BURNSIDE

Engineer's Report
Minto Drain No. 121 - 2025

Town of Minto
5941 Highway 89
Harriston, ON N0G 1Z0

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ASSESSMENTS for CONSTRUCTION
MINTO DRAIN 121

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals	*Less* 1/3 Grant	*Less* Allowances	Net Assessment
		Agricultural Lands								
8	33	Bradley and Lindsey Hall	0-042	0.00	$ 2,980	$ -	$ 2,980	$ 993	$ 3,800	$ (1,813)
8	42	* Lavolit Limited	1-158~	0.34	$ -	$ 290	$ 290	$ -	$ -	$ 290
8	42	Lavolit Limited	1-158	24.48	$ 13,270	$ 15,340	$ 28,610	$ 9,537	$ 17,800	$ 1,273
8	Pt. 41	* Henry and Agnes Weber	1-158-10	0.29	$ 1,470	$ 1,990	$ 3,460	$ -	$ 1,600	$ 1,860
8	41	John and Miriam Martin	1-159	12.39	$ 22,230	$ 98,640	$ 120,870	$ 40,290	$ 1,200	$ 79,380
8	40	Archibald and Lisa Wilson	1-158-50	1.13	$ -	$ 7,740	$ 7,740	$ 2,580	$ -	$ 5,160
		TOTAL ON LANDS		**38.63**	**$ 39,950**	**$ 124,000**	**$ 163,950**	**$ 53,400**	**$ 24,400**	**$ 86,150**
		Roads								
Unopened Road (Between Lot 40&41)		* Town of Minto		0.51	$ -	$ 3,490	$ 3,490	$ -	$ -	$ 3,490
Unopened Road (Howick Minto Townline)		* Town of Minto		0.00	$ 1,280	$ -	$ 1,280	$ -	$ -	$ 1,280
Unopened Road (Howick Minto Townline)		* Township of Howick		0.00	$ 1,280	$ -	$ 1,280	$ -	$ -	$ 1,280
		TOTAL ON ROADS		**0.51**	**$ 2,560**	**$ 3,490**	**$ 6,050**	**$ -**	**$ -**	**$ 6,050**
		ALL LANDS AND ROADS		**39.14**	**$ 42,510**	**$ 127,490**	**$ 170,000**	**$ 53,400**	**$ 24,400**	**$ 92,200**

Notes:

(1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *

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

(3) A possible severance on Roll No. 1-158 was ongoing at the time of the report. The proposed parcel was denoted with ~ Should this severance be rejected or incomplete at time of construction the assessment will revert back to Roll No. 1-158

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Minto Drain 121 - 2025

Town of Minto
5941 Highway 89
Harriston, ON N0G 1Z0

R.J. Burnside & Associates Limited
449 Josephine Street P.O. Box 10
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February 2025
300054764.3000

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Distribution List

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8	Yes	Yes	Town of Minto (for Council, Drainage Superintendent, general municipal use)
5	No	No	Assessed Landowners
1	Yes	Yes	Maitland Valley Conservation Authority (MVCA)
1	Yes	Yes	Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA)

Record of Revisions

Revision	Date	Description
0	December 11, 2024	Draft Submission to the Town of Minto and Maitland Valley Conservation Authority
1	February 3, 2025	Final Submission for Engineer's Report

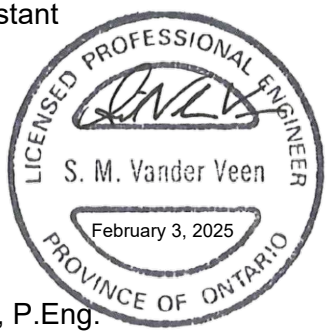
R.J. Burnside & Associates Limited

Report Prepared By:

Greg Nancekivell, C.E.T.
Project Manager

Edison Peel, E.I.T.
Engineering Assistant
EP/GN/SV:tp

Report Reviewed By



Sid Vander Veen, P.Eng.
Project Engineer

Executive Summary

Authorization

This report is being prepared in response to an appointment by the Town of Minto, dated January 18, 2022, to investigate drainage issues on the properties of the petitioning property owners, in accordance with Section 4 of the Drainage Act, R.S.O. 1990.

Objective & Recommendations

The objective of this report is to determine a drainage solution to provide a subsurface drainage outlet for the properties in the watershed.

This report recommends the construction of a new open drain beginning in Lot 33, Concession 8, Township of Howick, Huron County to the west lot line of Lot 42, Concession 8 in the Town of Minto, Wellington County and a tile drain proceeding easterly into Lot 41, Concession 8, Town of Minto, Wellington County.

Summary of Assessments

A summary of the assessments for this project are as follows:

Municipal Lands	$	6,050
Privately Owned Non-Agricultural	$	3,750
Privately Owned Agricultural – Grantable	$	160,200
Total Estimated Assessments	**$**	**170,000**

Acknowledgements

R.J. Burnside & Associates Limited (Burnside) would like to acknowledge the assistance and cooperation of the property owners directly involved with this project, as well as Ryan Binkle, Drainage Superintendent for the Town of Minto, and Kirsten Snoek from the Maitland Valley Conservation Authority (MVCA).

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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
H – horizontal
ha – hectare (2.471 ac)
HDPE – high density polyethylene
BJB – buried junction box
km – kilometre
LS – lump sum
m – metre
mm – millimetre
m^2 – square metre
m^3 – cubic metre
OB – observation box
o/s – offset
PDT – plastic drainage tubing
PL – property line
ROW – right of way
S & I – supply and install
Sta. – station (chainage)
SWI – surface water inlet
SWWSP – smoothwall welded steel pipe
t – tonne (2,205 pounds)
u/s – upstream
V – vertical

Other

CA – Conservation Authority
DFO – Fisheries and Oceans Canada
MECP – Ministry of Environment, Conservation and Parks
MTO – Ministry of Transportation
NRCS – Natural Resources Conservation Service
OMAFA – Ontario Ministry of Agriculture, Food and Agribusiness
SCS – Soil Conservation Service

1.0 Project Authorization

This report is being prepared in response to an appointment by the Town of Minto, dated January 18, 2022 to investigate drainage issues on the property of the petitioning landowners, in accordance with Section 4 of the Drainage Act, R.S.O. 1990.

The Drainage Act

The “Drainage Act” provides a mechanism for the construction, improvement and maintenance of a drainage works. Procedures under the Drainage Act are designed to enable non-riparian landowners to obtain a legal drainage outlet while safeguarding the rights and property of riparian landowners through which the drainage system may be constructed. The Drainage Act definition of “drainage works” includes a drain constructed by any means, including the improvement of a natural watercourse, and includes works necessary to regulate the water table or water level within or on any lands or to regulate the waters of a drain, reservoir, lake or pond and includes a dam, embankment, wall, protective works or any combination thereof.

Drains constructed under the Drainage Act, which are referred to as Municipal Drains, are user pay systems. This means the landowners within the watershed, including lands and roads, for the proposed drain will contribute a portion of costs towards the design, construction and maintenance of the municipal drain. The most common means of assessing project costs are through a benefit and/or outlet assessment (Sections 22 & 23 of the Drainage Act).

Aside from assessing costs, allowances are awarded to owners whose property is physically affected by the construction and maintenance of the drain. The most common sections under the Drainage Act to award allowances are; Section 29 for right-of-way, which awards costs based on the area of land required to construct, improve and maintain the drain in the future; and Section 30 for damages, which are awarded based on damages to the property during construction or improvements to the drain. For more details on allowances, see Appendix A.

1.1 Engineer’s Report

The proposed works and costs contained herein are intended to reflect the requirements of the stakeholders and are based on information gathered during field survey, as well as at the property owner’s meetings and follow up discussions. Details of the proposed work are described in this report, its appendices and on the plan and profile drawings.

1.2 Petition for Drainage Works by Owners

A petition, dated January 10, 2022, was submitted by John and Miriam Martin (Roll No. 1-159); owners of part lot 41, Concession 8 in the Town of Minto, Wellington County.

1.3 Validity of Petition

The area requiring drainage for Minto Drain 121 was determined as being part of Lot 41, Concession 8 in the Town of Minto, Wellington County.

The petition having been signed by John and Miriam Martin owners of Lot 41, Concession 8 represent all of the landowners in the area requiring drainage as determined by the engineer. The petition has been to be valid in accordance with Section 4(1)a of the Drainage Act, R.S.O. 1990 having the majority in number of the owners within the area requiring drainage.

This report has been prepared in accordance with Section 4 of the Drainage Act, R.S.O. 1990.

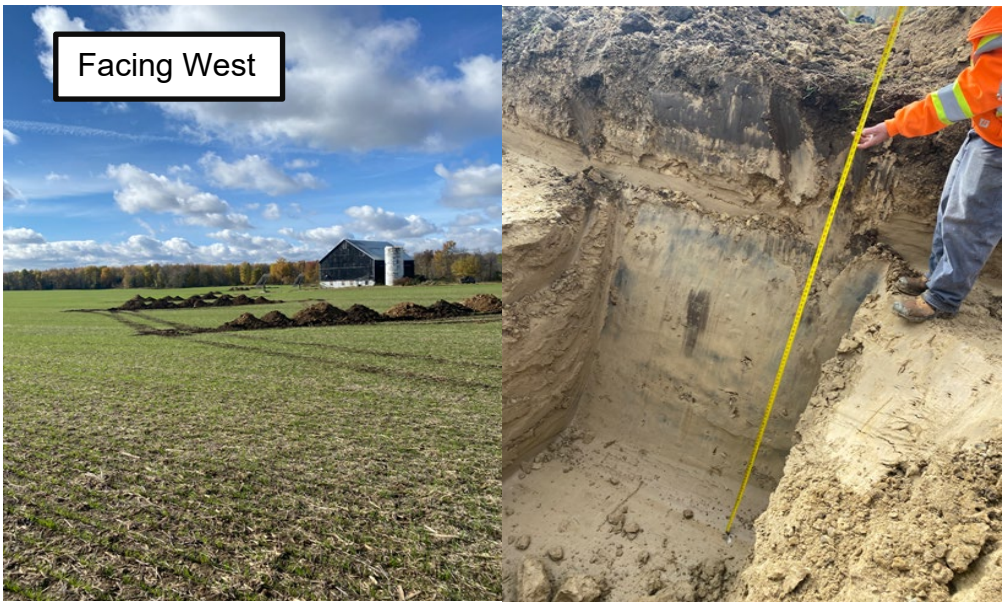
2.0 Background Information

The watershed of the proposed Minto Drain 121 is not currently assessed to an existing municipal drain. Burnside conducted a thorough review of all the historical documentation available in the Town of Minto and Township of Howick pertaining to Municipal Drains abutting the proposed Minto Drain 121. The watershed of Minto Drain 121 ultimately flows to the Milton Leonard Award Drain constructed in 1919.

2.1 Existing Conditions

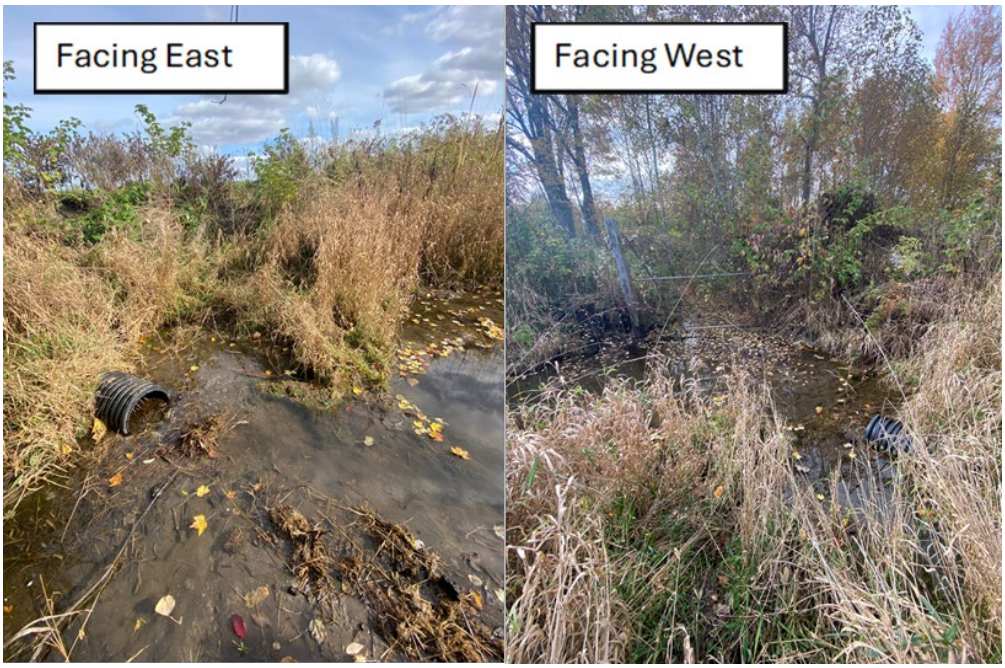
Surface water from the watershed generally flows from Lot 40, Concession 8 (Minto) westerly to Lot 33, Concession 8 (Howick) outletting into an open channel which flows to the Milton Leonard Award Drain.

Figure 1: Soils and Tile Investigation on Lot 42, Conc. 8, (Roll No. 1-158) Lavolit Limited property



The above photos show the tile and soils investigation which was completed. The surface water and private tile drainage system on this property flows to the west.

Figure 2: Private Tile Outlet on Lot 42, Conc. 8, (Roll No. 1-158)
Lavolit Limited property



The private tile outlets to an open channel as shown in the photo above. The tile is partially submerged in sediment. This ditch flows west to Lot 33 Conc. 8, Howick (Roll 0-042).

Figure 3: Existing Culvert to be Removed on Lot 33 Conc. 8, Howick, (Roll 0-042)
Bradley & Lindsey Hall property

The photos above show the condition of an existing culvert crossing on Lot 33 Conc. 8, Howick (Roll 0-042). The culvert is perched higher than the existing channel bottom with a considerable amount of sediment backing up on the upstream side as shown in the photo on the right. The photo on the left depicts the confluence with an existing channel flowing to the south.

Figure 4: Downstream of Channel Confluence Lot 33 Conc. 8, Howick,(Roll 0-042) Bradley & Lindsey Hall property

The photo on the left shows an existing crossing downstream of the channel confluence. The photo on the right depicts the well-defined channel cross section downstream of the crossing. This channel flows south to connect to the Milton Leonard Award Drain (1919).

2.2 Watershed Area & Land Use

The watershed of Minto Drain 121 was investigated by Burnside. The boundary was examined through the examination of topographic contour mapping data with the use of South Western Ontario Ortho Photography (SWOOP) and computer aided drafting (CAD) software, the examination of existing Municipal Drain reports, and the review of field survey and observations.

The watershed area was determined to be approximately 39.1 ha.

Land use within the watershed area is divided as follows:

- 38.6 ha (95.4 ac) agricultural land.
- 0.5 ha (1.2) municipal road right-of-way (ROW).

The proposed Minto Drain 121 shares a contiguous watershed boundary with the following drainage systems.

- Milton-Leonard Award (1919) to the North, West and South.
- Minto Drain 72 (1981) to the East.
- Minto Drain 119 (2024) to the Southeast (proposed).

