pipe and two catchbasins.

SCHEDULES

Three schedules are attached hereto and form part of this report, being Schedule 'A' - Allowances, Schedule 'B' - Cost Estimate, and Schedule 'C' - Assessment for Future Maintenance.

Schedule 'A' - Allowances. In accordance with Sections 29 and 30 of the Drainage Act, allowances are provided for right-of-way and damages to lands and crops along the route of the drain as defined below.

Schedule 'B' - Cost Estimate. This schedule provides for a detailed cost estimate of the proposed work which is in the amount of $345,000.00. This estimate includes engineering and administrative costs associated with this project.

SCHEDULES (cont'd)

Schedule 'C' - Assessment for Future Maintenance. In accordance with Section 65(3) of the Drainage Act, this schedule outlines changes to the existing Schedule of Assessment in the 1969 report and the distribution of future repair and/or maintenance costs for portions of, or the entire drainage works. Any changed property/assessment is shown in bold.

Spriet Associates Drawings No. 1 to 4, Job No. 220278 and Drawings No.'s 1 to 4, Stormwater Management Appendix F by Dillon Consulting dated November 2023 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.

ALLOWANCES

RIGHT-OF-WAY: Section 29 of the Drainage Act provides for an allowance to the owners whose land must be used for the construction, repair, or future maintenance of a drainage works.

The allowance provides for the loss of land due to the construction provided for in the report. The amounts granted are based on the value of the land, and the rate used was $50,000.00/ha. When any buffer strip is incorporated and/or created, the allowance granted is for any land beyond a 1.8-meter width deemed to have always been part of the drain. For existing open ditches, the right-of-way to provide for the right to enter and restrictions imposed on those lands is deemed to have already been granted.

DAMAGES: Section 30 of the Drainage Act provides for the compensation to landowners along the drain for damages to lands and crops caused by the construction of the drain. The amount granted is based on $5,300.00/ha. This base rate is multiplied by the hectares derived from the working widths shown on the plans and the applicable lengths.

ASSESSMENT

Due to the nature of the work, location, materials, installation methods, and agreement, a Special Assessment has been made against the MTO in accordance with Section 26 of the Drainage Act, for the entire cost of this report.

MAINTENANCE

Upon completion of construction, all owners are hereby made aware of Sections 80 and 82 of the Drainage Act which forbid the obstruction of or damage or injury to a municipal drain.

In accordance with Section 65(3) of the Drainage Act the Assessment for Future Maintenance on the original 1969 report to properties affected by this report have been altered to reflect the changes occurring.

Therefore, the portion of the Main Drain from Orr Drive upstream to Sta. 0+710 (Dillon Page 1) with the exception of culverts shall continue to be maintained by the City of London at the expense of all upstream lands and roads assessed in the revised attached 1969 Schedule of Assessment, until such time as the assessment is changed under the Drainage Act.

MAINTENANCE (cont'd)

Repairs or improvements to the road culverts on the Main Drain at Sta. 0+260 and Sta. 0+470 under Tempo Road and Sta. 0+000 Under Highway 4 shall be the responsibility of the applicable Road Authority, entirely at their cost. The culvert at Sta. 0+120 shall be maintained by the City of London, with cost being assessed as 35% to Highway 4, 30% to Roll # 080-060-016 and the remaining 35% against the upstream outletting assessments.

The portion of the drain, previously referred to as the Fournie Drain Extension 1981, be included as part of this report. After completion, this part of the drain (Sta. 0+710 to Sta. 1+412) shall be maintained by the City of London, at the expense of the MTO.

After completion, the Super Truck Branch shall be maintained by the City of London at the expense of the MTO.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED

M.P. DeVos, P. Eng.

MPD:ms

SCHEDULE 'A' - ALLOWANCES

FOURNIE DRAIN 2023

City of London

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

CON.	LOT	ROLL NUMBER (Owner)	Section 29 Right-of-Way	Section 30 Damages	TOTALS
MAIN DRAIN					
Geographic Westminster					
ENBTR	SW¼ 53	060-015(S. Peake)	$ 930.00	$ 100.00	$ 1,030.00
ENBTR	Pt.54& 55	060-019(1068788 Ontario Ltd.)	370.00	3,660.00	4,030.00
ENBTR	PtS½ 54	060-016-01(806433 Ontario Ltd.)	40.00	210.00	250.00
		Total Allowances	$ 1,340.00	$ 3,970.00	$ 5,310.00
		TOTAL ALLOWANCES ON THE FOURNIE DRAIN 2023			**$ 5,310.00**

SCHEDULE 'B' - COST ESTIMATE

FOURNIE DRAIN 2023

City of London

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

ALLOWANCES

Allowances under Sections 29 & 30 of the Drainage Act	$	5,310.00

CONSTRUCTION

Mobilization of equipment	$	2,000.00
Remobilization of equipment to open channel once seeding has established and backfill	$	2,000.00
Clearing and grubbing including disposal	$	3,000.00
Install and maintain sediment and erosion control measures	$	800.00
Construct temporary crossing using 900mm pipe or larger including removal during backfill	$	2,500.00
18.0 meters of 450mm aluminized C.S.P. 2.0mm thickness		
Supply	$	1,800.00
Construct access laneway/ramp including supply and compaction of Granular 'A'	$	2,200.00
Strip, stockpile topsoil from new ditch area and area to be regraded and haul and deposit at existing ditch (8200 m²)	$	10,250.00
212 meters of open ditch construction and cut adjacent area on west side of existing ditch (Approx. 7100 m³ excavation)	$	52,500.00
Scarify ditch banks and apply Flexterra HP-FGM bonded fibre on ditch banks (approx. 2850 m²)	$	14,250.00
Hand seeding of buffer strip (approx. 450 m²)	$	900.00
Backfill existing ditch (Approximately 210m length - 3800 m³)	$	39,550.00
Redistribution of topsoil on area outside of ditch and final grading upon completion (Approx. 6900 m²)	$	10,350.00
Supply and place N.A.G. C350 Turf Reinforcement Mat on seeded bank with quarry stone rip-rap bank protection		
(Approx. 160 m² NAG C-350 TRM required)	$	6,400.00
(Approx. 77 m³ quarry stone required)	$	21,180.00
Backfill washouts, supply and place quarry stone rip-rap protection (with filter blanket) on ditch slopes as rock chutes		
(Approx. 14.0 m³ quarry stone required)	$	3,850.00

SCHEDULE 'B' - COST ESTIMATE (cont'd)

FOURNIE DRAIN 2023
City of London

CONSTRUCTION (cont'd)

Haul excess excavated material to adjacent area as specified on drawings and level including grading (3400 m^3)	$	34,000.00
Contract security financing	$	2,960.00
Contingencies	$	9,000.00
Contingency for OLS to re-establish property bars	$	3,000.00

ADMINISTRATION

Net Harmonized Sales Tax	$	6,600.00
Survey, Plan and Final Report	$	61,000.00
Expenses	$	1,000.00
Review of Construction Drawings	$	13,600.00
Supervision and Updating Final Construction Details	$	35,000.00
TOTAL ESTIMATED COST	**$**	**345,000.00**

SCHEDULE ' C ' - ASSESSMENT FOR FUTURE MAINTENANCE

FOURNIE DRAIN 2023

City of London

Original Schedule Feburary 6 1969
Job No. 220278 Revised by Sect. 65 December 20, 2023

** = Non-agricultural*

	CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
MAIN DRAIN - OPEN PORTION							
	Geographic Westminster						
	WNBTR	**Pt. 57**	**1.2**	**060-156(London Valley IV Inc.)**	**$**	**$ 8.00**	**$ 8.00**
	WNBTR	**Pt. 57**	**0.59**	**060-158(D. & M. Coleman)**		**4.00**	**4.00**
	WNBTR	**N½ 56**	**2.8**	**060-159(806433 Ontario Ltd.)**		**19.00**	**19.00**
	WNBTR	**Pt.S½ 56**	**2.5**	**060-161(Dauntless ULC)**		**16.00**	**16.00**
*	WNBTR	Pt.S½ 56	0.22	060-160(R. & D. Backes)		1.00	1.00
	WNBTR	**55**	**23.4**	**060-162(C. & J. & J. M. Ferguson)**		**113.00**	**113.00**
	WNBTR	Pt 54	30.3	060-167-01(646808 Ontario Limited)			
	WNBTR			combined with 050-181 & 050-167-01 in Midd. Cent.		146.00	146.00
*	**WNBTR**	**Pt 54**	**0.11**	**060-017(The Hastings Mill Inc.)**		**2.00**	**2.00**
*	**WNBTR**	**Pt 54**	**0.10**	**060-168(Rose Chapel Inc)**		**2.00**	**2.00**
*	**WNBTR**	**Pt53& 54**	**7.5**	**060-164(Stone Ridge Travel Centre Inc.)**		**41.00**	**41.00**
	WNBTR	WPt. 53	0.80	050-181 (646808 Ontario Ltd.) Midd. Cent.		4.00	4.00
	WNBTR	53	27.3	060-166(J. & C. Burtwistle)	567.00	145.00	712.00
	WNBTR	Pt. 53	19.3	North Part of 050-167-02(JNC AG Capital Inc.) Midd. Cent.		99.00	99.00
	WNBTR	Pt. 52	3.2	South Part 050-167-02 & Part 050-167 Midd. Cent.		16.00	16.00
	WNBTR	Pt. 52	2.0	050-179 (JNC AG Capital Inc.) Midd. Cent.		10.00	10.00
	WNBTR	N½ 52	20.6	060-170(J. & E. Burtwistle)	683.00	104.00	787.00
	WNBTR	PtN½ 52	1.0	060-169(1886966 Ont. Ltd)		9.00	9.00
	WNBTR	S½ 52	25.5	060-171(C. &. D. Carrothers)	870.00	123.00	993.00
	WNBTR	N½ 51	31.0	060-172(S. Peake)	990.00	124.00	1,114.00
	WNBTR	S½ 51	25.8	060-173(Thomas Brothers Produce Inc.)	855.00	78.00	933.00
	ENBTR	NPt. 57	1.0	060-040(London Valley 11 Inc.)		7.00	7.00
*	**ENBTR**	**Pt.S½ 57**	**0.0**	**060-038(M. Catulli)**			
	ENBTR	**Pt.S½ 57**	**11.1**	**060-039-01(2533430 Ontario Inc.)**		**74.00**	**74.00**
	ENBTR	**Pt.S½ 57**	**3.0**	**060-039-02(Shogun Maitake Property)**		**20.00**	**20.00**
	ENBTR	**Pt.S½ 57**	**1.0**	**060-030(G. Axford)**		**7.00**	**7.00**
*	**ENBTR**	**NWPt. 56**	**8.0**	**060-037(2726064 Ontario Inc.)**		**52.00**	**52.00**
*	ENBTR	Pt. 56	11.9	060-036(Associated Materials Canada Ltd.)		78.00	78.00
*	**ENBTR**	**Pt. 56**	**4.37**	**060-034(All Makes Logistics Intermodal Freight Services Inc.)**		**34.00**	**34.00**
*	**ENBTR**	**Pt. 56**	**1.88**	**060-035-05 PART 1(756950 Ontario Ltd.)**		**12.00**	**12.00**
*	**ENBTR**	**Pt. 56**	**0.53**	**060-035-05 PART 2(756950 Ontario Ltd.)**		**3.00**	**3.00**
*	**ENBTR**	**Pt. 56**	**1.71**	**060-035(Cameron Grane & Riggers)**		**31.00**	**31.00**
*	**ENBTR**	**Pt.54& 55**	**3.3**	**060-018(IBEW Local 120 Bld. Corp.)**		**13.00**	**13.00**
	ENBTR	**Pt.54& 55**	**36.6**	**060-019(1068788 Ontario Ltd.)**	205.00	**83.00**	**288.00**
	ENBTR	**PtS½ 54**	**17.6**	**060-016-01(806433 Ontario Ltd.)**	**30.00**	**95.00**	**125.00**
	ENBTR	**Pt.N½ 53**	**24.2**	**060-016 (1000182402 Ontario Inc.)**	**122.00**	**125.00**	**247.00**
*	ENBTR	NWPt 53	2.0	060-014(Henry Wall Holdings Inc.)		10.00	10.00

SCHEDULE ' C ' - ASSESSMENT FOR FUTURE MAINTENANCE (Cont'd)

FOURNIE DRAIN 2023
City of London

** = Non-agricultural*

	CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
MAIN DRAIN - OPEN PORTION (cont'd)							
	Geographic Westminster						
	ENBTR	SW¼ 53	17.7	060-015(S. Peake)		88.00	88.00
	ENBTR	Pt.52& 53	2.0	060-024(J. & M. Ferguson)		10.00	10.00
*	ENBTR	Pt 52	0.2	060-012(T. & H. Bramley)		3.00	3.00
	ENBTR	NW¼ 52	14.0	060-013(1068788 Ont. Ltd.)		69.00	69.00
	ENBTR	S½ 52	10.5	060-011(J. Burtwistle)		49.00	49.00
	ENBTR	NPt. 51	6.1	060-010(J. & R. Baker)		28.00	28.00
	ENBTR	**SPt. 51**	**0.7**	**060-008(L. & I. Orr)**		**3.00**	**3.00**
				TOTAL ASSESSMENT ON LANDS	$ 4,322.00	$ 1,958.00	$ 6,280.00
	Orr Drive		**0.6**	**City of London**	**$**	**$ 3.00**	**$ 3.00**
	Littlewood Dr.		**0.3**	**City of London**		**5.00**	**5.00**
	Old Litlewood Dr.		**0.9**	**City of London**		**17.00**	**17.00**
	Col. Talbot Road		**2.3**	**City of London**		**61.00**	**371.00**
	Col. Talbot Road		**4.6**	**Ontario Ministry of Tansportation**	**310.00**	**122.00**	**122.00**
	Glanworth Drive		**4.1**	**City of London**		**82.00**	**82.00**
	Burtwistle Lane		**0.8**	**City of London**		**12.00**	**12.00**
	Tempo Road		**5.7**	**City of London**	**133.00**	**112.00**	**245.00**
	Highway 401		**50.0**	**Ontario Ministry of Tansportation**	**792.00**	**983.00**	**1,775.00**
				TOTAL ASSESSMENT ON ROADS	$ 1,235.00	$ 1,397.00	$ 2,632.00
				TOTAL ASSESSMENT ON THE FORUNIE DRAIN 1969			**$ 8,912.00**

Properties in bold have been revised under Section 65 of the Drainage Act

SPECIFICATIONS FOR CONSTRUCTION
OF
MUNICIPAL DRAINAGE WORKS

GENERAL INDEX

SECTION A - GENERAL WORK

INDEX

SECTION A

GENERAL WORK

A.1 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. If weather creates poor ground or working conditions the Contractor may be required, at the discretion of the Engineer, to postpone or halt work until conditions become acceptable.

