



THE CORPORATION OF THE TOWNSHIP OF WAINFLEET

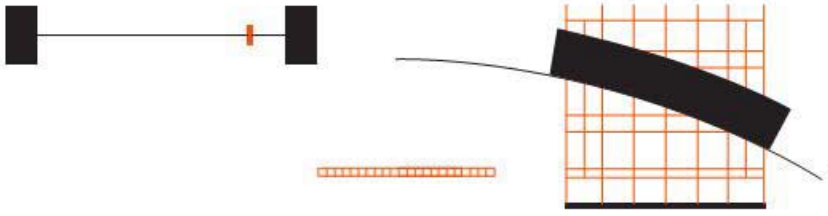
SPECIAL MEETING OF COUNCIL AGENDA

OCTOBER 19, 2021 – 7:00 P.M.

COUNCIL CHAMBERS

C21/21

1. **Call to Order**
2. **Disclosure of Pecuniary Interest and the General Nature Thereof**
3. **Reports**
 - a) Raimondo & Associates Architects Inc. – Central Station Value Engineering Report
 - b) Drainage Memorandum Re: Chambers Corner Drain Extension
4. **Closed Meeting**
5. **Rise & Report**
6. **Adjournment of Meeting**



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20-163

October 15, 2021

Wainfleet Township Council
31940 Highway #3
PO Box 40
Wainfleet, ON L0S 1V0

Re: Township of Wainfleet Fire and Emergency Services - Central Station Value Engineering report

As per council resolution a Value Engineering meeting Independent of the Projects Building Committee was held at the architect's office with Councillor Van Vliet and Councillor MacLellan in attendance representing the Township of Wainfleet, along with Representative of the Architectural, Mechanical, Electrical and Structural Consultants. The purpose of the meeting was to discuss the concerns of errors and omissions raised by Councillor MacLellan and also to discuss possible areas that components of the project could be reduced, altered or eliminated in order to reduce the projected cost of the Station.

The items discussed are listed in the attached Table 1, noting the potential additional costs or savings and if the item is required by the Ontario Building Code.

No alterations to the tender document have been made to date.

However, we would propose that the preparation of this report any of the changes to the contract documents that council may elect to move forward on be conducted on a time and material basis by the hourly rates on the attached cost schedules.

We Remain,
At Your Service,

RAIMONDO + ASSOCIATES ARCHITECTS Inc.

David Robbins, Architect
OAA, B.Arch.
ER/er

Township Of Wainfleet Fire and Emergency Services Central Station (project 20-163)