2.3 Types of Soils

The soils survey for the area taken from Soil Survey of Wellington County 1963 indicates that the predominant soil type within the watershed area is Harriston Loam, with smaller areas of Listowel Loam, Teeswater Silt Loam.

- **Harriston Loam** – A slightly stony soil with good drainage and rolling topography.
- **Listowel Loam** – A slightly stony soil with imperfect drainage and undulating topography.
- **Teeswater Silt Loam** – A slightly stony soil with good drainage and gently sloping topography.

Based on the characteristics of the soils and their potential for future agricultural use, the Canada Land Inventory (CLI) provides Soil Capability Classification of Agriculture for lands across the country. The soils within the new watershed area have an agricultural capability rating of Class of 1, with no limitation in crop use.

3.0 Preliminary Investigations

3.1 On-Site Meeting

The on-site meeting for this petition drain as well as for improvement works on Minto Drain 102 was held on March 11, 2022 at 83 Arthur Street West, Harriston (Harriston Train Station). The following were present at the meeting:

Name	Position	Roll No.
Dan Templeton	Property Representative	Roll No. 1-116
John Kuipers	Property Owner	Roll No. 1-115-50, 1-117 & 1-120
Ian Marsh	Property Owner	Roll No. 1-119
William Wilken	Property Owner	Roll No. 1-157
James Gibson	Property Owner	Roll No. 1-157-50
John Martin	Property Owner	Roll No. 1-159
Mike McIsaac	Roads & Drainage Manager, Town of Minto	N/A
Michael Siemon	R.J. Burnside & Associates Limited	N/A
Greg Nancekivell	R.J. Burnside & Associates Limited	N/A
Trevor Kuepfer	R.J. Burnside & Associates Limited	N/A

The existing drainage conditions were discussed amongst those in attendance. John Martin explained that he is not able to install underdrainage on his property since he has no access to a legal drainage outlet.

As a result of the meeting, it was determined that the primary purpose of this report would be to establish a legal drainage outlet for subsurface drainage to the petitioning property.

4.0 Design Criteria & Engineering Considerations

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 the Ontario Ministry of Agriculture, Food, and Rural Affairs, were used to determine and supplement the design considerations for this drain.

4.1 Modelling

A hydrologic and hydraulic model was created for the Minto Drain 121 watershed using SWMHYMO software model to simulate effects of the 2, 5, 10 and 25-year return period design rainfall events on the drainage system.

Input parameters were based on watershed land use and soil parameters gathered from aerial photography and the Wellington County soils report and mapping.

The Ministry of Transportation (MTO) intensity duration frequency (IDF) curve tool was used to develop a local IDF curve for the watershed and determine rainfall amounts and intensities as input to the design storm. A SCS Type II rainfall distribution was chosen to provide design storms for this simulation.

4.2 Open Drain Design

In accordance with OMAFRA Publication 852, dated 2018 the open ditches have been designed to accommodate the flows resulting from the 2-year return storm event.

4.3 Closed Drain Design

Under the previously mentioned guidelines it is recommended to use a drainage coefficient for the underdrainage requirements of cleared, worked, agricultural land and to consider an additional drainage coefficient for the surface water requirements of all lands and roads within the watershed area. For this project, a drainage coefficient of 12.7 mm (1/2 inch) for under drainage requirements, and 25.4 mm (1 inch) for surface water requirements over a 24-hour period has been used.

Together, this produces a combined design coefficient of 38.1 mm (1½ inches) in 24 hours, and following discussion with the property owners, this coefficient was selected as the design standard for this project.

4.4 Water Quality Considerations

The loss of sediment and nutrients from cropped land is a major concern to water quality in Ontario. Therefore, this design has incorporated the following features to minimize these impacts including:

- Rip-rap erosion protection along banks susceptible to erosion to reduce channel degradation.
- A permanent stilling basin to promote sediment deposition.

4.5 Soils Investigation

A soils investigation was completed in various locations near the proposed drain alignment on October 23, 2023. This investigation was completed to evaluate the construction conditions of various design and installation options. The results of the investigation have been summarized and locations shown on the accompanying plan in Appendix G.

5.0 Environmental and Fisheries Considerations

When a new Engineer's report is prepared that could affect an existing Municipal Drain, natural watercourse, wetland, or other environmental features, a review of the work is required, and subsequent approvals and/or project requirements must be obtained from the applicable agency. These may include the local Conservation Authority (CA), The Ministry of the Environment, Conservation and Parks (MECP) and Fisheries and Oceans Canada (DFO).

5.1 Maitland Valley Conservation Authority (MVCA)

The MVCA has been apprised of the project throughout its progression. A permit noting important considerations is included in Appendix D.

5.2 Fisheries and Oceans Canada (DFO)

A request for review of the proposed works was submitted to DFO for review on February 22, 2024. A letter of advice from DFO was received on May 5, 2024. The recommended fish habitat mitigation measures can be found in Appendix D.

No Federal Species at Risk have been identified within this drainage area that would require special consideration under the Species at Risk Act (SARA).

6.0 Stakeholder Meetings

A meeting was organized with the stakeholders involved with this project to gain input and comments on the proposed drain and its associated costs.

6.1 Information Meeting No. 1

An information meeting for the Minto Drain 121 was held on January 30, 2024 at the Town of Minto Council Chambers. The following were present at the meeting:

Name	Position	Roll No.
Bradley (Brad) Hall	Property Owner	Roll No. 0-042
Jim Hall	Property Representative	Roll No. 0-042
John Martin	Property Owner	Roll No. 1-159
Hubertus Vonwesterholt	Property Representative	Roll No. 1-158 & 1-162
Mike McIsaac	Roads & Drainage Manager, Town of Minto	N/A
Greg Nancekivell	R.J. Burnside & Associates Limited	N/A
Edison Peel	R.J. Burnside & Associates Limited	N/A

The watershed boundary, estimated costs, design, allowances and assessments were discussed with all meeting attendees.

Following this meeting, the Drainage Superintendent was available to the property owners who were not in attendance for information on the progress of the project.

Subsequent to the information meeting an on-site meeting was held on the Bradley & Lindsey Hall (Roll No. 0-042) property. The following were present at the meeting:

Name	Position	Roll No.
Bradley (Brad) Hall	Property Owner	Roll No. 0-042
Scott Richardson	Drainage Superintendent Howick Township	N/A
Greg Nancekivell	R.J. Burnside & Associates Limited	N/A
Edison Peel	R.J. Burnside & Associates Limited	N/A

The purpose of the meeting was to discuss the proposed removal and replacement of an existing private culvert crossing and construction access to carry out the proposed works on the property.

At this meeting Brad Hall requested not have the culvert replaced under this report. He also stated that the preferred access to his property would be from the Lavolit Limited (Roll No. 1-158) property. Brad understood that this access would necessitate the removal and reinstatement of a section of the fence along the east side of his property.

7.0 Proposed Design

Minto Drain 121 includes the installation of approximately 556 m of CDT, 37 m HDPE pipe, two (2) concrete catch basins complete with rip-rap, removal of one culvert crossing, 107 m of channel deepening/cleanout, and the construction of one (1) stilling basin.

7.1 Description of Proposed Work on Each Property

Bradley and Lindsey Hall (Roll No. 0-042)

- Approximately 85 m of channel deepening/cleanout.
- Removal of one (1) existing culvert crossing and re-establishment of channel.

Unopened Road Allowance

- Approximately 22 m of channel deepening/cleanout.
- Construction of one (1) stilling basin complete with rip-rap erosion protection.
- Supply and install approximately 3 m of 450 mm dia. dual-wall HDPE pipe (320 kPa).

Lavolit Limited (Roll No. 1-158)

- Supply and install approximately 34 m of 450 mm dia. dual-wall HDPE pipe (320 kPa).
- Supply and install approximately 333 m of 350 mm dia. CDT (2000D).
- Supply and install approximately 168 m of 250 mm dia. CDT (2000D).
- The connection of all impacted private tiles.

Henry and Agnes Weber (Roll No. 1-158-10)

- Supply and install approximately 55 m of 250 mm dia. CDT (2000D).
- Supply and install two (2) (600 mm) x (600 mm) inline concrete catchbasins c/w rip-rap erosion protection.

7.2 Working Space and Access Routes

The working space and access routes being provided to the Contractor are described in Appendix F – Special Provisions. The working space shall also be available for future maintenance of the drain. Access to the working space is to be confirmed by the Contractor with property owners and the Engineer prior to the commencement of construction. Allowances for the working space and access routes have been provided to the affected properties. Access to various parts of the drain shall be as shown in the accompanying drawings in Appendix H.

7.3 Damaged Private Tiles

Open Drains

The replacement of damaged or poorly functioning tile outlets encountered during the installation of the drain will be included as part of the construction costs and protected against erosion with rip-rap, as approved by the Contract Administrator.

These repairs will be completed at the time of construction of the proposed drain and shall be as specified in Appendix F. **Private tile outlets are not to be considered part of the drain for future maintenance.**

Closed Drains

The connection and reconnection of existing tiles encountered during the installation of the drain will be included as part of the construction costs.

7.4 Change Orders

If minor unforeseen circumstances are encountered following the adoption of this report, the Engineer may issue change orders, as required to have the work properly constructed. If significant changes to the drain design are identified during construction, the procedures of Regulation 500/21 under the Drainage Act must be followed.

8.0 Description of Appendices

8.1 Appendix A – Allowances

In accordance with Section 8(1)(d) of the Act, this Appendix provides a breakdown of the allowances provided under Sections 29 and 30 of the Act. These sections are:

- Section 29 – Right-of-Way
- Section 30 – Damages

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 the proposed work, including all labour, materials, construction, engineering, administration and allowances.

8.3 Appendix C – Construction and Maintenance Assessment Schedules and Assessment Background Information

This Appendix provides an explanation of the methodology used in determining the assessments for this project and also a summary of the proposed assessments that shall be assessed on a pro rata fashion to each property impacted by the proposed works **prior to any grant or allowances being provided.**

Furthermore, this Appendix provides maintenance assessment schedules that shall be used by the Drainage Superintendent following the construction of the proposed drain to determine how to distribute future maintenance costs.

8.4 Appendix D – Agency Correspondence

Project recommendations and requirements from the MVCA and DFO are listed in this Appendix.

8.5 Appendix E – Standard Drain Specifications

The Standard Drain Specifications have been provided in Appendix E and govern the work described herein.

8.6 Appendix F – Special Provisions

Special Provisions are specific directions for this project. The Special Provisions detail requirements not encompassed by Appendix E – Standard Drain Specifications. Special Provisions shall take precedence over Standard Drain Specifications where a conflict between the two documents may exist.

8.7 Appendix G – Soils Investigation

A soils investigation was completed in various locations near the proposed drain alignment on October 23, 2023. This investigation was completed to evaluate the construction conditions of various design options. The results of the investigation have been summarized and locations shown on the accompanying plan.

8.8 Appendix H– Drawings

Four (4) drawings are included with this report, consisting of a plan, profile and structure details pertinent to the construction of the proposed drain.

9.0 Maintenance and Future Considerations

General

While the Town of Minto and the Township of Howick will be responsible for the maintenance of the drain after construction is complete, the sections with the Act dealing with obstruction of, damage, and injury to a Municipal Drain, namely Sections 80 and 82, are brought to the attention of the property owners. Under these sections, both the property owners and the Town of Minto have responsibilities to ensure that a Municipal Drain is properly maintained and kept in good working condition.

The drain should be inspected regularly by the Drainage Superintendent, and appropriate action should be taken by the Drainage Superintendent to ensure the proper function of the drain.

9.1 Maintenance Eligibility

Regarding future maintenance works, the Town of Minto shall be responsible for maintaining the Municipal Drain from Sta. -0+022 to Sta. 0+593 as per the profiles and details on the accompanying drawing set and notes in the special provisions. Regarding future maintenance works, the Township of Howick shall be responsible for maintaining the Municipal Drain from Sta. -0+096 to Sta. -0+022 as per the profiles and details on the accompanying drawing set and notes in the special provisions.

9.2 Future Maintenance

Open Drain Maintenance

Any areas of washout, settlement, erosion, or other disrepair within the proposed drain shall be maintained as needed by the Drainage Superintendent. The rip-rap erosion protection, stilling basin, etc. shall be inspected on a periodic basis by the Drainage Superintendent and cleaned out as required to maintain the efficiency of the structures and to prevent sedimentation or erosion of the channel.

Closed Drain Maintenance

Catchbasin inlets should be inspected by the Drainage Superintendent and landowners on a regular basis, prior to heavy rainfall events and spring snowmelt to ensure that ice or snow or other material have not obstructed the inlets. Property owners should assist with the maintenance activity by making regular inspections of the drain and inlet structures, clearing debris from the inlet structures in a timely manner and reporting any problems to the appropriate municipality so that the Drainage Superintendent can take proper action.

9.3 Maintenance Costs

Minto Drain 121 shall be maintained by the drainage superintendents of the Town of Minto or Township of Howick at the expense of the upstream lands and roads, in accordance with Section 74 of the Drainage Act.

Costs shall be distributed among the upstream property owners using Appendix C – Maintenance Assessment Schedule and in the same relative portions until such a time as they are varied in accordance with the Drainage Act.

9.4 Future Connections

Connections by the property owners or their Contractor not approved by the Town of Minto or its Drainage Superintendent may be removed at the expense of the Owner responsible for the connection.

Open Drains

After construction, new private tile drains may be installed and outlet directly into the proposed drain, provided that each one is 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 ditch bank of the drain with a proper outlet marker or sign to the satisfaction of the Drainage Superintendent.

Any outlets not installed as described above and causing damage or erosion to the drain may be upgraded as described above or removed at the expense of the Owner responsible for the connection.

Closed Drains

All future connections must be made at a knock-out provided in a precast concrete structure or an approved core drilled hole into the tile, with approved fittings and materials to the satisfaction of the Drainage Superintendent.

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Appendix A

Allowances – Sections 29 & 30

Appendix A – Allowances

Allowances will be deducted from total assessments in accordance with Section 62(3) of the Act. The land and crop values used for these calculations were determined based on a general understanding of the values within this geographic area and are described in the following sections. A summary of the allowances provided under each section of the Act is included in this Appendix. Details regarding working space can be found in the Special Provisions.

- A 5 m access was provided as detailed in the Special Provisions, and as shown on the drawings.
- A 5 m drain corridor was provided through the length of the existing open drain.
- A 10 m working corridor was provided along the length of the existing open drain to allow for construction vehicles and placement of spoil.
- A 20 m working corridor was provided along the proposed tile to allow for damages during initial construction. A 10 m working corridor was provided along the proposed tile for the right of way for future maintenance.

Section 29 – Right-of-Way

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 defined as the footprint of the drain, the working space for the Contractor during construction, and also the working space for the Town of Minto for future maintenance.

Right-of-Way has also been provided for access to the drains for construction and future maintenance. A nominal allowance for access right-of-way of **$500** was provided to lands where an access route is noted on the drawings and special provisions.

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

Land Use	Land Value	Factor for Right-of-Way	Adjusted Land Value for Right-of-Way
Agricultural (Working Corridor)	$65,000/ha ($26,305/ac)	33%	$21,667/ha ($8,768/ac)
Pasture (Working Corridor)	$32,500/ha ($13,153/ac)	33%	$10,833/ha ($4,384/ac)
Pasture (Ex. Drain Corridor)	$32,500/ha ($13,153/ac)	100%	$32,500/ha ($13,153/ac)

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.*"

The following was assumed for crop losses for the specified width of the working area.

