

Engineer's Report
For the Construction of the
Chenier-Jeaurond Municipal Drain
Township of North Glengarry

Prepared For:



The Township of North Glengarry

Prepared By:

Robinson Consultants Inc.
Consulting Engineers

February 16th, 2017

Mayor and Members of Council
Township of North Glengarry
90 Main Street P.O. Box 700
Alexandria, ON K0C 1A0

Attention: **Mr. Daniel Gagnon**
 CAO/Clerk

Reference: **Engineer's Report**
 For the Construction of the
 Chenier-Jeaurond Municipal Drain
 Township of North Glengarry
 Our Project No. B15041

Dear Sir:

This Engineer's Report for the Chenier-Jeaurond Municipal Drain, Township of North Glengarry (Former Township of Lochiel) which is respectfully submitted for Council's consideration, was initiated by three petitions of the landowners under Section 4 of the Drainage Act, RSO 1990 (Act). The purpose of the report is to implement the recommendations of the previously submitted and accepted Preliminary Engineer's Report "Bureau Road Municipal Drain and Branch Drain #1 – Preliminary Report" as prepared by Ainley Group, dated April 2015 with additional consideration for the third petition which was received following the meeting to consider the Preliminary Report. At the direction of Council the Final Engineer's Report for the three petitions received in this regard were combined to form one project under Section 8(4) of the Act.

All costs associated with the project, including the Engineer's Report, allowances and construction will be assessed against the lands as indicated on Dwg. No. 15041-A3, and on the Schedules of Assessment.

If you have any questions, please feel free to contact the undersigned at 592-6060 extension 104.

Yours very truly,

ROBINSON CONSULTANTS INC.



A.J. Robinson, P.Eng.
Drainage Engineer

AJR:plw

c.c. Ryan Morton, Manager of Public Works, Township of North Glengarry

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1.0 INTRODUCTION

Robinson Consultants Inc. was appointed by the Township of North Glengarry on April 13, 2015 to complete an Engineer's Report on the proposed Chenier-Jeurond Municipal Drain, following the acceptance of the Preliminary Engineer's Report. At Council's direction, as authorized under Section 8(4) of the Act, three petitions for areas requiring drainage within the overall drainage area of the proposed Chenier-Jeurond Municipal Drain were combined to form one project. The Engineer's Report for the Municipal Drain was initiated by petition of the Landowners under Section 4 of the Drainage Act. The purpose of the proposed drain is to provide adequate drainage and adequate outlet for surface and tile drainage to the lands and roads within the drainage area.

The Preliminary Engineer's Report discussed potential costs and environmental concerns related to proceeding with the project. The recommendations of the Preliminary Engineer's Reports, as approved, are implemented by this Engineer's Report.

1.1 History

The Preliminary Engineer's Report was initiated in response to a petition by landowners. Two additional petitions were received following the initial on-site meeting (conducted by Ainley Group for the Preliminary Engineer's Report).

The initial petition listed properties forming parts of Lot 24 through Lot 28 Concession 1 (inclusive) in the Township of North Glengarry (Former Township of Lochiel) requiring a drain to provide sufficient tile drainage outlet.

Petition 2 was received during the Preliminary Report for the proposed branch drain to provide outlet for drainage under Cty. Rd. 10 in Lot 27 to a sufficient outlet.

A third petition was received for the area upstream of the area requiring drainage prescribed by the initial petition by owners in Lot 19 and Lot 21 Concession 1 in the Township of North Glengarry (Former Township of Lochiel), requiring sufficient outlet for surface and tile drainage.

At the meeting for the appointment of the Drainage Engineer for the Final Report Council, as authorized under Sections 8(4) of the Act, combined the three petitions to form one project to be known as the Chenier-Jeurond Municipal Drain.

An on-site meeting was held on August 6th, 2015 to discuss the requirements for drainage and other concerns within the drainage area. The primary issues put forward by the landowners present at the meeting were as follows:

- Sufficient outlet for surface water drainage.
- Outlet sufficient for current and future tile drainage.

2.0 PURPOSE OF THE DRAINAGE REPORT

The Township of North Glengarry initiated the Engineer's Report as a result of the petitions of the landowners under Section 4 of the Ontario Drainage Act. The landowners require that the following concerns be addressed:

- Sufficient outlet for current and future tile drainage for the lands described by the petitions.
- Sufficient outlet for surface water drainage.

Additionally, the environmental approving agencies, including the Raisin Region Conservation Authority (RRCA), Ontario Ministry of Natural Resources and Forestry (MNR) and the Federal Department of Fisheries and Oceans (DFO) require that certain measures and Best Management Practices (BMP) be implemented by the project for the protection of the environment.

2.1 Sufficient Outlet for Tile Drainage

To provide sufficient outlet for tile drainage a free flowing drain with a normal operating water level or drain invert (freeboard) 300mm below the invert of the lowest tile outlet to be serviced is to be provided. The requirement for freeboard as noted above is provided for known and existing tile outlets found during the initial survey completed in 2015 as well as anticipated future outlets. Existing outlets are shown on the profiles on Dwg. No. 15041-P1 through 15041-P10 (inclusive) which are provided in **Appendix C**.

2.2 Protection of Environmentally Sensitive Areas

The implementation of measures to protect environmentally sensitive areas and accommodate Best Management Practices (BMP), as indicated by the approving Agencies while addressing the concerns of the petitioning landowners are addressed in this drainage report.

2.3 Distribution of Costs

The fair and equitable distribution of the costs associated with the construction and future maintenance of the Chenier-Jeurond Municipal Drain are addressed by this report.

2.4 Future Maintenance

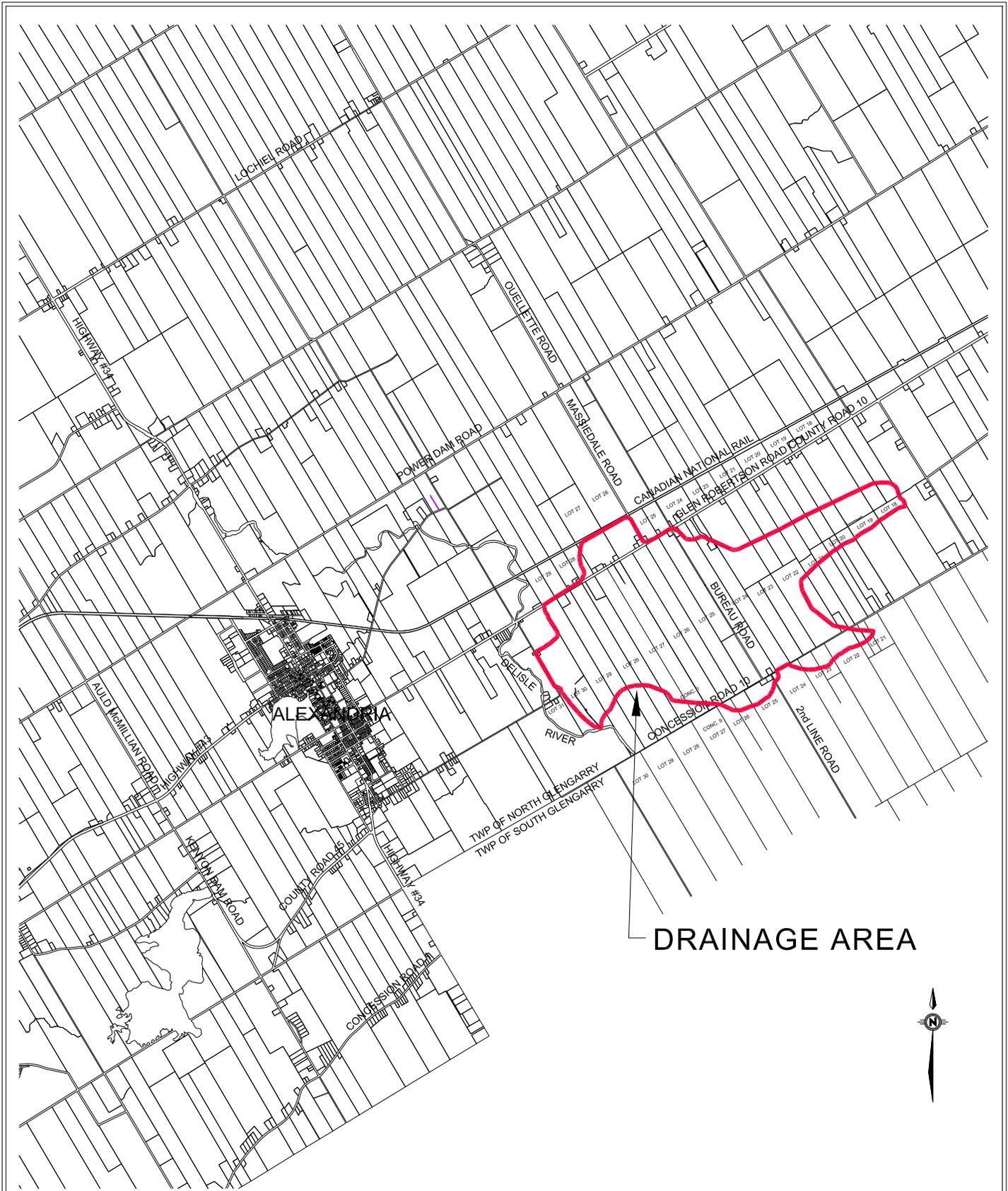
This Engineer's Report will provide for the enhancement and/or modification of the existing watercourse to form a new municipal drain, complete with any required roadway or farm access crossings, and taken to a sufficient outlet (determined to be the Delisle River). Once the Municipal Drain has been constructed, regular maintenance can be completed, under the direction of the Drainage Superintendent, to the plans, cross-sections and profiles in this report. Maintenance is typically initiated by landowner request(s) and is only completed where deemed necessary by the Drainage Superintendent.

3.0 EXISTING CONDITIONS

3.1 Location of the Drain

The existing watercourse to be reconstructed which forms the Chenier-Jeurond Municipal Drain commences within Lot 19, Con 1 at Sta. 6+525.5. The channel continues in a generally south-westerly direction, crossing under Bureau Road (between Lot 24/25, Con 1), outletting to the Delisle River in Lot 30, Con 1.

Figure 3.1 shows a Location Plan, including the drainage boundary and drain, as well as the surrounding area.



DRAINAGE AREA



Robinson
Consultants

Title		LOCATION PLAN		Fig. No.
				3.1
Project		CHENIER - JEAUROND MUNICIPAL DRAIN		Job No.
				15041
		Scale	Date	
		NTS	FEBRUARY 2017	

3.2 Drainage Basin and Limits

The drainage basin for the Chenier-Jeurond Municipal Drain includes parts of Lots 18 through 30 inclusive, Concessions 1 in the Township of North Glengarry (Former Township of Lochiel), and parts of Lots 21 through 26 (inclusive), Con 9 in the Township of South Glengarry, as well as part of Lots 26 through 28 Con 2 in the Township of North Glengarry which includes Branch No. 1.

The drainage area is approximately 753 hectares (1860 Acres). The limits of the Drainage area (drainage basin) are shown on Dwg. No. 15041-A1. These limits have been determined by contour mapping, field reconnaissance and field survey, and are in general conformance with the established drainage area boundaries of adjacent drains.

3.3 Drawings Forming Part of the Engineer's Report

A "Drainage Area Plan", Dwg. No. 15041-A1, has been prepared showing the drainage area boundary as a bold heavy solid line (red where provided in colour), and the proposed drain as bold black dash-dot-dot line. Property information including taxation roll numbers, a property ID No. (for reference to schedules), property lines, and the area of each property (or portion of a property) contributory to the drainage basin is shown on the "Property Ownership Plan", Dwg. No. 15041-A3. The "Culvert and Sediment/Erosion Control Plan", Dwg. No. 15041-A2, shows culverts and culvert information and the proposed minimum sediment/erosion control measures.

Profiles of the proposed drain are shown on Dwg. No. 15041-P1 through 15041-P10 inclusive. The profile shows the existing bottom of the ditch, the original ground for channel sections, existing/known tile outlets (as surveyed), and the proposed profile .

Cross-Sections of the proposed Municipal Drain are shown on Dwg. No. 15041-C1 and 15041-C2 and indicate the existing and proposed sections through typical portions of the proposed drain.

All plans, profiles and cross-sections are provided in **Appendix C** of this report. Standard Detail Dwg's are also provided in **Appendix C**.

4.0 AREA REQUIRING DRAINAGE

The area requiring drainage under this report for the Chenier-Jeurond Municipal Drain is described as part of Lots 24 through 28, Con 1, inclusive under Petition 1, part of Lot 27, Con. 1 and 2 under Petition 2 and part of Lots 19 and 21, Con. 1 under Petition 3 (in 2 parts). Flows are to be conveyed downstream to a sufficient outlet. In this case, sufficient outlet was determined by the Drainage Engineer to be the confluence of the existing private ditch with the Delisle River.

5.0 DESIGN CONSIDERATIONS

5.1 Drain Construction Limits

The Limits of Construction for the proposed Chenier-Jeurond Municipal Drain are within Lots 19 through 30 (inclusive), Con 1, Township of North Glengarry (former Township of Lochiel).

Construction/modifications for the Chenier-Jeaurond Municipal Drain commence at Station 0+000 at the confluence with the Delisle River. Modifications for the main drain terminate at Station 6+525.5, within Lot 19, Con 1 and at Station 10+350 within Lot 27 Con 2 for Branch No. 1

5.2 Soil Characteristics

Soil types have been determined utilizing the following information sources:

“Soils of Glengarry County, Ontario – Soil Survey Report No. 24”, Cartography Section – Land Resource Research Institute – Research Branch – Canada Department of Agriculture, 1956.

The Soils within the basin are predominantly loams and clays. Soil groups found within the Chenier-Jeaurond Municipal Drain watershed are listed in **Table 5.1** and shown on **Figure 5.1**.

Table 5.1
Soil Descriptions

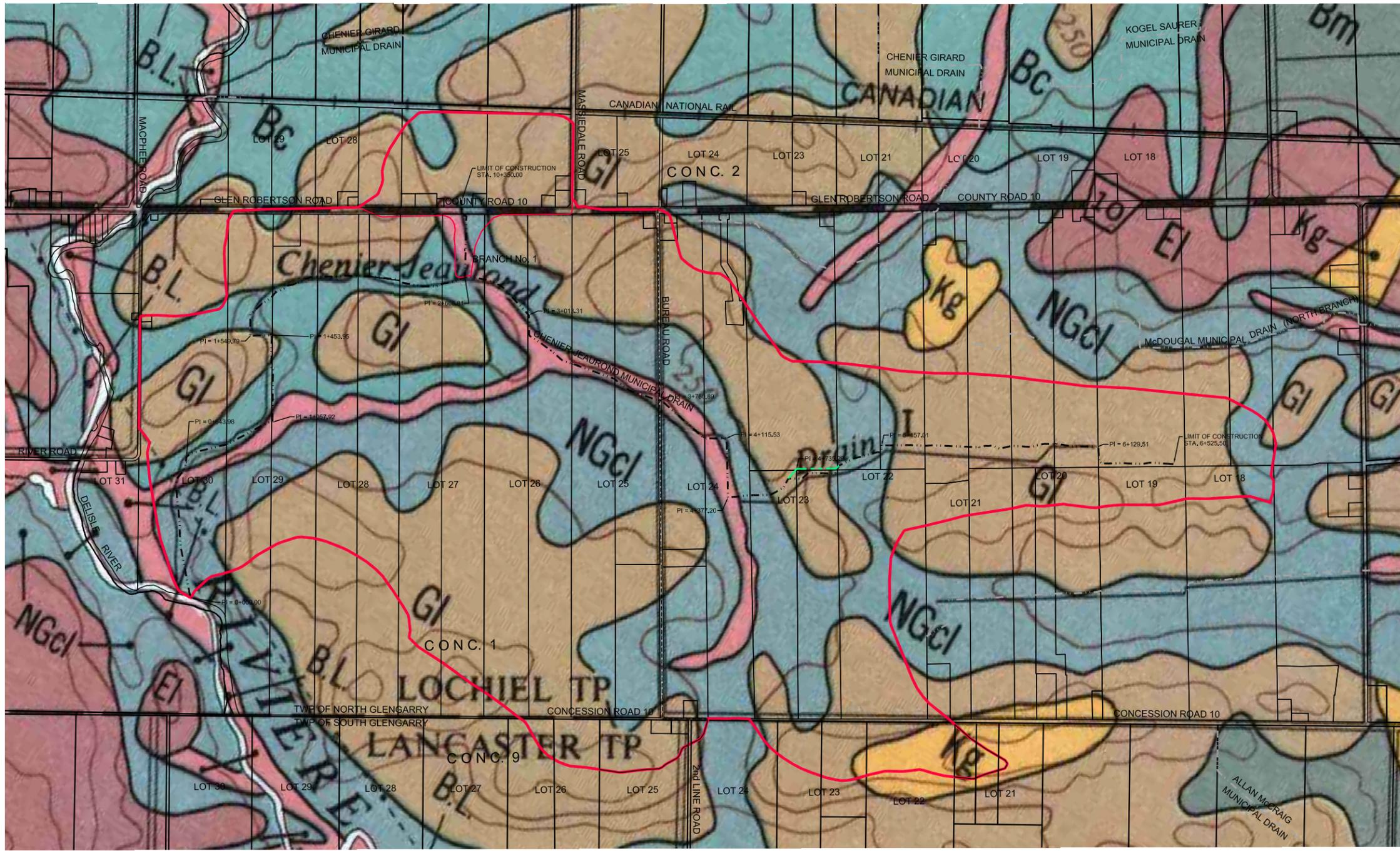
Soil Type	Symbol	Description	Hyd. Soil Gr.	CN
Township of North Glengarry				
North Gower Clay Loam	NG _{CL}	Water laid fine grey gleysolic clay.	C	78.8
		Drainage/Stoniness/Slope		
		Poor Drainage		
		Smooth-level		
		Stone free		
Grenville Loam	G _I	Brown forest loam with medium to very limey medium textured till	BC	73.1
		Drainage/Stoniness/Slope		
		Good Drainage		
		Smooth-gently sloping		
		Moderately stoney		
Kars Gravely/Sandy Loam	K _g	Grey-brown podzolic with unstratified water-laid gravels	A	51.6
		Drainage/Stoniness/Slope		
		Good drainage		
		Smooth to moderately sloping		
		Slightly to moderately stoney		

5.3 Hydrologic Modelling

The SWMHYMO model was developed to generate runoff rates from rainfall events. The rainfall events used for the generation of these hydrographs are the 12 hour 2, 5, 10, 25, and 50 year design storms. Rainfall hydrograph ordinates for the various events were calculated using data obtained from the Cornwall Hydro, Atmospheric Environment Service rain gauge.

LEGEND

-  PROPERTY LINE
-  EXISTING CONSTRUCTED DRAINS
-  MUNICIPAL DRAIN
-  DRAINAGE AREA BOUNDARY
-  RELOCATED DRAIN



SOILS MAP SOURCE

Soils of Glengarry County,
 Ontario Soil Survey Report No. 24
 Cartography Section – Land Resource Research Institute
 Research Branch – Canada Department of Agriculture, 1956.

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES
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CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY
 CHENIER - JEAUMONT
 MUNICIPAL DRAIN

SOILS MAP

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	FIG 5.1

The SCS type II storm distribution was used. An average soil moisture condition was assumed for all flow simulations. Other parameters required for hydrograph generation are: basin area, initial abstraction, slope, fraction impervious, and soil curve number.

For modeling purposes, the watershed was divided into nine (9) sub-catchments and seven channel reaches. Each subcatchment, shown on **Figure 5.2**, was described by the various hydrologic parameters required by the model.

All of the subcatchments were modeled using the CALIB WILHYD routine that requires three basic parameters, CN number, time to peak (TP), and the shape factor K. The CN number or Composite Number is used by the model to transform rainfall inputs into runoff, therefore, the parameters reflect all runoff related phenomena such as infiltration, interception and depression storage.

5.4 Modeling Results

The rainfall-runoff relationship of the Chenier-Jeurond Municipal Drain was evaluated for existing land use conditions, with consideration given to the potential for future conversion of forested areas within the drainage area into crop land. This provided flow estimates for the watershed under current conditions. The total instantaneous peak flow at key locations along the Drain is presented in **Table 5.2**. Table 5.2 should be reviewed in conjunction with **Figure 5.2**, which shows a plan view of the watershed. The flows are calculated at the downstream limit of the subcatchment, or the outlet of the subcatchment basin.

Table 5.2
Peak Flow Estimates

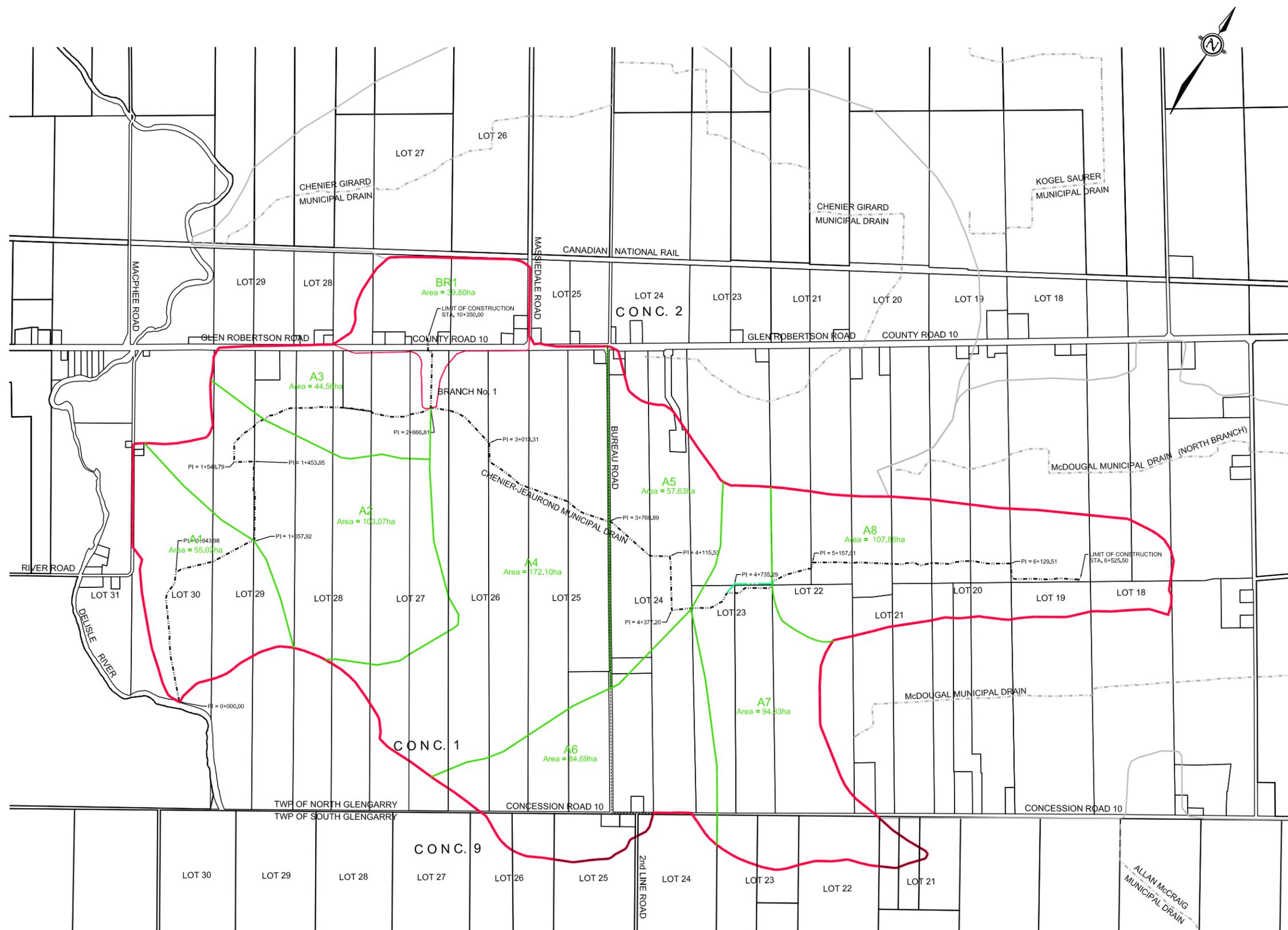
Locations	Peak Flow m ³ /s				
	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr
Main Drain					
STA. 6+525.5 to STA. 5+010 (A8)	0.55	1.12	1.53	2.07	2.56
STA 5+010 to STA. 4+525 (A7,A6)	1.60	3.32	4.59	6.24	7.72
STA. 4+525 to STA. 3+755 (A5)	1.89	3.86	5.24	7.10	8.82
STA. 3+755 to STA. 2+667 (A4, BR1)	2.16	4.38	5.96	8.03	9.90
STA. 2+667 to STA. 1+991 (A3)	2.42	4.88	6.62	8.92	11.00
STA. 1+991 to STA. 1+058 (A2)	2.91	5.84	7.91	10.65	13.12
STA. 1+058 to STA. 0+000 (A1)	3.10	6.15	8.32	11.15	13.73

5.4.1 Secondary Flow Check

Modeled flows were compared with flow estimates obtained from the MTO modified index equation $Q_{25} = C A^{0.75}$.

Q_{25} = 25 year flow
 C = watershed class
 A = area in km²

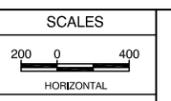
Using this method, Q_{25} was found to be 12.00 m³/s at Station 0+000. This is approximately 7.3% higher than the modeled peak flow.



LEGEND

- PROPERTY LINE
- EXISTING CONSTRUCTED DRAINS
- MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- SUBCATCHMENT AREAS
- RELOCATED DRAIN

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

CHENIER - JEUROND
MUNICIPAL DRAIN

SUBCATCHMENT AREAS

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	FIG. 5.2

5.5 Drain Capacity

Table 5.2 summarizes the flow at key stations along the drainage system. This table is best reviewed in conjunction with Dwg. No. 15041-A1 that shows an overall view of the watershed. The flows are listed from the upstream end of the existing drain to the outlet of the drain at the Delisle River.

5.6 Side Slopes (Typical Cross Section)

The side slopes on the various sections of the drain are as shown on Dwg. No. 15041-C1 and 15041-C2.

5.7 Capacity of Existing Culverts and Bridges

5.7.1 General

The capacities of existing culverts along the Chenier-Jeurond Municipal Drain were obtained using MTO nomographs and HY-8 modelling software. The modeled flow at these culverts was then used to verify if sufficient capacity exists. A summary of capacities and flows is included in **Table 5.3**.

Table 5.3
Summary of Culvert Capacities
Chenier-Jeurond Municipal Drain

Culvert No. and Location	Existing Capacity m ³ /s	Flow Return Period				
		2 yr m ³ /s	5 yr m ³ /s	10 yr m ³ /s	25 yr m ³ /s	50 yr m ³ /s
Main Drain – Roadway Culverts						
Bureau Road STA. 3+761	5.00	1.89	3.86	5.24	7.10	8.82
Access Culverts						
A8-1 STA. 5+939	2.10	0.28	0.55	0.77	1.04	1.28
A8-2 STA. 5+589	0.13	0.55	1.12	1.53	2.07	2.56
A8-3 STA. 5+455	0.36	0.55	1.12	1.53	2.07	2.56
A5-1 STA. 4+103	0.62	1.89	3.86	5.24	7.10	8.82
A5-2 STA. 4+016	1.00	1.89	3.86	5.24	7.10	8.82
A4-1 STA. 3+336	1.00	2.16	4.38	5.96	8.03	9.90
A4-2 STA. 3+222	2.05	2.16	4.38	5.96	8.03	9.90
A4-3 STA. 2+759	2.05	2.16	4.38	5.96	8.03	9.90
A3-1 STA. 2+564	2.70	2.42	4.88	6.62	8.92	11.00
A3-2 STA. 2+465	1.95	2.42	4.88	6.62	8.92	11.00
A3-3 STA. 2+175	--	2.42	4.88	6.62	8.92	11.00
A3-4 STA. 2+081	0.34	2.42	4.88	6.62	8.92	11.00
A3-5 STA. 1+890	1.95	2.42	4.88	6.62	8.92	11.00
A2-1 STA. 1+714	0.03	2.42	4.88	6.62	8.92	11.00
A1-1 STA. 0+827	1.35	3.10	6.15	8.32	11.15	13.73
A1-2 STA. 0+618	0.75	3.10	6.15	8.32	11.15	13.73
A1-3 STA. 0+289	0.90	3.10	6.15	8.32	11.15	13.73

Note: Culverts Stations are listed to the approximate centerline of the culvert

5.7.2 Culverts Requiring Replacement

In accordance with Section 26 of The Drainage Act, any increase in cost of the work caused by the existence of a utility is chargeable directly to the road authority or public utility in addition to all other normal assessment sums charged against the road authority or public utility when the work is required as part of the Engineer's Report. Based on the Drainage Act, the road or other authority shall be assessed only for the actual increased cost of the project due to the existence of the roadway or utility and such work shall be provided under separate construction items.

Under Section 69 of the Drainage Act, a road authority or other public utility has the option to carry out this work itself. When a road authority or public utility carries out this work, any respective Special Assessments will be reduced to reflect only the actual accrued engineering costs that will remain as a Special Assessment against the respective road authority or public utility. The cost of replacing the road authority culverts is not included in the report. Therefore, all assessments against the road authority have already been reduced by the cost of the culverts and represent the net amount payable.

It is the responsibility of the individual authority to advise the Municipality of its intentions regarding the bridge/culvert sites under Section 69, The Drainage Act RSO, 1990. If the authority or public utility does not complete the work in a timely fashion, then the Municipality will complete the work and charge the cost to the authority or utility as an assessment under The Drainage Act RSO, 1990 and in accordance with this report.

The Road Authority structures have been inspected throughout the course of the proposed drainage works and improvements are recommended where needed to provide satisfactory drainage of the adjacent lands. Recommendations for improvements to Road Authority structures are made only when such structures are deficient in elevation or capacity necessary for drainage. Roadway culverts should be sized to accommodate the 10 year return period flow at a minimum in order to provide satisfactory drainage of the lands for rural purposes. Design standards for roadway culverts are typically based on a criteria established by the Road Authority. The design return period for each structure depends on its type, location and function. **Table 5.4** lists roadway culverts that require replacement to increase capacity.

The closest standard culvert size was chosen to accommodate the design flow. The selection of the design return period culvert size (greater or equal to the minimum indicated), and culvert material is to be made by the Road Authority, based on the most current design standards and hydrologic/hydraulic information.

The cost of replacing the culverts under any existing road on the Chenier-Jeurond Municipal Drain is to be paid directly by the appropriate Road Authority. The Road Authority has the option to replace the structure on its own, or to have the Township replace the structure as part of the Drainage Works and assess the cost, including additional engineering, to the respective Authority all in accordance with this report.

The private farm and residential culverts that require replacement to increase capacity are noted in **Table 5.5**. Where the alignment of the drain segments a property, each landowner is entitled to the installation (or replacement where required) of one standard access crossing (up to 10 meters in length). Additional crossings (existing or otherwise), or non-standard crossings (additional length, decorative headwalls, etc.) will be installed or replaced at the individual owners expense.

The cost of replacing private culverts identified in this report is to be paid through the assessed cost to the landowners as part of the Modifications of the Chenier-Jeurond Municipal Drain. No private culverts, other than those noted in **Table 5.5**, will be replaced as part of these improvements.

Table 5.4
Capacity of Roadway Culverts that Require Replacement

Culvert No. and Location	Existing		10 yr Return Period		25 yr Return Period	
	Existing Capacity (m ³ /s)	Existing Size (mm)	Design Flow (m ³ /s)	Proposed Size (mm)	Design Flow (m ³ /s)	Proposed Size (mm)
Main Drain – Roadway Culverts						
Bureau Road STA. 3+761	5.00	1450	5.24	1800 Ø CSP	7.10	2130x1400 CSP Arch
				1650 Ø Concrete		

Note: Culverts Stations are listed to the approximate centerline of the culvert. See Section 5.7.3 with regard to roadway culvert sizing.

Table 5.5
Capacity of Farm/Residence Access That Require Replacement

Culvert No. and Location	Design Return Period (year)	Existing		Proposed	
		Capacity (m ³ /s)	Size (mm)	Design Flow (m ³ /s)	Size (mm)
Main Drain – Access Culverts					
A8-1 STA. 5+939	2	2.10	1250 Ø Conc.	0.28	600 Ø CSP
A8-2 STA. 5+589	2	0.13	400 Ø Conc.	0.55	800 Ø CSP
A8-3 STA. 5+455	2	0.36	600 Ø Conc.	0.55	800 Ø CSP
A5-1 STA. 4+103	2	0.62	750 Ø Conc.	1.89	1630x1120 CSP
A5-2 STA. 4+016	2	1.00	900 Ø Conc.	1.89	1630x1120 CSP
A4-1 STA. 3+336	2	1.00	900 Ø Conc.	2.16	1630x1120 CSP
A4-2 STA. 3+222	2	2.05	1200 Ø Conc.	2.16	1630x1120 CSP
A4-3 STA. 2+759	2	2.05	1200 Ø Conc.	2.16	1500 Ø CSP
A3-1 STA. 2+564	2	2.70	1350 Ø Conc.	2.42	1630x1120 CSP
A3-2 STA. 2+465	2	1.95	1250 Ø CSP	2.42	1630x1120 CSP
A3-3 STA. 2+175	2	--	Crushed CSP	2.42	1630x1120 CSP
A3-4 STA. 2+081	2	0.34	600 Ø CSP	2.42	1630x1120 CSP
A3-5 STA. 1+890	2	1.95	1250 Ø CSP	2.42	1630x1120 CSP
A2-1 STA. 1+714	2	0.03	250 Ø Conc.	2.42	2 – 1000 Ø CSP
A1-1 STA. 0+832	2	1.35	1000 Ø Conc.	3.10	1500 Ø CSP
A1-2 STA. 0+618	2	0.75	800 Ø Conc.	3.10	1630x1120 CSP
A1-3 STA. 0+289	2	1.80	2 - 900 Ø CSP	3.10	1500 Ø CSP

Note: Culverts Stations are listed to the approximate centerline of the culvert

*: Smaller sized culverts are sufficient to provide the required capacity, however it is proposed that these culverts be replaced with like-for-like sizing.

5.7.3 Roadway Culvert Sizing

Bureau Road is considered to be a “rural collector road”. The typical design standard for culverts associated with rural roads is the 10 year return period flow. However, the selection of the design return period, culvert size and culvert material is to be made by the Road Authority, but culverts should not be sized to accommodate less than the 10 year return period flow in order to provide satisfactory drainage of the adjacent lands.

5.7.4 Culverts Requiring Lowering

No existing farm crossing or Road Authority culverts were determined to be of sufficient capacity and/or condition to permit lowering (to accommodate the design profile of the drain).

5.8 Clearing

Landowners are advised that the Contractor will clear only those trees, which may affect its operation within the working area. All trees having a diameter of 150 mm or greater shall be cleared of limbs and cut in reasonable lengths and neatly piled clear of the drain so that the wood may be salvaged by the property owners. All brush, limbs and other debris resulting from the clearing operation shall be removed from the site at the Contractor's expense (note restrictions may apply with regard to Ash – Emerald Ash Borer).

5.9 Excavation

The construction of the Chenier-Jeaurond Municipal Main Drain will be an open channel with design grades, side slopes and ditch bottom widths as specified on the design profile Dwg. No. 15041-P1 through 15041-P10 (inclusive) and Cross-Section Drawings No. 15041-C1 and 15041-C2

The existing private/farm drain will be improved between Station 0+000 and Station 6+525.5 on the drain.

Associated with the drain improvements for the existing private/farm drain, erosion control measures will be placed at bends which are subject to erosion, at tile outlets, at culverts, confluences, and areas of bank instability. Erosion control measures will be of an engineering type, primarily rock protection with filter cloth.

5.10 Fisheries Act and Special Design Considerations

The Raisin Region Conservation Authority (RRCA) previously completed a drain classification, however, a fish Habitat and fish community assessment of the area was not completed due to heavy vegetation in the drain. A visual site assessment to inventory the type of habitat present was completed by Robinson Consultants Inc. and submitted to the Department of Fisheries and Oceans (DFO) for confirmation of the current Drain Classification. Confirmed Drain Classification as well as a Class Authorization for the proposed work was provided by the DFO in the spring of 2016 and is attached in **Appendix G** of this report.

In conjunction with the Preliminary Engineer's Reports consultations were conducted with the RRCA and the Ontario Ministry of Natural Resources and Forestry (MNRF) to refine parameters of the design that would allow the works to proceed under the requirements of the Conservation Authorities Act, Fisheries Act and the Ontario Endangered Species Act. Measures to minimize or eliminate the impact on this or adjacent watercourses, fish or endangered species (that may exist in the general vicinity) have been incorporated into this report and the related plans and specifications.

The provisions of this report for channel design include measures to preserve and protect fish habitat. It is anticipated that many measures associated with the construction or clean-out will improve water quality. The new channel will enhance the fish habitat by providing improved access for fish (by removing barriers to fish traffic) and greater connectivity between existing localized areas of fish habitats.

