



The Municipal Corporation of the Town of Fort Erie

By-law No. 115-2016

Being a By-law to Provide for Drainage Works in the Town of Fort Erie, in the Regional Municipality of Niagara, known as the St. John's Marsh Municipal Drain

Whereas the Municipal Council of the Town of Fort Erie has procured a report under Section 78 of the *Drainage Act* for the improvement of the St. John's Municipal Drain; and

Whereas the Engineer's Report dated April 8, 2016 has been authored by Neal Morris of K. Smart Associates Limited and is attached as Schedule "A" and forming part of this by-law; and

Whereas the estimated total cost of the drainage works is Three Hundred and Three Thousand, Five Hundred and Fifty-Five Dollars (\$303,555.00); and

Whereas Two Hundred and Forty-Four Thousand, Two Hundred and Seventy-One Dollars (\$244,271.00) is the amount to be contributed by the Town of Fort Erie for the drainage works; and

Whereas Fifteen Thousand, Five Hundred and Forty-Seven Dollars (\$15,547.00) is being assessed in the City of Port Colborne and Forty-Three Thousand, Seven Hundred and Thirty-Seven Dollars (\$43,737.00) is being assessed in the City of Niagara Falls; and

Whereas the Council is of the opinion that drainage of the area is desirable;

Now therefore the Municipal Council of The Corporation of the Town of Fort Erie enacts as follows:

1. **That** the Engineer's Report prepared by K. Smart Associates Limited dated April 8, 2016, attached as Schedule "A" and forming part of this by-law, is adopted and the drainage works is authorized and shall be completed as specified in the report.
2. **That** a Schedule of Assessments of lands and roads in the Town of Fort Erie, City of Port Colborne and City of Niagara Falls, as set out in Schedule "C" of the aforestated Engineer's Report, is attached as Schedule "B" to this by-law.
3. **That** this by-law shall come into force and effect on the passing thereof.

- 4.** **That** the Clerk of the Town is authorized to effect any minor modifications, corrections or omissions, solely of an administrative, numerical, grammatical, semantical or descriptive nature to this by-law or its schedules after the passage of this by-law.

Read a first and second time and provisionally adopted this 24th day of October, 2016.

Mayor

Clerk

Read a third time and finally passed this day of , 201_.

Mayor

Clerk

I, Laura Bubanko, the Clerk, of The Corporation of the Town of Fort Erie certifies the foregoing to be a true copy of By-law No. 115-2016 of the said Town. Given under my hand and the seal of the said Corporation, this _____ day of _____, 20____

SCHEDULE "A" to BY-LAW NO. 115-2016

ENGINEERING REPORT

for the

ST. JOHN'S MARSH DRAIN 2016

Town of Fort Erie

Region of Niagara

April 8, 2016

File No. 13-249



K. SMART ASSOCIATES LIMITED
85 McIntyre Drive, Kitchener, ON, N2R 1H6



K. SMART ASSOCIATES LIMITED

CONSULTING ENGINEERS AND PLANNERS

85 McIntyre Drive
Kitchener ON N2R 1H6

Tel: (519) 748-1199
Fax: (519) 748-6100
ksmart@ksmart.ca

April 8, 2016

File No. 13-249

ST. JOHN'S MARSH DRAIN 2016 Town of Fort Erie

SUMMARY

This report is prepared pursuant to Section 78 of the Drainage Act, RSO 1990 in accordance with the Town of Fort Erie resolution made at the June 22, 2002 Council meeting. The original resolution identified the need for an Engineer's report providing for the repair and improvement of the Black Creek Drain, the Marsh Drain and the St. John's Marsh Drain. During the initial investigation, it was determined that no major work was required on the Marsh Drain or the Black Creek Drain except for preparing new schedules of assessment for future maintenance. The St. John's Marsh Drain does need repairs and improvements (maintenance work) and new schedules of assessment for future maintenance.

On June 14, 2002 K. Smart Associates Limited was appointed under Town of Fort Erie Bylaw 95-2002 to prepare the report on the St. John's Marsh Drain. The objective of this report is to provide for repair and improvement of the St. John's Marsh Drain in Concession 14, Lots 12 - 16.

This objective will be achieved by:

- Excavating the entire length of the existing channel across and downstream of Netherby Road (Regional Road 25) downstream to the outlet into the Marsh Drain, with an increased and constant grade.
- Removal of obstructions in the channel and on the banks including long grasses, brush and trees.
- Incorporation of environmental features to improve both water quality and aquatic habitat.

A summary of the proposed St. John's Marsh Drain 2016 is as follows:

- Approximately 2.6 ha of brushing and cleaning along channel (1.0 ha heavy brushing and 1.6 ha light brushing)
- 1,884m of ditch cleanout with low flow swale (notch) including cleanout through four (4) existing culverts/bridges
- One (1) temporary straw bale dam/sediment trap and four (4) permanent rock sediment traps
- 1 Newbury weir (with 76m² of riprap)
- Placing 25m² of riprap on filter fabric underlay at scattered locations.

Total length of open drain work is 1,884m.

The total estimated cost of the work is \$303,555.

Total watershed area affected is 1161.0 hectares (2,869 acres) (587.4 Town of Fort Erie, 195.8 ha City of Port Colborne and 377.8 ha City of Niagara Falls).

Schedule A shows the assessment of the total estimated cost for the St. John's Marsh Drain 2016 to the affected lands and roads and will be used to prorate the final cost of the St. John's Marsh Drain 2016. Schedule A is on Pages 19 to 21.

Schedule B (Schedule of Assessment for Future Maintenance) will be used to bill out future repair and maintenance costs when incurred for the St. John's Marsh Drain 2016. Schedule B is on Pages 22 to 24.

Schedule C illustrates estimated net assessments after deducting possible available grants and allowances. Schedule C is not an official schedule. It is included for information purposes only. It is

of assistance when preparing the final/actual cost bylaw and grant form application. Schedule C I on Pages 25 to 28.

Under Section 74 of the Drainage Act the Town of Fort Erie will be responsible for maintaining the St. John's Marsh Drain 2016 in accordance with the maintenance provisions in this report.

DRAINAGE HISTORY

The St. John's Marsh Drain is located in the Town of Fort Erie and is a tributary of the Black Creek Drain. The St. John's Marsh Drain flows south through Concession 14 from Lot 16 to Lot 12. Here, the drain outlets into the Marsh Drain which flows to the east and meets the Black Creek Drain in Concession 13, Lot 11. Although the construction date of the St. John's Marsh Drain is unknown, it likely dates back to the late 1880's.

On October 22, 1921 the Township of Bertie adopted Bylaw 953 which contained a report by George Ross, Engineer, and dated September 17, 1921. This report provided for the repair and improvement of the St. John's Marsh Drain which was burdened with poor grades and vegetative obstructions.

The latest drainage works on the St. John's Marsh Drain occurred under the adopted Township of Willoughby Bylaw A-115 on August 9, 1948. This report contained the report by C.A. Grassie Engineering dated August 6, 1948 and provided for excavation work in both the Township of Bertie and Willoughby to the 1948 grades and removal of obstructions (fallen trees/branches, etc.).

AUTHORITY FOR REPORT

Section 78 of the Drainage Act allows for an Engineer's report to be prepared for improvements to a drain previously constructed by bylaw under the Drainage Act without having a petition under Section 4 of the Drainage Act. Section 78 identifies repair and improvement of an existing drain as an appropriate project under a Section 78 report. Since the St. John's Marsh Drain was previously constructed by bylaw under the Drainage Act and since it has been determined from the site examination and meeting discussion that the existing St. John's Marsh Drain does require repair and improvement, therefore, this report is properly authorized under Section 78 of the Drainage Act.

ON SITE MEETING (SEPTEMBER 26, 2002)

The initial on-site meeting for the St. John's Marsh Drain took place on September 26, 2002. In attendance for the meeting was John Kuntze, P. Eng. (K. Smart Associates Ltd.), Brett Ruck (Town of Fort Erie, Drainage Superintendent), and only two landowners from along the route of the drain. One owner indicated that work was required, and the other owner was unsure of what type of work should be done.

Since the on-site meeting was so poorly attended, a questionnaire was mailed to the landowners abutting the St. John's Marsh Drain on October 1, 2002. The questionnaire was in regard to known drainage issues, and the scope of work that the landowners thought might be required. Responses were received from Robin Singleton (Roll No. 31-086-00), Jim & Brenda Williams (Roll No. 31-086-00), Dave Belme (Roll No. 55-307-01), and Mark McGarry (Roll No. 55-307-00). The returned questionnaires contained the following comments:

Robin Singleton (Roll No. 31-086-00)

Mrs. Singleton's property is located on the west side of the drain, south of College Road, and she uses the land for recreational purposes. Her survey indicated that drainage problems were a regular

issue, and she would be in favour of improving the drain. Mrs. Singleton suggested digging the drain deeper or rerouting it off of her property as solutions to the problem.

Jim & Brenda Williams (Roll No. 31-086-00)

Mr. and Mrs. Williams' property is located on the east side of the drain, south of College Road, and they use the land for agricultural purposes. There is a ditch that drains House Road across their property. The Williams' survey indicated that when the drain backs up after heavy rains, the ditch overtops its banks and floods their driveway. The Williams' are in favour of drain improvements, and they suggested cleaning out the drain as a solution.

Dave Belme (Roll No. 55-307-01)

Mr. Belme's property is located on the west side of the drain, south of Willow Road, and he uses the land for agriculture and pasture. Mr. Belme's survey indicated that he does not want improvements made to the drain because his family enjoys the wildlife (waterfowl) that the flooding attracts. Mr. Belme has done habitat enhancement work on his property, and does not want the local environment to change.

Mark McGarry (Roll No. 55-307-00)

Mr. McGarry had responded to the original on-site meeting notice by email stating that work was required on the drain, and his questionnaire response indicating the same. Mr. McGarry's property backs onto the St. John's Marsh Drain just north of Netherby Road (Regional Road 25), and he primarily uses the land for horse pasture. He describes his property as a swamp at times, and blames this on the poor condition of the drain. Mr. McGarry is highly in favour of drainage improvements.

SECOND MEETING (NOVEMBER 19, 2014)

All of the landowners in the St. John's Marsh Drain watershed were invited to attend a second meeting on November 19, 2014 at the Stevensville Memorial Hall in Fort Erie. This meeting was held to inform the landowners and agencies of the status of the drainage project and to present the proposed improvement plan for the drain.

The meeting was attended by the Engineer, Drainage Superintendent, and many landowners. The Engineer began the meeting with an explanation of the Drainage Act which included discussions on drain improvement, report preparation, assessments, and the appeal process. The drain improvement plan was then presented with an explanation of the objectives of the project.

The Engineer and Drainage Superintendent then took questions and comments from the landowners in attendance. The nature of the discussions that took place were mixed. Some landowners were anxious to have the drain improved while others were strictly opposed to the proposed work.

The owners who were in favour of drainage improvements were those directly impacted by flooding on their property. The owners opposed to drainage improvements were those who were not directly impacted by flooding and felt they should not be assessed any portion of the improvement cost.

SITE EXAMINATION AND SURVEY

A thorough site examination and survey of the St. John's Marsh Drain waterway took place from 2003 to 2014. The drain was in a poor state of repair, and dense grasses and brush had overtaken the channel. Distinguishing between the channel and floodplain was difficult along certain stretches of the drain. Mature trees were established on the banks and bed of the drain, and fallen trees were commonly observed in the channel. As a result of this condition, water levels were high and flow was not readily observed toward the lower end of the drain.

The survey also revealed that the grade of the St. John's Marsh Drain had significant deteriorated over time. Sediment built up has resulted in flat to reverse grade along stretches of the channel. The sediments have also caused the drain to become wide and shallow along some of its stretches.

The drain crossing structures were also evaluated during the site examination. The Fox Road concrete bridge was in fair condition for the type and volume of traffic that uses Fox Road. The C.P.R. bridge is monitored and maintained by the rail company, and it appeared to be in fair condition. The College Road bridge also appeared to be in very poor condition. The Netherby Road (Regional Road 25) culvert appeared to be in good condition.

DESIGN CONSIDERATIONS

Adequate/Sufficient Outlet

The St. John's Marsh Drain system outlets into the Marsh Drain. The Marsh Drain is an open system which flows to the Black Creek Drain. The St. John's Marsh Drain is being retained close to its original design with regard to bottom elevation and grade. Therefore, it is deemed that the St. John's Marsh Drain will have a sufficient outlet.

Environmental Impact

The St. John's Marsh Drain is classified as a regulated wetland by the Ministry of Natural Resources and Forestry (MNRF). As such, the Niagara Peninsula Conservation Authority (NPCA) has been consulted throughout the design and report preparation phases of this report.

The NPCA's main concern with the improvement of the St. John's Marsh Drain has been to maintain a certain depth of water in the channel for aquatic habitat. This concern has been addressed by first limiting the proposed grade and depth of the channel to that established by previous drain reports.

