ENGINEERING REPORT

For

BRESLAU DRAIN 1

Township of Woolwich

September 22, 2023

KSAL File No. 18-285

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SPECIFICATIONS

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Definitions:

"Act" or "Drainage Act" means *The Drainage Act RSO 1990*
"CB" means catchbasin
"CBMH" means catchbasin maintenance hole
"CSP" means Corrugated Steel Pipe
"DFO" means Fisheries and Oceans Canada
"DGSSMS" means Design Guidelines and Supplemental Specifications for Municipal Services
"Drain" means Breslau Drain 1
"DICB" means ditch inlet catchbasin
"EA" means Environmental Assessment
"EDIM" means the Township of Woolwich Engineering Development and Infrastructure Manual
"GRCA" means Grand River Conservation Authority
"HDPE" means High Density Polyethylene
"HE" means Horizontal Elliptical
"MECP" means Ministry of Environment, Conservation and Parks
"MH" means Maintenance Hole
"MNRF" means Ministry of Natural Resources and Forestry
"MTCS" means Ministry of Tourism, Culture and Sport
"MTO" means Ministry of Transportation (of Ontario)
"OMAFRA" means the Ontario Ministry of Agriculture, Food and Rural Affairs
"Tribunal" means Agriculture, Food and Rural Affairs Appeal Tribunal

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BRESLAU DRAIN 1

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1 EXECUTIVE SUMMARY

This report is prepared pursuant to Sections 4 and 78 of the *Drainage Act, RSO 1990* (the Act) for Breslau Drain 1, originally constructed in 1954.

In September and October of 2018, the Township received a landowner petition for drainage works under Section 4 (Roll No. 004-16101) and three landowner requests for drain improvement under Section 78 (Roll Nos. 004-15900, 004-10500 and 004-10400). Subsequently, a *Preliminary Report* to improve Breslau Drain 1 was prepared. Council accepted the *Preliminary Report* on December 10, 2019, and directed K. Smart Associates to prepare a final report for Breslau Drain 1.

During preparation of this final report, an additional Section 4 petition for drainage works was filed by Madwest Breslau Limited (Madwest), owner of Roll Nos. 004-16994 and 005-04100, for proposed development between Fountain St. North and the Elroy Acres subdivision. In April 2022, Council directed K. Smart Associates to address the Madwest petition as part of the Breslau Drain 1 final report.

As a result of on-site meetings, discussions with landowners, survey, design and agency consultation, the proposed Breslau Drain 1 includes:

- Main Drain – 1,000m of ditch and 1,164m of pipe (750 to 1350mm equiv. dia.)
- Woolwich Branch – 730m of pipe (300 to 900mm dia.)
- Berlin Branch – 89m of pipe (450mm dia.)
- Kennedy Branch – 66m of pipe (300mm dia.)
- Scarlett Branch – 675m of swale with pipe (300 to 600mm dia.)

Total drain length is approximately 3,725m and estimated total cost is $5,650,000.

The watershed area served is approximately 240.6 hectares (594.5 acres)

Assessment schedules are provided for construction and future maintenance of the Drain. Schedule A shows assessments based on the total estimated cost. Schedule B is for prorating future maintenance costs. Schedule C provides estimated net assessments after deducting allowances, where applicable, and will be used for levying the actual cost of the Drain following construction.

2 BACKGROUND

2.1 Drainage History

(Authors note: Throughout this report, paragraphs shown in italics indicate excerpts from the Breslau Drain 1 *Preliminary Report*, by K. Smart Associates Limited, dated November 25, 2019 and excerpted here for ease of reference.)

The Drain was originally constructed under the Municipal Drainage Act through a 1953 report by E. P. Bowman, O.L.S. of Bowman, Black and Shoemaker. The report was adopted on June 15, 1954 by Bylaw No. 746A and Township records indicate construction was completed in 1954. The construction route is visible in 1955 aerial photography.

The downstream portion of the Drain, south of Menno Street, was an open ditch and the upstream portion was constructed as a 300mm diameter tile drain, with a 125mm diameter branch drain near Berlin Street. Drawings 1 and 2 depict the alignment of the Drain per the 1953 report.

Based on Township records, *the only subsequent report prepared under the Drainage Act in this watershed was a Preliminary Report dated May 1993, prepared by G. D. Gambsy, P. Eng., in response to a Section 78 request to improve the open ditch portion of the Drain. It appears the Preliminary Report recommendations were not implemented because Council did not proceed to a final report at that time.*

2.2 Land Use Changes and Breslau Drain 1

1955 aerial photography shows the land use in the watershed, at the time the original drain was constructed, was predominantly agricultural, with scattered buildings and roads. The route of 1954 construction work for the drain is visible in the 1955 imagery.

Following initial construction, the open ditch portion of the Drain downstream of Woolwich Street was realigned across Roll Nos. 004-08102 and 007-08200 to accommodate commercial/industrial development.

In the 1960's, residential developments in the watershed included the Elroy Acres Subdivision (between Woolwich Street S., Kennedy Road, Menno Street and Elroy Road) and the Hartford Developments project in the vicinity of Cooper Crescent.

In the mid 2000s, additional portions of Breslau Drain 1 were realigned due to residential development in the vicinity of Kennedy Road and Cooper Crescent.

For tile drains in agricultural areas, design practice assumes significant rainfall and snowmelt events will exceed the capacity of the tile and result in short-term overland flow, which is generally acceptable due to land use. Frequent overland flow and extended surface ponding is not desirable in residential areas.

As development occurred in the watershed, a series of studies to improve drainage within the Drain's service area were completed. These investigations, undertaken

independent of the Drainage Act, are summarized in Table 2-1 of the Preliminary Report. It does not appear any of the drainage infrastructure schemes recommended by these studies were constructed.

Around 2003, the Township constructed a 300mm storm sewer along Elroy Road from Kennedy Road to Woolwich Street to divert some of the load away from the upstream portion of the existing Drain. At Woolwich Street, the new 300mm storm sewer for Elroy Road was connected to the existing 300mm Drain.

Presently, the lands between Fountain Street North and the Elroy Acres subdivision are undergoing the approval process for development. Given the history of drainage concerns in the Breslau Drain 1 watershed, the Township has required the developer to implement a stormwater management strategy that diverts runoff away from the Elroy Acres and Cooper Crescent neighbourhoods.

3 INVESTIGATION

3.1 Watershed Description

The watershed boundary for Breslau Drain 1 is depicted on Drawing 1 and was determined by reviewing available topographic data, historic drain reports, field surveys, and on-site examination. To the east, the Drain shares its watershed boundary with the Randall Drainage Works. Lands to the north of the Drain watershed, including most of the Cooper Crescent neighbourhood drain, north toward Hopewell Creek. East of Joseph St. between Shields St. and Berlin St. the western boundary for Breslau Drain 1 was revised from its location per the 1953 report to reflect current lot grading.

Following initial construction, 1955 aerial photography shows the watershed of the Drain was primarily woods and cleared agricultural land with scattered residential properties. The following table summarizes existing land use in the Drain watershed.

Table 3.1-1 – Summary of Land Use

Category	**Land Use (2023)**	
	Hectares	%
Residential	26.5	11
Commercial/Industrial	17.7	7
Agriculture	116.9	49
Wooded/Wetland Areas	60.4	25
Road Allowances	19.1	8
Total	**240.6**	**100**

3.2 Preliminary Report Site Meetings and Consultation

In accordance with Section 9(1) of the Act, an initial meeting for landowners in the watershed, including landowners in the vicinity of the Section 4 petition by Roll No. 004-16101, was held on December 6, 2018. After the December 2018 meeting, over forty other site-specific discussions were held with landowners during preparation of the *Preliminary Report.* Appendix C of the *Preliminary Report* presented the observations and input gathered during those discussions. Many landowners described recurring flooding and drainage issues.

3.3 Open Portion Condition

Downstream of Woolwich St. S., the open portion of the Drain flows westerly as a constructed ditch between commercial properties, then across portions of Roll Nos. 004-07810 (Forwell lands) and 004-08200 (Safety Kleen) into the same receiving watercourse/ravine as the 1953 Drain.

The open portion of the Drain and the route of the receiving watercourse were examined downstream to the large ponds near the Grand River. Lands adjacent to the watercourse are under active aggregate extraction with several access culverts along the watercourse and approximately 15m of elevation drop from Station - 1+000 to the Grand River.

Breslau Drain 1 crosses Woolwich St. S. through a concrete box culvert, measured by K. Smart field staff to be 1.5m wide x 1.5m high.

Upstream of the Woolwich St. S. culvert, the Drain follows the 1953 alignment through a Provincially Significant Wetland (PSW). At the PSW, a tributary from the east, serving a 141 ha. watershed, enters the Drain. Upstream of the PSW, the tributary crosses under Fountain Street N. and Township Road 80. This unnamed watercourse has been incorrectly labelled as “Breslau Drain” in multiple reports and studies prepared by others in recent years. At present, the tributary watercourse flowing into the PSW from the east does not have status as a municipal drain under the *Drainage Act.*

From the PSW, the existing Drain continues upstream as an open ditch for approximately 300m through agricultural land to the outlet for the closed portion of the Drain.

In late 2018, a maintenance project was completed for the open portion of the Drain upstream of Woolwich Street South to cleanout the ditch and remove obstructions.

3.4 Closed Portion Condition

Through the Township’s Drainage Superintendent, flushing and CCTV inspection was completed in 2017 and 2019 on the closed portion of the Drain, which is a 300mm diameter clay tile. The tile outlets south of Menno Street and is located east of Woolwich St. S. on private lands. The undersized tile was found to be in poor

structural condition and prone to blockages from roots and other obstructions. Refer to Section 3.2.2 of the *Preliminary Report* for additional information.

3.5 Final Report Site Meeting

In accordance with Section 9(1) of the Act, on June 21, 2022 the initial meeting was held for landowners in the vicinity of the area affected by the Madwest Section 4 petition. In addition to the Township Drainage Superintendent, the engineer and representatives for Madwest, there were fourteen landowners present at the meeting, representing ten properties along Kennedy Road.

At the meeting, the preliminary stormwater management scheme was presented for development lands abutting the rear yards of residential properties on the east side of Kennedy Road. Specifically, after re-grading the majority of development lands to new SWM facilities, the 28-hectare catchment that presently drains westerly across Roll Nos. 004-16901 and 005-04100 into Elroy Acres will be reduced to a 1.03-hectare catchment of rear-yard runoff from proposed residential lots.

Additionally, it was noted that Township development standards require offsite drainage be conveyed to a legal outlet. Landowners at the June 21 meeting were generally supportive of a pipe and swale system (presented herein as the Scarlett Branch) to intercept sheet flow from the rear yards of development parcels and direct it into Breslau Drain 1, along a route that can be readily accessed by the Township for future maintenance. Several other non-drainage topics were raised by landowners, including the history of servicing studies for Elroy Acres, post-development traffic patterns and the grade differential resulting from raising development lands several metres above the existing Kennedy Road properties. After the meeting, portions of the proposed Scarlett Branch alignment were reviewed with several landowners, including:

- 61 Kennedy Road – owner explained drainage patterns in the vicinity of property and extent of ponding in the rear yard during runoff events.
- 101 Kennedy Road – owners explained where runoff from Roll Nos. 004-16994 crosses onto their property and causes adverse impacts each spring.

4 AUTHORITY FOR REPORT

4.1 Section 4 Petitions and Areas Requiring Drainage

Section 4 of the Act provides for construction of new drainage works for an area requiring drainage.

The area requiring drainage for the petition by 127 Woolwich Street South for Roll No. 004-16101 *is approximately 0.40 hectares of low-lying land on 117, 127 and 133 Woolwich Street South, with approximately 0.30 hectares being situated on 127*

Woolwich Street South, the petition is thus valid in accordance with Section 4(1)(b) of the Act.

The area requiring drainage arising from the petition by Madwest for Roll Nos. 004-16994 and 005-04100 is the west-draining catchment on these lands slated for a change in land-use. Approximately 18.7 hectares of west-draining agricultural land will be re-graded for residential development and will require a functional outlet for interim stormwater management during construction. Upon subdivision completion, 1.03 hectares of the original 18.7-hectare catchment will continue to require an outlet into Breslau Drain 1. Since the signatures on the petition represent 100% of the owners and 100% of the area of the existing 18.7-hectare and the proposed 1.03-hectare catchments, the petition is thus valid in accordance with Section 4(1)(a) and 4(1)(b) of the Act.

4.2 Section 78 Requests for Improvement

Section 78 of the Act provides for the repair and improvement of an existing drain constructed under the Act through a new Engineer's report. Breslau Drain No. 1 was constructed under the Act and it has been determined from the on-site meeting and site examination that the drain requires improvement. Therefore, this report is also properly initiated under Section 78 of the Drainage Act.

5 DESIGN CONSIDERATIONS

5.1 Sufficient Outlet

Section 15 of the Act requires the 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."

Section 5.2 in the Preliminary Report noted:

During discussions with Safety Kleen Canada (Roll No. 004-08200) and a representative for 957859 Ontario Ltd (owner of the active aggregate operation on Roll Nos. 004-07810 and 005-03000), landowners indicated that the existing drainage pattern across their lands is acceptable in its present condition. Based on these landowner discussions, on-site inspection and review of the operational plan under the Aggregate Resources Act for the receiving property, sufficient outlet exists for the Breslau Drain No. 1 at the outlet location shown on Drawing 1.

The determination summarized above, was confirmed by additional on-site review and landowner discussions during preparation of this final report.

5.2 Drain Alignment

The options analysis presented in Section 7 of the *Preliminary Report* considered various alignments for the following sub-components of Breslau Drain 1: Lower Main Drain, Upper Main Drain and Branches A, B and C. Depending on the

selected option, total costs in Table 7-3 in the *Preliminary Report* ranged from $2M to $2.7M.

Drawings 1 and 2 in the *Preliminary Report* provided the recommended alignments for improving Breslau Drain 1 based on information available at that time. The following table compares the *Preliminary Report* recommendations with the Final Report proposed design.

Table 5.2-1 – Drain Alignment Summary

Sub-component	**Recommended by Preliminary Report**	**Proposed by Final Report**
Lower Main Drain	Lower Main Drain Option 1 followed the existing ditch downstream of wetland, upstream of wetland new channel west to Woolwich St. S.	Downstream of wetland, Main Drain to follow existing ditch. **Upstream of wetland, Main Drain to be piped west to Woolwich St S.**
Upper Main Drain	Upper Main Drain Option 1 continued north along Woolwich St S., Sheridan Dr., Elroy Rd., across Kennedy Rd. Included offset connection to divert Kennedy Rd. cross-culvert discharge away from private properties to new structure at Elroy Rd.	**Main Drain to continue north along east side Woolwich St. S. to Elroy Rd**., then along Elroy Rd., across Kennedy Rd. Kennedy Branch diverts cross-culvert discharge away from private properties to new structure at Elroy Rd.
Branch A	Continued upstream along Woolwich St. S. to #127, then easterly across private lands to point of connection with existing Breslau Drain at 76 Kennedy Rd. / 11 Cooper Cr.	Woolwich Branch upstream along east side of Woolwich St. S. to #127, then easterly across private lands to point of connection with existing Breslau Drain at 76 Kennedy Rd. / 11 Cooper Cr.
Branch B	Replaced existing drain pipe across Woolwich St. S and connected to existing 1953 Subsidiary Trunk Drain.	Berlin Branch to cross Woolwich St. S. **and replace existing Drain to north side of Berlin St.**
Branch C	Provided spot repairs of existing 1953 Drain along east side of Woolwich St. S.	Main Drain along east side of Woolwich St. S. fully replaces the 1953 Drain in this location.

Regarding final design for the Drain, the *Preliminary Report* noted:
"*recommendations presented in this Preliminary Report may be modified by the Final Report if new information arises from concurrent studies, further agency and landowner input or geotechnical investigations."*

Lower Main Drain change:

From the wetland to Woolwich St. S., the Main Drain design was changed from an open channel to a pipe system due to the future Ottawa Street corridor and grading and stormwater management associated with development along future Ottawa Street. Refer to Section 12 for assessment information related to this portion of the Drain.

Upper Main Drain change:

From the future Ottawa Street intersection with Woolwich St. S., the Main Drain alignment follows the east edge of Woolwich Street S. north to Elroy Road, instead of the Menno St./Sheridan Dr. alignment presented in the *Preliminary Report.* The proposed Woolwich St. S. location is preferred for the following reasons:

- Fully decommissions the old 1953 drain on private lands east of Woolwich St. S. from Menno St. to Elroy Rd.
- With upcoming servicing construction along Woolwich Street related to proposed development, consolidating construction impacts to only Woolwich St. S. is preferred versus disruptions along Woolwich St. S., Menno St. and Sheridan Dr.

5.3 Berlin Branch

Under the 1953 report, the entire block bounded by Joseph Street, Berlin Street, Shields Street and Woolwich Street South was included in the Breslau Drain 1 watershed and served by a tile drain designated the “Subsidiary Trunk Drain.”

After confirming through on-site survey and CCTV investigation that the 1953 tile required replacement, landowners in the sub-watershed for the Berlin Branch were contacted in October 2021 to inquire whether landowners needed improvements upstream of Berlin Street. Since no requests for Drain improvement upstream of Berlin Street were received, the upstream limit of the proposed Berlin Branch is at the north limit of the Berlin St. road allowance.

5.4 Capacity

5.4.1 Channel

Downstream of the PSW, the existing channel cross-section requires minor cleanout to provide uniform capacity. No deepening or widening of the channel is proposed through the PSW.

5.4.2 Storm Sewers

Upstream of the PSW, proposed pipes in roadways have been sized for the 5-year event. Proposed pipes in rear yards and side yards have been sized for the 2-year event. Refer to Appendix C for the storm sewer sizing sheets.

5.4.3 Future Ottawa Street Pipe Sizing

There is a low point along existing Woolwich St. S. near Main Drain Station 0+350, which is south of Menno St. and north of the future Ottawa Street corridor. As a result, the proposed storm under the north edge of the future Ottawa Street corridor has been sized to ensure maximum ponding depth on Woolwich St. S. at Station 0+350 during the 100-year event is less than 150mm. In addition, the required pipe shape for this portion of the drain is 1730mmW x 1090mmH horizontal elliptical pipe (equivalent to a 1350mm diameter) to provide vertical clearance from other utilities.

5.4.4 Scarlett Branch Catchment

Presently, at the upstream end of the existing Drain near the intersection of Elroy Road and Kennedy Drive, the peak flow during the 5-year event (Q_5) from the existing 28 ha. catchment to the east is 0.34 m^3/s. (For comparison purposes, the capacity of the existing 300mm diameter Drain in this location is 0.08 m^3/s.).

Under post-development conditions, the 28 ha. catchment reduces to 1 ha. with a Q_5 = 0.09 m^3/s where the Scarlett Branch leaves development lands at Station 0+209. As the Scarlett Branch reaches the Elroy/Kennedy intersection, Q_5 = 0.23 m^3/s. Accordingly, Main Drain pipe sizing downstream of the Elroy/Kennedy intersection is based on post-development flows from the Scarlett Branch catchment.

Refer to Section 15.2 for discussion of future maintenance assessments after the Scarlett Branch catchment is reduced under post-development conditions.

5.5 Modelling

The proposed Drain was evaluated using PCSWMM, a computer model that incorporates both hydrologic and hydraulic computations. Updated watershed boundaries, conveyance system information, and rainfall events from the 2-year to 100-year storm return period were included in the modeling work. Hydrographs were based on the 12-hour, SCS Type 2 storm distribution. The model calculated the stormwater runoff resulting from rainfall events and computed the hydraulic grade line for various scenarios.

The model accounted for tailwater impacts due to water level fluctuations in the PSW at the downstream end of the closed system. The model also included flows from the tributary east of the PSW and preliminary hydrographs from stormwater management facilities on Roll Nos. 004-07510 and 005-04110.

As noted in Section 3.1, storm sewers for the Cooper Crescent neighbourhood outlet flow north to Hopewell Creek. Review of the Cooper Crescent system and service area confirmed its capacity for the 5-year event. For events greater than the 5-year storm, the model accounted for overflows from the Cooper Crescent neighbourhood into Breslau Drain 1 based on lot-grading.

The following table presents water elevations (CGVD 28:78) computed by the model at locations of interest along the Drain for the 2-year through 100-year events.

Table 5.5-1 – Summary of Modelling Results

Location	Maximum water level (HGL)				
	2-yr	5-yr	10-yr	25-yr	100-yr
Main Drain					
Main Drain -0+625 Low ground at adjacent bldg. slab = 311.05	309.94	310.07	310.23	310.39	310.56
Main Drain -0+531 Woolwich St. S. box culvert inlet East edge pavement = 312.66	310.16	310.40	310.61	310.82	311.17
Main Drain 0+000 Future Ottawa Street low point Road centerline = 313.56	310.61	310.90	311.11	311.31	311.56
Main Drain 0+360 Woolwich St. S. low point Road centerline = 313.44	311.93	312.07	312.22	312.31	312.50
Main Drain 0+713 Woolwich/Elroy intersection Road centerline = 315.30	313.17	313.66	314.21	314.50	314.89
Main Drain 1+164 Kennedy/Elroy intersection Road centerline = 316.51	314.53	315.19	315.97	316.20	316.37
Woolwich Branch					
Woolwich Branch 0+209 Woolwich/Berlin intersection Road centerline = 316.23	313.40	313.88	314.49	314.76	315.03
Woolwich Branch 0+458 127 Woolwich St. S. SE corner, adjacent to 133 Woolwich St. S. Ground = 314.96	314.07	314.18	314.79	314.92	315.07
Woolwich Branch 0+533 139 Woolwich St. S. SE corner, adjacent to 147 Woolwich St. S. Ground = 316.01	314.28	314.36	315.00	315.16	315.36
Woolwich Branch 0+673 On P/L between 11 Cooper Cr. and 76 Kennedy Rd. Ground = 315.72	314.77	314.82	315.55	315.84	315.96
Scarlett Branch					
Scarlett Branch 0+340 East of 61 Kennedy Road Ground = 316.50	315.26	315.54	316.16	316.24	316.37

Location	Maximum water level (HGL)				
	2-yr	5-yr	10-yr	25-yr	100-yr
Berlin Branch					
Berlin Branch 0+080 Adjacent to 8 and 14 Berlin St. Road centerline = 315.26	313.88	313.97	314.61	314.97	315.14

5.6 Woolwich Street Culvert

Woolwich Street South is classified as a collector road on Regional road network mapping. Table 5.5-1 provides the modelled water levels on the upstream side of the existing 25mL x 1,500mW x 1,500mH concrete culvert at Main Drain Station - 0+531. Freeboard measured from east edge of pavement down to the inlet water level is 1.84m for the 25-year event and 1.49m for the 100-year event. Culvert replacement is not proposed because the existing culvert satisfies applicable capacity requirements for a collector road and no structural deficiencies were observed during visual inspection.

5.7 Private Drain Connections

Along the route of the proposed Drain, private drain connections (PDCs) are provided for adjacent properties and for properties on both sides of affected roads. PDCs provide an outlet for sump pump discharge or private yard piping.

Basement gravity drains are not to be connected (now or in the future) directly to the new Drain or municipal storm sewers without the use of a backwater valve (BWV).

Properties with existing PDCs will be connected to the new Drain and will include a BWV, unless the BWV is deemed unnecessary by the engineer at the time of construction due to site topography and other factors.

Properties without existing PDCs will receive a PDC stub to their property line to allow for future connections at the landowner's discretion. The Township Drainage Superintendent shall be notified prior to any future connections to the Drain. Future connections will also be subject to Plumbing Permit requirements from the Township of Woolwich.

BWVs installed under this project will be on the private side of the property line so landowners can access the BWV for periodic inspection and maintenance.

Refer to Section 15 for maintenance responsibilities related to PDCs and BWVs.

5.8 Geotechnical Investigation

During the final report process, a geotechnical investigation was completed with findings presented in the January 7, 2021 report by Sirati & Partners Consultants Ltd. Six boreholes were completed along roadways identified in the *Preliminary*

Report as potential locations for the Drain. Boreholes were advanced below the anticipated trench bottom for installation. The full Sirati report is provided in Appendix E with borehole information also shown on the Drawings.

Three of the six boreholes included monitoring well installations and groundwater levels were measured manually and via data loggers from late 2019 to late 2020. Full details with seasonal fluctuations are shown in the Sirati report, but the overall trend shows lowest groundwater levels from August/September through November with the highest groundwater levels occurring from January through March. Construction during low groundwater conditions is recommended.

5.9 Other Utilities

The proposed Drain location maintains an open corridor along affected roadways for future installation of sanitary servicing.

The Drawings show the water main lowerings required to accommodate the proposed Drain. Water mains will be lowered at the cost of the Township and completed during Drain construction.

The Drawings show where existing gas mains conflict with the proposed Drain. Gas relocations will be undertaken in accordance with the existing franchise agreement and completed prior to Drain construction.

5.10 Restoration

The following specifications provide restoration requirements for areas impacted by the work:

Field areas – SP 301.21

Roadways – SP 301.16 to SP 301.19

Boulevard areas – SP 301.20 TO SP 301.23

Private commercial – SP 301.21

Private residential – SP 301.20

6 INFORMATION MEETING AND STAKEHOLDER CONSULTATION

On October 29, 2021 a letter was sent to landowners within the Berlin Street Branch sub-watershed. Refer to Section 5.3 for more information regarding this mailout.

On Dec. 14, 2022, an informational meeting (drop-in/open-house format) was held at the Breslau Community Centre, with notices mailed to all landowners in the watershed. The sign-in sheet for the meeting shows at least forty-six landowners attended, representing approximately forty properties. Staff from the Township and the Drainage Superintendent were also in attendance.

Drawings illustrating the recommended work were available for review. In addition, the Engineer provided a summary of the project history, proposed improvements and assessment schedules listing the estimated gross assessments (per *Schedule A*) and net assessments (per *Schedule C*) for all landowners in the watershed. At the meeting, errors were noted in *Schedule A.* Corrected copies of *Schedule A* were mailed to all meeting attendees in late 2022.

In addition to the information meeting, multiple discussions were held with landowners, the Township and agencies throughout preparation of this final report. Agency input is summarized in Section 7. A summary of other consultations are provided in Appendix D.

7 ENVIRONMENTAL CONSIDERATIONS

7.1 Agency Notification and Reponses

7.1.1 GRCA

During preparation of the *Preliminary Report,* options for improving Breslau Drain 1 were reviewed with GRCA. GRCA noted any improvements to the Drain needed to avoid adverse impacts on the PSW in the open portion of the Drain.

Drawings for the proposed Drain design were circulated to GRCA for review and comment in October 2022. GRCA indicated no concerns with the proposed Drain design. Design items of note re. the PSW include: continued routing of upstream Breslau Drain 1 flows through the PSW, a stilling basin for energy dissipation at the pipe outlet, no deepening of the channel through the PSW, and a rock grade control feature in the open channel downstream of the PSW to isolate the wetland from future ditch maintenance.

7.1.2 DFO

Drawings for the proposed Drain design were submitted for review via DFO's *Request for Review* process. DFO indicated the existing Drain is a Class C drain and provided the following requirements in a *Letter of Advice* to minimize impacts to fish and fish habitat: avoid in-water work between March 15 and July 15, use work site isolation during construction to avoid trapping fish in the work area, minimize impacts on riparian vegetation, implement erosion and sediment control and implement a spill response plan. If these measures are implemented, DFO noted authorization under the *Fisheries Act* or the *Species at Risk Act* would not be required.

7.2 Excess Soil Regulations

Excess material resulting from this project is subject to the "Rules for Soil Management and Excess Soil Quality Standards" per O. Reg. 406/19, made under the *Environmental Protection Act,* R. S. O. 1990, c. E. 19.

Prior to construction, additional sampling will be completed in the project area and excess material handling requirements included in the tender package for

construction. The estimated cost to comply with excess soil regulations is included in this report and is based on recently completed, comparable projects.

7.3 Other Reports

The following reports were reviewed during the preparation of this report:

- *Sanitary Sewerage System for Elroy Acres* (Proctor & Redfern Limited – October 23, 1969)
- *Breslau Storm Drain* (Proctor & Redfern Limited – May 26, 1975)
- *Randall Drain Fluvial Geomorphological Assessment* (Water's Edge – November 28, 2014)
- *Floodplain Mapping for Breslau Drain and Hopewell Creek* (SCS consulting Group Ltd. – August 28, 2015)
- *East Side Lands – Stage 2 Master Environmental Servicing Plan & Secondary Plan Study* (WSP, MMM Group December 2017 & May 2018)
- *Breslau EIS Addenda #1* (Dougan & Associates – March 2021)
- *Madwest Subdivision Functional Servicing Report* (MTE – April 28, 2023)
- *Madwest Subdivision Preliminary Stormwater Management Report* (MTE – April 28, 2023)
- *Addenda 2: Effects of Revised Breslau Plan of Subdivision on Central and Southern Wetlands* (Dougan & Associates – April 27, 2023)

8 RECOMMENDATIONS

8.1 Summary of Proposed Work

Details regarding construction and maintenance of the Drain can be found in the Special Provisions and the Drawings. Major work items are summarized below:

Table 8.1-1 – Summary of Proposed Work

Drain Component	Major Work Items
1. Main Drain – Ditch portion from STA -1+000 to 0+000 to (from Forwell lands upstream to proposed pipe outlet into PSW)	• 575m of ditch cleanout/excavation; • Riprap bank protection in erosion susceptible locations; • Erosion and sediment control measures.

Drain Component	Major Work Items
2. Main Drain – Piped portion from STA 0+000 to 1+164 (From pipe outlet upstream along future Ottawa St., Woolwich St. S. and Elroy Rd.)	• Headwall and stilling basin at pipe outlet at PSW; • 244m of 1090x1730mm elliptical concrete storm sewer; • 469m of reinforced concrete storm sewer (1,050mm to 1,200mm dia.); • 451m of HDPE storm sewer (600mm to 900mm dia.); • 22 maintenance holes/catchbasins.
3. Woolwich Branch	• 673m of HDPE storm sewer (375mm to 900mm dia.); • 8 maintenance holes/catchbasins; • Incorporate 57m of existing 300mm dia. HDPE storm.
4. Scarlett Branch	• 675m of swale/ditch and 631m of concrete storm sewer (300mm to 600mm dia.); • 11 maintenance holes/catchbasins.
5. Kennedy Branch	• 66m of HDPE storm sewer (300mm dia.); • 2 catchbasins.
6. Berlin Branch	• 89m of HDPE storm sewer (450mm dia.); • 3 catchbasins.

Road side ditches along the route of the Drain, which are shown on the drawings to be reinstated are not considered part of the Drain for future maintenance.

9 CONSTRUCTION CONSIDERATIONS

9.1 Utilities

Before starting work, the Contractor shall ensure all public utilities are located and shall contact all landowners along the proposed drain route, to determine the location of any private utilities. The Contractor is responsible for determining there are no utility conflicts for the proposed drainage works.

Utility daylighting was completed via hydro excavation during the design phase to minimize unexpected utility conflicts during construction. Daylighting locations are shown on the drawings.

9.2 Construction Scheduling

Construction shall not commence until 10 days after a bylaw to adopt this report is given third reading in accordance with the Act.

The timing window identified by the DFO requires that no in-water work is to occur between March 15 and July 15. This restriction only applies to in-water work for the open portion of the Drain.

9.3 Minor Changes During Construction

Minor changes (e.g. invert elevations, location of private drain connections, etc.) to the Drain may be made during construction if the changes are approved by the Engineer and the Municipality and comply with the Specifications in this report.

Additional work desired by a landowner 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 and the additional work is reviewed by the Engineer in advance. Such additional work is not part of the drainage works for future maintenance.

9.4 Substantial Changes to the Drain After the Bylaw is Passed

Substantial changes not complying with the criteria outlined in O. Reg. 500/21, which are requested by landowners, agencies or other stakeholders after the bylaw is passed, cannot be undertaken unless a revised report is prepared and processed in compliance with the Act.

9.5 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 understood 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, it is recommended that the landowners obtain a legal survey at their own cost prior to Drain construction or maintenance.

10 DRAWINGS AND SPECIFICATIONS

10.1 Drawings

The location of the drain, watershed boundary and the affected properties are shown on Drawings 1 and 2 included with this report. The numbers adjacent to the drain are station numbers which indicate in metres the distance measured along the drain. Drawings 3 to 28 provide profiles, cross-sections and details and specifications for construction of the Drain.

10.2 Specifications

This report incorporates the Supplemental Specifications and Standard Specifications listed in the Table of Contents which govern the construction and maintenance of the Drain.

11 COST ESTIMATE

The estimated cost of this project includes allowances (see Section 11.5), construction, engineering and other costs associated with the project.

11.1 Construction Cost Estimate

The estimated cost for Labour, Equipment and Materials to construct the proposed drain is outlined in detail in Appendix B and summarized in *Table 11.6-1 - Estimated Cost Summary.* The construction cost estimate, for the proposed work, 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.

The contract for the proposed work 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 to determine if the project should proceed.

11.2 Engineering Cost Estimate

Engineering costs include:

- Preparation of Engineer's Report (site meetings, agency consultations/ applications/permits, site-wide topographic survey, detailed design, consultation, drawings, specifications, report and assessment schedules);
- Attendance at Council meeting(s) to 'Consider the Engineer's Report';
- Attendance at the Court of Revision;
- Tendering (preparation of tender documents, addressing any inquiries from plan takers during the tender period, review of tender submissions, recommending award of the project to the qualified Contractor);
- Contract Administration and Construction Inspection services (attendance at pre-construction meeting(s), preparation of payment certificates, coordinating material sampling and testing, review of activities occurring on-site, liaising with property owners, review of shop drawings, coordination of deficiency walk-throughs of the drain, scheduling any remediation work, etc.); and,
- Warranty and Post-Construction Services (providing 'as-recorded' engineering information and drawings, coordinate warranty period walk-throughs of the drain, identifying and scheduling any warranty period work).

The cost for report preparation is typically not revised at the conclusion of a drainage project. If the report is referred back the Engineer, or if the report is appealed to the Drainage Tribunal, additional costs will be incurred and the cost for report preparation will be revised. The amount shown for meetings is an estimate;

final cost will be based on the actual time required for meetings. The estimate shown for construction tendering, contract administration and construction services, and warranty and post construction services is based on past experience on similar projects, assuming normal site conditions and an experienced contractor who completed the work in an efficient manner. The final cost for these services will vary as per the actual time spent to administer and construction the Drain.

11.3 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 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 the 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 if the project is appealed beyond the Court of Revision; however such costs may form part of the final drain cost.

Estimated Section 73 costs are provided in *Table 11.6-1 - Estimated Cost Summary.*

11.4 Harmonized Sales Tax

The Harmonized Sales Tax (HST) will apply to most costs on this project. The Municipality is eligible for a partial refund of 11.24% on HST paid; therefore, a net HST of 1.76% is included in the cost estimates in this report.

11.5 Allowances

Sections 29 to 33 of the *Drainage Act* provides for allowances (compensation) to lands affected by proposed drain construction. This section describes the applicable allowances per Section 29 (Right of Way) and Section 30 (Damages).

11.5.1 Section 29 – Right of Way

Section 29 provides for payment of an allowance to landowners for right of way required for construction and maintenance of the drain. This allowance compensates the owner for land used to accommodate the drain, access routes to the drain and for a working area along the drain for construction and maintenance purposes. Market valuations are discounted to determine Section 29 allowance rates, since Section 29 allowances are not intended to provide full compensation for fee simple interest in land, and the land occupied by the Drain is typically subject to restricted use due to zoning setbacks or conservation authority regulation limits.

The following rates were used to compute Section 29 allowances:

- Residential land $140,000 per hectare
- Commercial land & GRCA-regulated agricultural land $12,000 per hectare
- Wetlands $5,000 per hectare

11.5.2 Section 30 - Damages

Section 30 provides for payment of an allowance to landowners along the drain for damage caused by construction of the drain.

During construction, affected fences will be replaced and disturbed areas revegetated as outlined in this report. Allowances are provided in accordance with the Act for incidental costs that may be incurred for additional seeding or clean-up of the working area during future maintenance activities.

The following rates were used to compute Section 30 allowances:

- Residential land $3,500 per hectare
- Commercial land $3,500 per hectare
- Agricultural land $2,000 per hectare

11.5.3 Summary of Allowances

The table below summarizes the corridor widths used to compute Section 29 and Section 30 allowances and the amounts of allowances to be provided under this report:

Table 11.5-1 – Summary of Allowances

Int.*	Station	Street Address & Roll No.	R.O.W. (S.29)		Damages (S.30)		Total
			(m)	$	(m)	$	
M-1	-1+000 to -0+755	(004-07810)	15	4,400	20	1,700	6,100
M-1	-0+755 to -0+556	268 Woolwich St. S (004-07900)	10	2,400	20	1,400	3,800
M-1	-0+755 to -0+633	280 Woolwich St. S (004-08102)	5	750	-	-	750
M-1	-0+633 to -0+556	278 Woolwich St. S (004-08101)	5	450	-	-	450
M-1	-0+529 to -0+219	285 Woolwich St. S (004-08400)	15	350	20	900	1,250
M-1	-0+219 to -0+064	265 Woolwich St. S (004-08600)	15	1,150	-	-	1,150
M-1	-0+064 to 0+000	231 Woolwich St. S (004-07510)	15	500	-	-	500

Int.*	Station	Street Address & Roll No.	R.O.W. (S.29)		Damages (S.30)		Total
			(m)	$	(m)	$	
M-2	0+000 to 0+237	231 Woolwich St. S (004-07510)	15	4,250	20	950	5,200
M-5	1+018 to 1+094	57 Elroy Road (004-14400)	3	3,200	3	100	3,300
SB-1	0+206 to 0+362	118 Menno St. (005-04100)	6	1,100	6	200	1,300
SB-1	0+362 to 0+675	(004-16994)	6	2,250	6	400	2,650
WB-2	0+368 to 0+460	127 Woolwich St. S (004-16101)	6	7,750	6	200	7,950
WB-2	0+460 to 0+501	133 Woolwich St. S (004-16100)	6	3,450	6	100	3,550
WB-2	0+501 to 0+536	139 Woolwich St. S (004-16010)	6	2,950	6	50	3,000
WB-2	0+536 to 0+662	147 Woolwich St. S (004-16000)	6	10,600	6	250	10,850
WB-2	0+662 to 0+696	11 Cooper Crescent (004-12621)	3	1,450	3	100	1,550
WB-2	0+696	7 Cooper Crescent (004-12623)	3	100	-	-	100
WB-2	0+662 to 0+726	76 Kennedy Rd. (004-12625)	3/6	3,950	3	100	4,050
WB-2	0+726 to 0+730	68 Elroy Rd. (004-14500)	6	350	-	-	350
Total							**57,850**

*Note: M-1 = Main Drain interval 1, SB-1 = Scarlett Branch interval 1, etc.

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 at the conclusion of construction.

11.6 Estimated Cost Summary

The Table below summarizes the total cost of the drain including allowances and estimates for construction, engineering and Section 73 costs. Refer to Appendix B for additional cost estimate details.

Table 11.6-1 - Estimated Cost Summary

Description		Amount	Total
Estimated Construction Cost			
	Main Drain	$2,321,095	
	Kennedy Branch	$19,800	
	Scarlett Branch	$320,200	
	Woolwich Branch	$472,200	
	Berlin Branch	$34,500	
	Roadwork and Restoration	$915,000	
	Utility Relocations	$109,200	
	Contingencies and Overhead	$406,660	
		Construction Subtotal	$4,598,655
Allowances			$57,850
Estimated Engineering Cost			
	Report Services	$368,100	
	Construction Services	$289,600	
		Engineering Subtotal	$657,700
Estimated Section 73 Costs			$243,275
Net HST (1.76% on applicable costs)			$92,520
Total Estimated Cost			**$5,650,000**

12 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). This section describes the applicable assessments for Benefit, Outlet Liability and Increased Cost (Special) Assessment.

12.1 Calculation of Assessments

The method for assessment calculations is provided in Appendix A of this report. Appendix A divides the Drain into branches and intervals. The estimated cost for each branch and interval is first determined. For each branch/interval, the next step in the assessment calculation is to determine the benefit assessments to the affected lands and roads (see Sections 12.2 and 12.4). Then, special assessments to roads and utilities are determined, where applicable, (see Section 12.5). After deducting the total benefit and special assessments from the interval cost, the balance of the cost is then distributed as outlet assessments on a per hectare basis to all lands and roads in the watershed (see Section 12.3).

The terms non-proratable and proratable are used in this report and appear in the assessment schedules. Non-proratable assessments include fixed assessments

(e.g. PDC connections) and also assessments that apply certain costs directly to designated parcels (e.g. cost incurred due to land development) or utilities/roads (increased cost due to utility/road). All other assessments are proratable.

12.2 Benefit Assessments (S. 22)

Section 22 benefits were determined for lands and roads that receive an *improved outlet* and/or *improved drainage* as a result of this project.

Benefit assessments are not necessarily proportional to watershed area, instead they reflect the advantage derived by lands and roads due to construction of the drain. *Improved outlet* includes providing access to a legal outlet and/or providing access to an outlet with improved capacity and/or depth. *Improved drainage* includes improved control of surface drainage and more efficient land use due to re-direction of surface drainage.

Main Drain – Interval 1

For this project, benefit for improved drainage along the route of the drain was computed on a per metre basis for properties abutting the open ditch portion (Interval 1) of the Main Drain from Station -1+000 to Station 0+000.

Main Drain – Interval 2

Interval 2 of the Main Drain (Station 0+000 to 0+357) involves reconfiguring the existing Drain to accommodate proposed development south of Menno Street on Roll No. 004-07510. Accordingly, all costs for Interval 2 are assessed as non-proratable benefit to Roll No. 004-07510 except for the following Interval 2 work: Section 24 benefits for PDCs, Section 26 special assessments for roadway reinstatement and the equivalent cost for 375m of standard ditch cleanout, which would be the minimum recommendation for this interval, were the property to continue with an agricultural land use.

Kennedy Branch

Construction of the Kennedy Branch redirects runoff from to large rain/melt events away from lands immediately west of Kennedy Road (the historic Breslau Drain 1 route) toward the new Main Drain pipe at Elroy Road. Due to this flow re-direction, a portion of the Kennedy Road cost is assessed as proratable benefit to the following four properties in the immediate vicinity downstream of Kennedy Road: 7 Cooper Crescent (004-12623), 11 Cooper Crescent (004-12621), 68 Elroy Road (004-14500), 76 Kennedy Road (004-12625).

Scarlett Branch

Since the Scarlett Branch is proposed to address the Section 4 petition from developing lands west of Fountain Street on Roll Nos. 005-04100 and 004-16994. Accordingly, all costs for the Scarlett Branch are assessed as non-proratable benefit to Roll Nos. 005-04100 and 004-16994 except for the following items: Section 24 benefits for PDCs and Section 26 special assessments for roadway reinstatement.

Woolwich Branch – Interval 2

Interval 2 of Woolwich Branch (Station 0+185 to 0+730) replaces the undersized, existing drain currently situated on private lands with encroaching structures and a history of flooding due to lot grading. Accordingly, the immediate community of parcels most affected [11 Cooper Crescent (004-12621), 19 Cooper Crescent (004-12620), 21 Cooper Crescent (004-12613), 76 Kennedy Road (004-12625), 133 Woolwich Street South (004-16100), 139 Woolwich Street South (004-16010), 147 Woolwich Street South (004-16000), 151 Woolwich Street South (004-15900)] are each assessed a proratable benefit of $1,800, which in aggregate represents the minimum construction cost that would be incurred if: there a suitable outlet in Woolwich Street, no *Drainage Act* report was underway and the affected parcels cooperated to design, construct and fund a replacement, private drainage scheme.

Woolwich Branch – 127 Woolwich Street South

Intervals 1 and 2 of the Woolwich Branch provide drainage outlet for historic drainage issues on the vacant parcel at 127 Woolwich Street South (004-16101). A proratable benefit of $63,000 was determined based on the construction cost for the drain from Station 0+270 to 0+358, less road-work related costs for this portion which are assessed under Section 26 to the Township.

Berlin Branch

Construction of the Berlin Branch replaces the existing, non-functional 1954 “Subsidiary Trunk Drain” with a new drain having sufficient depth to provide outlet to address drainage issues at 14 Berlin Street (004-03800). A proratable benefit of $6,000 was determined based on the minimum construction cost involved if a connection to the Joseph Street storm sewer were feasible.

12.3 Outlet Liability Assessments (S. 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. To satisfy this requirement, 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. Per OMAFRA Publication 852 *Guide for Engineers Working Under the Drainage Act in Ontario*, the following runoff factors were used for this project.

Table 12.3-1 – Relative Runoff Factors for Outlet Assessments

Land Use	Runoff factor
Wooded	0.5
Agricultural	1.0
Developed	1.33
Gravel Road	1.33
Paved Road	2.0

12.4 Special Benefit Assessment (Section 24)

Section 24 special benefits are assessed for items which are unrelated to the function of the Drain are not considered part of the Drain for future maintenance purposes.

For this project, PDCs are assessed as special benefit. A $2,000 special benefit amount for a private drain connection (PDC) is assessed to each existing residential property along the route of the Drain. PDCs are a typical feature of storm sewer systems in residential settings and provide current (and future) landowners with an outlet for current (and future) drainage needs. Refer to Section 5.6 for design-related discussion of PDCs.

12.5 Special Assessments (Section 26)

Section 26 of the Drainage Act directs that any increased cost due to a public utility or road authority is paid by that utility or road. Section 26 assessments are commonly referred to as Special Assessments. Estimated special assessments on a per-interval basis are presented in Table 12.5-1 - Estimated Special Assessments.

Table 12.5-1 - Estimated Special Assessments

Int.	Road/Utility	Est. Const.	Est. Eng.	Net HST	Est. Total
M-2	Township Roads	$79,600	$15,100	$1,700	$96,400
M-2	Township Utilities	$29,000	$5,500	$600	$35,100
M-3	Township Roads	$155,400	$29,400	$3,300	$188,100
M-4	Township Roads	$109,300	$20,700	$2,300	$132,300
M-4	Township Utilities	$23,000	$4,400	$480	$27,880
M-4	Waterloo North Hydro	$9,000	$1,700	$200	$10,900
M-5	Township Roads	$68,200	$12,900	$1,400	$82,500
M-5	Township Utilities	$9,000	$1,700	$200	$10,900
M-5	Waterloo North Hydro	$5,400	$1,000	$100	$6,500
KB-1	Township Roads	$4,000	$800	$100	$4,900
KB-1	Township Utilities	$9,000	$1,700	$200	$10,900
KB-1	Waterloo North Hydro	$1,800	$300	$0	$2,100
SB-1	Township Roads	$3,800	$700	$100	$4,600
SB-1	Waterloo North Hydro	$1,800	$300	$0	$2,100
WB-1	Township Roads	$108,700	$20,600	$2,300	$131,600
WB-1	Township Utilities	$14,000	$2,600	$300	$16,900
WB-1	Waterloo North Hydro	$1,800	$300	$0	$2,100
WB-2	Township Roads	$108,000	$20,400	$2,300	$130,700
WB-2	Waterloo North Hydro	$3,600	$700	$100	$4,400
BB-1	Township Roads	$7,200	$1,400	$200	$8,800
BB-1	Waterloo North Hydro	$1,800	$300	$0	$2,100

Totals	
Township Roads	$779,900
Township Utilities	$101,680
Waterloo North Hydro	$30,200

The actual Special Assessments will be determined after construction by inserting the actual construction and engineering costs in the Special Assessments Table.

The road authority or utility may elect to complete required works within their right of way with their own 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.

Special Assessments do not apply to future maintenance assessments.

Conflicts between the proposed drain and existing Enbridge gas mains were identified during the design phase. Gas relocations have now been completed with cost sharing per the franchise agreement between Enbridge and the Township. Gas service conflicts, if encountered during construction, will be handled in a similar manner under the franchise agreement.

12.6 Assessment Schedules

In the assessment schedules, each parcel of land assessed has been identified by the municipal assessment roll number available at the time of the preparation of this report. The size of each parcel was established using current assessment roll information. For convenience only, each parcel is also identified by the street address.

12.6.1 Schedule A- Schedule of Assessments

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

12.6.2 Schedule B -Schedule of Assessments for Future Maintenance

In accordance with Section 74 of the Act, the Drain shall be maintained by the municipality and the cost of maintenance shall be assessed to lands and roads upstream of the maintenance location, prorata with the amounts in the future maintenance schedule.

The percentages in Schedule B are derived from the cost distribution shown in Appendix A, and will be used to levy future maintenance work.

Schedule B is divided into columns to reflect the different drain intervals where maintenance work may be undertaken. These column intervals assist in identifying

upstream lands and roads to be assessed for future maintenance. The percentages shown in Schedule B determine the share of future maintenance to be levied to a property or road. For example, a $1,000 repair project will result in a $50 assessment to a property with a 5% maintenance assessment.

12.6.3 Schedule C – Schedule for Actual Cost Bylaw

Costs presented in this report are estimated based on recent pricing for similar projects. After construction of the drain is certified complete by the Engineer, and final costs are known, actual assessments will be calculated using Schedule C.

The second column lists the non-proratable assessments identified in Appendix A, including: the $2,000 benefit amount for PDCs, the cost for Main Drain – Interval 2 and Scarlett Branch (assessed to the developing landowner under Section 22) and the costs for Special Assessments (assessed to the utility/Township under Section 26). The PDC benefit assessment will remain fixed at $2,000. Other non-proratable assessments will be based on actual costs.

After deducting the actual, non-proratable amounts listed in the paragraph above from the total actual cost, the remaining actual cost will be assessed pro-rata, using the proportions in Schedule C, to all lands and roads in the watershed.

Net assessments are calculated by deducting allowances amounts where applicable. Refer to Section 11.5 for allowance information.

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

13 GRANT

In accordance with the provisions of Section 85 of the Act, a grant not exceeding 1/3 (33-1/3%) may be available on the assessments against lands used for agricultural purposes. Current OMAFRA 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 Municipality to apply for this grant after the construction of the drain is certified complete by the Engineer. The municipality must confirm the Farm Property Tax Class on the assessed parcels at the time the grant application is completed and submitted to OMAFRA. OMAFRA has the authority to determine grant eligibility regardless of the designation herein.

Based on current OMAFRA grant policy, none of the proposed work is eligible for grant due to the presence of a Provincially Significant Wetland along the existing Drain.

14 PRIVACY OF LANDS

Although a municipal drain is situated on the property of various landowners, one landowner may not enter another landowner's property by means of the drain. Persons authorized to enter private lands to carry out duties authorized under the Act include: Engineers (or their assistants), Contractors (or their assistants) and the appointed Drainage Superintendents (or their assistants).

15 MAINTENANCE

15.1 General

Section 74 of the Act requires the Drain, as outlined in this report, to be maintained by the Municipality, and the cost of maintenance to be assessed to the upstream lands and roads prorata with the assessments in Schedule B.

All parties affected by Breslau Drain 1 are encouraged to periodically inspect the drain and report any visible or suspected problems to Municipality.

A right-of-way along the drain and access routes to the drain exist for the Municipality to maintain the drain. The right-of-way for the drain, as described in the Allowances section of this report, shall remain free of obstructions. The cost for removing obstructions is the responsibility of the landowner. Where the drawings show a prevailing surface flow direction along the right-of-way, no grading changes are permitted. If the right-of-way is for maintenance access only, minor grading may occur on the right-of-way, subject to Drainage Superintendent approval.

Section 65(5) of the Act requires that any landowner making a new connection to the Drain to 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 landowner.

The discharge of anything but clean, unpolluted water into a drain is regulated by other provincial legislation. Any non-compliance will be reported to the appropriate agency.

For consistency with the Township’s Sewer Lateral Policy, the property owner is responsible for maintenance of the entire PDC lateral from the Drain, regardless of whether it is located in the road allowance or not, unless there is a structural problem (pipe collapse) under the road allowance, which is covered by the Township. Backwater valve installations shall be maintained and replaced as required by the property owner.

15.2 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, 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.

A report under Section 76 of the *Act* is recommended upon completion of residential developments in the watershed to ensure future maintenance schedules are equitable and reflect the watershed boundaries slated for alteration by development.

15.3 Culvert Maintenance

Woolwich Street South culvert:

- The cost for periodic cleanout and maintenance at the box culvert under Woolwich Street South will be assessed as drain maintenance to upstream lands and roads.
- The cost for future structural repair, extension or replacement of the Woolwich Street South culvert will be assessed fully to the road authority.

Future culvert installations:

Prior approval of the Municipality is required before a landowner installs a culvert not constructed under this report and the future culvert shall be installed per the design grade and capacity requirements of this report. Installation and maintenance of future culverts are at the sole expense of the landowner, unless a separate report is prepared under the *Drainage Act*. Future culverts which do not meet the capacity requirements of this report will be deemed an obstruction to the drain and removed at the landowner's expense.

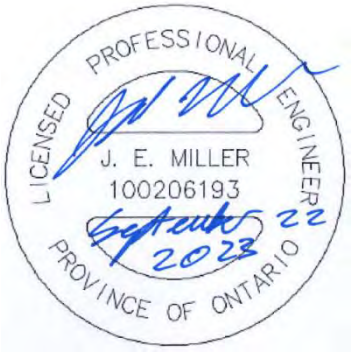
16 BYLAW

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.

Joel E. Miller, P. Eng
mw



SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Total Ha Affected	Main Drain Ha Affected	Main Drain Benefit (Proratable)	Main Drain Benefit (Non-Proratable)	Main Drain Outlet	Main Drain Total	Kennedy Branch Ha. Affected	Kennedy Branch Benefit (Proratable)	Kennedy Branch Benefit (Non-Proratable)	Kennedy Branch Outlet	Kennedy Branch Total
Twp of Woolwich (Roll No. 30-29-030-)											
Berlin Street											
8 Berlin Street (004-03701)	0.15	-	-	-	1,650	1,650	-	-	-	-	-
14 Berlin Street (004-03800)	0.16	-	-	-	1,732	1,732	-	-	-	-	-
Cooper Crescent											
7 Cooper Crescent (004-12623)	0.15	-	-	-	1,650	1,650	-	400	-	-	400
11 Cooper Crescent (004-12621)	0.16	-	-	-	1,732	1,732	-	800	-	-	800
19 Cooper Crescent (004-12620)	0.19	-	-	-	2,063	2,063	-	-	-	-	-
21 Cooper Crescent (004-12613)	0.36	-	-	-	3,959	3,959	-	-	-	-	-
23 Cooper Crescent (004-12614)	0.13	-	-	-	1,402	1,402	-	-	-	-	-
31 Cooper Crescent (004-12615)	0.13	-	-	-	1,402	1,402	-	-	-	-	-
37 Cooper Crescent (004-12616)	0.09	-	-	-	990	990	-	-	-	-	-
Dovercourt Road											
8 Dovercourt Road (004-13600)	0.18	0.18	-	-	1,978	1,978	-	-	-	-	-
11 Dovercourt Road (004-11500)	0.18	0.18	-	-	1,978	1,978	-	-	-	-	-
12 Dovercourt Road (004-13500)	0.20	0.20	-	-	2,751	2,751	-	-	-	-	-
16 Dovercourt Road (004-13400)	0.21	0.21	-	-	2,986	2,986	-	-	-	-	-
19 Dovercourt Road (004-11600)	0.18	0.18	-	-	1,978	1,978	-	-	-	-	-
22 Dovercourt Road (004-13300)	0.25	0.25	-	-	3,623	3,623	-	-	-	-	-
32 Dovercourt Road (004-13200)	0.17	0.17	-	-	2,135	2,135	-	-	-	-	-
Elroy Road											
5 Elroy Road (004-10800)	0.24	0.24	-	2,000	2,640	4,640	-	-	-	-	-
6 Elroy Road (004-15500)	0.17	0.14	-	-	1,897	1,897	-	-	-	-	-
12 Elroy Road (004-15400)	0.18	0.18	-	2,000	1,978	3,978	-	-	-	-	-
18 Elroy Road (004-15300)	0.18	0.18	-	2,000	1,978	3,978	-	-	-	-	-
25 Elroy Road (004-13800)	0.19	0.19	-	2,000	2,063	4,063	-	-	-	-	-
26 Elroy Road (004-15200)	0.17	0.17	-	2,000	2,289	4,289	-	-	-	-	-
29 Elroy Road (004-13900)	0.21	0.21	-	2,000	3,306	5,306	-	-	-	-	-
33 Elroy Road (004-14000)	0.30	0.30	-	2,000	4,723	6,723	-	-	-	-	-
37 Elroy Road (004-14100)	0.21	0.21	-	2,000	3,306	5,306	-	-	-	-	-
40 Elroy Road (004-15100)	0.17	0.17	-	2,000	2,716	4,716	-	-	-	-	-
41 Elroy Road (004-14200)	0.20	0.20	-	2,000	3,188	5,188	-	-	-	-	-
46 Elroy Road (004-15000)	0.18	0.12	-	2,000	2,548	4,548	-	-	-	-	-
47 Elroy Road (004-14300)	0.21	0.21	-	2,000	3,306	5,306	-	-	-	-	-
52 Elroy Road (004-14900)	0.17	0.06	-	2,000	2,182	4,182	-	-	-	-	-
54 Elroy Road (004-14800)	0.30	0.05	-	2,000	3,547	5,547	-	-	-	-	-
57 Elroy Road (004-14400)	0.17	0.17	-	2,000	2,716	4,716	-	-	-	-	-
58 Elroy Road (004-14700)	0.22	0.05	-	2,000	2,723	4,723	-	-	-	-	-
64 Elroy Road (004-14600)	0.18	0.07	-	2,000	2,299	4,299	-	-	-	-	-
68 Elroy Road (004-14500)	0.19	0.09	-	2,000	2,490	4,490	-	800	-	-	800
Fountain Street North											
4813 Fountain Street North (005-04301)	37.28	32.44	-	-	31,567	31,567	-	-	-	-	-
4881 Fountain Street North (005-01000)	52.20	52.20	-	-	4,337	4,337	-	-	-	-	-
5185 Fountain Street North (005-02450)	3.75	3.75	-	-	571	571	-	-	-	-	-
Joseph Street											
15 Joseph Street (004-04000)	0.09	-	-	-	990	990	-	-	-	-	-
19 Joseph Street (004-04100)	0.09	-	-	-	990	990	-	-	-	-	-
23 Joseph Street (004-04200)	0.09	-	-	-	990	990	-	-	-	-	-
27 Joseph Street (004-04300)	0.09	-	-	-	990	990	-	-	-	-	-
31 Joseph Street (004-04310)	0.11	-	-	-	1,237	1,237	-	-	-	-	-
Kennedy Road											
7 Kennedy Road (004-09700)	0.15	0.15	-	-	766	766	-	-	-	-	-
13 Kennedy Road (004-11700)	0.28	0.28	-	-	1,416	1,416	-	-	-	-	-
16 Kennedy Road (004-20900)	0.02	0.02	-	-	247	247	-	-	-	-	-
21 Kennedy Road (004-11800)	0.28	-	-	-	4,369	4,369	-	-	-	-	-
27 Kennedy Road (004-11900)	0.27	-	-	-	4,252	4,252	-	-	-	-	-
30 Kennedy Road (004-13150)	0.15	0.15	-	-	2,362	2,362	-	-	-	-	-
31 Kennedy Road (004-12000)	0.26	-	-	-	4,133	4,133	-	-	-	-	-
34 Kennedy Road (004-13100)	0.15	0.15	-	-	2,362	2,362	-	-	-	-	-
40 Kennedy Road (004-13000)	0.21	0.21	-	-	3,306	3,306	-	-	-	-	-
43 Kennedy Road (004-12100)	0.24	-	-	-	3,780	3,780	-	-	-	-	-
46 Kennedy Road (004-12900)	0.21	0.21	-	-	3,306	3,306	-	-	-	-	-
47 Kennedy Road (004-12200)	0.23	-	-	-	3,660	3,660	-	-	-	-	-
52 Kennedy Road (004-12800)	0.21	0.21	-	-	3,306	3,306	-	-	-	-	-
53 Kennedy Road (004-12300)	0.11	-	-	-	1,771	1,771	-	-	-	-	-
58 Kennedy Road (004-12700)	0.20	0.20	-	2,000	3,188	5,188	-	-	-	-	-
61 Kennedy Road (004-12400)	0.24	0.24	-	2,000	3,780	5,780	-	-	-	-	-
67 Kennedy Road (004-12500)	0.28	0.12	-	-	4,369	4,369	0.16	-	2,000	523	2,523
69 Kennedy Road (004-12600)	0.02	-	-	-	354	354	0.02	-	-	75	75
73 Kennedy Road (004-12601)	0.01	-	-	-	118	118	0.01	-	-	25	25
76 Kennedy Road (004-12625)	0.24	-	-	-	2,640	2,640	-	1,600	-	-	1,600
Lonsdale Road											
2117 Lonsdale Road (005-04500)	3.66	3.66	-	-	419	419	-	-	-	-	-
2186 Lonsdale Road (005-04400)	0.81	0.81	-	-	102	102	-	-	-	-	-
Mader's Lane											
37-38 Mader's Lane (004-16900)	0.01	-	-	-	118	118	-	-	-	-	-
Menno Street											
7 Menno Street (004-08800)	0.23	0.23	-	2,000	1,186	3,186	-	-	-	-	-
8 Menno Street (004-10300)	0.18	0.18	-	2,000	918	2,918	-	-	-	-	-
13 Menno Street (004-08900)	0.23	0.23	-	-	898	898	-	-	-	-	-
14 Menno Street (004-10200)	0.18	0.18	-	-	918	918	-	-	-	-	-
24 Menno Street (004-10100)	0.19	0.19	-	-	958	958	-	-	-	-	-
27 Menno Street (004-09000)	0.25	0.25	-	-	649	649	-	-	-	-	-

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

		Main Drain					Kennedy Branch				
Street Address (Roll No.)	Total Ha Affected	Ha Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total
32 Menno Street (004-10000)	0.18	0.18	-	-	918	918	-	-	-	-	-
33 Menno Street (004-09100)	0.21	0.21	-	-	528	528	-	-	-	-	-
38 Menno Street (004-09900)	0.18	0.18	-	-	918	918	-	-	-	-	-
41 Menno Street (004-09300)	0.20	0.20	-	-	526	526	-	-	-	-	-
44 Menno Street (004-09800)	0.45	0.45	-	-	3,358	3,358	-	-	-	-	-
47 Menno Street (004-09400)	0.43	0.43	-	-	591	591	-	-	-	-	-
53 Menno Street (004-09500)	0.43	0.43	-	-	591	591	-	-	-	-	-
59 Menno Street (004-09200)	0.43	0.43	-	-	591	591	-	-	-	-	-
60 Menno Street (004-09600)	0.17	0.17	-	-	881	881	-	-	-	-	-
118 Menno Street (005-04100)	19.76	3.24	180,000	-	167,343	347,343	-	-	-	-	-
164 Menno Street (005-04201)	0.73	0.73	-	-	111	111	-	-	-	-	-
313 Menno Street (005-04305)	1.21	1.21	-	-	184	184	-	-	-	-	-
Sheridan Drive											
10 Sheridan Drive (004-11300)	0.18	0.18	-	-	918	918	-	-	-	-	-
11 Sheridan Drive (004-11400)	0.19	0.19	-	-	1,532	1,532	-	-	-	-	-
20 Sheridan Drive (004-11200)	0.18	0.18	-	-	1,492	1,492	-	-	-	-	-
24 Sheridan Drive (004-11100)	0.18	0.18	-	-	1,978	1,978	-	-	-	-	-
30 Sheridan Drive (004-11000)	0.18	0.18	-	-	1,978	1,978	-	-	-	-	-
31 Sheridan Drive (004-13700)	0.18	0.18	-	-	1,978	1,978	-	-	-	-	-
38 Sheridan Drive (004-10900)	0.21	0.21	-	2,000	2,309	4,309	-	-	-	-	-
Shields Street											
19 Shields Street (004-04400)	0.04	-	-	-	412	412	-	-	-	-	-
Woolwich Street South											
107 Woolwich Street South (004-16400)	0.06	-	-	-	659	659	-	-	-	-	-
111 Woolwich Street South (004-16300)	0.20	-	-	-	2,226	2,226	-	-	-	-	-
115 Woolwich Street South (004-16200)	0.25	-	-	-	2,722	2,722	-	-	-	-	-
117 Woolwich Street South (004-16102)	0.37	-	-	-	4,042	4,042	-	-	-	-	-
120-122 Woolwich Street South (004-03300)	0.21	-	-	-	2,309	2,309	-	-	-	-	-
127 Woolwich Street South (004-16101)	0.37	-	-	-	4,042	4,042	-	-	-	-	-
128 Woolwich Street South (004-03400)	0.22	-	-	-	2,391	2,391	-	-	-	-	-
133 Woolwich Street South (004-16100)	0.37	-	-	-	4,042	4,042	-	-	-	-	-
134 Woolwich Street South (004-03401)	0.23	-	-	-	2,474	2,474	-	-	-	-	-
138 Woolwich Street South (004-03500)	0.17	-	-	-	1,814	1,814	-	-	-	-	-
139 Woolwich Street South (004-16010)	0.37	-	-	-	4,042	4,042	-	-	-	-	-
144 Woolwich Street South (004-03600)	0.15	-	-	-	1,650	1,650	-	-	-	-	-
147 Woolwich Street South (004-16000)	0.89	-	-	-	8,908	8,908	-	-	-	-	-
150 Woolwich Street South (004-03700)	0.15	-	-	-	1,650	1,650	-	-	-	-	-
151 Woolwich Street South (004-15900)	0.40	-	-	-	4,371	4,371	-	-	-	-	-
158 Woolwich Street South (004-06900)	0.16	-	-	-	1,732	1,732	-	-	-	-	-
159 Woolwich Street South (004-15800)	0.61	-	-	-	6,680	6,680	-	-	-	-	-
162 Woolwich Street South (004-07000)	-	-	-	-	-	-	-	-	-	-	-
166 Woolwich Street South (004-07100)	-	-	-	-	-	-	-	-	-	-	-
167 Woolwich Street South (004-15700)	0.20	-	-	-	2,226	2,226	-	-	-	-	-
169 Woolwich Street South (004-15602)	0.27	-	-	-	2,970	2,970	-	-	-	-	-
171 Woolwich Street South (004-15601)	0.27	-	-	-	2,970	2,970	-	-	-	-	-
175 Woolwich Street South (004-15600)	0.27	-	-	-	2,970	2,970	-	-	-	-	-
201 Woolwich Street South (004-10700)	0.18	0.18	-	2,000	1,978	3,978	-	-	-	-	-
208 Woolwich Street South (004-2110321182)	0.02	0.02	-	-	247	247	-	-	-	-	-
209 Woolwich Street South (004-10600)	0.18	0.18	-	2,000	1,978	3,978	-	-	-	-	-
214-226 Woolwich Street South (004-07400)	0.17	0.17	-	-	1,058	1,058	-	-	-	-	-
215 Woolwich Street South (004-10500)	0.18	0.18	-	2,000	1,448	3,448	-	-	-	-	-
221 Woolwich Street South (004-10400)	0.18	0.18	-	2,000	918	2,918	-	-	-	-	-
231 Woolwich Street South (004-07510)	7.23	7.23	4,200	1,561,725	2,508	1,568,433	-	-	-	-	-
232 Woolwich Street South (004-07402)	0.03	0.03	-	2,000	154	2,154	-	-	-	-	-
238 Woolwich Street South (004-07404)	0.04	0.04	-	2,000	191	2,191	-	-	-	-	-
244 Woolwich Street South (004-07406)	0.03	0.03	-	2,000	154	2,154	-	-	-	-	-
250 Woolwich Street South (004-07408)	0.03	0.03	-	2,000	5	2,005	-	-	-	-	-
255 Woolwich Street South (004-08700)	0.40	0.40	-	-	61	61	-	-	-	-	-
256 Woolwich Street South (004-07500)	0.94	0.94	-	-	143	143	-	-	-	-	-
262 Woolwich Street South (004-07805)	0.44	0.44	-	-	68	68	-	-	-	-	-
265 Woolwich Street South (004-08600)	3.45	3.45	10,100	-	326	10,426	-	-	-	-	-
268 Woolwich Street South (004-07900)	1.64	1.64	10,100	-	250	10,350	-	-	-	-	-
275 Woolwich Street South (004-08500)	0.81	0.81	3,000	-	124	3,124	-	-	-	-	-
278 Woolwich Street South (004-08101)	0.31	0.31	5,000	-	47	5,047	-	-	-	-	-
280 Woolwich Street South (004-08102)	2.26	2.26	7,900	-	345	8,245	-	-	-	-	-
285 Woolwich Street South (004-08400)	7.74	7.74	20,200	-	862	21,062	-	-	-	-	-
300 Woolwich Street South (004-08200)	-	-	9,000	-	-	9,000	-	-	-	-	-
305 Woolwich Street South (004-08300)	1.24	1.24	-	-	189	189	-	-	-	-	-
307 Woolwich Street South (005-02470)	1.41	1.41	-	-	215	215	-	-	-	-	-
Street Address N/A											
(004-07810)	1.07	1.07	15,900	-	122	16,022	-	-	-	-	-
(004-08495)	0.18	0.18	-	-	27	27	-	-	-	-	-
(004-16901)	10.46	10.46	-	-	952	952	-	-	-	-	-
(004-16994)	12.41	5.47	180,000	-	82,582	262,582	-	-	-	-	-
(005-02490)	0.22	0.22	-	-	13	13	-	-	-	-	-
(005-04110)	14.34	14.34	10,000	-	1,641	11,641	-	-	-	-	-
(005-04170)	3.29	3.29	-	-	501	501	-	-	-	-	-
(005-04350)	8.73	8.73	-	-	857	857	-	-	-	-	-
Subtotal (Lands):	221.45	182.27	455,400	1,623,725	543,218	2,622,343	0.19	3,600	2,000	623	6,223

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

		Main Drain					Kennedy Branch				
Street Address (Roll No.)	Total Ha Affected	Ha Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total
Berlin Street (Township of Woolwich)	0.14	-	-	-	2,309	2,309	-	-	-	-	-
Dovercourt Road (Township of Woolwich)	0.39	0.39	30,000	-	6,503	36,503	-	-	-	-	-
Elroy Road (Township of Woolwich)	0.87	0.87	145,000	-	18,339	163,339	-	-	-	-	-
Fountain Street North (Region of Waterloo)	8.11	6.92	10,000	-	29,690	39,690	-	-	-	-	-
Kennedy Road (Township of Woolwich)	0.89	0.56	85,000	-	17,917	102,917	0.09	28,000	-	447	28,447
Lonsdale Road (Township of Woolwich)	1.24	1.24	-	-	284	284	-	-	-	-	-
Menno Street (Township of Woolwich)	3.05	3.05	-	-	6,270	6,270	-	-	-	-	-
Ottawa Street (Unopened) (Township of Woolwich)	0.36	0.36	-	-	55	55	-	-	-	-	-
Scarlett Road (Unopened) (Township of Woolwich)	0.13	-	-	-	1,536	1,536	-	-	-	-	-
Sheridan Drive (Township of Woolwich)	0.52	0.52	35,000	-	6,810	41,810	-	-	-	-	-
Shields Street (Township of Woolwich)	0.02	-	-	-	331	331	-	-	-	-	-
Woolwich Street South (Township of Woolwich)	3.39	2.61	260,000	-	22,963	282,963	-	-	-	-	-
Township of Woolwich Roads (S.26 Special Assessment)			-	499,300	-	499,300		-	4,900	-	4,900
Township of Woolwich Utilities (S.26 Special Assessment)			-	73,880	-	73,880		-	10,900	-	10,900
Waterloo North Hydro (S.26 Special Assessment)			-	17,400	-	17,400		-	2,100	-	2,100
Subtotal (Roads & Utilities):	19.11	16.52	565,000	590,580	113,007	1,268,587	0.09	28,000	17,900	447	46,347
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**198.79**	**1,020,400**	**2,214,305**	**656,225**	**3,890,930**	**0.28**	**31,600**	**19,900**	**1,070**	**52,570**

Notes:

1. Roll numbers are per the municipality's last revised assessment roll.

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

	Scarlett Branch					Woolwich Branch				
Street Address (Roll No.)	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total
Twp of Woolwich (Roll No. 30-29-030-)										
Berlin Street										
8 Berlin Street (004-03701)	-	-	-	-	-	-	-	-	456	456
14 Berlin Street (004-03800)	-	-	-	-	-	-	-	-	478	478
Cooper Crescent										
7 Cooper Crescent (004-12623)	-	-	-	-	-	0.15	-	2,000	653	2,653
11 Cooper Crescent (004-12621)	-	-	-	-	-	0.16	1,800	2,000	685	4,485
19 Cooper Crescent (004-12620)	-	-	-	-	-	0.19	1,800	2,000	815	4,615
21 Cooper Crescent (004-12613)	-	-	-	-	-	0.36	1,800	2,000	1,566	5,366
23 Cooper Crescent (004-12614)	-	-	-	-	-	0.13	-	-	555	555
31 Cooper Crescent (004-12615)	-	-	-	-	-	0.13	-	-	555	555
37 Cooper Crescent (004-12616)	-	-	-	-	-	0.09	-	-	391	391
Dovercourt Road										
8 Dovercourt Road (004-13600)	-	-	-	-	-	-	-	-	-	-
11 Dovercourt Road (004-11500)	-	-	-	-	-	-	-	-	-	-
12 Dovercourt Road (004-13500)	-	-	-	-	-	-	-	-	-	-
16 Dovercourt Road (004-13400)	-	-	-	-	-	-	-	-	-	-
19 Dovercourt Road (004-11600)	-	-	-	-	-	-	-	-	-	-
22 Dovercourt Road (004-13300)	-	-	-	-	-	-	-	-	-	-
32 Dovercourt Road (004-13200)	-	-	-	-	-	-	-	-	-	-
Elroy Road										
5 Elroy Road (004-10800)	-	-	-	-	-	-	-	-	-	-
6 Elroy Road (004-15500)	-	-	-	-	-	0.03	-	2,000	91	2,091
12 Elroy Road (004-15400)	-	-	-	-	-	-	-	-	-	-
18 Elroy Road (004-15300)	-	-	-	-	-	-	-	-	-	-
25 Elroy Road (004-13800)	-	-	-	-	-	-	-	-	-	-
26 Elroy Road (004-15200)	-	-	-	-	-	-	-	-	-	-
29 Elroy Road (004-13900)	-	-	-	-	-	-	-	-	-	-
33 Elroy Road (004-14000)	-	-	-	-	-	-	-	-	-	-
37 Elroy Road (004-14100)	-	-	-	-	-	-	-	-	-	-
40 Elroy Road (004-15100)	-	-	-	-	-	-	-	-	-	-
41 Elroy Road (004-14200)	-	-	-	-	-	-	-	-	-	-
46 Elroy Road (004-15000)	-	-	-	-	-	0.06	-	-	182	182
47 Elroy Road (004-14300)	-	-	-	-	-	-	-	-	-	-
52 Elroy Road (004-14900)	-	-	-	-	-	0.11	-	-	342	342
54 Elroy Road (004-14800)	-	-	-	-	-	0.25	-	-	1,038	1,038
57 Elroy Road (004-14400)	-	-	-	-	-	-	-	-	-	-
58 Elroy Road (004-14700)	-	-	-	-	-	0.17	-	-	751	751
64 Elroy Road (004-14600)	-	-	-	-	-	0.11	-	-	490	490
68 Elroy Road (004-14500)	-	-	-	-	-	0.10	-	-	424	424
Fountain Street North										
4813 Fountain Street North (005-04301)	4.84	-	-	-	-	-	-	-	-	-
4881 Fountain Street North (005-01000)	-	-	-	-	-	-	-	-	-	-
5185 Fountain Street North (005-02450)	-	-	-	-	-	-	-	-	-	-
Joseph Street										
15 Joseph Street (004-04000)	-	-	-	-	-	-	-	-	273	273
19 Joseph Street (004-04100)	-	-	-	-	-	-	-	-	273	273
23 Joseph Street (004-04200)	-	-	-	-	-	-	-	-	273	273
27 Joseph Street (004-04300)	-	-	-	-	-	-	-	-	273	273
31 Joseph Street (004-04310)	-	-	-	-	-	-	-	-	342	342
Kennedy Road										
7 Kennedy Road (004-09700)	-	-	-	-	-	-	-	-	-	-
13 Kennedy Road (004-11700)	-	-	-	-	-	-	-	-	-	-
16 Kennedy Road (004-20900)	-	-	-	-	-	-	-	-	-	-
21 Kennedy Road (004-11800)	0.28	-	-	-	-	-	-	-	-	-
27 Kennedy Road (004-11900)	0.27	-	-	-	-	-	-	-	-	-
30 Kennedy Road (004-13150)	-	-	-	-	-	-	-	-	-	-
31 Kennedy Road (004-12000)	0.26	-	-	-	-	-	-	-	-	-
34 Kennedy Road (004-13100)	-	-	-	-	-	-	-	-	-	-
40 Kennedy Road (004-13000)	-	-	2,000	-	2,000	-	-	-	-	-
43 Kennedy Road (004-12100)	0.24	-	2,000	-	2,000	-	-	-	-	-
46 Kennedy Road (004-12900)	-	-	2,000	-	2,000	-	-	-	-	-
47 Kennedy Road (004-12200)	0.23	-	2,000	-	2,000	-	-	-	-	-
52 Kennedy Road (004-12800)	-	-	2,000	-	2,000	-	-	-	-	-
53 Kennedy Road (004-12300)	0.11	-	2,000	-	2,000	-	-	-	-	-
58 Kennedy Road (004-12700)	-	-	-	-	-	-	-	-	-	-
61 Kennedy Road (004-12400)	-	-	-	-	-	-	-	-	-	-
67 Kennedy Road (004-12500)	-	-	-	-	-	-	-	-	-	-
69 Kennedy Road (004-12600)	-	-	-	-	-	-	-	-	-	-
73 Kennedy Road (004-12601)	-	-	-	-	-	-	-	-	-	-
76 Kennedy Road (004-12625)	-	-	-	-	-	0.24	1,800	2,000	1,044	4,844
Lonsdale Road										
2117 Lonsdale Road (005-04500)	-	-	-	-	-	-	-	-	-	-
2186 Lonsdale Road (005-04400)	-	-	-	-	-	-	-	-	-	-
Mader's Lane										
37-38 Mader's Lane (004-16900)	0.01	-	-	-	-	-	-	-	-	-
Menno Street										
7 Menno Street (004-08800)	-	-	-	-	-	-	-	-	-	-
8 Menno Street (004-10300)	-	-	-	-	-	-	-	-	-	-
13 Menno Street (004-08900)	-	-	-	-	-	-	-	-	-	-
14 Menno Street (004-10200)	-	-	-	-	-	-	-	-	-	-
24 Menno Street (004-10100)	-	-	-	-	-	-	-	-	-	-
27 Menno Street (004-09000)	-	-	-	-	-	-	-	-	-	-

