

**THE CORPORATION OF THE TOWN OF AMHERSTBURG**

**BY-LAW NO. 2019 – 058**

**By-law to provide for the Parks Drain based on the Drainage Report by Dillon Consulting Ltd.**

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**WHEREAS** a request for the creation of a new municipal drain was received under section 4(1)b of the Drainage Act;

**WHEREAS** Council of the Corporation of the Town of Amherstburg felt it necessary to appoint an engineer for the purpose of preparation of an engineer's report for the Parks Drain under section 4 of the Drainage Act;

**WHEREAS** Council of the Corporation of the Town of Amherstburg has authorized Tim Oliver, P. Eng., to prepare a report and said engineer's report dated May 16, 2019, can be referenced as Schedule A, as attached hereto;

**WHEREAS** \$74,250.00 is the amount to be contributed by the Town of Amherstburg for the drainage works;

**AND WHEREAS** the report was considered by the Amherstburg Drainage Board at the meeting held on Tuesday, June 4<sup>th</sup>, 2019.

**NOW THEREFORE** the Council of the Corporation of the Town of Amherstburg hereby enacts as follows:

**1. AUTHORIZATION**

The attached report is adopted and the drainage works is authorized and shall be completed as specified in the report

**2. BORROWING**

The Corporation of the Town of Amherstburg may borrow on the credit of the Corporation the amount of \$74,250.00 being the amount necessary for the improvements of the drainage works.

This project being the Parks Drain.

**3. DEBENTURE(S)**

The Corporation may issue debenture(s) for the amount borrowed less the total amount of:

- (a) Grants received under section 85 of the Drainage Act;
- (b) Monies paid as allowances;
- (c) Commuted payments made in respect of lands and roads assessed with the municipality;
- (d) Money paid under subsection 61(3) of the Drainage Act; and
- (e) Money assessed in and payable by another municipality.

**4. PAYMENT**

Such debenture(s) shall be made payable within 5 years from the date of the debenture(s) shall bear interest at a rate not higher than 1% more than the municipal lending rates as posted by The Town of Amherstburg's Bank's Prime Lending Rate on the date of sale of such debenture(s).

- (1) A special equal annual rate sufficient to redeem the principal and interest on the debenture(s) shall be levied upon the lands and roads as shown in the schedule and shall be collected in the same manner and at the same as

other taxes are collected in each year for 5 years after the passing of this by-law.

- (2) For paying the amount \$11,386.00 being the amount assessed upon the lands and roads belonging to or controlled by the municipality a special rate sufficient to pay the amount assessed plus interest thereon shall be levied upon the whole rateable property in the Town of Amherstburg in each year for 5 years after the passing of this by-law to be collected in the same manner and at the same time as other taxes collected.
- (3) All assessments of \$1000.00 or less are payable in the first year in which the assessments are imposed.


**5. SCHEDULE OF ASSESSMENTS OF LANDS AND ROADS**

Property Description				Estimated Assessment as per Report	Estimated Grants 33 1/3%	Annual Debenture Payment Amount
Lot or Part Lot No.	Concession	Geographic Township	Parcel Roll No.			
Pt. Lot 52	5	Malden	580-03401	\$7,370.00	\$0.00	1,653.18
Pt. Lot 52	5	Malden	580-03402	\$8,904.00	\$0.00	1,997.27
Pt. Lot 52	5	Malden	580-03403	\$8,620.00	\$0.00	1,933.57
Pt. Lot 52	5	Malden	580-03404	\$8,532.00	\$0.00	1,913.83
Pt. Lot 52	5	Malden	580-03405	\$8,238.00	\$0.00	1,847.88
Pt. Lot 52	5	Malden	520-03400	\$19,178.00	\$6,859.33	2,763.22
<b>Total</b>				<b>\$60,842.00</b>	<b>\$6,859.33</b>	<b>\$12,108.95</b>

Read a first and second time and provisionally adopted this 10<sup>th</sup> day of June, 2019.

  
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 MAYOR - ALDO DICARLO  
 DEPUTY MAYOR - LEO MELONE  
  
 \_\_\_\_\_  
 CLERK - PAULA PARKER

Read a third time and finally passed this 9<sup>th</sup> day of Sept, 2019.

  
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 MAYOR - ALDO DICARLO  
  
 \_\_\_\_\_  
 CLERK - PAULA PARKER

**DRAINAGE REPORT  
FOR THE**

**PARKS DRAIN**

**TOWN OF AMHERSTBURG  
COUNTY OF ESSEX**



16 MAY 2019  
TIM R. OLIVER, P.ENG.  
FILE No. 19-9396

File No. 19-9396

Drainage Board  
Town of Amherstburg  
271 Sandwich St. South  
Amherstburg, Ontario  
N9V 2A5

**Drainage Report for the  
PARKS DRAIN  
Town of Amherstburg  
County of Essex**

Drainage Board:

**Instructions**

The Town received a petition from the landowner of property Roll No. 580-03400 for a new municipal drain in order to provide legal outlet for the drainage of five (5) proposed residential lots along County Road No. 20 within Pt. Lot 52, Concession 5, former Malden Township. Council accepted the petition in accordance with Section 4 of the Drainage Act and on 6<sup>th</sup> February, 2019 appointed Dillon Consulting Limited to prepare a report.

**Area Requiring Drainage**

The area requiring drainage encompasses the lands fronting the north side of County Road No. 20 measuring approximately 8.71 hectares (21.48 acres). At this time, the lands are primarily agricultural and include part of a municipally owned lot and part of County Road No. 20. There is little topographic relief and the soil type is Brookston Clay Loam.

We have determined the petition to be valid in accordance with Section 4(1)(b) of the Drainage Act because the land owned by the petitioner represents at least 60% of the land within the area requiring drainage.

**On-Site Meeting**

We conducted an on-site meeting on 20<sup>th</sup> February, 2019. A record of the meeting is provided in Schedule 'A', which is appended hereto.

**Survey**

Our survey and examination of the Parks Drain was carried out in March 2019. The survey comprised the recording of topographic data to determine the area requiring drainage and examining the existing road ditch for available depth necessary to provide sufficient drainage. We commenced the survey at the outlet of the existing ditch that outlets to the Albert McGee Drain near the intersection of County Road No. 20 and Concession Road 6 South. We then proceeded westerly upstream along the ditch, parallel to County Road No. 20 to the westerly limit of property Roll No. 580-03400.

Our findings are that the existing ditch requires deepening along its course to permit a sufficient outlet for the new residential lots including rear yard drainage. We find the Albert McGee Drain to have sufficient depth and capacity to accept the drainage flows from the Parks Drain without negatively impacting the hydraulic performance of the said drain.



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## 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 return period 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. For residential properties where flooding could wash out an access culvert, a higher 5 to 10 year return period design storm is the recommended design criteria. We have applied this criterion for the Parks Drain.

Design storm peak flows were determined. Since the Parks Drain runs parallel along County Road No. 20, we sized the culverts such that the 10 year return period design storm flows could freely pass through the culverts without overtopping the driveways. For each of the residential access bridges and downstream fire hydrant access bridge, a minimum 525 mm diameter culvert is required. Upstream of these bridges, the minimum culvert size required is a 450 mm diameter culvert.

We have recommended the location of the residential access bridges to the east side of the respective lots as shown on the drawings provided herein. Should the property owner wish to consider an alternative location for any of the residential access bridges, permission must first be obtained from the Town of Amherstburg prior to construction. We would recommend that a minimum of 3 m (10') of open drain exist between any two culverts.

A municipal watermain exists along the north shoulder of the road. We do not anticipate any interference with the Parks Drain excavation work. The lateral connections to the fire hydrants cross under the drain with access culverts being placed to maintain existing cover.

## Recommendations

We recommend the existing ditch be improved including the deepening and widening thereof as detailed on our drawings appended hereto. Having given consideration to the County of Essex Roads Department review, the side slopes of the drain shall be 3:1 with minimum 0.5 metre bottom width, and the centreline of the drain be offset from the edge of the road by 7.8 metres. The entire drain shall be located within the County Road 20 right-of-way. For the upper portion of the drain upstream of the proposed lots, a 1 metre grass buffer strip shall be established on the north side of the drain. We further recommend the improved drain be known as the Parks Drain.

The access bridges required are numbered and described below:

### Bridge No. 1 – Station 0+100 (Town of Amherstburg PUC)

A 2.5 m long, 300 mm diameter culvert currently exists providing access to the existing fire hydrant. This pipe is undersized and the access width is deficient according to Ontario Provincial Standard Drawings.

