THE CORPORATION OF THE TOWN OF LASALLE
MEETING TO CONSIDER

AGENDA

Tuesday, June 26, 2018, 5:00 PM

Council Chambers, LaSalle Civic Centre, 5950 Malden Road

Pages

A. OPENING BUSINESS

1. Call to Order

2. Disclosures of Pecuniary Interest and the General Nature Thereof

3. Introduction and Purpose of Meeting

   The purpose of the meeting is to give consideration to the Drainage Report prepared by Dillon Consulting Ltd.,dated June 6, 2018, for the repair and improvement of the Burke Drain and Howard Avenue Drain, and to hear from any affected land owners.

B. DELEGATIONS

C. COMMUNICATIONS FOR INFORMATION

1. TOWN OF LASALLE NOTICE OF CONSIDERATION 3

   Clerks Note: *The Notice of Consideration is for background information purposes only and a motion is not required.*

D. REPORTS

1. HOWARD AVENUE DRAIN - CONSIDER ENGINEER'S DRAINAGE REPORT 4

RECOMMENDATION
That the report of the Manager of Engineering dated June 20, 2018 (PW-25-18) regarding the Drainage Report and specifications for the Howard Avenue Drain as prepared by Dillon Consulting and N.J. Peralta Engineering, dated June 6, 2018 (Drainage Report) BE RECEIVED and that the first and second readings of the corresponding provisional by-law BE ADOPTED and further that notice BE GIVEN to all affected landowners of the Court of Revision to be held Tuesday, August 14, 2018 at 5:00 p.m. in accordance with Section 46(1) of the Drainage Act subject to adoption of the provisional by-law.

2. BURKE DRAIN - CONSIDER ENGINEER'S DRAINAGE REPORT 78

RECOMMENDATION
That the report of the Manager of Engineering dated June 20, 2018 (PW-26-18) regarding the Drainage Report and specifications for the Burke Drain as prepared by Dillon Consulting and N.J. Peralta Engineering, dated June 6, 2018 (Drainage Report) BE RECEIVED and that the first and second readings of the corresponding provisional by-law BE ADOPTED and further that notice BE GIVEN to all affected landowners of the Court of Revision to be held Tuesday, August 14, 2018 at 5:00 p.m. in accordance with Section 46(1) of the Drainage Act subject to adoption of the provisional by-law.

E. BY-LAWS 173

RECOMMENDATION
That the following Bylaws BE GIVEN first reading:

8183 - A Bylaw to provide for the repair and improvements of the Burke Drain

8184 - A Bylaw to provide for the repair and improvements of the Howard Avenue Drain

RECOMMENDATION
That Bylaw numbers 8183 and 8184 BE GIVEN second reading.

F. ADJOURNMENT

Corporation of the Town of LaSalle

5950 Malden Road, LaSalle, Ontario, N9H 1S4
Phone: 519-969-7770 Fax: 519-969-0070 www.town.lasalle.on.ca

Public Works Department

NOTICE OF CONSIDERATION

PLEASE TAKE NOTICE that on June 8, 2018, Tim Oliver, P.Eng., of Dillon Consulting Ltd. Filed with the Clerk's Office the Drainage Report (Report) dated June 6, 2018 for the repair and improvement of the **Burke Drain and the Howard Avenue Drain.**

A copy of the Report is attached hereto, including plans, Profiles, Assessment Schedules and on-site meeting minutes.

The Council of the Town of LaSalle will consider the Report at the following date, time and place.

Date: Tuesday, June 26, 2015
Time: 5:00 pm – 6:00 pm
Place: Town of LaSalle, Civic Centre, Council Chambers
5950 Malden Road
LaSalle, Ontario

As a landowner affected by these drainage works, your attendance is encouraged and requested at the meeting.

Persons wishing to make comment at the meeting are asked to contact the Town of LaSalle, Deputy Clerk, Linda Jean at 519-96-7770 [ex 1256].

For questions please contact Jonathan Osborne, Manager of Engineering at 519-969-7770 [ex 1255].

Linda Jean
Deputy Clerk

This document is available in alternate formats upon request.

The Corporation of the Town of LaSalle

Date	June 20, 2018	**Report No:**	PW-25-18
Directed To:	Mayor and Members of Council	**Attachments:**	Howard Ave Drainage Report
Department:	Public Works	**Policy References:**	
Prepared By:	Jonathan Osborne, P.Eng. – Manager of Engineering		
Subject:	Howard Avenue Drain – Consider Engineer's Drainage Report		

RECOMMENDATION:

It is recommended that:

1. The Drainage Report and specifications for the Howard Avenue Drain (Drain) as prepared by Dillon Consulting and N.J. Peralta Engineering, dated June 6, 2018 (Drainage Report) be received; and that

2. Consideration be given to first and second readings of a provisional by-law to adopt the Drainage Report; and further that

3. The Clerk give notice to all affected landowners of the Court of Revision to be held Tuesday, August 14, 2018 at 5:00 p.m. in accordance with Section 46(1) of the Drainage Act subject to adoption of the provisional by-law.

REPORT:

Pursuant to Section 4 of the Drainage Act, Dillon Consulting and N.J. Peralta Engineering have prepared a drainage report for the Howard Avenue Drain. This report is to be presented to Council at the Meeting to Consider June 26, 2018.

Respectfully Submitted

Jonathan Osborne, P.Eng.
Manager of Engineering

Reviewed by:							
CAO	Treasury	Clerks	Public Works	Planning	Cult. & Rec.	Building	Fire

DRAINAGE REPORT
FOR THE

HOWARD AVENUE DRAIN

TOWN OF LASALLE
COUNTY OF ESSEX

DILLON CONSULTING

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers

6 JUNE 2018
FILE NO. 12-6578-1200

DILLON CONSULTING

TABLE OF CONTENTS

PREAMBLE.....PAGE 2 - 3

PART A – TECHNICAL CONSIDERATIONS.....PAGE 4 - 26
DILLON CONSULTING LIMITED

PART B – ASSESSMENT CONSIDERATIONS.....PAGE 1 – 26
N.J. PERALTA ENGINEERING LTD.

CONSTRUCTION SCHEDULE OF ASSESSMENT.....PAGE 1 - 2

APPENDIX "A"..... PAGE 1 - 4
MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE HOWARD AVENUE DRAIN

APPENDIX "B".....PAGE 1
MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE ACCESS BRIDGE PORTION OF ENCLOSURE STA. 0+428.0 TO STA. 0+458.0

PREAMBLE

Instructions

On February 17, 2012 the Ministry of Transportation Ontario (MTO) filed a petition with the Town of LaSalle, in accordance with Section 4 of the Drainage Act. The purpose of the petition was for an engineer to be appointed by Council to examine and report on the municipal drains that provide a drainage outlet for the Rt. Hon. Herb Gray Parkway (formerly known as the Windsor Essex Parkway).

A subsequent letter from the MTO was submitted on January 11, 2013 requesting the original appointment be in accordance with Section 78 of the Drainage Act and further defined eight (8) downstream Municipal Drains that are to be reported on as follows:

3rd Concession Drain
Howard Avenue Drain
Burke Drain
Cahill Drain
Lennon Drain
Grand Marais Drain
Basin Drain
West Branch of the Cahill Drain (only if required based on analysis of Cahill Drain)

The West Branch of the Cahill Drain is interconnected to the Cahill Drain and provides an outlet for spillover flows from the Cahill Drain. A report on the West Branch of the Cahill Drain is provisional only and is dependent on our findings from the hydraulic analysis performed on the Cahill Drain. If we determine the spillover is such as to potentially cause an impact on the West Branch of the Cahill Drain, a report on the said drain will be prepared. If there is determined to be no impact, then a report on the West Branch of the Cahill Drain will not be required.

Howard Avenue Drain (Municipal Drain Status)

No previous bylaw or engineer's report for the Howard Avenue Drain was found on file with the Town of LaSalle. Following an extensive search we were unsuccessful to find any evidence that would substantiate the legal status of the Howard Avenue Drain. Upon further discussion with the MTO and the Town of LaSalle, it was decided that the existing Section 78 appointment for the Howard Avenue Drain be replaced with a petition for a new municipal drainage works in accordance with Section 4(1)(c) of the Drainage Act, as part of the process in establishing a legal outlet for MTO lands. The original petition from February 2012 had been previously withdrawn in January 2013 and subsequently, the MTO filed a new petition on May 3, 2016.

Joint Appointment of Engineer

On January 22, 2013, Council for the Town of LaSalle reconfirmed a joint appointment of Dillon Consulting Limited (Dillon) and Stantec Consulting Ltd. (Stantec), each having distinct roles, as outlined below, for the preparation of all necessary drainage reports in accordance with Section 78 of the Drainage Act, for all drains serving as an outlet for the Rt. Hon. Herb Gray Parkway. Subsequently, there was a change made by Council for the Town of LaSalle to appoint N.J. Peralta Engineering Ltd (Peralta) to assume the responsibilities of Stantec Consulting Ltd.

To address the new petition specific to the Howard Avenue Drain, the Town of LaSalle reappointed Dillon and Peralta on May 10, 2016 to prepare a Section 4 report.

Engineer's Role (Dillon Consulting Limited)

Dillon's responsibilities are limited to on-site meetings, survey work, hydraulic analysis and design, detailed watershed determination, and to report thereon the recommended improvements necessary to each of the above mentioned municipal drains outlined herein. These reports shall contain all plans, profiles and details accompanying the recommended drainage works, together with an estimate of costs, determination of any land allowances and the provision of specifications associated with the work.

The content, as noted above, is contained within this report under **PART A – TECHNICAL CONSIDERATIONS**.

Engineer's Role (N.J. Peralta Engineering Ltd.)

Peralta's responsibilities are limited to determination of assessments and provision of rationale for the distribution of costs against all lands, roads and public utilities affected by the improvements to the drainage works as outlined by Dillon within each of the above mentioned municipal drain reports. These assessments shall be prepared for both the construction and future maintenance of each drain and presented in the form of assessment schedules.

The content, as noted above, is contained within this report under **PART B – ASSESSMENT CONSIDERATIONS**.

File No. 12-6578-1200

Mayor and Council
Corporation of the Town of LaSalle
5950 Malden Road
LaSalle, Ontario
N9H 1S4

DILLON CONSULTING

10 Fifth Street South
Chatham, Ontario
Canada
N7M 4V4
Telephone
519.354.7802
Fax
519.354.2050

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle
County of Essex

Mayor and Council:

PART A – TECHNICAL CONSIDERATIONS

Watershed Description

The petitioned drain to be known as the Howard Avenue Drain comprises 249 metres of open drain and 272 metres of covered drain situated on the west side of Howard Avenue within the Town of LaSalle. The extents of the Howard Avenue Drain represent the portion of the west side ditch on Howard Avenue that serves as an outlet for MTO lands. Beginning at the downstream end of existing driveway access culvert to property Roll No. 290-06000 (referenced as Station 0+521) the Howard Avenue Drain continues southerly as an open drain through a covered drain portion across Laurier Parkway before continuing southerly as an open drain to its outlet into the 3rd Concession Drain. The overall watershed area is approximately 114.53 Ha (283.01 acres). The lands within the watershed are predominately urban with a mix of low density residential, commercial, institutional and agricultural use. There is little topographic relief and the soils comprising the watershed are generally poorly drained, classified as a Brookston Clay Loam soil that requires sub-surface tile drainage for agricultural lands to be productive.

Drain History

The drainage ditch on the west side of Howard Avenue has historically been maintained under the jurisdiction of the County of Essex Roads department since 1991. Prior to that, the roadway and associated drainage works were addressed by the Windsor Suburban Roads Commission. More recently in 2010, the Town of LaSalle constructed Laurier Parkway, a connecting link from Malden Road east to Howard Avenue, including a new intersection at Howard Avenue, also known as Essex County Road 9.

Sufficiency of Petition and Area Requiring Drainage

We have reviewed the petition for the new drainage works in accordance with Section 9 of the Drainage Act. The petition was received from the MTO as the acting road authority having jurisdiction over a portion of Howard Avenue they previously acquired from the County of Essex prior to the construction of the Rt. Hon. Herb Gray Parkway. Modifications were made to Howard Avenue and its existing drainage at the intersection with Laurier Parkway and South Talbot Road and extending both north and south beyond

this intersection. The northerly segment of Howard Avenue was cutoff with the construction of the Howard Avenue Diversion from the north intersecting with Laurier Parkway to the west, South Talbot Road to the east and Howard Avenue to the south. A new cul-de-sac on Howard Avenue was constructed and the east side ditch was converged with the west side ditch of the new Howard Avenue Diversion and directed to the enclosed portion of the west side ditch on Howard Avenue. The Howard Avenue Connector was constructed to connect the northerly segment of Howard Avenue with the new Howard Avenue Diversion. These modifications form an integral part of the connecting link to King's Highway No. 3 and the Rt. Hon. Herb Gray Parkway. The petition filed by the MTO was determined to be sufficient under Section 4(1) (c) of the Drainage Act.

In terms of the area requiring drainage, the lands affected are to the east and west side of Howard Avenue confined between King's Highway No. 401 to the north and South Talbot Road to the south; and also include lands that are west of the original Burke Drain watershed which depend on the west and east side ditches along the said portion of Howard Avenue for drainage outlet. Included within the area requiring drainage are also former residential lands located just south of King's Highway No. 401 (denoted as Block 'A' & Block 'B') that were acquired by the MTO for construction of the Rt. Hon. Herb Gray Parkway. These new highway lands were originally part of the Sixth Concession Drain watershed and the drainage is now redirected to the Burke Drain and the Howard Avenue Drain. The overall area affected, as described above, measures approximately 145 acres of which more than 60% of this area (approximately 88 acres) is owned by the MTO. The petition filed by the MTO would also be sufficient under Section 4(1) (b) of the Drainage Act.

On-Site Meeting

We conducted an on-site meeting on July 3, 2013 at the Macedonian Community Centre, in the Town of LaSalle. All landowners within the 3rd Concession Drain watershed were invited which included upstream drains like the Howard Avenue Drain and Burke Drain. An overview of The Parkway project was introduced to those landowners who attended this meeting. It was explained that the Town of LaSalle appointed an engineer to examine the Howard Avenue Drain and assess its condition and adequacy to provide a sufficient outlet for the lands and roads being serviced including the Rt. Hon. Herb Gray Parkway.

Furthermore, where the engineer determines that improvements are required to obtain a sufficient outlet, the recommendations will be contained within the engineer's report that will be presented to Town of LaSalle Council for their consideration and adoption thereof prior to undertaking any necessary drainage works. The MTO has agreed in principle that costs associated with the preparation of this report for the Howard Avenue Drain will be covered by the Parkway project. In accordance with the Drainage Act legislation, these costs form part of the costs of the drainage works.

All landowners were invited to submit their questions, provide comment or concerns as to their present drainage condition. The feedback was recorded and compiled for the Howard Avenue Drain. Where more information or clarification was required by the engineer, there was subsequent follow up with the landowner to better understand the issues

Survey and Findings

Our survey and examination of the Howard Avenue Drain was completed in October 2012.

The survey comprised the recording of topographic data and examining the drain for available depth and capacity necessary to provide a sufficient drainage outlet for all the lands and roads within the watershed. The Howard Avenue Drain will also provide an outlet for the Burke Drain.

In 2010, Laurier Parkway was constructed within the Town of LaSalle starting east of Malden Road and continuing westerly to Howard Avenue. Drainage modifications were made to facilitate the new intersection between Laurier Parkway and Howard Avenue. These works included the replacement of the existing 900 mm diameter CSP road culvert across Howard Avenue for which the inlet side (east side) of the said culvert has been the point of outlet for the Burke Drain leading to the west side ditch on Howard Avenue. The said culvert was replaced with a 900 mm diameter concrete pipe.

Furthermore, the Howard Avenue Drain at the confluence with the Burke Drain was enclosed with a 96 m long, 600 mm diameter concrete pipe extending upstream and north of Laurier Parkway; and further enclosed extending downstream with a 106 m long, 900 mm diameter concrete pipe south of Laurier Parkway. With this enclosure the drain was also deepened by approximately 0.50 metres. We discovered there is a significant accumulation of sediment within the upstream 600 mm diameter pipe section of the enclosure that requires cleaning.

Downstream of the enclosure, as described above, the Howard Avenue Drain is an open drain. During the Laurier Parkway construction the bottom of the drain was lined with gabion stone and a 300 mm diameter HDPE sub drain pipe was installed below the open drain to the depth of the enclosure and continued to the Howard Avenue Drain outlet into the 3rd Concession Drain. We understand that the sub drain pipe placement was opted for instead of deepening and widening the downstream portion of the Howard Avenue Drain in order to avoid to relocation of existing utilities (Hydro poles and underground Bell telephone lines) that were encountered within close proximity to the drain.

Subsequent to the Laurier Parkway construction, there were four (4) drain crossings installed on the Howard Avenue Drain downstream of the enclosed drain portion, each consisting of a 1000 mm diameter CSP culvert for the purpose of providing access to three existing hydro poles and one existing telephone service pedestal located on the west side of the drain. We understand the work was undertaken by the respective operating utilities. The timelines of this work are not exactly known, however we believe the work to have occurred after the original enclosure of the Howard Avenue Drain in 2010 and before the continuation of the enclosure in 2012 as noted below.

In July 2012 during the construction of the Rt. Hon. Herb Gray Parkway several modifications were made to the existing Howard Avenue Drain enclosure. The downstream end of the enclosure consisting of a 900 mm diameter concrete pipe was further extended with a 70 m long, 1200 mm diameter concrete pipe to facilitate the road widening of Howard Avenue south of Laurier Parkway. The upstream end of the Howard Avenue Drain enclosure consisting of a 600 mm diameter concrete pipe was opened up (Station 0+425) to permit some of the drainage area east of Howard Avenue and north of South Talbot Road to enter further upstream from its original outlet that was the Howard Avenue road culvert conveying the Burke Drain flows into the Howard Avenue Drain. Drainage flows from the east side ditch on Howard Avenue north of South Talbot Road, the west side ditch of the new Howard Avenue Diversion and the north and south ditches

of the new Howard Avenue Connector no longer use the Howard Avenue road culvert as an outlet into the Howard Avenue Drain.

From the results of our hydraulic analysis we find the capacity of the Howard Avenue Drain is limited by the existing enclosure and results in a surcharged condition when conveying the flows from a 2 year return period design storm. The surcharging results in a minor backwater condition extending upstream within the Howard Avenue Drain, Burke Drain and the interconnected road side ditches along Howard Avenue, Howard Avenue Diversion and Howard Avenue Connector. Hydrologic modelling results indicate the drainage flows and resulting backwaters will remain within the respective drains and roadside ditches without overtopping provided they are kept in good repair.

Design Considerations

The Design and Construction Guidelines for Work under the Drainage Act, 1985 as published by OMAFRA, is the current reference document used by engineers carrying out work on municipal drains under the Act. The 2 year return period design storm is the recommended design standard applied to municipal drains within rural Ontario specific to open drain channels and low hazard agricultural field access crossings. For residential, industrial and commercial properties where flooding could wash out an access culvert, a higher 5 to 10 year return period design storm is the recommended design criteria.

The 10 year return period design storm is the recommended design criteria applied to culverts on municipal drains that are crossing municipal roads such as South Talbot Road and Laurier Parkway. For county road culverts like Howard Avenue, the recommended design criteria can vary from a 10 year to 25 year return period design storm. From consultations with the County of Essex road authority we confirmed that their current criteria for culvert design across Howard Avenue is the 10 year return period design storm, which we have selected.

Private access culverts and road crossings have been sized using the Rational Method. The peak flows determined should freely pass through the culverts without experiencing any backwater effects. Hydrologic and hydraulic analyses using computer aided modeling were applied to check the downstream impacts the Burke Drain improvements may have on the receiving drains that being the Howard Avenue Drain and further downstream, the 3rd Concession Drain.

With respect to the above design considerations, the enclosed portion of the Howard Avenue Drain involves the crossing of Laurier Parkway, where a minimum 10 year return period design storm criteria would apply. From the results of our hydraulic analysis we find the capacity of the Howard Avenue Drain is limited by the existing enclosure and results in a surcharged condition when conveying the flows from a 10 year return period design storm. The surcharging results in a backwater condition extending upstream within the Howard Avenue Drain and Burke Drain where minor overtopping of the drain banks and localized flooding is possible within low lying areas.

Given that the present Howard Avenue Drain enclosure has been identified as an insufficient outlet to convey the peak flows of a 2 year return period design storm and that the existing road crossing being Laurier Parkway lacks the capacity to convey the 10 year return period design storm, improvements to the Howard Avenue Drain and Burke Drain are being recommended as such to convey the 10 year return period design storm without

overtopping the drain channel. This criteria was also applied in design of and improved capacity provided for the four (4) drain crossings on the downstream open drain portion of the Howard Avenue Drain such as to convey flows from both the Howard Avenue Drain and Burke Drain with minimal backwater condition experienced.

Recommendations

Based on our review of the history, the information obtained during the site meeting, our examination of the survey data, hydrologic and hydraulic analysis, we have recommended the following improvements to the Howard Avenue Drain:

- In lieu of replacing or twinning the Howard Avenue Drain enclosure to acquire the required additional capacity, we have recommended a relief drain be provided through a new Burke Drain outlet re-directed to the Howard Avenue Drain beyond the enclosure. The new Burke Drain outlet has been designed to provide the standard municipal drain design capacity for the Burke Drain watershed plus the additional capacity necessary to alleviate the restriction within the Howard Avenue Drain enclosure, as noted above. The details are outlined within the new drainage report for the Burke Drain.
- Re-grade the existing gabion stone lined drain channel bottom to establish an improved gradient from Station 0+010 to Station 0+186.
- For the existing 259 m long, 300 mm diameter high density polyethylene (HDPE) pipe underdrain on the lower open drain portion, we understand it was installed during the construction of Laurier Parkway so we further recommend that it be incorporated as part of the Howard Avenue Drain.
- Replace the existing four (4) 1000 mm diameter utility access culverts with larger 1350 mm diameter size culverts to convey the increased flows from the new Burke Drain outlet. The work requires the relocation of a portion of the existing 300 mm diameter HDPE underdrain.
- Cleanout of the open drain portion from the upstream end of the drain enclosure to the first access culvert, a distance of approximately 63 metres (Station 0+458 to Station 0+521). We further recommend that this open portion of drain be incorporated as part of the Howard Avenue Drain.
- Establishment of a 1 m wide grass buffer strip along the west side of the open portion of drain from Station 0+000 to Station 0+186 and from Station 0+458 to Station 0+521.
- Repair outlet end of existing road culvert (Station 0+116) that drains the Howard Avenue east side road swale and collects surface water from abutting properties.
- Flush and cleanout the 900 mm diameter concrete pipe portion of the Howard Avenue Drain enclosure (106 m long segment). We further recommend that this enclosure be incorporated as part of the Howard Avenue Drain.
- Flush and cleanout the 600 mm diameter concrete pipe portion of the Howard Avenue Drain enclosure (60 m long and 30 m long segments). We further recommend that this enclosure be incorporated as part of the Howard Avenue Drain.

The Howard Avenue Drain has been defined to be 521 metres long starting at its outlet into the 3rd Concession Drain (Station 0+000) and continuing upstream to the southerly limit of property Roll No. 290-06000 (Station 0+521). For the remaining portion of the

county road ditch along the west side of Howard Avenue that is upstream and beyond Station 0+521 extending northerly approximately 676 metres to the Sixth Concession Road, there was no drainage entering from lands petitioned by the MTO so therefore it has not been included as part of the municipal drainage works.

Allowances

In accordance with Sections 29 and 30 of the Drainage Act, we have made a determination of the amount to be paid for damages to the lands and for land taken in the improvements to the Howard Avenue Drain and the establishment of a permanent 1.0 m wide grass buffer strip on the west side of the drain from Station 0+000 to Station 0+186 and from Station 0+458 to Station 0+521, as specified herein.

In accordance with Section 31 of the Drainage Act, where an existing drain that was not constructed on requisition or petition under this Act or any predecessor of this Act is incorporated in whole or in part, the engineer shall provide an allowance for the value of the drainage works of such drain or part and include within the estimate of costs. Given the costs estimated to put the drain back into good repair with a sufficient outlet is expected to exceed the costs of the original ditch that was constructed prior to its enclosure in 2010, there was no existing drains allowance provided under Section 31. Schedule 'A' shows the distribution of these allowances for damages and for land taken in the amount totalling $2,000.00.

Cost Estimate

We estimate the costs of the Howard Avenue Drain repairs and improvements as described below:

Item	Description	Amount
	OPEN DRAIN WORK	
1.	Excavate and re-grade existing gabion stone lined drain channel bottom from Station 0+010 to Station 0+186 as per design grades shown on drawings. Salvaged gabion stone to be placed on drain banks where required.	$3,500.00
2.	Excavate and widen drain from Station 0+458 to Station 0+521, approximately 63 lineal metres and approximately 30 m^3 including trucking and disposal of excavated materials off site and hydraulic seeding of west drain bank (approx. 100 m^2)	$2,000.00
3.	Seeding of 1 metre wide grass buffer along west side of drain from Station 0+010 to Station 0+186.	$800.00
4.	Seeding of 1 metre wide grass buffer along west side of drain from Station 0+458 to Station 0+521.	$300.00
5.	Utility Access Bridge works, as follows:	

Item	Description	Amount
	a) Bridge No. 1 - Station 0+005 (Bell Pedestal Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 15 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Note: The Contractor shall arrange for telephone utility company to pick up salvaged culvert pipe.	$18,000.00
	b) Bridge No. 2 - Station 0+043 (Hydro Pole Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 25 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Supply and installation of 18 m long, 300 mm diameter HDPE pipe complete with 4-45 degree elbows for the tile relocation along the west side of the new culvert. Note: The Contractor shall arrange for hydro utility company to pick up salvaged culvert pipe.	$19,300.00

Item	Description	Amount
	c) Bridge No. 3 - Station 0+093 (Hydro Pole Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 25 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Supply and installation of 18 m long, 300 mm diameter HDPE pipe complete with 4-45 degree elbows for the tile relocation along the west side of the new culvert. Note: The Contractor shall arrange for hydro utility company to pick up salvaged culvert pipe.	$19,300.00
	d) Bridge No. 4 - Station 0+143 (Hydro Pole Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 25 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Supply and installation of 18 m long, 300 mm diameter HDPE pipe complete with 4-45 degree elbows for the tile relocation along the west side of the new culvert. Note: The Contractor shall arrange for hydro utility company to pick up salvaged culvert pipe.	$19,300.00

Item	Description	Amount
6.	Repair existing 750 mm diameter CSP road culvert outlet end on east drain bank at Station 0+116 including removal and replacement of 3 m length of existing pipe with new 3 m long, 750 mm diameter aluminized CSP (2.0 mm thickness and 68 x 13 mm corrugations) complete with coupler and stone erosion protection on east drain bank (approximately 20 m^2).	$3,000.00
7.	Flush and clean existing 106 m long, 900 mm diameter concrete pipe Station 0+256 to Station 0+362 including hydrovac work and disposal of flushed sediment off-site.	$5,000.00
8.	Flush and clean existing 60 m long, 600 mm diameter concrete pipe Station 0+362 to Station 0+422 including hydrovac work and disposal of flushed sediment off-site.	$3,000.00
9.	Flush and clean existing 30 m long, 600 mm diameter concrete pipe Station 0+428 to Station 0+458 including hydrovac work and disposal of flushed sediment off-site.	$1,500.00
	Total Construction Estimate Howard Avenue Drain	**$95,000.00**
10.	Allowances under Sections 29 and 30	$2,000.00
11.	Drain Survey, Design, Report, attend Council meetings (2) including expenses and incidentals.	$125,000.00
12.	Drain Assessment Rationale & Assessment Schedules including expenses and incidentals as per N.J. Peralta Engineering.	$24,000.00
13.	Contract administration and inspection of Howard Avenue Drain.	$8,000.00
	Total Estimate Howard Avenue Drain	**$254,000.00**

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

Assessments

The foregoing capital costs as well as future costs of maintenance have been assessed to the affected landowners, roads and other parties as shown in the appended schedules of assessment to this report **(see Part 'B' – Assessment Considerations)** as prepared by N.J. Peralta Engineering Ltd. A rationale for the assessments is also provided.

Drawings and Specifications

Attached to this report is "Schedule B", which are Specifications setting out the details of the recommended works, and "Schedule C," which represents the following drawings that are also attached to this report:

Page 1 of 9: Watershed Plan
Page 2 of 9: Property Information
Page 3 of 9: Plan 1 Sta. 0+000 to Sta. 0+186
Page 4 of 9: Plan 2 Sta. 0+186 to Sta. 0+350
Page 5 of 9: Plan 3 Sta. 0+350 to Sta. 0+521
Page 6 of 9: Profile Sta. 0+000 to Sta. 0+600
Page 7 of 9: Cross Sections
Page 8 of 9: Utility Access Bridge Details
Page 9 of 9: OPSD Details

Fisheries Issues

The Howard Avenue Drain has been classified as a "Type F" drain by the Department of Fisheries and Oceans. Type F drains have intermittent water flow and may only provide habitat for fish periodically. Standard practices to be followed to minimize disruption to fish habitat include embedment of the culvert a minimum 10% below grade, constructing the work during low water levels in the drain, maintaining a 1.0 metre wide grass buffer strip along the drain banks, providing silt fencing until permanent erosion protection is in place on drain banks and cutting only trees necessary to do the work (no clear-cutting).

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

- In order to protect local fish populations during their spawning and nursery periods no **'in-water'** work should be conducted from March 15 – June 30 (DFO/MNRF) timing window without prior authorization from DFO (Department of Fisheries and Oceans) for emergency situations. Prior to undertaking any of these works, a DFO review and authorization in accordance with Fisheries Act may be required.
- All in-stream work should be completed in **'the dry'**.
- Sediment and erosion control measures should be implemented prior to work and regularly inspected and maintained during the work phase, to prevent entry of sediment into the water.
- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt, etc.) from entering the water.
- All disturbed areas should be stabilized immediately, and upon completion of work returned to a pre-disturbed state or better as soon as conditions allow.

Grants

In accordance with the provisions of Sections 85, 86 and 87 of the Drainage Act, a grant in the amount of 33–1/3 percent of the assessment eligible for a grant may be made in respect to the assessment made under this report upon privately owned lands used for agricultural purposes. The assessments levied against privately owned agricultural land must also satisfy all other eligibility criteria set out in the Agricultural Drainage Infrastructure Program policies. Most of the privately owned lands are used for agricultural purposes and are eligible under the A.D.I.P. policies. We are not aware of any lateral drains involved in this work that would not be eligible for a grant. We recommend that application be made to the Ministry of Agriculture, Food and Rural Affairs in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

Respectfully submitted,

DILLON CONSULTING LIMITED

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

SCHEDULE 'A'

SCHEDULE OF ALLOWANCES

HOWARD AVENUE DRAIN

TOWN OF LASALLE (COUNTY OF ESSEX)

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
290-16300	6	Pt. Lots 1-3 RP12R6478 Pts. 1-6,8,9 & Pt. Pt. 7	Howard Business Centre Inc.	$600.00	$700.00	$1,300.00
290-06100	6	Pt. Lot 3 RP12R2517 Pts. 1,2&3	Trustees of the Apostolic Christian Church Nazarean	$200.00	$500.00	$700.00
TOTAL ALLOWANCES				**$800.00**	**$1,200.00**	**$2,000.00**

"SCHEDULE B"
DRAINAGE REPORT FOR THE
HOWARD AVENUE DRAIN
TOWN OF LASALLE
COUNTY OF ESSEX

SPECIAL PROVISIONS - GENERAL

1.0 GENERAL SPECIFICATIONS

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

2.0 DESCRIPTION OF WORK

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

- Excavate and re-grade existing gabion stone lined drain channel bottom from Station 0+010 to Station 0+186 as per design grades shown on drawings. Salvaged gabion stone to be placed on drain banks where required.
- Excavate and widen drain from Station 0+458 to Station 0+521, approximately 63 lineal metres and approximately 30 m^3 including trucking and disposal of excavated materials off site and hydraulic seeding of west drain bank (approx.. 100 m^2).
- Seeding of 1 metre wide grass buffer along west side of drain from Station 0+010 to Station 0+186.
- Seeding of 1 metre wide grass buffer along west side of drain from Station 0+458 to Station 0+521.
- Utility Access Bridge works, as follows:
    - Bridge No. 1 - Station 0+005 (Bell Pedestal Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 15 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Note: The Contractor shall arrange for telephone utility company to pick up salvaged culvert pipe.
    - Bridge No. 2 - Station 0+043 (Hydro Pole Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 25 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported

clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Supply and installation of 18 m long, 300 mm diameter HDPE pipe complete with 4-45 degree elbows for the tile relocation along the west side of the new culvert. Note: The Contractor shall arrange for hydro utility company to pick up salvaged culvert pipe.

- Bridge No. 3 - Station 0+093 (Hydro Pole Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 25 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Supply and installation of 18 m long, 300 mm diameter HDPE pipe complete with 4-45 degree elbows for the tile relocation along the west side of the new culvert. Note: The Contractor shall arrange for hydro utility company to pick up salvaged culvert pipe.
- Bridge No. 4 - Station 0+143 (Hydro Pole Access) – Carefully remove and salvage existing 9 m long 1000 mm diameter CSP and sloping stone end walls. Remove and dispose of excavation materials off-site that are not suitable for native backfill. Supply and install a new 10 m long, 1350 mm diameter precast concrete pipe (CSA A-257.2, Class 100-D) with one flared end inlet section. Supply and install clear stone bedding material beneath pipe, minimum 150 mm thickness (approximately 25 tonnes), Granular 'A' backfill (approximately 70 tonnes), clean native or imported clean native backfill material beyond the granular backfilled area to construct the 0.50 m wide native buffer strips (approximately 20 m^3) and sloping stone end walls (approximately 25 m^2). Supply and installation of 18 m long, 300 mm diameter HDPE pipe complete with 4 -45 degree elbows for the tile relocation along the west side of the new culvert. Note: The Contractor shall arrange for hydro utility company to pick up salvaged culvert pipe.

- Repair existing 750 mm diameter CSP road culvert outlet end on east drain bank at Station 0+116 including removal and replacement of 3 m length of existing pipe with new 3 m long, 750 mm diameter aluminized CSP (2.0 mm thickness and 68 x 13 mm corrugations) complete with coupler and stone erosion protection on east drain bank (approximately 20 m^2).
- Flush and clean existing 106 m long, 900 mm diameter concrete pipe Station 0+256 to Station 0+362 including hydrovac work and disposal of flushed sediment off-site.
- Flush and clean existing 60 m long, 600 mm diameter concrete pipe Station 0+362 to Station 0+422 including hydrovac work and disposal of flushed sediment off-site.
- Flush and clean existing 30 m long, 600 mm diameter concrete pipe Station 0+428 to Station 0+458 including hydrovac work and disposal of flushed sediment off-site.

3.0 ACCESS TO THE WORK

Access to the drain shall be from Howard Avenue (Essex County Road 9) and the working corridors. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All road areas and grass lawn areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING CORRIDOR

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

FROM STA.	TO STA.	PRIMARY (See Note 1)	SECONDARY (See Note 2)
0+000	0+186	9.0 m wide on west side of drain	Howard Avenue road allowance
0+186	0+458	Howard Avenue road allowance	N/A
0+458	0+521	9.0 m wide on west side of drain	Howard Avenue road allowance

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

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

5.0 BRUSHING

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

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

Following completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which remain standing, disposing of the branches cut off along with other brush and leaving the trees in a neat and tidy condition. Brush and trees removed from the working area are to be put into piles by the Contractor, in locations where they can be safely burned, and to be burned by the Contractor after

obtaining the necessary permits, as required. If, in the opinion of the Drainage Superintendent, any of the piles are too wet or green to be burned, he shall so advise the Contractor to haul away the unburned materials to an approved dump site. Prior to, and during the course of burning operations, the Contractor shall comply with the current guidelines prepared by the Air Quality Branch of the Ontario Ministry of Environment and shall ensure that the Environmental Protection Act is not violated. Since the trees and brush that are cut off flush with the earth surface may sprout new growth later, it is strongly recommended that the Municipality make arrangements for spraying this new growth at the appropriate time so as to kill the trees and brush.

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

6.0 EXCAVATION AND LEVELLING OF EXCAVATED MATERIALS

6.1 Excavation of Existing Drain Channel

In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades. **THE CONTRACTOR SHALL NOT EXCAVATE DEEPER THAN THE GRADELINES SHOWN ON THE DRAWINGS**. Should over-excavation of the drain bank occur, the Contractor will **not** be permitted to repair with native material packed into place by the excavator and reshaped. Should over-excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

All excavated material shall be handled as specified in Section 6.2. Materials deposited on the farmlands shall be within the working corridors, at least 1.0 m from the top of the drain bank, or as specified on the drawings. Upon allowing drying of excavated materials (if necessary) and as approved by the Drainage Superintendent, the Contractor shall level excavated materials in accordance with Section 6.2. Excavated material shall not be placed on dykes, in ditches, tiles or depressions intended to conduct water into the drain. Seeding of the disturbed drain banks shall be completed immediately following drain construction and as specified in Section 9.0.

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

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

6.2 Levelling of Excavated Materials

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

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

6.3 Trucking of Excavated Materials

Trucking of excavated materials to off-site disposal site to be arranged by Contractor.

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

7.0 STONE EROSION PROTECTION (SEP)

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

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

8.0 SEEDING OF GRASS BUFFER

All existing grassed areas disturbed by construction or as identified as new or existing grass buffers shall be seeded as specified herein. The existing ground surface to be seeded shall be loosened to a depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of. If mulching is required, it shall be carried out by the contractor as part of the item's tendered price.

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

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.

9.0 HYDRAULIC SEEDING OF DRAIN BANKS

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

Hydraulic mulch shall consist of finely ground cellulose pulp derived from recycled newsprint and shall be dyed green. Its fiber consistency shall be approximately 60% fine fiber with the balance being paper particles, 40% of which shall be a diameter of 3 mm minimum and 6 mm maximum. Hydraulic mulch shall be applied at 2,000 kg per 10,000 m². Clean water shall be applied at 42,700 liters per 10,000 m².

Seeding and mulching shall be a one step process in which the seed, fertilizer and hydraulic mulch are

applied simultaneously in a water slurry via the hydraulic seeder/mulcher. The materials shall be added to the supply tank while it is being loaded with water. The materials shall be thoroughly mixed into a homogeneous water slurry and shall be distributed uniformly over the prepared surface. The materials shall be measured by mass or by a mass-calibrated volume measurement, acceptable to the Drainage Superintendent. The hydraulic seeder/mulcher shall be equipped with mechanical agitation equipment capable of mixing the materials into a homogenous state until applied. The discharge pumps and gun nozzles shall be capable of applying the material uniformly.

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

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

10.0 ACCESS BRIDGE WORK

10.1 Location of New Culverts

The new culverts shall be installed as shown on the drawings attached hereto. The centerline of the new culvert shall be located to align itself with the existing laneway.

10.2 Removal of Existing Culverts

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

10.3 Materials for New Bridge

Materials should be as follows:

Culvert Pipe	**Bridge No. 1 - Station 0+005:** *New 10 m long, 1350 diameter CSA A-257.2 Class 100-D reinforced circular concrete pipe including a flared end inlet pipe.* **Bridge No. 2 - Station 0+043:** *New 10 m long, 1350 diameter CSA A-257.2 Class 100-D reinforced circular concrete pipe including a flared end inlet pipe.* **Bridge No. 3 - Station 0+093:** *New 10 m long, 1350 diameter CSA A-257.2 Class 100-D reinforced circular concrete pipe including a flared end inlet pipe.* **Bridge No. 4 - Station 0+143:** *New 10 m long, 1350 diameter CSA A-257.2 Class 100-D reinforced circular concrete pipe including a flared end inlet pipe.*

	Howard Avenue road culvert Station 0+116: *New 3 m long, 750 mm diameter aluminized Type II corrugated steel pipe (CSP) wall thickness of 2.0 mm and 68 mm x 13 mm corrugations. New culvert shall be joined with annular aluminized corrugated wide bolt and angle couplers (minimum of 8 corrugation overlap and 2.0 mm wall thickness) and no single pipe less than 6.0 m in length. All pipes connected with couplers shall abut to each other with no more than a 25 mm gap between pipes prior to installation of the coupler. Pre-fabricated 30 degree bend to be in accordance with the manufacturer's specification.*
Tile & Prefabricated 45° Bends	*300 mm (12") diameter smooth wall, high density polyethylene (HDPE), conforming to ASTM D3350, CSA B182.8-02 and OPSD 1840. The pipe is to provide a minimum stiffness of 320kPa.* *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 ASTMD3350, CSA B182.8-02 and OPSD 1840.*
Pipe Bedding Below Pipe	*20-25 mm clear stone conforming to OPSS Division 10.*
Backfill	*Granular 'A' conforming to OPSS Division 10.*
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.*
Buffer Strips	*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.*

10.4 Culvert Installation

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

10.5 Sloping Stone End Walls

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

10.6 Granular 'A' Driveway

The Contractor shall construct the driveway with a maximum 3% longitudinal grade approach over the new culvert providing a minimum 300 mm cover. The minimum top width of the driveway shall be as shown on the drawings.

10.7 Native Materials

Native materials suitable for use as backfill, as defined under Section 10.2, shall be salvaged from the existing bridge site, as required to complete the work as shown on the drawings, (**Native Backfill Zone only**). Where there is an insufficient amount of native fill materials for backfilling the culvert, the Contractor may elect to import additional dry native materials or alternatively use Granular 'B' at his/her own expense.

10.8 Lateral Tile Drains

Should the Contractor encounter any lateral tiles within the proposed culvert limits not shown on attached drawings, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new culvert. **Tile drain outlets through the wall of the new culvert pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense. Care must be taken in handling plastic drain pipe in cold weather to avoid causing damage. Plastic drain pipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

11.0 REINFORCED CONCRETE PIPE CULVERT

OPSS Form 410 shall apply and govern except as extended or amended herein. The size, type and class of sewer pipe shall meet CSA A257.2 standards. For reinforced concrete pipe culverts, the bedding shall be Class 'B' as per OPSD 802.03 using approved Granular 'A' materials. The bedding shall be recessed to receive the hubs of the bell and spigot ends in order to allow the barrel of the pipe to be uniformly supported on compacted Granular 'A' bedding material for its entire length.

If the culvert pipe is situated within a traveled driveway or roadway the entire width and depth of the trench shall be backfilled with Granular 'A' material and compacted to 100% standard proctor density. Where the culvert is situated beyond the limits of the driveway, the remaining excavation above the bedding shall be backfilled with select native material and mechanically compacted to 95% standard proctor density.

The Contractor shall install the pipe using rubber gasket joints and shall be joined in accordance with the manufacturer's instructions using approved gaskets and lubricating materials.

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.

HOWARD AVENUE DRAIN

PART B – ASSESSMENT CONSIDERATIONS

TOWN OF LASALLE

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division St. N., Kingsville, Ontario N9Y 1E1
Tel. (519) 733-6587

Project No. D-14-034

June 6th, 2018

Mayor and Council
Corporation of the Town of LaSalle
5950 Malden Road
LaSalle, Ontario
N9H 1S4

SUBJECT: HOWARD AVENUE DRAIN
Town of LaSalle, County of Essex
Project No. D-14-034 (Dillon File No. 12-6578-1200)

PART B – ASSESSMENT CONSIDERATIONS

I. INSTRUCTIONS

As referred to in the preamble portion of this report, it has been established that no previous By-Law or Engineer's Report for the Howard Avenue Drain was found on file with the Town of LaSalle. Following Dillon's extensive research, no evidence was found that would substantiate the legal status of the drain along the west side of County Road 9 (Howard Avenue) as the Howard Avenue Drain. Upon their further discussions with the Ministry of Transportation Ontario (M.T.O.) and the Town of LaSalle, it was decided that the construction of the Howard Avenue Drain shall be initiated by way of a petition for a new drainage works in accordance with Section 4(1)(c) of the Drainage Act. The petition shall form part of the process necessary to establish a legal outlet for M.T.O. lands including the north half of the Howard Avenue Diversion road and other M.T.O. lands to the north of same. Subsequently, the M.T.O. filed a new petition on May 3rd, 2016.

