PRELIMINARY DRAINAGE REPORT

DRIEDGER DRAIN

(Situated adjacent to north side of Mersea Road 6)
(Geographically former Township of Mersea)

RC SPENCER ASSOCIATES INC.
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File No: 14-391

1 June 2016

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DRIEDGER DRAIN

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Mayor and Municipal Council
Corporation of the Municipality of Leamington
111 Erie Street North
Leamington, Ontario N8H 2Z9

Re: Preliminary Drainage Report
Driedger Drain
Municipality of Leamington

1.0 INTRODUCTION

1.1. Authorization

Pursuant to Section 4 of the Drainage Act, 1990, the Corporation of the Municipality of Leamington accepted a signed petition for drainage works from the Leamington road authority for drainage on Mersea Road 6 between Essex Road 37 and Mersea Road 21. The Corporation of the Municipality of Leamington appointed the firm of RC Spencer Associates Inc. to prepare a preliminary report under the provisions of "The Drainage Act, 1990" as per the attached correspondence letter dated April 23, 2015.

As requested by Council we have made a survey and examination of the drainage along Mersea Road 6 between Essex Road 37 and Mersea Road 21, situated within Lots 224-225, Concession NTR and Lots 19-20, Concession 6, Municipality of Leamington, and we report thereon as follows.

1.2. Purpose of Preliminary Report

In early 2014, landowners from 1944 Mersea Road 6, Mr. and Mrs. Erwin Reidl, applied for a building permit for a residential dwelling. During the review of the application it was determined that their outlet for stormwater drainage was the Setterington Drain. A lot was severed off a farm parcel and thereby required to have a mutual agreement with the original land owner to allow the new lot access into the Setterington Drain. At that time the builder believed drainage could be provided to the new home by cleaning out the existing bottom of the adjacent Mersea Road 6 roadside ditch. The builder was advised by the Municipality Drainage Superintendent that the roadside ditch was not a legal outlet for storm runoff water from private lands and that he must direct the rainwater westerly to the Setterington Drain.

Upon further inspection of the Setterington Drain, the builder and the owner both decided it was not feasible to cross through an adjoining bush lot in order to drain their stormwater into the Setterington Drain. Accordingly the residents requested alternative options from the Municipality.

Municipality Administration began a review of the area and determined that there are several residential lots and three large farm parcels, presently directing their storm water into the roadside ditches for drainage outlet. Mr. Len Driedger, owner of the farm parcel on the north side of Mersea Road 6 advised the Municipality he had drainage concerns and he therefore proceeded to clean out a portion of the roadside ditch along the north side of Mersea Road 6 at his own expense to improve the drainage for his farm.

The Municipality's Drainage Superintendent has reviewed the various options with the landowners and the road authority and all are in agreement that the roadside ditch should be converted to a municipal drain, thus allowing for future maintenance and cost sharing.

In general, landowners wishing to improve their drainage by directing their stormwater to a road allowance may do so under the provisions of the Drainage Act and establishing a municipal drain. Accordingly maintenance and cost sharing would be determined through a drainage report prepared by an Engineer and approved by the Municipal Council.

1.3. Drainage Inspection by Consultant

a) The extent of the drainage investigation was to review the condition of the existing roadside drain commencing at the existing Derbyshire Drain proceeding westerly along Mersea Road 6 to County Road 37 being approximately 700 metres in length. During the initial walkthrough, we also reviewed the condition of the existing outlet Drain, being the Derbyshire Drain, to determine whether it provides a sufficient outlet. However it was apparent that there was a substantial depth of standing water in the Derbyshire Drain.

   We commenced our preliminary inspection at the existing drain outlet from the Road 6 roadside ditch into the Derbyshire Drain. It was apparent that the Derbyshire Drain, being the main outlet drain for the Road 6 roadside ditch, would also require routine maintenance to remove bottom sediment and other minor blockages in order to provide a sufficient outlet for the proposed Driedger Drain. Accordingly, we continued our inspection of the proposed Driedger Drain along the proposed new drain route along Road 6 toward the proposed new Reidl residence being approximately 700 metres from the Derbyshire Drain.

b) Additionally, a land survey of the roadside ditch was performed starting at the Derbyshire Drain at Station 0+000 and proceeding westerly along Mersea Road 6 to Station 0+700. Distances were painted on the edge of the asphalt road for reference.

c) Our investigation included a detailed survey of the existing roadside ditch including all culverts located within the roadside ditch. We prepared a preliminary hydraulic analysis of the proposed new Drain, and also prepared a photo survey of the culverts and various portions of the new Drain. We further determined the extent of the drainage basin and affected lands contributing storm runoff. A hydraulic analysis was performed to determine required drainage pipe sizes.

d) We further utilized aerial photographs, topographical mapping, Municipality GIS mappings, Essex County soil maps and current drainage reports for the surrounding Drains in order to perform our preliminary review of the drainage basin.

e) Discussions with adjacent landowners were also undertaken to determine the agricultural tile drainage contributing to the drainage area. The drainage area for the proposed municipal Drain (tentatively called the Driedger Drain) has been determined to be approximately 45.0 Hectares.

1.4. Summary

In order to address the construction of the proposed Driedger Drain a number of repair alternatives were considered. Cost estimates were prepared for applicable alternatives. A summary of the alternatives considered and cost estimates is as follows:

a) Option No. 1 – Convert the existing roadside ditch to a municipal drain

b) Option No. 2 – Provide an additional branch drain for Leonard Driedger and Jim Tiessen situated to the west of the proposed Driedger Drain

2.0 BACKGROUND

2.1. On Site Meeting

The on-site meeting was held on June 24, 2015 on Mersea Road 6 in Leamington.
A summary of the meeting is listed below:

In Attendance:	**Representing:**
Lu-Ann Barreto	Municipality of Leamington
Lou Zarlenga, P.Eng.	RC Spencer Associates Inc.
Amy Grenier	RC Spencer Associates Inc.
Dennis Driedger	Landowner
Len Driedger	Landowner
Jeremy Krueger	ECH County Roads
Peter Neufeld	Landowner
Erwin Reidl	Landowner
J. Vellinga / K. Barnesky	Landowner

The Drainage Superintendent, Lu-Ann Barreto, made introductions, announced the Engineer on Record and reviewed the purpose of the meeting and history of the drainage along Mersea Road 6.

The Engineer on Record, Lou Zarlenga, P.Eng., provided a brief history of the Drainage Act and summary of the procedures under Section 4 of the Drainage Act and described the affected drainage area and answered questions as follows:

Purpose of Meeting:

1. The Municipality received a Petition for Drainage from the road authority under Section 4 of the Drainage Act.

2. Council, at their 23 April 2015 public meeting, appointed Lou Zarlenga, P.Eng. of RC Spencer Associates Inc. to examine the drainage area and prepare a Preliminary Drainage Report for the proposed Driedger Drain.

3. The purpose of the site meeting held is to review the drainage concerns and document landowner concerns for better understanding of the drainage issues.

4. Mr. Zarlenga, P.Eng., will inspect the drain; confirm the drainage area; confirm the drainage outlet is sufficient to handle the inletting stormwater/run-off, and conduct a land drainage survey.

5. Landowners may receive a call from the Engineer to assist in determining the drainage area.

6. A Preliminary Engineer's Report will be completed and filed with the Municipality and circulated to the affected landowners. This report will detail the engineer's findings and cost estimate for the drainage works. As this is a preliminary report, a schedule of assessment is not prepared.

The Drainage Superintendent noted that while the petition started, landowners had hired a private contractor to perform cleaning of the roadside ditch along Mersea Road 6. The roadside ditch is not a municipal drain, the upstream owners are not currently paying their share of the maintenance costs for drainage.

Mr. Len Driedger raised concern that the roadside ditch is not routinely maintained.

Concern was raised that the Derbyshire Drain needs to be cleaned as well. The Drainage Superintendent noted that they had attempted to have this done; however, funding was not available.

The Engineer raised concern about private landowners performing road drain maintenance. It was noted that this work was done by Marc Rivard, who is an experienced drainage contractor (Rivard Excavating) and the work was acknowledged by the Drainage Superintendent.

The Engineer is to determine the upstream drainage limits, and requested a diagram of the drainage tiling if available for the farm land from Mr. Driedger.

The Drainage Superintendent requested the Engineer to survey the 2nd residential lot and wood lot which are currently assessed to the Setterington Drain.

It was noted that the tenant for the Barnesky farm, situated on the south side of Mersea Road 6 east of Municipal No. 2000, is Mr. Len Driedger.

It was noted that the tenant for Mr. Ron Bailey is Mr. Peter Neufeld.

Further to the onsite meeting, the Municipality Drainage Superintendent contacted our office and requested clarification of the following:

a) Clarification of the drainage area for the review of the Setterington Drain.

b) Extend our proposed land survey to the west up to County Road 37 to determine proper drainage boundary.

c) The Municipality Drainage Superintendent confirmed that the proposed new municipal drain would commence at the Derbyshire Drain near the two existing solar panel installations. The proposed Driedger Drain would flow easterly following the course of the existing road side ditch up to 1944 Road 6, at which point the drain would cross Road 6, then head easterly along the north side of Road 6.

d) The Drainage Superintendent requested that we check the existing Corrugated Steel Pipe that crosses Road 6 situated near Municipal Number 1944 Road 6 for flow capacity and pipe condition.

e) The Municipality Drainage Superintendent suggested that we consider a tile drain and an open drain along the north side of Mersea Road 6; however the existence of several Hydro One poles may pose additional concerns.