During construction a series of check dams (Straw Bale – Std. Dwg 3. or Rock – Std. Dwg 6) will be installed to control sediment movement to downstream areas. Sediment traps will be constructed upstream of the check dams. These excavations are typically 500 mm deep, 15 metres long and the width of the channel as shown on the standard drawings. Once construction has been completed the check dams will be removed along with the sediment and the excavations will remain. Depending on placement, these excavations form areas of concentrated future cleanout (where close to roads), limiting the need for full maintenance activities, or provide pool habitat/refuge (remote locations). Culverts will be installed with invert elevations below that of the adjacent drain by 150mm for culverts sized 600mm to 1500mm, or by 10% of the height for circular, arches or box culverts greater than 1500mm in height. The proposed culvert inset complies with the intent of DFO recommendations in this regard, while preserving culvert capacity, and ensures barrier-free fish passage.

Rock or straw bale check dams, complete with sediment traps, will be installed at locations as shown on Drawing No. 15041-A2.

Some tree removal may be required. Since riparian cover on the south or west side of the drain has been shown to improve water temperatures within the drain, where possible, any required clearing of trees for excavation will be completed on the north or east side of the drain.

Where possible, excavation will be limited to one side of the drain (north or east preferably), leaving the one side of the drain intact, while providing the required additional channel width. Where possible, work is to be limited to a bottom clean-out, leaving the sides of the drain intact, with access from the north or east side. This is anticipated to minimize impacts of full riparian zone removal. In zones of current bank instability banks will be repaired and/or protected as necessary, with efforts made to maintain as much of the natural conditions as possible.

Following construction, the disturbed areas (excluding spread areas on agricultural fields outside of the scheduled buffer area) will be seeded with a seed mix composed of perennial rye, white clover, red top, creeping red fescue and Canada bluegrass, as detailed in Section 6.1 of the Engineer's Report. Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation that is shade and water tolerant with limited requirement for seed bed preparation, white clover provides quick cover and produces nitrogen to aid in the establishment of other vegetation and red top's root system is well suited for holding soils on wetlands, waterways and ditch banks. The seeding will be completed as soon as possible after the channel is excavated. Erosion and sediment control works will be implemented and maintained throughout the length of the drain during and following construction, until other measures implemented, such as seeding, become effective. The locations and details of proposed erosion and sediment control works are shown on Dwg. No. 15041-A2. Other erosion or sediment control works may be implemented by the contractor, if approved by the Drainage Engineer, in an effort to maintain the required sediment free conditions downstream of the work area.

5.11 Mitigation Measures

The mitigation measures recommended by the RRCA and MNRF when implemented should allow for reasonable mitigation of the proposed design including the following:

The proposed Municipal Drain construction must abide by timing window restrictions, which include "no in-water work between March 15th and June 30th to protect local fish spawning populations".

- Finished channel to be as narrow and deep as possible.
- Riparian vegetation can be removed from either bank (not both).
- Minimize tree removal.
- Install sediment & erosion control measures.
- Bends in channel to be stabilized.
- Work in water only when flows not elevated.
- Where applicable, measures must be implemented to protect any hibernating turtles during the period from October 15th to March 15th and nesting turtles from March 15th to June 30th.

The above noted requirements have been addressed in the design of the proposed works and are anticipated to form part of the permitting requirements by the RRCA, MNRF and DFO. Where applicable, the permit conditions will be incorporated into the construction contract.

5.12 Disposal of Excavated Materials

The excavation of the drain shall be completed along all sections as previously described and all materials including silt, debris, etc. shall be removed from the drain.

In excavation areas, all suitable material(s) will be placed outside the required buffer area, on the side of the drain that is best suited for the owner and/or where clearing is not required for disposal. The excavated material shall be spread and seeded (except in areas of tilled agricultural fields). All material shall be spread on the adjacent lands no closer than 5 metres to the top of slope (buffer strip) and to a maximum depth of 150mm for agricultural fields, and 300 mm for non-agricultural areas. Drainage openings shall be constructed wherever required throughout the disposal area at a maximum spacing of 50 meters for agricultural land and 100 meters for non-agricultural land. All drainage openings shall be maintained and the soil spread to accommodate these drainage openings to ensure that the drainage from adjacent land is not impeded. Any non-suitable material, such as rock, boulders, hard-pan or garbage/debris, shall be disposed of on the adjacent property, in an area of the property designated by the owner.

In areas scheduled for the spreading of material, owners who wish to pay the Contractor to have the Contractor dispose of the excavated material off-site rather than spread the material may make arrangements directly with the Contractor, subject to approval by the Drainage Engineer.

5.13 Permit Requirements and Underground Utilities

It may be expected that the Contractor will have to fill out an application for an encroachment permit within the Township right-of-ways prior to the commencement of construction. It is also expected that underground utility lines may be encountered during the construction of the project. A copy of the drawings must be submitted by the contractor to all area utilities, so

that they may show underground plant on the plan. A copy of the drawings so marked, must be returned to the Drainage Engineer prior to commencing construction. The Contractor will also be required to arrange with all Utilities to mark underground cables or pipelines in the field before commencing construction. If any owner knows of other underground utilities please make the Drainage Engineer aware of such.

Typical contract methodology including the impoundment and by-pass pumping of water or passive instream diversion no longer require Ministry of Environment and Climate Change (MOECC) registration or a Permit-To-Take-Water provided that prescribed procedures are met. The Contractor may be required to obtain a Permit-To-Take-Water (PTTW) from the MOECC should its methodology exceed the MOECC conditions for exemption.

5.14 Site Access and Access Plan

It is intended that for the purpose of construction and future maintenance, the drain be accessed from adjacent roads with equipment moving along the side of the drain scheduled for construction, within the designated work area as specified in SP1.0, and designated future Drain Right-of-Way. Equipment may only cross the drain at existing or constructed crossings as shown on the Culvert and Sediment/Erosion Control Plan, Drawing 15041-A2.

Where ever possible, isolated work areas are to be accessed by existing roads (farm lanes/unpaved driveways) on adjacent lands. This is to limit the disturbance of non-work areas adjacent to the drain. The Contractor is required to provide notification to the landowner of the intended use of existing farm lanes in advance of the usage (minimum 48 hours). The Contractor will be responsible for the repair and maintenance of any access used, and for the restoration of the access following the construction to existing or better conditions. The contractor will be required to make the arrangements for access, and notify the Drainage Engineer of the proposed access routes.

6.0 EROSION CONTROL

6.1 Seeding

To help protect the drain banks against erosion, all disturbed banks and spread spoils shall be hand seeded within 48 hours of construction. The seed mixture is to be as follows:

Sow Rate (minimum)	100 kg/ha
Creeping Red Fescue	60%
Canada Bluegrass	20%
White Clover	3%
Perennial Rye	12%
Red Top	5%

Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation that is shade and water tolerant with limited requirement for seed bed preparation, white clover provides quick cover and produces nitrogen to aid in the establishment of other vegetation and red top's root system is well suited for holding soils on wetlands, waterways and ditch banks.

6.2 Buffer Strips

It is recognized that buffer strips have a role in reducing bank erosion, reducing pollution (pesticides and nutrient runoff) and improving fish and wildlife habitat by providing shading and habitable areas, as well as reducing water temperatures. The provision and

maintenance of adequate buffer strips is environmentally friendly and reduces long term costs associated with drain maintenance for all properties assessed on the drain and is a benefit to all. As such, it is strongly recommended that where the drain passes through cropland, where soil erosion is now occurring, or land where the farmer indicates the intention of tilling the soil for continuous field crop production, a strip of uncultivated land at least 5 m wide along the edge of the drain be retained. It is recommended that the owners take hay off this buffer strip, but that the soil not to be tilled.

6.3 Fencing

Where fences are encountered or for access to the drain, it will be the Contractor's responsibility to remove the existing fence and re-erect the fence in a condition equal to or better than the condition of the fence prior to the commencement of the work.

6.4 Rock Protection

Associated with the drain improvements, Rock Protection with filter cloth will be placed at typical areas as per Drawing Nos. 15041-A2, 15041-P1 through 15041-P10 (inclusive), and Standard Drawing No. 1. Rock Protection at tile drain outlets shall be installed at all existing outlets in accordance with Standard Drawing No. 2. Standard Drawings are provided in **Appendix C**. In general, Rock Protection will be installed at all locations as indicated below (at the discretion of the Drainage Engineer) and may not necessarily be indicated on plans and profiles.

- Rock Protection at channel ends of realignment sections
- Rock Protection at significant bends
- Rock Protection at storm sewer outlets
- Rock Protection at tile drain outlets
- Rock Protection at culverts and concrete structures
- Rock Protection at confluence of branch drains
- Rock Protection at areas of current or on-going erosion

6.5 Flow Checks and Sediment Traps

6.5.1 Excavation

Sediment trap excavation shall be 15 m in length and 0.5 m below the proposed grade (drain bottom), directly upstream of the flow checks, as per Standard Drawing No. 3, Straw Bale Checks or Standard Drawing No. 6, Rock Checks. Standard Drawings are provided in **Appendix C**.

6.5.2 Sediment Removal

Accumulated sediment in sediment traps shall be removed as necessary to affect maintenance repairs and immediately prior to the removal of the flow checks.

6.5.3 Locations

Straw Bale or Rock flow checks shall be installed as indicated in Standard Drawing No. 3 and No. 6 to prevent sediment passage from the upstream to the downstream side of the flow check, and shall be installed at all specified locations as per Drawing No. 15041-A2, and 15041-P1 through 15041-P10 (inclusive). Standard Drawings are provided in **Appendix C**.

6.5.4 Long-Term Use

Excavated sediment basins will remain in place following removal of the flow check. It is anticipated that these basins will continue to serve as localized concentrated cleanout areas, and possible interim pool refuge fish habitat. Removal of sediment in these cleanout areas is expected to have long term fish habitat benefits by reducing the need for full scale maintenance along the length of the drain.

7.0 ASSESSMENTS

7.1 General

The Drainage Act requires that the total estimated cost be assessed against 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 of public utility or road authority (Section 26). On this project there is no assessment for injuring liability.

7.2 Benefit

Benefit by definition under the Drainage Act, RSO 1990 is the “advantages to any lands, roads, building or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings, or other structures”.

7.3 Outlet

Lands and roads that may be assessable for outlet liability are those lands that use a drainage works as an outlet or for which after construction or improvement of the drainage works an improved outlet is provided. The outlet or improved outlet may be provided either directly or indirectly through any drainage works, overland flow, swale, ravine, creek or watercourse. Assessment for outlet is based on location, area and rate of flow.

7.4 Special Benefit/Special Assessment

Special Benefit by definition under the Drainage Act, RSO is “any additional work or feature included in the construction, repair or improvement of a drainage works that has no effect on the functioning of the drainage works.” A Special Benefit Assessment and/or a Special Assessment is charged against any owner, public utility, agency, authority or municipality for which special consideration was required to accommodate special design consideration or a special feature.

7.5 Assessment Schedules

As part of this Engineer's Report assessment schedules have been developed for the Chenier-Jeaurond Municipal Drain that reflect a fair and equitable distribution of costs for construction.

The exact method of determining the appropriate assessment and the distribution between outlet and benefit is left to the Drainage Engineer using best judgment to provide a system of assessments that is fair to all concerned. There are a number of basic principles that apply to the assessment for construction and future maintenance on the Chenier-Jeaurond Municipal Drain. The principles are:

1. You cannot assess a property for any part of the cost of work that is completed upstream from it, unless there is a special circumstance.
2. You cannot make a benefit assessment against a property for work completed some distance downstream, although you do assess the property for outlet liability on this work.
3. You can only assess benefit for lands that are reasonably close to the drain. These usually are properties abutting the drain or which otherwise have direct accesses to the drain.
4. You cannot assess those lands that are too low to make use of the works, such as a gravel pit or quarry, unless they are clearly connected by an outlet to the drain.
5. You must assess public utilities and road authorities for the increase in the actual cost of the proposed drainage work, caused by the existence of the works of the public utility or road authority. An example is a culvert on a public roadway.
6. In assessing lands covered with bush and trees, if the situation is such that once the drain is in place the property owner will be able to clear the bush and cultivate the land, then the property should be assessed in the same way as land already under cultivation, unless there are agreement or legal restrictions which prevent clearing and cultivation.

The principles of assessment for municipal drains have evolved over time. At present, the recommended approach is to divide the drain into a series of sections in arriving at the ultimate benefit and outlet assessment schedules. This permits the cost estimates to be developed for each section and should result in a fair distribution of costs throughout the drainage basin. The division of the drain into sections is most beneficial for assessing the cost of future maintenance.

A technique that we employ to simplify the assessment process, involves converting all the lands within the watershed into a factored or equivalent area. In the case of benefit assessment, this includes the area of the land within the basin and a factor that is related to land use. In the case of outlet assessment, we use the area of the land within the drainage basin, the land use and a factor that represents the location of the land relative to the drain. For the location factor (or the distance from the drain), the principle is to apply a higher factor for lands that are closer to the drain, or to an outlet that connects directly into the drain, and a lower factor to lands that are more remote from the drain. The factored area method permits the Drainage Engineer to recognize that the volume and rate of flow of water differs with different land uses, soil types, surface conditions and distance from the drain. The method brings the entire area within a watershed to a common denominator and simplifies the application of outlet assessments.

Based on the principle that properties are only assessed for works that are undertaken downstream of the property in question, we have further introduced a factor within each section which divides the section into three equal parts (subsections) and applies a subsection factor to the outlet assessment. Therefore, the properties that are within the downstream one-third of a section of drain, are in essence only using one-third of the total

section of drain, whereas the lands that are in the upstream one-third or beyond, are using the whole section of the drain. Hence, we have applied what we have called a subsection factor to the lands within the section of the drain where maintenance is being carried out. All of the lands upstream of the section where maintenance is being undertaken are also assessed a portion of the costs of the drainage works. The assessment on the lands upstream of the section where maintenance is being completed are charged a section factor equal to the most upstream portion of the lands within the section where the work is being completed.

These same principles apply to the initial construction or future maintenance of the drain, as required by this Engineer's Report.

7.6 Maintenance Sections

In order to develop schedules that represent a fair and equitable distribution for future maintenance charges, the Chenier-Jeurond Municipal Drain has been divided into three (3) sections as follows:

- Section 1 is from Sta.0+000 at the outlet/confluence with the Delisle River to Sta. 3+755 (the downstream end of culvert under Bureau Road) of the Chenier-Jeurond Municipal Drain.
- Section 2 is from Sta. 3+755 to Sta. 6+525.5 (the Limit of Construction of the Chenier-Jeurond Municipal Drain).
- Branch 1 is from Sta. 10+000 (=Sta. 2+666.8 Main Drain) to Sta. 10+350 (the Limit of Construction of Branch No. 1 of the Chenier-Jeurond Municipal Drain).

The sections are shown on **Figure 7.1**. The area that is tributary to each of these sections has been determined based on the sub-drainage basins. The area tributary to each of the drainage maintenance sections is shown on Figure 7.1.

In calculating the outlet assessment for the two sections of the Chenier-Jeurond Municipal Drain (main drain) indicated in the previous paragraph, each section has been divided into three subsections or parts. The upstream subsection is assigned a factor of one, the middle section is assigned a factor of 0.67 and the downstream subsection is assigned a factor of 0.33. Each individual property is assigned a subsection factor corresponding to the location where the drainage from the property enters the drain. All properties upstream of the section where construction or maintenance is being undertaken are assigned a subsection factor of one.

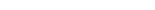
Due to the relatively short constructed length for Branch No. 1, sub-sections were not used and all properties upstream of the location where construction or maintenance is being undertaken are assigned a factor of one.

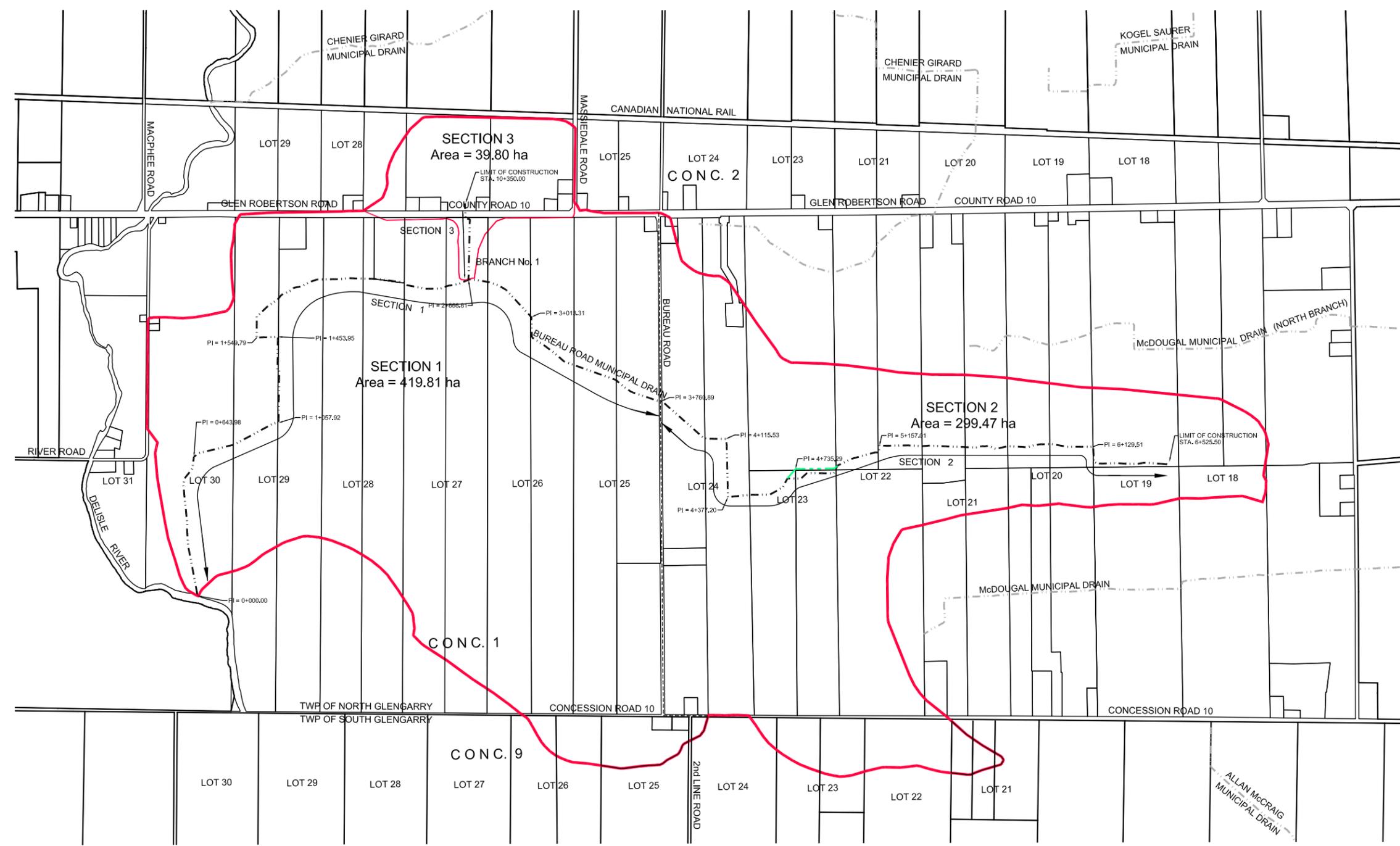
The use of the subsection or section factor is based on the principle that all land is assessed for construction or maintenance that is undertaken downstream of the location where the runoff from the land enters the drain.

7.7 Land Use Factor

A land use factor is included in the assessment calculation in order to account for the volume of runoff from lands that are used for different purposes. A numeric value of 1.0 is given to all agricultural land. A value of 2.0 is given to small, non-agricultural lots (residential) that are 5 acres (2.0 Ha) or less, and a value of 4.0 is given to land that is classified as institutional, commercial or is a road right-of-way.

LEGEND

-  PROPERTY LINE
-  EXISTING CONSTRUCTED DRAINS
-  MUNICIPAL DRAIN
-  DRAINAGE AREA BOUNDARY
-  RELOCATED DRAIN



No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



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DRAWN	JHB
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APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY
**CHENIER - JEAUROND
 MUNICIPAL DRAIN**

**MAINTENANCE SECTIONS and
 SECTION DRAINAGE AREAS**

PROJECT No. 15041
 CONTRACT No.
 DATED FEBRUARY 2017
 DWG. No.
FIG 7.1

The area of each parcel of land within the drainage basin is multiplied by the land use factor to arrive at a factored area that in turn is used to determine the final benefit and outlet assessment. Therefore, one acre of road right-of-way is assessed at four times the rate applied to one acre of agricultural land.

In many cases, a property may have areas of differential land use. For example, a portion of a property might be primarily agricultural and the remainder might be industrial. In this case, a calculated combined land use factor is applied based on the individual land use factors as a function of the percentage of the overall area.

7.8 Distance Factor

A distance factor was developed to take into account the proximity of land to the drain and the relative amount of water that will enter the drain. A band is drawn on each side of the drain at a distance of approximately 200 meters; a second band is drawn at a distance of approximately 600 metres from the drain, and a third at 1000 meters from the drain. A property that is included entirely within the first band is given a distance factor of 1.0. A property that falls entirely within the second band is given a distance factor 0.75. A property that falls entirely within the third band is given a distance factor 0.5 and the land that is located beyond 1000 metres from the drain (outside the third band), is given a distance factor of 0.3.

In many cases, a property will not be entirely included within one of the bands. For example, one-half of a property might fall within the first band and the other half might fall in the second band. In this case, a distance factor of 0.875 is assigned to that property. The distance factor information is included on **Figure 7.2**.

7.9 Outlet Assessment

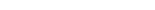
Each parcel of land that lies within the drainage basin and is upstream of the location where construction or maintenance is being undertaken pays for a portion of the cost of the construction or maintenance through an outlet assessment.

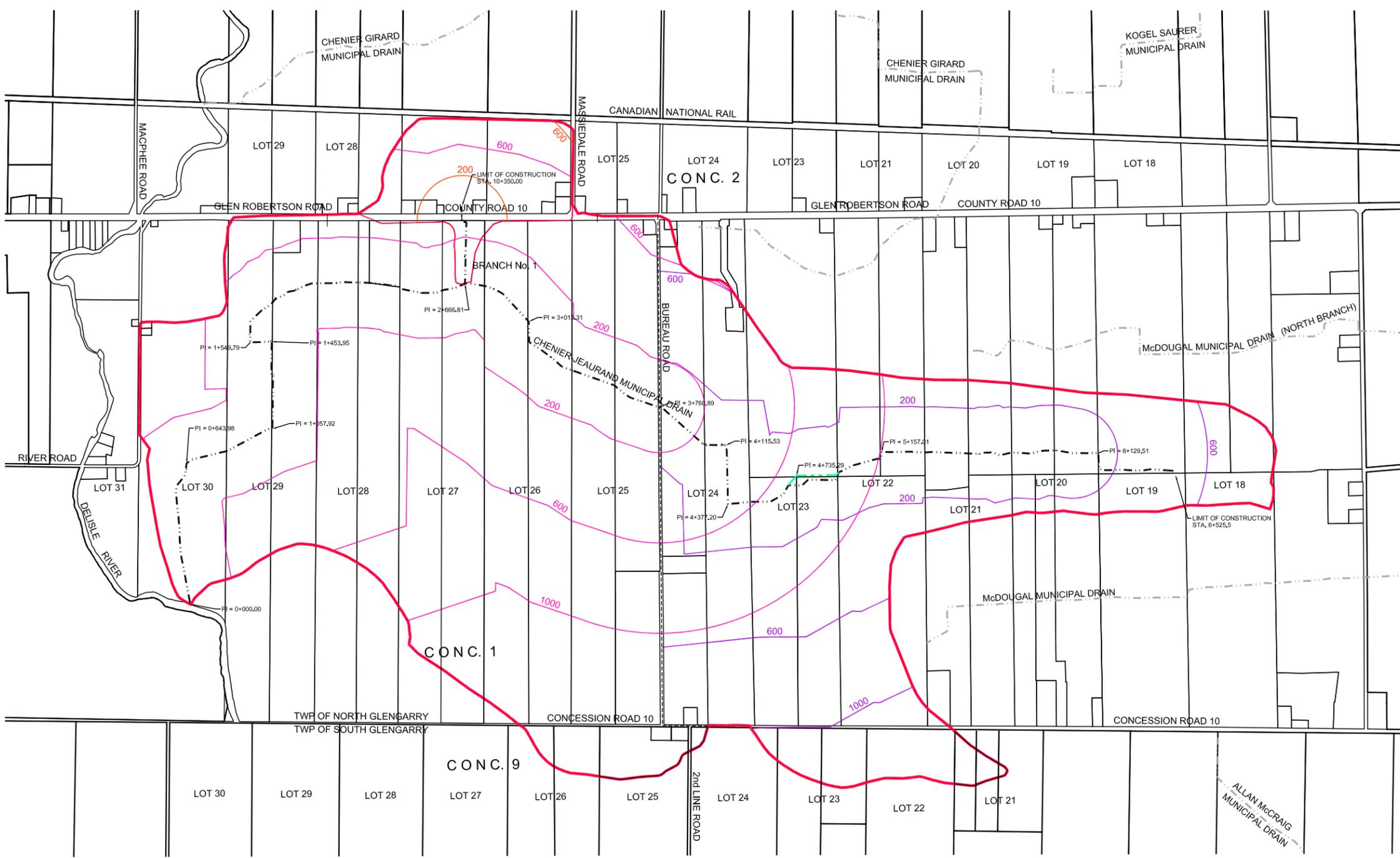
The outlet assessment factored area for each property is determined by multiplying the area of each property in the drainage basin by the land use factor, the distance factor and the section or subsection factor. Using the outlet assessment factored area for all of the properties being assessed and the cost of the construction or future maintenance assigned to outlet assessment, a cost per unit outlet factored area (factored hectare) is determined. This is then multiplied by the total outlet assessment factored area of each property to calculate the outlet assessment that is applied to that property.

7.10 Benefit Assessment

Lands that are located immediately adjacent to the drain are charged a benefit assessment. A benefit assessment for construction or maintenance is only charged against properties in the section where work is being completed. The benefit factored area is determined by multiplying the individual assessed area of each property that is immediately adjacent to the drain, by the land use factor. Using the benefit factored area for all of the properties and the cost of construction or maintenance assigned to benefit assessment, a cost per unit benefit factored area (factored hectare) is determined. This amount is then multiplied by the total benefit factored area of each property to calculate the benefit assessment that is applied to that property. For specific properties, an on-site engineering review was completed and determined that not all land adjacent to the drain was capable of direct outlet to the drain and as such the non-benefiting lands were removed from the benefit calculation.

LEGEND

-  PROPERTY LINE
-  EXISTING CONSTRUCTED DRAINS
-  MUNICIPAL DRAIN
-  DRAINAGE AREA BOUNDARY
-  RELOCATED DRAIN
-  DISTANCE FACTORS



No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



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TOWNSHIP OF NORTH GLENGARRY
CHENIER - JEAUROUND MUNICIPAL DRAIN

DISTANCE FACTORS

PROJECT No. 15041
CONTRACT No.
DATED FEBRUARY 2017
DWG. No. FIG 7.2

7.11 Special Assessment

In this case, a Special Assessment is charged to the Township of North Glengarry and the County of Stormont Dundas and Glengarry for special consideration that was required to accommodate increased drainage and design (10 year Storm) for Bureau Road and Cty. Road 10 respectively through the downstream lands.

7.12 Land Ownership

Land ownership is based on the most recent assessment rolls and map fabric information as provided by the Township of North Glengarry. The land ownership, identified by taxation roll number and the assigned property ID number (for reference to schedules) on the Chenier-Jeurond Municipal Drain is shown on Drawing No. 15041-A3.

7.13 Assessment Schedules

As described in this report, the drain has been divided into three sections for the purpose of developing Assessment Schedules for construction and future maintenance. The land area, land use factor, section or subsection factor and distance factor have been entered into an Excel spreadsheet for each of the sections of the drain. The total area of each land parcel is further divided as required, placing the appropriate portion of area in each section of the drain. The individual Excel spreadsheets for each section are linked to a summary sheet. Once the total cost of construction or future maintenance is determined, this amount can be entered on the appropriate spreadsheet and the outlet, benefit and total assessments are calculated. Where the one-third grant on agricultural land is applicable, this is calculated and deducted from the total assessment to arrive at the net cost assessed against the property. The Drainage Superintendent should modify the schedules to apply the amount of grant that is in existence at the time that maintenance is undertaken. Assessment Schedules for the construction and future maintenance of the Chenier-Jeurond Municipal Drain are provided in **Appendix A**.

In developing the Assessment Schedule, the portion of the cost for outlet and benefit has been determined for each section of the drain to reflect the relative use of the drain by immediate benefiting landowners and the landowners in the larger watershed. The Assessment Schedules for the various sections with the percentage split between Outlet Assessment and Benefit Assessment are as follows:

Summary Schedule of Assessment

Section 1	–	Station 0+000 to Station 3+755		
		Outlet Assessment	-	75%
		Benefit Assessment	-	25%
Section 2	–	Station 3+755 to Station 6+525.5		
		Outlet Assessment	-	75%
		Benefit Assessment	-	25%
Branch No. 1	–	Station 10+000 to Station 10+350		
		Outlet Assessment	-	75%
		Benefit Assessment	-	25%

8.0 COST ESTIMATE

8.1 General

The total estimated cost associated with the construction, engineering, contract administration, allowances, report and contingencies will be charged to the landowners in the drainage basin in accordance with Schedule A, Summary Schedule of Assessment. The total allowance that must be paid directly to the affected landowners and a description for the purpose of the allowances is contained in Section 8.2. The amount of the allowances is included in **Appendix B**. The total cost of the improvements to the Chenier-Jeurond Municipal Drain, subdivided by sections is included in **Table 8.1**. A detailed cost estimate is included in **Appendix B**.

Table 8.1
Cost Estimate

Item	Section 1	Section 2	Branch 1	Total
Routine				
Construction	\$ 218,457.50	\$ 88,306.25	\$ 8,978.75	\$ 315,742.50
Contingency Allowance	\$ 20,000.00	\$ 8,000.00	\$ 2,000.00	\$ 30,000.00
Engineering/Admin.	\$ 69,720.00	\$ 40,670.00	\$ 5,810.00	\$ 116,200.00
Other (Incl. Allowances)	\$ 50,010.77	\$ 14,549.28	\$ 3,833.84	\$ 68,939.88
Subtotal Routine	\$ 358,278.27	\$ 151,705.53	\$ 20,622.59	\$ 530,606.38
Special Benefit				
Twp./Cty. – Road Auth.	\$ 5,991.04		\$ 2,410.96	\$ 8,402.00
Subtotal – Special Benefit	\$ 5,986.54		\$ 2,410.96	\$ 8,402.00
Net Total (Assessed to Properties)	\$ 352,287.23	\$ 151,705.53	\$ 18,211.63	\$ 522,204.38

8.2 Allowances

The parcels of land that have been granted allowances are outlined in the Schedule of Allowances provided in **Appendix B**. The allowances have been established in accordance with Sections 29, 30 and 31 of the Drainage Act, RSO 1990. The allowance for the land (Section 29) is for the land lost due to ditch widening. The allowance for use of the working area and for damage to lands and crops in the working area (Sections 29 & 30) is on lands anticipated to be out of production during construction and for a period thereafter. The area damaged is calculated using the length and width of the access route and the area for spreading excavated material. The allowance for existing drains (Section 31) is to compensate property owners for the costs associated with improvements to drainage works which were not constructed by requisition or petition under the Act but which will be incorporated in whole or in part in the drainage works. Section 31 of the Drainage Act stipulates that the Engineer shall estimate and allow in money to the owner of such drain the value of such drainage works and shall include the sum in the estimated cost of construction, improvement, repair or maintenance of the drainage works.

These allowances are fixed amounts and are in accordance with Section 62 (3) and 62(4) of the Drainage Act, RSO 1990. The allowance shown for each property may be deducted from the final assessment levied before the assessment is collected from the affected owner.

Payment to the owner would only be made when the allowance is greater than the assessment against the property. The allowances can only be changed if modified prior to adoption of the report by bylaw.

The allowance for land lost due to the Municipal Drain construction or widening has been calculated using local area estimated land values.

The allowance for crop loss assumes full loss for the first year, 60% reduction for the second year and 40% reduction for the third year in areas where excavated material has been spread or for equipment access for construction.

Local crops were determined to be grains, corn and beans. The allowance for crops lost due to the construction or spreading of material has been calculated using the averaged value for the above noted crops as posted by AgriCorp as the value of this type of crop for production insurance.

9.0 LOCATION OF TILE DRAIN OUTLETS

Tile drainage and tile outlets are anticipated to be encountered within the Drainage Area for the Chenier-Jeurond Municipal Drain. Where they exist, property owners are requested to mark the location of any tile outlets prior to the commencement of construction. Future maintenance of tile outlets shall be the responsibility of the individual property owners.

The Contractor will be responsible for adjusting the tile outlets, including CSP outlet (or alternative approved product), rodent grate and Rock Protection in accordance with Standard Drawing No. 2.

10.0 WORKING SPACE

A right-of-way or working area must be available, preferably along the east and north sides of the proposed drain, or the side that is best suited for construction. For open drainage works, a right-of-way of up to 50 m is necessary to allow construction to be carried out and excavated material to be spread. If asphalt areas are damaged, they shall be restored as per Township Road Cut Restoration Standards. A right-of-way of 20 m from the top of the bank is designated for future access and maintenance along the side of the drain that is best suited for clean-out as determined by the Drainage Superintendent.

11.0 CHANGING THE SCOPE OF THE WORK

Should changes, deletions or extensions in construction be requested or required after the bylaw is passed, the report must be amended and a revised bylaw must be passed. Since this project will be constructed through provisions of the Drainage Act, a bylaw must first be passed to authorize the work. Changes to the work are not to be undertaken without a change in the bylaw, unless the changes can generally be completed for less than the contingency estimate or 10% of the construction costs. If it is desired to make any substantial increase or decrease in the scope of work as designed it will be necessary that either a revised report be prepared and processed, or if the desired works are considered to be a gross error in accordance with the Drainage Act, that an application be made to the

Agricultural, Food and Rural Affairs Appeal Tribunal (Drainage Tribunal) pursuant to Section 58(4) of the Drainage Act to obtain approval for such change. If unforeseen obstacles are encountered and can be completed for the amount within the contingency allowance, the bylaw does not require modification. If any individual or group of owners require additional work and are prepared to apply for such and do not wish to be part of the Drainage Works they may make their own arrangements with the Contractor, but the Drainage Engineer must approve such in order that no detrimental effect to the drain or its maintenance results.

12.0 SPECIAL PROVISIONS

Special Provisions for the construction of this municipal drain are included in **Appendix D**.

13.0 MAINTENANCE

Future maintenance of the project shall be the responsibility of the Township of North Glengarry, although the individual owners shall be responsible for periodic inspection of the drain and reporting maintenance problems to the Township.

The cost of future maintenance is to be assessed in proportion to the Schedule of Assessment for the Construction of the Chenier-Jeurond Municipal Drain, excluding the Road Authority Special Benefit (Bureau Road and Cty. Rd. 10 – for the Engineer's Report associated with the roadway culverts) and Allowances. Maintenance costs are to be assessed on a pro rata basis for the section where maintenance is completed (summarized in Schedule A and shown in Schedule B, Schedule C or Schedule D respectively) provided in **Appendix A** of this report, excluding the above noted costs. Therefore, maintenance costs are to be levied against the lands upstream from the location of the maintenance work pro rata with the assessments for Benefit, Outlet and Special Benefits in the Schedules for Construction, all of which is in accordance with the Drainage Act.

The Contractor shall be responsible for making good any construction defects found in the works for a period of one year from the date of final acceptance of the work. This obligation shall include such items as culverts, fencing, grass (seeding), abnormal erosion/ sedimentation, and rock protection but shall not include for normal erosion or sedimentation of the drain.

The maintenance of the Chenier-Jeurond Municipal Drain considered under the terms of this report, including channel and erosion control maintenance, shall be the responsibility of the Township of North Glengarry as previously noted. Maintenance of private culverts and fences shall be the responsibility of the adjacent landowner. Maintenance of public road culverts shall be the responsibility of the Road Authority; however, if the Road Authority or individual property owner does not complete the maintenance, then the Township will complete the maintenance and charge the cost to the Road Authority or individual property owner. Future maintenance of tile outlets shall be the responsibility of and shall be at the cost of the affected landowners.

14.0 MINISTRY OF NATURAL RESOURCES AND FORESTRY – SPECIES AT RISK

Pre-Screening of the proposed Chenier-Jeurond Municipal Drain was completed by the Ministry of Natural Resources and Forestry – Ontario (MNR) with regard to the Species At Risk (SAR) Legislation, and a "Letter of Advise" was issued. The Screening Report and Letter of Advise are provided in **Appendix F**. Documented occurrences of Species at Risk of note for this project as identified by the MNR are included in the following sections.