We recommend the bridge be replaced with a new 525 mm diameter, 9.0 m long high density polyethylene (HDPE) pipe, with sloping stone end walls providing a minimum 4.0 m wide grassed access constructed in general conformance with OPSD 217.050.

### Bridge No. 2 – Station 0+120 (Roll No. 580-03401)

We recommend a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe be installed, complete with sloping stone end walls, providing a minimum 6.1 m drivable gravel top width. The driveway alignment shall be constructed in the same direction as the residential lot lines.

Bridge No. 3 – Station 0+153 (Roll No. 580-03402)

We recommend a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe be installed, complete with sloping stone end walls, providing a minimum 6.1 m drivable gravel top width. The driveway alignment shall be constructed in the same direction as the residential lot lines.

Bridge No. 4 – Station 0+186 (Roll No. 580-03403)

We recommend a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe be installed, complete with sloping stone end walls, providing a minimum 6.1 m drivable gravel top width. The driveway alignment shall be constructed in the same direction as the residential lot lines.

Bridge No. 5 – Station 0+221 (Roll No. 580-03404)

We recommend a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe be installed, complete with sloping stone end walls, providing a minimum 6.1 m drivable gravel top width. The driveway alignment shall be constructed in the same direction as the residential lot lines.

Bridge No. 6 – Station 0+256 (Roll No. 580-03405)

We recommend a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe be installed, complete with sloping stone end walls, providing a minimum 6.1 m drivable gravel top width. The driveway alignment shall be constructed in the same direction as the residential lot lines.

Bridge No. 7 – Station 0+297 (580-03400)

A 9.0 m long, 300 mm diameter corrugated steel pipe (CSP) currently provides farm access to the agricultural field Roll No. 580-03400. This pipe is undersized and the access width deficient for modern farm equipment.

We recommend the bridge be replaced with a new 14.5 m long, 450 mm diameter high density polyethylene (HDPE) pipe, complete with sloping stone end walls, providing a minimum 7.3 m drivable gravel top width. The driveway alignment shall be constructed in the same direction as the farm lot lines.

Bridge No. 8 – Station 0+379 (Town of Amherstburg PUC)

We recommend a new 9.5 m long, 450 mm diameter high density polyethylene (HDPE) pipe be installed, complete with sloping stone end walls providing a minimum 4.0 m wide grassed access constructed in general conformance with OPSD 217.050.

**Allowances**

We have made a determination of the amount to be paid for lands taken in accordance with Section 29, as well as for the amount to be paid for damages to lands under Section 30. For lands taken, an average land value of \$6,070 per hectare (\$15,000 per acre) was used for establishing a 1 metre wide grass buffer strip along the drain on property Roll No. 580-3400. Schedule 'B' shows this allowance in the amount of \$700.00. Schedule 'B' shows an additional allowance of \$700.00 for the 9.0 m wide corridor along the farm property Roll No. 580-03400 for the spreading and levelling of drain spoils. A rate of \$3,707 per hectare, (\$1,500 per acre) was used in calculating this allowance. No damage allowance was provided for the portion of the working corridor adjacent to the municipally owned property Roll No. 580-03500 since the drain spoils are to be trucked and the existing property to be restored to original conditions at the Contractor's expense.

### 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 Parks Drain be constructed as described below:

Item	Description	Amount
	<b><u>OPEN DRAIN WORK</u></b>	
1.	Excavation, trucking and/or levelling of excavated materials works, as follows:	
	a) Excavation to deepen and widen drain including levelling of excavated materials from Station 0+114 to Station 0+470 totalling approximately 356 lineal metres of drain and approximately 530 m <sup>3</sup> of material.	\$4,500.00
	b) Excavation to deepen and widen drain from Station 0+000 to Station 0+114 across the frontage of 580-03500 (Town of Amherstburg), approximately 114 lineal metres of drain and approximately 30 m <sup>3</sup> including trucking of excavated materials to be spread and levelled within working corridor upstream of Station 0+114.	\$1,100.00
2.	Hydraulic seeding as follows:	
	a) Hydraulic seeding of drain banks disturbed by drain excavation from Station 0+000 to Station 0+286 (approximately 1,300 m <sup>2</sup> ).	\$3,900.00
	b) Hydraulic seeding of drain banks disturbed by drain excavation and 1 metre grass buffer strip on north side of drain from Station 0+286 to Station 0+470 (approximately 1,450 m <sup>2</sup> ).	\$4,300.00
3.	Bridge works, as follows:	
	a) <u>Bridge No. 1 - Station 0+100 (Town of Amherstburg)</u> – Removal and disposal of existing 2.5 m long 300 mm diameter culvert off-site. Supply and installation of a new 9.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 5 tonnes). Clean native or imported clean native backfill material from invert of pipe culvert to the driveway surface (approximately 15 m <sup>3</sup> ). Hydraulic seeding of top surface (approximately 20 m <sup>2</sup> ) and sloping stone end walls (approximately 15 m <sup>2</sup> ).	\$4,100.00

Item	Description	Amount
	<p>b) <u>Bridge No. 2 - Station 0+120 (Roll No. 580-03401)</u> – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill up to the underside of Granular 'A' driveway material (approximately 40 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 25 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 10 m<sup>2</sup>).</p>	\$4,500.00
	<p>c) <u>Bridge No. 3 - Station 0+153 (Roll No. 580-03402)</u> – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 60 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).</p>	\$5,650.00
	<p>d) <u>Bridge No. 4 - Station 0+186 (Roll No. 580-03403)</u> – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 50 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).</p>	\$5,400.00



Item	Description	Amount
	<p>e) <u>Bridge No. 5 - Station 0+221 (Roll No. 580-03404)</u> – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 45 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).</p>	\$5,300.00
	<p>f) <u>Bridge No. 6 - Station 0+256 (Roll No. 580-03405)</u> – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 50 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 20 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).</p>	\$5,050.00
	<p>g) <u>Bridge No. 7 - Station 0+297 (Roll No. 580-03400)</u> – Removal and disposal of existing 9.0 m long 300 mm diameter CSP culvert at Station 0+284. Supply and installation of a new 14.5 m long, 450 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill up to pipe springline of pipe (approximately 10 tonnes). Clean native or imported clean native backfill material from springline of pipe culvert to the underside of Granular 'A' driveway material and outside of driveway portion to construct the 0.50 m wide native buffer strips (approximately 25 m<sup>3</sup>). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Sloping stone end walls (approximately 15 m<sup>2</sup>).</p>	\$5,900.00

Item	Description	Amount
	h) <b>Bridge No. 8 - Station 0+379 (Town of Amherstburg)</b> – Supply and installation of a new 9.5 m long, 450 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 5 tonnes). Clean native or imported clean native backfill material from invert of pipe culvert to the driveway surface and outside of driveway portion to construct the 0.50 m wide native buffer strips (approximately 20 m <sup>3</sup> ). Hydraulic seeding of top surface (approximately 20 m <sup>2</sup> ) and sloping stone end walls (approximately 15 m <sup>2</sup> ).	\$3,400.00
4.	Excavate sediment trap from Station 0+018 to Station 0+022 (3 m long x 1 m wide x 0.3 m deep) complete with rock flow check dam on downstream side (1 m long x 2 m wide x 0.3 m high) (approximately 5 tonnes). The work shall include trucking of excavated materials off-site.	\$500.00
5.	Supply and installation of 6 m long, 300 mm diameter high density polyethylene (HDPE) outlet pipe including galvanized steel rodent gate and stone erosion protection on north bank (approximately 10 m <sup>2</sup> ) at the following locations:	
	a) Station 0+112	\$1,000.00
	b) Station 0+288	\$1,000.00
	<b>SUB-TOTAL – PARKS DRAIN</b>	<b>\$55,600.00</b>
6.	Allowances under Section 29 and Section 30	\$1,400.00
7.	Survey, Report, Attendance at Meetings	\$15,100.00
8.	Periodic inspection and contract administration including incidentals.	\$2,000.00
9.	ERCA permit application fee	\$150.00
	<b>TOTAL ESTIMATE – PARKS DRAIN</b>	<b>\$74,250.00</b>

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 and as shown in Schedule 'D.' 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

For the drainage works associated with the improvement of the Parks Drain open channel from Station 0+000 to Station 0+114 we have assessed these costs to the lands and roads within the entire watershed apportioned 20% Benefit assessment and 80% Outlet assessment.