Table 1- Points of Discussion from V.E. Meeting September 21, 2021

1	Change Description	Credit or Addition		Required by Codes	Notes
		Credit	Addition		
a	Removal of Barn renovation separate price	\$145,582.80		N/A	cost of barn renovation less cost of total demolition of the barn and site repair \$221,308.00-\$75,725.00= \$145,582.80
2	BID ALLOWANCES				
a	remove contingency allowance from contractors purview	0	0	N/A	contingency will remain in overall cost but will be internally administrated by the town.
b	removal of any cash allowances from contractors purview	0	0	N/A	Cash allowance will remain in overall cost but be internally administrated by the town.
3	CIVIL AND SITE WORKS				
a	addition of concrete slab spill pad at point of discharge to grade from apparatus bays floor drains oil grit separator		\$6,000.00	not a code issue	intension is to act as a last chance indicator of oil grit separator maintenance requirement - Requested as 6" concrete slab +/- 40 sf (5x8). But due to low elevation of point of discharge (gravity feed from Station floor) level discharge point is at bank of drainage swale requiring a headwall type bank retention and integrated slab is required
b	over flow for fire cistern		\$3,000.00	not a code issue	cistern is receiving water from roof drainage, could conceivably overflow underground tank elevation requires overflow to be piped to daylight elevation
c	add alternates for domestic water cistern	0	0	N/A	Moodi / Acton/ Wilkinson/ Weiser / D&L will be listed in specifications as alternatives
d	Substitute Cast in Place Fire 50,000 gallon cistern for a group of five 10,000 of Precast Cisterns	\$45,000.00	0	N/A	RAAI Suggests adding the precast as an alternate to the cast in place. Precast cistern noted in QS report \$120,000. Received pricing during design for 50000 gal CIP cistern for \$70,000. Supply of 5 precast cisterns \$60,000.00 less \$15000. for excavation and backfill anchoring and plumbing.
4	ARCHITECTURAL				
a	alter generator slab to include a retention pan for potential oil spill		\$2,000	not a code issue	Manufacturer has optional Fluid containment system based on 110% of engine fluid capacity (both oil and coolant) It adds several weeks to the order, but less expensive and less complicated than a modified slab with its required exterior oil grit separator and its ongoing maintenance.
b	Suggested removal of Fob Key Security system	\$14,500.00		Not a code issue	For possible cost savings- May create security issues with Keys - Fobbed access is municipal building standard - Savings of access system and electric strike door hardware (9 instances)
5	STRUCTURAL				
a	No Items Identified				
6	MECHANICAL				
a	Removal of Radiant Slab heating in Administration side of station	\$45,000.00			look at heat pump or roof top units (radiant is still to be used in apparatus bays)
b	use of split system in rooms to eliminate limited ductwork	\$15,000.00			
c	installation of water filter UV light system for Domestic Water Cistern		\$7,500.00	Not Required	it was felt the water in the cistern may sit for so long a filter Ultraviolet system would prove beneficial
d	Change from a boiler system to heat pumps for supply of heat to radiant		\$30,000.00	not a code issue	Heat pumps will also likely yield higher maintenance costs \$500-\$1000 per year
e	look at instant hot water heaters or or heat pumps instead of boilers -for domestic hot water	0	0	N/A	Similar upfront costs Tankless heaters are generally best for very large buildings, or for buildings with large peaks in demand followed by low/no demand for a long time. In this case hot water will be used consistently so will be the most efficient to use a heater with a storage tank.
f	Remove 2 of 4 exterior hose bibbs	\$1,000.00		N/A	4 was felt to be unnecessary -arch to choose which to be removed 2@\$500
g	tank for laundry extractor effluent - stemming from concerns of septic bed contamination		\$15,000.00	not a code issue	on floor tank requested. The tank would be required to be routinely pumped out trucked to a Niagara Regional Sanitary station. On floor tank will require floor space which is at a premium since barn removal and will require the addition of a sump chamber and pump to get extractor effluent into the tank
h	the only electronic washroom fixtures are to be in the barrier free washroom	\$18,850.00		not a code issue	electronic fixtures considered unnecessary
7	ELECTRICAL				
a	possible redesign from Central controlled light occupancy sensor to localized system	\$4,000.00		not a code issue	
b	Carefully coordinated sensor placement	0	0	NA	Removal of light sensors was requested to eliminate unintentional light activation. Sensors are required by current building code

V.E. Sub Totals	\$143,350.00	\$63,500.00
Credit for elimination of barn	\$145,582.80	
Totals	\$288,932.80	\$63,500.00



COST SCHEDULE/ DISBURSEMENTS

Effective June 2019

Any approved, additional services if required above and beyond the tasks listed in the scope of services on contract or proposal will be based on the following hourly rates

HOURLY RATES

Principal Architect /Engineers	\$180.00 per hour
Associate/Architect/Engineers	\$150.00 per hour
Project Managers/ Associates	\$125.00 per hour
Interior Designer	\$ 95.00 per hour
Senior Technologists	\$ 105.00 per hour
Intermediate Technologist	\$ 85.00 per hour
Junior Technologist	\$ 75.00 per hour
Administrative Assistants	\$ 55.00 per hour
Additional Site Visit (cost per visit)	\$475.00 per visit

