BRIDGES OVER THE UPPER PART OF SILVER CREEK DRAIN

(Geographic Township of Mersea)

MUNICIPALITY OF LEAMINGTON

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Project No. D-17-012

May 26th, 2017

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

Mayor Patterson and Members of Council:

SUBJECT: BRIDGES OVER THE UPPER PART OF SILVER CREEK DRAIN
(Geographic Township of Mersea)
Municipality of Leamington, County of Essex
Project No. D-17-012

I. INTRODUCTION

In accordance with the instructions received by email on January 30th, 2017, from the Assistant Drainage Superintendent, Ms. Lucy Simpson, we have made the necessary survey, examinations, and investigations, etc. and have prepared the following report that provides for the installation of a new access bridge, along with establishing future maintenance provisions for existing access bridges and an enclosure within the Upper Part of Silver Creek Drain. These investigations and improvements were initiated by a resolution passed by Council, through Policy E09, for our firm to undertake the necessary drainage reports resulting from a request of a landowner for future development, in accordance with the Drainage Act. A plan showing the alignment of the Upper Part of Silver Creek Drain, the general location of the existing and proposed structures within the drain and details for the general improvements under this project is included herein as part of this report.

The initial request to provide an Engineer's Report to address improvements to the Upper Part of Silver Creek Drain, was submitted by J.P.I. Farms Inc. (720-03705). These improvements include a new access bridge to their lands for their future greenhouse development. Upon further review of the governing drainage reports and the existing access bridges, and further discussions with the Drainage Superintendent, Ms. Lu-Ann Marentette, the Municipality of Leamington has provided instructions to include future maintenance provisions for the access bridges and enclosure which serve the lands currently owned by J.P.I. Farms Inc., being parcels 720-03700 & 720-03705, together with J.P.I. Sales Inc. (720-03650), and within the Upper Part of Silver Creek Drain, as part of this drainage report.

Our appointment and the works relative to the Upper Part of Silver Creek Drain proposed under this report, are being conducted in accordance with Section 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended in 2010". We have

performed all of the necessary survey, investigations, etc., for the Upper Part of Silver Creek Drain, and its improvements, and we report thereon as follows.

II. BACKGROUND AND DRAINAGE HISTORY

A review of the Municipality of Leamington's drainage records indicate that the Upper Part of Silver Creek Drain is an existing open Municipal Drain that has been repaired and improved under the provisions of the Drainage Act. The Upper Part of Silver Creek Drain commences on the south side of Mersea Road 6, just west of Bruner Lane, and extends northerly between Lots 3 and 4, and continues easterly along the south limit of Mersea Road 7, to its outlet into the Silver Creek Drain. The last major works of repair and improvements carried out on the entire length of this drain was completed under an Engineer's Report prepared by William J. Setterington, P.Eng., dated December 20th, 1974. The works proposed under this report provided for drain cleaning and general improvements, along with the replacement and/or improvements to existing access bridges within the entire length of the drain.

III. PRELIMINARY INVESTIGATIONS AND ON-SITE MEETING

After reviewing all of the drainage information provided by the Municipality of Leamington, we arranged for a site meeting to be scheduled for March 17th, 2017. The following people were in attendance at said meeting: Peter and Isaak Giesbrecht (representatives of J.P.I. Farms Inc. and J.P.I. Sales Inc.), Lu-Ann Marentette (Municipality of Leamington's Drainage Superintendent), Lucy Simpson (Municipality of Leamington's Assistant Drainage Superintendent), and Tony Peralta, P.Eng. (N.J. Peralta Engineering Ltd.).

Upon introductions, it was generally discussed that a written notice had been submitted by Peter Giesbrecht, to provide a new access bridge over the Upper Part of Silver Creek Drain for the parcel currently owned by J.P.I. Farms Inc. (720-03705). This new access bridge is being provided to serve the proposed greenhouse development on this property.

Mr. Giesbrecht was reminded that all costs associated to the construction of the proposed access bridge shall be assessed 100% to the subject property.

Upon review of the governing report, the subject property currently has an existing access within the Upper Part of Silver Creek Drain. The Geisbrecht's advised that they prefer this access bridge remain to serve as an access for the existing residence within the property. Therefore, the new access bridge that will serve the greenhouse development will be considered a secondary access to the subject property. As a secondary access

bridge for the subject property, the installation of same would not be eligible for cost sharing, nor available for grants through the Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A.). It was further discussed that the proposed access bridge shall be installed to provide an entrance to the property to satisfy the M.T.O. Commercial Site Access Policy and Standard Designs for an Entrance to Small Business (C.S.A.S.-31). Therefore, this new access bridge would require additional top width to satisfy this requirement. We further discussed that this new access bridge is intended for high truck traffic and therefore, the Owner agreed that the new culvert pipe shall have increased pipe thickness for additional strength and longevity.

As part of the greenhouse development on the property, it was further confirmed that the new access bridge location shall be set per the Site Plans submitted to the Municipality of Leamington for their approvals.

There were considerable discussions regarding the options of sloped quarried limestone end treatments versus a vertical headwall. It was further established that due to the overall length required for such an access that the final design length of culverts may be governed by the general recommendations of the Department of Fisheries and Oceans (D.F.O.). With the extended length required to accommodate an access for truck traffic, it would very be likely that a vertical headwall system would be required for this application. We further discussed the various options for end treatments and established that once a preliminary design has been completed, we can review the various end treatment options.

Mr. Giesbrecht was advised that the new access bridge installation would be subject to further approvals and mitigation measures of the Department of Fisheries and Oceans (D.F.O), Essex Region Conservation Authority (E.R.C.A), and the Ministry of Natural Resources and Forestry (M.N.R.F.).

The overall Drainage Report and Future Maintenance processes were reviewed. We also discussed general timelines for construction. The Owner had advised that they would be looking to have the new access bridge installed for the Fall of 2017.

Ms. Marentette generally reviewed the status of the existing access bridges and enclosure within the drain, that serve as an access to the lands owned by the Giesbrecht’s. She was unsure of their current status, with respect to the Municipal Drain, and was concerned that there was no mechanism for future maintenance for these structures. As a result, she had requested that we investigate whether a mechanism for future Cost Sharing and provisions for all structures owned by the Giesbrecht’s, and within the Upper Part of Silver Creek Drain. She further requested that these provisions be included as part of this report in order to fairly distribute costs for future

maintenance and repairs to any of these structures. After reviewing the condition of these structures, we established that they were in fair condition and have some life remaining. After considerable discussion and review, the Giesbrecht's agreed to investigate the incorporation of these future bridge maintenance provisions.

At the conclusion of our discussions, we advised the Giesbrecht's that we would contact them prior to the preparation of our Engineer's Report, to review the headwall alternatives, along with details of the new access bridge installation.

On this note, the on-site meeting had concluded.

IV. FIELD SURVEY AND INVESTIGATIONS

Following our on-site meeting, we arranged for our survey crew to attend the site to perform a topographic survey, including taking all necessary levels and details, to establish the design parameters for the installation of the new access bridge structure.

Bench Marks were looped from previous work carried out on the drain and were utilized in establishing a relative site Bench Mark near the locations of the new access bridges. We also surveyed the drain for a considerable distance both upstream and downstream of the proposed access bridge sites in order to establish a design grade profile for the installation of same. We also took cross sections of the Upper Part of Silver Creek Drain at the general location of the new access bridge site, as necessary, for us to complete our design calculations, estimates and specifications.

The Ministry of Natural Resources and Forestry (M.N.R.F.) Endangered Species Act Municipal Drain agreements, under Section 23 of the Act, with the Municipality had expired as of June 30th, 2015. New regulation provisions have replaced these existing drain agreements under Ontario Regulation 242/08, Section 23.9 which allows the Municipality to conduct repairs, maintenance, and improvements, within existing Municipal Drains, under the Drainage Act to be exempt from Section 9 and 10 of the Endangered Species Act, so long as the rules in the regulation are followed. If eligible, the regulatory provision allows Municipalities to give notice to the Ministry by registering their drainage activities through an online registry system.

For the purposes of establishing the watershed area upstream of the proposed access bridge, and determining the pipe size required for same, we investigated and reviewed the past Engineer's Reports on the Upper Part of Silver Creek Drain. We also carried out a review of the watershed limits utilizing the most recent Stormwater Management Report and Plans for the greenhouse development and conducted a review of the adjacent

lands to verify the contributing watershed area into the Upper Part of Silver Creek Drain.

V. FINDINGS AND RECOMMENDATIONS

E.R.C.A., D.F.O. and M.N.R.F. Considerations

During the course of our investigations, this drainage project was discussed and reviewed in detail with Ms. Cynthia Casagrande, of the E.R.C.A., to deal with any E.R.C.A. issues and comments related to this Municipal Drain. The Upper Part of Silver Creek Drain is located within the regulated area and is under the jurisdiction of E.R.C.A., and therefore an E.R.C.A. permit is required for construction of the proposed access bridge structures. Further to the above, E.R.C.A. provided us with their comments and concerns through email correspondence, and said correspondence is included herein as **Appendix "A"**.

As outlined in the correspondence from E.R.C.A., with respect to the Department of Fisheries and Oceans concerns and comments, due to amendments to the Fisheries Act coming into effect, the existing partnership agreements between D.F.O. and E.R.C.A. has lapsed as of November 25th, 2013. As a result, the proposed works within the Upper Part of Silver Creek Drain was self-assessed by the Engineer, through the D.F.O. website to determine whether this project shall be reviewed by D.F.O. Based on the D.F.O. Self Assessment website, we have determined that the project activities would not require a D.F.O. review for the works proposed under this project, so long as standard measures for fish habitat and migration are implemented.

Under the Species at Risk Provincial Legislation, set in place with the Ministry of Natural Resources and Forestry (M.N.R.F.), Section 23.9 of the Endangered Species Act, 2007, allows the Municipality to conduct eligible repair, maintenance, and improvement work under the Drainage Act that exempts these works from Sections 9 and 10 of this Act, so long as they follow the rules within Ontario Regulation 242/08.

In recognition of impact that these species may experience as a result of the subject works, the Municipality of Leamington has provided comprehensive mitigation measures as well as species identification guides for reference. These references shall be provided to the successful Tenderer and shall be available for viewing at the Municipal Office for those interested.

Through correspondence with Cynthia Casagrande, of the E.R.C.A., the self assessment through D.F.O., and the mitigation measures through the Endangered Species Act, we have provided for all of the E.R.C.A., D.F.O., and M.N.R.F. concerns and issues in our design and recommend that this drainage works be constructed in total compliance with all of the above.

Report - Bridges Over the Upper Part of Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

Upper Part of Silver Creek Drain Bridge and Enclosure Improvements

As part our discussions and instructions established at the on-site meeting, we have reviewed all of the structures within the 9th Concession Road Branch of the Silver Creek Drain, owned by J.P.I. Farms Inc. and J.P.I. Sales Inc. They are as follows:

Bridge ① (J.P.I. Farms Inc., 720-03705)

Based on our investigations and the information provided to us, the new access bridge newly requested to serve as a secondary access to the subject agricultural lands of J.P.I. Farms Inc. (720-03705) within Lot 4, Concession 6, has been identified within this report as Bridge ①.

