

THE CORPORATION OF THE TOWN OF AMHERSTBURG

BY-LAW NO. 2016 - 49

**By-law to provide for the Repair and Improvement
of the Tremblay Drain based on
the Drainage Report by Dillon Consulting Ltd.**

WHEREAS as request for repair and improvement of the Tremblay Drain was received under section 78 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 repair and improvement under section 78 of the Drainage Act;

WHEREAS Council of the Corporation of the Town of Amherstburg has authorized Mark D. Hernandez, P. Eng., Dillon Consulting Ltd. to prepare a report and said report dated January 6, 2016, is attached hereto and forms part of this by-law;

WHEREAS \$ 14,720.00 is the amount to be contributed by the Town of Amherstburg of the total \$95,050.00 for the drainage works; and,

WHEREAS the report was considered and adopted by the Drainage Board at the meeting held on Tuesday, May 10, 2016.

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 \$95,050.00 being the amount necessary for the improvements of the drainage works.

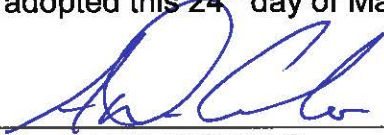
This project being the Tremblay Drain (West End Depot Bridges).

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.

Read a first and second time and provisionally adopted this 24th day of May, 2016.



MAYOR – ALDO DICARLO



CLERK – PAULA PARKER

Read a third time and finally passed this 8 day of August, 2016.



MAYOR – ALDO DICARLO



CLERK – PAULA PARKER

**DRAINAGE REPORT
FOR THE**

**TREMBLAY DRAIN
(WEST END DEPOT BRIDGES)**

**TOWN OF AMHERSTBURG
COUNTY OF ESSEX**



**6 JANUARY 2016
MARK D. HERNANDEZ, P.ENG.
FILE No. 14-1338**

File No. 14-1338

Mayor and Members of Council
The Corporation of the Town of Amherstburg
271 Sandwich St. South
Amherstburg, Ontario
N9V 2A5

**Drainage Report for the
TREMBLAY DRAIN
In the Town of Amherstburg
County of Essex**

Mayor and Members of Council:

Instructions

The Town of Amherstburg received a letter from the County of Essex requesting improvements to the Tremblay Drain on 8th September 2014. Council accepted the request under Section 78 of the Drainage Act and on 17th November 2014 appointed Dillon Consulting Limited to prepare a report.

The County of Essex is proposing to develop a new road maintenance and traffic signal facility, referred to as the West End Depot, near the intersection of North Sideroad and Howard Avenue (County Road No. 9). The development requires access to the site at two locations over the Tremblay Drain. In addition, the intersection will undergo improvements including a widening and the replacement of the road bridge and some localized drain realignment will be required. Lastly, the stormwater management requirements for the site development will require a minor change in watershed between the Beneteau-Vollans Drain and Tremblay Drain.

The Town of Amherstburg confirmed that they will be undertaking maintenance on the balance of the Tremblay Drain. This work is anticipated to be completed in the near future.

Watershed Description

The Tremblay Drain is an open channel drain commencing at Concession 8 Road flowing along the southerly limit of North Sideroad to Howard Avenue where it turns north along the east limit of Howard Avenue to outlet into the Shuell Creek Drain in Lot 12, Concession 7. The Tremblay Drain consists of an open channel with a length of 2,200 metres and a watershed area of approximately 147.67 acres (59.75 hectares). The lands comprising the watershed are agricultural, residential and industrial.

Drain History

The recent history of work done under an Engineer's report for the Tremblay Drain is as follows:

- **14 March 1984 by J.M. Horan, P.Eng.:** The recommended work included the repair and improvement of the entire Tremblay Drain. The report also recommended the cleaning, lowering and installation of new end wall treatment on several existing culverts.



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On-Site Meeting

An on-site meeting was held on 5th March 2015. A record of the meeting is provided in Schedule 'A', which is appended hereto.

Survey

Our survey and examination of the Tremblay Drain was carried out in May 2014. The survey comprised the recording of topographic data and examining the channel for available depth necessary to provide sufficient drainage. We commenced the survey at the access bridge of Municipal No. 7651 North Side Road. We then proceeded downstream along the channel on the south side of North Sideroad, to the outlet end of the road crossing at Howard Avenue and North Sideroad.

Design Considerations

The hydraulic capacity of the bridges is designed to meet the current design standards recommended by the Ontario Ministry of Agriculture and Food. The Design and Construction Guidelines suggest that major agricultural bridges and township road culvert replacements be designed to a 5-10 year storm event. We have designed Bridges No. 1 and No. 2 to a 5 year storm event and Bridge No. 3 to a 10 year storm event. The close proximity of the two (2) service yard culverts and the road culvert to each other resulted in the same size culverts.

Allowances

In accordance with Sections 29 and 30 of the Drainage Act, we do not anticipate any residential or agricultural lands being damaged or taken as a result of the proposed drainage works. Any damage to the existing grassed areas shall be restored to original conditions as part of the work. Therefore, 'Schedule B' for Allowances has not been included in this report.

Recommendations and Cost Estimate

For the area in the Beneteau-Vollans Drain that has been noted to be removed and now forms part of the Tremblay Drain watershed, we have provided a memorandum letter in Schedule 'B' appended hereto. We recommend this letter be kept on file, to be later incorporated into a future drainage report and by-law prepared for said drain, under Section 65 (4) of the Drainage Act.

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 Tremblay Drain be repaired and improved in accordance with the drawings and specifications attached hereto.