Secondly, to protect established aquatic habitat, excavation and channel restoration work will be limited to one side of the waterway. The spoil from the excavation and channel work will be piled, instead of spread, adjacent to the drain in order to further preserve habitat on the working side of the waterway.

Lastly, the NPCA has requested that a Newbury weir be constructed upstream of the C.P.R. bridge in part of Lot 13, Concession 14. This structure will preserve an acceptable standing water level for aquatic species during drier periods.

The St. John's Marsh Drain watershed contains multiple aquatic organisms that are classified as species at risk (SAR). The SAR are fish such as Grass Pickerel, Northern Brook Lamprey, and River Redhorse and mussels such as Hickorynut and Lilliput.

All work related to the St. John's Marsh Drain 2016 will follow the DART Protocol Standard Compliance Requirements for working within regulated wetland limits. These requirements are as follows:

i) Activity-Specific Mitigation Requirements

- There should be no appreciable change in grade with the removal of sediment.
- This work, including the disposal of the sediment, should be conducted in a manner consistent with the Engineer's Report and authorizing by-law.
- Minimize flooding upstream and downstream.
- Perform work in no/low flow conditions to minimize sediment movement and erosion. Avoid work after recent precipitation or snowmelt.
- The conservation authority, drainage superintendent and property owner should agree on access to the site where not specified in the Engineer's Report.

ii) General Mitigation Requirements

- Choose conditions and equipment appropriate to minimize site disturbance by equipment (e.g. frozen or dry soil conditions or the use of load distributing machines or mats).
- Place brush, debris and sediment in such a location as to minimize entry into the channel.
- Perform work in appropriate flow conditions to minimize debris movement and erosion.

- Limit soil movement and erosion; use appropriate control measures before work begins and inspect and maintain those measures regularly until all disturbed areas are stabilized.
- Except on cultivated lands, any areas of disturbed or bare soil around the drain should be seeded with native, non-invasive herbaceous material while the ground is moist and conditions are appropriate for germination.

RECOMMENDED WORK

The following is a description of the recommended work and also describes the drain for future maintenance purposes for the St. John's Marsh Drain 2016 on a property by property basis:

C. Childs & B. Lemire (Roll No. 31-078-10)

- Light brushing/clearing of channel and banks (20m wide corridor).
- 145m of ditch cleanout with low flow swale (notch) (2m wide bottom and 2:1 side slopes). Work from east side of drain and pile spoil (do not spread) adjacent to drain.
- Seed excavated/disturbed bank areas.
- Construction of one temporary straw bale dam including one permanent rock sediment trap with 10m² of riprap on filter fabric underlay at outlet of drain (Sta. 0+000).
- Construction of one permanent rock sediment trap with 10m² of riprap on filter fabric underlay at upstream property line/downstream of Fox Road culvert (Sta. 0+145).

Fox Road (Town of Fort Erie)

- Clean through concrete bridge and across road allowance. Bridge not to be disturbed. Bridge to remain as part of the drain, but to be fully maintained by the Town. Pile spoil in road right-of-way upstream and downstream of bridge.
- Construct end treatment with 10m² of riprap on filter fabric underlay at upstream end of culvert

M. & D. Legacy (Roll No. 31-079-00) and C. Ferreira & L. Vieira-Ferreira (Roll No. 31-083-00)

- Light brushing/clearing of channel and banks (20m wide corridor).
- 198m of ditch cleanout with low flow swale (notch) to design grade (2m wide bottom and 2:1 side slopes). Work from east side of drain and pile spoil (do not spread) adjacent to drain.
- Seed excavated/disturbed bank areas.
- Place 10m² of riprap on filter fabric underlay at tile outlets (5m² at each outlet) (Sta's. 0+210 & 0+322).

Canadian Pacific Railway (Roll No. 31-996-00)

- Clean through/under the east bridge opening and upstream and downstream of the bridge. The west bridge opening is an overflow area and is not to be disturbed. Bridge structure is not to be disturbed. Pile spoil in right-of-way upstream and downstream of bridge. Bridge to remain as part of the drain, but to be fully maintained by the C.P.R.

D. Pattison (Roll No. 31-080-00) and W. Turinski & L. Cryderman (Roll No. 31-093-00)

- Heavy brushing/clearing of channel and banks (10m wide corridor).
- 219m of ditch cleanout with low flow swale (notch) (2m wide bottom and 2:1 side slopes). Work from east side of drain and pile spoil (no not spread) adjacent to drain.
- Seed excavated/disturbed bank areas.
- Construction of Newbury weir/riffle at downstream property line/upstream of railway bridge with 76m² of riprap (62m² of 150mm rock size and 14m² of 200mm rock size) on filter fabric underlay (Sta. 0+417).

J. & B. Williams (Roll No. 31-082-00) and R. Singleton (Roll No. 31-086-00)

- Heavy brushing/clearing of channel and banks (10m wide corridor).
- 475m of ditch cleanout with low flow swale (notch) (2.0m wide bottom and 2:1 side slopes). Work from east side of drain and pile spoil (do not spread) adjacent to drain.

- Seed excavated/disturbed bank areas.
- Construction of one permanent rock sediment trap with 10m² of riprap on filter fabric underlay at upstream property line/downstream of College Road bridge (Sta. 1+084)
- Seed excavated/disturbed bank areas.
- Place 5m² of riprap on filter fabric underlay at ditch inlet (Sta. 0+850)
- 50m of Schil Drain cleanout

College Road (Town of Fort Erie)

- Clean through/under concrete bridge and across road allowance. Bridge not to be disturbed. Bridge to remain as part of the drain, but to be fully maintained by the Town. Pile spoil in right-of-way upstream and downstream of bridge.

D. & P. Bonneau Jr. (Roll No. 31-099-00)

- Heavy brushing/clearing of channel and banks (10m wide corridor).
- 306m of ditch cleanout with low flow swale (notch) (1.5m wide bottom and 2:1 side slopes). Work from west side of drain and pile spoil (do not spread) adjacent to drain.
- Seed excavated/disturbed bank areas.

D. & P. Bonneau (Roll No. 31-099-25) and M. Amyot & P. Henderson (Roll No. 31-100-00)

- Light brushing/clearing of channel and banks (20m wide corridor).
- 439m of ditch cleanout with low flow swale (notch) (1.5m wide bottom and 2:1 side slopes). Work from west side of drain and pile spoil (do not spread) adjacent to drain.
- Seed excavated/disturbed bank areas.
- Construction of one permanent rock sediment trap with 10m² of riprap on filter fabric underlay at upstream property line/downstream of Regional Road 25 (Netherby Road) culvert (Sta. 1+855).

Regional Road 25 (Netherby Road) (Region of Niagara)

- Cleanout through existing 1750mm high x 2800mm wide flat bottom arch CSP and across road allowance. Existing culvert to remain as part of drain but to be fully maintained by the Region.
- Spoil to be hauled off site.

R. & J. Hind (Roll No. 55-304) / S. Shchavyelyev (Roll No. 55-303) / M. & C. McGarry (Roll No. 55-307)

- Existing ditch to remain. No work required at this time.
- There is a new report being prepared by another Engineer for this portion.

CONSTRUCTION METHOD

The ditch work will be done with an excavator equipped with a ditching or grade-all type bucket. Spoil will be piled on the side specified. New channel bank slopes are to be manually seeded as construction proceeds. Disposal of cleared and grubbed material to be as outlined in the General and Specific Construction Notes on Drawing 6 and in the General Conditions (E).

CONSTRUCTION SCHEDULING

Construction cannot commence until after the statutory requirements of the Drainage Act have been satisfied. If there are no appeals after the Court of Revision, construction may commence approximately three months after the date of this report. Appeals under the procedures in the Drainage Act could result in a later starting date for construction, as construction cannot commence until all appeals are settled. Once construction commences, if the work is proceeded with continuously, it should be completed in approximately 10 to 15 working days. The Engineer may provide periodic inspection during the construction of the drain and may conduct meetings with the Contractor and landowners affected by construction at the commencement and the completion of construction. The contract for construction of the drain will be awarded by public tender. Unless

construction commencement and completion dates are requested prior to the tender call, the Contractor will specify the starting and completion dates for construction in the tender.

DRAIN LOCATION AND WATERSHED PLANS

The location of the St. John's Marsh Drain 2016 is shown as a dark solid line on the watershed plan on Drawing No. 1 included with this report. The numbers adjacent to this line indicate in meters the distance along the drain measured from the point marked 0+000 at the outlet into the Marsh Drain. The heavy dashed line indicates the approximate watershed boundary for the St. John's Marsh Drain 2016. The thin dashed lines indicate the approximate intermediate (sub) watersheds/intervals. The watershed plan also shows the location of other existing drains, property boundaries and Town assessment roll numbers from the Town assessment roll at the time of the preparation of this report. Drawing No. 2 is a plan enlargement.

PROFILES AND CONSTRUCTION DETAILS

The profile for the St. John's Marsh Drain 2016 is on Drawing No. 3. The profile shows the depth and grade of the proposed new ditch excavation/cleanout. The upper solid or dashed line represents the existing ground (bank) level along the ditch. A lower dashed line represents the bottom of the existing ditch. The lower heavy solid line represents the grade line for the proposed new ditch bottom cleanout.

Drawing No. 4 has typical cross-sections for the ditch excavation/cleanout proposed.

Drawing No. 5 contains the details for the proposed Newbury weir/riffle.

Drawing No. 6 contains the general and specific notes, Construction Notes (special provisions) for construction and maintenance.

COST ESTIMATE

The cost estimate of this project is outlined in the following sections.

a) Allowances

- i) Section 29 of the Drainage Act provides for the payment of allowances for right of way (R.O.W.) to landowners whose land is located within the cross-section of the ditch and land required for additional right of way outlined in the report. Since the St. John's Marsh Drain is an existing drain, R.O.W. allowances were paid in 1948, and no new allowance has been included in this report.
- ii) Section 30 of the Drainage Act provides for payment of allowances to landowners along the drain for damages to lands and crops caused by the construction of the 2016 drain. The allowance for damages was calculated using a rate of \$5,000 per hectare based on a 10m width in heavy brush areas and a 20m width in all other areas, for all lands along the proposed drain work.

In accordance with Section 62(3) of the Drainage Act RSO 1990, the allowances shown will be deducted from the final assessments levied. Payment to the owner would only be made when the allowance is greater than the final assessment. The allowances are a fixed amount and are not adjusted at the conclusion of construction. Allowances can only be changed if the report is modified prior to adoption of the report by bylaw or in accordance with the paragraph in this report that deals with changing the scope of work after the bylaw is passed. Allowances do not apply for future maintenance on the drain.

The allowances payable to the owners entitled thereto on this project are as follows:

Con	Lot	Roll No. (27-03-020-0)	Owner	Section 30 (Damage)	Recomm. CSP Culvert Size
14NR	Pt 12	31-078-10	C. Childs & B. Lemire	\$ 1,900	Twin 1500mm
14NR	Pt 13	31-079-00	M. & D. Legacy	2,000	n/a
14NR	Pt 13	31-080-00	D. Pattison	500	n/a
14NR	Pt 14	31-082-00	J. & B. Williams	1,100	n/a
14NR	Pt 13	31-083-00	C. Ferreira & L. Vieira-Ferreira	500	n/a

14NR	Pt 14	31-086-00	R. Singleton	1,200	n/a
14NR	Pt 13	31-093-00	W. Turinski & L. Cryderman	500	n/a
14NR	Pt 15	31-099-00	D. & P. Bonneau Jr.	1,500	Twin 1500mm
14NR	Pt 15	31-099-25	D. & P. Bonneau	1,700	Twin 1500mm
14NR	Pt 15&16	31-100-00	M. Amyot & P. Henderson	500	n/a
TOTAL ALLOWANCES:				\$ 11,400	

Note: The above lands are in the geographic Township of Bertie, in the Town of Fort Erie

b) Construction Cost Estimate

The estimated cost for Labour, Equipment and Materials to construct the proposed drain is outlined in detail in the following section. The cost estimate is formatted to comply with the Niagara Peninsula Standard Contract Document. The final cost of drain construction cannot be established until the construction is completed. The Contractor is to supply all labour, equipment and materials.