Prior to the completion of our Engineer's Report on this project, we had contacted Mr. Peter Giesbrecht (representative of J.P.I. Farms Inc.), to review the particulars of the new access bridge, in great length and detail.

As part of our preliminary design, we found that in order to keep the culvert to an acceptable length, the new access bridge shall be installed utilizing vertical headwalls. Based on Mr. Giesbrecht's request at the on-site meeting, we had investigated various headwall options for the proposed structure. We found that the most cost effective vertical headwall option for this application would be concrete filled jute bag headwalls. However, we also provided Mr. Giesbrecht with the option of Interlocking Concrete Block Headwall System. After reviewing details of these options, Mr. Giesbrecht decided to proceed with Interlocking Concrete Block Headwall System, based on its appearance and long-term advantages.

Based on our preliminary design we determined that the new access bridge would require approximately 28.0 metres of 2000mm diameter corrugated steel pipe with a vertical headwall system. By incorporating the M.T.O. Commercial Site Access Policy and Standard Design for an Entrance to Small Business (C.S.A.S.-31), the resulting traveled portion of driveway top width would be 26.80 metres (87.93 ft.), to accommodate for the intended truck traffic. Mr. Giesbrecht was reminded that all of the construction and incidental costs associated to this new access bridge will be assessed 100% to their property, as the bridge user. He was further reminded that as a secondary access to the property, that he would be responsible for any future maintenance costs associated to the repair or improvements to this access bridge through the Municipality of Leamington. As a second access to the property, Mr. Giesbrecht was reminded that this new access bridge installation would not be eligible for a grant through the Ontario Ministry of Agricultural Food and Rural Affairs (O.M.A.F.R.A.). Mr. Giesbrecht confirmed his understanding of the above information and he accepted our recommendations with respect to this access bridge installation.

Report - Bridges Over the Upper Part of Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

The details of this new access bridge installation and the works proposed herein has been prepared on that basis.

Based on our detailed survey, investigations, examinations, and discussions with the affected property Owner, we recommend that the new access bridge be constructed between Stations 0+112.0 and Station 0+140.0 within the Upper Part of Silver Creek Drain, and at the location and to the general parameters as established in our design drawings attached herein. This new access bridge shall serve as the secondary access to these lands and shall be installed as part of this report, and identified herein as **Bridge ①**.

Bridge ② (J.P.I. Farms Inc., 720-03705)

The existing access bridge extending from Station 0+246.3 to Station 0+256.0, serving as the primary access to the subject agricultural lands of J.P.I. Farms Inc. (720-03705), within Lot 4, Concession 6, has been identified within the December 20th, 1974 Engineer's Report prepared by William J. Setterington, P.Eng. Within this report, the access bridge consisted of 6.70m of 1727mm Cast Iron Pipe. The access bridge currently consists of approximately 9.70 metres of 1727mm Cast Iron Pipe and 1800mm (71") diameter corrugated steel pipe with concrete pieces and concrete block end treatments. We find that the existing access bridge culvert to be in fair condition and adequately sized. We also find the end treatments to be in fair condition while maintaining a driveway top width of 8.70 metres (28.54 ft.). Therefore, based on the condition of the existing access bridge, we recommend that no improvements are required to this structure as part of this report. This structure has been labelled herein as **Bridge ②**.

Enclosure ③ (J.P.I. Farms Inc., 720-03700 & J.P.I. Sales Inc., 720-03650)

The existing enclosure extending from Station 0+339.8 to Station 0+401.8, serving as the primary access and lawn piping across the residential lands of J.P.I. Sales Inc. (720-03650) and the primary access to agricultural lands of J.P.I. Farms Inc. (720-03700), within Lot 4, Concession 6. A portion of the enclosure between Station 0+381.9 to Station 0+387.7, and within the lands of J.P.I. Sales Inc. (720-03650), was identified within the December 20th, 1974 Engineer's Report prepared by William J. Setterington, P.Eng. Within this report, the access bridge portion consisted of 5.80m of 1702mm Cast Iron Pipe. The extension upstream includes approximately 14.1 metres of 1800mm diameter corrugated steel culvert. The extension downstream includes approximately 42.1 metres of 1500mm diameter corrugated steel culvert. As a result, the overall enclosure currently consists of approximately 62.0 metres with stacked concrete pieces headwalls.

Report - Bridges Over the Upper Part of Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

We find that the existing enclosure culvert and headwalls appear to be in fair condition and on grade relative to the profile grades. Overall, this enclosure conveys flows at a rate slightly less than the 1:2 year storm event. After considerable review of the existing structure, we find that the deficiencies in the culvert size do not pose as a significant obstruction to the flows within the drain. **However, when future maintenance is performed on this structure, we recommend that it be replaced in its entirety with an 1800mm diameter Aluminized Steel Type II corrugated steel pipe. This increase in culvert size will address the deficiencies in culvert capacity, to convey a minimum 1:2 year storm event.** Therefore, based on the condition of the existing enclosure, we recommend that no improvements are required to this structure as part of this report. This structure has been labelled herein as **Enclosure ③.**

With the access portion of the enclosure within the lands currently owned by J.P.I. Sales Inc. (720-03650) being referred to within the above mentioned Engineer's Report, this access portion is considered to be a legal entity with respect to the Upper Part of Silver Creek Drain.

Although the existing access bridge portion within the lands of agricultural lands of J.P.I. Farms Inc. (720-03700) is currently considered to be a private entity within the Upper Part of Silver Creek Drain, we find that due to the overall fair condition, we can now incorporate this access bridge as a legal entity with respect to the Upper Part of Silver Creek Drain.

The existing enclosure consists of an access bridge portion and a lawn piping portion. We recommend that the cost for the access bridge portions of the enclosure within these lands be eligible to have the costs for its future replacement and/or improvements be shared with the lands and roads within the drains watershed contributing their runoff into the drain, upstream of said enclosure. We also recommend that all of the costs of the lawn piping portion be entirely assessed to the adjoining lands of J.P.I. Sales Inc. (720-03650). All of same has been provided for within the Future Maintenance provisions, included within this report.

VI. ALLOWANCES AND COMPENSATION

All of the work under this project shall be carried out along the south limit of Mersea Road 7. All areas disturbed by this work are specified for full restoration; therefore, these works shall not result in any loss of production of agricultural property, or any indirect damages to the non-agricultural areas. Therefore, no allowances or compensation has been provided for under this report.

Report - Bridges Over the Upper Part of Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

VII. ESTIMATE OF COST

Our estimate of the total cost of this work, including all incidental expenses, is the sum of **SEVENTY SEVEN THOUSAND SIX HUNDRED AND NINETY ONE DOLLARS ($77,691.00)** made up as follows:

CONSTRUCTION

Item 1)	**Bridge ① (Station 0+112.0 to Station 0+140.0)**; Provide all labour, equipment and materials to construct a new access bridge consisting of 28.0 metres (91.86 ft.) of 2000mm diameter, 2.8mm thick, Aluminized Steel Type II Corrugated Hel-Cor pipe with rolled annular ends and 125mm x 25mm corrugations profile, including interlocking concrete block headwalls with daylighting and concrete footings, sloped quarried limestone erosion protection, granular bedding and backfill, granular driveway approach and transition, excavation, compaction, cleanup and restoration, complete. Lump Sum	$	59,500.00
Item 3)	Net H.S.T. on above item. (1.76%)	$	1,047.00
	TOTAL FOR CONSTRUCTION	**$**	**60,547.00**

INCIDENTALS

1)	Report, Estimate, and Specifications	$	7,900.00
2)	Survey, Assistants, Expenses, and Drawings	$	4,200.00
3)	Duplication Costs of Drawings and Report	$	200.00
4)	Estimated Cost of preparing Tender Documents for use by the Municipality for Letting of the Contract on an invitation basis	$	900.00
5)	Estimated Cost of providing Supervision and Full-Time Inspection during Construction (based on a 3 day duration)	$	3,500.00
6)	Net H.S.T. on above items (1.76%)	$	294.00
7)	Estimated Cost for E.R.C.A. Permit	$	150.00

TOTAL FOR INCIDENTALS	**$ 17,144.00**
TOTAL FOR CONSTRUCTION (brought forward)	**$ 60,547.00**
TOTAL ESTIMATE	**$ 77,691.00**

VII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached the design drawing for the construction of this access bridge. The design drawings show the alignment of the Upper Part of Silver Creek Drain, and the approximate locations of the subject access bridges within this Municipal Drain. The drawings also illustrate the affected landowners and the details associated to the proposed new access bridge installation. The design drawing is attached to the back of this report and is labelled herein as **Appendix "C"**.

Also attached, we have prepared Specifications which set out the required construction details for the proposed bridge installation, which also includes Standard Specifications labelled therein as **Appendix "B"**.

VIII. CONSTRUCTION SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated to the construction of the new secondary agricultural access bridge, as identified and detailed herein as **Bridge ①**, be totally assessed against the adjoining agricultural lands currently owned by J.P.I. Farms Inc. (720-03705), and in accordance with the attached **Construction Schedule of Assessment.**

Since **Bridge ①** is considered a secondary access to the subject lands, the cost for same would be ineligible for the 1/3 grant through the current Ontario Ministry of Agriculture, Food and Rural Affairs (O.M.A.F.R.A.) administrative policies for Agricultural Drainage Infrastructure Program (A.D.I.P.). Therefore, the assessments related to the construction of the secondary access to this property, shall be shown in the attached Construction Schedule of Assessment under the Subheading **"5. Privately Owned – Agricultural Lands (non-grantable)"**.

IX. FUTURE MAINTENANCE

It should be noted that a mechanism should be provided herein so that the Municipality can undertake future maintenance works on the access bridges identified within this report, so that the future maintenance costs for same can be properly assessed to the affected landowners. We would therefore recommend that these structures within the Upper Part of Silver Creek Drain, for which future maintenance costs are to be shared with upstream lands and roads within the watershed, be maintained by the Municipality. Said maintenance work would include works to the access bridge culvert, bedding and backfill, end treatment and other ancillary work. Should concrete or asphalt driveway surfaces over these access bridge driveways require removal as part of the maintenance work, these surfaces should be repaired or replaced as part of the work. Likewise, if any fencing, gate, decorative walls, guard rails or other special features exist that will be impacted by the maintenance work, they are also to be removed and restored or replaced as part of the bridge maintenance work. However, the cost of the supply and installation of any surface material other than Granular "A" material, and the cost of removal and restoration or replacement, if necessary, of any special features, shall be totally assessed to the benefiting adjoining Owner served by said access bridge.

