



Engineers Report

Traxton Municipal Drain
Pembroke, Ontario

Township of Laurentian Valley
Geographic Township of Pembroke

D.M. Wills Project Number 21-5460



D.M. Wills Associates Limited
Partners in Engineering, Planning and
Environmental Services
Peterborough

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Township of Laurentian Valley

Submissions Summary

Submission No.	Submission Title	Date of Release	Submissions Summary
1	1 st Submission	October 2021	Draft Submission to Township of Laurentian Valley
2	2 nd Submission	November 2021	Final Submission to Township of Laurentian Valley

This report / proposal has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

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1.0 Introduction

1.1 Summary of Petition

As per Section 4.0 of the Drainage Act (the Act), and following the receipt of a petition for drainage works from property owners in the Township of Laurentian Valley (Township), council have appointed D.M. Wills Associates Limited (Wills) as the Drainage Engineer to establish a new municipal drain northeast of the intersection of Highway 40 and Highway 148, near Pembroke Ontario.

The following property owners in the Township of Laurentian Valley have petitioned under Section 4 of the Drainage Act for a new Municipal Drain:

Andrew Plummer
Traxton Holdings Ltd.

Lot 11, 12 & 13, Con. 2 FAL
Geographic Township of Pembroke

At the time that the petition was submitted, it was not clear whether the land requiring drainage would extend beyond the limits of the above properties. While the local road authority, provincial road authority and adjacent landowners are not signatories on the petition, the project team was not aware of any active objections to the petition. Through this process, the validity of the petition will be reviewed and opportunities may exist to adjust the petitioners or recommend a new petition, if required, to achieve the validation criteria as per Section 4 of the Act.

1.2 Report Objectives

The work involved with the preparation of this report has followed the procedures of the Drainage Act to achieve the following key objectives:

- Conduct an on-site meeting as per Section 9 of the Act to determine the area requiring drainage, and to provide a forum for property owners and agencies to present the goals, objectives and constraints of the project to the engineer;
- Provide notification to council regarding the validity of the petition;
- Complete a field review of the site, undertake topographic survey and various technical studies as required to provide a design that adequately conveys drainage to a sufficient outlet;
- Develop a cost estimate, supported by applicable construction drawings and specifications;
- Complete an assessment schedule to allocate all applicable allowances and costs over the lands and roads of the project; and
- Communicate and provide a clear record of the above technical findings and assessment processes for submission to council and for the review of the watershed community.

2.0 Project Objective and Background

The purpose of this application is to provide, formalize, and protect an outlet for potential stormwater runoff from the proposed subdivision located within Lot 11, 12 & 13, Con. 2 FAL (the Traxton Subdivision). The developer of the proposed subdivision is Mr. Plummer, who is a petitioner for this drain.

A Stormwater Management Report has been prepared by others for the Subject Property; which envisions the construction of a new Stormwater Management Pond. Based on the stormwater management plan developed to date, the stormwater pond for the subdivision will require downstream works to create an adequate and protected outlet to the Ottawa River over private property and the Algonquin Trail (owned by the County of Renfrew).

The developer of the Subject Property to complete a natural heritage review of the wetland area downstream of the Subject Property and to initiate consultations with the Department of Fisheries and Oceans (DFO) has retained the firm of Natural Resources Solutions Inc. (NRSI). NRSI has completed a technical report entitled "XXXXX" which details the potential impacts and recommend mitigation for the proposed stormwater management design and potential modifications to create an outlet to the Ottawa River.

3.0 The Drainage Act

The Drainage Act is a piece of legislation that allows for the construction and maintenance of drainage features that may span multiple properties, with funds raised by local special assessments. The cost of the drainage works is assessed in varying proportions to lands within the watershed, levied above and beyond municipal taxes.

This engineers report is one component of the overall process in the development of a municipal drain. The process is not complete until the levying and collection of assessments occurs after the construction of the municipal drain. A general overview of the process is provided below:

Steps completed to date:

1. Submission of a Petition under Section 4 of the Act and consideration by council;
2. Notice sent to local agencies;
3. Council appoints a Drainage Engineer;
4. Engineer holds On-Site Meeting as Per Section 9(1) of the Act;
5. Engineering team completes topographic survey work;
6. The project team holds internal design meetings and agency consultation; and
7. Engineer prepares the Engineer Report.

Next Steps:

1. Report presented and considered by council, petitioners and a By-Law adopted;
2. Clerk sends out provisional By-Law notice of meeting to consider and notice of court of revision;
3. If appeals are filed, Appeal to Tribunal and referee;
4. Disposition of appeals by the Tribunal, or if none, final passage of the By-Law, that establishes the drain in law and authorizes construction;
5. Tendering and Construction of the municipal drain;
6. Project finalization;
7. Application for Grants, if available;
8. Municipality collects assessed costs as per the Drainage Report.

4.0 Meetings

4.1 On-Site Meeting

In accordance with Section 9(1) of the Drainage Act, an on-site meeting was held on July 21, 2021 at 1:00 pm, on Traxton Way, at the rail trail intersection. Persons in attendance were:

Engineers and Township

Claus Trost	– Drainage Superintendent, LV
Ken Smith	– Project Manager, Wills
Mark Hoar	– Project Engineer, Wills
James Chambers	– Project Designer, Wills

Parties Present and Properties (by Roll No.) Represented:

Andrew Plumber	– Petitioner	(476606204014200)
Ana Beck	– Local Resident	
Brian Tousignant	– Local Resident	
Bruce Mackeen	– Local Resident	
Darwin Chevalier	– Local Resident	(476606204013960)
Dave Fairweather	– Local Resident	
Don Trudeau	– Local Resident	
Jon Arsenault	– Local Resident	
Peter deHoog	– Local Resident	
Suzanne Mackeen	– Local Resident	
Trudi Nieman	– Local Resident	

4.1.1 The On-Site Meeting

The Engineers started the meeting by explaining the purpose of the meeting. It was explained that this on-site meeting is required to satisfy Section 9(1) and 9(2) of the Drainage Act for the Traxton Municipal Drain project.

The Wills project team explained that the drainage petition, brought forward by Mr. Plummer, would be discussed and evaluated for sufficiency. The meeting was also explained to be for information gathering purposes. The Engineers indicated they wished to hear about the drainage issues in the watershed, and to obtain input to help define the Area Requiring Drainage and to ensure that runoff would be conveyed to a sufficient outlet.

All of those in attendance were then asked to introduce themselves and identify which property they represent in the watershed. They were also asked to speak about any drainage issues that they may have.

A brief overview of the Drainage Act was provided; the overall goal is to provide a legal means to facilitate drainage for a property or properties that require drainage. Wills confirmed that once the engineer confirms the Area Requiring Drainage, an engineers report will be prepared for the detailed design of the proposed municipal drain. The Township of Laurentian Valley indicated that if local residents require additional information on the Municipal Drain Process, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) website are excellent resources.

4.1.2 Description of the Area Requiring Drainage - Petitioners

The purpose of this application is to provide a stormwater outlet for the proposed new subdivision within Lot 11, 12 & 13, Con. 2 FAL (Traxton Subdivision). A Stormwater Management Report has been prepared for the Subdivision by the developer's engineers (JP2G Consultants Inc.). The stormwater pond for the subdivision requires an outlet to a sufficient outlet that will likely require conveyance over private property and the Algonquin Trail, which is owned by the County of Renfrew.

Andrew Plummer (Traxton Holdings Ltd., 476606204014200), the petitioner and potential developer, noted his understanding that the majority of the benefit may be assessed to his lands and therefore may bear the majority of the cost of construction of the drain. Mr. Plummer also provided an overview of his engineer's proposal to construct an overflow drain on lands owned by his grandmother's estate.

4.1.3 Questions Asked During the Meeting

- Who will pay for the drain and how much will the cost of construction and maintenance be?

All associated costs will be assessed throughout the watershed and described within the engineer's report. It is anticipated that a significant portion of the cost will be borne by the developer. The project team does not have an estimate of the cost yet.

- What will this petition drain be draining?

The drain will create an outlet for the proposed stormwater management pond for a subdivision located to the west of Traxton Way.

- How will the wetlands be restored back to a natural state? Will impurities from the subdivision be transferred into the wetlands?

The proposed works will not include construction in the wetlands; water quality will be managed within the stormwater pond prior to discharge.

- How do stormwater management ponds function?

Wills staff provided an overview of the principles of Stormwater management, including peak flow attenuation and inter-event sediment settling.

- How much water will be drained through the feature?

These details will be outlined within the stormwater management report, the principle of which will be that the peak flow rate under proposed conditions will be no greater than the existing peak flow rate.

- Who retained Wills as the new drainage engineer?

Wills was appointed by the Municipality of Laurentian Valley in response to the receipt of the petition for the drain. The engineering costs will be assessed to the drain in a manner that is similar to the construction costs.

- Will the drainage plan be based on the best option or best price?

The engineer that is working in the interest of 'the drain', the drainage plan will be based on an assessment of social, environmental and economic impacts.

- Are you allowed to work within a Provincially Significant Wetland?

Wills staff discussed the environmental constraints associated with work in or around wetlands and confirmed that all works would require appropriate permits. Having said that, Wills does not anticipate any construction within the wetland area.

- How will I be compensated for damages or potential decrease in property value due to the overflow drainage feature?

Potential damages and negative impacts to lands are accounted for as 'allowances' in the schedule of assessment, which result in a financial credit, or reduction in the amount owing, to the property in question.

- Will the beaches along the Ottawa River be disturbed or impacted by the outlet?

While the impacts are not yet fully understood, it would be the goal of the drainage design to avoid and/or adequately mitigate any proposed impacts.

- Will this feature affect my drilled drinking water well?

The proposed works would be intended to manage surface water only, and would focus on flood conveyance. As such, groundwater impacts are not anticipated.

- Why does the township not use MTO property to drain to the Ottawa River?

The suggestion was noted by the project team, and a variety of viable options will be explored to find the optimal solution.

- What does the project schedule look like?

Mr. Trost indicated that construction would not likely occur until Spring 2022.

- How do I appeal to the tribunal counsel?

Affected land owners will have an opportunity to appeal to the tribunal within 40 days from the point at which they are informed as to the outcome of the study as per Section 40 or 46(2)

4.2 Area Requiring Drainage and Sufficiency of Petition

In order to satisfy Section 4 (1) of the Drainage Act, the engineer must evaluate the Validity of the Petition based on four (4) criteria. The petition is determined to be valid if the Area Requiring Drainage is supported by any one (1) of the following criteria:

- a) the majority in number of the owners, as shown by the last revised assessment roll of lands in the area, including the owners of any roads in the area;
- b) the owner or owners, as shown by the last revised assessment roll, of lands in the area representing at least 60 per cent of the hectareage in the area;
- c) where a drainage works is required for a road or part thereof, the engineer, road superintendent or person having jurisdiction over such road or part, despite Subsection 61 (5); or
- d) where a drainage works is required for the drainage of lands used for agricultural purposes, the Director. R.S.O. 1990, c. D.17, s. 4 (1).

Section 4(1)(b) – The Area Requiring Drainage was estimated at 20.4 ha in size. The area of the land owner by the signed petitioner was estimated at 12.9 ha, or 63%. Therefore, Section 4(1) (b) is satisfied.

5.0 Design Considerations

5.1 Description of the Watershed

The catchment area for the proposed drain was determined to be approximately 25 ha, considering all lands that drain to the point that was identified to be the adequate outlet for the drain. The topography of the catchment is split between a very steep upstream areas and a flat, low wet area between the rail line and the Ottawa River. The site consists primarily of a mixture of vegetated areas, wooded areas, wetland areas and some developed areas. A large portion of the catchment is proposed to become a residential subdivision.

The Soil types within the catchment are comprised primarily of Rubicon Sandy Loam, Uplands Sandy Loam and St. Rosalie Clay. The sandy loam soils generally represent the downstream lands to the north of Highway 148. The clay area is generally poorly drained and characterizes the lands to the south of Highway 148.

5.2 Topographic Survey

A topographic survey of the site was completed by Wills between August 23, 2021 and August 27, 2021. This survey was used to determine elevations and locations of existing site features, determine drainage patterns to establish the proposed grades, and set local benchmarks.

5.2.1 Drainage Problem / Opportunity

The Traxton Holdings Ltd., property (476606204014200) requires a legal defined outlet in order to develop the property further. The proposed development consists of 21 residential lots, an internal road right-of-way and a Stormwater management facility. The existing drainage course downstream of the proposed development is poorly defined through the existing low, wet area and as such, the municipality is hesitant to permit a concentrated discharge from the residential lands. Converting the existing drainage course into a Municipal Drain will formalize the status of the watercourse and allow for the approval of appropriate upstream development opportunities.

5.3 Design Criteria and Considerations

The goal of the municipal drain will be to provide a sustainable, maintainable and adequate outlet for the proposed residential development. In general, the standard of care for residential development and urban stormwater conveyance is the 100-year storm (major system). Therefore, it is recommended that the municipal drain be design with consideration to the 100 year, post-development runoff, as controlled by appropriate stormwater management infrastructure designed by others. In the

absence of a finalized stormwater management design, it is anticipated that the pre-development peak flows will be an appropriate target for the control of surface water runoff.

The Traxton Subdivision Stormwater Management Plan Scoped Environmental Impact Assessment report, prepared by Natural Resource Solutions Inc. (April 2015), highlighted the Entrance Culvert to the residence at 250 Highway 148, near the outlet of the drainage system to the Ottawa River as an area of potential concern. The following recommendation was made:

The replacement of the corrugated steel pipe beneath the Chevalier property access driveway (20 cm below the elevation of the existing pipe), will alleviate the damming and extended inundation of the Chevalier wetland, which occurs under the current circumstances. The development is not anticipated to cause negative impact to the wetlands and surrounding forest provided that recommended mitigation measures (e.g. sediment and erosion controls) are followed.

The recommendation from the Environmental Impact Assessment is an important consideration in selecting the appropriate drainage solution for the watershed; as there may be an opportunity to rectify the existing environmental impact at the entrance culvert while meeting the needs of the drain for stormwater conveyance.

5.3.1 Options Considered during design

Two options were considered for the proposed municipal drain:

- Option 1 The Stormwater Management Report for the Traxton Subdivision proposed maintaining the existing drainage course, but included a drainage ditch to the Ottawa River located on 476606204050900 & 476606204014205 to alleviate excess ponding within the adjacent wetland. Relieving excess water from the existing wetland was a priority due to a poorly installed driveway culvert at the downstream end of the existing drainage course. This Option would maintain the existing, flow path for more frequent flow events, and would provide an overflow to a new outlet to the Ottawa River during extreme flow events.