- Landowners should expect to lose a crop during the construction of this drain.
- Landowners are encouraged to not to plant specialty crops such as vegetables or ginseng as the allowances provided have not calculated to reflect specialty crops.

It should be noted that the allowances provided in this report are not adjustable/negotiable after the by-law has been given third and final reading.

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

Land Use	Damage Value
Agricultural Land	$4,000/ha ($1,620/ac)
Pasture Land	$2,000/ha ($809/ac)
Fence Damage	$800
Minor Damage (i.e., CB Installation)	$500

APPENDIX A - ALLOWANCES

Conc.	Lot	Owner	Roll No.	Right of Way (Sect.29)	Damages (Sect.30)	Totals
8	33	Bradley and Lindsey Hall	0-042	2,800	1,000	$ 3,800
8	42	Lavolit Limited	1-158	13,200	4,600	$ 17,800
8	Pt. 41	Henry and Agnes Weber	1-158-10	1,200	400	$ 1,600
8	41	John and Miriam Martin	1-159	500	700	$ 1,200
			Total - Main Drain	**$ 17,700**	**$ 6,700**	**$ 24,400**
TOTAL ALLOWANCES				**$ 17,700**	**$ 6,700**	**$ 24,400**

* Damage allowance calculations have been provided based on an approximate area of disturbance during construction. Any discrepancy in these areas at the time of construction shall be investigated and resolved at the discretion of the Contract Administrator.

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Appendix B

Project Cost Estimate

Appendix B - Project Cost Estimate

The estimate of the cost of all labour, equipment and material required to construct this project is as follows:

Note **SP** refers to the **Special Provisions** (in Appendix F) to reference for additional details of work.

Item	Description	Approx. Quantity	Unit	Unit Price	Cost Estimate
M.	**Minto Drain 121**				
M0	Mobilization **(SP 0)**	1.0	LS	$ 2,013	$ 2,000
Open Work					
M1	Crossing the existing post and wire fence to allow for construction equipment **(SP 1)** *(Sta. -0+006)*	1.0	LS	$ 115	$ 100
M2	Remove and dispose of 6 m long 450 dia. HDPE field culvert and re-establish channel **(SP 2)** *(Sta. -0+090 to Sta. -0+082)*	1.0	ea.	$ 863	$ 900
M3	Channel deepening and cleanout (approx. 107 m of < 0.3 m excavation) **(SP 3)** *(Sta. -0+107 to Sta. 0+000)*	$ 107	m	$ 35	$ 3,700
M4	Construction of one (1) stilling basin **(SP 4)**				
	a) Excavation of a 6 m long x 0.3 m deep stilling basin	1.0	ea.	$ 1,725	$ 1,700
	b) Supply and install a 450 mm thickness of OPSS R50 quarry stone rip-rap with geotextile underlay (approx. 30 m^2) *(Sta. -0+006 to Sta. 0+000)*	30.0	m	$ 86	$ 2,600
M5	Handseeding of disturbed channel banks, levelled spoil, and disturbed areas. **(SP 5)** *(Sta. -0+107 to Sta. 0+000)*	535.0	m	$ 1.44	$ 800

Closed Work

M6	High Density Polyethylene Pipe **(SP 6)**			
	a) Supply approx. 37 m of 450 mm dia. bell and spigot HDPE pipe (320 kPa stiffness) complete with two (2) 45° elbows and rodent grate.	37.0 m	$ 184	$ 6,800
	b) Install approx. 37 m of HDPE via wheel trencher. *(Sta. 0+000 to Sta. 0+037)*	37.0 m	$ 35	$ 1,300
M7	Concrete Drainage Tile **(SP 7)**			
	a) Supply approx. 333 m of 350 mm dia. 2000D geotextile wrapped CDT.	333.0 m	$ 35	$ 11,500
	b) Install approx. 333 m of CDT via wheel trencher. *(Sta. 0+037 to Sta. 0+370)*	333.0 m	$ 29	$ 9,600
	c) Supply approx. 223 m of 350 mm dia. 2000D geotextile wrapped CDT.	223.0 m	$ 26	$ 5,700
	d) Install approx. 223 m of CDT via wheel trencher. *(Sta. 0+370 to Sta. 0+593)*	223.0 m	$ 29	$ 6,400
M8	Catch Basin **(SP 8)**			
	a) Supply two (2) 600 mm x 600 mm inline concrete CB.	2.0 m	$ 1,955	$ 4,000
	b) Install two (2) concrete CB *(Sta. 0+538 and Sta. 0+0+593)*	2.0 ea.	$ 863	$ 1,800
M9	Clear and grub one (1) large tree (>=0.3m dia.) including disposal offsite **(SP 9)** *(Sta. 0+530)*	1.0 m	$ 460	$ 500
M10	Repair and reconnect five (5) 100 mm dia. field tiles (as approved by the Engineer). **(SP 10)** *(As required)*	5.0 ea.	$ 201	$ 1,000

Estimated Cost of Construction **$ 60,400**

C. CONTINGENCIES

C1	Tile connections and existing tile reconnections to the drain (as approved by the Engineer). **(SP 10)**			
	a) 100 mm dia. pipe – Reconnection	3.0 ea.	$ 201	$ 600
	b) 150 mm dia. pipe – Reconnection	3.0 ea.	$ 230	$ 700
	c) 100 mm dia. pipe – Connection	3.0 ea.	$ 230	$ 700
	d) 150 mm dia. pipe – Connection	3.0 ea.	$ 259	$ 800
C2	Install drain on specified depth of 19 mm dia. crushed clear stone bedding (c/w supply of materials) in areas of soil instability, as directed by the Engineer. This cost represents the additional unit price for installation by excavator and will be paid in addition to the cost of installation specified by wheel trencher. **(SP 11)**			
	a) 150 mm depth bedding and backfill to pipe springline (pipe diameter less than or equal to 450 mm)	15.0 m	$ 52	$ 800
	c) 300 mm depth bedding, wrapped in geotextile and backfill to springline (pipe diameter less than or equal to 450 mm)	15.0 m	$ 115	$ 1,700
C3	Removal of wheel trencher due to large stones. **(SP 12)**	4.0 ea.	$ 460	$ 1,800
C4	Supply and install a 450 mm thickness of OPSS R50 quarry stone rip-rap with geotextile underlay. **(SP 13)**	15.0 m2	$ 86	$ 1,300
C5	Supply and install OPSS 19 mm (3/4”) clear crushed stone. (**SP 14)**	15.0 tonne	$ 29	$ 400
C6	Supply and install OPSS Granular ‘B’ material. **(SP 15)**	15.0 tonne	$ 58	$ 900
Estimated Cost of Contingencies				**$ 9,700**
Total Estimated Cost of Construction - MINTO DRAIN 121				**$ 70,100**

SUMMARY OF COSTS

Total Estimated Cost of Construction - MINTO DRAIN 121		**$ 70,100**
Allowances to Owners (Sections 29 & 30)		**$ 24,400**
Preparation of Report	$ 35,000	
On-site meeting, soils investigations, field survey, information meetings, drawing set and system design, report preparation, determining allowances, construction and maintenance assessment schedules		
Printing and Consideration of the Report	$ 2,500	
Preparation of report copies for distribution, preparation and attendance at the consideration of the report		
Tendering	$ 2,500	
Preparation and distribution of tender, review of Contractor bid documents, preparation of letter of recommendation for Council		
Contract Administration	$ 14,500	
Preparation and attendance for pre-construction meeting, site reviews during construction (assumed 15 days for drain construction), payment certificates and related appurtenances (progress payment, substantial performance, statutory holdback, and warranty holdback certificates)		
Total Estimated Engineering		**$ 54,500**
Other Costs (Legal Fees & Tile Locates)		**$ 8,000**
Administration and Financing		**$ 13,000**
MVCA review fee, net HST (construction and engineering) and interest charges		
Total Estimated Cost - Minto Drain 121		**$ 170,000**

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.

Also, in addition to the work included in the above estimate, should repairs, replacements, underpinning or other alterations be required for existing bridges, culverts, overflow culverts or any other structure necessary to conduct overflow water, or water in open channels under or across a road allowance, as affected by this drainage work, the work and cost thereof, including any necessary expenses incidental thereto, and if not determined otherwise, shall be the responsibility of and shall be assessed against the authority having control of such road or road allowance.

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Appendix C

Construction and Maintenance Assessment Schedules

Appendix C – Construction and Maintenance Assessment Schedules and Assessment Background Information

Appendices C1– Schedules of Assessment for Construction

In accordance with Section 8(1)(c) of the Act, this Appendix shows the distribution of the total estimated cost over the lands and roads involved and are in accordance with Sections 21, 22, 23, 24, and 26 of the Act. Affected private lands that are deemed to have an agricultural tax class may be eligible for any grants which may be available through the Ontario Ministry of Agriculture and Food and Rural Affairs (OMAFRA). The engineering and administration costs have been assessed out over the entire drain.

The assessments have been calculated using the Modified Todgham Method to distribute the project costs throughout the watershed in a fair and equitable manner. Detailed calculations of these assessments are **available to affected property owners upon request**. More information on assessment and the Drainage Act can be found on the OMAFRA website.

Sections 22 and 23 – Benefit and Outlet Assessment

Section 21 of the Act states:

"The engineer in the report shall assess for benefit, outlet liability and injuring liability, and shall insert in an assessment schedule, in separate columns, the sums assessed for each opposite each parcel of land and road liable therefor. R.S.O. 1990, c. D.17, s. 21."

Section 22 of the Act states:

"Lands, roads, buildings, utilities or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance or repair of a drainage works may be assessed for benefit. R.S.O. 1990, c. D.17, s.22"

Section 23 of the Act states:

"(1) Lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek, or watercourse, may be assessed for outlet liability.

(2) 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.

(3) The assessment for outlet liability and injuring liability provided for in subsections (1) and (2) shall be based upon the volume and rate of flow of the water artificially caused to flow upon the injured land or road or into the drainage works from the lands and roads liable for such assessments.

(4) The owners of the lands and roads made liable to assessment only under subsection (1) or (2) shall neither count for nor against the petition required by section 4 unless within the area therein described. R.S.O. 1990, c. D.17, s.23."

Throughout the course of the drain, specific costs were assigned to various property owners. Parts of the costs of items such as catchbasins, junction boxes, berms, etc. were assessed to the lands directly upstream and downstream of the item and/or the entire upstream watershed.

Appendices C2 to C4 – Schedules of Assessment for Maintenance

In accordance with Section 38 of the Act, assessment schedules for future maintenance of the proposed drain have been completed. Affected lands located upstream of the maintenance shall be determined by the Drainage Superintendent and assessed according to these schedules.

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APPENDIX C1 - ASSESSMENTS for CONSTRUCTION
MINTO DRAIN 121

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Benefit Assess't (Sect.22)	Outlet Assess't (Sect.23)	Totals
		Agricultural Lands					
8	33	Bradley and Lindsey Hall	0-042	0.00	$ 2,980	$ -	$ 2,980
8	42	* Lavolit Limited	1-158~	0.34	$ -	$ 290	$ 290
8	42	Lavolit Limited	1-158	24.48	$ 13,270	$ 15,340	$ 28,610
8	Pt. 41	* Henry and Agnes Weber	1-158-10	0.29	$ 1,470	$ 1,990	$ 3,460
8	41	John and Miriam Martin	1-159	12.39	$ 22,230	$ 98,640	$ 120,870
8	40	Archibald and Lisa Wilson	1-158-50	1.13	$ -	$ 7,740	$ 7,740
		TOTAL ON LANDS		**38.63**	**$ 39,950**	**$ 124,000**	**$ 163,950**
		Roads					
Unopened Road (Between Lot 40&41)		* Town of Minto		0.51	$ -	$ 3,490	$ 3,490
Unopened Road (Howick Minto Townline)		* Town of Minto		0.00	$ 1,280	$ -	$ 1,280
Unopened Road (Howick Minto Townline)		* Township of Howick		0.00	$ 1,280	$ -	$ 1,280
		TOTAL ON ROADS		**0.51**	**$ 2,560**	**$ 3,490**	**$ 6,050**
		ALL LANDS AND ROADS		**39.14**	**$ 42,510**	**$ 127,490**	**$ 170,000**

Notes:

(1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *

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

(3) A possible severance on Roll No. 1-158 was ongoing at the time of the report. The proposed parcel was denoted with ~ Should this severance be rejected or incomplete at time of construction the assessment will revert back to Roll No. 1-158

APPENDIX C2 - ASSESSMENTS for MAINTENANCE STA. -0+096 to 0+000
MINTO DRAIN 121

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Equivalent Area (Ha.)	Totals
		Agricultural Lands				
8	33	Bradley and Lindsey Hall	0-042	0.00	0.00	0.00%
8	42	Lavolit Limited	1-158~	0.34	0.43	1.15%
8	42	Lavolit Limited	1-158	24.48	22.18	60.07%
8	Pt. 41	Henry and Agnes Weber	1-158-10	0.29	0.29	0.79%
8	41	John and Miriam Martin	1-159	12.39	12.39	33.55%
8	40	Archibald and Lisa Wilson	1-158-50	1.13	1.13	3.06%
			TOTAL ON LANDS	**38.63**	**36.42**	**98.62%**
		Roads				
Unopened Road (Between Lot 40&41)		* Town of Minto		0.51	0.51	1.38%
			TOTAL ON ROADS	**0.51**	**0.51**	**1.38%**
			ALL LANDS AND ROADS	**39.14**	**36.93**	**100.00%**

Notes:
(1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
(2) A possible severance on Roll No. 1-158 was ongoing at the time of the report. The proposed parcel was denoted with ~
Should this severance be rejected or incomplete at time of construction the assessment will revert back to Roll No. 1-158

APPENDIX C3 - ASSESSMENTS for MAINTENANCE STA. 0+000 to 0+538
MINTO DRAIN 121

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Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Equivalent Area (Ha.)	Totals
		Agricultural Lands				
8	Pt. 41	Henry and Agnes Weber	1-158-10	0.29	0.29	2.03%
8	41	John and Miriam Martin	1-159	12.39	12.39	86.52%
8	40	Archibald and Lisa Wilson	1-158-50	1.13	1.13	7.89%
			TOTAL ON LANDS	**13.81**	**13.81**	**96.44%**
		Roads				
Unopened Road (Between Lot 40&41)		* Town of Minto		0.51	0.51	3.56%
			TOTAL ON ROADS	**0.51**	**0.51**	**3.56%**
			ALL LANDS AND ROADS	**14.32**	**14.32**	**100.00%**

Notes:
(1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
(2) A possible severance on Roll No. 1-158 was ongoing at the time of the report. The proposed parcel was denoted with ~
Should this severance be rejected or incomplete at time of construction the assessment will revert back to Roll No. 1-158

APPENDIX C4 - ASSESSMENTS for MAINTENANCE STA. 0+538 to 0+593
MINTO DRAIN 121

BURNSIDE

Conc. or Plan	Lot or Part	Owner	Roll No.	Affected Area (Ha.)	Equivalent Area (Ha.)	Totals
		Agricultural Lands				
8	41	John and Miriam Martin	1-159	12.39	12.39	100.00%
			TOTAL ON LANDS	**12.39**	**12.39**	**100.00%**
		Roads				
			TOTAL ON ROADS	**0.00**	**0.00**	**0.00%**
			ALL LANDS AND ROADS	**12.39**	**12.39**	**100.00%**

Notes:
(1) It is presumed that all private lands are Agricultural, within the meaning of the Drainage Act except properties denoted with *
(2) A possible severance on Roll No. 1-158 was ongoing at the time of the report. The proposed parcel was denoted with ~
Should this severance be rejected or incomplete at time of construction the assessment will revert back to Roll No. 1-158

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Appendix D

Agency Correspondence

Fisheries and Oceans Canada
Pêches et Océans Canada

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

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

May 5, 2024

Our file *Notre référence*
24-HCAA-00419

Mike McIsaac
Town of Minto, Drainage Manager
5941 Highway 89
Harriston, ON
N0G 1Z0

Subject: Drain Maintenance, Minto Drain 121, Class Unrated, Maitland River, Township of Howick (24-HCAA-00419) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Mike McIsaac:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on February 22, 2024. We understand that you propose to:

- Deepen and cleanout 100 meters of the Minto Drain (~150m^2 footprint below the high water mark);
- Replace culvert with like-for-like or remove culvert at lot 33 concession 8; and,
- Work in low flow conditions and install erosion control measures.

