

ENGINEERING REPORT

For

PAFF DRAIN 2025

Township of Wellesley

Region of Waterloo

Date: October 9, 2025

File No. 23-175



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Definitions:

“Act” means The Drainage Act R.S.O. 1990

“CSP” means corrugated steel pipe

“*Drainage Guide*” means *A Guide for Engineers working under the Drainage Act in Ontario*, (OMAFRA Publication 852, 2018)

“GRCA” means Grand River Conservation Authority

“Drain” means Paff Drain 2025

“Grant” means provincial grant as per Section 85 of the Act

“Grant Policy” means OMAFA Agricultural Drainage Infrastructure Program Administrative Policies

“HDPE” means high-density polyethylene

“Municipal Drain” means a drainage works constructed under the Act

“Municipality” means Township of Wellesley

“OMAFRA” means the Ontario Ministry of Agriculture, Food and Agribusiness

“Tribunal” or “Drainage Tribunal” means Agriculture, Food and Rural Affairs Appeal Tribunal

“Ø” means diameter

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PAFF DRAIN 2025

TOWNSHIP OF WELLESLEY

1 EXECUTIVE SUMMARY

This report is prepared pursuant to Section 78 of the Drainage Act R.S.O. 1990.

On April 19, 2023 the Township of Wellesley received a *Request for Drain Major Improvement* from Ron Stroh (Strohvest Ontario Inc.) for improvements to the Paff Drainage Works in Concession 1, Lot 13 in the Township of Wellesley. Pursuant to Section 8 of the Act, on July 12, 2023, K. Smart Associates Limited was appointed under Section 78 of the Drainage Act by resolution of Council to prepare a report on the Paff Drainage Works.

To address the request received, this report recommends the following:

- Installation of 418m of 900mmØ concrete tile
- Installation of one (1) 900x1500mm concrete catchbasin
- Installation of two (2) 1200x1500mm concrete catchbasins
- Installation of 21m of 900mmØ HDPE by open cut

The estimated cost of this project is \$381,000

The watershed served is approximately 30.0 hectares (74.13 acres).

Assessment schedules are for construction and future maintenance of the drainage works.

- Schedule A shows the assessment of the total estimated cost
- Schedule B is for prorating future maintenance cost
- Schedule C is for levying the final cost of the Drain.
- Appendix A illustrates the calculation of the assessments outlined in Schedules A and B.

2 BACKGROUND

On April 19, 2023 the Township of Wellesley received a *Request for Major Drain Improvement* from Ron Stroh (Strohvest Ontario Inc.) for improved capacity of the Paff Drainage Works in the Township of Wilmot and abandonment of the Paff Drainage Works in the Township of Wellesley. Pursuant to Section 8 of the Act, on July 12, 2023, K. Smart Associates Limited was appointed by resolution of Council to prepare a report on the Paff Drainage Works.

At the time of the initial appointment of K. Smart Associates Limited, Curtis MacIntyre, P. Eng., was listed as the project engineer, with Thomas Jackson, P. Eng. acting as the project manager. On May 20, 2025 K. Smart Associates Limited submitted a change of engineer letter, listing Thomas Jackson as the project engineer for the Paff Drain 2025 report.

3 DRAINAGE HISTORY

The Paff Drainage Works was originally established in accordance with a report by Wm. J. Mannerow dated October 26, 1967. Under the 1967 report, the Main Drain extended north from the Nith River across Concession 4, Lots 18 and 19 in the Township of Wilmot and Concession 1, Lots 13 and 14 in the Township of Wellesley for an approximate distance of 1,115m (3,657 feet). The drain began as a 300mmØ tile for the first 335m before reducing to a 200mmØ tile for the next 275m, the drain crosses Gerber Road as a 200mmØ tile and then finally to a 150mmØ for the remaining 505m.

The Kuntze Drain and Wagler Drain border the present day Paff Drain 2025 watershed to the north and north-west, respectively.

4 INVESTIGATION

4.1 On-Site Meeting

On November 23, 2023, an on-site meeting was held in accordance with Section 9(1) and 9(2) of the Act at the Wellesley Community Centre.

Attendees:

Wayne Kuntze (020-008-01500)	Greg Romanick (Stantec)
Art Woods (010-16200)	Bryan Weersink (Stantec)
Brett Bartlett (010-17600)	Curtis Schaerer (Wilmot) Eng. & Public Works
Ron Stroh (010-001-37200)	Amy Harron (Wellesley) Deputy Clerk
Brendon Jantzi (020-008-01400)	John Kuntze, (Wilmot) Drainage Superintendent
	Thomas Jackson, P. Eng. (K. Smart) Project Engineer

Thomas Jackson briefly explained the purpose of the meeting and an overview of the existing Paff Drainage Works. Generalized comments are listed below;

Strovest Ontario Inc. (Roll. 010-001-37200)

- This property was represented by Ron Stroh, Greg Romanick and Bryan Weersink.
- The property requires drain improvements to provide an outlet for a proposed development.
- Ron has done tile repairs in the past and had confirmed that the existing municipal drain was concrete tile.
- There were several washouts on the west property line from surface flow.
- The proposed lot grading for the subdivision will bring additional water from the north into the watershed.
- It was asked if the pond can outlet to the surface before entering the municipal drain. Thomas explained that that wouldn't be ideal because it would give the CB grate a chance to clog and not accept the water.
- The proposed subdivision would provide an outlet for the upstream property in the agreement.

Brett Bartlett (Roll. 010-17600)

- Brett questioned the accuracy of the Drain alignment as shown on the drawings, he believes it follows the property line.
- The road crossing causes erosion on his property, and while there was an offset catchbasin installed as maintenance, it doesn't catch the flow.
- Brett asked about increased costs depending on tile size to accommodate subdivision design standards.
- Brett rents out the land but does not have a plan to tile his field.
- Brett asked if it was possible to preserve his trees on the treeline when installing new tile.

Wayne Kuntze (Roll. 020-008-01500)

- Wayne believes the existing catchbasin on his east property line may need to be moved to the south or an additional catchbasin should be installed because there are two washouts in the fence line from surface flow.

Art Woods (representing Vogel Estate Roll. 010-16200)

- He plans to sell the Vogel Farm in the Spring.

4.2 Site Examination and Survey

The route of the existing drain was examined after the on-site meeting and on several occasions during the design phase of the project. Topographic survey was completed on January 11, 2024 from the outlet of the Drain to the upstream extent.

Under the site investigation it was observed that the 1200mmø CSP culvert crossing under Gerber Road was in poor condition and was being reinforced by wooden posts to prevent collapse. An unknown tile upstream of Gerber Road was outletting into the culvert from the west.

Based on the 1967 report, a single catchbasin was to be installed on the north side of Gerber Road, however, upon inspection of the area the catchbasin could not be located. It was discovered that after the 1967 report was filed the catchbasin was relocated to the south side of the road during construction. Sometime later an offline catchbasin was installed approximately 6m east as part of a maintenance project. Both catchbasins were only allowing minimal amounts of water into the drain during the site examination.

The existing drain outlet was replaced as a maintenance project and appeared to be in good condition when observed.

4.3 Watershed Description

The perimeter watershed of the Drain has been established based on open source Lidar-derived Ontario Digital Terrain Model, on-site investigation, available tile plans and historical reports. The watershed was finalized using the catchment area used for the storm water management pond, which was delineated by the developers engineer. The proposed development adds about 3.4 hectares of the north lands on the proposed development property.

The watershed area is approximately 53% agricultural lands, 1% forested lands, 35% residential lands and 11% roads.

The Paff Drain 2025 watershed is neighboured by the Kuntze Drain to the north and the Wagler Drain to the west.

5 AUTHORITY FOR REPORT

Section 78 of the Drainage Act provides for the repair and improvement of an existing drain constructed under the Act through a new Engineer's report. The Paff Drainage Works was constructed under the Act, and it was determined from the on-site meeting and site examination that the Drain requires improvement. Therefore, this report is properly initiated under Section 78 of the Act.

6 DESIGN CONSIDERATIONS

6.1 Sufficient Outlet

Section 15 of the Act requires that the proposed work be continued downstream to a sufficient outlet. Section 1 of the Act defines sufficient outlet as "a point at which water can be discharged safely so that it will do no damage to lands or roads." For this project, the Nith River at Station 0+000 on the Main Drain provides sufficient outlet and will allow the proposed works to function as intended.

6.2 Drain Capacity

To function as an outlet for the proposed subdivision, the Township of Wellesley requires the proposed system to convey the Regional Storm Event. This can either be accomplished by providing an overland flow route or in a closed system.

The size of the proposed tile drain was determined using flow rates provided by Stantec's *Revised Functional Servicing Report*, dated March 11, 2025. The Township requires the outlet for the stormwater management pond to convey the regional storm.

6.3 Soil Conditions

The *Soils of Waterloo County 1971* soils mapping for this area indicates that the soils adjacent to this Drain are predominately Huron Loam. The soils consist of a poorly drained sandy-loam mixture.

Based on available information, adverse subsurface conditions are not expected on this project, and the use of conventional construction equipment is anticipated. Refer to the Standard Specifications and Special Provisions for drain construction procedures when adverse subsurface conditions are encountered.

7 RECOMMENDED WORK

A description of the Drain for construction, on a property basis, is as follows:

A. Buehrle (Roll 010-1700)

- Construct permanent plunge pool with 2m width by 3m long bottom and 1.5:1 side slopes. Place 40m² riprap (R50) on geotextile in basin.
- Install 4m of 900mmø concrete tile with joint wrap with 6m of 900mmø solid plastic pipe at outlet with rodent grate.

K. Gerber (Roll 010-16200)

- Install 212m of 900mmø concrete tile with joint wrap

B. Bartlett & J. Robson (Roll 010-17600)

- Construct 900x1500mm concrete catch basin.
- Install 202m of 900mmø concrete tile with joint wrap.

Township of Wellesley/Township of Wilmot (Gerber Road)

- Construct 1200x1500mm concrete catch basin with 15m of new berm
- Install 21m of 900mmø solid plastic pipe by open cut.
- Construct 1200x1500mm ditch inlet catch basin.
- Re-grade existing 90m of roadside ditch.

Further detail regarding the construction and maintenance of the Drain is in the Special Provisions and Drawings.

8 ENVIRONMENTAL CONSIDERATIONS

8.1 Agency Notification

Contact was made with the Grand River Conservation Authority during the process of preparing this report.

8.2 Agency Responses

8.2.1 Grand River Conservation Authority

The Grand River Conservation Authority did not request an environmental appraisal under Section 6 of the Act. Public meeting notices were sent to the Conservation Authority. A project description and drawing package were provided to the Conservation Authority for review. A response from the Conservation Authority was dated November 26, 2024 with comments and recommendations that have been addressed in this report.

9 MEETING(S)

On June 26, 2025, an information meeting with landowners was held. Notice for the meeting was sent to all affected landowners in the watershed, affected agencies, the Township of Wellesley and the Township of Wilmot. At the meeting, the results of the investigation to-date were presented along with a summary of the proposed work and preliminary cost estimates and assessments.

Attendees:

Wayne Kuntze (020-008-01500)	Alice Burle (010-17000)
Kevin Gerber (010-16200)	John Kuntze (Wilmot) Drainage Superintendent
Brett Bartlett (010-17600)	Thomas Jackson, P. Eng. (K. Smart)
Ron Stroh (010-001-37200)	

Primary discussion topics of the meeting involved the timeline for the proposed work, and the increased cost of the project due to the proposed development. It was explained that the landowners were assessed based on the cost associated with replacing the existing tile with a tile sized to present day design standards. The increased cost for upsizing the tile is assessed as a special benefit to the development property. No concerns were raised with the proposed works.

10 CONSTRUCTION CONSIDERATIONS

10.1 Construction Scheduling

Construction cannot commence until ten days after a bylaw to adopt this report is given third reading in accordance with the Act.

Work in the Gerber Road allowance is subject to a permit to be obtained from the Township of Wellesley.

Restricted timing windows for this project, if any, are described in *Section 8 ENVIRONMENTAL CONSIDERATIONS*.

10.2 Design Changes During Construction

In general, design changes requested by landowners, agencies or other authorities after the bylaw is passed cannot be undertaken.

Section 84.1 of the Act and the associated regulation, O. Reg. 500/21, provides criteria and a process for amending this report if design changes are required during construction due to unforeseen circumstances and the design changes are approved by the Engineer. If design changes are made, this report must be amended after construction with the as-constructed drawings before passing the actual cost bylaw.

Additional work desired by the landowner(s) which is not part of the drainage works may be arranged with the Contractor provided the cost of the work is paid by the landowner(s), and the engineer reviews the additional work in advance. Such additional work is not part of the drainage works for future maintenance.

10.3 Alignment of Drains

All drains shall be constructed and maintained generally to the alignment, as noted on the plans and specified by the Special Provisions. In the absence of survey bars, existing fences and similar boundary features are assumed to represent property lines. Should landowners desire a more precise location for the drains in relation to their property line or if there is a dispute about the location of any property line, landowners may obtain a legal survey at their own cost before construction.

11 DRAWINGS AND SPECIFICATIONS

11.1 Drawings

The location of the drain, watershed boundary and the affected properties are shown on Drawing No. 1 and 2 included with this report. The numbers adjacent to the Drain are station numbers which indicate in metres the distance along the Drain from the outlet. The profiles, details and special provisions for the Drain are on Drawings 3 to 6.

11.2 Specifications

This report incorporates the General Conditions, Standard Specifications and Special Provisions listed in the Table of Contents, which govern the construction and maintenance of the Drain.

12 COST ESTIMATE

The estimated cost of this project includes allowances to owners, the construction cost, the engineering cost and other costs associated with the project.

12.1 Allowances

Sections 29 to 33 of the Drainage Act provides for allowances (compensation) to owners affected by proposed drain construction. On this project, allowances under Section 29 and Section 30 apply and are summarized in Table 12.1-1 - Summary of Allowances.

12.1.1 Section 29 – Right-of-Way

Section 29 provides for payment of an allowance to landowners for the right-of-way required for the Drain. This allowance compensates the owners for land to accommodate the Drain, access routes to the Drain and for a corridor along the Drain for construction and maintenance purposes. Section 29 allowance rates consider current municipal assessment information and land use but are generally below full market value because there is no transfer of land ownership.

Section 29 allowances were computed based on a rate of \$20,000 /hectare and a 10m corridor width for closed drains.

12.1.2 Section 30 - Damages

Section 30 provides for payment of an allowance to landowners along the Drain for damages caused by the construction of the Drain. Where separate access routes to the working area are specified in this report, Section 30 allowances also account for access route damage. In agricultural areas, crop damages are computed using the methodology outlined in the *Drainage Guide*, published crop values, and declining productivity loss in the years following construction.

The allowance for damage to land and crops was calculated using a rate of \$4,000 per hectare applied to the defined working area.

12.1.3 Summary of Allowances

The table below summarizes the corridor widths used to compute allowances and the total allowance amounts provided under this report:

Table 12.1-1 - Summary of Allowances

Interval	Station	Roll No.	R.O.W. (S.29)		Damages (S.30)		Total
			(m)	\$	(m)	\$	
M-1	0+010 to 0+222	010-16200	6	2,550	25	2,150	\$4,950
M-1	Access	010-16200	-	-	4	100	\$100
M-2	Access	010-17600	-	-	4	100	\$100
M-2	0+222 to 0+424	010-17600	6	2,400	35	4,050	\$6,450
Total							\$11,350

In accordance with Section 62(3) of the Act, the allowances shown may be deducted from the final assessment levied. Payment to the owner would only be made when

the allowance is greater than the final assessment. The allowances are a fixed amount and are not adjusted due to construction.

12.2 Construction Cost Estimate

The estimated cost for Labour, Equipment and Materials to construct the proposed Drain is outlined in detail in Estimated Costs Summary in Table 12.6-1 - Estimated Cost Summary.

The construction cost estimate is based on recent costs for comparable work. A contingency amount is included to cover additional work that may be required due to field conditions or minor alterations to the project.

The contract for the Drain will be awarded by public tender. If the contract price is more than 33% over the engineer's estimate, Section 59 of the Act requires a Council meeting with the assessed landowners to determine if the project should proceed.

12.3 Engineering Cost Estimate

Engineering costs include the Engineer's Report, the Council meeting to the consider the report, Court of Revision, and Construction Phase Services.

The Engineer's Report includes landowner meetings, survey, agency consultation, and preparation of the report (design, drawings, specifications, cost estimates, and assessments).

Construction Phase Services may include: preparing tender documents and tender call, review of tenders, attending the pre-construction meeting, periodic construction inspection, payments, final inspection, post-construction follow-up, final cost analysis and preparation of the grant application.

The cost for report preparation is usually not altered at the conclusion of a project unless the report is referred back or the report is appealed to the Drainage Tribunal, which would result in additional costs. The amount shown for meetings (Report Consideration by Council and Court of Revision) is an estimate. The estimate shown for construction phase services assumes standard construction conditions and an efficient Contractor. The final cost for meetings and construction phase services will be based on the actual time spent. Engineering costs are summarized in Table 12.6-1 - Estimated Cost Summary.

12.4 Estimate of Section 73 Costs

Section 73(2) and 73(3) of the Act direct that the cost of services provided by municipal staff and the Council to carry out the Act process shall not form part of the final cost of the Drain. However, Section 73(1) outlines that the following costs incurred by either municipality can be included in the cost of the Drain: "*cost of any application, reference or appeal and the cost of temporary financing.*"

The estimate of Section 73 costs is included to cover the above-referenced items from Section 73(1) and primarily provides for interest charges on financing the

project until it is completed. This cost estimate may not be adequate to cover legal or engineering costs incurred by or assessed to both municipalities should the project be appealed beyond the Court of Revision though such costs will form part of the final drain cost.

Grant policy indicates that certain administrative costs required to carry out the required procedures under the Act can be included in the final drain cost. Section 73 costs are summarized in Table 12.6-1 - Estimated Cost Summary.

12.5 Harmonized Sales Tax

The Harmonized Sales Tax (HST) will apply to most costs on this project. Both municipalities are eligible for a partial refund on HST paid, the net 1.76% HST (non-recoverable portion) is included in the cost estimates in this report.

