DRAINAGE REPORT

DANUBE DRAIN IMPROVEMENTS

**(for 617885 Ontario Limited (300-32600),
Part of Lot 9, Concession 2 E.D.)**

TOWN OF KINGSVILLE

N. J. Peralta Engineering Ltd.

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Project No. D-19-120

October 1st, 2020

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October 1st, 2020

Mayor and Municipal Council
Corporation of the Town of Kingsville
2021 Division Road North
Kingsville, Ontario
N9Y 2Y9

Mayor Santos and Members of Council:

PROJECT: **DANUBE DRAIN IMPROVEMENTS**
(for 617885 Ontario Limited (300-32600),
Part of Lot 9, Concession 2 E.D.)
(Geographic Township of Gosfield South)
Town of Kingsville, County of Essex
Project No. D-19-120

I. INTRODUCTION

In accordance with the instructions received by email on May 6th, 2020, from the Drainage Superintendent, Mr. Ken Vegh, we have made the necessary survey, examinations, and investigations, etc. and have prepared the following report that provides for the enclosure and general improvements to the Danube Drain, together with the replacement of the existing road crossing culvert across Peterson Road. These investigations were initiated by a resolution passed by Council for our firm to investigate the necessary improvements to the Danube Drain, in accordance with the Drainage Act. A plan showing the alignment of the Danube Drain, the general location of the proposed enclosure and road crossing, together with general details of the proposed improvements. All of which are included herein as part of this report.

The request to provide an Engineer's Report to address the improvements to the Danube Drain was submitted to the Town of Kingsville by Paul Mastronardi of 617885 Ontario Limited (300-32600). For the sake of clarity, the lands currently owned by 617885 Ontario Limited, shall be identified herein as JEM Farms.

Our appointment and the works relative to the Municipal Drain improvements 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 realignment of the Danube Drain, and we report thereon as follows.

II. BACKGROUND AND WATERSHED CHARACTERISTICS

At present, JEM Farms is in the process of developing their lands to accommodate for the expansion of their greenhouse facilities within Parcels 300-32600, Part of Lot 9, Concession 2 E.D. Currently, this multi-phased project is in various stages of development, ranging from design to full operation. Heide Mikkelsen, P.Eng., of our firm, was retained and instructed by Paul Mastronardi, Vice President of JEM Farms to provide a Site Plan, Stormwater Management (S.W.M.) design, and a site grading plan to accommodate the future greenhouse development. In order to aid in the most efficient layout for the future greenhouse development, it was established by JEM Farms that a section of the Danube Drain would need to be enclosed to better facilitate the development. Accordingly, a formal request from JEM Farms was submitted to the Town of Kingsville to appoint an Engineer to address these improvements through the provisions of the Drainage Act.

The Danube Drain is an existing Municipal Drain that services a relatively small watershed within Lots 7 through Lot 9, Concession 2 E.D. The Danube Drain consists primarily as an open drain with portions of its upper end having existing enclosures. The Municipal Drain extends from its top end, located along the east side of Peterson Road and south of Road 3 East. The drain extends downstream for approximately 500.00 metres where the drain crosses Peterson Road and continues westerly to its outlet into the Lane Drain. The Danube Drain primarily provides an outlet for agricultural lands, together with some residential properties.

The soil type within the subject project area is predominantly identified as Fox Sandy Loam. This soil is categorized as Hydrological Soil Group A and is described as having low runoff potential with high infiltration rates, even when thoroughly wetted. This soil type consists chiefly of soils of deep, well to excessively drained sands or gravels and having a high rate of water transmission.

III. DRAINAGE HISTORY

From our review of the Town of Kingsville's drainage records, an Engineer's Report was prepared through the provisions of the Drainage Act for the Danube Drain.

From our review, we found that the "Danube Drain" was petitioned for under an Engineer's Report prepared by W.J. Setterington, P.Eng., with a reconsidered date of November 29th, 1985 and was carried out under Gosfield South Drainage By-Laws No. 507 and 507A. The works conducted under this report generally provided for the new construction of this Municipal Drain with improving and incorporating portions of an existing open drain. These works included the installation of the road crossing culvert across Peterson Road and the installation of enclosures at the top end of the drainage system.

From our detailed research of the above Engineer's Report we have determined that generally speaking, the 1985 Report serves as the current governing By-Law for the entire length of the Danube Drain. Therefore, the design parameters identified within the 1985 report were in part utilized to determine the watershed limits and as the minimum standard in our determination of the design for the new drain enclosure and road crossing replacement under this project.

IV. PRELIMINARY EXAMINATION AND ON-SITE MEETING

JEM Farms originally contacted N.J. Peralta Engineering Ltd. to determine the requirements for construction of a greenhouse development within the subject lands. In discussions with JEM Farms, it was noted that their plans for the future development would be affected by the open drain portion of the Danube Drain. It was further determined that in order to facilitate their intended use of the future greenhouse development and associated facilities, the existing open portion of this Municipal Drain would need to be enclosed to maximize the use of their land for this development. As such, JEM Farms was subsequently advised to contact the Town of Kingsville's Drainage Superintendent to arrange for the work to be carried out pursuant to Section 78 of the Drainage Act. We were subsequently appointed by Mr. Ken Vegh, Drainage Superintendent, through the provisions of the Drainage Act.

Upon receiving the request for improvements to the Danube Drain, and prior to our appointment to this project, we understand that the Town of Kingsville had submitted a notice to the Essex Region Conservation Authority (E.R.C.A.) as required through Section 78(2) of the Drainage Act, for their comments and concerns related to the requested works.

In February of 2020, the novel coronavirus (COVID-19) pandemic began its spread across the nation. The Canadian federal and provincial governments, together with the local Health Unit implemented measures to protect the public's safety and well-being. As a result, public gathering of five (5) people or more was prohibited. With the proposed works only affecting the properties currently owned by JEM Farms and with no other upstream lands contributing to this drainage system, it was determined that this meeting could be conducted with less than five (5) participants. As a result, it was determined that this On-Site Meeting could proceed in a public forum, so long social distancing measures and precautions established by the local Health Unit were adhered to. As an extra layer of precaution, the On-Site Meeting notices to the public included a COVID-19 checklist for their consideration prior to attending this meeting.

After reviewing all of the drainage information provided by the Town of Kingsville and establishing the necessary COVID-19 provisions, we arranged for an On-Site Meeting to be scheduled for June 12th, 2020. The following people were in attendance at the said meeting:

Jamie Mastronardi (Representative of JEM Farms)
Olie Mastronardi (Representative of JEM Farms)
Russell Leclair, E.I.T. (N.J. Peralta Engineering Ltd.)
Tony Peralta, P.Eng. (N.J. Peralta Engineering Ltd.)

