

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /23

Being a by-law to provide for drainage works in Haldimand County within the McNichol Municipal Drain

WHEREAS Section 78 of the Drainage Act R.S.O 1990, c. D17 as amended provides for the updating of a drainage works described in the said Act;

WHEREAS the Council of the Corporation of Haldimand County has procured a report prepared by Robinson Consultants Inc of Ottawa, Ontario;

WHEREAS the estimated total cost of the drainage works is \$180,498.50;

WHEREAS \$70,771.57 of the total cost is to be contributed by the Corporation of Haldimand County;

WHEREAS \$137,112.90 of the total cost is being assessed to the landowners within the drainage area of Haldimand County for the drainage works;

AND WHEREAS Haldimand County Council is of the opinion that the drainage of the area is desirable,

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** the Engineer's Report dated June 23, 2023, attached to and forming part of this by-law, is hereby adopted, and the drainage works as indicated in the report are hereby authorized and shall be completed in accordance with the report.
2. **THAT** a special annual rate sufficient to recover the costs of the drainage work and associated interest costs shall be levied upon the lands and roads as set forth in Schedule C in the attached Engineer's Report, to be collected in the same manner and at the same time as other taxes are collected in each year for five (5) years after the passing of a by-law to levy the final costs.
3. **THAT** implementation of the recommendations contained in the Engineer's Report be carried out under the scheduled maintenance of the McNichol Drain.

4. **AND THAT** this by-law shall come into force and effect upon the third and final reading and may be cited as the "McNichol Municipal Drain By-Law, 2023".

READ a first and second time this 25th day of September, 2023.

READ a third time and finally passed this day of , 2023.

MAYOR

CLERK

Amendment to the
Engineer's Report for the
McNichol Municipal Drain
Haldimand County

Prepared For:



Prepared By:

Robinson Consultants Inc.
Consulting Engineers

Project No. 21071
June 2023

June 23, 2023

Mayor and Members of Council
Haldimand County
53 Thorburn St.
Cayuga, ON N0A 1E0

Attention: **Ms. Evelyn Eichenbaum**
 City Clerk

Reference: **Amendment to the Engineer's Report**
 McNichol Municipal Drain, Haldimand County
 Our Project No. 21071

Dear Ms. Eichenbaum:

This Amendment to the Engineer's Report for the McNichol Municipal Drain, which is respectfully submitted for Council's consideration, was initiated at the direction of Haldimand County under Section 78 of the Drainage Act, R.S.O. 1990, c. D17. The purpose of the report is to provide for modifications and improvements to ensure adequate outlet for the improved McNichol Municipal Drain.

All costs associated with the project, including the Engineer's Report, allowances and construction will be assessed against the property owners, road authorities and utilities in the drainage area of the McNichol Municipal Drain as indicated on Dwg. No. 21071-A3, and on the Schedules of Assessment.

If you have any questions, please feel free to contact Andy Robinson at (ajrobinson@rcii.com) or Lorne Franklin (lfranklin@rcii.com) at 613-592-6060 extension 123.

Yours very truly,

ROBINSON CONSULTANTS INC.



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



Lorne Franklin, L.E.T., C.E.T., rcca, CISEC
Licensed Engineering Technologist
Drainage Services

c.c. John Van Rooy, Project Manager – Municipal Drains, Haldimand County

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1.0 INTRODUCTION

1.1 Appointment

Robinson Consultants Inc. was appointed by Haldimand County in October of 2021 to complete an Engineer's Report on the McNichol Municipal Drain, for improvements and maintenance of the existing drain under Section 78 of the Ontario Drainage Act, R.S.O. 1990, c. D17.

The primary purpose of the proposed work is to update/replace the existing report and develop a fair and equitable distribution of costs. Additionally, the proposed work makes provisions to incorporate the existing drain and ensure adequate drainage/adequate outlet for surface drainage of the lands and roads within the drainage area. All proposed work is in general conformance with the existing drain but with modifications and improvements where necessary.

1.2 On-Site Meeting

An on-site meeting of the affected property owners and concerned parties was held on October 19, 2021, to discuss the project and provide public consultation as required under the Ontario Drainage Act, R.S.O. 1990, c. D17. The primary issues put forward by the property owners present at the meeting were as follows:

- Overall cost of the project
- Restoration of driveways and access during construction

1.3 History

The McNichol Municipal Drain is located in Poll 8 of Ward 5 in Haldimand County. The date of the original construction of the drain is unknown.

The McNichol Municipal Drain is governed by Haldimand County, however, the file in this regard is incomplete, with the original Engineer's Report not available.

1.4 Supplemental information and Consultation Meeting

In advance of finalization of the Engineer's Report, a supplementary information and consultation meeting (not specifically required under the Drainage Act) was completed to discuss the findings of the Engineer with the affected landowners and provide the opportunity for further input. The meeting was held on May 3, 2023, at Dunnville Memorial Arena.

Concerns expressed by the affected owners at the meeting included the following:

- A previous assessment levied December of 2022 for work completed in 2014/2015. Information in this regard was relayed by Municipal Staff at the meeting, however, it was noted that the assessment and previous work was not directly related to the proposed work or this Engineer's Report.
- The overall cost.
- Drainage from properties not directly on the drain (limited ability for improved drainage) – why should they pay?
- Next Steps

Ultimately, these questions/concerns were addressed at the information/consultation meeting. No additional considerations were required to be addressed by this Report. Therefore, it is our recommendation to proceed to distribution of the Engineer's Report, and to the "Meeting to Consider" as required under the Ontario Drainage Act, R.S.O. 1990, c. D.17.

2.0 PURPOSE OF THE DRAINAGE REPORT

Haldimand County initiated the Engineer's Report under Section 78 of The Drainage Act, R.S.O. 1990, c. D17 in order to ensure the Engineer's Report and By-Law are available in conformance with the Act and, propose improvements (where necessary) and ultimately to complete maintenance on the drain.

This Report makes provision for modifications, and improvements to ensure adequate outlet for the McNichol Municipal Drain, develops a schedule of assessment and ensures the file is complete and in conformance with the Act.

Environmental protection measures and standard Best Management Practices (BMP) will be implemented by the project as necessary and/or as prescribed by the environmental approving agencies, including the Grand River Conservation Authority (GRCA), Ontario Ministry of Environment Conservation and Parks (MECP) and the Federal Department of Fisheries and Oceans (DFO).

2.1 Modifications

Modifications to the existing McNichol Municipal Drain include establishing new profiles and cross sections for the existing portion of drain.

3.0 EXISTING CONDITIONS

3.1 Location of the Drain

The main drain identified by this report commences at Sta. 0+000 at the confluence with the Dent Municipal Drain. The drain continues in a north easterly direction to Bird Road (Sta. 0+467.57) and continues south easterly adjacent to Bird Road (as a roadside ditch) crossing under Jenny Jump Road (Sta.1+300.80 and ultimately to the upstream Limit of Construction (sta.1+535.22).

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

3.2 Drainage Basin and Limits

The drainage basin for the McNichol Municipal Drain includes parts of the following Lots and Concessions:

- Lots 9, Con. Range 2 (Grand River) to Lot 14, Con. Range 2 (Grand River)
- Lot 9, Con. Gore B
- Lot 19, Con. S. of Forks Rd. to Lot 24, Con. S. of Forks Rd.

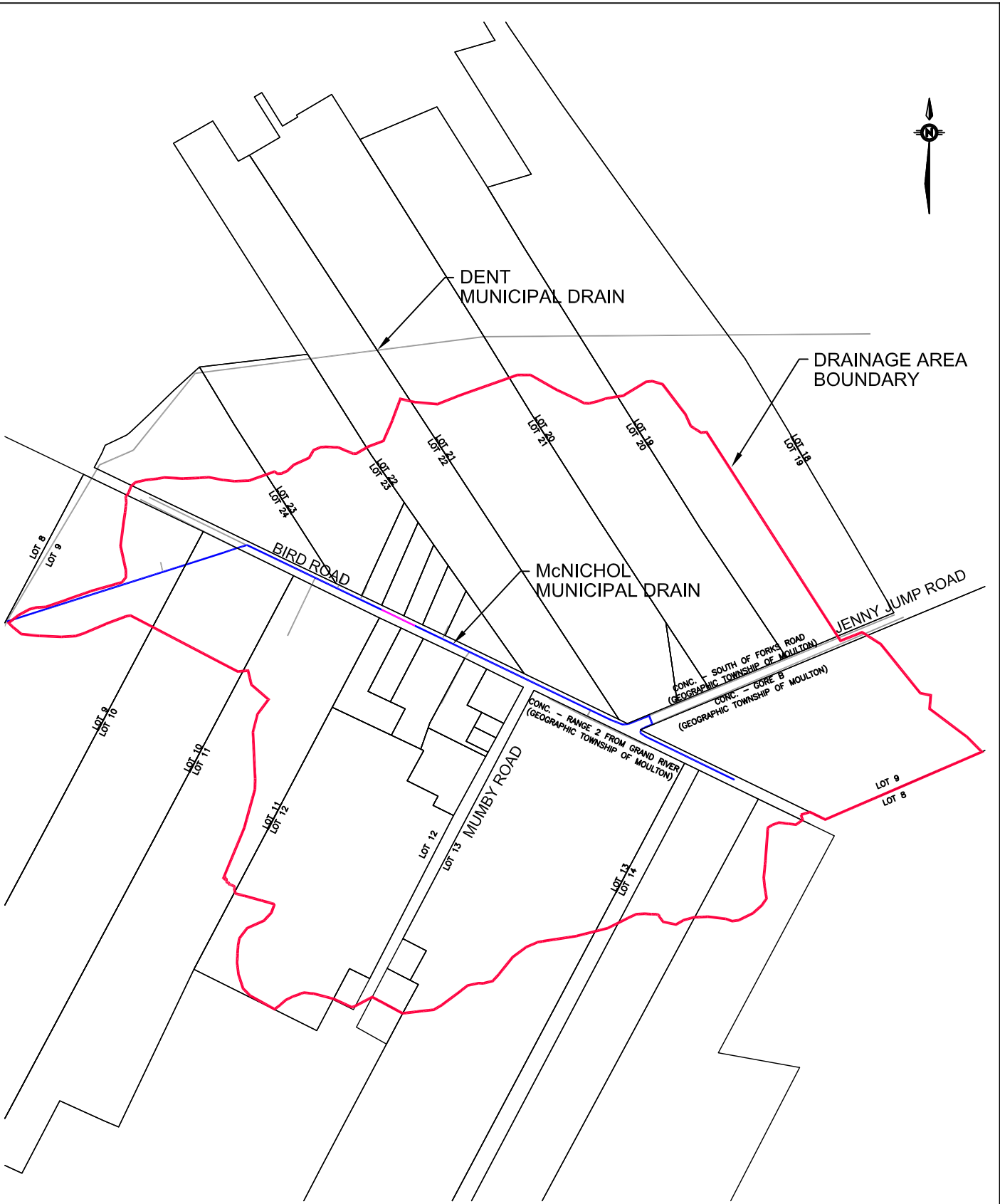
The drainage area is approximately 116 hectares (287 Acres). The limits of the Drainage area (drainage basin) are shown on Dwg. No. 21071-A1. These limits have been determined by contour mapping, LiDAR data provided by the County of Haldimand and the provincial Digital Elevation Model (DEM), field reconnaissance 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

Dwg. No. 21071-A1 – “Drainage Area Plan” has been prepared showing the drainage area boundary as a bold heavy dash-dot-dot line (red when provided in color), and the existing (incorporated) drain as heavy solid line (blue where provided in colour).

Dwg. No. 21071-A2 - “Culvert and Sediment and Erosion Control Plan” has been prepared showing the location of any existing and proposed (where applicable) culverts as well as minimum measures required for construction phase sediment and erosion control including rock check dams, sediment traps and permanent erosion control (rock protection).

Dwg. No. 21071-A3 – “Property Ownership Information Plan” has been prepared showing property information including a property ID No. (for reference to schedules), property lines, and the portion of the property contributory to the drainage basin.



Robinson
Consultants

Title		LOCATION PLAN	Fig. No.
Project		McNICHOL MUNICIPAL DRAIN	3.1
Scale		NTS	Job No.
Date		MAR 2023	21071

Profiles of the existing (incorporated) drain are shown on Dwg. Nos. 21071-P1 through 21071-P3 inclusive. The profile shows the existing bottom of the ditch, the original ground for channel sections, existing/known tile outlets or side culverts (as surveyed), existing/proposed culverts and the proposed profile.

Cross-Sections of the proposed Municipal Drain are shown on Dwg. No. 21071-C1 which indicate the existing and proposed sections through typical portions of the proposed drain. Two-Stage channel design is also indicated (where applicable).

All plans, profiles and cross-sections are provided in **Appendix A** of this report. Applicable Ontario Provincial Standard Drawings and/or Robinson Consultants Inc. Standard Detail Drawings are also provided in **Appendix A**.

3.4 Special Provisions

Special provisions for the construction and future maintenance of this municipal drain are included in **Appendix B**.

4.0 AREA REQUIRING DRAINAGE

The area requiring drainage under this report for Amendments to the McNichol Municipal Drain is set in general conformance with the area prescribed to the McNichol Municipal Drain within the larger drainage area for the Dent Municipal Drain and may be described as parts of the following Lots and Concessions:

- Lots 9, Con. Range 2 (Grand River) to Lot 14, Con. Range 2 (Grand River)
- Lot 9, Con. Gore B
- Lot 19, Con. S. of Forks Rd. to Lot 24, Con. S. of Forks Rd.

Flows are to be conveyed downstream to a sufficient outlet. In this case, sufficient outlet was determined by the Drainage Engineer to be the Dent Municipal Drain.

5.0 DESIGN CONSIDERATIONS

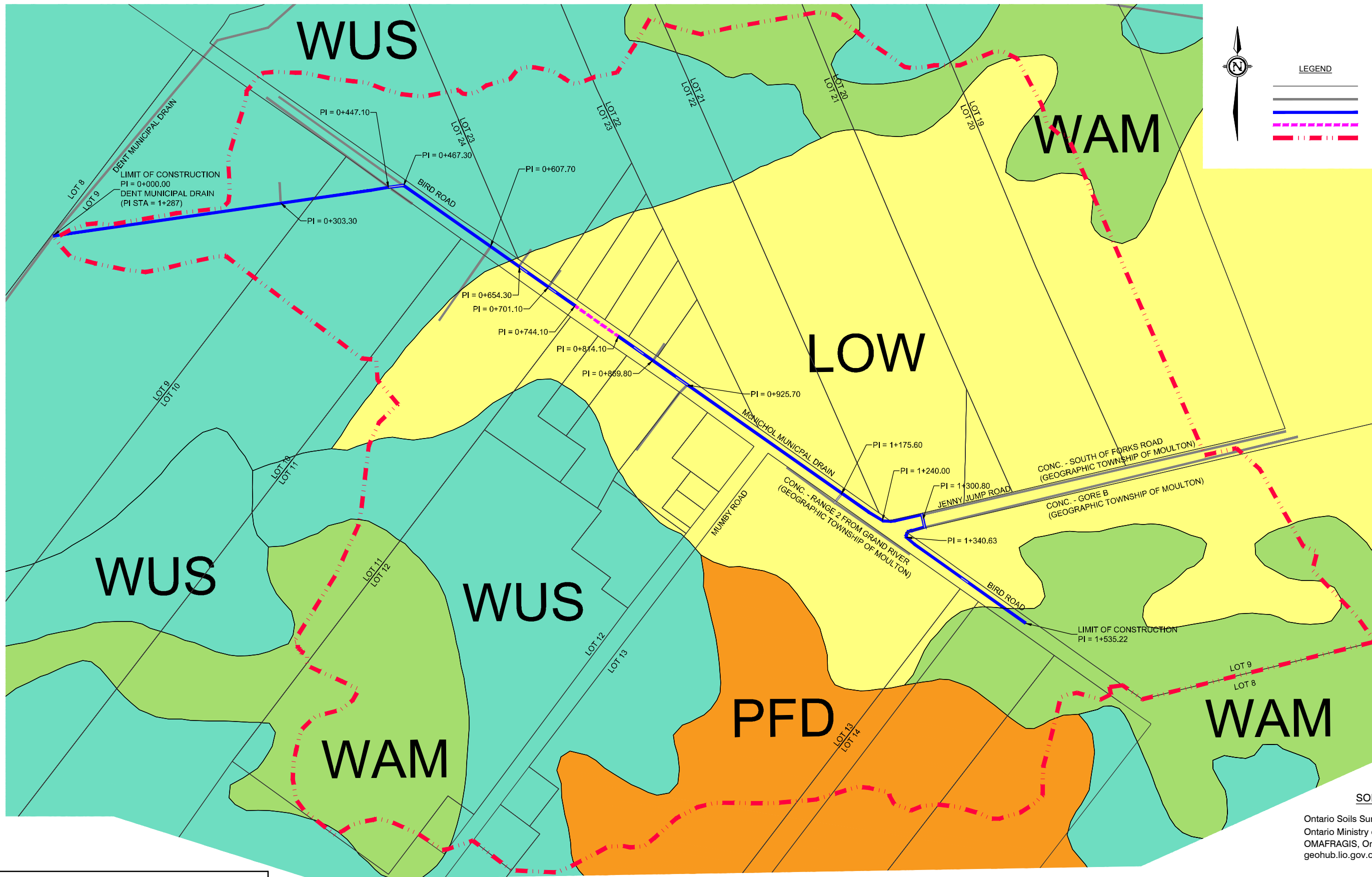
5.1 Soil Characteristics

The Soils within the basin are predominantly sand-loams and silty-clays.

Soil types have been determined utilizing the following information sources:

“Ontario Soil Survey Complex”, Ontario Ministry of Agriculture Food and Rural Affairs – OMAFRAGIS, Ontario GeoHub, available at geohub.lio.gov.on.ca

Soil groups found within the McNichol Municipal Drain watershed are listed in **Table 5.1** and shown on **Figure 5.1**.



LEGEND	
	PROPERTY LINE
	EXISTING WATERCOURSES
	MUNICIPAL DRAIN (OPEN DRAIN)
	MUNICIPAL DRAIN (ENCLOSED DRAIN)
	DRAINAGE AREA BOUNDARY

SOILS MAP SOURCE
 Ontario Soils Survey Complex
 Ontario Ministry of Agriculture Food and Rural Affairs
 OMAFRAGIS, Ontario GeoHub
 geohub.lio.gov.on.ca. Last updated Nov. 29, 2019

NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
1	17.06.22	ISSUED FOR COUNTY AND AGENCY REVIEW	AJR
2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR

SCALES	
25	50
HORIZONTAL	

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DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY	
McNICHOL MUNICIPAL DRAIN	

SOILS	
-------	--

PROJECT No.	21071
CONTRACT No.	
DATED	MAR 2023
DWG. No.	FIG 5.1

Table 5.1
Soil Descriptions

Soil Type	Symbol	Description	HSG	CN (Crop)	CN (Pasture)	CN (Woodlot)
Lowbanks	LOW	Lowbanks	D	86	81	77
		Loamy fine Sand				
		Drainage /Slope 0-2% slope and with very poor drainage				
Plainfield	PFD	Plainfield	B	74	65	58
		Fine sand				
		Drainage/Slope 6-9% slope and rapid to well-draining				
Walsingham	WAM	Walsingham	A	66	58	50
		Fine sand				
		Drainage/Slope 2-5% slope with imperfect drainage				
Wauseon	WUS	Wauseon	C	82	76	71
		Sandy textures over lacustrine silty clay				
		Drainage/Stoniness/Slope 0-2% slope with poor drainage				

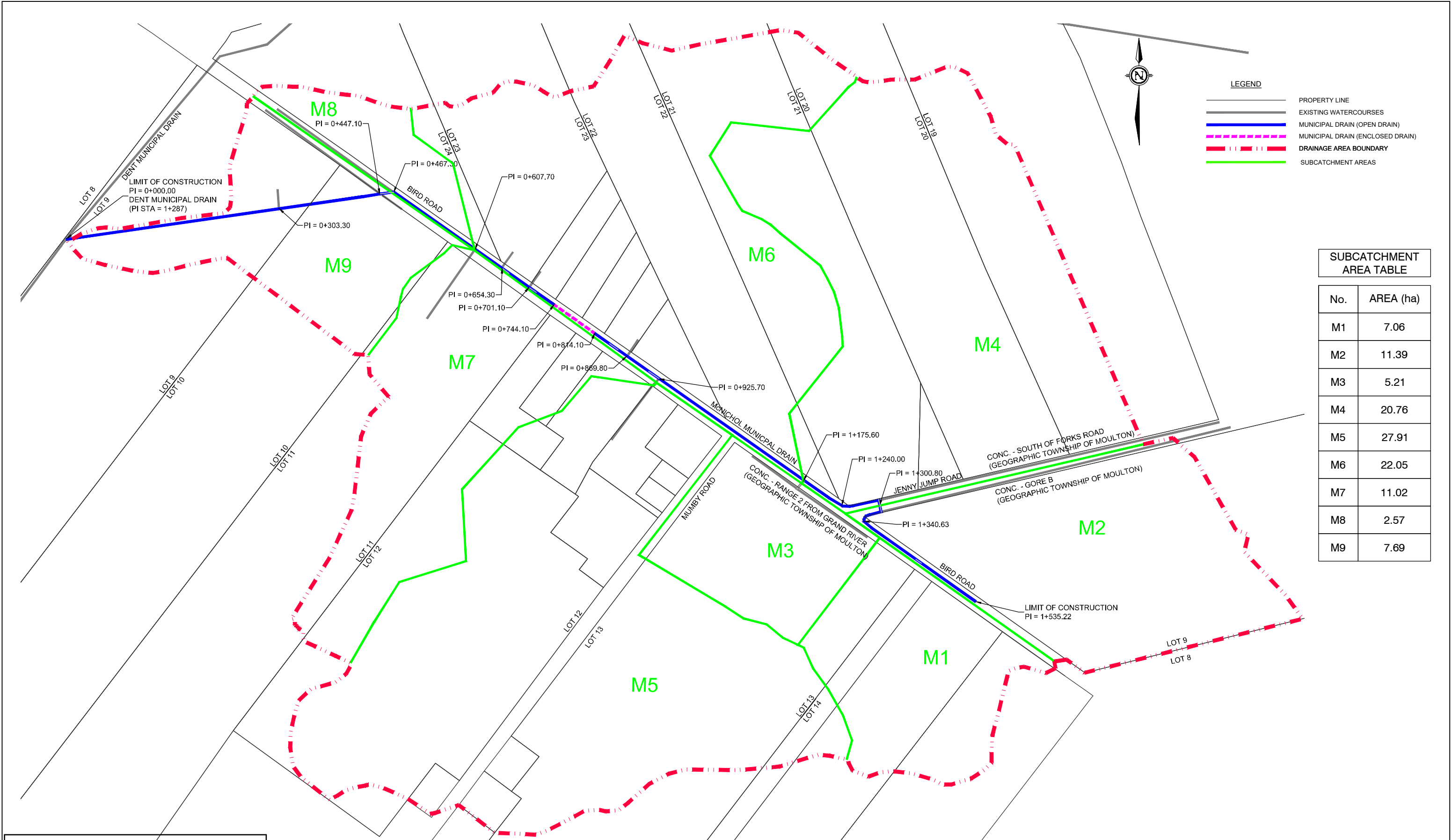
5.2 Hydrologic Modelling – Rational Method

Due to the size of the drainage area being just over 100 ha, the rational method equation $Q = 0.00278CIA$ was selected as the most appropriate method to calculate flow estimates.

- Q = Peak Flow (m³/s)
- C = Weighted Runoff Coefficient for the Catchment Area
- I = Rainfall Intensity (mm/hr)
- A = Drainage Area (ha)

5.3 Hydrologic Modeling Results

The rainfall-runoff relationship of the McNichol Municipal Drain was evaluated for existing land use conditions. This provided flow estimates for the watershed under existing conditions. The total instantaneous peak flows at key locations along the Drain are 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 sub-catchment, or the outlet of the sub-catchment basin.



SUBCATCHMENT AREA TABLE	
No.	AREA (ha)
M1	7.06
M2	11.39
M3	5.21
M4	20.76
M5	27.91
M6	22.05
M7	11.02
M8	2.57
M9	7.69

NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
1	17.06.22	ISSUED FOR COUNTY AND AGENCY REVIEW	AJR
2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR

SCALES	
25	50
HORIZONTAL	

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DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY	
McNICHOL MUNICIPAL DRAIN	

SUBCATCHMENT AREAS	
--------------------	--

PROJECT No.	21071
CONTRACT No.	
DATED	MAR 2023
DWG. No.	FIG 5.2

The proposed channel can accommodate flows for the 5-year design storm event. Capacities of the proposed channel for the McNichol Municipal Drain range from 0.902 m³/s to 8.373 m³/s.

Table 5.2
Peak Flow Estimates
Existing Conditions

Location	Peak Flow (m ³ /s)					
	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
Jenny Jump Road						
Sta. 1+300.8	0.100	0.133	0.154	0.199	0.073	0.275
Bird Road Crossing						
Sta. 1+175.6	0.131	0.174	0.201	0.260	0.315	0.360
Bird Road Crossing						
Sta. 0+925.7	0.167	0.220	0.255	0.330	0.399	0.456
Bird Road Crossing						
Sta. 0+607.7	0.316	0.417	0.484	0.625	0.757	0.865
Bird Road Crossing						
Sta. 0+457.2	0.400	0.528	0.612	0.791	0.957	1.094
Dent Municipal Drain						
Sta. 0+000.0	0.546	0.721	0.836	1.081	1.309	1.495
Total Drainage Area						
	0.546	0.721	0.836	1.081	1.309	1.495

5.4 Secondary Flow Check

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, 50, and 100 year design storms. Rainfall hydrograph ordinates for the various events were calculated using data obtained from MTO IDF Curve Lookup which uses Environment Canada data sets for coordinate: 42.904167, -79.570833. 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 9 sub-catchments and 6 channel reaches. Each sub-catchment, shown on Figure 5.2, was described by the various hydrologic parameters required by the model.

The watershed was modeled using the CALIB WILHYD routine.

The CALIB WILHYD routine 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 parameter reflects all runoff related phenomena such as infiltration, interception, and depression storage. The time to peak, and shape factor were calculated using the Federal Aviation Agency (FAA) Airport Method.

Using this method, the flow for the full drainage area for the 25 year event was found to be 0.81m³/s. This is approximately 28.2% less than the Rational Method peak flow.

5.5 Side Slopes (Typical Cross Section)

The existing and proposed side slopes (typical bottom width of 1.0m and minimum 2:1 side slopes) at various sections of the McNichol Municipal Drain are as shown on Drawing No. 21071-C1.

To address fisheries concerns a two-stage profile is incorporated into the profile and cross-section at 300mm above the proposed profile. The two-stage profile is described in further detail in Section 5.9 of this Report.

5.6 Capacity of Culverts

5.6.1 General

The capacities of existing culverts along the McNichol Municipal Drain were calculated using MTO nomographs. 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
Existing Conditions

Location	Existing Capacity (m ³ /s)	Peak Flow (m ³ /s)					
		2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
Access Culverts							
Sta. 1+436.4	0.15	0.100	0.133	0.154	0.199	0.073	0.275
Sta. 0+916.9	0.9	0.316	0.417	0.484	0.625	0.757	0.865
Sta. 0+847.2	0.47	0.316	0.417	0.484	0.625	0.757	0.865
Sta. 0+801.6	0.63	0.316	0.417	0.484	0.625	0.757	0.865
Sta. 0+707.4	0.63	0.316	0.417	0.484	0.625	0.757	0.865
Sta. 0+660.8	0.63	0.316	0.417	0.484	0.625	0.757	0.865
Sta. 0+016.4	7.25	0.546	0.721	0.836	1.081	1.309	1.495

Table 5.3 cont'd
Summary of Culvert Capacities
Existing Conditions

Location	Existing Capacity (m ³ /s)	Peak Flow (m ³ /s)					
		2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
Roadway Culverts							
Sta. 1+300.8 (Jenny Jump Road)	0.12	0.100	0.133	0.154	0.199	0.073	0.275
Sta. 0+457.2 (Bird Road)	0.75	0.400	0.528	0.612	0.791	0.957	1.094

Note: For culverts, existing capacity is based on inlet control with a HW/D equal to 1 for comparison purposes only.

