

BARAN DRAIN 2023
Municipality of Strathroy-Caradoc



SPRIET
ASSOCIATES
ENGINEERS & ARCHITECTS
155 York Street
London, Ontario N6A 1A8
Tel. (519) 672-4100
Fax (519) 433-9351
Email: mail@spriet.on.ca
www.spriet.on.ca

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BARAN DRAIN 2023

Municipality of Strathroy-Caradoc

To the Mayor and Council of
The Municipality of Strathroy-Caradoc

Mayor and Council:

We are pleased to present our report on the reconstruction of the Baran Municipal Drain serving parts of Lots 3 and 4, Concessions 3 and 4 in the Municipality of Strathroy-Caradoc. The total watershed area contains approximately 19 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 Baran Drain was originally constructed pursuant to a report submitted by A. J. Devos, P. Eng. dated August 16, 1971 and consisted of a tile drain extending from an outlet in the Government Drain No. 1 in the east half of Lot 3, Concession 3, north-westerly into Lot 4, then north-westerly across Falconbridge Drive, and then northerly into the west half of Lot 4, to its head at the half lot line.

EXISTING DRAINAGE CONDITIONS

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

- that there is ponding in the upper portion of the drain on the north side of Falconbridge Drive
- that the existing drain is too shallow for today's standards and is in poor working condition, old, and not working satisfactorily
- that several gasmains have been installed in the area of Falconbridge Drive



EXISTING DRAINAGE CONDITIONS (cont'd)

A field investigation and survey were completed. Upon reviewing our findings, including discussion with the owners, we note the following:

- that the existing drain is quite shallow in places and not providing proper drainage
- that several gas mains now exist with one in conflict with respect to elevation compared with the existing drain
- that the Government Drain No. 1 to the southwest of the Baran Drain has been relocated to go around the Hydro transformer site which results in it being within 150 meters of the Baran Drain near Falconbridge Drive
- that a portion of the watershed in the east half of Lot 4, Concession 4 has been diverted northerly to the Cobban Drain
- that the owner of the property downstream of Falconbridge Drive indicated it would be more efficient and requested to install the new drain to head southwest parallel to Falconbridge Drive to outlet into the relocated Government No. 1 Drain which would result in a much shorter drain
- that there would be significant cost to lower the drain downstream of the gas mains to accommodate the conflict in grade
- that the alternative of shifting the location of the drain south-westerly from where it crosses the gas mains to avoid the conflict in grade may be more cost effective

Preliminary design, cost estimates, and assessments were prepared and an informal public meeting was held to review the findings and preliminary proposals. Further input and requests were provided by the affected owners at that time and at later dates.

DESIGN CRITERIA AND CONSIDERATIONS

The Drainage Coefficient method contained in the "DRAINAGE GUIDE FOR ONTARIO", Publication 29 by the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) is typically used to design municipal drains. The Drainage Coefficient defines a depth of water that can be removed in a 24-hour period and is expressed in millimetres per 24 hours. The coefficient used to design this drain with respect to capacity was 38mm per 24 hrs.

We would like to point out that there have been indications of sandy and unstable soil conditions. It should be noted that no formal soil investigation has been made, with this information being provided by the owners and soil mapping.

The proposed design and report have been generally completed using the "GUIDE FOR ENGINEERS WORKING UNDER THE DRAINAGE ACT IN ONTARIO" OMAFRA Publication 852.

RECOMMENDATIONS

We are therefore recommending the following:

- that the existing Baran Drain be replaced with a new 200mm to 375mm pipe, including related appurtenances
- that the existing portions downstream and upstream of the proposed drain be officially abandoned as municipal drains under Section 19 of the Drainage Act. The owners may maintain the intact portions as private header tiles if they so wish
- that the existing portion being replaced be destroyed or abandoned from Municipal status
- that catchbasins be installed at various locations on the proposed drains to allow direct surface water entry into the tiles and thereby reduce surface flow and erosion

Due to the indications of poor soil conditions, for any areas with concrete tiles our design includes the wrapping of tile joints with geotextile and a contingency allowance for crushed stone bedding wrapped with geotextile where and if necessary. These areas are typically identified at the time of construction but may only become apparent after construction is completed. In this case, the extra costs for removal and reinstallation on stone bedding would be an extra to the project and if already billed become a supplementary billing.