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

	Scarlett Branch					Woolwich Branch				
Street Address (Roll No.)	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total
32 Menno Street (004-10000)	-	-	-	-	-	-	-	-	-	-
33 Menno Street (004-09100)	-	-	-	-	-	-	-	-	-	-
38 Menno Street (004-09900)	-	-	-	-	-	-	-	-	-	-
41 Menno Street (004-09300)	-	-	-	-	-	-	-	-	-	-
44 Menno Street (004-09800)	-	-	-	-	-	-	-	-	-	-
47 Menno Street (004-09400)	-	-	-	-	-	-	-	-	-	-
53 Menno Street (004-09500)	-	-	-	-	-	-	-	-	-	-
59 Menno Street (004-09200)	-	-	-	-	-	-	-	-	-	-
60 Menno Street (004-09600)	-	-	-	-	-	-	-	-	-	-
118 Menno Street (005-04100)	16.52	-	271,433	-	271,433	-	-	-	-	-
164 Menno Street (005-04201)	-	-	-	-	-	-	-	-	-	-
313 Menno Street (005-04305)	-	-	-	-	-	-	-	-	-	-
Sheridan Drive										
10 Sheridan Drive (004-11300)	-	-	-	-	-	-	-	-	-	-
11 Sheridan Drive (004-11400)	-	-	-	-	-	-	-	-	-	-
20 Sheridan Drive (004-11200)	-	-	-	-	-	-	-	-	-	-
24 Sheridan Drive (004-11100)	-	-	-	-	-	-	-	-	-	-
30 Sheridan Drive (004-11000)	-	-	-	-	-	-	-	-	-	-
31 Sheridan Drive (004-13700)	-	-	-	-	-	-	-	-	-	-
38 Sheridan Drive (004-10900)	-	-	-	-	-	-	-	-	-	-
Shields Street										
19 Shields Street (004-04400)	-	-	-	-	-	-	-	-	114	114
Woolwich Street South										
107 Woolwich Street South (004-16400)	-	-	-	-	-	0.06	-	-	261	261
111 Woolwich Street South (004-16300)	-	-	-	-	-	0.20	-	-	881	881
115 Woolwich Street South (004-16200)	-	-	-	-	-	0.25	-	-	1,077	1,077
117 Woolwich Street South (004-16102)	-	-	-	-	-	0.37	-	-	1,599	1,599
120-122 Woolwich Street South (004-03300)	-	-	-	-	-	0.11	-	-	786	786
127 Woolwich Street South (004-16101)	-	-	-	-	-	0.37	63,000	2,000	1,599	66,599
128 Woolwich Street South (004-03400)	-	-	-	-	-	0.13	-	2,000	829	2,829
133 Woolwich Street South (004-16100)	-	-	-	-	-	0.37	1,800	2,000	1,599	5,399
134 Woolwich Street South (004-03401)	-	-	-	-	-	0.13	-	2,000	851	2,851
138 Woolwich Street South (004-03500)	-	-	-	-	-	0.10	-	2,000	629	2,629
139 Woolwich Street South (004-16010)	-	-	-	-	-	0.37	1,800	2,000	1,599	5,399
144 Woolwich Street South (004-03600)	-	-	-	-	-	0.09	-	2,000	574	2,574
147 Woolwich Street South (004-16000)	-	-	-	-	-	0.89	1,800	2,000	3,525	7,325
150 Woolwich Street South (004-03700)	-	-	-	-	-	0.07	-	2,000	545	2,545
151 Woolwich Street South (004-15900)	-	-	-	-	-	0.40	1,800	2,000	1,730	5,530
158 Woolwich Street South (004-06900)	-	-	-	-	-	-	-	-	478	478
159 Woolwich Street South (004-15800)	-	-	-	-	-	0.61	-	2,000	1,845	3,845
162 Woolwich Street South (004-07000)	-	-	-	-	-	-	-	2,000	-	2,000
166 Woolwich Street South (004-07100)	-	-	-	-	-	-	-	2,000	-	2,000
167 Woolwich Street South (004-15700)	-	-	-	-	-	0.20	-	2,000	615	2,615
169 Woolwich Street South (004-15602)	-	-	-	-	-	0.27	-	2,000	820	2,820
171 Woolwich Street South (004-15601)	-	-	-	-	-	0.27	-	2,000	820	2,820
175 Woolwich Street South (004-15600)	-	-	-	-	-	0.27	-	2,000	820	2,820
201 Woolwich Street South (004-10700)	-	-	-	-	-	-	-	-	-	-
208 Woolwich Street South (004-2110321182)	-	-	-	-	-	-	-	-	-	-
209 Woolwich Street South (004-10600)	-	-	-	-	-	-	-	-	-	-
214-226 Woolwich Street South (004-07400)	-	-	-	-	-	-	-	-	-	-
215 Woolwich Street South (004-10500)	-	-	-	-	-	-	-	-	-	-
221 Woolwich Street South (004-10400)	-	-	-	-	-	-	-	-	-	-
231 Woolwich Street South (004-07510)	-	-	-	-	-	-	-	-	-	-
232 Woolwich Street South (004-07402)	-	-	-	-	-	-	-	-	-	-
238 Woolwich Street South (004-07404)	-	-	-	-	-	-	-	-	-	-
244 Woolwich Street South (004-07406)	-	-	-	-	-	-	-	-	-	-
250 Woolwich Street South (004-07408)	-	-	-	-	-	-	-	-	-	-
255 Woolwich Street South (004-08700)	-	-	-	-	-	-	-	-	-	-
256 Woolwich Street South (004-07500)	-	-	-	-	-	-	-	-	-	-
262 Woolwich Street South (004-07805)	-	-	-	-	-	-	-	-	-	-
265 Woolwich Street South (004-08600)	-	-	-	-	-	-	-	-	-	-
268 Woolwich Street South (004-07900)	-	-	-	-	-	-	-	-	-	-
275 Woolwich Street South (004-08500)	-	-	-	-	-	-	-	-	-	-
278 Woolwich Street South (004-08101)	-	-	-	-	-	-	-	-	-	-
280 Woolwich Street South (004-08102)	-	-	-	-	-	-	-	-	-	-
285 Woolwich Street South (004-08400)	-	-	-	-	-	-	-	-	-	-
300 Woolwich Street South (004-08200)	-	-	-	-	-	-	-	-	-	-
305 Woolwich Street South (004-08300)	-	-	-	-	-	-	-	-	-	-
307 Woolwich Street South (005-02470)	-	-	-	-	-	-	-	-	-	-
Street Address N/A										
(004-07810)	-	-	-	-	-	-	-	-	-	-
(004-08495)	-	-	-	-	-	-	-	-	-	-
(004-16901)	-	-	-	-	-	-	-	-	-	-
(004-16994)	6.94	-	252,732	-	252,732	-	-	-	-	-
(005-02490)	-	-	-	-	-	-	-	-	-	-
(005-04110)	-	-	-	-	-	-	-	-	-	-
(005-04170)	-	-	-	-	-	-	-	-	-	-
(005-04350)	-	-	-	-	-	-	-	-	-	-
Subtotal (Lands):	29.70	-	536,165	-	536,165	7.81	77,400	46,000	35,546	158,946

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

	Scarlett Branch					Woolwich Branch				
Street Address (Roll No.)	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total	Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total
Berlin Street (Township of Woolwich)	-	-	-	-	-	-	115,000	-	638	115,638
Dovercourt Road (Township of Woolwich)	-	-	-	-	-	-	-	-	-	-
Elroy Road (Township of Woolwich)	-	-	-	-	-	-	-	-	-	-
Fountain Street North (Region of Waterloo)	1.19	-	-	-	-	-	-	-	-	-
Kennedy Road (Township of Woolwich)	0.24	-	-	-	-	-	-	-	-	-
Lonsdale Road (Township of Woolwich)	-	-	-	-	-	-	-	-	-	-
Menno Street (Township of Woolwich)	-	-	-	-	-	-	-	-	-	-
Ottawa Street (Unopened) (Township of Woolwich)	-	-	-	-	-	-	-	-	-	-
Scarlett Road (Unopened) (Township of Woolwich)	0.13	-	-	-	-	-	-	-	-	-
Sheridan Drive (Township of Woolwich)	-	-	-	-	-	-	-	-	-	-
Shields Street (Township of Woolwich)	-	-	-	-	-	0.02	-	-	130	130
Woolwich Street South (Township of Woolwich)	-	-	-	-	-	0.76	530,000	-	4,581	534,581
Township of Woolwich Roads (S.26 Special Assessment)		-	4,600	-	4,600		-	262,300	-	262,300
Township of Woolwich Utilities (S.26 Special Assessment)		-	-	-	-		-	16,900	-	16,900
Waterloo North Hydro (S.26 Special Assessment)		-	2,100	-	2,100		-	6,500	-	6,500
Subtotal (Roads & Utilities):	1.56	-	6,700	-	6,700	0.78	645,000	285,700	5,349	936,049
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**31.26**	**-**	**542,865**	**-**	**542,865**	**8.59**	**722,400**	**331,700**	**40,895**	**1,094,995**

Notes:

1. Roll numbers are per the municipality's last revised assessment roll.

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Ha. Affected	Berlin Branch Benefit (Proratable)	Berlin Branch Benefit (Non-Proratable)	Outlet	Total	Grand Total Assessment ($)
Twp of Woolwich (Roll No. 30-29-030-)						
Berlin Street						
8 Berlin Street (004-03701)	0.15	-	2,000	942	2,942	5,048
14 Berlin Street (004-03800)	0.16	6,000	2,000	989	8,989	11,199
Cooper Crescent						
7 Cooper Crescent (004-12623)	-	-	-	-	-	4,703
11 Cooper Crescent (004-12621)	-	-	-	-	-	7,017
19 Cooper Crescent (004-12620)	-	-	-	-	-	6,678
21 Cooper Crescent (004-12613)	-	-	-	-	-	9,325
23 Cooper Crescent (004-12614)	-	-	-	-	-	1,957
31 Cooper Crescent (004-12615)	-	-	-	-	s	1,957
37 Cooper Crescent (004-12616)	-	-	-	-	-	1,381
Dovercourt Road						
8 Dovercourt Road (004-13600)	-	-	-	-	-	1,978
11 Dovercourt Road (004-11500)	-	-	-	-	-	1,978
12 Dovercourt Road (004-13500)	-	-	-	-	-	2,751
16 Dovercourt Road (004-13400)	-	-	-	-	-	2,986
19 Dovercourt Road (004-11600)	-	-	-	-	-	1,978
22 Dovercourt Road (004-13300)	-	-	-	-	-	3,623
32 Dovercourt Road (004-13200)	-	-	-	-	-	2,135
Elroy Road						
5 Elroy Road (004-10800)	-	-	-	-	-	4,640
6 Elroy Road (004-15500)	-	-	-	-	-	3,988
12 Elroy Road (004-15400)	-	-	-	-	-	3,978
18 Elroy Road (004-15300)	-	-	-	-	-	3,978
25 Elroy Road (004-13800)	-	-	-	-	-	4,063
26 Elroy Road (004-15200)	-	-	-	-	-	4,289
29 Elroy Road (004-13900)	-	-	-	-	-	5,306
33 Elroy Road (004-14000)	-	-	-	-	-	6,723
37 Elroy Road (004-14100)	-	-	-	-	-	5,306
40 Elroy Road (004-15100)	-	-	-	-	-	4,716
41 Elroy Road (004-14200)	-	-	-	-	-	5,188
46 Elroy Road (004-15000)	-	-	-	-	-	4,730
47 Elroy Road (004-14300)	-	-	-	-	-	5,306
52 Elroy Road (004-14900)	-	-	-	-	-	4,524
54 Elroy Road (004-14800)	-	-	-	-	-	6,585
57 Elroy Road (004-14400)	-	-	-	-	-	4,716
58 Elroy Road (004-14700)	-	-	-	-	-	5,474
64 Elroy Road (004-14600)	-	-	-	-	-	4,789
68 Elroy Road (004-14500)	-	-	-	-	-	5,714
Fountain Street North						
4813 Fountain Street North (005-04301)	-	-	-	-	-	31,567
4881 Fountain Street North (005-01000)	-	-	-	-	-	4,337
5185 Fountain Street North (005-02450)	-	-	-	-	-	571
Joseph Street						
15 Joseph Street (004-04000)	0.09	-	-	565	565	1,828
19 Joseph Street (004-04100)	0.09	-	-	565	565	1,828
23 Joseph Street (004-04200)	0.09	-	-	565	565	1,828
27 Joseph Street (004-04300)	0.09	-	-	565	565	1,828
31 Joseph Street (004-04310)	0.11	-	-	707	707	2,286
Kennedy Road						
7 Kennedy Road (004-09700)	-	-	-	-	-	766
13 Kennedy Road (004-11700)	-	-	-	-	-	1,416
16 Kennedy Road (004-20900)	-	-	-	-	-	247
21 Kennedy Road (004-11800)	-	-	-	-	-	4,369
27 Kennedy Road (004-11900)	-	-	-	-	-	4,252
30 Kennedy Road (004-13150)	-	-	-	-	-	2,362
31 Kennedy Road (004-12000)	-	-	-	-	-	4,133
34 Kennedy Road (004-13100)	-	-	-	-	-	2,362
40 Kennedy Road (004-13000)	-	-	-	-	-	5,306
43 Kennedy Road (004-12100)	-	-	-	-	-	5,780
46 Kennedy Road (004-12900)	-	-	-	-	-	5,306
47 Kennedy Road (004-12200)	-	-	-	-	-	5,660
52 Kennedy Road (004-12800)	-	-	-	-	-	5,306
53 Kennedy Road (004-12300)	-	-	-	-	-	3,771
58 Kennedy Road (004-12700)	-	-	-	-	-	5,188
61 Kennedy Road (004-12400)	-	-	-	-	-	5,780
67 Kennedy Road (004-12500)	-	-	-	-	-	6,892
69 Kennedy Road (004-12600)	-	-	-	-	-	429
73 Kennedy Road (004-12601)	-	-	-	-	-	143
76 Kennedy Road (004-12625)	-	-	-	-	-	9,084
Lonsdale Road						
2117 Lonsdale Road (005-04500)	-	-	-	-	-	419
2186 Lonsdale Road (005-04400)	-	-	-	-	-	102
Mader's Lane						
37-38 Mader's Lane (004-16900)	-	-	-	-	-	118
Menno Street						
7 Menno Street (004-08800)	-	-	-	-	-	3,186
8 Menno Street (004-10300)	-	-	-	-	-	2,918
13 Menno Street (004-08900)	-	-	-	-	-	898
14 Menno Street (004-10200)	-	-	-	-	-	918
24 Menno Street (004-10100)	-	-	-	-	-	958
27 Menno Street (004-09000)	-	-	-	-	-	649

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Berlin Branch Ha. Affected	Benefit (Proratable)	Benefit (Non-Proratable)	Outlet	Total	Grand Total Assessment ($)
32 Menno Street (004-10000)	-	-	-	-	-	918
33 Menno Street (004-09100)	-	-	-	-	-	528
38 Menno Street (004-09900)	-	-	-	-	-	918
41 Menno Street (004-09300)	-	-	-	-	-	526
44 Menno Street (004-09800)	-	-	-	-	-	3,358
47 Menno Street (004-09400)	-	-	-	-	-	591
53 Menno Street (004-09500)	-	-	-	-	-	591
59 Menno Street (004-09200)	-	-	-	-	-	591
60 Menno Street (004-09600)	-	-	-	-	-	881
118 Menno Street (005-04100)	-	-	-	-	-	618,776
164 Menno Street (005-04201)	-	-	-	-	-	111
313 Menno Street (005-04305)	-	-	-	-	-	184
Sheridan Drive						
10 Sheridan Drive (004-11300)	-	-	-	-	-	918
11 Sheridan Drive (004-11400)	-	-	-	-	-	1,532
20 Sheridan Drive (004-11200)	-	-	-	-	-	1,492
24 Sheridan Drive (004-11100)	-	-	-	-	-	1,978
30 Sheridan Drive (004-11000)	-	-	-	-	-	1,978
31 Sheridan Drive (004-13700)	-	-	-	-	-	1,978
38 Sheridan Drive (004-10900)	-	-	-	-	-	4,309
Shields Street						
19 Shields Street (004-04400)	0.04	-	-	236	236	762
Woolwich Street South						
107 Woolwich Street South (004-16400)	-	-	-	-	-	920
111 Woolwich Street South (004-16300)	-	-	-	-	-	3,107
115 Woolwich Street South (004-16200)	-	-	-	-	-	3,799
117 Woolwich Street South (004-16102)	-	-	-	-	-	5,641
120-122 Woolwich Street South (004-03300)	0.10	-	-	612	612	3,707
127 Woolwich Street South (004-16101)	-	-	-	-	-	70,641
128 Woolwich Street South (004-03400)	0.09	-	-	565	565	5,785
133 Woolwich Street South (004-16100)	-	-	-	-	-	9,441
134 Woolwich Street South (004-03401)	0.10	-	-	612	612	5,937
138 Woolwich Street South (004-03500)	0.07	-	-	424	424	4,867
139 Woolwich Street South (004-16010)	-	-	-	-	-	9,441
144 Woolwich Street South (004-03600)	0.06	-	-	377	377	4,601
147 Woolwich Street South (004-16000)	-	-	-	-	-	16,233
150 Woolwich Street South (004-03700)	0.08	-	-	518	518	4,713
151 Woolwich Street South (004-15900)	-	-	-	-	-	9,901
158 Woolwich Street South (004-06900)	0.16	-	2,000	989	2,989	5,199
159 Woolwich Street South (004-15800)	-	-	-	-	-	10,525
162 Woolwich Street South (004-07000)	-	-	-	-	-	2,000
166 Woolwich Street South (004-07100)	-	-	-	-	-	2,000
167 Woolwich Street South (004-15700)	-	-	-	-	-	4,841
169 Woolwich Street South (004-15602)	-	-	-	-	-	5,790
171 Woolwich Street South (004-15601)	-	-	-	-	-	5,790
175 Woolwich Street South (004-15600)	-	-	-	-	-	5,790
201 Woolwich Street South (004-10700)	-	-	-	-	-	3,978
208 Woolwich Street South (004-2110321182)	-	-	-	-	-	247
209 Woolwich Street South (004-10600)	-	-	-	-	-	3,978
214-226 Woolwich Street South (004-07400)	-	-	-	-	-	1,058
215 Woolwich Street South (004-10500)	-	-	-	-	-	3,448
221 Woolwich Street South (004-10400)	-	-	-	-	-	2,918
231 Woolwich Street South (004-07510)	-	-	-	-	-	1,568,433
232 Woolwich Street South (004-07402)	-	-	-	-	-	2,154
238 Woolwich Street South (004-07404)	-	-	-	-	-	2,191
244 Woolwich Street South (004-07406)	-	-	-	-	-	2,154
250 Woolwich Street South (004-07408)	-	-	-	-	-	2,005
255 Woolwich Street South (004-08700)	-	-	-	-	-	61
256 Woolwich Street South (004-07500)	-	-	-	-	-	143
262 Woolwich Street South (004-07805)	-	-	-	-	-	68
265 Woolwich Street South (004-08600)	-	-	-	-	-	10,426
268 Woolwich Street South (004-07900)	-	-	-	-	-	10,350
275 Woolwich Street South (004-08500)	-	-	-	-	-	3,124
278 Woolwich Street South (004-08101)	-	-	-	-	-	5,047
280 Woolwich Street South (004-08102)	-	-	-	-	-	8,245
285 Woolwich Street South (004-08400)	-	-	-	-	-	21,062
300 Woolwich Street South (004-08200)	-	-	-	-	-	9,000
305 Woolwich Street South (004-08300)	-	-	-	-	-	189
307 Woolwich Street South (005-02470)	-	-	-	-	-	215
Street Address N/A						
(004-07810)	-	-	-	-	-	16,022
(004-08495)	-	-	-	-	-	27
(004-16901)	-	-	-	-	-	952
(004-16994)	-	-	-	-	-	515,314
(005-02490)	-	-	-	-	-	13
(005-04110)	-	-	-	-	-	11,641
(005-04170)	-	-	-	-	-	501
(005-04350)	-	-	-	-	-	857
Subtotal (Lands):	1.48	6,000	6,000	9,231	21,231	3,344,908

SCHEDULE A - SCHEDULE OF ASSESSMENTS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Ha. Affected	Berlin Branch Benefit (Proratable)	Berlin Branch Benefit (Non-Proratable)	Outlet	Total	Grand Total Assessment ($)
Berlin Street (Township of Woolwich)	0.14	35,000	-	1,320	36,320	154,267
Dovercourt Road (Township of Woolwich)	-	-	-	-	-	36,503
Elroy Road (Township of Woolwich)	-	-	-	-	-	163,339
Fountain Street North (Region of Waterloo)	-	-	-	-	-	39,690
Kennedy Road (Township of Woolwich)	-	-	-	-	-	131,364
Lonsdale Road (Township of Woolwich)	-	-	-	-	-	284
Menno Street (Township of Woolwich)	-	-	-	-	-	6,270
Ottawa Street (Unopened) (Township of Woolwich)	-	-	-	-	-	55
Scarlett Road (Unopened) (Township of Woolwich)	-	-	-	-	-	1,536
Sheridan Drive (Township of Woolwich)	-	-	-	-	-	41,810
Shields Street (Township of Woolwich)	-	-	-	-	-	461
Woolwich Street South (Township of Woolwich)	0.02	-	-	189	189	817,733
Township of Woolwich Roads (S.26 Special Assessment)		-	8,800	-	8,800	779,900
Township of Woolwich Utilities (S.26 Special Assessment)		-	-	-	-	101,680
Waterloo North Hydro (S.26 Special Assessment)		-	2,100	-	2,100	30,200
Subtotal (Roads & Utilities):	0.16	35,000	10,900	1,509	47,409	2,305,092
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**1.64**	**41,000**	**16,900**	**10,740**	**68,640**	**5,650,000**

Notes:

1. Roll numbers are per the municipality's last revised assessment roll.

SCHEDULE B - SCHEDULE OF ASSESSMENTS FOR FUTURE MAINTENANCE
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

		Main Drain										Kennedy Branch		Scarlett Branch		Woolwich Branch				Berlin Branch	
		Interval 1		Interval 2		Interval 3		Interval 4		Interval 5		Interval 1		Interval 1		Interval 1		Interval 2		Interval 1	
	Total Ha	-1+000 to 0+000		0+000 to 0+357		0+357 to 0+569		0+569 to 0+880		0+880 to 1+164		0+000 to 0+076		0+000 to 0+675		0+000 to 0+0185		0+185 to 0+730		0+000 to 0+089	
Street Address (Roll No.)	Affected	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%
Twp of Woolwich (Roll No. 30-29-030-)																					
Berlin Street																					
8 Berlin Street (004-03701)	0.15	3	0.03%	17	0.17%	19	0.19%	21	0.21%	-		-		-		82	0.82%	-		510	5.10%
14 Berlin Street (004-03800)	0.16	3	0.03%	17	0.17%	20	0.20%	22	0.22%	-		-		-		86	0.86%	-		536	5.36%
Cooper Crescent																					
7 Cooper Crescent (004-12623)	0.15	3	0.03%	17	0.17%	19	0.19%	21	0.21%	-		-		-		82	0.82%	128	1.28%	-	
11 Cooper Crescent (004-12621)	0.16	3	0.03%	17	0.17%	20	0.20%	22	0.22%	-		-		-		86	0.86%	135	1.35%	-	
19 Cooper Crescent (004-12620)	0.19	3	0.03%	21	0.21%	24	0.24%	26	0.26%	-		-		-		102	1.02%	160	1.60%	-	
21 Cooper Crescent (004-12613)	0.36	6	0.06%	40	0.40%	45	0.45%	50	0.50%	-		-		-		196	1.96%	308	3.08%	-	
23 Cooper Crescent (004-12614)	0.13	2	0.02%	14	0.14%	16	0.16%	18	0.18%	-		-		-		69	0.69%	109	1.09%	-	
31 Cooper Crescent (004-12615)	0.13	2	0.02%	14	0.14%	16	0.16%	18	0.18%	-		-		-		69	0.69%	109	1.09%	-	
37 Cooper Crescent (004-12616)	0.09	2	0.02%	10	0.10%	11	0.11%	13	0.13%	-		-		-		49	0.49%	77	0.77%	-	
Dovercourt Road																					
8 Dovercourt Road (004-13600)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
11 Dovercourt Road (004-11500)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
12 Dovercourt Road (004-13500)	0.20	3	0.03%	22	0.22%	25	0.25%	27	0.27%	27	0.27%	-		-		-		-		-	
16 Dovercourt Road (004-13400)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	31	0.31%	-		-		-		-		-	
19 Dovercourt Road (004-11600)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
22 Dovercourt Road (004-13300)	0.25	4	0.04%	28	0.28%	32	0.32%	35	0.35%	37	0.37%	-		-		-		-		-	
32 Dovercourt Road (004-13200)	0.17	3	0.03%	18	0.18%	21	0.21%	23	0.23%	15	0.15%	-		-		-		-		-	
Elroy Road																					
5 Elroy Road (004-10800)	0.24	4	0.04%	27	0.27%	30	0.30%	33	0.33%	-		-		-		-		-		-	
6 Elroy Road (004-15500)	0.17	3	0.03%	19	0.19%	22	0.22%	24	0.24%	-		-		-		16	0.16%	-		-	
12 Elroy Road (004-15400)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
18 Elroy Road (004-15300)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
25 Elroy Road (004-13800)	0.19	3	0.03%	21	0.21%	24	0.24%	26	0.26%	-		-		-		-		-		-	
26 Elroy Road (004-15200)	0.17	3	0.03%	19	0.19%	22	0.22%	24	0.24%	18	0.18%	-		-		-		-		-	
29 Elroy Road (004-13900)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	45	0.45%	-		-		-		-		-	
33 Elroy Road (004-14000)	0.30	5	0.05%	33	0.33%	38	0.38%	42	0.42%	65	0.65%	-		-		-		-		-	
37 Elroy Road (004-14100)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	45	0.45%	-		-		-		-		-	
40 Elroy Road (004-15100)	0.17	3	0.03%	19	0.19%	22	0.22%	24	0.24%	37	0.37%	-		-		-		-		-	
41 Elroy Road (004-14200)	0.20	3	0.03%	22	0.22%	25	0.25%	28	0.28%	44	0.44%	-		-		-		-		-	
46 Elroy Road (004-15000)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	26	0.26%	-		-		33	0.33%	-		-	
47 Elroy Road (004-14300)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	45	0.45%	-		-		-		-		-	
52 Elroy Road (004-14900)	0.17	3	0.03%	19	0.19%	22	0.22%	24	0.24%	13	0.13%	-		-		61	0.61%	-		-	
54 Elroy Road (004-14800)	0.30	5	0.05%	33	0.33%	38	0.38%	42	0.42%	11	0.11%	-		-		135	1.35%	186	1.86%	-	
57 Elroy Road (004-14400)	0.17	3	0.03%	19	0.19%	22	0.22%	24	0.24%	37	0.37%	-		-		-		-		-	
58 Elroy Road (004-14700)	0.22	4	0.04%	25	0.25%	28	0.28%	31	0.31%	11	0.11%	-		-		94	0.94%	148	1.48%	-	
64 Elroy Road (004-14600)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	15	0.15%	-		-		61	0.61%	96	0.96%	-	
68 Elroy Road (004-14500)	0.19	3	0.03%	21	0.21%	24	0.24%	26	0.26%	19	0.19%	-		-		53	0.53%	83	0.83%	-	
Fountain Street North																					
4813 Fountain Street North (005-04301)	37.28	361	3.60%	201	2.01%	228	2.28%	253	2.53%	391	3.91%	-		-		-		-		-	
4881 Fountain Street North (005-01000)	52.20	479	4.78%	-		-		-		-		-		-		-		-		-	
5185 Fountain Street North (005-02450)	3.75	63	0.63%	-		-		-		-		-		-		-		-		-	
Joseph Street																					
15 Joseph Street (004-04000)	0.09	2	0.02%	10	0.10%	11	0.11%	13	0.13%	-		-		-		49	0.49%	-		306	3.06%
19 Joseph Street (004-04100)	0.09	2	0.02%	10	0.10%	11	0.11%	13	0.13%	-		-		-		49	0.49%	-		306	3.06%
23 Joseph Street (004-04200)	0.09	2	0.02%	10	0.10%	11	0.11%	13	0.13%	-		-		-		49	0.49%	-		306	3.06%
27 Joseph Street (004-04300)	0.09	2	0.02%	10	0.10%	11	0.11%	13	0.13%	-		-		-		49	0.49%	-		306	3.06%
31 Joseph Street (004-04310)	0.11	2	0.02%	12	0.12%	14	0.14%	16	0.16%	-		-		-		61	0.61%	-		383	3.83%
Kennedy Road																					
7 Kennedy Road (004-09700)	0.15	3	0.03%	17	0.17%	19	0.19%	-		-		-		-		-		-		-	
13 Kennedy Road (004-11700)	0.28	5	0.05%	31	0.31%	35	0.35%	-		-		-		-		-		-		-	
16 Kennedy Road (004-20900)	0.02	-		2	0.02%	3	0.03%	3	0.03%	-		-		-		-		-		-	
21 Kennedy Road (004-11800)	0.28	5	0.05%	31	0.31%	35	0.35%	39	0.39%	60	0.60%	-		-		-		-		-	
27 Kennedy Road (004-11900)	0.27	5	0.05%	30	0.30%	34	0.34%	38	0.38%	58	0.58%	-		-		-		-		-	
30 Kennedy Road (004-13150)	0.15	3	0.03%	17	0.17%	19	0.19%	21	0.21%	32	0.32%	-		-		-		-		-	
31 Kennedy Road (004-12000)	0.26	4	0.04%	29	0.29%	33	0.33%	37	0.37%	57	0.57%	-		-		-		-		-	
34 Kennedy Road (004-13100)	0.15	3	0.03%	17	0.17%	19	0.19%	21	0.21%	32	0.32%	-		-		-		-		-	
40 Kennedy Road (004-13000)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	45	0.45%	-		-		-		-		-	
43 Kennedy Road (004-12100)	0.24	4	0.04%	27	0.27%	30	0.30%	33	0.33%	52	0.52%	-		-		-		-		-	
46 Kennedy Road (004-12900)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	45	0.45%	-		-		-		-		-	
47 Kennedy Road (004-12200)	0.23	4	0.04%	26	0.26%	29	0.29%	32	0.32%	50	0.50%	-		-		-		-		-	
52 Kennedy Road (004-12800)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	45	0.45%	-		-		-		-		-	

SCHEDULE B - SCHEDULE OF ASSESSMENTS FOR FUTURE MAINTENANCE
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

		Main Drain										Kennedy Branch		Scarlett Branch		Woolwich Branch				Berlin Branch	
		Interval 1		Interval 2		Interval 3		Interval 4		Interval 5		Interval 1		Interval 1		Interval 1		Interval 2		Interval 1	
	Total Ha	-1+000 to 0+000		0+000 to 0+357		0+357 to 0+569		0+569 to 0+880		0+880 to 1+164		0+000 to 0+076		0+000 to 0+675		0+000 to 0+0185		0+185 to 0+730		0+000 to 0+089	
Street Address (Roll No.)	Affected	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%
53 Kennedy Road (004-12300)	0.11	2	0.02%	12	0.12%	14	0.14%	16	0.16%	24	0.24%	-		-		-		-		-	
58 Kennedy Road (004-12700)	0.20	3	0.03%	22	0.22%	25	0.25%	28	0.28%	44	0.44%	-		-		-		-		-	
61 Kennedy Road (004-12400)	0.24	4	0.04%	27	0.27%	30	0.30%	33	0.33%	52	0.52%	-		-		-		-		-	
67 Kennedy Road (004-12500)	0.28	5	0.05%	31	0.31%	35	0.35%	39	0.39%	60	0.60%	420	4.20%	-		-		-		-	
69 Kennedy Road (004-12600)	0.02	-		2	0.02%	3	0.03%	3	0.03%	5	0.05%	60	0.60%	-		-		-		-	
73 Kennedy Road (004-12601)	0.01	-		1	0.01%	1	0.01%	1	0.01%	2	0.02%	20	0.20%	-		-		-		-	
76 Kennedy Road (004-12625)	0.24	4	0.04%	27	0.27%	30	0.30%	33	0.33%	-		-		-		131	1.31%	205	2.05%	-	
Lonsdale Road																					
2117 Lonsdale Road (005-04500)	3.66	46	0.46%	-		-		-		-		-		-		-		-		-	
2186 Lonsdale Road (005-04400)	0.81	11	0.11%	-		-		-		-		-		-		-		-		-	
Mader's Lane																					
37-38 Mader's Lane (004-16900)	0.01	-		1	0.01%	1	0.01%	1	0.01%	2	0.02%	-		-		-		-		-	
Menno Street																					
7 Menno Street (004-08800)	0.23	4	0.04%	26	0.26%	29	0.29%	-		-		-		-		-		-		-	
8 Menno Street (004-10300)	0.18	3	0.03%	20	0.20%	23	0.23%	-		-		-		-		-		-		-	
13 Menno Street (004-08900)	0.23	4	0.04%	24	0.24%	22	0.22%	-		-		-		-		-		-		-	
14 Menno Street (004-10200)	0.18	3	0.03%	20	0.20%	23	0.23%	-		-		-		-		-		-		-	
24 Menno Street (004-10100)	0.19	3	0.03%	21	0.21%	24	0.24%	-		-		-		-		-		-		-	
27 Menno Street (004-09000)	0.25	4	0.04%	24	0.24%	15	0.15%	-		-		-		-		-		-		-	
32 Menno Street (004-10000)	0.18	3	0.03%	20	0.20%	23	0.23%	-		-		-		-		-		-		-	
33 Menno Street (004-09100)	0.21	3	0.03%	20	0.20%	12	0.12%	-		-		-		-		-		-		-	
38 Menno Street (004-09900)	0.18	3	0.03%	20	0.20%	23	0.23%	-		-		-		-		-		-		-	
41 Menno Street (004-09300)	0.20	3	0.03%	19	0.19%	12	0.12%	-		-		-		-		-		-		-	
44 Menno Street (004-09800)	0.45	8	0.08%	50	0.50%	57	0.57%	25	0.25%	-		-		-		-		-		-	
47 Menno Street (004-09400)	0.43	6	0.06%	38	0.38%	12	0.12%	-		-		-		-		-		-		-	
53 Menno Street (004-09500)	0.43	6	0.06%	38	0.38%	12	0.12%	-		-		-		-		-		-		-	
59 Menno Street (004-09200)	0.43	6	0.06%	38	0.38%	12	0.12%	-		-		-		-		-		-		-	
60 Menno Street (004-09600)	0.17	3	0.03%	19	0.19%	22	0.22%	-		-		-		-		-		-		-	
118 Menno Street (005-04100)	19.76	219	2.18%	1,180	11.80%	1,329	13.29%	1,474	14.74%	2,283	22.83%	-		5,178	51.78%	-		-		-	
164 Menno Street (005-04201)	0.73	12	0.12%	-		-		-		-		-		-		-		-		-	
313 Menno Street (005-04305)	1.21	20	0.20%	-		-		-		-		-		-		-		-		-	
Sheridan Drive																					
10 Sheridan Drive (004-11300)	0.18	3	0.03%	20	0.20%	23	0.23%	-		-		-		-		-		-		-	
11 Sheridan Drive (004-11400)	0.19	3	0.03%	21	0.21%	24	0.24%	14	0.14%	-		-		-		-		-		-	
20 Sheridan Drive (004-11200)	0.18	3	0.03%	20	0.20%	23	0.23%	14	0.14%	-		-		-		-		-		-	
24 Sheridan Drive (004-11100)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
30 Sheridan Drive (004-11000)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
31 Sheridan Drive (004-13700)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
38 Sheridan Drive (004-10900)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	-		-		-		-		-		-	
Shields Street																					
19 Shields Street (004-04400)	0.04	1	0.01%	4	0.04%	5	0.05%	5	0.05%	-		-		-		20	0.20%	-		128	1.28%
Woolwich Street South																					
107 Woolwich Street South (004-16400)	0.06	1	0.01%	6	0.06%	8	0.08%	8	0.08%	-		-		-		33	0.33%	51	0.51%	-	
111 Woolwich Street South (004-16300)	0.20	3	0.03%	22	0.22%	25	0.25%	28	0.28%	-		-		-		110	1.10%	173	1.73%	-	
115 Woolwich Street South (004-16200)	0.25	4	0.04%	28	0.28%	31	0.31%	34	0.34%	-		-		-		135	1.35%	211	2.11%	-	
117 Woolwich Street South (004-16102)	0.37	6	0.06%	41	0.41%	46	0.46%	51	0.51%	-		-		-		200	2.00%	314	3.14%	-	
120-122 Woolwich Street South (004-03300)	0.21	4	0.04%	23	0.23%	26	0.26%	29	0.29%	-		-		-		115	1.15%	96	0.96%	331	3.31%
127 Woolwich Street South (004-16101)	0.37	6	0.06%	41	0.41%	46	0.46%	51	0.51%	-		-		-		200	2.00%	314	3.14%	-	
128 Woolwich Street South (004-03400)	0.22	4	0.04%	24	0.24%	27	0.27%	30	0.30%	-		-		-		119	1.19%	109	1.09%	306	3.06%
133 Woolwich Street South (004-16100)	0.37	6	0.06%	41	0.41%	46	0.46%	51	0.51%	-		-		-		200	2.00%	314	3.14%	-	
134 Woolwich Street South (004-03401)	0.23	4	0.04%	25	0.25%	28	0.28%	31	0.31%	-		-		-		123	1.23%	109	1.09%	331	3.31%
138 Woolwich Street South (004-03500)	0.17	3	0.03%	18	0.18%	21	0.21%	23	0.23%	-		-		-		90	0.90%	83	0.83%	230	2.30%
139 Woolwich Street South (004-16010)	0.37	6	0.06%	41	0.41%	46	0.46%	51	0.51%	-		-		-		200	2.00%	314	3.14%	-	
144 Woolwich Street South (004-03600)	0.15	3	0.03%	17	0.17%	19	0.19%	21	0.21%	-		-		-		82	0.82%	77	0.77%	204	2.04%
147 Woolwich Street South (004-16000)	0.89	14	0.14%	90	0.90%	102	1.02%	113	1.13%	-		-		-		439	4.39%	692	6.92%	-	
150 Woolwich Street South (004-03700)	0.15	3	0.03%	17	0.17%	19	0.19%	21	0.21%	-		-		-		82	0.82%	58	0.58%	281	2.81%
151 Woolwich Street South (004-15900)	0.40	7	0.07%	44	0.44%	50	0.50%	55	0.55%	-		-		-		217	2.17%	340	3.40%	-	
158 Woolwich Street South (004-06900)	0.16	3	0.03%	17	0.17%	20	0.20%	22	0.22%	-		-		-		86	0.86%	-		536	5.36%
159 Woolwich Street South (004-15800)	0.61	10	0.10%	67	0.67%	76	0.76%	85	0.85%	-		-		-		331	3.31%	-		-	
162 Woolwich Street South (004-07000)	-	-		-		-		-		-		-		-		-		-		-	
166 Woolwich Street South (004-07100)	-	-		-		-		-		-		-		-		-		-		-	
167 Woolwich Street South (004-15700)	0.20	3	0.03%	22	0.22%	25	0.25%	28	0.28%	-		-		-		110	1.10%	-		-	
169 Woolwich Street South (004-15602)	0.27	5	0.05%	30	0.30%	34	0.34%	38	0.38%	-		-		-		147	1.47%	-		-	
171 Woolwich Street South (004-15601)	0.27	5	0.05%	30	0.30%	34	0.34%	38	0.38%	-		-		-		147	1.47%	-		-	

SCHEDULE B - SCHEDULE OF ASSESSMENTS FOR FUTURE MAINTENANCE
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

		Main Drain										Kennedy Branch		Scarlett Branch		Woolwich Branch				Berlin Branch	
		Interval 1		Interval 2		Interval 3		Interval 4		Interval 5		Interval 1		Interval 1		Interval 1		Interval 2		Interval 1	
	Total Ha	-1+000 to 0+000		0+000 to 0+357		0+357 to 0+569		0+569 to 0+880		0+880 to 1+164		0+000 to 0+076		0+000 to 0+675		0+000 to 0+0185		0+185 to 0+730		0+000 to 0+089	
Street Address (Roll No.)	Affected	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%
175 Woolwich Street South (004-15600)	0.27	5	0.05%	30	0.30%	34	0.34%	38	0.38%	-		-		-		147	1.47%	-		-	
201 Woolwich Street South (004-10700)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
208 Woolwich Street South (004-2110321182)	0.02	-		2	0.02%	3	0.03%	3	0.03%	-		-		-		-		-		-	
209 Woolwich Street South (004-10600)	0.18	3	0.03%	20	0.20%	23	0.23%	25	0.25%	-		-		-		-		-		-	
214-226 Woolwich Street South (004-07400)	0.17	3	0.03%	19	0.19%	22	0.22%	4	0.04%	-		-		-		-		-		-	
215 Woolwich Street South (004-10500)	0.18	3	0.03%	20	0.20%	23	0.23%	13	0.13%	-		-		-		-		-		-	
221 Woolwich Street South (004-10400)	0.18	3	0.03%	20	0.20%	23	0.23%	-		-		-		-		-		-		-	
231 Woolwich Street South (004-07510)	7.23	321	3.20%	493	4.93%	19	0.19%	-		-		-		-		-		-		-	
232 Woolwich Street South (004-07402)	0.03	1	0.01%	3	0.03%	4	0.04%	-		-		-		-		-		-		-	
238 Woolwich Street South (004-07404)	0.04	1	0.01%	4	0.04%	5	0.05%	-		-		-		-		-		-		-	
244 Woolwich Street South (004-07406)	0.03	1	0.01%	3	0.03%	4	0.04%	-		-		-		-		-		-		-	
250 Woolwich Street South (004-07408)	0.03	1	0.01%	-		-		-		-		-		-		-		-		-	
255 Woolwich Street South (004-08700)	0.40	7	0.07%	-		-		-		-		-		-		-		-		-	
256 Woolwich Street South (004-07500)	0.94	16	0.16%	-		-		-		-		-		-		-		-		-	
262 Woolwich Street South (004-07805)	0.44	8	0.08%	-		-		-		-		-		-		-		-		-	
265 Woolwich Street South (004-08600)	3.45	594	5.92%	-		-		-		-		-		-		-		-		-	
268 Woolwich Street South (004-07900)	1.64	586	5.84%	-		-		-		-		-		-		-		-		-	
275 Woolwich Street South (004-08500)	0.81	179	1.79%	-		-		-		-		-		-		-		-		-	
278 Woolwich Street South (004-08101)	0.31	281	2.80%	-		-		-		-		-		-		-		-		-	
280 Woolwich Street South (004-08102)	2.26	475	4.74%	-		-		-		-		-		-		-		-		-	
285 Woolwich Street South (004-08400)	7.74	1,212	12.09%	-		-		-		-		-		-		-		-		-	
300 Woolwich Street South (004-08200)	-	497	4.96%	-		-		-		-		-		-		-		-		-	
305 Woolwich Street South (004-08300)	1.24	21	0.21%	-		-		-		-		-		-		-		-		-	
307 Woolwich Street South (005-02470)	1.41	24	0.24%	-		-		-		-		-		-		-		-		-	
Street Address N/A																					
(004-07810)	1.07	892	8.90%	-		-		-		-		-		-		-		-		-	
(004-08495)	0.18	3	0.03%	-		-		-		-		-		-		-		-		-	
(004-16901)	10.46	105	1.05%	-		-		-		-		-		-		-		-		-	
(004-16994)	12.41	157	1.57%	581	5.81%	659	6.59%	727	7.27%	1,120	11.20%	-		4,822	48.22%	-		-		-	
(005-02490)	0.22	1	0.01%	-		-		-		-		-		-		-		-		-	
(005-04110)	14.34	734	7.32%	-		-		-		-		-		-		-		-		-	
(005-04170)	3.29	55	0.55%	-		-		-		-		-		-		-		-		-	
(005-04350)	8.73	95	0.95%	-		-		-		-		-		-		-		-		-	
Subtotal (Lands):	221.45	7,875	78.53%	5,000	50.00%	5,000	50.00%	5,000	50.00%	5,000	50.00%	500	5.00%	10,000	100.00%	4,995	49.95%	4,999	49.99%	5,000	50.00%
Berlin Street (Township of Woolwich)	0.14	4	0.04%	102	1.02%	107	1.07%	147	1.47%	-		-		-		745	7.45%	-		4,374	43.74%
Dovercourt Road (Township of Woolwich)	0.39	10	0.10%	286	2.86%	298	2.98%	409	4.09%	20	0.20%	-		-		-		-		-	
Elroy Road (Township of Woolwich)	0.87	22	0.22%	639	6.39%	666	6.66%	913	9.13%	1,113	11.13%	-		-		-		-		-	
Fountain Street North (Region of Waterloo)	8.11	758	7.56%	874	8.74%	911	9.11%	1,249	12.49%	2,366	23.66%	-		-		-		-		-	
Kennedy Road (Township of Woolwich)	0.89	23	0.23%	654	6.54%	681	6.81%	735	7.35%	1,372	13.72%	9,500	95.00%	-		-		-		-	
Lonsdale Road (Township of Woolwich)	1.24	31	0.31%	-		-		-		-		-		-		-		-		-	
Menno Street (Township of Woolwich)	3.05	77	0.77%	552	5.52%	574	5.74%	-		-		-		-		-		-		-	
Ottawa Street (Unopened) (Township of Woolwich)	0.36	6	0.06%	-		-		-		-		-		-		-		-		-	
Scarlett Road (Unopened) (Township of Woolwich)	0.13	2	0.02%	48	0.48%	50	0.50%	68	0.68%	129	1.29%	-		-		-		-		-	
Sheridan Drive (Township of Woolwich)	0.52	13	0.13%	382	3.82%	398	3.98%	336	3.36%	-		-		-		-		-		-	
Shields Street (Township of Woolwich)	0.02	1	0.01%	15	0.15%	15	0.15%	21	0.21%	-		-		-		106	1.06%	183	1.83%	-	
Woolwich Street South (Township of Woolwich)	3.39	1,206	12.03%	1,448	14.48%	1,300	13.00%	1,122	11.22%	-		-		-		4,154	41.54%	4,818	48.18%	626	6.26%
Subtotal (Roads & Utilities):	**19.11**	2,153	21.47%	5,000	50.00%	5,000	50.00%	5,000	50.00%	5,000	50.00%	9,500	95.00%	-	0.00%	5,005	50.05%	5,001	50.01%	5,000	50.00%
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**10,028**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**	**10,000**	**100.00%**

Notes:
1. Roll numbers are per the municipality's last revised assessment roll.

SCHEDULE C - SCHEDULE FOR ACTUAL COST BYLAW
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Ha. Affected	Estimated Proratable Assessment	Estimated Non-Proratable Assessment	Estimated Gross Assessment	Allowances	Estimated NET
Twp of Woolwich (Roll No. 30-29-030-)						
Berlin Street						
8 Berlin Street (004-03701)	0.15	3,048	2,000	5,048		5,048
14 Berlin Street (004-03800)	0.16	9,199	2,000	11,199		11,199
Cooper Crescent						
7 Cooper Crescent (004-12623)	0.15	2,703	2,000	4,703	100	4,603
11 Cooper Crescent (004-12621)	0.16	5,017	2,000	7,017	1,550	5,467
19 Cooper Crescent (004-12620)	0.19	4,678	2,000	6,678		6,678
21 Cooper Crescent (004-12613)	0.36	7,325	2,000	9,325		9,325
23 Cooper Crescent (004-12614)	0.13	1,957	-	1,957		1,957
31 Cooper Crescent (004-12615)	0.13	1,957	-	1,957		1,957
37 Cooper Crescent (004-12616)	0.09	1,381	-	1,381		1,381
Dovercourt Road						
8 Dovercourt Road (004-13600)	0.18	1,978	-	1,978		1,978
11 Dovercourt Road (004-11500)	0.18	1,978	-	1,978		1,978
12 Dovercourt Road (004-13500)	0.20	2,751	-	2,751		2,751
16 Dovercourt Road (004-13400)	0.21	2,986	-	2,986		2,986
19 Dovercourt Road (004-11600)	0.18	1,978	-	1,978		1,978
22 Dovercourt Road (004-13300)	0.25	3,623	-	3,623		3,623
32 Dovercourt Road (004-13200)	0.17	2,135	-	2,135		2,135
Elroy Road						
5 Elroy Road (004-10800)	0.24	2,640	2,000	4,640		4,640
6 Elroy Road (004-15500)	0.17	1,988	2,000	3,988		3,988
12 Elroy Road (004-15400)	0.18	1,978	2,000	3,978		3,978
18 Elroy Road (004-15300)	0.18	1,978	2,000	3,978		3,978
25 Elroy Road (004-13800)	0.19	2,063	2,000	4,063		4,063
26 Elroy Road (004-15200)	0.17	2,289	2,000	4,289		4,289
29 Elroy Road (004-13900)	0.21	3,306	2,000	5,306		5,306
33 Elroy Road (004-14000)	0.30	4,723	2,000	6,723		6,723
37 Elroy Road (004-14100)	0.21	3,306	2,000	5,306		5,306
40 Elroy Road (004-15100)	0.17	2,716	2,000	4,716		4,716
41 Elroy Road (004-14200)	0.20	3,188	2,000	5,188		5,188
46 Elroy Road (004-15000)	0.18	2,730	2,000	4,730		4,730
47 Elroy Road (004-14300)	0.21	3,306	2,000	5,306		5,306
52 Elroy Road (004-14900)	0.17	2,524	2,000	4,524		4,524
54 Elroy Road (004-14800)	0.30	4,585	2,000	6,585		6,585
57 Elroy Road (004-14400)	0.17	2,716	2,000	4,716	3,300	1,416
58 Elroy Road (004-14700)	0.22	3,474	2,000	5,474		5,474
64 Elroy Road (004-14600)	0.18	2,789	2,000	4,789		4,789
68 Elroy Road (004-14500)	0.19	3,714	2,000	5,714	350	5,364
Fountain Street North						
4813 Fountain Street North (005-04301)	37.28	31,567	-	31,567		31,567
4881 Fountain Street North (005-01000)	52.20	4,337	-	4,337		4,337
5185 Fountain Street North (005-02450)	3.75	571	-	571		571
Joseph Street						
15 Joseph Street (004-04000)	0.09	1,828	-	1,828		1,828
19 Joseph Street (004-04100)	0.09	1,828	-	1,828		1,828
23 Joseph Street (004-04200)	0.09	1,828	-	1,828		1,828
27 Joseph Street (004-04300)	0.09	1,828	-	1,828		1,828
31 Joseph Street (004-04310)	0.11	2,286	-	2,286		2,286
Kennedy Road						
7 Kennedy Road (004-09700)	0.15	766	-	766		766
13 Kennedy Road (004-11700)	0.28	1,416	-	1,416		1,416
16 Kennedy Road (004-20900)	0.02	247	-	247		247
21 Kennedy Road (004-11800)	0.28	4,369	-	4,369		4,369
27 Kennedy Road (004-11900)	0.27	4,252	-	4,252		4,252
30 Kennedy Road (004-13150)	0.15	2,362	-	2,362		2,362
31 Kennedy Road (004-12000)	0.26	4,133	-	4,133		4,133
34 Kennedy Road (004-13100)	0.15	2,362	-	2,362		2,362
40 Kennedy Road (004-13000)	0.21	3,306	2,000	5,306		5,306
43 Kennedy Road (004-12100)	0.24	3,780	2,000	5,780		5,780
46 Kennedy Road (004-12900)	0.21	3,306	2,000	5,306		5,306
47 Kennedy Road (004-12200)	0.23	3,660	2,000	5,660		5,660
52 Kennedy Road (004-12800)	0.21	3,306	2,000	5,306		5,306
53 Kennedy Road (004-12300)	0.11	1,771	2,000	3,771		3,771
58 Kennedy Road (004-12700)	0.20	3,188	2,000	5,188		5,188

SCHEDULE C - SCHEDULE FOR ACTUAL COST BYLAW
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Ha. Affected	Estimated Proratable Assessment	Estimated Non-Proratable Assessment	Estimated Gross Assessment	Allowances	Estimated NET
61 Kennedy Road (004-12400)	0.24	3,780	2,000	5,780		5,780
67 Kennedy Road (004-12500)	0.28	4,892	2,000	6,892		6,892
69 Kennedy Road (004-12600)	0.02	429	-	429		429
73 Kennedy Road (004-12601)	0.01	143	-	143		143
76 Kennedy Road (004-12625)	0.24	7,084	2,000	9,084	4,050	5,034
Lonsdale Road						
2117 Lonsdale Road (005-04500)	3.66	419	-	419		419
2186 Lonsdale Road (005-04400)	0.81	102	-	102		102
Mader's Lane						
37-38 Mader's Lane (004-16900)	0.01	118	-	118		118
Menno Street						
7 Menno Street (004-08800)	0.23	1,186	2,000	3,186		3,186
8 Menno Street (004-10300)	0.18	918	2,000	2,918		2,918
13 Menno Street (004-08900)	0.23	898	-	898		898
14 Menno Street (004-10200)	0.18	918	-	918		918
24 Menno Street (004-10100)	0.19	958	-	958		958
27 Menno Street (004-09000)	0.25	649	-	649		649
32 Menno Street (004-10000)	0.18	918	-	918		918
33 Menno Street (004-09100)	0.21	528	-	528		528
38 Menno Street (004-09900)	0.18	918	-	918		918
41 Menno Street (004-09300)	0.20	526	-	526		526
44 Menno Street (004-09800)	0.45	3,358	-	3,358		3,358
47 Menno Street (004-09400)	0.43	591	-	591		591
53 Menno Street (004-09500)	0.43	591	-	591		591
59 Menno Street (004-09200)	0.43	591	-	591		591
60 Menno Street (004-09600)	0.17	881	-	881		881
118 Menno Street (005-04100)	19.76	347,343	271,433	618,776	1,300	617,476
164 Menno Street (005-04201)	0.73	111	-	111		111
313 Menno Street (005-04305)	1.21	184	-	184		184
Sheridan Drive						
10 Sheridan Drive (004-11300)	0.18	918	-	918		918
11 Sheridan Drive (004-11400)	0.19	1,532	-	1,532		1,532
20 Sheridan Drive (004-11200)	0.18	1,492	-	1,492		1,492
24 Sheridan Drive (004-11100)	0.18	1,978	-	1,978		1,978
30 Sheridan Drive (004-11000)	0.18	1,978	-	1,978		1,978
31 Sheridan Drive (004-13700)	0.18	1,978	-	1,978		1,978
38 Sheridan Drive (004-10900)	0.21	2,309	2,000	4,309		4,309
Shields Street						
19 Shields Street (004-04400)	0.04	762	-	762		762
Woolwich Street South						
107 Woolwich Street South (004-16400)	0.06	920	-	920		920
111 Woolwich Street South (004-16300)	0.20	3,107	-	3,107		3,107
115 Woolwich Street South (004-16200)	0.25	3,799	-	3,799		3,799
117 Woolwich Street South (004-16102)	0.37	5,641	-	5,641		5,641
120-122 Woolwich Street South (004-03300)	0.21	3,707	-	3,707		3,707
127 Woolwich Street South (004-16101)	0.37	68,641	2,000	70,641	7,950	62,691
128 Woolwich Street South (004-03400)	0.22	3,785	2,000	5,785		5,785
133 Woolwich Street South (004-16100)	0.37	7,441	2,000	9,441	3,550	5,891
134 Woolwich Street South (004-03401)	0.23	3,937	2,000	5,937		5,937
138 Woolwich Street South (004-03500)	0.17	2,867	2,000	4,867		4,867
139 Woolwich Street South (004-16010)	0.37	7,441	2,000	9,441	3,000	6,441
144 Woolwich Street South (004-03600)	0.15	2,601	2,000	4,601		4,601
147 Woolwich Street South (004-16000)	0.89	14,233	2,000	16,233	10,850	5,383
150 Woolwich Street South (004-03700)	0.15	2,713	2,000	4,713		4,713
151 Woolwich Street South (004-15900)	0.40	7,901	2,000	9,901		9,901
158 Woolwich Street South (004-06900)	0.16	3,199	2,000	5,199		5,199
159 Woolwich Street South (004-15800)	0.61	8,525	2,000	10,525		10,525
162 Woolwich Street South (004-07000)	-	-	2,000	2,000		2,000
166 Woolwich Street South (004-07100)	-	-	2,000	2,000		2,000
167 Woolwich Street South (004-15700)	0.20	2,841	2,000	4,841		4,841
169 Woolwich Street South (004-15602)	0.27	3,790	2,000	5,790		5,790
171 Woolwich Street South (004-15601)	0.27	3,790	2,000	5,790		5,790
175 Woolwich Street South (004-15600)	0.27	3,790	2,000	5,790		5,790
201 Woolwich Street South (004-10700)	0.18	1,978	2,000	3,978		3,978
208 Woolwich Street South (004-2110321182)	0.02	247	-	247		247
209 Woolwich Street South (004-10600)	0.18	1,978	2,000	3,978		3,978

SCHEDULE C - SCHEDULE FOR ACTUAL COST BYLAW
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Street Address (Roll No.)	Ha. Affected	Estimated Proratable Assessment	Estimated Non-Proratable Assessment	Estimated Gross Assessment	Allowances	Estimated NET
214-226 Woolwich Street South (004-07400)	0.17	1,058	-	1,058		1,058
215 Woolwich Street South (004-10500)	0.18	1,448	2,000	3,448		3,448
221 Woolwich Street South (004-10400)	0.18	918	2,000	2,918		2,918
231 Woolwich Street South (004-07510)	7.23	6,708	1,561,725	1,568,433	5,700	1,562,733
232 Woolwich Street South (004-07402)	0.03	154	2,000	2,154		2,154
238 Woolwich Street South (004-07404)	0.04	191	2,000	2,191		2,191
244 Woolwich Street South (004-07406)	0.03	154	2,000	2,154		2,154
250 Woolwich Street South (004-07408)	0.03	5	2,000	2,005		2,005
255 Woolwich Street South (004-08700)	0.40	61	-	61		61
256 Woolwich Street South (004-07500)	0.94	143	-	143		143
262 Woolwich Street South (004-07805)	0.44	68	-	68		68
265 Woolwich Street South (004-08600)	3.45	10,426	-	10,426	1,150	9,276
268 Woolwich Street South (004-07900)	1.64	10,350	-	10,350	3,800	6,550
275 Woolwich Street South (004-08500)	0.81	3,124	-	3,124		3,124
278 Woolwich Street South (004-08101)	0.31	5,047	-	5,047	450	4,597
280 Woolwich Street South (004-08102)	2.26	8,245	-	8,245	750	7,495
285 Woolwich Street South (004-08400)	7.74	21,062	-	21,062	1,250	19,812
300 Woolwich Street South (004-08200)	-	9,000	-	9,000		9,000
305 Woolwich Street South (004-08300)	1.24	189	-	189		189
307 Woolwich Street South (005-02470)	1.41	215	-	215		215
Street Address N/A						
(004-07810)	1.07	16,022	-	16,022	6,100	9,922
(004-08495)	0.18	27	-	27		27
(004-16901)	10.46	952	-	952		952
(004-16994)	12.41	262,582	252,732	515,314	2,650	512,664
(005-02490)	0.22	13	-	13		13
(005-04110)	14.34	11,641	-	11,641		11,641
(005-04170)	3.29	501	-	501		501
(005-04350)	8.73	857	-	857		857
Subtotal (Lands):	221.45	1,131,018	2,213,890	3,344,908	57,850	3,287,058
Berlin Street (Township of Woolwich)	0.14	154,267	-	154,267		154,267
Dovercourt Road (Township of Woolwich)	0.39	36,503	-	36,503		36,503
Elroy Road (Township of Woolwich)	0.87	163,339	-	163,339		163,339
Fountain Street North (Region of Waterloo)	8.11	39,690	-	39,690		39,690
Kennedy Road (Township of Woolwich)	0.89	131,364	-	131,364		131,364
Lonsdale Road (Township of Woolwich)	1.24	284	-	284		284
Menno Street (Township of Woolwich)	3.05	6,270	-	6,270		6,270
Ottawa Street (Unopened) (Township of Woolwich)	0.36	55	-	55		55
Scarlett Road (Unopened) (Township of Woolwich)	0.13	1,536	-	1,536		1,536
Sheridan Drive (Township of Woolwich)	0.52	41,810	-	41,810		41,810
Shields Street (Township of Woolwich)	0.02	461	-	461		461
Woolwich Street South (Township of Woolwich)	3.39	817,733	-	817,733		817,733
Township of Woolwich Roads (S.26 Special Assessment)	-	-	779,900	779,900		779,900
Township of Woolwich Utilities (S.26 Special Assessment)	-	-	101,680	101,680		101,680
Waterloo North Hydro (S.26 Special Assessment)	-	-	30,200	30,200		30,200
Subtotal (Roads & Utilities):	19.11	1,393,312	911,780	2,305,092	-	2,305,092
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**2,524,330**	**3,125,670**	**5,650,000**	**57,850**	**5,592,150**

Notes:

1. Roll numbers are per the municipality's last revised assessment roll.
2. As described in Section 12.6 of the report, net assessments will be adjusted at the conclusion of the project based on actual costs for completing the drain.

APPENDIX A

Calculation of Assessments

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain											
			Interval 1				Interval 2				Interval 3			
			Station	-1+000	to	0+000	Station	0+000	to	0+357	Station	0+357	to	0+569
ESTIMATED COST	Allowances				14,000				5,200				-	
	Construction				114,400				1,403,295				544,600	
	Engineering				9,200				112,300				43,600	
	Construction Services				7,200				88,400				34,300	
	Section 73 Costs				6,075				74,200				28,800	
	Net HST				2,305				28,230				10,955	
	TOTAL				153,180				1,711,625				662,255	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet
Twp of Woolwich (Roll No. 30-29-030-)														
Berlin Street														
8 Berlin Street (004-03701)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
14 Berlin Street (004-03800)	0.16	0.21	-	-	0.21	24	-	-	0.21	35	-	-	0.21	745
Cooper Crescent														
7 Cooper Crescent (004-12623)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
11 Cooper Crescent (004-12621)	0.16	0.21	-	-	0.21	24	-	-	0.21	35	-	-	0.21	745
19 Cooper Crescent (004-12620)	0.19	0.25	-	-	0.25	29	-	-	0.25	42	-	-	0.25	887
21 Cooper Crescent (004-12613)	0.36	0.48	-	-	0.48	55	-	-	0.48	81	-	-	0.48	1,702
23 Cooper Crescent (004-12614)	0.13	0.17	-	-	0.17	19	-	-	0.17	29	-	-	0.17	603
31 Cooper Crescent (004-12615)	0.13	0.17	-	-	0.17	19	-	-	0.17	29	-	-	0.17	603
37 Cooper Crescent (004-12616)	0.09	0.12	-	-	0.12	14	-	-	0.12	20	-	-	0.12	426
Dovercourt Road														
8 Dovercourt Road (004-13600)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
11 Dovercourt Road (004-11500)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
12 Dovercourt Road (004-13500)	0.20	0.26	-	-	0.26	30	-	-	0.26	44	-	-	0.26	922
16 Dovercourt Road (004-13400)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
19 Dovercourt Road (004-11600)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
22 Dovercourt Road (004-13300)	0.25	0.34	-	-	0.34	39	-	-	0.34	57	-	-	0.34	1,206
32 Dovercourt Road (004-13200)	0.17	0.22	-	-	0.22	25	-	-	0.22	37	-	-	0.22	780
Elroy Road														
5 Elroy Road (004-10800)	0.24	0.32	-	-	0.32	37	-	-	0.32	54	-	-	0.32	1,135
6 Elroy Road (004-15500)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816
12 Elroy Road (004-15400)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
18 Elroy Road (004-15300)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
25 Elroy Road (004-13800)	0.19	0.25	-	-	0.25	29	-	-	0.25	42	-	-	0.25	887
26 Elroy Road (004-15200)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816
29 Elroy Road (004-13900)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
33 Elroy Road (004-14000)	0.30	0.40	-	-	0.40	46	-	-	0.40	67	-	-	0.40	1,418
37 Elroy Road (004-14100)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
40 Elroy Road (004-15100)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816
41 Elroy Road (004-14200)	0.20	0.27	-	-	0.27	31	-	-	0.27	45	-	-	0.27	957
46 Elroy Road (004-15000)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
47 Elroy Road (004-14300)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
52 Elroy Road (004-14900)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816
54 Elroy Road (004-14800)	0.30	0.40	-	-	0.40	46	-	-	0.40	67	-	-	0.40	1,418
57 Elroy Road (004-14400)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816
58 Elroy Road (004-14700)	0.22	0.30	-	-	0.30	34	-	-	0.30	51	-	-	0.30	1,064
64 Elroy Road (004-14600)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
68 Elroy Road (004-14500)	0.19	0.25	-	-	0.25	29	-	-	0.25	42	-	-	0.25	887

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain											
			Interval 1				Interval 2				Interval 3			
			Station	-1+000	to	0+000	Station	0+000	to	0+357	Station	0+357	to	0+569
ESTIMATED COST	Allowances				14,000				5,200				-	
	Construction				114,400				1,403,295				544,600	
	Engineering				9,200				112,300				43,600	
	Construction Services				7,200				88,400				34,300	
	Section 73 Costs				6,075				74,200				28,800	
	Net HST				2,305				28,230				10,955	
	TOTAL				153,180				1,711,625				662,255	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet
Fountain Street North														
4813 Fountain Street North (005-04301)	37.28	28.54	-	-	28.54	3,266	-	-	2.42	407	-	-	2.42	8,582
4881 Fountain Street North (005-01000)	52.20	37.89	-	-	37.89	4,337	-	-	-	-	-	-	-	-
5185 Fountain Street North (005-02450)	3.75	4.99	-	-	4.99	571	-	-	-	-	-	-	-	-
Joseph Street														
15 Joseph Street (004-04000)	0.09	0.12	-	-	0.12	14	-	-	0.12	20	-	-	0.12	426
19 Joseph Street (004-04100)	0.09	0.12	-	-	0.12	14	-	-	0.12	20	-	-	0.12	426
23 Joseph Street (004-04200)	0.09	0.12	-	-	0.12	14	-	-	0.12	20	-	-	0.12	426
27 Joseph Street (004-04300)	0.09	0.12	-	-	0.12	14	-	-	0.12	20	-	-	0.12	426
31 Joseph Street (004-04310)	0.11	0.15	-	-	0.15	17	-	-	0.15	25	-	-	0.15	532
Kennedy Road														
7 Kennedy Road (004-09700)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
13 Kennedy Road (004-11700)	0.28	0.37	-	-	0.37	42	-	-	0.37	62	-	-	0.37	1,312
16 Kennedy Road (004-20900)	0.02	0.03	-	-	0.03	3	-	-	0.03	5	-	-	0.03	106
21 Kennedy Road (004-11800)	0.28	0.37	-	-	0.37	42	-	-	0.37	62	-	-	0.37	1,312
27 Kennedy Road (004-11900)	0.27	0.36	-	-	0.36	41	-	-	0.36	61	-	-	0.36	1,277
30 Kennedy Road (004-13150)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
31 Kennedy Road (004-12000)	0.26	0.35	-	-	0.35	40	-	-	0.35	59	-	-	0.35	1,241
34 Kennedy Road (004-13100)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
40 Kennedy Road (004-13000)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
43 Kennedy Road (004-12100)	0.24	0.32	-	-	0.32	37	-	-	0.32	54	-	-	0.32	1,135
46 Kennedy Road (004-12900)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
47 Kennedy Road (004-12200)	0.23	0.31	-	-	0.31	35	-	-	0.31	52	-	-	0.31	1,099
52 Kennedy Road (004-12800)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
53 Kennedy Road (004-12300)	0.11	0.15	-	-	0.15	17	-	-	0.15	25	-	-	0.15	532
58 Kennedy Road (004-12700)	0.20	0.27	-	-	0.27	31	-	-	0.27	45	-	-	0.27	957
61 Kennedy Road (004-12400)	0.24	0.32	-	-	0.32	37	-	-	0.32	54	-	-	0.32	1,135
67 Kennedy Road (004-12500)	0.28	0.37	-	-	0.37	42	-	-	0.37	62	-	-	0.37	1,312
69 Kennedy Road (004-12600)	0.02	0.03	-	-	0.03	3	-	-	0.03	5	-	-	0.03	106
73 Kennedy Road (004-12601)	0.01	0.01	-	-	0.01	1	-	-	0.01	2	-	-	0.01	35
76 Kennedy Road (004-12625)	0.24	0.32	-	-	0.32	37	-	-	0.32	54	-	-	0.32	1,135
Lonsdale Road														
2117 Lonsdale Road (005-04500)	3.66	3.66	-	-	3.66	419	-	-	-	-	-	-	-	-
2186 Lonsdale Road (005-04400)	0.81	0.89	-	-	0.89	102	-	-	-	-	-	-	-	-
Mader's Lane														
37-38 Mader's Lane (004-16900)	0.01	0.01	-	-	0.01	1	-	-	0.01	2	-	-	0.01	35
Menno Street														
7 Menno Street (004-08800)	0.23	0.31	-	-	0.31	35	-	-	0.31	52	-	2,000	0.31	1,099
8 Menno Street (004-10300)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	2,000	0.24	851
13 Menno Street (004-08900)	0.23	0.29	-	-	0.29	33	-	-	0.29	49	-	-	0.23	816
14 Menno Street (004-10200)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
24 Menno Street (004-10100)	0.19	0.25	-	-	0.25	29	-	-	0.25	42	-	-	0.25	887
27 Menno Street (004-09000)	0.25	0.29	-	-	0.29	33	-	-	0.29	49	-	-	0.16	567
32 Menno Street (004-10000)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
33 Menno Street (004-09100)	0.21	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.13	461
38 Menno Street (004-09900)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain											
			Interval 1				Interval 2				Interval 3			
			Station	-1+000	to	0+000	Station	0+000	to	0+357	Station	0+357	to	0+569
ESTIMATED COST	Allowances				14,000				5,200				-	
	Construction				114,400				1,403,295				544,600	
	Engineering				9,200				112,300				43,600	
	Construction Services				7,200				88,400				34,300	
	Section 73 Costs				6,075				74,200				28,800	
	Net HST				2,305				28,230				10,955	
	TOTAL				153,180				1,711,625				662,255	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet
41 Menno Street (004-09300)	0.20	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.13	461
44 Menno Street (004-09800)	0.45	0.60	-	-	0.60	69	-	-	0.60	101	-	-	0.60	2,128
47 Menno Street (004-09400)	0.43	0.46	-	-	0.46	53	-	-	0.46	77	-	-	0.13	461
53 Menno Street (004-09500)	0.43	0.46	-	-	0.46	53	-	-	0.46	77	-	-	0.13	461
59 Menno Street (004-09200)	0.43	0.46	-	-	0.46	53	-	-	0.46	77	-	-	0.13	461
60 Menno Street (004-09600)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816
118 Menno Street (005-04100)	19.76	17.30	-	-	17.30	1,980	-	-	14.14	2,381	60,000	-	14.14	50,143
164 Menno Street (005-04201)	0.73	0.97	-	-	0.97	111	-	-	-	-	-	-	-	-
313 Menno Street (005-04305)	1.21	1.61	-	-	1.61	184	-	-	-	-	-	-	-	-
Sheridan Drive														
10 Sheridan Drive (004-11300)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
11 Sheridan Drive (004-11400)	0.19	0.25	-	-	0.25	29	-	-	0.25	42	-	-	0.25	887
20 Sheridan Drive (004-11200)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
24 Sheridan Drive (004-11100)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
30 Sheridan Drive (004-11000)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
31 Sheridan Drive (004-13700)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
38 Sheridan Drive (004-10900)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
Shields Street														
19 Shields Street (004-04400)	0.04	0.05	-	-	0.05	6	-	-	0.05	8	-	-	0.05	177
Woolwich Street South														
107 Woolwich Street South (004-16400)	0.06	0.08	-	-	0.08	9	-	-	0.08	13	-	-	0.08	284
111 Woolwich Street South (004-16300)	0.20	0.27	-	-	0.27	31	-	-	0.27	45	-	-	0.27	957
115 Woolwich Street South (004-16200)	0.25	0.33	-	-	0.33	38	-	-	0.33	56	-	-	0.33	1,170
117 Woolwich Street South (004-16102)	0.37	0.49	-	-	0.49	56	-	-	0.49	83	-	-	0.49	1,738
120-122 Woolwich Street South (004-03300)	0.21	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
127 Woolwich Street South (004-16101)	0.37	0.49	-	-	0.49	56	-	-	0.49	83	-	-	0.49	1,738
128 Woolwich Street South (004-03400)	0.22	0.29	-	-	0.29	33	-	-	0.29	49	-	-	0.29	1,028
133 Woolwich Street South (004-16100)	0.37	0.49	-	-	0.49	56	-	-	0.49	83	-	-	0.49	1,738
134 Woolwich Street South (004-03401)	0.23	0.30	-	-	0.30	34	-	-	0.30	51	-	-	0.30	1,064
138 Woolwich Street South (004-03500)	0.17	0.22	-	-	0.22	25	-	-	0.22	37	-	-	0.22	780
139 Woolwich Street South (004-16010)	0.37	0.49	-	-	0.49	56	-	-	0.49	83	-	-	0.49	1,738
144 Woolwich Street South (004-03600)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
147 Woolwich Street South (004-16000)	0.89	1.08	-	-	1.08	124	-	-	1.08	182	-	-	1.08	3,830
150 Woolwich Street South (004-03700)	0.15	0.20	-	-	0.20	23	-	-	0.20	34	-	-	0.20	709
151 Woolwich Street South (004-15900)	0.40	0.53	-	-	0.53	61	-	-	0.53	89	-	-	0.53	1,879
158 Woolwich Street South (004-06900)	0.16	0.21	-	-	0.21	24	-	-	0.21	35	-	-	0.21	745
159 Woolwich Street South (004-15800)	0.61	0.81	-	-	0.81	93	-	-	0.81	136	-	-	0.81	2,872
162 Woolwich Street South (004-07000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
166 Woolwich Street South (004-07100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
167 Woolwich Street South (004-15700)	0.20	0.27	-	-	0.27	31	-	-	0.27	45	-	-	0.27	957
169 Woolwich Street South (004-15602)	0.27	0.36	-	-	0.36	41	-	-	0.36	61	-	-	0.36	1,277
171 Woolwich Street South (004-15601)	0.27	0.36	-	-	0.36	41	-	-	0.36	61	-	-	0.36	1,277
175 Woolwich Street South (004-15600)	0.27	0.36	-	-	0.36	41	-	-	0.36	61	-	-	0.36	1,277
201 Woolwich Street South (004-10700)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
208 Woolwich Street South (004-2110321182)	0.02	0.03	-	-	0.03	3	-	-	0.03	5	-	-	0.03	106
209 Woolwich Street South (004-10600)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	-	0.24	851
214-226 Woolwich Street South (004-07400)	0.17	0.23	-	-	0.23	26	-	-	0.23	39	-	-	0.23	816

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain											
			Interval 1				Interval 2				Interval 3			
			Station	-1+000	to	0+000	Station	0+000	to	0+357	Station	0+357	to	0+569
ESTIMATED COST	Allowances				14,000				5,200				-	
	Construction				114,400				1,403,295				544,600	
	Engineering				9,200				112,300				43,600	
	Construction Services				7,200				88,400				34,300	
	Section 73 Costs				6,075				74,200				28,800	
	Net HST				2,305				28,230				10,955	
	TOTAL				153,180				1,711,625				662,255	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet
215 Woolwich Street South (004-10500)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	2,000	0.24	851
221 Woolwich Street South (004-10400)	0.18	0.24	-	-	0.24	27	-	-	0.24	40	-	2,000	0.24	851
231 Woolwich Street South (004-07510)	7.23	7.01	4,200	-	7.01	802	-	1,561,725	5.92	997	-	-	0.20	709
232 Woolwich Street South (004-07402)	0.03	0.04	-	-	0.04	5	-	-	0.04	7	-	2,000	0.04	142
238 Woolwich Street South (004-07404)	0.04	0.05	-	-	0.05	6	-	2,000	0.05	8	-	-	0.05	177
244 Woolwich Street South (004-07406)	0.03	0.04	-	-	0.04	5	-	2,000	0.04	7	-	-	0.04	142
250 Woolwich Street South (004-07408)	0.03	0.04	-	-	0.04	5	-	2,000	-	-	-	-	-	-
255 Woolwich Street South (004-08700)	0.40	0.53	-	-	0.53	61	-	-	-	-	-	-	-	-
256 Woolwich Street South (004-07500)	0.94	1.25	-	-	1.25	143	-	-	-	-	-	-	-	-
262 Woolwich Street South (004-07805)	0.44	0.59	-	-	0.59	68	-	-	-	-	-	-	-	-
265 Woolwich Street South (004-08600)	3.45	2.85	10,100	-	2.85	326	-	-	-	-	-	-	-	-
268 Woolwich Street South (004-07900)	1.64	2.18	10,100	-	2.18	250	-	-	-	-	-	-	-	-
275 Woolwich Street South (004-08500)	0.81	1.08	3,000	-	1.08	124	-	-	-	-	-	-	-	-
278 Woolwich Street South (004-08101)	0.31	0.41	5,000	-	0.41	47	-	-	-	-	-	-	-	-
280 Woolwich Street South (004-08102)	2.26	3.01	7,900	-	3.01	345	-	-	-	-	-	-	-	-
285 Woolwich Street South (004-08400)	7.74	7.53	20,200	-	7.53	862	-	-	-	-	-	-	-	-
300 Woolwich Street South (004-08200)	-	-	9,000	-	-	-	-	-	-	-	-	-	-	-
305 Woolwich Street South (004-08300)	1.24	1.65	-	-	1.65	189	-	-	-	-	-	-	-	-
307 Woolwich Street South (005-02470)	1.41	1.88	-	-	1.88	215	-	-	-	-	-	-	-	-
Street Address N/A														
(004-07810)	1.07	1.07	15,900	-	1.07	122	-	-	-	-	-	-	-	-
(004-08495)	0.18	0.24	-	-	0.24	27	-	-	-	-	-	-	-	-
(004-16901)	10.46	8.32	-	-	8.32	952	-	-	-	-	-	-	-	-
(004-16994)	12.41	12.41	-	-	12.41	1,420	-	-	6.94	1,169	60,000	-	6.94	24,611
(005-02490)	0.22	0.11	-	-	0.11	13	-	-	-	-	-	-	-	-
(005-04110)	14.34	14.34	10,000	-	14.34	1,641	-	-	-	-	-	-	-	-
(005-04170)	3.29	4.38	-	-	4.38	501	-	-	-	-	-	-	-	-
(005-04350)	8.73	7.49	-	-	7.49	857	-	-	-	-	-	-	-	-
Subtotal (Lands):	221.45	204.87	95,400	-	204.87	23,438	-	1,567,725	60.07	10,107	120,000	10,000	52.96	187,809
Berlin Street (Township of Woolwich)	0.14	0.28	-	-	0.28	32	-	-	0.28	47	-	-	0.28	993
Dovercourt Road (Township of Woolwich)	0.39	0.78	-	-	0.78	89	-	-	0.78	131	-	-	0.78	2,766
Elroy Road (Township of Woolwich)	0.87	1.74	-	-	1.74	199	-	-	1.74	293	-	-	1.74	6,170
Fountain Street North (Region of Waterloo)	8.11	16.22	10,000	-	16.22	1,856	-	-	2.38	401	-	-	2.38	8,440
Kennedy Road (Township of Woolwich)	0.89	1.78	-	-	1.78	204	-	-	1.78	300	-	-	1.78	6,312
Lonsdale Road (Township of Woolwich)	1.24	2.48	-	-	2.48	284	-	-	-	-	-	-	-	-
Menno Street (Township of Woolwich)	3.05	6.10	-	-	6.10	698	-	-	1.50	253	-	-	1.50	5,319
Ottawa Street (Unopened) (Township of Woolwich)	0.36	0.48	-	-	0.48	55	-	-	-	-	-	-	-	-
Scarlett Road (Unopened) (Township of Woolwich)	0.13	0.13	-	-	0.13	15	-	-	0.13	22	-	-	0.13	461
Sheridan Drive (Township of Woolwich)	0.52	1.04	-	-	1.04	119	-	-	1.04	175	-	-	1.04	3,688
Shields Street (Township of Woolwich)	0.02	0.04	-	-	0.04	5	-	-	0.04	7	-	-	0.04	142
Woolwich Street South (Township of Woolwich)	3.39	6.78	20,000	-	6.78	786	-	-	3.90	664	110,000	-	3.40	12,055
Township of Woolwich Roads (S.26 Special Assessment)						-		96,400		-		188,100		-
Township of Woolwich Utilities (S.26 Special Assessment)						-		35,100		-				-
Waterloo North Hydro (S.26 Special Assessment)						-				-				-
Subtotal (Roads & Utilities):	19.11	37.85	30,000	-	37.85	4,342	-	131,500	13.57	2,293	110,000	188,100	13.07	46,346
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**242.72**	**125,400**	**0**	**242.72**	**27,780**	**0**	**1,699,225**	**73.64**	**12,400**	**230,000**	**198,100**	**66.03**	**234,155**

Notes:
1. Roll numbers are per the municipality's last revised assessment roll.

