

SPRIET ASSOCIATES
CONSULTING ENGINEERS
LONDON — SUDBURY

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BRANCH NO. 1
of the COBBAN DRAIN
Township of Caradoc
#339



SPRIET ASSOCIATES

Our Job No. 94063

December 5, 1994

London, Ontario
December 5, 1994

BRANCH NO. 1 OF THE COBBAN DRAIN

Township of Caradoc

To the Reeve and Council
of the Township of Caradoc

Reeve and Council:

We are pleased to present our report on the reconstruction of Branch No. 1 of the Cobban Municipal Drain serving parts of Lots 1 to 5, Concessions 4 and 5 in the Township of Caradoc. The total watershed area contains approximately 117 hectares.

AUTHORIZATION

This report was prepared pursuant to Section 78 of the Drainage Act in accordance with instructions received from your Clerk with respect to a motion of the Township Council. The work was initiated by a request signed by some of the affected landowners.

HISTORY

The Cobban Drain was last reconstructed in its entirety pursuant to a report submitted by A.J. DeVos, P. Eng. of A.M. Spriet & Associates dated August 31, 1965. The drain includes a Main Drain and Branches No. 1, 2 and 3. The Main Drain consisted of approximately 6615 lineal meters of open ditch extending from its outlet into the Government Drain No. 1 in Lot 1, Concession 4, Township of Ekfrid, easterly across the Townline (County Road No. 9), thence south-easterly across the south half of Lot 1, Concession 5, Township of Caradoc and thence easterly across Lots 1 to 8, Concession 4, Township of Caradoc.

Branch No. 1 consists of approximately 2234 lineal meters of open ditch extending across the north parts of Lots 1 to 4, Concession 4, Township of Caradoc, and the upper 1200 lineal meters was last reconstructed pursuant to a report by E.P. Elston, P. Eng. dated April 29, 1982.

EXISTING DRAINAGE CONDITIONS AND DESIGN CONSIDERATIONS

A site meeting with respect to the project was held on June 2, 1994 and the owners pointed out that the existing ditch has silted in, and is choked with weeds and brush. The owners of the north-east part of Lot 2, Concession 4 (Roll No. 40-088 D. & L. Campbell) reported that the lower portion of the ditch in their property consistently overflowed its banks. They also requested that an additional pipe culvert be constructed to permit access to the bush lands on the south side of the ditch.

EXISTING DRAINAGE CONDITIONS AND DESIGN CONSIDERATIONS (cont'd)

We have made a field investigation and survey of the requested work and found that the upper portion of the existing ditch (last cleaned out in 1982) has silted in an average depth of 200mm and is choked with brush and weeds. The lower portion (last cleaned out in 1965) is also choked with weeds and brush and has silted in considerably, some portions to the point that the ditch is almost non-existent. Accordingly, the ditch in its present state does not provide a proper surface and sub-surface drainage outlet for the affected watershed area.

We also found that the existing farm culvert in the north-west quarter of Lot 2, Concession 4 (Roll No. 40-087) owned by B. & S. Breen has partially collapsed and was obstructing the flow of water in the ditch. It is our understanding that this culvert was removed in the fall of this year in order to alleviate upstream flooding. The owners have requested that a new pipe culvert be constructed at the same location. We investigated the capacity and condition of the remaining farm culverts on the drain and found them to be satisfactory.

We would like to point out that there are indications of poor soil conditions, (ie. silt, sand, muck) but no formal soil investigation has been made. We have taken the soil conditions into account in our design by the inclusion of various erosion control methods.

RECOMMENDATIONS

We are therefore recommending that the Branch No. 1 of the Cobban Drain open ditch be reconstructed to provide a suitable outlet for the affected watershed area, that the existing culvert in the Breen property (Roll No. 40-087) be replaced with a new pipe culvert and that a new pipe culvert be constructed in the Campbell Property (Roll No. 40-088).

We are also recommending that the following mitigation measures be included as part of our reconstruction proposal:

- timing of construction is to be in summer months of July and August and then only at times of low or no flow
- various sediment traps are to be constructed along the course of the drain at the locations specified on the plan
- a temporary flow check of straw bales is to be installed at the bottom end of the drainage works
- the existing ditch from Sta.0 + 000 to Sta.0 + 600 is to be reconstructed with new bank slopes varying from 2:1 to 3:1 in order to provide a more stable ditch configuration and the new banks are to be hydro seeded with a suitable grass seed mixture

RECOMMENDATIONS (cont'd)

- a three meter wide grassed buffer strip between the top of the bank and any adjacent cultivated lands on both sides of the ditch is to be constructed from Sta.0+000 to Sta.0+600 as specified on the plan
- a ditch bottom cleanout only from Sta.0+600 to Sta.2+234 has been specified so that the existing bank vegetation is not disturbed
- a three meter wide buffer strip is to be maintained between the top of the bank and any adjacent cultivated lands from Sta. 0+600 to Sta. 2+234
- some existing washouts along the course of the drain are to be backfilled and protected with quarry stone rip-rap
- all work is to be completed from the north and west sides of the ditch where possible. Any natural vegetation, brush, trees, etc. that exist on the unaffected sides of the ditch, especially the south side, should be retained to provide shade and cover

FUTURE CONSIDERATIONS

It is to be noted that both the existing and newly vegetated banks as well as the existing natural and newly created buffer strips along each side of the ditch are permanent parts of Branch No. 1 of the Cobban Drain and shall not be disturbed or destroyed.