The following information was discussed:

1. Prior to the start of the meeting, Mr. Vegh had contacted Mr. Peralta by telephone and advised that an emergency had arose and he could not attend this meeting. He requested that the meeting continue in his absence and that he can address any specific questions or concerns following this meeting.

2. All participants filled out the Town of Kingsville COVID-19 Screening Checklist upon arrival and were informed of the necessary social distancings requirements as part of this meeting.

3. Upon introductions, it was generally discussed that a written notice had been submitted by JEM Farms, to enclose a portion of the Danube Drain adjacent to the parcel currently owned by JEM Farms (300-32600). It was understood that the proposed works were intended to facilitate the future development of the proposed greenhouse expansion on these properties.

4. Based on previous discussions with representatives of JEM Farms, it was understood that in order to accommodate the most efficient greenhouse layout, it was proposed that the existing Municipal Drain adjacent to the subject properties be enclosed alongside Peterson Road.

5. Based on the nature of this project, it was discussed that all of the cost for the drain enclosure will likely be borne by the greenhouse development properties currently owned by JEM Farms (300-32600), who solely benefits from the proposed improvements. Any further arrangements related to the costs on the project, would be solely between the proponent and the Town of Kingsville.

6. It was discussed that the improvements under this project shall not adversely affect the upstream lands and affected roads as there should be no negative impacts on the functionality of the drain as a result of the enclosure. The proposed drain improvements shall maintain or improve the existing drain parameters.

7. The proposed greenhouse development will incorporate a Stormwater Management Pond that will collect all runoff from the property and discharge these flows into the drain at its pre-development flow rate. Therefore, this development shall not adversely affect this Municipal Drain.

8. Based on similar past projects, it will be likely that authorization for this work will be required by the Department of Fisheries and Oceans (D.F.O.), Ministry of Environment, Conservation and Parks (M.E.C.P.), and the Essex Region Conservation Authority (E.R.C.A.), and adhere to any mitigation measures that may be required to satisfy their comments.

9. The overall Drainage Report and Future Maintenance processes were reviewed. We also discussed general timelines for construction.

At the conclusion of our discussions, we advised that we would be in close consultation with the representatives of JEM Farms towards the preparation of our Engineer's Report, to review the details of the drain enclosure installation.

On this note, the On-Site Meeting had concluded.

V. 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 of the existing Danube Drain alongside the lands currently owned by JEM Farms (300-32600). We also took numerous cross-sections of the Danube Drain at the general locations along with the potential enclosure site as necessary for us to complete our design calculations, estimates and specifications.

Benchmarks were looped from previous work carried out on the drain and were utilized in establishing a relative site Benchmark near the locations of the new enclosure site. We also surveyed the drain for a considerable distance both upstream and downstream of the proposed drain enclosure site in order to establish a new design grade profile. We further gathered pertinent details along Peterson Road, including the culvert crossing Peterson Road, as necessary for us to complete our design calculations, estimates and Specifications.

The 1985 Engineer's Report for the improvements to the Danube Drain provided for the initial installation of the road crossing enclosure crossing Peterson Road. As part of our review of the existing road crossing, we found that the road crossing culvert was in poor condition and had reached the end of its useful service life. As a result, we had contacted Mr. Ken Vegh, Kingsville Drainage Superintendent, to discuss and review the potential replacement of this road crossing culvert as part of this project. Through our discussions and review, Mr. Vegh advised us to proceed with the removal and replacement of the road crossing culvert as part of this project, with the understanding that all associated costs will be assessed entirely to the Town of Kingsville through Section 26 of the Drainage Act.

The Ministry of Environment, Conservation and Parks (M.E.C.P.) currently regulates the Endangered Species Act, 2007. New regulation provisions under Ontario Regulation 242/08, Section 23.9 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.

As part of our investigations, we had requested utility locates and found that various utilities could potentially conflict with the proposed covered drainage system. In light of the potential conflicts, we arranged for hydro-vacuum excavations to expose and establish depths for each potential conflicting utility. Based on the information provided by the Utility Companies, along with the findings from our hydro-vacuum excavations, we determined that minor utility conflicts were present within the proposed alignment of the new road crossing culvert.

To establish the watershed area upstream of the proposed drain enclosure, and determine the pipe size required for the same, we investigated and reviewed the past Engineer's Report on the Danube Drain. We also reviewed 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 these Municipal Drains.

VI. FINDINGS AND RECOMMENDATIONS

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

During the course of our investigations, this drainage project was discussed and reviewed in detail with Ms. Ashley Gyori, of the E.R.C.A., to deal with any E.R.C.A. issues and comments related to this Municipal Drain. The Danube Drain is located within the regulated area and is under the jurisdiction of the E.R.C.A. Therefore, an E.R.C.A. Permit is required for the improvements to the Danube Drain. Further to the various correspondence and upon their request, a design proposal was submitted to the E.R.C.A. for their review and consideration. Further to the above, the E.R.C.A. provided us with their comments and concerns through email correspondence, which is included within **Appendix "A"**.

With respect to the Department of Fisheries and Oceans (D.F.O.) concerns related to the Fisheries Act, the proposed works within the Municipal Drains were "self-assessed" by the Engineer, through the D.F.O. website and the documentation prepared by D.F.O. on the "Guidance for Maintaining and Repairing Municipal Drains in Ontario". These references help to determine whether this project shall be reviewed by the D.F.O. The Danube Drain is primarily an open drain with only the downstream reach of this Municipal Drain currently rated as a Class 'C' Drain by the D.F.O. The remainder

of the Danube Drain was not classified by D.F.O. Based on the D.F.O. Self Assessment website, we determined that this project will require the submission of a "Request for Review" application to the D.F.O., to ensure that the works proposed under this project will not cause serious harm to fish and their habitat. A "Request for Review" application was submitted on June 24th, 2020, for this project. On September 9th, 2020, we received a verification from the D.F.O. advising us that the proposed works under this project will likely not result in impacts to fish and fish habitat, so long that the mitigation measures outlined within their comments are implemented. As a result, the D.F.O. will not require formal approval in order to proceed with the works under this project. A copy of the D.F.O. response is included within **Appendix "A"**.

The Ministry of Natural Resources and Forestry (M.N.R.F.) have transitioned responsibilities of the Species at Risk Provincial Legislation to the Ministry of the Environment, Conservation and Parks (M.E.C.P.). Section 23.9 of the Endangered Species Act, 2007, allows the Municipality to conduct the 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 the impact that these species may experience as a result of the subject works, the Town of Kingsville 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 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.E.C.P. concerns and issues in our design and recommend that these drainage works be constructed in total compliance with all of the above.

