

**THE MUNICIPALITY OF NORTH PERTH
COURT OF REVISION AGENDA
Marks Municipal Drain**



Date: October 7, 2024
Time: 6:30 pm
Location: Municipality of North Perth Council Chambers

Pages

1. Call to Order

2. Land Acknowledgement Statement

"We acknowledge that we are on the traditional land of the Anishnaabe people. We wish to recognize the long history of Indigenous People of Canada and show our respect to them today. We recognize their stewardship of the land, may we all live with respect on this land and live in peace and friendship."

3. Disclosure of Pecuniary Interest

4. List of Appeals of Assessments

Ask the Clerk for appeals received by the Court

5. Comments from Engineer

1

6. Verbal Appeals from Landowner

Chair advises: The purpose of the Court of Revision is to hear appeals regarding the Schedule of Assessment only. The Court of Revision has no authority to change the Engineer's Report in any way. The Schedule of Assessment may be altered but the total must remain the same. If one assessment is reduced than the other assessments must be increased to balance.

7. Questions from the Court of Revision Members

8. Any other questions from the landowners

9. Court of Revision's Decision

Sustain the Assessments of the Engineer (with revisions if required)

Chair advises: All parties to the drain will receive a written notice of the Court decision which will contain additional information on the process to appeal the

decision of the Court of Revision to the Ontario Drainage Tribunal.

10. Adjourn

Marks Municipal Drain, 2024

The Municipality of North Perth

330 Wallace Ave. N

Listowel, ON N4W 1L3

Submitted by:

GEI Consultants Limited

975 Wallace Avenue North

Listowel, ON, N4W 1M6

July 18, 2024

Project No. 2401678



Ben Gowing, P.Eng
Project Engineer



Matt Ash, C.E.T.
Author

Mayor Kasenberg and Council of the Municipality of North Perth:

We are pleased to present our report on the Marks Municipal Drain 2024 serving Lots 3 to 4 in Concessions 2 and 3 Elma in the Municipality of North Perth, County of Perth.

Authority to prepare this report was obtained by a resolution of North Perth Council as stated in its October 2, 2023 letter to appoint GEI Consultants Canada Ltd. (GEI), formerly GM BluePlan Engineering, to prepare an Engineer's Report.

In accordance with your instructions pursuant to a request received by Council under Section 78 of the Drainage Act, R.S.O. 1990, for the request for drainage works improvements, GEI has held an on-site meeting, undertaken a field survey and prepared for Council's consideration the following Drainage Report, Plan, Profiles and Specifications for this work to be completed on the Marks Municipal Drain.

We trust that the information contained within will be satisfactory. If there are any questions or concerns, please do not hesitate to contact us.

Yours truly,

GEI Consultants Canada Ltd.

Per:



Matt Ash, C.E.T.

Encl.

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APPENDIX 'C': DRAWINGS

APPENDIX 'D': SPECIAL PROVISIONS

APPENDIX 'E': CONSTRUCTION SPECIFICATIONS

1. Introduction

At the request of property owners in the Municipality of North Perth, council have appointed GEI Consultants Canada under Section 78 of the Drainage Act to investigate improvements to be made to the Marks Municipal Drain.

The owner and properties represented on the request are:

Doug Green

Lots 3 and 4

Concession 2 Elma

Based on site observations and previous drainage reports, four properties have been determined as within the drainage area of the Marks Drain.

2. History

The Municipality of North Perth has provided background municipal drain maps and reports.

This drainage system was originally known as two separate drains, the Richard Johnston Award Drain constructed in 1924, and the G. Hutchison Award Drain constructed in 1940.

The Marks Municipal Drain is a merger of the two former award drains and was formally adopted under the Municipal Drainage Act through a report prepared by S.W. Archibald in 1949. The existing drain at that time consisted of the Main Drain and a Branch Drain called Branch 'A'. The Main Drain consisted of approximately 940 feet of 12" field tile and 360 feet of 6" field tile. Branch 'A' which extended from the Main Drain to the east towards Trowbridge consisted of 1700 feet of 10" field tile and 371 feet of 8" field tile. Catch basins were included at the junction of the two drains as well as at both upstream ends. The Marks Drain has outlet into the Hamilton Drain, an open ditch system located on Lot 3 Concession 2.

To our knowledge no further work has occurred and the drain as it exists today is by and large identical to that as constructed in 1949.

3. Proceedings Under the Drainage Act

The Drainage Act is a vehicle by which a drainage scheme can be constructed, and the cost raised by local special assessment. That is, the cost is assessed in varying proportions to lands within the watershed, as a one-time charge over and above any taxes paid. Maintenance of the drain is likewise charged to the watershed, most often in the same proportions as the original construction.

The Act has evolved over many years and attempts have been made to balance the rights of the individual against the benefits of the construction of drains that involve more than one property. The Act recognizes that perfect agreement is not possible in every case and provides a number of proceedings that give owners and others the opportunity to influence the outcome.

This Report is one of those proceedings. To aid in the understanding of the process listed below in chronological order are all normal proceedings with the notation "Completed" beside those which have been completed. This

listing is a summary of many but not all parts of the Drainage Act and applies to the ordinary course of events. Further proceedings are available, and for these the Drainage Act should be consulted directly.

1. Submission of a Petition/Request. *Completed.*
2. Notification of the Project to the Maitland Valley Conservation Authority (MVCA). *Completed.*
3. Engineer appointed. *Completed.*
4. On-site meeting. *Completed.*
5. Preparation of Report. *Completed.*
6. Report considered by Council and a By-Law is adopted.
7. Court of Revision convened to consider and deal with appeals on assessment if necessary.
8. Appeal is available from the decisions of the Court of Revision and on other matters to the Ontario Drainage Tribunal.
9. Disposition of appeals by the Tribunal, or if none, final passage of the By-Law, which establishes the drain in law and authorizes construction.
10. Construction of Municipal Drain Improvements.
11. Levying and collecting of assessments.

4. On-Site Meeting

In accordance with Section 9(1) of the Drainage Act, R.S.O. 1990 an on-site meeting was held on December 18th, 2023. The meeting was scheduled to take place at 11:00 am at the North Perth Municipal Office. Persons in attendance were:

Ben Gowing, P.Eng
Scott Richardson
Doug Green
John Duif

GEI Consultants
Drainage Superintendent, North Perth
Landowner representing Lots 2 and 3 Concession 2
Landowner representing Lot 4 Concession 3

A handout was distributed which described the procedures under the Drainage Act, steps already taken by Council in appointing an Engineer, a map of the pertinent part of the watershed, and preliminary results of the investigation to date.

The landowners provided comments which generally revealed that the existing drain was undersized for current conditions and standards and required upsizing for current conditions.

Doug Green had requested the drainage improvement to the Marks Municipal Drain. Mr. Green indicated areas of his property which saw water ponding and suggested that investigating a larger drainage coefficient would be warranted. Mr. Green also indicated that the proposed route for the replacement drain on his property may not be correct and that further investigation may be needed. It was also noted by Mr. Green that his preference was that the existing drain system be removed or decommissioned as part of this work under this report. He also noted that it was likely during construction to encounter stoney conditions through his property.

John Duif indicated that his intention is to systematically tile this land in the future and noted that he will require a sufficient outlet.

5. Findings

Based on the information obtained at the on-site meeting, we feel that the tile drain that currently services the Landowners contained within the watershed does not have sufficient size to convey runoff flows. The drainage system is 75 years old and is likely at the end of its serviceable life. Full replacement of the existing drain is proposed with capacity to accommodate current drainage standards.

6. Design Review Meeting

A design review meeting was held April 22nd, 2024, at 10am at the property of Fisher Family Poultry in Trowbridge. A representative of Fisher Family Poultry and Mr. Doug Green were in attendance, as was the municipality's Drainage Superintendent. The design, cost and estimated assessments were discussed. No particular concerns were raised at this meeting.

7. Basis for Design

Tile drains are generally designed to have capacity to remove between 12 and 38mm of water from the watershed per day, and this rate of removal is called the drainage coefficient. 12mm is generally adequate when there is little surface water, but the watershed is under-drained. When surface water is to be accommodated, 25mm to 38mm per day is typically used for the basis of design.