Item #	Stations	Work description	Unit	Quantity	Unit Price	Cost
i) Main Drain						
Interval 1						
1.	0+000	Construct temporary straw bale dam and permanent rock sediment trap with 10m ² of riprap on filter fabric underlay	L.S.	1	\$ 1,300	\$ 1,300
2.	0+000 to 0+145	Light brushing/clearing of channel and banks (20m corridor)	/m ²	2,900	\$ 1	2,900
3.	0+000 to 0+145	Ditch cleanout with low flow swale (notch) (2m wide bottom and 2:1 side slopes) including piling of spoil	/m	145	\$ 20	2,900
4.	0+000 to 0+145	Seeding of banks (5m width)	/m ²	725	\$ 1	725
5.	0+145	Construct rock permanent sediment trap at Fox Rd. d/s lot line with 10m ² of riprap on filter fabric underlay	L.S.	1	\$ 1,200	1,200
6.	0+145 to 0+165	Cleanout through Fox Rd. box bridge and across road allowance	/m	20	\$ 50	1,000 a)
7.	0+165	Construct end treatment at u/s end of Fox Rd. bridge with riprap on filter fabric underlay	/m ²	5	\$ 40	200 a)
8.	0+165 to 0+373	Light brushing/clearing of channel and banks (20m corridor)	/m ²	4,160	\$ 1	4,200
9.	0+165 to 0+373	Ditch cleanout with low flow swale (notch) (2m wide bottom and 2:1 side slopes) including piling of spoil	/m	208	\$ 20	4,200
10.	0+165 to 0+373	Seeding of banks (5m width)	/m ²	1,040	\$ 1	1,000
11.	0+210 & 0+322	Place 5m ² of riprap on filter fabric at each incoming ditch (10m ² riprap total)	/m ²	10	\$ 40	400
12.	0+373 to 0+396	Cleanout through/under railway east bridge opening and upstream and downstream of the bridge (C.P.R.)	/m	23	\$ 40	900 b)
Interval 2						
13.	0+396 to 1+055	Heavy brushing/clearing of channel and banks (10m corridor)	/m ²	6,590	\$ 15	98,850
14.	0+396 to 1+055	Ditch cleanout with low flow swale (notch) (2m wide bottom and 2:1 side slopes) including piling of spoil	/m	659	\$ 15	9,900
15.	0+396 to 1+055	Seeding of banks (5m width)	/m ²	3,295	\$ 1	3,300
16.	0+417	Construct Newbury weir/riffle with 76m ² of riprap (62m ² of 150mm rock size and 14m ² of 200mm rock size) on filter fabric underlay	L.S.	1	\$ 1,500	1,500

17.	0+850	Place 5m ² of riprap on filter fabric at incoming ditch	/m ²	5	\$ 40	200
18.	1+055	Schihi Drain cleanout (50m length)	/m	50	\$ 20	1,000
Interval 3						
19.	1+055 to 1+084	Ditch cleanout with low flow swale (notch) (2m wide bottom and 2:1 side slopes) including piling of spoil	/m	29	\$ 20	600
20.	1+084	Construct permanent rock sediment trap at College Rd. d/s lot line with 10m ² riprap on filter fabric underlay	L.S.	1	\$ 1,200	1,200
21.	1+084 to 1+104	Cleanout through/under College Road bridge and across road allowance	/m	20	\$ 40	800 c)
22.	1+104 to 1+410	Heavy brushing/clearing of channel and banks (10m corridor)	/m ²	3,060	\$ 15	45,900
23.	1+104 to 1+410	Ditch cleanout with low flow swale (notch) (1.5m wide bottom and 2:1 side slopes) including piling of spoil	/m	306	\$ 20	6,100
24.	1+104 to 1+410	Seeding of banks (5m width)	/m ²	1,530	\$ 1	1,550
25.	1+410 to 1+855	Light brushing/clearing of channel and banks (20m corridor)	/m ²	8,900	\$ 1	8,900
26.	1+410 to 1+855	Ditch cleanout with low flow swale (notch) (1.5m wide bottom and 2:1 side slopes) including piling of spoil	/m	445	\$ 20	8,900
27.	1+410 to 1+855	Seeding of banks (5m width)	/m ²	2,225	\$ 1	2,200
28.	1+855	Construct permanent rock sediment trap with 10m ² riprap on filter fabric underlay	L.S.	1	\$ 1,200	1,200
29.	1+855 to 1+884	Cleanout through Regional Road 25 (Netherby Road) culvert and across road allowance	/m	21	\$ 40	800 d)
Sub Total (Section i):						\$ 213,825

Section ii) Provisional Items (Contingency Allowances									
30.	Lump sum contingency allowance				\$ 21,375				
Sub Total (Section ii):									
TOTAL CONSTRUCTION COST ESTIMATE:									

- a) Part of Special Assessment to Fox Road Sta. 0+145 to 0+165
- b) Part of Special Assessment to CPR Sta. 0+373 to 0+396
- c) Part of Special Assessment to College Road Sta. 1+084 to 1+104
- d) Part of Special Assessment to Regional Road 25 (Netherby Road) Sta. 1+855 to 1+884

c) Engineering Cost Estimate

Report Preparation

For work related to gathering of background information, preparing for and attending on-site meeting, field surveys including GPS surveys, fly levels and cross-sections, preparing profiles and details, drain design, conducting discussions with affected landowners and authorities, attending to alternatives (options), cost estimates, reviewing past reports, preparing assessment schedules, preparing future maintenance schedules, completing drawings and specifications, report writing, and preparing for and attending Consideration of Report and Court of Revision.

Report Preparation	\$ 28,000
Prepare future maintenance schedules	2,000
Consideration of Report (Attend 1 meeting)	1,000
Court of Revision (Attend 1 meeting) **	1,000
TOTAL ENGINEERING COST ESTIMATE:	\$ 32,000 *

** Cost up to a maximum of 4 appeals. Additional appeals will increase this cost. If the Engineer is not required at this meeting, then this item will be deleted.

The cost for report preparation is usually not altered at the conclusion of a project unless the report is referred back or the report is appealed to the Drainage Tribunal, which would be additional costs. The cost of attendance at meetings is an estimate only. Final costs for meetings will be actual costs incurred including disbursements.

d) Construction Supervision and Eligible Administration Cost Estimate

i) Construction Supervision Cost Estimate

For work to prepare tender documents and to review contract award, attend pre-construction meeting, construction inspection, payments, attend final inspection meeting and do final inspection, post construction follow-up, and prepare or assist in preparing grant applications

Total Construction Supervision (Estimate)	\$ 16,000
--------------------------------------------------	------------------

The estimate shown for Construction Supervision is based on past experience and assumes good construction conditions and a Contractor who completes the construction in an efficient manner. The final (actual) cost for construction supervision will vary as per the actual time spent during the construction stage.

ii) Eligible Administration Cost Estimate

Section 73 of the Drainage Act indicates that specific administration costs incurred by the municipality in carrying out the Drainage Act process are eligible as a cost of the drain. Section 73(1) lists the following eligible costs: *cost of any application, reference or appeal and the cost of temporary financing*. Section 73(2) and 73(3) indicates that costs of elected and staff personnel are not eligible.

This administration cost estimate may not be adequate to cover any legal or engineering costs incurred by or assessed to the municipality should the project be appealed beyond the Court of Revision though such costs may form part of the final drain cost.

The OMAFRA Agricultural Drainage Infrastructure Program (ADIP) policies (applicable where the provincial grant is made) indicates that municipal costs for photocopying and mailing required to carry out the required procedures under the Drainage Act can also be included as eligible administrative costs on a drain.

The Harmonized Sales Tax (HST) will apply to most costs on this project (allowances are excluded). However, the Municipality is eligible for a refund of a proportion of the HST paid. Therefore, the cost estimate in this report does include a dollar allowance equivalent to a net tax (Net HST) in the amount of 1.76%. The Net HST has been rounded off. It is also shown as an eligible administration cost.

The eligible administration cost estimate thus includes an allowance for the following items.

MNRF/DFO/NPCA submissions	2,000 *
Printing of reports	400 *
Printing of tender documents	500 *

Interest Allowance	500 *
Permits and Applications Fees Allowance	500 *
Sub Total:	\$ 3,900 *
Net HST (1.76%)	<u>5,055</u>
Total Eligible Administration Cost Estimate	\$ 8,955
TOTAL CONSTRUCTION SUPERVISION AND ELIGIBLE ADMINISTRATION COSTS ESTIMATE:	\$ 24,955

e) Estimated Cost Summary

Allowances	\$ 11,400
Construction Cost Estimate	235,200
Engineering Cost Estimate	32,000
Construction Supervision and Eligible Administration Cost Estimate	<u>24,955</u>
TOTAL ESTIMATED PROJECT COST:	\$ 303,555

* The Net HST (1.76%) would be applicable to these items.

It is possible that additional costs (construction and administration) may be incurred if the Ministry of Natural Resources and Forestry (MNRF) or Department of Fisheries and Oceans (DFO) or Niagara Peninsula Conservation Authority (NPCA) would require additional investigation to address their concerns.

ASSESSMENTS

The Drainage Act requires that the total estimated cost be assessed to the affected lands and roads under the categories of Benefit (Section 22), Outlet Liability (Section 23), Injuring Liability (Section 23), Special Benefit (Section 24), and Special Assessment (Section 26). On this project assessments for Benefit, Outlet Liability, and Special Assessment are involved.

The method of calculating the assessments for the St. John's Marsh Drain 2016 is illustrated in Appendix A which has been included with this report. Appendix A divides the drain into intervals. The estimated cost for each interval is then determined. The first step in the assessment calculation is to apply benefit, special benefit and special assessments, if applicable, to the affected lands and roads in each of the drain intervals. After deducting the total benefit, special benefit and special assessment from the interval cost, the balance of the cost is then assessed as outlet liability on a per hectare basis to all upstream lands and roads in the watershed. As noted, the hectares affected are adjusted prior to calculating the outlet liability. The basis for this adjustment is 1 hectare (2.5 acres) of cleared agricultural land contributing both surface and subsurface water to the drain. Areas which generate greater runoff such as roads are increased by a factor of 1.5 for gravel roads to 2.5 for paved roads and 2.0 for built-up/commercial/industrial/institutional areas. Areas which generate lesser runoff such as woodlots (bush areas) are decreased by a factor of 0.5. These same methods and adjustments have also been used in Appendix B, which was used to calculate the assessments in Schedule B (Schedule of Assessments for Future Maintenance).

On this project, there is a minimum gross assessment of \$40 per property.

SPECIAL BENEFIT

There are no assessments for Special Benefit on this project at this time. However, Special Benefits could be incurred as follows:

- If a landowner elects to haul spoil off site (where not so indicated by this report) the increased cost of hauling spoil off-site above the cost of piling will be assessed to the abutting landowners and it is not eligible for the grant.
- If a landowner elects to have new fencing in this report, the landowner will be assessed the increased cost for the new fence and it is not eligible for grant.

SPECIAL ASSESSMENTS

Section 26 of the Drainage Act directs that: *any public utility or road authority shall be assessed the increased cost to a drainage works caused by the existence of the works of the public utility or road authority.*

The Town of Fort Erie, Canadian Pacific Railway (C.P.R.) and Region of Niagara are assessed a special assessment for the culvert/bridge cleanout work plus riprap, if any, required at each drain crossing. The following table illustrates the calculation of the Special Assessments:

Station	Crossing	Owner	Cost of Work *	Less Equivalent Drain Cost**	Plus Engin. & Admin. Cost*	Plus Net HST (1.76) *	Special Assessment (Estimate)
Main Drain							
0+145 to 0+165	Fox. Road	Town of Fort Erie	\$ 1,200	\$ 500	\$ 500	\$ 20	\$ 1,220
0+145 to 0+396	C.P.R. (Roll No. 13-996-00)	C.P.R.	900	500	500	15	915
1+084 to 1+104	College Road	Town of Fort Erie	800	400	500	15	915
1+855 to 1+884	Regional Rd 25 (Netherby Rd)	Region of Niagara	800	400	500	15	915
TOTALS:			\$ 3,700	\$ 1,800	\$ 2,000	\$ 65	\$ 3,965

Notes:

1. * These are estimated as per cost estimate for this report. Use final contract and engineering administration figures for final special assessments.
2. ** These are fixed amounts to be used in final calculations.
3. The special assessments shall not apply for future maintenance purposes.

The final special assessment will be determined by substituting the actual cost of the construction work, engineering and administration costs required at each crossing into the above table. An owner of a road or utility can elect to construct the crossing with their own forces in which case zero (0) would be entered into the construction costs and then the actual engineering and administration costs required at each crossing is entered into the above table to determine the final special assessment.

Should crossings of utilities (such as Bell and Union Gas) be encountered and require work by the Contractor, or should any municipal utilities (such as sanitary sewers or watermains) require work by the Contractor, the costs will also be assessed as special assessments to the utilities or road authority, based on the actual costs incurred and any additional engineering. However, if the utility or road authority undertakes the work, there will be no Special Assessment. If the work of the Contractor at a utility or watermain is only to locate, protect, possibly put a low cost protective medium between the utility line and the new pipe, there will be no Special Assessment for such.