Danube Drain Improvements

Prior to the preparation of our report, we had various discussions with the representatives of JEM Farms and the Town of Kingsville. We reviewed the particulars of the proposed drainage works and general improvements to the Danube Drain. From our investigations, examinations, calculations, discussions, and determinations with the affected parties, the following findings were noted and recommendations regarding same are provided as follows:

1) The Danube Drain commences from its outlet into the Lane Drain at Station 0+000.0. This drain continues upstream as an open drain to Station 1+204.1, where it transitions to the existing road crossing culvert across Peterson Road and to an existing Maintenance Hole at Station 1+232.5. From the existing Maintenance Hole, the drain continues upstream as an enclosure to Station 1+280.2, where it converts back to an open drain

configuration. The open drain continues for 236.70 metres upstream where it transitions back to an enclosure at Station 1+516.9. The enclosure extends upstream to its top end at Station 1+728.2.

2) Through our investigations, the existing 900mm diameter corrugated steel pipe road crossing culvert across Peterson Road was found to be in poor condition and has reached the end of its service life. Per our discussions with Town Staff, the Town would like to replace the existing road crossing culvert as part of this project. As such, we recommend the removal and replacement of the existing road crossing culvert with 28.40 metres of 750mm diameter H.D.P.E. smoothwall plastic pipe with water-tight gasketed bell and spigot joining system from Station 1+204.1 to the existing MH-1 at Station 1+232.5.

3) 617885 Ontario Limited (300-32600), operating as JEM Farms, is in the process of expanding their greenhouse operations. In order to facilitate the most efficient greenhouse layout, they will require the enclosure of the Danube Drain between Station 1+232.5 to Station 1+516.9.

4) With the existing enclosure between Station 1+232.5 to Station 1+280.2 being installed at the same time and in similar condition as the road crossing culvert, we recommend that this section of the enclosure be removed and replaced as part of this project. We further recommend that the existing Danube Drain between Station 1+232.5, at the existing MH-1, to Station 1+516.9, at the end of the existing top end enclosure, be enclosed, including all appurtenances, and backfilled as shown and detailed within the accompanying drawings and further detailed within the specifications.

5) The new Danube Drain enclosure shall comprise of 525mm diameter, 320kPa H.D.P.E. plastic pipe with water-tight gasketed bell and spigot joining system, together with precast concrete structures. The new enclosure pipe has been sized to provide equivalent or better drain capacities of the existing upstream section. This will ensure that the new enclosure will not adversely affect the entire system.

6) We recommend that the proposed enclosure of the Danube Drain include boulevard swales that shall be established based on the existing road grades and future grading elevations of the development. Catch basins shall be installed along the boulevard, or as otherwise noted, to collect surface runoff from the roads and adjacent lands. The boulevard grading shall also accommodate for positive drainage for the existing and future widening of Peterson Road. Positive drainage must be maintained at all times and surface runoff shall be directed to the proposed catch basins.

7) We further recommend that all works related to the drain improvements be carried out in compliance with all of the requirements set out in any E.R.C.A Permits, D.F.O's Letter of Advice and any Mitigation Plans through the Endangered Species Act (E.S.A.).

8) We further recommend that all ancillary work required to complete the proper functionality of the new drain enclosure within the Danube Drain also be conducted and performed as part of this project and that all of the work associated with this project be provided to the full satisfaction of both the Town's Drainage Superintendent and the Consulting Engineers.

In summary, we would recommend that the remaining portion of the Danube Drain, located along the east side of Peterson Road and adjacent to the lands owned by 617885 Ontario Limited (300-32600), be enclosed as shown on the accompanying plans. We further recommend that the road crossing culvert across Peterson Road be removed and replaced as part of this project. All works shall be completed in accordance with this Report, the attached Specifications, and the accompanying Drawings and that all of the works associated with same be carried out in accordance with Sections 78 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010".

VII. ALLOWANCES AND COMPENSATION

Allowances For Land Taken

The enclosure of the Danube Drain shall be constructed along and within the agricultural lands in Part of Lot 9, Concession 2 E.D. With the Owner of the subject land responsible for all construction and engineering costs associated with the enclosure of the open drain, we have established compensation for the land taken, together with the use of these lands to construct the enclosure, at a nominal value of $1.00 per property. These values shall be paid to re-establish the legal right for the Municipal Drain through these lands and to establish the right to access along the drain for future maintenance.

We find that the following Owners are entitled to and should receive the following amounts as compensation for the Value of Land Taken, for the improvements to the Danube Drain:

1)	JEM Farms, (300-32600)	Owner,	Pt. Lot 9, Concession 2 E.D.	$ 1.00
2)	Town of Kingsville (for Peterson Road)			$ 1.00
	TOTAL FOR LAND TAKEN			$ 2.00

We have provided for this land taken compensation in our estimate, as is provided for under Section 29 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010".

Compensation For Damages

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 shall be provided for under Section 30 of the "Drainage Act, R.S.O. 1990, Chapter D.17, as amended 2010".

VIII. ESTIMATE OF COST

Our estimate of the total cost of this work, including all incidental expenses, is the sum of **TWO HUNDRED SIXTY-EIGHT THOUSAND FOUR HUNDRED THIRTY-ONE DOLLARS ($268,431.00)** made up as follows:

CONSTRUCTION

Part 'A' – Road Crossing Improvements

Item 1)	**New Road Crossing Culvert (Station 1+204.1 to Existing MH-1);** Neatly sawcut, remove and dispose of the existing tar and chip pavement as identified on the plans, remove and dispose of existing 900mm dia. CSP road crossing culvert, and supply and install approximately 28.4 lineal metres of 750mm diameter 320kPa, smoothwall H.D.P.E. plastic pipe with water-tight gasketed joining system, connected to existing MH-1 and including sloped quarried limestone end protection at the west end, including excavation, granular bedding, backfill, compaction and restoration, complete at $982.39 per lineal metre.	$ 27,900.00
Item 2)	**Asphalt Restoration;** Replace the removed tar and chip pavement from the proposed road crossing replacement with minimum 100mm thick, or match existing thickness, HL-3 Asphaltic Concrete Pavement in minimum two equal lifts, supplied, laid, and compacted to the limits shown on the plans, complete, approximately 10.00 tonnes, at $500.00 per tonne.	$ 5,000.00
	SUBTOTAL FOR CONSTRUCTION - PART 'A'	**$ 32,900.00**