5.6.2 Culverts Requiring Replacement

The farm/residence access culverts that require replacement as part of this contract to increase the capacity and/or lowering to accommodate the new drain profile are listed in **Table 5.4**

The access culverts that require replacement under future maintenance are listed in **Table 5.5**.

The road culverts that require replacement as part of this contract to increase the capacity and/or lowering to accommodate the new drain profile are listed in **Table 5.6**

Road culverts are not required to be replaced under the current/proposed maintenance as they are generally considered to be of satisfactory condition, capacity and grade/elevation but may be replaced as necessary under future maintenance are listed in **Table 5.7**.

Table 5.4
Capacities of Farm/Residence Access Culverts
that Require Replacement or Installation as Part of this Report

Culvert No. and Location	Design Return Period (year)	Existing		Proposed	
		Capacity (m ³ /s)	Size (mm)	Capacity (m ³ /s)	Size (mm)
Access Culverts					
McNichol Municipal Drain					
Sta. 1+436.4**	5	0.15	1- 450mm Ø CSP	0.2***	1- 500mm Ø CSP
Sta. 0+425.0	5	N/A	N/A	0.9	1- 900mm Ø CSP
Sta. 0+016.4	5	7.25	1- 2100mm Ø steel culvert	N/A	To be removed

Note: For culverts, existing capacity is based on inlet control with a HW/D equal to 1 for comparison purposes only.

***Note: For culverts denoted (**), proposed capacity is for the 25 year design event. Culvert sizing was determined based on municipality's minimum culvert sizing requirements.*

****Note: This culvert is replaced to meet minimum standard size requirements. The capacity provided by the minimum size culvert exceeds the requirements of the 5 year design requirement.*

Table 5.5
Capacities of Farm/Residence Access Culverts
that Require Replacement Under Future Maintenance

Culvert No. and Location	Design Return Period (year)	Existing		Proposed	
		Capacity (m ³ /s)	Size (mm)	Capacity (m ³ /s)	Size (mm)
Access Culverts					
McNichol Municipal Drain					
Sta. 0+916.9	5	0.9	1- 900mm Ø CSP	0.63	1- 800mm Ø CSP
Sta. 0+847.2	5	0.47	1- 700mm Ø CSP	0.63	1- 800mm Ø CSP
Sta. 0+801.6	5	0.63	1- 800mm Ø CSP	0.63	1- 800mm Ø CSP
Sta. 0+707.4	5	0.63	1- 800mm Ø CSP	0.63	1- 800mm Ø CSP
Sta. 0+660.8	5	0.63	1- 800mm Ø CSP	0.63	1- 800mm Ø CSP

Note: For culverts, existing capacity is based on inlet control with a HW/D equal to 1 for comparison purposes only.

Table 5.6
Capacity of Roadway Culverts that
Require Replacement as Part of this Report

Culvert No. and Location	Existing		10 yr return Period		25 yr return Period	
	Existing Capacity (m ³ /s)	Existing Size (mm)	Proposed Capacity (m ³ /s)	Proposed Size (mm)	Proposed Capacity (m ³ /s)	Proposed Size (mm)
Roadway Culverts						
Jenny Jump Road*** Sta. 1+300.8	0.12	1- 400mm Ø CSP	0.14	1- 600mm Ø CSP	0.33	1- 600mm Ø CSP

Note: For culverts, existing capacity is based on inlet control with a HW/D equal to 1 for comparison purposes only.

****Note: Roads as noted (***) were assumed to be local roads and were sized for the 10 year return period on Drawing No. 21071-P2. If the road authority classifies these roads as collector or arterial roads, the existing roadway culvert may be replaced with the culvert size proposed for the 25 year return period.*

Table 5.7
Capacity of Roadway Culverts
that Require Replacement under Future Maintenance

Culvert No. and Location	Design Return Period (year)	Existing		Proposed	
		Capacity (m ³ /s)	Size (mm)	Capacity (m ³ /s)	Size (mm)
Roadway Culverts					
Sta. 0+457.2** (Bird Road)	25	0.75	1- 850mm Ø CSP	0.9	1- 900mm Ø CSP

Note: For culverts, existing capacity is based on inlet control with a HW/D equal to 1 for comparison purposes only.

***Note: Culverts as noted (**) are undersized and/or off-grade but within acceptable tolerances and, as such, may remain in place until such time as they are required to be replaced (poor condition) under future maintenance or otherwise at the discretion of the Drainage Superintendent.*

5.7 Clearing

Property owners are advised that the Contractor will clear only those trees which may affect its operation within the working space. All necessary trees will be cleared and those 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 the wood may be salvaged by

the property owners. All trees under 150mm diameter, 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).

5.8 Excavation

The construction of the McNichol Municipal Drain will be an open channel with design grades, side slopes and ditch bottom widths as specified on the design profile Dwg. Nos. 21071-P1 through 21071-P3, and Cross-Section Dwg. No. 21071-C1.

The existing Drain will be improved between Station 0+000 and Station 1+535.22 of the McNichol Municipal Drain.

Associated with the drain improvements for the existing 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.

To address fisheries concerns, a two-stage profile is incorporated into the profile and cross-section at 300mm above the proposed profile. The two-stage profile is described in further detail in Section 5.9 of this Report.

5.9 Fisheries Act and Special Design Considerations

The Grand River Conservation Authority (GRCA) in conjunction with the Department of Fisheries and Oceans (DFO) typically provides a drain classification for Municipal Drains in this area. At the time of this report, the McNichol Municipal Drain is classified as not rated (NR) by DFO.

The McNichol Municipal Drain consists generally of steeper gradients, with some differential grade at the outlet (to the Dent Municipal Drain – NR), limiting backwater and fish passage and serves a limited drainage area. As such, the McNichol Municipal Drain is anticipated to provide conditions typically associated with a Class F drain.

In conjunction with preliminary review of this Engineer's Report consultations were conducted with the GRCA, the Ontario Ministry of Environment Conservation and Parks (MECP) and the Federal Department of Fisheries and Oceans (DFO) to refine parameters of the design which 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 and fish or endangered species (which may exist in the general vicinity) have been incorporated into this report and the related plans and specifications.

5.9.1 Class F Municipal Drains

Typical conditions for a “Class F” drain include periods of the year where the drain is subject to low or no flows, may be periodically dry and has no sensitive species present which use the drain. As such, where work is completed within the prescribed time frame, there is a limited impact on fish and fish habitat.

The proposed work provides for continued (generally unmodified) capacity and it is not anticipated that the work will change the nature of the drain or the fish utilizing the drain. As such, Robinson Consultants Inc. proposes the standard conditions for the maintenance of a “Type F” Municipal Drain be implemented for the reconstruction of the drain.

Typical conditions for work on a “Type F” Municipal Drain are listed below:

- Timing - All work to be completed within prescribed timing windows.
- Complete all work in dry or low flow conditions.
- Seed all banks within 48 hours of construction.
- Sediment control features to be in place prior to the commencement of work and to remain in place until permanent features (such as vegetation) are in place.

When implemented these measures are anticipated to protect water quality and fish habitat.

5.9.2 Special Considerations

Reconstruction is proposed to be completed from the south side of the drain where there are areas of bank instability to be addressed. The primary method for addressing bank instability will be slope flattening (to the standard 2h:1v side-slope).

During construction a series of check dams will be installed to the relevant Ontario Provincial Standard (Rock Check Dam – OPSD 219.211) to control sediment movement to downstream areas. Where prescribed, sediment traps will be constructed upstream and in conjunction with check dams. Sediment Traps are constructed as per Robinson Consultants Inc. Std. Dwg. I (a modified version of OPSD 219.220). The standard sediment trap excavation is 500 mm deep and 15 meters long, with the width as per the prescribed width of the channel for the section where installed. 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 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 complete with sediment traps (where specified), will be installed at locations as shown on Dwg. No. 21071-A2.

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.

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. 21071-A2.

Other erosion or sediment control works may be implemented by the contractor, if reviewed by the Drainage Engineer, in an effort to maintain the required sediment free conditions downstream of the work area.

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.

Tree removal may be required, however, there are limited or no known locations.

Where possible, excavation will be limited to one side of the drain 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. 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.

In preliminary consultation and review by the DFO, it was recommended that a two-stage profile was implemented. Where implemented, one half of the prescribed bottom width is constructed to the proposed profile and the alternate half is constructed at 300mm above grade or, where the existing grade is lower than 300mm above the proposed grade the area remains untouched (areas are not filled to meet the grade).

Where possible, the lowest existing portion of the drain is to form the first (lower) stage and the second stage is constructed from the higher grade. Where additional width is prescribed the second stage is constructed on the side of the drain where the width construction is completed. Therefore, Stage 1 of the two-stage channel is provided by

the existing bank (to remain undisturbed) with the bottom maintained as necessary to the proposed profile. Additional width excavation then commences from the bank where construction is to be completed (300mm above the proposed grade) to the specified channel width and forms stage 2 of the two-stage profile.

5.10 Mitigation Measures

Typical measures recommended by the reviewing environmental authorities, including (but not limited to) the Grand River Conservation Authority (GRCA), Ministry of Environment Conservation and Parks (MECP), Ministry of Natural Resources and Forestry (MNRF) and the Department of Fisheries and Oceans (DFO) for the type of work are listed below. When implemented, these measures should allow for reasonable mitigation of the proposed reconstruction.

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

- Finished channel to be as narrow and deep as possible.
- Riparian vegetation can be removed from either bank (preferably 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 requirements associated with Species at Risk (SAR) legislation are included in the Special Provisions of this report.

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 GRCA, MNRF, MECP and DFO. Where applicable, the permit conditions will be incorporated into the construction contract.

5.11 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. Typically, the construction and spreading is completed on the north/east side of the drain. However, the alternate side may be prescribed by the Drainage Engineer in consideration of special circumstances (i.e., where clearing is not required for disposal). The excavated material shall be spread and seeded, except in areas of tilled agricultural fields, which will be spread but not seeded.

All material shall be spread on the adjacent lands no closer than 5 meters to the top of the slope and no further than the prescribed working space outlined in Section 10.0. All material shall be spread to a maximum depth of 150mm for agricultural fields, and 300mm for non-agricultural fields.

Seeding is to be completed as soon as possible after the channel is excavated (within 48 hours of construction) 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.

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.

Hard-pan shall be disposed of on the adjacent property, in an area of the property designated by the property owner, subject to review by the Drainage Engineer.

Any non-suitable material, such as rock, boulders, or garbage/debris, shall be disposed of the material off the site at a location arranged for by the Contractor and agreed to by the Drainage Engineer.

Property owners may procure a Contractor privately, at the expense of the property owner, to dispose of the excavated material off site, subject to approval by the Drainage Engineer. It remains the responsibility of the property owner to adhere to all applicable legislation, including excess soil regulations, for the disposal and transportation of such material.

In areas of smaller lots up to 2 Ha in size, the access corridor will be limited to 8 metres in width and all excavated material will be removed from the area and disposed of off site in accordance with excess soil regulations.

For Developed areas (adjacent to Bird Road), from station 0+450 to Sta. 1+535.22 all excavated material will be removed off-site to a location provided for by the contractor and reviewed by the Contract Administrator.

5.12 Permit Requirements and Underground Utilities

The Contractor is expected to fill out an application for an encroachment permit within the County right-of-ways prior to the commencement of construction. It is also expected for underground utility lines to be encountered during the construction of the project. A copy of the drawings must be submitted by the contractor to all area utilities, so 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 Conservation and Parks (MECP) registration or a Permit-To-Take-Water provided the prescribed procedures are met. The Contractor may be required to obtain a Permit-To-Take-Water (PTTW) from the MECP should its methodology exceed the MECP conditions for exemption.

5.13 Site Access and Access Plan

It is intended, for the purpose of construction and future maintenance, that 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, Dwg. No. 21071-A2.

Wherever 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 property owner 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 the following shall be required:

For agricultural areas, all disturbed banks, and a 5 metres buffer strip adjacent to the drain shall be hand seeded. Beyond the 5-meter buffer strip, spoils are not to be seeded. It is anticipated that property owners will till these areas and fields will be returned to normal crop production.

For non-agricultural areas all disturbed banks and a 5 metres buffer strip adjacent to the drain shall be hand seeded. Beyond the 5-meter buffer strip, spoils are to be seeded in areas where clearing and grubbing has occurred. However, where spreading is placed around trees and/or over brush, seeding is not to be placed as it is anticipated these areas will be subject to natural regeneration.

All identified areas are to be seeded a maximum of 48 hours after construction, except for the 5-meter buffer strip. The 5-meter buffer strip can be seeded once work in the working area has been completed.

The seed mixture (or an alternate reviewed by the Drainage Engineer) 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%

Canada Bluegrass establishes a deep creeping root system and tough sod ideal for stabilizing low-fertile rocky or clay soils and is drought, flood, and salt tolerant. Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation which 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

Buffer strips are recognized to 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 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 the owners take hay off this buffer strip, but 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, installed in conformance with the standards associated with the type of fence. Where fence crosses the drain, fence is to be installed in conformance with Robinson Consultants Inc. Std. Dwg. H, provided in **Appendix A**.

6.4 Rock Protection

Associated with the drain improvements, Rock Protection with filter cloth will be placed at typical areas as per Dwg Nos. 21071-A2, and 21071-P1 through 21071-P3, and Standard Drawings as provided in **Appendix A**. 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 significant bends (RCI Std. Dwg. D)
- Rock Protection at storm sewer outlets (OPSD 810.010)
- Rock Protection at tile drain outlets (RCI Std. Dwg. F)
- Rock Protection at culverts and concrete structures (RCI Std. Dwg. C)
- Rock Protection at confluence of branch drains (RCI Std. Dwg. E)
- Rock Protection at areas of current or on-going erosion (RCI Std. Dwg. D)

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), constructed as per RCI Std. Dwg. I (a modified version of OPSD 219.220). Flow Check Dams, installed to the relevant Ontario Provincial Standard (Rock Check Dam – OPSD 219.211) are constructed directly upstream in conjunction with sediment traps.

Where sediment control features are proposed for rock-cut areas, sediment trap excavation is only completed to the extent of existing rock (no rock removal for sediment traps) and the check dam control feature is installed as scheduled.

Standard Drawings are provided in **Appendix A**.

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

Flow Check Dams, installed to the relevant Ontario Provincial Standard (Rock Check Dam – OPSD 219.211) shall be installed as indicated to prevent sediment passage from the upstream to the downstream side of the flow check at all locations as specified on Dwg Nos. 21071-A2 and 21071-P1 through 21071-P3.

6.5.4 Long-Term Use

Excavated sediment basins will remain in place following removal of the flow check. It is anticipated 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, R.S.O. 1990, c D.17 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). Definitions of each of the above noted considerations are provided along with additional details in **Appendix E**.

The primary considerations for the calculation of assessments are as follows:

- **Benefit** - Consideration for the advantages provided to any lands or roads by the Municipal Drain. Typically, these advantages may include (but are not limited to) a higher market value, increased crop production, improved appearance, or better control of surface or subsurface water, etc. Assessment for Benefit is typically made to all properties directly adjacent to the Municipal Drain.
- **Outlet** - All lands and roads that ultimately use the Municipal Drain (by direct or indirect contribution of flow) as an outlet are assessed a portion of the cost for Outlet. Assessment for Outlet is based on location, area, and rate of flow which are given consideration via modifying factors (see "Factors Affecting Assessment", below).
- **Special Benefit** - Special Benefit is typically considered where a special feature or consideration is required for a property that is not otherwise required for the function of the drain. This may include (but is not limited to) additional culverts or improved culvert length, ornamental features, special alignment considerations, improvements to accommodate land use changes, etc. The cost of the special feature is assessed as a Special Benefit to the property where it is provided.
- **Injuring Liability** – Injuring Liability is typically considered where there is no other reasonable means to provide sufficient outlet. An allowance is given to the properties that are "injured" by the insufficient outlet and an assessment made against all other properties that contribute flow.

7.2 Factors Affecting Assessment

Assessments are based on location, area, and rate of flow for each property within the overall drainage area. To account for these considerations the following modifying factors are applied:

- **Maintenance Section(s)** – The Municipal Drain may be split into one or more “Maintenance Sections”. This consideration allows for factors to be adjusted where work for construction and future maintenance is completed. This factor accounts for how much of the drain each property uses and allows for other factors such as the Distance Factor to be applied (reducing assessments the further away from the drain that the property is located). Maintenance Sections and Distance Factors are indicated on **Figure 7.1** following this page.
- **Sub-Section** – Each Maintenance Section is further divided into sub-sections to account for where flow from an individual property or group of properties enters the Maintenance Section. This factor ensures that a property is not assessed for the portion of the Maintenance Section upstream of where the property enters the drain, therefore, is not utilized by the property.
- **Land Use Factor** - A land use factor is provided to account for the varying use and nature of the land. Lands considered typical or standard throughout the drainage area (agricultural or other rural land use) are applied a LUF of 1.0 where lands considered to have a lower runoff are applied at a factor of less than 1.0 (reducing assessment) and lands with greater runoff are applied a factor of greater than 1.0 (increasing assessment) to account for the increased or decreased flow and usage of the drain.
- **Grants** – Grants for eligible agricultural properties may be offered by the Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) under the Agricultural Drainage Infrastructure Program (ADIP). Program availability and property eligibility requirements are dynamic and subject to change.
- **Allowances** – Allowances may be offered to affected properties for land lost due to the widening of the existing drain/watercourse and/or for crops lost due to construction. Allowances are not provided for future maintenance.

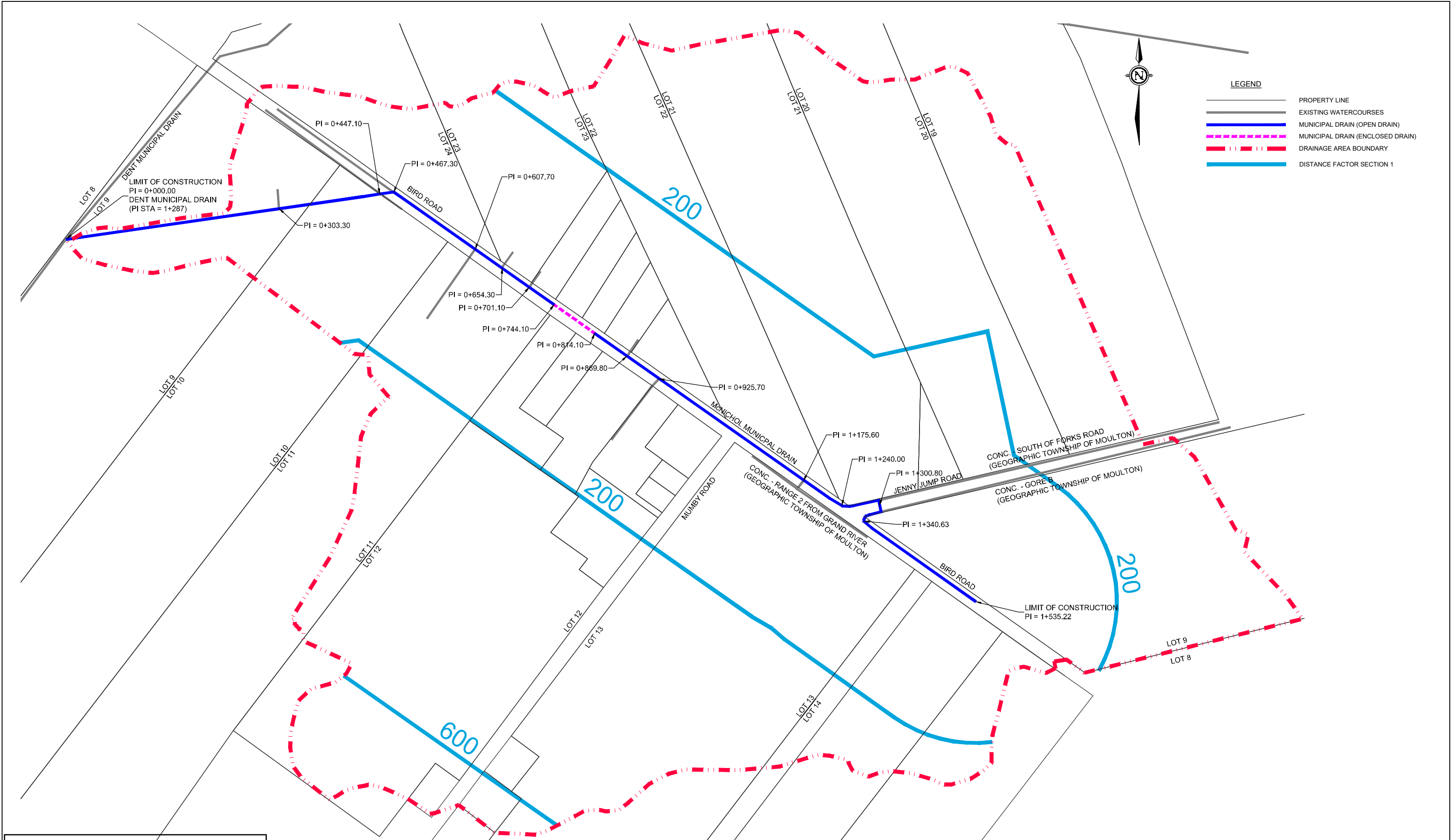
Additional details of these Factors Affecting Assessment are provided in **Appendix E**.

7.3 Injuring Liability

There are no Injuring Liability Assessments for this Municipal Drain.

7.4 Assessment for Special Benefit

A special Benefit is assessed to each Road Authority for consideration of engineering any requirements (culvert sizing, etc.) and/or any special requirements related to road drainage for work downstream of the location (impacts of adjacent crossings, etc.).



LEGEND

	PROPERTY LINE
	EXISTING WATERCOURSES
	MUNICIPAL DRAIN (OPEN DRAIN)
	MUNICIPAL DRAIN (ENCLOSED DRAIN)
	DRAINAGE AREA BOUNDARY
	DISTANCE FACTOR SECTION 1

NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
1	17.06.22	ISSUED FOR COUNTY AND AGENCY REVIEW	AJR
2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR

SCALES

25	0	50
HORIZONTAL		

Robinson
Consultants

350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcil.com

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY
McNICHOL MUNICIPAL DRAIN

DISTANCE FACTORS
PROJECT No. 21071
CONTRACT No.
DATED MAR 2023
DWG. No. FIG 7.1

No private property owner Special Benefits are anticipated for this project.

Any assessment for Special Benefit for initial construction is shown on the Schedules of Assessment (**Appendix C**) as "Assessment for Special Benefit" and is calculated in the Detailed Cost Estimate (**Appendix D**).

7.5 Assessments to Landowners

7.5.1 Initial Construction

All costs associated with this report, the initial design, allowances, other costs, and construction are as a result of the land use changes to accommodate the proposed development and will be paid for by the property owners within the drainage area as shown on Dwg. 21071-A3.

7.5.2 Future Maintenance

Following the completion of the initial construction, the cost for any future maintenance is to be distributed to all property owners within the drainage area as shown on Dwg. 21071-A3 and in the Schedule of Assessment for Future Maintenance. As part of this Engineer's Report an assessment schedule has been developed for the McNichol Municipal Drain that reflects an equitable distribution of costs for future maintenance. The Schedule of Assessment for Future Maintenance is provided in **Appendix C**.

7.6 Maintenance Sections

For consideration of the assessments, this drain has one (1) maintenance section. The land area, land use factor, section or subsection factor and distance factor have been entered into an Excel spreadsheet for the section of the drain.

In developing the Assessment Schedule for future maintenance, the cost for outlet and benefit has been set to reflect the relative use of the drain by immediate benefiting property owners including the property owners in the commercial/urbanized part of the watershed. The Assessment Schedules have been developed with the percentage split between Outlet Assessment and Benefit Assessment as follows:

Summary Schedule of Assessment

Section 1	Sta. 0+000.00 to Sta. 1+535.22
	<ul style="list-style-type: none">• Outlet Assessment – 95%• Benefit Assessment – 5%

Details with regard to the consideration of maintenance sections are provided in **Appendix E**.

7.7 Grants

Properties currently eligible (at the time of this report) for grants are marked with a “*” notation in the “ADIP (Grant) Eligibility” column of the Schedules of Assessment.

Details with regard to grant eligibility are provided in **Appendix E**.

7.8 Allowances

Properties eligible for allowances are marked with a “**” notation in the “Allowance Eligibility” column of the Schedules of Assessment.

The parcels of land that have been granted allowances associated with the initial construction are outlined in the Schedule of Allowances provided in **Appendix D**.

Details with regard to the calculation of allowances are provided in **Appendix E**.

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 property owners in the drainage basin in accordance with Schedule A, Summary Schedule of Assessment. The total allowance, which must be paid directly to the affected property owners, and a description for the purpose of the allowances is contained in Section 8.2. The amount of the allowances is included in **Appendix D**. The total cost of the improvements to the McNichol Municipal Drain is included in **Table 8.1**. A detailed cost estimate is included in **Appendix D**.

It is noted that the costs provided are based on 2023 estimates. However, it is not the intent of the Municipality to complete the construction directly following this report (see Section 12 for details). As such, costs are dynamic and subject to change at the time of construction.

Table 8.1
Cost Estimate Summary
McNichol Municipal Drain

Item	Section 1	Total
Routine		
Construction	\$ 66,533.00	\$ 66,533.00
Contingency	\$ 8,000.00	\$ 8,000.00
Engineering/Administration	\$ 90,737.50	\$ 90,737.50
Other (Incl. Allowances)	\$ 15,228.00	\$ 15,228.00
Sub-Total - Routine	\$ 180,498.50	\$ 180,498.50

Table 8.1 cont'd
Cost Estimate Summary
McNichol Municipal Drain

Item	Section 1	Total
Special Benefit		
County - Road Authority - Jenny Jump	\$ 32,789.05	\$ 32,789.05
County - Road Authority - Bird Road	\$ 10,596.55	\$ 10,596.55
Sub-Total - Routine	\$ 43,385.60	\$ 43,385.60
Net Total (Assessed to Properties)	\$ 137,112.90	\$ 137,112.90

8.2 Allowances

Where applicable, allowances as outlined in Section 7 of this report are provided to affected properties.

Allowances are deducted from the total assessment. Payment to a property owner may be made where the amount of the allowance exceeds the value of the assessment.

8.3 ADIP Grants

Where applicable, at the time of assessment, grants (subject to program availability and property eligibility) as prescribed by the Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) within the Agricultural Drainage Infrastructure Program (ADIP) policies and outlined in Section 7 of this report can be deducted from the assessment of the properties that qualify for the grant.

9.0 LOCATION OF TILE DRAIN OUTLETS

Tile drainage and tile outlets are anticipated to be encountered within the Drainage Area for the McNichol 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 RCI Std. Dwg. F.

10.0 WORKING SPACE

As per S.63(1) of the Ontario Drainage Act, R.S.O. 1990, c. D.17 (provided below) a "Working Space" must be available for the purpose of construction and future maintenance.

63 (1) The contractor and the contractor's assistants when engaged in the construction, maintenance, improvement, or repair of a drainage works may, with their equipment, enter upon whatever lands are necessary to complete the work within the working space designated in the engineer's report. R.S.O. 1990, c. D.17, s. 63 (1).

For the purpose of construction and future maintenance, the standard Working Space adjacent to the drain must be available along the side that is best suited for construction. In some sections of the drain, it may be necessary to complete construction or maintenance from both sides of the drain.

The designated Working Space is set at 25 m from the top of bank (each way) from Sta. 0+000 to Sta. 0+457.2 and is necessary to allow construction to be carried out and excavated material to be spread. The designated Working Space is set at 8 m from the top of bank from Sta. 0+457.2 to Sta. 1+535.2 along the north (property) side of the drain to allow access for maintenance where necessary.

It is recommended that the working space be kept free of permanent obstructions including (but not limited to), plantings (trees), non-removable fences, structures and/or other permanent landscaping features.