ASSESSMENT SUMMARY

The assessments against the affected lands and roads are summarized in Schedule A. Schedule B (Schedule of Assessments for Future Maintenance) is the schedule to use for future maintenance and repairs of all of the St. John's Marsh Drain in the Town of Fort Erie. Schedule C illustrates the Net Assessments after possible grants and allowances are deducted. Schedule C is not an official schedule. It has been included for information purposes only. Schedule A will be used to assess the final cost of the drain which may vary depending on final construction, engineering and

administration costs. Net assessments in Schedule C may vary depending on the availability of grants. In Schedules A to C each parcel of land assessed has been identified by the Assessment Roll Number for the municipality at the time of the preparation of this report. The size of each parcel was established using the assessment roll information. For convenience only, each parcel is further identified by the owner's name from the last revised assessment roll.

FINAL COST

Final assessments are not levied until after the work is certified complete by the engineer. The final assessments will thus be levied to the owner of the identified parcel at the time that the final cost is levied. Schedule A will be used to levy the final cost of the drain which may vary, depending on final construction, engineering and administration costs. Some of the assessed properties (lands) are considered agricultural and are taxed as Farm properties and are eligible for the Farm Property Class Tax Rate (F.P.C.T.R.) and thus are eligible for the provincial (OMAFRA) one third (33-1/3%) grant and as part OMAFRA's ADIP policies. This grant may also be available for maintenance assessments. The other properties are considered to be non-agricultural.

COST OVERRUN PROVISIONS ON DRAINAGE ACT PROJECTS

In any cost estimate prepared by the Engineer, the substantial component relates to "construction". The construction cost estimate is prepared by the Engineer using his best knowledge of past and expected costs. However, any project must be put to tender after any report to implement it is adopted and the costs for construction can vary as per the tender received. The Drainage Act makes it mandatory to have a review by the petitioners if the tender cost should exceed the Engineer's estimate by 33%. It is this Engineer's practice to undertake such reviews if a tendered cost is 20% more than the estimate.

Where a tender does increase the Engineer's estimate substantially, methods are initially sought to try to reduce the scope of the construction to keep the project within the estimate. Also recourse to retendering can be followed.

The allowances component of the report and the engineering for the preparation of the report itself do not vary except if appeals are involved. Supervision and non-administrative costs can vary with the extent of supervision required and with any lengthy costs or delays due to appeals, etc. where interest costs and legal representation are impacted.

All increased costs are normally prorated against the assessment schedule that is included. Contingency allowances are also included in the cost estimate and such could reduce the impact of cost increases.

ALIGNMENT OF CHANNELS AND CLOSED DRAINS IN RELATION TO PROPERTY LINES

All channels/closed drains shall be constructed generally to the alignment as noted on the plans and as dictated by the Specific Notes section of the Construction Notes (Special Provisions on Drawing 6). Existing fences near boundaries between properties shall be deemed to be in the proper location of the boundary unless otherwise noted by the affected landowners. In the absence of fences or other properly marked and located legal boundaries, the channels/closed drains shall be located more or less on the lands as noted in the drawings without the benefit of a legal survey to confirm property lines.

Construction shall follow the location of existing ditches specified on the plan, wherever such exist and where practicable, and only minor straightening is to occur if and as indicated in the drawings. The location shown on the drawings roughly follows the location of the existing ditches. Where indicated, some portions of the channels will be new. Other straightening or realignment will not be allowed.

Should the owners require a more precise location for the drains in relation to their property line or if there is a dispute about the location of the line, we recommend that they establish their legal property boundaries in advance of construction or maintenance and/or advise the Drainage Superintendent and/or the Engineer prior to construction or maintenance, of the concern re the property line location.

PROVISIONS OF SECTION 61(3) OF DRAINAGE ACT

Pursuant to Section 61(3), a Municipality may pay out of General Funds any assessment equal to or less than \$50. However, if such is done, the Municipality should send a copy of the notice regarding the meeting to consider the report, to any owner affected by Section 61(3).

BUFFER STRIP

In order to facilitate maintenance, provide for nutrient management and decrease the amount of soil erosion and bank degradation, it is recommended that a narrow 0.6m (2') wide buffer strip be maintained on both sides of any open drain. Ideally buffer strips should not be cultivated but could be used for lawn, pasture, access or forage crops.

WORKING CORRIDOR AND RIGHT OF WAY

The Contractor shall be allowed to operate his equipment within a working corridor as defined in the General Notes on the drawings and also in Sections E.10 and E.11 of the attached General Conditions. Each landowner is required to provide the Contractor and the Municipality with reasonable access to the drain on his property for both construction and maintenance.

RIPRAP & OTHER BANK PROTECTION

Riprap is the placement of angular stone on top of a filter fabric to give stability to eroding or erodible banks, at tile outlets and at bends and other locations. Riprap is also required as part of culvert work. If additional areas to be protected become evident at the time of construction, additional riprap may be authorized at such time as part of the contingency allowance.

In areas where access for hauling of stone may be difficult, the Engineer may authorize an alternative method of bank protection, such as erosion control blankets or turf reinforced mats as part of the contingency allowance.

REPAIR OF CONSTRUCTED WORK

Should any portions of the constructed work require corrective work up to the end of the maintenance period due to soil instability or erosion, the engineer may authorize bank stabilization (riprap, erosion control mats, etc.), re-sloping of banks and/or stone check dams (temporary rock sediment traps) as necessary. The additional costs for such will be assessed against the overall assessment schedule. The Engineer and Municipality may also elect to do such repairs as works under the Drainage Superintendent, if time and financing allow. If any areas require corrective work as the result of construction deficiencies such will be attended to as part of the contract.

ADDITIONAL WORK ITEMS THAT COULD BE REQUESTED BY OWNERS AT TIME OF CONSTRUCTION

Items of additional work that could be requested by owners at the time of construction (examples of this would be more expensive methods of disposal of excavated or brush material (hauling away) and new fences) would have to be paid directly by the owner to the contractor. These items would not form part of the drain nor be eligible for the 1/3 grant. Only if the engineer determines that such additional items are necessary for the intended purpose of the drain and that such are in compliance with OMAFRA policies could such be part of the drain and be eligible for grant. The work added would also not form part of the drain for purposes of future maintenance.

GRANTS

In accordance with the provisions of Section 85 of the Drainage Act, a grant not exceeding 1/3 (33-1/3%) may be available on the assessments against privately owned parcels of land which are used for agricultural purposes. Current OMAFRA policy states that lands can be designated as agricultural and thus eligible for the 1/3 grant provided the current assessment roll information for the Municipality identifies that at least 85% of the assessed parcel area has the Farm Property Tax Class. Based on Municipal assessment roll information reviewed during the preparation of this report the assessed parcels that have the Farm Property Tax Class and are thus eligible for the 1/3 grant are identified with an 'F' in the first column of Schedule C. The Town must confirm that the Farm Property Tax Class is still in effect on the assessed properties at the time the grant application is completed and forwarded to OMAFRA. Please be advised that OMAFRA retains the final right to determine eligibility under the grant program, regardless of designation herein.

Schedule C illustrates the net assessments after deducting grants and allowances from the final assessments and is included for information purposes only. Please note that Schedule C assumes that all project costs will be eligible for the grant and that the identified properties in the watershed will retain the Farm Property Tax Class.

In accordance with Section 85 of the Drainage Act, a grant not exceeding 1/3 (33-1/3%) may also be available in the future on the assessments against privately owned parcels of land taxed as agriculture (again as per OMAFRA ADIP policies), for maintenance and repair of the St. John's Marsh Drain 2016, if done on the recommendation and supervision of an approved Drainage Superintendent and using the same eligibility requirements as outlined above.

MAINTENANCE

After completion the St. John's Marsh Drain 2016, as outlined in this report, shall be maintained by the Town of Fort Erie.

The cost of all maintenance is to be assessed to the lands and roads prorata with the assessments in the appropriate interval columns found in Schedule B (Schedule of Assessments for Future Maintenance) that has been prepared and included in this 2016 report. This schedule however is only for the portion of the St. John's Marsh Drain in the Town of Fort Erie. The St. John's Marsh Drain actually extends into the City of Niagara Falls. There is a new report being prepared on the St. John's Marsh Drain for that portion in the City of Niagara Falls. The portion of the drain in the City of Niagara Falls is to be maintained by the City. Also refer to the "Recommended Work" section in this 2016 report for a description of the drain to be maintained. The schedule is divided into columns to reflect different intervals of drain where maintenance work may be undertaken and to identify the lands and roads upstream of the interval. All lands identified in each interval have drainage run-off from their property flow into the drain and contribute to overall flows carried by the municipal drainage channel in that interval.

The method of calculating the assessments in Schedule B is illustrated in Appendix B which has been included with this report. The same method and adjustments as outlined for Appendix A on Page 11 have also been used in Appendix B with the exception that Special Assessments were not included in these calculations.

To use Schedule B, the drain interval in which maintenance work is to be undertaken must be identified. The percentages (or dollar amounts) associated with this interval can then be used, along with the total cost of maintenance, to calculate the assessments that the lands and roads will bear. If repair or maintenance is performed in 2 or more intervals, the assessments calculated for each interval in Schedule B are to be totaled. A minimum percentage assessment is applied to all future lots in the watershed of 0.01% per interval affected.

It is noted that the dollar amounts currently shown in Schedule B are only theoretical and not amounts to be paid. These theoretical amounts were used to develop the assessment percentages which would apply to any future maintenance costs.

All parties affected by the St. John's Marsh Drain 2016 are encouraged to periodically inspect the drain and report any visible or suspected problems to the Town Drainage Superintendent. Repeated inspection and maintenance of the drain should allow the drain to provide a service for many years.

The following notes apply for future repairs and maintenance and are to be considered as further specifications for the St. John's Marsh Drain 2016 (Sta.0+000 to 1+884):

- (a) All bridges/culverts where the St. John's Marsh Drain 2016 is shown to cross a road allowance shall be considered to be a part of the St. John's Marsh Drain 2016, but only the cost of cleaning through such bridge/culverts* shall be assessed as per ditch clean out cost upstream or downstream of the bridge/culvert. Any work to maintain the structural integrity or to extend or replace the bridge/culverts and resulting costs will be assessed fully (100%) to the road authority.
- (b) The bridge across the C.P.R. shall be considered to be part of the St. John's Marsh Drain 2016, but only the cost of cleaning through such bridge* shall be assessed as per ditch cleanout cost upstream or downstream of the bridge. Any work to maintain the structural integrity or to extend or replace the bridge and resulting costs will be assessed fully (100%) to the railway authority.
- (c) Residential bridge/culvert may be replaced up to 9m in length with the cost being split with 50% to the abutting property and 50% to the upstream lands. The cost of additional length over 9m is to be solely assessed (paid) by the abutting property and is not eligible for grant. Cleanout costs*
- (d) Industrial, commercial or farmland bridge/culverts may be replaced up to 12m in length with the cost being split with 50% to the abutting property and 50% to the upstream lands. The cost of additional length over 12m is to be solely assessed (paid) by the abutting property and is not eligible for grant. If a residential home is located on industrial, commercial or farmland property a second access bridge/culvert may be installed with the cost being split with 50% to the abutting property and 50% to the upstream lands. Cleanout costs.*
- (e) Culverts installed to service public utilities shall be assessed 50% to the utility and 50% to the road authority.
- (f) The replacement of an existing bridge/culvert or placing of a new bridge/culvert on the St. John's Marsh Drain 2016 must be approved by the Town of Fort Erie. The cost of new laneway bridge/culvert and the future maintenance of such a bridge/culvert shall be fully incurred by the landowner unless a new Engineer's report is prepared for such under the Drainage Act.
- (g) It is recommended that each abutting owner work no closer than 0.6m (2') to any ditch bank. Such area does not have to be grassed but it should not be cultivated.
- (h) Under Section 74 of the Drainage Act, RSO 1990, and pursuant to the St. John's Marsh Drain 2016 report, a reasonable maintenance right of way shall always be available to allow access to and a working area for drain maintenance (usually a 5m wide right of way on either side or any combination to a maximum of 10m from the top of the tile or bank is used). Landowners may not place obstructions within the R.O.W. that may prevent routine maintenance of the drain. All costs resulting from the removal of such obstructions shall be assessed fully to the landowner without any grant.

* Removal of accumulated sediments or debris within any culvert shall be considered as normal maintenance.

- (i) The discharge of anything but clean, unpolluted water into a drain is forbidden by other provincial legislation. Materials such as petroleum products, liquid and granular fertilizers, herbicides, insecticides, empty containers/boxes, spoiled produce, domestic and industrial garbage and waste, human or animal sewage, grey water sewage, scrap machinery cannot be stored or placed adjacent to a ditch and can not be allowed to enter a ditch.
- (j) The remainder of the St. John's Marsh Drain upstream of Sta. 1+884 in the geographic Township of Bertie, now in the Town of Fort Erie and in the geographic Township of Willoughby, now in the City of Niagara Falls, is to be maintained using the plan, drawing and specifications from the new report being prepared by another engineer for this portion.
- (k) Any landowner making a new connection into to the St. John's Marsh Drain either, tile, open ditch or outlet, shall request permission from the Drainage Superintendent to connect to such drain. If the Drainage Superintendent is not notified, this connection will be deemed to be an obstruction under Sections 81& 82 of the Drainage Act RSO 1990 and shall be removed at the landowner's expense.