It is recommended that basement, cellar, or crawlspace drains be directed to a sump and then discharged onto the ground surface well away from foundations and septic systems or should owners desire to connect these drains to the new outlet drain, then it is suggested that they not be directly connected to the drains. Rather it is suggested that such a connection be made by an indirect method such as by sump pump with an open-air connection such as a mini-catchbasin, crushed stone filled excavation connected to a storm P.D.C. and should include a check valve and be piped above foundation level. It is noted that there is still a risk of flooding even with indirect methods of connection and any/all responsibility shall be borne by the owner. Downspouts from eavestroughs should be directed onto the ground surface well away from foundations and septic systems and are **not** permitted to be connected to the Municipal Drain.

ENVIRONMENTAL CONSIDERATIONS AND MITIGATION MEASURES

Based on the information available, there are no significant wetlands, sensitive areas, or endangered species along the route of the drains. The proposed construction of the Baran Drain includes quarry stone outlet protection and surface inlets which help reduce any subsequent erosion. A temporary flow check of silt fencing is to be installed in the ditch downstream of the tile outlet for the duration of the construction.

SUMMARY OF PROPOSED WORK

The proposed work consists of approximately 474 lineal meters of 200mm to 375mm pipe and sewer pipe including related appurtenances.



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 Construction.

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 \$160,100.00. This estimate includes engineering and administrative costs associated with this project.

Schedule 'C' - Assessment for Construction. This schedule outlines the distribution of the total estimated cost of construction over the roads and lands which are involved.

Drawing No. 1, Job No. 222064 and specifications 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 \$5,500.00/ha.

This base rate is multiplied by the hectares derived from the working widths shown on the plans and the applicable lengths.

ASSESSMENT DEFINITIONS

In accordance with the Drainage Act, lands that make use of a drainage works are liable for assessment for part of the cost of constructing and maintaining the system. These assessments are known as benefit, outlet liability and special benefit as set out under Sections 22 and 23 of the Act.

SECTION 22

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

Special Benefit is assessed to lands for which some additional work or feature has been included in the construction repair or improvement of a drainage works. The costs of such work are separated and assessed independently from the regular work.



ASSESSMENT DEFINITIONS (cont'd)

Benefit By Cut-Off is assessed to lands or roads which obtain relief from surface and/or sub-surface drainage onto or through their lands by the diversion of said surface and/or sub-surface drainage into another watershed.

SECTION 23

Outlet liability is assessed to lands or roads that may make use of a drainage works as an outlet either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek, or watercourse.

In addition, a Public Utility or Road Authority shall be assessed for and pay all the increased cost to a drainage works due to the construction and operation of the Public Utility or Road Authority. This may be shown as either benefit or special assessment.

ASSESSMENT

A modified "Todgham Method" is typically used to calculate the assessments shown on Schedule 'C'- Assessment for Construction. This entails breaking down the costs of the drain into sections along its route where warranted and then extracting Special Assessments and Special Benefit Assessments from each section.

The remainder is then separated into Benefit and Outlet Assessments. The Benefit is distributed to those properties receiving benefit as defined under "Assessment Definitions", with such properties usually being located along or close to the route of the drain. The Outlet is distributed to all properties within the watershed area of that section on an adjusted basis. The areas are adjusted for location along that section and relative run-off rates. Due to their different relative run-off rates forested lands are assessed for outlet at lower rates than cleared lands. Also, roads and residential properties are assessed for outlet at higher rates than cleared farmlands.

The actual cost of the work involving this report, with the exception of Special Assessments, is to be assessed on a pro-rata basis against the lands and roads liable for assessment for benefit and outlet as shown in detail on Schedule 'C' - Assessment for Construction. The Special Assessments shall be levied as noted in the Section "Special Assessment".

The cost to restore water supply for any well determined to be impacted by any construction covered under this report shall become part of this report and be pro-rated with the costs provided for in this report.