As noted on the drawing, the contractor must first arrange for a preconstruction meeting to be held on the site with the Contractor and affected owners attending to review in detail the construction scheduling, access and other pertinent details. The Contractor's costs for attending this meeting shall be included in his lump sum tender price. If the Contractor leaves the job site for a period of time after initiation of work, he shall give the Engineer and the Superintendent a minimum of twenty-four (24) hours' notice prior to returning to the project.

The work must be proceeded with in such a manner as to ensure its completion at the earliest possible date and within the time limit set out in the tender or in the contract documents.

A.2 WORKING AREA AND ACCESS

The working area available to the Contractor to construct the drain and related works including an access route to the drain shall be as specified on the drawings.

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.

A.3 ROAD CROSSINGS

.1 General

.1 Scope: These specifications apply to all road crossings - Municipal, County, Regional, or Highway Roads. Where the word "Authority" is used, it shall be deemed to apply to the appropriate owning authority. These specifications in no way limit the Authority's Specifications and Regulations governing the construction of drains on their Road Allowance. The Authority will supply no labour, equipment or materials for the construction of the road crossing unless otherwise noted on the drawings.

.2 Road Occupancy Permit: Where applicable the Contractor must submit an Application for a Road Occupancy Permit to the Authority and allow a minimum of 5 working days (exclusive of holidays) for its review and issuance.

.3 Road Closure Request and Construction Notification: The Contractor shall submit written notification of construction and request for road closure (if applicable) to the Road Authority/Public Works Manager and the Drainage Engineer or Superintendent for review and approval a minimum of five (5) working days (exclusive of holidays) prior to proceeding with any work on road allowance. It shall be the Road Authority's responsibility to notify all the applicable emergency services, schools, etc. of the road closure or construction taking place.

.4 Traffic Control: Where the Contractor is permitted to close the road to through traffic, the Contractor shall provide for and adequately sign the detour route to the satisfaction of the Road Authority. Otherwise, the Contractor shall keep the road open to traffic at all times. The Contractor shall provide, for the supply, erection and maintenance, suitable warning signs and/or flagmen in accordance with the Manual of Uniform Traffic Control Devices and to the satisfaction of the Road Authority to notify the motorists of work on the road ahead.

A.3 **ROAD CROSSINGS** (cont'd)

.5 Site Meeting/Inspection: A site meeting shall be held with the affected parties to review in detail the crossing and/or its related works. The Authority's Inspector and/or the Drainage Engineer will inspect the work while in progress to ensure that the work is done in strict accordance with the specifications.

.6 Weather: No construction shall take place during inclement weather or periods of poor visibility.

.7 Equipment: No construction material and/or equipment is to be left within 3 meters of the edge of pavement overnight or during periods of inclement weather.

.2 **Jacking and Boring**

.1 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.

.2 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 or approved. 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.

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

.4 Unstable Soil or Rock: The Contractor shall contact the Engineer immediately should unstable soil 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 Superintendent and the owning authority.

.5 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.

.6 Backfill: Unless otherwise specified, the area below the proposed grade shall be backfilled with a crushed stone bedding. 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 hand seeded. Surplus material from the boring operation shall be removed from the site at the Contractor's expense.

.7 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 85 kg/per ha. unless otherwise specified or in accordance with the M.T.O. Encroachment Permit. Fences shall be restored to their original condition in accordance with the General Conditions.

.8 Acceptance: All work undertaken by the Contractor shall be to the satisfaction of the Engineer.

A.3 **ROAD CROSSINGS** (cont'd)

.3 **Open Cut**

.1 Material: The culvert or sub-drain crossing pipe material shall be specified on the drawings.

.2 Site Preparation and Excavation: Where necessary, fences shall be carefully taken down as specified in the general conditions. Prior to any excavation taking place, the areas which will be disturbed shall be stripped of topsoil. The topsoil is to be stockpiled in locations away from the construction area.

.3 Installation: The pipe shall be installed using bedding and cover material in accordance with Standard Detailed Drawing No. 2 or detail provided on drawings.

.4 Unstable Soil or Rock: The Contractor shall contact the Engineer immediately should unstable soil be encountered or if boulders of sufficient size and number to warrant concern are encountered.

.5 Tile Connections: Prior to commencement of backfilling, all tiles 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 connections not shown on the drawings shall be an extra to the contract.

.6 Backfill: Backfill from the top of the cover material up to the underside of road base shall meet the requirements for M.T.O. Granular "B". The backfill shall be placed in lifts not exceeding 300mm in thickness and each lift shall be thoroughly compacted to produce a density of 98% Standard Proctor. Granular "B" road base for County Roads and Highways shall be placed to a 450mm thickness and Granular "A" shall be placed to a thickness of 200mm, both meeting M.T.O. requirements. Granular road base materials shall be thoroughly compacted to produce a density of 100% Standard Proctor.

Where the road surface is paved, the Contractor shall be responsible for placing an HL-4 Hot Mix Asphalt patch of the same thickness as the existing pavement. The asphalt patch shall be flush with the existing roadway on each side and not overlap. If specified, the asphalt patch shall not be placed immediately over the road base and the Granular "A" shall be brought up flush with the existing asphalt and a liberal amount of calcium chloride shall be spread on the gravel surface. The asphalt patch must be completed within the time period set out on the drawing.

The excavated material from the trench beyond a point 2.5 meters from the travelled portion or beyond the outside edge of the gravel shoulder, may be used as backfill in the trench in the case of covered drains. This material should be compacted in layers not exceeding 600mm.

A.4 **SURPLUS EXCAVATED MATERIAL AND GRAVEL**

Excess excavated material from open cut installation through roads, railways, laneways and lawn/grass areas, shall be removed and disposed of off-site by the Contractor as part of their lump sum installation price. If as a result of any work, gravel or crushed stone is required and not all the gravel or crushed stone is used in the construction of the works, the Contractor shall haul away such surplus gravel or stone unless otherwise approved.

A.5 **FENCES**

No earth shall 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 accordance with accepted methods and to the satisfaction of the owner and the Engineer or Superintendent. Where existing fences are deteriorated to the extent that existing materials are not salvageable for replacement, the Contractor shall notify the Engineer or the Superintendent prior to dismantling. 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 Superintendent. 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.

A.6 LIVESTOCK

The Contractor shall provide each property owner with 48 hours' notice prior to removing any fences along fields which could possibly contain livestock. Thereafter, the property owner shall be responsible 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.

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 at least 48 hours 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.

A.7 STANDING CROPS

The Contractor shall not be held responsible for damages to standing crops within the working area available and the access route provided if he notifies the owner thereof at least 48 hours prior to commencement of the work on that portion.

A.8 RAILWAYS, HIGHWAYS, UTILITIES

A minimum of forty-eight (48) hours' notice to Railways, Highways and Utilities, exclusive of Saturdays, Sundays and Holidays, shall be required by the Contractor prior to any work being performed and in the case of a pipe being installed by open cutting or boring under a Highway or Railway, a minimum of 72 hours' notice is required.

A.9 UTILITIES

The attention of the Contractor is drawn to the presence of utilities along the course of the drain. The Contractor will be responsible for determining the location of all utilities and will be held liable for any damage to all utilities caused by his operations. The Contractor shall co-operate with all authorities to ensure that all utilities are protected from damage during the performance of the work. The cost of any necessary relocation work shall be borne by the utility. No allowance or claims of any nature will be allowed on account for delays or inconveniences due to utilities relocation, or for inconveniences and delays caused by working around or with existing utilities not relocated.

A.10 IRON BARS

The Contractor shall be held liable for the cost of an Ontario Land Surveyor to replace any iron bars destroyed during the course of construction.

A.11 STAKES

At the time of the survey, 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. At the request of the Contractor, any stakes which are removed or disturbed by others or by livestock, shall be replaced at the expense of the drain.

A.12 **RIP-RAP**

Rip-rap shall be specified on the drawings and shall conform to the following:

.1 **Quarry Stone**: shall range in size from 150mm to 300mm evenly distributed and shall be placed to a 300mm thickness on a filter blanket at a 1.5 to 1 slope unless otherwise noted. Filter blanket to be Mirafi 160N or approved equal.

.2 **Broken Concrete**: may be used in areas outside of regular flows if first broken in maximum 450mm sized pieces and mixed to blend with quarry stone as above. No exposed reinforcing steel shall be permitted.

.3 **Shot Rock**: shall range in size from 150mm to 600mm placed to a depth of 450mm thickness on a filter blanket at a 1.5:1 slope unless otherwise noted. Filter blanket to be Mirafi 160N or approved equal.

A.13 **GABION BASKETS**

Supply and install gabion basket rip-rap protection as shown on the drawings.
Gabion baskets shall be as manufactured by Maccaferri Gabions of Canada Ltd. or approved equal and shall be assembled and installed in strict accordance with the manufacturer's recommendations.
The gabion fill material shall consist solely of fractured field stone or gabion stone graded in size from 100mm to 200mm (4" to 8") and shall be free of undersized fragments and unsuitable material.

A.14 **RESTORATION OF LAWNS**

.1 **General**: Areas noted on the drawings to be restored with seeding or sodding shall conform to this specification, and the Contractor shall allow for all costs in his lump sum bid for the following works.

.2 **Topsoil**: Prior to excavation, the working area shall be stripped of existing topsoil. The topsoil stockpile shall be located so as to prevent contamination with material excavated from the trench. Upon completion of backfilling operations, topsoil shall be spread over the working area to a depth equal to that which previously existed but not less than the following:

- Seeding and sodding - minimum depth of 100mm
- Gardens - minimum depth of 300mm

In all cases where a shortfall of topsoil occurs, whether due to lack of sufficient original depth or rejection of stockpiled material due to Contractor's operations, imported topsoil from acceptable sources shall be imported at the Contractor's expense to provide the specified depths. Topsoil shall be uniformly spread, graded, and cultivated prior to seeding or sodding. All clods or lumps shall be pulverized, and any roots or foreign matter shall be raked up and removed as directed.

.3 **Sodding**

.1 **Materials**: Nursery sod to be supplied by the Contractor shall meet the current requirements of the Ontario Sod Growers Association for No. 1 Bluegrass Fescue Sod.
.2 **Fertilizer**: Prior to sod placement, approved fertilizer shall be spread at the rate of 5kg/100m² of surface area and shall be incorporated into such surfaces by raking, discing or harrowing. All surfaces on which sod is to be placed shall be loose at the time of placing sod to a depth of 25mm.
.3 **Placing Sod**: Sod shall be laid lengthwise across the face of slopes with ends close together. Sod shall be counter sunk along the joints between the existing grade and the new sodding to allow for the free flow of water across the joint. Joints in adjacent rows shall be staggered and all joints shall be pounded and rolled to a uniform surface.

On slopes steeper than 3 to1, and in unstable areas, the Engineer may direct the Contractor to stake sod and/or provide an approved mesh to prevent slippages. In all cases where such additional work is required, it will be deemed an extra to the contract and shall be paid for in accordance with the General Conditions. No sod shall be laid when frozen nor upon frozen ground nor under any other condition not favourable to the growth of the sod. Upon completion of sod laying the Contractor shall thoroughly soak the area with water to a depth of 50mm. Thereafter it will be the responsibility of the property owner to maintain the area in a manner so as to promote growth.

