

**DRAINAGE REPORT
FOR THE**

DESJARDINS DRAIN

**TOWN OF TECUMSEH
&
CITY OF WINDSOR**



(FINAL)
30 SEPTEMBER 2025
MARK D. HERNANDEZ, P.ENG.
FILE No. 17-6774
TECUMSEH FILE NO. E09DE(26)

File No. 17-6774

Mayor and Council
The Corporation of the Town of Tecumseh
917 Lesperance Road
Tecumseh, Ontario N8N 1W9

**Drainage Report for the
DESJARDINS DRAIN
Town of Tecumseh & City of Windsor**

Mayor and Council:

Instructions

The Municipality submitted a request to repair and improve the Desjardins Drain on 15 September 2017. Council accepted the request under Section 78 of the Drainage Act and on 14 November 2017 appointed Dillon Consulting Limited to prepare a report.

In addition, the County of Essex is planning the reconstruction and diversion of County Road No. 43 which crosses the Desjardins Drain and requires that provisions necessary to facilitate the reconstruction of the road be included in this appointment.

The north/south upstream portion of the drain is not included in the 1948 or the 1970 by-law and there have been no Section 4 petitions for this section of drain, therefore it is being referenced as a private ditch from Station 2+144 southerly.

Watershed Description

The Desjardins Drain is an open channel that commences at the westerly limit of McAuliffe Woods Conservation Area (Essex Region Conservation Authority Roll No. 570-33930) along the line of Lot 148 and 149, Concession 3. The drain flows westerly approximately 2,144 metres and continues to flow to its outlet into the Little River Drain in Lot 136, Concession 3. The watershed area encompasses approximately 148 ha (365.7 acres) which consists of approximately 118.9 hectares (293.9 acres) within the Town of Tecumseh and the remainder of land is within the City of Windsor 29.1 hectares (71.8 acres)

The lands comprising the watershed are under mixed agricultural, institutional and residential use. There is little topographic relief. From the Ontario Soil Survey (provided by the Ontario Ministry of Agriculture, Food and Rural Affairs), the principle surficial soils in the study area are described as Brookston Clay and Brookston Clay – Sand Spot Phase. Brookston Clay is characterized as having poor natural drainage. Most of the agricultural land parcels are systematically tiled.

On-Site Meeting

We conducted on-site meetings on 8 February 2018 and 6 April 2018. Records of the meetings are provided in Schedule 'A-1' and 'A-2', which is appended hereto.



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Drain History

The recent history of Engineers' reports for the Desjardins Drain follows:

- **20 July 1970 by C.G.R. Armstrong, P.Eng.:** The report recommended the repair and improvement of the entire drain by brushing and deepening. There were three (3) culverts recommended to be lowered.
- **30 July 1948 by C.G.R. Armstrong, P.Eng.:** This report was referred back from the original report dated May 8, 1948. Council instructed the Engineer to straighten the drain from Banwell Road to the head of the drain. The report recommended the repair and improvement of the entire drain.

Survey

Our survey and examination of the Desjardins Drain was carried out in April 2018. The survey is comprised of the recording of topographic data and the examination of the channel for available depth necessary to provide sufficient drainage. We commenced the survey at the outlet into the Little River Drain. We then proceeded upstream southeasterly along the channel to its upstream at Station 2+144. At this point the channel turns southerly as an open ditch without any known legal status. We followed the private ditch southerly to its most upstream location at Station 2+498.

Our survey revealed a significant amount of overgrown brush and vegetation with frequent accumulations of debris, forming blockages within the channel. There is a uniform build-up of sediment averaging 370 mm above the design bottom in the 1970 engineer's report. Erosion of the drain banks was observed at some locations where surface water inlets exist.

Additional survey was completed in December 2024 downstream of Bridge No. 6 (County Road No. 43 - Banwell Road) to Bridge No. 2 to determine whether the depth of sediment was increasing or remaining steady.

Excess Soils Management

In October 2024, in consultation with the Town of Tecumseh, Dillon Consulting completed a Soil Characterization Report following the requirements of Ontario Regulation 406/19 – On-Site Excess Soil Management (O. Reg 406/19) to determine the level of contamination of the excess soils generated from the Desjardins Drain improvements and confirm appropriate reuse criteria for the excess soils.

Soil sample analyses indicate that most of the soil has some reuse potential. Excess soil generated from the report recommendations but not captured in the soil sampling work described shall adhere to the relevant requirements as set out in O. Reg 406/19. Based on the findings of the soil sampling and analysis program, excess soils within the Project Area are suitable to be transported to a beneficial reuse site accepting soils meeting Table 3.1 RPI ESQS or Table 3.1 ICC ESQS. Soil samples downstream of County Road No. 43 are impacted by salt. Samples upstream of County Road No. 43 did not have the same salt impact.

Heritage Impact Assessment

The Banwell Cemetery (Roll No. 580-05000) has a designation under Part IV of the Ontario Heritage Act, and as improvements are proposed on the property, a Heritage Impact Assessment (HIA) is required in accordance with Section 3.4 of the Town of Tecumseh's Official Plan. The HIA for the Banwell Cemetery was completed by Archaeological Services Inc. in August and September of 2025, with the final report submitted on September 22, 2025. The report found that the proposed scope of work is far removed from the heritage attributes identified in the Town's By-Law 2013-20. As such, no major alterations, alternatives, or mitigative measures were proposed.

Minor mitigation measures were recommended to avoid the potential for impacts to undiscovered heritage elements. These measures generally include the following:

1. Ensuring that the Contractor is aware of the heritage attributes of the site and that the Contractor contain their work to the established working corridor.
2. Engaging a qualified heritage consultant to review the potential impacts should the work area need to be increased.
3. Should any currently undiscovered heritage elements be found, construction on the property must stop and report outlines the required notifications.
4. Notifications of the HIA be made to Town of Tecumseh planning staff, the Ministry of Citizenship and Multi-Culturalism and the Ontario Heritage Trust. These notifications were completed in September 2025 as documented in the report.

In addition to the above, the Town of Tecumseh has recommended that a construction observer be engaged full time as the work is completed through the Banwell Cemetery to ensure compliance with the above mitigation measures.

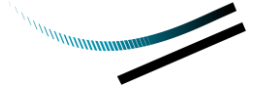
Design Considerations

A Guide for Engineers working under the Drainage Act in Ontario, OMAFRA Publication 852 (2018) is the current reference document used by engineers carrying out work on municipal drains under the Act. The 2-year design storm is the recommended design standard applied to municipal drains within rural Ontario specific to open drain channels and low hazard agricultural field access crossings. We have applied this criterion for the Desjardins Drain.

The design of Bridge Nos. 1, 2 and 3 have been designed in accordance with City of Windsor drawing AS-209A as directed by the City of Windsor.

For road crossings, a higher 10-25 year design storm is the recommended design criteria. We have applied this criterion for the Desjardins Drain.

We believe that these design standards should provide a reasonable level of service, but it should be clearly understood that runoff generated from large storms or fast snow melts may sometimes exceed the capacity of the proposed systems and result in surface ponding for short periods of time.



Existing Conditions and Recommendations

The last report for repair and improvement of the drain was completed in 1970. The drain will require a bottom cleanout to align with the 1970 profile with minor adjustments as shown on the profile attached. Generally, the drain banks are reasonably well grassed and stabilized.

Based on our review of the history, the information obtained during the site meeting and our examination and analysis of the survey data, we recommend that the Desjardins Drain be repaired and improved by cleaning the entire drain complete with bridge replacements.

All of the access bridges were inspected during the course of our investigation. Our assessment identified culverts that are in poor condition, good condition and culverts that are still in serviceable condition but will likely require replacement in the next 5 to 10 years.

Specific structure numbers have been designated for ease of reference between the specifications and the drawings. The locations, dimensions, condition and use of each structure are as follows:

Bridge No. 1: Station 0+285 Hydro One Networks Inc. (Roll No. 090-050-00500)

A 7.4 m long, 1200 mm diameter corrugated steel pipe provides access across the drain for this property. A culvert was shown at this location on the profile in the 1970 report. This culvert is deficient in top width, positive grade, cover, hydraulic capacity and lacks end protection. This bridge is a primary access to Hydro One lands.

We recommend the culvert be replaced with a new 10.0 m long, 1200 mm diameter SaniTite HP polypropylene pipe complete with concrete block end walls with a 7.3 m granular driveable top width.

Bridge No. 2: Station 0+523 Hydro One Networks Inc. (Roll No. 090-050-00500)

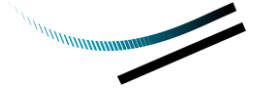
A 6.1 m long pipe consisting partially of 900 mm diameter concrete pipe and 1100 mm diameter steel pipe provides access across the drain for this property. A culvert was shown at this location on the profile in the 1970 report. This culvert is deficient in top width, hydraulic capacity and lacks end protection.

The culvert is being used for access across the drain. This culvert will be a secondary access to Hydro One lands.

We recommend the culvert be replaced with a new 10.0 m long, 1200 mm diameter SaniTite HP polypropylene pipe complete with concrete block end walls with a 7.3 m granular driveable top width.

Bridge No. 3: Station 0+921 Debra Cowin & Lawrence Baillargeon (Roll No. 090-040-03200)

A 7.6 m long, 900 mm diameter corrugated steel pipe provides access to this property. A culvert was shown at this location on the profile in the 1970 report. This culvert is deficient in top width, hydraulic capacity and lacks end protection.



We recommend the culvert be replaced with a new 10.0 m long, 1200 mm diameter SaniTite HP polypropylene pipe complete with concrete block end walls with a 7.3 m granular driveable top width.

Bridge No. 4: Station 1+269 Felina Salas (Roll No. 580-05100)

A 4.0 m long, 1400 mm diameter steel pipe provides primary access to this property. A culvert was shown at this location on the profile in the 1970 report.

After consultation with the landowner, this culvert is not required. We recommend the culvert be removed from the drain and that the drain be shaped and graded to the proposed cross section and profile.

Bridge No. 5: Station 1+306 Felina Salas (Roll No. 580-05100)

A 6.2 m long, 1450 mm diameter corrugated steel pipe provides a secondary access to this property. The origin of this culvert is unknown. This culvert is perched in the drain and deficient in top width, cover and lacks end protection.

We recommend the culvert be replaced with a new 16.0 m long, 1200 mm diameter aluminized corrugated steel pipe complete with rip rap end walls with filter fabric underlay with a 7.3 m granular driveable top width. With the removal of the primary access Bridge No. 4, this bridge will become the primary access.

Bridge No. 6: Station 1+439 County of Essex (County Road No. 43 - Banwell Road)

A 12.5 m long, 900 mm diameter HDPE and 1400 mm diameter CSP with broken concrete end protection and asphalt surface provides a road crossing. A culvert was shown at this location on the profile in the 1970 report.

The County Road No. 43 reconstruction project proposes to widen the existing road to a four lane urbanized cross section with centre median complete with new storm sewers. We therefore recommend that the culvert be replaced with a new 46.0 m long, 1200 mm diameter concrete pipe complete with rip rap end walls with filter fabric underlay. The bridge shall include a custom 3000 mm x 2400 mm precast concrete box storm manhole to provide a serviceable connection for the new County Road No. 43 storm sewers. The road cross section shall be constructed according to the County Road No. 43 Construction Drawings.

Bridge No. 7: Station 1+573 1000044993 Ontario Inc. (Roll No. 570-34300)

A 4.9 m long, 1600 mm diameter steel boiler pipe provides access to this property. A culvert was shown at this location on the profile in the 1970 report. This culvert is deficient in cover and lacks end protection. The pipe characteristics are unknown.

There is no evidence that this culvert has been used in many years, however due to the reconstruction of Banwell Road, the landowner will now require access across the drain. We recommend the culvert be replaced with a new 14.5 m long, 1,000 mm diameter aluminized corrugated steel pipe complete with rip rap end walls with filter fabric underlay with a 7.3 m granular driveable top width.

Bridge No. 8: Station 1+796 Eugene & Clement Lachance (Roll No. 570-34100)

A 6.5 m long, 900 mm diameter concrete pipe provides access to this property. A culvert was shown at this location on the profile in the 1970 report. This culvert has failed.

After consultation with the landowner, the culvert is not required. We recommend the culvert be removed from the drain and the drain be graded to the proposed design profile and the banks reshaped and repaired accordingly to the proposed cross section.

Bridge No. 9: Station 1+844 Eugene & Clement Lachance (Roll No. 570-34100)

A 7.0 m long, 1200 mm diameter corrugated steel pipe provides access to this property. The origin of this culvert is unknown. This culvert is perched in the drain and is deficient in cover, top width, lacks end protection and has backfall.

We recommend the culvert be replaced with a new 14.5 m long, 900 mm diameter aluminized corrugated steel pipe complete with rip rap end walls with filter fabric underlay with a 7.3 m granular driveable top width.

Bridge No. 10: Station 1+972 2041235 Ontario Ltd. (Roll No. 570-34000)

A 7.0 m long, 900 mm diameter concrete pipe provides access to this property. A culvert was shown at this location on the profile in the 1970 report. This culvert has failed. This culvert is deficient in adequate cover, top width and end protection.

We recommend the culvert be replaced with a new 13.5 m long, 900 mm diameter aluminized corrugated steel pipe complete with rip rap end walls with filter fabric underlay with a 7.3 m granular driveable top width.

Allowances

In accordance with Sections 29 of the Drainage Act, we have made a determination of the amount to be paid for land taken in the improvements to the drain as recommended. The average land cost for the surrounding area used to calculate the value of land taken is \$49,420 per hectare.

In accordance with Section 30 of the Drainage Act, we have determined the amount to be paid to the owners for damages to lands and crops (if any) occasioned by the operation of equipment and the disposal of material excavated from the drain. Throughout the length of the work, the excavated material is to be disposed of as set out in the Special Provisions in Schedule 'F' herein. In general, a 9 metre wide working corridor measured from the top of bank has been considered for the drainage works. The allowance for damages is calculated at a rate of \$4,448 per hectare (\$1,800 per acre).

Based on findings from soil sampling and analysis, excavated soils from the drain downstream of Banwell Road contain salt parameters that may affect crop growth.

Therefore, for the lands west of Banwell Road where the spoils are to be spread in the working corridor, the allowances for damages have been increased to \$5,683 per hectare (\$2,300 per acre), an increase of \$1,235 per hectare (\$500 per acre).

Allowances provided to owners under Section 29 and Section 30 are summarized in Schedule 'B-1' and Schedule 'B-2' for lands within the Town of Tecumseh and the City of Windsor, respectively.

Recommendations and Cost Estimate

Based on our review of the history, the information obtained during the site meeting and our examination and analysis of the survey data, we recommend that the Desjardins Drain be repaired and improved as described below:

Item	Description	Amount
	<u>OPEN DRAIN WORK</u>	
1.	Brushing of the drain from Station 0+000 to Station 2+144 including the disposal by burning on-site or removal off-site with trimming and/or removal of existing trees as required to accommodate the drainage works.	\$33,000.00
2.	Excavation, levelling and trucking of excavated materials, as follows:	
	a) Excavation of the drain bottom, as follows:	
	i) Station 0+000 to Station 2+144, totalling approximately 2,144 lineal metres of drain and approximately 1,260 m ³ of material.	\$30,800.00
	b) Levelling of excavated materials, as follows:	
	i) Station 0+000 to Station 1+028, totalling approximately 1,028 lineal metres of drain and approximately 600 m ³ of material.	\$2,400.00
	ii) Station 1+415 to Station 2+144, totalling approximately 729 lineal metres of drain and approximately 405 m ³ of material.	\$1,600.00
	c) Trucking of excavated materials at all non-agricultural properties and grassed lawns, as follows:	
	i) Station 1+028 to Station 1+144, totalling approximately 116 lineal metres of drain and approximately 65 m ³ of material. <i>(Based on the findings of the soil sampling and analysis program, excess soils within the Project Area are suitable to be transported to a beneficial reuse site accepting soils meeting Table 3.1 RPI ESQS or Table 3.1 ICC ESQS).</i>	\$5,300.00
	ii) Station 1+144 to Station 1+415, totalling approximately 271 lineal metres of drain and approximately 190 m ³ of material. <i>(Based on the findings of the soil sampling and analysis program, excess soils within the Project Area are suitable to be transported to a beneficial reuse site accepting soils meeting Table 3.1 RPI ESQS or Table 3.1 ICC ESQS)</i>	\$15,100.00

Item	Description	Amount
3.	Stone erosion protection on drain banks, as follows:	
	a) Station 0+128 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	b) Station 0+136 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	c) Station 0+728 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	d) Station 0+820 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	e) Station 1+569 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	f) Station 1+615 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	g) Station 1+682 Surface swale enters from north – Supply and install 15 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$1,300.00
	h) Station 1+709 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	i) Station 1+738 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	j) Station 1+790 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	k) Station 1+791 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	l) Station 1+880 - 200 mm dia. Big 'O' enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection around pipe including filter fabric underlay.	\$900.00
	m) Station 1+882 - 200 mm dia. Big 'O' enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection around pipe including filter fabric underlay.	\$900.00

Item	Description	Amount
	n) Station 1+967 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	o) Station 1+967 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	p) Station 2+053 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	q) Station 2+054 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$900.00
	r) Station 2+143 Surface swale enters from north – Supply and install 15 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.	\$1,300.00
4.	Private access bridge replacement works, as follows:	
	a) <u>Bridge No. 1</u> – Station 0+285 (Roll No. 090-050-00500) – Removal and disposal of existing 7.4 m long, 1200 mm diameter CSP and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 10.0 m long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) (see specifications), compacted Granular ‘A’ bedding material beneath pipe (minimum 300 mm thickness), (approximately 20 tonnes), compacted Granular ‘A’ material backfill (approximately 70 tonnes), Granular ‘A’ driveway materials (approximately 25 tonnes) and vertical concrete Lock Block endwalls (approximately 9 full blocks and 7 half wide blocks) providing a minimum 7.3 m (24 ft.) driveable top width. Rip rap on drain banks, minimum 300 mm thickness with filter fabric underlay, minimum 1.0 m wide beside concrete block endwalls on all four sides of bridge (approximately 15 m ²). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$25,000.00

Item	Description	Amount
	b) <u>Bridge No. 2</u> – Station 0+523 (Roll No. 090-050-00500) – Removal and disposal of existing 6.1 m long, 900 mm diameter concrete pipe/1100 mm diameter steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 10.0 m long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) (see specifications), compacted Granular ‘A’ bedding material beneath pipe (minimum 300 mm thickness), (approximately 20 tonnes), compacted Granular ‘A’ material backfill (approximately 70 tonnes), Granular ‘A’ driveway materials (approximately 25 tonnes) and vertical concrete Lock Block endwalls (approximately 9 full blocks and 7 half wide blocks) providing a minimum 7.3 m (24 ft.) driveable top width. Rip rap on drain banks, minimum 300 mm thickness with filter fabric underlay, minimum 1.0 m wide beside concrete block endwalls on all four sides of bridge (approximately 15 m²). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$24,000.00
	c) <u>Bridge No. 3</u> – Station 0+921 (Roll No. 090-040-03200) – Removal and disposal of existing 7.6 m long, 900 mm diameter corrugated steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 10.0 m long, 1200 mm triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) (see specifications), compacted Granular ‘A’ bedding material beneath pipe (minimum 300 mm thickness), (approximately 20 tonnes), compacted Granular ‘A’ material backfill (approximately 70 tonnes), Granular ‘A’ driveway materials (approximately 30 tonnes) and vertical concrete Lock Block endwalls (approximately 11 full blocks and 4 half wide blocks) providing a minimum 7.3 m (24 ft.) driveable top width. Rip rap on drain banks, minimum 300 mm thickness with filter fabric underlay, minimum 1.0 m wide beside concrete block endwalls on all four sides of bridge (approximately 15 m²). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$25,000.00

Item	Description	Amount
	d) <u>Bridge No. 5</u> – Station 1+306 (Roll No. 580-05100) – Removal and disposal of existing 6.2 m long, 1450 mm diameter corrugated steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area, removal and reinstatement of wood fence. Supply and installation of a new 16.0 m long, 1200 mm diameter aluminized corrugated steel pipe with a 2.8 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 15 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 25 tonnes), clean native backfill material above (approximately 45 m ³), Granular ‘A’ driveway materials (approximately 25 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 30 m ²) providing a minimum 7.3 m (24 ft.) driveable top width. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$18,500.00
	e) <u>Bridge No. 7</u> – Station 1+573 (Roll No. 570-34300) – Removal and disposal of existing 4.9 m long, 1600 mm diameter steel boiler pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 14.5 m long, 1000 mm diameter aluminized corrugated steel pipe with a 2.0 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 10 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 20 tonnes), clean native backfill material above (approximately 35 m ³), Granular ‘A’ driveway materials (approximately 25 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 30 m ²) providing a minimum 7.3 m (24 ft.) driveable top width. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$13,300.00