Part 'B' – Drain Enclosure Improvements

Item 3)	**Brushing, Grubbing and Stripping of Open Drain (Station 1+280.2 to Station 1+576.9)**; Provide all labour, equipment and materials to excavate the sediment from the bottom of the open drain, remove all trees and brush from within the banks of the drain, grub the existing drain banks to remove all vegetation, stripping of all organic material and topsoil from the drain banks including the removal of any rip-rap erosion protection and all deleterious material; Scavenging the topsoil and windrowing along the existing open drain; all works include chipping or burning, loading, handling and disposal, complete, for approximately 236.7 lineal metres at $20.28 per lineal metre.	$ 4,800.00
Item 4)	**Existing MH-1 to DICB-3**; Remove and dispose of the existing 900mm diameter CSP culvert between Station 1+232.5 to Station 1+280.2; Supply and install approximately 142.2 lineal meters of 525mm diameter 320kPa, smoothwall H.D.P.E. plastic pipe with water-tight gasketed bell and spigot joining system, including excavation, full granular backfill for driveway access, granular bedding, backfill, compaction and restoration, complete at $302.39 per lineal metre.	$ 43,000.00
Item 5)	**DICB-3 to CBMH-5**; Supply and install approximately 142.2 lineal meters of 525mm diameter 320kPa, smoothwall H.D.P.E. plastic pipe with water-tight gasketed bell and spigot joining system, including excavation, full granular backfill for driveway access, granular bedding, backfill, compaction and restoration, complete at $279.90 per lineal metre.	$ 39,800.00
Item 6)	**DICB-3**; Supply and install a 600mm x 1200mm precast concrete ditch inlet catch basin (Type-A) 2.10 metres deep with galvanized steel grate at a 3:1 grade, including adjustment units, excavation, disposal, bedding, connection of the proposed pipes, 450mm sump, backfill, compaction and restoration, complete, approximately 1 unit at $10,200.00 each.	$ 10,200.00

Item 7)	**DICB-5**; Supply and install a 600mm x 1200mm precast concrete ditch inlet catch basin (Type-B) 2.10 metres deep with galvanized steel grate at a 3:1 grade, including adjustment units, excavation, disposal, bedding, connection of the existing and proposed pipes, 450mm sump, backfill, compaction and restoration, complete, approximately 1 unit at $10,200.00 each.		$ 10,200.00
Item 8)	**Offset CB-2 and Offset CB-4**; Supply and install a 600mm square precast concrete offset catch basin 1.80 metres deep with a 600mm square cast iron frame and grate, including adjustment units, excavation, bedding, connections, 450mm sump, backfill, compaction and restoration, complete, approximately 2 units at $3,500.00 each.		$ 7,000.00
Item 9)	**Station 1+232.5 to Station 1+516.9**; Provide all labour, equipment, and materials to fill in the existing open drain and construct new swale and grading between the proposed greenhouse and roadway elevations utilizing clean fill material (approximately 5,515.0 cubic metres), including placement, compaction, spreading of topsoil, seeding and mulching, cleanup and restoration, complete, approximately 284.4 lineal meters at $169.13 per lineal meter.		$ 48,100.00
	SUBTOTAL FOR CONSTRUCTION - PART 'B'		**$163,100.00**

Part 'C' – General Improvements

Item 10)	**Traffic Control**; Supply, install and maintain traffic control measures, including signs, flashers, flaggers and other traffic control devices per the Ontario Traffic Manuals and M.T.O. Roadside Safety Manual requirements. Remove all components at completion of project.	Lump-Sum	$ 10,000.00
Item 11)	**Final Clean Up and Restoration**; Provide all labour, equipment and materials to cleanup the project site on completion of the work, complete.	Lump-Sum	$ 5,000.00

SUBTOTAL FOR CONSTRUCTION - PART 'C'	**$ 15,000.00**
SUBTOTAL FOR CONSTRUCTION - PART 'B' (brought forward)	**$ 163,100.00**
SUBTOTAL FOR CONSTRUCTION - PART 'A' (brought forward)	**$ 32,900.00**
TOTAL FOR CONSTRUCTION	**$ 211,000.00**
Net H.S.T. on above Items (1.76%)	**$ 3,714.00**
TOTAL FOR CONSTRUCTION (including Net H.S.T.)	**$ 214,714.00**

INCIDENTALS

1) Report, Estimate, and Specifications	$ 10,000.00
2) Survey, Assistants, Expenses, and Drawings	$ 23,300.00
3) Duplication Costs of Drawings and Report	$ 600.00
4) Estimated Cost of preparing Tender Documents by the Municipality for Letting of the Contract on an invitation basis	$ 1,200.00
5) Estimated Cost of providing Supervision and Full-Time Inspection during Construction (based on a 3-week duration)	$ 11,400.00
6) Pre-Engineering Utility Locate Charges, including Hydro-Vacuum Excavation	$ 3,500.00
7) Costs for Geotechnical Inspections	$ 2,000.00
8) Net H.S.T. on above items (1.76%)	$ 915.00
9) Estimated Cost for E.R.C.A. Permit	$ 800.00
TOTAL FOR INCIDENTALS	**$ 53,715.00**
TOTAL FOR LAND TAKEN (brought forward)	**$ 2.00**
TOTAL FOR CONSTRUCTION (brought forward)	**$ 214,714.00**
TOTAL ESTIMATE	**$ 268,431.00**

IX. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached the design drawing for the improvements proposed under this project. The design drawings show the existing alignment of the Danube Drain. These drawings further illustrate the required improvements and ancillary works associated with this Municipal Drain. The design drawing is attached to the back of this report and is labelled herein as **Appendix "B"**. The drawings attached herein have been reduced in size and the scale therefore varies. However, full-scale drawings can be viewed at the Town of Kingsville Municipal Office, if required.

Also attached, we have prepared Specifications which set out the required construction details for the proposed improvements outlined within this report.

X. CONSTRUCTION SCHEDULE OF ASSESSMENT

We would recommend that all of the costs associated with the improvements to the Danube Drain, as identified and detailed herein, be assessed in accordance with the attached **Construction Schedule of Assessment.**

In a review of the existing road crossing culvert across Peterson Road, we found that this culvert has reached the end of its useful service life and is slated for replacement. Through the discussions and review of the proposed improvements to this Municipal Drain, the Town of Kingsville was amenable to replacing this road crossing culvert. As a result, we have determined that the estimated construction cost plus incidental costs for the removal and replacement of the road crossing culvert that shall be assessed to the Town of Kingsville Public Works as Special Assessment under Section 26 of the Drainage Act. All other construction works, together with the associated incidental and engineering costs under this project, is required to facilitate the proposed greenhouse development and shall be assessed to the lands currently owned by 617885 Ontario Limited (300-32600), within Lot 9, Concession 2 E.D., in the Geographic Township of Gosfield South.

It shall be noted that the attached Construction Schedule of Assessment is to be utilized for the distribution of costs related to the construction works being provided for under this report and this Construction Schedule of Assessment shall not be utilized for the sharing of any future maintenance works conducted to same.