12.6 Estimated Cost Summary

Table 12.6-1 - Estimated Cost Summary

Item	Stations	Description	Cost	Total
Construction Costs				
1	-0+006 to 0+000	Construct permanent plunge pool with 2mW x 3mL bottom and 1.5:1 side slopes. Place 40m ² riprap (R50) on geotextile.	4,000	
2	-0+010 to 0+010	16m of brushing, 20m width. Work around large trees where possible	1,600	
3	0+000 to 0+006	Install 6m of 900mmø solid plastic pipe at outlet	9,000	
4	0+006 to 0+222	Install 216m of 900mmø concrete tile with joint wrap. Existing Paff Drainage Works to be broken up and buried	69,100	
5	0+222	Construct 900x1500mmø concrete catchbasin including connections, birdcage grate and riprap apron. Remove and dispose of 1-2 existing trees as required	6,000	
6	0+222 to 0+424	Install 202m of 900mmø concrete tile with joint wrap. Existing Paff Drainage Works to be broken up and buried	64,600	
7	0+424	Construct 1200x1500mmø concrete catchbasin, including connections, birdcage grate, marker and riprap apron. Re-grade 30m roadside ditch to provide positive drainage to catchbasin	6,500	
8	0+424 to 0+445	Install 21m of 900mmø HDPE by open cut methods. Remove and dispose of existing 1200mmø CSP and fill existing 200mmø Paff Drainage Works under Gerber Road	62,500	
9	0+445	Construct 1200x1500mm concrete catchbasin, including connections birdcage grate, marker and riprap apron. Re-grade 60m roadside ditch to provide positive drainage to catchbasin	7,000	
Sub Total Part i)			230,300	

Item	Stations	Description	Cost	Total
Construction Costs				
Contingencies				
C1		Increased cost to install 50m of tile by backhoe in stony conditions, where authorized and with thin bedding of clear crushed stone. (If required and authorized, would be paid in addition to regular bid item)	2,500	
C2		Increase costs to install 50m of tile by backhoe in stony conditions, where authorized and with thin bedding of clear crushed stone. (Contingency is intended to be independent of tile size. If required and authorized, would be paid in addition to regular bid item.)	2,500	
C3		Contingency allowance for lift-outs of wheel machine to allow for stone removal, including the stone removal and restarting/ continuing the wheel machine (Based on 4 @ \$300/lift-out)	1,200	
C4		Tile connections (based on 5 @ \$200/connection)	1,000	
		Lump sum contingency allowance	17,900	
		Sub Total Part ii)	25,100	
Total Construction Estimate:				\$255,400

	Total
Allowances	\$11,350
Engineering Costs	
Report Preparation	75,000
Consideration of Report Meeting	1,000
Court of Revision	1,000
Construction Phase Services	20,100
Total Engineering Cost Estimate:	\$97,100
Section 73 Costs	\$9,945
Net HST (1.76%) on applicable costs	\$6,205
Total Estimated Cost:	\$380,000

13 ASSESSMENTS

The Drainage Act requires that the total estimated cost be assessed to the affected lands and roads under the categories of Benefit (Section 22), Outlet Liability (Section 23), Injuring Liability (Section 23), Special Benefit (Section 24) and Increased Cost (Section 26). On this project assessment for Benefit, Special Benefit, Outlet Liability and Increased Cost (Special) Assessment are involved.

13.1 Calculation of Estimated Assessments

Appendix A in this report illustrates how the Drain is divided into sub-sections (intervals) and presents the estimated cost for each interval, as outlined in the *Drainage Guide*. For each interval, the first step in the assessment calculation is to determine the benefit assessment to the affected lands and roads, then special

assessments to roads and utilities are determined, where applicable. After deducting the total benefit and special assessments from the interval cost, the balance of the cost is then assessed as outlet liability on a per hectare basis to all lands and roads in the watershed.

13.2 Benefit Assessments (Section 22)

Section 22 benefit assessments are listed in Schedule A – Schedule of Assessments and are shown on a per interval basis in Appendix A – Calculation of Assessments.

Section 22 benefits represent the estimated value provided to the property by the works based on the following benefit categories: Direct Outlet (ability of a property to connect directly to the new drain), Improved Drainage (improved drainage along the length of the drain crossing a property), Subsurface Service Area (size of land area that is or could be directly connected via subsurface tile drains) and Cut-off Benefit (when the Drain diverts flow away from an area).

Table 13.2-1 – Section 22 Benefit Assessments

<u>Roll No.</u>	<u>Description</u>	<u>MAIN DRAIN</u>
010-16200	- For improved sub-surface service area	\$600
	- For improved drainage along drain	\$11,700
	- For improved outlet	\$5,000
010-17600	- For improved sub-surface service area	\$2,200
	- For improved drainage along drain	\$9,000
	- For improved outlet	\$10,000
020-008-01500	- For improved sub-surface area	\$600
	- For improved outlet	\$800
010-001-37200	- For improved direct outlet	\$30,000
Gerber Road	- For improved sub-surface service area	\$10,700
TOTAL BENEFIT		\$80,600

13.3 Outlet Liability Assessments (Section 23)

Section 23(3) of the Drainage Act states that outlet liability assessment is to be based on the volume and rate of flow of the water artificially caused to flow. Therefore, the lands and roads in the watershed are assessed on a per hectare basis, with adjustments made to recognize the different amount of runoff generated by different land uses, as outlined in the *Drainage Guide*. The basis for the adjustments is 1 hectare of cleared agricultural land contributing both surface and subsurface water to the Drain. Land uses with a different runoff rate are adjusted by the factors given in Table 13.3-1 – Runoff Factors Table.

Table 13.3-1 – Runoff Factors Table

Land Use	Runoff factor
Agricultural	1.0
Forest/swamp	0.5
Residential	2.0
Gravel Road	2.0
Paved Road	3.0

13.4 Special Benefit Assessment (Section 24)

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.

Special benefit is assessed to lands for costs associated with a requested improvement above the current design standards. The increase in tile size to accommodate a proposed development has been assessed as a special benefit based on the following table.

Table 13.4-1 – Section 24 Special Benefit Assessments

<u>Roll No.</u>	<u>Description</u>	<u>MAIN DRAIN</u>
010-001-37200	- For increase in tile size	\$130,000
TOTAL SPECIAL BENEFIT		\$130,000

13.5 Increased Cost (Special) Assessments (Section 26)

Section 26 of the Drainage Act directs that any increased cost due to a public utility or road authority shall be paid for by that utility or road. This assessment is known as a Special Assessment.

The estimated special assessments are presented in Table 13.5-1 - Estimated Special Assessments. The equivalent drain cost is based on the length of Drain affected by the road allowance or utility right of way and the normal cost of drain construction. The increased cost caused by the road or utility is determined by subtracting the equivalent drain cost from the construction and engineering costs.

Table 13.5-1 - Estimated Special Assessments

Location	Main Drain
Road/Railroad/Utility	Gerber Road
Authority/Owner	Township of Wellesley/ Township of Wilmot
Construction Cost	\$76,000
+ Engineering Cost	\$21,400
+ Section 73 Costs	\$0
- Equivalent Drain Cost	\$1,200
+ Net HST	\$1,690
= Estimated Special Assess.	\$97,890

Actual special assessments are non-proratable and will be determined after construction using the actual construction and engineering costs. Any additional Section 26 costs identified by the engineer will be included with the actual special assessment where appropriate.

The road authority or utility may elect to construct the Drain within their right of way with their forces. In this case, the special assessment is calculated by inserting zero for the construction cost.

If there are increased costs to the drain project due to a utility or road not listed in the table above, a Special Assessment will be based on the actual costs incurred.

13.6 Assessment Schedules

In the assessment schedules, each parcel of land assessed has been identified by the municipal assessment roll number at the time of the preparation of this report. The size of each parcel was established using current assessment roll information. If an "F" is shown in the first column, it denotes lands with current Farm Property Tax Class designation that may qualify for Grant.

13.6.1 Schedule A- Schedule of Assessments

The estimated cost for the drainage works in this report is distributed among lands, roads and utilities, as shown in Schedule A, the Schedule of Assessments.

Section 24 Special Benefits and Section 26 Increased Cost Assessments are considered non-proratable and will be directly assessed to the listed roll number, road or utility based on actual costs for specific work.

Section 22 Benefits and Section 23 Outlet assessments are proratable, and will be adjusted at the conclusion of the project using the actual drain cost and a pro rata application of the cost distribution shown in Schedule A.

13.6.2 Schedule B -Schedule of Assessments for Maintenance

In accordance with Section 74 of the Act, each municipality shall be responsible for the maintenance of the portion of drain within their municipal boundary, and the cost

of maintenance assessed to lands and roads upstream of the maintenance location, pro rata with the amounts in Schedule B.

Schedule B \$ amounts are listed for calculating share of future maintenance costs. Schedule B \$ amounts will not be included in the actual cost levy for construction of this Drain.

Schedule B provides separate columns for each interval of the drain to identify upstream lands and roads. For any parcel, the future maintenance assessment will be computed by summing that parcel's share of the maintenance cost for all intervals upstream of the maintenance location.

13.6.3 Schedule C – Schedule for Actual Cost Bylaw

After the construction of the Drain is certified complete by the Engineer, the initiating municipality, the Township of Wellesley, will determine the actual cost of the Drain. Non-proratable assessments identified in Schedule A will be updated using actual costs.

After deducting actual non-proratable assessments from the actual total drain cost, the remainder will be assessed pro rata using Schedule C.

Net assessments are determined by deducting allowance and grant amounts where applicable. Eligibility for grant will be confirmed by the initiating municipality at the time the actual cost is levied.

Actual assessments in Schedule C will be levied to the owner of the identified parcel at the time the Actual Cost Bylaw is passed.

14 GRANT

In accordance with the provisions of Section 85 of the Act, a grant not exceeding $\frac{1}{3}$ (33-1/3%) may be available on the assessments against lands used for agricultural purposes. The current OMAFA grant policy defines agricultural lands as privately owned parcels of land which have the Farm Property Class Tax Rate. Based on Municipal assessment roll information, parcels that have the Farm Property Tax Class are identified with an 'F' in the first column of the assessment schedules.

Section 88 of the Act provides for the initiating municipality to apply for this grant after the construction of the Drain is certified complete by the Engineer. The initiating Municipality must confirm the Farm Property Tax Class on the assessed parcels at the time the grant application is completed and submitted to OMAFA. OMAFA has the authority to determine grant eligibility regardless of the designation herein.

15 PRIVACY OF LANDS

Although a right of way for each municipality exists along the Drain and along access routes identified in this report for future maintenance, the land remains private property. Other landowners or the public may not enter or use the drain right of way. Persons authorized to enter the drain right of way to carry out duties under the Act include: Engineers, Contractors and the Drainage Superintendent and/or their assistants.

16 MAINTENANCE

Section 74 of the Act requires each municipality shall maintain the portion of drain within their municipal boundary with the cost of maintenance assessed to the upstream lands and roads pro rata with the assessments in Schedule B.

16.1 The Drain For Future Maintenance

The Paff Drain 2025, for the purpose of future maintenance is to include all concrete tile, solid plastic pipe, catchbasins, road crossing berms and stilling pools as defined and constructed in accordance with the drawings and special provisions of this report. work constructed in accordance with the drawings and special provisions of this report.

In accordance with Section 19 of the Act, the entirety of the existing Paff Drainage Works will hereby abandoned of status under the Drainage Act.

16.2 General

All parties affected by the Drain, are encouraged to periodically inspect the Drain and report any visible or suspected problems to their respective municipality. Any landowner making a new connection to the Drain shall notify the Drainage Superintendent before making the connection. If the Drainage Superintendent is not notified, the cost to remedy new connections that obstruct or otherwise damage the Drain will be the responsibility of the owner.

A right-of-way along the drain and access routes to the Drain exist for each municipality to maintain the Drain. The right-of-way for the Drain, as described in this report shall remain free of obstructions. Costs to remove obstructions from the maintenance right-of-way will be assessed to the owner.

The cost of cleaning through road crossings shall be assessed to upstream lands and roads in accordance with Schedule B. The cost of replacing, repairing and/or maintaining any road culverts or crossings shall be assessed fully to the road authority. The road authority may elect to complete such work with their own forces, provided the work is completed in a timely manner and maintains the function of the Drain.

16.3 Updating Future Maintenance Schedules

To ensure future maintenance assessments are equitable, the assessments provided in this report should be reapportioned under Section 65 when severances or amalgamations occur or when new lands are connected to the Drain or when a land-use change occurs that can be accommodated by the existing Drain. If a future land-use change will cause the drain capacity to be exceeded, a report under Section 4 or 78 may be required to provide increased capacity.

17 BYLAW

This report including the drawings and specifications, assessment schedules and appendices, when adopted by bylaw in accordance with the Act, provides the basis for construction and maintenance of the Drain.

All of which is respectfully submitted,

K. SMART ASSOCIATES LTD.



Thomas Jackson, P. Eng.



SCHEDULE A - SCHEDULE OF ASSESSMENTS FOR CONSTRUCTION
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT

			Main Drain			
Con	Lot	Roll Number (Owner)	Total ha affected	Benefit (Sec. 22)	Special (Sec. 26)	Outlet (Sec. 23) Total
<i>Township of Wellesley (Roll No. 30-24-)</i>						
1 Eastern Div.	13	010-001-37200 (Strohvest Ontario Inc.)	15.0	160,000	0	49,175 209,175
1 Eastern Div.	13	020-008-01500 (W. & R. Kuntze)	6.1	1,400	0	11,590 12,990
1 Eastern Div.	13	020-008-01400 (M. & N. Jantzi)	0.03	0	0	114 114
Subtotal Township of Wellesley (Lands):			21.1	161,400	0	60,879 222,279
<i>Township of Wellesley</i>						
		1/2 Gerber Road (Wellesley)	0.35	5,350	48,945	1,881 56,176
Subtotal Township of Wellesley (Roads & Utilities):			0.4	5,350	48,945	1,881 56,176
<i>Township of Wilmot (Roll No. 30-18-090-)</i>						
1 Eastern Div.	13	010-16200 (K. Gerber)	4.0	17,300	0	2,500 19,800
1 Eastern Div.	13	010-17000 (A. Buehrle)	0.0	0	0	0 0
1 Eastern Div.	13	010-17600 (B. Bartlett & J. Robson)	4.2	21,300	0	4,269 25,569
Subtotal Township of Wilmot (Lands):			8.2	38,600	0	6,769 45,369
<i>Township of Wilmot</i>						
		1/2 Gerber Road (Wilmot)	0.35	5,350	48,945	1,881 56,176
Subtotal Township of Wilmot (Roads & Utilities):			0.4	5,350	48,945	1,881 56,176
TOTAL ASSESSMENT PAFF DRAIN:			30.0	210,700	97,890	71,410 380,000

Notes:

1. Lands noted with an "F" are classified as agricultural and according to current OMAFRA policy qualify for the 1/3 grant
Eligibility for the 1/3 grant will be confirmed at the time the final cost is levied.
2. Section 21 of the Drainage Act, RSO 1990 requires that assessments be shown opposite each parcel of land and road affected.
The affected parcels of land have been identified using the roll number from the last revised assessment roll for the Township.
For convenience the owner's names as shown by the last revised assessment roll have also been included.

**SCHEDULE B - SCHEDULE OF ASSESSMENTS
FOR FUTURE MAINTENANCE
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT**

Roll No. (Owner)	MAIN DRAIN			
	Interval 1		Interval 2	
	0+000 to 0+223		0+223 to 0+449	
	\$	%	\$	%
<i>Township of Wellesley (Roll No. 30-24-)</i>				
010-001-37200 (Strohvest Ontario Inc.)	300	3.87	500	2.49
Lot 1	50	0.64	100	0.50
Lot 2	50	0.64	100	0.50
Lot 3	50	0.64	100	0.50
Lot 4	50	0.64	100	0.50
Lot 5	50	0.64	100	0.50
Lot 6	50	0.64	100	0.50
Lot 7	50	0.64	100	0.50
Lot 8	50	0.64	100	0.50
Lot 9	50	0.64	100	0.50
Lot 10	50	0.64	100	0.50
Lot 11	50	0.64	100	0.50
Lot 12	50	0.64	100	0.50
Lot 13	50	0.64	100	0.50
Lot 14	50	0.64	100	0.50
Lot 15	50	0.64	100	0.50
Lot 16	50	0.64	100	0.50
Lot 17	50	0.64	100	0.50
Lot 18	50	0.64	100	0.50
Lot 19	50	0.64	100	0.50
Lot 20	50	0.64	100	0.50
Lot 21	50	0.64	100	0.50
Lot 22	50	0.64	100	0.50
Lot 23	50	0.64	100	0.50
Lot 24	50	0.64	100	0.50
Lot 25	50	0.64	100	0.50
Lot 26	50	0.64	100	0.50
Lot 27	50	0.64	100	0.50
Lot 28	50	0.64	100	0.50
Lot 29	50	0.64	100	0.50
Lot 30	50	0.64	100	0.50
Lot 31	50	0.64	100	0.50
Lot 32	50	0.64	100	0.50
Lot 33	50	0.64	100	0.50
Lot 34	50	0.64	100	0.50

**SCHEDULE B - SCHEDULE OF ASSESSMENTS
FOR FUTURE MAINTENANCE
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT**

	MAIN DRAIN			
	Interval 1		Interval 2	
	0+000 to 0+223		0+223 to 0+449	
Lot 35	50	0.64	100	0.50
Lot 36	50	0.64	100	0.50
Lot 37	50	0.64	100	0.50
Lot 38	50	0.64	100	0.50
Lot 39	50	0.64	100	0.50
Lot 40	50	0.64	100	0.50
Lot 41	50	0.64	100	0.50
Lot 42	50	0.64	100	0.50
Lot 43	50	0.64	100	0.50
Lot 44	50	0.64	100	0.50
Lot 45	50	0.64	100	0.50
Lot 46	50	0.64	100	0.50
Lot 47	50	0.64	100	0.50
Lot 48	50	0.64	100	0.50
Lot 49	50	0.64	100	0.50
Lot 50	50	0.64	100	0.50
Lot 51	50	0.64	100	0.50
Lot 52	50	0.64	100	0.50
Lot 53	50	0.64	100	0.50
Lot 54	50	0.64	100	0.50
Lot 55	50	0.64	100	0.50
Lot 56	50	0.64	100	0.50
Lot 57	50	0.64	100	0.50
Lot 58	50	0.64	100	0.50
Lot 59	50	0.64	100	0.50
Lot 60	50	0.64	100	0.50
Lot 61	50	0.64	100	0.50
Lot 62	50	0.64	100	0.50
Lot 63	50	0.64	100	0.50
Lot 64	50	0.64	100	0.50
Lot 65	50	0.64	100	0.50
Lot 66	50	0.64	100	0.50
Lot 67	50	0.64	100	0.50
Lot 68	50	0.64	100	0.50
Lot 69	50	0.64	100	0.50
Lot 70	50	0.64	100	0.50
Lot 71	50	0.64	100	0.50

**SCHEDULE B - SCHEDULE OF ASSESSMENTS
FOR FUTURE MAINTENANCE
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT**

	MAIN DRAIN			
	Interval 1		Interval 2	
	0+000 to 0+223		0+223 to 0+449	
Lot 72	50	0.64	100	0.50
Lot 73	50	0.64	100	0.50
Lot 74	50	0.64	100	0.50
Block 1	100	1.28	200	1.00
Block 2	100	1.28	200	1.00
Block 3	100	1.28	200	1.00
Block 4	100	1.28	200	1.00
Block 5	100	1.28	200	1.00
Block 6	100	1.28	200	1.00
Block 7	100	1.28	200	1.00
Block 8	100	1.28	200	1.00
Block 9	100	1.28	200	1.00
Block 10	100	1.28	200	1.00
Block 11	100	1.28	200	1.00
Block 12	100	1.28	200	1.00
Block 13	50	0.64	100	0.50
Block 15	50	0.64	100	0.50
020-008-01500 (W. & R. Kuntze)	200	2.56	400	2.01
020-008-01400 (M. & N. Jantzi)	0	0.00	0	0.00
Total Assessment on Township of Wellesley Lands:	5,500	70.43	10,900	54.50
<i>Township of Wellesley</i>				
1/2 Gerber Road (Wellesley)	200	2.57	3,550	17.75
Street A	200	2.57	400	2.00
Street B	200	2.57	400	2.00
Street C	200	2.57	400	2.00
Street D	200	2.57	400	2.00
Street E	200	2.57	400	2.00
Total Assessment on Township of Wellesley Roads:	1,200	15.42	5,550	27.75

**SCHEDULE B - SCHEDULE OF ASSESSMENTS
FOR FUTURE MAINTENANCE
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT**

	MAIN DRAIN			
	Interval 1		Interval 2	
	0+000 to 0+223		0+223 to 0+449	
<i>Township of Wilmot (Roll No. 30-18-090-)</i>				
010-16200 (K. Gerber)	400	5.15	0	0.00
010-17000 (A. Buehrle)	0	0.00	0	0.00
010-17600 (B. Bartlett & J. Robson)	500	6.43	0	0.00
Total Assessment on Township of Wilmot Lands:	900	11.58	0	0.00
<i>Township of Wilmot</i>				
1/2 Gerber Road (Wilmot)	200	2.57	3,550	17.75
Total Assessment on Township of Wilmot Roads:	200	2.57	3,550	17.75
TOTAL ASSESSMENTS ON PAFF DRAIN:	7,800	100.00	20,000	100.00