Item	Description	Amount
	f) <u>Bridge No. 9</u> – Station 1+844 (Roll No. 570-34100) – Removal and disposal of existing 7.0 m long, 1200 mm diameter corrugated steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 14.5 m long, 900 mm diameter aluminized corrugated steel pipe with a 2.0 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 10 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 15 tonnes), clean native backfill material above (approximately 35 m ³), Granular ‘A’ driveway materials (approximately 30 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 30 m ²) providing a minimum 7.3 m (24 ft.) driveable top width. Reroute existing 100 mm diameter Big ‘O’ to end wall (approximately 3 m long). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$12,500.00
	g) <u>Bridge No. 10</u> – Station 1+972 (Roll No. 570-34000) – Removal and disposal of existing 7.0 m long, 900 mm diameter concrete pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 13.5 m long, 900 mm diameter aluminized corrugated steel pipe with a 2.0 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 10 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 15 tonnes), clean native backfill material above (approximately 30 m ³), Granular ‘A’ driveway materials (approximately 25 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 20 m ²) providing a minimum 7.3 m (24 ft.) driveable top width. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.	\$10,800.00
5.	Private access bridge removals, as follows:	
	a) <u>Bridge No. 4</u> – Station 1+269 (Roll No. 580-05100) – Remove existing 4.0 m long, 1400 mm diameter steel pipe from drain. The work includes the full removal of all backfill and driveway materials to an off-site location. The work also includes the full restoration of the disturbed drain banks with fine grading and seeding.	\$2,300.00

Item	Description	Amount
	b) <u>Bridge No. 8 – Station 1+796 (Roll No. 570-34100) – Remove existing 6.5 m long, 900 mm diameter concrete pipe from drain. The work includes the full removal of all backfill and driveway materials to an off-site location. The work also includes the full restoration of the disturbed drain banks with fine grading and seeding.</u>	\$2,500.00
6.	Temporary Silt Control Measures During Construction	<u>\$1,000.00</u>
	SUB-TOTAL – EXCLUDING SECTION 26 COSTS	\$240,100.00
7.	Allowances under Section 30.	\$10,100.00
8.	Survey, Report, Assessment and Final Inspection. (cost portion)	\$58,000.00
9.	Expenses and incidentals. (cost portion)	\$1,500.00
10.	Excess soils sampling, reporting, lab expense and assistance during construction.	\$17,000.00
11.	Services during construction.	\$30,000.00
12.	ERCA application review and permit fee.	\$800.00
13.	Heritage Impact Assessment Study	<u>\$11,620.00</u>
	TOTAL – EXCLUDING SECTION 26 COSTS	\$369,120.00
	SECTION 26 NON PRO-RATEABLE COSTS	
14.	Road bridge works, as follows:	
	a) <u>Bridge No. 6 (County Road No. 43 - Banwell Road) – Station 1+439 Removal and disposal of existing 12.5 m long, combination 900 mm diameter HDPE/1400 mm diameter CSP and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 46.0 m long, 1200 mm diameter concrete pipe (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 45 tonnes), full Granular ‘A’ backfill (approximately 430 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 40 m²) complete with connections into a custom 3000 mm x 2400 mm precast concrete storm manhole with frame and cover. Asphalt surface by others. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.</u>	\$136,600.00

Item	Description	Amount
	SUB-TOTAL – SECTION 26 NON PRO-RATEABLE COSTS	\$136,600.00
15.	Allowances under Section 30.	\$1,200.00
16.	Engineering cost portion.	<u>\$37,000.00</u>
	TOTAL – SECTION 26 NON PRO-RATEABLE COSTS	\$174,800.00
	TOTAL ESTIMATE – DESJARDINS DRAIN	\$543,920.00

The estimate provided in this report was prepared according to current materials and installation prices as of the date of this report. In the event of delays from the time of filing of the report by the Engineer to the time of tendering the work, it is understood that the estimate of cost is subject to inflation. The rate of inflation shall be calculated using the Consumer Price Index applied to the cost of construction from the date of the report to the date of tendering.

Should the Road Authority elect to construct the drainage works across their road right-of-ways (Section 26.0 increased cost items) with their own forces, as per Section 69 of the Drainage Act, R.S.O., 1990, the Road Authority shall remain responsible for their allotment of costs for the preparation of this report as outlined in our estimate. Should the Road Authority elect not to undertake this work, the work items, as noted under Section 26 above, should be kept separate when tendering out the entire drainage works.

Assessment of Costs

The individual assessments are comprised of three (3) assessment components:

- i. Benefit (*advantages relating to the betterment of lands, roads, buildings, or other structures resulting from the improvement to the drain*).
- ii. Outlet Liability (*part of cost required to provide outlet for lands and roads*).
- iii. Special Benefit (*additional work or feature that may not affect function of the drain*).

We have assessed the estimated costs against the affected lands and roads as listed in Schedule 'C' under "Value of Special Benefit," "Value of Benefit" and "Value of Outlet." Details of the Value of Special Benefit listed in Schedule 'C' are provided in Schedule 'D.'

Assessment Rationale - Open Drain Improvements

We have assessed the above estimated costs for the repair and improvement of the Desjardins Drain against the affected lands and roads listing in Schedule "C" under "Benefit" and "Outlet Liability".

The above estimated costs have been assessed 50% as a Benefit assessment and 50% as an Outlet Liability assessment against all upstream lands and roads within the drainage area.

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1. For tile main outlet repairs including stone erosion protection as required, at the location of the said main tile outlets, the Drainage Superintendent and/or Engineer may direct the contractor to make these repairs at the expense of the landowner. Private tile repairs shall be assessed 100% against the property on which the said tile exists.
 2. Bank failure repairs caused by surface water inlets on abutting lands along the drain shall be assessed 100% to the abutting landowner.
 3. Lands containing woodlots were reduced in the assessment to reflect that only surface water from the woodlots enter the drain.
 4. The additional Section 30 allowances (\$500 per acre) awarded for the spreading of salt impacted soils has been assessed against the County of Essex Roads Department since it is reasonable to infer that salts originate from winter deicing activities along Banwell Road (County Road No. 43).
 5. The Heritage Impact Assessment study was completed for Roll No. 580-05000 as it has a designation under Part IV of the Ontario Heritage Act and as required under Section 3.4 of the Town of Tecumseh Official Plan shall be assessed 100% to the landowner.

Assessment Rationale for Special Benefit Assessments (Bridges)

Special Benefit assessments shown in Schedule 'C' and detailed in Schedule 'D-1' and Schedule 'D-2' were derived as follows:

1. Replacement costs of primary access Bridge Nos. 1, 3, 5, 7, 9 and 10 have been assessed 50% against the abutting property and the remaining 50% as an Outlet assessment against the upstream lands and roads.
2. Removal costs of access Bridge Nos. 4 and 8 without replacement have been assessed 100% against the adjacent landowner. These bridges represent secondary access to the property.
3. Replacement costs of Bridge No. 2 have been assessed 100% against Hydro One Networks Inc. (Roll No. 090-050-00500) being a secondary access.
4. Replacement costs of road access Bridge No. 6 has been assessed 100% against the County of Essex under Section 26 of the Drainage Act and shall have a non-proratable assessment.

Utilities

It may become necessary to temporarily or permanently relocate utilities that may conflict with the construction recommended under this report. In accordance with Section 26 of the Drainage Act, we assess any relocation cost against the public utility having jurisdiction. Under Section 69 of the Drainage Act, the public utility is at liberty to do the work with its own forces, but if it should not exercise this option within a reasonable time, the Municipality will arrange to have this work completed and the costs will be charged to the appropriate public utility.

Future Maintenance (Open Drain)

After completion, the Desjardins Drain shall be maintained by the Town of Tecumseh and the City of Windsor at the expense of lands and roads and in the same relative proportions subject, of course, to any variations that may be made under the authority of the Drainage Act. Future costs assessed to lands and roads within the Town of Tecumseh shall be assessed according to Schedule 'E-1.' Costs assessed to lands within the City of Windsor shall be assessed according to Schedule 'E-2'. The assessments are based on an arbitrary amount of \$20,000.00.

Future Maintenance (Private Access Bridges)

We recommend that future work of repair and maintenance of the Desjardin Drain private access bridges be carried out by the Town of Tecumseh and the City of Windsor at the expense of the property or properties accessed by the bridge and of the lands and roads upstream of the respective bridge.

Schedule 'E-3' represents all the lands and roads upstream of Bridge No. 5 and is applicable to other primary access bridges located further upstream by including only those properties that are upstream of the said bridge.

Similarly, Schedule 'E-4' represents all the lands and roads upstream of Bridge No. 1 and is only applicable to primary access bridges located within the City of Windsor (Bridge Nos. 1, 2, and 3). The assessments are based on an arbitrary amount of \$10,000.00 of future access bridge maintenance costs.

The division between Special Benefit and Outlet assessment for each bridge shall be as follows:

Bridge No.	Type	Owner(s)	Special Benefit	Outlet
1	Primary	Hydro One Networks Inc. Roll No. 090-050-00500	50%	50%
2	Secondary	Hydro One Networks Inc. Roll No. 090-050-00500	100%	0%
3	Primary	Debra Cowin & Lawrence Baillargeon Roll No. 090-040-03200	50%	50%
5	Primary	Felina Salas Roll No. 580-05100	50%	50%
6	Road	County of Essex	100%	0%
7	Primary	10000449933 Ontario Inc. 570-34300	50%	50%
9	Primary	Eugene & Clement Lachance Roll No. 570-34100	50%	50%
10	Primary	2041235 Ontario Ltd. Roll No. 570-34000	50%	50%

Drawings and Specifications

Attached to this report is Schedule 'F', which are Specifications setting out the details of the recommended works and Schedule 'G' which represent the drawings that are attached to this report.

Page 1 of 8 - Watershed Plan

Page 2 of 8 - Profile

Page 3 of 8 - Cross Sections

Page 4 of 8 - Bridge Design Table

Page 5 of 8 - Bridge Details (Block End Walls)

Page 6 of 8 - Bridge Details

Page 7 of 8 - Road Bridge Details

Page 8 of 8 - Miscellaneous Details

Approvals

The construction and/or improvement to a drainage works, including repair and maintenance activities, and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced by the proposed works. Prior to any construction or maintenance works, the Municipality or proponent designated on the Municipality's behalf shall obtain all the necessary approvals for the recommended works have been acquired from Essex Region Conservation Authority, Department of Fisheries and Oceans and Ministry of Environment, Conservation and Parks. Construction of the works shall be carried out in accordance with all mitigation measures, timing windows, standard practices and other applicable limitations related to in-stream works.

Grants

In accordance with the provisions of Sections 85, 86 and 87 of the Drainage Act, a grant in the amount of 33-1/3 percent of the assessment eligible for a grant may be made in respect to the assessment made under this report upon privately owned lands used for agricultural purposes. The assessments levied against privately owned agricultural land must also satisfy all other eligibility criteria set out in the Agricultural Drainage Infrastructure Program policies. Most of the privately owned lands are used for agricultural purposes and are eligible under the A.D.I.P. policies. We are not aware of any lateral drains involved in this work that would not be eligible for a grant.

We recommend that application be made to the Ontario Ministry of Agriculture and Food in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

Respectfully submitted,

DILLON CONSULTING LIMITED



Mark D. Hernandez, P.Eng.

MDH: kaw/wlb/lld

Meeting Minutes

Subject: Desjardins Drain
Date: February 8, 2018
Location: Town of Tecumseh Council Chambers, 917 Lesperance Road, Town of Tecumseh
Our File: 17-6774
Distribution: Distribution

Attendees

Sam Paglia	Town of Tecumseh
Mark Hernandez	Dillon Consulting Limited
Landowners	See sign-in sheet

Notes

Item	Discussion	Action by
1.	General Information Regarding The Drainage Act	
1.1.	The Drainage Act is a Provincial Act that is the responsibility of the municipal government to implement.	
1.2.	The act is over 100 years old and can be found on E-Laws website	
1.3.	The Act is a user based system, this is dissimilar to municipal sewers.	
1.4.	The drainage process is generally as follows: • A request is submitted • The Engineer is appointed by the Municipality • Site Meetings are held • The Report is prepared • PIC is held (not required by the Act) • A Meeting to Consider the technical aspects of the report • Court of Revision is held to discuss assessments	
1.5.	The purpose of the site meeting is to gather information in which landowners can provide feedback about the performance of the drain as well as make comments.	
2.	Payment	
2.1.	Drain Cleanouts	
2.1.1.	These costs are currently assessed for benefit and outlet per the Act. The assessment is based on how much water is sent down the drain and how much of the drain is used.	
2.2.	Culvert Replacements	
2.2.1.	When a replacement culvert is required the cost assessment is usually split 50/50.	
2.2.2.	If a new culvert is required the landowner is typically assessed 100% of the cost.	
2.3.	Special Benefit Assessment	
2.3.1.	These are items that do not affect the function of the drain, these items could include: different headwalls, longer pipes, etc.	

Item	Discussion	Action by
2.4.	The Engineer determines the assessment. Each assessment will include details for each property that falls within the watershed.	
2.5.	Grants are available for properties that have a "Farm Class Tax Rate"	
2.6.	The municipality will bill the landowners after the work is complete for their net assessment.	
3.	Report Expectations	
3.1.	All landowners shall receive copies of the draft report with their notice for the PIC, Meeting to Consider and the Court of Revision. Reports generally contain: • Background information about the request • History on the drain • Watershed • Design considerations • Recommended work • Cost estimate • Meeting Minutes • Drawings • Assessments including FM Provisions • Specifications	
4.	Affects during Construction	
4.1.	Typically only landowners along the drain will be affected by construction.	
4.2.	Working corridors are defined within the report.	
4.3.	Work shall result in creating either the same or better level or service.	
4.4.	The quality of work is typically monitored during construction by the Drainage Superintendent.	
4.4.1.	The engineer is required to complete a final inspection.	
5.	Environmental Requirements	
5.1.	Often the DFO, MNRF and ERCA are involved with a drainage report.	
6.	Next Steps	
6.1.	Topographical survey will be completed and then the preparation of the report will commence	
6.2.	PIC Meeting	
6.3.	Board Meetings	
7.	Questions & Comments	
7.1.	Last year work was done on Banwell under Section 74, there is sediment and failed culverts	
7.2.	School's pump station feeds into a private ditch, would need a Section 4 to make it a municipal drain	
7.3.	Poor performance of the drain was noted	

Errors and/or Omissions

These minutes were prepared by Kristine Wilkinson who should be notified of any errors and/or omissions.

Meeting Minutes

Subject: Desjardins Drain
Date: April 6, 2018
Location: Town of Tecumseh Council Chambers, 917 Lesperance Road, Town of Tecumseh
Our File: 17-6774
Distribution: Distribution

Attendees

Sam Paglia	Town of Tecumseh
Anna Godo	City of Windsor
Mark Hernandez	Dillon Consulting Limited
Kristine Wilkinson	Dillon Consulting Limited

Notes

Item	Discussion	Action by
1.	This meeting was held specifically for the benefit of landowners within the City of Windsor, who had not received a copy of the invitation for the 8 February 2018 meeting. No landowners attended the meeting.	

Errors and/or Omissions

These minutes were prepared by Kristine Wilkinson who should be notified of any errors and/or omissions.

"SCHEDULE B-1"
SCHEDULE OF ALLOWANCES

DESJARDINS DRAIN
TOWN OF TECUMSEH

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
590-00500	3	Hydro R.O.W.	Hydro One Networks Inc.	\$170.00	\$0.00	\$170.00
580-05000	3	N. Pt. Lot 143 Plan 65 Pt. Lot 10	Trustees of the British Methodist Episcopal Church	\$450.00	\$0.00	\$450.00
580-05100	3	Pt. Lots 142&143 Plan 65 Lot 9	Felina Salas	\$1,080.00	\$0.00	\$1,080.00
580-05200	3	Pt. Lots 142&143 Plan 65 Lot 5,7,8 & Pt. Lot 6	Domenic & Maria D. Conflitti	\$70.00	\$0.00	\$70.00
570-34300	3	Pt. Lots 144-146 RP12R23680 Pts. 1,3&11- 15	1000044993 Ontario Inc.	\$1,530.00	\$0.00	\$1,530.00
570-34100	3	S. Pt. Lot 147	Eugene & Clement Lachance	\$700.00	\$0.00	\$700.00
570-34000	3	S. Pt. Lot 148 RP12R1772 Pts. 1&2	2041235 Ontario Ltd.	\$700.00	\$0.00	\$700.00
TOTAL ALLOWANCES				\$4,700.00	\$0.00	\$4,700.00

"SCHEDULE B-2"
SCHEDULE OF ALLOWANCES

DESJARDINS DRAIN
CITY OF WINDSOR

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
090-050-00500	3	Hydro R.O.W.	Hydro One Networks Inc.	\$4,040.00	\$0.00	\$4,040.00
090-040-03000	3	S. Pt. Lot 140	James Sylvestre Developments Inc.	\$200.00	\$0.00	\$200.00
090-040-03200	3	S. Pt. Lot 141	Debra Cowin & Lawrence Baillargeon	\$1,160.00	\$0.00	\$1,160.00
TOTAL ALLOWANCES				\$5,400.00	\$0.00	\$5,400.00

"SCHEDULE C"
SCHEDULE OF ASSESSMENT
DESJARDINS DRAIN
TOWN OF TECUMSEH & CITY OF WINDSOR

TOWN OF TECUMSEH

MUNICIPAL LANDS:

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 43 (Banwell Road)	4.00	1.62	County of Essex	\$0.00	\$2,600.00	\$5,982.00	\$8,582.00
Shields Street	1.60	0.65	Town of Tecumseh	\$0.00	\$780.00	\$1,989.00	\$2,769.00
570-33920 3 Pt. Lot 149 RP12R3074 Pt. 2	5.00	2.02	Town of Tecumseh	\$0.00	\$679.00	\$4,363.00	\$5,042.00
Total on Municipal Lands.....				\$0.00	\$4,059.00	\$12,334.00	\$16,393.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
580-05000	3	N. Pt Lot 143 Plan 65 Pt. Lot 10	4.77	1.93 *	Trustees of The British Methodist Episcopal Church	\$23,854.00	\$853.00	\$631.00	\$25,338.00
580-05100	3	Pt. Lots 142&143 Plan 65 Pt. Lot 9	10.00	4.05 *	Felina Salas	\$37,572.00	\$2,327.00	\$1,985.00	\$41,884.00
570-34300	3	Pt. Lots 144- 146 RP12R23680 Pts. 1,3&11- 15	81.56	33.01	1000044993 Ontario Inc.	\$17,552.00	\$11,617.00	\$28,500.00	\$57,669.00
580-05300	3	Pt. Lot 143 Plan 65 Pt. Lots 5&6	1.00	0.40	Hitesh & Trisha Kharwal	\$0.00	\$240.00	\$523.00	\$763.00
580-05320	3	Pt. Lot 143 Plan 65 Pt. Lot 4 RP12R9654 Pt. 1	0.47	0.19	Michael M. & Anna Baillargeon	\$0.00	\$171.00	\$372.00	\$543.00
570-34350	3	Lots 144-146 RP12R23680 Pts. 6,9,10	22.12	8.95	Greater Essex County District School Board	\$0.00	\$3,566.00	\$10,248.00	\$13,814.00
570-34325	3	Lot 146 RP12R23680 Pt. 5	8.00	3.24	Greater Essex County District School Board	\$0.00	\$1,776.00	\$5,247.00	\$7,023.00
570-33930	3	Lot 149 RP12R3074 Pt. 1	22.38	9.06 *	Essex Region Conservation Authority	\$0.00	\$3,272.00	\$7,942.00	\$11,214.00
570-32001	3	Lot 149 RP12R3074 Pt. 3	6.71	2.72	Windsor-Essex Catholic District School Board	\$0.00	\$815.00	\$5,215.00	\$6,030.00
590-00500	3	Hydro R.O.W.	30.00	12.14	Hydro One Networks Inc.	\$0.00	\$3,742.00	\$8,078.00	\$11,820.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$78,978.00	\$28,379.00	\$68,741.00	\$176,098.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
580-05200	3	Pt. Lot 142&143 Plan 65 Lots 5,7,8 & Pt. Lot 6	42.14	17.05	Domenic & Maria D. Conflitti	\$0.00	\$5,213.00	\$12,552.00	\$17,765.00
570-34100	3	S. Pt Lot 147	33.00	13.35	Eugene & Clement Lachance	\$17,408.00	\$4,927.00	\$15,230.00	\$37,565.00
570-34000	3	S. Pt Lot 148 RP12R1772 Pts. 1&2	30.00	12.14	2041235 Ontario Limited	\$13,252.00	\$6,355.00	\$16,684.00	\$36,291.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$30,660.00	\$16,495.00	\$44,466.00	\$91,621.00