A.14 **RESTORATION OF LAWNS (cont'd)**

.4 **Seeding**: Seed to be supplied by the Contractor shall be "high quality grass seed" harvested during the previous year, and shall be supplied to the project in the supplier's original bags on which a tag setting out the following information is affixed:

- Year or Harvest - recommended rate of application
- Type of Mixture - fertilizer requirements

Placement of seed shall be by means of an approved mechanical spreader. All areas on which seed is to be placed shall be loose at the time of placing seed, to a depth of 25mm. Seed and fertilizer shall be spread in accordance with the supplier's recommendations unless otherwise directed by the Engineer. Thereafter it will be the responsibility of the property owner to maintain the area in a manner so as to promote growth.

.5 **Settlement**: The Contractor shall be responsible during the one-year guarantee period for the necessary repair of restored areas due to trench settlement. Areas where settlement does not exceed 50mm may be repaired by top dressing with fine topsoil. In areas where settlement exceeds 50mm, the Contractor will be required to backfill the area with topsoil and restore with seeding and/or sodding as originally specified.

A.15 **RESTORATION OF ROADS AND LANEWAYS**

.1 **Gravel**: Restoration shall be in accordance with the applicable standard detailed drawing or as shown on the drawings.

.2 **Asphalt and Tar and Chip**: Prior to restoration all joints shall be neatly sawcut. Restoration shall be as a in gravel above with the addition of the following:

.1 Roads shall have the finished grade of Granular 'A', allow two courses of hot-mix asphalt (M.T.O. 310), 80mm HL6 and 40mm HL3 or to such greater thickness as may be required to match the existing.

.2 Laneways shall have the finished grade of Granular 'A' allow one 50mm minimum course of hot-mix asphalt (HL3) or greater as may be required to match existing.

SECTION B - OPEN DRAIN

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SECTION B

OPEN DRAIN

B.1 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 elevation of the ditch bottom. These cuts are established for the convenience of the Contractor; however, benchmarks will govern the final elevation of the drain. Benchmarks 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.

B.2 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 Superintendent before commencing the work.

B.3 CLEARING AND GRUBBING

Prior to commencement of work, all trees, scrub, fallen timber and debris shall be removed from the side slopes of the ditch and for such a distance on the working side so as to eliminate any interference with the construction of the drain or the spreading of the spoil. The side slopes shall be neatly cut and cleared flush with slope whether or not they are affected directly by the excavation. With the exception of large stumps causing damage to the drain, the side slope 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 larger, that it is necessary to remove, shall be considered as logs and shall be cut and trimmed, and left in the working width separate from the brush, for use or disposal by the owner. Trees or limbs less than 150mm in diameter shall be cut in lengths not greater than 5 meters and placed in separate piles with stumps spaced not less than 75 meters apart in the working width, for the use or disposal of the owner. In all cases, these piles shall be placed clear of excavated materials, and not be piled against 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.

B.4 EXCAVATION

The bottom width and the side slopes of the ditch shall be those shown on the profile drawing.

Unless otherwise specified on the drawings, only the existing ditch bottom is to be cleaned out and the side slopes are not to be disturbed. Where existing side slopes become unstable because of construction, the Contractor shall immediately contact the Engineer or Superintendent. 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 for 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.

B.5 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 Superintendent. A buffer strip of not less than 3 meters in width through farmed lands and 2 meters in width through bush areas shall be left along the top edges of the drain. The buffer strip shall be seeded and/or incorporated as specified on the drawings. The material shall be deposited beyond the specified buffer strip.

B.5 **EXCAVATED MATERIAL** (cont'd)

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 spoil bank. The excavated material shall be placed and levelled to a minimum width to depth ratio of 50 to 1 unless instructed otherwise. The edge of the spoil bank away from the ditch shall be feathered down to the existing ground; the edge of the spoil bank nearest the ditch shall have a maximum slope of 2 to 1. The 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.

Any stones 150mm or larger left exposed on top of the levelled excavated material shall be removed and disposed of as an extra to the contract unless otherwise noted on plans.

B.6 **EXCAVATION THROUGH BRIDGES AND CULVERTS**

The Contractor shall excavate the drain to the full specified depth and width under all bridges. Where the bridge or culvert pipe is located within a road allowance, the excavated material shall be levelled within the road allowance. Care shall be taken not to adversely affect existing drainage patterns. 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 Superintendent if excavation may cause the structure to undermine or collapse.

B.7 **PIPE CULVERTS**

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 detail drawings as noted on the drawings. If couplers are required, 5 corrugation couplers shall be used for up to and including 1200mm dia. pipe and 10 corrugation couplers for greater than 1200mm dia.

B.8 **MOVING DRAINS OFF ROADS**

Where an open drain is being removed from a road allowance, it must be reconstructed wholly on the adjacent lands with a minimum distance of 2.0 meters between the property line and the top of the bank, 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 beyond the buffer strip, unless otherwise noted. 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.

B.9 **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 or as noted on the profile, and subsequently damaged by the Contractor's operations will be repaired by the Contractor at his cost. All outlet pipes repaired by the Contractor under direction of the Drainage Superintendent or Engineer which were not part of the Contract shall be considered an extra to the contract price.

B.10 SEDIMENT BASINS AND TRAPS

Sediment basins shall be excavated as specified on drawings prior to commencement of upstream work as shown on the Drawings. The basin shall be in a parabolic shape with a depth of 450mm below the proposed ditch bottom and extend along the drain for a minimum length of 15 meters.

Silt fences shall be placed across ditch bottom immediately downstream of the proposed work as specified on the drawings prior to construction and maintained during construction. The silt fence shall be removed and disposed of after construction.

B.11 SEEDING

.1 **Delivery**: The materials shall be delivered to the site in the original unopened containers which shall bear the vendor's guarantee of analysis and seed will have a tag showing the year of harvest.

.2 **Hydro Seeding**: Areas specified on drawings shall be hydro seeded and mulched upon completion of construction in accordance with O.P.S.S. 572 and with the following application rates:

Primary Seed (85 kg/ha.):	50% Creeping Red Fescue 40% Perennial Ryegrass 5% White Clover
Nurse Crop	Italian (Annual) Ryegrass at 25% of Total Weight
Fertilizer (300 kg/ha.)	8-32-16
Hydraulic Mulch (2000 kg/ha.)	Type "B"
Water (52,700 litres/ha.)	

Seeding shall not be completed after September 30.

.3 **Hand Seeding**: Hand seeding shall be completed daily with the seed mixture and fertilizer and application rate shown under "Hydro Seeding" above. Placement of the seed shall be by means of an approved mechanical spreader. Seeding shall not be completed after September 30.

SECTION C - TILE DRAIN

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SECTION C

TILE DRAIN

C.1 PIPE MATERIALS

.1 **Concrete 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. Concrete tile shall conform to Designation C412 "Extra Quality" except that the minimum compression strengths shall be increased by 25%. Heavy Duty tile shall conform to Designation C412 "Heavy Duty Extra Quality".

.2 **Corrugated Steel Pipe**: Unless otherwise specified, all metal pipe shall be corrugated, riveted steel pipe or helical corrugated steel pipe with a minimum wall thickness of 1.6mm (16 gauge) and shall be fully galvanized.

.3 **Plastic Tubing**: The plans will specify the type of tubing or pipe, such as non-perforated or perforated (with or without filter material).

i) Corrugated Plastic Drainage Tubing shall conform to the current O.F.D.A. Standards

ii) Heavy Duty Corrugated Plastic Pipe shall be "Boss 1000" manufactured by the Big 'O' Drain Tile Co. Ltd. or approved equal

.4 **Concrete Sewer Pipe**: The Designations for concrete sewer pipe shall be 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.

Where concrete sewer pipe “seconds” are permitted the pipe should exhibit no damages or cracks on the barrel section and shall be capable of satisfying the crushing strength requirements for No.1, Pipe Specifications (C14 or C76). The pipe may contain cracks or chips in the bell or spigot which could be serious enough to prevent the use of rubber gaskets, but which are not so severe that the joint could not be mortared conventionally.

.5 **Plastic Sewer Pipe**: The plans will specify the type of sewer pipe, such as non-perforated or perforated (with or without filter material). All plastic sewer pipe and fittings shall be “Boss Poly-Tite”, ULTRA-RIB”, “Challenger 3000" or approved equal with a minimum stiffness of 320 kpa at 5% deflection.

.6 **Plastic Fittings**: All plastic fittings shall be "Boss 2000" or "Challenger 2000" with split coupler joints or approved equal.

C.2 TESTING

The manufacturer shall provide specimens for testing if required. The random selection and testing procedures would follow the appropriate A.S.T.M. requirements for the material being supplied. The only variation is the number of tiles tested: 200mm to 525mm dia. - 5 tile tested, 600mm to 900mm dia. - 3 tile tested. The drain will be responsible for all testing costs for successful test results. Where specimens fail to meet the minimum test requirements, the manufacturer will be responsible for the costs of the unsuccessful tests. Alternately, the Engineer may accept materials on the basis of visual inspections and the receipt in writing from the Manufacturer of the results of daily production testing carried out by the Manufacturer for the types and sizes of the material being supplied.

C.3 LINE

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

Where an existing drain is to be removed and replaced in the same trench by the new drain or where the new drain is to be installed parallel to an existing drain, the Contractor shall excavate test holes to locate the existing drain (including repairing drainage tile) at intervals along the course of the drain as directed by the Engineer and/or the Superintendent. The costs for this work shall be included in the tender price.

Where an existing drain is to be removed and replaced in the same trench by the new drain, all existing tiles shall be destroyed, and all broken tile shall be disposed of offsite.

C.3 **LINE** (cont'd)

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.

C.4 **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 centred on the line of the drain.

All trees or limbs 150mm (6") or larger, that it is necessary to remove, shall be considered as logs and shall be cut and trimmed, and left in the working width separate from the brush, for use or disposal by the owner. Trees or limbs less than 150mm in diameter shall be cut in lengths not greater than 5 meters and placed in separate piles with stumps spaced not less than 75 meters apart in the working width, for the use or disposal of the owner. In all cases, these piles shall be placed clear of excavated materials, and not be piled against 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.

C.5 **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, benchmarks will govern the final elevation of the drain. Benchmarks have been established along the course of the drain and their locations and elevations are noted on the profile drawing.

C.6 **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, the Contractor 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.

C.7 **EXCAVATION**

.1 **Trench:** Unless otherwise specified, all trenching shall be done with a recognized farm tiling machine approved by the Engineer or Superintendent. The machine shall shape the bottom of the trench to conform to the outside diameter of the pipe for a minimum width of one-half of the outside diameter. The minimum trench width shall be equal to the outside diameter of the tile to be installed plus 100mm (4") on each side unless otherwise approved. The maximum trench width shall be equal to the outside diameter of the tile to be installed plus 250mm (10") on each side unless otherwise approved.

C.7 **EXCAVATION** (cont'd)

.2 **Scalping**: Where the depths of cuts in isolated areas along the course of the drain as shown on the profile exceed the capacity of the Contractor's tiling machine, he shall lower the surface grade in order that the tiling 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.

.3 **Excavator**:Where the Contractor's tiling machine consistently does not have the capacity to dig to the depths required or to excavate the minimum trench width required, he shall indicate in the appropriate place provided on the tender form his proposed methods of excavation.

Where the use of an excavator is either specified on the drawings or approved as evidenced by the acceptance of his tender on which he has indicated the proposed use of a backhoe he shall conform to the following requirements:

a) the topsoil shall be stripped and replaced in accordance with Section .2 "Scalping".
b) all tile shall be installed on a bed of 19mm crushed stone with a minimum depth of 150mm which has been shaped to conform to the lower segment of the tile.
c) the Contractor shall allow for the cost of the preceding requirements (including the supply of the crushed stone) in his lump sum tender price unless it is otherwise provided for in the contract documents.

.4 **Backfilling Ditch**: Where the contract includes for a closed drain to replace an open drain and the ditch is to be backfilled, the Contractor shall install the tile and backfill the trench prior to backfilling the ditch unless otherwise noted. The distance the trench shall be located away from the ditch shall be as noted on the drawings, (beyond area required for stockpiling topsoil and backfilling). After tile installation is complete topsoil (if present) shall be stripped and stockpiled within the above limits prior to backfilling of ditch. Only tracked equipment shall be permitted to cross backfilled tile trench and must be at 90 degrees to line of tile.

C.8 **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 the joint shall be wrapped with filter cloth as below. Where the width of a joint exceeds 12mm the tile shall first be removed and the joint bevelled to reduce the gap. The maximum deflection of one tile joint shall be 15 degrees. Where a drain connects to standard or ditch inlet catchbasins or junction box structures, the Contractor shall include in his tender price for the supply and installation of compacted Granular 'A' bedding under areas backfilled from the underside of the pipe to undisturbed soil. 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 "A" bedding from the underside of the pipe down to undisturbed soil within the limits of the bore pit.

