



BURNSIDE

**Engineer's Report
Hewitt's Creek Drainage Works
Innisfil Beach Road Realignment
2024 S.78 Improvements**

**Town of Innisfil
2101 Innisfil Beach Road
Innisfil ON L9S 1A1**



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2024 S.78 Improvements**

**Town of Innisfil
2101 Innisfil Beach Road
Innisfil ON L9S 1A1**

**R.J. Burnside & Associates Limited
128 Wellington Street West, Suite 301
Barrie ON L4N 8J6 CANADA**

**April 15, 2024
300043974.2022**

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1	Yes	Yes	Lake Simcoe Region Conservation Authority (LSRCA)
1	Yes	Yes	Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)

Record of Revisions

Revision	Date	Description
0	April 10, 2024	Draft Submission to Municipality
1	April 15, 2024	Issued for Engineer's Report

R.J. Burnside & Associates Limited

Report Prepared By:



Jeff Dickson, P.Eng.
Project Engineer
JRD:tp

Executive Summary

Authorization

This Report regarding a major improvement to the Hewitt's Creek Drainage Works (the drain) is being prepared in response to an appointment by the Town of Innisfil (Town) received via email from Lee Parkin, Manager of Legal & Clerk Services, dated May 16, 2022. The instructions were *"to commence the process pursuant to Section 78 of the Drainage Act in relation to the improvement of the Hewitt's Creek Drainage Works, Innisfil Beach Road Realignment."*

Objective & Recommendations

The Objective of this Report is to formally incorporate as part of the drain proposed major improvements to an upstream portion proposed by the County of Simcoe (County) necessitated by the reconstruction of County Road No. 21 (Innisfil Beach Road (or IBR)).

The Recommendations of this Report are to incorporate the following:

1. The twin 32.0 m - 800 mm dia. HDPE Culverts under IBR and the second twin 15.0 m - 800 mm dia. HDPE upstream under a new Multi-Use Trail which replaces the 18 m - 800 mm dia. CSP crossing in the 1987 Report between Stations A 3+707 and A 3+727 / (this crossing is longer due to a wider road allowance);
2. The relocation (and abandonment) of the existing closed portion of the drain identified in the 1987 Report between Stations A 3+707 and A 3+630 off of the residential property at civic address 1792 IBR to the east but as a naturalized channel in a 10 m wide parcel on part of Lot 19, south part of Concession 8; and
3. The connection of the relocated new open portion of the drain to the existing open drain on part of Lot 18, south part of Concession 8 immediately north of 1792 IBR and identified in the 1987 Report as downstream of Station A 3+630.

Summary of Assessments

A summary of the Assessments, as estimated by the engineer (and as per Column 1 of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Application for a Grant for Municipal Drain Construction or Improvement form), for this improvement project are as follows:

1. Canada Owned Lands	—
2. Ontario Lands	—
3. Municipal Lands	\$34,000
4. Privately Owned Non-Agricultural	—
5. Privately Owned Agricultural – Grantable	—
6. Privately Owned Agricultural – Non-grantable	—
7. Special Non-Proratable Assessments (Section 26)	—

Total Estimated Assessments (Project Cost)	\$34,000
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Acknowledgements

Burnside would like to acknowledge the assistance and cooperation of the affected property owners involved with this project.

Also, to be recognized is the support and/or assistance of the Town’s Council, Clerk and staff, Operations staff and notably the Town Drainage Superintendent Mr. Nyenhuis.

Staff from the County, and its consultant Tatham Engineering (Tatham), also provided input as well as pertinent documentation and files regarding the reconstruction of IBR that were used for and in the preparation of this Report.

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- Appendix E Drawings

Nomenclature

General

ac – acre (0.4047 ha)
BSWI – buried surface water inlet
CB – catchbasin
CCTV – closed circuit television
CDT – concrete drain tile
CSP – corrugated steel pipe
c/w – complete with
dia. – diameter
DICB – ditch inlet catchbasin
d/s – downstream
ea. – each
FL – fence line
FPPDT – filtered perforated plastic drainage tubing
H – horizontal
ha – hectare (2.471 ac)
HDPE – high density polyethylene
BJB – buried junction box
km – kilometre
LS – lump sum
m – metre
mm – millimetre
m² – square metre
m³ – cubic metre
OB – observation box
o/s – offset
PDT – plastic drainage tubing
PL – property line
RCSP – riveted corrugated steel pipe
ROW – right of way
S & I – supply and install
Sta. – station (chainage)
SWI – surface water inlet
SWRP – surface water riser pipe
SWWSP – smoothwall welded steel pipe
t – tonne (2,205 pounds)
u/s – upstream
V – vertical

Other

CA – Conservation Authority
DFO – Department of Fisheries and Oceans
MECP – Ministry of Environment, Conservation and Parks
MTO – Ministry of Transportation
NRCS – Natural Resources Conservation Service
OMAFRA – Ontario Ministry of Agriculture, Food and Rural Affairs
SCS – Soil Conservation Service

1.0 Project Authorization

1.1 General

This Report was prepared in response to an appointment by the Town due to action taken as a result of a request letter dated March 31, 2022 from the County (J. Scruton, P.Eng., Manager, Transportation Construction). The letter indicated the improvements to the drain were proposed as part of the IBR project commencing later the same year.

The improvement to the drain, as described by the County, was *“The project includes removing the existing 97 m long culvert that conveys flow under Innisfil Beach Road and adjacent lands with a shorter 32 m long culvert that daylight the remainder of the drain into a naturalized channel meandering through the 10 m wide parcel (owned by the County of Simcoe) adjacent to the east of 1792 Innisfil Beach Road.”*

Accompanying the letter (and of the same date) was a completed and endorsed Notice of Request for Drain Major Improvement, *Drainage Act*, R.S.O. 1990, c. D.17, subs. 78 (1.1) Form; the Form was received by the Town Clerk on the same day.

1.2 Engineer's Report

This Report incorporates work either completed by or that will be completed by the County relating to the portion of the drain under IBR and as described herein. For clarification, all of the work was as a result of and in response to the requested Major Improvement submitted by the County; none of the work was undertaken by the Town.

Furthermore, R.J. Burnside & Associates Limited (Burnside) completed no engineering calculations, design, or survey of existing conditions; the services and the work completed by Burnside related to **only** the preparation of and the filing of this Report and the corresponding process relating thereto in compliance with Section 78 of the *Drainage Act*, R.S.O. 1990, c. D.17 (Act).

The information contained in this Report is intended to reflect the requirements of the County and/or Tatham as they relate to only this drain. They are based on information gathered during the On Site Meeting and the Information Meeting, as well as discussions with the various stakeholders. For specific details of the proposed work, contact the County and/or Tatham.

1.3 Notice of Request for Drain Major Improvement

The request for this improvement relating to changing the course of the Hewitt's Creek Drainage Works dated March 31, 2022 was submitted by the County (J. Scruton, P.Eng.) as the owner of IBR.

2.0 Background Information

2.1 History

The Town provided Burnside with the historical documentation pertaining to the drain; a comprehensive review of it was conducted.

The Hewitt's Creek Drainage Works was originally constructed as an Award Drain in 1901, and subsequently incorporated as a *municipal drain* via an engineer's report in accordance with the Act in 1934. A second report was authored in 1954 for the cleanout of the entire drain under By-Law No. A-42 which was passed in 1957; however, the 1934 assessment schedule was used to levy the resulting costs. Minor work and/or cleanouts of the drain were also undertaken in 1960, 1973, 1977, and 1982.

Following the preparation of a Preliminary Report, a Final Report dated August 1987 for a repair and improvement to this drain was filed and the specified work completed. More recently in 2019, an engineer's report complete with an updated watershed plan and maintenance assessment schedule were filed in accordance with Section 65 of the Act. Subsequently, the entire length of the drain was maintained, and the costs associated with that work were levied in December of 2020 using the new schedule but under governing By-law 71-87 for the above-noted 1987 report.

2.2 Existing Conditions

The drain is comprised of a 4,600 m long A Drain and a short 200 m long B Drain, having a combined overall length of approximately 4,800 m. With the exception of field and road crossings, and an approximate 70 m portion across a residential property immediately to the north of IBR, the drain is an open system.

The A Drain flows south to north from Station A 4+-000 in Lot 18, north part of Concession 7 to Station A -0+600 in part of Lot 19, south part of Concession 10. The 200 m long B Drain flows from east to west in the west part of Lot 19, north part of Concession 8. As a result of the 2019 cleanout, this drain is in good condition.

2.3 Watershed Area & Land Use

The total watershed area contributing runoff to the drain is approximately 606 ha; it is (for all intents and purposes) very similar to that in the 1987 report.

With the exception of the east side of the Village of Stroud, residential properties abutting the north and south sides of IBR, the various roads, and the Metrolinx railway, the majority of the watershed is used for agricultural purposes.

To that end, land use within the watershed area is divided as follows:

- 584.3 ha as agricultural and/or residential land; and
- 21.9 ha as municipal road and railway ROW.

The drain shares a contiguous watershed boundary with the 8th Line Drain to the west.

2.4 Soils

There was no investigation of soils or soil types within this watershed area.