Our review considered the following information:

- Request for Review form and associated documents submitted on February 22, 2024.

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 impacts are prohibited unless authorized under their respective legislation and regulations.

Canada

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

- Plan in-water works, undertakings and activities to respect timing windows to protect fish and fish habitat
    - No in-water work between March 15 and July 15;
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity
    - Limit access to banks or areas adjacent to waterbodies;
    - Construct access points and approaches perpendicular to the watercourse or waterbody;
- Conduct in-water undertakings and activities during periods of low flow;
- Limit the duration of in-water works, undertakings and activities so that it does not diminish the ability of fish to carry out one or more of their life processes (spawning, rearing, feeding, migrating);
- Develop and implement an Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the work, undertaking or activity
    - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories);
    - Inspect and maintain regularly the erosion and sediment control measures and structures during all phases of the project;
    - Use biodegradable erosion and sediment control materials whenever possible;
    - Remove all exposed non-biodegradable sediment control materials once site has been stabilized;
    - Operate machinery on land;
    - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action;
    - Dispose and stabilize all dredged material above the high water mark of nearby waterbodies to prevent entry in the water;
- 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 is not likely to result in the contravention of the above mentioned prohibitions and requirements.

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 (Projects near water (dfo-mpo.gc.ca)) 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 DFO.OPHabitat.MPO@dfo-mpo.gc.ca or 1-855-852-8320.

.../3

Please notify this office at least 10 days before starting any in-water works. Send your notification to the assessor (contact information below) and the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. We recommend that a copy of this letter 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 Kaela Middleton by email at Kaela.Middleton@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Kaela Middleton
Biologist, Triage and Planning
Fish and Fish Habitat Protection Program

December 16, 2024

R.J. Burnside & Associates Limited
Agent for Town of Minto
449 Josephine Street
Wingham, ON
N0G 2W0

MVCA File No. 12318

Attention: Edison Peel

Re: Permit ALT74/2024
Concession 7, Lot 41, Concession 8, Part Lot 41, and Part Lot 42, Wellington Ward, Town of Minto, County of Wellington; Minto Drain No. 121

The Maitland Valley Conservation Authority (MVCA) has approved your application signed 10/14/2024, to perform upgrades to Minto Drain No. 121.

Part of the work is to be undertaken within a watercourse. Watercourses plus a 15-metre buffer, are regulated pursuant to *Ontario Regulation 41/24 Prohibited Activities, Exemptions and Permits* made under Section 28 of the *Conservation Authorities Act (R.S.O. 1990, Chapter C.27)*. Your application was reviewed with regard for *O. Regulation 41/24* and in accordance with MVCA Board approved policies made under the Regulation.

Please be advised that Permit No. ALT74/2024 is subject to conditions outlined on the attached Permit.

MVCA has the legal authority to revoke your Permit should the specific and/or general conditions of the Permit not be met. Every person who contravenes the regulation or the terms and conditions of a Permit is liable to fines and prosecution under Section 28 of the *Conservation Authorities Act (R.S.O 1990, as amended).*

MVCA permission does not exempt you (the applicant) from complying with any or all other approvals, laws, statues, ordinances, directives, regulations, by-laws etc. that may affect the property. Specifically this Permit does not exempt you from approvals from Fisheries and Oceans Canada (DFO).

Thank you for your cooperation. **Please sign the Permit and return a copy to this office**. You may fax or email the signed copy.

Feel free to contact this office should you have any questions or concerns.

Regards,

Kirsten Snoek
Resource Technician - Regulations Officer
MAITLAND VALLEY CONSERVATION AUTHORITY

Enc.: *Permit No. ALT 74/2024*
Cc: Ryan Binkle, Town of Minto

No. **ALT74/2024**
Wroxeter, Ontario, December 16, 2024

PERMIT TO: DEVELOP IN A REGULATED AREA
X **ALTER A WATERCOURSE**

In accordance with Ontario Regulation 41/24 and amendments there to, permission has been granted to:

	R.J. Burnside & Associates Ltd. (*Agent for Town of Minto)*
Address:	449 Josephine St., Wingham ON, N0G 2W0
Location of works:	Concession 7, Lot 41, Concession 8, Part Lot 41, and Part Lot 42, Wellington Ward, Town of Minto, County of Wellington; Minto Drain No. 121
Existing land use:	Infrastructure
For the following works:	Construct drain upgrades from December 16, 2024, to December 16, 2026, subject to the following conditions:

SPECIFIC CONDITIONS:

1. **All work must be carried out in conformance with the application, signed by Edison Peel (R.J. Burnside 7 Associates Ltd.) on 10/14/2024, along with the Landowner Authorization form, signed by Ryan Binkle (Town of Minto) on December 11, 2024, and in accordance with the following:**
    a. **Engineer's Report, titled "*Minto Drain No. 121"*, for the Town of Minto, dated July 2024, prepared by R.J. Burnside & Associates Ltd., under the names of Edison Peel, EIT, Engineering Assistant, and reviewed by Sid Vander Veen, P.Eng., Project Engineer, including:**
        i. **Drawings, titled "*Municipal Drain"*, prepared by R.J. Burnside & Associates Ltd., dated 2024/01/30, Project No. 300054764, Drawn by EP, Checked by GN, and including:**
            1. **Drawing 1: Minto 121 Plan**
            2. **Drawing 2: Minto 121 Profile**
            3. **Drawing 3: Minto 121 Details and Notes**
2. **MVCA requires site to be secured in a manner to ensure water events above base flow will pass unobstructed through site in a manner that prevents flooding upstream or erosion and sediment release downstream.**
3. **Works shall have regard for weather conditions and for potential rapid changes in those conditions.**
4. **Stock piles of overburden material shall not be kept beside or within the floodplain of the watercourse. MVCA prefers material to be removed from site as soon as possible unless needed to backfill.**
5. **Placed rip rap or field stone shall be sufficient to prevent erosion.**
6. **Equipment and materials should not be stored in the floodplain of the watercourse.**

GENERAL CONDITIONS:

The applicant, by acceptance of and in consideration of the issuance of this Permit, agrees to the following conditions:

1. This Permit does not preclude compliance from any other legislation, federal or provincial, or necessary approvals from the local municipality.
2. Authorized representatives of the Maitland Valley Conservation Authority (MVCA) may, at any time, enter onto the lands which are described herein in order to make any surveys, examinations, investigations, or inspections which are required for the purposes of ensuring the work(s) authorized by this Permit are being carried out according to the terms of the Permit.
3. The applicant agrees:
    a) To indemnify and save harmless on a solicitor and client basis, the Maitland Valley Conservation Authority and its officers, employees, or agents, from any act or omission of the owner and/or applicant or any of his agents, employees or contractors relating to any of the particulars, terms of conditions of the Permit.
    b) That this Permit shall not release the applicant from any legal liability or obligation and remains in force subject to all limitations, requirements and liabilities imposed by law;

c) That all complaints arising from the execution of the works authorized under this Permit shall be reported prior to the expiration of this Permit by the applicant to the Maitland Valley Conservation Authority.

d) That the Permit issued herein is based upon the plan(s) submitted to the Authority and the accuracy of the matters contained in the Application to the Authority.

4. This Permit is not assignable.
5. The applicant agrees that should the works be carried out contrary to the terms of this Permit, the Maitland Valley Conservation Authority may enter onto the property and cause the terms to be satisfied, at the expense of the applicant.

I agree to carry out or cause to be carried out the work(s) indicated above in compliance with the conditions set out herein and in accordance with the information contained in the application and any accompanying sketches. I realize should I carry out the work(s) contrary to the terms of this Permit, this Permit may be revoked. I also realize this Permit is valid only for the time period noted, and I agree to re-apply to the Authority prior to the expiration of this period should an extension be required.

Original Signed by (Applicants signature): _____*Date:*_____

Signature of Authority Official

Kirsten Snoek
Resource Technician - Regulations Officer
MAITLAND VALLEY CONSERVATION AUTHORITY ***Date:*** *December 16, 2024*

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Appendix E

Standard Drain Specifications

E.2.1 GENERAL DRAIN SPECIFICATIONS

E.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).

E.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.

E.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.

E.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.

E.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.

E.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.

E.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.

E.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.

E.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.

E.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.

E.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.

E.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.

E.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 five days prior and it shall be completed as soon as possible or as soon thereafter as weather conditions permit.

E.2.2 SPECIFICATIONS FOR OPEN DRAINS

E.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).

E.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.

E.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.

E.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 riprapped as directed by the Engineer and reimbursed under the appropriate contract item.

E.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 Contactor will be reimbursed for damage to unmarked outlet pipes under the appropriate contract item.

E.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.

E.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.

E.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 m^2, plus a nurse crop of Fall Rye Grain or Winter Wheat Grain at an application rate of 60 kg/10,000 m^2, at the end of each working day.

E.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.

E.2.2.10 PERMANENT SEDIMENT/STILLING BASINS

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

E.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).

E.2.3 SPECIFICATIONS FOR CLOSED DRAINS

E.2.3.1 MATERIALS

Tile, tubing and pipe materials supplied by the Contractor shall be approved by the Engineer prior to being incorporated in the work. The Contractor shall be responsible for the unloading and placement of all materials required for the Municipal Drain construction. Such unloading and placement shall be undertaken in a manner acceptable to the Engineer using only the specified and approved access routes and working space.

Concrete Drain Tile (CDT) - All CDT installed under these specifications shall have a circular cross section with a minimum 2000D, meeting the latest revision of CSA A257.1-14 and ASTM C412. The manufacturer shall provide the Engineer with a copy of all available test results for the materials being shipped to the project site. The Engineer shall have the right to order any additional tests he deems necessary to be performed on the tile taken from inventory prior to shipment from the manufacturer's plant. The cost of such additional tests shall be borne by the Contractor.

Plastic Drainage Tubing (PDT) - All PDT installed under these specifications shall be manufactured in accordance with the latest revision of the Drainage Guide for Ontario, as published by the Ministry of Agriculture and Food.

Corrugated Steel Pipe (CSP) - All CSP installed under these specifications shall be galvanized spiral wound corrugated steel pipe. All corrugated steel pipe installed under these specifications shall conform to CSA G401.

- CSP tile outlet pipes shall be up to 1,200 mm in diameter and 2.0 mm in thickness and shall have 68 mm x 13 mm corrugations unless specified otherwise.
- CSP culverts shall be up to 1,000 mm in diameter and 2.8 mm in thickness and shall have 68 mm x 13 mm corrugations unless specified otherwise. CSP culverts equal to and larger than 1,200 mm in diameter shall be 3.5 mm in thickness and shall have 125 mm x 25 mm corrugations unless specified otherwise.

High Density Polyethylene(HDPE) Pipe - All corrugated or dual wall smooth walled HDPE pipe (Armtec BOSS 2000 or equivalent) installed under these specifications as culverts or as part of a new closed drain shall be manufactured in accordance with the latest revision of Ontario Provincial Standard Specification 1840 and shall have a pipe stiffness of 320 kPa.

- All perforated dual-wall smoothwalled HDPE pipe joining systems shall be soil-tight split coupler unless specified otherwise, conforming to CSA B182.8. As specified, perforated pipe shall include a knitted sock or non-woven geotextile covering (Terrafix 200R or equivalent).
- All solid dual-wall smoothwalled HDPE pipe shall be soil-tight split coupler, unless specified otherwise, conforming to CSA B182.8.
- All watertight solid dual-wall HDPE pipe joining systems shall be water-tight bell and spigot, complete with gasketed connections unless specified otherwise, conforming to CSA B182.6.

Steel Reinforced Polyethylene (SRPE) Pipe - All smooth walled SRPE pipe (Armtec DuroMaxx or equivalent) installed under these specifications as culverts or as part of a new closed drain shall be manufactured in accordance with the latest revision of Ontario Provincial Standard Specification 1840. All SRPE pipe shall conform to AASHTO M294.

- All solid SRPE pipe shall be soil-tight split coupler, unless specified otherwise, conforming to CSA B182.14.
- All watertight solid SRPE pipe joining systems shall be water-tight bell and spigot, complete with gasketed connections unless specified otherwise, conforming to CSA B182.15.

Polyprolylene (PP) Pipe - All triple-wall smooth walled PP pipe (ADS HP Sanitite or equivalent) installed under these specifications as culverts or as part of a new closed drain shall be manufactured in accordance with the latest revision of Ontario Provincial Standard Specification 1843 and shall have a pipe stiffness of 320 kPa.

- All watertight solid triple-wall PP pipe joining systems shall be water-tight bell and spigot, complete with gasketed connections unless specified otherwise, conforming to CSA B182.13.

Non-Woven Geotextile - All geotextile under these specifications shall conform to OPSS 1860. 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).

E.2.3.2 DRAIN GRADIENT AND VERIFICATION

The proposed gradient shall be established using laser grade control equipment, cross-head boning rods together with horizontal sight-bars at stations above and below the point where the tile is being laid or other method acceptable to the Engineer.

If the Engineer has not checked the tile, inspection points shall be left at intervals of not greater than 50 m for sections with gradients less than 0.5% and at intervals of not greater than 30 m for sections with gradients above 0.5%. Inspection points shall also be left at all structures and all changes in gradient. Other inspections points may be required from time to time as requested by the Engineer.

E.2.3.3 TILE LAYING INCLUDING TOPSOIL STRIPPING

In the case of the installation of CDT, and unless specified otherwise in the Special Provisions, the Contractor shall strip the topsoil a full width of the trenching machine plus 0.3 m on each side prior to installing the new tile with the trencher as part of the work under the appropriate item and no extra payment will be made for this stripping. After installation, confirming gradient, blinding, and back filling of the trench, the topsoil shall be replaced throughout the entire length of the Drain. The Contractor shall take into consideration the settlement of the backfill material over the trench prior to replacing the topsoil.