Special Assessments (Section 26)

We determined that a Special Assessment shall be charged to the **Town of Kingsville Public Works** for the extra costs to the project caused by the existence of **Peterson Road** in accordance with Section 26 of the Drainage Act. This extra **non-proratable** cost pursuant to Section 26 is related to the removal and replacement of the **Road Crossing Culvert** crossing Peterson Road between Station 1+204.1 to

Station 1+232.5. The estimated net increase in cost to the project for the construction of Road Crossing, including all necessary appurtenances, together with all related incidental costs is **$54,436.00**.

The construction items associated with the road crossing, together with the Town of Kingsville's share of the costs, generally consists of the following Construction Items within this report:

Construction Item #	% of Item Costs	Total Cost
Item 1	100.0%	$ 27,900.00
Item 2	100.0%	$ 5,000.00
Item 10	100.0%	$ 10,000.00
Item 11	25.0%	$ 1,250.00
Subtotal of Construction Costs =		**$ 44,150.00**
Net HST on above Items (1.76%) =		**$ 777.00**
Total Construction Costs =		**$ 44,927.00**

The above estimated Special Assessment to the Town of Kingsville for these works, pursuant to Section 26 of the Drainage Act, is listed under Section 6 of the Construction Schedule of Assessment and is to be **non-proratable.** The incidental costs portion associated with the above net cost consists of an amount of **$9,508.00**.

Once the construction of this work is completed, the Town of Kingsville Public Works Department shall be assessed the **actual construction costs** for the above-noted Construction Items, together with its share of the project incidental costs associated with the same, in the amount of **$9,508.00**. This combined amount represents the actual Section 26 Special Assessment amount to be assessed to the Town of Kingsville Public Works Department for their share of this work and this actual amount shall replace the estimated amount for same in Section 6 of the Construction Schedule of Assessment when charging out the works to the affected landowners and roads.

These non-proratable assessments to the Town of Kingsville Public Works Department do not include any unforeseen costs that may arise during construction, nor does it include for any potential costs for appeals to the Court of Revision, Tribunal or Referee. Any unforeseen construction costs directly related to this Section 26 works shall be assessed entirely, as an extra, to the applicable Road Authority or Utility. Any costs to the project associated with dealing with any appeals to the Court of Revision, Tribunal and/or the Referee shall be shared by all assessments in the Construction Schedule of Assessment including all Section 6 non-proratable assessments, including the Special Benefit Assessments, on a pro-rata basis.

Furthermore, during construction, it may become necessary to temporarily or permanently relocate existing utilities that may conflict with the works outlined within this report. Under these circumstances, the relocation of these utilities shall be assessed any relocation costs against the public utility having jurisdiction in accordance with Section 26 of the Drainage Act. In accordance with Section 69 of the Drainage Act, the utility company is allowed the option to carry out this work utilizing their own forces and at their own cost. However, should they not exercise this option within a reasonable time, the Municipality may arrange to have this work completed and the costs for the same shall be charged to the appropriate public utility.

XI. FUTURE MAINTENANCE

After the completion of all of the works associated with this Engineer's Report, we recommend that the entire Danube Drain be maintained in the future by the Town of Kingsville.

Open Drain Portion from Station 0+000.0 to Station 1+204.1

When future maintenance is performed on the open drain portion, between Station 0+000.0 to Station 1+204.1, we recommend that it be kept up and maintained in the future in the same proportions as the Assessments shown in the governing Schedule of Assessment established within the Engineer's Report prepared by W.J. Setterington, P.Eng., dated November 29th, 1985, or per subsequent amendments made thereto under the Drainage Act.

Culvert Crossing Peterson Road (Station 1+204.1 to Station 1+232.5)

We wish to establish that when future maintenance is performed on the road crossing portion between Station 1+204.1 to Station 1+232.5, all costs associated with same shall be assessed **100%** to the Town of Kingsville as the governing road authority. The maintenance work would include the road crossing culvert, the quarried limestone erosion protection, and 50% of the cost for any works on MH-1, together with all ancillary works associated with the road crossing culvert.

Enclosure from Station 1+232.5 to Station 1+728.2

It should be noted that a mechanism shall be provided herein so that the Town can undertake future maintenance works on the subject enclosure and allocate future maintenance costs for same to be properly assessed to the affected landowners. Therefore, we would recommend that the enclosure identified within this report, for which future maintenance costs are to be shared with upstream lands and roads within the watershed, be maintained by the Municipality on the following basis:

1. **98.6%** of the future maintenance costs shall be assessed against the lands currently owned by **617885 Ontario Limited (300-32600)** for their share of the access bridge portion of the overall enclosure, between approximately Station 1+581.4 to Station 1+591.4, as the original and Primary Access to the subject lands. This percentage also includes for all future maintenance costs associated with the remaining enclosed portions of the Danube Drain fronting along the subject property.

2. **1.4%** of the remaining future maintenance costs shall be assessed against the **upstream lands and roads** contributing their flows through the primary access bridge portions of the enclosure in the same proportions as Assessments shown in the governing Schedule of Assessment established within the Engineer's Report prepared by W.J. Setterington, P.Eng., dated November 29th, 1985, or per subsequent amendments made thereto under the Drainage Act.

We would also recommend that the enclosure as identified herein, be maintained in the future as part of the drainage works. We would also recommend that the enclosure, for which the maintenance costs are to be shared with the upstream lands and road within the watershed, be maintained by the Municipality and that said maintenance would include works to the enclosure culvert, bedding, backfill and end treatments. Should concrete, asphalt or other decorative driveway surfaces over this enclosure require removal as part of the maintenance works, these surfaces should also be repaired or replaced as part of the works. Likewise, if any greenhouse structure, 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 the said enclosure.

Working Corridors for Future Maintenance

Once all construction has been completed for this project, the Contractor shall be expected to keep all future equipment and forces within the following working corridors for any future maintenance performed on this portion of the Danube Drain outlined within this report:

1) From Station 1+204.1 to Station 1+212.0: The Contractor shall have access for a distance 6.00 metres north of the top of bank of the open portion of the drain, together with a distance of 10.00 meters westerly, within the private lands and along the drain alignment.

2) From Station 1+212.0 to Station 1+227.7: The Contractor may utilize the full right-of-way of Peterson Road.

3) From Station 1+227.7 to Station 1+728.2: The Contractor shall have access of a strip of land that extends 5.00 metres (16.40 ft.) to the west and 6.00 metres (19.70 ft.) to the east of the pipe centreline, for a total distance of 11.00 metres (36.10 ft.).

When future maintenance is performed on portions of the Danube Drain beyond the works outlined above, all working corridors and future maintenance provisions shall be addressed per the plans and specifications within the Engineer's Reports for the "Danube Drain" prepared by W.J. Setterington, P.Eng., dated November 29th, 1985, or per subsequent amendments made thereto under the Drainage Act.

All of the above provisions for future maintenance 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.

