

# **BOERSMA - BURWELL ROAD DRAIN 2023**

**Municipality of Strathroy-Caradoc**



**SPRIET  
ASSOCIATES**

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London, Ontario  
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## **BOERSMA - BURWELL ROAD 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 construction of the Boersma - Burwell Road 2023 Municipal Drain serving parts of Lots 6 and 7, Concession E.M.R. and parts of Lots 17 and 18, Concessions 2 and 3 S.L.R. (geographic Caradoc) in the Municipality of Strathroy-Caradoc.

### **AUTHORIZATION**

This report was prepared pursuant to Section 4 of the Drainage Act. Instructions were received from your Municipality with respect to a motion of Council. The work was initiated by a petition signed by the owners whose lands contain over 60 percent of the area requiring drainage.

### **DRAINAGE AREA**

The total watershed area as described above contains approximately 31.7 hectares. The area requiring drainage is described as the east parts of Lot 6 and 7, Concession E.M.R., and the east part of Lot 17 and part of the west half of Lot 18 in Range 2 S.L.R. and part of Lot 17 in Range 3 S.L.R.

### **EXISTING DRAINAGE CONDITIONS**

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

- that the area is presently served by a private main tile that does not provide a proper drainage outlet
- that the petitioning owners requested that a new Municipal Drain be constructed to replace the existing private tile

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

- that the affected watershed does not have a legal sub-surface or surface drain and is relying on an aging private tile
- that the existing tile is undersized by today's standards but in poor working condition



## EXISTING DRAINAGE CONDITIONS (cont'd)

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:

- they requested the use of a sealed sewer pipe in certain locations to accommodate future tree growth
- that the existing private tile be left in place where possible

## 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 no indications of any adverse soil conditions. It should be noted that no formal soil investigation has been made, with this information being provided by the owners.

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 a new closed drain, to be known as the Boersma - Burwell Road Drain 2023, and consisting of 200mm to 375mm concrete tile and sewer pipe, including related appurtenances, be constructed to provide a proper surface and sub-surface drainage outlet
- 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

Our design includes the wrapping of tile joints with geotextile to prevent the incursion of fine soil particles into the drain. If areas of poor soil are encountered at the time of construction, it may become necessary to install the tile on crushed stone bedding wrapped with geotextile or substitute plastic filter tile through such areas. The additional costs of such work would be an extra to the project. 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.

## RECOMMENDATIONS (cont'd)

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 Boersma - Burwell Road Drain 2023 includes quarry stone outlet protection and surface inlets which greatly help reduce the overland surface flows and 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 1,242 lineal meters of 200mm to 375mm concrete field tile and HDPE 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 \$191,600.00. 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. 222155 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

**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.

For tile drains where the owners will be able to continue to use the land, the allowance provides for the right to enter upon such lands, and at various times for the purpose of inspecting such drain, removing obstructions, and making repairs. Also, the allowance provides for the restrictions imposed on those lands to protect the right-of-way from obstruction or derogation. The amounts granted for right-of-way on tile drains is based on a percentage of the value of the land designated for future maintenance. Therefore, the amounts granted are based on \$9,000.00/ha. through cropped lands. This value is multiplied by the hectares derived from the width granted for future maintenance and the applicable lengths.

**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 for closed drains installed with a wheel machine.

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.

### 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. Special Assessments and Special Benefit Assessments are then extracted 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 below and 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, Special Assessments have been made against the Municipality of Strathroy-Caradoc being the increased cost to the drainage work for installing a 375mm sewer pipe across their road allowance on the Main Drain, due to the construction and operation of Burwell Road and Reily 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        | Cost of Work | Less Equivalent Drain Cost (Fixed) | Plus Administration Cost | Plus Interest, Contract Security, & Net H.S.T. | Special Assessment |
|--------------|--------------|------------------------------------|--------------------------|--|--------------------|
| Burwell Road | \$16,880.00  | \$790.00                           | \$2,750.00               | \$940.00                                       | \$19,780.00        |
| Reily Drive  | \$9,460.00   | \$840.00                           | \$2,750.00               | \$570.00                                       | \$11,940.00        |

In accordance with Section 26 of the Drainage Act, a Special Assessment has been made against EH! Telecom for the cost of locating and determining the elevation of their fibre optic cables on the Burwell Road and Reily Drive R.O.W., 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'.