We estimate the cost of the recommended work as described below:

Item	Description	Amount
1.	Bridge works, as follows:	
	a) Bridge No. 1 - (West End Depot-Secondary Access) – Supply and installation of a new 18.5 m long, 1390 mm x 970 mm aluminized corrugated steel pipe arch (CSPA) culvert with 68 mm x 13 mm corrugations and 3.5 mm thickness (see specifications) complete with clear stone bedding up to pipe springline with filter fabric overlay (approximately 40 tonnes), full Granular 'A' (crushed limestone) backfill from pipe springline to compacted driveway surface (approximately 175 tonnes) and sloping stone end walls (approximately 20 m ²). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.	\$15,450.00
	b) Bridge No. 2 - (West End Depot-Primary Access) – Supply and installation of a new 18.5 m long, 1390 mm x 970 mm aluminized corrugated steel pipe arch (CSPA) culvert with 68 mm x 13 mm corrugations and 3.5 mm thickness (see specifications) complete with clear stone bedding up to pipe springline with filter fabric overlay (approximately 40 tonnes), Granular 'A' (crushed limestone) backfill material from pipe springline (approximately 120 tonnes) to underside of surface asphalt, asphalt driveway surface 100 mm thickness (approximately 30 tonnes) and sloping stone end walls (approximately 25 m ²). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.	\$22,550.00
	SUB-TOTAL – EXCLUDING SECTION 26 COSTS	\$38,000.00
2.	Survey, Report, Assessment and Final Inspection	\$7,480.00
3.	Expenses and incidentals	<u>\$500.00</u>
	TOTAL – EXCLUDING SECTION 26 COSTS	\$45,980.00

Item	Description	Amount
	SECTION 26 NON PRO-RATABLE COSTS	
4.	Road Bridge works, as follows:	
	<u>Bridge No. 3</u> - Removal and disposal of existing 21.5 m long 800 mm diameter CSP, end walls and backfill off-site that are not suitable for native backfill. Supply and installation of a new 27 m long 1390 mm x 970 mm polymer laminated corrugated steel pipe arch (CSPA) polymer laminated pipe with 68 mm x 13 mm corrugations and 3.5 mm thickness (see specifications), clear stone bedding material up to pipe springline with filter fabric overlay (approximately 55 tonnes), Granular 'A' backfill from pipe springline to underside of asphalt surface under road portion and backfill at existing culvert excavation (approximately 320 tonnes). Beyond road surface and shoulders, clean native or imported clean native backfill material from springline of pipe culvert to match existing elevation (approximately 20 m ³), asphalt road surface 120 mm thickness (approximately 25 tonnes) and sloping stone end walls (approximately 15 m ²). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.	\$35,450.00
5.	Open Drain realignment, as follows:	
	a) Excavation, filling and compaction of excavated materials of realigned drain at the intersection of County Road No. 9 and North Sideroad as outlined on detail in Schedule 'G' Page 1 of 3. Excavation of the new channel shall have 1.5 to 1 side slopes and a 1.0 metre bottom width. The work is to include seeding of disturbed areas and stone erosion protection on the realigned drain banks (approximately 60 m ²).	\$5,100.00
	SUB-TOTAL	\$40,550.00
	- SECTION 26 NON PRO-RATABLE COSTS	
6.	Survey, Report, Assessment & Final Inspection (cost portion)	\$8,320.00
7.	Expenses & Incidental (cost portion)	<u>\$200.00</u>
	TOTAL - SECTION 26 NON PRO-RATABLE COSTS	\$49,070.00
	TOTAL ESTIMATE - TREMBLAY DRAIN	\$95,050.00

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

Special Benefit assessment shown in Schedule 'C' and detailed in Schedule 'D' were derived as follows:

1. Bridge costs for new access bridges (Bridge No. 1 & No. 2) shall be assessed 100% to the County of Essex.
2. Replacement of the pipe under North Sideroad (Bridge No. 3) shall be assessed 70% against the County of Essex and 30% against the Town of Amherstburg Road Authority in accordance with Section 26 of the Drainage Act as a non-proratable assessment.
3. All costs associated with the open drain realignment shall be assessed 70% against the County of Essex and 30% against the Town of Amherstburg Road Authority in accordance with Section 26 of the Drainage Act as 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

We recommend that future work of repair and maintenance of Bridges No. 1, 2 and 3 be carried out by the Municipality as follows:

1. Bridge No. 1 (secondary access) shall be assessed 100% against the lands on which the bridge is located.
2. Bridge No. 2 (primary access) shall be assessed 50% against the lands on which the bridge is located and the remaining 50% assessed as "Outlet" assessment pro-rata against the lands and road that are located upstream of the affected bridge site in the same relative proportions as shown in Schedule "E". The outlet assessment is based on an arbitrary \$10,000.00 amount.
3. Increased cost to provide asphalt driveway/laneway surfaces shall be assessed 100% against the owner of the bridge.
4. Bridge No. 3 shall be assessed 50% against the County of Essex and 50% against the Town of Amherstburg Road Authority as a non-proratable assessment.
5. All technical aspects of future maintenance works on the open drain shall be governed by the report dated 14 March 1984 authored by J.M. Horan, P.Eng.

These provisions for maintenance are subject to any other variations that may be made under the authority of the Drainage Act.

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 3 - Overall Plan

Page 2 of 3 - Bridge No. 1 Details

Page 3 of 3 - Bridge No. 2 & 3 Details

Fisheries Issues

The Tremblay Drain has been classified by the Department of Fisheries and Oceans (DFO) as a Type F drain. Type F drains have intermittent water flow and may provide habitat for bait fish. Standard mitigation measures shall be followed to minimize disruption.

At the time of construction or maintenance, the Drainage Superintendent shall notify the regulatory agencies to confirm any construction limitations including timing windows or limitations related to in-stream work etc. as required.

All disturbed areas should be stabilized immediately. Upon completion of the work, or as soon as conditions allow, all disturbed areas shall be returned to a pre-disturbed state or better.

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/lwt/wlb/ges



SCHEDULE 'A'
SUMMARY OF DRAINAGE ON-SITE MEETING

TREMBLAY DRAIN

Town of Amherstburg - Public Works Dept. 512 Sandwich St.

Thursday, March 5, 2015 @ 10 a.m.