As above and where soil conditions warrant, the Engineer may require (or as specified on the drawings) that each tile joint be wrapped with synthetic filter cloth. The width of the filter cloth shall be 300mm wide for tile sizes of 150mm to 300mm and 400mm wide for sizes of 350mm to 750mm. The filter cloth shall cover the full perimeter of the tile and overlap a minimum of 100mm or as specified on the drawings. The type of cloth shall be Mirafi 140NL for loam soils and 150N for sandy soil. Any such work not shown on the drawings shall be considered as an addition to the contract price unless specified on the drawings.

C.9 **ROAD AND LANEWAY SUB-SURFACE CROSSINGS**

All road and laneway crossings may be made with an open cut in accordance with standard detailed drawings in the specifications or on the drawings. The exact location of the crossing shall be verified and approved by the Road Authority and the Engineer and/or Superintendent.

C.10 **BACKFILLING**

As the laying of the tile progresses, blinding up to the springline including compaction by tamping (by hand) is to be made on both sides of the tile. No tile shall be backfilled until inspected by the Engineer or Drainage Superintendent unless otherwise approved by the Engineer.

The remainder of the trench shall be backfilled with special care being taken in backfilling up to a height approximately 150mm above the top of the tile to ensure that no tile breakage occurs. During the backfilling operation no equipment shall be operated in a way that would transfer loads onto the tile trench. Surplus material is to be mounded over the tile trench so that when settlement takes place the natural surface of the ground will be restored. Upon completion, a minimum cover of 600mm is required over all tile. Where stones larger than 150mm are present in the backfill material, they shall be separated from the material and disposed of by the Contractor.

Where a drain crosses a lawn area, the backfilling shall be carried out as above except that, unless otherwise specified, the backfill material shall be mechanically compacted to eliminate settlement.

C.11 **UNSTABLE SOIL**

The Contractor shall immediately contact the Engineer or Superintendent if quicksand is encountered, such that installation with a tiling machine is not possible. The Engineer shall, after consultation with the Superintendent 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.

C.12 **ROCKS**

The Contractor shall immediately contact the Engineer or Superintendent if boulders of sufficient size and number are encountered such that the Contractor cannot continue trenching with a tiling machine. The Engineer or Superintendent may direct the Contractor to use some other method of excavating to install the drain. The basis of payment for this work shall be determined by the Engineer and Drainage Superintendent.

If only scattered large stones or boulders are removed on any project, the Contractor shall haul same to a nearby bush or fence line, or such other convenient location as approved by the Landowners(s).

C.13 **BROKEN, DAMAGED TILE OR EXCESS TILE**

The Contractor shall remove and dispose of off-site all broken (existing or new), damaged or excess tile or tiles. 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.

C.14 **TRIBUTARY DRAINS**

Any tributary tile encountered in the course of the drain shall 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. 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 Superintendent. 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 Superintendent.

For tributary drains 150mm dia. or smaller connected to new tiles 250mm dia. or larger, and for 200mm dia. connected to 350mm dia. or larger, the Contractor shall neatly cut a hole in the middle of a tile length. The connections shall be made using a prefabricated adaptor. All other connections shall be made with prefabricated wyes or tees conforming to Boss 2000 split coupler or approved equal.

Where an open drain is being replaced by a new 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.

C.14 **TRIBUTARY DRAINS** (cont'd)

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.

C.15 **OUTLET PIPES**

Corrugated steel 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 steel 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 immediately.

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

C.16 **CATCHBASINS AND JUNCTION BOXES**

.1 **Catchbasins**: Unless otherwise noted or approved, catchbasins shall be in accordance with O.P.S.D. 705.010, 705.030. All catchbasins shall include two - 150mm riser sections for future adjustments. All ditch inlet catchbasins shall include one 150mm riser section for future adjustments. The catchbasin top shall be a "Bird Cage" type substantial steel grate, removable for cleaning and shall be inset into a recess provided around the top of the structure. The grate shall be fastened to the catchbasin with bolts into the concrete. Spacing of bars on grates for use on 600mmx600mm structures shall be 65mm centre to centre. Spacing of bars on grates for use on structures larger than 600mmx600mm shall be 90mm with a steel angle frame.

The exact location and elevation of catchbasins shall be approved by the Road Authority or the Engineer/Superintendent. Catchbasins offset from the drain shall have "Boss 2000" 200mm diameter leads or approved equal 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.

.2 **Junction Boxes**: Junction boxes shall be the precast type unless otherwise approved. Dimensions for precast junction boxes shall conform to those for catchbasins. 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. Benching to spring line shall be supplied with all junction boxes.

.3 **Connections**: Catchbasins and junction boxes shall not be ordered until elevations of existing pipes being connected have been verified in the field as indicated on the drawings. All connections shall be securely grouted at both the inside and outside walls of the structure.

.4 **Installation**: Where the native material is clay, all catchbasins shall be backfilled with an approved granular material placed and compacted to a minimum width of 300mm on all sides with the following exception. Where the native material is sandy or granular in nature it may be used as backfill. Filter cloth shall be placed between the riser sections of all catchbasins.

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 compacted clay keyed 300mm into undisturbed soil. Topsoil shall be distributed to a 65mm thickness and seeded unless otherwise specified. The Contractor shall also include for regrading, shaping and seeding of road ditches for a maximum of 15 meters each way from all catchbasins.

C.17 **BLIND INLETS**

Where specified, blind inlets shall be installed along the course of the drain in accordance with details on the drawings.

C.18 **GRASSED WATERWAY**

Topsoil to be stripped from construction area and stockpiled prior to construction of waterway. Waterway to be graded into a parabolic shape to the width shown on the drawings. Topsoil to be relevelled over the waterway and other areas disturbed by construction.

Waterway to be prepared for seeding by harrowing and then seeded by drilling followed by rolling. Seeding rate to be 85 Kg/Ha with the following mixture:

30% Canon Canada Bluegrass
25% Koket Chewings Fescue
30% Rebel Tall Fescue
15% Diplomat Perennial Rye
Plus #125 Birdsfoot Trefoil (25% of Total Weight)

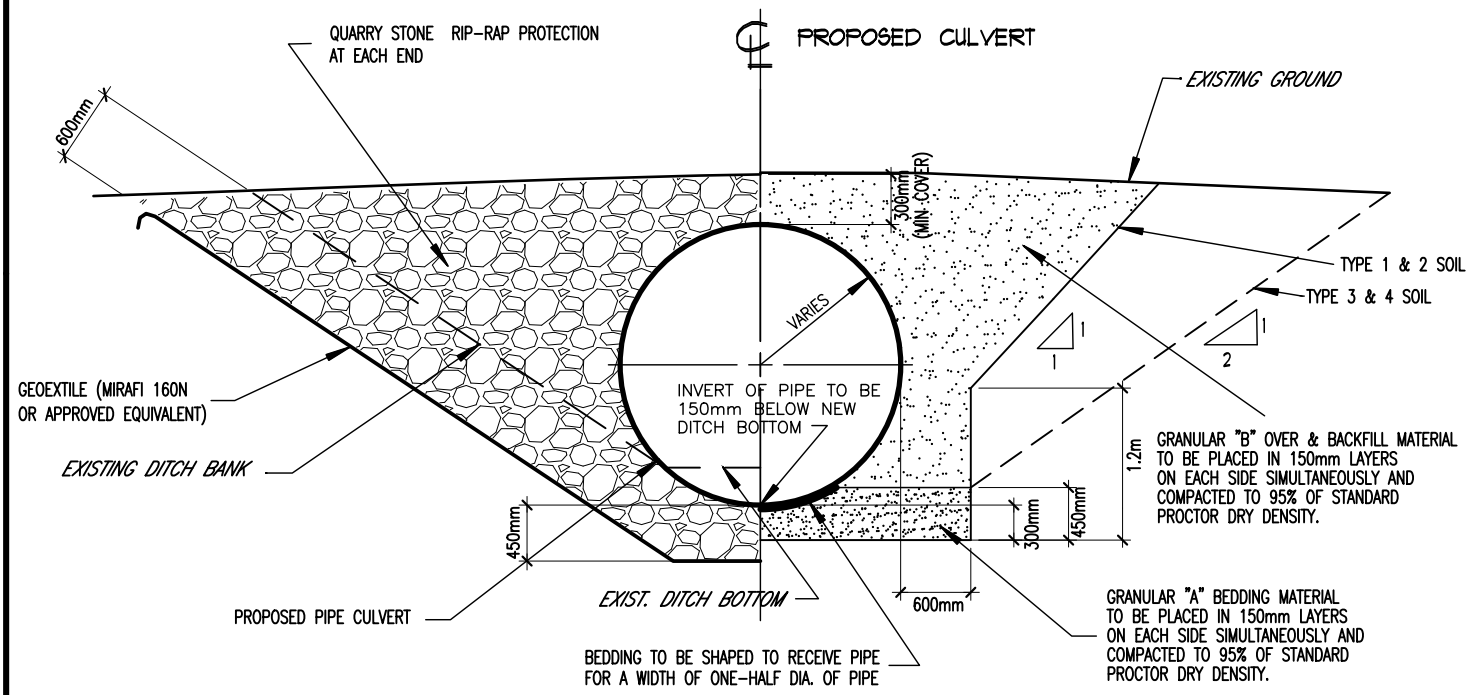
C.19 **BACKFILLING EXISTING DITCHES**

The Contractor shall backfill the ditch sufficiently for traversing by farm machinery. If sufficient material is not available from the old spoil banks to fill in the existing ditch, the topsoil shall be stripped and the subsoil shall be bulldozed into the ditch and the topsoil shall then be spread over the backfilled ditch unless otherwise specified on the contract drawings. The Contractor shall ensure sufficient compaction of the backfill and if required, repair excess settlement up to the end of the warranty period. The final grade of the backfilled ditch shall provide an outlet for surface water.

C.20 **RECOMMENDED PRACTICE FOR CONSTRUCTION OF SUBSURFACE DRAINAGE SYSTEM**

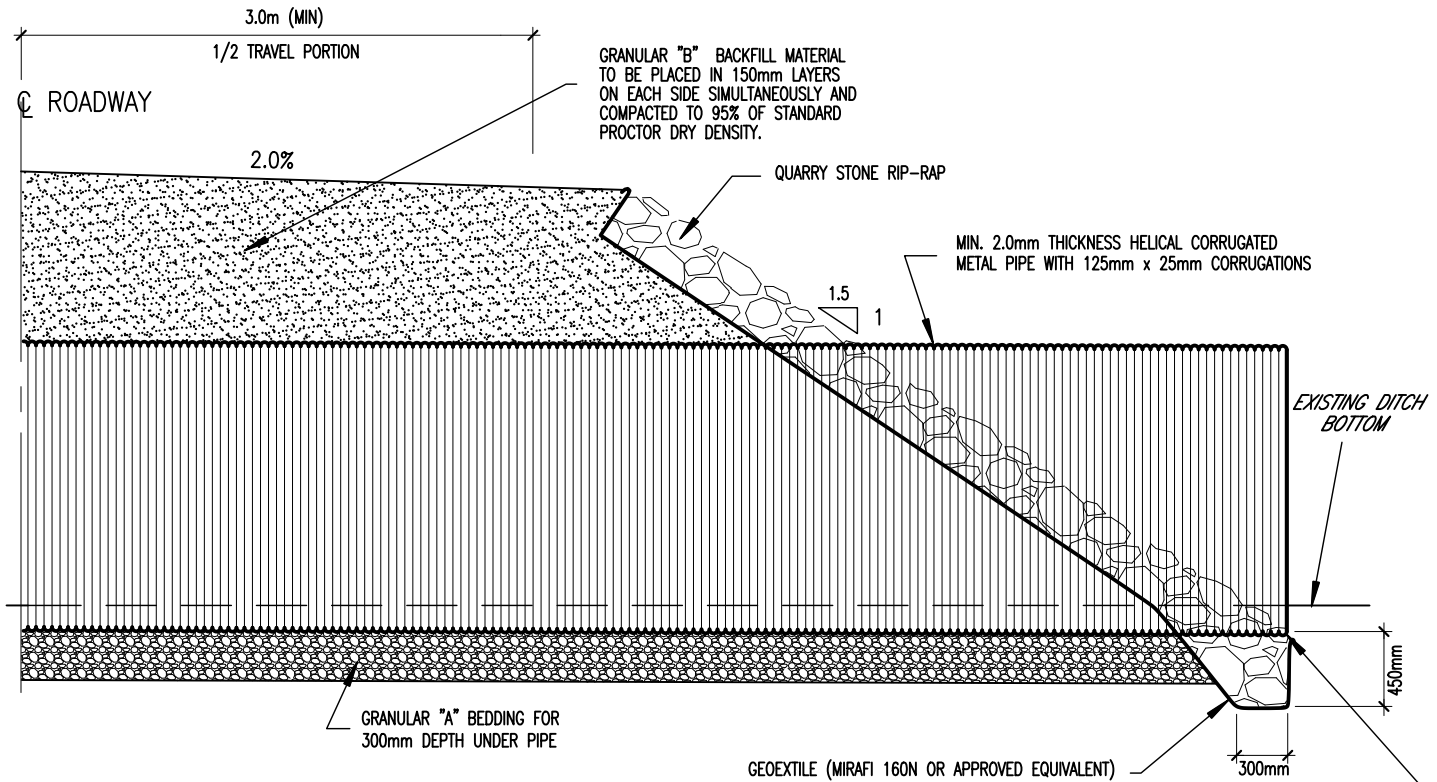
Drainage guide for Ontario, Ministry of Agriculture, Food and Rural Affairs Publication Number 29 and its amendments, dealing with the construction of Subsurface Drainage systems, shall be the guide to all methods and materials to be used in the construction of tile drains except where superseded by other specifications of this contract.

