

**DRAINAGE REPORT
FOR THE**

**MARTIN-BERGERON DRAIN
(MARTIN LANE DEVELOPMENT
ROAD BRIDGES)**

TOWN OF LASALLE



(DRAFT-CLIENT REVIEW)
21 NOVEMBER 2022
KYLE N. EDMUNDS, P. ENG.
FILE No. 21-2140

File No. 21-2140

Members of Council
Town of LaSalle
5950 Malden Road
LaSalle, Ontario
N9H 1S4

**Drainage Report for the
MARTIN-BERGERON DRAIN
(MARTIN LANE DEVELOPMENT ROAD BRIDGES)
In the Town of LaSalle**

Mayor and Members of Council:

Instructions

The Municipality received a request from the landowner of property Roll No. 140-41200 2544236 Ontario Inc. for the installation of two (2) new road bridges in support of a new residential development on 5 June, 2022. Council accepted the request under Section 78(5) of the Drainage Act for minor improvements to a drainage works, and on 6 June, 2022 appointed Dillon Consulting Limited to prepare a report.

Ontario Regulation 500/21

We have assessed the applicability of Section 78(5) of the Drainage Act and find the proposed works satisfy the requirements for minor improvement work as described in Subsection 7 of O.Reg 500/21 Part II.

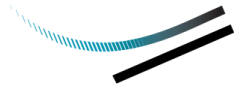
Watershed Description

The Martin-Bergeron Drain consists of an open drain commencing at the line of Lot 20 and Lot 21, Concession 1 Petite Cote and Runstedler Drive. It flows easterly for approximately 145 metres then turns southerly for a distance of 150 metres. The drain then turns westerly for a distance of 60 metres where it turns in a southerly direction to the line between Lot 18 and Lot 19, Concession 1 Petite Cote, where it continues easterly for approximately 215 m. The drain then turns southerly for approximately 180 m where it crosses Martin Lane in a southwesterly direction to its outlet into the Chappus Drain in Lot 8, Concession 1, Petite C. The surficial soils are predominately Berrien Sand and Colwood Fine Sandy Loam which are defined as having fair to poor drainage.

Drain History

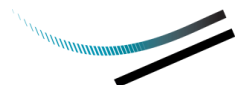
The recent history of Engineers' reports for the Martin-Bergeron Drain follows:

- **7 March 1994 by E.O. Lafontaine, C.E.:** As part of the drainage works recommended on the Chappus Drainage System, it is recommended that a portion of the Martin-Bergeron Drain within Lot 18, Concession 1 Petite Cote and across Martin Lane be relocated.



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- **11 November 1943 by W. J. Fletcher, C. E.:** The recommended work included the repair and improvement of the entire drain.
- **1 November 1925 by W. J. Fletcher, C. E.:** The recommended work included the repair and improvement of the lower portion of the drain.
- **6 November 1906 by J. J. Newman, C. E.:** The recommended work included the repair and improvement of the entire drain.



Survey

Our survey and examination of the Martin-Bergeron Drain was carried out in July 2021 as part of the survey conducted for the Martin Lane development.

Design Considerations

A Guide for Engineers working under the Drainage Act, OMAFRA Publication 852 (2018) is the current reference document used by engineers carrying out work on municipal drains under the Act. The 5 year return period design storm is the recommended design standard applied to local road culverts over a municipal drain. We have applied this criterion to the future road crossings.

In accordance with requirements from the Essex Region Conservation Authority, the proposed improvements to the drain are to cause no negative impacts to lands or roads either upstream or downstream of the development during major events. Considering that lands adjacent to the drain will be developed, flows from the 1:100 year design storm event are also to remain within the banks of the drain where the drain abuts developed land.

We have considered the controlled discharge proposed for the Martin Lane development including the proposed stormwater detention pond and pumping station outlet which discharges downstream of the proposed road crossings. The release rate of the pond is to be limited to 190 L/s which is equivalent to the 2 year return period peak runoff during pre-development conditions.

The following design criteria has been applied as noted below:

- An existing conditions model and post-development model were completed using PCSWMM hydrologic and hydraulic modelling software to assess flow and hydraulic grade line conditions in the Martin-Bergeron Drain before and after development, and confirm that hydraulic grade line elevations were not adversely impacted either upstream or downstream of the proposed development. The downstream extent of the PCSWMM models is the downstream end of the closed portion of drain crossing south of Martin Lane. The 100 year design storm event was used in this analysis.
- The proposed conditions model included the newly installed road bridge culverts, as well as the constructed residential development complete with the proposed stormwater management facility. The results of the model showed a reduction in the hydraulic grade line during the 100 year return period design storm compared to the existing conditions model. A Stormwater Management memorandum detailing the impacts to the drain has been included herein as Schedule 'A.'

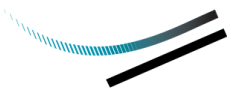
Allowances

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

Recommendations and Cost Estimate

Based on our review of the history, the information obtained from our examination and analysis of the survey data, we recommend that the Martin-Bergeron Drain be repaired and improved as described below:

Item	Description	Amount
	<u>BRIDGE WORKS</u>	
1.	Road Bridge Work, as follows:	
	a) <u>Bridge No. 1 – (Oke Drive)</u> - Supply and installation of a new 29.0 m long, 900 mm diameter corrugated solid (unslotted) high density polyethylene pipe (HDPE) smooth interior dual wall profile (Boss 2000, 320 kPa or approved equivalent) with bell and spigot joining system, complete with sloped stone end walls (approx. 40 m ²) including clear stone levelling base (approx. 20 tonnes), compacted Granular 'B' backfill up to pipe springline beyond road (approx. 30 tonnes) and clean native backfill above (approximately 80 m ³) and full compacted Granular 'A' backfill up to road subgrade (approx. 120 tonnes). Work to include fine grading, seeding and restoration of all disturbed areas. This work is to include the removal off-site of all excess materials not suitable for bridge backfill. The work shall also include drain bottom cleanout in close proximity to the bridge.	\$27,500.00