For the drainage works associated with the improvement of the Parks Drain open channel from Station 0+114 to Station 0+470 we have assessed these costs solely to the adjacent lands north of the drain apportioned 80% Benefit assessment and 20% Outlet assessment. Special Benefit assessment shown in Schedule 'C' was derived as follows:

1. For each of the residential access bridges, 100% of the cost has been assessed against the bridge owner.
2. For the farm access bridge, 100% of the cost has been assessed against the bridge owner.
3. For the fire hydrant access bridges, 100% of the cost has been assessed to Town of Amherstburg PUC as per Section 26 of the Drainage Act.
4. For the new surface drain swale outlet pipes, 100% of the costs has been assessed against the lands to where the surface swale originates from.

### 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 Town will arrange to have this work completed and the costs will be charged to the appropriate public utility.

### Future Maintenance – Open Drain

We recommend that future work of repair and maintenance of the Parks Drain (open channel portion and cleaning of culverts) be carried out by the Town of Amherstburg and assessed to the lands and roads within the watershed in the same relative proportions as shown in Schedule 'E-1.' The assessments are based on an arbitrary amount of \$1,000.00 apportioned 50% Benefit assessment and 50% Outlet assessment. Future assessments are subject, of course, to any variations that may be made under the authority of the Drainage Act.

### Future Maintenance – Access Bridges

We recommend that future work of repair and replacement of the access bridges be carried out by the Town of Amherstburg and assessed as outlined below.

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

Bridge No.	Type	Owner(s)	Special Benefit	Outlet
1	Fire Hydrant Access	Town of Amherstburg PUC (Section 26)	100%	0%
2	Primary	Roll No. 580-03401	50%	50%
3	Primary	Roll No. 580-03402	50%	50%
4	Primary	Roll No. 580-03403	50%	50%
5	Primary	Roll No. 580-03404	50%	50%
6	Primary	Roll No. 580-03405	50%	50%
7	Primary	Roll No. 580-03400	50%	50%
8	Fire Hydrant Access	Town of Amherstburg PUC (Section 26)	100%	0%

For the outlet portion assessed as part of the maintenance cost of each bridge, the assessments as shown in Schedule 'E-2' represent the lands and roads upstream of Bridge No. 2. The assessment is based on an arbitrary amount of \$1,000.00. For the other bridges with a shared assessment for future repair or replacement costs, Schedule 'E-2' shall apply in the same relative proportions and be applicable to only the lands and roads upstream of the said bridge.

### 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 represents the following drawings that are also attached to this report:

- Page 1 of 5: Overall Plan**
- Page 2 of 5: Drain Profile**
- Page 3 of 5: Drain Cross-Sections**
- Page 4 of 5: Bridge Details**
- Page 5 of 5: 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 Town or proponent designated on the Town's behalf shall obtain all required approvals/permits and confirm any construction limitations including timing windows, mitigation/off-setting measures, standard practices or any other limitations related to in-stream works. The report had also been sent to the County of Essex Roads Department and the Essex Region Conservation Authority for review and comments.

**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**



Tim R. Oliver, P. Eng.  
TRO:oem:ges



Oliver E. Moir, EIT



**SCHEDULE 'A**

**PARKS DRAIN – SITE MEETING**

**FEBRUARY 20, 2019**

**Location: Town of Amherstburg Public Works Building**

**Attendees**

Jon M. Parks  
Mark Fishleigh  
Shane McVitty  
Tim Oliver

Land Owner (Roll No. 580-03400)  
County of Essex Road Department  
Town of Amherstburg  
Dillon Consulting Limited

**Notes**

<b>Item</b>	<b>Discussion</b>	<b>Action By</b>
1.	Purpose of meeting is to discuss the proposed new drain petitioned under the Drainage Act to be constructed along the north side of County Road 20 just west of the 6 <sup>th</sup> Concession Road South.	Notes
2.	Jon Parks submitted a petition for the new drain to be known as the Parks Drain that would serve to provide a legal outlet for the proposed development of five (5) new residential lots fronting County Road 20.	Notes
3.	Initially, Mr. Parks applied to the Town of Amherstburg Planning Department for the lot severancing. The proposed lot layout of the 5 new residential lots was reviewed by the County of Essex Roads Department and the landowner obtained entrance permits for 5 new culverts at a cost of \$6,250.	Notes
4.	The County of Essex Roads Department, upon their review of the severance application, had suggested the culverts be equally spaced. With the proposed site plan illustrating storm drainage connections for each of the new residential lots to outlet into the County Road ditch, the County recommended that their ditch be incorporated as a municipal drain.	Notes
5.	Tim Oliver noted the first thing he will need to establish is whether we have a valid petition which will require at least 60% of the area within the area requiring drainage being represented by lands owned by Mr. Parks. A field survey will be required to determine the overall area contributing to the Parks Drain and then establish the limits of the drain. Prior to doing so, he will check with Peralta Engineering to see what they may have available to prevent duplication of effort.	Dillon Consulting Limited
6.	Based on an initial assumption of the drainage area to be served by the Parks Drain, Mr. Oliver stated the minimum culvert size expects to be 450 mm (18") diameter. There are two existing access culverts observed within the drain providing farm access and access to an existing fire hydrant. Both of these culverts will require replacement as they are undersized.	Notes

Item	Discussion	Action By
	Mr. Parks was asked where he would like the new farm access culvert located to. He mentioned to locate it to the west just far enough to keep it a similar equal spacing as the new residential lots should there be the opportunity to develop additional residential lots to the west.	
7.	Mr. Parks asked that consideration be given to extend the municipal drain as far enough to the west to avoid the need for a subsequent drainage report should there be further lot severances. Mr. Oliver noted that the drain may require more depth than exists now with the road side ditch to accommodate sufficient grade, depth of cover for culverts and for storm drain connections. The Parks Drain will drain east to the Albert McGee Drain.	Notes
8.	Once it is confirmed the petition is valid, we will proceed with preparation of a draft report that will be circulated amongst the Town, County of Essex Roads Department and landowner for review and comment prior to issuing to the Conservation Authority of their review.	Dillon Consulting Limited
9.	Following these reviews, the final report will be issued to the Town, for consideration before the Drainage Board by early Summer 2019.	Dillon Consulting Limited
10.	Mr. Parks asked about construction and that he had a contractor in mind to complete the work. Shane McVitty noted that if the contractor has previous drainage construction experience, they would be included on the list to quote a price for the work. Several contractors will be contacted for quotes, and timelines to when the work shall be completed can be stipulated if the landowner is interested to expedite the construction of the new drainage works.	Notes

Meeting summary prepared by Tim Oliver, P. Eng. who should be notified of any errors and/or omissions.

**"SCHEDULE B"**  
**SCHEDULE OF ALLOWANCES**

**PARKS DRAIN**  
**TOWN OF AMHERSTBURG**

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
520-03400	5	Pt. Lot 52	Jon M. Parks	\$700.00	\$700.00	\$1,400.00
<b>TOTAL ALLOWANCES .....</b>				<b>\$700.00</b>	<b>\$700.00</b>	<b>\$1,400.00</b>



**"SCHEDULE C"**  
**SCHEDULE OF ASSESSMENT**  
**PARKS DRAIN**  
**TOWN OF AMHERSTBURG**

**MUNICIPAL LANDS:**

Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
	(Acres)	(Ha.)					
County Road No. 20	2.52	1.02	County of Essex	\$0.00	\$130.00	\$492.00	\$622.00
Total on Municipal Lands.....				\$0.00	\$130.00	\$492.00	\$622.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
			(Acres)	(Ha.)					
580-03401	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$5,850.00	\$1,239.00	\$281.00	\$7,370.00
580-03402	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$7,345.00	\$1,252.00	\$307.00	\$8,904.00
580-03403	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$7,020.00	\$1,269.00	\$331.00	\$8,620.00
580-03404	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$6,890.00	\$1,287.00	\$355.00	\$8,532.00
580-03405	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$6,565.00	\$1,295.00	\$378.00	\$8,238.00
580-03500	5	Pt. Lot 52	2.10	0.85	Town of Amherstburg	\$1,300.00	\$90.00	\$246.00	\$1,636.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$34,970.00	\$6,432.00	\$1,898.00	\$43,300.00

**PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)**

Roll No.	Con.	Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
			(Acres)	(Ha.)					
520-03400	5	Pt. Lot 52	13.81	5.59	Jon M. Parks	\$8,970.00	\$8,334.00	\$3,274.00	\$20,578.00
Total on Privately-Owned - Agricultural Lands (Grantable).....						\$8,970.00	\$8,334.00	\$3,274.00	\$20,578.00

**SECTION 26 & NON-AGRICULTURAL LANDS (NON PRO-RATABLE)**

Roll No.	Con.	Description	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Total Section 26 & Non-Agricultural Lands (Non Pro-ratable).....				\$9,750.00	\$0.00	\$0.00	\$9,750.00

<b>TOTAL ASSESSMENT</b> .....				<b>\$53,690.00</b>	<b>\$14,896.00</b>	<b>\$5,664.00</b>	<b>\$74,250.00</b>
		(Acres)	(Ha.)				
	<b>Total Area:</b>	<b>21.48</b>	<b>8.71</b>				

**"SCHEDULE D"**  
**DETAILS OF SPECIAL BENEFIT**  
**PARKS DRAIN**  
**TOWN OF AMHERSTBURG**

**SPECIAL BENEFIT ASSESSMENT**  
**(AGRICULTURAL LANDS GRANTABLE)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
520-03400	Jon M. Parks	<u>Bridge No. 7</u> - Station 0+297 - Supply and install a new 14.5 m long, 450 mm diameter HDPE (100%).	\$5,900.00	\$1,770.00	\$7,670.00
520-03400	Jon M. Parks	Station 0+288 - Supply and install a new 6 m long, 300 mm diameter HDPE outlet pipe including galvanized steel rodent gate and stone erosion protection approx. 10m <sup>2</sup> (100%).	\$1,000.00	\$300.00	\$1,300.00
Total Special Benefit - Roll No. 580-03400			\$6,900.00	\$2,070.00	\$8,970.00
Total Special Benefit Assessment (Grantable Agricultural Lands).....			\$6,900.00	\$2,070.00	\$8,970.00

**SPECIAL BENEFIT ASSESSMENT**  
**(NON - AGRICULTURAL LANDS)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
580-03401	Jon M. Parks	<u>Bridge No. 2</u> - Station 0+120 - Supply and install a new 12.0 m long, 525 mm diameter HDPE (100%).	\$4,500.00	\$1,350.00	\$5,850.00
580-03402	Jon M. Parks	<u>Bridge No. 3</u> - Station 0+153 - Supply and install a new 12.0 m long, 525 mm diameter HDPE (100%).	\$5,650.00	\$1,695.00	\$7,345.00
580-03403	Jon M. Parks	<u>Bridge No. 4</u> - Station 0+186 - Supply and install a new 12.0 m long, 525 mm diameter HDPE (100%).	\$5,400.00	\$1,620.00	\$7,020.00
580-03404	Jon M. Parks	<u>Bridge No. 5</u> - Station 0+221 - Supply and install a new 12.0 m long, 525 mm diameter HDPE (100%).	\$5,300.00	\$1,590.00	\$6,890.00
580-03405	Jon M. Parks	<u>Bridge No. 6</u> - Station 0+256 - Supply and install a new 12.0 m long, 525 mm diameter HDPE (100%).	\$5,050.00	\$1,515.00	\$6,565.00
580-03500	Town of Amherstburg	Station 0+112 - Supply and install a new 6 m long, 300 mm diameter HDPE outlet pipe including galvanized steel rodent gate and stone erosion protection approx. 10m <sup>2</sup> (100%).	\$1,000.00	\$300.00	\$1,300.00
Total Special Benefit Assessment (Non - Agricultural Lands).....			\$26,900.00	\$8,070.00	\$34,970.00

**(SECTION 26 INCREASED COSTS TO PUBLIC UTILITY)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
Public Utility	Town of Amherstburg PUC	<u>Bridge No. 1</u> - Station 0+100 - Removal of 2.5 m long 300 mm diameter pipe and supply and install a new 9.0 m long, 525 mm diameter HDPE (100%).	\$4,100.00	\$1,230.00	\$5,330.00
		<u>Bridge No. 8</u> - Station 0+379 - Supply and install a new 9.5 m long, 450 mm diameter HDPE (100%).	\$3,400.00	\$1,020.00	\$4,420.00
		Total Special Benefit - Town of Amherstburg PUC	\$7,500.00	\$2,250.00	\$9,750.00
Total Special Benefit Assessment (Section 26 Increased Costs to Public Utility)			\$7,500.00	\$2,250.00	\$9,750.00
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT .....					\$53,690.00

**"SCHEDULE E-1"**  
**ASSESSMENT SCHEDULE FOR FUTURE MAINTENANCE (OPEN DRAIN)**  
**PARKS DRAIN**  
**TOWN OF AMHERSTBURG**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 20	2.52	1.02	County of Essex	\$0.00	\$147.00	\$32.00	\$179.00
Total on Municipal Lands.....				\$0.00	\$147.00	\$32.00	\$179.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
580-03401	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$22.00	\$24.00	\$46.00
580-03402	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$22.00	\$27.00	\$49.00
580-03403	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$23.00	\$27.00	\$50.00
580-03404	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$23.00	\$29.00	\$52.00
580-03405	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$24.00	\$30.00	\$54.00
580-03500	5	Pt. Lot 52	2.10	0.85	Town of Amherstburg	\$0.00	\$80.00	\$73.00	\$153.00
Total on Privately-Owned - Non-Agricultural Lands.....				\$0.00	\$194.00	\$210.00	\$404.00		

**PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
520-03400	5	Pt. Lot 52	13.81	5.59	Jon M. Parks	\$0.00	\$159.00	\$258.00	\$417.00
Total on Privately-Owned - Agricultural Lands (Grantable).....				\$0.00	\$159.00	\$258.00	\$417.00		

<b>TOTAL ASSESSMENT .....</b>				<b>\$0.00</b>	<b>\$500.00</b>	<b>\$500.00</b>	<b>\$1,000.00</b>
		(Acres) (Ha.)					
		<b>Total Area:</b>		<b>21.48</b>	<b>8.71</b>		

**"SCHEDULE E-2"**  
**ASSESSMENT SCHEDULE FOR FUTURE MAINTENANCE (ACCESS BRIDGES)**  
**PARKS DRAIN**  
**TOWN OF AMHERSTBURG**

**MUNICIPAL LANDS:**

Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
	(Acres)	(Ha.)					
County Road No. 20	1.89	0.76	County of Essex	\$0.00	\$0.00	\$100.00	\$100.00
Total on Municipal Lands.....				\$0.00	\$0.00	\$100.00	\$100.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
			(Acres)	(Ha.)					
580-03401	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$0.00	\$69.00	\$69.00
580-03402	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$0.00	\$69.00	\$69.00
580-03403	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$0.00	\$69.00	\$69.00
580-03404	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$0.00	\$69.00	\$69.00
580-03405	5	Pt. Lot 52	0.61	0.25	Jon M. Parks	\$0.00	\$0.00	\$69.00	\$69.00
Total on Privately-Owned - Non-Agricultural Lands.....				\$0.00	\$0.00	\$345.00	\$345.00		

**PRIVATELY-OWNED - AGRICULTURAL LANDS (GRANTABLE)**

Roll No.	Con.	Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
			(Acres)	(Ha.)					
580-03400	5	Pt. Lot 52	13.81	5.59	Jon M. Parks	\$0.00	\$0.00	\$555.00	\$555.00
Total on Privately-Owned - Agricultural Lands (Grantable).....				\$0.00	\$0.00	\$555.00	\$555.00		

<b>TOTAL ASSESSMENT .....</b>				<b>\$0.00</b>	<b>\$0.00</b>	<b>\$1,000.00</b>	<b>\$1,000.00</b>	
			(Acres)	(Ha.)				
<b>Total Area:</b>			<b>18.75</b>	<b>7.60</b>				

"SCHEDULE F"  
DRAINAGE REPORT FOR THE  
**PARKS DRAIN**  
TOWN OF AMHERSTBURG  
COUNTY OF ESSEX

**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:

Open Drain Work

- Excavation, trucking and/or levelling of excavated materials works, as follows:
  - Excavation to deepen and widen drain including levelling of excavated materials from Station 0+114 to Station 0+470 totalling approximately 356 lineal metres of drain and approximately 530 m<sup>3</sup> of material.
  - Excavation to deepen and widen drain from Station 0+000 to Station 0+114 across the frontage of 580-03500 (Town of Amherstburg), approximately 114 lineal metres of drain and approximately 30 m<sup>3</sup> including trucking of excavated materials to be spread and levelled within working corridor upstream of Station 0+114.
- Hydraulic seeding as follows:
  - Hydraulic seeding of drain banks disturbed by drain excavation from Station 0+000 to Station 0+286 (approximately 1,300 m<sup>2</sup>).
  - Hydraulic seeding of drain banks disturbed by drain excavation and 1 metre grass buffer strip on north side of drain from Station 0+286 to Station 0+470 (approximately 1,450 m<sup>2</sup>).
- Bridge works, as follows:
  - Bridge No. 1 - Station 0+100 (Town of Amherstburg) – Removal and disposal of existing 2.5 m long 300 mm diameter culvert off-site. Supply and installation of a new 9.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 5 tonnes). Clean native or imported clean native backfill material from invert of pipe culvert to the driveway surface (approximately 15 m<sup>3</sup>). Hydraulic seeding of top surface (approximately 20 m<sup>2</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).