- Option 2 Maintain the existing drainage course as-is and relieve excess ponding within the adjacent wetland by lowering the driveway culvert at 250 Highway 148, near the downstream end of the existing drainage course. This option would include an improvement to the entrance culvert at 250 Highway 148, would enact the recommendations of the Environmental Impact Assessment, and would maintain all flow to the existing outlet to the Ottawa River.

Our evaluation of the options considered the implications on social, economic and environmental factors. In general, local residents expressed concern regarding the

potential impact to property values, beach function and performance, and flooding potential associated with a new outlet as per Option 1. Furthermore, the existing riparian rights are better respected by maintaining the existing drainage course.

As identified in Section 5.3, the Environmental Impact Assessment recommended that the existing culvert at 250 Highway 148 be lowered to improve the current inundation of the upstream lands. Option 2 capitalizes on this opportunity and will protect the long term control of this outlet feature.

We anticipate that the relative cost between the options will favour Option 2, which will include the construction of a new entrance culvert and very few other alterations to the existing waterway. Option 1 would include a new culvert crossing, channel construction, additional property allowances, road grading, and construction restoration efforts that would be more costly.

On the weight of evidence discussed above, Option 2 was selected as the preferred alternative.

5.3.2 Design Criteria

A Guide for Engineers working under the Drainage Act in Ontario – Publication 852, (The Guide) prepared by the Ministry of Agriculture, Food and Rural Affairs Ontario, was used to establish the criteria for the drainage assessment.

The MTO Drainage Management Manual and the MTO Highway Drainage Design Standards (HDDS) were used to establish the design criteria for the entrance crossing within the drainage assessment at 250 Highway 148.

The culverts were assessed based on the criteria for a Lower-Tier Municipal Road.

Table B2-2 of the Guide, states:

- The design storm for a Rural/Agricultural Channel is the 2-year event.
- The design storm for a Field Crossings is the 2 – 5 year event.
- The design storm for a Lower-Tier Municipal Road is the 5 – 10 year event.
- The design storm for an Upper-Tier Municipal Road is the 10 – 25 year event.

Notwithstanding the above design criteria, the proposed culvert was considered with respect to long-term stability and performance during the 100-year event, given the nature of the upstream development and the standard of design allocated to stormwater management runoff from urban environments.

5.3.3 Environmental Approval

The drain will be subject to the review of the department of Fisheries and Oceans (DFO) and consideration under the Species-at-Risk Act. Although the exact views of these agencies cannot be known in advance, the environmental impacts are expected to be appropriately mitigated through use of temporary erosion and sediment controls

during construction and by facilitating construction during a seasonal in-water working window.

This project is anticipated to have no permanent adverse impact on any species-at-risk as it intends to maintain the existing drainage feature and to continue to support the existing land use within the watershed.

6.0 Recommendations for the Traxton Municipal Drain

6.1 Recommendations

The proposed drain will be split into one (1) main branch. The main branch will be referred to as Branch A.

It is our recommendation that:

Station 0+000 to 0+530	Provide earth ditch cleanout within the existing channel to provide positive drainage. (This will be considered a provisional item, to be considered for future maintenance).
Station 0+052	Install new entrance culvert designed to convey the 5-year event and to be stable during the 100-year event. The proposed culvert is recommended to be a 1000 mm HDPE pipe. The inverts of the culvert will be lowered 0.20 m from the existing upstream and downstream elevations, as recommended by the NRSI impact assessment report (April 2015).
Station 0+491	Install new cross culvert designed to convey the 5-year event and to be stable during the 100-year event. The proposed culvert is recommended to be a 1200 x 900 mm concrete box. The inverts of the culvert will match existing. (This will be considered a provisional item, to be considered for future maintenance. The existing pipe is in good condition and does not require replacement at this time).
Station 0+529 to 0+728	Stormwater Management Block for the Traxton Subdivision. The block will include the stormwater management pond, inlet, and outlet sewers. All works and cost associated with the stormwater management block will be the sole responsibility of the developer. Maintenance costs for the Stormwater Management Block will only be borne by the upstream landowners only after full assumption of the block by the municipality.

6.2 Working Area

The width of the working area for construction purposes shall be a maximum of 20 m. The width of the working area for maintenance shall be 10 m on the right side of the drain, facing upstream. Each landowner on whose property the drainage works is to be constructed shall designate access to and from the working area at the time of construction or upon failure to do so, the engineer or Drainage Superintendent shall designate access as identified on the detailed design drawings.

7.0 Cost Estimate

The general principle of the Drainage Act is that the project costs, incurred from both design and construction activities, along with any funds owed to landowners for various impacts and inconveniences, and are distributed fairly to all lands and roads within the contributing area. The cost estimate on this project consists of:

- The allowances recommended to be made to those owners having work on their properties or other detrimental impacts;
- The construction cost estimate;
- The engineering cost estimate;
- The construction supervision and eligible administration costs which include financing, applications and miscellaneous costs, and
- Contingency items, as required.

As per Section 59 (1) of the Act, in the case where tender prices are 33% higher than the engineer's estimate of the contract price, then another meeting to consider the price must be held before the work can proceed.

7.1 Allowances

Various allowances are considered part of a Municipal Drain and are intended to provide appropriate compensation to landowners who are negatively impacted by the construction of the drain. The drainage act states in Section 29 to 33 that the Engineer is to allow for the value of several items, as follows:

7.1.1 Section 29 – Allowance for Right of Way

Allowances under this section are provided for lands taken out of production permanently because of the construction or improvement of a drain.

The allowance recognizes the funds owed to a landowner to secure right-of-way access to lands for both construction and future maintenance activities. These right-of-ways are not required to be taken out of production, but are to always be available for maintenance activities.

7.1.1.1 Allowance for Land Taken Permanently out of Production

The drainage engineer is to provide for an allowance to be paid to the landowner whose lands is proposed to be used for construction of the new drain. This includes the top width of the new channel; lands designated as a permanent buffer or vegetated berm.

Allowance rates for lands taken permanently out of production were provided as follows:

Rural / Regulated Land taken for Drain - \$ 12,265 / ha (\$ 4,964 / acre)

For the proposed drain, the lands designated as a permanent buffer were based on the design top width of the channel of 5.0 m with a 0.5 m vegetated buffer on either side of the channel.

7.1.1.2 Allowance for Land Used Periodically

The drainage engineer is to provide for an allowance to be paid to the landowner whose land is proposed to be used periodically for the equipment used to construct and maintain the drain. Typically, this section refers to agricultural crops; however, it also applies to lawns, ornamental trees and fences.

With no farmland, ornamental trees or fences located along the proposed drain, an allowance for land used periodically will not applied to any of the properties along the proposed drain.

7.1.2 Section 30 – Amount for Damages

The drainage engineer is to provide for allowances to be paid to the landowner for damages to crops caused by the disposal of material removed from the drainage system. The damage allowance should compensate for the long-term effect on the land that would reduce crop production over the next few years.

With no farm land, ornamental trees or fences located along the proposed drain, this allowance will not applied to any of the properties along the proposed drain.

7.1.3 Section 31 – Allowance for Existing Drain

The proposed work does not involve incorporating an existing private drain into the Traxton Municipal Brown Drain. Therefore, no allowances for this section have been provided.

7.1.4 Section 32 – Allowance for Damages due to Insufficient Outlet

A sufficient outlet has been confirmed. Therefore, no allowances for this section have been provided.

7.1.5 Section 33 – Allowance for Loss of Access

Crossings are to be provided at each property, where they were originally provided. Therefore, no allowances for this section have been provided.

7.1.6 Summary

The allowances payable to the owners entitled thereto on this project are documented in **Table 1**.

Table 1 – Allowances

Roll Number (47660620-)	Con	Lot	Owner	Section 29
				Land Taken
4013960	2	10	Darwin Chevalier	\$1,398.22
4014200	2	11-13	Traxton Holdings Ltd.	\$11,698.46
4014205	2	11	Lulu Mae Plummer Estate	\$1,942.79
4050800	2	11	Lulu Mae Plummer Estate	\$73.59
2552200	2	11-13	County of Renfrew	\$309.08
			Total	\$15,422.14

The net amount owed to or from a landowner is the difference between their assessments, as per **Section 8** of this report, and the above allowances. The allowances are generally less than the assessment to the properties, resulting in the property owners being billed the difference when the project is complete.

7.2 Construction Cost Estimate

The estimated cost of Labour, Equipment and Materials to construct the proposed drain is outlined in the following section. The final cost of the drain construction cannot be established until the construction is complete. The contractor is to supply all labour, equipment and materials to construct are documented in **Table 2**.

Table 2 - Cost Estimate

Item No.	Description	Total
101	Bonding and Insurance	\$5,000
102	Mobilization and Demobilization	\$5,000
103	Temporary Traffic Controls	\$1,000
104	Erosion and Sediment Controls	
a)	Light Duty Silt Fence	\$500
b)	Staw Bale Check Dam [SiltSoxx]	\$200
105	Excavation and Grading (local disposal)	\$26
201	Removals	\$260
202	Clearing and Grubbing	\$1,000
203	Removal of CSP Pipe and Culverts (Entrance - 250 Highway 148)	\$925
301	Pipe Culvert - Road	
a)	Install 1000mm HDPE Pipe. (Entrance - 250 Highway 148)	\$23,000
303	Rip Rap on Filter Cloth	\$500
401	Granular B - Type 1 Road Subbase (300mm Depth)	\$1,463
402	Granular A	\$1,300
SUM		\$ 40,174

7.3 Engineering Cost Estimate

The Engineering Cost Estimate is intended to provide for the work involved with generating background information to prepare for and attend on-site meetings; field survey; the preparation of plans, profiles, cross sections, drawings, and details; the design of the municipal drain features; conducting discussions with affected land owners and authorities; evaluating alternatives; preparing cost estimates, allowance tables, assessment schedules and future maintenance schedules; preparing specifications; report writing; and attending public meetings.

The Engineering Cost Estimate for the Traxton Municipal Drain is summarized as follows:

- Report Preparation..... \$ 35,502
- Permitting..... \$ 4,000
- Sum..... \$ 39,502

The cost of the report preparation is usually not altered at the conclusion of a project unless the report is referred back to the engineer following significant input or a change in the project circumstances, or the report is appealed, both of which would involve additional cost.

The estimates provided above for Consideration and Court of Revision are typical costs only, and would only be exceeded in the case of lengthy or unusual meetings,

uncommon report preparation costs, appeals, or other cases where additional input or services are required from the Engineer.

7.4 Construction Supervision and Eligible Administration Cost Estimate

7.4.1 Construction Supervision

The cost estimate for construction supervision typically includes work to prepare tender documents, facilitate the award of contracts, attend pre-construction meetings, perform construction inspection, facilitate contractor payment, complete all required final inspections, attend and facilitate meetings, conduct post construction follow-up, and to assist with preparation of grant applications.

- Construction Supervision \$ 10,000

7.4.2 Eligible Administration Cost

It is appropriate to assess various other administration costs incurred by the municipality and the engineer to the project. Section 73(1) of the Drainage Act states that "Except where otherwise provided in this Act or by a decision on an appeal, the cost of any application, reference or appeal and the cost of temporary financing for the construction, improvement, repair and maintenance of a drainage works, shall form part of the cost of the drainage works."

The Eligible Administration Cost Estimate for the Traxton Municipal Drain is summarized as follows:

- Eligible Administration Cost (excluding HST) \$ 3,000
- Allowance for Report Reproduction \$ 1,000
- Sum \$ 4,000

7.5 Estimated Cost Summary

The total estimated cost for the Traxton Municipal Drain is summarized as follows:

- Allowances \$ 15,422
- Construction Cost Estimate \$ 40,174
- Engineering Cost Estimate \$ 39,502
- Construction Supervision & Eligible Administration Cost Estimate \$ 14,000
- Total Estimated Cost \$ 109,098

8.0 Cost Assessments Principles

Section 21 of the Drainage Act requires that the Engineer “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.” The intention of the assessment schedule is to determine and communicate the proportional costs that are to be levied to each landowner or agency that benefit and/or contribute runoff to the drain.

8.1 Cost Assessment

8.1.1 Assessment of Benefit

Section 22 of the Drainage Act states that “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.” The intention of this component of the assessment schedule is to recognize particular landowners or agencies for whom the drain will provide a significant drainage improvement, and to ensure that appropriate additional costs are assessed to those parties.

Benefits to landowners can include higher market value for the property, improved appearance or better control of surface or subsurface water, or any other advantage relating to the betterment of lands, roads, buildings or structures.

There is no Benefit for subsurface water drainage for the drain.

The Benefit for Direct Connection was estimated based on the assumed cost for a property to construct a private drain to reach an adequate outlet. The assumed cost to connect a typical private drain is estimated at 15 \$/m (cost to install a 150 mm diameter drain).

The Benefit for Increased Market Value was estimated based on a 138% premium for rural land converted to developable land. The value of rural land was estimated at \$ 12,265 / ha (\$ 4,964 / acre) with the value of developed land \$ 29,180 / ha (\$ 11,809 / acre). The Net Benefit Value as estimated at \$ 16,914 /ha.

8.1.2 Assessment of Outlet Liability

Section 23(1) of the Drainage Act states that “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.” The intention of this component of the assessment schedule is to recognize the lands that have no right of drainage, but still function as the ‘source’ of the surface runoff; that is, lands which contribute runoff via sheet flow or other artificially constructed means to the drain.

The assessments of outlet liabilities within the Traxton Municipal Drain were determined using the equivalent areas method, a technique used to simplify the process of calculating the outlet liability assessments. The liability assessment on a parcel of land is based on the "volume and rate of flow of water artificially caused to flow", which varies with factors related to land use, soil type and surface conditions.

For County Road 148, the road was assigned an Equivalent Area factor of 2.25 for outlet liability.

8.1.3 Assessment of Injuring Liability

Section 23(2) of the Drainage Act states that "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." The intention of this component of the assessment schedule is similar to Outlet Liability, as above, and recognizes flows that are artificially collected and result in specific negative downstream impacts.