It is important to understand that the Municipal Drain in itself does not remove this amount of water. It serves as the conduit to convey water brought to it by under drainage, and for surface water finding its way or guided to the inlet structures.

It is noted that the Marks Municipal Drain supports the growing of high value cash crops, and therefore GEI has selected a 38mm drainage coefficient.

This level of service will provide a good outlet for under drainage and will conduct a useful amount of surface water. During the growing season it is expected that flooding will not normally persist for more than 24 hours

8. Environmental Considerations

This Drain will be subject to the review of the MVCA due to the outlet into an open watercourse. A permit application for work at the outlet will be submitted to MVCA prior to commencement of construction.

This project is anticipated to have no permanent adverse impact on any species, as it intends to continue land use in the watershed as productive farmland.

9. Recommendations for the Marks Municipal Drain

It is our recommendation that:

1. A new tile drainage system be constructed to replace the Marks Main Drain beginning at the outlet into the Hamilton Drain and continuing upstream to the property line between Lot 4 Concession 3 and Lot 4 Concession 2. The Main Drain will consist of approximately 298m of 600mm (24") diameter concrete drain tile and 115m of 250mm (10") concrete drain tile.
2. The existing Branch 'A' will be replaced beginning at the current junction location with the Main Drain, located in the southwest corner of Lot 4 Concession 2 and continuing upstream to the property line between Lot 4 Concession 2 and Lot 5 Concession 2. Branch 'A' will be constructed of approximately 633m of 450mm (18") diameter concrete drain tile.
3. New catch basins will be installed at all pipe junctions and locations where the drain crosses property lines in order to provide access points for future maintenance works.

The drawings included with the Report show the extent of the work, land affected, profile of the tile and other details of the work. The plan shown on Drawing No. 1 – Marks Municipal Drain Plan gives the area considered to be in the drainage area of the work proposed.

During construction, contingencies may arise and will be dealt with as determined by the Engineer and included as part of construction. There will be no special assessments for contingencies. Common contingencies are clear stone bedding, tile connections and extra effort to deal with poor soil conditions.

10. Working Area

The working area for construction purposes shall be a width of 20m centered on the proposed tile drain. The working areas for maintenance purpose shall be a width of 10m centered on the proposed tile drain. Each Landowner on whose property the drainage work 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, as the case may be, shall designate access.

11. Watershed Characteristics

The Drainage Area comprises approximately 50.4 hectares. Land use within the watershed is primarily agricultural.

Specific land uses within the watershed are as follows:

Agricultural	- 45.6 ha
Forest	- 4.8 ha

12. Allowances

Various allowances are considered part of a Municipal Drain. The Drainage Act provides in Sections 29 to 33 that the Engineer is to allow in money for the value of several items, as follows:

- a) **Section 29 – Right-of-Way**

The Drainage Engineer is to provide for an allowance to be paid to the landowner whose land is proposed to be used for construction of a new ditch or tile. As this project involves replacement of an existing tile drainage system, no allowance for right-of-way is provided.

b) Section 30 - Damages

The Drainage Engineer is to provide for an allowance to be paid to the landowner of land that may be damaged during construction. Typically, this section refers to agricultural crops, however, it also applies to lawns, ornamental trees and fences.

As all lawn areas are to be restored with topsoil and hydroseed, there are no areas with crops along the Drain, and any access locations are to be restored to existing conditions, no damage allowances are proposed to be provided.

Damage from installing the tile is valued at \$2,550.00 / hectare (\$1,030 / acre) and is based on a 20m wide working area. The allowance is calculated on a 5-year declining balance basis, with 100% of the allowance paid for the first year, as total destruction of crop is anticipated. In the following 4 years, a declining allowance is paid based on a 5m width of disturbed ground, with 80% of the allowance paid in year 2, 60% in year 3, 40% in year 4, and 20% in year 5. This is done to reflect the decreased crop yields in the area where the subsoil was disturbed for drain installation.

For example, a parcel of cropland 500m in length that is disturbed for drain installation would be given a damage allowance calculated as follows:

Year 1: 500m x 20m = 1.0 ha x \$2,550	= \$2,550
Year 2: 500m x 5m = 0.25 ha x \$2,550 x 80%	= \$510
Year 3: 500m x 5m = 0.25 ha x \$2,550 x 60%	= \$383
Year 4: 500m x 5m = 0.25 ha x \$2,550 x 40%	= \$255
Year 5: 500m x 5m = 0.25 ha x \$2,550 x 20%	= \$127
Total Damage Allowance Paid in Report	= \$3,825

Allowances are paid regardless of what crop is grown or whether or not it is harvested in advance of construction. Municipal Drains are generally constructed before beans and corn can be harvested, so the damage can be expected to occur. Crop value is calculated using a 2-year average of the "Area, Yield, Production and Farm Value of Specified Field Crops, Ontario" as published annually by the Ontario Ministry of Agricultural, Food and Rural Affairs.

c) Section 31 – Allowance for Existing Drains

No existing private drains are involved in this project.

d) Section 32 – Allowance for Damage Due to Insufficient Outlet

As sufficient outlet has been confirmed, there is no allowance for insufficient outlet.

e) Section 33 – Allowance for loss of Access

As crossings are provided at each property where crossings were originally provided, no loss of access allowance is considered appropriate.

The allowances are generally less than the assessment to the properties and the property owner is billed the difference when the project is complete.

GMBP determines the amounts to be paid in allowances to owners as shown in the following Schedule of Allowances. The allowances shall become due and payable according to Section 62 of the Drainage Act.

Table 1: Schedule of Allowances

Concession	Lot	Owner and Roll No.		Damages (Section 30)	
				Cost (\$)	Length (m)
2	3	Doug Green	105500	2,280	298
2	4	Doug Green	105600	4,840	633
			Total	\$7,120	

13. Assessments

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 therefore.” On this project, Benefit and Outlet liability assessments are involved.

Assessment for Benefit is described in **Section 22** of the Act, which states “Lands, roads, buildings, utilities or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance or repair of a drainage works may be assessed for benefit.” As defined in the act, Benefits to landowners can include higher market value for the property, improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings or structures.

Assessment for Outlet Liability is described in **Section 23(1)** of the Act which states “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.” Outlet liability is the part of the cost of the works that is required to provide such outlet or improved outlet.

Assessments were determined using a modified “Todgham” method, a method of assessment that is recognized to be a fair and equitable way of dividing costs between the benefitting landowners. This methodology involves assigning Equivalent Area Factors to various types of property which reflect their runoff potential, using Agricultural lands as a base (Ag factor = 1.0). Land areas covered in forest are discounted by 50% to reflect their lower runoff potential. The cost of the drain is divided into logical sections, each property is assigned to a section, and benefit and outlet assessments are determined on a property-by-property basis, starting at the outlet and working towards the topmost property.

There is no injuring liability assessment on this drain. No property is considered to have riparian rights insofar as assessment is concerned.

Assessments on agricultural lands may be eligible for a one third provincial grant. Neither the availability nor the amount of the grant can be determined in advance.

Should the project not proceed by reason of withdrawal from the petition, costs to date are payable by the petitioners prorated to the assessments contained herein. There is no grant should this happen.

14. Cost Estimates

The cost of this Municipal Drain Improvement is estimated as **\$147,200** and is raised by assessment from properties within the watershed. A Schedule of Estimated Assessments can be found in **Appendix A**.