On November 23, 2015, subsequent to the site meeting, further discussions were held with Mr. Leonard Driedger. The following is a summary of the items discussed:

a) There are 3 catchbasins connected with 100 mm diameter tile situated on the north side of Mersea Road 6 previously installed by Mr. Driedger.

b) The approximate drainage area was discussed, and according to Mr. Driedger, the approximate drainage area for his existing 100 mm diameter tile on the north side of Mersea Road 6 is as follows:

- 15 Acres from Municipal Number 600 (Jim and Christine Tiessen),
- 70 Acres from Driedger Farms (rolls 730-00300 and 730-00500), and
- 30 Acres from Dennis and Karen Driedger (Municipal Number 2010).

c) It was discussed whether Mr. Driedger would like to include the tile drain on the north side of Mersea Road 6 as part of the municipal drain. A preference had not been determined at that time. Accordingly Option 2 has been provided in the preliminary report for consideration of the additional branch Drain for Mr. Driedger and Mr. Tiessen.

d) An additional two catchbasins are situated on the south side of Mersea Road 6 at approximately stations 0+100 and 0+200. Mr. Driedger believes these head directly to the Derbyshire Drain to the east. At the time of the site visit, the catchbasin was submerged under water, and no connections were located within the roadside ditch on the north side of Mersea Road 6. Therefore, it was determined these two catchbasins on the south side of Mersea Road 6 do not drain into the north side of Mersea Road 6.

e) Discussion was held with Mr. Driedger for placing additional catch basins in the proposed municipal drain near Municipal No. 2000 on the south side of Mersea Road 6. Mr. Driedger was not in favour of an additional catchbasin for the farm field, unless it was just for draining the south side of Mersea Road 6 within the road R.O.W.

f) On November 26, 2015, further discussion with Mr. Jim Tiessen, owner of Municipal No. 600, was held. The following items were discussed:

The agricultural land at Municipal No. 600, located on the north side of Mersea Road 6 at County Road 37 is assessed to the Setterington Drain situated on the south side of Mersea Road 6; however, there is no pipe connection to the Setterington Drain. Mr. Setterington confirmed that the drainage tiles for this lot (Drainage area of 13.8 Acres) are heading to the east (through Mr. Driedger's tile) towards the Derbyshire Drain and that there is an existing catchbasin along Mersea Road 6 at the low spot catching surface storm water. He mentioned that it was tiled sometime in 1992-1993, and that, since the construction of a gas line, there have been issues with flooding along the road and his land.

Additionally, discussion was held for an option to provide a new branch tile drain along Mersea Road 6. Mr. Tiessen had no preference at the time. Option 2 has been provided in this preliminary report for further consideration.

2.2. Current Surrounding Drainage Reports

The following current drainage reports were reviewed for the purpose of establishing the drainage area for the proposed Driedger Drain:

a) Drainage report prepared by William J. Setterington, P.Eng. for the "Reconsidered Report - Upper Part of the Derbyshire Drain" and dated March 25, 1977, being the current report from Highway 3 to the upstream end of the drain north of Mersea Road 6.

b) Drainage report prepared by William J. Setterington, P.Eng. for the "Goslin Drain" and dated December 16, 1981, being the current report from the old Chesapeake and Ohio Railway northerly to 5th Concession Road.

c) Drainage report prepared by William J. Setterington, P.Eng. for the "Part of the Upper Part of the Derbyshire Drain" and dated September 18, 1981, being the current report for north of Highway 3 (north limit of Larry Derbyshire) northerly to approximately 416 metres north of the old Chesapeake and Ohio Railway.

d) Drainage report prepared by Nick J. Peralta, P.Eng. for the "West Branch of the Derbyshire Drain" and dated July 2, 1982, being the current report from Derbyshire Drain south of Kings Highway 3 north westerly for approximately 550 metres.

e) Drainage report prepared by Gerard Rood, P.Eng. for the "Setterington Drain Maintenance Schedule" and dated December 1, 2010, being the maintenance schedule and watershed plan for the Setterington Drain from Piggott Creek Drain to the upper end at the south side of Mersea Road 6.

2.3. Background and History of Drain

The existing Drain along Mersea Road 6 is currently a roadside ditch which outlets to the Derbyshire Drain. Maintenance of this ditch has been previously performed by the current landowners with permission of the road authority. Recently, there have been homes built on the south side of the road which have directed water to the roadside ditch; therefore, it has been requested by the road authority that this drain be converted to a municipal drain for scheduled maintenance and fair cost distribution.

2.4. Description of Watershed Area

The drainage area for the Driedger Drain was determined through a review of current reports for the surrounding drains, along with modifications through survey and discussions with landowners as depicted in the accompanying drawings.

Municipal Number 600 (Tiessen) was originally assessed to the Setterington Drain and the Goslin Drain. However, the 100mm diameter tile drain installed by Mr. Driedger currently outlets to the roadside ditch along Mersea Road 6. Accordingly the Tiessen lands do not drain into the Setterington Drain or the Goslin Drain. This fact should be removed from the current reports via an updated maintenance schedule.

The total land area situated within the drainage basin, within the Municipality of Leamington, is approximately 41.2 Hectares, as shown on the attached drawing. This area is predominately agricultural with little residential development.

2.5. Soil Type and Land Use

The lands within the drainage limits of the proposed Driedger Drain are situated within an area classified as Berrien Sandy Loam. This being a brown sandy loam over yellow and then mottled sand with clay at about 3 to 6 feet. This soil has fair to poor drainage characteristics as shown in the Essex County Soil Map, Survey Number 11, dated in 1947.

3.0 EXISTING CONDITIONS

3.1. Survey and Examination

We commenced our survey of the proposed Driedger Drain at Station 0+000 being situated at the centerline of the Derbyshire Drain on the north side of Mersea Road 6 in the Municipality of Leamington. We then proceeded westerly, following the upstream course of the ditch to Station 0+700 being situated at the west limit of municipal number 1940 Mersea Road 6. And further situated at the head of the Setterington Drain.

Paint marks were placed every 25 metres along the edge of pavement on Mersea Road 6.

On September 2, 2015, geodetic elevations were taken on the Mersea Road 6 roadside ditch bottom and top of water and top of bank every 25 metres, and full cross sections every 100 metres using standard survey equipment.

Examination of the existing Derbyshire Drain started at Mersea Road 6 and continued downstream (southerly) approximately 750 metres. It was noted that at Station 0+00 there was approximately 500mm (20 inches) of standing water being held back in the Derbyshire Drain throughout. The standing water will pose an impediment to the repair and improvement of the Mersea Road 6 ditch. It is recommended that the Derbyshire Drain be maintained pursuant to the current drainage report for this drain prior to the repair and improvement of the Mersea road 6 ditch.

3.2. Description of Existing Roadside Ditch

The existing ditch along Mersea Road 6 is currently an open roadside ditch along the north side of the road with a top width varying from approximately 6.0 to 6.5 metres from Station 0+000 (at Derbyshire Drain) to Station 0+486 metres westerly. The ditch then crosses Mersea Road 6 at Station 0+486 via a 300mm diameter culvert to the south side of the road

and continues westerly to Station 0+700. The top width of the ditch along the south side of Mersea Road 6 is 3.5 to 4.0 metres wide.

3.3. Existing Culverts

From Station 0+000 to Station 0+639 there are presently 2 pipe culverts along the roadside ditch.

At Station 0+486 is situated a 300mm diameter corrugated steel pipe crossing Mersea Road 6. This culvert is undersized and in poor condition; therefore it is recommended to install a new 600mm diameter smooth wall pipe.

At Station 0+536 is situated a 475mm diameter plastic pipe. This culvert is in good condition, yet installed higher than proposed grade; therefore this pipe could be salvaged and re-used.

3.4. Findings and Observations

As a result of our survey and examination of the existing drainage along the proposed Driedger Drain and the outlet at Derbyshire Drain, we have found the following:

a) **Outlet condition (Derbyshire Drain):**
The existing Derbyshire Drain is in poor condition, and it is recommended that this drain be cleaned in accordance with the latest drainage report prior to any work being done on the Dreidger Drain in order to provide a sufficient outlet to the proposed Driedger Drain.

b) **Sideslopes:**
Presently, the sideslopes are constructed at approximately 1:1, this being very steep and difficult to maintain. Minimum sideslopes for municipal drains are 1.5:1, with a preferred minimum of 2:1 (2 units horizontal for every 1 unit vertical). Leaving or incorporating the existing 1:1 sideslope is not a viable design option.