14.1 Documented Endangered Species

“Endangered Species” with documented occurrences within the vicinity of the Chenier-Jeurond Municipal Drain include the following:

- American Eel
- Butternut Trees

14.2 Documented Threatened Species

“Threatened Species” with documented occurrences within the vicinity of the Chenier-Jeurond Municipal Drain include the following:

- Barn Swallow
- Bobolink
- Cutlip Minnow
- Eastern Meadowlark

14.3 Species of Special Concern

Species of “Special Concern” include the following:

- Snapping Turtle.
- Monarch Butterfly

14.5 Species at Risk – Location

14.5.1 American Eel – Location

Occurrences of American Eel have been documented within the greater region of this project for watercourses outletting to the St. Lawrence River system; however, this project is separated by a significant distance for any reported occurrence. Preferred habitats includes burrows, tubes, snags, masses of plants, or other types of shelters and are found in a variety of habitats including streams, rivers, and muddy or silt-bottomed lakes.

14.5.2 Butternut Trees – Location

Butternut trees are identified in this area, however, specific locations are unknown, therefore, butternut trees may or may not exist on this drain. Butternut trees, as a species, are subject to a disease known as “Butternut Canker”. Some butternut trees are resilient despite some canker (known as retainable) and some are resistant to the butternut canker disease (known as “archivable butternut trees”). Only retainable and archivable butternut trees are afforded protection under the SAR Act. The status of a butternut tree must be verified by a “Qualified Butternut Health Assessor” (BHA).

14.5.3 Barn Swallow – Location

Occurrences of barn swallow have been documented in the general vicinity of the Chenier-Jeurond Municipal Drain. Barn swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests.

14.5.4 Bobolink – Location

Occurrences of Bobolink have been documented in the general vicinity of the Chenier-Jeurond Municipal Drain. Preferred habitats are tallgrass prairie and other open meadows (historical), however, with the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses.

14.5.5 Cutlip Minnow – Location

Occurrences of Cutlip Minnow have been documented within the greater region of this project for watercourses outletting to the St. Lawrence River system; however, this project is separated by a significant distance for any reported occurrence. Preferred habitat includes warmer rivers and creeks with clear, slow-moving water, and a rocky or gravel bottom.

14.5.6 Eastern Meadowlark – Location

Occurrences of the Eastern Meadowlark have been documented in the general vicinity of the Chenier-Jeurond Municipal Drain. Preferred habitats includes moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches.

15.0 RAISIN REGION CONSERVATION AUTHORITY PERMIT

The Preliminary Engineer's Report for the Chenier-Jeurond Municipal Drain was circulated to Raisin Region Conservation Authority (RRCA) for review and permit. The RRCA provides permission under the Conservation Authorities Act, O. Reg. 175/06, for the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses".

A copy of the Permit under O. Reg. 175/06 including conditions is attached as **Appendix E**.

16.0 DEPARTMENT OF FISHERIES AND OCEANS – CLASS AUTHORIZATION

The Federal Department of Fisheries and Oceans (DFO) provides review of projects where additional review is required by the completion of a self-screening process. Authorization under the Fisheries Act may be required as an outcome of the review process.

The current watercourse that forms the proposed Chenier-Jeurond Municipal Drain was assessed in 2002 by the RRCA to be "Class E" (permanent, warm water, with sensitive species or communities present) due to its close proximity to the Delisle River and is warm water in thermal regime. However, no fish data was collected during the 2002 sampling as it was reported that the "drain was too choked with cattails". This observation for the portion of the drain adjacent to the Delisle River in conjunction with grade differential at the outlet and observed intermittent dry conditions in the upper reaches of the drain suggests that the drain does not provide suitable direct fish habitat.

In conjunction with the Preliminary Engineer's Reports consultations were conducted with the RRCA and the Ontario Ministry of Natural Resources to refine parameters of the design that would allow the works to proceed under the requirements of the Conservation Authorities Act and the Ontario Endangered Species Act. Measures to minimize or eliminate the impact on this or adjacent watercourses, fish or endangered species have been incorporated into this report and the related plans and specifications.

Through consultation with the DFO it was determined that the proposed work could be completed in conformance with the Class Authorization process. All applicable conditions have been addressed by this Report and where applicable, will be incorporated into contract requirements and specifications for the construction of the Chenier-Jeaurond Municipal Drain. A copy of the Class Authorization is provided in **Appendix G** of this report.

All of which is respectfully submitted,

ROBINSON CONSULTANTS INC.



A.J. Robinson, P.Eng
Drainage Engineer



Appendix A

Schedules of Assessment

SCHEDULE A - SUMMARY
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF ALL SECTIONS
OF THE CHENIER-JEAUROND MUNICIPAL DRAIN



Project No.: B15041
 Date: Feb-17

ID	Roll No.	Property (located in)		Area	Benefit Cost	Outlet Cost	Sub-total Costs	Special Benefit & Utilities	Grants	Allowances	Total Net Costs
		Lot	Con	Total	Total	Total		Total	Total	Total	Total
Township of North Glengarry -- Individual Landowners											
1	0111 016 002 30000	30	1	41.14	\$ 11,376.14	\$ 9,107.04	\$ 20,483.17	\$ -	\$ 6,759.45	\$ 11,186.73	\$ 2,537.00
2	0111 016 002 32000	30	1	0.14	\$ -	\$ 50.74	\$ 50.74	\$ -	\$ -	\$ -	\$ 50.74
3	0111 016 002 31000	30	1	0.13	\$ -	\$ 47.12	\$ 47.12	\$ -	\$ -	\$ -	\$ 47.12
4	0111 016 002 29000	29	1	30.63	\$ 8,503.43	\$ 6,807.32	\$ 15,310.75	\$ -	\$ 5,052.55	\$ 6,086.17	\$ 4,172.03
5	0111 016 002 28001	29	1	27.16	\$ 7,634.90	\$ 6,112.03	\$ 13,746.93	\$ -	\$ 4,536.49	\$ 6,439.33	\$ 2,771.12
6	0111 016 002 28000	29	1	1.70	\$ -	\$ 664.48	\$ 664.48	\$ -	\$ -	\$ -	\$ 664.48
7	0111 016 002 27000	28	1	26.61	\$ 6,559.41	\$ 10,502.13	\$ 17,061.54	\$ -	\$ 5,630.31	\$ 3,145.77	\$ 8,285.46
8	0111 016 002 26000	28	1	25.65	\$ 6,131.01	\$ 9,816.22	\$ 15,947.23	\$ -	\$ 5,262.59	\$ 2,144.85	\$ 8,539.80
9	0111 016 002 25000	28	1	3.80	\$ -	\$ 1,703.49	\$ 1,703.49	\$ -	\$ 562.15	\$ -	\$ 1,141.34
10	0111 016 002 23000	27	1	35.48	\$ 7,061.11	\$ 11,305.39	\$ 18,366.50	\$ -	\$ 6,060.94	\$ 1,009.24	\$ 11,296.31
11	0111 016 002 24000	27	1	38.91	\$ 7,048.85	\$ 12,228.59	\$ 19,277.44	\$ -	\$ 6,361.56	\$ 3,734.19	\$ 9,181.69
12	0111 016 002 21000	26	1	42.34	\$ 8,311.01	\$ 13,306.57	\$ 21,617.58	\$ -	\$ 7,133.80	\$ 1,756.18	\$ 12,727.60
13	0111 016 002 22000	26	1	42.95	\$ 8,595.49	\$ 20,851.58	\$ 29,447.06	\$ -	\$ 9,717.53	\$ 1,097.61	\$ 18,631.92
14	0111 016 002 20000	25	1	43.10	\$ 8,620.39	\$ 20,911.98	\$ 29,532.37	\$ -	\$ 9,745.68	\$ 1,581.31	\$ 18,205.38
15	0111 016 002 19660	25	1	13.39	\$ -	\$ 3,732.09	\$ 3,732.09	\$ -	\$ -	\$ -	\$ 3,732.09
16	0111 016 002 19600	25	1	29.54	\$ 7,008.59	\$ 17,001.97	\$ 24,010.56	\$ -	\$ 7,923.49	\$ 1,778.97	\$ 14,308.10
17	0111 016 002 19650	25	1	0.37	\$ -	\$ 270.92	\$ 270.92	\$ -	\$ -	\$ -	\$ 270.92
18	0111 016 002 15000	24	1	0.47	\$ -	\$ 348.12	\$ 348.12	\$ -	\$ -	\$ -	\$ 348.12
19	0111 016 002 15800	24	1	12.55	\$ -	\$ 5,890.57	\$ 5,890.57	\$ -	\$ -	\$ -	\$ 5,890.57
20	0111 016 002 15850	24	1	1.47	\$ -	\$ 1,740.83	\$ 1,740.83	\$ -	\$ -	\$ -	\$ 1,740.83
21	0111 016 006 16000	24	1	25.01	\$ 7,127.89	\$ 21,118.43	\$ 28,246.32	\$ -	\$ 9,321.29	\$ 1,068.16	\$ 17,856.88
22	0111 016 002 19000	24	1	0.58	\$ -	\$ 599.47	\$ 599.47	\$ -	\$ -	\$ -	\$ 599.47
23	0111 016 002 18900	24	1	0.12	\$ -	\$ 124.03	\$ 124.03	\$ -	\$ -	\$ -	\$ 124.03
24	0111 016 002 17000	24	1	37.51	\$ 9,743.02	\$ 24,632.56	\$ 34,375.58	\$ -	\$ 11,343.94	\$ 1,965.41	\$ 21,066.23
25	0111 016 002 15850	24	1	0.99	\$ -	\$ 1,534.84	\$ 1,534.84	\$ -	\$ -	\$ -	\$ 1,534.84
26	0111 016 002 14000	23	1	22.09	\$ 5,345.23	\$ 11,475.68	\$ 16,820.91	\$ -	\$ -	\$ 1,068.16	\$ 15,752.76
27	0111 016 002 14000	23	1	20.57	\$ 1,049.43	\$ 9,959.26	\$ 11,008.69	\$ -	\$ -	\$ 747.71	\$ 10,260.98
28	0111 016 002 13000	23	1	21.07	\$ -	\$ 15,156.80	\$ 15,156.80	\$ -	\$ -	\$ -	\$ 15,156.80
29	0111 016 002 12000	22	1	33.21	\$ -	\$ 20,746.85	\$ 20,746.85	\$ -	\$ 6,846.46	\$ -	\$ 13,900.39
30	0111 016 002 12700	22	1	8.87	\$ 2,673.89	\$ 8,115.68	\$ 10,789.57	\$ -	\$ -	\$ 747.71	\$ 10,041.86
31	0111 016 002 12600	22	1	8.67	\$ 2,658.51	\$ 6,744.79	\$ 9,403.29	\$ -	\$ -	\$ 939.98	\$ 8,463.32
32	0111 016 002 11000	21	1	3.24	\$ -	\$ 2,326.95	\$ 2,326.95	\$ -	\$ 767.89	\$ -	\$ 1,559.06
33	0111 016 002 09000	21	1	9.39	\$ 2,935.40	\$ 7,407.09	\$ 10,342.49	\$ -	\$ -	\$ 769.07	\$ 9,573.42
34	0111 016 002 08000	21	1	3.70	\$ -	\$ 2,787.42	\$ 2,787.42	\$ -	\$ 919.85	\$ -	\$ 1,867.57
35	0111 016 002 10000	21	1	7.92	\$ 2,429.76	\$ 6,163.56	\$ 8,593.31	\$ -	\$ -	\$ 854.52	\$ 7,738.79
36	0111 016 002 08600	20	1	1.75	\$ -	\$ 1,856.92	\$ 1,856.92	\$ -	\$ -	\$ -	\$ 1,856.92
37	0111 016 002 07050	20	1	1.45	\$ -	\$ 1,562.72	\$ 1,562.72	\$ -	\$ -	\$ -	\$ 1,562.72
38	0111 016 002 03300	20	1	7.43	\$ 2,324.65	\$ 8,044.93	\$ 10,369.58	\$ -	\$ -	\$ 747.71	\$ 9,621.87
39	0111 016 002 07000	20	1	3.35	\$ -	\$ 3,418.35	\$ 3,418.35	\$ -	\$ -	\$ -	\$ 3,418.35
40	0111 016 002 03000	20	1	7.11	\$ -	\$ 7,778.30	\$ 7,778.30	\$ -	\$ -	\$ 341.81	\$ 7,436.49
41	0111 016 002 02000	19	1	6.37	\$ -	\$ 5,830.48	\$ 5,830.48	\$ -	\$ 1,924.06	\$ -	\$ 3,906.42
42	0111 016 002 01000	19	1	13.14	\$ -	\$ 12,228.24	\$ 12,228.24	\$ -	\$ 4,035.32	\$ -	\$ 8,192.92
43	0111 016 002 00000	18	1	5.55	\$ -	\$ 3,981.51	\$ 3,981.51	\$ -	\$ 1,313.90	\$ -	\$ 2,667.61
44	0111 016 001 99000	18	1	6.30	\$ -	\$ 4,876.81	\$ 4,876.81	\$ -	\$ -	\$ -	\$ 4,876.81
45	0111 016 001 98000	18	1	4.55	\$ -	\$ 3,076.96	\$ 3,076.96	\$ -	\$ 1,015.40	\$ -	\$ 2,061.56
100	0111 016 004 98000	28	2	2.49	\$ -	\$ 1,741.04	\$ 1,741.04	\$ -	\$ 574.54	\$ -	\$ 1,166.49
101	0111 016 004 93200	27	2	0.37	\$ -	\$ 517.42	\$ 517.42	\$ -	\$ -	\$ -	\$ 517.42
102	0111 016 004 93100	27	2	0.59	\$ -	\$ 957.53	\$ 957.53	\$ -	\$ -	\$ -	\$ 957.53
103	0111 016 004 94000	27	2	0.12	\$ -	\$ 194.75	\$ 194.75	\$ -	\$ -	\$ -	\$ 194.75
104	0111 016 004 93000	27	2	14.21	\$ 4,311.60	\$ 9,703.02	\$ 14,014.62	\$ -	\$ -	\$ 975.60	\$ 13,039.02

SCHEDULE A - SUMMARY
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF ALL SECTIONS
OF THE CHENIER-JEAUROND MUNICIPAL DRAIN



Project No.: B15041
 Date: Feb-17

ID	Roll No.	Property (located in)		Area Total	Benefit Cost Total	Outlet Cost Total	Sub-total Costs	Special Benefit & Utilities Total	Grants Total	Allowances Total	Total Net Costs Total
		Lot	Con								
105	0111 016 004 93300	27	2	0.37	\$ -	\$ 600.49	\$ 600.49	\$ -	\$ -	\$ -	\$ 600.49
106	0111 016 004 90000	26	2	14.07	\$ -	\$ 9,156.58	\$ 9,156.58	\$ -	\$ -	\$ -	\$ 9,156.58
107	0111 016 004 91000	26	2	0.31	\$ -	\$ 433.51	\$ 433.51	\$ -	\$ -	\$ -	\$ 433.51
108	0111 016 004 90500	26	2	0.49	\$ -	\$ 685.23	\$ 685.23	\$ -	\$ -	\$ -	\$ 685.23
109	0111 016 004 90600	26	2	0.42	\$ -	\$ 587.34	\$ 587.34	\$ -	\$ -	\$ -	\$ 587.34
Township of North Glengarry -- Roads/Other											
	River Road			0.33	\$ -	\$ 318.95	\$ 318.95	\$ -	\$ -	\$ -	\$ 318.95
	Massiedale Road			0.41	\$ -	\$ 1,027.82	\$ 1,027.82	\$ -	\$ -	\$ -	\$ 1,027.82
	Bureau Road			3.09	\$ 2,860.08	\$ 5,945.56	\$ 8,805.64	\$ 5,991.04	\$ -	\$ -	\$ 14,796.68
	N. 1/2 Concession Road 10			0.92	\$ -	\$ 996.40	\$ 996.40	\$ -	\$ -	\$ -	\$ 996.40
Township of South Glengarry -- Individual Owners											
200	0101 001 018 25000	26	9	1.44	\$ -	\$ 316.32	\$ 316.32	\$ -	\$ 104.38	\$ -	\$ 211.93
201	0101 001 018 22200	26	9	4.21	\$ -	\$ 924.78	\$ 924.78	\$ -	\$ 305.18	\$ -	\$ 619.61
202	0101 001 018 21000	25	9	7.15	\$ -	\$ 1,570.60	\$ 1,570.60	\$ -	\$ 518.30	\$ -	\$ 1,052.30
203	0101 001 018 21100	25	9	0.54	\$ -	\$ 237.24	\$ 237.24	\$ -	\$ -	\$ -	\$ 237.24
204	0101 001 018 21090	25	9	0.45	\$ -	\$ 197.70	\$ 197.70	\$ -	\$ -	\$ -	\$ 197.70
205	0101 001 018 18100	24	9	1.49	\$ -	\$ 458.80	\$ 458.80	\$ -	\$ 151.40	\$ -	\$ 307.39
206	0101 001 018 11700	23	9	3.93	\$ -	\$ 1,401.60	\$ 1,401.60	\$ -	\$ -	\$ -	\$ 1,401.60
207	0101 001 018 11600	23	9	5.08	\$ -	\$ 1,811.74	\$ 1,811.74	\$ -	\$ -	\$ -	\$ 1,811.74
208	0101 001 018 11100	22	9	8.72	\$ -	\$ 3,109.91	\$ 3,109.91	\$ -	\$ 1,026.27	\$ -	\$ 2,083.64
209	0101 001 018 10110	21	9	1.86	\$ -	\$ 663.35	\$ 663.35	\$ -	\$ -	\$ -	\$ 663.35
210	0101 001 018 10100	21	9	1.07	\$ -	\$ 381.61	\$ 381.61	\$ -	\$ -	\$ -	\$ 381.61
211	0101 001 018 10200	21	9	0.16	\$ -	\$ 57.06	\$ 57.06	\$ -	\$ -	\$ -	\$ 57.06
	S. 1/2 Concession Road 10			0.92	\$ -	\$ 2,166.83	\$ 2,166.83	\$ -	\$ -	\$ -	\$ 2,166.83
	2nd Line Road			0.19	\$ -	\$ 631.70	\$ 631.70	\$ -	\$ -	\$ -	\$ 631.70
County of Stormont Dundas and Glengarry -- Roads/Other											
	Glen Robertson Road (Cty. Rd. 10)			0.41	\$ 241.31	\$ 910.65	\$ 1,151.96	\$ 2,410.96	\$ -	\$ -	\$ 3,562.92
TOTAL				753.28	\$ 130,551.10	\$ 391,653.29	\$ 522,204.38	\$ 8,402.00	\$ 114,914.71	\$ 50,186.18	\$ 365,505.49

**SCHEDULE B
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 1 OF THE CHENIER-JEAUROND MUNICIPAL DRAIN**



Project No.: B15041
Date: Feb-17

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S1 Total		S1 Total	S1	S1		S1	S1	S1								
Township of North Glengarry -- Individual Landowners																		
1	0111 016 002 30000	41.14	1.00	41.14	Y	0.92	37.69	\$ 11,376.14	0.92	0.33	12.44	\$ 9,107.04	\$ 20,483.17	100%	\$ -	\$ 6,759.45	\$ 11,186.73	\$ 2,537.00
2	0111 016 002 32000	0.14	2.00	0.28	N	0.75		\$ -	0.75	0.33	0.07	\$ 50.74	\$ 50.74	0%	\$ -	\$ -	\$ -	\$ 50.74
3	0111 016 002 31000	0.13	2.00	0.26	N	0.75		\$ -	0.75	0.33	0.06	\$ 47.12	\$ 47.12	0%	\$ -	\$ -	\$ -	\$ 47.12
4	0111 016 002 29000	30.63	1.00	30.63	Y	0.92	28.17	\$ 8,503.43	0.92	0.33	9.30	\$ 6,807.32	\$ 15,310.75	100%	\$ -	\$ 5,052.55	\$ 6,086.17	\$ 4,172.03
5	0111 016 002 28001	27.16	1.00	27.16	Y	0.93	25.30	\$ 7,634.90	0.93	0.33	8.35	\$ 6,112.03	\$ 13,746.93	100%	\$ -	\$ 4,536.49	\$ 6,439.33	\$ 2,771.12
6	0111 016 002 28000	1.70	2.00	3.40	N	0.81		\$ -	0.81	0.33	0.91	\$ 664.48	\$ 664.48	0%	\$ -	\$ -	\$ -	\$ 664.48
7	0111 016 002 27000	26.61	1.00	26.61	Y	0.82	21.73	\$ 6,559.41	0.82	0.66	14.34	\$ 10,502.13	\$ 17,061.54	100%	\$ -	\$ 5,630.31	\$ 3,145.77	\$ 8,285.46
8	0111 016 002 26000	25.65	1.00	25.65	Y	0.79	20.31	\$ 6,131.01	0.79	0.66	13.41	\$ 9,816.22	\$ 15,947.23	100%	\$ -	\$ 5,262.59	\$ 2,144.85	\$ 8,539.80
9	0111 016 002 25000	3.80	1.00	3.80	N	0.93		\$ -	0.93	0.66	2.33	\$ 1,703.49	\$ 1,703.49	100%	\$ -	\$ 562.15	\$ -	\$ 1,141.34
10	0111 016 002 23000	35.48	1.00	35.48	Y	0.66	23.39	\$ 7,061.11	0.66	0.66	15.44	\$ 11,305.39	\$ 18,366.50	100%	\$ -	\$ 6,060.94	\$ 1,009.24	\$ 11,296.31
11	0111 016 002 24000	38.91	1.00	38.91	Y	0.65	23.35	\$ 7,048.85	0.65	0.66	16.70	\$ 12,228.59	\$ 19,277.44	100%	\$ -	\$ 6,361.56	\$ 1,547.50	\$ 11,368.38
12	0111 016 002 21000	42.34	1.00	42.34	Y	0.65	27.54	\$ 8,311.01	0.65	0.66	18.17	\$ 13,306.57	\$ 21,617.58	100%	\$ -	\$ 7,133.80	\$ 1,756.18	\$ 12,727.60
13	0111 016 002 22000	42.95	1.00	42.95	Y	0.66	28.48	\$ 8,595.49	0.66	1.00	28.48	\$ 20,851.58	\$ 29,447.06	100%	\$ -	\$ 9,717.53	\$ 1,097.61	\$ 18,631.92
14	0111 016 002 20000	43.10	1.00	43.10	Y	0.66	28.56	\$ 8,620.39	0.66	1.00	28.56	\$ 20,911.98	\$ 29,532.37	100%	\$ -	\$ 9,745.68	\$ 1,581.31	\$ 18,205.38
15	0111 016 002 19660	13.39	1.00	13.39	N	0.38		\$ -	0.38	1.00	5.10	\$ 3,732.09	\$ 3,732.09	0%	\$ -	\$ -	\$ -	\$ 3,732.09
16	0111 016 002 19600	29.54	1.00	29.54	Y	0.79	23.22	\$ 7,008.59	0.79	1.00	23.22	\$ 17,001.97	\$ 24,010.56	100%	\$ -	\$ 7,923.49	\$ 1,778.97	\$ 14,308.10
17	0111 016 002 19650	0.37	2.00	0.74	N	0.50		\$ -	0.50	1.00	0.37	\$ 270.92	\$ 270.92	0%	\$ -	\$ -	\$ -	\$ 270.92
18	0111 016 002 15000	0.47	2.00	0.94		0.30		\$ -	0.30	1.00	0.28	\$ 206.48	\$ 206.48	0%	\$ -	\$ -	\$ -	\$ 206.48
19	0111 016 002 15800	12.55	1.00	12.55		0.39		\$ -	0.39	1.00	4.85	\$ 3,547.57	\$ 3,547.57	0%	\$ -	\$ -	\$ -	\$ 3,547.57
20	0111 016 002 15850	1.47	2.00	2.94		0.50		\$ -	0.50	1.00	1.47	\$ 1,076.35	\$ 1,076.35	0%	\$ -	\$ -	\$ -	\$ 1,076.35
21	0111 016 006 16000	25.01	1.00	25.01		0.80		\$ -	0.80	1.00	19.98	\$ 14,629.60	\$ 14,629.60	100%	\$ -	\$ 4,827.77	\$ -	\$ 9,801.83
22	0111 016 002 19000	0.58	2.00	1.16		0.50		\$ -	0.50	1.00	0.58	\$ 424.68	\$ 424.68	0%	\$ -	\$ -	\$ -	\$ 424.68
23	0111 016 002 18900	0.12	2.00	0.24		0.50		\$ -	0.50	1.00	0.12	\$ 87.87	\$ 87.87	0%	\$ -	\$ -	\$ -	\$ 87.87
24	0111 016 002 17000	37.51	1.00	37.51		0.57		\$ -	0.57	1.00	21.53	\$ 15,763.07	\$ 15,763.07	100%	\$ -	\$ 5,201.81	\$ -	\$ 10,561.25
25	0111 016 002 15850	0.99	2.00	1.98		0.75		\$ -	0.75	1.00	1.49	\$ 1,087.34	\$ 1,087.34	0%	\$ -	\$ -	\$ -	\$ 1,087.34
26	0111 016 002 14000	22.09	1.00	22.09		0.41		\$ -	0.41	1.00	9.03	\$ 6,609.68	\$ 6,609.68	0%	\$ -	\$ -	\$ -	\$ 6,609.68
27	0111 016 002 14000	20.57	1.00	20.57		0.37		\$ -	0.37	1.00	7.67	\$ 5,616.80	\$ 5,616.80	0%	\$ -	\$ -	\$ -	\$ 5,616.80
28	0111 016 002 13000	21.07	1.00	21.07		0.63		\$ -	0.63	1.00	13.26	\$ 9,709.14	\$ 9,709.14	0%	\$ -	\$ -	\$ -	\$ 9,709.14
29	0111 016 002 12000	33.21	1.00	33.21		0.32		\$ -	0.32	1.00	10.48	\$ 7,675.78	\$ 7,675.78	100%	\$ -	\$ 2,533.01	\$ -	\$ 5,142.77
30	0111 016 002 12700	8.87	1.00	8.87		0.50		\$ -	0.50	1.00	4.44	\$ 3,247.36	\$ 3,247.36	0%	\$ -	\$ -	\$ -	\$ 3,247.36
31	0111 016 002 12600	8.67	1.00	8.67		0.30		\$ -	0.30	1.00	2.60	\$ 1,904.48	\$ 1,904.48	0%	\$ -	\$ -	\$ -	\$ 1,904.48
32	0111 016 002 11000	3.24	1.00	3.24		0.30		\$ -	0.30	1.00	0.97	\$ 711.71	\$ 711.71	100%	\$ -	\$ 234.86	\$ -	\$ 476.85
33	0111 016 002 09000	9.39	1.00	9.39		0.30		\$ -	0.30	1.00	2.82	\$ 2,062.64	\$ 2,062.64	0%	\$ -	\$ -	\$ -	\$ 2,062.64

**SCHEDULE B
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 1 OF THE CHENIER-JEAUROND MUNICIPAL DRAIN**



Project No.: B15041
Date: Feb-17

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S1 Total		S1	S1	S1		S1	S1									
34	0111 016 002 08000	3.70	1.00	3.70		0.30		\$ -	0.30	1.00	1.11	\$ 812.76	\$ 812.76	100%	\$ -	\$ 268.21	\$ -	\$ 544.55
35	0111 016 002 10000	7.92	1.00	7.92		0.30		\$ -	0.30	1.00	2.38	\$ 1,739.74	\$ 1,739.74	0%	\$ -	\$ -	\$ -	\$ 1,739.74
36	0111 016 002 08600	1.75	1.00	1.75		0.30		\$ -	0.30	1.00	0.53	\$ 384.41	\$ 384.41	0%	\$ -	\$ -	\$ -	\$ 384.41
37	0111 016 002 07050	1.45	1.00	1.45		0.30		\$ -	0.30	1.00	0.44	\$ 318.51	\$ 318.51	0%	\$ -	\$ -	\$ -	\$ 318.51
38	0111 016 002 03300	7.43	1.00	7.43		0.30		\$ -	0.30	1.00	2.23	\$ 1,632.10	\$ 1,632.10	0%	\$ -	\$ -	\$ -	\$ 1,632.10
39	0111 016 002 07000	3.35	1.00	3.35		0.30		\$ -	0.30	1.00	1.01	\$ 735.87	\$ 735.87	0%	\$ -	\$ -	\$ -	\$ 735.87
40	0111 016 002 03000	7.11	1.00	7.11		0.30		\$ -	0.30	1.00	2.13	\$ 1,561.81	\$ 1,561.81	0%	\$ -	\$ -	\$ -	\$ 1,561.81
41	0111 016 002 02000	6.37	1.00	6.37		0.30		\$ -	0.30	1.00	1.91	\$ 1,399.26	\$ 1,399.26	100%	\$ -	\$ 461.76	\$ -	\$ 937.50
42	0111 016 002 01000	13.14	1.00	13.14		0.30		\$ -	0.30	1.00	3.94	\$ 2,886.38	\$ 2,886.38	100%	\$ -	\$ 952.51	\$ -	\$ 1,933.88
43	0111 016 002 00000	5.55	1.00	5.55		0.30		\$ -	0.30	1.00	1.67	\$ 1,219.13	\$ 1,219.13	100%	\$ -	\$ 402.31	\$ -	\$ 816.82
44	0111 016 001 99000	6.30	1.00	6.30		0.30		\$ -	0.30	1.00	1.89	\$ 1,383.88	\$ 1,383.88	0%	\$ -	\$ -	\$ -	\$ 1,383.88
45	0111 016 001 98000	4.55	1.00	4.55		0.30		\$ -	0.30	1.00	1.37	\$ 999.47	\$ 999.47	100%	\$ -	\$ 329.83	\$ -	\$ 669.64
100	0111 016 004 98000	2.49	1.00	2.49		0.75		\$ -	0.75	0.66	1.23	\$ 902.49	\$ 902.49	100%	\$ -	\$ 297.82	\$ -	\$ 604.67
101	0111 016 004 93200	0.37	2.00	0.74		0.75		\$ -	0.75	0.66	0.37	\$ 268.21	\$ 268.21	0%	\$ -	\$ -	\$ -	\$ 268.21
102	0111 016 004 93100	0.59	2.00	1.18		0.75		\$ -	0.75	0.66	0.58	\$ 427.69	\$ 427.69	0%	\$ -	\$ -	\$ -	\$ 427.69
103	0111 016 004 94000	0.12	2.00	0.24		0.75		\$ -	0.75	0.66	0.12	\$ 86.99	\$ 86.99	0%	\$ -	\$ -	\$ -	\$ 86.99
104	0111 016 004 93000	14.21	1.00	14.21		0.66		\$ -	0.66	0.66	6.23	\$ 4,558.35	\$ 4,558.35	0%	\$ -	\$ -	\$ -	\$ 4,558.35
105	0111 016 004 93300	0.37	2.00	0.74		0.75		\$ -	0.75	0.66	0.37	\$ 268.21	\$ 268.21	0%	\$ -	\$ -	\$ -	\$ 268.21
106	0111 016 004 90000	14.07	1.00	14.07		0.64		\$ -	0.64	0.66	5.96	\$ 4,362.11	\$ 4,362.11	0%	\$ -	\$ -	\$ -	\$ 4,362.11
107	0111 016 004 91000	0.31	2.00	0.62		0.75		\$ -	0.75	0.66	0.31	\$ 224.72	\$ 224.72	0%	\$ -	\$ -	\$ -	\$ 224.72
108	0111 016 004 90500	0.49	2.00	0.98		0.75		\$ -	0.75	0.66	0.49	\$ 355.20	\$ 355.20	0%	\$ -	\$ -	\$ -	\$ 355.20
109	0111 016 004 90600	0.42	2.00	0.84		0.75		\$ -	0.75	0.66	0.42	\$ 304.45	\$ 304.45	0%	\$ -	\$ -	\$ -	\$ 304.45
Township of North Glengarry -- Roads/Other																		
River Road		0.33	4.00	1.32	N	1.00		\$ -	1.00	0.33	0.44	\$ 318.95	\$ 318.95	0%	\$ -	\$ -	\$ -	\$ 318.95
Massiedale Road		0.41	4.00	1.64		0.60		\$ -	0.60	0.66	0.65	\$ 475.53	\$ 475.53	0%	\$ -	\$ -	\$ -	\$ 475.53
Bureau Road		3.09	4.00	12.36	Y	0.66	4.05	\$ 1,221.48	0.66	1.00	8.12	\$ 5,945.56	\$ 7,167.05	0%	\$ 5,991.04	\$ -	\$ -	\$ 13,158.08
N. 1/2 Concession Road 10		0.92	4.00	3.68	N	0.30		\$ -	0.30	1.00	1.10	\$ 808.36	\$ 808.36	0%	\$ -	\$ -	\$ -	\$ 808.36

**SCHEDULE B
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 1 OF THE CHENIER-JEAUROND MUNICIPAL DRAIN**



Project No.: B15041
Date: Feb-17

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S1 Total		S1 Total	S1	S1		S1	S1	S1								
Township of South Glengarry -- Individual Owners																		
200	0101 001 018 25000	1.44	1.00	1.44	N	0.30		\$ -	0.30	1.00	0.43	\$ 316.32	\$ 316.32	100%	\$ -	\$ 104.38	\$ -	\$ 211.93
201	0101 001 018 22200	4.21	1.00	4.21	N	0.30		\$ -	0.30	1.00	1.26	\$ 924.78	\$ 924.78	100%	\$ -	\$ 305.18	\$ -	\$ 619.61
202	0101 001 018 21000	7.15	1.00	7.15	N	0.30		\$ -	0.30	1.00	2.15	\$ 1,570.60	\$ 1,570.60	100%	\$ -	\$ 518.30	\$ -	\$ 1,052.30
203	0101 001 018 21100	0.54	2.00	1.08	N	0.30		\$ -	0.30	1.00	0.32	\$ 237.24	\$ 237.24	0%	\$ -	\$ -	\$ -	\$ 237.24
204	0101 001 018 21090	0.45	2.00	0.90	N	0.30		\$ -	0.30	1.00	0.27	\$ 197.70	\$ 197.70	0%	\$ -	\$ -	\$ -	\$ 197.70
205	0101 001 018 18100	1.49	1.00	1.49	N	0.30		\$ -	0.30	1.00	0.45	\$ 327.30	\$ 327.30	100%	\$ -	\$ 108.01	\$ -	\$ 219.29
206	0101 001 018 11700	3.93	1.00	3.93		0.30		\$ -	0.30	1.00	1.18	\$ 863.28	\$ 863.28	0%	\$ -	\$ -	\$ -	\$ 863.28
207	0101 001 018 11600	5.08	1.00	5.08		0.30		\$ -	0.30	1.00	1.52	\$ 1,115.89	\$ 1,115.89	0%	\$ -	\$ -	\$ -	\$ 1,115.89
208	0101 001 018 11100	8.72	1.00	8.72		0.30		\$ -	0.30	1.00	2.62	\$ 1,915.47	\$ 1,915.47	100%	\$ -	\$ 632.10	\$ -	\$ 1,283.36
209	0101 001 018 10110	1.86	1.00	1.86		0.30		\$ -	0.30	1.00	0.56	\$ 408.57	\$ 408.57	0%	\$ -	\$ -	\$ -	\$ 408.57
210	0101 001 018 10100	1.07	1.00	1.07		0.30		\$ -	0.30	1.00	0.32	\$ 235.04	\$ 235.04	0%	\$ -	\$ -	\$ -	\$ 235.04
211	0101 001 018 10200	0.16	1.00	0.16		0.30		\$ -	0.30	1.00	0.05	\$ 35.15	\$ 35.15	0%	\$ -	\$ -	\$ -	\$ 35.15
Township of South Glengarry -- Roads/Other																		
S. 1/2 Concession Road 10		0.92	4.00	3.68	N	0.66		\$ -	0.66	1.00	2.45	\$ 1,790.75	\$ 1,790.75	0%	\$ -	\$ -	\$ -	\$ 1,790.75
2nd Line Road		0.19	4.00	0.76		0.89		\$ -	0.89	1.00	0.68	\$ 494.29	\$ 494.29	0%	\$ -	\$ -	\$ -	\$ 494.29
County of Stormont Dundas and Glengarry -- Roads/Other																		
Glen Robertson Road (Cty. Rd. 10)		0.41	4.00	1.64	N	0.79		\$ -	0.79	0.66	0.85	\$ 622.72	\$ 622.72	0%	\$ -	\$ -	\$ -	\$ 622.72
Total		753.28		781.72			291.79	\$ 88,071.81			360.85	\$ 264,215.42	\$ 352,287.23		\$ 5,991.04	\$ 91,924.39	\$ 37,773.67	\$ 228,580.21