SECTION 26 INCREASED COSTS (NON PRO-RATABLE)

Roll No.	Con.	Description	Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 43 (Banwell Road)			County of Essex	\$174,800.00	\$0.00	\$0.00	\$174,800.00
Total Section 26 Increased Costs (Non Pro-ratable).....				\$174,800.00	\$0.00	\$0.00	\$174,800.00
TOTAL ASSESSMENT (Town of Tecumseh).				\$284,438.00	\$48,933.00	\$125,541.00	\$458,912.00

	(Acres)	(Ha.)
Total Area:	302.75	122.52

CITY OF WINDSOR**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-050-005	3	Hydro R.O.W.	42.67	17.27	Hydro One Networks Inc.	\$38,348.00	\$9,282.00	\$7,671.00	\$55,301.00
090-040-012	3	S. Pt. Lot 135 N. Pt. Lots 136-137 RP12R9463	3.00	1.21	Amrik & Gurmail Singh Maan	\$0.00	\$362.00	\$312.00	\$674.00
090-040-032	3	S. Pt. Lot 141	7.35	2.97	Debra Cowin & Lawrence Baillargeon	\$18,283.00	\$1,906.00	\$1,542.00	\$21,731.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$56,631.00	\$11,550.00	\$9,525.00	\$77,706.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-040-033	3	Pt. Lot 138	3.50	1.42	Pointe East Windsor Limited	\$0.00	\$489.00	\$471.00	\$960.00
090-040-027	3	Pt. Lot 139 RP12R18203 Pt. 1	7.30	2.95	Petrovec Investments Limited	\$0.00	\$1,900.00	\$1,218.00	\$3,118.00
090-040-02902	3	Pt. Lot 140 RP12R26594 Pt. 3	4.50	1.82	James Sylvestre Developments Ltd.	\$0.00	\$545.00	\$769.00	\$1,314.00
090-040-030	3	S. Pt. Lot 140	3.50	1.42	James Sylvestre Developments Ltd.	\$660.00	\$636.00	\$614.00	\$1,910.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$660.00	\$3,570.00	\$3,072.00	\$7,302.00
TOTAL ASSESSMENT (City of Windsor).....						\$57,291.00	\$15,120.00	\$12,597.00	\$85,008.00

	(Acres)	(Ha.)
Total Area:	68.32	27.64

TOTAL OVERALL ASSESSMENT (Town of Tecumseh & City of Windsor).....	\$341,729.00	\$64,053.00	\$138,138.00	\$543,920.00
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	(Acres)	(Ha.)
Total Area:	371.07	150.16

* denotes woodlots assessed at half rate of agricultural land

"SCHEDULE D-1"
DETAILS OF SPECIAL BENEFIT
DESJARDINS DRAIN
TOWN OF TECUMSEH

SPECIAL BENEFIT ASSESSMENT
(NON - AGRICULTURAL LANDS)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
580-05000	Trustees of the British Methodist Episcopal Church	Trucking of excavated materials - Station 1+028 to Station 1+144 (1.2 m wide bottom totalling 116 lineal metres of drain and approximately 65 m ³ of material. (100%)	\$5,300.00	\$2,172.00	\$7,472.00
		Heritage Impact Assessment Study (100%)	\$11,620.00	\$4,762.00	\$16,382.00
		Total Special Benefit - Roll No. 580-05000	\$16,920.00	\$6,934.00	\$23,854.00
580-05100	Felina Salas	<u>Bridge No. 4</u> -Station 1+306 Remove ex. 4 m long, 1400 mm dia. steel pipe from drain. (100%)	\$2,300.00	\$943.00	\$3,243.00
		<u>Bridge No. 5</u> -Station 1+306 Remove ex. 6.2 m long, 1450 mm dia. CSP. Supply & install new 16 m long, 1200 mm dia. CSP c/w sloping stone end walls. (50%)	\$9,250.00	\$3,791.00	\$13,041.00
		Trucking of excavated materials - Station 1+144 to Station 1+415, (1.2m wide bottom totalling 271 lineal metres of drain and approximately 190 m ³ of material. (100%)	\$15,100.00	\$6,188.00	\$21,288.00
		Total Special Benefit - Roll No. 580-05100	\$26,650.00	\$10,922.00	\$37,572.00
570-34300	1000044993 Ontario Inc.	<u>Bridge No. 7</u> -Station 1+573 Remove ex. 4.9 m long, 1600 mm dia. Steel pipe. Supply & install new 14.5 m long, 1000 mm dia. CSP c/w sloping stone end walls.(50%)	\$6,650.00	\$2,725.00	\$9,375.00
		Station 1+569 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 1+615 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 1+682 Surface swale enters from south – Supply and install 15 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$1,300.00	\$533.00	\$1,833.00
		Station 1+709 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 1+738 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 1+790 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$184.00	\$634.00

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
		Station 1+791 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$184.00	\$634.00
		Total Special Benefit - Roll No. 570-34300	\$12,450.00	\$5,102.00	\$17,552.00
Total Special Benefit Assessment (Non - Agricultural Lands).....			\$56,020.00	\$22,958.00	\$78,978.00

SPECIAL BENEFIT ASSESSMENT
(AGRICULTURAL LANDS GRANTABLE)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
570-34100	Eugene & Clement Lachance	<u>Bridge No. 8</u> -Station 1+796 Remove ex. 6.5 m long, 900 mm dia. concrete pipe from drain. (100%)	\$2,500.00	\$1,024.00	\$3,524.00
		<u>Bridge No. 9</u> -Station 1+844 Remove ex. 7 m long, 1200 mm dia. CSP. Supply & install new 14.5 m long, 900 mm dia. CSP c/w sloping stone end walls. (50%)	\$6,250.00	\$2,561.00	\$8,810.00
		Station 1+790 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$184.00	\$634.00
		Station 1+791 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$184.00	\$634.00
		Station 1+880 - 200 mm dia. Big 'O' enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection around pipe including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 1+882 - 200 mm dia. Big 'O' enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection around pipe including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 1+967 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$184.00	\$634.00
		Station 1+967 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$184.00	\$634.00
		Total Special Benefit - Roll No. 570-03100	\$12,350.00	\$5,059.00	\$17,408.00
570-34000	2041235 Ontario Ltd	<u>Bridge No. 10</u> -Station 1+972 Remove ex. 7 m long, 900 mm dia. conc. pipe. Supply & install new 13.5m, 900 mm diameter CSP c/w sloping stone end walls. (50%)	\$5,400.00	\$2,213.00	\$7,613.00

"SCHEDULE D-2"
DETAILS OF SPECIAL BENEFIT
DESJARDINS DRAIN
CITY OF WINDSOR

SPECIAL BENEFIT ASSESSMENT
(NON - AGRICULTURAL LANDS)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
090-050-00500	Hydro One Networks Inc.	<u>Bridge No. 1</u> -Station 0+285 Remove ex. 7.4 m long, 1200 mm dia. CSP. Supply & install new 10.0 m long, 1200 mm diameter SaniTite HP pipe c/w Lock Block end walls. (50%)	\$12,500.00	\$5,123.00	\$17,623.00
		<u>Bridge No. 2</u> -Station 0+523 Remove ex. 6.1 m long, 900 mm dia. Conc/1100 mm dia. Steel pipe. Supply & install new 10.0 m long, 1200 mm diameter SaniTite HP pipe c/w Lock Block end walls. (100%)	\$12,000.00	\$4,918.00	\$16,918.00
		Station 0+128 Surface swale enters from north – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 0+136 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
		Station 0+728 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (100%)	\$900.00	\$369.00	\$1,269.00
Total Special Benefit - Roll No. 090-050-00500			\$27,200.00	\$11,148.00	\$38,348.00
090-040-03200	Debra Cowin & Lawrence Baillargeon	<u>Bridge No. 3</u> -Station 0+921 Remove ex. 7.6 m long, 900 mm dia. CSP. Supply & install new 10.0 m long, 1200 mm diameter SaniTite HP pipe c/w Lock Block end walls. (50%)	\$12,500.00	\$5,123.00	\$17,623.00
		Station 0+820 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$210.00	\$660.00
Total Special Benefit - Roll No. 090-040-032			\$12,950.00	\$5,333.00	\$18,283.00
Total Special Benefit Assessment (Non - Agricultural Lands).....			\$40,150.00	\$16,481.00	\$56,631.00

SPECIAL BENEFIT ASSESSMENT
(AGRICULTURAL LANDS)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
090-040-03000	James Sylvestre Developments Ltd.	Station 0+820 Surface swale enters from south – Supply and install 10 m ² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay. (50%)	\$450.00	\$210.00	\$660.00
Total Special Benefit Assessment (Agricultural Lands).....			\$450.00	\$210.00	\$660.00
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT (City of Windsor).....					\$57,291.00

"SCHEDULE E-1"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (DRAIN)
DESJARDINS DRAIN
TOWN OF TECUMSEH

MUNICIPAL LANDS:

Description			Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 43 (Banwell Road)			4.00	1.62	County of Essex	\$0.00	\$200.00	\$284.00	\$484.00
Shields Street			1.60	0.65	Town of Tecumseh	\$0.00	\$50.00	\$98.00	\$148.00
570-33920	3	Pt. Lot 149 RP12R3074 Pt. 2	5.00	2.02	Town of Tecumseh	\$0.00	\$57.00	\$90.00	\$147.00
Total on Municipal Lands.....						\$0.00	\$307.00	\$472.00	\$779.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
580-05000	3	N. Pt Lot 143 Plan 65 Pt. Lot 10	4.77	1.93 *	Trustees of The British Methodist Episcopal Church	\$0.00	\$167.00	\$34.00	\$201.00
580-05100	3	Pt. Lots 142&143 Plan 65 Pt. Lot 9	10.00	4.05 *	Felina Salas	\$0.00	\$431.00	\$106.00	\$537.00
570-34300	3	Pt. Lots 144- 146 RP12R23680 Pts. 1,3&11- 15	81.56	33.01	1000044993 Ontario Inc.	\$0.00	\$1,084.00	\$1,247.00	\$2,331.00
580-05300	3	Pt. Lot 143 Plan 65 Pt. Lots 5&6	1.00	0.40	Hitesh & Trisha Kharwal	\$0.00	\$15.00	\$28.00	\$43.00
580-05320	3	Pt. Lot 143 Plan 65 Pt. Lot 4 RP12R9654 Pt. 1	0.47	0.19	Michael M. & Anna Baillargeon	\$0.00	\$11.00	\$20.00	\$31.00
570-34350	3	Lots 144-146 RP12R23680 Pts. 6,9,10	22.12	8.95	Greater Essex County District School Board	\$0.00	\$227.00	\$447.00	\$674.00
570-34325	3	Lot 146 RP12R23680 Pt. 5	8.00	3.24	Greater Essex County District School Board	\$0.00	\$113.00	\$223.00	\$336.00
570-33930	3	Lot 149 RP12R3074 Pt. 1	22.38	9.06 *	Essex Region Conservation Authority	\$0.00	\$565.00	\$219.00	\$784.00
570-32001	3	Lot 149 RP12R3074 Pt. 3	6.71	2.72	Windsor-Essex Catholic District School Board	\$0.00	\$52.00	\$120.00	\$172.00
590-00500	3	Hydro R.O.W.	30.00	12.14	Hydro One Networks Inc.	\$0.00	\$231.00	\$424.00	\$655.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$0.00	\$2,896.00	\$2,868.00	\$5,764.00

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)									
Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
580-05200	3	Pt. Lot 142&143 Plan 65 Lots 5,7,8 & Pt. Lot 6	42.14	17.05	Domenic & Maria D. Conflitti	\$0.00	\$352.00	\$595.00	\$947.00
570-34100	3	S. Pt Lot 147	33.00	13.35	Eugene & Clement Lachance	\$0.00	\$498.00	\$528.00	\$1,026.00
570-34000	3	S. Pt Lot 148 RP12R1772 Pts. 1&2	30.00	12.14	2041235 Ontario Limited	\$0.00	\$947.00	\$537.00	\$1,484.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$0.00	\$1,797.00	\$1,660.00	\$3,457.00
TOTAL ASSESSMENT (Town of Tecumseh).						\$0.00	\$5,000.00	\$5,000.00	\$10,000.00
			(Acres)	(Ha.)					
Total Area:			302.75	122.52					

* denotes woodlots assessed at half rate of agricultural land

"SCHEDULE E-2"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (DRAIN)
DESJARDINS DRAIN
CITY OF WINDSOR

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-050-00500	3	Hydro R.O.W.	42.67	17.27	Hydro One Networks Inc.	\$0.00	\$3,086.00	\$3,097.00	\$6,183.00
090-040-01200	3	S. Pt. Lot 135 N. Pt. Lots 136-137 RP12R9463	3.00	1.21	Amrik & Gurmail Singh Maan	\$0.00	\$104.00	\$165.00	\$269.00
090-040-03200	3	S. Pt. Lot 141	7.35	2.97	Debra Cowin & Lawrence Baillargeon	\$0.00	\$652.00	\$533.00	\$1,185.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$0.00	\$3,842.00	\$3,795.00	\$7,637.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-040-03300	3	Pt. Lot 138	3.50	1.42	Pointe East Windsor Limited	\$0.00	\$147.00	\$206.00	\$353.00
090-040-02700	3	Pt. Lot 139 RP12R18203 Pt. 1	7.30	2.95	Petrovec Investments Limited	\$0.00	\$650.00	\$465.00	\$1,115.00
090-040-02902	3	Pt. Lot 140 RP12R26594 Pt. 3	4.50	1.82	James Sylvestre Developments Ltd.	\$0.00	\$157.00	\$296.00	\$453.00
090-040-03000	3	S. Pt. Lot 140	3.50	1.42	James Sylvestre Developments Ltd.	\$0.00	\$204.00	\$238.00	\$442.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$0.00	\$1,158.00	\$1,205.00	\$2,363.00
TOTAL ASSESSMENT (City of Windsor).....						\$0.00	\$5,000.00	\$5,000.00	\$10,000.00

	(Acres)	(Ha.)
Total Area:	71.82	29.06

"SCHEDULE E-3"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (BRIDGES)
DESJARDINS DRAIN
TOWN OF TECUMSEH

MUNICIPAL LANDS:

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 43 (Banwell Road)	4.00	1.62	County of Essex	\$0.00	\$0.00	\$679.00	\$679.00
Shields Street	1.60	0.65	Town of Tecumseh	\$0.00	\$0.00	\$218.00	\$218.00
570-33920 3 Pt. Lot 149 RP12R3074 Pt. 2	5.00	2.02	Town of Tecumseh	\$0.00	\$0.00	\$169.00	\$169.00
Total on Municipal Lands.....				\$0.00	\$0.00	\$1,066.00	\$1,066.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
580-05000	3	N. Pt Lot 143 Plan 65 Pt. Lot 10	4.77	1.93 *	Trustees of The British Methodist Episcopal Church	\$0.00	\$0.00	\$20.00	\$20.00
580-05100	3	Pt. Lots 142&143 Plan 65 Pt. Lot 9	10.00	4.05 *	Felina Salas	\$0.00	\$0.00	\$64.00	\$64.00
570-34300	3	Pt. Lots 144- 146 RP12R23680 Pts. 1,3&11- 15	81.56	33.01	1000044993 Ontario Inc.	\$0.00	\$0.00	\$2,770.00	\$2,770.00
580-05300	3	Pt. Lot 143 Plan 65 Pt. Lots 5&6	1.00	0.40	Hitesh & Trisha Kharwal	\$0.00	\$0.00	\$67.00	\$67.00
580-05320	3	Pt. Lot 143 Plan 65 Pt. Lot 4 RP12R9654 Pt. 1	0.47	0.19	Michael M. & Anna Baillargeon	\$0.00	\$0.00	\$48.00	\$48.00
570-34350	3	Lots 144-146 RP12R23680 Pts. 6,9,10	22.12	8.95	Greater Essex County District School Board	\$0.00	\$0.00	\$999.00	\$999.00
570-34325	3	Lot 146 RP12R23680 Pt. 5	8.00	3.24	Greater Essex County District School Board	\$0.00	\$0.00	\$497.00	\$497.00
570-33930	3	Lot 149 RP12R3074 Pt. 1	22.38	9.06 *	Essex Region Conservation Authority	\$0.00	\$0.00	\$416.00	\$416.00
570-32001	3	Lot 149 RP12R3074 Pt. 3	6.71	2.72	Windsor-Essex Catholic District School Board	\$0.00	\$0.00	\$228.00	\$228.00
590-00500	3	Hydro R.O.W.	30.00	12.14	Hydro One Networks Inc.	\$0.00	\$0.00	\$255.00	\$255.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$0.00	\$0.00	\$5,364.00	\$5,364.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

Roll No.	Con.	Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
			(Acres)	(Ha.)					
580-05200	3	Pt. Lot 142&143 Plan 65 Lots 5,7,8 & Pt. Lot 6	42.14	17.05	Domenic & Maria D. Conflitti	\$0.00	\$0.00	\$1,431.00	\$1,431.00
570-34100	3	S. Pt Lot 147	33.00	13.35	Eugene & Clement Lachance	\$0.00	\$0.00	\$1,120.00	\$1,120.00
570-34000	3	S. Pt Lot 148 RP12R1772 Pts. 1&2	30.00	12.14	2041235 Ontario Limited	\$0.00	\$0.00	\$1,019.00	\$1,019.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$0.00	\$0.00	\$3,570.00	\$3,570.00
TOTAL ASSESSMENT (Town of Tecumseh).						\$0.00	\$0.00	\$10,000.00	\$10,000.00

	(Acres)	(Ha.)
Total Area:	302.75	122.52

* denotes woodlots assessed at half rate of agricultural land

"SCHEDULE E-4"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (BRIDGES)
DESJARDINS DRAIN
CITY OF WINDSOR

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-050-00500	3	Hydro R.O.W.	42.67	17.27	Hydro One Networks Inc.	\$0.00	\$0.00	\$5,833.00	\$5,833.00
090-040-03200	3	S. Pt. Lot 141	7.35	2.97	Debra Cowin & Lawrence Baillargeon	\$0.00	\$0.00	\$1,254.00	\$1,254.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$0.00	\$0.00	\$7,087.00	\$7,087.00

PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-040-03300	3	Pt. Lot 138	3.50	1.42	Pointe East Windsor Limited	\$0.00	\$0.00	\$300.00	\$300.00
090-040-02700	3	Pt. Lot 139 RP12R18203 Pt. 1	7.30	2.95	Petrovec Investments Limited	\$0.00	\$0.00	\$1,245.00	\$1,245.00
090-040-02902	3	Pt. Lot 140 RP12R26594 Pt. 3	4.50	1.82	James Sylvestre Developments Ltd.	\$0.00	\$0.00	\$768.00	\$768.00
090-040-03000	3	S. Pt. Lot 140	3.50	1.42	James Sylvestre Developments Ltd.	\$0.00	\$0.00	\$600.00	\$600.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$0.00	\$0.00	\$2,913.00	\$2,913.00
TOTAL ASSESSMENT (City of Windsor).						\$0.00	\$0.00	\$10,000.00	\$10,000.00

	(Acres)	(Ha.)
Total Area:	68.82	27.85

"SCHEDULE F"
DRAINAGE REPORT FOR THE
DESJARDINS DRAIN
IN THE TOWN OF TECUMSEH & CITY OF WINDSOR

SPECIAL PROVISIONS - GENERAL

1.0 GENERAL SPECIFICATIONS

The General Specifications attached hereto is part of "Schedule F." It also forms part of this specification and is to be read with it, but where there is a difference between the requirements of the General Specifications and those of the Special Provisions which follow, the Special Provisions will take precedence.