3.0 On-Site Meeting

The On-Site Meeting for the project was held on June 7, 2022 at the Town Hall. The following stakeholders were present:

Name	Position
Landowners (2)	
County staff (2)	County of Simcoe
Tatham staff	Tatham Engineering
Mr. J. Nyenhuis	Town Drainage Superintendent
Burnside staff (2)	R.J. Burnside & Associates Limited (Burnside)

The impetus for the meeting was explained to the attendees, as well as recent request for an 'improvement' to the drain (refer to the Executive Summary and Section 1.0).

Except for the proposed work; namely, the new crossing under IBR and the relocation of the drain to the east off of 1792 IBR, no property owner expressed any interest or need for any work on the remainder of the drain, as the Town recently maintained the entire length of the drain.

As a result of the discussions, it was determined that Burnside would prepare an engineer's report for the proposed County/Tatham improvements; however, prior to filing it, there would be an Information Meeting to bring the stakeholders up-to-date on the status of the project and particulars of the report. Affected stakeholders will be notified of that future meeting in accordance with the Act.

4.0 Design Criteria & Engineering Considerations

4.1 Drainage System Design & Sizing

All design for this improvement to the drain was completed for the County by Tatham.

However, there are other considerations that an engineer should bear in mind during the design of a municipal drainage system. Accordingly, the applicable sections of the "A Guide for Engineers Working Under the Drainage Act in Ontario" (Publication 852), and the applicable sections of the "Drainage Guide for Ontario" (Publication 29), both of

which were published by OMAFRA, are normally used to determine and supplement the design considerations of a municipal drain and are to be taken into consideration.

4.2 Modelling

The hydrologic and hydraulic modelling for this improvement to the drain was undertaken for the County by Tatham. As such, the reader is directed to a Tatham Report entitled "*Reconstruction of Simcoe Road 21 – Phase 1 (Drainage and Stormwater Management Design Brief)*" dated and sealed July 23, 2020.

4.3 Utilities Investigation

No utilities investigation was undertaken by Burnside for this improvement to the Drain.

4.4 Material Selection

Material selections for this improvement were made by the County and/or Tatham.

5.0 Environmental and Fisheries Considerations

When a new engineer's report is prepared that affects an existing Municipal Drain, natural watercourse, wetland, or other environmental features, a review of the work is required, and subsequent approvals and/or permits, as well as the requirements for same, must be obtained from the applicable agency. Agencies may include the local Conservation Authority (CA), the Ministry of the Environment, Conservation and Parks (MECP), the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF), and Fisheries and Oceans Canada (DFO).

Since the design and the construction of this improvement to the drain was undertaken by the County and/or Tatham, no permits and/or approvals were obtained by Burnside.

6.0 Stakeholder Meetings

A Landowner Information Meeting was organized and held for the stakeholders affected by this improvement; however, only insofar as it related to the Report being prepared under the auspices of Section 78 of the Act.

This meeting was held on Wednesday, March 27, 2024 at the Town Hall. The following were present at the meeting:

Name	Position
Landowners (5)	
County staff (1)	County of Simcoe
Mr. J. Nyenhuis	Town Drainage Superintendent
Burnside staff (1)	R.J. Burnside & Associates Limited (Burnside)

After the meeting was opened and all were welcomed, the purpose of this project and the reason for this meeting were explained by the engineer. Furthermore, attendees were informed that the County had (in 2022) requested improvements to the drain, whereas Burnside was simply preparing a report to incorporate those improvements under the auspices of Section 78 of the Act.

County staff provided an update regarding the improvements to the drain that have been completed, as well as those proposed for completion in 2024. There were several questions from landowners present, which were responded to.

Burnside provided an update regarding the status of report, the associated engineering costs and allowances, and the general assessment logic for distributing these costs.

There was a lengthy discussion regarding the history of the drain, and its current and future impact on the affected properties, primarily those on the north side of IBR adjacent to the various improvements.

Prior to the adjournment of the meeting, the stakeholders were informed that Burnside would finalize the Report and "file" it with the Town. Subsequently, all stakeholders would be sent a copy of it as well as a Notice of the date, time, and place for its Consideration (before the Council) in accordance with the Act.

7.0 Proposed Improvements

7.1 General

This Report is to incorporate, as part of the Hewitt's Creek Drainage Works, major improvements to an upstream portion of the drain by the County as part of the IBR reconstruction. As such, the construction of these improvements have been or will be attended to by the County including the cost thereof.

7.2 Drain Abandonment

Section 19 of the Act states:

"The engineer in the report may recommend the abandonment of any drain or part thereof that is no longer useful or that is being supplanted by a new drainage works. R.S.O. 1990, c. D.17, s.19."

Accordingly, the portion of the A Drain located on 1792 IBR consisting of about 70 m 800 mm dia. CSP, and the 18 m 800 mm dia. CSP under IBR (as per the 1987 engineer's report) shall be abandoned and cease to have Municipal Drain status following the adoption of this engineer's report. The portion under IBR has been removed.

The County proposes to plug the north and south ends of the CSP on 1792 IBR as part of the work yet to be completed. To that end, the owner of 1792 IBR has been provided with an allowance in accordance with Section 30 of the Act to deal with the abandoned portion of the A Drain on this property if the owner chooses to do so.

7.3 Working Space and Access Routes

A working space and access route to it are being provided for future maintenance of the drain by the Town. The working space, consisting of 7 m, is immediately east of the proposed ditch (swale) on the property identified by Roll No. 21-217-00; an allowance for this working space has been provided to this property in accordance with Section 29 of the Act. Access to the working space is to be off of the north side of the IBR right-of-way.

8.0 Description of Appendices

8.1 Appendix A – Allowances and Allowance Calculations

In accordance with Section 8(1)(d) of the Act, this Appendix provides a breakdown of the allowances provided under Section 29 (Right-of-Way) and 30 (Damages) of the Act.

8.2 Appendix B – Project Cost Estimate

In accordance with Section 8(1)(b) of the Act, this Appendix provides a breakdown of the total estimated cost of ONLY the engineering, administration, and allowances.

It is noted (and acknowledged) that all construction costs related to this improvement to the drain were borne by the County.

8.3 Appendix C – Assessment Schedule

In accordance with Section 8(1)(c) of the Act, this Appendix provides the Schedule of “... *an assessment of the amount or proportion of the cost of the works to be assessed against every parcel of land and road ...*” for this project. However, ONLY those costs identified in Item 8.2 above and **prior to any grant or allowances being provided.**

8.4 Appendix D – Standard Drain Specifications

In accordance with Section 8(1)(a) of the Act, this Appendix provides standard specifications to assist with the future maintenance of the improved portion of this drain.

Construction specifications (i.e., the Special Provisions) were the responsibility of the County and/or Tatham.

8.5 Appendix E – Drawings

In accordance with Section 8(1)(a) of the Act, this Appendix contains two drawings of plans and details pertinent to the drain improvements; namely:

- Drawing No. 1 of 2 – Main Watershed Plan and Detail 2; and
- Drawing No. 2 of 2 – Sub-Watershed Plan and Detail 1.

9.0 Maintenance and Future Considerations

9.1 General

While the Town will be responsible for the maintenance of this drain after improvements are complete, the Sections with the Act dealing with *obstruction*, and *damage to*, a drainage works, namely Sections 80 and 82 respectively, are brought to the attention of the property owners. In accordance with these sections, property owners and the Town each have responsibilities to ensure that a Municipal Drain is properly maintained and kept in good working condition.

The maintenance of this drain should include regular inspections by the Drainage Superintendent, and appropriate action to ensure the proper function of the drain.

9.2 Future Maintenance

Any areas of washout, settlement, erosion, or other disrepair within the drain shall be maintained as needed by the Drainage Superintendent. Rip-rap and erosion protection shall be inspected on a periodic basis and repaired as required to maintain drain bank stability and to prevent sedimentation or erosion of the drain. Inlets should also be inspected on a regular basis, especially prior to heavy rainfall events and spring snowmelt to ensure that ice or snow or other material have not obstructed them.

Property owners can also assist with maintenance by making regular inspections of the drain and inlets, clearing debris from any inlets in a timely manner and reporting any problems to the Town so that the Drainage Superintendent can take proper action.

The spoil leveling zone for any material removed to maintain the drain shall be within the new Section 29 “right-of-way” on the property identified by Roll No. 21-217-00. No spoil shall be leveled within either 1.5 m buffer on Roll No. 21-217-12. Surface water inlets shall be provided through leveled spoil, and riparian plantings protected and left intact.

9.3 Maintenance Costs

The Hewitt's Creek Drainage Works shall be maintained by the Town at the expense of the lands and roads, as determined by the Drainage Superintendent in accordance with Section 74 of the Drainage Act.

Future maintenance costs shall be distributed in accordance with the terms of the Act and at the expense of all of the lands and roads assessed using the *Revised Maintenance Assessment Schedule* contained in the July 3, 2019 Report, and in the same relative portions until such time as they are varied in accordance with the Act.

Furthermore, all aspects of the 1987 Engineer's Report for the Hewitt's Creek Drainage Works governed by By-Law No. 71-87 shall apply except and unless altered by either this Report or the July 3, 2019 Report.

The County shall be entirely responsible for the maintenance and costs of the drain located within the IBR right-of-way, including river stone, riprap, and piping.

9.4 Future Connections

Any future outlets into the drain must be made in a manner acceptable to the Town. Direct outlets by the owners or their Contractors may not be permitted unless approved by the Town and/or its Drainage Superintendent; connections not approved may be removed and at the expense of the owner of the land from which the connection and/or outlet was made.