In Attendance:

Eric Chamberlain	-	Town of Amherstburg
Tom Bateman	-	County of Essex
Mark Hernandez	-	Dillon Consulting Limited

Tom Bateman comments:

- Noted these improvements are required for the proposed West End Depot facility
- Stated the County requires two (2) access culverts for the site and they may have to be elliptical because of the lack of depth of the drain
- Stated one (1) road culvert replacement would be needed for the proposed intersection improvements

Eric Chamberlain comments:

- Town has tendered maintenance on the Tremblay Drain
- Mentioned the in-water works must be completed within the timing window
- ERCA has asked to review the draft drainage report
- Noted that Board meetings are before Council
- The new road crossing culvert would require a trench coat

Mark Hernandez comments:

- Noted that there would be a change in the watershed due to the Stormwater Management strategy for the West End Depot Property
- Noted the standing 1984 report includes a design profile for the drain
- It was discussed that there would be a cost sharing for the road culvert between the County of Essex and Town of Amherstburg

Notes recorded by Mark Hernandez

SCHEDULE 'B'

January 6, 2016

The Corporation of the Town of Amherstburg
271 Sandwich St. South
Amherstburg, Ontario
N9V 2A5

Attention: Mr. Eric Chamberlain, CET
Manager, Public Works

**Assessment Changes to Beneteau-Vollans Drain
Tremblay Drain Report Dated 6 January 2016
Town of Amherstburg**

Dear Sir:

In reference to our report dated 27 October 2015 on the Tremblay Drain, we hereby recommend the following change in assessment be taken into consideration on the Beneteau-Vollans Drain in accordance with Section 65 (4) of the Drainage Act, or until such time that a new engineer's report is required. We understand the current Beneteau-Vollans Drain report and by-law is 22 November, 1968.

1. Property Roll No. 430-03300 – area assessed to be reduced 0.63 hectares in the Beneteau-Vollans Drain from 4.05 hectares to 3.42 hectares in Lot 10, Concession 7. Changes result from a recent development project on the subject lands outletting into the Tremblay Drain.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours sincerely,

DILLON CONSULTING LIMITED



Mark D. Hernandez, P.Eng.
Project Manager

MDH:ges

Our File: 14-1338



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"SCHEDULE C"
SCHEDULE OF ASSESSMENT
TREMBLAY DRAIN
TOWN OF AMHERSTBURG

MUNICIPAL LANDS:

Description	Area Affected		Owner	Special Benefit	Benefit	Outlet	Total Assessment
	(Acres)	(Ha.)					
430-03302 West End Depot	10.00	4.05	County of Essex	\$45,980.00	\$0.00	\$0.00	\$45,980.00
Total on Municipal Lands.....				\$45,980.00	\$0.00	\$0.00	\$45,980.00

SECTION 26 INCREASED COSTS - NON PRO-RATABLE

Description	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Howard Avenue (County Road No. 9)	County of Essex	\$34,350.00	\$0.00	\$0.00	\$34,350.00
Total Section 26 Increased Costs (Non Pro-ratable).....		\$49,070.00	\$0.00	\$0.00	\$49,070.00
TOTAL ASSESSMENT		\$95,050.00	\$0.00	\$0.00	\$95,050.00

	(Acres)	(Ha.)
Total Area:	10.00	4.05

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

**SPECIAL BENEFIT ASSESSMENT
(GENERAL DESCRIPTION OF SPECIAL BENEFIT)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
430-03302	County of Essex	Bridge No.1 West End Depot Bridge (100%) Secondary	\$15,450.00	\$3,245.00	\$18,695.00
430-03302	County of Essex	Bridge No.2 West End Depot Bridge (100%) Primary	\$22,550.00	\$4,735.00	\$27,285.00
Total Special Benefit Assessment (Excl. Non Pro-Ratable Costs).....			\$38,000.00	\$7,980.00	\$45,980.00

**SPECIAL BENEFIT ASSESSMENT
(SECTION 25 - NON PRO-RATABLE COSTS)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
Howard Avenue (County Rd. No. 9)	County of Essex	Bridge No.3 Road Crossing & Drain Realignment (70%)	\$28,385.00	\$5,965.00	\$34,350.00
North Sideroad	Town of Amherstburg	Bridge No.3 Road Crossing & Drain Realignment (30%)	\$12,165.00	\$2,555.00	\$14,720.00
Total Special Benefit Assessment (Non Pro-Ratable Costs).....			\$40,550.00	\$8,520.00	\$49,070.00

OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT \$95,050.00

"SCHEDULE E"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (BRIDGE NO. 2)
TREMBLAY DRAIN
TOWN OF AMHERSTBURG

MUNICIPAL LANDS:

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
North Sideroad	5.90	2.39	Town of Amherstburg	\$0.00	\$0.00	\$1,942.00	\$1,942.00
430-03302 West End Depot	10.00	4.05	County of Essex	\$0.00	\$0.00	\$987.00	\$987.00
Total on Municipal Lands				\$0.00	\$0.00	\$2,929.00	\$2,929.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
430-03700	7	N. Pt. Lot 10 RP12R2181, Pt.1	1.39	0.56	Dennis E. Toth	\$0.00	\$0.00	\$246.00	\$246.00
430-03600	7	N. Pt. Lot 10	9.12	3.69	Diane L. Toth	\$0.00	\$0.00	\$999.00	\$999.00
430-03500	7	N. Pt. Lot 10	5.00	2.02	Walker Aggregates Inc.	\$0.00	\$0.00	\$547.00	\$547.00
Total on Privately-Owned - Non-Agricultural Lands						\$0.00	\$0.00	\$1,792.00	\$1,792.00

PRIVATELY-OWNED - AGRICULTURAL LANDS

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
430-03300	7	Pt. Lot 10	18.50	6.68	Walker Aggregates Inc.	\$0.00	\$0.00	\$1,447.00	\$1,447.00
470-00300	7	Pt. Lot 11 RP12R7388, Pt. 2	22.59	9.14	Teresa M. & Giovanni Costa	\$0.00	\$0.00	\$2,475.00	\$2,475.00
470-00400	7	Pt. Lot 11	16.50	6.68	2402592 Ontario Inc.	\$0.00	\$0.00	\$1,357.00	\$1,357.00
Total on Privately-Owned - Agricultural Lands						\$0.00	\$0.00	\$5,279.00	\$5,279.00
TOTAL ASSESSMENT						\$0.00	\$0.00	\$10,000.00	\$10,000.00

