THE CORPORATION OF THE TOWN OF AMHERSTBURG

BY-LAW NO. 2016 - 50

By-law to provide for the Petition for Drainage Works of the DiCecco Drain No. 1 and Branch No. 1 based on the Drainage Report by Dillon Consulting Ltd.

WHEREAS as petition for drainage works was received under section 4(1)b and 4(1)c 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 4(1)b and 4(1)c of the Drainage Act;

WHEREAS Council of the Corporation of the Town of Amherstburg has authorized Chris Thibert, Dillon Consulting Ltd. to prepare a report and said report dated April 27, 2016, is attached hereto and forms part of this by-law;

WHERE AS $ 34,200.00 is the amount to be contributed by the Town of Amherstburg of the total $88,000.00 for the drainage works; and,

WHEREAS the report was considered and adopted by 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 $88,000.00 being the amount necessary for the improvements of the drainage works.

   This project being the DiCecco Drain No. 1 and Branch No. 1.

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 2% more than the municipal lending rates as posted by Bank of Canada 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 $53,800.00 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 $1,000.00 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 Rate to be Imposed Equal Bi-Annually
Lot or Part Lot No.	Concession	Geographic Township	Parcel Roll No.			
Part Lot 29	3	Malden	590-02800	$53,800.00		$5,989.37
			Total	**$53,800.00**		**$59,893.66**

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

DICECCO DRAIN No. 1 & BRANCH No. 1

TOWN OF AMHERSTBURG
COUNTY OF ESSEX

DILLON
CONSULTING

27 APRIL 2016

CHRIS D. THIBERT, P.ENG.

FILE No. 15-1463

File No. 15-1463

Mayor and Members of Council
The Corporation of the Town of Amherstburg
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Drainage Report for the
DiCecco Drain No. 1 and Branch No. 1
In the Town of Amherstburg
County of Essex

Mayor and Members of Council:

Instructions

The Municipality received a Section 4 petition from the landowners of property Roll No. 590-02800 to provide improved drainage and sufficient outlet for storm runoff from their property. The property is planned to be severed into five (5) residential lots that require separate municipal drainage outlets, formalized under the Drainage Act, into the adjacent Big Creek Drain.

The Section 4 petition for drainage improvements was signed by the owners of property Roll No. 590-02800 on the 14th October, 2014. At that time and without any further survey and investigation, the petition was valid under Section 4(1)(b) with the entire property Roll No. 590-02800 representing over 60% of the area requiring drainage. Council accepted the valid petition under Section 4 of the Drainage Act and on 18th November 2014 appointed Dillon Consulting Limited to prepare a report.

During the on-site meeting, it was determined that the proposed drainage works for the planned residential Lot 1 be separated from the other planned residential lots due to lands and roads to the east requiring drainage through this portion of the property as well. Therefore, the Section 4 petition for drainage improvements for residential Lot 1 is no longer valid under Section 4(1)(b) for the petitioner no longer makes up at least 60% of the area requiring drainage. The Town of Amherstburg Road Authority, on the 21 April 2016, signed the Section 4 petition to now validate under Section 4(1)(c) of the Drainage Act.

This report provides for the establishment of a new drainage works under the provisions of the Drainage Act, to be known as the DiCecco Drain No. 1 and Branch No. 1 which is located in the proposed residential Lot No. 1 of property Roll No. 590-02800. The Municipal Drains for the proposed residential Lots 2 to 5 of property Roll No. 590-02800 will be under a separate report.

Watershed Description

The area requiring drainage, as intended by the petition, is in Lot 29, Concession 3 (former Township of Anderdon) between Creek Road and Big Creek. This area is further identified as property Roll No. 590-02800, and is to be eventually subdivided into five (5) separate residential lots as shown on the attached drawings.

Roll numbers have not been assigned to the lots at this time, but will be assigned as the land development process proceeds. For purposes of this report, we have shown the five lots as Lots 1 to 5 on the attached drawings.

The area requiring drainage under this report for DiCecco Drain No. 1 is approximately 5.6 acres (2.3 hectares) and Branch No. 1 is approximately 0.5 acres (0.2 hectares).

On-Site Meeting

We conducted an on-site meeting on 24th February 2015. A record of the meeting is provided in Schedule 'A', which is appended hereto.

Survey and Existing Conditions

Our survey and examination of the surrounding lands was carried out on 9th August 2013 as part of the pre-development planning stage. The survey comprised the recording of topographic data and examining the area for available options necessary to provide sufficient drainage.

In review of the topographic survey data, there is an existing broad swale across the proposed residential Lot 1 which has naturally formed due to storm water runoff from Creek Road and the properties east of Creek Road within the watershed limits. The overall topography of the entire property Roll No. 590-02800 is rolling and currently is not well suited for residential development. Final lot grading is to be provided by the developer and/or property owner and reviewed by the municipality. All individual lot drainage is to be maintained and directed, in accordance with the Town of Amherstburg's lot grading and services information standard, to the west limits of each individual property and east to the Creek Road open ditch.

During the on-site meeting, it was discovered that there is a private tile that crosses Creek Road and outlets into Big Creek through the proposed residential Lot 1. On the 24th April 2015, this private tile was located within the road limits and determined to be a 150 mm diameter clay tile which provides outlet to properties on the east side of Creek Road. Depth and location information was obtained to sufficiently incorporate this tile into the design of DiCecco Drain No. 1.

Based on information obtained from the site meetings, topographic survey and review of additional information provided by landowners, we understand currently there is no legal drainage outlet under the Drainage Act for the properties within the area requiring drainage.

Design Considerations

The new drain has been designed to convey a 1:2 year design storm which is generally acceptable for semi-urban areas. There will likely be some temporary ponding at the west limits of each property, during heavier intense rain events based on the capacity available, however that will dissipate over time after the storm event has passed.

The Essex Region Conservation Authority (ERCA) determined that any works within the 1:100 year flood limits to Big Creek would result in harmful alteration, disruption or destruction of habitat. It is understood that the lands and roads within these specified watershed limits currently drain by sheet flow to Big Creek. ERCA would like the flows maintained through new municipal drains with a limited number of outlets into Big Creek as well as providing consideration to control heavier flows.

Portions of the proposed works for the DiCecco Drain No. 1and Branch No. 1 are within the existing Big Creek 100 year floodplain as delineated on the Canard River and Big Creek floodplain mapping study (Proctor & Redfern Ltd., 1982) Map. No. ER5-50. The proposed works within the existing floodplain include construction of new swales, berms and enclosed tile drains.

The proposed berms along the west limits of the property will have cuts below the 100 year water surface elevation (176.00) to maintain a hydraulic connection to the floodplain. In addition, flood waters will be conveyed around the berms at the north limits of the property and will therefore not restrict the extent of the existing floodplain.

A cut-fill assessment of floodplain storage volume was also considered using the elevation of 176.00 meters. Below the 100 year elevation, it is anticipated that approximately 90 cubic meters of fill will be required for the construction of the proposed berms and 30 cubic meters of cut will be required for the construction of the proposed swales. Given the overall size of the Big Creek watershed, the small reduction in available storage within the delineated 100 year floodplain will be negligible.

The Road Authority and property owner is concerned about the impacts from the runoff from the road onto the adjacent lands on the west side of Creek Road. Therefore, it was determined that drainage must be provided that not only effectively collects the runoff from the road but also conveys this runoff to a sufficient legal outlet.

Allowances

All of the recommended works are being done on the road allowance for Creek Road and on the future residential property (Roll No. 590-02800) where full restoration of the lands is included as part of the works. Therefore, we have not awarded any damages under Section 30 of the Drainage Act. In accordance with Section 29 of the Drainage Act we have determined land allowances for right of way associated with the new drain. Schedule 'B' which is a schedule for allowances is appended to this report.

Section 29 allowances were determined with a value of land taken to construct and incorporate the drain at a rate of $10,000 per acre ($24,710 per hectare). For the covered drain incorporated under this report and for the new berm and swales, an allowance for land is made to acknowledge the presence of the covered drain as part of the DiCecco Drain No. 1 and Branch No. 1 and the existence of a working corridor for the purposes of future maintenance. This working corridor must remain unobstructed to allow for future works on the drain as required. The total amount of allowances for land shown in Schedule 'B' is $4,000.00.

Recommendations and Cost Estimate

Based on our review of the history, the information obtained during the site meeting and our examination and analysis of the survey data, we recommend that the DiCecco Drain No. 1 and Branch No. 1 be constructed as described below:

Item	Description	Amount
	DICECCO DRAIN NO. 1	
1.	Strip and replace topsoil as follows:	
	a) Station 0+021 to Station 0+083 – Strip and replace topsoil a minimum of 150 mm depth over the proposed trench width prior to tile drain installation. **All topsoil materials shall be temporarily stockpiled south of the new tile drain within the designated working corridor and kept separate from trench excavation materials to be later spread back over working area and fine graded.**	$1,800.00
	b) Station 0+083 to Station 0+130 – Strip and replace topsoil a minimum of 150 mm depth within the specified berm/swale corridor prior to the tile drain installation. **All topsoil materials shall be temporarily stockpiled east of the new tile drain within the designated working corridor and kept separate from trench excavation materials to be later spread back over working area and fine graded.**	$1,400.00
2.	Tile drain and earth works as follows:	
	a) Station 0+021 to Station 0+083 – Supply and install 62 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with wrapped split coupler joints. Pipe installation is to include Class 'B' bedding up to pipe springline (approximately 80 tonnes). Native backfill beyond except for Station 0+030 to Station 0+048 where there shall be full Class 'B' bedding and backfill for new tile drain (approximately 25 tonnes). Seeding over new tile drain including working area (approximately 500 m^2).	$12,500.00
	b) Station 0+083 to Station 0+130 - Supply and install 47 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with wrapped split coupler joints. Pipe installation is to include Class 'B' bedding up to pipe springline (approximately 80 tonnes) and native backfill beyond. Works include the construction of an earth berm over the new tile drain and the excavation and grading of a new swale east of the tile/berm. New berm/swale corridor and working area to be seeded (approximately 800 m^2).	$6,800.00

Item	Description	Amount
	c) Station 0+040 to Station 0+083 – Excavation and grading of new overflow flood route 'V'-ditch, 43 lineal meters with 1.5:1 side slopes (approximately 50 m^3). Works include seeding of new ditch banks.	$1,000.00
3.	Supply and installation of catch basins as follows:	
	a) **CB3** – Station 0+037 – Supply and install one (1) new off-set 600 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with cast iron grate and 150 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe connection (3.0 m length) to new 450 mm diameter tile drain (Boss 2000 or approved equal) complete with wrapped split coupler joints. Work to also include connection of upstream end of existing 150 mm diameter private tile from north to CB3 and capping of downstream end of existing 150 mm diameter private tile beyond new drain.	$2,000.00
	b) **CB4** – Station 0+083 – Supply and install one (1) new in-line 900 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with cast iron grate.	$2,500.00
	c) **CB5** – Station 0+130 – Supply and install one (1) new in-line 900 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with cast iron grate. Works include the installation of a 2.0 meter long, 300 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe extending east from CB5 into the bottom of the new swale complete with rodent gate and rip-rap w/filter fabric around pipe and swale banks (approximately 5 m^2).	$3,200.00
4.	Outlet spillway Station 0+130 to Station 0+138:	
	a) Station 0+130 to Station 0+132 – Supply and install 2 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with rodent gate extending west from CB5 into outlet spillway.	$500.00