DISBURSEMENTS

Photocopies	\$0.15/copy
Blue Printing	\$0.50sf or \$5.00/ sheet
Mileage	\$0.58/km
Faxes	\$1.50/sheet – in/out
Photographic Material	\$1.65/page
CD	\$5.00/ CD
Long Distance Calls	Cost Plus 10%
Courier	Cost Plus 10%
Accommodations	Cost Plus 10%
Travel/ Flight	Cost Plus 10%
Other	Cost Plus 10%
Insurance above Architects Standard limits (Spike up)	Cost Plus 10%

Additional work would be authorized by the Client before proceeding

Subject to change at discretion of RAAI

HOURLY RATES

EFFECTIVE

JANUARY 1 - DECEMBER 31, 2020

Principal	\$185.00
Senior Engineer	\$160.00
Intermediate Engineer	\$150.00
Engineer	\$120.00
Project Management	\$150.00
Senior Technologist	\$120.00
Technologist	\$105.00
Field Inspector	\$120.00
Senior Draftsperson	\$95.00
Draftsperson	\$80.00
Clerical	\$75.00
Additional Site Meetings	\$600.00 / person
Mileage (charged when indicated in fees)	\$0.62 / km



Memo

To: Mayor and Members of Council
From: Mark Jemison, Drainage Superintendent
Date: October 19, 2021
Re: Chambers Corner Drain Extension

Through the engineering and design of the Central Fire Station the need for an improved drainage outlet was identified. Following the recommendation of Drainage Staff Report 14-2021 Council appointed Spriet Associates Engineering to create an outlet for the Central Fire Station "Chambers Corner Drain Extension."

A site meeting was held on September 16, 2021 with the impacted landowner. Submitted on September 23, the attached report recommends that the existing 221m long privately owned swale be improved and formalized under the Drainage Act to serve as outlet for the Central Fire Station.

Total estimated cost for the Chambers Corner Drain Extension including engineering, construction and allowances under the Drainage Act is \$13,900. Utilizing the Drainage Act to provide legal outlet for the Central Fire Station provides a cost savings over the previously discussed stormwater management pond estimated at \$66,000.

Under the Drainage Act the engineer's report will be formally considered at the General Council Meeting on November 16, 2021. The report and meeting notification will be distributed to all impacted landowners in compliance with the Drainage Act.

Attachment:
Chambers Corner Drain Extension Report
Chambers Corner Drain Extension Plan Drawing

CHAMBERS CORNER DRAIN EXTENSION

Township of Wainfleet



**SPRIET
ASSOCIATES**
ENGINEERS & ARCHITECTS

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London, Ontario N6A 1A8
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Our Job No. 221224

September 23, 2021

London, Ontario
September 23, 2021

CHAMBERS CORNER DRAIN EXTENSION

Township of Wainfleet

To the Mayor and Council of
the Township of Wainfleet

Mayor and Council:

We are pleased to present our report on the extension of the Chambers Corner Municipal Drain serving parts of Lot 20, Concession 4 in the Township of Wainfleet.

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 Township of Wainfleet for the lands of their new Fire and Emergency Services Central Station.

DRAINAGE AREA

The total watershed area as described above contains approximately 4.5 hectares. The area requiring drainage for the drain extension is described as the land on the south side of Highway No. 3 in Lot 20, Concession 4, also described as Roll No. 8-139 and Roll No. 8-140. This being the location of the new Fire & Emergency Services Central Station.

HISTORY

The Chambers Corner Drain was originally constructed pursuant to a report submitted by J.B. Wiebe, P. Eng. dated July 25, 1986 and consisted of 245 lineal meters of open ditch, including a farm culvert, and 205 lineal meters of 300mm to 350mm diameter perforated plastic tile and included a bore under Highway No.3.