2.0 DESCRIPTION OF WORK

The work to be carried out under this Contract includes, but is not limited to, the supply of all **labour, equipment and materials** to complete the following items:

- Brushing of the drain from Station 0+000 to Station 2+144 including the disposal by burning on-site or removal off-site with trimming and/or removal of existing trees as required to accommodate the drainage works.
- Excavation, levelling and trucking of excavated materials works, as follows:
 - Excavation of the drain bottom, as follows:
 - Station 0+000 to Station 2+144, totalling approximately 2,144 lineal metres of drain and approximately 1,260 m³ of material.
 - Levelling of excavated materials, as follows:
 - Station 0+000 to Station 1+028, totalling approximately 1,028 lineal metres of drain and approximately 600 m³ of material.
 - Station 1+415 to Station 2+144, totalling approximately 729 lineal metres of drain and approximately 405 m³ of material.
 - Trucking of excavated materials at all non-agricultural properties and grassed lawns, as follows:
 - Station 1+028 to Station 1+144, totalling approximately 116 lineal metres of drain and approximately 65 m³ of material. *(Based on the findings of the soil sampling and analysis program, excess soils within the Project Area are suitable to be transported to a beneficial reuse site accepting soils meeting Table 3.1 RPI ESQS or Table 3.1 ICC ESQS)*
 - Station 1+144 to Station 1+415, totalling approximately 271 lineal metres of drain and approximately 190 m³ of material. *(Based on the findings of the soil sampling and analysis program, excess soils within the Project Area are suitable to be transported to a beneficial reuse site accepting soils meeting Table 3.1 RPI ESQS or Table 3.1 ICC ESQS)*

- Stone erosion protection on drain banks, as follows:
- Station 0+128 Surface swale enters from north – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 0+136 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 0+728 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 0+820 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+569 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+615 Surface swale enters from north – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+682 Surface swale enters from north – Supply and install 15 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+709 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+738 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+790 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+791 Surface swale enters from north – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+880 - 200 mm dia. Big 'O' enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection around pipe including filter fabric underlay.
 - Station 1+882 - 200 mm dia. Big 'O' enters from north – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection around pipe including filter fabric underlay.
 - Station 1+967 Surface swale enters from north – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 1+967 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 2+053 Surface swale enters from south – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 2+054 Surface swale enters from north – Supply and install 10 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.
 - Station 2+143 Surface swale enters from north – Supply and install 15 m² (min. 300 mm thickness) of stone erosion protection including filter fabric underlay.

- Private access bridge replacement works, as follows:
- Bridge No. 1 – Station 0+285 (Roll No. 090-050-00500) – Removal and disposal of existing 7.4 m long, 1200 mm diameter CSP and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 10.0 m long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) (see specifications), compacted Granular ‘A’ bedding material beneath pipe (minimum 300 mm thickness), (approximately 20 tonnes), compacted Granular ‘A’ material backfill (approximately 70 tonnes), Granular ‘A’ driveway materials (approximately 25 tonnes) and vertical concrete Lock Block endwalls (approximately 9 full blocks and 7 half wide blocks) providing a minimum 7.3 m (24 ft.) driveable top width. Rip rap on drain banks, minimum 300 mm thickness with filter fabric underlay, minimum 1.0 m wide beside concrete block endwalls on all four sides of bridge (approximately 15 m²). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.
 - Bridge No. 2 – Station 0+523 (Roll No. 090-050-00500) – Removal and disposal of existing 6.1 m long, 900 mm diameter concrete pipe/1100 mm diameter steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 10.0 m long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) (see specifications), compacted Granular ‘A’ bedding material beneath pipe (minimum 300 mm thickness), (approximately 20 tonnes), compacted Granular ‘A’ material backfill (approximately 70 tonnes), Granular ‘A’ driveway materials (approximately 25 tonnes) and vertical concrete Lock Block endwalls (approximately 9 full blocks and 7 half wide blocks) providing a minimum 7.3 m (24 ft.) driveable top width. Rip rap on drain banks, minimum 300 mm thickness with filter fabric underlay, minimum 1.0 m wide beside concrete block endwalls on all four sides of bridge (approximately 15 m²). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.
 - Bridge No. 3 – Station 0+921 (Roll No. 090-040-03200) – Removal and disposal of existing 7.6 m long, 900 mm diameter corrugated steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 10.0 m long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) (see specifications), compacted Granular ‘A’ bedding material beneath pipe (minimum 300 mm thickness), (approximately 20 tonnes), compacted Granular ‘A’ material backfill (approximately 70 tonnes), Granular ‘A’ driveway materials (approximately 30 tonnes) and vertical concrete Lock Block endwalls (approximately 11 full blocks and 4 half wide blocks) providing a minimum 7.3 m (24 ft.) driveable top width. Rip rap on drain banks, minimum 300 mm thickness with filter fabric underlay, minimum 1.0 m wide

beside concrete block endwalls on all four sides of bridge (approximately 15 m²). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.

- Bridge No. 5 – Station 1+306 (Roll No. 580-05100) – Removal and disposal of existing 6.2 m long, 1450 mm diameter corrugated steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area, removal and reinstatement of wood fence. Supply and installation of a new 16.0 m long, 1200 mm diameter aluminized corrugated steel pipe with a 2.8 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 15 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 25 tonnes), clean native backfill material above (approximately 45 m³), Granular ‘A’ driveway materials (approximately 25 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 30 m²) providing a minimum 7.3 m (24 ft.) driveable top width. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.
- Bridge No. 7 – Station 1+573 (Roll No. 570-34300) – Removal and disposal of existing 4.9 m long, 1600 mm diameter steel boiler pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 14.5 m long, 1000 mm diameter aluminized corrugated steel pipe with a 2.0 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 10 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 20 tonnes), clean native backfill material above (approximately 35 m³), Granular ‘A’ driveway materials (approximately 25 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 30 m²) providing a minimum 7.3 m (24 ft.) driveable top width. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.
- Bridge No. 9 – Station 1+844 (Roll No. 570-34100) – Removal and disposal of existing 7.0 m long, 1200 mm diameter corrugated steel pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 14.5 m long, 900 mm diameter aluminized corrugated steel pipe with a 2.0 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 10 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 15 tonnes), clean native backfill material above (approximately 35 m³), Granular ‘A’ driveway materials (approximately 30 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 30 m²) providing a minimum 7.3 m (24 ft.) driveable top width. Reroute existing 100 mm diameter Big ‘O’ to end wall (approximately 3 m long). All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.

- Bridge No. 10 – Station 1+972 (Roll No. 570-34000) – Removal and disposal of existing 7.0 m long, 900 mm diameter concrete pipe and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 13.5 m long, 900 mm diameter aluminized corrugated steel pipe with a 2.0 mm thickness (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 10 tonnes), Granular ‘B’ backfill to springline of pipe (approximately 15 tonnes), clean native backfill material above (approximately 30 m³), Granular ‘A’ driveway materials (approximately 25 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 20 m²) providing a minimum 7.3 m (24 ft.) driveable top width. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.
- Private access bridge removals, as follows:
 - Bridge No. 4 – Station 1+269 (Roll No. 580-05100) – Remove existing 4.0 m long, 1400 mm diameter steel pipe from drain. The work includes the full removal of all backfill and driveway materials to an off-site location. The work also includes the full restoration of the disturbed drain banks with fine grading and seeding.
 - Bridge No. 8 – Station 1+796 (Roll No. 570-34100) – Remove existing 6.5 m long, 900 mm diameter concrete pipe from drain. The work includes the full removal of all backfill and driveway materials to an off-site location. The work also includes the full restoration of the disturbed drain banks with fine grading and seeding.
- Temporary Silt Control Measures During Construction
- Road bridge works, as follows:
 - Bridge No. 6 (County Road No. 43 - Banwell Road) – Station 1+439 Removal and disposal of existing 12.5 m long, combination 900 mm diameter HDPE/1400 mm diameter CSP and backfill off-site that is not suitable for native backfill. The work is to include site clean-up and restoration within the working area. Supply and installation of a new 46.0 m long, 1200 mm diameter concrete pipe (see specifications). Clear stone bedding material beneath pipe (minimum 150 mm thickness) (approximately 45 tonnes), full Granular ‘A’ backfill (approximately 430 tonnes) and sloping stone end walls c/w filter fabric underlay (approximately 40 m²) complete with connections into a custom 3000 mm x 2400 mm precast concrete storm manhole with frame and cover. Asphalt surface by others. All surplus materials resulting from culvert installation are to be trucked away to an approved dumping site at the Contractors expense.

3.0 ACCESS TO THE WORK

The Contractor shall access the working corridor from Station 0+000 to Station 1+430 from County Road No. 43 (Banwell Road) via property Roll No. 590-00500 (Hydro One Networks Inc.) where the existing gravel driveway along the north side of said property shall be used. The Contractor shall avoid the Hydro Tower Gravel Area as shown on the drawings and access the working corridor via the surrounding lands.

The Contractor shall access the working corridor from Station 1+464 to Station 2+144 from County Road No. 43 (Banwell Road) via an existing access located approximately 320 metres north of the drain. Property Roll No. 590-005 (Hydro One Networks Inc.) and Roll No. 570-34300 shall provide a 6 metre wide access for equipment along the easterly limit of the Banwell Road right-of-way. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All road areas and grass lawn areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING AREA

For the repair and improvement of the Desjardins Drain, the working corridor shall be described in the table below. The working Corridors should remain free and clear of any obstructions. The working corridors and access to work shall be used in the future maintenance and repair works.

FROM STA.	TO STA.	PRIMARY (See Note 1)	SECONDARY (See Note 2)
0+000	0+285	9 m wide on north side of drain*	-
0+285	0+392	9 m wide on south side of drain*	-
0+392	1+144	9 m wide on north side of drain*	6 m wide on south side of drain (Station 0+921 to Station 1+144 only)
1+144	1+430	9 m wide on south side of drain*	-
1+464	1+972	9 m wide on north side of drain*	-
1+972	2+144	9 m wide on north side of drain*	-

Note 1: *Primary working corridor* indicates the access corridor along the side of the drain where excavation and levelling is recommended (unless noted otherwise below and/or in the Specifications, as well as all purposes listed for Secondary Working Corridors).

Note 2: *Secondary working corridor* indicates the access corridor alongside the drain where construction equipment may travel for the purpose of trucking, drain bank repairs, tile inlet repairs, surface water inlet repairs, grass buffer strips and other miscellaneous works. **No disposal of fill or levelling of materials shall be permitted within a secondary working corridor. As further specified, use of this secondary working corridor may be further restricted due to site condition. Read all Specifications, Drawings and/or notes before completing works.**

***Note:** *In the event that a landowner owns the property on both sides of the drain, the landowner can choose which side of the drain to place the spoil. The landowner should advise the Drainage Superintendent of their preference of spoil placement before improvements to the drain are made so that the Drainage Superintendent can notify the Contractor in advance.*

SPECIAL PROVISIONS – OPEN DRAIN

5.0 BRUSHING

Brushing shall be carried out on the entire drain within the above identified sections of the drain where required and as specified herein. **All** brush and trees located within the drain side slopes shall be cut parallel to the side slopes, as close to the ground as practicable. Tree branches that overhang the drain shall be trimmed within reason. Small branches and limbs are to be disposed of by the Contractor along with the other brush. Tree stumps, where removed to facilitate the drain excavation and reshaping of the drain banks, may be burned by the Contractor where permitted; otherwise, they shall be disposed of, off the site. The Contractor shall make every effort to preserve mature trees which are beyond the drain side slopes, and the working corridors. If requested to do so by the Drainage Superintendent, the Contractor shall preserve certain mature trees within the designated working corridors (see Section 4.0).

Except as specified herein, all brush and trees shall be stockpiled adjacent to the drain within the working corridors. Stockpiles shall not be less than 100 m apart and shall be a minimum of 2.0 m from the edge of the drain bank. All brush, timber, logs, stumps, large stones or other obstructions and deleterious materials that interfere with the construction of the drain, as encountered along the course of the drain are to be removed from the drain by the Contractor. Large stones and other similar material shall be disposed of by the Contractor off the site.

Following completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which remain standing, disposing of the branches cut off along with other brush and leaving the trees in a neat and tidy condition. Brush and trees removed from the working area are to be put into piles by the Contractor, in locations where they can be safely burned, and to be burned by the Contractor after obtaining the necessary permits, as required. If, in the opinion of the Drainage Superintendent, any of the piles are too wet or green to be burned, he shall so advise the Contractor to haul away the unburned materials to an approved dump site. Prior to, and during the course of burning operations, the Contractor shall comply with the current guidelines prepared by the Air Quality Branch of the Ontario Ministry of Environment and shall ensure that the Environmental Protection Act is not violated. The Contractor must make application under and comply with Town of Tecumseh By-Law 2021-50. The Contractor is responsible for all the requirements of the by-law and obtaining utility locates in the area of burning, landowner approvals for the burning on their property and be held responsible for all liabilities related to the burning of the brush and smoke generated. Since the trees and brush that are cut off flush with the earth surface may sprout new growth later, it is strongly recommended that the Municipality make arrangements for spraying this new growth at the appropriate time so as to prevent regrowth.

As part of this work, the Contractor shall remove any loose timber, logs, stumps, large stones or other debris from the drain bottom and from the side slopes. **Timber, logs, stumps, large stones or other debris shall be disposed of off-site.**

6.0 EXCAVATION AND LEVELLING OF EXCAVATED MATERIALS

6.1 Excavation of Existing Drain Channel

In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades.

THE CONTRACTOR SHALL NOT EXCAVATE DEEPER THAN THE GRADELINES SHOWN ON THE DRAWINGS.

Should over-excavation of the drain bank occur, the Contractor will **not** be permitted to repair with native material packed into place by the excavator and reshaped. Should over-excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

All excavated material shall be handled as specified in Section 6.2, unless specified otherwise. Materials deposited on the farmlands shall be within the working corridors, at least 1.0 m from the top of the drain bank, or as specified on the drawings. Upon allowing drying of excavated materials (if necessary) and as approved by the Drainage Superintendent, the Contractor shall level excavated materials in accordance with Section 6.2. Excavated material shall not be placed on dykes, in ditches, tiles or depressions intended to conduct water into the drain.

Seeding of the disturbed drain banks shall be completed immediately following drain construction and as specified in Section 9.0.

All excavation work shall be done in such a manner as to not harm any vegetation or trees, not identified in this report or by the Drainage Superintendent for clearing. Any damages to trees or vegetation caused by the Contractors work shall be rectified to the satisfaction of the Drainage Superintendent.

The Contractor shall exercise caution around existing tile inlets and shall confirm with the property owners that all tiles have been located, and tile ends repaired as specified.

6.2 Levelling of Excavated Materials

Excavation of the drain bottom shall be completed as specified in Section 6.1, above and also as specified below and as shown on the drawings.

Excavated drain materials shall be spread to a depth not to exceed 300 mm, unless specified otherwise on the drawings. The material shall be sufficiently levelled to allow further working by agricultural implements. All stones and other debris removed from the drain, which may interfere with agricultural implements, shall be disposed of off-site. Excavated material shall not be placed on dykes, in ditches, tiles or depressions intended to conduct water into the drain.

6.3 Trucking of Excavated Materials

Trucking of excavated materials to an off-site disposal site is to be arranged by Contractor as per Section 14.0 On-site and Excess Soil Management.

The Contractor shall be solely responsible for acquiring any and all permits and approvals required prior to hauling and disposal of materials off-site. The Contractor shall restore any such areas which are damaged by his operations, to original or better condition. The Contractor will be held liable for damages to roads, sodded areas and gardens, resulting from his non-compliance with these Specifications.

7.0 TILE OUTLET REPAIR WORKS

The Contractor shall excavate a sufficient distance into the drain bank to accommodate the tile inlet repair. All new pipes shall be equipped with a new aluminized rodent gate and shall be as specified below.

- New high-density polyethylene (H.D.P.E.) pipes shall have minimum 320 kPa pipe stiffness and conform to ASTM D3350, CAN/CSA B182.6-M92 and OPSS 1840.
- New plastic drainage tubing (Big 'O') shall be black (UV resistant) corrugated, high density, polyethylene tubing, made with high density polyethylene resin, meeting or exceeding Type III, Category 4 or 5, Grade P33 or P34, Class C per ASTM D1248 and shall have a minimum pipe stiffness of 170 kPa and 210 kPa at 5% deflection, when tested in accordance with ASTM D2412.
- New aluminized corrugated steel pipe minimum 1.6 mm thickness, 38 mm x 6.5 mm corrugations for pipe diameters ranging from 150 mm to 250 mm.
- New aluminized corrugated steel pipe minimum 2.0 mm thickness, 68 mm x 13 mm corrugations for pipe diameters ranging from 300 mm to 1000 mm.

All connections to the existing tile shall be in a silt-tight manner, as approved by the Drainage Superintendent. When connecting two (2) pieces of plastic drainage tubing, the Contractor shall use factory manufactured snap, insert or split couplers that are silt-tight. The area of the bank disturbed by the repairs and/or relocation shall be backfilled with compacted native material and shaped to match the contour of the adjacent drain bank. The Contractor shall minimize disturbance of the very sensitive banks. Where specified by the Engineer or Drainage Superintendent, disturbed areas shall then be covered with filter fabric followed by the placement of a minimum 300 mm thickness of graded rip-rap stone erosion protection as specified in Section 8.0. When cutting back the existing plastic drainage tubing exposes white tubing (non-UV resistant), the Contractor shall replace the last 6.0 m of drainage tubing, as specified above with black (UV resistant) tubing.

8.0 STONE EROSION PROTECTION (SEP)

The Contractor shall supply and install the required quantities of graded stone rip-rap erosion protection materials where specified. All stone to be used for erosion protection shall be 125 - 250 mm clear **quarried rock** or OPSS 1001 placed over a non-woven filter fabric Terrafix 270R or approved equivalent. **Concrete rip-rap will not be permitted.**

The minimum thickness requirement of the erosion stone layer is 300 mm with no portion of the filter fabric to be exposed.

9.0 HYDRAULIC SEEDING OF DRAIN BANKS

All existing grassed areas disturbed by construction shall be hydraulic mulch seeded as specified herein. The existing ground surface to be seeded shall be loosened to a depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of.

Hydraulic mulch shall consist of finely ground cellulose pulp derived from recycled newsprint and shall be dyed green.

Its fiber consistency shall be approximately 60% fine fiber with the balance being paper particles, 40% of which shall be a diameter of 3 mm minimum and 6 mm maximum. Hydraulic mulch shall be applied at 2,000 kg per 10,000 m². Clean water shall be applied at 42,700 liters per 10,000 m².

Seeding and mulching shall be a one step process in which the seed, fertilizer and hydraulic mulch are applied simultaneously in a water slurry via the hydraulic seeder/mulcher. The materials shall be added to the supply tank while it is being loaded with water. The materials shall be thoroughly mixed into a homogeneous water slurry and shall be distributed uniformly over the prepared surface. The materials shall be measured by mass or by a mass-calibrated volume measurement, acceptable to the Drainage Superintendent.

The hydraulic seeder/mulcher shall be equipped with mechanical agitation equipment capable of mixing the materials into a homogenous state until applied. The discharge pumps and gun nozzles shall be capable of applying the material uniformly.

Grass seed shall be Canada No. 1 grass seed mixture meeting the requirements of a Waterway Slough Mixture as supplied by Growmark or approved equal, as follows:

<i>Creeping Red Fescue</i>	20%
<i>Meadow Fescue</i>	30%
<i>Tall Fescue</i>	30%
<i>Timothy</i>	10%
<i>White Clover</i>	10%

Bags shall bear the label of the supplier indicating the content by species, grade, and mass. Seed shall be applied at a rate of 200 kg per 10,000 m².

Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m². It shall be in granular form, dry, free from lumps and in bags bearing the label of the manufacturer, indicating mass and analysis.

The hydraulic seeding shall be deemed "Completed by the Contractor" when the seed has established in all areas to the satisfaction of the Engineer. Re-seeding and/or other methods required to establish the grass will be given consideration to achieve the end result, and the costs shall be incidental to the works.

10.0 BRIDGE CONSTRUCTION

10.1 Location of New Bridges

The new bridges shall be installed as shown on the drawings attached hereto. The centerline of the new bridges shall be located to align with the existing laneways.

10.2 Removal of Existing Bridges

The Contractor shall exercise caution when removing these materials as to minimize damage to the drain banks. Any damage to the drain shall be restored to original conditions at the expense of the Contractor. The removed materials (existing bridge debris and end wall materials) shall be hauled away off-site and disposed of at an approved disposal site.