- Bridge No. 2 - Station 0+120 (Roll No. 580-03401) – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill up to the underside of Granular 'A' driveway material (approximately 40 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 25 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 10 m<sup>2</sup>).
- Bridge No. 3 - Station 0+153 (Roll No. 580-03402) – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 60 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).
- Bridge No. 4 - Station 0+186 (Roll No. 580-03403) – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 50 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).
- Bridge No. 5 - Station 0+221 (Roll No. 580-03404) – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 45 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).
- Bridge No. 6 - Station 0+256 (Roll No. 580-03405) – Supply and installation of a new 12.0 m long, 525 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill to the underside of Granular 'A' driveway material (approximately 50 tonnes). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 20 tonnes). Native material backfill beyond the edges of driveway to construct the 0.5 m wide native buffer strips (approximately 5 m<sup>3</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).

- Bridge No. 7 - Station 0+297 (Roll No. 580-03400) – Supply and installation of a new 14.5 m long, 450 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 10 tonnes). Granular 'B' backfill up to pipe springline of pipe (approximately 10 tonnes). Clean native or imported clean native backfill material from springline of pipe culvert to the underside of Granular 'A' driveway material and outside of driveway portion to construct the 0.50 m wide native buffer strips (approximately 25 m<sup>3</sup>). Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 30 tonnes). Sloping stone end walls (approximately 15 m<sup>2</sup>).
- Bridge No. 8 - Station 0+379 (Town of Amherstburg) – Supply and installation of a new 9.5 m long, 450 mm diameter high density polyethylene (HDPE) pipe. Clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 5 tonnes). Clean native or imported clean native backfill material from invert of pipe culvert to the driveway surface and outside of driveway portion to construct the 0.50 m wide native buffer strips (approximately 20 m<sup>3</sup>). Hydraulic seeding of top surface (approximately 20 m<sup>2</sup>) and sloping stone end walls (approximately 15 m<sup>2</sup>).
- Excavate sediment trap from Station 0+018 to Station 0+022 (3 m long x 1 m wide x 0.3 m deep) complete with rock flow check dam on downstream side (1 m long x 2 m wide x 0.3 m high) (approximately 5 tonnes). The work shall include trucking of excavated materials off-site.
- Supply and installation of 6 m long, 300 mm diameter high density polyethylene (HDPE) outlet pipe including galvanized steel rodent gate and stone erosion protection on north bank (approximately 10 m<sup>2</sup>) at the following stations:
  - Station 0+112
  - Station 0+288

### 3.0 ACCESS TO THE WORK

Access to the drain shall be from County Road No. 20 using existing farm access bridge to property Roll No. 580-03400. 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 construction of the entire Parks Drain, the primary working corridor shall be on the north side of the drain. Future maintenance of the Parks Drain will differ from the current working corridor to accommodate future residential lots. For future maintenance, the primary working corridor will be the north half of the County Road No. 20 right-of-way from Station 0+000 to Station 0+286. From Station 0+286 to Station 0+470, the primary working corridor for future maintenance will be on the north side of the drain. Any damages to lands and/or roads from the Contractor's work within the working area for the bridge sites shall be rectified to pre-existing conditions at his expense.

The Contractor shall restrict his equipment to the working corridors as specified in this Section. Any damage resulting from non-compliance with this Section shall be borne by the Contractor. The working corridor shall be measured from the top of the newly constructed north drain bank and shall be as follows:



FROM STA.	TO STA.	PRIMARY (See Note 1)	SECONDARY (See Note 2)
<b>WORKING CORRIDOR FOR CONSTRUCTION</b>			
0+000	0+470	9.0 m wide on north side of drain	County Road No. 20 R.O.W.
<b>WORKING CORRIDOR FOR FUTURE MAINTENANCE</b>			
0+000	0+286	County Road No. 20 R.O.W.	N/A
0+286	0+470	9.0 m wide on north side of drain	County Road No. 20 R.O.W.

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 along side the drain where construction equipment may travel for the purpose of trucking, drain bank repairs, tile inlet repairs 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 and necessary traffic protection and safety control measures taken. Read all Specifications, Drawings and/or notes before completing works.**

## SPECIAL PROVISIONS – OPEN DRAIN

### 5.0 EXCAVATION AND LEVELLING OF EXCAVATED MATERIALS

#### 5.1 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 5.2. 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 5.2. 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 7.0.

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.

Where the existing guy anchors may be affected by the proposed work, the Contractor shall notify the utility in advance of the work to determine if the guy anchor requires relocation outside of open drain channel limits.

#### 5.2 Levelling of Excavated Materials

Excavation of the drain bottom shall be completed as specified in Section 5.1, above 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.

#### 5.3 Trucking of Excavated Materials

**Contractor shall be solely responsible for acquiring all permits required from the Town of Amherstburg prior to hauling any fill 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. Should the landowner prefer to have the excavated materials trucked rather than levelled on site, all additional costs shall be at the landowner's expense.

## 6.0 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.

## 7.0 HYDRAULIC SEEDING OF DRAIN BANKS AND GRASS BUFFER

All existing grassed areas disturbed by construction, the new drain cross section and the grass buffer 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 m<sup>2</sup>. Clean water shall be applied at 42,700 liters per 10,000 m<sup>2</sup>.

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 m<sup>2</sup>.

Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m<sup>2</sup>. 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.**

## 8.0 ACCESS BRIDGE WORK

### 8.1 Location of New Culvert

The new culvert shall be installed as shown on the drawings attached hereto. The centerline of the new culverts shall be located to align itself with the proposed drain centerline. For the residential access culverts, the end of the pipe shall not extend past the lot line.

### 8.2 Removal of Existing Culverts

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.

### 8.3 Materials for New Bridges

Materials shall be as follows:

<i>Culvert Pipe</i>	<b>Bridge No. 1 - Station 0+100:</b> <i>New 9.0 m long, 525 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>
<i>Culvert Pipe</i>	<b>Bridge No. 2 - Station 0+120:</b> <i>New 12.0 m long, 525 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>
<i>Culvert Pipe</i>	<b>Bridge No. 3 - Station 0+153:</b> <i>New 12.0 m long, 525 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>
<i>Culvert Pipe</i>	<b>Bridge No. 4 - Station 0+186:</b> <i>New 12.0 m long, 525 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>

<i>Culvert Pipe</i>	<b>Bridge No. 5 - Station 0+221:</b> <i>New 12.0 m long, 525 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>
<i>Culvert Pipe</i>	<b>Bridge No. 6 - Station 0+256:</b> <i>New 12.0 m long, 525 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>
<i>Culvert Pipe</i>	<b>Bridge No. 7 - Station 0+297:</b> <i>New 14.5 m long, 450 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>
<i>Culvert Pipe</i>	<b>Bridge No. 8 - Station 0+379:</b> <i>New 9.5 m long, 450 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i>  <i>New pipes shall be joined using (soil tight) "split" coupler joining system (split couplers manufactured by Armtec Limited or approved equal), supplied by the pipe manufacturer and conforming to ASTM D3350, CSA 182.8-02 and OPSS 1840. Joints wrapped in "Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 446, Mirafi 140NC or approved equivalent.</i>
<i>Pipe Bedding Below Pipe</i>	<i>20-25 mm clear stone conforming to OPSS Division 10.</i>
<i>Backfill up to Pipe Culvert Springline</i>	<i>Granular 'B' conforming to OPSS Division 10 for Bridges 2, 3, 4, 5, 6, &amp; 7.</i> <i>Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances for Bridges 1 &amp; 8.</i>
<i>Backfill Above Pipe Springline up to Bottom of Driveway Surface Materials</i>	<i>For Bridges 1, 7 &amp; 8, dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.</i> <i>Granular 'B' conforming to OPSS Division 10 for Bridges 2, 3, 4, 5 &amp; 6. Alternatively, Granular 'A' conforming to OPSS Division 10 may be used at the Contractor's expense.</i>

<i>Driveway Surface</i>	<i>For Bridges 1 &amp; 8, top soil of minimum 100 mm thickness and hydro-seeded as per Section 7.0. For Bridges 2, 3, 4, 5, 6, &amp; 7, 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>

#### **8.4 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.

#### **8.5 Sloping Stone End Walls**

End walls shall be constructed of quarry stone rip-rap, as specified herein. Each end wall shall extend from the invert of the new culvert to the top of the proposed lane. Unless specified otherwise, 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 and wrapping around the drain banks to align with the ends of the new pipe culvert. The minimum thickness requirement of the erosion stone layer is 300 mm with no portion of the filter fabric to be exposed to sunlight.