SCHEDULE C
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 2 OF THE CHENIER-JEAUROND MUNICIPAL DRAIN



Project No.: B15041
 Date: Feb-17

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S2 Total		S2 Total	S2	S2		S2	S2	S2								
<i>Township of North Glengarry -- Individual Landowners</i>																		
18	0111 016 002 15000	0.47	2.00	0.94	N	0.50		\$ -	0.50	0.33	0.16	\$ 141.63	\$ 141.63	0%	\$ -	\$ -	\$ -	\$ 141.63
19	0111 016 002 15800	12.55	1.00	12.55	N	0.62		\$ -	0.62	0.33	2.57	\$ 2,343.00	\$ 2,343.00	0%	\$ -	\$ -	\$ -	\$ 2,343.00
20	0111 016 002 15850	1.47	2.00	2.94	N	0.75		\$ -	0.75	0.33	0.73	\$ 664.48	\$ 664.48	0%	\$ -	\$ -	\$ -	\$ 664.48
21	0111 016 006 16000	25.01	1.00	25.01	Y	0.86	21.53	\$ 7,127.89	0.86	0.33	7.11	\$ 6,488.83	\$ 13,616.72	100%	\$ -	\$ 4,493.52	\$ 1,068.16	\$ 8,055.04
22	0111 016 002 19000	0.58	2.00	1.16	N	0.50		\$ -	0.50	0.33	0.19	\$ 174.78	\$ 174.78	0%	\$ -	\$ -	\$ -	\$ 174.78
23	0111 016 002 18900	0.12	2.00	0.24	N	0.50		\$ -	0.50	0.33	0.04	\$ 36.16	\$ 36.16	0%	\$ -	\$ -	\$ -	\$ 36.16
24	0111 016 002 17000	37.51	1.00	37.51	Y	0.78	29.43	\$ 9,743.02	0.78	0.33	9.71	\$ 8,869.49	\$ 18,612.52	100%	\$ -	\$ 6,142.13	\$ 1,965.41	\$ 10,504.98
25	0111 016 002 15850	0.99	2.00	1.98	N	0.75		\$ -	0.75	0.33	0.49	\$ 447.51	\$ 447.51	0%	\$ -	\$ -	\$ -	\$ 447.51
26	0111 016 002 14000	22.09	1.00	22.09	Y	0.73	16.15	\$ 5,345.23	0.73	0.33	5.33	\$ 4,866.00	\$ 10,211.23	0%	\$ -	\$ -	\$ 1,068.16	\$ 9,143.08
27	0111 016 002 14000	20.57	1.00	20.57	P	0.70	3.17	\$ 1,049.43	0.70	0.33	4.76	\$ 4,342.46	\$ 5,391.89	0%	\$ -	\$ -	\$ 747.71	\$ 4,644.18
28	0111 016 002 13000	21.07	1.00	21.07	n	0.86		\$ -	0.86	0.33	5.97	\$ 5,447.66	\$ 5,447.66	0%	\$ -	\$ -	\$ -	\$ 5,447.66
29	0111 016 002 12000	33.21	1.00	33.21	N	0.65		\$ -	0.65	0.66	14.31	\$ 13,071.07	\$ 13,071.07	100%	\$ -	\$ 4,313.45	\$ -	\$ 8,757.62
30	0111 016 002 12700	8.87	1.00	8.87	Y	0.91	8.08	\$ 2,673.89	0.91	0.66	5.33	\$ 4,868.31	\$ 7,542.20	0%	\$ -	\$ -	\$ 747.71	\$ 6,794.50
31	0111 016 002 12600	8.67	1.00	8.67	Y	0.93	8.03	\$ 2,658.51	0.93	0.66	5.30	\$ 4,840.30	\$ 7,498.81	0%	\$ -	\$ -	\$ 939.98	\$ 6,558.83
32	0111 016 002 11000	3.24	1.00	3.24	N	0.83		\$ -	0.83	0.66	1.77	\$ 1,615.24	\$ 1,615.24	100%	\$ -	\$ 533.03	\$ -	\$ 1,082.21
33	0111 016 002 09000	9.39	1.00	9.39	Y	0.94	8.87	\$ 2,935.40	0.94	0.66	5.85	\$ 5,344.45	\$ 8,279.85	0%	\$ -	\$ -	\$ 769.07	\$ 7,510.78
34	0111 016 002 08000	3.70	1.00	3.70	N	0.89		\$ -	0.89	0.66	2.16	\$ 1,974.66	\$ 1,974.66	100%	\$ -	\$ 651.64	\$ -	\$ 1,323.02
35	0111 016 002 10000	7.92	1.00	7.92	Y	0.93	7.34	\$ 2,429.76	0.93	0.66	4.84	\$ 4,423.82	\$ 6,853.58	0%	\$ -	\$ -	\$ 854.52	\$ 5,999.05
36	0111 016 002 08600	1.75	1.00	1.75	N	0.92		\$ -	0.92	1.00	1.61	\$ 1,472.51	\$ 1,472.51	0%	\$ -	\$ -	\$ -	\$ 1,472.51
37	0111 016 002 07050	1.45	1.00	1.45	N	0.94		\$ -	0.94	1.00	1.36	\$ 1,244.21	\$ 1,244.21	0%	\$ -	\$ -	\$ -	\$ 1,244.21
38	0111 016 002 03300	7.43	1.00	7.43	Y	0.95	7.02	\$ 2,324.65	0.95	1.00	7.02	\$ 6,412.83	\$ 8,737.48	0%	\$ -	\$ -	\$ 747.71	\$ 7,989.77
39	0111 016 002 07000	3.35	1.00	3.35	N	0.88		\$ -	0.88	1.00	2.94	\$ 2,682.47	\$ 2,682.47	0%	\$ -	\$ -	\$ -	\$ 2,682.47
40	0111 016 002 03000	7.11	1.00	7.11	N	0.96		\$ -	0.96	1.00	6.81	\$ 6,216.49	\$ 6,216.49	0%	\$ -	\$ -	\$ 341.81	\$ 5,874.68
41	0111 016 002 02000	6.37	1.00	6.37	N	0.76		\$ -	0.76	1.00	4.85	\$ 4,431.22	\$ 4,431.22	100%	\$ -	\$ 1,462.30	\$ -	\$ 2,968.92
42	0111 016 002 01000	13.14	1.00	13.14	N	0.78		\$ -	0.78	1.00	10.23	\$ 9,341.86	\$ 9,341.86	100%	\$ -	\$ 3,082.81	\$ -	\$ 6,259.05
43	0111 016 002 00000	5.55	1.00	5.55	N	0.55		\$ -	0.55	1.00	3.03	\$ 2,762.38	\$ 2,762.38	100%	\$ -	\$ 911.58	\$ -	\$ 1,850.79
44	0111 016 001 99000	6.30	1.00	6.30	N	0.61		\$ -	0.61	1.00	3.83	\$ 3,492.92	\$ 3,492.92	0%	\$ -	\$ -	\$ -	\$ 3,492.92
45	0111 016 001 98000	4.55	1.00	4.55	N	0.50		\$ -	0.50	1.00	2.28	\$ 2,077.49	\$ 2,077.49	100%	\$ -	\$ 685.57	\$ -	\$ 1,391.92

SCHEDULE C
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 2 OF THE CHENIER-JEAUROND MUNICIPAL DRAIN



Project No.: B15041
 Date: Feb-17

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S2 Total		S2 Total	S2	S2		S2	S2	S2								
Township of North Glengarry -- Roads/Other																		
Bureau Road		1.55	4.00	6.20	Y	0.80	4.95	\$ 1,638.60	0.80	0.00	0.00	\$ -	\$ 1,638.60	0%	\$ -	\$ -	\$ -	\$ 1,638.60
N. 1/2 Concession Road 10		0.52	4.00	2.08	N	0.30		\$ -	0.30	0.33	0.21	\$ 188.04	\$ 188.04	0%	\$ -	\$ -	\$ -	\$ 188.04
Township of South Glengarry -- Individual Owners																		
205	0101 001 018 18100	0.96	1.00	0.96	N	0.30		\$ -	0.30	0.50	0.14	\$ 131.50	\$ 131.50	100%	\$ -	\$ 43.39	\$ -	\$ 88.10
206	0101 001 018 11700	3.93	1.00	3.93	N	0.30		\$ -	0.30	0.50	0.59	\$ 538.32	\$ 538.32	0%	\$ -	\$ -	\$ -	\$ 538.32
207	0101 001 018 11600	5.08	1.00	5.08	N	0.30		\$ -	0.30	0.50	0.76	\$ 695.85	\$ 695.85	0%	\$ -	\$ -	\$ -	\$ 695.85
208	0101 001 018 11100	8.72	1.00	8.72	N	0.30		\$ -	0.30	0.50	1.31	\$ 1,194.44	\$ 1,194.44	100%	\$ -	\$ 394.17	\$ -	\$ 800.28
209	0101 001 018 10110	1.86	1.00	1.86	N	0.30		\$ -	0.30	0.50	0.28	\$ 254.78	\$ 254.78	0%	\$ -	\$ -	\$ -	\$ 254.78
210	0101 001 018 10100	1.07	1.00	1.07	N	0.30		\$ -	0.30	0.50	0.16	\$ 146.57	\$ 146.57	0%	\$ -	\$ -	\$ -	\$ 146.57
211	0101 001 018 10200	0.16	1.00	0.16	N	0.30		\$ -	0.30	0.50	0.02	\$ 21.92	\$ 21.92	0%	\$ -	\$ -	\$ -	\$ 21.92
Township of South Glengarry -- Roads/Other																		
S. 1/2 Concession Road 10		0.52	4.00	2.08	N	0.30		\$ -	0.30	0.66	0.41	\$ 376.09	\$ 376.09	0%	\$ -	\$ -	\$ -	\$ 376.09
2nd Line Road		0.19	4.00	0.76	N	0.30		\$ -	0.30	0.66	0.15	\$ 137.42	\$ 137.42	0%	\$ -	\$ -	\$ -	\$ 137.42
Total		298.99					114.57	\$ 37,926.38			124.60	\$ 113,779.14	\$ 151,705.53		\$ -	\$ 22,713.60	\$ 9,250.23	\$ 119,741.70

SCHEDULE D
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF BRANCH No. 1 OF THE CHENIER-JEAUROND MUNICIPAL DRAIN



Project No.: B15041
 Date: Feb-17

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost	
		BR 1 Total		BR 1 Total	BR 1	BR 1		BR 1	BR 1	BR 1									
Township of North Glengarry -- Individual Landowners																			
11	0111 016 002 24000	3.00	1.00	3.00	Y	0.00		\$ -	0.00	1.00	0.00	\$ -	\$ -	100%	\$ -	\$ -	\$ 2,186.69	(-\$ 2,186.69)	
100	0111 016 004 98000	2.49	1.00	2.49	N	0.75		\$ -	0.75	1.00	1.87	\$ 838.55	\$ 838.55	100%	\$ -	\$ 276.72	\$ -	\$ 561.83	
101	0111 016 004 93200	0.37	2.00	0.74	N	0.75		\$ -	0.75	1.00	0.56	\$ 249.21	\$ 249.21	0%	\$ -	\$ -	\$ -	\$ 249.21	
102	0111 016 004 93100	0.59	2.00	1.18	N	1.00		\$ -	1.00	1.00	1.18	\$ 529.85	\$ 529.85	0%	\$ -	\$ -	\$ -	\$ 529.85	
103	0111 016 004 94000	0.12	2.00	0.24	N	1.00		\$ -	1.00	1.00	0.24	\$ 107.77	\$ 107.77	0%	\$ -	\$ -	\$ -	\$ 107.77	
104	0111 016 004 93000	14.21	1.00	14.21	Y	0.81	11.46	\$ 4,311.60	0.81	1.00	11.46	\$ 5,144.67	\$ 9,456.26	0%	\$ -	\$ -	\$ 975.60	\$ 8,480.66	
105	0111 016 004 93300	0.37	2.00	0.74	N	1.00		\$ -	1.00	1.00	0.74	\$ 332.28	\$ 332.28	0%	\$ -	\$ -	\$ -	\$ 332.28	
106	0111 016 004 90000	14.07	1.00	14.07	N	0.76		\$ -	0.76	1.00	10.68	\$ 4,794.47	\$ 4,794.47	0%	\$ -	\$ -	\$ -	\$ 4,794.47	
107	0111 016 004 91000	0.31	2.00	0.62	N	0.75		\$ -	0.75	1.00	0.47	\$ 208.80	\$ 208.80	0%	\$ -	\$ -	\$ -	\$ 208.80	
108	0111 016 004 90500	0.49	2.00	0.98	N	0.75		\$ -	0.75	1.00	0.74	\$ 330.03	\$ 330.03	0%	\$ -	\$ -	\$ -	\$ 330.03	
109	0111 016 004 90600	0.42	2.00	0.84	N	0.75		\$ -	0.75	1.00	0.63	\$ 282.88	\$ 282.88	0%	\$ -	\$ -	\$ -	\$ 282.88	
Township of North Glengarry -- Roads/Other																			
Massiedale Road		0.41	4.00	1.64	N	0.75		\$ -	0.75	1.00	1.23	\$ 552.30	\$ 552.30	0%	\$ -	\$ -	\$ -	\$ 552.30	
County of Stormont Dundas and Glengarry -- Roads/Other																			
Glen Robertson Road (Cty. Rd. 10)		0.19	4.00	0.76	Y	0.84	0.64	\$ 241.31	0.84	1.00	0.64	\$ 287.94	\$ 529.25	0%	\$ 2,410.96	\$ -	\$ -	\$ 2,940.21	
Total		37.04		41.51				12.10	\$ 4,552.91			30.42	\$ 13,658.72	\$ 18,211.63		\$ 2,410.96	\$ 276.72	\$ 3,162.29	\$ 17,183.58

Appendix B

Schedule of Allowances And Detailed Cost Estimate

**SCHEDULE E
ALLOWANCES FOR LANDS USED IN THE CONSTRUCTION OF
THE CHENIER-JEAUROND MUNICIPAL DRAIN**

Project No.: B15041
Date: Feb-17

ID	Roll No.	Land Allowance						Total Value
		S1		S2		BR 1		
		Area	Value	Area	Value	Area	Value	
<i>Township of North Glengarry -- Individual Landowners</i>								
1	0111 016 002 30000	0.88	\$ 3,237.50	0.00	\$ -	0.00	\$ -	\$ 3,237.50
4	0111 016 002 29000	0.54	\$ 1,998.00	0.00	\$ -	0.00	\$ -	\$ 1,998.00
5	0111 016 002 28001	0.66	\$ 2,442.00	0.00	\$ -	0.00	\$ -	\$ 2,442.00
7	0111 016 002 27000	0.22	\$ 814.00	0.00	\$ -	0.00	\$ -	\$ 814.00
8	0111 016 002 26000	0.15	\$ 555.00	0.00	\$ -	0.00	\$ -	\$ 555.00
10	0111 016 002 23000	0.15	\$ 555.00	0.00	\$ -	0.00	\$ -	\$ 555.00
11	0111 016 002 24000	0.23	\$ 851.00	0.00	\$ -	0.33	\$ 1,202.50	\$ 2,053.50
12	0111 016 002 21000	0.18	\$ 666.00	0.00	\$ -	0.00	\$ -	\$ 666.00
13	0111 016 002 22000	0.11	\$ 416.25	0.00	\$ -	0.00	\$ -	\$ 416.25
14	0111 016 002 20000	0.10	\$ 370.00	0.00	\$ -	0.00	\$ -	\$ 370.00
16	0111 016 002 19600	0.11	\$ 416.25	0.00	\$ -	0.00	\$ -	\$ 416.25
21	0111 016 006 16000	0.00	\$ -	0.13	\$ 462.50	0.00	\$ -	\$ 462.50
24	0111 016 002 17000	0.00	\$ -	0.23	\$ 851.00	0.00	\$ -	\$ 851.00
26	0111 016 002 14000	0.00	\$ -	0.13	\$ 462.50	0.00	\$ -	\$ 462.50
27	0111 016 002 14000	0.00	\$ -	0.09	\$ 323.75	0.00	\$ -	\$ 323.75
30	0111 016 002 12700	0.00	\$ -	0.09	\$ 323.75	0.00	\$ -	\$ 323.75
31	0111 016 002 12600	0.00	\$ -	0.11	\$ 407.00	0.00	\$ -	\$ 407.00
33	0111 016 002 09000	0.00	\$ -	0.09	\$ 333.00	0.00	\$ -	\$ 333.00
35	0111 016 002 10000	0.00	\$ -	0.10	\$ 370.00	0.00	\$ -	\$ 370.00
38	0111 016 002 03300	0.00	\$ -	0.09	\$ 323.75	0.00	\$ -	\$ 323.75
40	0111 016 002 03000	0.00	\$ -	0.04	\$ 148.00	0.00	\$ -	\$ 148.00
104	0111 016 004 93000	0.00	\$ -	0.00	\$ -	0.15	\$ 536.50	\$ 536.50
<i>County of Stormont Dundas and Glengarry -- Roads/Other</i>								
Total		3.33	\$ 12,321.00	1.08	\$ 4,005.25	0.47	\$ 1,739.00	\$ 18,065.25

SCHEDULE F
ALLOWANCES FOR CROPS LOST IN THE CONSTRUCTION OF
SECTIONS OF THE CHENIER-JEAUROND MUNICIPAL DRAIN

Project No: B15041
Date: Feb-17

ID	Roll No.	Crop Allowance						Total Value
		S1		S2		BR 1		
		Area	Total	Area	Total	Area	Total	
<i>Township of North Glengarry -- Individual Landowners</i>								
1	0111 016 002 30000	2.63	\$ 7,949.23	0.00	\$ -	0.00	\$ -	\$ 7,949.23
4	0111 016 002 29000	1.35	\$ 4,088.17	0.00	\$ -	0.00	\$ -	\$ 4,088.17
5	0111 016 002 28001	1.32	\$ 3,997.33	0.00	\$ -	0.00	\$ -	\$ 3,997.33
7	0111 016 002 27000	0.77	\$ 2,331.77	0.00	\$ -	0.00	\$ -	\$ 2,331.77
8	0111 016 002 26000	0.53	\$ 1,589.85	0.00	\$ -	0.00	\$ -	\$ 1,589.85
10	0111 016 002 23000	0.15	\$ 454.24	0.00	\$ -	0.00	\$ -	\$ 454.24
11	0111 016 002 24000	0.23	\$ 696.50	0.00	\$ -	0.33	\$ 984.19	\$ 1,680.69
12	0111 016 002 21000	0.36	\$ 1,090.18	0.00	\$ -	0.00	\$ -	\$ 1,090.18
13	0111 016 002 22000	0.23	\$ 681.36	0.00	\$ -	0.00	\$ -	\$ 681.36
14	0111 016 002 20000	0.40	\$ 1,211.31	0.00	\$ -	0.00	\$ -	\$ 1,211.31
16	0111 016 002 19600	0.45	\$ 1,362.72	0.00	\$ -	0.00	\$ -	\$ 1,362.72
21	0111 016 006 16000	0.00	\$ -	0.20	\$ 605.66	0.00	\$ -	\$ 605.66
24	0111 016 002 17000	0.00	\$ -	0.37	\$ 1,114.41	0.00	\$ -	\$ 1,114.41
26	0111 016 002 14000	0.00	\$ -	0.20	\$ 605.66	0.00	\$ -	\$ 605.66
27	0111 016 002 14000	0.00	\$ -	0.14	\$ 423.96	0.00	\$ -	\$ 423.96
30	0111 016 002 12700	0.00	\$ -	0.14	\$ 423.96	0.00	\$ -	\$ 423.96
31	0111 016 002 12600	0.00	\$ -	0.18	\$ 532.98	0.00	\$ -	\$ 532.98
33	0111 016 002 09000	0.00	\$ -	0.14	\$ 436.07	0.00	\$ -	\$ 436.07
35	0111 016 002 10000	0.00	\$ -	0.16	\$ 484.52	0.00	\$ -	\$ 484.52
38	0111 016 002 03300	0.00	\$ -	0.14	\$ 423.96	0.00	\$ -	\$ 423.96
40	0111 016 002 03000	0.00	\$ -	0.06	\$ 193.81	0.00	\$ -	\$ 193.81
104	0111 016 004 93000	0.00	\$ -	0.00	\$ -	0.15	\$ 439.10	\$ 439.10
Total		8.41	\$ 25,452.67	1.73	\$ 5,244.98	0.47	\$ 1,423.29	\$ 32,120.93

**DETAILED COST ESTIMATE
SECTION 1
THE CHENIER-JEAUROND MUNICIPAL DRAIN**



Project No: B15041
Date: Feb-17

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total	
Section 1 (Sta 0+000 to Sta 3+755)						3,755.00m	
Construction							
Construction	Site Preparation Activities						
		Mobilization	LS	\$ 3,750.00	60%	\$ 2,250.00	
		Erosion and Sediment Control Plan	LS	\$ 3,000.00	60%	\$ 1,800.00	
		Erosion and Sediment Control Measures -- Minimum as Follows: - (2) Rock Check Dam c/w Sediment Trap - (6) Straw Bale Dam c/w Sediment Trap - Additional Silt Fence (where required)	LS	\$ 4,600.00	60%	\$ 2,760.00	
		Clearing/Grubbing (including individual tree removals)	LS	\$ 2,500.00	1.00	\$ 2,500.00	
		Fence removal and reinstatement	m	\$ 30.00	225.00	\$ 6,750.00	
	Excavation Activities						
		Earth Ex. - Ditch (full construction) - Incl. Spreading	m ³	\$ 5.25	11690.00	\$ 61,372.50	
		Rock Excavation (hydraulic ram)	m ³	\$ 150.00	15.00	\$ 2,250.00	
		Access Culvert(s) -- 1630x1120mm CSPA	m	\$ 535.00	80.00	\$ 42,800.00	
		Access Culvert(s) -- 1500mm dia CSP	m	\$ 460.00	40.00	\$ 18,400.00	
		Access Culvert(s) -- 1000mm dia CSP	m	\$ 325.00	20.00	\$ 6,500.00	
	Reinstatement Activities						
		Tile Outlet Restoration/Protection	each	\$ 500.00	12.00	\$ 6,000.00	
		Hand Seeding	m ²	\$ 0.50	37750.00	\$ 18,875.00	
		Rock Protection - Erosion Control	m ²	\$ 27.50	900.00	\$ 24,750.00	
		Rock Protection - Culvert End Treatments	each	\$ 825.00	26.00	\$ 21,450.00	
		Sub-Total - Construction Costs					\$ 218,457.50
		Contingency Allowance - Construction					\$ 20,000.00
		Total - Construction Costs					\$ 238,457.50
	Engineering/Administration						
			Engineer's Report (apportioned by Section)	LS	\$ 87,000.00	60%	\$ 52,200.00
			Contract Administration/Inspection	LS	\$ 29,200.00	60%	\$ 17,520.00
			Sub-Total - Routine Engineering				\$ 69,720.00
	Total - Engineering/Administration						\$ 69,720.00
Other							
		Carrying Cost(s)	L.S	(4% OF Costs Above)		\$ 12,327.10	
		Allowances	LS	(See Schedule)		\$ 37,773.67	
Total - Other Costs						\$ 50,100.77	
Sub-Total - Net Costs						\$ 358,278.27	
Special Benefits							
Road Authority (Twp. of North Glengarry) Section 1		<i>Under Section 69 of the Drainage Act, the "Road Authority" has the option to construct the required drainage works within the Road Right-Of-Way. It is assumed for the purpose of this estimate that the Road Authority will exercise this option. As such, the items required to complete the Road Authority works have been excluded from this estimate. However, the Engineering/Administration and Other fees, associated with the required Road Authority works, where required downstream of the works as noted below are considered payable as a Special Benefit by the Township Road Authority. It is estimated that 5% of the costs noted below are due to the required Road Authority Works.</i>					
		Engineering/Administration and Other	LS	\$ 119,820.77	5%	\$ 5,991.04	
		Sub-Total - Road Authority Costs					\$ 5,991.04
Total - Special Benefits						\$ 5,991.04	
Total Net Costs - Section 1 (For Distribution to Properties)						\$ 352,287.23	

**DETAILED COST ESTIMATE
SECTION 2
THE CHENIER-JEAUROND MUNICIPAL DRAIN**

**Robinson
Consultants**

Project No: B15041
Date: Feb-17

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total	
Section 2 (Sta 3+755 to Sta 6+534.8)						2,779.80m	
Construction							
Construction	Site Preparation Activities						
		Mobilization	LS	\$ 3,750.00	35%	\$ 1,312.50	
		Erosion and Sediment Control Plan	LS	\$ 3,000.00	35%	\$ 1,050.00	
		Erosion and Sediment Control Measures -- Minimum as Follows: - (3) Rock Check Dam c/w Sediment Trap - (6) Straw Bale Dam c/w Sediment Trap - Additional Silt Fence (where required)	LS	\$ 4,600.00	35%	\$ 1,610.00	
		Clearing/Grubbing (including individual tree removals)	LS	\$ 8,000.00	1.00	\$ 8,000.00	
		Fence removal and reinstatement	m	\$ 30.00	180.00	\$ 5,400.00	
	Excavation Activities						
		Earth Ex. - Ditch (full construction) - Incl. Spreading	m ³	\$ 5.25	1615.00	\$ 8,478.75	
		Rock Excavation (hydraulic ram)	m ³	\$ 150.00	30.00	\$ 4,500.00	
		Access Culvert(s) -- 1630X1120 CSPA	m	\$ 535.00	10.00	\$ 5,350.00	
		Access Culvert(s) -- 1200 dia CSP	m	\$ 435.00	10.00	\$ 4,350.00	
		Access Culvert(s) -- 800 dia CSP	m	\$ 348.00	20.00	\$ 6,960.00	
		Access Culvert(s) -- 600 dia CSP	m	\$ 282.00	10.00	\$ 2,820.00	
	Reinstatement Activities						
		Tile Outlet Restoration/Protection	each	\$ 500.00	5.00	\$ 2,500.00	
		Hand Seeding	m ²	\$ 0.50	22450.00	\$ 11,225.00	
		Rock Protection - Erosion Control	m ²	\$ 27.50	600.00	\$ 16,500.00	
		Rock Protection - Culvert End Treatments	each	\$ 825.00	10.00	\$ 8,250.00	
		Sub-Total - Construction Costs				\$ 88,306.25	
		Contingency Allowance - Construction				\$ 8,000.00	
		Total - Construction Costs				\$ 96,306.25	
	Engineering/Administration						
			Engineer's Report (apportioned by Section)	LS	\$ 87,000.00	35%	\$ 30,450.00
			Contract Administration/Inspection	LS	\$ 29,200.00	35%	\$ 10,220.00
			Sub-Total - Engineering				\$ 40,670.00
Total - Engineering/Administration						\$ 40,670.00	
Other							
		Carrying Cost(s)	LS	(4% OF Costs Above)		\$ 5,479.05	
		Allowances	LS	(See Schedule)		\$ 9,250.23	
Total - Other Costs						\$ 14,729.28	
Sub-Total - Net Costs						\$ 151,705.53	
Total - Special Benefits						\$ -	
Total Net Costs - Section 1 (For Distribution to Properties)						\$ 151,705.53	

DETAILED COST ESTIMATE
BRANCH No. 1 (Sta 10+000 to Sta 10+350)
THE CHENIER-JEAUROND MUNICIPAL DRAIN

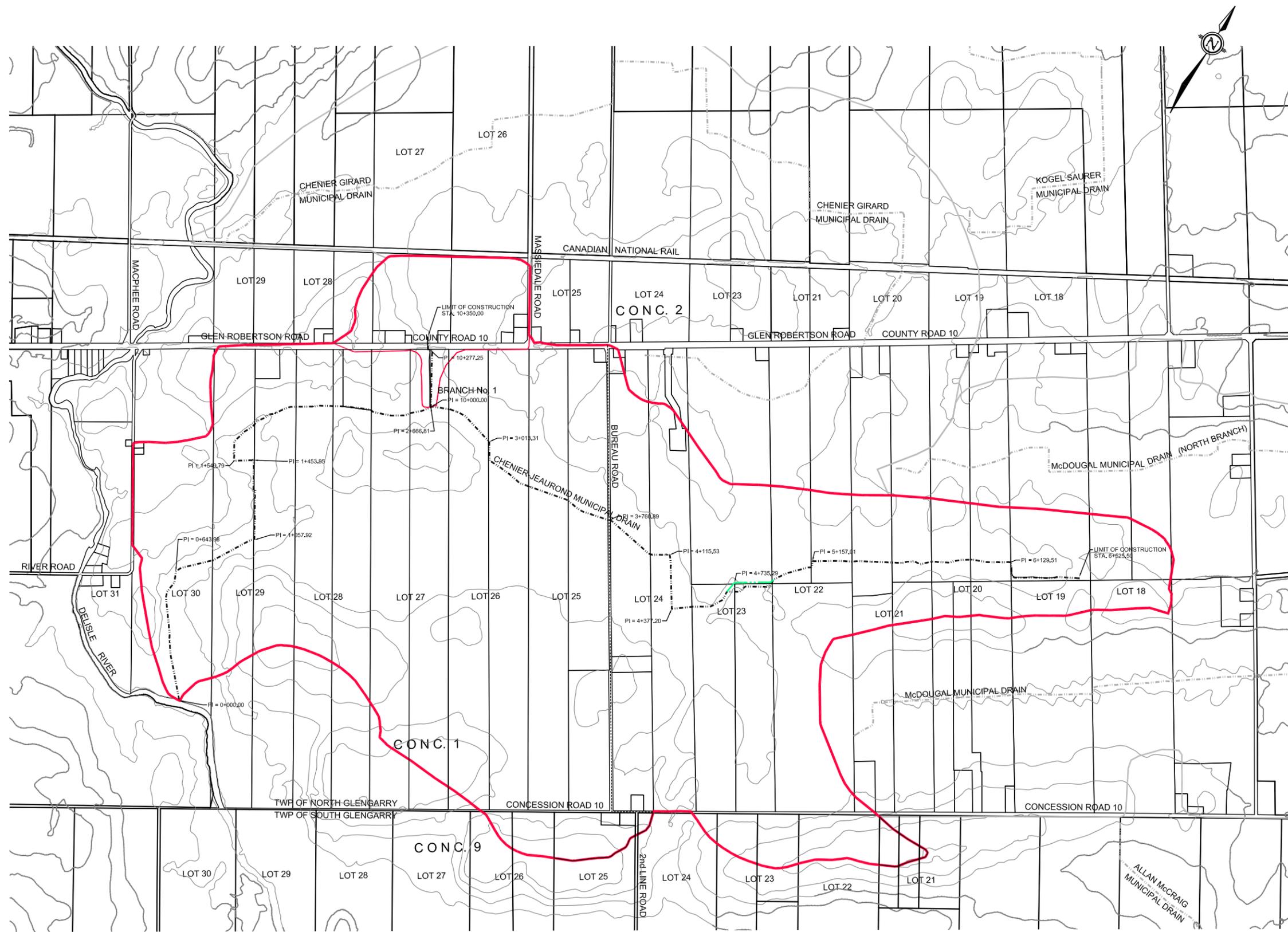
Robinson
Consultants

Project No: B15041
Date: Feb-17

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total	
Branch No. 1 (Sta 10+000 to Sta 10+350)						350.00m	
Construction							
Routine Construction	Site Preparation Activities						
			Mobilization	LS	\$ 3,750.00	5%	\$ 187.50
			Erosion and Sediment Control Plan	LS	\$ 3,000.00	5%	\$ 150.00
			Erosion and Sediment Control Measures -- Minimum as Follows: - (3) Rock Check Dam c/w Sediment Trap - (6) Straw Bale Dam c/w Sediment Trap - Additional Silt Fence (where required)	LS	\$ 4,600.00	5%	\$ 230.00
			Clearing/Grubbing (including individual tree removals)	LS	\$ 500.00	1.00	\$ 500.00
			Fence removal and reinstatement	m	\$ 30.00	40.00	\$ 1,200.00
	Excavation Activities						
			Earth Ex. - Ditch (full construction) - Incl. Spreading	m ³	\$ 5.25	265.00	\$ 1,391.25
			Access Culvert(s) -- 500 dia CSP	m	\$ 192.00	10.00	\$ 1,920.00
	Reinstatement Activities						
			Tile Outlet Restoration/Protection	each	\$ 500.00	0.00	\$ -
			Hand Seeding	m ²	\$ 0.50	3500.00	\$ 1,750.00
			Rock Protection - Erosion Control	m ²	\$ 27.50	0.00	\$ -
			Rock Protection - Culvert End Treatments	each	\$ 825.00	2.00	\$ 1,650.00
			Sub-Total - Construction Costs				\$ 8,978.75
		Contingency Allowance - Construction				\$ 2,000.00	
		Total - Construction Costs				\$ 10,978.75	
Engineering/Administration							
		Engineer's Report (apportioned by Section)	LS	\$ 87,000.00	5%	\$ 4,350.00	
		Contract Administration/Inspection	LS	\$ 29,200.00	5%	\$ 1,460.00	
		Sub-Total - Engineering				\$ 5,810.00	
Total - Engineering/Administration						\$ 5,810.00	
Other							
		Carrying Cost(s)	L.S	(4% OF Costs Above)		\$ 671.55	
		Allowances	LS	(See Schedule)		\$ 3,162.29	
Total - Other Costs						\$ 3,833.84	
Sub-Total - Net Costs						\$ 20,622.59	
Special Benefits							
Road Authority (Twp. of North Glengarry) Section 1		<i>Under Section 69 of the Drainage Act, the "Road Authority" has the option to construct the required drainage works within the Road Right-Of-Way. It is assumed for the purpose of this estimate that the Road Authority will exercise this option. As such, the items required to complete the Road Authority works have been excluded from this estimate. However, the Engineering/Administration and Other fees, associated with the required Road Authority works, where required downstream of the works as noted below are considered payable as a Special Benefit by the Township Road Authority. It is estimated that 25% of the costs noted below are due to the required Road Authority Works.</i>					
		Engineering/Administration and Other	LS	\$ 9,643.84	25%	\$ 2,410.96	
		Sub-Total - Road Authority Costs					\$ 2,410.96
Total - Special Benefits						\$ 2,410.96	
Total Net Costs - Section 1 (For Distribution to Properties)						\$ 18,211.63	

Appendix C

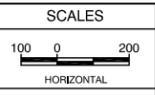
Drawings and Details



LEGEND

	PROPERTY LINE
	EXISTING CONSTRUCTED DRAINS
	MUNICIPAL DRAIN
	DRAINAGE AREA BOUNDARY
	BRANCH DRAINAGE AREA BOUNDARY
	ADJACENT DRAINAGE AREA BOUNDARY
	RELOCATED DRAIN

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
ds.mm.yy	ds.mm.yy			ds.mm.yy			
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



Robinson
Consultants

CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

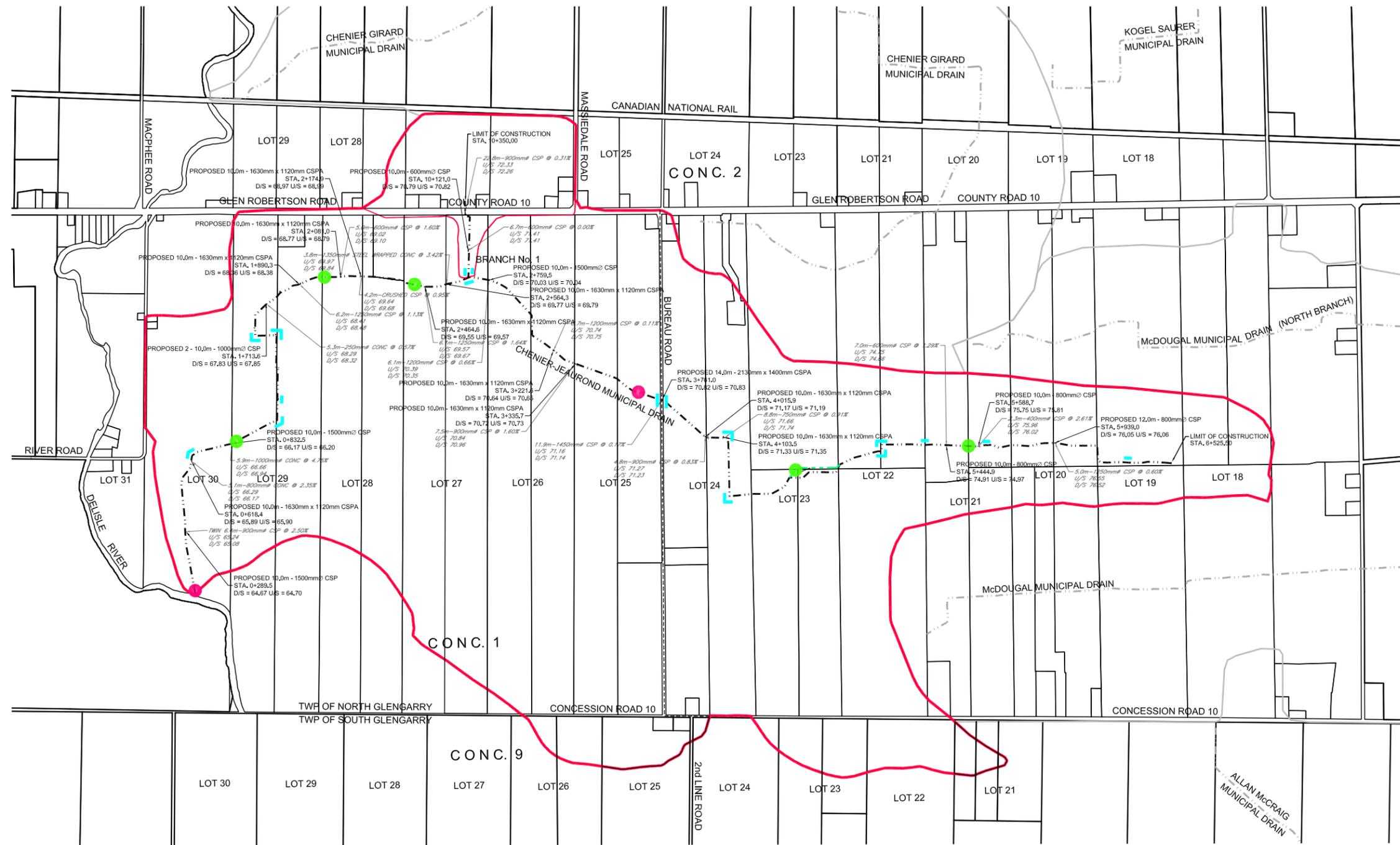
CHENIER - JEUROND
MUNICIPAL DRAIN

DRAINAGE AREA PLAN

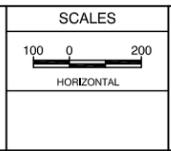
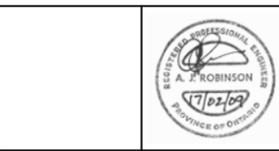
PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	15041-A1