Item	Description	Amount
	b) Station 0+132 to Station 0+138 – Excavation and grading of spillway section and placement of stone rip-rap minimum 300 mm thickness c/w filter cloth underlay on downstream end of tile drain including rock check dam (approximately 25 m^2).	$1,400.00
5.	Temporary silt control measures during construction.	$800.00
	SUBTOTAL – DICECCO DRAIN NO. 1 (EXCLUDING SECTION 26 COSTS)	**$33,900.00**
6.	Allowances under Section 29	$3,700.00
7.	Survey, Report, Assessment and Final Inspection (cost portion)	$8,500.00
8.	Expenses and incidentals (cost portion)	$500.00
9.	Contract administration and periodic inspection (cost portion)	$1,500.00
10.	ERCA application review and permit fee	$800.00
	TOTAL – DICECCO DRAIN NO. 1 (EXCLUDING SECTION 26 COSTS)	**$48,900.00**
	SECTION 26 NON PRO-RATEABLE COSTS	
11.	Tile Drain and earth works as follows:	
	Station 0-029 to Station 0+000 – Supply and install 29 m of 300 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 of approved equal) complete with wrapped split coupler joints. Pipe installation is to include Class 'B' bedding up to pipe springline (approximately 15 tonnes) with native backfill beyond. Seeding over new tile drain including all disturbed areas (approximately 150 m^2).	$3,700.00
12.	Creek Road - Station 0+000 to Station 0+021 – Supply and install 21.0 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with wrapped split coupler joints, clear stone bedding with filter fabric overlay (approximately 9 tonnes), Granular 'A' backfill under road portion (approximately 35 tonnes), native backfill material beyond road (approximately 10 m^3) and asphalt restoration, 80 mm HL4 base layer (two 40 mm lifts) and 40 mm HL3 surface layer (approximately 20 m^2) and including connections into new catch basins on both sides of the road.	$8,000.00
13.	Abandon, cut, infill and seal existing 450 mm diameter corrugated steel pipe (CSP) across Creek Road with a non-shrink concrete grout.	$1,200.00

Item	Description	Amount
14.	Supply and installation of catch basins as follows:	
	a) **CB1** – Station 0+000 – Supply and install one (1) new 600 mm x 1200 mm precast concrete ditch inlet catch basin, OPSD 705.040 (Type 'B'), on east side of Creek Road including new honeycomb galvanized steel grate, OPSD 403.010, and a minimum 300 mm deep sump. The grates are to be equipped with fasteners to secure grates to catch basins as supplied by the manufacturer. Works include the placement of stone rip-rap, 500 mm wide, around catch basin grate complete with filter fabric underlay (approximately 5 m^2).	$3,200.00
	b) **CB2** – Station 0+021 - Supply and install one (1) new 600 mm x 1200 mm precast concrete ditch inlet catch basin, OPSD 705.040 (Type 'B'), on west side of Creek Road including new honeycomb galvanized steel grate, OPSD 403.010, and a minimum 300 mm deep sump. The grates are to be equipped with fasteners to secure grates to catch basins as supplied by the manufacturer. Works include the placement of stone rip-rap, 500 mm wide, around catch basin grate complete with filter fabric underlay (approximately 5 m^2)	$3,200.00
	c) **CB6** – Station 0-029 – Supply and install one (1) new in-line 900 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with galvanized steel bird cage style grate as manufactured by Coldstream Concrete Inc. (or approved equal) and a minimum 300 mm deep sump. Works include the placement of stone rip-rap, 500 mm wide, around catch basin grate complete with filter fabric underlay (approximately 5 m^2).	$2,900.00
15.	Excavation and grading of new road swales as follows:	

Item	Description	Amount
	a) 30 lineal meters of new 'V'-ditch with 2:1 side slopes, minimum 300 mm deep, north of CB2, west of Creek Road (approximately 8 m^3). Works include hauling of excavated material off site, seeding of ditch banks and the supply and installation of a new 4.0 meter long, 300 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with rodent gate extending from CB2 north to the bottom of the new road ditch and stone rip-rap w/filter fabric underlay around pipe inlet and ditch banks (approximately 8 m^2).	$1,500.00
	b) 80 lineal meters of new 'V'-ditch with 2:1 side slopes, minimum 300 mm deep, south of CB2, west of Creek Road (approximately 15 m^3). Works include hauling of excavated material off site and seeding of ditch banks.	$2,000.00
	SUB-TOTAL – SECTION 26 NON PRO-RATABLE COSTS	**$25,700.00**
16.	Survey, Report, Assessment and Final Inspection (cost portion)	$7,000.00
17.	Expenses and incidentals (cost portion)	$500.00
18.	Contract administration and periodic inspection (cost portion)	$1,000.00
	TOTAL – SECTION 26 NON PRO-RATABLE COSTS	**$34,200.00**
	TOTAL - DICECCO DRAIN NO.1	**$83,100.00**
	BRANCH NO. 1	
1.	Station 0+000A to Station 0+030A – Strip and replace topsoil a minimum of 150 mm depth within the specified berm/swale corridor prior to excavation. **All topsoil materials shall be temporarily stockpiled east of the new berm/swale corridor within the designated working corridor and kept separate from excavation materials to be later spread back over working area and fine graded.**	$900.00
2.	Station 0+000A to Station 0+030A - Excavate (construct) and grade new swale with 3:1 side slopes and 0.5 m bottom width (approximately 6 m^3)	$600.00

Item	Description	Amount
3.	Station 0+000A to Station 0+030A - Construct earth berm west of grassed swale using clean native material from swale and/or imported native materials (approximately 12 m³) compacted and sloped with 2:1 side slopes and 0.9 m top width.	$1,000.00
4.	Seeding of swale/berm corridor (approximately 300 m²).	$900.00
	SUB-TOTAL – BRANCH NO. 1	**$3,400.00**
5.	Allowances under Section 29	$300.00
6.	Survey, Report, Assessment and Final Inspection (cost portion)	$700.00
7.	Expenses and incidentals (cost portion)	$200.00
8.	Contract administration and periodic inspection (cost portion)	$300.00
	TOTAL – BRANCH NO. 1	**$4,900.00**
	OVERALL TOTAL ESTIMATE - DICECCO DRAIN NO. 1 & BRANCH NO. 1	**$79,300.00**

The estimate provided in this report was prepared according to current materials and installation prices as of the date of this report. Included within the estimate above are also the costs of temporary financing (interest costs) and the non-rebated portion of the HST (1.76%) that comprise a part of the costs of the drainage works, in accordance with Sections 73(1) and 88(2) of the Drainage Act. 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 the 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-1' and 'C-2' under "Value of Special Benefit," "Value of Benefit" and "Value of Outlet." Details of the Value of Special Benefit listed in Schedule 'C-1' and 'C-2' are provided in Schedules 'D-1' and 'D-2' respectively. Schedules 'C-1' and 'D-1' represent schedules for the DiCecco Drain No. 1 and Schedules 'C-2' and 'D-2' represent schedules for Branch No. 1.

Assessment Rationale

We have assessed the above estimated cost for the installation of the DiCecco Drain No. 1 and Branch No.1 against the affected lands and roads listed in Schedule 'C-1' and 'C-2' respectively under "Special Benefit".

1. The costs of the drainage works for the DiCecco Drain No. 1 and Branch No. 1 excluding Section 26 costs have been assessed 100% against Roll No. 590-02800.
2. All costs related to the installation of the crossing under Creek Road have been assessed 100% against the Town of Amherstburg Road Authority under Section 26 of the Drainage Act.

Special Benefit Assessments (Section 26)

The Special Benefit assessments to the Road Authority, as noted above, shall be assessed as non-proratable assessments and are in accordance with Section 26 of the Drainage Act. These assessments shall be based on the actual construction costs plus engineering cost apportionment for the preparation of this report including contract administration and inspection costs and should be kept separate when tendering out the entire drainage works.

Should the Road Authority elect to undertake the drainage works across their road right-of-way of Creek Road with their own forces, as per Section 69 of the Drainage Act; the Road Authority shall remain responsible for their allotment of costs for the preparation of this report as outlined in Schedule 'D-1'.

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

After completion, we recommend that future work of repair and maintenance of the DiCecco Drain No.1 and Branch No. 1 be carried out by the Town of Amherstburg at the expense of the upstream lands and roads herein assessed in Schedule 'E-1', which is an assessment schedule for DiCecco Drain No. 1 and Schedule 'E-2', which is an assessment schedule for Branch No. 1 and in the same relative proportions subject, of course, to any variations that may be made under the authority of the Drainage Act. The assessments are based on arbitrary amounts of $10,000.00.

Drawings and Specifications

Attached to this report is "Schedule F," which contains 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 6: Overall Plan & Big Creek Plan

Page 2 of 6: Detail Plans

Page 3 of 6: Catch Basin Details & DiCecco Drain No. Profile 1

Page 4 of 6: DiCecco Drain No. 1 Profile 2

Page 5 of 6: Branch No. 1 Profile & Cross Sections

Page 6 of 6: Details

Fisheries Issues

The DiCecco Drain No.1 and Branch No. 1 are new closed tile drain systems. Standard practices shall be followed to minimize disruption to fish habitat within the Big Creek.

In addition, to alleviate potentially harmful impacts and avoid disruption to fish habitat, the following is recommended:

At the time of construction or maintenance, the Drainage Superintendent shall contact the governing Conservation Authority (acting liaison for DFO) or equivalent regulatory agency 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.. In this particular circumstance, the entire cost of the work will be levied against Roll No. 590-02800 which is a proposed residential development and therefore, none of the assessed cost is eligible for a grant from the Ministry of Agriculture and Food.

Respectfully submitted,

DILLON CONSULTING LIMITED

Chris D. Thibert, P.Eng.
CDT:prc:wlb:ges

SCHEDULE 'A'

DiCECCO DRAINS
RECORD OF ENGINEERING ON-SITE MEETING
February 24, 2015 - 9:00 - 11:00 a.m.

Record of Attendance:

Eric Chamberlain	Town of Amherstburg
Nicole Humber	Town of Amherstburg
Tim Byrne	Essex Region Conservation Authority
Chris Thibert	Dillon Consulting Limited
Chris Patten	Dillon Consulting Limited
Robert Oliver	Landowner
Dan Paquette	Landowner
Ryan Varney	Landowner
Joe DiCecco	Landowner
Brain & Pam Hutchins	Landowner
Winona Dent	Landowner
Robert & Sharon Dent	Landowner

Introductions and a brief explanation of the reason for the meeting was made by Eric Chamberlain, Drainage Superintendent and Manager of Public Works for the Town of Amherstburg. Eric explained that this meeting was to discuss a Section 4 petition under the Drainage Act by Mr. DiCecco to satisfy drainage constraints as required by Essex Region Conservation Authority (ERCA) and the Town of Amherstburg. Eric then turned the meeting over to Chris Thibert as Drainage Engineer for the project.

Chris outlined the process of submitting a report under Section 4 of the Drainage Act and explained that the next steps are to have the drain surveyed and then prepare a report. He explained that since a survey was already completed for a different aspect of the project that a new survey may not be required if the topographical information was sufficient for design and construction of these new Section 4 drains. He also explained that the main purpose of a Section 4 drainage on-site is to gather information about the existing drainage systems from the adjacent landowners to better determine watershed limits and areas requiring drainage which is why additional landowners beyond the limits of the assumed watershed were invited to attend.

Chris further explained that the purpose of these Section 4 drains within the DiCecco property is due to proposed lot severances and development. There presently is no municipal drain in this area and portions of properties east of Creek Road outlet through the DiCecco property to Big Creek. If Mr. DiCecco develops the residential properties, this would cut off lands and roads to the east and therefore a drainage system needs to be in place. Chris proposed that a new municipal drain along the north property line of the DiCecco property including a new road crossing, sized to properly accommodate the upstream lands and roads, would be the best approach and would redirect and control the flows that currently cut through the center of the property to Big Creek. Chris explained that options for either an open drain or closed drain would be discussed with the landowner and a separate report would be completed for this new drain for it involves additional landowners east of Creek Road (including Creek Road) which will be included in a schedule of assessment for future maintenance for they will use this drain as outlet to Big Creek.

Chris mentioned that all costs related to the proposed drainage works on the DiCecco property would be paid for by Mr. DiCecco as owner of the property Roll. No. 590-02800 and all costs related to a new road crossing would be paid for by the Town of Amherstburg under Section 26 of the Drainage Act. The costs to Mr. DiCecco would be a one-time 'Special Benefit' assessment to establish these municipal drains as he is the landowner requiring them but in the future, all lands and roads identified in the report/watershed would be assessed for any required maintenance to the municipal drain. Chris explained that the current petition is only valid to do work on the DiCecco and road property and therefore the municipal drain would stop just east of Creek Road. If any other landowners east of Creek Road wish to connect by having the drain extend to their property, they would have to either sign the petition or start a new one. At this time, no other landowners expressed interest in signing but were provided contact information if they wish to do so.

Tim Byrne explained that Big Creek is a regulated watercourse and would like to see only three (3) storm water outlets into Big Creek as a result of the proposed residential development and controlled by being new municipal drains which gives the Town of Amherstburg the ability to properly maintain them under the Drainage Act. Tim also would like to see grassed swales over top any proposed tile drain system. Tim also explained that lands on the east side of Creek Road have no prescriptive right to drain through the DiCecco property and presently do not have a legal outlet. Tim expressed that these landowners should therefore sign onto this Section 4 petition.