	(Acres)	(Ha.)
Total Area:	87.00	35.21

"SCHEDULE F"
DRAINAGE REPORT FOR THE
TREMBLAY DRAIN (WEST END DEPOT BRIDGES)
TOWN OF AMHERSTBURG
IN THE 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:

➤ Bridge works, as follows:

- **Bridge No. 1** - (West End Depot-Secondary Access) – Supply and installation of a new 18.5 m long, 1390 mm x 970 mm aluminized corrugated steel pipe arch (CSPA) culvert with 68 mm x 13 mm corrugations and 3.5 mm thickness (see specifications) complete with clear stone bedding up to pipe springline with filter fabric overlay (approximately 40 tonnes), full Granular 'A' (crushed limestone) backfill from pipe springline to compacted driveway surface (approximately 175 tonnes) and sloping stone end walls (approximately 20 m²). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.
- **Bridge No. 2** - (West End Depot-Primary Access) – Supply and installation of a new 18.5 m long, 1390 mm x 970 mm aluminized corrugated steel pipe arch (CSPA) culvert with 68 mm x 13 mm corrugations and 3.5 mm thickness (see specifications) complete with clear stone bedding up to pipe springline with filter fabric overlay (approximately 40 tonnes), Granular 'A' (crushed limestone) backfill material from pipe springline (approximately 120 tonnes) to underside of surface asphalt, asphalt driveway surface 100 mm thickness (approximately 30 tonnes) and sloping stone end walls (approximately 25 m²). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.

➤ Road Bridge works, as follows:

- **Bridge No. 3** - Removal and disposal of existing 21.5 m long 800 mm diameter CSP, end walls and backfill off-site that are not suitable for native backfill. Supply and installation of a new 27 m long 1390 mm x 970 mm polymer laminated corrugated steel pipe arch (CSPA) polymer laminated pipe with 68 mm x 13 mm corrugations and 3.5 mm thickness (see specifications), clear stone bedding material up to pipe springline with filter fabric overlay (approximately 55 tonnes), Granular 'A' backfill from pipe springline to underside of asphalt surface under road portion and backfill at existing culvert excavation (approximately 320 tonnes). Beyond road surface and shoulders,

clean native or imported clean native backfill material from springline of pipe culvert to match existing elevation (approximately 20 m³), asphalt road surface 120 mm thickness (approximately 25 tonnes) and sloping stone end walls (approximately 15 m²). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.

- Excavation, filling and compaction of excavated materials of realigned drain at the intersection of County Road No. 9 and North Sideroad as outlined in detail in Schedule 'G' Page 1 of 3. Excavation of the new channel shall have 1.5 to 1 side slopes and a 1.0 metre bottom width. The work is to include seeding of disturbed areas and stone erosion protection on the realigned drain banks (approximately 60 m²).

3.0 ACCESS TO THE WORK

Access to the drain shall be from North Side Road and Howard Avenue (County Road No. 9). 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

The working area shall be restricted to a radius of 20 metres from the center of the new bridge location.

5.0 BRIDGE CONSTRUCTION

5.1 Location of New Bridges

The new culverts shall be installed as shown on the drawings attached hereto.

5.2 Materials for New Bridges

Materials should be as follows:

*Culvert Pipe
(Arch Pipe)*

Bridge No. 1: *New 18.5 long, 1390 mm x 970 mm aluminized Type II corrugated steel pipe arch (CSPA) wall thickness of 3.5 mm and 68 mm x 13 mm corrugations with rerolled ends.*

Bridge No. 2: *New 18.5 long, 1390 mm x 970 mm aluminized corrugated steel pipe arch (CSPA) wall thickness of 3.5 mm and 68 mm x 13 mm corrugations with rerolled ends.*

New culvert 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 &
Backfill up to Pipe
Springline*

20-25 mm clear stone conforming to OPSS Division 10.

*Backfill Material from
Pipe Springline for
Asphalt Surface
driveway*

Granular 'A' made from crushed limestone conforming to OPSS Division 10.

<i>Backfill Material from Pipe Springline for Gravel Surface Driveway</i>	<i>Granular 'A' made from crushed limestone conforming to OPSS Division 10.</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>Native Backfill</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>

5.3 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.

5.4 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. 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.

5.5 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. The minimum top width of the driveway shall be as shown on the drawings.

5.6 Asphalt Driveway

Asphalt driveways shall be constructed as follows:

- 100 mm HL3 Surface Asphalt (two 50 mm lifts)

5.7 Native Materials

Native materials suitable for use as backfill, as defined under Section 5.2, 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.

5.8 Seeding

All existing grassed areas disturbed by construction or as identified as new or existing grass buffers shall be 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. If mulching is required, it shall be carried out by the contractor as part of the item's tendered price.

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 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.

5.9 Lateral Tile Drains

Should the Contractor encounter any lateral tiles within the proposed culvert limits not shown on the 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.

6.0 ROAD CROSSING WORK

6.1 Removal of Existing Culvert

The Contractor shall completely remove the existing road bridge(s) as follows:

- Bridge No. 3-(Howard Ave. (County Road No. 9) at North Sideroad), consisting of a 21.5 m long, 800 mm diameter corrugated steel pipe (CSP) with grassed/earth end walls.

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.

Dry, native material, free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances may be used as native backfill for the new bridge beyond the limits of the road surface and shoulders. All excess materials removed from the existing bridge structure that are not suitable to use as native backfill, shall be disposed of, off the site. Such materials include rubber tires, poured concrete end walls, broken concrete, stones, wood, metal, etc.

6.2 Location of Bridge Replacement

The bridge replacements shall be located and installed as shown on the drawings.