Given the existing conditions and proximity of the ditch to the edge of pavement, a minimum slope of 1.5:1 is recommended (1½ units horizontal to one unit vertical).

c) **Hydro Poles:**
We found that 8 hydro poles are situated along the north side of Mersea Road 6 from Station 0+00 to 0+700. The hydro poles are further situated very near the north ditch

bank. Accordingly, any proposed improvement of the roadside ditch incorporating an open drain would require protective works to the hydro poles. The recommended protective work would consist of a culvert pipe with granular backfill around the pipe complete with quarried rock erosion protection at each end of the culvert pipe. As an alternative to the culvert pipes, a hydro pole guy wire can be placed on the private farmland anchoring the hydro pole from moving towards the road. There would be 8 anchor poles. This option would also require an easement agreement between Hydro One and the landowner (Mr. Len Driedger, and Mr. and Mrs. Dennis Driedger). Past practice has found the guy wire option not favoured by the landowners. A further option would be to enclose the open ditch with a suitable sized pipe; however this would be more expensive. In this regard, the required pipe would be a 900mm diameter.

A Hydro One representative was contacted in regards to the proposed drainage works and potential confliction with the noted hydro poles. We further indicated the protective culvert work to the 8 hydro poles would be undertaken by the Municipality through the Drainage Act and Engineers report and the cost of the culvert pipes and protective work would be assessed to Hydro One pursuant to Section 26 of the Drainage Act due to the utility being in proximity to a municipal drain.

d) Agricultural Tile Drains:

There are presently five tile drains which outlet to the roadside ditch between stations 0+000 and 0+639, as shown on the attached drawing profile.

The 100mm diameter tile drain along the north side of Mersea Road 6 from station 0+486 westerly to County Road 37 is undersized for municipal drain standards. Option 2 has been provided as an optional branch drain to the proposed Driedger Drain should the landowners request this (Tiessen, Driedger).

e) Road Culverts

There presently exists a 300mm diameter corrugated steel pipe crossing Mersea Road 6 at Station 0+486. This culvert is in poor condition and the north end is crushed.

f) Condition of Existing Ditch Banks

The following is a generalization of the existing bank conditions:

Station 0+000 to 0+486
- Drain located on north side of Mersea Road 6
- Sideslopes are vegetated, steep but stable.
- Water being held back along bottom of drain

Station 0+486 to 0+700
- Drain located on south side of Mersea Road 6
- Very Shallow Drain
- Sideslopes are vegetated and stable.

4.0 POSSIBLE REPAIR AND IMPROVEMENT ALTERNATIVES

4.1. Extent of Required Work

Based on our survey, examination and findings regarding the drainage along Mersea Road 6 we have determined that the following repair works would be required to convert the roadside ditch to a municipal drain:

a) Station 0+000 to 0+486
Minor excavation of existing roadside ditch on the north side of Mersea Road 6 to remove sediment, and re-grading of sideslopes. Installation of culverts at each hydro pole.

b) Station 0+486
Remove and replace existing 300mm diameter CSP with new 600mm diameter culvert

c) Station 0+486 to 0+639
Excavate and deepen the ditch along south side of Mersea Road 6.

d) Optional Branch Drain on north side Station 0+486 to County Road 37
Remove and replace existing 100mm diameter tile drain along Mr. Driedger's and Mr. Tiessen's land up to County Road 37. Install a 375mm (15") diameter Boss 2000 along Mr. Driedger's property, and a 200mm (8") diameter plastic tile along Mr. Tiessen's property.

4.2. Repair Alternatives Available

We have investigated the following repair alternatives:

Option No. 1 - Construct a new open municipal drain along the alignment of the roadside ditch on Mersea Road 6.

Option No. 2 – Provide a branch drain for Mr. Driedger and Mr. Tiessen in addition to the new municipal drain along Mersea Road 6.

Option No. 3 – Do nothing

4.3. Preliminary Design Criteria

If improvements to the Drain are performed, the following criteria would be considered:

a) Bottom Grade 0.1%
b) Drain sideslopes 1.5:1 (1.5 units horizontal to 1 unit vertical)
c) Buffer Strips (see attached Municipality standards)
d) Grass lined channel
   - Minimum flow velocity 0.30 metre per second
   - Maximum flow velocity 1.20 metre per second
e) Erosion Protection
   - quarried rock on sideslopes if water velocity is greater than 1.20 metres per second.
   - grass on sideslopes if water velocity is less than 1.20 metres per second.

4.4. Hydraulic Investigation

In order to determine the extent of required repairs, type of material and sizing of culverts within the drain, certain hydraulic characteristics of the Drain were reviewed. The rational method was applied to the overall drainage area, as well as the areas upstream of various culverts, and separately for the branch drain. A summary of the analysis results are as follows:

a) The culverts located at the hydro poles along the north side of Mersea Road 6 from Station 0+000 to 0+486 are sized for the minor storm event as 900mm diameter smooth walled pipes with a slope of 0.1 percent.

b) The culvert located across Mersea Road 6 at Station 0+486 is sized for the 1:50 year storm event as a 600mm diameter with a slope of 0.5 percent.

c) The optional enclosed branch drain is sized for the minor storm event as a 375mm diameter plastic pipe with a slope of 0.1 percent along Mr. Driedger's land, and a 200mm diameter plastic pipe with a slope of 0.1 percent along Mr. Tiessen's property.

5.0 DESCRIPTION AND COST ESTIMATE OF CONSTRUCTION ALTERNATIVES

The following provides a brief description of the proposed repair and improvement alternatives for the proposed Driedger Drain:

5.1. Option Number 1 - Construct municipal drain along alignment of roadside ditch

In general, Option No. 1 involves the construction of a municipal Drain along Mersea Road 6 starting at Station 0+000 (the Derbyshire Drain) westerly to Station 0+639.

In particular, this option involves the following works:

1) Minor excavation of existing roadside ditch on the north side of Mersea Road 6 to remove sediment, and re-grading of sideslopes from Station 0+000 to 0+486.

2) Installation of 900mm diameter culverts with rip rap end treatment at each hydro pole from Station 0+000 to 0+486. There are 8 hydro poles in total.

3) Remove and replace existing 300mm diameter CSP with new 600mm diameter culvert crossing Mersea Road 6 at Station 0+486.

4) Excavate and deepen drain along south side of Mersea Road 6 from Station 0+486 to 0+639.

OPTION 1
Open Municipal Drain Adjacent to Road 6

Our preliminary estimate for the total cost of Option Number 1 is as follows:

1) Open Drain Construction Stations 0+000 to 0+639

a) Excavation of new drain from Station 0+000 to Station 0+639 along both banks of existing roadside drain on Road 6 including salvaging of existing topsoil and placing same on the new drain area, hauling and disposing of clay material.

Approximately 1,900 cubic metres at $18.00 per cubic metre **$15,200.00**

b) Supply and install a total of approximately 10 square metres of quarried rock protection at pipe ends at Station 0+000, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of geotextile non-woven filter fabric.

Complete at Lump Sum of $450.00 **$ 450.00**

c) Supply and install a total of approximately 15 square metres of quarried rock protection at pipe ends at Station 0+483, approximately 300 mm in depth including all required excavation, disposal of surplus materials, and placement of geotextile non-woven filter fabric.

Complete at Lump Sum of $675.00 **$ 700.00**

d) Supply and place seeding and mulching of all excavated areas of new drain.

Approximately 6,100 square metres at $0.75 per square metre **$ 4,600.00**

2) Culvert No.1 at Station 0+486, under Mersea Road 6

a) Excavate, remove and dispose of existing 300 mm diameter corrugated steel pipe approximately 10 metre long culvert, including end treatment and road asphalt.

Complete at Lump Sum of $200.00 **$ 200.00**

b) Supply to site 10.0 metres of 600 mm diameter Hel-Cor corrugated steel pipe 2.8 mm thick (12 gauge) wall thickness, aluminized steel Type II with 125 mm x 25 mm corrugations with rolled annular ends and required couplers.

Complete at Lump Sum of $2,200.00 **$ 2,200.00**

c) Supply labour and equipment to excavate for and install specified pipe including all drain excavation, disposal of surplus material and all drain bank and road restoration and bank seeding & mulching.

Complete at Lump Sum of $2,400.00 **$ 2,400.00**

d) Supply and install all granular material including approximately 80 tonne of granular 'A' for pipe bedding and backfill to restore road grade.

Complete at Lump Sum of $1,750.00 **$ 1,750.00**

e) Supply and install a total of approximately 20 square metres of sloped quarried rock erosion protection at pipe ends including all excavation and disposal of surplus materials, and placement of geotextile nonwoven filter fabric.

Complete at Lump Sum of $900.00 **$ 900.00**

f) Supply and place hot mix, hot laid asphaltic concrete 100mm thick.

Approximately 10 tonnes at $100 per tonnes **$ 1,000.00**

3) Culvert No. 2 at Station 0+536, being the downstream end, owned by 1944 Mersea Road 6

a) Excavate, remove and salvage of existing 450 mm diameter BOSS pipe 7 metre long access bridge, including quarried rock end treatment.

Complete at Lump Sum of $200.00 **$ 200.00**

b) Supply labour and equipment to excavate for and re-install 450mm Boss salvaged pipe including all drain excavation, disposal of surplus material and all drain bank and road restoration and bank seeding and mulching.