Should any works of maintenance be required in the future to the structures within the Upper Part of Silver Creek Drain, the following provisions with respect to cost sharing, for each of same, shall be shared by the abutting landowner, and upstream affected lands and roads in accordance with the following provisions:

a) The access bridge labelled herein as **Bridge ①**, serving as the secondary access to the agricultural lands of J.P.I. Farms Inc. (720-03705), in Part of Lot 4, Concession 6, shall be maintained in the future on the basis that **100.0%** of all maintenance costs for said access bridge shall be assessed as a benefit to the bridge user.

b) The access bridge labelled herein as **Bridge ②**, serving as the primary access to the agricultural lands of J.P.I. Farms Inc. (720-03705), in Part of Lot 4, Concession 6, shall be maintained in the future on the basis that **77.5%** of all maintenance costs for said access bridge shall be assessed as a benefit to the bridge user, and the remaining **22.5%** of the maintenance costs shall be assessed as an outlet liability against the lands and roads within the watershed lying upstream of said access bridge, in the same proportions as the Outlet Assessments shown in the Maintenance Schedule of Assessment established within the Engineer's Report prepared by William J. Setterington, P.Eng., dated December 20th, 1974, or per subsequent amendments made thereto under the Drainage Act. The

percentages above account for the bridge user share of the increased pipe length beyond the standard length available to provide the standard 6.10 metres (20.0 ft.) minimum driveway top width.

c) The existing enclosure labelled herein as **Enclosure ③** located along the frontage of the residential lands of J.P.I. Sales Inc. (720-03650) and the primary access to agricultural lands of J.P.I. Farms Inc. (720-03700), consists of an access bridge portion and a lawn piping portion. A standard access typically requires a minimum top width of approximately 6.10 metres (20.0 ft.). The standard access bridge portion of this enclosure consists of the equivalent of 9.0 metres of pipe together with granular backfill and vertical headwalls, with the costs for same being shared between the Owner gaining said access and all upstream Owners of lands and roads within the drains watershed.

However, the access portion for the entrance to J.P.I. Farms Inc. (720-03700) requires a top with of approximately 12.1 metres, resulting in an access bridge portion of this enclosure consists of the equivalent of 15.0 metres of pipe together with granular backfill and vertical headwalls. The costs for the standard access bridge portion is shared between the Owner gaining said access and all upstream Owners of lands and roads within the drains watershed. The additional pipe length of approximately 6.0 metres shall be assessed entirely to the bridge user.

The balance of the enclosure is the lawn piping portion along the residential lands of J.P.I. Sales Inc. (720-03650) for which the cost of maintenance is to be assessed entirely to these lands as the sole beneficiary of the lawn piping.

Based on the above, **Enclosure ③** shall be maintained in the future on the basis that **54.6%** of all maintenance costs for said enclosure shall be assessed as a benefit to J.P.I. Sales Inc. (720-03650), **31.3%** be assessed as a benefit to J.P.I. Farms Inc. (720-03700), and the remaining **14.1%** of the maintenance costs shall be assessed as an outlet liability against the lands and roads within the watershed lying upstream of said enclosure in the same proportions as the Outlet Assessments shown in the governing Maintenance Schedule of Assessment established within the Engineer's Report prepared by William J. Setterington, P.Eng., dated December 20th, 1974, or per subsequent amendments made thereto under the Drainage Act.

Report - Bridges Over the Upper Part of Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

All of the above provisions for future maintenance of the above listed bridge structures under this report, shall remain as aforesaid until otherwise determined under the provisions of the "Drainage Act, R.S.O. 1990, Chapter, D.17, as amended 2010".

All of which is respectfully submitted.

N. J. PERALTA ENGINEERING LTD.

Antonio B. Peralta, P.Eng.

ABP/amm

Att.

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CONSTRUCTION SCHEDULE OF ASSESSMENT

BRIDGES OVER THE UPPER PART OF SILVER CREEK DRAIN

(Former Geographic Township of Mersea)

MUNICIPALITY OF LEAMINGTON

5. PRIVATELY OWNED - AGRICULTURAL LANDS (non-grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Special Benefit	Value of Outlet	TOTAL VALUE
720-03705	6	4	26.11	26.11	10.566	J.P.I. Farms Inc.	$ 77,691.00	$ -	$ -	$ 77,691.00
Total on Privately Owned - Non-Agricultural Lands.....							**$ 77,691.00**	**$ -**	**$ -**	**$ 77,691.00**
TOTAL ASSESSMENT				26.11	10.566		**$ 77,691.00**	**$ -**	**$ -**	**$ 77,691.00**

1 Hectare = 2.471 Acres
Project No. D-17-012
May 26th, 2017

SPECIFICATIONS

BRIDGES OVER THE UPPER PART

OF SILVER CREEK DRAIN

(Geographic Township of Mersea)

MUNICIPALITY OF LEAMINGTON

I. GENERAL SCOPE OF WORK

The scope of the work to be provided under this project consists of the installation of a new access bridge within the Upper Part of Silver Creek Drain.

The Contractor shall provide all material, labour, tools and equipment to provide and install a new access bridge comprising of 28.00 metres (91.86 ft.) of 2000mm diameter, 2.8mm thick, Aluminized Steel Type II corrugated Hel-Cor pipe with rolled annular ends and 125mm x 25mm corrugation profile, including interlocking concrete block headwalls with daylighting, sloped quarried limestone erosion protection adjacent to the new headwalls, granular bedding and backfill, granular driveway approach and transitions, excavation, compaction, and all other ancillary work, cleanup and restoration. All works under this project shall provide us with a complete and satisfactory job.

The location of the new access bridge shall be the exact designated location, as identified within the plans, unless otherwise directed by the property Owner and the Municipal Drainage Superintendent, prior to the construction of same. Any changes to the location of the new access bridge, must be approved in writing by the Consulting Engineer. All work shall be carried out in accordance with these specifications, and shall comply in all regards with **Appendix "A"**, as well as the Standard Specifications included in **Appendix "B"**. The works shall also be carried out in accordance with the plans labelled herein as **Appendix "C"**. The structure shall be of the size, type, depth, etc., as is shown in the accompanying drawings, as determined from the **Bench Mark**, and as may be further laid out at the site at the time of construction. All work carried out under this project shall be completed to the full satisfaction of the Municipal Drainage Superintendent or the Consulting Engineer.

II. E.R.C.A. AND D.F.O. CONSIDERATIONS

The Contractor will be required to implement stringent erosion and sedimentation controls during the course of the work to minimize the amount of silt and sediment being carried downstream into the Silver Creek Drain. It is intended that work on this project be carried out during relatively dry weather to ensure proper site and drain conditions and to avoid conflicts with sediment being deposited into the outlet drainage systems. All disturbed areas shall be restored as quickly as

possible with grass seeding and mulching installed to ensure a protective cover and to minimize any erosion from the work site subsequent to construction. The Contractor may be required to provide temporary silt fencing and straw bales as outlined further in these specifications.

All of the work shall be carried out in accordance with any permits or authorizations issued by the Essex Region Conservation Authority (E.R.C.A.) or the Department of Fisheries and Oceans (D.F.O.), copies of which will be provided, if available. The Contractor is advised that no work shall be carried out in the existing drain from March 15th to June 30th of any given year because the drain is directly connected to the downstream drain that is classified as sensitive to impacts on aquatic life and habitat by E.R.C.A. and D.F.O.

As part of its work, the Contractor will implement the following measures that will ensure that any potential adverse effects on fish and fish habitat will be mitigated:

a) As per standard requirements, work will not be conducted at times when flows in the drain are elevated due to local rain events, storms, or seasonal floods. Work will be done in the dry.

b) All disturbed soils on the drain banks and within the channel, including spoil, must be stabilized immediately upon completion of work. The restoration of the site must be completed to a like or better condition to what existed prior to the works. The spoil material must be hauled away and disposed of at a suitable site, or spread an appropriate distance from the top of the drain bank to ensure that it is not washed back into the drain.

c) To prevent sediment entry into the Drain, in the event of an unexpected rainfall, silt barriers and/or traps must be placed in the channel during the works and until the site has been stabilized. All sediment and erosion control measures are to be in accordance with related Ontario Provincial Standards. It is incumbent on the proponent and his/her contractors to ensure that sediment and erosion control measures are functioning properly and are maintained/upgraded as required.

d) Silt or sand accumulated in the barrier traps must be removed and stabilized on land once the site is stabilized.

e) All activities including maintenance procedures should be controlled to prevent the entry of petroleum products, debris, rubble, concrete, or other deleterious substances into the water. Vehicular refuelling and maintenance should be conducted away from the water.

Specifications – Bridges Over the Upper Part
of the Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

Not only shall the Contractor comply with all of the above, it shall also be required to further comply with notes included within the email from Cynthia Casagrande, of the E.R.C.A., labelled within these specifications as **Appendix "A"**.

III. M.N.R.F. CONSIDERATIONS

Under the Species at Risk Provincial Legislation, set in place with the Ministry of Natural Resources and Forestry (M.N.R.F.), Section 23.9 of the Endangered Species Act, 2007, allows the Municipality to conduct eligible repair, maintenance, and improvement work under the Drainage Act that exempts these works from Sections 9 and 10 of this Act, so long as they follow the rules within Ontario Regulation 242/08.

Prior to commencing work, The Municipality of Leamington will complete an "Endangered Species Act Review" for the Upper Part of Silver Creek Drain and will provide the Contractor with the results of said review, including Town documents for the purpose of identification of known species at risk within the project area and mitigation measures for species and habitat protection. It is the responsibility of the Contractor to make certain that necessary provisions are undertaken to ensure the protection of all species at risk and their habitats throughout the course of construction.

The Contractor will be responsible for providing the necessary equipment and materials required by the mitigation plans and shall contact the Municipality of Leamington Drainage Superintendent immediately if any endangered species are encountered during construction.

IV. ACCESS TO WORK AND TRAFFIC CONTROL

The Contractor is advised that majority of the work to be carried out on this project extends along the south side of Mersea Road 7. The Contractor shall have access for the full width of the roadway abutting the proposed drainage works. Furthermore, in order to perform the necessary work identified within this project, the Contractor shall also have access onto private lands to the south of the right-of-way limit for a distance 40.0 metres, along the length of the subject works.

The Contractor shall ensure that the travelling public is protected at all times while utilizing the roadway for its access. The Contractor shall provide traffic control, including flag persons when required. The Contractor shall be required to submit a Traffic Control Plan to the Consulting Engineer for approval from the governing Road Authorities. The Traffic Control Plan shall be carried out in accordance with the requirements of the Ontario Traffic Manual's Book 7 for Temporary Conditions. Under no circumstances shall the

Specifications – Bridges Over the Upper Part
of the Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

Contractor arrange to close Mersea Road 7 for the proposed works, unless requested and authorized by the Municipality of Leamington. The Contractor shall also ensure that all emergency services, school bus companies, etc. are contacted about any disruption at least 48 hours in advance of same. Any and all detour routes shall be established in consultation with the Municipal, County of Essex and M.T.O. Roads Departments.

Throughout the course of the work it is imperative that the Contractor protect as much landscaping and vegetation as possible when accessing along the drain. Due to the extent of the work and the area for carrying out the work, the Contractor will be required to carry out all of the necessary steps to direct traffic and provide temporary diversion of traffic around work sites, including provision of all lights, signs, flag persons, and barricades required to protect the safety of the travelling public. Any accesses or areas used in carrying out the works are to be fully restored to their original conditions by the Contractor, including topsoil placement and lawn restoration as directed by the Municipal Drainage Superintendent and/or the Consulting Engineer. Restoration shall include but not be limited to all necessary levelling, grading, shaping, topsoil, seeding and mulching, and granular placement required to make good any damage caused.