LEGEND	
	DRAINAGE AREA BOUNDARY
	MUNICIPAL DRAIN
	EXISTING CONSTRUCTED DRAINS
	RELOCATED DRAIN
	STRAW CHECK DAM
	ROCK CHECK DAM
	ROCK PROTECTION and EROSION CONTROL



No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



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 350 PALLADIUM DRIVE
 KANATA, ONTARIO K2V 1A8
 TELEPHONE (613) 592-6060

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

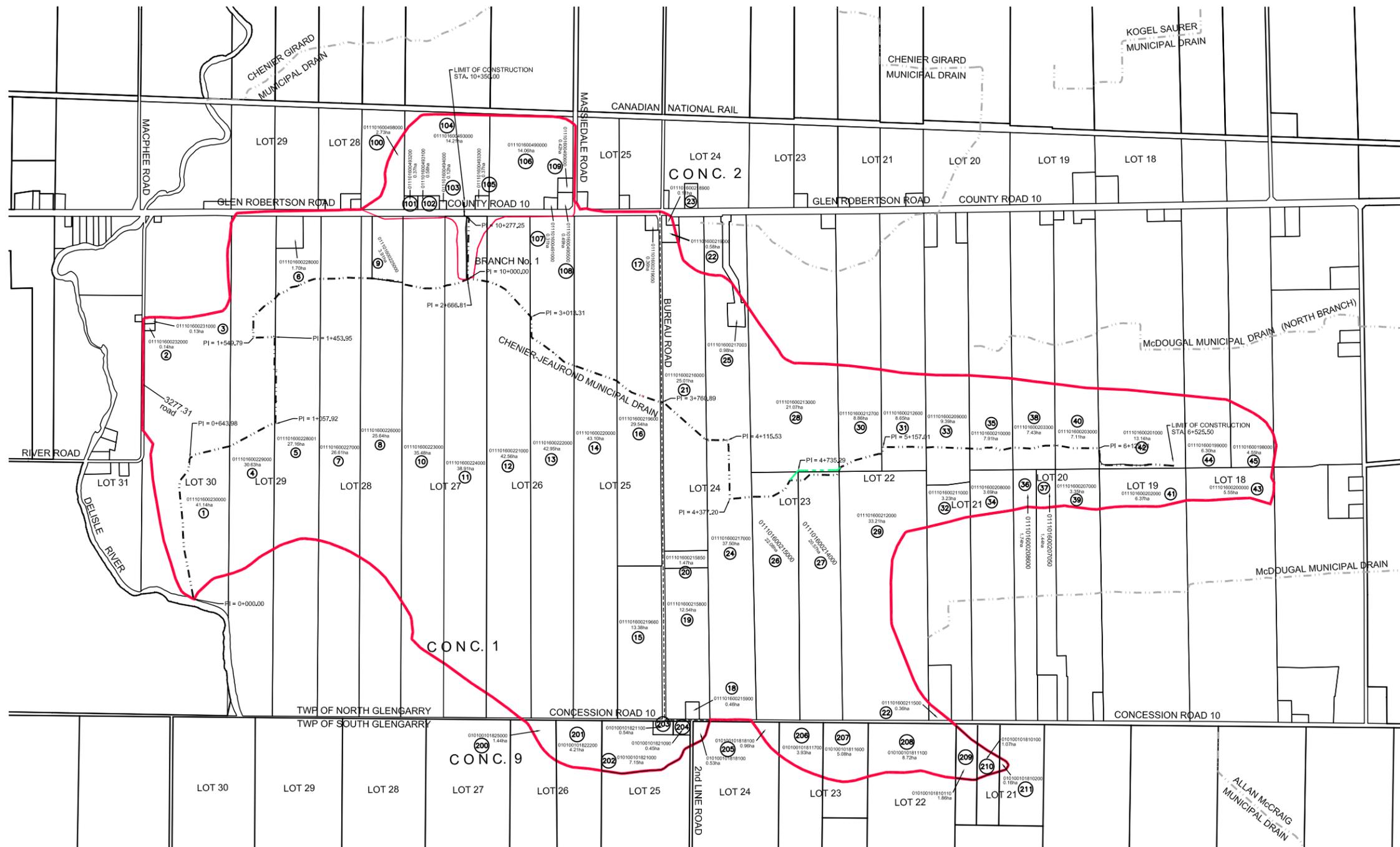
TOWNSHIP OF NORTH GLENGARRY
CHENIER - JEAUROND MUNICIPAL DRAIN

CULVERT AND SEDIMENT and EROSION CONTROL PLAN

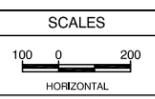
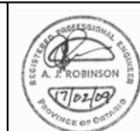
PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	15041-A2

LEGEND

-  PROPERTY LINE
-  EXISTING CONSTRUCTED DRAINS
-  MUNICIPAL DRAIN
-  DRAINAGE AREA BOUNDARY
-  RELOCATED DRAIN
-  PROPERTY ID#



No.	DATE dd.mm.yy	REVISION	BY	No.	DATE dd.mm.yy	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

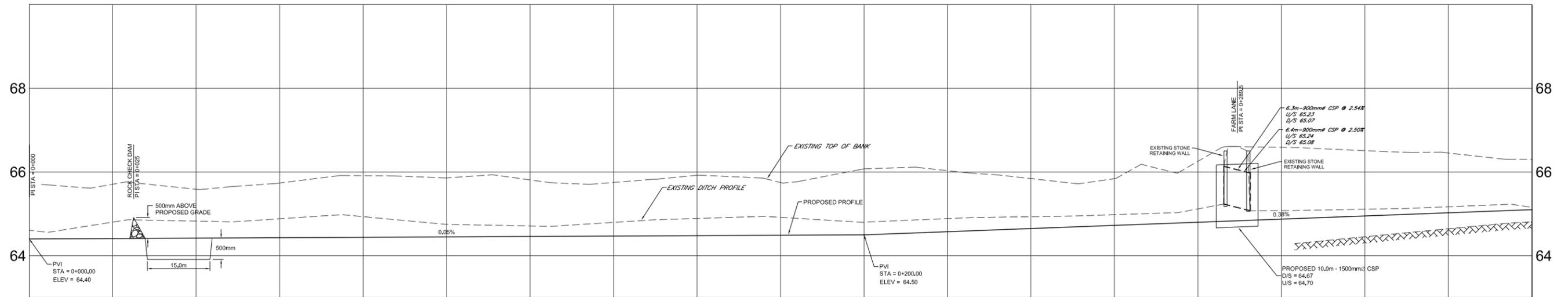
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

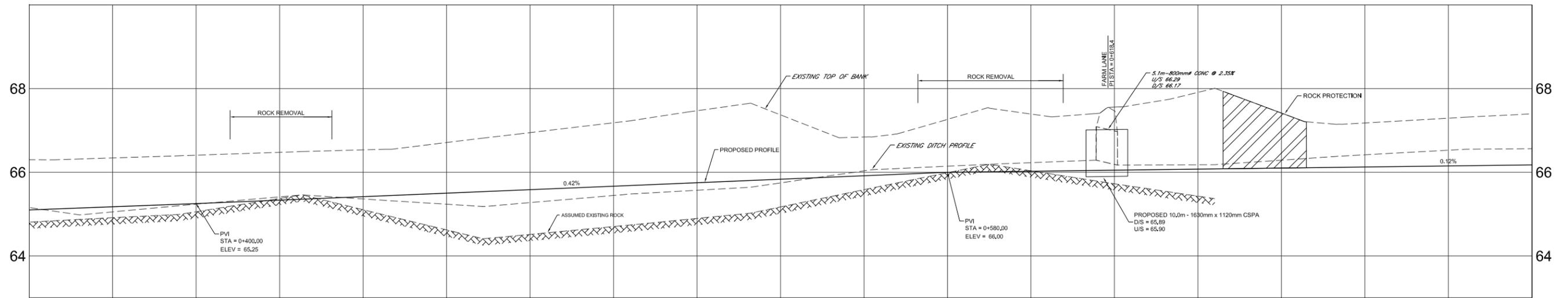
CHENIER - JEAUROND MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN

PROJECT No. 15041
CONTRACT No.
DATED FEBRUARY 2017
DWG. No. 15041-A3



PROPOSED GRADE	64.40	64.41	64.42	64.43	64.44	64.45	64.46	64.47	64.48	64.49	64.50	64.58	64.65	64.72	64.80	64.88	64.95	65.02	65.10
EXISTING FIRM BOTTOM	64.67	64.80	64.83	64.89	64.93	64.75	64.71	64.80	64.89	64.92	64.80	64.89	64.93	64.99	65.12	65.09	65.11	65.17	65.16
STATION	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+350



PROPOSED GRADE	65.10	65.18	65.25	65.33	65.42	65.50	65.58	65.67	65.75	65.83	65.92	66.00	66.02	66.05	66.08	66.10	66.12	66.15	66.18
EXISTING FIRM BOTTOM	65.16	65.05	65.24	65.41	65.36	65.24	65.27	65.45	65.57	65.75	65.83	66.14	66.23	67.47	66.19	66.29	66.42	66.53	66.56
STATION	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES	
HORIZONTAL	10 0 20
VERTICAL	1 0 2



CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

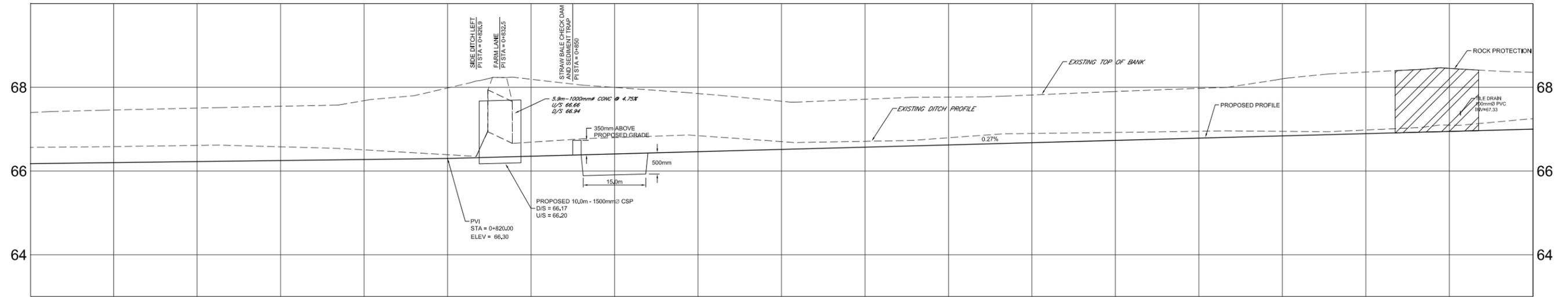
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DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

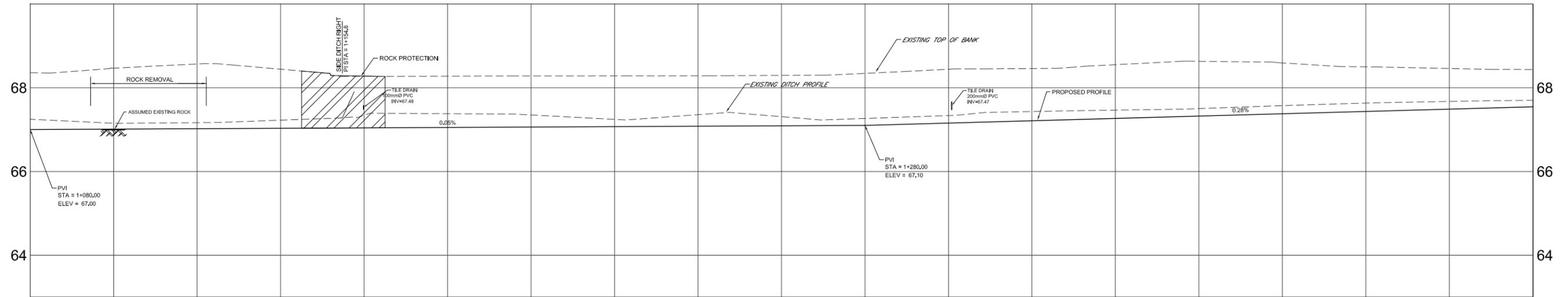
CHENIER - JEAUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 0+000 TO STA. 0+720

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	15041-P1

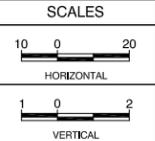


PROPOSED GRADE	66.18	66.20	66.22	66.25	66.28	66.30	66.35	66.41	66.46	66.52	66.57	66.62	66.68	66.73	66.78	66.84	66.89	66.95	67.00
EXISTING FIRM BOTTOM	66.56	66.59	66.61	66.59	66.50	66.39	66.69	66.80	66.84	66.70	66.71	66.79	66.90	66.92	66.95	66.95	66.99	67.10	67.25
STATION	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060	1+080



PROPOSED GRADE	67.00	67.01	67.02	67.03	67.04	67.05	67.06	67.07	67.08	67.09	67.10	67.16	67.21	67.27	67.32	67.38	67.43	67.49	67.54
EXISTING FIRM BOTTOM	67.25	67.15	67.17	67.23	67.34	67.39	67.35	67.24	67.36	67.31	67.27	67.33	67.43	67.47	67.50	67.57	67.63	67.67	67.70
STATION	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



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CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

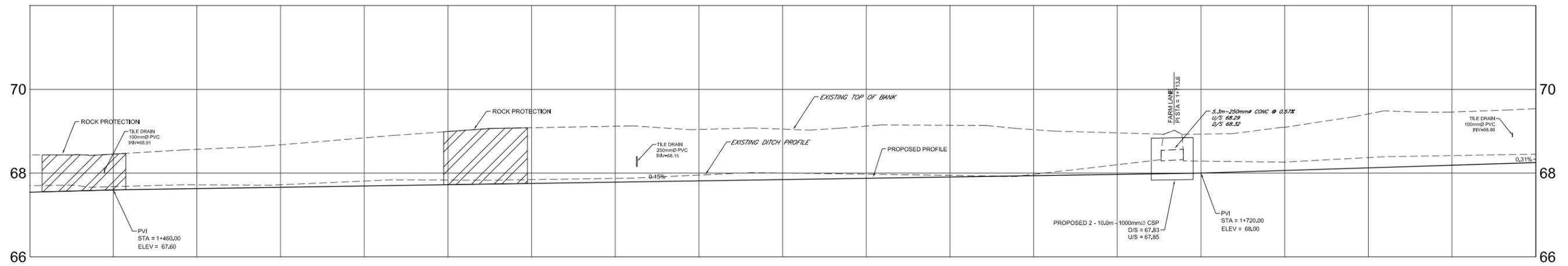
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

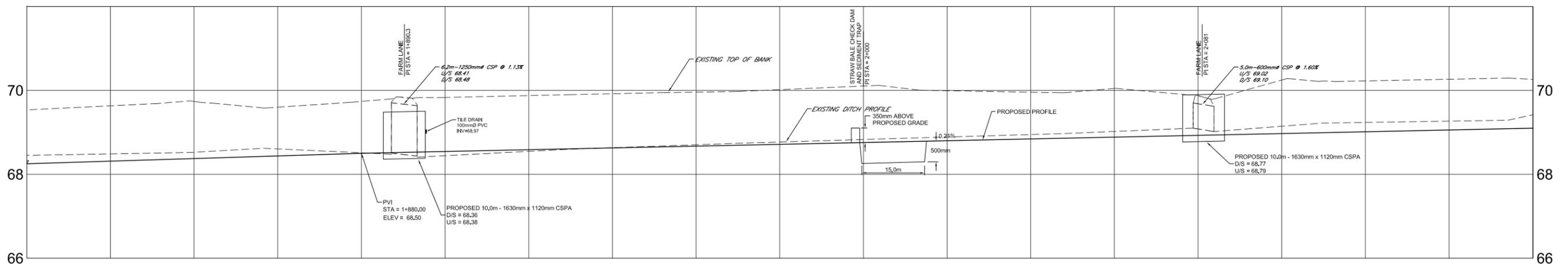
CHENIER - JEUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 0+720 TO STA.1+440

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No:	15041-P2



PROPOSED GRADE	67.54	67.60	67.63	67.66	67.69	67.72	67.75	67.78	67.82	67.85	67.88	67.91	67.94	67.97	68.00	68.06	68.12	68.19	68.25
EXISTING FIRM BOTTOM	67.70	67.69	67.72	67.72	67.81	67.83	67.84	67.87	67.95	68.00	67.97	67.94	67.97	68.20	68.29	68.26	68.37	68.42	68.45
STATION	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720	1+740	1+760	1+780	1+800



PROPOSED GRADE	68.25	68.31	68.38	68.44	68.50	68.54	68.59	68.63	68.67	68.71	68.76	68.80	68.84	68.89	68.93	68.97	69.01	69.06	69.10	
EXISTING FIRM BOTTOM	68.45	68.49	68.52	68.60	68.57	68.44	68.55	68.63	68.70	68.77	68.83	68.89	68.95	69.02	69.07	69.14	69.24	69.27	69.32	
STATION	1+800	1+820	1+840	1+860	1+880	1+900	1+920	1+940	1+960	1+980	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES
 10 0 20
 HORIZONTAL
 1 0 2
 VERTICAL

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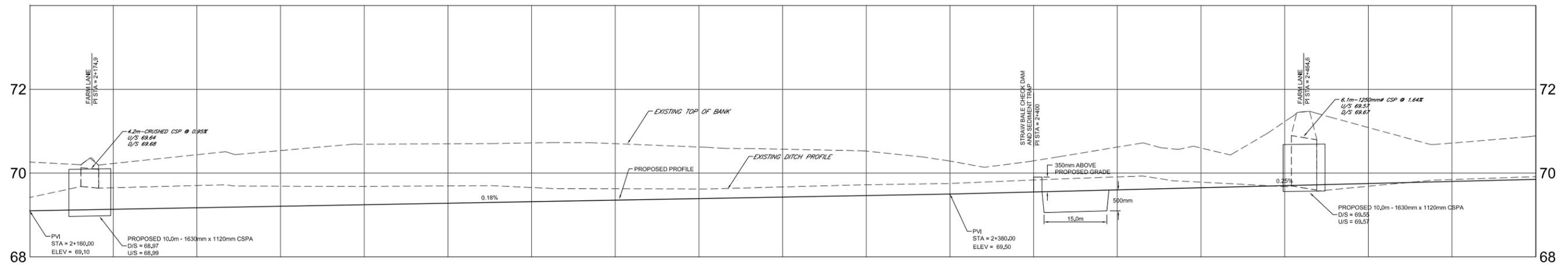
CONSULTING ENGINEERS
 350 PALLADIUM DRIVE
 KANATA, ONTARIO K2V 1A8
 TELEPHONE (613) 592-6060

DESIGN L.F.
 CHECKED AJR
 DRAWN JHB
 CHECKED L.F.
 APPROVED AJR

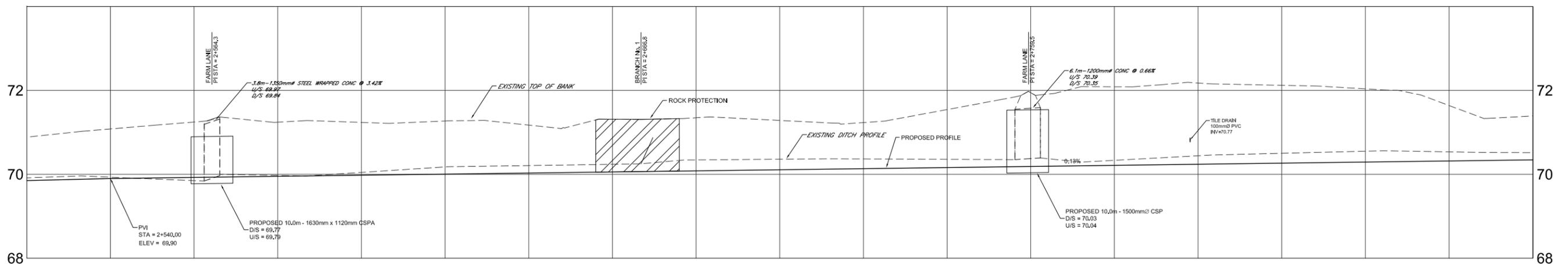
TOWNSHIP OF NORTH GLENGARRY
 CHENIER - JEAUROND
 MUNICIPAL DRAIN

DRAIN PROFILE
 STA. 1+440 TO STA. 2+160

PROJECT No. 15041
 CONTRACT No.
 DATED FEBRUARY 2017
 DWG. No: 15041-P3

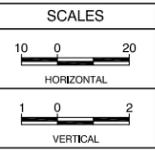


PROPOSED GRADE	69.10	69.14	69.17	69.21	69.25	69.28	69.32	69.35	69.39	69.43	69.46	69.50	69.55	69.60	69.65	69.70	69.75	69.80	69.85
EXISTING FIRM BOTTOM	69.42	69.65	69.70	69.69	69.69	69.69	69.65	69.63	69.62	69.67	69.72	69.75	69.84	69.91	69.79	69.69	69.69	69.65	69.62
STATION	2+160	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320	2+340	2+360	2+380	2+400	2+420	2+440	2+460	2+480	2+500	2+500



PROPOSED GRADE	69.85	69.90	69.93	69.95	69.98	70.00	70.03	70.06	70.08	70.11	70.13	70.16	70.19	70.21	70.24	70.27	70.29	70.32	70.34
EXISTING FIRM BOTTOM	69.92	69.93	69.85	69.97	70.05	70.18	70.21	70.24	70.24	70.26	70.27	70.26	71.55	70.23	70.44	70.50	70.55	70.53	70.52
STATION	2+520	2+540	2+560	2+580	2+600	2+620	2+640	2+660	2+680	2+700	2+720	2+740	2+760	2+780	2+800	2+820	2+840	2+860	2+880

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



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CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

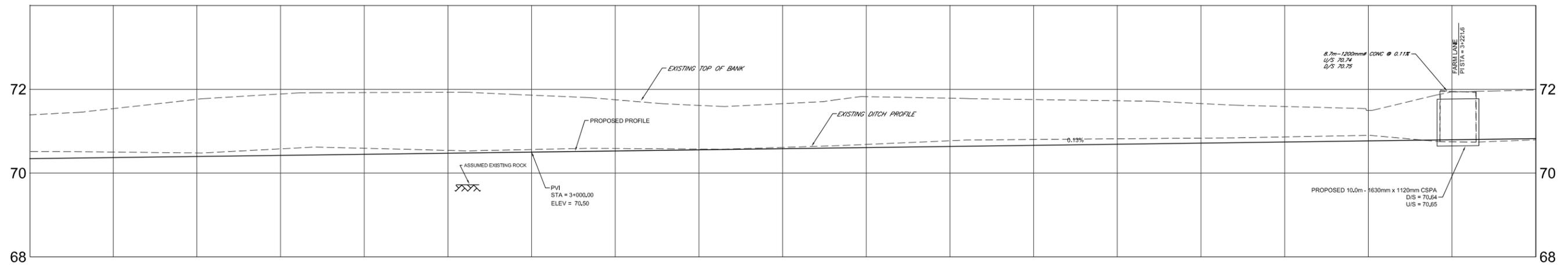
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

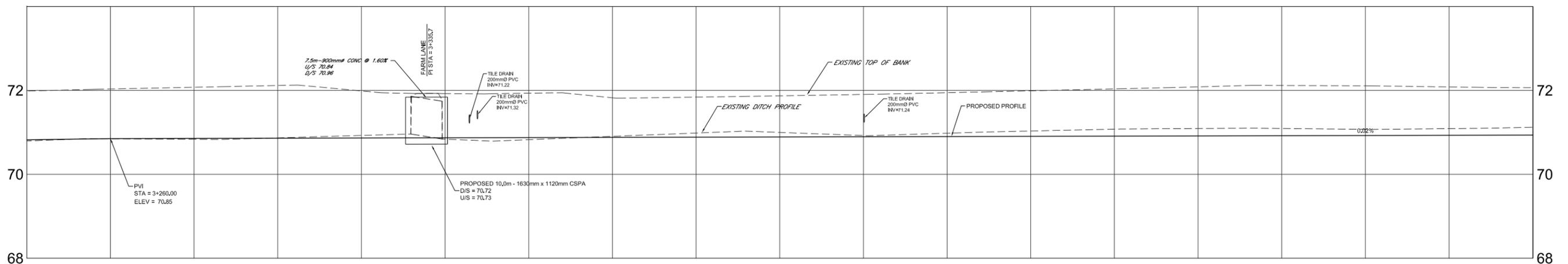
CHENIER - JEAUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 2+160 TO STA. 2+880

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No:	15041-P4



PROPOSED GRADE	70.34	70.37	70.40	70.42	70.45	70.47	70.50	70.53	70.55	70.58	70.61	70.63	70.66	70.69	70.72	70.74	70.77	70.80	70.82
EXISTING FIRM BOTTOM	70.52	70.50	70.49	70.59	70.59	70.54	70.56	70.59	70.57	70.61	70.69	70.77	70.80	70.82	70.83	70.86	70.90	71.04	70.79
STATION	2+880	2+900	2+920	2+940	2+960	2+980	3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220	3+240



PROPOSED GRADE	70.82	70.85	70.86	70.86	70.86	70.87	70.88	70.88	70.88	70.89	70.90	70.90	70.90	70.91	70.92	70.92	70.92	70.93	70.94
EXISTING FIRM BOTTOM	70.79	70.85	70.83	70.87	70.83	70.84	70.82	70.91	70.88	71.00	70.92	70.88	71.03	71.08	71.09	71.09	71.07	71.09	71.12
STATION	3+240	3+260	3+280	3+300	3+320	3+340	3+360	3+380	3+400	3+420	3+440	3+460	3+480	3+500	3+520	3+540	3+560	3+580	3+600

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES	
10	0 20
HORIZONTAL	
1	0 2
VERTICAL	

Robinson
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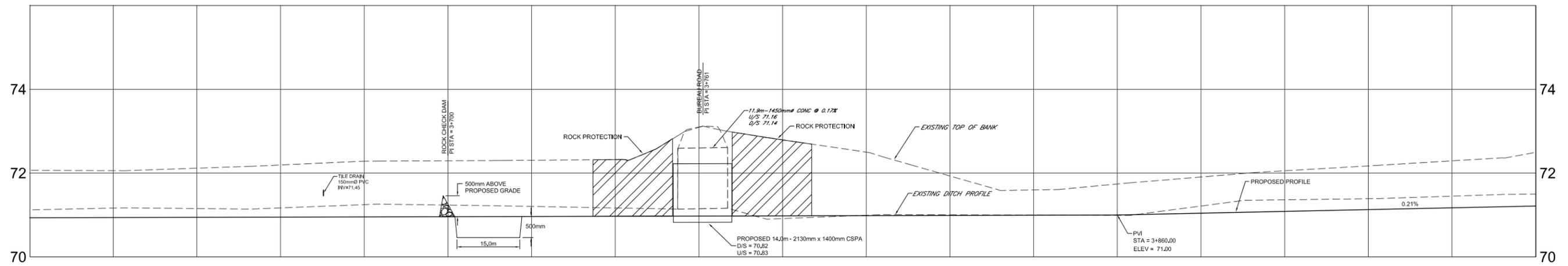
CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

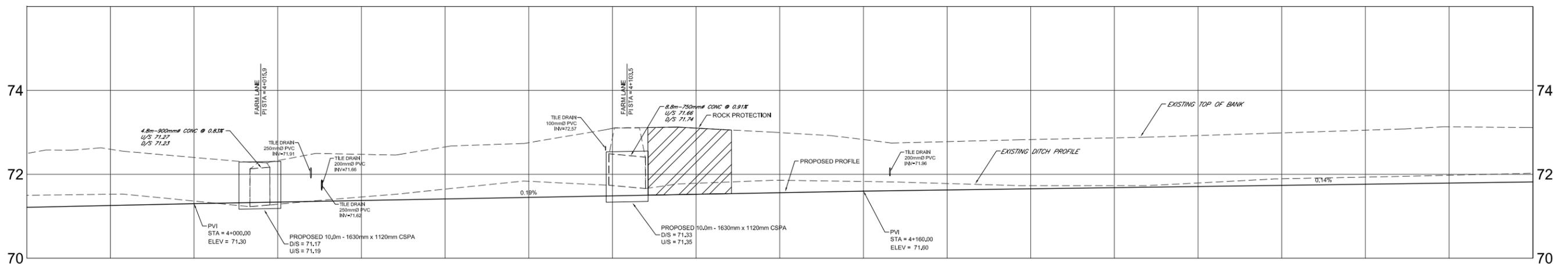
TOWNSHIP OF NORTH GLENGARRY
CHENIER - JEAUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 2+880 TO STA. 3+600

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No:	15041-P5



PROPOSED GRADE	70.84	70.84	70.84	70.85	70.86	70.86	70.86	70.87	70.88	70.88	70.88	70.89	71.00	71.00	71.00	71.04	71.09	71.13	71.17	71.21
EXISTING FIRM BOTTOM	71.12	71.16	71.15	71.17	71.25	71.24	71.20	71.17	71.10	70.92	70.99	71.00	71.00	70.99	71.21	71.36	71.39	71.45	71.45	71.50
STATION	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	3+880	3+900	3+920	3+940	3+960	



PROPOSED GRADE	71.21	71.26	71.30	71.34	71.38	71.41	71.45	71.49	71.52	71.56	71.60	71.63	71.65	71.68	71.71	71.74	71.76	71.79	71.82
EXISTING FIRM BOTTOM	71.50	71.53	71.56	71.59	71.66	71.65	71.63	71.67	71.79	71.86	71.83	71.78	71.73	71.73	71.79	71.89	71.93	71.98	72.02
STATION	3+980	4+000	4+020	4+040	4+060	4+080	4+100	4+120	4+140	4+160	4+180	4+200	4+220	4+240	4+260	4+280	4+300	4+320	

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES	
HORIZONTAL	10 0 20
VERTICAL	1 0 2

Robinson
Consultants

CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

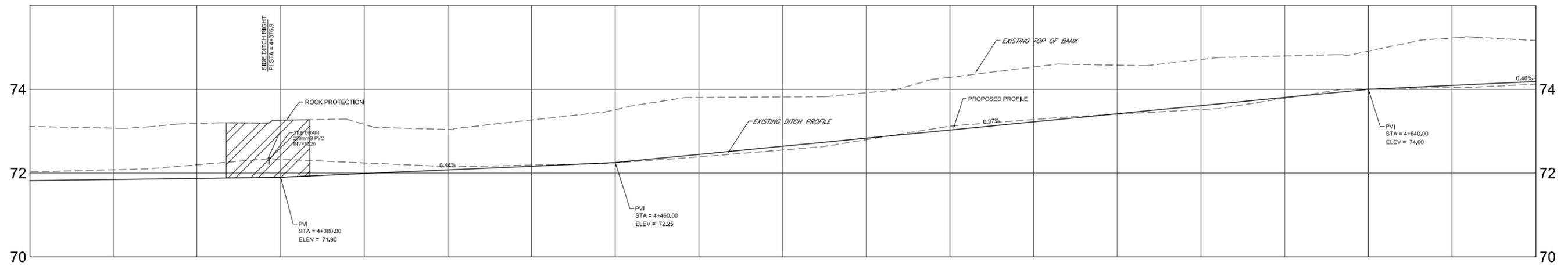
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

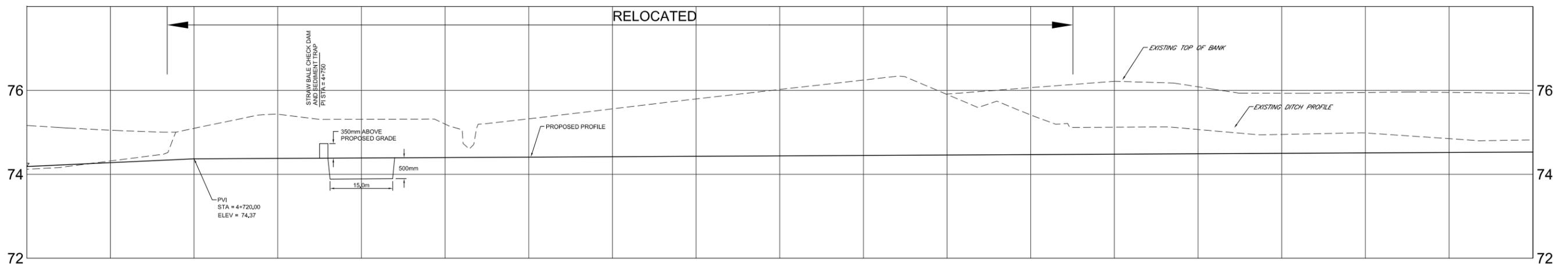
CHENIER - JEUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 3+600 TO STA. 4+320

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No:	15041-P6



PROPOSED GRADE	71.82	71.85	71.87	71.90	71.99	72.08	72.16	72.25	72.44	72.64	72.83	73.03	73.22	73.42	73.61	73.81	74.00	74.09	74.18
EXISTING FIRM BOTTOM	72.02	72.09	72.20	72.33	72.24	72.16	72.19	72.24	72.39	72.55	72.80	73.12	73.29	73.40	73.52	73.79	74.01	74.04	74.12
STATION	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660	4+680



PROPOSED GRADE	74.18	74.28	74.37	74.38	74.39	74.40	74.41	74.42	74.43	74.44	74.45	74.46	74.47	74.48	74.49	74.50	74.51	74.52	74.53
EXISTING FIRM BOTTOM	74.12	74.32	75.10	75.43	75.31	75.20	75.32	75.56	75.80	76.02	76.25	75.90	75.71	75.12	75.07	74.95	74.99	74.85	74.82
STATION	4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020	5+040

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES	
HORIZONTAL	10 0 20
VERTICAL	1 0 2

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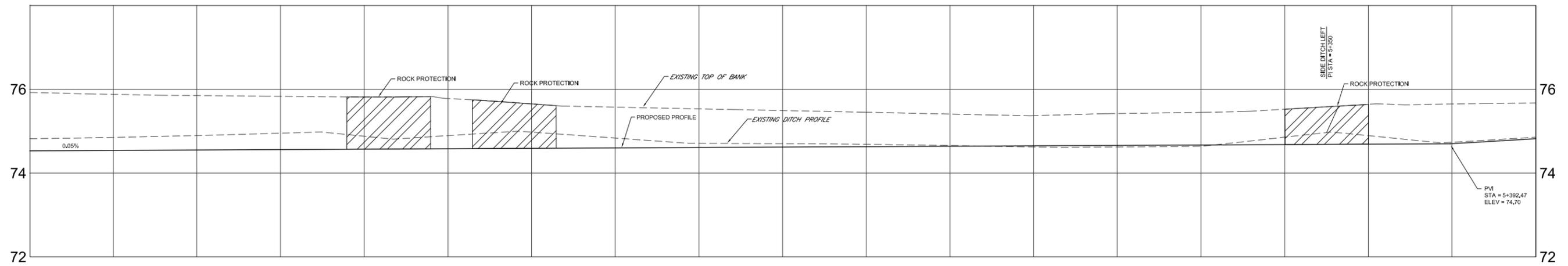
CONSULTING ENGINEERS
350 PALLADIUM DRIVE
KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

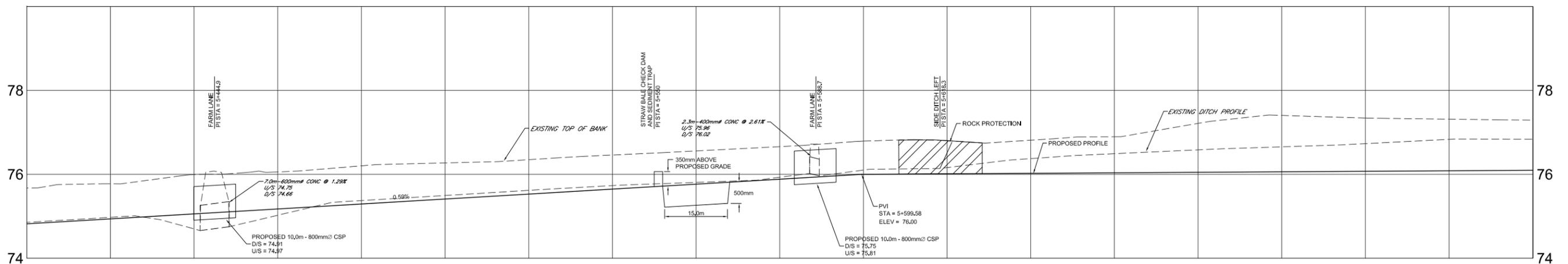
TOWNSHIP OF NORTH GLENGARRY
CHENIER - JEAUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 4+320 TO STA. 5+040