Complete at Lump Sum of $1,500.00 **$ 1,500.00**

c) Supply and install all granular material including approximately 35 tonne of granular 'A' for pipe bedding and backfill to finish road grade.

Complete at Lump Sum of $750.00 **$ 750.00**

d) Haul and install a total of approximately 10 square metres of salvaged sloped quarried rock erosion protection at pipe ends including all excavation and disposal of surplus materials, and placement of geotextile non-woven filter fabric.

Complete at Lump Sum of $300.00 **$ 300.00**

4) Supply and install 900mm diameter culvert crossings at 8 hydro poles with quarried rock end treatments between Stations 0 + 000 to 0 + 486 to be paid by Hydro One as per Section 26 of the Drainage Act.. **$ 45,600.00**

5) Contingency Amount for Unforeseen Additional Work **$ 1,750.00**

6) Payment of Allowances

Land Used for Buffer Strip	**$ 3,000.00**
Land Used for Drain Excavation	**$ 3,000.00**
Damages to lands or crops and land taken	**$ 1,000.00**

7) Incidental Costs:

a) Cost of Engineering	**$ 6,600.00**
b) Contract Administration, Tendering, Inspections	**$13,900.00**
Sub-Total for Construction and Incidentals	**$107,000.00**
H.S.T. (13%)	**$13,910.00**
TOTAL ESTIMATE FOR OPTION NUMBER 1 (Including HST)	**$120,910.00**

5.2. Option Number 2 – Provide branch drain for Len Driedger and Jim Tiessen
NOTE: This Option requires the installation of Option 1 ($100,645)

In general, Option Number 2 involves the construction of a branch municipal Drain along the north side of Mersea Road 6 starting at Station 0+486 westerly to County Road 37.

In particular, this option involves the following works:

1) Excavate and remove the existing 100mm diameter tile drain along Mersea Road 6 from Station 0+486 westerly up to County Road 37.

2) Supply and install a 375mm diameter Boss 2000 fronting Mr. Driedger's property

3) Supply and install a 200mm diameter plastic tile fronting Mr. Tiessen's property

OPTION 2
Provide branch drain for Len Driedger and Jim Tiessen

Our preliminary estimate for the total cost of Option Number 2 is as follows:

1) Supply and install new 200mm diameter plastic tile along the Jim Tiessen lands, connecting to existing concrete catch basins

Approximately 355 metres at $50.00 per linear metre **$ 17,750.00**

2) Supply and install new 375mm diameter plastic tile along the Len Driedger property connecting to existing catch basins

Approximately 320 metres at $75.00 per linear metre **$ 24,000.00**

3) Incidental Costs:

Cost of Engineering, Tendering,
Contract Administration and Inspections **$ 12,000.00**

4) Payment of Allowances	
Land used for Drain Construction	**$ 2,100.00**
Damages to Lands or Crops	**$ 700.00**
5) Contingency Amount	**$1,200.00**
Sub-Total for Construction and Incidentals	**$ 57,750.00**
H.S.T. (13%)	**$ 7,508.00**
TOTAL ESTIMATE FOR OPTION NUMBER 2 (Including HST)	**$ 65,258.00**

OPTION 3

5.3. Option Number 3 – Do nothing

This option would involve undertaking no repair work or preparation of a new drainage report for repair and improvement. Maintenance performed by the Municipality on the existing roadside ditch has no method of distributing costs to the landowners within the drainage area. The residential dwellings on the south side of Mersea Road 6, as well as the agricultural land at Municipal Number 600 currently have no legal outlet to the Derbyshire Drain.

Advantages

a) No initial outlay of money.

Disadvantages

a) Does not provide fair distribution of costs for future maintenance.

6.0 ESTIMATE OF COST

6.1. Cost Estimates

The cost estimates provided are preliminary in nature and are intended to provide a comparison of the cost of the various options. If the Municipal Council selects one of the options, as a preferred method to proceed with, a final report would be prepared containing a detailed estimate of the selected option.

The estimates provided are based on prices obtained from previous projects and/or calculated costs based on current labour and material prices. Should any of the described options proceed to construction, the actual work would be tendered by local experienced Contractors. The final cost of the project would be a total of the Contractors tender price plus all incidental costs such as engineering, contract administration, inspection and unforeseen contingency costs.

6.2. Assessment of Cost

A detailed approximation of cost to each individual landowner is not made in this report due to the preliminary nature of the material presented herein. In the event that the Municipal Council decides to proceed with a Final Drainage Report a detailed **Schedule of Assessment** would be prepared at that time. All lands using the Drain as an outlet for their storm water runoff or those lands deriving a benefit from the existence of the Drain would be assessed a portion of the cost of the work. The assessment would be based upon the size, land use and topography of each land parcel.

7.0 GENERAL CONSIDERATIONS

7.1. Allowances for Use of Private Property

Implementation of any of the works provided herein will require the use of privately owned lands. Under the provisions of the Drainage Act the owners of lands required to construct a drainage project, or to obtain access to drainage works, or to dispose of excavated material must be compensated for the loss or use of the land.

Accordingly in our estimates we have provided the following allowance rates for compensation.

- Land used for Drain construction $ 8,000 /acre ($19,800/hectare)
- Land used for disposal purposes $ 800 /acre ($1,980/hectare)
- Land need for access purposes $ 800 /acre ($1,980/hectare)
- Land used for buffer area purpose $ 8,000 /acre ($19,800/hectare)

All landowners receiving an allowance payment would be individually described and listed in a schedule contained in a final drainage report.

Land value was discussed with Mr. Len Driedger, who indicated the approximate value of agriculture land is $8,000 per acre. This was reviewed and found to be reasonable.

7.2. Environmental Impact

The existing west drain bank is mainly grass covered. The east bank for most areas is covered in light to medium brush. Should repair work proceed it may be necessary to remove the existing vegetation and brush to permit construction of the works. Any areas disturbed by construction would be restored with new grass vegetation or quarried rock erosion protection. Implementation of silt devices will be required for any construction work to ensure that silt and suspended debris are not carried into the downstream watercourse.

During our survey and examination of the drain we did not observe any fish or wildlife; however, the drain banks undoubtedly provide cover and habitat for small animals. Disturbance of portions of the drain banks will be unavoidable, but would be kept to a minimum. The bank disturbance would also be of a temporary nature. It is not anticipated that any significant degradation of the local natural environment would result from the proposed repair options.

- Should an environmental impact assessment be requested, as per Section 6 of the Drainage Act, this assessment would be paid for by the requesting party.

- ERCA has been notified of the proposed works (see attached response from ERCA).

7.3. Proceedings under the Drainage Act

Preparation of this Preliminary Drainage Report was authorized by the Municipality of Leamington under the provisions of the Drainage Act. The following provides a brief description of the further proceedings that would be followed as required by the Drainage Act.

a) The preliminary report is considered by the Municipality of Leamington at a public meeting where all affected landowners are notified of the meeting and are invited to attend.

b) Council will consider the preliminary report and may instruct the engineer to prepare a final report.

c) The final report would be considered by Council at a further announced public meeting whereby the report may be adopted.

d) If the final report is adopted, an additional meeting would be held by the Court of Revision to consider any changes to the Schedule of Assessment and any appeals to said Schedule of Assessment.

e) The recommended works could then be constructed subject to any appeals and upon expiration of statutory waiting periods.

f) Additional information regarding proceedings under the Drainage Act, R.S.O. 1990 may be obtained from the Municipality of Leamington office.

g) The affected landowners would be notified of all required meetings. The meetings would be held in the Municipality of Leamington offices.

7.4. Government Grants

In accordance with the provisions of The Drainage Act, 1990, a grant in the amount of 33 1/3% of the assessment eligible for a grant, may be made in respect of the assessment made under a drainage report upon privately owned lands used for agricultural purposes. Therefore all agricultural lands assessed a portion of the final cost may be eligible to receive the above noted grant; however, land used for purposes other than agricultural would not be eligible to receive a grant.

8.0 RECOMMENDATIONS

8.1. Discussion

Final recommendations will be provided in a final report should Council approve Option 1 or Option 2. Please note Option Number 2 cannot be constructed unless Option 1 is constructed.

Preliminary Reports do not contain a schedule of assessment. However, in order to provide an indication of potential costs, the following chart provides a very preliminary cost to the landowners.

9.0 PRELIMINARY DRAWINGS

9.1. Description of Drawings

Accompanying this report are preliminary plans dated December 12, 2015, Drawings 1 to 3.