SPECIAL ASSESSMENT

In accordance with Section 26 of the Drainage Act, a Special Assessment has been made against the Municipality of Strathroy-Caradoc being the increased cost to the drainage work for installing a sewer pipe across their road allowance, due to the construction and operation of Falconbridge Drive. The Special Assessments shall be made up of the actual cost of this work and both the final and estimated values of the Special Assessment are to be calculated as follows:

Drain Crossing	Cost of Work	Less Equivalent Drain Cost (Fixed)	Plus Administration Cost	Plus Interest, Contract Security, & Net H.S.T.	Special Assessment
Falconbridge	\$11,140.00	\$1,300.00	\$3,200.00	\$720.00	\$13,760.00

In accordance with Section 26 of the Drainage Act, a Special Assessment has been made against Enbridge for the cost of locating and determining the elevation of their gas mains as well as the engineer's cost for assessment and relocating the drain, being the increased cost to the drainage works due to the construction and operation of their utilities. The Special Assessment shall be as shown on Schedule 'C'.

In accordance with Section 26 of the Drainage Act, a pro-rateable Special Assessment has been made against Enbridge for the increased cost to the drain for the additional length and cost of sewer pipe along the Falconbridge Drive right-of-way.

In accordance with Section 26 of the Drainage Act, Special Assessments have been made against Enbridge being the increased cost to the drainage work for installing sewer pipes across the gas mains. These Special Assessments shall be made up of the actual cost of this work and both the final and estimated values of the Special Assessment are to be calculated as follows:

Crossing	Cost of Work	Less Equivalent Drain Cost (Fixed)	Plus Administration Cost	Plus Interest, Contract Security, & Net H.S.T.	Special Assessment
North	\$11,000.00	\$380.00	\$2,550.00	\$720.00	\$13,890.00
South (2 pipes)	\$12,480.00	\$1,330.00	\$2,550.00	\$770.00	\$14,470.00

In accordance with Section 26 of the Drainage Act, a Special Assessment has been made against the Enbridge being the increased cost to the drainage work for the increased cost of installing a surface culvert under Falconbridge Drive due to relocating the drain to the west to avoid an elevation conflict with the existing gasmain. The Special Assessment shall be made up of the actual cost of this work and both the final and estimated values of the Special Assessment are to be calculated as follows:

Crossing	Cost of Work	Plus Administration Cost	Plus Interest, Contract Security, & Net H.S.T.	Special Assessment
Culvert	\$9,300.00	\$1,700.00	\$610.00	\$11,610.00

If any additional work is required to the drainage works due to the existence of buried utilities such as gas/water/oil pipelines, communications cables, etc. or if any of the utilities require relocation or repair, then, the extra costs incurred shall be borne by the utility involved in accordance with the provisions of Section 26 of the Drainage Act.

GRANTS

In accordance with the provisions of Section 85 of the Drainage Act, a grant **may** be available for assessments against privately owned parcels of land which are used for agricultural purposes and eligible for the Farm Property Class Tax rate. Section 88 of the Drainage Act directs the Municipality to make application for this grant upon certification of completion of this drain. The Municipality will then deduct the grant from the assessments prior to collecting the final assessments.

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. This includes tree roots penetrating tiles from trees planted by owners or naturally occurring.

After completion, the Baran Drain 2023 shall be maintained by the Municipality of Strathroy-Caradoc at the expense of all upstream lands and roads assessed in Schedule 'C' - Assessment for Construction and in the same relative proportions.

Special Assessments shall **not** be pro-rated for future maintenance purposes but shall be applied as an actual cost special if part of the maintenance with the exception that the pro-rateable Special Assessment shall be included.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED



G. A. Vereyken, P. Eng.



MPD:ms



SCHEDULE 'A' - ALLOWANCES

BARAN DRAIN 2023

Municipality of Strathroy-Caradoc

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
3	Pt. 2 & 3	014-040-131(Hydro One Networks Inc.)	\$ 180.00	\$ 220.00	\$ 400.00
3	Pt. 3	014-040-134 (G. B. Lockwood)	1,700.00	2,080.00	3,780.00
3	Pt. NW¼ 4	014-040-126 (Hydro One Networks Inc.)	70.00	90.00	160.00
4	Pt. SW¼ 4	014-040-125 (J. Beintema)	1,320.00	1,610.00	2,930.00
4	Pt. SW¼ 4	014-040-124 (N. Heggarty)	730.00	890.00	1,620.00
Total Allowances			\$ 4,000.00	\$ 4,890.00	\$ 8,890.00
TOTAL ALLOWANCES ON THE BARAN DRAIN 2023					\$ <u>8,890.00</u>