V. REMOVAL OF BRUSH, TREES AND RUBBISH

Where there is any brush, trees or rubbish along the course of the drainage works, including the full width of the work access, all such brush, trees or rubbish shall be close cut and grubbed out, and the whole shall be chipped up for recycling, burned or otherwise satisfactorily disposed of by the Contractor. The brush and trees removed along the course of the work are to be put into piles by the Contractor in locations where they can be safely chipped and disposed of, or burned by it, or hauled away and disposed of by the Contractor to a site to be obtained by it at its expense. Prior to and during the course of any burning operations, the Contractor shall comply with the guidelines prepared by the Air Quality Branch of the Ontario Ministry of the Environment and Climate Change, and shall ensure that the Environmental Protection Act is not violated. The Contractor will be required to notify the local fire authorities and co-operate with them in the carrying out of any work. The removal of brush and trees shall be carried out in close consultation with the Municipal Drainage Superintendent or Consulting Engineer to ensure that no decorative trees or shrubs are disturbed by the operations of the Contractor that can be saved. It is the intent of this project to save as many trees and bushes as practical within the roadway allowances and on private lands.

The Contractor shall protect all other trees, bushes, and shrubs located along the length of the drainage works except for those trees that are established, in consultation with the Municipal Drainage Superintendent, the Consulting Engineer, and the Owners, to be removed as part of the works. The Contractor shall note that protecting and saving the trees may require the Contractor to carry out hand work around the trees, bushes, and shrubs to complete the necessary final site grading and restoration.

Following the completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which are to remain standing, and it shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition.

The Contractor shall remove all deleterious materials and rubbish along the course of the open drain while carrying out its cleaning of same. All such deleterious materials and rubbish shall be loaded up and hauled away by the Contractor to a site to be obtained by it at its cost.

VI. FENCING

Where it is necessary to take down any fence to proceed with the work, the same shall be done by the Contractor across or along that portion of the work where such fence is located. The Contractor will be required to exercise extreme care in the removal of any fencing so as to cause a minimum of damage to same. The Contractor will be required to replace any fence that is taken down in order to proceed with the work, and the fence shall be replaced in a neat and workmanlike manner. The Contractor will not be required to procure any new materials for rebuilding the fence provided that it has used reasonable care in the removal and replacing of same. When any fence is removed by the Contractor, and the Owner thereof deems it advisable and procures new material for replacing the fence so removed, the Contractor shall replace the fence using the new materials and the materials from the present fence shall remain the property of the Owner.

VII. DETAILS OF BRIDGE WORK

The Contractor shall provide all material, labour and equipment to install a new access bridge, for J.P.I. Farms Inc. (720-03705), within the Upper Part of Silver Creek Drain.

When complete, the access bridge along the centerline of the new culvert shall have a total top width, including the top width of the interlocking concrete block headwalls, of approximately 28.0 metres (91.86 ft.) and a travelled driveway width of 26.8 metres (87.93 ft.).

Specifications – Bridges Over the Upper Part
of the Silver Creek Drain
(Geographic Township of Mersea)
Municipality of Leamington - D-17-012

The culvert installation on this project shall be set to the grades and elevations as shown on the plan or as otherwise established herein and the Municipal Drainage Superintendent or the Consulting Engineer may make minor changes to the bridge alignment as they deem necessary to suit the site conditions. All work shall be carried out in general accordance with the "**STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENTS, BACKFILLING AND INSTALLATION PROCEDURES**" attached to the specification and labelled **Appendix "B"**.

VIII. ALUMINIZED STEEL PIPE INSTALLATION

The Aluminized Steel Type II Corrugated Hel-Cor pipe, having a thickness of 2.8mm, for this project shall be supplied with no more than four (4) lengths of pipe, which are to be coupled together with the use of similar thickness 10C Aluminized Steel Corrugated Bolted Couplers, secured in accordance with the manufacturers recommendations. Under no circumstances shall the bridge culvert be provided with more than four (4) lengths of pipe. The overall Corrugated Steel Pipe for this installation must be of the length, size, and thickness identified in the plans and approved by the Drainage Superintendent and the Consulting Engineer prior to its placement in the drain.

The Contractor shall also note that the placement of the new access bridge culvert is to be performed totally in the dry, and it shall be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Municipal Drainage Superintendent and/or Consulting Engineer. As part of the work, the Contractor shall be required to clean out the drain along the full length of the bridge pipe and for a distance of 3.05 metres (10.00 ft.) both upstream and downstream of said pipe. The design parameters of the Upper Part of Silver Creek Drain at the location of the new access bridge installation consists of a 0.91 metres (3.00 ft.) bottom width, 0.08% grade, and 1.50 horizontal to 1.00 vertical sideslopes. The Contractor shall be required to cut any brush and denude the existing drain sideslopes of any vegetation as part of the grubbing operation. The Contractor shall also be required to dispose of all excavated and deleterious materials, as well as any grubbed out materials, to a site to be obtained by it at its own expense. The Contractor shall note that our survey indicates that the existing drain bottom is below the design grade. The Contractor shall be required to provide any and all labour, materials and equipment to set the pipe to the required design grades. The Contractor shall also be required to supply, if necessary, a minimum of 150mm (6”) of 20mm (3/4”) clear stone bedding underneath the culvert pipe, extending from the bottom of the drain to the culvert invert grade, all to the full satisfaction of the Municipal Drainage Superintendent and/or Consulting Engineer. Furthermore, if an unsound base is

encountered, it must be removed and replaced with 20mm (3/4") clear stone satisfactorily compacted in place to the full satisfaction of the Municipal Drainage Superintendent and/or the Consulting Engineer.

The installation of the complete length of the new culvert pipe, including all appurtenances, shall be completely inspected by the Municipal Drainage Superintendent and/or the Consulting Engineer's Inspector prior to backfilling any portions of same. Under no circumstance shall the Contractor commence the construction or backfill of the replacement culvert pipe without the site presence of the Municipal Drainage Superintendent and/or the Consulting Engineer's Inspector to inspect and approve said installation. The Contractor shall provide a minimum of forty-eight (48) hours notice to the Municipal Drainage Superintendent and/or the Consulting Engineer prior to commencement of the work. The installation of the replacement culvert structure is to be performed during normal working hours of the Municipal Drainage Superintendent and/or the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend said working hours.

The Contractor shall also note that the placing of the new access bridge culvert shall be completed so that it totally complies with the parameters established and noted in the bridge plan. The placement of the culvert shall be on an even grade and performed totally in the dry, and the Contractor should be prepared to take whatever steps are necessary to ensure same, all to the full satisfaction of the Municipal Drainage Superintendent and/or Consulting Engineer.

IX. BRIDGE CONSTRUCTION

Once the new corrugated steel pipe has been satisfactorily set in place, the Contractor shall completely backfill same with granular material M.T.O. Type "B" O.P.S.S. Form 1010, or local approved equivalent, with the following exception. The top 305mm (12") of the backfill material for the full top width of the access, the full top width of the drain, and the approach to the south and transitions to the north shall be M.T.O. Type "A" O.P.S.S. Form 1010, or local approved equivalent.

The Contractor shall also perform the necessary excavation to extend the width of the driveway from the existing edge of the gravel shoulder to the top of the north bank, and from the top of the south bank to approximately 4.50 metres south of the south right-of-way limit of Mersea Road 7. This driveway approach for the entire length and width shall consist of a minimum of 305mm (12") of granular material M.T.O. Type "A" satisfactory compacted in place. The gravel apron shall extend from the full width of the access bridge culvert length, and include the daylighted portion of the headwall, from approximately the edge of the gravel roadway to the edge of the

new gravel driveway, as shown on the plans. The gravel backfill shall extend across the pipe to approximately 4.50 metres south of the south right-of-way limit of Mersea Road 7, as shown on the plans.

All granular backfill for the bridge installation shall be satisfactorily compacted in place to a minimum standard proctor density of 98% by means of mechanical compaction equipment. All of the backfill material, equipment used, and method of compacting the backfill material shall be provided and performed to the satisfaction of the Municipal Drainage Superintendent and/or Consulting Engineering.

The new corrugated steel pipe, for this installation, is to be provided with a minimum depth of cover measured from the top of the pipe of 350mm (14"). If the bridge culvert is placed at its proper elevations, same should be achieved. The above specified minimum requirement is **critical** and must be attained. Obviously, in order for the new agricultural access bridge culvert to properly fit the channel parameters, **all of the design grade elevations must be strictly adhered to**.

Also, for use by the Contractor, we have established a Bench Mark on-site. This Bench Mark is the top nut of existing fire hydrant located on the north side of Mersea Road 7, approximately 16.0 metres east of the proposed Bridge ①, for M.N. 430, and this **Bench Mark** is Elevation **197.706 metres**. The new pipe culvert and the backfilling is to be placed on the following basis:

i) The **west (upstream) invert** of the proposed bridge culvert is to be set at Elevation **194.687** metres.

ii) The **east (downstream) invert** of the proposed bridge culvert is to be set at Elevation **194.665** metres.

iii) The centreline of driveway for this bridge installation shall be set to Elevation **197.275** metres at the existing edge of the asphalt roadway, Elevation **197.232** metres at the culvert pipe centreline, and Elevation **197.150** metres at approximately 4.50 metres south of the south right-of-way limit of Mersea Road 7. The access bridge driveway, in all cases, shall be graded with a crossfall from the centreline of the driveway to the outer ends of the driveway at an approximate grade of 1.00%.

As a check, all of the access bridge culvert design grade elevations shall be confirmed before commencing to the next stage of the access bridge installation. The Contractor is also to check that the pipe invert grades are correct by referencing the Bench Mark and the information provided on the detail within the plans.

Although it is anticipated that the culvert installation shall be undertaken in the dry, the Contractor shall supply and install a temporary Straw Bale Check Dam in the drain bottom immediately downstream of the culvert site during the time of construction. The straw bale check dam shall be to the satisfaction of the Municipal Drainage Superintendent and/or Consulting Engineer and must be removed upon completion of the Construction. All costs associated with the supply and installation of this Straw Bale Check Dam shall be included in the cost bid for the bridge installation.

X. REMOVALS

The Contractor shall be required to cut any brush and denude the existing drain sideslopes of any vegetation as part of the grubbing operation. However, the Contractor is asked to create minimal disturbance to existing vegetation beyond the limits of the proposed access bridge site. The Contractor shall also be required to dispose of all excavated and deleterious materials, as well as any grubbed out materials, to a site to be obtained by it at its own expense. Likewise, any material excavated to allow for granular approaches to the bridge, driveway transitions, or installation of new end treatments shall be hauled away and disposed of by the Contractor.

In all cases, the disposal of any trucked material with be the responsibility of the Contractor and it shall ensure that any permits required for fill disposal are obtained from the appropriate authority. The Contractor will be responsible for keeping all private and public roadways free and clear of mud and debris resulting from its use of same for access and hauling purposes.

XI. PRECAST INTERLOCKING CONCRETE BLOCK HEADWALLS

Once the new Aluminized Steel Corrugated Pipes has been set in place, the Contractor shall construct precast interlocking concrete block headwalls at both ends of each access. The precast interlocking concrete block headwalls are to be provided and laid out as is shown and detailed in the accompanying drawing, and as is noted in the Standard Specifications in **Appendix "B"**.