#### **8.6 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.

#### **8.7 Native Materials**

Native materials suitable for use as backfill, as defined under Section 8.3, 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.

### **8.8 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 drain pipe in cold weather to avoid causing damage.

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

### **8.9 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.

## **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. To access the electronic standards on the Web go to <http://www.mto.gov.on.ca/english/transrd/>. Under the title Technical Manuals is a link to the Ontario Provincial Standards. Users require Adobe Acrobat to view all pdf files.

## **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. To access the electronic standards on the Web go to <http://www.mto.gov.on.ca/english/transrd/>, click on "Library Catalogue," under the "Title," enter "Ontario Traffic Manual" as the search. Open the applicable "Manual(s)" by choosing the "Access Key," once open look for the "Attachment," click the pdf file. Users require Adobe Acrobat to view all pdf files.

**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.

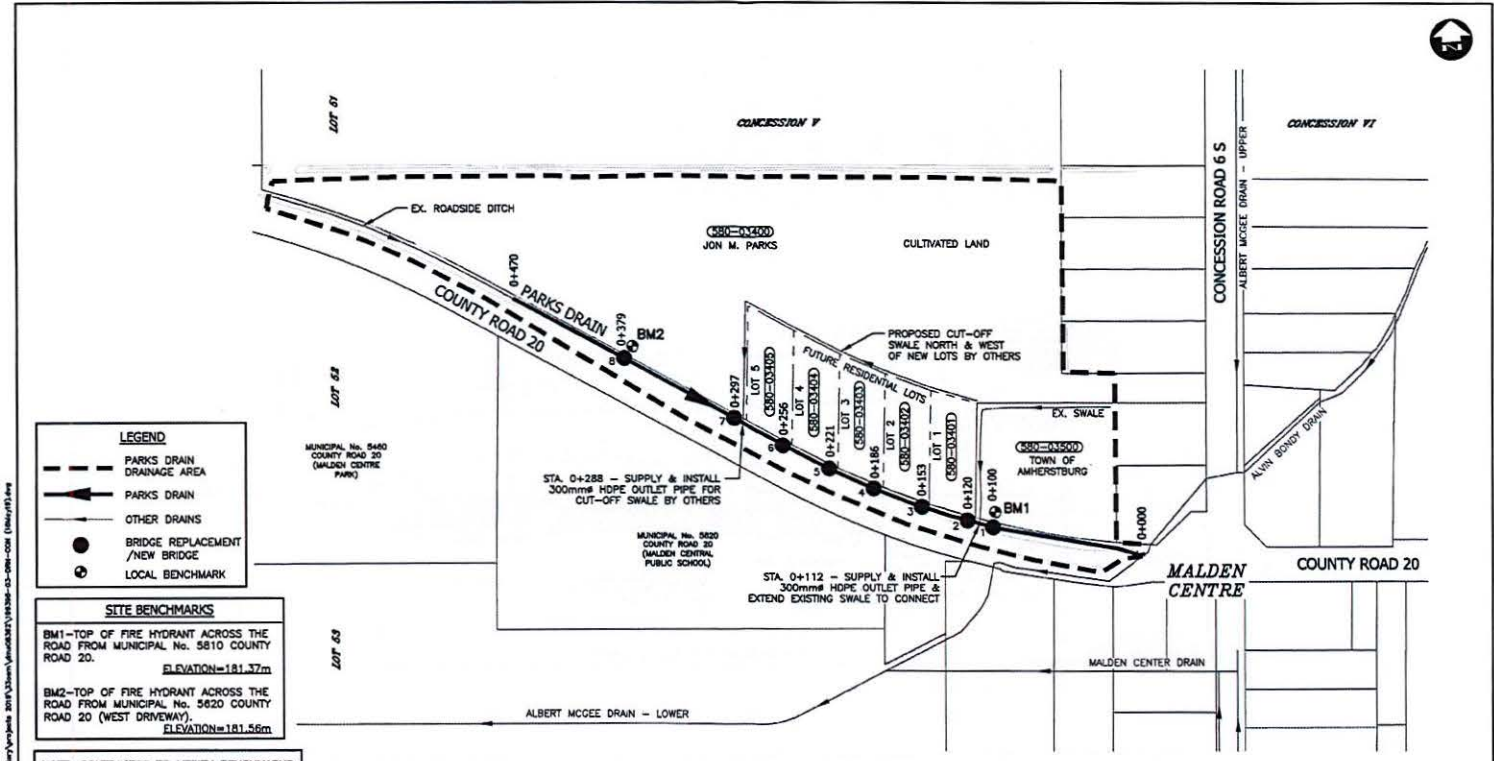
#### **16.0 FINAL INSPECTION**

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.



**LICENSED PROFESSIONAL ENGINEER**  
T.R. OLIVER  
14/03/19  
PROVINCE OF ONTARIO

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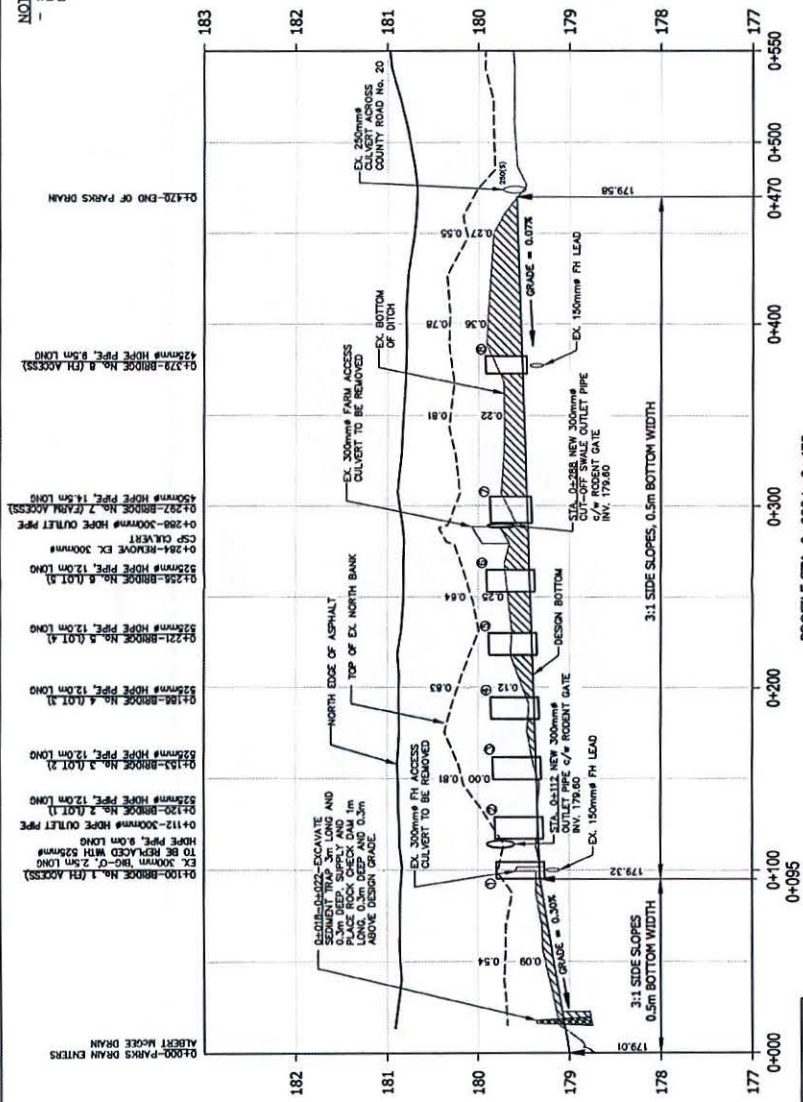
NO.	DATE	BY	SCALE	REVISION
2	18MAY19	TRO		COUNTY OF ESSEX ROADS DEPARTMENT REVIEW
1	30APR19	TRO		CLIENT REVIEW