1. Agricultural designation not included as grant eligibility has to be confirmed at the time of maintenance cost levy
2. \$ amounts above are listed solely for calculating percentages (share of future maintenance costs) and will not be levied with the final cost of the drainage works

SCHEDULE C - SCHEDULE FOR ACTUAL COST BYLAW
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT

Con	Lot	Owner	Ha. Affected	Estimated Gross	1/3 Grant	Allowances	NET
Township of Wellesley (Roll No. 30-24-)							
	1 Eastern Div.	13 010-001-37200 (Strohvest Ontario Inc.)	15.0	209,175	0	0	209,175
F	1 Eastern Div.	13 020-008-01500 (W. & R. Kuntze)	6.1	12,990	4,330	0	8,660
	1 Eastern Div.	13 020-008-01400 (M. & N. Jantzi)	0.0	114	0	0	114
Subtotal Township of Wellesley (Lands):			21.1	222,279	4,330	0	217,949
Township of Wellesley							
		1/2 Gerber Road (Wellesley)	0.4	56,176	0	0	56,176
Subtotal Township of Wellesley (Roads & Utilities):			0.4	56,176	0	0	56,176
Township of Wilmot (Roll No. 30-18-090-)							
F	1 Eastern Div.	13 010-16200 (K. Gerber)	4.0	19,800	6,600	4,800	8,400
	1 Eastern Div.	13 010-17000 (A. Buehrle)	0.0	0	0	0	0
F	1 Eastern Div.	13 010-17600 (B. Bartlett & J. Robson)	4.2	25,569	8,523	6,450	10,596
Subtotal Township of Wilmot (Lands):			8.2	45,369	15,123	11,250	18,996
Township of Wilmot							
		1/2 Gerber Road (Wilmot)	0.4	56,176	0	0	56,176
Subtotal Township of Wilmot (Roads & Utilities):			0.4	56,176	0	0	56,176
TOTAL ASSESSMENT PAFF DRAIN:			30.0	380,000	19,453	11,250	349,297

Notes:

1. Lands noted with an "F" are classified as agricultural and according to current OMAFRA policy qualify for the 1/3 grant.
Eligibility for the 1/3 grant will be confirmed at the time the final cost is levied.
2. Actual Gross Assessment is determined based on the final actual costs, following construction.
3. Actual Net Assessment will be the amount levied to the owner of the parcel at the end of the project
(Net Assessments subtract Allowances and the anticipated 1/3 grant from the Gross Assessment)

APPENDIX A - Calculation of Assessments
PAFF DRAIN 2025
TOWNSHIP OF WELLESLEY /
TOWNSHIP OF WILMOT

				Main Drain													
				Interval 1					Interval 2				Main Drain				
	Station	0+000	to	0+223	Station	0+223	to	0+449						Total			
ESTIMATED COST	Allowances			4,700				6,650						11,350			
	Construction			100,700				154,700					255,400				
	Engineering			30,200				46,400					76,600				
	Construction Supervision			8,100				12,400					20,500				
	Administration			4,200				5,745					9,945				
	Net HST			2,445				3,760					6,205				
	TOTAL			150,345				229,655					380,000				
Roll No. (Owner)	Total Ha Affected	Run-off Factor	Total ha Adjusted	Benefit (Sec. 22)	Special Benefit	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Benefit (Sec. 22)	Special Benefit	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total Benefit	Total Special	Total Outlet	Total
Township of Wellesley (Roll No. 30-24-)																	
010-001-37200 (Strohvest Ontario Inc.)	15.0	1.0	25.9	15,000	70,000	-	25.9	26,303	15,000	60,000	-	25.9	22,872	160,000	-	49,175	209,175
020-008-01500 (W. & R. Kuntze)	6.1	1.0	6.1	600		-	6.1	6,200	800		-	6.1	5,391	1,400	-	11,590	12,990
020-008-01400 (M. & N. Jantzi)	0.03	2.0	0.1	-		-	0.1	61	-		-	0.1	53	-	-	114	114
Subtotal Township of Wellesley (Lands):	21.1	4.0	32.0	15,600	70,000	-	32.0	32,564	15,800	60,000	-	32.0	28,316	161,400	-	60,879	222,279
Township of Wellesley																	
1/2 Gerber Road (Wellesley)	0.35	3.0	1.0	-		-	1.0	1,006	5,350		48,945	1.0	875	5,350	48,945	1,881	56,176
Subtotal Township of Wellesley (Roads & Utilities):	0.4	3.0	1.0	-	-	-	1.0	1,006	5,350	-	48,945	1.0	875	5,350	48,945	1,881	56,176
Township of Wilmot (Roll No. 30-18-090-)																	
010-16200 (K. Gerber)	4.0	0.6	2.5	17,300		-	2.5	2,500	-		-	-	-	17,300	-	2,500	19,800
010-17000 (A. Buehrle)	-	-	-	-		-	-	-	-		-	-	-	-	-	-	-
010-17600 (B. Bartlett & J. Robson)	4.2	1.0	4.2	6,100		-	4.2	4,269	15,200		-	-	-	21,300	-	4,269	25,569
Subtotal Township of Wilmot (Lands):	8.2	1.6	6.7	23,400	-	-	6.7	6,769	15,200	-	-	-	-	38,600	-	6,769	45,369
Township of Wilmot																	
1/2 Gerber Road (Wilmot)	0.35	2.8	1.0	-		-	1.0	1,006	5,350		48,945	1.0	875	5,350	48,945	1,881	56,176
SubtotalTownship of Wilmot (Roads & Utilities):	0.4	2.8	1.0	-	-	-	1.0	1,006	5,350	-	48,945	1.0	875	5,350	48,945	1,881	56,176
TOTAL ASSESSMENT PAFF DRAIN:	30.0	11.4	40.7	39,000	70,000	-	40.7	41,345	41,700	60,000	97,890	34.0	30,066	210,700	97,890	71,410	380,000

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200 GENERAL CONDITIONS**200.1 SCOPE**

The work to be done under this contract consists of supplying all labour, equipment and materials to construct the drainage work as outlined in the Instructions to Tenderers, the Form of Tender and Agreement, the Schedule of Tender Prices, the Drawings, the General Conditions, Special Provisions and the Standard Specifications.

200.2 ORDER OF PRECEDENCE

In case of any inconsistency or conflict between the drawings and specifications, the following order of precedence shall apply: Addenda, Form of Tender and Agreement, Schedule of Tender Prices, Special Provisions, Contract Drawings, Standard Specifications, General Conditions.

200.3 MUNICIPALITY

Municipality refers to a municipal corporation in the Province of Ontario. Where reference to Township, County, Region, Town, City or Owner appears it shall be deemed to be the same as the word Municipality. Where reference to owner appears in the specifications it is usually in reference to the owner of the property on which the drain is being constructed.

200.4 TENDERS AND CONTRACT SECURITY

Tenders are to be submitted for the complete works or a portion thereof, as instructed by the Municipality. The Schedule of Tender Prices must be completed and provided with the Contractor's tender.

A Tender Deposit in the form of a certified cheque, bank draft, bonding, or other security acceptable to the Municipality must accompany each tender as a guarantee of good faith. The Tender Deposit shall name the Municipality as the payee. Refer to the Instructions to Tenderers for additional Tender Deposit information and Contract Security requirements.

200.5 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Prior to the submission of the Tender, the Tenderer must examine the premises and site to compare them with the Drawings and Specifications in order to be satisfied with the existing conditions and the extent of the work to be done. If site examination requires entry onto privately owned lands, the Tenderer shall contact the Drainage Superintendent at least one week prior to the tender closing date to arrange site examination with the Drainage Superintendent.

The Tenderer must ensure that the meaning and intent of the drawings, estimated quantities and specifications is clearly understood before submission of the Tender. No allowances shall be made on behalf of the Contractor by reason of any error made in the preparation of the tender submission.

Any estimates of quantities shown or indicated on the drawings or elsewhere in the tender/contract document are provided for the convenience of the Tenderer. The Tenderer shall check the estimate of quantities for accuracy. Any use made of the estimated quantities by the Tenderer in calculating the tendered amounts is done at the Tenderer's risk.

200.6 COMMENCEMENT AND COMPLETION OF WORK

The work must commence immediately after the Tenderer is notified of the contract award or at a later date, where specified in the tender/contract document. If weather and ground conditions are unsuitable,

work may be started at a later date from either of the above two dates if such delay is approved by the Engineer.

Refer to Standard Specifications 400.2, 400.11, 400.20, 400.21, 400.25 and 400.26 for notification requirements related to the *PRE-CONSTRUCTION MEETING, BENCHMARKS AND LAYOUT, WORKING IN ROAD ALLOWANCES, LANEWAYS AND ACCESS CROSSINGS, LIVESTOCK, AND STANDING CROPS*.

The work must proceed in such manner as to ensure its completion at the earliest possible date consistent with first class workmanship and within the time limit set out in the tender/contract document. Failure to commence or complete the work as set out in the tender/contract document may result in a forfeiture of all or part of the Contract Security if the Engineer determines that damages have been sustained by the Municipality or any landowner because of the non-commencement or non-completion of the contract as awarded and that the failure to meet the specified dates has been the fault of the Contractor.

200.7 NOTICE FOR RESUMPTION OF WORK

If the Contractor leaves the job site for a period of time after initiation of work, a minimum of 2 working days advance notice shall be given to the Engineer and the Municipality before returning to the job site to resume work. If any work is resumed without the advance notice, the Contractor shall be fully responsible for all such work undertaken prior to said notification and shall make good any works or materials judged to be inadequate.

200.8 PERMITS, NOTICES, LAWS AND RULES

The Contractor shall apply and pay for all necessary permits or licenses required for the execution of the work. This shall not include the obtaining of permanent easements or rights or servitude. The Contractor shall give all necessary notices and pay all fees required by the law and comply with all laws, ordinances, rules and regulations 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 expense incurred by the Contractor shall constitute an addition to the contract price.

200.9 HEALTH AND SAFETY

Contractor must comply with the *Occupational Health and Safety Act (OHSA)* and the associated *Regulations for Construction Projects*, including, but not limited to the requirements related to hazardous materials, physical agents and designated substances. Contractor must also follow any site-specific safety and training requirements of the Municipality, agencies, utility companies or other authorities.

Communication about site-specific hazards and safety requirements shall occur at the pre-construction meeting. If no pre-construction meeting is conducted, Contractor will communicate site-specific hazards and safety requirements before beginning work.

Contractor shall immediately report any workplace incidents, near misses, injuries and occupational illnesses to the Engineer.

200.10 LIMITATIONS OF OPERATIONS

Except for such work as may be required by the Engineer to maintain the works in a safe and satisfactory condition, the Contractor shall not carry out operations under the contract on Sundays or Statutory Holidays without permission in writing from the Engineer. The Engineer may direct in writing to the Contractor to cease or limit operations under the contract on any day or days if the operations are of such a nature, or if the work is so located, or if the traffic is of such a volume, that the Engineer deems it necessary or expedient to do so.

200.11 SUPERVISION

The Contractor shall provide constant supervision of the construction work and shall keep a competent foreman in charge at the site.

200.12 CHARACTER AND EMPLOYMENT OF WORKERS

The Contractor shall employ only orderly, competent and skillful workers to do the work and shall give preference to available qualified residents in the area of the contract. Whenever the Engineer informs the Contractor in writing that any workers are, in the opinion of the Engineer, disorderly, incompetent, or breaking the law, such workers shall be discharged from the job site and shall not again be employed on the job site without the written consent of the Engineer.

200.13 SUB-CONTRACTORS

If the Municipality so directs, the Contractor shall not sublet the whole or any part of this contract without the approval of the Engineer.

200.14 PAYMENT

Progress payments equal to the value of the work completed to date, less applicable holdbacks, will be made to the Contractor monthly or at the completion of the work. The Contractor may be required to provide a Proper Invoice for the progress payment amount. In accordance with the *Construction Act, R.S.O. 1990*, sixty (60) days after certification of substantial performance, the 10% Statutory Holdback will be released. Warranty Holdback of 3% of the contract value, unless specified otherwise in the tender/contract documents, may be reserved by the Municipality for one year after certification of substantial performance.

Holdbacks may be increased by the Municipality if, in the written opinion of the Engineer, particular conditions of the contract require such greater holdback.

After certification of substantial performance, the Warranty Holdback may be used by the Municipality to correct defects from faulty construction and/or materials, provided that notice shall first be given by the Engineer in writing to the Contractor stating that the Contractor has seven (7) days to remedy the defect in construction and/or materials.

Where alterations to the work are authorized by the Engineer, the Engineer's evaluation of payment for such changes shall consider the tendered price for similar work item(s). See Specification 400.8 – *Alterations to Work*.

200.15 TERMINATION OF CONTRACT BY THE MUNICIPALITY

Termination of the contract by the Municipality may be considered if the Contractor:

1. should be adjudged bankrupt or make a general assignment for the benefit of creditors or if a receiver should be appointed on account of insolvency;
2. should refuse or fail to supply enough properly skilled workmen or proper materials after having received seven (7) days' notice in writing from the Engineer to supply such additional workmen or materials in order to commence or complete the works;
3. should fail to make prompt payment to sub-contractors or suppliers for labour or materials.
4. should persistently disregard laws, ordinances, or instructions from the Engineer, or otherwise be guilty of a substantial violation of the provisions of the contract;

then the Municipality, upon Certificate of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, give written notice to the Contractor to terminate the employment of the Contractor and take possession of the premises, and of all materials, tools and

appliances thereon, and may finish the work by whatever method the Municipality may deem expedient, but without undue delay or expense. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price will exceed the expense of finishing the work including compensation to the Engineer for additional services and including other damages of every name and nature, such excess shall be paid to the Contractor. If such expense will exceed such unpaid balance including the Contract Security, the Contractor shall pay the difference to the Municipality. The expense incurred by the Municipality, as herein provided, shall be certified by the Engineer. If the contract is terminated by the Municipality due to the Contractor's failure to properly commence the works, the Contractor shall forfeit the Contract Security and furthermore shall pay to the Municipality an amount to cover the increased costs, if any, associated with a new tender for the contract being terminated.

If any unpaid balance and the Contract Security do not equal the monies owed by the Contractor upon the termination of the contract, the Municipality may also charge such expenses against any money which is or may thereafter be due to the Contractor from the Municipality.

200.16 LIQUIDATED DAMAGES

It is agreed by the parties to the Contract that if all the work called for under the Contract is not finished or complete within the period of time as set forth in the tender/contract document, damage will be sustained by the Municipality. It is understood by the parties that it will be impracticable and extremely difficult to ascertain and determine the actual damage which the Municipality will sustain in the event of and by reason of such delay. The parties hereto agree that the Contractor will pay to the Municipality a sum as set out in the tender/contract documents for liquidated damages for each and every calendar day delay, including Saturdays, Sundays and Statutory Holidays, spent finishing the work in excess of the number of working days prescribed. It is agreed that the liquidated damages amount is an estimate of the actual damage to the Municipality which will accrue during the period in excess of the prescribed number of working days.

The Municipality may deduct any amount due under this section from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated damages payable under this section are in addition to and without prejudice to any other remedy, action or other alternative that may be available to the Municipality.

The Contractor shall not be assessed with liquidated damages for any delay caused by acts of nature, or of the Public Enemy, Acts of the Province or of any Foreign State, Fire, Flood, Epidemics, Quarantine Restrictions, Embargoes or any delays of Sub-Contractors due to such causes.

If the time available for the completion of the work is increased or decreased by reason of alterations or changes made under the provisions of the Contract, the number of working days shall be increased or decreased as determined by the Engineer.

If the tender/contract document does not show an amount for Liquidated Damages then Liquidated Damages do not apply for this contract.

200.17 CONTRACTOR'S LIABILITY

The Contractor and all workers, agents or any party under the Contractor's control, including Sub-Contractors, shall use due care that no person or property is injured and that no rights are infringed during the construction work outlined in the contract. The Contractor shall be solely responsible for all damages by whomsoever claimable in respect of any injury to persons or to lands, buildings, structures, fences, livestock, trees, crops, roadways, ditches, drains and watercourses, whether natural or artificial, or property of whatever description and in respect of any infringement of any right, privilege or easement wherever occasioned in the carrying on of the work or any part thereof, or by any neglect, misfeasance or non-feasance on the Contractor's part or on the part of any workers, agents or parties under the Contractor's control including Sub-Contractors, and shall bear the full cost thereof. The Contractor shall be fully responsible to make such temporary provisions as may be necessary to ensure the avoidance of

any such damage, injury or infringement and to prevent the interruption of or danger or menace to the traffic in any railway or any public or private road entrance or sidewalk and to secure to all persons and corporations the uninterrupted enjoyment of all their rights, in and during the performance of the work. The Contractor shall indemnify and save harmless the Municipality and the Engineer from and against all claims, demands, losses, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon, occasioned by, or attributed to any such damage, injury or infringement.

Wherever any work is of such an extent and nature that it must necessarily be confined to particular areas of a roadway, a working area, or private property, the Contractor shall use reasonable care not to damage or deface the remaining portions of the property, and if any damage is occasioned as a result of the Contractor's operations, it shall be rectified by and at the expense of the Contractor, to the satisfaction of the Engineer. Notwithstanding the indemnity provisions contained in this section, where in the opinion of the Engineer the Contractor has failed to rectify any damage, injury or infringement or has failed to adequately compensate any person for any damage, injury or infringement for which the Contractor is responsible under the contract, the Engineer, following notice in writing to the Contractor of an intention so to do, may withhold payment of any monies due the Contractor under this or any other contract until the Contractor has rectified such damage, injury or infringement or has paid adequate compensation for such damage, injury or infringement, provided however, that the Municipality will not withhold such monies where in the opinion of the Engineer there are reasonable grounds upon which the Contractor denies liability for such damage, injury or infringement and the Contractor has given the claimant a reasonable time in which to establish the validity of the claim, and provided further that the amount withheld under this section shall not exceed the amount of such claims against the Contractor.

Where the Contractor uses privately owned lands for material disposal, the Contractor shall comply with applicable laws and provide the Engineer with a release signed by or on behalf of the owner of each material disposal area used by the Contractor. If the said release is not obtained, then sufficient monies will be withheld from the Contractor except, however, where the owner's signature is withheld solely on the basis of damage, injury, or infringement it will be dealt with as provided elsewhere in this subsection.

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. Neither the Certificate of Substantial Performance nor final payment thereunder, nor any provision in the Contract Document shall relieve the Contractor from this liability.

200.18 LIABILITY INSURANCE

The Contractor shall take out and keep in force until the end of the warranty period for the entire work, a comprehensive policy of public liability and property damage insurance providing insurance coverage of at least \$3,000,000 for each and every accident, exclusive of interest and cost, against loss or damage resulting from bodily injury to or death of one or more persons and loss of or damage to property and such policy shall name the Municipality, K. Smart Associates Limited, and such additional parties as may be required by the Municipality or K. Smart Associates Limited, as additional insured thereunder and shall protect all named parties against all claims for all damage or injury including death to any person or persons and for damage to any property of the Municipality or any other public or private property resulting from or arising out of any act or omission on part of the Contractor or any of his servants or agents during the execution of the Contract.

200.19 LOSSES DUE TO ACTS OF NATURE, ETC.

All damage, loss, expense and delay incurred or experienced by the Contractor in the prosecution of the work, by reason of unanticipated difficulties, bad weather, strikes, wars, acts of nature, or other mischances, shall be borne by the Contractor and shall not be the subject of a claim for additional compensation.