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No:	15041-P7



PROPOSED GRADE	74.83	74.84	74.85	74.86	74.87	74.88	74.89	74.90	74.91	74.92	74.93	74.94	74.95	74.96	74.97	74.98	74.99	75.00	75.01	75.02	75.03	75.04	75.05	75.06	75.07	75.08	75.09	75.10	
EXISTING FIRM BOTTOM	74.82	74.85	74.90	74.95	74.99	74.99	74.99	74.94	74.71	74.70	74.69	74.66	74.62	74.62	74.64	74.66	74.69	74.74	74.74	74.74	74.74	74.74	74.74	74.74	74.74	74.74	74.74	74.74	74.74
STATION	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200	5+220	5+240	5+260	5+280	5+300	5+320	5+340	5+360	5+380	5+400										



PROPOSED GRADE	74.82	74.94	75.06	75.18	75.29	75.41	75.53	75.65	75.77	75.88	76.00	76.01	76.02	76.04	76.05	76.06	76.07	76.08	76.09	76.10	76.11	76.12	76.13	76.14	76.15	76.16	76.17	76.18	76.19	76.20
EXISTING FIRM BOTTOM	74.86	74.97	74.70	75.02	75.37	75.50	75.62	75.73	75.81	75.93	76.10	76.16	76.37	76.49	76.59	76.65	76.73	76.83	76.83	76.83	76.83	76.83	76.83	76.83	76.83	76.83	76.83	76.83	76.83	76.83
STATION	5+400	5+420	5+440	5+460	5+480	5+500	5+520	5+540	5+560	5+580	5+600	5+620	5+640	5+660	5+680	5+700	5+720	5+740	5+760											

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SCALES	
HORIZONTAL	10 0 20
VERTICAL	1 0 2

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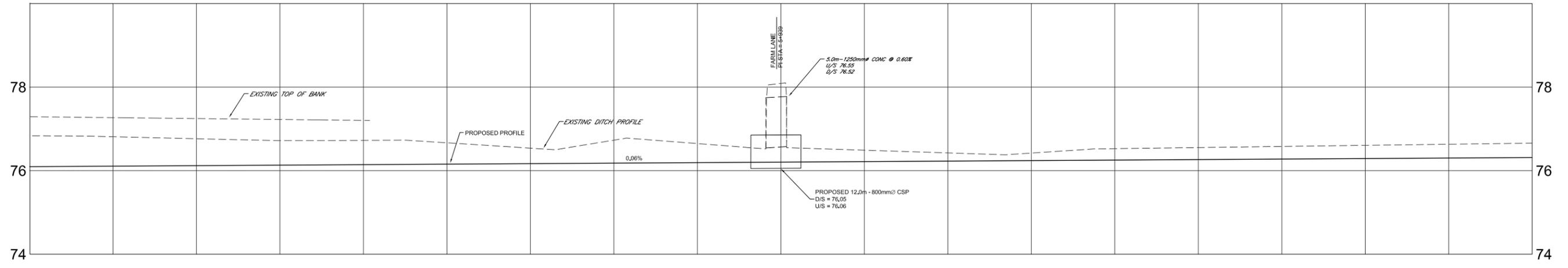
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

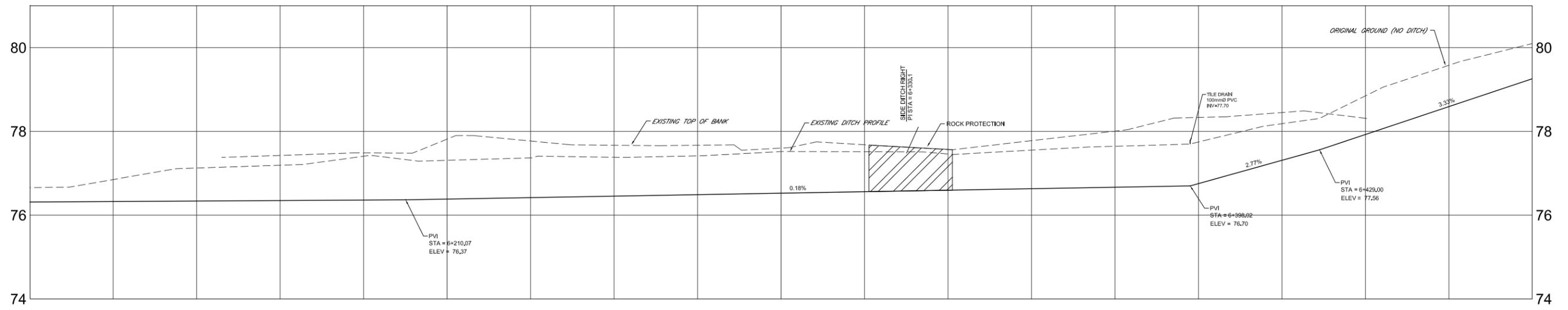
CHENIER - JEAUROND MUNICIPAL DRAIN

DRAIN PROFILE
STA. 5+040 TO STA. 5+760

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	15041-P8



PROPOSED GRADE	76.10	76.11	76.12	76.13	76.14	76.16	76.17	76.18	76.19	76.20	76.22	76.23	76.24	76.25	76.26	76.28	76.29	76.30	76.31
EXISTING FIRM BOTTOM	76.83	76.81	76.79	76.72	76.72	76.67	76.54	76.73	76.65	76.09	76.49	76.42	76.42	76.57	76.55	76.59	76.67	76.67	76.66
STATION	5+760	5+780	5+800	5+820	5+840	5+860	5+880	5+900	5+920	5+940	5+960	5+980	6+000	6+020	6+040	6+060	6+080	6+100	6+120



PROPOSED GRADE	76.31	76.33	76.34	76.35	76.36	76.38	76.42	76.46	76.49	76.53	76.56	76.60	76.63	76.67	76.76	77.31	77.93	76.99	79.26
EXISTING FIRM BOTTOM	76.66	76.65	77.13	77.19	77.41	77.31	77.37	77.39	77.42	77.52	77.51	77.46	77.55	77.65	77.25	78.19	78.65	79.59	82.12
STATION	6+120	6+140	6+160	6+180	6+200	6+220	6+240	6+260	6+280	6+300	6+320	6+340	6+360	6+380	6+400	6+420	6+440	6+460	6+480

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES	
10	0 20
HORIZONTAL	
1	0 2
VERTICAL	

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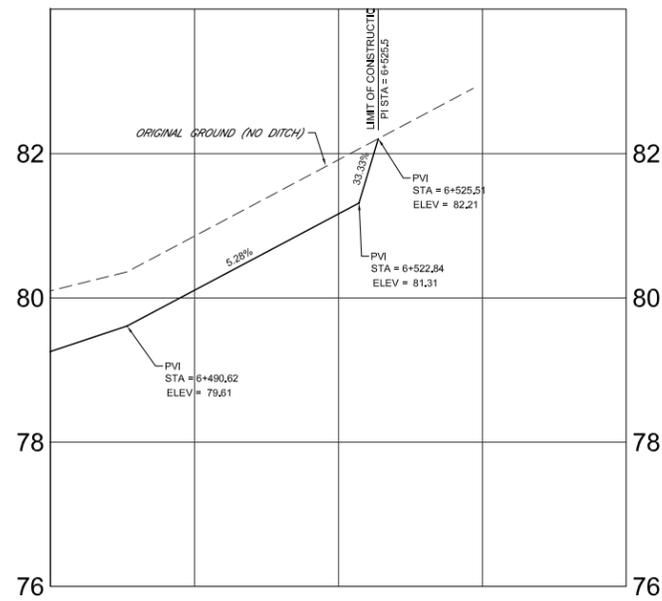
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TOWNSHIP OF NORTH GLENGARRY

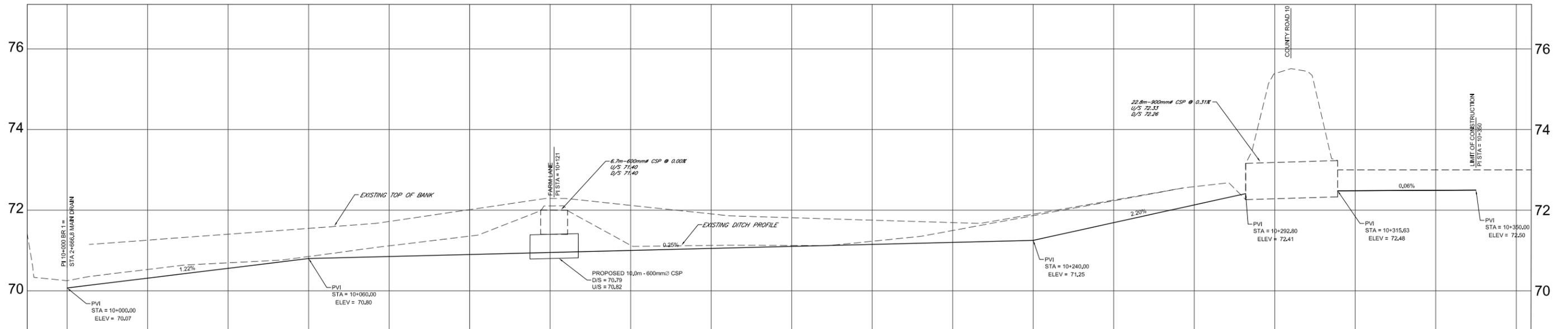
CHENIER - JEAUROND
MUNICIPAL DRAIN

PROJECT No. 15041
CONTRACT No.
DATED FEBRUARY 2017
DWG. No: 15041-P9

DRAIN PROFILE
STA. 5+760 TO STA. 6+480



PROPOSED GRADE	79.26	80.11	81.16
EXISTING FIRM BOTTOM	80.72	80.86	81.91
STATION	6+480	6+500	6+540



PROPOSED GRADE	70.07	70.31	70.56	70.80	70.85	70.90	70.95	71.00	71.05	71.10	71.15	71.20	71.25	71.28	72.13	72.48	72.49		
EXISTING FIRM BOTTOM	72.25	72.57	72.69	72.85	71.11	71.26	72.11	71.17	71.12	71.12	71.27	71.50	71.86	72.27	72.58	75.29			
STATION	10+000	10+020	10+040	10+060	10+080	10+100	10+120	10+140	10+160	10+180	10+200	10+220	10+240	10+260	10+280	10+300	10+320	10+340	10+360

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
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SCALES	
HORIZONTAL	10 0 20
VERTICAL	1 0 2

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TELEPHONE (613) 592-6060

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

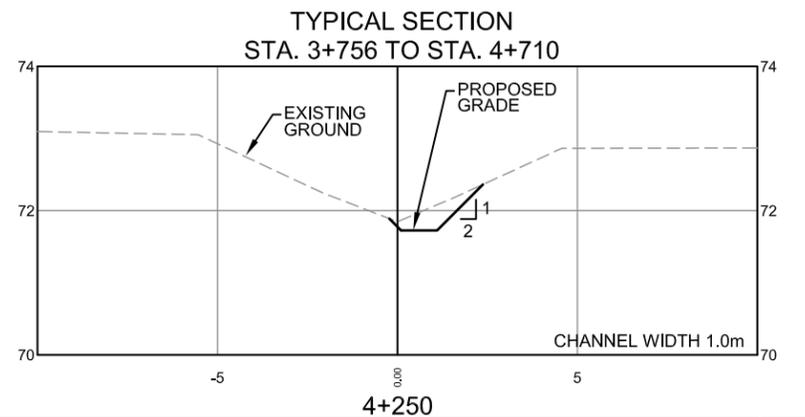
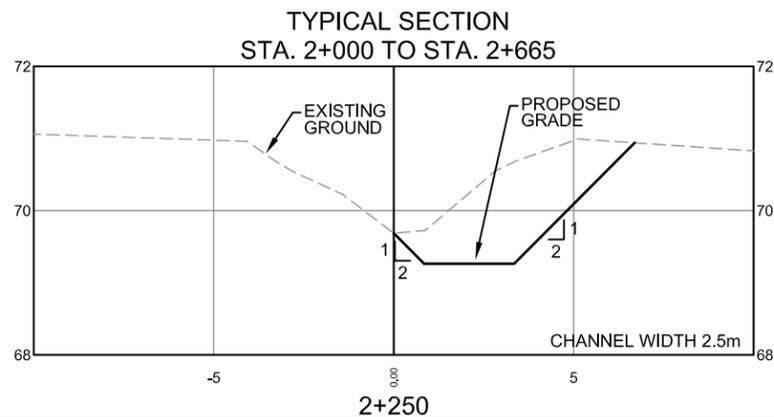
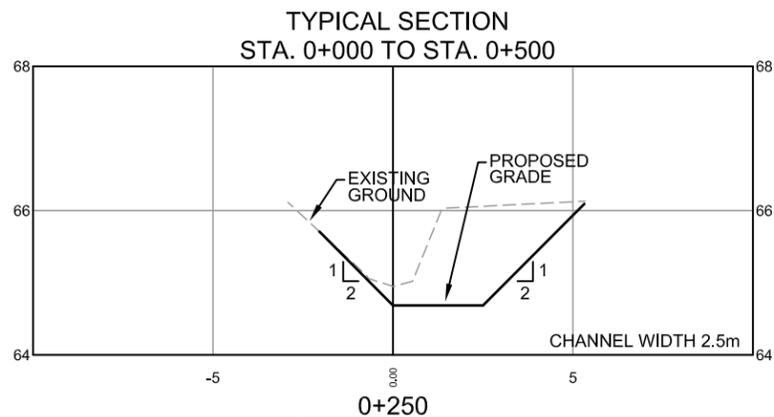
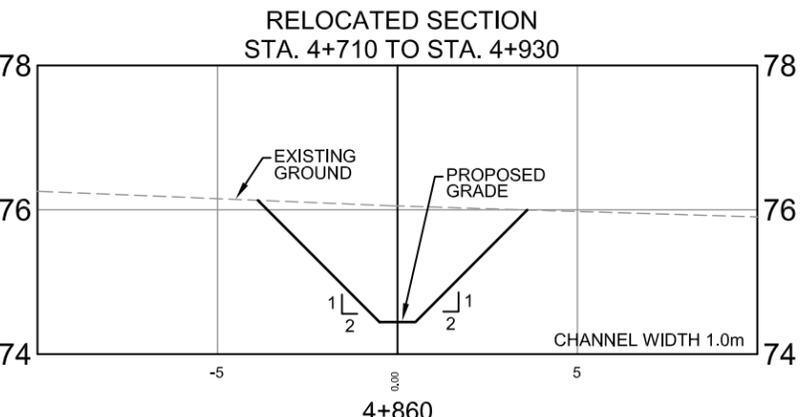
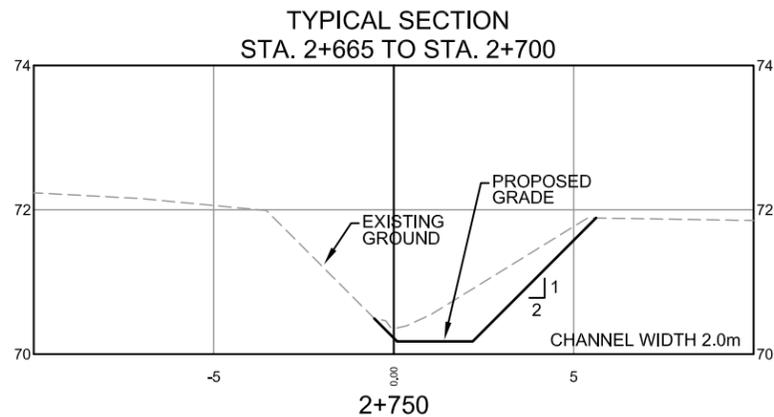
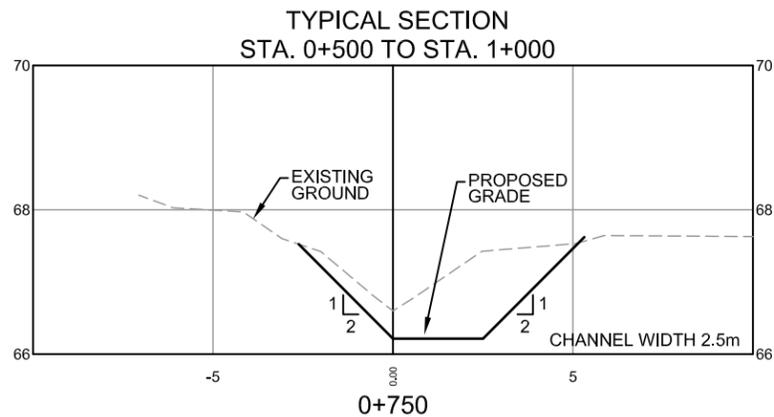
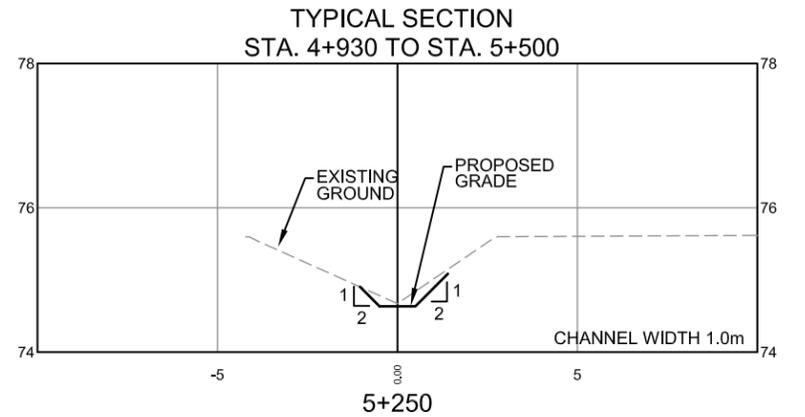
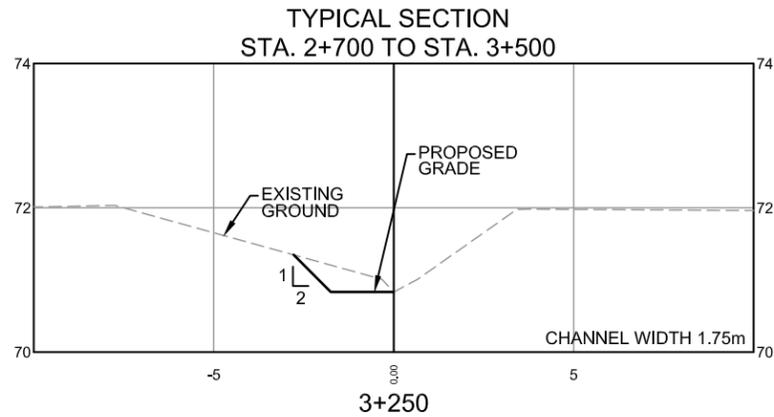
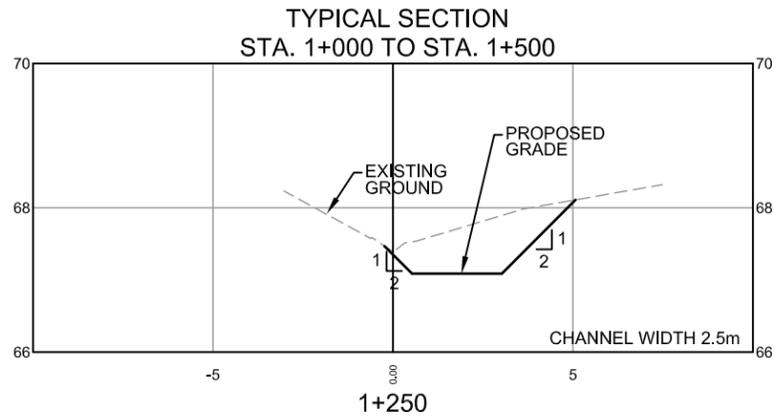
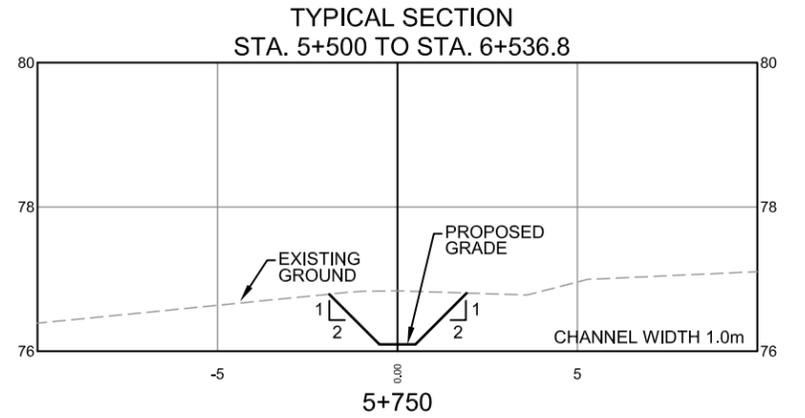
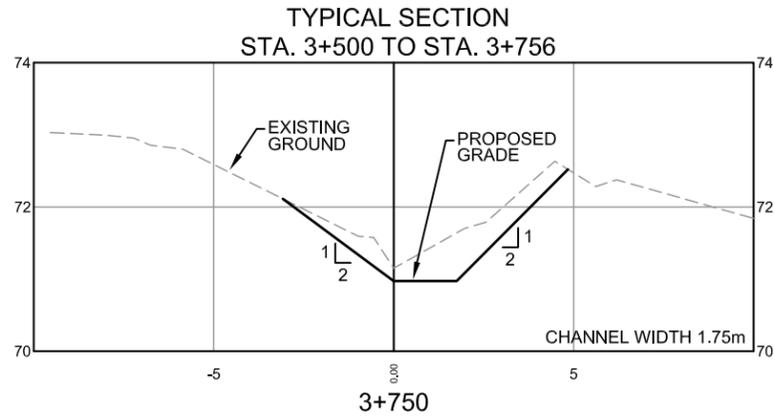
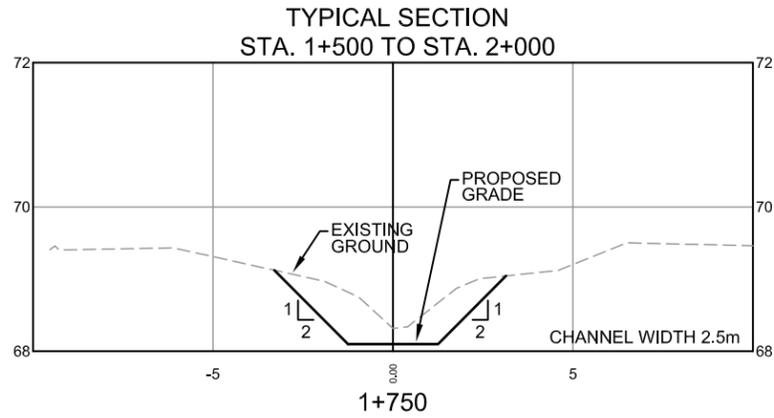
TOWNSHIP OF NORTH GLENGARRY

CHENIER - JEAUROND
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 6+480 TO STA. 6+540

BRANCH 1 PROFILE
STA. 10+000 TO STA. 10+350

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No:	15041-P10



No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
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SCALES

HORIZONTAL	1:1000
VERTICAL	1:100



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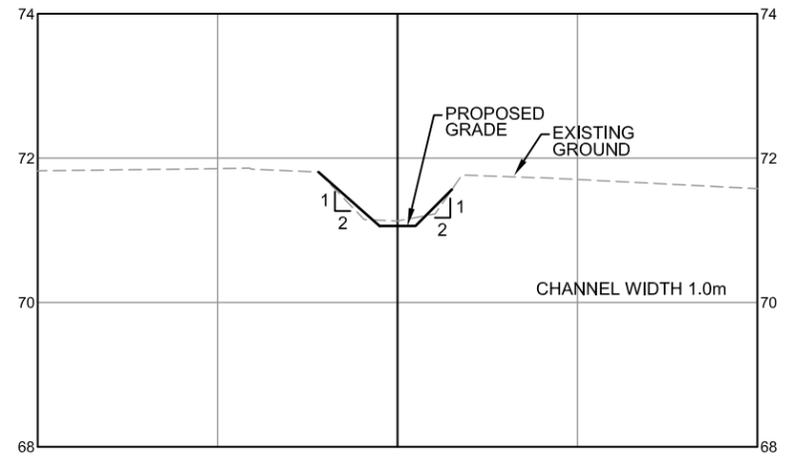
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY
CHENIER - JEAUROND
MUNICIPAL DRAIN

CROSS SECTIONS
MAIN DRAIN

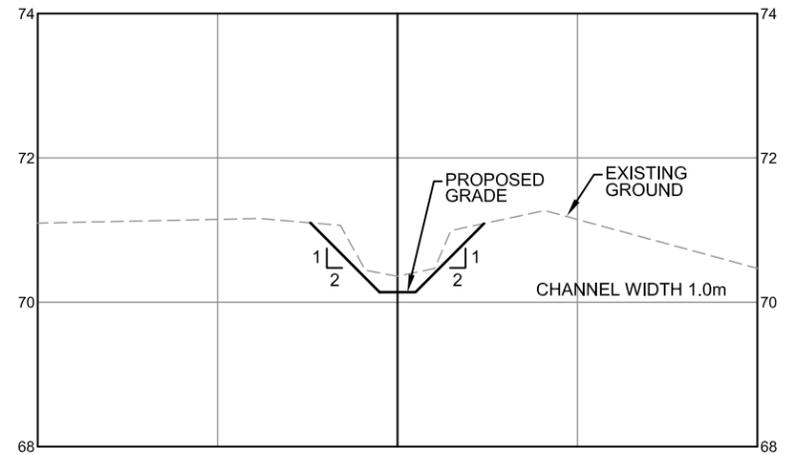
PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	15041-C1

TYPICAL SECTION
STA. 10+150 TO STA. 10+350



10+164

TYPICAL SECTION
STA. 10+000 TO STA. 10+150



10+006

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	09.02.17	ISSUED FOR DISTRIBUTION	AJR				



SCALES	
HORIZONTAL	1:2
VERTICAL	1:2

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KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

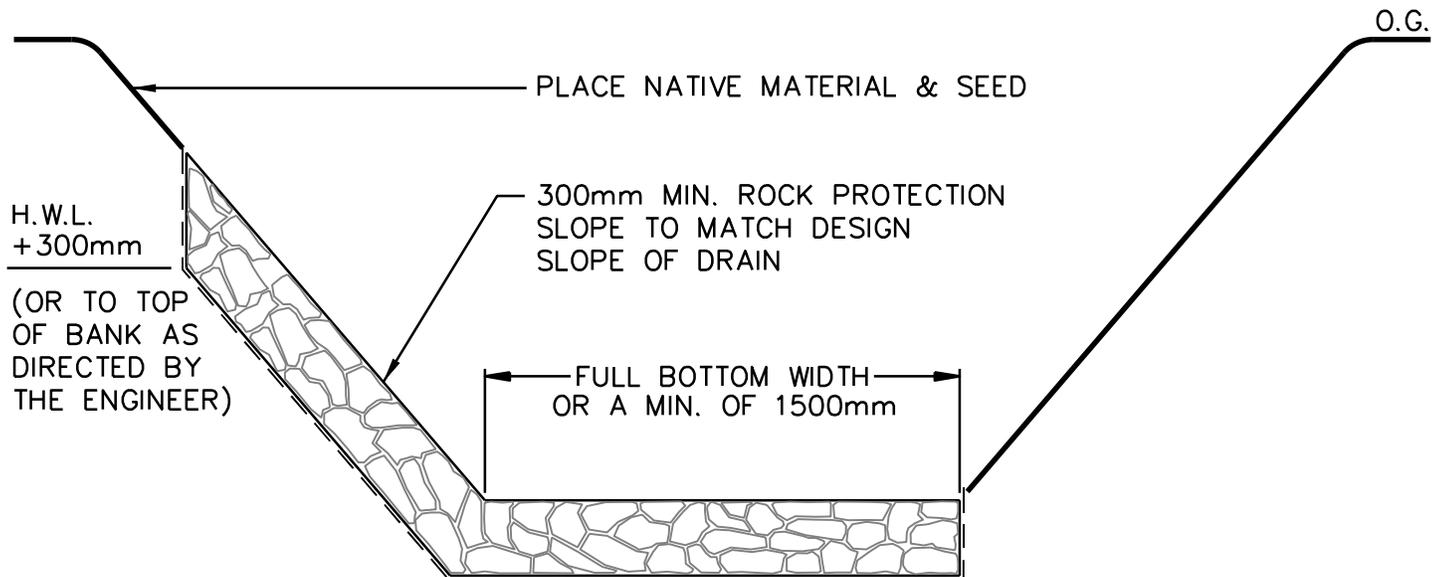
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

TOWNSHIP OF NORTH GLENGARRY

CHENIER - JEAUROND
MUNICIPAL DRAIN

CROSS SECTIONS
BRANCH 1

PROJECT No.	15041
CONTRACT No.	
DATED	FEBRUARY 2017
DWG. No.	15041-C2



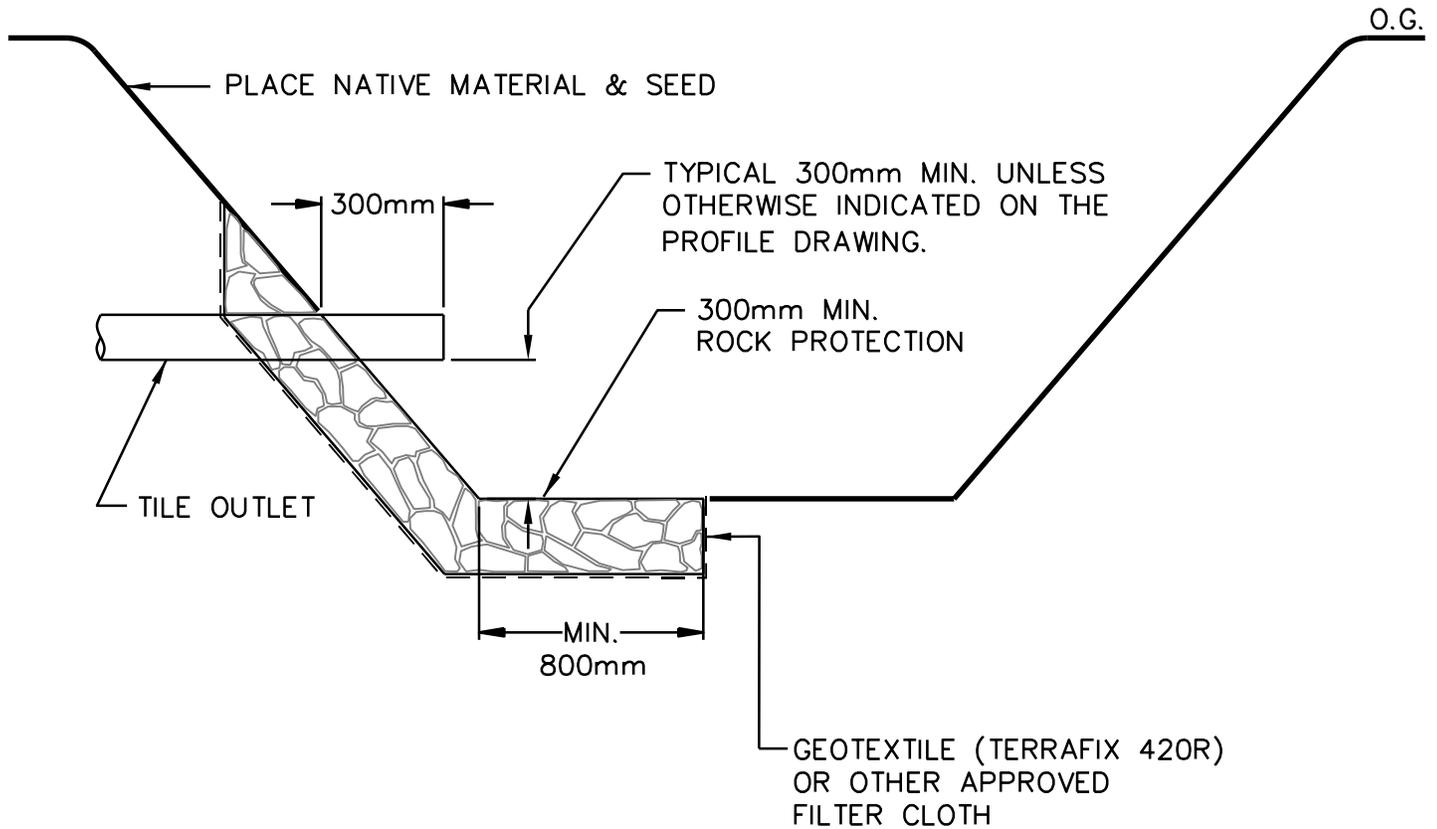
NOTE:

1. SURFACE OF ROCK PROTECTION TO BE FLUSH WITH FINISHED SURFACE OF DRAIN UPSTREAM AND DOWNSTREAM OF THE EROSION CONTROL. MIN. SIDE SLOPE IS 1 VERT TO 1 HOR. OR AS SPECIFIED IN ENGINEER'S REPORT.
2. FOR ROCK PROTECTION, USE R-50 AS PER OPSS 1004.05.05.02 OR ROCK PROTECTION AS PER OPSS 1004.05.05.03.

GEOTEXTILE (TERRAFIX 420R) OR OTHER APPROVED FILTER CLOTH

DATED: AUG/13

<p>Robinson Consultants</p>	<p>CONSULTING ENGINEERS</p> <p>350 Palladium Dr., Suite 210 Keno, Ontario, K2V 1A8 Telephone (613) 592-6060</p>	SCALE	<p>MUNICIPAL DRAIN</p> <p>TYPICAL ROCK PROTECTION EROSION CONTROL</p>	PROJECT NO.
		HORIZONTAL N.T.S.		STD.DWG.No.
		VERTICAL N.T.S.	<p>1</p>	



NOTES:

1. OUTLET TO BE CONTINUOUS C.S.P. AND A MIN. LENGTH OF 4.0m.
2. ROCK PROTECTION TO BE PLACED AS REQUIRED TO PREVENT EROSION. THE SURFACE TO BE FLUSH WITH THE STREAM BED AND BANK. ROCK PROTECTION TO EXTEND A MINIMUM OF 1000mm UPSTREAM AND 1000mm DOWNSTREAM OF THE TILE OUTLET.
3. THE CONNECTION BETWEEN THE C.S.P. AND THE FIELD TILE IS TO BE ENCASED IN CONCRETE.
4. A RODENT GRATE IS TO BE INSTALLED AT THE END OF THE C.S.P. OUTLET.
5. MIN. SIDE SLOPE IS 1 VERT TO 1 HOR OR AS SPECIFIED IN ENGINEER'S REPORT.
6. FOR ROCK PROTECTION, USE R-50 RIP-RAP AS PER OPSS 1004.05.05.02 OR ROCK PROTECTION AS PER OPSS 1004.05.05.03.