Access to the Working Space for the purpose of construction, inspection or maintenance is restricted to persons prescribed under the authority of the Ontario Drainage Act, R.S.O. 1990, c. D.17 being the Drainage Engineer (or assistants) – S.12(1), the Contractor (or assistants) – S.63(1) and/or the Drainage Superintendent (or assistants) – S.95(3). Where possible (excluding emergencies) it is required that a minimum 48 hours advance notice (in writing) or direct communication with the affected property owner be provided before accessing the drain working space.

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 to prepare and process a revised report, or if the desired works are considered to be a gross error in accordance with the Drainage Act, an application can be made to the Agricultural, Food and Rural Affairs Appeal Tribunal (Drainage Tribunal) pursuant to Section 58(4) of the Drainage Act, R.S.O. 1990, c. D17 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 so no detrimental effect to the drain or its maintenance results.

12.0 CONSTRUCTION AND FUTURE MAINTENANCE

At the time of this report, Haldimand County indicated that the existing drain is considered to be in a good state of repair and in general conformance with the requirements of this report. As such, it is the Municipality's intent to not complete the initial construction until 2029. At that time, Engineering review and any required inspection must be completed such that the Drainage Engineer may provide the required Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) "Certification" that the drain is constructed in conformance with this report. Following the initial construction, the Drain may be maintained at the discretion of the Municipality.

Future maintenance of the Drain shall be the responsibility of Haldimand County, although the individual owners shall be responsible for periodic inspection of the drain and reporting maintenance problems to the County.

The cost of future maintenance is to be assessed in proportion to the Schedule of Assessment for the Construction and Future Maintenance of the McNichol Municipal Drain, excluding allowances and special benefits. Maintenance costs are to be assessed on a pro rata basis for the subsection where maintenance is completed, summarized in Schedule A, and provided in **Appendix C** of this report.

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 and Outlet (excluding Special Benefits) in the Schedule 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 McNichol Municipal Drain considered under the terms of this report, including channel and erosion control maintenance, shall be the responsibility of the Haldimand County as previously noted.

Maintenance of public road culverts shall be the responsibility of the Road Authority; however, if the Road Authority does not complete the maintenance, then the County will complete the maintenance and charge the cost to the Road Authority.

As per the conditions of the Drainage Act and the Agricultural Drainage Infrastructure Program (ADIP/Grants), property owners are entitled to one standard crossing per property dissected by the drain. Culverts identified and prescribed by this Report form part of the drain for construction and future maintenance. At the discretion of the Drainage Superintendent, owners may seek approval for additional or non-standard crossings (increased length, decorative headwalls, etc.). Where reviewed, these items do not form part of the report and are the responsibility of the associated owner. Additional features installed without written approval may be removed as necessary during maintenance (at the cost of the property owner and will not be replaced.

Future maintenance of tile outlets shall be the responsibility of and shall be at the cost of the affected property owners.

13.0 MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS SPECIES AT RISK

The Ministry of the Environment, Conservation and Parks (MECP) – Ontario is responsible for review with regard to the Endangered Species Act (ESA) Legislation.

Endangered Species are dynamic and subject to change. Additional screening and general awareness of local Species at Risk (SAR) is recommended for any/all construction or maintenance activities. Information with regard to currently identified (at the time of this report) Species at Risk are provided in the following sections.

13.1 MECP Specified Endangered Species

The draft Engineer's Report for the McNichol Municipal Drain was circulated to Ministry of Environment Conservation and Parks (MECP) for review and screening with regard to the Endangered Species Act. A copy of the screening report and any associated advice is provided in **Appendix F** of this Report. MECP identified species are as listed below.

Species	Type	SAR Level
American Badger (Southwestern Ontario population)	Mammal	Endangered
American Eel	Fish	Endangered
Bank Swallow	Bird	Threatened
Barn Swallow	Bird	Threatened
Black Redhorse	Fish	Threatened
Blanding's Turtle	Reptile	Threatened
Cerulean Warbler	Bird	Threatened
Chimney Swift	Bird	Threatened
Eastern Foxsnake (Carolinian population)	Reptile	Endangered
Eastern Hog-nosed Snake	Reptile	Threatened
Eastern Pondmussel	Mussel	Endangered
Eastern Whip-poor-will	Bird	Threatened
Fawnsfoot	Mussel	Endangered

Species	Type	SAR Level
Fowler's Toad	Amphibian	Endangered
Gray Ratsnake (Carolinian population)	Reptile	Endangered
Hickorynut	Mussel	Endangered
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Fish	Endangered
Least Bittern	Bird	Threatened
Lilliput	Mussel	Threatened
Mapleleaf Mussel	Mussel	Special Concern
Round Hickorynut	Mussel	Endangered
Round Pigtoe	Mussel	Endangered

For specific species, standard mitigation and avoidance measures were determined to be not applicable (as per consultation with the MECP). However, an exemption may be made available at the time of construction (where applicable). Subsequent to this determination, Robinson Consultants Inc. contracted Natural Resource Solutions Inc. to provide services for “background and agency correspondence” and a more detailed “site investigation and SAR screen”. The NSRI – Species at Risk (SAR) and Species of Special Concern (SCC) Screening Table is provided in **Appendix F**. For species identified in Table with indication that species and/or habitat are present within the working area further actions that must be completed in advance of proposed 2029 construction are detailed in a follow-up e-mail by NSRI, (dated Feb 13, 2023), a copy of which is provided in **Appendix F**.

At the time of this report, an exemption/permit would be available for the proposed construction provided the conditions in the NSRI report are met. However, it is noted that exemption/permit conditions are subject to change and may vary at the time of proposed construction.

14.0 GRAND RIVER CONSERVATION AUTHORITY PERMIT

Review of the proposed work area regarding Conservation Authority Regulations is completed in conjunction with draft circulation for agency review. The draft Engineer's Report for the McNichol Municipal Drain was circulated to Grand River Conservation Authority (GRCA) for review and permit. The GRCA provides permission under the Conservation Authorities Act, O. Reg. 150/06, for the “Development, Interference with Wetlands and Alterations to Shorelines and Watercourses”.

A copy of the Permit under O. Reg. 150/06 including conditions was requested and will be in **Appendix G** once received.

15.0 DEPARTMENT OF FISHERIES AND OCEANS

Review of the proposed work area regarding Fisheries Act Regulations is completed in conjunction with draft circulation for agency review. 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.

In conjunction with the Draft Engineer's Report, consultation was conducted with the DFO to determine suitable mitigation measures so work may be completed with no net impact on fish and fish habitat.

Robinson Consultants proposed the implementation of modified Class Authorization measures, typical of a "Class F" Municipal Drain. Implementation of these measures will minimize or eliminate the impact on this or adjacent watercourses, fish or fish habitat and have been incorporated into this report and the related plans and specifications.

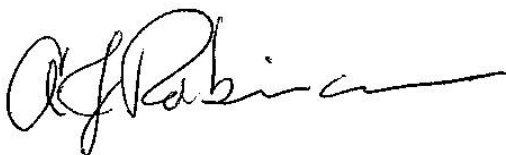
A copy of the Authorization under the Fisheries Act including conditions is included in **Appendix H**.

16.0 PERMITS AND AUTHORIZATIONS

All required permits and authorizations required for the initial construction, including, but not limited to, Department of Fisheries and Oceans (DFO), Ministry of Environment Conservation and Parks – Species at Risk (MECP-SAR), the Grand River Conservation Authority (GRCA) and Ontario Ministry of the Environment Conservation and Parks (MECP) have been applied for in conjunction with the preparation of the Engineer's Report and, where applicable, are provided in **Appendix F, G and H**.

All of which is respectfully submitted,

ROBINSON CONSULTANTS INC.



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



Lorne Franklin, L.E.T, C.E.T., rcca, CISEC
Licensed Engineering Technologist
Drainage Services



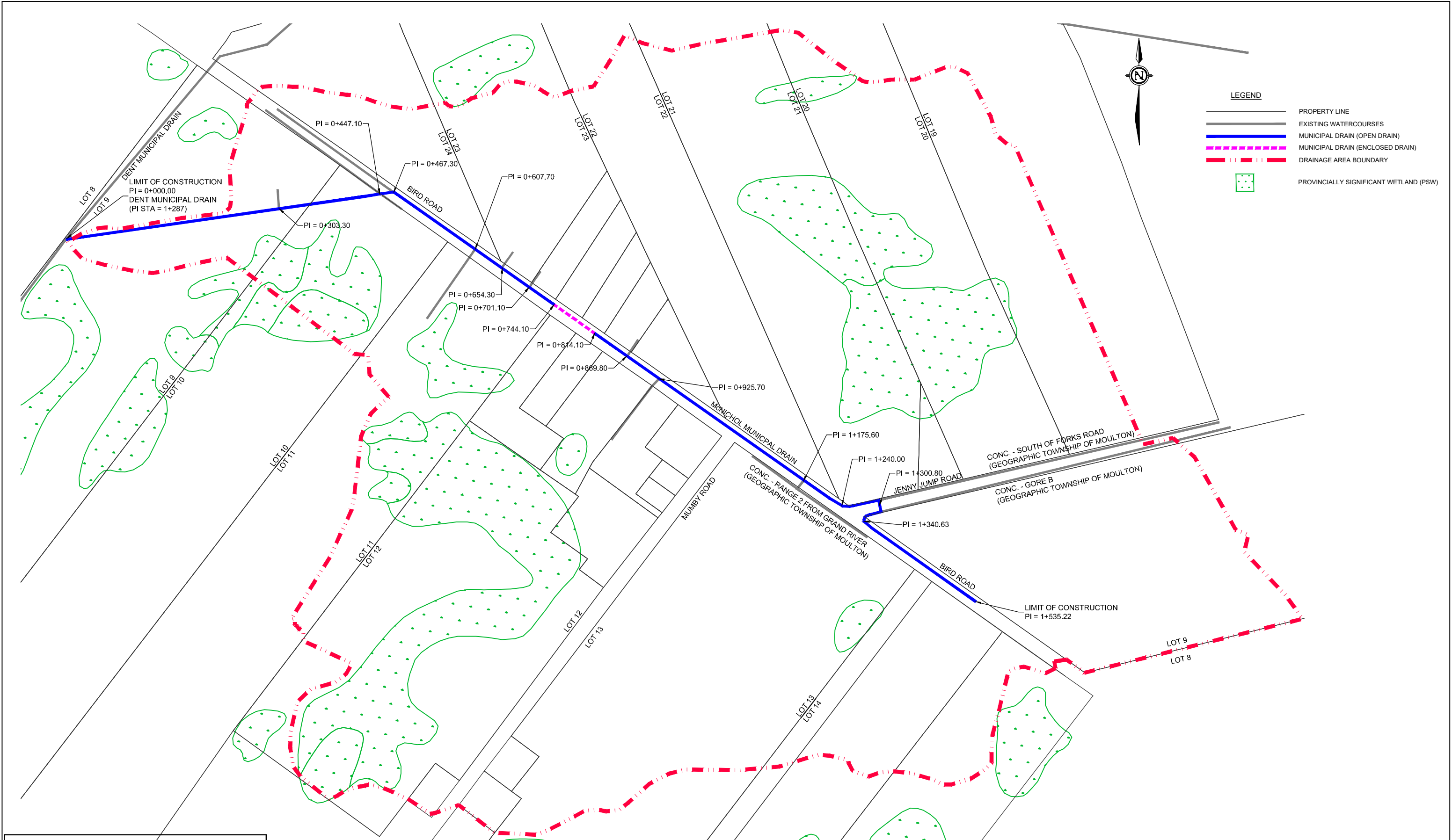
Professional Engineers
Ontario
23/06/23
Licensed Engineering Technologist

Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.

Association of Professional Engineers of Ontario

Appendix A

Drawings and Details



NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
1	17.06.22	ISSUED FOR COUNTY AND AGENCY REVIEW	AJR
2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR

SCALES
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HORIZONTAL

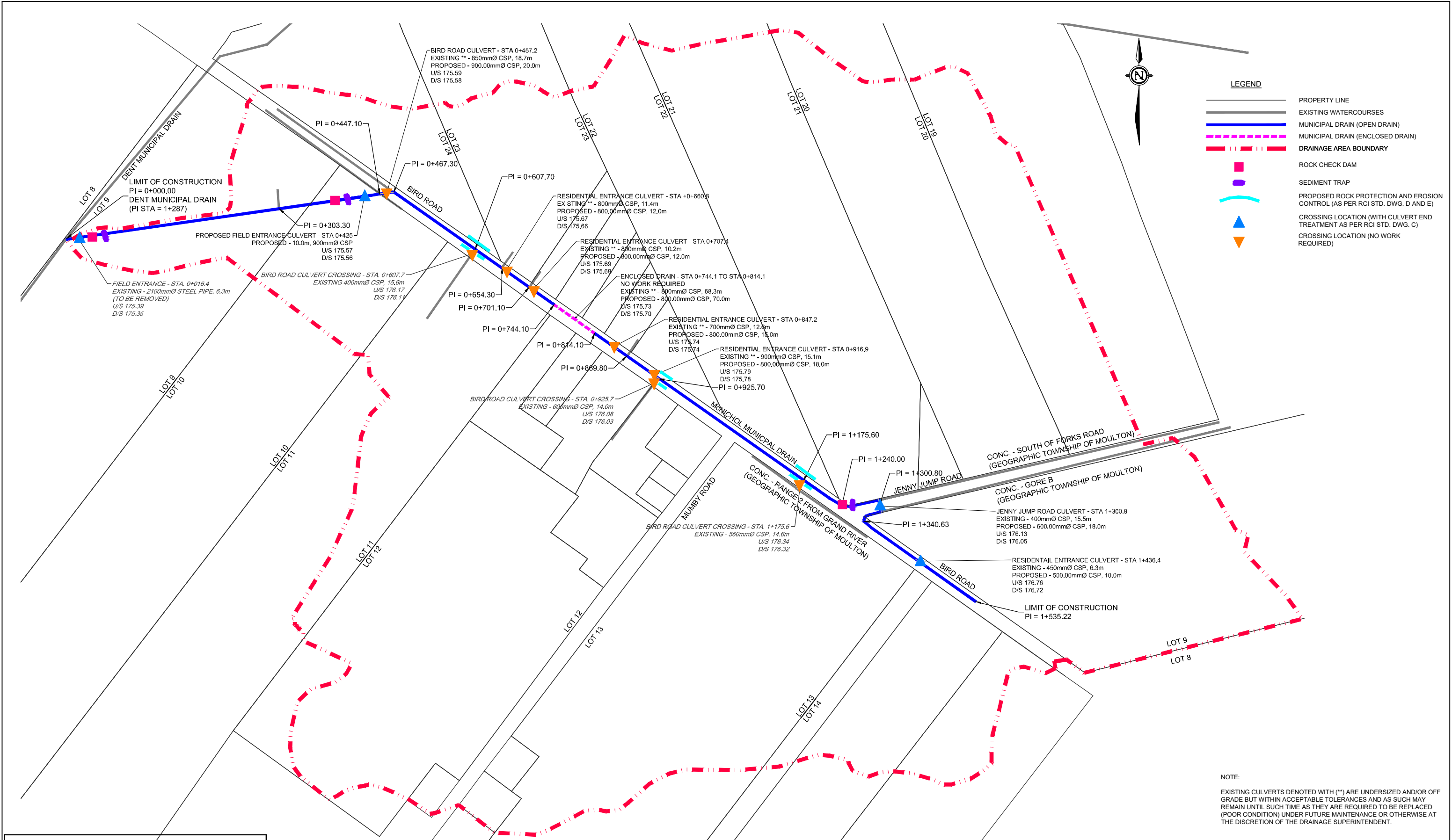
Robinson
Consultants

350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcil.com

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY
McNICHOL MUNICIPAL DRAIN

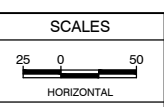
DRAINAGE AREA PLAN
PROJECT No. 21071
CONTRACT No.
DATED MAR 2023
DWG. No. 21071-A1



NOTE:
 EXISTING CULVERTS DENOTED WITH (**) ARE UNDERSIZED AND/OR OFF GRADE BUT WITHIN ACCEPTABLE TOLERANCES AND AS SUCH MAY REMAIN UNTIL SUCH TIME AS THEY ARE REQUIRED TO BE REPLACED (POOR CONDITION) UNDER FUTURE MAINTENANCE OR OTHERWISE AT THE DISCRETION OF THE DRAINAGE SUPERINTENDENT.

NOT FOR CONSTRUCTION

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2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR



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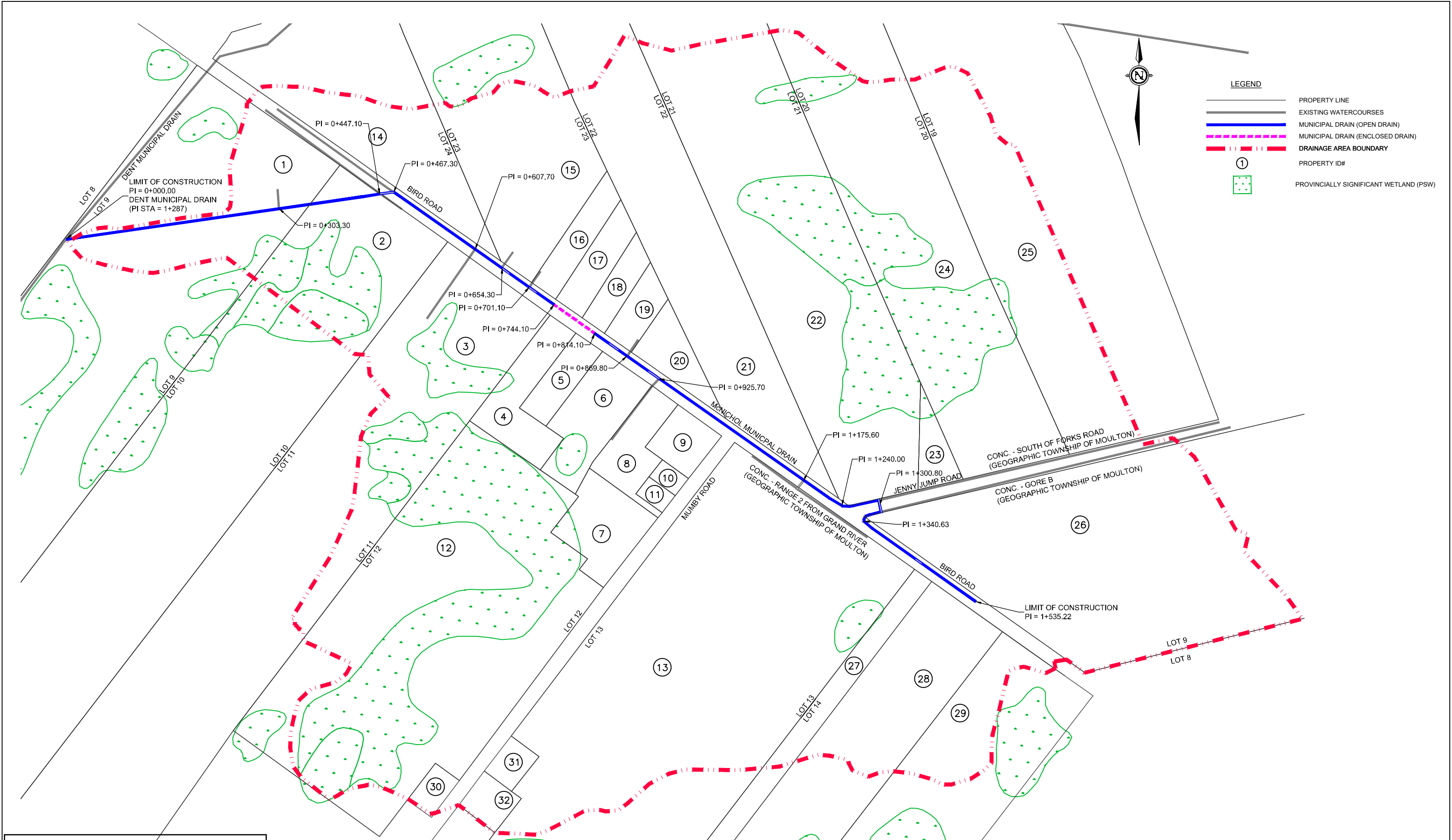
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY

McNICHOL MUNICIPAL DRAIN

PROJECT No. 21071
 CONTRACT No.
 DATED MAR 2023
 DWG. No. 21071-A2

CULVERT and SEDIMENT and EROSION CONTROL PLAN



NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
1	17.06.22	ISSUED FOR COUNTY AND AGENCY REVIEW	AJR
2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR

SCALES
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HORIZONTAL

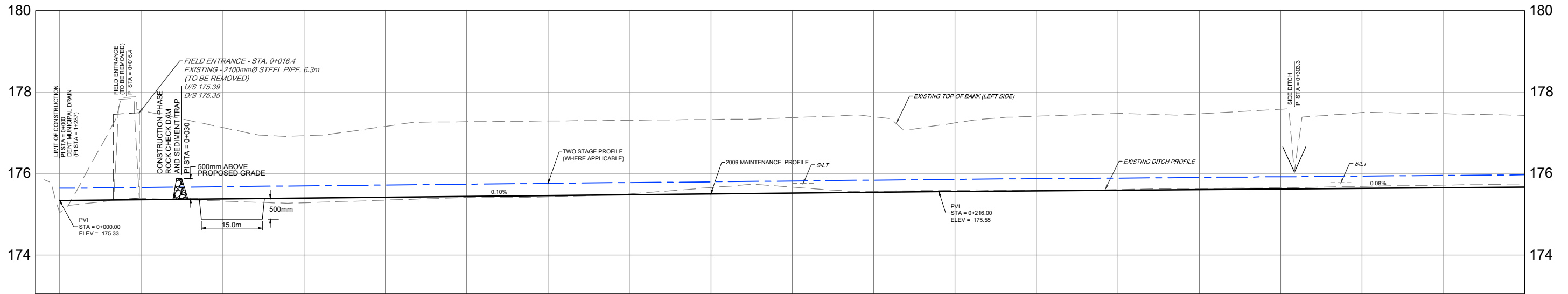
Robinson
Consultants

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Ottawa, ON K2V 1A8
(613) 592-6060 rcil.com

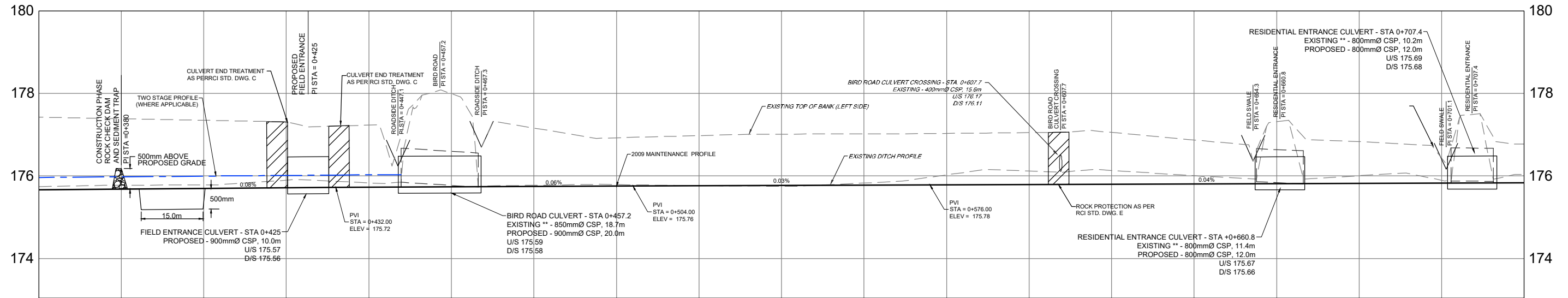
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY
McNICHOL MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN
PROJECT No. 21071
CONTRACT No.
DATED MAR 2023
DWG. No. 21071-A3



PROPOSED GRADE	175.33	175.35	175.37	175.39	175.41	175.43	175.45	175.47	175.49	175.51	175.53	175.55	175.57	175.58	175.60	175.62	175.63	175.65	175.67
EXISTING FIRM BOTTOM	175.03	175.39	175.32	175.29	175.34	175.41	175.47	175.50	175.65	175.66	175.66	175.69	175.69	175.60	175.63	175.64	175.66	175.71	175.74
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+360
EXISTING SILT									175.75							175.77			

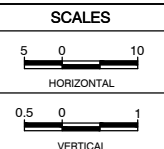


PROPOSED GRADE	175.67	175.68	175.70	175.71	175.73	175.74	175.75	175.75	175.76	175.77	175.78	175.78	175.79	175.80	175.81	175.81	175.82	175.83	175.84
EXISTING FIRM BOTTOM	175.74	175.78	175.78	175.80	175.83	177.89	175.78	175.79	175.77	175.75	175.83	176.03	176.12	176.12	176.01	177.31	176.01	176.99	176.04
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	

NOTE:
 EXISTING CULVERTS DENOTED WITH (**) ARE UNDERSIZED AND/OR OFF GRADE BUT WITHIN ACCEPTABLE TOLERANCES AND AS SUCH MAY REMAIN UNTIL SUCH TIME AS THEY ARE REQUIRED TO BE REPLACED (POOR CONDITION) UNDER FUTURE MAINTENANCE OR OTHERWISE AT THE DISCRETION OF THE DRAINAGE SUPERINTENDENT.

NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
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2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR



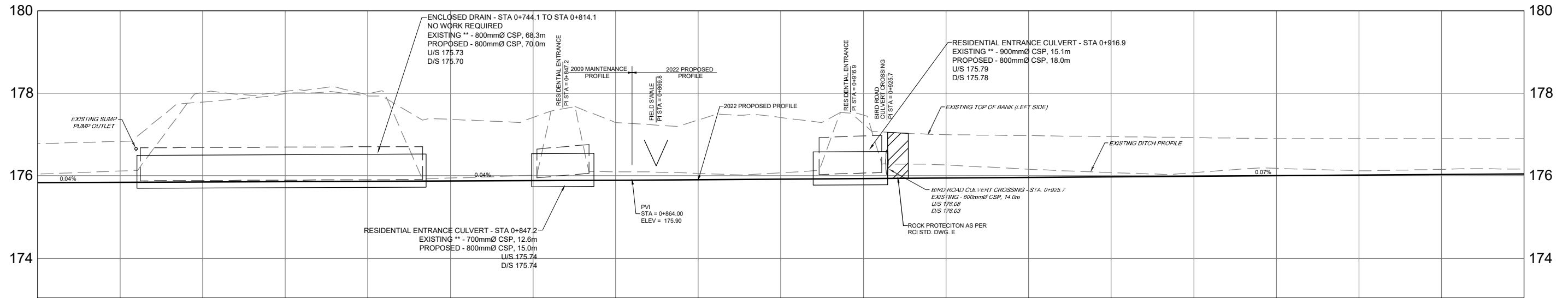
350 Palladium Drive
 Ottawa, ON K2V 1A6
 (613) 592-6060 rcii.com

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DRAWN	JHB
CHECKED	LF
APPROVED	AJR

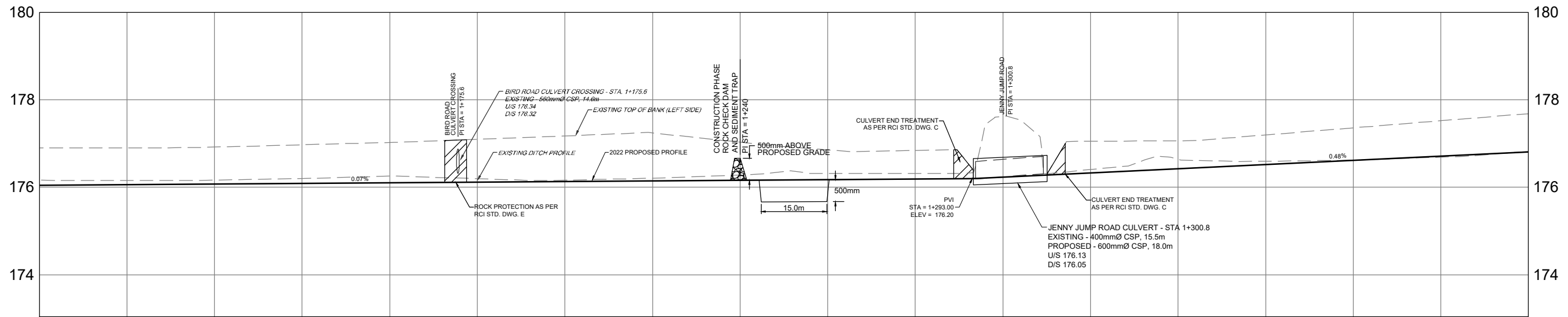
HALDIMAND COUNTY
 McNICHOL MUNICIPAL DRAIN

DRAIN PROFILE
 STA. -0+005 TO STA. 0+720

PROJECT No.	21071
CONTRACT No.	
DATED	MAR 2023
DWG. No.	21071-P1



PROPOSED GRADE	175.84	175.85	175.85	175.86	175.87	175.88	175.89	175.89	175.91	175.92	175.94	175.95	175.96	175.98	175.99	176.01	176.02	176.03	176.05
EXISTING FIRM BOTTOM	176.04	176.12	176.07	176.04	176.09	176.05	176.07	176.10	176.09	176.09	176.09	176.26	176.16	176.09	176.09	176.16	176.17	176.16	176.16
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

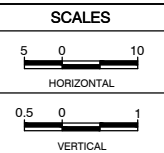


PROPOSED GRADE	176.05	176.06	176.08	176.09	176.11	176.12	176.13	176.15	176.16	176.18	176.19	176.23	176.33	176.43	176.52	176.62	176.71	176.81
EXISTING FIRM BOTTOM	176.15	176.15	176.16	176.20	176.25	176.20	176.16	176.21	176.28	176.32	176.32	177.62	176.41	176.64	176.67	176.62	176.69	176.82
STATION	1+080	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

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NOT FOR CONSTRUCTION

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2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR



Robinson Consultants

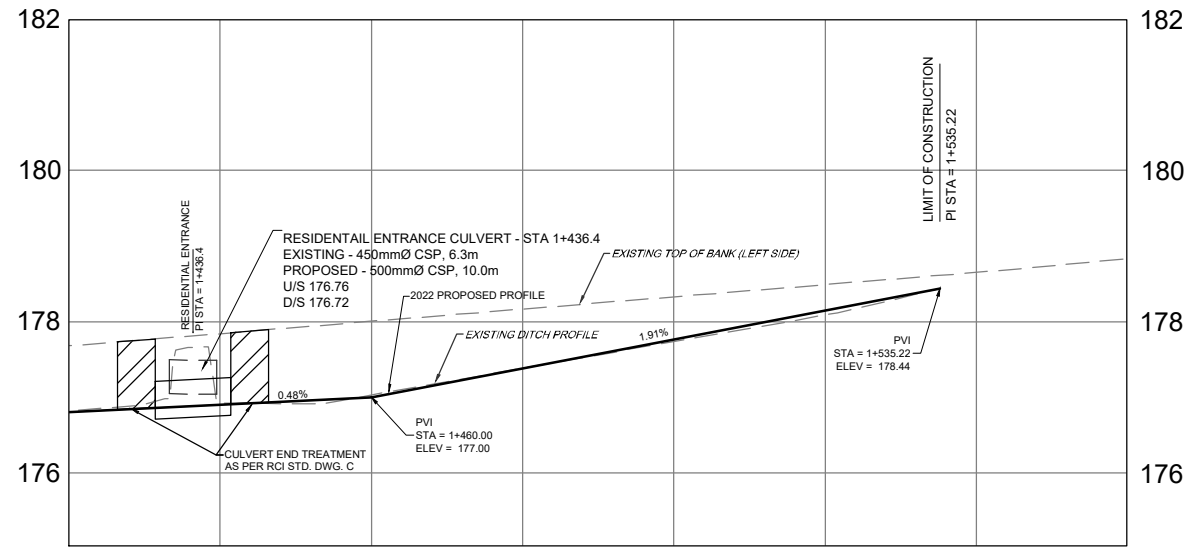
350 Palladium Drive
 Ottawa, ON K2V 1A8
 (613) 592-6060 rcii.com

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY
McNICHOL MUNICIPAL DRAIN

DRAIN PROFILE
STA. 0+720 TO STA. 1+420

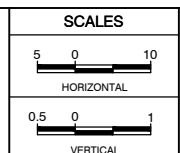
PROJECT No.	21071
CONTRACT No.	
DATED	MAR 2023
DWG. No.	21071-P2



PROPOSED GRADE	176.81	176.81	177.00	177.39	177.77	178.15
EXISTING FIRM BOTTOM	176.82	176.87	177.07	177.39	177.74	178.09
STATION	1+420	1+440	1+460	1+480	1+500	1+540

NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
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2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR



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DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

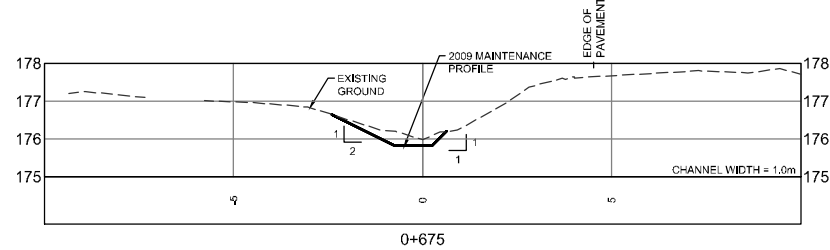
HALDIMAND COUNTY

McNICHOL MUNICIPAL DRAIN

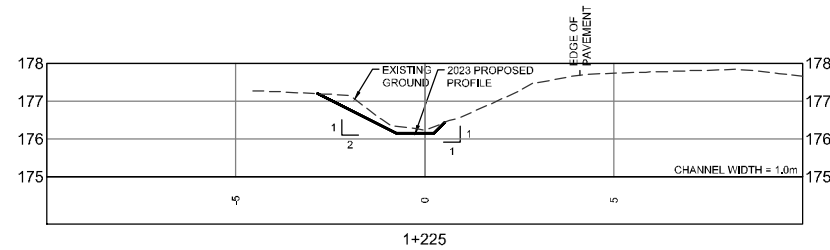
DRAIN PROFILE
STA. 1+420 TO STA. 1+600

PROJECT No.	21071
CONTRACT No.	
DATED	MAR 2023
DWG. No.	21071-P3

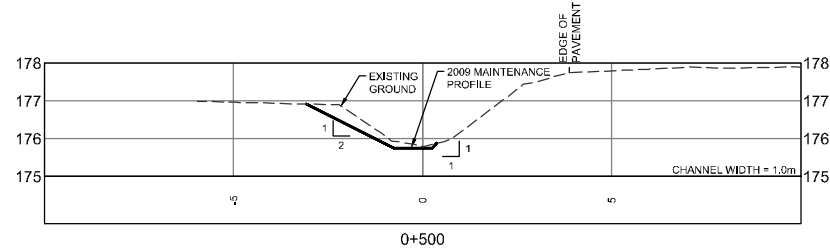
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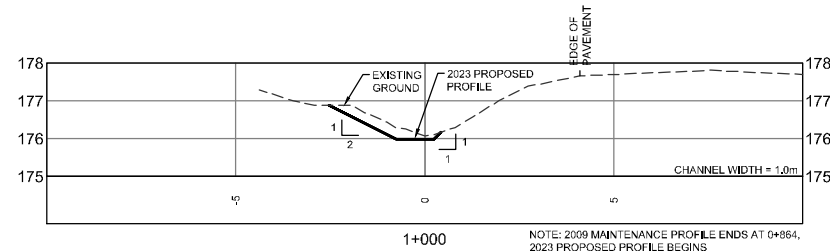
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STA. 1+175.6 TO STA. 1+300.8



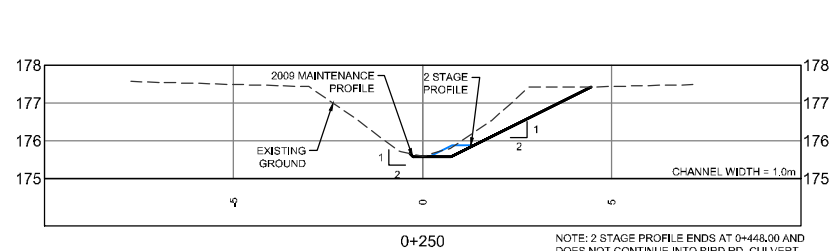
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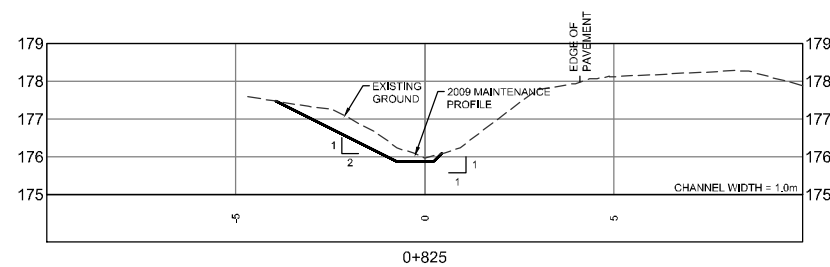
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STA. 0+864 TO STA. 1+175.6



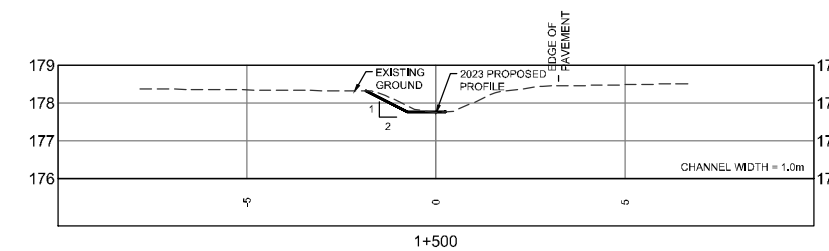
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STA. 0+175 TO STA. 0+467.3



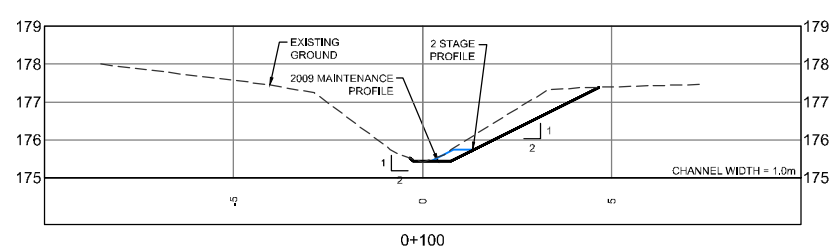
TYPICAL SECTION
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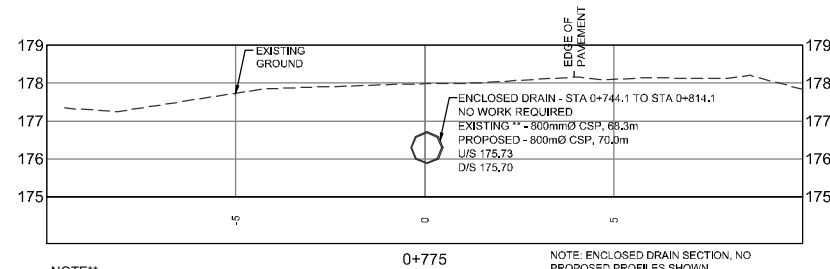
TYPICAL SECTION
STA. 1+125 TO STA. 1+375



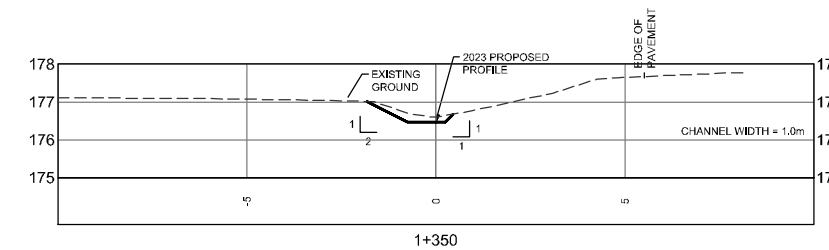
TYPICAL SECTION
STA. 0+000 TO STA. 0+175



TYPICAL SECTION
STA. 0+744.1 TO STA. 0+814.1



TYPICAL SECTION
STA. 1+300.8 TO STA. 1+375



NOTE**:
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NOTE: THE CONSTRUCTION WORKING SPACE IS DEFINED IN SP1.0 -WORKING SPACE AND SP3.1 EXCAVATION OF THE ENGINEER'S REPORT. IT IS THE INTENTION OF THE ENGINEER TO COMPLETE WORK FROM THE RIGHT (SOUTH) SIDE OF THE DRAIN. THE WORKING SPACE WILL VARY FOR FUTURE MAINTENANCE

NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
1	17.06.22	ISSUED FOR COUNTY AND AGENCY REVIEW	AJR
2	24.03.23	ISSUED FOR FINAL DRAFT REVIEW	AJR

SCALES	
1	0 2
HORIZONTAL	
1	0 2
VERTICAL	

Robinson
Consultants

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Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

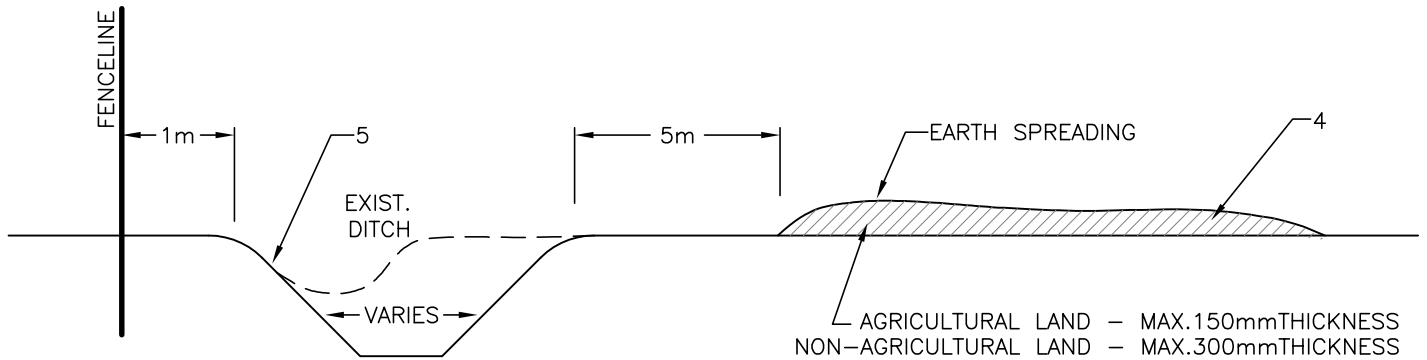
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

HALDIMAND COUNTY

McNICHOL MUNICIPAL DRAIN

CROSS SECTIONS


PROJECT No.	21071
CONTRACT No.	
DATED	MAR 2023
DWG. No.	21071-C1

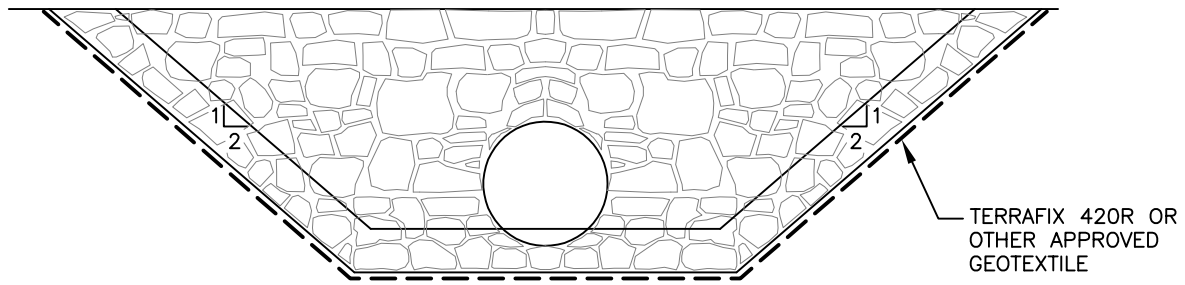
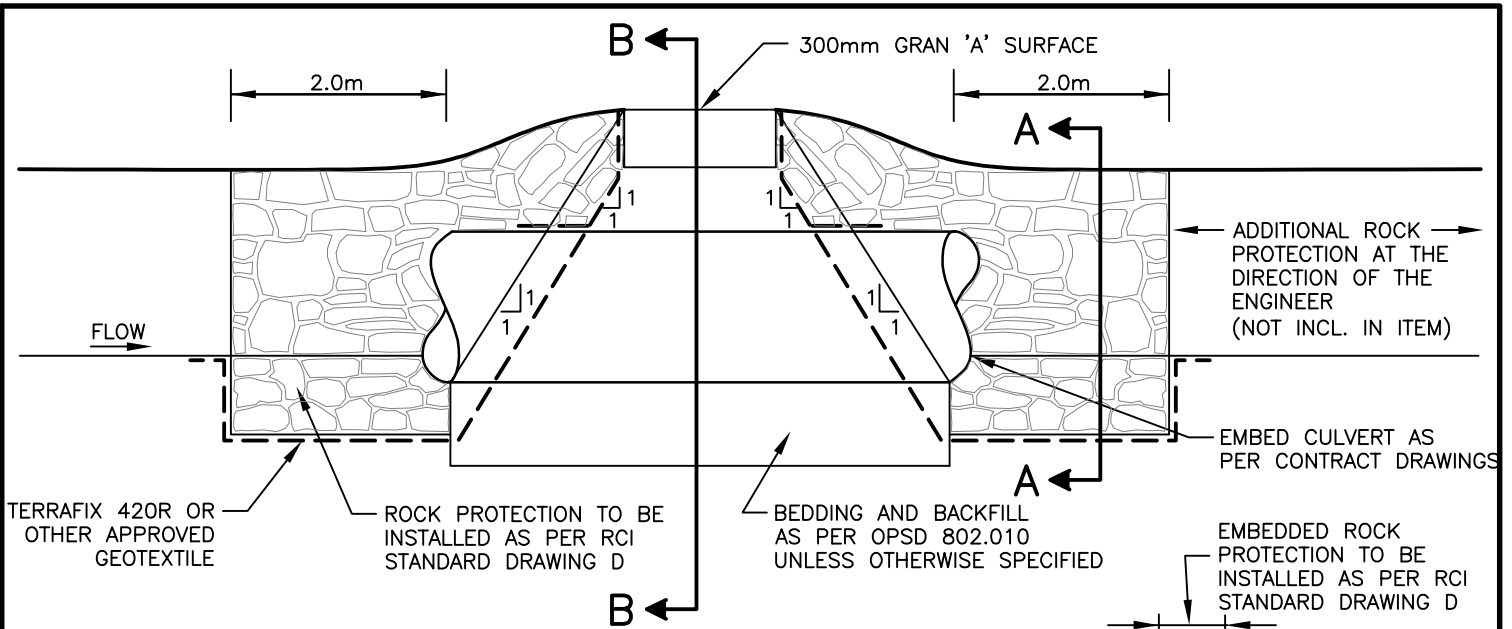


NOTES:

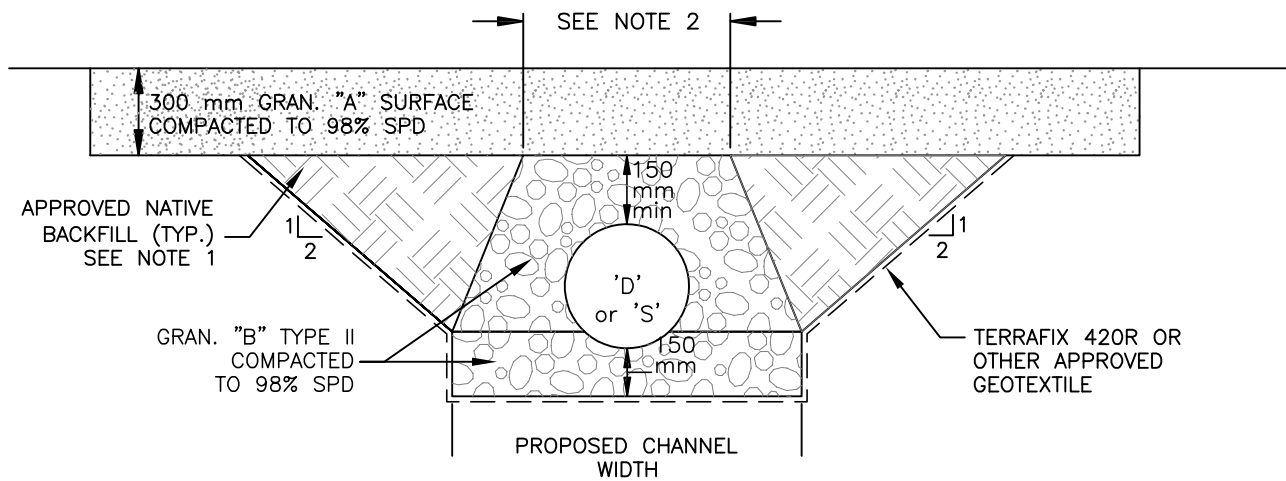
1. NO EXCAVATION WITHIN 1 METRE OF EXISTING FENCELINE.
2. SIDE SLOPES AND CHANNEL DIMENSIONS AS PER CONTRACT DRAWINGS.
3. NO SPOIL OR SPREADING WITHIN 5 METRES OF TOP OF BANK.
4. SPOIL THICKNESS, WIDTH, DRAINAGE OPENINGS AND SPREADING LOCATION AS NOTED IN THE SPECIAL PROVISIONS OR THE CONTRACT DOCUMENTS.
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.

DATED: FEB/21

 <p>CONSULTING ENGINEERS 350 Palladium Dr., Suite 210 Kanata, Ontario, K2V 1A8 Telephone (613) 592-6060</p>	SCALE	MUNICIPAL DRAIN OPEN CHANNEL SYSTEMS EARTH CUT CHANNEL	PROJECT NO.
	HORIZONTAL N.T.S.		STD.DWG.No. A
	VERTICAL N.T.S.		



END SECTION A-A



SECTION B-B

NOTES:

1. "Approved Native Backfill" material may consist of dry clay, sand or granular material with no large stones, boulders, debris, or organic material. Backfill must be placed in lifts not exceeding 300mm thick and compacted. All requirements for granular bedding, cover and surface course must be met prior to placing any backfill.
2. For circular culverts, the top-width of cover material shall be a minimum of the diameter of the pipe ('D') plus 0.5 x 'D' each way for a total of 2.0 x 'D'. For arch culverts, the top-width of cover material shall be a minimum of the span of the pipe ('S') plus 0.75 x 'S' each way for a total of 2.5 x 'S'. The minimum bottom width shall conform with the proposed channel width upstream/downstream of the culvert.
3. Follow manufacturers installation instructions for all pipes.

DATED: FEB/22

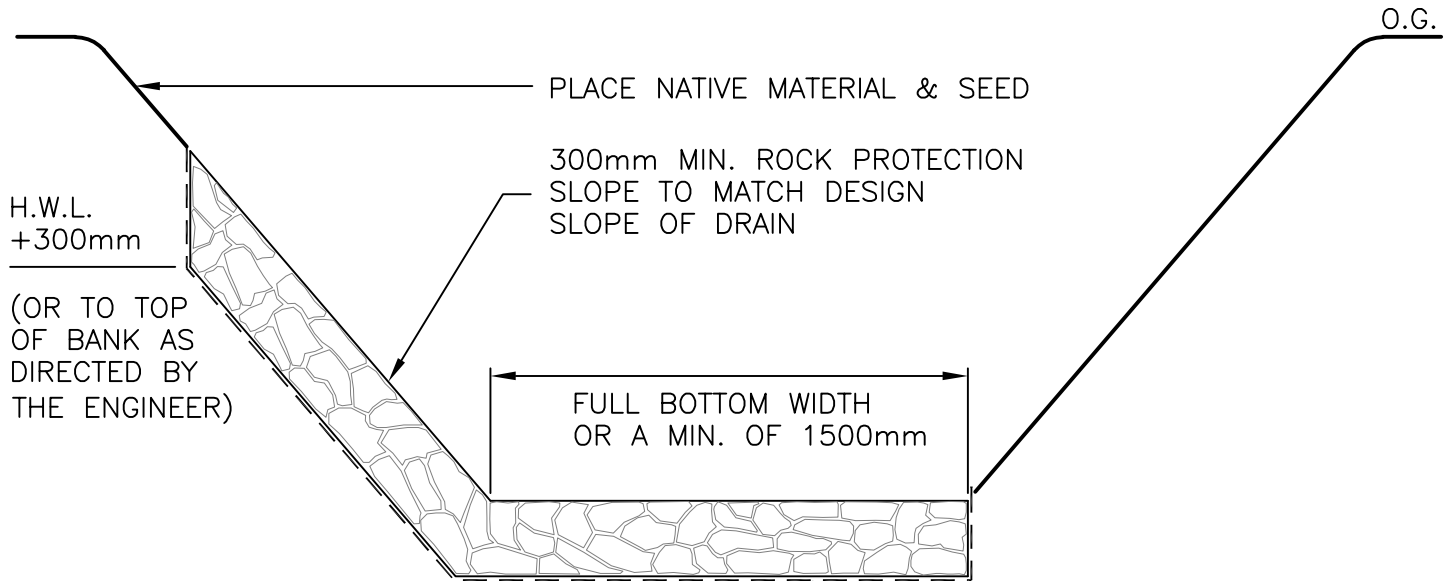
Robinson
Consultants

CONSULTING ENGINEERS
350 Palladium Dr., Suite 210
Kanata, Ontario, K2V 1A8
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.
C



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 OR THE CONTRACT DRAWINGS.
2. FOR ROCK PROTECTION, USE R-50 AS PER OPSS 1004.05.05.02 OR ROCK PROTECTION AS PER OPSS 1004.05.05.03.

TERRAFIX 420R
OR OTHER APPROVED
GEOTEXTILE

DATED: FEB/21

Robinson
Consultants

CONSULTING ENGINEERS
350 Palladium Dr., Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592-6060

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

MUNICIPAL DRAIN
TYPICAL ROCK PROTECTION EROSION CONTROL

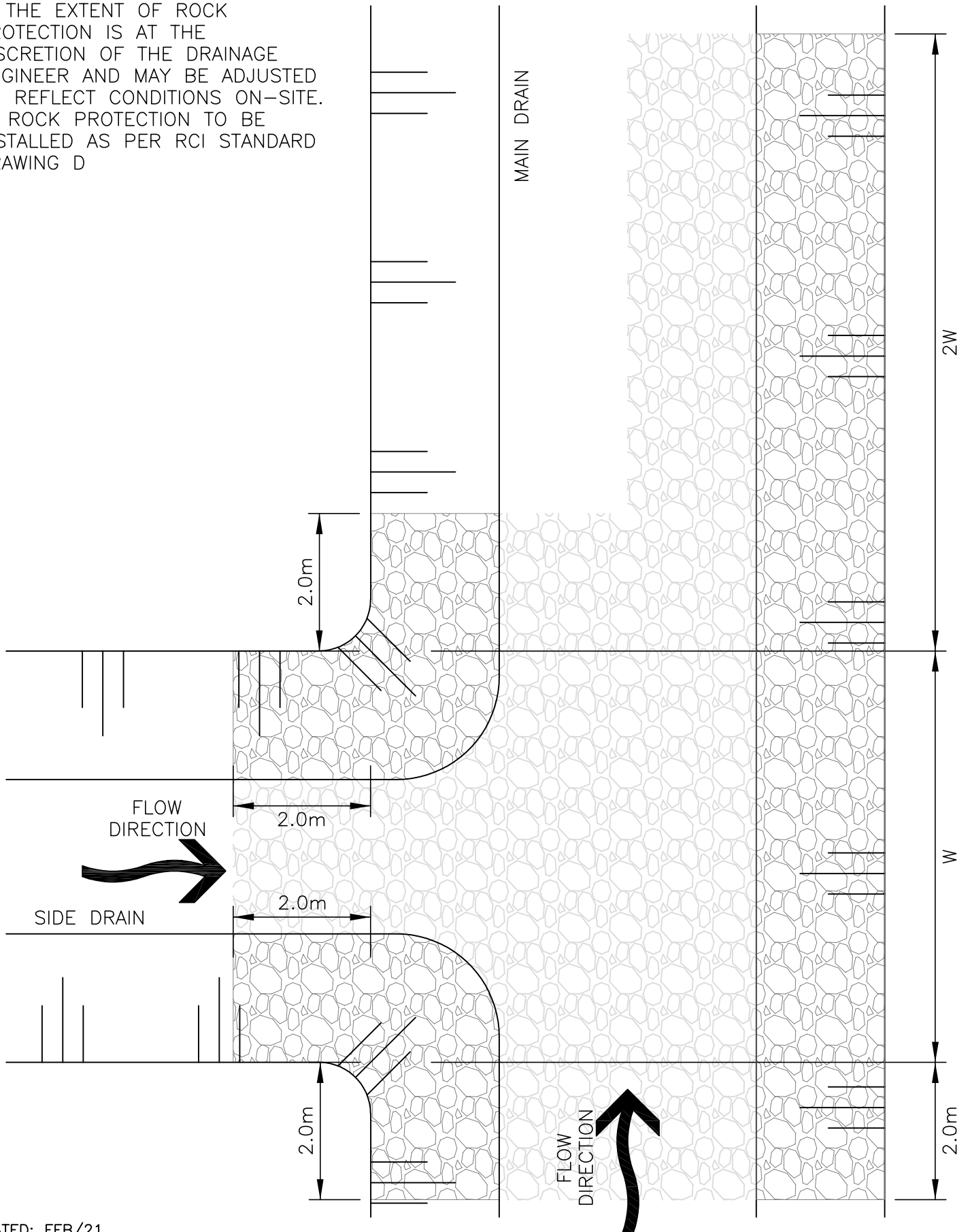
PROJECT NO.