GM BluePlan estimates the cost of the Marks Municipal Drain as follows:

COST ESTIMATE - Marks Municipal Drain The Municipality of North Perth		
Allowances	\$	7,120
Marks Main Drain Construction		
6m of 750mm dia. HDPE outlet pipe c/w rip rap	\$	4,900
Install 298m of 600mm dia. Concrete drain tile	\$	26,820
Install 115m of 250mm dia. Concrete drain tile	\$	4,370
1 ea. 900 x 1200 catch basin	\$	3,300
1 ea. 600mm catch basin	\$	2,400
Allowance for brushing	\$	5,000
Allowance for poor soil conditions	\$	1,500
Contingency Fund at approx. 10% of construction	\$	4,800
Total Estimated Main Drain Construction Cost	\$	53,090
Marks Branch 'A' Construction		
Install 633m of 450mm dia. Concrete drain tile	\$	42,410
1 ea. 900 x 1200 catch basin	\$	3,300
Allowance for tile connections	\$	1,500
Allowance for poor soil conditions	\$	2,500
Contingency Fund at approx. 10% of construction	\$	5,000
Total Estimated Branch 'A' Construction Cost	\$	54,710
Non-Construction Costs		
On Site Meeting, Survey, Plan, Profile, and Report	\$	19,400

COST ESTIMATE - Marks Municipal Drain The Municipality of North Perth		
Tendering, Construction Review, Contract Administration and Grant Application	\$ 6,500	
Carrying Costs (est. @ 3% for 1 year) & Net HST (1.76%)	\$ 6,400	
Total Non-Construction Costs		\$ 32,300
TOTAL ESTIMATED COST		\$ 147,200

**The above costs are estimates only. The final costs of engineering and administration cannot be determined until construction is completed. The above costs also do not include costs to defend the drainage report should appeals be filed with the Court of Revision, Drainage Tribunal and/or Drainage Referee as the extent of the work required cannot be determined. Should additional costs be incurred, unless directed otherwise, the costs would be assessed in pro rata fashion as per the Schedule of Assessments.*

15. Maintenance

As per section 74 of the Act, after construction of the improvements the Marks Municipal Drain as described in this Report shall be maintained by Municipality of North Perth at the expense of the upstream lands and roads assessed, in the proportions set out in the By-Law which adopts this Report. Any future maintenance or repair costs shall be distributed pro rata in accordance with **Appendix B**, the Schedule of Assessments for Future Maintenance. The Schedule of Assessments for Future Maintenance is based on the equivalent contributing areas for all properties.

Landowners should take note that there is responsibility for landowners to not damage or block flow in the Municipal Drain. Section 80(1) of the Drainage Act states;

“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.”

Any landowners, who have questions as to their rights and responsibilities under the Drainage Act, should contact the Municipality of North Perth Drainage Superintendent who can provide additional information and answer any questions that landowners may have.

Regular inspection of the culverts and drainage course should be undertaken by the Drainage Superintendent. Landowners can assist with the inspection by making regular inspections of the drain as it crosses their property, clearing debris from the drain and culverts if possible, and reporting any problems or concerns to the Drainage Superintendent who can inspect and take any necessary actions.

Marks Municipal Drain
July, 2024
FILE: 2401678

All of which is respectfully submitted.

GEI CONSULTANTS CANADA LTD.

Per:



Ben Gowling, P.Eng



Disclaimer: This report is intended for the sole use of the Municipality of North Perth for the purposes as expressed in the report. Any use of or reliance upon this report by third parties is at the expressed responsibility of the third party. GEI Consultants is not responsible for any damages suffered by any third party as a result of decisions or actions made based upon the information contained in this report.

Appendix A
Schedule of Estimated Assessments for Construction

Schedule of Estimated Assessments											
Prepared by GM BluePlan Engineering Limited July 2024											
Marks Municipal Drain											
Roll No.	Legal Description	Owner	Affected Area		Adjusted Area		Benefit (sect. 22)	Outlet (sect. 23)	TOTAL ASSESSMENT ¹	Allowances	NET ASSESSMENT ²
			ac.	ha.	ac.	ha.					
Lands											
314036000105500	CON 2 LOT 3	GREEN JAMES DOUGLAS	-	-	-	-	\$ -	\$ -	\$ -	\$ (2,280)	\$ (2,280)
314036000105600	CON 2 LOT 4	GREEN JAMES DOUGLAS	74.38	30.10	68.45	27.70	\$ 45,550	\$ 33,240	\$ 78,790	\$ (4,840)	\$ 73,950
314036000105700	ELMA CON 2 PT LOT 5 CON 3 PT; LOT 5 PLAN 281 LOTS 23 TO 31; 43 AND 44 PT LOT 42 RP; 44R3100 PART 1	FISCHER FAMILY POULTRY LTD	33.61	13.60	33.61	13.60	\$ -	\$ 46,700	\$ 46,700	\$ -	\$ 46,700
314036000107300	CON 3 LOT 4	DUIF JAN DIRK	16.56	6.70	16.56	6.70	\$ 13,670	\$ 8,040	\$ 21,710	\$ -	\$ 21,710
Total Estimated Assessment - Lands			124.54	50.40	118.61	48.00	\$ 59,220	\$ 87,980	\$ 147,200	\$ (7,120)	\$ 140,080
TOTAL ESTIMATED ASSESSMENTS			124.54	50.40	118.61	48.00	\$ 59,220	\$ 87,980	\$ 147,200	\$ (7,120)	\$ 140,080

¹Agricultural lands may be eligible for a one third provincial grant. Neither the availability nor the amount of the grant can be determined in advance

²Allowances are shown for information only, and should not be used for comparison purposes

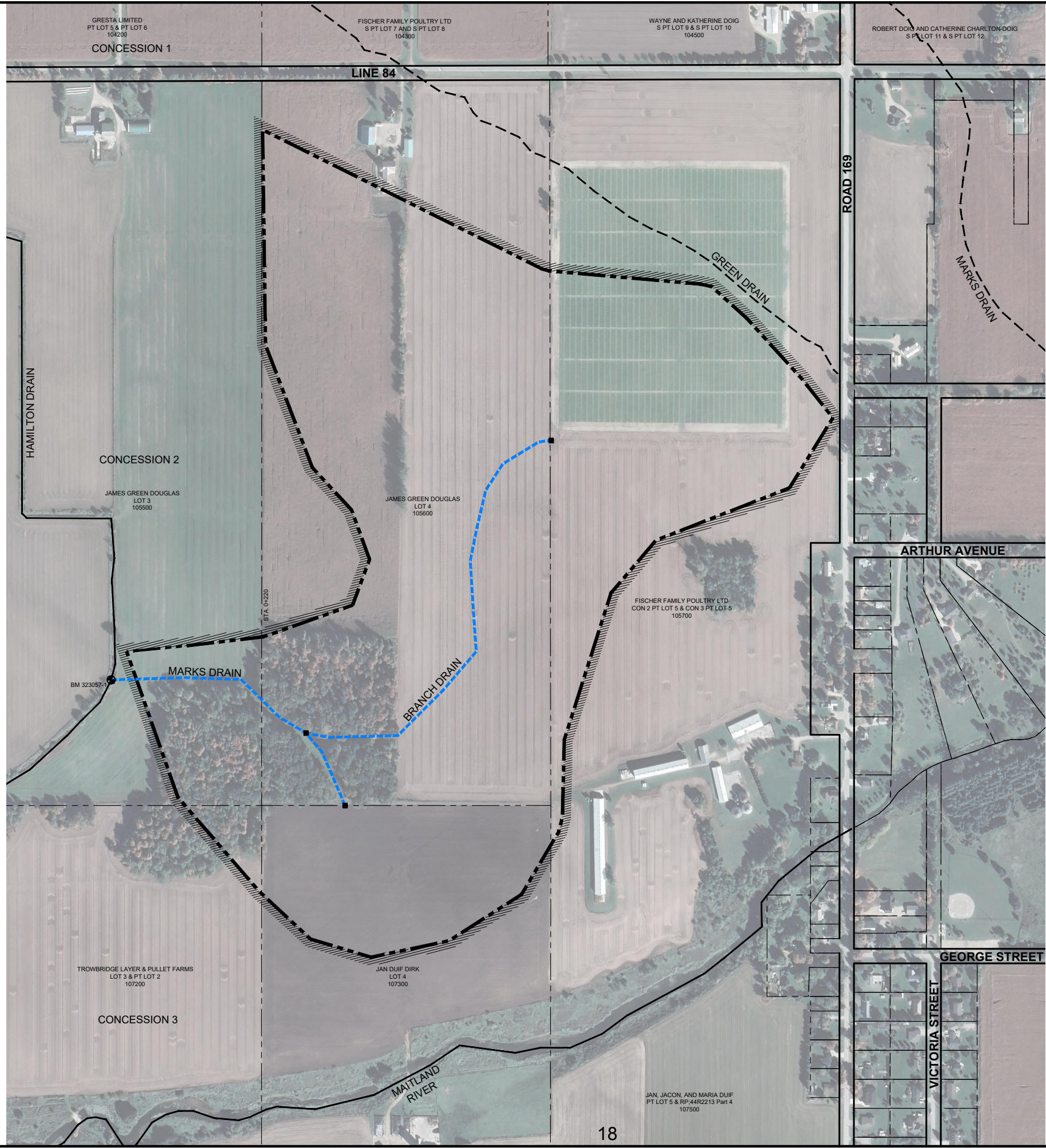
Summary for OMAFRA Grant Purposes	Main Drain
1. Canada Owned Lands	\$ -
2. Ontario Lands	\$ -
3. Municipal Lands	\$ -
4. Privately Owned Non-Agricultural	\$ -
5a. Privately Owned Agricultural - Grantable	\$ 87,980
5b. Privately Owned Agricultural - Non Grantable	\$ -
6a. Special Non-Proratable Assessments - Agricultural Grantable	\$ 59,220
6b. Special Non-Proratable Assessments - Agricultural Non-Grantable	\$ -
Section 26	\$ -
TOTAL	\$ 147,200