6.3 Materials

Materials shall be as follows:

<i>Culvert Pipe</i>	Bridge No. 3: <i>New 27.0 m long, 1390 mm x 970 mm polymer laminated corrugated steel pipe arch (CSPA) wall thickness of 3.5 mm and 68 mm x13 mm. New culvert 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.</i>
<i>Pipe Bedding & Backfill to Pipe Springline</i>	<i>20-25 mm clear stone conforming to OPSS Division 10.</i>
<i>Beneath Road Surface and Shoulders, Backfill From Pipe Springline to Bottom of Asphalt Surface</i>	<i>Granular 'A' conforming to OPSS Division 10.</i>
<i>Beyond Road Surface and Shoulders, Backfill Above Pipe Springline to Finished Topsoil Layer</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>Road Surface and Shoulders</i>	<i>Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 300 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>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>

6.4 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 17.0 of these specifications except as amended below.

6.5 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.

6.6 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.

6.7 Native Materials

Native materials suitable for use as backfill, as defined under Section 6.3, shall be salvaged from the existing bridge site as required to complete the work as shown on the drawings.

6.8 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.

6.9 Asphalt Pavement Restoration

Asphalt roads shall be constructed as follows:

- 60 mm SP12.5 surface asphalt
- 60 mm SP19 base asphalt

Final restoration of the asphalt road surface must be restored to the approved surface following the completion of the road crossing, as approved by and to the satisfaction of the Town of Amherstburg Road Superintendent.

The Contractor shall saw-cut the asphalt pavement prior to removal of the existing culvert taking precautions not to undermine the adjoining pavement structure. Mill top layer into existing asphalt minimum 60 mm deep, 600 mm wide across the entire road surface at all saw-cuts (full road width). Where the pavement and underlying granular base is disturbed by the culvert replacement work, the Contractor shall be required at his/her own expense to saw-cut the asphalt pavement surface a minimum 300 mm beyond the disturbed portion prior to milling the 600 mm wide transition strips and repaving. The new asphalt shall be hot in SP19 asphalt mix for the base course rolled and compacted to minimum 92% of the Marshall Density followed by SP12.5 grade asphalt for the surface course in one lift of 60 mm compacted to minimum 92% of the Marshall Density. Any road line painting removed by the pavement operations shall be restored on the new pavement surface.

7.0 DRAIN REALIGNMENT/OPEN CHANNEL WORKS

7.1 Setting Out

Benchmarks are provided on the attached drawings (Page 1 of 3). From these benchmarks, the contractor will do his own setting out. The setting out by the Contractor shall include but shall not be limited to the preparation of grade sheets, the installation of centreline stakes, grade stakes, offsets, and sight rails.

If, during the setting out, the contractor finds an error in the benchmarks provided by the Engineer in the attached drawings, or is uncertain as to the interpretation of the information provided or the work intended, he shall notify the Engineer immediately for additional verification or clarification before proceeding with construction.

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work.

If, at any time during the progress of the works, an error shall appear or arise in the position, levels, dimensions or alignment of any part of the works, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer.

7.2 Profile and Excavation of New Drain

Excavation shall be carried out in accordance with the specifications shown on the drawings for the drain relocation. 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 re-shaped. 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.

The contractor shall complete the excavation of the new course of the drain as shown on the drawings (Page 1 of 3). The subsoil is to be excavated from the new course, and placed directly in the existing drain as long as it is spread in uniform full width layers of not more than 250 mm depths to ensure proper compaction practices as described below.

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.

7.3 Obstructions

All brush, timber, logs, stumps, stones or other obstructions that interfere with the construction of the drain, encountered along the course of the drain are to be removed by the Contractor. Timber, logs and stumps are to be dealt with in the same manner as specified for brush and trees. Large stones and other similar material are to be disposed of off-site.

Where the new drain alignment encounters private open drains it may be necessary to remove pipes which have been installed as erosion protection in the mouth of the open private drain. These pipes are to be removed with reasonable care and deposited on the adjacent land at the edge of the working corridor. The landowner shall remain responsible to replace the pipe in the private drain or dispose of it as they prefer.

7.4 Filling and Levelling of Existing Drain

Native soil materials removed from new alignment of the Tremblay Drain shall be used to fill the existing open drain. Excess excavated materials shall require trucking and hauling off-site and disposed of at the Contractor's expense. Prior to the infilling of the open drain, the contractor shall remove all vegetation, organic debris and topsoil from the existing drain slopes and haul off-site and dispose of at the Contractor's expense. The native materials used to fill the drain shall be placed in maximum 250 mm loose lifts, with the exception of within accesses and tile drain extensions as described herein, and compacted with sheeps foot type compaction equipment capable of achieving 95% of the maximum standard proctor density or better. The contractor shall use benching when filling in the drain as per OPSD 208.010 with bench lifts not exceeding 0.6 metres. Fill shall be placed in the existing drain to the surface to match existing grade. **Furthermore, the contractor shall confirm**

with the Drainage Superintendent that all existing lateral and main tile outlets have been found and marked prior to infilling the drain.

Each layer shall be compacted to a Standard Proctor Dry Density of 95% by repetitive passes over the fill area with standard levelling equipment or compaction equipment if necessary. Then, the excess excavated subsoil is to be placed and graded in the area of the existing drain and the areas where topsoil was stripped on both sides of the existing drain. These areas are to be levelled and graded to provide a uniform contour and slope.

Then, the stockpiled topsoil removed from this area is to be replaced and spread over the entire area. The grading and re-leveling of this area is to be carried out to the satisfaction of the Drainage Superintendent in charge. The finished work shall allow for drainage of surface runoff without ponding.

Alternative methods or procedures for completing the earthworks may be proposed by the Contractor for approval of the engineer prior to construction. All work must be acceptable to the Drainage Superintendent in charge.

It may be required to relocate excavated material on-site for use in other locations to reach the desired grade elevation and contours for the area where the existing drain is backfilled. On-site relocation shall be completed at the expense of the Contractor.

Materials in excess of that required to fill the drain shall be hauled off-site to an approved dumping location. Topsoil shall not be removed from the site but is to be used as the top layer of backfill for the abandoned open drain.

7.5 STONE EROSION PROTECTION (SEP)

Erosion protection, as specified in the locations on the drawings, shall be constructed of quarry stone rip-rap consisting of 150 - 250 mm sized clear quarry angular limestone materials placed over a non-woven filter fabric Terrafix 270R or approved equivalent.