Private tile outlets directly into the drain shall be installed with a corrugated steel or dual-wall HDPE outlet pipe complete with a rodent grate, sufficient rip-rap erosion protection, and identified along the drain bank of the drain with a proper outlet marker or sign to the satisfaction of the Drainage Superintendent.



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Appendix A

Allowances and Allowance Calculations (Sections 29 & 30)

Appendix A – Allowances

In accordance with Section 8(1)(d) of the Act, the engineer is to prepare a report which shall include “... allowances, if any, to be paid to the owners of land affected by the drainage works; ...”. Allowances are governed by Sections 29 to 33 inclusive of the Act (and 34). Allowances will be deducted from total assessments in accordance with Section 62(3) of the Act. The land values used for these calculations were determined based on a general understanding of those within this geographic area and are described as follows. A summary of the allowances provided under each section of the Act is included in this Appendix. Details re working space can be found in the Report.

Section 29 – Right-of-Way (Use)

Section 29 the Act states:

“The engineer in the report shall estimate and allow in money to the owner of any land that it is necessary to use,

- a) for the construction or improvement of a drainage works;*
- b) for the disposal of material removed from drainage works;*
- c) as a site for a pumping station to be used in connection with a drainage works;*
- d) or as a means of access to any such pumping station, if, in the opinion of the engineer, such right of way is sufficient for the purposes of the drainage works,*

the value of any such land or the damages, if any, thereto, and shall include such sums in the estimates of the cost of the construction, improvement, repair or maintenance of the drainage works. R.S.O. 1990, c. D.17, s.29.”

The right-of-way is described as the footprint of the drain itself, the working space for its construction of a drain and also for use by the Town for future maintenance.

In this report, ROW allowances have been provided as follows:

- A 7.0 m working space has been provided alongside the open drain. The lands where this working space has been provided have been given an allowance at a rate of **\$90,000** per hectare (i.e., ~ **\$36,420** per acre).

No permanent buildings, structures or plantings should be allowed within the right-of-way, to allow for the future maintenance of this drain.

Section 30 – Damages

Section 30 of the Act states:

“The engineer shall determine the amount to be paid to persons entitled thereto for damage, if any, to ornamental trees, lawns, fences, lands and crops occasioned by the disposal of material removed from a drainage works and shall include such sums in the estimates of the cost of construction, improvement, repair or maintenance of the drainage works. R.S.O. 1990, c. D.17, s.30.”

In this report, an amount of \$4,000 has been calculated as a damage allowance for the property identified by Roll No. 21-216-00. This damage allowance has been provided to deal with the abandoned portion of the A Drain on this property if the owner chooses to do so.

APPENDIX A - ALLOWANCES

PROJECT: Hewitt's Creek Drainage Works (S.78)
DATE : April 15, 2024

MUNICIPALITY: Town of Innisfil
PROJECT #: 300043974.2022

Conc.	Lot	Owner	Roll No.	Right of Way (Sect.29)	Damages (Sect. 30)	Totals
8	Pt. 18	N. & S. GHINIS ET AL	21-215-00	\$ -	\$ -	\$ -
8	Pt. 18	T. CLAUDIO	21-216-00	\$ -	\$ 4,000	\$ 4,000
8	Pt. 19	BEACHCREST CORP.	21-217-00	\$ 1,900	\$ -	\$ 1,900
8	Pt. 19	COUNTY OF SIMCOE	21-217-12	\$ -	\$ -	\$ -
TOTAL ALLOWANCES				\$ 1,900	\$ 4,000	\$ 5,900

APPENDIX A - SECTION 29 - ALLOWANCE CALCULATIONS - Right-of-Way (Use)

PROJECT: Hewitt's Creek Drainage Works (S.78)
DATE: April 15, 2024

MUNICIPALITY: Town of Innisfil
PROJECT #: 300043974.2022

\$ / hectare 90,000 ~\$ / acre 36,420

Section	Conc.	Lot	Owner	Description	Station (m)	Station (m)	Length (m)	Width (m)	Allowance Factor	Allowance (\$)	Section Sub-Total
A - 1	8	Pt. 18	N. & S. GHINIS ET AL	New Swale	0	0	0	0	0.00	-	-
A - 1	8	Pt. 18	T. CLAUDIO	Existing ~70 m of 800 mm CSP	0	0	0	0	0.00	-	-
A - 1	8	Pt. 19	BEACHCREST CORP.	New Swale	0	0	90	7	0.33	1,900	1,900
A - 1	8	Pt. 19	COUNTY OF SIMCOE	New Swale	0	0	0	0	0.00	-	-
										TOTAL \$ 1,900	

Factors
 Existing Open Drain 0.00
 Agricultural Land 0.33

APPENDIX A - SECTION 30 - ALLOWANCE CALCULATIONS - Damages

PROJECT: Hewitt's Creek Drainage Works (S.78)

DATE: April 15, 2024

MUNICIPALITY: Town of Innisfil

PROJECT #: 300043974.2022

\$/ hectare n/a

\$/ acre n/a

Section	Conc.	Lot	Owner	Description	Station (m)	Station (m)	Length (m)	Width (m)	Allowance Factor	Allowance (\$)	Section Sub-Total
A - 1	8	Pt. 18	N. & S. GHINIS ET AL	New Swale	0	0	0	0	0.00	-	-
A - 1	8	Pt. 18	T. CLAUDIO	Existing ~70 m of 800 mm CSP	0	0	0	0	n/a	4,000	4,000
A - 1	8	Pt. 19	BEACHCREST CORP.	New Swale	0	0	0	0	0.00	-	-
A - 1	8	Pt. 19	COUNTY OF SIMCOE	New Swale	0	0	0	0	0.00	-	-
										TOTAL \$	4,000

Factors

Existing Open Drain 0.00
 Agricultural Land 1.00



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Appendix B

Project Cost Estimate

Appendix B

APPENDIX B - PROJECT COST ESTIMATE

PROJECT: Hewitt's Creek Drainage Works (S.78)
DATE : April 15, 2024

MUNICIPALITY: Town of Innisfil
PROJECT #: 300043974.2022

Item	Description	Approx. Quantity	Cost Estimate
<u>SUMMARY OF COSTS</u>			
CONSTRUCTION			n/a
	This improvement project and the costs thereof for all construction are being borne by the County of Simcoe. Accordingly, there is no estimated amount for the cost of any labour, equipment, or material required to construct this drain improvement.		
ALLOWANCES to Owners (Sections 29 & 30)			\$ 5,900
ENGINEERING			
Project Management and Support of Report		\$ 5,000	
	Various general and project management tasks as well as the production of the Engineer's Report.		
Initial Investigations		\$ 2,000	
	Examination of historical files; examination and inspection of the site or the proposed work; etc.		
Various Meetings		\$ 4,000	
	Prepare for and attend the On-Site Meeting; and Prepare for and attend Landowner Information Meeting.		
Submission of Engineer's Report		\$ 13,000	
	Drawing set preparation, determine allowances, prepare and file Report, etc.; prepare for and attend report Consideration Meeting.		
Total Estimated ENGINEERING			\$ 24,000
Administration, Financing, and Other Costs			\$ 4,100
	Printing, mileage, net HST (only on engineering), interest charges, contingency, etc.		
<u>TOTAL ESTIMATED COST</u>			<u>\$ 34,000</u>

Note: The above summary contains cost estimates only. It is emphasized that these estimates do NOT include costs to defend the Drainage Report and procedures if appeals are filed with the Court of Revision, Ontario Drainage Tribunal and/or the Ontario Drainage Referee.

Unless otherwise directed, additional costs to defend the Report are typically distributed in a pro rata fashion over the assessments contained in the Construction Assessment Schedule, excluding any Special Assessments.



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Appendix C

Assessment Schedule

FACTSHEET



ORDER NO. 92-035

FEBRUARY 1992

AGDEX 557



Ontario

Ministry of Agriculture,
Food and Rural Affairs

AGRICULTURAL
ENGINEERING

UNDERSTANDING DRAINAGE ASSESSMENTS

Agriculture and Rural Division
(Reprinted March 1997)

The *Drainage Act* provides a legal procedure by which an "area requiring drainage" may have an outlet drain constructed to dispose of excess water.

The drainage work is initiated by interested individuals within an "area requiring drainage" who will benefit from the construction of the drain. A petition form, obtained from the municipal clerk, is signed by interested landowners. In order to be valid or sufficient, the petition must be signed by the majority of the owners in the "area requiring drainage" or by owners that represent at least 60% of the lands in this area. The "area requiring drainage" is usually described by lot and concession, or other legal land description. By taking this action, it is presumed that the owners signing the petition have made a decision that the drain will be of benefit to them and that the probable cost will be lower than the anticipated benefits. The initial benefit-cost decision is made at this point by the landowners, not the engineer or Council.

The petition is presented to and considered by Council. If the petition represents a proper "area requiring drainage", that is a real drainage basin, and appears to be valid, the Council may decide to proceed. Council then notifies each of the petitioners of this decision as well as any other municipality affected and the local Conservation Authority and the Ministry of Natural Resources.