The standard precast interlocking concrete blocks shall be rectangular in shape with square corners and be a minimum size of 600mm x 600mm x 1200mm (2' x 2' x 4'), as available from Underground Specialties Inc., or equal. Blocks with modified lengths may be utilized to fill in staggered sections of the block wall. All blocks shall be cast in one pour with no cold joints and shall have minimum compression strength of 20MPa at 28 days. All precast concrete blocks shall be formed with

interlocking pockets and tenons and each block shall be assembled in a staggered formation to prevent sliding at the interface between blocks. All precast concrete blocks shall be uniform in size with relatively smooth and consistent joints. All precast concrete blocks shall have a smooth and consistent exterior finish. Each block shall be fitted with a lifting ring that will not interfere with the assembly of the block wall once they are set in place. Cap blocks shall be utilized on the top course of the wall with the top of the cap blocks having a smooth, uniform finish.

Precast interlocking blocks that abut the culvert pipe shall be cut and shaped to fit closely around the perimeter of the pipe. The face of the wall shall not extend beyond the end of the pipe. All minor gaps between the blocks and the pipe shall be sealed with non-shrink grout for the full depth of the blocks. At the base of the wall, a base block may be used at the bottom of the interlocking block wall. The base block shall be founded on a firm solid base. When necessary, the Contractor shall provide a minimum of 150mm thickness of level compacted granular bedding, or a lean concrete footing, as a firm foundation for the blocks. The base block shall be set level and shall convey a vertical projection throughout its full height and shall include filter cloth behind the wall for the full height of the blocks to prevent soil migration though any joints. Filter cloth fabric shall be non-woven geotextile material and be minimum GMN-160 meeting O.P.S.S. Class I. Both headwalls shall be assembled concurrently with a continuous uni-axial geogrid SG350, or equal, installed across the entire structure at every second course of blocks, to tie each headwall to each other. Both the non-woven filter cloth and the uni-axial geogrid are available from Armtec Construction Products, or equal.

The blocks shall extend up from the pipe invert and cross the full width of the drain and be embedded a minimum of 500mm into the drain banks. Where required for the top of the block wall to match the height of the completed driveway, the Contractor shall embed the bottom course of blocks into the drain bottom the appropriate depth to achieve the required top elevation of the wall.

The Contractor shall arrange for the supplier to provide an interlocking block layout drawings outlining block assembly of the proposed headwall to the Consulting Engineer for approval prior to proceeding with fabrication and assembly of same. The Contractor shall arrange with the supplier for technical assistance with the assembly of the structure on-site in full accordance with the requirements of the supplier. All assembly

installation shall be carried out to avoid any damage to the culvert and shall follow the supplier's recommendation in every respect to ensure a proper and safe installation.

The precast interlocking concrete block headwalls shall be installed vertically, and shall extend from the end of the Aluminized Steel Corrugated Hel-Cor Pipe to the top elevation of the driveway. Under no circumstances shall the interlocking block wall be installed with an outward projection. When complete, the outside face of the headwall shall be installed flush with the end of the proposed culvert. At the northerly approach, adjacent to Mersea Road 7, the headwalls are to be installed so that daylighting is provided off the travelled roadway. The daylighting are to be designed to deflect outwardly from approximately the extreme north face of the new culvert, to a point just beyond the north bank of the drain. The outwardly projection of the new headwalls shall be deflected at approximately a 45° angle, and the maximum outward deflection shall not be greater than 2.00 metres parallel to the projection of the straight portion of the finished wall. The straight portion of the precast interlocking concrete block headwall shall be installed perpendicular to the drain banks. The Contractor shall also be required to satisfactorily backfill the area in behind the new headwall with granular fill as already specified in the preceding paragraphs for backfilling of the bridge culvert. The top elevation of the straight portion of the headwall, perpendicular to the culvert, shall be set to an elevation of 197.000 metres. The top elevation of the headwalls, opposite the travelled roadway, are to be set no less than 75mm (3"), below the existing ground elevation. The alignment of these headwalls shall be performed to the full satisfaction of the Drainage Superintendent or the Consulting Engineer.

The installation of the precast interlocking concrete block headwalls and the placement of the backfill shall be carried out at the same time and shall be provided in total compliance with Item 1, Item 3, and Item 4 of the **"STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENT, BACKFILLING AND INSTALLATION PROCEDURES"**. These are attached to the back of these specifications within **Appendix "B"**. The Contractor shall also comply in all respects with the "Typical Precast Interlocking Concrete Block Headwall End Protection Detail" shown within the accompanying drawings. The installation of the precast interlocking concrete block headwalls shall also comply with the "Block Headwall Installation Instructions for Culverts" provided by Underground Specialties Inc., as outlined in **Appendix "B"**.

XII. SLOPED QUARRIED LIMESTONE EROSION PROTECTION

The Contractor shall also provide, as part of this project, sloped quarried limestone erosion protection adjacent and along the new precast interlocking concrete block headwalls as noted in the accompanying drawing, at the general locations and to the widths shown within the details included therein.

The sloped quarried limestone erosion protection shall be embedded into the sideslopes of the drain a minimum thickness of 305mm and shall be underlain in all cases with a synthetic filter mat. The filter mat shall not only be laid along the flat portion of the erosion protection, but also contoured to the exterior limits of the quarried limestone and the unprotected slope. The width of the general erosion protection shall be as established in the accompanying drawing or as otherwise directed by the Municipal Drainage Superintendent and/or the Consulting Engineer during construction. In placing the erosion protection the Contractor shall carefully tamp the quarried limestone pieces into place with the use of a shovel bucket so that the erosion protection when completed will be consistent, uniform and tightly laid. In no instance shall the quarried limestone protrude beyond the exterior contour of the unprotected drain sideslopes along either side of said protection. The synthetic filter mat to be used shall be **non-woven** geotextile GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products, or equal. The quarried limestone to be used shall be graded in size from a minimum of 100mm (4”) to a maximum of 250mm (10”), and is available from Amherst Quarries Ltd., in Amherstburg, Ontario, or equal.

XIII. BENCH MARKS

Also, for use by the Contractor, we have established a Bench Mark along the course of the work and especially at the location where the structure is being constructed.

The plan includes a detail illustrating the work to be carried out. A Bench Mark has been indicated and the elevation has been shown and may be utilized by the Contractor in carrying out its work. The Contractor shall note that a specific design elevation grade has been provided for the invert at each end of the pipe in the table accompanying the detail. The table also sets out the pipe size, materials, and other requirements relative to the installation of the bridge structure. In all cases, the Contractor is to utilize the specified drain slope to set any new pipe installation. The Contractor shall ensure that it takes note of the direction of flow and sets the pipe to assure that all grades flow from east to west to match the direction of flow within the drain. The Contractor's attention is drawn to the fact that the pipe invert grades established

herein provide for same to be set approximately 372mm below the existing drain bottom, which is approximately 19% of the culvert diameter.

XIV. ANCILLARY WORK

During the course of any repair or improvements, the Contractor shall be required to protect or extend any existing tile ends or swales to maintain the drainage from the adjacent lands. All existing tiles shall be extended utilizing Boss 1000 or equal plastic pipe of the same diameter as the existing tile and shall be installed in accordance with the **"Standard Lateral Tile Detail"** as shown in the details included within **Appendix "B"**, unless otherwise noted. Connections shall be made using a manufacturer's coupling wherever possible. For other connections, the Contractor shall utilize a grouted connection. Grouted mortar joints shall be composed of three (3) parts of clean, sharp sand to one (1) part of Portland Cement with just sufficient water added to provide a stiff plastic mix, and the mortar connection shall be performed to the full satisfaction of the Municipal Drainage Superintendent or the Consulting Engineer. The mortar joint shall be of a sufficient mass around the full circumference of the joint on the exterior side to ensure a tight, solid seal.

The Contractor shall also be required as part of the bridge installations to excavate and widen the drain bottom where required to fit the new bridge culvert pipes in order to provide a smooth transition between the new bridge culvert installations and the existing drain.

XV. TOPSOIL, SEED AND MULCH

The Contractor shall be required to restore all existing grassed areas and drain side slopes damaged or created by the structure installation, and place topsoil and seed and mulch over said areas including any specific areas noted on the plans. The Contractor shall be required to use the scavenged topsoil stripped from the drain banks. The balance of the topsoil required shall be obtained by the Contractor at its own expense. The Contractor shall provide all the material to cover the above mentioned surface areas with approximately 50mm of good, clean, dry topsoil on slopes and 100mm of good, clean, dry topsoil on horizontal surfaces, fine graded and spread in place ready for seeding and mulching. The placing and grading of all topsoil shall be carefully carried out according to Ontario Provincial Standard Specifications, Form 570, dated November, 2007, or as subsequently amended or as amended by these Specifications. Once the topsoil has been properly placed and fine graded, the Contractor shall seed and mulch the area. Seeding and mulching operations shall be carried out according to Ontario Provincial Standard Specifications, Form 572, dated November, 2003, or as

subsequently amended or as amended by these Specifications. The seeding mixture shall be OSECO Seed Mixture Canada No. 1, as available from Morse Growers Supply in Leamington, or equal. As part of the seeding and mulching operation, the Contractor shall be required to provide either a hydraulic mulch mix or a spread straw mulch with an adhesive binder in accordance with O.P.S.S. 1103.05.03 dated November, 2007, or as subsequently amended, to ensure that the grass seed shall be protected during germination and provide a thick, uniform cover to protect against erosion, where necessary. All work shall be completed to the full satisfaction of the Municipal Drainage Superintendent and/or the Consulting Engineer.

All of the work relative to the placement of topsoil and the seeding and mulching operation, shall be meticulously done and completed in a good and workmanlike manner all to the full satisfaction of the Municipal Drainage Superintendent and/or Consulting Engineer.

XVI. GENERAL CONDITIONS

a) The Municipal Drainage Superintendent or Consulting Engineer shall have authority to carry out minor changes to the work where such changes do not lessen the efficiency of the work.

b) The Contractor shall satisfy itself as to the exact location, nature and extent of any existing structure, utility or other object which it may encounter during the course of the work. The Contractor shall indemnify and save harmless the Municipality of Leamington and the Consulting Engineer and its' representatives for any damages which it may cause or sustain during the progress of the work. It shall not hold the Municipality of Leamington or the Consulting Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.

c) The Contractor shall provide a sufficient number of layout stakes and grade points so that the Drainage Superintendent and Consulting Engineer can review same and check that the work will generally conform with the design and project intent.

d) The Contractor will be responsible for any damage caused by it to any portion of the Municipal road system, especially to the travelled portion. When excavation work is being carried out and the excavation equipment is placed on the travelled portion of the road, the travelled portion shall be protected by having the excavation equipment placed on satisfactory timber planks or timber pads. If any part of the travelled portion of the road is damaged by the Contractor, the Municipality shall have the right to have the necessary repair work done by its' employees and the cost of all labour and materials used to carry out the repair work shall be

deducted from the Contractor's contract and credited to the Municipality. The Contractor, upon completing the works, shall clean all debris and junk, etc., from the roadside of the drain, and leave the site in a neat and workmanlike manner. The Contractor shall be responsible for keeping all public roadways utilized for hauling materials free and clear of mud and debris.

e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. A Traffic Control Plan is required on this project. The Traffic Control Plan is to comply with The Ontario Traffic Manual's Book 7 for Temporary Conditions. A suitable Traffic Control Plan must be submitted to the Consulting Engineer, the Municipality and/or the County of Essex for approval, where applicable.

f) Following the completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which are to remain standing, and it shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition.

g) The whole of the work shall be satisfactorily cleaned up, and during the course of the construction, no work shall be left in any untidy or incomplete state before subsequent portions are undertaken.

h) All driveways, laneways and access bridges, or any other means of access on to the job site shall be fully restored to their former condition at the Contractor's expense. Before authorizing Final Payment, the Municipal Drainage Superintendent and the Consulting Engineer shall inspect the work in order to be sure that the proper restoration has been performed. In the event that the Contractor fails to satisfactorily clean up any portion of these accesses, the Consulting Engineer shall order such cleanup to be carried out by others and the cost of same be deducted from any monies owing to the Contractor.

i) The Contractor will be required to submit to the Municipality, a Certificate of Good Standing from the Workplace Safety and Insurance Board prior to the commencement of the work and the Contractor will be required to submit to the Municipality, a Certificate of Clearance for the project from the Workplace Safety and Insurance Board before Final Payment is made to the Contractor.

j) The Contractor shall furnish a Performance and Maintenance Bond along with a separate Labour and Material Payment Bond within ten (10) days after notification of the execution of the Agreement by the Owner unless otherwise established

within the Tender Documents. One copy of said bonds shall be bound into each of the executed sets of the Contract. Each Performance and Maintenance Bond and Labour and Material Payment Bond shall be in the amount of 100% of the total Tender Price. All Bonds shall be executed under corporate seal by the Contractor and a surety company, authorized by law to carry out business in the Province of Ontario. The Bonds shall be acceptable to the Owner in every way and shall guarantee faithful performance of the Contract during the period of the Contract, including the period of guaranteed maintenance which will be in effect for twelve (12) months after substantial completion of the works.