There were no specific injuring liabilities that were identified within the Traxton Municipal Drain; the general impacts of surface runoff to the drain were captured and assessed within the assessment for outlet liability, as per Section 8.1.2.

8.1.4 Assessment of Special Benefit

Section 24 of the Drainage Act states that "The engineer may assess for special benefit any lands for which special benefits have been provided by the drainage works." Defined as additional works of features included in the construction, repair, or improvement of drainage works that has no effect on the function of the drainage works." The intention of this component of the assessment schedule is to recognize lands and agencies that receive additional, unique and specific benefits that are not related to general improvements to drainage.

No Special Benefits have been applied to any of the properties within the watershed.

8.1.5 Increased Cost, How Borne

Section 26 of the Drainage Act states that "In addition to all other sums lawfully assessed against the property of a public utility or road authority under this Act, and despite the fact that the public utility or road authority is not otherwise assessable under this Act, the public utility or road authority shall be assessed for and shall pay all the increase of cost of such drainage works caused by the existence of the works of the public utility or road authority."

8.2 Assessment Summary

The assessment summary for the Traxton Municipal Drain is shown in detail within **Schedule A**, located in **Appendix A**.

Schedule A will be used to assess the final costs of the drain, which may vary depending on final engineering, construction administration, and eligible administration costs. Final costs will be prorated, with the exception of Special Assessment, which is to be based on actual costs. **Schedule B** will be used to prorate the future drain repair and maintenance costs.

9.0 Future Maintenance and repair Provisions

After the construction of the Traxton Municipal Drain is complete, as described in this report, the Township of Laurentian Valley, at the expense of the lands, shall maintain the drain and all associated features and roads as assessed and in the proportions set out in the By-Law, which adopts this Report. The cost of all maintenance is to be assessed to the upstream lands and roads on a prorated basis in keeping with the percentages in **Schedule B**.

Future costs for maintenance of the road crossings are to be fully assessed to the Township of Laurentian Valley.

The Traxton Municipal Drain shall be maintained using the specification, plans and profiles as contained in this Report.

At each time of maintenance, ditch banks are to be seeded. Over-seeding is recommended. Rates of application and use of fertilizer and mulch is to be as per supplier's recommendations.

The drain should be cleaned out at a minimum 10-year frequency as is being recommended by the Township of Laurentian Valley. The stormwater management facility should include an Operations and Maintenance plan, which will specify the anticipated maintenance frequency of the pond.

10.0 General Instructions to Property Owners

Once the drainage system is constructed, it is the municipality's responsibility to manage it. The drainage system becomes part of the municipal infrastructure and is to be repaired and maintained by the Township of Laurentian Valley, not by the property owners.

Landowners should note that there is responsibility for landowners to not damage or obstruct the flow in the municipal drain. Section 80(1) of the Drainage act states that "When a drainage works becomes obstructed by a dam, low bridge, fence, washing out of a private drain, or other obstruction, for which the owner or occupant of the land adjoining the drainage works is responsible, so that the free flow of the water is

impeded thereby, the persons owning or occupying the land shall, upon reasonable notice sent by the council of the local municipality whose duty it is to maintain and repair the drainage works or by a drainage superintendent appointed by the council, remove such obstruction and, if it is not so removed within the time specified in the notice, the council or the drainage superintendent shall forthwith cause it to be removed, and the cost thereof is payable to the municipality by the owner or occupant of the land."

Section 82 (1) of the Drainage act states that "A municipality in which a drainage works or part thereof is situate may bring an action for damages against any person who destroys or injures in any way a drainage works, including any bench mark or permanent level, and any damages ordered by the referee to be paid shall be paid to the municipality and used for the construction, improvement, maintenance or repair of the drainage works."

When the drainage superintendent is required to perform any necessary maintenance, the property owners are to provide access to the drain. Section 74(1) of the Drainage Act states "Any drainage works constructed under a by-law passed under this Act or any predecessor of this Act, relating to the construction or improvement of a drainage works by local assessment, shall be maintained and repaired by each local municipality through which it passes, to the extent that such drainage works lies within the limits of such municipality, at the expense of all the upstream lands and roads in any way assessed for the construction or improvement of the drainage works and in the proportion determined by the then current by-law pertaining thereto until, in the case of each municipality, such provision for maintenance or repair is varied or otherwise determined by an engineer in a report or on appeal therefrom."

Future connections to the municipal drainage system require permission from the Township of Laurentian Valley. Section 65(5) of the Drainage Act states that "No person shall connect to or disconnect from drainage works without the approval of the council of the municipality."

The drain is designed based on land use and management. Municipal Approval is required if land use is changed such that the drain is impacted. Section 65(3) of the Drainage Act states "If an owner of land that is not assessed for a drainage works subsequently connects the land with the drainage works for the purpose of drainage, or if the nature or extent of the use of a drainage works by land assessed for the drainage works is subsequently altered, the clerk of the local municipality in which the land is situate shall instruct an engineer in writing to inspect the land and assess it for a just proportion of the drainage works, taking into account any compensation paid to the owner of the land in respect of the drainage works."

It is the land owner's responsibility to identify / mark existing tile drains along the proposed drain. Marked outlets that are damaged by the contractors during construction will be required to repair or replace damaged tile.

It is the landowner's responsibility not to plant trees or any permanent feature within the working corridor of the municipal drain.

No material that can impair water quality should be discharged into the drainage system.

A permit to take water is required if more than 50,000 L/day of water is taken from the drain, subject to the provisions of Section 34 of the Water Resource Act.

It is recommended that each abutting owner conduct work no closer than 1.0 m to any ditch bank. Such area does not have to be grassed but it should not be cultivated.

11.0 Grants

As per Section 85 of the Drainage Act and OMAFRA's ADIP policies, a grant not exceeding 1/3 (33.3%) may be available on the assessments against privately owned parcels of land which are used for agricultural purposes and are eligible for the Farm Property Class Tax Rate (F.P.C.T.R.).

Section 88(1) of the Drainage Act states that "Upon the practical completion of the drainage works and after the time for appealing against assessments has expired and there are no appeals or after all appeals against assessments have been decided, the council of the initiating municipality shall forward to the Director an application for a grant in such form as is provided by the Director.

If an assessed owner not shown as having the Farm Property Class Tax Rate feels that their property should be eligible for the grant, and they can provide proof to the Municipality of this eligibility as noted prior to the final cost levy, then the property could have the 1/3 (33.3%) grant deducted from the final cost levy. It is to be noted that OMAFRA retains the final right to determine eligibility under the grant program, regardless of designation herein.

12.0 Seal and Signature of the Engineers

Respectfully submitted,



Mark Hoar, P.Eng.
Senior Water Resources Engineer



Ken Smith, P.Eng.,
Manager, Water Resources Engineer

MH/jl

Appendix A

Schedule of Estimated Assessment for Construction



SCHEDULE A
CONSTRUCTION ASSESSMENT SCHEDULES
TRAXTON MUNICIPAL DRAIN

Roll Number	Owner	Concession	Lot or Part	Approximate Area Affected (ha)	Equivalent Area	Assessment				Allowance	Farm Tax Rate Parcel 2020	Cash Settlements
						Outlet	Benefit	Special	Total			
476606204013940	-	2	10	2.99	1.24	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -	No	\$ 0.00
476606204013950	-	2	11	0.39	0.14	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -	No	\$ 0.00
476606204013960	Darwin Chevalier	2	11	1.30	0.17	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ 1,398.22	No	\$ (1,398.22)
476606204014200	Traxton Holdings Ltd.	2	11, 12, 13	9.59	5.98	\$ 0.00	\$ 109,098.16	\$ -	\$ 109,098.16	\$ 11,698.46	No	\$ 97,399.71
476606204014205	Lulu Mae Plummer Estate	2	11	2.64	0.30	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ 1,942.79	No	\$ (1,942.79)
476606204020000	-	2	13	0.70	0.13	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -	No	\$ 0.00
476606204050200	Bruce & Suzanne Mackeen	2	11	0.03	0.01	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -	No	\$ 0.00
476606204050800	Lulu Mae Plummer Estate	2	11	0.47	0.04	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ 73.59	No	\$ (73.59)
476606204051200	-	2	12	2.81	0.26	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -	No	\$ 0.00
476606602552200	County of Renfrew	2	11, 12, 13	1.27	0.53	\$ 0.00	\$ -		\$ 0.00	\$ 309.08	No	\$ (309.08)
Total Lands				22.2	8.8	\$ 0.00	\$ 109,098.16	\$ -	\$ 109,098.16	\$ 15,422.14		\$ 93,676.02
MTO - Highway 148				2.4	2.25	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -	No	\$ 0.00
Total Roads				2.4	2.2	\$ 0.00	\$ -	\$ -	\$ 0.00	\$ -		\$ 0.00
TOTAL				24.6	11.0	\$ 0.00	\$ 109,098.16	\$ -	\$ 109,098.16	\$ 15,422.14		\$ 93,676.02

Appendix B

Schedule of Assessment for Future Maintenance



SCHEDULE B
MAINTENANCE ASSESSMENT SCHEDULES
TRAXTON MUNICIPAL DRAIN

Stormwater Management Pond - 0+530 to 0+728

Roll Number	Owner	Concession	Lot or Part	Approximate Area Affected (ha)	Equivalent Area	Assessment				Allowance	Farm Tax Rate Parcel 2020	Cash Settlements
						Outlet	Benefit	Special	Total			
476606204014200 - Lot 02	-	2		0.08	0.05	\$ 1,198.16	\$ -	\$ -	\$ 1,198.16	\$ -	No	\$ 1,198.16
476606204014200 - Lot 03	-	2		0.10	0.06	\$ 1,391.64	\$ -	\$ -	\$ 1,391.64	\$ -	No	\$ 1,391.64
476606204014200 - Lot 04	-	2		0.07	0.04	\$ 1,067.74	\$ -	\$ -	\$ 1,067.74	\$ -	No	\$ 1,067.74
476606204014200 - Lot 05	-	2		0.07	0.04	\$ 1,004.68	\$ -	\$ -	\$ 1,004.68	\$ -	No	\$ 1,004.68
476606204014200 - Lot 06	-	2		0.07	0.04	\$ 982.74	\$ -	\$ -	\$ 982.74	\$ -	No	\$ 982.74
476606204014200 - Lot 07	-	2		0.07	0.04	\$ 989.41	\$ -	\$ -	\$ 989.41	\$ -	No	\$ 989.41
476606204014200 - Lot 08	-	2		0.06	0.04	\$ 857.40	\$ -	\$ -	\$ 857.40	\$ -	No	\$ 857.40
476606204014200 - Lot 09	-	2		0.08	0.04	\$ 1,066.75	\$ -	\$ -	\$ 1,066.75	\$ -	No	\$ 1,066.75
476606204014200 - Lot 10	-	2		0.07	0.04	\$ 938.75	\$ -	\$ -	\$ 938.75	\$ -	No	\$ 938.75
476606204014200 - Lot 11	-	2		0.07	0.04	\$ 993.21	\$ -	\$ -	\$ 993.21	\$ -	No	\$ 993.21
476606204014200 - Lot 12	-	2		0.07	0.04	\$ 889.40	\$ -	\$ -	\$ 889.40	\$ -	No	\$ 889.40
476606204014200 - Lot 13	-	2		0.08	0.04	\$ 1,093.42	\$ -	\$ -	\$ 1,093.42	\$ -	No	\$ 1,093.42
476606204014200 - Lot 14	-	2		0.11	0.06	\$ 1,528.12	\$ -	\$ -	\$ 1,528.12	\$ -	No	\$ 1,528.12
476606204014200 - Lot 15	-	2		0.17	0.10	\$ 2,330.85	\$ -	\$ -	\$ 2,330.85	\$ -	No	\$ 2,330.85
476606204014200 - Lot 16	-	2		0.39	0.21	\$ 5,155.07	\$ -	\$ -	\$ 5,155.07	\$ -	No	\$ 5,155.07
476606204014200 - Lot 17	-	2		0.35	0.19	\$ 4,696.37	\$ -	\$ -	\$ 4,696.37	\$ -	No	\$ 4,696.37
476606204014200 - Lot 18	-	2		0.12	0.07	\$ 1,602.79	\$ -	\$ -	\$ 1,602.79	\$ -	No	\$ 1,602.79
476606204014200 - Lot 19	-	2		0.08	0.05	\$ 1,126.76	\$ -	\$ -	\$ 1,126.76	\$ -	No	\$ 1,126.76
476606204014200 - Lot 20	-	2		0.07	0.04	\$ 904.07	\$ -	\$ -	\$ 904.07	\$ -	No	\$ 904.07
476606204014200 - Lot 21	-	2		0.14	0.08	\$ 1,909.48	\$ -	\$ -	\$ 1,909.48	\$ -	No	\$ 1,909.48
476606204014200 - Lot 22	-	2		0.52	0.29	\$ 6,996.55	\$ -	\$ -	\$ 6,996.55	\$ -	No	\$ 6,996.55
Total Lands				2.9	1.6	\$ 38,723.37	\$ -	\$ -	\$ 38,723.37	\$ -		\$ 38,723.37
Laurentian Valley												
476606204014200 - Lot 01		2		0.94	0.56	\$ 13,510.81	\$ -	\$ -	\$ 13,510.81	\$ -	No	\$ 13,510.81
476606204014200 - ROW		2		1.15	1.07	\$ 25,940.82	\$ -	\$ -	\$ 25,940.82	\$ -	No	\$ 25,940.82
MTO - Highway 148				0.0	0	\$ -	\$ -	\$ -	\$ -	\$ -	No	\$ -
Total Roads				2.1	1.6	\$ 39,451.63	\$ -	\$ -	\$ 39,451.63	\$ -		\$ 39,451.63
TOTAL				5.0	3.2	\$ 78,175.00	\$ -	\$ -	\$ 78,175.00	\$ -		\$ 78,175.00