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400 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS**400.1 ABBREVIATIONS**

- i) MTO means the Ministry of Transportation of Ontario
- ii) ASTM means the American Society for Testing Materials
- iii) CSA means the Canadian Standard Association
- iv) OPSD means Ontario Provincial Standard Drawings
- v) OPSS means Ontario Provincial Standard Specifications
- vi) DFO means Fisheries and Oceans Canada
- vii) MNRF means Ministry of Natural Resources and Forestry
- viii) MECP means Ministry of Environment, Conservation and Parks

400.2 PRE-CONSTRUCTION MEETING

The Contractor shall arrange a pre-construction meeting with the Engineer, Municipality, and affected landowners prior to commencement of construction. The Contractor shall provide at least ten working days advance notice of the pre-construction meeting. Construction shall not commence less than five working days after the pre-construction meeting to allow time for layout and crop salvage.

If there is no pre-construction meeting or if a landowner is not present at the pre-construction meeting, prior to construction, the drain is to be walked by the Contractor and each landowner not present at the meeting to ensure that both agree with the work shown on the Drawings. Any difference of opinion shall be referred to the Engineer for decision. If the landowner is not contacted for such review, the Contractor shall advise the Engineer or the Municipality.

The cost to coordinate and attend the pre-construction meeting, including any follow-up meetings, is considered incidental and shall be included in the price of other tender items.

400.3 COLD WEATHER

When working in cold weather is approved by the Engineer, the Contractor shall provide suitable means for heating, protection of the work, and snow and ice removal. All work completed in cold weather conditions shall be to the satisfaction of the Engineer and any additional cost to remedy unsatisfactory work, or to protect the work, shall be borne by the Contractor. All backfilling shall occur as soon as possible to avoid backfilling with ground containing frozen particles. The Contractor will assume all responsibility for damages to any tile drains and for settlements or bank failure that may result from work in cold weather.

400.4 WORKING AREA

Unless otherwise specified on the Drawings, the working area is defined as follows:

- Where any part of the drain is on a road allowance, the road allowance shall be the working area.
- If any part of the drain is close to a property line, then the property line shall be one of the limits of the working area.
- For a closed drain, the working area shall not exceed 25 metres. A 10m x 10m working area exists around any catchbasin, junction box or access point.
- For an open drain, the working area shall be 17 metres wide on the side for leveling and 3 metres wide on the opposite side.
- A 10m wide working area shall exist for any overflow swale or grassed waterway.

400.5 PROPERTY BARS AND MONUMENTS

All property bars and monuments shall be protected. If a property bar or monument is shown on the Drawings with a note “***to be protected***”, or similar, and is damaged by the Contractor, the damaged bar(s) shall be reinstated by an Ontario Land Surveyor at the Contractor's expense.

400.6 ACCESS

The Contractor shall have access to the drain by entering the working area directly from road allowances or along access routes shown on the Drawings. No other access routes shall be used unless first approved by the Engineer and the affected landowner. The Contractor shall notify each landowner prior to using the designated access routes. Standard Specifications 400.24 - *FENCES*, 400.25 - *LIVESTOCK*, and 400.26 - *STANDING CROPS* also apply to access routes. The Contractor shall make good any damages caused by using the designated access routes. Costs to restore access routes to existing conditions shall be borne by the Contractor.

400.7 ACCESS TO PROPERTIES ADJOINING THE WORK

The Contractor shall provide at all times and at no additional cost, access to private properties adjoining the work, unless otherwise authorized by the Engineer. Where interruptions to access have been authorized by the Engineer, a minimum of 48 hours written notice shall be given by the Contractor to the affected landowners and such interruptions shall be arranged to minimize interference to those affected.

400.8 ALTERATIONS TO WORK

Design changes determined by the Engineer (alteration, additions, and deletions) shall be implemented by the Contractor without delay and shall in no way render the contract void.

In every such case, the contract amount shall be increased or decreased as required according to a fair evaluation of the work completed. Where such design changes involve additional work similar to items in the contract, the price for additional work shall be determined after consideration is given to the tendered price for similar items.

Additional work desired by the landowner(s), which is not part of the drainage works, may be arranged with the Contractor provided the cost of the work is paid by the landowner(s) and the Engineer reviews the additional work in advance. Such additional work is not part of the drainage works for future maintenance.

400.9 ERRORS AND UNUSUAL CONDITIONS

The Contractor shall notify the Engineer immediately of any “*errors or unusual conditions*” which may be found. Any attempt by the Contractor to correct an “*error*” without notice to the Engineer is at the Contractor's risk and expense. The Engineer shall determine necessary steps to correct errors or address unusual conditions. The contract amount shall be adjusted through a fair evaluation of documentation for the work added, deleted, or adjusted.

400.10 TESTS

The Engineer reserves the right to subject any materials to a competent testing laboratory for compliance with applicable Provincial and/or Municipal standards. If any materials supplied by the Contractor fail to meet the applicable standards, the Contractor shall bear full responsibility to remove all rejectable materials and replace with acceptable materials.

400.11 BENCHMARKS AND LAYOUT

The Engineer will layout the location of the proposed work unless otherwise provided in the Contract.

It is the Contractor's responsibility to confirm the location and elevation of benchmarks and layout stakes prior to construction and notify the Engineer immediately of any discrepancies.

The Contractor shall be liable for the cost of replacing any benchmarks or layout stakes destroyed during construction. The Contractor shall also be liable for the cost of additional layout if the Contractor's schedule delay requires replacement of original layout stakes.

400.12 INSPECTION OF UNDERGROUND WORK

The Contractor shall not cover up any work without providing the Engineer two working days notice and opportunity for carrying out an inspection.

If inspection does not occur as the work proceeds, inspection points shall be provided, with no additional payment, at the following locations: 50m intervals, tile connections, grade changes, junction boxes, fittings and pipe diameter/material transitions. If no inspection points are provided, the Engineer reserves the right to require the Contractor to expose the buried work for inspection purposes.

No additional payment will be made if the Engineer requires additional inspection points or exposure of covered work in other locations.

400.13 FINAL INSPECTION

Final inspection by the Engineer will occur after receiving written notice from the Contractor that work is complete. All the work included in the contract shall, at the time of final inspection, be completed to the dimensions and cross-sections shown on the Drawings.

Prior to issuing the certificate of substantial performance, a final inspection meeting may be held by the Engineer with landowners directly affected by the construction of the drain. The Contractor shall attend this meeting upon notice by the Engineer.

If there is no final inspection meeting with the Engineer, the Contractor shall obtain from each landowner a written statement indicating that the work has been performed to the landowner's satisfaction. If the Contractor is unable to obtain a written statement from the landowner, the Engineer will determine if further work is required prior to issuing the certificate of substantial performance.

The cost of attending the final inspection meeting and/or obtaining written statements from landowners, including any follow-up meetings, is considered incidental and shall be included in price of other tender items.

400.14 WARRANTY

There shall be a one-year warranty period on all completed work. The warranty period will commence on the date of the certificate of substantial performance.

When directed by the Engineer, the Contractor shall repair and make good any deficiencies in the work that may appear during the warranty period.

Before final acceptance by the Municipality and release of Warranty Holdback, the Contractor shall complete all work as directed by the Engineer, remove all debris and surplus materials, and leave the work neat and presentable.

400.15 PIPE MATERIALS**400.15.1 Concrete Drain Tile**

Concrete drain tile shall conform to the requirements of the most recent ASTM C412 specifications for heavy duty extra quality concrete tile, unless a stronger concrete tile is required by the Special Provisions or Drawings. All tile furnished shall be subject to the approval of the Engineer.

The minimum nominal length of concrete drain tile shall be 1200mm.

All tile shall be of good quality, free from distortions and cracks and shall meet the standards specified. The ends shall be smooth and free from cracks. The Engineer reserves the right to reject unacceptable tiles. All rejected tiles are to be immediately removed from the site at the Contractor's expense.

400.15.2 Corrugated Plastic Tubing

Corrugated plastic tubing shall conform to the current version of the *Land Improvement Contractors of Ontario Standard Specification for Corrugated Plastic Drainage Tubing*.

Type of material (solid or perforated) and need for filter sock will be specified on the Drawings or in the description of the work in the Special Provisions. Filter sock, where specified, shall be a standard synthetic filter material as provided by a recognized plastic tubing manufacturer unless noted differently on the contract drawings or elsewhere in the contract document. The Contractor shall protect coils of plastic tubing from damage and deformation.

400.15.3 Smooth Wall Plastic Tubing

Smooth wall plastic tubing shall be dual-wall, high density polyethylene and conform to the requirements of the most recent ASTM 3390 specification for "*lined flexible corrugated polyethylene pipe*" for land drainage applications.

Type of material (solid or perforated) and need for filter sock will be specified on the Drawings or in the description of the work in the Special Provisions. Filter sock where specified shall be a standard synthetic filter material as provided by a recognized plastic tubing manufacturer unless noted differently on the contract drawings or elsewhere in the contract document. The Contractor shall protect coils of smooth wall plastic tubing from damage and deformation.

400.15.4 Corrugated Steel Pipe

Corrugated Steel Pipe (CSP) shall be according to OPSS.MUNI 1801 (CSA G401). Unless stated otherwise in the Special Provisions the pipe shall be:

- galvanized
- helical corrugation with lock seam and re-rolled annular ends
- 68mm x 13mm corrugation profile for diameters up to 1200mm
- 125mm x 25mm corrugation profile for diameters 1200mm and larger
- minimum wall thickness of 1.6mm for diameters up to 500mm
- minimum wall thickness of 2.0mm for diameters 600mm and larger
- joined using standard couplers matching the pipe diameter and material

Other coatings that may be specified include aluminized Type 2 or polymer. Polymer coating shall be a 254mm polymer film laminated to both sides of the pipe.

400.15.5 HDPE Pipe

Material indicated as "HDPE Pipe" or "Solid Plastic Pipe" shall be a high density polyethylene, dual-wall corrugated pipe with smooth inner wall, solid with no perforations, and minimum pipe stiffness at 320 kPa at 5% deflection certified to CSA B182.8, in accordance with OPSS.MUNI 1840.

When HDPE pipe is installed under a road right-of-way, private laneways or parking areas, the pipe joints shall be bell and spigot with rubber gaskets (CSA 182.8, Type 1) so that joints are watertight.

When HDPE pipe is specified for use on private lands, acceptable joints may be bell and spigot with rubber gaskets, or snap-on or split couplers (CSA 182.8, Type 3) so that joints are soil tight.

All fittings shall be injection molded HDPE.

400.15.6 Concrete Sewer Pipe

Concrete sewer pipe shall be in accordance with OPSS 1820.

Concrete sewer pipe shall be reinforced circular concrete pipe according to CSA A257.2 with joints and gaskets according to CSA A257.3.

Where specified, reinforced elliptical concrete sewer pipe, joints and gaskets shall be according to ASTM C 507M.

Classes shall be as shown on the Contract Drawings or as described in the Form of Tender.

Where concrete sewer pipe “**seconds**” are specified, the pipe should exhibit no damage or cracks on the barrel section and shall be capable of satisfying the crushing strength requirements of OPSS 1820. The pipe may contain cracks or chips in the bell or spigot which prevent the use of rubber gaskets but the joints must be protected with geotextile.

400.16 RIPRAP

All riprap is to be placed on a geotextile underlay, unless directed otherwise in the Drawings. Geotextile material shall be as specified in Specification 400.17 - *GEOTEXTILE*, with the upstream edge of the geotextile keyed down 300mm below the bottom of riprap. The riprap is to be graded heavy angular stone (quarry stone is recommended) and shall meet gradation requirements for R-50 riprap per OPSS.MUNI 1004 Table 8 (averaging in size from 210mm to 305mm) and is to be placed at 300mm thickness, unless otherwise specified. Smaller particles may be included to fill voids. The finished top of riprap shall be at design cross-section, at design elevation or flush with existing ground.

400.17 GEOTEXTILE

Geotextile to be non-woven fabric that is rot proof, non-biodegradable, chemically resistant to acidic and alkaline soils and is dimensionally stable under different hydraulic conditions (Terrafix 360R or equal). Alternative geotextile materials shall be submitted to the Engineer prior to construction. The primary function of geotextile is to act as a highly permeable, non-clogging barrier between different materials. The Contractor shall follow the manufacturer's recommendations for cutting, installation and precautions necessary to avoid damage to the geotextile.

400.18 BACKFILL

Where sufficient clean on-site material is not available, the Contractor shall import material for backfill. Any imported material shall be approved by the Engineer in advance of supply & placement. Imported material shall be free of deleterious material and shall satisfy the requirements of O. Reg. 406/19 for use in the location proposed. If requested by the Engineer, the Contractor shall provide test results at no additional cost to demonstrate conformance with project requirements. If non-conforming materials are rejected by the Engineer, they shall be removed at no additional cost.

If the work is being performed during winter months, frozen material shall not be used as backfill under roads or any other areas where settlement could negatively affect the surface above the work area.

400.19 NOTIFICATION OF ROAD AUTHORITIES, UTILITIES AND RAILROADS

The Contractor shall notify any Road Authority, Utility, or Railroad at least two working days in advance regarding work to be performed on their property or affecting their infrastructure. Where a Road Authority, Utility or Railroad has specific notification requirements, those requirements shall apply. The notice will be in writing and is exclusive of Saturdays, Sundays and Holidays. The Contractor is responsible to determine, understand and comply with the requirements of all authorities that may place restrictions upon the performance of the work, including without limitation, MTO, local utilities and railway authorities. In

submitting the tender, the Contractor represents that they have made all necessary inquiries to all authorities, as required, to carry out the proposed work.

400.20 WORKING IN ROAD ALLOWANCES

400.20.1 General

Work within public road allowances shall be done in accordance with the Ontario Traffic Manual Book 7, latest edition and the requirements of the Road Authority.

400.20.2 Maintenance of Traffic

Unless directed otherwise on the drawings or in the specifications, the Contractor shall keep roads open to traffic at all times. The Contractor shall provide suitable warning signs and/or flagging per OTM Book 7 requirements to the satisfaction of the Road Authority and the Engineer. Where specified in the Contract or when requested by the Engineer, the Contractor shall provide a Traffic Control Plan to the satisfaction of the Road Authority and the Engineer at no additional cost.

If road closure is required, the Contractor shall submit a Detour Plan for approval by the Road Authority and Engineer. The Contractor shall provide all signage for the detour route per OTM Book 7 and undertake all notifications required for the road closure in consultation with the Municipality.

400.20.3 Road Crossings

If no specific detail is provided for road crossings on the drawings or in the specifications the following shall apply:

General/Pre-Construction Phase

- A Road Authority will supply no labour, equipment, or materials for the construction of the road crossing.
- The Contractor shall not commence road crossing work until any required permits have been obtained.
- The Contractor shall notify the Road Authority, per the Road Authority's notification requirements, in advance of any construction in the road allowance. If the Road Authority has no notification requirements, at least 3 working days written notice shall be given.
- At least 2 working days prior to starting road crossing work, the Contractor shall confirm with the Municipality that EMS, OPP and Fire Department have been properly notified of any detours or road closures.

Construction Phase

- Exact location of the crossing shall be verified with the Road Authority and the Engineer.
- Pipe bedding shall be a minimum 150mm depth of Granular A, shaped for the pipe and compacted to 98% SPMDD.
- Pipe cover shall be Granular B, compacted to 98% SPMDD and extend 300mm above the top of the pipe.
- Trench shall be backfilled with acceptable native material for the base width of the road base. Trench backfill material shall be placed in lifts not exceeding 300mm in depth and shall be thoroughly compacted to 95% SPMDD. Trench backfill (subgrade) shall be inspected and approved by the Engineer prior to the placement of road base granular material.
- Road base granular material shall be placed in lifts not exceeding 300mm in depth and shall be compacted to 100% SPMDD. Unless otherwise specified, road base shall consist of minimum 450mm of Granular B and minimum 150mm of Granular A.
- Any surplus excavated material within the road allowance shall be disposed of per the Road Authority's requirements.
- The Contractor shall restore the road surface to the satisfaction of the Engineer and Road Authority requirements.

Warranty Phase

- The Contractor shall be responsible for correcting any backfill settlement during construction and during the warranty period. Upon approval of the Road Authority, surplus gravel shall be stockpiled near gravel road crossings to provide backfill for future trench settlement.

- If any road crossing is not left in a safe manner at the end of the working day, barricades and warning signs shall be erected to guarantee the safety of the travelling public per OTM Book 7 requirements.
- If the Engineer deems a road surface to have been damaged by the construction of a drain, either across or along the road, the Engineer may direct the Contractor to restore the road surface to existing or better condition, at no additional cost.
- All road crossings shall meet the final approval of the Road Authority at the end of the warranty period.

400.21 LANEWAYS AND ACCESS CROSSINGS

If no specific detail is provided for laneways and access crossings on the Drawings or in the Specifications the following shall apply:

General/Pre-Construction Phase

- The Contractor shall notify the landowner(s) at least 1 working day prior to impacting laneway access.

Construction Phase

- Pipe shall be on suitable, undisturbed, native material. If native material is deemed unsuitable by the Engineer, pipe shall be placed on 300mm depth of 19mm clear stone, wrapped in geotextile.
- Pipe bedding, cover and trench backfill shall be suitable native material placed in lifts not exceeding 300mm in depth and shall be thoroughly compacted to 95% SPMDD.
- Top 450mm of laneway backfill shall consist of minimum 300mm depth of Granular B and minimum 150mm depth of Granular A, compacted to 98% SPMDD, and shall be placed in lifts not exceeding 300mm in depth.
- Where pipe cover is minimal, laneway backfill may consist of minimum 300mm depth of Granular A, compacted to 98% SPMDD, subject to approval by the Engineer.
- Unless otherwise specified, the Contractor shall restore the laneway surface and dimensions to existing conditions, to the satisfaction of the Engineer.

Warranty Period Phase

- The Contractor shall be responsible for correcting any backfill settlement during construction and warranty period.

400.22 LOCATIONS OF EXISTING UTILITIES

The position of pole lines, conduits, watermains, sewers and other underground and overhead utilities are 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 have all public and private utilities located.

Upon the request of the Utility owner or the Engineer, utilities shall be exposed to confirm there are no utility conflicts and adequate clearance is provided between existing utilities and the proposed work. In the case of utility conflict(s) or inadequate clearance(s), the Contractor shall notify the Engineer immediately. The Engineer may change the proposed design in accordance with Specification 400.8 - *ALTERATIONS TO WORK*.

Unless otherwise provided in the tender, the cost of exposing utilities, including the use of hydrovac methods, shall be included in the price of other tender items. Additional payment will be allowed for relocation of utilities if conflicts are encountered.

The Contractor is responsible for protecting all located and exposed utilities from damage during construction. The Contractor shall assume liability for damage caused to all properly located utilities.

400.23 EXISTING CROSSING CLEANOUT

Where the Special Provisions require an existing crossing to be cleaned, the Contractor shall provide a bottom width and depth that provides capacity equivalent to the capacity of the channel on either side. Excavated materials shall be hauled away unless adjacent landowners give permission for leveling. Care shall be taken to ensure that existing abutments or any portion of the structure are not damaged or undercut. The method of removing the material is to be pre-approved by the Engineer.

400.24 FENCES

If the Contractor is responsible to remove and install fences, the following shall apply:

- All fences removed by a Contractor are to be re-erected in as good a condition as existing materials permit.
- All fences shall be properly stretched and fastened. Where directed by the Engineer, additional steel posts shall be placed to adequately support a fence upon re-erection.
- Where possible, the Contractor shall take down an existing fence at the nearest anchor post and roll the fence back rather than cutting the fence and attempting to patch it.
- Where fence materials are in such poor condition that re-erection is not possible, the Contractor shall replace the fence using equivalent materials. Such fence material shall be approved by the Engineer and the landowner. Where the Engineer approves new fence material, additional payment will be provided.