STD.DWG.No.

D

NOTE:

1. THE EXTENT OF ROCK PROTECTION IS AT THE DISCRETION OF THE DRAINAGE ENGINEER AND MAY BE ADJUSTED TO REFLECT CONDITIONS ON-SITE.
2. ROCK PROTECTION TO BE INSTALLED AS PER RCI STANDARD DRAWING D



DATED: FEB/21

Robinson
Consultants

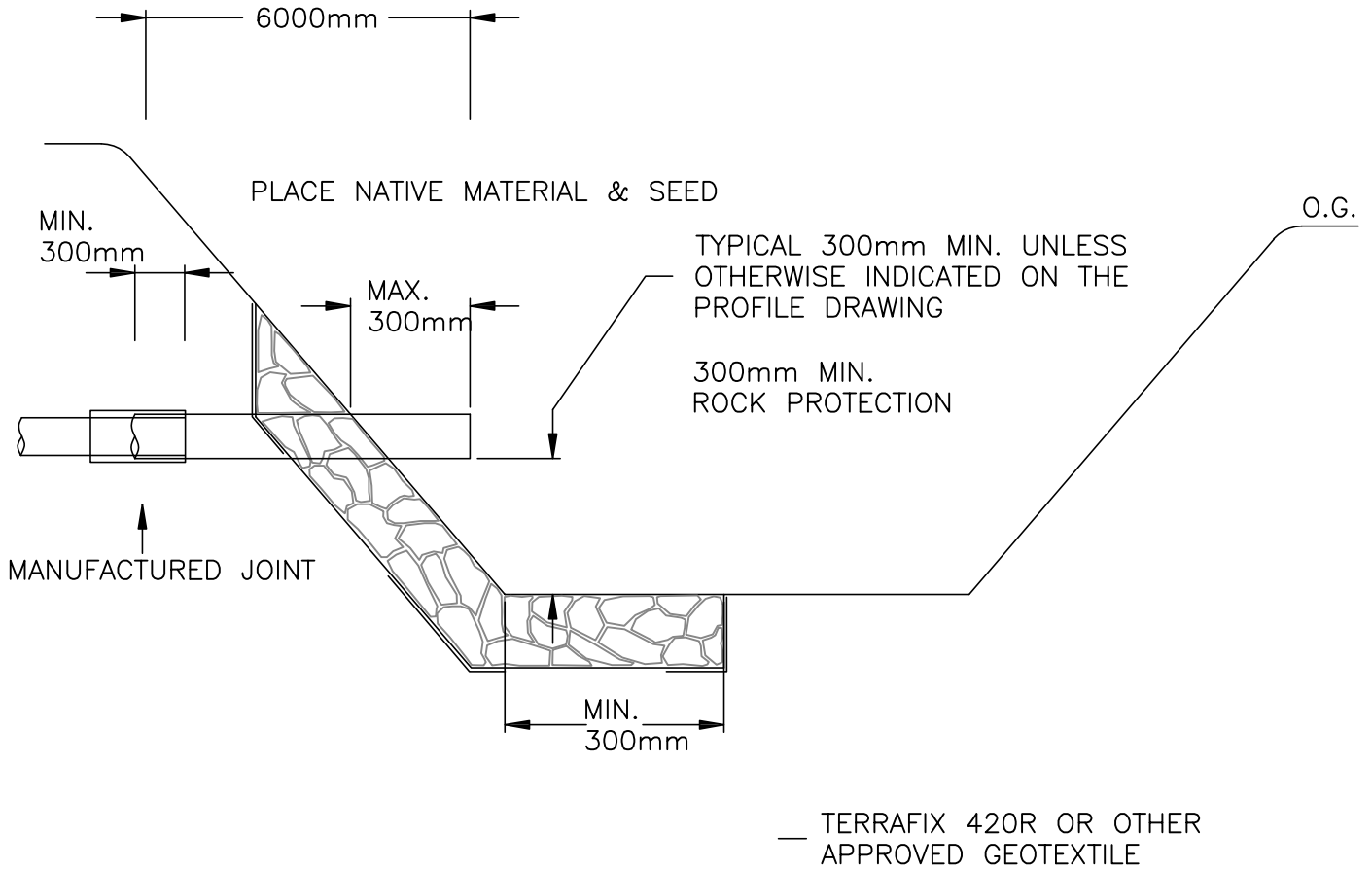
CONSULTING ENGINEERS
350 Palladium Dr., Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592-6060

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

MUNICIPAL DRAIN
STANDARD SIDE DITCH
ROCK PROTECTION

PROJECT NO.
STD.DWG.No. E

TILE OUTLET



NOTES:

1. OUTLET TO BE CONTINUOUS HDPE (SMOOTHWALL – MIN. STIFFNESS OF 320KPa) AND A MIN. LENGTH OF 8.0m
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 PREFERRED CONNECTION BETWEEN THE OUTLET AND THE FIELD TILE IS TO BE A LOCKING MANUFACTURED JOINT, OTHER METHODOLOGY INCLUDES A TAPE SEALED JOINT ENCASED IN CONCRETE OR OVERLAP JOINT (MIN. 300mm) ENCASED IN CONCRETE.
4. A RODENT GRATE IS TO BE INSTALLED AT THE END OF THE TILE OUTLET
5. MIN. SIDE SLOPE IS 1 VERT TO 2 HOR OR AS SPECIFIC IN THE ENGINEER'S REPORT
6. FOR ROCK PROTECTION, USE R-50 RIP-RAP AS PER OPSS MUNI 1004.05.05.02

DATED: JUL/22

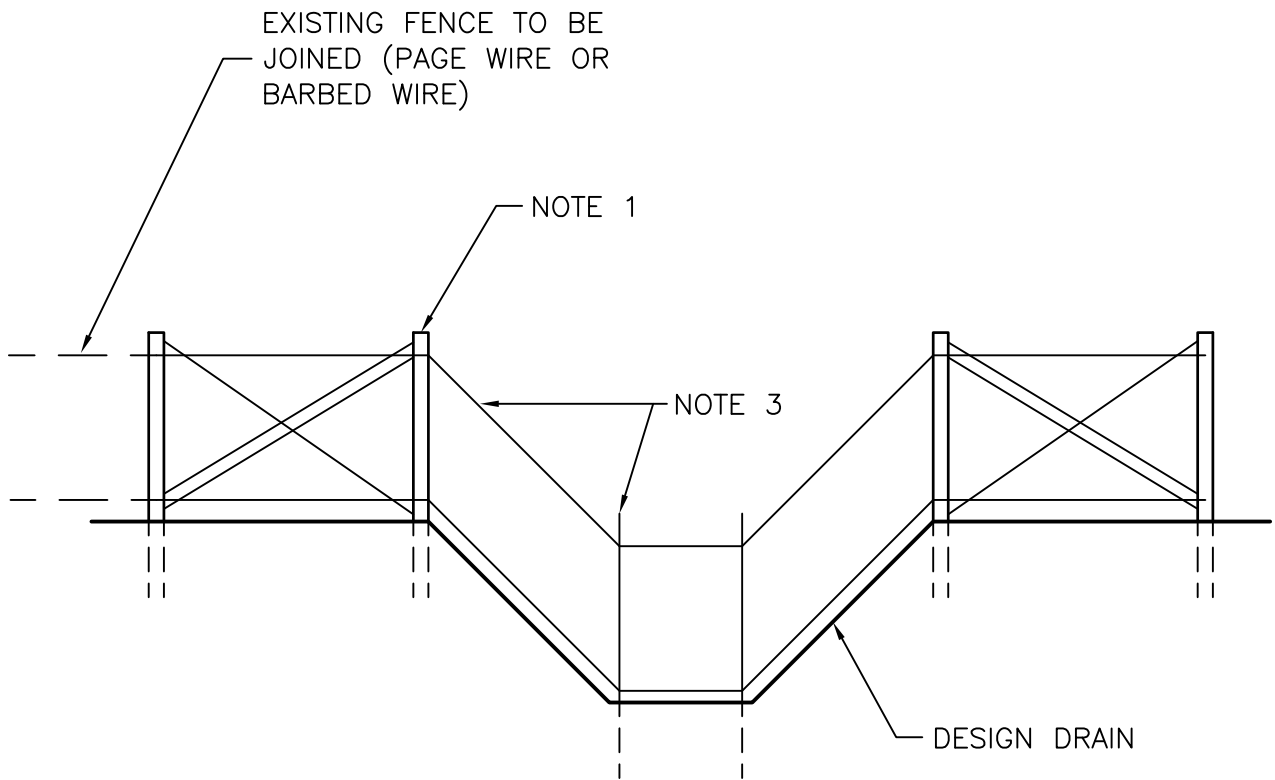
Robinson
Consultants

CONSULTING ENGINEERS
350 Palladium Dr., Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592-6060

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

MUNICIPAL DRAIN
STANDARD TILE OUTLET

PROJECT NO.
STD.DWG.No.
F



NOTES:

1. REFER TO OPSD DWG. No. 971.101 FOR BRACE PANEL DETAIL
2. USE OPSD 971.101 FOR REINSTATEMENT OF FENCE WHERE REQUIRED
3. T-RAILS SHALL BE NEW STEEL, MINIMUM LENGTH 2.4m.
4. CROSS-FENCE WIRE SHALL BE HEAVY GAUGE BARBED WIRE, MINIMUM 6 STRANDS AT EVEN SPACING

DATED: FEB/21

Robinson
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CONSULTING ENGINEERS
350 Palladium Dr., Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592-6060

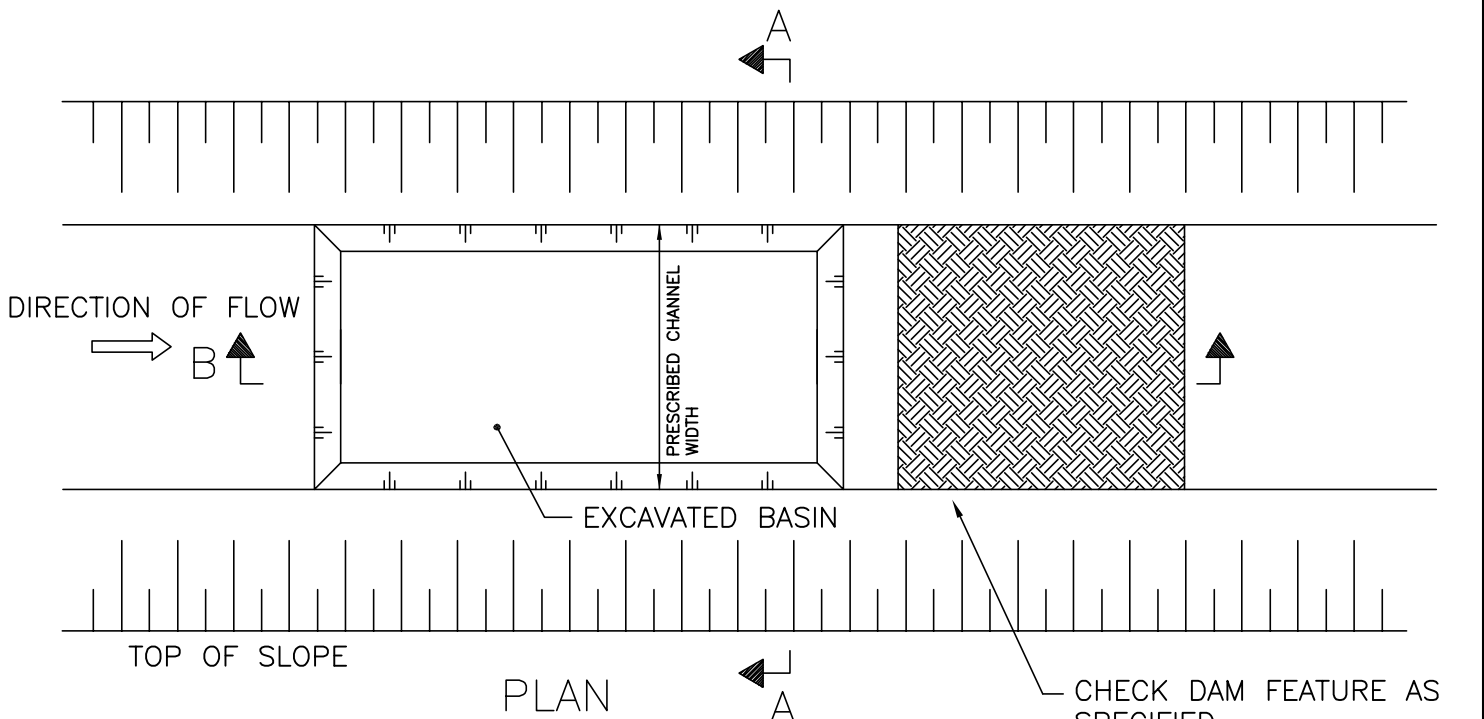
SCALE
HORIZONTAL
N.T.S.
VERTICAL
N.T.S.

MUNICIPAL DRAIN
FENCE REINSTATEMENT AND CROSSING DETAIL

PROJECT NO.

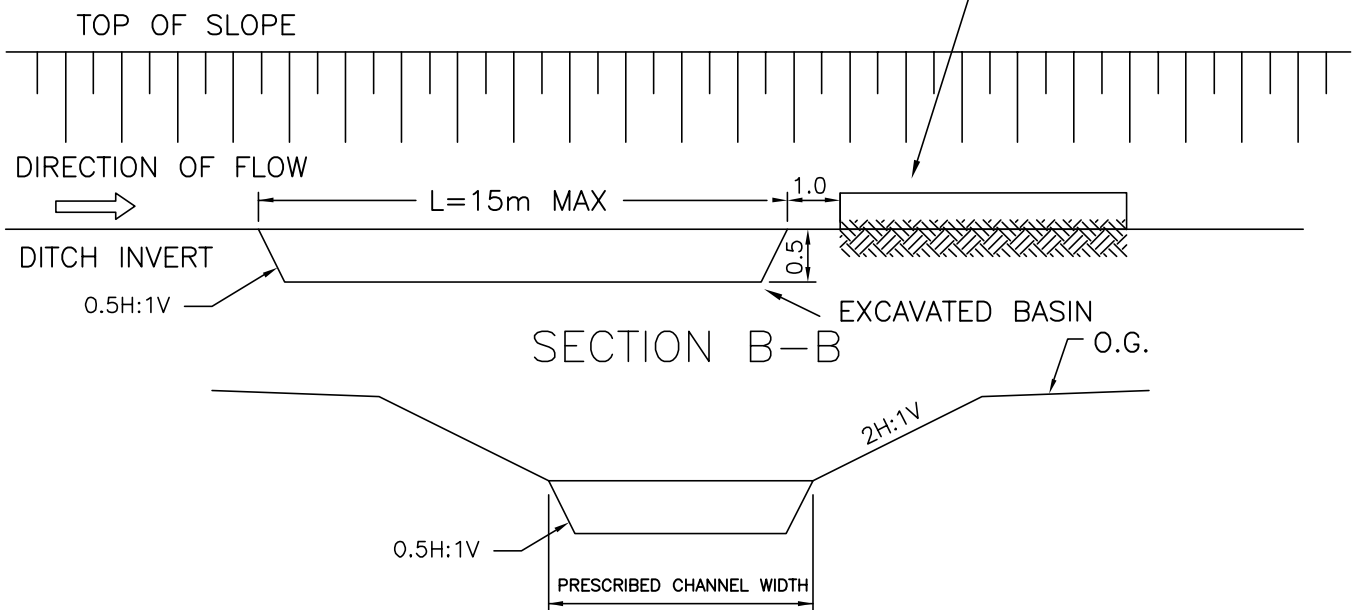
STD.DWG.No.

H



PLAN

CHECK DAM FEATURE AS SPECIFIED
219.180/219.191/219.211



SECTION B-B

SECTION A-A

NOTES:

1. THIS DRAWING MODIFIES OPSD 219.220
2. DITCH CROSS-SECTION UPSTREAM OR DOWNSTREAM OF SEDIMENT TRAP MAY BE FLAT BOTTOM OR V-SHAPED, FLAT BOTTOM SHOWN.
3. THIS STANDARD DRAWING SHALL BE READ IN CONJUNCTION WITH OPSD 219.180 OR 219.191 OR 219.211 FOR THE SPECIFIED CHECK DAM FEATURE.
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

DATED: FEB/21

Robinson
Consultants

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350 Palladium Dr., Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592-6060

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

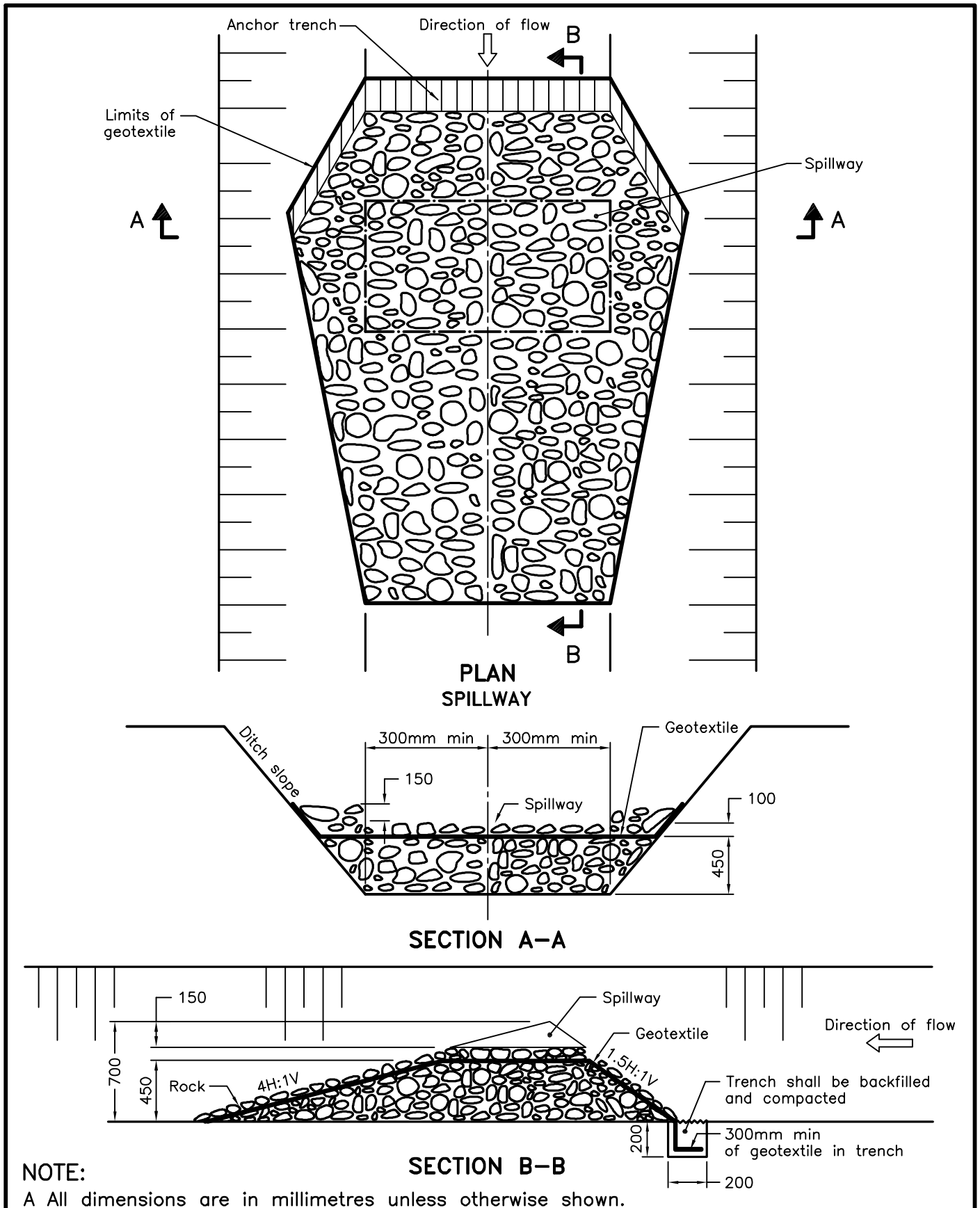
MUNICIPAL DRAIN

SEDIMENT TRAP

PROJECT NO.


STD.DWG.No.

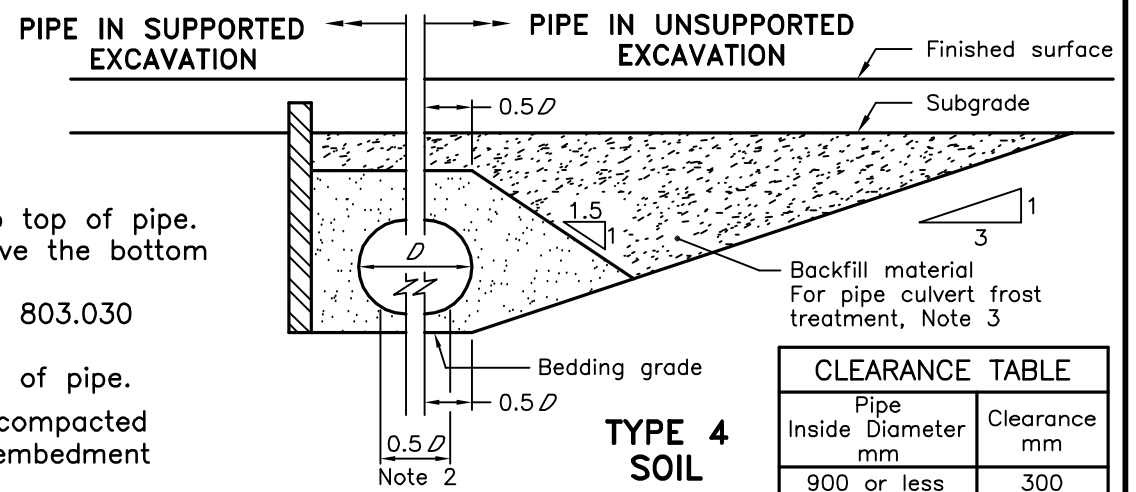
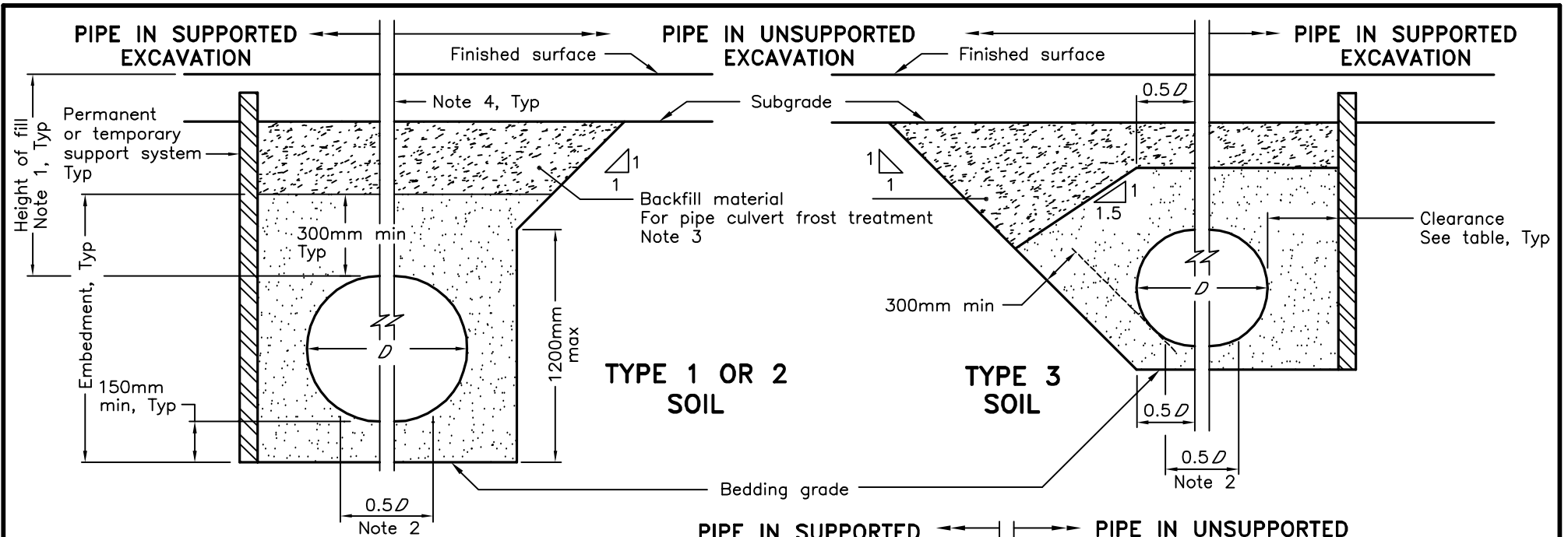
1



NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING		Nov 2015	Rev 2
TEMPORARY ROCK FLOW CHECK DAM FLAT BOTTOM DITCH			
		OPSD 219.211	



LEGEND:

D - Inside diameter

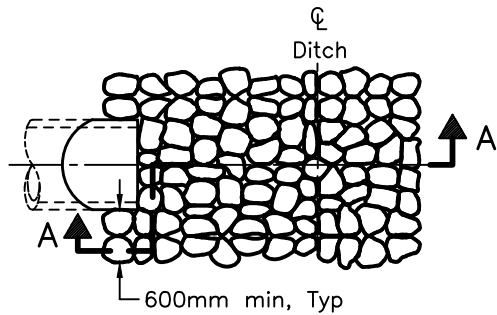
NOTES:

- 1 Height of fill is measured from the finished surface to top of pipe.
 - 2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 - 3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 - 4 Condition of excavation is symmetrical about centreline of pipe.
- A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
- B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
- C All dimensions are in metres unless otherwise shown.