DATED: AUG/13

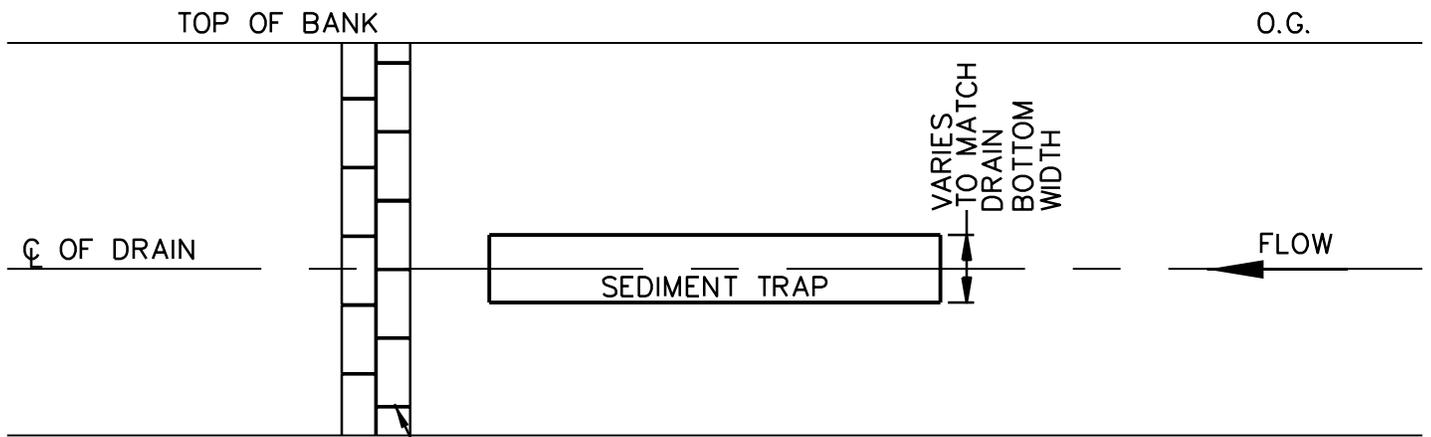
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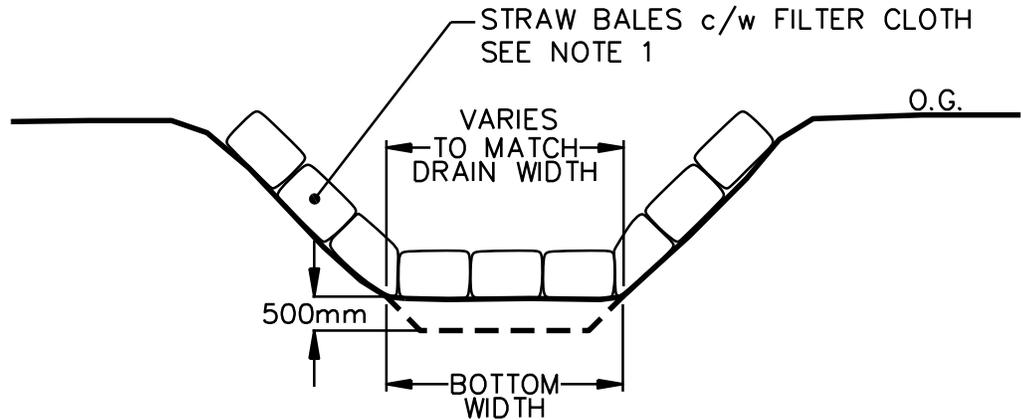
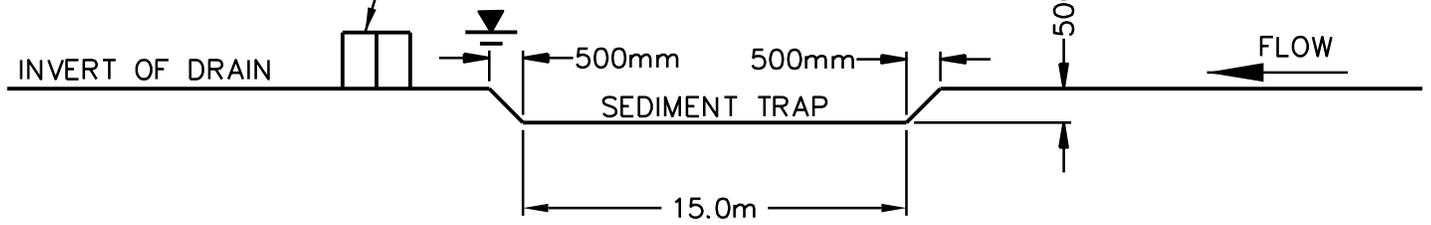
SCALE
HORIZONTAL N.T.S.
VERTICAL N.T.S.

MUNICIPAL DRAIN
STANDARD TILE OUTLET

PROJECT NO.
STD.DWG.No. 2



NOTE: TWO ROWS OF STRAW BALES TO TOP OF BANK c/w FILTER CLOTH ANCHORED w/ 1200mmL. STAKES. MIN OF 2 STAKES PER BALE



DATED: AUG/13

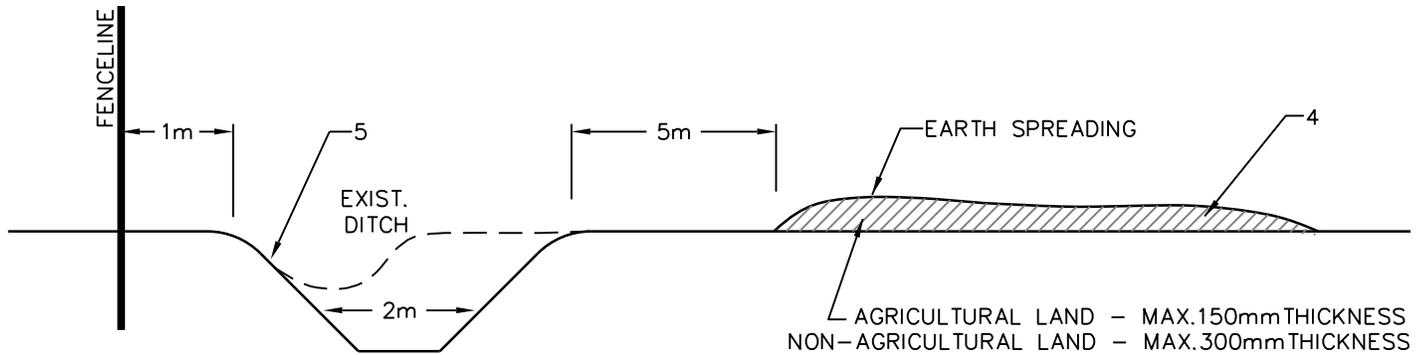
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SCALE
HORIZONTAL
N.T.S.
VERTICAL
N.T.S.

MUNICIPAL DRAIN
TYPICAL STRAW BALE CHECK DAM AND SEDIMENT TRAP

PROJECT NO.
STD.DWG.No.
3



NOTES:

1. NO EXCAVATION WITHIN 1 METRE (3 FEET) OF EXISTING FENCELINE.
2. SIDE SLOPES AND CHANNEL DIMENSIONS AS PER PROFILE DRAWING.
3. NO SPOIL OR SPREADING WITHIN 5 METRES (16 FEET) OF TOP OF BANK.
4. SPOIL THICKNESS, WIDTH, DRAINAGE OPENINGS AND SPREADING LOCATION TO BE AS PER SPECIAL PROVISIONS.
5. WHERE ONE-SIDED CONSTRUCTION IS SPECIFIED, THE EXISTING GRASSED SLOPE SHALL BE PRESERVED WHERE POSSIBLE.
6. SEEDING TO BE COMPLETED WITHIN 48 HOURS OF CONSTRUCTION. SEE ENGINEER'S REPORT FOR DETAILS.

DATED: AUG/13

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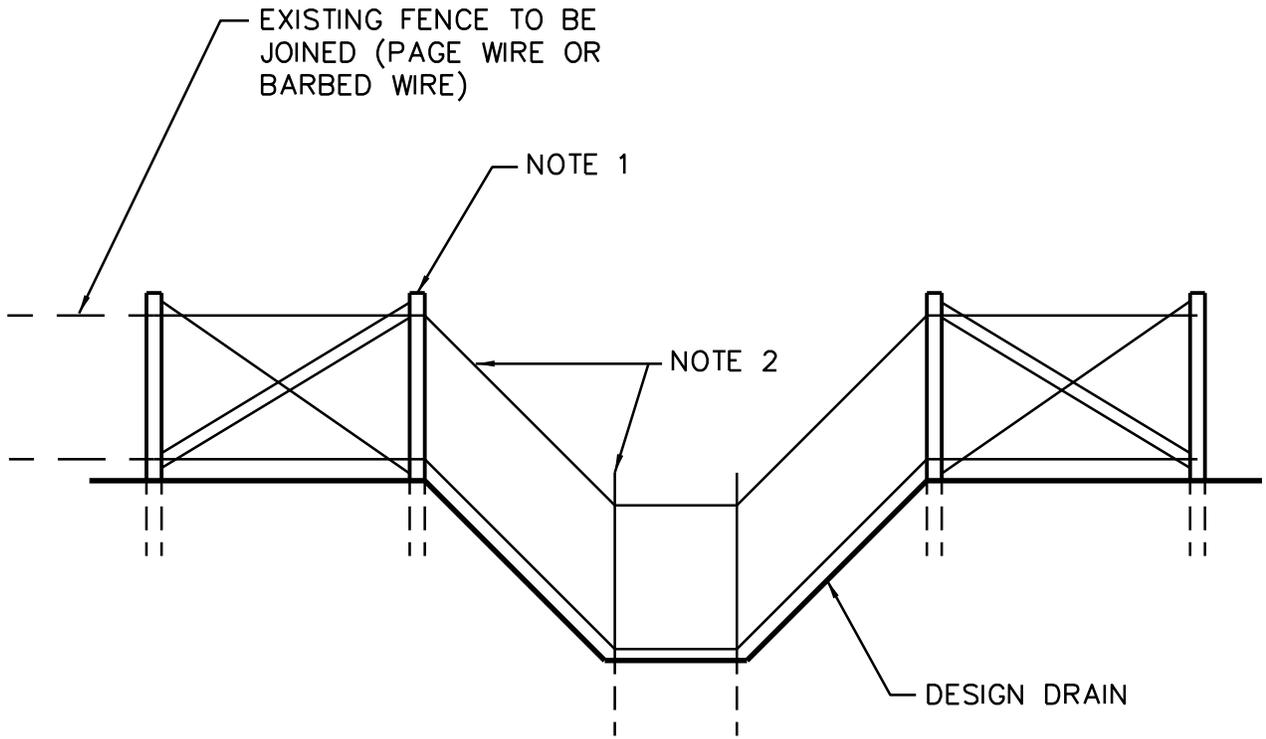
SCALE
HORIZONTAL N.T.S.
VERTICAL N.T.S.

MUNICIPAL DRAIN
OPEN CHANNEL SYSTEMS
EARTH CUT CHANNEL

PROJECT NO.

STD. DWG. No.

4



NOTES:

1. REFER TO OPSD DWG. No. 901.01 FOR BRACE PANEL DETAIL.
2. T-RAILS SHALL BE NEW STEEL, MINIMUM LENGTH 2.4m (8 FEET).
3. CROSS-FENCE WIRE SHALL BE HEAVY GAUGE BARBED WIRE, MINIMUM 6 STRANDS AT EVEN SPACING.

DATED: AUG/13

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SCALE
HORIZONTAL N.T.S.
VERTICAL N.T.S.

MUNICIPAL DRAIN
CROSS FENCE DETAIL

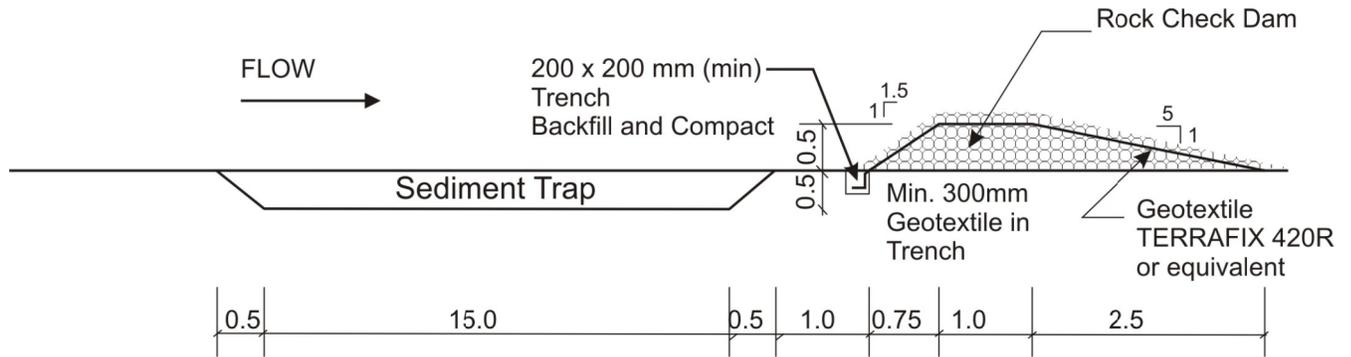
PROJECT NO.

STD.DWG.No.

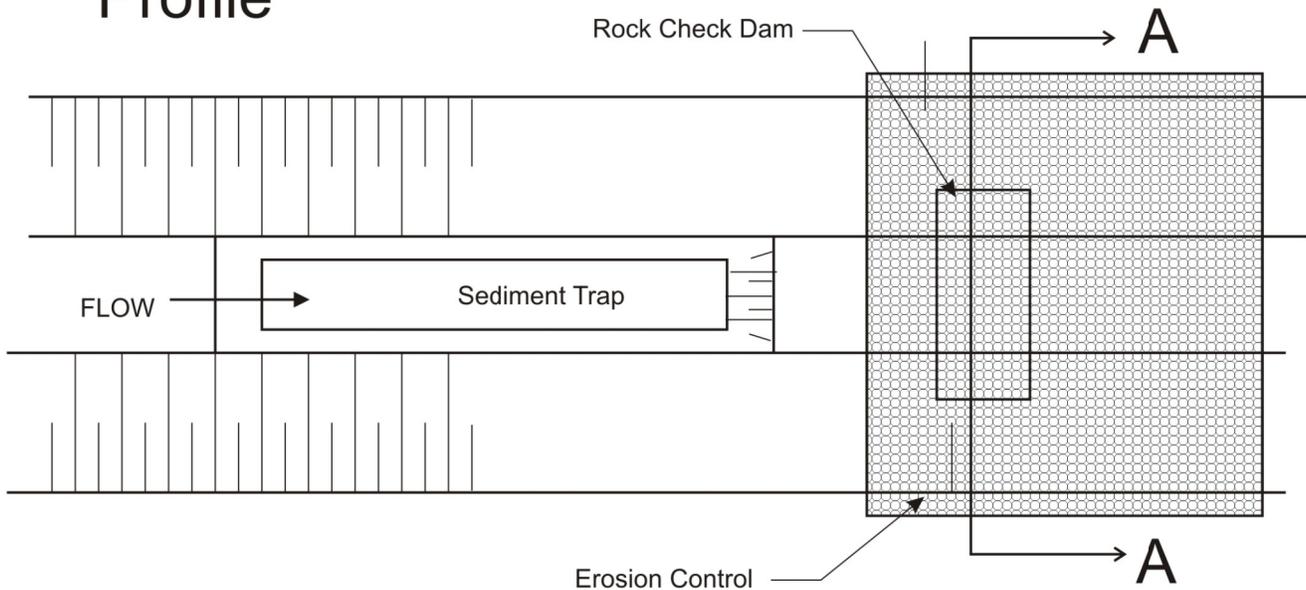
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NOTE:

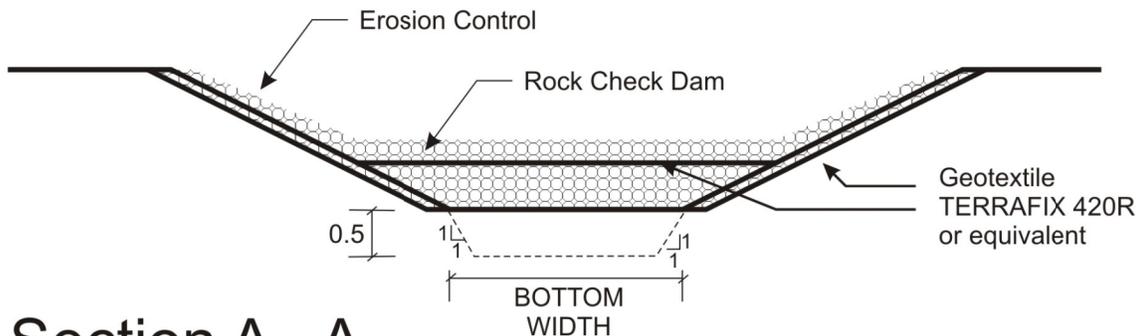
- FOR ROCK CHECK DAM AND EROSION CONTROL, USE R-50 RIP-RAP AS PER OPSS 1004.05.05.02 OR ROCK PROTECTION AS PER OPSS 1004.05.05.03.
- REFER TO OPSD 219.211 & 219.220 FOR ADDITIONAL DETAILS



Profile



Plan



Section A - A

NOTE: All dimensions in metres unless noted

DATED: AUG/13

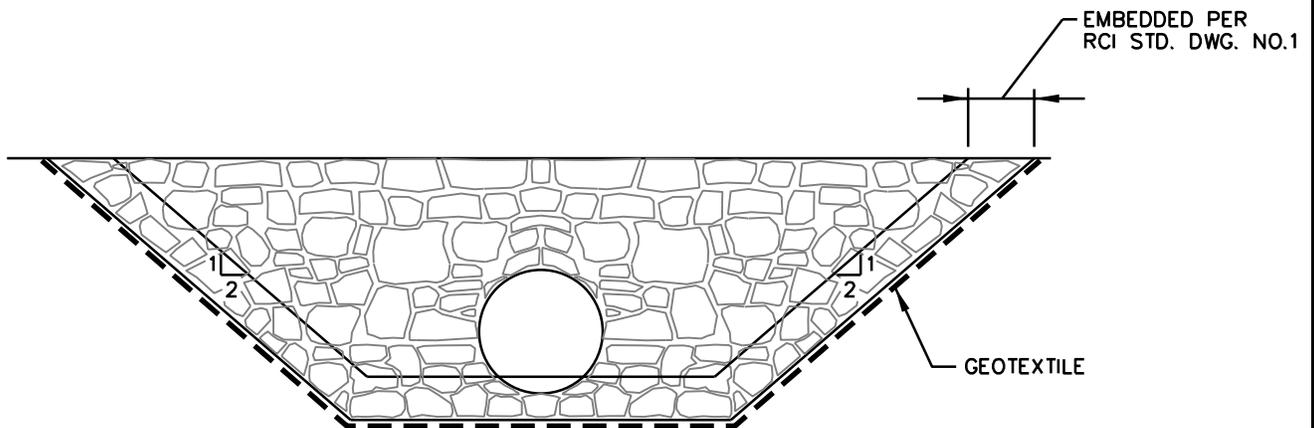
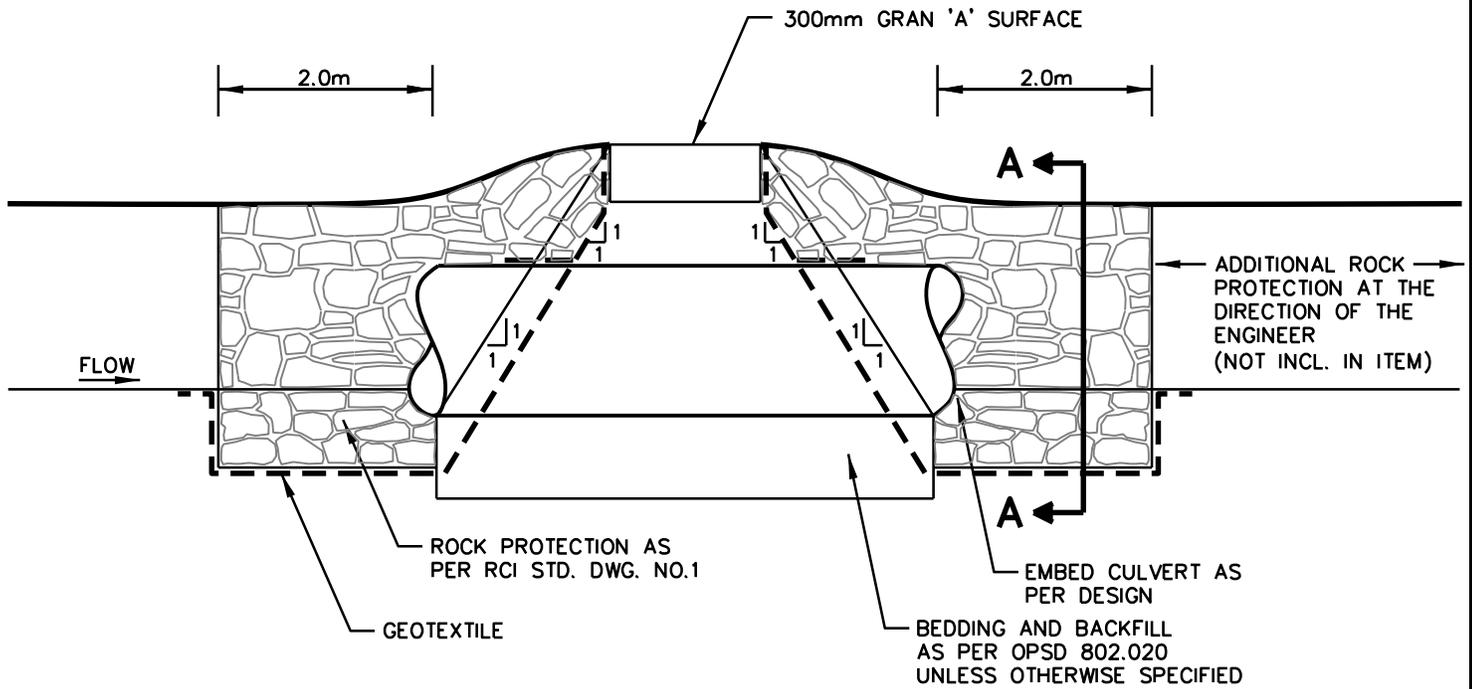
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SCALE
HORIZONTAL
N.T.S.
VERTICAL
N.T.S.

MUNICIPAL DRAIN
TEMPORARY ROCK CHECK DAM AND SEDIMENT TRAP

PROJECT NO.
STD.DWG.No.
6



END SECTION A-A

DATED: OCT/13

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Telephone (613) 592-6060

SCALE
HORIZONTAL N.T.S.
VERTICAL N.T.S.

MUNICIPAL DRAIN
STANDARD FARM CROSSING AND CULVERT END TREATMENT DETAIL

PROJECT NO.

STD.DWG.No.
10

Appendix D

Special Provisions

SPECIAL PROVISIONS

INDEX

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SP1.0 WORKING AREA

A working area of 50 metres is designated along both sides of the proposed drain.

The designated working area shall be deemed to include area for spreading of excavated material, access roads for fuel and service and material haul routes, as approved by the Drainage Engineer. These access points to the designated working area should be along existing farm lanes or access points where possible, and are to be approved by the Drainage Engineer. It is the contractor's responsibility to obtain final approval for access locations and to reinstate the access to original condition or better, at the contractor's expense.

SP1.1 Alignment

The constructed channel alignment shall be in general conformity with the existing alignment and Dwg. No. 15041-A1. Where necessary, the alignment shall be set out by the Drainage Engineer prior to the commencement of construction on this project.

SP2.0 CLEARING AND GRUBBING

Clearing and grubbing shall consist of the removal of all trees, brush and windfalls within the top of slopes for the drain and the area required for machine access, for clean out of the drain and spreading of excavated material. All dead trees located near the drain that would in time fall into the drain are to be removed. When clearing is undertaken in an area of tillable land all stumps shall be removed and in all other areas, stumps shall be cut flush with the ground.

Brush removal (grubbing) shall include the removal of brush which has grown up in previously cleared areas.

SP2.1 Disposal of Material

In all areas any trees having a diameter of 150 mm or greater shall be cleared of limbs and cut into cord lengths or multiples of cord lengths, to a maximum length of 5 m and piled neatly clear of the drain so that the wood may be salvaged by the property owners. All brush, limbs and other debris resulting from the clearing operation shall be disposed of at a location on the property chosen by the owner and approved by the Drainage Engineer. Large stones, stumps, tree roots and other debris shall also be disposed of at a location on the property chosen by the owner and approved by the Drainage Engineer.

SP2.2 Payment

The cost of all labour, materials and equipment for clearing and grubbing and disposing of material as discussed herein shall be deemed to have been included in the lump sum or unit price tendered for this item.

SP3.0 EXCAVATION AND DISPOSAL

SP3.1 Excavation

The construction of the Chenier-Jeurond Municipal Drain will be an open channel drain with side slopes and ditch bottom widths as specified on the design profiles and cross-sections Drawing No. 15041-P1 through 15041-P10 (inclusive), and 15041-C1 through 15041-C2. The Main Branch Chenier-Jeurond Municipal Drain will be located between Station 0+000 and Station 6+525.5 and Branch No. 1 between Station 10+000 and 10+350.

SP3.2 Disposal of Excavated Earth Material

The excavation of the drain shall be completed along all sections as previously described and all materials including silt, debris, etc. shall be removed from the drain. In the non-agricultural land all material shall be spread on the adjacent lands no closer than 5 meters to the top of slope and to a maximum depth of 300 mm. Drainage openings shall be constructed wherever required throughout the disposal area but at a maximum spacing of 100 meters. All drainage openings shall be maintained and the soil spread to accommodate these drainage openings to ensure that the drainage from adjacent land is not impeded.

In areas of agricultural land, all suitable earth material shall be spread no closer than 5 m to the top of the slope and to a maximum depth of 150 mm on the adjacent land with drainage openings provided wherever required, but at a maximum spacing of 50 meters.

Property owners who wish to pay the Contractor to have the Contractor dispose of the excavated material off-site which would otherwise be spread or deposited on the property may make arrangements directly with the Contractor, subject to approval by the Drainage Engineer.

SP3.3 Hardpan Excavation and Disposal

All unsuitable material and debris such as boulders, hardpan, etc. shall be disposed of by the contractor on the adjacent property, in an area of the property designated by the owner and as approved by the Drainage Engineer.

SP3.4 Rock Excavation & Disposal

The Contractor is required to excavate rock and dispose of the material off the site at a location arranged for by the Contractor and agreed to by the Drainage Engineer .

SP3.5 Payment

Payment for earth excavation shall be by the unit price tendered per cubic meter or linear meter and shall be full compensation for all work required to excavate and spread the spoil in the manner described previously.

For the purpose of excavation, hardpan shall be considered as earth excavation, shall be by the unit price tendered per cubic metre (for excavation) and shall be full compensation for all work required to excavate and dispose of the material in the manner described previously.

Where incurred, payment for rock excavation shall be by the unit price tendered per cubic metre and shall be full compensation for all work required to excavate, remove off-site and dispose of the material in the manner described previously. Measurement for payment shall be from the calculated quantity using the surveyed top of rock (as exposed) to the theoretical trench width and proposed channel grade.

SP3.6 Disposal Off-Site at Property Owner's Expense

Property owners who wish to pay the Contractor to have the Contractor dispose of the excavated material off-site which would otherwise be spread or deposited on the property may make arrangements directly with the Contractor, subject to approval by the Drainage Engineer.

SP4.0 PRIVATE CULVERTS

SP4.1 Supply and Placement or Lowering of Private Farm Culverts

The culverts shall be installed so that the culvert invert is 150mm below the invert of the drain. The farm culvert bedding, backfill, surface course and rock protection end-treatment shall be as shown on RCI Std. Dwg. 10. The standard length for supplied culverts shall be 10 meters, unless otherwise specified.

SP4.2 Culvert Location

Culverts that must be installed or lowered and reinstalled are shown on Drawing No. 15041-A2 and 15041-P1 through 15041-P10 (inclusive).

SP4.3 Payment

Payment at the per metre or lump-sum unit price bid for each culvert shall include for all excavation and disposal of materials and for the supply and installation of a new culvert or the reinstallation of the old culvert respectively and shall include backfill and Granular "A" material for the driving surface.

Payment at the unit price bid for removing existing structures shall include for all excavation and disposal of materials.

Rock protection with filter cloth at both ends of the culvert shall be paid under the item for culvert end treatments by the item unit price.

SP5.0 FENCING

Where fences are encountered or for access to the drain, it will be the Contractor's responsibility to remove the existing fence and re-erect the fence in a condition equal to or better than the condition of the fence prior to the commencement of the work.

SP5.1 Fencing - Replacement

Where fences are encountered or for access to the drain, where it is the determination of the on-site representative of the Drainage Engineer that the fence is not in a reasonable condition for the Contractor to remove the existing fence and re-erect the fence in a suitable condition, the Contractor shall supply and install similar fence to the OPSD that governs that type of fence, and/or to the satisfaction of the Drainage Engineer.

SP5.2 Payment

SP5.2.1 Payment – Fences in Good Condition

Fences encountered, which are in reasonable condition, are to be reinstalled in a condition equal to or better than the condition of the fence prior to the commencement of the work, at the Contractor's expense.

SP5.2.1 Payment – Fences Poor Condition (to be replaced)

Payment for fences to be replaced (as per SP 5.1) will be made, as per the tendered amount for the Provisional Item, on a per location basis.

SP6.0 SEEDING

SP6.1 Main Drain Seeding

All disturbed banks shall be hand seeded within 48 hours of construction. Additionally, the "buffer zone" (the first 5m from the top of bank) must be seeded following the completion of access activities in the area. Any spread areas outside of agricultural fields must also be seeded, except where spreading occurs in a forest/bush area.

The minimum sow rate will be 100 kg/ha and the following seed mixture, or an alternate mixture presented by the contractor and approved by the Drainage Engineer shall be used.

Creeping Red Fescue	60%
Canada Bluegrass	20%
White Clover	3%
Perennial Rye	12%
Red Top	5%

Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation that is shade and water tolerant with limited requirement for seed bed preparation, white clover provides quick cover and produces nitrogen to aid in the establishment of other vegetation and red top's root system is well suited for holding soils on wetlands, waterways and ditch banks. Any proposed alternative mix should make accommodation for all attributes described above.

SP6.2 Timing Restrictions

Seed shall not be placed from November 1st through April 30. Where excavation occurs between November 1st and April 30, seeding shall be completed as soon as possible after April 30, or as directed by the Drainage Engineer.

The Contractor is required to ensure a seed catch and may be required to re-seed areas as directed by the Drainage Engineer.

SP6.3 Measurement for Payment

Measurement for payment for the placement of the seed shall be by the square metre in place on the prescribed areas seeded. Payment will not be made for any area seeded beyond the prescribed area unless approved by the Drainage Engineer prior to placing the seed. The Contractor will not be paid for reinstatement of other areas disturbed by construction activities.

SP6.4 Payment

Payment for seeding shall be by the unit price tendered and shall be full compensation for all labour, materials and equipment required to complete the work as described above, and for any required reseeding during the maintenance period.

SP7.0 ROCK PROTECTION EROSION CONTROL

Rock Protection Erosion Control shall consist of quarried rock fragments which meet the standards as specified in the OPSS 1004.05.05.02 for R-50 Rip-Rap, and/or the standards for Rock Protection, OPSS 1004.05.05.03.

Fieldstones will not be accepted for rock protection unless they are enclosed in gabion baskets or other materials to be approved by the Drainage Engineer, at no extra cost to the drain or project.

Excavated rock from the site which meets the standards as specified above, and is approved by the Drainage Engineer for use, may, at the contractor's discretion, be used in place of imported Rock Protection.

The rock protection shall be inset into the bank and the bed of the drain so that the finished surface will be of the same cross-section and will be flush with upstream and downstream sections. The rock protection shall be placed on a geotextile Terrafix 420R (or approved equivalent) as indicated on the Standard Drawing. Rock protection shall be installed in accordance with Standard Drawing No. 1 and No. 2 (provided in **Appendix C**).

SP7.1 Rock Protection Erosion Control Location

Refer to Drawing Nos. 15041-A2, and 15041-P1 through 15041-P10 (inclusive) for Rock Protection locations. Other locations may be identified in the field during construction.

SP7.2 Measurement for Payment

Measurement for placement of rock protection with filter cloth shall be by the square metre and measurement shall be made in place. Payment will only be made for the area of rock protection agreed to in advance by the Drainage Engineer.

SP7.3 Payment

Payment for rock protection shall be by the unit price tendered and shall be full compensation for all labour, material and equipment required to complete the work as described above.

SP8.0 UTILITIES

The Contractor shall be required to arrange with all utilities to mark all underground cables or pipelines in the field prior to commencing construction, and shall be responsible for protecting the utilities during construction and repair of any damaged utilities.

SP9.0 FLOW CHECKS & SEDIMENT TRAPS

SP9.1 Straw Bale Flow Check

SP9.1.1 Straw Bales

Straw bales shall consist of oat or wheat straw, shall be dry, firm, tightly tied in at least two places, show no evidence of straw or tie decay, and be free of sediment. They shall be of standard agricultural rectangular conformation and dimensions, approximately 600 mm x 600 mm x 1200 mm.

SP9.1.2 Stakes

Stakes shall be of sufficient strength to satisfy straw bale flow check performance and maintenance requirements and shall be a minimum of 1200 mm in length and each bale shall be firmly anchored in place by two stakes spaced and driven firmly 150 mm from each end of each bale.

SP9.1.3 Installation

Straw bale flow checks shall be installed as indicated in the Standard Drawing to prevent sediment passage from the upstream to the downstream side of the flow check, and shall be installed at all specified locations on Drawing Nos. 15041-A2, and 15041-P1 through 15041-P10 (inclusive), all in accordance with Standard Drawing No. 3 (provided in **Appendix C**).

Straw bale flow checks shall consist of a double row of bales in compliance with the following:

- a) The two rows of bales shall be butted tightly beside one another without gaps.
- b) The bales in the two rows shall be uniformly staggered, so that the ends of the upstream row of bales are adjacent to the centres of the downstream row of bales.
- c) The upstream row of bales shall be one bale longer than the downstream row.

SP9.2 Rock Flow Checks

SP9.2.1 Rock

The rock flow check shall be constructed using clean quarried rock fragments which meet the standards as specified in the OPSS 1004.05.05.02 for R-50 Rip-Rap, and/or the standards for Rock Protection, OPSS 1004.05.05.03.

SP9.2.2 Geotextile

Geotextile shall be placed under the rock protection on the banks of the drain and over the rock check as shown on Standard Drawing No. 6. The geotextile over the rock check is to permit drainage while filtering sediments and must be covered with a layer of rock.

SP9.2.3 Installation

Rock flow checks shall be installed as shown on Standard Drawing No. 6 (provided in **Appendix C**).

SP9.3 Excavation

Sediment trap excavation shall be 15 m in length and 500 mm below the proposed grade (drain bottom), for the full width of the channel directly upstream of the straw bale or rock flow checks.

SP9.4 Sediment Removal

Accumulated sediment in the sediment trap shall be removed as necessary to affect maintenance repairs and immediately prior to the removal of the flow check.

SP9.5 Flow Check Removal

The straw bale and rock flow checks shall be removed after all construction is complete on the drainage works.

SP9.6 Measurement for Payment

Measurement will be by the number of sediment trap and straw bale or rock flow checks installed. Alternatively, erosion and sediment control items including flow checks may be combined into an overall lump-sum item for an all-inclusive erosion and sediment control plan and implementation item within the final contract.

SP9.7 Payment

Payment at the Contract price for the tender item "Sediment Traps" shall be full compensation for all labour, equipment and material required to complete the installation and removal of the sediment traps and straw bale or rock flow checks and sediment removal from the traps upon completion of the project. Alternatively, erosion and sediment control items including flow checks may be combined into an overall lump-sum item for an all-inclusive erosion and sediment control plan and implementation item within the final contract.

SP10.0 TILE OUTLET PROTECTION

Existing tile outlets shall be located by the Contractor and protected during construction. Where existing tile outlets are affected by the construction, they shall be restored by installing a CSP outlet pipe complete with a rodent grate (or alternative approved product). Rock protection, complete with geotextile filter cloth, shall be installed at the tile outlet to prevent erosion

Restoration of the tile outlets shall be completed in accordance with Standard Drawing No. 2 (provided in **Appendix C**).

SP10.1 Material Specification

Rock protection and geotextile materials shall be in accordance with the specification for rock protection in these Special Provisions.

SP10.2 Measurement for Payment

Measurement will be by the unit price for each tile outlet restoration completed.

SP10.3 Payment

Payment for tile outlet restoration shall include for all materials, excavation and installation, including CSP end piece, rodent grate, rock protection and geotextile in accordance with Standard Drawing No. 2.

SP11.0 CULVERT END TREATMENTS

Culvert End Treatments shall be installed as indicated in the Standard Drawing to prevent erosion and scour from the upstream and downstream culvert ends. End treatments shall be installed on the upstream and downstream end of each culvert shown on Drawing No. 15041-A2, all in accordance with Standard Drawing No. 10 (provided in **Appendix C**).

SP11.1 Payment

Payment for culvert end treatments shall include for all materials, excavation and installation, including rock protection and geotextile in accordance with Standard Drawing No. 10.

SP12.0 GUARANTEED MAINTENANCE

Upon completion of the work the Contractor will be required to post a guaranteed maintenance security for a period of 12 months, in the amount of 10% of the value of the work completed.

This amount will guarantee workmanship of such items as fencing, rock protection, seeding and culvert installation.

Should the Contractor schedule his work during months when seeding cannot be carried out, or should a seed catchment not be satisfactorily established, then subsequent repair of sloughed areas and excavation of the drains due to erosion of unseeded or inadequately seeded banks shall be carried out by the Contractor without any extra payment for such repair work.

SP13.0 MINISTRY OF NATURAL RESOURCES AND FORESTRY – SPECIES AT RISK

The Ontario Ministry of Natural Resources and Forestry (MNRF) has screened the proposed works and work area for Species at Risk (SAR) and has provided the Letter of Advise in this regard. However, the contractor must be aware that the SAR Act and the individual species at risk are dynamic and subject to change. The contractor is responsible to ensure all necessary measures are taken to ensure no harm to any SAR or its habitat (if protected). Current species of note, their location (if available) and associated advise are found in the MNRF-- SAR Letter of Advise as provided in **Appendix F** of the Engineer's Report. For this project, current SAR are American Eel, Butternut Trees, Barn Swallow, Bobolink, Eastern Meadowlark,

Cutlip Minnow, Snapping Turtle and Monark Butterflies (all reported in the general/greater area). The general procedures to be followed are outlined in the following sections. However, the contractor is advised that following these procedures may not eliminate the possibility of harm to a protected species. The contractor is responsible to ensure all necessary measures are taken to ensure no harm to any SAR or its habitat (if protected). Following these procedures and/or any additional required measures implemented by the contractor are to be performed at the contractor's expense, except as otherwise noted.