SCHEDULE B
MAINTENANCE ASSESSMENT SCHEDULES
TRAXTON MUNICIPAL DRAIN

Ditch Cleanout - 0+000 to 0+530

Roll Number	Owner	Concession	Lot or Part	Approximate Area Affected (ha)	Equivalent Area	Assessment				Allowance	Farm Tax Rate Parcel 2020	Cash Settlements
						Outlet	Benefit	Special	Total			
476606204013940	-	2	10	2.99	1.24	\$ 3,030.68	\$ -	\$ -	\$ 3,030.68	\$ -	No	\$ 3,030.68
476606204013950	-	2	11	0.39	0.14	\$ 343.83	\$ -	\$ -	\$ 343.83	\$ -	No	\$ 343.83
476606204013960	Darwin Chevalier	2	11	1.30	0.17	\$ 423.33	\$ -	\$ -	\$ 423.33	\$ -	No	\$ 423.33
476606204014200 - Lot 02	-	2		0.84	0.50	\$ 1,215.41	\$ -	\$ -	\$ 1,215.41	\$ -	No	\$ 1,215.41
476606204014200 - Lot 03	-	2		0.67	0.39	\$ 963.43	\$ -	\$ -	\$ 963.43	\$ -	No	\$ 963.43
476606204014200 - Lot 04	-	2		0.49	0.29	\$ 712.17	\$ -	\$ -	\$ 712.17	\$ -	No	\$ 712.17
476606204014200 - Lot 05	-	2		0.43	0.25	\$ 625.04	\$ -	\$ -	\$ 625.04	\$ -	No	\$ 625.04
476606204014200 - Lot 06	-	2		0.48	0.26	\$ 639.74	\$ -	\$ -	\$ 639.74	\$ -	No	\$ 639.74
476606204014200 - Lot 07	-	2		0.53	0.29	\$ 718.25	\$ -	\$ -	\$ 718.25	\$ -	No	\$ 718.25
476606204014200 - Lot 08	-	2		0.88	0.48	\$ 1,186.73	\$ -	\$ -	\$ 1,186.73	\$ -	No	\$ 1,186.73
476606204014200 - Lot 09	-	2		0.28	0.16	\$ 399.84	\$ -	\$ -	\$ 399.84	\$ -	No	\$ 399.84
476606204014200 - Lot 10	-	2		0.43	0.25	\$ 619.99	\$ -	\$ -	\$ 619.99	\$ -	No	\$ 619.99
476606204014200 - Lot 11	-	2		0.13	0.07	\$ 181.91	\$ -	\$ -	\$ 181.91	\$ -	No	\$ 181.91
476606204014200 - Lot 12	-	2		0.07	0.04	\$ 89.66	\$ -	\$ -	\$ 89.66	\$ -	No	\$ 89.66
476606204014200 - Lot 13	-	2		0.08	0.04	\$ 110.23	\$ -	\$ -	\$ 110.23	\$ -	No	\$ 110.23
476606204014200 - Lot 14	-	2		0.11	0.06	\$ 154.05	\$ -	\$ -	\$ 154.05	\$ -	No	\$ 154.05
476606204014200 - Lot 15	-	2		0.17	0.10	\$ 234.98	\$ -	\$ -	\$ 234.98	\$ -	No	\$ 234.98
476606204014200 - Lot 16	-	2		0.39	0.21	\$ 519.70	\$ -	\$ -	\$ 519.70	\$ -	No	\$ 519.70
476606204014200 - Lot 17	-	2		0.35	0.19	\$ 473.45	\$ -	\$ -	\$ 473.45	\$ -	No	\$ 473.45
476606204014200 - Lot 18	-	2		0.12	0.07	\$ 161.58	\$ -	\$ -	\$ 161.58	\$ -	No	\$ 161.58
476606204014200 - Lot 19	-	2		0.08	0.05	\$ 113.59	\$ -	\$ -	\$ 113.59	\$ -	No	\$ 113.59
476606204014200 - Lot 20	-	2		0.07	0.04	\$ 91.14	\$ -	\$ -	\$ 91.14	\$ -	No	\$ 91.14
476606204014200 - Lot 21	-	2		0.14	0.08	\$ 192.50	\$ -	\$ -	\$ 192.50	\$ -	No	\$ 192.50
476606204014200 - Lot 22	-	2		0.52	0.29	\$ 705.34	\$ -	\$ -	\$ 705.34	\$ -	No	\$ 705.34
476606204014205	Lulu Mae Plummer Estate	2	11	2.64	0.30	\$ 740.25	\$ -	\$ -	\$ 740.25	\$ -	No	\$ 740.25
476606204020000	-	2	13	0.70	0.13	\$ 324.84	\$ -	\$ -	\$ 324.84	\$ -	No	\$ 324.84
476606204050200	Bruce & Suzanne Mackeen	2	11	0.03	0.01	\$ 12.72	\$ -	\$ -	\$ 12.72	\$ -	No	\$ 12.72
476606204050800	Lulu Mae Plummer Estate	2	11	0.47	0.04	\$ 104.92	\$ -	\$ -	\$ 104.92	\$ -	No	\$ 104.92
476606204051200	-	2	12	2.81	0.26	\$ 628.25	\$ -	\$ -	\$ 628.25	\$ -	No	\$ 628.25
476606602552200	County of Renfrew	2	11, 12, 13	1.27	0.53	\$ 1,288.20	\$ -	\$ -	\$ 1,288.20	\$ -	No	\$ 1,288.20
Total Lands				19.9	6.9	\$ 17,005.77	\$ -	\$ -	\$ 17,005.77	\$ -		\$ 17,005.77
Laurentian Valley												
476606204014200 - Lot 01		2		0.94	0.56	\$ 1,362.06	\$ -	\$ -	\$ 1,362.06	\$ -	No	\$ 1,362.06
476606204014200 - ROW		2		1.37	1.27	\$ 3,123.08	\$ -	\$ -	\$ 3,123.08	\$ -	No	\$ 3,123.08
MTO - Highway 148				2.36	2.25	\$ 5,518.29	\$ -	\$ -	\$ 5,518.29	\$ -	No	\$ 5,518.29
Total Roads				4.7	4.1	\$ 4,485.14	\$ -	\$ -	\$ 4,485.14	\$ -		\$ 10,003.43
TOTAL				24.6	11.0	\$ 27,009.20	\$ -	\$ -	\$ 27,009.20	\$ -		\$ 27,009.20

Appendix C

Drawings





1.0 GENERAL - CONSTRUCTION

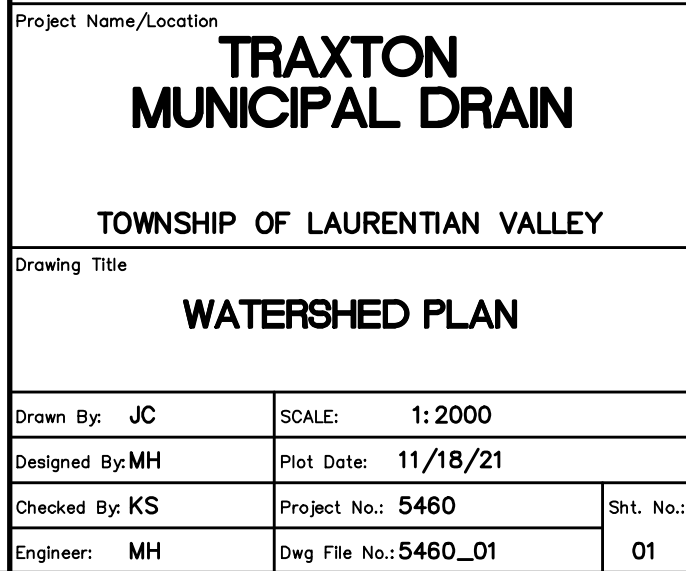
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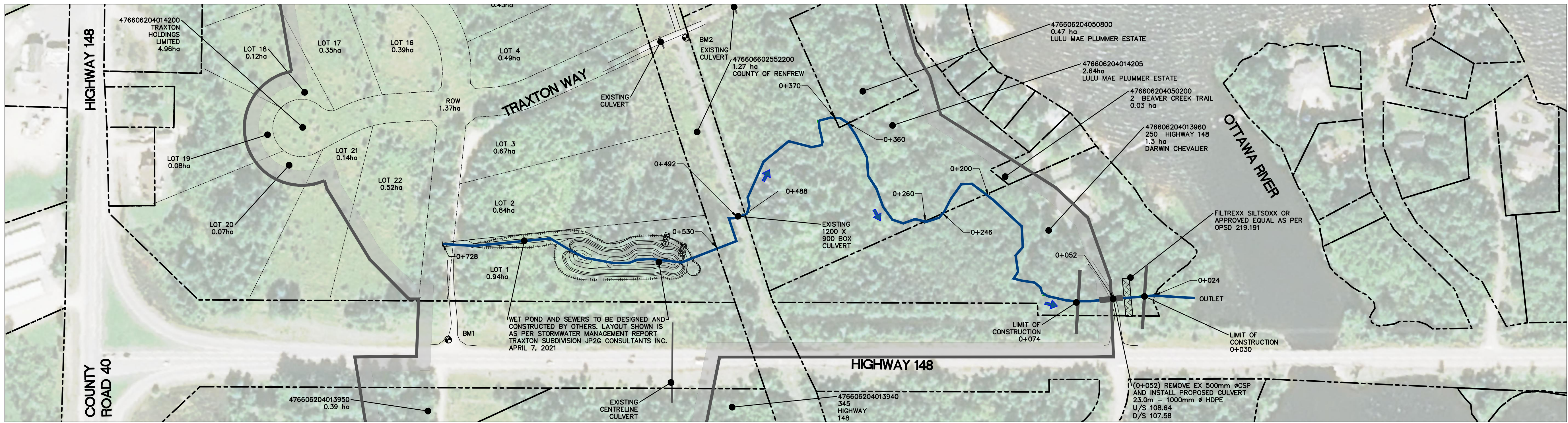
- OPSS/OPSD LIST

<u>OPSD LIST</u>			
No.	REV.	DESCRIPTION	REVISION DATE
802.010 (MODIFIED)	3	FLEXIBLE PIPE EMBEDMENT MODIFICATION AND BACKFILL, EARTH EXCAVATION.....	APRIL 2015



Laurentian
valley





BENCH MARK ELEV.
B.M. 1 - NAIL - 119.14m
B.M. 2 - NAIL - 111.98m

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
1	1st SUBMISSION TO LAURENTIAN VALLEY	10/29/21
2	2nd SUBMISSION TO LAURENTIAN VALLEY	11/19/21

METRIC Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

- PROPERTY LINE
- EXISTING DITCH
- PROPOSED MUNICIPAL DRAIN
- MUNICIPAL DRAIN FLOW DIRECTION
- CATCHMENT BOUNDARY
- ACCESS ROAD
- SILT SOCK

Laurentian valley

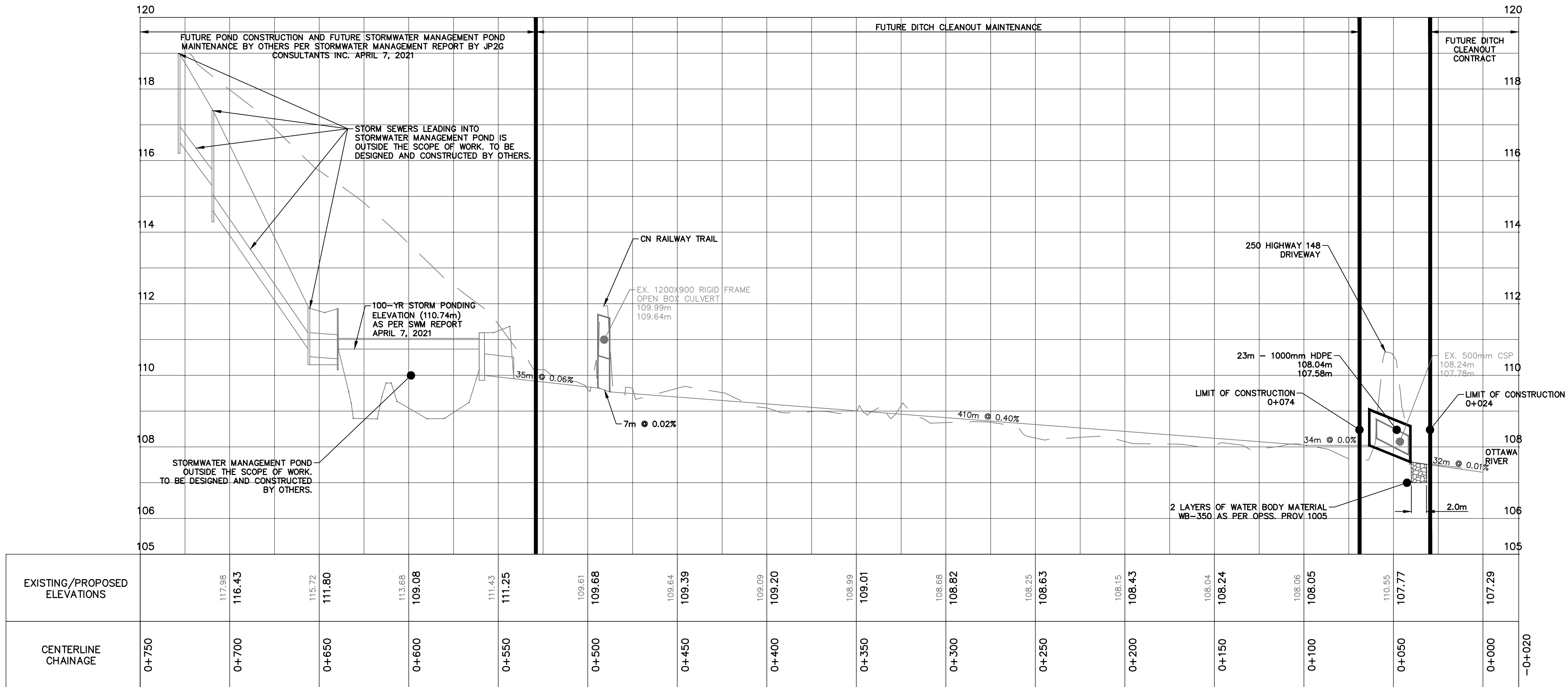
LICENSED PROFESSIONAL ENGINEER
M.J. HOAR
100136811
Nov 19, 2021
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
K.P. SMITH
100149006
Nov 19, 2021
PROVINCE OF ONTARIO

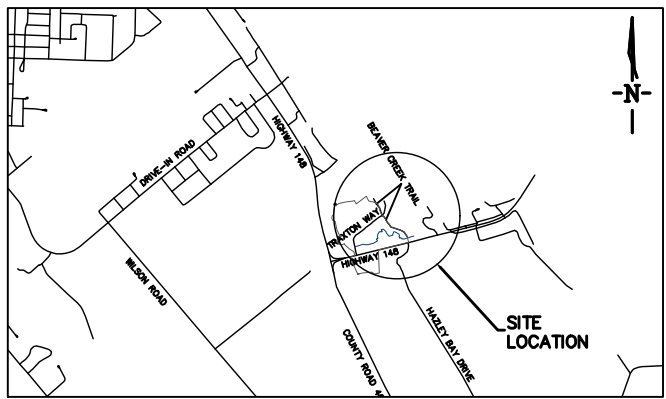
Project Name/Location
TRAXTON MUNICIPAL DRAIN
TOWNSHIP OF LAURENTIAN VALLEY