After Bridge Nos. 4 and 8 are removed, the drain shall be restored to match the cross sections of the adjacent sections of the open drain and the new banks vegetated by seeding in accordance with Section 9.0.

10.3 Materials for New Bridges

The Contractor shall exercise caution when removing these materials as to minimize damage to the drain banks. Any damage to the drain shall be restored to original conditions at the expense of the Contractor. The removed materials (existing culvert debris and end wall materials) shall be hauled away off-site.

Culvert Pipe	Bridge No. 1 - Station 0+285: New 10.0 metres long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe with dual gasket joints (ADS Canada or approved equal) unless otherwise specified conforming to the following specifications: CSA B182.13, ASTM D2412. The pipe is to provide a minimum stiffness of 320 kPa.
Culvert Pipe	Bridge No. 2 - Station 0+523: New 10.0 metres long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) unless otherwise specified conforming to the following specifications: CSA B182.13, ASTM D2412. The pipe is to provide a minimum stiffness of 320 kPa. Bridge No. 3 - Station 0+921: New 10.0 metres long, 1200 mm diameter triple wall smooth interior SaniTite HP polypropylene pipe (ADS Canada or approved equal) unless otherwise specified conforming to the following specifications: CSA B182.13, ASTM D2412. The pipe is to provide a minimum stiffness of 320 kPa. Bridge No. 5 - Station 1+306: New 16.0 metres long, 1200 mm diameter aluminized Type II corrugated steel pipe (CSP) with a wall thickness of 2.8 mm thickness and 125 x 25 mm corrugations with rerolled ends. Bridge No. 7 – Station 1+573: New 14.5 metres long, 1000 mm diameter aluminized Type II corrugated steel pipe (CSP) with a wall thickness of 2.0 mm thickness and 68 x 13 mm corrugations with rerolled ends. Bridge No. 9 - Station 1+844: New 14.5 metres long, 900 mm diameter aluminized Type II corrugated steel pipe (CSP) with a wall thickness of 2.0 mm thickness and 68 x 13 mm corrugations with rerolled ends. Bridge No. 10 - Station 1+972: New 13.5 metres long, 900 mm diameter aluminized Type II corrugated steel pipe (CSP) with a wall thickness of 2.0 mm thickness and 68 x 13 mm corrugations with rerolled ends. Note: New culverts shall be joined with annular aluminized corrugated wide bolt and angle couplers (minimum of 8 corrugation overlap and 2.8 mm wall thickness) and no single pipe less than 6.0 m in length. All pipes connected with couplers shall abut to each other with no more than a 25 mm gap between pipes prior to installation of the coupler and wrapped with filter fabric.
Pipe Bedding Below Pipe	20-25 mm clear stone conforming to OPSS Division 10.
Pipe Bedding Below Pipe (City of Windsor Standard AS-209A)	Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 300 mm thickness.

<i>Backfill up to Pipe Springline (Round)</i>	<i>Granular 'B' conforming to OPSS Division 10.</i>
<i>Backfill up to Pipe Springline (Arch)</i>	<i>20-25 mm clear stone conforming to OPSS Division 10.</i>
<i>Backfill Above Pipe Springline up to Bottom of Driveway Surface Materials</i>	<i>Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances. Alternatively, Granular 'A' or 'B' conforming to OPSS Division 10.</i>
<i>Backfill (City of Windsor Standard AS-209A)</i>	<i>Granular 'A' made from crushed limestone conforming to OPSS Division 10.</i>
<i>Driveway Surface</i>	<i>Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 200 mm thickness.</i>
<i>Erosion Stone</i>	<i>All stone to be used for erosion protection shall be 125 - 250 mm clear quarried rock or OPSS 1004, minimum 300 mm thickness.</i>
<i>Buffer Strips</i>	<i>Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.</i>
<i>Filter Fabric</i>	<i>"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC or approved equivalent.</i>
<i>Concrete Blocks</i>	<i>New precast concrete interlocking blocks with filter fabric underlay.</i>

10.4 Culvert Installation

Suitable dykes shall be constructed in the drain so that the installation of the pipe can be accomplished in the dry. The drain bottom shall be cleaned, prepared, shaped and compacted to suit the new culvert configuration, as shown on the drawings. Granular materials shall be compacted to 100% of their maximum dry density; imported clean native materials shall be supplied, placed and compacted to 95% of their maximum dry density.

10.5 Sloping Stone End Walls

Sloping stone end walls shall be constructed of quarry stone rip-rap, as shown on the drawings and as specified herein. Each end wall shall extend from the invert of the new culvert to the top of the proposed lane. The end walls shall be sloped 1 vertical to 1.5 horizontal, with a filter fabric underlay surrounding the pipe and spanning across the entire width of the drain. The minimum thickness requirement of the erosion stone layer is 300 mm, with no portion of the filter fabric to be exposed.

10.6 Vertical Concrete Lock Block End Walls

Concrete block end walls shall be designed by a Professional Engineer licensed in the Province of Ontario. End walls shall be constructed of interlocking concrete blocks as shown on the attached drawings using 600 mm wide x 600 mm high x 1200 mm long blocks.

Where specified, the contractor shall make use of half blocks (600 mm x 600 mm x 600 mm), half-high blocks (600 mm x 300 mm x 1200 mm), and half-high, half blocks (600 mm x 300 mm x 600 mm). Each end wall shall extend from the invert of the new culvert to the top of the proposed driveway. The concrete block end walls shall be set at a 10:1(V:H) batter. Each layer of blocks for each endwall shall be tied back with uniaxial high strength geogrid (Stratagrid SG 550) minimum 4.5 m long within reinforcement zone backfilled with granular 'A' compacted to minimum 98% S.P.D. The concrete block end walls shall be keyed into the existing drain banks and provided with a filter fabric backing to separate the backfill materials from the concrete blocks. All void space between the culvert and the concrete blocks shall be filled with concrete minimum 30 MPa compressive strength. Contractor shall arrange for inspection and certification of the block wall installation by the design engineer.

Other styles and sizes of concrete blocks may be considered for the construction of the end walls. If the Contractor wishes to use concrete blocks that vary from the style or size specified, he/she shall submit the manufacturers block Specifications and an intended block layout plan to the Drainage Superintendent and/or the Engineer prior to commencing construction. Any additional costs incurred from the use of alternative blocks shall be the Contractors responsibility.

10.7 Granular 'A' Driveway

The Contractor shall construct the driveway with a maximum 3% longitudinal grade approach over the new culvert providing a minimum 300 mm cover. This work includes the installation of a minimum 200 mm thickness of compacted Granular 'A' (crushed limestone) surface. The minimum top width of the driveway shall be as shown on the drawings.

10.8 Native Materials

Native materials suitable for use as backfill, as defined under Section 12.3, shall be salvaged from the existing bridge site, as required to complete the work as shown on the drawings, **(Native Backfill Zone only)**. Where there is an insufficient amount of native fill materials for backfilling the culvert, the Contractor may elect to import additional dry native materials or alternatively use Granular 'B' at his/her own expense.

10.9 Lateral Tile Drains

Should the Contractor encounter any lateral tiles within the proposed culvert limits not shown on attached drawings, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new culvert. **Tile drain outlets through the wall of the new culvert pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense.

Care must be taken in handling plastic drainpipe in cold weather to avoid causing damage.

Plastic drainpipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

11.0 ROAD CROSSING WORK

11.1 Location of New Road Bridge

The replacement of Bridge No. 6 shall be constructed in accordance with the specifications and drawings attached hereto. The centerline of the new bridge shall be located to align itself with the existing roadway.

11.2 Removal of Existing Road Bridge

The Contractor shall exercise caution when removing these materials as to minimize damage to the drain banks. Any damage to the drain shall be restored to original conditions at the expense of the Contractor. The removed materials (existing bridge debris and end wall materials) shall be hauled away off-site and disposed of at an approved disposal site.

11.3 Materials for New Road Bridge

Materials shall be as follows:

<i>Culvert Pipe</i>	Bridge No. 6 - Station 1+439: New 46.0 metres long, 1200 mm diameter high quality concrete pipe (CSA A-257.2, Class 65-D).
<i>Pipe Bedding Below Pipe</i>	20-25 mm clear stone conforming to OPSS Division 10.
<i>Backfill Beneath Road Surface and Shoulders</i>	Full Granular 'A' conforming to OPSS Division 10 compacted to 100% Standard Proctor Maximum Dry Density.
<i>Shoulders</i>	Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 200 mm thickness.
<i>Erosion Stone</i>	All stone to be used for erosion protection shall be 125 - 250 mm clear quarried rock or OPSS 1004, minimum 300 mm thickness.
<i>Filter Fabric</i>	"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, and Mirafi 140NC or approved equivalent.

11.4 Lateral Tile Drains

The Contractor shall re-route any outlet tile drains, in consultation with the Drainage Superintendent, as required to accommodate the new culverts. Tile drain outlets through the wall of the new culvert pipe will not be permitted. All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense.

All tile relocation work (if any) shall be in accordance with Section 12.8 of these specifications except as amended below.

11.5 Culvert Installation

Suitable dykes shall be constructed in the drain so that the installation of the pipe can be accomplished in the dry. The drain bottom shall be cleaned, prepared, shaped and compacted to suit the new culvert configuration, as shown on the drawings. Granular materials shall be compacted to 100% of their maximum dry density; native materials shall be compacted to 95% of their maximum dry density.

11.6 Reinforced Concrete Pipe

OPSS Volume 7 Form 410 shall apply and govern except as extended or amended herein. The size, type and class of sewer pipe shall meet CSA A257.2 standards. For reinforced concrete pipe culverts, the bedding shall be Class 'B' as per OPSD 802.030 using approved materials as noted above. The bedding shall be recessed to receive the hubs of the bell and spigot ends in order to allow the barrel of the pipe to be uniformly supported on compacted granular bedding material for its entire length.

11.7 Storm Manhole

General

OPSS.MUNI 407 shall apply and govern except as amended or extended herein.

Scope of Work

Precast concrete manholes are to be supplied and installed in conjunction with the installation of the sewer and shall be equipped with cast iron frames and covers to OPSD 401.010 (Type A), ladder rungs to OPSD 405.020 and adjustment units shall be IPEX Lifesaver Adjustment Rings. Type 20 cement shall be used for all manholes.

The Contractor shall consider the elevation of the future road as shown in the drawings when placing adjustment rings and shall ensure that there is an adequate number of adjustment rings to facilitate lowering of the roadway in a future roadwork contract.

The Contractor shall be responsible to ensure that the use of engineered or prefabricated trench support systems are appropriate to satisfy the requirements of the Occupational Health and Safety Act.

The location of private drain connections may be revised depending on final locations confirmed with landowners. An extra credit to the tendered price shall only be considered if there is a 300 mm or more difference between the asbuilt depth to invert and the design depth to invert.

Backfill

Backfill shall be Granular "A", mechanically compacted to 100 percent of the Standard Proctor Maximum Dry Density. Handheld mechanical compaction equipment or non-shrink fill shall be used where other conventional compaction equipment cannot be used.

11.8 Site Cleanup and Restoration

As part of the work and upon completion, the Contractor shall remove and dispose of, off-site any loose timber, logs, stumps, large stones, rubber tires, cinder blocks or other debris from the drain bottom and from the side slopes. Where the construction works cross a lawn, the Contractor shall take extreme care to avoid damaging the lawn, shrubs and trees encountered. Upon completion of the work, the Contractor shall completely restore the area by the placement and fine grading of topsoil and seeding or sodding the area as specified by the Engineer or Drainage Superintendent.

12.0 ON-SITE AND EXCESS SOIL MANAGEMENT

The Contractor's attention is hereby drawn to the fact that construction of this Contract will necessitate special measures being taken with respect to the management of on-site and excess soil to meet the requirements of Ontario Regulation 406/19 On-Site and Excess Soil Management and supporting documents, in particular the Rules for Soil Management and Excess Soil Quality Standards, MECP, December 2019, as amended.

The Contractor shall prepare an excavation contingency plan in compliance with Section 23 of O.Reg. 406/19 and submit the procedure to the Owner for review and approval prior to excavating any soil in the Project Area.

The Contractor is responsible for ensuring that any vehicle hauling excess soil from the project area meets the criteria listed in Section 17 of O.Reg. 406/19 and can provide the information set out in Section 18 of O.Reg. 406/19 upon request.

In general, on-site storage will not be permitted, unless special approval is provided by the Town. If required and approved, on-site soil storage shall comply with the Soil Storage Rules set out in Section C of the Rules for Soil Management and Excess Soil Quality Standards.

12.1 Chemical Soils Analysis and Results

An Excess Soil Management Technical Memo (dated October 29, 2024) has been prepared for the Project Area. As described in the Excess Soil Management Technical Memo, excess soils within the Project Area are suitable to be transported to a beneficial reuse site accepting soils meeting Table 3.1 Residential, Parkland and Institutional (RPI) Excess Soil Quality Standards (ESQS) or Table 3.1 Industrial, Commercial and Community (ICC) ESQS, with salt parameter (i.e., electrical conductivity (EC) and sodium adsorption ratio (SAR)) exemptions, pending review and acceptance by the reviewer. These soils are not suitable for receivers that do not accept salt-impacted soils.

Part I Section D.1 (3) of the Rules for Soil Management and Excess Soil Quality Standards prescribed the following reuse conditions for excess soil with salt impacts.

- The excess soil is finally placed at one of the following locations:
 - Where it is reasonable to expect that the soil will be affected by the same chemicals as a result of continued application of a substance for the safety of vehicular or pedestrian traffic under conditions of snow or ice;
 - At an industrial or commercial property use and to which non-potable standards would be applicable; or
 - At least 1.5 metres below the surface of the soil.
- The excess soil is not finally placed at any of the following locations:
 - Within 30 metres of a waterbody;
 - Within 100 metres of a potable water well or area with an intended property use that may require a potable water well; or
 - A location that will be used for growing crops or pasturing livestock unless the excess soil is placed 1.5 metres or greater below the soil surface.

The Contractor shall not claim any misunderstanding with regard to subsurface physical or chemical conditions provided in the reports for this contract. No claims related to Contract delays while obtaining an approved disposal/reuse site will be paid to the Contractor.

12.2 Excess Excavated Material

Material excavated in carrying out the work of the various tender items included in this Contract which is surplus to the requirements of the Contract shall be reused offsite at the Contractor's expense in accordance with OPSS 180. It is the Contractor's responsibility to find a suitable reuse site and no claims related to Contract delays while obtaining an approved reuse site will be paid to the Contractor. Any additional chemical testing required by reuse sites shall be at the Contractor's expense. The Contractor shall determine the appropriate reuse site, and all costs associated with the disposal shall be at the Contractor's expense.

All excess soils must be finally placed within a period of 90 days following excavation.

The Contractor shall develop and apply an Excess Soil tracking system as required by Section 16 of O.Reg. 406/19, and Subsection 5 in Section B of Part I of the Soil Rules, to track each load of excess soil during its transportation and deposit, including quality and quantities for each load from the project area.

The Contractor will provide a monthly deliverable that includes a table summary of excess soil movements to and from the Project, including all information required by the tracking system per load. The Contractor shall ensure that excess soil transportation and hauling records requirements under Section 17 and Section 18, respectively, of O.Reg. 406/19 are met for this Project. This includes a requirement for the Contractor to obtain a declaration from the excess soil receiving site acknowledging the deposit of the excess soil from the Project.

The Contractor shall provide the Contract Administrator with a copy of OPSF 180-2 form, "SITE SELECTION NOTIFICATION FOR MATERIAL MANAGED AS DISPOSABLE FILL" as well as a copy of OPSF 180-3 form, "PROPERTY OWNER'S RELEASE" two weeks prior to the start of excavation activities.

A minimum of ten (10) Working Days prior to the start of construction the Contractor shall provide the Owner with the following information for review and approval by the Owner and the Owner's QP (Dillon Consulting Limited to be retained as QP to act on behalf of Owner) for any Excess Soil destination site (reuse, disposal, and/or recycling facility) under consideration by the Contractor:

- Identification of the location of the Contractor's proposed Reuse Site(s) (or other MECP-approved receiving sites) and the name and contact information for their owner, operator and QP, as applicable.
- Where Reuse Sites are governed by an instrument listed in Section 3(2)4 of O.Reg. 406/19 ("Reuse Site Instrument"):
 - A copy of the Reuse Site Instrument; and
 - The Soil quality standard under the Standards (or, if applicable and approved by the Owner, site-specific standard generated by a QP through the BRAT) applicable to the Reuse Site under the Soil Rules and Standards or as established by the Reuse Site's QP.
- Where Reuse Sites are not governed by a Reuse Site Instrument:
 - A description of the beneficial purpose for which the Excess Soil from the Project Areas will be used at the Reuse Site, as contemplated in Section 5(1)3 of the Regulation; and
 - Written confirmation that the Excess Soil, including its quantity and quality, will meet the timing and all other requirements for Excess Soil placement at the Reuse Site in accordance with Section 5 of the Regulation.
- Contingency measures the Contractor will implement, including but not limited to, location of an alternate site in the event Excess Soil cannot be deposited at the locations listed.
- Identification and location of any interim sites permitted by Ontario's Excess Soil and Waste Laws, including Class 1 Soil Management Sites, Class 2 Soil Management Sites, Local Waste Transfer Facilities, Retail Landscaping Soil Depots, and/or Residential Development Soil Depots (collectively, "Temporary Sites") proposed to be used to temporarily store and/or process Excess Soil, as well as the name and contact information for the owner and operator for each site, or waste disposal sites approved by MECP to accept Excess Soil for final disposal, as well as the name and contact information for the owner and operator for each site.

- A description of the proposed Reuse Sites (or other MECP-approved receiving site), the permitted beneficial reuse volumes, any other requirements for the deposit of Excess Soil and confirmation that those requirements can and will be complied with by the Contractor.
- A copy of the Environmental Compliance Approval issued by the MECP for each Class 1 Soil Management Site the Contractor will be using to temporary store and/or process the Excess Soil and/or waste disposal site the Contractor will be using to dispose of the Excess Soil, if applicable.

The Contractor is not permitted to start any excavation works until these forms have been signed and provided the Contract Administrator and receiving sites have been approved by the Owner.

This item applies to any item that includes excavation, removal and reuse of excess material. All costs associated with the requirements of this special provision are to be included within the unit prices for those items.

12.3 Hauling and Transportation

The Contractor is responsible for retaining haulers for transportation of Excess Soil and for ensuring that any vehicle hauling Excess Soil from the Project Areas meets all criteria outlined in Section 17 of the O.Reg. 406/19.

Prior to commencement of excavation, the Contractor will provide to the Owner for approval a Hauling Record template to be used for each load of excess soil. The Contractor shall ensure the Hauling Record is used to record the required information for every load of excess soil leaving the project area, as detailed in Section 18 of O.Reg. 406/19. The Contractor shall submit copies of all completed Hauling Records on a weekly basis to the Owner and keep the Hauling Record available upon request for two (2) years, including all backup documentation.

The Contractor shall cause any person who is operating a vehicle for the purpose of transporting excess soil to have available at all times during the transportation a completed Hauling Record for every load either in hard copy or electronic version.

The Contractor shall cause any person who is operating a vehicle for the purpose of transporting excess soil to, upon arriving at a Temporary Site, or Reuse Site (or other MECP-approved receiving site) complete the receiver information on the Hauling Record and ensure the receiving site representative signs the declaration on the Hauling Record.

The Contractor must also develop and implement a Tracking System as outlined in the Material Management section above.

12.4 Payment

The costs associated with these requirements are to be included within the unit prices for the items which require excess materials management.

GENERAL SPECIFICATIONS

1.0 AGREEMENT AND GENERAL CONDITIONS

The part of the Specifications headed "Special Provisions" which is attached hereto forms part of this Specification and is to be read with it. Where there is any difference between the requirements of this General Specification and those of the Special Provisions, the Special Provisions shall govern.

Where the word "Drainage Superintendent" is used in this specification, it shall mean the person or persons appointed by the Council of the Municipality having jurisdiction to superintend the work.

Tenders will be received, and contracts awarded only in the form of a lump sum contract for the completion of the whole work or of specified sections thereof. The Tenderer agrees to enter into a formal contract with the Municipality upon acceptance of the tender. The General Conditions of the contract and Form of Agreement shall be those of the Stipulated Price Contract CCDC2-Engineers, 1994 or the most recent revision of this document.