The requirements of licensing of operators, etc. which apply to the installation of closed drains under the Tile Drainage Act shall also be applicable to this contract in full unless approval otherwise is given in advance by the Engineer.



HALF ELEVATION

HALF SECTION



HALF SECTION THROUGH PIPE

NOTES

1) WHERE THE CULVERT IS TO BE INSTALLED IN POOR SOIL CONDITIONS, THE BEDDING MATERIAL SHALL BE 19mm CRUSHED STONE COMPLETELY WRAPPED IN GEOTEXTILE SUCH AS MIRAFI 160N OR APPROVED EQUIVALENT.

TYPICAL FARM CULVERT INSTALLATION DETAIL

Scale: N.T.S.	Approved by:	Date: January 1983
Drawn by: jk	M.P.D.	Revised: November 2000

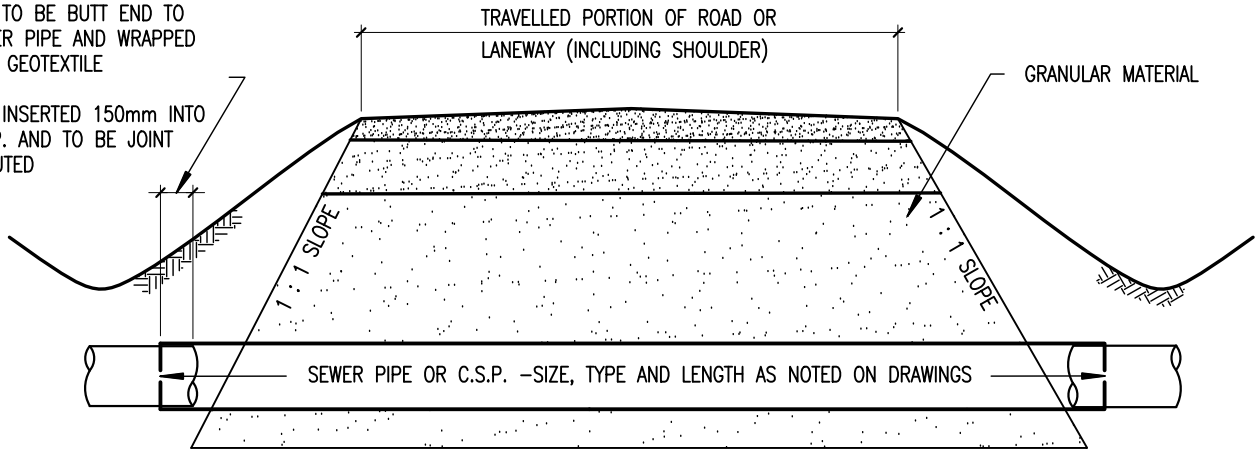
ELEVATION & SECTION

STANDARD DETAILED DRAWING No. 01

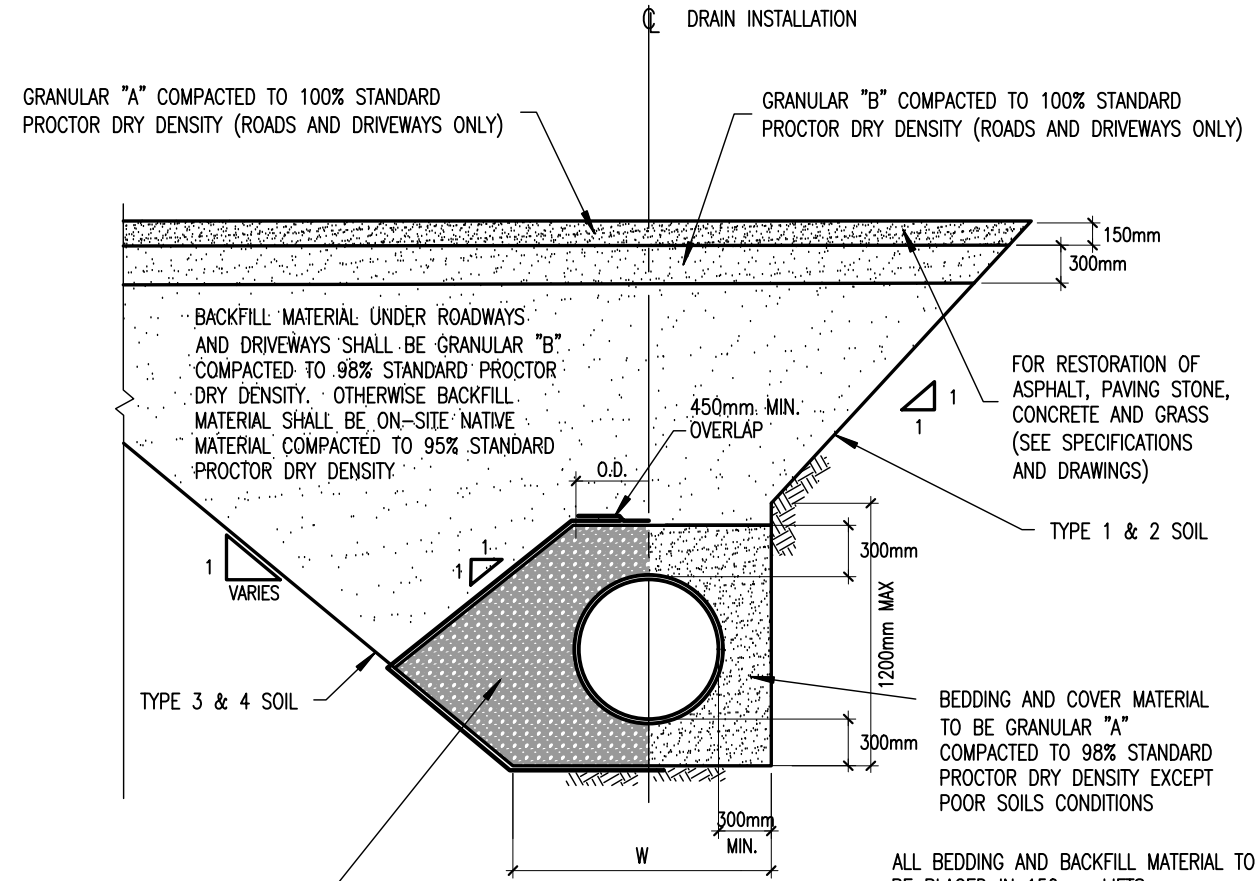
SPRIET ASSOCIATES LONDON LIMITED
CONSULTING ENGINEERS ARCHITECTS

1. TILE TO BE BUTT END TO SEWER PIPE AND WRAPPED WITH GEOTEXTILE

2. TILE INSERTED 150mm INTO C.S.P. AND TO BE JOINT GROUTED

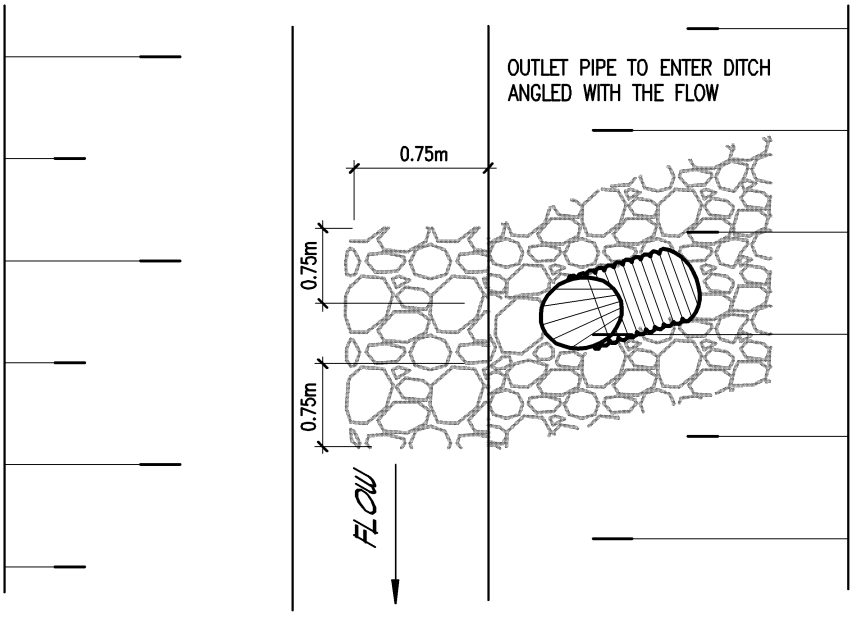


SECTION THROUGH PIPE



CROSS SECTION

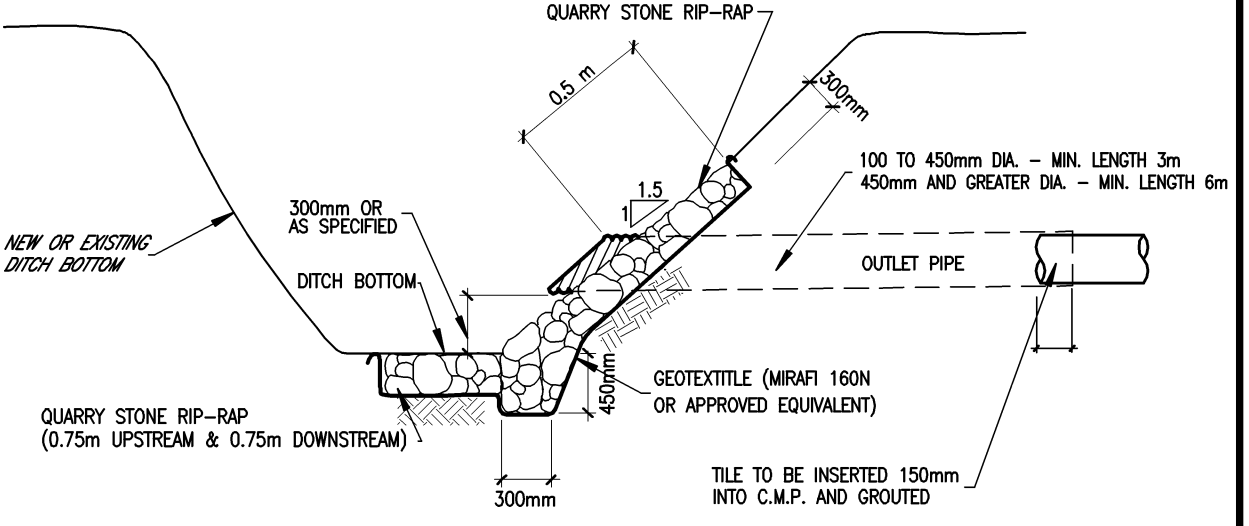
TYPICAL INSTALLATION DETAIL FOR SEWER PIPE UNDER DRIVEWAYS AND TRAVELLED PORTIONS OF ROADS		
Scale: N.T.S.	Approved by:	Date: January 1983
Drawn by: jk	M.P.D.	Revised: JULY 2018
ELEVATION & SECTION		STANDARD DETAILED DRAWING No. 02
SPRIET ASSOCIATES LONDON LIMITED CONSULTING ENGINEERS ARCHITECTS		