Appendix B
Schedule of Assessments for Future Maintenance

Schedule of Assessment for Future Maintenance						
Prepared by GM BluePlan Engineering Limited July 2024						
Marks Municipal Drain						
Roll Number	Legal Description	Owner	Land Area	Adjusted Area		Maintenance Assessment
			ha.	ha.	ac.	
314036000105500	CON 2 LOT 3	GREEN JAMES DOUGLAS	0.0	0.0	0.0	0.0%
314036000105600	CON 2 LOT 4	GREEN JAMES DOUGLAS	30.1	27.7	68.4	57.7%
314036000105700	ELMA CON 2 PT LOT 5 CON 3 PT; LOT 5 PLAN 281 LOTS 23 TO 31; 43 AND 44 PT LOT 42 RP; 44R3100 PART 1	FISCHER FAMILY POULTRY LTD	13.6	13.6	33.6	28.3%
314036000107300	CON 3 LOT 4	DUJIF JAN DIRK	6.7	6.7	16.5	14.0%
			50.4	48.0	118.6	100.0%
			50.4	48.0	118.6	100.0%

Appendix C Drawings

FILED: WINDSOR/NORTH PERTH CON. MUN. CD 2024/01/09 - 2020/07/19 Marks Municipal Drain's Work by Program/CD/2019/07/19 - Marks Municipal Drain/Proj. LAYOUT WATERSHED
 CAD: DAVES BY: 1/19/2024 10:30 AM FILED: 1/19/2024 10:30 AM

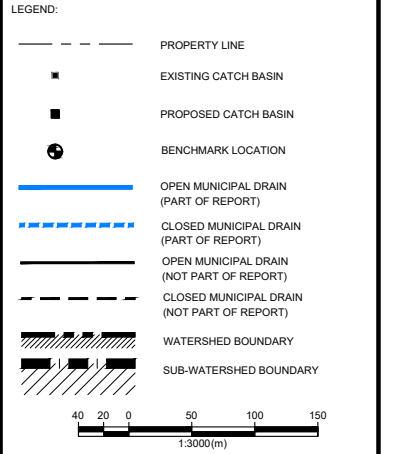


NOTES:

- CONTRACTOR IS TO OBTAIN UTILITY LOCATES PRIOR TO CONSTRUCTION.
- CONTRACTOR IS TO CONNECT EXISTING TILES DURING CONSTRUCTION.

NOMENCLATURE:

APPROX. COMPLETE WITH	APPROXIMATE COMPLETE WITH
CB	CATCH BASIN
CONC.	CONCRETE
CSP	CORRUGATED STEEL PIPE
D/CB	DITCH INLET CATCH BASIN
ELEV.	ELEVATION
EX.	EXISTING
INV.	INVERT
MIN.	MINIMUM
PL	PROPERTY LINE
R	RADIUS
STA.	STATION
TYP.	TYPICAL
T/G	TOP OF GRATE ELEVATION (NOTE: FOR BIRDCAGE GRATE = LOWER / GROUND ELEV.)



BENCH MARKS:

BM 323057-1, ELV = 362.022
 INVERT OF MARKS MUNICIPAL DRAIN 2000 CSP OUTLET

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

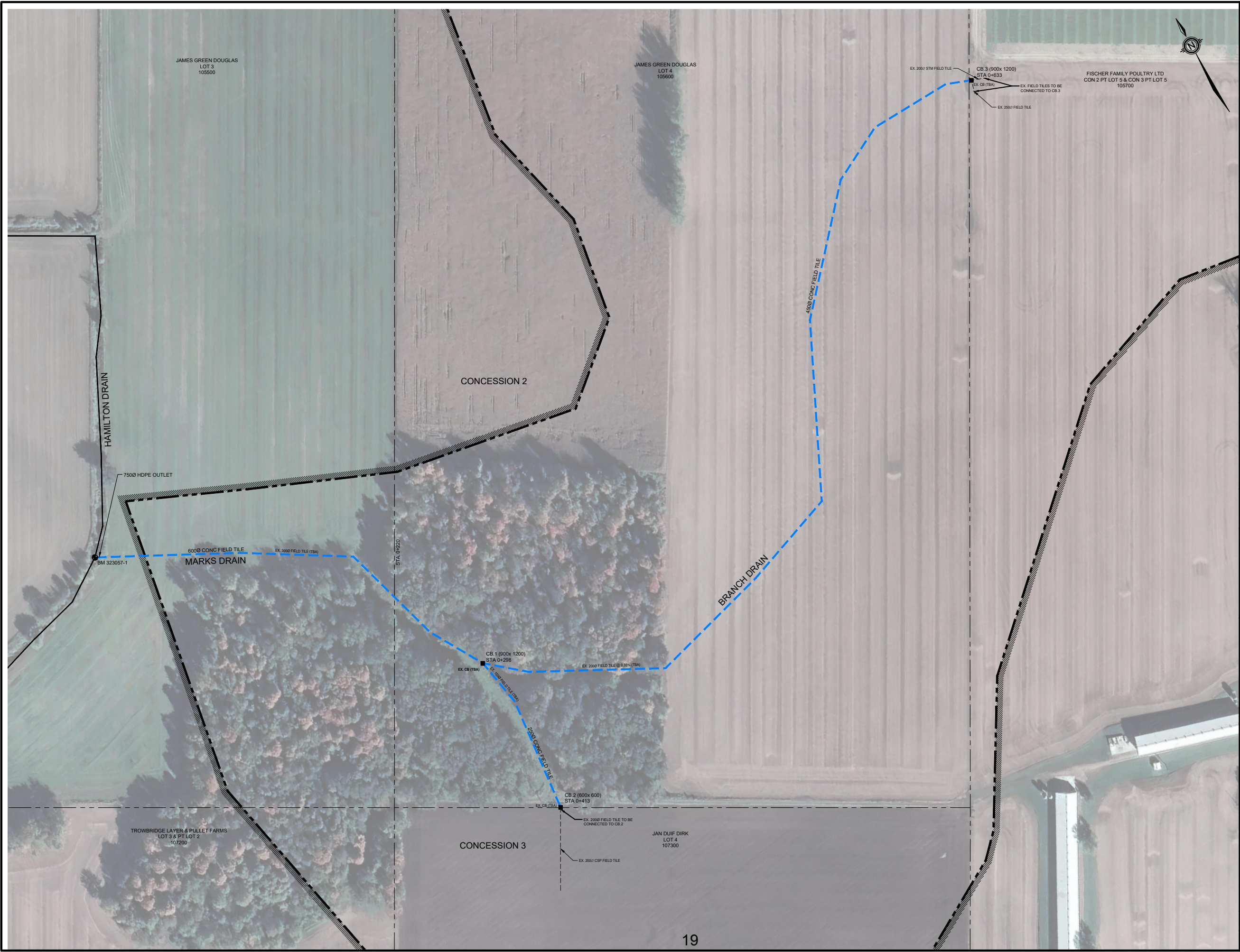
BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.