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain - Cont'd											
			Interval 4				Interval 5				Main Drain			
			Station	0+569	to	0+880	Station	0+880	to	1+164	Total			
ESTIMATED COST	Allowances				-				3,300				22,500	
	Construction				684,900				434,060				3,181,255	
	Engineering				54,800				34,700				254,600	
	Construction Services				43,100				27,300				200,300	
	Section 73 Costs				36,200				23,000				168,275	
	Net HST				13,780				8,730				64,000	
	TOTAL				832,780				531,090				3,890,930	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Main Drain
Twp of Woolwich (Roll No. 30-29-030-)														
Berlin Street														
8 Berlin Street (004-03701)	0.15	0.20	-	-	0.20	884	-	-	-	-	-	-	1,650	1,650
14 Berlin Street (004-03800)	0.16	0.21	-	-	0.21	928	-	-	-	-	-	-	1,732	1,732
Cooper Crescent														
7 Cooper Crescent (004-12623)	0.15	0.20	-	-	0.20	884	-	-	-	-	-	-	1,650	1,650
11 Cooper Crescent (004-12621)	0.16	0.21	-	-	0.21	928	-	-	-	-	-	-	1,732	1,732
19 Cooper Crescent (004-12620)	0.19	0.25	-	-	0.25	1,105	-	-	-	-	-	-	2,063	2,063
21 Cooper Crescent (004-12613)	0.36	0.48	-	-	0.48	2,121	-	-	-	-	-	-	3,959	3,959
23 Cooper Crescent (004-12614)	0.13	0.17	-	-	0.17	751	-	-	-	-	-	-	1,402	1,402
31 Cooper Crescent (004-12615)	0.13	0.17	-	-	0.17	751	-	-	-	-	-	-	1,402	1,402
37 Cooper Crescent (004-12616)	0.09	0.12	-	-	0.12	530	-	-	-	-	-	-	990	990
Dovercourt Road														
8 Dovercourt Road (004-13600)	0.18	0.24	-	-	0.24	1,060	-	-	-	-	-	-	1,978	1,978
11 Dovercourt Road (004-11500)	0.18	0.24	-	-	0.24	1,060	-	-	-	-	-	-	1,978	1,978
12 Dovercourt Road (004-13500)	0.20	0.26	-	-	0.26	1,149	-	-	0.17	606	-	-	2,751	2,751
16 Dovercourt Road (004-13400)	0.21	0.28	-	-	0.28	1,237	-	-	0.19	677	-	-	2,986	2,986
19 Dovercourt Road (004-11600)	0.18	0.24	-	-	0.24	1,060	-	-	-	-	-	-	1,978	1,978
22 Dovercourt Road (004-13300)	0.25	0.34	-	-	0.34	1,502	-	-	0.23	819	-	-	3,623	3,623
32 Dovercourt Road (004-13200)	0.17	0.22	-	-	0.22	972	-	-	0.09	321	-	-	2,135	2,135
Elroy Road														
5 Elroy Road (004-10800)	0.24	0.32	-	2,000	0.32	1,414	-	-	-	-	-	2,000	2,640	4,640
6 Elroy Road (004-15500)	0.17	0.23	-	-	0.23	1,016	-	-	-	-	-	-	1,897	1,897
12 Elroy Road (004-15400)	0.18	0.24	-	2,000	0.24	1,060	-	-	-	-	-	2,000	1,978	3,978
18 Elroy Road (004-15300)	0.18	0.24	-	2,000	0.24	1,060	-	-	-	-	-	2,000	1,978	3,978
25 Elroy Road (004-13800)	0.19	0.25	-	2,000	0.25	1,105	-	-	-	-	-	2,000	2,063	4,063
26 Elroy Road (004-15200)	0.17	0.23	-	2,000	0.23	1,016	-	-	0.11	392	-	2,000	2,289	4,289
29 Elroy Road (004-13900)	0.21	0.28	-	2,000	0.28	1,237	-	-	0.28	997	-	2,000	3,306	5,306
33 Elroy Road (004-14000)	0.30	0.40	-	-	0.40	1,767	-	2,000	0.40	1,425	-	2,000	4,723	6,723
37 Elroy Road (004-14100)	0.21	0.28	-	-	0.28	1,237	-	2,000	0.28	997	-	2,000	3,306	5,306
40 Elroy Road (004-15100)	0.17	0.23	-	-	0.23	1,016	-	2,000	0.23	819	-	2,000	2,716	4,716
41 Elroy Road (004-14200)	0.20	0.27	-	-	0.27	1,193	-	2,000	0.27	962	-	2,000	3,188	5,188
46 Elroy Road (004-15000)	0.18	0.24	-	-	0.24	1,060	-	2,000	0.16	570	-	2,000	2,548	4,548
47 Elroy Road (004-14300)	0.21	0.28	-	-	0.28	1,237	-	2,000	0.28	997	-	2,000	3,306	5,306
52 Elroy Road (004-14900)	0.17	0.23	-	-	0.23	1,016	-	2,000	0.08	285	-	2,000	2,182	4,182
54 Elroy Road (004-14800)	0.30	0.40	-	-	0.40	1,767	-	2,000	0.07	249	-	2,000	3,547	5,547
57 Elroy Road (004-14400)	0.17	0.23	-	-	0.23	1,016	-	2,000	0.23	819	-	2,000	2,716	4,716
58 Elroy Road (004-14700)	0.22	0.30	-	-	0.30	1,325	-	2,000	0.07	249	-	2,000	2,723	4,723
64 Elroy Road (004-14600)	0.18	0.24	-	-	0.24	1,060	-	2,000	0.09	321	-	2,000	2,299	4,299
68 Elroy Road (004-14500)	0.19	0.25	-	-	0.25	1,105	-	2,000	0.12	427	-	2,000	2,490	4,490

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain - Cont'd											
			Interval 4				Interval 5				Main Drain			
			Station	0+569	to	0+880	Station	0+880	to	1+164	Total			
ESTIMATED COST	Allowances				-				3,300				22,500	
	Construction				684,900				434,060				3,181,255	
	Engineering				54,800				34,700				254,600	
	Construction Services				43,100				27,300				200,300	
	Section 73 Costs				36,200				23,000				168,275	
	Net HST				13,780				8,730				64,000	
	TOTAL				832,780				531,090				3,890,930	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Main Drain
Fountain Street North														
4813 Fountain Street North (005-04301)	37.28	28.54	-	-	2.42	10,692	-	-	2.42	8,620	-	-	31,567	31,567
4881 Fountain Street North (005-01000)	52.20	37.89	-	-	-	-	-	-	-	-	-	-	4,337	4,337
5185 Fountain Street North (005-02450)	3.75	4.99	-	-	-	-	-	-	-	-	-	-	571	571
Joseph Street														
15 Joseph Street (004-04000)	0.09	0.12	-	-	0.12	530	-	-	-	-	-	-	990	990
19 Joseph Street (004-04100)	0.09	0.12	-	-	0.12	530	-	-	-	-	-	-	990	990
23 Joseph Street (004-04200)	0.09	0.12	-	-	0.12	530	-	-	-	-	-	-	990	990
27 Joseph Street (004-04300)	0.09	0.12	-	-	0.12	530	-	-	-	-	-	-	990	990
31 Joseph Street (004-04310)	0.11	0.15	-	-	0.15	663	-	-	-	-	-	-	1,237	1,237
Kennedy Road														
7 Kennedy Road (004-09700)	0.15	0.20	-	-	-	-	-	-	-	-	-	-	766	766
13 Kennedy Road (004-11700)	0.28	0.37	-	-	-	-	-	-	-	-	-	-	1,416	1,416
16 Kennedy Road (004-20900)	0.02	0.03	-	-	0.03	133	-	-	-	-	-	-	247	247
21 Kennedy Road (004-11800)	0.28	0.37	-	-	0.37	1,635	-	-	0.37	1,318	-	-	4,369	4,369
27 Kennedy Road (004-11900)	0.27	0.36	-	-	0.36	1,591	-	-	0.36	1,282	-	-	4,252	4,252
30 Kennedy Road (004-13150)	0.15	0.20	-	-	0.20	884	-	-	0.20	712	-	-	2,362	2,362
31 Kennedy Road (004-12000)	0.26	0.35	-	-	0.35	1,546	-	-	0.35	1,247	-	-	4,133	4,133
34 Kennedy Road (004-13100)	0.15	0.20	-	-	0.20	884	-	-	0.20	712	-	-	2,362	2,362
40 Kennedy Road (004-13000)	0.21	0.28	-	-	0.28	1,237	-	-	0.28	997	-	-	3,306	3,306
43 Kennedy Road (004-12100)	0.24	0.32	-	-	0.32	1,414	-	-	0.32	1,140	-	-	3,780	3,780
46 Kennedy Road (004-12900)	0.21	0.28	-	-	0.28	1,237	-	-	0.28	997	-	-	3,306	3,306
47 Kennedy Road (004-12200)	0.23	0.31	-	-	0.31	1,370	-	-	0.31	1,104	-	-	3,660	3,660
52 Kennedy Road (004-12800)	0.21	0.28	-	-	0.28	1,237	-	-	0.28	997	-	-	3,306	3,306
53 Kennedy Road (004-12300)	0.11	0.15	-	-	0.15	663	-	-	0.15	534	-	-	1,771	1,771
58 Kennedy Road (004-12700)	0.20	0.27	-	-	0.27	1,193	-	2,000	0.27	962	-	2,000	3,188	5,188
61 Kennedy Road (004-12400)	0.24	0.32	-	-	0.32	1,414	-	2,000	0.32	1,140	-	2,000	3,780	5,780
67 Kennedy Road (004-12500)	0.28	0.37	-	-	0.37	1,635	-	-	0.37	1,318	-	-	4,369	4,369
69 Kennedy Road (004-12600)	0.02	0.03	-	-	0.03	133	-	-	0.03	107	-	-	354	354
73 Kennedy Road (004-12601)	0.01	0.01	-	-	0.01	44	-	-	0.01	36	-	-	118	118
76 Kennedy Road (004-12625)	0.24	0.32	-	-	0.32	1,414	-	-	-	-	-	-	2,640	2,640
Lonsdale Road														
2117 Lonsdale Road (005-04500)	3.66	3.66	-	-	-	-	-	-	-	-	-	-	419	419
2186 Lonsdale Road (005-04400)	0.81	0.89	-	-	-	-	-	-	-	-	-	-	102	102
Mader's Lane														
37-38 Mader's Lane (004-16900)	0.01	0.01	-	-	0.01	44	-	-	0.01	36	-	-	118	118
Menno Street														
7 Menno Street (004-08800)	0.23	0.31	-	-	-	-	-	-	-	-	-	2,000	1,186	3,186
8 Menno Street (004-10300)	0.18	0.24	-	-	-	-	-	-	-	-	-	2,000	918	2,918
13 Menno Street (004-08900)	0.23	0.29	-	-	-	-	-	-	-	-	-	-	898	898
14 Menno Street (004-10200)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	918	918
24 Menno Street (004-10100)	0.19	0.25	-	-	-	-	-	-	-	-	-	-	958	958
27 Menno Street (004-09000)	0.25	0.29	-	-	-	-	-	-	-	-	-	-	649	649
32 Menno Street (004-10000)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	918	918
33 Menno Street (004-09100)	0.21	0.24	-	-	-	-	-	-	-	-	-	-	528	528
38 Menno Street (004-09900)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	918	918

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain - Cont'd											
			Interval 4				Interval 5				Main Drain			
			Station	0+569	to	0+880	Station	0+880	to	1+164	Total			
ESTIMATED COST	Allowances				-				3,300				22,500	
	Construction				684,900				434,060				3,181,255	
	Engineering				54,800				34,700				254,600	
	Construction Services				43,100				27,300				200,300	
	Section 73 Costs				36,200				23,000				168,275	
	Net HST				13,780				8,730				64,000	
	TOTAL				832,780				531,090				3,890,930	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Main Drain
41 Menno Street (004-09300)	0.20	0.23	-	-	-	-	-	-	-	-	-	-	526	526
44 Menno Street (004-09800)	0.45	0.60	-	-	0.24	1,060	-	-	-	-	-	-	3,358	3,358
47 Menno Street (004-09400)	0.43	0.46	-	-	-	-	-	-	-	-	-	-	591	591
53 Menno Street (004-09500)	0.43	0.46	-	-	-	-	-	-	-	-	-	-	591	591
59 Menno Street (004-09200)	0.43	0.46	-	-	-	-	-	-	-	-	-	-	591	591
60 Menno Street (004-09600)	0.17	0.23	-	-	-	-	-	-	-	-	-	-	881	881
118 Menno Street (005-04100)	19.76	17.30	60,000	-	14.14	62,475	60,000	-	14.14	50,364	180,000	-	167,343	347,343
164 Menno Street (005-04201)	0.73	0.97	-	-	-	-	-	-	-	-	-	-	111	111
313 Menno Street (005-04305)	1.21	1.61	-	-	-	-	-	-	-	-	-	-	184	184
Sheridan Drive														
10 Sheridan Drive (004-11300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	918	918
11 Sheridan Drive (004-11400)	0.19	0.25	-	-	0.13	574	-	-	-	-	-	-	1,532	1,532
20 Sheridan Drive (004-11200)	0.18	0.24	-	-	0.13	574	-	-	-	-	-	-	1,492	1,492
24 Sheridan Drive (004-11100)	0.18	0.24	-	-	0.24	1,060	-	-	-	-	-	-	1,978	1,978
30 Sheridan Drive (004-11000)	0.18	0.24	-	-	0.24	1,060	-	-	-	-	-	-	1,978	1,978
31 Sheridan Drive (004-13700)	0.18	0.24	-	-	0.24	1,060	-	-	-	-	-	-	1,978	1,978
38 Sheridan Drive (004-10900)	0.21	0.28	-	2,000	0.28	1,237	-	-	-	-	-	2,000	2,309	4,309
Shields Street														
19 Shields Street (004-04400)	0.04	0.05	-	-	0.05	221	-	-	-	-	-	-	412	412
Woolwich Street South														
107 Woolwich Street South (004-16400)	0.06	0.08	-	-	0.08	353	-	-	-	-	-	-	659	659
111 Woolwich Street South (004-16300)	0.20	0.27	-	-	0.27	1,193	-	-	-	-	-	-	2,226	2,226
115 Woolwich Street South (004-16200)	0.25	0.33	-	-	0.33	1,458	-	-	-	-	-	-	2,722	2,722
117 Woolwich Street South (004-16102)	0.37	0.49	-	-	0.49	2,165	-	-	-	-	-	-	4,042	4,042
120-122 Woolwich Street South (004-03300)	0.21	0.28	-	-	0.28	1,237	-	-	-	-	-	-	2,309	2,309
127 Woolwich Street South (004-16101)	0.37	0.49	-	-	0.49	2,165	-	-	-	-	-	-	4,042	4,042
128 Woolwich Street South (004-03400)	0.22	0.29	-	-	0.29	1,281	-	-	-	-	-	-	2,391	2,391
133 Woolwich Street South (004-16100)	0.37	0.49	-	-	0.49	2,165	-	-	-	-	-	-	4,042	4,042
134 Woolwich Street South (004-03401)	0.23	0.30	-	-	0.30	1,325	-	-	-	-	-	-	2,474	2,474
138 Woolwich Street South (004-03500)	0.17	0.22	-	-	0.22	972	-	-	-	-	-	-	1,814	1,814
139 Woolwich Street South (004-16010)	0.37	0.49	-	-	0.49	2,165	-	-	-	-	-	-	4,042	4,042
144 Woolwich Street South (004-03600)	0.15	0.20	-	-	0.20	884	-	-	-	-	-	-	1,650	1,650
147 Woolwich Street South (004-16000)	0.89	1.08	-	-	1.08	4,772	-	-	-	-	-	-	8,908	8,908
150 Woolwich Street South (004-03700)	0.15	0.20	-	-	0.20	884	-	-	-	-	-	-	1,650	1,650
151 Woolwich Street South (004-15900)	0.40	0.53	-	-	0.53	2,342	-	-	-	-	-	-	4,371	4,371
158 Woolwich Street South (004-06900)	0.16	0.21	-	-	0.21	928	-	-	-	-	-	-	1,732	1,732
159 Woolwich Street South (004-15800)	0.61	0.81	-	-	0.81	3,579	-	-	-	-	-	-	6,680	6,680
162 Woolwich Street South (004-07000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
166 Woolwich Street South (004-07100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
167 Woolwich Street South (004-15700)	0.20	0.27	-	-	0.27	1,193	-	-	-	-	-	-	2,226	2,226
169 Woolwich Street South (004-15602)	0.27	0.36	-	-	0.36	1,591	-	-	-	-	-	-	2,970	2,970
171 Woolwich Street South (004-15601)	0.27	0.36	-	-	0.36	1,591	-	-	-	-	-	-	2,970	2,970
175 Woolwich Street South (004-15600)	0.27	0.36	-	-	0.36	1,591	-	-	-	-	-	-	2,970	2,970
201 Woolwich Street South (004-10700)	0.18	0.24	-	2,000	0.24	1,060	-	-	-	-	-	2,000	1,978	3,978
208 Woolwich Street South (004-2110321182)	0.02	0.03	-	-	0.03	133	-	-	-	-	-	-	247	247
209 Woolwich Street South (004-10600)	0.18	0.24	-	2,000	0.24	1,060	-	-	-	-	-	2,000	1,978	3,978
214-226 Woolwich Street South (004-07400)	0.17	0.23	-	-	0.04	177	-	-	-	-	-	-	1,058	1,058

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Main Drain - Cont'd											
			Interval 4				Interval 5				Main Drain			
			Station	0+569	to	0+880	Station	0+880	to	1+164	Total			
ESTIMATED COST	Allowances				-				3,300				22,500	
	Construction				684,900				434,060				3,181,255	
	Engineering				54,800				34,700				254,600	
	Construction Services				43,100				27,300				200,300	
	Section 73 Costs				36,200				23,000				168,275	
	Net HST				13,780				8,730				64,000	
	TOTAL				832,780				531,090				3,890,930	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Main Drain
215 Woolwich Street South (004-10500)	0.18	0.24	-	-	0.12	530	-	-	-	-	-	2,000	1,448	3,448
221 Woolwich Street South (004-10400)	0.18	0.24	-	-	-	-	-	-	-	-	-	2,000	918	2,918
231 Woolwich Street South (004-07510)	7.23	7.01	-	-	-	-	-	-	-	-	4,200	1,561,725	2,508	1,568,433
232 Woolwich Street South (004-07402)	0.03	0.04	-	-	-	-	-	-	-	-	-	2,000	154	2,154
238 Woolwich Street South (004-07404)	0.04	0.05	-	-	-	-	-	-	-	-	-	2,000	191	2,191
244 Woolwich Street South (004-07406)	0.03	0.04	-	-	-	-	-	-	-	-	-	2,000	154	2,154
250 Woolwich Street South (004-07408)	0.03	0.04	-	-	-	-	-	-	-	-	-	2,000	5	2,005
255 Woolwich Street South (004-08700)	0.40	0.53	-	-	-	-	-	-	-	-	-	-	61	61
256 Woolwich Street South (004-07500)	0.94	1.25	-	-	-	-	-	-	-	-	-	-	143	143
262 Woolwich Street South (004-07805)	0.44	0.59	-	-	-	-	-	-	-	-	-	-	68	68
265 Woolwich Street South (004-08600)	3.45	2.85	-	-	-	-	-	-	-	-	10,100	-	326	10,426
268 Woolwich Street South (004-07900)	1.64	2.18	-	-	-	-	-	-	-	-	10,100	-	250	10,350
275 Woolwich Street South (004-08500)	0.81	1.08	-	-	-	-	-	-	-	-	3,000	-	124	3,124
278 Woolwich Street South (004-08101)	0.31	0.41	-	-	-	-	-	-	-	-	5,000	-	47	5,047
280 Woolwich Street South (004-08102)	2.26	3.01	-	-	-	-	-	-	-	-	7,900	-	345	8,245
285 Woolwich Street South (004-08400)	7.74	7.53	-	-	-	-	-	-	-	-	20,200	-	862	21,062
300 Woolwich Street South (004-08200)	-	-	-	-	-	-	-	-	-	-	9,000	-	-	9,000
305 Woolwich Street South (004-08300)	1.24	1.65	-	-	-	-	-	-	-	-	-	-	189	189
307 Woolwich Street South (005-02470)	1.41	1.88	-	-	-	-	-	-	-	-	-	-	215	215
Street Address N/A														
(004-07810)	1.07	1.07	-	-	-	-	-	-	-	-	15,900	-	122	16,022
(004-08495)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	27	27
(004-16901)	10.46	8.32	-	-	-	-	-	-	-	-	-	-	952	952
(004-16994)	12.41	12.41	60,000	-	6.94	30,663	60,000	-	6.94	24,719	180,000	-	82,582	262,582
(005-02490)	0.22	0.11	-	-	-	-	-	-	-	-	-	-	13	13
(005-04110)	14.34	14.34	-	-	-	-	-	-	-	-	10,000	-	1,641	11,641
(005-04170)	3.29	4.38	-	-	-	-	-	-	-	-	-	-	501	501
(005-04350)	8.73	7.49	-	-	-	-	-	-	-	-	-	-	857	857
Subtotal (Lands):	221.45	204.87	120,000	18,000	47.89	211,590	120,000	28,000	30.96	110,274	455,400	1,623,725	543,218	2,622,343
Berlin Street (Township of Woolwich)	0.14	0.28	-	-	0.28	1,237	-	-	-	-	-	-	2,309	2,309
Dovercourt Road (Township of Woolwich)	0.39	0.78	-	-	0.78	3,446	30,000	-	0.02	71	30,000	-	6,503	36,503
Elroy Road (Township of Woolwich)	0.87	1.74	70,000	-	1.74	7,688	75,000	-	1.12	3,989	145,000	-	18,339	163,339
Fountain Street North (Region of Waterloo)	8.11	16.22	-	-	2.38	10,516	-	-	2.38	8,477	10,000	-	29,690	39,690
Kennedy Road (Township of Woolwich)	0.89	1.78	35,000	-	1.40	6,186	50,000	-	1.38	4,915	85,000	-	17,917	102,917
Lonsdale Road (Township of Woolwich)	1.24	2.48	-	-	-	-	-	-	-	-	-	-	284	284
Menno Street (Township of Woolwich)	3.05	6.10	-	-	-	-	-	-	-	-	-	-	6,270	6,270
Ottawa Street (Unopened) (Township of Woolwich)	0.36	0.48	-	-	-	-	-	-	-	-	-	-	55	55
Scarlett Road (Unopened) (Township of Woolwich)	0.13	0.13	-	-	0.13	574	-	-	0.13	464	-	-	1,536	1,536
Sheridan Drive (Township of Woolwich)	0.52	1.04	35,000	-	0.64	2,828	-	-	-	-	35,000	-	6,810	41,810
Shields Street (Township of Woolwich)	0.02	0.04	-	-	0.04	177	-	-	-	-	-	-	331	331
Woolwich Street South (Township of Woolwich)	3.39	6.78	130,000	-	2.14	9,458	-	-	-	-	260,000	-	22,963	282,963
Township of Woolwich Roads (S.26 Special Assessment)				132,300		-		82,500		-	-	499,300	-	499,300
Township of Woolwich Utilities (S.26 Special Assessment)				27,880		-		10,900		-	-	73,880	-	73,880
Waterloo North Hydro (S.26 Special Assessment)				10,900		-		6,500		-	-	17,400	-	17,400
Subtotal (Roads & Utilities):	19.11	37.85	270,000	171,080	9.53	42,110	155,000	99,900	5.03	17,916	565,000	590,580	113,007	1,268,587
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**242.72**	**390,000**	**189,080**	**57.42**	**253,700**	**275,000**	**127,900**	**35.99**	**128,190**	**1,020,400**	**2,214,305**	**656,225**	**3,890,930**

Notes:
1. Roll numbers are per the municipality's last revised assessment roll.

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Kennedy Branch					Scarlett Branch				
			Station	Interval 1 0+000	to	0+076		Station	Interval 1 0+000	to	0+675	
ESTIMATED COST	Allowances				-					3,950		
	Construction				43,200					443,200		
	Engineering				3,500					35,500		
	Construction Services				2,700					27,900		
	Section 73 Costs				2,300					23,400		
	Net HST				870					8,915		
	TOTAL				52,570					542,865		
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Kennedy Branch	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Scarlett Branch
Twp of Woolwich (Roll No. 30-29-030-)												
Berlin Street												
8 Berlin Street (004-03701)	0.15	0.20	-	-	-	-	-	-	-	-	-	-
14 Berlin Street (004-03800)	0.16	0.21	-	-	-	-	-	-	-	-	-	-
Cooper Crescent												
7 Cooper Crescent (004-12623)	0.15	0.20	400	-	-	-	400	-	-	-	-	-
11 Cooper Crescent (004-12621)	0.16	0.21	800	-	-	-	800	-	-	-	-	-
19 Cooper Crescent (004-12620)	0.19	0.25	-	-	-	-	-	-	-	-	-	-
21 Cooper Crescent (004-12613)	0.36	0.48	-	-	-	-	-	-	-	-	-	-
23 Cooper Crescent (004-12614)	0.13	0.17	-	-	-	-	-	-	-	-	-	-
31 Cooper Crescent (004-12615)	0.13	0.17	-	-	-	-	-	-	-	-	-	-
37 Cooper Crescent (004-12616)	0.09	0.12	-	-	-	-	-	-	-	-	-	-
Dovercourt Road												
8 Dovercourt Road (004-13600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
11 Dovercourt Road (004-11500)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
12 Dovercourt Road (004-13500)	0.20	0.26	-	-	-	-	-	-	-	-	-	-
16 Dovercourt Road (004-13400)	0.21	0.28	-	-	-	-	-	-	-	-	-	-
19 Dovercourt Road (004-11600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
22 Dovercourt Road (004-13300)	0.25	0.34	-	-	-	-	-	-	-	-	-	-
32 Dovercourt Road (004-13200)	0.17	0.22	-	-	-	-	-	-	-	-	-	-
Elroy Road												
5 Elroy Road (004-10800)	0.24	0.32	-	-	-	-	-	-	-	-	-	-
6 Elroy Road (004-15500)	0.17	0.23	-	-	-	-	-	-	-	-	-	-
12 Elroy Road (004-15400)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
18 Elroy Road (004-15300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
25 Elroy Road (004-13800)	0.19	0.25	-	-	-	-	-	-	-	-	-	-
26 Elroy Road (004-15200)	0.17	0.23	-	-	-	-	-	-	-	-	-	-
29 Elroy Road (004-13900)	0.21	0.28	-	-	-	-	-	-	-	-	-	-
33 Elroy Road (004-14000)	0.30	0.40	-	-	-	-	-	-	-	-	-	-
37 Elroy Road (004-14100)	0.21	0.28	-	-	-	-	-	-	-	-	-	-
40 Elroy Road (004-15100)	0.17	0.23	-	-	-	-	-	-	-	-	-	-
41 Elroy Road (004-14200)	0.20	0.27	-	-	-	-	-	-	-	-	-	-
46 Elroy Road (004-15000)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
47 Elroy Road (004-14300)	0.21	0.28	-	-	-	-	-	-	-	-	-	-
52 Elroy Road (004-14900)	0.17	0.23	-	-	-	-	-	-	-	-	-	-
54 Elroy Road (004-14800)	0.30	0.40	-	-	-	-	-	-	-	-	-	-
57 Elroy Road (004-14400)	0.17	0.23	-	-	-	-	-	-	-	-	-	-
58 Elroy Road (004-14700)	0.22	0.30	-	-	-	-	-	-	-	-	-	-
64 Elroy Road (004-14600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
68 Elroy Road (004-14500)	0.19	0.25	800	-	-	-	800	-	-	-	-	-

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Kennedy Branch					Scarlett Branch				
			Station	Interval 1 0+000	to	0+076		Station	Interval 1 0+000	to	0+675	
ESTIMATED COST	Allowances				-					3,950		
	Construction				43,200					443,200		
	Engineering				3,500					35,500		
	Construction Services				2,700					27,900		
	Section 73 Costs				2,300					23,400		
	Net HST				870					8,915		
	TOTAL				52,570					542,865		
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Kennedy Branch	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Scarlett Branch
Fountain Street North												
4813 Fountain Street North (005-04301)	37.28	28.54	-	-	-	-	-	-	-	2.42	-	-
4881 Fountain Street North (005-01000)	52.20	37.89	-	-	-	-	-	-	-	-	-	-
5185 Fountain Street North (005-02450)	3.75	4.99	-	-	-	-	-	-	-	-	-	-
Joseph Street												
15 Joseph Street (004-04000)	0.09	0.12	-	-	-	-	-	-	-	-	-	-
19 Joseph Street (004-04100)	0.09	0.12	-	-	-	-	-	-	-	-	-	-
23 Joseph Street (004-04200)	0.09	0.12	-	-	-	-	-	-	-	-	-	-
27 Joseph Street (004-04300)	0.09	0.12	-	-	-	-	-	-	-	-	-	-
31 Joseph Street (004-04310)	0.11	0.15	-	-	-	-	-	-	-	-	-	-
Kennedy Road												
7 Kennedy Road (004-09700)	0.15	0.20	-	-	-	-	-	-	-	-	-	-
13 Kennedy Road (004-11700)	0.28	0.37	-	-	-	-	-	-	-	-	-	-
16 Kennedy Road (004-20900)	0.02	0.03	-	-	-	-	-	-	-	-	-	-
21 Kennedy Road (004-11800)	0.28	0.37	-	-	-	-	-	-	-	0.37	-	-
27 Kennedy Road (004-11900)	0.27	0.36	-	-	-	-	-	-	-	0.36	-	-
30 Kennedy Road (004-13150)	0.15	0.20	-	-	-	-	-	-	-	-	-	-
31 Kennedy Road (004-12000)	0.26	0.35	-	-	-	-	-	-	-	0.35	-	-
34 Kennedy Road (004-13100)	0.15	0.20	-	-	-	-	-	-	-	-	-	-
40 Kennedy Road (004-13000)	0.21	0.28	-	-	-	-	-	-	2,000	-	-	2,000
43 Kennedy Road (004-12100)	0.24	0.32	-	-	-	-	-	-	2,000	0.32	-	2,000
46 Kennedy Road (004-12900)	0.21	0.28	-	-	-	-	-	-	2,000	-	-	2,000
47 Kennedy Road (004-12200)	0.23	0.31	-	-	-	-	-	-	2,000	0.31	-	2,000
52 Kennedy Road (004-12800)	0.21	0.28	-	-	-	-	-	-	2,000	-	-	2,000
53 Kennedy Road (004-12300)	0.11	0.15	-	-	-	-	-	-	2,000	0.15	-	2,000
58 Kennedy Road (004-12700)	0.20	0.27	-	-	-	-	-	-	-	-	-	-
61 Kennedy Road (004-12400)	0.24	0.32	-	-	-	-	-	-	-	-	-	-
67 Kennedy Road (004-12500)	0.28	0.37	-	2,000	0.21	523	2,523	-	-	-	-	-
69 Kennedy Road (004-12600)	0.02	0.03	-	-	0.03	75	75	-	-	-	-	-
73 Kennedy Road (004-12601)	0.01	0.01	-	-	0.01	25	25	-	-	-	-	-
76 Kennedy Road (004-12625)	0.24	0.32	1,600	-	-	-	1,600	-	-	-	-	-
Lonsdale Road												
2117 Lonsdale Road (005-04500)	3.66	3.66	-	-	-	-	-	-	-	-	-	-
2186 Lonsdale Road (005-04400)	0.81	0.89	-	-	-	-	-	-	-	-	-	-
Mader's Lane												
37-38 Mader's Lane (004-16900)	0.01	0.01	-	-	-	-	-	-	-	0.01	-	-
Menno Street												
7 Menno Street (004-08800)	0.23	0.31	-	-	-	-	-	-	-	-	-	-
8 Menno Street (004-10300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
13 Menno Street (004-08900)	0.23	0.29	-	-	-	-	-	-	-	-	-	-
14 Menno Street (004-10200)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
24 Menno Street (004-10100)	0.19	0.25	-	-	-	-	-	-	-	-	-	-
27 Menno Street (004-09000)	0.25	0.29	-	-	-	-	-	-	-	-	-	-
32 Menno Street (004-10000)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
33 Menno Street (004-09100)	0.21	0.24	-	-	-	-	-	-	-	-	-	-
38 Menno Street (004-09900)	0.18	0.24	-	-	-	-	-	-	-	-	-	-

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Kennedy Branch					Scarlett Branch				
			Station	Interval 1 0+000	to	0+076		Station	Interval 1 0+000	to	0+675	
ESTIMATED COST	Allowances				-					3,950		
	Construction				43,200					443,200		
	Engineering				3,500					35,500		
	Construction Services				2,700					27,900		
	Section 73 Costs				2,300					23,400		
	Net HST				870					8,915		
	TOTAL				52,570					542,865		
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Kennedy Branch	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Scarlett Branch
41 Menno Street (004-09300)	0.20	0.23	-	-	-	-	-	-	-	-	-	-
44 Menno Street (004-09800)	0.45	0.60	-	-	-	-	-	-	-	-	-	-
47 Menno Street (004-09400)	0.43	0.46	-	-	-	-	-	-	-	-	-	-
53 Menno Street (004-09500)	0.43	0.46	-	-	-	-	-	-	-	-	-	-
59 Menno Street (004-09200)	0.43	0.46	-	-	-	-	-	-	-	-	-	-
60 Menno Street (004-09600)	0.17	0.23	-	-	-	-	-	-	-	-	-	-
118 Menno Street (005-04100)	19.76	17.30	-	-	-	-	-	-	271,433	14.14	-	271,433
164 Menno Street (005-04201)	0.73	0.97	-	-	-	-	-	-	-	-	-	-
313 Menno Street (005-04305)	1.21	1.61	-	-	-	-	-	-	-	-	-	-
Sheridan Drive												
10 Sheridan Drive (004-11300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
11 Sheridan Drive (004-11400)	0.19	0.25	-	-	-	-	-	-	-	-	-	-
20 Sheridan Drive (004-11200)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
24 Sheridan Drive (004-11100)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
30 Sheridan Drive (004-11000)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
31 Sheridan Drive (004-13700)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
38 Sheridan Drive (004-10900)	0.21	0.28	-	-	-	-	-	-	-	-	-	-
Shields Street												
19 Shields Street (004-04400)	0.04	0.05	-	-	-	-	-	-	-	-	-	-
Woolwich Street South												
107 Woolwich Street South (004-16400)	0.06	0.08	-	-	-	-	-	-	-	-	-	-
111 Woolwich Street South (004-16300)	0.20	0.27	-	-	-	-	-	-	-	-	-	-
115 Woolwich Street South (004-16200)	0.25	0.33	-	-	-	-	-	-	-	-	-	-
117 Woolwich Street South (004-16102)	0.37	0.49	-	-	-	-	-	-	-	-	-	-
120-122 Woolwich Street South (004-03300)	0.21	0.28	-	-	-	-	-	-	-	-	-	-
127 Woolwich Street South (004-16101)	0.37	0.49	-	-	-	-	-	-	-	-	-	-
128 Woolwich Street South (004-03400)	0.22	0.29	-	-	-	-	-	-	-	-	-	-
133 Woolwich Street South (004-16100)	0.37	0.49	-	-	-	-	-	-	-	-	-	-
134 Woolwich Street South (004-03401)	0.23	0.30	-	-	-	-	-	-	-	-	-	-
138 Woolwich Street South (004-03500)	0.17	0.22	-	-	-	-	-	-	-	-	-	-
139 Woolwich Street South (004-16010)	0.37	0.49	-	-	-	-	-	-	-	-	-	-
144 Woolwich Street South (004-03600)	0.15	0.20	-	-	-	-	-	-	-	-	-	-
147 Woolwich Street South (004-16000)	0.89	1.08	-	-	-	-	-	-	-	-	-	-
150 Woolwich Street South (004-03700)	0.15	0.20	-	-	-	-	-	-	-	-	-	-
151 Woolwich Street South (004-15900)	0.40	0.53	-	-	-	-	-	-	-	-	-	-
158 Woolwich Street South (004-06900)	0.16	0.21	-	-	-	-	-	-	-	-	-	-
159 Woolwich Street South (004-15800)	0.61	0.81	-	-	-	-	-	-	-	-	-	-
162 Woolwich Street South (004-07000)	-	-	-	-	-	-	-	-	-	-	-	-
166 Woolwich Street South (004-07100)	-	-	-	-	-	-	-	-	-	-	-	-
167 Woolwich Street South (004-15700)	0.20	0.27	-	-	-	-	-	-	-	-	-	-
169 Woolwich Street South (004-15602)	0.27	0.36	-	-	-	-	-	-	-	-	-	-
171 Woolwich Street South (004-15601)	0.27	0.36	-	-	-	-	-	-	-	-	-	-
175 Woolwich Street South (004-15600)	0.27	0.36	-	-	-	-	-	-	-	-	-	-
201 Woolwich Street South (004-10700)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
208 Woolwich Street South (004-2110321182)	0.02	0.03	-	-	-	-	-	-	-	-	-	-
209 Woolwich Street South (004-10600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
214-226 Woolwich Street South (004-07400)	0.17	0.23	-	-	-	-	-	-	-	-	-	-

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Kennedy Branch					Scarlett Branch				
			Station	Interval 1 0+000	to	0+076		Station	Interval 1 0+000	to	0+675	
ESTIMATED COST	Allowances				-					3,950		
	Construction				43,200					443,200		
	Engineering				3,500					35,500		
	Construction Services				2,700					27,900		
	Section 73 Costs				2,300					23,400		
	Net HST				870					8,915		
	TOTAL				52,570					542,865		
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Kennedy Branch	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Scarlett Branch
215 Woolwich Street South (004-10500)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
221 Woolwich Street South (004-10400)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
231 Woolwich Street South (004-07510)	7.23	7.01	-	-	-	-	-	-	-	-	-	-
232 Woolwich Street South (004-07402)	0.03	0.04	-	-	-	-	-	-	-	-	-	-
238 Woolwich Street South (004-07404)	0.04	0.05	-	-	-	-	-	-	-	-	-	-
244 Woolwich Street South (004-07406)	0.03	0.04	-	-	-	-	-	-	-	-	-	-
250 Woolwich Street South (004-07408)	0.03	0.04	-	-	-	-	-	-	-	-	-	-
255 Woolwich Street South (004-08700)	0.40	0.53	-	-	-	-	-	-	-	-	-	-
256 Woolwich Street South (004-07500)	0.94	1.25	-	-	-	-	-	-	-	-	-	-
262 Woolwich Street South (004-07805)	0.44	0.59	-	-	-	-	-	-	-	-	-	-
265 Woolwich Street South (004-08600)	3.45	2.85	-	-	-	-	-	-	-	-	-	-
268 Woolwich Street South (004-07900)	1.64	2.18	-	-	-	-	-	-	-	-	-	-
275 Woolwich Street South (004-08500)	0.81	1.08	-	-	-	-	-	-	-	-	-	-
278 Woolwich Street South (004-08101)	0.31	0.41	-	-	-	-	-	-	-	-	-	-
280 Woolwich Street South (004-08102)	2.26	3.01	-	-	-	-	-	-	-	-	-	-
285 Woolwich Street South (004-08400)	7.74	7.53	-	-	-	-	-	-	-	-	-	-
300 Woolwich Street South (004-08200)	-	-	-	-	-	-	-	-	-	-	-	-
305 Woolwich Street South (004-08300)	1.24	1.65	-	-	-	-	-	-	-	-	-	-
307 Woolwich Street South (005-02470)	1.41	1.88	-	-	-	-	-	-	-	-	-	-
Street Address N/A												
(004-07810)	1.07	1.07	-	-	-	-	-	-	-	-	-	-
(004-08495)	0.18	0.24	-	-	-	-	-	-	-	-	-	-
(004-16901)	10.46	8.32	-	-	-	-	-	-	-	-	-	-
(004-16994)	12.41	12.41	-	-	-	-	-	-	252,732	6.94	-	252,732
(005-02490)	0.22	0.11	-	-	-	-	-	-	-	-	-	-
(005-04110)	14.34	14.34	-	-	-	-	-	-	-	-	-	-
(005-04170)	3.29	4.38	-	-	-	-	-	-	-	-	-	-
(005-04350)	8.73	7.49	-	-	-	-	-	-	-	-	-	-
Subtotal (Lands):	221.45	204.87	3,600	2,000	0.25	623	6,223	-	536,165	25.37	-	536,165
Berlin Street (Township of Woolwich)	0.14	0.28	-	-	-	-	-	-	-	-	-	-
Dovercourt Road (Township of Woolwich)	0.39	0.78	-	-	-	-	-	-	-	-	-	-
Elroy Road (Township of Woolwich)	0.87	1.74	-	-	-	-	-	-	-	-	-	-
Fountain Street North (Region of Waterloo)	8.11	16.22	-	-	-	-	-	-	-	2.38	-	-
Kennedy Road (Township of Woolwich)	0.89	1.78	28,000	-	0.18	447	28,447	-	-	0.48	-	-
Lonsdale Road (Township of Woolwich)	1.24	2.48	-	-	-	-	-	-	-	-	-	-
Menno Street (Township of Woolwich)	3.05	6.10	-	-	-	-	-	-	-	-	-	-
Ottawa Street (Unopened) (Township of Woolwich)	0.36	0.48	-	-	-	-	-	-	-	-	-	-
Scarlett Road (Unopened) (Township of Woolwich)	0.13	0.13	-	-	-	-	-	-	-	0.13	-	-
Sheridan Drive (Township of Woolwich)	0.52	1.04	-	-	-	-	-	-	-	-	-	-
Shields Street (Township of Woolwich)	0.02	0.04	-	-	-	-	-	-	-	-	-	-
Woolwich Street South (Township of Woolwich)	3.39	6.78	-	-	-	-	-	-	-	-	-	-
Township of Woolwich Roads (S.26 Special Assessment)				4,900			4,900		4,600			4,600
Township of Woolwich Utilities (S.26 Special Assessment)				10,900			10,900					-
Waterloo North Hydro (S.26 Special Assessment)				2,100			2,100		2,100			2,100
Subtotal (Roads & Utilities):	19.11	37.85	28,000	17,900	0.18	447	46,347	-	6,700	2.99	-	6,700
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**242.72**	**31,600**	**19,900**	**0.43**	**1,070**	**52,570**	**0**	**542,865**	**28.36**	**0**	**542,865**

Notes:
1. Roll numbers are per the municipality's last revised assessment roll.

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Woolwich Branch											
			Interval 1				Interval 2				Woolwich Branch Total			
			Station	0+000	to	0+185	Station	0+185	to	0+730				
ESTIMATED COST	Allowances				-				31,400				31,400	
	Construction				364,900				509,700				874,600	
	Engineering				29,200				40,800				70,000	
	Construction Services				23,000				32,100				55,100	
	Section 73 Costs				19,300				27,000				46,300	
	Net HST				7,340				10,255				17,595	
	TOTAL				443,740				651,255				1,094,995	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Woolwich Branch
Twp of Woolwich (Roll No. 30-29-030-)														
Berlin Street														
8 Berlin Street (004-03701)	0.15	0.20	-	-	0.20	456	-	-	-	-	-	-	456	456
14 Berlin Street (004-03800)	0.16	0.21	-	-	0.21	478	-	-	-	-	-	-	478	478
Cooper Crescent														
7 Cooper Crescent (004-12623)	0.15	0.20	-	-	0.20	456	-	2,000	0.20	197	-	2,000	653	2,653
11 Cooper Crescent (004-12621)	0.16	0.21	-	-	0.21	478	1,800	2,000	0.21	207	1,800	2,000	685	4,485
19 Cooper Crescent (004-12620)	0.19	0.25	-	-	0.25	569	1,800	2,000	0.25	246	1,800	2,000	815	4,615
21 Cooper Crescent (004-12613)	0.36	0.48	-	-	0.48	1,093	1,800	2,000	0.48	473	1,800	2,000	1,566	5,366
23 Cooper Crescent (004-12614)	0.13	0.17	-	-	0.17	387	-	-	0.17	168	-	-	555	555
31 Cooper Crescent (004-12615)	0.13	0.17	-	-	0.17	387	-	-	0.17	168	-	-	555	555
37 Cooper Crescent (004-12616)	0.09	0.12	-	-	0.12	273	-	-	0.12	118	-	-	391	391
Dovercourt Road														
8 Dovercourt Road (004-13600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
11 Dovercourt Road (004-11500)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
12 Dovercourt Road (004-13500)	0.20	0.26	-	-	-	-	-	-	-	-	-	-	-	-
16 Dovercourt Road (004-13400)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
19 Dovercourt Road (004-11600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
22 Dovercourt Road (004-13300)	0.25	0.34	-	-	-	-	-	-	-	-	-	-	-	-
32 Dovercourt Road (004-13200)	0.17	0.22	-	-	-	-	-	-	-	-	-	-	-	-
Elroy Road														
5 Elroy Road (004-10800)	0.24	0.32	-	-	-	-	-	-	-	-	-	-	-	-
6 Elroy Road (004-15500)	0.17	0.23	-	2,000	0.04	91	-	-	-	-	-	2,000	91	2,091
12 Elroy Road (004-15400)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
18 Elroy Road (004-15300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
25 Elroy Road (004-13800)	0.19	0.25	-	-	-	-	-	-	-	-	-	-	-	-
26 Elroy Road (004-15200)	0.17	0.23	-	-	-	-	-	-	-	-	-	-	-	-
29 Elroy Road (004-13900)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
33 Elroy Road (004-14000)	0.30	0.40	-	-	-	-	-	-	-	-	-	-	-	-
37 Elroy Road (004-14100)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
40 Elroy Road (004-15100)	0.17	0.23	-	-	-	-	-	-	-	-	-	-	-	-
41 Elroy Road (004-14200)	0.20	0.27	-	-	-	-	-	-	-	-	-	-	-	-
46 Elroy Road (004-15000)	0.18	0.24	-	-	0.08	182	-	-	-	-	-	-	182	182
47 Elroy Road (004-14300)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
52 Elroy Road (004-14900)	0.17	0.23	-	-	0.15	342	-	-	-	-	-	-	342	342
54 Elroy Road (004-14800)	0.30	0.40	-	-	0.33	752	-	-	0.29	286	-	-	1,038	1,038
57 Elroy Road (004-14400)	0.17	0.23	-	-	-	-	-	-	-	-	-	-	-	-
58 Elroy Road (004-14700)	0.22	0.30	-	-	0.23	524	-	-	0.23	227	-	-	751	751
64 Elroy Road (004-14600)	0.18	0.24	-	-	0.15	342	-	-	0.15	148	-	-	490	490
68 Elroy Road (004-14500)	0.19	0.25	-	-	0.13	296	-	-	0.13	128	-	-	424	424

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Woolwich Branch											
			Interval 1				Interval 2				Woolwich Branch Total			
			Station	0+000	to	0+185	Station	0+185	to	0+730				
ESTIMATED COST	Allowances				-				31,400				31,400	
	Construction				364,900				509,700				874,600	
	Engineering				29,200				40,800				70,000	
	Construction Services				23,000				32,100				55,100	
	Section 73 Costs				19,300				27,000				46,300	
	Net HST				7,340				10,255				17,595	
	TOTAL				443,740				651,255				1,094,995	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Woolwich Branch
Fountain Street North														
4813 Fountain Street North (005-04301)	37.28	28.54	-	-	-	-	-	-	-	-	-	-	-	-
4881 Fountain Street North (005-01000)	52.20	37.89	-	-	-	-	-	-	-	-	-	-	-	-
5185 Fountain Street North (005-02450)	3.75	4.99	-	-	-	-	-	-	-	-	-	-	-	-
Joseph Street														
15 Joseph Street (004-04000)	0.09	0.12	-	-	0.12	273	-	-	-	-	-	-	273	273
19 Joseph Street (004-04100)	0.09	0.12	-	-	0.12	273	-	-	-	-	-	-	273	273
23 Joseph Street (004-04200)	0.09	0.12	-	-	0.12	273	-	-	-	-	-	-	273	273
27 Joseph Street (004-04300)	0.09	0.12	-	-	0.12	273	-	-	-	-	-	-	273	273
31 Joseph Street (004-04310)	0.11	0.15	-	-	0.15	342	-	-	-	-	-	-	342	342
Kennedy Road														
7 Kennedy Road (004-09700)	0.15	0.20	-	-	-	-	-	-	-	-	-	-	-	-
13 Kennedy Road (004-11700)	0.28	0.37	-	-	-	-	-	-	-	-	-	-	-	-
16 Kennedy Road (004-20900)	0.02	0.03	-	-	-	-	-	-	-	-	-	-	-	-
21 Kennedy Road (004-11800)	0.28	0.37	-	-	-	-	-	-	-	-	-	-	-	-
27 Kennedy Road (004-11900)	0.27	0.36	-	-	-	-	-	-	-	-	-	-	-	-
30 Kennedy Road (004-13150)	0.15	0.20	-	-	-	-	-	-	-	-	-	-	-	-
31 Kennedy Road (004-12000)	0.26	0.35	-	-	-	-	-	-	-	-	-	-	-	-
34 Kennedy Road (004-13100)	0.15	0.20	-	-	-	-	-	-	-	-	-	-	-	-
40 Kennedy Road (004-13000)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
43 Kennedy Road (004-12100)	0.24	0.32	-	-	-	-	-	-	-	-	-	-	-	-
46 Kennedy Road (004-12900)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
47 Kennedy Road (004-12200)	0.23	0.31	-	-	-	-	-	-	-	-	-	-	-	-
52 Kennedy Road (004-12800)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
53 Kennedy Road (004-12300)	0.11	0.15	-	-	-	-	-	-	-	-	-	-	-	-
58 Kennedy Road (004-12700)	0.20	0.27	-	-	-	-	-	-	-	-	-	-	-	-
61 Kennedy Road (004-12400)	0.24	0.32	-	-	-	-	-	-	-	-	-	-	-	-
67 Kennedy Road (004-12500)	0.28	0.37	-	-	-	-	-	-	-	-	-	-	-	-
69 Kennedy Road (004-12600)	0.02	0.03	-	-	-	-	-	-	-	-	-	-	-	-
73 Kennedy Road (004-12601)	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-
76 Kennedy Road (004-12625)	0.24	0.32	-	-	0.32	729	1,800	2,000	0.32	315	1,800	2,000	1,044	4,844
Lonsdale Road														
2117 Lonsdale Road (005-04500)	3.66	3.66	-	-	-	-	-	-	-	-	-	-	-	-
2186 Lonsdale Road (005-04400)	0.81	0.89	-	-	-	-	-	-	-	-	-	-	-	-
Mader's Lane														
37-38 Mader's Lane (004-16900)	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-
Menno Street														
7 Menno Street (004-08800)	0.23	0.31	-	-	-	-	-	-	-	-	-	-	-	-
8 Menno Street (004-10300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
13 Menno Street (004-08900)	0.23	0.29	-	-	-	-	-	-	-	-	-	-	-	-
14 Menno Street (004-10200)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
24 Menno Street (004-10100)	0.19	0.25	-	-	-	-	-	-	-	-	-	-	-	-
27 Menno Street (004-09000)	0.25	0.29	-	-	-	-	-	-	-	-	-	-	-	-
32 Menno Street (004-10000)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
33 Menno Street (004-09100)	0.21	0.24	-	-	-	-	-	-	-	-	-	-	-	-
38 Menno Street (004-09900)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Woolwich Branch											
			Interval 1				Interval 2				Woolwich Branch Total			
			Station	0+000	to	0+185	Station	0+185	to	0+730				
ESTIMATED COST	Allowances				-				31,400				31,400	
	Construction				364,900				509,700				874,600	
	Engineering				29,200				40,800				70,000	
	Construction Services				23,000				32,100				55,100	
	Section 73 Costs				19,300				27,000				46,300	
	Net HST				7,340				10,255				17,595	
	TOTAL				443,740				651,255				1,094,995	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Woolwich Branch
41 Menno Street (004-09300)	0.20	0.23	-	-	-	-	-	-	-	-	-	-	-	-
44 Menno Street (004-09800)	0.45	0.60	-	-	-	-	-	-	-	-	-	-	-	-
47 Menno Street (004-09400)	0.43	0.46	-	-	-	-	-	-	-	-	-	-	-	-
53 Menno Street (004-09500)	0.43	0.46	-	-	-	-	-	-	-	-	-	-	-	-
59 Menno Street (004-09200)	0.43	0.46	-	-	-	-	-	-	-	-	-	-	-	-
60 Menno Street (004-09600)	0.17	0.23	-	-	-	-	-	-	-	-	-	-	-	-
118 Menno Street (005-04100)	19.76	17.30	-	-	-	-	-	-	-	-	-	-	-	-
164 Menno Street (005-04201)	0.73	0.97	-	-	-	-	-	-	-	-	-	-	-	-
313 Menno Street (005-04305)	1.21	1.61	-	-	-	-	-	-	-	-	-	-	-	-
Sheridan Drive														
10 Sheridan Drive (004-11300)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
11 Sheridan Drive (004-11400)	0.19	0.25	-	-	-	-	-	-	-	-	-	-	-	-
20 Sheridan Drive (004-11200)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
24 Sheridan Drive (004-11100)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
30 Sheridan Drive (004-11000)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
31 Sheridan Drive (004-13700)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
38 Sheridan Drive (004-10900)	0.21	0.28	-	-	-	-	-	-	-	-	-	-	-	-
Shields Street														
19 Shields Street (004-04400)	0.04	0.05	-	-	0.05	114	-	-	-	-	-	-	114	114
Woolwich Street South														
107 Woolwich Street South (004-16400)	0.06	0.08	-	-	0.08	182	-	-	0.08	79	-	-	261	261
111 Woolwich Street South (004-16300)	0.20	0.27	-	-	0.27	615	-	-	0.27	266	-	-	881	881
115 Woolwich Street South (004-16200)	0.25	0.33	-	-	0.33	752	-	-	0.33	325	-	-	1,077	1,077
117 Woolwich Street South (004-16102)	0.37	0.49	-	-	0.49	1,116	-	-	0.49	483	-	-	1,599	1,599
120-122 Woolwich Street South (004-03300)	0.21	0.28	-	-	0.28	638	-	-	0.15	148	-	-	786	786
127 Woolwich Street South (004-16101)	0.37	0.49	30,000	-	0.49	1,116	33,000	2,000	0.49	483	63,000	2,000	1,599	66,599
128 Woolwich Street South (004-03400)	0.22	0.29	-	-	0.29	661	-	2,000	0.17	168	-	2,000	829	2,829
133 Woolwich Street South (004-16100)	0.37	0.49	-	-	0.49	1,116	1,800	2,000	0.49	483	1,800	2,000	1,599	5,399
134 Woolwich Street South (004-03401)	0.23	0.30	-	-	0.30	683	-	2,000	0.17	168	-	2,000	851	2,851
138 Woolwich Street South (004-03500)	0.17	0.22	-	-	0.22	501	-	2,000	0.13	128	-	2,000	629	2,629
139 Woolwich Street South (004-16010)	0.37	0.49	-	-	0.49	1,116	1,800	2,000	0.49	483	1,800	2,000	1,599	5,399
144 Woolwich Street South (004-03600)	0.15	0.20	-	-	0.20	456	-	2,000	0.12	118	-	2,000	574	2,574
147 Woolwich Street South (004-16000)	0.89	1.08	-	-	1.08	2,460	1,800	2,000	1.08	1,065	1,800	2,000	3,525	7,325
150 Woolwich Street South (004-03700)	0.15	0.20	-	-	0.20	456	-	2,000	0.09	89	-	2,000	545	2,545
151 Woolwich Street South (004-15900)	0.40	0.53	-	-	0.53	1,207	1,800	2,000	0.53	523	1,800	2,000	1,730	5,530
158 Woolwich Street South (004-06900)	0.16	0.21	-	-	0.21	478	-	-	-	-	-	-	478	478
159 Woolwich Street South (004-15800)	0.61	0.81	-	2,000	0.81	1,845	-	-	-	-	-	2,000	1,845	3,845
162 Woolwich Street South (004-07000)	-	-	-	2,000	-	-	-	-	-	-	-	2,000	-	2,000
166 Woolwich Street South (004-07100)	-	-	-	2,000	-	-	-	-	-	-	-	2,000	-	2,000
167 Woolwich Street South (004-15700)	0.20	0.27	-	2,000	0.27	615	-	-	-	-	-	2,000	615	2,615
169 Woolwich Street South (004-15602)	0.27	0.36	-	2,000	0.36	820	-	-	-	-	-	2,000	820	2,820
171 Woolwich Street South (004-15601)	0.27	0.36	-	2,000	0.36	820	-	-	-	-	-	2,000	820	2,820
175 Woolwich Street South (004-15600)	0.27	0.36	-	2,000	0.36	820	-	-	-	-	-	2,000	820	2,820
201 Woolwich Street South (004-10700)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
208 Woolwich Street South (004-2110321182)	0.02	0.03	-	-	-	-	-	-	-	-	-	-	-	-
209 Woolwich Street South (004-10600)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
214-226 Woolwich Street South (004-07400)	0.17	0.23	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Woolwich Branch											
			Interval 1				Interval 2				Woolwich Branch Total			
			Station	0+000	to	0+185	Station	0+185	to	0+730				
ESTIMATED COST	Allowances				-				31,400				31,400	
	Construction				364,900				509,700				874,600	
	Engineering				29,200				40,800				70,000	
	Construction Services				23,000				32,100				55,100	
	Section 73 Costs				19,300				27,000				46,300	
	Net HST				7,340				10,255				17,595	
	TOTAL				443,740				651,255				1,094,995	
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Benefit (Proratable)	Total Benefit (Non-Proratable)	Total Outlet	Total Woolwich Branch
215 Woolwich Street South (004-10500)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
221 Woolwich Street South (004-10400)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
231 Woolwich Street South (004-07510)	7.23	7.01	-	-	-	-	-	-	-	-	-	-	-	-
232 Woolwich Street South (004-07402)	0.03	0.04	-	-	-	-	-	-	-	-	-	-	-	-
238 Woolwich Street South (004-07404)	0.04	0.05	-	-	-	-	-	-	-	-	-	-	-	-
244 Woolwich Street South (004-07406)	0.03	0.04	-	-	-	-	-	-	-	-	-	-	-	-
250 Woolwich Street South (004-07408)	0.03	0.04	-	-	-	-	-	-	-	-	-	-	-	-
255 Woolwich Street South (004-08700)	0.40	0.53	-	-	-	-	-	-	-	-	-	-	-	-
256 Woolwich Street South (004-07500)	0.94	1.25	-	-	-	-	-	-	-	-	-	-	-	-
262 Woolwich Street South (004-07805)	0.44	0.59	-	-	-	-	-	-	-	-	-	-	-	-
265 Woolwich Street South (004-08600)	3.45	2.85	-	-	-	-	-	-	-	-	-	-	-	-
268 Woolwich Street South (004-07900)	1.64	2.18	-	-	-	-	-	-	-	-	-	-	-	-
275 Woolwich Street South (004-08500)	0.81	1.08	-	-	-	-	-	-	-	-	-	-	-	-
278 Woolwich Street South (004-08101)	0.31	0.41	-	-	-	-	-	-	-	-	-	-	-	-
280 Woolwich Street South (004-08102)	2.26	3.01	-	-	-	-	-	-	-	-	-	-	-	-
285 Woolwich Street South (004-08400)	7.74	7.53	-	-	-	-	-	-	-	-	-	-	-	-
300 Woolwich Street South (004-08200)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305 Woolwich Street South (004-08300)	1.24	1.65	-	-	-	-	-	-	-	-	-	-	-	-
307 Woolwich Street South (005-02470)	1.41	1.88	-	-	-	-	-	-	-	-	-	-	-	-
Street Address N/A														
(004-07810)	1.07	1.07	-	-	-	-	-	-	-	-	-	-	-	-
(004-08495)	0.18	0.24	-	-	-	-	-	-	-	-	-	-	-	-
(004-16901)	10.46	8.32	-	-	-	-	-	-	-	-	-	-	-	-
(004-16994)	12.41	12.41	-	-	-	-	-	-	-	-	-	-	-	-
(005-02490)	0.22	0.11	-	-	-	-	-	-	-	-	-	-	-	-
(005-04110)	14.34	14.34	-	-	-	-	-	-	-	-	-	-	-	-
(005-04170)	3.29	4.38	-	-	-	-	-	-	-	-	-	-	-	-
(005-04350)	8.73	7.49	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal (Lands):	221.45	204.87	30,000	16,000	12.23	27,856	47,400	30,000	7.80	7,690	77,400	46,000	35,546	158,946
Berlin Street (Township of Woolwich)	0.14	0.28	65,000	-	0.28	638	50,000	-	-	-	115,000	-	638	115,638
Dovercourt Road (Township of Woolwich)	0.39	0.78	-	-	-	-	-	-	-	-	-	-	-	-
Elroy Road (Township of Woolwich)	0.87	1.74	-	-	-	-	-	-	-	-	-	-	-	-
Fountain Street North (Region of Waterloo)	8.11	16.22	-	-	-	-	-	-	-	-	-	-	-	-
Kennedy Road (Township of Woolwich)	0.89	1.78	-	-	-	-	-	-	-	-	-	-	-	-
Lonsdale Road (Township of Woolwich)	1.24	2.48	-	-	-	-	-	-	-	-	-	-	-	-
Menno Street (Township of Woolwich)	3.05	6.10	-	-	-	-	-	-	-	-	-	-	-	-
Ottawa Street (Unopened) (Township of Woolwich)	0.36	0.48	-	-	-	-	-	-	-	-	-	-	-	-
Scarlett Road (Unopened) (Township of Woolwich)	0.13	0.13	-	-	-	-	-	-	-	-	-	-	-	-
Sheridan Drive (Township of Woolwich)	0.52	1.04	-	-	-	-	-	-	-	-	-	-	-	-
Shields Street (Township of Woolwich)	0.02	0.04	-	-	0.04	91	-	-	0.04	39	-	-	130	130
Woolwich Street South (Township of Woolwich)	3.39	6.78	150,000	-	1.56	3,555	380,000	-	1.04	1,026	530,000	-	4,581	534,581
Township of Woolwich Roads (S.26 Special Assessment)				131,600		-		130,700		-	-	262,300	-	262,300
Township of Woolwich Utilities (S.26 Special Assessment)				16,900		-				-	-	16,900	-	16,900
Waterloo North Hydro (S.26 Special Assessment)				2,100		-		4,400		-	-	6,500	-	6,500
Subtotal (Roads & Utilities):	19.11	37.85	215,000	150,600	1.88	4,284	430,000	135,100	1.08	1,065	645,000	285,700	5,349	936,049
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**242.72**	**245,000**	**166,600**	**14.11**	**32,140**	**477,400**	**165,100**	**8.88**	**8,755**	**722,400**	**331,700**	**40,895**	**1,094,995**

Notes:
1. Roll numbers are per the municipality's last revised assessment roll.