DESIGN	TRO	REVIEWED BY	ACW
DRAWN	OEM	CHECKED BY	EPS
DATE	May 16, 2019		

<b>DILLON CONSULTING</b>		<b>SCHEDULE 'D'</b>	
PROJECT NO.	19-9396	DRAINAGE REPORT FOR THE PARKS DRAIN	
DRAWING SCALES BASED ON A 11" X 17" SHEET		LOT 5, CONCESSION 5 IN THE TOWN OF AMHERSTBURG (FORMER MALDEN TOWNSHIP)	
		OVERALL PLAN	
		PAGE NO. 1 of 5	

May 17, 2019 - 11:30am - C:\projects\parks\parks\parks.dwg - 2019\31000\parks\parks.dwg - 2019-05-16 11:30:00 (User:PTD)

NOTE:  
 STATIONING SHOWN FOR  
 NEW ACCESS BRIDGES  
 DENOTES % OF CULVERT.



04-000- PARKS DRAIN ENTERS ALBERT MOORE DRAIN  
 04-100- BRIDGE NO. 1 (7H ACCESS) EX. 300mm (10'-0") C-2.5M LONG HDPE PIPE, 9.0M LONG TO BE REPLACED WITH 525mm HDPE PIPE, 2.00m LONG  
 04-112- 300mm HDPE PIPE, 2.00m LONG HDPE PIPE, 2.00m LONG HDPE PIPE, 1.01m LONG  
 04-120- BRIDGE NO. 2 (101.1) EX. 300mm HDPE PIPE, 12.0m LONG  
 04-125- BRIDGE NO. 3 (101.1) EX. 300mm HDPE PIPE, 12.0m LONG  
 04-186- BRIDGE NO. 4 (101.1) EX. 300mm HDPE PIPE, 12.0m LONG  
 04-221- BRIDGE NO. 5 (101.4) EX. 300mm HDPE PIPE, 12.0m LONG  
 04-256- BRIDGE NO. 6 (101.5) EX. 300mm HDPE PIPE, 12.0m LONG  
 04-284- REMOVE EX. 300mm CSF CULVERT  
 04-298- 300mm HDPE OUTLET PIPE  
 04-299- 300mm HDPE ACCESS  
 04-300- BRIDGE NO. 7 (FARM ACCESS) EX. 300mm HDPE PIPE, 14.5m LONG  
 04-378- BRIDGE NO. 8 (7H ACCESS) EX. 300mm HDPE PIPE, 9.5m LONG  
 04-420- END OF PARKS DRAIN

PROFILE STA. 0+000 TO 0+470  
 SCALE-HORIZ = 1:2,000  
 VERT. = 1:40

LICENSED PROFESSIONAL ENGINEER  
 T.R. OLIVER  
 16/05/19  
 DURHAM OFFICE OF ENGINEERING  
 16/05/19

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 - It is not to be used in any way that would bring the Engineer's firm into disrepute.  
 - It is not to be used in any way that would bring the Engineer's profession into disrepute.

NO.	DATE	BY	CHKD.	TRD.	NO.	AS SHOWN
1						
2						
3						

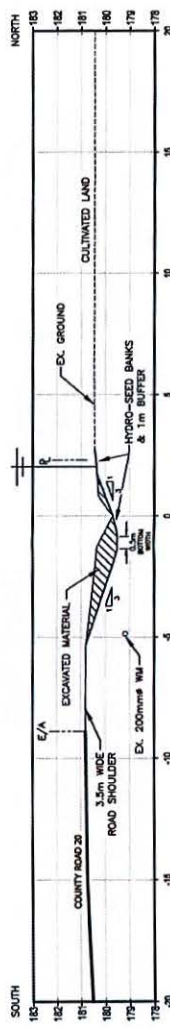
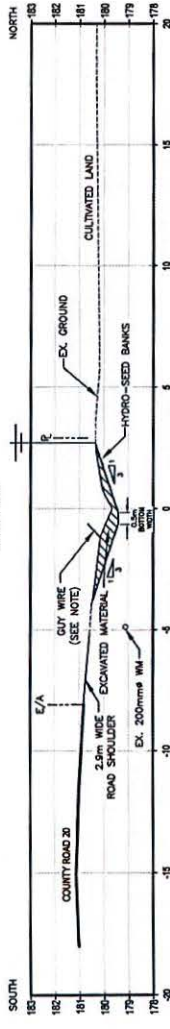
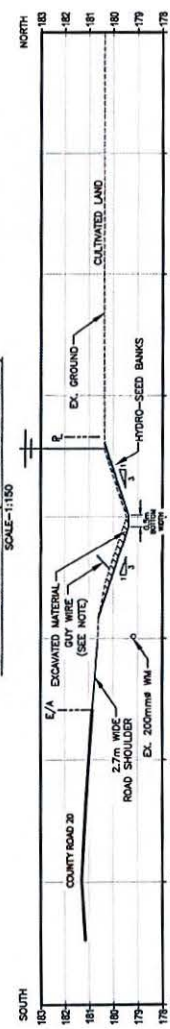
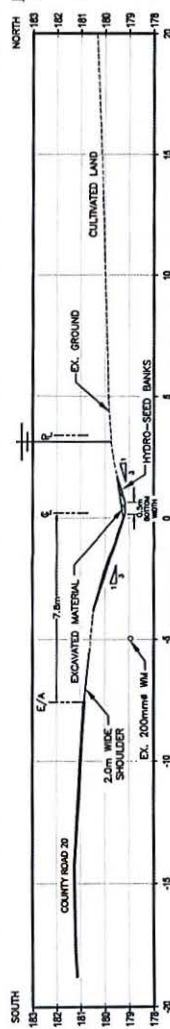
  

REVISIONS	DATE	BY	CHKD.	TRD.	NO.
1					
2					
3					

DESIGNER: DILLON CONSULTING ENGINEERS  
 PROJECT NO.: 19-0308  
 DRAWING NO.: 19-0308  
 DATE: MAY 14, 2019

SHEET NO.: 2 OF 5  
 DRAWING TITLE: DRAIN PROFILE  
 PROJECT TITLE: DRAINAGE REPORT FOR THE PARKS DRAIN LOT 22, CONCESSION 1 BY TOWN OF WALTON (FORMER WALTON TOWNSHIP)

**NOTE:**  
 - NEW CENTERLINE OF PARKS DRAIN TO BE LOCATED NORTH SIDE OF COUNTY ROAD 20.  
 - EXISTING HYDRO-SEED BANKS TO REMAIN WITHIN EXISTING RIGHT OF WAY.  
 - EXISTING HYDRO-SEED BANKS TO BE REMOVED AND REPLACED WITH HYDRO-SEED BANKS WITHIN EXISTING RIGHT OF WAY.  
 - EXISTING HYDRO-SEED BANKS TO BE REMOVED AND REPLACED WITH HYDRO-SEED BANKS WITHIN EXISTING RIGHT OF WAY.  
 - EXISTING HYDRO-SEED BANKS TO BE REMOVED AND REPLACED WITH HYDRO-SEED BANKS WITHIN EXISTING RIGHT OF WAY.  
 - EXISTING HYDRO-SEED BANKS TO BE REMOVED AND REPLACED WITH HYDRO-SEED BANKS WITHIN EXISTING RIGHT OF WAY.  
 - EXISTING HYDRO-SEED BANKS TO BE REMOVED AND REPLACED WITH HYDRO-SEED BANKS WITHIN EXISTING RIGHT OF WAY.  
 - EXISTING HYDRO-SEED BANKS TO BE REMOVED AND REPLACED WITH HYDRO-SEED BANKS WITHIN EXISTING RIGHT OF WAY.