N.J. Peralta Engineering Ltd.'s role with respect to this drainage project shall be limited to the determination of assessments and provisions of rationale for the distribution of costs against all lands, roads, and public utilities affected by the improvements to the drainage works as outlined in **PART A – TECHNICAL CONSIDERATIONS** portion of this Drainage Report prepared by Dillon Consulting Limited. Our assessments are intended to be prepared for both the construction and for the future maintenance of this new Municipal Drain which shall be hereinafter known as the Howard Avenue Drain, all in the form of Assessment Schedules. Our initial confirmation of appointment for the preparation of the assessment portion of an Engineer's Report for the Howard Avenue Drain was provided to us by letter from Peter Marra, P.Eng. (LaSalle Director of Public Works), dated January 23rd, 2015, with subsequent instructions advising that the Howard Avenue Drain would be pursued by way of a petition for a new municipal drainage works in accordance with Section 4(1)(c) of the Drainage Act.

Our appointment as above described and all of the work related to the Howard Avenue Drain for our portion of this report are in accordance with Section 4(1)(c) of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended in 2010". We carried out all of the necessary examinations, investigations, and review of the Dillon Consulting Limited PART A – TECHNICAL CONSIDERATIONS portion of this report as well as their related design drawings. We also

discussed all details with Mr. Tim Oliver, P.Eng., where necessary, in order to gain a clearer understanding of the technical findings and determinations, to assist us with establishing both the Construction Assessment Rationale and the Future Maintenance Assessment Rationale relative to this drainage works.

II. INTRODUCTION

Our responsibilities with respect to this drainage project are to be limited to the determinations of assessments and the provision of the assessment rationale for the distribution of costs against all lands, roads, and public utilities affected by the proposed construction of the Howard Avenue Drain, as described within the design drawings included with the PART A - TECHNICAL CONSIDERATIONS by Dillon Consulting Limited. The assessment considerations to be provided by us shall be prepared for not only the construction works being recommended by Dillon within this report, but also for the future maintenance provision for this drainage system.

In order for us to establish our construction assessments and future maintenance assessments, we worked closely with Mr. Oliver, P.Eng., to obtain all relevant and necessary detailed technical information related to their design of this drainage works.

III. DRAINAGE HISTORY AND WATERSHED DETERMINATIONS

From a review of the Town of LaSalle infrastructure records, as well as our review of past roadway design plans and records on County Road 9 (Howard Avenue) which were obtained from the County of Essex, we offer the following historical information and detail regarding the existing drain along the west side of County Road 9 (Howard Avenue), part of which shall be turned into the Municipal Drain hereinafter to be known as the Howard Avenue Drain.

From the detailed drawings provided by the County of Essex for the "Reconstruction of Howard Avenue from 8th Concession of Sandwich West to the King's Highway No.3", dated July 25th, 1963, it was determined that the existing drain on the west side of County Road 9 (Howard Avenue) extending from the 3rd Concession Drain northerly to a point approximately 80 metres south of the 6th Concession Road was generally an open roadway ditch that drained in a southerly direction, with its outlet into the 3rd Concession Drain.

We have also determined that historically the existing County Road 9 (Howard Avenue) roadway crossing pipe and the open roadway ditch on the west side of County Road 9 (Howard Avenue) southerly of said road crossing and extending to the 3rd Concession Drain served as the outlet for not only the Burke Drain watershed but also for the majority of the lands in the area to the north and west of the Burke Drain watershed in Lot 306 S.T.R. Concession,

bounded by County Road 9 (Howard Avenue) to the west and King's Highway No.3 to the north.

Prior to the Parkway Development, the overall watershed area mentioned above consisted primarily of agricultural lands with the exception of some low density residential and commercially developed areas along King's Highway No.3 and along the east side of County Road 9 (Howard Avenue). This area had little topographic relief and the soils in the watershed are generally poorly draining and classified as Brookston Clay Loam soil that requires sub-surface drainage for the agricultural lands to be productive.

From the review of Town of LaSalle infrastructure records, it was found that in 2010, Laurier Parkway was constructed within the Town of LaSalle starting east of Malden Road and continuing easterly to County Road 9 (Howard Avenue). Drainage modifications were made at the time to facilitate the construction of a new intersection at Laurier Parkway and County Road 9 (Howard Avenue). The drainage improvements under this project included the replacement and improvement of the existing County Road 9 (Howard Avenue) road crossing and the closing-in of part of the previously mentioned open roadway ditch on the west side of County Road 9 (Howard Avenue). Said open roadway ditch was covered in as a road crossing under Laurier Parkway for a distance of approximately 106 metres to the south of the County Road 9 (Howard Avenue) roadway crossing culvert and for a distance of 96 metres north of said roadway crossing pipe. The covered drain to the north was installed to provide a transitional clear zone for the Laurier Parkway / County Road 9 (Howard Avenue) intersection. It is our understanding that all of the costs associated with these drainage improvements were paid for entirely by the Town of LaSalle.

It was also determined by Dillon Consulting that a 300mm diameter H.D.P.E. pipe was installed below the bottom of the open drain from Station 0+000.0 to Station 0+256.0 to the depth of the roadway crossing pipe under Laurier Parkway as part of the intersection improvements, which was opted for, by the Town of LaSalle, instead of deepening and widening the open drain, in order to avoid the relocation of the existing utilities (Hydro poles and underground Bell telephone lines) that were encountered within close proximity to the open drain.

Subsequent to the Laurier Parkway / County Road 9 (Howard Avenue) intersection construction, four (4) drain crossing culverts were constructed in the existing open roadway ditch downstream of the Laurier Parkway for the purposes of providing access and/or the protection of three (3) existing hydro poles and one (1) existing Bell Canada Service Pedestal, all located along the west bank of the roadway ditch. It is our understanding that the construction of these drain crossing culverts were undertaken by their respective operating utilities.

In July 2012, at approximately the same time that construction works commenced on the Rt. Hon. Herb Gray Parkway, the M.T.O.

extended the Laurier Parkway roadway crossing culvert further south for an additional distance of 70 metres in order to provide a transitional clear zone where the new Howard Avenue Diversion Road transitions into the existing County Road 9 (Howard Avenue) roadway. It is our understanding that all of the costs associated with this road crossing extension were paid for entirely by the M.T.O.

None of the above improvements to the existing open roadway ditch on the west side of County Road 9 (Howard Avenue) were conducted by way of a Drainage Report under the auspices of the Drainage Act, which generally supports the argument that the establishment and improvements of the Howard Avenue Drain, under this report must be conducted as a petition drain pursuant to Section 4(1)(c) of the Drainage Act.

IV. RT. HON. HERB GRAY PARKWAY (WINDSOR-ESSEX PARKWAY) IMPROVEMENTS

From our review and detailed discussions with Mr. Tim Oliver, P.Eng., of Dillon Consulting Limited, the M.T.O., as part of the Parkway Development, carried out significant change to the drainage patterns and the outlet location of the watershed area to the north of the Howard Avenue Diversion and east of County Road 9 (Howard Avenue). These above changes which included the construction of the Howard Avenue Diversion road, the construction of the Howard Avenue Connector Road and the disconnect of County Road 9 (Howard Avenue) to the north of the Howard Avenue Diversion road has resulted in the improvements and re-purpose of the existing covered drain on the west side of County Road 9 (Howard Avenue) located between Station 0+362.0 and Station 0+458.0.

Also, with the construction of the Howard Avenue Diversion road, the lands within the overall affected watershed area on the east side of County Road 9 (Howard Avenue), that historically drained southerly and previously outletted through the existing County Road 9 (Howard Avenue) roadway crossing, has been cut off by the new Diversion roadway west ditch and made to connect and outlet further upstream into the existing enclosure on the west side of the former County Road 9 (Howard Avenue). In order to provide the new outlet, as above mentioned, a six (6) metre portion of the existing enclosure pipe was removed to accommodate the connection at Station 0+425.0 of the proposed new Howard Avenue Drain.

By carrying out the above improvements, the diverted watershed east of County Road 9 (Howard Avenue) and north of the Howard Avenue Diversion road now utilizes the existing enclosure pipe from Station 0+362.0 to Station 0+422.0 as an outlet and said length of enclosure pipe now becomes part of the drainage infrastructure in the Howard Avenue Drain that supports the improvements carried out by the M.T.O. as part of the Parkway Development.

The M.T.O. has also, as part of the Parkway improvements, constructed a new Howard Avenue Connector Road and a cul-de-sac at the south end of the disconnected portion of County Road 9 (Howard Avenue) located just north of the Howard Avenue Diversion road. As a result of these improvements, the M.T.O. also re-aligned and re-laid the existing 30 metres of 600mm diameter enclosure pipe extending from approximately Station 0+428.0 to Station 0+458.0 in order to provide an improved and sufficient outlet for the disconnected portion of County Road 9 (Howard Avenue).

As previously mentioned herein, the M.T.O. also constructed a southerly extension to the Laurier Parkway road crossing culvert consisting of 70 metres of 1200mm diameter reinforced concrete pipe from approximately Station 0+186.0 to Station 0+256.0 for the purposes of providing a clear zone for the safe transition from the new Howard Avenue Diversion road onto the existing County Road 9 (Howard Avenue) roadway, all as part of the improvements necessary to accommodate the new Parkway Development.

V. DESIGN CONSIDERATIONS AND FINDINGS

Dillon Consulting in their PART A - TECHNICAL CONSIDERATION portion of this report has referenced the Design and Construction Guidelines for work under the Drainage Act, 1985 as published by O.M.A.F.R.A. as the current reference documentation used by engineer's carrying out work on municipal drains under the Drainage Act. They have confirmed that the design criteria to be utilized for this project are as follows:

- The two (2) year return period design storm is the recommended design standard applied to municipal drains within rural Ontario specific to open drain channels and low hazard agricultural access crossings. The exception being for residential, industrial and commercial properties where flooding could wash out an access culvert, where a higher five (5) to ten (10) year return period design storm could be the design criteria.

- The ten (10) year return period design storm is the recommended design criteria applied to culverts on municipal drains crossing municipal roads such as South Talbot Road and Laurier Parkway.

- For County and/or Provincial Highway roadway culverts like the existing County Road 9 (Howard Avenue) roadway crossing, the recommended design criteria can vary from a ten (10) year to twenty five (25) year return period design storm. From their consultation with the County of Essex and the Ministry of Transportation Road Authorities, it was confirmed that their current criteria for culvert design across Howard Avenue Diversion and County Road 9 (Howard Avenue) is a ten (10) year return design storm.

It was also established that private access culverts and road crossings, under this project, have been sized using the rational method. The peak flows determined by the rational method should freely pass through these culverts without experiencing any backwater affects. Furthermore, hydrologic and hydraulic analysis using computer aided modelling were also applied by Dillon Consulting to check the downstream impacts caused by the Howard Avenue Drain improvements and the land use changes within the overall affected upstream watershed, along with the affect they may have on the 3rd Concession Drain, which is the downstream receiving drainage outlet.

Based on Dillon's analysis of all of the existing enclosures and access bridge structures within the portion of the roadway ditch on the west side of County Road 9 (Howard Avenue) which is intended to become the Howard Avenue Drain under this report, the following determinations within said reach have been established as follows:

a) The existing Bridge No.1 at Station 0+005.0, serving as protection and as an access for the existing Bell Pedestal located on the west bank of the drain, has been found to have a sufficient capacity to handle the required pre-Parkway Development design flows for the two (2) year storm event. However, this existing bridge does not have the capacity to handle the post-Parkway Development increased design flows, and shall therefore need to be enlarged and replaced as part of the work being provided under this project.

b) The existing Bridge No.2 at Station 0+043.0, serving as protection and as access for the existing hydro pole located on the west bank of the drain, has been found to be of insufficient capacity to provide the required pre-Parkway Development design flows for the two (2) year storm, meaning that it was already undersized, prior to any Parkway improvements being carried out. Obviously, this bridge would have been required to be enlarged just to satisfy the pre-Parkway Development two (2) year storm event. Based on this finding, the existing Bridge No.2 is to be enlarged and replaced as part of the work being provided under this project. Also, due to the two (2) year storm pre-Parkway Development deficiencies of the existing culvert, it is likely that the required improvement costs for this bridge, under this report would be shared between Hydro One and the M.T.O.

c) The existing Bridge No.3 at Station 0+093.0, serving as protection and as access for the existing hydro pole located on the west bank of the drain, has been found to be of insufficient capacity to provide the required pre-Parkway Development design flows for the two (2) year storm, meaning that it was already undersized, prior to any Parkway improvements being carried out. Obviously, this bridge would have been required to be enlarged just to satisfy the pre-Parkway Development two (2) year storm event. Based on this

finding, the existing Bridge No.3 is to be enlarged and replaced as part of the work being provided under this project. Also, due to the two (2) year storm pre-Parkway Development deficiencies of the existing culvert, it is likely that the required improvement costs for this bridge, under this report would be shared between Hydro One and the M.T.O.

d) The existing Bridge No.4 at Station 0+143.0, serving as protection and as access for the existing hydro pole located on the west bank of the drain, has been found to be of insufficient capacity to provide the required pre-Parkway Development design flows for the two (2) year storm, meaning that it was already undersized, prior to any Parkway improvements being carried out. Obviously, this bridge would have been required to be enlarged just to satisfy the pre-Parkway Development two (2) year period storm event. Based on this finding, the existing Bridge No.4 is to be enlarged and replaced as part of the work being provided under this project. Also, due to the two (2) year storm pre-Parkway Development deficiencies of the existing culvert, it is likely that the required improvement costs for this bridge, under this report would be shared between Hydro One and the M.T.O.

e) The existing enclosure extension from Station 0+186.0 to Station 0+256.0, was constructed by the M.T.O. in 2012 as part of the infrastructure needed for the Parkway Development, specifically to provide a clear zone for the transitioning of the new Howard Avenue Diversion roadway to the existing County Road 9 (Howard Avenue) roadway. This portion of enclosure consists of 70 metres of 1200mm diameter reinforced concrete pipe.

It has been determined that this enclosure has a sufficient capacity to handle the required pre-Parkway Development design flows for the ten (10) year storm event; however, it does not have the capacity to handle the increased flows for the post-Parkway Development ten (10) year storm event.

This enclosure however, does not require to be improved as part of the Howard Avenue Drain report, because of the improvements being carried out to the Burke Drain consisting of diverting all of the flows from the Burke Drain through a new Burke Drain Outlet which by-passes this enclosure and outlets into the Howard Avenue Drain just downstream of same at Station 0+184.0.

f) The existing enclosure from Station 0+256.0 to Station 0+362.0, consisting of 106 metres of 900mm diameter reinforced concrete pipe, which had been constructed by the Town of LaSalle as part of the Laurier Parkway / Howard Avenue Intersection Improvement Project in 2010 was found to be considerably deficient in size to handle the required pre-Parkway Development design flows for the ten (10) year storm

event, let alone the increased flows resulting from the ten (10) year post-Parkway Development storm event.

This enclosure however does not require to be improved as part of the Howard Avenue Drain report, because of the improvements being carried out to the Burke Drain consisting of diverting all of the flows from the Burke Drain through a new Burke Drain Outlet which by-passes this enclosure and outlets into the Howard Avenue Drain just downstream of same at Station 0+184.0.

g) The existing enclosure from Station 0+362.0 to Station 0+422.0 was initially constructed as part of the Laurier Parkway / County Road 9 (Howard Avenue) Intersection Improvement Project in 2010 by the Town of LaSalle. The enclosure was generally constructed to provide a clear zone for the roadway transition of County Road 9 (Howard Avenue) into said intersection.

Due to the construction of the Howard Avenue Diversion road by the M.T.O., as part of the Parkway Improvements, approximately twenty-two (22) hectares located to the north of said Diversion road and east of County Road 9 (Howard Avenue) have been cut-off and re-routed westerly into the above mentioned existing enclosure by way of the new west ditch of the Diversion road.

Instead of enlarging the above mentioned existing Howard Avenue Drain enclosure, the M.T.O. chose to re-purpose this enclosure. This existing enclosure pipe in conjunction with the new Diversion roadway ditch, serve to attenuate peak flows and control backwater effects along the Howard Avenue Diversion road. We also suspect that for this outlet to function as intended, the existing enclosure between Station 0+362.0 and Station 0+422.0 would have been completely flushed of all sediment at the time; therefore, any flushing and cleaning to this enclosure required under this report would have resulted from subsequent sedimentation resulting from the improvement works carried out by the M.T.O.

Based on all of the above, no structural or sizing improvements are required nor proposed to be carried out to this portion of enclosure, under this report.

h) The existing enclosure from Station 0+428.0 to Station 0+458.0 was also initially constructed as part of the Laurier Parkway / County Road 9 (Howard Avenue) Intersection Improvement Project in 2010 by the Town of LaSalle. This enclosure was also generally constructed to provide a clear zone for the roadway transition of County Road 9 (Howard Avenue) into said intersection.

It was determined that in order to deal with the disconnect of County Road 9 (Howard Avenue) to the north of the new Howard Avenue Diversion road, which also included the

construction of the Howard Avenue Connector Road and the new cul-de-sac at the south end of the disconnected portion of County Road 9 (Howard Avenue), the existing thirty (30) metres of 600mm diameter reinforced concrete enclosure pipe from Station 0+428.0 to Station 0+458.0 was re-aligned and re-laid in order to provide a sufficient outlet to accommodate these changes in the watershed. All of this work including the re-aligning and re-laying of this existing enclosure pipe was carried out entirely by the M.T.O. It is also assumed that when the re-laying of this enclosure pipe was carried out that all of the pipe was thoroughly cleaned of any existing sediment; therefore, any flushing and cleaning of this enclosure required under this report would have resulted from subsequent sedimentation resulting from the improvement works carried out by the M.T.O.

Based on all of the above, no structural or sizing improvements are required nor proposed to this portion of enclosure, under this report.

VI. CONSTRUCTION ASSESSMENT RATIONALE AND CONSTRUCTION SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated with the construction of the Howard Avenue Drain, including all related incidental expenses, be charged against the lands, roads and public utilities affected in accordance with the attached **Construction Schedule of Assessment.** Lands which are used for agricultural purposes, if any, have been listed in the Construction Schedule of Assessment under Subheading "**5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable)**".

Grant Eligibility

On September 22nd, 2005, the Ontario Ministry of Agriculture, Food, and Rural Affairs (O.M.A.F.R.A.) issued Administrative Policies for the Agricultural Drainage Infrastructure Program (A.D.I.P.). This program has re-instated financial assistance for eligible costs and assessed lands pursuant to the Drainage Act. Sections 85 to 90 of the Drainage Act allow the Minister to provide grants for various activities under said Act. Sections 85 and 87 make it very clear that grants are provided at the discretion of the Minister. Based on the current A.D.I.P., "lands used for agricultural purposes" may be eligible for a grant in the amount of 1/3 of their total assessment. The new policies define "lands used for agricultural purposes" as those lands eligible for either the "Farm Property Class Tax Rate", the "Managed Forest Tax Incentive Program", or the "Conservation Land Tax Incentive Program". The Municipality has provided this information to the Engineer from the current property tax roll and the Engineer has further confirmed this information with the AG Maps Geographic Information Portal Services through O.M.A.F.R.A. Properties that meet the criteria for "lands used for agricultural purposes", if any, are shown in

the attached Construction Schedule of Assessment under the subheading **"5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable)"** and are expected to be eligible for the 1/3 grant from O.M.A.F.R.A. In accordance with same, we expect that this project will qualify for the grant normally available for agricultural lands. We would therefore, recommend that the Town of LaSalle make an application, on their behalf, for a Grant from the Ontario Ministry of Agriculture, Food, and Rural Affairs (O.M.A.F.R.A.) in the amount of 1/3 of their total grantable assessment for this project, in accordance with the provisions of Sections 85 and 88 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010". Even though it is our opinion that certain lands shall likely be eligible for grants, there is no guarantee that these lands will qualify or that grants may be available in the future.

Assessment Components

The total individual assessments, within the Construction Schedule of Assessments, are comprised of four (4) separate assessment components, including:

i) **Benefit** *defined as advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures, as it relates to Section 22 of the Drainage Act.*

ii) **Outlet Liability** *defined as part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved outlet, as it relates to Section 23 of the Drainage Act.*

iii) **Special Benefit** *defined as any additional work or feature included in the construction, repair or improvement of a drainage works that has no effect on the functioning of the drainage works, as it relates to Section 24 of the Drainage Act.*

iv) **Section 26 Special Assessment** *in addition to all other sums lawfully assessed against the property of a public utility or road authority under this Act, and despite the fact that the public utility or road authority is not otherwise assessable under the Act, the public utility or road authority shall be assessed for and shall pay all the increase of cost of such drainage works caused by the existence of the works of the public utility or road authority.*

General Rationale

From a comprehensive review of the contents of the **PART A - TECHNICAL CONSIDERATIONS** portion of this report and the design drawings related thereto prepared by Tim R. Oliver, P.Eng., of Dillon Consulting Limited, our considerable discussions with the author, and our review of all past Engineer's Reports on the Burke Drain and all other municipal drains located in the general area, we have established our construction assessment rationale and determinations relative to the improvements being carried out on the Howard Avenue Drain, and they are as follows:

a) The estimated construction cost *(Construction Item 5a)* associated with the replacement of Bridge No.1 at Station 0+005.0, which serves as an access and for the protection of the existing Bell Pedestal located on the west bank of the open drain is an amount of $18,000.00. The existing bridge was found to be sufficiently sized for the required two (2) year pre-Parkway Development storm event, and the enlargement and replacement of this existing bridge is being carried out under this report primarily to handle the increased flows in the drainage system required for the ten (10) year post-Parkway Development storm event. We would therefore recommend that the above construction amount plus all related incidental expenses be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)**, as a **Section 26 Special Assessment**.

b) The estimated construction cost *(Construction Item 5b)* associated with the replacement of Bridge No.2 at Station 0+043.0, which will serve as an access and for the protection of the existing hydro pole on the west bank of the open drain, is in the amount of $19,300.00. We have determined that the existing access bridge is currently insufficiently sized and therefore deficient to handle the required two (2) year pre-Parkway Development storm event flows. Based on this, Hydro One would be responsible for the costs associated with providing an access bridge sufficiently sized to handle the pre-Parkway Development two (2) year storm event flows and the M.T.O. would be responsible for the increased costs associated with upgrading the bridge culvert size to handle the increased flows in the drainage system to accommodate the ten (10) year post-Parkway Development storm event flows. We would therefore recommend that the above construction amount plus all related incidental expenses shall be shared by **Hydro One** and the **Ministry of Transportation Ontario (M.T.O.)**, as a **Section 26 Special Assessment**, on the share basis of **74%** and **26%**, respectively. The basis for this sharing rationale is further clarified in subsequent paragraphs on pages 15 and 16 of this report.

c) The estimated construction cost *(Construction Item 5c)* associated with the replacement of Bridge No.3 at Station 0+093.0, which serves as an access and for the protection of the existing hydro pole on the west bank of the open drain,

is in the amount of $19,300.00. We have determined that the existing access bridge is currently insufficiently sized and therefore deficient to handle the required two (2) year pre-Parkway Development storm event flows. Based on this, Hydro One would be responsible for the costs associated with providing an access bridge sufficiently sized to handle the pre-Parkway Development two (2) year storm event flows and the M.T.O. would be responsible for the increased costs associated with upgrading the bridge culvert size to handle the increased flows in the drainage system to accommodate the ten (10) year post-Parkway Development storm event flows. We would therefore recommend that the above construction amount plus all related incidental expenses shall be shared by **Hydro One** and the **Ministry of Transportation Ontario (M.T.O.)**, as a **Section 26 Special Assessment**, on the share basis of **74%** and **26%**, respectively. The basis for this sharing rationale is further clarified in subsequent paragraphs on pages 15 and 16 of this report.

d) The estimated construction cost *(Construction Item 5d)* associated with the replacement of Bridge No.4 at Station 0+143.0, which serves as an access and for the protection of the existing hydro pole on the west bank of the open drain, is in the amount of $19,300.00. We have determined that the existing access bridge is currently insufficiently sized and therefore deficient to handle the required two (2) year pre-Parkway Development storm event flows. Based on this, Hydro One would be responsible for the costs associated with providing an access bridge sufficiently sized to handle the pre-Parkway Development two (2) year storm event and the M.T.O. would be responsible for the increased costs associated with upgrading the bridge culvert size to handle the increased flows in the drainage system to accommodate the ten (10) year post-Parkway Development storm event flows. We would therefore recommend that the above construction amount plus all related incidental expenses shall be shared by **Hydro One** and the **Ministry of Transportation Ontario (M.T.O.)**, as a **Section 26 Special Assessment**, on the share basis of **74%** and **26%**, respectively. The basis for this sharing rationale is further clarified in subsequent paragraphs on pages 15 and 16 of this report.

e) The estimated construction cost *(Construction Item 6)* associated with the repair of the west end of the existing 750mm diameter corrugated steel pipe road culvert on the east bank of the Howard Avenue Drain at Station 0+116.0 complete with coupler and stone erosion protection comprises of an amount of $3,000.00. These repairs are being conducted on an existing County Road 9 (Howard Avenue) crossing pipe, and we would recommend that the above construction amount plus all related incidental expenses be assessed entirely to the **County of Essex Roads Department** as a **Section 26 Special Assessment**.

f) The estimated construction cost *(Construction Item 7)* associated with the flushing and cleaning of the existing 106 metres of 900mm diameter concrete pipe enclosure from Station 0+256.0 to Station 0+362.0, comprising of hydrovac work and disposal of flushed sediment off-site is an amount of $5,000.00. This portion of the existing enclosure is the Laurier Parkway roadway crossing pipe which is in need of flushing and cleaning. We have been made aware that this enclosure pipe was further impacted by the upstream construction works carried out by the M.T.O., where further sedimentation occurred due to ineffective sediment control implemented at the time. Based on this, we would recommend that the above construction amount plus all related incidental expenses be shared by the **Town of LaSalle Roads Department** and the **Ministry of Transportation Ontario (M.T.O.)** as an **Outlet Liability Assessment**, on the share basis of **50%** and **50%**, respectively.

g) The estimated construction cost *(Construction Item 8)* associated with the flushing and cleaning of the existing 60 metres of 600mm diameter concrete pipe enclosure from Station 0+362.0 to Station 0+422.0 comprising of hydrovac work and disposal of flushed sediment off-site, is an amount $3,000.00. Based on the fact that this enclosure is now an integral part of the drainage design to attenuate peak flows and control backwater affects in the Diversion road west ditch, in lieu of replacing the subject enclosure to a proper size, we are of the opinion that said existing enclosure should now be the sole responsibility of the M.T.O. We are also of the opinion that in order for this enclosure to function as intended to attenuate peek flows, the flushing of same would have been carried out by the M.T.O. at the same time as the construction of the Howard Avenue Diversion road. We were made aware that the current sedimentation of this enclosure occurred due to ineffective sediment control related to the M.T.O. improvements mentioned above. Based on this, we would recommend that the above construction amount plus all related incidental expenses be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)**, as an **Outlet Liability Assessment.**

h) The estimated construction cost *(Construction Item 9)* associated with the flushing and cleaning of the existing 30 metres of 600mm diameter concrete pipe from Station 0+428.0 to Station 0+458.0, compromising of hydrovac work and disposal of flushed sediment off-site, is an amount of $1,500.00. The M.T.O. re-laid and re-aligned this existing enclosure as part of their improvements necessary to provide a sufficient outlet to accommodate the increased run-off caused by the constructed of the Howard Avenue Connector Road and the cul-de-sac newly constructed for the County Road 9 (Howard Avenue) disconnect. This existing enclosure pipe would have been cleaned of all sediment at that time which means that any sediment currently within this enclosure would have resulted due to ineffective Sediment Control along the

previously mentioned works conducted by the M.T.O. Based on this, we would therefore recommend that the above construction amount plus all related incidental expenses be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)** as an **Outlet Liability Assessment.**

i) The balance of the costs *(Construction Items 1, 2, 3 and 4, and allowance per Incidental Item 10)* associated with the open drain works from Station 0+010.0 to Station 0+186.0 and from Station 0+458.0 to Station 0+521.0 comprises of an amount of $8,600.00. This work being carried out along the open portions of the Howard Avenue Drain is being carried out primarily for the purpose of providing a sufficient outlet to satisfy the ten (10) year post-Parkway Development storm event flows and the general requirements of the M.T.O. Petition. We therefore recommend that the above amount including construction and allowances under Sections 29 and 30 of the Drainage Act, plus all related incidental expenses, be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)** as an **Outlet Liability Assessment.**

j) The engineering costs on the Howard Avenue Drain consisting of Incidental Items 11, 12 and 13 within the project Cost Estimates total an amount of $157,000.00.

Due to the fact that the Burke Branch and Burke Drain Outlet works diverts all of the Burke Drain watershed area (which also includes all of the lands to the east of the Howard Avenue Diversion road, and all of the outflows from the Parkway S.W.M. Pond) so that it enters the Howard Avenue Drain downstream of the existing enclosures between Station 0+186.0 and Station 0+362.0, said enclosures did not require any improvements under the Howard Avenue Drain project. Because of this Burke Drain Diversion, the construction costs associated with the proposed improvements to the Howard Avenue Drain have been greatly diminished, leaving all of the considerable engineering costs to be unfairly distributed onto the remaining construction items within the Howard Avenue Drain report.

It is our opinion that the engineering costs on the Howard Avenue Drain consisting of Incidental Items 11, 12 and 13 should be shared on the basis of the total estimated construction costs for the Howard Avenue Drain including the hypothetical estimated construction costs for the improvements that would have been necessary for the Station 0+186.0 to Station 0+256.0 enclosure and the Station 0+256.0 to Station 0+362.0 enclosures, if the Burke Branch and Burke Drain Outlet diversion was not provided. Dillon's estimated construction costs for the hypothetical enclosure improvements would have been $121,000.00 and $201,400.00, respectively.

With the hypothetical enclosure improvement estimated costs included in the total estimated construction cost for the

Howard Avenue Drain, we determined that approximately **77.24%** of the estimated engineering costs in Incidental Items 11, 12 and 13 would be assessed against the enclosures and the remaining **22.76%** would be assessed against all of the other Construction Items in the report.

Based on this, **$121,267.00** of the **$157,000.00** of the engineering costs in Incidental Items 11, 12 and 13 should be assessed to the parties responsible for these two (2) enclosures which would be the **Ministry of Transportation Ontario (M.T.O.)** and the **Town of LaSalle Roads Department**, as a **Section 26 Special Assessment**, on a share basis of **67%** and **33%**, respectively. The sharing rationale used here is the same percentages used for the Burke Branch and the Burke Drain Outlet.

In order to provide some clarification with respect to the Section 26 Special Assessments established above for the improvements to Bridge No.1, Bridge No.2, Bridge No.3 and Bridge No.4, we offer the following:

- Based on Dillon Consulting's hydraulic modelling it was determined that the existing Bridge No.1 culvert was sufficiently sized to handle the two (2) year pre-Parkway Development storm event flows, and that the replacement of this access bridge is primarily required in order for it to handle the increased flows in the Howard Avenue Drain required for the ten (10) year post-Parkway Development design storm event flows. Based on this, the entire cost associated with the improvements to Bridge No.1 shall be the sole responsibility of the M.T.O. and all of the costs associated with this bridge improvement shall be assessed entirely to them as a Section 26 Special Assessment.

- Based on Dillon Consulting's hydraulic modelling it was determined that Bridge No.2, Bridge No.3 and Bridge No.4 are not sufficiently sized to handle the required two (2) year pre-Parkway Development storm event flows and are all therefore currently deficient. These three (3) bridges serve both as an access and for the protection of the existing hydro poles located on the west bank of the Howard Avenue Drain. Based on this, Hydro One will have the responsibility to improve each of these bridges so that they provide a sufficient outlet for the two (2) year pre-Parkway Development storm event flows, and any additional pipe upgrading required in order to satisfy the increased flows in the drainage system for the ten (10) year post-Parkway development storm event flows would be the responsibility of the M.T.O. Therefore, the costs for the improvements being carried out under this report, for each of Bridge No.2, Bridge No.3 and Bridge No.4 shall be shared between Hydro One and the M.T.O.

- Based on the above rationale and the detailed construction estimates provided by Dillon Consulting, we have determined

that the estimated construction cost for the improvement to each of Bridge No.2, Bridge No.3 and Bridge No.4 is an amount of $19,300.00. From our investigations, we have determined that the estimated construction costs to upgrade each of the existing bridges to handle the two (2) year pre-Parkway Development design flows would be an amount of $14,300.00. We also determined that the estimated construction cost to further upgrade each of these bridges to handle the ten (10) year post-Parkway Development storm event flows would be an amount of $5,000.00. Based on these estimated construction costs, we find that the sharing of costs for each of Bridge No.2, Bridge No.3 and Bridge No.4 is to be assessed to Hydro One and the M.T.O. on the basis of **74%** and **26%**, respectively. These sharing percentages would therefore apply to each of these bridges and would be assessed within the Construction Schedule of Assessment to both of the above, as a Section 26 Special Assessment.

Section 26 Special Assessments

The Section 26 Special Assessments outlined below summarize the assessments listed under Section 6 of the Construction Schedule of Assessment, based on the Assessment Rational determined in the preceding paragraphs:

A. We determined that a Special Assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.)** for the extra costs to the project related to the replacement and improvement of Bridge No.1 in accordance with Section 26 of the Drainage Act. This extra cost to the project consist of all works associated with *Construction Item 5a* within this report. The estimated net increase in cost to the project caused by the replacement of Bridge No.1, together with all related incidental expenses is **$24,772.00**.

The above estimated Special Assessment to the Ministry of Transportation Ontario (M.T.O) for the removal and replacement of Bridge No.1 in the Howard Avenue Drain, pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above net cost consists of an amount of **$6,772.00**.

Once the construction of this work is completed, the M.T.O. shall be assessed for the **actual construction costs** for Construction Item 5a, together with its share of the project incidental costs associated with same, in the amount of **$6,772.00**. This amount represents the actual Section 26 Special Assessment amount to be assessed to the M.T.O. for this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners, roads, and utilities. This non-proratable assessment does not include for any potential costs for any

unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated towards dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Outlet assessments, all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

B. We determined that a Special Assessment is to be assessed to **Hydro One** and the **Ministry of Transportation Ontario (M.T.O.)** to be shared by them on the basis of **74%** and **26%** respectively, for the increase of cost to the project related to the replacement and improvement of Bridge No.2 in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of all works associated with *Construction Item 5b* within this report. The estimated net increase in cost to the project caused by the above special improvements, together with all related incidental expenses is **$26,560.00**, with the Special Assessment to Hydro One being **$19,654.00** and the Special Assessment to the M.T.O. being an amount of **$6,906.00**.

The above estimated Special Assessment to Hydro One and the M.T.O. pursuant to Section 26 of the Drainage Act are listed separately under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above is **$7,260.00** with the assessment to Hydro One consisting of an amount of **$5,372.00** and the incidental costs portion associated with the above assessment to the M.T.O. consists of an amount of **$1,888.00**.

Once the construction of this work is completed, Hydro One and the M.T.O. shall be assessed for the **actual construction costs** for Construction Item 5b on the basis of 74% and 26% respectively together with their share of the project incidental costs associated with same, in the amount of **$5,372.00** to Hydro One and **$1,888.00** to the M.T.O. These amounts represent the actual Section 26 Special Assessment amounts to be assessed to said parties for this work and these actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Outlet assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

C. We determined that a Special Assessment is to be assessed to **Hydro One** and the **Ministry of Transportation Ontario (M.T.O.)**

to be shared by them on the basis of **74%** and **26%** respectively, for the increase of cost to the project related to the replacement and improvement of Bridge No.3 in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of all works associated with *Construction Item 5c* within this report. The estimated net increase in cost to the project caused by the above special improvements, together with all related incidental expenses is **$26,560.00**, with the Special Assessment to the Hydro One being **$19,654.00** and the Special Assessment to the M.T.O. being an amount of **$6,906.00**.

The above estimated Special Assessment to Hydro One and the Ministry of Transportation Ontario (M.T.O), pursuant to Section 26 of the Drainage Act are listed separately under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above is **$7,260.00** with the assessment to Hydro One consisting of an amount of **$5,372.00** and the incidental costs portion associated with the above assessment to the M.T.O. consists of an amount of **$1,888.00**.

Once the construction of this work is completed, Hydro One and the M.T.O. shall be assessed for the **actual construction costs** for Construction Item 5c on the basis of 74% and 26% respectively together with their share of the project incidental costs associated with same, in the amount of **$5,372.00** to Hydro One and **$1,888.00** to the M.T.O. These amounts represent the actual Section 26 Special Assessment amounts to be assessed to said parties for this work and these actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Outlet assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

D. We determined that a Special Assessment is to be assessed to **Hydro One** and the **Ministry of Transportation Ontario (M.T.O.)** to be shared by them on the basis of **74%** and **26%** respectively, for the increase of cost to the project related to the replacement and improvement of Bridge No.4 in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of all works associated with *Construction Item 5d* within this report. The estimated net increase in cost to the project caused by the above special improvements, together with all related incidental expenses is **$26,560.00**, with the Special Assessment to Hydro One being

$19,654.00 and the Special Assessment to the M.T.O. being an amount of **$6,906.00**.

The above estimated Special Assessment to Hydro One and the Ministry of Transportation Ontario (M.T.O), pursuant to Section 26 of the Drainage Act are listed separately under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above is **$7,260.00** with the assessment to the Hydro One consisting of an amount of **$5,372.00** and the incidental costs portion associated with the above assessment to the M.T.O. consists of an amount of **$1,888.00**.

Once the construction of this work is completed, Hydro One and the M.T.O. shall be assessed for the **actual construction costs** for Construction Item 5d on the basis of 74% and 26% respectively together with their share of the project incidental costs associated with same, in the amount of **$5,372.00** to Hydro One and **$1,888.00** to the M.T.O. These amounts represent the actual Section 26 Special Assessment amounts to be assessed to said parties for this work and these actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Outlet assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

E. We determined that a Special Assessment is to be assessed to the **County of Essex Roads Department** for the extra costs to the project related to the repair and improvements provided to the west end of the existing 750mm diameter corrugated steel road crossing pipe under County Road 9 (Howard Avenue), entering the Howard Avenue Drain at Station 0+116.0 in accordance with Section 26 of the Drainage Act. The extra cost to the project consists of all works associated with *Construction Item 6* within this report. The estimated net increase in cost to the project caused by these improvements, together with all related incidental expenses is **$4,127.00**.

The above estimated Special Assessment to the County of Essex Roads Department for the improvements to their existing roadway crossing culvert under County Road 9 (Howard Avenue), pursuant to Section 26 of the Drainage Act is listed under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above net cost consists of an amount of **$1,127.00**.

Once the construction of this work is completed, the County of Essex Roads Department shall be assessed for the **actual construction costs** for Construction Item 6, together with its share of the project incidental costs associated with same, in the amount of **$1,127.00**. This amount represents the actual Section 26 Special Assessment amount to be assessed to the County of Essex for this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners, roads, and utilities. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated towards dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Outlet assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

F. We have determined that a Special Assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.)** and the **Town of LaSalle Roads Department** to be shared by them on the basis of **67%** and **33%** respectively, for the increase in cost to the project related to the engineering fees associated with the potential improvements to the Station 0+186.0 to Station 0+256.0 enclosure and the Station 0+256.0 to Station 0+362.0 enclosure that would have been necessary to carry out in lieu of the Burke Branch and Burke Drain Outlet diversion, all in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of 77.24% of the engineering fees associated with Incidental Items 11, 12 and 13 within the Cost Estimated provided in the report. The estimated net increase in cost to the project caused by the above Special Assessment is **$121,267.00**, with the Special Assessment to the M.T.O. being **$81,249.00** and the Special Assessment to the Town of LaSalle Roads Department being an amount of **$40,018.00**.

The above Special Assessments have been established based on the estimated engineering costs noted in Incidental Items 11, 12 and 13 of the Cost Estimates for the Howard Avenue Drain. Once the Howard Avenue Drain has been completed 77.24% of the **actual engineering costs** for Incidental Items 11, 12 and 13 shall be assessed to the above parties. This amount shall represent the actual Section 26 Special Assessment amount to be assessed to said parties on a 67% and 33% basis. These actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in

the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Outlet assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

Outlet Liability Assessments

1. We determined that an Outlet Liability Assessment is to be assessed to both the **Town of LaSalle Roads Department** and the **Ministry of Transportation Ontario (M.T.O.)**, for *Construction Item 7*, consisting of the flushing and cleaning of the existing 106 metres of 900mm diameter concrete pipe located between Station 0+256.0 and Station 0+362.0, including hydrovac work and disposal of flushed sediment off-site.

   The cost to the project for *Construction Item 7*, together with its share of all incidental expenses is **$6,880.00**. This cost is to be shared on an equal basis to both the Town of LaSalle Roads Department and the M.T.O.

2. We determined that an Outlet Liability Assessment is to be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)**, for *Construction Item 8* consisting of the flushing and cleaning of the existing 60 metres of 600mm diameter concrete pipe located between Station 0+362.0 and Station 0+422.0, including hydrovac work and disposal of flushed sediment off-site.

   The cost to the project for *Construction Item 8*, together with its share of all incidental expenses is **$4,127.00**.

3. We determined that an Outlet Liability Assessment is to be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)** for the cost to the project related to *Construction Item 9* consisting of the flushing and cleaning of the existing 30 metres of 600mm diameter concrete pipe located between Station 0+428.0 and Station 0+456.0, including hydrovac work and disposal of flushed sediment off-site.

   The net cost to the project for *Construction Item 9*, together with its share of all incidental expenses is **$2,064.00**.

4. We determined that an Outlet Liability Assessment is to be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)** for the cost to the project related to *Construction Items 1, 2, 3 and 4* for work being carried out to the Howard Avenue Drain which consists primarily of open drain works from Station 0+010.0 to Station 0+186.0 and from Station 0+458.0 to Station 0+521.0, to provide a sufficient outlet for the Parkway improvements carried out by the M.T.O.

   The cost to the project for *Construction Items 1, 2, 3 and 4*, together with its share of all incidental expenses and for all allowances provided in accordance with Sections 29 and 30 of the Drainage Act, is **$11,083.00**.

It should be noted that all of the Outlet Liability Assessments referred to above have been assessed within the Construction Schedule of Assessment attached herein.

VII. FUTURE MAINTENANCE

After the completion of all of the works associated with this engineer's report, the Howard Avenue Drain as established herein, shall be maintained in the future by the Town of LaSalle, and the future maintenance of this Municipal Drain shall be carried out on the following basis.

We would recommend that the **Howard Avenue Drain**, as established within this report, be kept up and maintained in the future at the expense of the lands, roads and utilities included within the Maintenance Schedule of Assessment attached herein and labelled **Appendix 'A'**, and same shall remain in the proportions therein contained until otherwise varied and/or determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17, as amended 2017", or subsequent amendments made thereto.

The assessment proportions as outlined in the attached Maintenance Schedule of Assessment for the Howard Avenue Drain have been established on the basis of an estimated future maintenance cost of **$15,000.00**; however, these assessment charges shall not be made until such time that maintenance works are conducted to said drain in the future. Therefore, when **$15,000.00** worth of future maintenance work is conducted to this drain, the assessment to each of the individual affected property owners and roads shall be as listed in the attached Maintenance Schedule of Assessment.

The attached Maintenance Schedule of Assessment for the Howard Avenue Drain is to be utilized only for the maintenance of all open drains and for the flushing and cleaning of all sediment material within all existing access bridges, municipal roadway crossing culverts and enclosures within the drain, as well as the 259.0 metres of 300mm diameter H.D.P.E. tile from Station 0-003.0 to Station 0+256.0. This maintenance schedule is not to be utilized in any way for the maintenance, repair works and replacement works being conducted directly to any of the access bridges, municipal roadway crossing culverts, existing enclosure structures or the above mentioned tile within the Howard Avenue Drain.

It should be noted that for the Howard Avenue Drain, a mechanism should be established herein so that the Municipality, in which the drainage works are situated, can undertake future maintenance works to the existing access bridge structures, municipal roadway crossing culvert structures, existing enclosure structures and the H.D.P.E. tile within this drain, so that the future maintenance costs associated with each of same can be properly assessed to the affected landowners and/or roads. The works for these structures,

where applicable, would include their bedding and backfill, end treatments, and any other ancillary work. Should concrete, asphalt or other special driveway surfaces over access bridge driveways and enclosure driveways require removal as part of the maintenance work these surfaces should be repaired or replaced as part of the work. Likewise, if any fencing, gate, decorative walls, guard rails or other special features exist that will be impacted by the maintenance work, they are also to be removed and restored or replaced as part of the access bridge / enclosure maintenance work. However, the cost of the supply and installation of any surface material other than Granular "A" material, and the cost of removal and restoration or replacement, if necessary, of any special features, shall be totally assessed to the benefiting adjoining owner served by said access bridge and/or enclosure. Likewise, for any access bridges with driveway top width wider than the standard 6.10 metres, the additional pipe length, granular bedding and backfill for the extended portion of the structure shall be assessed entirely to the adjacent benefitting owner.