EXISTING DRAINAGE CONDITIONS

A site meeting was held on September 16, 2021, with respect to the project and through later discussions, the owners reported the following:

- that the Township indicated that they intend to construct a new Fire & Emergency Services building and required a legal outlet for their stormwater
- that the owner, L. & J. Aarts (Roll No. 8-134), indicated that there was an existing private swale in the northerly portion of their lands, currently serving those lands



EXISTING DRAINAGE CONDITIONS (cont'd)

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

- that the existing drain, constructed in 1986, is in working condition and could be extended to serve the lands of the new Fire & Emergency Services Central Station
- a portion of the requested lands are outside the original watershed area but are now included due to grading alterations on the property
- that the existing private swale currently serving the lands could be improved to provide a legal surface outlet
- that the existing drain, constructed in 1986, has a design capacity of 19mm per 24 hours

Preliminary design, cost estimates and assessments were prepared and circulated to affected owners. Further input and requests were provided by the affected owners at that time and at later dates. Based on the proposed design it was decided to proceed with the report.

DESIGN CONSIDERATIONS

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. The drain is limited to the design of the exiting tile installed in 1986, which has a design capacity of 19mm per 24 hours.

RECOMMENDATIONS

We are therefore recommending the following:

- that the existing private swale be improved in the lands of L. & J. Aarts (Roll No. 8-134), from the head of the Chambers Corner Drain, west to just within the lands of the new Fire & Emergency Services Central Station (Roll No 8-140). The length of this new swale shall be approximately 221 lineal meters and referred to as the Chambers Corner Drain Extension
- that the additional lands in the Roll No. 8-140 property be included in the Chambers Corner Drain due to the grading alterations being completed, and a subsequent charge be assessed under Section 65 of the Drainage Act.

ENVIRONMENTAL CONSIDERATIONS AND MITIGATION MEASURES

There are no significant wetlands or sensitive areas within the affected watershed area or along the route of the drains. The proposed construction of the Chambers Corner Drain Extension includes grassed swales 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 downstream end of the swale for the duration of the construction.



SUMMARY OF PROPOSED WORK

The proposed work consists of approximately 221 lineal meters of swale construction including quarry stone rip-rap rock chutes and swale seeding.

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 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 \$13,900.00. This estimate includes engineering and administrative costs associated with this project.

Schedule 'C' - Assessment for Maintenance. In accordance with Section 38 of the Drainage Act, 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. 221224, 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 \$4,647.00/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.

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 swales, 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 \$25,000.00/ha.

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, outlet liability and special benefit liability as set out under Sections 22, 23, 24 and 26 of the Act.

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



ASSESSMENT DEFINITIONS (cont'd)

better control of surface or sub-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.

ASSESSMENT

A modified "Todgham Method" was used to calculate the maintenance assessments shown on Schedule 'C'- Assessment for Construction. This entailed breaking down the costs of the drain into sections along its route. It is then separated into Benefit and Outlet costs. The Benefit cost 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 Costs are 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 township lands and residential properties have been assessed for outlet at higher rates than cleared farmlands.

We assess the entire cost of this report to the Township of Wainfleet the owners of the Fire & Emergency Services Central Station (Roll No 8-139 & 8-140). It is to be noted that the cost of this report is not eligible for the Provincial Agricultural Grant.

SPECIAL ASSESSMENT

If any additional work is required to the drainage works due to the existence of buried utilities such as gas 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.

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 Chambers Corner Drain Extension shall be maintained by the Township of Wainfleet at the expense of all upstream lands and roads assessed in Schedule 'C' - 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

B. Widner, P.Eng.



SCHEDULE 'A' - ALLOWANCES

CHAMBERS CORNER DRAIN EXTENSION

Township of Wainfleet

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

CONCESSION	LOT	ROLL NUMBER (Owner)	Section 29 Right-of-Way	Section 30 Damages	TOTALS
MAIN DRAIN					
4	Pt. 20	8-134 (L. & J. Aarts)	\$ 2,450.00	\$ 990.00	\$ 3,440.00
			=====		
Total Allowances			\$ 2,450.00	\$ 990.00	\$ 3,440.00
			=====		
TOTAL ALLOWANCES ON THE MAIN DRAIN					\$ 3,440.00
					<u>3,440.00</u>
TOTAL ALLOWANCES ON THE CHAMBERS CORNER DRAIN EXTENSION					\$ 3,440.00
					<u>3,440.00</u>