Any fences paralleling an open drain, that are not line fences, which hinder the proper working of the excavating machinery for drain construction or maintenance, shall be removed and rebuilt by the landowner at their own expense. If such parallel fences are line fences, they shall be removed and reinstalled by the Contractor.

No excavated or cleared material shall be placed against fences.

The installation of all fences shall be done to the satisfaction of the Engineer and the landowner.

400.25 LIVESTOCK

If any construction is within a fenced field containing livestock that are evident or have been made known to the Contractor, the Contractor shall notify the owner at least two working days in advance of accessing the field. Thereafter, the owner shall be responsible for the protection of the livestock in the field during construction and shall also be liable for any damage to or by the livestock.

The Contractor shall adequately re-erect all fences at the end of each working day, unless the owner provides written approval for the fences to remain open until construction is complete. No field containing livestock shall have a trench left open at the end of the working day, unless the trench has been adequately protected with fencing. Failure of the Contractor to comply with this paragraph shall render the Contractor liable for any damage to or by the livestock.

Where livestock may be encountered on any property the Contractor shall notify the Engineer to arrange for inspection of the work prior to backfilling.

400.26 STANDING CROPS

The Contractor shall not be held responsible for damages to standing crops within the working area and designated access routes for the drain. However, the Contractor shall notify the owner of upcoming work that will damage/destroy crops at least two working days prior to commencement of construction to allow the owner an opportunity to harvest or salvage the crop within the drain working area. If this advance notice is not given, the Contractor may be held liable for the loss of the standing crops if harvest could have reasonably been achieved by the owner if proper notice had been given by the Contractor.

400.27 CLEARING VEGETATION**400.27.1 General**

The area for clearing, if not defined elsewhere, shall be 15m on each side of the drain.

400.27.2 Trees to Remain

Where it is feasible to work around existing trees that do not impede the function of the drainage works, the Contractor shall not remove any deciduous tree larger than 300mm and any coniferous tree larger than 200mm, unless authorized by the Engineer.

400.27.3 Incidental Clearing

Incidental clearing includes removal of trees, brush or other vegetation with an excavator during construction activities, and the cost is to be included in the price for the related construction activity.

400.27.4 Power Brushing

Power brushing includes removal of above-ground vegetation with a rotary brush cutter or other mechanical means. Stump and root removal is not required. Power brushed vegetation in a channel cross-section shall be removed and leveled in the working area. Excavated material may be placed and leveled on power brushed vegetation.

400.27.5 Close-Cut Clearing

Close-cut clearing includes removal of above-ground vegetation cut flush with the ground. Stump and root removal is not required.

400.27.6 Clearing And Grubbing

Clearing and grubbing includes removal of vegetation, including stumps and roots. Removal of earth from the grubbed area into the windrows or piles is to be minimized.

400.27.7 Disposal of Cleared Vegetation**400.27.7.1 In Bush Areas**

Cleared vegetation is to be pushed into windrows or piles at the edge of the cleared area. Stumps and roots are to be piled first at the edge of the cleared area, followed by other vegetation (trunks, branches, etc.). Provisions for lateral drainage are required through all windrows. Windrows are not to block any laneways or trails. After removing cleared vegetation, the working area shall be leveled to the satisfaction of the Engineer.

400.27.7.2 In Field Areas

Cleared vegetation resulting from incidental clearing or power brushing may be hauled away, mulched in place or reduced to a size that permits cultivation using conventional equipment without causing undue hardship on farm machinery.

Cleared vegetation resulting from close-cut clearing or clearing and grubbing is to be hauled away to an approved location. Disposal sites may be in bush areas or other approved locations on the same farm. No excavated material shall be levelled over any logs, brush or rubbish of any kind.

400.27.8 Landowner Requested Salvage

A landowner may request that wood be separated from the windrows for the landowner's future use. This additional work would be eligible for extra payment, subject to the approval of the Engineer.

400.27.9 Clearing by Landowner

Wherever the Contract indicates that clearing may be undertaken by the landowner, work by the landowner shall be in accordance with the Clearing Vegetation requirements of this specification and must be completed so as not to cause delay for the Contractor. If the landowner does not complete clearing in accordance with these requirements, the Contractor will undertake the clearing at a price approved by the Engineer.

400.28 TOPSOIL

The Contractor shall strip, stockpile and salvage all existing topsoil within the disturbance limit of construction activities. The salvaged topsoil shall then be used to restore disturbed areas to the satisfaction of the Engineer. Disposal of excess topsoil shall be approved by the Engineer, and shall be disposed of at an approved disposal site.

Unless specified otherwise, the cost to remove, handle, haul, stockpile, salvage, dispose, supply and place topsoil, including all labour, material and equipment, shall be included in the price of other tender items.

400.29 BEDROCK REMOVAL**400.29.1 General**

This section applies to bedrock and boulders that are greater than one-half cubic meter in size and that require blasting or hoe-ram removal. Bedrock or boulders that can be removed with an excavator bucket are not considered bedrock removal for the purposes of this section.

400.29.2 Blasting Requirements

All blasting shall be performed by a competent, qualified blaster in accordance with OPSS 120. Blasting mats are required. A pre-blast survey meeting the requirements of OPSS 120 must be completed for any structure within 200m of any blasting. The cost for pre-blast survey shall be included in the tender price for bedrock removal.

400.29.3 Typical Sections and Pay Limits

For tile drains and road culverts, bedrock shall be removed to 150mm below the proposed grade shown on the profile so that pipes are not in direct contact with bedrock. The width of bedrock removal shall be 1m minimum or the diameter of the pipe plus 600mm.

For open drains, bedrock removal shall match the proposed grade and bottom width shown on the Drawings. Side slopes shall be vertical or sloped outward. Side slopes shall be free of loose bedrock when excavation is completed.

Payment for the quantity of bedrock removed will be based on the typical sections described in these specifications and confirmed by field measurements. There will be no payment for overbreak.

400.29.4 Disposal of Bedrock

Excavated bedrock shall be piled at the edge of the working area at locations designated by the landowner. The cost to pile excavated bedrock shall be included in the tender price for bedrock removal. If the Special Provisions or the landowner require excavated bedrock to be hauled away, additional payment will be considered.

Where approved by the Engineer, excavated bedrock may be used in place of imported riprap in compliance with Specification 400.16 - *RIPRAP*.

400.30 SURFACE RESTORATION**400.30.1 General**

The Contractor shall be responsible for re-seeding as necessary for uniform catch during warranty period.

Areas that remain grassed after construction may not need to be seeded, unless directed otherwise by the Engineer.

400.30.2 Seeding

All disturbed ditch banks, berms and other grassed areas are to be seeded at the end of the day.

The following seed mixture shall be applied at 60kg/ha using a mechanical (cyclone) spreader:

- 35% Creeping Red Fescue
- 25% Birdsfoot Trefoil
- 25% Kentucky Bluegrass
- 10% Cover Crop (Oats, Rye, Barley, Wheat)
- 5% White Clover

Provide temporary cover for late fall planting by adding an additional 10 kg/ha of rye or winter wheat.

400.30.3 Hydroseeding

Where hydroseeding is specified, disturbed areas will be restored by the uniform application of a standard roadside mix, fertilizer, mulch and water at a rate of 2,000 kg/ha and be in accordance with OPSS 804.

400.30.4 Lawns

Unless specified otherwise, lawn areas shall be seeded with Canada No. 1 lawn grass mixture applied at 300 kg/ha using a mechanical (cyclone) spreader on 100mm of topsoil. Fertilizer shall be 5:20:20 or 10:10:10 applied at 300 kg/ha. Seed and fertilizer shall be applied together. Contractor shall arrange for watering with landowners.

400.30.5 Sod

Where sod is specified, sod is to be commercial grade turfgrass nursery sod, Kentucky Bluegrass placed on 150mm of topsoil. Fertilizer shall be 5-20-20 applied at 10kg/ha. Place sod in accordance with supplier instructions. The Contractor is responsible for saturating the sod with water on the day of sod placement. Subsequent watering is the responsibility of the landowner.

400.31 EROSION AND SEDIMENT CONTROL**400.31.1 General**

The Contractor shall install sediment control features at the downstream limits of the project and at other locations as shown on the drawings or as directed by the Engineer.

Sediment control features shall be installed prior to any excavation taking place upstream of that location. The Contractor shall maintain all sediment control features throughout construction and the warranty period.

Sediment that accumulates during construction shall be removed and levelled as required by the Contractor.

400.31.2 Silt Fence

Silt fence shall be in accordance with OPSS 805.07.02.02 and OPSD 219.110 (light-duty).

400.31.3 Erosion Control Blankets

Erosion Control Blankets (ECB) shall be biodegradable and made of straw/coconut (Terrafix SC200, Nilex SC32 or equal) or coconut (Terrafix C200, Nilex C32 or equal) with photodegradable, double net construction. The blanket and the staples shall be supplied and installed as per OPSS 804.

Erosion control blankets shall be placed and stapled into position as per the manufacturer's installation instructions on slopes as directed by the Engineer. Blankets shall be installed in direct contact with the ground surface to form a uniform, cohesive mat over the seeded earth area. The blankets are to be single course with 150mm overlap between blankets and staggered joints. The Contractor shall ensure that the ECB is anchored to the soil and that tenting of the ECB does not occur.

On slopes, when the ECB cannot be extended 1m beyond the crest of the slope, the uppermost edge of the ECB shall be anchored in a 150mm wide by 150mm deep trench. The trench shall be backfilled with earth and compacted.

400.31.4 Flow Check Dams

400.31.4.1 Temporary Straw Bale Flow Check Dam

The straw bale flow check dam shall consist of a minimum of 3 bales. Each bale is to be embedded at least 75mm into the channel bottom and shall be anchored in place with two (2) - 1.2m wooden stakes, driven through the bale and 600mm below ground.

Accumulated sediments shall be excavated and levelled prior to demobilization from the site after initial construction and at the end of the warranty period. Straw bales are to be removed at the end of the warranty period.

400.31.4.2 Temporary Rock Flow Check Dam

The temporary rock flow check dam shall extend to the top of the banks so that dam overtopping does not cause bank erosion. Rock shall be embedded a minimum of 150mm into the ditch bottom and banks. No geotextile is required for temporary rock flow check dams.

Accumulated sediments shall be excavated and levelled prior to demobilization from the site after initial construction and at the end of the warranty period. Temporary rock flow check dams are to be removed at the end of the warranty period.

400.31.4.3 Permanent Rock Flow Check Dam

The requirements of temporary rock flow check dams shall apply except rock shall be placed on geotextile and the dam shall remain in place permanently.

400.31.5 Sediment Traps

400.31.5.1 General

The channel bottom shall be deepened in accordance with the dimensions provided in the Drawings or Special Provisions. If dimensions are not specified on the Drawings, the sediment trap shall be excavated within the channel cross-section at least 0.3m below the design grade.

The Contractor shall monitor the sediment trap during construction and cleanout accumulated sediments as required to maintain the function of the sediment trap.

If specified to be temporary, no sediment trap maintenance is required after construction is complete.

If specified to be permanent, the contractor shall cleanout the sediment trap at the conclusion of the warranty period, unless directed otherwise by the Engineer.

A permanent rock sediment trap shall include a permanent sediment trap and a rock flow check dam.

A temporary rock/straw sediment trap shall include a temporary sediment trap and a rock/straw flow check dam.

400.31.6 Turbidity Curtains

A turbidity curtain is required when there is permanent water level/flow and a sediment trap is not feasible.

Turbidity curtains shall be in accordance with OPSP 219.260, OPSS 805 and installed per manufacturer's instructions.

Turbidity curtains shall be sized and anchored to ensure the bottom edge of the curtain is continuously in contact with the waterbody bed so that sediment passage from the enclosed area is prevented. The curtain must be free of tears and capable of passing the base flow from the drainage works. Turbidity curtain locations shall be approved by the Engineer.

Turbidity curtains are to remain functional until work in the enclosed area is completed. Prior to relocating or removing turbidity curtains, accumulated sediment is to be removed from the drain and levelled. Where a turbidity curtain remains in place for more than two weeks it shall be inspected for damage or clogging and replaced, repaired, or cleaned as required. No additional payment shall be made for the replacement and maintenance of turbidity curtains during construction.

400.32 GRASSED WATERWAYS AND OVERFLOW SWALES

Grassed waterways and overflow swales typically follow low ground along the historic flow route. The cross-section shall be saucer shaped with a nominal 1m bottom width, 8:1 side slopes and 300mm depth, unless stated otherwise in the Special Provisions.

All grassed waterways are to be permanently vegetated. Grassed waterways shall be seeded with the seed mixture specified in Specification 400.30.2 – *SURFACE RESTORATION - Seeding*.

Overflow swales in field areas which are not designated as grassed waterways shall not be seeded.

400.33 BUFFER STRIPS

Open drains shall include minimum 3m wide, permanently vegetated, buffer strips on each side of the drain, unless alternative dimensions are specified on the Drawings. Catchbasins shall include a minimum 1m vegetated buffer around the catchbasin, unless riprap is placed for sediment control.

400.34 POLLUTION

The Contractor shall keep their equipment in good repair. The Contractor or any landowner shall not spill or cause to flow any polluted material into the drain that is not acceptable to the MECP. The local MECP office and the Engineer shall be contacted if a polluted material enters the drain. The Contractor shall refill or repair equipment away from open water. If the Contractor causes a spill, the Contractor is responsible to clean-up the spill in accordance with MECP clean-up protocols.

400.35 SPECIES AT RISK

If a Contractor encounters a known Species at Risk designated by the MECP, MNRF or DFO, the Contractor shall notify the Engineer immediately and follow applicable authority's guidelines for work around the species.

400.36 SITE CLEANUP

The Contractor shall remove all surplus materials from the job site at the end of the project prior to demobilization. The Contractor shall locate the disposal site for all materials to be disposed of. Disposal of materials shall comply with applicable regulations. Unless specified otherwise, the cost to dispose of all surplus materials shall be included in the price of other tender items.

400.37 MAINTENANCE CORRIDOR

The maintenance corridor along the route of the drain, as defined in the report, Drawings, and Specification 400.4 - *WORKING AREA* and 400.6 - *ACCESS*, shall be kept free of obstructions, ornamental vegetation and structures. When future maintenance is undertaken, the cost of removing such items from the corridor shall be assessed to the landowner.

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410 STANDARD SPECIFICATION FOR OPEN DRAINS**410.1 DESCRIPTION**

Work under this item shall include the supply of labour, equipment and materials required for: channel excavation to the cross-section specified, leveling or disposal of all excavated material (spoil) as directed, reconstruction of all intercepted drains as required and any other items related to open drain construction as required by the Schedule of Tender Prices, Special Provisions or the Drawings.

410.2 MATERIALS

Refer to **400 Standard Specifications for Drain Construction** for any materials required for open drain construction.

410.3 CONSTRUCTION**410.3.1 Excavation**

The bottom width and the side slopes of the ditch shall be as shown on the profile drawing. If the channel cross-section is not specified in the Special Provisions it shall be a 1m bottom width with 1.5m horizontal to 1m vertical (1.5:1) bank slope. At locations along the drain where the specified side slopes change there shall be a transitional length of not less than 5m between the varying side slopes. At locations along the drain where the specified bottom width changes there shall be a transitional length of not less than 5m. In all cases there shall be a smooth transition between changes in any part of the channel cross-section. Where the bottom width of the existing ditch matches the specified bottom width, ditch excavation shall be completed without disturbing existing banks.

410.3.2 Low Flow Channels

Unless specified otherwise in the Special Provisions, all intermittent open drains with a bottom width greater than 1.8m and a grade less than 0.07%, shall have a low flow channel. The bottom of the low flow channel shall be the grade shown on the profiles, and shall have a U-shaped cross-section with an average top width of 0.5m and a minimum depth of 0.3m. The low flow channel will not be seeded and may meander along the main channel bottom provided it remains at least 0.3m from the toe of the main channel bank slope.

410.3.3 Line

The drain shall be constructed according to the alignment shown on the drawings or shall follow the course of the existing ditch. All bends shall have a minimum inside radius of 2m. There shall be a smooth transition between changes in the channel alignment. The Contractor shall contact the Engineer before removing any bends or irregularities in an existing ditch.

410.3.4 Grade Control

The profile shows the grade line for the bottom of the ditch. Cuts may be shown on the profile from the existing top of bank and/or from the existing ditch bottom to the new ditch bottom. These cuts are shown for the convenience of the Contractor and are not recommended for quantity estimate or grade control. Accurate grade control must be maintained by the Contractor during ditch excavation. The ditch bottom elevation should be checked every 50 metres and compared to the elevation on the profile.

Benchmarks are identified on the Contract Drawings. The Engineer will confirm all benchmark elevations prior to construction.

410.3.5 Variation from Design Grade

A variation of greater than 25mm above the design grade line may require re-excavation. Excavation below design grade up to 150mm is recommended so that sediment accumulation during or following excavation will not place the ditch bottom above the design grade at completion. Under some circumstances the Engineer may direct that over excavation greater than 200mm will have to be backfilled. No additional payment will be made if backfilling is required to remedy over excavation.

410.3.6 Excavated Material

Excavated material (spoil) shall be deposited on either or both sides of the drain within the specified working area as directed in the Special Provisions. The Contractor shall verify the location for the spoil with each landowner before commencing work on their property. If not specified, spoil shall be placed on the low side of the ditch or opposite trees and fences. The spoil shall be placed a minimum 1m from the top of the bank. No excavated material shall be placed in tributary drains, depressions, or low areas such that water is trapped behind the spoil bank. Swales shall be provided through the leveled or piled spoil at approximately 60m intervals to prevent trapping water behind the spoil bank.

The excavated material shall be placed and leveled to a maximum depth of 250mm; unless otherwise instructed. If excavating more than 450mm topsoil shall be stripped, stockpiled separately and replaced over the leveled spoil, unless stated otherwise in the Special Provisions. The edge of the spoil bank furthest from the ditch shall be feathered down to existing ground. The edge of the spoil bank nearest the ditch shall have a maximum slope of 2:1. The material shall be leveled such that it may be cultivated with conventional equipment without causing undue hardship on farm machinery.

Wherever clearing is necessary prior to leveling, the Contractor shall remove all stumps and roots from the working area. No excavated material shall cover any logs, brush or rubbish of any kind. Large stones in the leveled spoil that are greater than 300mm in diameter shall be moved to the edge of the spoil bank nearest to the ditch but in general no closer than 1m to the top of bank.

Lateral channels that outlet into the drain shall be tapered over a distance of 10m to match the grade of drain excavation. No additional payment will be made for this work. Where the elevation difference between the lateral channel and the drain is greater than 450mm, a rock chute or similar bank protection approved by the Engineer shall be provided. Additional payment may be allowed for this work.

Where it is specified to straighten any bends or irregularities in the alignment of the ditch or to relocate any portion of an existing ditch, the excavation from the new cut shall be used for backfilling the original ditch. Regardless of the distance between the new ditch and old ditch, no additional payment will be allowed for backfilling the existing ditch.

The Contractor shall contact the Engineer if a landowner indicates in writing that spoil on the owner's property does not need to be leveled. The Engineer may release the Contractor from the obligation to level the spoil and the Engineer shall determine the credit to be applied to the Contractor's payment. No additional compensation is provided to the owner if the spoil is not leveled.

The Engineer may require the Contractor to obtain written statements from any or all of the landowners affected by the leveling of the spoil. Final determination on whether or not the leveling of spoil meets the specification shall be made by the Engineer.