Item	Description	Amount
	b) <u>Bridge No. 2 – (Pallies Drive)</u> – Removal and disposal off-site of existing 10 m long, 600 mm diameter CSP. Supply and installation of a new 29.0 m long, 900 mm diameter corrugated solid (unslotted) high density polyethylene pipe (HDPE) smooth interior dual wall profile (Boss 2000, 320 kPa or approved equivalent) with bell and spigot joining system, complete with sloped stone end walls (approx. 40 m ²) including clear stone levelling base (approx. 20 tonnes), compacted Granular ‘B’ backfill up to pipe springline beyond road (approx. 30 tonnes) and clean native backfill above (approximately 80 m ³) and full compacted Granular ‘A’ backfill up to road subgrade (approx. 120 tonnes). Work to include fine grading, seeding and restoration of all disturbed areas. This work is to include the removal off-site of all excess materials not suitable for bridge backfill. The work shall also include drain bottom cleanout in close proximity to the bridge.	\$28,700.00
2.	Temporary silt control measures during construction.	<u>\$1,000.00</u>
	SUB-TOTAL	\$57,200.00
3.	Report, Assessments and Final Inspection.	\$9,500.00
4.	Expenses and Incidentals.	\$500.00
5.	ERCA application review and permit fee	<u>\$800.00</u>
	TOTAL ESTIMATE – MARTIN-BERGERON DRAIN (excluding Net HST)	\$68,000.00

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.

Assessment of Costs

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

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

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

Assessment Rationale

We have assessed the above estimated costs for the improvements to the Martin-Bergeron Drain against the affected lands listed in Schedule 'C' under "Special Benefit", "Benefit" and "Outlet Liability".

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

1. As the bridge works are only required for the proposed residential development, we have assessed 100% of the costs to the benefiting lands having property Roll No. 140-41200 (2544236 Ontario Inc.).

Future Maintenance

After completion and once the Municipality assumes ownership, the new bridges shall be maintained by the Town of LaSalle at the expense of the Town of LaSalle Road Authority, subject of course, to any variations that may be made under the authority of the Drainage Act.

Drawings and Specifications

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

Page 1 of 2 - Watershed Plan

Page 2 of 2 – Bridge Details

Approvals

The construction and/or improvement to a drainage works, including repair and maintenance activities, and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced by the proposed works. Prior to any construction or maintenance works, the Municipality or proponent designated on the Municipality's behalf shall obtain all required approvals/permits and confirm any construction limitations including timing windows, mitigation/off-setting measures, standard practices or any other limitations related to in-stream works.

Respectfully submitted,

DILLON CONSULTING LIMITED

Kyle N. Edmunds, P.Eng.
KNE:wlb

Memo

To: Paul Quaggiotto, Trinity Woods Inc. & Scott D'Amore, 2544236 Ontario Inc.
From: Aakash Bagchi, P.Eng., M.Eng., Dillon Consulting Limited
Date: November 18, 2022
Subject: Schedule A - Hydraulic Analysis of Martin-Bergeron Drain (Road Culverts)
Our File: 21-2140

Dillon Consulting Limited (Dillon) was retained to prepare a technical memorandum outlining the hydraulic assessment completed in support of the proposed new road access culverts over the Martin-Bergeron Drain. The proposed residential subdivision located within Pt. Lots 18 & 19, Concession 1 in the Town of LaSalle is approximately 20.88 ha. Figure 1 shows the proposed locations of the bridges over the drain. Construction of the access bridges is proposed to be completed along with the initial phase of the proposed subdivision development.

The purpose of this memo is to demonstrate that the proposed road culverts for the Martin Lane Development will not have an adverse impact on the Martin-Bergeron Drain in an ultimate build out scenario. The analysis is based on a previous stormwater management (SWM) PCSWMM model completed for the development. The 1:100 year, 4 hour (Chicago distribution) design storm event was used for this assessment.

Existing Conditions Hydraulic Assessment

The existing conditions model was used as the baseline for the hydraulic analysis of the Martin-Bergeron culverts. It includes the existing drain from its most upstream end where a 750 mm diameter storm sewer outlets, and extends downstream to the downstream end of the Martin Lane road culvert.

The results from the 1:100 year event simulation show that the drain has a flat HGL elevation of 176.96 m, which is as a result of the Martin Lane culvert restricting flows during the 1:100 year event. Comparing this HGL elevation to the topographic survey completed by Dillon in July 2021, the drain is overtopping its banks from approximately the north property limit of the development downstream to Martin Lane.

Proposed Conditions Hydraulic Assessment

The following updates were made to the PCSWMM model to represent proposed conditions.

New Culverts - The proposed access culverts (see Figure 1 for location) include:

- Bridge No. 1 (Street 'B'): A new 88.8 m long, 900 mm diameter HDPE, smooth wall interior pipe. This pipe description represents the ultimate length of the bridge. The drainage report recommendation only includes a 29 m long culvert which is an interim condition.

- Bridge No. 2 (Street 'C'): A new 39.3 m long, 900 mm diameter HDPE, smooth wall interior pipe. This pipe description represents the ultimate length of the bridge. The drainage report recommendation only includes a 29 m long culvert which is an interim condition.