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Berlin Branch								
			Station	Interval 1 0+000	to	0+089					Grand Total
ESTIMATED COST	Allowances				-						57,850
	Construction				56,400						4,598,655
	Engineering				4,500						368,100
	Construction Services				3,600						289,600
	Section 73 Costs				3,000						243,275
	Net HST				1,140						92,520
	TOTAL				68,640						5,650,000
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Berlin Branch	Total Benefit (Proratable)	Benefit (Non-Proratable)	Total Outlet	**TOTAL**
Twp of Woolwich (Roll No. 30-29-030-)											
Berlin Street											
8 Berlin Street (004-03701)	0.15	0.20	-	2,000	0.20	942	2,942	-	2,000	3,048	5,048
14 Berlin Street (004-03800)	0.16	0.21	6,000	2,000	0.21	989	8,989	6,000	2,000	3,199	11,199
Cooper Crescent											
7 Cooper Crescent (004-12623)	0.15	0.20	-	-	-	-	-	400	2,000	2,303	4,703
11 Cooper Crescent (004-12621)	0.16	0.21	-	-	-	-	-	2,600	2,000	2,417	7,017
19 Cooper Crescent (004-12620)	0.19	0.25	-	-	-	-	-	1,800	2,000	2,878	6,678
21 Cooper Crescent (004-12613)	0.36	0.48	-	-	-	-	-	1,800	2,000	5,525	9,325
23 Cooper Crescent (004-12614)	0.13	0.17	-	-	-	-	-	-	-	1,957	1,957
31 Cooper Crescent (004-12615)	0.13	0.17	-	-	-	-	-	-	-	1,957	1,957
37 Cooper Crescent (004-12616)	0.09	0.12	-	-	-	-	-	-	-	1,381	1,381
Dovercourt Road											
8 Dovercourt Road (004-13600)	0.18	0.24	-	-	-	-	-	-	-	1,978	1,978
11 Dovercourt Road (004-11500)	0.18	0.24	-	-	-	-	-	-	-	1,978	1,978
12 Dovercourt Road (004-13500)	0.20	0.26	-	-	-	-	-	-	-	2,751	2,751
16 Dovercourt Road (004-13400)	0.21	0.28	-	-	-	-	-	-	-	2,986	2,986
19 Dovercourt Road (004-11600)	0.18	0.24	-	-	-	-	-	-	-	1,978	1,978
22 Dovercourt Road (004-13300)	0.25	0.34	-	-	-	-	-	-	-	3,623	3,623
32 Dovercourt Road (004-13200)	0.17	0.22	-	-	-	-	-	-	-	2,135	2,135
Elroy Road											
5 Elroy Road (004-10800)	0.24	0.32	-	-	-	-	-	-	2,000	2,640	4,640
6 Elroy Road (004-15500)	0.17	0.23	-	-	-	-	-	-	2,000	1,988	3,988
12 Elroy Road (004-15400)	0.18	0.24	-	-	-	-	-	-	2,000	1,978	3,978
18 Elroy Road (004-15300)	0.18	0.24	-	-	-	-	-	-	2,000	1,978	3,978
25 Elroy Road (004-13800)	0.19	0.25	-	-	-	-	-	-	2,000	2,063	4,063
26 Elroy Road (004-15200)	0.17	0.23	-	-	-	-	-	-	2,000	2,289	4,289
29 Elroy Road (004-13900)	0.21	0.28	-	-	-	-	-	-	2,000	3,306	5,306
33 Elroy Road (004-14000)	0.30	0.40	-	-	-	-	-	-	2,000	4,723	6,723
37 Elroy Road (004-14100)	0.21	0.28	-	-	-	-	-	-	2,000	3,306	5,306
40 Elroy Road (004-15100)	0.17	0.23	-	-	-	-	-	-	2,000	2,716	4,716
41 Elroy Road (004-14200)	0.20	0.27	-	-	-	-	-	-	2,000	3,188	5,188
46 Elroy Road (004-15000)	0.18	0.24	-	-	-	-	-	-	2,000	2,730	4,730
47 Elroy Road (004-14300)	0.21	0.28	-	-	-	-	-	-	2,000	3,306	5,306
52 Elroy Road (004-14900)	0.17	0.23	-	-	-	-	-	-	2,000	2,524	4,524
54 Elroy Road (004-14800)	0.30	0.40	-	-	-	-	-	-	2,000	4,585	6,585
57 Elroy Road (004-14400)	0.17	0.23	-	-	-	-	-	-	2,000	2,716	4,716
58 Elroy Road (004-14700)	0.22	0.30	-	-	-	-	-	-	2,000	3,474	5,474
64 Elroy Road (004-14600)	0.18	0.24	-	-	-	-	-	-	2,000	2,789	4,789
68 Elroy Road (004-14500)	0.19	0.25	-	-	-	-	-	800	2,000	2,914	5,714

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Berlin Branch								
			Interval 1								Grand
			Station	0+000	to	0+089					Total
ESTIMATED COST	Allowances				-						57,850
	Construction				56,400						4,598,655
	Engineering				4,500						368,100
	Construction Services				3,600						289,600
	Section 73 Costs				3,000						243,275
	Net HST				1,140						92,520
	TOTAL				68,640						5,650,000
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Berlin Branch	Total Benefit (Proratable)	Benefit (Non-Proratable)	Total Outlet	**TOTAL**
Fountain Street North											
4813 Fountain Street North (005-04301)	37.28	28.54	-	-	-	-	-	-	-	31,567	31,567
4881 Fountain Street North (005-01000)	52.20	37.89	-	-	-	-	-	-	-	4,337	4,337
5185 Fountain Street North (005-02450)	3.75	4.99	-	-	-	-	-	-	-	571	571
Joseph Street											
15 Joseph Street (004-04000)	0.09	0.12	-	-	0.12	565	565	-	-	1,828	1,828
19 Joseph Street (004-04100)	0.09	0.12	-	-	0.12	565	565	-	-	1,828	1,828
23 Joseph Street (004-04200)	0.09	0.12	-	-	0.12	565	565	-	-	1,828	1,828
27 Joseph Street (004-04300)	0.09	0.12	-	-	0.12	565	565	-	-	1,828	1,828
31 Joseph Street (004-04310)	0.11	0.15	-	-	0.15	707	707	-	-	2,286	2,286
Kennedy Road											
7 Kennedy Road (004-09700)	0.15	0.20	-	-	-	-	-	-	-	766	766
13 Kennedy Road (004-11700)	0.28	0.37	-	-	-	-	-	-	-	1,416	1,416
16 Kennedy Road (004-20900)	0.02	0.03	-	-	-	-	-	-	-	247	247
21 Kennedy Road (004-11800)	0.28	0.37	-	-	-	-	-	-	-	4,369	4,369
27 Kennedy Road (004-11900)	0.27	0.36	-	-	-	-	-	-	-	4,252	4,252
30 Kennedy Road (004-13150)	0.15	0.20	-	-	-	-	-	-	-	2,362	2,362
31 Kennedy Road (004-12000)	0.26	0.35	-	-	-	-	-	-	-	4,133	4,133
34 Kennedy Road (004-13100)	0.15	0.20	-	-	-	-	-	-	-	2,362	2,362
40 Kennedy Road (004-13000)	0.21	0.28	-	-	-	-	-	-	2,000	3,306	5,306
43 Kennedy Road (004-12100)	0.24	0.32	-	-	-	-	-	-	2,000	3,780	5,780
46 Kennedy Road (004-12900)	0.21	0.28	-	-	-	-	-	-	2,000	3,306	5,306
47 Kennedy Road (004-12200)	0.23	0.31	-	-	-	-	-	-	2,000	3,660	5,660
52 Kennedy Road (004-12800)	0.21	0.28	-	-	-	-	-	-	2,000	3,306	5,306
53 Kennedy Road (004-12300)	0.11	0.15	-	-	-	-	-	-	2,000	1,771	3,771
58 Kennedy Road (004-12700)	0.20	0.27	-	-	-	-	-	-	2,000	3,188	5,188
61 Kennedy Road (004-12400)	0.24	0.32	-	-	-	-	-	-	2,000	3,780	5,780
67 Kennedy Road (004-12500)	0.28	0.37	-	-	-	-	-	-	2,000	4,892	6,892
69 Kennedy Road (004-12600)	0.02	0.03	-	-	-	-	-	-	-	429	429
73 Kennedy Road (004-12601)	0.01	0.01	-	-	-	-	-	-	-	143	143
76 Kennedy Road (004-12625)	0.24	0.32	-	-	-	-	-	3,400	2,000	3,684	9,084
Lonsdale Road											
2117 Lonsdale Road (005-04500)	3.66	3.66	-	-	-	-	-	-	-	419	419
2186 Lonsdale Road (005-04400)	0.81	0.89	-	-	-	-	-	-	-	102	102
Mader's Lane											
37-38 Mader's Lane (004-16900)	0.01	0.01	-	-	-	-	-	-	-	118	118
Menno Street											
7 Menno Street (004-08800)	0.23	0.31	-	-	-	-	-	-	2,000	1,186	3,186
8 Menno Street (004-10300)	0.18	0.24	-	-	-	-	-	-	2,000	918	2,918
13 Menno Street (004-08900)	0.23	0.29	-	-	-	-	-	-	-	898	898
14 Menno Street (004-10200)	0.18	0.24	-	-	-	-	-	-	-	918	918
24 Menno Street (004-10100)	0.19	0.25	-	-	-	-	-	-	-	958	958
27 Menno Street (004-09000)	0.25	0.29	-	-	-	-	-	-	-	649	649
32 Menno Street (004-10000)	0.18	0.24	-	-	-	-	-	-	-	918	918
33 Menno Street (004-09100)	0.21	0.24	-	-	-	-	-	-	-	528	528
38 Menno Street (004-09900)	0.18	0.24	-	-	-	-	-	-	-	918	918

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Berlin Branch								
			Interval 1								Grand
			Station	0+000	to	0+089					Total
ESTIMATED COST	Allowances				-						57,850
	Construction				56,400						4,598,655
	Engineering				4,500						368,100
	Construction Services				3,600						289,600
	Section 73 Costs				3,000						243,275
	Net HST				1,140						92,520
	TOTAL				68,640						5,650,000
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Berlin Branch	Total Benefit (Proratable)	Benefit (Non-Proratable)	Total Outlet	**TOTAL**
41 Menno Street (004-09300)	0.20	0.23	-	-	-	-	-	-	-	526	526
44 Menno Street (004-09800)	0.45	0.60	-	-	-	-	-	-	-	3,358	3,358
47 Menno Street (004-09400)	0.43	0.46	-	-	-	-	-	-	-	591	591
53 Menno Street (004-09500)	0.43	0.46	-	-	-	-	-	-	-	591	591
59 Menno Street (004-09200)	0.43	0.46	-	-	-	-	-	-	-	591	591
60 Menno Street (004-09600)	0.17	0.23	-	-	-	-	-	-	-	881	881
118 Menno Street (005-04100)	19.76	17.30	-	-	-	-	-	180,000	271,433	167,343	618,776
164 Menno Street (005-04201)	0.73	0.97	-	-	-	-	-	-	-	111	111
313 Menno Street (005-04305)	1.21	1.61	-	-	-	-	-	-	-	184	184
Sheridan Drive											
10 Sheridan Drive (004-11300)	0.18	0.24	-	-	-	-	-	-	-	918	918
11 Sheridan Drive (004-11400)	0.19	0.25	-	-	-	-	-	-	-	1,532	1,532
20 Sheridan Drive (004-11200)	0.18	0.24	-	-	-	-	-	-	-	1,492	1,492
24 Sheridan Drive (004-11100)	0.18	0.24	-	-	-	-	-	-	-	1,978	1,978
30 Sheridan Drive (004-11000)	0.18	0.24	-	-	-	-	-	-	-	1,978	1,978
31 Sheridan Drive (004-13700)	0.18	0.24	-	-	-	-	-	-	-	1,978	1,978
38 Sheridan Drive (004-10900)	0.21	0.28	-	-	-	-	-	-	2,000	2,309	4,309
Shields Street											
19 Shields Street (004-04400)	0.04	0.05	-	-	0.05	236	236	-	-	762	762
Woolwich Street South											
107 Woolwich Street South (004-16400)	0.06	0.08	-	-	-	-	-	-	-	920	920
111 Woolwich Street South (004-16300)	0.20	0.27	-	-	-	-	-	-	-	3,107	3,107
115 Woolwich Street South (004-16200)	0.25	0.33	-	-	-	-	-	-	-	3,799	3,799
117 Woolwich Street South (004-16102)	0.37	0.49	-	-	-	-	-	-	-	5,641	5,641
120-122 Woolwich Street South (004-03300)	0.21	0.28	-	-	0.13	612	612	-	-	3,707	3,707
127 Woolwich Street South (004-16101)	0.37	0.49	-	-	-	-	-	63,000	2,000	5,641	70,641
128 Woolwich Street South (004-03400)	0.22	0.29	-	-	0.12	565	565	-	2,000	3,785	5,785
133 Woolwich Street South (004-16100)	0.37	0.49	-	-	-	-	-	1,800	2,000	5,641	9,441
134 Woolwich Street South (004-03401)	0.23	0.30	-	-	0.13	612	612	-	2,000	3,937	5,937
138 Woolwich Street South (004-03500)	0.17	0.22	-	-	0.09	424	424	-	2,000	2,867	4,867
139 Woolwich Street South (004-16010)	0.37	0.49	-	-	-	-	-	1,800	2,000	5,641	9,441
144 Woolwich Street South (004-03600)	0.15	0.20	-	-	0.08	377	377	-	2,000	2,601	4,601
147 Woolwich Street South (004-16000)	0.89	1.08	-	-	-	-	-	1,800	2,000	12,433	16,233
150 Woolwich Street South (004-03700)	0.15	0.20	-	-	0.11	518	518	-	2,000	2,713	4,713
151 Woolwich Street South (004-15900)	0.40	0.53	-	-	-	-	-	1,800	2,000	6,101	9,901
158 Woolwich Street South (004-06900)	0.16	0.21	-	2,000	0.21	989	2,989	-	2,000	3,199	5,199
159 Woolwich Street South (004-15800)	0.61	0.81	-	-	-	-	-	-	2,000	8,525	10,525
162 Woolwich Street South (004-07000)	-	-	-	-	-	-	-	-	2,000	-	2,000
166 Woolwich Street South (004-07100)	-	-	-	-	-	-	-	-	2,000	-	2,000
167 Woolwich Street South (004-15700)	0.20	0.27	-	-	-	-	-	-	2,000	2,841	4,841
169 Woolwich Street South (004-15602)	0.27	0.36	-	-	-	-	-	-	2,000	3,790	5,790
171 Woolwich Street South (004-15601)	0.27	0.36	-	-	-	-	-	-	2,000	3,790	5,790
175 Woolwich Street South (004-15600)	0.27	0.36	-	-	-	-	-	-	2,000	3,790	5,790
201 Woolwich Street South (004-10700)	0.18	0.24	-	-	-	-	-	-	2,000	1,978	3,978
208 Woolwich Street South (004-2110321182)	0.02	0.03	-	-	-	-	-	-	-	247	247
209 Woolwich Street South (004-10600)	0.18	0.24	-	-	-	-	-	-	2,000	1,978	3,978
214-226 Woolwich Street South (004-07400)	0.17	0.23	-	-	-	-	-	-	-	1,058	1,058

APPENDIX A - Calculation of Assessments
BRESLAU DRAIN 1 - TOWNSHIP OF WOOLWICH

			Berlin Branch								
			Interval 1								Grand
			Station	0+000	to	0+089					Total
ESTIMATED COST	Allowances				-						57,850
	Construction				56,400						4,598,655
	Engineering				4,500						368,100
	Construction Services				3,600						289,600
	Section 73 Costs				3,000						243,275
	Net HST				1,140						92,520
	TOTAL				68,640						5,650,000
Street Address (Roll No.)	Total Ha Affected	Total Ha Adjusted	Benefit (Proratable)	Benefit (Non-Proratable)	Adj Ha	Outlet	Total Berlin Branch	Total Benefit (Proratable)	Benefit (Non-Proratable)	Total Outlet	**TOTAL**
215 Woolwich Street South (004-10500)	0.18	0.24	-	-	-	-	-	-	2,000	1,448	3,448
221 Woolwich Street South (004-10400)	0.18	0.24	-	-	-	-	-	-	2,000	918	2,918
231 Woolwich Street South (004-07510)	7.23	7.01	-	-	-	-	-	4,200	1,561,725	2,508	1,568,433
232 Woolwich Street South (004-07402)	0.03	0.04	-	-	-	-	-	-	2,000	154	2,154
238 Woolwich Street South (004-07404)	0.04	0.05	-	-	-	-	-	-	2,000	191	2,191
244 Woolwich Street South (004-07406)	0.03	0.04	-	-	-	-	-	-	2,000	154	2,154
250 Woolwich Street South (004-07408)	0.03	0.04	-	-	-	-	-	-	2,000	5	2,005
255 Woolwich Street South (004-08700)	0.40	0.53	-	-	-	-	-	-	-	61	61
256 Woolwich Street South (004-07500)	0.94	1.25	-	-	-	-	-	-	-	143	143
262 Woolwich Street South (004-07805)	0.44	0.59	-	-	-	-	-	-	-	68	68
265 Woolwich Street South (004-08600)	3.45	2.85	-	-	-	-	-	10,100	-	326	10,426
268 Woolwich Street South (004-07900)	1.64	2.18	-	-	-	-	-	10,100	-	250	10,350
275 Woolwich Street South (004-08500)	0.81	1.08	-	-	-	-	-	3,000	-	124	3,124
278 Woolwich Street South (004-08101)	0.31	0.41	-	-	-	-	-	5,000	-	47	5,047
280 Woolwich Street South (004-08102)	2.26	3.01	-	-	-	-	-	7,900	-	345	8,245
285 Woolwich Street South (004-08400)	7.74	7.53	-	-	-	-	-	20,200	-	862	21,062
300 Woolwich Street South (004-08200)	-	-	-	-	-	-	-	9,000	-	-	9,000
305 Woolwich Street South (004-08300)	1.24	1.65	-	-	-	-	-	-	-	189	189
307 Woolwich Street South (005-02470)	1.41	1.88	-	-	-	-	-	-	-	215	215
Street Address N/A											
(004-07810)	1.07	1.07	-	-	-	-	-	15,900	-	122	16,022
(004-08495)	0.18	0.24	-	-	-	-	-	-	-	27	27
(004-16901)	10.46	8.32	-	-	-	-	-	-	-	952	952
(004-16994)	12.41	12.41	-	-	-	-	-	180,000	252,732	82,582	515,314
(005-02490)	0.22	0.11	-	-	-	-	-	-	-	13	13
(005-04110)	14.34	14.34	-	-	-	-	-	10,000	-	1,641	11,641
(005-04170)	3.29	4.38	-	-	-	-	-	-	-	501	501
(005-04350)	8.73	7.49	-	-	-	-	-	-	-	857	857
Subtotal (Lands):	221.45	204.87	6,000	6,000	1.96	9,231	21,231	542,400	2,213,890	588,618	3,344,908
Berlin Street (Township of Woolwich)	0.14	0.28	35,000	-	0.28	1,320	36,320	150,000	-	4,267	154,267
Dovercourt Road (Township of Woolwich)	0.39	0.78	-	-	-	-	-	30,000	-	6,503	36,503
Elroy Road (Township of Woolwich)	0.87	1.74	-	-	-	-	-	145,000	-	18,339	163,339
Fountain Street North (Region of Waterloo)	8.11	16.22	-	-	-	-	-	10,000	-	29,690	39,690
Kennedy Road (Township of Woolwich)	0.89	1.78	-	-	-	-	-	113,000	-	18,364	131,364
Lonsdale Road (Township of Woolwich)	1.24	2.48	-	-	-	-	-	-	-	284	284
Menno Street (Township of Woolwich)	3.05	6.10	-	-	-	-	-	-	-	6,270	6,270
Ottawa Street (Unopened) (Township of Woolwich)	0.36	0.48	-	-	-	-	-	-	-	55	55
Scarlett Road (Unopened) (Township of Woolwich)	0.13	0.13	-	-	-	-	-	-	-	1,536	1,536
Sheridan Drive (Township of Woolwich)	0.52	1.04	-	-	-	-	-	35,000	-	6,810	41,810
Shields Street (Township of Woolwich)	0.02	0.04	-	-	-	-	-	-	-	461	461
Woolwich Street South (Township of Woolwich)	3.39	6.78	-	-	0.04	189	189	790,000	-	27,733	817,733
Township of Woolwich Roads (S.26 Special Assessment)				8,800			8,800	-	779,900	-	779,900
Township of Woolwich Utilities (S.26 Special Assessment)							-	-	101,680	-	101,680
Waterloo North Hydro (S.26 Special Assessment)				2,100			2,100	-	30,200	-	30,200
Subtotal (Roads & Utilities):	19.11	37.85	35,000	10,900	0.32	1,509	47,409	1,273,000	911,780	120,312	2,305,092
TOTAL ASSESSMENT BRESLAU DRAIN 1:	**240.56**	**242.72**	**41,000**	**16,900**	**2.28**	**10,740**	**68,640**	**1,815,400**	**3,125,670**	**708,930**	**5,650,000**

Notes:
1. Roll numbers are per the municipality's last revised assessment roll.

APPENDIX B

Cost Estimate Detail

APPENDIX B - COST ESTIMATE DETAIL
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Item	Stations	SP No.	Description	Cost	Total
CONSTRUCTION COST ESTIMATE					
			General Items		
G-1		300.9	Mobilization and demobilization	$ 75,000	
G-2			Bonding and Insurance	$ 25,000	
G-3		300.10	Traffic control and temporary fencing	$ 20,000	
G-4		300.11	Water for compaction and dust control	$ 5,000	
G-5		300.12	Erosion and sediment control	$ 10,000	
			Sub Total General Items	**$ 135,000**	
			Drain Items		
Main Drain					
Removals					
M-1	0+432 to 0+457	301.11 & 301.12	Remove and dispose of existing 300mm diameter concrete storm under Menno St and plug at both ends. Remove and dispose of existing MH.	$ 2,000	
M-2	1+146 to 1+165	301.11	Remove and dispose of existing 300mm diameter concrete storm under Kennedy Road and plug at both ends.	$ 2,000	
M-3	0+000 to 1+237	301.11	Remove and dispose of existing CSP culverts (15 total)	$ 7,500	
M-4	0+000 to 1+237	301.11	Remove existing tile (439m total)	$ 2,200	
Proposed Work - Open Portion					
M-5	-1+000 to -0+975	301.21	Construct 25m permanent sediment trap with rock check dam and 5m2 riprap on geotextile	$ 1,500	
M-6	-1+000 to -0+815	301.21	185m of ditch excavation. 1.5m bottom width & 2:1 side slopes, level spoil along drain. Includes pre-location of existing sanitary sewer force main.	$ 7,400	
M-7	-0+740 to -0+556	301.21	184m of ditch excavation. 1.5m bottom width & 2:1 side slopes, level spoil along drain.	$ 7,400	
M-8	-0+739 to -0+592	301.21	Re-grade 147m of swale.	$ 4,400	
M-9	-0+575 to -0+560	301.21	Construct 15m permanent sediment trap with rock check dam and 50m2 riprap on geotextile	$ 2,000	
M-10	-0+531 to -0+325	301.21	206m of ditch bottom cleanout. 1.5m bottom width & 2:1 side slopes	$ 4,100	
M-11	-0+350 to -0+325	301.21	Construct 25m permanent sediment trap with rock check dam and 5m2 riprap on geotextile	$ 1,500	
M-12	-0+020 to -0+004	301.21	Permanent stilling pool (200m³) with 125m² of new riprap on geotextile at outlet.	$ 15,500	
M-13	-1+000 to 0+000	301.21	Place riprap on geotextile (various locations) (195sq.m total)	$ 19,500	
M-14	-1+000 to 0+000	420.3.7	100mm diameter tile outlet repairs (includes 5m2 riprap on geotextile)	$ 1,800	
M-15	-1+000 to 0+000	420.3.7	150mm diameter tile outlet repairs (includes 5m2 riprap on geotextile)	$ 1,300	
M-16			2018/2019 maintenance	$ 37,800	
Proposed Work - Closed Portion					
M-17	0+000	301.14	Precast headwall per OPSD 804.040 with grate per OPSD 804.050	$ 59,995	
M-18	0+000 to 0+065	301.15	65m of 1090x1730mm diameter elliptical reinforced concrete pipe (HE IV). Includes excavation, pipe bedding and backfill	$ 214,700	
M-19	0+065 to 0+151	301.15	86m of 1090x1730mm diameter elliptical reinforced concrete pipe (HE III). Includes excavation, pipe bedding and backfill	$ 248,000	
M-20	0+151 to 0+244	301.15	93m of 1090x1730mm diameter elliptical reinforced concrete pipe (HE II). Includes excavation, pipe bedding and backfill	$ 240,100	
M-21	0+244 to 0+357	301.15	113m of 1200mm diameter reinforced concrete pipe. Includes excavation, pipe bedding and backfill	$ 164,700	
M-22	0+357 to 0+713	301.15	356m of 1050mm diameter reinforced concrete pipe. Includes excavation, pipe bedding and backfill	$ 421,000	
M-23	0+713 to 0+922	301.15	209m of 900mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 106,400	
M-24	0+922 to 1+165	301.15	243m of 750mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 94,200	
M-26	0+000 to 1+237	301.15	140m of 375mm diameter HDPE pipe (driveway culverts). Includes excavation, pipe bedding and backfill (does not include driveway restoration)	$ 24,800	
M-27	0+063	301.15	1090x1730mm diameter elliptical reinforced concrete (HE IV) 45 degree bend. Includes excavation, bedding and backfill.	$ 16,100	
M-28	0+066	301.14	Construct 1200mm diameter MD-MH1 (Tee) (OPSD 707.01). Includes excavation, bedding, connections and backfill. Height = 1.89m	$ 16,600	
M-29	0+152	301.14	Construct 1200mm diameter MD-MH2 (Tee) (OPSD 707.01). Includes excavation, bedding, connections and backfill. Height = 1.98m	$ 16,600	
M-30	0+244	301.14	Construct 3600mm diameter MD-CBMH3 (OPSD 701.014). Includes excavation, bedding, connections and backfill. Height = 3.28m	$ 124,900	
M-31	0+337	301.14	Construct 600x600mm MD-CB4.1 (OPSD 705.010) and 10m of 250mm diameter HDPE storm lead. Includes excavation, bedding, tee, connections and backfill (does not include road restoration). Height = 0.85m	$ 3,500	
M-32	0+357	301.14	Construct 2400mm diameter MD-CBMH4 (OPSD 701.013). Includes excavation, bedding, connections and backfill. Height = 2.60m	$ 38,000	
M-33	0+357	301.14	Construct 600x600mm ditch inlet MD-DICB4.2 and 5m of 250mm diameter HDPE storm lead. Includes excavation, bedding, connections and backfill. Height = 0.60m	$ 2,800	
M-34	0+405	301.14	Construct 600x600mm MD-CB5.1 (OPSD 705.010) and 13m of 250mm diameter HDPE storm lead. Includes excavation, bedding, connections, tee and backfill (does not include road restoration). Height = 1.07m	$ 5,400	
M-35	0+471	301.14	Construct 1800mm diameter MD-CBMH5 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.50m	$ 22,100	
M-36	0+569	301.14	Construct 1800mm diameter MD-CBMH6 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.38m	$ 22,100	

Item	Stations	SP No.	Description	Cost	Total
M-37	0+656	301.14	Construct 1800mm diameter MD-MH7 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.69m	$ 22,900	
M-38	0+713	301.14	Construct 2400mm diameter MD-CBMH8 (OPSD 701.013). Includes excavation, bedding, connections and backfill. Height = 2.86m	$ 40,700	
M-39	0+726	301.14	Construct 1800mm diameter MD-CBMH9 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 1.70m	$ 18,800	
M-40	0+813	301.14	Construct 1800mm diameter MD-CBMH10 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.08m	$ 20,400	
M-41	0+836	301.14	Construct 1800mm diameter MD-CBMH11 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.28m	$ 21,200	
M-42	0+880	301.14	Construct 1800mm diameter MD-CBMH12 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.72m	$ 22,900	
M-43	0+922	301.14	Construct 1800mm diameter MD-CBMH13 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.92m	$ 23,200	
M-44	1+006	301.14	Construct 1500mm diameter MD-CBMH14 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 3.10m	$ 16,400	
M-45	1+039	301.14	Construct 1500mm diameter MD-CBMH15 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 2.20m	$ 13,800	
M-46	1+061	301.14	Construct 1500mm diameter MD-CBMH16 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 2.17m	$ 13,800	
M-47	1+105	301.14	Construct 1500mm diameter MD-CBMH17 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 2.14m	$ 13,300	
M-48	1+146	301.14	Construct 1500mm diameter MD-CBMH18 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 1.92m	$ 12,700	
M-49	1+165	301.14	Construct 1800mm diameter MD-CBMH19 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 1.56m	$ 18,800	
M-50	0+703	301.14	Connect existing MH to new storm with 10m of 300mm diameter HDPE pipe. Includes excavation, pipe bedding, backfill, connections, tee, existing MH break-in and cap.	$ 2,900	
M-51		301.15	PDC's - 150mm diameter PVC, 4-6m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (12 total)	$ 26,400	
M-52		301.15	PDC's - 150mm diameter PVC, 10-12m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (7 total)	$ 15,700	
M-53		301.15	PDC's - 150mm diameter PVC, 16-18m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (8 total)	$ 27,900	
M-54	0+000 to 0+332	301.21	Backfill 332m of existing ditch using suitable on-site material.	$ 6,600	
M-55	0+000 to 1+145	301.21	Re-grade 1145m of road ditch.	$ 22,800	
			Sub Total Main Drain - Drain Items	**$ 2,321,095**	
Kennedy Branch					
Removals					
KB-1	0+000 to 0+057	301.11	Remove 57m of existing tile	$ 300	
Proposed Work					
KB-2	0+000 to 0+066	301.15	66m of 300mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 9,800	
KB-3	0+023	301.14	Construct 600x600mm KB-CB13 (OPSD 705.010) Includes excavation, bedding, connections and backfill (does not include road restoration). Height = 1.37m	$ 3,100	
KB-4	0+066	301.14	Construct 600x600mm KB-CB2 (OPSD 705.010) Includes excavation, bedding, connections and backfill (does not include road restoration). Height = 0.77m	$ 1,600	
KB-5		301.15	PDC's - 150mm diameter PVC, 16-18m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (1 total)	$ 3,900	
KB-6	0+023 to 0+076	301.21	Re-grade 53m of road ditch	$ 1,100	
			Sub Total Kennedy Branch - Drain Items	**$ 19,800**	
Scarlett Branch					
Removals					
SB-1		301.11	Remove and dispose of existing CSP culverts (4 total)	$ 2,000	
SB-2	0+000 to 0+141	301.11	Remove 141m of existing CSP subdrain	$ 700	
SB-3		301.13	Incidental tree/debris removal (30 total)	$ 15,000	
Proposed Work					
SB-4	0+000 to 0+141	301.15	141m of 750mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 54,700	
SB-5	0+141 to 0+209	301.15	68m of 525mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 16,400	
SB-6	0+209 to 0+340	301.15	131m of 450mm diameter reinforced concrete pipe. Includes excavation, pipe bedding and backfill	$ 40,400	
SB-7	0+340 to 0+458	301.15	118m of 375mm diameter reinforced concrete pipe. Includes excavation, pipe bedding and backfill	$ 35,700	
SB-8	0+458 to 0+631	301.15	173m of 300mm diameter reinforced concrete pipe. Includes excavation, pipe bedding and backfill	$ 45,700	
SB-9		301.15	31m of 375mm diameter HDPE pipe (driveway culverts). Includes excavation, pipe bedding and backfill (does not include driveway restoration)	$ 5,500	

Item	Stations	SP No.	Description	Cost	Total
SB-10	0+077	301.14	Construct 1800mm diameter SB-CBMH1 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 2.43m	$ 7,500	
SB-11	0+141	301.14	Construct 1500mm diameter SB-CBMH2 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 3.29m	$ 16,900	
SB-12	0+209	301.14	Construct 1800mm diameter SB-CBMH3 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 4.76m	$ 19,200	
SB-13	0+271	301.14	Construct 900x1200mm SB-CB4. Includes excavation, bedding, connections and backfill. Height = 2.17m	$ 5,000	
SB-14	0+340	301.14	Construct 900x1200mm SB-CB5. Includes excavation, bedding, connections and backfill. Height = 1.06m	$ 5,000	
SB-15	0+398	301.14	Construct 600x600mm SB-CB6 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 1.25m	$ 3,100	
SB-16	0+458	301.14	Construct 600x600mm SB-CB7 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 1.04m	$ 3,100	
SB-17	0+487	301.14	Construct 600x600mm SB-CB8 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 2.50m	$ 4,700	
SB-18	0+517	301.14	Construct 600x600mm SB-CB9 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 2.10m	$ 4,700	
SB-19	0+577	301.14	Construct 600x600mm SB-CB10 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 0.97m	$ 1,600	
SB-20	0+631	301.14	Construct 600x600mm SB-CB11 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 1.24m	$ 3,100	
SB-21		301.15	PDC's - 150mm diameter PVC, 4-6m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (3 total)	$ 6,200	
SB-22		301.15	PDC's - 150mm diameter PVC, 16-18m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (3 total)	$ 10,500	
SB-23	0+000 to 0+675	301.21	Re-grade 675m of road ditch/grade overflow swale	$ 13,500	
			Sub Total Scarlett Branch - Drain Items	**$ 320,200**	
Woolwich Branch					
Removals					
WB-1	0+450 to 0+517	301.11	Remove & dispose of 67m of existing tile	$ 300	
WB-2	0+200 to 0+250	301.29	Fill 50m of existing 200mm diameter storm under Berlin St. intersection with 10 MPa flowable grout.	$ 800	
WB-3		301.13	Incidental tree/debris removal (10 total)	$ 5,000	
WB-4	0+517 to 0+623	301.13	Incidental hedge removal	$ 500	
Proposed Work					
WB-5	0+000 to 0+209	301.15	209m of 900mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 106,400	
WB-6	0+209 to 0+358	301.15	149m of 750mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 57,800	
WB-7	0+358 to 0+457	301.15	99m of 600mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 28,500	
WB-8	0+457 to 0+533	301.15	76m of 450mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 15,900	
WB-9	0+533 to 0+673	301.15	140m of 375mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 24,800	
WB-10	0+000 to 1+237	301.15	112m of 375mm diameter HDPE pipe (driveway culverts). Includes excavation, pipe bedding and backfill (does not include driveway restoration)	$ 19,900	
WB-11	0+108	301.14	Construct 1800mm diameter WB-CBMH1 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 3.26m	$ 24,700	
WB-12	0+209	301.14	Construct 1800mm diameter WB-CBMH2 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 3.31m	$ 24,700	
WB-13	0+230	301.14	Construct 600x600mm WB-CB2.1 (OPSD 705.010) and 8m of 250mm diameter HDPE storm lead. Includes excavation, bedding, tee, connections and backfill (does not include road restoration). Height = 2.04m	$ 6,500	
WB-14	0+270	301.14	Construct 1500mm diameter WB-CBMH3 (OPSD 701.011). Includes excavation, bedding, connections and backfill. Height = 3.28m	$ 28,300	
WB-15	0+358	301.14	Construct 1800mm diameter WB-CBMH4 (OPSD 701.012). Includes excavation, bedding, connections and backfill. Height = 3.60m	$ 24,700	
WB-16	0+399	301.14	Construct 900x1200mm WB-CB5 with birdcage grate. Includes excavation, bedding, connections and backfill. Height = 1.33m	$ 5,000	
WB-17	0+457	301.14	Remove and dispose of existing CB and construct 900x1200mm WB-CB6 with birdcage grate. Connect existing 300mm diameter storm to new WB-CB6 with 15m of 300mm diameter plastic tubing. Includes excavation, bedding, connections and backfill. Height = 0.83m	$ 6,800	
WB-18	0+533	301.14	Construct 900x1200mm WB-CB7 with birdcage grate. Includes excavation, bedding, connections and backfill. Height = 2.16m	$ 5,000	
WB-19	0+639	301.14	Construct 600x600mm WB-CB8 (OPSD 705.010) Includes excavation, bedding, connections and backfill. Height = 1.47m	$ 3,100	
WB-20	0+673	301.14 & 301.15	Connect new 375mm HDPE pipe to existing 1200mm diameter WB-MH8. Includes grouting and backfill.	$ 500	

Item	Stations	SP No.	Description	Cost	Total
WB-21	0+192	301.12 & 301.14 & 301.15	Remove and dispose of existing 1500mm diameter MH and connect existing 300mm diameter storm to new WB-CBMH2 with 12m of 300mm diameter HDPE pipe. Cap existing 300mm diameter storm on south and west side of existing MH	$ 1,600	
WB-22	0+291	301.12 & 301.14 & 301.15	Connect existing 600mm diameter MH's to new storm with 8-10m of 250mm diameter PVC pipe. Includes excavation, coring, bedding, connection, tee's and backfill.	$ 5,900	
WB-23		301.15	Remove & replace 1-2m of existing 300mm diameter plastic pipe and repair existing 100mm diameter plastic PDC using 300mm HDPE pipe, tee and watertight connections	$ 2,000	
WB-24		301.15	Remove & replace 1-2m of existing 300mm diameter plastic pipe (spot repair) using 300mm HDPE pipe and watertight connections	$ 4,000	
WB-25		301.15	PDC's - 150mm diameter PVC, 4-6m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (6 total)	$ 13,700	
WB-26		301.15	PDC's - 150mm diameter PVC, 10-12m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (8 total)	$ 25,500	
WB-27		301.15	PDC's - 150mm diameter PVC, 16-18m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill. (3 total)	$ 9,500	
WB-28	0+019 to 0+358	301.21	Re-grade 339m of road ditch.	$ 6,800	
WB-29		301.31	1.8m high chain link fence removal and reinstatement (three locations)	$ 9,000	
WB-30		301.32	57m of flushing on existing 250/300mm diameter plastic pipe.	$ 5,000	
			Sub Total Woolwich Branch - Drain Items	**$ 472,200**	
Berlin Branch					
Removals					
BB-1	0+000 to 0+089	301.11	Remove and dispose of existing 175mm diameter concrete storm under Berlin St. and plug at both ends. Remove and dispose of existing Berlin Branch structures at STA 0+010 and 0+089.	$ 2,000	
Proposed Work					
BB-2	0+000 0+089	301.14	89m of 450mm diameter HDPE pipe. Includes excavation, pipe bedding and backfill	$ 18,600	
BB-3	0+010	301.15	Construct 600x600mm BB-CB1 (OPSD 705.010). Includes excavation, bedding, connections and backfill. Height = 2.63m	$ 4,700	
BB-4	0+062	301.15	Construct 600x600mm BB-CB2 (OPSD 705.010). Includes excavation, bedding, connections and backfill. Height = 1.54m	$ 3,100	
BB-5	0+079	301.15	Construct 600x600mm BB-CB3 (OPSD 705.010). Includes excavation, bedding, connections and backfill. Height = 1.54m	$ 3,100	
BB-6		301.15	PDC's - 150mm diameter PVC, 10-12m in length. Includes excavation, bedding, tee's, connections, sweeps, caps, marker posts, backflow preventors and backfill.	$ 3,000	
			Sub Total Berlin Branch - Drain Items	**$ 34,500**	
			Sub Total Drain Items	**$ 3,167,795**	
			Roadwork and Restoration Items		
Removals					
RD-1		301.7	Remove & dispose of existing asphalt (4590sq.m total)	$ 27,400	
RD-2		301.6	Remove & dispose of excess clean material (6850cu.m total)	$ 205,500	
RD-3		301.6	Remove & dispose of excess contaminated material (2300 tonnes total)	$ 132,000	
Proposed Work					
RD-4		301.10 & 301.22	Gravel driveway restoration (includes removal) (80sq.m total)	$ 2,900	
RD-5		301.10 & 301.22	Asphalt driveway restoration (includes removal) (1035sq.m total)	$ 77,600	
RD-6		301.10 & 301.22	Concrete driveway restoration (includes removal) (35sq.m total)	$ 4,400	
RD-7		301.10 & 301.22	Interlock driveway restoration (includes removal) (21sq.m total)	$ 3,600	
RD-8		301.16	Supply and place HL3 top asphalt (448 tonnes total)	$ 58,200	
RD-9		301.17	Supply and place HL8 asphalt base (980 tonnes total)	$ 117,600	
RD-10		301.18	Supply and place Granular A (2259 tonnes total)	$ 56,400	
RD-11		301.19	Supply and place Granular B (3402 tonnes total)	$ 68,200	
RD-12		301.19	Place reclaimed material as Granular B road base (2259 tonnes total)	$ 15,100	
RD-13		301.20	Restoration with 100mm of salvaged topsoil and sod (7590sq.m total)	$ 129,000	
RD-14		301.20	Restoration with 100mm of salvaged topsoil and hydroseed (2135sq.m total)	$ 17,100	
			Sub Total Roadwork and Restoration Items	**$ 915,000**	
			Township Utility Items		
U-1		301.24	Replace fire hydrant assembly. (1 total)	$ 15,000	
U-2		301.24	Lower existing 300mm diameter watermain (2 total)	$ 28,000	
U-3		301.24	Lower existing 150mm diameter watermain (3 total)	$ 27,000	
U-4		301.24	Relocate existing water services. Includes excavation, bedding, connections and backfill.(7 total)	$ 14,000	

APPENDIX B - COST ESTIMATE DETAIL
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Item	Stations	SP No.	Description	Cost	Total
U-5		301.26	Hydro pole holding service (by others) (14 total)	$ 25,200	
			Sub Total Township Utility Items	**$ 109,200**	
			Contingency Items		
C-1		301.24	Water service relocations (15 estimated)	$ 30,000	
C-3		301.14	Incidental PDCs - 150mm diameter PVC. Includes excavation, bedding, connections, sweeps and backfill. (50m estimated)	$ 7,500	
C-4		301.30	Increased costs to install 300mm depth of clear crushed stone wrapped in geotextile fabric in areas of unstable soils. (100m estimated)	$ 7,000	
C-5		301.33	Increased costs to daylight unlocatable services using hydro excavation (10 estimated)	$ 30,000	
C-6		301.23	Remove and replace 10m of concrete sidewalk. (10m estimated)	$ 1,200	
C-7		301.28	Supply and apply calcium chloride flake for dust (500kg estimated)	$ 1,500	
C-8			Lump Sum contingency allowance	$ 194,460	
			Sub Total Contingency Items	**$ 271,660**	
			TOTAL CONSTRUCTION COST ESTIMATE:		**$ 4,598,655**
ALLOWANCES					**$ 57,850**
ENGINEERING AND CONSTRUCTION SERVICES					
			Preliminary Report Preparation	$ 50,000	
			Final Report Subconsultant Services (geotechnical report, hydro excavation for utilities)	$ 12,000	
			Final Report Preparation	$ 301,100	
			Consideration of Report Meeting	$ 2,500	
			Court of Revision Meeting	$ 2,500	
			Construction Phase Subconsultant Services (geotechnical for testing and excess soils)	$ 44,500	
			Construction Phase Services (tendering, contract administration, inspection)	$ 245,100	
			TOTAL ENGINEERING COST ESTIMATE		**$ 657,700**
SECTION 73 COSTS					
			Interest estimate	$ 217,000	
			Other eligible costs	$ 26,275	
			TOTAL SECTION 73 COSTS ESTIMATE		**$ 243,275**
NET HST (1.76% on applicable costs):					**$ 92,520**
TOTAL ESTIMATED COST:					**$ 5,650,000**

APPENDIX C

Storm Sewer Sizing Sheets

APPENDIX C - STORM SEWER SIZING SHEETS
BRESLAU DRAIN 1
TOWNSHIP OF WOOLWICH

Catchment ID	Reach	Design Storm	From	To	Δ Area (ha)	C	AC	Total AC	Tc (minutes)	Rain (mm/hr)	Q design (cms)	Design Pipe Size	Qcap (cms)	Velocity (m/sec)	Mannings N	Pipe Slope (%)	Pipe Length (meters)	Travel Time (minutes)	Total Time (minutes)	Remaining Capacity
1	*Woolwich Branch*	*2*	*0+730*	*0+673*	0.151	*0.20*	*0.030*	*0.030*	*10.000*	*80.474*	***0.007***	*375*	***0.088***	*0.794*	*0.013*	*0.25*	*57*	*1.197*	*11.197*	*92%*
2	Woolwich Branch	2	0+673	0+639	0.653	0.35	0.229	0.259	11.197	74.360	**0.053**	375	**0.088**	0.794	0.013	0.25	33	0.693	11.890	39%
3	Woolwich Branch	2	0+639	0+533	0.353	0.35	0.124	0.382	11.890	71.303	**0.076**	375	**0.088**	0.794	0.013	0.25	106	2.226	14.116	14%
4	Woolwich Branch	2	0+533	0+457	0.498	0.35	0.174	0.557	14.116	63.244	**0.098**	450	**0.143**	0.896	0.013	0.25	76	1.413	15.529	31%
5	Woolwich Branch	2	0+457	0+358	2.186	0.35	0.765	1.322	15.529	59.163	**0.217**	600	**0.275**	0.971	0.013	0.20	99	1.699	17.228	21%
6	Woolwich Branch	5	0+358	0+270	0.293	0.35	0.103	1.424	17.228	84.570	**0.335**	750	**0.431**	0.976	0.013	0.15	88	1.503	18.731	22%
7	Woolwich Branch	5	0+270	0+209	1.052	0.35	0.368	1.792	18.731	80.801	**0.403**	750	**0.498**	1.127	0.013	0.20	61	0.902	19.633	19%
8	Berlin Street Branch	5	0+089	0+000	1.337	0.35	0.468	0.468	10.000	109.677	**0.143**	450	**0.180**	1.134	0.013	0.40	89	1.308	11.308	21%
9	Woolwich Branch	5	0+209	0+108	1.619	0.35	0.567	2.827	19.633	78.706	**0.619**	900	**0.701**	1.102	0.013	0.15	101	1.527	21.160	12%
10	Woolwich Branch	5	0+108	0+000	1.436	0.35	0.503	3.330	21.160	75.411	**0.698**	900	**0.810**	1.273	0.013	0.20	108	1.414	22.574	14%
11	Scarlett Branch	2	0+631	0+577	0.050	0.60	0.030	0.030	10.000	80.474	**0.007**	300	**0.048**	0.684	0.013	*0.25*	54	1.316	11.316	86%
12	Scarlett Branch	2	0+577	0+517	0.156	0.60	0.094	0.124	11.316	73.813	**0.025**	300	**0.048**	0.684	0.013	*0.25*	60	1.462	12.778	48%
	Scarlett Branch	2	0+517	0+458	0.000	0.60	0.000	0.124	12.778	67.802	**0.023**	300	**0.048**	0.684	0.013	*0.25*	59	1.438	14.215	52%
13	Scarlett Branch	2	0+458	0+340	0.377	0.60	0.226	0.350	14.215	62.933	**0.061**	375	**0.078**	0.710	0.013	*0.20*	118	2.770	16.985	22%
14	Scarlett Branch	2	0+340	0+209	0.465	0.60	0.279	0.629	16.985	55.569	**0.097**	450	**0.128**	0.802	0.013	*0.20*	132	2.744	19.730	24%
	Scarlett Branch	5	0+209	0+141	0.000	0.35	0.000	0.629	19.730	78.488	**0.137**	525	**0.192**	0.888	0.013	*0.20*	68	1.276	21.005	29%
15	Scarlett Branch	5	0+141	0+077	1.100	0.60	0.660	1.289	21.005	75.731	**0.271**	750	**0.431**	0.976	0.013	*0.15*	64	1.093	22.098	37%
16	Scarlett Branch	5	0+077	0+000	0.403	0.35	0.141	1.430	22.098	73.529	**0.292**	750	**0.431**	0.976	0.013	*0.15*	77	1.315	23.413	32%
17	Main Drain	5	1+165	1+146	0.569	0.35	0.199	1.629	23.413	71.054	**0.322**	750	**0.498**	1.127	0.013	0.20	19	0.281	23.694	35%
18	Kennedy Branch	5	0+066	0+000	0.374	0.35	0.131	0.131	10.000	109.677	**0.040**	300	**0.057**	0.809	0.013	0.35	66	1.359	11.359	30%
19	Main Drain	5	1+146	1+104	0.863	0.35	0.302	2.062	23.694	70.548	**0.404**	750	**0.498**	1.127	0.013	0.20	42	0.621	24.315	19%
20	Main Drain	5	1+105	1+061	0.224	0.35	0.078	2.140	24.315	69.456	**0.413**	750	**0.498**	1.127	0.013	0.20	44	0.651	24.966	17%
21	Main Drain	5	1+061	1+037	0.289	0.35	0.101	2.242	24.966	68.351	**0.426**	750	**0.498**	1.127	0.013	0.20	24	0.355	25.321	14%
22	Main Drain	5	1+039	1+006	0.496	0.35	0.174	2.415	25.321	67.763	**0.455**	750	**0.557**	1.260	0.013	0.25	33	0.437	25.757	18%
23	Main Drain	5	1+006	0+922	0.056	0.35	0.020	2.435	25.757	67.055	**0.454**	750	**0.557**	1.260	0.013	0.25	84	1.111	26.869	18%
24	Main Drain	5	0+922	0+880	1.866	0.35	0.653	3.088	26.869	65.323	**0.561**	900	**0.810**	1.273	0.013	0.20	42	0.550	27.419	31%
25	Main Drain	5	0+880	0+836	0.463	0.35	0.162	3.250	27.419	64.500	**0.583**	900	**0.810**	1.273	0.013	0.20	44	0.576	27.995	28%
26	Main Drain	5	0+836	0+813	2.497	0.35	0.874	4.124	27.995	63.662	**0.730**	900	**0.810**	1.273	0.013	0.20	23	0.301	28.296	10%
27	Main Drain	5	0+813	0+726	0.344	0.35	0.120	4.244	28.296	63.233	**0.746**	900	**0.905**	1.423	0.013	0.25	87	1.019	29.315	18%
28	Main Drain	5	0+726	0+713	0.059	0.35	0.021	4.265	29.315	61.826	**0.733**	900	**0.905**	1.423	0.013	0.25	13	0.152	29.468	19%
29	Main Drain	5	0+713	0+656	1.326	0.35	0.464	8.059	29.468	61.621	**1.380**	1050	**1.616**	1.866	0.013	0.35	57	0.509	29.977	15%
30	Main Drain	5	0+656	0+569	0.429	0.35	0.150	8.209	29.977	60.948	**1.391**	1050	**1.616**	1.866	0.013	0.35	87	0.777	30.754	14%
31	Main Drain	5	0+569	0+471	1.115	0.35	0.390	8.599	30.754	59.949	**1.433**	1050	**1.616**	1.866	0.013	0.35	98	0.875	31.629	11%
32	Main Drain	5	0+471	0+357	2.650	0.35	0.928	9.527	31.629	58.866	**1.559**	1050	**1.727**	1.995	0.013	0.40	114	0.953	32.582	10%
33	Main Drain	5	0+357	0+244	1.078	0.35	0.3773	9.9038	32.58	57.734	**1.590**	1200	**2.1354**	1.888	0.013	0.30	113	0.997	33.579	25.6%
	Main Drain Outlet	5	0+244	0+000	0	0.35	0	9.9038	33.58	56.597	**1.558**	1350	**2.3870**	1.668	0.013	0.20	244	2.439	36.018	34.7%

Notes:
1. Station 0+000 to 0+244 - 1350mm round pipe is equivalent to 1730Wx1090H elliptical pipe

NOTES:

1. DRAINAGE AREAS 11, 12, 13 & 14 SHOWN PER PRELIMINARY LOT GRADING DRAWINGS BY MTE DATED APRIL 12, 2023

BENCHMARKS:

BM#1
TOP SPINDLE OF FIRE HYDRANT ON W SIDE WOOLWICH ST. S. 5m N OF ENTRANCE TO LOT #280.
ELEV. 313.481

BM#2
CUT CROSS ON TOP OF CONCRETE HEADWALL DIRECTLY ABOVE 750mmØ CONC. OUTLET WHERE DITCH BENDS SW.
ELEV. 309.724

OBM
BRIDGE ACROSS SMALL STREAM ON WOOLWICH ST. IN BRESLAU, APPROXIMATELY 105M SOUTH OF HWY. NO. 7, TABLET IN TOP NORTHWEST ABUTMENT 37CM WEST OF CONCRETE PORTION OF GUARDRAIL.
N 4,814,471.483
E 547,162.425
ELEV. 303.43

VERTICAL DATUM CGVD 28:78
HORIZONTAL DATUM UTM NAD 83 ZONE 17N

LEGEND:

- WATERSHED
- EXTERNAL WATERSHED
- 1953 WATERSHED (FOR INFORMATION ONLY)
- PROPOSED DRAIN (PIPE)
- PROPOSED DRAIN (DITCH)
- 1953 DRAIN ROUTE TO BE ABANDONED
- STORM OR WATERCOURSE
- WOODED AREA
- 5-YEAR CATCHMENT AREA
- A6 — STORM DRAINAGE I.D. (5-YEAR)
- 1.18 — STORM DRAINAGE AREA (Hectares) (5-YEAR)
- 0.25 — COEFFICIENT (5-YEAR)

SCALE
0 — 40m
(1 : 4,000 ON 11"x 17")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.13/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100086193 SEPT. 22, 2023
SEPT. 22, 2023 ALEXANDER FAHLEY

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

POST DEVELOPMENT CATCHMENT AREAS FOR PIPE SIZING

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
FIGURE: A

S:\2018\18-285\Drafting\Final Report\WS 18-285.dwg Post Development Catchment Areas 22-Sep-23 2:25:41 PM

APPENDIX D

Summary of Landowner Consultations

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Berlin Street	8	December 10, 2019	Owner explained property was purchased in May 1985 and described existing infrastructure on property. Explained no flow was observed in the existing drain pipe when it was severed during excavation for the foundation. Also explained sump pump currently discharges to an existing catchbasin on the southern property line which Township has determined to be private - owner replaced CB cover with steel lid privately. (Comments at Consideration Meeting for Preliminary Report)
Berlin Street	8	December 20, 2019	Owner requested confirmation from Township regarding cost implications for their property. (Letter to Twp.)
Berlin Street	8	December 24, 2019	Engineer clarified no works proposed on property at time of preliminary report and that property would still be assessed based on outlet liability. (Engineer response to December 20 letter via. Email)
Berlin Street	8	March 3, 2020	Owner explained that the existing infrastructure on the property had been abandoned a long time ago and that the property should not be assessed any cost for the proposed work. (Owner response to December 24 email)
Berlin Street	8	December 14, 2022	Owner explained their sump currently discharging at the front could be re-directed to the back if needed, requested a follow-up on-site meeting.
Berlin Street	8	December 21, 2022	During site meeting, owner explained that they currently have two sump pumps, one discharges in the rear of his lot and one discharges in the front of his lot. Would like to see front lot sump connected to new CB at SW corner of his lot. Discuss outlet assessment amounts.
Berlin Street	14	October 7, 2021	During site meeting, owner explained that they currently have two sump pumps and that both pumps run every couple of minutes during/after rain events. Both pumps are directed to a low area in the rear lot which does not have an outlet. Ponding up to 450mm in depth has occurred in the spring time in this area.
Berlin Street	14	January 20, 2023	During site meeting, engineer explained design and cost to owner for Berlin Branch work, new CB to be located at SE corner of lot with knockout for future connection. Owner explained they would be able to connect sump to new CB privately.
Cooper Crescent	7	December 14, 2022	Owner requested meeting with engineer on site.
Cooper Crescent	11	December 14, 2022	Owner requested meeting with engineer on site, mentioned existing pipe along southern property line is adequate and does not need to be replaced as part of project.
7 Cooper Crescent, 11 Cooper Crescent & 76 Kennedy Road		December 21, 2022	Owners have no interest in replacing existing 300mm diameter plastic pipe or catchbasins along 11 Cooper Cres./76 Kennedy Road property line becuase catchbasins and pipe are relatively new. Owners recognized spot repairs in several locations may be required to address concerns noted during CCTV inspection of the pipe. Explained CCTV information to 76 Kennedy Road owners regarding location of existing 100mm diameter private drain connection. Owner's suggested perhaps the 100mm pipe drains a portion of the rear yard Discussed preferred drain route with owner of 11 Cooper Crescent, owner prefers new pipe downstream of existing MH be installed on an angle across property line to avoid damage to trees. Also discussed private drain connections, explained these connections may need to be re-routed to new drain privately
Elroy Road	18	December 14, 2022	Owners inquired about capacity of proposed drain vs. the existing storm piping, also inquired about reasons why assessments vary between neighbours. Owners expressed concern about potential damage to trees during construction.
Elroy Road	18	December 22, 2022	(Email) Engineer email to Owners, explained assessment rational and that properties with direct connections to the Drain will be assessed for benefit.

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Elroy Road	37	December 14, 2022	Owner explained runoff from properties along north side of Dovercourt Road drains through their backyard before getting into storm system in Elroy Road. Owner and engineer agreed drainage patterns and catchment boundaries should be a factor when determining assessments.
Elroy Road	57	December 14, 2022	Owners mentioned their septic bed is close to the road allowance, also mentioned their property is low and that they experience flooding. Owners concerned with tree removal during construction - Drainage Superintendent explained damage to trees would be minimized as much as possible during construction.
Joseph Street	23	Late December 2022	During phone call owner indicated Township should pay 100% of project cost.
Joseph Street	31	December 14, 2022	(Comment sheet) The following comments were provided: - The Township should be paying for this upgrade - Very little or no maintenance was ever done on drain - No money has been spent on upgrading old Breslau - New developments should be paying for the infrastructure they need in order to build new homes
Joseph Street	31	December 21, 2022	(Phone call) Owner requested copy of schedule C. Also mentioned they previously lived at 159 Woolwich Street S and installed a private drain connection to the existing MH on the lot at this time.
Kennedy Road	7	December 14, 2022	Mentioned existing CSP subdrain in east side of Kennedy Road does not work very well. Also mentioned there is an existing drain along the property line of 7 & 13 Kennedy Road that connects to a catchbasin on the east side of Kennedy Road.
Kennedy Road	7	December 15, 2022	(Email) Owner noted misprint on copy of Schedule A at December 14, 2022 public meeting.
Kennedy Road	30	December 14, 2022	(Comment sheet) Inquired about the different affected area amounts listed in assessment schedules and asked why properties are assessed that are not along the drain.
Kennedy Road	31	June 21, 2022	Owner concerned with impact of proposed development to east of property, also concerned with future maintenance of future Township block along east property line, does not think the Township will keep up with cutting grass.
Kennedy Road	40	June 21, 2022	Owner concerned with traffic impacts due to proposed development to east of Kennedy Road.
Kennedy Road	40	August 2, 2023	(Phone call) Engineer explained location of proposed drain and that drain will accommodate future urbanization of Kennedy Road if this were to occur in the future. Also discussed new private drain connection, Owner agreed it made sense to provide connection pipe across the road at the time of construction.
Kennedy Road	47	June 21, 2022	Owner concerned about proposed grade differential between existing lots and the upcoming development to east of property.
Kennedy Road	47	December 21, 2022	Discussed construction details and assessment rational. Owner indicated his backyard and north side yard are low-lying and collect surface water from neighbouring properties. A drain connection to improve drainage would provide some options.
Kennedy Road	58	December 14, 2022	Owners in favour of project and would like to see Drain constructed as soon as possible. Explained flooding that occurs on their property, mentioned water gets trapped at Elroy Road/Kennedy Road intersection then backs up onto their property.
Kennedy Road	58	December 21, 2022	Discussed construction-related items for the drain, owners are okay if cedar hedge impacted during construction. Owners also mentioned plans for improvements to property, suggested waiting until after drain is built to start to avoid any damage.

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Kennedy Road	61	June 21, 2022	During site meeting owner indicated that surveyors do not have access to the property. Noted several items along eastern property line that would obstruct construction, owner offered to move items privately given sufficient notice of work.
Kennedy Road	61	July 8, 2022	(Letter to Twp.) Owner opposed to recent petition filed by developer, indicated to Township no access is permitted to their property.
Kennedy Road	61	July 12, 2022	(Letter to Owner) Township response to letters received, Township suggested in person meeting to discuss project details.
Kennedy Road	61	July 14, 2022	(Letter to Owner) Engineer response to Owner, explained the drain on 61 Kennedy Road currently has status under the Drainage Act and was constructed through the 1953 report prepared by E.P. Bowman. Engineer also informed the Owner that right-of-entry exists through the Drainage Act.
Kennedy Road	61	December 14, 2022	At information meeting owner indicated preference for existing pipe on their property to not have status under the Drainage Act - Engineer explained this could be considered but also explained the final report may still recognize an overflow route along the north property line, subject to final design and flow calculations. Owner mentioned in addition to water flowing on his yard, there is an overflow path across his neighbour to the north (67 Kennedy Road).
Kennedy Road	61	December 14, 2022	(Letter to Twp.) Owner notified Township of future plans for improvement on lot and that the existing 300mm pipe on their property would be removed in order to do so. Explained this pipe was installed privately. Owner suggested the drainage from developmetn lands should be re-routed southward with a new open ditch to the connect to the existing Breslau Drain ditch with a new culvert installed under Menno Street.
Kennedy Road	61	December 19, 2022	(Letter to Twp.) Owner informed Township he would not permit any access to his property. Owner noted Township had previously stated that the pipe on their property was private and was not the Township's responsibility.
Kennedy Road	61	December 23, 2022	(Letter to Twp.) Owner suggested Drain should be taken south along the perimeter of Breslau. Owner also informed Township he would not permit any access to his property
Kennedy Road	61	January 11, 2023	(Letter to Owner) Township response to Owner, explained the Drain on the property currently has status under the Drainage Act and recommended that the existing Drain remain in place until the new Drain is constructed. Also informed the Owner of Section 82 of the Drainage Act regarding the implications in the legislation for removing municipal drains.
Kennedy Road	61	February 24, 2023	(Letter from Owner) Owner explained their family originally purchased the property in 1968 and that no mention of a Drain existing on the property had been mentioned at that time. Owner confirmed plans to remove the existing pipe on their property.
Kennedy Road	73	December 14, 2022	Owner concerned with future development east of property. Owner explained property does not appear to be within watershed boundary but is still appears in the assessment schedules - Engineer explained a small portion along the south edge of the property flows into the Kennedy Branch.
Kennedy Road	76	January 30, 2020	Owners purchased the property in late 2019. Surprised by how much water ponds in rear yard - have seen up to 4 foot depth of water ponding during spring melt. Owners in favor of drainage improvements. Owners are concerned with tree removal during construction.
Kennedy Road	76	May 5, 2021	Email from Owners to Engineer, Owners unsure how much benefit their property will receive from a new Drain, concerned construction could cause harm to trees.

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Kennedy Road	76	May 13, 2021	Engineer emailed response to May 5, 2021 email, explained current design is to cutoff majority of flow from east at Kennedy Road before the water reaches their parcel and that the design on 76 Kennedy Road had not changed as of the Jan 30, 2020 site meeting other than moving the replacment pipe closer to the property line, where the existing pipe is proposed to be replaced. Explained that the Contractor is required to minimize construction footprint/impact on private properties.
Kennedy Road	76	December 14, 2022	Owners mentioned they recently consulted with an arborist regarding impacts drain construction could cause to trees on property, requested on site meeting with Engineer.
Kennedy Road	101	June 21, 2022	Owners explained their backyard floods every year from farmland runoff which impacts their septic bed. Owners also asked about new drain corridor, would prefer if the corridor is not fenced. Engineer noted several trees along east property line that would likely be removed as part of construction, no objections from owners.
Kennedy Road	115	June 21, 2022	Owners concerned with proposed development east of their property, also asked about sanitary servicing in Breslau. Owners also mentioned abandoned well at the south end of Kennedy Road, thought well could adding to high water table if not decommissioned properly.
Kennedy Road	7 & 13	June 21, 2022	Owners explained runoff from farmland and possible old farm tiles drain to and through their properties now. Also explained Kennedy Road ditches sit full of water for several days after rain events.
Lonsdale Road	2117	December 14, 2022	Owner unsure why they were invited to meeting, property is outside of Breslau - Drainage Superintendent explained property adds water to system and therefore is assessed for outlet liability.
Menno Street	7	December 14, 2022	Owner unsure why estimated assessment differs from neighbours, also discussed new private drain connection location with Engineer
Sheridan Drive	10	December 14, 2022	(Comment sheet) The following comments were provided: - Water runs down Dovercourt & down Sheridan into our driveway and side yard - The water mostly does not get into the grates on the corners of Dovercourt - A bump we built at the end of our driveway saves us somewhat from flooding - We were told to wait until the Township fixed this before getting a new driveway, that was 3 years ago - This has been a problem for years, I sent a video of the water flow during a hard rain several years ago

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Sheridan Drive	24	December 14, 2022	(Comment sheet) The following comments were provided: Drainage that does not specifically benefit my property but I have to pay? This is a Township maintenance issue. Drainage has been neglected by the Township for many many years which is why we are in this situation.
Woolwich Street South	117	December 11, 2019	(Phone call) Owner explained they have owned the property for 8 years and have plans for improvements in the rear lot in the future. Engineer explained the final report would most likely designate a strip of land at the east end of 127 Woolwich with status under the Drainage Act as a minor swale to address runoff from neighbouring properties that currently ponds on 127 Woolwich St. S.
Woolwich Street South	127	June 23, 2020	(Email) Project update request from owner. Engineer response (June 24, 2020) explained draft Geotechnical report had been received, final report phase still in progress.
Woolwich Street South	127	December 14, 2022	Owners had no objections to the location of the drain, would like to see construction start as soon as possible.
Woolwich Street South	127	January 19, 2023	Site meeting with Owners, explained future plans for lot. Owners okay with general location of drain, would like to see working corridor reduced as much as possible to allow Owners to maximize use of property.
Woolwich Street South	127	August 24, 2023	Email from engineer to Owners to explain basis for drain location and width of right-of-way corridor along the drain.
Woolwich Street South	133	December 14, 2022	Owners mentioned several new tree plantings on their property, would like trees to be protected during construction and would like to see proposed location of drain prior to construction. Owners also indicated future changes at 127 Woolwich Street South need to be done in such a way that neighbouring properties are not adversely affected by grading or drainage changes. Owners also mentioned they had observed beavers in the existing open portion of the drain near the Woolwich St. S crossing.
Woolwich Street South	133	December 21, 2022	Site meeting to review the 6m working corridor required for construction. Owners okay with tree removals required for construction.
Woolwich Street South	144	December 14, 2022	Owner explained existing storm system on the west side of Woolwich Street South does not function very well, believes the existing catchbasins had no outlet pipes and were designed to simply soak away into the ground
Woolwich Street South	147	September 22, 2023	Engineer call to owner's representative regarding anticipated project schedule, estimated assessments and proposed work in vicinity of their property.
Woolwich Street South	151	December 14, 2022	Owners questioned what would be done with existing drain on their property - Engineer explained the drain would be plugged and that existing private connections would be tied into new drain pipe. Owners explained plans for improvement to property and asked if existing drain on their property could be removed prior to construction of new drain - Drainage Superintendent explained that the owners should wait to remove the old drain until the new drain has been constructed to avoid flooding on their property and neighbour's properties.

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Woolwich Street South	151	June 1, 2023	Email from owners to engineer inquiring about project status and construction timing.
Woolwich Street South	151	September 13, 2023	Township forwarded email inquiry from owners regarding project status.
Woolwich Street South	151	September 21, 2023	Engineer emailed response to owners with update about project schedule and proposed work in vicinity of their property.
Woolwich Street South	169	December 21, 2023	Email from owners to engineer inquiring about project information distributed at December 2022 meeting.
Woolwich Street South	169	September 20, 2023	Engineer emailed response to owners with December 2022 meeting information, anticipated project schedule and proposed work in vicinity of their property.
Woolwich Street South	221	December 14, 2022	Owner questioned what will be done with existing drain pipe, Engineer explained the pipe will be plugged and abandoned and that connections to the new drain will be provided to adjacent properties
Woolwich Street South	255	December 18, 2019	(Email) Owners opposed to new drain along north property line, one of the options presented in the preliminary engineering report. Basis for their concern was: - new drain will flood their property during large rain events - construction will damage or kill trees on their property - moving drain from existing route only trades one problem for another - new open ditch will only worsen mosquito problem in Breslau - moving the existing drain will cause damage to wildlife - Owners should not be paying for installation of new drain
Woolwich Street South	255	December 24, 2019	(Email) Engineer response to December 18, 2019 email from landowners: - Final route of drain has not yet been determined, preliminary report explored several alternatives - The proposed ditch will be sized to ensure major flows stay within the cross-section of the ditch - No work is proposed in the existing wetland east of the property - The Drainage Act requires all owners within the drain watershed are assessed a portion of the project cost
Woolwich Street South	255	May 9, 2023	(Email) Township forwarded to the engineer an email from owner inquiring about project and expressing concern about potential assessment amount.
Woolwich Street South	255	August 25, 2023	Email from engineer to owners providing a project update and explanation of estimated assessment.
Woolwich Street South	278	May 17, 2022	(Phone call) Owner plans on removing trees in the NE corner of the property for future improvements. Owner okay with estimated assessment.
Woolwich Street South	004-07810	July 17, 2023	(Virtual Meeting) Discussed construction details with property representative, owner is okay with alignment of drain. Rep. wanted to ensure drain will not negatively impact any future improvements to property - explained drain can be relocated under section 78 of the Drainage Act at any point in the future. Rep. also asked about assessment rationale, thought properties assessment was a little high.

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Woolwich Street South	214-226	August 1, 2023	(Phone call) Owner's representative explained the property currently has a private storm sewer system which conveys parking lot water westward to a storm water management pond near the rear of the lot. Owner's representative mentioned some minor ponding in front of the church on the sidewalk in the spring but did not think a connection to the new drain would be necessary at this time since they have their own on-site storm piping, will contact K. Smart if this changes.
Woolwich Street South	232-250	March 23, 2021	K. Smart on-site to review watershed boundary, spoke with several owners/tenants who had no concerns with project.
957859 Ontario Limited	004-07810	March 5, 2021	Email from engineer to owner regarding upcoming site review
957859 Ontario Limited	004-07810	July 7, 2023	Email from engineer to owner regarding site review observations, project status and and the downstream extent of the proposed drain.
957859 Ontario Limited	004-07810	July 17, 2023	Virtual meeting with owner's representative regarding project status, estimated assessment and recommended drain work on subject property.
Breslau Properties Walden	005-04110 004-07510	March 1, 2021	Discussion with Owner's representative (IBI Group) regarding status of Environmental Assessment (EA) for future Ottawa Street Extension. IBI Group explained that the first phase of EA is completed and that the preferred route for Ottawa street is Option D. Also discussed preliminary grading concepts for future Ottawa Street.
Madwest Breslau	004-16994 005-04100	November 18, 2022	Meeting with Owner and and their consultant team (JPE, IBI Group) to review Scarlett Branch concept design arising from the Owner's Section 4 petition. Discussion included preliminary rear yard grading for future residential lots abutting existing lots on Kennedy Road - consultant team suggested piping flows to Kennedy Road along existing property lines in several locations and also mentioned retaining walls may be required to account for 4.5m wide Township owned block along drain corridor, but this would be subject to final/detailed design.
Madwest Breslau		March 31, 2023	Design discussion with Owner's consultant (MTE) on the following: - Breslau Drain 1 pipe portion will outlet into existing open ditch portion on downstream side of future Ottawa Street with headwall at toe of future road embankment - Ottawa Street is proposed to be constructed in phases - the first phase will include all earthwork but only 2 lanes of the road will be constructed - Current Drain alignment does not conflict with alignments for future servicing or the Ottawa Street corridor. - MTE noted the Breslau Drain 1 piping under the Ottawa Street corridor needed to sized to ensure ponding at the sag in Woolwich Street South is less than 150mm deep during a 100-year design storm. - MTE noted horizontal elliptical pipe would likely be necessary for Breslau Drain 1 under Ottawa Street to avoid vertical conflict with proposed storm sewers leading to the future stormwater management facility. - Briefly discussed existing 1.5x1.5m concrete box culvert on Breslau Drain 1 under Woolwich Street South, MTE explained the Region of Waterloo may upsize upstream culverts under Fountain Street in the future and that their modelling shows the Woolwich Street culvert impacts Regional event floodlines. - MTE noted the south half of Cooper Crescent neighbourhood enters the Drain during the 100-year event based on topography. Agreed this major event overflow would be accounted for in the Breslau Drain 1 sizing under future Ottawa Street, but the south half of the Cooper Crescent area is not part of the Breslau Drain 1 watershed, since the service level for Breslau Drain 1 is the 5-year event. - Discussed contribution areas to the Scarlett Branch.

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Township of Woolwich		October 21, 2020	Progress meeting with Township, the following was discussed: - Sirati is currently working on final Geotechnical report - Ottawa Street EA is in progress, Option D is recommended alternative - Discussed timeline for future sanitary sewer in Woolwich Street S required by Breslau Properties. - Discussed existing Cooper Crescent storm system - Township will ensure the existing catchment is not overlooked by Breslau Properties - Discussed the preferred alignment for Breslau Drain 1 in light of Geotechnical investigation and preliminary Breslau Properties servicing. The preferred route for the drain will be along the east edge of pavement along Woolwich Street South from Elroy Road to the future Ottawa Street intersection. The Drain will then continue east along the future Ottawa Street corridor to a point where it can cross underneath the development's proposed sanitary sewer. The following options for the alignment of the drain were also discussed but ultimately decided against: 1. West side of Woolwich Street (will cause a conflict with connections to the future sanitary sewer) 2. Run drain through private property south of Menno Street (could conflict with future servicing as lands are developed or be very deep subject to development grading) 3. East side of Sheridan Street (costly due to additional length of large diameter pipe)
			- Some interim maintenance on the existing drain may be necessary prior to construction of new Drain - Existing utilities are to be daylighted and surveyed to confirm conflict locations - K. Smart to investigate any private wells that may exist along the route of the proposed Drain and potential impacts caused by the new Drain - Township will likely want Woolwich Street S to be urbanized as part of the project - Discussed reduced traffic impacts if sanitary sewer is installed at same time as Drain along Woolwich Street S. - Township mentioned DGSSMS only allows for reinforced concrete pipe - PP pipe is not an approved material and would require specific approval by the Township - Discussed question of servicing in Breslau, Township will be conducting 2 surveys to residents to gather information
Township of Woolwich		December 10, 2021	Progress meeting with Township, the following was discussed: - Ottawa Street will be constructed in two phases, first phase will only construct half of the final cross section of the road. - Retaining wall on south side of Ottawa Street should not be included in the costs for the Drain but a headwall at the outlet of the Drain should be included - Township suggested using tee maintenance holes to reduce cost - Preferred route of the Drain along the Ottawa Street corridor is a constant 2.3m southern offset from the north property line. - Drain project will not include urbanization of Woolwich Street or Elroy Road - work to be limited to drainage related items only and reinstating existing cross-section. - Discussed potentially moving the Drain into the boulevard and the watermain under the road along Woolwich Street S - this would be the Township's preference for future access - Township requires all pipe materials comply with DGSSMS (PP not accepted)

Street/ Owner	Address/ Roll No.	Date	Comments and Discussion
Township of Woolwich		October 13, 2022	Progress meeting with Township, the following was discussed: Gas Relocation - A portion of the existing gas at the Woolwich St. S/Ottawa Street cross section will need to be relocated due to location of proposed Drain. - Discussed several options, moving the existing gas instead of the proposed Drain keeps the Woolwich Street Cross section more available for improvements in the future - Gas needs be relocated prior to construction of the Drain **Hydro** - Holding hydro poles during construction will be much less costly than relocation - Discussed cost sharing, portion of costs may be assessed to Waterloo North Hydro under Section 26 - Engineer to discuss project with Waterloo North Hydro **Scarlett Branch** - Discussed two alignment options, Township noted future maintenance is easiest if drain is on Township property property - Township will require a 4.5m wide block from the Madwest Breslau for a drain maintenance corridor. Additional easements may be required - Township suggested checking minimum velocities on pipes with minimal slope
			General Drain Comments - Drain project only to include Drain installation, roads should be restored to existing conditions - Township would like maintenance holes to be located in areas where the grates will be out of the wheel paths of traffic - Regarding storm sewer material, DGSSMS allows HDPE pipe up to 450mm diameter, with reinforced concrete required for diameters larger than 450mm. Since this is a landowner funded project and HDPE pipe provides a cheaper alternative to concrete, while meeting technical/site requirements, on this project the Township will accept HDPE as an alternative material for pipes that are 900mm diameter and smaller. All pipes greater than 900mm in diameter shall be reinforced concrete.
Township of Woolwich		November 18, 2022	Discussed Scarlett Branch, Township requested the Drain be sized using a C factor of 0.60 in anticipation of account for future hardscaping by landowners. Also required the Drain be reinforced concrete pipe and that the catchbasins have no sumps. Also discussed 4.5m wide future Township block along Drain corridor - Township requested that the block remain grassed and will require access to the block from future roadways at each end of the corridor.
Township of Woolwich		July 20, 2023	Design discussion with Township, the following was discussed: - Rear-yard private drain connections to Scarlett Branch not advisable for future lots, would likely be damaged by future fencing/retaining walls, etc, - Private drain connections should be provided for all properties adjacent to the Drain, not just properties adjacent to the Drain on Woolwich St. S - Backflow preventors shall only be provided where existing drain connections are being tied into the new Drain and are subject to Engineer's evaluation at the time of construction. Private drain connection stubs for future tie-ins will not include backflow preventors at this time.

SUPPLEMENTAL SPECIFICATIONS

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300 GENERAL PROVISIONS

300.1 Order of Precedence

In case of any inconsistency or conflict between the drawings and specifications, the following order of precedence shall apply: Addenda, The Township of Woolwich Contract Documents, Schedule of Tender Prices, Contract Drawings, Supplemental Specifications, Standard Specifications.

300.2 Mandatory On-Site Pre-Bid Meeting

Prior to submitting a bid, the Tenderer shall attend an on-site meeting with the Engineer and the Municipality. The Tenderer must examine the premises and site to compare them with the Drawings and Specifications to be satisfied with the existing conditions and the extent of the work to be done. It is the Tenderer's responsibility to clearly understand the drawings, estimated quantities, and specifications before submission of the Tender. No allowances shall be made on behalf of the Contractor due to any error made in the preparation of the Tender.

300.3 Pricing

The unit prices as tendered shall include the supply of all labour, equipment, materials, including any fees or other charges required by law, to complete this Contract to the satisfaction of the Engineer. Any estimates of quantities in the tender document are provided for the convenience of the Tenderer. The Tenderer should 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 Tenderers risk.

300.4 Permits and Fees

The Township, through the Engineer, shall obtain and pay for all necessary permits that may be required by GRCA, MECP and DFO. Any other permits or licenses required for execution of the work shall be obtained and paid for by the contractor.

300.5 Construction Noise Constraints

Equipment shall be maintained in an operating condition that prevents unnecessary noise, this includes, but is not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.

Idling of equipment shall be restricted to the minimum necessary to perform the specified work.

Equipment, pumps, etc. are not to be operated between 8:00 pm and 7:00 am on weekdays or weekends, except as required in the case of emergency or when approved by the Engineer. No work is allowed on Saturdays, Sundays, or statutory holidays. Whenever practical, stationary noise generating equipment is to be enclosed.

300.6 Weighing Materials

Weigh tickets shall be supplied by the Contractor showing the date, source of material, type of material, truck number, gross, tare and net weights, place of dumping, and provided spaces for the signature of the scale operator and the Engineer.

300.7 Trench Stabilization

The Contractor shall provide, at all times, sheeting, shoring, bracing, draining, pumping, and dewatering equipment as required for maintaining any trench or open cut, in a dry, straight, and stable condition. The cost for the above shall be included in the tendered unit price for channel, culvert, or maintenance hole work. No separate payment shall be made for the equipment, labour, and materials necessary to perform this work.

300.8 Excavations Near Traffic

The Contractor shall schedule the work so excavations adjacent to a lane carrying traffic are not left open overnight and on non-working days except when approved by the Engineer. Excavations within 1.5m of the travelled lane shall be backfilled to the travelled lane elevation at the end of each day’s work. No separate payment shall be made for the equipment, labour, and materials necessary to perform this work.

300.9 Testing of Material

Refer to Standard Specification for Construction of Drains 400.10 “Tests”

301 SPECIAL PROVISIONS

GENERAL

301.1 Mobilization, Demobilization, and Insurance

1.0 General

.1 Provide and maintain sanitary facilities for workers. Move as necessary through project site.

.2 Attend construction site meetings on weekly basis or as requested by Township or Engineer.

.3 Provide construction layout for all work including alignment layout for storm sewer, sanitary sewer, watermain and ditch excavation.

.4 Arrange for utility locates and protection.

.5 The Contractor shall provide insurance in accordance with the Contract Documents and shall pay all premiums.

2.0 Measurement and Payment

.1 On first Payment Certificate 60% of this Lump Sum item shall be paid. The remaining 40% shall be paid upon Substantial Completion of the project.

301.2 Traffic Control and Temporary Fencing

1.0 Applicable Provisions and Specifications

.1 Ontario Traffic Manual Book 7, latest edition

.2 OPSS.MUNI 706 “Construction Specification for Temporary Traffic Control Devices”

2.0 General

.1 The Contractor shall supply, erect, and maintain all the necessary detour signs, barricades, and flashing lights in order to safely warn traffic of the impending construction and detours.

.2 The Contractor shall provide public access to homes and businesses. Any short-term road closure is subject to Township approval.

.3 When feasible, the Contractor shall backfill all trenches/excavation nightly to protect the public.

.4 The Contractor shall provide safety fencing around unattended excavations.

.5 The Contractor shall maintain safety fences as necessary to control public access to the construction area and to protect the public.

3.0 Measurement and Payment

.1 Measurement and payment shall be made in lump sum and is considered compensation in full for all detour signs, barricades, flashing lights, safety fencing, labour, materials, and equipment required to complete the work.

301.3 Water for Compaction and Dust Control

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 501 “Construction Specification for Compacting”

.2 OPSS.MUNI 506 “Construction Specification for Dust Suppressants”

2.0 General

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

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

.3 The Contractor shall arrange for the supply and placement of water as necessary and/or as ordered for compaction and dust control by the Engineer and/or the Township

.4 Dust control using water shall be the primary means of dust control on this project.

3.0 Measurement and Payment

.1 Measurement and payment will be in lump sum. Payment includes rental of water trucks, hauling of water, purchasing water and application of water.

301.4 Erosion and Sediment Control

1.0 Applicable Provisions and Specifications

.1 OPSD 219.100 “Light-Duty, Straw Bale Barrier”

.2 OPSD 219.110 “Light-Duty, Silt Fence Barrier”

.3 OPSS.MUNI 805 “Construction Specification for Temporary Erosion and Sediment Control Measures”

2.0 General

.1 The Contractor shall provide temporary erosion control measures as required and directed by the Engineer to prevent offsite sediment transport and maintain slope stability until disturbed areas are fully vegetated.

.2 Erosion control may include installation of silt fences, staked straw bale dams, or other control features necessary to minimize erosion and sediment transport.

.3 Refer to Standard Construction Specifications for Construction of Drains 400.31 “Sediment Control”

3.0 Measurement and Payment

.1 Measurement and payment to provide temporary erosion measures will be made using the lump sum price tendered and is considered compensation in full for all labour, material and equipment required to complete the work.

.2 Measurement and payment of permanent sediment traps will be in lump sum and shall be compensation in full for all excavation, levelling material, riprap, geotextile fabric, labour, materials, and equipment required to complete the work.

REMOVALS

301.5 Excess Soils

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 206 “Construction Specification for Grading”

.2 OPSS.MUNI 510 “Construction Specification for Removal”

.3 O. Reg 406/19: “On-site and Excess Soil Management”
.4 The following project-specific reports prepared under O. Reg 406/19:
a. Soil Characterization Report
b. Excess Soil Destination Report

2.0 General

.1 Excavated material which is not re-used on-site for trench backfill or site grading is considered excess soil.