Drawing Title
PLAN AND PROFILE

Drawn By: JC	SCALE: Horz. 1:1500 Vert. 1:75
Designed By: MH	Plot Date: 11/18/21
Checked By: KS	Project No.: 5460
Engineer: MH	Dwg File No.: 5460_02



KEY PLAN



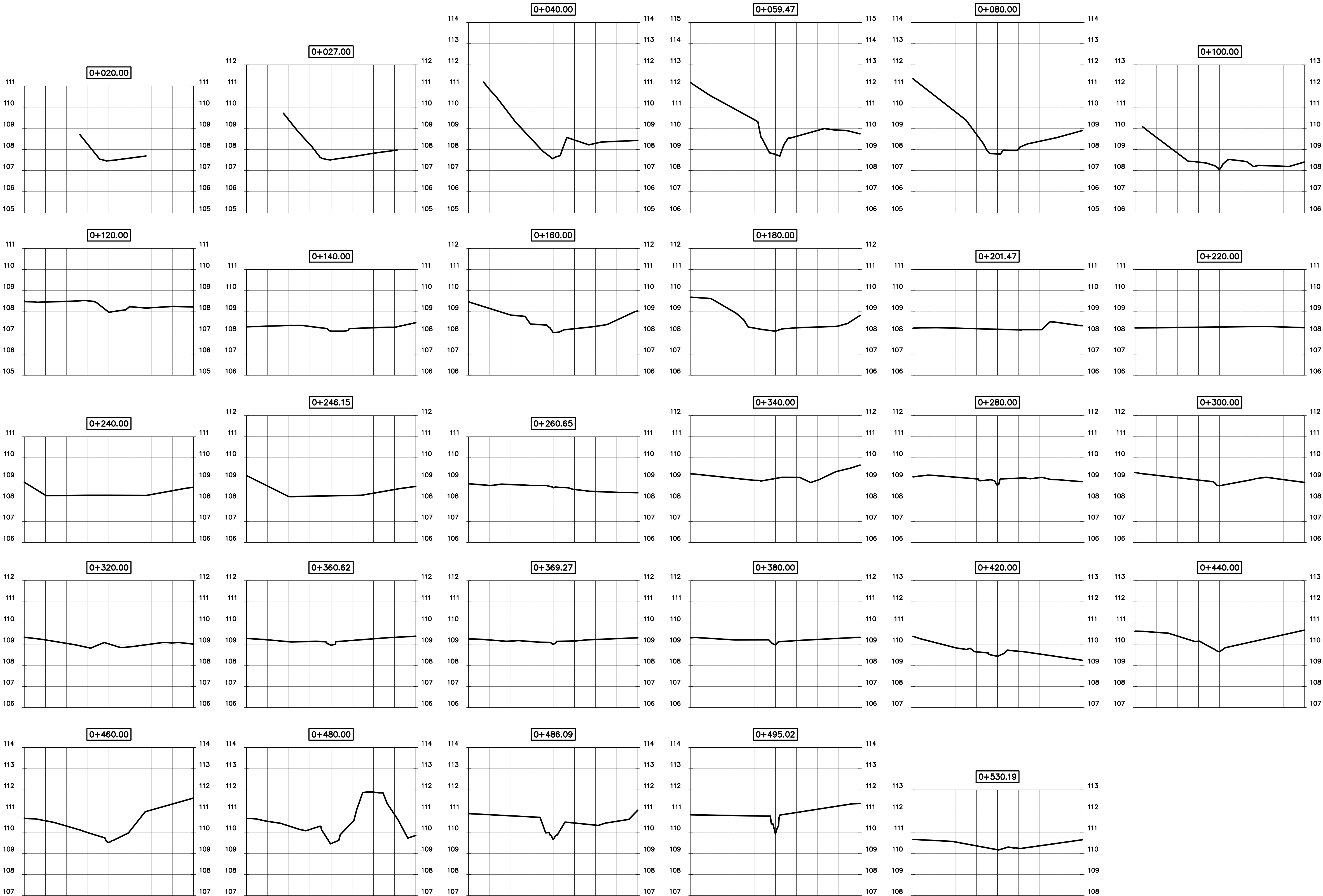
REVISIONS

No.	Description	Date
1	1st SUBMISSION TO LAURENTIAN VALLEY	10/29/21
2	2nd SUBMISSION TO LAURENTIAN VALLEY	11/19/21

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES



Project Name/Location TRAXTON MUNICIPAL DRAIN		
TOWNSHIP OF LAURENTIAN VALLEY		
Drawing Title CROSS SECTIONS		
Drawn By: JC	SCALE: Horz. 1:500	Vert.
Designed By: MH	Plot Date: 11/18/21	
Checked By: KS	Project No.: 5460	Sht. No.:
Engineer: MH	Dwg File No.: 5460_03	03



Appendix D

Special Provisions



Special Provisions

For the Construction of the

Traxton Municipal Drain

D.M. Wills Project Number 21-5460

D.M. Wills Associates Limited

Partners in Engineering, Planning and
Environmental Services
Peterborough

October 2021

Prepared for:

Township of Laurentian Valley

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SPW 001 - Bonding

Performance and Warranty Bond

The Contractor is required to provide a Performance Bond in an amount equal to 50% of the contract price as accepted, for due and proper fulfillment of the Contract and shall remain valid until Completion of the project.

The Bond shall be with a satisfactory Guarantee Surety Company, resident in Canada or authorized to carry on business in Canada.

Labour and Materials Bond

The Contractor is required to provide a Labour and Materials Bond in an amount equal to 50% of the contract price as accepted, for payment of all monies due to the Contractor's suppliers and subcontractors, for materials, equipment, and labour supplied under this Contract for a period of two (2) years after the Substantial Performance of the Contract.

The Surety shall remain liable for a default occurring up to the date of expiry of this bond but shall not be liable for a default occurring subsequent to such expiry date. Notwithstanding the terms of the Contract, non-renewal of the bond shall not be considered a default hereunder.

The Bond shall be with a satisfactory Guarantee Surety Company, resident in Canada or authorized to carry out business within Canada.

SPW 002 - Mobilization and Demobilization

The work consists of the mobilization and demobilization of the Contractor's forces and equipment necessary for performing the work required under the Contract.

Mobilization shall include all activities and associated costs for transportation of Contractor's personnel, equipment, and operating supplies to the site; establishment of field offices, storage facilities, and other necessary general facilities for the contractor's operations at the site.

Security protection of the Contractors field office, equipment and stored materials during the course of the Contract.

Maintenance and repair of all necessary access to the project including haul roads as required and the restoration of the surfaces to the original condition after the haul roads are removed.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the Contract from the site; including the disassembly, removal, and site cleanup of field offices, storage areas, and

other facilities assembled on the site specifically for project construction to original site conditions.

Upon site mobilization 30% of fees shall be paid. Partial release for maintenance works will be at the discretion of the Contract Administrator. Upon demobilization and achievement of Substantial Performance, to the satisfaction of the Contract Administrator, the remaining fees shall be released.

SPW 005 - Removal, Transportation and Disposal of Contaminated Earth Excavation Material (Provisional)

The Contractor shall understand that this item is provisional and shall only apply when site conditions warrant and only to the extent of work involved as determined by the Contract Administrator.

Contaminated earth excavation material may be encountered in the performance of this contract. The contractor shall take the necessary precautions to ensure personal protection under the appropriate governing regulations and the Occupational Health and Safety Act regulations.

The name of the disposal company and disposal destination, as well as, proof of all licensing and certification as required by the Ministry of the Environment and the waste management sites for transportation and disposal and the license plate numbers of all haul trucks shall be provided to the Township of Laurentian Valley a minimum of 24 hours prior to transporting disposable material

The contractor is required to submit copies of all bills of lading from disposal facilities and transfer stations to the contract administrator as proof of compliance.

All soil/earth within or immediately adjacent to the public right-of-way shall be assumed to have levels of Sodium Absorption Ratio (SAR) and Electrical Conductivity (EC) that exceeds the acceptable limits. Therefore, earth excavation material within or adjacent to the right-of-way shall not be considered to be contaminated if the SAR and/or EC limits are exceeded.

Tipping fees for waste management sites are to be included in the unit price bid for the item.

Measurement for Payment - in cubic meters.

Basis of Payment - Payment at the Contract unit price shall be compensation in full for the supply of all labour, equipment, and materials required to completely remove, transport and dispose of any or all contaminated earth excavation material, including any permits, fees or other charges incidental to this item to the satisfaction of the Contract Administrator.

SP 201 - Clearing and Grubbing

Reference: OPSS 201

Work under this item shall conform to OPSS 201. The Contractor shall include in the price bid for this item, all labour, equipment and materials required to remove all trees and shrubs in the work area which are designated for removal as indicated on the drawings or by the Contract Administrator. The Contractor shall carefully cut and trim trees and shrubs as necessary to eliminate any conflicts or damage to existing above ground and underground utilities and nearby structures. All stumps shall be completely removed by the Contractor. All material shall be disposed of by the Contractor. No on site burning will be allowed.

Measurement for payment - Lump Sum.

Basis of Payment - Payment for this item will be a percentage based upon the actual work completed.

SP 206 - Excavation and Grading (Local Disposal)

Reference: OPSS 180, 206 & 510

The contract quantities for earth excavation have been determined from existing ground cross-sections and theoretical design sections. No further measurement for payment will be made unless the Contract Administrator requires a change in grade or removal of additional material. Should this occur, additional payment shall be made as additional quantity over the planned quantity.

The contract unit prices shall include the removal and disposal off-site of all concrete, wood, abandoned services, utilities, and other debris encountered during the course of excavation. All materials to be disposed off-site are to be hauled off-site to a location arranged for by the Contractor and approved by the Contract Administrator. Removal of such materials shall include all plant, equipment and labour to complete the required works.

The Contract unit prices shall include the removal and stockpiling of all surplus material, boulders, and rock slabs up to and including one (1) cubic meter in size to the designated areas as shown on the contract drawings.

The subgrade (Palestine Road) shall be proof rolled, inspected and approved by the City / Contract Administrator's geotechnical engineer prior to the placement of granular materials.

Grading limits and proposed works on private property are subject to the MacEachern Brown Municipal Drain Engineering Report, to which both the Township of Laurentian Valley and the property owners are parties. No adjustments to these works are to be undertaken without prior approval from the Contract Administrator. Spot checks will be taken on the subgrade elevation by the Contract Administrator at regular intervals to

substantiate compliance with the theoretical cross-sections. Work under this item shall also include the following:

- Excavation quantities all cut and cut to fill requirements as indicated on the plan, profile and cross-section drawings.
- Fill quantities include all earth material required to meet the levels, grades and contours of those items noted above, and all other fill requirements as indicated on the plan, profile and cross-section drawings.
- Quantities do not include surplus material from sewer trenches that must also be disposed at location approved by the Township of Laurentian Valley. Payment for disposal of such surplus blow-up material shall be included in the unit rate bid under the appropriate pipe items.
- The unit price for this item shall include all plant, equipment, labour and material to grade ditches to provide positive drainage. The unit price shall be full compensation for all work associated with the grading of ditches, and swales. All work shall be done to the satisfaction of the Township of Laurentian Valley.

Measurement for Payment

1. Volumes have been computed in cubic meters by average theoretical end area method.
2. Theoretical quantity is the basis of final quantity payment with
 - a. slope tolerance of 300mm, and
 - b. grade tolerance of 30mm.
3. No additions or reductions are to be applied within tolerances of 0.2m above or below theoretical.
4. Overcuts outside the 0.2 m tolerance ordered by Selwyn Township will be computed and paid extra over the planned quantity.
5. Undercuts outside the 0.2 m tolerance either ordered by the City or undertaken by the Contractor as his responsibility will be computed and deducted from the planned quantity.

Basis of Payment: The Contractor shall include provision for all associated costs to perform the works identified above, **including** disposal of surplus material off site.

Cross-sections showing both the original ground surface and the proposed construction are included in the contract drawings.

All soil/earth within the public right-of-way shall be assumed to have levels of Sodium Absorption Ratio (SAR) and Electrical Conductivity (EC) that exceeds the acceptable limits. Therefore, earth excavation material within the right-of-way shall not be considered to be contaminated if the SAR and/or EC limits are exceeded. It is the Contractor's responsibility to find a suitable/approved disposal site and no additional claims will be entertained as a result of these elevated levels.

Unsuitable Earth Excavation and Backfill (Provisional)

OPSS 180, 206, 314, 1010

The Contractor shall understand that this item is provisional and shall only apply when site conditions warrant and only to the extent of work involved as determined by the Contract Administrator.

Where soft spots are identified and are local/dry in nature, the Contract Administrator shall instruct the Contractor to sub-excavate such areas to depths and limits as determined by the Contract Administrator or his agent, and to supply and place approved backfill as directed. All costs associated with the sub-excavation, supply, placement, and compaction of granulars, and any disposal of surplus material shall be included in this item.

SP 403 - Rock Excavation (Provisional)

Reference: OPSS 403

The Contractor shall understand that this item is provisional and shall only apply when site conditions warrant and only to the extent of work involved as determined by the Contract Administrator.

This item will only apply when rock is fractured by mechanical means (Blasting will not be permitted). Rock shatter, over-break or item overlap will not be considered for payment. Weathered rock that can be removed by excavation equipment will not be considered for payment.

All rock and large boulders excavated shall be kept onsite.

Rock shall be considered rock under this item regardless of the hardness. No extra payments will be made for the hardness of rock.

Boulders with a volume in excess of 1.0 m³ that are excavated from the trench or road subgrade shall be included in the calculation for payment under this item. No measurement shall be made for boulders less than 1.0 m³.

Measurement of payment as per OPSS MUNI 403.

Basis of Payment – payment at the unit price shall be compensated in full for the removal and disposal of bedrock and large boulders (>1.0m³) that are excavated and removed from the trench or road excavation.