The Tenderer shall include the cost of bonds in the unit price of the Tender items as no additional payment will be made in this regard.

k) The Contractor shall be required, as part of this Contract, to provide Comprehensive Liability Insurance coverage for not less than $5,000,000.00 on this project unless otherwise established in the Tender Documents, and shall name the Municipality of Leamington and its' officials, and the Consulting Engineer and its staff as additional insured under the policy. The Contractor must submit a copy of this policy to both the Municipality Clerk and the Consulting Engineer prior to the commencement of work.

l) Monthly progress orders for payment shall be furnished the Contractor by the Municipal Drainage Superintendent. Said orders shall be for not more than 90% of the value of the work done and the materials furnished on the site. The paying of the full 90% does not imply that any portion of the work has been accepted. The remaining 10% will be paid 45 days after the final acceptance and completion of the work and payment shall not be authorized until the Contractor provides the following:

   i) a Certificate of Clearance for the project from the Workplace Safety and Insurance Board

   ii) proof of advertising

   iii) a Statutory Declaration, in a form satisfactory to the Consulting Engineer and the Municipality, that all liabilities incurred by the Contractor and its Sub-Contractors in carrying out the Contract have been discharged and that all liens in respect of the Contract and Sub-Contracts thereunder have expired or have been satisfied, discharged or provided for by payment into Court.

The Contractor shall satisfy the Consulting Engineer or Municipality that there are no liens or claims against the work and that all of the requirements as per the Construction Lien Act, 1983 and its' subsequent amendments have been adhered to by the Contractor.

m) In the event that the Specifications, Information to Tenderers, or the Form of Agreement do not apply to a specific condition or circumstance with respect to this project, the applicable section or sections from the Canadian Construction Documents Committee (C.C.D.C.) shall govern and be used to establish the requirements of the work.

APPENDIX “A”

Subject: Bridges Over the Upper Part of Silver Creek Drain (JPI Farms Inc.) - Municipality of Leamington - D17-012
From: Tony Peralta <tony@peraltaengineering.com>
Date: 5/18/2017 10:48 AM
To: Cynthia Casagrande <CCasagrande@erca.org>
CC: Lucy Simpson <lsimpson@leamington.ca>, Lu-Ann Marentette <lmarentette@leamington.ca>, Dan Jenner <DJenner@erca.org>, "russell@peraltaengineering.com" <russell@peraltaengineering.com>

Good morning Cynthia;

Further to the information below, and based on your request, we are providing you with the preliminary design proposals for the above noted project.

Under this project we will be installing one (1) new access bridge, within the above noted drain.

The proposed access bridge will be installed near the east end of the subject property. Upstream of the proposed access bridge, and within the same property, is a culvert that consists of approximately 6.7m of 1725mm diameter CIP. Further upstream, and approximately 200.0m from the proposed bridge site, is an enclosure that consists of approximately 62.5m of 1800mm diameter CSP. Approximately 120m downstream of the proposed access bridge is the existing road crossing culvert crossing Mersea Road 7. It shall be noted that there are several other access bridge culverts crossing the Silver Creek Drain downstream of this road crossing culvert.

Based on our preliminary design, we have determined that the new access bridge shall be installed with 28.0m of 2000mm dia CSP, together with interlocking concrete block headwalls. The proposed culvert shall be embedded approximately 317mm below the design grade of the drain. The access bridge is intended for truck traffic and is designed as per the CSAS-31 MTO standard.

We have reviewed the DFO website as it relates to the Fisheries Act and have performed a "Self Assessment" for this project. Also, as it relates the the Endangered Species Act, we have contacted the Municipality of Leamington to ensure that this project is covered under the new ESA Regulation 242/08.

We trust that this information is satisfactory. However, if you have any concerns or require additional information, please contact us at your earliest opportunity as we intend on finalizing this report as soon as possible.

Regards,

Tony Peralta, P.Eng.

N.J. Peralta Engineering Ltd.
45 Division Street North
Kingsville, ON
N9Y 1E1
(519)733-6587 office
(519)733-6588 fax

-------- Original Message --------
Subject: Re: Notification of Project - Silver Creek Drain
From: Cynthia Casagrande <CCasagrande@erca.org>
To: Lucy Simpson <lsimpson@leamington.ca>
Cc: Lu-Ann Marentette <lmarentette@leamington.ca>, "tony@peraltaengineering.com" <tony@peraltaengineering.com>, Dan Jenner <DJenner@erca.org>
Date: Fri Feb 10 2017 10:08:58 GMT-0500 (Eastern Daylight Time)

Dear Lucy:

This office acknowledges receipt of the Notice to undertake drainage works to the Silver Creek Drain at 430 Mersea Road 7. We further understand that the firm of N. J. Peralta Engineering Ltd. will be completing the Drainage Report for this project.

A review of our floodplain mapping for the Silver Creek Drain indicates that this drain is located within an area that is under the jurisdiction of the Essex Region Conservation Authority (ERCA) (Section 28 of the *Conservation Authorities Act*). Prior to undertaking works, a permit is required from this office.

At this time, we do not expect that there will be any extraneous comments or concerns with respect to this project. However, we cannot be more specific in this regard without an actual proposal to review.

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

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

Yours truly,

Cynthia Casagrande
Regulations Coordinator
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311
Essex ON N8M 1Y6
(519) 776-5209, Ext. 349

From: Lucy Simpson [mailto:lsimpson@leamington.ca]

Sent: Monday, February 6, 2017 3:34 PM
To: Cynthia Casagrande <CCasagrande@erca.org>
Cc: Lu-Ann Marentette <lmarentette@leamington.ca>
Subject: Notification of Project - Silver Creek Drain

Good Afternoon Cynthia,

The Municipality has received a request form from JPI Farms Inc for a new bridges over Silver Creek Drain. As a results, we have hired Peralta Engineering to complete a report under Section 78 of the Drainage Act.

The property is located at 430 Mersea Road 7.

This email serves to fulfill the following requirement under the Act:

Under the Drainage Act, Section 78
Notice to conservation authority

(2) An engineer shall not be appointed under subsection (1) until thirty days after a notice advising of the proposed drainage works has been sent to the secretary-treasurer of each conservation authority that has jurisdiction over any of the lands that would be affected. R.S.O. 1990, c. D.17, s. 78 (2); 2010, c. 16, Sched. 1, s. 2 (28).

Please confirm receipt of this email.

Thank you
Lucy

Lucy Simpson
Assistant Drainage Superintendent
Municipality of Leamington
111 Erie Street North
Leamington, ON N8H 2Z9
(P)519-326-5761 Ext. 1310
(F) 519-326-2481

Attachments:

170301 Silver Creek Drain Site Map.pdf 703 KB

APPENDIX “B”

STANDARD SPECIFICATIONS FOR ACCESS BRIDGE CONSTRUCTION INCLUDING ENDWALL TREATMENT, BACKFILLING AND INSTALLATION PROCEDURES

1. CONCRETE FILLED JUTE BAG HEADWALLS

After the Contractor has set in place the new pipe, it shall completely backfill the same and install new concrete jute bag headwalls at the locations and parameters indicated on the drawing. When constructing the concrete jute bag headwalls, the Contractor shall place the bags so that the completed headwall will have a slope inward from the bottom of the pipe to the top of the finished headwall. The slope of the headwall shall be one unit horizontal to five units vertical. The Contractor shall completely backfill behind the new concrete jute bag headwalls with Granular "B" and Granular "A" material as per O.P.S.S. Form 1010 and the granular material shall be compacted in place to a Standard Proctor Density of 100%. The placing of the jute bag headwalls and the backfilling shall be performed in lifts simultaneously. The granular backfill shall be placed and compacted in lifts not to exceed 305mm (12") in thickness.

The concrete jute bag headwalls shall be constructed by filling jute bags with concrete. All concrete used to fill the jute bags shall have a minimum compressive strength of 21 MPa in 28 days and shall be provided and placed only as a wet mix. Under no circumstance shall the concrete to be used for filling the jute bags be placed as a dry mix. The jute bags, before being filled with concrete, shall have a dimension of 460mm (18") x 660mm (26"). The jute bags shall be filled with concrete so that when they are laid flat, they will be approximately 100mm (4") thick, 305mm (12") to 380mm (15") wide and 460mm (18") long.

The concrete jute bag headwall to be provided at the end of the bridge pipe shall be of a single bag wall construction. The concrete filled bags shall be laid so that the 460mm (18") dimension is parallel with the length of the new pipe. The concrete filled jute bags shall be laid on a footing of plain concrete being 460mm (18") wide, extending for the full length of the wall, and from 305mm (12") below the bottom of the culvert pipe to the bottom of the culvert pipe.

All concrete used for the footing, cap and bags shall have a minimum compressive strength of 21 Mpa in 28 days and include 6% ± 1% air entrainment.

Upon completion of the jute bag headwall the Contractor shall cap the top row of concrete filled bags with a layer of plain concrete, minimum 100mm (4") thick, and hand trowelled to obtain a pleasing appearance. If the cap is made more than 100mm thick, the Contractor shall provide two (2) continuous 15M reinforcing bars set at mid-depth and equally spaced in the cap. The Contractor shall fill all voids between the concrete filled jute bags and the corrugated steel pipe with concrete, particular care being taken underneath the pipe haunches to fill all voids.

The completed jute bag headwalls shall be securely embedded a minimum of 500mm (20") measured perpendicular to the sideslopes of the drain.

As an alternate to constructing a concrete filled jute bag headwall, the Contractor may construct a grouted concrete rip rap headwall. The specifications for the installation of a concrete filled jute bag headwall shall be followed with the exception that broken sections of concrete may be substituted for the jute bags. The concrete rip rap shall be approximately 460mm (18") square and 100mm (4") thick and shall have two (2) flat parallel sides. The concrete rip rap shall be fully mortared in place using a mixture composed of three (3) parts of clean sharp sand and one (1) part of Portland Cement.