Council then appoints an engineer. The engineer is an employee of Council, hired to design this specific drain. Under *The Drainage Act*, Section 9(2), the engineer is required to hold an on-site meeting to determine (1) the area requiring drainage, (2) if the petition is valid, (3) the drainage needs of the area. The engineer is then required "to make an examination of the area requiring drainage as described in the petition and to prepare a report which shall include:

- (a) plans, profiles and specifications of the drainage works;
- (b) a description of the area requiring drainage;
- (c) an estimate of the total cost thereof;
- (d) an assessment of the amount or proportion of the cost of the works to be assessed against every parcel of land and road for benefit, outlet liability and injuring liability;

- (e) allowances, if any, to be paid to the owners of land affected by the drainage works and
- (f) such other matters as are provided for under this Act."

The engineer's report is presented to Council, who then notifies all persons assessed and calls a special meeting where the report is considered. General objections to the report may be raised at this time. At this meeting signatures may be added or removed from the petition and this determines if the project will continue. Unresolved problems, depending on the subject, may be appealed to the Court of Revision, the Ontario Drainage Tribunal or the Drainage Referee. Details on appeal procedures may be found in *The Drainage Act** or in Ontario Ministry of Agriculture, Food and Rural Affairs Factsheet, Drainage Legislation.

The engineer's report includes two important items:

1. The estimated cost of the work — No matter how individual assessments are arrived at, this total estimated cost must always be equal to the total amount assessed, otherwise the work cannot proceed.
2. The assessment liability — This may be spread over several pages if an owner owns several parcels of land and if there are branch drains. It may be summarized.

Let us examine the obligations regarding this assessment.

RESPONSIBILITIES UNDER COMMON LAW

A natural watercourse is defined generally as a stream of water which flows along a defined channel, with bed and banks, for a sufficient time to give it substantial existence. This may include streams that dry up periodically.

**The Drainage Act may be found in the Revised Statutes of Ontario 1980, Chapter 126, available in most public libraries. Individual copies may be purchased from the Ontario Government Bookstore, 1-800-668-9938.*

A riparian landowner (owner of lands that abut upon a natural watercourse) has the right to drain his or her lands into the natural stream, but may not bring water in from another watershed. He or she can collect water in ditches and drains and discharge it into the watercourse even though it results in an increase in volume and rate of flow.

Where a natural watercourse becomes a part of a drain, it is no longer a natural watercourse. When this occurs, the riparian rights, as described earlier, are lost.

Surface water not flowing in a natural watercourse (i.e. not having discernible bed and banks) has no right of drainage. An owner of lower land may, at his or her own choice, either allow the water from higher land to flow over it or by dams or banks, keep such water off his or her property. No owner has the right to collect such surface water by ditches or drains and discharge it on lands of another. He or she has a responsibility to take this water to a sufficient outlet, i.e., a natural watercourse or a drain constructed under *The Drainage Act*.

Since there is no right to drain surface water, the owner of each parcel of land in the watershed is generally assessed for "outlet liability". In other words, his or her Common Law liability is removed by paying for the increased size or cost of the drain due to the volume of water which is discharged from his or her property, even though the drain may not provide a direct outlet for this water. The authority for this liability is set out in Section 23(1).

Since, through Common Law, a landowner is also liable for any damage he or she may cause from water which he or she collects in drains and discharges on other land without a sufficient outlet, he or she may be assessed for relief from such "injuring liability" if the new drain serves as an outlet for his or her drains and prevents this injury from occurring. The authority for this liability is set out in Section 23(2).

Injuring liability is frequently difficult to distinguish from outlet liability, consequently many engineers' reports do not contain such an item.

The assessment for outlet liability and injuring liability is based on the volume and rate of flow of the water artificially caused to flow from an owner's property. Generally, the assessment is based upon a unit value per hectare. Owners at higher elevations on a watershed may have a higher unit charge than those owners near the outlet since the water from their land makes use of a greater length of drain. A difference may be made in the unit outlet charge due to varying types of soil or land use, or the distance to the drain.

RESPONSIBILITY UNDER THE DRAINAGE ACT

In addition to the Common Law responsibility, an owner may also be assessed for benefit.

Benefit will vary between different lands, according to their differences of elevation, quantity of water to be drained from each, distance of undrained land from the course of the proposed ditch, and the presence or absence of existing drains, and other like factors.

To consider whether a parcel of land will receive any benefit from the construction, it is proper to consider whether any enhanced financial value will accrue to it as a result of the drain construction. This may occur through the increased productive power of the land or by rendering it more salable and at a better price, or by preventing water from entering on to it.

If the proposed drainage works can be of no possible benefit to the owner, or is of no commercial or agricultural value, the Act does not authorize a contribution for benefit.

Sometimes, an owner has an undeveloped area that he or she intends to leave in this condition. The owner may feel that he or she should not be assessed since the drain will be of no benefit. However, the property could change hands and the new owner might want to drain and develop it. It is with this in mind that the engineer must make an assessment, regardless of the present owner's intentions.

It is the duty of the engineer to determine whether or not a parcel of land will benefit from the project. When appealing a benefit assessment, the landowner must prove that the land does not benefit from the drain.

An owner has no responsibility for work done upstream from his or her property unless the work provides a benefit by "cutting off" a harmful flow of water across the property.

In some instances, a "special benefit assessment" may be levied against the property. This value usually represents the difference in cost between that which was originally designed and the increased level of design requested by a landowner. Examples include a closed or tile drain where open ditches would ordinarily suffice, or the construction of ponds beside the drain, or other special requests by a landowner specifically for this benefit. The authority for this liability is set out in Section 24.

ENGINEER'S REPORT

The Engineer's report should contain a plan and profile of the drain, as well as details on the drain design and the assessment schedule.

The plan shows the location of drains and the limits of the watershed. The profile shows ground elevations along the drain and the present and proposed drain bottom. The specifications give details on how the drain is to be constructed.

The Schedule of Assessment contains several columns. The first group contains the names of owners with a description of each parcel of land assessed.

The hectareage shown in the schedule for which an owner is assessed is only approximate. No survey is made to accurately establish the watershed boundary or farm areas. Any minor error in hectareage assessed is not a valid basis for appeal nor does it greatly affect the assessment. The other columns in the Schedule set forth the assessment liability for each drain and/or branch drain. These values are only estimates. The final value will not be known until the construction work is finished. The assessment will then be prorated to recover the actual cost.

Allowances to lands injured by the work are set out in a separate schedule by the engineer as authorized in Sections 29 to 33 of *The Drainage Act*.

Damage to crops during construction and disposal of waste material will vary depending on the time of year that the work is constructed. Crop damage due to spreading the spoil on the banks is based on a decreasing yearly loss of crop over several years. All or part of the cost of access bridges from a public road to the property may be assessed to the property owner.

Farm bridges are constructed as a part of the work. In certain circumstances a severance allowance may be paid instead of building the bridge. The allowance will depend upon the value of the land severed, or the cost of the bridge that would be required. The cost, or part of the cost of farm bridges or the severance allowance may be assessed across the property.

Where private drains are incorporated into the new drain, a nominal allowance may be paid based on any saving that may result from using the private drain. These allowances may not be included in the Summary of Assessments but are usually shown in a separate Schedule of Allowances.

RELEVANT OMAFRA FACTSHEETS

Drainage Legislation.

This Factsheet was authored by **Sid Vander Veen, P.Eng.**, Resources Management Branch.

POD

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(commande n° 92-065)



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**APPENDIX C - ASSESSMENTS for PROJECT COSTS
HEWITT'S CREEK DRAINAGE WORKS - S.78 IMPROVEMENTS**

PROJECT: Hewitt's Creek Drainage Works (S.78)
DATE : April 15, 2024

MUNICIPALITY: Town of Innisfil
PROJECT #: 300043974.2022

Conc. Plan	Lot Part			Affected (Ha.)	Benefit (Section 22)	Outlet (Section 23)	Special (Section 24)	Special (Sect.24)	Special (Section 26)	TOTALS
		Lands								
7	N. Pt. 17	B. & E. SPRING	21-129-00	1.40	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 17	SPRING TREE FARM CORP.	21-130-00	0.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 18	D'ANGELO GROUP INC.	21-211-00	20.50	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 18	E. & P. SPRING	21-212-00	0.70	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 19	POTENZA WOODBRIDGE GROUP LTD.	21-208-00	0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 19	A. & M. LEONE ET AL	21-209-00	0.70	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 19	L. REZNICK	21-210-00	2.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	N. Pt. 19	L. & P. STRINGER	21-210-10	0.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 17	HEWITT CREEK FARMS LTD.	21-120-00	0.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 17	TOWN OF INNISFIL	21-124-00	0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 18	2747478 ONTARIO INC.	21-213-00	5.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 18	SPRING TREE FARM CORP.	21-214-00	1.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 18	N. & S. GHINIS ET AL	21-215-00	0.90	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 18	T. CLAUDIO	21-216-00	0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 19	BEACHCREST CORP.	21-217-00	10.75	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 19	INNSCREST CORP.	21-217-10	0.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Pt. 19	COUNTY OF SIMCOE	21-217-12	0.01	\$ -	\$ -	\$ 22,760	\$ -	\$ -	\$ 22,760
TOTAL ON LANDS				44.46	\$ -	\$ -	\$ 22,760	\$ -	\$ -	\$ 22,760
		Roads								
IBR / CR No. 21		COUNTY OF SIMCOE	IBR	3.60	\$ -	\$ -	\$ 11,240	\$ -	\$ -	\$ 11,240
TOTAL ON ROADS				3.60	\$ -	\$ -	\$ 11,240	\$ -	\$ -	\$ 11,240
ALL LANDS AND ROADS				48.06	\$ -	\$ -	\$ 34,000	\$ -	\$ -	\$ 34,000

Notes: (1) It is the responsibility of the landowner to confirm whether their property is eligible for an OMAFRA grant, under the ADIP policies. Grant eligibility has not been confirmed as part of the preparation of this report.