.2 Excess soil handling, temporary stockpiling, hauling and disposal will comply with applicable regulations, reports, and directives of the Excess Soils Qualified Person.

.3 Clean excess soil which is suitable for offsite re-use shall be kept separate from contaminated excess soil.

.4 Disposal sites shall be left in a condition satisfactory to the Owner of the disposal site.

3.0 Measurement and Payment

.1 The cost for excavation of excess soils is included in other items.

.2 Measurement and payment for the disposal of excess material will be based on tonnes as shown on weigh tickets and shall include supply, placement, all labour and materials, handling, stockpiling, hauling, tipping fees and grading of the material at the approved destination, as well as restoration of the disposal site to the satisfaction of the Owner.

.3 If in the opinion of the Engineer, the trench has been over excavated, then the Engineer reserves the right to calculate the quantity of excess soil based on theoretical dimensions and payment will be based on theoretical quantity and weigh tickets will not be accepted for the area in question.

.4 The Contractor is responsible for restoration of all temporary staging/stockpiling/laydown areas, no additional payment will be made.

301.6 Road Asphalt Removal

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 330 - “Construction Specification for In-Place Full Depth Reclamation of Bituminous Pavement and Underlying Granular”

.2 OPSS.MUNI 330 - “Construction Specification for In-Place Full Depth Reclamation of Bituminous Pavement and Underlying Granular”

2.0 General

.1 Asphalt or surface treatment shall be sawcut at the removal limits. All joints are to be milled across the entire width of the existing asphalt a minimum of 2.0m in milled width. The depth of the butt or lap joint shall match the depth of the asphalt being placed as directed, and to the satisfaction of the Township. The Contractor is responsible for all sweeping to ensure a clean and neat joint for paving against.

.2 No more than 100 metres of asphalt shall be removed in advance of underground installation.

.3 After removal, asphalt shall be disposed of in accordance with the requirements for contaminated excess soils.

.4 Granular ramps shall be provided and maintained at all times as required to facilitate traffic through asphalt removal areas.

.5 Contractor shall be responsible for dust control and maintenance of the travelled roadway, including re-grading and compacting granular as required to remedy ruts and potholes.

3.0 Measurement and Payment

.1 Measurement for payment will be by horizontal area in square metres of the area of pavement removed. Payment shall include milling of asphalt and removal of equal thickness of granular below asphalt, loading on to trucks and transportation of stockpiling of same, and placement of temporary ramps to allow vehicular access after asphalt removal, grading of remaining road base and compaction, application of calcium chloride and water.

301.7 Concrete Sidewalk Removal

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 510 - "Construction Specification for Removal"

2.0 General

.1 Remove sidewalk as shown on the drawings or as required for service installation (not shown on drawings) or as authorized. Work shall include the removal of any

combination of sidewalk material, asphalt on concrete, concrete and asphalt sidewalks. All removed edges should be sawcut or go to construction expansion joint if nearby.

.2 If a new sidewalk is not being installed in the old location, the Engineer may direct the Contractor to supply and place topsoil and sod to fill in area of old sidewalk.

.3 If a new sidewalk will replace the removed sidewalk, place Granular 'A' temporarily, shape and compact in area of removed sidewalk. In all areas where sidewalk is removed solely for installation of services, provide Granular 'A' surface restoration as sidewalk restoration.

.4 Where sidewalks are removed adjacent to a paving stone driveway, remove, and salvage the paving stone. Collect the paving stone and arrange for secure storage of the paving stones.

.5 Where sidewalks are removed adjacent to asphalt driveways, sawcut the asphalt driveway 500mm back from the sidewalk.

.6 The Contractor shall provide off-site disposal of sidewalks and adjacent portions of asphalt driveway.

.7 Where sidewalks are removed across driveways, fill in with Granular ‘A’ temporarily and compact to 100% SPMDD. Also see restoration of driveways item.

3.0 Measurement and Payment

.1 Measurement and payment for sidewalk removal is included in “Concrete Sidewalk and Walkways” item, no separate payment shall be made for this item.

301.8 Boulevard Topsoil and Sod Removal

1.0 Applicable Specifications and Provisions

.1 OPSS.MUNI 206 - “Construction Specification for Grading” and others referenced.

2.0 General

.1 Work includes removal and disposal of all boulevard materials other than those paid under driveway or sidewalk removal.

.2 Limits of removal are to be indicated by or confirmed with Engineer in the field.

.3 Depth of removal shall be sufficient to allow for new finished grades and required depths of topsoil and sod.

.4 All required utility locates are to be undertaken.

.5 Provisions for drainage, erosion control and dust control must be maintained by the Contractor between time of removal and replacement.

.6 Requirements for temporary driveways are to be observed.

.7 No more than 100 metres of boulevard topsoil and sod shall be removed in advance of underground installations.

3.0 Measurement and Payment

.1 Measurement and payment for boulevard topsoil and sod removal is included in "Topsoil and Sod or Seed" item, no separate payment shall be made for this item.

301.9 Driveway Removal

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 510 - "Construction Specification for Removal"

2.0 General

.1 Excavate and regrade driveways to limits shown on drawings or as approved by the Engineer. In general, driveways must be graded to new road profiles.

.2 Where driveway is paving stone construction, carefully remove and salvage the paving stone. Collect the paving stone and arrange for secure storage of the paving stones. Paving stone will be reinstalled only in part.

.3 Where driveway is asphalt or concrete, saw cut the asphalt or concrete at the limits of regrading. Remove asphalt or concrete and dispose of off-site. In the case of concrete driveway, the Engineer may direct Contractor to remove driveway at nearest cold joint or expansion joint.

.4 If new driveway elevation is being changed, regrade grass areas adjacent to driveways so as to eliminate drastic changes in grade between driveways and grass areas. Topsoil and sod changes in lawn grades adjacent to driveways.

.5 Construct new driveway base so as to provide a minimum of 300mm of Granular 'A' base and so as to provide a uniform transition from the existing driveway to the new road profile. The driveway Granular 'A' must be compacted to 100% SPMDD.

.6 Provide temporary granular ramps as required to maintain access.

3.0 Measurement and Payment

.1 Measurement and payment for driveway removal is included in “Restoration of Driveways” item, no separate payment shall be made for this item.

301.10 & 301.12 Removal of Existing Storm Sewer and Storm Structures

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 510 - "Construction Specification for Removal"

2.0 General

.1 Drawings identify storm sewers and catch basins to be removed.

.2 Excavate and remove storm sewers and storm structures and dispose off site.

.3 Salvage existing frames and grates and deliver to the municipal works yard if and as directed by Engineer, otherwise haul away.

3.0 Measurement and Payment

.1 Storm Sewer Removal (Item 301.11)
Measurement and Payment for storm sewer removal will be as follows:

a. For storm sewers which are removed as part of excavation work for installation of new works, payment will be considered included in unit price for new works.

b. For storm sewer which cannot be removed as part of other new works, measurement and payment will be based on horizontal lineal meters. Payment includes off-site disposal of storm sewer pipe.

c. All pipes that are joined into existing catch basins being removed are either to be capped, joined together, or joined to the new drain as directed by the Engineer if not removed as part of the work specified. Such work of capping, joining together or connecting to the new drain will be part of the unit price bid for removal of catch basins. Where

drains into existing catch basins are to be joined together, PVC pipe is to be used. Similarly, where drains are to be joined to the new drain, PVC piping is to be used unless the Engineer specifically allows plastic tubing.

d. The excavation remaining from storm sewer and storm structure removals are to be backfilled with Granular 'B.' 100% compaction if on roads and native material, 95% compaction in boulevard areas.

e. Where existing storm structures removed are to be replaced by new storm structures, the existing drains into the existing structures are to be joined to the new structures except where the drawings specify that such are to be capped or removed. The work of joining existing drains to new catch basins is to be considered as part of either the work item for the installation of new basins or the removal of existing basins, PVC piping, or plastic tubing if necessary and approved, is to be used for connections.

f. The unit price bid for the removal of existing drains shall include all work to trench, remove the drain, backfill, and compact with native or granular materials, and to bring to surface restoration grades. It is to be noted that when any existing drain is to be removed, that all drains joined to the drain are to be noted and are to be joined to the new drains unless otherwise directed by the Engineer. Existing drains are to be removed prior to construction of new private drain connections. Where appropriate and/or required the new private drain connection shall be located/constructed so as to join up to lateral drain evident after removal of existing drain.

g. If additional existing drains or catch basins are requested to be removed at the time of construction, the Contractor is to remove such at the unit price bid under this item. The connecting up of existing drains formerly joined to the removed drain is to be done as directed by the Engineer and unit prices for plastic tubing or PVC piping in the contract will apply.

h. Surface restoration will be measured and paid as per the surface items applicable.

i. Where existing drains to be removed are under hard surfaced driveways or gravel driveways in good condition that do not otherwise have to be disturbed for grading the road work, the existing drain may remain under the driveway but careful and complete sealing of each end of the drain with concrete and enveloping the sealed ends with filter fabric will be required.

.2 Catch basin Removal (Item 301.12)
Measurement and Payment will be based on number of catch basins removed. Payment includes off-site disposal, backfill and all connection work as evident from the drawings and/or as described herein.

301.13 Removal of Trees

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 201 - "Construction Specification for Close Cut Clearing, Grubbing, Removal of Surface and Piled Boulders"

.2 Other OPSS referenced in OPSS.MUNI 201

2.0 General

.1 Clear and grub as necessary as per drawings and/or as directed.

.2 As part of the unit price bid for removal of the trees, the Contractor is to remove the trees, including roots, backfill the hole and restore the surface. Where the owner or the adjacent owner request the wood from the removed tree, the Contractor is to brush the tree, separate the roots and cut all lumber that the owner wishes left in lengths of 3 meters, for the owner to dispose of. The Contractor is to dispose of off-site all cleared and grubbed materials not required by the owners. Backfill shall be native subject to road or trench backfill requirements for granular if applicable.

.3 For tree removal on agricultural lands refer to Standard Specification for Construction of Drains 400.27 “Clearing Vegetation.”

3.0 Measurement and Payment

.1 Measurement for clearing will be done per tree removed. Payment for all labor, materials and equipment required for clearing shall be based on the Unit Price entered in the Form of Tender.

STORM SEWER AND APPURTENANCES

301.14 Storm Sewer Structures

1.0 Applicable Provisions and Specifications

.1 OPSD 400.11 “Cast Iron, Square Frame with Square Overflow Type Flat Grate for Catch Basins, Perforated Openings”

.2 OPSD 401.01 “Cast Iron, Square Frame with Circular Closed or Open Cover for Maintenance Holes” ‘Type A’

.3 OPSD 403.010 “Galvanized Steel Honeycomb Grating for Ditch Inlet”

.4 OPSS.MUNI 407 "Construction Specification for Maintenance Holes, Catch basins, Ditch Inlets and Valve Chambers”

.5 All other OPSS specifications referenced in OPSS.MUNI 407

.6 OPSS.MUNI 410 “Pipe Sewer Installation in Open Cut”

.7 OPSS.MUNI 491 “Construction Specification for Preservation, Protection and Reconstruction of Existing Facilities”

.8 OPSD 701.021 “Maintenance Hole Benching and Pipe Opening Details”

.9 OPSD 701.03 "Precast Concrete Maintenance Hole Components 1200 mm Dia, Tapered Top and Flat Cap"

.10 OPSD 701.04 "Precast Concrete Maintenance Hole Components 1500 mm Dia, Transition Cone and Slabs"

.11 OPSD 701.05 "Precast Concrete Maintenance Hole Components 1800 mm Dia, Transition Slabs"

.12 OPSD 701.06 "Precast Concrete Maintenance Hole Components 2400 mm Dia, Transition Slabs"

.13 OPSD 704.01 “Maintenance Holes, Catch Basins and Valve Chambers, Precast Concrete Adjustment Units”

.14 OPSD 705.01 "Precast Concrete Catch basin 600 x 600 mm"

.15 OPSD 705.03 "Precast Concrete Ditch Inlets, 600 x 600 mm"

.16 OPSD 708.01 “Catch Basin Connection Rigid Pipe Sewer “

.17 OPSD 708.020 “Support for Pipe at Catch Basin or Maintenance Hole”

.18 OPSD 804.040 “Concrete Headwall for Sewer or Culvert Pipe Outlet”

.19 OPSD 805.050 “Grating for Concrete Headwall”

.20 OPSD 980.101 “Pedestrian Barricade Installation”

.21 OPSS.MUNI 1850 “Frames, Grates, Covers and Gratings”

.22 OPSD 3940.150 “Figures in Concrete, Warning Message, Layout”

.23 OPSD 3940.151 “Figures in Concrete, Warning Message, Letters”

.24 All other OPSS specifications referenced in OPSS.MUNI 407, OPSS.MUNI 410 and OPSS.MUNI 1850.

2.0 General

.1 All catchbasins maintenance holes to have 600mm sump unless otherwise noted.

.2 All maintenance holes and catchbasins to be placed on a 200mm compacted Granular Base.

.3 All maintenance holes to have closed covers OPSD 401.01 Type A.

.4 All catchbasins to be OPSD 705.01 and to have 600mm deep sumps unless otherwise noted.

.5 All catchbasins to have filter fabric (Mirafi P250) below grate supported by steel grill or equivalent for sediment control throughout the course of construction as part of catchbasin cost. Silt fences may be required at specific catchbasins in the boulevards with separate payment.

.6 Catchbasin frame and grate to be OPSD 400.110.

.7 Backfill to be Granular ‘B.’

.8 Capped stubs or knock outs to be provided as indicated on drawings or as directed by Engineer prior to ordering.

.9 All catchbasin and maintenance holes at or near gutter line or edge of road (in the sag of the road especially) must be constructed to allow for a temporary top of grate elevation to match base asphalt rather than the finished grade if final asphalt occurs in following year. All maintenance holes near or at centre line of road must also be constructed to allow for a grate elevation to match base asphalt elevation. If such catchbasins or maintenance holes in the centre of the road or at non sag locations are approved to be constructed to final grade where surface asphalt occurs in the following year asphalt ramping to the catchbasin, or maintenance hole is to be completed as per the applicable OPSS specification. If the catchbasin is in a swale the finished grate elevation shall be as shown on drawings or as required by the Engineer on site.

.10 Maintenance hole and catchbasin frames to be set on at least one adjustment unit and to a maximum depth of adjustment units of 300mm. Adjustment units shall be as per OPSS.MUNI 407 and OPSD 704.01.

.11 Where possible maintenance holes will have cone tops. Where not possible the maintenance hole shall be constructed to allow for at least 300mm of granular material over the top of the cap. In this case the maximum depth of adjustment units may be over 300mm.

.12 Where silt fences or straw bales are required at catchbasins in the boulevard, such shall be attended to in accordance with Item 301.4.

.13 All catchbasin and maintenance hole grates and covers shall be finally adjusted as necessary in the field to fit final surface both horizontally and vertically.

.14 Where the contract requires birdcage grates to be installed, or where the Engineer indicates prior to ordering of normal grates, such are required, no additional payment will be allowed. Payment will be in accordance with this item for standard catchbasin work. Birdcage grates are available from Coldstream Concrete Products (or equal). Required grates shall be secured with non-corrosive hold down devices.

.15 Sumps are kept clean during construction and are to be cleaned just before the completion certificate and again just before release of holdback.

.16 Drop connections shall be used in maintenance holes wherever the difference in connections exceeds 0.9m. The connections shall be the Wye type in accordance with the applicable OPSD.

.17 Boulevard catchbasins located in swales shall be located in the optimum location to serve the swale and to minimize utility relocations. This may mean some catchbasins will be tight to existing utilities. Pre-locating of utilities will be necessary.

.18 Where the drawings show an existing catchbasin to be retained and joined to and altered in location or elevation, each catchbasin shall be so altered and the work shall be paid under the item for catchbasin adjustment regardless of the extent of work necessary. If new grates are required separate payment as discussed will be made. Existing catchbasins with no concrete bottom shall not be retained. If the Engineer determines an existing catchbasin cannot be reused, authorization for a new catchbasin will be given.

.19 The Engineer may direct that small diameter (25mm±) weeping holes be drilled in the sump of selected catchbasins for exfiltration. If such is done a negotiable price is required in advance of undertaking the work.

.20 For riprap and geotextile, refer to Standard Specifications for Construction of Drains 400.16 “Riprap” and 400.17 “Geotextile”

.21 Surplus materials to be placed in designated fill areas or be hauled away.

.22 Headwalls to be OPSD 804.040

.23 Headwall to be placed on 300mm thickness of clear stone on geotextile. Pipe outlet shall be mortared in place so that no gaps remain at the connection. Mortar is to be applied on both the inside and outside wall surfaces.

.24 Handrail to be OPSD 980.101

.25 Safety grating to be OPSD 804.050 with 4 rods in frame.

3.0 Measurement and Payment

.1 Measurement and Payment in accordance with Tender Items is considered full compensation for excavation, dewatering, flow diversion, placement of granular base, placement of granular backfill, supply of structures complete with frame and grate/covers, labour, materials, silt inserts, frame adjustment units, final field adjustments of grate and cover locations and elevations, benching, testing and connections.

.2 Measurement and Payment for adjusting existing MH covers and catchbasin grates will be based on a unit price value for each structure. Payment is considered full compensation for excavation, maintenance hole or catchbasin components, disposal of surplus components, supply of additional components, granular backfill, adjustment units, re-setting of structure and leads.

.3 Payment for new grates on existing catchbasins will be paid at material cost plus 15%. Installation will be paid under the item of catchbasin adjustments.

301.15 Storm Sewers

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 410 “Construction Specification for Pipe Sewer Installation in Open Cut”

.2 Other OPSS & OPSD reference in OPSS.MUNI 410.

2.0 General

.1 All storm sewer to be:

a. PVC SDR 35 pipe, smooth interior wall, with gaskets, pipe stiffness of 320 kPa at 5% deflection, CSA B182.2. All pipe fittings shall be injection molded PVC fittings.

b. or HDPE ribbed pipe, smooth interior wall, with gaskets. Pipe stiffness 320 kPa at 5% deflection certified to CSA B182.8. Pipe tee fittings shall be injection molded HDPE fittings. The Township of Woolwich will only accept concrete pipe for storm sewer over 900mm diameter within municipal right of way.

c. or reinforced concrete sewer pipe. Reinforced CSA A257.2 with gaskets conforming to OPSS 1820, horizontal elliptical (HE) pipe conforming to ASTM C507 or approved equal.

.2 Use of field applied saddles or field cutting of pipe and inserting tee connections must be approved by Engineer.

.3 Catchbasin leads shall be PVC SDR 35 with gasket conforming to CSA B182.2 and ASTM D3034, ASTM F679 minimum pipe stiffness must be 320 kPa.

.4 Corrugated steel pipe shall conform to OPSS 1821. Wall thickness to be 1.6m for 525mm dia. or smaller and 2.0mm wall for 600mm dia. or larger.

.5 Pipe bedding shall be Granular ‘A’ bedding. Bedding shall be compacted to 100% SPMDD.

.6 Pipe cover material shall be Granular ‘A’ or 19mm clear crushed stone compacted to 100% SPMDD.

.7 All trench backfill shall be native material. Backfill shall be compacted to 100% SPMDD. Backfilling of service trench shall be with Granular 'B' Type II below road and at a 45-degree slope from edge of road. Remainder of service trench may be backfilled with native earth. Native earth compacted to 95% SPMDD. Any mains beyond road limits may also be backfilled with native material compacted to 95% SPMDD.

.8 Where Road Authority requests native material backfill between pipe bedding and cover and underside of surface road restoration, materials to mirror existing soils shall be used and shall be compacted to 95% SPMDD. The alternative prices for trench work with native material backfill as established in the Form of Tender will apply in such case.

.9 Surplus materials to be placed in designated fill areas or be hauled away.

.10 Any disturbed private lands shall be restored to a condition equal to existing and topsoil shall be separately stripped and replaced. In urban sections topsoil and sod will be separately measured. In rural sections topsoil work is to be included in storm pipe costs.

.11 Where metal pipe is to be used for outlets for storm sewers, the pipe shall be equipped with a free-swinging rodent gate and shall be so installed that the concrete pipe may be inserted into it for a length of 75 mm and the annular space grouted with concrete and wrapped with filter fabric. The metal pipe shall be 6 meters in length and in accordance with the specifications for corrugated steel pipe.

.12 In field areas, after backfilling, all excess granular material, large stones (in excess of 300mm in diameter) or other debris shall be removed prior to replacing topsoil. Final grading of topsoil to be done with bulldozer so that surface waters will drain across working area with no ponding. Imported topsoil shall be provided as necessary to mix with existing topsoil to provide a minimum depth of topsoil equivalent to adjacent existing topsoil (maximum of 200 mm).

.13 As part of this item, the Contractor shall pre expose all utilities including watermains, force mains and sanitary sewers and any sanitary or watermain services where close and drains at all locations as shown on or as evident from the drawings. The Engineer shall be present to record locations and elevations at each exposure.

.14 Temporary restoration shall be made where necessary and all backfill shall be carefully packed to reduce settlement. Granulars and topsoils are to be separately replaced.

.15 All utility companies are to be notified and are to be given the opportunity to be present during the exposing. Approximate locates on the surface are to be made in advance.

.16 The drawings show approximate locations of buried public utilities. This however does not relieve the Contractor of the responsibility to obtain utility locates at time of construction.

.17 Locating, protecting, supporting, and backfilling to any public utilities including the private services from them is required. Supporting these utilities is to be done in accordance with OPSS.MUNI 491 and/or other support details shown on drawings and/or as required by the utility affected. The cost of locating, protecting, and supporting these utilities shall be included in the unit price bid for the appropriate drain and road work. In the event that the Contractor finds it not feasible to provide the above noted protection and support, or that a private service is damaged or broken accidentally then the affected utility portion, if a municipal line, shall be repaired with new materials in accordance with the standards on the drawings.

.18 All damage to telecommunication and gas lines shall be reported to and be repaired by the utility owner. Contractor shall not attempt any temporary or permanent repair. All costs of repair shall be borne by the Contractor except where the utility was not properly located by the utility owner prior to the work.

.19 No separate measurement or payment will be made for repair to damaged public utilities or for support of such.

.20 If an existing drain is to be joined to the lead, the unit price shall include the coupling to the drain including cutting materials to butt, wrapping with filter and/or encasing the joint with a concrete envelope.

.21 The Engineer may require at the time of construction that lengths of 150mm diameter perforated plastic tubing with sock be installed in the trench and adjacent to gasketed main line piping to provide infiltration. If installed, the plastic tubing shall be paid separately.

.22 Where the drawings show that the lead is to join to a new catchbasin, the unit price bid shall include the mortaring to the new catchbasin.

.23 The following testing is required, refer to EDIM, DGSSMS and OPSS for details:

a. Cleaning and flushing

b. Deflection testing per OPSS.MUNI 438

c. CCTV inspection

.24 Private drain connections (PDCs) are subject to the following provisions:

a. Private drain connections are to be PVC gravity pipe with gasket, SDR 28 150 mm Dia. conforming to CSA B182.2 and ASTM D3034 ASTM F679 minimum pipe stiffness 320 kPa.

b. Private drain connections to existing drains shall include backflow preventors installed on private lands, 1m (minimum) past the property line. Backflow preventors shall be approved by the Township prior to installation.

c. All future private drain pipe shall end 1m (minimum) past the property line and be capped. A marker post shall be installed at the end of the pipe for future locating.

d. All PDCs shown on the Drawings shall be connected to the storm sewer via factory-provided stubs or pre-manufactured tees.

e. Where unknown tiles or drains are encountered during construction, the connection shall be made by coring the storm sewer and using an Inserta Tee connection or approved equal. All connections are to be inspected prior to backfilling.

f. The Contractor is to speak to each owner and the Engineer and confirm installation locations for each PDC.

g. Excavation for the leads shall be done with a small, rubber-tired or tracked machine wherever possible in order to limit the extent of surface damage to lawn or ornamental trees. The private drain lead shall be installed on a bed of granular or 19mm clear crushed stone and backfilled to 300mm above top of pipe with granular or crushed stone. The balance of the backfill to surface restoration level may be native backfill compacted to 95% SPMDD. Utilities shall be pre-exposed. If no existing lead from the house exists, the service is to be capped and marked.

h. Maintain outlet for existing private drain connections throughout construction.

i. The grade for the private drain lead shall be a minimum of 2% and maximum of 8% unless otherwise noted. The Contractor shall ensure the engineer has surveyed the as-built connection prior to backfilling.

j. When the drawings show the PDC to join to existing catchbasins, the unit price bid shall include pre-exposing any affected utility, breaking into and grouting to the existing catchbasin, including removing and capping any former lead to or from the catchbasin. Payment will also be made under the item for adjustment to existing catchbasins.

3.0 Measurement and Payment

.1 To be as per OPSS.MUNI 410.09.01 actual measurement. Payment shall include pre-exposing utilities, excavation, dewatering, flow diversion, trench liner, trench shoring and bracing, supply and placement of pipe, compacted pipe bedding from trench bottom to 300mm above pipe, pipe fittings, connections to maintenance holes, temporary connection to existing storm sewer, maintaining existing drainage, utility protection and trench backfill with native material to underside of surface restoration. In paved areas, trench backfill may include re-used existing granular road base.

.2 Offsite disposal of excess excavated material will be paid separately.

.3 The cost of cleaning and flushing, deflection testing and CCTV video inspection is included in the storm sewer item.

.4 No separate measurement or payment will be made for repair to damaged public utilities or for support of such.

ROAD RECONSTRUCTION

301.16 Supply and Place HL3 Surface Asphalt

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 310 “Construction Specification for Hot Mixed Asphalt”

.2 OPSS.MUNI 1150 “Material Specifications for Hot Mixed Asphalt”

2.0 General

.1 Asphalt shall be supplied, placed, and compacted to the thickness shown.

.2 Provide asphalt design mix prior to batching of asphalt for approval by contract administrator.

.3 This item shall be for the supply and placing of new asphalt.

.4 Asphalt paving shall be performed in accordance with OPSS 310.

.5 Asphalt or surface treatment shall be sawcut at the removal limits. All joints are to be milled across the entire width of the existing asphalt a minimum of 2.0m in milled width. The depth of the butt or lap joint shall match the depth of the asphalt being placed as directed, and to the satisfaction of the Township. The Contractor is responsible for all sweeping to ensure a clean and neat joint for paving against.

.6 Any pavement marking is to be undertaken by the applicable Road Authority outside of this contract.

.7 HL3 asphalt shall be compacted to 97% SPMDD.

.8 Asphalt Cement Payment Adjustment

a. Payment to the Contractor shall be adjusted based on changes to the Ministry of Transportation's performance graded asphalt cement price index unless the Contractor opts out by notifying the Township in writing within five business days of the award of the contract. Once the contractor has opted out of payment adjustments based on the index, the Contractor will not be permitted to opt back in. The price index will be published monthly in the MTO Contract Bulletin and displayed on the OHMPA and MTO website. The price index will be used to calculate the amount of the payment adjustment per tonne of asphalt cement accepted into the Work.

b. The price index will be based on the price, excluding taxes, FOB the depots in the Toronto area, of asphalt cement grade PG 58-28 or equivalent. One index will be used to establish and calculate the payment adjustment for all grades.

c. A payment adjustment per tonne of new asphalt cement will be established for each month in which paving occurs when the price index for the month differs by more than 5% from the price index for the month prior to tender opening. When the price index differential is less than 5%, there will be no payment adjustment established for that month. Payment adjustments due to changes in the price index are independent of any other payment adjustments made to hot mix tender items.

d. The payment adjustment per tonne will apply to the quantity of asphalt cement in the hot mix accepted into the Work during the month for which it is established. The payment adjustment for the month will be calculated by the following formulae:

Asphalt Cement Price Adjustment, PA		
I_p	**Paving Within Approved Contract Time**	**Paving Beyond Approved Contract Time**
$I_p > 1.05I_{TO}$	$PA=(I_p-1.05I_{TO}) \times T_{AC}$	$PA=(I_{AT}-1.05I_{TO}) \times T_{AC}$
$I_p < 0.95I_{TO}$	$PA=(0.95_{TO}-I_p) \times T_{AC}$	

Where:
PA = payment adjustment for new asphalt cement, in dollars

I_{TO} = performance graded asphalt cement price index for the month prior to Tender Opening
I_p = performance graded asphalt cement price index for the month in which paving occurs
I_{AT} = performance graded asphalt cement price index for the month of expiry of approved Contract Time
T_{AC} = quantity of new asphalt cement in tonnes
PST = Provincial Sales Tax effective on Tender Opening Date

e. The quantity of new asphalt cement includes all grades of asphalt cement supplied by the Contractor with and without polymer modifiers. For each month in which a payment adjustment has been established, the quantity will be calculated using the hot mix quantity accepted into the Work and its corresponding asphalt cement content as required by the job mix formula except for mixes which contain reclaimed asphalt pavement.

f. For mixes which contain reclaimed asphalt pavement, the increase due the contractor or the rebate due the owner will be calculated as if virgin hot mix asphalt has been supplied. This fairly reflects the increasing value of the Contractor's RAP pile when AC prices are increasing and the opposite when they are declining.

g. Notes:
1. Contractors should bid the hot mix asphalt item using the cost of the PGAC specified. The AC Price Index is only a tool for qualifying hot mix prices and is not intended as a standard AC price to be incorporated into the contract bid.

2. The payment adjustment calculated using this formula is full compensation for any and all PGAC grades specified.

3. If the AC index has not changed more than 5% up or down, no adjustment is required. Only the amount of the change that is greater than 5% is used to calculate payment adjustments.

4. The AC Price index on for the month (February 2018) prior to tender opening will be used as the AC bid price to calculate AC adjustments.

3.0 Measurement and Payment

.1 Measurement and Payment for HL3 asphalt shall be by tonnes placed and shall include supply, placement, compaction of asphalt, all labour and materials required to perform the work. Submit weigh tickets to Construction Inspector daily. If in the opinion of the Engineer, asphalt has not been placed to specified dimensions, then the Engineer reserves the right to calculate the quantity of asphalt based on theoretical dimensions and payment will be based on the theoretical quantity and weigh tickets will not be accepted for the area in question.

301.17 Supply and Place HL4 Base Asphalt

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 310 “Construction Specification for Hot Mixed Asphalt”

.2 OPSS.MUNI 1150 “Material Specifications for Hot Mixed Asphalt”

2.0 General

.1 Hot mix asphalt HL4 shall contain up to 25% of Reclaimed Asphalt Pavement (RAP) as per OPSS.MUNI 1150 with 4.7% to 5.0% asphalt cement. Contractor to supply location of batch plant prior to starting asphalt work.

.2 Provide asphalt design mix prior to batching of asphalt for approval by contract administrator.

.3 Asphalt shall be supplied, placed, and compacted to the thickness shown.

.4 HL4 asphalt shall be compacted to 97% SPMDD.

.5 This item shall be for the supply and placing of new asphalt.

.6 Asphalt paving shall be performed in accordance with OPSS.MUNI 310.

.7 Asphalt or surface treatment shall be sawcut at the removal limits. All joints are to be milled across the entire width of the existing asphalt a minimum of 2.0m in milled width. The depth of the butt or lap joint shall match the depth of the asphalt being placed as directed, and to the satisfaction of the Township. The Contractor is responsible for all sweeping to ensure a clean and neat joint for paving against.

.8 Provide temporary asphalt curb at all catchbasin frames which have been set at base asphalt.

.9 Provide HL4 asphalt padding in other locations to blend between new and old asphalt.

.10 Asphalt cement payment adjustment shall also be made for HL4 asphalt. See "Supply and Place HL3 Surface Asphalt" item for payment adjustment specifications.

3.0 Measurement and Payment

.1 Measurement and Payment for HL4 asphalt shall be by tonnes placed and shall include supply, placement, compaction of asphalt, all labour and materials required to perform the work. Submit weigh tickets to Construction Inspector daily. If in the opinion of the Engineer, asphalt has not been placed to specified dimensions, then the Engineer reserves the right to calculate the quantity of asphalt based on theoretical dimensions and payment will be based on the theoretical quantity and weigh tickets will not be accepted for the area in question.

.2 Measurement and Payment for HL4 asphalt ramping and temporary curb shall be included in the cost for HL4 asphalt and shall include supply, placement, compaction of asphalt, tack coat, all labour and materials required to perform the work.

301.18 Supply and Place Granular A

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 314 - "Construction Specification for Untreated Granular Subbase, Base, Surface Shoulder and Stockpiling"

.2 OPSS.MUNI 1010 - "Material Specification for Aggregates – Base, Subbase, Select Subgrade and Backfill Material"

.3 OPSS 408 - "Construction Specification for Adjusting or Rebuilding Maintenance Holes, Catchbasins, Ditch Inlets and Valve Chambers.

2.0 General

.1 Granular 'A' is to be supplied, placed and fine graded on all roads to final granular road base profile.

.2 Granular 'A' is to be also used for shoulder reconstruction.

.3 Granular 'A' shall be in accordance with OPSS.MUNI 1010.

.4 The Contractor must supply a gradation curve for the material to be used. The gradation curve must also show the limits specified in OPSS.MUNI 1010. The gradation curve shall be the result of analysis made on currently produced material within the last month of production.

.5 Granular ‘A’ compaction to be 100% SPMDD.

.6 . The Contractor shall grade Granular ‘B’ road to 2% crossfall prior to adding new Granular ‘A’ material.

.7 The Contractor shall supply and place Granular ‘A’ to final granular road profile and cross section.

.8 Granular ‘A’ is to be used for shoulders when required as per typical sections shown on drawings or as directed in the field.

.9 Contractor to provide temporary Granular ‘A’ ramps to provide temporary access to each driveway during construction.

.10 Contractor is responsible for setting-up horizontal and vertical control reference points for the control of road location and elevation.

.11 Each road shall have marker stakes established at 15-meter intervals to identify station chainage along the road.

.12 Alignment control points as shown on Drawings will be identified by the Engineer. It is the Contractors responsibility to provide qualified personnel to provide all layout of works to be constructed.

.13 Contractor shall control dust.

.14 Contractor to submit weigh tickets for all Granular material delivered to site. The tickets shall be submitted to Engineer daily.

3.0 Measurement and Payment

.1 Measurement and payment for supply of Granular 'A' in pipe trenches is considered part of the unit price for pipe installation.

.2 Measurement for payment will be by tonnes of Granular ‘A’ based on weigh tickets submitted to Engineer daily and shall include supply, placement, all labour, and materials. The Contractor shall schedule their work so that Granular ‘A’ is being applied to road surfaces only. Payment shall include supply of Granular ‘A,’ hauling, placing, stockpiling, fine grading and compaction. If in the opinion of the Engineer, the trench has been over excavated, then the Engineer reserves the right to calculate Granular ‘A’ backfill based on theoretical dimensions and payment for Granular ‘A’ will be based on theoretical of Granular ‘A’ and Granular weigh tickets will not be accepted for the area in question.

.3 Water for compaction and Dust Control shall be paid under “Water for Compaction and Dust Control” item.

.4 Application of Calcium Chloride (Flake) only at the direction of Engineer will be paid under “Calcium Chloride Flak for Dust Control” item.

301.19 Supply and Place Granular B

2.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 314 - "Construction Specification for Untreated Granular Subbase, Base, Surface Shoulder, and Stockpiling"

.2 OPSS.MUNI 330 - “Construction Specification for In-place Full Depth Reclamation of Bituminous Pavement and Underlying Granular.”

.3 OPSS.MUNI 1010 - "Material Specification for Aggregates – Base, Subbase, Select Subgrade and Backfill Material"

3.0 General

.1 Granular ‘B’ shall meet Type II gradation in accordance with OPSS.MUNI 1010.

.2 The Contractor must supply a gradation curve for the material to be used. The gradation curve must also show the limits specified in OPSS.MUNI 1010.

.3 The material need not have the required crushed faces nor be a quarry material.

.4 Existing Granular ‘B’ road base material from below the milled and mixed asphalt/granular ‘A’ material shall be used to backfill all pipe trenches under road

base and at a 45-degree angle from edge of road subgrade. As well any trenches perpendicular to the road shall be backfilled.

.5 Granular ‘B’ Type II gradation shall be used as subbase material for all roads.

.6 Suitable reinstated Granular ‘A’ is to constitute a portion of the required Granular ‘B’ as approved by the Engineer.

.7 All streets to be constructed with 450mm Granular 'B' subbase including the recycled road materials.

.8 All Granular ‘B’ to be compacted to 100% SPMDD.

4.0 Measurement and Payment

.1 Measurement and payment for supply of Granular 'B' in pipe trenches is considered part of the unit price for pipe installation.

.2 Measurement and payment for supply and placement of Granular 'B' road base will be based on tonnes as shown on weigh tickets and shall include supply, placement, stockpiling, all labour, and materials. If in the opinion of the Engineer, the trench has been over excavated, then the Engineer reserves the right to calculate Granular ‘B’ backfill based on theoretical dimensions and payment for Granular ‘B’ will be based on theoretical of Granular ‘B’ and Granular weigh tickets will not be accepted for the area in question.

SURFACE WORKS

301.20 Topsoil and Sod or Seed

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 501 “Construction Specification for Compacting”

.2 OPSS.MUNI 802 - “Construction Specification for Topsoil”

.3 OPSS.MUNI 803 - “Construction Specification for Sodding”

.4 OPSS.MUNI 804 - “Construction Specification for Seed and Cover”

.5 OPSS.MUNI 805- “Construction Specification for Temporary Erosion and Sediment Control Measures”

2.0 General

.1 Minimum depth of topsoil shall be 100mm or equivalent to existing unless otherwise noted or directed by Engineer. If the Contractor wishes to strip and save topsoil in urban areas, the work will be subject to the Engineers approval. Contaminated soils will not be accepted for reuse.

.2 The areas to be sodded will be all areas disturbed as ordered or approved by the Engineer and not restored with other approved surface.

.3 On portions to be sodded, a mixture of saved topsoil and imported topsoil will be acceptable only if approved beforehand.

.4 Sod to be laid as soon as possible after delivery. Immediately after laying sod, spread sufficient water to saturate the sod and the upper 100mm of topsoil. After sod has sufficiently dried to prevent damage, roll the area with a roller providing 72 kPa pressure to ensure a good bond between the sod and soil and to remove minor irregularities. Contractor is responsible for watering on the day of sod placement. Subsequent watering is the responsibility of the landowner.

.5 Staking will be necessary on slopes.

.6 Areas to be restored with topsoil and hydroseed are indicated on the drawings. Final will be confirmed on-site by the Engineer.

.7 For open channel work, topsoil is to be salvaged, replaced, and seeded as part of the channel work.

3.0 Measurement and Payment

.1 Measurement and Payment for supply and placement of sod and supply and place seed and mulch will be by square metre of actual area as required or approved by the Engineer and shall include excavation, traffic control, disposal, drainage provisions, maintaining access, topsoil work necessary, initial watering and rolling and shall include temporary cover material in sloped areas.

301.21 Open Ditch Excavating and Overflow Swale Grading

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 206 “Construction Specification for Grading”

.2 OPSD 219.220 “Sediment Trap in Ditch”

.3 OPSS.MUNI 501 “Construction Specification for Compacting”

.4 OPSD.MUNI 511 “Construction Specification for Riprap, Rock Protection, and Granular Sheeting”

.5 OPSD.MUNI 1860 “Material Specification for Geotextiles”

2.0 General

.1 For ditch excavation and overflow swale grading, refer to Standard Specifications for Open Drains 410.

.2 For permanent sediment traps or stilling basins, refer to Standard Specifications for Construction of Drains 400.31.3 “Sediment Traps”

.3 For riprap and geotextile, refer to Standard Specifications for Construction of Drains 400.16 “Riprap” and 400.17 “Geotextile”

3.0 Measurement and Payment

.1 Measurement and payment for ditch excavation, cleanout and overflow swale grading will be per lineal metre and 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, and reconnection of all intercepted drains as required.

301.22 Restoration of Driveways

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 311 – “Construction Specification for Asphalt Sidewalk, Driveway, Boulevard and Sidewalk Resurfacing” and all other OPSS referred to by OPSS 311

.2 OPSS 350 - “Concrete Specification for Concrete Pavement and Concrete Base”

.3 OPSS.MUNI 1010 - “Material Specification for Aggregates – Base, Subbase, Select Subgrade and Backfill Material”

.4 OPSD 351.010 “Urban Residential Entrance”

2.0 General

.1 Granular 'A' shall be in accordance with OPSS.MUNI 1010, compaction to be 100% SPMDD.

.2 The Contractor must supply a gradation curve for the material to be used. The gradation curve must also show the limits specified in OPSS.MUNI 1010.

.3 The Contractor shall complete the driveway and boulevard construction by supplying and fine grading Granular ‘A’ material and compacting to 100% SPMDD.

.4 Any fine grading of existing Granular ‘A,’ including small amounts of excavation and disposal to allow for placement of hard surface, are to be included in this item.

.5 New driveway construction shall involve the excavation and disposal as necessary and the supply of Granular ‘A’ to construct the base. Granular ‘A’ for new driveways shall not be separately measured and paid.

.6 New boulevard construction shall involve the excavation and disposal as necessary and the supply of Granular ‘A’ to construct the base. Granular ‘A’ for new boulevards shall not be separately measured and paid.

.7 The Contractor shall regrade grass areas adjacent to each driveway or boulevard as necessary to provide a uniform gradual transition in grade from driveway edge to existing ground. The regraded areas shall have a slope of 4:1 or less. Payment for regrading grass areas adjacent to driveways and surface restoration of grass areas will be paid under “Topsoil and Sod or Seed” item.

.8 If retaining walls are required by the engineer at the time of construction, a specification will be provided at such time and will be paid by means of a change order.

.9 All driveways are to be rough graded during removals so that no major changes in driveway grade are necessary.

.10 Work under this item shall include excavation and salvage of any existing Granular ‘A’ material, excavation, and disposal of native earth as necessary to provide design

driveway widths and grade and replacement of salvaged Granular ‘A’ including compaction.

.11 In general, restoration of lawn areas adjacent to driveway which must be regraded to provide for new driveway profiles will be paid for under this contract. Lawn areas which do not require regrading, and which are damaged by the Contractor will not be measured or paid.

.12 Any water service curb stops in driveways must be raised to surface grade as part of this item.

.13 Asphalt placed at spillway areas alongside gutter outlets will be measured and paid under this item.

GRAVEL DRIVEWAYS

.14 Supply and place Granular ‘A’ as required to bring driveway up to final grade and width specified by Engineer and to 250mm thickness minimum. Compact Granular ‘A’ to 100% SPMDD.

.15 The item will be used to pay for all Granular 'A' required to grade driveways. Payment covers supply, placement and compaction of Granular 'A' as required to bring driveway up to final grade.

.16 Payment for earth grading and excavation of areas adjacent to driveways is considered included under Items 301.20.

ASPHALT DRIVEWAYS & BOULEVARDS

.17 Supply and place Granular ‘A’ (250mm minimum) as required to bring driveway or boulevard up to final grade (less allowance for 60mm of asphalt) and width. Compact Granular ‘A’ to 100% SPMDD. Payment for supply and placement of Granular 'A' will be part of this item.

.18 Asphalt to conform to OPSS 1150 and shall be HL3.

.19 Place asphalt pavement to width specified by Engineer and to 60mm thickness minimum.

.20 Payment for asphalt shall be also included under this Item.

CONCRETE DRIVEWAYS

.21 Supply and place Granular ‘A’ (200mm minimum) as required to bring driveway up to final grade (less allowance for 150mm of concrete) and width. Compact Granular ‘A’ to 100% SPMDD. Payment for supply of Granular 'A' will be part of this item.

.22 Place concrete pavement to width specified by Engineer and to 150mm thickness minimum. Provide saw cut contraction joints and dummy joints, as necessary.

.23 Concrete shall be 32 MPa with 6% air entrainment.

.24 Payment for concrete shall be also included under this Item.

PAVING STONE DRIVEWAYS

.25 Asphalt blending shall consist of a minimum 60mm of Hot Mix (HL3F) asphalt. Concrete paving stone laneways shall be blended to as close as possible beyond a new curb. In the area required for blending the existing stones shall be removed and saved and given to the owner (if requested). Portions of removed existing stone, or new stone as necessary, shall be cut as necessary and re-laid to give a uniform butt line, which for many such driveways will be not much more than 1 meter from curb line. From the butt line to the curb, asphalt driveway construction shall occur. If the owner wishes to be paid the cost of the asphalt driveway work and reconstruct his drive with paving stone himself, he shall have that option. In this case he will be responsible for all base preparation plus the surface works as well.

.26 Supply and place Granular ‘A’ (200mm minimum) as required to bring driveway up to final grade. Supply and place 40 mm sand base for paving stone. Compact all material to 100% SPMDD.

.27 Using existing paving stone salvaged and stored on-site, reconstruct the straight edge for the blending portion of the driveway. New paving stones may also be necessary. Contractor to discuss matching existing stone with new stone, if he wishes, with homeowner and Engineer. Any new stone is also paid under this item.

.28 Concrete Paving Stones shall conform to CAN3-A231.2-M85.

.29 Paving Stone to be re-installed in accordance with Manufacturers recommendations and to match existing.

.30 Payment for all works, including granular, shall be included under this item.

.31 Payment for the asphalt portion shall be under ‘Asphalt Driveways.’

3.0 Measurement and Payment

.1 Gravel Driveway

Measurement and Payment for final grading of gravel driveways will be paid per square meter of driveway constructed as shown on the drawings or as ordered by the Engineer in the field. Payment includes supply of all labor, material, and equipment necessary to complete driveway.

.2 Asphalt Driveway

Measurement and Payment for restoration of asphalt driveways will be paid per square meter of asphalt driveway constructed as shown on the drawings or as ordered by the Engineer in the field. Payment includes supply of all labor, material, and equipment necessary to adjust and fine grade granular material in preparation for pavement, and for placement of HL3 asphalt paving.

.3 Concrete Driveway

Measurement and Payment for restoration of concrete driveways will be paid by square meter of concrete driveway constructed as shown on the drawings or as ordered by the Engineer in the field. Payment includes supply of all labor, material, and equipment necessary to adjust and fine grade granular material for driveway base, and 125 mm concrete paving, protection of, curing of and sawcutting.

.4 Paving Stone Driveway Restoration Item

Measurement and Payment for restoration of concrete paving stone driveway will be paid by square meter constructed as shown on the drawings or as ordered by the Engineer in the field. Payment includes supply of all labor, materials, and equipment necessary, sand bedding, installation of existing concrete pavers for butt joint and supply of new pavers, as necessary. The asphalt portion shall be measured and paid under Item ‘asphalt driveway.’

301.23 Concrete Sidewalks and Walkways

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 351 - “Construction Specification for Concrete Sidewalk”

.2 OPSD 310.010 - “Concrete Sidewalk”

.3 OPSD 310.020 - “Concrete Sidewalk Adjacent to Curb and Gutter”

.4 OPSD 310.030 - “Concrete Sidewalk Ramps at Intersections”

.5 OPSD 310.040 - “Utility Isolation in Concrete Sidewalks”

.6 OPSD 310.050 - “Concrete Sidewalk Driveway Entrance Details (Modified)”

.7 OPSD 350.01 - “Urban, Industrial, Commercial and Apartment Entrances”

.8 OPSD 351.01 - “Urban Residential Entrance”

2.0 General

.1 Concrete Paving Stones shall conform to CAN3-A231.2-M85.

.2 Paving Stone to be installed in accordance with Manufacturers recommendations.

.3 Concrete shall be 32MPa (28 day) with 6% air entrainment.

.4 Standard sidewalk thickness shall be 125mm and 150mm Granular 'A' base. Sidewalk adjacent to residential driveways and curbs shall be 150mm thick.

.5 All sidewalk repairs shall match existing widths.

.6 All sidewalks shall have a 150mm thickness of compacted Granular ‘A’ base. Granular ‘A’ shall be compacted to 100% SPMDDD.

.7 Contractor shall provide all layout (horizontal and vertical) for sidewalk construction.

.8 Contractor shall trim and remove all tree roots which affect the placement of sidewalk base and sidewalk. Roots where cut and remaining shall be painted with an approved root preservative.

.9 If concrete is required between a concrete curb and a nearby sidewalk, the area shall be measured and paid as though concrete sidewalk.

3.0 Measurement and Payment

.1 Measurement and Payment for scattered areas of sidewalk reconstruction will be based on square meters of existing sidewalk removed and reconstructed as

approved and/or authorized. Payment includes sidewalk removal, saw cutting of asphalt driveways, saw cutting, salvage and storage of paving stone from driveways, supply and placement of temporary granular material, supply and placement of temporary asphalt, off-site disposal of sidewalks, granular base for sidewalk, supply and placement of concrete, installation of expansion and contraction joints, trimming of roots, placing steel grates, if necessary, placement of expansion joint material, boxing around poles, wheelchair ramps at intersections, and increased thickness at driveways complete with reinforcement. If excavation for sidewalks is not included in another contract item, then it is to be considered included in this item.

.2 Measurement and Payment for sidewalk areas constructed using concrete paving stones, as indicated, or as referenced, will be based on square meters constructed and paid for at the unit price for paving stone driveways. Payment includes granular base, supply and placement of concrete paving stones complete with paving stone edger.

MISCELLANEOUS

301.24 Watermain Services, Hydrants and Crossings

1.0 Applicable Provisions and Specifications

.1 OPSS 701 - "Construction Specification for Watermain Installation in Open Cut"

.2 OPSS 514 - "Construction Specification for Trenching, Backfilling and Compacting"

.3 OPSS 504 - "Construction Specification for Preservation, Protection and Reconstruction of Existing Facilities"

.4 OPSS 503 - "Construction Specification for Site Preparation for Pipelines, Utilities and Associated Structures"

.5 OPSD 802.010 - "Flexible Pipe Embedment and Backfill Earth Excavation"

.6 OPSD 802.030 - "Rigid Pipe Bedding, Cover and Backfill Type 1 or 2 Soil - Earth Excavation"

.7 OPSD 802.031 - "Rigid Pipe Bedding, Cover and Backfill Type 3 Soil - Earth Excavation"

.8 OPSD 1103.01 - "Concrete Thrust Blocks for Tees, Plugs and Horizontal Bends"

.9 OPSD 1103.02 - "Concrete Thrust Blocks for Vertical Bends"

.10 OPSD 1104.01 – “Water Service Connection Detail 19 mm & 25 mm Dia"

.11 OPSD 1104.02 - "Water Service Connection Detail 32 mm, 38 mm & 50 mm Dia"

.12 OPSD 1104.03 - "25 mm Blow Off Installation"

.13 DGSSMS E2-01 “Hydrant Installation”

.14 DGSSMS E2-02 “Valve and Box Installation Detail (Up to 300mm Diameter)”

.15 DGSSMS E2-03 “Frost Collar Installation for Curb Stop Boxes Located in Driveways”

.16 DGSSMS E2-04 “Metallic Water Service Connection Detail for Metallic Watermain 25mm Diameter Services”

.17 DGSSMS E2-05 “Non-Metallic Water Service Connection Detail for Non-Metallic Watermain 25mm and 50mm Diameter Services”

2.0 General

.1 Watermain pipe shall be one of the following types and shall be used throughout project:

a. Ductile iron pipe AWWA C151 Class 52 cement lined

b. PVC AWWA C900 Class 150 (Dr 18) and CSA B137.3 certified. Tracer wire to be TWH Copper 4.2 mm. Bind Tracer wire to pipe @ 3m intervals. Water services shall be connected to pipe using tapped couplers.

.2 Different materials may be required, if noted by the Township of Woolwich, to match the existing material and as noted in a tender addendum.

.3 Fittings shall be cast iron fittings AWWA C110. Where PVC piping is used anodes shall be used at all fittings and valves. DZP-12, 5.4 kg or equal.

.4 Water service pipe shall be 25 mm Type K soft copper tube or 25mm PVC AWWA C900 Class 150 (Dr 18) and CSA B137.3 certified.

.5 Corporation main stops shall be brass with compression joint fitting. Service connections on plastic watermains shall be installed using tapped couplers.

.6 Curb stops shall be brass inverted key curb stops with compression joint fittings. Provide curb stop service boxes.

.7 Water services shall be installed with cover of 1.5 meters at property line.

.8 Existing water services conflicting with new drain location shall be reconstructed from main to curb stop. New services shall be installed according to DGSSMS E2-04 & E2-05.

.9 Hydrant relocations shall be constructed according to DGSSMS E2-01.

.10 Provide gate valves of iron body, bronze mounted double disc type, mechanical joint non-rising spindle with two-inch operating nut, to open by turning counterclockwise AWWA C509 resilient seated gate valves for water and sewage systems.

.11 Provide 150mm screw type valve boxes.

.12 Pipe bedding shall be Class B sand bedding. Bedding shall be compacted to 100% SPMDD. Pipe cover material shall be sand compacted to 100% SPMDD.

.13 All trench backfill shall meet Granular ‘B’ Type II gradation. Backfill shall be compacted to 100% SPMDD.

.14 Backfilling of service trench shall be with Granular ‘B’ Type II below road and at a 45-degree slope from edge of road. Remainder of service trench may be backfilled with native earth compacted to 95% SPMDD.

.15 New watermain to pass below sanitary sewers and storm sewers by a minimum of 500 mm.

.16 All 90-degree changes in watermain or raw watermain direction shall be made using two 45-degree bends.

.17 Surplus materials to be placed in designated fill areas or to be hauled away.

.18 Any disturbed private lands shall be restored to a condition equal to existing where required by the Engineer.

.19 Watermain beyond road limits may be backfilled with acceptable native materials compacted to 95% SPMDD.

3.0 Measurement and Payment

.1 Measurement for watermain relocation will be in lump sum per relocation and shall include all fittings, temporary water, tracer wire, thrust blocking, excavation, sand bedding, granular backfill, utility protection, and testing.

.2 Measurement for service connections will be in lump sum per service and shall include corporation main stop, temporary water, service pipe, curb stop with service box, excavation, sand bedding, granular backfill, utility protection and restoration of private lands to underside of surface restoration.

.3 Measurement for hydrant relocations will be in lump sum per relocation. Payment for hydrant relocation includes all fittings, tracer wire, temporary water, thrust blocking, excavation, sand bedding, granular backfill, utility protection, and testing.

301.25 Gas Services

1.0 General

.1 If during construction any existing gas services are determined to require relocation, the Contractor shall coordinate with Enbridge Gas to have the services relocated. The Contractor shall not perform any work on existing services without Enbridge Gas approval.

2.0 Measurement and Payment

.1 Measurement and Payment will be in lump sum per gas service relocation where required or as directed by Engineer. Payment shall include supply, placement, all labour, and materials required to perform the work.

301.26 Hold/Remove/Reinstall Hydro Pole and Guy Wires

1.0 General

.1 The Contractor shall coordinate with Waterloo North Hydro to ensure hydro poles are held where required while installing storm to prevent movement or damage of existing hydro poles and wires.

.2 Contractor shall also coordinate with Waterloo North Hydro to re-set guy wires in proper location and tension after backfilling operations.

2.0 Measurement and Payment

.1 Measurement and Payment will be per pole held where required or as directed by Engineer. Payment shall include supply of equipment required to hold poles for duration of service installation.

301.27 Water for Compaction and Dust Control

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 501 - “Construction Specification for Compacting”

.2 OPSS.MUNI 506 - “Construction Specification for Dust Suppressants”

2.0 General

.1 Water shall be used as necessary and as required by the Engineer to aid in Compaction of granular material and native material and for dust control.

.2 The Contractor shall arrange for the supply and placement of water as necessary and/or as ordered for compaction and dust control.

.3 Each water truck is to be measured by the Engineer prior to its use and the volume shall be computed in cubic meters.

.4 Dust control using water shall be the primary means of dust control on this project.

3.0 Measurement and Payment

.1 Measurement and Payment will be in lump sum.

.2 Payment includes rental of water trucks, hauling of water, purchasing water and application of water.

301.28 Calcium Chloride Flake for Dust Control

1.0 Applicable Provisions and Specifications

.1 OPSS.MUNI 506 - “Construction Specification for Dust Suppressants”

2.0 General

.1 Calcium shall be applied to the roads as directed by the Engineer and/or Township.

.2 The Contractor shall provide dust control measures upon direction of Engineer.

.3 During construction flake calcium chloride shall be used only as directed by Engineer.

.4 The use of calcium chloride shall be minimal.

3.0 Measurement and Payment

.1 Measurement and Payment will be in kilograms based on size of calcium bags used. Engineer to verify the weight.

.2 Payment includes supply, storage, and application of calcium chloride.

301.29 Flowable Grout

1.0 General

.1 Contractor shall fill existing drain sewer with flowable 10MPa grout in locations shown on contract drawings and as directed by Engineer.

.2 Grout shall be pumped to ensure volume of existing outfall pipe is filled completely.

2.0 Measurement and Payment

.1 Measurement and payment shall be in lump sum and is considered compensation in full for all labour, materials and equipment required to complete the work.

301.30 Unstable Soils

1.0 Applicable Provisions and Specifications

.1 OPSS 314 “Construction Specification for Untreated Granular Subbase, Base, Surface Shoulder and Stockpiling”

2.0 General

.1 If poor subsoil conditions are encountered during storm sewer or structure installation, the Contractor shall, when instructed by the Engineer, provide 300mm

depth of clear stone wrapped in geotextile fabric underneath the pipe bedding provided in “Storm Sewer” item.

.2 All clear stone shall be in 19mm size. Crushed clear stone shall be supplied where required by the Construction Inspector.

3.0 Measurement and Payment

.1 Measurement and Payment for will be by lineal meter as approved by the Engineer and shall include supply, placement, all labour, and materials required to perform the work.

301.31 Fence

1.0 Applicable Provisions and Specifications

.1 OPSD 972.132 “Fence, Chain-Link Details and Table”

.2 OPSS.MUNI 772 “Construction Specification for Chain-Link Fence”

.3 OPSS.MUNI 1541 “Material Specification for Chain-Link Fence Components”

2.0 General

.1 Where existing fence is removed as part of construction and cannot be reinstated to the satisfaction of the Engineer and the landowner, new replacement fence shall be of same material and height as existing fence.

.2 Chain link fence posts shall be set in concrete as per OPSD 972.132, minimum specified strength of 25 MPa at 25 days.

3.0 Measurement and Payment

.1 Measurement and payment shall be in lump sum and is considered compensation in full for all removal and reinstatement of existing fence or the supply and installation of new fencing, including concrete, materials, labour, and equipment required to complete the work.

301.32 Flushing

1.0 General

.1 This item only pertains to flushing the existing Woolwich Branch storm pipe from station 0+673 to 0+730.

.2 The Contractor shall flush the existing storm pipe and ensure the flushing does not cause any negative impacts or blockages to properties or storm sewers downstream.

2.0 Measurement and Payment

.1 Measurement and payment shall be in lump sum and shall include supply of all materials, labour, and equipment to complete the work.

.2 Flushing of new catchbasins, new maintenance holes or new pipes, if required for CCTV inspection or if directed by the Engineer, is included in the installation price.

301.33 Hydrovac Excavation for Utility Daylighting

1.0 General

.1 This item applies to use of hydrovac excavation methods to daylight buried utilities and services.

2.0 Measurement and Payment

.1 Daylighting by hydrovac excavation is only payable when:

a. Daylighting of the specific utility or service has been approved in advance by the Engineer, and

b. The utility owner cannot locate the utility or service.

.2 Measurement and payment shall be on a “per each” basis for each utility or service approved for daylighting and is considered full compensation for all labour, equipment, materials, travel time, disposal fees, protection of the excavation via fencing or backfill and any other costs necessary to daylight the utility or service.

400 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS

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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 should arrange a pre-construction meeting with the Engineer, Municipality, affected landowners prior to commencement of construction.

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

400.3 COLD WEATHER

When working in cold weather is approved by the Engineer, the Contractor shall provide suitable means for heating, protection, 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 protect the work shall be borne by the Contactor. All backfilling operations shall be done 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 slippages that may result from work in cold weather.

400.4 WORKING AREA

Where any part of the drain is on a road allowance, the road allowance shall be the working area. For a closed drain the working area shall be a 10 metre width on either side of the trench or any combination not exceeding 20 metres. A 10m x 10m working area shall exist around any catchbasin, junction box or access point. For an open drain the working area shall be 17 metres on the side for leveling and 3 metres on the opposite side. A 10m working area shall exist for any overflow swale or grassed waterway. If any part of the drain is close to a property line then the fence line shall be one of the limits of the work area. Reduced or increased working areas will be described in detail on the Drawings.

400.5 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. All specifications governing fences, livestock and crops during drain construction apply to access routes. No other access routes shall be used unless first approved by the Engineer and the affected landowner. The Contractor shall contact each landowner prior to using the designated access routes. Contractor shall make good any damages caused by using the designated access routes.

400.6 ACCESS TO PROPERTIES ADJOINING THE WORK

The Contractor shall provide at all times and at no additional cost, adequate pedestrian access to private homes and commercial establishments unless otherwise authorized by the Engineer. Where interruptions to access have been authorized by the Engineer, reasonable notice shall be given by the Contractor to the affected landowners and such interruptions shall be arranged to minimize interference to those affected.

400.7 DRAINAGE SUPERINTENDENT

Where a Drainage Superintendent (Superintendent) is appointed by the Municipality, the Engineer may designate the Superintendent to act as the Engineer's representative. If so designated, the Superintendent will have the power to inspect and direct the execution of the work.

Any instructions given by the Superintendent which change the proposed work or with which the Contractor does not agree shall be referred to the Engineer for final decision.

400.8 ALTERATIONS TO WORK

The Engineer shall have the power to make alterations, additions and/or deletions in the work as shown or described in the Drawings or Specifications and the Contractor shall proceed to implement such changes without delay. Alterations ordered by the Engineer shall in no way render the contract void.

If a landowner desires deviations from the work described on the Drawings, the landowner shall submit a written request to the Engineer, at least 48 hours in advance of the work in question.

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 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.

In no case shall the Contractor commence work considered to be extra work without the Engineer's approval. Payment for extra work is contingent on receipt of documentation to the satisfaction of the Engineer. Refer to the Extra Work Summary included in the Special Provisions.

400.9 ERRORS AND UNUSUAL CONDITIONS

The Contractor shall notify the Engineer immediately of any error or unusual conditions which may be found. Any attempt by the Contractor to correct the error without notice shall be done at the Contractor's risk. Any additional cost incurred by the Contractor to remedy an error or unusual condition without notice shall be borne by the Contractor. The Engineer shall direct the alteration necessary to correct errors or unusual conditions. The contract amount shall be adjusted in accordance with 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 the standard. If any materials supplied by the Contractor are determined to be inadequate to meet the applicable standards, the Contractor shall bear full responsibility to remove and/or replace all such inadequate materials with materials capable of meeting the standards.

The cost of testing the materials supplied by the Contractor shall be borne by the Contractor.

400.11 BENCHMARKS AND STAKES

Prior to construction, the Engineer will confirm the benchmarks. The Contractor shall be held liable for the cost of replacing any benchmarks destroyed during construction.

If the Engineer provides layout stakes, the Contractor shall be held liable for the cost of replacing any layout stakes destroyed during construction.

Where property bars are shown on the Drawings, they are to be protected and if damaged by the Contractor, they will be reinstated by an Ontario Land Surveyor at the expense of the Contractor. Where property bars not shown on the Drawings are damaged, they will be reinstated by an Ontario Land Surveyor at the expense of the project.

400.12 OPENING UP OF FINISHED WORK

If ordered by the Engineer, the Contractor shall make such openings in the work as are needed to re-examine the work, and shall forthwith make the work good again. Should the Engineer find the work so opened up to be faulty in any respect, the whole of the expense of opening, inspecting and making the work good shall be borne by the Contractor. Should the Engineer find the work opened up to be in an acceptable condition the Contractor shall be paid for the expense of opening and making the work good, unless the Contractor has been obligated by any specification or by the direction of the Engineer to the leave the work open for the Engineer's inspection.

400.13 FINAL INSPECTION

Final inspection by the Engineer will be made within twenty (20) days after receiving notice in writing from the Contractor that work is complete, or as soon thereafter as weather conditions permit. All the work included in the contract must at the time of final inspection have the full dimensions and cross-sections.

Prior to commencing the final inspection an on-site meeting may be held by the Engineer and landowners directly affected by the construction of the drain. The Contractor will attend this meeting upon notice by the Engineer.

If there is no on-site meeting with the Engineer and landowners, the Contractor shall obtain from each landowner a written statement indicating that the work has been performed to the owner'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 Completion Certificate.

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 Completion Certificate.

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 the work shall be finally accepted by the Municipality, the Contractor shall complete all work as directed by the Engineer and remove all debris and surplus materials and leave the work neat and presentable.

400.15 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, 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 lengths of the tile shall be 750mm for 150 to 350mm diameter tile and 1200mm for 400 to 900mm diameter tile.

All tile should be of good quality, free from distortions and cracks and shall meet the standards specified. The ends should be smooth and free from cracks or checks. All rejected tile are to be immediately removed from the site.

Granular backfill, where required, shall consist of approved sand or gravel having no particles retained on a screen having 50mm square openings.

Earth backfill shall consist of approved material having no large lumps or boulders.

400.15.2 Corrugated Plastic Tubing

Corrugated plastic tubing shall conform to the *Land Improvement Contractors of Ontario Standard Specification for Corrugated Plastic Drainage Tubing, 2006*. 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. Protect coils of plastic tubing from damage and deformation.

400.15.3 Corrugated Steel Pipe

Corrugated Steel Pipe (CSP) shall be according to OPSS 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.

400.15.4 Plastic Pipe

Plastic Pipe shall be a high density polyethylene (HDPE) double wall corrugated pipe with smooth inner wall, solid with no perforations in accordance with OPSS 1840.

A minimum stiffness of 320 KPa at 5% deflection

The pipe shall be joined with snap-on or split couplers.

400.15.5 Concrete Sewer Pipe

Concrete sewer pipe shall be in accordance with OPSS 1820.

Non-reinforced concrete sewer pipe shall be used for pipe 375mm in diameter and smaller and reinforced concrete sewer pipe shall be used for pipe over 375mm.

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

All new concrete sewer pipe shall have rubber-type gasket joints.

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 filter cloth.

400.16 RIPRAP

All riprap is to be placed on a geotextile underlay (Terrafix 360R or equal) unless directed otherwise in the specific construction notes. The riprap is to be graded heavy angular stone (quarry stone is recommended) with particles averaging in size from 200mm to 300mm and is to be placed at 300mm thickness. Fine particles may be included to fill voids. Along upstream edges of riprap, where surface water will enter, underlay is to extend a minimum of 300mm upstream from riprap and then be keyed down a minimum of 300mm. Wherever riprap is placed, the area is to be over-dug so that finished top of riprap is at design cross-section, at design elevation or flush with existing ground.

400.17 GEOTEXTILE

To be non-woven fabric that is rot proof, non-biodegradable, chemically resistant to acidic or alkaline soils and is dimensionally stable under different hydraulic conditions. The filter fabric is to be a material whose primary function is to act as a highly permeable, non-clogging soil separator for fine soils (Terrafix 360R or equal). Contractor is to follow the manufacturer's recommendations for cutting, installation and precautions necessary to avoid damage to fabric. Other approved equals will be considered by the Engineer prior to construction.

400.18 DISPOSAL OF MATERIALS

The Contractor shall remove all surplus materials from the job site at the end of the project. The Contractor shall locate the disposal site for all materials to be disposed of. Disposal of materials shall comply with applicable regulations.

400.19 NOTIFICATION OF RAILROADS, ROAD AUTHORITIES AND UTILITIES

Contractor will notify any Railroad, Road Authority or Utility at least 48 hours in advance regarding work to be performed on their property or affecting their infrastructure. The notice will be in writing and is exclusive of Saturdays, Sundays and Holidays.

A utility includes any entity supplying the general public with necessaries or conveniences.

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.

400.20.2 Road Crossings

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

- A Road Authority will supply no labour, equipment or materials for the construction of the road crossing.
- Contractor will not commence road crossing work until any required permits have been obtained. The Engineer may apply for any required permits prior to construction.
- Contractor will notify the Road Authority at least 72 hours in advance of any construction in the road allowance.
- Road crossings may be made with an open cut unless otherwise noted.
- Exact location of crossing shall be verified with the Road Authority and the Engineer.
- Pipe shall be placed on a minimum 150mm depth of Granular A shaped for the pipe.
- Pipe backfill shall be compacted Granular A and extend 300mm above the top of the pipe.
- Trench shall be backfilled with acceptable native material for the base width of the road bed.
- The material shall be placed in lifts not exceeding 300mm in depth and shall be thoroughly compacted with an approved mechanical vibrating compactor.
- Top 600mm of the road bed backfill shall consist of 450mm Granular B and 150mm of Granular A placed in lifts and fully compacted.
- Any surplus excavated material within the road allowance may be spread on the right-of-way with consent of the Road Superintendent otherwise the surplus material shall be hauled away.
- Existing asphalt or concrete pavement or surface treatment shall be replaced by the Contractor to the satisfaction of the Engineer and Road Authority.
- 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.
- All road crossings shall meet the approval of the Road Authority.
- 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.
- If the Engineer deems a road to 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.

400.20.3 Maintenance of Traffic

Unless directed otherwise on the drawings or in the specifications the Contractor shall keep the road open to traffic at all times. The Contractor shall provide suitable warning signs and/or flagging to the satisfaction of the Road Authority to notify of the construction work.

If a detour is required, the Contractor shall submit a proposal as to the details of the detour for approval by the Road Authority. If necessary to close the road to through traffic, the Contractor shall provide for and adequately sign the detour route. Contractor shall undertake all notifications required for a road closure in consultation with the Municipality.

400.21 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 utilities located in accordance with the Ontario Underground Infrastructure Notification System Act.

All utilities shall be exposed to the satisfaction of the utility company to verify that the construction proposed will not conflict with the utility structure. Additional payment will be allowed for relocation of utilities if conflicts should occur.

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.

400.22 LANEWAYS

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

- Pipe backfill shall be acceptable native material that can be compacted in place.
- Top 450mm of laneway backfill shall consist of 300mm Granular B and 150mm of Granular A placed in lifts and fully compacted.
- Minimum cover on laneway culverts shall be 300mm.
- Existing asphalt or concrete pavement or surface treatment shall be replaced by the Contractor.
- The width of surface restoration shall match the existing laneway.
- Contractor shall be responsible for correcting any backfill settlement during construction and during the warranty period.

The timing of laneway closures will be coordinated by the Contractor to the satisfaction of the landowner.

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 practical and where required by the landowner, 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, that 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 will be within a fenced field containing livestock that are evident or have been made known to the Contractor, the Contractor shall notify the owner of the livestock 48 hours in advance of access into 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.

Where the owner so directs or where the Contractor has failed to reach the owner, the Contractor shall adequately re-erect all fences at the end of each working day. No field containing livestock shall have a trench left open at the end of the working day, unless the trench has been adequately backfilled or protected. 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 for the drain. However, the Contractor shall notify the owner of the crops 48 hours prior to commencement of construction so as 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 liable for the loss of the standing crops.

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. The cost of the additional work would be assessed to the landowner.

400.27.9 Clearing by Landowner

Wherever the Special Provisions indicate 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 ROCK REMOVAL

400.28.1 General

Rock shall be defined as bedrock and boulders that are greater than one-half cubic metre in size and that require blasting or hoe-ram removal. Bedrock or boulders that can be removed with a standard excavator bucket are not considered rock removal.

400.28.2 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 rock removal.

400.28.3 Typical Sections and Pay Limits

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

For open drains, rock 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 rock when excavation is completed.

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

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

Where approved by the Engineer, excavated rock may be used in place of imported riprap.

400.29 SEEDING

400.29.1 General
Contractor 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.

400.29.2 Drainage Works and Road Allowances
All disturbed ditch banks, berms and road allowances 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.

400.29.3 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.

400.29.4 Seeding 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.

400.29.5 Sod
Where sod is specified, sod is to be commercial grade turfgrass nursery sod, Kentucky Bluegrass placed on 50mm of topsoil. Fertilizer shall be 5-20-20 applied at 10kg/ha. Place sod in accordance with supplier instructions. Contractor is responsible for saturating the sod with water on the day of sod placement. Subsequent watering is the responsibility of the landowner.

400.30 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 blanket 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 joints are to be staggered. 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 SEDIMENT CONTROL

400.31.1 General

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

400.31.2 Flow Check Dams

400.31.2.1 *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 150mm into the channel bottom and shall be anchored in place with 2 T-bar fence posts or 1.2m wooden stakes driven through the bale.

Straw bales shall be hauled away at the end of the warranty period. Accumulated sediments shall be excavated and levelled when the temporary straw bale flow check dam is removed.

400.31.2.2 *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 when the temporary rock flow check dam is removed at the conclusion of the warranty period.

400.31.2.3 *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.

400.31.3 Sediment Traps

400.31.3.1 *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 will 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 will clean out the sediment trap at the conclusion of the warranty period, unless directed otherwise by the Engineer.

400.31.3.2 *Sediment Trap with Flow Check Dam*
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.

400.31.4 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 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 may 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.

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

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 following permanent seed mixture: 50% red fescue, 45% perennial ryegrass and 5% white clover, broadcast at 80 kg/ha. Fertilizer to be 7-7-7 applied at 80 kg/ha.
Provide temporary cover for late fall planting by adding an additional 10 kg/ha of rye or winter wheat.

Overflow swales may be cropped using conventional farming practice.

400.33 BUFFER STRIPS

Open drains shall include minimum 3m wide, permanently vegetated buffer strips on each side of the drain. Catchbasins shall include a minimum 1m radius, vegetated buffer strip around the catchbasin.

Cultivation of buffer strips using conventional farming practice may be undertaken, provided sediment transport into the drain is minimized.

400.34 MAINTENANCE CORRIDOR

The maintenance corridor along the route of the drain, as established in the report, 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.

400.35 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.

400.36 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 the Ministry's guidelines for work around the species.

410 STANDARD SPECIFICATIONS

FOR

OPEN DRAINS

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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 Section 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.

The low flow channel 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 .3m from the toe of 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 the General Specifications for Drain Construction and the Drawings.

Any crossings assembled on-site shall be assembled in accordance with the manufacturer's specifications.

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 the invert elevations as specified on the Drawings, usually 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 pipe crossing.

For backfill and surface restoration, refer to the General Specifications for Drain Construction and the Drawings.

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.

420 **STANDARD SPECIFICATIONS**

FOR

TILE DRAINS

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420 STANDARD SPECIFICATIONS FOR TILE DRAINS

420.1 DESCRIPTION

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

The work shall include the supplying of all labour, tools, equipment and extra materials required for the installation of the tile; the excavation and backfilling of the trenches; the hauling, handling, placing and compaction of the excavated material for backfill, the loading, hauling, handling and disposal of surplus excavation material; the removal and replacing of topsoil and sod where required by the Engineer.

All existing laterals crossed by the new line 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 construct catchbasins, junction boxes and other structures where directed by the Engineer.

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

The Engineer will designate the general location of the new drain. A landowner may indicate a revised location for the drain which must be approved by the Engineer. Where a change in alignment is required that is not accommodated in a catchbasin, junction box or similar structure the alignment change shall run on a curve with a radius not less than the minimum installation radius specified for the tile material.

The Contractor shall exercise care to not disturb any existing tile drains which parallel the course of the new drain, particularly where the new and existing tile act together to provide the necessary capacity. 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 is to be installed to the elevation and grade 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

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.

Topsoil over the trench shall be stripped, stockpiled separately and replaced after the trench is backfilled. Where installation is across a residential lawn, existing sod over the trench shall be cut, lifted and replaced in a workmanlike manner or new sod laid to match pre-construction conditions.

420.3.5.1 Installation of Concrete Tile

Concrete tile shall be installed by a wheel trencher unless an alternate method of construction is noted on the Drawings.

Digging of the trench shall start at the outlet end and proceed upstream. The location and grade shall be as shown on Drawings but shall be liable to adjustment or change by the Engineer on site with no additional payment allowed except where the change involves increased depth of cut beyond the limitation of the wheel trencher in use at the time of the change. 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 the tile will be embedded in undisturbed soil or in a compacted bed at least for 10% of its overall height. Where hard shale, boulders or other unsuitable bedding material is encountered, the trench shall be excavated to 75mm below grade and backfilled with granular material compacted to a shaped, firm foundation. If the trench is overcut below the proposed grade, it is to be backfilled with granular material to the correct grade and compacted to a shaped, firm foundation.

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 and backfilling and stripping and replacing topsoil over the trench.

The inside of the tile is to be kept clean during installation. All soil and debris should be removed before the next tile is laid. Maximum spacing at joints between tiles should be about 3mm. Directional changes can be made without fittings or structures provided the centre-line radius of the bend is not less than 15m radius. The tiles are to be beveled, if necessary, to ensure close joints on all bends.

All 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 overlap on top is required. No additional payment will be made for joint wrapping.

420.3.5.2 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.