CHAMBERS CORNER DRAIN EXTENSION**Township of Wainfleet**

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

MAIN DRAIN

Clearing & grubbing of swale corridor (Approx. 221m)	\$ 500.00
221 meters of Swale Construction	\$ 2,000.00
Levelling of excavated material	\$ 900.00
Seeding of swale (Approx 1500m ²)	\$ 500.00
Supply and Installation of Quarry Stone Rip-Rap rock chutes (3 Locations) Approx 6 ³ quarry stone required)	\$ 900.00
Allowances under Sections 29 and 30 of the Drainage Act	\$ 3,440.00

ADMINISTRATION

Interest and Net Harmonized Sales Tax	\$ 260.00
Survey, Plan and Final Report	\$ 3,900.00
Expenses	\$ 650.00
Supervision and Final Inspection	\$ <u>850.00</u>
TOTAL ESTIMATED COST	\$ <u><u>13,900.00</u></u>

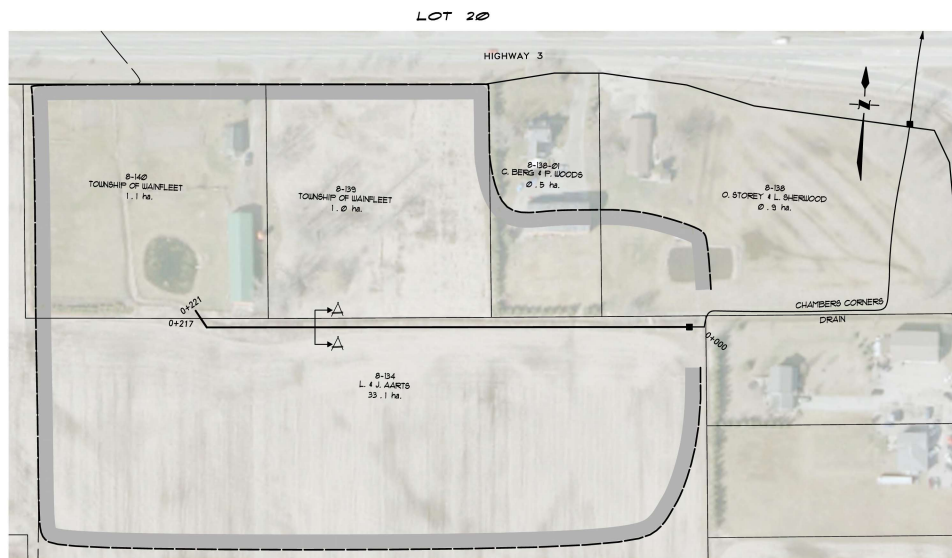
CHAMBERS CORNER DRAIN EXTENSION**Township of Wainfleet**