PLAN

NOTES

1. WHERE THE DISTURBED AREA EXCEEDS THE MIN. WIDTHS, RIP-RAP TO EXTEND TO A MIN. OF 600mm BEYOND THE DISTURBED AREA



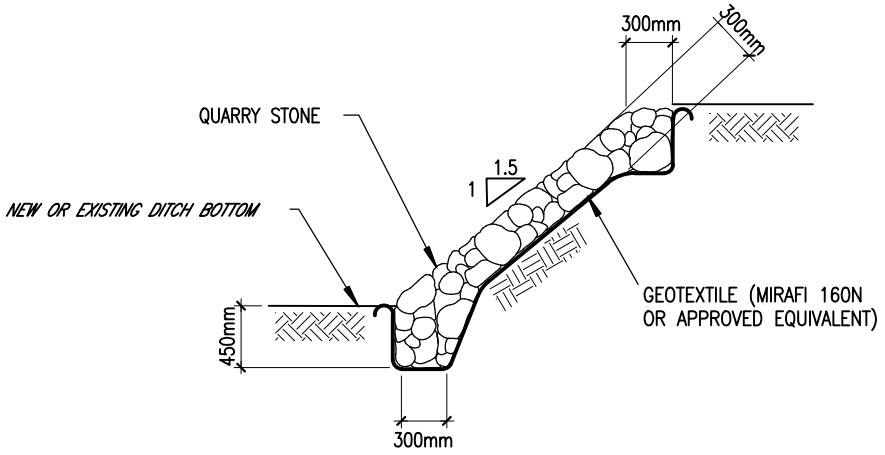
TYPICAL OUTLET RIP-RAP

NOTES

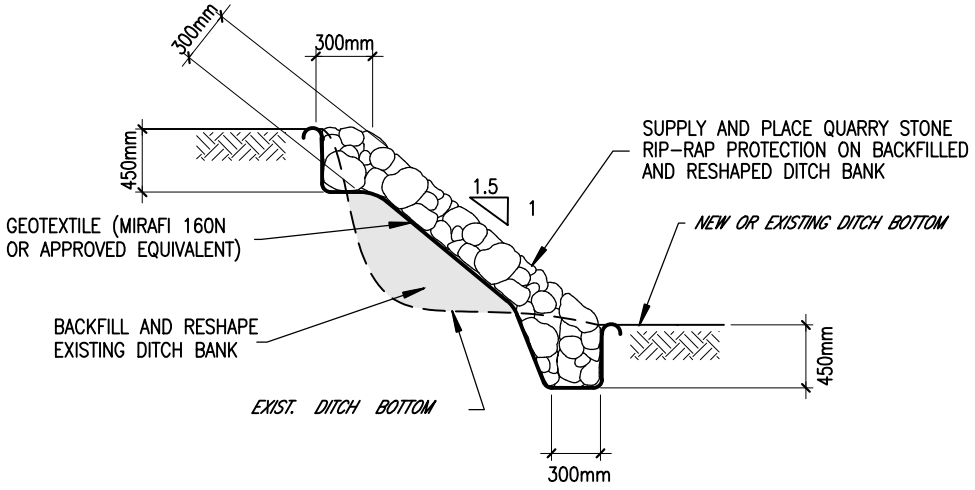
1. RIP-RAP TO EXTEND UP THE SLOPE 0.5 METER ABOVE TOP OF OUTLET
2. WHERE SURFACE RUN ENTERS DITCH AT OUTLET PIPE, A ROCK CHUTE SHALL BE INSTALLED (SEE S.D.D. No. 05) AND PIPE SHALL BE INSTALLED ADJACENT TO ROCK CHUTE.
3. HINGED RODENT GATE TO BE AFFIXED TO END OF OUTLET PIPE.

TYPICAL OUTLET RIP-RAP THROUGH SIDE SLOPE OF DITCH		
Scale: N.T.S.	Approved by:	Date: November 2000
Drawn by: jk	M.P.D.	Revised: January 2009
PLAN & SECTION		STANDARD DETAILED DRAWING No. 03

SPRIET ASSOCIATES LONDON LIMITED
CONSULTING ENGINEERS ARCHITECTS

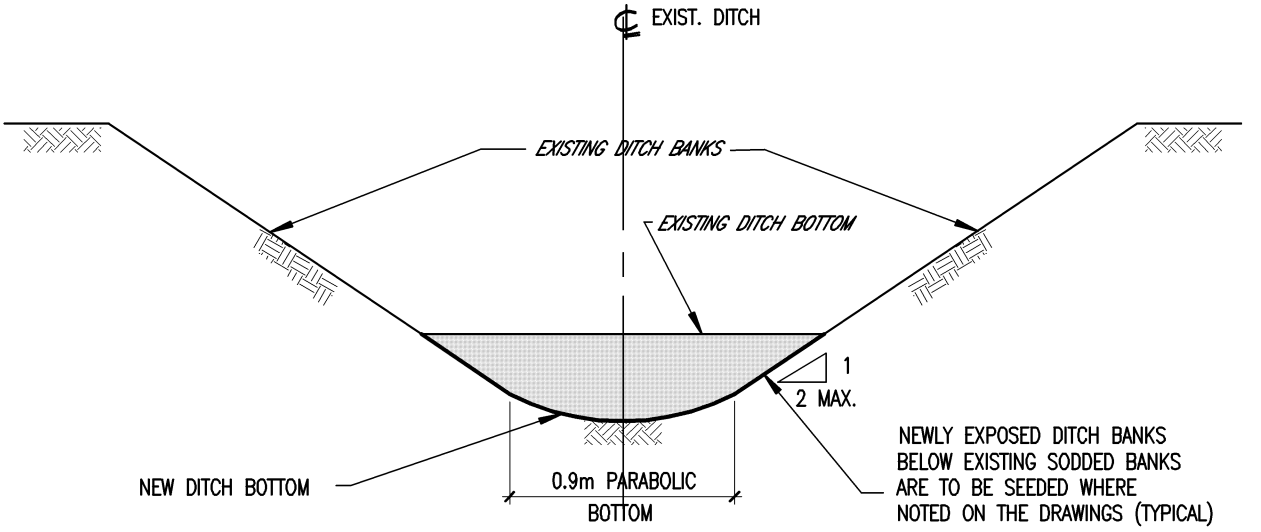


TYPICAL DITCH BANK RIP–RAP

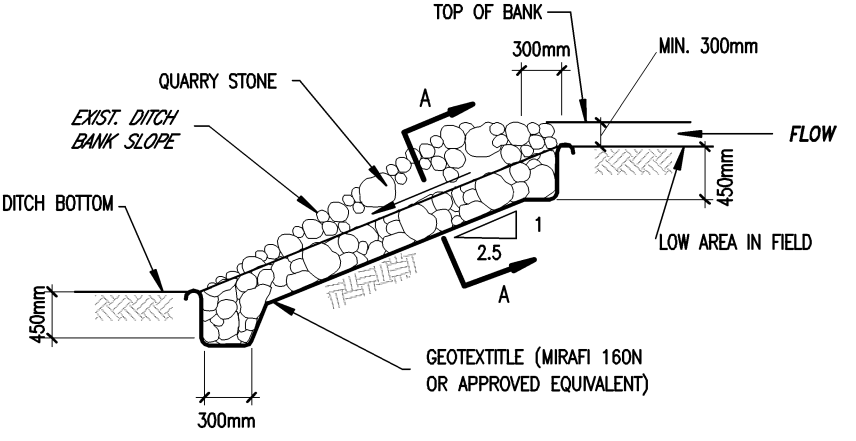


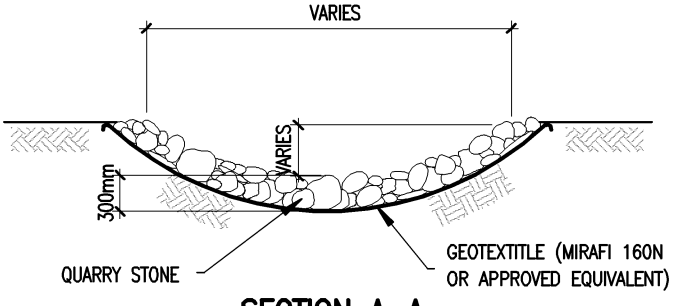
TYPICAL DITCH BANK RIP–RAP WITH BACKFILLING OF WASHOUT

TYPICAL DITCH BANK RIP–RAP DETAILS		
Scale: N.T.S.	Approved by:	Date: July 2000
Drawn by: jk	M.P.D.	Revised: November 2000
SECTIONS		STANDARD DETAILED DRAWING No. 04
SPRIET ASSOCIATES LONDON LIMITED CONSULTING ENGINEERS ARCHITECTS		



TYPICAL DITCH BOTTOM CLEANOUT





SECTION A–A

TYPICAL ROCK CHUTE

TYPICAL DITCH BOTTOM CLEANOUT TYPICAL ROCK CHUTE CONSTRUCTION		
Scale: N.T.S.	Approved by:	Date: November 2000
Drawn by: jk	M.P.D.	Revised:
SECTIONS		STANDARD DETAILED DRAWING No. 05
SPRIET ASSOCIATES LONDON LIMITED CONSULTING ENGINEERS ARCHITECTS		

NOTE: Additional Drawings noted below are available upon request.

Fournie Drain 2023 - Plan & General Notes
Fournie Drain 2023 - Detail Plan & Profile
Fournie Drain 2023 - Cross Sections

APPENDIX 'B'

Bill No.
2024

By-law No.

A by-law to provide for Drainage Works in the City of London (Construction of the Gold Seal & Fournie Municipal Drains)

WHEREAS the Municipal Council of The Corporation of the City of London appointed Spriet Associates Ltd, pursuant to section 78 of the *Drainage Act*, R.S.O. 1990, c. D.17, to prepare a report on the construction of the Gold Seal and Fournie Municipal Drains ;

AND WHEREAS the Municipal Council of the Corporation of The City of London at it's meeting February 21, 2024 adopted the Consulting Engineers' report dated November 30th, 2023.

NOW THEREFORE the Municipal Council of The Corporation of the City of London enacts as follows:

1. The reports dated November 30th, 2023, are hereby adopted and the undertaking and completion of the drainage works outlined in the report are hereby authorized.

2. The allowances in connection with this drainage works set out in Schedule "A" of this by-law are hereby approved.

3. The assessments for future maintenance for this drainage works set out in Schedule "D" of this by-law are hereby approved and shall be levied upong the lands, including roads, listed in Schedule "D" of this by law.

4. This by-law comes into force and effect on the day it is passed.

PASSED in Open Council on [insert date]

Josh Morgan
Mayor

Michael Schulthess
City Clerk

First Reading – insert date
Second Reading – insert date
Third Reading – insert date

SCHEDULE ' A ' - ALLOWANCES

GOLD SEAL DRAIN 2023

City of London

e with Section 30 of the Drainage Act, we determine the allowances payable to
to owners entitled thereto as follows:

CON.	LOT	ROLL NUMBER (Owner)	Section 30 Damages	TOTALS
ENBTR	W½E½ 56	80-060-021-01(806584 Ontario Ltd.)	$ 200.00	$ 200.00
ENBTR	Pt.E½ 56	80-060-033 PART 1 (1068788 Ontario Ltd.)	200.00	200.00
ENBTR	Pt.E½ 56	80-060-033 PART 2 (1068788 Ontario Ltd.)	150.00	150.00
		Total Allowances	$ 550.00	$ 550.00

TOTAL ALLOWANCES ON THE MAIN DRAIN-CLOSED PORTION **$ 550.00**

SCHEDULE 'B' - COST ESTIMATE

GOLD SEAL DRAIN 2023

City of London

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

CONSTRUCTION		
Locate and expose existing tile	$	1,010.00
Contingencies	$	350.00
Allowances under Section 30 of the Drainage Act	$	550.00
ADMINISTRATION		
Net Harmonized Sales Tax	$	660.00
Survey, Plan and Final Report	$	15,500.00
Expenses	$	230.00
Review of Construction Drawings	$	2,000.00
Supervision and Updating Final Construction Details	$	3,000.00
TOTAL ESTIMATED COST	**$**	**23,300.00**

GOLD SEAL DRAIN 1998 October 14, 1998
City of London **Revised by Section 65 (3)**
November 30, 2023

CON.	LOT	HECTARES AFFECTED	ED	ROLL No. (OWNER)	SPECIAL BENEFIT	BENEFIT	OUTLET	TOTAL
MAIN DRAIN-CLOSED PORTION								
ENBTR	Pt.S½	53	2.4	80-060-024(J. & M. Ferguson)	$	$ 2,910.00	43.00	2,953.00
ENBTR	E¼	53	5.2	80-060-025(1068788 Ontario Ltd.)		750.00	76.00	826.00
ENBTR	NWPt.	53	6.0	80-060-016(1000182402 Ontario Inc.)		11,990.00	487.00	12,477.00
ENBTR	SWPt.	54	8.9	80-060-01601(806433 Ontario Ltd.)		6,720.00	1,612.00	8,332.00
ENBTR	NWPt.	54	1.2	80-060-019(1068788 Ontario Ltd.)			146.00	146.00
ENBTR	Pt.N½	54	10.1	80-060-021-01(806584 Ontario Ltd.)		6,270.00	2,245.00	8,515.00
ENBTR	E¼	54	12.1	80-060-021-01(806584 Ontario Ltd.)			987.00	987.00
ENBTR	WPt.	55	4.7	80-060-019(1068788 Ontario Ltd.)			1,318.00	1,318.00
ENBTR	W½E½	55	20.2	80-060-021-01(806584 Ontario Ltd.)		11,580.00	5,923.00	17,503.00
ENBTR	E¼	55	14.1	80-060-022(J. & M. Ferguson)			2,350.00	2,350.00
* ENBTR	Pt.W½	56	0.55	80-060-035(Cameron Grane & Riggers Inc.)			501.00	501.00
ENBTR	**Pt.W½**	**56**	**0.8**	**80-060-03505 PART 1 (756950 Ontario Ltc**			**364.00**	**364.00**
ENBTR	**Pt.W½**	**56**	**1.6**	**80-060-03505 PART 2 (756950 Ontario Ltd.)**			**727.00**	**727.00**
ENBTR	**Pt.E½**	**56**	**32.2**	**80-060-033 PART 1 (1068788 Ontario Ltd.**		**14,240.00**	**13,579.00**	**27,819.00**
ENBTR	**Pt.E½**	**56**	**0.8**	**80-060-033 PART 2 (1068788 Ontario Ltd.)**			**337.00**	**337.00**
ENBTR	SEPt.	57	15.6	80-060-030(G. Axford)		650.00	9,639.00	10,289.00
ENBTR	NEPt.	57	6.3	80-060-031(M. Lorenzutti & F. Damico)			4,762.00	4,762.00
				TOTAL ASSESSMENT ON LANDS	$	$ 55,110.00	$ 45,096.00	$ 100,206.00
Glanworth Drive		**4.5**		**City of London**	**$**	**$ 2,270.00**	**7,383.00**	**9,653.00**
Tempo Road		**0.7**		**City of London**		**1,510.00**	**1,148.00**	**2,658.00**
				TOTAL ASSESSMENT ON ROADS	$	$ 3,780.00	$ 8,531.00	$ 12,311.00