All CDT shall be installed with a wheel-type trencher and each tile shall be laid firmly and carefully in a smooth bottomed trench so that successive tiles align both vertically and horizontally as tightly as possible; the maximum allowable space between successive tiles shall be 6 mm.

All joints of the CDT **Must** be completely wrapped with geotextile (Terrafix 200R or equivalent) as part of the work under the appropriate item and no extra payment will be made for this wrapping. The wrap on each joint shall be a minimum of:

- 300 mm wide for tile sizes smaller than 450 mm diameter
- 600 mm wide for tile sizes 450 mm diameter and above

The Contractor is reminded that the widths of the tile trenches are to be kept to a minimum. It is recommended that the minimum trench width be 300 mm greater than the outside diameter of the tile or 150 mm on each side of the tile being installed. It is recommended that the maximum trench width be 600 mm greater than the outside diameter of the tile or 300 mm on each side of the tile being installed.

All PDT shall be installed with a self-propelled drainage plow.

All obstructions, dirt or foreign material shall be removed from the inside of the tile prior to laying.

Tile drains shall be constructed at an offset from, and parallel to, any existing drain, defined watercourse or low run. The Contractor shall exercise care not to disturb any existing private or municipal tile drains which follow the same course as the new drain.

E.2.3.4 RECONNECTION OF EXISTING PRIVATE TILE

Any subsurface drain encountered by the Contractor when constructing a Municipal Drain under these specifications shall be reconnected to itself and not connected to the new Municipal Drain, unless approved otherwise by the Engineer. The accepted practice for reconnecting existing tile drains will be to compact sub-base material from the new trench bottom to the underside of the existing tile. Rigid pipe, HDPE (320 kPa) or approved equivalent, with a diameter equal or larger than the existing tile with a minimum length of 0.6 m beyond the trench width to the existing tile. This connection shall be made only where the existing tile is operable and in good condition. When completing backfilling of the Municipal Drain trench at such a location, the Contractor shall take sufficient care to ensure that the new connecting pipe is not damaged.

The Contractor shall provide a unit price per connection and the unit price shall include the supply of all material, labour and equipment necessary to make the connection. Further, the Contractor shall keep a written record of all sub-surface drains encountered. All connections completed shall be reviewed with the Engineer on a daily basis and a summary of all subdrains shall be provided to the landowner.

E.2.3.5 CONNECTION OF EXISTING PRIVATE TILES TO MUNICIPAL DRAIN

A subsurface drain encountered during construction can be connected to the Municipal Drain if requested by the landowner and approved by the Engineer prior to commencement of the connection. The drain shall be connected to the Municipal Drain either by core drilling through the CDT or a prefabricated fitting for HDPE. The core shall be drilled on-site and backfilled as per the specified detail included within the drawings. Any tile drains connected to the Municipal Drain shall have the downstream end of the tile plugged to prevent entry of foreign material into the tile.

E.2.3.6 TRENCH BACKFILLING

As the laying of the tile progresses, partial filling or blinding shall be made at the sides of the trench sufficient to hold the tiles securely in place. The Contractor shall place the remainder of the excavated material carefully when backfilling the trench. Any excess backfill material shall be mounded over the trench such that future settlement and compaction around the new tile can occur without creating a depression over the width of the trench. The Contractor shall not operate construction equipment over any backfilled trench, except as specified in Trench Crossings. Care shall be exercised in backfilling the trench to see that no stone or boulder capable of damaging the tile is used in the backfill material adjacent to the tile. In no case shall stones having a diameter greater than 150 mm be used in backfill material within 300 mm of the tile. The Contractor shall backfill any open tile trenches at the end of each working day except for inspection points as specified. The Contractor shall be entirely responsible for any damage to the new tile throughout the warranty period.

E.2.3.7 TRENCH CROSSINGS

The Contractor shall not cross any backfilled trench with any construction equipment or vehicles, except at only **One** designated crossing location on each property which shall be marked in an acceptable manner. The Contractor shall ensure that the bedding and backfill material at this designated crossing location is properly placed and compacted so as to adequately support the equipment and vehicles that may cross the trench. The Contractor may undertake any other approved work to ensure the integrity of the tile at the crossing location. The Contractor shall insure that no equipment or vehicles are allowed to travel along the length of any trench. The Contractor shall be entirely responsible for any damage to the new tile throughout the warranty period.

E.2.3.8 OUTLET PROTECTION

The outlet end of a tile drain shall normally consist of a 6 m length of CSP or HDPE fitted with a rodent proof grating which is hinged at the top to allow the exit of foreign material from the tile. An outlet marker shall be supplied and installed.

Unless otherwise specified, the end of the CSP or HDPE shall be protected with the type of riprap on geotextile as specified by the Engineer from a point 500 mm above the drain bottom on the opposite side of the drain, across the drain bottom, and for the full height of the drain sideslope where the pipe is located. The minimum width of this riprap shall be equal to the outside diameter of the outlet pipe plus 2 m.

E.2.3.9 PRECAST CONCRETE STRUCTURES

Junction Box (JB) means an acceptable precast concrete structure installed and buried below the surface of the ground to facilitate two or more tiles meet and connect.

Catchbasin (CB) or **Ditch Inlet Catchbasin** (DICB) means an acceptable precast concrete structure installed at or slightly below the surface of the ground where two or more tiles meet and connect and that is intended to accommodate surface water.

Observation Box (OB) means an acceptable precast concrete structure installed above the surface of the ground where two or more tiles meet and connect and that is intended to only inspect the tile connected thereto.

Unless specified otherwise, JBs, CBs, DICBs and OBs shall be supplied by a precast manufacturer meeting the Engineer's approval. An "approximate elevation of top" of each structure has been indicated on the "Structures Table"; however, each structure shall be placed onsite such that the exact horizontal and vertical location in the field is as directed by the Engineer. All structures shall have a knock out, set at a minimum of 100 mm above the elevation of the outlet or as specified, placed in ***all*** sides not used by the municipal drain. Knock outs must be of a size capable of connecting a HDPE pipe

with a minimum inside diameter of 250 mm. All structures shall have a minimum 300 mm deep sump, unless specified otherwise.

Non-shrink grouting material, unless specified otherwise, shall be placed around all pipes connected to the structure. In addition, the exterior of all grouted connections shall be completely wrapped with geotextile (similar to a wrapped joint). Geotextile shall also be placed in the joints between all sections of the box and around the full perimeter of the box at these joints. For the area surrounding catchbasins, unless noted otherwise, the contractor shall supply and install a 300 mm thickness of 100 to 150 mm (R10) diameter quarry stone rip rap with filter cloth underlayment.

Hot dipped galvanized, heavy duty, three-sided protruding type bird cage grates, shall be supplied for all CBs, DICBs or OBs, unless specified otherwise. All DICBs shall have a slope of 2H:1V, unless specified otherwise. Grates shall be fastened to the structure using non-corrosive fasteners as recommended by the Ontario Farm Safety Association. JBs shall have no sump and shall have a minimum 150 mm thick solid reinforced concrete tops.

Post and sign type markers shall be supplied and installed at each at or above ground structure.

E.2.3.10 STRIPPING FOR DEEP TILE INSTALLATION

Where the tile installation depth exceeds the digging or plowing depth of the Contractor's equipment, the Contractor shall undertake any stripping that may be necessary in a manner such that when restored, the topsoil returns uncontaminated to the top of the stripped area. This would normally mean that the topsoil would be stripped and piled separately from the subsoil. The Contractor shall have regard for the working space provided for such stripping operations. Unless approved otherwise by the Engineer prior to work being undertaken, stripping shall be done using a hydraulic excavator. The cost of any stripping shall be included in the price provided for the tile installation.

E.2.3.11 STONE REMOVAL

The Contractor shall remove and dispose of any stones larger than 100 mm that remain on the surface of the working space after completion of construction.

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Appendix F

Special Provisions

Appendix F – Special Provisions
Minto Drain 121

These ***Special Provisions*** are specific directions for this project and detail requirements not encompassed by the ***Standard Drain Specifications***.

Special Provisions shall take precedence over the ***Standard Drain Specifications*** where a conflict between them may exist.

1.0 Standard Drain Specifications

All work for this project shall also be governed by **Appendix E - Standard Drain Specifications**. The Contractor is fully responsible for a reasonable and prudent review of these Standards to have a complete and clear understanding of the scope and character of the work.

2.0 Description and Location

The proposed drain is located on Lots 41-42, Concessions 8, Town of Minto, Wellington County and Lot 33 Concession 8 Township of Howick, Huron County.

The Minto Drain 121 includes approximately 107 m of channel construction and 593 m of tile construction. The location of the work is shown in the enclosed plan.

3.0 Instruction and Process

3.1 Pre-Construction Meeting

The Contractor **MUST** arrange an on-site Pre-Construction Meeting with the Engineer, Drainage Superintendents and affected landowners before any equipment or materials are moved onto the site and before any work is commenced on this project.

Furthermore, the Contractor shall also provide notification of the commencement of in-water work (if required) Maitland Valley Conservation Authority (MVCA) or any other applicable agency(s) at least ten (10) working days prior to the initiation of the work.

3.2 Working Space

The area being provided to the Contractor to undertake the work is described herein and the maximum widths are specified on the table entitled *'Working Space'*.

Working Space		
Station	Max. Width (m)	Comments
Main Drain		
Sta. -0+107 to Sta. 0+000	10 m working space (South Bank)	Access to this portion of the **Main Drain** will be from Wellington County Road 87 to: • **AR#1** on the Lavolit Limited (Roll No. 1-158) And subsequently following the proposed drain alignment as shown on the plan.
Sta. 0+000 to Sta. 0+0+538	20 m working space	Access to this portion of the **Main Drain** will be from Wellington County Road 87 to: • **AR#1** on the Lavolit Limited (Roll No. 1-158) And subsequently following the proposed drain alignment as shown on the plan.
Sta. 0+538 to Sta. 0+593	20 m working space	Access to this portion of the **Main Drain** will be from Wellington County Road 87 to: • **AR#2** through both John & Miriam Martins property (Roll No. 1-159) and Henry & Agnes Weber Property (158-10) And subsequently following the proposed drain alignment as shown on the plan.

NOTES:

(1) The Contractor shall contain their construction operations to as narrow a width as possible, so as to prevent damage to lands, crops, bush, etcetera and shall not exceed the widths indicated.

(2) The Contractor shall be entirely responsible for any damage to lands, crops, etcetera, beyond the widths and locations of both the access routes and the working spaces specified, caused by the Contractor, their Subcontractors or their employees while undertaking the work.

(3)The Engineer's approval MUST BE OBTAINED BEFORE exceeding the maximum widths indicated.

(4) Access to the working space shall be public roads or as specified. All routes must be approved by the Engineer and Drainage Superintendent prior to construction.

3.3 Access Routes

The access routes for construction shall be from specified locations on Wellington County Road 87 to the drain, as specified in the table 'Working Space' and on the enclosed plan.

The Contractor shall confirm these access routes with the Engineer, Drainage Superintendent and affected landowners prior to commencing any work.

The width of the access route on each property shall be a maximum of 5 m. Any increase of this width shall be at the discretion of the Engineer.

3.4 Utilities Investigation

The Contractor shall locate all utilities prior to construction. No utility investigation has been completed in this location.

3.5 Staging of Construction

The Contractor shall stage the construction to ensure that the site is left each day with appropriate controls to avoid erosion. Any excavated spoil areas shall be protected with silt fence or other measures to avoid erosion during construction, as directed by the Contract Administrator. All channel works shall be completed during periods of low or no flow. Additional erosion measures shall be paid for as extra items on an as directed basis.

3.6 Construction Document Errors

Any issues during construction with respect to errors or omissions with the design drawings or documents, the constructability of the system, etc. must be brought to the attention of the Contract Administrator immediately. It is expected that a clear communication channel will exist between the Contractor and the Contract Administrator and that any discrepancies relating to construction of the work will be remedied immediately. Work resulting from failure to seek clarification with the Contract Administrator by the Contractor will be the responsibility of the Contractor to remedy at no extra charge to the project and must be completed to the satisfaction of the Engineer prior to demobilization.

3.7 Final Inspection

After substantial completion of the work and prior to demobilization and removal of equipment and materials from the site, the Contractor **Must** arrange an on-site **Final** inspection of the work with the Engineer. This is 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. Notification to the Engineer of this Final Inspection shall be provided at least two days prior.

3.8 Deficiencies

Deficient items such as catchbasin markers, grate tabs, rodent grates, additional rip-rap, etc., shall be remedied by the Contractor during the warranty period and paid at the Contract price. If the Contractor fails to complete the work within a reasonable timeframe in the opinion of the Engineer and/or the Municipality, the work shall be completed by a Contractor of the Engineer's choosing and the cost of the work deducted from the Contract holdback.

3.9 Liquidated Damages

In addition to GC 8.02.09.01 and the supplemental general specifications any breach of the Contract terms by the Contractor may be subject to **daily liquidated damages of $500** at the discretion of the Contract Administrator. Pertinent examples may include but are not limited to:

- Work outside the timing windows stated in the Contract.
- Failure to install applicable erosion and sediment controls prior to completing other construction activities.
- Failure to meet Substantial Performance of the Contract by the date specified in the Contract Documents.

4.0 Agency Project Requirements

4.1 Maitland Valley Conservation Authority (MVCA)

Attention is drawn to the MVCA permit. All work is to be in accordance with the terms of this permit and the mitigation practices described in the Engineer's Report.

4.2 Ministry of Environment, Conservation, and Parks (MECP)

The Contractor will be responsible to ensure that during construction activities no extirpated, endangered, threatened, or special concern species or their habitats are adversely affected.

5.0 Description of Work

This section includes specific instructions pertaining to the drain construction and shall be in addition to any specifications noted in the Standard Drain Specifications. The numbering of each item references the corresponding item in the schedule of unit prices. Each Item shall be bid as a lump sum price unless otherwise noted. **For the lump sum price bid, unless otherwise noted, the Contractor shall provide the following items:**

SP 0 Mobilization

This item covers the Contractors costs associated with the transportation and/or accommodation (meals and lodging) of labour, equipment, offices, conveniences, temporary facilities, construction plant and other items not required to form part of the permanent works and not covered by other items in the Schedule of Unit Prices. This line item shall only apply to the first/primary mobilization/demobilization required to fulfill the Contract. Additional mobilization costs will not be paid if the Contractor chooses to leave the site on their own accord following the initial mobilization. However, if at the discretion of the Contract Administrator a situation warrants the Contractor to demobilize from site to complete the remainder of the work at a later date, the costs associated with this may be negotiated with the Contract Administrator and paid as an extra item.

Payment at the Lump Sum price set out in the schedule of unit prices for mobilization and demobilization will be made as follows:

- 50% payable on first Payment Certificate
- 50% payable on Substantial performance Payment Certificate.

SP 1 Crossing Existing Post and Wire Fence

The existing fence on Bradley & Lindsay Hall's Property (Roll No. 0-042) shall be cut or removed to allow for construction equipment necessary for the open channel work. The contractor shall make a reasonable effort to minimize unnecessary damage to the fence. Works may include but are not limited to hand/power tools for cutting the fence or machinery to remove of fence posts. Contractor is not responsible for reinstatement of the fence.