Job No. 221224

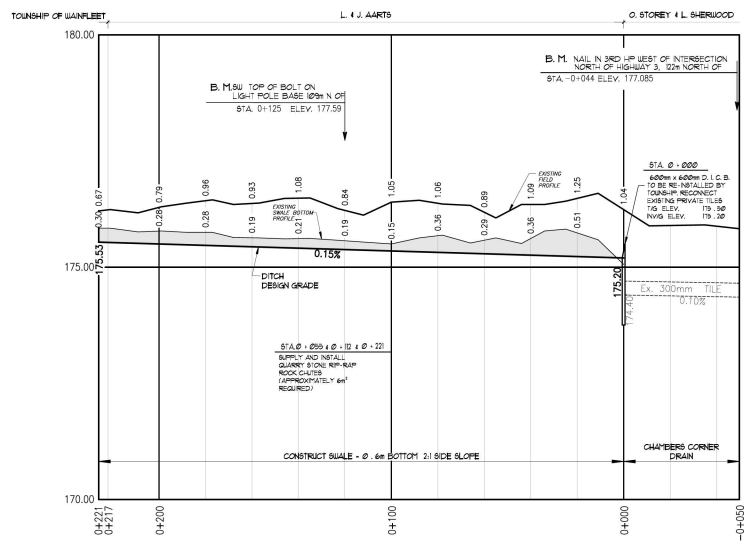
September 23, 2021

CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
MAIN DRAIN				
4	Pt. 20	2.0	8-134 (L. & J. Aarts)	15.6 %
4	Pt. 20	0.2	8-138 (O. Storey & L. Sherwood)	5.3
4	Pt. 20	0.2	8-138-01 (C. Berg & P. Woods)	5.9
4	Pt. 20	1.0	8-139 (Township of Wainfleet)	36.4
4	Pt. 20	1.1	8-140 (Township of Wainfleet)	36.8
				=====
TOTAL ASSESSMENT ON LANDS				100.0 %
				=====
TOTAL ASSES!				
MAIN DRAIN				<u>100.00 %</u>
TOTAL ASSESSMENT FOR MAINTENANCE OF THE CHAMBERS CORNER DRAIN EXTENSION				<u>100.00 %</u>

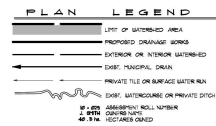
CONCESSION IV



DETAIL PLAN SCALE 1:1,000

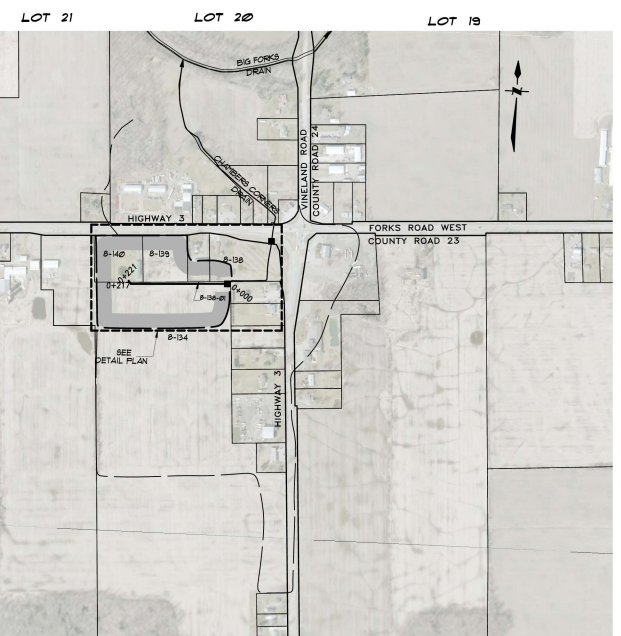


MAIN DRAIN

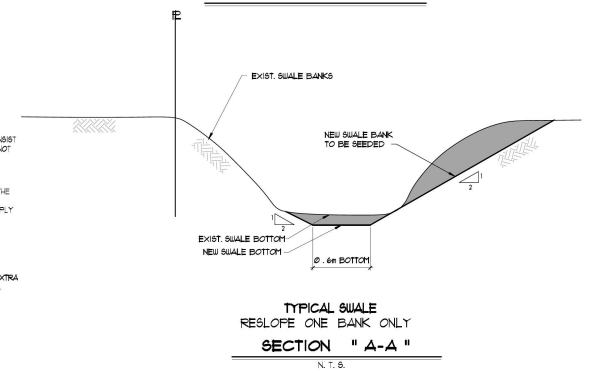
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GENERAL NOTES