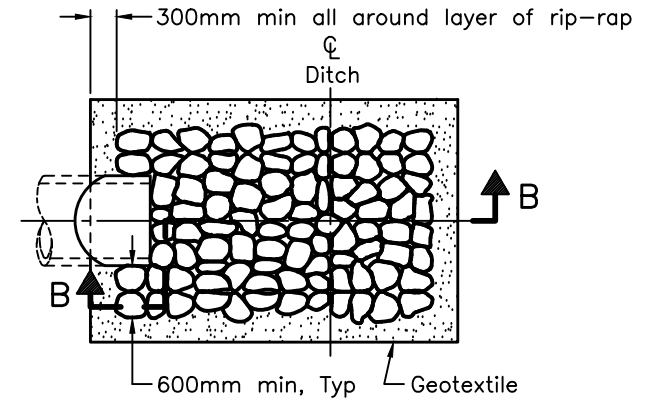
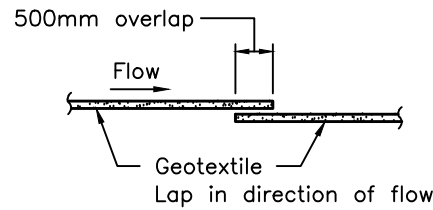
CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev	3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION	OPSD 802.010		

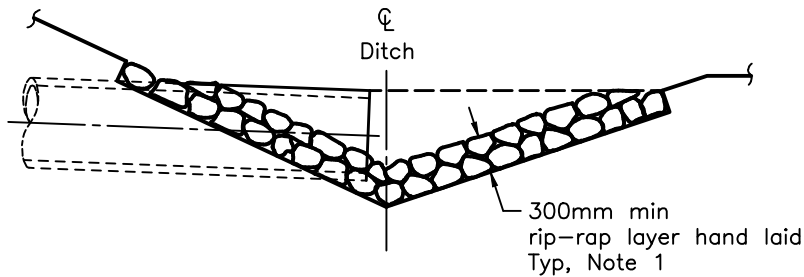




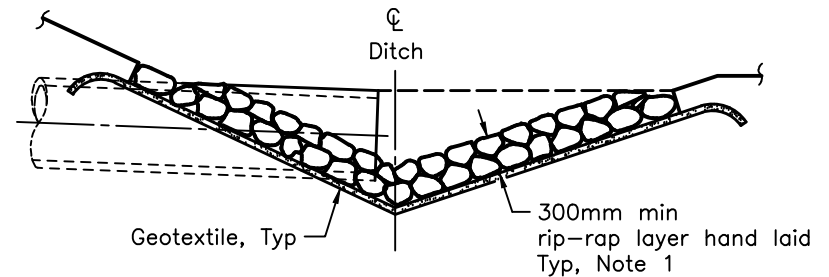
600mm min, Typ
**PLAN
 CUT OR FILL**



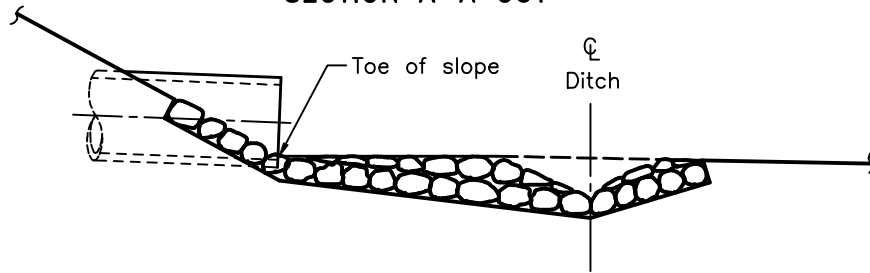
600mm min, Typ
**PLAN
 CUT OR FILL**



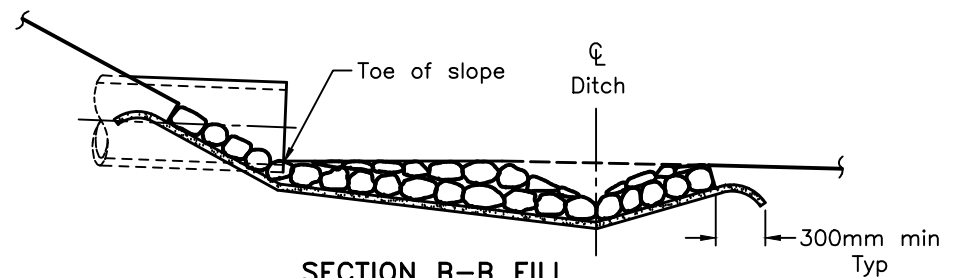
SECTION A-A CUT



SECTION B-B CUT



SECTION A-A FILL



SECTION B-B FILL

TYPE A - WITHOUT GEOTEXTILE

TYPE B - WITH GEOTEXTILE

NOTES:

1 The thickness of the rip-rap layer shall be at least 1.5 times the rip-rap mean diameter.

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2018 Rev 3

**GENERAL RIP-RAP LAYOUT
 FOR SEWER AND CULVERT OUTLETS**



OPSD 810.010

Appendix B

Special Provisions

SPECIAL PROVISIONS

INDEX

SP 1.0	Working Space
SP 2.0	Clearing
SP 3.0	Excavation and Disposal
SP 4.0	Private Culverts
SP 5.0	Fencing
SP 6.0	Seeding
SP 7.0	Rock Protection Erosion Control
SP 8.0	Utilities
SP 9.0	Flow Checks & Sediment Traps
SP 10.0	Tile Outlet Protection
SP 11.0	Culvert End Treatments
SP 12.0	Guaranteed Maintenance
SP 13.0	MECP - Species at Risk
SP 14.0	South Nation Conservation Permission (O.Reg. 150/06)
SP 15.0	Department of Fisheries and Oceans Class Authorization – Fisheries Act

SP1.0 WORKING SPACE

As per S.63(1) of the Ontario Drainage Act, R.S.O. 1990, c. D.17 (provided below) a "Working Space" must be available for the purpose of construction and future maintenance.

63 (1) The contractor and the contractor's assistants when engaged in the construction, maintenance, improvement, or repair of a drainage works may, with their equipment, enter upon whatever lands are necessary to complete the work within the working space designated in the engineer's report. R.S.O. 1990, c. D.17, s. 63 (1).

For the purpose of construction and future maintenance, the standard Working Space adjacent to the drain must be available along the side that is best suited for construction. In some sections of the drain, it may be necessary to complete construction or maintenance from both sides of the drain.

The designated Working Space is set at 25 m from the top of bank (each way) from Sta. 0+000 to Sta. 0+457.2 and is necessary to allow construction to be carried out and excavated material to be spread. The designated Working Space is set at 8 m from the top of bank from Sta. 0+457.2 to Sta. 1+535.2 along the north (property) side of the drain to allow access for maintenance where necessary.

It is recommended that the working space be kept free of permanent obstructions including (but not limited to), plantings (trees), non-removable fences, structures and/or other permanent landscaping features.

Access to the Working Space for the purpose of construction, inspection or maintenance is restricted to persons prescribed under the authority of the Ontario Drainage Act, R.S.O. 1990, c. D.17 being the Drainage Engineer (or assistants) – S.12(1), the Contractor (or assistants) – S.63(1) and/or the Drainage Superintendent (or assistants) – S.95(3). Where possible (excluding emergencies) it is required that a minimum 48 hours advance notice (in writing) or direct communication with the affected property owner be provided before accessing the drain working space.

SP1.1 Alignment

The constructed channel alignment shall be in general conformity with the existing alignment and Dwg. No. 21071-A1. Where necessary, the alignment shall be set out by the Drainage Engineer prior to the commencement of construction on this project. The Contractor is to coordinate with the Drainage Engineer to verify the coordinate and datum information.

The centerline alignment of the Municipal Drain will be provided to the contractor for the purpose of layout. The Contractor may utilize this information as necessary (including, but not limited to, the generation of a model for the purpose of using GPS guided equipment). However, it is noted that this information should not be solely relied upon

and is not intended to override the specified intent defined on the plan, profile, and cross section information. In general, it is noted that natural meanders will occur along the Municipal Drain, which may not be fully accommodated/incorporated into the alignment provided to the Contractor or any generated model. The contractor is responsible for ensuring that excavation is completed in general conformance with the intent of the work as indicated on the plan, profile, and cross-sections.

SP2.0 CLEARING AND GRUBBING

For the purpose of construction and future maintenance, clearing and grubbing shall consist of the removal of all trees, brush, and windfalls from the following areas:

- Between the top of the North/East bank and the top of the South/West bank (bank to bank - including all material within the drain).
- The area required for machine access to allow 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.

When clearing is undertaken in an area of tillable land, all stumps shall be removed. 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

Property owners are advised that the Contractor will clear only those trees, which may affect its operation within the working space. All trees having a diameter of 150 mm or greater shall be cleared of limbs and cut in reasonable lengths (to a maximum of 5m) and neatly piled clear of the drain so that the wood may be salvaged by the property owners.

The Contractor and the property owner may make agreements for the removal/disposal of the wood, which would otherwise be left on the property, at a location on the property, chosen by the property owner subject to review by the Drainage Engineer.

SP2.1.1 Construction Phase

All brush, limbs, and other debris resulting from the clearing operation shall be chipped and buried beneath spread excavated materials, except in agricultural fields.

Where chipped in agricultural fields, materials are to be disposed of off-site at a location provided by the Contractor and reviewed by the Drainage Engineer (at the Contractor's expense).

Large stones, stumps, tree roots, and other debris shall also be disposed of at a location on the property chosen by the property owner and reviewed by the Drainage Engineer, except in agricultural fields.

In agricultural fields, all large stones, stumps, tree roots, and other debris shall be disposed of off-site at a location provided by the Contractor and reviewed by the Drainage Engineer.

SP2.1.2 Future Maintenance Phase

All brush, limbs and other debris resulting from the clearing operation shall be chipped and buried beneath spread excavated materials, except in agricultural fields.

Where chipped in agricultural fields, material shall be disposed of off-site at a location provided by the Contractor and reviewed by the Drainage Superintendent

Large stones, stumps, tree roots, and other debris are to be disposed of at a location on the property chosen by the property owner and reviewed by the Drainage Superintendent.

SP2.2 Payment

The cost of all labor, 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 McNichol Municipal Drain will be an open channel drain with side slopes and ditch bottom widths as specified on the design profiles and cross-sections Dwg Nos. 21071-P1 through 21071-P3 (inclusive), 21071-C1.

Where possible, excavation will be limited to the bottom and/or one side of the drain, leaving one side of the drain intact, while providing the required additional channel width on the opposite side (construction side). This is anticipated to minimize impacts of full riparian zone removal. Clean-out of the bottom only may be specified where additional channel width is not required.

Where necessary, zones of current and/or anticipated bank instability on the non-construction side banks will be repaired and/or protected. In these areas, efforts shall be made to maintain as much of the natural conditions as possible.

For this project, excavation is in general described as following:

Using the alignment provided, from Sta. 0+000 to Sta. 0+457.2 to the North bank is to remain untouched. Excavation is to be completed from the South bank, except where otherwise specified or authorized by the Drainage Engineer. Excavation commences from the toe of the North bank to the invert of the proposed profile, across the channel to the width specified by the cross section with the bank constructed at a 2h:1v slope.

Using the alignment provided, from Sta. 0+457.2 to Sta. 1+535.2 the South bank is to remain untouched. Excavation is to be completed from the South bank, except where otherwise specified or authorized by the Drainage Engineer. Excavation commences from the toe of the South bank to the invert of the proposed profile, across the channel to the width specified by the cross section with the bank constructed at a 2h:1v slope.

Where indicated on profiles and cross sections with a blue line, a two-stage profile is to be constructed. A two-stage profile is constructed only where material can be left in place during excavation and where material is firm enough to hold its shape.

Excavation commences from the toe of the bank to the invert of the proposed profile, across the width of the channel to the two-stage profile, up 300mm from the proposed profile, across the remaining width of the channel, and up the bank constructed at a 2h:1v slope.

SP3.2 Disposal of Excavated Earth Material

For the purpose of construction and future maintenance, 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.

From Sta. 0+000 to Sta. 0+457.2, 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. Spreading is to be completed in conformance with RCI Std. Dwg. A, provided in **Appendix A**.

From Sta. 0+457.2 to Sta. 1+535.2, all excavated material shall be disposed of off-site at the expense of the Contractor.

SP3.2.1 Off-Site Disposal of Excavated Earth Material

For off-site removal of excavated earth material, the Contractor is advised to comply with O. Reg. 406/19 On-Site and Excess Soil Management.

The Township is the Project Leader for this project. A Section 8 Notice will not be filed on the Registry for this project, as this project is deemed to be exempt under O.Reg. 406/19. Note that exemptions do not relieve the Contractor from complying with requirements specified in this provision and/or elsewhere in the Contract Documents.

The Contractor is responsible for the management of all excavated earth material that is disposed of off-site, including, but not limited to, handling, storage, sampling and analysis, transportation, placement, and disposal, whether it is reused on-site, removed off-site, or used as fill material. It is recommended that the Contractor re-use the excavated earth material as fill material where applicable within the project area.

The Contractor is responsible for designating the Receiver Sites for the management of excess soil generated from the project, subject to review by the Drainage Engineer.

The Contractor will ensure that all excess soil is collected and transported by retained haulers in vehicles satisfying the requirements of O.Reg. 406/19.

SP3.3 Hardpan Excavation and Disposal

Hardpan is considered to be densely compacted clay material (similar in nature to shale) that requires the use of specialized equipment for the removal – typically a singular ripping tooth.

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

SP3.4 Rock Excavation & Disposal

Rock Excavation is considered for areas of bedrock and boulders in excess of 1m³ where the use of specialized equipment (hoe-ram) is required for the removal.

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 Other Unsuitable Material

Other Unsuitable Material is considered to be any other material that is not suitable for spreading, including (but not limited to) boulders (less than 1m³), garbage or other debris. This material does not require the use of specialized equipment for the purpose of excavation,

The Contractor is required to excavate all unsuitable material. Excavation of this material and separation of the material from the excavation is considered to form part of the standard excavation item. Garbage, rocks, wood, and other debris (at the discretion of the Drainage Engineer) are to be disposed of off-site at a location arranged for by the Contractor and reviewed by the Drainage Engineer.

Boulders (less than 1m³) are to be disposed of by the Contractor on the adjacent property, in an area of the property designated by the owner and reviewed by the Drainage Engineer.

SP3.6 Payment

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

Where incurred, payment for hardpan excavation shall be by the unit price tendered per cubic metre and shall be full compensation for all work required to excavate, move on-site, and dispose of the material in the manner described previously. Measurement for payment shall be from the calculated quantity using the measured depth of material to the theoretical trench width and proposed channel grade.

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.

The excavation and separation of materials are considered to form part of the standard excavation item. However, where incurred, payment for the off-site disposal of unsuitable material shall be by the unit price tendered per cubic metre and shall be full compensation for all work required to remove off-site and dispose of the material in the manner described previously. Measurement for payment shall be by the estimated truck box volume (cubic meter) as defined for each truck utilized. The truck box volume is to be calculated by the Contract Administrator.

SP3.7 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 through the Contractor, subject to a signed agreement between the property owner and the Contractor, and review by the Drainage Engineer. If paid to the Contractor through the Contract, it will be charged as a special benefit, assessed to the requesting property owners.

Note that off-site removal may require consideration of Excess Soil Regulations, please refer to SP3.2.1 for excess soil provisions to be met.

SP4.0 PRIVATE CULVERTS

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

The culverts shall be installed so the culvert invert is embedded 150mm below the invert of the drain for culverts with a height or diameter up to 1500 mm. For culverts with a height or diameter greater than 1500 mm the culvert shall be embedded by 10% of the height or diameter 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. C. The standard length for supplied culverts shall be 10 meters, unless otherwise specified.

SP4.2 Culvert Location

Culverts to be installed or lowered and reinstalled are shown on Dwg Nos. 21071-A2 and 21071-P1 through 21071-P3.

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 which impede construction, or where the removal of fences is required for access to the drain or designated working space, it will be the Contractor's responsibility to remove the existing fence and reinstate the fence in a condition equal to or better than the condition of the fence prior to the commencement of the work. Fences are installed in conformance with the standards associated with the type of fence. Where fence crosses the drain, fence is to be installed in conformance with RCI Std. Dwg. H, provided in **Appendix A**.

SP5.1 Fencing - Replacement

Where fences are encountered which impede construction, or where the removal of fences is required for access to the drain or designated working space, the on-site representative of the Drainage Engineer shall determine if a fence is not in reasonable condition to be reinstated. If a fence is not in reasonable condition to be reinstated, the

Contractor shall supply and install a similar fence to the OPSD that governs that type of fence, and 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

For agricultural areas, all disturbed banks, and a 5 metres buffer strip adjacent to the drain, shall be hand seeded. Beyond the 5-meter buffer strip, spoils are not to be seeded. It is anticipated that property owners will till these areas and return to normal crop production.

For non-agricultural areas, seeding is placed on the disturbed banks, 5m buffer area and in all fully cleared and grubbed areas. Seeding is not typically required in forest or brush lands (not fully cleared) where spreading may occur around trees and over brush (typically razored) as these areas are anticipated to naturally regenerate.

Additional areas of seeding or additional seeding requirements may be identified by the Drainage Engineer.

All identified areas are to be seeded a maximum of 48 hours after construction, except for the 5-meter buffer strip. The 5-meter buffer strip can be seeded once work in the area has been completed.

The seed mixture (or an alternate reviewed by the Drainage Engineer) is to be as follows:

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

Canada Bluegrass establishes a deep creeping root system and tough sod ideal for stabilizing low-fertile rocky or clay soils and is drought, flood, and salt tolerant. Perennial rye will encourage quick establishment of a ground cover, while red fescue provides

deeper rooting vegetation, which 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 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

The rock protection shall be inset into the bank and the bed of the drain so 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 Std. Dwg. D and F (provided in **Appendix A**).

SP7.1 Rock Protection Erosion Control Location

Refer to Dwg. Nos. 21071-A2 and 21071-P1 through 21071-P3 (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 Rock Flow Checks

SP9.1.1 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.

SP9.1.2 Geotextile

Geotextile shall be placed under the rock protection on the banks of the drain and over the rock check as shown on OPSD 219.211.

SP9.1.3 Installation

Rock flow checks shall be installed as shown on OPSD 219.211 (provided in **Appendix A**).

SP9.2 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 and constructed in conformance with RCI Std. Dwg. I.

SP9.3 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.

SP9.4 Flow Check Removal

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

SP9.5 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.

SP9.6 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 an outlet pipe complete with a rodent grate. 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 RCI Std. Dwg. F (provided in **Appendix A**).

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 RCI Std. Dwg. F.

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 Dwg. No. 21071-A2, all in accordance with RCI Std. Dwg. C (provided in **Appendix A**).

SP11.1 Payment

Payment for culvert end treatments shall include for all materials, excavation, and installation, including rock protection and geotextile in accordance with RCI Std. Dwg. C.

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 ENVIRONMENT CONSERVATION AND PARKS – SPECIES AT RISK

The Ontario Ministry of Environment Conservation and Parks (MECP) has screened the proposed works and work area for Species at Risk (SAR) and has provided the Letter of Advice in this regard. Species were identified which require an exemption/permit to be in place at the time of construction (not completed at the time of this Report). Where available, the specified exemption/permit is to be attached to this SP for construction purposes. The contractor must be aware of the SAR Act and that 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 advice are found in the MECP- SAR Letter of Advice as provided in **Appendix F** of the Engineer's Report and/or attached to this SP for the purpose of construction.

For this project, current SAR are detailed in NRSI – Species at Risk (SAR) and Species of Special Concern (SCC) Screening Table in **Appendix F** of the Engineer's Report and/or attached to this SP for the purpose of construction.

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.

SP 14.0 GRAND RIVER CONSERVATION AUTHORITY – PERMISSION (O.REG. 150/06)

The Permit with related to the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" (O.Reg. 150/06) for works to be completed on the McNichol Municipal Drain by GRCA is contained in **Appendix G** of the Engineer's Report. The Contractor shall insure any conditions are adhered to.

SP15.0 DFO – CLASS AUTHORIZATION

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

Appendix C

Schedules of Assessment

**SCHEDULE A
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF THE
McNICHOL MUNICIPAL DRAIN**



Project No.: B21071
Date: 23-Jun-23

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	Allowance Eligibility	Special Benefit & Utilities	Total Net Cost	
		S1 Total		S1	S1	S1			S1									
Haldimand County -- Individual Landowners																		
1	230 022 21000 0000	3.49	0.98	3.42	Y	1.00	3.42	\$ 405.51	1.00	0.33	1.13	\$ 1,500.85	\$ 1,906.36	*	**	\$ -	\$ 1,906.36	
2	230 022 22000 0000	3.79	0.78	2.97	Y	1.00	2.96	\$ 350.76	1.00	0.33	0.98	\$ 1,298.22	\$ 1,648.97	*	**	\$ -	\$ 1,648.97	
3	230 022 23000 0000	6.20	0.85	5.26				\$ -	0.88	0.66	3.07	\$ 4,076.67	\$ 4,076.67	*		\$ -	\$ 4,076.67	
4	230 022 37040 0000	1.26	0.98	1.24				\$ -	1.00	0.66	0.82	\$ 1,086.24	\$ 1,086.24			\$ -	\$ 1,086.24	
5	230 022 60000 0000	0.61	2.00	1.21				\$ -	1.00	0.66	0.80	\$ 1,065.64	\$ 1,065.64			\$ -	\$ 1,065.64	
6	230 022 63100 0000	1.44	1.80	2.58				\$ -	1.00	0.66	1.70	\$ 2,265.02	\$ 2,265.02			\$ -	\$ 2,265.02	
7	230 022 63000 0000	1.25	1.86	2.32				\$ -	0.84	0.66	1.29	\$ 1,716.47	\$ 1,716.47			\$ -	\$ 1,716.47	
8	230 022 63050 0000	0.91	1.00	0.91				\$ -	1.00	0.66	0.60	\$ 802.79	\$ 802.79			\$ -	\$ 802.79	
9	230 022 60040 0000	0.58	2.00	1.16				\$ -	1.00	0.66	0.76	\$ 1,015.91	\$ 1,015.91			\$ -	\$ 1,015.91	
10	230 022 61000 0000	0.14	2.00	0.28				\$ -	1.00	0.66	0.18	\$ 241.55	\$ 241.55			\$ -	\$ 241.55	
11	230 022 61040 0000	0.14	2.00	0.28				\$ -	1.00	0.66	0.18	\$ 241.55	\$ 241.55			\$ -	\$ 241.55	
12	230 022 62000 0000	13.45	0.75	10.13				\$ -	0.70	0.66	4.69	\$ 6,237.70	\$ 6,237.70			\$ -	\$ 6,237.70	
13	230 022 28000 0000	15.66	1.00	15.66				\$ -	0.84	1.00	13.14	\$ 17,472.32	\$ 17,472.32			\$ -	\$ 17,472.32	
14	230 021 33000 0000	2.71	1.00	2.71	Y	1.00	2.71	\$ 321.14	1.00	0.33	0.89	\$ 1,188.61	\$ 1,509.75		**	\$ -	\$ 1,509.75	
15	230 021 33050 0000	4.00	1.00	3.99	Y	0.96	3.84	\$ 454.78	0.96	0.66	2.53	\$ 3,366.44	\$ 3,821.22		**	\$ -	\$ 3,821.22	
16	230 021 39800 0000	0.72	2.00	1.43	Y	1.00	1.43	\$ 169.87	1.00	0.66	0.95	\$ 1,257.46	\$ 1,427.33		**	\$ -	\$ 1,427.33	
17	230 021 39750 0000	0.63	2.00	1.25	Y	1.00	1.25	\$ 148.76	1.00	0.66	0.83	\$ 1,101.17	\$ 1,249.92			\$ -	\$ 1,249.92	
18	230 021 39700 0000	0.53	2.00	1.07	Y	1.00	1.07	\$ 126.69	1.00	0.66	0.71	\$ 937.77	\$ 1,064.45		**	\$ -	\$ 1,064.45	
19	230 021 39650 0000	0.51	2.00	1.03	Y	1.00	1.03	\$ 121.89	1.00	0.66	0.68	\$ 902.25	\$ 1,024.13		**	\$ -	\$ 1,024.13	
20	230 021 39600 0000	0.80	2.00	1.59	Y	1.00	1.59	\$ 189.07	1.00	1.00	1.59	\$ 2,120.52	\$ 2,309.59		**	\$ -	\$ 2,309.59	
21	230 021 37500 0000	6.57	1.00	6.57	Y	0.90	5.92	\$ 702.57	0.90	1.00	5.92	\$ 7,879.82	\$ 8,582.39	*	**	\$ -	\$ 8,582.39	
22	230 021 39000 0000	11.55	0.86	9.92	Y	0.84	8.33	\$ 987.34	0.84	1.00	8.33	\$ 11,073.67	\$ 12,061.01	*	**	\$ -	\$ 12,061.01	
23	230 021 39500 0000	0.48	0.94	0.45				\$ -	1.00	1.00	0.45	\$ 598.73	\$ 598.73			\$ -	\$ 598.73	
24	230 021 42000 0000	9.44	0.84	7.89				\$ -	0.80	1.00	6.32	\$ 8,407.12	\$ 8,407.12	*		\$ -	\$ 8,407.12	
25	230 040 41000 0000	5.82	0.99	5.78				\$ -	0.75	1.00	4.34	\$ 5,767.04	\$ 5,767.04	*		\$ -	\$ 5,767.04	
26	230 022 40000 0000	10.97	1.00	10.97	Y	0.87	9.51	\$ 1,127.67	0.87	1.00	9.51	\$ 12,647.62	\$ 13,775.29		**	\$ -	\$ 13,775.29	
27	230 021 39500 0000	1.02	1.00	1.02				\$ -	0.89	1.00	0.90	\$ 1,201.43	\$ 1,201.43			\$ -	\$ 1,201.43	
28	230 022 29200 0000	3.42	1.00	3.42				\$ -	0.92	1.00	3.13	\$ 4,167.52	\$ 4,167.52	*		\$ -	\$ 4,167.52	
29	230 022 29300 0000	1.72	1.00	1.72				\$ -	0.91	1.00	1.56	\$ 2,079.80	\$ 2,079.80	*		\$ -	\$ 2,079.80	
30	230 022 64100 0000	0.28	2.00	0.55				\$ -	0.50	0.66	0.18	\$ 241.55	\$ 241.55			\$ -	\$ 241.55	
31	230 022 73000 0000	0.28	2.00	0.56				\$ -	0.75	0.66	0.28	\$ 367.65	\$ 367.65			\$ -	\$ 367.65	
32	230 022 73100 0000	0.37	2.00	0.74				\$ -	0.50	0.66	0.25	\$ 326.80	\$ 326.80			\$ -	\$ 326.80	
Haldimand County -- Roads/Other																		
Bird Rd		2.90	4.00	11.61	Y	1.00	11.61	\$ 1,376.97	1.00	1.00	11.61	\$ 15,443.68	\$ 16,820.65			\$ 10,596.55	\$ 27,417.20	
Mumby Rd		1.42	4.00	5.66				\$ -	0.79	1.00	4.50	\$ 5,980.39	\$ 5,980.39			\$ -	\$ 5,980.39	
Jenny Jump Rd		0.88	4.00	3.50	Y	0.90	3.14	\$ 372.63	0.90	1.00	3.14	\$ 4,179.31	\$ 4,551.94			\$ 32,789.05	\$ 37,340.99	
Total		115.91		130.85				57.82	\$ 6,855.65			97.94	\$ 130,257.26	\$ 137,112.90			\$ 43,385.60	\$ 180,498.50

Appendix D

Schedule of Allowances and Detailed Cost Estimate

**SCHEDULE B
ALLOWANCES FOR LANDS USED IN THE CONSTRUCTION OF
McNICHOL MUNICIPAL DRAIN**

Project No.: B21071

Date: 23-Jun-23

ID	Roll No.	Land Allowance				Total Value
		S1				
		L	W	Area	Value	
<i>Haldimand County -- Individual Landowners</i>						
1	230 022 21000 0000	350.00	2.00	0.07	\$ 5,670.00	\$ 5,670.00
2	230 022 22000 0000	100.00	2.00	0.02	\$ 1,620.00	\$ 1,620.00
14	230 021 33000 0000	180.00	1.00	0.02	\$ 1,458.00	\$ 1,458.00
15	230 021 33050 0000	50.00	1.00	0.01	\$ 405.00	\$ 405.00
16	230 021 39800 0000	40.00	1.00	0.00	\$ 324.00	\$ 324.00
18	230 021 39700 0000	10.00	1.00	0.00	\$ 81.00	\$ 81.00
19	230 021 39650 0000	50.00	1.00	0.01	\$ 405.00	\$ 405.00
20	230 021 39600 0000	160.00	1.00	0.02	\$ 1,296.00	\$ 1,296.00
21	230 021 37500 0000	200.00	1.00	0.02	\$ 1,620.00	\$ 1,620.00
22	230 021 39000 0000	60.00	1.00	0.01	\$ 486.00	\$ 486.00
26	230 022 40000 0000	230.00	1.00	0.02	\$ 1,863.00	\$ 1,863.00
Total		1,430.00	13.00	0.19	\$ 15,228.00	\$ 15,228.00