PRIVACY OF LANDS

Even though a Municipal Drain is being constructed or exists across lands of various owners, there still is no right of one owner to enter onto another owner's property. Only the Engineer (and/or Engineer's staff) as part of the work with respect to this report and the Drainage Superintendent or staff under their direction (as part of his or her maintenance duties) and the selected/approved drain construction and maintenance contractors have the right to enter onto privately owned lands of others in connection with this drain.

AGENCY APPROVALS

It is recognized that this final report is to be submitted to Fisheries and Oceans Canada (DFO) and to the Niagara Peninsula Conservation Authority (NPCA) and Ministry of Natural Resources and Forestry (MNRF) with respect to Species at Risk.

The DFO is aware of the project and has participated to date on it. With respect to the NPCA and MNRF, all drainage projects are to be reviewed to determine if there is the potential of a species-at-risk being involved under the Endangered Species Act. The NPCA and MNRF will be invited to attend the consideration meeting. Further follow up with NPCA and MNRF may then be required in the future.

PROVIDING FOR FUTURE LAND USE CHANGES

To ensure that the capacity of the drain is not exceeded by future land use changes, it is recommended that all land uses which may generate increased runoff be developed with on site (storm frequency) storm water management.

BYLAW

This report, including the drawings, the assessment and future maintenance schedules, appendices and the specifications, when adopted by bylaw in accordance with the Drainage Act, RSO 1990 provides for the construction and maintenance of the St. John's Marsh Drain 2016.

CHANGES TO DRAIN AFTER BYLAW IS PASSED AND BEFORE COST IS LEVIED

Should changes, deletions or extensions to the drain proposed in this report be requested or required after the bylaw is passed and the contract is awarded, there may be some difficulty in attending to such. Since this drain is to be constructed in accordance with a Bylaw of the Town of Fort Erie, changes to the drain cannot be undertaken without a change to the bylaw. An exception

would be very minor changes which are approved by the Engineer and the Municipality in accordance with the General Conditions in the report.

If it is desired to make a substantial addition or deletion to the drain proposed in this report, it will be necessary that a revised report be prepared and processed through the Drainage Act, or in some cases, an application to the Ontario Drainage Tribunal may be required under the Drainage Act to obtain approval for a necessary change.

If any individual or group of owners require additional work on the proposed drain and are prepared to pay for such, they may make their own arrangements with the contractor to have such work constructed. The Engineer must pre-approve such additions to verify there is no impact on the function or maintenance of the drain as proposed. Even so, the work added would not form part of the drain for the purpose of future maintenance

All of which is respectfully submitted.

K. SMART ASSOCIATES LIMITED



Neal Morris, P. Eng.



SCHEDULE B - SCHEDULE OF ASSESSMENTS FOR FUTURE MAINTENANCE
ST. JOHN'S MARSH DRAIN 2016
Town of Fort Erie

Conc.	Lot	Roll No.	Owner(s)	Interval 1		Interval 2		Interval 3		Interval 4	
				Sta. 0+000	to 0+396	Sta. 0+396	to 1+055	Sta. 1+055	to 1+855	Sta. 1+855	to 2+335
				Assess. (\$)	%						
Con. C	Pl 11	4-225-10	P. Martel & J. Cosby	5	0.11	8	0.10	12	0.13	28	0.49
Sub-Total (Lands):				745	15.65	1,128	14.22	1,782	18.61	4,027	69.90
<i>Roads</i>											
Willow Rd.			City of Niagara Falls	8	0.16	12	0.15	18	0.19	41	0.71
Lapp Rd.			City of Niagara Falls	8	0.16	13	0.16	20	0.21	45	0.78
Baker Rd.			City of Niagara Falls	12	0.24	19	0.24	30	0.31	67	1.16
King Rd.			City of Niagara Falls	17	0.35	27	0.27	42	0.44	95	1.64
Beck Rd. -			City of Niagara Falls	6	0.13	9	0.11	15	0.16	33	0.57
Durlat Rd.			City of Niagara Falls	3	0.06	5	0.06	8	0.08	18	0.31
Unopened Road A			City of Niagara Falls	2	0.04	3	0.04	4	0.04	10	0.17
Sub-Total (Roads):				56	1.14	88	1.03	137	1.43	309	5.34
Total Assessments for City of Niagara Falls:				801	16.79	1,216	15.25	1,919	20.04	4,336	75.24
Total Assessments for St. John's Marsh Drain 2016:				4,752	100.00	7,908	100.00	9,600	100.00	5,760	100.00

Notes:

1. Section 21 of the Drainage Act, RSO 1990 requires that assessments be shown opposite each parcel of land and road affected. The affected parcels of land have been identified using the roll number from the last revised assessment roll for the Township. For convenience only, the owners' names as shown by the last revised assessment roll, have been included.
2. The dollar amounts shown are not amounts to be paid at this time. These amounts were only used to determine the percentage or portions that each parcel (property) and road will pay for any future maintenance repair or maintenance costs.

**SCHEDULE C - SCHEDULE FOR ACTUAL COST BYLAW
ST. JOHN'S MARSH DRAIN 2016
Town of Fort Erie**

	Conc.	Lot	Roll No.	Owner(s)	Gross Total (\$)	1/3 Grant (\$)	Allowance (\$)	Net (\$)
F	5	Pt 1	4-101-01	C. Sauer	56	-		56
F	4	Pt 1	4-103-00	D. & D. McGowan	1,385	462		923
F	5	Pt 1	4-104-00	M. & K. Markey	3,834	1,278		2,556
	5	Pt 1	4-104-01	-	111	-		111
	Con. C	Pt 11,1&2	4-167-00	Niagara Peninsula C.A.	3,186	-		3,186
	Con. C	Pt 10	4-213-00	N. & C. Panto	56	-		56
F	Con. C	Pt 10	4-214-00	F. Susin	1,592	531		1,061
F	Con. C	Pt 10	4-215-00	J. & P. Scigliano	1,202	401		801
F	Con. C	Pt 10	4-216-00	D. & D. Belme	1,049	350		699
F	Con. C	Pt 11	4-219-00	G. & C. White	1,454	485		969
	Con. C	Pt 11	4-219-10	G. & S. Burberry	111	-		111
	Con. C	Pt 11	4-220-00	A. & D. Daudelin	111	-		111
F	Con. C	Pt 11	4-221-00	W. Daudelin	484	-		484
F	Con. C	Pt 11	4-223-00	F. & C. Muileboom	3,202	1,067		2,135
	Con. C	Pt 11	4-223-50	C. & C. Cook	56	-		56
	Con. C	Pt 11	4-224-00	J. Adams	40	-		40
F	Con. C	Pt 11	4-225-00	W. & S. Young	2,855	952		1,903
	Con. C	Pt 11	4-225-10	P. Martel & J. Cosby	277	-		277
Sub-Total (Lands):					40,616	10,217	-	30,399
	<u>Roads</u>							
	Willow Rd.			City of Niagara Falls	417	-		417
	Lapp Rd.			City of Niagara Falls	458	-		458
	Baker Rd.			City of Niagara Falls	680	-		680
	King Rd.			City of Niagara Falls	956	-		956
	Beck Rd. -			City of Niagara Falls	333	-		333
	Durlat Rd.			City of Niagara Falls	180	-		180
	Unopened Road A			City of Niagara Falls	97	-		97
Sub-Total (Roads):					3,121	-	-	3,121
Total Assessments for City of Niagara Falls:					43,737	10,217	-	33,520
Total Assessment for St. John's Marsh Drain 2016:					303,555	49,141	11,400	243,014

Notes:

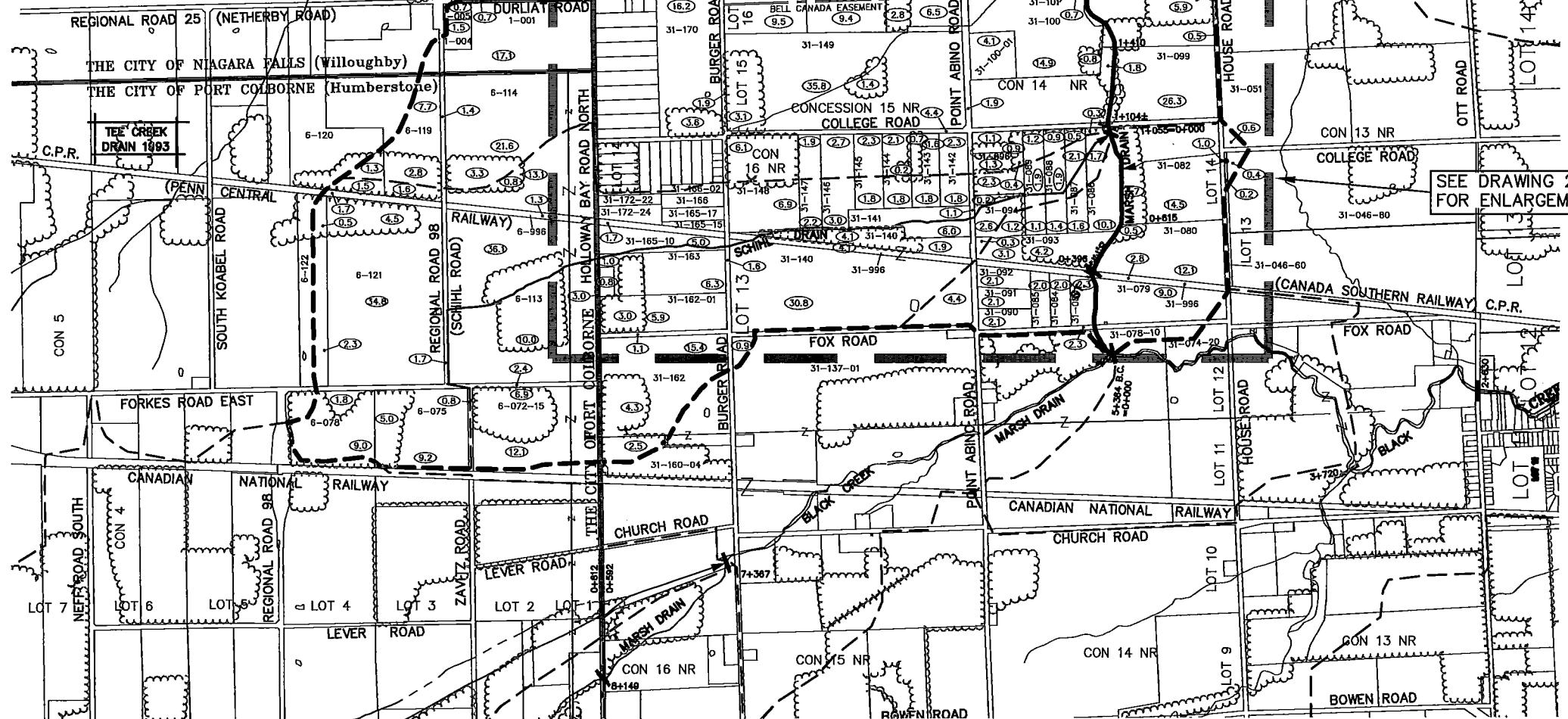
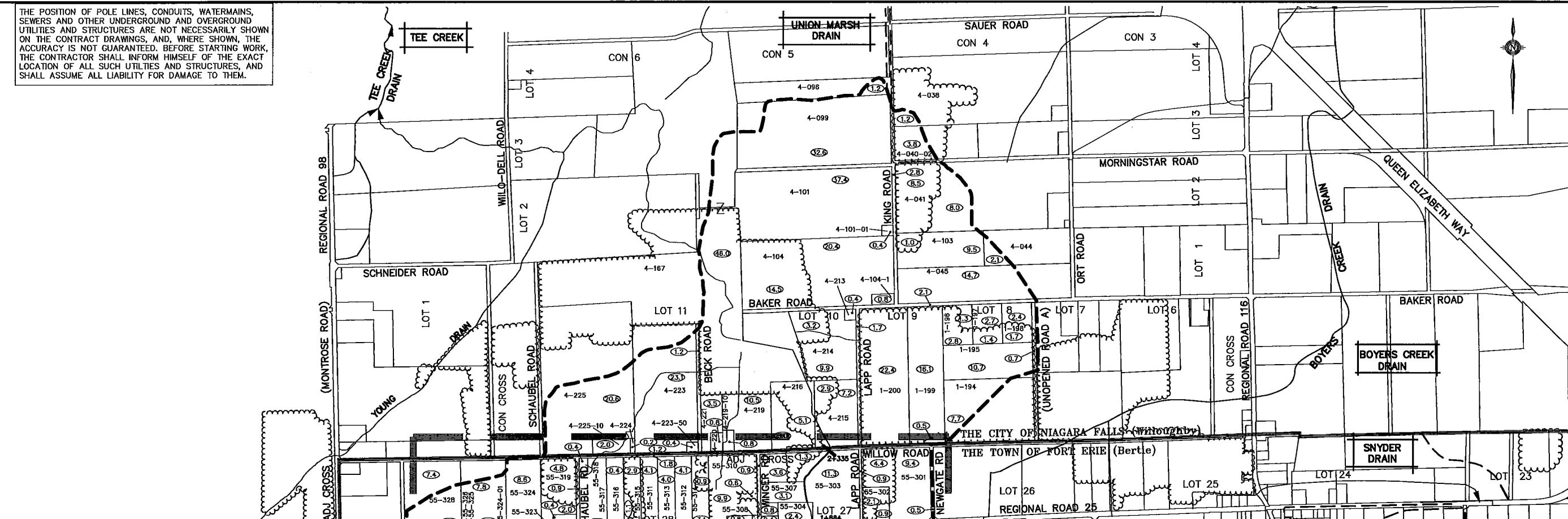
1. The above lands marked "F" are currently classified as agricultural according to the OMAFRA and are therefore entitled to a 1/3 grant .
The other lands are considered to be non-agricultural.
2. Section 21 of the Drainage Act, RSO 1990 requires that assessments be shown opposite each parcel of land and road affected. The affected parcels of land have been identified using the roll number from the last revised assessment roll for the Township. For convenience only, the owners' names as shown by the last revised assessment roll, have been included.
3. **The value of the assessments identified in this schedule are estimates only, and should not be considered final.**
4. This schedule is included for information purposes only. It is not an official schedule.