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Appendix D

Standard Drain Specifications

D.2.1 GENERAL DRAIN SPECIFICATIONS

D.2.1.1 SCOPE OF SPECIFICATIONS

This specification covers the general conditions governing the construction of a Municipal Drain under the most recent revision of The Drainage Act and amendments. All work shall be done in accordance with current and applicable Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD).

D.2.1.2 BENCHMARKS

Benchmarks shall be set at intervals along the course of the work at locations shown on the accompanying plan and/or profile. The Contractor or landowner shall be held liable for the cost of re-establishing benchmarks destroyed. Attention is drawn to Section 13 of The Drainage Act.

D.2.1.3 STAKES/FLAGS/MARKERS

Stakes, flags or markers are typically set at intervals throughout the course of the work, at all fences and property lines. The Contractor or landowner shall be held liable for the cost of replacing any stakes removed or destroyed.

D.2.1.4 PROFILE

The drain is to be excavated or installed to regular gradient lines as shown on the profile(s). These gradients show the bottom of the finished drain (open or closed) and are governed entirely by the benchmarks. In the case of closed drains, the gradient is that of the invert of the tile. The profile(s) shows the approximate depth from the surface of the ground to the invert of the tile or drain bottom at the point where the stations are set and from the average bottom of the open drain as taken at the time of survey. Open drains shall be brought to an even gradient in the bottom to prevent standing water. For closed drains, a variation of 25 mm (unless specified otherwise) from the gradient may be deemed sufficient reason for the work to be rejected and required to be rebuilt.

D.2.1.5 CLEARING

Clearing means the cutting of all standing trees, brush, bushes and other vegetation to a maximum height of 300 mm above original ground level as well as the removal of felled materials and windfalls. Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents.

The work shall consist of clearing all areas of earth excavation, earth surfaces to be covered by embankments up to and including 1.2 m in height, and any other areas specified in the Contract Documents.

No trees, brush or bushes are to be left inside the slopes of the drain, whether they are located within the limits of the excavation or not. Brush cleared in accordance with the above shall be piled in a location and in a manner satisfactory to the Engineer for burning by the Owner. Unless otherwise specified or directed, these piles shall be a minimum of 100 m apart and shall contain only cleared material. All work shall be done in accordance with OPSS 201.

D.2.1.6 CLOSE CUT CLEARING

Close Cut Clearing means the cutting of all standing trees, stumps, brush, bushes and other vegetation at original ground level and the removal of felled materials and windfalls. Grubbing means the removal of all stumps, roots, embedded logs, debris and secondary growth. Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents.

The work shall consist of close cut clearing all earth surfaces to be covered by embankments greater than 1.2 m in height, and any other areas specified in the Contract Documents.

No trees, stumps, brush or bushes are to be left inside the slopes of the drain whether they are located within the limits of the excavation or not. Brush cleared in accordance with the above shall be piled in a location and in a manner satisfactory to the Engineer for burning by the Owner. Unless otherwise specified or directed, these piles shall be a minimum of 100 m apart and shall contain only cleared material. All work shall be done in accordance with OPSS 201.

D.2.1.7 BRUSHING

Brushing means the grinding or chipping to ground level of vegetation in the working space under 150 mm in diameter by means of a hydraulic brushing attachment used with an excavator or approved equivalent. This includes grinding or chipping all standing trees, stumps, brush, bushes and other vegetation to original ground level.

Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

D.2.1.8 GRUBBING

Grubbing means the removal of all stumps, roots, embedded logs, debris and secondary growth.

The work shall consist of grubbing all areas of earth excavation, earth surfaces to be covered by embankments up to and including 1.2 m in height and any other areas specified in the Contract Documents.

Grubbing is not required in swamps. Mechanical stump cutters are permitted, provided the entire root structure is removed. Depressions remaining after grubbing shall be backfilled with suitable earth material and compacted to avoid settlement. When clearing has been previously completed by others, all secondary growth, brush and debris shall be removed.

Piled boulders and surface boulders that are not specified in the Contract Documents for removal and lie within areas to be grubbed shall be removed. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

D.2.1.9 REMOVAL OF SURFACE BOULDERS & REMOVAL OF PILED BOULDERS

Piled Boulders means any cobbles, boulders or rock fragments that have been placed in fence rows or piles.

Rock means rock as defined in OPSS 206.

Surface Boulder means any boulder or rock fragment that measures 200 mm or greater in any one dimension, extends a minimum of 200 mm above original ground and can be removed without excavation.

The work shall consist of the removal of surface boulders and removal of piled boulders within the areas specified in the Contract Documents. Depressions remaining after removal shall be backfilled with suitable earth material and compacted to avoid settlement. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

D.2.1.10 FENCES

The Contractor will be permitted to remove fences to the extent necessary to allow the construction of the drain and to dispose of any excess material according to the specifications. Any such fences shall be carefully handled so as to cause no unnecessary damage. Unless allowance has been provided, such fences shall be replaced by the Contractor in as good a condition as found. The Contractor shall supply all material necessary to properly reconstruct any fences. The Contractor shall not leave any fence open when he is not at work in the immediate area and shall replace the fence in a timely manner, all to the satisfaction of the Engineer.

D.2.1.11 STANDING CROPS AND LIVESTOCK

Should a property owner wish to harvest any crop along an access route or within the construction working space as set out in the Engineer's Report, then it shall be the responsibility of the property owner to do so prior to construction. Provisions for the loss of, or damage to, crops along the access route or in the construction area ("Working Space") have been made in the Report and such loss or damage shall not be the liability of the Contractor.

The Contractor shall contain construction operations to the working space and width specified. As long as the construction operations are contained within the specified working space, the Contractor shall not be responsible for damages to crops along the course of the drain.

It shall be the responsibility of the property owners to keep their livestock clear of the construction area upon receiving 24 hours advance notice by the Contractor. After receiving proper notice, the Owner of the property upon which a drain is being constructed shall be liable for any loss or damage to livestock, the drain, drain materials or the Contractor's equipment caused by their livestock.

D.2.1.12 NOTIFICATION OF AGENCIES

The Contractor shall notify the appropriate agency before performing any work affecting the land or property of the MTO, railway, telephone, pipeline or public utility or regulatory agency. The Contractor shall further agree to perform the work affecting such lands or property in accordance with the specifications and approval/permit of the applicable agency.

D.2.1.13 FINAL INSPECTIONS

After substantial completion of the work, but prior to demobilization and final removal of all equipment and materials from the site, the Contractor MUST arrange an on-site FINAL Inspection of the work with the engineer to ensure all aspects of the work have been satisfactorily completed and/or that arrangements have been made to expedite the completion of any outstanding "minor" items or deficiencies. All the work included in the contract, at the time of the Final Inspection, must have the full dimensions and cross-sections called for in the plans and specifications. Notification to the Engineer of this Final Inspection shall be provided at least 5 days prior and it shall be completed as soon as possible or as soon thereafter as weather conditions permit.

D.2.2 SPECIFICATIONS FOR OPEN DRAINS

D.2.2.1 GEOMETRY

The drain shall have the full bottom width, at the gradient, specified or shown on the accompanying plan(s), profile(s) and detail sheet(s).

D.2.2.2 ALIGNMENT

The drain shall run in straight lines throughout each course except at intersections, where it shall run on a minimum curve of 15 m radius unless otherwise specified. If the work consists of the improvement of an existing open drain, then the centre line of the existing drain may be the centre line of the finished work unless otherwise specified.

D.2.2.3 EXCAVATED MATERIAL

A clear buffer of at least 3 m shall be left between the top edge of the open drain and the excavated material. Excavated material shall be placed on the side specified or, if not specified, on the lower side of the drain or on the side opposite trees or fences. No excavated material is to be left in any low runs intended to conduct water into the open drain. It shall be deposited, spread and leveled to a maximum depth of 150 mm, unless specified otherwise and left in a manner such that the lands on which it is spread may be cultivated with adjacent lands by use of ordinary farm machinery. Material excavated in land that is timbered, may be spread to the depth specified or to a maximum depth of 300 mm, which ever is greater. In cultivated areas, the Contractor shall remove stones and boulders on the surface greater than 100 mm diameter from the excavated material and dispose of in an approved location. Treatment of excavated material shall be to the satisfaction of the Engineer. After the excavated material has been spread and leveled, it shall be seeded as specified.

D.2.2.4 SURFACE WATER INLETS

Surface water inlets to the drain shall be provided through the leveled spoil on each property at obvious natural low runs or at other locations as specified by the Engineer on site at the time of construction. No excavated material shall be left in, or any damage done to a ditch, furrow, pipe, tile or depression that is intended to conduct water into an open drain. The drain bank at all such inlets shall be ripped as directed by the Engineer and reimbursed under the appropriate contract item.