Brain Hutchins explained that there is a 6" tile coming from his property that crosses Creek Road and outlets into Big Creek. Chris said that this tile would have to be located and would be picked up in the new drainage system.

Landowners on the east side of Creek Road explained that runoff used to travel south to the Whelan Drain but only part now goes this way with the installation of the existing 450 mm CSP road crossing. Ever since this road crossing was installed there have been problems both upstream and immediately downstream of the crossing that landowners would like to see addressed. Landowners also explained that there could be development on the agricultural property east of Creek Road. Chris explained that if this does happen then the Town of Amherstburg would have to be notified for this would be part of the Whelan Drain.

Both Winona Dent and Ryan Varney explained that their drainage does not go this direction and flows north directly to Big Creek.

Robert and Sharon Dent explained that there have been significant flooding problems on their property ever since the road crossing was installed and they have tried to fix this many times. They also requested that the new drain (location and/or construction) does not impact their property. Chris explained that this new municipal drain can be aligned to avoid their property and will ultimately resolve the flooding concerns as well.

Notes taken by Chris Thibert

"SCHEDULE B"

SCHEDULE OF ALLOWANCES

DICECCO DRAIN NO. 1 & BRANCH NO. 1

TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
590-02800	3	Pt. Lot 29	Giuseppe & Anne DiCecco	$0.00	$4,000.00	$4,000.00
TOTAL ALLOWANCES				**$0.00**	**$4,000.00**	**$4,000.00**

"SCHEDULE C-1"
SCHEDULE OF ASSESSMENT
DiCECCO DRAIN NO. 1
TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Creek Road	0.70	0.28	Town of Amherstburg	$34,200.00	$0.00	$0.00	$34,200.00
Total on Municipal Lands				$34,200.00	$0.00	$0.00	$34,200.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
590-02800	3	Pt. Lot 29	1.00	0.40	Giuseppe & Anne DiCecco	$48,900.00	$0.00	$0.00	$48,900.00
Total on Privately-Owned - Non-Agricultural Lands						$48,900.00	$0.00	$0.00	$48,900.00
TOTAL ASSESSMENT						**$83,100.00**	**$0.00**	**$0.00**	**$83,100.00**

	(Acres)	(Ha.)
Total Area:	**1.70**	**0.68**

"SCHEDULE C-2"
SCHEDULE OF ASSESSMENT
BRANCH NO. 1
TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

Roll No.	Con.	Description	(Acres)	(Ha.)	Owner	Benefit	Benefit	Outlet	Assessment
590-02800	3	Pt. Lot 29	0.50	0.20	Giuseppe & Anne DiCecco	$4,900.00	$0.00	$0.00	$4,900.00
Total on Privately-Owned - Non-Agricultural Lands.....						$4,900.00	$0.00	$0.00	$4,900.00
TOTAL ASSESSMENT						**$4,900.00**	**$0.00**	**$0.00**	**$4,900.00**
			(Acres)	(Ha.)					
		Total Area:	**0.50**	**0.20**					

"SCHEDULE D-1"
DETAILS OF SPECIAL BENEFIT
DICECCO DRAIN NO. 1
TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

SPECIAL BENEFIT ASSESSMENT
(GENERAL DESCRIPTION OF SPECIAL BENEFIT)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
590-02800	Giuseppe & Anne DiCecco	Installation of DiCecco Drain No. 1 from Station 0+021 to Outlet into Big Creek including all catch basins, stone erosion protection, permits and required earthworks (100%)	$38,400.00	$10,500.00	$48,900.00
Total Special Benefit Assessment (Excl. Non Pro-Ratable Costs)			$38,400.00	$10,500.00	$48,900.00

SPECIAL BENEFIT ASSESSMENT
(SECTION 26 - NON PRO-RATABLE COSTS)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
Creek Road	Town of Amherstburg	Installation of new pipe drain within road allowance including crossing Creek Road from Station 0-029 to Station 0+021 including all catch basins, new swales, fill materials, stone erosion protection, utility coordination and infilling of existing pipe under road (100%)	$25,700.00	$8,500.00	$34,200.00
Total Special Benefit Assessment (Non Pro-Ratable Costs)			$25,700.00	$8,500.00	$34,200.00
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT					**$83,100.00**

"SCHEDULE D-2"
DETAILS OF SPECIAL BENEFIT
BRANCH NO. 1
TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

SPECIAL BENEFIT ASSESSMENT
(GENERAL DESCRIPTION OF SPECIAL BENEFIT)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
590-02800	Giuseppe & Anne DiCecco	Installation of Branch No. 1 from Station 0+000A to Station 0+030A (100%)	$3,700.00	$1,200.00	$4,900.00
Total Special Benefit Assessment			$3,700.00	$1,200.00	$4,900.00
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT					**$4,900.00**

"SCHEDULE E-1"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE
DiCECCO DRAIN NO. 1
TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Creek Road	1.37	0.55	Town of Amherstburg	$0.00	$2,835.00	$1,199.00	$4,034.00
Total on Municipal Lands				$0.00	$2,835.00	$1,199.00	$4,034.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
590-02800	3	Pt. Lot 29	1.00	0.40	Giuseppe & Anne DiCecco	$0.00	$3,237.00	$348.00	$3,585.00
590-02900	3	Pt. Lot 29	0.13	0.05	Robert S. & Sharon I. Dent	$0.00	$98.00	$65.00	$163.00
640-00450	3	Pt. Lot 29 RP 12R11912, Part 1	1.35	0.55	Robert G. & Kristie L. Oliver	$0.00	$593.00	$396.00	$989.00
640-00500	3	Pt. Lot 29	0.55	0.22	Justine Merlo, Ryan, David & Suzanne Varney	$0.00	$417.00	$278.00	$695.00
Total on Privately-Owned - Non-Agricultural Lands						$0.00	$4,345.00	$1,087.00	$5,432.00

PRIVATELY-OWNED - AGRICULTURAL LANDS

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
640-00400	3	Pt. Lot 29	1.20	0.49	Daniel E. & Cathy M. Paquette	$0.00	$320.00	$214.00	$534.00
Total on Privately-Owned - Agricultural Lands						$0.00	$320.00	$214.00	$534.00
TOTAL ASSESSMENT						**$0.00**	**$7,500.00**	**$2,500.00**	**$10,000.00**
			(Acres)	(Ha.)					
		Total Area:	**5.60**	**2.26**					

"SCHEDULE E-2"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE
BRANCH NO. 1
TOWN OF AMHERSTBURG (COUNTY OF ESSEX)

Roll No.	Con.	Description	(Acres)	(Ha.)	Owner	Benefit	Benefit	Outlet	Assessment
590-02800	3	Pt. Lot 29	0.50	0.20	Giuseppe & Anne DiCecco	$0.00	$7,500.00	$2,500.00	$10,000.00
Total on Privately-Owned - Non-Agricultural Lands						$0.00	$7,500.00	$2,500.00	$10,000.00
TOTAL ASSESSMENT						**$0.00**	**$7,500.00**	**$2,500.00**	**$10,000.00**
			(Acres)	(Ha.)					
		Total Area:	**0.50**	**0.20**					

"SCHEDULE F"
DRAINAGE REPORT FOR THE
DICECCO DRAIN NO. 1 AND BRANCH NO. 1
TOWN OF AMHERSTBURG
COUNTY OF ESSEX

SPECIAL PROVISIONS - GENERAL

1. 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. 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:

DiCecco Drain No. 1

- Strip and replace topsoil as follows:
  - Station 0+021 to Station 0+083 – Strip and replace topsoil a minimum of 150 mm depth over the proposed trench width prior to tile drain installation. **All topsoil materials shall be temporarily stockpiled south of the new tile drain within the designated working corridor and kept separate from trench excavation materials to be later spread back over working area and fine graded.**
  - Station 0+083 to Station 0+130 – Strip and replace topsoil a minimum of 150 mm depth within the specified berm/swale corridor prior to the tile drain installation. **All topsoil materials shall be temporarily stockpiled east of the new tile drain within the designated working corridor and kept separate from trench excavation materials to be later spread back over working area and fine graded.**
- Tile Drain and earth works as follows:
  - Station 0+021 to Station 0+083 – Supply and install 62 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with wrapped split coupler joints. Pipe installation is to include Class 'B' bedding up to pipe springline (approximately 80 tonnes). Native backfill beyond except for Station 0+030 to Station 0+048 where there shall be full Class 'B' bedding and backfill for new tile drain (approximately 25 tonnes). Seeding over new tile drain including working area (approximately 500 m^2).
  - Station 0+083 to Station 0+130 - Supply and install 47 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with wrapped split coupler joints. Pipe installation is to include Class 'B' bedding up to pipe springline (approximately 80 tonnes) and native backfill beyond. Works include the construction of an earth berm over the new tile drain and the excavation and grading of a new swale east of the tile/berm. New berm/swale corridor and working area to be seeded (approximately 800 m^2).

- Station 0+040 to Station 0+083 – Excavation and grading of new overflow flood route 'V'-ditch, 43 lineal meters with 1.5:1 side slopes (approximately 60 m^3). Works include seeding of new ditch banks.

- Supply and installation of catch basins as follows:
  - **CB3** – Station 0+037 – Supply and install one (1) new off-set 600 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with cast iron grate and 150 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe connection (3.0 m length) to new 450 mm diameter tile drain (Boss 2000 or approved equal) complete with wrapped split coupler joints. Work to also include connection of upstream end of existing 150 mm diameter private tile from north to CB3 and capping of downstream end of existing 150 mm diameter private tile beyond new drain.
  - **CB4** – Station 0+083 – Supply and install one (1) new in-line 900 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with cast iron grate.
  - **CB5** – Station 0+130 – Supply and install one (1) new in-line 900 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with cast iron grate. Works include the installation of a 2.0 meter long, 300 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe extending east from CB5 into the bottom of the new swale complete with rodent gate and rip-rap w/filter fabric around pipe and swale banks (approximately 5 m^2).
- Outlet spillway Station 0+130 to Station 0+138:
  - Station 0+130 to Station 0+132 – Supply and install 2 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with rodent gate extending west from CB5 into outlet spillway.
  - Station 0+132 to Station 0+138 – Excavation and grading of spillway section and placement of stone rip-rap minimum 300 mm thickness c/w filter cloth underlay on downstream end of tile drain including rock check dam (approximately 25 m^2).
- Temporary silt control measures during construction.

Section 26 Works

- Tile Drain and earth works as follows:
  - Station 0-029 to Station 0+000 – Supply and install 29 m of 300 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 of approved equal) complete with wrapped split coupler joints. Pipe installation is to include Class 'B' bedding up to pipe springline (approximately 15 tonnes) with native backfill beyond. Seeding over new tile drain including all disturbed areas (approximately 150 m^2).
- Creek Road - Station 0+000 to Station 0+021 – Supply and install 21.0 m of 450 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with wrapped split coupler joints, clear stone bedding with filter fabric overlay (approximately 9 tonnes), Granular 'A' backfill under road portion (approximately 35 tonnes), native backfill material beyond road (approximately 10 m^3) and asphalt restoration, 80 mm HL4 base layer (two 40 mm lifts) and 40 mm HL3 surface layer (approximately 20 m^2) and including connections into new catch basins on both sides of the road.