At locations where surface water run-off enters the drain, as determined on site by the Drainage Superintendent, the contractor shall install surface water inlets.

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.

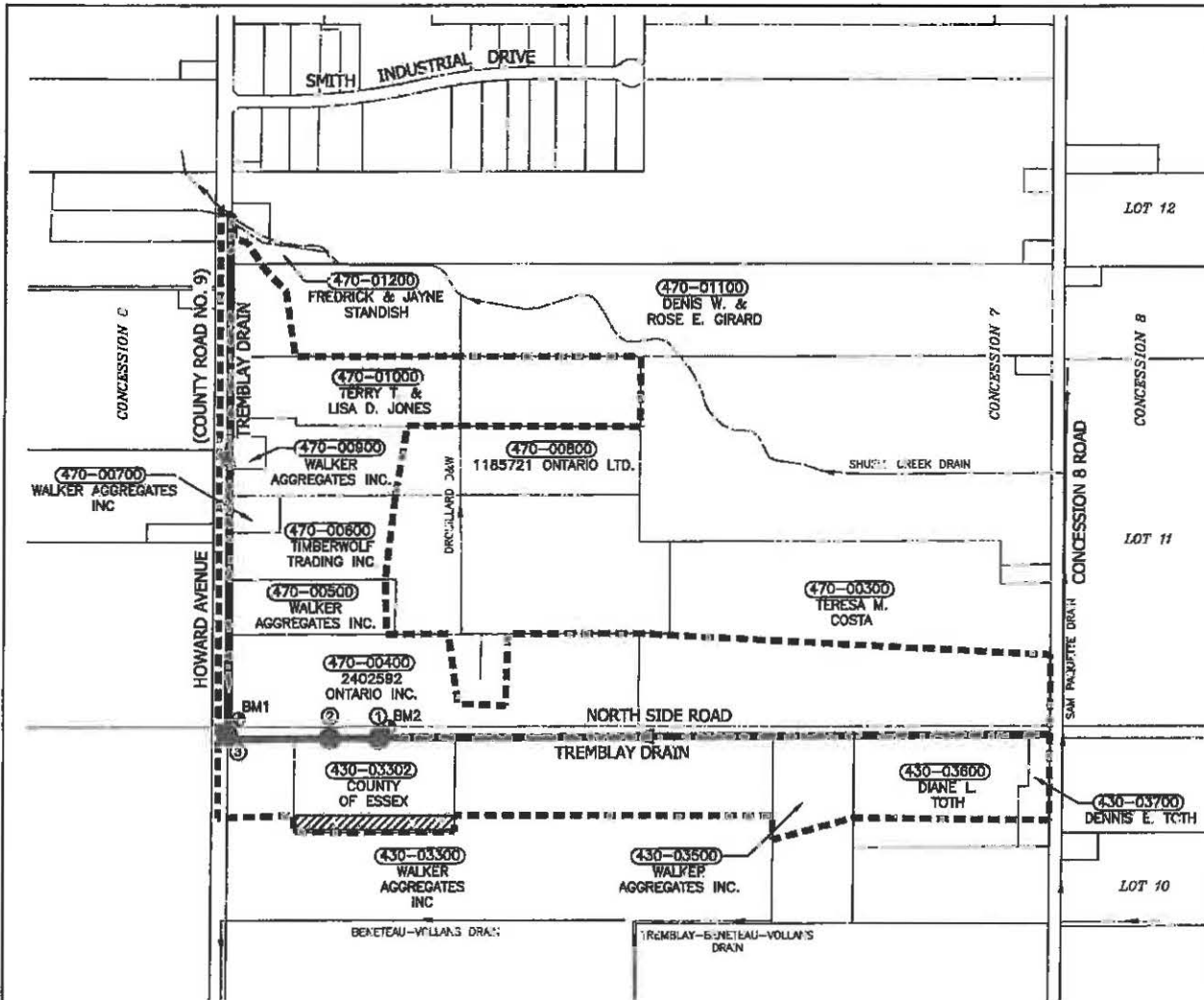
16.0 FINAL INSPECTION

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.

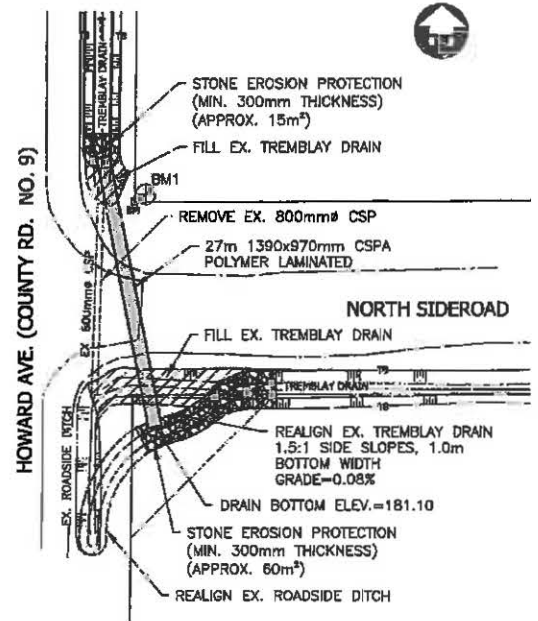
Final inspection will be made by the Engineer within 20 days after the Drainage Superintendent has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

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.



OVERALL PLAN
SCALE: 1:7,500



BRIDGE NO. 3 DETAIL PLAN
N.T.S.

LEGEND

- TREMBLAY DRAIN DRAINAGE AREA
- TREMBLAY DRAIN
- OTHER DRAINS
- BRIDGE REPLACEMENT
- LOCAL BENCHMARK
- AREA ADDED TO WATERSHED

BENCHMARKS

BM1 TOP OF SIB AT NORTHEAST CORNER OF NORTH SIDEROAD & COUNTY RD NO. 9 (HOWARD AVENUE).
ELEVATION=182.29m

BM2 NAIL IN SOUTH FACE OF HYDRO POLE ON NORTH SIDE OF NORTH SIDEROAD APPROX. 280 METRES EAST OF HOWARD AVE. NEAR Ⓞ BRIDGE NO. 2 LOCATION.
ELEVATION=182.81m

SCHEDULE G



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, text or E, or use it for purposes other than those intended at the time of its preparation without the written permission from Dillon Consulting Limited.