SCHEDULE 'B' - COST ESTIMATE

BARAN DRAIN 2023

Municipality of Strathroy-Caradoc

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

CONSTRUCTION

Mobilization of equipment	\$	1,200.00
Supply & install rodent grate on 375mm dia., and supply and install quarry stone rip-rap rip-rap protection around pipe and end of ditch (Approximately 2m ³ quarry stone req'd)	\$	800.00
Installation of the following perforated coilable double wall plastic pipe with filter sock and pipe (with rubber gaskets) including geotextile around joints and supply & installation and compaction of crushed stone bedding and filter cloth for pipe and installation of coilable pipe with an approved drainage plow		
24 meters of 200mm dia. sewer pipe as stub	\$	1,800.00
78 meters of 200mm dia. double wall plastic pipe (perforated)	\$	1,640.00
70 meters of 250mm dia. double wall plastic pipe (perforated)	\$	1,680.00
39 meters of 300mm dia. concrete tile	\$	2,930.00
17 meters of 350mm dia. concrete tile	\$	1,280.00
60 meters of 375mm dia. sewer pipe	\$	6,000.00
180 meters of 375mm dia. double wall plastic pipe (perforated)	\$	9,700.00
Supply of the above listed tile/pipe	\$	22,280.00
Contingency Allowance to install the new tile immediately adjacent to the existing tile and destroying the existing tile with a rubber tired backhoe afterwards (See General Notes on Drawings) (Approx. 262 meters)	\$	1,050.00
Installation of the following PVC SDR 35 sewer pipe (with rubber gaskets) across Enbridge pipe lines by open cut including supply and installation of bedding and backfill materials and two Fernco Couplers		
4.0 meters of 375mm dia. sewer pipe PVC SDR 35 over pipeline	\$	4,000.00
Supply of the above listed tile	\$	5,500.00
Supply and install 50mm HL polystyrene insulation between gasmain and pipe	\$	1,500.00
Installation of the following HDPE sewer pipe (with rubber gaskets) across Enbridge pipe lines by open cut including supply and installation of bedding and backfill materials		
14.0 meters of 375mm dia. HDPE sewer pipe under pipelines	\$	8,500.00
Supply of the above listed tile	\$	980.00
Supply and install 50mm HL polystyrene insulation between gasmain and pipe	\$	3,000.00
12.0 meters of 375mm sewer pipe		
Supply	\$	840.00
Installation under Falconbridge Road by open cut	\$	4,800.00
Restoration of Paved Surface	\$	5,500.00

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

BARAN DRAIN 2023
Municipality of Strathroy-Caradoc**CONSTRUCTION (cont'd)**

12.0 meters of 300mm dia. 2.0mm thickness aluminized C.S.P.		
Supply		\$ 550.00
Installation under Falconbridge Road by open cut		\$ 2,750.00
Destroy existing subsurface pipe in road right of way		\$ 1,500.00
Restoration of Paved Surface		\$ 4,500.00
Sta. 0+365 - Restore laneway with Granular 'A'		\$ 800.00
Supply and install two 600mm x 600mm ditch inlet catchbasin and one 600mm x 600mm standard catchbasin, including grates, leads and removal and disposal of existing catchbasins		\$ 6,400.00
Clearing and grubbing		\$ 800.00
Exposing and locating existing tile drains	(report)	\$ 1,210.00
	(construction)	\$ 520.00
Exposing and locating existing utilities	(report)	\$ 4,440.00
	(construction)	\$ 1,200.00
Tile connections as noted on plan		\$ 1,300.00
Contract security financing		\$ 1,660.00
Tile connections and contingencies		\$ 2,000.00
Allowances under Sections 29 & 30 of the Drainage Act		\$ 8,890.00

ADMINISTRATION

Conservation Authority Review Fee		\$ 300.00
Interest and Net Harmonized Sales Tax		\$ 5,853.00
Survey, Plan and Final Report		\$ 22,184.00
Expenses		\$ 1,463.00
Supervision and Final Inspection		\$ <u>6,800.00</u>