- Abandon, cut, infill and seal existing 450 mm diameter corrugated steel pipe (CSP) across Creek Road with a non-shrink concrete grout.
- Supply and installation of catch basins as follows:
    - **CB1** – Station 0+000 – Supply and install one (1) new 600 mm x 1200 mm precast concrete ditch inlet catch basin, OPSD 705.040 (Type 'B'), on east side of Creek Road including new honeycomb galvanized steel grate, OPSD 403.010, and a minimum 300 mm deep sump. The grates are to be equipped with fasteners to secure grates to catch basins as supplied by the manufacturer. Works include the placement of stone rip-rap, 500 mm wide, around catch basin grate complete with filter fabric underlay (approximately 5 m^2).
    - **CB2** – Station 0+021 - Supply and install one (1) new 600 mm x 1200 mm precast concrete ditch inlet catch basin, OPSD 705.040 (Type 'B'), on west side of Creek Road including new honeycomb galvanized steel grate, OPSD 403.010, and a minimum 300 mm deep sump. The grates are to be equipped with fasteners to secure grates to catch basins as supplied by the manufacturer. Works include the placement of stone rip-rap, 500 mm wide, around catch basin grate complete with filter fabric underlay (approximately 5 m^2).
    - **CB6** – Station 0-029 – Supply and install one (1) new in-line 900 mm diameter 320 kPa, smooth wall solid corrugated high density polyethylene (H.D.P.E.) catch basin (Boss 2000 or approved equal) complete with galvanized steel bird cage style grate as manufactured by Coldstream Concrete Inc. (or approved equal) and a minimum 300 mm deep sump. Works include the placement of stone rip-rap, 500 mm wide, around catch basin grate complete with filter fabric underlay (approximately 5 m^2).
- Excavation and grading of new road swales as follows:
    - 30 lineal meters of new 'V'-ditch with 2:1 side slopes, minimum 300 mm deep, north of CB2, west of Creek Road (approximately 8 m^3). Works include hauling of excavated material off site, seeding of ditch banks and the supply and installation of a new 4.0 meter long, 300 mm diameter 320 kPa, non-perforated high density polyethylene (H.D.P.E.) pipe (Boss 2000 or approved equal) complete with rodent gate extending from CB2 north to the bottom of the new road ditch and stone rip-rap w/filter fabric underlay around pipe inlet and ditch banks (approximately 8 m^2).
    - 80 lineal meters of new 'V'-ditch with 2:1 side slopes, minimum 300 mm deep, south of CB2, west of Creek Road (approximately 15 m^3). Works include hauling of excavated material off site and seeding of ditch banks.

Branch No. 1

- Station 0+000A to Station 0+030A – Strip and replace topsoil a minimum of 150 mm depth within the specified berm/swale corridor prior to excavation. **All topsoil materials shall be temporarily stockpiled east of the new berm/swale corridor within the designated working corridor and kept separate from excavation materials to be later spread back over working area and fine graded.**
- Station 0+000A to Station 0+030A - Excavate (construct) and grade new swale with 3:1 side slopes and 0.5 m bottom width (approximately 6 m^3).
- Station 0+000A to Station 0+030A - Construct earth berm west of grassed swale using clean native material from swale and/or imported native materials (approximately 12 m^3) compacted and sloped with 2:1 side slopes and 0.9 m top width.
- Seeding of swale/berm corridor (approximately 300 m^2).

3. ACCESS TO THE WORK

Access to the drain shall be from Creek Road and Roll No 590-02800. 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. WORKING AREA

For the construction of the portion of the DiCecco Drain No. 1 between Station 0-029 and Station 0+021, the working corridor shall be within the Creek Road right-of-way. For the construction of the DiCecco Drain No. 1 from Station 0+021 to Station 0+083, the working corridor shall be 10 m wide centered on the alignment of the new tile drain. For the construction of the DiCecco Drain No. 1 from Station 0+083 to Station 0+130, the working corridor shall be 10 m wide measured east of the chain link fence. For the construction of the Branch No. 1 from Station 0+000A to Station 0+030A, the working corridor shall be 10 m wide measured east of chain link fence. For the construction of the spillway outlet Station 0+130 to Station 0+138, the working corridor shall be 12 m wide centered on the centerline alignment of the spillway. This will also provide access for equipment and temporary placement of excavating materials. One lane of Creek Road shall remain open during the construction period and traffic control (found in General Specifications) maintained at all times. 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.

For future drain maintenance activities, the working corridors specified above shall govern. **No re-grading will be permitted within the specified corridors and municipal drain easements.**

SPECIAL PROVISIONS – TILE DRAIN

5.0 DRAINAGE PIPE CONSTRUCTION

5.1 Setting Out

The Engineer shall provide the Contractor, in writing, with benchmarks and points of reference. From these benchmarks and points of reference, 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 centerline stakes, grade stakes, offsets, and sight rails.

If, during the setting out, the contractor finds an error in the benchmarks or points of reference provided by the Engineer 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.

The Contractor shall be responsible to ensure that the alignment selected results in a minimum depth of cover of 300 mm over the top of the drainage pipe for DiCecco Drain No. 1 to be installed.

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.

5.2 Profile

The drainage pipe shall be laid so that its invert shall be at the gradeline shown on the profile, which gradeline is governed by the benchmarks. The profile shows, for the convenience of the Contractors and others, the approximate depth of cut from the surface of the ground at 25 metre intervals, to the final invert of the drainage pipe in metres and decimals of a metre. Benchmarks, which have been established along the course of the drain, shall govern the final elevation of the drain. The locations and elevations of the benchmarks are shown on the General Details.

A variation in grade may be tolerated where the actual capacity of the drain exceeds the required capacity. The as-constructed invert of the drainage pipe shall not deviate from the specified gradeline more than 10% of the internal diameter of the drainage pipe. These deviations are allowable, provided they are gradual over a distance of not less than 10 m. No reverse grade shall be allowed.

5.3 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 and disposed of off-site. Timber, logs, stumps, large stones and other similar material are to be dealt with in the same manner as specified for brush and trees.

5.4 Location of New Tile Drain

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

5.5 Drainage Pipe Materials

5.5.1 H.D.P.E. Pipe

Tile Drain (Sta. 0-029 to 0+000)	*New 300 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) 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*
Tile Drain (Sta. 0+000 to 0+132)	*New 450 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) 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.* *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.*
Pipe Bedding Under Entire Pipe	*Granular 'A' conforming to OPSS Division 10 or 19 mm clearstone.*
Backfill up to Pipe Springline	*Granular 'A' conforming to OPSS Division 10 or 19 mm clearstone.*

Native Backfill Up to Existing Conditions	*Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.*
Filter Fabric	*"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC or approved equivalent.*
Erosion Stone	*All stone to be used for erosion protection shall be 125 – 250 mm clear quarried rock or OPSS 1001, minimum 300 mm thickness.*

The pipe to be used for the enclosed drain tile of the DiCecco Drain No. 1 shall be corrugated high density polyethylene pipe (H.D.P.E.) smooth interior wall pipe meeting the following specifications:

ASTM D3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa. 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 B182.8-02 and OPSS 1840. Connections to the catch basin shall be completely parged in place with an approved non-shrink grout.

All joints of the H.D.P.E. pipe are to be wrapped with non-woven filter fabric as per the specifications in Section 5.8. The filter fabric shall be a minimum of 1 m wide and centered over the pipe joint. The filter fabric shall be installed neatly around the circumference of the tile without any unnecessary bunching or folding of the material so that voids between the filter fabric and the tile are avoided.

5.6 Stripping of Topsoil

Topsoil shall be stripped for a minimum depth of 150 mm from the proposed drain alignment for DiCecco Drain No. 1 Station 0+021 to Station 0+130 including the location of the berm. The topsoil shall be stockpiled south and east of the proposed tile and/or swale for DiCecco Drain No. 1 in a temporary 10.0 m wide corridor. Later, the topsoil will be spread on the new berm and swale. A minimum depth of topsoil is 100 mm.

Excess topsoil shall not be removed from the site. Excess topsoil shall be used to repair settlements and increase the topsoil thickness over the filled alignment.

It is anticipated that the amount of topsoil stripped from proposed open channel alignments will be greater than the amount required to dress the entire surface of the filled alignment however, if needed, the Contractor shall import screened topsoil to complete the work at their expense.

5.7 Excavating the Trench

Construction of the trench shall normally start at the outlet and proceed upstream and be by excavator. The trench walls may be cut vertically to a height of 1 metre from the trench bottom. Beyond 1 metre of the trench bottom the walls are to be cut no steeper than 1:1 side slopes unless a trench box is utilized.

Minimum width of trench, measured at the top of the drainage pipe, shall be equal to the outside diameter of the drainage pipe plus approximately half of the outside pipe diameter on both sides of the pipe, to permit proper granular material bedding placement around the drainage pipe.

The bottom of the trench shall be cut to a minimum of 150 mm below the gradeline to allow for the Class 'B' bedding materials.

Any additional excavated material not required for backfilling purposes shall be disposed of off-site.

The topsoil is to be separated from the subsoil and during the backfilling operation it shall be replaced as the top layer.

5.8 Laying Drainage Pipe

DiCecco Drain No. 1

The Contractor shall supply and install Class 'B' granular material for bedding, placed to a depth of 150 mm below the design invert of the pipe and shaped to receive the pipe. After pipe placement, Class 'B' backfill shall be placed and compacted to the springline of the pipe throughout its entire length.

Laying of the drainage pipe shall normally begin at the lower end of the drain and progress upstream.

All soil or debris in the drainage pipe shall be removed before installation.

All drainage pipes shall be free from clinging wet or frozen material that would hinder the laying of the drainage pipe on grade.

Before work is suspended for the day, all drainage pipe laid in trenches shall be blinded and any open ends closed.

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.

5.9 Connections

The existing tile drain at Station 0-029 and Station 0+037 from the north shall be inspected by the Drainage Superintendent and if found to be in working order, it shall be connected to the new system. Drains containing very little sediment shall be directly connected and drains containing substantial quantities of sediment shall be indirectly connected through filter material.

Drains carrying sewage or farmstead wastes shall not be connected to the drainage system.

Plastic tubing connections to rigid drainage pipe shall be made with manufactured plastic adapters.

Directional changes in plastic tubing may be made without the use of fittings provided that the centre line radius of the bend is not less than five times the tubing diameter.

Manufactured "T", "Y", or elbow fittings shall be used for connections at the junction of two drains.

All connections shall be carried out by the Contractor as part of his work. The cost of connections shall be an expense of the drain.

The Contractor shall plug the existing tile in the wall of the trench, on the opposite side on which the connection is made, if the tile extends across the trench.

5.10 Blinding

As the laying of drainage pipe progresses, the drainage pipe shall be blinded by placing crumbly sub-soils from the springline of the pipe to a minimum depth of 150 mm above the top of pipe.

Drainage pipe laid in open trenches shall be blinded by the end of each day.

Large stones and frozen lumps of soil shall not be permitted in the blinding material.

On steep grades, or where the topsoil contains fine sand, loam or clay soil (if available from the sides of the trench) shall be used as blinding material.

5.11 Backfilling

After the Drainage Superintendent has inspected the laying of the drainage pipe, earth excavated from the trench shall be used as backfill material. Surplus soil shall be spread and heaped evenly to a maximum of 400 mm above the trench of DiCecco Drain No. 1 from Station 0-029 to Station 0+000 and from Station 0+021 to Station 0+0132 only to avoid depressions following settlement. Topsoil shall then be replaced over the heaped material. If necessary the contractor shall return for additional levelling no later than one year from the time of project completion.

From Station 0+030 to Station 0+048, the contractor shall use full Class 'B' bedding and backfill materials, as specified on the drawings.

Large stones, roots, broken pipe and other material likely to impede or damage field equipment shall be removed from the backfill and placed in a suitable disposal area by the Contractor.

To avoid the danger of damaging the drainage pipe, large stones and lumps of frozen earth may not be placed in the trench during the backfill operation.

Where plastic tubing is not blinded in a separate operation, a backfilling method shall be used that permits backfill material to roll into the trench and provide uniform soil placement around tubing, immediately after installation.

Except at laneways and road crossings, backfill material shall not be compacted; compaction shall be allowed to occur naturally.

5.12 Catch Basins (CB)

The Contractor shall arrange for the supply and installation of catch basins and lawn type catch basins at the locations and elevations as shown on the drawing Details and Profiles. The price bid for the catch basin installations shall include all material, equipment and labour necessary to complete the catch basin installations including connections to the covered drain. This specification refers to the catch basins at Station 0-029, 0+037, Station 0+083 and Station 0+0130/0+030A.

The lawn type catch basin at Station 0+037 shall be 600 mm diameter solid corrugated high density polyethylene (H.D.P.E.) smooth wall 320 kPa pipe (Boss 2000 or approved equal) pipe with flat cast iron grates and a 9.5 mm welded bottom. The catch basins shall have an overall height as shown on the drawings with a sump of 300 mm. The control elevations for the lawn type catch basins shall be set to the elevations shown on the profile.

The catch basin at Station 0-029 shall be 900 mm diameter solid corrugated high density polyethylene (H.D.P.E.) smooth wall 320 kPa pipe (Boss 2000 or approved equal) pipe with galvanized steel bird cage style grate as manufactured by Coldstream Concrete Inc. (or approved equal) and a 9.5 mm welded bottom. The catch basin shall have an overall height as shown on the drawings with a sump of 300 mm. The control elevations for the catch basin shall be set to the elevations shown on the profile.