DETAILED COST ESTIMATE
McNICHOL MUNICIPAL DRAIN



Project No: B21071
Date: 23-Jun-23

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 1						
Construction						
Construction	Site Preparation Activities					
		Mobilization (maximum 2% of total construction cost)	LS	\$ 1,300.00	100%	\$ 1,300.00
		Erosion and Sediment Control Plan	LS	\$ 1,000.00	100%	\$ 1,000.00
		Erosion and Sediment Control Measures -- Minimum as Follows:				
		- Rock Check Dam c/w Sediment Trap	each	\$ 850.00	3.00	\$ 2,550.00
		- Straw Bale Dam c/w Sediment Trap	each	\$ 300.00	0.00	\$ -
		Clearing/Grubbing (including individual tree removals)	ha	\$ 5,000.00	0.50	\$ 2,500.00
		Silt Fence (Provisional)	m	\$ 7.50	200.00	\$ 1,500.00
		Fence removal and reinstatement	m	\$ 30.00	0.00	\$ -
	Excavation Activities					
		Earth Ex. - Ditch (full construction) - Incl. Silt Excavation	m ³	\$ 5.00	1465.00	\$ 7,325.00
		Earth Ex. - Spreading	m ³	\$ 2.50	788.00	\$ 1,970.00
		Earth Ex. - Off Site Disposal	m ³	\$ 12.50	677.00	\$ 8,462.50
		Access Culvert(s) -- 900mm CSP	m	\$ 475.00	10.00	\$ 4,750.00
		Access Culvert(s) -- 500mm CSP	m	\$ 500.00	10.00	\$ 5,000.00
		Rock Excavation (hydraulic ram)	m ³	\$ 150.00	0.00	\$ -
	Reinstatement Activities					
		Tile Outlet Restoration/Protection	each	\$ 500.00	0.00	\$ -
		Hand Seeding	m ²	\$ 0.50	8726.00	\$ 4,363.00
		Rock Protection - Erosion Control	m ²	\$ 27.50	85.00	\$ 2,337.50
		Rock Protection - Culvert End Treatments	each	\$ 825.00	4.00	\$ 3,300.00
	Road Authority Activities					
		Roadway Culvert -- Jenny Jump Rd	LS	\$ 20,175.00	1.00	\$ 20,175.00
		Sub-Total - Construction Costs				\$ 66,533.00
		Contingency Allowance - Construction				\$ 8,000.00
	Total - Construction Costs				\$ 74,533.00	
Engineering/Administration						
	Engineer's Report (apportioned by Section)	LS	\$ 57,645.00	100%	\$ 57,645.00	
	NSRI -- Biologist Report (SAR)	LS	\$ 4,992.50	100%	\$ 4,992.50	
	Contract Administration/Inspection	LS	\$ 28,100.00	100%	\$ 28,100.00	
	Sub-Total - Routine Engineering				\$ 90,737.50	
	Sub-Total - Engineering/Administration				\$ 90,737.50	
Other						
	Carrying Cost(s)	L.S	Not Applicable		\$ -	
	Allowances	LS	(See Schedule)		\$ 15,228.00	
	Sub-Total - Other Costs				\$ 15,228.00	
Sub-Total - Construction, Engineering/Admisitration, Others Costs						\$ 180,498.50
Special Benefits						
Road Authority (Haldimand County) 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 County Road Authority. It is estimated that 10% of the costs noted below are due to the required Road Authority Works.</i>					
		Engineering/Administration and Other - Jenny Jump Road	LS	\$ 105,965.50	10%	\$ 10,596.55
		Roadway Culvert -- Jenny Jump Rd	LS	\$ 20,175.00	1.00	\$ 20,175.00
		Roadway Culvert -- Jenny Jump Rd (Construction Contingency)	LS	\$ 2,017.50	1.00	\$ 2,017.50
	Sub-Total - Haldimand County				\$ 32,789.05	
Road Authority (Haldimand County) 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 County Road Authority. It is estimated that 10% of the costs noted below are due to the required Road Authority Works.</i>					
		Engineering/Administration and Other - Bird Road	LS	\$ 105,965.50	10%	\$ 10,596.55
		Sub-Total - Haldimand County				\$ 10,596.55
		Special Benefits - Total				\$ 43,385.60
Total Net Costs - Section 1 (For Distribution to Properties)						\$ 137,112.90

Note*: Contract Inspection is required to be completed by the Drainage Engineer under the Drainage Act, R.S.O. 1990, c. D17. However, the estimate and a level of effort for these services may be modified at the time of construction.

Appendix E

Assessment Methodology

AS1.0 General

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 several basic principles that apply to the assessment for future maintenance of the McNichol 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 for 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 access 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 is an 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 is employed 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. For 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 allows 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. This 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 with an outlet 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 a subsection factor to the lands within the section of the drain where maintenance will be 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.

AS2.0 Calculation of Assessments

AS2.1 Benefit Assessment

Benefit by definition under the Drainage Act, R.S.O. 1990, c D.17, is the “advantages to any lands, roads, building or other structures from the construction, improvement, repair or maintenance of a drainage works 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”.

Lands that are located immediately adjacent to the drain are charged a benefit assessment. A Benefit Assessment for 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 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.

AS2.2 Outlet Assessment

Outlet by definition under the Drainage Act, R.S.O. 1990, c. D17, is the “outlet liability” and means the part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved 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.

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

AS2.3 Assessment for Special Benefit

Special Benefit as defined under the Drainage Act, RSO 1990, c D.17 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.” An assessment for Special Benefit 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.

AS2.4 Injuring Liability Assessment

Injuring Liability as defined under the Drainage Act, RSO 1990, c D.17 is “If, from any land or road, water is artificially caused by any means to flow upon and injure any other land or road, the land or road from which the water is caused to flow may be assessed for injuring liability with respect to a drainage works to relieve the injury so caused to such other land or road.”

AS3.0 Factors Affecting Assessments

AS3.1 Maintenance Sections

The consideration of maintenance sections allows for factors to be adjusted where work for construction and future maintenance is completed. This factor accounts for how much of the drain each property uses and allows for other factors such as the Distance Factor to be applied (reducing assessments the further away from the drain the property is). The area that is tributary to each section has been determined based on the subcatchment areas that convey flow to each section.

AS3.2 Sub-Section Factor

For each maintenance section as defined in the Report, the section is further divided into three subsections or parts. The upstream subsection is assigned a factor of 1.00, the middle subsection of the drain 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 a section are assigned a subsection factor of 1.0.

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

AS3.3 Land Use Factor

A land use factor is included in the assessment calculation to account for the volume of runoff from lands used for different purposes. A numeric value of 1.0 is assigned to all agricultural, rural use, large lot residential (greater than 2.0ha) and vacant lands, or any land where an alternative factor is not otherwise specified. A numerical value of 0.7 is assigned to unprotected forest lands (not subject to a registered management agreement). A value of 2.0 is assigned to small lots of 2.0 Ha (5.0 acres) or less. A value of 4.0 is assigned to land classified as higher density residential, institutional, and commercial or is a road right-of-way. A value of 2.0 is assigned for a Hydro right-of-way. A value of 0.5 is assigned to all lands designated as Provincially Significant Wetland (PSW) and subsequently protected by legislation. A value of 0.5 may be applied to forested land where the Drainage Engineer has been provided with documentation confirming that the forested land is subject to a registered Forest Management Agreement and subsequently protected from modification by the agreement.

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

AS3.4 Distance Factor

A distance factor was developed to account for 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 of 0.75. A property that falls entirely within the third band is given a distance factor of 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.

AS3.5 Grants

Grants are applied at the time of assessment, typically one (1) year or greater following the construction or maintenance of the drain based on eligibility at that time. As such, current grant eligibility should not be considered to indicate that a property will be grant eligible at the time of assessment. Additionally, it is noted that program eligibility and/or availability is subject to change at the discretion of the Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) within the Agricultural Drainage Infrastructure Program (ADIP). Current eligibility requirements as prescribed by OMAFRA are available on the OMAFRA website (<http://omafra.gov.on.ca/>).

To accurately provide the cost of the drain and provide property owners with the full cost for their consideration exclusive of any deductions that may be made under the Drainage Act, “grants” are not summarized in conjunction with the assessments and must be deducted separately.

Where program availability and property eligibility are confirmed at the time of assessment, the grant (currently set at 33%) will be applied to the total net assessment.

AS3.6 Allowances

Properties eligible for allowances are marked with a “***” notation in the “Allowance Eligibility” column of the Schedules of Assessment. In order to accurately provide the cost of the drain and provide property owners with the full cost of their assessment, exclusive of any deductions that may be made under the Drainage Act, allowances are not summarized in conjunction with the assessments and must be viewed separately.

The parcels of land which have been granted allowances are outlined in the Schedule of Allowances provided in **Appendix D**. The allowances have been established in accordance with Sections 29, 30 and 31 of the Drainage Act, RSO 1990, c D.17.

The allowance for the land (Section 29) is for the land lost due to ditch widening and relocation. The allowance is calculated using the following:

- The width of any land lost to the proposed construction (new – excludes the existing channel), multiplied by;
- The length of the proposed modification on the property, multiplied by;
- The unit rate (value) of lands based on the average Municipal Property Assessment Corporation (MPAC) assessed value for farmlands (land only) in the area.

The allowance for crops lost due to the use of the working space (Sections 29 & 30) is provided for agricultural lands (only) as that area is anticipated to be out of production during construction, with reduced productivity for a period of two years thereafter. The area associated with the allowance is calculated using the following:

- The anticipated width (for spreading of material) plus the width of the prescribed buffer area, multiplied by;
- the length of the disturbed area on the property, multiplied by;
- The value of the crops.

The value of crops used in the allowance is calculated using an average of corn and soya beans, based on the latest published AgriCorp market prices for the area and the average area yield as published by the Ontario Ministry of Agriculture Food and Rural Affairs to determine an average value per hectare of crops.

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, RSO 1990, c D.17 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 initial cost of construction, improvement or repair of the drainage works.

These allowances are fixed amounts and are in accordance with Section 62 (3) and 62(4) of the Drainage Act, R.S.O. 1990, c D.17. 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. Where the allowance is greater than any assessment the municipality shall collect the amount and pay the amount to the respective property owners.

The allowance for land lost due to the Municipal Drain construction or widening has been calculated using average MPAC 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 on lands presently under cultivation.

Due to the nature of this drain and extent of construction it is not anticipated that crops will be lost to the construction of this drain. Therefore, no allowance for the loss of crops has been included in this Report.

Appendix F

MECP

Species at Risk – Screening Species At Risk

NRSI – Construction Requirements 2029
(Email dated Feb 13, 2023)

NRSI – Species at Risk (SAR) and
Species of Special Concern (SCC)
Screening Table

Species at Risk (SAR) and Species of Special Concern (SCC) Screening Table

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Vascular Plants										
American Ginseng	<i>Panax quinquefolius</i>	S2	END	E	E	Schedule 1	Michigan Flora Online (A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011)	Rich, even swampy, hardwoods (beech, sugar maple, hemlock), especially on slopes or ravines (including forested dunes). Flowering in early summer.	No	American Ginseng was not observed during the preliminary site visit. Habitat within the study area is limited and is comprised of disturbed cultural thicket. The species is not present within the study area, but could be found beyond the boundary within the deciduous swamp.
Eastern Flowering Dogwood	<i>Cornus florida</i>	S2?	END	E	E	Schedule 1	Michigan Flora Online (A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011)	Dry (usually oak) to rich deciduous forests, especially on hillsides and river banks; rarely recorded with tamaracks. Flowering in spring. Fruiting in summer to fall.	No	Eastern Flowering Dogwood was not observed during the preliminary site visit. Habitat within the study area is limited and is comprised of disturbed cultural thicket. The species is not present within the study area, but could be found beyond the boundary within the deciduous swamp.
American Chestnut	<i>Castanea dentata</i>	S1S2	END	E	E	Schedule 1	Flora of North America Online (Flora of North America Editorial Committee, eds. 1993+)	Rich deciduous and mixed forests, particularly with oak. Flowering in summer.	No	American Chestnut was not observed during the preliminary site visit. Habitat within the study area is limited and is comprised of disturbed cultural thicket. The species is not present within the study area, but could be found beyond the boundary within the deciduous swamp.
Birds										
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	THR	T	T	Schedule 1	Recovery Strategy for the Eastern Whip-poor-will (MECP 2019)	Areas with a mix of open and forested areas, such as open woodlands, savannas, pine plantations, woodland edges, or openings in more mature deciduous, coniferous and mixed forests. Forages in open areas and uses forested areas for roosting and nesting.	Yes	Habitat along the edge of the Cultural Thicket adjacent to McNichol Drain may provide suitable roost and forage habitat. However, suitable nesting is restricted to the edge of the woodland (FOD) within the study area, which should be avoided during excavation.
Chimney Swift	<i>Chaetura pelagica</i>	S3B	THR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Commonly found in urban areas near buildings; nests in chimneys, hollow trees, and crevices of rock cliffs. Feeds over open water.	No	Identified cavity trees along the boundary of the study area were not adequate for nesting by Chimney Swift. No other suitable nesting habitat was identified.
King Rail	<i>Rallus elegans</i>	S1B	END	E	E	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Large, shallow, densely vegetated, fresh water marshes; shrubby swamps; marshy borders of lakes and ponds with abundant vegetation.	No	Suitable wetland habitat is not present within the study area. Cattail habitat within the drain is limited and directly adjacent to the roadway. Suitable habitat may exist beyond the study area in the deciduous swamp.
Least Bittern	<i>Ixobrychus exilis</i>	S4B	THR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Strongly prefers cattail marshes with a mix of open pools and channels. Also found in swamps and bogs and marshy borders of lakes, ponds, streams and ditches with dense emergent vegetation of cattail, bulrush and sedge. Nests in cattails. Intolerant of loss of habitat and human disturbance.	No	Suitable wetland habitat is not present within the study area. Cattail habitat within the drain is limited and directly adjacent to the roadway. Suitable habitat may exist beyond the study area in the deciduous swamp.
Barn Swallow	<i>Hirundo rustica</i>	S4B	THR	SC	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.	No	Though residential dwellings exist within proximity to the study area, these will not be impacted by drainage works.
Bank Swallow	<i>Riparia riparia</i>	S4B	THR	T	T	Schedule 1	Recovery Strategy for the Bank Swallow in Ontario (Falconer et al. 2016)	Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Usually on banks of river and lakes, but also found in sand and gravel pits.	No	Suitable deposits of silt, sand, or gravel are not present within the study area. The banks of the drain are approximately 50-60 degrees from the water, and do not provide adequate nesting habitat.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	SC	T	Schedule 1	Recovery Strategy for the Bobolink and Eastern Meadowlark in Ontario (McCracken et al. 2013)	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occasionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	Suitable open habitat is not present within the study area. Study area is characterized by cultural thicket and residential properties surrounded by deciduous swamp and forest habitat.
Eastern Meadowlark	<i>Sturnella magna</i>	S4B,S3N	THR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	Suitable open habitat is not present within the study area. Study area is characterized by cultural thicket and residential properties surrounded by deciduous swamp and forest habitat.
Cerulean Warbler	<i>Setophaga cerulea</i>	S2B	THR	E	E	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Mature deciduous woodland of Great Lakes-St. Lawrence and Carolinian forests, with large, tall trees and an open understory. Area sensitive species needing extensive areas of forest (>100 ha).	No	Habitat within the study area is not comprised of interior habitat and is characterized by cultural thicket and residential properties.
Reptiles and Amphibians										
Blanding's Turtle (Great Lakes / St. Lawrence population)	<i>Emydoidea blandingii</i>	S3	THR	E	E	Schedule 1	Recovery Strategy for the Blanding's Turtle (MECP 2019)	Eutrophic, shallow wetlands such as marshes, ponds, swamps, bogs, fens, or coastal wetlands, with soft, muddy substrates, abundant aquatic vegetation, and basking structures (logs, stumps, hummocks). Large overland movements occur between aquatic habitats and to open sandy or gravelly areas for nesting. Forest habitat is important for upland movements. Overwintering typically occurs in permanent wetlands.	No	Suitable basking and overwintering habitat is not found within the study area. It is possible that Blanding's Turtle may use the area as a movement corridor or foraging area, but suitable seasonal habitat is not present.
Eastern Foxsnake (Carolinian population)	<i>Pantherophis gloydi pop. 2</i>	S2	END	T	E	Schedule 1	Recovery Strategy for the Eastern Foxsnake (Eastern Foxsnake Recovery Team. 2010)	Open natural and semi-natural upland habitats, such as meadows, fields, restored prairies, and marshes and creeks. Root wads and logs provide cover and shelter. Nests in rotten logs, stumps, dune slopes, decaying piles of vegetation. Hibernates communally underground in animal burrows, or in old wells or foundations.	No	Suitable open habitat is not present within the study area. The area directly adjacent to McNichol Creek is characterized by a semi-open regenerating cultural thicket, but is not representative of suitable upland habitat for Eastern Foxsnake. Suitable hibernaculum is not present.
Gray Ratsnake (Carolinian population)	<i>Pantherophis spiloides pop. 2</i>	S1	END	E	E	Schedule 1	Recovery Strategy for the Gray Ratsnake (Kraus, T., B. Hutchinson, S. Thompson & K. Prior. 2010)	Found in a mix of agricultural land and deciduous forest, preferring habitat where forest meets more open environments. Nests in cavities of large deciduous trees, stumps, logs or compost piles. Overwinters in underground cracks and crevices.	Yes	The forest surrounding and adjacent to McNichol Creek is dominated by deciduous trees and contains few potential candidate nesting trees with cavities. Forest edges along roadsides and drain features may provide basking opportunities for Gray Ratsnake. However, no suitable nesting habitat is present immediately adjacent to the drain, no suitable overwintering habitat is present within the study area, and the deciduous forests within the study area are largely inundated with water and unsuitable for Gray Ratsnake. Gray Ratsnakes may use the area as a movement corridor and thermoregulation habitat.
Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>	S3	THR	T	T	Schedule 1	Recovery Strategy for the Eastern Hog-nosed Snake (Kraus, T. 2011)	Open habitats, such as open woods, brushland or forest edges, with well-drained loose or sandy soils, well-drained substrates. Specializes in hunting and eating toads; occurs in habitats near or adjacent to wetland habitats where toads are present. Rocks, logs, stumps, etc. are used for shelter. Use snout to dig nests as well as to dig burrows for overwintering.	No	Open foraging, nesting, and overwintering habitats with sandy soils are not present within the study area. Study area is characterized by cultural thicket and residential properties surrounded by deciduous swamp and forest habitat.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Fowler's Toad	<i>Anaxyrus fowleri</i>	S2	END	E	E	Schedule 1	Recovery Strategy for the Fowler's Toad (Green, D. M., A. R. Yagi, & S. E. Hamill. 2011)	Open beaches, dunes, sandy shorelines, rocky pools, creek and stream mouths, backshore wetlands, and marshes along the northern shore of Lake Erie. Breeds in early successional wetlands, drains and stream mouths that open onto sand beaches, bedrock pools, shallow bays, and ponds, with either sand or bedrock substrates. Overwinters in sand dunes and areas of deep sand where toads can dig below the frost line.	No	Suitable open, breeding, and overwintering habitats are not present within the study area. Sandy soil, beaches, dunes, shorelines, and water features that open onto sand beaches, bedrock pools, shallow bays, and ponds are not present within or near the study area. Study area is characterized by cultural thicket and residential properties surrounded by deciduous swamp and forest habitat.
Mammals										
Little Brown Myotis	<i>Myotis lucifugus</i>	S3	END	E	E	Schedule 1	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fortherby. 2019)	Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.	Yes	Suitable roost trees have been identified as present along the edge of the cultural thicket (CUT) adjacent to McNichol Drain, specifically within the edge of woodland (FOD) habitat. Other candidate roost trees have been identified along the northern side of McNichol Drain where it follows adjacent to Bird Road. Pending the distance from the drain required for equipment, these trees may not fall within the area of impact. These areas should be avoided during vegetation clearing and be flagged and avoided during excavation.
Tri-colored Bat	<i>Perimyotis subflavus</i>	S3?	END	E	E	Schedule 1	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fortherby. 2019)	Roosts and maternity colonies in older forests and occasionally in barns or other structures. Forage over water and along streams in the forest. Hibernate in caves.	Yes	Suitable roost trees have been identified as present along the edge of the cultural thicket (CUT) adjacent to McNichol Drain, specifically within the edge of woodland (FOD) habitat. Other candidate roost trees have been identified along the northern side of McNichol Drain where it follows adjacent to Bird Road. Pending the distance from the drain required for equipment, these trees may not fall within the area of impact. These areas should be avoided during vegetation clearing and be flagged and avoided during excavation.
Northern Myotis	<i>Myotis septentrionalis</i>	S3	END	E	E	Schedule 1	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fortherby. 2019)	Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy. ^{3,4}	Yes	Suitable roost trees have been identified as present along the edge of the cultural thicket (CUT) adjacent to McNichol Drain, specifically within the edge of woodland (FOD) habitat. Other candidate roost trees have been identified along the northern side of McNichol Drain where it follows adjacent to Bird Road. Pending the distance from the drain required for equipment, these trees may not fall within the area of impact. These areas should be avoided during vegetation clearing and be flagged and avoided during excavation.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Eastern Small-footed Myotis	<i>Myotis leibii</i>	S2S3	END			Schedule 1	Recovery Strategy for the Eastern Small-footed Myotis (Humphrey, C. 2017)	Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.	Yes	Suitable roost trees have been identified as present along the edge of the cultural thicket (CUT) adjacent to McNichol Drain, specifically within the edge of woodland (FOD) habitat. Other candidate roost trees have been identified along the northern side of McNichol Drain where it follows adjacent to Bird Road. Pending the distance from the drain required for equipment, these trees may not fall within the area of impact. These areas should be avoided during vegetation clearing and be flagged and avoided during excavation.
American Badger (Southwestern Ontario population)	<i>Taxidea taxus jacksoni</i>	S1	END	E	E	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches	No	Open grassland or oak savannahs are not present within the study area. Habitat is highly disturbed and adjacent to Bird Road.
Fish										
Lake Sturgeon (Great Lakes - Upper St. Lawrence River populations)	<i>Acipenser fulvescens pop. 3</i>	S2	THR	T	NS	No schedule	Assessment and Update Status Report on the Lake Sturgeon (COSEWIC 2006)	Lake Sturgeon are bottom-dwelling fish found in large rivers and lakes, at depths generally between 5 and 10 m, sometimes greater. Spawning occurs in the spring in fast-flowing water at depths between 0.6 and 5 m over hard-pan clay, sand, gravel and boulders.	No	McNichol Drain does not provide suitable habitat for Lake Sturgeon as depths do not exceed 0.4m. Though clay and sandy substrates are observed within the drain, suitable flow for spawning is not present.
American Eel	<i>Anguilla rostrata</i>	S1S2	END	T	NS	No schedule	Species at Risk in Ontario (MECP 2022)	All fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean, from Niagara Falls in the Great Lakes up to the mid-Labrador coast.	No	McNichol Drain does not provide suitable habitat for American Eel.
Black Redhorse	<i>Moxostoma duquesnei</i>	S2	THR	T	T	Schedule 1	Species at Risk in Ontario (MECP 2022)	Pools and riffle areas of medium-sized rivers and streams, usually less than two metres deep. Usually few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, adults migrate to breeding habitat where eggs are laid on gravel in fast water.	No	McNichol Drain contains aquatic and terrestrial vegetation throughout the drain in varying abundances and does not provide adequate current. No gravel within fast current is present to provide adequate spawning habitat.
Mussels										
Round Pigtoe	<i>Pleurobema sintoxia</i>	S1	END	E	E	Schedule 1	Species at Risk in Ontario (MECP 2022)	Small rivers in areas of moderate flow with gravel, cobble and boulder substrates, to larger rivers in mud, sand and gravel at varying depths. Host fish include: Spotfin Shiner, Northern Redbelly Dace, Bluntnose Minnow, Bluegill and Central Stoneroller.	No	McNichol Drain is characterized by sand, silt and clay substrates with slow flow, and therefore does not provide suitable conditions for Round Pigtoe.
Mapleleaf	<i>Quadrula quadrula</i>	S2	THR	SC	SC	Schedule 1	Species at Risk in Ontario (MECP 2022)	The Mapleleaf mussel is usually found in medium to large rivers with slow to moderate currents and firmly packed sand, gravel, or clay and mud bottoms. It also lives in lakes and reservoirs. The fish host of the Mapleleaf Mussel is the Channel catfish. Presence of the fish host is one of the key features determining whether the body of water can support a healthy mussel population.	No	McNichol Drain contains slow current with sand, silt, and clay substrates. The drain itself does not provide suitable habitat for the fish host (Channel Catfish) which may be a limiting factor.
Eastern Pondmussel	<i>Ligumia nasuta</i>	S1	END	SC	SC	Schedule 1	Species at Risk in Ontario (MECP 2022)	Sheltered areas of lakes and slow-moving areas of rivers and canals with sand or mud bottoms. Fish hosts are unknown.	No	Slow current and sandy-clay substrates may provide suitable habitat for Eastern Pondmussel. However, no mussels or remnant valves were observed during the preliminary screening.
Threehorn Wartyback	<i>Obliquaria reflexa</i>	S1	THR	T	T	Schedule 1	Species at Risk in Ontario (MECP 2022)	Large rivers with moderate current and stable gravel, sand and mud bottoms. Likely host fish are common shiner and longnose dace.	No	McNichol Drain contains slow current with sand, silt, and clay substrates. The drain does not meet the preferred habitat requirements of the species.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Hickorynut	<i>Obovaria olivaria</i>	S1?	END	E	E	Schedule 1	Species at Risk in Ontario (MECP 2022)	Sandy beds in large, wide, deep rivers – usually more than two or three metres deep – with a moderate to strong current. Fish host is Lake Sturgeon.	No	McNichol Drain is a small watercourse containing depths at a maximum of 0.4 with slow current. The drain does not provide suitable habitat for the fish host (Lake Sturgeon) or Hickorynut.
Round Hickorynut	<i>Obovaria subrotunda</i>	S1	END	E	E	Schedule 1	Species at Risk in Ontario (MECP 2022)	Rivers with clay, sand, or gravel bottoms. Also shallow areas of lakes with firm sand. Prefers moderately fast moving water. Fish hosts but may include Greenside darter and Eastern sand darter (not confirmed).	No	McNichol Drain does contain sand and clay substrates. However, suitable current is not present within the drain. Water levels are expected to drop significantly in summer months, and likely provides limited standing water along Bird Road.
Lilliput	<i>Toxolasma parvum</i>	S1	THR	E	E	Schedule 1	Species at Risk in Ontario (MECP 2022)	A variety of soft river bottoms, such as mud, sand, and silt. Very sensitive to changes in water quality. Likely hosts are Johnny Darter, White Crappie, Bluegill and Green Sunfish.	No	Though sand and silt are present substrates within McNichol Drain, these sediments do not exceed 10cm in depth and are underlain by clay. Suitable substrates for Lilliput are not present.
Fawnsfoot	<i>Truncilla donaciformis</i>	S1	END	E	E	Schedule 1	Species at Risk in Ontario (MECP 2022)	Medium to large rivers, with moderate to slow flowing water. Usually inhabits shallow waters (one to five metres deep) with muddy, sand or gravel bottoms. Potential fish hosts are Freshwater Drum and Sauger.	No	McNichol Drain is a small watercourse with slow current. Substrates are characterized by sand, silt, and clay with depths not exceeding 0.4m. Suitable habitat for Fawnsfoot nor their fish hosts are present.