SP 421 - Pipe Culvert Installation in Open Cut

Reference: OPSS 421

All driveway culverts are to be circular galvanized steel with a 2.0 mm thickness and provided with bolt and angle fasteners.

The unit price shall include for the following:

- Excavation for culverts in accordance with OPSS 421 at the locations as indicated on the Contract Drawings.
- Disposal of excavated material to the designated locations shown on the contract drawings, and supply and placement of Granular 'A' pipe embedment and Granular 'A' backfill.

Measurement for Payment – actual quantity of pipe culvert placed in meters.

SP 506 - Dust Control (Provisional)

Reference: OPSS 506

The Contractor shall understand that this item is provisional and shall only apply when site conditions warrant and only to the extent of work involved as determined by the Contract Administrator.

The Contractor shall take such steps as may be required to prevent dust nuisance resulting from his operations either within the right of way or elsewhere or by public traffic where it is the Contractor's responsibility to maintain a roadway through the work.

Where the work requires the sawing of asphalt or the sawing or grinding of concrete, blades and grinders of the wet type shall be used together with sufficient water to prevent the incidence of dust, wherever dust would affect traffic or wherever dust would be a nuisance to residents of the area where the work is being carried out.

The Contractor shall spread Calcium Chloride in a uniform manner to reduce waste.

Measurement for Payment – Payment for Calcium Chloride shall be in kilograms. There will be no payment made for water. There will be no payment for calcium placed on pulverized road.

Basis of Payment – Payment at contract prices shall include all labour, equipment and materials for the supply and application of flaked calcium chloride for dust control as required for trench backfill areas, or directed by the contract administrator.

SP 510 – Removals

Reference: OPSS 510

Work under these items shall also include the following:

- All materials removed that are not specified for salvage, stockpiling, reinstallation and/or relocation, including asphalt, culverts and curb & gutter, manholes,

watermains and sewers, as specified on the Removal Drawings are to be hauled off site to a location arranged for by the Contractor and approved by the Authority. Removal of such materials shall include all labour and equipment to complete the required works.

- Removal of multiple layers of asphalt and concrete including all buried asphalt and concrete.
- Removal, disposal, stockpile, store, separate and reuse existing road granular material for trench backfill (at the Contract Administrators approval).
- All materials to be salvaged are to be stored in a secure location. Salvaged materials that have been damaged due to carelessness by the Contractor are to be replaced by the Contractor at no expense to the Township of Laurentian Valley.
- Any additional costs needed to remove asphalt using a grinding machine (cold planer) shall be included.
- The Contractor is to use extreme care when removing asphalt and granulars at the project limits to prevent uplifting of the adjacent pavement and curb and gutter. Damage to adjacent pavement and curb and gutter due to carelessness by the Contractor, as determined by the Contract Administrator, will be repaired at the Contractors expense.
- Removal of existing drainage pipes sewer pipes as indicated on the Contract Drawings or as directed by the Contract Administrator.
- The Contractor shall saw-cut all asphalt pavement to be removed in order to provide a clean joint.

Basis of Payment - Based on estimated percentage complete, as determined by the Contract Administrator.

SP 511 – Rip-Rap Stone on Filter Cloth

Reference: OPSS 511, 1004, OPSD 810.010 Type "B"

The Contractor shall understand that this item is provisional and shall only apply when site conditions warrant and only to the extent of work involved as determined by the Contract Administrator.

Work under these items shall also include the following:

- Excavation and disposal of the excavated materials.
- Class 1 Geotextile Filter Fabric (Terrafix 360-R or equivalent) supplied and installed in place.
- Supply and place rip-rap stone (100 mm to 150 mm). Note, placement of material shall be completed by hand in such a manner that the surface of the finished river run stone shall have a uniform appearance and be without segregation.

SP 706 - Temporary Traffic Control

Reference: OPSS 706; OTM Book 7. Section H - General Provisions

The Contractor shall include in the Lump Sum (L.S.) price bid for this item, all labour, equipment and materials required to supply, place and maintain all traffic control measures, signing and Traffic Control Person's (TCP's), in conformance with OPSS 706, the Ontario Traffic Manual (OTM), Book 7, "Temporary Conditions", MTO requirements, and the Occupational Health & Safety Act (OHSA), Regulations 213/91 and 145/00.

The Contractor is to submit a traffic management plan that conforms to the above, to the Contract Administrator for review prior to the commencement of work. The traffic control plan shall be submitted a minimum of two (2) weeks prior to any work taking place.

The Contractor must maintain vehicular access to all businesses, residences, etc., at all times and must be 100% accessible at the end of each construction day.

Maintaining access to all properties and their parking areas may involve constructing temporary entrances, temporary ramping, blocking only one (1) driveway at a time, or carrying out such Work as may be required to provide the minimum amount of disruption.

The Contractor may be permitted to temporarily block normal vehicular access to the properties and respective parking areas, as approved, if the Contractor can either provide alternative or limited access which is acceptable to the respective property owners. All such arrangements and provisions must be approved by the Contract Administrator in writing.

All pedestrian traffic within the Contract limits must be maintained at all times during construction. The Contractor shall supply and place ramps to provide access for pedestrians to houses, and other locations as required, if normal access has been blocked as a result of construction.

The Contractor shall be responsible for maintaining all road cuts and disturbed areas during evenings and weekends including supply and place cold mix asphalt or hot mix asphalt on road cuts as directed by the Contract Administrator throughout the full duration of construction.

At all times the Contractor shall maintain one (1) lane of vehicular traffic during working hours and two (2) lanes of vehicular traffic during non-working hours. Traffic shall be under control of qualified Traffic Control Persons during all traffic restrictions.

Any remedial work shall be completed by the Contractor within 24 hours of being notified. Should the Contractor fail to comply, the Township of Laurentian Valley will arrange to have the works completed and deduct all associated costs from the Contractor's payment.

Measurement for Payment - Lump Sum.

Basis of Payment – Per OPSS 706.10.02

SP 804 - Seed and Cover

Reference: OPSS 804

Work under this item shall include the following:

- Supply and placement of seed and mulch as per the drawings or as directed by the Contract Administrator.
- Seed shall be MTO mix seed.

Measurement for Payment – per square meter (m²)

Basis for Payment – 50% upon successful supply and placement. 50% upon established full growth.

SP 805 - Erosion and Sediment Control

Reference: OPSS 805. OPSD 219.110 and 219.100

Light Duty Silt Fence

The unit price for this item shall include all plant, equipment, labour and material to supply, install, maintain and remove the siltation control fence system as shown on the drawings or as directed by the Contract Administrator, prior to the commencement of earthworks and underground servicing.

The Contractor shall, at all times, prevent sediment from entering private property. The Contractor shall advise the City / Contract Administrator of any locations where siltation control fence may be required, for approval prior to installation.

The siltation fence shall be Dominion Textile (Envirofence), or an approved equivalent.

The scope of work includes:

- Excavation to facilitate installation of silt fence prior to any construction commencement at locations shown on Contract Drawings and around stockpiles or as indicated by the Contract Administrator.
- Maintenance of silt fence and reinstatement as required during construction or as indicated by the Contract Administrator.
- Removal of all material related to the above work offsite upon successful restoration as determined by the Contract Administrator.
- Restore ground surface to original state once silt fence has been removed.

Measurement for payment - per meter (m) of silt fence installed.

Basis of Payment - Per OPSS 805.10.01

Terrifix Silt Sock

Terrifix Silt Sock shall be installed as detailed on the plans or as directed by the Contract Administrator, and shall be installed at the locations noted on the plans. The Contractor shall include in the price bid for this item, all labour, equipment and materials required to install, maintain until all surfaces are stabilized and removal. The Contractor shall include all costs for disposal of all materials off-site. The Terrifix Silt Sock shall be installed in accordance with the manufacturer's recommendations.

Measurement for payment – per meter (m) of silt sock installed.

Basis of Payment: Per OPSS 805.10.01

SP 1010 – Aggregates – Base, Subbase, Select Subgrade and Backfill Material

Granular B

Reference: OPSS 314, 501, and 1010

The scope of work shall include:

- Preparing and proof rolling of road subgrade to the satisfaction of the Contract Administrator prior to placement of any Granular 'B' Type I or approved equivalent.
- Supply, place, fine grade and compact Granular "B" Type I to 100% of material's Standard Proctor Maximum Dry Density (SPMDD).
- Application of water and/or calcium chloride for compaction and/or dust control.

The Contractor shall submit a representative sample and a gradation of the proposed Granular 'B' material two (2) weeks prior to placing. If the gradation analysis fails, the Contractor shall stop operations immediately and pay for all subsequent testing until an acceptable result sample is achieved.

Granular 'B' that becomes contaminated due to Contractor's activity shall be removed and replaced at the Contractor's expense.

No additional payment will be made for the supply of water required for compaction and/or dust control.

Measurement for payment will be actual quantity installed and the unit of measurement is square metres.

Payment at the Contract unit price shall be full compensation for all labour, equipment and material required to perform the work.

Granular A

Reference: OPSS 314, 501, and 1010

The scope of work shall include:

- Preparing and proof-rolling of Granular "B" in Roadway and/or Subgrade in Driveways to the satisfaction of the Contract Administrator prior to placement of any Granular "A".
- Supply, place, fine grade and compact 150 mm of Granular "A" in Roadway compacted to 100% of materials SPMDD.
- Application of water and/or calcium chloride for compaction and/or dust control.

Work to be in accordance with OPSS 314.

The Contractor shall submit a representative sample and a gradation of the proposed Granular "A" material two (2) weeks prior to placing. If the gradation analysis fails, the contractor shall stop operations immediately and pay for all subsequent testing until an acceptable result sample is achieved.

Granular "A" that becomes contaminated due to Contractor's activity, shall be removed and replaced at the contractors expense.

No additional payment will be made for the supply of water required for compaction and/or dust control.

Measurement for payment will be actual quantity installed and the unit of measurement is square metres.

Payment at the Contract unit price shall be full compensation for all labour, equipment and material required to perform the work.

Gravel Driveway

Reference: OPSS 301, 314, 501, and 1010

Residential or commercial driveways having existing gravel access shall be restored to a state similar or better than pre-construction conditions and shall remain gravel unless otherwise agreed.

Excavate, supply, place, fine grade and compact 150 mm of Granular "A" in Residential Gravel Driveways compacted to 100% of materials where existing driveways have been disturbed.

Measurement for payment – actual quantity of granular A placed and the unit of measurement is square meters (m²).

Basis of payment – All labour, equipment and material required to excavate and dispose of surplus material and supply, place, grade and compact 150 mm imported.

Appendix E

Construction Specifications



**Specification for the Construction of
Municipal Drain Works**

D.M. Wills Project Number 21-5460

D.M. Wills Associates Limited
Partners in Engineering, Planning and
Environmental Services
Peterborough

November 2021

**Prepared for:
Township of Laurentian Valley**

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Section A General

A.1 Scope

The work to be done under this specification consists of supplying all labour, materials and equipment to construct the work as outlined on the drawing(s). In some Municipalities, the Contractor shall supply all materials while in other Municipalities, they shall supply only certain materials, the form of Tender and Agreement lists which materials are to be supplied by the Contractor.

A.2 Tender

Tenders are to be submitted on a lump sum basis for the complete works or a portion thereof, as set out in the Form of Tender and Agreement.

A.3 Drawings and Specifications

The tenderer must satisfy himself that he understands the meaning and Intent of the drawings and specifications before submission of his tender. The standard specifications have been separated into sections for reference purpose only. They shall be considered complementary and, where a project is controlled under one of the sections, the remaining sections will still apply for miscellaneous works. In case of any inconsistency or conflict in the Tender Documents, the following order of precedence shall apply:

- Contract Drawings
- Form of Tender and Agreement
- General Conditions
- Standard Specifications (Open Drain, Tile Drain, Specifications for Municipal Drain Crossing County Roads)
- Standard Drawings

A.4 Errors and Unusual Conditions

The Contractor shall notify the Engineer immediately of any error or unusual condition which may be found. Any attempt by the Contractor to make changes because of the error or unusual condition on his own shall be done at their own risk. Any additional cost incurred by the Contractor to remedy a wrong decision on their part shall be borne by the Contractor.

The Engineer shall make the alteration necessary to correct errors or to adjust for unusual conditions during which time it will be the Contractor's responsibility to keep their workers and equipment gainfully employed elsewhere on the project. The contract amount shall be adjusted in accordance with a faire valuation of the work added or deleted.

A.5 Payment

1. Except as herein provided, payments under this Contract will be made in accordance with GC8.02.04.
2. The Contractor shall submit a draft invoice for each progress payment application five (5) days prior to the first (1st) day of each month for review and approval by the Contract Administrator.
3. A proper invoice shall be submitted to the Contract Administrator within two (2) days of the approval of the draft invoice, and shall be in accordance with the Construction Act Part I.1 (s 6.1). A proper invoice shall only be considered when the following conditions have been met:
 - a. The Contract Administrator has agreed to the draft invoice, and the date on the proper invoice is current with the date the draft invoice was agreed upon.
 - b. A current WSIB Clearance Certificate has been received.
 - c. A Statutory Declaration has been received.
 - d. An updated construction Schedule identifying the critical path of the project has been received.
4. Should the Contract Administrator disagree with any part of the proper invoice for any reason, a Notice of Dispute will be submitted to the Contractor within two (2) days of the receipt of a proper invoice in accordance with the Construction Act (s 6.4).
5. All interim monthly certificates are not conclusive as to the value or quality of services provided and payment certificates are subject to reopening and readjustment.
6. The Owner shall have the right to withhold from any sum otherwise payable to the Contractor such amount as may be sufficient to remedy any defect or deficiency in the work pending correction of it.

A.6 Warranty Holdback and Payment

1. GC7.16.02, is hereby revised by the addition of the following, "...the Contractor shall correct promptly, within 48 hrs of written notification, at no additional cost to the Owner,..."
2. A holdback, the Warranty Holdback, will be applied to the contract amount that is separate from the Statutory Holdback amounts under the Construction Act and without prejudice to any other rights the Owner may have at law, in equity or in contract. Beginning with and continuing for all amounts in excess of 97% of the final Contract Amount, the Owner will retain from payment an amount equal to 3% of the Contract Amount. This amount shall be held by the Owner as a surety for the timely and complete correction by the Contractor, defects identified by the Owner during the period associated with the Warranty as described in GC 7.16.