Conc.	Lot	Roll No.	Owner	St. John's Marsh Drain - Cont'd					Total	
				Interval 4		Benefit (\$)	Adjusted Outlet (\$)	% Benefit (\$)		
				Sta. 1+855	to 2+335					
				\$ 5,760 (\$12/m for ditch cleanout)					\$ 28,020	
<u>Town of Fort Erie (27-03-020-01 (Former Township of Bertie))</u>										
<u>Lands</u>										
13NR	Pt 14	3-046-80	Town of Fort Erie					0	2	
13NR	Pt 14	3-050-00	-					0	3	
13NR	Pt 15	3-051-00	C & L. Crosby					0	4	
14NR	Pts 11&12	3-074-20	M. Fastje & K. Bodnar					0	3	
14NR	Pt 12	3-078-10	C. Childs & B. Lemire					392	398	
14NR	Pt 13	3-079-00	M. & D. Legacy					461	484	
14NR	Pt 13	3-080-00	D. Pattison					873	954	
14NR	Pt 13	3-081-00	Carver & Barnhart Cemetery					0	1	
14NR	Pt 14	3-082-00	J. & B. Williams					1,534	1,664	
14NR	Pt 13	3-083-00	C. Ferreira & L. Vieira-Ferreira					461	467	
14NR	Pt 13	3-084-00	H. & P. Barrington					0	5	
14NR	Pt 13	3-085-00	R. Gabin					0	5	
14NR	Pt 14	3-086-00	R. Singleton					1,005	1,026	
14NR	Pt 14	3-087-00	D. & S. Mitchell					0	15	
14NR	Pt 14	3-088-00	W. Carver					0	20	
14NR	Pt 14	3-089-00	W. Carver					0	19	
14NR	Pt 13	3-090-00	M. & M. Cossette					0	5	
14NR	Pt 13	3-091-00	M. & R. Reisch					0	5	
14NR	Pt 13	3-092-00	K. Kullerkupp					0	5	
14NR	Pt 13	3-093-00	V. Turniski & L. Cryderman					397	445	
14NR	Pt 14	3-094-00	R. Charon					0	25	
14NR	Pt 14	3-096-00	R. & D. Willick					0	25	
14NR	Pt 14	3-098-00	D. Hardt					0	26	
14NR	Pt 15	3-099-00	D. & P. Bonneau JR.					1,277	1,623	
14NR	Pts 15&16	3-099-25	D. & P. Bonneau					1,106	1,322	
14NR	Pts 15&16	3-100-00	M. Amyot & P. Henderson					723	914	
14NR	Pt 15	3-100-01	Golden Harvest Baptist Church					0	77	
14NR	Pt 16	3-101-00	A. Mueller					0	9	
14NR	Pt 16	3-102-00	J. Everett					0	77	
15NR	Pt 11&12	3-1137-01	J. Myrmik					0	5	
15NR	Pt 13	3-140-00	V. Lloyd Ltd.					0	234	
15NR	Pt 13	3-141-00	L. & H. Van Der Meer					0	38	
15NR	Pt 14	3-142-00	K. & S. Sider					0	38	
15NR	Pt 14	3-143-00	V. & S. Kikkert					0	34	
15NR	Pt 14	3-144-00	D. Dagesse & D. Holloway					0	38	
15NR	Pt 14	3-145-00	L. & A. Smith					0	39	
15NR	Pt 14	3-146-00	V. & L. Staubwasser					0	53	
15NR	Pt 14	3-147-00	C. Slackwood					0	37	
15NR	Pt 14	3-148-00	R. Berlin					0	84	
15NR	Pt 14	3-148-10	E. Brooks					0	10	
15NR	Pt 14	3-148-12	E. Brooks					0	10	
16NR	Pt 14	3-148-14	G. Morell					0	10	
16NR	Pt 14	3-148-16	G. Morell					0	10	
16NR	Pt 14	3-148-18	G. Morell					0	10	
16NR	Pt 14	3-148-20	L. Morell					0	13	
16NR	Pt 14	3-148-22	L. Morell					0	13	
15NR	Pt 15	3-149-00	C. & A. Berardocco					0	475	
15NR	Pt 16	3-149-01	H. & D. Hwang & S. Dy					99	99	
15NR	Pt 16	3-150-02	M. & L. Gauthier					117	117	
15NR	Pt 16	3-150-02	G. & L. Hedge					119	119	
16NR	Pt 11	3-160-04	P. Potts					0	8	
16NR	Pts 11&12	3-162-00	R. Brost & T. Chute					0	113	
16NR	Pts 11&12	3-162-01	P. & A. Brunet					48	48	
16NR	Pt 13	3-163-00	D. Cregneur					0	40	

Town of Fort Erie

Conc.	Lot	Roll No.	Owner	St. John's Marsh Drain - Cont'd				
				Interval 4		Total		
				Sta. \$ 5,760	1+855 (\$12/m for ditch cleanout)	to 2+335	\$ 28,020	
Conc.	Lot	Roll No.	Owner	Benefit (\$)	Adjusted (Ha)	Outlet (\$)	%	Benefit (\$)
16NR	Pt W½	31-164-00	C. Mugas & K. Beardwood	-	-	-	-	5
16NR	Pt W½	31-165-00	W. & K. Hawkins	-	-	-	-	5
16NR	Pt N½ 13 & ;	31-165-10	I. & J. McKenzie	-	-	-	-	12
16NR	Pt S½ 14	31-165-15	A. & J. Natale	-	-	-	-	32
16NR	Pt S½ 14	31-165-17	A. & J. Natale	-	-	-	-	5
16NR	Pt S½ 14	31-166-00	H. & S. Dyck	-	-	-	-	10
16NR	Pt S½ 14	31-166-02	J. Brooks	-	-	-	-	11
16NR	Pt 14	31-167-00	N. Lunn	-	-	-	-	3
16NR	Pt 14	31-168-00	E. Brooks	-	-	-	-	4
16NR	Pt 14	31-168-01	G. Morell	-	-	-	-	3
16NR	Pt 14	31-169-00	I. Corbett	-	-	-	-	3
16NR	Pt 14	31-169-01	M. & K. Kiss	-	-	-	-	6
16NR	Pts 15&16	31-170-00	L. & T. Hamby	-	-	-	-	6
16NR	Pt 16	31-170-02	O. & J. Randall	-	-	-	-	6
16NR	Pt 16	31-171-00	S. Seelig	-	-	-	-	10
16NR	Pt 16	31-171-01	-	-	-	-	-	15
16NR	Pt 16	31-171-02	-	-	-	-	-	15
16NR	Pt 16	31-172-00	-	-	-	-	-	15
16NR	Pt 16	31-172-01	R. Purvis	-	-	-	-	15
16NR	Pt 16	31-172-02	I. Cameron	-	-	-	-	15
16NR	Pt 16	31-172-03	-	-	-	-	-	15
16NR	Pt 16	31-172-04	-	-	-	-	-	15
16NR	Pt 16	31-172-05	-	-	-	-	-	15
16NR	Pt 16	31-172-06	-	-	-	-	-	15
16NR	Pt 16	31-172-07	-	-	-	-	-	15
16NR	Pt 16	31-172-08	-	-	-	-	-	15
16NR	Pt 16	31-172-09	-	-	-	-	-	15
16NR	Pt 16	31-172-10	-	-	-	-	-	15
16NR	Pts 15&16	31-172-11	K. Mitchell	-	-	-	-	15
16NR	Pt 14	31-172-12	G. Morell	-	-	-	-	15
16NR	Pt 14	31-172-14	K. Partington	-	-	-	-	15
16NR	Pt 14	31-172-16	J. Arbour	-	-	-	-	15
16NR	Pt 14	31-172-18	P. Lapp	-	-	-	-	15
16NR	Pt 14	31-172-20	P. Lapp	-	-	-	-	15
16NR	Pt 14	31-172-22	Town of Fort Erie	-	-	-	-	15
16NR	Pt 14	31-172-24	A. & J. Natale	-	-	-	-	15
16NR	Pt 16	31-173-00	B. McCallum & B. Geyer	-	-	-	-	15
16NR	Pt 16	31-173-01	F. Juliani	-	-	-	-	15
16NR	Pt 16	31-173-05	Reg. Municipality of Niagara	-	-	-	-	15
Adj. Cross. Pt 27	55-301-00	G. Hopkins	11.6	159	2.76	0	305	9
Adj. Cross. Pt 27	55-302-00	D. Lapp	2.6	36	0.63	0	69	8
Adj. Cross. Pt 27	55-303-00	S. Schiavelyev	11.3	156	2.71	0	298	13
Adj. Cross. Pt 27	55-304-00	R. & J. Hind	2.4	33	0.57	0	9	9
Adj. Cross. Pt 27	55-305-00	D. Warner	0.6	8	0.14	0	16	9
Adj. Cross. Pt 27	55-306-00	V. Kiss	1.2	17	0.30	0	32	9
Adj. Cross. Pt 27	55-307-00	M. & C. McCarty	3.1	43	0.75	0	82	8
Adj. Cross. Pt 27	55-307-01	D. Belme	4.2	58	1.01	0	111	8
Adj. Cross. Pt 28	55-308-00	J. & D. Dumelle	0.1	1	0.02	0	3	3
Adj. Cross. Pt 28	55-309-00	R. Collart & A. Hamelin	0.4	5	0.09	0	10	10
Adj. Cross. Pt 28	55-310-00	R. & C. Darksen	5.5	76	1.32	0	144	10
Adj. Cross. Pt 28	55-311-00	T. Papavasilou	4.1	56	0.97	0	107	10
Adj. Cross. Pt 28	55-312-00	R. & S. Fortin	4.1	56	0.97	0	107	10
Adj. Cross. Pt 28	55-313-00	D. & J. Guignard	4.0	55	0.95	0	104	10
Adj. Cross. Pt 28	55-314-00	D. Michael	3.6	50	0.87	0	95	9
Adj. Cross. Pt 28	55-315-00	N. & R. Stenzel	2.6	36	0.63	0	69	9
Adj. Cross. Pt 28	55-316-00	V. Ashcroft & M. Martin	4.0	55	0.95	0	104	10

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.



NOTES:

- ALL ROLL NO'S IN TOWN OF FORT ERIE BEGIN WITH 27-03-020-0 EG. 31-16100 IN FULL IS 27-03-020-031-16100
- ALL ROLL NO'S IN CITY OF PORT COLBORNE BEGIN WITH 27-11-040-00 EG. 6-07700 IS 27-11-040-006-07700
- ALL ROLL NO'S IN CITY OF NIAGARA FALLS BEGIN WITH 27-25-013-00 EG. 1-200 IS FULL IN 27-25-013-001-200

PLAN LEGEND

- ST. JOHN'S MARSH DRAIN WATERSHED
- INTERMEDIATE WATERSHED
- DRAIN TO BE MAINTAINED
- EXISTING DRAIN
- ACCESS
- DENOTES PROPERTY OWNERSHIP ON BOTH SIDES OF LOT LINE
- APPROXIMATE HECTARES IN WATERSHED
- ASSESSMENT ROLL NUMBER
- LIMITS BETWEEN MUNICIPALITIES

DESIGNED BY: N.W.M.	SCALE
CHECKED BY: H.A.W.	0 250 500
DRAWN BY: D.C.P.	(1:25,000 ON 11"X17")
CHECKED BY: N.W.M.	