2.0 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Each tenderer must visit the site and review the plans and specifications before submitting his/her tender and must satisfy himself/herself as to the extent of the work and local conditions to be met during the construction. Claims made at any time after submission of his/her tender that there was any misunderstanding of the terms and conditions of the contract relating to site conditions, will not be allowed. The Contractor will be at liberty, before bidding to examine any data in the possession of the Municipality or of the Engineer.

The quantities shown or indicated on the drawings or in the report are estimates only and are for the sole purpose of indicating to the tenderers the general magnitude of the work. The tenderer is responsible for checking the quantities for accuracy prior to submitting his/her tender.

3.0 MAINTENANCE PERIOD

The successful Tenderer shall guarantee the work for a period of one (1) year from the date of acceptance thereof from deficiencies that, in the opinion of the Engineer, were caused by faulty workmanship or materials. The successful Tenderer shall, at his/her own expense, make good and repair deficiencies and every part thereof, all to the satisfaction of the Engineer. Should the successful Tenderer for any cause, fail to do so, then the Municipality may do so and employ such other person or persons as the Engineer may deem proper to make such repairs or do such work, and the whole costs, charges and expense so incurred may be deducted from any amount due to the Tenderer or may be collected otherwise by the Municipality from the Tenderer.

4.0 GENERAL CO-ORDINATION

The Contractor shall be responsible for the coordination between the working forces of other organizations and utility companies in connection with this work. The Contractor shall have no cause of action against the Municipality or the Engineer for delays based on the allegation that the site of the work was not made available to him by the Municipality or the Engineer by reason of the acts, omissions, misfeasance or non-feasance of other organizations or utility companies engaged in other work.

5.0 RESPONSIBILITY FOR DAMAGES TO UTILITIES

The Contractor shall note that overhead and underground utilities such as hydro, gas, telephone and water are not necessarily shown on the drawings. It is the Contractor's responsibility to contact utility companies for information regarding utilities, to exercise the necessary care in construction operations and to take other precautions to safeguard the utilities from damage. All work on or adjacent to any utility, pipeline, railway, etc., is to be carried out in accordance with the requirements of the utility, pipeline, railway, or other, as the case may be, and its specifications for such work are to be followed as if they were part of this specification. The Contractor will be liable for any damage to utilities.

6.0 CONTRACTOR'S LIABILITY

The Contractor, his/her agents and all workmen or persons under his/her control including sub-contractors, shall use due care that no person or property is injured and that no rights are infringed in the prosecution of the work. The Contractor shall be solely responsible for all damages, by whomsoever claimable, in respect to any injury to persons or property of whatever description and in respect of any infringement of any right, privilege or easement whatever, occasioned in the carrying on of the work, or by any neglect on the Contractor's part.

The Contractor shall indemnify and hold harmless the Municipality and the Engineer, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the contract.

7.0 PROPERTY BARS AND SURVEY MONUMENTS

The Contractor shall be responsible for marking and protecting all property bars and survey monuments during construction. All missing, disturbed or damaged property bars and survey monuments shall be replaced at the Contractor's expense, by an Ontario Land Surveyor.

8.0 MAINTENANCE OF FLOW

The Contractor shall, at his/her own cost and expense, permanently provide for and maintain the flow of all drains, ditches and water courses that may be encountered during the progress of the work.

9.0 ONTARIO PROVINCIAL STANDARDS

Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) shall apply and govern at all times unless otherwise amended or extended in these Specifications or on the Drawing. Access to the electronic version of the Ontario Provincial Standards is available online through the MTO website, free of charge to all users.

10.0 APPROVALS, PERMITS AND NOTICES

The construction of the works and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced in this Contract. The Contractor shall obtain all approvals and permits and notify the affected authorities when carrying out work in the vicinity of any public utility, power, underground cables, railways, etc.

11.0 SUBLETTING

The Contractor shall keep the work under his/her personal control, and shall not assign, transfer, or sublet any portion without first obtaining the written consent of the Municipality.

12.0 TIME OF COMPLETION

The Contractor shall complete all work on or before the date fixed at the time of tendering. The Contractor will be held liable for any damages or expenses occasioned by his/her failure to complete the work on time and for any expenses of inspection, superintending, re-tendering or re-surveying, due to their neglect or failure to carry out the work in a timely manner.

13.0 TRAFFIC CONTROL

The Contractor will be required to control vehicular and pedestrian traffic along roads at all times and shall, at his/her own expense, provide for placing and maintaining such barricades, signs, flags, lights and flag persons as may be required to ensure public safety. The Contractor will be solely responsible for controlling traffic and shall appoint a representative to maintain the signs and warning lights at night, on weekends and holidays and at all other times that work is not in progress. All traffic control during construction shall be strictly in accordance with the **Occupational Health and Safety Act** and the current version of the **Ontario Traffic Manuals**. Access to the electronic version of the **Ontario Traffic Manual** is available online through the MTO website, free of charge to all users.

Contractors are reminded of the requirements of the Occupational Health and Safety Act pertaining to Traffic Protection Plans for workers and Traffic Control Plan for Public Safety.

14.0 SITE CLEANUP AND RESTORATION

As part of the work and upon completion, the Contractor shall remove and dispose of, off-site any loose timber, logs, stumps, large stones, rubber tires, cinder blocks or other debris from the drain bottom and from the side slopes. Where the construction works cross a lawn, the Contractor shall take extreme care to avoid damaging the lawn, shrubs and trees encountered. Upon completion of the work, the Contractor shall completely restore the area by the placement and fine grading of topsoil and seeding or sodding the area as specified by the Engineer or Drainage Superintendent.

15.0 UTILITY RELOCATION WORKS

In accordance with Section 26 of the Drainage Act, if utilities are encountered during the installation of the drainage works that conflict with the placement of the new culvert, the operating utility company shall relocate the utility at their own costs. The Contractor however will be responsible to co-ordinate these required relocations (if any) and their co-ordination work shall be considered incidental to the drainage works.

16.0 FINAL INSPECTION

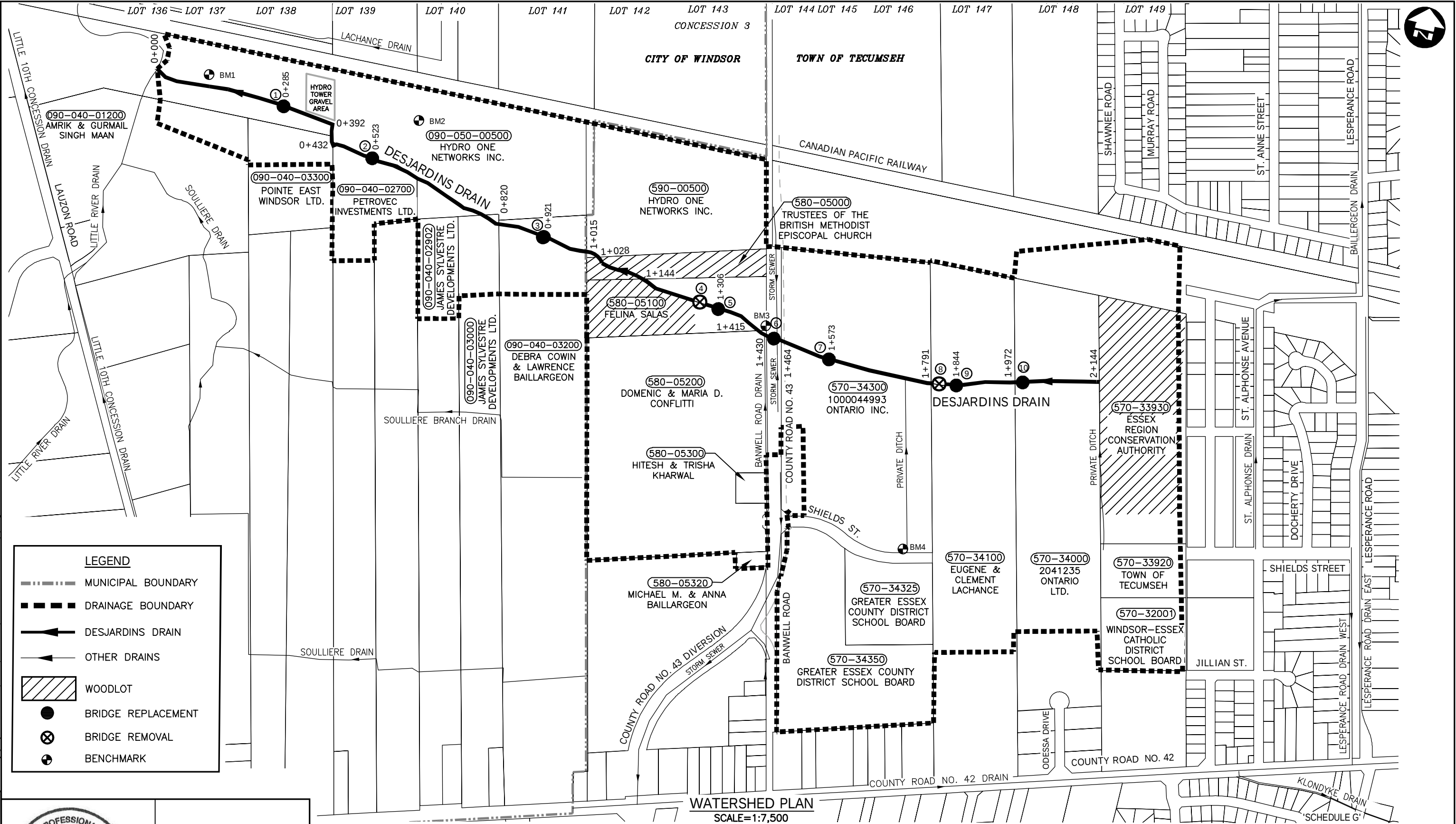
All work shall be carried out to the satisfaction of the Drainage Superintendent for the Municipality, in compliance with the specifications, drawings and the Drainage Act. Upon completion of the project, the work will be inspected by the Engineer and the Drainage Superintendent. Any deficiencies noted during the final inspection shall be immediately rectified by the Contractor.

Final inspection will be made by the Engineer within 20 days after the Drainage Superintendent has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

17.0 FISHERIES CONCERNS

Standard practices to be followed to minimize disruption to fish habitat include embedment of the culvert a minimum 10% below grade, constructing the work 'in the dry' and cutting only trees necessary to do the work (no clear-cutting). No in-water work is to occur during the timing window unless otherwise approved by the appropriate authorities.

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LEGEND

- MUNICIPAL BOUNDARY
- DRAINAGE BOUNDARY
- DESJARDINS DRAIN
- OTHER DRAINS
- WOODLOT
- BRIDGE REPLACEMENT
- BRIDGE REMOVAL
- BENCHMARK



Conditions of Use

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1	CLIENT REVIEW	JAN. 17/25	MDH

DESIGN	MDH	REVIEWED BY	CDP
DRAWN	KAW/WLB	CHECKED BY	TRO
DATE	September 30, 2025		
SCALE	AS SHOWN		

DILLON CONSULTING

PROJECT NO. 17-6774

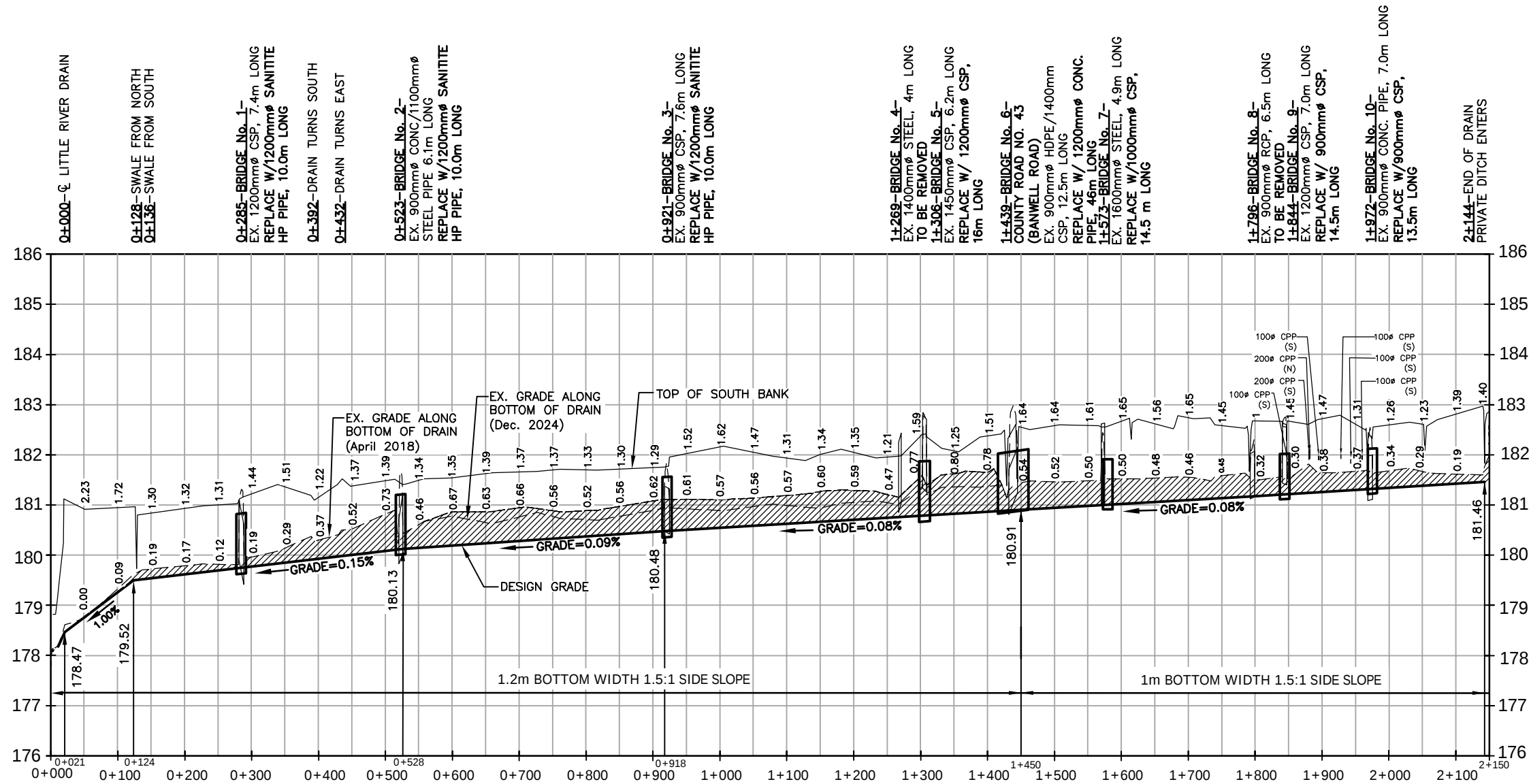
DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
DESJARDINS DRAIN
Town of Tecumseh & City of Windsor

SHEET TITLE
WATERSHED PLAN

PAGE NO.
1 of 8

WATERSHED PLAN
SCALE=1:7,500



PROFILE

SCALE-HORIZ.=1:7,500

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DESIGN MDH	REVIEWED BY CDP
DRAWN KAW/WLB	CHECKED BY TRO
DATE September 30, 2025	
SCALE AS SHOWN	

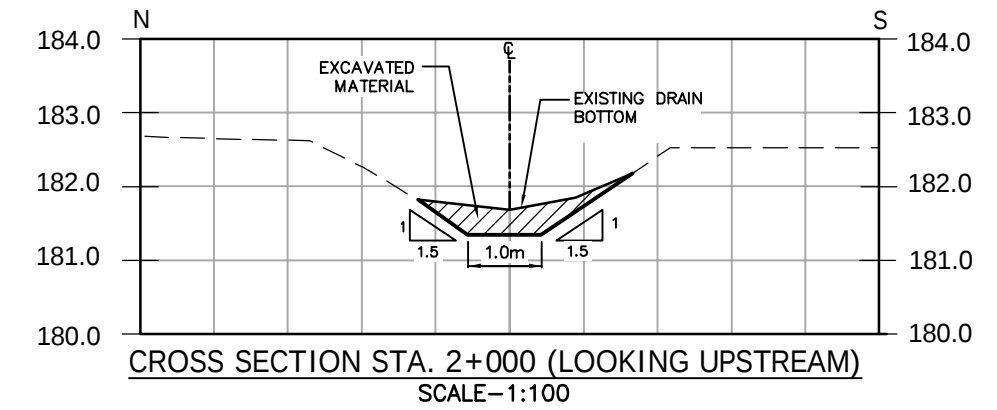
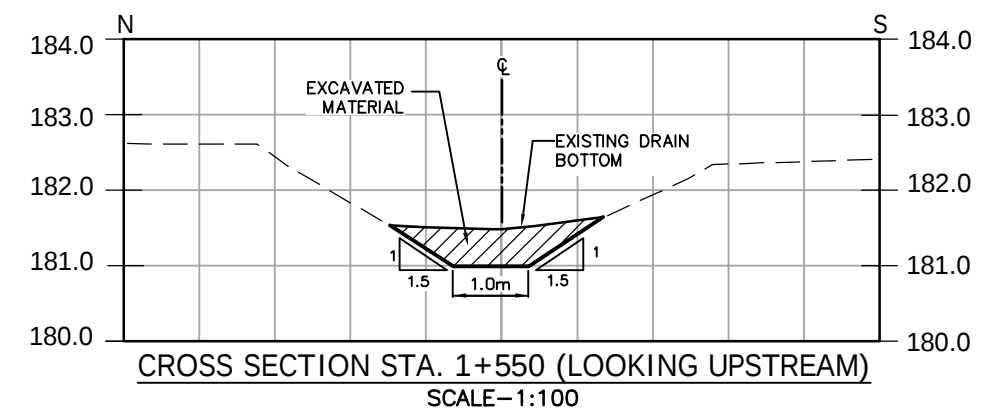
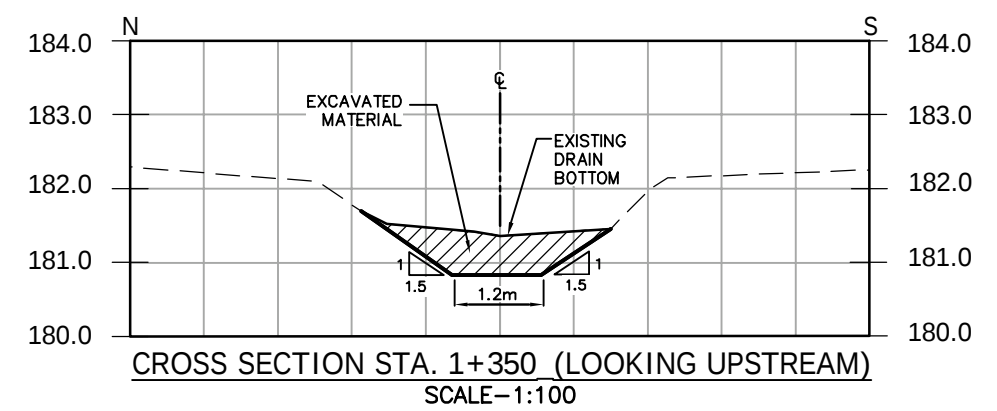
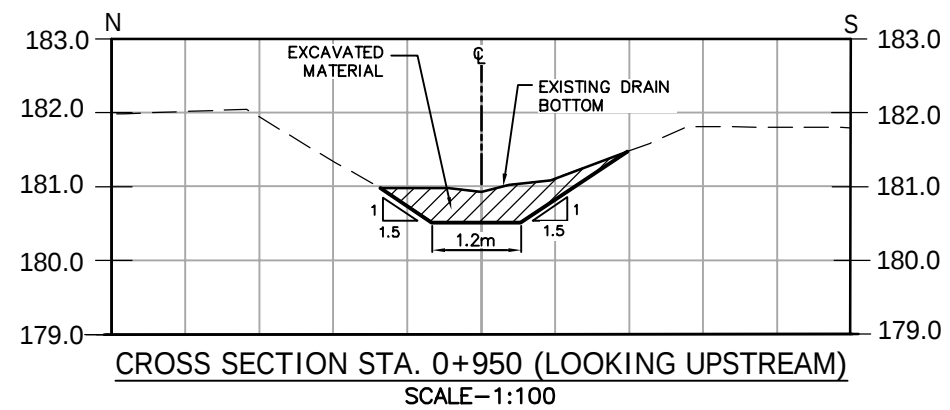
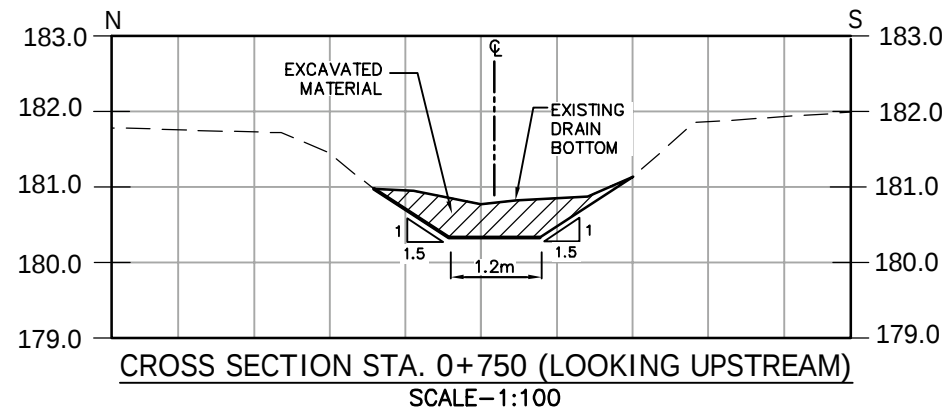
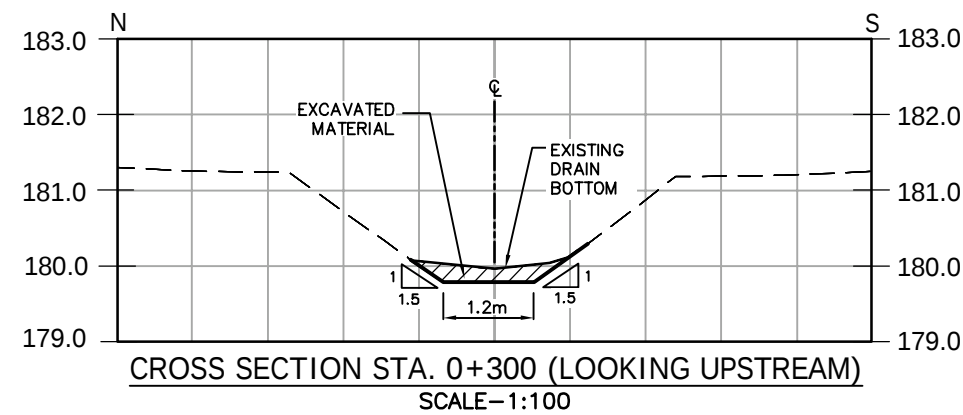
 PROJECT NO. 17-6774
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE G'