The catch basin at Station 0+083 shall be 900 mm diameter solid corrugated high density polyethylene (H.D.P.E.) smooth wall 320 kPa pipe (Boss 2000 or approved equal) pipe with flat cast iron grate and a 9.5 mm welded bottom. The catch basin shall have an overall height as shown on the drawings with a sump of 300 mm. The control elevations for the lawn type catch basins shall be set to the elevations shown on the profile.

The catch basin at Station 0+130/0+030A shall be 900 mm diameter solid corrugated high density polyethylene (H.D.P.E.) smooth wall 320 kPa pipe (Boss 2000 or approved equal) pipe with a flat cast iron grate and a 9.5 mm welded bottom. The catch basin shall have an overall height as shown on the drawings with a sump of 300 mm. The control elevations for the lawn type catch basins shall be set to the elevations shown on the profile.

All work must be carried out to the satisfaction of the Drainage Superintendent. The proposed location of each catch basin must be staked in the field by the contractor for approval by the Drainage Superintendent prior to construction.

All pipes are to be securely grouted into the catch basins. All catch basins are to be installed on a 300 mm thick base of 19 mm size clear stone.

Pipe placed in the walls for inlet and outlet connections shall extend through the wall a sufficient distance to allow for connections. The pipes shall be trimmed flush with the inside wall and shall be securely sealed into place using grout or manufactured water tight 'tee' connections.

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 equal. **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.

5.13 Spillway Outlet to Big Creek (Station 0+132 to Station 0+138)

Erosion protection for the outlet spillway and rock check dam, as specified in the location on the drawings, shall be constructed of quarry stone rip-rap consisting of 150-250 mm sized clear quarried angular limestone materials placed over a non-woven filter fabric Terrafix 270R or approved equal. The rock check dam shall be constructed in accordance with OPSD 219.211 as shown on the drawings.

The center of the spillway from Station 0+132 to Station 0+138 shall be excavated 300 mm deep, with materials excavated compacted along the sides forming side slopes at a maximum of 1.5:1. The minimum thickness requirement of the erosion stone layer is 300 mm with no portion of the filter fabric to be exposed.

The contractor shall supply and install a galvanized rodent gate on the outlet of the 450 mm diameter H.D.P.E. pipe at Station 0+132.

5.14 Overflow Flood-Route Ditch

The contractor will be required to construct a new ditch starting at Station 0+040 approximately 3.0 m south of the north property line and tying into existing grade just beyond the west property line at Station 0+083 as shown on the attached drawings.

The 'V' shaped ditch shall be excavated to the grade and elevation provided on the drawings and constructed with 1.5:1 side slopes. All excavated materials are to be hauled off site at the contractor's expense.

Once the ditch is shaped to the dimensions defined herein, the surface of the swale shall be covered with a minimum 100 mm thick layer of salvaged topsoil and seeded as per Special Provision No. 9.

SPECIAL PROVISIONS – BERM & SWALE

6.0 SWALE EXCAVATION

The contractor will be required to construct a swale east of the new tile drain for DiCecco Drain No. 1 (Station 0+083 to Station 0+130) and for Branch No. 1 (Station 0+000A to Station 0+030A).

Topsoil shall be stripped for a minimum depth of 150 mm from the proposed berm/swale alignment for Branch No. 1 Station 0+000A to Station 0+030A. The topsoil shall be stockpiled east of the proposed swale for Branch No. 1 in a temporary 10.0 m wide corridor. Later, the topsoil will be spread on the new berm and swale. A minimum depth of topsoil is 100 mm.

Excess topsoil shall not be removed from the site. Excess topsoil shall be used to repair settlements and increase the topsoil thickness over the filled alignment.

It is anticipated that the amount of topsoil stripped will be greater than the amount required to dress the entire surface of the filled alignment however, if needed, the Contractor shall import screened topsoil to complete the work at their expense.

The trapezoidal shaped swale shall be excavated to the grade and elevation provided on the drawings and constructed with a 500 mm bottom width and 3:1 side slopes.

Once the swale is shaped to the dimensions defined herein, the surface of the swale shall be covered with a minimum 100 mm thick layer of salvaged topsoil and seeded as per Special Provision No. 9.

7.0 BERM CONSTRUCTION

The contractor shall construct the berm as outlined on the drawings appended hereto at the location as shown to the dimensions as shown.

The excavated materials from the swale excavation shall be used to construct the berm. If there is insufficient material to construct the berm, the contractor shall import clean native fill. The materials shall be free of debris, weeds and other deleterious materials. The Contractor shall grade and place the material to a depth of 300 mm for compaction to a minimum 95% of the maximum standard proctor density.

The berm shall be constructed with 2:1 (H:V) side slopes with a top width of 0.9 m. Once the berm is shaped to the dimensions defined herein, the surface of the berm shall be covered with a minimum 100 mm thick layer of salvaged topsoil and seeded as per Special Provision No. 9.

8.0 ROAD CROSSING

8.1 Location of Road Crossing

The road crossing shall be located and installed as shown on the drawings.

8.2 Materials

Materials shall be as follows:

Tile Drain (Station 0+000 to Station 0+021)	*New 450 mm diameter solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) 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.* *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.
Bedding Below Pipe	*19 mm clear stone conforming to OPSS Division 10 (150 mm thick).*
Backfill up to Pipe Springline	*Granular 'A' or 19 mm clear stone conforming to OPSS Division 10.*
Beneath Road Surface and Shoulders, Backfill From Pipe Springline to Bottom of Granular 'A' Road Surface.	*Granular 'A' conforming to OPSS Division 10.*
Beyond Road Surface and Shoulders, Backfill Above Pipe Springline to Finished Topsoil Layer	*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.*
Road Surface and Shoulders	*Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 300 mm thickness.*
Erosion Stone	*All stone to be used for erosion protection shall be 125 - 250 mm clear quarried rock or OPSS 1004, minimum 300 mm thickness.*
Filter Fabric	*"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC or approved equivalent.*

8.3 Pipe 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 pipe configuration, as shown on the drawings. Full Granular 'A' bedding and backfill shall be used and compacted to 100% of their maximum dry density; native materials shall be compacted to 95% of their maximum dry density.

8.4 New Ditch Inlet Concrete Catch Basins (CB)

The Contractor shall arrange for the supply and installation of two (2) 600 mmx 1200 mm precast concrete ditch inlet catch basins at Station 0+000 and Station 0+021 with a minimum 150 mm wall thickness, as manufactured by Coldstream Concrete or approved equivalent in accordance with OPSD 705.040 at the location and elevation as shown on the drawing Details and Profiles. The catch basins shall contain a minimum 300 mm sump. Catch basins shall have a sloped top and fitted with a new galvanized heavy duty honeycomb steel grate as per OPSD 403.010. The grates shall be set flush with the top of the catch basins and secured in place with metal tabs bolted in place as manufactured by Coldstream Concrete or approved equivalent. All inlet and outlet pipes shall be completely parged in place with an approved non-shrink grout. All disturbed road swales and grassed areas to be restored with fine grading and seeding.

The Contractor shall install all precast structures plumb and true to line and grade. Precast bases shall be set to the specified grade, shall be level, and shall have uniform overall contact with the underlying soil.

All catch basins installed shall meet the dimensions and locations outlined in the drawings. Precast concrete catch basins shall conform to the requirements of Ontario Provincial Standard Specification (OPSS) 1351. The floor elevation shall be at least 300 mm below the invert of the outlet pipe in the wall of the catch basin.

Pipe placed in the walls for inlet and outlet connections shall extend through the wall a sufficient distance to allow for connections. The pipes shall be trimmed flush with the inside wall and shall be securely sealed into place using grout.

8.5 Stone Erosion Protection

The Contractor shall supply and install the required quantity of graded stone rip-rap erosion protection materials at the new catch basins and swales as shown on the drawings.

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.

8.6 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.

8.7 Asphalt Pavement Restoration

Asphalt roads shall be constructed as follows:

- 80 mm HL4 Base Asphalt (two 40 mm lifts)
- 40 mm HL3 Surface 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 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 25 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 place HL4 asphalt mix in two 40 mm lifts for the base course rolled and compacted to minimum 98% of the Marshall Density followed by HL3 grade asphalt for the surface course in one lift of 40 mm compacted to minimum 98% of the Marshall Density. Any road line painting removed by the pavement operations shall be restored on the new pavement surface.

8.8 Non-Shrink Fill of Abandoned Road Crossing

The Contractor shall be required to prepare the existing pipe, where indicated on the drawings, to be abandoned.

The Contractor shall expose the existing 450 mm diameter corrugated steel pipe crossing Creek Road, cut and cap off each section and fill with non-shrink flowable backfill materials. The non-shrink backfill shall consist of pre-mixed sand and Portland cement slurry provided by the concrete truck with pumping unit. The Contractor shall confirm with the owners and Municipality that all connections to the old pipe have been found prior to infilling.

8.9 New Roadside Swales

The contractor will be required to construct a swale north and south of the new catch basin (CB2) along the west side of Creek Road as shown on the attached drawings.

Topsoil shall be stripped for a minimum depth of 150 mm from the proposed swale alignments. The topsoil shall be stockpiled west of the proposed swale within the road allowance. Later, the topsoil will be spread on the new swale. A minimum depth of topsoil is 100 mm.

Excess topsoil shall not be removed from the site. Excess topsoil shall be used to repair settlements and increase the topsoil thickness over the filled alignment.

It is anticipated that the amount of topsoil stripped will be greater than the amount required to dress the entire surface of the swale alignment however, if needed, the Contractor shall import screened topsoil to complete the work at their expense.

The 'V' shaped swale shall be excavated to the grade and elevation provided on the drawings (minimum 300 mm deep) and constructed with 2:1 minimum side slopes. All excavated materials are to be hauled off site at the contractor's expense.

The contractor shall install a new 4.0 m long, 300 mm diameter, 320 kPa solid (non-perforated) corrugated High Density Polyethylene (H.D.P.E.) smooth wall interior (Armtec Boss 2000 or approved equivalent) pipe extending from CB2 north to the bottom of the new swale complete with rodent gate.

Once the swale is shaped to the dimensions defined herein, the surface of the swale shall be covered with a minimum 100 mm thick layer of salvaged topsoil and seeded as per Special Provision No. 9.

9.0 SEEDING OF SWALE, BERM AND ROADSIDE

All existing grassed areas disturbed by construction or as identified as new seeded areas 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:

Creeping Red Fescue	*20%*
Meadow Fescue	*30%*
Tall Fescue	*30%*
Timothy	*10%*
White Clover	*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.

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.