420.3.5.3 Installation of Concrete Sewer Pipe or Plastic Pipe

The Contractor may install pipe using a wheel trencher. For concrete sewer pipe, the bells must be recessed.

The Contractor may install pipe using an excavator by shaping the bottom of the trench to receive and support the pipe over 10% of its diameter if the trench is backfilled with native material. Shaping the trench bottom is not required where 150mm of granular bedding is placed to the satisfaction of the engineer.

420.3.6 Backfilling

All tile should be blinded by the end of the day's work to protect and hold them in place against disturbances. After tile is inspected, it shall initially be 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.

The 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.

420.3.7 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. Lateral drains that are full of sediments or contain polluted waters will be addressed by the Engineer at the time of construction. All lateral drains are to be connected to the new tile using a pipe material and size that will provide the same flow capacity as the existing lateral drain unless a different connection is described in the Special Provisions. Corrugated plastic tubing can be used for all tile connections. Tubing can be solid or perforated, filter sock is not required. Contractor is responsible for installation and backfilling in a manner than maintains the structural integrity of the connection. Manufactured fittings should be used to ensure tight connections. Where an opening must

be made in the new tile drain for a connection, the opening shall be field cut or cored. After the opening is cut in the new tile 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 than any material used to seal the connection does not protrude beyond the inside wall of the new tile drain.

All connections that are described in the Special Provisions are considered to be part of the original Contract price. For all other connections the Contractor will be paid in accordance with the price established in the Schedule of Tender Prices. The Contractor must list all connections on the Lateral Connection Summary sheet, if included in the Special Provisions, in order to qualify for payment. The Lateral Connection Summary sheet describes all tile encountered based on location (station), side of trench, size and type of tile and approximate length and type of material used for the connection.

420.3.8 Stones and Rock

The Contractor shall immediately contact the Engineer if bedrock or stones of sufficient size and number are encountered such that installation by wheel trencher cannot continue. The Engineer may direct the Contractor to use some other method of excavation to install the tile. The basis of payment for such extra work shall be determined by the Engineer. Stones greater than 300mm in diameter that are removed during excavation shall be disposed of by the Contractor at an offsite location. No additional payment for excavating or hauling these stones will be provided.

420.3.9 Brush, Trees and Debris

Unless stated otherwise in the Special Provisions, the following requirements shall apply for installation of a tile drain in a wooded area. The Contractor will clear and grub a minimum corridor width of 30m centered on the tile drain alignment. The resulting debris shall be placed in a windrow along the edge of the working area. No additional payment will be made for such work.

420.3.10 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 weigh tickets and the suppliers invoice.

If poor subsoil conditions are encountered during tile installation by backhoe or excavator, the tile shall be installed on stone bedding as noted above. For this installation only the material cost of the stone will be paid as an extra. Supply of stone and cost to be supported by weigh tickets and supplier's invoice.

If the subsoil is a fine grained soil it may necessary to place the stone on a geotextile with the geotextile wrapped over the stone before laying the tile. Additional payment will be allowed to supply and install the geotextile.

420.3.11 Broken or Damaged Tile

The Contractor shall dispose of all damaged or broken tile and broken tile pieces off-site.

420.3.12 Excess Tile

All excess tile shall be removed from the job site.

420.3.13 Catchbasins

420.3.13.1 General

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

420.3.13.2 Materials

Requirements in this section apply 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 concrete catchbasins shall be manufactured by Coldstream Concrete or approved equal. Minimum wall thickness for catchbasins without reinforcement is 150mm and with reinforcement 100mm. 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. Steel catchbasins shall be the Heavy Duty Steel Catch Basin as manufactured by AgriDrain or approved equal. PVC catchbasins shall be Nyloplast as manufactured by ADS or approved equal. HDPE, steel 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.

420.3.13.3 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.

420.3.14 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 lid. The lid shall be a minimum of 125mm thick with wire mesh reinforcement and 2 lifting handles. The top of the junction box should have a minimum ground cover of 450mm.

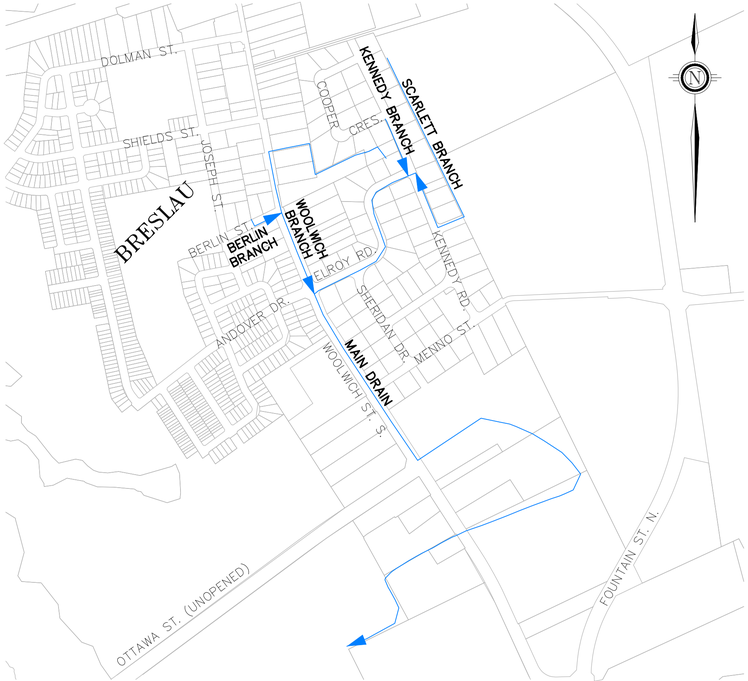
BRESLAU DRAIN 1

ISSUED FOR FINAL REPORT

WOOLWICH TOWNSHIP

SANDY SHANTZ
MAYOR

JARED PUPPE, C.E.T.
DIRECTOR OF INFRASTRUCTURE SERVICES



KEY PLAN

NOT TO SCALE

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

LIST OF DRAWINGS

NOTES:

1. PRELIMINARY ROAD LAYOUT AND DRAINAGE BLOCK LOCATION ON ROLL NO.'S 004–07510, 004–16994, 005–04100 & 005–04110 SHOWN PER MTE DRAWING ST2.1 DATED APRIL 12, 2023

BENCHMARKS:

BM#1
TOP SPINDLE OF FIRE HYDRANT ON W. SIDE WOOLWICH ST. S., 5m N. OF ENTRANCE TO LOT #280.
ELEV. 313.481

BM#2
CUT CROSS ON TOP OF CONCRETE HEADWALL DIRECTLY ABOVE 200mmø CONC. OUTLET WHERE DITCH BENDS SW.
ELEV. 309.724

GBM
BRIDGE ACROSS SMALL STREAM ON WOOLWICH ST. IN BRESLAU, APPROXIMATELY 105M SOUTH OF HWY. NO. 7, TABLET IN TOP NORTHWEST ABUTMENT 37CM WEST OF CONCRETE PORTION OF GUARDRAIL.
N 4,814,471.483
E 547,162.425
ELEV. 303.43

VERTICAL DATUM CGVD 28:78
HORIZONTAL DATUM UTM NAD 83 ZONE 17N

LEGEND:

- WATERSHED
- SUBWATERSHED
- EXTERNAL WATERSHED
- 1953 WATERSHED (FOR INFORMATION ONLY)
- DENOTES PROPERTY OWNERSHIP ON BOTH SIDES OF LOT LINE
- (004–07900) ASSESSMENT ROLL NUMBER
- (12.8) APPROXIMATE HECTARES IN WATERSHED
- PROPOSED DRAIN (PIPE)
- PROPOSED DRAIN (DITCH)
- 1953 DRAIN ROUTE TO BE ABANDONED
- STORM OR WATERCOURSE
- EXISTING MUNICIPAL DRAIN
- EXISTING MUNICIPAL DRAIN TO BE REMOVED OR ABANDONED
- WOODED AREA

SCALE
0 100m
(1 : 5,000 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

LICENSED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
SEPT. 22, 2023
PROVINCE OF ONTARIO

CERTIFIED ENGINEERING TECHNOLOGIST
ONTARIO
SEPT. 22, 2023
ALEXANDER PASLEY
Nº 901718

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

WATERSHED PLAN

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: **18–285**
DRAWING
1 OF 28

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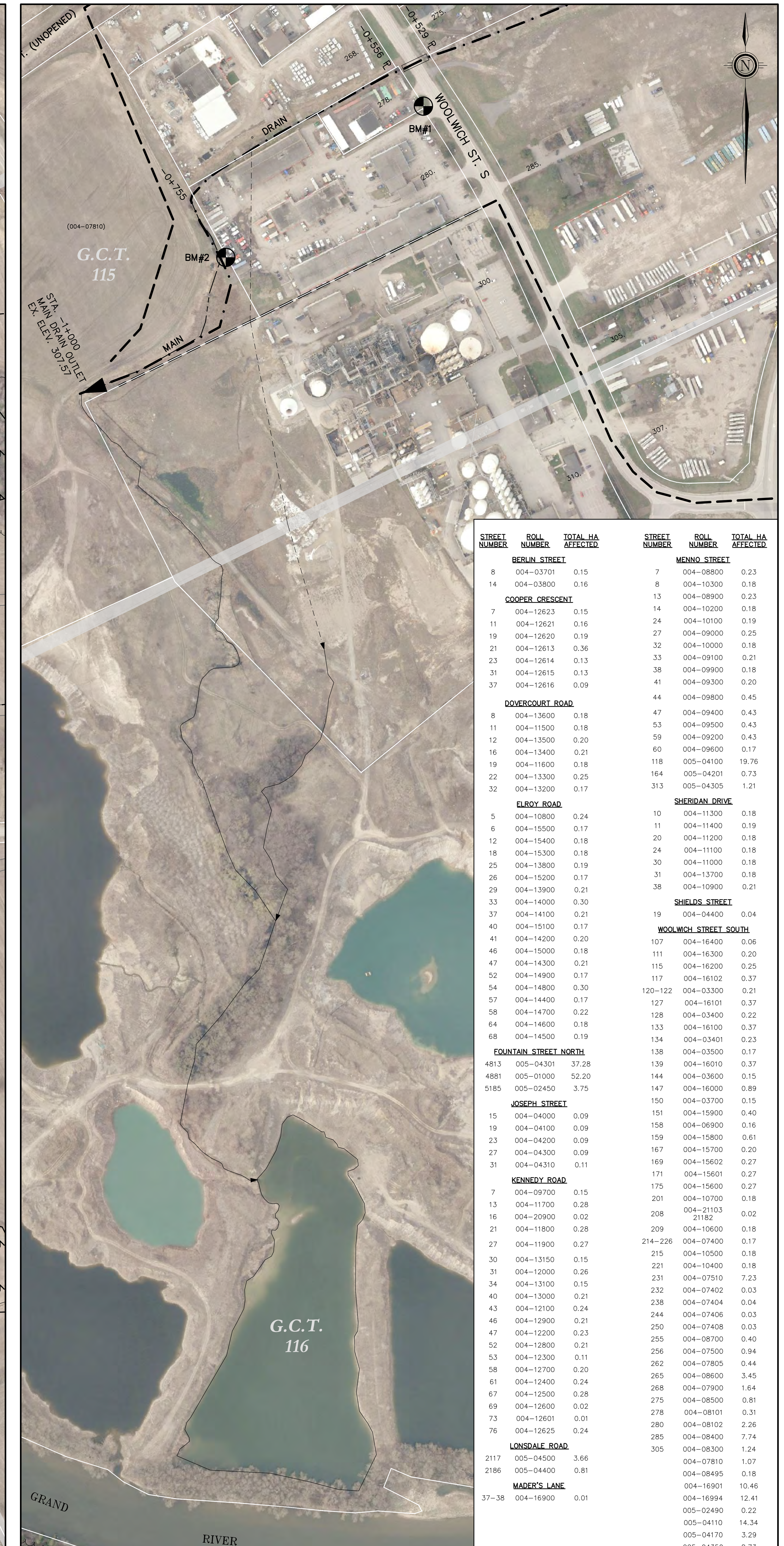

STREET NUMBER	ROLL NUMBER	TOTAL HA AFFECTED
	BERLIN STREET	
8	004-03701	0.15
14	004-03800	0.16
	COOPER CRESCENT	
7	004-12623	0.15
11	004-12621	0.16
19	004-12620	0.19
21	004-12613	0.36
23	004-12614	0.13
31	004-12615	0.13
37	004-12616	0.09
	DOVERCOURT ROAD	
8	004-13600	0.18
11	004-11500	0.18
12	004-13500	0.20
16	004-13400	0.21
19	004-11600	0.18
22	004-13300	0.25
32	004-13200	0.17
	ELROY ROAD	
5	004-10800	0.24
6	004-15500	0.17
12	004-15400	0.18
18	004-15300	0.18
25	004-13800	0.19
26	004-15200	0.17
29	004-13900	0.21
33	004-14000	0.30
37	004-14100	0.21
40	004-15100	0.17
41	004-14200	0.20
46	004-15000	0.18
47	004-14300	0.21
52	004-14900	0.17
54	004-14800	0.30
57	004-14400	0.17
58	004-14700	0.22
64	004-14600	0.18
68	004-14500	0.19
	FOUNTAIN STREET NORTH	
4813	005-04301	37.28
4881	005-01000	52.20
5185	005-02450	3.75
	JOSEPH STREET	
15	004-04000	0.09
19	004-04100	0.09
23	004-04200	0.09
27	004-04300	0.09
31	004-04310	0.11
	KENNEDY ROAD	
7	004-09700	0.15
13	004-11700	0.28
16	004-20900	0.02
21	004-11800	0.28
27	004-11900	0.27
30	004-13150	0.15
31	004-12000	0.26
34	004-13100	0.15
40	004-13000	0.21
43	004-12100	0.24
46	004-12900	0.21
47	004-12200	0.23
52	004-12800	0.21
53	004-12300	0.11
58	004-12700	0.20
61	004-12400	0.24
67	004-12500	0.28
69	004-12600	0.02
73	004-12601	0.01
76	004-12625	0.24
	LONSDALE ROAD	
2117	005-04500	3.66
2186	005-04400	0.81
	MADER'S LANE	
37-38	004-16900	0.01

STREET NUMBER	ROLL NUMBER	TOTAL HA AFFECTED
	MENNO STREET	
7	004-08800	0.23
8	004-10300	0.18
13	004-08900	0.23
14	004-10200	0.18
24	004-10100	0.19
27	004-09000	0.25
32	004-10000	0.18
33	004-09100	0.21
38	004-09900	0.18
41	004-09300	0.20
44	004-09800	0.45
47	004-09400	0.43
53	004-09500	0.43
59	004-09200	0.43
60	004-09600	0.17
118	005-04100	19.76
164	005-04201	0.73
313	005-04305	1.21
	SHERIDAN DRIVE	
10	004-11300	0.18
11	004-11400	0.19
20	004-11200	0.18
24	004-11100	0.18
30	004-11000	0.18
31	004-13700	0.18
38	004-10900	0.21
	SHIELDS STREET	
19	004-04400	0.04
	WOOLWICH STREET SOUTH	
107	004-16400	0.06
111	004-16300	0.20
115	004-16200	0.25
117	004-16102	0.37
120-122	004-03300	0.21
127	004-16101	0.37
128	004-03400	0.22
133	004-16100	0.37
134	004-03401	0.23
138	004-03500	0.17
139	004-16010	0.37
144	004-03600	0.15
147	004-16000	0.89
150	004-03700	0.15
151	004-15900	0.40
158	004-06900	0.16
159	004-15800	0.61
167	004-15700	0.20
169	004-15602	0.27
171	004-15601	0.27
175	004-15600	0.27
201	004-10700	0.18
208	004-21103 21182	0.02
209	004-10600	0.18
214-226	004-07400	0.17
215	004-10500	0.18
221	004-10400	0.18
231	004-07510	7.23
232	004-07402	0.03
238	004-07404	0.04
244	004-07406	0.03
250	004-07408	0.03
255	004-08700	0.40
256	004-07500	0.94
262	004-07805	0.44
265	004-08600	3.45
268	004-07900	1.64
275	004-08500	0.81
278	004-08101	0.31
280	004-08102	2.26
285	004-08400	7.74
305	004-08300	1.24
	004-07810	1.07
	004-08495	0.18
	004-16901	10.46
	004-16994	12.41
	005-02490	0.22
	005-04110	14.34
	005-04170	3.29
	005-04350	8.73

NOTES:

1. PRELIMINARY ROAD LAYOUT AND DRAINAGE BLOCK LOCATION ON ROLL NO.'S 004-07510, 004-16994, 005-04100 & 005-04110 SHOWN PER MTE DRAWING ST2.1 DATED APRIL 12, 2023

BENCHMARKS:

BM#1
TOP SPINDLE OF FIRE HYDRANT ON W. SIDE WOOLWICH ST. S., 5m N. OF ENTRANCE TO LOT #280.
ELEV. 313.481

BM#2
CUT CROSS ON TOP OF CONCRETE HEADWALL DIRECTLY ABOVE 200mmØ CONC. OUTLET WHERE DITCH BENDS SW.
ELEV. 309.724

GBM
BRIDGE ACROSS SMALL STREAM ON WOOLWICH ST. IN BRESLAU, APPROXIMATELY 105M SOUTH OF HWY. NO. 7, TABLET IN TOP NORTHWEST ABUTMENT 37CM WEST OF CONCRETE PORTION OF GUARDRAIL.
N 4,814,471.483
E 547,162.425
ELEV. 303.43

VERTICAL DATUM CGVD 28:78
HORIZONTAL DATUM UTM NAD 83 ZONE 17N

LEGEND:

- WATERSHED
- SUBWATERSHED
- EXTERNAL WATERSHED
- 1953 WATERSHED (FOR INFORMATION ONLY)
- DENOTES PROPERTY OWNERSHIP ON BOTH SIDES OF LOT LINE
- (004-07900) ASSESSMENT ROLL NUMBER
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- EXISTING MUNICIPAL DRAIN
- EXISTING MUNICIPAL DRAIN TO BE REMOVED OR ABANDONED
- WOODED AREA

SCALE
0 50m
(1 : 2,500 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

LICENSED PROFESSIONAL ENGINEER J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

CERTIFIED ENGINEERING TECHNOLOGIST OACETT ONTARIO SEPT. 22, 2023 ALEXANDER PASLEY No 901718

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

ENLARGEMENT PLAN

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 2 OF 28

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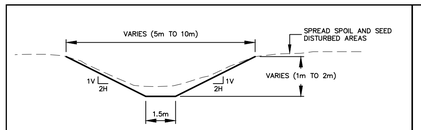
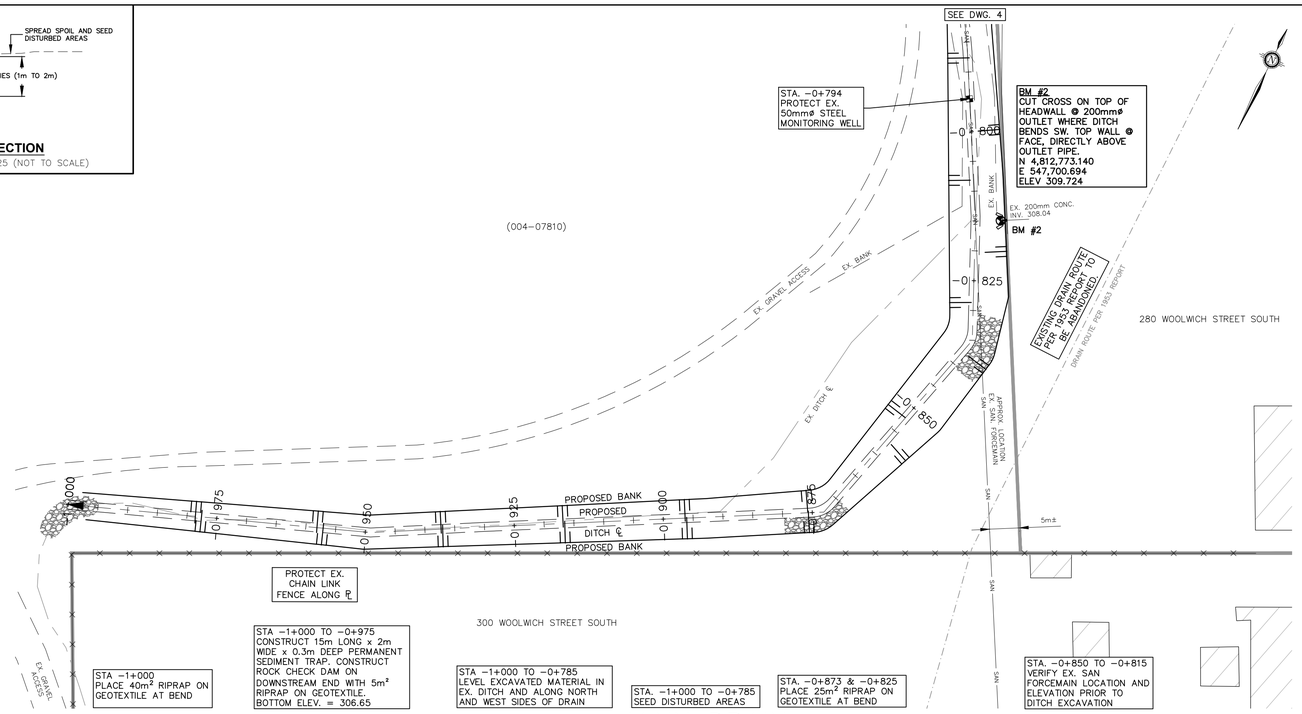
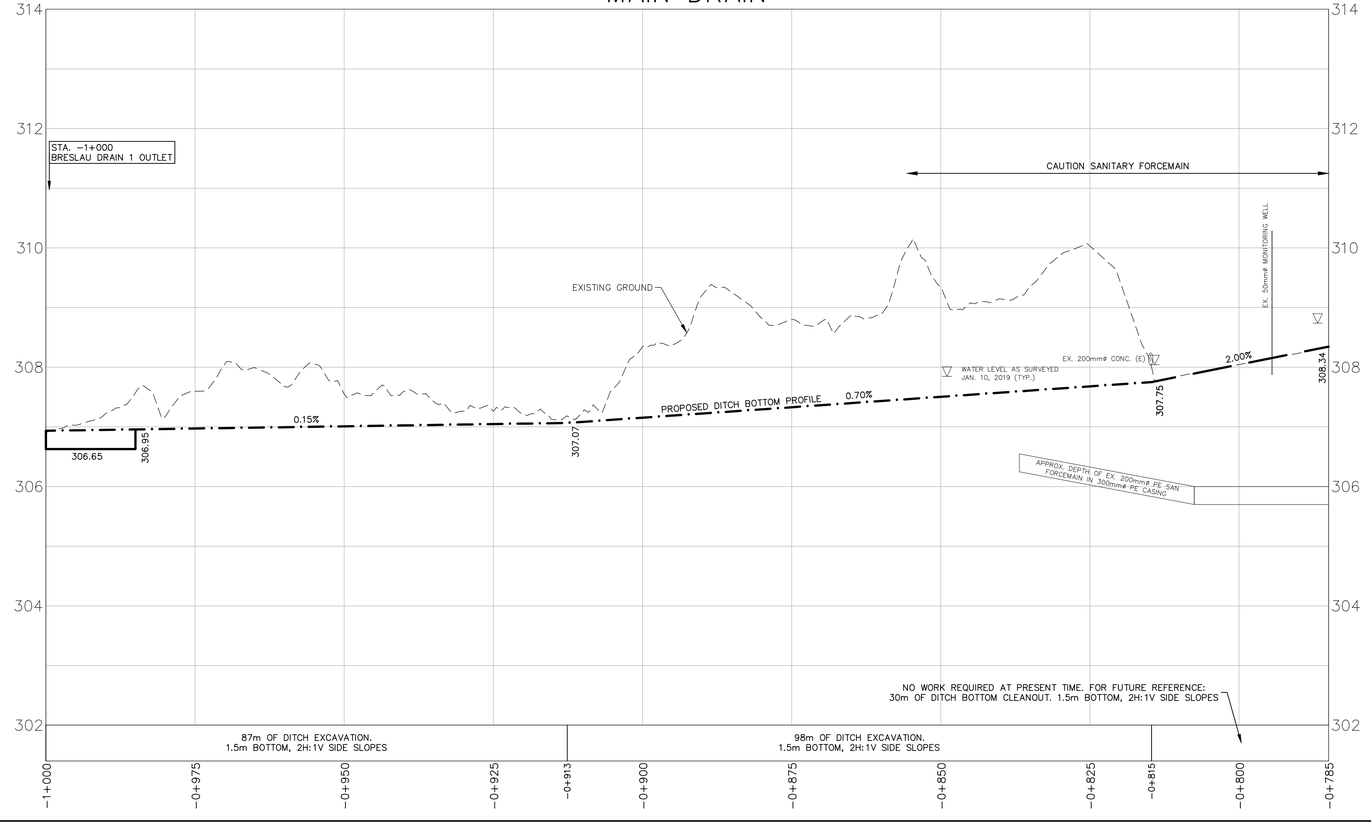


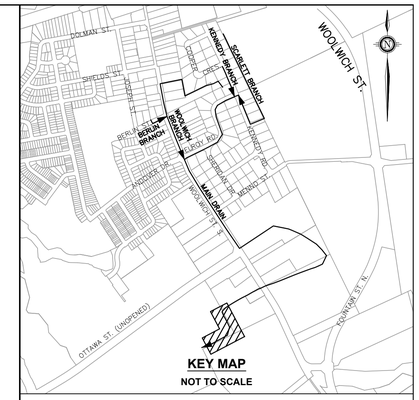
PROPOSED DITCH TYPICAL SECTION

STA. −1+000 TO −0+739 & −0+592 TO −0+325 (NOT TO SCALE)



MAIN DRAIN





KEY MAP

NOT TO SCALE

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE−LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
2. EXISTING PRIVATE DRAIN CONNECTIONS ARE ANTICIPATED. THE CONTRACTOR IS TO VERIFY THE EXACT LOCATION. ALL EXISTING DRAINS ARE TO BE CONNECTED TO THE NEW STORM SEWER
3. ALL FUTURE LOT LAYOUT AND SERVICING TO BE PROVIDED BY OTHERS. ALL FUTURE LINEWORK SHOWN ON THESE DRAWINGS ARE BASED ON PRELIMINARY DRAWINGS RECEIVED FROM MTE ON APRIL 12, 2023.
4. ANY INCIDENTAL REMOVAL OF TREES/DEBRIS SHALL BE APPROVED BY ENGINEER PRIOR TO COMMENCING WORK

LEGEND:

STM	EXISTING STORM AND CATCHBASIN
PDC PDC	APPROXIMATE LOCATION EXISTING PRIVATE DRAIN CONNECTION
	REMOVE/ABANDON EXISTING STORM (PROFILE)
	REMOVE/ABANDON EXISTING STORM
W WS	EXISTING WATERMAIN AND FIRE HYDRANT
WS	APPROXIMATE LOCATION EXISTING WATER SERVICE
W	EXISTING ABANDONED WATERMAIN
SAN	EXISTING SANITARY AND MAINTENANCE HOLE
SS	APPROXIMATE LOCATION EXISTING SANITARY SERVICE
G	APPROXIMATE LOCATION EXISTING U/G GAS
GS	APPROXIMATE LOCATION EXISTING U/G GAS SERVICE
XGX	APPROXIMATE LOCATION ABANDONED U/G GAS
B	APPROXIMATE LOCATION EXISTING U/G BELL
O/H	APPROXIMATE LOCATION EXISTING OVERHEAD POWER LINE
	HYDROVAC TEST HOLE LOCATION DEC. 9, 2020/ MAR. 22, 2021
CBMH 3	PROPOSED STORM AND CATCHBASIN MAINTENANCE HOLE
PLUG	PROPOSED PLUG IN EXISTING STORM
PDC PDC	PROPOSED PRIVATE DRAIN CONNECTION
	PROPOSED DITCH/SURFACE SWALE
SAN	FUTURE SANITARY AND MAINTENANCE HOLE
STM	FUTURE STORM AND MAINTENANCE HOLE
W	FUTURE WATERMAIN

SCALE

0 10m (1 : 500 ON 22"x 34") HORZ.

0 1m (1 : 50 ON 22"x 34") VERT.

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

SEPT. 22, 2023 ALEXANDER PANEVIN No. 901718 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN

OPEN DITCH

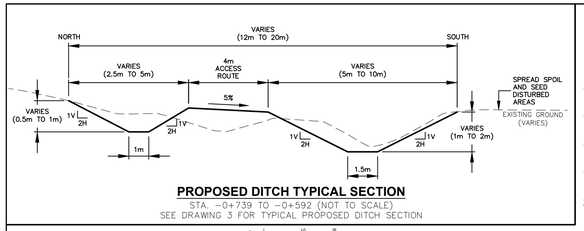
STATION −1+035 TO −0+800

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023

JOB NUMBER: 18−285

DRAWING 3 OF 28



PROPOSED DITCH TYPICAL SECTION

STA. −0+739 TO −0+592 (NOT TO SCALE)

SEE DRAWING 3 FOR TYPICAL PROPOSED DITCH SECTION

STA. −0+705
OUTLET EX. 150mmø PLAS. FROM HB (HICKENBOTTOM) TO NEW DITCH. PLACE 5m² RIPRAP ON GEOTEXTILE AT OUTLET

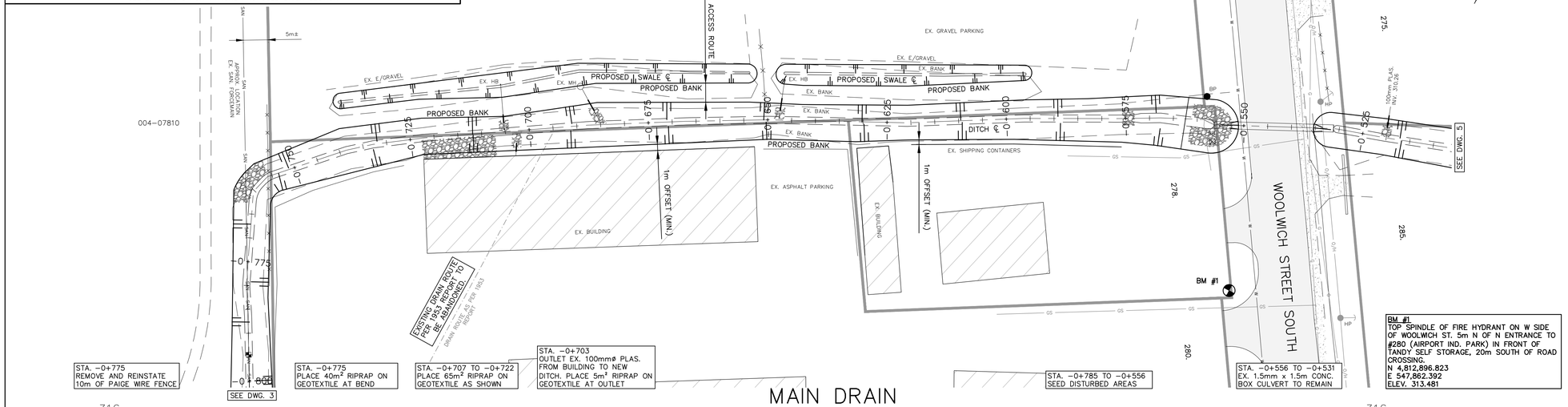
STA. −0+687
OUTLET EX. 100mmø PLAS. FROM MH TO NEW DITCH. PLACE 5m² RIPRAP ON GEOTEXTILE AT OUTLET. EX. MH TO BE PROTECTED DURING CONSTRUCTION.

STA. −0+647
OUTLET EX. 150mmø PLAS. FROM HB TO NEW DITCH. PLACE 5m² RIPRAP ON GEOTEXTILE AT OUTLET

STA. −0+739 TO −0+592
RE-GRADE EXISTING SWALE. 1m BOTTOM, 2H:1V SIDE SLOPES

STA −0+575 TO −0+560
CONSTRUCT 15m LONG x 2m WIDE x 0.3m DEEP PERMANENT SEDIMENT TRAP. CONSTRUCT ROCK CHECK DAM ON DOWNSTREAM END WITH 50m² RIPRAP ON GEOTEXTILE AS SHOWN.
BOTTOM ELEV. = 309.07

STA. −0+520
OUTLET EX. 100mmø PLAS. TO NEW DITCH. PLACE 5m² RIPRAP ON GEOTEXTILE AT OUTLET



STA. −0+775
REMOVE AND REINSTATE 10m OF PAIGE WIRE FENCE

SEE DWG. 3

STA. −0+775
PLACE 40m² RIPRAP ON GEOTEXTILE AT BEND

STA. −0+707 TO −0+722
PLACE 65m² RIPRAP ON GEOTEXTILE AS SHOWN

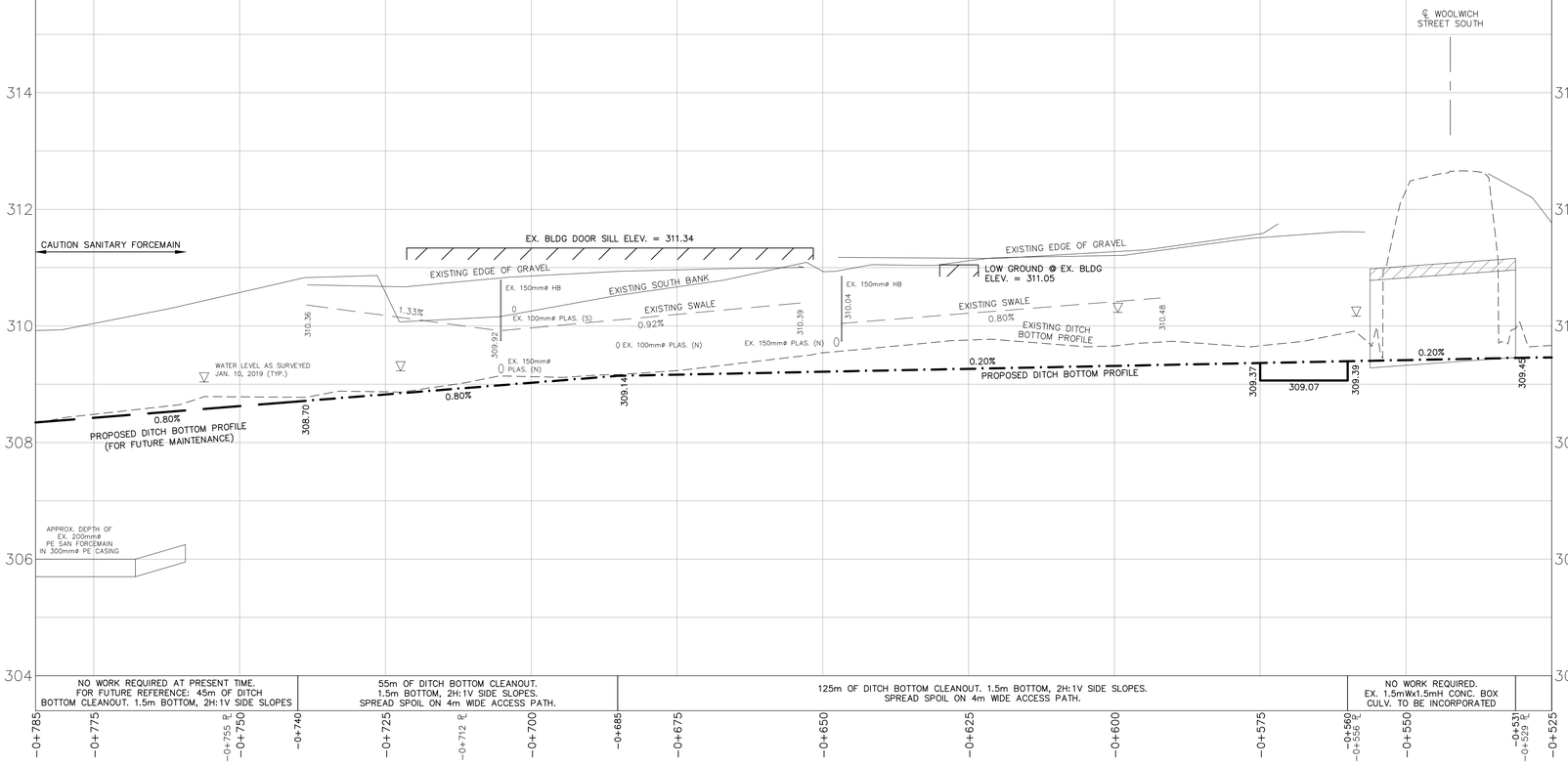
STA. −0+703
OUTLET EX. 100mmø PLAS. FROM BUILDING TO NEW DITCH. PLACE 5m² RIPRAP ON GEOTEXTILE AT OUTLET

STA. −0+785 TO −0+556
SEED DISTURBED AREAS

STA. −0+556 TO −0+531
EX. 1.5mm x 1.5m CONC. BOX CULVERT TO REMAIN

BM #1.
TOP SPINDLE OF FIRE HYDRANT ON W SIDE OF WOOLWICH ST. 5m N OF N ENTRANCE TO #280 (AIRPORT IND. PARK) IN FRONT OF TANDY SELF STORAGE, 20m SOUTH OF ROAD CROSSING.
N 4,812,896.823
E 547,862.392
ELEV. 313.481

MAIN DRAIN

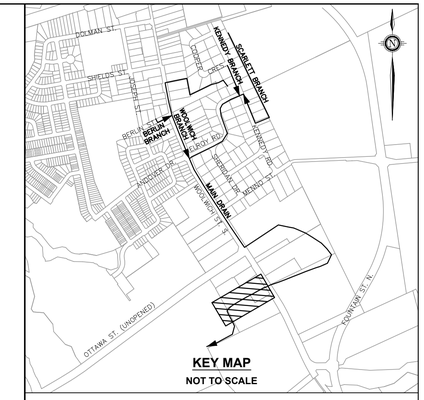


NO WORK REQUIRED AT PRESENT TIME. FOR FUTURE REFERENCE: 45m OF DITCH BOTTOM CLEANOUT. 1.5m BOTTOM, 2H:1V SIDE SLOPES

55m OF DITCH BOTTOM CLEANOUT. 1.5m BOTTOM, 2H:1V SIDE SLOPES. SPREAD SPOIL ON 4m WIDE ACCESS PATH.

125m OF DITCH BOTTOM CLEANOUT. 1.5m BOTTOM, 2H:1V SIDE SLOPES. SPREAD SPOIL ON 4m WIDE ACCESS PATH.

NO WORK REQUIRED. EX. 1.5mWx1.5mH CONC. BOX CULV. TO BE INCORPORATED



KEY MAP

NOT TO SCALE

NOTES:

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4. ANY INCIDENTAL REMOVAL OF TREES/DEBRIS SHALL BE APPROVED BY ENGINEER PRIOR TO COMMENCING WORK

LEGEND:

STM □	EXISTING STORM AND CATCHBASIN
PDC PDC	APPROXIMATE LOCATION EXISTING PRIVATE DRAIN CONNECTION
	REMOVE/ABANDON EXISTING STORM (PROFILE)
	REMOVE/ABANDON EXISTING STORM
W ⊕	EXISTING WATERMAIN AND FIRE HYDRANT
WS	APPROXIMATE LOCATION EXISTING WATER SERVICE
W	EXISTING ABANDONED WATERMAIN
SAN ○	EXISTING SANITARY AND MAINTENANCE HOLE
SS	APPROXIMATE LOCATION EXISTING SANITARY SERVICE
G	APPROXIMATE LOCATION EXISTING U/G GAS
GS	APPROXIMATE LOCATION EXISTING U/G GAS SERVICE
XGX	APPROXIMATE LOCATION ABANDONED U/G GAS
B	APPROXIMATE LOCATION EXISTING U/G BELL
O/H	APPROXIMATE LOCATION EXISTING OVERHEAD POWER LINE
	HYDROVAC TEST HOLE LOCATION DEC. 9, 2020/ MAR. 22, 2021
CBMH 3	PROPOSED STORM AND CATCHBASIN MAINTENANCE HOLE
PLUG	PROPOSED PLUG IN EXISTING STORM
PDC PDC	PROPOSED PRIVATE DRAIN CONNECTION
	PROPOSED DITCH/SURFACE SWALE
SAN ○	FUTURE SANITARY AND MAINTENANCE HOLE
STM ○	FUTURE STORM AND MAINTENANCE HOLE
W	FUTURE WATERMAIN

SCALE

0 10m (1 : 500 ON 22"x 34") HORZ.

0 1m (1 : 50 ON 22"x 34") VERT.

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO — SEPT. 22, 2023

ALEXANDER PASLEY Nº 901718 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO — SEPT. 22, 2023

BRESLAU DRAIN 1

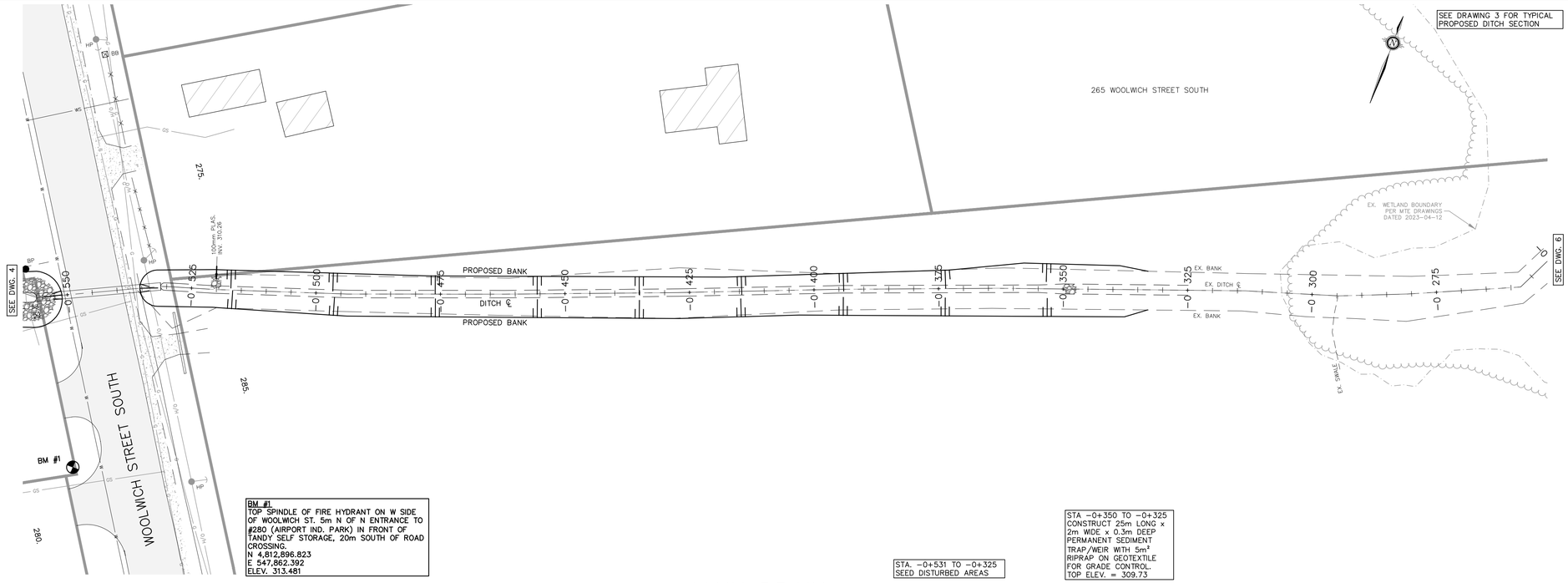
REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN
OPEN DITCH
STATION −0+785 TO −0+525

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 4 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 4. Main Drain – Open Portion 22-Sep-23 3:12:01 PM

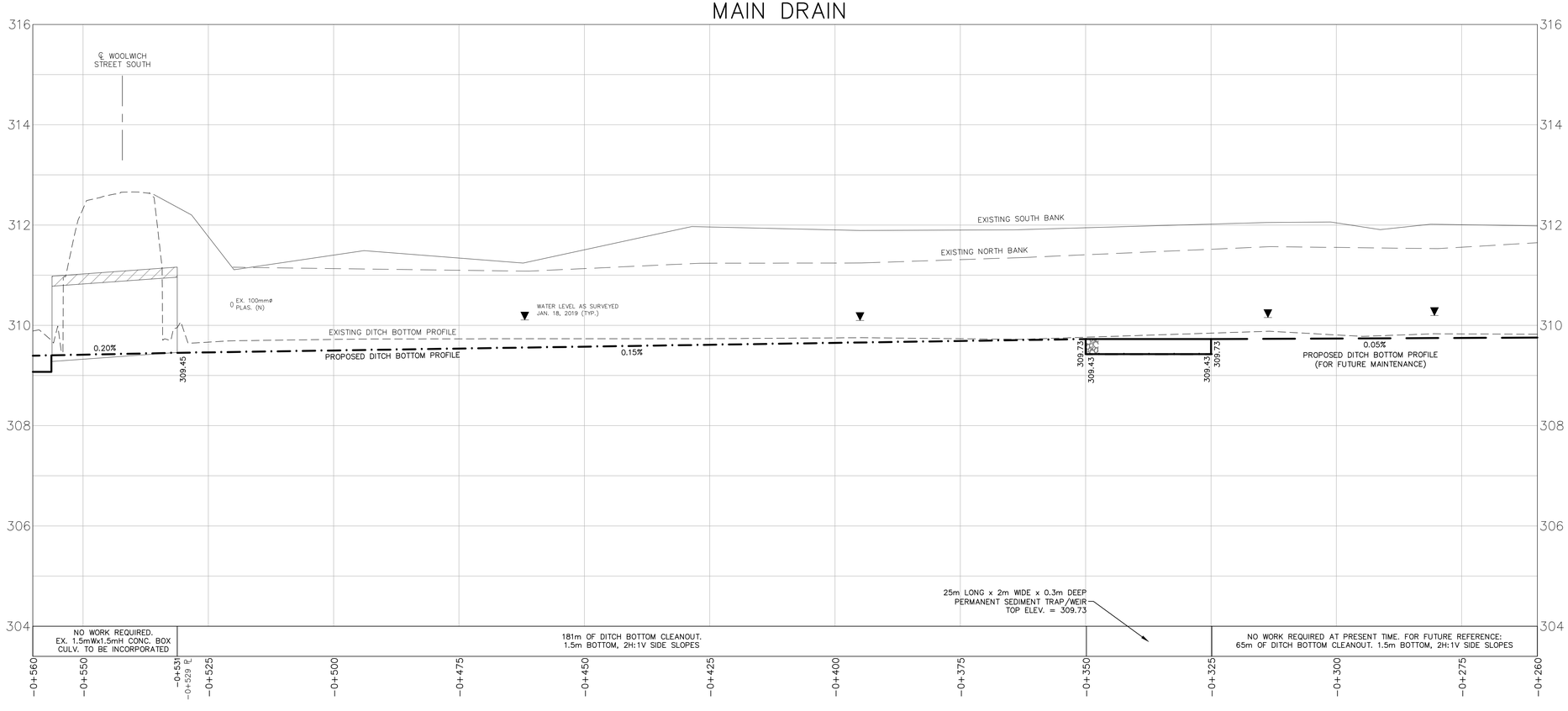


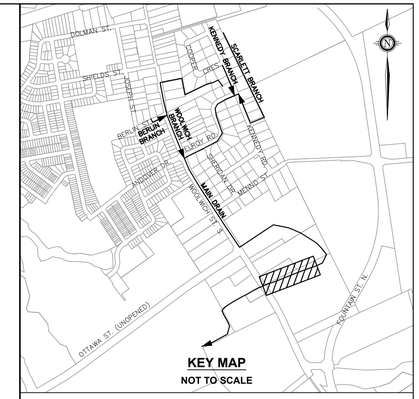
BM #1
TOP SPINDLE OF FIRE HYDRANT ON W SIDE OF WOOLWICH ST. 5m N OF N ENTRANCE TO #280 (AIRPORT IND. PARK) IN FRONT OF TANDY SELF STORAGE, 20m SOUTH OF ROAD CROSSING.
N 4,812,896.823
E 547,862.392
ELEV. 313.481

STA. −0+531 TO −0+325
SEED DISTURBED AREAS

STA −0+350 TO −0+325
CONSTRUCT 25m LONG x 2m WIDE x 0.3m DEEP PERMANENT SEDIMENT TRAP/WEIR WITH 5m³ RIPRAP ON GEOTEXTILE FOR GRADE CONTROL.
TOP ELEV. = 309.73

MAIN DRAIN





KEY MAP
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LEGEND:

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- PDC — PDC — APPROXIMATE LOCATION EXISTING PRIVATE DRAIN CONNECTION
- REMOVE/ABANDON EXISTING STORM (PROFILE)
- REMOVE/ABANDON EXISTING STORM
- W — EXISTING WATERMAIN AND FIRE HYDRANT
- WS — APPROXIMATE LOCATION EXISTING WATER SERVICE
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- SAN — EXISTING SANITARY AND MAINTENANCE HOLE
- SS — APPROXIMATE LOCATION EXISTING SANITARY SERVICE
- G — APPROXIMATE LOCATION EXISTING U/G GAS
- GS — APPROXIMATE LOCATION EXISTING U/G GAS SERVICE
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- CBMH 3 — PROPOSED STORM AND CATCHBASIN MAINTENANCE HOLE
- PLUG — PROPOSED PLUG IN EXISTING STORM
- PDC — PDC — PROPOSED PRIVATE DRAIN CONNECTION
- PROPOSED DITCH/SURFACE SWALE
- SAN — FUTURE SANITARY AND MAINTENANCE HOLE
- STM — FUTURE STORM AND MAINTENANCE HOLE
- W — FUTURE WATERMAIN

SCALE
0 10m (1 : 500 ON 22"x 34") HORZ.
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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO — SEPT. 22, 2023
ALEXANDER PASLEY Nº 901718 LICENCE PROFESSIONAL ENGINEER PROVINCE OF ONTARIO — SEPT. 22, 2023

BRESLAU DRAIN 1

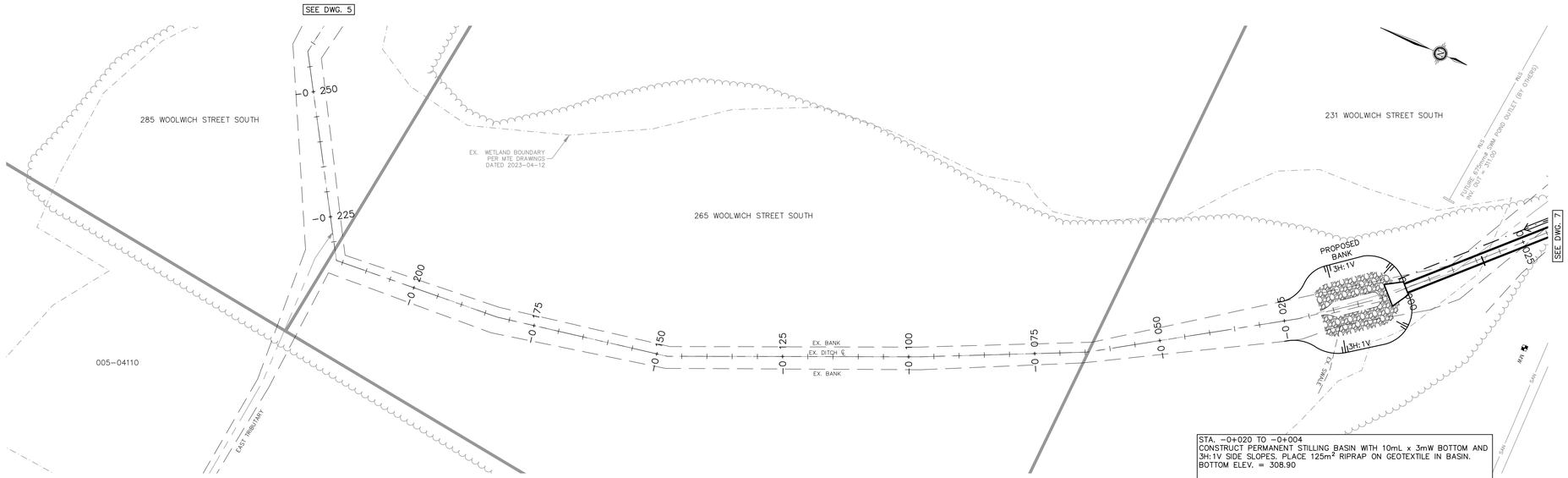
REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN
OPEN DITCH
STATION −0+560 TO −0+260

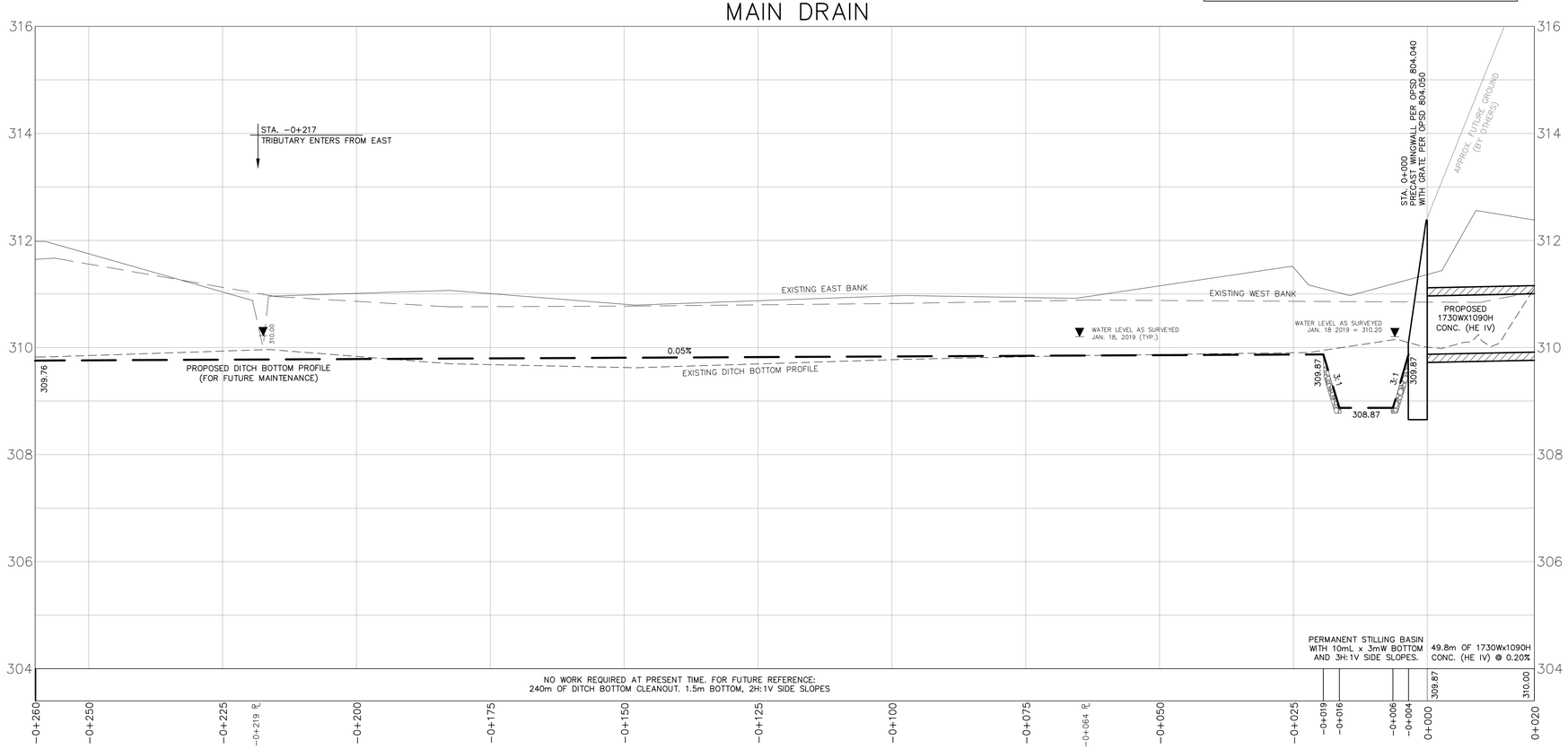
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

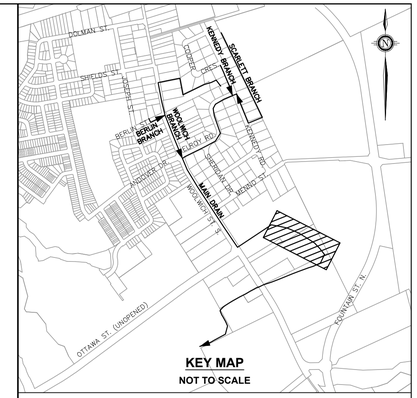
SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 5 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 5. Main Drain – Open Portion 22-Sep-23 3:13:06 PM



MAIN DRAIN





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SCALE

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

LICENCE OF PROFESSIONAL ENGINEER — J. E. MILLER — 100206193 — SEPT. 22, 2023 — PROVINCE OF ONTARIO

CERTIFICATE OF AUTHORIZATION — SEPT. 22, 2023 — ALEXANDER PAILEY — Nº 901718

BRESLAU DRAIN 1

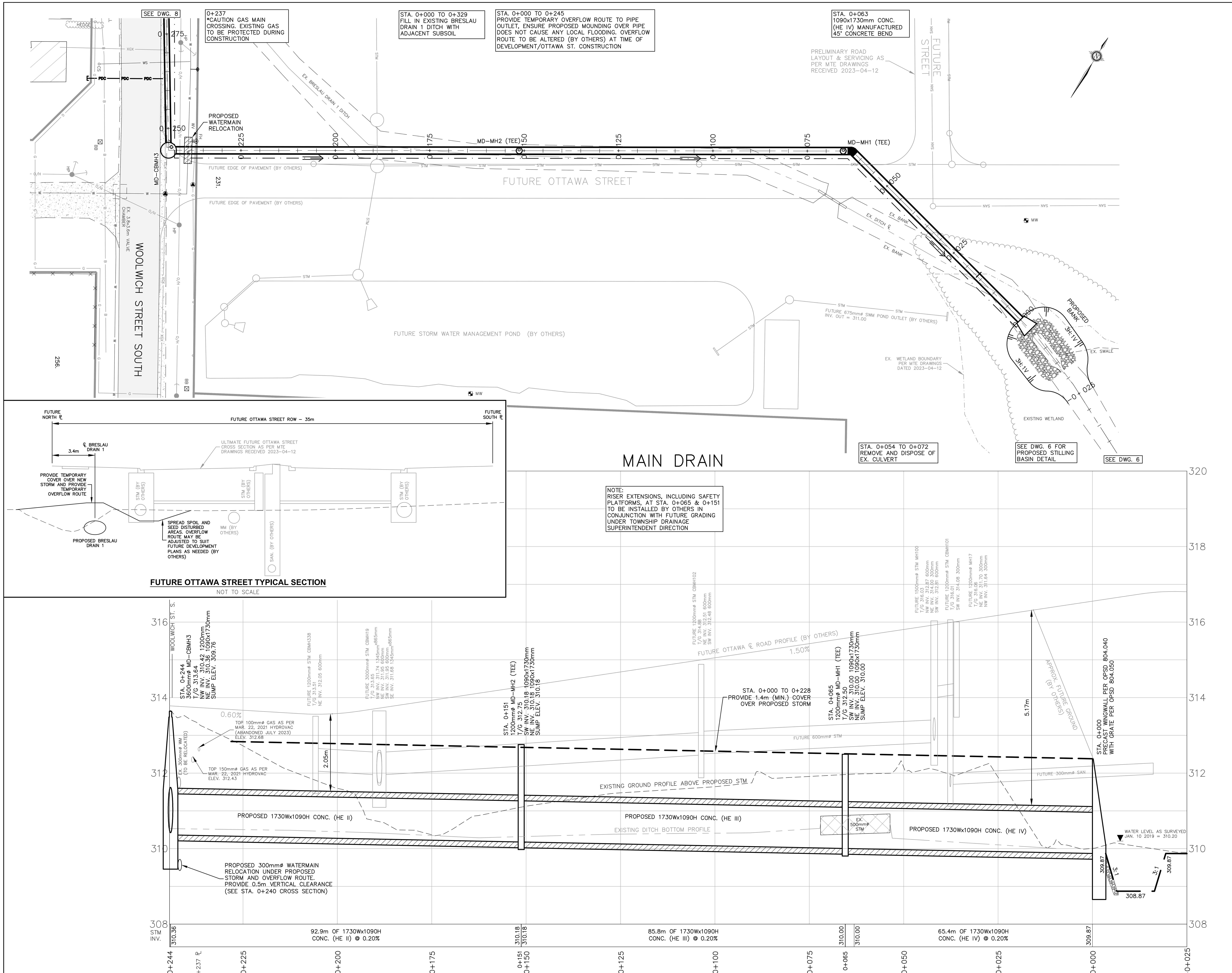
REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

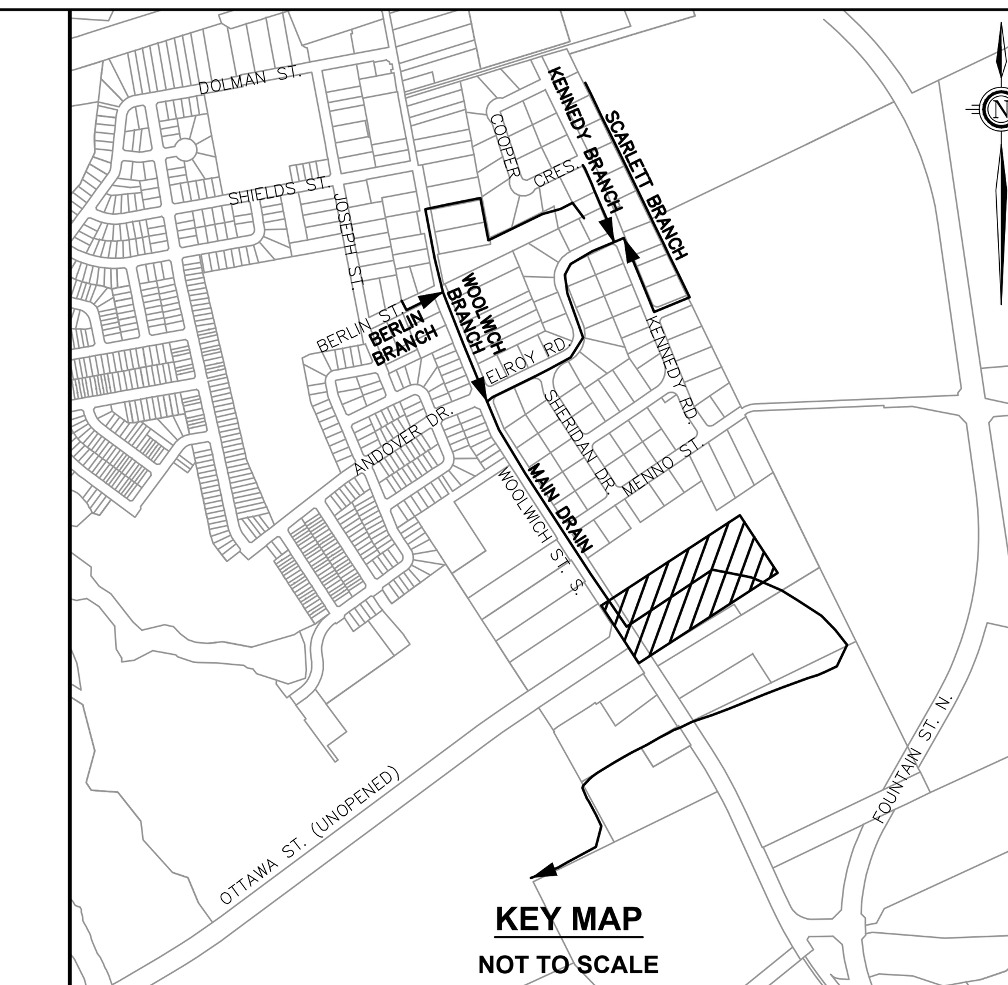
MAIN DRAIN
OPEN DITCH
STATION -0+260 TO 0+020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 6 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 6. Main Drain - Open Portion 22-Sep-23 3:14:00 PM





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- FUTURE SANITARY AND MAINTENANCE HOLE
- FUTURE STORM AND MAINTENANCE HOLE
- FUTURE WATERMAIN

SCALE

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

ALEXANDER PASLEY No 901718 SEPT 22, 2023

BRESLAU DRAIN 1

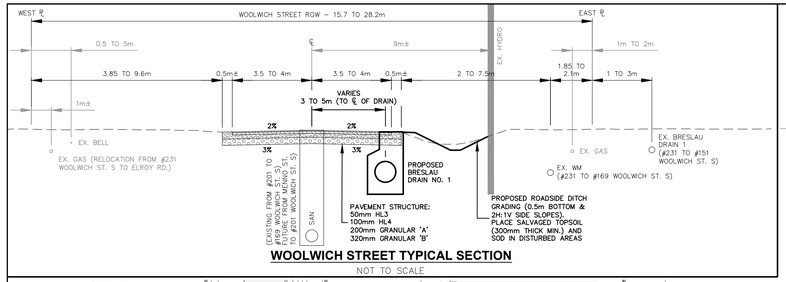
REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN

FUTURE OTTAWA STREET
STATION −0+025 TO 0+244

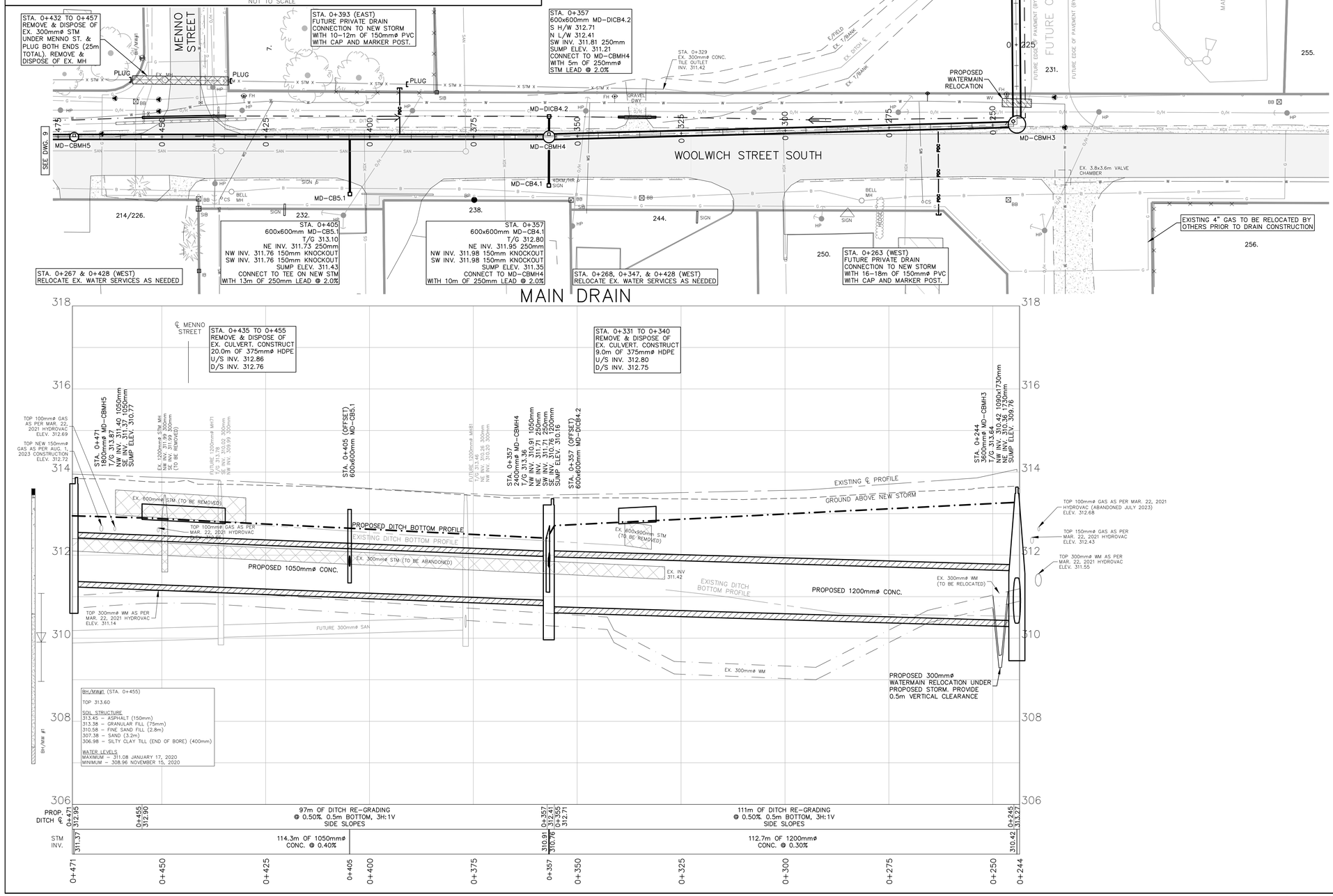
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

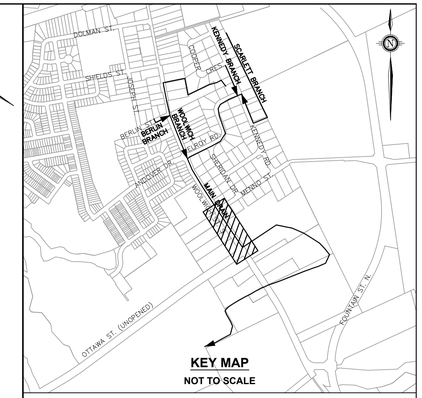
SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING



WOOLWICH STREET TYPICAL SECTION

NOT TO SCALE





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SCALE

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

SEPT. 22, 2023 ALEXANDER PANTEV № 90171R

BRESLAU DRAIN 1

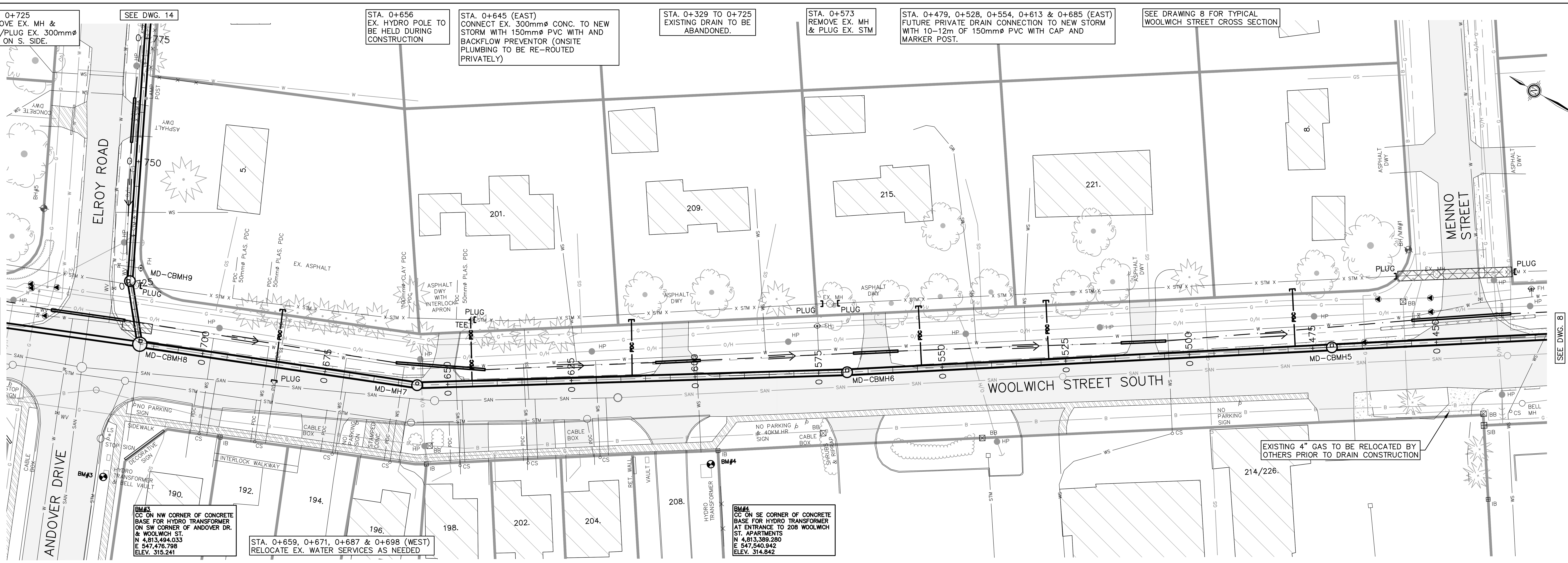
REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN
WOOLWICH STREET SOUTH
STATION 0+244 TO 0+471

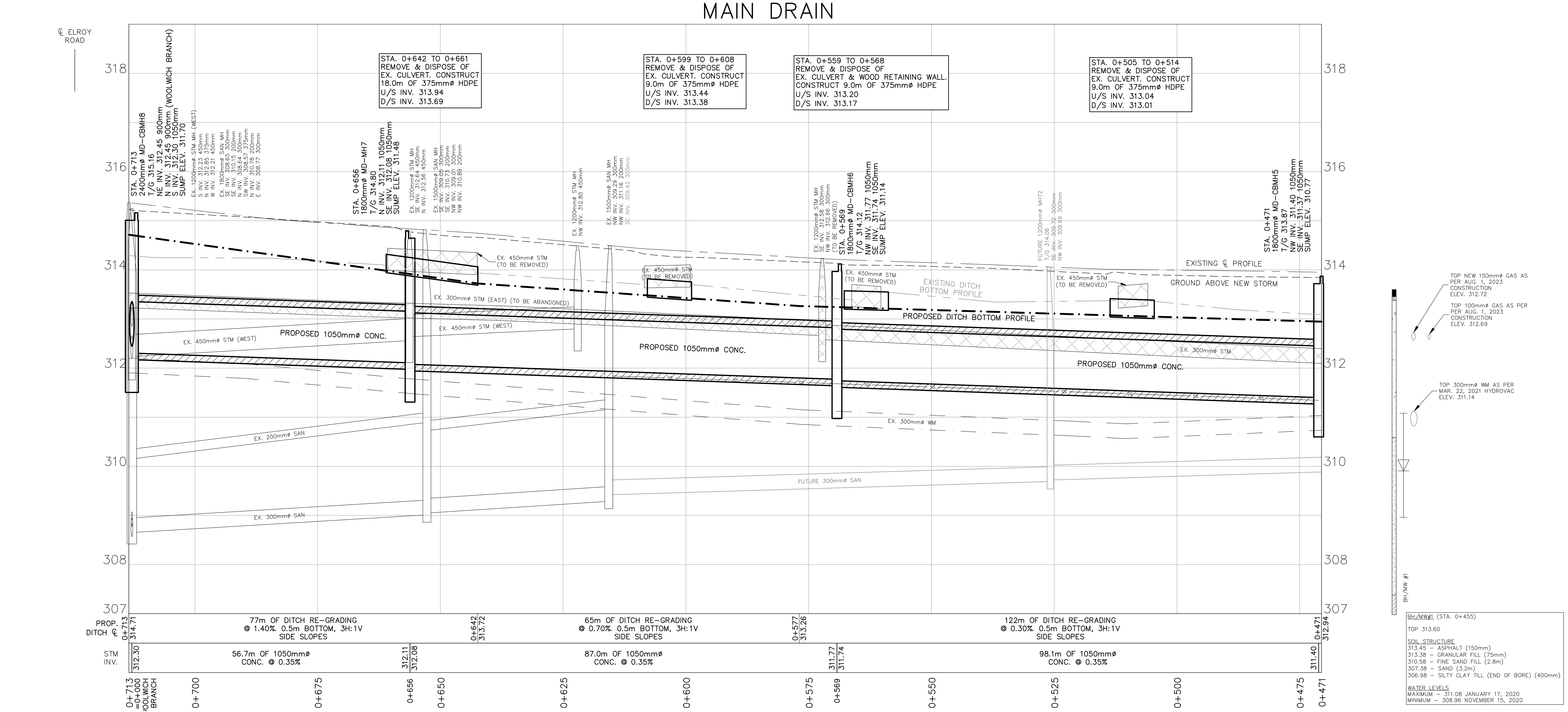
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18–285
DRAWING 8 OF 28

S:\2018\18–285\Drafting\Final Report\PROFILE 18–285.dwg 8. Main Drain – Woolwich 22–Sep–23 3:16:41 PM