0	07/18/24	ISSUED FOR TENDER	B.G.
NO.	MMDDYY	REVISION DESCRIPTION	CHKD

GEI Consultants
 975 WALLACE AVENUE NORTH
 LISTOWEL, ONTARIO N4W 1M6
 519.291.9339

MARKS MUNICIPAL DRAIN			
MUNICIPALITY OF NORTH PERTH			
WATERSHED PLAN			
DRAWN BY:	APPROVED BY:	PROJECT NO.:	DRAWING NO.:
S.A.		323057	1
DESIGNED BY:	DATE:	SCALE:	
M.A.	MARCH 2024	AS NOTED	



NOTES :

1. CONTRACTOR IS TO OBTAIN UTILITY LOCATES PRIOR TO CONSTRUCTION.
2. CONTRACTOR IS TO CONNECT EXISTING TILES DURING CONSTRUCTION.

NOMENCLATURE:

APPROX. C&W	APPROXIMATE COMPLETE WITH
CB	CATCH BASIN
CONC.	CONCRETE
CSP	CORRUGATED STEEL PIPE
Ø	DIAMETER
D/CB	DITCH INLET CATCH BASIN
ELEV.	ELEVATION
EX.	EXISTING
INV.	INVERT
MIN.	MINIMUM
PL	PROPERTY LINE
R	RADIUS
STA.	STATION
TYP.	TYPICAL
T/G	TOP OF GRATE ELEVATION (NOTE: FOR BIRD-CAGE GRATE = LOWER / GROUND ELEV.)

LEGEND:

---	PROPERTY LINE
■	EXISTING CATCH BASIN
■	PROPOSED CATCH BASIN
⊕	BENCHMARK LOCATION
—	OPEN MUNICIPAL DRAIN (PART OF REPORT)
- - -	CLOSED MUNICIPAL DRAIN (PART OF REPORT)
---	OPEN MUNICIPAL DRAIN (NOT PART OF REPORT)
- - -	CLOSED MUNICIPAL DRAIN (NOT PART OF REPORT)
▨	WATERSHED BOUNDARY
▩	SUB-WATERSHED BOUNDARY

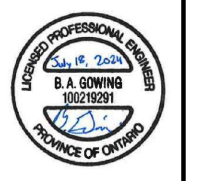
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BENCH MARKS :

BM 323057-1, ELY = 362.022
INVERT OF MARKS MUNICIPAL DRAIN 2000 CSP OUTLET

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.



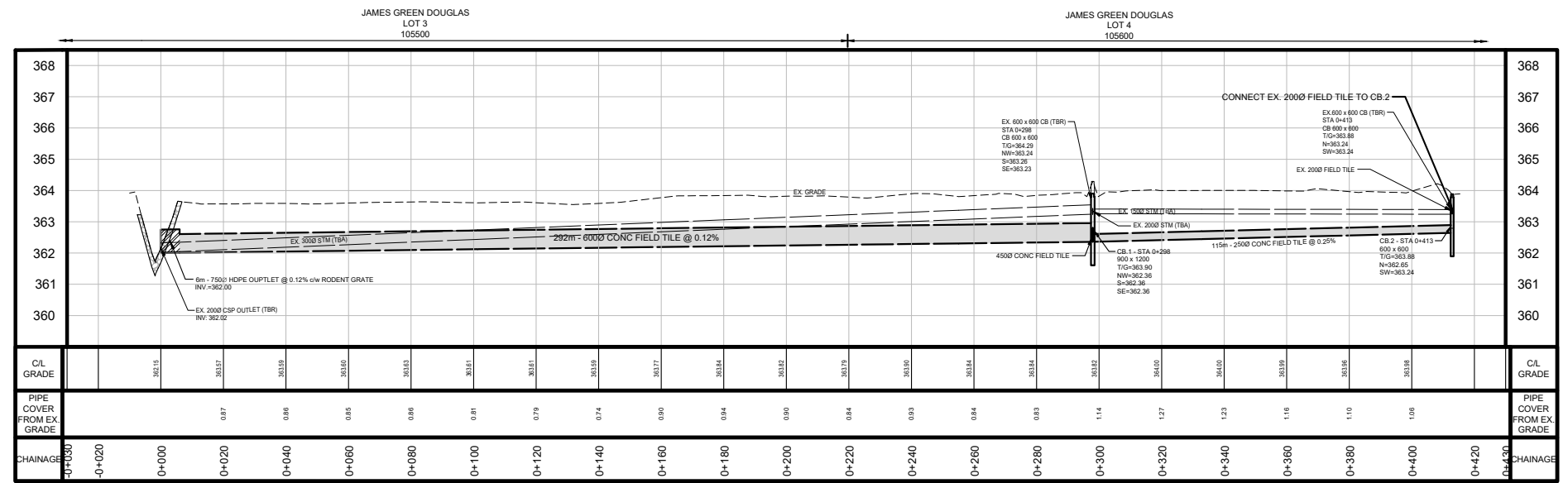
0	07/18/24	ISSUED FOR TENDER	B.G.
NO.	MMDDYY	REVISION DESCRIPTION	CHKD

GEI Consultants
 975 WALLACE AVENUE NORTH
 LISTOWEL, ONTARIO N4W 1M6
 519.291.9339

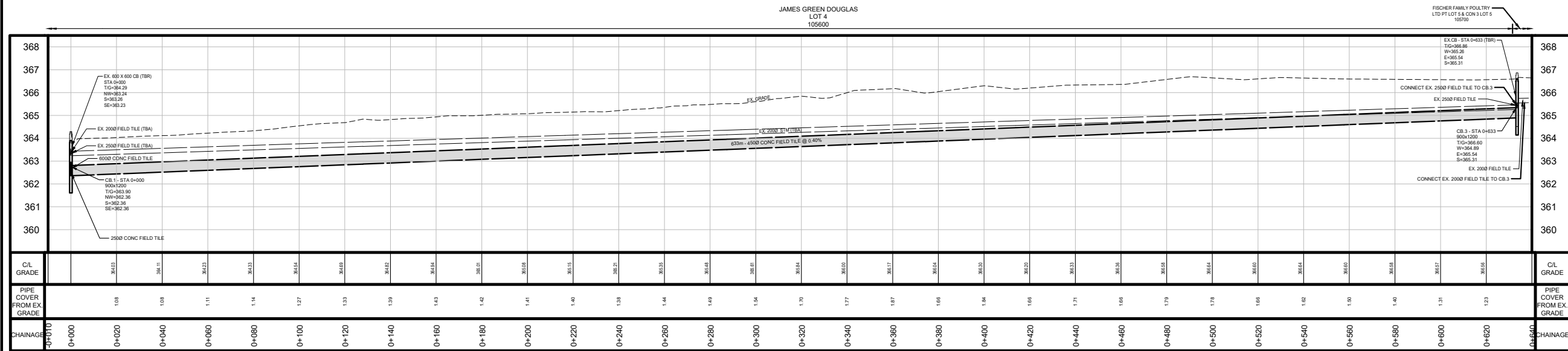
MARKS MUNICIPAL DRAIN
 MUNICIPALITY OF NORTH PERTH
 PLAN