The complete placement and backfilling of the headwalls shall be performed to the full satisfaction of the Town Drainage Superintendent.

2. QUARRIED LIMESTONE ENDWALLS

The backfill over the ends of the corrugated steel pipe shall be set on a slope of 1-½ metres horizontal to 1 metre vertical from the bottom of the corrugated steel pipe to the top of each sideslope and between drain sideslopes. The top 305mm (12") in thickness of the backfill over the ends of the corrugated steel pipe shall be quarried limestone. The quarried limestone shall also be placed on a slope of 1-½ metres horizontal to 1 metre vertical from the bottom of the corrugated steel pipe to the top of each sideslope of the drain and between both sideslopes. The quarried limestone shall have a minimum dimension of 100mm (4") and a maximum dimension of 250mm (10"). It shall be placed with the quarried limestone pieces carefully tamped into place with the use of a shovel bucket so that, when complete, the end protection shall be consistent, uniform, and tightly laid in place.

Prior to placing the quarried limestone end protection over the granular backfill, the Contractor shall lay non-woven geotextile filter fabric "GMN160" conforming to O.P.S.S. 1860 Class I or approved equal. The geotextile filter fabric shall extend from the bottom of the corrugated steel pipe to the top of each sideslope of the drain and between both sideslopes of the drain.

The Contractor shall take extreme care not to damage the geotextile filter fabric when placing the quarried limestone on top of the filter fabric.

3. BRIDGE BACKFILL

After the corrugated steel pipe has been set in place, the Contractor shall backfill the pipe with Granular "B" material, O.P.S.S. Form 1010 with the exception of the top 305mm (12") of the backfill. The top 305mm (12") of the backfill for the full width of the excavated area (between each sideslope of the drain) and for the top width of the driveway, shall be Granular "A" material, O.P.S.S. Form 1010. The granular backfill shall be compacted in place to a Standard Proctor Density of 100% by means of mechanical compactors. All of the backfill material, equipment used, and method of compacting the backfill material shall be inspected and approved and meet with the full satisfaction of the Town Drainage Superintendent.

4. GENERAL

Prior to the work commencing, the Town Drainage Superintendent must be notified, and under no circumstances shall work begin without the Superintendent being at the site. Furthermore, the grade setting of the pipe must be checked, confirmed, and approved by the Superintendent prior to continuing on with the bridge installation.

The alignment of the new bridge culvert pipe shall be in the centreline of the existing drain, and the placing of same must be performed totally in the dry.

Prior to the installation of the new access bridge culvert, the existing sediment build-up in the drain bottom must be excavated and completely removed. This must be done not only along the drain where the bridge culvert pipe is to be installed, but also for a distance of 3.05 metres (10 ft.) both upstream and downstream of said new access bridge culvert. When setting the new bridge culvert pipe in place it must be founded on a good undisturbed base. If unsound soil is encountered, it must be totally removed and replaced with 20mm (3/4") clear stone, satisfactorily compacted in place.

When doing the excavation work or any other portion of the work relative to the bridge installation, care should be taken not to interfere with, plug up, or damage any existing surface drains, swales, and lateral or main tile ends. Where damage is encountered, repairs to correct same must be performed immediately as part of the work.

The Contractor and/or landowner performing the bridge installation shall satisfy themselves as to the exact location, nature and extent of any existing structure, utility or other object that they may encounter during the course of the work. The Contractor shall indemnify and save harmless the Town, the Town Drainage Superintendent and the Engineer for any damages which it may cause or sustain during the progress of the work. It shall not hold them liable for any legal action arising out of any claims brought about by such damage caused by it.

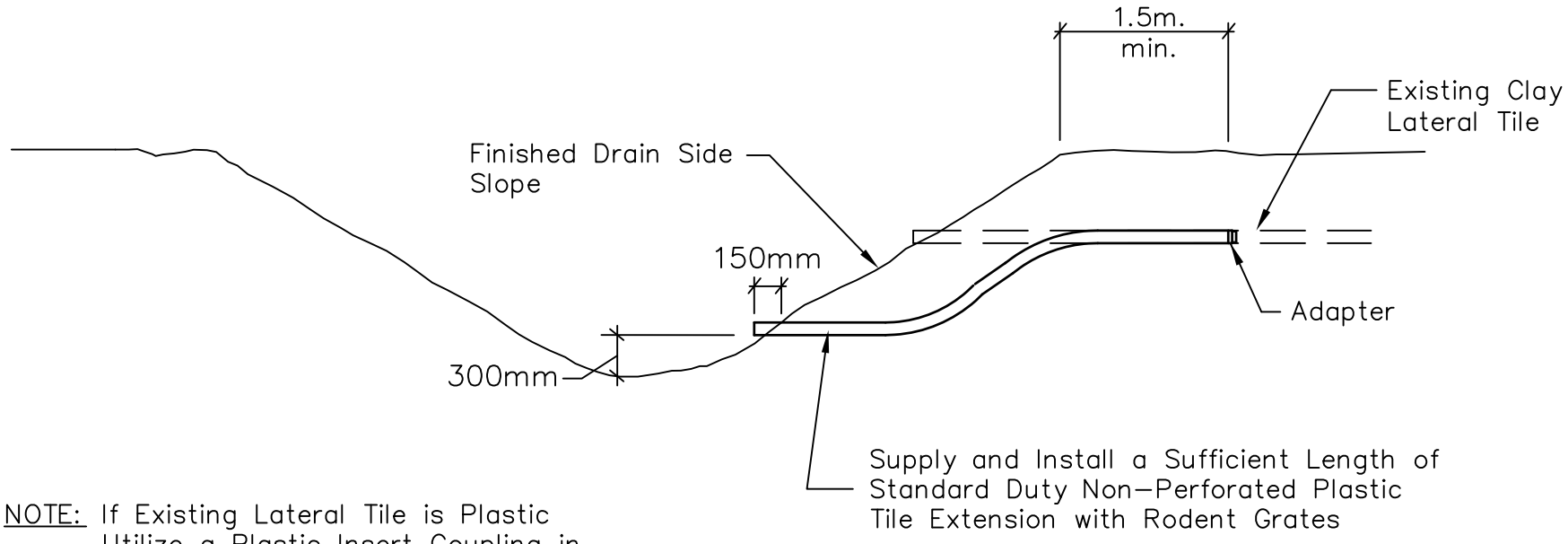
Where applicable, the Contractor and/or landowner constructing the new bridge shall be responsible for any damage caused by them to any portion of the Town road right-of-way. They shall take whatever precautions are necessary to cause a minimum of damage to same and must restore the roadway to its' original condition upon completion of the works.

When working along a municipal roadway, the Contractor shall provide all necessary lights, signs, barricades and flagmen, as required to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. If traffic control is required on this project, it is to comply with the M.T.O. Traffic Control Manual for Roadway Work Operations.

Once the bridge installation has been completed, the drain sideslopes directly adjacent the new headwalls and/or endwalls are to be completely restored including revegetation, where necessary.

All of the work required towards the installation of the bridge shall be performed in a neat and workmanlike manner. The general site shall be restored to its' original condition, and the general area shall be cleaned of all debris and junk, etc. caused by the work.

All of the excavation, installation procedures, and parameters as above mentioned under this sub-heading, are to be carried out and performed to the full satisfaction of the Town Drainage Superintendent.



NOTE: If Existing Lateral Tile is Plastic Utilize a Plastic Insert Coupling in Place of Adapter.

STANDARD LATERAL TILE DETAIL

SCALE = N.T.S.

Block Headwall Installation Instructions for Culverts

1. A swift lift device will be required to place the blocks. A 75mm eye bolt will be required to place the caps.
2. The bottom course of blocks shall be founded on a firm solid base. The contractor shall provide a minimum levelling course of 150mm of compacted 3/4" Clear Stone, or a 100% compacted granular A, or lean concrete as a foundation base.
3. Ensure that the base is level and flat as this will greatly improve speed of installation.
4. On new culverts a minimum of 150mm of block wall will extend below the culvert to prevent scouring under the culvert.
5. The bottom course of blocks shall be embedded into the drain bottom to achieve the desired top elevation of the wall.
6. Blocks shall extend from the pipe invert across the full height and width of the drain and be imbedded a minimum of 300mm into the drain banks. Where possible the top of the block wall will match the height of the completed driveway.
7. Blocks shall be placed such that all joints are staggered.
8. Any excavation voids on the ends of block walls below subsequent block layers shall be filled with ¾" Clear Stone.
9. Where block walls extend beyond three blocks in height, they should be battered a minimum of 1 unit horizontal for every 10 units vertical throughout the wall's full height and width. This can be achieved using pre-battered base blocks, or by careful preparation of the base.
10. Filter cloth (270R or equivalent) should be placed behind the wall to prevent the migration of fill material through the joints.
11. The walls should be backfilled with a free draining granular fill.
12. A uni-axial geogrid (SG350 or equivalent) should be used to tie back the headwalls where walls extend beyond 1.8m in height.
13. The face of the block wall shall not extend beyond the end of the pipe culvert.
14. Any gaps between the blocks and culvert shall be sealed with non-shrink grout for the full depth of the block.

APPENDIX “C”

PLAN & DETAILS

OF THE

BRIDGES OVER THE UPPER PART OF SILVER CREEK DRAIN

IN THE

MUNICIPALITY OF LEAMINGTON (Geographic Township of Mersea)