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. For tiles through bush areas, we recommend the owner maintain the cleared space by either mowing (hay) or growing a crop over it. If no maintenance is completed over several years, we recommend the Municipality complete the mowing/clearing as part of maintenance at the discretion of the Drainage Superintendent.

After completion, the Boersma - Burwell Road 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 until such time as the assessment is changed under the Drainage Act.

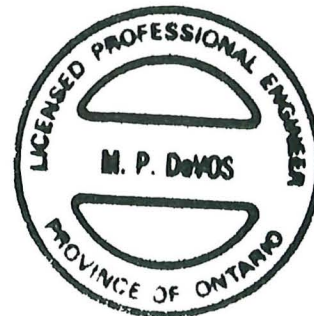
Special Assessments shall **not** be pro-rated for future maintenance purposes but shall be applied as an actual cost special if part of the maintenance. Special Benefit Assessments shall only be pro-rated for future maintenance purposes, if the work assessed for special benefit is part of the maintenance.

Repairs or improvements to any road culvert or sub-surface road crossing shall be the responsibility of the applicable Road and Railway Authority, entirely at their cost.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED

M.P. DeVos, P. Eng.



MPD:ms



## SCHEDULE 'A' - ALLOWANCES

## BOERSMA-BURWELL ROAD 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<br>Right-of-Way | Section 30<br>Damages | TOTALS       |
|--|----------|--|----------------------------|-----------------------|--------------|
| <b>MAIN DRAIN</b>  |          |  |                            |                       |              |
| E.M.R.   | Pt. 6    | 014-010-302 (J. Sharman & K. Cianci)   | \$ 2,030.00                | \$ 2,480.00           | \$ 4,510.00  |
| E.M.R.   | Pt S½ 7  | 014-010-258 (J. & S. Ferket)           | 1,140.00                   | 1,400.00              | 2,540.00     |
| 2 SLR  | Pt. 17   | 014-010-268-01 (G. Gibbs & T. Chapman) | 30.00                      | 30.00                 | 60.00        |
| 2 SLR  | Pt.17&18 | 014-010-268 (Diesel Acres Ltd.)        | 2,010.00                   | 2,450.00              | 4,460.00     |
| 3 SLR  | Pt. 17   | 014-010-274 (Tulip Acres Ltd.)         | 4,010.00                   | 4,900.00              | 8,910.00     |
| 3 SLR  | Pt. 17   | 014-010-276 (K. & T. Boersma)          | 1,850.00                   | 2,270.00              | 4,120.00     |
| Total Allowances   |          |  | \$ 11,070.00               | \$ 13,530.00          | \$ 24,600.00 |
| <b>TOTAL ALLOWANCES ON THE MAIN DRAIN</b>                      |          |  | <b>\$ 24,600.00</b>        |                       |              |
| <b>TOTAL ALLOWANCES ON THE BOERSMA-BURWELL ROAD DRAIN 2023</b> |          |  | <b>\$ 24,600.00</b>        |                       |              |