Martin Lane Development SWM Facility – A Stormwater Management (SWM) Facility is proposed for the Martin Lane development, located north of the Martin-Bergeron Drain. It includes a SWM Pond and a pump-station to restrict flows to an allowable release rate of 190 L/s to the Martin-Bergeron Drain, which is equivalent to a 1:2 year pre-development peak runoff rate.

Table 1 below compares the simulated pre- and post-development peak flows and water levels in the drain at various locations during the 1:100 year, 4 hour design storm simulation.

Table 1 – Martin-Bergeron Drain hydraulic comparison (1:100 year, 4 hour design storm)

Location	Existing Conditions		Proposed Conditions		Relative Difference		
	Peak Flow	WSEL	Peak Flow	WSEL	Peak Flow	WSEL	
	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(%)	(m)
U/S End (750 mm dia. Pipe Outlet)	2.22	176.96	2.22	176.76	+0.00	+0.0%	-0.20
U/S of Bridge No. 2	0.88	176.96	1.01	176.70	+0.13	+14.8%	-0.26
U/S of Bridge No. 1	2.81	176.96	0.67	176.65	-2.14	-76.2%	-0.31
U/S of Martin Lane Crossing	1.43	176.95	0.59	176.60	-0.84	-58.7%	-0.35

The Water Surface Elevations (WSELs) in the Martin-Bergeron Drain are reduced along the entire length of drain within the modeled area compared to existing conditions as a result of the SWM facility and its 1:2 year pre-development restricted release rate. Lowering the WSEL will have the effect of reducing boundary conditions previously acting against flows in the drain during pre-development conditions. The lower boundary condition allows for a greater flow during post-development conditions at some locations, as shown at the upstream end of Bridge No. 2 in Table 1.

Considering the overall reduction in WSEL within the drain, we expect the proposed culverts will not adversely impact lands and/or roads either upstream or downstream. Drain channel profiles representing a comparison of the water level within the drain under existing and proposed conditions is presented in Figure 2.

The proposed grading of the development will have raised boulevards adjacent to the drain to lower the risk of flooding during major events. It is expected there will be 0.20 m of freeboard from the estimated 1:100 year HGL to the finished boulevard grading of Street 'B' at Bridge No. 2, and likewise 0.40 m of freeboard to the finished boulevard grading of Street 'C' at Bridge No. 1.

Conclusions

Dillon was retained to prepare a technical memorandum outlining the hydraulic assessment completed in support of the proposed two new road culverts over the Martin-Bergeron Drain. The hydraulic analysis was completed found that the proposed drain improvements will have no adverse impacts to the drainage system under the design storm assessed.

If you have any questions regarding the analysis presented above, please feel free to contact the undersigned.