Therefore, as a mechanism for sharing the cost for any works of future maintenance and/or replacement of the existing access bridge structures, municipal roadway crossing culvert structures, enclosure structures, and the 300mm diameter H.D.P.E. tiles within this drain, the following provisions with respect to cost sharing for each of same, shall be shared by the benefiting landowner and upstream affected lands and roads, where applicable, in accordance with the percentages shown in the following table:

TABLE SHOWING COST SHARING FOR ACCESS BRIDGE STRUCTURES, ENCLOSURE STRUCTURES, AND MUNICIPAL ROAD CROSSING STRUCTURES IN THE HOWARD AVENUE DRAIN

STRUCTURE	ROLL NUMBER	OWNERS	% TO BENEFITING OWNER	% UPSTREAM LANDS AND ROADS
1	Bell Canada access bridge (Sta. 0+005.0)	Bell Canada	100.0	0.0
2	Hydro One access bridge (Sta. 0+043.0)	Hydro One	100.0	0.0
3	Hydro One access bridge (Sta. 0+093.0)	Hydro One	100.0	0.0
4	Hydro One access bridge (Sta. 0+143.0)	Hydro One	100.0	0.0

Report - Howard Avenue Drain
Town of LaSalle - D-14-034

STRUCTURE	ROLL NUMBER	OWNERS	% TO BENEFITING OWNER	% UPSTREAM LANDS AND ROADS
5	Enclosure Structure (0+186.0 to 0+256.0)	Ministry of Transportation Ontario	100.0	0.0
6	Enclosure Structure (0+256.0 to 0+362.0)	Town of LaSalle Roads Department	100.0	0.0
7	Enclosure Structure (0+362.0 to 0+422.0)	Ministry of Transportation Ontario	100.0	0.0
8	Enclosure Structure (0+428.0 to 0+437.0 and 0+448.0 to 0+458.0)	Ministry of Transportation Ontario	63.4	
	Access Bridge Portion of Enclosure (0+437.0 to 0+448.0)	290-06200 Faith Community Church -LaSalle	28.0	8.6
-	300mm diameter Tile Main (0+000.0 to 0+256.0)	Town of LaSalle Roads Department	100.0	0.0

The 259.0 metres of 300mm diameter H.D.P.E. tile main installed below the bottom of the open drain was constructed as part of the Laurier Parkway / County Road 9 (Howard Avenue) Intersection Improvement project carried out in 2010 by the Town of LaSalle. This tile main was installed primarily to provide a sufficient outlet depth for the Laurier Parkway roadway crossing pipe also installed under this project. Based on this, the future maintenance and/or replacement responsibility for this tile main structure remains entirely with the Town of LaSalle Roads Department.

Within the Howard Avenue Drain there is only one enclosure structure with an access bridge portion, where part of the cost of maintaining same in the future is assessed to upstream lands and roads within the Howard Avenue drain watershed. This is the Enclosure Structure 8 between Station 0+428.0 and Station 0+458.0,

where access is being provided to Parcel 290-06200 owned by Faith Community Church - LaSalle.

The access bridge portion of the above enclosure is located between Station 0+437.0 and Station 0+448.0 consisting of approximately an 11.0 metre portion of the 30.0 metre total length of the enclosure. The enclosure portion represents approximately 63.4%, and the access bridge portion represents approximately 36.6% of the overall enclosure. The future maintenance costs for the enclosure portion shall be assessed entirely to the M.T.O. and the future maintenance costs for the access bridge portion of this enclosure shall be shared by the adjoining landowner for 28.0% of the costs and the upstream lands and roads within the Howard Avenue Drain for 8.6% of the costs.

Based on the sharing percentages for the above access bridge portion of enclosure, we have prepared a **Maintenance Schedule of Assessment for the Access Bridge Portion of Enclosure Station 0+428.0 to Station 0+458.0,** which is attached and labelled herein as **Appendix 'B'**. This Maintenance Schedule of Assessment has been developed on the basis of an assumed cost of **$5,000.00** and said assessment would be charged out to the affected lands and roads when **$5,000.00** worth of maintenance works are carried out in the future.

We therefore recommend, that future work of repair and/or maintenance to the above access bridge portion of the subject enclosure structure be carried out by the governing Municipality. Part of the future maintenance cost for the bridge portion of the subject enclosure structure shall be assessed as a Benefit Assessment against the property being served by the access, and the balance of the maintenance cost shall be assessed as an Outlet Assessment to the lands and roads within the Howard Avenue Drain watershed located upstream of said access bridge portion of enclosure. Any future maintenance costs related to this access bridge portion of the enclosure shall be assessed on a pro-rata basis to the assessments shown in the Appendix 'B' Schedule.

General

It should be noted that Stormwater Management Systems, by definition, have been utilized within the Howard Avenue Drain watershed. These Stormwater Management Systems capture the post-development total volume and restrict the discharge of these properties to a pre-development flow rate. As a result, these restricted flows are extended for a longer period of time in order to empty the system after the rain event. With the higher total volume and prolonged release rate of runoff entering the receiving drain, the drain remains wetter for a longer period of time and extends the time that the drain flows. Thus causing increased soil saturation and creates a higher degree of destabilization of the drain banks and erosion. As a result, these higher total volumes and restricted release rate tend to increase sedimentation in the drain.

Report - Howard Avenue Drain
Town of LaSalle - D-14-034

We consider the above to be an injuring liability to the receiving drains which will generally reduce their service life resulting in more periodic drain maintenance and therefore increased maintenance costs. Pursuant to Section 23 of the Drainage Act we have taken into account the increased volume of artificial runoff coming from the Parkway Detention Pond as well as the new Storm Water Management System existing on Parcels 290-06000 and 290-06100, owned by the Trustee of the Apostolic Christian Church Nazorean. We have factored same into the outlet assessment for the lands being served by this increased volume from the above S.W.M. Systems within our new Maintenance Schedules of Assessment for the "Howard Avenue Drain". The outlet assessment factor takes into account the additional volume that these sites now contribute to the drainage system, along with the reduction in runoff that the Stormwater Management System provides. Resulting in a blended factor that has been utilized.

All of the above provisions for the future maintenance of the Howard Avenue Drain, shall remain as aforesaid until otherwise determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17, as amended 2017", or subsequent amendments made thereto.

All of which is respectfully submitted.

N. J. PERALTA ENGINEERING LTD.

REGISTERED PROFESSIONAL ENGINEER
N.J. PERALTA
2018.06.06
PROVINCE OF ONTARIO

Nick J. Peralta, P.Eng.

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2018-06-06
PROVINCE OF ONTARIO

Antonio B. Peralta, P.Eng.

NJP/sa

Att.

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division Street North
KINGSVILLE, Ontario
N9Y 1E1

CONSTRUCTION SCHEDULE OF ASSESSMENT

HOWARD AVENUE DRAIN

TOWN OF LASALLE & TOWN OF TECUMSEH

TOWN OF TECUMSEH

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
37	Howard Aveune Diversion				4.97	2.011					
	1. Flush and clean 0+256.0 to 0+362.0 Enclosure - Const. Item 7 (50% Share)						Ministry of Transportation Ontario	$ -	$ 3,440.00	$ -	$ 3,440.00
	2. Flush and clean 0+362.0 to 0+422.0 - Const. Item 8						Ministry of Transportation Ontario	$ -	$ 4,127.00	$ -	$ 4,127.00
	3. Flush and clean 0+428.0 to 0+458.0 - Const. Item 9						Ministry of Transportation Ontario	$ -	$ 2,064.00	$ -	$ 2,064.00
	4. Improvements to Open Drain Portions - Const. Items 1, 2, 3 and 4 plus Incidental Item 10						Ministry of Transportation Ontario	$ -	$ 11,083.00	$ -	$ 11,083.00
	Total on Ontario Lands.....							**$ -**	**$ 20,714.00**	**$ -**	**$ 20,714.00**

6. SPECIAL NON PRO-RATEABLE ASSESSMENTS (non-agricultural (Sec.26)):

	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
A.	Bridge No.1 -Const. Item 5a						Ministry of Transportation Ontario	$ 24,772.00	$ -	$ -	$ 24,772.00
B.	Bridge No.2 -Const. Item 5b (Shared)						Ministry of Transportation Ontario	$ 6,906.00	$ -	$ -	$ 6,906.00
C.	Bridge No.3 -Const. Item 5c (Shared)						Ministry of Transportation Ontario	$ 6,906.00	$ -	$ -	$ 6,906.00
D.	Bridge No.4 -Const. Item 5d (Shared)						Ministry of Transportation Ontario	$ 6,906.00	$ -	$ -	$ 6,906.00
F.	Engineering Fees - Incidental Items 11, 12 and 13 (Shared)						Ministry of Transportation Ontario	$ 81,249.00	$ -	$ -	$ 81,249.00
	Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26)).....							**$ 126,739.00**	**$ -**	**$ -**	**$ 126,739.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH					4.97	2.011		**$ 126,739.00**	**$ 20,714.00**	**$ -**	**$ 147,453.00**

TOWN OF LASALLE

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
37	Laurier Parkway				0.20	0.081					
	1. Flush and clean 0+256.0 to 0+362.0 Enclosure - Const. Item 7 (50% Share)						Town of LaSalle Road Authority	$ -	$ 3,440.00	$ -	$ 3,440.00
	Total on Municipal Lands.....							**$ -**	**$ 3,440.00**	**$ -**	**$ 3,440.00**

6. SPECIAL NON PRO-RATEABLE ASSESSMENTS (non-agricultural (Sec.26)):

	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
B.	Bridge No.2 -Const. Item 5b (Shared)						Hydro One	$ 19,654.00	$ -	$ -	$ 19,654.00
C.	Bridge No.3 -Const. Item 5c (Shared)						Hydro One	$ 19,654.00	$ -	$ -	$ 19,654.00
D.	Bridge No.4 -Const. Item 5d (Shared)						Hydro One	$ 19,654.00	$ -	$ -	$ 19,654.00
E.	Repair the County Road 9 (Howard Avenue) Road Crossing Culvert at Station 0+116.0 - Const. Item 6						County of Essex Roads Department	$ 4,127.00	$ -	$ -	$ 4,127.00
F.	Engineering Fees - Incidental Items 11, 12 and 13 (Shared)						Town of LaSalle Road Authority	$ 40,018.00	$ -	$ -	$ 40,018.00
	Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26)).....							**$ 103,107.00**	**$ -**	**$ -**	**$ 103,107.00**
TOTAL ASSESSMENT -TOWN OF LASALLE					0.20	0.081		**$ 103,107.00**	**$ 3,440.00**	**$ -**	**$ 106,547.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH (brought forward)					4.97	2.011		**$ 126,739.00**	**$ 20,714.00**	**$ -**	**$ 147,453.00**
TOTAL ASSESSMENT					5.17	2.092		**$ 229,846.00**	**$ 24,154.00**	**$ -**	**$ 254,000.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018

APPENDIX "A"

MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE HOWARD AVENUE DRAIN

APPENDIX 'A'

MAINTENANCE SCHEDULE OF ASSESSMENT

FOR THE HOWARD AVENUE DRAIN

TOWN OF LASALLE & TOWN OF TECUMSEH

TOWN OF TECUMSEH

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
37	Howard Aveune Diversion			4.97	4.97	2.011	Ministry of Transportation Ontario	$ 345.00	$ 306.00	$ -	$ 651.00
	Block 'B'			16.00	16.00	6.475	Ministry of Transportation Ontario	$ -	$ 687.00	$ -	$ 687.00
	Block 'C'				5.21	2.108	Ministry of Transportation Ontario	$ -	$ 224.00	$ -	$ 224.00
48	Kings Highway No. 3				5.45	2.206	Ministry of Transportation Ontario	$ -	$ 285.00	$ -	$ 285.00
	Total on Ontario Lands.....							**$ 345.00**	**$ 1,502.00**	**$ -**	**$ 1,847.00**

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
38	Outer Drive			1.20	1.20	0.486	Town of Tecumseh	$ -	$ 69.00	$ -	$ 69.00
39	Outer Drive (Closed)			5.40	5.40	2.185	Ministry of Transportation Ontario	$ 105.00	$ 226.00	$ -	$ 331.00
40	Howard Avenue				2.50	1.012	County of Essex	$ 105.00	$ 120.00	$ -	$ 225.00
41	South Talbot Road				2.00	0.809	Town of Tecumseh	$ 115.00	$ 115.00	$ -	$ 230.00
	Howard Avenue (Pond)				0.80	0.324	County of Essex	$ -	$ 34.00	$ -	$ 34.00
	Total on Municipal Lands.....							**$ 325.00**	**$ 564.00**	**$ -**	**$ 889.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
45	450-02300	5	8	0.96	0.48	0.194	Synod Dioces of Huron Inc.	$ 28.00	$ 39.00	$ -	$ 67.00
44	450-02400	5	8	0.92	0.46	0.186	Trustees of the Khemara Buddist Temple	$ 27.00	$ 28.00	$ -	$ 55.00
20	470-01400	STR	306	0.54	0.54	0.219	Ministry of Transportation Ontario	$ 29.00	$ 18.00	$ -	$ 47.00

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
21	470-01410	STR	306	4.90	4.90	1.983	Ministry of Transportation Ontario	$ 206.00	$ 185.00	$ -	$ 391.00
19	470-01450	STR	306	5.40	5.40	2.185	Al-Hijra Mosque	$ 194.00	$ 268.00	$ -	$ 462.00
18	470-01500	STR	306	3.47	3.47	1.404	Windsor Community of Christ	$ 89.00	$ 162.00	$ -	$ 251.00
17	470-01510	STR	306	2.99	2.99	1.210	Royal Canadian Legion Metropolitan Branch 594	$ 58.00	$ 237.00	$ -	$ 295.00
22	470-01580	STR	306 & 307	42.43	41.18	16.665	Ministry of Transportation Ontario	$ 257.00	$ 2,138.00	$ -	$ 2,395.00
16	470-01600	1381	BLK B	0.50	0.50	0.202	Robert H.C. Sherman	$ 9.00	$ 22.00	$ -	$ 31.00
15	470-01700	1381	BLK B	3.50	3.50	1.416	Mohamed Kougan	$ 41.00	$ 109.00	$ -	$ 150.00
14	470-01800	1381	BLK B	2.60	2.60	1.052	Greg P. Morrow	$ 18.00	$ 79.00	$ -	$ 97.00
13	470-01801	1381	BLK B	0.43	0.43	0.174	Robert B. & Deborah A. Armitage	$ 5.00	$ 19.00	$ -	$ 24.00
12	470-01900	1381	BLK B	1.77	1.77	0.716	Mazhar A. Khan & Aaliya Mir	$ 12.00	$ 55.00	$ -	$ 67.00
11	470-02000	1381	BLK B	1.34	1.34	0.542	Sheila A. Donlon	$ 5.00	$ 52.00	$ -	$ 57.00
23	470-05000	STR	306	1.00	0.40	0.162	Ministry of Transportation Ontario	$ -	$ 17.00	$ -	$ 17.00
24	470-05003	STR	306	1.08	0.63	0.255	Ministry of Transportation Ontario	$ -	$ 27.00	$ -	$ 27.00
28	470-05100	STR	306	36.06	36.06	14.593	Ministry of Transportation Ontario	$ -	$ 1,585.00	$ -	$ 1,585.00
25	470-05200	STR	306	1.00	1.00	0.405	Ministry of Transportation Ontario	$ -	$ 43.00	$ -	$ 43.00
26	470-05201	STR	306	4.29	4.29	1.736	Ministry of Transportation Ontario	$ -	$ 166.00	$ -	$ 166.00
27	470-05300	STR	306	3.65	3.65	1.477	Miksa Marton	$ -	$ 126.00	$ -	$ 126.00
29	470-05400	STR	306	0.10	0.10	0.040	Ministry of Transportation Ontario	$ -	$ 3.00	$ -	$ 3.00
32	470-05401	STR	305	0.70	0.70	0.283	Ministry of Transportation Ontario	$ -	$ 37.00	$ -	$ 37.00
34	470-05402	STR	305	32.54	32.54	13.169	Congregation of the Order Antonin Maronite in Ontario	$ -	$ 1,533.00	$ -	$ 1,533.00
31	470-05405	STR	305	1.13	1.13	0.457	Ministry of Transportation Ontario	$ -	$ 46.00	$ -	$ 46.00
30	470-05412	STR	305	1.64	1.64	0.664	470698 Ontario Ltd.	$ -	$ 112.00	$ -	$ 112.00
33	470-05500	STR	305	11.23	10.85	4.391	Ministry of Transportation Ontario	$ -	$ 511.00	$ -	$ 511.00
46	470-05600	STR	305	66.82	1.60	0.648	Victoria Memorial Gardens	$ -	$ 42.00	$ -	$ 42.00
47	N/A	STR	305	0.00	3.00	1.214	Chrysler Greenway (Town of Tecumseh)	$ 33.00	$ 126.00	$ -	$ 159.00
	Total on Privately Owned - Non-Agricultural Lands.....							**$ 1,011.00**	**$ 7,785.00**	**$ -**	**$ 8,796.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
36	450-02500	5	8	14.85	4.00	1.619	2484234 Ontario Inc.	$ 137.00	$ 63.00	$ -	$ 200.00
35	470-01300	STR	305	37.29	37.29	15.091	Amico Infrastructures	$ 436.00	$ 586.00	$ -	$ 1,022.00
	Total on Privately Owned - Agricultural Lands (grantable).....							**$ 573.00**	**$ 649.00**	**$ -**	**$ 1,222.00**
TOTAL ASSESSMENT - TOWN OF TECUMSEH					251.97	101.971		**$ 2,254.00**	**$ 10,500.00**	**$ -**	**$ 12,754.00**

TOWN OF LASALLE

2. ONTARIO LANDS:

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
	Block 'A'			10.60	10.60	4.290	Ministry of Transportation Ontario	$ -	$ 455.00	$ -	$ 455.00
	Total on Ontario Lands.....							**$ -**	**$ 455.00**	**$ -**	**$ 455.00**

3. MUNICIPAL LANDS:

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
42	Laurier Parkway				0.20	0.081	Town of LaSalle	$ 16.00	$ 16.00	$ -	$ 32.00
43	Howard Business Parkway				0.20	0.081	Town of LaSalle	$ 16.00	$ 14.00	$ -	$ 30.00
40	Howard Avenue				3.08	1.246	County of Essex	$ 130.00	$ 185.00	$ -	$ 315.00
	Howard Avenue (Pond)				0.80	0.324	County of Essex	$ -	$ 34.00	$ -	$ 34.00
	Total on Municipal Lands.....							**$ 162.00**	**$ 249.00**	**$ -**	**$ 411.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
1	290-05800	6	2	73.77	3.50	1.416	Roman Catholic Episcopal Corporation London Diocese	$ 68.00	$ 87.00	$ -	$ 155.00
2	290-05900	6	2	14.25	2.70	1.093	St. Nicholas Macedonian Eastern Orthodox Church	$ 86.00	$ 256.00	$ -	$ 342.00

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
3	290-06000	6	3	6.08	3.30	1.335	Trustees of the Apostolic Christian Church Nazarean	$ 129.00	$ 192.00	$ -	$ 321.00
4	290-06100	6	3	4.21	2.36	0.955	Trustees of the Apostolic Christian Church Nazarean	$ 114.00	$ 132.00	$ -	$ 246.00
5	290-06200	6	3	1.93	1.93	0.781	Faith Community Church-LaSalle	$ 93.00	$ 87.00	$ -	$ 180.00
8	290-16350	6	3	0.09	0.10	0.040	Union Gas Limited	$ 6.00	$ 8.00	$ -	$ 14.00
			Total on Privately Owned - Non-Agricultural Lands.....					**$ 496.00**	**$ 762.00**	**$ -**	**$ 1,258.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
7	290-06250	6	3	3.95	0.57	0.231	1486192 Ontario Limited	$ 22.00	$ 9.00	$ -	$ 31.00
10	290-16300	6	1, 2 & 3	76.65	0.80	0.324	Howard Business Centre Inc.	$ 31.00	$ 11.00	$ -	$ 42.00
9	290-16300	6	1, 2 & 3	30.50	0.77	0.312	Howard Business Centre Inc.	$ 30.00	$ 12.00	$ -	$ 42.00
6	290-16300	6	4	1.74	0.13	0.053	Howard Business Centre Inc.	$ 5.00	$ 2.00	$ -	$ 7.00
			Total on Privately Owned - Agricultural Lands (grantable).....					**$ 88.00**	**$ 34.00**	**$ -**	**$ 122.00**
TOTAL ASSESSMENT - TOWN OF LASALLE					31.04	12.562		**$ 746.00**	**$ 1,500.00**	**$ -**	**$ 2,246.00**
TOTAL ASSESSMENT - TOWN OF TECUMSEH (brought forward)					251.97	101.971		**$ 2,254.00**	**$ 10,500.00**	**$ -**	**$ 12,754.00**
TOTAL ASSESSMENT					283.01	114.53		**$ 3,000.00**	**$ 12,000.00**	**$ -**	**$ 15,000.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018

APPENDIX "B"

MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE ACCESS BRIDGE PORTION OF ENCLOSURE STA. 0+428.0 TO STA. 0+458.0

APPENDIX 'B'

MAINTENANCE SCHEDULE OF ASSESSMENT

FOR THE ACCESS BRIDGE PORTION OF ENCLOSURE STA. 0+428.0 TO STA. 0+458.0

TOWN OF LASALLE

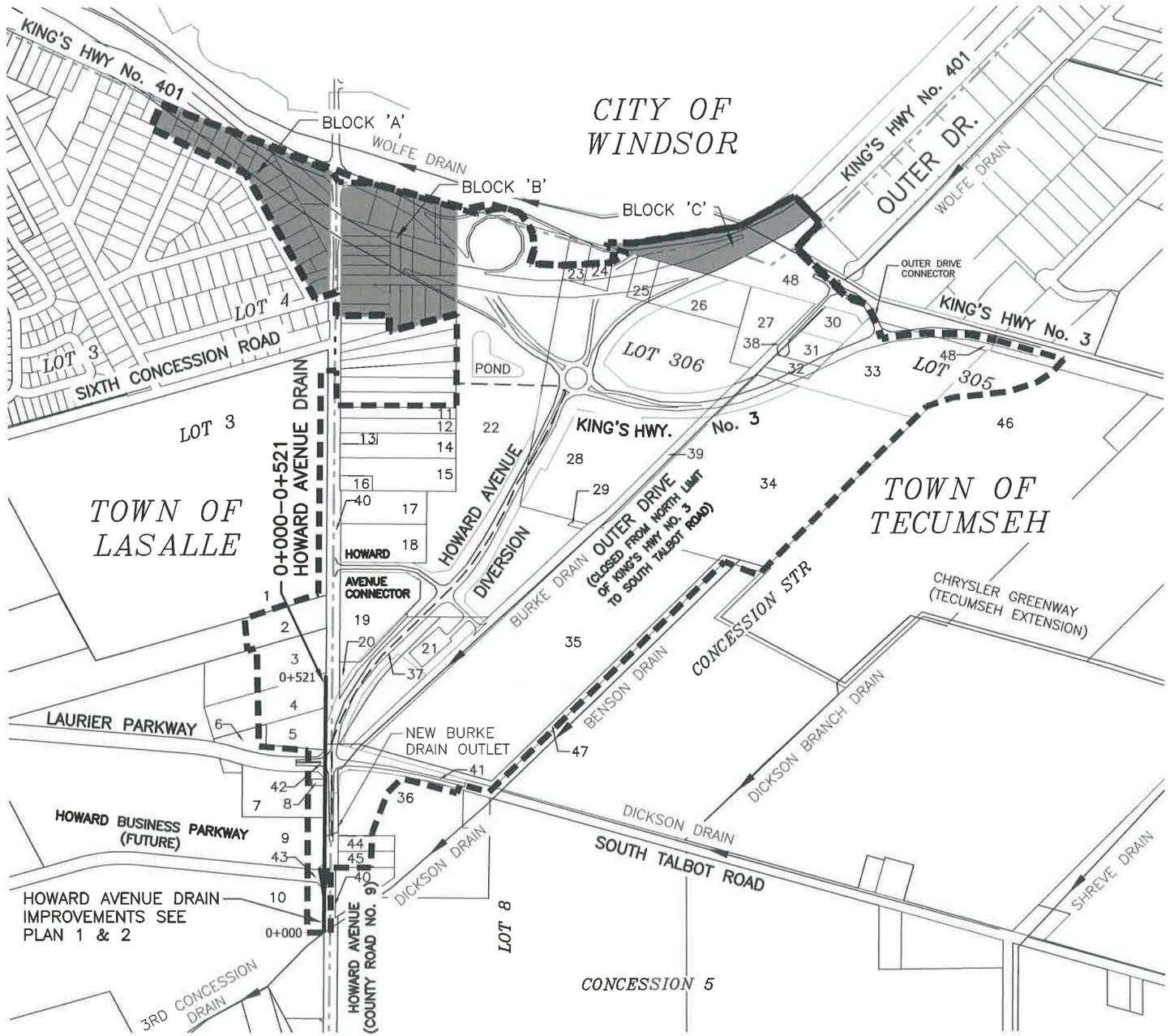
3. MUNICIPAL LANDS:

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
40	Howard Avenue				2.39	0.967	County of Essex	$ -	$ 211.00	$ -	$ 211.00
	Total on Municipal Lands.....							**$ -**	**$ 211.00**	**$ -**	**$ 211.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Dillon No.	Tax Roll No.	Con. or No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Benefit	TOTAL VALUE
1	290-05800	6	2	73.77	3.50	1.416	Roman Catholic Episcopal Corporation London Diocese	$ -	$ 123.00	$ -	$ 123.00
2	290-05900	6	2	14.25	2.70	1.093	St. Nicholas Macedonian Eastern Orthodox Church	$ -	$ 363.00	$ -	$ 363.00
3	290-06000	6	3	6.08	3.30	1.335	Trustees of the Apostolic Christian Church Nazarean	$ -	$ 273.00	$ -	$ 273.00
4	290-06100	6	3	4.21	2.36	0.955	Trustees of the Apostolic Christian Church Nazarean	$ -	$ 195.00	$ -	$ 195.00
5	290-06200	6	3	1.93	0.15	0.061	Faith Community Church-LaSalle	$ 3,825.00	$ 10.00	$ -	$ 3,835.00
	Total on Privately Owned - Non-Agricultural Lands.....							**$ 3,825.00**	**$ 964.00**	**$ -**	**$ 4,789.00**
TOTAL ASSESSMENT					14.40	5.828		**$ 3,825.00**	**$ 1,175.00**	**$ -**	**$ 5,000.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018



WATERSHED PLAN
SCALE=1:10,000

HOWARD AVENUE DRAIN STATIONING	
STATION	DESCRIPTION
0+068	S. LIMIT HOWARD BUSINESS PARKWAY (FUTURE)
0+124	N. LIMIT HOWARD BUSINESS PARKWAY (FUTURE)
0+218	LINE BETWEEN 290-06250 & 290-16300
0+284	LINE BETWEEN 290-06250 & 290-16350
0+297	S. LIMIT LAURIER PARKWAY
0+357	N. LIMIT LAURIER PARKWAY
0+445	LINE BETWEEN 290-06200 & 290-06100

LEGEND

- WATERSHED BOUNDARY
- MUNICIPAL BOUNDARY
- HOWARD AVE. DRAIN
- SURROUNDING DRAINS
- SUBWATERSHED FOR BURKE DRAIN & BURKE DRAIN OUTLET

FOR PROPERTY OWNERSHIP INFORMATION ON NUMBERED LAND PARCELS SEE PAGE 2 OF 9

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN: TRO | REVIEWED BY: FRF
DRAWN: AJL | CHECKED BY: EPS
DATE: June 6, 2018
SCALE: 1 : 10000

DILLON CONSULTING
PROJECT NO. 12-6578-1200
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'
Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE: WATERSHED PLAN
PAGE NO. 1 of 9

Jun 05, 2018 - 3:36pm G:\CAD\1285781\LaSalle Drains\Howard Drain-1200\Howard Drain_Plan (Final June 6 18).dwg

HOWARD AVENUE DRAIN PARCEL INFORMATION

PARCEL No.	ROLL No.	LANDOWNER	AREA WITHIN WATERSHED (ACRES)
TOWN OF LASALLE			
BLOCK A	N/A	MINISTRY OF TRANSPORTATION	10.60
	HOWARD AVENUE	COUNTY OF ESSEX (TO POND)	0.80
1	290–05800	ROMAN CATHOLIC EPISCOPAL CORPORATION LONDON DIOCESE	3.50
2	290–05900	ST NICHOLAS MACEDONIAN EASTERN ORTHODOX CHURCH	2.70
3	290–06000	TRUSTEES OF THE APOSTOLIC CHRISTIAN CHURCH NAZAREAN	3.30
4	290–06100	TRUSTEES OF THE APOSTOLIC CHRISTIAN CHURCH NAZAREAN	2.36
5	290–06200	FAITH COMMUNITY CHURCH–LASALLE	1.93
6	290–16300	HOWARD BUSINESS CENTRE INC	0.13
7	290–06250	1486192 ONTARIO LIMITED	0.57
8	290–16350	UNION GAS LIMITED	0.10
9	290–16300	HOWARD BUSINESS CENTRE INC	0.77
10	290–16300	HOWARD BUSINESS CENTRE INC	0.80
40 (PART)	HOWARD AVENUE	COUNTY OF ESSEX	3.08
42	LAURIER PARKWAY	TOWN OF LASALLE	0.20
43	HOWARD BUSINESS PARKWAY	TOWN OF LASALLE	0.20
TOWN OF TECUMSEH			
BLOCK B	N/A	MINISTRY OF TRANSPORTATION	16.00
	HOWARD AVENUE	COUNTY OF ESSEX (TO POND)	0.80
BLOCK C	KING'S HWY. NO. 401	MINISTRY OF TRANSPORTATION	5.21
11	470–02000	SHEILA A. DONLON	1.34
12	470–01900	MAZHAR A. KHAN & AALIYA MIR	1.77
13	470–01801	ROBERT B. & DEBORAH A. ARMITAGE	0.43
14	470–01800	GREG P. MORROW	2.60
15	470–01700	MOHAMED KOUGAN	3.50
16	470–01600	ROBERT H.C. SHERMAN	0.50
17	470–01510	ROYAL CANADIAN LEGION METROPOLITAN BRANCH 594	2.99
18	470–01500	WINDSOR COMMUNITY OF CHRIST	3.47
19	470–014500	AL–HIJRA MOSQUE	5.40
20	470–01400	MINISTRY OF TRANSPORTATION	0.54
21	470–01410	MINISTRY OF TRANSPORTATION	4.90
22 *	470–01580	MINISTRY OF TRANSPORTATION	41.18
23 *	470–05000	MINISTRY OF TRANSPORTATION	0.40
24 *	470–05003	MINISTRY OF TRANSPORTATION	0.63
25 *	470–05200	MINISTRY OF TRANSPORTATION	1.00
26 *	470–05201	MINISTRY OF TRANSPORTATION	4.29
27	470–05300	MISKA MARTON	3.65
28 *	470–05100	MINISTRY OF TRANSPORTATION	36.06
29	470–05400	MINISTRY OF TRANSPORTATION	0.10
30	470–05412	470698 ONTARIO LTD	1.64
31 *	470–05405	MINISTRY OF TRANSPORTATION	1.13
32 *	470–05401	MINISTRY OF TRANSPORTATION	0.70
33 *	470–05500	MINISTRY OF TRANSPORTATION	10.85
34 *	470–05402	CONGREGATION OF THE ORDER ANTONIN MARONITE IN ONTARIO	32.54
35	470–01300	AMICO INFRASTRUCTURES	37.29
36	450–02500	2484234 ONTARIO INC.	4.00
37	HOWARD AVENUE DIVERSION	MINISTRY OF TRANSPORTATION	4.97
38	OUTER DRIVE	TOWN OF TECUMSEH	1.20
39	OUTER DRIVE (CLOSED)	MINISTRY OF TRANSPORTATION	5.40
40 (PART)	HOWARD AVENUE	COUNTY OF ESSEX	2.50
41	SOUTH TALBOT ROAD	TOWN OF TECUMSEH	2.00
44	450–02400	TRUSTEES OF THE KHEMARA BUDDHIST TEMPLE	0.46
45	450–02300	SYNOD DIOCES OF HURON INC	0.48
46	470–05600	VICTORIA MEMORIAL GARDENS	1.60
47	N/A	CHRYSLER GREENWAY (TOWN OF TECUMSEH)	3.00
48	KING'S HIGHWAY NO. 3	MINISTRY OF TRANSPORTATION	5.45
TOTAL DRAINAGE AREA–HOWARD AVENUE DRAIN=114.53 Ha (283.01 Acres)			

* AREAS SHOWN INCLUDE NEW ROADWAY AREAS

'SCHEDULE C'

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN: TRO | REVIEWED BY: FRF
DRAWN: AJL | CHECKED BY: EPS
DATE: June 6, 2018
SCALE: AS SHOWN

DILLON CONSULTING

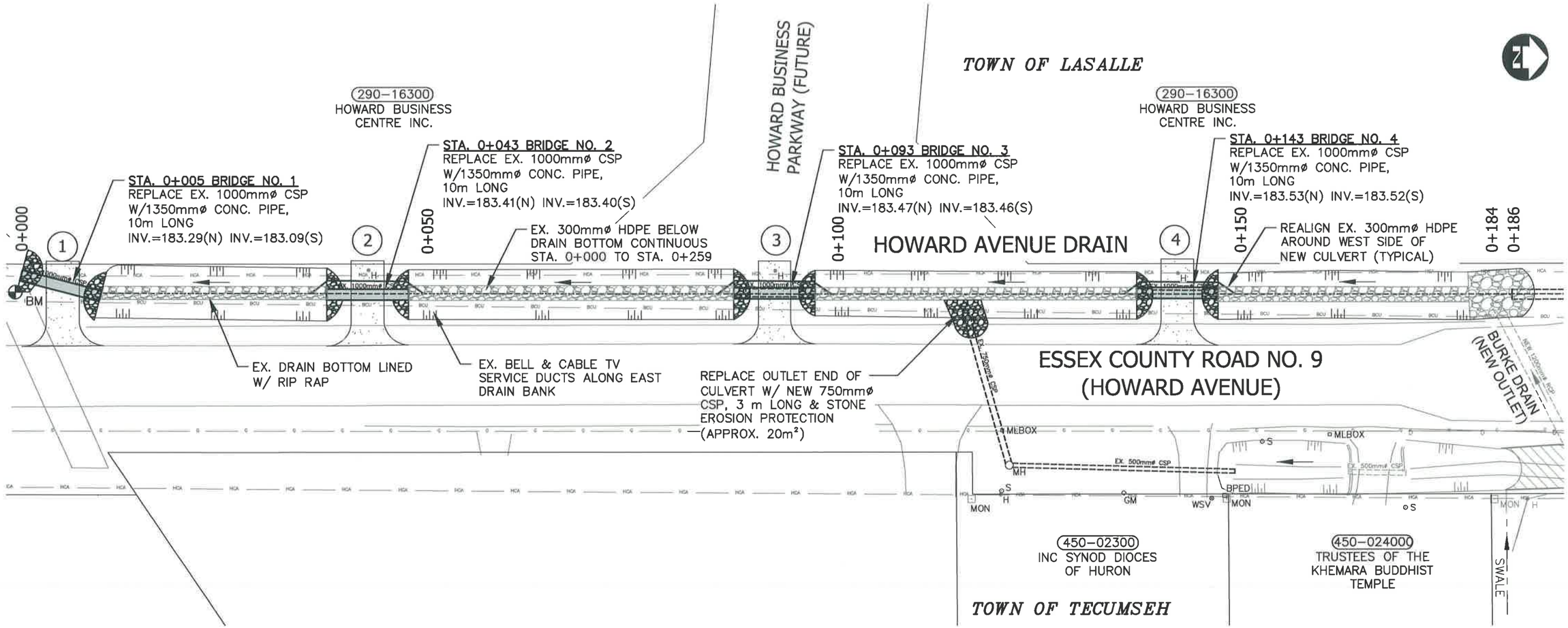
PROJECT NO. 12-6578-1200

DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE: PROPERTY INFORMATION

PAGE NO. 2 of 9



PLAN 1 (STA. 0+000 TO STA. 0+186)
HOWARD AVENUE DRAIN
SCALE=1:500

SITE BENCHMARK
BM1—TOP OF WEST END OF CONCRETE CULVERT UNDER HOWARD AVENUE AT STA. 0+000. ELEVATION=184.75m

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1200

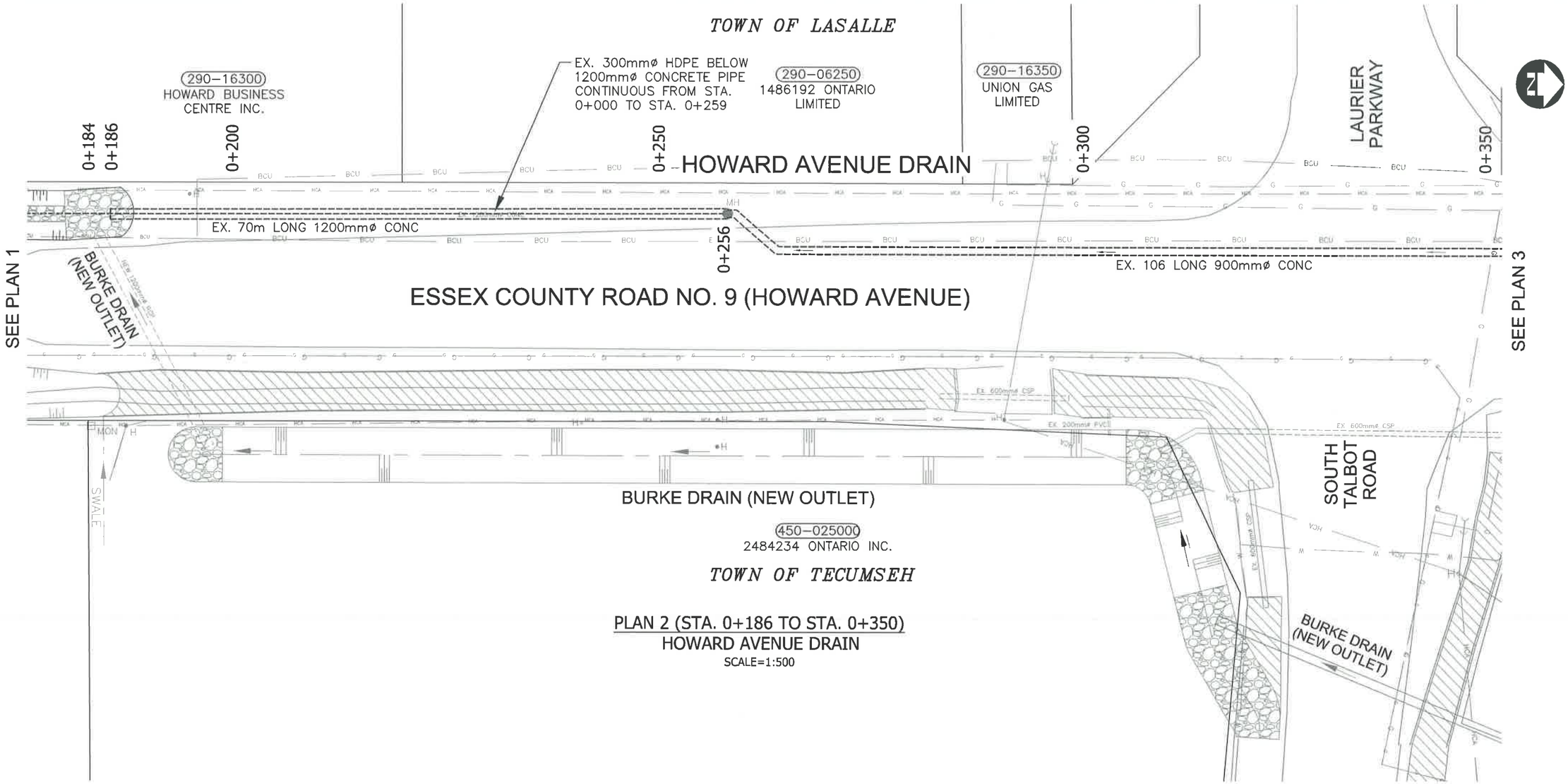
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE
PLAN 1
STA. 0+000 TO STA. 0+186

PAGE NO. 3 of 9



PLAN 2 (STA. 0+186 TO STA. 0+350)
HOWARD AVENUE DRAIN
SCALE=1:500

Jun 05, 2018 - 3:24pm G:\CAD\126578\LaSalle Drains\Howard Drain-1200\Howard Drain Detail Plan (Final June 6 18).dwg

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1200

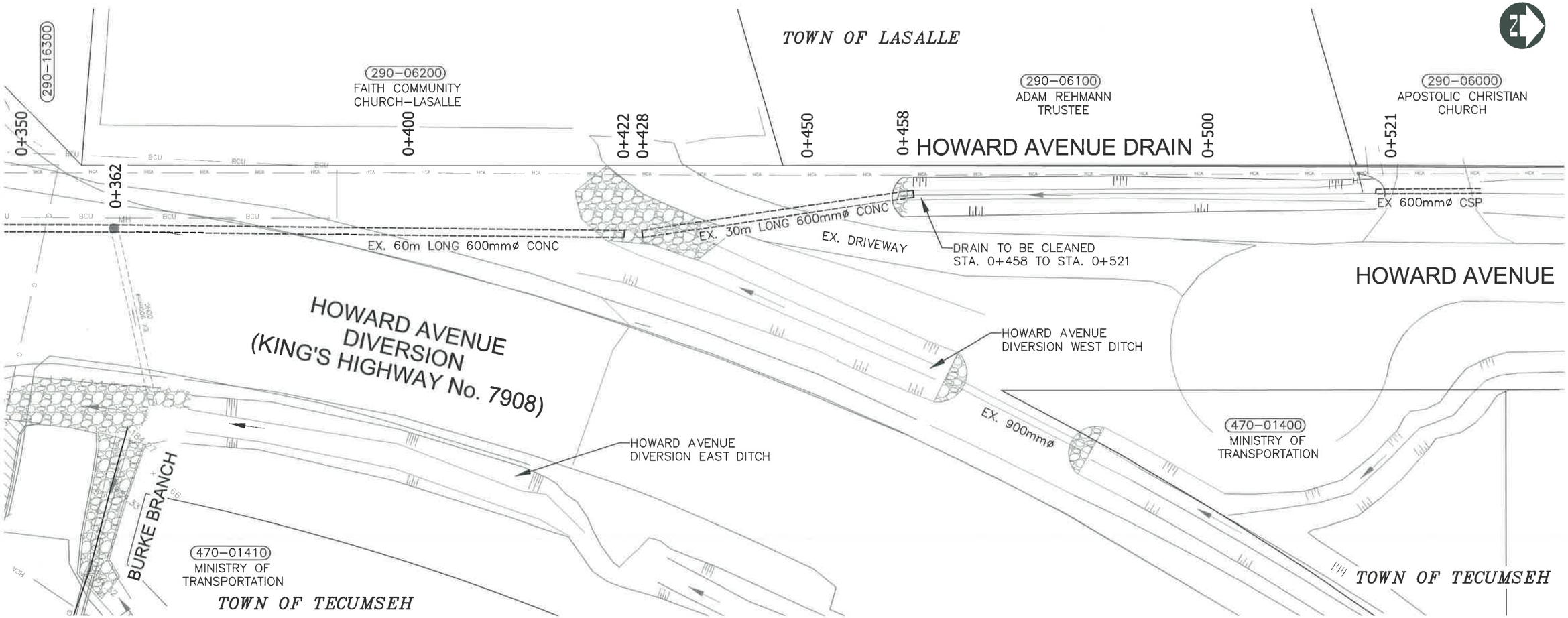
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE
PLAN 2
STA. 0+186 TO STA. 0+350

PAGE NO. 4 of 9



PLAN 3 STA. (0+350 TO STA. 0+521)
HOWARD AVENUE DRAIN
SCALE=1:500

Jun 05, 2018 - 3:24pm G:\CAD\126578\LaSalle Drains\Howard Drain-1200\Howard Drain Detail Plan (Final June 6 18).dwg