## SCHEDULE 'B' - COST ESTIMATE

## BOERSMA-BURWELL ROAD 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:

**MAIN DRAIN**

|  |                |    |           |
|--|----------------|----|-----------|
| Mobilization of equipment  |                | \$ | 1,000.00  |
| Supply & install 6 meters of 375mm dia., H.D.P.E. plastic sewer pipe including rodent gate and quarry stone rip-rap protection around pipe and end of ditch (Approximately 3m <sup>3</sup> quarry stone req'd)     |                | \$ | 2,150.00  |
| Installation of the following concrete field tile including supply & installation of geotextile around tile joints   |                |    |           |
| 198 meters of 200mm dia. concrete tile   |                | \$ | 4,690.00  |
| 93 meters of 250mm dia. concrete tile  |                | \$ | 2,280.00  |
| 925 meters of 350mm dia. concrete tile   |                | \$ | 24,300.00 |
| Supply of the above listed tile/pipe   |                | \$ | 29,620.00 |
| Supply & Installation of the following sewer pipe (with rubber gaskets) across property lines and forested area as shown on profile including supply, installation & compaction of bedding and backfill materials. |                |    |           |
| 15 meters of 200mm dia. sewer pipe   |                | \$ | 600.00    |
| 60 meters of 375mm dia. sewer pipe   |                | \$ | 4,500.00  |
| Supply of the above listed sewer pipe  |                | \$ | 4,320.00  |
| Strip, stockpile and relevel topsoil from tile trench and adjacent working area (4m wide) specified on drawings (approx. 1242m)  |                | \$ | 7,450.00  |
| 15.0 meters of 406mm dia., 7.9mm thickness smooth wall steel pipe  |                |    |           |
| Supply   |                | \$ | 5,630.00  |
| Installation under Burwell Road by boring  |                | \$ | 11,250.00 |
| 16.0 meters of 375mm sewer pipe  |                |    |           |
| Supply   |                | \$ | 1,060.00  |
| Installation under Reily Drive Line by open cut  |                | \$ | 8,400.00  |
| Supply and install one 600mm x 600mm ditch inlet catchbasin and four 600mm x 600mm standard catchbasins, including berms with Turfmat overflow chutes, grates, leads, removal and disposal of existing structures  |                | \$ | 16,500.00 |
| Exposing and locating existing tile drains   | (report)       | \$ | 660.00    |
|  | (construction) | \$ | 2,480.00  |
| Exposing and locating existing utilities   | (report)       | \$ | 600.00    |
|  | (construction) | \$ | 500.00    |
| Tile connections as noted on plan  |                | \$ | 700.00    |

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

**BOERSMA-BURWELL ROAD DRAIN 2023**  
**Municipality of Strathroy-Caradoc****MAIN DRAIN (cont'd)**

|   |    |           |
|---|----|-----------|
| Clearing and Grubbing                                 | \$ | 1,000.00  |
| Contract security financing                           | \$ | 1,930.00  |
| Tile connections and contingencies                    | \$ | 2,700.00  |
| Allowances under Sections 29 & 30 of the Drainage Act | \$ | 24,600.00 |

**ADMINISTRATION**

|                                       |    |                 |
|---------------------------------------|----|-----------------|
| Conservation Authority Review Fee     | \$ | 300.00          |
| Interest and Net Harmonized Sales Tax | \$ | 6,129.00        |
| Survey, Plan and Final Report         | \$ | 20,736.00       |
| Expenses                              | \$ | 1,265.00        |
| Supervision and Final Inspection      | \$ | <u>4,250.00</u> |