D.2.2.5 OUTLETS

During the construction of an open drain, the Contractor shall guard against damaging the outlet of any tributary drain or pipes encountered. The Contractor will be reimbursed for damage to unmarked outlet pipes under the appropriate contract item.

D.2.2.6 ACCESS CULVERTS

All culverts shall be installed with the invert a minimum of 10% of its diameter or as specified below the gradient and the firm bottom of the drain.

All pipes installed under these specifications shall be carefully bedded so as to ensure uniform bearing throughout its entire length.

Except where requiring concrete cradle or encasement, all pipes shall be bedded on granular fill as specified or as shown on the contract drawings. Bedding shall be hand placed, tamped and consolidated throughout. Granular fill and bedding shall be gravel or crushed stone having no particles over 20 mm in size, except where otherwise specified.

Concrete cradle and concrete encasement shall be placed as shown on the drawings, and the concrete shall be minimum 25 MPa.

From the top of the bedding material to a point 150 mm below the existing grade of the laneway, backfill material shall be clean pit run gravel meeting O.P.S.S. Granular B or approved equivalent. The material shall be placed in lifts not to exceed 300 mm in depth and all granular materials shall be compacted to 100 % SPMDD and all subsoil or previously excavated material to 95 % SPMDD.

The final 150 mm of the excavation shall be filled with clean crushed gravel conforming to O.P.S.S. Granular "A" specifications. The material shall be placed in lifts not exceeding 150 mm in depth and shall be thoroughly compacted to 100 % SPMDD.

D.2.2.7 EXCAVATION AT BRIDGE SITES

The excavation at bridge sites shall be to the full depth of the drain and as nearly as possible the full width of the drain as specified for the bridge location. The excavation at a bridge site shall be made in a manner to protect the structural integrity of any permanent bridge. A temporary bridge may be carefully removed to allow excavation. The removal of a bridge is to be done in such a manner so as to cause no damage to the bridge components. Temporary bridges removed to allow excavation shall be replaced in as good a condition as found, so far as material allows. Replacing of such bridges shall be to the satisfaction of the Engineer. The Contractor shall immediately notify the Engineer if it becomes apparent that excavating to a specified gradient will endanger or underpin any culvert or bridge. The Contractor shall cease excavation at the bridge or culvert site until the Engineer instructs the Contractor to proceed.

D.2.2.8 SEEDING

Unless indicated otherwise in the Special Provisions, the Contractor shall seed all disturbed areas which includes newly excavated drain banks and leveled spoil (where specified) with the OPSS (MTO) Standard Roadside Seed Mix, consisting of 55% Creeping Red Fescue, 27% Kentucky Bluegrass, 15% Perennial Ryegrass and 3% White Clover, at an application rate of 100 kg/10,000 m², plus a nurse crop of Fall Rye Grain or Winter Wheat Grain at an application rate of 60 kg/10,000 m², at the end of each working day.

D.2.2.9 TEMPORARY SEDIMENT CONTROLS

Unless indicated otherwise in the Special Provisions, the Contractor shall install an approved sediment control measure at the downstream end of the open drain excavation and at any other locations specified. The Contractor shall remove any accumulated sediment at regular intervals or as directed by the Engineer. The Contractor shall then remove these temporary measures, and any accumulated sediment therein, after the new open drain has stabilized and only after authorized by the Engineer or the Drainage Superintendent.

D.2.2.10 PERMANENT SEDIMENT/STILLING BASINS

The Contractor shall construct and maintain sediment control or stilling basins as specified in the Special Provisions.

D.2.2.11 RIP RAP & NON-WOVEN GEOTEXTILE

Rip Rap – The Contractor shall supply and install a 450 mm thickness of 150 mm to 300 mm (R-50) diameter quarry stone rip rap with filter cloth underlayment for culvert and pipe outlets. This will include areas of the existing bank where erosion or bank slumping has occurred, as directed on-site by the Engineer. For the area surrounding catchbasins, unless noted otherwise, the contractor shall supply and install a 300 mm thickness of 100 to 150 mm (R-10) diameter quarry stone rip rap with filter cloth underlayment.

Non-Woven Geotextile - All geotextile used for tile wrapping under these specifications shall be non-woven Terrafix 200R (or equivalent). All geotextile used under these specifications for heavy duty applications such as under rip-rap surrounding catchbasins, and at tile outlets into drains shall be non-woven Terrafix 270R (or equivalent).



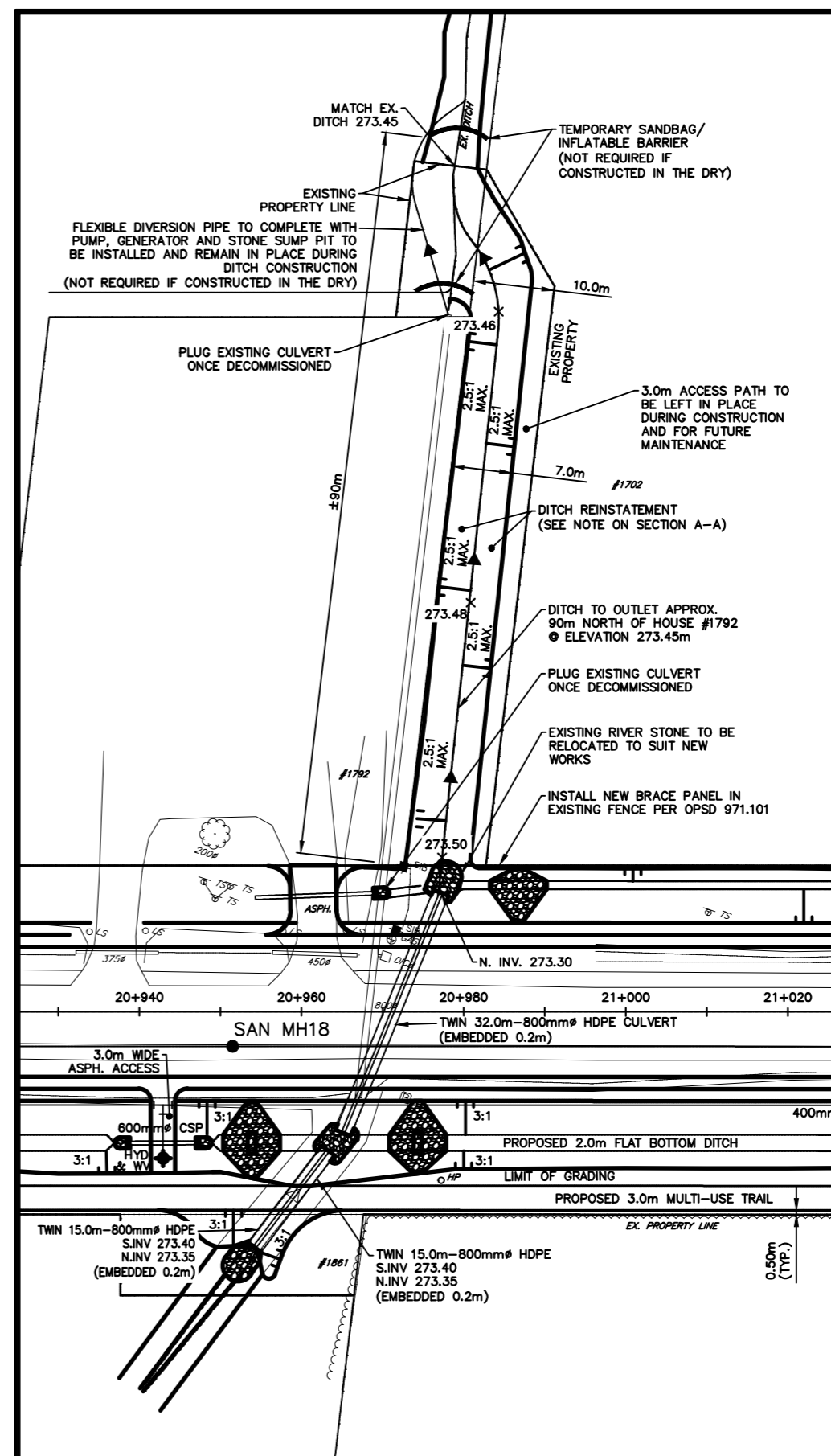
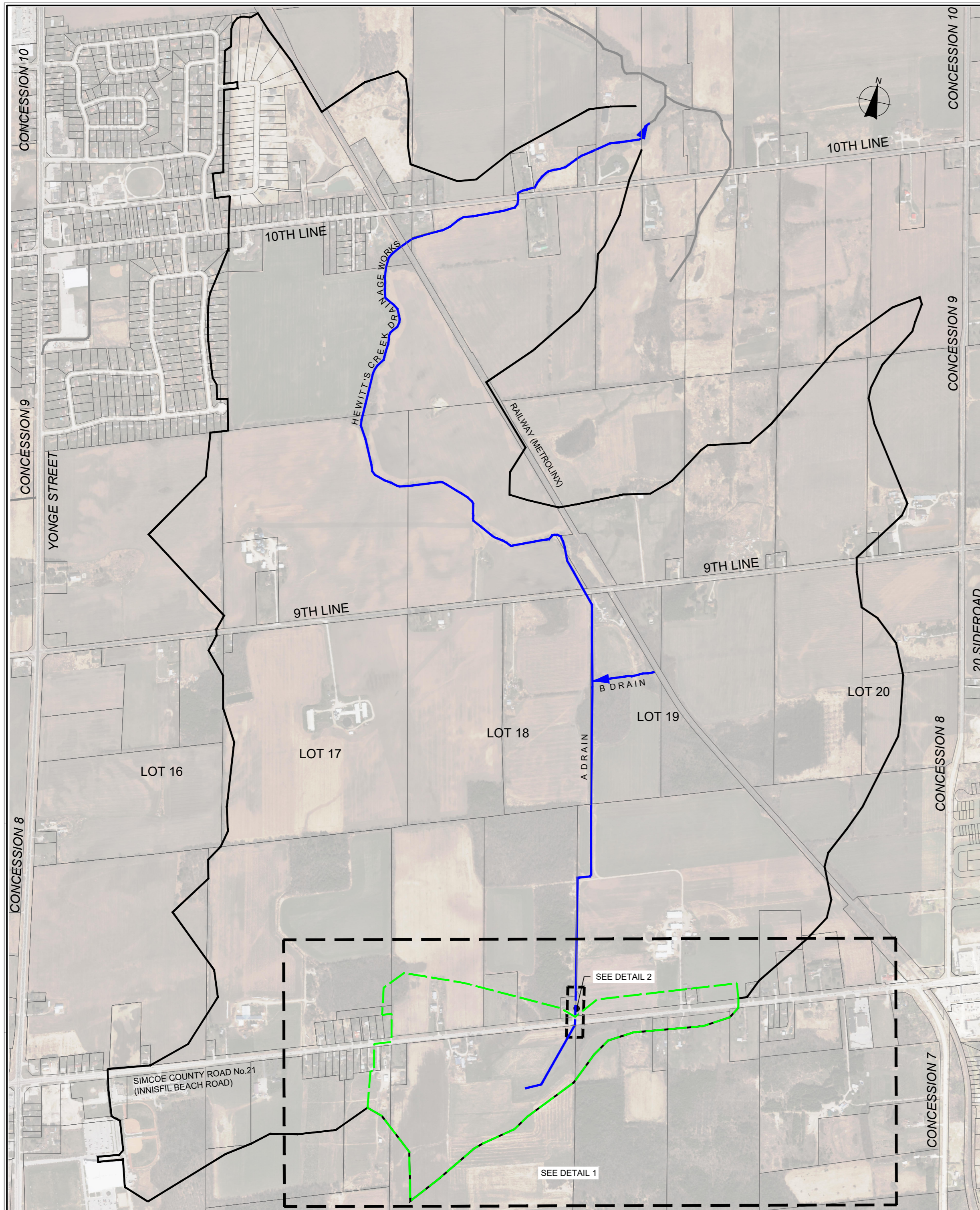
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Appendix E