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2020-10-01
PROVINCE OF ONTARIO

ABP/amm

N. J. PERALTA ENGINEERING LTD.
Consulting Engineers
45 Division Street North
Kingsville, Ontario
N9Y1E1

CONSTRUCTION SCHEDULE OF ASSESSMENT

DANUBE DRAIN IMPROVEMENTS

(Geographic Township of Gosfield South)

TOWN OF KINGSVILLE

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 Outlet	Value of Special Benefit	TOTAL VALUE
300-32600	2 E.D.	9	72.58	72.58	29.373	617885 Ontario Limited	$ 213,996.00	$ -	$ -	$ 213,996.00
Total on Privately Owned - Agricultural Lands (non-grantable).....							**$ 213,996.00**	**$ -**	**$ -**	**$ 213,996.00**

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

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Owned	Acres Afft'd	Hectares Afft'd	Owner's Name	Value of Benefit	Value of Outlet	Value of Special Benefit	TOTAL VALUE
Road Crossing Replacement						Town of Kingsville - Public Works	$ 54,435.00	$ -	$ -	$ 54,435.00
Total on Special Non Pro-Rateable Assessments (non-agricultural (Sec.26)).....							**$ 54,435.00**	**$ -**	**$ -**	**$ 54,435.00**
TOTAL ASSESSMENT				72.58	29.373		**$ 268,431.00**	**$ -**	**$ -**	**$ 268,431.00**

1 Hectare = 2.471 Acres
D-19-120
October 1st, 2020

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SPECIFICATIONS

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DANUBE DRAIN IMPROVEMENTS

SPECIFICATIONS TABLE OF CONTENTS

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SPECIFICATIONS

DANUBE DRAIN IMPROVEMENTS

(Part of Lots 8 & 9, Concession 2 E.D.)

(Geographic Township of Gosfield South)

TOWN OF KINGSVILLE

I. GENERAL SCOPE OF WORK

The works proposed under this project consists of the complete removal and disposal of the existing road crossing culvert across Peterson Road between Stations 1+204.1 to Station 1+232.5, in addition to the complete removal and disposal of the existing enclosure along the east side of Peterson Road, between Station 1+232.5 and Station 1+280.2. The proposed work also includes the installation of a new road crossing culvert, from Station 1+204.1 to Station 1+232.5 in addition to the installation of a new enclosure from Station 1+232.5 to Station 1+516.9, utilizing 320kPa, smoothwall H.D.P.E. plastic pipe with water-tight gasketed joining systems, granular bedding, precast concrete structures, including all excavation of drain bottom sediment, the removal of all vegetation along the existing drain banks, scavenging of all available topsoil, supply and placement and compaction of backfill material, swale construction, topsoil, seeding and mulching, and all other ancillary work.

All work shall be carried out in accordance with these Specifications that serve to supplement and/or amend the current Ontario Provincial Standard Specifications and Standard Drawings, adopted by the Ontario Municipal Engineers Association. The Contractor shall review the information outlined within **Appendix "A"**. The works shall be further carried out in accordance with these Specifications and shall comply in all regards with the accompanying drawings labelled herein as **Appendix "B"**. The structures shall be of the size, type, depth, etc., as is shown in the accompanying drawings, as determined from the **Benchmark**, 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 Town Drainage Superintendent or the Consulting Engineer.

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

The Contractor shall 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 Lane 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 sites 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.

As part of its work, the Contractor shall 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 their Contractors to ensure that sediment and erosion control measures are functioning properly and are maintained and 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.

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 the E.R.C.A., and the letter provided by the D.F.O. of which are included within **Appendix "A"**.

III. M.E.C.P. CONSIDERATIONS

Under the Species at Risk Provincial Legislation, set in place with the Ministry of Environment, Conservation and Parks (M.E.C.P.), Section 23.9 of the Endangered Species Act, 2007, allows the Town 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 Town of Kingsville will complete an "Endangered Species Act Review" for the subject drain and will provide the Contractor with the results of said review, including Kingsville 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 Town of Kingsville Drainage Superintendent immediately if any endangered species are encountered during construction.

IV. ACCESS TO WORK, WORKING CORRIDORS AND TRAFFIC CONTROL

Access to Work

The Contractor is advised that the majority of the work to be carried out on this project extends along the east side of Peterson Road, with the exception of the road crossing culvert replacement which extends across the entire Peterson Road right-of-way and into the private lands on the west side of the road. The Contractor shall have access for the full width of the roadway abutting the proposed drainage works. The Contractor may use the entire width of the Peterson Road right-of-way as necessary to permit the completion of the work required to be carried out for this project. Furthermore, in order to perform the necessary work identified within this project, the Contractor shall have access to private lands as identified within these Specifications.

Initial Construction Working Corridors

Once access is obtained onto the private lands, the Contractor shall be expected to keep the construction equipment and forces within the following working corridors for the initial construction and restoration of the required works.

1) From Station 1+204.1 to Station 1+212.0: The Contractor shall have access for a distance 6.00 metres north of the top of bank of the open portion of the drain, together with a distance of 10.00 meters westerly, within the private lands and along the drain alignment.

2) From Station 1+212.0 to Station 1+227.7: The Contractor may utilize the full right-of-way of Peterson Road.

3) From Station 1+227.7 to Station 1+516.9: The Contractor shall have access for a distance of 20.00 metres east of the right-of-way limit of Peterson Road.

The Contractor is advised that all excavated material from the work along residential, greenhouse and lawn areas shall be hauled away and disposed of by the Contractor at their own expense. In all cases, the disposal of any trucked material will be the responsibility of the Contractor, and any work at the disposal site shall be established between the Contractor and the Site Owner. The Contractor shall ensure that any permits required for fill disposal are obtained from the appropriate authority. The Contractor shall 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.

Future Maintenance Working Corridor

Upon completion of the works for the Danube Drain, the Contractor shall be expected to keep all future equipment and forces within the following working corridors for any future maintenance performed along the new enclosure:

1) From Station 1+204.1 to Station 1+212.0: The Contractor shall have access for a distance 6.00 metres north of the top of bank of the open portion of the drain, together with a distance of 10.00 meters westerly, within the private lands and along the drain alignment.

2) From Station 1+212.0 to Station 1+227.7: The Contractor may utilize the full right-of-way of Peterson Road.

3) From Station 1+227.7 to Station 1+728.2: The Contractor shall have access of a strip of land that extends 5.00 metres (16.40 ft.) to the west and 6.00 metres (19.70 ft.) to the east of the pipe centreline, for a total distance of 11.00 metres (36.10 ft.).

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 Town 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. Any damages caused, resulting from non-compliance of the above-noted provisions, shall be restored by the Contractor to its original condition, at the Contractor’s expense.