SP13.1 Species at Risk – Procedures (Barn Swallow)

Barn swallows have been documented in general/greater area of this site and typical habitats may exist adjacent to the proposed works. For work within the specified working area, it is not anticipated that barn swallow will be encountered, however, the contractor shall avoid unnecessarily disturbing structures and a sweep of all culverts to be removed (especially larger diameter or box culverts) shall be completed. Where barn swallows are found, all work that would directly affect the habitat (i.e. removal of the structure) shall stop, and the sighting be reported to the contract administrator.

SP13.2 Species at Risk – Procedures (Turtles)

It is noted that the best time to conduct works in turtle habitat is when they are not hibernating. The hibernation period generally occurs between Oct 15 and March 30. Work is currently limited prior to June 30 of each year by the Department of Fisheries and Oceans regulations, as such, the March 30 restriction is not of concern to this project. Late works may be of concern. Therefore, Robinson Consultants Inc. recommends that work be completed prior to October 15. Should it be required that works proceed beyond October 15, Robinson Consultants Inc. will have a site assessment (limited to turtle habitat within the work area) completed by a biologist to determine if Blanding's turtles are present. Should Blanding's turtles be found within the late-work area, the late work shall not be completed until the following July.

Prior to any in-water works a general sweep of the area must be completed by the contractor and Robinson Consultants Inc. staff and/or the Consultant Biologist. This sweep will ensure these species have adequate time to move away from works. Turtle nests (with eggs) should not be disturbed, however, it is anticipated that the nesting period should be completed prior to the construction period due to the Fisheries and Oceans Canada Permit restrictions (no in-water construction March 15 through July 1).

SP13.3 Species at Risk – Procedures (Bobolink and Eastern Meadowlark)

Bobolink and Eastern Meadowlark have been documented in general/greater area of this site and typical habitats may exist adjacent to the proposed works. However, for work within the specified working area, it is not anticipated that Bobolink and Eastern Meadowlark will be encountered. In general, it is recommended that brush removal be completed in winter months, where possible, to avoid impacts on breeding birds.

13.4 Species at Risk – Payment

13.4.1 Species at Risk – Payment (Barn Swallow)

Following the procedures as noted with regard to barn swallow shall be considered part of the normal procedures with no additional payment made.

It is not anticipated that additional tasks shall be required in this regard, however, any additional specific task assigned to the contractor will, upon notice of intent to claim by the contractor, be considered for additional payment as per the General Conditions of the Contract.

13.4.2 Species at Risk – Payment (Turtles)

Following the procedures as noted with regard to turtles shall be considered part of the normal excavation procedure with no additional payment made.

It is not anticipated that additional tasks shall be required in this regard, however, any additional specific task assigned to the contractor will, upon notice of intent to claim by the contractor, be considered for additional payment as per the General Conditions of the Contract.

13.4.3 Species at Risk – Payment (Bobolink and Meadowlark)

It has been determined by the Ministry of Natural Resources that it is unlikely that Bobolink and Meadowlark will be encountered while working within the defined working area, therefore, it is not anticipated that any additional tasks shall be required in this regard. However, any additional specific task assigned to the contractor will, upon notice of intent to claim by the contractor, be considered for additional payment as per the General Conditions of the Contract. It is recommended that the contractor take all necessary precautions to avoid potential impacts to breeding birds, however, no additional payment shall be considered beyond normal brush removal costs for the completion of this task.

SP14.0 RAISIN REGION CONSERVATION AUTHORITY – PERMISSION (O.REG. 175/06)

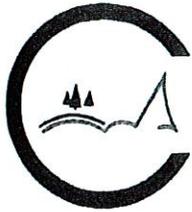
The Permit with regard to the “Development, Interference with Wetlands and Alterations to Shorelines and Watercourses” (O.Reg. 175/06) for works to be completed on the Chenier-Jeurond Municipal Drain by RRCA is contained in **Appendix E** of the Engineer’s Report. The Contractor shall insure that any conditions are adhered to.

SP15.0 DEPARTMENT OF FISHERIES AND OCEANS – CLASS AUTHORIZATION

The class authorization letter and associated advice with regard to the Fisheries Act for works to be completed on the Chenier-Jeurond Municipal Drain by the Department of Fisheries and Oceans (DFO) is contained in **Appendix G** of the Engineer’s Report. The Contractor shall insure that any advise/conditions are adhered to.

Appendix E

Raisin Region Conservation Authority
Permit (O.Reg. 175/06)



**Raisin
Region
Conservation
Authority**

Personal information contained on this form is collected under the authority of regulations made under Section 28 of the Conservation Authorities Act of Ontario and may be shared with departments or agencies of local provincial or the federal government having an interest in same. Questions about this collection should be directed to: Watershed Planner at the Raisin Region Conservation Authority.

RRCA Use Only
File No.: Locho03/16
Inquiry received: OCT. 17/16
Complete Application Date: March 3-17

PERMIT APPLICATION FORM FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES

Pursuant to O.REG. 175/06 Made Under the Conservation Authorities Act (Under 97/04)

PROPERTY OWNER DETAILS:

Name of Property Owner: CHENIER-JEAUROND MUN. DRAIN (TWP. OF NORTH GLENGARRY)

Mailing Address: 90 MAIN ST., P.O. BOX 700, ALEXANDRIA, ON K0C 1A0
Postal Code

Telephone No. (Work/Cell): 613-525-1110 Telephone No. (Home) _____

Fax No. 613-525-1649 email address: ryanmorton@northglengarry.ca

If Applicable, Name of Agent: ROBINSON CONSULTANTS INC. (DRAINAGE ENGINEER)

Mailing Address: 210-350 PALLADIUM DRIVE, KANATA, ON K2V 1A8
Postal Code

Telephone No. (Work/Cell): 613-592-6060 Telephone No. (Home) _____

Fax No. 613-592-5995 email address: ajrobinson@rcii.com

PROPERTY DETAILS:

Street Address/Civic No.: N/A

Lot: 18-30 Concession: 1/2 Registered Lot No.: _____ Registered Plan No.: _____

Municipality: NORTH GLENGARRY Former Municipality: LOCHIEL

Roll No.: VARIOUS

Existing Land Use: RURAL/AGRICULTURAL Proposed Land Use: RURAL/AGRICULTURAL

DESCRIPTION OF WORK: (check off one or more as applicable)

- | | | |
|---|--|---|
| <input type="checkbox"/> Construct New Residential Building | <input type="checkbox"/> Add to or Alter Existing Building | <input type="checkbox"/> Shoreline/Erosion Control/Bank stabilization |
| <input type="checkbox"/> Construct New Accessory Building | <input type="checkbox"/> Install Sewage Disposal System | <input type="checkbox"/> Alteration to an Existing Wetland |

Alter an Existing Watercourse or Shoreline:

Name of Watercourse: CHENIER-JEAUROND

- Channelization Dredge Dam or Weir Diversion Road Crossing Realignment

Construct a Pond, Lake or Reservoir Other (specify): _____



Place or Remove Fill Material:

Type of Fill Material:

Spreading of material excavated from the drain on adjacent lands

Quantity of Fill:

+/- 13,000m3

Description, Purpose and Details of Proposed Work:

Modification of an exiting channelized drainage ditch to provide improved outlet for surface and tile drainage and incorporation as a Municipal Drain with all works completed under the Ontario Drainage Act, R.S.O. 1990.

Proposed Start Date: 01 / 07 / 2017
D M Y

Proposed Finished Date: 30 / 11 / 2017
D M Y

ADDITIONAL INFORMAITON:

PLANNING APPLICATIONS: Does this application apply to a planning application (Minor Variances, Severance, Zoning Amendment, Subdivision Application, etc)? Yes No If yes, please provide application No.: _____

PREVIOUS PERMIT APPLICATION: Has a previous application from the Raisin Region Conservation Authority been processed for the subject property? Yes No If yes, please provide the application No.: _____

PLEASE PROVIDE FOUR COPIES OF THE FOLLOWING:



Location Plan showing property, major roads, access roads, landmarks, etc.



Site Plan (use plan of survey if available) showing location of work on the subject property and other important features such as drainage swales, ditches, watercourses, septic systems, wells, etc.



Legible drawings of the proposed work showing dimensions, cross-sections, building envelopes, setbacks, materials, geodetic elevations, etc. For example, grades should include pre and post elevations, top of foundation, basement floor elevation, etc. (see sample plan)



Detailed professional drawings such as grading and survey plans from a professional engineer and/or Ontario Land Surveyor may be required for dwellings, structures and/or fill within the floodplain.



Photographs of the work site if available

***Insufficient information will delay the processing of your application and shall deem your application incomplete.**

ROBINSON CONSULTANTS INC.
I, ANDREW J ROBINSON, P.ENG the landowner/acting agent declare that all of the above information is correct.

The owner (or agent) hereby gives ^{*} permission to employees or agents of the Raisin Region Conservation Authority to enter into the land in question to survey monitor or inspect the construction of a building or structure, the placement of fill, and/or alterations of a watercourse(s) and agrees to pay the applicable fee, as listed on the attached fee schedule.

* Where authorized by legislation or by the permission of the landowner where obtained by the RRCA.

SIGNATURE OF OWNER (OR AGENT):  DATE: 18 / 10 / 2016
D M Y

PERMIT FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES

PERMISSION HAS BEEN GRANTED TO UNDERTAKE THE WORK DESCRIBED IN THIS APPLICATION. PLEASE VERIFY RRCA LETTER OF APPROVAL AND PERMIT STIPULATIONS FOR DETAILS, CONDITIONS AND/OR MODIFICATIONS.

THIS PERMIT WILL EXPIRE TWO (2) YEARS FROM THE DATE OF ISSUE, UNLESS OTHERWISE SPECIFIED BY THE RAISIN REGION CONSERVATION AUTHORITY.

PLEASE NOTE: THIS PERMIT IS ISSUED ONLY TO INDICATE COMPLIANCE WITH THE REGULATIONS OR THE RAISIN REGION CONSERVATION AUTHORITY PASSED PURSUANT TO THE CONSERVATION AUTHORITIES ACT AND DOES NOT ABSOLVE THE APPLICANT OF ANY LIABILITIES IN SO FAR AS THE PRIVATE OWNERSHIP OR RIGHTS OF OTHERS BEING AFFECTED ARE CONCERNED.

THIS PERMISSION IS NOT VALID UNLESS SIGNED BY BOTH THE OWNER/AGENT AND THE AUTHORIZED REPRESENTATIVE OF THE RAISIN REGION CONSERVATION AUTHORITY.

PLEASE ALSO NOTE: DUE TO TIMING RESTRICTIONS THAT MAY APPLY, THE VOLUME OF APPLICATIONS RECEIVED AND MULTI-AGENCY INVOLVEMENT, PLEASE SUBMIT YOUR APPLICATION SEVERAL MONTHS IN ADVANCE.

RAISIN REGION CONSERVATION AUTHORITY


ENFORCEMENT OFFICER

March 8, 2017
DATE

P.O. Box 429, 18045 County Rd. 2, Cornwall, Ontario K6H 5T2
Tel: (613) 938-3611 Fax: (613) 938-3221
Website: www.rca.on.ca Email: info@rca.on.ca



Raisin Region Conservation Authority

18045 County Road 2, P.O. Box 429, Cornwall, ON K6H 5T2

Tel: 613-938-3611 Fax: 613-938-3221 www.rrca.on.ca

March 6, 2017

Attention: Lorne Franklin
Robinson Consultants Inc.
350 Palladium Drive
Ottawa, Ontario
K2V 1A8

Subject: O. Reg. 175/06 Alterations to Shoreline & Watercourses Permit
New Municipal Drain: Chenier-Jeaurond Municipal Drain
Lot 18-30, Conc. 1 & 2
Township of North Glengarry – Former Lochiel Township
RRCA File #: Loch003/16

Dear Mr. Franklin,

The Raisin Region Conservation Authority (RRCA) is responsible for the evaluation of proposed works regarding development, interference with wetlands and alterations to shorelines and watercourses under the Conservation Authorities within the RRCA's jurisdiction. Your proposal to provide adequate drainage and adequate outlet for surface and tile drainage to the lands and roads within the Chenier-Jeaurond Municipal drainage area Lot 18-30, Conc. 1 and 2 in the Township of North Glengarry (Former Lochiel Township) has been reviewed by this office.

My understanding of the proposed work is as follows:

- Robinson Consultants Inc. was appointed by the Township of North Glengarry to complete an Engineer's report on the proposed Chenier-Jeaurond Municipal Drain to provide adequate drainage and adequate outlet (for tile drainage) to the lands and roads within the drainage area;
- This engineers report will provide for the enhancement and/or modifications of the existing watercourse to form a new municipal drain, complete with any required roadway or fram access crossings, and taken to a sufficient outlet (determined to be the Delisle River). Once the municipal drain has been constructed, regular maintenance can be completed, under the direction of the drainage superintendent;
- To provide sufficient outlet for tile drainage a free flowing drain with a normal operating water level or drain invert (freeboard) 300mm below the invert of the lowest tile outlets to be serviced is to be provided;
- The limits of construction for the proposed Chenier-Jeaurond Municipal Drain commences within Lot 19, Conc. 1 at Station 6+525.5. The channel continues in a generally south-



- westerly direction, crossing under Bureau Road (between Lot 24/25, Conc 1) outletting to the Delisle River in Lot 30, Conc 1;
- The culverts and sediment control plan will be as per drawing No. 15041-A3;
 - A number of culverts will require replacement to increase capacity as listed in Table 5.4 and Table 5.5 of the Engineer's Report for the Chenier-Jearond Municipal Drain;
 - The culverts will be sized accordingly to the most current design standards and hydrologic/hydraulic information;
 - All culverts will be installed to follow the natural drainage path of the drain;
 - Work should ideally be conducted in the dry - see the generic dewatering mitigation measures below;
 - Tree removal will be kept to a minimum and will be limited to one side of the drain leaving one side of the drain intact;
 - The construction of the Chenier-Jearond Municipal Main Drain will be open channel with design grades, side slopes and ditch bottom widths as specified on the design profile Dwg. No 15041-P1 through 15041-P10 (inclusive) and Cross-Section Drawings No. 15041-C1 and 15041-C2;
 - The existing private/farm drain will be improved between Station 0+000 and Station 6+525.5 on the drain;
 - Associated with the drain improvements for the existing private/farm drain, erosion control measures will be placed at bends which are subject to erosion, at tile outlets, at culverts, confluences, and areas of bank instability. Erosion control measures will be of an engineering type, primarily rock protection with filter cloth;
 - Straw bale or rock flow check dams shall be installed as indicated in Standard Drawing No.3 and No.6 to prevent sediment passage from the upstream to the downstream side of the flow check, and shall be installed at all specified locations as per drawing No 15041-A2 and 15041-P1 through 15041-P10 (inclusive);
 - Accumulated sediment in sediment traps shall be removed as necessary to affect maintenance repairs and immediately prior to the removal of the flow checks;
 - To help protect the drain banks against erosion, all disturbed bank and spread soils shall be hand seeded within 48 hours of construction;
 - Areas where the drain passes through cropland, where soil erosion is now occurring, or land where the farmer indicates the intention of tilling the soil for continuous field crop production, a strip of uncultivated land (buffer strip) at least 5 m wide along the edge of the drain will be retained;
 - Erosion and sediment control works will be implemented and maintained throughout the length of the drain during and following construction until seeding becomes effective;
 - Finished channel will be as narrow and deep as possible;
 - Rock protection with filter cloth will be placed at typical areas as per drawing Nos 150410A2, 15041-P1 through 15041-P10 (inclusive) and standard drawing No. 1.
 - Riparian vegetation can be removed from either bank (not both);



- Work will minimize tree removal;
- Bends in channel to be stabilized;
- Channel ends of realignment sections, bends, storm sewer outlets, tile drain outlets, culverts and concrete structures and confluence of branch drain will be stabilized with rock protection with filter cloth;
- Work should be conducted during low flow conditions;
- The excavated material from the drain excavation shall be spread and seeded (except in areas of tilled agricultural fields). The excavated material shall be spread on the adjacent lands no closer than 5 metres to the top of slope (buffer strip);
- All work shall be done from land and only the bucket of the backhoe/heavy equipment shall enter the water;
- Equipment onsite will likely include but not be limited to: excavators, dump trucks and compaction equipment.

To reduce potential impacts to the environment we are requiring the following additional best management practices be included in your plans:

Sediment & Erosion Control Measures

- All erosion and sediment control practices will be monitored for stability and operation following every runoff-producing rainfall and also at a minimum of once per day. Any needed repairs will be made immediately to maintain proper operation of the system;

Deleterious Substances

- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt, debris, etc.) from entering the water.
- Any stockpiled materials should be stored and stabilized away from the water.
- Vehicle and equipment re-fuelling and maintenance should be conducted away from the water.
- Any part of equipment entering the water should be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the water.
- Construction material for the proposed shoreline protection will be free of organic materials refuse, garbage, animal waste, chemicals, toxic materials, hazardous substance, or any other substance which may be considered harmful to water quality or aquatic habitat.



Generic Dewatering Mitigation Measures:

- All in stream work should be completed *in the dry* by de-watering the work area and diverting and/or pumping flows around cofferdams placed at the limits of the work area.
- Existing stream flows should be maintained downstream of the de-watered work area without interruption, during all stages of the work. There should be no increase in water levels upstream of the de-watered work area.
- Flow dissipaters and/or filter bags, or equivalent, should be placed at water discharge points to prevent erosion and sediment release.
- Silt or debris that has accumulated around the temporary cofferdams should be removed prior to their withdrawal.
- Please note it is preferred that pea gravel bags are used over sand bags for the dewatering barrier dam;
- Sediment laden dewatering discharge should be pumped to a settling basin or filtering system well away from the watercourse and allowed to settle and/or filter through the riparian vegetation before re-entering the watercourse downstream of the construction area.

Please note that this permit does not release you of the responsibility for obtaining any other permits that may be required under federal, provincial or municipal legislation.

If you have any questions concerning the mitigation measures or should there be any changes to the proposed work, please contact the undersigned.

Sincerely,

RAISIN REGION CONSERVATION AUTHORITY

A handwritten signature in cursive script, reading "Lissa Deslandes".

Lissa Deslandes
Regulations Officer

Appendix F

Ministry of Natural
Resources and Forestry
Species at Risk - Letter of Advice

**Ministry of Natural
Resources and Forestry**

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**Ministère des Richesses
naturelles et des Forêts**

District de Kemptville

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Wed. Nov 25, 2015

Lorne Franklin
Robinson Consultants
350 Palladium Drive
Kanata
K2V 1A8
(613) 592-6060 ext 123
lfranklin@rcii.com

Attention: Lorne Franklin

Subject: Information Request - Infrastructure (Drain, Bridge, Culvert)
**Project Name: New Drain Construction under the Ontario Drainage Act, Bureau Rd.
Municipal Drain**
Site Address: south of County Rd. 10, east of River Rd., and north of Con Rd. 10
Our File No. 2015_LOC-3257

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the area in order to identify any potential natural resource and natural heritage values.

Natural heritage features and values contribute to the province's rich biodiversity and provide habitat for a variety of species. The following Natural Heritage values were identified:

- Evaluated Wetland, Glen Norman Swamp (Evaluated-Other)

Municipal Official Plans contain additional information related to natural heritage features. Please see the local municipal Official Plan for more information such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality.

Where natural values and natural hazards exist (e.g., floodplains), there may be additional approvals and permitting required from the local Conservation Authority. The MNRF strongly recommends contacting the local Conservation Authority for further information and approvals.

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Please see the MNRF Kemptville Information Guide (2012) for contact information pertaining to Conservation Authorities located within the Kemptville District area.

For additional information and online mapping tools, please see the Natural Heritage Information Centre (NHIC), where additional data and files can be downloaded in both list and digital format. In addition sensitive species information can be requested and accessed through the NHIC at NHICrequests@ontario.ca.

In Addition, the following Fish species were identified: American eel, banded killifish, blackchin shiner, blacknose shiner, bluntnose minnow, brassy minnow, brook stickleback, brown bullhead, central mudminnow, common carp, common shiner, creek chub, emerald shiner, fantail darter, fathead minnow, finescale dace, golden shiner, Iowa darter, johnny darter, johnny darter/tesselated darter, largemouth bass, logperch, longear sunfish, longnose dace, mimic shiner, muskellunge, North American Catfishes, northern redbelly dace, Notropis sp., Pimephales sp., pumpkinseed, rock bass, rosyface shiner, sand shiner, smallmouth bass, spottail shiner, stonecat, white sucker, yellow perch.

Water

Where the site is adjacent to or contains a watercourse or waterbodies, additional considerations apply. If any in-water works are to occur, there are timing restriction periods for which work in water can take place (see below). Appropriate measures should be taken to minimize and mitigate impact on water quality and fish habitat, including:

- including the installation of sediment and erosion control measures;
- avoiding removal alteration or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures should be put in place to manage falling debris (e.g. spalling).

A work permit from the MNRF may be required pending further details regarding the proposed works. No encroachment on the bed or banks of the waterbody (e.g. abutments, embankments, etc.) is permitted until MNRF approval and clearance has been issued. In order for MNRF staff to determine when a work permit is required, additional information can include:

- Detailed drawings (existing and proposed)
- Location mapping
- Registered Plan survey
- Site photographs
- Public Lands Act Forms - application forms, ownership form and landowner notification form.

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The MNRF does not have any water quality or quantity data available. We recommend that the Ministry of the Environment and Climate Change be contacted for such data along with the local Conservation Authority. For further information regarding fish habitat and protocols, please refer to the following interagency, document, *Fish Habitat Referral Protocol for Ontario* at: <http://www.MNRF.gov.ca/264110.pdf>

Timing restriction periods in MNRF Kemptville District*:

- Warmwater → March 15 – June 30
→ March 15 – July 15 for St. Lawrence River & Ottawa River
- Coldwater → October 1 – May 31
- Mixed lakes → October 1 – June 30 (Big Rideau & Charleston)

* Please note: Additional timing restrictions may apply as it relates to Endangered and Threatened Species, including works in both water and wetland areas.

	FISH SPECIES	TIMING WINDOW
Spring:	Walleye	March 15 to May 31
	Northern Pike	March 15 to May 31
	Lake Sturgeon	May 1 to June 30
	Muskellunge	March 15 to May 31
	Largemouth/Smallmouth Bass	May 1 to July 15
	Rainbow Trout	March 15 to June 15
	Other/Unknown Spring Spawning Species	March 15 to July 15

	FISH SPECIES	TIMING WINDOW
Fall:	Lake Trout	October 1 to May 31
	Brook Trout	October 1 to May 31
	Pacific Salmon	September 15 to May 31
	Lake Whitefish	October 15 to May 31
	Lake Herring	October 15 to May 31
	Other/Unknown Fall Spawning Species	October 1 to May 31

Additional approvals and permits may be required for the proposed works as it relates to the Fisheries Act. Please contact your local Conservation Authority and the Department of Fisheries and Oceans to determine requirements and next steps. Where the Fisheries Act is triggered and habitat compensation, mitigation measures or best management practices are being considered; as the MNRF is charged with the management of Provincial fish populations, the MNRF requests ongoing involvement in such discussions in order to ensure population conservation. Furthermore, local Conservation Authorities may also have additional approvals for works in and adjacent to water and wetland features. Finally, Transport Canada's Navigable Waters Protection Division

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may require review and approval of the proposed project. Please contact these local agencies directly for more information.

Timing restrictions apply from October 16 – March 15 to protect at-risk hibernating turtles. If the proposed works are to occur during this time, the MNRF recommends fencing off the site in early fall to prevent turtles from hibernating there. Caution should also be taken during the turtle nesting season in June and early July as turtles use embankments and other terrestrial site for nesting. During the active season (April 1 – October 30) the MNRF recommends a thorough sweep of the area before works begin to encourage any turtles using the site to move away.

Where drainage works are proposed within wetland areas, the MNRF is concerned is the impacts to the hydrology and ecology of the wetland, which may have impacts on species and their habitats. For example, changing water levels as a result of drainage works may impact turtles or nesting birds, some of which may be protected under legislation such as the Endangered Species Act or the Fish and Wildlife Conservation Act. Therefore a consideration for direct and indirect impacts to species and their habitats is imperative.

Where drainage works occur within the originally approved drainage footprint, as per the Drainage Act, there are no Public Land's Act requirements from the MNRF. However, other MNRF legislation may apply including, but not limited to the Endangered Species Act, 2007

MNRF is streamlining and automating its approvals processes for natural resource-related activities. Some activities that may otherwise contravene the ESA may be eligible to proceed without a permit from MNRF provided that regulatory conditions are met for the ongoing protection of species at risk and their habitats. To proceed under the regulation with ongoing maintenance and improvement of drainage infrastructure that would adversely affect endangered or threatened species or their habitat, a person must register with the Ministry of Natural Resources and Forestry and follow the rules in regulation.

For more information please check out the following link <http://www.ontario.ca/environment-and-energy/ditch-and-drainage-work-and-endangered-or-threatened-species>

Species at Risk

With the new Endangered Species Act (ESA, 2007) in effect, it is important to understand which species and habitats exist in the area and the implications of the legislation. A review of the Natural Heritage Information Centre (NHIC) and internal records and aerial photograph interpretation indicate that there is a potential for the following Threatened (THR) and/or Endangered (END) species on the site or in proximity to it:

- American Eel (END)

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- Barn Swallow (THR)
- Bobolink (THR)
- Butternut (END)
- Cutlip Minnow (THR)
- Eastern Meadowlark (THR)

All Endangered and Threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance of possible important habitat (e.g. nesting sites). Please note that as of June 30, 2013 general habitat protection applies to all Threatened and Endangered species. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. Please keep this date in mind when planning any species and habitat surveys

Species receiving General Habitat protection:

- American Eel (END)
- Barn Swallow (THR)
- Bobolink (THR)
- Butternut (END)
- Cutlip Minnow (THR)
- Eastern Meadowlark (THR)

If the proposed activity is known to have an impact on the species mentioned above or any other SAR, an authorization under the Endangered Species Act, 2007 (ESA) may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey and mitigation measures to avoid contravention of the ESA.

Habitat has been identified within the project area that appears suitable for one or more species listed by SARO as Special Concern (SC). In Addition, one or more Special Concern species has been documented to occur either on the site or nearby. Species listed as Special Concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act. Species of Special Concern for consideration:

- Monarch (SC)
- Snapping Turtle (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF

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should be contacted immediately and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

Please note that information regarding species at risk is based on documented occurrences only and does not include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. i.e.: Species at Risk (SAR) or their habitat could still be present at the location or in the immediate area. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed; or their habitat is not damaged or destroyed through the activities carried out on the site. The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the ESA (such as Section 9 or 10), the proponent must contact the MNRF to discuss the potential for a permit (Section 17). For specific questions regarding the Endangered Species Act (2007) or SAR, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca. For more information regarding the ESA (2007), please see attached ESA Information Sheet.

As of July 1, 2013, the approvals processes for a number of activities that have the potential to impact SAR or their habitat were changed in an effort to streamline approvals processes while continuing to protect and sustainably manage Ontario's natural resources. For those activities that require registration with the Ministry, businesses and individuals will be able to do so through a new online system. The online system will also include information to help guide individuals and businesses through the new processes. For further information on which activities are authorized through this new online registration process and how to apply, please refer to the following website: http://www.MNRF.gov.on.ca/en/About/2ColumnSubPage/STDPROD_104342.html. General inquiries may be directed towards Kemptville District MNRF, while questions and comments involving the new online forms can be directed to the Registry Approvals Service Centre (RASC) at 1-855-613-4256 or MNRF.rasc@ontario.ca.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species.
- Additional occurrences of species are discovered.
- Habitat protection comes into force for one of the above-mentioned species through the creation of a habitat regulation (see general habitat protection above).

**Ministry of Natural
Resources and Forestry**

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This letter is valid until: Thu. Nov 24, 2016

Sincerely,

Erin Seabert
Fish & Wildlife Technical Specialist
erin.seabert@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet

Appendix G

Department of Fisheries and Oceans
Class Authorization



Fisheries and Oceans Canada Pêches et Océans Canada

Central and Arctic Region
Fisheries Protection Program
867 Lakeshore Road
Burlington, Ontario
L7S 1A1

Région centrale et de l'Arctique
Programme de protection des pêches
876 chemin Lakeshore
Burlington, Ontario
L7S 1A1

May 27, 2016

Your file *Votre référence*

Our file *Notre référence*
16-HCAA-00461

Ryan Morton
Manager of Public Works
North Glengarry Township
90 Main Street P.O. Box 700
Alexandria, ON K0C 1A0

Dear Ryan Morton,

Subject: *Fisheries Act* Authorization

Pursuant to paragraph 35(2)(b) of the *Fisheries Act*, the Minister of Fisheries and Oceans Canada authorizes the carrying on of your proposed work, undertaking or activity that results in serious harm to fish arising from maintenance activities in Bureau Road Drain, a Class C Municipal Drain designated under the Provincial Drainage Act. A paragraph 35(2)(b) *Fisheries Act* authorization is attached.

A class authorization protects you from being liable under the *Fisheries Act* provided the specified conditions included in the authorization are adhered to. These include, in part, the requirement to complete a "Notification of Municipal Drain Maintenance Work" form for each drain being maintained, adherence to timing windows (when work may be undertaken), the use of sediment and erosion controls and other mitigation measures.

Failure to comply with any of the terms or conditions of the attached Authorization may lead to prosecution under the *Fisheries Act*.

A copy of this Authorization should be kept on site while the work is in progress and upon request be provided to relevant federal or provincial officials. Work crews should be familiar with, and able to adhere to, the conditions.

Note: None of the foregoing should be taken to imply Authorization of this undertaking in accordance with any Section of the *Fisheries Act* **other** than Section 35. Also note that an Authorization issued under the *Fisheries Act* does not release the proponent from the requirements of any other federal, provincial or municipal legislation.

Canada

If you or anyone conducting work on your behalf has any questions please contact Gary Cooper at our Burlington office at 905-336-6248 or by email at Gary.Cooper@dfo-mpo.gc.ca.

Yours sincerely,

A handwritten signature in cursive script that reads "Gary Cooper".

Gary Cooper
A/Team Leader Triage and Planning
Fisheries Protection Program
Fisheries and Oceans Canada

COPY: Lissa Deslandes, Raisin Region Conservation Authority,
Lorne Franklin, Robinson Consultants

ATTACHMENTS:

Notification of Drain Maintenance or Repair for Bureau Road Drain, received April 22, 2016

Fisheries Act Authorization, Class C Drain



FISHERIES ACT 35 (2)(b)AUTHORIZATION

Authorization issued to:

Drainage Superintendent or other municipal representative in Ontario as identified as, the Contact Name and Municipality on the “*Notification of Municipal Drain Maintenance Work*” form submitted for this work. (hereafter referred to as the “Proponent”)

Location of Proposed Project

Class C Drainage Systems in Ontario established under the authority of a municipal by-law under the Drainage Act in Ontario.

Description of Proposed Project

The proposed project of which the work, undertaking or activity authorized is a part involves:

Routine maintenance of an existing 'Class C Municipal Drain' to facilitate drainage activities

Description of Authorized work(s), undertaking(s) or activity(ies) likely to result in serious harm to Fish

The works, undertakings, or activities associated with the proposed project described above, that are likely to result in serious harm to fish, are:

- Any combination of, brushing of side slope (removal of riparian vegetation on one side only), bottom cleanout (removal of sediment to lower the elevation of the bed of the drain, as per the most recent Engineer's Report - Municipal Bylaw), partial bank reshaping, debris removal affecting the flow and full clean out.
- This Fisheries Act Class Authorization is restricted to be applicable only to drains as defined as "drainage works" under the Ontario Drainage Act and classified as Class "C" by Fisheries and Oceans Canada through the Agricultural Drain Classification Process. (Class C Municipal Drains have permanent flow, warm water temperatures and Commercial, Recreational, Aboriginal fish species tolerant to drain maintenance).

The serious harm to fish likely to result from the proposed work, undertaking, or activity, and covered by this authorization includes:

- Incidental death of fish through dredging activities associated with drain maintenance works.
- Permanent alteration and destruction of fish habitat in Class C Municipal Drains
- Type and sensitivity of fish habitat to be permanently altered or destroyed is defined as a 'Class C Municipal Drain' have permanent flow, warm water temperatures, and Commercial, Recreational, Aboriginal fish species tolerant to drain maintenance.
- Quantity of habitat impacted will vary depending on specific project location. The length of drain impacted and the duration of the work, as outlined in the form: Notification of Municipal Drain Maintenance Work Conducted under a Fisheries Act Subsection 35(2) Class Authorization.

Conditions of Authorization

The above described work, undertaking or activity that is likely to result in serious harm to fish must be carried on in accordance with the following conditions.

1. Conditions that relate to the period during which the work, undertaking or activity that will result in serious harm to fish can be carried on:

The work, undertaking or activity that results in serious harm to fish is authorized to be carried on during the following period:

From	To
March 15, 2014	March 14, 2017

If the Proponent cannot complete the work, undertaking or activity during this period, Fisheries and Oceans Canada (DFO) must be notified. DFO may, where it considers appropriate, provide in writing notice that the period to carry on the work, undertaking or activity has been extended.

The period during which other conditions of this authorization must be complied with are provided in their respective sections below.

2. Conditions that relate to measures and standards to avoid and mitigate serious harm to fish:

- 2.1 This Fisheries Act Class Authorization is restricted to be applicable only to drains as defined as “drainage works” under the Ontario Drainage Act and classified as Class “C” (defined above) by Fisheries and Oceans Canada.
- 2.2 No in-stream work or construction activity shall occur from **March 15th to June 30th**, without the specific written permission from DFO.
- 2.3 Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity.
- 2.4 The finished channel shall be as narrow and deep as possible within the specifications of the most recent Engineer’s Report (Municipal Bylaw).
- 2.5 A bottom clean-out involving bank reshaping shall include the following:
 - 2.5.1 Bank slopes shall be graded to a slope that will maintain bank stability. This value may vary depending on local conditions.
 - 2.5.2 Any bends in the channel shall be stabilized, to prevent erosion as required.
- 2.6 Work in water shall not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods.
- 2.7 Riparian vegetation shall not be removed (dug-out, root systems remains) on more than one side of the drain. Where riparian vegetation must be altered on one side, the shade producing side of the drain shall remain unaltered unless specified in the most recent Engineer’s Report (Municipal Bylaw).

-
- 2.8 Where riparian and bank vegetation has been removed, the proponent shall stabilize the banks to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
 - 2.9 All construction materials and equipment used for the purposes of site preparation and project completion shall be operated and stored in a manner that prevents any deleterious substances from entering the water.

3. Conditions that relate to monitoring and reporting of measures and standards to avoid and mitigate serious harm to fish:

- 3.1 The Proponent shall undertake monitoring and report to DFO, **within 60 days after the work** has been completed, whether measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this Authorization.
 - 3.1.1 Upon request, the proponent shall provide dated photographs, a site sketch, and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the serious harm to what is covered by this authorization.
 - 3.1.2 Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.

4. Conditions that relate to the offsetting for the serious harm to fish likely to result from the authorized work, undertaking or activity:

- 4.1 Offsetting measures shall be carried out according to the Notification Form approved by DFO and attached to the authorization.
- 4.2 All fish habitat offsetting measures shall be completed and functioning according to the criteria as described in the proponent's plan.
- 4.3 If the results of monitoring as required in condition 5 indicate that the offsetting measures are not completed by the date specified in condition 4.2, and/or are not functioning according to the above criteria, the Proponent shall give written notice to DFO and put in place contingency measures and associated monitoring measures, as contained within their approved offsetting plan, to ensure the offsetting is completed and/or functioning as required by this authorization.
- 4.4 Offsetting measures shall function as intended, and the Proponent shall not carry on any work, undertaking or activity that will adversely disturb or impact the offsetting measures.

5. Conditions that relate to monitoring and reporting of offsetting measures (described above in section 4):

- 5.1 The Proponent shall undertake monitoring, **within 60 days after the work** has been completed, to demonstrate that offsetting measures were conducted according to the conditions of this Authorization.
-

-
- 5.1.1 Upon request, the proponent shall provide the monitoring report to DFO with dated photographs, and a site sketch to demonstrate effective implementation and functioning of offsetting measures.
-

Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this Authorization and for all design, safety and workmanship aspects of all the works associated with this Authorization.

The holder of this authorization is hereby authorized under the authority of paragraph 35(2)(b) of the Fisheries Act, R.S.C., 1985, c.F. 14 to carry on the works, undertakings and/or activities that are likely to result in serious harm to fish as described herein. This authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This Authorization does ***not*** permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

At the date of issuance of this Authorization, no individuals of aquatic species listed under the *Species at Risk Act* (SARA) were identified in the vicinity of the authorized works, undertakings or activities. In the event that any such individuals are identified in this area, or in the event that an aquatic species found in this same area is listed under the SARA after this Authorization is issued, this Authorization does not permit the killing, harming, capture or taking of individuals of any such species (section 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).

The failure to comply with any condition of this authorization constitutes an offence under paragraph 40(3)(a) of the *Fisheries Act* and may result in charges being laid under the *Fisheries Act*.

This authorization must be held on site and work crews must be made familiar with the conditions attached.

This authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this authorization are expected to be sold or transferred, or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this authorization shall advise DFO in advance.

Date of Issuance: JUL 1 0 2014

Approved by: 
Dave Burden
Regional Director General
Central and Arctic Region
Fisheries and Oceans Canada