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN: TRO | REVIEWED BY: FRF
DRAWN: AJL | CHECKED BY: EPS
DATE: June 6, 2018
SCALE: AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1200

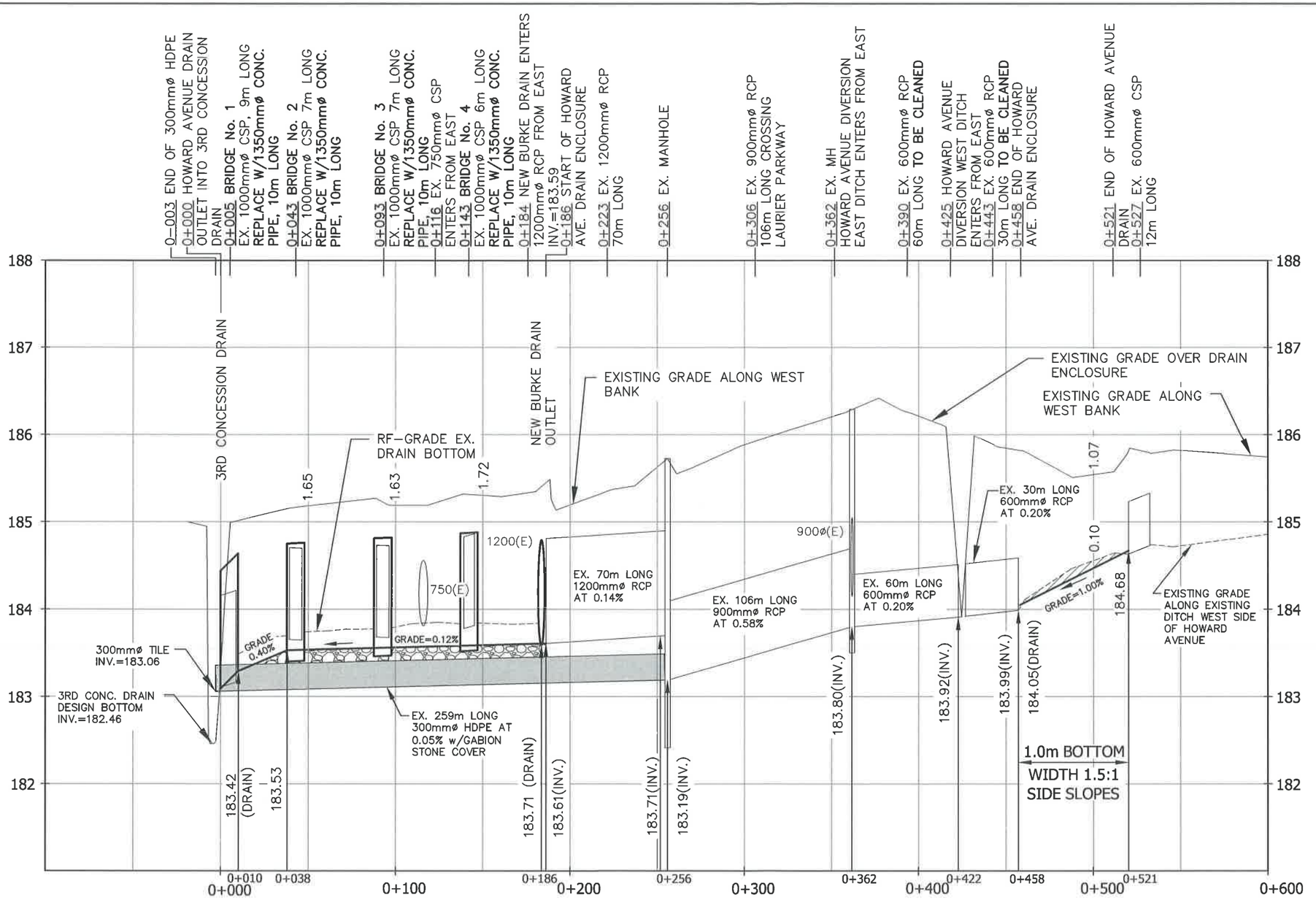
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE: PLAN 3 STA. 0+350 TO STA. 0+521

PAGE NO. 5 of 9



PROFILE STA. 0+000 TO 0+600

SCALE-HORIZ.=1:2500
VERT.=1:50

NOTE:
RCP denotes REINFORCED CONCRETE PIPE
CSP denotes CORRUGATED STEEL PIPE

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1200

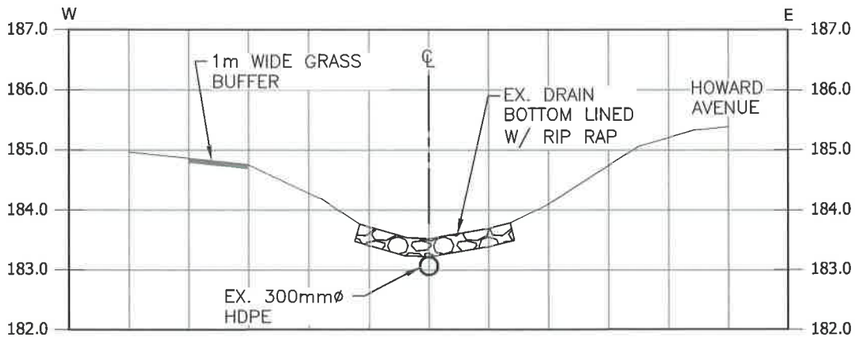
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

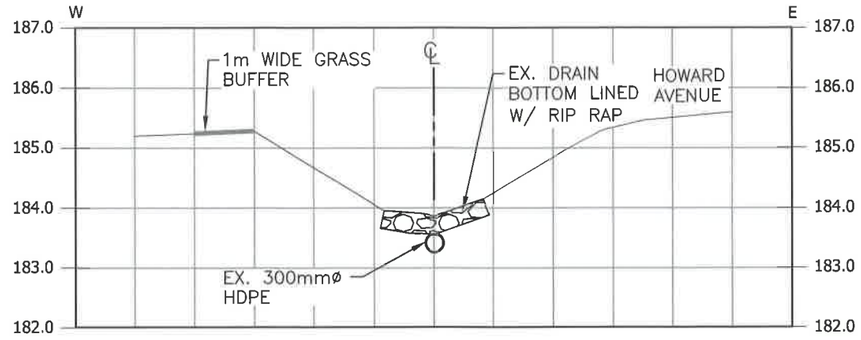
Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE: PROFILE STA. 0+000 TO STA. 0+600

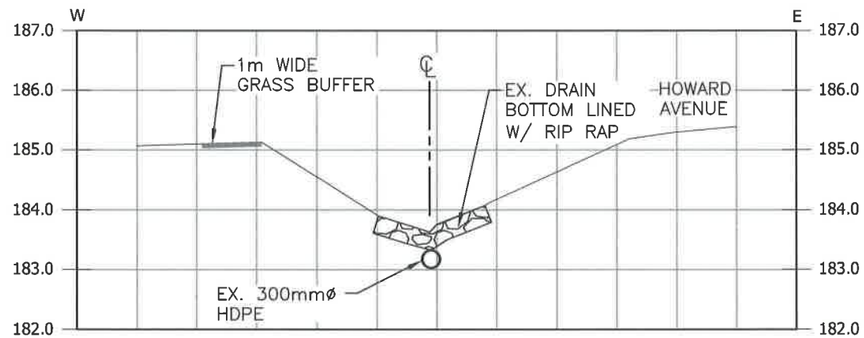
PAGE NO. 6 of 9



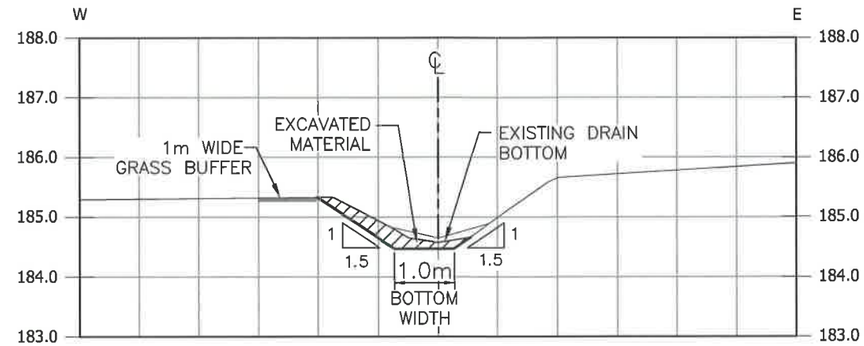
CROSS SECTION 0+020
HOWARD AVENUE DRAIN LOOKING UPSTREAM
SCALE=1:100



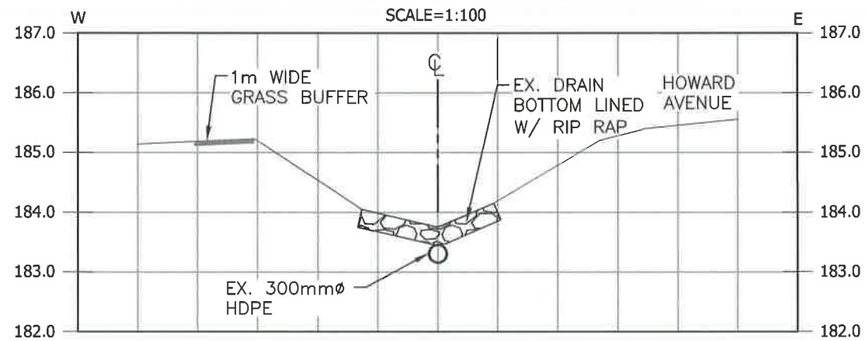
CROSS SECTION 0+160
HOWARD AVENUE DRAIN LOOKING UPSTREAM
SCALE=1:100



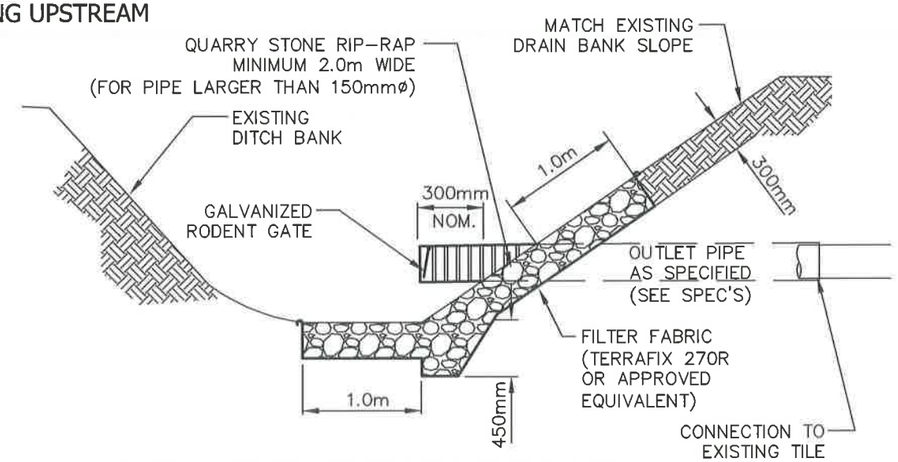
CROSS SECTION 0+050
HOWARD AVENUE DRAIN LOOKING UPSTREAM
SCALE=1:100



CROSS SECTION 0+500
HOWARD AVENUE DRAIN LOOKING UPSTREAM
SCALE=1:100



CROSS SECTION 0+120
HOWARD AVENUE DRAIN LOOKING UPSTREAM
SCALE=1:100



TYPICAL CSP TILE INLET REPLACEMENT DETAIL
NOT TO SCALE

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1200

DRAWING SCALES BASED ON A 11" X 17" SHEET

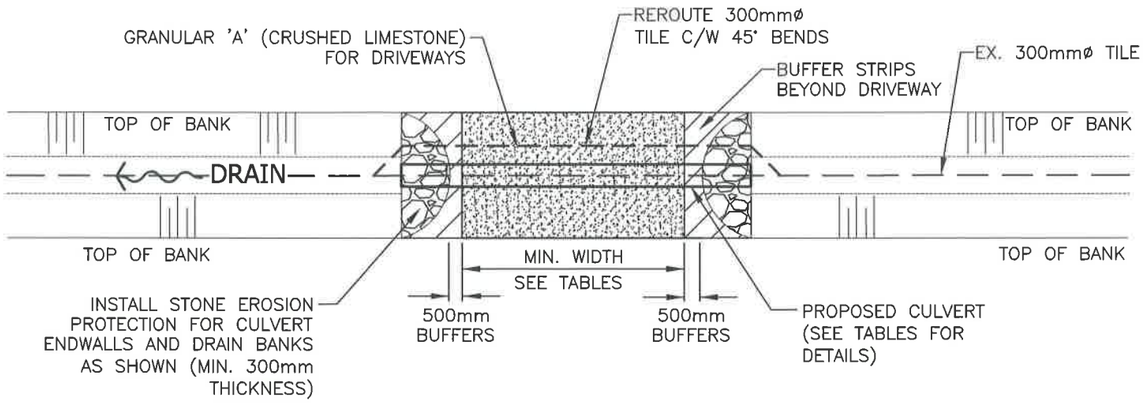
'SCHEDULE C'

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

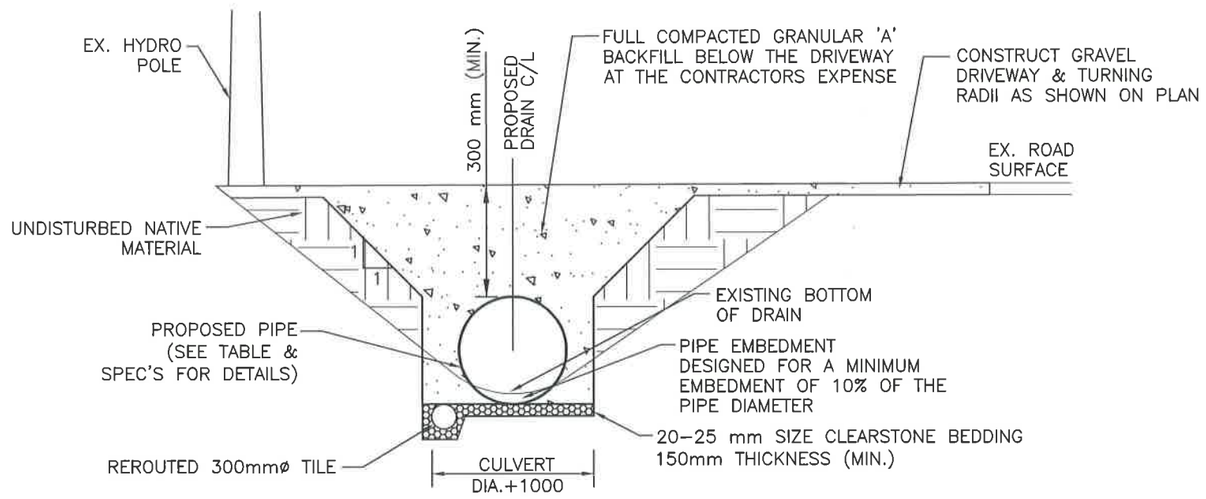
SHEET TITLE: CROSS SECTIONS

PAGE NO. 7 of 9

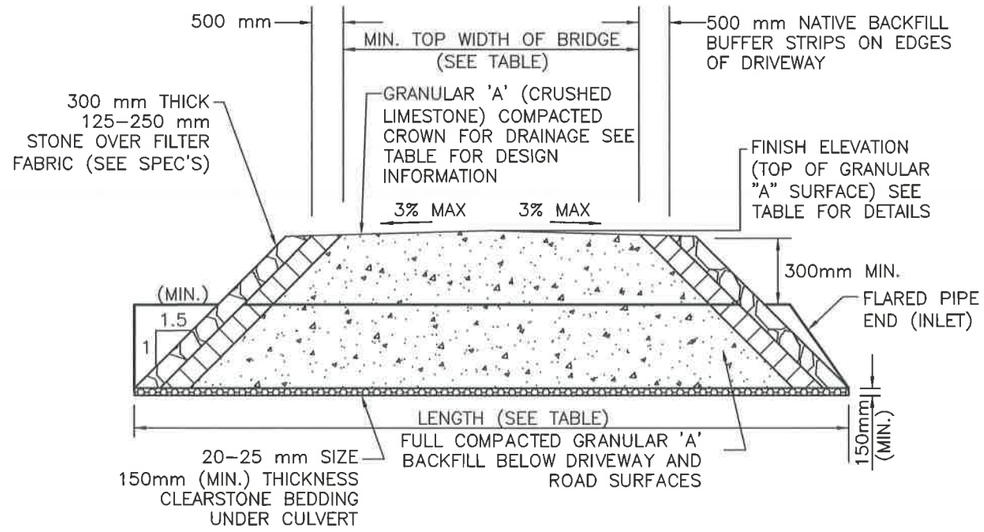
Jun 05, 2018 - 3:25pm G:\CAD\126578\LaSalle Drains\Howard Drain-1200\Howard Drain Detail Plan (Final June 6 18).dwg



BRIDGE PLAN
N.T.S.



CROSS SECTION
N.T.S.



LONGITUDINAL SECTION
N.T.S.

TABLE 1 – ACCESS CULVERT DESIGN INFORMATION

DESCRIPTION	BRIDGE NO. 1	BRIDGE NO. 2	BRIDGE NO. 3	BRIDGE NO. 4
PIPE INVERT ELEV. U/S SIDE(m)	183.29	183.41	183.47	183.53
PIPE INVERT ELEV. D/S SIDE(m)	183.09	183.40	183.46	183.52
TOP OF ℄ DRIVEWAY SURFACE ELEV. (m)	185.01	185.18	185.25	185.30
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	183.32	183.54	183.60	183.66
MIN. TOP WIDTH OF DRIVEWAY (m)	3.0	3.0	3.0	3.0
MIN. CULVERT GRADE (%)	2.00	0.10	0.10	0.10
CULVERT MATERIAL	CONC.	CONC.	CONC.	CONC.
CULVERT LENGTH (m)	10.0	10.0	10.0	10.0
PIPE SIZE (mm)	1350	1350	1350	1350
CULVERT ENDWALL TYPE	SLOPING STONE	SLOPING STONE	SLOPING STONE	SLOPING STONE

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
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN: TRO | REVIEWED BY: FRF
DRAWN: AJL | CHECKED BY: EPS
DATE: June 6, 2018
SCALE: AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1200

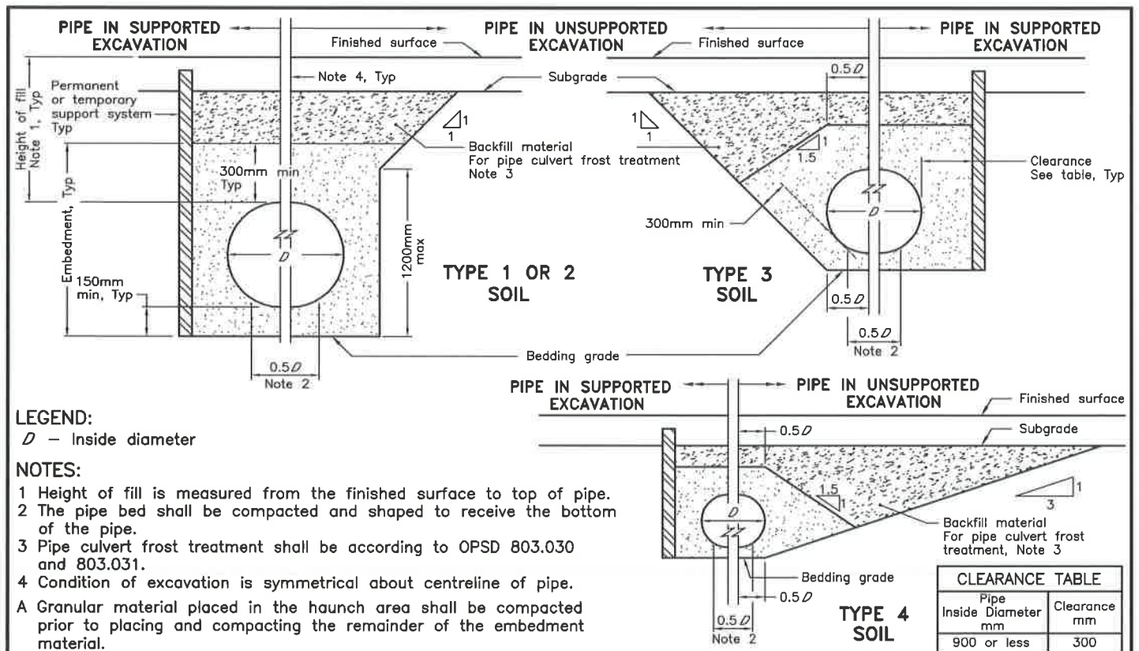
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE: UTILITY ACCESS BRIDGE DETAILS

PAGE NO. 8 of 9



LEGEND:

D – Inside diameter

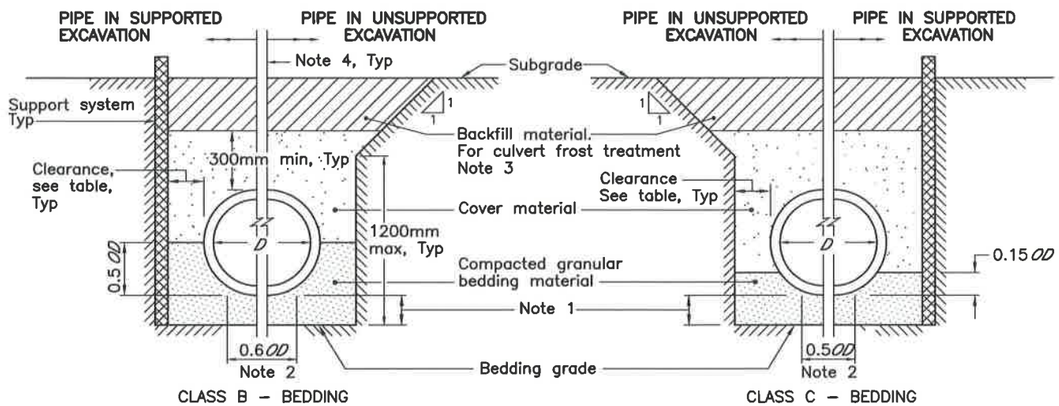
NOTES:

1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.

A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		
	OPSD 802.010	



NOTES:

1 The minimum bedding depth below the pipe shall be 0.15*D*. In no case shall this dimension be less than 150mm or greater than 300mm.
2 The pipe bed shall be shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment according to OPSD–803.030 and 803.031.
4 Condition of trench is symmetrical about centreline of pipe.

A Soil types as defined in the Health & Safety Act and Regulations for Construction Projects.
B Protection against heavy construction equipment according to OPSD–808.010.
C All dimensions are in millimetres or metres unless otherwise shown.

LEGEND:

D – Inside diameter
OD – Outside diameter

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	1996 09 15	Rev
RIGID PIPE BEDDING, COVER AND BACKFILL TYPE 1 OR 2 SOIL – EARTH EXCAVATION	Date	
	OPSD – 802.030	

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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.		DATE	BY
4	FINAL SUBMISSION	JUNE 6/18	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO
	ISSUED FOR 77		

DESIGN	REVIEWED BY
TRO	FRF
DRAWN	CHECKED BY
AJL	EPS
DATE	
June 6, 2018	
SCALE	
AS SHOWN	

DILLON CONSULTING

PROJECT NO. 12-6578-1200

DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
HOWARD AVENUE DRAIN
Town of LaSalle

SHEET TITLE: OPSD DETAILS

PAGE NO. 9 of 9

The Corporation of the Town of LaSalle

Date	June 20, 2018	**Report No:**	PW-26-18
Directed To:	Mayor and Members of Council	**Attachments:**	Burke Drainage Report
Department:	Public Works	**Policy References:**	
Prepared By:	Jonathan Osborne, P.Eng. – Manager of Engineering		
Subject:	Burke Drain – Recommendation to Provisionally Adopt Report		

RECOMMENDATION:

It is recommended that:

1. The Drainage Report and specifications for the Burke Drain (Drain) as prepared by Dillon Consulting and N.J. Peralta Engineering, dated June 6, 2018 (Drainage Report) be received; and that

2. Consideration be given to first and second readings of a provisional by-law to adopt the Drainage Report; and further that

3. The Clerk give notice to all affected landowners of the Court of Revision to be held Tuesday, August 14, 2018 at 5:00 p.m. in accordance with Section 46(1) of the Drainage Act subject to adoption of the provisional by-law.

REPORT:

Pursuant to Section 78 of the Drainage Act, Dillon Consulting and N.J. Peralta Engineering have prepared a Drainage Report for the Burke Drain. This report is to be presented to Council at the Meeting to Consider June 26, 2018.

Respectfully Submitted

for Jonathan Osborne, P.Eng.
Manager of Engineering

Reviewed by:							
CAO	Treasury	Clerks	Public Works	Planning	Cult. & Rec.	Building	Fire

DRAINAGE REPORT
FOR THE

BURKE DRAIN

TOWN OF LASALLE & TOWN OF TECUMSEH
COUNTY OF ESSEX

DILLON CONSULTING

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers

6 JUNE 2018
FILE NO. 12-6578-1300

DILLON CONSULTING

TABLE OF CONTENTS

PREAMBLE.....PAGE 2 - 3

PART A – TECHNICAL CONSIDERATIONS.....PAGE 4 – 36
DILLON CONSULTING LIMITED

PART B – ASSESSMENT CONSIDERATIONS.....PAGE 1 – 34
N.J. PERALTA ENGINEERING LTD.

CONSTRUCTION SCHEDULE OF ASSESSMENT.....PAGE 1 - 2

APPENDIX "A"..... PAGE 1 - 2
MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE BURKE BRANCH DRAIN

APPENDIX "B".....PAGE 1 – 3
MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE BURKE DRAIN AND BURKE DRAIN OUTLET

APPENDIX "C".....PAGE 1 - 2
SCHEDULE OF ASSESSMENT FOR FUTURE ACCESS BRIDGE STRUCTURE MAINTENANCE

PREAMBLE

Instructions

On February 17, 2012 the Ministry of Transportation Ontario (MTO) filed a petition with the Town of LaSalle, in accordance with Section 4 of the Drainage Act. The purpose of the petition was for an engineer to be appointed by Council to examine and report on the municipal drains that provide a drainage outlet for the Rt. Hon. Herb Gray Parkway (formerly known as the Windsor Essex Parkway).

A subsequent letter from the MTO was submitted on January 11, 2013 requesting the original appointment be in accordance with Section 78 of the Drainage Act and further defined eight (8) downstream Municipal Drains that are to be reported on as follows:

3rd Concession Drain
Howard Avenue Drain
Burke Drain
Cahill Drain
Lennon Drain
Grand Marais Drain
Basin Drain
West Branch of the Cahill Drain (only if required based on analysis of Cahill Drain)

The West Branch of the Cahill Drain is interconnected to the Cahill Drain and provides an outlet for spillover flows from the Cahill Drain. A report on the West Branch of the Cahill Drain is provisional only and is dependent on our findings from the hydraulic analysis performed on the Cahill Drain. If we determine the spillover is such as to potentially cause an impact on the West Branch of the Cahill Drain, a report on the said drain will be prepared. If there is determined to be no impact, then a report on the West Branch of the Cahill Drain will not be required.

Joint Appointment of Engineer

On January 22, 2013, Council for the Town of LaSalle reconfirmed a joint appointment of Dillon Consulting Limited (Dillon) and Stantec Consulting Ltd. (Stantec), each having distinct roles, as outlined below, for the preparation of all necessary drainage reports in accordance with Section 78 of the Drainage Act, for all drains serving as an outlet for the Rt. Hon. Herb Gray Parkway.

Subsequently, there was a change made by Council for the Town of LaSalle to appoint N.J. Peralta Engineering Ltd (Peralta) to assume the responsibilities of Stantec Consulting Ltd.

The Burke Drain is located almost entirely within the Town of Tecumseh with the exception being the outlet which crosses Howard Avenue into the Howard Avenue Drain within the Town of LaSalle.

In November 2015, the Town of Tecumseh requested the assignment for the Burke Drain be expanded to include the entire drain. The request was accepted by the Ministry of Transportation and the Town of LaSalle who remains the initiating municipality.

Engineer's Role (Dillon Consulting Limited)

Dillon's responsibilities are limited to on-site meetings, survey work, hydraulic analysis and design, detailed watershed determination, and to report thereon the recommended improvements necessary to each of the above mentioned municipal drains outlined herein. These reports shall contain all plans, profiles and details accompanying the recommended drainage works, together with an estimate of costs, determination of any land allowances and the provision of specifications associated with the work.

The content, as noted above, is contained within this report under **PART A – TECHNICAL CONSIDERATIONS**.

Engineer's Role (N.J. Peralta Engineering Ltd.)

Peralta's responsibilities are limited to determination of assessments and provision of rationale for the distribution of costs against all lands, roads and public utilities affected by the improvements to the drainage works as outlined by Dillon within each of the above mentioned municipal drain reports. These assessments shall be prepared for both the construction and future maintenance of each drain and presented in the form of assessment schedules.

The content, as noted above, is contained within this report under **PART B – ASSESSMENT CONSIDERATIONS**.

File No. 12-6578-1300

Mayor and Council
Corporation of the Town of LaSalle
5950 Malden Road
LaSalle, Ontario
N9H 1S4

DILLON CONSULTING

10 Fifth Street South
Chatham, Ontario
Canada
N7M 4V4
Telephone
519.354.7802
Fax
519.354.2050

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh
County of Essex

Mayor and Council:

PART A – TECHNICAL CONSIDERATIONS

Watershed Description

The Burke Drain, as per the recommended improvements herein, comprises 1,383 metres of open drain and 185 metres of covered drain at its upstream end located within the Town of Tecumseh. The Burke Drain commences at the original location of King's Highway No. 3 and continues southerly along the east side of Outer Drive to South Talbot Road where it then continues westerly across Outer Drive to its outlet at the road culvert crossing Howard Avenue Diversion. From this outlet point Burke Drain flows cross Howard Avenue through an existing 900 mm diameter culvert into the west side ditch within the Town of LaSalle. The overall watershed area is approximately 87.69 Ha (216.68 acres). Historically, the majority of the lands within the watershed had been used for agriculture (approximately 66%) with some low density residential and commercial development areas along King's Highway No. 3. There is little topographic relief and the soils comprising the watershed are generally poorly drained, classified as a Brookston Clay Loam soil that requires sub-surface tile drainage for agricultural lands to be productive.

Land Use Changes

With the recent construction of the Rt. Hon. Herb Gray Parkway (The Parkway) extending over a period of 3 years to its completion in 2015, the land use has significantly changed within the Burke Drain watershed. Presently, over 75% of the watershed is used by The Parkway with less than 25% for agriculture purposes. The Parkway is an integrated transportation corridor consisting of a six (6) lane extension of the King's Highway No. 401, a new four (4) lane King's Highway No. 3 service road, roundabout, new connector roads for both Howard Avenue to the south and Outer Drive to the north, storm water quantity and quality management ponds, stock pile berms and parkland with a pedestrian trail system. The Ministry of Transportation Ontario (MTO) owns the majority of the lands within the Burke Drain watershed.

In response to these changes the *Burke Drain Storm water Management Report* (Dillon, 2014) was prepared to document the development of the storm water management plan, a flood plain management plan and the design of drainage infrastructure for the easterly segment of The Parkway associated with the Burke Drain.

Parkway Drainage Design and Floodplain Management

Several new drainage elements were designed and constructed as part of The Parkway's integrated drainage design including a system of storm sewers, culverts, pumping station and storm water management pond associated with the Burke Drain. There are a number of new culverts associated with the drainage throughout The Parkway corridor. The 10 year return period design storm was applied to culvert crossings of the new road infrastructure connecting to the King's Highway No. 401. The new road infrastructure within the Burke Drain watershed includes the Outer Drive Connector, Howard Avenue Diversion, the new roundabout and its associated interchange ramps, re-alignment of South Talbot Road, Howard Avenue Connector and the King's Highway No. 3 service road that crosses the Burke Drain where a new 825 mm diameter culvert was installed.

The Burke Drain watershed area was expanded to the northwest to include part of the new westbound King's Highway No. 401 underpass which is collected by a storm sewer designed to handle peak flows from the 100 year return period design storm without flooding. The storm sewer discharges to a new pump station designed to pump the 100 year return period design storm flows into a storm water detention pond. The release rate from the pond is over controlled to not exceed the peak flow from a low intensity 25 mm storm which is then discharged into the east ditch on the Howard Avenue Diversion which flows southerly discharging into the Burke Drain at its most downstream location being the inlet of the Howard Avenue Diversion road culvert.

In terms of storm water quantity management, the pond effectively attenuates peak flows comparable to pre development conditions at the Burke Drain outlet for all storm events up to and including the 100 year return period. The pond has also been designed to provide water quality treatment in accordance with the Ontario Ministry of Environment (MOE) Storm water Management Planning and Design Manual (2003) to meet the Ministry and project specific design criteria.

For the lands located between the Howard Avenue Diversion and Howard Avenue to the north of South Talbot Road, the drainage is rerouted southerly along the west ditch of the Howard Avenue Diversion and discharges directly into the upstream portion of the Howard Avenue Drain enclosure separate from the Burke Drain confluence (Howard Avenue Diversion culvert). Given that flows are restricted by smaller 450 mm diameter culverts located on the downstream Howard Avenue east side ditch between the Howard Avenue Connector and South Talbot Road, the roadside ditch along the north side of the Howard Avenue Connector has been designed to provide relief to upstream flows on the Howard Avenue east ditch by re-directing over to the new Howard Avenue Diversion west ditch.

Previous to the development of The Parkway, Howard Avenue had represented the boundary line between drainage basins for the Howard Avenue Drain (upper portion) and the Burke Drain. Subsequently, with the construction of the Howard Avenue Diversion it has become the new boundary line. As a result, there is approximately 22 hectares (54.3 acres) from the Burke Drain watershed that is now routed directly into the Howard Avenue Drain just upstream of where the Burke Drain presently outlets to the Howard Avenue Drain. Through this redistribution of flows via the interconnection of existing drains, there is some attenuation of peak flow and reduced backwater effects at the Burke Drain outlet (Howard Avenue Diversion road culvert).

Drain History

The recent history of Engineer's reports for the Burke Drain follows:

- **February 21, 1958 by C.G.R. Armstrong, P.Eng.**, recommended drain cleanout and repair of the Burke Drain. This is the only report known to exist on the said drain.

The present outlet for the existing Burke Drain is the road culvert under Howard Avenue Diversion where drainage flows through an existing 900 mm diameter concrete culvert and into a deeper roadside ditch along the west side of Howard Avenue continuing southerly to its outlet into the 3rd Concession Drain. The Burke Drain was recently maintained in 2012 by The Parkway's contractor to remove sediment and restore the drain to the design profile and cross section of the governing 1958 report and by-law. Some redundant farm access culverts were removed and some new culverts were added for construction access and for the crossing of the new King's Highway No. 3 service road. The existing drain enclosure at the upper part of the Burke Drain located north of the new King's Highway No. 3 service was removed and replaced with a new concrete pipe varying in size from 525 mm to 600 mm diameter as part of the Parkway project. Besides providing access to existing commercial properties on the east side of Outer Drive, the new enclosure facilitates new road works on Outer Drive between Outer Drive Connector heading south to the cul-de-sac.

In 2010, Laurier Parkway was constructed within the Town of LaSalle starting east of Malden Road and continuing westerly to Howard Avenue. Drainage modifications were made to facilitate the new intersection between Laurier Parkway and Howard Avenue. These works included the replacement of the existing 900 mm diameter CSP road culvert across Howard Avenue (now known as Howard Avenue Diversion) for which the inlet side (east side) of the said culvert has been the point of outlet for the Burke Drain leading to the west side ditch on Howard Avenue (to be known as Howard Avenue Drain). The said culvert was replaced with a 900 mm diameter concrete pipe and continues to exist subsequent to the construction of the Howard Avenue Diversion in 2013. Furthermore, the Howard Avenue Drain at the confluence with the Burke Drain was enclosed with a 97 m long, 600 mm diameter concrete pipe extending upstream and north of Laurier Parkway; and further enclosed extending downstream with a 106 m long, 900 mm diameter concrete pipe south of Laurier Parkway. With this enclosure the Howard Avenue Drain was also deepened by approximately 0.50 metres, however the road culvert under Howard Avenue Diversion at the Burke Drain outlet was not lowered to coincide with and offer a deeper outlet for the Burke Drain. To accomplish this would have required the lowering of an existing water main and high pressure gas main located on the east side of Howard Avenue.

Downstream of the enclosure, as described above, the Howard Avenue Drain is an open drain. During the Laurier Parkway construction the bottom of the drain was lined with gabion stone and a 300 mm diameter HDPE sub drain pipe was installed below the open drain to the depth of the enclosure and continued to the Howard Avenue Drain outlet into the 3rd Concession Drain. We understand that the sub drain pipe placement was opted for instead of deepening and widening the downstream portion Howard Avenue Drain in order to avoid to relocation of existing utilities (Hydro poles and underground Bell telephone lines) that were encountered within close proximity to the drain.

Subsequent to the Laurier Parkway construction, there were four (4) drain crossings installed on the Howard Avenue Drain downstream of the enclosed drain portion, each consisting of a 1000 mm diameter CSP culvert for the purpose of providing access to three existing hydro poles and one existing telephone service pedestal located on the west side of the drain. We understand the work was undertaken by the respective operating utilities. The timelines of this work are not exactly known, however we believe the work to have occurred after the original enclosure of the Howard Avenue Drain in 2010 and before the continuation of the enclosure in 2012 as noted below.

In July 2012 during the construction of the Rt. Hon. Herb Gray Parkway several modifications were made to the existing Howard Avenue Drain enclosure. The downstream end of the enclosure consisting of a 900 mm diameter concrete pipe was further extended with a 70 m long, 1200 mm diameter concrete pipe to facilitate the road widening of Howard Avenue south of Laurier Parkway. The upstream end of the Howard Avenue Drain enclosure consisting of a 600 mm diameter concrete pipe was opened up to permit some of the drainage area east of Howard Avenue and north of South Talbot Road to enter further upstream from its original outlet that was the Howard Avenue road culvert conveying the Burke Drain flows into the Howard Avenue Drain. Drainage flows from the east side ditch on Howard Avenue north of South Talbot Road, the west side ditch of the new Howard Avenue Diversion and the north and south ditches of the new Howard Avenue Connector no longer use the Howard Avenue road culvert as an outlet into the Howard Avenue Drain. The outlet for this drainage has been moved approximately 60 m further upstream and connected into the smaller 600 mm diameter enclosure section of the Howard Avenue Drain

Previous to the construction of both the Laurier Parkway and Rt. Hon. Herb Gray Parkway, the drainage flows from the east side ditch on Howard Avenue north of South Talbot Road would flow into the Burke Drain. Any excess flows continued south within the road ditch crossing South Talbot Road through an existing 1050 mm CSP culvert and continuing along the east side of Howard Avenue through a series of 500 mm diameter CSP culverts before crossing over Howard Avenue through an existing 750 mm diameter CSP culvert into the Howard Avenue Drain. The South Talbot Road culvert provided relief for the Burke Drain during times of high flows. This culvert was later replaced with a smaller 600 mm diameter culvert at the time of Laurier Parkway construction. It remains as a 600 mm diameter culvert although was raised approximately 300 mm higher during the re-alignment of South Talbot Road at the time of Rt. Hon. Herb Gray Parkway construction. This culvert still provides some drainage relief for the Burke Drain during high flows, however at a reduced rate.

On-Site Meeting

We conducted an on-site meeting on July 3, 2013 at the Macedonian Community Centre, in the Town of LaSalle. All landowners within the 3rd Concession Drain watershed were invited which included upstream drains like the Howard Avenue Drain and Burke Drain. An overview of The Parkway project was introduced to those landowners who attended this meeting. It was explained that the Town of LaSalle accepted a request from the MTO to have an engineer appointed under Section 78 of the Drainage Act to examine the Burke Drain and assess its condition and adequacy to provide a sufficient outlet for the lands and roads being serviced including the Rt. Hon. Herb Gray Parkway.

Furthermore, where the engineer determines that improvements are required to obtain a sufficient outlet, the recommendations will be contained within the engineer's report that will be presented to Town of LaSalle Council for their consideration and adoption thereof prior to undertaking any necessary drainage works. The MTO has agreed in principle that costs associated with the preparation of this report for the Burke Drain will be covered by the Parkway project. In accordance with the Drainage Act legislation, these costs form part of the costs of the drainage works.

All landowners were invited to submit their questions, provide comment or concerns as to their present drainage condition. The feedback was recorded and compiled for the Burke Drain. Where more information or clarification was required by the engineer, there was subsequent follow up with the landowner to better understand the issues.

Regulatory Authorities and Stakeholder Consultation

Stakeholder consultation and engagement was an ongoing process during the detailed design phase of The Parkway. With respect to the Burke Drain, key stakeholders included Fisheries and Oceans Canada (DFO), Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Town of LaSalle, the Town of Tecumseh, the County of Essex, and the Essex Region Conservation Authority (ERCA). Core agency consultation group meetings were held on an average of every four to six weeks which provided opportunities for the design team to present aspects of the design in advance of submissions to MTO, and to solicit feedback to identify additional design considerations and/or concerns. Supplementary meetings were held with the Towns of LaSalle and Tecumseh to discuss drainage requirements for the service roads connecting the future Highway 401 to existing municipal drains, confirm Drainage Act requirements and appointments, and address potential peak flow impacts to downstream municipal drainage systems. The existing land on the east side of the Burke Drain near Outer Drive & South Talbot Road has experienced flooding occasionally. In recognition of this, drainage works proposed as part of the Windsor-Essex Parkway project were not to exacerbate the existing conditions.

Survey and Findings

Our survey and examination of the Burke Drain was originally completed in October 2012 prior to the drain cleanout undertaken by The Parkway's contractor in 2013. The survey comprised the recording of topographic data and examining the channel for available depth and capacity necessary to provide a sufficient drainage outlet for the lands and roads within the watershed. We found that there is a significant amount of overgrown brush and vegetation with frequent accumulation of debris forming blockages within the channel. There is also considerable sedimentation which reduces the drain's capacity.

A second survey of the Burke Drain was carried out in July 2015 to record the drain bottom condition approximately two years following the cleanout. We discovered that a considerable accumulation of sediment has returned to the drain. We surmise the premature sediment build up is partially attributed to the presence of straw bales staked into the bottom of the drain that effectively trap the sediment and prevent it from migrating downstream into the covered portion of the Howard Avenue Drain.

The most upstream portion of the Burke Drain located north of King's Highway No. 3 from Station 1+383 to Station 1+568 represents the enclosed portion of drain

consisting of 70 m of 525 mm diameter concrete pipe followed by 115 m of 600 mm diameter concrete pipe installed as part of Burke Drain improvements during the Herb Gray Parkway construction in 2012. This same section of drain was known to previously exist as a covered drain consisting of 600 mm diameter pipe however to our knowledge no previous report or by-law representing this enclosure confirms its legal status. We discovered during our July 2015 survey that the new drain enclosure pipe was considerably filled in with sediment and there was standing water observed within the three (3) existing maintenance holes.

Upon further inspection later in October 2015, it was determined that the Parkway's contractor had subsequently cleaned the full length of the drain enclosure during the completion of the Outer Drive roadwork with no standing water observed within the enclosure pipe or the lateral road crossings. There is minimal grade on the 600 mm diameter enclosure pipe lacking the necessary gradient to create self-flushing velocities, and therefore may be subject to more frequent maintenance. Despite this the gradient available is sufficient to convey the 25 year design peak flow comparable to the original open drain design condition that once existed as per the 1958 report. The maintenance holes on the drain enclosure are at an appropriate spacing to allow future cleaning using modern sewer pipe flushing equipment.

We also discovered that the lower portion of the Burke Drain is relatively shallow at approximately 1 m depth compared to over 1.5 m depth further upstream. Both the existing 900 mm diameter CSP culvert across Outer Drive and the existing 900 mm diameter concrete culvert across Howard Avenue Diversion beyond the Burke Drain outlet are currently limiting the depth of the drain. Beyond these culverts there is a drop of approximately 0.5 m into the covered portion of the Howard Avenue Drain.

From the results of our hydraulic analysis we find the capacity of the Howard Avenue Diversion culvert at the outlet of the Burke Drain is limited by the existing enclosure on the Howard Avenue Drain and results in a surcharged condition when conveying the flows from a 2 year return period design storm. The surcharging results in a minor backwater condition extending upstream within the Howard Avenue Drain, Burke Drain and the interconnected road side ditches along Howard Avenue, Howard Avenue Diversion and Howard Avenue Connector. Hydrologic modelling results indicate the drainage flows and resulting backwaters will remain within the respective drains and roadside ditches without overtopping provided they are kept in good repair.