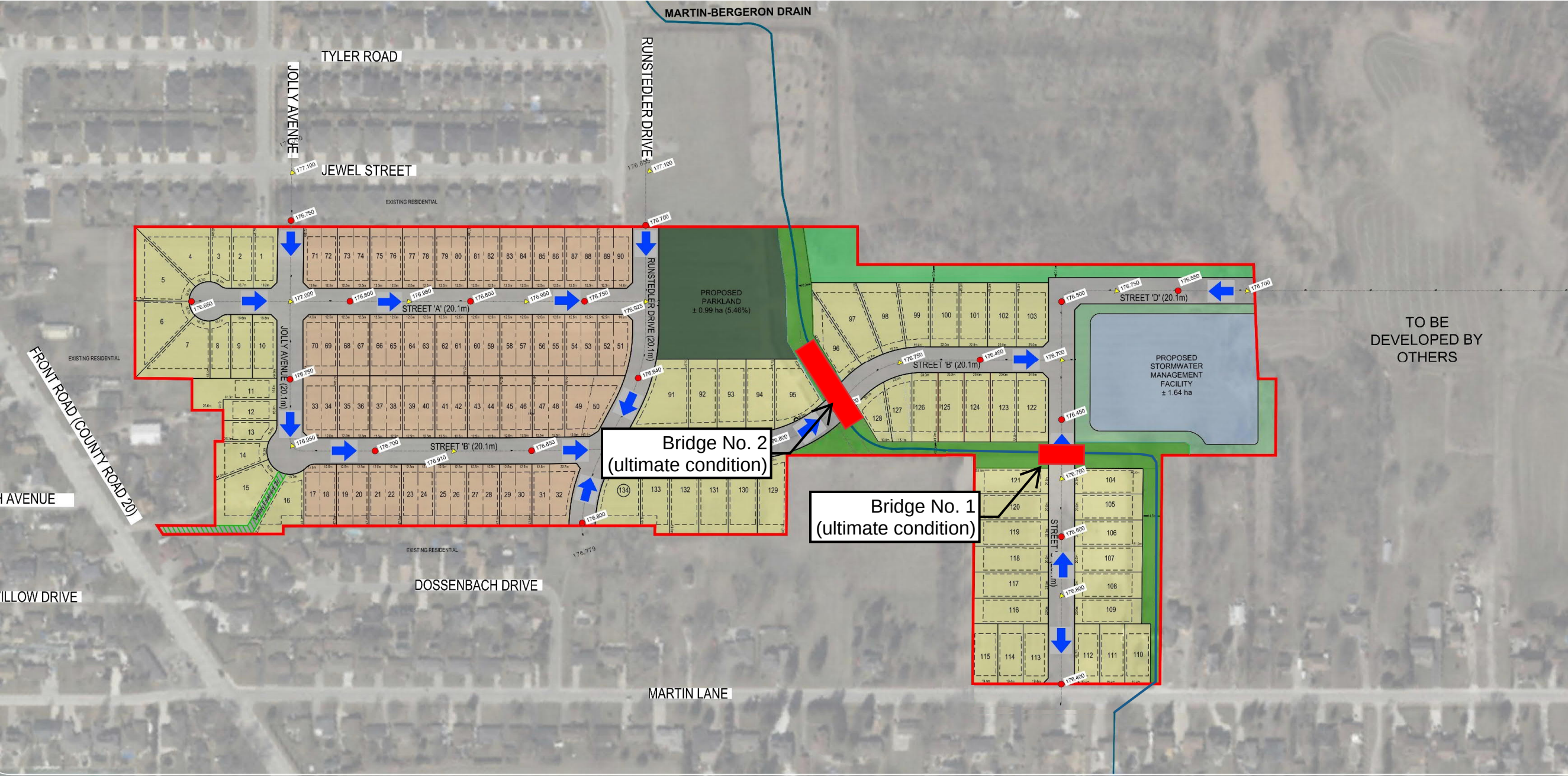
DILLON CONSULTING LIMITED

Aakash Bagchi, P.Eng., M.Eng.
Water Resources Engineer

DILLON CONSULTING LIMITED

www.dillon.ca

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2544236 ONTARIO INC.
MARTIN LANE SUBDIVISION, LASALLE ON

SITE SERVICING
FIGURE #2

- SUBJECT SITE (±18.99ha)
- PROPOSED SINGLE DETACHED LOTS(60 UNITS)
- PROPOSED SEMI-DETACHED LOTS (74 UNITS)
- PROPOSED PARKLAND
- BUFFER AREA
- EASEMENT
- DRAINAGE CORRIDOR
- PROPOSED STORMWATER MANAGEMENT FACILITY
- MUNICIPAL DRAIN

File Location:
c:\pw working directory\projects 2019\32sef\dms50448\191729-fsr-fig.dwg
August, 31, 2020 12:08 PM

MAP/DRAWING INFORMATION
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL
DIMENSIONS AND BOUNDARY INFORMATION SHOULD BE
VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.
CREATED BY: MVM
CHECKED BY: KNE
DESIGNED BY: KNE / MAM

SCALE : 1:3000



PROJECT: 19-1729
STATUS: FINAL
DATE: 03/09/2020

Figure 1: Bridge Locations



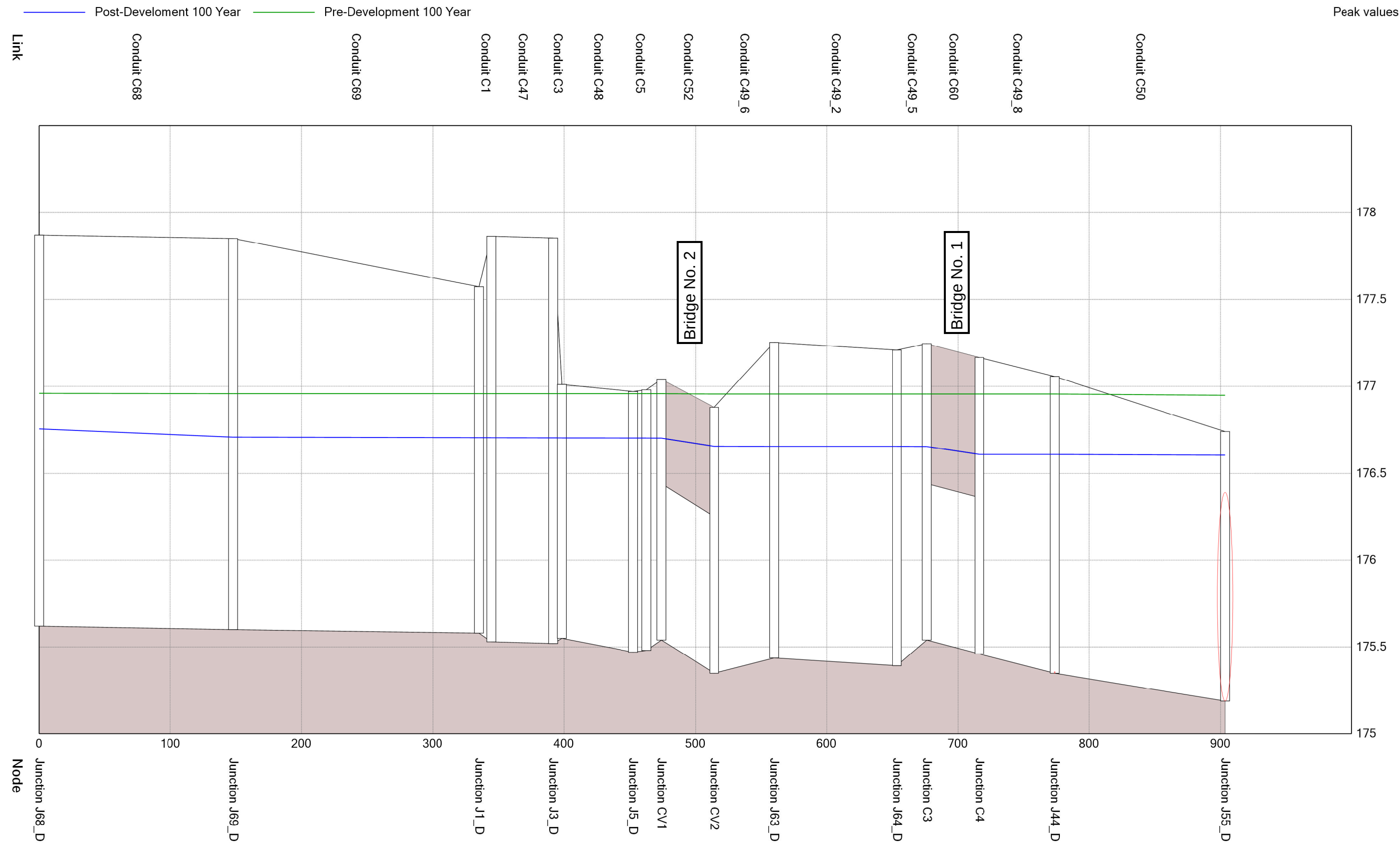


Figure 2: HGL Profile comparison of Martin-Bergeron Drain (1:100 Year, 4 Hour design storm)