SPECIAL ASSESSMENT against the City of London for the increased cost of boring a 406mm (16") smooth wall pipe under Glanworth Drive on the Main Drain $ 6,480.00

SPECIAL ASSESSMENT against Union Gas for the administration and construction costs of locating their gas line on Glanworth Drive and any modifications to the drainage works if required $ 300.00

TOTAL ASSESSMENT ON THE MAIN DRAIN-CLOSED PORTION $ 119,297.00

GOLD SEAL DRAIN 1998
City of London

October 14, 1998
Job No. 97226 **Revised by Section 65**
November 30, 2023

	CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
	MAIN DRAIN-OPEN PORTION				
	City of London		(Former Township of Westminster)		
*	ENBTR	WPt. 49	0.3	80-060-003(1188165 Ontario Ltd.)	0.02 %
*	ENBTR	Pt.W½ 50	1.4	80-060-004(CRM Properties Inc..)	0.09
*	ENBTR	Pt.W½ 50	1.7	80-060-00402(Laidlaw Carriers Bulk GP Inc.)	0.11
*	ENBTR	Pt.W½ 50	5.9	80-060-00410(Laidlaw Carriers Bulk GP Inc.)	1.48
*	ENBTR	Pt.W½ 50	1.8	80-060-00401(Badger Daylighting Inc.)	1.31
	ENBTR	Pt.W½ 50	5.4	80-060-00403(C. & K. Wodrich)	0.33
	ENBTR	SPt. 51	16.8	80-060-008(R. & I. Orr)	3.47
*	ENBTR	SPt. 51	0.1	80-060-008(R. & I. Orr)	0.01
	ENBTR	NWPt. 51	17.4	80-060-010(J. & R. Baker)	5.47
	ENBTR	Pt.51&Pt. 52	25.4	80-060-011(J. Burtwistle)	9.70
	ENBTR	NW¼ 52	6.1	80-060-013(1068788 Ontario Ltd.)	0.74
	ENBTR	NE¼ 52	16.2	80-060-024(J. & M. Ferguson)	5.14
	ENBTR	SW¼ 53	1.2	80-060-015(S. Peake)	0.15
	ENBTR	Pt.S½ 53	8.1	80-060-024(J. & M. Ferguson)	1.69
	ENBTR	E¼ 53	13.7	80-060-025(1068788 Ontario Ltd.)	5.04
	ENBTR	NWPt. 53	6.0	80-060-016(1000182402 Ontario Inc.)	2.05
	ENBTR	SWPt. 54	8.9	80-060-01601(806433 Ontario Ltd.)	3.04
	ENBTR	NWPt. 54	1.2	80-060-019(1068788 Ontario Ltd.)	0.20
	ENBTR	Pt.N½ 54	10.1	80-060-021-01(806584 Ontario Ltd.)	3.45
	ENBTR	E¼ 54	12.1	80-060-021-01(806584 Ontario Ltd.)	4.13
	ENBTR	WPt. 55	4.7	80-060-019(1068788 Ontario Ltd.)	1.25
	ENBTR	W½E½ 55	20.2	80-060-021-01(806584 Ontario Ltd.)	6.90
	ENBTR	E¼ 55	14.1	80-060-022(J. & M. Ferguson)	4.82
*	ENBTR	Pt.W½ 56	0.55	80-060-035(Cameron Grane & Riggers Inc.)	0.29
	ENBTR	**Pt.W½ 56**	**0.8**	**80-060-03505 PART 1 (756950 Ontario Ltd.)**	**0.27**
	ENBTR	**Pt.W½ 56**	**1.6**	**80-060-03505 PART 2 (756950 Ontario Ltd.)**	**0.56**
	ENBTR	**Pt.E½ 56**	**32.2**	**80-060-033 PART 1 (1068788 Ontario Ltd.)**	**10.75**
	ENBTR	**Pt.E½ 56**	**0.8**	**80-060-033 PART 2 (1068788 Ontario Ltd.)**	**0.28**
	ENBTR	SEPt. 57	15.6	80-060-030(G. Axford)	4.35
	ENBTR	NEPt. 57	6.3	80-060-031(M. Lorenzutti & F. Damico)	2.15
	WNBTR	Pt.NE¼ 49	13.6	80-060-176(Oegema Grains Ltd.)	2.77
*	WNBTR	Pt.NE¼ 49	1.0	80-060-17610(Oegema Grains Ltd.)	0.01
	WNBTR	S½ 50	17.4	80-060-175(Thomas Brothers Produce Inc.)	3.34
	WNBTR	N½ 50	17.0	80-060-174(Thomas Brothers Produce Inc.)	1.95
	WNBTR	SEPt. 51	20.2	80-060-173(Thomas Brothers Produce Inc.)	0.89
				TOTAL ASSESSMENT ON LANDS	88.20 %
	Colonel Talbot Rd.		2.8	City of London	1.90 %
	Orr Drive		2.5	City of London	1.03
	Tempo Road		**0.7**	**City of London**	**1.40**
	Glanworth Drive		**4.5**	**City of London**	**5.80**
				TOTAL ASSESSMENT ON ROADS	10.13 %
				TOTAL ASSESSMENT IN THE CITY OF LONDON	**98.33 %**

GOLD SEAL DRAIN 1998
City of London

CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
MAIN DRAIN-OPEN PORTION (Continued) **Township of Southwold**				
County Road No. 18		0.8	County of Elgin	1.67 %
		TOTAL ASSESSMENT ON ROADS		1.67 %
		TOTAL ASSESSMENT IN TOWNSHIP OF SOUTHWOLD		**1.67 %**
		TOTAL ASSESSMENT FOR MAINTENANCE ON THE MAIN DRAIN-OPEN PORTION		**100.00 %**

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

SCHEDULE 'A' - ALLOWANCES

FOURNIE DRAIN 2023

City of London

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

CON.	LOT	ROLL NUMBER (Owner)	Section 29 Right-of-Way	Section 30 Damages	TOTALS
MAIN DRAIN					
Geographic Westminster					
ENBTR	SW¼ 53	060-015(S. Peake)	$ 930.00	$ 100.00	$ 1,030.00
ENBTR	Pt.54& 55	060-019(1068788 Ontario Ltd.)	370.00	3,660.00	4,030.00
ENBTR	PtS½ 54	060-016-01(806433 Ontario Ltd.)	40.00	210.00	250.00
		Total Allowances	$ 1,340.00	$ 3,970.00	$ 5,310.00
		TOTAL ALLOWANCES ON THE FOURNIE DRAIN 2023			**$ 5,310.00**

SCHEDULE 'B' - COST ESTIMATE

FOURNIE DRAIN 2023

City of London

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

ALLOWANCES

Allowances under Sections 29 & 30 of the Drainage Act	$	5,310.00

CONSTRUCTION

Mobilization of equipment	$	2,000.00
Remobilization of equipment to open channel once seeding has established and backfill	$	2,000.00
Clearing and grubbing including disposal	$	3,000.00
Install and maintain sediment and erosion control measures	$	800.00
Construct temporary crossing using 900mm pipe or larger including removal during backfill	$	2,500.00
18.0 meters of 450mm aluminized C.S.P. 2.0mm thickness		
Supply	$	1,800.00
Construct access laneway/ramp including supply and compaction of Granular 'A'	$	2,200.00
Strip, stockpile topsoil from new ditch area and area to be regraded and haul and deposit at existing ditch (8200 m²)	$	10,250.00
212 meters of open ditch construction and cut adjacent area on west side of existing ditch (Approx. 7100 m³ excavation)	$	52,500.00
Scarify ditch banks and apply Flexterra HP-FGM bonded fibre on ditch banks (approx. 2850 m²)	$	14,250.00
Hand seeding of buffer strip (approx. 450 m²)	$	900.00
Backfill existing ditch (Approximately 210m length - 3800 m³)	$	39,550.00
Redistribution of topsoil on area outside of ditch and final grading upon completion (Approx. 6900 m²)	$	10,350.00
Supply and place N.A.G. C350 Turf Reinforcement Mat on seeded bank with quarry stone rip-rap bank protection		
(Approx. 160 m² NAG C-350 TRM required)	$	6,400.00
(Approx. 77 m³ quarry stone required)	$	21,180.00
Backfill washouts, supply and place quarry stone rip-rap protection (with filter blanket) on ditch slopes as rock chutes		
(Approx. 14.0 m³ quarry stone required)	$	3,850.00

SCHEDULE 'B' - COST ESTIMATE (cont'd)

FOURNIE DRAIN 2023
City of London

CONSTRUCTION (cont'd)

Haul excess excavated material to adjacent area as specified on drawings and level including grading (3400 m^3)	$	34,000.00
Contract security financing	$	2,960.00
Contingencies	$	9,000.00
Contingency for OLS to re-establish property bars	$	3,000.00

ADMINISTRATION

Net Harmonized Sales Tax	$	6,600.00
Survey, Plan and Final Report	$	61,000.00
Expenses	$	1,000.00
Review of Construction Drawings	$	13,600.00
Supervision and Updating Final Construction Details	$	35,000.00
TOTAL ESTIMATED COST	**$**	**345,000.00**

SCHEDULE ' C ' - ASSESSMENT FOR FUTURE MAINTENANCE

FOURNIE DRAIN 2023

City of London

Original Schedule Feburary 6 1969
Job No. 220278 Revised by Sect. 65 December 20, 2023

** = Non-agricultural*

	CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
MAIN DRAIN - OPEN PORTION							
	Geographic Westminster						
	WNBTR	**Pt. 57**	**1.2**	**060-156(London Valley IV Inc.)**	**$**	**$ 8.00**	**$ 8.00**
	WNBTR	**Pt. 57**	**0.59**	**060-158(D. & M. Coleman)**		**4.00**	**4.00**
	WNBTR	**N½ 56**	**2.8**	**060-159(806433 Ontario Ltd.)**		**19.00**	**19.00**
	WNBTR	**Pt.S½ 56**	**2.5**	**060-161(Dauntless ULC)**		**16.00**	**16.00**
*	WNBTR	Pt.S½ 56	0.22	060-160(R. & D. Backes)		1.00	1.00
	WNBTR	**55**	**23.4**	**060-162(C. & J. & J. M. Ferguson)**		**113.00**	**113.00**
	WNBTR	Pt 54	30.3	060-167-01(646808 Ontario Limited)			
	WNBTR			combined with 050-181 & 050-167-01 in Midd. Cent.		146.00	146.00
*	**WNBTR**	**Pt 54**	**0.11**	**060-017(The Hastings Mill Inc.)**		**2.00**	**2.00**
*	**WNBTR**	**Pt 54**	**0.10**	**060-168(Rose Chapel Inc)**		**2.00**	**2.00**
*	**WNBTR**	**Pt53& 54**	**7.5**	**060-164(Stone Ridge Travel Centre Inc.)**		**41.00**	**41.00**
	WNBTR	WPt. 53	0.80	050-181 (646808 Ontario Ltd.) Midd. Cent.		4.00	4.00
	WNBTR	53	27.3	060-166(J. & C. Burtwistle)	567.00	145.00	712.00
	WNBTR	Pt. 53	19.3	North Part of 050-167-02(JNC AG Capital Inc.) Midd. Cent.		99.00	99.00
	WNBTR	Pt. 52	3.2	South Part 050-167-02 & Part 050-167 Midd. Cent.		16.00	16.00
	WNBTR	Pt. 52	2.0	050-179 (JNC AG Capital Inc.) Midd. Cent.		10.00	10.00
	WNBTR	N½ 52	20.6	060-170(J. & E. Burtwistle)	683.00	104.00	787.00
	WNBTR	PtN½ 52	1.0	060-169(1886966 Ont. Ltd)		9.00	9.00
	WNBTR	S½ 52	25.5	060-171(C. &. D. Carrothers)	870.00	123.00	993.00
	WNBTR	N½ 51	31.0	060-172(S. Peake)	990.00	124.00	1,114.00
	WNBTR	S½ 51	25.8	060-173(Thomas Brothers Produce Inc.)	855.00	78.00	933.00
	ENBTR	NPt. 57	1.0	060-040(London Valley 11 Inc.)		7.00	7.00
*	**ENBTR**	**Pt.S½ 57**	**0.0**	**060-038(M. Catulli)**			
	ENBTR	**Pt.S½ 57**	**11.1**	**060-039-01(2533430 Ontario Inc.)**		**74.00**	**74.00**
	ENBTR	**Pt.S½ 57**	**3.0**	**060-039-02(Shogun Maitake Property)**		**20.00**	**20.00**
	ENBTR	**Pt.S½ 57**	**1.0**	**060-030(G. Axford)**		**7.00**	**7.00**
*	**ENBTR**	**NWPt. 56**	**8.0**	**060-037(2726064 Ontario Inc.)**		**52.00**	**52.00**
*	ENBTR	Pt. 56	11.9	060-036(Associated Materials Canada Ltd.)		78.00	78.00
*	**ENBTR**	**Pt. 56**	**4.37**	**060-034(All Makes Logistics Intermodal Freight Services Inc.)**		**34.00**	**34.00**
*	**ENBTR**	**Pt. 56**	**1.88**	**060-035-05 PART 1(756950 Ontario Ltd.)**		**12.00**	**12.00**
*	**ENBTR**	**Pt. 56**	**0.53**	**060-035-05 PART 2(756950 Ontario Ltd.)**		**3.00**	**3.00**
*	**ENBTR**	**Pt. 56**	**1.71**	**060-035(Cameron Grane & Riggers)**		**31.00**	**31.00**
*	**ENBTR**	**Pt.54& 55**	**3.3**	**060-018(IBEW Local 120 Bld. Corp.)**		**13.00**	**13.00**
	ENBTR	**Pt.54& 55**	**36.6**	**060-019(1068788 Ontario Ltd.)**	205.00	**83.00**	**288.00**
	ENBTR	**PtS½ 54**	**17.6**	**060-016-01(806433 Ontario Ltd.)**	**30.00**	**95.00**	**125.00**
	ENBTR	**Pt.N½ 53**	**24.2**	**060-016 (1000182402 Ontario Inc.)**	**122.00**	**125.00**	**247.00**
*	ENBTR	NWPt 53	2.0	060-014(Henry Wall Holdings Inc.)		10.00	10.00