- 1) OUR SPECIFICATIONS DATED JANUARY 2000 APPLY TO THIS PROJECT.
 - 2) THE WORKING WIDTH AVAILABLE TO THE CONTRACTOR TO CONSTRUCT THE NEW DRAIN SHALL CONSIST OF THOSE LANDS IMMEDIATELY ADJACENT TO THE DRAIN AND CONNECTIONS AND SHALL NOT EXCEED THE FOLLOWING AVERAGE WIDTHS:
OPEN PORTIONS - 2.1 meters
THE WORKING WIDTH FOR PURPOSES OF FUTURE MAINTENANCE SHALL BE THE SAME AS ABOVE
 - 3) ALL OWNERS ALONG THE COURSE OF THE DRAIN SHALL MAKE AN ACCESS ROUTE FROM THE NEAREST ROAD TO THE DRAIN LOCATION AVAILABLE TO THE CONTRACTOR THE AVERAGE WIDTH OF THIS ROUTE SHALL NOT EXCEED 8 METERS. THE ACCESS ROUTE SHALL ALSO APPLY FOR FUTURE MAINTENANCE PURPOSES.
 - 4) a) ALL UTILITIES TO BE LOCATED AND EXPOSED PRIOR TO CONSTRUCTION SO THAT THE NEW TILE GRADES CAN BE CORRELATED. IF THERE IS A CONFLICT IN ELEVATION BETWEEN THE PROPOSED DRAIN AND THE UTILITY, THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY.
b) CONTRACTOR TO NOTIFY ALL UTILITIES 1 HOUR PRIOR TO HIS SCHEDULED TIME FOR STARTING THE ABOVE WORK.
c) THE COST FOR THIS WORK SHALL BE INCLUDED IN THE ITEM ON THE EXTENT OF WORK AND NO EXTRA PAYMENT SHALL BE DUE TO THE CONTRACTOR, EXCEPT IF ROAD RESTORATION IS REQUIRED.
 - 5) ALL TREES, SCRUB, BRUSH, ETC. TO BE CLEARED AND GRUBBED IN ACCORDANCE WITH 'SECTION B.3 AND C.4' SPECIFICATIONS.
 - 6) RIP-RAP TO BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH 'SECTION A.2' IN THE SPECIFICATIONS.
 - 7) CONTRACTOR TO ARRANGE A PRE-CONSTRUCTION MEETING WITH THE ENGINEER, DRAINAGE SUPERINTENDENT, AND THE AFFECTED OWNERS. ALL PARTIES SHALL RECEIVE 48 HOURS NOTICE TO THE MEETING.
- OPEN PORTIONS**
- 8) EXISTING SWALE ONLY TO BE CLEARED OUT IN ACCORDANCE WITH SPECIFICATIONS UNLESS OTHERWISE NOTED ON PROFILES AND IN SECTIONS.
 - 9) WORK TO BE COMPLETED FROM AND EXCAVATED MATERIAL TO BE DEPOSITED AND LEVELLED ON THE FOLLOWING SIDES OF THE SWALE IN ACCORDANCE WITH 'SECTION B.5' IN THE SPECIFICATIONS.
STA. 0+000 TO STA. 0+121 - SOUTH SIDE AND LEVELLED
STA. 0+121 TO STA. 0+000 - SOUTH SIDE AND LEVELLED
 - 10) NEWLY EXPOSED SWALE BANKS ARE TO BE HAND SEEDDED UPON COMPLETION OF CONSTRUCTION IN ACCORDANCE WITH 'SECTION B.11' IN THE SPECIFICATIONS.
 - 11) SILT FENCE TO BE PLACED ACROSS SWALE AT STA. 0+000 DURING CONSTRUCTION TO PREVENT SILT FROM FILLING DOWNSTREAM AND ARE TO BE MAINTAINED AND NECESSARY DURING CONSTRUCTION. SILT FENCE AND SILT TO BE REMOVED AND DISPOSED OF AFTER CONSTRUCTION.



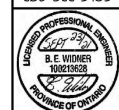
PLAN SCALE 1:5,000

TYPICAL SWALE
RESLOPE ONE BANK ONLY
SECTION "A-A"

CHAMBERS CORNER DRAIN EXTENSION

Township of Wainfleet

Drainage Superintendent:
MARK JEMISON
505-899-3463



Drawn By: MJ
Date: SEPT. 23, 2021
Field Book: GPM
JOB No.: 221224
Drawing No.: 1 of 1

PLAN, PROFILE, NOTES, & DETAIL
SPRIET ASSOCIATES LIMITED
CONSULTING ENGINEERS
100 YORK STREET - LONDON
(519) 872-4100 - FAX 1-800-468-1108