TOTAL ESTIMATED COST **\$ 160,100.00**

SCHEDULE 'C' - ASSESSMENT FOR CONSTRUCTION

BARAN DRAIN 2023

Municipality of Strathroy-Caradoc

Job No. 222064

October 6, 2023

* = Non-agricultural

CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
CONSTRUCTION						
*	3	Pt. 2 & 3	014-040-131(Hydro One Networks Inc.)	\$ 340.00	\$	\$ 340.00
	3	Pt. 3	1.8 014-040-134 (G. B. Lockwood)	13,190.00	1,788.00	14,978.00
	3	Pt. NW¼ 4	2.6 014-040-134-02 (1666039 Ontario Inc.)	3,715.00	3,152.00	6,867.00
*	3	Pt. NW¼ 4	3.3 014-040-133 (2386395 Ontario Inc.)		4,577.00	4,577.00
	3	NE¼ 4	1.1 014-040-135 (CJVA Farms Ltd.)		1,849.00	1,849.00
*	4	S½ 3	0.6 014-040-126 (Hydro One Networks Inc.)	1,860.00	1,000.00	2,860.00
*	4	Pt. SW¼ 4	2.7 014-040-125 (J. Beintema)	12,893.00	5,607.00	18,500.00
*	4	Pt. SW¼ 4	4.7 014-040-124 (N. Heggarty)	7,920.00	11,093.00	19,013.00
	4	SE¼ 4	1.0 014-040-123 (B. & J. Piskorowski)		1,666.00	1,666.00
TOTAL ASSESSMENT ON LANDS				\$ 39,918.00	\$ 30,732.00	\$ 70,650.00
* Falconbridge Drive				\$ 9,500.00	\$ 6,700.00	\$ 16,200.00
TOTAL ASSESSMENT ON ROADS				\$ 9,500.00	\$ 6,700.00	\$ 16,200.00
SPECIAL ASSESSMENT against the Municipality of Strathroy-Caradoc for the increased cost of installing a 375mm (15") sewer pipe under Falconbridge Drive						\$ 13,760.00
SPECIAL ASSESSMENT against the Enbridge Gas for the increased of locating and exposing three gasmains along Falconbridge Drive including relocating when rerouting the drain						\$ 9,850.00
SPECIAL ASSESSMENT against the Enbridge Gas for the increased cost of installing sewer pipe over and under their gasmains due to operation of three gasmains along Falconbridge Drive						\$ 28,360.00
SPECIAL ASSESSMENT against the Enbridge Gas for the increased cost to the drain due to additional length required and engineering redesign due to their operation of three gasmains along Falconbridge Drive (prorateable)						\$ 9,670.00
SPECIAL ASSESSMENT against the Enbridge Gas for the increased cost of a surface culvert installation under Falconbridge Drive to accommodate reroute the municipal drain to accommodate crossing their gasmains due to the operation of three gasmains along Falconbridge Drive						\$ 11,610.00
TOTAL ASSESSMENT ON THE BARAN DRAIN 2023						\$ 160,100.00

SCHEDULE OF NET ASSESSMENT

BARAN DRAIN 2023

Municipality of Strathroy-Caradoc

Job No. 222064

October 6, 2023

* = *Non-agricultural*

ROLL NUMBER (OWNER)	TOTAL ASSESSMENT	GRANT	ALLOWANCES	APPROX. NET
* 014-040-131(Hydro One Networks Inc.)	\$ 340.00	\$	\$ 400.00	\$ -60.00
014-040-134 (G. B. Lockwood)	14,978.00	4,993.00	3,780.00	6,205.00
014-040-134-02 (1666039 Ontario Inc.)	6,867.00	2,289.00		4,578.00
* 014-040-133 (2386395 Ontario Inc.)	4,577.00			4,577.00
014-040-135 (CJVA Farms Ltd.)	1,849.00	616.00		1,233.00
* 014-040-126 (Hydro One Networks Inc.)	2,860.00		160.00	2,700.00
* 014-040-125 (J. Beintema)	18,500.00		2,930.00	15,570.00
* 014-040-124 (N. Heggarty)	19,013.00		1,620.00	17,393.00
014-040-123 (B. & J. Piskorowski)	1,666.00	555.00		1,111.00
* Falconbridge Drive	\$ 16,200.00	\$	\$	\$ 16,200.00
* Non-Prorated Special Assessment	13,760.00			13,760.00
* Enbridge Gas				
* Non-Prorated Special As. - Crossings	\$ 28,360.00	\$	\$	\$ 28,360.00
* N.P. Sp.As. - Locating and Exposing	9,850.00			9,850.00
* Non-Prorated Special As. - Culvert	11,610.00			11,610.00
* Prorateable Assessment	9,670.00			9,670.00
	\$ 160,100.00	\$ 8,453.00	\$ 8,890.00	\$ 142,757.00