MAIN DRAIN

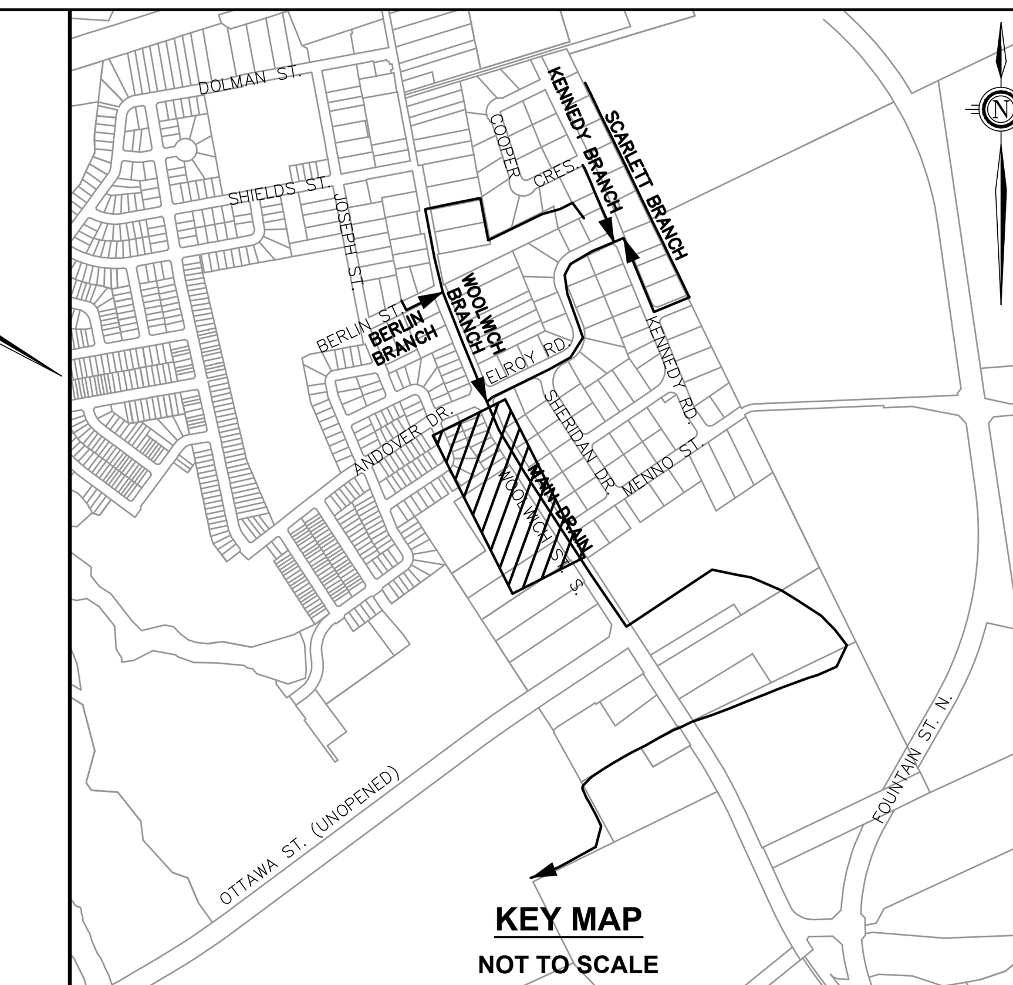


BH/MW#1 (STA. 0+455)

TOP 313.60

SOIL STRUCTURE
313.45 – ASPHALT (150mm)
313.38 – GRANULAR FILL (75mm)
310.58 – FINE SAND FILL (2.8m)
307.38 – SAND (3.2m)
306.98 – SILTY CLAY TILL (END OF BORE) (400mm)

WATER LEVELS
MAXIMUM – 311.08 JANUARY 17, 2020
MINIMUM – 308.96 NOVEMBER 15, 2020



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- FUTURE STORM AND MAINTENANCE HOLE
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SCALE
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No.	DESCRIPTION	DATE
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2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

LICENSED PROFESSIONAL ENGINEER — J. E. MILLER 100206193 — SEPT. 22, 2023 — PROVINCE OF ONTARIO

CERTIFIED ENGINEERING TECHNOLOGIST — OACETT ONTARIO — SEPT. 22, 2023 — ALEXANDER PASLEY — No 901718

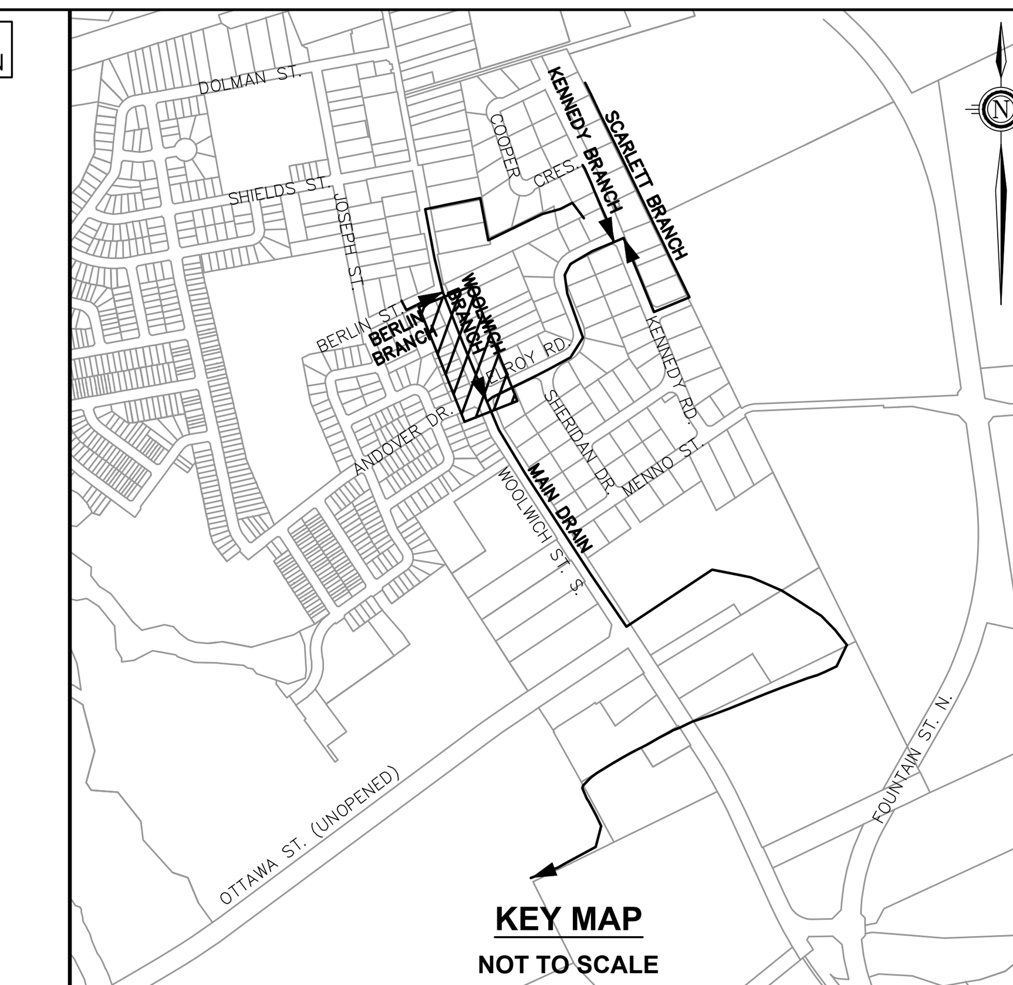
BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN
WOOLWICH STREET SOUTH
STATION 0+471 TO 0+713

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 9 OF 28



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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

LICENSED PROFESSIONAL ENGINEER J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

CERTIFIED ENGINEERING TECHNOLOGIST OACETT ONTARIO SEPT. 22, 2023 ALEXANDER PASLEY No 901718

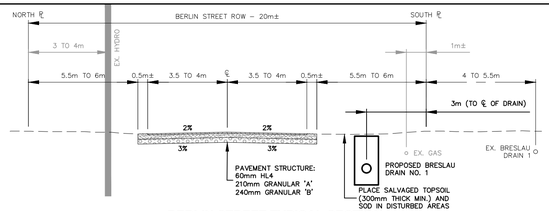
BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

WOOLWICH BRANCH
WOOLWICH STREET SOUTH
STA. 0+000 TO 0+209

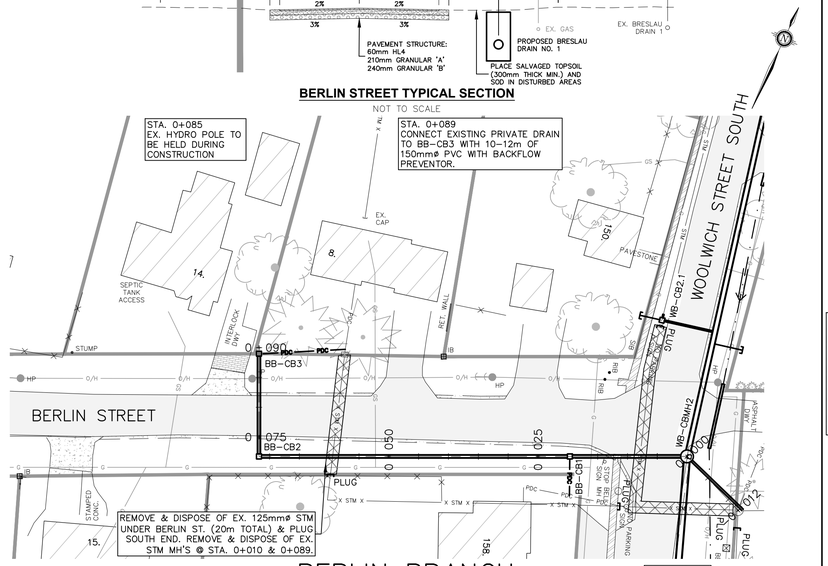
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

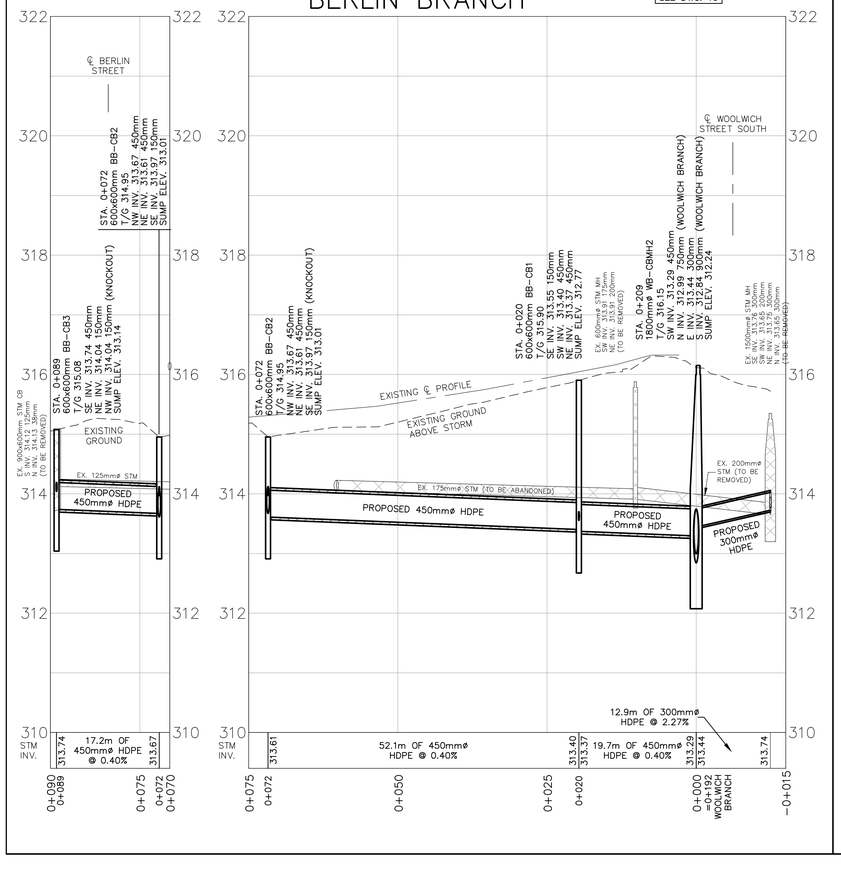
SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 10 OF 28

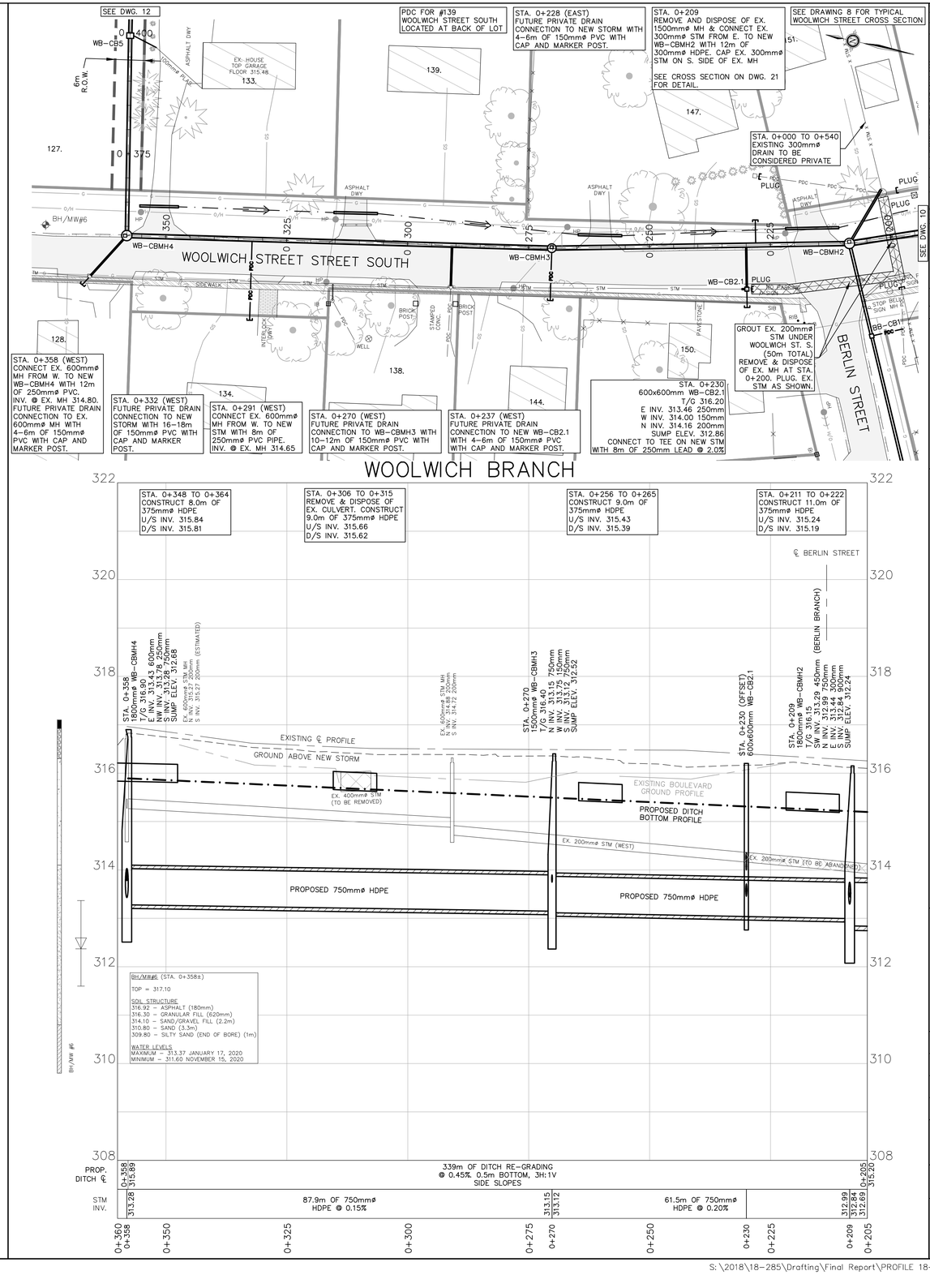


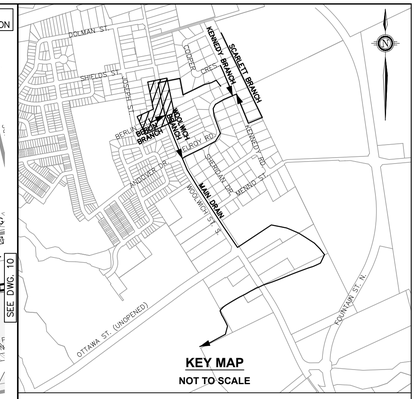
BERLIN STREET TYPICAL SECTION

NOT TO SCALE









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SCALE

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

ALEXANDER PAISLEY Nº 901718 SEPT. 22, 2023

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

WOOLWICH BR. & BERLIN BRANCH

WOOLWICH STREET SOUTH & BERLIN STREET

STATION 0+205 TO 0+360 (WB) & –0+015 TO 0+090 (BB)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18–285
DRAWING 11 OF 28

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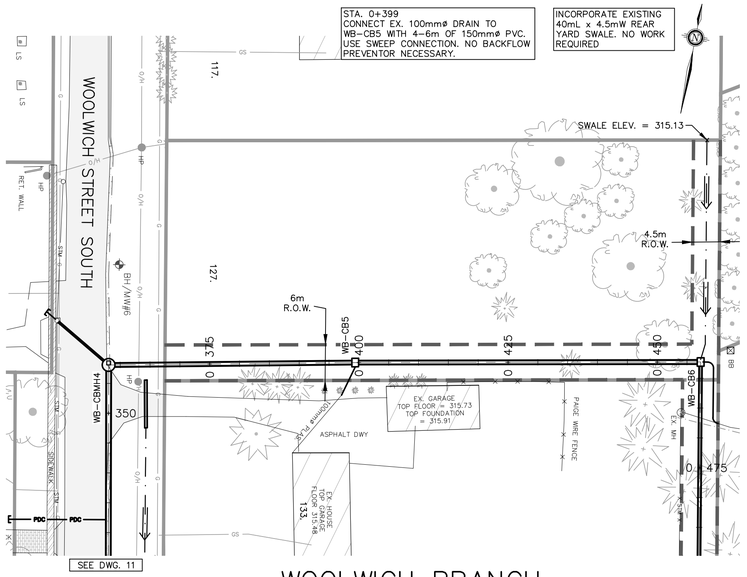

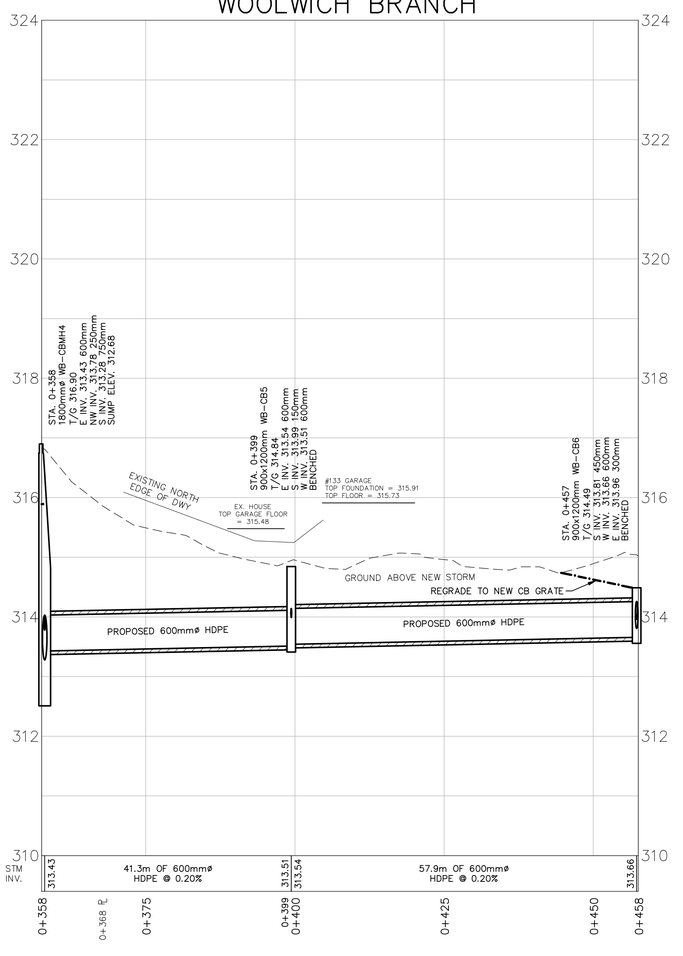

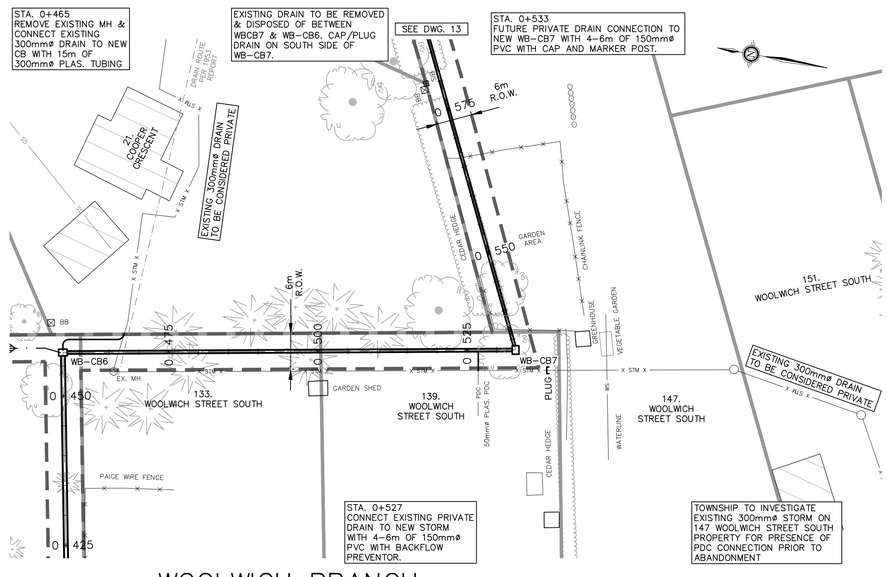

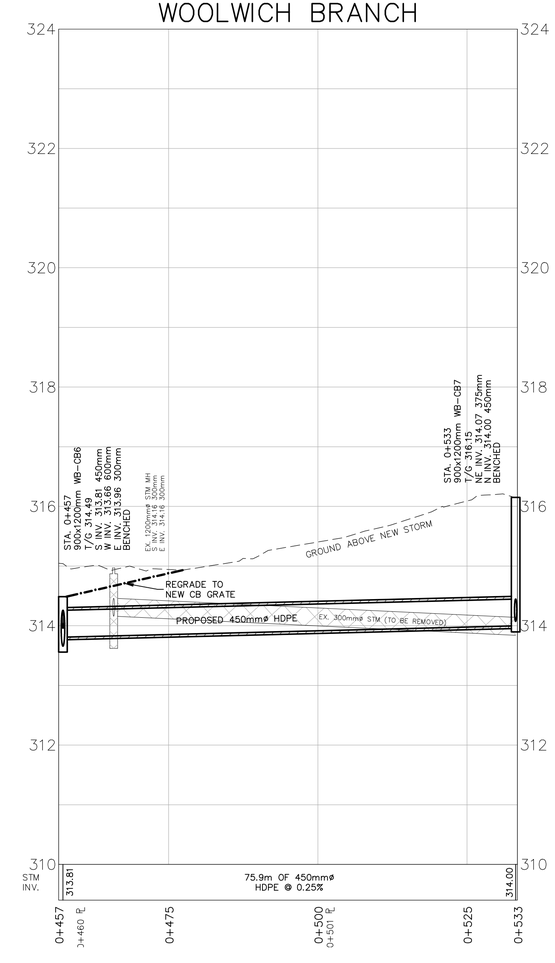

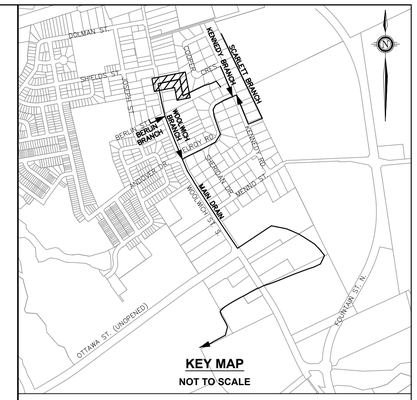

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SCALE

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

SEPT 22, 2023 ALEXANDER HANLEY 901718 LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

WOOLWICH BRANCH
PRIVATE PROPERTY
STATION 0+358 TO 0+533

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 12 OF 28

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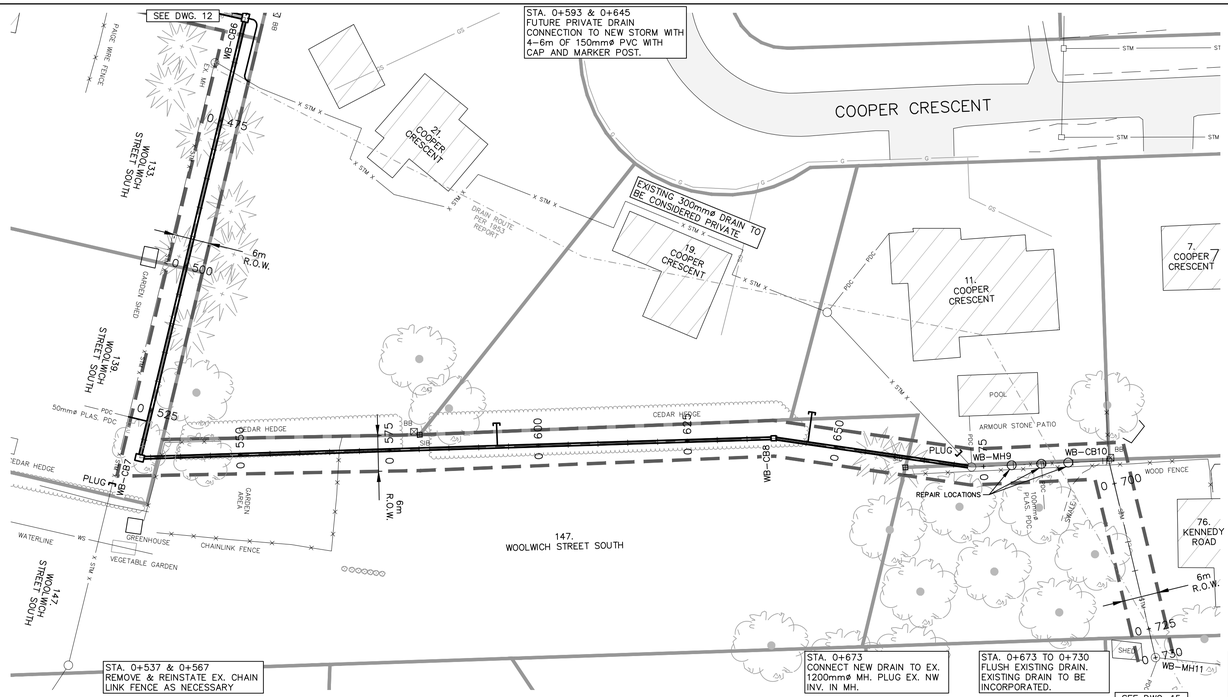
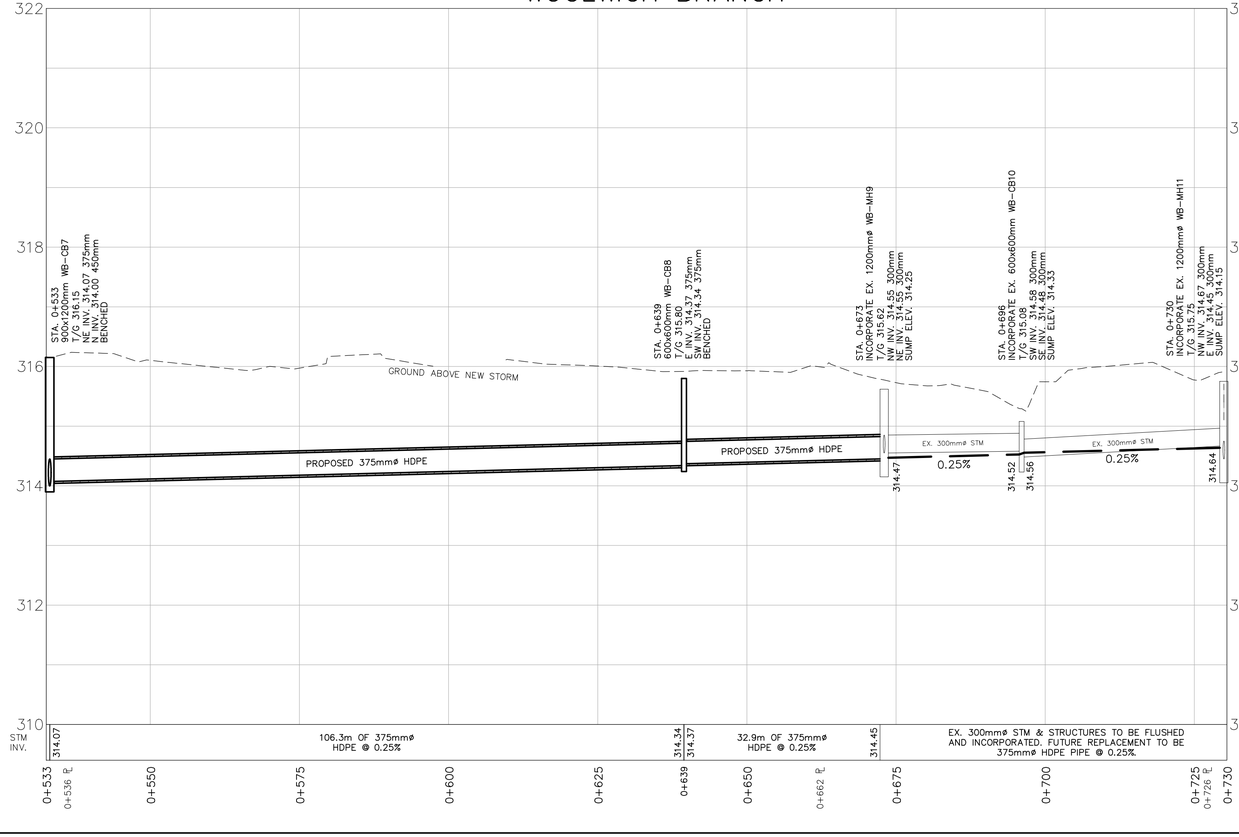
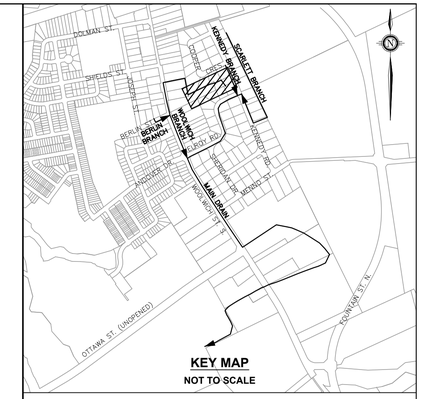


WOOLWICH BRANCH





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CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
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J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

SEPT. 22, 2023 ALEXANDER PAISLEY No. 901718

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

WOOLWICH BRANCH
PRIVATE PROPERTY
STATION 0+533 TO 0+730

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023
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DRAWING 13 OF 28

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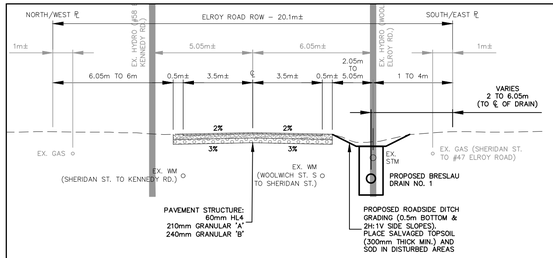
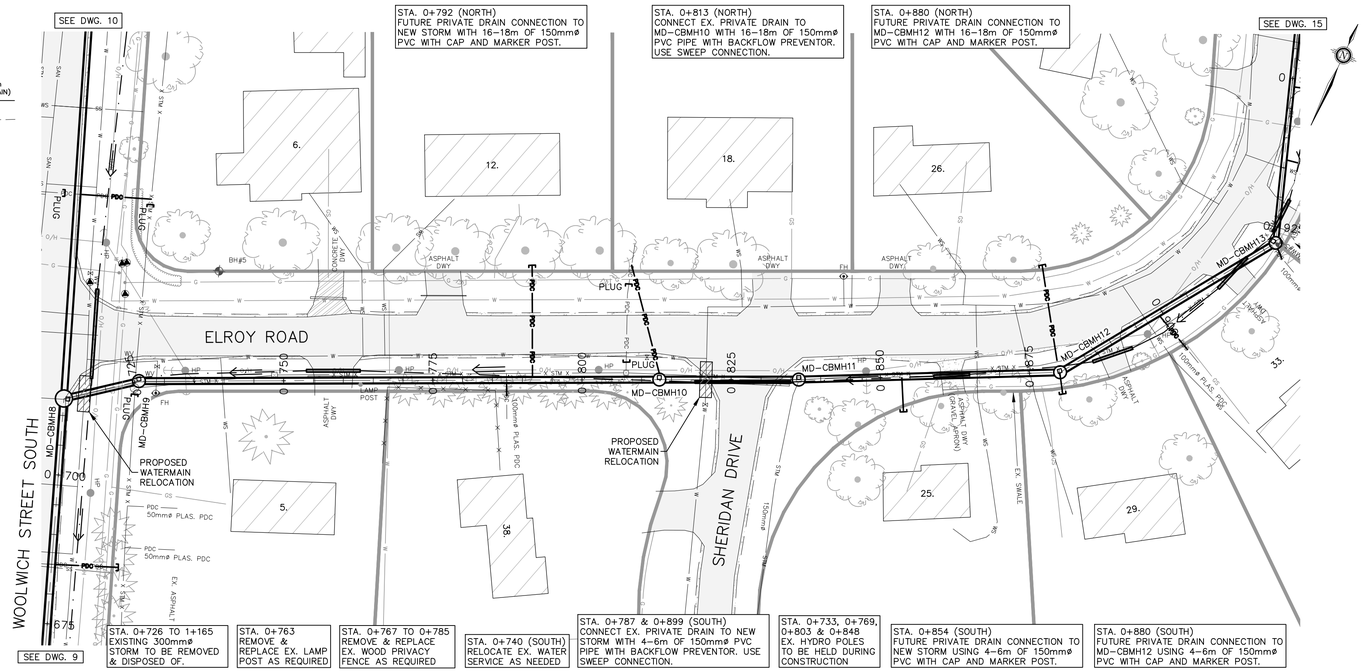
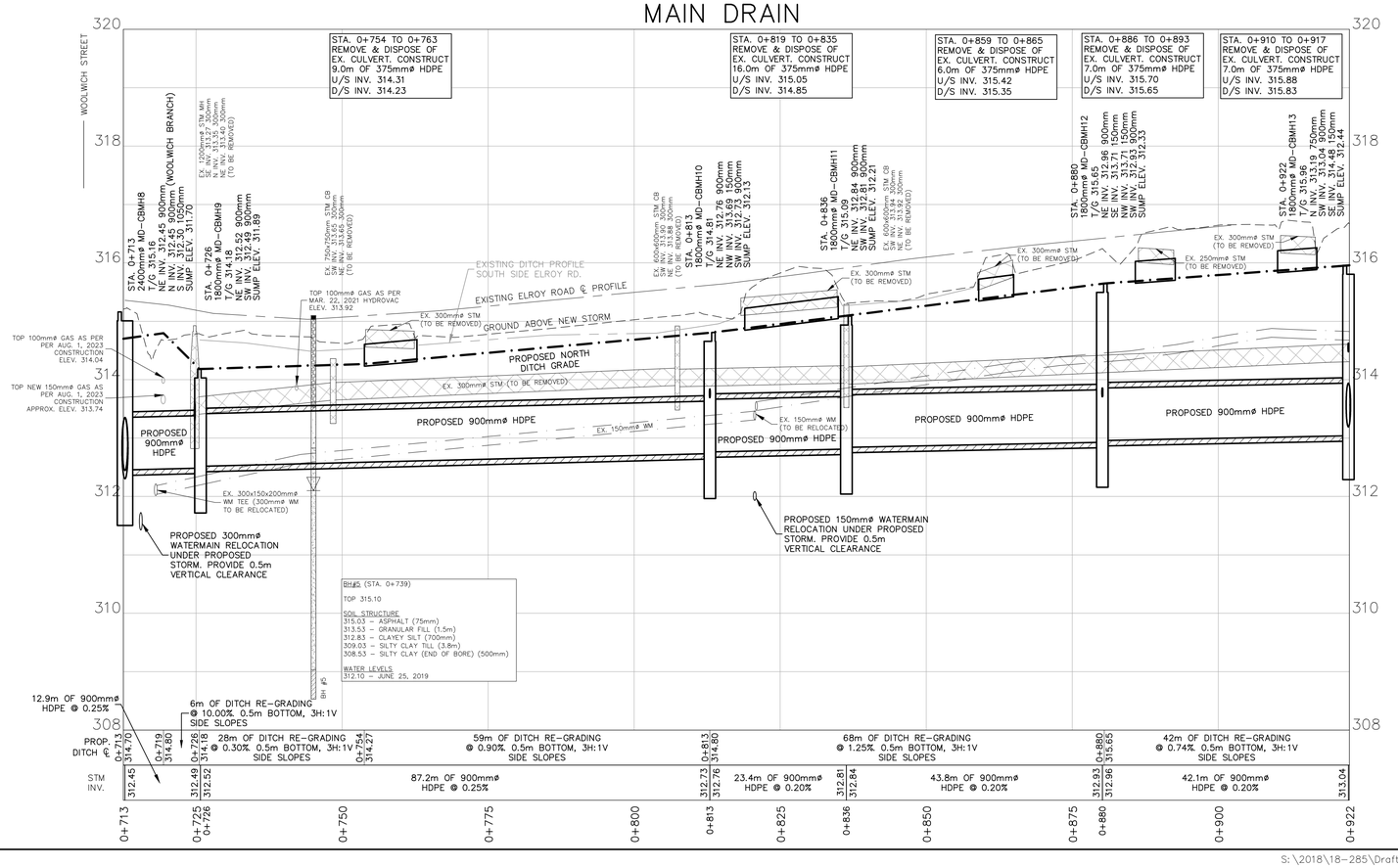


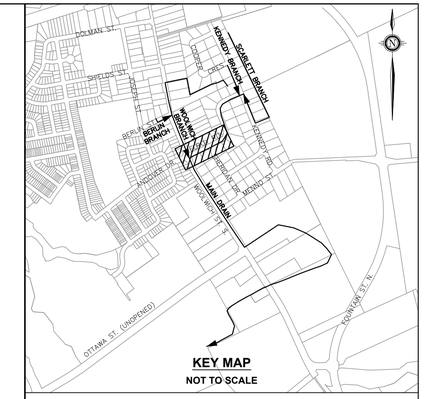
ELROY ROAD TYPICAL SECTION

NOT TO SCALE



MAIN DRAIN





KEY MAP

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- PROPOSED PRIVATE DRAIN CONNECTION
- PROPOSED DITCH/SURFACE SWALE
- FUTURE SANITARY AND MAINTENANCE HOLE
- FUTURE STORM AND MAINTENANCE HOLE
- FUTURE WATERMAIN

SCALE

0 10m (1 : 500 ON 22"x 34") HORZ.

0 1m (1 : 50 ON 22"x 34") VERT.

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 PROVINCE OF ONTARIO SEPT. 22, 2023

ALEXANDER PAISLEY Nº 9017118 SEPT. 22, 2023

BRESLAU DRAIN 1

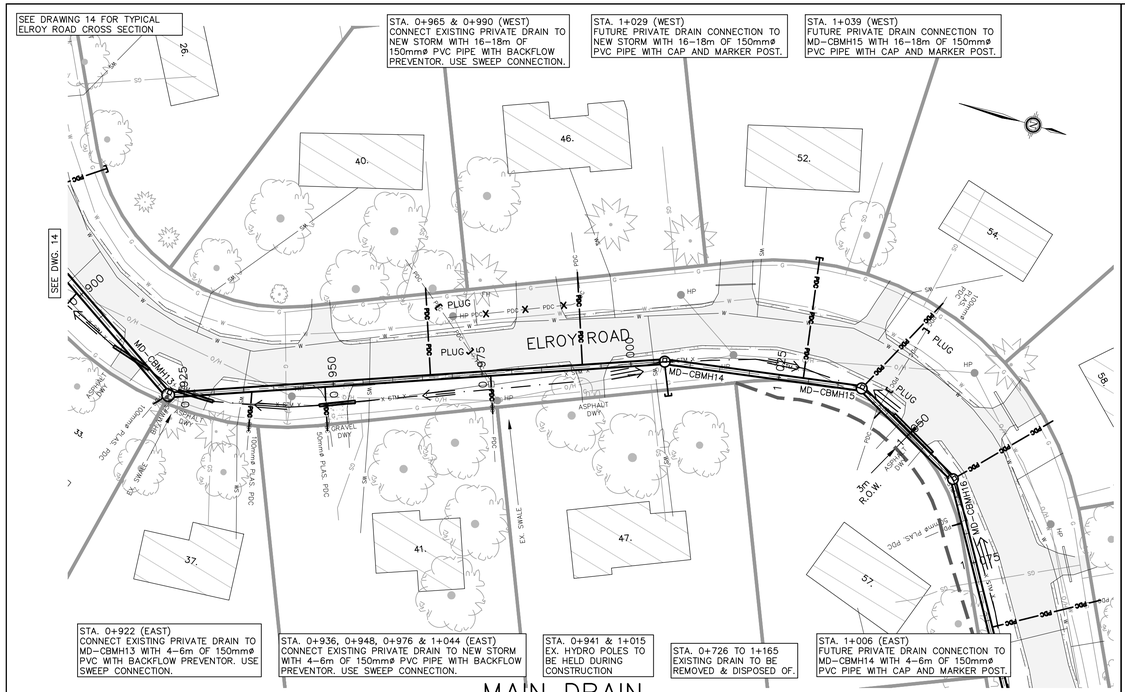
REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

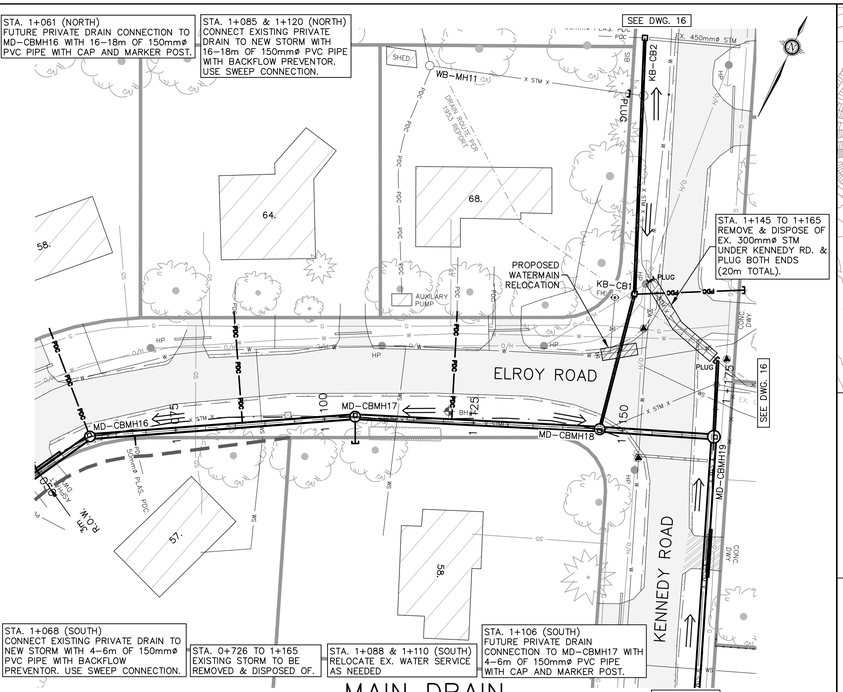
MAIN DRAIN
ELROY ROAD
STATION 0+713 TO 0+922

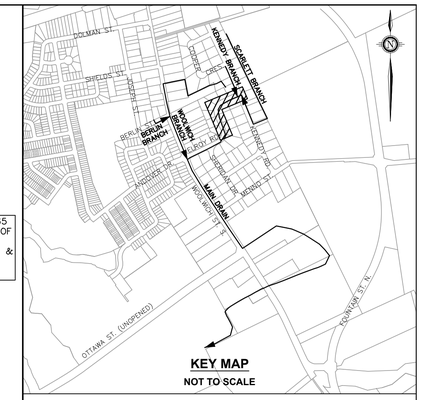
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18–285
DRAWING 14 OF 28

S:\2018\18–285\Drafting\Final Report\PROFILE 18–285.dwg 14. Main Drain – Elroy 22–Sep–23 3:24:00 PM







NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
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4. ANY INCIDENTAL REMOVAL OF TREES/DEBRIS SHALL BE APPROVED BY ENGINEER PRIOR TO COMMENCING WORK

LEGEND:

- STM — EXISTING STORM AND CATCHBASIN
- PDC — PDC — APPROXIMATE LOCATION EXISTING PRIVATE DRAIN CONNECTION
- REMOVE/ABANDON EXISTING STORM (PROFILE)
- REMOVE/ABANDON EXISTING STORM
- W — EXISTING WATERMAIN AND FIRE HYDRANT
- WS — APPROXIMATE LOCATION EXISTING WATER SERVICE
- W — EXISTING ABANDONED WATERMAIN
- SAN — EXISTING SANITARY AND MAINTENANCE HOLE
- SS — APPROXIMATE LOCATION EXISTING SANITARY SERVICE
- G — APPROXIMATE LOCATION EXISTING U/G GAS
- GS — APPROXIMATE LOCATION EXISTING U/G GAS SERVICE
- XGX — APPROXIMATE LOCATION ABANDONED U/G GAS
- B — APPROXIMATE LOCATION EXISTING U/G BELL
- O/H — APPROXIMATE LOCATION EXISTING OVERHEAD POWER LINE
- HYDROVAC TEST HOLE LOCATION DEC. 9, 2020/ MAR. 22, 2021
- CBMH 3 — PROPOSED STORM AND CATCHBASIN MAINTENANCE HOLE
- PLUG — PROPOSED PLUG IN EXISTING STORM
- PDC — PDC — PROPOSED PRIVATE DRAIN CONNECTION
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- SAN — FUTURE SANITARY AND MAINTENANCE HOLE
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- W — FUTURE WATERMAIN

SCALE

0 10m (1 : 500 ON 22" x 34") HORZ.

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO LICENSED PROFESSIONAL ENGINEER

SEPT. 22, 2023 ALEXANDER PASLEY № 901718 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN

ELROY ROAD

STATION 0+922 TO 1+165

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

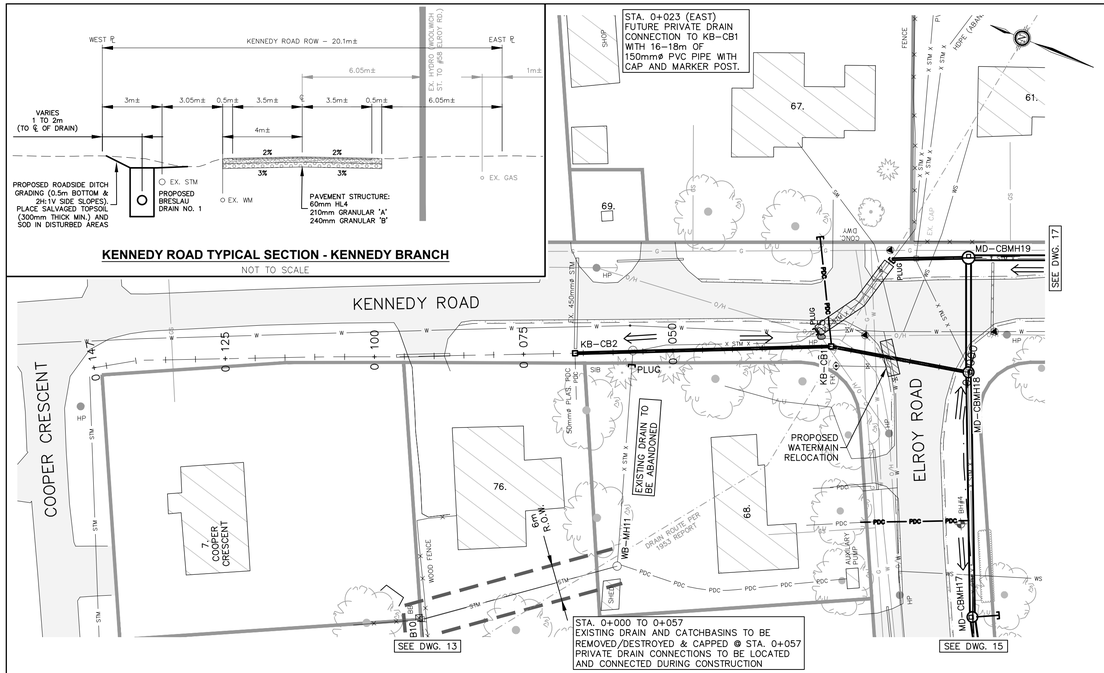
SEPTEMBER 22, 2023

JOB NUMBER: 18-285

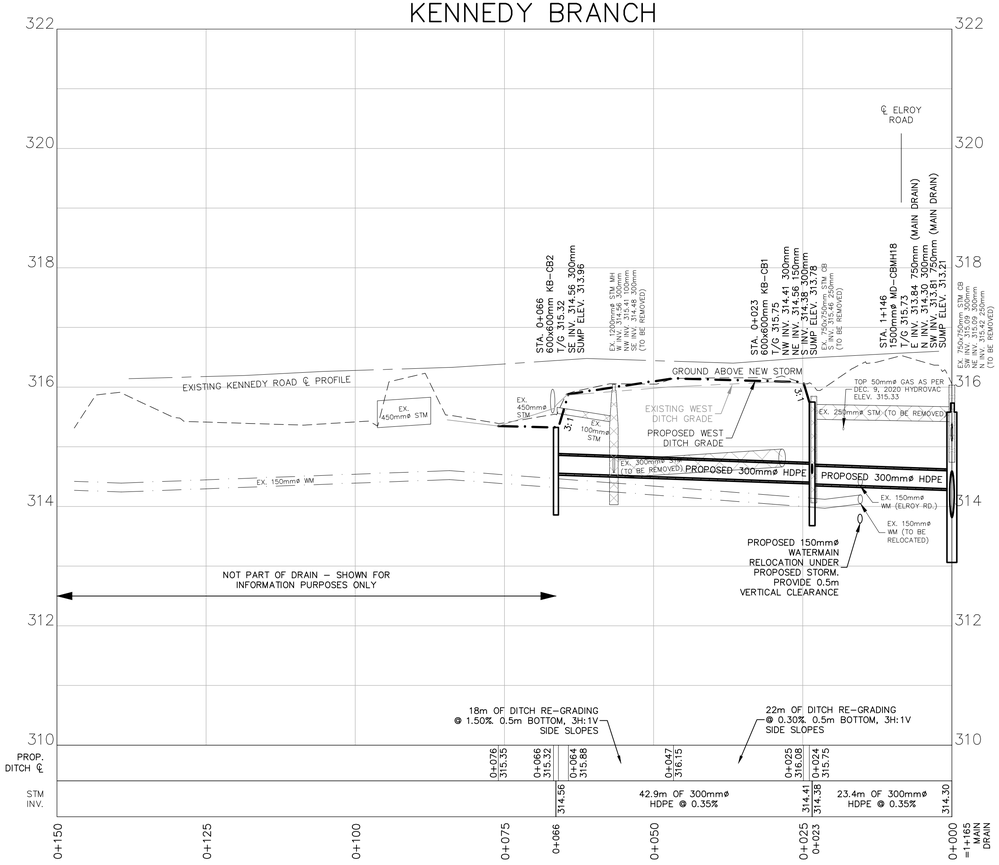
DRAWING 15 OF 28

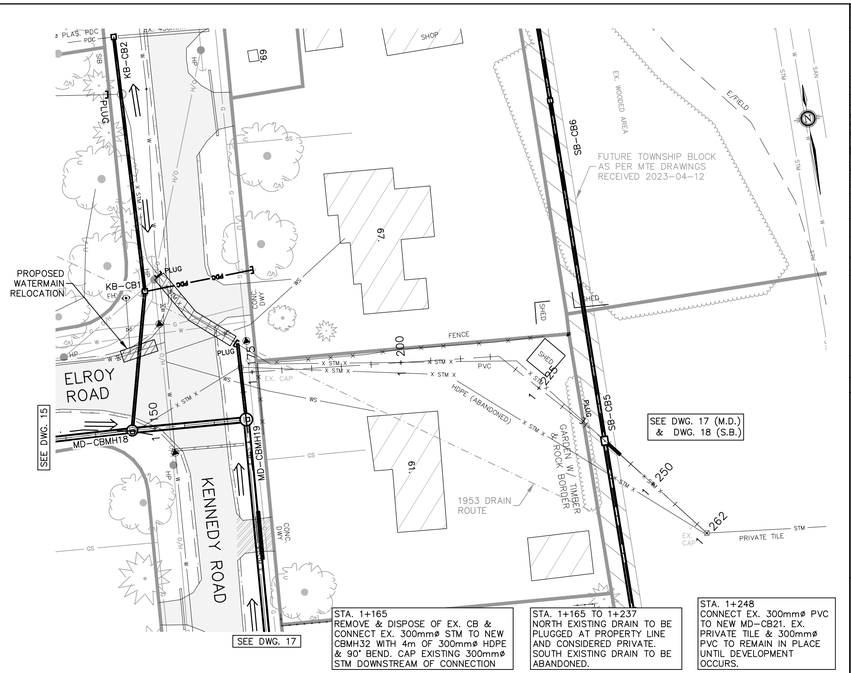
KENNEDY ROAD TYPICAL SECTION - KENNEDY BRANCH

NOT TO SCALE

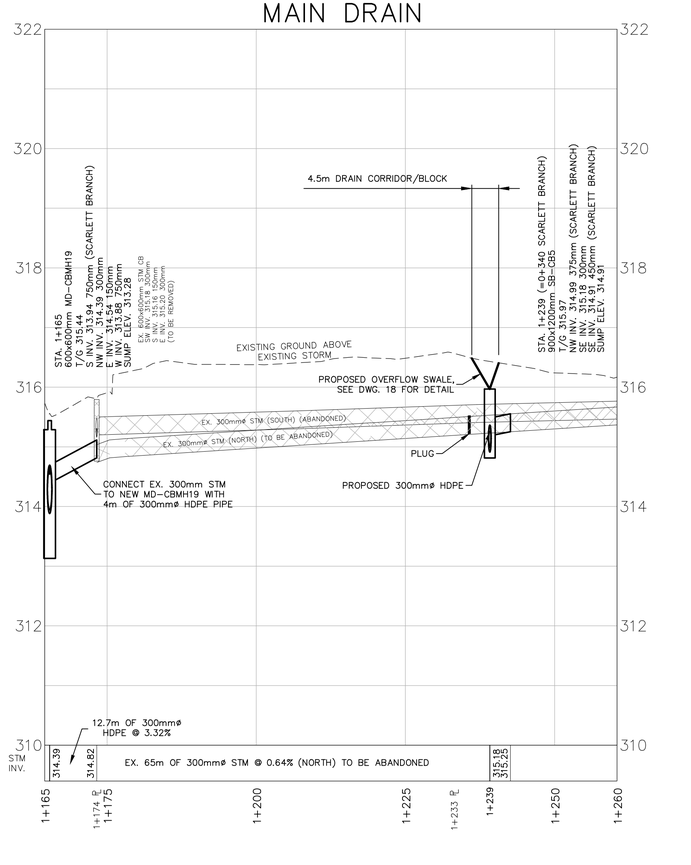


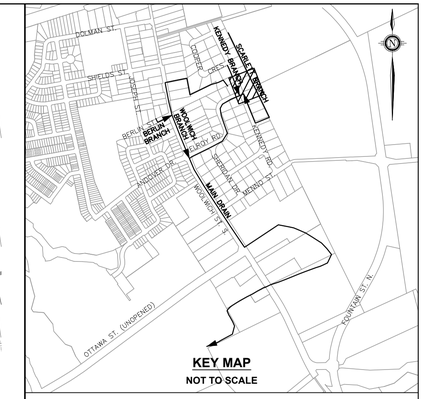
KENNEDY BRANCH





MAIN DRAIN





KEY MAP

NOT TO SCALE

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE–LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
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- WS — APPROXIMATE LOCATION EXISTING WATER SERVICE
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- SS — APPROXIMATE LOCATION EXISTING SANITARY SERVICE
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- SAN — FUTURE SANITARY AND MAINTENANCE HOLE
- STM — FUTURE STORM AND MAINTENANCE HOLE
- W — FUTURE WATERMAIN

SCALE

(1 : 500 ON 22"x 34") HORZ. 0 10m

(1 : 50 ON 22"x 34") VERT. 0 1m

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

LICENSED PROFESSIONAL ENGINEER — J. E. MILLER — 100206193 — SEPT. 22, 2023 — PROVINCE OF ONTARIO

CERTIFICATE OF AUTHORIZATION — SEPT. 22, 2023 — ALEXANDER PAISLEY — No. 901718

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

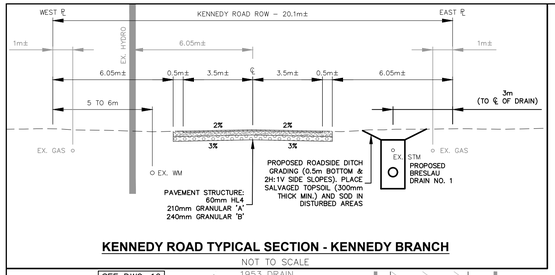
MAIN DRAIN & KENNEDY BRANCH

ELROY ROAD & KENNEDY ROAD

STATION 1+190 TO 1+260 (MD) & 0+000 TO 0+150 (KB)

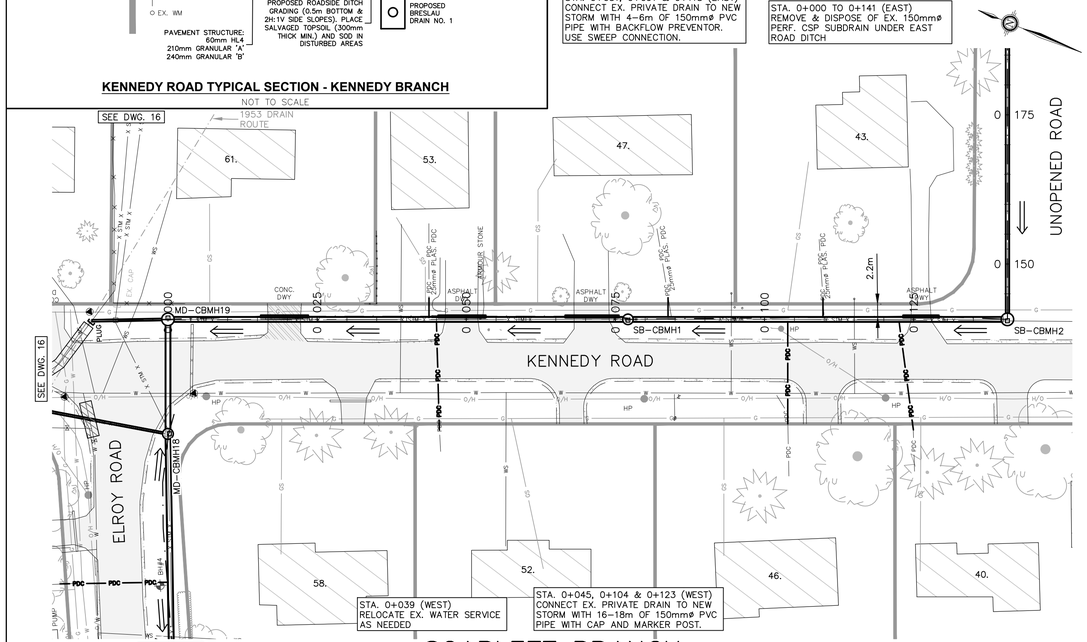
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

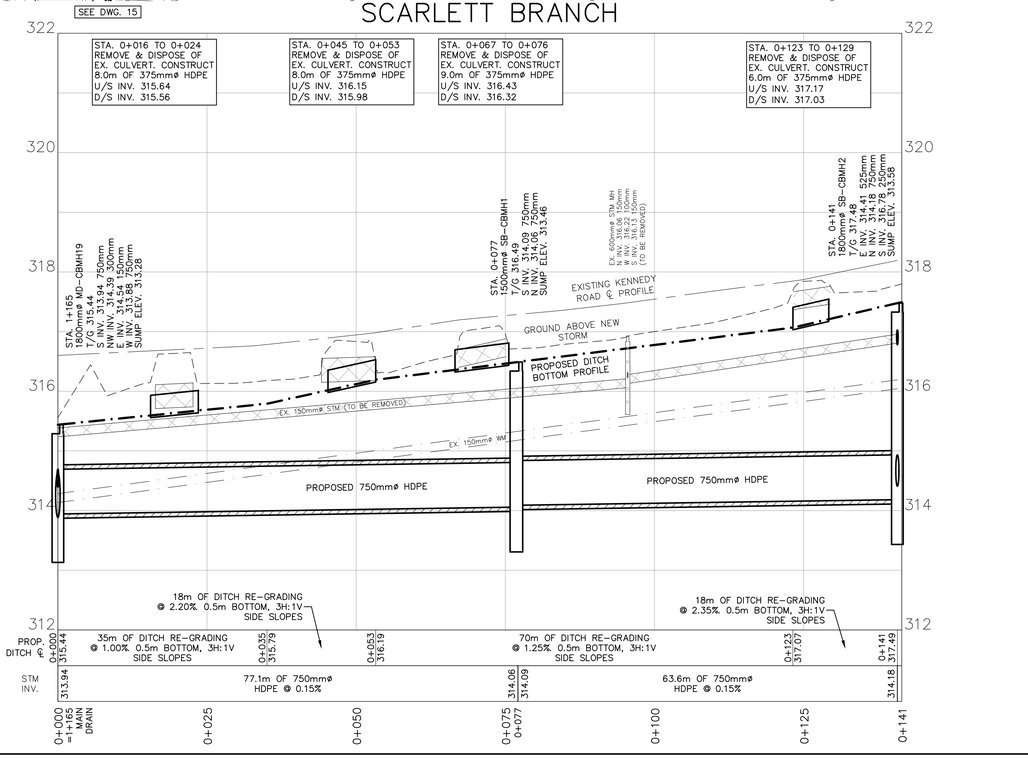
SEPTEMBER 22, 2023
JOB NUMBER: 18–285
DRAWING 16 OF 28

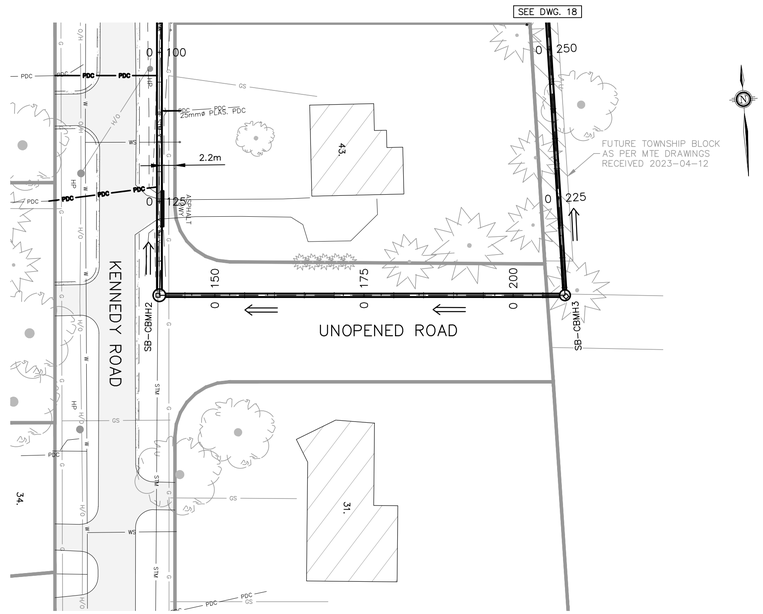


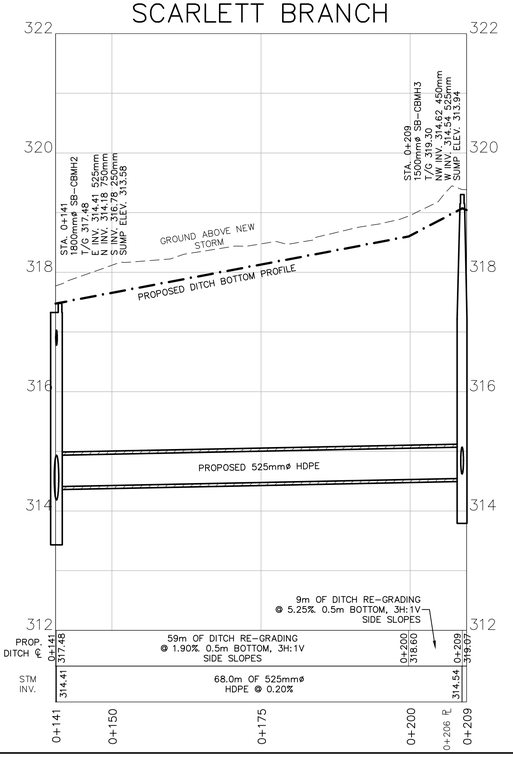
KENNEDY ROAD TYPICAL SECTION - KENNEDY BRANCH

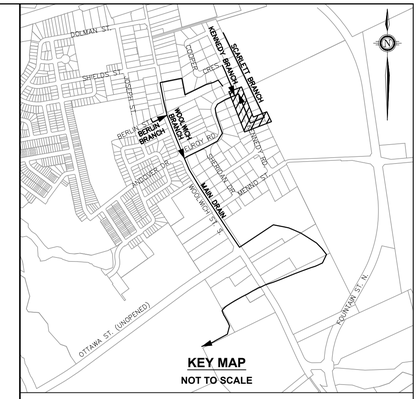
NOT TO SCALE











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LEGEND:

STM	EXISTING STORM AND CATCHBASIN
PDC — PDC	APPROXIMATE LOCATION EXISTING PRIVATE DRAIN CONNECTION
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	REMOVE/ABANDON EXISTING STORM
W / WS	EXISTING WATERMAIN AND FIRE HYDRANT
WS	APPROXIMATE LOCATION EXISTING WATER SERVICE
W	EXISTING ABANDONED WATERMAIN
SAN	EXISTING SANITARY AND MAINTENANCE HOLE
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SCALE

0 10m
(1 : 500 ON 22" x 34") HORZ.

0 1m
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No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
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4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO SEPT. 22, 2023

A. M. PASLEY 901718 ALEXANDER PASLEY SEPT. 22, 2023

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

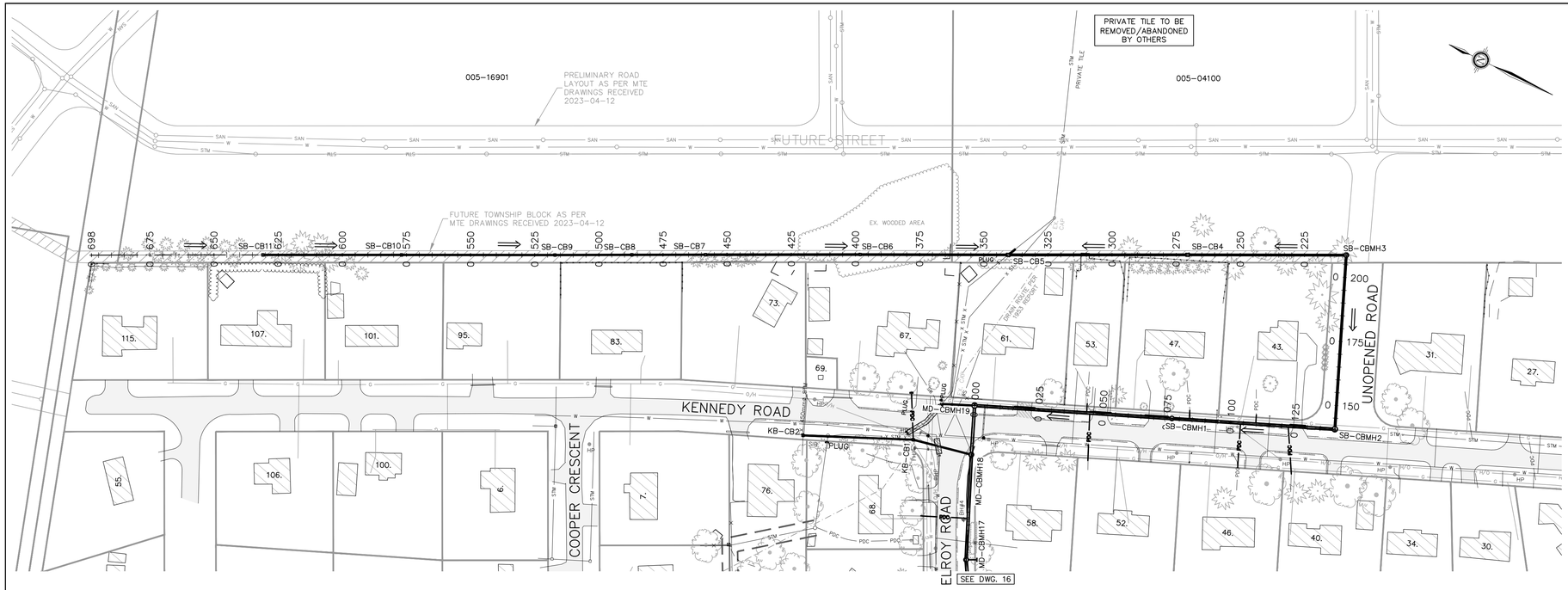
SCARLETT BRANCH

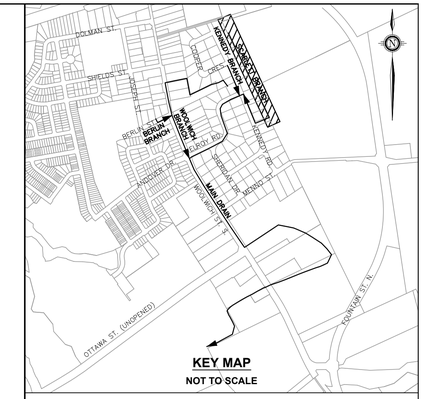
KENNEDY ROAD & UNOPENED ROAD
STATION 0+000 TO 0+209

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18–285
DRAWING 17 OF 28

S:\2018\18–285\Drafting\Final Report\PROFILE 18–285.dwg 17. Scarlett Branch – Kennedy 22–Sep–23 3:29:48 PM





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- APPROXIMATE LOCATION EXISTING PRIVATE DRAIN CONNECTION
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- REMOVE/ABANDON EXISTING STORM
- EXISTING WATERMAIN AND FIRE HYDRANT
- APPROXIMATE LOCATION EXISTING WATER SERVICE
- EXISTING ABANDONED WATERMAIN
- EXISTING SANITARY AND MAINTENANCE HOLE
- APPROXIMATE LOCATION EXISTING SANITARY SERVICE
- APPROXIMATE LOCATION EXISTING U/G GAS
- APPROXIMATE LOCATION EXISTING U/G GAS SERVICE
- APPROXIMATE LOCATION ABANDONED U/G GAS
- APPROXIMATE LOCATION EXISTING U/G BELL
- APPROXIMATE LOCATION EXISTING OVERHEAD POWER LINE
- HYDROVAC TEST HOLE LOCATION DEC. 9, 2020/ MAR. 22, 2021
- PROPOSED STORM AND CATCHBASIN MAINTENANCE HOLE (CBMH 3)
- PROPOSED PLUG IN EXISTING STORM (PLUG)
- PROPOSED PRIVATE DRAIN CONNECTION
- PROPOSED DITCH/SURFACE SWALE
- FUTURE SANITARY AND MAINTENANCE HOLE
- FUTURE STORM AND MAINTENANCE HOLE
- FUTURE WATERMAIN

SCALE

0 20m (1 : 1,000 ON 22"x 34") HORZ.

0 2m (1 : 100 ON 22"x 34") VERT.

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.