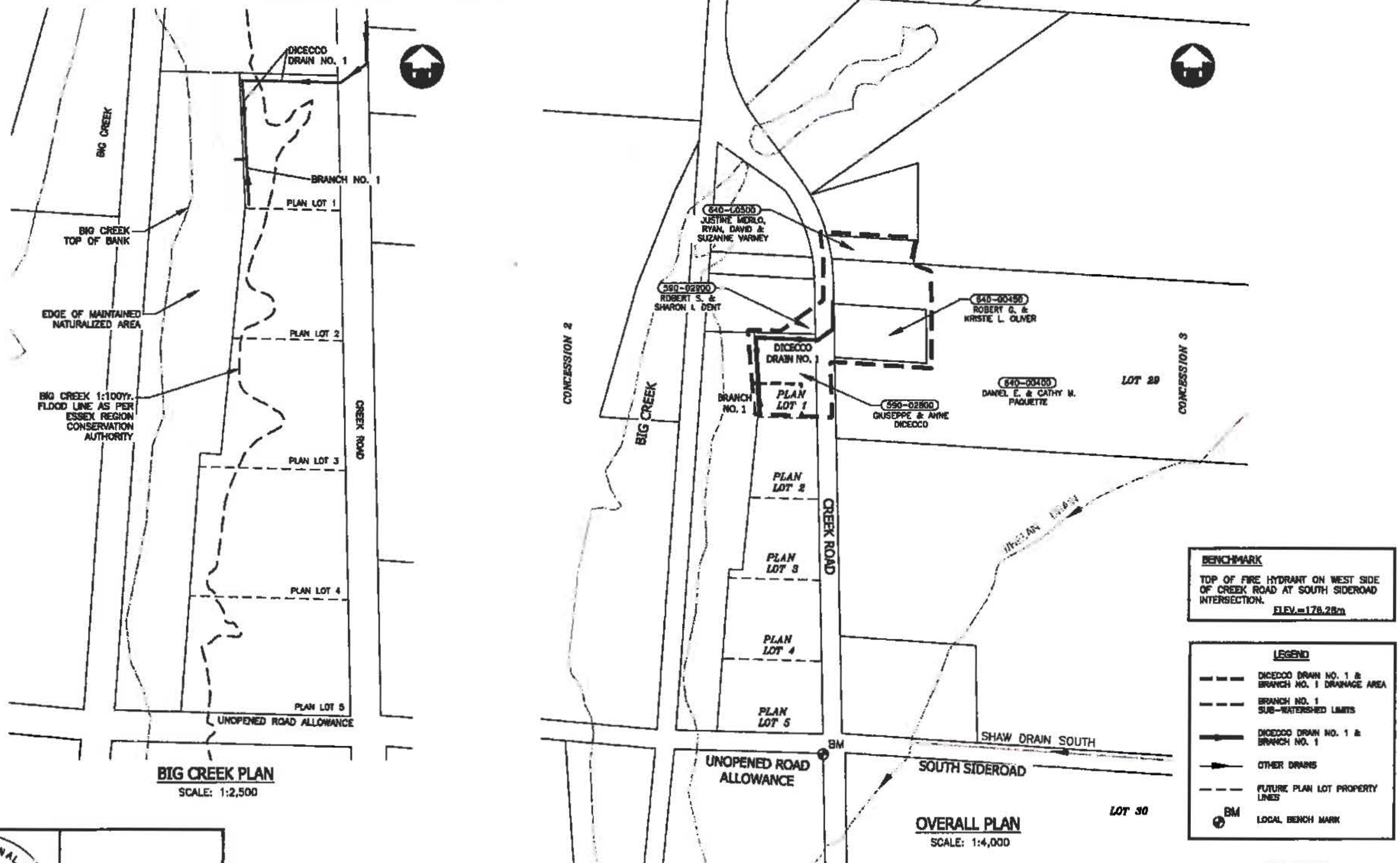
16.0 FINAL INSPECTION

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.


DICECCO DRAIN NO. 1
BIG CREEK
BRANCH NO. 1
PLAN LOT 1
BIG CREEK TOP OF BANK
EDGE OF MAINTAINED NATURALIZED AREA
PLAN LOT 2
BIG CREEK 1:100Yr. FLOOD LINE AS PER ESSEX REGION CONSERVATION AUTHORITY
CREEK ROAD
PLAN LOT 3
PLAN LOT 4
PLAN LOT 5
UNOPENED ROAD ALLOWANCE
BIG CREEK PLAN
SCALE: 1:2,500
640-00500
JUSTINE MERLO, RYAN, DAVID & SUZANNE VARNEY
590-02900
ROBERT S. & SHARON L. DENT
640-00456
ROBERT G. & KRISTIE L. OLIVER
CONCESSION 2
BIG CREEK
DICECCO DRAIN NO. 1
BRANCH NO. 1
PLAN LOT 1
590-02800
GIUSEPPE & ANNE DICECCO
640-00400
DANIEL E. & CATHY M. PAQUETTE
LOT 29
CONCESSION 3
PLAN LOT 2
CREEK ROAD
PLAN LOT 3
PLAN LOT 4
PLAN LOT 5
BM
SHAW DRAIN SOUTH
UNOPENED ROAD ALLOWANCE
SOUTH SIDEROAD
OVERALL PLAN
SCALE: 1:4,000
LOT 30
BENCHMARK
TOP OF FIRE HYDRANT ON WEST SIDE OF CREEK ROAD AT SOUTH SIDEROAD INTERSECTION.
ELEV.=176.28m
LEGEND
DICECCO DRAIN NO. 1 & BRANCH NO. 1 DRAINAGE AREA
BRANCH NO. 1 SUB-WATERSHED LIMITS
DICECCO DRAIN NO. 1 & BRANCH NO. 1
OTHER DRAINS
FUTURE PLAN LOT PROPERTY LINES
BM LOCAL BENCH MARK

'SCHEDULE G'

LICENSED PROFESSIONAL ENGINEER
C.D. THIBERT
100139162
27-APR-16
PROVINCE OF ONTARIO

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	ISSUED FOR	DATE	BY
1	FINAL REPORT	APR 27/16	CDT

DESIGN: CDT	REVIEWED BY: FRF
DRAWN: WLB	CHECKED BY: TRO
DATE: APRIL 27, 2016	
SCALE: AS SHOWN	

DILLON CONSULTING

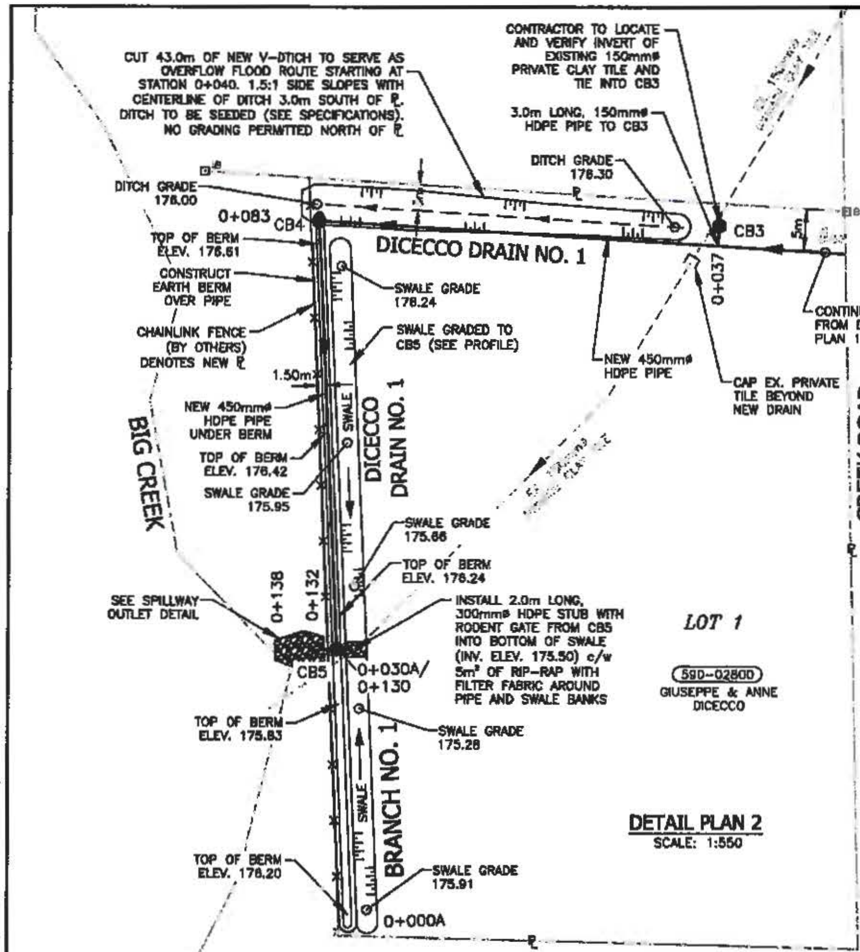
PROJECT NO: 15-1463

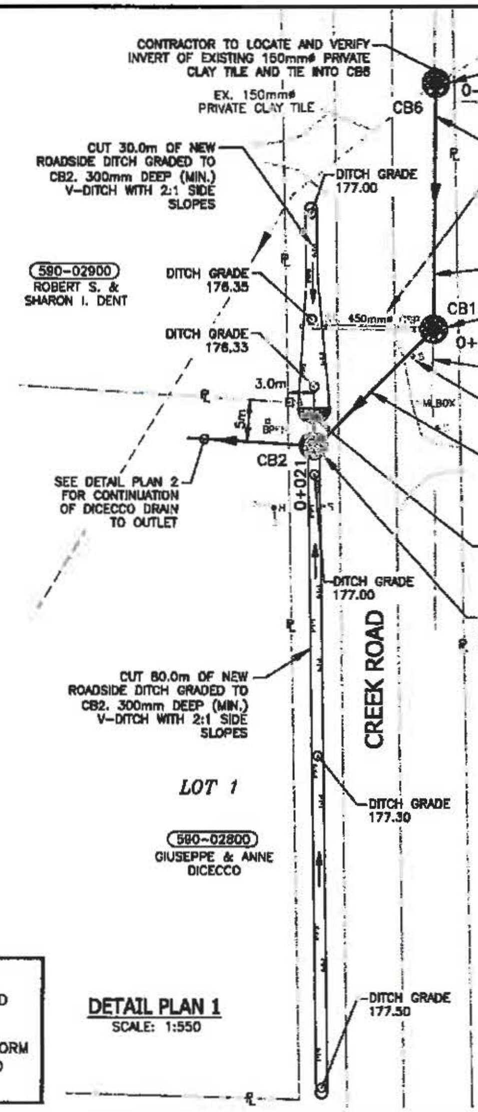
DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
DICECCO DRAIN NO. 1 & BRANCH NO. 1
Town of Amherstburg

SHEET TITLE: OVERALL PLAN & BIG CREEK PLAN

PAGE NO. 1 of 6


CUT 43.0m OF NEW V-DITCH TO SERVE AS OVERFLOW FLOOD ROUTE STARTING AT STATION 0+040. 1.5:1 SIDE SLOPES WITH CENTERLINE OF DITCH 3.0m SOUTH OF ℄. DITCH TO BE SEEDED (SEE SPECIFICATIONS). NO GRADING PERMITTED NORTH OF ℄
CONTRACTOR TO LOCATE AND VERIFY INVERT OF EXISTING 150mmø PRIVATE CLAY TILE AND TIE INTO CB3
3.0m LONG, 150mmø HDPE PIPE TO CB3
DITCH GRADE 176.30
DITCH GRADE 176.00
0+083
CB4
CB3
5m
TOP OF BERM ELEV. 176.61
DICECCO DRAIN NO. 1
CONSTRUCT EARTH BERM OVER PIPE
SWALE GRADE 176.24
CHAINLINK FENCE (BY OTHERS) DENOTES NEW ℄
SWALE GRADED TO CB5 (SEE PROFILE)
NEW 450mmø HDPE PIPE
0+037
CONTINUED FROM DETAIL PLAN 1
CAP EX. PRIVATE TILE BEYOND NEW DRAIN
1.50m
NEW 450mmø HDPE PIPE UNDER BERM
BIG CREEK
TOP OF BERM ELEV. 176.42
SWALE
DICECCO DRAIN NO. 1
CREEK ROAD
SWALE GRADE 175.95
SWALE GRADE 175.66
TOP OF BERM ELEV. 176.24
SEE SPILLWAY OUTLET DETAIL
0+138
0+132
INSTALL 2.0m LONG, 300mmø HDPE STUB WITH RODENT GATE FROM CB5 INTO BOTTOM OF SWALE (INV. ELEV. 175.50) c/w 5m² OF RIP-RAP WITH FILTER FABRIC AROUND PIPE AND SWALE BANKS
LOT 1
CB5
0+030A/ 0+130
590-02800
GIUSEPPE & ANNE DICECCO
TOP OF BERM ELEV. 175.83
SWALE GRADE 175.26
BRANCH NO. 1
SWALE
TOP OF BERM ELEV. 176.20
SWALE GRADE 175.91
0+000A
DETAIL PLAN 2
SCALE: 1:550