REGISTERED PROFESSIONAL ENGINEER
N. W. MORRIS 10010937
PROVINCE OF ONTARIO

ST. JOHN'S MARSH DRAIN 2016

REGION OF NIAGARA TOWN OF FORT ERIE

WATERSHED PLAN

APR. 8, 2016

REVISED:

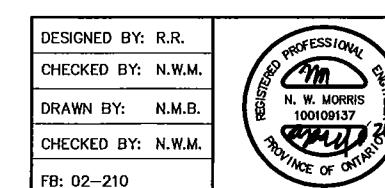
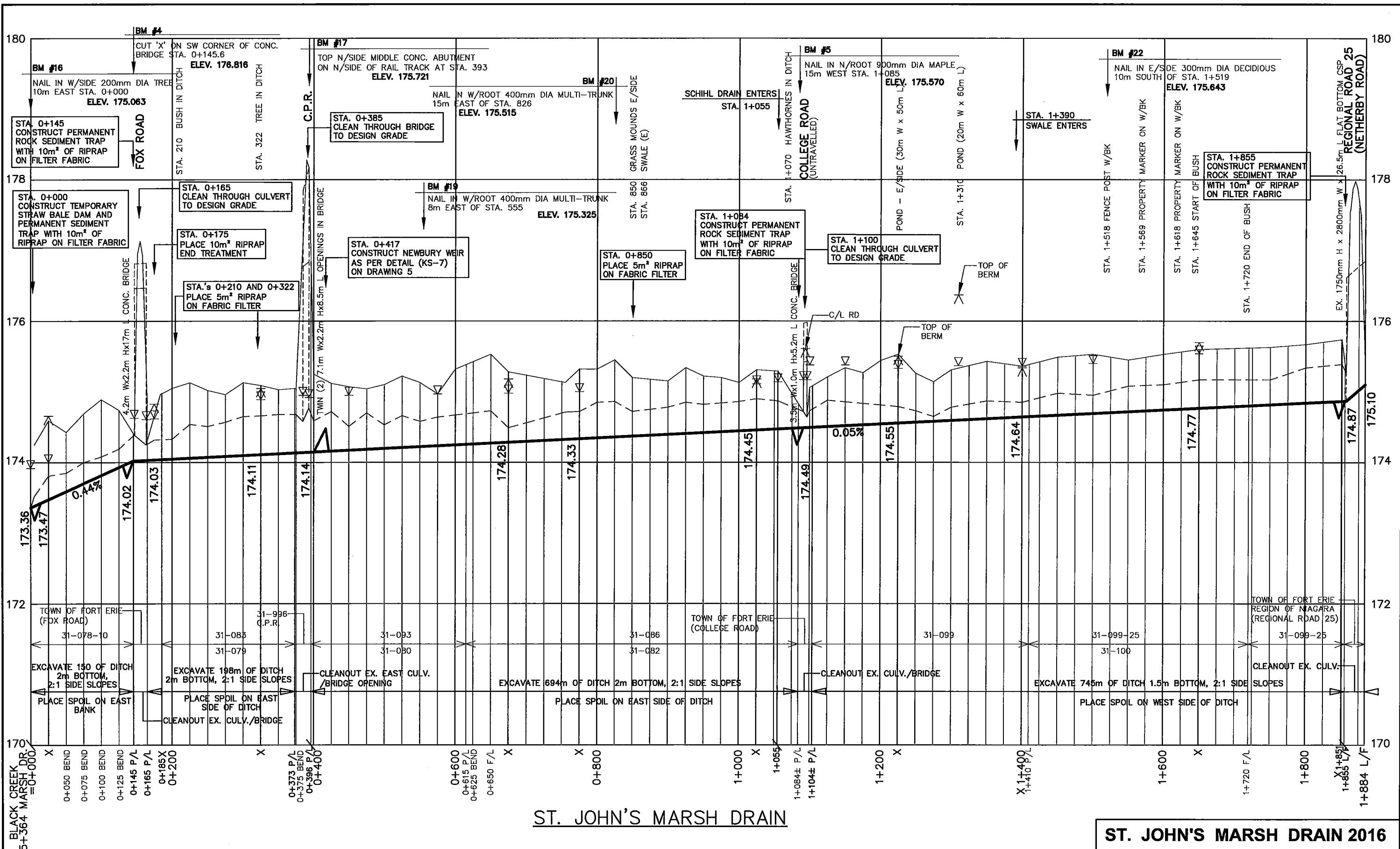
JOB NUMBER: 13-249

DRAWING

1 OF 6

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDSBURY



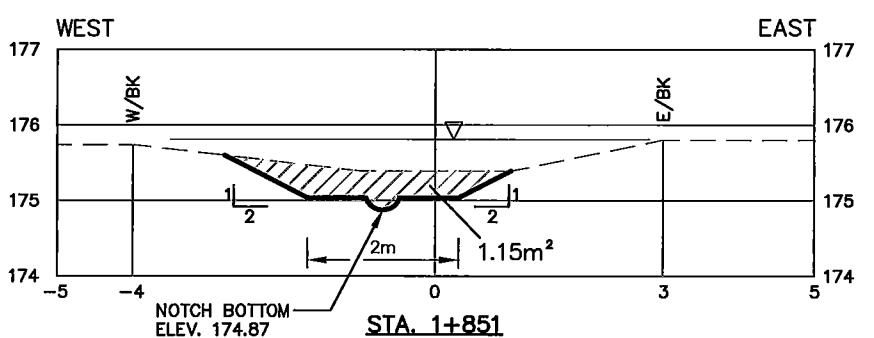
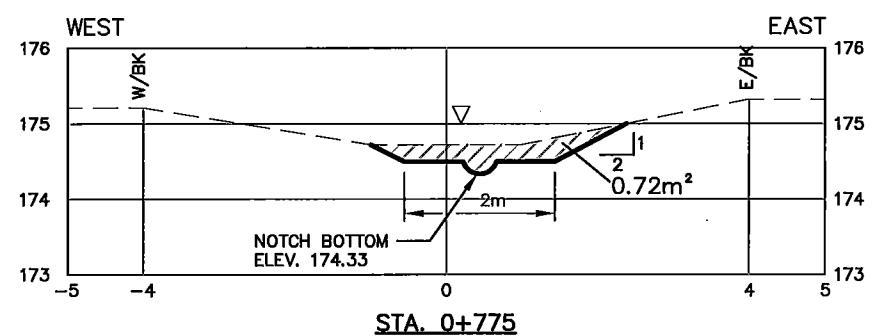
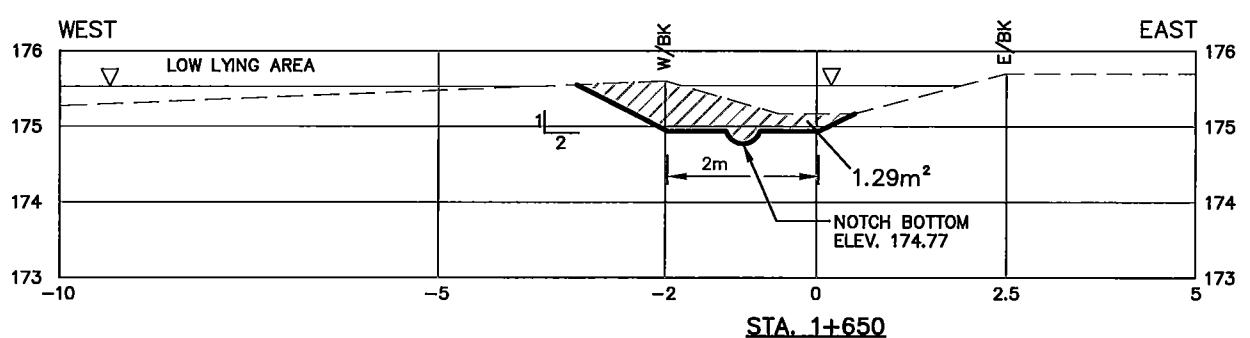
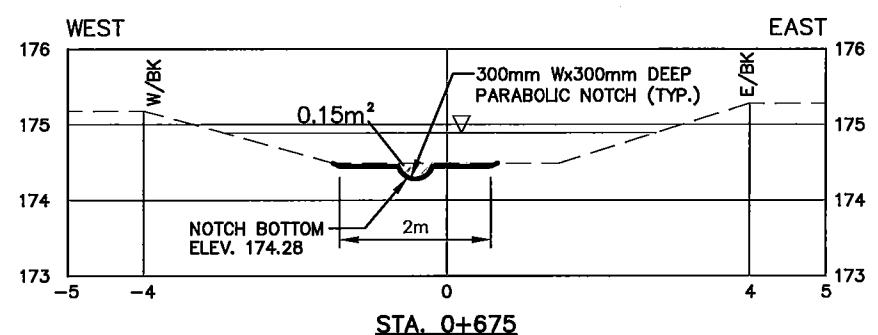
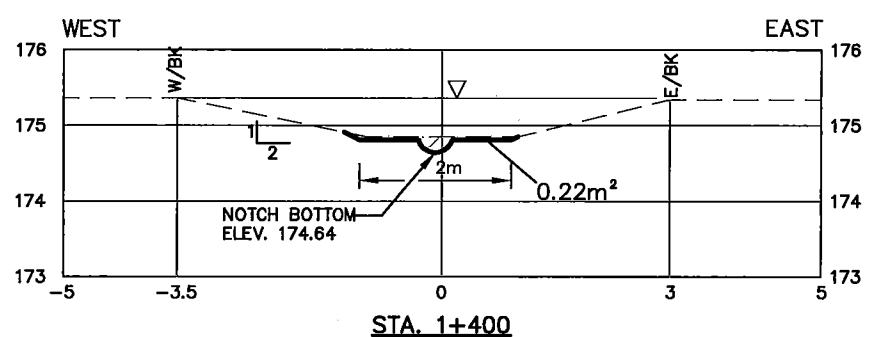
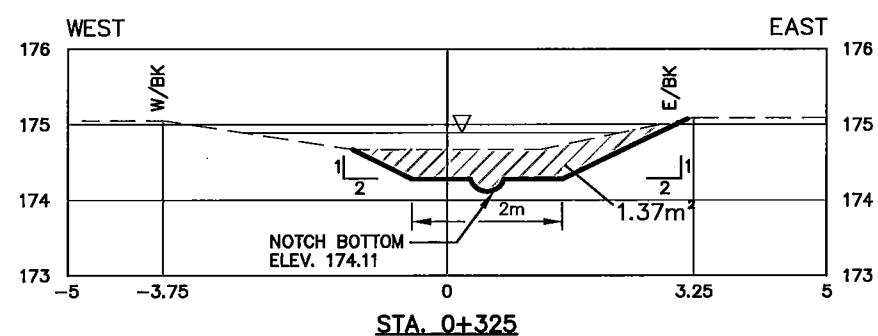
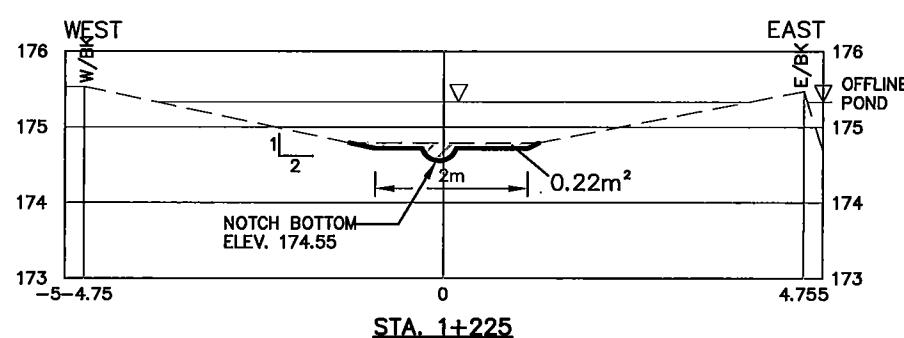
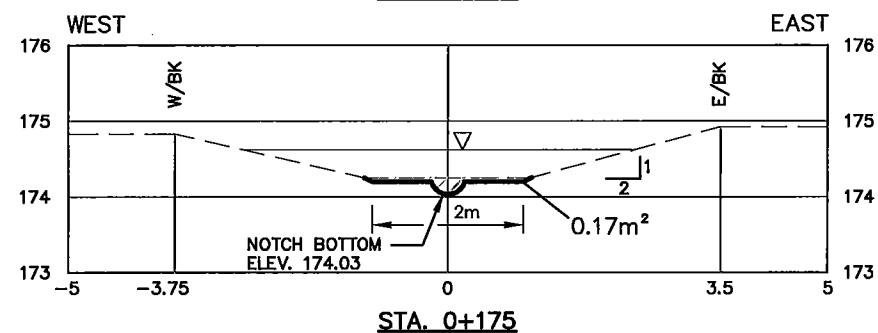
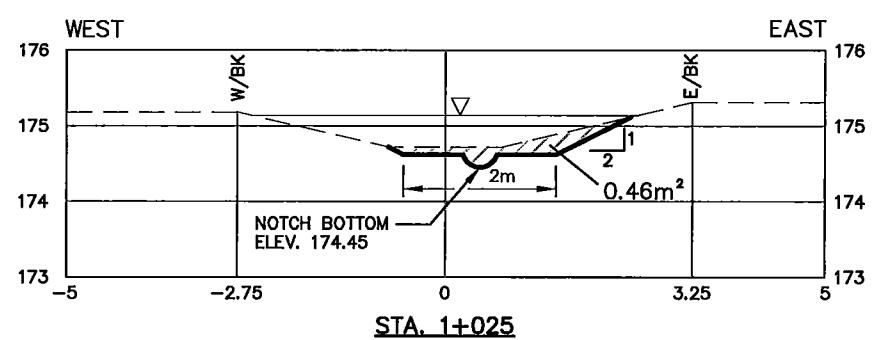
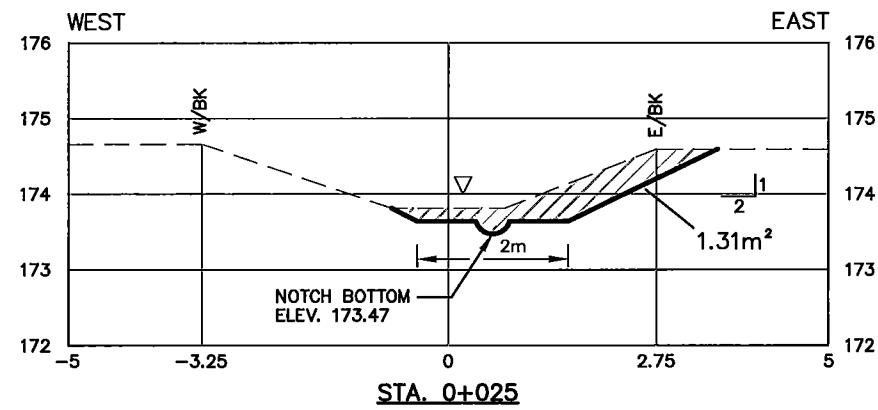