**TOTAL ESTIMATED COST****\$ 191,600.00**

## SCHEDULE ' C ' - ASSESSMENT FOR CONSTRUCTION

## BOERSMA-BURWELL ROAD DRAIN 2023

## Municipality of Strathroy-Caradoc

Job No. 222155

September 15, 2023

\* = Non-agricultural

| CON.  | LOT      | HECTARES<br>AFFECTED | ROLL No. (OWNER)                       | BENEFIT      | OUTLET       | TOTAL                |
|---|----------|----------------------|--|--------------|--------------|----------------------|
| <b>MAIN DRAIN</b>   |          |                      |  |              |              |                      |
| * E.M.R.  | Pt. 6    | 2.5                  | 014-010-302 (J. Sharman & K. Cianci)   | \$ 13,120.00 | \$ 906.00    | \$ 14,026.00         |
| E.M.R.  | Pt S½ 7  | 3.8                  | 014-010-258 (J. & S. Ferket)           | 6,910.00     | 2,163.00     | 9,073.00             |
| 2 SLR   | Pt. 17   | 1.3                  | 014-010-267 (R. & E. Doane)            |              | 2,735.00     | 2,735.00             |
| 2 SLR   | Pt. 17   | 2.6                  | 014-010-268-01 (G. Gibbs & T. Chapman) | 230.00       | 5,304.00     | 5,534.00             |
| 2 SLR   | Pt.17&18 | 9.9                  | 014-010-268 (Diesel Acres Ltd.)        | 13,160.00    | 36,214.00    | 49,374.00            |
| 3 SLR   | Pt. 17   | 6.9                  | 014-010-274 (Tulip Acres Ltd.)         | 26,240.00    | 16,729.00    | 42,969.00            |
| 3 SLR   | Pt. 17   | 3.4                  | 014-010-276 (K. & T. Boersma)          | 12,180.00    | 3,698.00     | 15,878.00            |
| TOTAL ASSESSMENT ON LANDS   |          |                      |  | \$ 71,840.00 | \$ 67,749.00 | \$ 139,589.00        |
| Reily Drive   |          | 0.6                  | Municipality of Strathroy-Caradoc      | \$ 4,680.00  | \$ 5,513.00  | \$ 10,193.00         |
| Burwell Road  |          | 0.7                  | Municipality of Strathroy-Caradoc      | 6,570.00     | 1,798.00     | 8,368.00             |
| TOTAL ASSESSMENT ON ROADS   |          |                      |  | \$ 11,250.00 | \$ 7,311.00  | \$ 18,561.00         |
| <b>SPECIAL ASSESSMENT</b> against the Municipality of Strathroy Caradoc<br>for the increased cost of Installing a 406mm smooth wall steel pipe<br>pipe under Burwell Road by boring |          |                      |  |              |              | \$ 19,780.00         |
| <b>SPECIAL ASSESSMENT</b> against the Municipality of Strathroy Caradoc<br>for the increased cost of Installing a 375mm Dia. sewer pipe<br>pipe under Reily Drive by open cut       |          |                      |  |              |              | \$ 11,940.00         |
| <b>SPECIAL ASSESSMENT</b> against Eh Telecom for the increased cost of locating and<br>exposing their fibre optic on Reily Drive and Burwell Road                                   |          |                      |  |              |              | \$ 1,730.00          |
| <b>TOTAL ASSESSMENT ON THE BOERSMA-BURWELL ROAD DRAIN 2023</b>  |          |                      |  |              |              | <b>\$ 191,600.00</b> |



SCHEDULE OF NET ASSESSMENT

**BOERSMA-BURWELL ROAD DRAIN 2023**

**Municipality of Strathroy-Caradoc**

Job No. 222155

September 15, 2023

\* = *Non-agricultural*

| ROLL NUMBER<br>(OWNER)                           | TOTAL GRANTABLE<br>ASSESSMENT | GRANT               | ALLOWANCES          | APPROX.<br>NET      |
|--|-------------------------------|---------------------|---------------------|---------------------|
| 014-010-302 (J. Sharman & K. Cianci)             | \$ 14,026.00                  | \$ 4,675.00         | \$ 4,510.00         | \$ 4,841.00         |
| 014-010-258 (J. & S. Ferket)                     | 9,073.00                      | 3,024.00            | 2,540.00            | 3,509.00            |
| 014-010-267 (R. & E. Doane)                      | 2,735.00                      | 912.00              |                     | 1,823.00            |
| 014-010-268-01 (G. Gibbs & T. Chapman)           | 5,534.00                      | 1,845.00            | 60.00               | 3,629.00            |
| 014-010-268 (Diesel Acres Ltd.)                  | 49,374.00                     | 16,458.00           | 4,460.00            | 28,456.00           |
| 014-010-274 (Tulip Acres Ltd.)                   | 42,969.00                     | 14,323.00           | 8,910.00            | 19,736.00           |
| 014-010-276 (K. & T. Boersma)                    | 15,878.00                     | 5,293.00            | 4,120.00            | 6,465.00            |
| Reily Drive                                      | \$ 10,193.00                  | \$ 3,398.00         | \$                  | \$ 6,795.00         |
| Burwell Road                                     | 8,368.00                      | 2,789.00            |                     | 5,579.00            |
| <b><u>Non-Prorated Special Assessments</u></b>   |                               |                     |                     |                     |
| * Mun. of Strathroy-Caradoc - Reily Road Pipe    | 11,940.00                     |                     |                     |                     |
| * Mun. of Strathroy-Caradoc - Burwelly Road Pipe | 19,780.00                     |                     |                     |                     |
| * EHItel Networks Inc. - Fibre Optic             | 1,730.00                      |                     |                     |                     |
|  | <b>\$ 191,600.00</b>          | <b>\$ 52,717.00</b> | <b>\$ 24,600.00</b> | <b>\$ 80,833.00</b> |