Reference List

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- Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry. Peterborough, Ontario. Vii + 76pp.
- Kraus, T. 2011. Recovery Strategy for the Eastern Hog-nosed Snake (*Heterodon platirhinos*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. i + 6 pp + Appendix vi + 24 pp. Adoption of the Recovery Strategy for the Eastern Hog-nosed Snake (*Heterodon platirhinos*) in Canada (Seburn, 2009). <https://www.ontario.ca/page/eastern-hog-nosed-snake-recovery-strategy#section-1>
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Dakota Dumont

From: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>
Sent: October 14, 2022 8:26 AM
To: Lorne Franklin
Cc: Angela Jonkman; Dakota Dumont; Andy Robinson
Subject: RE: McNichol Municipal Drain - Draft Report

"CAUTION: External Sender"

Hello Lorne,

Further discussions regarding the applicability of the ESA – specifically, whether it appears that adverse impacts to species and habitat can be avoided or whether a permit may be required - can occur once the IGF is received. It's noted that, based on imagery, approximately 50% of the project footprint appears to be adjacent to forested habitat.

The Eastern Fox snake occurrences are near the intersection of Bird Road and Highway 3. More information on the habitat regulation is available [here](#).

MECP is not requesting an environmental appraisal; MECP is potentially an approval authority for the proposed drainage works.

Any person that carried out an activity – such as drainage works - that adversely impacts species at risk or species at risk habitat is in violation of the Endangered Species Act, unless a permit or agreement has been issued by the Minister or the activity is carried out in accordance with an eligible conditional exemption. MECP is providing guidance to Robinson Consultants about the proponent's obligations under the ESA. The IGF is, once a preliminary screening has noted the presence of species at risk in or around the area of the activity, the first stage is determining whether an authorization may be required or a conditional exemption can be relied on. It is not the role or responsibility of the ministry to ensure the proponent's compliance with the ESA nor to carry out the work to do that. MECP has provided assistance beyond its role so far, including screening the site for species observations, and it is now in the hands of the person responsible for the drainage works to take the necessary next steps. Again, we advise that the next step is the preparation and submission of an IGF.

I trust this information is helpful. If concerns about our guidance remain, you may call Paul Heeney, Manager, Permissions, at 613-202-1889.

Thank you,

Tarryn Adams

A/Management Biologist, Permissions Section
Species at Risk Branch
Ministry of the Environment, Conservation and Parks (MECP)
Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Lorne Franklin <lfranklin@rcii.com>
Sent: October 13, 2022 9:56 AM
To: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Dakota Dumont <ddumont@rcii.com>; Andy Robinson

<ajrobinson@rcii.com>

Subject: RE: McNichol Municipal Drain - Draft Report

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Tarryn,

We will complete the IGF as requested and submit shortly

In general, we note that the Municipal Drain currently exists and ultimately is only receiving limited maintenance. The report is only being completed to replace a lost report and facilitate maintenance that has not been completed for the period the report was lost. The drain itself is primarily road-side ditch, mostly in rural residential areas with sod/mowed grass as the primary construction. The maintenance area forms a small component of similar adjacent habitat for any species and lasts only a few weeks, ultimately retuning to the same habitat within a few days or weeks after maintenance is completed resulting in only a temporary displacement to similar adjacent habitats – standard timing windows (as specified by MECP) are generally suitable to mitigate risks.

Contractors and other staff must be knowledgeable in the identification of SAR species listed. As such, avoidance may be an option even for eastern flowering dogwood, etc. as these trees would simply be identified and not cut. We have used a similar process successfully for butternut. Overall, it is not anticipated that species will be found in the front laws of residential properties.

Can you identify where regulated eastern fox snake habitat may be found within the footprint of this project?

Additional study and/or detailed review may be completed at your request, however, such study may be considered to form a component of an “Environmental Appraisal”. In this case, the MECP, as the requesting agency, would be required to pay the cost of the Appraisal as per the requirements of Section 6 of the Ontario Drainage Act, R.S.O.1990, ch. 17. Please confirm if you will be requiring and Environmental Appraisal (All or in Part) and that the MECP is prepared to pay for this Appraisal.

Should you have any questions or concerns, or for further discussion, please contact us.

Sincerely,

Lorne Franklin, L.E.T., C.E.T., rcca, CISEC | Drainage Services

Robinson Consultants 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
T.(613) 592-6060 ext. 123 | rcii.com

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From: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>

Sent: October 12, 2022 3:37 PM

To: Dakota Dumont <ddumont@rcii.com>

Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>

Subject: RE: McNichol Municipal Drain - Draft Report

“CAUTION: External Sender”

Hello Dakota,

The IGF is required because potential SAR concerns exist due to the following:

-There is little to no information on the habitat classes that exist within/near the project footprint. This information is needed to assess the potential of species/habitat presence.

-It is not known whether appropriate timing windows will be applied as the specific dates are not listed.

-It is not known whether "avoidance" is an option for every species. For example, avoidance may not be an option depending on if/where Eastern Flowering Dogwood occurs.

-The general mitigation measure of "avoidance" through adherence to timing windows may not be sufficient to reduce impacts for each species. For example, the project footprint may be within regulated Eastern Foxsnake habitat.

Thank you,

Tarryn Adams

A/Management Biologist, Permissions Section
Species at Risk Branch
Ministry of the Environment, Conservation and Parks (MECP)
Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Dakota Dumont <ddumont@rcii.com>

Sent: October 12, 2022 11:58 AM

To: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>

Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>

Subject: RE: McNichol Municipal Drain - Draft Report

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Tarryn,

As noted in our response and provision of the preliminary screening, it is our interpretation that all species noted from the screening and impacts to their habitat are avoided and/or successfully mitigated. As such we are seeking confirmation that this has been accepted and a permit (or exemption request) is not required. Alternatively, if a permit/application is required, please advise.

Should you have any questions or concerns, please advise.

Thanks,

Dakota Dumont | Civil EIT

Robinson 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8

Consultants T.(613) 592-6060 ext. 157 C.(613) 290-1859 | rcii.com

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From: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>
Sent: October 11, 2022 4:21 PM
To: Dakota Dumont <ddumont@rcii.com>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

"CAUTION: External Sender"

Hello Dakota,

Thank you for completing the preliminary screening for this project.

As mentioned, it is possible that your project qualifies for a conditional exemption. Conditional exemptions are meant to streamline and expediate the approvals process. The process is proponent lead and it is up to you to ensure a qualified professional, with experience preparing mitigation plans under the ESA, is retained and that your project remains compliant with the conditions of the exemption.

It can take a minimum of 9-12 months to work through alternative approvals (i.e., a permit). A completed Information Gathering Form (IGF) is required in order to determine if a permit is needed. Both the form and guide for completing it are available [here](#). Detailed survey information should be included if suitable habitat for American Chestnut and Eastern Flowering Dogwood is likely to be impacted. Additional survey's may be required based on the IGF. Rationale regarding why the project doesn't qualify for the exemption will be required if it's determined that a permit is needed.

Thank you,

Tarryn Adams

A/Management Biologist, Permissions Section
Species at Risk Branch
Ministry of the Environment, Conservation and Parks (MECP)
Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

Tarryn Adams

A/Management Biologist, Permissions Section
Species at Risk Branch
Ministry of the Environment, Conservation and Parks (MECP)
Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Dakota Dumont <ddumont@rcii.com>
Sent: October 4, 2022 3:44 PM
To: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

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Tarryn,

Thank you for your response with regard to SAR in the general vicinity of the McNichol Municipal Drain – Haldimand County. Based on your comments and additional species we have updated our report. Please see the attached document incorporating the response that will be appended to the report (replacing previous sections). Please confirm the information and proposed avoidance/mitigation measures are acceptable. We have a short time frame to finalize the report for processing under the Drainage Act. As such, we request that you provided confirmation that the document is acceptable October 21, 2023. We note, if no response is received in this time, we will assume the document to be considered acceptable for use, finalize the report and prepare for the required distribution under the Ontario Drainage Act, R.S.O. 1990.

Thanks,

Dakota Dumont | Civil EIT

Robinson Consultants 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
T.(613) 592-6060 ext. 157 C.(613) 290-1859 | rcii.com

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From: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>
Sent: September 15, 2022 2:08 PM
To: Dakota Dumont <ddumont@rcii.com>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

"CAUTION: External Sender"

Hello Dakota,

Thank you for confirming that a thorough preliminary screening was completed.

The Species at Risk Branch (SARB) has conducted a review of the submission titled "21071 – Draft Report".

The following additional species are within the vicinity of the site and are not listed in the submission:

Blanding's Turtle	<i>(Emydoidea blandingii);</i>
Barn Swallow	<i>(Hirundo rustica);</i>
American Badger (Southwestern Ontario population)	<i>(Taxidea taxus jacksoni);</i>
American Eel	<i>(Anguilla rostrata);</i>
Bank Swallow	<i>(Riparia riparia);</i>
Black Redhorse	<i>(Moxostoma duquesnei);</i>
Cerulean Warbler	<i>(Setophaga cerulea);</i>
Chimney Swift	<i>(Chaetura pelagica);</i>
Eastern Foxsnake (Carolinian population)	<i>(Pantherophis gloydi pop. 2);</i>
Eastern Hog-nosed Snake	<i>(Heterodon platirhinos);</i>
Eastern Pondmussel	<i>(Ligumia nasuta);</i>
Eastern Whip-poor-will	<i>(Antrostomus vociferus);</i>
Fawnsfoot	<i>(Truncilla donaciformis);</i>
Fowler's Toad	<i>(Anaxyrus fowleri);</i>
Gray Ratsnake (Carolinian population)	<i>(Pantherophis spiloides pop. 2);</i>

Hickorynut	<i>(Obovaria olivaria);</i>
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	<i>(Acipenser fulvescens pop. 3);</i>
Least Bittern	<i>(Ixobrychus exilis);</i>
Lilliput	<i>(Toxolasma parvum);</i>
Mapleleaf Mussel	<i>(Quadrula quadrula);</i>
Round Hickorynut	<i>(Obovaria subrotunda);</i>
Round Pigtoe	<i>(Pleurobema sintoxia);</i>
Threehorn Wartyback	<i>(Obliquaria reflexa).</i>

No other species at risk occurrences were detected which were not already identified in the submission.

While this review represents MECP's best currently available information, it is important to note that a lack of information for a site does not mean that SAR or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in areas not previously surveyed. On-site assessments will better verify site conditions, identify and confirm presence of species at risk and/or their habitats.

As mentioned below, it remains the proponents responsibility to determine if their project qualifies for a conditional exemption. MECP recommends that you take a look at the following link: [Ditch and drainage work and endangered or threatened species | ontario.ca](#), as well as [O.Reg 242/08, S. 23.9](#). If your project meets the criteria outlined in the rules of the regulation, you likely can register the project under the ESA. Please let me know if it's determined that you do not qualify for the exemption, at which time permitting and mitigation measures can be discussed.

Thank you,

Tarryn Adams
 A/Management Biologist, Permissions Section
 Species at Risk Branch
 Ministry of the Environment, Conservation and Parks (MECP)
 Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Dakota Dumont <ddumont@rcii.com>
Sent: September 15, 2022 1:13 PM
To: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

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Tarryn

We note that preliminary screen using the tools and sources as noted in the guide has been completed and was incorporated in the Engineer's Report as sent in Section 13. A copy of Section 13 has been extracted from the report and included here for your reference.

We note, in addition to the Preliminary Screening, that some information, particularly on sensitive species, is not made available by MECP through these sources – as such, it is imperative that MECP also conduct a screening and provide comments. Additionally, under the Drainage Act, the MECP has a responsibility to comment on the acceptability of any

mitigation/avoidance measures (as currently identified in S. 13 of the Report), request an environmental site assessment and/or additional study (under Section 6 of the Drainage Act) and/or prescribe that a permit is required (and set specific requirements).

We trust this to be satisfactory and await your review.

Should you have and further questions or concerns, please contact us.

Thanks,

Dakota Dumont | Civil EIT

Robinson 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8

Consultants T.(613) 592-6060 ext. 157 C.(613) 290-1859 | rcii.com

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From: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>

Sent: September 13, 2022 3:33 PM

To: Dakota Dumont <ddumont@rcii.com>

Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>

Subject: RE: McNichol Municipal Drain - Draft Report

"CAUTION: External Sender"

Hello Dakota,

I apologize for the delayed response. MECP continues to work through a back-log of requests.

It does not appear that a thorough preliminary-screening has been completed for species at risk or their habitat that exist, or are likely to exist, at or near the proposed activity. Please refer to the attached guide for more information on how to complete a preliminary screening for your project. It may be worthwhile to engage the services of a professional environmental/biological consultant to assist in the completion of the preliminary screening. An environmental consultant will be able to provide direction on the type of surveys that should be performed and will be able to interpret the results of the surveys to determine if your activity is likely to impact species at risk or protected habitat under the ESA (e.g. damage or destruction of habitat, killing, harming or harassing species at risk).

It remains the proponents responsibility to determine if their project qualifies for a conditional exemption. It's recommended that you take a look at the following link: [Ditch and drainage work and endangered or threatened species | ontario.ca](#), as well as [O.Reg 242/08, S. 23.9](#). If your project meets the criteria outlined in the rules of the regulation, you likely can register the project under the ESA.

Please be aware it is the responsibility of the proponent to ensure that SAR are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out on the site. You remain responsible for ensuring compliance with the ESA and may be subject to enforcement action if the activities result in any harm to an at-risk species or habitat, without appropriate authorization.

Regards,

Tarryn Adams
A/Management Biologist, Permissions Section
Species at Risk Branch
Ministry of the Environment, Conservation and Parks (MECP)
Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Dakota Dumont <ddumont@rcii.com>
Sent: August 31, 2022 11:19 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

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Hi Carolyn,

Please see the attached

Thanks,

Dakota Dumont | Civil EIT

Robinson 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
Consultants T.(613) 592-6060 ext. 157 C.(613) 290-1859 | rcii.com

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From: Species at Risk (MECP) <SAROntario@ontario.ca>
Sent: August 31, 2022 11:16 AM
To: Dakota Dumont <ddumont@rcii.com>; Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

"CAUTION: External Sender"

Can you please re-send the original attachment for review.

Thank you,
Carolyn Hann

From: Dakota Dumont <ddumont@rcii.com>
Sent: July-27-22 1:39 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>
Subject: RE: McNichol Municipal Drain - Draft Report

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To whom it may concern,

May you please provide us with an update on the status of SAR's/MECP's review

Thanks,

Dakota Dumont | Civil EIT

Robinson 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8

Consultants T.(613) 592-6060 ext. 157 C.(613) 290-1859 | rcii.com

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From: Dakota Dumont

Sent: June 17, 2022 9:08 AM

To: grca@grandriver.ca; FPP.CA / PPP.CA (DFO/MPO) <fisheriesprotection@dfo-mpo.gc.ca>; Species at Risk (MECP) <SAROntario@ontario.ca>; fnatolochny@grandriver.ca; John Van Rooy <jvanrooy@HaldimandCounty.on.ca>

Cc: Angela Jonkman <ajonkman@rcii.com>; Lorne Franklin <lfranklin@rcii.com>; Andy Robinson <ajrobinson@rcii.com>

Subject: McNichol Municipal Drain - Draft Report

-- SENT ON BEHALF OF LORNE FRANKLIN --

Please see the attached Engineer's Report for the McNichol Municipal Drain. The Report is submitted in DRAFT for initial Environmental Agency and Municipal Review. Any issues or concerns may be given consideration at this time. It is the intent that the finalized version of this Draft will incorporate all necessary/applicable approvals/permits/authorizations.

At this time, the Draft is Submitted to the following:

- DFO – ***REQUEST FOR REVIEW** -- For fisheries Act concerns leading to A letter of Advice (or Authorization where applicable). A "Request for Review" form will follow.
- MECP – for required Species at Risk (SAR) Screening and/or other MECP legislation (as directed by MECP)
- MNRF– for other environmental legislation (as directed by MNRF)
- GRCA – for conservation concerns and Permit under Fill, Construction, Alteration to Waterways and Wetlands Regulations.
- MUNICIPALITY – for Drainage Superintendent review and consideration.

Please respond as soon as possible indicating that you have received this message and providing an estimated response time for your review.

Should you have any questions or concerns, please contact us.

Sincerely,

Dakota Dumont on behalf of

Lorne Franklin, L.E.T, C.E.T., rcca, CISEC | Drainage Services

Robinson 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8

Consultants T.(613) 592-6060 ext. 123 | rcii.com

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Dakota Dumont

From: Sam Catry <scatry@nrsi.on.ca>
Sent: February 13, 2023 10:03 AM
To: Lorne Franklin
Cc: Angela Jonkman; Dakota Dumont; Andy Robinson; Kevin Bainbridge; Gina MacVeigh
Subject: Re: [EXTERNAL] FW: (proj3016) McNichol Municipal Drain - SAR Assessment

"CAUTION: External Sender"

Good morning Lorne,

No work would need to be completed at this time if works are proposed for 2029. We wouldn't recommend completing the mitigation plans at this time as of yet, since they need to be updated at a minimum of every 5 years, and are also checked yearly for any potential updates to best management practices.

Additionally, conditions on-site would need to be re-assessed prior to completing the works to determine if work will still be able to be registered in 2029. This would entail a quick site visit similar to our initial screening survey.

Let us know how you'd like to proceed. We can certainly maintain contact and re-evaluate the process as we near 2029.

Thanks,

Sam Catry



Sam Catry

Aquatic Biologist

Natural Resource Solutions Inc.

415 Phillip Street, Unit C

Waterloo, ON N2L 3X2

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On 2023-02-13 7:53 a.m., Lorne Franklin wrote:

Sam,

Would you be able to identify what level of work would need to be completed at this time if there is no construction planned until 2029?

Thanks,

Lorne Franklin, L.E.T., C.E.T., rcca, CISEC | Drainage Services

Robinson Consultants 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
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From: John Van Rooy <jvanrooy@HaldimandCounty.on.ca>
Sent: February 10, 2023 3:47 PM
To: Lorne Franklin <lfranklin@rcii.com>
Cc: Angela Jonkman <ajonkman@rcii.com>; Dakota Dumont <ddumont@rcii.com>; Andy Robinson <ajrobinson@rcii.com>; Kevin Bainbridge <kbainbridge@rcii.com>; Sam Catry <scatry@nrsi.on.ca>; Gina MacVeigh <gmacveigh@nrsi.on.ca>
Subject: RE: [EXTERNAL] FW: (proj3016) McNichol Municipal Drain - SAR Assessment

"CAUTION: External Sender"

Lorne,

Maintenance is scheduled for 2029. I will discuss with my manager, we may advance the maintenance if required and will let you know how to proceed.

Thanks.



John Van Rooy
Project Manager, Municipal Drains - Engineering Services
Haldimand County Administration Building
53 Thorburn St. S., Cayuga, ON N0A 1E0
Phone: 905-318-5932 x6424 **Web:** HaldimandCounty.ca

From: Lorne Franklin <lfranklin@rcii.com>
Sent: Wednesday, February 8, 2023 3:14 PM
To: John Van Rooy <jvanrooy@HaldimandCounty.on.ca>
Cc: Angela Jonkman <ajonkman@rcii.com>; Dakota Dumont <ddumont@rcii.com>; Andy Robinson <ajrobinson@rcii.com>; Kevin Bainbridge <kbainbridge@rcii.com>; Sam Catry <scatry@nrsi.on.ca>; Gina MacVeigh <gmacveigh@nrsi.on.ca>
Subject: [EXTERNAL] FW: (proj3016) McNichol Municipal Drain - SAR Assessment

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John,

Phase 1 and 2 of the NRSI study have now been completed and the MECP has confirmed that an "Exemption Application" under the SAR Act and Regulations is applicable. NSRI has revised their

proposal in this regard to match (the reduced) number of species found on-site – a copy of which is attached her for your review and consideration.

Assuming that the Municipality intends to complete any of the identified work within a year or two following the completion of the Drainage Act process, we would recommend proceeding with phase 3A at the identified cost of \$4,800 now. If it is not the intent to complete work in less than (2) years following adoption of the report and by-law, then alternatives that would allow our report to proceed may be discussed. However, the application and Mitigation plans would still be required in advance of any work being completed.

Please advise of how you wish to proceed.

Should you have any questions or concerns, please contact us.

Sincerely,

Lorne Franklin, L.E.T., C.E.T., rcca, CISEC | Drainage Services
Robinson Consultants 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
T.(613) 592-6060 ext. 123 | rcii.com

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From: Sam Catry <scatry@nrsi.on.ca>
Sent: January 30, 2023 4:14 PM
To: Lorne Franklin <lfranklin@rcii.com>
Cc: Gina MacVeigh <gmacveigh@nrsi.on.ca>; Angela Jonkman <ajonkman@rcii.com>
Subject: Re: (proj3016) McNichol Municipal Drain - SAR Assessment

"CAUTION: External Sender"

Good evening Lorne,

Please see attached for an updated work plan and cost estimate associated with Phase 3. At this time, our costing for Phase 3b and 3c remain as an estimate, as it is difficult to provide a cost to implement mitigation measures prior to the completion of our mitigation plans. These would be updated following further discussion regarding the timing of works. As such, it may be prudent to hold a meeting with team members to discuss the timeline associated with the work, so that we can determine what may or may not be necessary on our end.

I'd like to propose a meeting on February 6 or 7 next week to discuss, could you advise of your availability? We are unavailable on the 7th between 1:00-2:00pm but are otherwise flexible.

Thank you,



Sam Catry

Aquatic Biologist

Natural Resource Solutions Inc.

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On 2023-01-24 6:27 p.m., Lorne Franklin wrote:

Please update your cost estimate and we will provide it to our client for review.

Thanks

Lorne

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From: Sam Catry <scatry@nrsi.on.ca>

Sent: Tuesday, January 24, 2023 2:52:27 PM

To: Lorne Franklin <lfranklin@rcii.com>

Cc: Gina MacVeigh <gmacveigh@nrsi.on.ca>

Subject: Re: (proj3016) McNichol Municipal Drain - SAR Assessment

"CAUTION: External Sender"

Good afternoon Lorne,

I wanted to follow up on Tarryn's email from the MECP and the allowance to register works under O.Reg. 242/08 S. 23.9 to discuss Phase 3 of our initial work plan. NRSI initially based our work plan and cost estimate on the completion of mitigation plans for 8 species. NRSI is available to review and update our work plan and cost estimate based on our findings from Phase 1 and 2, should you be interested in retaining us for Phase 3.

Please let me know if you are interested in receiving an updated cost estimate and work plan for Phase 3, we are able to begin immediately to provide this early to mid next week.

Thank you,

Sam Catry



Sam Catry

Aquatic Biologist

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On 2023-01-24 9:02 a.m., Adams, Tarryn (MECP) wrote:

Good morning Sam,

If you've determined that the project qualifies for the drainage works exemption (O. Reg. 242/08 S. 23.9) , you can proceed with fulfilling the exemption requirements to comply with the ESA. There is no need to submit an IGF.

Thank you,

Tarryn Adams

A/Management Biologist, Permissions Section

Species at Risk Branch

Ministry of the Environment, Conservation and Parks (MECP)

Peterborough, ON K9J 3C7

Please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Sam Catry <scatry@nrsi.on.ca>

Sent: January 6, 2023 12:18 PM

To: Adams, Tarryn (MECP) <Tarryn.Adams@ontario.ca>

Cc: Gina MacVeigh <gmacveigh@nrsi.on.ca>; Lorne Franklin <lfranklin@rcii.com>

Subject: (proj3016) McNichol Municipal Drain - SAR Assessment

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Good afternoon Tarryn Adams,

NRSI had been retained by Robinson Consultants as a qualified professional environmental consultant as per your recommendations to Dakota Dumont via email on September 13, 2022. NRSI completed an assessment of potential habitat for Species at Risk (SAR) documented from within the vicinity of the study area through background review, including those identified by yourself on September 15, 2022.

Background data collection followed the Natural Heritage Information Request Guide (MNRF 2018) and the Client's Guide to Preliminary Screening for Species at Risk (Ministry of Environment, Conservation, and Parks 2019).

The assessment included completing a field investigation to further inform what species or their habitat may be present and may have the potential to be impacted based on the proposed drainage works. The field investigation was carried out by qualified biologists, with 1 of the biologists having expertise with SAR snakes.

Based on our background review and field investigation results, as well as our understanding of the proposed works and O. Reg 242/08 S. 23.9, we have determined that the project would qualify for a conditional exemption and the works could be registered under the ESA.

Through the correspondence with Dakota, you identified that an Information Gathering Form would be the required next step for MECP to continue their involvement with this project to determine whether a permit would be required. Now that NRSI has been retained and have determined that this project would qualify for the exemption, we would like to know if we can proceed with using the exemption (and follow all conditions as part of the registration) or if MECP is still looking for the IGF?

Please feel free to reach out should you require any clarification.

Thank you,

Sam Catry

--



Sam Catry

Aquatic Biologist

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Appendix G

GRCA
Permit (O.Reg. 150/06)



Administration Centre: 400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

Phone: 519-621-2761 Toll free: 1-866-900-4722 Fax: 519-621-4844 www.grandriver.ca

July 18, 2022

via email

Lorne Franklin
Robinson Consultants
350 Palladium Drive, Suite 210
Ottawa, ON K2V 1A8
lfranklin@rcii.com

**Re: Amendment to the Engineer's Report
McNichol Municipal Drain, Haldimand County
Project No. 21071**

Dear Mr. Franklin,

GRCA is in receipt of the draft Amendment to the Engineer's Report for the McNichol Municipal Drain in Haldimand County. Our understanding is that proposed modifications include establishing new profiles and cross-sections for the existing drain system. No changes to the alignment, drainage area, or outlet to the Dent Drain are proposed.

GRCA staff have now completed their review of the draft amendment report, and we have no significant concerns with the proposed design or improvements.

We trust this information is of assistance. If you have any questions or require additional information, please contact Will Towns, Resource Planner at wtowns@grandriver.ca or 519-621-2763 ext. 2232.

Sincerely,

A handwritten signature in black ink, appearing to read "F. Natolochny".

Fred Natolochny, MCIP RPP
Supervisor, Resource Planning
Grand River Conservation Authority

Enclosed: Resource Mapping

Appendix H

DFO

Class Authorization



Ontario & Prairie Region
Fish and Fish Habitat Protection Program
867 Lakeshore Road
Burlington, ON L7S 1A1

Région de l'Ontario et des Prairies
Programme de la protection du poisson et de son habitat
867 Lakeshore Road
Burlington, ON L7S 1A1

December 13, 2022

Our file *Notre référence*
22-HCAA-01553

John Van Rooy
Project Manager, Municipal Drains
Engineering and Capital Works
Haldimand County
53 Thorburn Street South
Cayuga, Ontario, N0A 1E0

Subject: Drain Maintenance, McNichol Municipal Drain, Haldimand County – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear John Van Rooy:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on June 17, 2022. We understand that you propose to:

- Undertake a bottom only cleanout, brush one bank, replace two culverts and install local rip rap bank protection along a 1500 linear metre section of the McNichol Municipal Drain with the creation of a new engineers report.

Our review considered the following information:

- Request for Review Form, maps showing proposed works, and photos of the drain habitat submitted on June 17, 2022 to DFO; and,
- correspondence between Lorne Franklin (Robertson Consultants) and Stuart Campbell (DFO) between November 15, 2022 and December 02, 2022.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and,
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures outlined in your plan, in addition to the following listed below:

- Plan in-water works, undertakings and activities to respect timing windows;
 - **No in-water work between March 15 – July 15**
- Conduct in-water undertakings and activities during periods of no flow;

- Follow DFO BMP for Culvert Replacements in Municipal Drains;
- Incorporate a two-stage channel design from station 0+000 to 0+425;
- Preserve mature trees and vegetation on the south bank;
- Install two (2) refugia pools;
- Immediately stabilize shoreline or banks disturbed by any activity associated with the project, through re-vegetation with **native species**;
- Install effective erosion and sediment control measures;
- Avoid introducing sediments (e.g., silts, clays and sand) in the water; and,
- Do not deposit any deleterious substances in the water course and develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries Act* or permit under the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, and the *Species at Risk Act*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (<http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html>).

Notify this office at least 10 days before starting any in-water works. Send your notification to the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Stuart Campbell at 365-323-4821 or by email at stuart.campbell@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,



Emily Morton
A/Senior Biologist, Fisheries and Oceans Canada

Copy:
Lorne Franklin, Robertson Consultants
Stuart Campbell, Fisheries and Oceans Canada