Drainage Report for the
DESJARDINS DRAIN
Town of Tecumseh & City of Windsor

SHEET TITLE
PROFILE

PAGE NO.
2 of 8



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DRAWN	KAW/WLB	CHECKED BY	TRO
DATE	September 30, 2025		
SCALE	AS SHOWN		

 DILLON CONSULTING	PROJECT NO.	17-6774
	DRAWING SCALES BASED ON A 11" X 17" SHEET	
	PAGE NO.	3 of 8

'SCHEDULE G'

Drainage Report for the
DESJARDINS DRAIN
Town of Tecumseh & City of Windsor

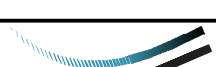
SHEET TITLE

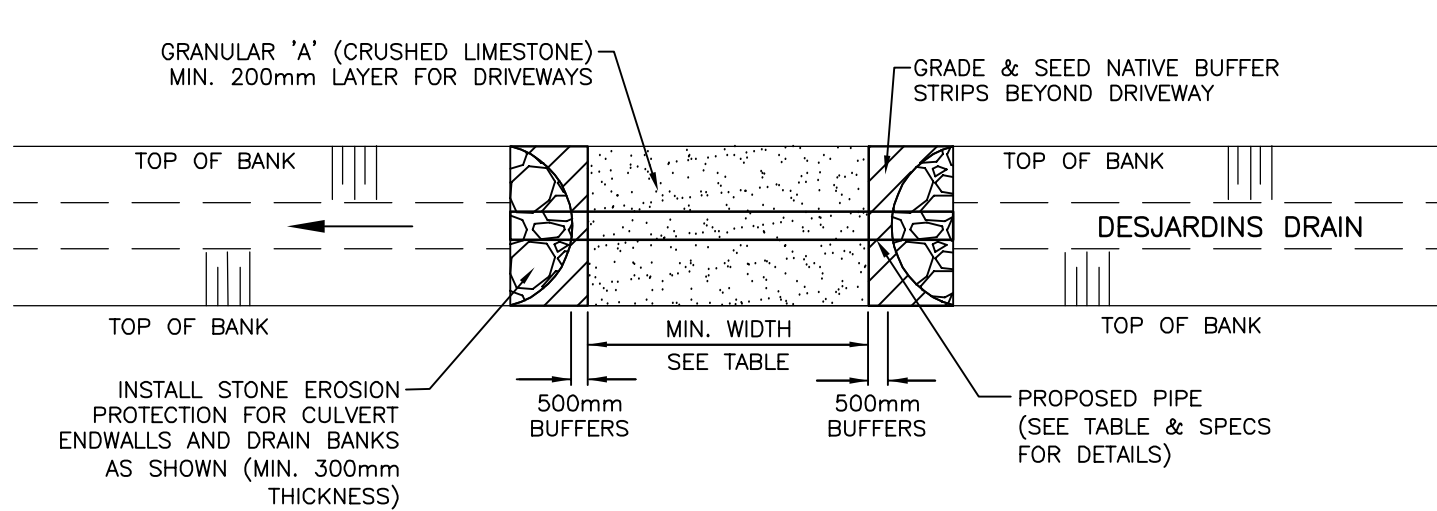
CROSS SECTIONS

TABLE 1 – BRIDGE DESIGN INFORMATION								
DESCRIPTION	BRIDGE No. 1	BRIDGE No. 2	BRIDGE No. 3	BRIDGE No. 5	BRIDGE No. 6	BRIDGE No. 7	BRIDGE No. 9	BRIDGE No. 10
BRIDGE $\varnothing$ LOCATION (STA.)	0+285	0+523	0+921	1+306	1+439	1+573	1+844	1+972
BRIDGE TYPE	FARM	FARM	FARM	FARM	ROAD	FARM	FARM	FARM
PIPE INVERT ELEV. U/S SIDE(m)	179.64	180.02	180.37	180.69	180.91	180.92	181.15	181.25
PIPE INVERT ELEV. D/S SIDE(m)	179.62	180.00	180.35	180.67	180.83	180.90	181.13	181.23
TOP OF $\varnothing$ DRIVEWAY SURFACE ELEV. (m)	181.21	181.68	181.87	182.87	182.89	182.56	182.77	182.55
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	179.75	180.13	180.48	180.80	180.90	181.01	181.23	181.33
MIN. TOP WIDTH OF DRIVEWAY (m)	7.3	7.3	7.3	7.3	–	7.3	7.3	7.3
MIN. CULVERT GRADE (%)	0.15%	0.15%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
CULVERT TYPE	SANITITE	SANITITE	SANITITE	CSP	CONCRETE	CSP	CSP	CSP
CULVERT MATERIAL	–	–	–	ALUM.	65–D	ALUM.	ALUM.	ALUM.
CULVERT LENGTH (m)	10.0	10.0	10.0	16.0	46.0	14.5	14.5	13.5
CULVERT THICKNESS (mm)	–	–	–	2.8	–	2.0	2.0	2.0
CULVERT CORRUGATIONS (mm)	–	–	–	125x25	–	68x13	68x13	68x13
PIPE SIZE (mm)	1200	1200	1200	1200	1200	1000	900	900
CULVERT ENDWALL TYPE	CONC. BLKS	CONC. BLKS	CONC. BLKS	SLOPING	SLOPING	SLOPING	SLOPING	SLOPING
DRAIN TOP WIDTH AT BLOCK WALL (m)	5.5	5.6	5.8	–	–	–	–	–

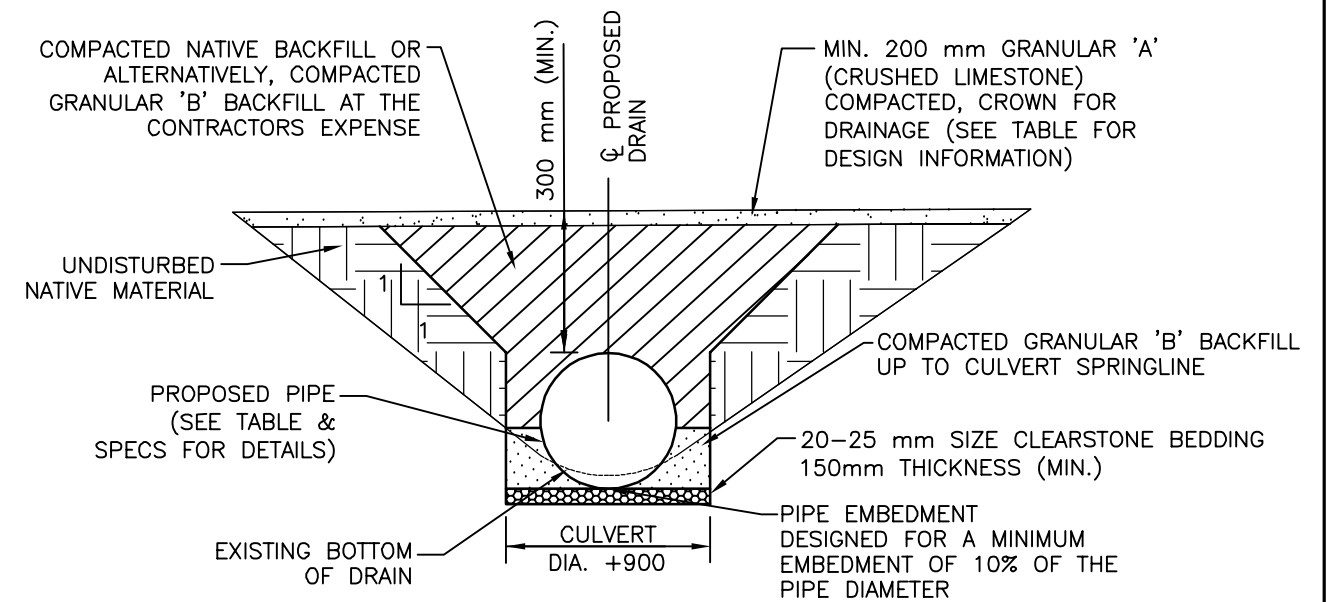
SITE BENCHMARKS
BM1–TOP OF NORTHWEST CORNER OF CONCRETE BASE OF EXISTING HYDRO TOWER APPROX. 24m NORTH OF CENTRELINE OF DESJARDINS DRAIN AT APPROX. STA. 0+116. ELEVATION=181.44m
BM2– TOP OF SOUTHWEST CORNER OF CONCRETE BASE OF EXISTING HYDRO TOWER APPROX. 32m NORTH OF CENTRELINE OF DESJARDINS DRAIN AT APPROX. STA. 0+340. ELEVATION=181.66m
BM3–TOP OF NAIL IN SOUTH FACE OF HYDRO POLE ON WEST SIDE OF BANWELL ROAD APPROX. 5m NORTH OF CENTRELINE OF DESJARDINS DRAIN AT APPROX. STA. 1+430. ELEVATION=182.57m
BM4–PKNAIL IN TOP OF CONCRETE PUMP STATION ON NORTH SIDE OF SHIELDS STREET LOCATED OPPOSITE THE NORTHERLY PROJECTION OF THE EAST WALL OF TECUMSEH VISTA SCHOOL. ELEVATION=183.51m

NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.

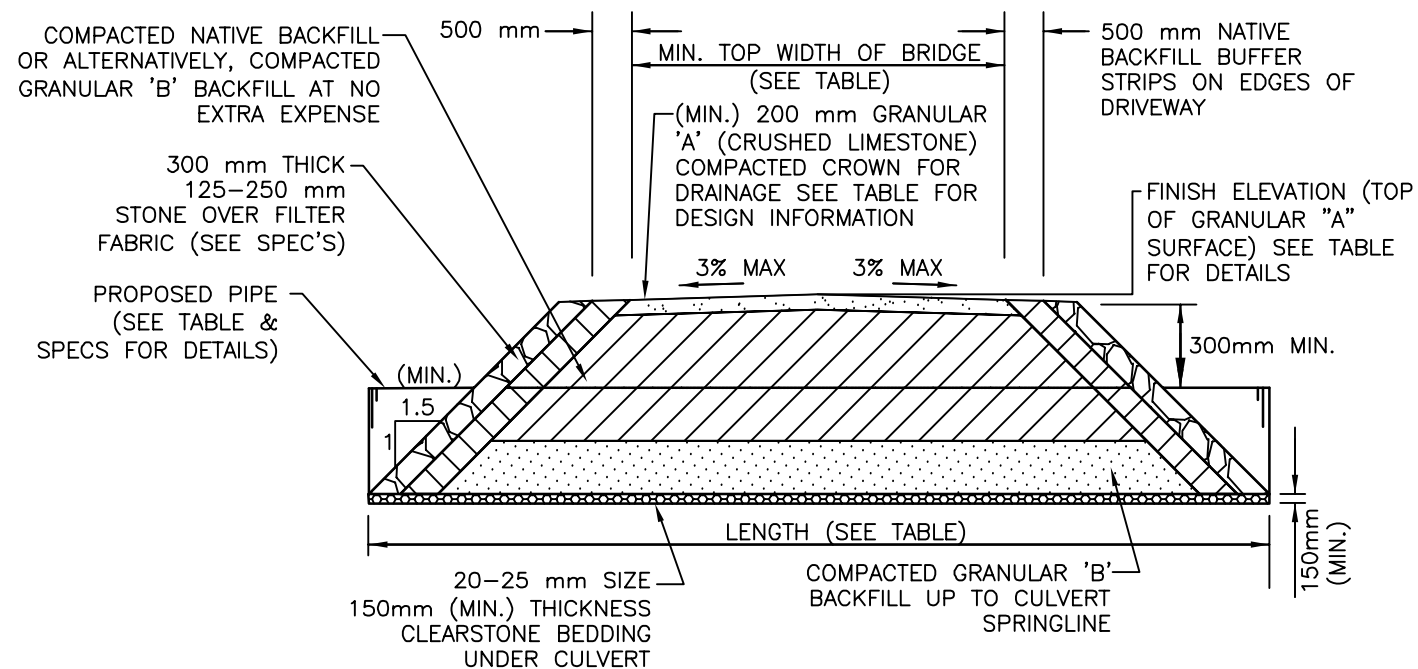
	Conditions of Use Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited. Do not scale dimensions from drawing. Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.					DESIGN	REVIEWED BY		Drainage Report for the DESJARDINS DRAIN Town of Tecumseh & City of Windsor		
						MDH	CDP				
						DRAWN	CHECKED BY				
						KAW/WLB	TRO				
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1	CLIENT REVIEW	JAN. 17/25	MDH	SCALE	AS SHOWN		DRAWING SCALES BASED ON A 11" X 17" SHEET	PAGE NO.	4 of 8		
No.	ISSUED FOR		DATE	BY							



BRIDGE PLAN (TYPICAL)
BRIDGE NO. 5, 9 & 10
NOT TO SCALE



BRIDGE CROSS SECTION
BRIDGE NO. 5, 9 & 10
NOT TO SCALE



BRIDGE LONGITUDINAL SECTION
BRIDGE NO. 5, 9 & 10
NOT TO SCALE



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PROJECT NO.	17-6774
DRAWING SCALES BASED ON A 11" X 17" SHEET	

'SCHEDULE G'

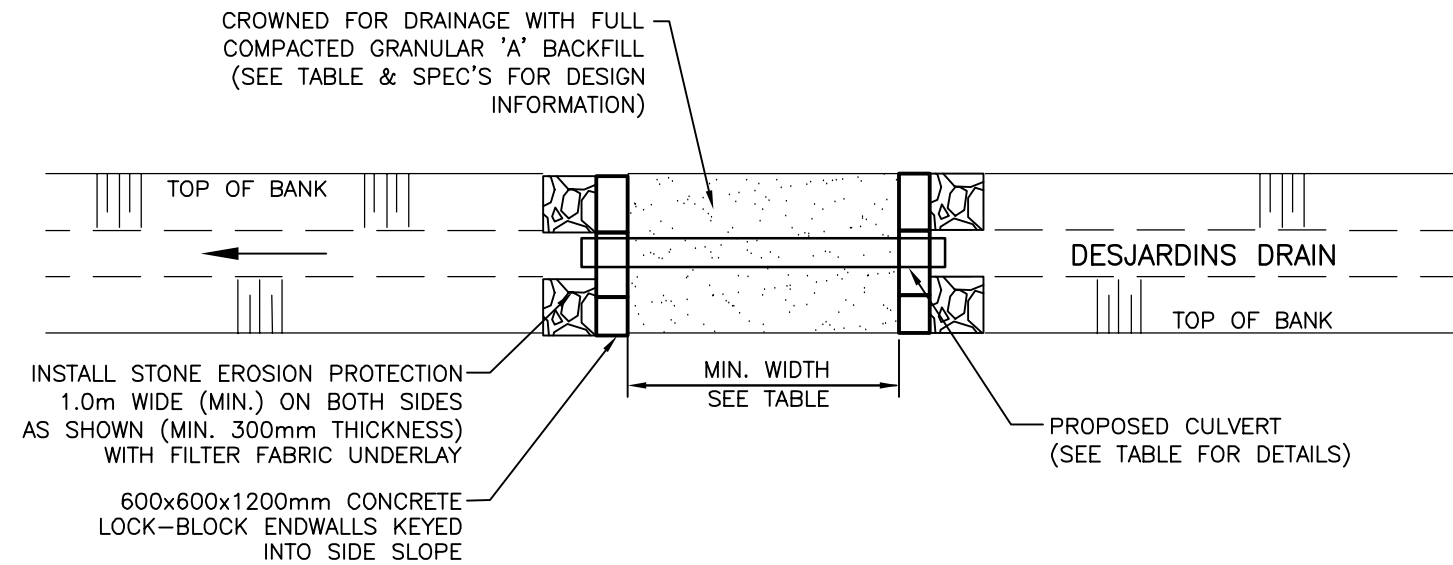
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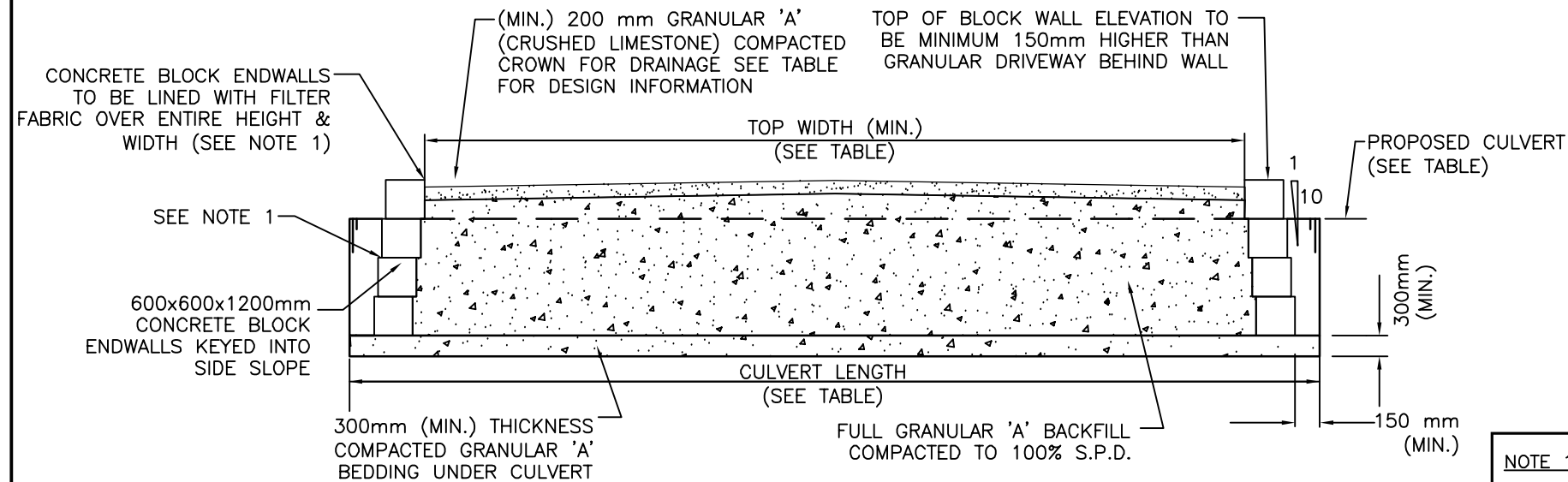
BRIDGE DETAILS

PAGE NO.