CONTRACTOR TO LOCATE AND VERIFY INVERT OF EXISTING 150mmø PRIVATE CLAY TILE AND TIE INTO CB6
EX. 150mmø PRIVATE CLAY TILE
CB6
0-029
500mm WIDE RIP-RAP WITH FILTER FABRIC AROUND TOP OF CB6 (APPROX. 5m²)
NEW 300mmø HDPE PIPE
CUT 30.0m OF NEW ROADSIDE DITCH GRADED TO CB2. 300mm DEEP (MIN.) V-DITCH WITH 2:1 SIDE SLOPES
DITCH GRADE 177.00
EX. 450mmø CSP TO BE ABANDONED, CUT AT ROADSIDE DITCHES, CAPPED & FILLED WITH CONC. GROUT (SEE SPECS)
590-02900
ROBERT S. & SHARON I. DENT
DITCH GRADE 176.35
RE-GRADE EXISTING ROADSIDE DITCHES TO CB1 AND CB6
450mmø CSP
CB1
0+000
500mm WIDE RIP-RAP WITH FILTER FABRIC AROUND TOP OF CB1 (APPROX. 5m²)
DITCH GRADE 176.33
3.0m
RE-GRADE EXISTING ROADSIDE DITCHES TO CB1
RELOCATE EXISTING SIGN
5m
CB2
0+021
SEE DETAIL PLAN 2 FOR CONTINUATION OF DICECCO DRAIN TO OUTLET
INSTALL 21.0m OF NEW 450mmø HDPE PIPE UNDER CREEK ROAD COMPLETE WITH FULL GRANULAR 'A' BEDDING AND BACKFILL AND ASPHALT SURFACE TO MATCH EXISTING ASPHALT SURFACE (SEE SPECS)
INSTALL 4.0m LONG, 300mmø HDPE STUB WITH RODENT GATE FROM CB2 TO CENTER OF NEW ROAD DITCH (U/S INV. 176.32) c/w RIP-RAP AROUND PIPE AND DITCH BANKS (APPROX. 8m²)
DITCH GRADE 177.00
500mm WIDE RIP-RAP WITH FILTER FABRIC AROUND TOP OF CB2 (APPROX. 5m²)
CUT 80.0m OF NEW ROADSIDE DITCH GRADED TO CB2. 300mm DEEP (MIN.) V-DITCH WITH 2:1 SIDE SLOPES
CREEK ROAD
LOT 1
DITCH GRADE 177.30
590-02800
GIUSEPPE & ANNE DICECCO
DITCH GRADE 177.50
DETAIL PLAN 1
SCALE: 1:550

NOTE

FINAL LOT GRADING TO BE PROVIDED BY DEVELOPER AND/OR PROPERTY OWNER AND REVIEWED BY MUNICIPALITY. ALL INDIVIDUAL LOT DRAINAGE TO BE MAINTAINED AND DIRECTED, IN ACCORDANCE WITH THE TOWN OF AMHERSTBURG'S LOT GRADING AND SERVICES INFORMATION STANDARD, TO THE WEST LIMITS OF THE PROPERTY AND EAST TO THE CREEK ROAD OPEN DITCH. NO REGRADING WILL BE PERMITTED WITHIN NEW MUNICIPAL DRAINAGE EASEMENTS AS SPECIFIED IN REPORT.

UTILITIES

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THESE DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HERSELF/HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM

'SCHEDULE G'

LICENSED PROFESSIONAL ENGINEER
C.D. THIBERT
100139162
27-APR-16
PROVINCE OF ONTARIO

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DILLON CONSULTING

PROJECT NO. 15-1463

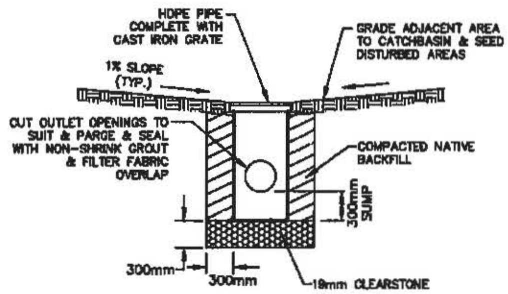
DRAWING SCALES BASED ON A 11"X17" SHEET

Drainage Report for the
DICECCO DRAIN NO. 1 & BRANCH NO. 1
Town of Amherstburg

SHEET TITLE: DETAIL PLANS

PAGE NO. 2 of 6

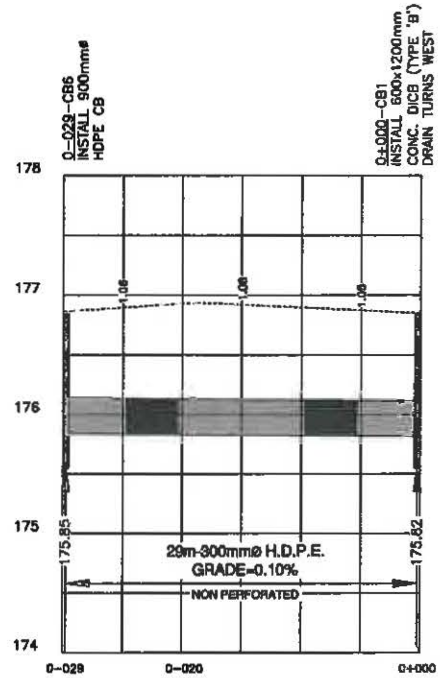
Apr 27, 2016 - 11:08am



HDPE CATCH BASIN DETAIL

NOT TO SCALE

DICECCO DRAIN NO. 1 CATCH BASIN DETAILS					
CB No.	SIZE(mm)	TOP ELEV. (m)	INV. ELEVATIONS. (m)		
CB1	600x1200 DICB	176.87 (INLET)	175.82(N)	175.82(W)	
CB2	600x1200 DICB	177.00 (INLET)	175.80(E)	175.80(W)	175.95(N)
CB3	600ø HDPE	176.27	175.85(S)		
CB4	900ø HDPE	176.61	175.74(E)	175.74(S)	
CB5	900ø HDPE	176.24	175.48(N)	175.48(E)	175.48(W)
CB6	900ø HDPE	176.84	175.85(S)		



DICECCO DRAIN NO. 1 PROFILE 1

SCALE: HORIZ.=1:4000
VERT.=1:400

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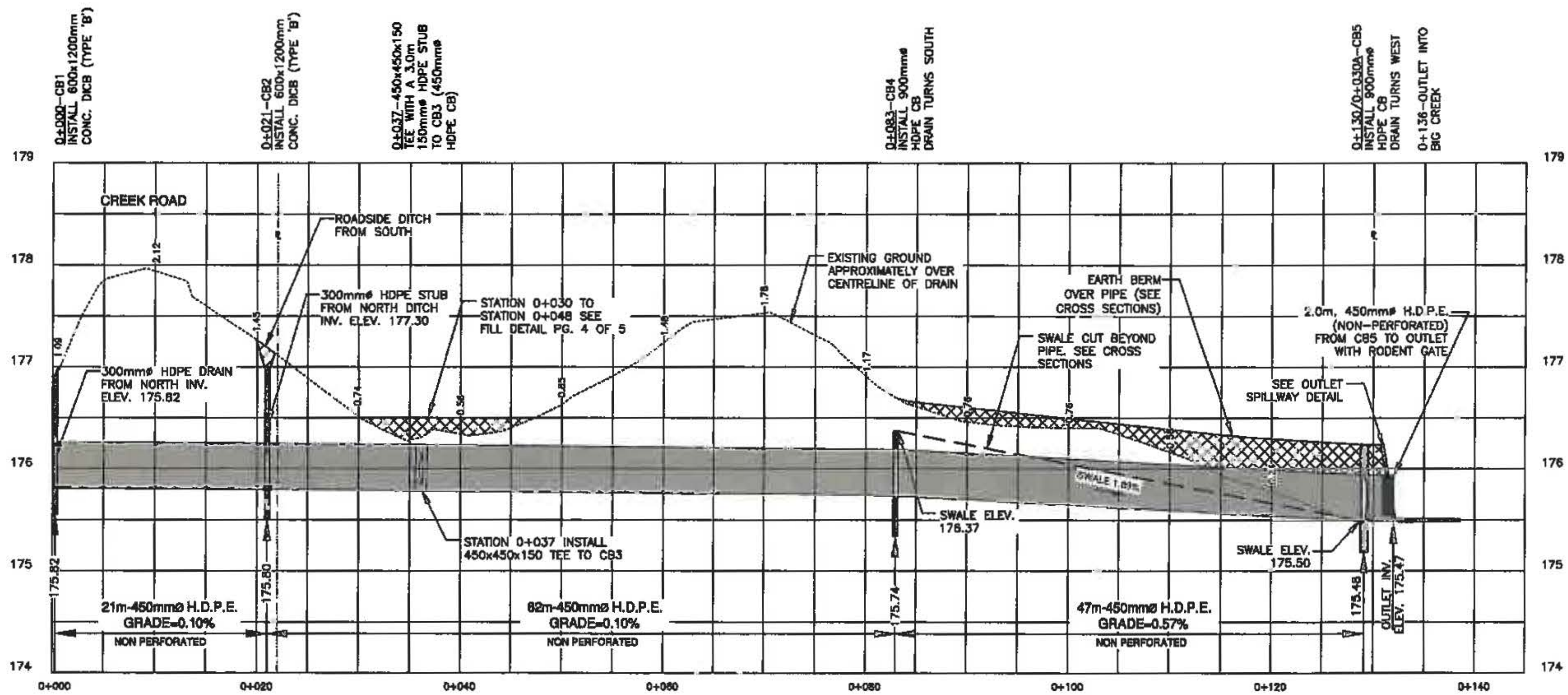
Drainage Report for the
DICECCO DRAIN NO. 1 & BRANCH NO. 1
Town of Amherstburg

SHEET TITLE: CATCH BASIN DETAILS AND DICECCO DRAIN NO. 1 PROFILE 1

PAGE NO. 3 of 6


0+000-CB1
INSTALL 600x1200mm
CONC. DICB (TYPE 'B')
0+021-CB2
INSTALL 600x1200mm
CONC. DICB (TYPE 'B')
0+037-450x450x150
TEE WITH A 3.0m
150mmø HDPE STUB
TO CB3 (450mmø
HDPE CB)
0+083-CB4
INSTALL 900mmø
HDPE CB
DRAIN TURNS SOUTH
0+130/0+030A-CB5
INSTALL 900mmø
HDPE CB
DRAIN TURNS WEST
0+136-OUTLET INTO
BIG CREEK
CREEK ROAD
ROADSIDE DITCH
FROM SOUTH
300mmø HDPE STUB
FROM NORTH DITCH
INV. ELEV. 177.30
STATION 0+030 TO
STATION 0+048 SEE
FILL DETAIL PG. 4 OF 5
EXISTING GROUND
APPROXIMATELY OVER
CENTRELINE OF DRAIN
EARTH BERM
OVER PIPE (SEE
CROSS SECTIONS)
SWALE CUT BEYOND
PIPE. SEE CROSS
SECTIONS
2.0m, 450mmø H.D.P.E.
(NON-PERFORATED)
FROM CB5 TO OUTLET
WITH RODENT GATE
SEE OUTLET
SPILLWAY DETAIL
300mmø HDPE DRAIN
FROM NORTH INV.
ELEV. 175.82
STATION 0+037 INSTALL
450x450x150 TEE TO CB3
SWALE ELEV.
176.37
SWALE ELEV.
175.50
OUTLET INV.
ELEV. 175.47
21m-450mmø H.D.P.E.
GRADE=0.10%
NON PERFORATED
62m-450mmø H.D.P.E.
GRADE=0.10%
NON PERFORATED
47m-450mmø H.D.P.E.
GRADE=0.57%
NON PERFORATED
175.82
175.80
175.74
175.48
174
175
176
177
178
179
0+000
0+020
0+040
0+060
0+080
0+100
0+120
0+140

DICECCO DRAIN NO. 1 PROFILE 2

SCALE: HORIZ.=1:4000
VERT.=1:400

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27-APR-16
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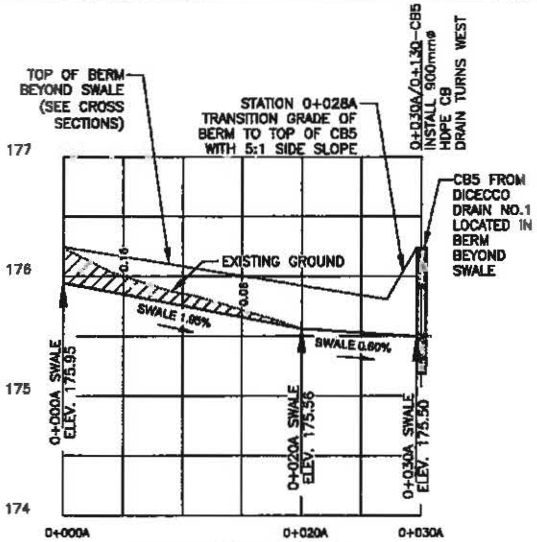
Drainage Report for the
DICECCO DRAIN NO. 1 & BRANCH NO. 1
Town of Amhersburg