J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

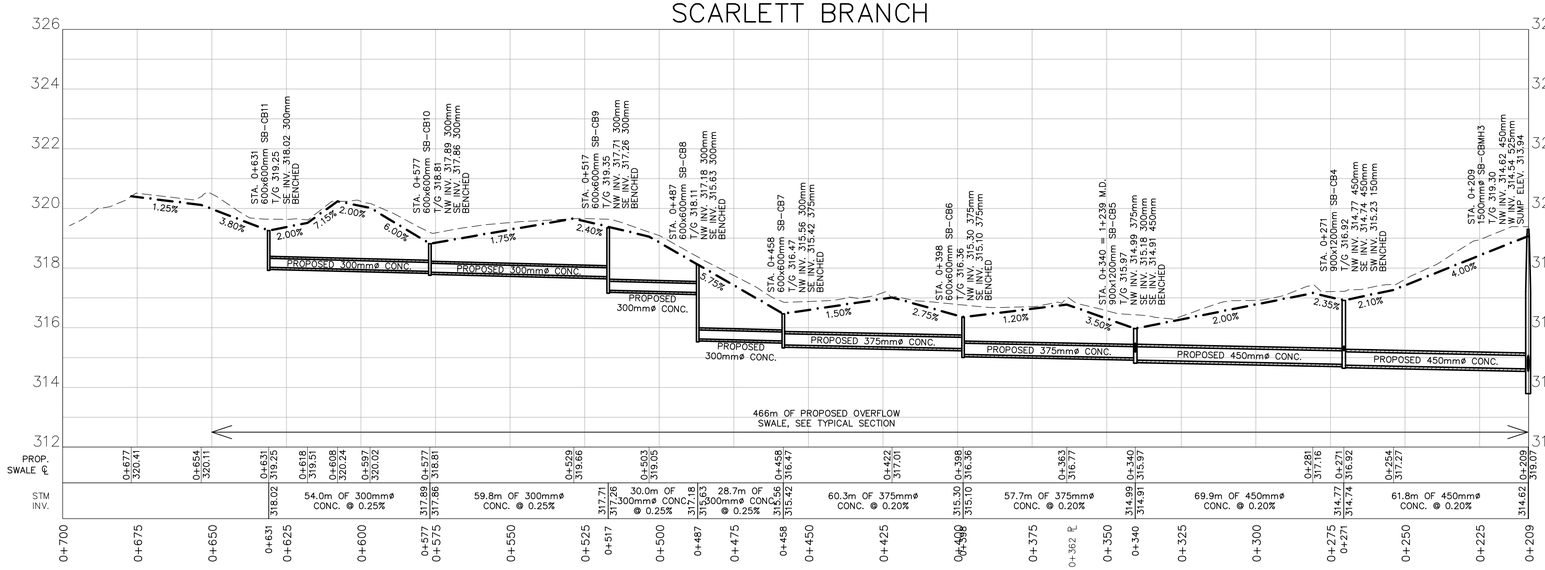
ALEXANDER M. PANTEV Nº 90171R SEPT. 22, 2023

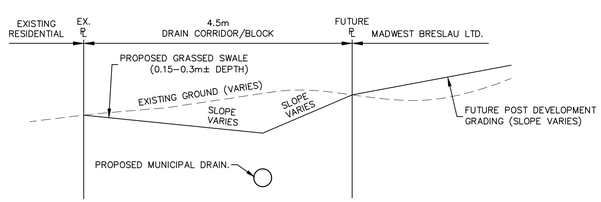
BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

SCARLETT BRANCH

DRAIN CORRIDOR/TOWNSHIP BLOCK
STATION 0+209 TO 0+700





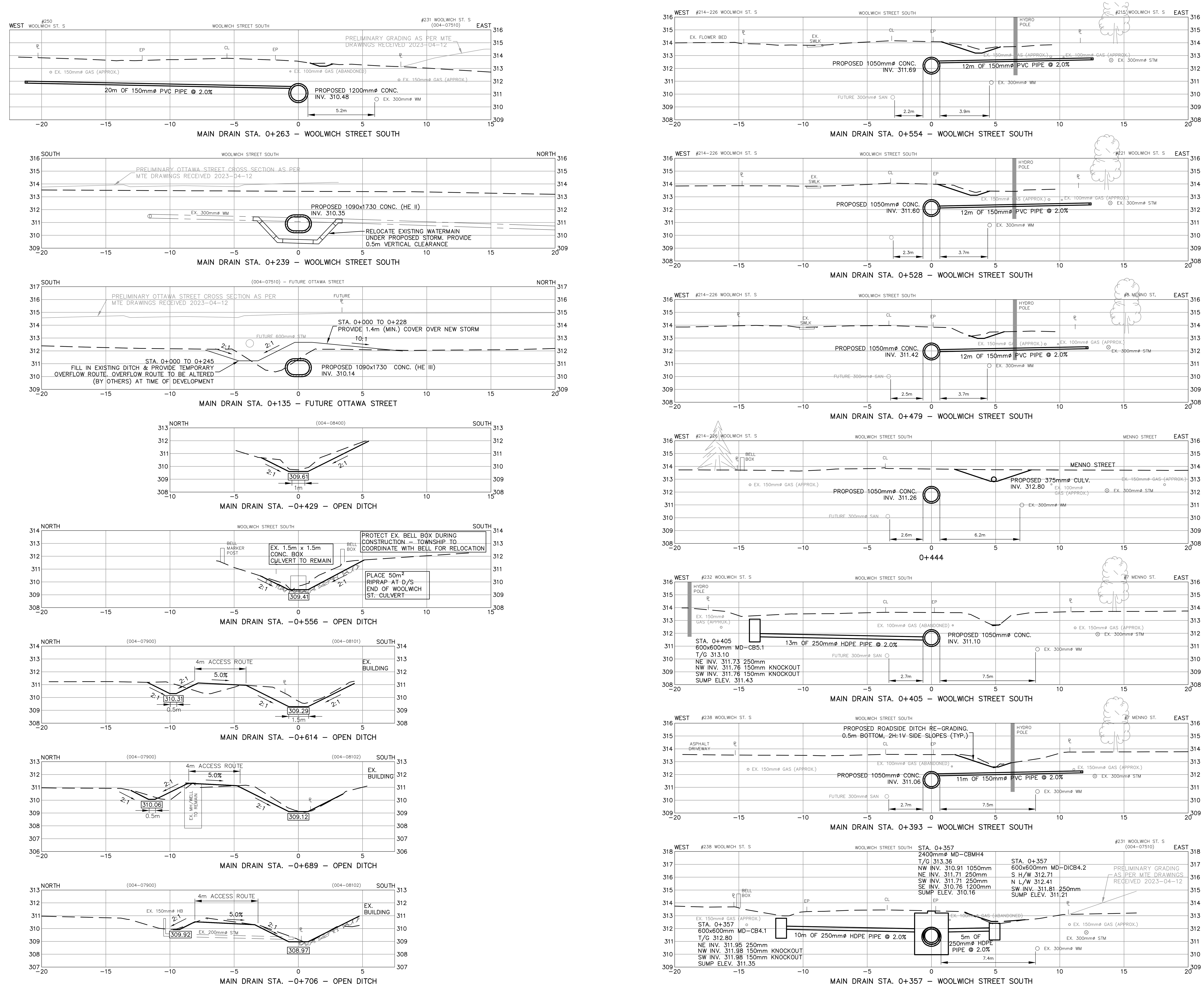
PROPOSED OVERFLOW SWALE TYPICAL SECTION

SCALE - 1:50

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 18 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 18. Scarlett Branch - Township Block 22-Sep-23 3:31:17 PM



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4. PRIVATE DRAIN CONNECTIONS:
   A. ALL LATERAL CONNECTIONS TO BE INSTALLED PERPENDICULAR TO MAIN DRAIN WITH WATERTIGHT FACTORY MADE FITTINGS
   B. MINIMUM SLOPE = 2.0%
   C. MAXIMUM SLOPE = 8.0%
   D. MINIMUM COVER AT ℙ = 1.2m
   E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

SCALE

0 3m

(1 : 150 ON 22"x 34")

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DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

LICENSED PROFESSIONAL ENGINEER – J. E. MILLER – 100206193 – SEPT. 22, 2023 – PROVINCE OF ONTARIO

CERTIFIED ENGINEERING TECHNOLOGIST – ONTARIO – SEPT. 22, 2023 – ALEXANDER PASLEY – № 901718

BRESLAU DRAIN 1

REGION OF WATERLOO   TOWNSHIP OF WOOLWICH

MAIN DRAIN

OPEN DITCH & WOOLWICH STREET SOUTH

STATION –0+706 TO 0+554

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER   SUDBURY

SEPTEMBER 22, 2023

JOB NUMBER: **18–285**

DRAWING 19 OF 28

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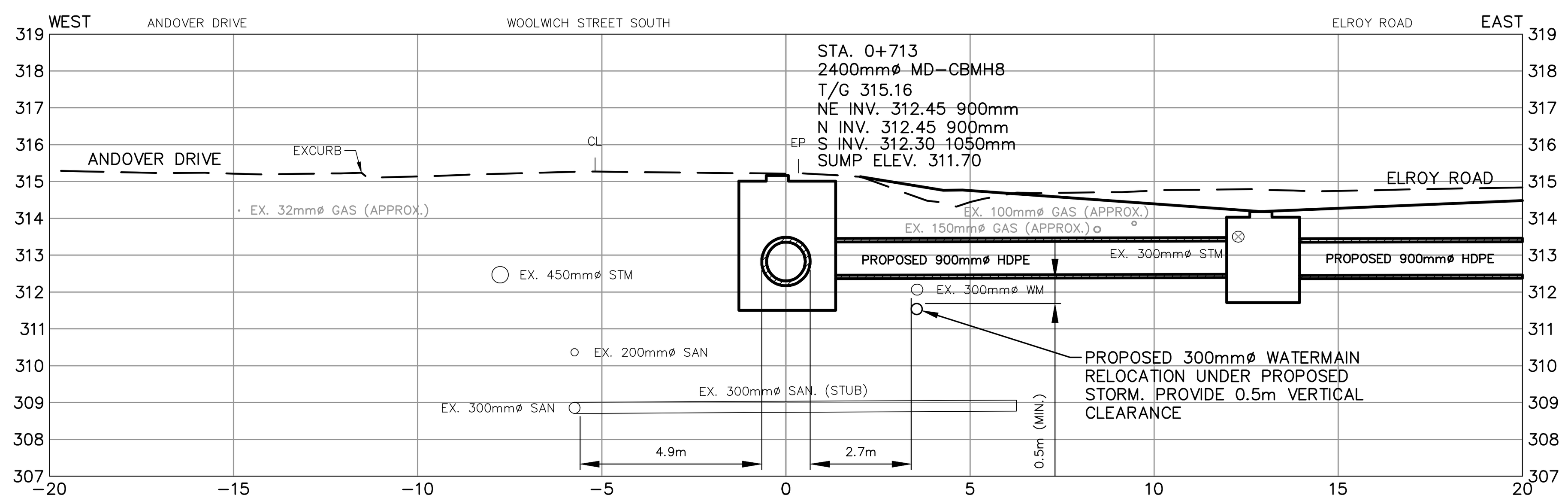
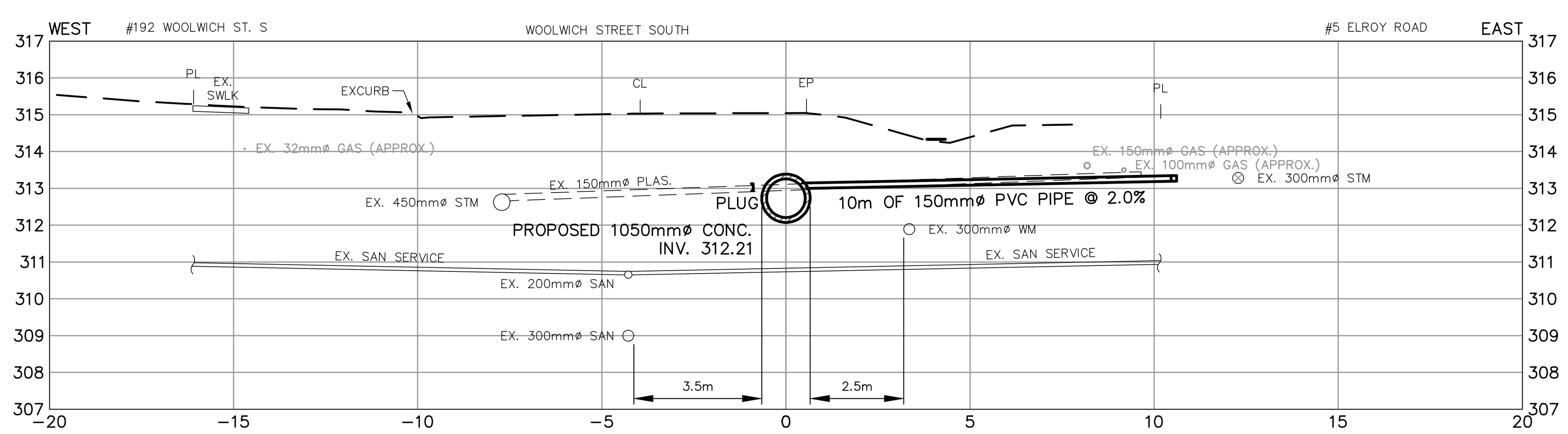


MAIN DRAIN STA. 0+713 – WOOLWICH STREET SOUTH



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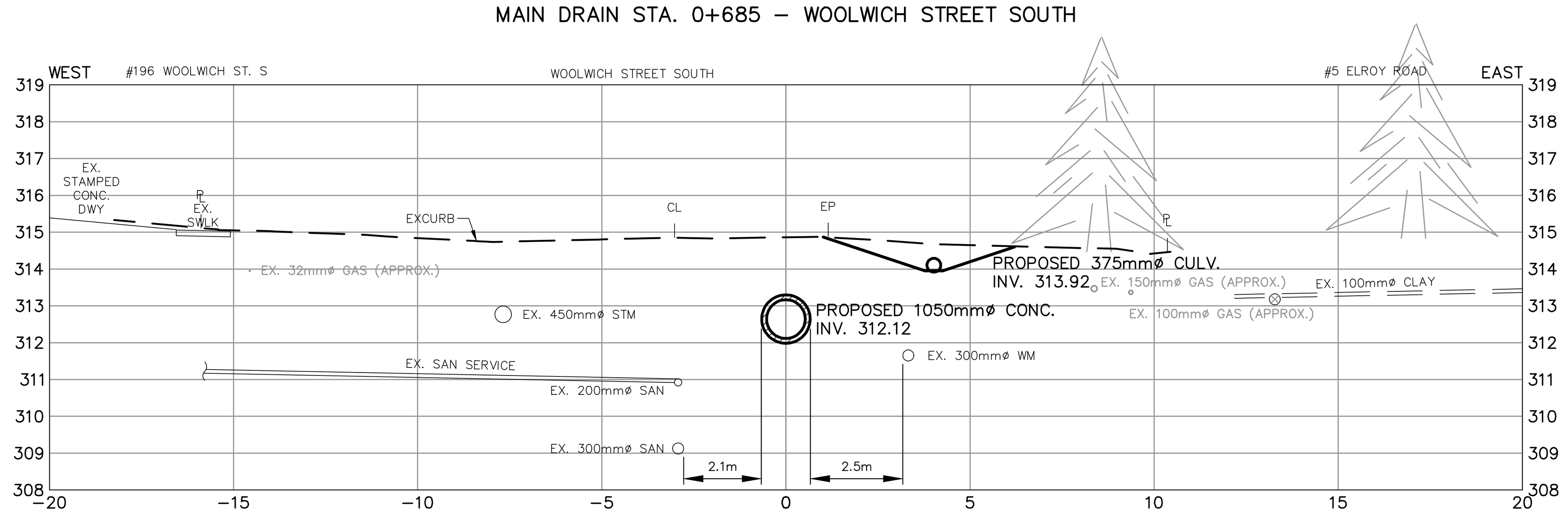

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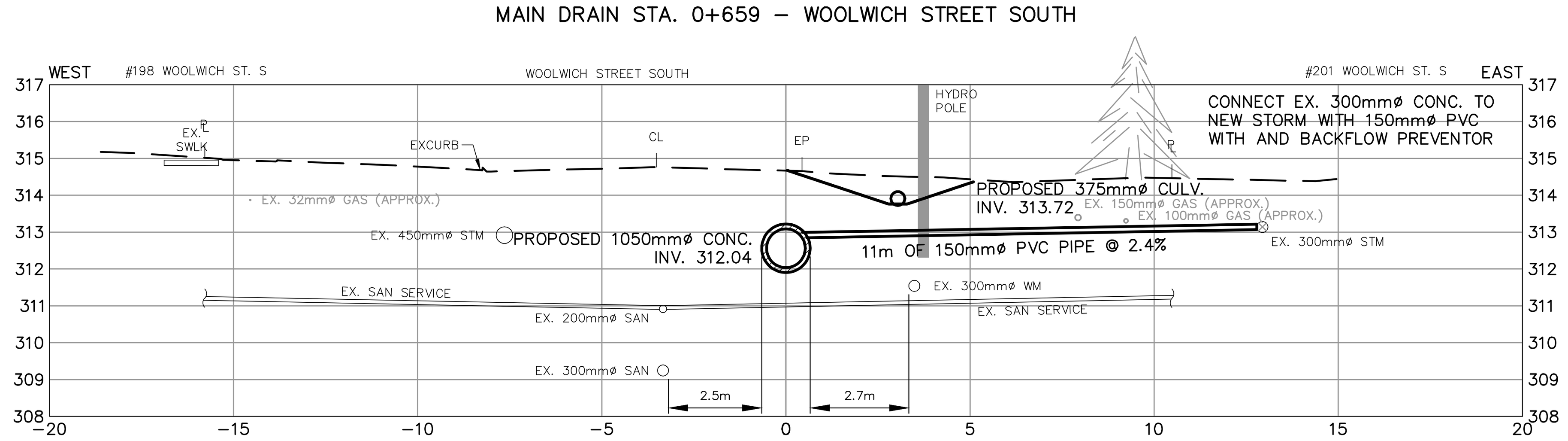

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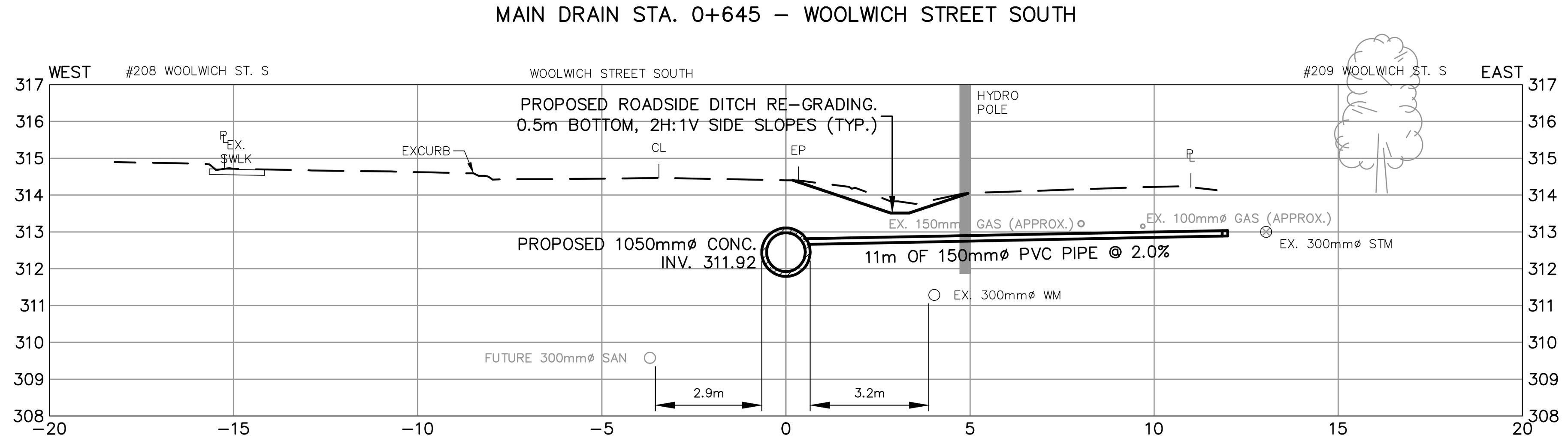

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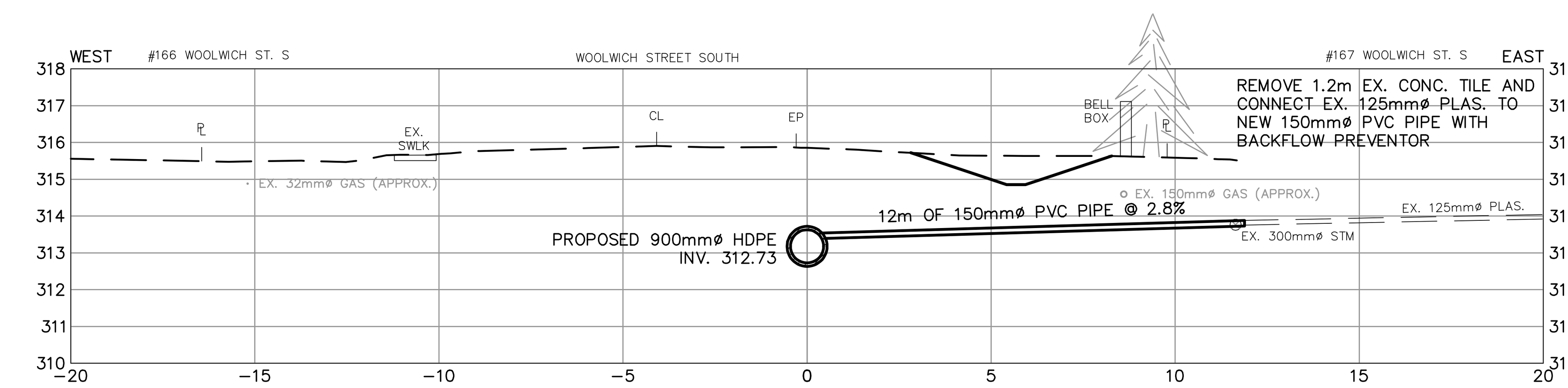
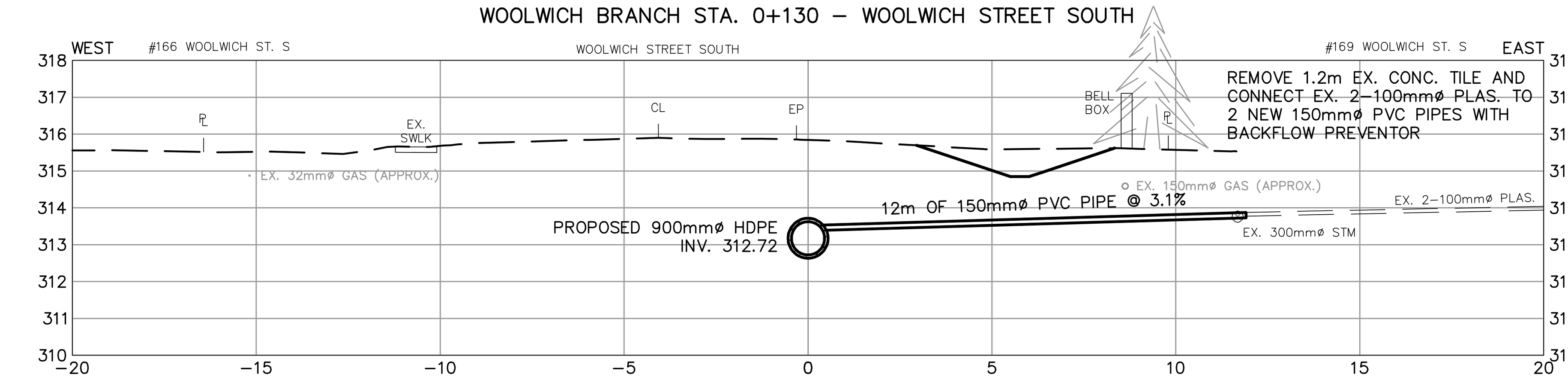


WOOLWICH BRANCH STA. 0+130 – WOOLWICH STREET SOUTH



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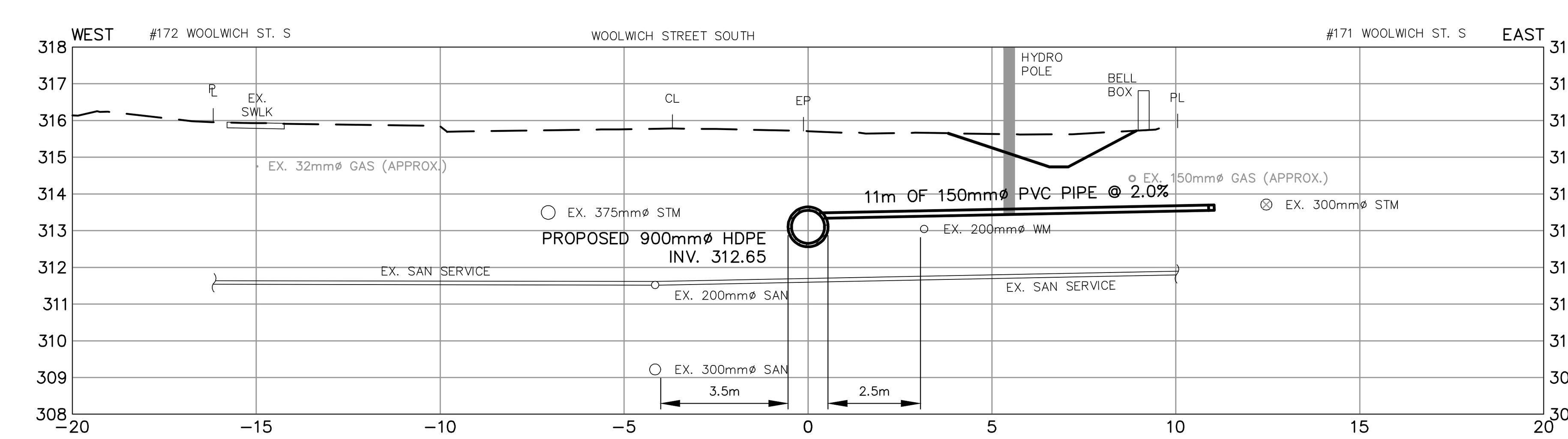

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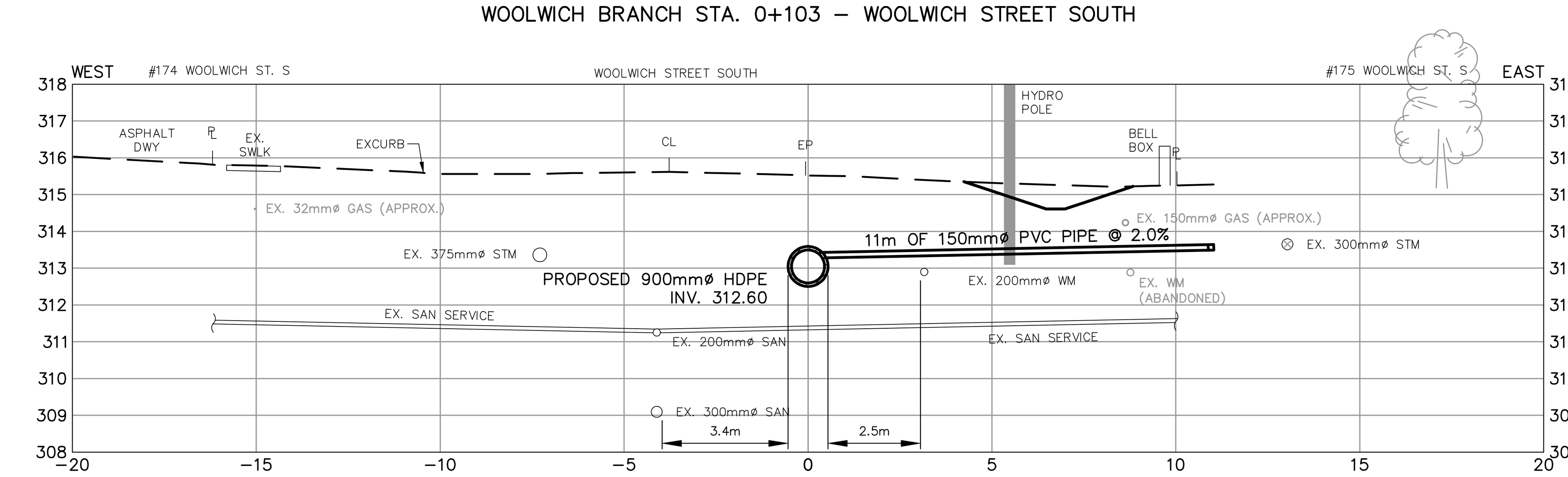
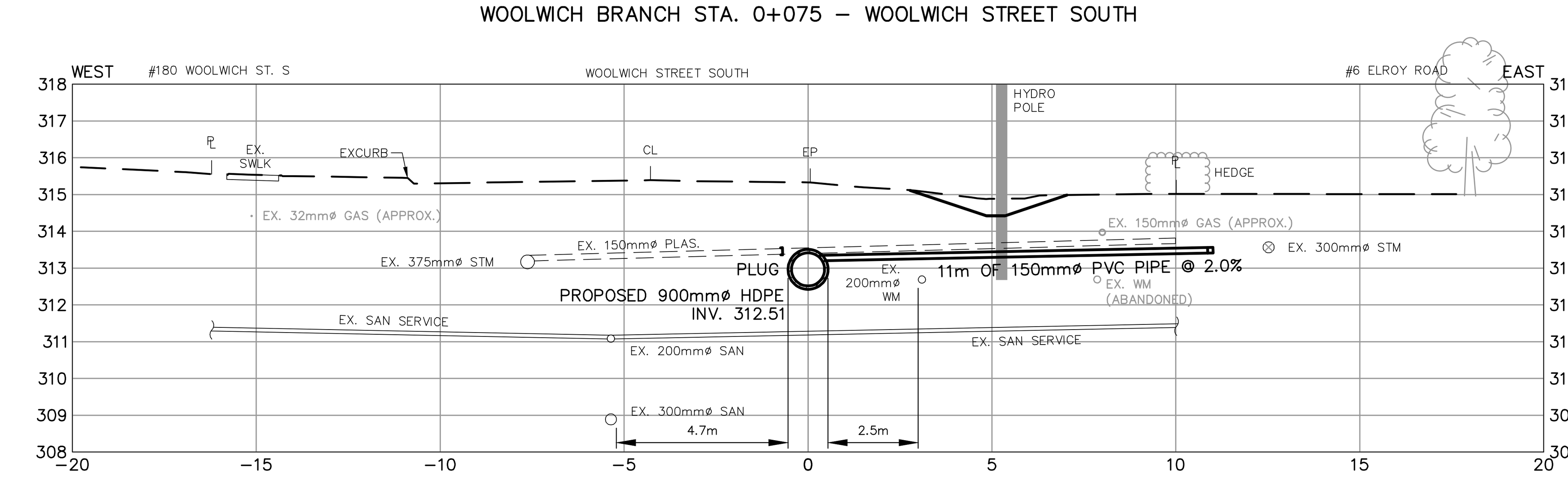


WOOLWICH BRANCH STA. 0+075 – WOOLWICH STREET SOUTH



WOOLWICH BRANCH STA. 0+034 – WOOLWICH STREET SOUTH

SCALE: 0 – 3m (1 : 150 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

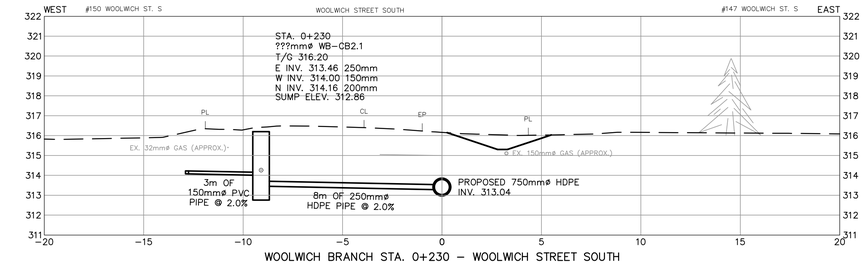
MAIN DRAIN & WOOLWICH BRANCH

WOOLWICH STREET SOUTH
STATION 0+613 TO 0+713 (MD) & 0+034 TO 0+130 (WB)

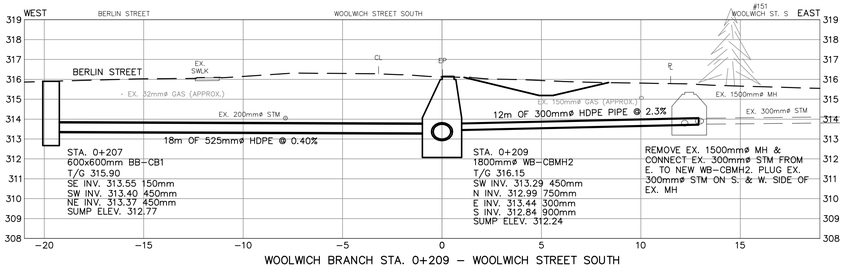
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 20 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 20. Cross Sections – Main Drain & Woolwich Branch 22-Sep-23 3:32:17 PM



WOOLWICH BRANCH STA. 0+230 – WOOLWICH STREET SOUTH



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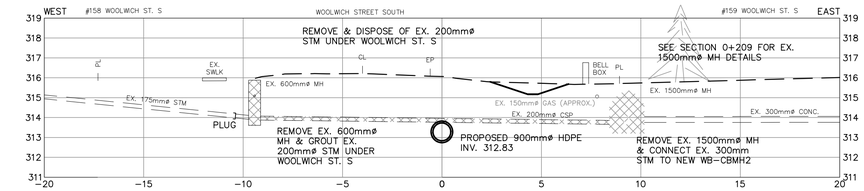

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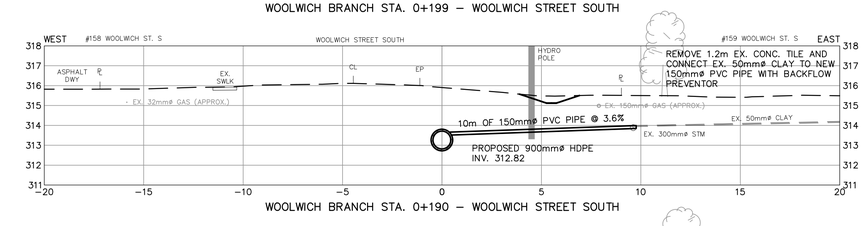
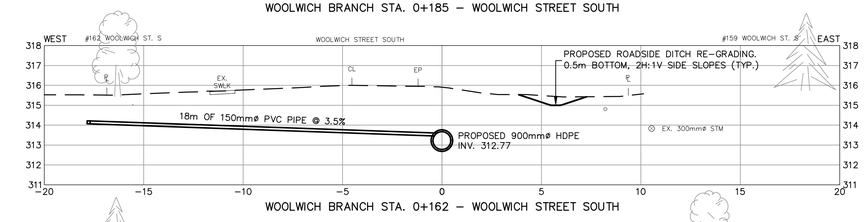
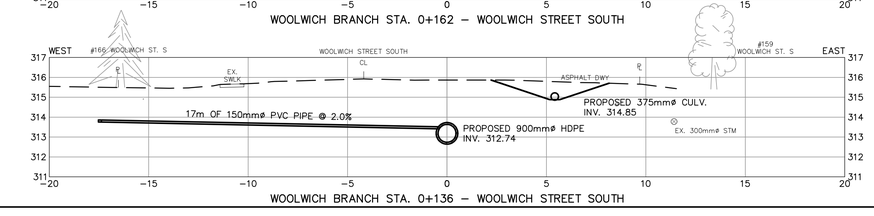


WOOLWICH BRANCH STA. 0+190 – WOOLWICH STREET SOUTH

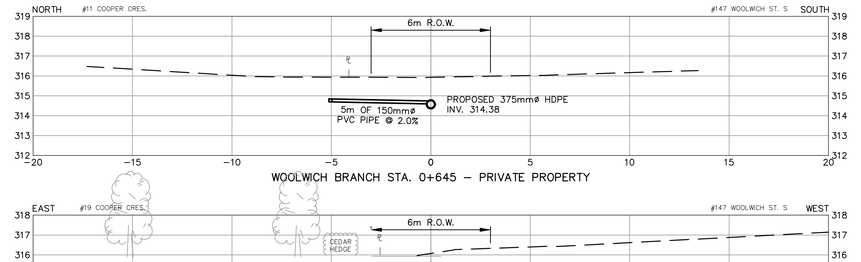
WOOLWICH BRANCH STA. 0+185 – WOOLWICH STREET SOUTH



WOOLWICH BRANCH STA. 0+162 – WOOLWICH STREET SOUTH



WOOLWICH BRANCH STA. 0+136 – WOOLWICH STREET SOUTH



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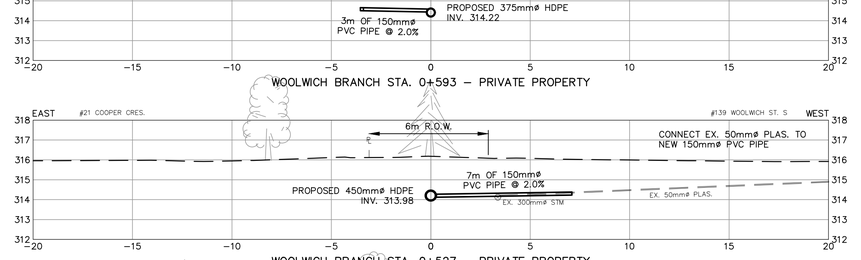

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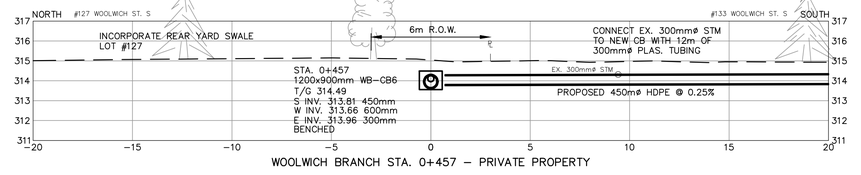

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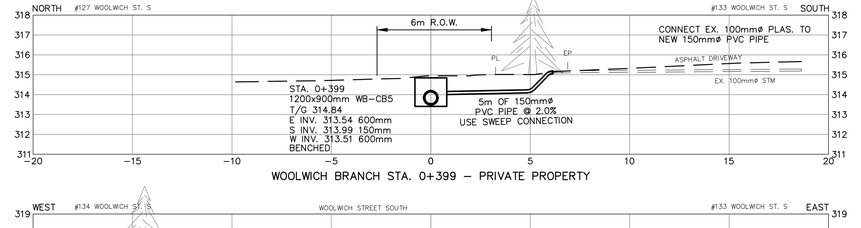

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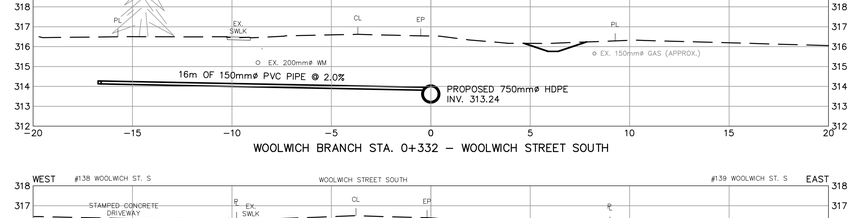

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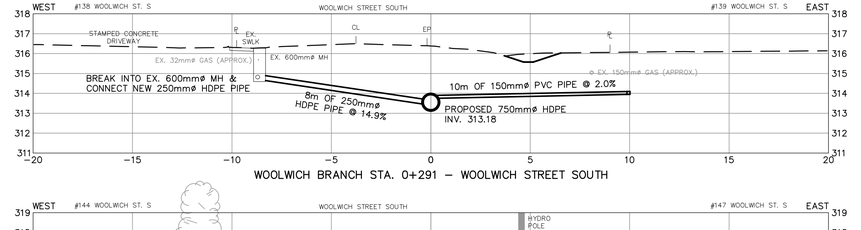
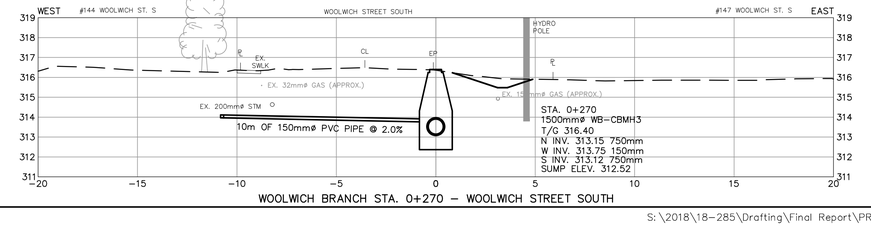


WOOLWICH BRANCH STA. 0+332 – WOOLWICH STREET SOUTH



WOOLWICH BRANCH STA. 0+291 – WOOLWICH STREET SOUTH

WOOLWICH BRANCH STA. 0+270 – WOOLWICH STREET SOUTH

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
2. EXISTING PRIVATE DRAIN CONNECTIONS ARE ANTICIPATED. THE CONTRACTOR IS TO VERIFY THE EXACT LOCATION. ALL EXISTING DRAINS ARE TO BE CONNECTED TO THE NEW STORM SEWER
3. ALL FUTURE LOT LAYOUT AND SERVICING TO BE PROVIDED BY OTHERS. ALL FUTURE LINEWORK SHOWN ON THESE DRAWINGS ARE BASED ON PRELIMINARY DRAWINGS RECEIVED FROM MTE ON APRIL 12, 2023.
4. PRIVATE DRAIN CONNECTIONS:
   - A. ALL LATERAL CONNECTIONS TO BE INSTALLED PERPENDICULAR TO MAIN DRAIN WITH WATERTIGHT FACTORY MADE FITTINGS
   - B. MINIMUM SLOPE = 2.0%
   - C. MAXIMUM SLOPE = 8.0%
   - D. MINIMUM COVER AT ℄ = 1.2m
   - E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

SCALE

0 3m

(1 : 150 ON 22" x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

J. E. MILLER 100206193 SEPT. 22, 2023 PROFESSIONAL ENGINEERS PROVINCE OF ONTARIO

SEPT. 22, 2023 ALEXANDER PASLEY No. 901718 LAND SURVEYOR

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

WOOLWICH BRANCH

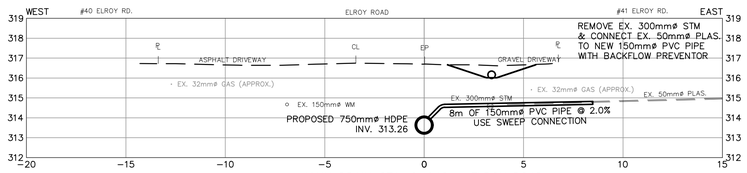
WOOLWICH STREET SOUTH & PRIVATE PROPERTY

STATION 0+136 TO 0+645

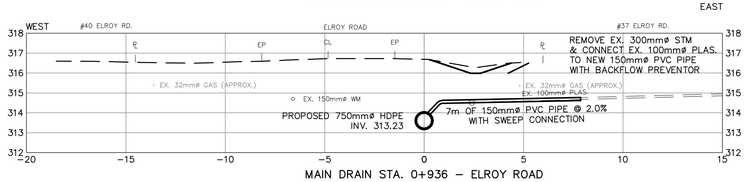
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 21 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 21. Cross Sections – Woolwich Branch 22-Sep-23 3:32:47 PM



MAIN DRAIN STA. 0+948 – ELROY ROAD



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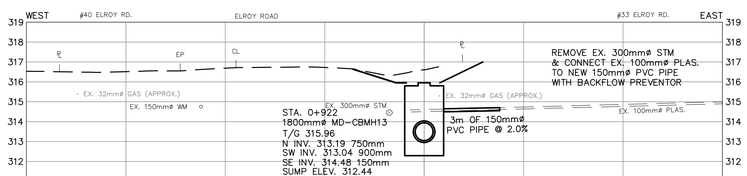

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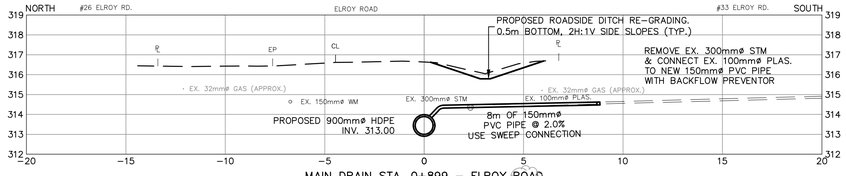

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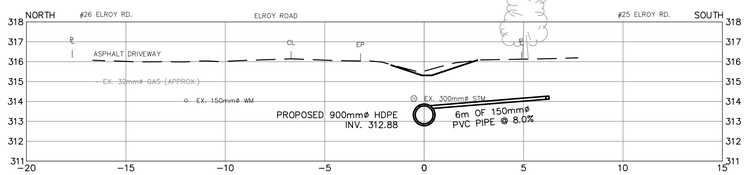

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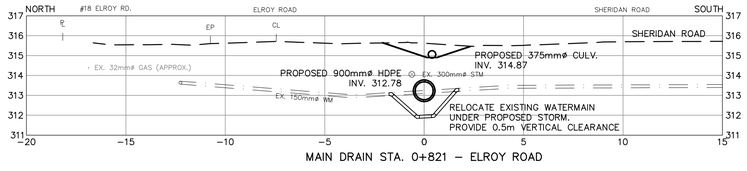

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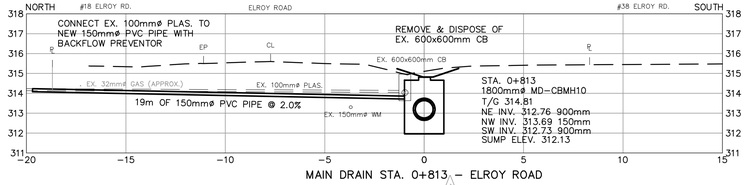

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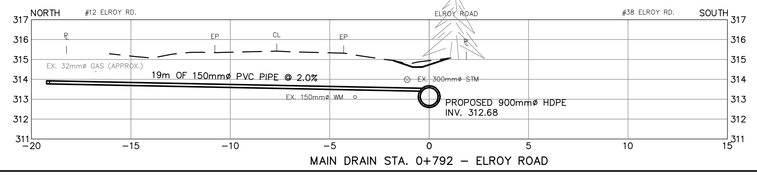
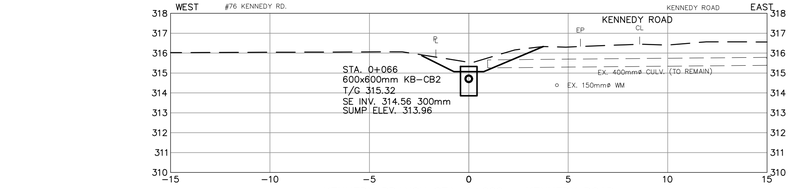
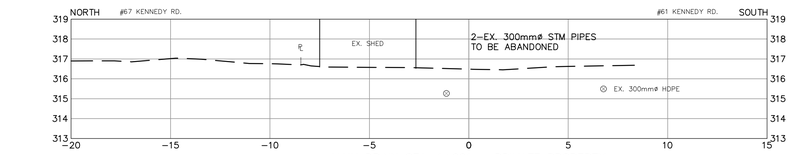


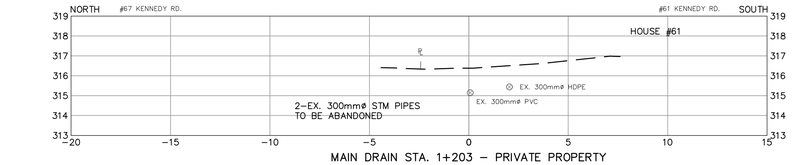
MAIN DRAIN STA. 0+792 – ELROY ROAD



KENNEDY BRANCH STA. 0+066 – KENNEDY ROAD



MAIN DRAIN STA. 1+221 – PRIVATE PROPERTY



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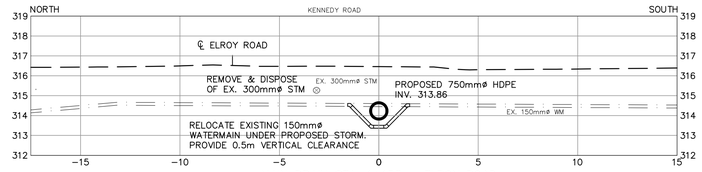
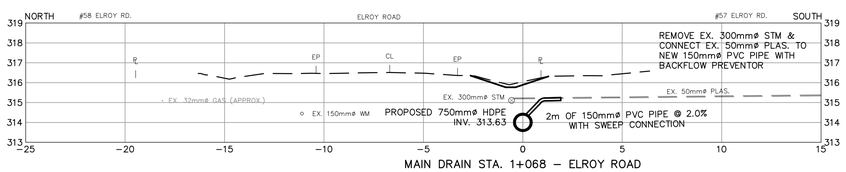
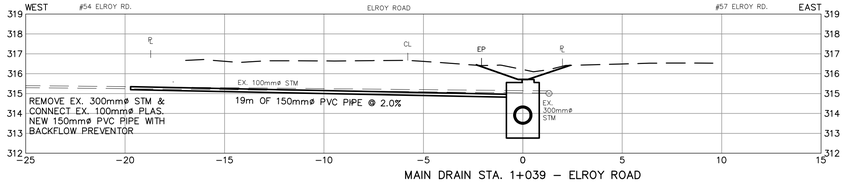


MAIN DRAIN STA. 1+153 – ELROY ROAD



MAIN DRAIN STA. 1+068 – ELROY ROAD



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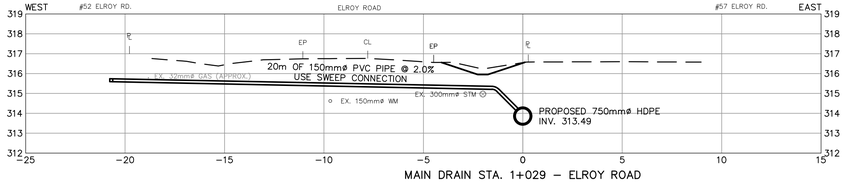

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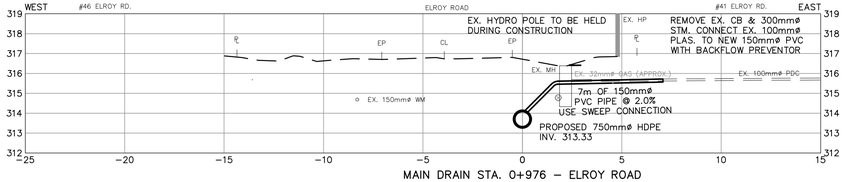

MAIN DRAIN STA. 0+976 – ELROY ROAD

NOTES:

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   - D. MINIMUM COVER AT ℄ = 1.2m
   - E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

SCALE

0 3m

(1 : 150 ON 22"x 34")

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4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

J. E. MILLER 100206193 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO — SEPT. 22, 2023

ALEXANDER PAISLEY LICENCE No. 901718 — SEPT. 22, 2023

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

MAIN DRAIN & KENNEDY BRANCH

ELROY ROAD & KENNEDY ROAD

STATION 0+791 TO 1+219 (MD) & 0+066 (KB)

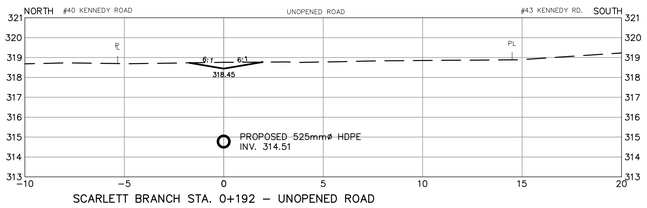
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023

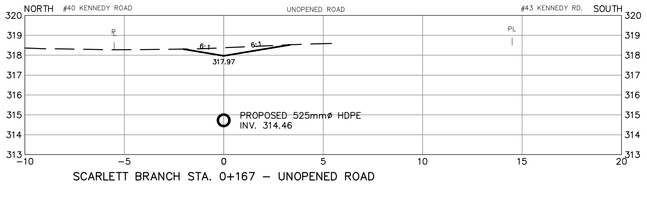
JOB NUMBER: 18–285

DRAWING 22 OF 28

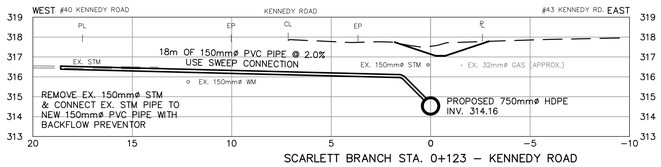
S:\2018\18–285\Drafting\Final Report\PROFILE 18–285.dwg 22. Cross Sections – Main Drain & Kennedy Branch 22–Sep–23 3:33:22 PM



SCARLETT BRANCH STA. 0+192 – UNOPENED ROAD



SCARLETT BRANCH STA. 0+167 – UNOPENED ROAD



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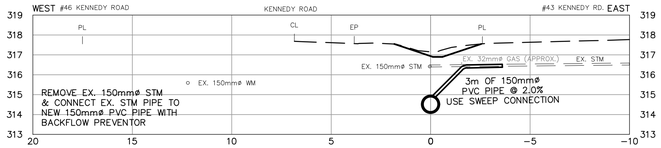

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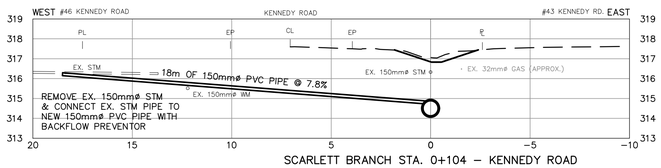
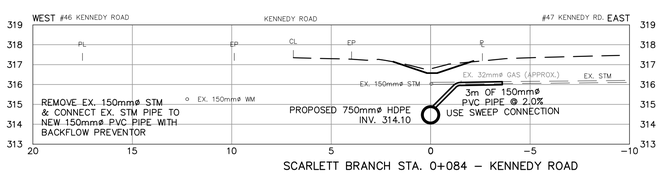


SCARLETT BRANCH STA. 0+104 – KENNEDY ROAD



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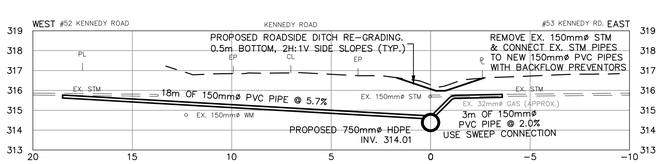

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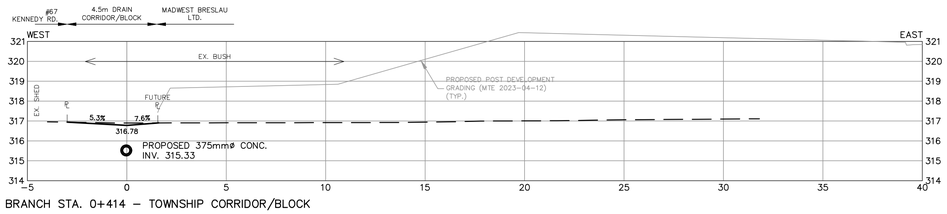

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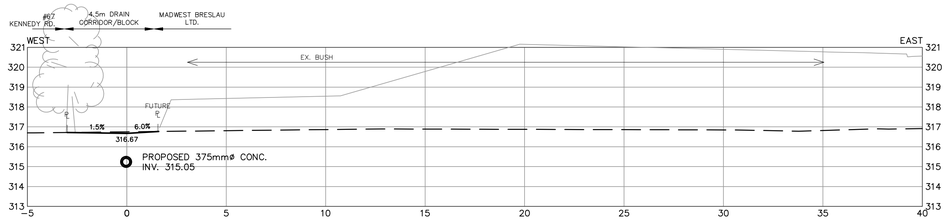

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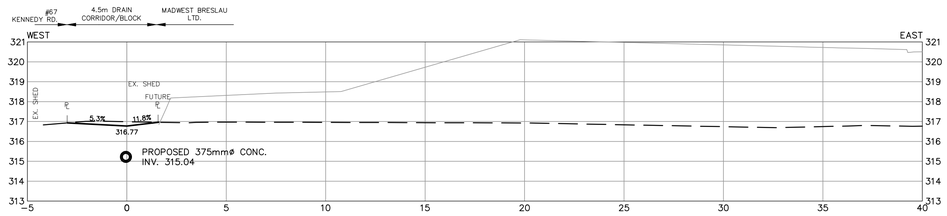

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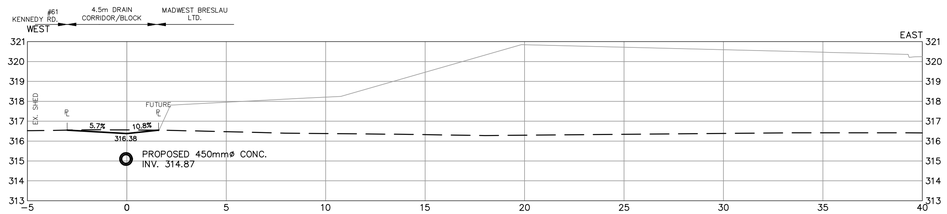

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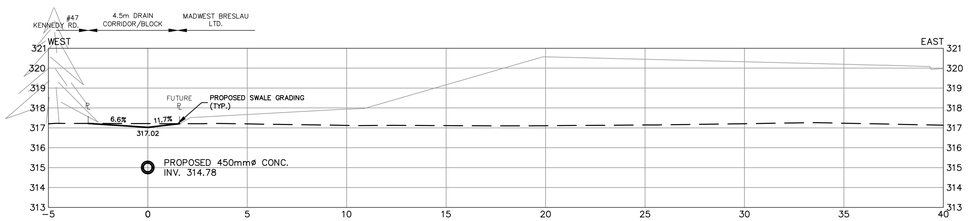

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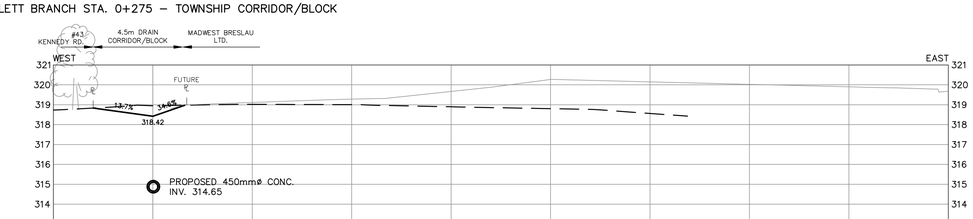


SCARLETT BRANCH STA. 0+225 – TOWNSHIP CORRIDOR/BLOCK

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
2. EXISTING PRIVATE DRAIN CONNECTIONS ARE ANTICIPATED. THE CONTRACTOR IS TO VERIFY THE EXACT LOCATION. ALL EXISTING DRAINS ARE TO BE CONNECTED TO THE NEW STORM SEWER
3. ALL FUTURE LOT LAYOUT AND SERVICING TO BE PROVIDED BY OTHERS. ALL FUTURE LINEWORK SHOWN ON THESE DRAWINGS ARE BASED ON PRELIMINARY DRAWINGS RECEIVED FROM MTE ON APRIL 12, 2023.
4. PRIVATE DRAIN CONNECTIONS:
   - A. ALL LATERAL CONNECTIONS TO BE INSTALLED PERPENDICULAR TO MAIN DRAIN WITH WATERTIGHT FACTORY MADE FITTINGS
   - B. MINIMUM SLOPE = 2.0%
   - C. MAXIMUM SLOPE = 8.0%
   - D. MINIMUM COVER AT ℄ = 1.2m
   - E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

SCALE

0 3m

(1 : 150 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY:	A.M.P.
CHECKED BY:	J.E.M.
DRAWN BY:	A.M.P.
CHECKED BY:	J.E.M.
REVISED:	

LICENSED PROFESSIONAL ENGINEER — J. E. MILLER — 100206193 — SEPT. 22, 2023 — PROVINCE OF ONTARIO

CERTIFICATE OF AUTHORIZATION — SEPT. 22, 2023 — ALEXANDER PARLEY — No. 901718

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

SCARLETT BRANCH

KENNEDY ROAD & TOWNSHIP BLOCK

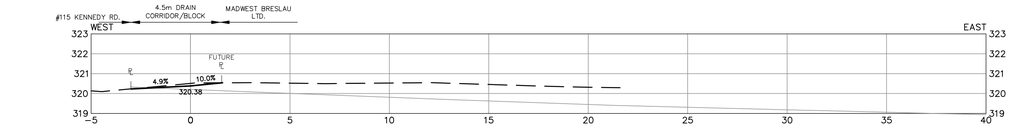
STATION 0+044 TO 0+414

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPTEMBER 22, 2023

JOB NUMBER: 18-285

DRAWING 23 OF 28



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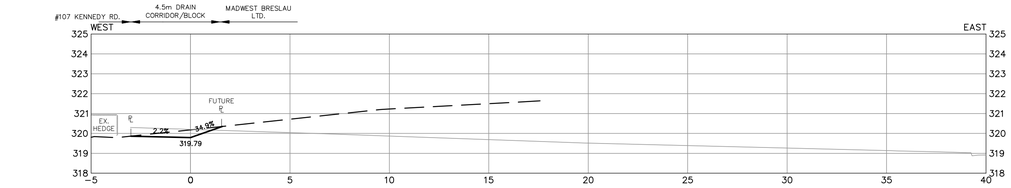

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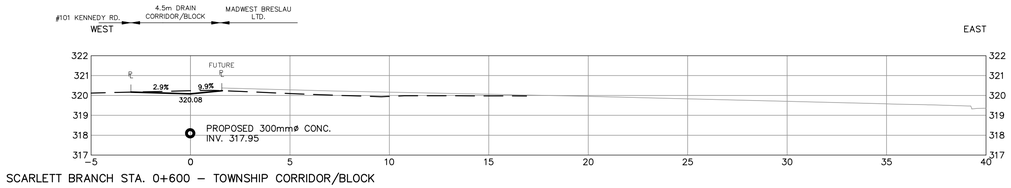

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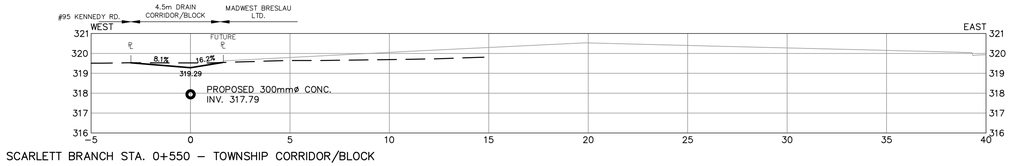

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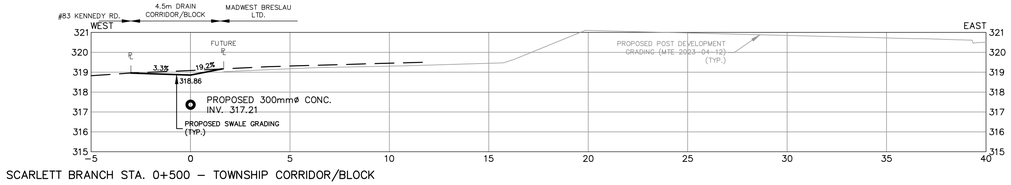

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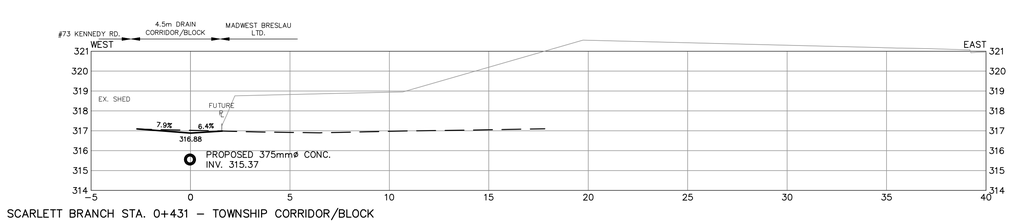

SCARLETT BRANCH STA. 0+431 – TOWNSHIP CORRIDOR/BLOCK

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
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3. ALL FUTURE LOT LAYOUT AND SERVICING TO BE PROVIDED BY OTHERS. ALL FUTURE LINEWORK SHOWN ON THESE DRAWINGS ARE BASED ON PRELIMINARY DRAWINGS RECEIVED FROM MTE ON APRIL 12, 2023.
4. PRIVATE DRAIN CONNECTIONS:
   - A. ALL LATERAL CONNECTIONS TO BE INSTALLED PERPENDICULAR TO MAIN DRAIN WITH WATERTIGHT FACTORY MADE FITTINGS
   - B. MINIMUM SLOPE = 2.0%
   - C. MAXIMUM SLOPE = 8.0%
   - D. MINIMUM COVER AT ℄ = 1.2m
   - E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

SCALE

0 3m

(1 : 150 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
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3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

J. E. MILLER
100206193
SEPT. 22, 2023
PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

SEPT 22, 2023
ALEXANDER PASLEY
No. 90171R

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

SCARLETT BRANCH

DRAIN CORRIDOR/TOWNSHIP BLOCK

STATION 0+431 TO 0+675

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023

JOB NUMBER: 18-285

DRAWING 24 OF 28

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
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   - D. MINIMUM COVER AT ℄ = 1.2m
   - E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

RESTORATION LEGEND

- – ASPHALT RESTORATION LIMITS
- – EXISTING ROAD CENTRELINE
- – GRAVEL RESTORATION LIMITS
- – CONCRETE RESTORATION LIMITS
- – BOULEVARD RESTORATION LIMITS (TOPSOIL & SOD)
- – BOULEVARD RESTORATION LIMITS (TOPSOIL & HYDROSEED)

SCALE

0 10m

(1 : 500 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
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3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

J. E. MILLER 100206193 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO SEPT. 22, 2023

ALEXANDER FAMILY PROFESSIONAL ENGINEER PROVINCE OF ONTARIO SEPT. 22, 2023 ALEXANDER FAMILY № 90171R

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

RESTORATION LIMITS
WOOLWICH STREET SOUTH

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 25 OF 28

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
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   D. MINIMUM COVER AT ℙ = 1.2m
   E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

RESTORATION LEGEND

- ASPHALT RESTORATION LIMITS
- EXISTING ROAD CENTRELINE
- GRAVEL RESTORATION LIMITS
- CONCRETE RESTORATION LIMITS
- BOULEVARD RESTORATION LIMITS (TOPSOIL & SOD)
- BOULEVARD RESTORATION LIMITS (TOPSOIL & HYDROSEED)

SCALE

0 10m

(1 : 500 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
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4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
CHECKED BY: J.E.M.
REVISED:

LICENSED PROFESSIONAL ENGINEER J. E. MILLER 100206193 SEPT. 22, 2023 PROVINCE OF ONTARIO

CERTIFIED ENGINEERING TECHNOLOGIST OACETT ONTARIO SEPT. 22, 2023 ALEXANDER PASLEY Nº 901718

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

RESTORATION LIMITS
LOCAL STREETS

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 26 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 26. Restoration - Local Streets 22-Sep-23 3:39:18 PM

NOTES:

1. ANY UTILITY, WATERMAIN, SANITARY SEWER OR FORCEMAIN THAT MAY AFFECT THE LOCATION OR ELEVATION OF ANY STORM STRUCTURE OR STORM SEWER IS TO BE PRE-LOCATED PRIOR TO PLACEMENT OF STORM STRUCTURE OR STORM SEWER
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   - C. MAXIMUM SLOPE = 8.0%
   - D. MINIMUM COVER AT R = 1.2m
   - E. ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AND MARKED AT PROPERTY LINE

RESTORATION LEGEND

- – ASPHALT RESTORATION LIMITS
- – EXISTING ROAD CENTRELINE
- – GRAVEL RESTORATION LIMITS
- – CONCRETE RESTORATION LIMITS
- – BOULEVARD RESTORATION LIMITS (TOPSOIL & SOD)
- – BOULEVARD RESTORATION LIMITS (TOPSOIL & HYDROSEED)

SCALE

0 10m

(1 : 500 ON 22"x 34")

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
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DESIGNED BY:	A.M.P.
CHECKED BY:	J.E.M.
DRAWN BY:	A.M.P.
CHECKED BY:	J.E.M.
REVISED:	

J. E. MILLER 100206193 PROVINCE OF ONTARIO SEPT. 22, 2023

ALEXANDER PAISLEY Nº 901718 SEPT. 22, 2023

BRESLAU DRAIN 1

REGION OF WATERLOO — TOWNSHIP OF WOOLWICH

RESTORATION LIMITS
PRIVATE PROPERTY/TOWNSHIP BLOCK

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

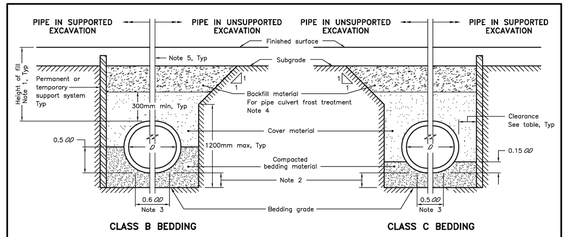
SEPTEMBER 22, 2023
JOB NUMBER: 18-285
DRAWING 27 OF 28

S:\2018\18-285\Drafting\Final Report\PROFILE 18-285.dwg 27. Restoration – Private Property 22-Sep-23 3:41:56 PM

CONSTRUCTION NOTES

REFERENCE SHALL ALSO BE MADE TO THE CURRENT REGION OF WATERLOO AND AREA MUNICIPALITIES DESIGN GUIDELINES AND SUPPLEMENTAL SPECIFICATIONS FOR MUNICIPAL SERVICES (DGSSMS), LATEST EDITION

1. ROADS:
   - PAVEMENT STRUCTURE SHOWN ON DRAWINGS
2. STORM SEWER:
   - STORM MAIN LINES 300mm TO 900mm IN DIAMETER TO BE HDPE RIBBED PIPE (UNLESS OTHERWISE SPECIFIED), SMOOTH INTERIOR WALL, WITH GASKETED, BELL AND SPIGOT JOINTS. PIPE STIFFNESS 320 KPA AT 5% DEFLECTION CERTIFIED TO CSA B182.6. PIPE FITTINGS SHALL BE FACTORY MANUFACTURED HDPE FITTINGS. USE OF FIELD APPLIED SADDLES OR FIELD CUTTING OF PIPE AND INSERTING TEE CONNECTIONS MUST BE APPROVED BY THE ENGINEER. STORM MAIN LINES GREATER THAN 900mm IN DIAMETER TO BE SEWER PIPE CLASS III WITH GASKET CONFORMING TO OPSS 1820 OR APPROVED EQUAL. TEE CONNECTIONS FOR 100 TO 300mm (OR OTHER DESIGNATED DIAMETER) TO BE SDR 28 PVC PIPE TO BE FACTORY INSTALLED. BREAKING INTO CONCRETE SEWER PIPE IS TO BE ONLY USED FOR UNKNOWN DRAINS LOCATED DURING CONSTRUCTION WHEN THE CONSTRUCTION INSPECTOR INSTRUCTS TO BE CONNECTED BY BREAKING INTO PIPE.
   - BEDDING, COVER AND BACKFILL AS PER OPSD 802.030, CLASS B.
   - IF GROUNDWATER TABLE ENCOUNTERED DURING CONSTRUCTION, CLASS A BEDDING MAY BE USED AS AN ALTERNATIVE
   - 1.5m MINIMUM DEPTH OF COVER
   - CB (SINGLE) LEADS TO BE 250mm PVC SDR 35
4. STORM SEWER – PRIVATE DRAIN CONNECTIONS:
   - 150mm DIA. (MIN) PVC SDR 28 UNLESS NOTED OTHERWISE
   - ALL LATERAL CONNECTIONS TO BE INSTALLED PERPENDICULAR TO MAIN DRAIN WITH WATERTIGHT FACTORY MADE FITTINGS
   - PROVIDE 1.2m OF COVER (MINIMUM) AT PROPERTY LINE
   - ALL FUTURE PRIVATE DRAIN CONNECTIONS TO BE CAPPED/PLUGGED AT PROPERTY LINE
5. CATCHBASINS:
   - OPSD TYPE 705.010, WITH GRATES AS PER OPSD 400.02 AND OPSD 400.09 CURB INLETS
6. MAINTENANCE HOLES:
   - OPSD 701.010, 701.011, 701.012, 701.013, WITH GRATES AS PER OPSD 400.02
   - ALL CBMH'S TO HAVE GRATES AS PER OPSD 400.02
   - MH ADAPTERS TO BE USED FOR HP PIPE
   - THE CONTRACTOR SHALL PLACE FILTER FABRIC UNDER MH COVERS AND CB GRATES TO PREVENT ENTRY OF DEBRIS DURING CONSTRUCTION UNTIL BASE ASPHALT IS PLACED. ADJUST MH'S TO GRADE OF THIS CONTRACT BEFORE FABRIC
7. CB'S AND MH'S TO HAVE PRECAST ADJUSTMENT UNITS (300mm MAX) AS PER OPSD 704.01 AND SHALL BE PARGED INSIDE AND OUT TO THE ENGINEERS SATISFACTION. ALL MH'S AND CBMH'S TO HAVE 600mm SUMP (UNLESS SPECIFIED OTHERWISE)
8. ALL CONSTRUCTION, MATERIALS, AND TESTING SHALL CONFORM TO THE CURRENT ONTARIO PROVINCIAL STANDARD SPECIFICATIONS
9. RESTORE BOULEVARD AND RESIDENTIAL PRIVATE PROPERTY WITH SALVAGED TOPSOIL (300mm THICK MIN.) & SOD. RESTORE AGRICULTURAL AREAS (INCLUDING SCARLETT BRANCH STA. 0+209 TO 0+651) WITH SALVAGED TOPSOIL (300mm THICK MIN.) AND SEED.
10. DRIVEWAYS:
    - ASPHALT DRIVEWAY AND APRON PAVEMENT STRUCTURE:
      – 1–60mm LIFT HL3F
      – 250mm GRANULAR 'A'
    - CONCRETE DRIVEWAY AND APRON PAVEMENT STRUCTURE:
      – 150mm 32MPa CONCRETE
      – 200mm GRANULAR 'A'
    - INTERLOCK PAVER DRIVEWAY PAVEMENT STRUCTURE:
      – 40mm BEDDING SAND
      – 200mm GRANULAR 'A'
    - GRAVEL DRIVEWAY STRUCTURE:
      – 250mm GRANULAR 'A'
11. WATERMAIN:
    - TO BE IN ACCORDANCE WITH THE CURRENT REGION OF WATERLOO AND AREA MUNICIPALITIES DESIGN GUIDELINES AND SUPPLEMENTAL SPECIFICATIONS FOR MUNICIPAL SERVICES (DGSSMS)
    - PVC AWWA C900, CSA B.137.3 CLASS 150 DR 18 – MINIMUM COVER – 1.8m COMPLETE WITH #13 CCS TRACER WIRE (BLUE)
    - GRANULAR 'A' BEDDING AND COVER AS PER OPSD 802.010 AND OPSS 1010 OR CLEAN SCREENED SAND THRUST BLOCKS AS PER OPSD 1103.01, 1103.02 IF APPROVED
    - MECHANICAL JOINT – UNI–FLANGE SERIES 1300, ROMAC "GRIP RING" (BLACK GRIP RING FOR D.I. AND PVC) OR APPROVED EQUAL
    - THE LOCATION OF ALL WATERMAINS, AS SHOWN ON THE PLAN AND PROFILE DRAWINGS ARE BASED ON INFORMATION FROM THE TOWNSHIP OF WOOLWICH. SUBSURFACE VERIFICATIONS ARE SHOWN WHERE MADE.
    - EXPOSE WATERMAIN AT ALL CROSSING LOCATIONS PRIOR TO CONSTRUCTION OF NEW DRAIN TO CONFIRM GRADES AS PROPOSED.
    - ALL WATER AND VALVES TO BE ADJUSTED TO SUIT NEW ROAD PROFILE.
15. CONTRACTOR TO CO–ORDINATE THE RELOCATION OF THE UNDERGROUND BELL LINES AND OTHER UTILITIES (THAT HAVE NOT ALREADY BEEN RELOCATED BY THE TOWNSHIP) PRIOR TO INSTALLATION OF STORM SEWER.
16. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
17. TREE REMOVAL – TRUNK AND LIMBS TO BE LEFT IF REQUESTED BY OWNER – STUMPS TO BE GROUND – DEBRIS TO BE DISPOSED OF AT ACCEPTABLE RECEIVING SITE.
18. ALL DISTURBED AREAS SHALL BE RESTORED TO THE SATISFACTION OF THE ENGINEER.
19. THE CONTRACTOR SHALL MAINTAIN THE FLOW OF ALL EXISTING DRAINS ENCOUNTERED WHETHER SHOWN ON PLAN OR NOT AND, WHERE REQUESTED, CONNECT THE DRAINS INTO THE STORM SEWERS. CONNECTION SHALL BE PAID AT UNIT PRICES BID FOR P.D.C. OR CB LEADS AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
20. ALL SEWERS AND WATERMAINS INCLUDING CATCHBASIN LEADS AND PRIVATE DRAIN CONNECTIONS WHETHER EXISTING OR INSTALLED BY THE CONTRACTOR, WHICH ARE EXPOSED BY A TRENCH OR EXCAVATED FOR A PIPE CROSSING AT A LOWER GRADE OR UNDERMINED FOR ANY REASON SHALL BE SUPPORTED TO SPRINGLINE WITH WELL COMPACTED CLEAR STONE BEDDING TO LOWER PIPE BEDDING AND COVERED WITH FILTER FABRIC. IF THE DIFFERENCE IN PIPE ELEVATIONS IS SUFFICIENT TO ALLOW COMPACTION OF BACKFILL OF THE UNDERMINED PIPE WITH A HOE PAC, THE REQUIREMENT OF CLEAR STONE WILL THEN BE REDUCED TO THE DEPTH OF BEDDING INACCESSIBLE BY THE HOE PAC.
21. REMOVALS:
    - EXISTING ASPHALT, CURBS, SIDEWALK AND CONCRETE PAVEMENT SHALL BE DISPOSED OF AT AN ACCEPTABLE RECEIVING SITE. EXISTING CASTINGS SHALL BE SALVAGED AND RETURNED TO THE TOWNSHIP. ABANDONED PIPES NOT REMOVED SHALL BE SEALED WITH CEMENT MORTAR OR FILL CEMENT AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
23. THE CONTRACTOR SHALL SHORE EXCAVATIONS AS REQUIRED TO PREVENT DAMAGE TO EXISTING PAVEMENT/UTILITIES/STRUCTURES/TREES. TRACKING OF CLEATED EQUIPMENT IS NOT PERMITTED ON PAVED SURFACES THAT ARE TO REMAIN. CARELESS DAMAGE TO PAVED AREAS SHALL BE REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO OWNER. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF HOLDING UTILITY POLES/STREET LIGHTS AS REQUIRED (INCLUDED IN PIPE PRICES, ETC.) HYDRO POLES MUST BE HELD (IF NECESSARY) BY THE AUTHORIZED HYDRO UTILITY.
22. THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE, HAUL AND DISPOSE OF EXCESS SOIL, CONCRETE, ASPHALT AND OTHER EXCESS MATERIAL SUBJECT TO THE APPROVAL OF THE CONTRACT ADMINISTRATOR AND REGULATING AUTHORITIES. HAUL ROUTES MUST BE APPROVED BY THE CONTRACT ADMINISTRATOR. THE CONTRACTOR SHALL OBTAIN A SIGNED RELEASE FROM THE OWNER FOR ALL DISPOSAL SITES.
23. RESTORATION:
    - PAVEMENT AND CONCRETE REMOVED SHALL BE SAWCUT FULL DEPTH ADJACENT TO AREAS TO REMAIN IN PLACE. LIMITS AS DIRECTED BY THE CONTRACT ADMINISTRATOR AT TIME OF CONSTRUCTION;
    - CURBS, SIDEWALKS, FENCES, ETC. DISTURBED DURING CONSTRUCTION SHALL BE RESTORED AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

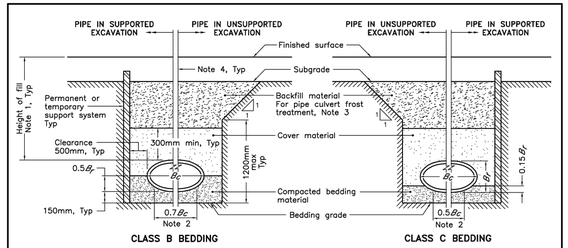


NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The minimum bedding depth below the pipe shall be 0.15∅ in no case shall this dimension be less than 150mm or greater than 300mm.
3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
5 Condition of excavation is symmetrical about centreline of pipe.
A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
B All dimensions are in metres unless otherwise shown.

LEGEND:
∅ – Inside diameter
∅∅ – Outside diameter

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	3
RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 1 OR 2 SOIL – EARTH EXCAVATION			
	OPSD 802.030		



NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
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3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
B All dimensions are in metres unless otherwise shown.

LEGEND:
Bc = Outside horizontal span
Rc = Outside vertical rise

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	3
HORIZONTAL ELLIPTICAL RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 1 OR 2 SOIL – EARTH EXCAVATION			
	OPSD 802.050		

No.	DESCRIPTION	DATE
1	TOWNSHIP REVIEW	OCT.21/20
2	AGENCY REVIEW	JAN.19/22
3	PUBLIC INFORMATION MEETING	DEC.14/22
4	ISSUED FOR REPORT	SEPT.22/23

DESIGNED BY: A.M.P.
CHECKED BY: J.E.M.
DRAWN BY: A.M.P.
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BRESLAU DRAIN 1

REGION OF WATERLOO TOWNSHIP OF WOOLWICH

CONSTRUCTION NOTES & DETAILS

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPTEMBER 22, 2023
JOB NUMBER: 18–285
DRAWING 28 OF 28