3. In the event the Contractor fails to comply promptly with GC 7.16 or any other obligations under the Contract, the Owner may make arrangements for the performance of any necessary work in relation to the Contractor's obligations under the Contract, and may recover the costs from the Warranty Holdback funds.
4. The Warranty Holdback, less any deductions made therefrom as required, will be paid to the Contractor upon the expiration of the later of the Warranty Period and Final Acceptance. Interest upon retained amounts shall accrue to the benefit of the Owner.

A.7 Superintendent

The word "Superintendent", as used hereinafter in these specifications, shall refer to a Drainage Superintendent, appointed by the Municipality. The Superintendent will act as the Engineer's representative. The Superintendent shall have the power to direct the execution of the work and to make any necessary minor adjustments. Adjustments in tile sizes or gradients shall not be made without the approval of the Engineer. Any Instructions given by the Superintendent, which changes considerably the proposed work or with which the Contractor does not agree, shall be referred to the Engineer for his decision.

A.8 Commencement and Completion of Work

The work must commence immediately after the Contractor is notified of the acceptance of his tender or at a later date, if set out as a condition of the tender. If weather creates poor ground or working conditions the Contractor may be required, at the discretion of the Engineer, to postpone or halt work until conditions become acceptable.

The contractor must arrange for a preconstruction meeting to be held on the site with the Contractor and affected owners attending to review in detail the construction scheduling, access and other pertinent details. The Contractor's costs for attending this meeting shall be included in his lump sum tender price. If the Contractor leaves the job site for a period of time after initiation of work, he shall give the Engineer and the Superintendent a minimum of 24 hours' notice prior to returning to the project.

The work must be proceeded with in such a manner as to ensure its completion at the earliest possible date and within the time limit set out in the tender or in the contract documents.

A.9 Working Area and Access

The working area available to the Contractor to construct the drain and related works including an access route to the drain shall be as specified on the drawings.

Should the specified widths become inadequate due to unusual conditions, the Contractor shall notify the Engineer immediately in order that negotiations with the affected owners can take place.

Where a Contractor exceeds the specified widths due to the nature of their operations and without authorization, they shall be held responsible for the costs of all additional damages and the amount shall be deducted from their contract price and paid to the affected owners by the Municipality.

A.10 Inspection

Final inspection by the Engineer will be made within 20 days after they have received notice in writing from the Contractor that the work is complete.

Periodic inspections by the Engineer or Superintendent will be made during the performance of the work. These interim inspections are required to check such items as location of drainage course and structures, tile grades prior to backfilling, backfilling and miscellaneous work items

A.11 Alterations and Additions

The Engineer shall have the power to make alterations in the work shown or described in the drawings or specifications and the Contractor shall proceed to make such changes without causing delay. In every such case, the price agreed to be paid for the work under the contract shall be increased or decreased as the case may require according to a fair and reasonable valuation of the work added or deleted. The valuation shall be determined as a result of negotiations between the Superintendent, the Contractor, and the Engineer, but in all cases, the Engineer shall maintain the final responsibility for the decision. Such alterations and variations shall in no way render void the contract. No claim for variations or alterations in the increased or decreased price shall be valid unless done in pursuance of an order from the Engineer and/or Superintendent and notice of such claims made in writing before commencement of such work. In no case shall the Contractor commence work which he considers to be extra work before receiving the Engineer's and/or Superintendent's approval in writing.

A.12 Maintenance

The Contractor shall repair and make good any damages or faults in the drain that may appear within one (1) year after its completion (as dated on the final completion certificate) as the result of imperfect or defective work done or materials furnished by the Contractor. Nothing herein contained shall be construed as in any way restricting or limiting the liability of the Contractor under the laws of the Country, Province or Locality in which the work is being done.

A.13 Insurance

1. As per GC 6.03.01, the Contractor shall provide Commercial General Liability and Automobile Insurance.
2. The Contractor shall provide proof of insurance within 10 business days after Contract execution.

3. The Contractor shall provide Commercial General Liability Insurance on an occurrence basis for third party bodily injury, personal injury, and property damage with a minimum inclusive limit of \$5,000,000.00 per occurrence with \$2,000,000.00 products and completed operations aggregate.
4. The Contractor shall name the following as additional insured under the General Liability policy;
 - a. The Township of Laurentian Valley
 - b. D.M. Wills Associates Limited

A.14 Permits, Notices, Laws and Rules

The Contractor shall ensure that all necessary permits or licenses required for the execution of the work have been obtained (but this shall not include MTO encroachment permits, County Road Permit, permanent easements or rights of servitude). The Contractor shall give all necessary notices and pay all fees required by law and comply with all laws, ordinances, rules and regulations (including the Occupational Health and Safety Act) relating to the work and to the preservation of the public's health and safety and if the specifications and drawings are at variance therewith, any resulting additional expenses incurred by the Contractor shall constitute an addition to the contract price.

A.15 Road Crossings

General

1. Scope: These specifications apply to all road crossings - Municipal, County, Regional, or Highway Roads. Where the word "Authority" is used, it shall be deemed to apply to the appropriate owning authority. These specifications in no way limit the Authority's Specifications and Regulations governing the construction of drains on their Road Allowance. The Authority will supply no labour, equipment or materials for the construction of the road crossing unless otherwise noted on the drawings.
2. Road Occupancy Permit: Where applicable the Contractor must submit an Application for a Road Occupancy Permit to the Authority and allow a minimum of five (5) working days (exclusive of holidays) for its review and issuance.
3. Road Closure Request and Construction Notification: The Contractor shall submit written notification of construction and request for road closure (if applicable) to the Road Authority/Public Works Manager and the Drainage Engineer or Superintendent for review and approval a minimum of five (5) working days (exclusive of holidays) prior to proceeding with any work on road allowance. It shall be the Road Authority's responsibility to notify all the applicable emergency services, schools, etc. of the road closure or construction taking place.
4. Traffic Control: Where the Contractor is permitted to close the road to through traffic, the Contractor shall provide for and adequately sign the detour route to the satisfaction of the Road Authority. Otherwise, the Contractor shall keep the road

open to traffic at all times. The Contractor shall provide, for the supply, erection and maintenance, suitable warning signs and/or flagmen in accordance with the Manual of Uniform Traffic Control Devices and to the satisfaction of the Road Authority to notify the motorists of work on the road ahead.

5. Site Meeting/Inspection: A site meeting shall be held with the affected parties to review in detail the crossing and/or its related works. The Authority's Inspector and/or the Drainage Engineer will inspect the work while in progress to ensure that the work is done in strict accordance with the specifications.
6. Weather: No construction shall take place during inclement weather or periods of poor visibility.
7. Equipment: No construction material and/or equipment is to be left within three (3) metres of the edge of pavement overnight or during periods of inclement weather.

Open Cut

1. Material: The culvert or sub-drain crossing pipe material shall be specified on the drawings.
2. Site Preparation and Excavation: Where necessary, fences shall be carefully taken down as specified in the general conditions. Prior to any excavation taking place, the areas which will be disturbed shall be stripped of topsoil. The topsoil is to be stockpiled in locations away from the construction area.
3. Installation: The pipe shall be installed using bedding and cover material in accordance with detailed design drawings or detail provided on drawings.
4. Unstable Soil or Rock: The Contractor shall contact the Engineer immediately should unstable soil be encountered or if boulders of sufficient size and number to warrant concern are encountered.
5. Tile Connections: Prior to commencement of backfilling, all tiles encountered in excavations shall be reconnected using material of a size comparable to the existing material. Where the excavation is below the tile grade, a compacted granular base is to be placed prior to laying the tile. Payment for connections not shown on the drawings shall be an extra to the contract.
6. Backfill: Backfill from the top of the cover material up to the underside of road base shall meet the requirements for MTO Granular "B". The backfill shall be placed in lifts not exceeding 300 mm in thickness and each lift shall be thoroughly compacted to produce a density of 98% Standard Proctor. Granular "B" road base for County Roads and Highways shall be placed to a 450 mm thickness and Granular "A" shall be placed to a thickness of 200 mm, both meeting MTO requirements. Granular road base materials shall be thoroughly compacted to produce a density of 100% Standard Proctor.

Where the road surface is paved, the Contractor shall be responsible for placing an HL-4 Hot Mix Asphalt patch of the same thickness as the existing pavement. The asphalt patch shall be flush with the existing roadway on each side and not overlap. If specified, the asphalt patch shall not be placed immediately over the road base and the Granular "A" shall be brought up flush with the existing asphalt

and a liberal amount of calcium chloride shall be spread on the gravel surface. The asphalt patch must be completed within the time period set out on the drawing.

The excavated material from the trench beyond a point 2.5 metres from the travelled portion or beyond the outside edge of the gravel shoulder, may be used as backfill in the trench in the case of covered drains. This material should be compacted in layers not exceeding 600 mm.

A.16 Surplus Excavated Material and Gravel

Excess excavated material from open cut installation through roads, railways, laneways and lawn/grass areas, shall be disposed of on-site by the Contractor as part of their lump sum installation price. If as a result of any work, gravel or crushed stone is required and not all the gravel or crushed stone is used in the construction of the works, the Contractor shall haul away such surplus gravel or stone unless otherwise approved.

A.17 Fences

No earth shall be placed against fences and all fences removed by the Contractor are to be replaced by him in as good condition as found. In general, the Contractor will not be allowed to cut existing fences but shall disconnect existing fences at the nearest anchor post or other such fixed joint and shall carefully roll it back out of the way. Where the distance to the closest anchor post or fixed joint exceeds 50 metres, the Contractor will be allowed to cut and splice in accordance with accepted methods and to the satisfaction of the owner and the Engineer or Superintendent. Where existing fences are deteriorated to the extent that existing materials are not salvageable for replacement, the Contractor shall notify the Engineer or the Superintendent prior to dismantling. Fences damaged beyond salvaging by the Contractor's negligence shall be replaced with new materials, similar to those existing, at the Contractor's expense. The replacement of the fences shall be done to the satisfaction of the owner and the Engineer or Superintendent. The site examination should indicate to the Contractor such work, if any, and an allowance should be made in the tendered price. The Contractor shall not leave any fence open when he is not at work in the immediate vicinity.

A.18 Livestock

The Contractor shall provide each property owner with 48 hours' notice prior to removing any fences along fields which could possibly contain livestock. Thereafter, the property owner shall be responsible to keep all livestock clear of the construction areas until further notified. Where necessary, the Contractor will be directed to erect temporary fences. The Contractor shall be held responsible for loss or injury to livestock or damage caused by livestock, where the injury or damage is caused by his failure to notify the property owner or through negligence or carelessness on the part of the Contractor.

The Contractor constructing a tile drain shall not be held responsible for damages or injury to livestock occasioned by leaving trenches open for inspection by the Engineer if he notifies the owner at least 48 hours prior to commencement of the work on that portion. The Contractor will be held liable for such damages or injury if the backfilling of such trenches is delayed more than one (1) day after acceptance by the Engineer.

A.19 Standing Crops

The Contractor shall not be held responsible for damages to standing crops within the working area available and the access route provided if he notifies the owner thereof at least 48 hours prior to commencement of the work on that portion.

A.20 Surplus Gravel

If as a result of any work, gravel or crushed stone is required and not all the gravel or crushed stone is used in the construction of the works, the Contractor shall haul away such surplus gravel or stone unless otherwise approved.

A.21 Railways, Highways, Utilities

A minimum of 48 hours' notice to Railways, Highways and Utilities, exclusive of Saturdays, Sundays and Holidays, shall be required by the Contractor prior to any work being performed and in the case of a pipe being installed by open cutting or boring under a Highway or Railway, a minimum of 72 hours' notice is required.

A.22 Utilities

The attention of the Contractor is drawn to the presence of utilities along the course of the drain. The Contractor will be responsible for determining the location of all utilities and will be held liable for any damage to all utilities caused by his operations. The Contractor shall co-operate with all authorities to ensure that all utilities are protected from damage during the performance of the work. The cost of any necessary relocation work shall be borne by the utility. No allowance or claims of any nature will be allowed on account for delays or inconveniences due to utilities relocation, or for inconveniences and delays caused by working around or with existing utilities not relocated

A.23 Iron Bars

The Contractor shall be held liable for the cost of an Ontario Land Surveyor to replace any iron bars destroyed during the course of construction.

A.24 Stakes

At the time of the survey, stakes are set along the course of the drain at intervals of 50 metres. The Contractor shall ensure that the stakes are not disturbed unless approval is obtained from the Engineer. Any stakes removed by the Contractor without the authority of the Engineer, shall be replaced at the expense of the Contractor. At the

request of the Contractor, any stakes which are removed or disturbed by others or by livestock, shall be replaced at the expense of the drain.

A.25 RIP-RAP

Rip-rap shall be specified on the drawings and shall conform to the following:

1. Quarry Stone: shall range in size from 150 mm to 300 mm evenly distributed and shall be placed to a 300 mm thickness on a filter blanket at a 1.5 to 1 slope unless otherwise noted. Filter blanket to be Terrafix 270R or approved equal.

A.26 Restoration of Lawns

1. General: Areas noted on the drawings to be restored with seeding or sodding shall conform to this specification, and the Contractor shall allow for all costs in his lump sum bid for the following works.
2. Topsoil: Prior to excavation, the working area shall be stripped of existing topsoil. The topsoil stockpile shall be located so as to prevent contamination with material excavated from the trench. Upon completion of backfilling operations, topsoil shall be spread over the working area to a depth equal to that which previously existed but not less than the following:
 - a. Seeding and sodding - minimum depth of 100 mm
 - b. Gardens - minimum depth of 300 mm

In all cases where a shortfall of topsoil occurs, whether due to lack of sufficient original depth or rejection of stockpiled material due to Contractor's operations, imported topsoil from acceptable sources shall be imported at the Contractor's expense to provide the specified depths. Topsoil shall be uniformly spread, graded, and cultivated prior to seeding or sodding. All clods or lumps shall be pulverized, and any roots or foreign matter shall be raked up and removed as directed.

3. Sodding .
 - a. Materials: Nursery sod to be supplied by the Contractor shall meet the current requirements of the Ontario Sod Growers Association for No. 1 Bluegrass Fescue Sod.
 - b. Fertilizer: Prior to sod placement, approved fertilizer shall be spread at the rate of 5 kg/100 m² of surface area and shall be incorporated into such surfaces by raking or harrowing. All surfaces on which sod is to be placed shall be loose at the time of placing sod to a depth of 25 mm.
 - c. Placing Sod: Sod shall be laid lengthwise across the face of slopes with ends close together. Sod shall be counter sunk along the joints between the existing grade and the new sodding to allow for the free flow of water across the joint. Joints in adjacent rows shall be staggered and all joints shall be pounded and rolled to a uniform surface.