"SCHEDULE C"
SCHEDULE OF ASSESSMENT
MARTIN-BERGERON DRAIN (ROAD BRIDGES)
TOWN OF LASALLE

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
140-41200	1 Petite Cote	Pt. Lots 19&20	0.00	0.00	2544236 Ontario Inc.	\$68,000.00	\$0.00	\$0.00	\$68,000.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$68,000.00	\$0.00	\$0.00	\$68,000.00
TOTAL ASSESSMENT						\$68,000.00	\$0.00	\$0.00	\$68,000.00
			(Acres)	(Ha.)					
Total Area:			0.00	0.00					

"SCHEDULE D"
DETAILS OF SPECIAL BENEFIT
MARTIN-BERGERON DRAIN - (ROAD BRIDGES)
TOWN OF LASALLE

SPECIAL BENEFIT ASSESSMENT
(NON - AGRICULTURAL LANDS)

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
140-41200	2544236 Ontario Inc.	Costs associated with the supply and installation of two (2) new road bridges for Martin Lane Development.	\$57,200.00	\$10,800.00	\$68,000.00
Total Special Benefit Assessment (Non - Agricultural Lands).....			\$57,200.00	\$10,800.00	\$68,000.00
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT					\$68,000.00

”SCHEDULE F”
DRAINAGE REPORT FOR THE
MARTIN-BERGERON DRAIN (ROAD BRIDGES)
TOWN OF LASALLE

SPECIAL PROVISIONS - GENERAL

1.0 GENERAL SPECIFICATIONS

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

2.0 DESCRIPTION OF WORK

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

BRIDGE WORKS

➤ Road Bridge Work, as follows:

- Bridge No. 1 – (Oke Drive) - Supply and installation of a new 29.0 m long, 900 mm diameter corrugated solid (unslotted) high density polyethylene pipe (HDPE) smooth interior dual wall profile (Boss 2000, 320 kPa or approved equivalent) with bell and spigot joining system, complete with sloped stone end walls (approx. 40 m²) including clear stone levelling base (approx. 20 tonnes), compacted Granular ‘B’ backfill up to pipe springline beyond road (approx. 30 tonnes) and clean native backfill above (approximately 80 m³) and full compacted Granular ‘A’ backfill up to road subgrade (approx. 120 tonnes). Work to include fine grading, seeding and restoration of all disturbed areas. This work is to include the removal off-site of all excess materials not suitable for bridge backfill. The work shall also include drain bottom cleanout in close proximity to the bridge.

Bridge No. 2 – (Pallies Drive) – Removal and disposal off-site of existing 10 m long, 600 mm diameter CSP. Supply and installation of a new 29.0 m long, 900 mm diameter corrugated solid (unslotted) high density polyethylene pipe (HDPE) smooth interior dual wall profile (Boss 2000, 320 kPa or approved equivalent) with bell and spigot joining system, complete with sloped stone end walls (approx. 40 m²) including clear stone levelling base (approx. 20 tonnes), compacted Granular ‘B’ backfill up to pipe springline beyond road (approx. 30 tonnes) and clean native backfill above (approximately 80 m³) and full compacted Granular ‘A’ backfill up to road subgrade (approx. 120 tonnes). Work to include fine grading, seeding and restoration of all disturbed areas. This work is to include the removal off-site of all excess materials not suitable for bridge backfill. The work shall also include drain bottom cleanout in close proximity to the bridge.

- Temporary silt control measures during construction.

3.0 ACCESS TO THE WORK

Access to the drain shall be from Martin Lane. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All road areas and grass lawn areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING AREA (FUTURE MAINTENANCE)

The working area for future maintenance purposes shall be restricted to the road right-of-way and a 6 metre wide working corridor located on the parkland surrounding the drain for both Bridge No. 1 and Bridge No. 2.

Any damages to lands and/or roads from the Contractor's work within the working areas for the new bridge sites shall be rectified to pre-existing conditions at his/her expense.

5.0 ROAD BRIDGE CONSTRUCTION

5.1 Location of New Bridges

The bridges shall be located and installed as shown on the drawings attached hereto.

5.2 Materials for New Road Bridges

Materials shall be as follows:

<i>Road Culverts</i>	<u>Bridge No. 1 – Oke Drive:</u> <i>New 29.0 m long, 900 mm diameter solid (non-perforated) corrugated High Density Polyethylene (HDPE) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i> <u>Bridge No. 2 – Pallies Drive:</u> <i>New 29.0 m long, 900 mm diameter solid (non-perforated) corrugated High Density Polyethylene (HDPE) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.</i> <i>Joined using (soil tight) "gasketed bell & spigot" Ultra Stab joining system (as manufactured by Armtec Limited or approved equal), supplied by the pipe manufacturer and conforming to ASTM D3350, CSA 182.8-02 and OPSS 1840.</i>
<i>Pipe Bedding Below Pipe</i>	<i>20-25 mm clear stone conforming to OPSS Division 10.</i>
<i>Backfill up to road asphalt surface (within roadway)</i>	<i>Granular 'A' conforming to OPSS Division 10.</i>
<i>Backfill to springline of pipe (beyond roadway)</i>	<i>Granular 'B' conforming to OPSS Division 10.</i>
<i>Backfill up to topsoil surface (beyond roadway)</i>	<i>Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.</i>

<i>Erosion Stone</i>	<i>All stone to be used for erosion protection shall be 125 – 250 mm clear quarried rock or OPSS 1004, minimum 300 mm thickness.</i>
<i>Filter Fabric</i>	<i>“Non-Woven” geotextile filter fabric with a minimum strength equal or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC, or approved equivalent.</i>

5.3 Culvert Installation

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

5.4 Sloping Stone End Walls

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.