The plans show the following:

a) Drainage Area and Drain Profile	Drawing Number 1
b) Cross Sections (Station 0+000 to Station 0+700)	Drawing Number 2
c) Cross Sections at Hydro Poles	Drawing Number 3

Preliminary and Approximate Assessments for Land Parcels

Option No. 1

	Name/Roll Number	Land Use	Hectares Affected	Approximate Costs
1	Jim Tiessen	AG	5.385	$ 2,130
2	Driedger Farms	AG	8.023	$ 3,170
3	Lenard Driedger	AG	15.995	$ 11,700
4	Dennis & Carol Driedger	AG	8.850	$ 6,470
5	Roll 610-02910	RES	0.300	$ 1,070
6	Roll 610-02915	RES	0.330	$ 3,370
7	Roll 610-03005	RES	0.880	$ 3,130
8	Mersea Road 6	Road	1.450	$ 28,370
9	Hydro One	Utility	--	$ 61,500
				$ 120,910

FE 14-391

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311, Essex, ON, Canada, N8M 1Y6 | P 519-776-5209 | F 519-776-8688 | ercaorg | ourgreenlegacy.org

02 April 2015

Partner Municipalities
Town of Amherstburg
Town of Essex
Town of Kingsville
Town of Lakeshore
Town of LaSalle
Municipality of Leamington
Township of Pelee
Town of Tecumseh
City of Windsor

Municipality of Leamington
111 Erie Street North
Leamington, Ontario
N8H 2Z9

Attention: Ms. Kim Siddall, Manager of Legislative Services

Dear Ms. Siddall:

RE: Petition for New Drainage Works
Mersea Rd 6 (Driedger Drain)
Lots 224 & 225, Concession NTR
Municipality of Leamington

The Essex Region Conservation Authority (ERCA) has received your notification dated March 20, 2015 regarding the petition for the drainage of certain lands by means of the drainage works designated above. The following information is provided with regard to the subject proposal.

The subject lands are located within the limit of regulation (Section 28 of the *Conservation Authorities Act*) for the Derbyshire Drain which is under the jurisdiction of the Essex Region Conservation Authority. Prior to undertaking work in this area, a "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit" is required from this office. The Derbyshire Drain is currently a municipal drain located on the north side of Mersea Road 6. The proposed new Driedger Municipal Drain is to be located in the same general area. Based on a review of our files, this office has no record of local natural heritage features within or adjacent to this section of the proposed new municipal drain. This does not however remove the Municipality's responsibility to contact other provincial or federal agencies that may have concerns with this proposal.

If during the design of the project, significant natural heritage features are identified, this office could request a biological assessment of the identified features as part of our requirements under Section 28 of the *Conservation Authorities Act*. The proponent would have a qualified biologist undertake a biological assessment of the proposed works. The purpose of the biological assessment is to ensure that the proposed works will not adversely impact any natural heritage issues and/or to determine measures that will mitigate any potential adverse impacts. For any biological assessment that is required in order to satisfy issues related to the *Conservation Authorities Act*, the cost of the biological assessment is the responsibility of the proponent.

/...2

Conservation Ontario Member

Ms. Siddall
02 April 2015
Mersea Road 6 (Driedger Drain)
Page 2

With respect to the Department of Fisheries and Oceans (DFO) concerns and comments, the proposed works outletting into the Derbyshire Drain will need to be self-assessed by the Municipality of Leamington, the proponent, through the DFO website at http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html. Through the self-assessment process, the proponent will be able to determine if the proposed works will require a formal authorization under the *Fisheries Act*.

In order to obtain a federal authorization, it may be necessary to provide habitat compensation for the proposed works. In general, the resulting habitat impacts must be replaced with equivalent habitat features. Determining if a proposed project is acceptable/compensatible would require biological investigations and would depend on the actual proposed works. The costs related to the biological investigations are the responsibility of the proponent.

The DFO will also need to be contacted regarding the *Species at Risk Act* for federally listed aquatic species at risk fish and associated approval requirements.

The Proposed New Municipal Drain may contain significant species (aquatic species at risk as well as plants, animals, habitat, etc.) that are protected under the provincial *Endangered Species Act*. The ERCA does not screen for species that are protected under the provincial *Endangered Species Act*. It is the proponent's responsibility to ensure all issues related to the provincial *Endangered Species Act* are addressed. All inquiries regarding the provincial *Endangered Species Act* should be made with the Aylmer office of the Ontario Ministry of Natural Resources and Forestry (MNRF) (ESAScreeningRequest.AylmerDistrict@ontario.ca).

It is our understanding that the engineering firm of R.C. Spencer Engineering will be preparing a Preliminary Report for the drainage works. Prior to your consultant moving forward with design for any proposed works, we recommend that they contact this office to discuss same.

If further information or clarification is required, please do not hesitate to contact this office.

Yours truly,

Cynthia Casagrande

Cynthia Casagrande
Regulations Technician

JH/CC/cc

LEAMINGTON
ONTARIO CANADA

POLICY NO.	E09-Buffer Strips
DATE ENACTED:	March 3, 2003
AMENDED BY:	C-69-12
PAGE:	1 of 2

SUBJECT: PROCEDURAL STEPS FOR INCORPORATION OF BUFFER STRIPS IN DRAINAGE REPORTS

OBJECTIVE: To ensure that the incorporation of buffer strips in drainage reports are handled consistently.

ACTIVITY: This is intended to be a policy for setting the recommended width of buffer strips and to set the value of compensation based on the rate percentage on the average assessed value per hectare for agriculture lands in a drainage report on Municipal Drains. In addition this policy is for the protection of the buffer strips under Section 80 of the Drainage Act.

POLICY:

As buffer strips become implemented into a Municipal Drain by an Engineer's Report the need to handle the situation in a prompt and fair manner will be required.

1. *Compensation due to Loss of Land:*
The Drainage Engineer will be responsible for calculating the compensation for loss of land pursuant to Section 30 of the Drainage Act.

2. *Width of Buffer Strips:*
The standard width for a buffer strip for all drainage reports shall be 3m (10'). This would be required on both sides of the open municipal drains throughout the course of the drain.

3. *Activities Within the Buffer Strip:*
The area within the limits of the buffer strip:
   - Shall not be tilled
   - Shall not have drainage furrows cut through the buffer
   - Shall not be sprayed with any herbicide product without consulting the Municipal Drainage Superintendent
   - Shall comply with the Nutrient Management Act in respect to applying fertilizers.

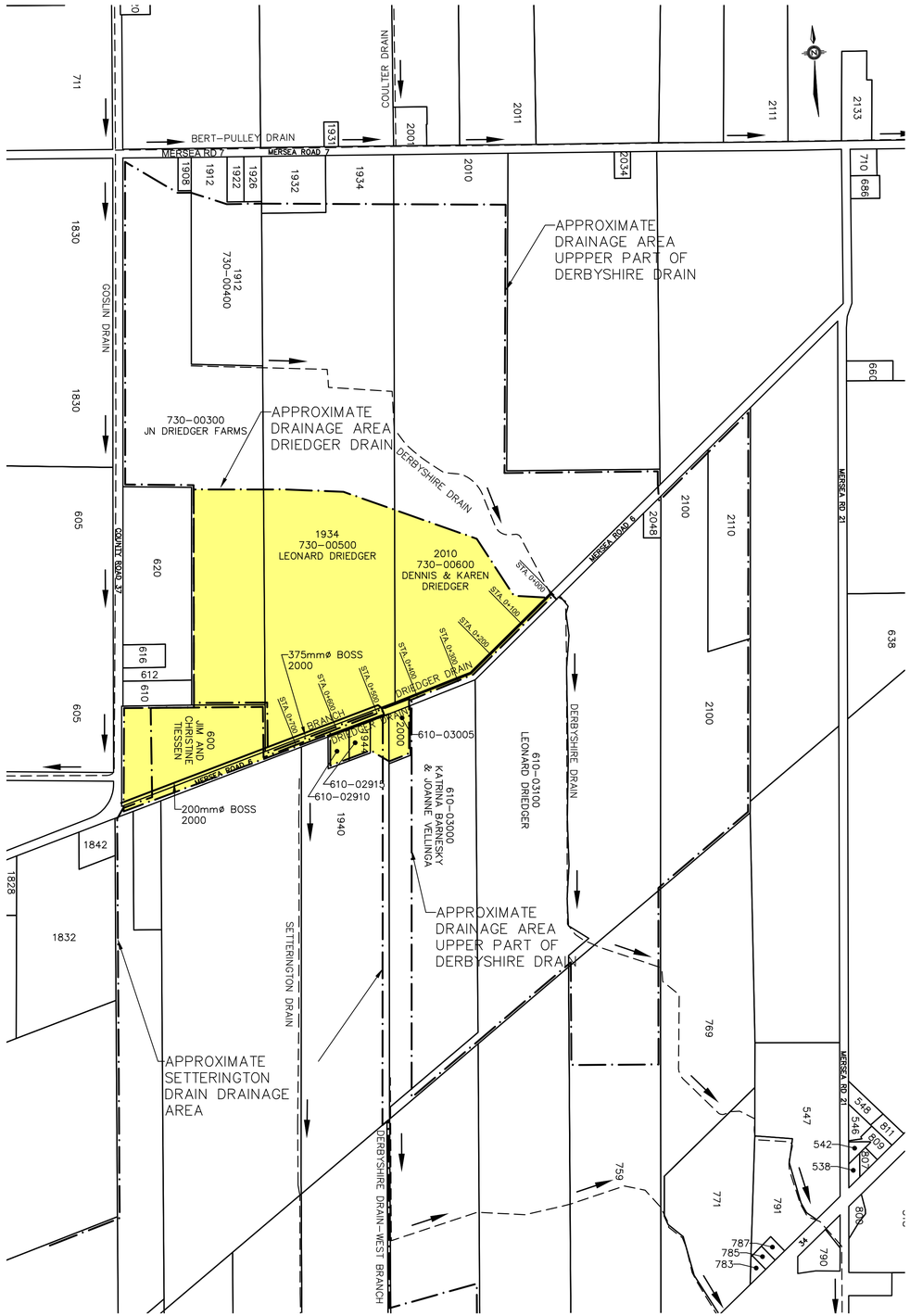
4. *Landowner Damaging a Buffer Strip Contained within An Engineer's Report:*
Notify the landowner in writing (in accordance with Section 80 of the Drainage Act)

   a) Of the damage which has been caused, the extent of the repairs and the length of time in which the landowner has to repair the damage.
   b) And that if the landowner does not comply within the written order of the municipality, the municipality will make the necessary repairs and the costs incurred will be charged to the landowner (Section 80(1)).

c) And if the owner of the land does not pay the cost of the repairs to the municipality, the municipality will pay the costs and subsequently place their costs on the collector's roll for this property and collect them as taxes accordingly (Section 80(2)).