Drawings

Main Watershed Plan and Detail 2	1 of 2
Sub-Watershed Plan and Detail 1	2 of 2

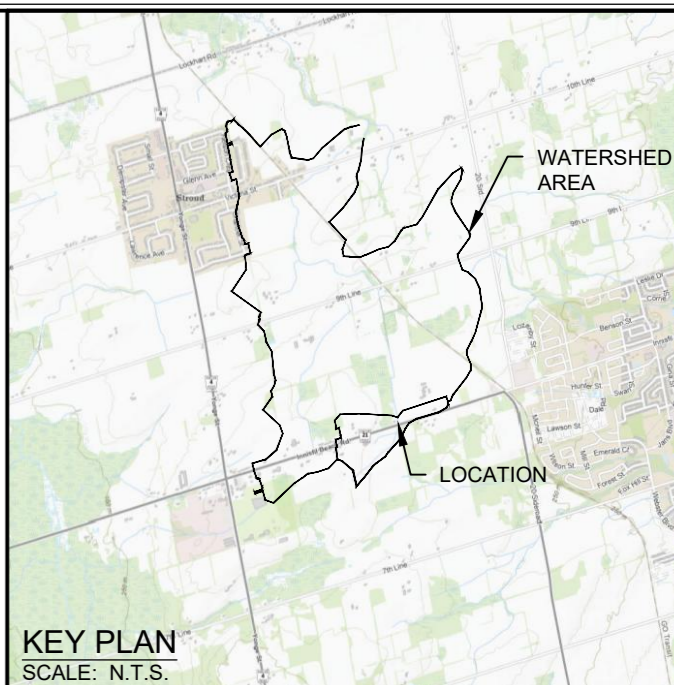


DETAIL 2
SCALE 1:750

NOTE: DETAIL 2 HAS BEEN PROVIDED BY TATHAM ENGINEERING. PLEASE REFER TO THE FEBRUARY 28, 2024 DRAWINGS, PREPARED BY TATHAM ENGINEERING FOR DETAILS CONCERNING THE PLAN FOR THE PROPOSED CULVERT.

PLEASE NOTE THAT THE PROPOSED DITCH WAS SHIFTED AND CENTERED BY BURNSIDE WITHIN THE 10.0m WIDE COUNTY OF SIMCOE PROPERTY.

NOTE: THE ORIGINALS OF THESE TWO DRAWINGS ARE APPROXIMATELY 16" x 24". FOR A FULL SIZE VERSION OF THESE DRAWINGS, PLEASE CONTACT THE TOWN OF INNISFIL



- KEY PLAN**
SCALE: N.T.S.
- LEGEND**
- HEWITT'S CREEK DRAINAGE WORKS WATERSHED BOUNDARY
 - SUB-WATERSHED BOUNDARY (PROPERTIES AFFECTED BY THIS REPORT)
 - ➔ EXISTING MUNICIPAL DRAIN
 - ➔ WATERCOURSE

- Notes
1. This drawing is the exclusive property of R. J. Burnside & Associates Limited. The reproduction of any part without prior written consent of this office is strictly prohibited.
 2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.
 3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.
 4. All property lines are approximate and for information purposes only.

NOT FOR CONSTRUCTION



No.	Issue / Revision	Date	Auth.
1	DRAFT ISSUED FOR TOWN REVIEW	2024/03/08	JRD
2	ISSUED FOR INFORMATION MEETING	2024/03/26	JRD
3	ENGINEER'S REPORT FILED	2024/04/15	JRD