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NO.	DATE	BY	CHKD.	APP'D.	REVISION
1	2019-05-14	TRO	TRO	AS SHOWN	AS SHOWN
2	2019-05-14	TRO	TRO	AS SHOWN	AS SHOWN

PROJECT	19-2096	DATE	19-05-14
CLIENT	DRAIN CROSS-SECTIONS	SCALE	1:150
PROJECT NO.	19-2096	DATE	19-05-14
CLIENT NAME	DRAIN CROSS-SECTIONS	SCALE	1:150

**SCHEDULE 6**  
 DRAINAGE REPORT FOR THE  
 PARKS DRAIN  
 IN THE TOWN OF AMHERSTBURG  
 (FORMER MALDEN TOWNSHIP)

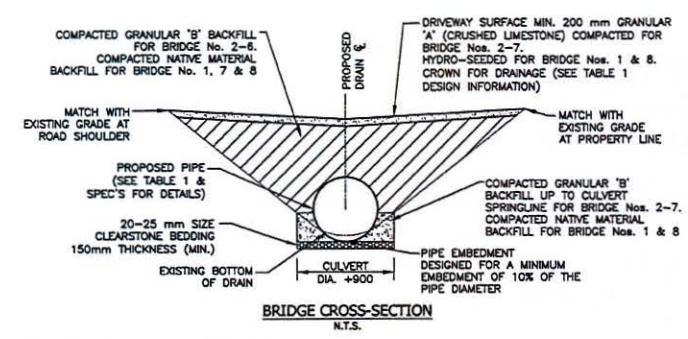
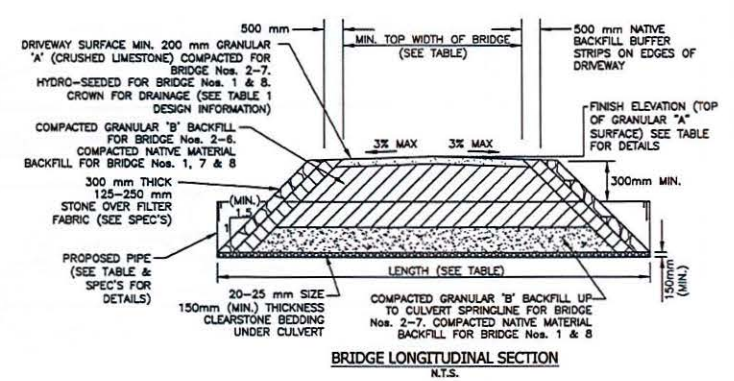
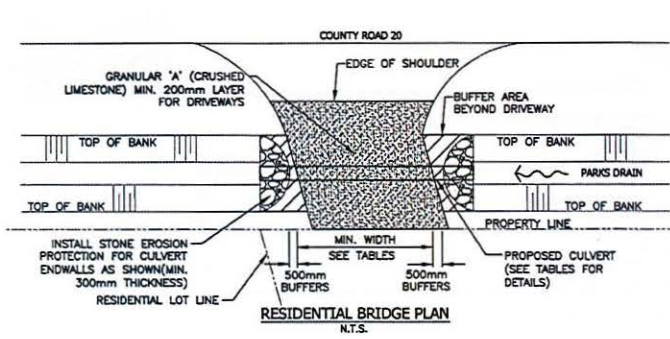


TABLE 1 - ACCESS BRIDGE DESIGN INFORMATION

DESCRIPTION	BRIDGE No. 1	BRIDGE No. 2	BRIDGE No. 3	BRIDGE No. 4	BRIDGE No. 5	BRIDGE No. 6	BRIDGE No. 7	BRIDGE No. 8
PIPE INVERT ELEV. U/S SIDE(m)	179.28	179.29	179.31	179.34	179.36	179.38	179.42	179.47
PIPE INVERT ELEV. D/S SIDE(m)	179.27	179.28	179.30	179.33	179.35	179.37	179.41	179.46
TOP OF $\phi$ DRIVEWAY SURFACE ELEV. (m)	180.20	180.59	180.61	180.64	180.66	180.68	180.46	180.48
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	179.32	179.34	179.36	179.39	179.41	179.43	179.47	179.52
MIN. TOP WIDTH OF DRIVEWAY (m)	4.0	6.1	6.1	6.1	6.1	6.1	7.3	4.0
MIN. CULVERT GRADE (%)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CULVERT MATERIAL	H.D.P.E.	H.D.P.E.	H.D.P.E.	H.D.P.E.	H.D.P.E.	H.D.P.E.	H.D.P.E.	H.D.P.E.
CULVERT LENGTH (m)	9.0	12.0	12.0	12.0	12.0	12.0	14.5	9.5
PIPE SIZE (mm)	525	525	525	525	525	525	450	450
CULVERT ENDWALL TYPE	SLOPING STONE	SLOPING STONE	SLOPING STONE	SLOPING STONE	SLOPING STONE	SLOPING STONE	SLOPING STONE	SLOPING STONE



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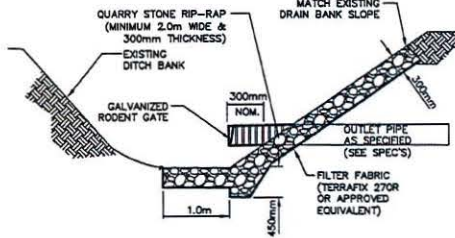
NO.	REVIEWED BY	DATE	BY	FOR
2	COUNTY OF ESSEX ROADS DEPARTMENT REVIEW	16MAY19	TRO	SIZE
1	CLIENT REVIEW	30APR19	TRO	SCALE
				AS SHOWN

**SCHEDULE G**  
 DRAINAGE REPORT FOR THE  
**PARKS DRAIN**  
 LOT 52, CONCESSION 5  
 IN THE TOWN OF AMHERSTBURG  
 (FORMER MALDEN TOWNSHIP)

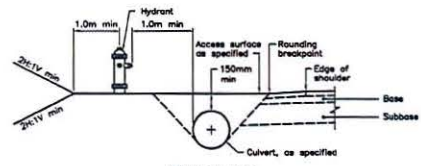
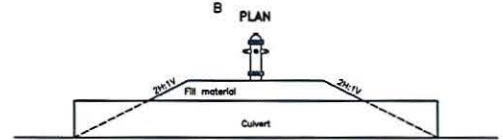
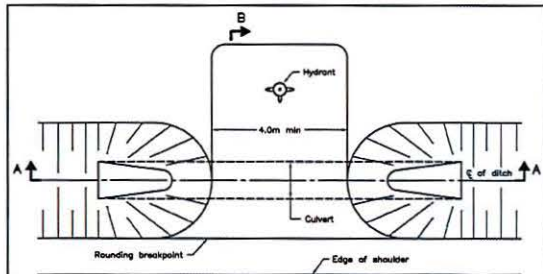
**DILLON CONSULTING**  
 PROJECT NO. 19-9396  
 SHEET TITLE: **BRIDGE DETAILS**  
 DRAWING SCALE BASED ON A 1/4" = 1' SHEET  
 PAGE NO. **4 of 5**

May 16, 2019 - 8:27am C:\projects\parks\2019\13\Drawings\19-9396-03-006-002 (19-9396) 1.dwg  
 2019/05/16 08:27:00 AM  
 TRO

**NOTE:**  
 - FOR BRIDGES Nos. 1 & 8  
 SLOPING STONE END  
 TREATMENT IS REQUIRED  
 CONSTRUCTED AT 2:1 SIDE  
 SLOPES.



**TYPICAL PIPE INLET DETAIL**  
 N.T.S.



**NOTE:**  
 A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING		Nov 2006	Rev 1
<b>ACCESS TO HYDRANT ACROSS DITCH</b>		 <b>OPSD 217.050</b>	



**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.

NO.	REVISION	DATE	BY
2	COUNTY OF ESSEX ROADS DEPARTMENT REVIEW	16MAY18	TRD
1	CLIENT REVIEW	30APR18	TRD
1	ISSUED FOR		

DESIGN	TRD	REVIEWED BY	ACW
DRAWN	OEM	CHECKED BY	EPS
DATE	May 16, 2019		
SCALE	AS SHOWN		

**DILLON CONSULTING**  
 PROJECT NO. 19-9396  
 DRAWING SCALES BASED ON A 1/4" X 1/4" SHEET

SCHEDULE 07	
DRAINAGE REPORT FOR THE PARKS DRAIN LOT 12, CONCESSION 5 IN THE TOWN OF AMHERSTBURG (FORMER MALDEN TOWNSHIP)	
SHEET TITLE	MISCELLANEOUS DETAILS
PAGE NO.	5 of 5

May 16, 2019 - 4:27pm - C:\pfiles\19-9396\mxd\217.050.dwg (16/65/19)