410.3.7 Excavation at Existing Bridge and Culvert Sites

The Contractor shall excavate the drain to the specified depth under all bridges and to the full width of the structure unless specified otherwise in the Special Provisions. All necessary care and precautions shall be taken to protect permanent structures. Temporary bridges may be removed and left on the bank of the drain. In cases where the design grade line falls below the top of footings, the Contractor shall take care to not over-excavate below the grade line. The Contractor shall notify the Engineer if excavation of the channel exposes the footings of the bridge or culvert, so the Engineer can make an evaluation.

The Contractor shall clean through all pipe culverts to the grade line and width specified on the profile. The Contractor shall immediately contact the Engineer after a culvert cleanout if it is found that the culvert bottom is above the grade line or where the structural integrity of the culvert is questionable. Material resulting from cleanout through bridges or culverts shall be levelled on the adjacent private lands or hauled offsite at the expense of the bridge/culvert owner.

410.3.8 Bridges and Culverts

The size and material for any new ditch crossings shall be as outlined in the Special Provisions. For culvert installation instructions, refer to **400 Standard Specifications for Construction of Drains**, the Drawings, and the Special Provisions.

If directed on the drawings that the existing crossing is to be salvaged for the owner, the Contractor shall carefully remove the existing crossing and place it beside the ditch or haul to a location as specified by the owner. If the existing crossing is not to be saved then the Contractor shall remove and dispose of the existing crossing. Disposal by burying on-site must be approved by the Engineer and the owner.

All new pipe crossings shall be installed at invert elevations as specified on the Drawings, typically a minimum of 50mm below design grade. If the ditch is over excavated greater than 200mm below design grade, the Contractor shall confirm with the Engineer the elevations for installation of the new crossing.

For backfill and surface restoration, refer to **400 Standard Specifications for Construction of Drains**, the Drawings, and the Special Provisions.

Any crossings assembled on-site shall be assembled in accordance with the manufacturer's specifications. Installation of private crossings during construction must be approved by the Engineer.

410.3.9 Obstructions

All trees, brush, fallen timber and debris shall be removed from the ditch cross-section and as required for spreading of the spoil. The roots shall be left in the banks if no bank excavation is required as part of the new channel excavation. In wooded or heavily overgrown areas all cleared material may be pushed into piles or rows along the edge of the cleared path and away from leveled spoil. All dead trees along either side of the drain that may impede the performance of the drain if allowed to remain and fall into the ditch, shall be removed and put in piles, unless directed otherwise by the Engineer.

410.3.10 Tile Outlets

The location of all existing tile outlets may not be shown on the profile for the drain. The Contractor shall contact each owner and ensure that all tile outlets are marked prior to commencing excavation on the owner's property. If a marked tile outlet or the tile upstream is damaged due to construction, it shall be replaced at the Contractor's expense. Additional payment will be allowed for the repair or replacement of any unmarked tile outlets encountered during excavation. In all cases, if an existing tile outlet requires replacement the Contractor shall confirm the replacement tile outlet with the Engineer. Where riprap protection exists at any existing tile outlet such protection shall be removed and replaced as necessary to protect the outlet after reconstruction of the channel.

If any tile outlet becomes plugged as a result of construction, the Contractor shall remove the obstruction.

410.3.11 Completion

At the time of final inspection, all work in the contract shall have the full dimensions and cross-sections specified.

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420 STANDARD SPECIFICATIONS FOR TILE DRAINS**420.1 GENERAL**

Work under this specification will consist of supplying, hauling, laying and backfilling subsurface drainage pipe, in the location, depth and invert grade as shown on the Drawings or described in the Special Provisions. In this specification the word "tile" will apply to all described pipe materials. Diameters are in millimeters (mm), lengths in meters (m).

The work shall include the supplying of all labour, tools, equipment and materials required for the installation of the tile including the following associated tasks: excavation and backfilling of the trenches; trench dewatering; hauling, handling, placing and compaction of the excavated material for backfill; loading, hauling, handling and disposal of surplus excavated material; and stripping, handling and replacing of topsoil and sod.

All existing laterals crossed by the new drain alignment shall be reconnected in an approved manner. Either special manufactured connections shall be used or another method of sealing connections as approved by the Engineer.

The Contractor shall also supply and install catchbasins, junction boxes and other structures where directed by the Engineer. Refer to Specifications 420.3.8, 420.3.10, and 420.3.11 for specifics on tile connections and catchbasin/junction box details.

Except where complete removal of an existing pipe is required by new construction, existing pipes to be abandoned shall be sealed with a 300mm minimum length concrete or mortar plug to the satisfaction of the Engineer.

Sections 6 and 7 of the current version of the *Drainage Guide for Ontario*, OMAFRA Publication 29 shall provide a general guide to all methods and materials to be used in the construction of tile drains except where superseded by this Contract.

The licensing requirements of the *Agricultural Tile Drainage Installation Act, 1990* will not be applicable to this Contract unless specified otherwise by this Contract.

420.2 MATERIALS

Refer to **400 Standard Specifications for Drain Construction** for any materials required for tile drain construction.

420.3 CONSTRUCTION**420.3.1 Outlet**

A tile drain outlet into a ditch or creek shall be protected using a 6m length of rigid pipe with a hinged grate for rodent protection. Maximum spacing between bars on the rodent grate shall be 50mm. Material for rigid pipe will be specified in the Special Provisions. If not otherwise specified, material shall be assumed to be plastic pipe as per Specification 400.15.5 – *HDPE Pipe* (dual wall high density polyethylene). The joint between the rigid pipe and the tile drain shall be wrapped with filter fabric. All outlets will be protected with rock riprap to protect the bank cut and as a splash apron. In some locations riprap may also be required on the bank opposite the outlet. The quantity of riprap required will be specified in the Special Provisions. A marker stake as approved by the Engineer shall be placed at each tile outlet.

420.3.2 Alignment & Pre-Location of Existing Drains

The Engineer will designate the general location of the new drain. When the proposed drain is generally parallel to existing drains, the Contractor shall pre-locate the existing drains.

For pre-locates, cross trenches are to be dug along the entire length of the new drain route at 100m to 200m intervals (minimum), prior to construction, to confirm the alignment of the new drain. The frequency of pre-locating will depend on the alignment of the existing drains. More pre-locates will be necessary for a meandering drain route.

The Contractor shall exercise care to not disturb any existing tile drains which parallel the new drain and are intended to remain. The alignment of the new drain shall be offset approximately four to six metres from the existing drain to minimize disturbance of the existing drain. Where an existing tile is disturbed or damaged the Contractor shall perform the necessary correction or repair with no additional compensation.

NOTE: It is the Contractor's responsibility to ascertain the location of, and to contact the owners of all utility lines, pipes and cables in the vicinity of drain excavations. The Contractor shall be completely responsible for all damages incurred.

420.3.3 Grade Control

Tile drain is to be installed to the elevation and grade as shown on the profiles. Accurate grade control must be maintained by the Contractor at all times during tile installation. The tile invert elevation should be checked every 50m and compared to the elevation on the profile.

Benchmarks are identified on the Contract Drawings. The Engineer will confirm all benchmark elevations prior to construction.

420.3.4 Variation from Design Grade

No reverse grade will be allowed. A small variation in grade can be tolerated where the actual capacity of the drain exceeds the required capacity. The constructed grade should be such that the drain will provide the capacity required for the drainage area. Constructed grade should not deviate from design grade by more than 10% of the internal diameter for more than 25m. Grade corrections shall be made gradually over a distance not less than 10m.

420.3.5 Installation

420.3.5.1 General

For installation of closed drains by wheel trencher or excavator and corrugated plastic tubing by drainage plow, topsoil shall be stripped, stockpiled separately and replaced after the trench is backfilled. Topsoil stripping extents shall account for the width of the trench and include adequate space for subsoil stockpiles.

At each work stoppage, the exposed end of the tile shall be covered by a tight-fitting board or metal plate. No installed tile shall be left exposed overnight.

Any tile damaged or plugged during construction shall be replaced or repaired at the Contractor's expense.

Restoration requirements are provided in Specification 400.30 - *Surface Restoration*.

420.3.5.2 Installation of Concrete Tile

The standard method for concrete tile installation is by wheel machine. Installation of concrete tile by backhoe/excavator is subject to the Engineer's approval and shall meet the requirements at the end of this section.

Trench excavation shall begin at the outlet and proceed upstream. The location and grade shall be as shown on the Drawings but may be revised by the Engineer on site with no additional payment, except where the change requires increased depth of cut beyond the limitation of the wheel trencher in use at the time of the change.

Where the depth for the tile installation exceeds the depth capacity of the wheel trencher, the Contractor shall excavate a trench of sufficient depth so that the wheel trencher can install the tile at the correct depth and grade. The tender price shall include the cost of the additional excavation, material handling, backfilling and stripping and replacing topsoil over the trench.

The trench width measured at the top of the tile should be at least 150mm greater than the tile diameter. The bottom of the trench is to be cut accurately to grade and shaped so that 10% of the tile diameter is embedded in undisturbed soil. If the trench is overcut below the proposed grade, it is to be backfilled with 19mm clear crushed stone material to the correct grade.

The inside and ends of the tile are to be kept clean during installation. All soil and debris should be removed before the next tile is installed. All concrete tile joints and connections with other pipe materials are to be fully and tightly wrapped with a minimum 300mm width of geotextile drain wrap. A 150mm minimum overlap on top is also required. No additional payment will be made for joint wrapping.

On straight runs, ensure tile joints are aligned, joint wrap is flat and covers the joint evenly, and maximum space between tiles is 3mm. On curved runs, ensure tile joints are touching on one side with a maximum gap of 12mm (1/2") on the opposite side. Where the maximum gap of 12mm cannot be achieved on a curved run, tiles shall be bevel cut or elbow fittings (maximum 45°) shall be used.

Additional Requirements for Excavator Installation

For installation of concrete tile by backhoe/excavator, concrete tile shall be installed on a minimum of 100mm of 19mm clear, crushed stone, shaped for 10% of the tile diameter. The cost to supply and place stone bedding shall be included in the tendered price for the concrete tile item.

420.3.5.3 *Installation of Corrugated Plastic Tubing*

Corrugated plastic tubing shall be installed by a drainage plow or wheel trencher unless an alternate method of construction is specified on the Drawings. For other installation methods, proper bedding and backfill is required to maintain the structural integrity of the plastic tubing so that surface and earth loads do not deflect the tubing by more than 20% of its nominal diameter.

For all installation methods:

- the plastic tubing should not be stretched by more than 7% of its normal length
- protect tubing from floating off grade when installing in saturated soil conditions
- directional changes can be made without fittings provided the centre-line radius of the bend is not less than five times the tubing diameter

Drainage plow equipment should construct a smooth bottomed opening in the soil and maintain the opening until the tubing is properly installed. The size of the opening in the soil should conform closely to the outside diameter of the tubing.

420.3.5.4 *Installation of Concrete Sewer Pipe or Plastic Pipe*

The Contractor shall shape the bottom of the trench to receive and support the pipe and bell over 10% of its diameter. In field and lawn areas, stone bedding is not required unless otherwise specified on the Drawings or directed by the Engineer.

420.3.6 **Stony Conditions and Bedrock**

The Contractor shall immediately contact the Engineer if stony conditions or bedrock is encountered such that installation by wheel trencher or drainage plow cannot continue. Upon approval of the Engineer, the Contractor shall continue with drain installation using excavator/backhoe methods, as described in Specification 420.3.5.2 - *Installation of Concrete Tile*. If not already established in the Tender, additional payment may be approved by the Engineer in consultation with the Contractor. All reasonable effort by the Contractor shall be made to continue with the wheel trencher, or return to use of the wheel trencher after the stony area has been passed.

Stones greater than 300mm in diameter that are pulled to the surface during excavation shall be disposed of by the Contractor at an on-site location acceptable to the landowner. No additional payment for excavating or hauling these stones will be provided.

420.3.7 Unstable Subsoils

The Contractor shall immediately contact the Engineer if unstable subsoil conditions are encountered during tile installation. Upon approval of the Engineer, the tile shall be installed on a 300mm layer of 19mm clear crushed stone. In locations with non-cohesive, fine-grained soils, the Engineer may require the clear crushed stone to be wrapped in geotextile to prevent migration of fines into the clear stone. In exceptional circumstances (e.g. muck soils), the Engineer may require the Contractor to subexcavate unsuitable materials and backfill with clear stone, as required to support pipe bedding.

If not already established in the Tender, additional payment will be considered by the Engineer including: the cost to supply and place the additional stone, geotextile, and the increased cost for installation.

420.3.8 Tile Connections

All lateral drains encountered along the route of the new tile drain are to be connected to the new drain if the intercepted tile are clean and do not contain polluted water. The Contractor shall obtain direction from the Engineer for lateral drains that are full of sediment or contain polluted water.

All lateral drains are to be connected to the new tile using a pipe material and size that will provide the same flow capacity. Corrugated plastic tubing may be used for all tile connections, unless specified otherwise by the Engineer. Tubing may be solid or perforated. Filter sock is not required.

The Contractor is responsible for installation and backfilling in a manner that maintains the structural integrity of the connection. Manufactured fittings shall be used to ensure tight connections. Where an opening must be made in the new tile drain for a connection, the opening shall be cored, unless a field-cut connection is approved by the Engineer. Any gaps or voids around the connection shall be sealed with mortar, low-expanding spray foam, or geotextile. Lateral tubing shall not protrude more than 25mm beyond the inside wall of the new tile drain. The Contractor shall ensure that any material used to seal the connection does also not protrude beyond the inside wall of the new tile drain.

Tile connections will be paid in accordance with the Schedule of Tender Prices and shall include the cost for all fittings, tubing, stone, equipment and labour required.

420.3.9 Backfilling

All tile shall be blinded by the end of the day's work to protect and hold them in place against disturbance. After the tile is inspected, it shall be initially backfilled with a minimum cover of 300mm. For blinding and initial backfilling, use clean native soil with no organic matter. Initial backfill shall be tamped around the pipe by backhoe bucket or similar, if directed by the Engineer.

For completion of backfill, tile shall be backfilled with native material such that there is a minimum cover of 600mm. In addition, a sufficient mound must be placed over the trench to ensure that no depression occurs after settling along the trench.

420.3.10 Catchbasins

420.3.10.1 General

All catchbasins shall have minimum inside dimensions matching the dimensions shown on the Drawings. The Contractor is responsible for ordering catchbasins to match the inlet and outlet connections and top elevations required by the Special Provisions and the Drawings.

420.3.10.2 *Materials*

The requirements in this section apply strictly to catchbasins in non-travelled locations. Where catchbasins are proposed for travelled locations, refer to the Special Provisions and the Drawings for applicable OPSD information.

Precast, reinforced concrete catchbasins shall be manufactured by Coldstream Concrete or approved equal. The joints between precast catchbasin sections shall be protected with geotextile to prevent soil material from entering into the catchbasin. Joint protection using mortar or water tight barrier is also acceptable. Grates are to be birdcage grates as manufactured by Coldstream Concrete or approved equal, unless specified otherwise on the Drawings. All grates to be secured with corrosion resistant hardware.

HDPE catchbasins shall be as fabricated by ADS, Armtec, Hancor or approved equal. PVC catchbasins shall be Nyloplast as manufactured by ADS or approved equal. HDPE and PVC catchbasins shall be supplied with integral stubouts, fabricated by the manufacturer and sized according to the pipe connections shown on the Drawings. Grates for HDPE, steel or PVC catchbasins shall be in accordance with the Special Provisions and manufacturer recommendations.

Marker stakes as supplied by Coldstream Concrete or equal are to be placed beside each catchbasin, unless specified otherwise on the Drawings.

420.3.10.3 *Installation*

All tile or pipe connected to concrete catchbasins shall be mortared or secured in place so that no gaps remain at the connection. Mortar is to be applied on both the inside and outside wall surfaces.

Backfill around all new catchbasins is recommended to be 19mm clear crushed stone to avoid future settlements. The Contractor shall be responsible for backfilling all settlement areas around catchbasins during the contract warranty period. No additional payment will be provided for adding backfill to settlement areas around catchbasins.

All catchbasin sumps to be fully cleaned by the Contractor after completion of drain installation and backfilling.

420.3.11 Junction Boxes

Junction boxes shall be precast concrete to the same specification as above for catchbasins, except that the junction box shall have a solid concrete lid, unless specified otherwise on the Drawings. The lid shall be a minimum of 125mm thick with welded wire reinforcement and 2 lifting handles. Junction boxes shall have minimum cover of 450mm.



NOTES:

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- ALL ROLL NUMBERS IN WELLESLEY BEGIN WITH 30-24- (i.e. 010-001-37200 IN FULL IS 30-24-010-001-37200)
- ALL ROLL NUMBERS IN WILMOT BEGIN WITH 30-18-090- (i.e. 010-17600 IN FULL IS 30-18-090-010-17600)
- PRELIMINARY ROAD LAYOUT AND PARCELS ON ROLL NO. 010-001-37200 (DISPLAYED IN LIGHT GREY) ARE SHOWN PER REVISED FUNCTIONAL SERVING REPORT BY STANTEC, DATED MARCH 11, 2025

BENCHMARKS:

BM#1
SPIKE IN WEST FACE OF FENCE BRACE POST ALONG PROPERTY LINE
ELEV. 349.490

BM#2
SPIKE IN EAST FACE OF HYDRO POLE ON SOUTH SIDE OF GERBER RD., APPROXIMATELY 25m WEST OF CULVERT CROSSING
ELEV. 353.905

GBM (REGION OF WATERLOO BENCHMARK WE-20)
CONCRETE BRIDGE ON QUEEN STREET (REGIONAL ROAD 5) IN WELLESLEY. TABLET SET VERTICALLY IN S/FACE OF SW CORNER OF EAST ABUTMENT. BRIDGE @ N/END MILL POND.
N 4,813,897.068
E 518,726.599
ELEV. 354.124

HORIZONTAL DATUM: WORLD WIDE/UTM 17 NORTH NAD 1983(CSRs)
VERTICAL DATUM: CGVD 28:78
PROJECTION: GRID (SCALE FACTOR = 1)

LEGEND

- WATERSHED
- SUBWATERSHED
- (004-07900) ASSESSMENT ROLL NUMBER
- 5.2 ha HECTARES OWNED
- (12.8) APPROXIMATE HECTARES IN WATERSHED
- PROPOSED WORK OR INCORPORATION
- FUTURE PRIVATE STORM (BY OTHERS)
- EXISTING MUNICIPAL DRAIN
- EXISTING MUNICIPAL DRAIN TO BE ABANDONED
- EXISTING DITCH OR WATERCOURSE
- AREA TILED OUT OF WATERSHED

No.	DESCRIPTION	DATE
1	DRAFT FOR REVIEW	AUGUST 30, 2024
2	REVISED PER GRCA COMMENTS	NOVEMBER 26, 2024
3	ISSUED FOR REPORT	OCTOBER 9, 2025

DESIGNED BY: T.B.J.
CHECKED BY: T.B.J.
DRAWN BY: N.M.B.
CHECKED BY: T.B.J.