DRAWN BY : S.A.	APPROVED BY :	PROJECT NO. : 323057	DRAWING NO. : 2
DESIGNED BY : M.A.	DATE : MARCH 2024	SCALE : AS NOTED	

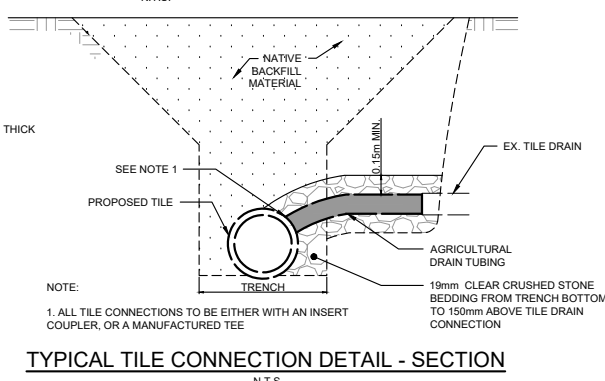
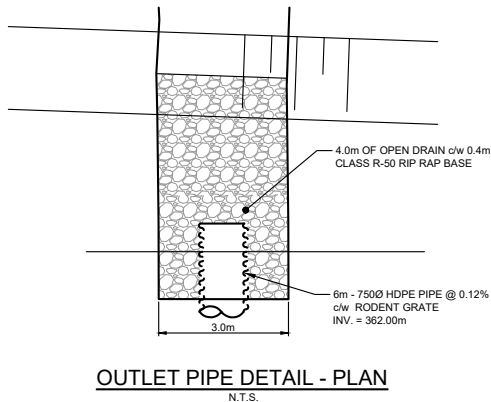
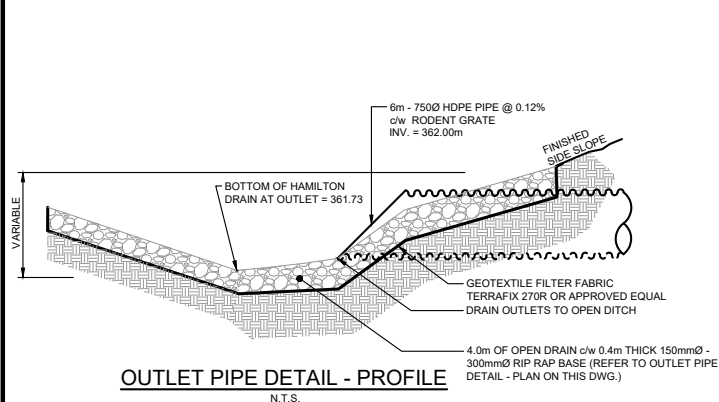
FILED: WINDING NORTH PERTH ON MUNI CD 20240109 - 202407 Marks Municipal Drain's Work by Program/CD/Eng/323057 - Marks Municipal Drain/Eng LAYOUT PLAN
 CAD: DRAWN BY: M.A. 07/18/24 10:30 AM PLOTTED BY: M.A. 07/18/24 10:30 AM



MARKS MUNICIPAL DRAIN
N.T.S.



BRANCH MUNICIPAL DRAIN
N.T.S.



STRUCTURE DETAIL SCHEDULE - MARKS DRAIN				
ITEM NO.	STA.	STRUCTURE DESCRIPTION	SIZE	
1	STA. 0+298	CB.1	900 X 1200	
2	STA. 0+413	CB.2	600 X 600	

PIPE DETAIL SCHEDULE - MARKS DRAIN					
STA. FROM	STA. TO	MATERIAL	SIZE	SLOPE	LENGTH
STA 0+000	STA 0+006	HDPE OUTLET c/w RODENT GRATE	7500	0.12%	6m
STA 0+006	STA 0+298	CONCRETE FIELD TILE	6000	0.12%	292m
STA 0+298	STA 0+413	CONCRETE FIELD TILE	2500	0.25%	115m

STRUCTURE DETAIL SCHEDULE - BRANCH DRAIN				
ITEM NO.	STA.	STRUCTURE DESCRIPTION	SIZE	
3	STA. 0+633	CB.3	900 X 1200	

PIPE DETAIL SCHEDULE - BRANCH DRAIN					
STA. FROM	STA. TO	MATERIAL	SIZE	SLOPE	LENGTH
STA 0+000	STA 0+633	CONCRETE FIELD TILE	4500	0.40%	633m

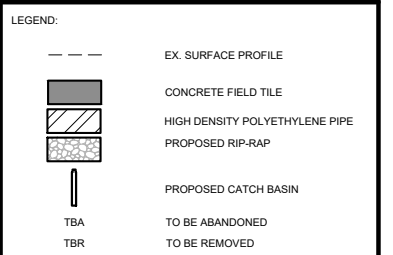
NOTES:

- CONTRACTOR IS TO OBTAIN UTILITY LOCATES PRIOR TO CONSTRUCTION.
- CONTRACTOR IS TO CONNECT EXISTING TILES DURING CONSTRUCTION.

NOMENCLATURE:

APPROX. c/w CB CONC. CSP Ø DICB EX. ELEV. EX. INV. EX. RADIUS PL STA TYP. TIG

APPROXIMATE COMPLETE WITH CATCH BASIN CONCRETE CENTER LINE CORRUGATED STEEL PIPE DITCH INLET EXISTING INVERT MINIMUM PROPERTY LINE STATION TYPICAL TOP OF GRATE ELEVATION (NOTE: FOR BIRDCAGE GRATE = LOWER / GROUND ELEV.)



BENCH MARKS:

BM 323057-1, ELEV = 362.022
INVERT OF MARKS MUNICIPAL DRAIN 2000 CSP OUTLET

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.



07/18/24	ISSUED FOR TENDER	B.G.
NO.	REVISION DESCRIPTION	CHKD

GEI Consultants
975 WALLACE AVENUE NORTH
LISTOWEL, ONTARIO N4W 1M6
519.291.9339

MARKS MUNICIPAL DRAIN

MUNICIPALITY OF NORTH PERTH

PROFILE & NOTES & DETAILS

DRAWN BY: S.A. APPROVED BY: PROJECT NO.: 323057 DRAWING NO.: 3
DESIGNED BY: M.A. DATE: MARCH 2024 SCALE: NTS

FILE: W:\07\2024\0718 - 2024\0718 - Marks Municipal Drain\0718 - Marks Municipal Drain.dwg
 DATE: 07/18/24 10:17 AM
 PLOT: 07/18/24 10:17 AM
 PLOTTER: HP DesignJet T1100e
 PLOT SCALE: 1:1
 PLOT SIZE: 11x17

Appendix D
Special Provisions

**Special Provisions (Non-Tender Items)
For The Construction of The
Marks Municipal Drain 2024
Municipality of North Perth**

STANDARD SPECIFICATIONS

Where reference is made to OPSS or OPSD, the Contractor shall refer to the latest revision of the Ontario Provincial Standard Specifications and the Ontario Provincial Standard Drawings. Where reference is made to OPSS, it shall be assumed to refer to OPSS.MUNI wherever equivalent municipal specifications exist. These specifications and drawings may not be bound within this document. They are available on-line from the Ontario Ministry of Transportation.

All work to be undertaken shall comply with the latest version of OPSS and OPSD, unless superceded by the Special Provisions included herein.

Where in the Specifications the word “Corporation”, “Municipality” or “Owner” occurs it shall mean the “Municipality of North Perth”.

Where in the Specifications the word “Engineer” occurs, it shall mean “GEI Consultants Canada Ltd.”.

ALIGNMENT

The Contractor shall be responsible for the true and proper setting out of the work and for the correctness of the position, elevation and alignment of all parts of the work in accordance with accepted survey procedures. Using qualified personnel and following accepted engineering practice, the Contractor shall calculate, layout, establish and maintain all lines and grades necessary for the construction and verification of the work. The Contractor shall provide such information on the calculations, layout, lines and grades as the Engineer may at any time require.

All elevations and dimensions pertaining to the work shall be verified by the Contractor before commencing work. The Contractor shall be responsible for, and bear the cost of, field verification of all elevations and dimensions as they affect the work. Any discrepancy between the actual conditions and details on the drawings shall be reported to the Engineer before proceeding with the work or fabricating materials so affected. Any delay or cost incurred by the Contractor’s failure to comply with this provision shall be borne by the Contractor.

Any discrepancies, errors, omissions or inconsistencies in the information shall be reported to the Engineer before proceeding with the work.

The Contractor shall use electronic means (laser, GPS) or equivalent line and grade control methods to maintain the vertical and horizontal alignment shown on the plans. Batter boards or any other means will not be acceptable. All tile drains shall be installed to a maximum vertical tolerance of +/-25mm, and any deviation from this tolerance shall be corrected by the Contractor at their expense.

TRENCHES TO BE CLOSED

No trench may be left open at the end of each day unless authorized by the Engineer. Any trench that is to be left open shall be completely fenced off with steel construction fencing. All fencing shall be at the Contractor's expense. If the Contractor neglects to fence a trench, the Engineer shall have the right to have this work done by others and charged to the Contractor.

ROAD SIGNS

The Contractor, at his/her own expense, shall carefully remove and satisfactorily replace Municipal Road Signs which must be removed in order to carry out the contract. Where traffic control signs, such as Stop Signs, have to be temporarily or permanently relocated, they shall be immediately reset either temporarily or permanently, as conditions dictate. All temporarily relocated signs shall be permanently reset as soon as site conditions permit. Where replacements are necessary, new signs shall conform to SMSM Development Standards.

DAMAGE TO TREES

A penalty of \$1,000.00 will be levied against the Contractor to be deducted from monies payable under this Contract for each and every tree destroyed or damaged due to the Contractor's carelessness or negligence and which is not designated in the Contract for removal. As to what constitutes the carelessness or negligence on the part of the Contractor, the Engineer's decision shall be final.