5. Maintenance of Buffer Strips Contained within an Engineer's Report:
That "normal" maintenance of buffer strips will be completed by the Drainage Superintendent as described in the Engineer's Report. However, should the land owner desire a manicured lawn buffer strip or specific landscaped quality, the landowner will be responsible for maintaining the buffer strip at their time and expense.

(DR 23/03)
(DR 9/12)



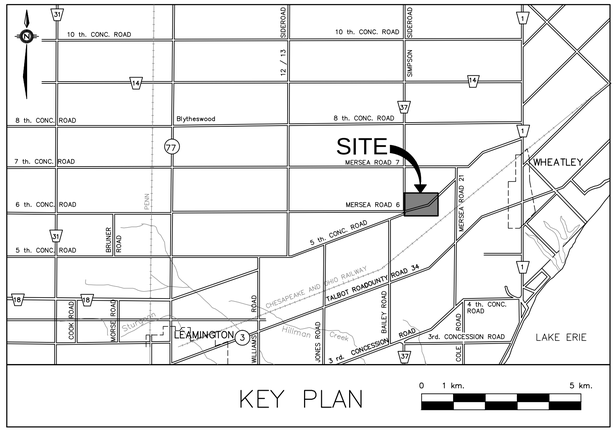
DRAINAGE AREA AND LANDS AFFECTED

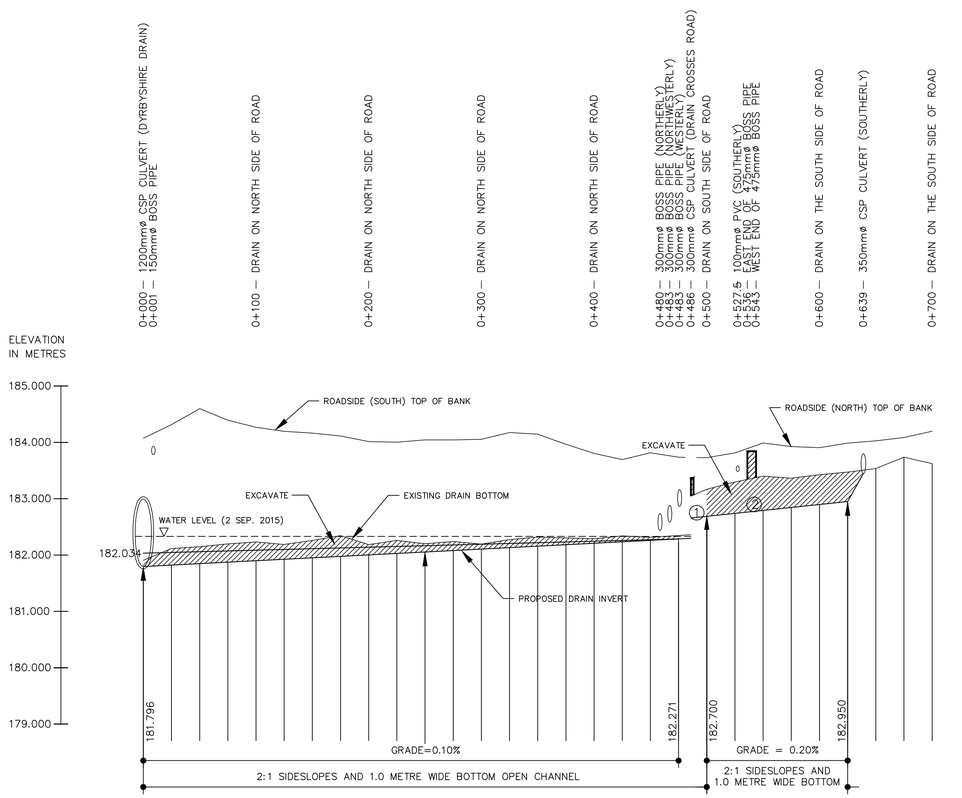
SCALE: 1 : 6000

BENCHMARKS			
NUMBER	STATION	DESCRIPTION	ELEVATION
NO. 1		TOP OF CATCHBASIN IN DRIVEWAY AT MUNICIPAL NO. 1812 MERSEA ROAD 6	184.130
NO. 2		NAIL IN HYDRO POLE AT MERSEA ROAD 6 AND ROAD 37 (NORTH SIDE)	184.662
NO. 3	0+900	NAIL IN HYDRO POLE #BSSLKE (NORTH OF SPEED SIGN)	184.614
NO. 4	0+750	NAIL IN HYDRO POLE #BSSLMP – NORTH SIDE, WEST OF WHITE HOUSE	184.631

LEGEND

- – – – – DENOTES CENTERLINE OF EXISTING MUNICIPAL DRAIN
- ——— DENOTES CENTERLINE OF NEW MUNICIPAL DRAIN
- DENOTES LIMITS OF DRAINAGE AREA





DRAIN STATIONS (IN METRES)	0+000	25	50	75	0+100	25	50	75	0+200	25	50	75	0+300	25	50	75	0+400	25	50	75	0+500	25	50	75	0+600	25	50	75	0+700
CUT OR FILL FROM EXISTING TOP OF BANK TO NEW GRADE (m)	+	+	+	+	+	+	+	+	+	+	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
EXISTING ROADSIDE TOP OF BANK	184.071	184.316	184.598	184.393	184.269	184.197	184.165	184.115	184.015	184.005	184.045	184.045	184.055	184.175	184.145	183.965	183.805	183.695	183.815	183.738	183.728	183.813	183.990	183.925	183.907	183.987	184.027	184.087	184.198
EXISTING BOTTOM OF DRAIN (METRES)	181.906	182.116	182.148	182.198	182.232	182.187	182.260	182.345	182.185	182.260	182.200	182.240	182.195	182.275	182.320	182.435	182.290	182.340	182.315	182.348	183.168	183.298	183.298	183.365	183.427	183.472	183.537	183.737	183.623

DRAIN PROFILE

SCALE: 1 : 3000H

PRELIMINARY

LEAMINGTON ONTARIO CANADA

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261 Shepherd Street E.
Windsor, On, N8X 2K6
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Professional Engineers Ontario
18 Talbot St. W.
Leamington, On, N8H 1M4
Phone: (519) 324-0606

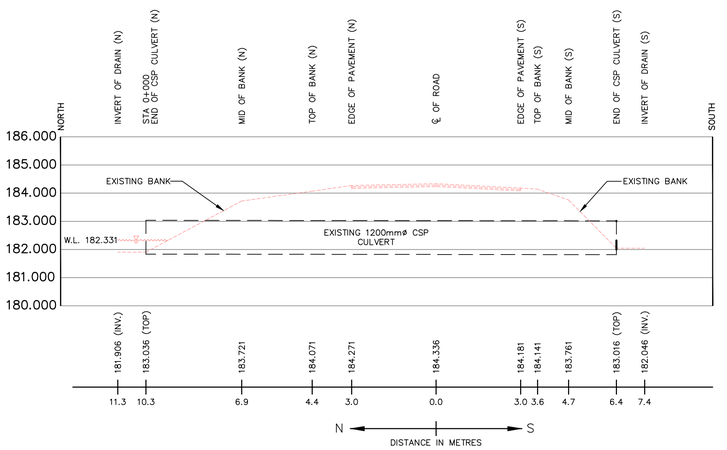
DESIGN	A.M.G.
CHECKED	L.Z.
DRAWN	D.L.
CHECKED	A.M.G.
DATE	1 JUNE 2016
SCALE	AS SHOWN