SCALE
0 100m
1 : 5,000
(ON 11"x 17")

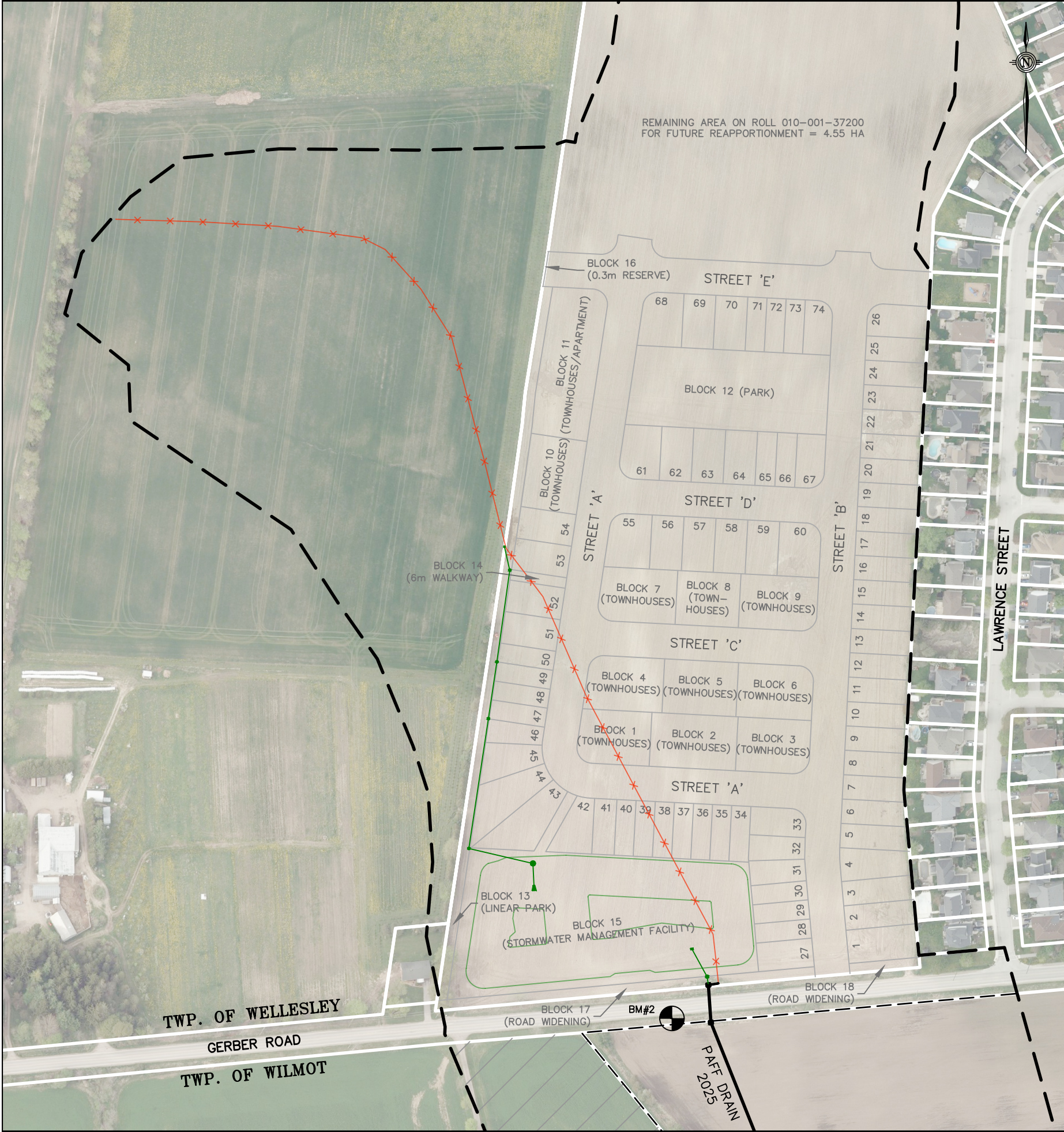
PAFF DRAIN 2025

TOWNSHIP OF WELLESLEY/
REGION OF WATERLOO TOWNSHIP OF WILMOT

WATERSHED PLAN

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUBURRY

OCTOBER 9, 2025
JOB NUMBER: 23-175
DRAWING
1 OF 7



010-001-37200 FUTURE LOT LEGEND (FOR FUTURE REAPPORTIONMENT PURPOSES)			
LOT NUMBER	TOTAL HA AFFECTED	LOT NUMBER	TOTAL HA AFFECTED
LOT 1	0.08	LOT 50	0.04
LOT 2	0.06	LOT 51	0.06
LOT 3	0.06	LOT 52	0.06
LOT 4	0.07	LOT 53	0.06
LOT 5	0.05	LOT 54	0.06
LOT 6	0.05	LOT 55	0.08
LOT 7	0.05	LOT 56	0.06
LOT 8	0.05	LOT 57	0.06
LOT 9	0.05	LOT 58	0.06
LOT 10	0.05	LOT 59	0.06
LOT 11	0.05	LOT 60	0.07
LOT 12	0.05	LOT 61	0.07
LOT 13	0.05	LOT 62	0.06
LOT 14	0.05	LOT 63	0.06
LOT 15	0.05	LOT 64	0.06
LOT 16	0.05	LOT 65	0.04
LOT 17	0.05	LOT 66	0.04
LOT 18	0.05	LOT 67	0.05
LOT 19	0.05	LOT 68	0.07
LOT 20	0.05	LOT 69	0.06
LOT 21	0.05	LOT 70	0.06
LOT 22	0.05	LOT 71	0.04
LOT 23	0.05	LOT 72	0.04
LOT 24	0.05	LOT 73	0.04
LOT 25	0.05	LOT 74	0.05
LOT 26	0.06	BLOCK 1	0.13
LOT 27	0.05	BLOCK 2	0.15
LOT 28	0.04	BLOCK 3	0.13
LOT 29	0.04	BLOCK 4	0.13
LOT 30	0.04	BLOCK 5	0.13
LOT 31	0.04	BLOCK 6	0.13
LOT 32	0.04	BLOCK 7	0.13
LOT 33	0.05	BLOCK 8	0.11
LOT 34	0.04	BLOCK 9	0.14
LOT 35	0.04	BLOCK 10	0.14
LOT 36	0.04	BLOCK 11	0.28
LOT 37	0.04	BLOCK 12	0.52
LOT 38	0.04	BLOCK 13	0.25
LOT 39	0.04	BLOCK 14	0.02
LOT 40	0.04	BLOCK 15	1.28
LOT 41	0.04	BLOCK 16	0.01
LOT 42	0.06	BLOCK 17	0.12
LOT 43	0.10	BLOCK 18	0.02
LOT 44	0.10	STREET A	1.09
LOT 45	0.06	STREET B	0.94
LOT 46	0.04	STREET C	0.22
LOT 47	0.04	STREET D	0.20
LOT 48	0.04	STREET E	0.29
LOT 49	0.04		

NOTES:

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BENCHMARKS:

BM#1
SPIKE IN WEST FACE OF FENCE BRACE POST ALONG PROPERTY LINE
ELEV. 349.490

BM#2
SPIKE IN EAST FACE OF HYDRO POLE ON SOUTH SIDE OF GERBER RD., APPROXIMATELY 25m WEST OF CULVERT CROSSING
ELEV. 353.905

GBM (REGION OF WATERLOO BENCHMARK WE-20)
CONCRETE BRIDGE ON QUEEN STREET (REGIONAL ROAD 5) IN WELLESLEY. TABLET SET VERTICALLY IN S/FACE OF SW CORNER OF EAST ABUTMENT. BRIDGE @ N/END MILL POND.
N 4,813,897.068
E 518,726.599
ELEV. 354.124

HORIZONTAL DATUM: WORLD WIDE/UTM 17 NORTH NAD 1983(CSRs)
VERTICAL DATUM: CGVD 28:78
PROJECTION: GRID (SCALE FACTOR = 1)

LEGEND

WATERSHED

SUBWATERSHED

(004-07900) ASSESSMENT ROLL NUMBER

5.2 ha HECTARES OWNED

(12.8) APPROXIMATE HECTARES IN WATERSHED

PROPOSED WORK OR INCORPORATION

FUTURE PRIVATE STORM (BY OTHERS)

EXISTING MUNICIPAL DRAIN

EXISTING MUNICIPAL DRAIN TO BE ABANDONED

EXISTING DITCH OR WATERCOURSE

AREA TILED OUT OF WATERSHED

No.	DESCRIPTION	DATE
1	DRAFT FOR REVIEW	AUGUST 30, 2024
2	REVISED PER GRCA COMMENTS	NOVEMBER 26, 2024
3	ISSUED FOR REPORT	OCTOBER 9, 2025

DESIGNED BY: T.B.J.

CHECKED BY: T.B.J.

DRAWN BY: N.M.B.

CHECKED BY: T.B.J.

SCALE

0 50m

1 : 2,500

(ON 11"x 17")

PAFF DRAIN 2025

TOWNSHIP OF WELLESLEY/
REGION OF WATERLOO

TOWNSHIP OF WILMOT

PLAN FOR FUTURE REAPPORTIONMENTS

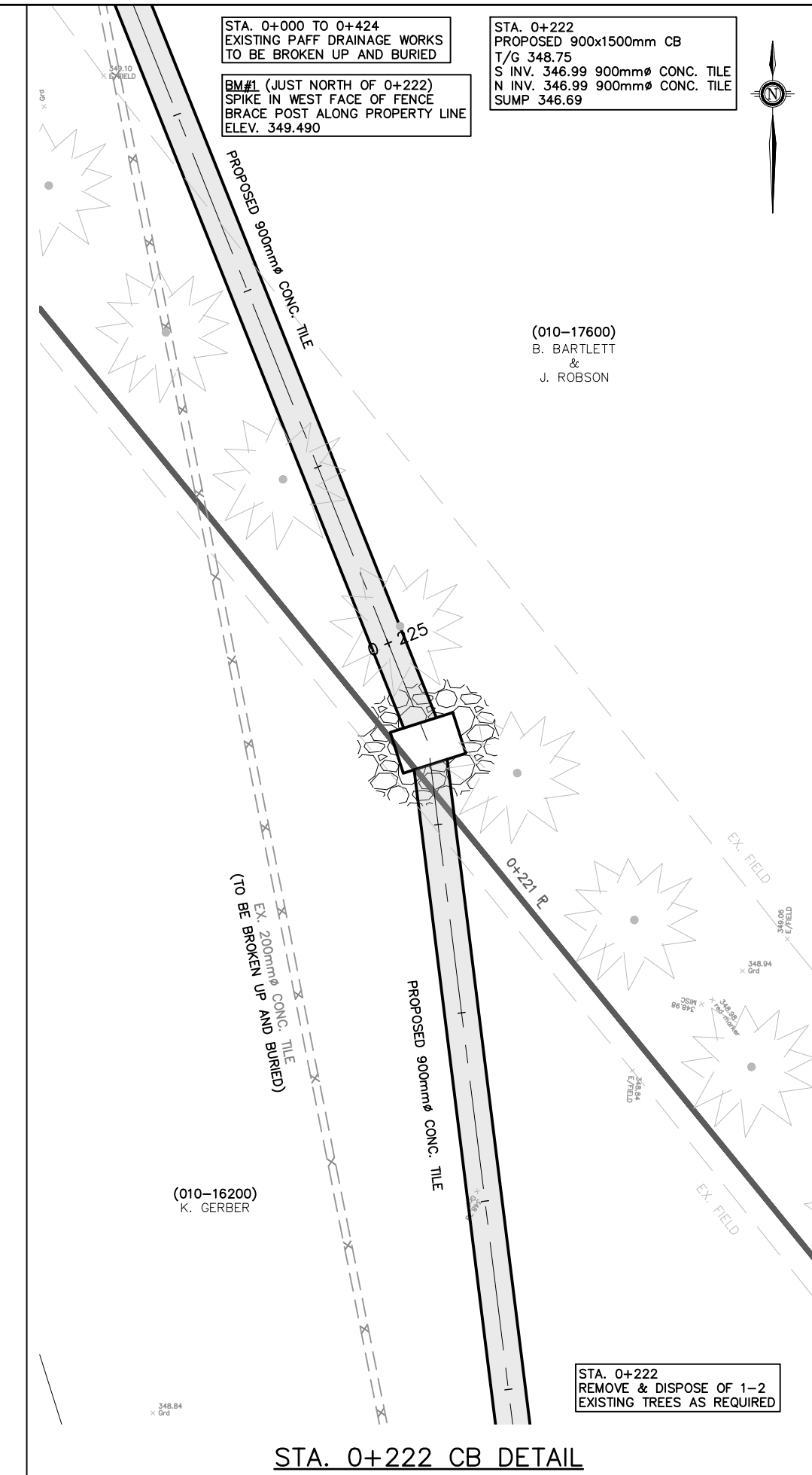
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

OCTOBER 9, 2025

JOB NUMBER: 23-175

DRAWING **2 OF 7**

S:\2023\23-175\Drafting\WS 23-175.dwg 2. Plan For Future Reapportionments 9-Oct-25 9:46:42 AM



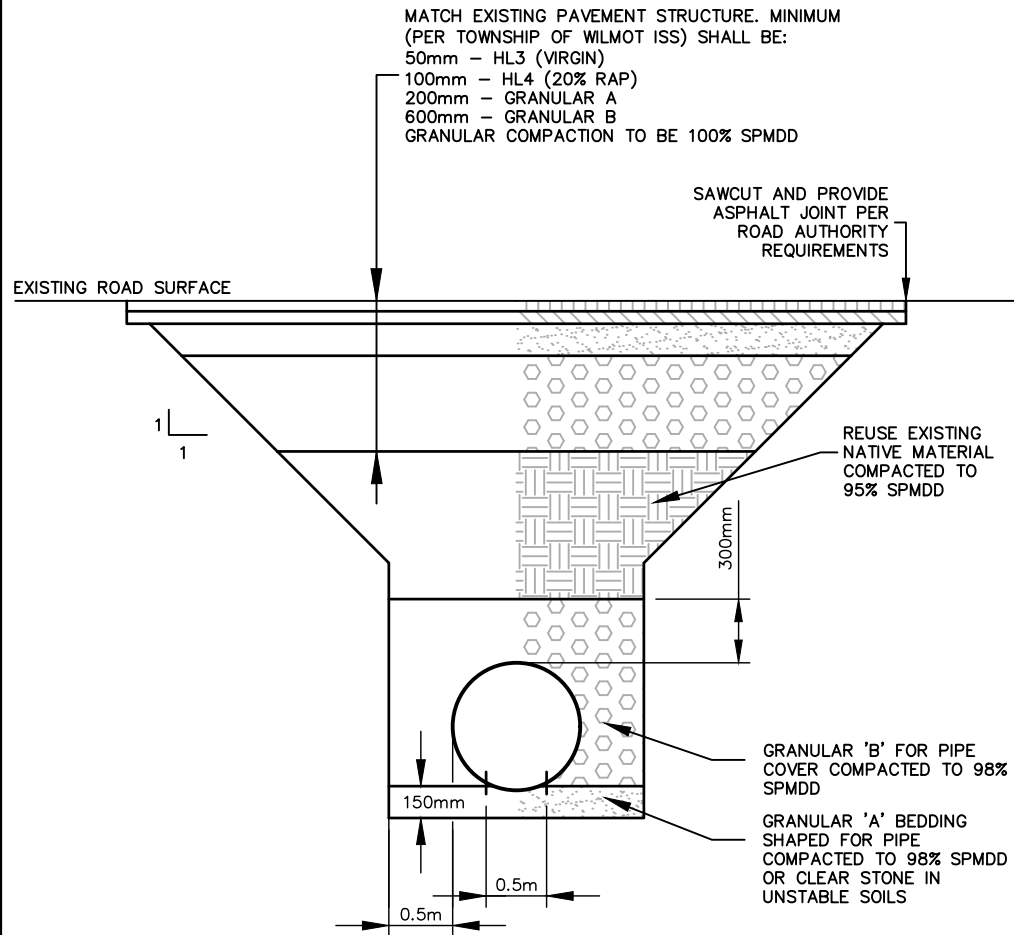
<u>SPECIAL PROVISIONS – CONSTRUCTION NOTES:</u>		
<u>(010–17000)</u>		
–0+010 TO 0+010	320m ² (16mLx20mW) OF BRUSHING. WORK AROUND LARGE TREES WHERE POSSIBLE	
–0+006 TO 0+000	CONSTRUCT PERMANENT PLUNGE POOL. SEE DWG. 5 FOR DETAIL	
0+000 TO 0+010	4m OF 900mmØ CONC. TILE WITH JOINT WRAP WITH 6m OF 900mmØ SOLID PLASTIC PIPE AT OUTLET WITH RODENT GRATE. EXISTING PAFF DRAINAGE WORKS TO BE BROKEN UP AND BURIED	
<u>(010–16200)</u>		
0+010 TO 0+222	212m OF 900mmØ CONC. TILE WITH JOINT WRAP. EXISTING PAFF DRAINAGE WORKS TO BE BROKEN UP AND BURIED	
<u>(010–17600)</u>		
0+222	CONSTRUCT 900x1500mm CONCRETE CB INCLUDING CONNECTIONS, BIRDCAGE GRATE AND RIPRAP APRON. REMOVE & DISPOSE OF 1–2 EXISTING TREES AS REQUIRED	
0+222 TO 0+424	202m OF 900mmØ CONC. TILE WITH JOINT WRAP. EXISTING PAFF DRAINAGE WORKS TO BE BROKEN UP AND BURIED	
0+424	CONSTRUCT 1200x1500mm CONCRETE CB INCLUDING CONNECTIONS, BIRDCAGE GRATE, MARKER AND RIPRAP APRON. SEE DWG. 4 FOR DETAIL	
<u>GERBER ROAD</u>		
0+424 TO 0+445	21m OF 900mmØ HDPE BY OPEN CUT. SEE DWG. 4 FOR DETAIL	
<u>010–001–37200</u>		
0+445	CONSTRUCT 1200x1500mm CONCRETE DIBC INCLUDING CONNECTIONS, BIRDCAGE GRATE, MARKER AND RIPRAP APRON. SEE DWG. 4 FOR DETAIL	

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DESIGNED BY: T.B.J.		<u>SCALE</u> 0 100m 1:5,000 (HORZ.) 0 1m 1:50 (VERT.) (ON 11"x 17")
CHECKED BY: T.B.J.		
DRAWN BY: N.M.B.		
CHECKED BY: T.B.J.		