SP 2 Remove and Dispose Culvert and Re-establish Channel

The 6 m long 450 mm dia. HDPE crossing on Bradley & Lindsay Halls Property (Roll No. 0-042) shall be removed and a channel re-established.

Agency Requirements: The culvert shall be removed in dry weather and in low or no flow channel conditions per the attached best management practice from DFO in Appendix D.

Culvert and Fill: The Contractor shall remove and dispose of the existing culvert offsite. Excess fill from the existing crossing shall be spread within the working space.

All required work for the channel construction shall take place within the specified working space where a 10 m ROW has been provided. Spreading and levelling of spoil shall be completed within the working ROW to a maximum depth of 300 mm, however the spoil shall not be spread within 2 m from the top of the ditch bank. The topsoil from the spoil placement area shall be stripped and spread back over the spoil within the working ROW.

If during construction there is excavated subsoil material deemed unsuitable by the Contract Administrator for spreading in the ROW, it shall be loaded and trucked off-site by the Contractor for disposal and paid for at an additional cost.

SP 3 Channel Construction

All required work for the channel construction shall take place within the specified working space where a 10 m ROW has been provided. Spreading and levelling of spoil shall be completed within the working ROW to a maximum depth of 300 mm, however the spoil shall not be spread within 2 m from the top of the ditch bank. The topsoil from the spoil placement area shall be stripped and spread back over the spoil within the working ROW.

The channel side slopes shall be excavated at approximately 2H:1V. Channel deepening shall commence at the toe of the slope of the far channel bank where the bank slope is carried to the channel bottom elevation. A minimum 0.6 m channel bottom width is required. Excavation will be completed in the channel bottom and on the near channel bank, where required. Vegetation on the far channel bank shall remain in place.

If during construction there is excavated subsoil material deemed unsuitable by the Contract Administrator for spreading in the ROW, it shall be loaded and trucked off-site by the Contractor for disposal and paid for at an additional cost.

SP 4 Stilling Basin Excavation

A permanent stilling basin shall be installed immediately downstream of the outlet pipe at Sta. 0+000 to the satisfaction of the Contract Administrator. The basin shall be excavated 0.3 m beyond the channel elevation and conform to the details in the accompanying drawings.

Additionally, approximately 30 m^2 of rip-rap (450 mm thickness of 150 to 300 mm (OPSS R50) diameter quarry stone with geotextile underlay) shall be installed on the side banks and channel bottom from Sta. 0+000 to -0+006 as erosion protection to the top of bank.

SP 5 Handseeding

Seeding is required on the exposed, newly excavated channel banks as well as on all locations where spoil has been placed or native vegetation has been disturbed along the open drain.

The Contractor shall apply 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 m^2, plus a nurse crop of Fall Rye Grain or Winter Wheat Grain at an application rate of 60 kg / 10,000 m^2.

SP 6 High Density Polyethylene Pipe

All HDPE pipe shall be dual-wall (320 kPa) bell and spigot gasketed pipe. The installation of the new pipe shall be by the wheel trencher unless specified otherwise.

Prior to the installation of the new tile, the Contractor shall strip the topsoil from the area of the proposed tile trench for a 10 m width. The topsoil shall be stockpiled separately from native subsoil and subsequently replaced over the backfilled tile trench. This shall be included as part of the work under the appropriate item. An extra payment will not be made for the stripping, stockpiling and replacing of topsoil.

Under no circumstances will frozen topsoil be levelled or placed over top of the drain. If the Contractor elects to install the drain during winter months, the contractor shall return to the site and level the topsoil when conditions are appropriate. No additional mobilization charges shall be made for returning the site to conduct the levelling of topsoil.

Contingency Items Associated with Tile Installation

The Contractor shall tender the installation of the new pipe on the basis of using a wheel trencher; however, as specified in the Contingency Items, the Contractor shall provide additional unit prices for instances that may require transition to a special installation technique or the temporary removal of the wheel trencher.

SP 7 Concrete Drainage Tile (Via Wheel Trencher)

All concrete drainage tile shall be Heavy Duty 2000D. The tile shall be installed as per the Standard Specifications. The installation of the new pipe shall be by the wheel trencher unless specified otherwise.

Prior to the installation of the new tile, the Contractor shall strip the topsoil from the area of the proposed tile trench for a 10 m width. The topsoil shall be stockpiled separately from native subsoil and subsequently replaced. This shall be included as part of the work under the appropriate item. An extra payment will not be made for the stripping, stockpiling and replacing of topsoil.

Under no circumstances will frozen topsoil be levelled or placed over top of the drain. If the Contractor elects to install the drain during winter months, the contractor shall return to the site and level the topsoil when conditions are appropriate. No additional mobilization charges shall be made for returning the site to conduct the levelling of topsoil.

Contingency Items Associated with Tile Installation

The Contractor shall tender the installation of the new pipe on the basis of using a wheel trencher; however, as specified in the Contingency Items, the Contractor shall provide additional unit prices for instances that may require transition to a special installation technique or the temporary removal of the wheel trencher.

Under no circumstances will frozen topsoil be levelled or placed over top of the drain. If the Contractor elects to install the drain during winter months, the contractor shall return to the site and level the topsoil when conditions are appropriate. No additional mobilization charges shall be made for returning the site to conduct the levelling of topsoil.

SP 8 Catchbasin Installation

The proposed catchbasins shall be installed as per the Standard Specifications and where applicable oriented as depicted on the accompanying details.

The Contractor shall supply and place a minimum of 1.0 m width of rip-rap and geotextile on all sides of all catchbasins.

The Contractor shall include the cost to complete all necessary municipal tile connections c/w parging on the interior and exterior of the proposed catchbasin as part of the associated line item. Each catchbasin shall be installed with tabs, and an approved post and marker.

SP 9 Clearing and Grubbing of Trees (OPSS.MUNI.201)

Specification: All work shall be in accordance with Sections E.2.1.5. to E.2.1.9. of the general specifications and OPSS.MUNI.201.

Clearing/Brushing: This item includes cutting, grinding, and/or chipping all standing trees, stumps, brush, bushes, and other vegetation to the existing ground level.

Trees measuring 150 mm dia. or more shall be felled, delimbed, cut into lengths no longer than 4 m, and stacked within the working space ROW to the satisfaction of the Contract Administrator.

Vegetation under 150 mm dia. shall be finished by the Contractor using one of the following three methods:

- Chipped in place by an excavator equipped with a hydraulic brushing attachment.
- Chipped using a woodchipper and piled or spread within the bush ROW.
- Piled and burned in accordance with the Municipality's burning regulations and by-law(s).

The method preferred by the Contractor shall be discussed at the pre-construction meeting and shall be at the discretion of and completed to the satisfaction of the Owner and Contract Administrator.

Grubbing: Tree stumps, boulders, and other vegetative debris shall be grubbed and removed from the site to the satisfaction of the Contract Administrator. Burying of grubbed materials shall not be permitted unless specific permission is given to the Contract Administrator by the landowner (email is acceptable).

SP 10 Reconnection and/or Connection of Existing Tiles

(Standard Drain Specifications - Sections E.2.3.4 and E.2.3.5)

General: The unit price bid for these items shall include all labour, equipment, and material required to reconnect/connect existing private tile drains encountered during construction to the drain.

Missed connections and/or reconnections during construction shall be completed by the Contractor during the warranty period and paid at the contract price. If the Contractor fails to complete the connection and/or reconnection within a reasonable timeframe in the opinion of the Engineer and/or the Municipality, the work shall be completed by a Contractor of the Engineer's choosing and the cost of the work deducted from the contract holdback.

Please refer to the Standard Drain Specifications (Sections E.2.3.4 and E.2.3.5) for additional information.

Reconnections: For the unit price bid the Contractor shall reconnect existing private tile drains encountered during construction across the trench to themselves, above the new tile. Included in this price shall be all labour, equipment and material required to support the tile connection above the new drain, consisting of compacted backfill or 19 mm dia. clear stone bedding, and connection of the tile using either of appropriately sized PDT or solid HDPE dual-wall (320 kPa) pipe (or approved equal) across the trench as per the detail in the accompanying drawings.

Connections: Typically, existing private tiles encountered during construction will be connected to themselves per the detail in the accompanying drawings. In circumstances where, in the opinion of the Engineer, reconnection is not possible, private tiles may be connected to the new drain as noted and with the downstream side of the existing tile capped.

Installation shall include appropriately sized PDT or solid HDPE dual-wall (320 kPa) pipe (or approved equal), connected to the new pipe using a core drilled hole and manufactured HDPE coupler fitting, with 19 mm dia. clear crushed stone backfill under the connection and a minimum of 150 mm over top of the connection per the accompanying detail. Connections directly into the new drain without the use of a coupler will not be permitted.

SP 11 Special Installation Techniques (Poor Trenching Conditions)

If poor construction conditions are encountered where, in the opinion of the Contractor, it is not feasible to use the wheel trencher, the Contractor shall immediately inform the Contract Administrator to obtain approval to switch to:

a) Installation on a minimum depth of 150 mm of 19 mm dia. clear crushed stone (or approved equal) with 19 mm clear crushed stone backfill up to the springline of the pipe at a minimum.

b) Installation on a minimum depth of 300 mm of geotextile wrapped 19 mm dia. clear crushed stone (or approved equal) with 19 mm clear crushed stone backfill up to the springline of the pipe at a minimum.

For the **additional** unit price bid per lineal metre of trench, the Contractor shall install the pipe on 19 mm (¾ inch) diameter clear crushed stone, or on geotextile wrapped 19 mm (¾ inch) diameter clear crushed stone, as described in the schedule of unit prices per the detail in the accompanying drawings, with a hydraulic excavator instead of a wheel trencher. The Contractor shall note that the wrapping of tile joints still applies under original items. The cost to supply 19 mm dia. clear crushed stone and/or geotextile shall be included as part of the Contractors bid in this line item.

The Contractor shall keep a list of stations where these installation techniques were used, to be confirmed with the Contract Administrator on a daily basis.

This item shall be used only when the soil conditions encountered are such that a wheel trencher cannot, in the opinion of the Contract Administrator, be used effectively to install the pipe. The Contractor must receive approval from the Engineer prior to using either of these techniques. When soil conditions are again favourable in the opinion of the Contractor and the Contract Administrator, the wheel trencher must again be used for tile installation as soon as possible. Failure to use the wheel trencher for installation when soil conditions are favourable in the opinion of the Contract Administrator may result in non-payment of this contingency item.

All costs are to be included in the associated special installation technique contingency costs. No extra payment will be made for the removal of the wheel trencher, crew downtime, or other costs for this transition when the Contractor is required to change to a special installation technique.

SP 12 Removal of Wheel Trencher

When large boulders or stony areas force the removal of the wheel trencher from the trench for cleanout and stone removal, prior to recommencing with the wheel trencher, the Contractor

shall be paid a fixed sum as a contingency for each time this takes place between periods of ***continuous*** wheel trenching.

For the unit bid price per occurrence, the Contractor shall specify the cost for the removal of the wheel trencher as a result of large stones and/or poor soil conditions, as required for continued pipe installation with the wheel trencher. This cost shall include the time to complete the transition and the downtime for the working crew during the transition.

The Contractor **shall** keep a detailed list and time of each instance and review each pullout of the trencher with the Contract Administrator at the end of each working day. Stones or obstructions causing the wheel trencher removal shall be kept to the side of the trench as evidence for the Contract Administrator for the wheel removal.

Pullouts of the trencher without sufficient evidence from the Contractor **shall not** be paid under this item at the discretion of the Contract Administrator.

In cases where the wheel trencher is removed to immediately switch to a special installation technique, the contingency for this item will not apply. Under this scenario, the additional contingency payment for the applicable alternate installation method will be applicable only.

SP 13 Supply and Install OPSS R50 Rip-Rap Erosion Protection

For the unit price bid per square metre, the Contractor shall supply and install a 450 mm thickness of 150 to 300 mm (OPSS R50) diameter quarry stone rip-rap with geotextile underlay. These unit prices shall be used for payment for any rip-rap installed in addition to those quantities already specified in other items and for credit for any quantities of rip-rap deleted from other items. Additionally, this will include areas of existing channel bank where erosion or bank slumping has occurred, as directed on-site by the Contract Administrator.

SP 14 Supply and Install OPSS 19 mm dia. Clear Crushed Stone

For the unit price bid per linear meter, the Contractor shall supply 19 mm (¾ inch) dia. clear crushed stone. These unit prices shall be used for payment for any 19 mm clear crushed stone installed in addition to those quantities already specified in other items and for credit for any quantities of 19 mm clear crushed stone deleted from other items.

The Contractor shall then install the clear stone as directed by the Contract Administrator.

SP 15 Supply and Install OPSS Granular 'B' Material

For the unit price bid per tonne, the Contractor shall supply OPSS Granular 'B' material. These unit prices shall be used for payment for any Granular 'B' material installed in addition to those quantities already specified in other items and for credit for any quantities of Granular 'B' deleted from other items.

The Contractor shall then install the granular material as directed by the Contract Administrator.

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Appendix G

Soils Investigation

Appendix G – Soils Investigation

A soils investigation was completed in various locations near the proposed drain alignment on October 23, 2023. This investigation was completed to evaluate the construction conditions of various design options. The results of the investigation have been summarized below and locations shown on the accompanying plan.

Test Pit No. 1

The test pit was dug on roll no. 1-158 near the existing channel. The test pit revealed the following soil structure:

- 0 - 0.5 m topsoil/peat;
- 0.5 m - 1.2 m solid brown clay; and
- 1.2 m - 1.5 m sandy gravel.

Water entering trench around 1.2 m, trench collapsed quickly.

Test Pit No. 2

The test pit was dug on roll no. 1-158 south of the barn. The test pit revealed the following soil structure:

- 0 - 0.2 m Topsoil; and
- 0.2 m - 2.0 m gravel and sand mixture.

Water entering trench about 1.8 m down, fairly stable trench.

Test Pit No. 3

The test pit was dug on roll no. 1-158 in a ridge near the top end of the proposed drain. The test pit revealed the following soil structure:

- 0-0.2 m topsoil;
- 0.2 m - 0.8 mm silty sand, minimal stones; and
- 0.8 m – 3 m sandy silt trace stone.

No water entering trench during investigation, good stable trench. Returned to trench about two hours later, water was observed in the bottom and the trench had partially collapsed.

Test Pit No. 4

The test pit was dug on roll no. 1-158 in a low-lying area at the top end of the proposed drain. The test pit revealed the following soil structure:

- 0-0.6 m topsoil material;
- 0.6 - 1.5 very soft clay material; and
- 1.5 m - 1.8 m harder clay.

Trench started to collapse, water entering the base of the trench.