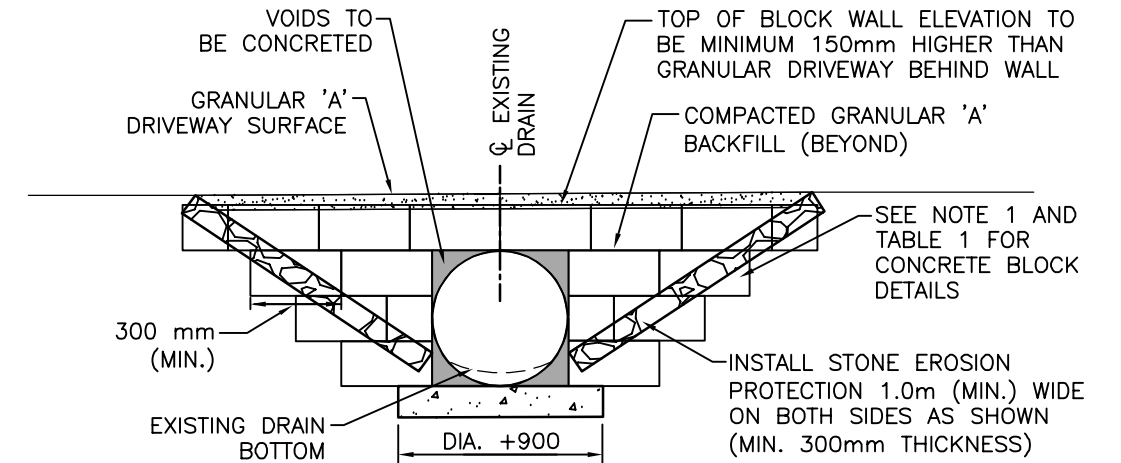
5 of 8



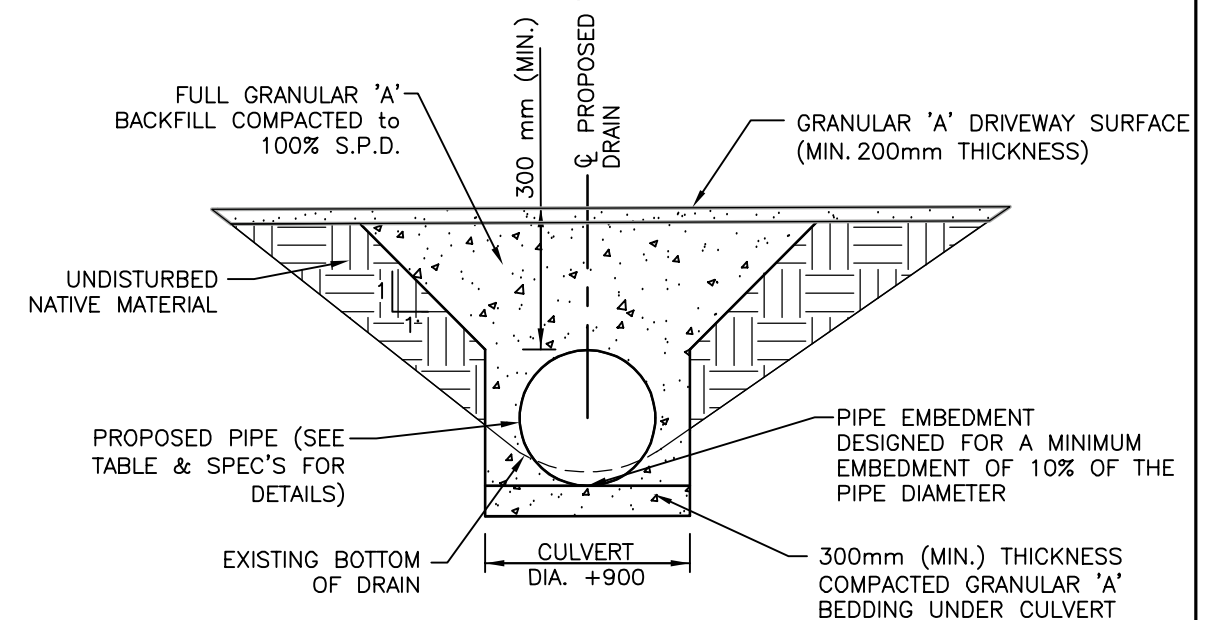
BRIDGE PLAN (BLOCK END WALLS)
BRIDGE NO. 1, 2 & 3
 N.T.S.



BRIDGE LONGITUDINAL SECTION (BLOCK ENDWALLS)
BRIDGE NO. 1, 2 & 3
 N.T.S.



BRIDGE CROSS SECTION (BLOCK END WALLS)
BRIDGE NO. 1, 2 & 3
 N.T.S.



BRIDGE CROSS SECTION (BACKFILL)
BRIDGE NO. 1, 2 & 3
 N.T.S.

- NOTE 1:**
- BLOCK ENDWALLS TO BE DESIGNED & SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
 - PIPE TO PROTRUDE A MINIMUM 150mm BEYOND THE LOWEST BLOCK ROW.
 - SEE BRIDGE DESIGN TABLE ON PAGE 4 FOR ELEVATIONS AND MEASUREMENTS.



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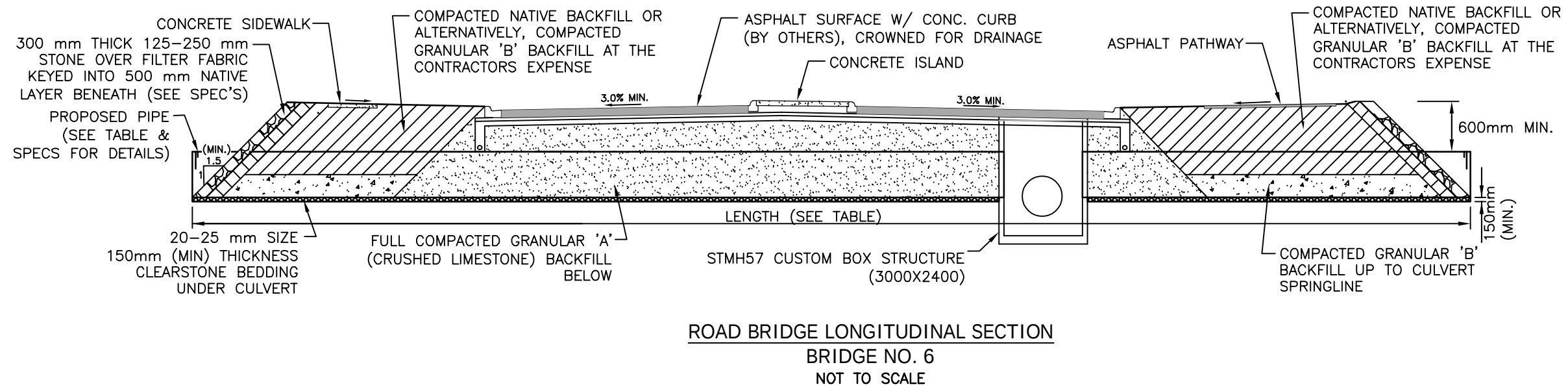
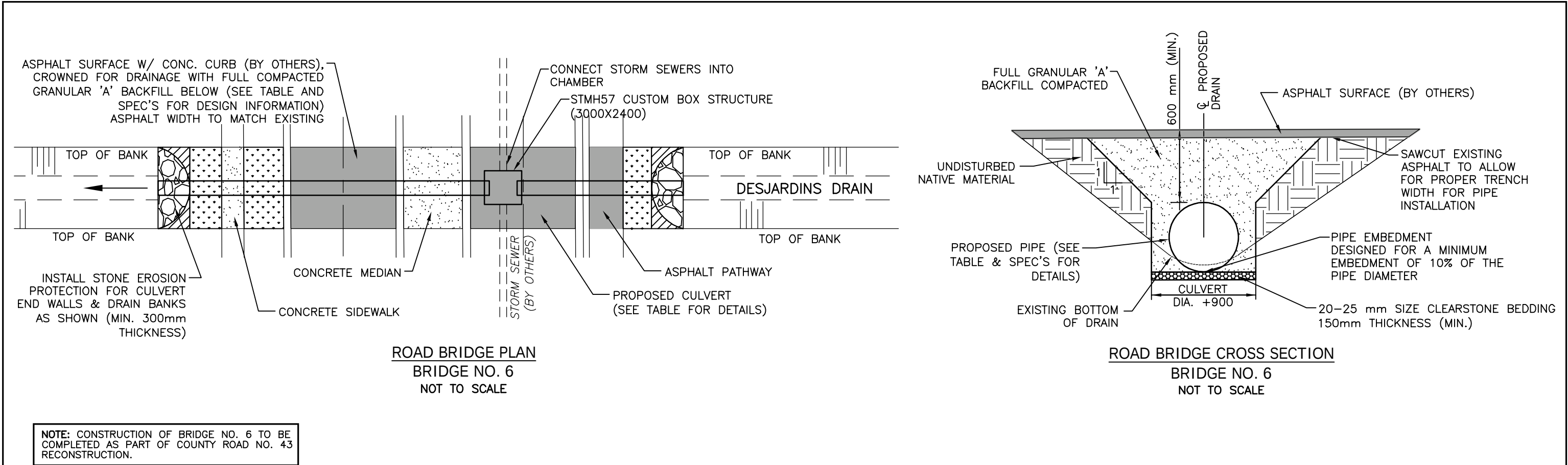
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SCALE	AS SHOWN		

PROJECT NO.	17-6774
DRAWING SCALES BASED ON A 11" X 17" SHEET	

'SCHEDULE G'	
Drainage Report for the DESJARDINS DRAIN Town of Tecumseh & City of Windsor	
SHEET TITLE	BRIDGE DETAILS (BLOCK END WALLS)
PAGE NO.	6 of 8



LICENSED PROFESSIONAL ENGINEER
M. D. HERNANDEZ
100078099
Sept 30/25
PROVINCE OF ONTARIO

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

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4	FINAL REPORT SUBMISSION	SEPT. 30/25	MDH
3	PUBLIC INFORMATION CENTRE REVIEW	APR. 14/25	MDH
2	ERCA REVIEW	APR. 7/25	MDH
1	CLIENT REVIEW	JAN. 17/25	MDH
No.	ISSUED FOR	DATE	BY

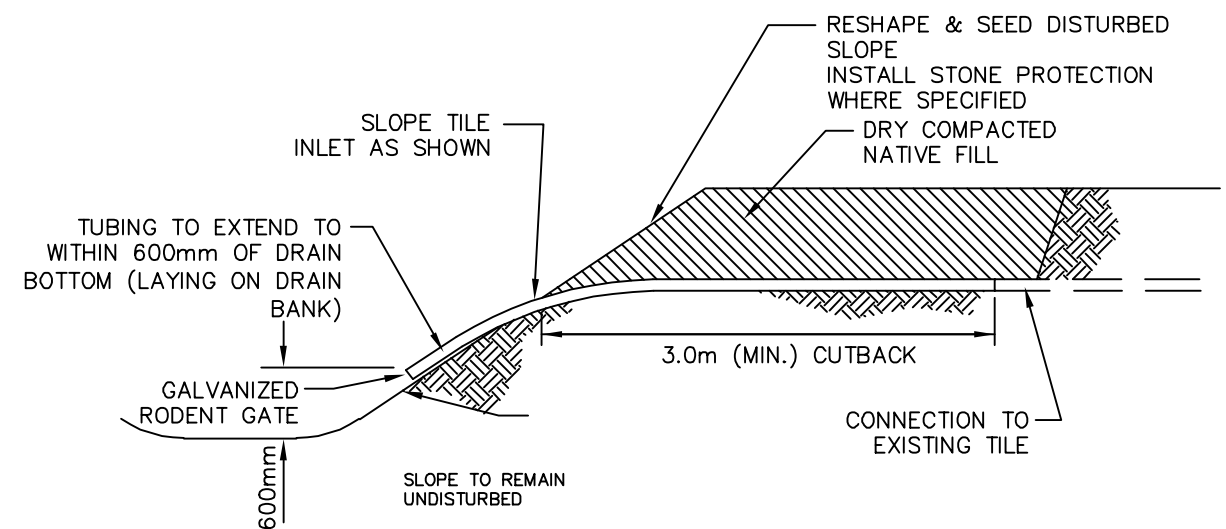
DESIGN	MDH	REVIEWED BY	CDP
DRAWN	KAW/WLB	CHECKED BY	TRO
DATE	September 30, 2025		
SCALE	AS SHOWN		

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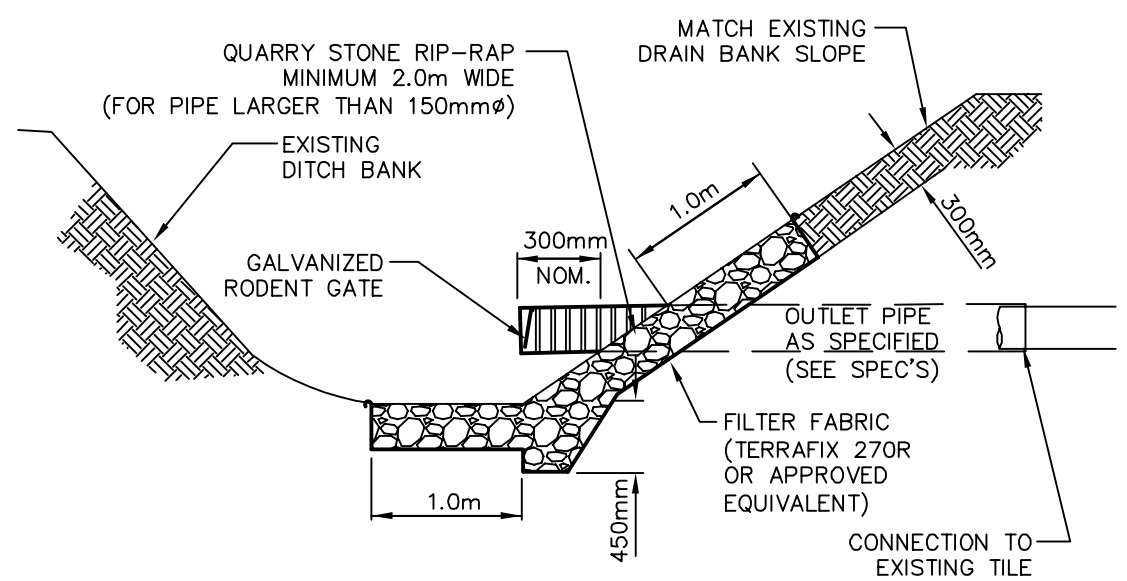
PROJECT NO. 17-6774

DRAWING SCALES BASED ON A 11" X 17" SHEET

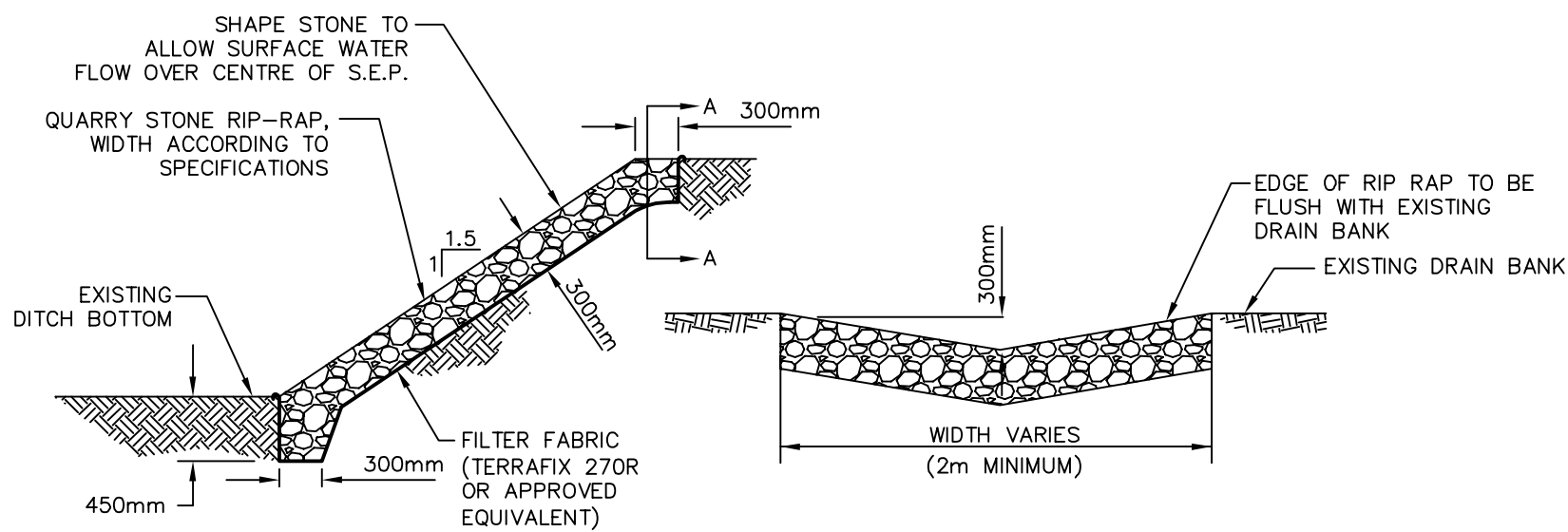
"SCHEDULE G"	
Drainage Report for the DESJARDINS DRAIN Town of Tecumseh & City of Windsor	
SHEET TITLE	ROAD BRIDGE DETAILS
PAGE NO.	7 of 8



**TYPICAL DRAINAGE TUBING TILE INLET
REPLACEMENT DETAIL
(FOR TILES 150mmØ OR SMALLER)
NOT TO SCALE**

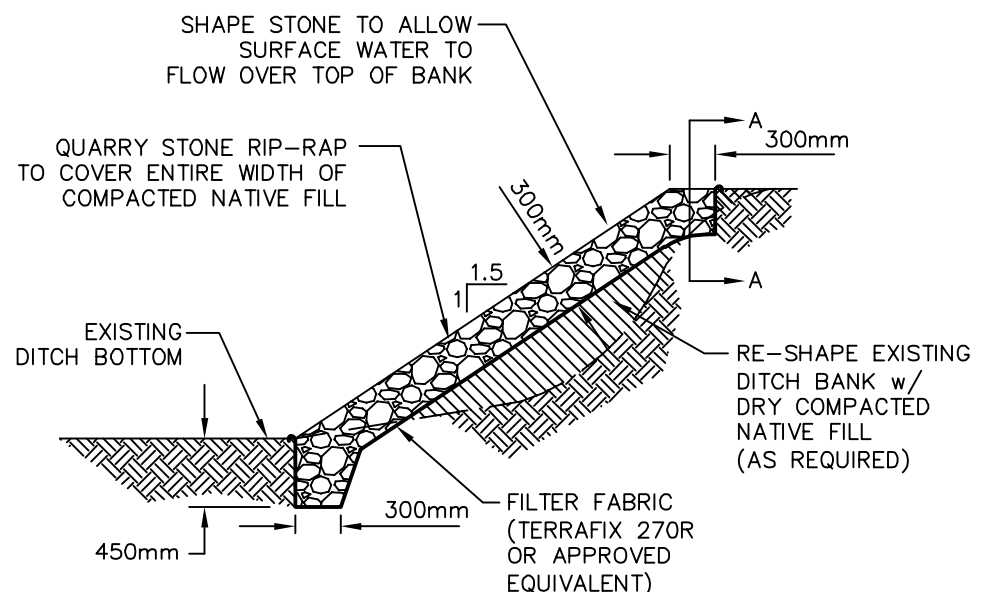


**TYPICAL CSP TILE INLET
REPLACEMENT DETAIL
NOT TO SCALE**



**TYPICAL DITCH BANK WASHOUT
DETAIL w/ RIP-RAP
NOT TO SCALE**

**SECTION A-A
NOT TO SCALE**



**TYPICAL DITCH BANK WASHOUT
DETAIL w/ BACKFILLING & RIP-RAP
NOT TO SCALE**



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DESIGN	MDH	REVIEWED BY	CDP
DRAWN	KAW/WLB	CHECKED BY	TRO
DATE	September 30, 2025		
SCALE	AS SHOWN		

DILLON CONSULTING
PROJECT NO.
17-6774
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE G'	
Drainage Report for the DESJARDINS DRAIN Town of Tecumseh & City of Windsor	
SHEET TITLE	MISCELLANEOUS DETAILS
PAGE NO.	8 of 8