ST. JOHN'S MARSH DRAIN 2016

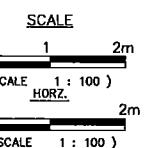
TOWN OF FORT ERIE REGION OF NIAGARA

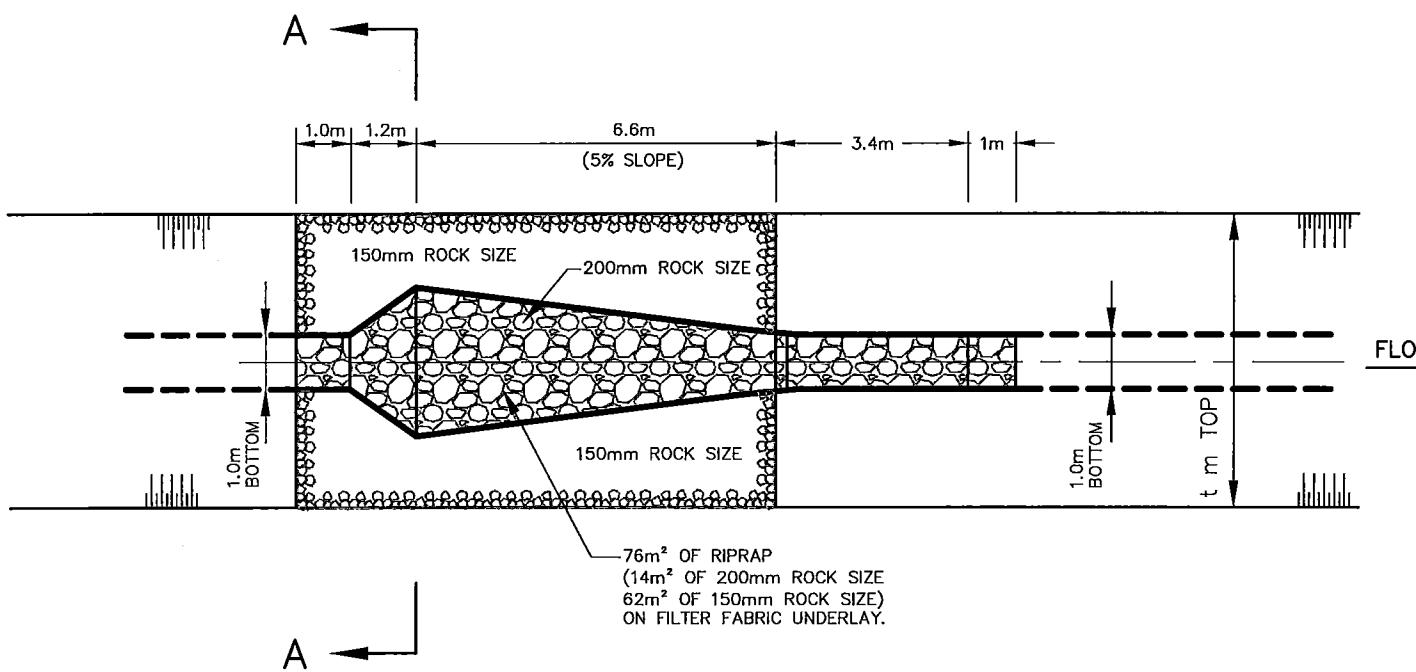
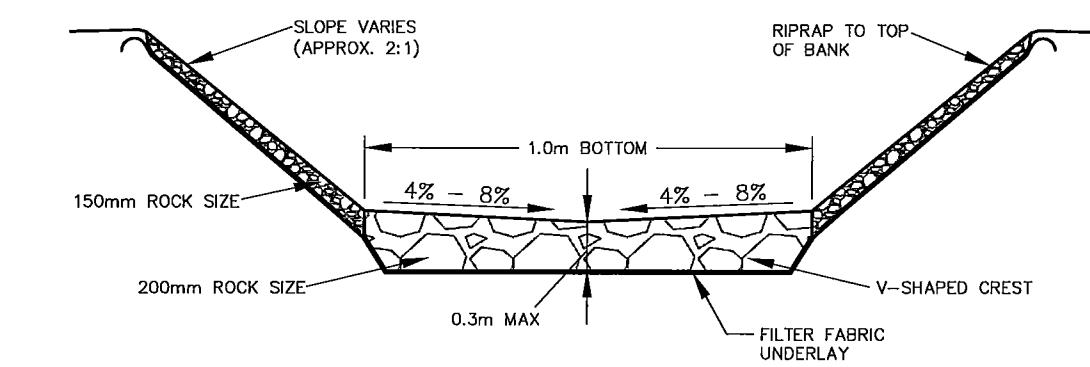
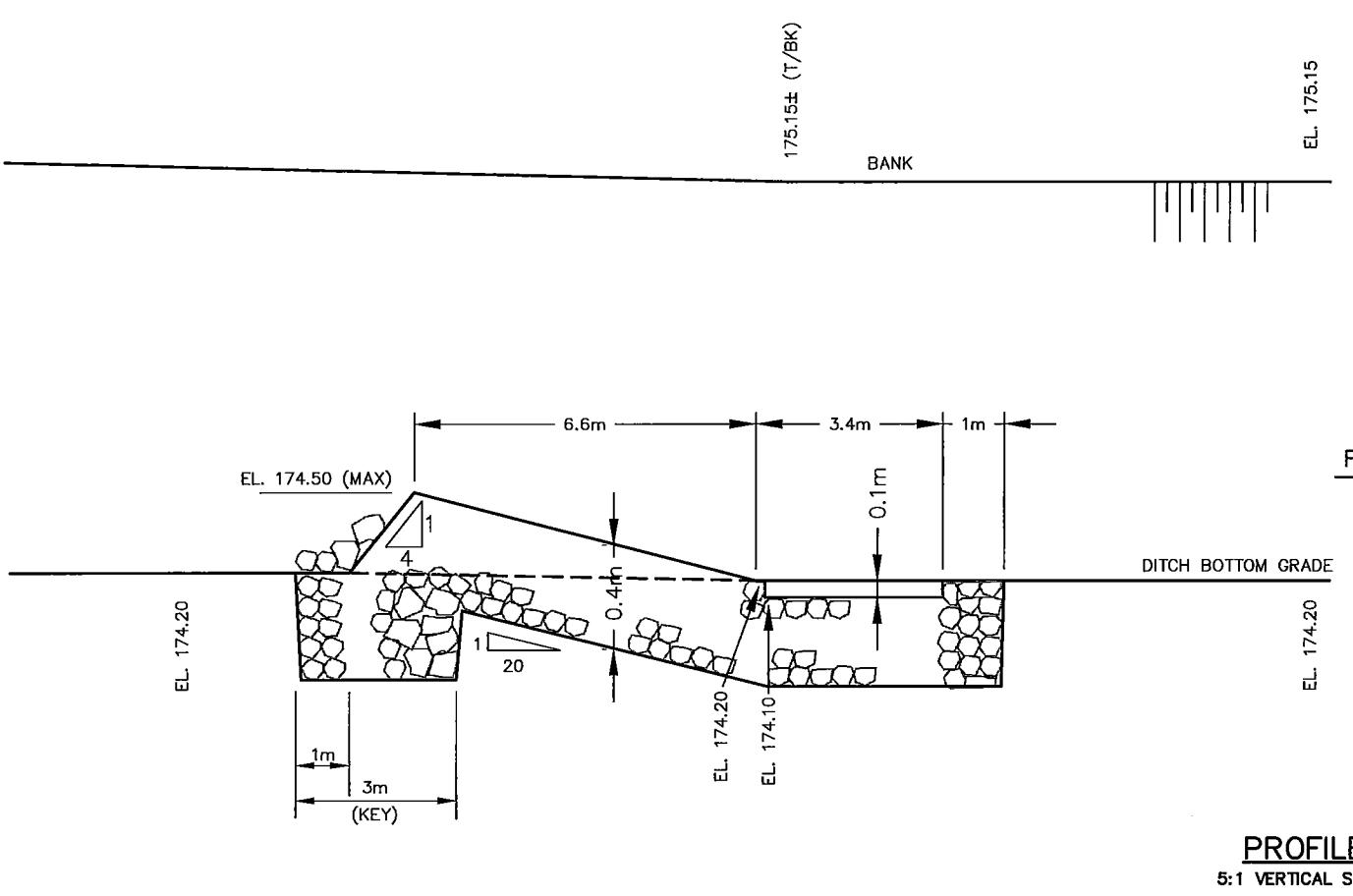
PROFILE	APR. 8, 2016
K. SMART ASSOCIATES LIMITED CONSULTING ENGINEERS AND PLANNERS KITCHENER	REVISED: JOB NUMBER: 13-249 DRAWING SUDBURY

3 OF 6



DESIGNED BY: R.R.	REGISTERED PROFESSIONAL ENGINEER N. W. MORRIS 100109137 PROVINCE OF ONTARIO	SCALE 0 1 2m (SCALE 1 : 100)
CHECKED BY: N.W.M.		0 1 2m (SCALE 1 : 100)
DRAWN BY: N.M.B.		0 1 2m (SCALE 1 : 100)
CHECKED BY: N.W.M.		0 1 2m (SCALE 1 : 100)
FB: 02-210		0 1 2m (SCALE 1 : 100)
ST. JOHN'S MARSH DRAIN 2016		
TOWN OF FORT ERIE		REGION OF NIAGARA
CROSS SECTIONS		APR. 8, 2016
K. SMART ASSOCIATES LIMITED CONSULTING ENGINEERS AND PLANNERS KITCHENER		REVISED: JOB NUMBER: 13-249 DRAWING 4 OF 6





NEWBURY WEIR/RIFFLE
STA. 0+417

DESIGNED BY: R.R.	REGISTERED PROFESSIONAL N. W. MORRIS 100109137 PROVINCE OF ONTARIO 	SCALE AS SHOWN
CHECKED BY: N.W.M.		
DRAWN BY: N.M.B.		
CHECKED BY: N.W.M.		
FB: 02-210		

ST. JOHN'S MARSH DRAIN 2016
REGION OF NIAGARA TOWN OF FORT ERIE

**DETAIL OF NEWBURY
WEIR/RIFFLE**

APR. 8, 2016

REVISED:	 K. SMART ASSOCIATES LIMITED CONSULTING ENGINEERS AND PLANNERS KITCHENER SUBDURY	JOB NUMBER: 13-249
DRAWING		
5 OF 6		

**DETAIL
DRAWING**
KS-7

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUBDURY

\server\data\2013\13-249\Drafting\NEWBURY WEIR 13-249.dwg Layout1 6-Apr-16 10:03:11 AM