PAFF DRAIN 2025	
REGION OF WATERLOO	TOWNSHIP OF WELLESLEY/ TOWNSHIP OF WILMOT
PROFILE & 0+222 CB DETAIL	

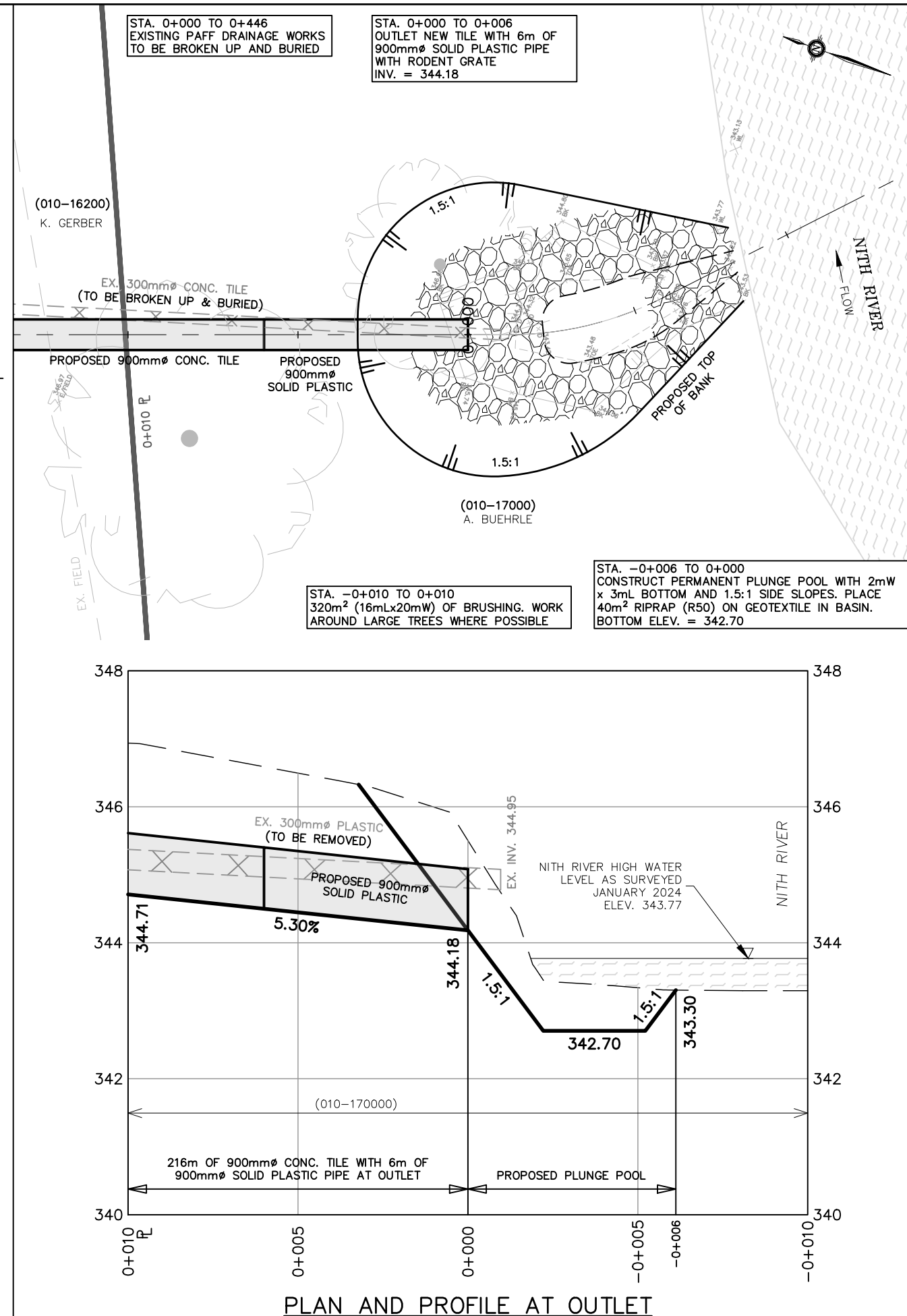
 K. SMART ASSOCIATES LIMITED CONSULTING ENGINEERS AND PLANNERS KITCHENER	OCTOBER 9, 2025 JOB NUMBER: 23–175 DRAWING 3 OF 7
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NOTES:

- BACKFILL AND COMPACTION REQUIREMENTS ALSO APPLY BEYOND THE SHOULDER AT A 1:1 SLOPE DOWN TO THE BOTTOM OF TRENCH EXCAVATION
- NEW FROST TAPER NOT REQUIRED UNLESS REQUESTED AT TIME OF CONSTRUCTION. BLEND INTO EXISTING TAPERS. IF REQUIRED, TAPERS TO BE IN ACCORDANCE WITH OPSD 803.03 AND ADDITIONAL PAYMENT WILL BE ALLOWED.
- ALL SURPLUS EXCAVATED MATERIAL TO BE HAULED AWAY
- ASPHALT SHALL COMPLY WITH APPLICABLE OPSS MATERIAL SPECIFICATIONS.
- IN INITIAL CONSTRUCTION SEASON ALL LIFTS OF ASPHALT SHALL BE PLACED IF CONDITIONS ARE SUITABLE. IF CONDITIONS ARE POOR, TEMPORARY ASPHALT MAY BE REQUIRED UNTIL FOLLOWING CONSTRUCTION YEAR.
- MATCH EXISTING ROAD CROSSFALL (2% MINIMUM)

GERBER ROAD RESTORATION DETAILS
(NOT TO SCALE)



SPECIAL PROVISIONS - CONSTRUCTION NOTES:

(010-17000)

-0+010 TO 0+010 320m² (16mLx20mW) OF BRUSHING. WORK AROUND LARGE TREES WHERE POSSIBLE

-0+006 TO 0+000 CONSTRUCT PERMANENT PLUNGE POOL WITH 2mW x 3mL BOTTOM AND 1.5:1 SIDE SLOPES. PLACE 40m² RIPRAP (R50) ON GEOTEXTILE IN BASIN.

0+000 TO 0+010 4m OF 900mmØ CONC. TILE WITH JOINT WRAP WITH 6m OF 900mmØ SOLID PLASTIC PIPE AT OUTLET WITH RODENT GRATE. EXISTING PAFF DRAINAGE WORKS TO BE BROKEN UP AND BURIED

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DESIGNED BY: T.B.J.

CHECKED BY: T.B.J.

DRAWN BY: N.M.B.

CHECKED BY: T.B.J.

SCALE

1:150 (HORZ.)

1:75 (VERT.)
(ON 11"x 17")

PAFF DRAIN 2025

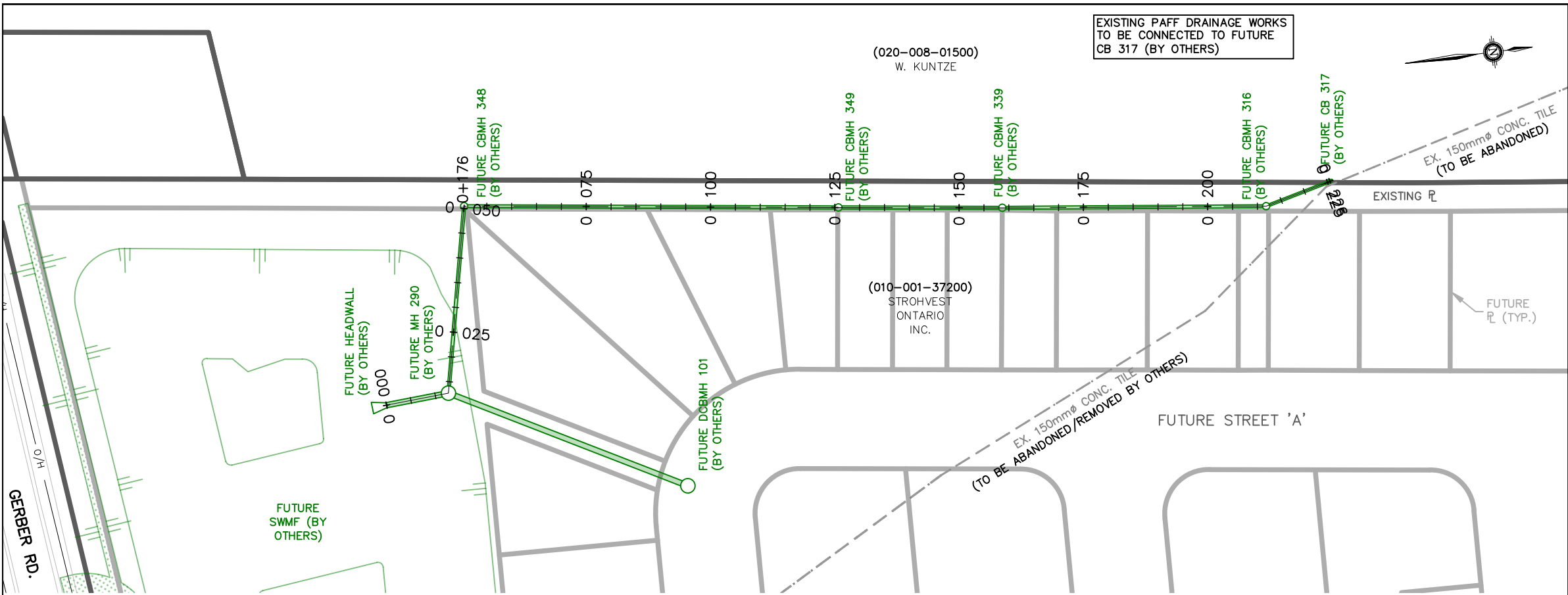
REGION OF WATERLOO TOWNSHIP OF WELLESLEY/
TOWNSHIP OF WILMOT

ROAD RESTORATION & OUTLET DETAILS

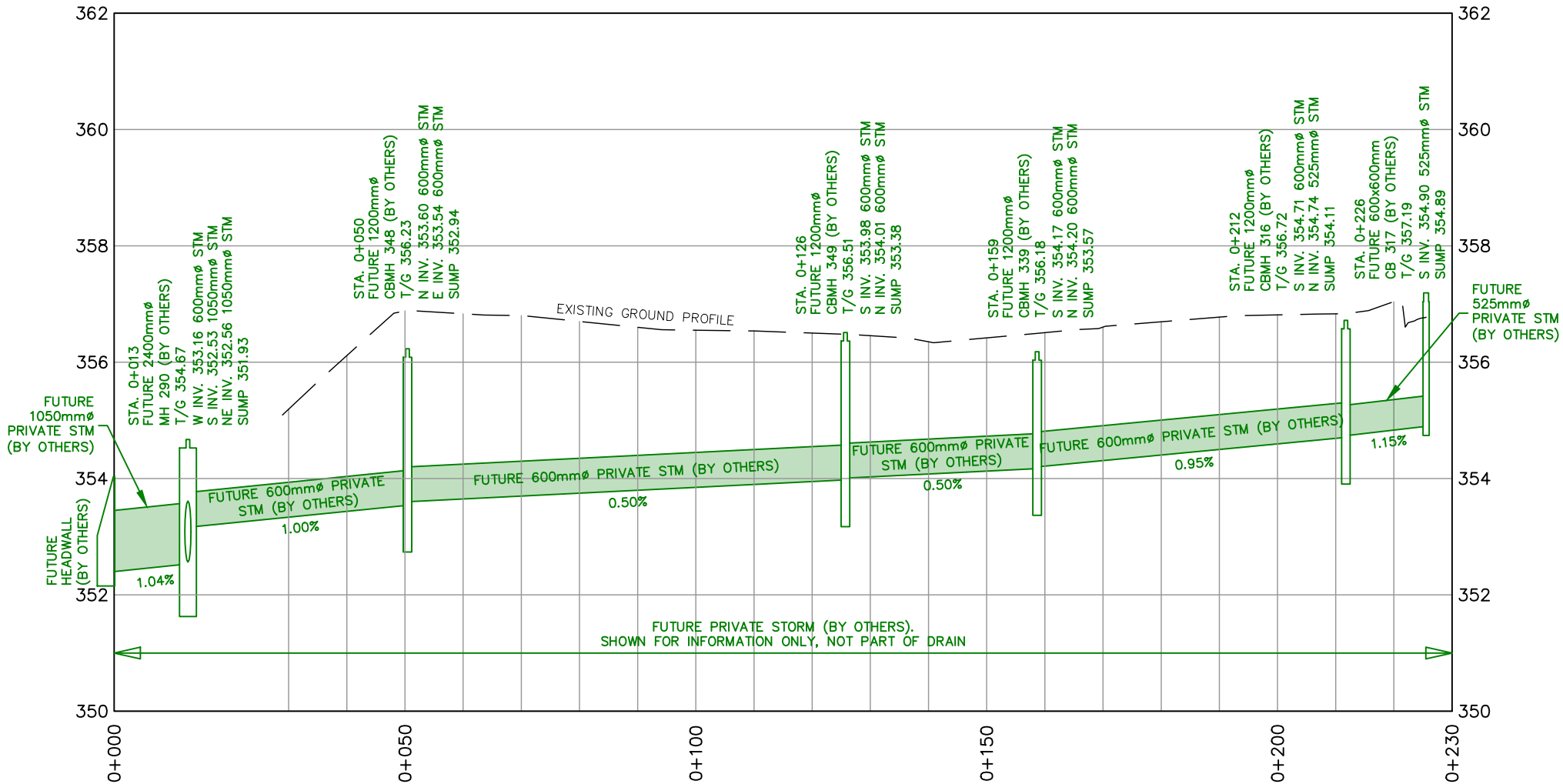
OCTOBER 9, 2025

JOB NUMBER: 23-175

DRAWING 5 OF 7



NOTE:
PRELIMINARY ROAD LAYOUT AND PARCELS ON ROLL NO. 010-001-37200 (DISPLAYED IN LIGHT GREY) ARE SHOWN PER REVISED FUNCTIONAL SERVICING REPORT BY STANTEC, DATED MARCH 11, 2025



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DESIGNED BY: T.B.J.
CHECKED BY: T.B.J.
DRAWN BY: N.M.B.
CHECKED BY: T.B.J.

SCALE
1:1,000 (HORZ.)
1:100 (VERT.)
(ON 11" x 17")

PAFF DRAIN 2025
REGION OF WATERLOO

TOWNSHIP OF WELLESLEY/
TOWNSHIP OF WILMOT

PRIVATE DEVELOPMENT STORM

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER

OCTOBER 9, 2025
JOB NUMBER: 23-175
DRAWING
6 OF 7

300) CONSTRUCTION NOTES (SPECIAL PROVISIONS)

300.1) CONSTRUCTION SPECIFICATIONS - GENERAL NOTES

1. Working Area for Construction
For a closed drain the working area shall be a 17.5m width on either side of the trench or any combination not exceeding 35m.

After the drain is constructed, the working area for the purpose of future maintenance shall be as specified in S.S. 400.4 of this report.

2. Access
Access to the working area shall be from road allowances and as designated on the drawings and/or specific notes. No other access routes shall be used unless first approved by the Engineer and the affected landowner. Specifications related to construction will apply to the access routes. Contractor shall make good any damages caused by using the designated access routes.

3. Pre and Post Construction Meetings
The Contractor may be required to attend pre-and post-construction site meetings with the Engineer and landowners before starting and after finishing the work if requested.

4. Pre-locates
Cross trenches to be dug along entire length of the Paff Drain 2025 route at 100 to 200m intervals (minimum) prior to commencing construction so that true alignment of new drains may be established alongside existing drain, without cutting off private lateral tiles. The frequency of pre-locating will depend on the alignment of the existing drains. More pre-locates will be necessary in a meandering route than in a route that is consistently straight.

5. Tile Drain Work
Refer to Specific Notes and 420 – Standard Specifications for Tile Drains.

TYPICAL NOTES FOR EACH NEW TILE LENGTH

- Maintain all existing headers. Locate as part of “4. Pre-locates”
- Ensure any connections to the old drain are connected/outletted to the new drain. All intercepted lateral tile are to be flagged so the Engineer can GPS.
- On straight runs, ensure tile joints are parallel (maximum 12mm (½”) gap), and tile wrap is flat, covers joint evenly and has overlap.
- On curved runs, ensure tile joints are touching on one side with maximum gap of 12mm (½”) on opposite side. Bevel cut tile or use elbow sections where curves are greater. Tile wrap to be flat, cover joints evenly and have overlap.

6. Concrete Tile Installation
New tile to be installed by tiling (wheel) machine with joints tightly wrapped and topsoils to be separately stripped and replaced to width of machine plus width of spoil pile. For further materials information, refer to Standard Specification for Construction of Drains, Section 400.15.1. For information regarding installation procedure of concrete tile, refer to Standard Specification for Tile Drains, Section 420.3.5.1.

If backhoe methods are approved by engineer, the following shall be attended to: additional topsoils may need to be stripped and replaced, a shaped bottom to be provided and careful tamping around the tile is necessary. Final excavation to grade to be by hand and a shaped bottom to be provided. The Engineer may require a thin lift of stone bedding also as part of usage of backhoe if the native ground/shaped bottom is not satisfactory for long term integrity of the tile.

7. Solid Plastic Pipe or High Density Polyethylene Pipe (HDPE)
Solid plastic pipe to be high density polyethylene (HDPE) double wall (corrugated on the outside and smooth wall on the inside), such as BOSS 2000 Series 320 kPa or equal.

Pipe material shall conform to CSA B182.8. Refer to Standard Specification for Tile Drains, Section 420.3.5.3 for installation on plastic pipe.

8. Tile Connections
The Contractor is to verify with each owner prior to starting, any systematic drainage scheme existing on each property and is to make provisions for connecting all headers and laterals.

All subsurface drainage tile encountered along the route of the proposed closed drain are to be connected up to the new drain if the intercepted tile are clean and do not contain polluted water.

All tile connections are to be flagged by the Contractor so the Engineer can GPS the location for future reference. The payment for connections is to be as set out in the tender form.

Refer to Standard Specification of Tile Drains, Section 420.3.7 for further information on tile connections.

9. Catchbasins and Junction Boxes
Catchbasins shall have secured grates and marker stakes. Grates are to be birdcage grates as manufactured by Coldstream Concrete or approved equal, unless otherwise specified in the Specific Notes. All grates are to be secured with non-corrosive fasteners. Marker stakes as supplied by Coldstream Concrete or equal are to be placed beside each catchbasin. Backfill around all new catchbasins and junction boxes is recommended to be compacted 19mm clear crushed stone to avoid future settlements and Contractor obligations to repair such and to ensure connected tile has granular backfill. All catchbasin sumps to be fully cleaned by the Contractor after completion of drain installation and backfilling.

Refer to Standard Specification for Tile Drains, Section 420.3.13 and 420.3.14 for more details.

10. Utilities
The Contractor shall arrange with all local utility companies (telephone, gas, hydro) to verify the location of all utilities within road allowances and on private lands. All utilities shall be exposed to the satisfaction of the utility company to verify that their elevations will not conflict with the construction of the drain at the specified elevations. Provisions for protection and relocation of utilities that conflict with the drain as designed will be determined at the time of construction.

11. Seeding of Non-Lawn Areas
For seeding use mechanical (cyclone) spreader (or approved equal) and the following shall apply:
Seed mixture to be applied at 60kg/ha and to be as follows:
i) Ditch banks and roadside ditches
35% Creeping Red Fescue
25% Birdsfoot Trefoil
25% Kentucky Bluegrass
10% Cover Crop (Oats, Rye, Barley, Wheat)
5% White Clover

To provide temporary cover for late fall planting add as additional 10 kg/ha of rye or winter wheat. Areas that remain grassed after excavation may not need to be seeded as directed by the Engineer.
Contractor responsible for additional seeding to provide uniform catch during one year maintenance period.

12. Seeding of Disturbed Green/Lawn Areas
Seed mixture shall be an approved residential lawn mixture (Canada No. 1). Contractor shall arrange for watering new seed with owners. Contractor responsible for re-seeding as necessary for uniform catch during warranty period. Also to be in accordance with OPSD 572 (seeding and mulching).

13. Open Cut Road Crossings (Gerber Road)
The Road Authority is to be given 72 hours’ notice of construction within their right-of-way. Proper detour signing in accordance with MTO signing manual to be used where roads are closed or restricted. Contractor is responsible to repair any settlement which occurs within warranty period. The location of the road crossing shall be confirmed with the Engineer and Road Authority prior to excavation. The Trench Detail on this drawing and the special construction notes shall also apply. If the Road Authority requires granular rather than native material backfill where native is allowed on the Trench Detail, additional payment will be allowed. Where granular is shown to be required, such is to be included as part of the tender. All surplus materials are to be hauled away. In the boulevards, topsoils shall be separately stripped and replaced. Seeding is required. All backfill to be compacted to 98% SPMDD. Pipe materials are to be as noted in the specific construction notes. All old crossings are to be located, removed and disposed of. If so noted, some may remain but are to be fully sealed with pumped concrete as part of the tender.

14. Subsoil Instability
If poor subsoil conditions are encountered during tile installation by wheel trencher an attempt shall be made to install the tile with a continuous geotextile underlay in the trench bottom. The cost of the underlay, if approved by the engineer, will be paid as an extra.
If the continuous geotextile underlay is not sufficient then the tile will be installed by backhoe or excavator on a bedding of 19mm clear crushed stone (300mm depth to achieve trench bottom stability for the new tile. If approved, the above work will be paid based on the unit price provided on the Form of Tender. The unit price shall include the cost to supply and place the stone. If more than 300mm depth of stone is required for bottom stability, additional payment will be allowed for the additional depth of stone. The additional quantity of stone shall be supported by weight tickets and the suppliers invoice.