IN THE

COUNTY OF ESSEX • ONTARIO

MUNICIPALITY OF LEAMINGTON

MAYOR: JOHN PATERSON
CLERK: RUTH ORTON
DRAINAGE SUPERINTENDENT: LU-ANN MARENTETTE

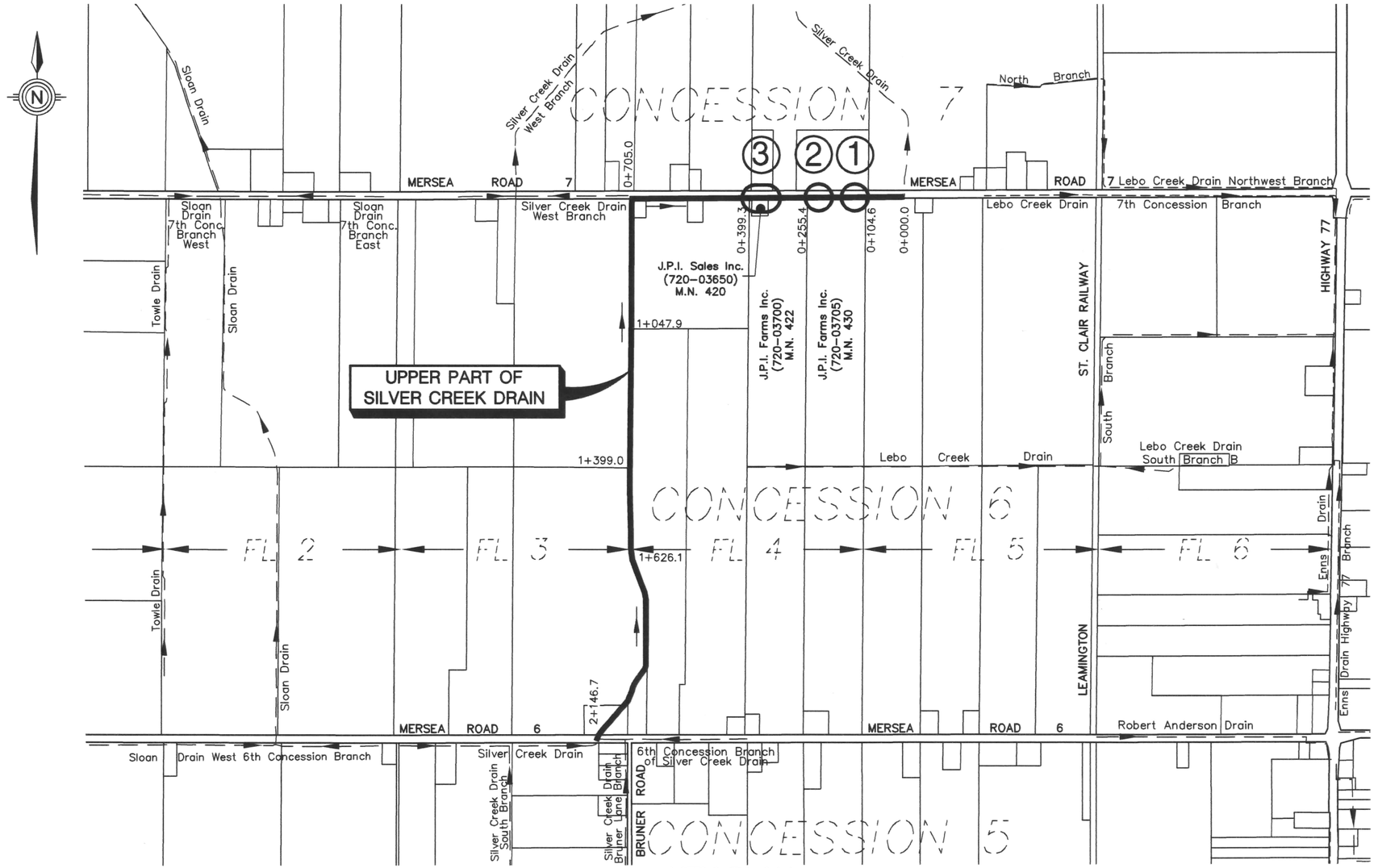
BENCHMARK:

TOP NUT OF EXISTING FIRE HYDRANT LOCATED ON THE NORTH SIDE OF MERSEA ROAD 7, APPROXIMATELY 16.0m EAST OF THE PROPOSED BRIDGE (1), FOR M.N. 430.

ELEV. = 197.706m

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2017-05-26
PROVINCE OF ONTARIO

ANTONIO B. PERALTA, P.ENG.



KEY PLAN
Scale = 1:12,500

SHEET No.: 1 OF 2

N. J. PERALTA ENGINEERING LTD.
45 DIVISION STREET NORTH
KINGSVILLE, ONTARIO
N9Y 1E1
DATE: MAY. 26th, 2017

FILE No.:	DRAWN BY: R.A.L. PLOT CODE: 1:1 FILE: D17012S4.DWG	
D17-012		APPENDIX 'C'

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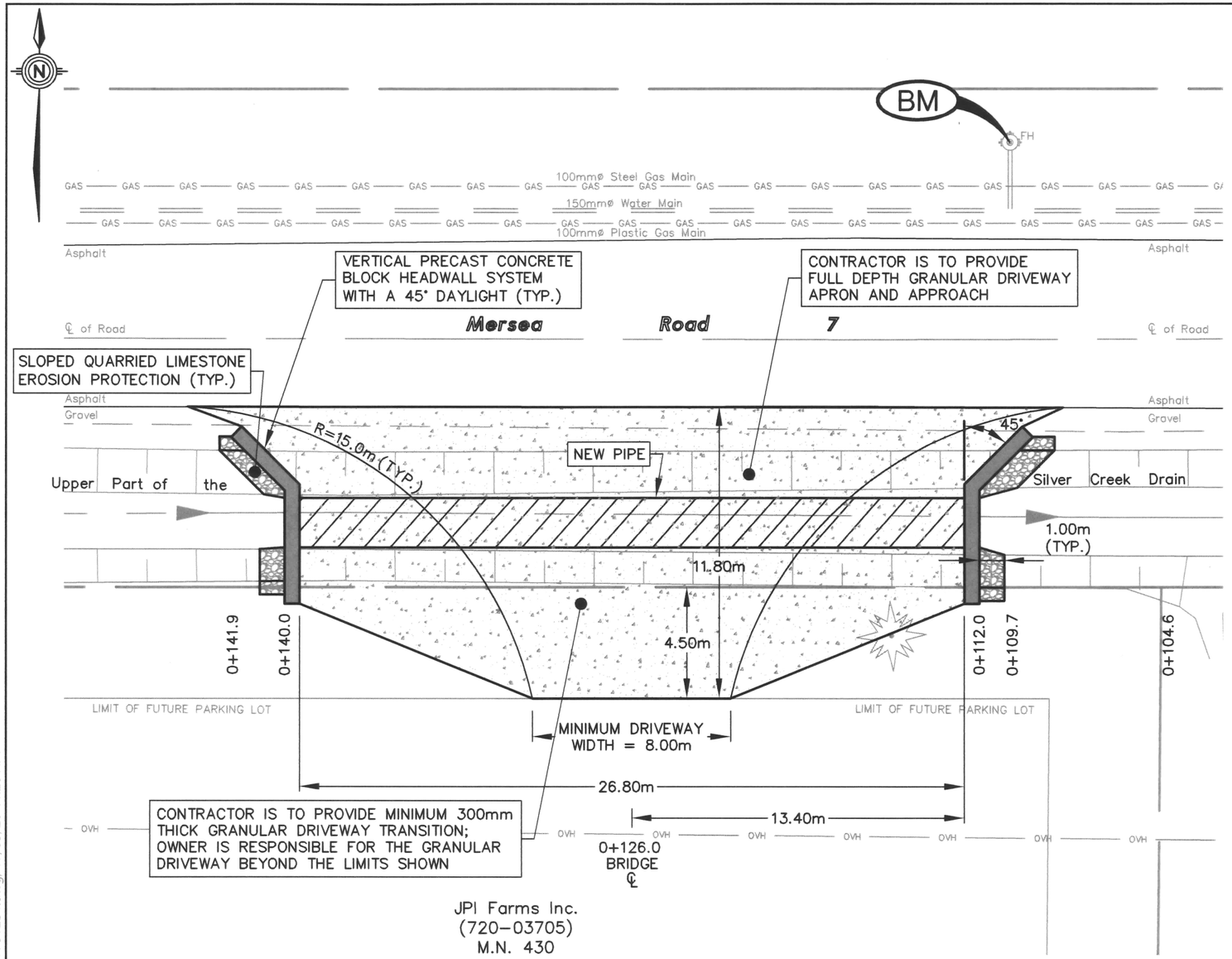
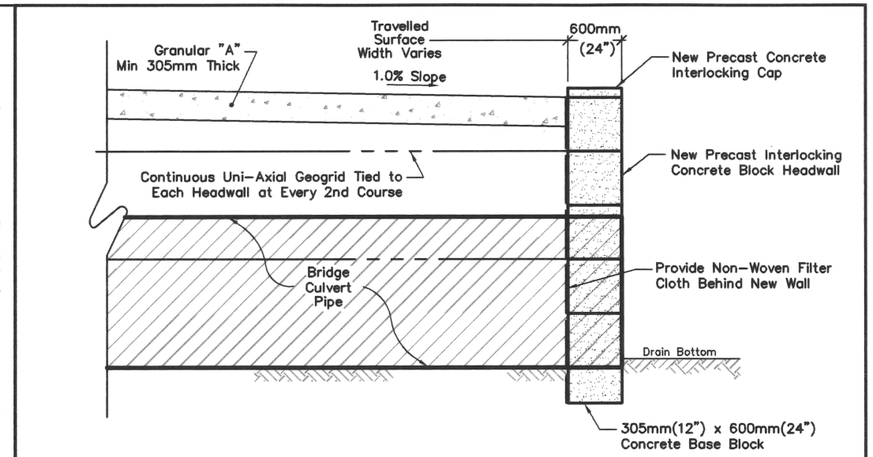


BRIDGE DETAIL

Scale = 1:200



Typical Precast Interlocking Concrete Block Vertical Headwall End Protection

N.T.S.

GENERAL NOTES:

1. THE ACCURACY OF THE UTILITIES SHOWN ON THESE DRAWINGS ARE NOT GUARANTEED BY THE OWNER OR N. J. PERALTA ENGINEERING LTD. OTHER UTILITIES MAY BE PRESENT OR THE UTILITIES SHOWN MAY DIFFER IN SIZE OR LOCATION SHOWN.
2. ALL DIMENSIONS SHOWN IN METRES UNLESS NOTED OTHERWISE. PROPERTY LINES ARE APPROXIMATE AND ARE BASED ON THE MUNICIPALITY OF LEAMINGTON GIS AND FIELD INFORMATION.
3. THE ENTRANCE LOCATION IS BASED ON THE SITE PLAN APPROVED BY THE MUNICIPALITY OF LEAMINGTON. THE ENTRANCE HAS BEEN DESIGNED TO SATISFY THE M.T.O. COMMERCIAL SITE ACCESS POLICY AND STANDARD DESIGNS FOR AN ENTRANCE TO SMALL BUSINESS (C.S.A.S.-31)
4. ALL EXISTING TREES ADJACENT TO THE PROPOSED ACCESS BRIDGE ENTRANCE SHALL BE COMPLETELY REMOVED AND DISPOSED OF, AS PART OF THE BRIDGE INSTALLATION.
5. ALTHOUGH A PAVED DRIVEWAY APRON IS NOT TO BE INSTALLED AS PART OF THIS PROJECT, THE OWNER SHALL COORDINATE AND INSTALL SAME AS PART OF THEIR SITE PLAN AGREEMENT WITH THE MUNICIPALITY OF LEAMINGTON

BENCHMARK:

TOP NUT OF EXISTING FIRE HYDRANT LOCATED ON THE NORTH SIDE OF MERSEA ROAD 7, APPROXIMATELY 16.0m EAST OF THE PROPOSED BRIDGE ①, FOR M.N. 430.

ELEV. = 197.706m

PIPE SIZE:	PIPE LENGTH:	PIPE GAUGE:	CORRUGATIONS:	TYPE OF PIPE:
2000mmø	28.0m (91.86 FT.)	2.8mm (12 GA.)	125mm x 25mm (5.0" x 1.0")	ALUMINIZED STEEL TYPE II CORRUGATED HEL-COR PIPE

PIPE & DRIVEWAY ELEVATIONS:

UPSTREAM INV. (W) =	194.687m
DOWNSTREAM INV. (E) =	194.665m
℄ OF ACCESS AT PAVEMENT EDGE =	197.275m
℄ OF ACCESS AT PIPE CENTRELINE =	197.232m
℄ OF DRIVEWAY 4.5m SOUTH OF R.O.W LIMIT =	197.150m

DRIVEWAY CROSSFALL FROM CENTRELINE TO TOP OUT END OF END WALL = 1.00%

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2017-05-26
PROVINCE OF ONTARIO

SHEET No.:
2 OF 2

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