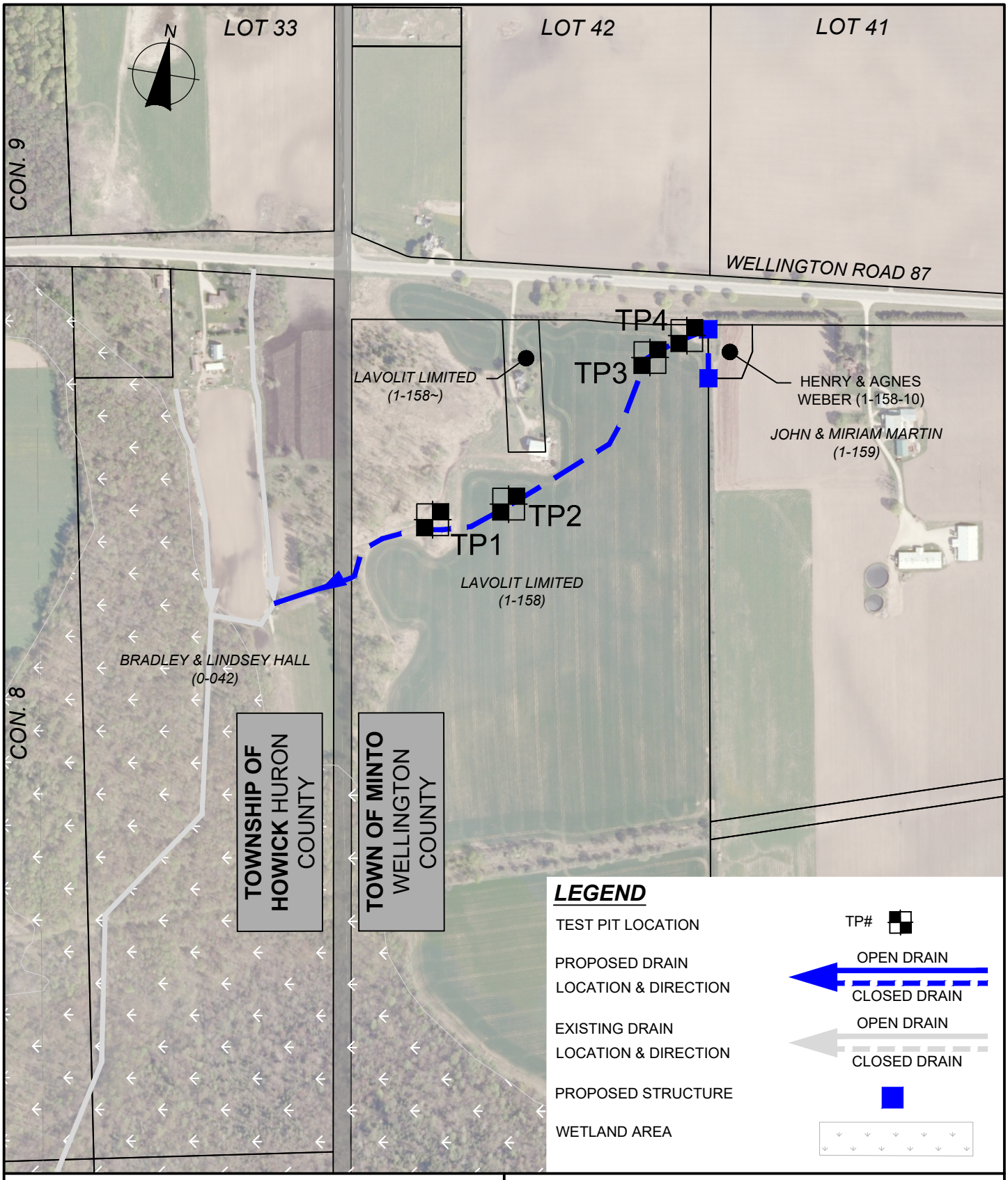

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Figure Title

MINTO DRAIN 121 INVESTIGATION

SOIL TEST PIT LOCATIONS

Client		Drawn	Checked	Date	Figure No.
TOWN OF MINTO		CC	EP	24/06/25	**1**
		Scale		Project No.	
		1:6000		300054764.2000	

File: \\winny\Shared Work Areas\054764.2000 MD 119\07_Figures\054764 MD 121 TEST PIT FIGURE.dwg Date Plotted: June 28, 2024 - 8:38 AM

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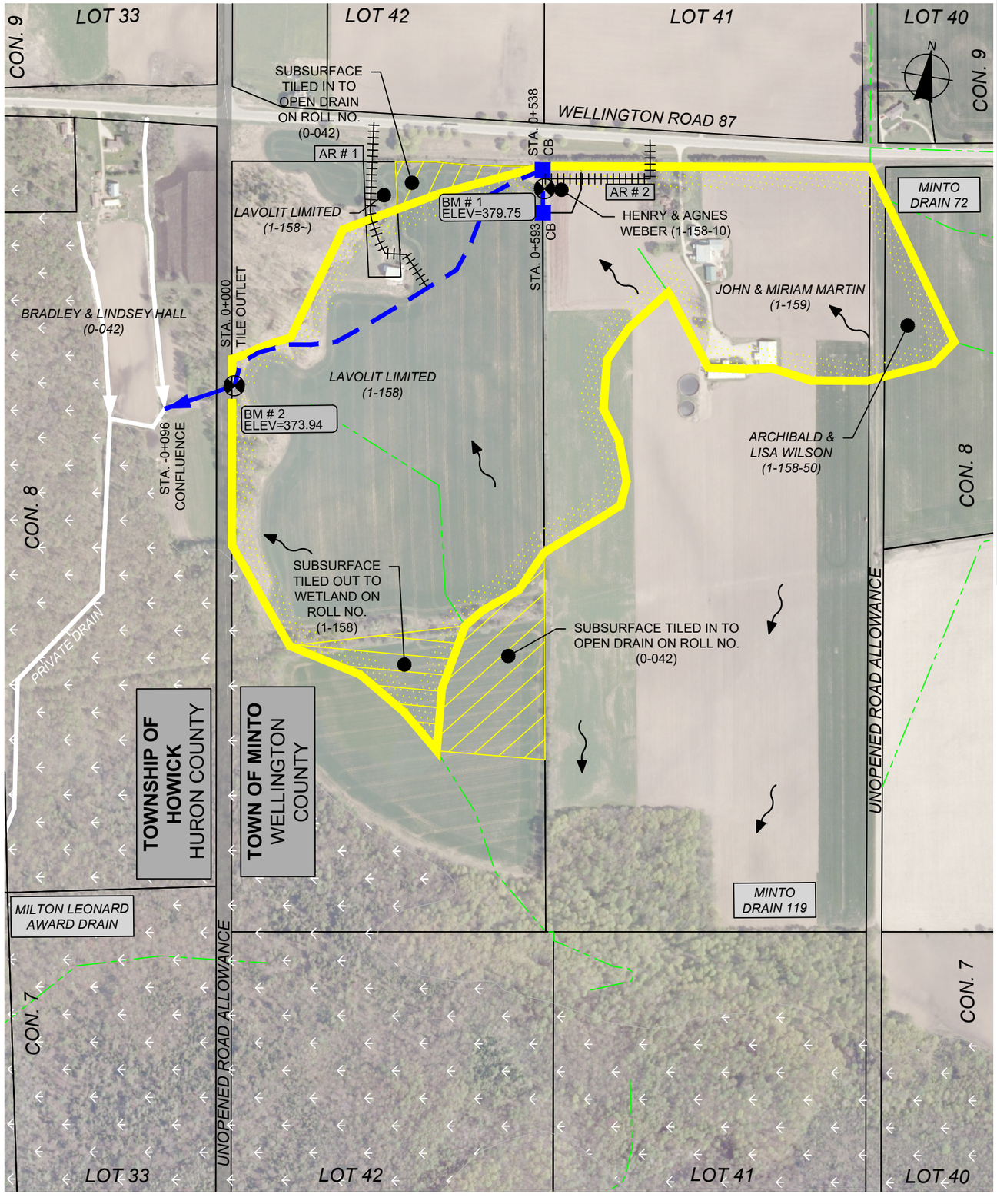
Appendix H

Drawings



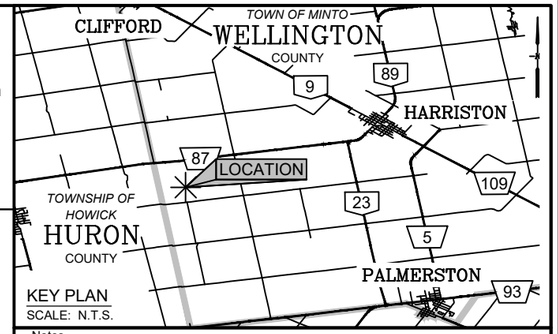
BENCHMARKS

BENCHMARK #1 **ELEVATION = 379.75m**
NAIL IN WOODEN FENCE POST.

BENCHMARK #2 **ELEVATION =373.94m**
TOP OF EXISTING 300 mm HPDE TILE OUTLET

LEGEND

- WATERSHED BOUNDARY
- SUB WATERSHED BOUNDARY
- DRAIN LOCATION & DIRECTION — OPEN DRAIN / CLOSED DRAIN
- BENCHMARK NUMBER (BM # ?) — BENCHMARK LOCATION
- PROPOSED STRUCTURE — DESC.
- ACCESS ROUTE (AR # ?)
- ROLL NUMBER (1-234)
- SHARED ROLL NUMBER
- WETLAND AREA
- SURFACE FLOW DIRECTION



Notes

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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.

LICENSED PROFESSIONAL ENGINEER
S. M. Vander Veen
February 3, 2025
PROVINCE OF ONTARIO

No.	Issue / Revision	Date	Auth.
0	ISSUED FOR INFO MEETING	2024/01/30	GN
1	ISSUED FOR ENGINEERS REPORT	2025/02/03	GN

BURNSIDE

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Client
TOWN OF MINTO
5941 HIGHWAY 89
HARRISTON, ONTARIO
N0G 1Z0

Drawing Title
MUNICIPAL DRAIN

MINTO DRAIN 121 PLAN

Drawn	Checked	Date	Drawing No.
EP	GN	2024/01/30	1OF4
Scale		Project No.	
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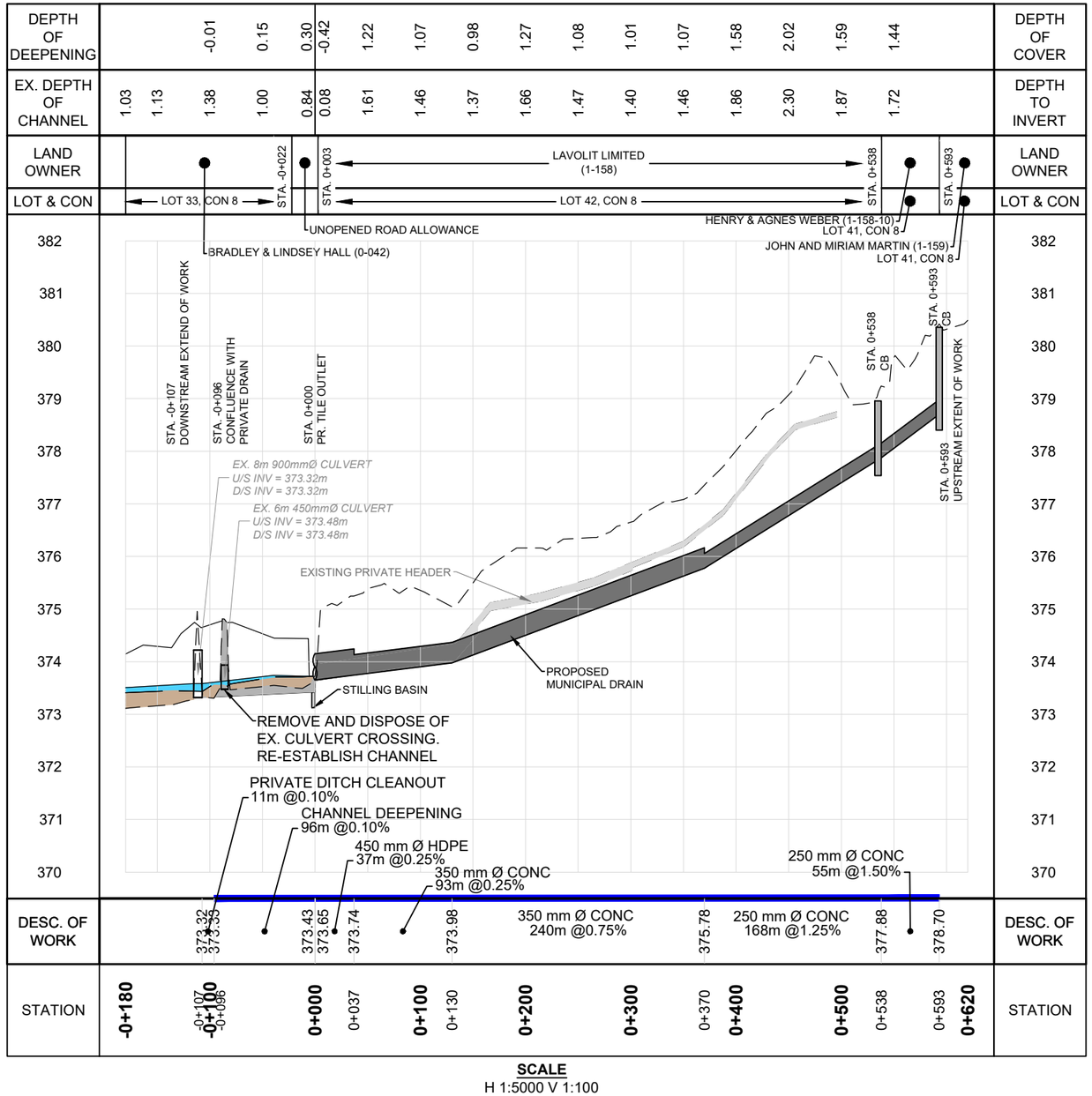
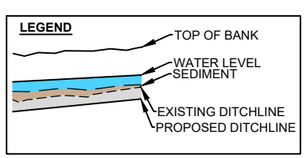
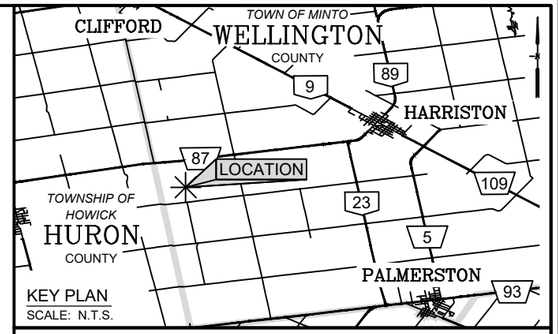


SCALE
H 1:5000 V 1:100

STRUCTURE TABLE

STATION	TYPE	SIZE	TOP/ LOW WALL ELEV. (m)	GRATE	INVERTS (m)
0+538	CB	600 mm x 600 mm	378.90	BIRDCAGE	W (250mm) = 377.88, S (250mm) =377.88
0+593	CB	600 mm x 600 mm	380.30	BIRDCAGE	N (250mm) = 378.70





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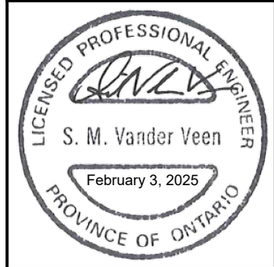

No.	Issue / Revision	Date	Auth.
0	ISSUED FOR INFO MEETING	2024/01/30	GN
1	ISSUED FOR ENGINEERS REPORT	2025/02/03	GN