We also observed that existing farmland on the east side of the Burke Drain (property Roll No. 470-01300 Amico Infrastructures) has experienced some tile drain damage following heavy rain events from June 2015. There was also extensive flooding at the south end of this farm as well as directly across South Talbot Road on the south side. Upon closer examination and discussions with the landowner it was discovered that the existing 300 mm diameter tile main servicing most of the farm's sub-surface drainage system is lower than the Burke Drain and was plugged by the build-up of sediment in the drain. We measured the tile to be 250 mm lower than the nearby downstream Outer Drive road culvert.

In the Spring of 2017, the Town of Tecumseh requested a new Burke Drain crossing to facilitate an approximate 3.5 km westerly extension of the existing Chrysler Greenway trail connecting to Outer Drive and the Parkway. Construction followed in the Summer of 2017 including the new drain crossing denoted as Bridge No. 3 herein.

Design Considerations

The Design and Construction Guidelines for Work under the Drainage Act, 1985 as published by OMAFRA, is the current reference document used by engineers carrying out work on municipal drains under the Act. The 2 year return period design storm is the recommended design standard applied to municipal drains within rural Ontario specific to open drain channels and low hazard agricultural field access crossings. For residential, industrial and commercial properties where flooding could wash out an access culvert, a higher 5 to 10 year return period design storm is the recommended design criteria.

The 10 year return period design storm is the recommended design criteria applied to culverts on municipal drains crossing municipal roads such as South Talbot Road and Laurier Parkway. For county and/or provincial highway road culverts like the 900 mm diameter across Howard Avenue Diversion, the recommended design criteria can vary from a 10 year to 25 year return period design storm. From consultations with the County of Essex and Ministry of Transportation road authorities we confirmed that their current criteria for culvert design across Howard Avenue Diversion is the 10 year return period design storm, which we have selected.

Private access culverts and road crossings have been sized using the Rational Method. The peak flows determined by the Rational Method should freely pass through the culverts without experiencing any backwater effects. Hydrologic and hydraulic analyses using computer aided modeling were applied and it was confirmed that the downstream impacts the Burke Drain improvements have a negligible effect on the receiving drains that being the Howard Avenue Drain and the 3rd Concession Drain.

With respect to the above design considerations, the outlet for the Burke Drain is the Howard Avenue Diversion culvert, where a minimum 10 year return period design storm criteria would apply for a road crossing. From the results of our hydraulic analysis we find the capacity of the Howard Avenue Diversion culvert on the Burke Drain is limited by the existing Howard Avenue Drain enclosure and results in a surcharged condition when conveying the flows from a 10 year return period design storm. The surcharging results in a backwater condition extending upstream within the Howard Avenue Drain and Burke Drain where minor overtopping of the drain banks and localized flooding is possible within low lying areas.

Considering the drainage condition that existed prior to the construction of the Howard Avenue Drain enclosure and culvert modifications at the Howard Avenue and South Talbot Road intersection, our hydraulic analysis determined that the existing 900 mm diameter culvert across Howard Avenue Diversion was previously adequate to handle the 10 year return period design storm as the outlet for the Burke Drain. The adequacy of this outlet is however dependent on the Howard Avenue east ditch conveying some of these flows southerly across South Talbot Road and through a more southerly Howard Avenue road culvert (750 mm diameter) located approximately 250 metres south of the 900 mm diameter culvert crossing Howard Avenue Diversion.

Given that the present Howard Avenue Drain enclosure has also been identified as an insufficient outlet for the Burke Drain, the dependency on flow relief being provided by the downstream Howard Avenue east side road ditch and the lack of depth available for existing farm sub-surface drainage systems, we have recommended that

improvements be made to the Burke Drain through a new relocated outlet into the Howard Avenue Drain just beyond the downstream end of the Howard Avenue Drain enclosure. The new Burke Drain outlet has been designed to provide sufficient capacity to alleviate the backwater condition experienced on the Howard Avenue Drain enclosure when subjected to a 10 year return period storm.

Recommendations

Based on our review of the history, the information obtained during the site meeting, our examination of the survey data, hydrologic and hydraulic analysis, we have recommended the following improvements to the Burke Drain:

- A new relocated Burke Drain outlet extending across South Talbot Road and continuing south along the east side of Howard Avenue for a distance of 132 m before crossing Howard Avenue to reach the Howard Avenue Drain open channel. The drainage works from Station 0+000 to Station 0+208 consist of an open drain channel with two new road crossings denoted as Bridge No. 1 and Bridge No. 2 on the drawings appended hereto. The new drainage outlet will serve as the primary outlet for the Burke Drain and the east ditch along the Howard Avenue Diversion providing greater depth and improved capacity meeting the 10 year return period design for both road crossings. To ensure these drainage works are taken to a sufficient outlet, there are also improvements required to the downstream portion of the Howard Avenue Drain. The details are provided under a separate report.
- The east –west portion of the existing Burke Drain outlet from Outer Drive to Howard Avenue uses the 900 mm diameter concrete culvert crossing under the Howard Avenue Diversion into the Howard Avenue Drain. Once the new relocated Burke Drain outlet is in place, this original outlet will still serve a secondary function providing backwater relief for the Howard Avenue Drain and alleviating the restriction imposed by the enclosure up to and including the 10 year return period design storm standard for the Howard Avenue Drain crossing of Laurier Parkway. To achieve this result we recommend the original outlet be deepened and re-graded to flow from west to east and be renamed the Burke Branch, an interconnecting drain municipal drain between the Howard Avenue Drain and Burke Drain.
- A new culvert across South Talbot Road (Bridge No. 2) consisting of a 1050 mm diameter concrete pipe with flared inlet has the capacity to convey the 10 year return period design storm without surcharging. The depth of the culvert will permit the upstream portion of the Burke Drain to be lowered by approximately 0.5 m. The culvert has also been sized to alleviate the surcharged condition experienced on the Howard Avenue Drain enclosure. To facilitate the installation of this culvert across South Talbot Road there is the required lowering of an existing 200 mm diameter high pressure gas main and an existing 200 mm diameter water main on the north and south sides of South Talbot Road respectively.
- A new culvert across Howard Avenue (Bridge No. 1) consisting of a 1200 mm diameter concrete pipe with flared inlet has the capacity to convey the 10 year return period design storm without surcharging. The culvert has also been sized to alleviate the surcharged condition experienced on the Howard Avenue Drain enclosure. To facilitate the installation of this culvert across Howard Avenue there

is the required lowering of an existing 200 mm diameter high pressure gas main on the east side of Howard Avenue.

- Replacement of the existing 900 mm diameter CSP culvert across the former Outer Drive (closed road allowance) on the original Burke Drain outlet with a new 900 mm diameter HDPE culvert accompanied by the re-grading to direct flows towards the new Burke Drain outlet. The new culvert will maintain access to the southerly end of the former Outer Drive as a future utility access corridor.
- Fill existing road swales on South Talbot Road and re-direct road surface drainage to new Burke Drain outlet.
- Extend existing 600 mm diameter CSP culvert under South Talbot Road to new Burke Drain outlet.
- Fill in existing road swale on east side of Howard Avenue and re-direct road surface drainage to new Burke Drain outlet.
- Construct new open drain channel for the Burke Drain outlet on private lands (Roll No. 450-02500) consisting of a 1 m wide bottom, 2:1 side slopes and including stone erosion protection on drain bends and hydraulic seeding of new drain banks.
- Removal of access culverts which are redundant following the infilling of road swales.
- Re-grading of the Burke Drain from Station 0+208 to Station 0+415 to deepen and provide a minimum 150 mm freeboard for existing farm drainage tile.
- Cleanout of Burke Drain from Station 0+415 to Station 1+383 including levelling and trucking of drain spoils and seeding of drain banks where specified.
- Widening of the Burke Drain east bank from Station 0+850 to Station 1+220.
- Seeding of 1 m wide grass buffer strip on east drain bank from Station 0+208 to Station 1+383.
- Excavate, remove and dispose of existing gravel road surface materials located within 1 m of the Burke Drain (west side) and restore the boulevard.
- Supply and installation of Bridge No. 3, a new access culvert for the proposed Chrysler Greenway crossing consisting of a 10 m long, 1200 mm diameter aluminized CSP with sloping stone end walls.
- Cleanout and repairs to Bridge No. 4 including placement of sloping stone end treatment. The existing 24 m long, 900 mm diameter corrugated steel pipe (CSP) is adequate in capacity and at sufficient depth. We understand it was installed during the Parkway project so we further recommend that it be incorporated as a legal crossing over the Burke Drain.
- Bridge No. 5 consisting of a 70 m long, 825 mm diameter steel ribbed pipe is adequate in capacity and at sufficient depth. We understand it was installed during the Parkway project so we further recommend that it be incorporated as a legal crossing over the Burke Drain.
- Replacement of Bridge No. 6, an existing 600 mm diameter CSP hydro pole access culvert with a new 9 m long, 800 mm diameter aluminized CSP with sloping stone end walls. The new culvert will provide a similar capacity to the upstream enclosed portion of the Burke Drain such that these flows will not create a temporary backwater condition and potential flooding impacting the south end of

Outer Drive north of King's Highway No. 3.

- Erosion protection at surface water inlets and replacement of silt fence barrier on east drain bank from Station 0+882 to Station 1+220.
- Construct temporary sediment trap and rock flow check dam at outlet of drain cleanout work. All other straw bale check dams should be removed where encountered.
- For the upper portion of the Burke Drain that is enclosed from Station 1+383 to Station 1+568, we recommend the main pipe consisting of 525 mm & 600 mm diameter concrete pipe and the three (3) maintenance holes associated therewith be incorporated as the upstream covered drain portion of the Burke Drain.

Allowances

In accordance with Sections 29 and 30 of the Drainage Act, we have made a determination of the amount to be paid for damages to the lands and for land taken in the improvements to the Burke Drain and the establishment of a permanent 1.0 m wide grass buffer strip on the east side of the drain from Station 0+208 to Station 1+383, as specified herein. Schedule 'A' shows the distribution of these allowances for damages and for land taken in the amount totalling $13,000.00.

Cost Estimate

We estimate the costs of the Burke Drain improvements as described below:

Item	Description	Amount
	BURKE DRAIN OUTLET (STA. 0+000 to 0+208)	
1.	Strip topsoil over width of new drain excavation from Station 0+032 to Station 0+164 (minimum 6.5 m wide and 150 mm depth) and temporarily stockpile at easterly limit of 15 m wide working corridor (approx. 900 m^2).	$2,000.00
2	Strip topsoil and remove vegetation from existing road swale on east side of Howard Avenue to be filled including disposal off-site.	$1,500.00
3.	Excavate new drain from Station 0+032 to Station 0+164 (1.0 m bottom, 2:1 sideslopes) including filling of existing road swale with excavated materials.	$7,000.00
4.	Dispose of excess excavation materials off-site (approx. 100 m^3) including trucking and hauling.	$1,500.00
5.	Supply and place salvaged topsoil over new drain channel (minimum 50 mm layer) including fine grading and hydro seeding (approx. 800 m^2).	$3,200.00
6.	Supply and place salvaged topsoil over filled road swale adjacent to new drain channel (minimum 100 mm layer) including fine grading and hydro seeding (approx. 700 m^2).	$2,800.00

Item	Description	Amount
7.	Remove and dispose of existing culverts off-site (2 total) – 600 mm dia. CSP 15 m long on south side of South Talbot Road, 600 mm dia. CSP 15 m long on east side of Howard Avenue.	$3,000.00
8.	Remove and salvage stone erosion protection from abandoned road swale portions on South Talbot Road (approx. 180 m^2).	$3,500.00
9.	Re-direct existing road swales along the north and south sides of South Talbot Road including the supply and placement of salvaged stone erosion protection (approx. 140 m^2), excavation and filling of abandoned road swale portions (approx. 70 m).	$10,500.00
10.	Supply and place salvaged topsoil over filled road swales along South Talbot Road (minimum 100 mm layer) including fine grading and hydro seeding (approx. 250 m^2).	$1,000.00
11.	Supply and place stone erosion protection on new drain bend for Burke Drain where specified at Station 0+145, minimum 300 mm thickness (approx. 60 m^2).	$4,000.00
12.	Bridge No. 1 – Station 0+016 (Howard Avenue) – Supply and installation of a new 30 m long, 1200 mm diameter concrete pipe (CSA A257.2) complete with flared end inlet pipe, clear stone bedding (approx. 30 tonnes), granular 'A' backfill (approx.. 250 tonnes), stone erosion protection (approx. 60 m^2) and restoration of asphalt roadway (60 mm SP19 base, 60 mm SP12.5 surface), approx. 60 m^2).	$44,000.00
13.	Bridge No. 2 – Station 0+186 (South Talbot Road) – Supply and installation of a new 42 m long, 1050 mm diameter concrete pipe (CSA A257.2) complete with flared end inlet pipe, clear stone bedding (approx. 35 tonnes), granular 'A' backfill (approx. 150 tonnes), stone erosion protection (approx. 50 m^2) on north end and restoration of asphalt roadway (60 mm SP19 base, 60 mm SP12.5 surface), approx. 60 m^2).	$42,000.00
14.	South Talbot Road culvert at Station 0+145 - Extend existing 600 mm diameter CSP with a new 600 mm CSP 10 m long, complete with 30 degree bend.	$1,500.00
15.	Remove and dispose off-site the existing catch basin and 200 mm diameter lead into the Howard Avenue east ditch.	$500.00
16.	Lowering of existing 200 mm diameter high pressure gas main on Howard Avenue crossing (Bridge No. 1).	$125,000.00

Item	Description	Amount
17.	Lowering of existing 200 mm diameter high pressure gas main on South Talbot Road crossing (Bridge No. 2).	$125,000.00
18.	Lowering of existing 200 mm diameter water main on South Talbot Road crossing (Bridge No. 2).	$15,000.00
	Total Construction Estimate **Burke Drain Outlet (Sta. 0+000 to Sta. 0+208)**	**$393,000.00**
19.	Allowances under Sections 29 and 30	$4,700.00
20.	Drain Survey, Design, Report, attend Council meetings including expenses and incidentals.	$114,000.00
21.	Drain Assessment Rationale & Assessment Schedules, Report, attend Council meetings including expenses and incidentals as per N.J. Peralta Engineering.	$20,000.00
22.	Contract administration and inspection of Burke Drain Outlet (Sta. 0+000 to Sta. 0+208)	$20,000.00
23.	Estimated future engineering costs associated with lowering of two (2) existing gas mains to locate (Hydrovac excavation), survey, prepare preliminary drawings and attend design and pre-construction site meetings.	$16,000.00
24.	Contract administration and inspection of two (2) gas mains lowering .	$12,500.00
25.	Engineering costs associated with lowering of watermain	$5,500.00
26.	Contract administration and inspection of watermain lowering .	$750.00
	Total Estimate **Burke Drain Outlet (Sta. 0+000 to Sta. 0+208)**	**$586,450.00**
	BURKE DRAIN (STA. 0+208 to 1+568)	
27.	Brushing of the drain from Station 0+208 to Station 1+220 including the disposal of brush off-site. Mature healthy trees beyond drain banks to remain.	$6,000.00
28.	Excavation and levelling of drain spoils, as follows:	
	a) Station 0+208 to Station 0+850, totalling approx. 642 lineal metres of drain and approx. 160 m^3 of material (1.0 m wide bottom).	$4,400.00

Item	Description	Amount
	b) Station 1+290 to Station 1+383, totalling approx. 93 lineal metres of drain and approx. 20 m^3 of material (1.0 m wide bottom). The work includes temporary removal and restoration of chain link fence. No levelling of drain spoils.	$3,100.00
29.	Excavation and widening of the drain (1 m beyond east bank), as follows:	
	a) Station 0+850 to Station 1+220, totalling approx. 370 lineal metres of drain and approx. 640 m^3 of material (1.0 m wide bottom).	$3,800.00
30.	Trucking of drain spoils off-site, as follows:	
	a) Station 0+850 to Station 1+220, totalling approx. 370 lineal metres of drain and approx. 640 m^3 of material.	$11,000.00
	b) Station 1+290 to Station 1+383, totalling approximately 93 lineal metres of drain and approximately 20 m^3 of material.	$400.00
31.	Hydraulic seeding of widened east drain bank from Station 0+850 to Station 1+220; and from Station 1+290 to Station 1+383 (approx. 1,250 m^2).	$6,000.00
32.	Seeding of minimum 1 m wide grass buffer strip along east side of drain from Station 0+208 to Station 1+383, (approx. 1,060 m^2).	$3,900.00
33.	Supply and install new light-duty silt fence barrier (as per OPSD 219.110) staked along east side of drain (1 m setback from drain) from Station 0+882 to Station 1+143.	$4,000.00
34.	Supply and install new light-duty silt fence barrier (as per OPSD 219.110) staked along east side of drain (1 m setback) from Station 1+167 to Station 1+220.	$1,000.00
35.	Excavate, remove and dispose of existing gravel road surface materials situated on or within 1 m of the Burke Drain (west side) to restore boulevard. Starting from existing commuter parking lot (approx. Station 0+500 and extending to the south end of Bridge No. 4 at approx. Station 1+143) the work shall include placement of imported screened top soil (minimum 150 mm layer) and seeding to establish a minimum 1 m wide grass buffer along west side of drain (approx. 643 m^2). Where the west drain bank has been disturbed by the gravel removal process the contractor shall re-grade and hydraulic seed.	$17,500.00

Item	Description	Amount
36.	Construct 1 m wide sediment trap from Station 0+201 to Station 0+208 (4 m long x 0.5 m deep) complete with rock flow check dam on downstream side (3 m long x 2.0 m wide x 0.5 m high) approx. 10 tonnes. The work shall be in accordance with OPSD 219.22	$1,200.00
37.	Bridge replacement works, as follows:	
	a) Bridge No. 6 - Station 1+328 (Hydro pole access) – Remove and dispose of existing 9 m long, 600 mm diameter CSP off-site. Supply and installation of a new 9 m long, 800 mm diameter aluminized corrugated steel pipe (CSP) complete with clear stone bedding (approx. 10 tonnes), granular 'A' backfill (approx. 25 tonnes), stone erosion protection (approx. 20 m^2). The work shall include temporary removal and restoration of existing chain link fence.	$6,500.00
38.	New access bridge works, as follows:	
	a) Bridge No. 3 - Station 0+227 (Chrysler Greenway Extension) - Supply and installation of a new 10 m long, 1200 mm diameter aluminized corrugated steel pipe (CSP) complete with clear stone bedding (approx. 10 tonnes), granular 'A' backfill (approx. 70 tonnes), stone erosion protection (approx. 40 m^2).	$8,500.00
39.	Bridge cleaning and repair works, as follows:	
	a) Bridge No. 4 - Station 1+155 (Roll No. 470-05402) – Flush and clean existing 24 m long, 900 mm diameter CSP including disposal of sediment off-site. Supply and place sloping stone endwalls (approx. 20 m^2).	$2,200.00
40.	Stone Erosion protection works as follows:	
	a) (Roll No. 470-05402) – Station 0+882 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 20 m^2).	$1,200.00
	b) (Roll No. 470-05402) – Station 0+912 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 10 m^2).	$600.00
	c) (Roll No. 470-05402) – Station 1+013 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 10 m^2).	$600.00

Item	Description	Amount
	d) (Roll No. 470-05402) – Station 1+083 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 10 m^2).	$600.00
	Total Construction Estimate **Burke Drain (Sta. 0+208 to Sta. 1+568)**	**$82,500.00**
41.	Allowances under Sections 29 and 30	$8,300.00
42.	Drain Survey, Design, Report, attend Council meetings including expenses and incidentals.	$32,000.00
43.	Drain Assessment Rationale & Assessment Schedules, Report, attend Council meetings including expenses and incidentals as per N.J. Peralta Engineering.	$11,500.00
44.	Modifications to report and assessment to address changes requested to accommodate pedestrian trail & relocation of Bridge No. 3 to Station 0+227.	$3,000.00
45.	Contract administration and inspection of Burke Drain (Sta. 0+208 to Sta. 1+568).	$4,000.00
	Total Estimate **Burke Drain (Sta. 0+208 to Sta. 1+568)**	**$141,300.00**
	BURKE BRANCH (STA. 0+000A to 0+039A)	
46.	Excavation and trucking of drain spoils off-site, as follows:	
	a) Station 0+000A to Station 0+039A, totalling approx. 39 lineal metres of drain and approx. 10 m^3 of material (1.0 m wide bottom).	$700.00
47.	Remove and dispose of existing culverts off-site (2 total) – 750 mm dia. CSP 6 m long, 900 mm dia. 15 m long crossing Outer Drive.	$5,650.00
48.	Bridge No. 1A - Station 0+010A (Outer Drive)– Supply & install new 18 m long, 900 mm diameter HDPE Boss 2000 pipe complete with clear stone bedding (approx. 15 tonnes) and granular 'A' backfill (approx. 60 tonnes).	$9,250.00
49.	Supply and place stone erosion protection within new re-graded drain channel from Station 0+019A to Station 0+039A (approx. 80 m^2).	$5,000.00

Item	Description	Amount
50.	Remove and dispose of asphalt road surface between South Talbot Road and Outer Drive culvert including excavation and re-grading, topsoil placement (minimum 100 mm layer) and hydro seeding (approx. 400 m^2).	$4,500.00
	Total Construction Estimate **Burke Branch (Sta. 0+000A to Sta. 0+039A)**	**$25,100.00**
51.	Drain Survey, Design, Report, attend Council meetings including expenses and incidentals.	$8,500.00
52.	Drain Assessment Rationale & Assessment Schedules, Report, attend Council meetings including expenses and incidentals as per N.J. Peralta Engineering.	$2,500.00
53.	Contract administration and inspection of Burke Branch.	$1,250.00
	Total Estimate **Burke Branch (Sta. 0+000A to Sta. 0+039A)**	**$37,350.00**
	OVERALL TOTAL ESTIMATE **BURKE DRAIN, BURKE BRANCH & BURKE DRAIN OUTLET**	**$765,100.00**

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

Assessments

The foregoing capital costs as well as future costs of maintenance have been assessed to the affected landowners, roads and other parties as shown in the appended schedules of assessment **(see Part 'B' – Assessment Considerations)** as prepared by N.J. Peralta Engineering Ltd. A rationale for the assessments is also provided.

Drawings and Specifications

Attached to this report is "Schedule B", which are Specification setting out the details of the recommended works, and "Schedule C", which represents the following drawings that are also attached to this report:

Page 1 of 9: Watershed Plan
Page 2 of 9: Burke Drain Outlet & Burke Branch
Page 3 of 9: Profile 1 Sta. 0+000 to Sta. 0+900
Page 4 of 9: Profile 2 Sta. 0+900 to Sta. 1+568

Page 5 of 9:	**Cross Sections**
Page 6 of 9:	**Bridge No. 1 & 2 Details**
Page 7 of 9:	**Bridge No. 3 & 6 Details**
Page 8 of 9:	**OPSD Details 1**
Page 9 of 9:	**OPSD Details 2**

Fisheries Issues

The Burke Drain has been classified as a "Type F" drain by the Department of Fisheries and Oceans. Type F drains have intermittent water flow and may only provide habitat for fish periodically. Standard practices to be followed to minimize disruption to fish habitat include embedment of the culvert a minimum 10% below grade, constructing the work during low water levels in the drain, maintaining a 1.0 metre wide grass buffer strip along the drain banks, providing silt fencing until permanent erosion protection is in place on drain banks and cutting only trees necessary to do the work (no clear-cutting).

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

- In order to protect local fish populations during their spawning and nursery periods no **'in-water'** work should be conducted from March 15 – June 30 (DFO/MNRF) timing window without prior authorization from DFO (Department of Fisheries and Oceans) for emergency situations. Prior to undertaking any of these works, a DFO review and authorization in accordance with Fisheries Act may be required.
- All in-stream work should be completed in **'the dry'**.
- Sediment and erosion control measures should be implemented prior to work and regularly inspected and maintained during the work phase, to prevent entry of sediment into the water.
- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt, etc.) from entering the water.
- All disturbed areas should be stabilized immediately, and upon completion of work returned to a pre-disturbed state or better as soon as conditions allow.

Grants

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

of any lateral drains involved in this work that would not be eligible for a grant. We recommend that application be made to the Ministry of Agriculture, Food and Rural Affairs in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

Respectfully submitted,

DILLON CONSULTING LIMITED

Tim R. Oliver, P.Eng.

TRO:wlb:ges

SCHEDULE 'A'

SCHEDULE OF ALLOWANCES

BURKE DRAIN

TOWN OF LASALLE & TOWN OF TECUMSEH (COUNTY OF ESSEX)

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
450-02500	5	Pt Lot 8 RP12R7743	2484234 Ontario Inc.	$800.00	$3,900.00	$4,700.00
450-01300	STR	S Pt Lot 305	Amico Infrastructures	$2,200.00	$1,500.00	$3,700.00
470-05402	STR	Lot 305 RP 12R4084 Part 3	Congregation of the Order Antonin Maronite in Ontario	$1,100.00	$1,200.00	$2,300.00
470-05401	STR	Lot 305 RP 12R11524 Part 3	Ministry of Transportation Ontario	$180.00	$1,200.00	$1,380.00
470-05500	STR	Lot 305 RP 12R4084 Part 3	Ministry of Transportation Ontario	$120.00	$800.00	$920.00
TOTAL ALLOWANCES				**$4,400.00**	**$8,600.00**	**$13,000.00**

"SCHEDULE B"
DRAINAGE REPORT FOR THE
BURKE DRAIN
TOWN OF LASALLE & TOWN OF TECUMSEH
COUNTY OF ESSEX

SPECIAL PROVISIONS - GENERAL

1.0 GENERAL SPECIFICATIONS

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

2.0 DESCRIPTION OF WORK

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

BURKE DRAIN OUTLET (STA. 0+000 to 0+208)

- Strip topsoil over width of new drain excavation from Station 0+032 to Station 0+164 (minimum 6.5 m wide and 150 mm depth) and temporarily stockpile at easterly limit of 15 m wide working corridor (approx. 900 m^2).
- Strip topsoil and remove vegetation from existing road swale on east side of Howard Avenue to be filled including disposal off-site.
- Excavate new drain from Station 0+032 to Station 0+164 (1.0 m bottom, 2:1 sideslopes) including filling of existing road swale with excavated materials.
- Dispose of excess excavation materials off-site (approx. 100 m^3) including trucking and hauling.
- Supply and place salvaged topsoil over new drain channel (minimum 50 mm layer) including fine grading and hydro seeding (approx. 800 m^2).
- Supply and place salvaged topsoil over filled road swale adjacent to new drain channel (minimum 100 mm layer) including fine grading and hydro seeding (approx. 700 m^2).
- Remove and dispose of existing culverts off-site (2 total) – 600 mm dia. CSP 15 m long on south side of South Talbot Road, 600 mm dia. CSP 15 m long on east side of Howard Avenue.
- Remove and salvage stone erosion protection from abandoned road swale portions on South Talbot Road (approx. 180 m^2).
- Re-direct existing road swales along the north and south sides of South Talbot Road including the supply and placement of salvaged stone erosion protection (approx. 140 m^2) excavation and filling of abandoned road swale portions (approx. 70 m).
- Supply and place salvaged topsoil over filled road swales along South Talbot Road (minimum 100 mm layer) including fine grading and hydro seeding (approx. 250 m^2).
- Supply and place stone erosion protection on new drain bend for Burke Drain where specified at Station 0+145, 300 mm thickness (approx. 60 m^2).
- Bridge No. 1 – Station 0+016 (Howard Avenue) – Supply and installation of a new 30 m long, 1200 mm diameter concrete pipe (CSA A257.2) complete with flared end inlet pipe, clear stone bedding (approx. 30 tonnes), granular 'A' backfill (approx. 250 tonnes), stone erosion protection (approx.. 60 m^2) and restoration of asphalt roadway (60 mm SP19 base, 60 mm SP12.5 surface), approx. 60 m^2).

- Bridge No. 2 – Station 0+186 (South Talbot Road) – Supply and installation of a new 42 m long, 1050 mm diameter concrete pipe (CSA A257.2) complete with flared end inlet pipe, clear stone bedding (approx. 35 tonnes), granular 'A' backfill (approx. 150 tonnes), stone erosion protection (approx. 50 m^2) and restoration of asphalt roadway (60 mm SP19 base, 60 mm SP12.5 surface), approx. 60 m^2).
- South Talbot Road culvert at Station 0+145 - Extend existing 600 mm diameter CSP with a new 600 mm CSP 10 m long, complete with 30 degree bend.
- Remove and dispose off-site the existing catch basin and 200 mm diameter lead into the Howard Avenue east ditch.
- Lowering of existing 200 mm diameter high pressure gas main on Howard Avenue crossing (Bridge No. 1).
- Lowering of existing 200 mm diameter high pressure gas main on South Talbot Road crossing (Bridge No. 2).
- Lowering of existing 200 mm diameter water main on South Talbot Road crossing (Bridge No. 2).

BURKE DRAIN (STA. 0+208 to 1+568)

- Brushing of the drain from Station 0+208 to Station 1+220 including the disposal of brush off-site. Mature healthy trees beyond drain banks to remain.
- Excavation and levelling of excavated materials works, as follows:
  - Station 0+208 to Station 0+850, totalling approximately 642 lineal metres of drain and approximately 160 m^3 of material (1.0 m wide bottom).
  - Station 1+290 to Station 1+383, totalling approx. 93 lineal metres of drain and approx. 20 m^3 of material (1.0 m wide bottom). The work includes temporary removal and restoration of chain link fence. No levelling of drain spoils.
- Excavation and widening of the drain (1 m beyond east bank), as follows:
  - Station 0+850 to Station 1+220, totalling approx. 370 lineal metres of drain and approx. 640 m^3 of material (1.0 m wide bottom).
- Trucking of drain spoils off-site, as follows:
  - Station 0+850 to Station 1+220, totalling approx. 370 lineal metres of drain and approx. 640 m^3 of material.
  - Station 1+290 to Station 1+383, totalling approximately 93 lineal metres of drain and approximately 20 m^3 of material.
- Hydraulic seeding of widened east drain bank from Station 0+850 to Station 1+220 and from Station 1+290 to Station 1+383 (approx. 1,250 m^2).
- Seeding of 1 m wide grass buffer strip along east side of drain from Station 0+208 to Station 1+383 (approx. 1,060 m^2).
- Supply and install new light-duty silt fence barrier (as per OPSD 219.110) staked along east side of drain (1 m setback) from Station 0+882 to Station 1+143.
- Supply and install new light-duty silt fence barrier (as per OPSD 219.110) staked along east side of drain (1 m setback) from Station 1+167 to Station 1+220.
- Excavate, remove and dispose of existing gravel road surface materials situated on or within 1 m of the Burke Drain (west side) to restore boulevard. Starting from existing commuter parking lot (approx. Station 0+500 and extending to the south end of Bridge No. 4 at approx. Station 1+143) the work shall include placement of imported screened top soil (minimum 150 mm layer) and seeding to establish a minimum 1 m wide grass buffer along west side of drain (approx. 643 m^2). Where the west drain bank has been disturbed by the gravel removal process the contractor shall re-grade and hydraulic seed.
- Construct 1 m wide sediment trap from Station 0+201 to Station 0+208 (4 m long x 0.5 m deep) complete with rock flow check dam on downstream side (3 m long x 2.0 m wide x 0.5 m high) approx. 10 tonnes. The work shall be in accordance with OPSD 219.22

- Bridge replacement works, as follows:
  - Bridge No. 6 - Station 1+328 (Hydro pole access) – Remove and dispose of existing 9 m long, 600 mm diameter CSP off-site. Supply and installation of a new 9 m long, 800 mm diameter aluminized corrugated steel pipe (CSP) complete with clear stone bedding (approx. 10 tonnes), granular 'A' backfill (approx. 25 tonnes), stone erosion protection (approx. 20 m^2). The work shall include temporary removal and restoration of existing chain link fence.
- New access bridge works, as follows:
  - Bridge No. 3 – Station 0+227 (Chrysler Greenway) - Supply and installation of a new 10 m long, 1200 mm diameter aluminized corrugated steel pipe (CSP) complete with clear stone bedding (approx. 10 tonnes), granular 'A' backfill (approx. 70 tonnes), stone erosion protection (approx. 40 m^2).
- Bridge cleaning and repair works, as follows:
  - Bridge No. 4 - Station 1+155 (Roll No. 470-05402) –Flush and clean existing 24 m long, 900 mm diameter CSP including disposal of sediment off-site. Supply and place sloping stone endwalls (approx. 20 m^2).
- Stone Erosion protection works as follows:
  - (Roll No. 470-05402) – Station 0+882 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 20 m^2).
  - (Roll No. 470-05402) – Station 0+912 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 10 m^2).
  - (Roll No. 470-05402) – Station 1+013 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 10 m^2).
  - (Roll No. 470-05402) – Station 1+083 - Supply and install stone erosion protection (SEP) including filter fabric underlay for surface water inlet on east drain bank (approximately 10 m^2).

BURKE BRANCH (STA. 0+000A to 0+039A)

- Excavation and trucking of drain spoils off-site, as follows:
  - Station 0+000A to Station 0+039A, totalling approx. 39 lineal metres of drain and approx. 10 m^3 of material (1.0 m wide bottom).
- Remove and dispose of existing culverts off-site (2 total) – 750 mm dia. CSP 6 m long, 900 mm dia. 15 m long crossing Outer Drive.
- Bridge No. 1A - Station 0+010A (Outer Drive)– Remove existing 900 mm diameter CSP culvert and replace with a new 18 m long, 900 mm diameter HDPE Boss 2000 pipe complete with clear stone bedding (approx. 15 tonnes) and granular 'A' backfill (approx. 60 tonnes).
- Supply and place stone erosion protection within new re-graded drain channel from Station 0+019A to Station 0+039A (approx. 80 m^2).
- Remove and dispose of asphalt road surface between South Talbot Road and Outer Drive culvert including excavation and re-grading, topsoil placement (minimum 100 mm layer) and hydro seeding (approx. 400 m^2).

3.0 CONSTRUCTION ACCESS

Construction access shall be from South Talbot Road using the nearest existing farm entrances on both north and south sides of the road. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All road areas and grass lawn areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING CORRIDORS

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

FROM STA.	TO STA.	PRIMARY (See Note 1)	SECONDARY (See Note 2)
0+000	0+024	Howard Avenue road allowance	N/A
0+024	0+164	15.0 m wide on east side of drain	Howard Avenue road allowance
0+164	0+208	South Talbot road allowance	N/A
0+208	0+882	9.0 m wide on east side of drain	Outer Drive (closed road allowance)
0+882	1+220	Outer Drive (closed road allowance)	5.0 m wide on east side of drain
1+290	1+383	Outer Drive	5.0 m wide on east side of drain
1+383	1+568	Outer Drive	N/A

Note 1: *Primary working corridor* indicates the access corridor where excavation work is recommended from unless noted otherwise below and/or in the Specifications, as well as all purposes listed for Secondary Working Corridors.

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

5.0 BRUSHING

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

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

Large stones and other similar material shall be disposed of by the Contractor off the site.

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

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

6.0 EXCAVATION AND LEVELLING OF EXCAVATED MATERIALS

6.1 Excavation of Existing Drain Channel

In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades. **THE CONTRACTOR SHALL NOT EXCAVATE DEEPER THAN THE GRADELINES SHOWN ON THE DRAWINGS.** Should over-excavation of the drain bank occur, the Contractor will **not** be permitted to repair with native material packed into place by the excavator and reshaped. Should over-excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

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

Seeding of the disturbed drain banks shall be completed immediately following drain construction and as specified in Section 17.

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

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

6.2 Levelling of Excavated Materials

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

Excavated drain materials shall be spread to a depth not to exceed 300 mm, unless specified

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

6.3 Trucking of Excavated Materials

Trucking of excavated materials to off-site disposal site to be arranged by Contractor.

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

7.0 STONE EROSION PROTECTION (SEP)

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

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

8.0 SEEDING OF GRASS BUFFER STRIPS

All existing grassed areas disturbed by construction or as identified as new or existing grass buffers shall be seeded as specified herein. The existing ground surface to be seeded shall be loosened to a depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of. If mulching is required, it shall be carried out by the contractor as part of the item's tendered price.

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

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 m^2. Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m^2. 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.

9.0 HYDRAULIC SEEDING OF DRAIN BANKS

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

Hydraulic mulch shall consist of finely ground cellulose pulp derived from recycled newsprint and shall be dyed green. Its fiber consistency shall be approximately 60% fine fiber with the balance being paper particles, 40% of which shall be a diameter of 3 mm minimum and 6 mm maximum. Hydraulic mulch shall be applied at 2,000 kg per 10,000 m². Clean water shall be applied at 42,700 liters per 10,000 m².

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

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

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

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

10.0 CLEANING OF PRIVATE ACCESS CULVERTS

At the locations listed below, the Contractor shall clean the existing pipes or culverts to their full capacity and cross section or width. The operation may be carried out by mechanical means or by flushing. Any damage resulting from the Contractor's operation shall be rectified at his expense. All material removed from the pipes or culverts shall be transported to a dump site arranged by the Contractor. The Contractor shall be solely responsible for acquiring all permits required for the dump site. The Contractor shall take precautions during the construction period to avoid re-sedimentation of the pipes and culverts. Any sediment deposited as a result of construction activities shall be removed at the Contractor's expense.

- Bridge No. 4 - Station 1+155, 24 m long, 900 mm diameter corrugated steel pipe (CSP) culvert.

11.0 ROAD BRIDGE WORK

11.1 Location of New Culvert

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

11.2 Removal of Existing Culverts (Outer Drive)

The Contractor shall exercise caution when removing these materials as to minimize damage to the drain banks. Any damage to the drain shall be restored to original conditions at the expense

of the Contractor. The removed materials (existing culvert debris and end wall materials) shall be hauled away off-site.

11.3 Materials for New Road Culverts

Materials should be as follows:

Culvert Pipe	**Bridge No. 1 - Station 0+016 (Howard Ave):** *New 30 long, 1200 diameter CSA A-257.2 Class 100-D reinforced circular concrete pipe including a flared end inlet pipe length.* **Bridge No. 2 - Station 0+186 (South Talbot Road):** *New 42 m long, 1050 diameter CSA A-257.2 Class 100-D reinforced circular concrete pipe including a flared end inlet pipe length.* **Bridge No. 1A - Station 0+010A (Outer Drive):** *New 18 m long, 900 mm diameter smooth wall, high density polyethylene (HDPE), conforming to ASTM D3350, CSA B182.8-02 and OPSD 1840. The pipe is to provide a minimum stiffness of 320kPa.* *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 ASTMD3350, CSA B182.8-02 and OPSD 1840* **South Talbot culvert -** *New 10 m long, 600 mm diameter aluminized Type II corrugated steel pipe (CSP) wall thickness of 2.0 mm and 68 mm x 13 mm corrugations. New culvert shall be joined with annular aluminized corrugated wide bolt and angle couplers (minimum of 8 corrugation overlap and 2.0 mm wall thickness). All pipes connected with couplers shall abut to each other with no more than a 25 mm gap between pipes prior to installation of the coupler. Pre-fabricated 30 degree bend to be in accordance with the manufacturer's specifications.*
Pipe Bedding Below Pipe	*20-25 mm clear stone conforming to OPSS Division 10.*
Backfill	*Granular 'A' conforming to OPSS Division 10.*
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.*
Buffer Strips	*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.*

11.4 Culvert Installation

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

11.5 Sloping Stone End Walls

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

11.6 Granular 'A' Driveway

The Contractor shall construct the driveway with a maximum 3% longitudinal grade approach over the new culvert providing a minimum 600 mm cover. The minimum top width of the driveway shall be as shown on the drawings.

11.7 Native Materials

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

11.8 Lateral Tile Drains

Should the Contractor encounter any lateral tiles within the proposed culvert limits not shown on attached drawings, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new culvert. **Tile drain outlets through the wall of the new culvert pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense. Care must be taken in handling plastic drain pipe in cold weather to avoid causing damage. Plastic drain pipe shall be held in position on planned grade immediately after installation by careful placement of backfill material.

11.9 Asphalt Restoration

The Contractor shall supply and install 60 mm lift of hot mix asphalt composed of SP 19 base course plus a final 60 mm lift of SP12.5 top course to match the existing road surface. The adjoining pavement must be saw-cut to the satisfaction of the Road Authority prior to asphalt placement. Prior to placing the top lift of asphalt, the contractor shall mill the existing road surface located immediately beyond the road cut to a 60 mm depth for an additional 300 mm width on both sides. The final course of asphalt shall extend across the full driving surface of the roadway and the gravel shoulders restored. The contractor shall perform the road reconstruction in accordance with OPSS 310 - Hot Mix Asphalt and OPSS 532 - Pavement Markings.

12.0 ACCESS BRIDGE WORK

12.1 Location of New Culvert

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

12.2 Removal of Existing Culvert

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

12.3 Materials

Materials shall be as follows:

Culvert Pipe	**Bridge No. 3 - Station 0+227:** *New 10.0 m long, 1200 mm aluminized Type II corrugated steel pipe (CSP) wall thickness of 2.8 mm and 125 mm x 25 mm corrugations. New culvert shall be joined with annular aluminized corrugated wide bolt and angle couplers (minimum of 8 corrugation overlap and 2.0 mm wall thickness) and no single pipe less than 6.0 m in length. All pipes connected with couplers shall abut to each other with no more than a 25 mm gap between pipes prior to installation of the coupler.* **Bridge No. 6 - Station 1+328:** *New 9.0 m long, 800 mm aluminized Type II corrugated steel pipe (CSP) wall thickness of 2.0 mm and 68 mm x 13 mm corrugations. New culvert shall be joined with annular aluminized corrugated wide bolt and angle couplers (minimum of 8 corrugation overlap and 2.0 mm wall thickness) and no single pipe less than 6.0 m in length. All pipes connected with couplers shall abut to each other with no more than a 25 mm gap between pipes prior to installation of the coupler.*
Pipe Bedding Below Pipe	*20-25 mm clear stone conforming to OPSS Division 10.*
Backfill	*Granular 'A' conforming to OPSS Division 10.*
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.*
Buffer Strips	*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.*

12.4 Culvert Installation

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

12.5 Sloping Stone End Walls

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

12.6 Granular 'A' Driveway

The Contractor shall construct the driveway with a maximum 3% longitudinal grade approach over the new culvert providing a minimum 300 mm cover. The minimum top width of the driveway shall be as shown on the drawings.

12.7 Native Materials

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

12.8 Lateral Tile Drains

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

All tile relocation work (if any) shall be in accordance with Section 17.0 of these specifications except as amended below. The Contractor shall construct the driveway with a maximum 3% longitudinal grade approach over the new culvert providing a minimum 300 mm cover. The minimum top width of the driveway shall be as shown on the drawings.

13.0 WATER MAIN RELOCATION

The Contractor shall relocate the existing 200 mm diameter PVC water main on the south side of South Talbot Road prior to the installation of the new concrete pipe culvert. The water main shall be deflected using four (4) mechanical joint 45 degree bends complete with retainer glands and restraint devices. Concrete thrust blocks shall be placed for the vertical bends in accordance with OPSD 1103.02. A minimum clearance of 500 mm is required between the relocated water main and the concrete pipe culvert while ensuring the water main has a minimum 1.50 m cover. The Contractor shall also be responsible for conducting pressure testing, chlorination and sampling tests following completion of the work in accordance with the requirements of the Town of Tecumseh Public Works Department.

14.0 GAS MAIN RELOCATION

The design details and specifications for the gas main lowering in both locations across the north side of South Talbot Road and east side of Howard Avenue will be provided by the operating authority and its agents. A franchise agreement between the Corporation (Municipality) and Union Gas requires execution prior to commencing the work. Should the contractor be required to provide the civil works associated with the gas main relocation, he/she shall possess all the necessary certifications and approvals required by Union Gas prior to construction.

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.