Traffic Control

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. The Contractor may arrange to close Peterson Road for the proposed road crossing works. However, they shall ensure that traffic is maintained and Detour Plans are provided. The road closure must be requested and subsequently authorized by the Town of Kingsville and in consultation with the County of Essex (if required). The Contractor shall also ensure that all emergency services, school bus companies, etc. are contacted about any disruption of at least 48 hours in advance of the same. Any and all detour routes shall be established in consultation with the Town of Kingsville and the County of Essex Roads Departments (if required).

Throughout the course of the work, it is imperative that the Contractor protects as much landscaping and vegetation as possible when accessing along the enclosure. This will be of particular concern along the lawn areas of residential properties. 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.

V. BRUSHING, GRUBBING, AND THE PREPARATION FOR FILLING THE NEW DRAIN ALIGNMENT

Prior to filling in the portion of the drain alignment, the Contractor is to prepare said drain for this operation.

The Contractor is to excavate and completely remove all existing brush, trees and tree stumps, which exist within the drain cross-section for the entire length of this existing open drain. Brush, trees and tree stumps removed from the drain may either be put into piles by the Contractor at locations where they can be safely burned, or they shall be trucked away and disposed of off-site. If the materials are intended to be burned on-site, the Contractor shall, prior to and during the burning operations, comply with the guidelines prepared by the Air Quality Branch of the Ministry of Environment and shall ensure that the Environmental Protection Act is not violated. The Contractor shall be required to notify the Municipality and advise them of their burning operations. The Contractor shall also be required to contact the local Fire Chief and notify him of his operations to avoid any false alarms.

As part of the preparation for filling in the existing open drain alignment, the Contractor shall also be required to remove all sediment, fill, organic, loosened, softened and topsoil material in the drain bottom and on the drain side slopes. The Contractor shall not use any of these materials for filling in the existing drain. The Contractor shall dispose of these materials to a site established by the Owner or to a site to be obtained by it, at its own expense.

The Contractor shall also be required to grub out and close-cut all of the vegetation which exists along the existing drain bottom and side slopes and dispose of same at a site to be obtained by the Contractor at its own expense. In order to conserve topsoil to finish off the filling of the existing drain, the Contractor shall strip all topsoil along the drain headlands on both sides of the existing drain and said topsoil is to be stockpiled along the drain a sufficient distance away to allow for temporary piling of backfill material.

The Contractor shall also, as part of the grubbing process, be required to excavate and completely remove any existing rock protection and tile ends and dispose of same at a site to be obtained by it, at its own expense.

Also, as part of the cleanup work, the Contractor shall be required to load up and haul away and dispose of all deleterious materials along the course of the drainage works. All overhanging branches and limbs shall be neatly cut and pruned taking care to protect trees where they can be preserved. All such removed material shall be disposed of as noted above.

XIV. DETAILS OF ROAD CROSSING REMOVAL AND RELOCATION WORK

From Station 1+204.1 to Station 1+232.5, the Contractor shall provide all material, labour and equipment to remove and dispose of the existing 900mm CSP road crossing culvert and supply and install the new 750mm 320kPa smoothwall H.D.P.E. plastic pipe as outlined on the plans, the schedule of items, and in these specifications.

The new 320kPa smoothwall H.D.P.E. plastic pipe extending from the existing 1800mm diameter MH-1 and across Peterson Road shall be installed with a minimum number of couplers and longer pipe sections are to be utilized whenever possible. Under no circumstances shall the culvert sections be less than 6.00 metres in length. All pipe lengths shall be of the size and gauge noted in the drawings and shall be coupled together with water-tight gasketed bell and spigot joining system. The installation must be inspected and approved by the Town Drainage Superintendent or the Consulting Engineer prior to backfilling.

The Contractor shall note that the placement of any new culvert pipe shall 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 Town Drainage Superintendent or the Consulting Engineer.

The new road crossing portion of this enclosure installation shall be provided with a minimum depth of cover from the top of the pipe of 450mm (18"). If the pipes are placed at their proper elevations, the same should be achieved. If the Contractor finds that the minimum cover is not being met, they shall notify the Drainage Superintendent and the Consulting Engineer immediately so that steps can be taken to rectify the condition prior to the placement of any backfill. The minimum cover requirement is **critical** and must be attained. In order for these new structures to properly fit the channel parameters, **all of the design grade elevations must be strictly adhered to**.

As a check, all of the above structure design grade elevations should be confirmed before commencing to the next stage of the road crossing installation. The Contractor is also to check that the pipe invert grades and set structure elevations are correct by referencing the Benchmark.

The installation of the complete length of the road crossing, including all appurtenances, shall be completely inspected by the Town Drainage Superintendent 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 new road crossing pipe without the site presence of the Town Drainage Superintendent or the Consulting Engineer's Inspector to inspect and approve the said installation. The Contractor shall provide a minimum of forty-eight (48) hours' notice to the Town Drainage Superintendent or the Consulting Engineer prior to commencement of the work. The installation of the new enclosure structure shall be performed during normal working hours of the Town Drainage Superintendent and the Consulting Engineer from Monday to Friday unless written authorization is provided by them to amend said working hours.

Upon the removal of the existing road crossing culvert and the installation of the proposed culvert, the Contractor shall backfill the trench with Granular "B" Type II compacted in place to a minimum 98% of Standard Proctor Density topped with a minimum 450mm thickness of Granular "A" compacted in place to a minimum 100% Standard Proctor Density and conforming to O.P.S.S. Form 1010. All of which shall be provided and placed as shown and detailed in the **"Roadway Crossing Backfill Detail"** on the accompanying drawings.

The Contractor shall also note that the placing of the new road crossing culvert shall be completed so that they totally comply with the parameters established and noted in the accompanying drawings. The enclosure shall be set on an even grade and the placement shall be 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 Town Drainage

Superintendent or the Consulting Engineer. The Contractor shall also be required to supply a minimum of 150mm (6") of Granular "A" pipe bedding compacted to a minimum of 98% Standard Proctor Density bedding underneath the culvert pipe and extending from the bottom of the trench to the underside of the proposed pipe. This bedding shall further extend up the haunches, to the spring-line of the new pipe. Alternatively, the Contractor may supply 20mm (3/4") clear stone in lieu of Granular "A" bedding material. All of which shall conform to O.P.S.D. 802.010 or 802.030 and shall be performed to the full satisfaction of the Town Drainage Superintendent or the 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 Town Drainage Superintendent or the Consulting Engineer. The Contractor is to note that when replacing the existing structures, it shall be required to excavate a trench having a width not less than the new pipe outside diameter plus a 600mm working width on both sides of the new pipe.