5.5 Native Materials

Native materials suitable for use as backfill, as defined under Section 5.2, shall be salvaged from the bridge site as required to complete the work as shown on the drawings and/or from the drain excavation. Where there is an insufficient amount of native fill materials for backfilling the culvert, the Contractor may elect to import additional dry native materials or alternatively use Granular ‘B’ at his/her own expense.

5.6 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 will not be permitted. All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor’s expense.

5.7 Seeding

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

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

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

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

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

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

5.8 Site Cleanup and Restoration

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

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

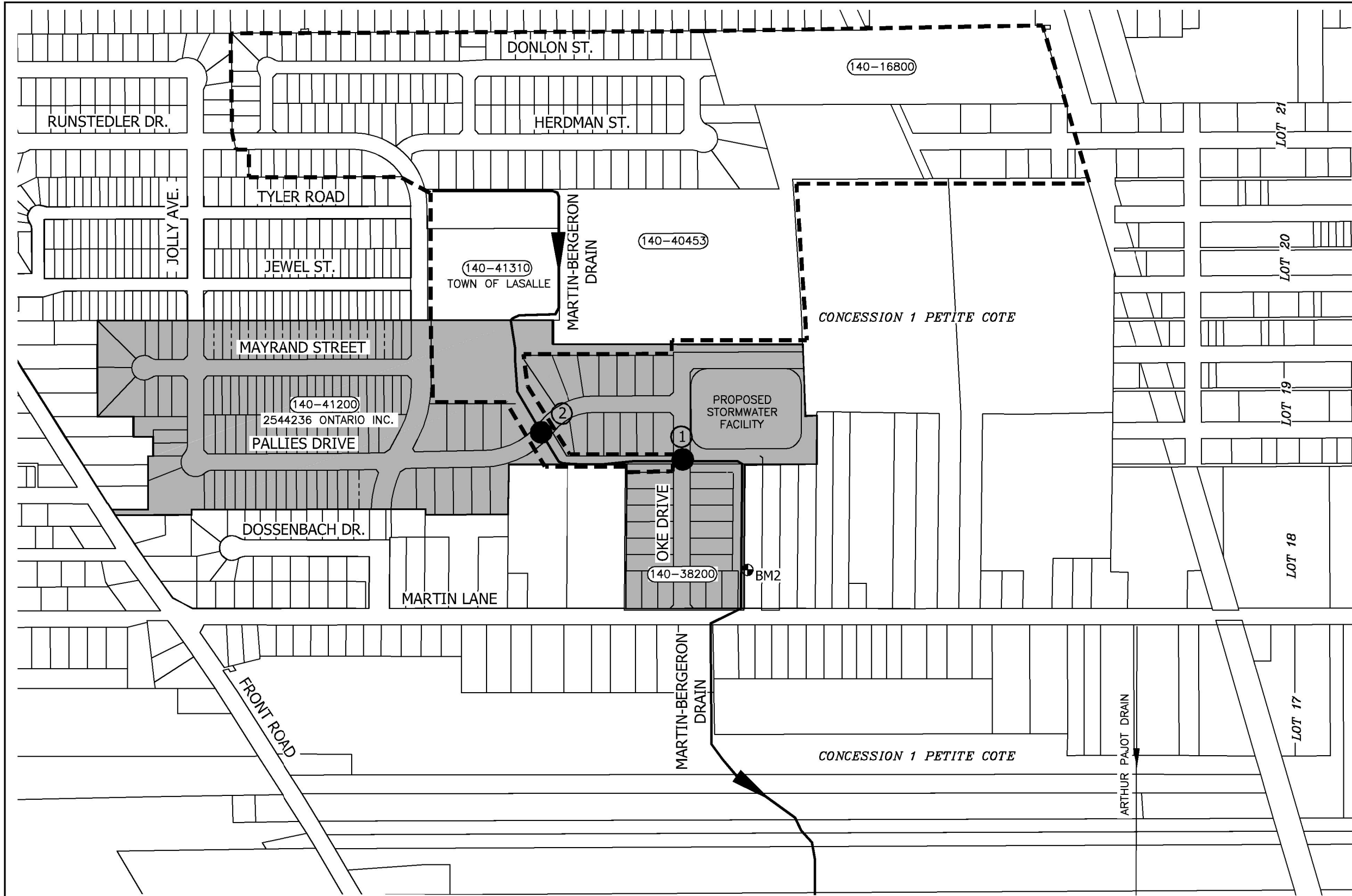
All work shall be carried out to the satisfaction of the Drainage Superintendent for the Municipality, in compliance with the specifications, drawings and the Drainage Act. Upon completion of the project, the work will be inspected by the Engineer and the Drainage Superintendent. Any deficiencies noted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

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LEGEND

MARTIN-BERGERON DRAIN WATERSHED BOUNDARY

MARTIN-BERGERON DRAIN

OTHER DRAINS

NEW BRIDGE

PROPOSED DEVELOPMENT

SITE BENCHMARK

BM #0011971U119
DATUM CGVD289:78-LASALLE HIGHWAY NO. 18 SMALL CONCRETE BRIDGE, 1.6KM SOUTH OF INTERSECTION WITH LAURIER DRIVE, TABLET IN EAST FACE OF NORTHEAST CONCRETE ABUTMENT, 1.95M SOUTH OF NORTH END, 30CM BELOW TOP OF BRIDGE.