BURKE DRAIN, BURKE BRANCH, AND

BURKE DRAIN OUTLET

PART B – ASSESSMENT CONSIDERATIONS

TOWN OF LASALLE & TOWN OF TECUMSEH

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division St. N., Kingsville, Ontario N9Y 1E1
Tel. (519) 733-6587

Project No. D-14-034

June 6th, 2018

Mayor and Council
Corporation of the Town of LaSalle
5950 Malden Road
LaSalle, Ontario
N9H 1S4

SUBJECT: BURKE DRAIN, BURKE BRANCH, AND BURKE DRAIN OUTLET
Town of LaSalle & Town of Tecumseh, County of Essex
Project No. D-14-034 (Dillon File No. 12-6578-1300)

PART B - ASSESSMENT CONSIDERATIONS

I. INSTRUCTIONS

As referred to in the preamble portion of this report, this drainage project is proceeding under a joint appointment of Dillon Consulting Limited and N.J. Peralta Engineering Ltd., with each having a distinct role for the preparation of this drainage report in accordance with Section 78 of the Drainage Act, for the Burke Drain which serves as an outlet for the Rt. Hon. Herb Gray Parkway.

N.J. Peralta Engineering Ltd.'s role with respect to this drainage project shall be limited to the determination of assessments and provision of rationale for the distribution of costs against all lands, roads, and public utilities affected by alterations necessary to the Burke Drain as outlined in **PART A - TECHNICAL CONSIDERATIONS** portion of this Drainage Report prepared by Dillon Consulting Limited. Our assessments are intended to be prepared for both the construction and for the future maintenance of the Burke Drain which has evolved under this report to be hereinafter known as the Burke Drain, Burke Branch, and Burke Drain Outlet, all in the form of Assessment Schedules. Our confirmation of appointment for this Section 78 Engineer's Report for the Burke Drain was provided us by letter from Peter Marra, P.Eng., (LaSalle Director of Public Works) on January 23rd, 2015.

Our appointment as above described and all of the work related to the Burke Drain, Burke Branch, and Burke Drain Outlet under our portion of this report are in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended in 2010". We carried out all of the necessary examinations, investigations, and review of the Dillon Consulting PART A - TECHNICAL CONSIDERATIONS portion of this report as well as their design drawings. We also

discussed all details with Mr. Tim Oliver, P.Eng., where necessary, in order to gain a clearer understanding of the technical findings and determinations, to assist us with establishing both the Construction Assessment Rationale and the Future Maintenance Assessment Rationale relative to this drainage works.

II. INTRODUCTION

Our responsibilities with respect to this drainage project are to be limited to the determinations of assessments and the provision of the assessment rationale for the distribution of costs against all lands, roads, and public utilities affected by the proposed improvements to the Burke Drain and the construction of the Burke Branch and Burke Drain Outlet, as described within the design drawings included with the PART A - TECHNICAL CONSIDERATIONS by Dillon Consulting. The assessment considerations to be provided by us shall be prepared for not only the construction works being recommended by Dillon within this report, but also for the future maintenance provision for this drainage system.

In order for us to establish our construction assessments and future maintenance assessments, we worked closely with Mr. Oliver, P.Eng., to obtain all relevant and necessary detailed technical information related to their design of this drainage system.

III. DRAINAGE HISTORY AND WATERSHED DETERMINATIONS

A review of the drainage records both in the Town of LaSalle and the Town of Tecumseh indicates that the Burke Drain is an existing and generally open Municipal Drain that has been repaired and maintained under a number of previous occasions under the provisions of the Drainage Act. The last major works and only engineer's report on this drain was completed under a report prepared by C.G.R. Armstrong, P.Eng., dated February 21st, 1958. At that time, the Burke Drain was constructed under petition and was deepened and widened throughout its entire length and taken to a sufficient outlet by the Engineer. This report was adopted by way of By-Law No.1269 of the former Corporation of the Township of Sandwich South, which is now known as the Town of Tecumseh.

The upper end of the Burke Drain commenced at approximately the south limit of King's Highway No.3 and extended in a southwesterly direction along the east side of Outer Drive to a point just northerly of the South Talbot Road, where the drain turned westerly across Outer Drive and extended further westerly from that point to approximately the east limit of County Road 9 (Howard Avenue) where it outletted into the east end of the existing road crossing culvert under County Road 9 (Howard Avenue). From our review of available County of Essex Roads Department plans and drawings along this section of County Road 9

(Howard Avenue), the road crossing culvert into which the Burke Drain outletted to, discharged into an existing roadway ditch along the west side of County Road 9 (Howard Avenue). This roadway ditch was completely open at the time and extended southerly along the west side of County Road 9 (Howard Avenue) to its outlet into the 3rd Concession Drain.

Historically, the above mentioned County Road 9 (Howard Avenue) roadway crossing and open roadway ditch outletting to the 3rd Concession Drain were generally being utilized and are still being utilized as an outlet not only for the Burke Drain watershed but also the majority of the lands in the area to the north and west of the Burke Drain watershed in Lot 306 S.T.R. Concession, bounded by County Road 9 (Howard Avenue) to the west and King's Highway No.3 to the north.

Prior to the Parkway Development the overall affected watershed mentioned above consisted primarily of agricultural lands with the exception of some low density residential and commercially developed areas along King's Highway No.3 and along the east side of County Road 9 (Howard Avenue). This area has little topographic relief and the soils in the watershed are generally poorly drained and classified as Brookston Clay Loam soil that requires sub-surface drainage for the agricultural lands to be productive.

In 2010, Laurier Parkway was constructed within the Town of LaSalle starting east of Malden Road and continuing easterly to County Road 9 (Howard Avenue). Drainage modifications were made to facilitate the new intersection between Laurier Parkway and County Road 9 (Howard Avenue). These works included the replacement and improvement of the existing County Road 9 (Howard Avenue) road crossing previously mentioned herein, and the closing-in of part of the previously mentioned open roadway ditch on the west side of County Road 9 (Howard Avenue). Said road ditch was covered in as a road crossing under Laurier Parkway for a distance of approximately 106 metres to the south of the County Road 9 (Howard Avenue) roadway crossing culvert and for a distance of 96 metres north of said roadway crossing pipe. The covered drain to the north was installed to provide a transitional clear zone for the Laurier Parkway/County Road 9 (Howard Avenue) intersection. It was also determined by Dillon Consulting that a 300mm diameter H.D.P.E. pipe was installed below the bottom of the open drain from Station 0-003.0 to Station 0+256.0 to the depth of the roadway crossing pipe under Laurier Parkway as part of the intersection improvements, which was opted for, by the Town of LaSalle, instead of deepening and widening the open drain, in order to avoid the relocation of the existing utilities (Hydro poles and underground Bell telephone lines) that were encountered within close proximity of the open drain. It is our understanding that all of the costs associated with these drainage improvements were paid for entirely by the Town of LaSalle.

Report - Burke Drain, Burke Branch, and
Burke Drain Outlet
Town of LaSalle & Town of Tecumseh - D-14-034

Subsequent to the Laurier Parkway/County Road 9 (Howard Avenue) intersection construction, there were four (4) drain crossing culverts installed in the existing roadway ditch downstream of the Laurier Parkway crossing culvert for the purposes of providing access and/or the protection of three (3) existing hydro poles and one (1) existing Bell Canada service pedestal, all located on the west side of the roadway ditch. It is our understanding that the construction of these drain crossing culverts were undertaken by their respective operating utilities.

In July 2012, at approximately the same time that construction works commenced on the Rt. Hon. Herb Gray Parkway (the Parkway), the Ministry of Transportation Ontario (M.T.O.) extended the Laurier Parkway roadway crossing culvert further south for an additional 70 metres in order to provide a transitional clear zone where the Howard Avenue Diversion Road transitions into the existing County Road 9 (Howard Avenue) roadway. It is our understanding that all of the costs associated with this road crossing extension were entirely paid for by the M.T.O.

On March 23rd, 2012, a Letter of Opinion Report pursuant to Section 77(3) of the Drainage Act was submitted by the Parkway Infrastructure Engineers (Dillon Consulting) prepared by Tom H. Marentette, P.Eng., which generally established the improvements to be carried out to the Burke Drain, which were necessary, as part of the Windsor-Essex Parkway works. The works proposed to the Burke Drain under this Letter of Opinion Report consisted of enclosure replacement and extension, removal and replacement of existing access bridges, the construction of new access bridges where necessary, the excavation and deepening of the open drain and the reshaping and widening of the drain banks, the grading of all disturbed areas including seeding and restoring of said areas and drain sideslopes, and the placing of erosion control blankets where necessary in the drain invert to establish vegetative growth.

In our opinion, due to the considerable improvements intended to be carried out and the fact that several private landowners were being affected by the intended works, the report for these improvements to the Burke Drain would have been better served and more appropriately proceeded upon pursuant to Section 78 of the Drainage Act. However, Mr. Marentette's Letter of Opinion Report does clearly establish that all of the improvements proposed to the Burke Drain are required in order to provide an improved outlet for the Windsor-Essex Parkway, and that all of costs associated with said improvements were to be entirely borne by the M.T.O. It should also be noted that not all of the works intended to be carried out under the Marentette Letter of Opinion Report have been completed to date and that said works are being completed as part of the works proposed under this report.

Furthermore, we understand that not all of the improvements and development works ancillary to the construction of the Windsor-

Essex Parkway outlet into the M.T.O. Stormwater Management Pond; therefore resulting in increased post-development flows outletting directly into the existing drainage infrastructure. The increases in the post-development flows affect the overall watershed area which includes both the affected watershed area in the Burke Drain as well as the watershed area to the north and west of Outer Drive bounded by County Road 9 (Howard Avenue) to the west and Highway No.3 to the north. The increased runoff in this overall area does not necessarily affect the Burke Drain but does adversely affect the drainage infrastructure which currently serves as the outlet for the above mentioned area and the Burke Drain. The increased post-development flows are generally attributable to part of the new roadway construction of King's Highway No.3, the Howard Avenue Diversion, the Howard Avenue Connector Road, the outflow from the M.T.O. Stormwater Management Pond and the numerous hills of stockpiled material resulting from the Parkway construction.

IV. DESIGN CONSIDERATIONS AND FINDINGS

Dillon Consulting in their PART A - TECHNICAL CONSIDERATION portion of this report has referenced the Design and Construction Guidelines for work under the Drainage Act, 1985 as published by O.M.A.F.R.A. as the current reference documentation used by Engineer's carrying out work on Municipal Drains under the Drainage Act. They have confirmed that the design criteria to be utilized for this project are as follows:

- The two (2) year return period design storm is the recommended design standard applied to Municipal Drains within rural Ontario specific to open drain channels and low hazard agricultural access crossings. The exception being for residential, industrial and commercial properties where flooding could wash out an access culvert, where a higher five (5) to ten (10) year return period design storm could be the design criteria.

- The ten (10) year return period design storm is the recommended design criteria applied to culverts on Municipal Drains crossing municipal roads such as South Talbot Road and Laurier Parkway.

- For County and/or Provincial Highway roadway culverts like the existing County Road 9 (Howard Avenue) roadway crossing, the recommended design criteria can vary from a ten (10) year to twenty five (25) year return period design storm. From their consultation with the County of Essex and the Ministry of Transportation Road Authorities, it was confirmed that their current criteria for culvert design across Howard Avenue Diversion and County Road 9 (Howard Avenue) is a ten (10) year return design storm.

It was also established that private access culverts and road crossings, under this project, have been sized using the rational method. The peak flows determined by the rational method should freely pass through these culverts without experiencing any backwater affects. Furthermore, hydrologic and hydraulic analysis using computer aided modelling were also applied by Dillon Consulting to check the downstream impacts caused by the Burke Drain improvements and the land use changes within the overall affected upstream watershed, and the affect they may have on the receiving drainage outlets such as the existing covered drain and open drainage ditch on the west side of County Road 9 (Howard Avenue) and the 3rd Concession Drain.

From Dillon's analysis of the existing covered drain outlet on the west side of the new Howard Avenue Diversion, they determined that the Laurier Parkway roadway crossing portion of same was already deficient in size to handle the pre-Parkway development design flows for the ten (10) year return period storm. It was further determined that the County Road 9 (Howard Avenue) road crossing culvert and the entire length of the covered drain on the west side of County Road 9 (Howard Avenue) southerly of said County Road 9 (Howard Avenue) road crossing were insufficiently sized to convey the higher post-Parkway development ten (10) year return period design storm flows. These higher post-Parkway development flows would also further impact the size deficiency of the Laurier Parkway road crossing portion of the existing enclosure.

In summary, it has been determined that the County Road 9 (Howard Avenue) roadway crossing would be of insufficient size to handle the post-Parkway Development ten (10) year flows. It has also been determined that the Laurier Parkway 106 metres of 900mm diameter roadway crossing portion of the existing enclosure on the west side of County Road 9 (Howard Avenue) is already insufficiently sized to handle the pre-Parkway Development ten (10) year return period design storm. It has also been determined that the post-Parkway Development ten (10) year return period design flows, which are considerably higher than the pre-development flows would not only further impact the size deficiency of the Laurier Parkway roadway crossing portion of the enclosure, but would also cause the entire portion of the existing enclosure that is southerly and downstream of the County Road 9 (Howard Avenue) roadway crossing to be deficient. Therefore, in order to satisfy the required post-Parkway Development ten (10) year flows, it would have been necessary to remove, replace and upgrade the existing County Road 9 (Howard Avenue) roadway crossing culvert, and completely remove, replace and upgrade the existing enclosure on the west side of County Road 9 (Howard Avenue) extending from where the existing County Road 9 (Howard Avenue) roadway crossing enters the enclosure, southerly and downstream to where it outlets into the open drain. These improvements would be very costly.

Based on the considerable costs associated with improving the current outlet as described and detailed above, Dillon proceeded towards looking at less costly outlet alternatives. From their investigations, Dillon proceeded to provide a less costly diversion system as part of the Burke Drain, by diverting flows easterly through the Burke Branch and then southerly through a new open drain labelled as the Burke Drain Outlet. This new diversion system generally eliminates the need of improving the County Road 9 (Howard Avenue) roadway crossing culvert and the current drainage outlet enclosure on the west side of County Road 9 (Howard Avenue). Dillon has adopted this diversion option in their overall design due to the considerable cost savings to the project, and have prepared their PART A - TECHNICAL CONSIDERATIONS portion of the report and related design drawings, on that basis.

V. CONSTRUCTION ASSESSMENT RATIONALE AND CONSTRUCTION SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated with the improvements to the Burke Drain and the construction of the Burke Branch and the new Burke Drain Outlet, including all related incidental expenses, be charged against the lands, roads and public utilities affected in accordance with the attached **Construction Schedule of Assessment.** Lands which are used for agricultural purposes have been listed in the Construction Schedule of Assessment under Subheading "**5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable)**".

Grant Eligibility

On September 22nd, 2005, the Ontario Ministry of Agriculture, Food, and Rural Affairs (O.M.A.F.R.A.) issued Administrative Policies for the Agricultural Drainage Infrastructure Program (A.D.I.P.). This program has re-instated financial assistance for eligible costs and assessed lands pursuant to the Drainage Act. Sections 85 to 90 of the Drainage Act allow the Minister to provide grants for various activities under said Act. Sections 85 and 87 make it very clear that grants are provided at the discretion of the Minister. Based on the current A.D.I.P., "lands used for agricultural purposes" may be eligible for a grant in the amount of 1/3 of their total assessment. The new policies define "lands used for agricultural purposes" as those lands eligible for either the "Farm Property Class Tax Rate", the "Managed Forest Tax Incentive Program", or the "Conservation Land Tax Incentive Program". The Municipality has provided this information to the Engineer from the current property tax roll and the Engineer has further confirmed this information with the AG Maps Geographic Information Portal Services through O.M.A.F.R.A. Properties that meet the criteria for "lands used for agricultural purposes" are shown in the attached Construction Schedule of Assessment under the subheading "**5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable)**"

and are expected to be eligible for the 1/3 grant from O.M.A.F.R.A. In accordance with same, we expect that this project will qualify for the grant normally available for agricultural lands. We would therefore, recommend that the Town of LaSalle make an application, on their behalf, for a Grant from the Ontario Ministry of Agriculture, Food, and Rural Affairs (O.M.A.F.R.A.) in the amount of 1/3 of their total grantable assessment for this project, in accordance with the provisions of Sections 85 and 88 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010". Even though it is our opinion that certain lands shall likely be eligible for grants, there is no guarantee that these lands will qualify or that grants may be available in the future.

Assessment Components

The total individual assessments, within the Construction Schedule of Assessments, are comprised of four (4) separate assessment components, including:

i) **Benefit** *defined as advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures, as it relates to Section 22 of the Drainage Act.*

ii) **Outlet Liability** *defined as part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved outlet, as it relates to Section 23 of the Drainage Act.*

iii) **Special Benefit** *defined as any additional work or feature included in the construction, repair or improvement of a drainage works that has no effect on the functioning of the drainage works, as it relates to Section 24 of the Drainage Act.*

iv) **Section 26 Special Assessment** *in addition to all other sums lawfully assessed against the property of a public utility or road authority under this Act, and despite the fact that the public utility or road authority is not otherwise assessable under the Act, the public utility or road authority shall be assessed for and shall pay all the increase of cost of such drainage works caused by the existence of the works of the public utility or road authority.*

Report - Burke Drain, Burke Branch, and
Burke Drain Outlet
Town of LaSalle & Town of Tecumseh - D-14-034

General Rationale

From a comprehensive review of the contents of the **PART A - TECHNICAL CONSIDERATIONS** portion of this report and the design drawings related thereto prepared by Tim R. Oliver, P.Eng., of Dillon Consulting Limited, our considerable discussions with the author, and our review of all past Engineer's Reports on the Burke Drain and all other Municipal Drains located in the general area, we have established our construction assessment rationale and determinations relative to the improvements being carried out to the Burke Drain, the Burke Branch, and the Burke Drain Outlet. They are as follows:

1. Burke Drain (Station 0+208 to Station 1+568)

The majority of the improvements being provided on the Burke Drain generally consists of the completion of all of the works proposed under the Letter of Opinion Report of March 23rd, 2012, prepared by Tom H. Marentette, P.Eng., of Dillon Consulting Limited, with the exception of the construction of Bridge No.3 at Station 0+227 requested by the Town of Tecumseh Parks and Recreation Department for the purposes of providing an access across the Burke Drain for the future Chrysler Greenway (Tecumseh Extension), and the further deepening of the Burke Drain between Station 0+208 and Station 0+415, being carried out in order to provide sufficient clearance for the existing private tile main serving land parcel 470-01300 currently owned by Amico Infrastructures.

We recommend that all of the costs associated with the Burke Drain (Station 0+208 to Station 1+568) be assessed within the Construction Schedule of Assessment, as follows:

a) The estimated construction cost *(Part of Construction Item 28a)* towards the additional deepening of the Burke Drain from Station 0+208 to Station 0+415 is a proportionate amount of $1,400.00. The further deepening of this portion of the Burke Drain is necessary to provide outlet clearance for the existing tile main to land parcel 470-01300. We would therefore recommend that the above amount plus all related incidental expenses be assessed entirely to **Parcel 470-01300** currently owned by **Amico Infrastructures**, and same shall be assessed to said lands as a **Special Benefit** assessment.

b) The estimated construction cost *(Construction Item 38a)* associated with the providing of Bridge No.3 at Station 0+227, which will serve as an access over the Burke Drain for the future Chrysler Greenway (Tecumseh Extension) is an amount of $8,500.00. We would recommend that this amount plus all related incidental

expenses be assessed to the current owner of the lands onto which the future Chrysler Greenway is to be constructed. The current owner of these lands is the **Town of Tecumseh Parks and Recreation Department**, and all of the Bridge No.3 costs shall be assessed entirely to them as a **Benefit** assessment.

c) The balance of the remaining estimated construction costs associated with the proposed improvements to the Burke Drain (Station 0+208 to Station 1+568) comprises of an amount of $72,600.00. The improvements to the Burke Drain with the exception of the above items a) and b) are being carried out for the purposes of providing a suitable outlet in the Burke Drain to deal with all of the roadway improvements carried out for the Parkway which generally included the improvement works within the Dillon Letter of Opinion Report. In our opinion this increase of cost to the Burke Drain should be assessed entirely to the Parkway Road Authority. We would therefore recommend that this amount plus all related incidental expenses and allowances provided in accordance with Sections 29 and 30 of the Drainage Act, be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)**, as a **Section 26 Special Assessment.**

2. Burke Branch (Station 0+000A to Station 0+039A)

This Municipal Drain is the former downstream portion of the Burke Drain, located downstream and westerly of where the Burke Drain turned westerly across Outer Drive. This section of the former Burke Drain is being re-routed from west to east as part of the improvements necessary to divert the flows coming from the M.T.O. S.W.M. Pond, and the runoff from part of the lands within the overall affected watershed area west of Outer Drive and east of the new Howard Avenue Diversion, draining southerly and easterly to the Burke Drain Outlet. The Burke Branch as well as the Burke Drain Outlet serve as a new diversion outlet route in lieu of carrying out the more costly improvements to the current outlet for the Burke Drain which would have comprised of the replacement of the existing County Road 9 (Howard Avenue) roadway crossing culvert and the covered drain enclosure located along the west side of County Road 9 (Howard Avenue), which would be undersized to handle the post-Parkway Development ten (10) year return period storm flows. It should also be noted that the existing Laurier Parkway roadway crossing portion of said enclosure is also deficient in size for the ten (10) year return period pre-Parkway Development flows.

The Burke Branch generally comprises of open drain improvements *(Construction Items 46a and 49)*, the removal, disposal and replacement of the existing roadway crossing

culvert under the closed portion of Outer Drive *(Construction Items 47 and 48)* and the roadway improvements of asphalt roadway surface removal and disposal and restoration of the area to grass *(Construction Item 50)*.

We recommend that all of the costs associated with the Burke Branch be assessed within the Construction Schedule of Assessment, as follows:

a) The estimated construction cost associated with *(Construction Items 47 and 48)* the removal, disposal and replacement of the existing roadway crossing culvert under Outer Drive is an amount of $14,900.00. During the time that the construction works were being carried out as part of the Letter of Opinion Report when the Outer Drive (closed) right of way was owned by the Town of Tecumseh, the M.T.O. or their representatives committed to the existing Outer Drive roadway crossing culvert remaining as part of their work, in order to maintain a safe turn around area at the south end of the closed portion of Outer Drive for utility trucks accessing their plants. We would therefore recommend that the above amount plus all related incidental expenses be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)** as a **Section 26 Special Assessment.** Now that the Outer Drive (closed) right of way has been officially transferred to the M.T.O., it provides further credence to the above road crossing works being entirely assessed to the M.T.O. as a Section 26 Special Assessment.

b) The estimated construction cost associated with *(Construction Item 50)* the removal and disposal of asphalt road surface and restoration to grass is in the amount of $4,500.00. This work consists primarily of road work necessary for the closure of Outer Drive. We therefore recommend that the above amount plus all related incidental expenses be assessed entirely to the **Ministry of Transportation Ontario (M.T.O.)** as a **Special Benefit** assessment.

c) The balance of the remaining estimated construction costs *(Construction Items 46a and 49)* associated with the improvements to the Burke Branch open drain is an amount of $5,700.00. The re-routing of the Burke Branch is required in order to divert the drain easterly to the new Burke Drain Outlet which is work being carried out in lieu of carrying out the more costly replacement and improvements that would have been necessary to the existing County Road 9 (Howard Avenue) roadway crossing and the existing enclosure on the west side of County Road 9 (Howard Avenue). In

our opinion these costs should be considered to be an increase of cost to the Burke drainage system to satisfy the deficiencies in the above mentioned road crossing and enclosure currently serving as the outlet for the Burke Drain. We would therefore recommend that this amount plus all related incidental expenses shall be shared by the **Ministry of Transportation Ontario (M.T.O.)** and the **Town of LaSalle Road Authority**, as a **Section 26 Special Assessment**, on a share basis of **67%** and **33%**, respectively. The basis for this sharing rationale is further clarified in subsequent paragraphs.

3. Burke Drain Outlet (Station 0+000 to Station 0+208)

As was the case for the Burke Branch, the Burke Drain Outlet provides a new diversion outlet route in lieu of the more costly improvements that would have been required to the existing County Road 9 (Howard Avenue) roadway crossing and the entire length of the outlet enclosure on the west side of County Road 9 (Howard Avenue) located to the south of said County Road 9 (Howard Avenue) road crossing. The Burke Drain Outlet generally comprises of the construction of a new open drain, including a new roadway crossing culvert under County Road 9 (Howard Avenue) and the lowering of the existing 200mm diameter gasmain under said culvert, a new roadway crossing culvert under South Talbot Road and the lowering of the existing 200mm diameter gasmain under said culvert, and the lowering of the existing 200mm diameter watermain under the crossing at South Talbot Road.

We recommend that all of the costs associated with the Burke Drain Outlet be assessed within the Construction Schedule of Assessment, as follows:

a) We have determined that if the current outlet for the Burke Drain, comprising of the existing County Road 9 (Howard Avenue) roadway crossing and the existing enclosure on the west side of County Road 9 (Howard Avenue) were improved in their existing locations in lieu of the Burke Drain Outlet, it would have been necessary to lower the existing 200mm diameter gasmain located along the east side of County Road 9 (Howard Avenue); therefore, the lowering of the gasmain along County Road 9 (Howard Avenue) at the new Burke Drain Outlet road crossing culvert would take the place of same and would similarly remain the responsibility of Union Gas pursuant to Section 26 of the Drainage Act. The estimated construction cost *(Construction Item 16)* for lowering this 200mm diameter gasmain under Bridge No.1 in the Burke Drain Outlet is an amount of $125,000.00. We recommend that this amount plus all

related incidental expenses be entirely assessed to **Union Gas** as a **Section 26 Special Assessment.**

b) We have also determined that if the current enclosure outlet for the Burke Drain, comprising of the existing County Road 9 (Howard Avenue) road crossing and the existing enclosure on the west side of County Road 9 (Howard Avenue) were improved in its existing location in lieu of the Burke Drain Outlet, it would have been necessary to lower the existing 200mm diameter watermain along the east side of County Road 9 (Howard Avenue); therefore, the lowering of the existing 200mm diameter watermain at South Talbot Road would take the place of same and would similarly be the responsibility of the Town of Tecumseh Water Department pursuant to Section 26 of the Drainage Act. The estimated construction cost *(Construction Item 18)* of lowering this existing 200mm diameter watermain under Bridge No.2 in the Burke Drain Outlet is an amount of $15,000.00. We recommend that this amount plus all related incidental expenses be entirely assessed to the **Town of Tecumseh Water Department** as a **Section 26 Special Assessment.**

c) We have determined that the lowering of the existing 200mm diameter gasmain at South Talbot Road under Bridge No.2 is an additional utility lowering resulting from the construction of the Burke Drain Outlet in lieu of improving the current drainage outlet for the Burke Drain. We therefore recommend that the cost of lowering this gasmain pursuant to Section 26 be shared by the M.T.O. and the Town of LaSalle. The estimated construction cost *(Construction Item 17)* of lowering this existing 200mm diameter gasmain under Bridge No.2 in the Burke Drain Outlet is an amount of $125,000.00. We recommend that this amount plus all related incidental expenses be entirely assessed to the **Ministry of Transportation Ontario (M.T.O.)** and the **Town of LaSalle Road Authority** as a **Section 26 Special Assessment,** on a share basis of **67%** and **33%,** respectively. The basis for this sharing rationale is further clarified in subsequent paragraphs.

d) The balance of the remaining estimated construction costs associated with the construction of the Burke Drain Outlet (Station 0+000 to Station 0+208) which generally includes the costs for the construction of Bridge No.1 and Bridge No.2, and for all other general open drain works related to the construction of this drain, is an amount of $128,000.00. As was the case for the Burke Branch, the Burke Drain Outlet is being constructed in order to divert the flows in the Burke drainage system in lieu of carrying out the more costly replacement and improvements that would have been

necessary to the existing County Road 9 (Howard Avenue) roadway crossing and existing enclosure on the west side of County Road 9 (Howard Avenue). In our opinion these remaining costs should be considered to be an increase of cost to the Burke drainage system to satisfy the deficiencies in the above mentioned road crossing and enclosure currently serving as the outlet for the Burke Drain. We would therefore recommend that this amount plus all related incidental expenses and allowances provided in accordance with Sections 29 and 30 of the Drainage Act, shall be shared between the **Ministry of Transportation Ontario (M.T.O.)** and the **Town of LaSalle Road Authority**, as a **Section 26 Special Assessment**, on the basis of **67%** and **33%**, respectively. The basis for this sharing rationale is further clarified in subsequent paragraphs.

As it relates to Items c) and d) above, we are of the opinion that a Special Assessment pursuant to Section 26 of the Drainage Act, normally assessed to the affected Road Authority, should not apply with respect to both the Bridge No.1 roadway crossing culvert under County Road 9 (Howard Avenue) and the Bridge No.2 roadway crossing culvert under the South Talbot Road. We are also of the opinion that a Special Assessment pursuant to Section 26 of the Drainage Act, normally assessed to Union Gas for the lowering of their utility, should not apply with respect to the lowering of the 200mm diameter gasmain at the South Talbot Road.

The above three (3) construction items became necessary due to the providing of the new Burke Drain Outlet which is being constructed in lieu of the more costly improvements that would have been required to the current outlet for the Burke Drain consisting of improvements to the existing County Road 9 (Howard Avenue) roadway crossing and the existing enclosure located on the west side of County Road 9 (Howard Avenue). These necessary improvements to this existing outlet, would have been assessed as a shared responsibility between the M.T.O. and the Town of LaSalle. The savings in cost to the M.T.O. and the Town of LaSalle by constructing the new Burke Drain Outlet diversion in lieu of improving said existing outlet should not be at the expense of the County of Essex for the Bridge No.1 crossing, the Town of Tecumseh for the Bridge No.2 crossing, nor Union Gas for the additional lowering of their existing 200mm diameter gasmain under the Bridge No.2 culvert.

In our opinion, the costs for these three (3) construction items along with all other general works related to the construction of the Burke Drain Outlet, including all related incidental expenses, should be totally assessed to the M.T.O. and the Town of LaSalle Road Authority as a Section 26 Special Assessment on the basis of 67% and 33%, respectively,

since these two (2) parties are gaining a monetary advantage from the construction of the Burke Drain Outlet.

Since the actual construction related to the lowering of the existing 200mm diameter gasmain at the South Talbot Road under Bridge No.2 shall be carried out by Union Gas, we have separated and individualized Construction Item 17 related thereto as a Section 26 Special Assessment, but rather than assessing Union Gas, it is recommended that same together with all related incidental expenses be shared between the M.T.O. and the Town of LaSalle Road Authority, as a Section 26 Special Assessment.

In order to provide some clarification with respect to the cost sharing established above between the M.T.O. and the Town of LaSalle Road Authority towards the construction of the Burke Branch and the Burke Drain Outlet, we offer the following:

- Based on Dillon's investigation it was determined that the existing County Road 9 (Howard Avenue) roadway crossing culvert and the existing enclosure on the west side of County Road 9 (Howard Avenue) south of the County Road 9 (Howard Avenue) road crossing, as well as the open drain downstream of same served as the outlet for both the Burke Drain watershed and the considerable watershed to the northwest of Outer Dive bounded by County Road 9 (Howard Avenue) to the west and the Old King's Highway No.3 to the north.

  Based on Dillon Consulting's hydraulic modelling it was further determined that the above road crossing and the enclosure outlet on the west side of County Road 9 (Howard Avenue) were of insufficient capacity to provide a sufficient outlet for the ten (10) year post-Parkway development flows. Dillon's modelling also determined that the Laurier Parkway road crossing portion of the enclosure, which was originally constructed as part of the Laurier Parkway/County Road 9 (Howard Avenue) Intersection Improvement project by the Town of LaSalle in 2010, was actually of insufficient capacity to handle the pre-Parkway Development flows, which means that it was already deficient of the size requirements for a roadway crossing under the Drainage Act. Based on all of the above, the Town of LaSalle therefore would be required to assume a partial responsibility towards any improvements to this outlet system.

- Estimated costs for the required improvements to the existing County Road 9 (Howard Avenue) roadway crossing and the enclosure outlet on the west side of County Road 9 (Howard Avenue) were provided to us by Dillon Consulting. It was established that the required

improvements to the existing 22 metres of 900mm diameter County Road 9 (Howard Avenue) roadway crossing culvert and the existing 70 metres of 1200mm diameter concrete pipe extension to the south of the Laurier Parkway roadway crossing culvert which was installed by M.T.O. in 2012 would be entirely the responsibility of the M.T.O.

It was also determined that any required improvements to the 106 metres of 900mm diameter road crossing portion of the enclosure under Laurier Parkway would be shared by the M.T.O. and the Town of LaSalle on the basis of a ratio between the flow deficiency in the existing pipe to meet the required ten (10) year return period pre-development flows versus the increased post-development flows caused by the post-Parkway influence.

- Based on the above rationale and the construction estimates provided by Dillon Consulting we have determined that the M.T.O. and the Town of LaSalle Road Authority would have been required to share the responsibility for the necessary outlet improvements on the basis of 67% and 33%, respectively. These same percentage sharing would therefore apply towards any applicable improvement to the Burke Branch and the Burke Drain Outlet which were constructed within this report in lieu of improving the existing outlet route for the Burke Drain and the increase of cost to this project for same is being assessed as a Section 26 Special Assessment.

Section 26 Special Assessments

The Section 26 Special Assessments outlined below provide additional clarification and summarize the assessments listed under Section 6 of the Construction Schedule of Assessment, based on the Assessment Rational determined in the preceding paragraphs:

A. We determined that a Special Assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.)** for the extra costs to the project related to the removal, disposal and replacement of the existing roadway crossing culvert under Outer Drive within the **Burke Branch** portion of the project in accordance with Section 26 of the Drainage Act. This extra cost to the project consist of all works associated with *Construction Items 47 and 48* within this report. The estimated net increase in cost to the project caused by the removal and replacement of the Bridge 1A Outer Drive roadway crossing and appurtenances in the Burke Branch, together with all related incidental expenses is **$22,222.00**.

The above estimated Special Assessment to the Ministry of Transportation Ontario (M.T.O) for the removal and

replacement of the Bridge 1A Outer Drive roadway crossing in the Burke Branch, pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above net cost consists of an amount of **$7,322.00**.

Once the construction of this work is completed, the M.T.O. shall be assessed for the **actual construction costs** for Construction Items 47 and 48, together with its share of the project incidental costs associated with same, in the amount of **$7,322.00**. This amount represents the actual Section 26 Special Assessment amount to be assessed to the M.T.O. for this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners, roads, and utilities. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated towards dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

Due to the timing constraints on the completion of the construction of the Chrysler Greenway (Tecumseh Extension), the replacement of the Bridge 1A Outer Drive roadway crossing, Construction Items 47 and 48 of this report, were carried out prior to the completion of our engineer's report, by the Town of Tecumseh. This work was fast tracked by the Municipality because if the Chrysler Greenway construction deadlines were not met the Town of Tecumseh and E.R.C.A. stood to potentially lose out on any funding, grants, and donations related to said Greenway project.

Furthermore, the removal of this existing Outer Drive roadway crossing culvert, as per Construction Item 47, was carried out by the Town of Tecumseh Roads Department and the construction of the Bridge 1A Outer Drive roadway crossing, as per Construction Item 48, was constructed by the Town of Tecumseh Parks and Recreation Department. Once the overall drainage project is completed, both of the above Town of Tecumseh Departments are to be reimbursed for their expenditures, by the project.

B. We determined that a Special Assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.) and the Town of LaSalle Road Authority** to be shared by them on the basis of **67%** and **33%** respectively, for the increase of cost to the project related to the improvements necessary to divert the

Burke Branch easterly towards the Burke Drain Outlet portion of the project in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of all works associated with *Construction Items 46a and 49* within this report. The estimated net increase in cost to the project caused by the above special improvements, together with all related incidental expenses is **$8,432.00**, with the Special Assessment to the M.T.O. being **$5,649.00** and the Special Assessment to the Town of LaSalle Road Authority being an amount of **$2,783.00**.

The above estimated Special Assessment to the Ministry of Transportation Ontario (M.T.O) and the Town of LaSalle, pursuant to Section 26 of the Drainage Act are listed separately under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above is **$2,732.00** with the assessment to the M.T.O. consisting of an amount of **$1,830.00** and the incidental costs portion associated with the above assessment to the Town of LaSalle Road Authority consists of an amount of **$902.00**.

Once the construction of this work is completed, the M.T.O. and the Town of LaSalle shall be assessed for the **actual construction costs** for Construction Items 46a and 49 on the basis of 67% and 33% respectively together with their share of the project incidental costs associated with same, in the amount of **$1,830.00** to the M.T.O. and **$902.00** to the Town of LaSalle Road Authority. These amounts represent the actual Section 26 Special Assessment amounts to be assessed to said parties for this work and these actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

C. We determined that a Special Assessment is to be assessed to **Ministry of Transportation Ontario (M.T.O.)** for the increase of cost to the project related to the improvements to the **Burke Drain** in order to provide a suitable outlet for all of the roadway improvements carried out by the Parkway, which generally includes all of the improvement works contained within the Dillon Letter of Opinion report in accordance with Section 26 of the Drainage Act. This extra cost to the project consist of all construction works associated with the

Burke Drain with the exception of Part of Construction Item 28a and Construction Item 38a within this report. The estimated net increase in cost to the project caused by the above special improvements in the Burke Drain Outlet, together with all related incidental expenses is **$122,700.00**.

The above estimated Special Assessment to the M.T.O. pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental cost portion associated with the above net cost consists of an amount of **$50,100.00**.

Once the construction of this work is completed, the M.T.O. shall be assessed for the **actual construction costs** for all of the Construction Items included in this report for the Burke Drain, with the exception of Construction Item 28a and Construction Item 38a, together with its share of the project incidental costs associated with same, in the amount of **$50,100.00**. This amount represents the actual Section 26 Special Assessment amount to be assessed to M.T.O. for this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners, roads, and utilities. This non-proratable assessment does not include for any potential costs for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

D. We determined that a Special Assessment is to be assessed to **Union Gas** for the extra costs to the project related to the lowering of the existing 200mm diameter gasmain under Bridge No.1 in the **Burke Drain Outlet** portion of the project in accordance with Section 26 of the Drainage Act. This extra cost to the project consist of all works associated with Construction Item 16 within this report. The estimated net increase in cost to the project caused by the lowering of this gasmain in the Burke Drain Outlet, together with all related incidental expenses is **$140,250.00**.

The above estimated Special Assessment to Union Gas for the lowering of this existing gasmain in the Burke Drain Outlet, pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental cost portion associated with the above net cost consists of an amount of **$15,250.00**.

Once the construction of this work is completed, Union Gas shall be assessed for the **actual construction costs** for Construction Item 16, together with its share of the project incidental costs associated with same, in the amount of **$15,250.00**. This amount represents the actual Section 26 Special Assessment amount to be assessed to Union Gas for this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners, roads, and utilities. This non-proratable assessment does not include for any potential costs for Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any Appeals to the Tribunal and/or the Referee shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

As is normally the case, Union Gas exercises its power under Section 69 of the Drainage Act and carry out the construction works of lowering their plant utilizing their own forces at their own expense. If the construction related to their Special Assessment for Construction Item 16 is undertaken and completed by them at their own expense, their Special Assessment for same listed in Section 6 of the Construction Schedule of Assessment would be reduced to **$15,250.00** which consists of related engineering and incidental costs associated with said works.

E. We determined that a Special Assessment is to be assessed to the **Town of Tecumseh Water Department** for the extra costs to the project related to the lowering of the existing 200mm diameter watermain under Bridge No.2 in the Burke Drain Outlet portion of the project in accordance with Section 26 of the Drainage Act. The extra cost to the project consists of all works associated with *Construction Item 18* within this report. The estimated net increase in cost to the project caused by the lowering of this watermain in the Burke Drain Outlet, together with all related incidental expenses is **$22,250.00**.

The above estimated Special Assessment to the Town of Tecumseh Water Department for the lowering of the existing 200mm diameter watermain under Bridge No.2 along the Burke Drain Outlet, pursuant to Section 26 of the Drainage Act is listed under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs portion associated with the above net cost consists of an amount of **$7,250.00**.

Once the construction of this work is completed, the Town of Tecumseh Water Department shall be assessed for the **actual construction costs** for Construction Item 18, together with its share of the project incidental costs associated with same, in the amount of **$7,250.00**. This amount represents the actual Section 26 Special Assessment amount to be assessed to the Town of Tecumseh Water Department for this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners, roads, and utilities. This non-proratable assessment does not include for any potential costs for Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any Appeals to the Tribunal and/or the Referee shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

It should be noted that the Town of Tecumseh Water Department may also exercise their rights under Section 69 of the Drainage Act to carry out the works of lowering their existing watermain utilizing their own forces at their own expense. If the construction relative to the lowering of this watermain, as per Construction Item 18, is completed by them utilizing their own forces and at their own cost, their Special Assessment for same listed in Section 6 of the Construction Schedule of Assessment would be reduced to **$7,250.00** which consists of related engineering and incidental costs associated with said works.

F. We determined that a Special Assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.) and the Town of LaSalle Road Authority** to be shared by them on the basis of **67%** and **33%** respectively, for the extra costs to the project related to the lowering of the gasmain under Bridge No.2 in the **Burke Drain Outlet** portion of the project in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of all works associated with *Construction Item 17* within this report. The estimated net increase in cost to the project caused by the lowering of this gasmain, together with all related incidental expenses is **$140,250.00**, with the Special Assessment to the M.T.O. being **$93,968.00** and the Special Assessment to the Town of LaSalle Road Authority being an amount of **$46,282.00**.

The above estimated Special Assessment to the Ministry of Transportation Ontario (M.T.O) and the Town of LaSalle Road Authority, for the lowering of this existing gasmain under Bridge No.2 in the Burke Drain Outlet, pursuant to Section 26 of the Drainage Act are listed separately under Section 6 of the Construction Schedule of Assessment and is to be non-

proratable. The incidental costs portion associated with the above is **$15,250.00** with the assessment to the M.T.O. consisting of an amount of **$10,218.00** and the incidental costs portion associated with the above assessment to the Town of LaSalle Road Authority consists of an amount of **$5,032.00**.

Once the construction of this work is completed, the M.T.O. and the Town of LaSalle Road Authority shall be assessed for the **actual construction costs** for Construction Item 17 on the basis of 67% and 33% respectively together with their share of the project incidental costs associated with same, in the amount of **$10,218.00** to the M.T.O. and **$5,032.00** to the Town of LaSalle Road Authority. These amounts represent the actual Section 26 Special Assessment amounts to be assessed to said parties for this work and these actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential cost for Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any Appeals to the Tribunal and/or the Referee shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

G. We determined that a Special Assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.) and the Town of LaSalle Road Authority** to be shared by them on the basis of **67%** and **33%** respectively, for the increase of cost to the project related to the construction of the **Burke Drain Outlet** in lieu of carrying out improvements to the current outlet through the existing County Road 9 (Howard Avenue) roadway crossing and the existing enclosure along the west side of County Road 9 (Howard Avenue) in accordance with Section 26 of the Drainage Act. This extra cost to the project consists of all construction works associated with the Burke Drain Outlet with the exception of Construction Items 16, 17 and 18 within this report. The estimated net increase in cost to the project caused by the above special improvements to the Burke Drain Outlet, together with all related incidental expenses is **$283,700.00**, with the Special Assessment to the M.T.O. being **$190,079.00** and the Special Assessment to the Town of LaSalle Road Authority being an amount of **$93,621.00**.

The above estimated Special Assessment to the Ministry of Transportation Ontario (M.T.O) and the Town of LaSalle, pursuant to Section 26 of the Drainage Act are listed separately under Section 6 of the Construction Schedule of Assessment and is to be non-proratable. The incidental costs

portion associated with the above is **$155,700.00** with the incidental cost portion to the M.T.O. consisting of an amount of **$104,319.00** and the incidental costs portion associated with the above assessment to the Town of LaSalle Road Authority consists of an amount of **$51,381.00**.

Once the construction of this work is completed, the M.T.O. and the Town of LaSalle Road Authority shall be assessed for the **actual construction costs** for all of the Construction Items included in this report for the Burke Drain Outlet with the exception of Construction Items 16, 17 and 18, on the basis of 67% and 33% respectively together with their share of the project incidental costs associated with same, in the amount of **$104,319.00** to the M.T.O. and **$51,381.00** to the Town of LaSalle Road Authority. These amounts represent the actual Section 26 Special Assessment amounts to be assessed to said parties for this work and these actual assessment amounts shall replace the estimated assessment amounts for same in Section 6 of the Construction Schedule of Assessment when charging out the works to each party. This non-proratable assessment does not include for any potential cost for any unexpected Appeals to the Court of Revision and for any Appeals to the Tribunal and/or the Referee. Any costs to the project associated to dealing with any of these Appeals shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 Non-Proratable assessments, as well as any Special Benefit assessments all on a pro-rata basis, or as otherwise established in any Decisions from these forums.