COORDINATION MEETINGS

The Contractor shall attend such meetings with the Owner, Engineer, landowners and Utility Company Authorities (as necessary) as may be required by the Engineer to co-ordinate services affected by this Contract.

DISPOSAL OF SURPLUS OR UNSUITABLE EXCAVATED MATERIAL

All earth material excavated in carrying out the work of the various tender items included in this Contract, and which is unsuitable for, or which is surplus to, the requirements for backfill shall be disposed of off-site. The excess material may be disposed of at a site arranged by the contractor upon receipt of a sign-off by the property owner.

All concrete, asphalt pavements, curbs, sidewalks, large boulders and other "solid" materials are to be loaded and hauled separately from the other earth and granular materials and disposed of at an MOECC- approved site obtained by the Contractor at no cost to the Owner.

COMPACTION

This Contract contains no separate tender item for compaction equipment as may be required to compact the earth or granular materials whether used for embankment construction, base courses, bedding, or backfill.

The Contract prices for the materials to be placed or the work to be carried out shall include full compensation for supplying and operating such compaction equipment as the Contractor may require and for compacting the materials to the specified density.

When it is impractical with the larger types of compaction equipment to obtain the required degree of compaction in areas where working space is limited, the Contractor shall provide and use mechanical hand compaction equipment in order to achieve the specified density.

Granular materials used as bedding shall be compacted to a density of 98% of the maximum dry density, granular backfill or base courses shall be compacted to a density of 100% of the maximum dry density. All other earth materials shall be compacted to a density of 95% of the maximum dry density.

When field tests indicate that the required degree of compaction cannot be obtained with the equipment in use or the procedure being followed, the Contractor's operations shall be halted until the Engineer is satisfied that the Contractor has made such modifications, in his/her equipment and procedure, which will produce the required results.

NATURAL GAS CONSTRUCTION SPECIFICATIONS

Where the Contractor is working near natural gas mains the work shall be carried out in accordance with the requirements and specifications of the Gas Company having control over such mains.

OTHER CONTRACTORS WITHIN OR ADJACENT TO THE LIMITS OF THE WORK

The Contractor is advised that other work may be in progress within and adjacent to the limits of this Contract and that he/she shall co-operate with other Contractors, Utility Companies, and the Corporation and they shall be allowed free access to their work at all times.

The Engineer reserves the right to alter the method of operation on this Contract to avoid interference with other work.

UTILITY POLE LINES

Where utility poles may have to be supported, the Contractor shall make arrangements with the hydro authority to do this work. There shall be no charge to the Contractor for this work.

UTILITIES AND PIPE CROSSINGS

The location and depth of underground utilities shown on the Contract Drawings are based on information received by the Engineer. The position of all pole lines, conduits, watermains, sewers and other underground and over ground utilities and structures is not necessarily shown on the Contract Drawings and where shown, the accuracy of the position of such utilities and structures is not guaranteed. It is the Contractor's responsibility before starting any work to contact the Municipal Authorities or Utility Companies for further information in regard to the exact location of these utilities and to take such other precautions as necessary to safeguard the utilities from damage.

Where pipes and other utilities are encountered in the excavation, these shall be maintained and supported by the Contractor to minimize damage done to them. Prior to backfilling, the Contractor shall submit to the Engineer, for his/her approval, details of the proposed method of support of such pipes and utilities and no backfilling may take place prior to the Engineer's review of such details. Approval by the Engineer of any such details will in no way relieve the Contractor from his/her responsibility to avoid any damage where possible.

DAMAGE BY VEHICLES AND OTHER EQUIPMENT

If at any time, in the opinion of the Engineer, damage is being or is likely to be done to any highway or any improvement thereon, other than such portions as are part of the work, by the Contractor's vehicles or other equipment,

whether licensed or unlicensed, the Contractor shall, on the direction of the Engineer and at the Contractor's own expense make changes in or substitutions for such vehicles or other equipment or shall alter loading or shall in some other manner remove the cause of such damage to the satisfaction of the Engineer. Where such damage has occurred, the Contractor shall make repairs satisfactory to the Owner or, where the Owner has found it necessary to make the repairs, make payment to the Owner of the cost of repairs carried out by the Owner.

SURVEY BARS AND MONUMENTS

The Contractor shall be responsible for replacing all survey bars which are bent, moved, removed, due to carelessness but will not be responsible for survey bars that have to be removed for construction. The contractor shall provide a list of all damaged and removed survey bars to the Engineer.

MAINTENANCE OF ROAD

The Contractor shall at all times and at his/her own expense, maintain safely and adequately, all private entrance facilities throughout the length of the Contract.

ACCESS TO PRIVATE PROPERTIES

If a traffic lane is closed temporarily to allow asphalt paving or road grading (including patch work), local access shall be maintained as much as possible and notifications shall be made 24 hours in advance.

CONSTRUCTION HOURS

The Contractor will be allowed to work from 7:00 a.m. to 7:00 p.m., Monday to Friday. Additional hours may be permitted under certain circumstances if approved by the Engineer.

MAINTENANCE OF FLOWS

The contractor shall be responsible to maintain all drainage flows during construction. No extra payment will be made for pumping, hauling or disposing of any drainage flow or removing any granular material that enters the drainage system through manhole or catch basin frame adjustments. The contractor will be responsible for maintaining and directing storm water flows during construction so that flooding of private property and silt migration or washouts do not occur. The contractor shall be responsible to pay for any damages caused by storm water flooding due to, or as a result of, construction activities during the duration of this project.

**Special Provisions
For The Construction of The
Marks Municipal Drain 2024
The Municipality of North Perth**

SPECIFICATIONS

The Special Provisions, along with the "*Specifications for the Construction of Municipal Drainage Works*" attached hereto, shall apply to and govern the construction of the "*Marks Municipal Drain*".

PLAN AND REPORT

The Plan and Profile and the Engineer's Report on the proposed Drainage Works shall be a part of this Specification.

EXTENT OF WORK

General

1. All standard Detailed Drawings are attached to these Specifications.
2. The Contractor shall notify the Owners and the Engineer forty-eight (48) hours prior to construction.
3. The Contractor shall verify the location of the new tile drains with the Engineer and the landowners prior to construction.
4. The working area shall be 20m centered on the proposed tile drain. Each landowner on whose property the drainage works is to be constructed shall designate access to and from the working area.
5. All utilities shall be located and uncovered in the affected areas by the Contractor prior to construction.
6. The Contractor shall supply all materials unless otherwise stated at the time of tendering.
7. All standard catch basins shall be precast concrete catch basins as per OPSD. Knockouts shall be provided in the catch basins.
8. The catch basin grate elevations shall be set to the satisfaction of the Engineer.
9. Stone rip-rap protection and geo-textile material (Terrafix 270R or approved equivalent) shall be placed around all catch basins as part of this contract.
10. All catch basin grates shall be fastened to the new catch basins.
11. The Contractor shall supply all necessary materials to complete the connections of any existing drains to the new drain.
12. All CSP pipe shall be minimum 2.0mm (14 gauge) with a 68mm x 13mm corrugation profile, and galvanized.
13. All HDPE pipe shall be CSA rated 320kPa with bell and spigot gasket joints. Pipe shall be double wall smooth interior, Boss2000 or approved equivalent.
14. All clear stone shall be 19mm Type I as per OPSS.MUNI 1004.
15. All Rip Rap stone shall be R50 quarry stone unless otherwise specified, as per OPSS.MUNI 1004.
16. The Contractor shall be responsible for all trench settlement.
17. The Contractor shall supply and install catch basin markers beside all catch basins.