ELEVATION=175.695m

BM2-TOP OF NORTH END OF 1630mmx1120mm CSPA LOCATED ADJACENT TO 3415 MARTIN LANE.

ELEVATION=176.275m

NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.

NOTE: CONTRACTOR IS RESPONSIBLE TO ARRANGE UTILITY LOCATES PRIOR TO CONSTRUCTION

WATERSHED PLAN
SCALE=1:5,000

DRAFT

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.

1	CLIENT REVIEW	NOV. 21/22	KNE
No.	ISSUED FOR	DATE	BY

DESIGN	KNE	REVIEWED BY	MDH
DRAWN	WLB	CHECKED BY	TRO
DATE	November 21, 2022		
SCALE	AS SHOWN		

PROJECT NO.
21-2140

DRAWING SCALES BASED
ON A 11" X 17" SHEET

'SCHEDULE G'

Drainage Report for the
MARTIN-BERGERON DRAIN
(ROAD BRIDGES)
Town of LaSalle

SHEET TITLE
WATERSHED PLAN

PAGE NO.
1 of 2

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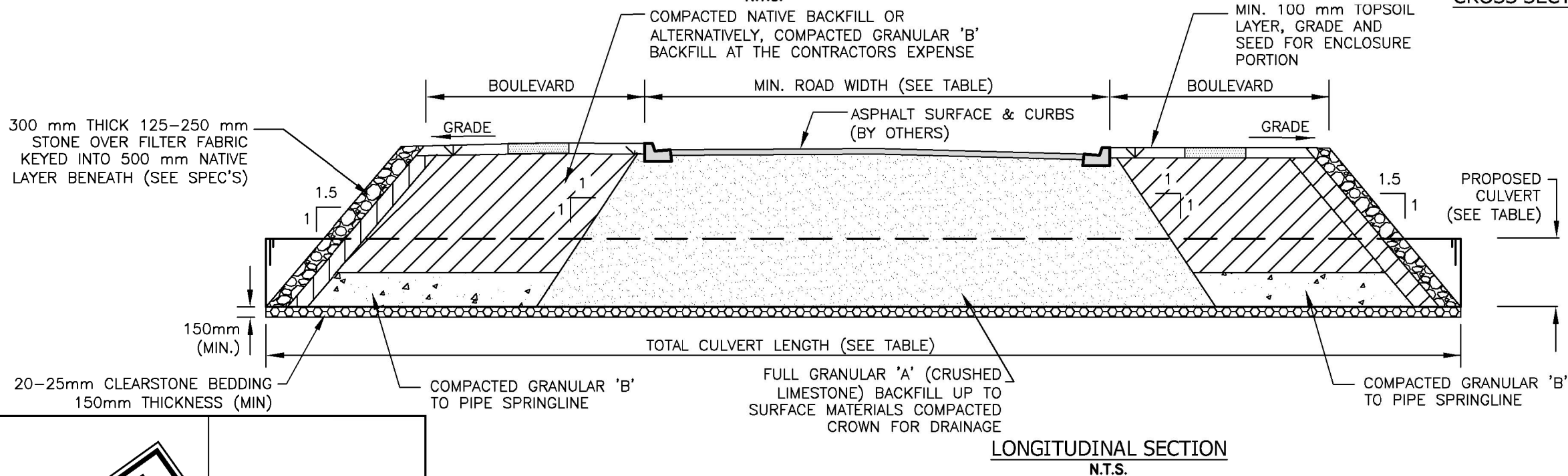
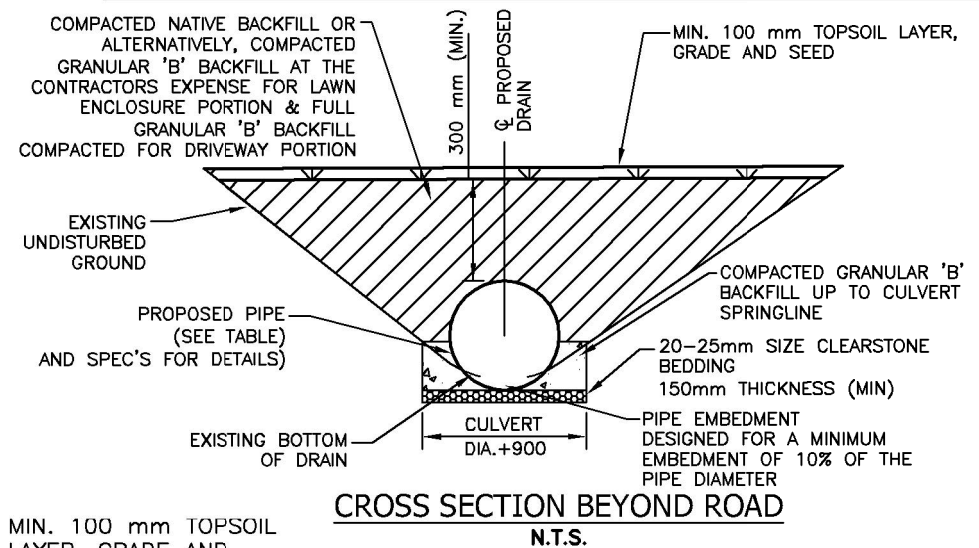
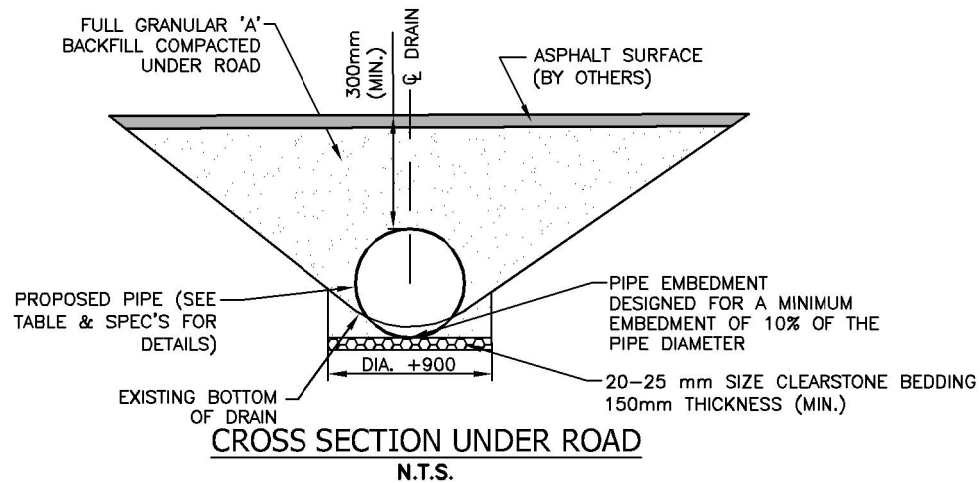