On slopes steeper than 3 to1, and in unstable areas, the Engineer may direct the Contractor to stake sod and/or provide an approved mesh to prevent slippages. In all cases where such additional work is required, it will be deemed an extra to the contract and shall be paid for in accordance with the General Conditions. No sod shall be laid when frozen nor upon frozen ground nor under any other condition not favourable to the growth of the sod. Upon completion of sod laying the Contractor shall thoroughly soak the area with water to a depth of 50 mm. Thereafter it will be the responsibility of the property owner to maintain the area in a manner so as to promote growth.

4. Seeding: Seed to be supplied by the Contractor shall be "high quality grass seed" harvested during the previous year, and shall be supplied to the project in the supplier's original bags on which a tag setting out the following information is affixed:

- a. Year or Harvest recommended rate of application
- b. Type of Mixture fertilizer requirements

Placement of seed shall be by means of an approved mechanical spreader. All areas on which seed is to be placed shall be loose at the time of placing seed, to a depth of 25 mm. Seed and fertilizer shall be spread in accordance with the supplier's recommendations unless otherwise directed by the Engineer. Thereafter it will be the responsibility of the property owner to maintain the area in a manner so as to promote growth.

5. Settlement: The Contractor shall be responsible during the one (1) -year guarantee period for the necessary repair of restored areas due to trench settlement. Areas where settlement does not exceed 50 mm may be repaired by top dressing with fine topsoil. In areas where settlement exceeds 50 mm, the Contractor will be required to backfill the area with topsoil and restore with seeding and/or sodding as originally specified.

A.27 Restoration of Roads and Laneways

1. Gravel: Restoration shall be in accordance with the applicable standard detailed drawing or as shown on the drawings.

Section B Open Drain

B.1 Profile

The profile drawing shows the depth of cuts from the ground beside the stake to the final invert of the ditch in metres and decimals of a metre and also the approximate depth of cuts from the existing bottom of the ditch to the elevation of the ditch bottom. These cuts are established for the convenience of the Contractor; however, benchmarks will govern the final elevation of the drain. Benchmarks have been established along the course of the drain and their locations and elevations are noted on the profile drawing. A uniform grade shall be maintained between stakes in accordance with the profile drawing.

B.2 Alignment

The drain shall be constructed in a straight line and shall follow the course of the present drain or water run unless otherwise noted on the drawings. Where it is necessary to straighten any bends or irregularities in alignment not noted on the drawings, the Contractor shall contact the Engineer or Drainage Superintendent before commencing the work.

B.3 Clearing and Grubbing

Prior to commencement of work, all trees, scrub, fallen timber and debris shall be removed from the side slopes of the ditch and for such a distance on the working side so as to eliminate any interference with the construction of the drain or the spreading of the spoil. The side slopes shall be neatly cut and cleared flush with slope whether or not they are affected directly by the excavation. With the exception of large stumps causing damage to the drain, the side slope shall not be grubbed. All other cleared areas shall be grubbed and the stumps put into piles for disposal by the owner.

All trees or limbs 150 mm (6") or larger, that it is necessary to remove, shall be considered as logs and shall be cut and trimmed, and left in the working width separate from the brush, for use or disposal by the owner. Trees or limbs less than 150 mm in diameter shall be cut in lengths not greater than 5 metres and placed in separate piles with stumps spaced not less than 75 metres apart in the working width, for the use or disposal of the owner. In all cases, these piles shall be placed clear of excavated materials, and not be piled against standing trees. No windrowing will be permitted. The clearing and grubbing and construction of the drain are to be carried out in two (2) separate operations and not simultaneously at the same location.

B.4 Excavation

The bottom width and the side slopes of the ditch shall be those shown on the profile drawing.

Unless otherwise specified on the drawings, only the existing ditch bottom is to be cleaned out and the side slopes are not to be disturbed. Where existing side slopes

become unstable because of construction, the Contractor shall immediately contact the Engineer or Superintendent. Alternative methods of construction and/or methods of protection will then be determined, prior to continuing the work.

B.5 Excavated Material

Excavated material shall be deposited as shown on the detailed design drawings or as directed by the Engineer or Superintendent. A buffer strip of not less than 3 metres in width through farmed lands and 2 metres in width through bush areas shall be left along the top edges of the drain. The buffer strip shall be seeded and/or incorporated as specified on the drawings. The material shall be deposited beyond the specified buffer strip.

No excavated material shall be placed in tributary drains, depressions, or low areas which direct water into the ditch so that water will be trapped behind the spoil bank. The excavated material shall be placed and levelled to a maximum depth as shown on the detailed design drawings, unless instructed otherwise. The edge of the spoil bank away from the ditch shall be feathered down to the existing ground; the edge of the spoil bank nearest the ditch shall have a maximum slope of 2 to 1. The material shall be levelled such that it may be cultivated with ordinary farm equipment without causing undue hardship on machinery and personnel. No excavated material shall cover any logs, scrub, debris, etc. of any kind.

Where it is necessary to straighten any unnecessary bends or irregularities in the alignment of the ditch, the excavated material from the new cut shall be used for backfilling the original ditch. Regardless of the distance between the new ditch and the old ditch no extra compensation will be allowed for this work and must be included in the Contractor's lump sum price for the open work.

Any stones 150 mm or larger left exposed on top of the levelled excavated material shall be removed and disposed of as an extra to the contract unless otherwise noted on plans.

B.6 Excavation through Bridges and Culverts

The Contractor shall excavate the drain to the full specified depth and width under all bridges. Where the bridge or culvert pipe is located within a road allowance, the excavated material shall be levelled within the road allowance. Care shall be taken not to adversely affect existing drainage patterns. Temporary bridges may be carefully removed and left on the bank of the drain but shall be replaced by the Contractor when the excavation is completed unless otherwise specified. Permanent bridges must be left intact. All necessary care and precautions shall be taken to protect the structure. The Contractor shall notify the Engineer or Superintendent if excavation may cause the structure to undermine or collapse.

B.7 Pipe Culverts

Where specified on the drawings, the existing culvert shall be carefully removed, salvaged and either left at the site for the owner or reinstalled at a new grade or location. The value of any damage caused to the culvert due to the Contractor's negligence in salvage operation will be determined and deducted from the contract price.

B.8 Moving Drains off Roads

Where an open drain is being removed from a road allowance, it must be reconstructed wholly on the adjacent lands with a minimum distance of 1.0 metre between the property line and the top of the bank, unless otherwise noted on the drawings. The excavated material shall be used to fill the existing open ditch and any excess excavated material shall be placed and levelled on the adjacent lands beyond the buffer strip, unless otherwise noted. Any work done on the road allowance, with respect to excavation, disposal of materials, installation of culverts, cleaning under bridges, etc., shall be to the satisfaction of the Road Authority and the Engineer.

B.9 Tributary Outlets

The Contractor shall guard against damaging the outlets of tributary drains. Prior to commencement of excavation on each property the Contractor shall contact the owner and request that all known outlet pipes be marked by the owner. All outlets so marked or visible or as noted on the profile, and subsequently damaged by the Contractor's operations will be repaired by the Contractor at his cost. All outlet pipes repaired by the Contractor under direction of the Drainage Superintendent or Engineer which were not part of the Contract shall be considered an extra to the contract price.

B.10 Temporary Sediment Basins

The Contractor shall excavate sediment basins prior to commencement of upstream work as shown on the plan and profile. The dimension of the basin will be in a parabolic shape with a depth of 450 mm below the proposed ditch bottom and the basin will extend along the drain for a minimum length of 15 metres. A sediment trap 300 mm deep and 5 metres long with silt fence placed across ditch bottom on the downstream end of the trap shall be constructed prior to and maintained during construction, to prevent silt from flushing downstream. The silt fence shall be removed and disposed of after construction.

B.11 Seeding

1. Delivery: The materials shall be delivered to the site in the original unopened containers which shall bear the vendor's guarantee of analysis and seed will have a tag showing the year of harvest.

2. Hydro Seeding: Areas specified on drawings shall be hydro seeded and mulched upon completion of construction in accordance with O.P.S.S. 572 and with the following application rates:

Primary Seed (85 kg/ha.):	50% Creeping Red Fescue 40% Perennial Ryegrass 5% White Clover
---------------------------	----------------------------------------------------------------------

Nurse Crop	Italian (Annual) Ryegrass at 25% of Total Weight
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Fertilizer (300 kg/ha.) 8-32-16
Hydraulic Mulch (2000 kg/ha.) Type "B"
Water (52,700 litres/ha.)


Seeding shall not be completed after September 30.

3. Hand Seeding: Hand seeding shall be completed daily with the seed mixture and fertilizer and application rate shown under "Hydro Seeding" above. Placement of the seed shall be by means of an approved mechanical spreader. Seeding shall not be completed after September 30.

Appendix F

Allowances and Assessments



Section 22 - Assessment of Benefit	1 of 1
	<div style="text-align: right;"> Project No: 5460 Project Name: Traxton Municipal Drain Designed/Checked By: MJH / KS Date: 10/20/2021 </div>

Benefit Value for Better Surface Water Drainage - N/A

Benefit Value for Subsurface Water Drainage - N/A

Benefit Value for Direct Connection

Cost of 150mm diameter pipe **15** \$ / m

Roll Number (47660620-)	Con	Lot	Owner	Length (m)	Benefit Rate (\$/ha)	Benefit Value (\$)
4014200	2	11, 12 & 13	Traxton Holdings Ltd.	530	15	7,950.00
Sum						\$ 7,950

Benefit Value for Increased Market Value


	Value of Undrained Farmland	\$ 12,265 / ha	\$ 4,964 / ac
138%	Adjusted Value of Developed Land	\$ 29,180 / ha	\$ 11,809 / ac
	Net Difference is Value	\$ 16,914 / ha	\$ 6,845 / ac
	Cost to Install Private Subsurface Drainage	\$ - / ha	\$ - / ac
	Benefit Value	\$ 16,914 / ha	\$ 6,845 / ac

Roll Number (47660620-)	Con	Lot	Owner	Area (ha)	Benefit Rate (\$/ha)	Benefit (\$)
4014200	2	11, 12 & 13	Traxton Holdings Ltd.	5.98	\$ 16,914	\$ 101,148.16
						\$ -
						\$ -
Sum						\$ 101,148.16

Summation of Section 22

Roll Number (47660620-)	Con	Lot	Owner	Section 22		Sum
				Direct Connection	Increase Market Value	
4014200	2	11, 12 & 13	Traxton Holdings Ltd.	\$ 7,950.00	\$ 101,148.16	\$ 109,098.16
Sum				\$		109,098.16

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Section 29 - Allowances for Land and Right-of-Way		1 of 1
	Project No: 5460 Project Name: Traxton Municipal Drain Designed/Checked By: MJH / KS Date: 10/20/2021	

Allowance for Land Taken Permanently Out of Production

Compensation Rates


Farm Land	\$ 12,265 / ha	\$ 4,964 / ac
Rural Lands	\$ 12,265 / ha	\$ 4,964 / ac

Roll Number (47660620-)	Con	Lot	Owner	Channel Dimensions				Compensation Rates (\$/ha)	Allowance for Land Taken
				Length (m)	Top Width (m)	Buffer Width (m)	Area (ha)		
4013960	2	10	Darwin Chevalier	190	5.00	1.00	0.114	\$ 12,265	\$ 1,398.22
4014200	2	11-13	Traxton Holdings Ltd.	198	48.2	0.00	0.954	\$ 12,265	\$ 11,698.46
4014205	2	11	Lulu Mae Plummer Estate	264	5.00	1.00	0.158	\$ 12,265	\$ 1,942.79
4050800	2	11	Lulu Mae Plummer Estate	10	5.00	1.00	0.006	\$ 12,265	\$ 73.59
2552200	2	11-13	County of Renfrew	42	5.00	1.00	0.025	\$ 12,265	\$ 309.08
Sum									\$ 15,422.14

Allowance for Land Used Periodically - N/A

Summation of Section 29

Roll Number (47660620-)	Con	Lot	Owner	Section 29		
				Allowance for Land Taken	Allowance for Land Used Periodically	Sum
4013960	2	10	Darwin Chevalier	\$ 1,398.22	\$ -	\$ 1,398.22
4014200	2	11-13	Traxton Holdings Ltd.	\$ 11,698.46	\$ -	\$ 11,698.46
4014205	2	11	Lulu Mae Plummer Estate	\$ 1,942.79	\$ -	\$ 1,942.79
4050800	2	11	Lulu Mae Plummer Estate	\$ 73.59	\$ -	\$ 73.59
2552200	2	11-13	County of Renfrew	\$ 309.08	\$ -	\$ 309.08
Sum						\$ 15,422.14

Compensation Rates		1 of 2
	Project No: 5460	
	Project Name: Traxton Municipal Drain	
	Designed/Checked By: MJH / KS	
	Date: 10/20/2021	

Total farm area and value of land and buildings, Canada, Province, CAR, CD, CCS, 2016 - 1991

Geography (English)	Total Farm Area		Total Value of Land and Buildings			
	Farms Reporting	Acres	Farms Reporting	Market value \$	\$ / Acre	\$ / ha
Laurentian Valley - 2001	158	40,231	158	43,675,500	\$ 1,085.62	\$ 2,682.62
Laurentian Valley - 2006	162	40,030	162	60,246,200	\$ 1,505.03	\$ 3,718.99
Laurentian Valley - 2011	209	55,489	209	116,474,025	\$ 2,099.05	\$ 5,186.85
Laurentian Valley - 2016	125	37,344	125	123,914,000	\$ 3,318.18	\$ 8,199.38

Average Yearly Rate of Return

2001 - 2006	6.6%
2006 - 2011	6.7%
2011 - 2016	9.2%
Average	7.5%
Base Year	2001
Total Value	2,682.62 \$ / ha
Future Year	2022
Years	21
Rate of Return	7.51 % / Year
Total Value 2021	12,265.11 \$ / ha

Source: 2016, Census of Agriculture, Statistics Canada

Source: 2011, Census of Agriculture, Statistics Canada

Source: 2006, Census of Agriculture, Statistics Canada