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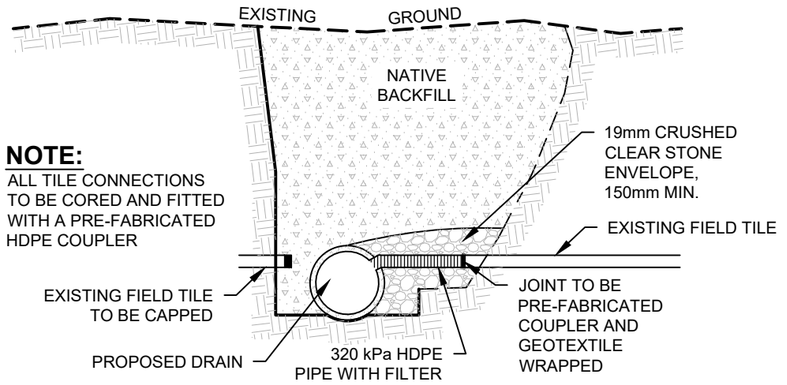
N0G 1Z0

Drawing Title
MUNICIPAL DRAIN

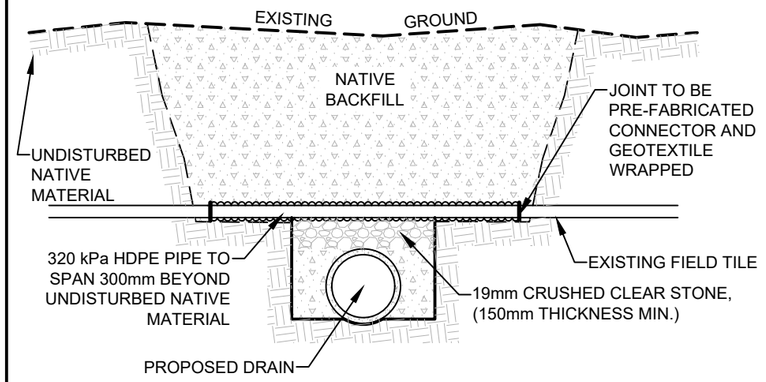
MINTO DRAIN 121 - PROFILE

Drawn	Checked	Date	Drawing No.
EP	GN	2024/01/30	2OF4
Scale		Project No.	
AS NOTED		300054764.3000	

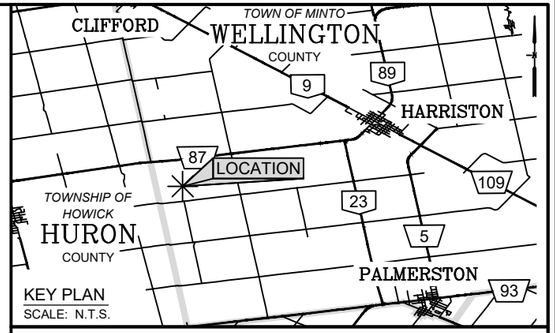


NOTE:
ALL TILE CONNECTIONS TO BE CORED AND FITTED WITH A PRE-FABRICATED HDPE COUPLER

TILE CONNECTION (TYPICAL)
N.T.S.



TILE RE-CONNECTION (TYPICAL)
N.T.S.



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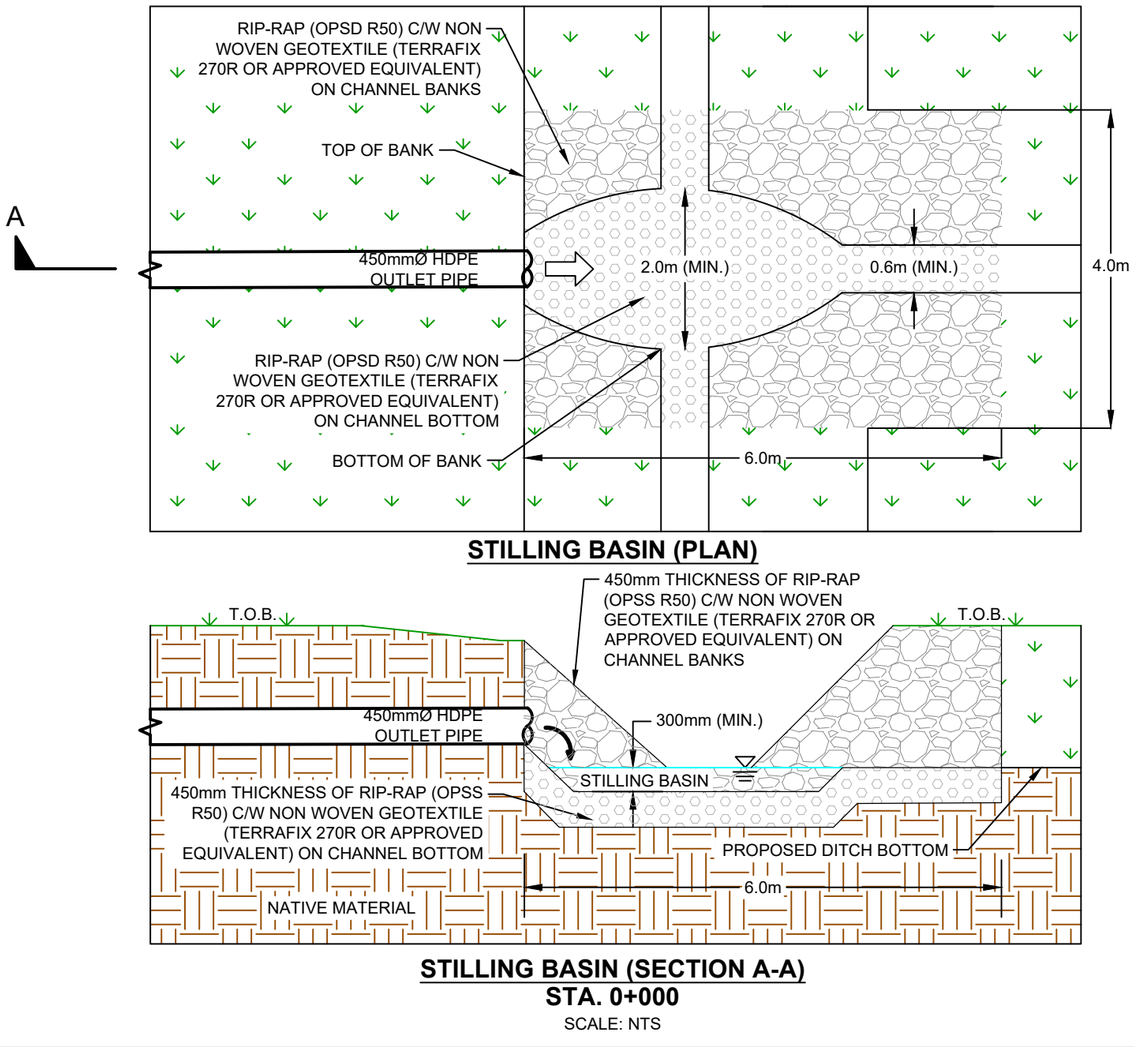

STILLING BASIN (PLAN)

STILLING BASIN (SECTION A-A)
STA. 0+000
SCALE: NTS

PIPE NOTES:
1. ALL PIPE AND PIPE WORKS SHALL CONFORM TO THE GENERAL SPECIFICATIONS.
2. ALL CONCRETE DRAINAGE TILE (CDT) SHALL BE NON-REINFORCED 2000D RATED, OR APPROVED EQUAL.
3. ALL HIGH DENSITY POLYETHYLENE (HDPE) PIPE SHALL BE DUAL-WALL, 320 kPA PIPE STIFFNESS, OR APPROVED EQUAL.
4. ALL OUTLET PIPES SHALL BE CORRUGATED STEEL PIPE (CSP) OR HIGH DENSITY POLYETHYLENE (HDPE).
5. HDPE OUTLET PIPES SHALL BE THE SAME DIAMETER AS THE LAST SECTION OF TILE, COMPLETE WITH A BELL CONNECTION TO FIT AROUND THE PIPE. THIS CONNECTION SHALL BE GEOTEXTILE WRAPPED.
6. ALL OUTLET PIPES SHALL HAVE A RODENT GRATE AND HAVE RIP-RAP PROTECTION.

CHANNEL NOTES:
1. ALL CHANNEL WORKS SHALL BE IN ACCORDANCE WITH THE PROVIDED PROFILE, AND SPECIFICATIONS.
2. ALL CHANNEL WORKS SHALL CONFORM TO THE GENERAL SPECIFICATIONS.
3. ALL CHANNEL WORKS AND EXCAVATIONS SHALL CONFORM TO THE GOVERNING OPSS AND OPSD.
4. ACCESS TO THE CHANNEL AND WORKING SPACE SHALL BE EXECUTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
5. SPOIL SHALL BE SPREAD ON THE DESIGNATED CHANNEL BANK, A MINIMUM OF 2m FROM THE TOP OF THE BANK, UNLESS OTHERWISE DIRECTED BY THE ENGINEER IN THE SPECIAL PROVISIONS OR AT THE TIME OF CONSTRUCTION.
6. ALL FUNCTIONING OUTLET PIPES AFFECTED BY THE EXCAVATION SHALL HAVE RIP-RAP EROSION PROTECTION (MINIMUM 2m²) PLACED BELOW THE OUTLET.
7. ALL WORKING OUTLET PIPES DAMAGED DURING THE EXCAVATION SHALL BE REPLACED SECURELY WITH CORRUGATED STEEL PIPE (CSP) OR HIGH DENSITY POLYETHYLENE (HDPE) TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
8. ALL WORKING OUTLET PIPES SHALL HAVE A RODENT GRATE.

STRUCTURE NOTES:
1. ANY VARIATION FROM THE ELEVATIONS AND DIMENSIONS OF THESE STRUCTURES MUST BE APPROVED BY THE ENGINEER.
2. STRUCTURES NOT MANUFACTURED AS SPECIFIED MAY BE REJECTED FOR USE AND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. ALL ABOVE GRADE STRUCTURES SHALL HAVE A MINIMUM SUMP OF 300mm UNLESS OTHERWISE NOTED; BURIED STRUCTURES ARE NOT REQUIRED TO BE BENCHED.
4. ALL ABOVE GRADE STRUCTURES SHALL HAVE BIRDCAGE GRATES TO SUIT AND RIP-RAP C/W GEOTEXTILE UNDERLAY FOR ONE METRE AROUND THE STRUCTURE, UNLESS INDICATED OTHERWISE IN THE SPECIAL PROVISIONS.
5. ALL ABOVE GRADE STRUCTURES ARE TO HAVE POSTS AND MARKERS.
6. ALL GRATES AND COVERS SHALL BE FASTENED TO THE STRUCTURE IN AN APPROVED MANNER.
7. ALL STRUCTURES MUST HAVE KNOCK-OUTS IN THE SIDES NOT UTILIZED BY THE MUNICIPAL DRAIN TO ACCOMMODATE A 250mm DIA. HDPE PIPE SET 0.10m ABOVE THE OUTLET INVERT, UNLESS OTHERWISE NOTED. ALL KNOCK-OUTS MUST HAVE THEIR LOCATION IDENTIFIED ON THE INSIDE OF THE STRUCTURE.
8. ALL CONNECTIONS TO STRUCTURES MUST BE MADE USING RIGID PIPE WHICH MUST SPAN FROM THE STRUCTURE TO UNDISTURBED NATIVE SOIL.
9. ALL STRUCTURES SHALL BE CAST WITH A MINIMUM OF A 150mm HIGH RISER SECTION TO ALLOW FOR ADJUSTMENT OF THE TOP ELEVATION TO SUIT FIELD CONDITIONS.
10. A CATCHBASIN (CB, OR DICB) IS INTENDED TO TAKE ON SURFACE WATER, AN OBSERVATION BOX (OB) IS INTENDED FOR TILE CONNECTIONS AND TO SERVE AS AN OBSERVATION/INSPECTION POINT.

No.	Issue / Revision	Date	Auth.
0	ISSUED FOR INFO MEETING	2024/01/30	GN
1	ISSUED FOR ENGINEERS REPORT	2025/02/03	GN

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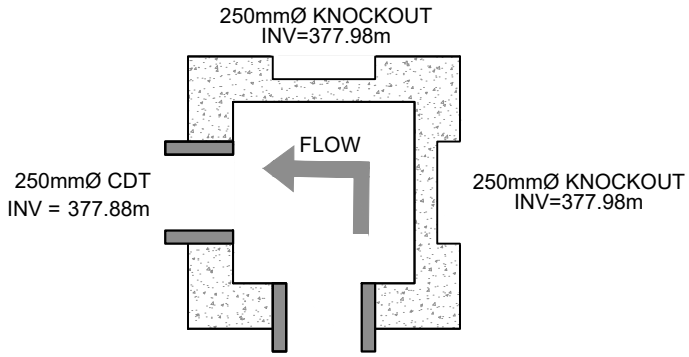
Drawing Title
MUNICIPAL DRAIN

MINTO DRAIN 121 - DETAILS AND NOTES

Drawn	Checked	Date	Drawing No.
EP	GN	2024/01/30	3OF4
Scale: AS SHOWN		Project No.: 300054764.3000	

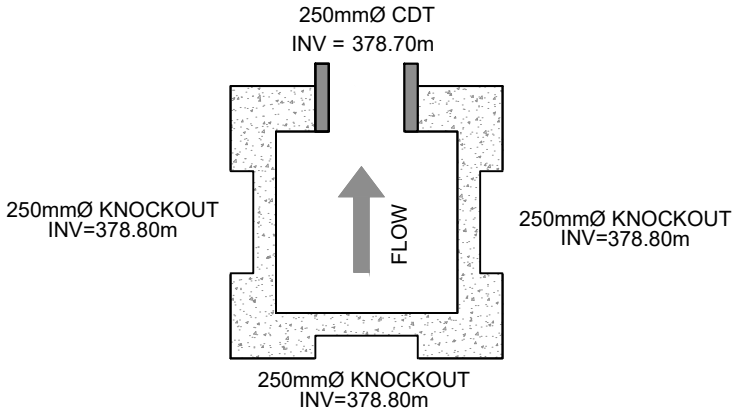
STATION 0+538

CB
600mmX600mm
TOP/LOW WALL ELEV = 378.90m
SUMP = 300mm



STATION 0+593

CB
600mmX600mm
TOP/LOW WALL ELEV = 380.30m
SUMP = 300mm



NOTES:

1. CATCH BASIN DETAILS ARE FOR INFORMATION PURPOSES ONLY.
2. THE CONTRACTOR HAS THE RESPONSIBILITY OF ENSURING THAT CONSTRUCTION IS CARRIED OUT ACCORDING TO THE CONTRACT SPECIFICATIONS AND DRAWINGS.
3. ALL KNOCKOUT ARE TO ACCOMMODATE DUAL-WALL HDPE (320kPa) PIPE OF THE SPECIFIED INNER DIAMETER.
4. THE CONCRETE PIPE SHOWN IS BASED ON 2000D PIPE DIMENSIONS.
5. ALL HDPE PIPE SHOWN IS BASED ON DUAL-WALL HDPE (320kPa) PIPE DIMENSIONS.

BURNSIDE

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Drawing Title

MUNICIPAL DRAIN

MINTO DRAIN 121 - CB DETAILS

Drawn	Checked	Date	Drawing No.
LK	GN	2024/01/30	**4OF4**
Scale		Project No.	
1:25		300054764	

R.J. Burnside & Associates Limited