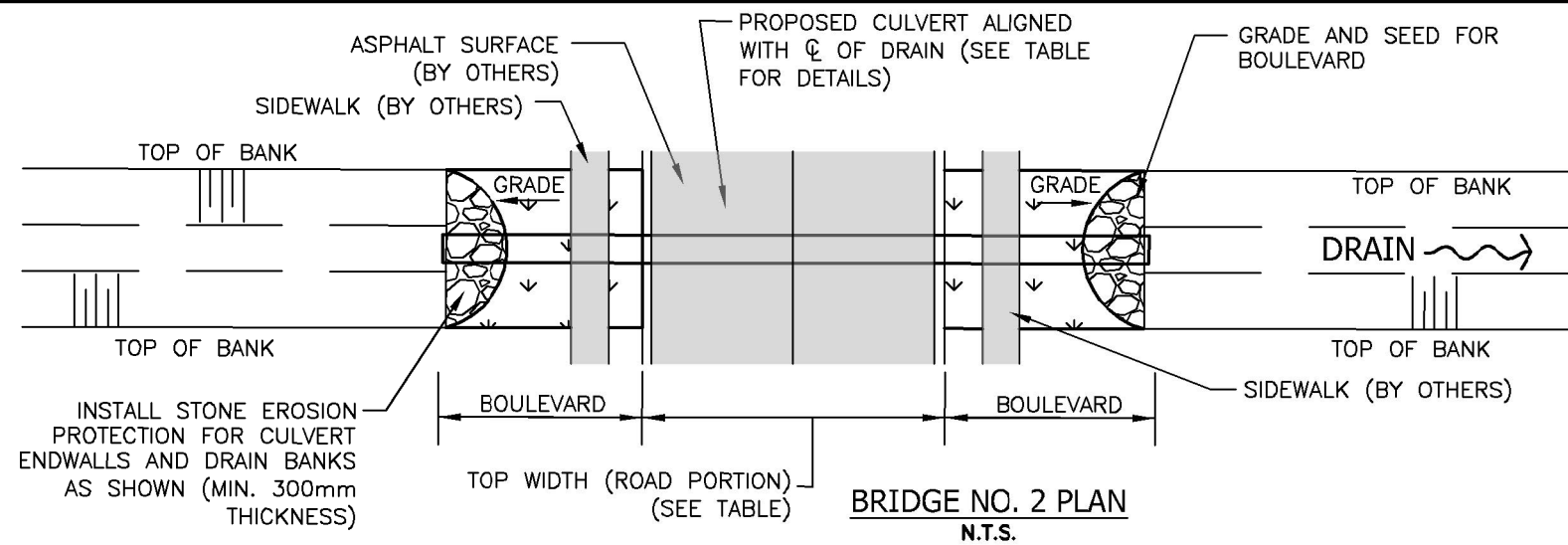


TABLE 1 - BRIDGE DESIGN INFORMATION		
	BRIDGE NO. 1	BRIDGE NO. 2
PIPE INVERT ELEV. U/S SIDE(m)	175.18	175.31
PIPE INVERT ELEV. D/S SIDE(m)	175.16	175.29
TOP OF CL ASPHALT ROAD SURFACE ELEV. (m)	176.90	176.87
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	175.26	175.39
MIN. ROAD WIDTH (INCL. CURBS) (m)	8.9	8.9
MIN. CULVERT GRADE (%)	0.10	0.10
CULVERT TYPE	HDPE	HDPE
CULVERT MATERIAL	320kPa	320kPa
CULVERT LENGTH (m)	29.0	29.0
CULVERT SIZE (mm)	900	900
CULVERT ENDWALL TYPE	SLOPING STONE	SLOPING STONE

DRAFT

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DESIGN	KNE	REVIEWED BY	MDH
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PROJECT NO.	21-2140
DRAWING SCALES BASED ON A 11" X 17" SHEET	

'SCHEDULE G'	
Drainage Report for the MARTIN-BERGERON DRAIN (ROAD BRIDGES) Town of LaSalle	
SHEET TITLE	BRIDGE DETAILS
PAGE NO.	2 of 2