No.	DESCRIPTION	DATE	BY
2	FINAL REPORT	JAN. 6/16	MDH
1	CLIENT REVIEW	OCT 30/15	MCH

DESIGN	MDH	REVIEWED BY	FAF
DRAWN	LWT/WLB	CHECKED BY	TRO
DATE:	January 5, 2016		
SCALE:	AS SHOWN		

DILLON CONSULTING

PROJECT NO. 14-1338

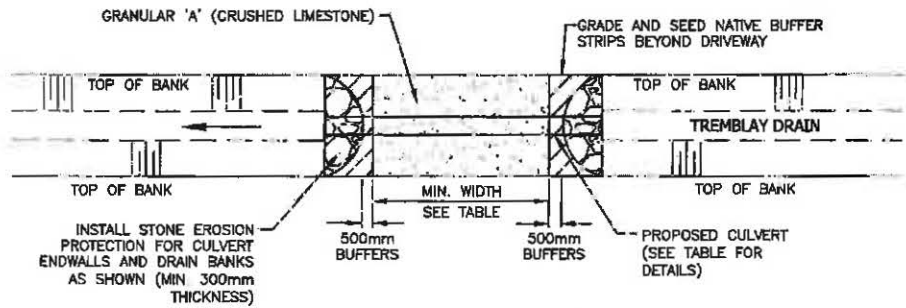
DRAWING SCALE BASED ON A 11" X 17" SHEET

Drainage Report for the
TREMBLAY DRAIN
(West End Depot Bridges)
Town of Amherstburg

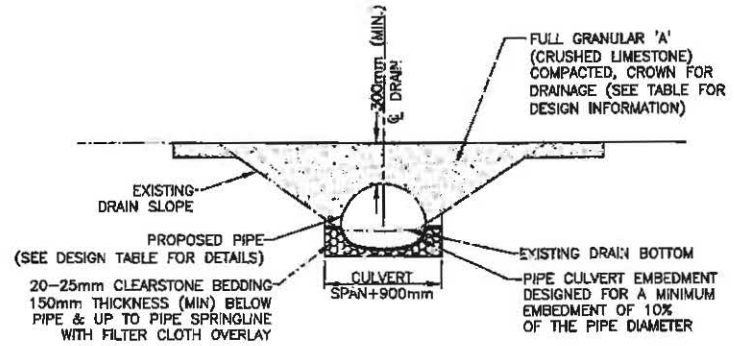
SHEET TITLE: **OVERALL PLAN**

PAGE NO: 1 of 3

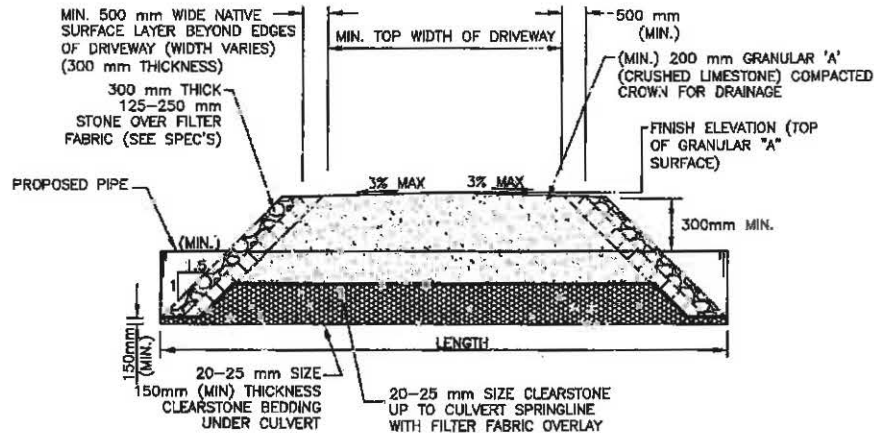
Jan 05, 2016 - 2:11pm - c:\p04\141338-Tremblay Drain\03-drawings\design\141338-02-DRN-CON.mxd



BRIDGE PLAN (GRAVEL SURFACE)
N.T.S.



CROSS SECTION (GRAVEL SURFACE)
N.T.S.



LONGITUDINAL SECTION (GRAVEL SURFACE)
N.T.S.

TABLE 1 - BRIDGE DESIGN INFORMATION	
DESCRIPTION	BRIDGE No. 1
PIPE INVERT ELEV. U/S SIDE(m)	181.15
PIPE INVERT ELEV. D/S SIDE(m)	181.13
TOP OF E DRIVEWAY SURFACE ELEV. (m)	182.80
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	181.29
MIN. TOP WIDTH OF DRIVEWAY (m)	11.0
MIN. CULVERT GRADE (%)	0.10
CULVERT TYPE	C.S.P.A
CULVERT MATERIAL	ALUM.
CULVERT LENGTH (m)	18.5
CULVERT THICKNESS (mm)	3.5
CULVERT CORRUGATIONS (mm)	68x13
PIPE SIZE (mm)	1390x970
CULVERT ENDWALL TYPE	SLOPING STONE

Jan 06, 2016 - 2:11pm G:\046\141336-Tremblay Drain\3D-Drainage\Design\141336-03-001-001.rvt.dwg



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 all for uses of the preparator without prior written permits on from Dillon Consulting Limited.