DRIEDGER DRAIN

DRAINAGE AREA AND DRAIN PROFILE

PROJECT NO.	14–391
SHEET NO.	1
OF	3

14–391_01–04 JUNE 1, 2016



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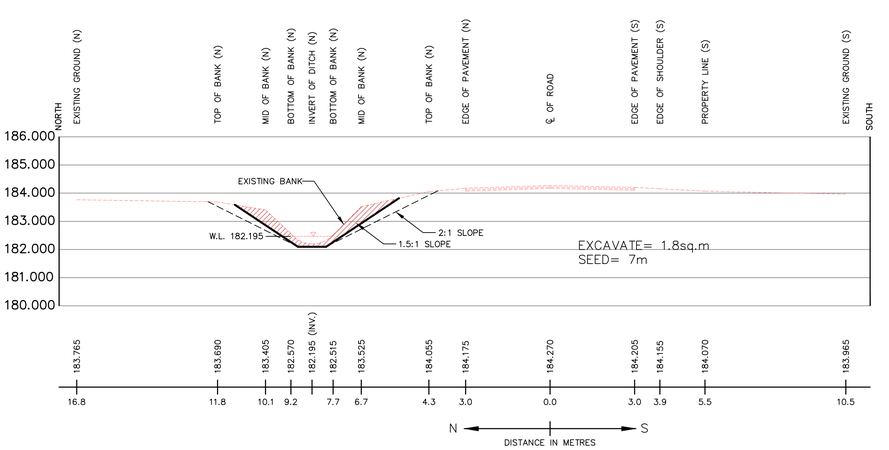

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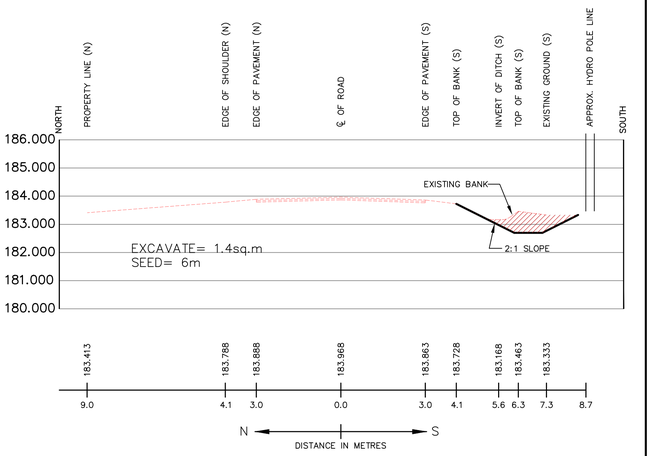

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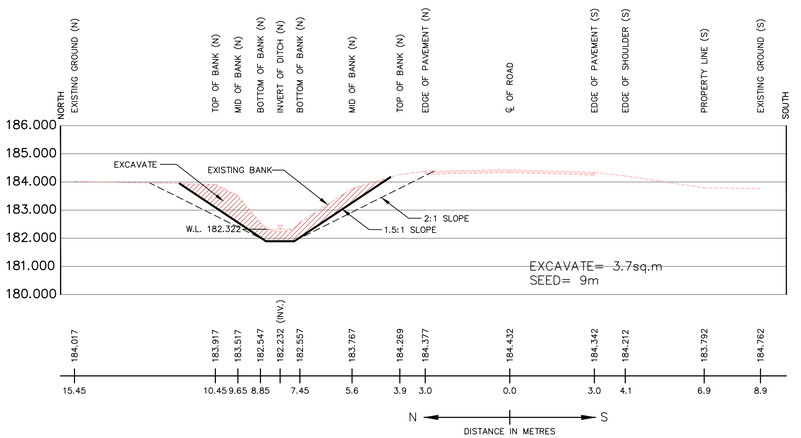

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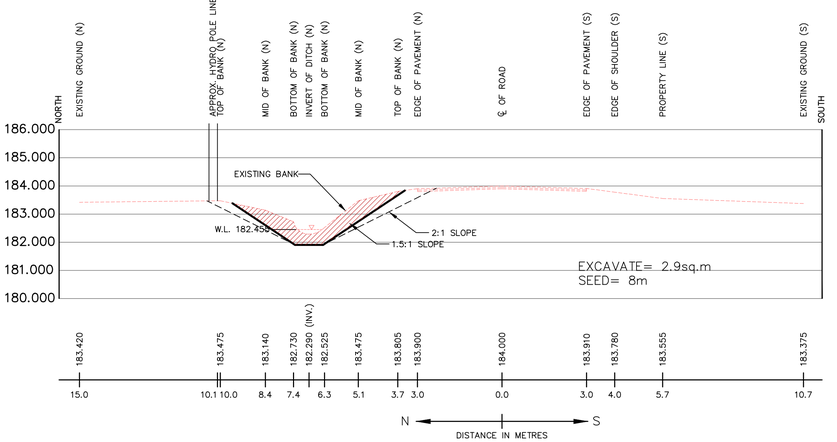

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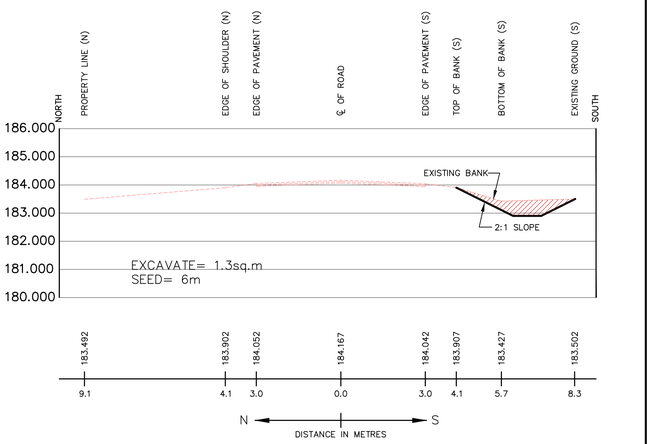

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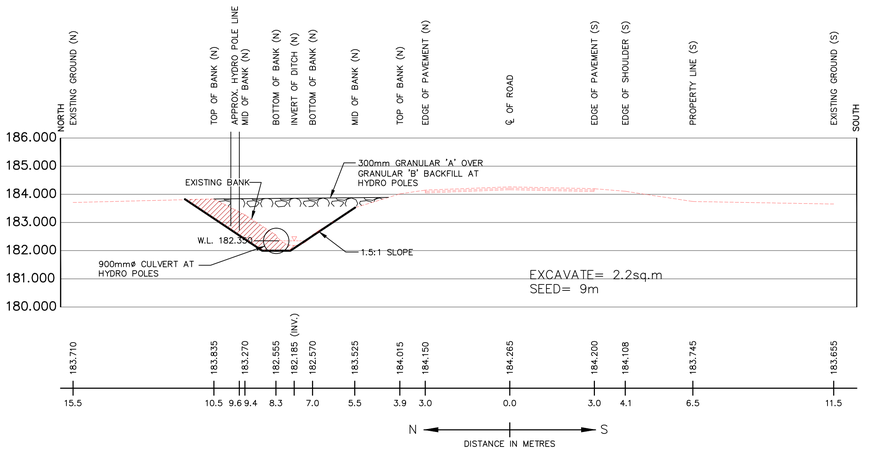

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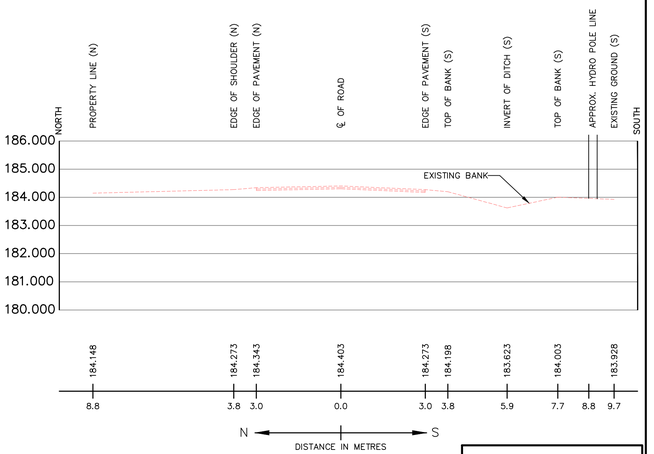

STA. 0+700

DRAIN CROSS-SECTION (STA. 0+000 TO STA. 0+700)

SCALE: 1 : 100

PRELIMINARY

LEAMINGTON ONTARIO CANADA

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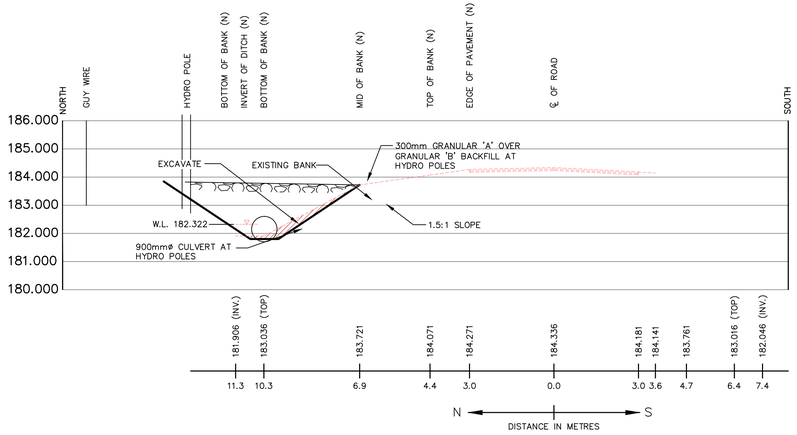
DESIGN	A.M.G.
CHECKED	L.Z.
DRAWN	D.L.
CHECKED	A.M.G.
DATE	1 JUNE 2016
SCALE	1 : 100