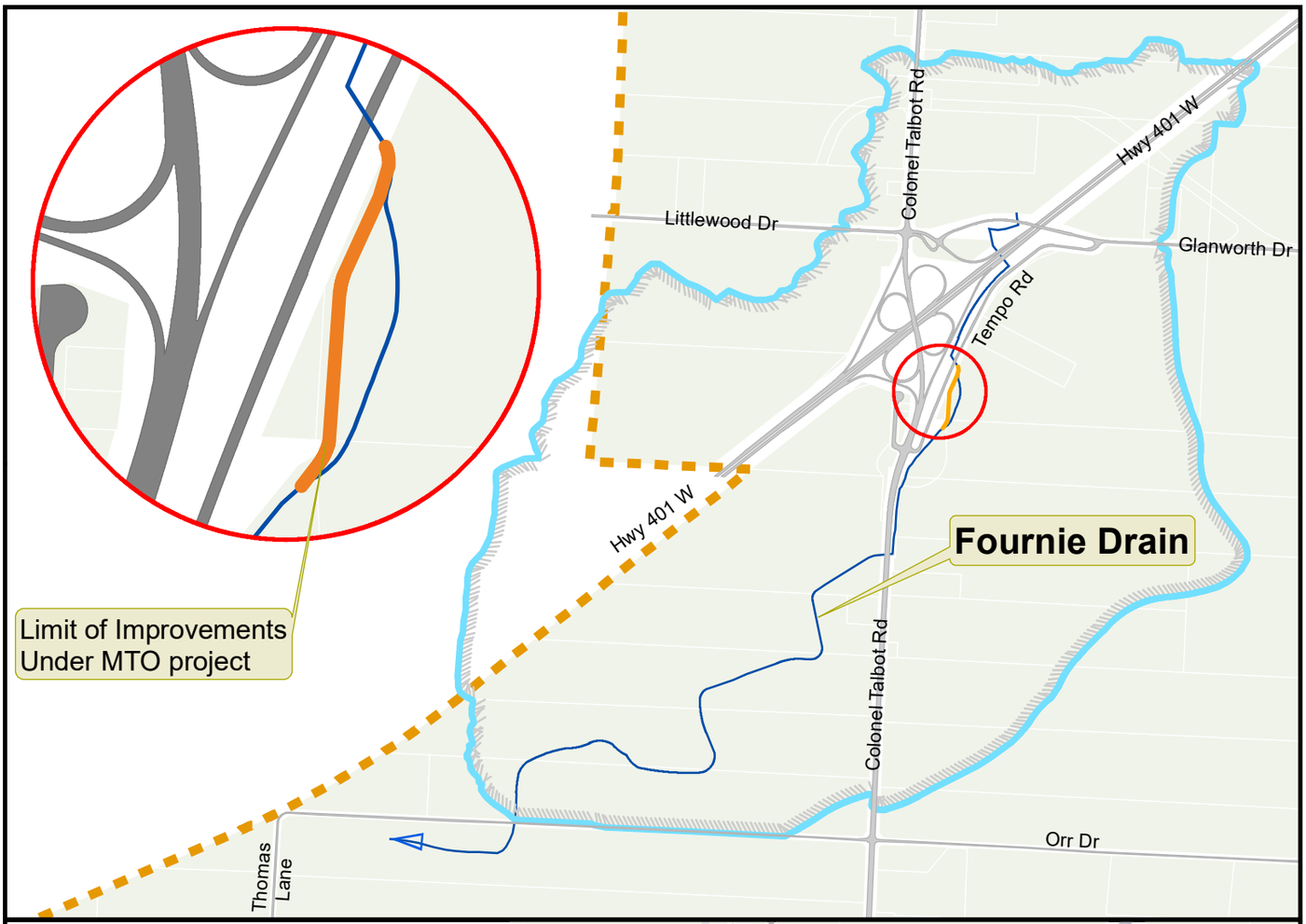
SCHEDULE ' C ' - ASSESSMENT FOR FUTURE MAINTENANCE (Cont'd)

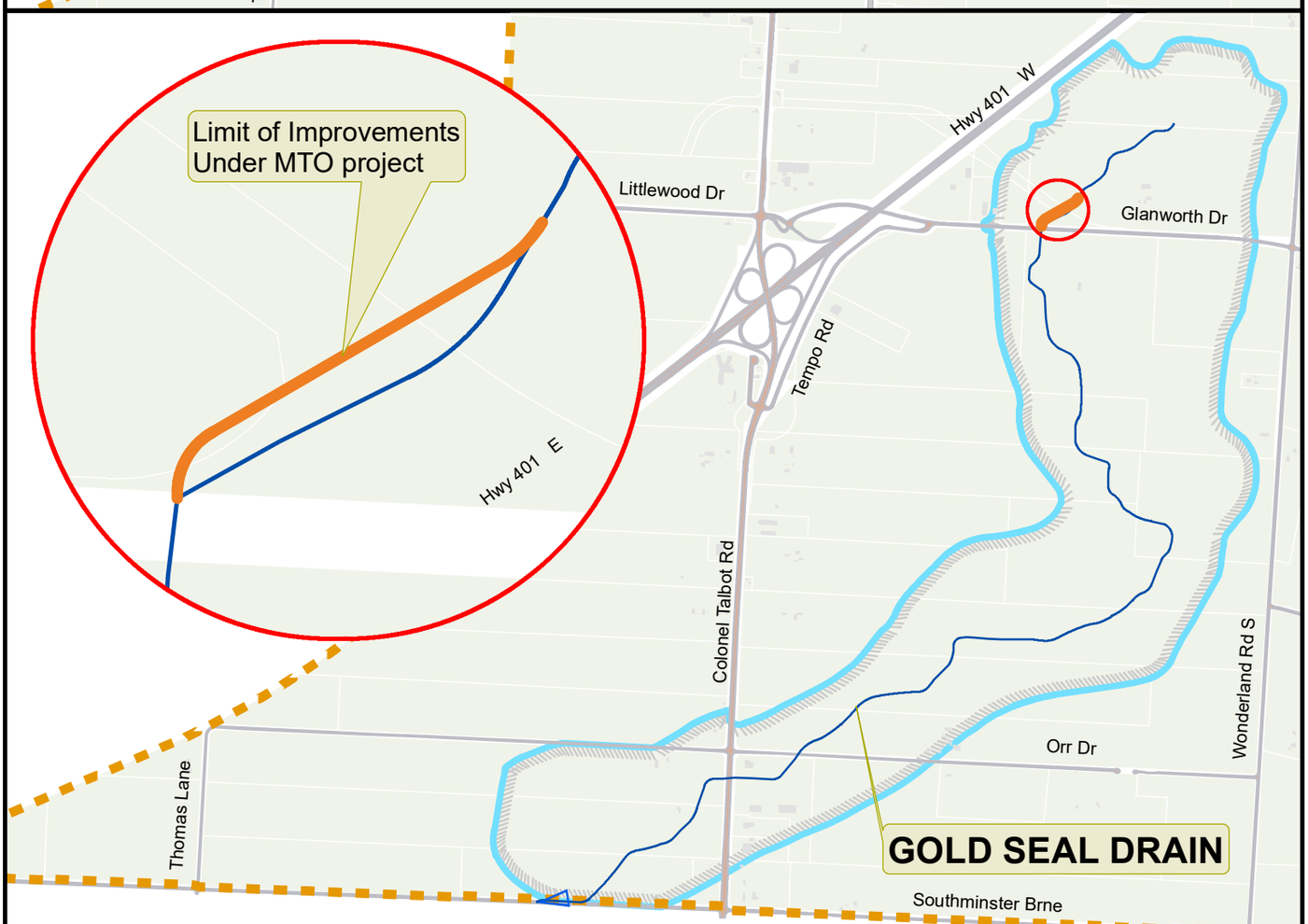
FOURNIE DRAIN 2023
City of London

** = Non-agricultural*

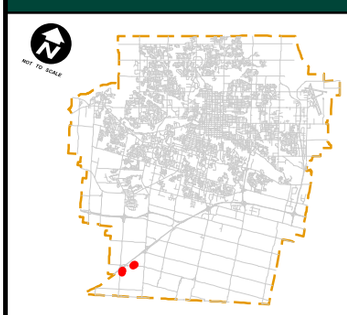
	CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
MAIN DRAIN - OPEN PORTION (cont'd)							
	Geographic Westminster						
	ENBTR	SW¼ 53	17.7	060-015(S. Peake)		88.00	88.00
	ENBTR	Pt.52& 53	2.0	060-024(J. & M. Ferguson)		10.00	10.00
*	ENBTR	Pt 52	0.2	060-012(T. & H. Bramley)		3.00	3.00
	ENBTR	NW¼ 52	14.0	060-013(1068788 Ont. Ltd.)		69.00	69.00
	ENBTR	S½ 52	10.5	060-011(J. Burtwistle)		49.00	49.00
	ENBTR	NPt. 51	6.1	060-010(J. & R. Baker)		28.00	28.00
	ENBTR	**SPt. 51**	**0.7**	**060-008(L. & I. Orr)**		**3.00**	**3.00**
				TOTAL ASSESSMENT ON LANDS	$ 4,322.00	$ 1,958.00	$ 6,280.00
	Orr Drive		**0.6**	**City of London**	**$**	**$ 3.00**	**$ 3.00**
	Littlewood Dr.		**0.3**	**City of London**		**5.00**	**5.00**
	Old Litlewood Dr.		**0.9**	**City of London**		**17.00**	**17.00**
	Col. Talbot Road		**2.3**	**City of London**		**61.00**	**371.00**
	Col. Talbot Road		**4.6**	**Ontario Ministry of Tansportation**	**310.00**	**122.00**	**122.00**
	Glanworth Drive		**4.1**	**City of London**		**82.00**	**82.00**
	Burtwistle Lane		**0.8**	**City of London**		**12.00**	**12.00**
	Tempo Road		**5.7**	**City of London**	**133.00**	**112.00**	**245.00**
	Highway 401		**50.0**	**Ontario Ministry of Tansportation**	**792.00**	**983.00**	**1,775.00**
				TOTAL ASSESSMENT ON ROADS	$ 1,235.00	$ 1,397.00	$ 2,632.00
				TOTAL ASSESSMENT ON THE FORUNIE DRAIN 1969			**$ 8,912.00**

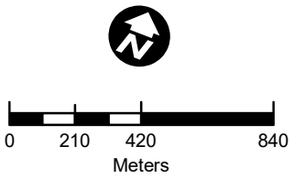
Properties in bold have been revised under Section 65 of the Drainage Act





APPENDIX 'C' - LIMITS OF WORK - FOURNIE DRAIN AND GOLD SEAL DRAIN





Legend

- City of London Limits
- Parcels
- Water body
- Drain Catchment Area

Map Produced by JCh
Stormwater Engineering
Printed: January 2024

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