NO.	DESCRIPTION	DATE	BY
2	FINAL REPORT	JAN 4/16	MDH
1	CLIENT REVIEW	OCT 30/15	MDH

DESIGN	REVIEW
MDH	FRF
DRAWN	CHECKED
LWJ/WLB	TRO
DATE	January 6, 2016
SCALE	AS SHOWN

DILLON CONSULTING	
PROJECT NO.	14-1336
DRAWING SCALES BASED ON A 11" X 17" SHEET	

"SCHEDULE G"

Drainage Report for the
TREMBLAY DRAIN
(West End Depot Bridges)
Town of Amherstburg

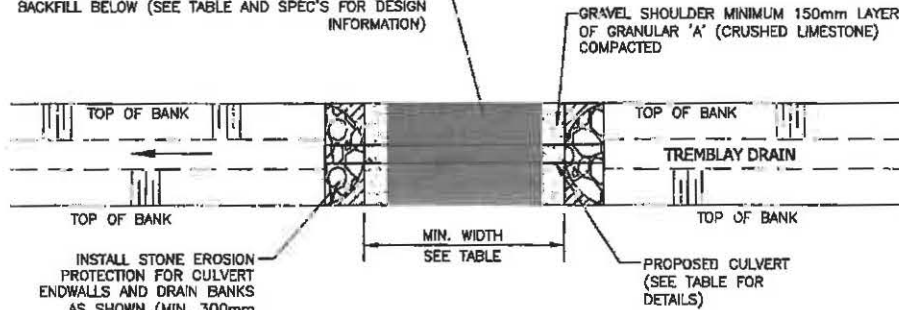
BRIDGE NO. 1 DETAILS

SHEET: E

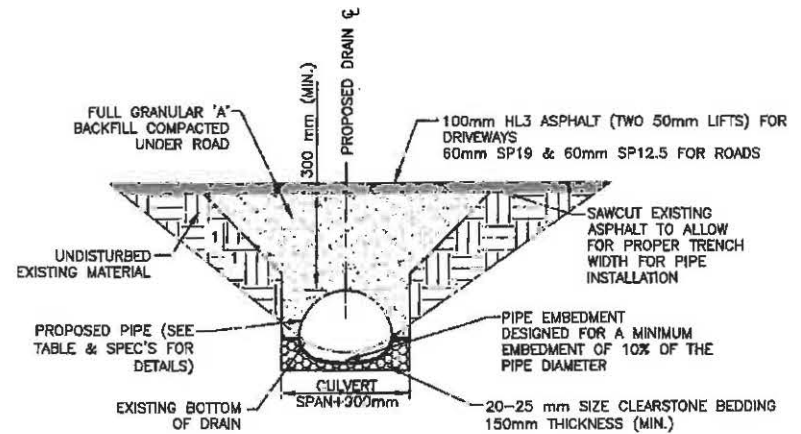
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2 of 3

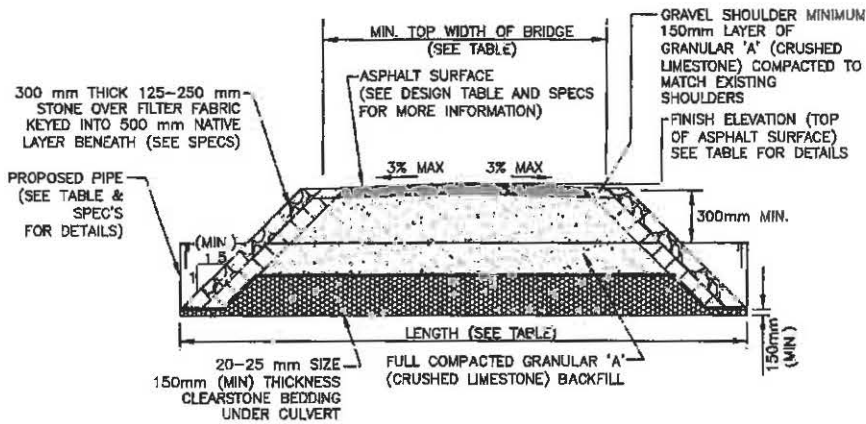
100mm HL3 ASPHALT (TWO 50mm LIFTS) FOR DRIVEWAYS
60mm SP19 & 60mm SP12.5 FOR ROADS,
CROWNED FOR DRAINAGE WITH FULL COMPACTED GRANULAR 'A'
BACKFILL BELOW (SEE TABLE AND SPEC'S FOR DESIGN
INFORMATION)



BRIDGE PLAN (ASPHALT SURFACE)
N.T.S.



CROSS SECTION (ASPHALT SURFACE)
N.T.S.



LONGITUDINAL SECTION (ASPHALT SURFACE)
N.T.S.

DESCRIPTION	BRIDGE No. 2	BRIDGE No. 3 NORTH SIDEROAD
PIPE INVERT ELEV. U/S SIDE(m)	181.08	180.88
PIPE INVERT ELEV. D/S SIDE(m)	181.06	180.86
TOP OF C DRIVEWAY/ROAD SURFACE ELEV (m)	182.80	182.43
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	181.22	181.08
MIN TOP WIDTH OF DRIVEWAY/ROAD(m)	11.0	6.73
MIN. CULVERT GRADE (%)	0.10	0.10
CULVERT TYPE	C.S.P.A.	C.S.P.A.
CULVERT MATERIAL	ALUM.	POLYMER LAMINATED
CULVERT LENGTH (m)	18.5	27.0
CULVERT THICKNESS (mm)	3.5	3.5
CULVERT CORRUGATIONS (mm)	68x13	68x13
PIPE SIZE (mm)	1390x970	1390x870
CULVERT ENDWALL TYPE	SLOPING STONE	SLOPING STONE

Job No. 2016 - 2-11pm, G:\2016\41338-Tremblay Drain\2016-04-08\04-08-14-1338-03-081-028.rvt.dwg



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, or use it for purposes other than that intended, in the absence of a separate written prior written permission from Dillon Consulting Limited.

No.	REVISION FOR	DATE	BY
2	FINAL REPORT	JAN. 6/16	MDH
1	CLIENT REVIEW	OCT 30/15	MDH

DESIGN	REVIEWED BY
MDH	FRF
DRAWN LWT/WLB	CHK BY TRO
DATE: January 6, 2016	
SCALE: AS SHOWN	

DILLON CONSULTING

PROJECT NO. 14-1338

DRAWING SCALE: BASED ON A 11" X 17" SHEET

'SCHEDULE G'

Drainage Report for the
TREMBLAY DRAIN
(West End Depot Bridges)
Town of Amherstburg

SHEET TITLE: **BRIDGE NO. 2 & 3 DETAILS**

PAGE NO. 3 of 3