Special Benefit Assessments

1. We determined that a Special Benefit assessment is to be assessed to **Amico Infrastructures**, the Owner of Parcel 470-01300, for Part of *Construction Item 28a* for the additional deepening of the Burke Drain from Station 0+208 to Station 0+415 to provide the necessary clearance for their existing tile main entering the Burke Drain from the east.

   The net increase in cost to the project to accommodate the additional deepening of the Burke Drain, including all related incidental costs is **$2,206.00**.

2. We determined that a Special Benefit assessment is to be assessed to the **Ministry of Transportation Ontario (M.T.O.)** for the extra cost to the project related to *Construction Item 50* in the Burke Branch for work being carried out which consists primarily of roadway improvement works for the closing of the Outer Drive in lieu of the Howard Avenue Diversion.

The net increase in cost to accommodate the roadway improvement works as part of the Burke Branch, together with all related incidental costs is **$6,696.00**.

It should be noted that all of the above Special Benefit assessments to the lands and road referred to above have been assessed to said lands and road within the Construction Schedule of Assessment.

Bridge No.3 (Burke Drain)

The construction of Bridge No.3 in the Burke Drain portion of the project was provided at the request of the Town of Tecumseh Parks and Recreation Department (on behalf of E.R.C.A.) and it provides access across the Burke Drain for the new Chrysler Greenway (Tecumseh Extension). The construction of this access bridge consists of all the work associated with *Construction Item 38a* in the report, together with all related incidental costs associated with same in an amount of **$16,394.00**, and is to be assessed entirely to the **Town of Tecumseh Parks and Recreation Department** as a Benefit assessment.

Due to the timing constraints on the completion of the construction of the Chrysler Greenway (Tecumseh Extension), the construction of Bridge No.3 was carried out prior to the completion of our engineer's report by the Town of Tecumseh Parks and Recreation Department. This work was fast tracked by the Municipality because if the Chrysler Greenway construction deadlines were not met the Town of Tecumseh and E.R.C.A. stood to potentially lose out on any funding, grants, and donations related to said Greenway project.

The Town of Tecumseh Parks and Recreation Department has paid for the cost of constructing Bridge No.3, and when charging out the final assessments for the project once it is completed, the assessment charge to the Town of Tecumseh Parks and Recreation Department for same shall be reduced by the amount of their Bridge No.3 construction expenditure.

It should be noted that the attached Construction Schedule of Assessment is to be utilized only for the sharing of all of the costs associated to the work being provided for under this report and said Construction Schedule of Assessment should not be utilized, under any circumstance, for the sharing of any future maintenance works conducted to any portion of the Municipal Drainage System established herein.

We would also recommend that the Municipality make an application for grant to O.M.A.F.R.A. in accordance with Section 88 of the "Drainage Act, R.S.O. 1990, Chapter D.17" for any grants that may be available for this project. The Ministry is continually reviewing their policy for grants, and even though it is our opinion that certain lands shall likely be eligible for grants,

there is no assurance that these lands will qualify or that grants may still be available in the future.

VI. FUTURE MAINTENANCE

After the completion of all of the works associated with this engineer's report, the Burke Branch and the Burke Drain and Burke Drain Outlet, as established herein, shall be maintained in the future by the Town of Tecumseh, and the future maintenance of these Municipal Drains shall be carried out on the following basis.

Burke Branch

We would recommend that the **Burke Branch**, as established within this report, be kept up and maintained in the future at the expense of the lands and roads included within the Maintenance Schedule of Assessment attached herein and labelled **Appendix 'A'**, and same shall remain in the proportions therein contained until otherwise varied and/or determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17".

The assessment proportions as outlined in the attached Maintenance Schedule of Assessment for the Burke Branch have been established on the basis of an estimated future maintenance cost of **$5,000.00**; however, these assessment charges shall not be made until such time that maintenance works are conducted to said drain in the future. Therefore, when **$5,000.00** worth of future maintenance work is conducted to this drain, the assessment to each of the individual affected property owners and roads shall be as listed in said attached Maintenance Schedule of Assessment.

The attached Maintenance Schedule of Assessment for the Burke Branch is to be utilized only for the maintenance of the open drain and for the flushing of sediment material within any existing access bridges and municipal roadway crossing culverts in the drain and is not to be utilized for any other maintenance and repair works being conducted to any of the existing access bridge or roadway crossing structures. It should be noted that the future maintenance of the Bridge 1A Outer Drive roadway crossing structure shall be maintained in the future entirely at the expense of the M.T.O. for the purposes of providing a safe turn around for all of the utility trucks accessing the Outer Drive (closed) roadway to maintain their plant along said roadway.

All of the above provisions for the future maintenance of the Burke Branch shall remain as aforesaid until otherwise determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17".

Report - Burke Drain, Burke Branch, and
Burke Drain Outlet
Town of LaSalle & Town of Tecumseh - D-14-034

Burke Drain and Burke Drain Outlet

We would recommend that the **Burke Drain and Burke Drain Outlet**, as established within this report, shall be kept up and maintained in the future at the expense of the lands and roads included within the Maintenance Schedule of Assessment attached herein and labelled **Appendix 'B'**, and same shall remain in the proportions therein contained until otherwise varied and/or determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17".

The assessment proportions as outlined in the attached Maintenance Schedule of Assessment for the Burke Drain and Burke Drain Outlet have been established on the basis of an estimated future maintenance cost of **$20,000.00**; however, these assessment charges shall not be made until such time that maintenance works are conducted to said drain in the future. Therefore, when **$20,000.00** worth of future maintenance work is conducted to this drain, the assessment to each of the individual affected property owners and roads shall be as listed in the attached Maintenance Schedule of Assessment.

The attached Maintenance Schedule of Assessment for the Burke Drain and Burke Drain Outlet is to be utilized only for the maintenance of the open drain and the flushing of all sediment material within all existing access bridges, municipal roadway crossings culverts and enclosures in the drain, and is not to be utilized for any other maintenance and repair works being conducted to any of the existing access bridges, municipal roadway crossings, and existing enclosure structures.

It should be noted that for the Burke Drain and Burke Drain Outlet a mechanism should be established herein so that the Municipality, for which the drainage works are situated in, can undertake future maintenance works to the existing access bridge structures, municipal roadway crossing structures, and existing enclosure structures within this drain so that the future maintenance costs associated with each of same can be properly assessed to the affected landowners and roads. We would therefore recommend that all access bridge structures and enclosure structures in this drain, for which future maintenance costs are to be shared with upstream lands and roads within the watershed, be maintained by the said Municipality and that said maintenance work would include works to the access bridge culvert and enclosure culvert, their bedding and backfill, end treatment, and any other ancillary work. Should concrete, asphalt or other special driveway surfaces over these access bridge driveways and enclosure driveways require removal as part of the maintenance work these surfaces should be repaired or replaced as part of the work. Likewise, if any fencing, gate, decorative walls, guard rails or other special features exist that will be impacted by the maintenance work, they are also to be removed and restored or replaced as part of the bridge maintenance work. However, the cost of the supply and installation of any surface material other than Granular "A"

material, and the cost of removal and restoration or replacement, if necessary, of any special features, shall be totally assessed to the benefiting adjoining owner served by said access bridge and/or enclosure. Likewise, for any access bridges with driveway top width wider than the standard 6.10 metres, the additional pipe length, granular bedding and backfill for the extended portion of the structure shall be assessed entirely to the adjacent benefitting owner.

Therefore, as a mechanism for sharing the cost for any works of future maintenance to all of the existing access bridge structures, enclosure structures, and municipal roadway structures, in this drain, the following provisions with respect to cost sharing for each of same, shall be shared by the abutting landowner and upstream affected lands and roads, in accordance with the percentages shown in the following table.

TABLE SHOWING COST SHARING FOR ACCESS BRIDGE STRUCTURES, ENCLOSURE STRUCTURES, AND MUNICIPAL ROAD CROSSING STRUCTURES IN THE BURKE DRAIN AND BURKE DRAIN OUTLET

STRUCTURE	ROLL NUMBER	OWNERS	% TO BENEFITING OWNER	% UPSTREAM LANDS AND ROADS
1	County Road 9 (Howard Avenue) road crossing	County of Essex	100.0	0.0
2	South Talbot Road road crossing	Town of Tecumseh Roads Department	100.0	0.0
3	Chrysler Greenway (Tecumseh Extension)	Town of Tecumseh Parks and Recreation Department	65.0	35.0
4	470-05402	Congregation of the Order Antonin Maronite in Ontario	84.6	15.4
5	Highway No.3 roadway crossing	Ministry of Transportation Ontario	100.0	0.0
6	Hydro One access bridge	Hydro One	100.0	0.0

Enclosure Structure (Sta. 1+383.0 to Sta. 1+568.0)

STRUCTURE	ROLL NUMBER	OWNERS	% TO BENEFITING OWNER	% UPSTREAM LANDS AND ROADS
Parcel 9 (12.0m FR.)	470-05401	Ministry of Transportation Ontario	100.0	0.0
Parcel 8 (67.0m FR.)	470-05405	Ministry of Transportation Ontario	100.0	0.0
Parcel 7 (73.0m Total FR.)				
• 20.0m Access bridge portion	470-05412	470698 Ontario Ltd.	87.5	12.5
• 48.0m remaining	470-05412	470698 Ontario Ltd.	100.0	0.0
• 5.0m north end	470-05412	Ministry of Transportation Ontario	100.0	0.0
Extended Portion (33.0m FR.)	Outer Drive Connector Road	Ministry of Transportation Ontario	100.0	0.0

The percentage to the upstream lands and roads as above established is to be assessed as an Outlet Liability towards the lands and roads within the Burke Drain and Burke Drain Outlet watershed lying upstream of said access bridge structures and access bridge portions of the enclosure structures, and shall be shared in the same proportions established within the **Schedule of Assessment for Future Access Bridge Structure Maintenance** attached herein and labelled **Appendix 'C'**. This Schedule of Assessment has been developed on the basis of an assumed cost of **$5,000.00** and the future maintenance costs for each affected access bridge and/or access bridge portion of enclosure within the drain shall be levied pro rata on only the affected lands and roads that are

situated upstream of the particular access bridge for which future maintenance works has been carried out.

At this time, the access bridges and/or access bridge portion of enclosure for which part of the future maintenance cost are shared with upstream lands and roads are Bridge No.3, Bridge No.4 and the access bridge portion of the enclosure located between Station 1+472 and Station 1+492 located along the frontage of Land Parcel 470-05412. We therefore recommend, that future work of repair and maintenance of the above mentioned access bridge structures and access bridge portion of enclosure structure be carried out by the governing Municipality. Part of the future maintenance cost of each access bridge or bridge portion of enclosure structure is to be assessed as a Benefit Assessment against the property or properties served by the access. The remainder of the maintenance cost will be assessed as "outlet assessments" only to the lands and roads upstream of each access bridge and access bridge portion of enclosure structures, prorated to the assessments shown in the Appendix 'C' Schedule.

It should also be noted that the above maintenance sharing for the Enclosure Structure applies only to the enclosure pipe and all of the costs for maintaining all catch basins and manholes within this Enclosure Structure shall be maintained in the future entirely at the expense of the M.T.O.

This Enclosure Structure was mostly replaced and extended further to the north by the M.T.O. as part of the work carried out to the Burke Drain under the Letter of Opinion Report prepared by Tom H. Marentette, P.Eng., of Dillon Consulting, which was primarily provided to accommodate all of the changes to the general area caused by the re-routing of King's Highway No.3 and improvements needed to provide a sufficient outlet for the Parkway Improvements. The original enclosure extended from Station 1+339 to Station 1+530 with Parcels 9 and 8 frontages being totally enclosed and Parcel 7's frontage enclosed for only 68 metres of its 73 metre frontage. The enclosure now commences at Station 1+383 and extends northerly beyond Parcel 7 to Station 1+568 into the Outer Drive Connector Road right-of-way.

General

We are also establishing herein that all of the costs associated with the temporary removal and restoration of the highway chain link fence installed along the Burke Drain from approximately Stations 1+290 to 1+330, which will be necessary in order to maintain that portion of the Burke Drain, shall be assessed entirely to the M.T.O. when maintenance works are carried out to the Burke Drain in the future.

It should also be noted that Stormwater Management Ponds, by definition, are utilized for restricting discharges and reducing flow rates into receiving drainage systems; however, these flows

extend for a longer period of time in order to empty the pond after a rain event and generally contribute a higher total volume of water to travel through the receiving drains which essentially causes injury to said drains in the form of higher direct erosion and extended saturation of the drain bottom which tends to destabilize the drain banks; basically the receiving drains are wetter for longer periods of time.

We consider this to be an injuring liability to the receiving drains which will generally reduce their service life resulting in more periodic drain maintenance and therefore increased maintenance costs. Pursuant to Section 23 of the Drainage Act we have taken into account the increased volume of artificial runoff coming from the pond and have factored same into the outlet assessment for the lands being served by the pond within our new Maintenance Schedules of Assessment for both the "Burke Branch Drain" and the "Burke Drain and Burke Drain Outlet".

It is our understanding that the M.T.O. prefers to carry out any required maintenance works to the Burke Drain located through their roadway corridor themselves utilizing their own forces and co-ordinated by the Windsor-Essex Mobility Group, established for this purpose. When maintenance works through this portion of the Burke Drain is deemed necessary by the Town of Tecumseh, they are to contact and establish the necessary maintenance works with the Windsor-Essex Mobility Group, and the maintenance works is to be carried out by said group in a reasonable length of time. All maintenance works to the Burke Branch and to the Burke Drain and Burke Drain Outlet shall be carried out in total compliance with Section 74 of the "Drainage Act, R.S.O. 1990, Chapter, D.17", as amended in 2010. The Town of Tecumseh is compelled to carry out maintenance works to their Municipal Drains in a timely manner as established in Section 79 of the Drainage Act, and the Windsor-Essex Mobility Group must carry out their maintenance works in a timely manner so that the Town of Tecumseh can carry out their obligation of said section of the Drainage Act. Also, the Windsor-Essex Mobility Group, prior to carrying out any maintenance works to the Burke Drain, must notify the Municipality at least one (1) week prior to the works commencing. If the M.T.O. wishes to initiate maintenance works of the Burke Drain along their roadway corridor they must submit a formal request to the Town of Tecumseh, and gain their approval to proceed prior to any maintenance works being carried out.

We are also establishing herein that the existing roadway crossing culvert under the former County Road 9 (Howard Avenue) which was earlier being utilized as the outlet for the Burke Drain shall hereinafter be maintained in the future entirely by the M.T.O., the current owner of the Howard Avenue Diversion.

All of the above provisions for the future maintenance of the Burke Branch and the Burke Drain and Burke Drain Outlet, shall remain as aforesaid until otherwise determined under the

provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17", or subsequent amendments made thereto.

All of which is respectfully submitted.

N. J. PERALTA ENGINEERING LTD.

Nick J. Peralta, P.Eng.

Antonio B. Peralta, P.Eng.

NJP/sa

Att.

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division Street North
KINGSVILLE, Ontario
N9Y 1E1

CONSTRUCTION SCHEDULE OF ASSESSMENT

Burke Drain, Burke Branch and Burke Drain Outlet

TOWN OF LASALLE & TOWN OF TECUMSEH

TOWN OF TECUMSEH

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
17	Howard Aveune Diversion				2.00	0.809	Ministry of Transportation Ontario	$ -	$ -	$ 6,696.00	$ 6,696.00
	Total on Ontario Lands.....							**$ -**	**$ -**	**$ 6,696.00**	**$ 6,696.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
22	Chrysler Greenway	STR	305	-	3.00	1.214	Town of Tecumseh Parks and Recreation Department	$ 16,394.00	$ -	$ -	$ 16,394.00
	Total on Privately Owned - Non-Agricultural Lands.....							**$ 16,394.00**	**$ -**	**$ -**	**$ 16,394.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
15	470-01300	STR	305	37.29	37.29	15.091	Amico Infrastructures	$ -	$ -	$ 2,206.00	$ 2,206.00
	Total on Privately Owned - Agricultural Lands (grantable).....							**$ -**	**$ -**	**$ 2,206.00**	**$ 2,206.00**

6. SPECIAL NON PRO-RATEABLE ASSESSMENTS (non-agricultural (Sec.26)):

	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
A.	Burke Branch - Outer Drive (Closed) Roadway Crossing; Const. Items 47 & 48						Ministry of Transportation Ontario	$ 22,222.00	$ -	$ -	$ 22,222.00
B.	Burke Branch - Drain Works consisting of Const. Items 46a & 49 (Shared)						Ministry of Transportation Ontario	$ 5,649.00	$ -	$ -	$ 5,649.00
C.	Burke Drain - All Burke Drain Works except for Const. Item 38a and Part of Const. Item 28						Ministry of Transportation Ontario	$ 122,700.00	$ -	$ -	$ 122,700.00
D.	Burke Drain Outlet - Lowering of Gasmain at Bridge No.1; Const. Item 16						Union Gas	$ 140,250.00	$ -	$ -	$ 140,250.00
E.	Burke Drain Outlet - Lowering of Watermain at Bridge No.2; Const. Item 18						Town of Tecumseh Water Department	$ 22,250.00	$ -	$ -	$ 22,250.00
F.	Burke Drain Outlet- Lowering of Gasmain at Bridge No.2; Const. Item 17 (Shared)						Ministry of Transportation Ontario	$ 93,968.00	$ -	$ -	$ 93,968.00
G.	Burke Drain Outet - All Burke Drain Outlet Works except for Const. Items 16, 17 & 18 (Shared)						Ministry of Transportation Ontario	$ 190,079.00	$ -	$ -	$ 190,079.00
	Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26))							**$ 597,118.00**	**$ -**	**$ -**	**$ 597,118.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH					42.29	17.115		**$ 613,512.00**	**$ -**	**$ 8,902.00**	**$ 622,414.00**

TOWN OF LASALLE

6. SPECIAL NON PRO-RATEABLE ASSESSMENTS (non-agricultural (Sec.26)):

	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
B.	Burke Branch - Drain Works consisting of Const. Items 46a & 49 (Shared)						Town of LaSalle Road Authority	$ 2,783.00	$ -	$ -	$ 2,783.00
F.	Burke Drain Outlet- Lowering of Gasmain at Bridge 2; Const. Item 17 (Shared)						Town of LaSalle Road Authority	$ 46,282.00	$ -	$ -	$ 46,282.00
G.	Burke Drain Outet - All Burke Drain Outlet Works except for Const. Items 16, 17 & 18 (Shared)						Town of LaSalle Road Authority	$ 93,621.00	$ -	$ -	$ 93,621.00
	Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26))							**$ 142,686.00**	**$ -**	**$ -**	**$ 142,686.00**
TOTAL ASSESSMENT -TOWN OF LASALLE								**$ 142,686.00**	**$ -**	**$ -**	**$ 142,686.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH (brought forward)								**$ 613,512.00**	**$ -**	**$ 8,902.00**	**$ 622,414.00**
TOTAL ASSESSMENT					42.29	17.115		**$ 756,198.00**	**$ -**	**$ 8,902.00**	**$ 765,100.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018

APPENDIX "A"

MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE BURKE BRANCH DRAIN

APPENDIX 'A'

MAINTENANCE SCHEDULE OF ASSESSMENT

Burke Branch Drain

TOWN OF LASALLE & TOWN OF TECUMSEH

TOWN OF TECUMSEH

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
17	Howard Aveune Diversion				2.00	0.809	Ministry of Transportation Ontario	$ 74.00	$ 86.00	$ -	$ 160.00
-	Block 'B'				16.00	6.475	Ministry of Transportation Ontario	$ -	$ 523.00	$ -	$ 523.00
-	Block 'C'				5.21	2.108	Ministry of Transportation Ontario	$ -	$ 170.00	$ -	$ 170.00
23	Kings Highway No. 3				2.65	1.072	Ministry of Transportation Ontario	$ 20.00	$ 106.00	$ -	$ 126.00
	Total on Ontario Lands.....							**$ 94.00**	**$ 885.00**	**$ -**	**$ 979.00**

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
19	Outer Drive (Closed)			5.40	2.70	1.093	Ministry of Transportation Ontario	$ 71.00	$ 86.00	$ -	$ 157.00
-	Howard Avenue (Pond)			-	0.80	0.324	County of Essex	$ -	$ 26.00	$ -	$ 26.00
	Total on Municipal Lands.....							**$ 71.00**	**$ 112.00**	**$ -**	**$ 183.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
14	470-01410	STR	306	4.90	4.90	1.983	Ministry of Transportation Ontario	$ 165.00	$ 125.00	$ -	$ 290.00
1	470-01580	STR	306 & 307	42.43	24.44	9.891	Ministry of Transportation Ontario	$ 548.00	$ 851.00	$ -	$ 1,399.00
2	470-05000	STR	306	1.00	0.40	0.162	Ministry of Transportation Ontario	$ -	$ 13.00	$ -	$ 13.00
3	470-05003	STR	306	1.08	0.63	0.255	Ministry of Transportation Ontario	$ -	$ 21.00	$ -	$ 21.00
11	470-05100	STR	306	36.06	30.06	12.165	Ministry of Transportation Ontario	$ 607.00	$ 1,004.00	$ -	$ 1,611.00
4	470-05200	STR	306	1.00	1.00	0.405	Ministry of Transportation Ontario	$ -	$ 33.00	$ -	$ 33.00

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
5	470-05201	STR	306	4.29	2.82	1.141	Ministry of Transportation Ontario	$ 13.00	$ 82.00	$ -	$ 95.00
13	470-05400	STR	306	0.10	0.10	0.040	Ministry of Transportation Ontario	$ 2.00	$ 2.00	$ -	$ 4.00
	Total on Privately Owned - Non-Agricultural Lands.....							**$ 1,335.00**	**$ 2,131.00**	**$ -**	**$ 3,466.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH					93.71	37.924		**$ 1,500.00**	**$ 3,128.00**	**$ -**	**$ 4,628.00**

TOWN OF LASALLE

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
-	Block 'A'				10.60	4.290	Ministry of Transportation Ontario	$ -	$ 346.00	$ -	$ 346.00
	Total on Ontario Lands.....							**$ -**	**$ 346.00**	**$ -**	**$ 346.00**

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
-	Howard Avenue (Pond)			-	0.80	0.324	County of Essex	$ -	$ 26.00	$ -	$ 26.00
	Total on Municipal Lands.....							**$ -**	**$ 26.00**	**$ -**	**$ 26.00**
TOTAL ASSESSMENT -TOWN OF LASALLE					11.40	4.614		**$ -**	**$ 372.00**	**$ -**	**$ 372.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH (brought forward)								**$ 1,500.00**	**$ 3,128.00**	**$ -**	**$ 4,628.00**
TOTAL ASSESSMENT					105.11	42.537		**$ 1,500.00**	**$ 3,500.00**	**$ -**	**$ 5,000.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018

APPENDIX "B"

MAINTENANCE SCHEDULE OF ASSESSMENT FOR THE BURKE DRAIN AND BURKE DRAIN OUTLET

APPENDIX 'B'

MAINTENANCE SCHEDULE OF ASSESSMENT

Burke Drain and Burke Drain Outlet

TOWN OF LASALLE & TOWN OF TECUMSEH

TOWN OF TECUMSEH

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
17	Howard Aveune Diversion				2.40	0.971	Ministry of Transportation Ontario	$ 103.00	$ 210.00	$ -	$ 313.00
-	Block 'B'				16.00	6.475	Ministry of Transportation Ontario	$ -	$ 1,051.00	$ -	$ 1,051.00
-	Block 'C'				5.21	2.108	Ministry of Transportation Ontario	$ -	$ 342.00	$ -	$ 342.00
23	Kings Highway No. 3				5.45	2.206	Ministry of Transportation Ontario	$ 168.00	$ 483.00	$ -	$ 651.00
	Total on Ontario Lands.....							**$ 271.00**	**$ 2,086.00**	**$ -**	**$ 2,357.00**

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
18	Outer Drive			1.20	1.20	0.486	Town of Tecumseh	$ 53.00	$ 128.00	$ -	$ 181.00
19	Outer Drive (Closed)			5.40	5.40	2.185	Ministry of Transportation Ontario	$ 202.00	$ 378.00	$ -	$ 580.00
-	Howard Avenue (Pond)			-	0.80	0.324	County of Essex	$ -	$ 53.00	$ -	$ 53.00
20	South Talbot Road			-	2.00	0.809	Town of Tecumseh	$ 88.00	$ 176.00	$ -	$ 264.00
	Total on Municipal Lands.....							**$ 343.00**	**$ 735.00**	**$ -**	**$ 1,078.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
14	470-01410	STR	306	4.90	4.90	1.983	Ministry of Transportation Ontario	$ 198.00	$ 251.00	$ -	$ 449.00
1	470-01580	STR	306 & 307	42.43	24.44	9.891	Ministry of Transportation Ontario	$ 290.00	$ 1,710.00	$ -	$ 2,000.00
2	470-05000	STR	306	1.00	0.40	0.162	Ministry of Transportation Ontario	$ -	$ 26.00	$ -	$ 26.00

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
3	470-05003	STR	306	1.08	0.63	0.255	Ministry of Transportation Ontario	$ -	$ 41.00	$ -	$ 41.00
11	470-05100	STR	306	36.06	34.66	14.027	Ministry of Transportation Ontario	$ 706.00	$ 2,495.00	$ -	$ 3,201.00
4	470-05200	STR	306	1.00	1.00	0.405	Ministry of Transportation Ontario	$ -	$ 66.00	$ -	$ 66.00
5	470-05201	STR	306	4.29	4.29	1.736	Ministry of Transportation Ontario	$ 84.00	$ 267.00	$ -	$ 351.00
6	470-05300	STR	306	3.65	3.65	1.477	Miksa Marton	$ 160.00	$ 234.00	$ -	$ 394.00
13	470-05400	STR	306	0.10	0.10	0.040	Ministry of Transportation Ontario	$ 3.00	$ 4.00	$ -	$ 7.00
9	470-05401	STR	305	0.70	0.70	0.283	Ministry of Transportation Ontario	$ 31.00	$ 69.00	$ -	$ 100.00
12	470-05402	STR	305	32.54	32.54	13.169	Congregation of the Order Antonin Maronite in Ontario	$ 1,372.00	$ 2,724.00	$ -	$ 4,096.00
8	470-05405	STR	305	1.13	1.13	0.457	Ministry of Transportation Ontario	$ 50.00	$ 86.00	$ -	$ 136.00
7	470-05412	STR	305	1.64	1.64	0.664	470698 Ontario Ltd.	$ 72.00	$ 209.00	$ -	$ 281.00
10	470-05500	STR	305	10.85	10.85	4.391	Ministry of Transportation Ontario	$ 419.00	$ 926.00	$ -	$ 1,345.00
21	470-05600	STR	305	66.82	1.60	0.648	Victoria Memorial Gardens	$ 56.00	$ 76.00	$ -	$ 132.00
22	Chrysler Greenway	STR	305	-	3.00	1.214	Town of Tecumseh Parks and Recreation Department	$ 132.00	$ 202.00	$ -	$ 334.00
	Total on Privately Owned - Non-Agricultural Lands.....							**$ 3,573.00**	**$ 9,386.00**	**$ -**	**$ 12,959.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
16	450-02500	5	8	14.85	4.00	1.619	2484234 Ontario Inc.	$ 176.00	$ 93.00	$ -	$ 269.00
15	470-01300	STR	305	37.29	37.29	15.091	Amico Infrastructures	$ 1,637.00	$ 951.00	$ -	$ 2,588.00
	Total on Privately Owned - Agricultural Lands (grantable).....							**$ 1,813.00**	**$ 1,044.00**	**$ -**	**$ 2,857.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH					205.28	83.076		**$ 6,000.00**	**$ 13,251.00**	**$ -**	**$ 19,251.00**

TOWN OF LASALLE

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
-	Block 'A'				10.60	4.290	Ministry of Transportation Ontario	$ -	$ 696.00	$ -	$ 696.00
	Total on Ontario Lands.....							**$ -**	**$ 696.00**	**$ -**	**$ 696.00**

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
-	Howard Avenue (Pond)			-	0.80	0.324	County of Essex	$ -	$ 53.00	$ -	$ 53.00
	Total on Municipal Lands.....							**$ -**	**$ 53.00**	**$ -**	**$ 53.00**
TOTAL ASSESSMENT -TOWN OF LASALLE					11.40	4.614		**$ -**	**$ 749.00**	**$ -**	**$ 749.00**
TOTAL ASSESSMENT -TOWN OF TECUMSEH (brought forward)								**$ 6,000.00**	**$ 13,251.00**	**$ -**	**$ 19,251.00**
TOTAL ASSESSMENT					216.68	87.689		**$ 6,000.00**	**$ 14,000.00**	**$ -**	**$ 20,000.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018

APPENDIX "C"

SCHEDULE OF ASSESSMENT FOR FUTURE ACCESS BRIDGE STRUCTURE MAINTENANCE

APPENDIX 'C'

SCHEDULE OF ASSESSMENT FOR FUTURE ACCESS BRIDGE STRUCTURE MAINTENANCE

Burke Drain and Burke Drain Outlet

TOWN OF LASALLE & TOWN OF TECUMSEH

TOWN OF TECUMSEH

2. ONTARIO LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
23	Kings Highway No. 3				2.80	1.133	Ministry of Transportation Ontario	$ -	$ 196.00	$ -	$ 196.00
	Total on Ontario Lands.....							**$ -**	**$ 196.00**	**$ -**	**$ 196.00**

3. MUNICIPAL LANDS:

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
18	Outer Drive			1.20	1.20	0.486	Town of Tecumseh	$ -	$ 92.00	$ -	$ 92.00
19	Outer Drive (Closed)			-	2.70	1.093	Ministry of Transportation Ontario	$ -	$ 150.00	$ -	$ 150.00
	Total on Municipal Lands.....							**$ -**	**$ 242.00**	**$ -**	**$ 242.00**

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

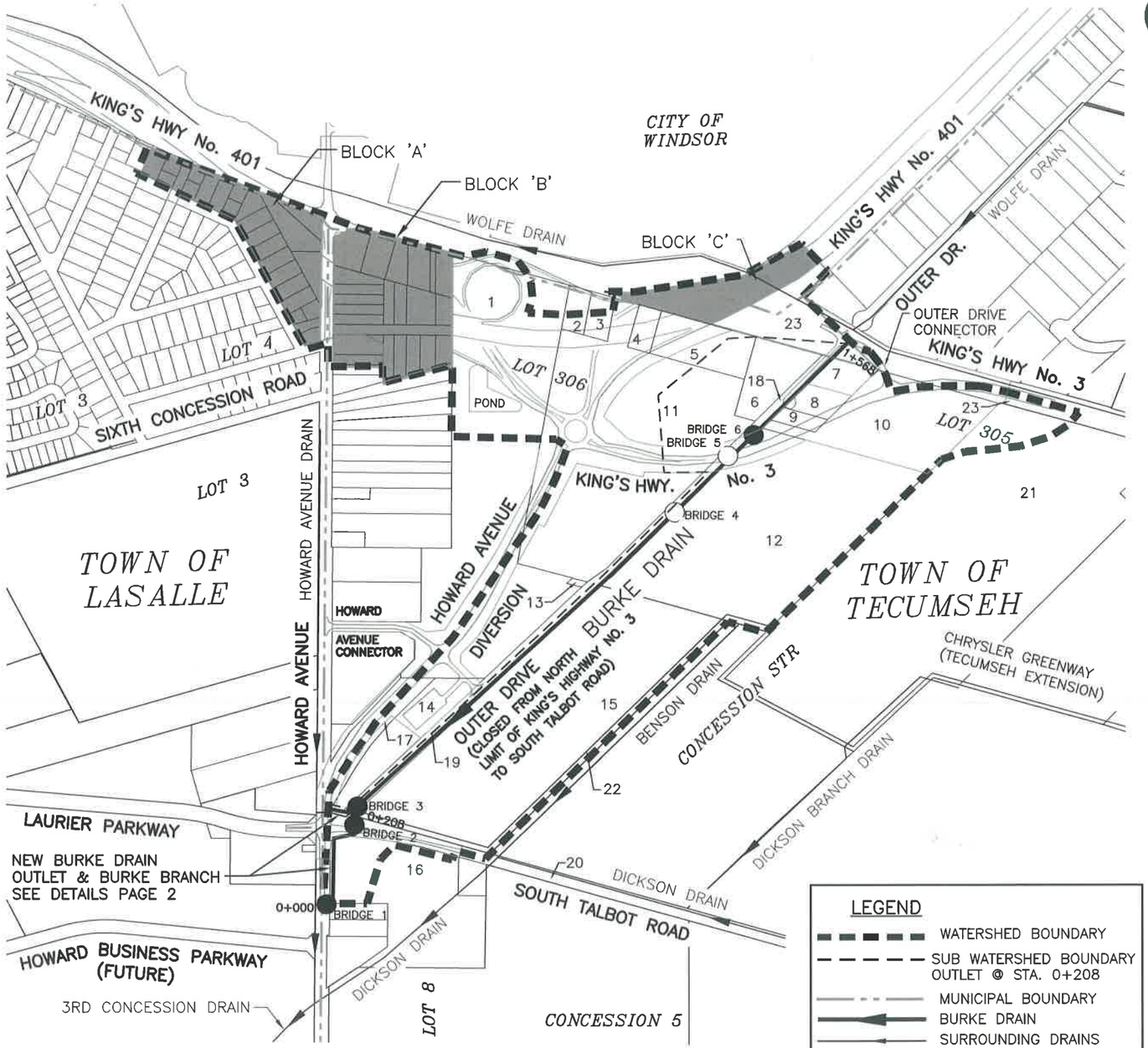
Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
11	470-05100	STR	306	36.06	6.00	2.428	Ministry of Transportation Ontario	$ -	$ 350.00	$ -	$ 350.00
5	470-05201	STR	306	4.29	1.47	0.595	Ministry of Transportation Ontario	$ -	$ 75.00	$ -	$ 75.00
6	470-05300	STR	306	3.65	3.65	1.477	Miksa Marton	$ -	$ 168.00	$ -	$ 168.00
13	470-05400	STR	306	0.10	0.10	0.040	Ministry of Transportation Ontario	$ -	$ 3.00	$ -	$ 3.00
9	470-05401	STR	305	0.70	0.70	0.283	Ministry of Transportation Ontario	$ -	$ 50.00	$ -	$ 50.00
12	470-05402	STR	305	32.54	32.54	13.169	Congregation of the Order Antonin Maronite in Ontario	$ -	$ 2,040.00	$ -	$ 2,040.00
8	470-05405	STR	305	1.13	1.13	0.457	Ministry of Transportation Ontario	$ -	$ 61.00	$ -	$ 61.00

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
7	470-05412	STR	305	1.64	1.64	0.664	470698 Ontario Ltd.	$ -	$ 148.00	$ -	$ 148.00
10	470-05500	STR	305	10.85	10.85	4.391	Ministry of Transportation Ontario	$ -	$ 680.00	$ -	$ 680.00
21	470-05600	STR	305	66.82	1.60	0.648	Victoria Memorial Gardens	$ -	$ 56.00	$ -	$ 56.00
22	Chrysler Greenway	STR	305	-	2.72	1.101	Town of Tecumseh Parks and Recreation Department	$ -	$ 152.00	$ -	$ 152.00
	Total on Privately Owned - Non-Agricultural Lands.....							**$ -**	**$ 3,783.00**	**$ -**	**$ 3,783.00**

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Dillon Parcel No.	Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
15	470-01300	STR	305	37.29	37.29	15.091	Amico Infrastructures	$ -	$ 779.00	$ -	$ 779.00
	Total on Privately Owned - Agricultural Lands (grantable).....							**$ -**	**$ 779.00**	**$ -**	**$ 779.00**
TOTAL ASSESSMENT					69.10	27.964		**$ -**	**$ 5,000.00**	**$ -**	**$ 5,000.00**

1 Hectare = 2.471 Acres
D-14-034
June 6th, 2018



LEGEND

- WATERSHED BOUNDARY
- SUB WATERSHED BOUNDARY OUTLET @ STA. 0+208
- MUNICIPAL BOUNDARY
- BURKE DRAIN
- SURROUNDING DRAINS
- EXISTING BRIDGE
- REPLACEMENT/NEW BRIDGE

BURKE DRAIN PARCEL INFORMATION

PARCEL No.	ROLL No.	LANDOWNER	AREA WITHIN WATERSHED (ACRES)
TOWN OF LASALLE			
BLOCK A	N/A	MINISTRY OF TRANSPORTATION	10.60
	HOWARD AVENUE	COUNTY OF ESSEX	0.80
TOWN OF TECUMSEH			
BLOCK B	N/A	MINISTRY OF TRANSPORTATION	16.00
	HOWARD AVENUE	COUNTY OF ESSEX	0.80
BLOCK C	KING'S HWY. NO. 401	MINISTRY OF TRANSPORTATION	5.21
1 *	470-01580	MINISTRY OF TRANSPORTATION	24.44
2 *	470-05000	MINISTRY OF TRANSPORTATION	0.40
3 *	470-05003	MINISTRY OF TRANSPORTATION	0.63
4 *	470-05200	MINISTRY OF TRANSPORTATION	1.00
5 *	700-52010	MINISTRY OF TRANSPORTATION	4.29
6	470-05300	MIKSA MARTON	3.65
7	470-05412	470698 ONTARIO LTD	1.64
8 *	470-05405	MINISTRY OF TRANSPORTATION	1.13
9 *	470-05401	MINISTRY OF TRANSPORTATION	0.70
10 *	470-05500	MINISTRY OF TRANSPORTATION	10.85
11 *	470-05100	MINISTRY OF TRANSPORTATION	34.66
12 *	470-05402	CONGREGATION OF THE ORDER ANTONIN MARONITE IN ONTARIO	32.54
13	470-05400	MINISTRY OF TRANSPORTATION	0.10
14	470-01410	MINISTRY OF TRANSPORTATION	4.90
15	470-01300	AMICO INFRASTRUCTURES	37.29
16	450-02500	2484234 ONTARIO INC	4.00
17	HOWARD AVENUE DIVERSION	MINISTRY OF TRANSPORTATION	2.40
18	OUTER DRIVE	TOWN OF TECUMSEH	1.20
19	OUTER DRIVE (CLOSED)	MINISTRY OF TRANSPORTATION	5.40
20	SOUTH TALBOT ROAD	TOWN OF TECUMSEH	2.00
21	470-05600	VICTORIA MEMORIAL GARDENS	1.60
22	N/A	CHRYSLER GREENWAY (TOWN OF TECUMSEH)	3.00
23	KING'S HIGHWAY NO. 3	MINISTRY OF TRANSPORTATION	5.45
TOTAL DRAINAGE AREA-BURKE DRAIN=87.69 Ha (216.68 Acres)			

* AREAS SHOWN INCLUDE NEW ROADWAY AREAS

'SCHEDULE C'

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	1 : 10000

DILLON CONSULTING

PROJECT NO. 12-6578-1300

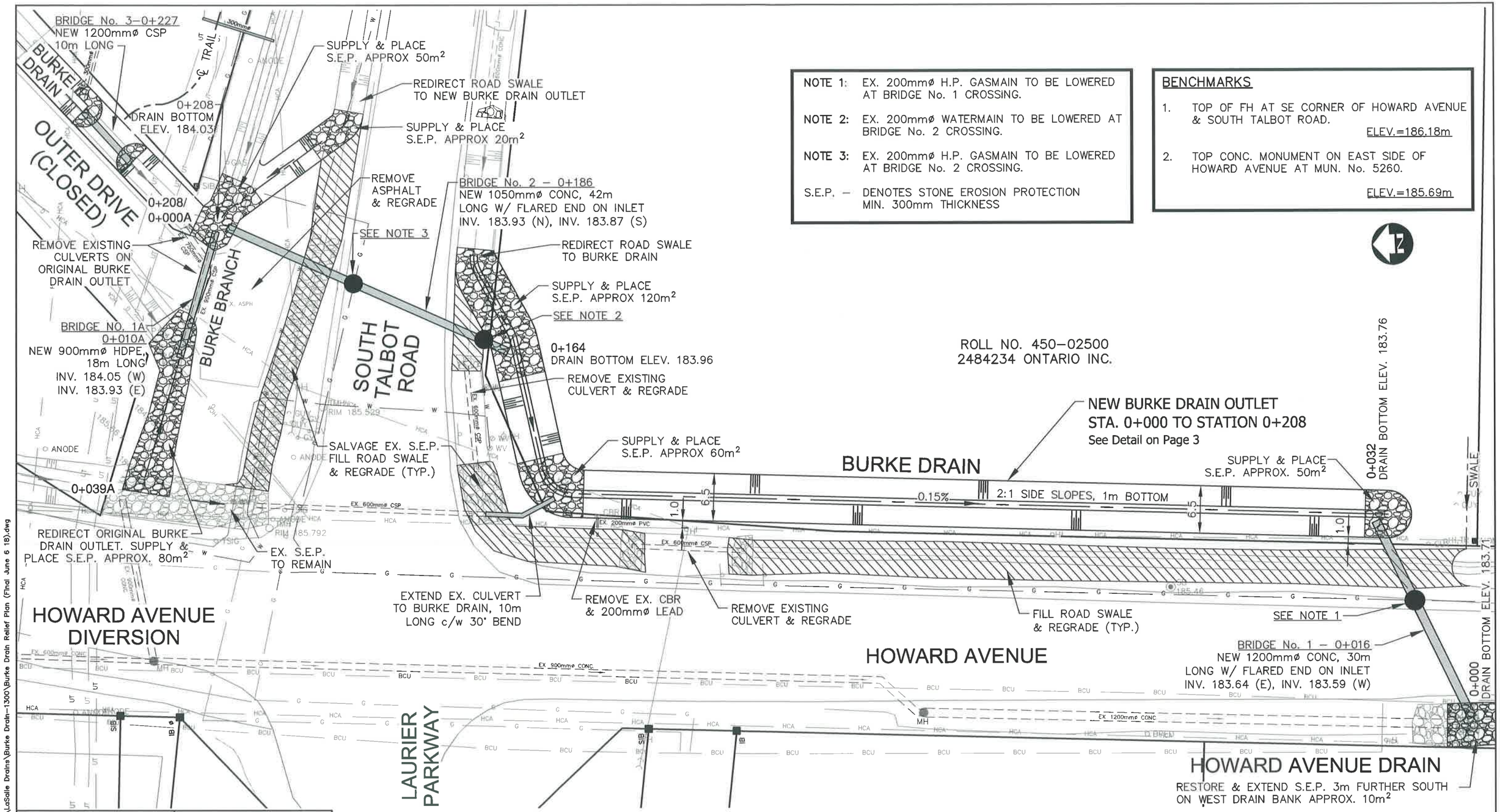
DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

SHEET TITLE: WATERSHED PLAN

PAGE NO. 1 of 9

Jun 05, 2018 - 4:07pm G:\CAD\126578\LaSalle Drains\Burke Drain-1300\Burke Drain_Plan (Final June 6 18).dwg



PLAN VIEW
SCALE:=1:500

NOTE 1:	EX. 200mmø H.P. GASMAIN TO BE LOWERED AT BRIDGE No. 1 CROSSING.
NOTE 2:	EX. 200mmø WATERMAIN TO BE LOWERED AT BRIDGE No. 2 CROSSING.
NOTE 3:	EX. 200mmø H.P. GASMAIN TO BE LOWERED AT BRIDGE No. 2 CROSSING.
S.E.P. –	DENOTES STONE EROSION PROTECTION MIN. 300mm THICKNESS

BENCHMARKS

1. TOP OF FH AT SE CORNER OF HOWARD AVENUE & SOUTH TALBOT ROAD.
   ELEV.=186.18m
2. TOP CONC. MONUMENT ON EAST SIDE OF HOWARD AVENUE AT MUN. No. 5260.
   ELEV.=185.69m

ROLL NO. 450–02500
2484234 ONTARIO INC.