18. All concrete tile shall meet the requirements of ASTM C412-15.
19. The Contractor shall strip the topsoil centered on the drain before installing the tile drain. The width of topsoil stripping shall be at the Contractor's discretion, but all operations shall be constrained to the working width as previously denoted in the report. In locations where there may be deep cuts or excessive soil generation, the Contractor may apply to the Engineer to strip wider than the working width. The Engineer shall have the right to permit or deny this request. Topsoil shall be kept separate from subsoil as much as possible. The topsoil shall be later spread over the backfilled trench.
20. The Contractor shall, where directed, remove either by excavation or by crushing, any existing tile drains, inlets and/or catch basins encountered that are no longer required for the drainage system. Removal of existing tile drains and associated drainage works shall be considered part of the work and there will be no extra payment for removal of existing drainage infrastructure.
21. The Contractor shall grade the road ditches to the new catch basins. The disturbed areas within the road Right-Of-Way shall be top soiled and seeded.
22. The Contractor shall clean up the site and leave it in a neat and tidy condition.
23. The tender shall be based upon unit prices and shall be as detailed on the tender form.
24. Nothing in these Specifications shall be construed as requiring less than a complete and satisfactory job in accordance with the obvious intent of the Drawings and Specifications.
25. All work shall be done to the satisfaction of the Engineer.
26. In accordance with the General Specifications, the Contractor shall be responsible for all faulty materials or workmanship which appears within a 1-year period from the date of the Engineer's final Payment Certificate. An amount equal to 3% of the final contract price shall be retained for the maintenance period. Any part of the money retained may be used to make good any deficiencies after five (5) working days' notice being given to the Contractor. This notice may be either in writing or by telephone.

CLOSED WORK

C-1 Outlet Pipe

Supply and install the first 6m section of 750mm diameter HDPE pipe complete with rodent grate from Sta. 0+000 to Sta. 0+006. Connect the successive 600mm diameter concrete field tile by sealing all around with 150mm of concrete or wrapping with a 600mm wide strip of Terrafix 270R filter cloth, or approved equivalent.

C-2 Rip Rap Outlet Protection and Rock Chute

Place approximately 100m² of rip rap at outlet pipe in accordance with the detail shown on Drawing #3.

Rip rap shall be field or quarry stone, of 150mm to 300mm diameter (R50) or as approved by the Engineer on a filter mat base (Terrafix 270R or approved equivalent), machine placed to produce a smooth locked surfaced. All rip rap and geotextile shall be installed as shown on the drawings accompanying the Report, and in accordance with OPSD 810.010 Type B.

C-3 Concrete Field Tile by Wheel Trencher

Concrete tile shall be a minimum of 2000D (Class IV) as per ASTM C76.

Supply and install 298m of 600mm (24") diameter, 633m of 450mm (18") and 115m of 250mm (10") diameter concrete field tile by wheel trencher or excavator.

By whatever means the pipe is installed, the Contractor shall place it so that support is provided for the bottom and sides. This may require hand work to "blind" the pipe and place and compact soil under the haunches of the pipe, and/or modification to the excavator. If the Contractor elects to install the pipe by excavator, the Contractor will be responsible for either properly shaping and preparing the trench bottom to seat the pipe to the satisfaction of the Engineer, or installing the pipe on a 200mm thick bed of 19mm clear stone. There shall be no additional payment made beyond the bid price where the Contractor has elected to install the drain by excavator. The Contractor is responsible for any breakage of pipe in the ground, however it occurs and whether or not the method of installation is approved by the Engineer.

If the Contractor elects to install the pipe by excavator, extra will not be paid for stoney conditions unless boulders are encountered, larger than can be lifted by the excavator.

Payment under this item includes all labour, equipment and materials necessary to excavate the trench and shape the bottom, lay and wrap the pipe, backfill and shape the trench, and includes topsoil stripping and replacement.

This item shall include the wrapping of tile joints. The Contractor shall supply and wrap all concrete tile joints with geotextile filter material as part of this contract.

- a. 300mm wide for tile sizes 150mm diameter to 350mm diameter
- b. 400mm wide for tile sizes 400mm diameter to 750mm diameter
- c. 500mm wide for tile sizes larger than 750mm diameter

The filter material shall completely cover the tile join and shall have a minimum overlap of 300mm. The type of filter material shall be Terrafix 270R or approved equal.

No additional payment will be made for wrapping of tile.

C-4 Ditch Inlet Catch Basins or Catch Basins

Supply and install catch basins complete with birdcage grate and 600mm sump as per OPSD 705.010 as shown on the Contract Drawings.

Flat catch basins shall have a flat top and heavy-duty galvanized steel grate (minimum bar diameter 15mm, maximum spacing 75mm) of the "birdcage" type set so that the top of the catch basins is approximately flush with the surrounding ground.

All catch basins shall be set on a 200mm thick layer of compacted granular 'A' or 19mm drainage stone.

All necessary minor grading and contouring to convey water to the catch basin is included. The approximate top of grate elevation has been shown on the detailed plans; however, the contractor shall confirm the surface elevations prior to ordering or placing any catch basins and shall ensure that the top does not extend above the ground surface.

For the purposes of this report, top of grate shall be equivalent to the lowest point that surface water can enter the structure. All catch basins shall include at least one 150mm riser section.

Securely fasten the grate to the structure with two galvanized bolts. All pipes connected to the catch basin shall be suitably grouted with concrete, and all grouted connections shall be completely wrapped with geotextile. Further, geotextile shall be placed over all the joints between sections of the box for the entire perimeter of the box.

Supply and install approximately 2 tonnes of rip rap at each structure to the standard described in Item C-1. Rip-rap shall be included in the price of the catch basin and there shall be no extra payment for supply and placement.

C-5 Tile Connections

All tile encountered shall be connected into the main drain or a catch basin. Tile connections may be made by using the same size of concrete field tile or one size larger of standard corrugated plastic drainage tubing. Connection at the main shall be “earth tight” to the satisfaction of the Engineer. All tile connections shall be done by core drilling the main drain or catch basin, and the connection shall be sealed by a method satisfactory to the Engineer.

The contractor will be paid as follows for the connection of tributary tile to the proposed works:

100mm Connections to	Total c/w Coring	150mm Connections to	Total c/w Coring	200mm Connections to	Total c/w Coring
250-675	\$ 110.00	300-675	\$ 120.00	250-675	\$ 150.00
750-900	\$ 130.00	750-900	\$ 140.00	750-900	\$ 170.00

The number of tributary tile connections required is unknown until construction commences.

The above prices include supply and install of up to a 3m length of tile or tubing to make connections. Connections in excess of 3m shall be paid for at the rate of \$20.00/m for 100mm and 150mm diameter tile, and \$30.00 for 200mm diameter tile.

C-6 Install Concrete Field Tile by Excavator (Provisional)

This specification shall also apply where the Contractor elects to lay the tile by hydraulic excavator, or when directed to do so by the Engineer due to poor soil conditions. Tile shall be as per specification C-3.

The Contractor shall place the pipe on a 200mm thick layer of 19mm clear stone bedding and use clear stone embedment to the spring line so that the pipe is supported from the bottom and sides. This may require hand work to “blind” the pipe and place stone under the haunches of the pipe, and/or modification to the excavator. The Contractor is responsible for any breakage of pipe in the ground however it occurs.

Extra will not be paid for stoney conditions unless boulders are encountered, larger than can be lifted by the excavator.

This item shall include the wrapping of tile joints. The Contractor shall supply and wrap all concrete tile joints with geotextile filter material as part of this contract.

- a. 300mm wide for tile sizes 150mm diameter to 350mm diameter
- b. 400mm wide for tile sizes 400mm diameter to 750mm diameter
- c. 500mm wide for tile sizes larger than 750mm diameter

The filter material shall completely cover the tile join and shall have a minimum overlap of 300mm. The type of filter material shall be Terrafix 270R or approved equal.

No additional payment will be made for wrapping of tile.

C-7 Poor Soil Conditions (Provisional)

Poor soil conditions may be encountered. Should they occur and be sufficiently severe, in the opinion of the Engineer, that installation by wheel trencher is not possible; extra will be paid at the rate quoted in the tender for installation of the tile by excavator as per Special Provision C-6. Any clear stone required due to poor soil conditions, as approved by the Engineer, will be paid at the rate quoted in the tender. Work under this item will include trench excavation of sufficient depth to install clear stone bedding if necessary. All costs involved in removing the wheel trencher, crew downtime, or any other costs related to the transition from wheel trencher to excavator will be included in the cost of this item, and no additional payments will be made.

C-8 19mm Clear Stone (Provisional)

Supply and install 19mm diameter clear crushed stone for bedding or envelope. Where not already specified in the contract, location for installation shall be designated by the Engineer at the time of construction. Payment will be for the actual quantity, in tonnes, installed.