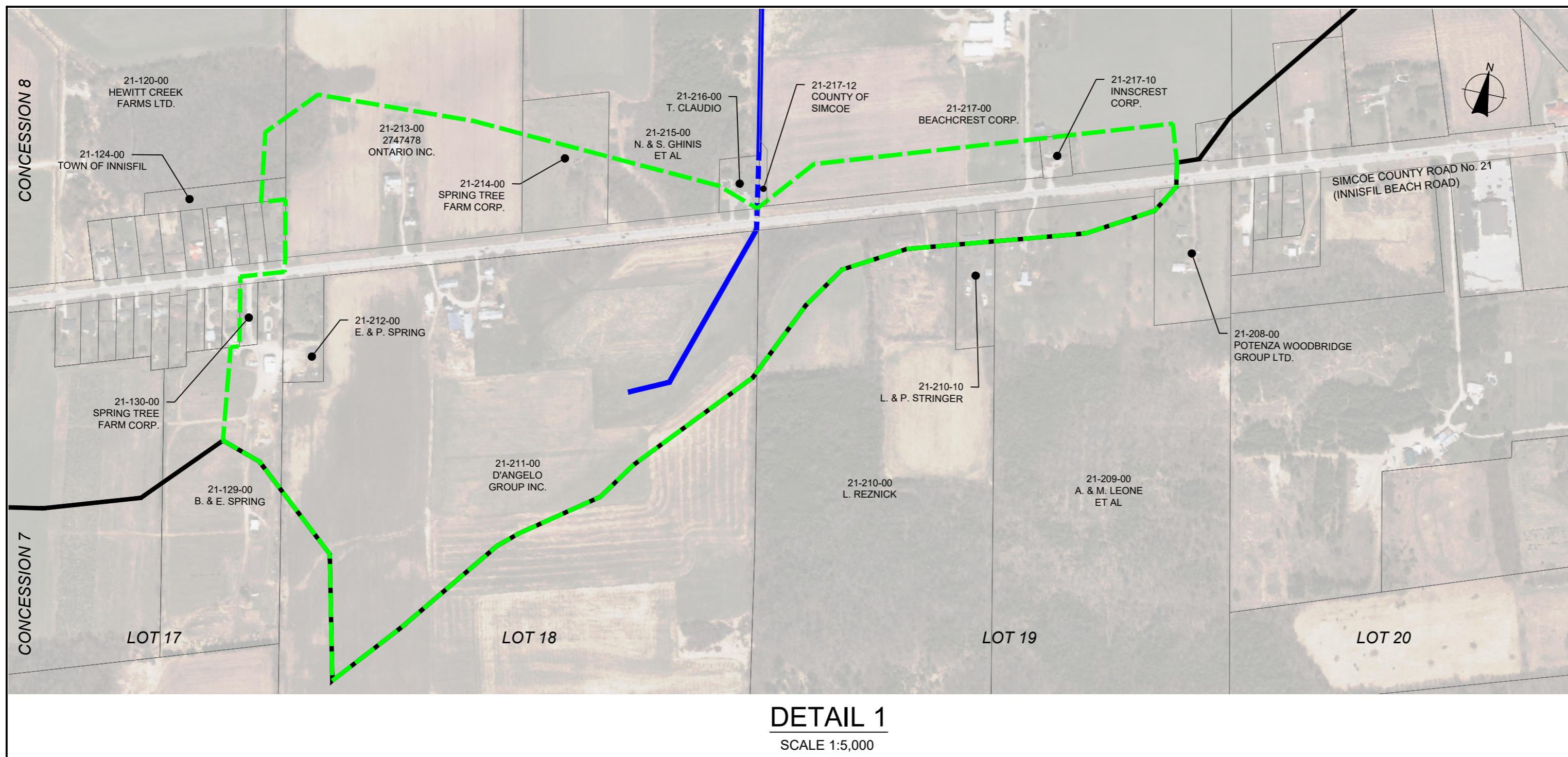


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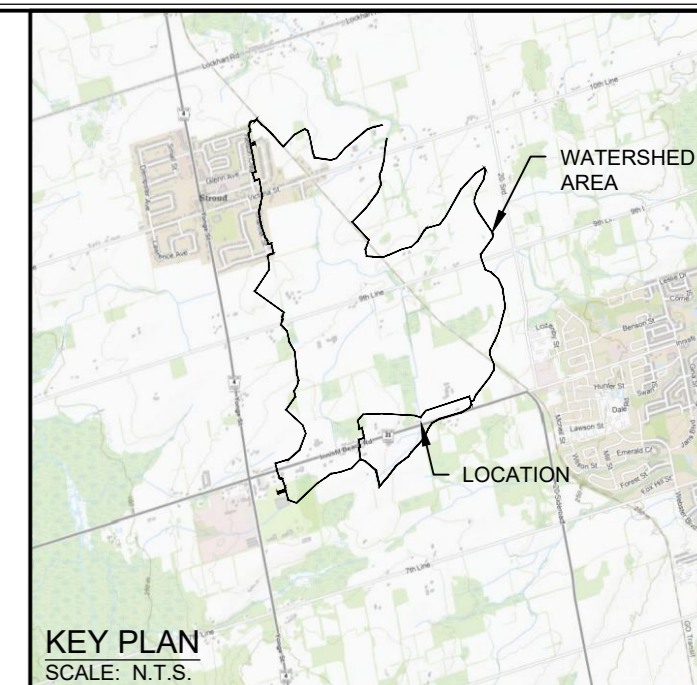
Client
TOWN OF INNISFIL
2101 INNISFIL BEACH ROAD
INNISFIL, ON
L9S 1A1

Drawing Title
HEWITT'S CREEK DRAINAGE WORKS
MAIN WATERSHED PLAN AND DETAIL 2

Designed	Checked	Drawn	Checked	Drawing No.
MZ	JRD	MZ	JRD	1 OF 2
Date	Project No.			
2022/05/30	300043974.2022			
Scale	0 200 400 600m			
1:10,000				



DETAIL 1
SCALE 1:5,000

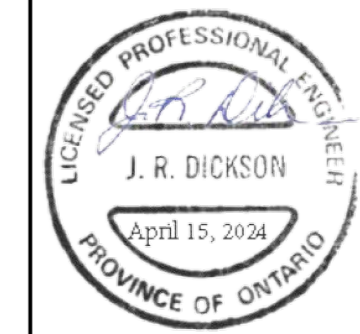


KEY PLAN
SCALE: N.T.S.

- LEGEND**
- HEWITT'S CREEK DRAINAGE WORKS WATERSHED BOUNDARY
 - SUB-WATERSHED BOUNDARY (PROPERTIES AFFECTED BY THIS REPORT)
 - EXISTING MUNICIPAL DRAIN
 - WATERCOURSE

- Notes**
1. This drawing is the exclusive property of R. J. Burnside & Associates Limited. The reproduction of any part without prior written consent of this office is strictly prohibited.
 2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.
 3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.
 4. All property lines are approximate and for information purposes only.

NOT FOR CONSTRUCTION



No.	Issue / Revision	Date	Auth.
1	DRAFT ISSUED FOR TOWN REVIEW	2024/03/08	JRD
2	ISSUED FOR INFORMATION MEETING	2024/03/26	JRD
3	ENGINEER'S REPORT FILED	2024/04/15	JRD

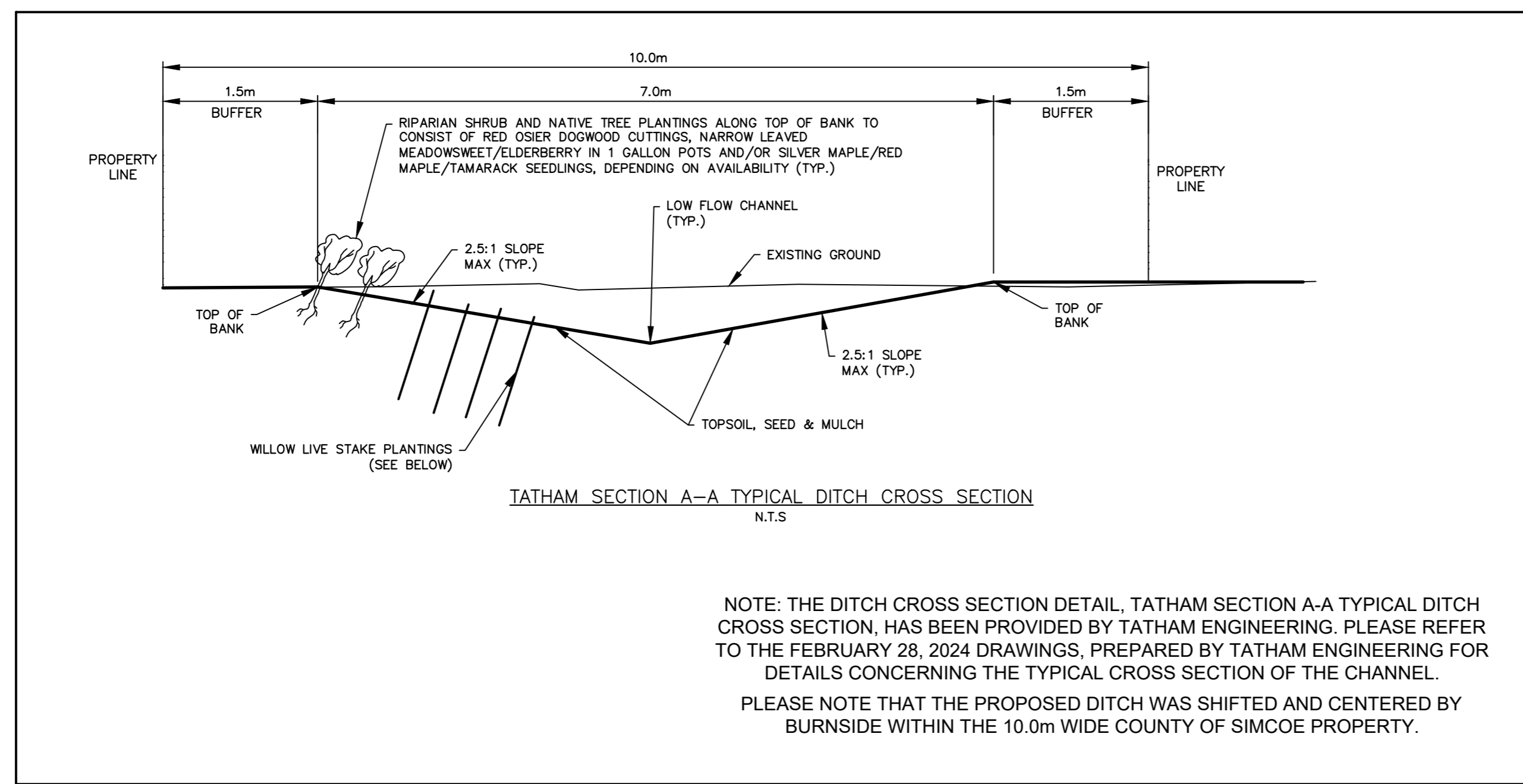


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INNISFIL, ON
L9S 1A1

Drawing Title
HEWITT'S CREEK DRAINAGE WORKS
SUB-WATERSHED PLAN AND DETAIL 1

Designed	Checked	Drawn	Checked	Drawing No.
MZ	JRD	MZ	JRD	2 OF 2
Date	Project No.			
2022/05/30	300043974.2022			
Scale	0 50 100 200 300m			
1:5,000				



NOTE: THE DITCH CROSS SECTION DETAIL, TATHAM SECTION A-A TYPICAL DITCH CROSS SECTION, HAS BEEN PROVIDED BY TATHAM ENGINEERING. PLEASE REFER TO THE FEBRUARY 28, 2024 DRAWINGS, PREPARED BY TATHAM ENGINEERING FOR DETAILS CONCERNING THE TYPICAL CROSS SECTION OF THE CHANNEL.

PLEASE NOTE THAT THE PROPOSED DITCH WAS SHIFTED AND CENTERED BY BURNSIDE WITHIN THE 10.0m WIDE COUNTY OF SIMCOE PROPERTY.

NOTE: THE ORIGINALS OF THESE TWO DRAWINGS ARE APPROXIMATELY 16" x 24". FOR A FULL SIZE VERSION OF THESE DRAWINGS, PLEASE CONTACT THE TOWN OF INNISFIL