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	TKS
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1300

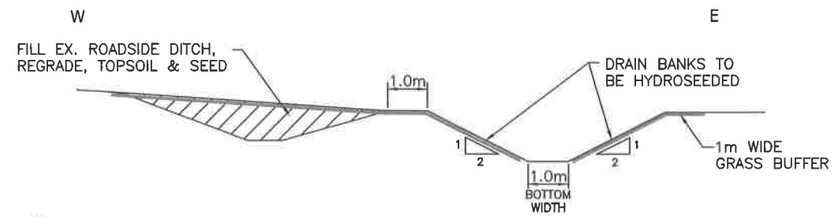
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

SHEET TITLE
BURKE DRAIN OUTLET & BURKE BRANCH

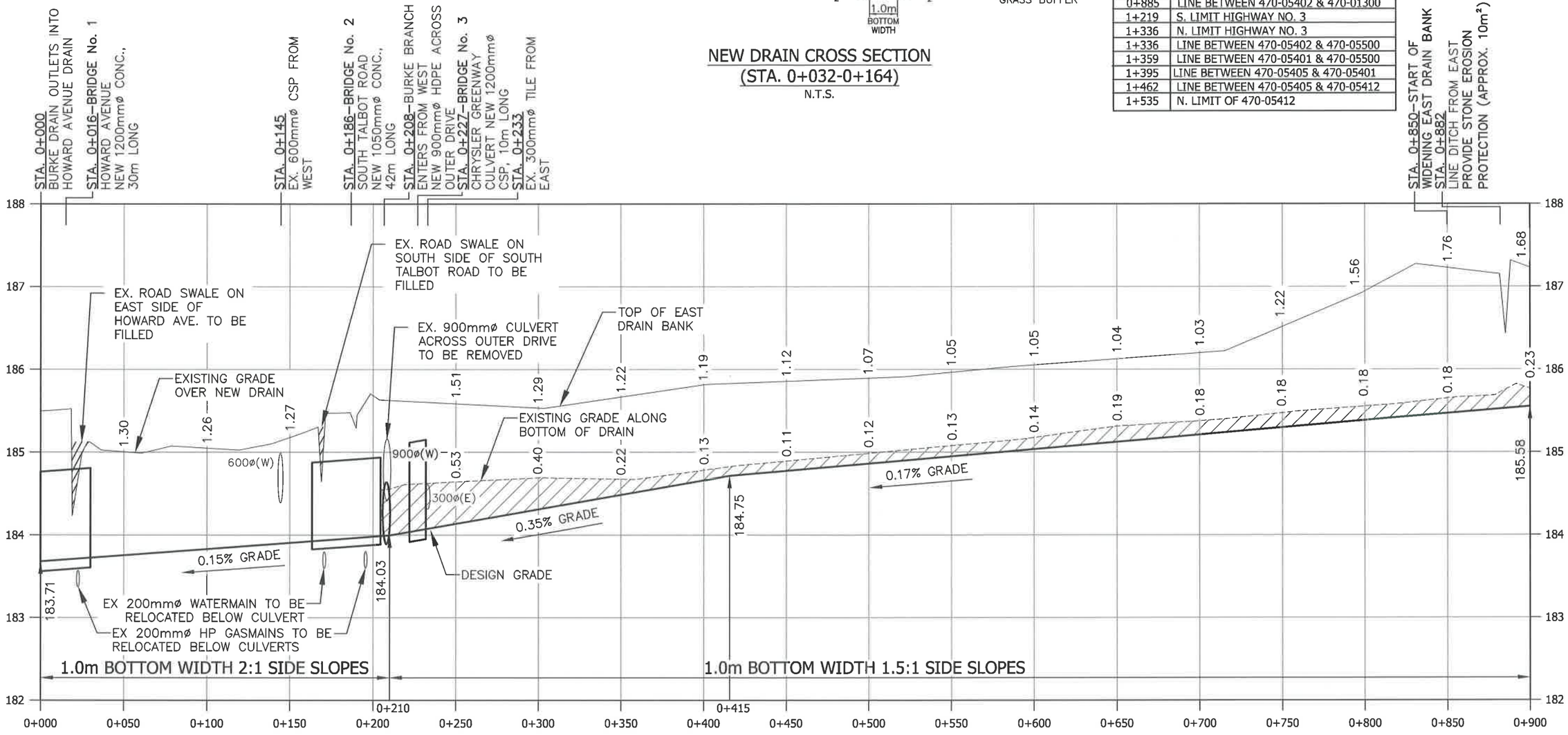
PAGE NO. 2 of 9



NEW DRAIN CROSS SECTION (STA. 0+032-0+164)

N.T.S.

BURKE DRAIN STATIONING	
STATION	DESCRIPTION
0+000	W. LIMIT BRIDGE NO. 1
0+027	E. LIMIT HOWARD AVENUE
0+030	E. LIMIT BRIDGE NO. 1
0+155	S. END BRIDGE NO. 2
0+165	S. LIMIT SOUTH TALBOT ROAD
0+207	N. END BRIDGE NO. 2
0+210	N. LIMIT SOUTH TALBOT ROAD
0+885	LINE BETWEEN 470-05402 & 470-01300
1+219	S. LIMIT HIGHWAY NO. 3
1+336	N. LIMIT HIGHWAY NO. 3
1+336	LINE BETWEEN 470-05402 & 470-05500
1+359	LINE BETWEEN 470-05401 & 470-05500
1+395	LINE BETWEEN 470-05405 & 470-05401
1+462	LINE BETWEEN 470-05405 & 470-05412
1+535	N. LIMIT OF 470-05412



PROFILE 1 STA. 0+000 TO 0+900

SCALE-HORIZ.=1:2500
VERT.=1:50

'SCHEDULE C'

No.	ISSUED FOR	DATE	BY
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN: TRO	REVIEWED BY: FRF
DRAWN: AJL	CHECKED BY: EPS
DATE: June 6, 2018	
SCALE: AS SHOWN	

DILLON CONSULTING

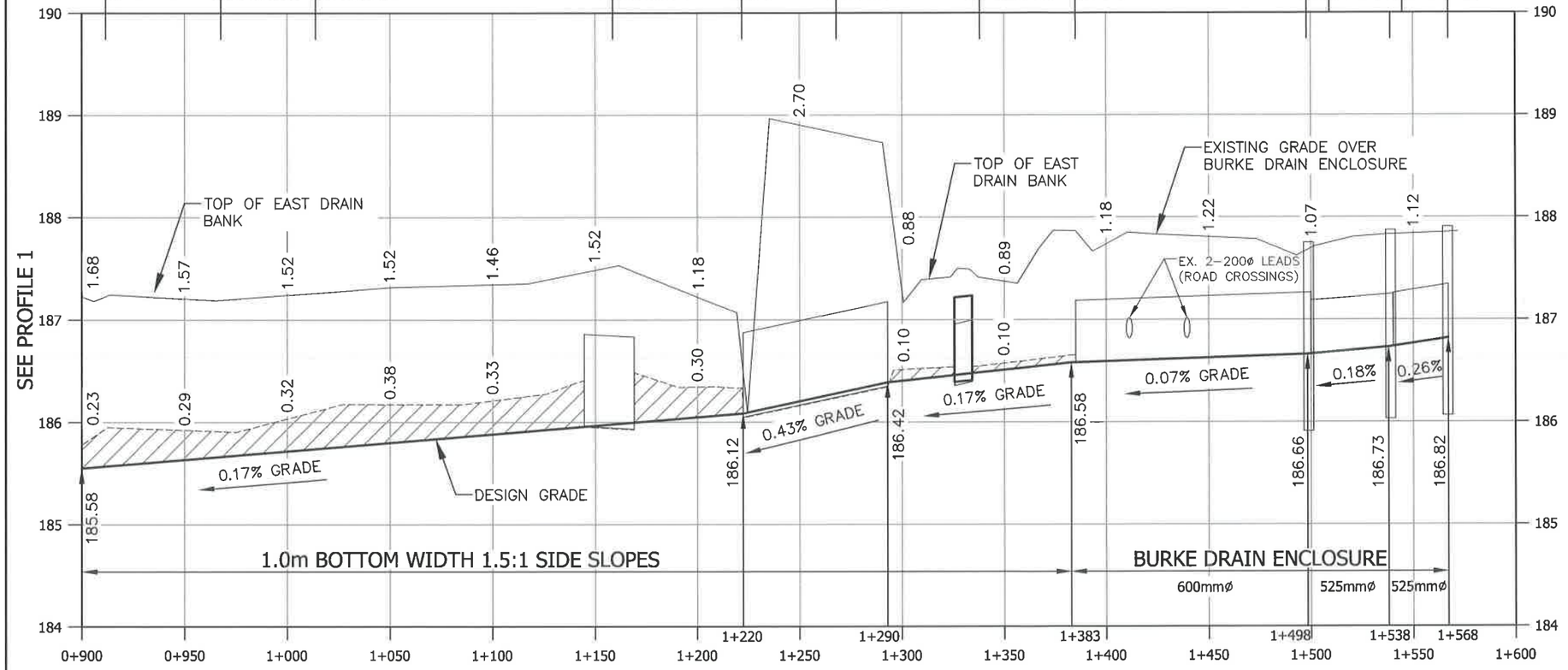
PROJECT NO: 12-6578-1300

DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

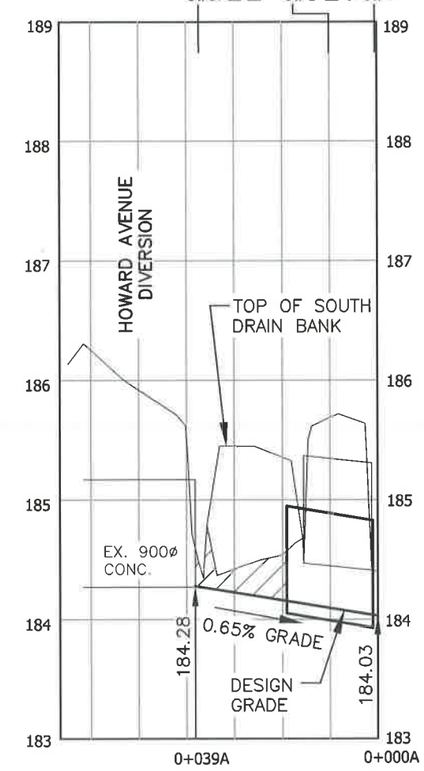
SHEET TITLE: PROFILE 1 STA. 0+000 TO STA. 0+900

PAGE NO: 3 of 9



PROFILE 2 STA. 0+900 TO 1+568

SCALE-HORIZ.=1:2500
VERT.=1:50



BURKE BRANCH PROFILE STA. 0+000A TO 0+039A

SCALE-HORIZ.=1:1250
VERT.=1:50

'SCHEDULE C'

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1300

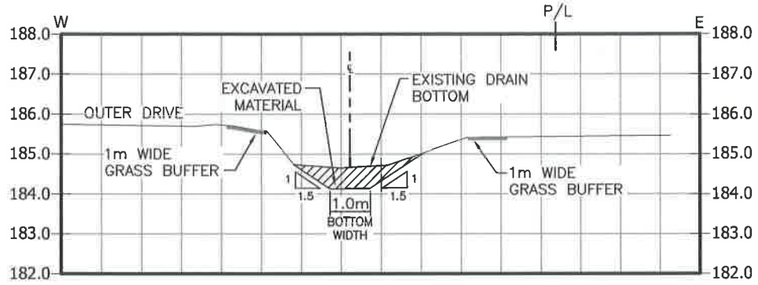
DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

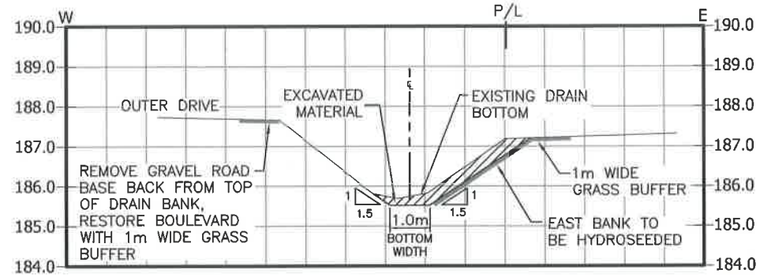
SHEET TITLE
PROFILE 2
STA. 0+900 TO STA. 1+568

PAGE NO. 4 of 9

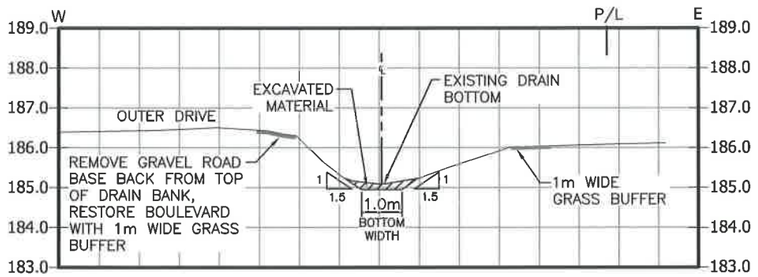
NOTE: FROM STATION 0+850 TO STATION 1+220, BURKE DRAIN TO BE WIDENED 1m BEYOND EAST BANK.



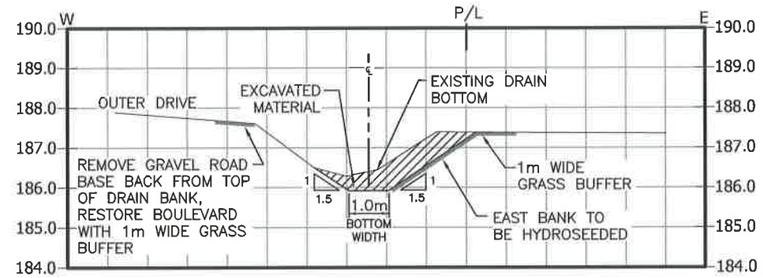
CROSS SECTION 0+250
BURKE DRAIN LOOKING UPSTREAM
SCALE=1:150



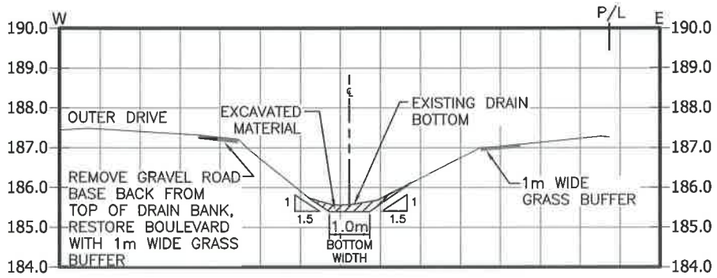
CROSS SECTION 0+875
BURKE DRAIN LOOKING UPSTREAM
SCALE=1:150



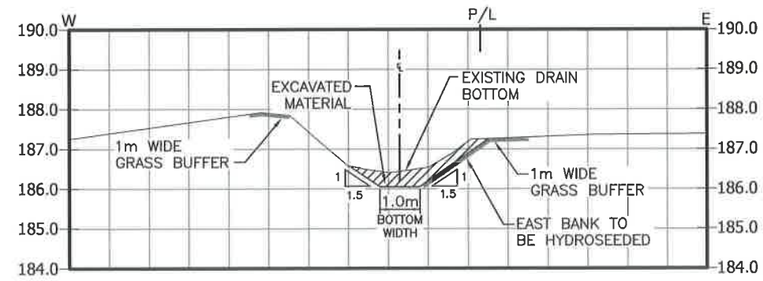
CROSS SECTION 0+550
BURKE DRAIN LOOKING UPSTREAM
SCALE=1:150



CROSS SECTION 1+125
BURKE DRAIN LOOKING UPSTREAM
SCALE=1:150



CROSS SECTION 0+800
BURKE DRAIN LOOKING UPSTREAM
SCALE=1:150



CROSS SECTION 1+200
BURKE DRAIN LOOKING UPSTREAM
SCALE=1:150

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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.		DATE	BY
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO
	ISSUED FOR 168		

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1300

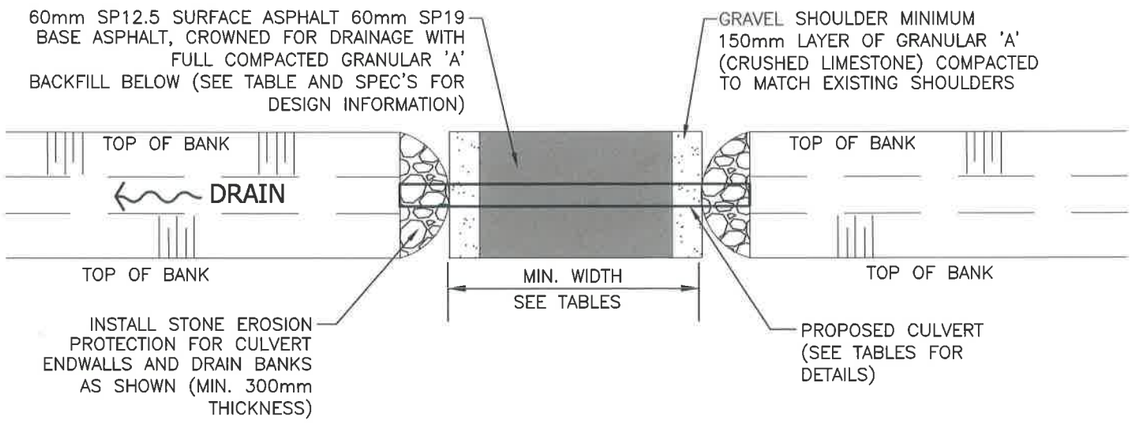
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

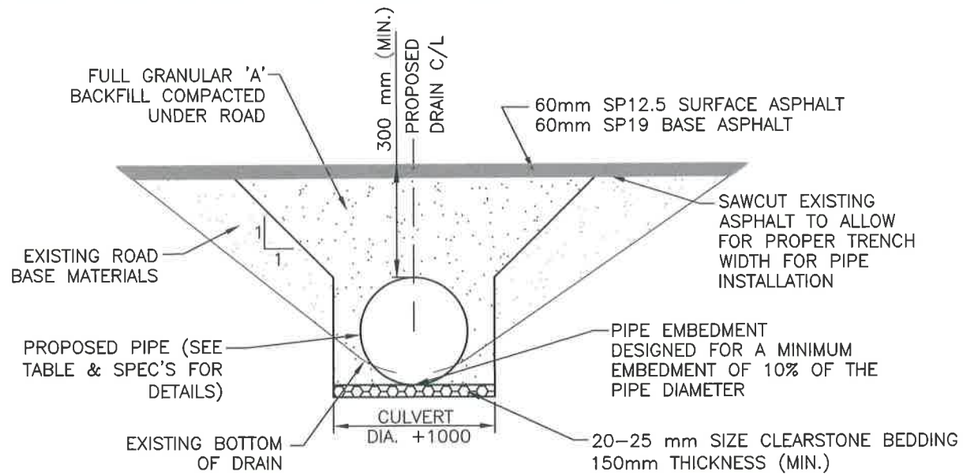
Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

SHEET TITLE: CROSS SECTIONS

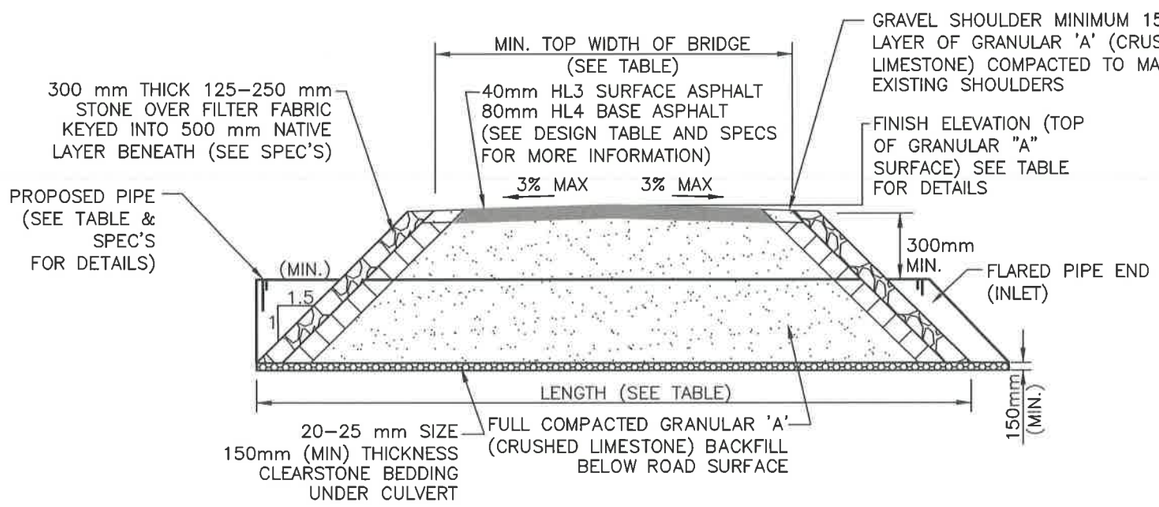
PAGE NO. 5 of 9



BRIDGE PLAN
N.T.S.



CROSS SECTION
N.T.S.



LONGITUDINAL SECTION
N.T.S.

TABLE 1 – ACCESS CULVERT DESIGN INFORMATION

DESCRIPTION	BRIDGE NO. 1	BRIDGE NO. 2
PIPE INVERT ELEV. U/S SIDE(m)	183.64	183.93
PIPE INVERT ELEV. D/S SIDE(m)	183.59	183.87
TOP OF ℄ ROAD SURFACE ELEV. (m)	185.80	185.70
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	183.73	183.99
MIN. TOP WIDTH OF ROAD (m)	12.0	15.0
MIN. CULVERT GRADE (%)	0.15	0.15
CULVERT MATERIAL	CONC.	CONC.
CULVERT LENGTH (m)	30.0	42
PIPE SIZE (mm)	1200	1050
CULVERT ENDWALL TYPE	SLOPING STONE	SLOPING STONE

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
66-06-7
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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN: TRO | REVIEWED BY: FRF
DRAWN: AJL | CHECKED BY: EPS
DATE: June 6, 2018
SCALE: AS SHOWN

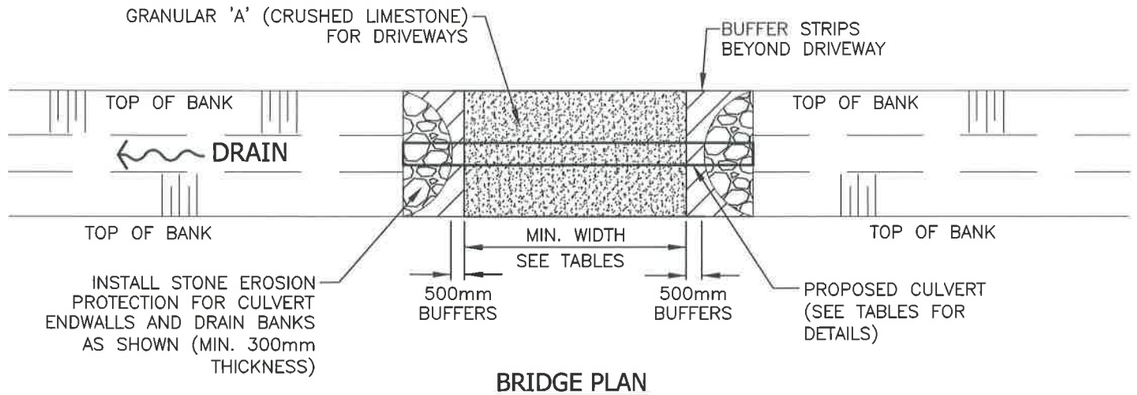
DILLON CONSULTING
PROJECT NO. 12-6578-1300
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

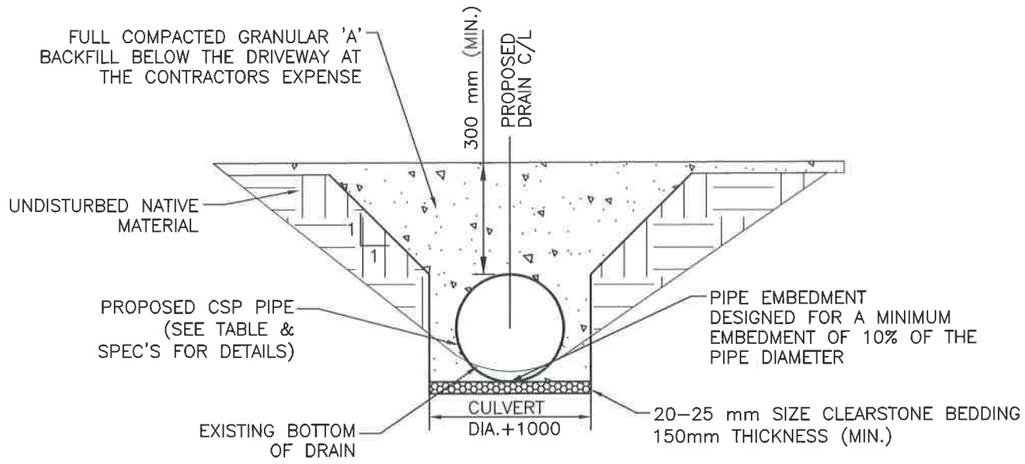
Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

SHEET TITLE: BRIDGE NO. 1 & 2 DETAILS

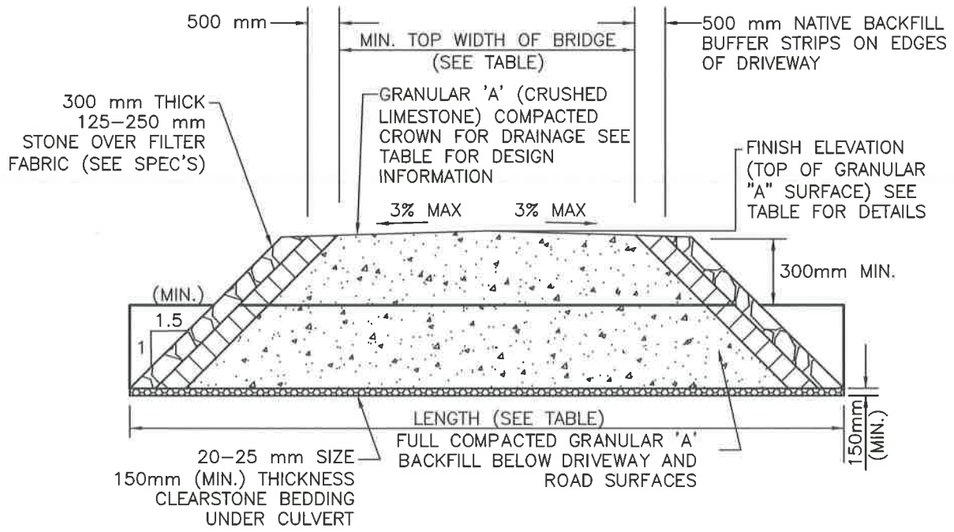
PAGE NO. 6 of 9



BRIDGE PLAN
N.T.S.



CROSS SECTION BRIDGE NO. 5
N.T.S.



LONGITUDINAL SECTION
N.T.S.

TABLE 1 – ACCESS CULVERT DESIGN INFORMATION–BURKE DRAIN			BURKE BRANCH
DESCRIPTION	BRIDGE NO. 3	BRIDGE NO. 6	BRIDGE NO. 1A
PIPE INVERT ELEV. U/S SIDE(m)	183.99	186.41	184.05
PIPE INVERT ELEV. D/S SIDE(m)	183.95	186.39	183.93
TOP OF ℄ DRIVEWAY SURFACE ELEV. (m)	185.60	187.50	185.70
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	184.09	186.48	184.09
MIN. TOP WIDTH OF DRIVEWAY (m)	3.0	4.0	9.0
MIN. CULVERT GRADE (%)	0.35	0.17	0.65
CULVERT MATERIAL	ALUM. CSP	ALUM. CSP	HDPE
CULVERT LENGTH (m)	10.0	9.0	18.0
PIPE SIZE (mm)	1200	800	900
PIPE THICKNESS (mm)	2.8	2.0	320kPa
CULVERT ENDWALL TYPE	SLOPING STONE	SLOPING STONE	SLOPING STONE

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	TRO
REVIEWED BY	FRF
DRAWN	AJL
CHECKED BY	EPS
DATE	June 6, 2018
SCALE	AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1300

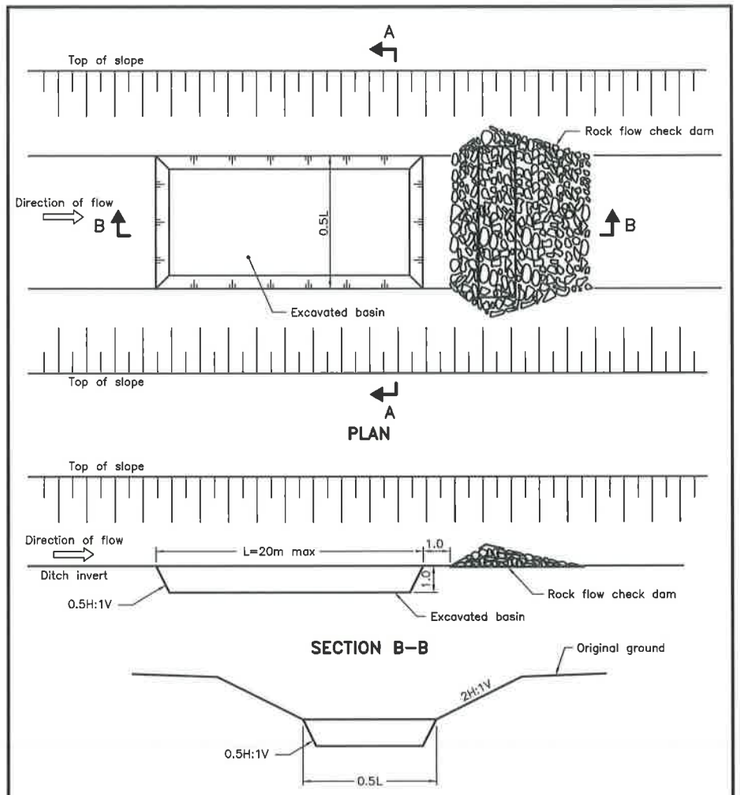
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

SHEET TITLE
BRIDGE NO. 3 & 6 DETAILS

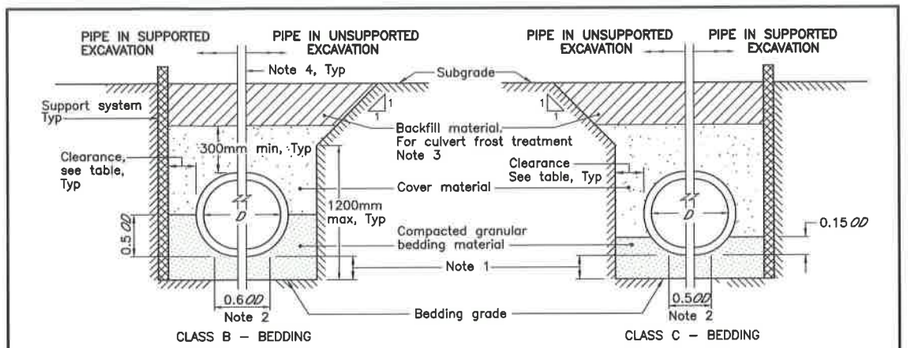
PAGE NO. 7 of 9



NOTES:

A Ditch cross–section upstream or downstream of sediment trap may be flat bottom or V–shaped. Flat bottom shown.
B This OPSD shall be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
SEDIMENT TRAP IN DITCH			
	OPSD 219.220		



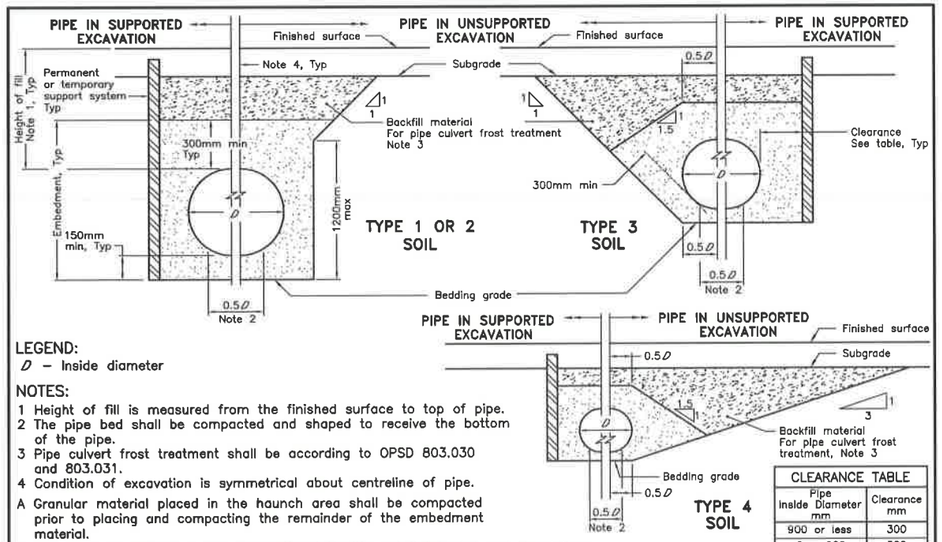
NOTES:

1 The minimum bedding depth below the pipe shall be 0.15*D*. In no case shall this dimension be less than 150mm or greater than 300mm.
2 The pipe bed shall be shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment according to OPSD–803.030 and 803.031.
4 Condition of trench is symmetrical about centreline of pipe.
A Soil types as defined in the Health & Safety Act and Regulations for Construction Projects.
B Protection against heavy construction equipment according to OPSD–808.010.
C All dimensions are in millimetres or metres unless otherwise shown.

LEGEND:
D – Inside diameter
OD – Outside diameter

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	1996 09 15	Rev
RIGID PIPE BEDDING, COVER AND BACKFILL TYPE 1 OR 2 SOIL – EARTH EXCAVATION	Date	
	OPSD – 802.030	



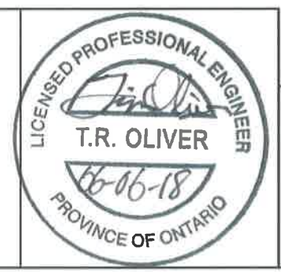
LEGEND:
D – Inside diameter

NOTES:

1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev	3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION			
	OPSD 802.010		



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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN	REVIEWED BY
TRO	FRF
DRAWN	CHECKED BY
AJL	EPS
DATE	
June 6, 2018	
SCALE	
AS SHOWN	

DILLON CONSULTING

PROJECT NO. 12-6578-1300

DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

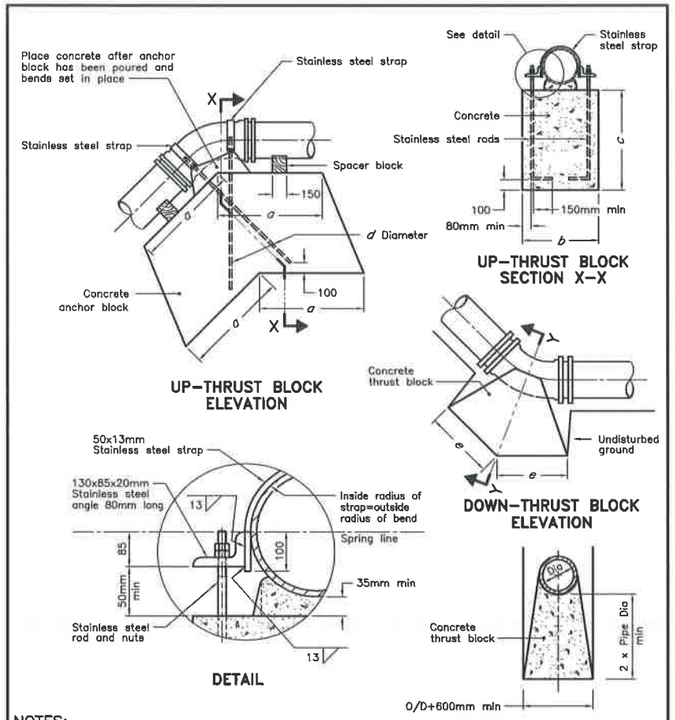
SHEET TITLE
OPSD DETAILS 1

PAGE NO. 8 of 9

NOTE

DIMENSIONS BASED ON 200mmø PIPE WITH TYPICAL SOIL BEARING STRENGTH OF 100 TO 199 kPa

a=600 d=13
b=900 e=450
c=1500



NOTES:

A Concrete shall be placed to within 50mm of the face of the bell.

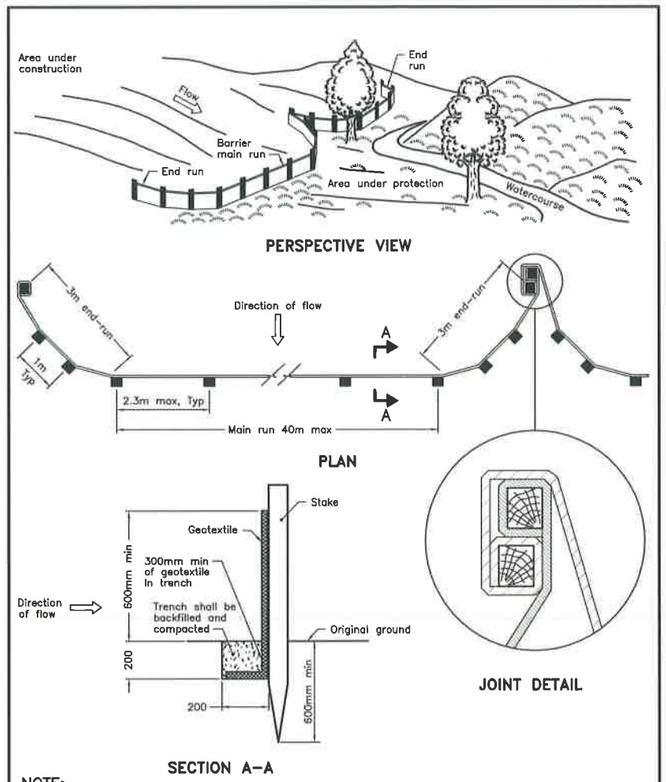
B Bond breaker shall be used between concrete and fittings.

C This blocking is for bends up to 45° for up-thrust and 90° for down-thrust.

D This OPSD shall be read in conjunction with OPSD 1103.021.

E All dimensions are in millimetres unless otherwise shown.

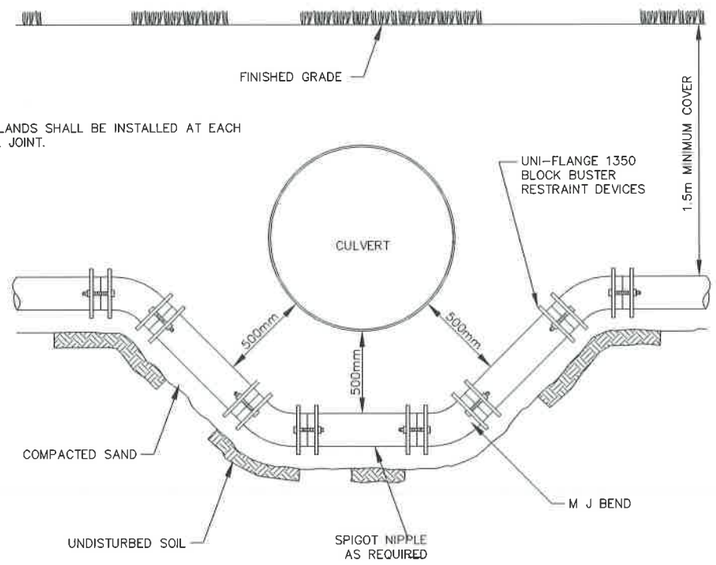
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 3
CONCRETE THRUST BLOCKS FOR VERTICAL BENDS		OPSD 1103.020



NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
LIGHT-DUTY SILT FENCE BARRIER		OPSD 219.110



NOTE

1. RETAINER GLANDS SHALL BE INSTALLED AT EACH MECHANICAL JOINT.

TYPICAL WATERMAIN LOWERING DETAIL

N.T.S.

LICENSED PROFESSIONAL ENGINEER
T.R. OLIVER
06-06-18
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
5	FINAL SUBMISSION	JUNE 6/18	TRO
4	ADDED BURKE BRANCH	APR. 20/17	TRO
3	2ND SUBMISSION TO N.J. PERALTA ENGINEERING	DEC. 9/16	TRO
2	RESUBMISSION TO N.J. PERALTA ENGINEERING	JULY 29/16	TRO
1	CLIENT REVIEW	JAN. 18/16	TRO

DESIGN TRO | REVIEWED BY FRF
DRAWN AJL | CHECKED BY EPS
DATE June 6, 2018
SCALE AS SHOWN

DILLON CONSULTING

PROJECT NO. 12-6578-1300

DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE C'

Drainage Report for the
BURKE DRAIN
Town of LaSalle & Town of Tecumseh

SHEET TITLE: OPSD DETAILS 2

PAGE NO. 9 of 9

THE CORPORATION OF THE TOWN OF LASALLE

BY-LAW NO. 8183

A Bylaw to provide for the repair and improvements of
the Burke Drain

WHEREAS the Council of the Corporation of the Town of LaSalle (Town) has been requested to provide for the repair and improvement of the Burke Drain;

AND WHEREAS the Town has procured a Drainage Report for the Burke Drain and specifications from the consulting engineering firm of N.J. Peralta Engineering Ltd. dated June 6, 2018;

AND WHEREAS notice of a Public Meeting to hear comments from the affected property owners was given May 10, 2018;

AND WHEREAS a Public Meeting was held on May 29, 2018 at 5:00 p.m. to 6:30 p.m. to hear from any affected property owners on the Drainage Report;

AND WHEREAS the Council of the Corporation of the Town of LaSalle is in the opinion that the repair and improvement of the Burke Drain is desirable;

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

1. That the Drainage Report providing for the repair and improvement of the Burke Drain dated June 6, 2018, as prepared by the consulting engineering firm N.J. Peralta Engineering Ltd. and attached hereto as Schedule “A” to this bylaw, is hereby adopted and the drainage works as therein indicated and set forth is hereby approved and shall be completed in accordance therewith.

2. That the Treasurer, subject to approval of Council, may authorize temporary borrowing to meet expenditures made in connection with a work to be financed in whole or in part by the issue of debentures.

3. That the Town may issue debentures for the amount borrowed and the amount of such debentures shall be reduced to the total amount of:
   a) Grants received under Section 85 of the said Act;
   b) Commuted payments made in respect of land and roads assessed.

4. That the specifications and General Specifications as established are adopted as set out in the Drainage Report which forms part of this bylaw.

5. That the Mayor and Deputy Clerk be authorized to enter into an agreement for the construction of the drainage works to be made with some person or persons, firm or corporations, subject to the approval of Council.

6. That this Bylaw shall come into force upon and after the final passing thereof.

Read a first and second time and finally passed this 26th day of June, 2018.

_____
Mayor

_____
Deputy Clerk

READ a third and final time, and finally passed this _____ day of _____, 2018.

_____
Mayor

_____
Deputy Clerk

THE CORPORATION OF THE TOWN OF LASALLE

BY-LAW NO. 8184

A Bylaw to provide for the repair and improvements of
the Howard Avenue Drain

WHEREAS the Council of the Corporation of the Town of LaSalle (Town) has been requested to provide for the repair and improvement of the Howard Avenue Drain;

AND WHEREAS the Town has procured a Drainage Report for the Howard Avenue Drain and specifications from the consulting engineering firm of N.J. Peralta Engineering Ltd. dated June 6, 2018;

AND WHEREAS notice of a Public Meeting to hear comments from the affected property owners was given May 10, 2018;

AND WHEREAS a Public Meeting was held on May 29, 2018 at 5:00 p.m. to 6:30 p.m. to hear from any affected property owners on the Drainage Report;

AND WHEREAS the Council of the Corporation of the Town of LaSalle is in the opinion that the repair and improvement of the Howard Avenue Drain is desirable;

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

1. That the Drainage Report providing for the repair and improvement of the Howard Avenue Drain dated June 6, 2018, as prepared by the consulting engineering firm N.J. Peralta Engineering Ltd. and attached hereto as Schedule “A” to this bylaw, is hereby adopted and the drainage works as therein indicated and set forth is hereby approved and shall be completed in accordance therewith.

2. That the Treasurer, subject to approval of Council, may authorize temporary borrowing to meet expenditures made in connection with a work to be financed in whole or in part by the issue of debentures.

3. That the Town may issue debentures for the amount borrowed and the amount of such debentures shall be reduced to the total amount of:
   a) Grants received under Section 85 of the said Act;
   b) Commuted payments made in respect of land and roads assessed.

4. That the specifications and General Specifications as established are adopted as set out in the Drainage Report which forms part of this bylaw.

5. That the Mayor and Deputy Clerk be authorized to enter into an agreement for the construction of the drainage works to be made with some person or persons, firm or corporations, subject to the approval of Council.

6. That this Bylaw shall come into force upon and after the final passing thereof.

Read a first and second time and finally passed this 26th day of June, 2018.

_____
Mayor

_____
Deputy Clerk

READ a third and final time, and finally passed this _____ day of _____, 2018.

_____
Mayor

_____
Deputy Clerk