DRIEDGER DRAIN

CROSS-SECTIONS (STA. 0+000 TO STA. 0+700)

PROJECT NO. 14-391

SHEET NO. 2 OF 3



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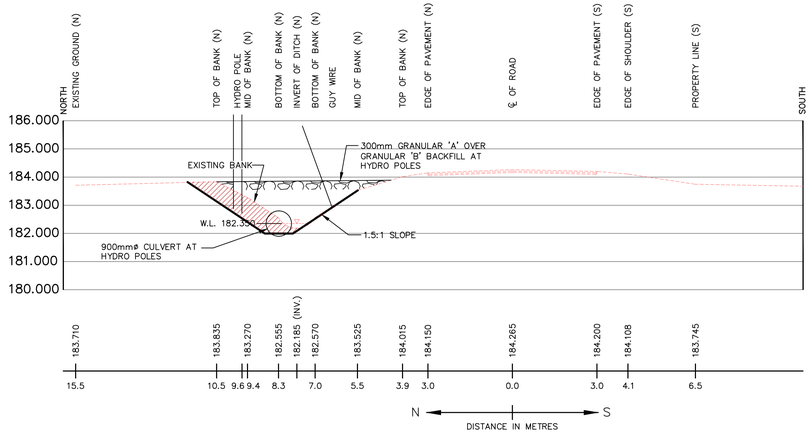

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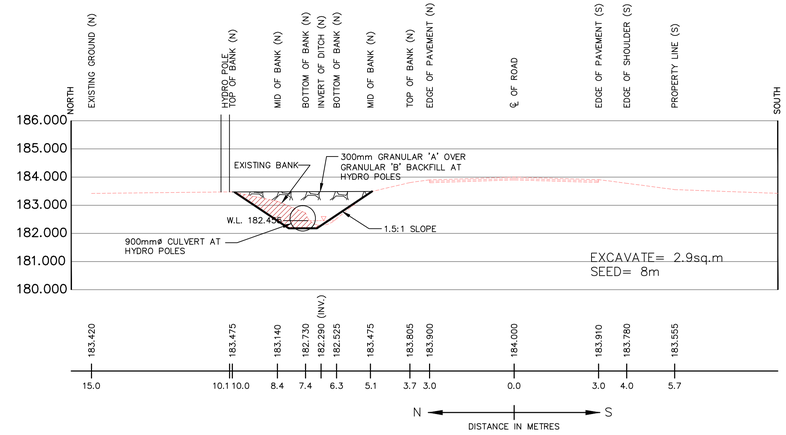

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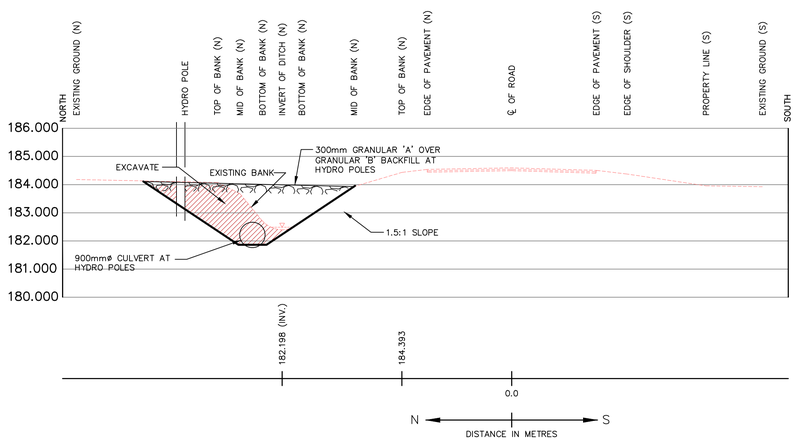

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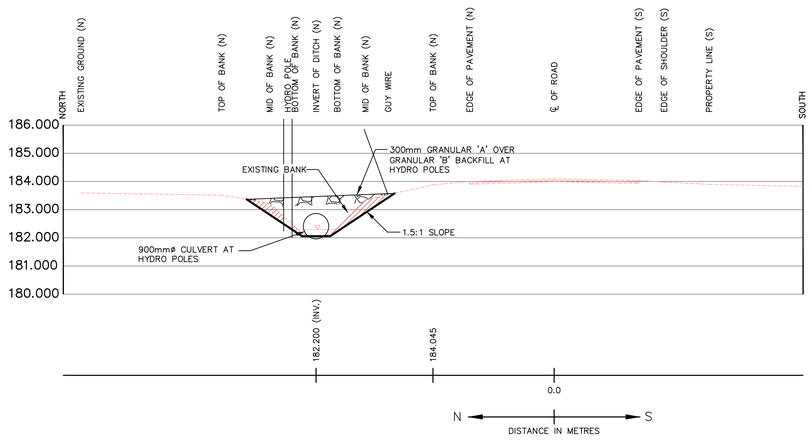

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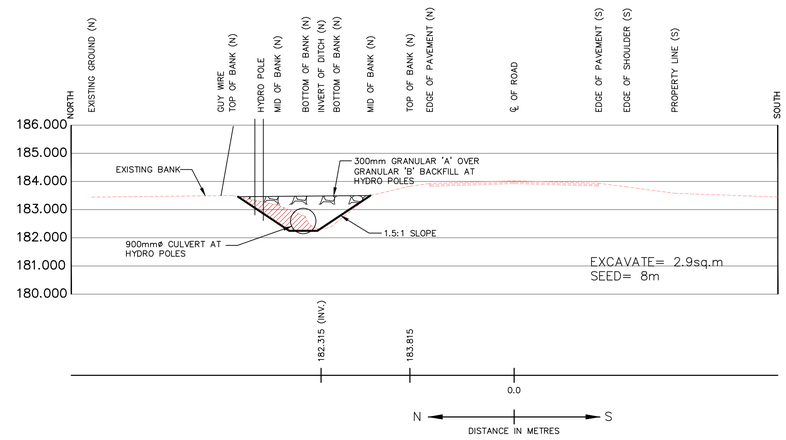

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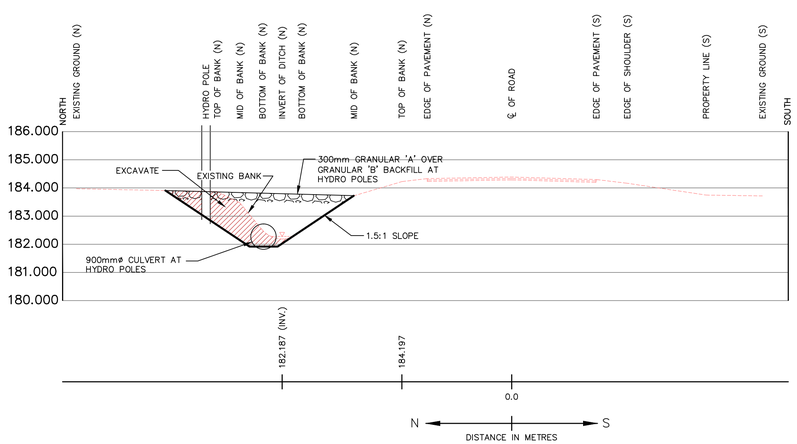

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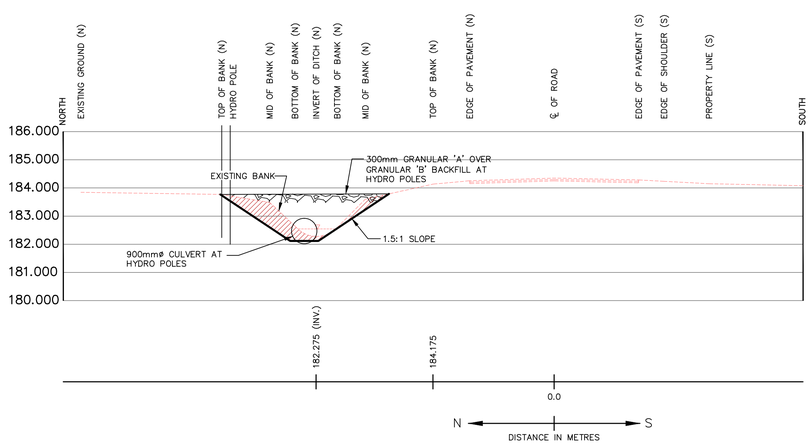

STA. 0+323

PRELIMINARY

*STATIONINGS SHOWN DEPICT HYDRO POLE LOCATIONS

LEAMINGTON ONTARIO CANADA

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Consulting Engineers
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DESIGN	A.M.G.
CHECKED	L.Z.
DRAWN	D.L.
CHECKED	A.M.G.
DATE	1 JUNE 2016
SCALE	1 : 100

DRIEDGER DRAIN

CROSS-SECTIONS AT HYDRO POLES

PROJECT NO. 14-391

SHEET NO. 3 OF 3