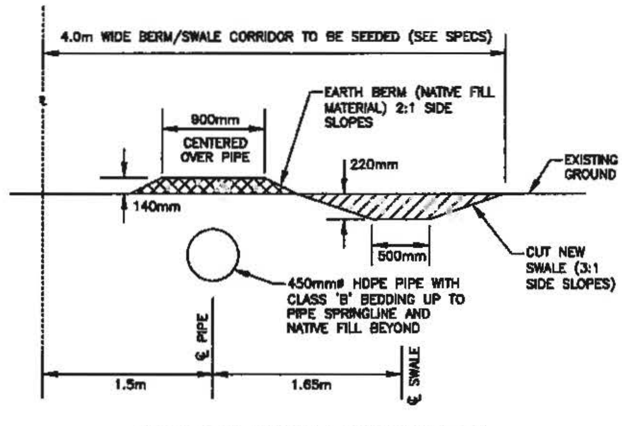
SHEET TITLE: DICECCO DRAIN NO. 1 PROFILE 2

PAGE NO. 4 of 6


TOP OF BERM BEYOND SWALE (SEE CROSS SECTIONS)
STATION 0+028A TRANSITION GRADE OF BERM TO TOP OF CB5 WITH 5:1 SIDE SLOPE
0+030A/0+130-CB5 INSTALL 900mmø HDPE CB DRAIN TURNS WEST
CB5 FROM DICECCO DRAIN NO.1 LOCATED IN BERM BEYOND SWALE
EXISTING GROUND
SWALE 1.95%
SWALE 0.60%
177
176
175
174
0+000A SWALE ELEV. 175.95
0+020A SWALE ELEV. 175.56
0+030A SWALE ELEV. 175.50
0+000A
0+020A
0+030A

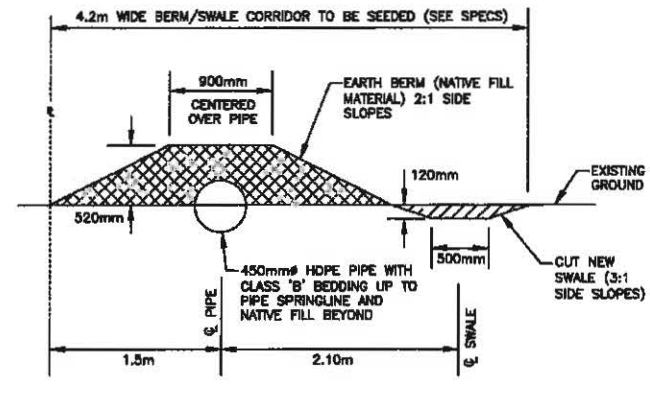
BRANCH NO. 1 PROFILE

SCALE: HORIZ.=1:4000
VERT.=1:400


4.0m WIDE BERM/SWALE CORRIDOR TO BE SEEDED (SEE SPECS)
900mm
CENTERED OVER PIPE
EARTH BERM (NATIVE FILL MATERIAL) 2:1 SIDE SLOPES
220mm
EXISTING GROUND
140mm
500mm
CUT NEW SWALE (3:1 SIDE SLOPES)
450mmø HDPE PIPE WITH CLASS 'B' BEDDING UP TO PIPE SPRINGLINE AND NATIVE FILL BEYOND
℄ PIPE
℄ SWALE
1.5m
1.65m

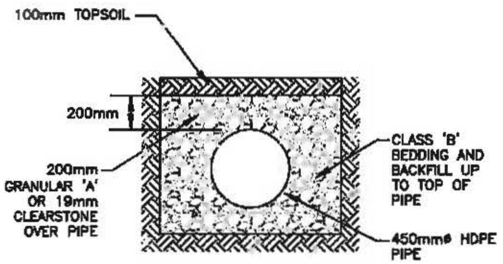
DICECCO DRAIN NO. 1 CROSS SECTION STATION 0+090

NOT TO SCALE


4.2m WIDE BERM/SWALE CORRIDOR TO BE SEEDED (SEE SPECS)
900mm
CENTERED OVER PIPE
EARTH BERM (NATIVE FILL MATERIAL) 2:1 SIDE SLOPES
120mm
EXISTING GROUND
520mm
500mm
CUT NEW SWALE (3:1 SIDE SLOPES)
450mmø HDPE PIPE WITH CLASS 'B' BEDDING UP TO PIPE SPRINGLINE AND NATIVE FILL BEYOND
℄ PIPE
℄ SWALE
1.5m
2.10m

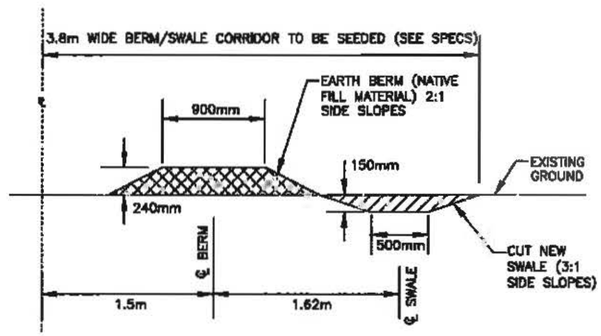
DICECCO DRAIN NO. 1 CROSS SECTION STATION 0+120

NOT TO SCALE



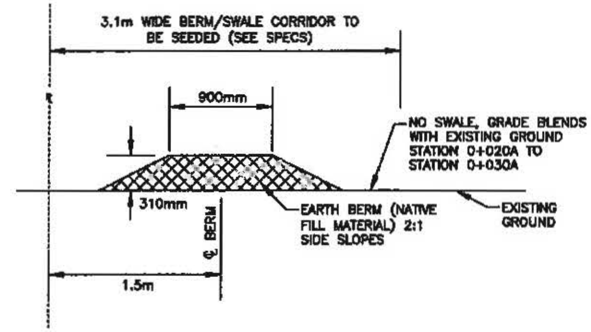
DICECCO DRAIN NO. 1 FILL DETAIL STATION 0+030 TO STATION 0+048

NOT TO SCALE



BRANCH NO. 1 CROSS SECTION STATION 0+005A

NOT TO SCALE



BRANCH NO. 1 CROSS SECTION STATION 0+025A

NOT TO SCALE

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27-APR-16
PROVINCE OF ONTARIO

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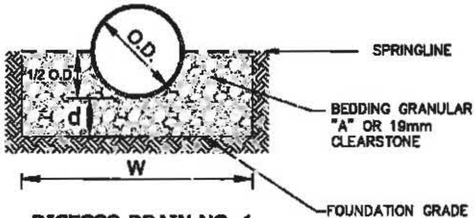
SHEET TITLE: BRANCH NO. 1 PROFILE & CROSS SECTIONS

PAGE NO. 5 of 6

NOMINAL PIPE INSIDE DIAMETER D (mm)	MINIMUM TRENCH WIDTH W (mm)	MINIMUM BEDDING BELOW d (mm) (SEE NOTE 2)
FLEXIBLE PIPE		
under 1200	O.D. + 600	150

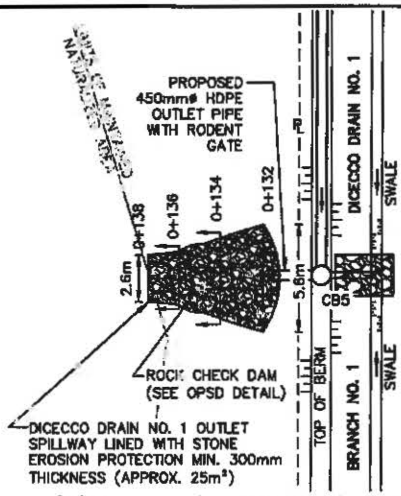


DICECCO DRAIN NO. 1 CLASS 'B' BEDDING DETAIL

SCALE: N.T.S.

BEDDING NOTES

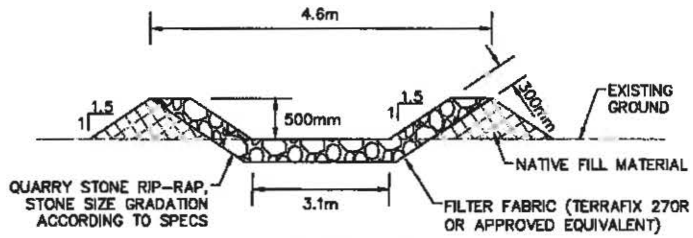
1. O.D. = OUTSIDE DIAMETER OF PIPE
2. IN ROCK TRENCHES, BEDDING DEPTH (d) BELOW PIPES SHALL BE INCREASED TO 300mm
3. BACKFILL MATERIALS ABOVE PIPE SPRINGLINE TO BE NATIVE FILL UNLESS SPECIFIED OTHERWISE
4. GRANULAR "A" BEDDING SHALL NOT CONTAIN RECYCLED ASPHALT
5. ALL BEDDING MATERIAL MUST BE COMPACTED TO 98% STANDARD PROCTOR DENSITY



PROPOSED 450mmø HDPE OUTLET PIPE WITH RODENT GATE
0+138
0+136
0+134
0+132
2.6m
5.6m
CB5
DICECCO DRAIN NO. 1
SWALE
TOP OF BERM
BRANCH NO. 1
SWALE
ROCK CHECK DAM (SEE OPSD DETAIL)
DICECCO DRAIN NO. 1 OUTLET SPILLWAY LINED WITH STONE EROSION PROTECTION MIN. 300mm THICKNESS (APPROX. 25m²)

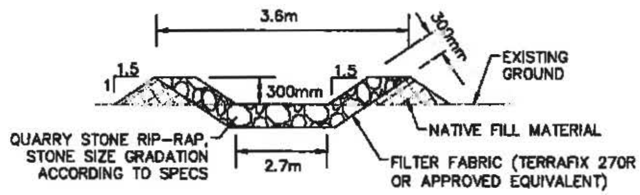
DICECCO DRAIN NO. 1 SPILLWAY OUTLET DETAIL

NOT TO SCALE



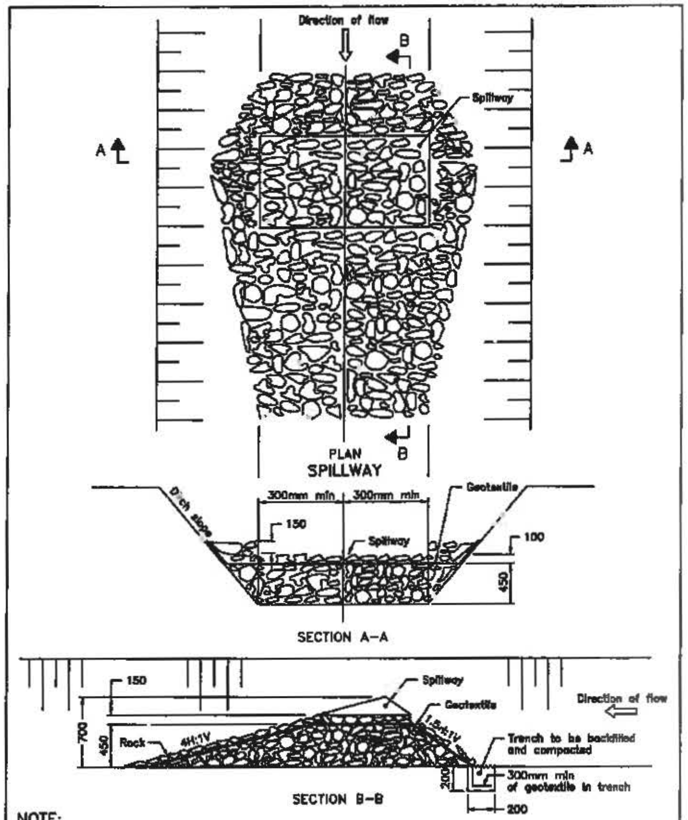
SPILLWAY SECTION STATION 0+134

NOT TO SCALE



SPILLWAY SECTION STATION 0+136

NOT TO SCALE



Direction of flow
B
A
Spillway
PLAN
SPILLWAY
300mm min
300mm min
Geotextile
150
100
450
SECTION A–A
Spillway
Geotextile
Direction of flow
700
450
Rock
4H:1V
Trench to be backfilled and compacted
300mm min of geotextile in trench
200
SECTION B–B

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

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006 Rev 1
ROCK FLOW CHECK DAM FLAT BOTTOM DITCH	OPSD 219.211

LICENSED PROFESSIONAL ENGINEER
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100139162
27–APR–16
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SHEET TITLE: DETAILS

PAGE NO. 6 of 6