We are recommending that owners consider using proper land use practices such as windbreaks, fence runs, contour ploughing, no-till farming, grassed waterways, etc.

All of the proposed work has been generally designed and shall be constructed in accordance with the DESIGN AND CONSTRUCTION GUIDELINES FOR WORK UNDER THE DRAINAGE ACT.

PROPOSED WORK

While full details of the proposed work covered under this report can be obtained from the attached plan and specifications, a short description is as follows:

The proposed work consists of approximately 2234 lineal meters of open ditch cleanout and reconstruction including sediment basins, quarry stone rip-rap bank protection, rock chutes, bank seeding, construction of grassed buffer strips and construction of farm culverts.

SCHEDULES

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

Schedule 'A' - Allowances. Under this schedule, we have provided allowances for damages to lands and crops in which the drain is actually constructed under Section 30 of the Drainage Act. An allowance for right-of-way is also provided to the lands used for the construction of the drain and for temporary access under Section 29 of the Drainage Act.

Schedule 'B' - Cost Estimate. This schedule provides for a detailed cost estimate of the proposed work which is in the amount of \$36,900.00. This estimate includes engineering and administrative costs associated with this project, including the net Goods and Services Tax.

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.

Schedule 'D' - Assessment for Maintenance. This schedule outlines the distribution of future repair and/or maintenance costs for portions of, or the entire drainage works.

Drawing No. 1, Job No. 94063 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.

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 liabilities are known as benefit liability, outlet liability and special benefit liability as set out under Sections 22,23 and 24 of the Act.

Benefit liability 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.

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.

Special benefit liability is assessed to lands and roads for which special benefits have been provided.

ASSESSMENT

The actual cost of the work involving this report is to be assessed on a pro-rata basis against the lands and roads liable for assessment for benefit and outlet as shown on Schedule 'C' - Assessment for Construction.

ROAD CULVERTS

Repairs or improvements to any road culvert or bridge required by the performance of this work shall be made by the road authority responsible for the structure.

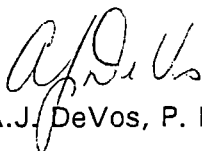
MAINTENANCE

Upon completion of construction, all owners are hereby made aware of Sections 80,82 and 83 of the Drainage Act which forbid the obstruction of, damage or injury to, and pollution of a municipal drain.

After completion, Branch No. 1 of the Cobban Municipal Drain shall be maintained by the Township of Caradoc at the expense of all upstream lands and roads assessed in Schedule 'D' - Assessment for Maintenance in the same relative proportions, until such time as the assessment is changed under the Drainage Act.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED


A.J. DeVos, P. Eng.

sjs

SCHEDULE 'A' - ALLOWANCES
 BRANCH NO. 1 OF THE COBBAN DRAIN
 Township of Caradoc

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

CONCESSION	LOT	ROLL NUMBER (OWNER)	DAMAGES AND RIGHT-OF-WAY
4	N ½ N ½ 1	40-085 (M. & T. Docheff)	\$ 350.00
4	NW ¼ 2	40-087 (B. & S. Breen)	\$ 2,000.00
4	NE ¼ 2	40-088 (D. & L. Campbell)	\$ 2,600.00
4	NWPt3	40-089 (B. & C. George)	\$ 1,150.00
4	NEPt3	40-08910 (M. & K. George)	\$ 1,850.00
4	NW ¼ 4	40-090 (J. & J. Derbyshire)	\$ 1,350.00
4	NE ¼ 4	40-091 (J. & J. Derbyshire)	\$ 1,200.00
Total Allowances			\$ 10,500.00 =====
Total Allowances under Sections 29 and 30 of the Drainage Act			\$ 10,500.00 =====

SCHEDULE 'B' - COST ESTIMATE
BRANCH NO. 1 OF THE COBBAN DRAIN

Township of Caradoc

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

600 meters of open ditch reconstruction from Sta.0+000 to Sta.0+600 (Approx. 3200m ³)	\$ 3,600.00
1634 meters of open ditch cleanout from Sta.0+600 to Sta.2+234 (Approx. 800m ³)	\$ 2,000.00
Hauling away and levelling of excavated material from Sta.1+126 to Sta.1+592 (Approx. 280m ³)	\$ 900.00
Levelling of excavated material from Sta.0+000 to Sta.0+600	\$ 1,000.00
Levelling of excavated material from Sta.0+600 to Sta.1+126 and Sta.1+592 to Sta.2+234	\$ 600.00
Clearing, Grubbing and Brushing	\$ 1,900.00
Hydro-seeding of ditch banks and buffer strips from Sta.0+000 to Sta.0+600 (Approx. 8700m ²)	\$ 2,000.00
Hydro-seeding of newly exposed banks below existing sodded banks from Sta.0+600 to Sta.2+234 (Approx. 3100m ²)	\$ 800.00
Backfill washouts if necessary, supply and place quarry stone rip-rap protection (with filter blanket) as rock chutes and across backfilled washouts (Approx. 13m ³ quarry stone required)	\$ 700.00

Two 12 meter lengths of 1400mm dia., 2.0mm thickness helical corrugated metal pipe with 125mm x 25mm corrugations

Supply	\$	3,000.00
Installation as new farm culvert including supply and installation of bedding and backfill material and quarry stone rip-rap protection (with filter blanket) at each end (Approx. 26m ³ quarry stone required)	\$	2,800.00
Contingencies	\$	100.00
Allowances under Sections 29 and 30 of the Drainage Act	\$	10,500.00

ADMINISTRATION

Interest and net Goods and Services Tax	\$	1,100.00
Survey, Plan and Report	\$	4,283.00
Assistance and Expenses	\$	937.00
Supervision and Final Inspection	\$	680.00

Total Estimated Cost	\$	36,900.00
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SCHEDULE "C" - ASSESSMENT FOR CONSTRUCTION

BRANCH No. "1" OF THE COBBAN DRAIN

Township of Caradoc

Job No. 94063

December 5, 1994

CON.	LOT	HECTARES		ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
		AFFECTED					
4	N½N½	1	-	40-085 (M. & T. Docheff)	\$ 625.00	\$	\$ 625.00
4	Pt.NW¼	2	7.5	40-087 (B. & S. Breen)	6,925.00	242.00	7,167.00
4	NE¼	2	12.4	40-088 (D. & L. Campbell)	8,045.00	359.00	8,404.00
4	NWPt.	3	16.2	40-089 (B. & C. George)	2,740.00	1,105.00	3,845.00
4	NEPt.	3	17.2	40-08910 (M. & K. George)	4,390.00	1,287.00	5,677.00
4	NW¼	4	20.6	40-090 (J. & J. Derbyshire)	2,565.00	1,772.00	4,337.00
4	NE¼	4	20.1	40-091 (J. & J. Derbyshire)	2,250.00	1,790.00	4,040.00
4	NWPt.	5	14.5	40-092 (D. Derbyshire)		1,347.00	1,347.00
5	SW¼	3	4.1	40-080 (M. & G. D'Hoine)		299.00	299.00
5	SE¼	3	0.8	40-079 (Cuddy Farms Int. Ltd.)		59.00	59.00
5	SW¼	5	0.4	40-076 (J. & J. Derbyshire)		38.00	38.00
TOTAL ASSESSMENT ON LANDS					\$ 27,540.00	\$ 8,298.00	\$ 35,838.00
Road Lots 4-5		1.6		Township of Caradoc	\$ 150.00	\$ 445.00	\$ 595.00
Road Con.'s 4-5		1.8		Township of Caradoc		467.00	467.00
TOTAL ASSESSMENT ON ROADS					\$ 150.00	\$ 912.00	\$ 1,062.00
TOTAL ASSESSMENT ON BRANCH No. "1" OF THE COBBAN DRAIN							<u>\$ 36,900.00</u>

NOTE: All of the above lands, are classified as agricultural.

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SCHEDULE 'D' - ASSESSMENT FOR MAINTENANCE

BRANCH No. "1" OF THE COBBAN DRAIN

Township of Caradoc

Job No. 94063

December 5, 1994

CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
4	N½N½ 1	-	40-085 (M. & T. Docheff)	0.8% <i>From 10</i>
4	Pt.NW¼ 2	7.5	40-087 (B. & S. Breen)	6.0 <i>2</i>
4	NE¼ 2	12.4	40-088 (D. & L. Campbell)	8.6 <i>3</i>
4	NWPt. 3	16.2	40-089 (B. & C. George)	12.1 <i>4</i>
4	NEPt. 3	17.2	40-08910 (M. & K. George)	15.8 <i>5</i>
4	NW¼ 4	20.6	40-090 (J. & J. Derbyshire)	17.7 <i>6</i>
4	NE¼ 4	20.1	40-091 (J. & J. Derbyshire)	17.5 <i>7</i>
4	NWPt. 5	14.5	40-092 (D. Derbyshire)	10.3 <i>8</i>
5	SW¼ 3	4.1	40-080 (M. & G. D'Hoine)	2.3 <i>9</i>
5	SE¼ 3	0.8	40-079 (Cuddy Farms Int. Ltd.)	0.5 <i>100</i>
5	SW¼ 5	0.4	40-076 (J. & J. Derbyshire)	0.3 <i>110</i>
TOTAL ASSESSMENT ON LANDS				91.9%
Road Lots 4-5				1.6 Township of Caradoc <i>12</i>
Road Con.'s 4-5				1.8 Township of Caradoc <i>130</i>
TOTAL ASSESSMENT ON ROADS				8.1%
TOTAL ASSESSMENT FOR MAINTENANCE OF BRANCH No. "1" OF THE COBBAN DRAIN				<u>100.0%</u>

NOTE: All of the above lands are classified as agricultural.

By-LAW 6-95
Cobban DRAIN # 339