XV. ASPHALT PAVEMENT REMOVAL AND REPLACEMENT

The proposed works will encroach on the existing tar and chip roadway across Peterson Road. The Contractor shall be required to neatly saw-cut the existing roadway and same shall be restored with fully compacted Granular "A" backfill and a minimum of 100mm thick hot mix asphalt, to be placed in a minimum two (2) equal lifts, or to the existing asphalt thickness if greater, to match the existing roadway elevation. All road tar and chip shall be saw cut to a point 300mm beyond the trench limits. All of which shall be restored as shown in the **"Roadway Crossing Backfill Detail"** within the accompanying drawings. The Contractor shall be required to dispose of all removed asphalt material and shall compact the Granular "A" as well as the hot mix asphalt to 97% of Standard Proctor Density, and complete all of the roadway restoration to the full satisfaction of the Town of Kingsville Public Works, the Drainage Superintendent, and the Consulting Engineer.

The Contractor shall supply and place hot-mix asphaltic concrete pavement, conforming to O.P.S.S. Form 310, Type HL-3 base course and surface course. The Contractor shall supply asphaltic mix designs to the Engineer for approval prior to any asphalt being laid.

All equipment used for placing and compacting the asphalt shall be approved by the Engineer. A paver shall be used for spreading and initial compaction of the asphalt. It shall be equipped with a distributing screw in front, adjustable screeds and be capable of spreading the mixture without segregation, in thickness from 12.5mm to 75mm and in width from a minimum of 1.80 metres to a maximum width of 4.00 metres, in increments of 0.15 metres. It shall also be equipped with a 3.00 metres straight edge for detecting variations from horizontal of 3.8mm in 3.00 metres.

The Contractor shall spread and compact the course of asphaltic concrete on a dry and solid base. The asphaltic concrete pavement delivered shall have a minimum temperature of 118 degrees Celsius (245 degrees Fahrenheit) and a maximum temperature of 150 degrees Celsius (300 degrees Fahrenheit) after spreading and prior to initial rolling. The Engineer shall reject any material which does not meet temperature requirements.

The Contractor shall hand spread asphaltic concrete at base widening, deep or irregular sections, intersections, turnouts, etc.

The asphaltic concrete shall be rolled in accordance with O.P.S.S. Form 310. The Contractor shall compact the asphaltic concrete until 97% of the density achieved in the laboratory has been reached. Hand tampers shall be used to compact asphaltic concrete in areas where machines have no access.

All joints, curbs, gutters, manholes, catch water basins and other structures at the point of contact with the asphaltic concrete, shall be painted with SS-1 Emulsion, O.P.S.S. Form 1102 or approved equal. The Contractor shall repair any faulty work under the Engineer's supervision.

VI. DETAILS OF ENCLOSURE WORK

The Contractor shall carry out the necessary excavation, together with all required labour and material, to remove and dispose of the existing 900mm CSP enclosure between Station 1+232.5 and Station 1+280.2. The Contractor shall then construct a new enclosure at the location shown on the accompanying drawings and same shall be aligned so that it follows the alignment outlined in the accompanying drawings. The new enclosure shall consist of 320kPa smoothwall H.D.P.E. plastic pipe with water-tight gasketed bell and spigot joining systems, extending from the existing 1800mm diameter MH-1 and connected with two (2) inline pre-cast concrete 1200mm x 600mm ditch inlet catch basins with galvanized steel honeycomb grate, and two (2) 600mm square pre-cast concrete offset catch basins with cast iron frame and grates.

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

VII. PIPE INSTALLATION

The installation of the complete length of the enclosure including all appurtenances shall be completely inspected by the Town Drainage Superintendent or Consulting Engineer prior to backfilling any portions of same and under no circumstance shall the Contractor backfill same until the Town Drainage Superintendent or Consulting Engineer inspects and approves said installation.

The new pipe enclosure shall be set in the alignment and to the grade elevations established in the accompanying drawing. This shall be the exact length and location of said enclosure unless otherwise directed by the Town Drainage Superintendent or Consulting Engineer prior to construction of same. Any changes relative to the enclosure must be approved by the Consulting Engineer prior to proceeding with construction. Benchmarks have been established near the enclosure site and are noted and detailed within the accompanying drawing.

All pipe materials shall be stored and handled by the Contractor at its own expense. It shall be responsible for the safe storage of all materials, for obtaining storage areas, for the safe transportation and distribution of all the materials at the job site, and for inspection in order to determine defects and breakage. No additional recompense will be allowed the Contractor for any loss incurred by it in the storage and handling of the materials.

Pipe, fittings, and all accessory appurtenances must be loaded and unloaded by lifting with means of a hoist or a skid so as to avoid shock or damage. Under no circumstances shall any drain material or materials for drain appurtenances be dropped.

All excavation shall be made in compliance with the drawings and in such a manner and at such depths and widths as will give ample room for installing the pipe, the bracing, sheeting, or otherwise supporting the sides of the excavation and for the pumping of groundwater if encountered. The Contractor is fully responsible for the safety of all its men and equipment and must conform completely with the provisions of the "Construction Safety Act" and "Regulations for Construction Projects".

The bottom of the trenches must be carefully excavated and trimmed to the elevation and shape of the bottom of the pipe. The bottom of the trenches shall be recessed to receive the pipe in order to allow the pipe to be uniformly supported on firm undisturbed earth for its' entire length. Corrections in depth of excavation caused by the Contractor excavating to an extent greater than that required for the elevation of the pipe shall be made by bedding the pipe with 20mm (3/4") clear stone granular material placed at the time that the pipes are being installed, at the Contractors expense.

The Contractor should note that, because the covered drain is being installed with an excavator, it is expected that they will provide approximately 150mm (6") of either compacted M.T.O. Granular "A" or Granular "B" (Type II) bedding material, as outlined within O.P.S.S. Form 1010, to the spring line of the proposed pipe, at a minimum, and throughout the entire length of the enclosure pipe. The Contractor shall ensure that a good firm base is provided under the drain pipe, and they shall provide for this item as part of their tender price. The Contractor shall refer to the backfill details on Sheet 5 for trench bedding and backfill details.

The trenches shall be excavated to the depths given by the Engineer and only as far in advance of the pipe laying as permitted by the said Engineer or the Town Drainage Superintendent.

If any part of the bottom of the trench is found to be unsound or in any way unsuitable in the Town Drainage Superintendent's or the Engineer's opinion to lay drain pipe, the Contractor shall remove as much material as may be required and shall replace same with sufficient approved 20mm (3/4") clear stone granular material to form a sound bed for the pipe. The Contractor shall not be paid an extra for any such additional excavation and for supplying and placing of the granular material in place of unsound soil.

No extras will be allowed for excavating any hardpan, boulders, rocks, ice or other obstacles found in the excavation or in the line of the trench or for any pumping or baling of water required in the excavation of the work. The trench must be drained or pumped in order to avoid the necessity of making joints under water. The trench must also be drained to avoid any possibility of groundwater entering the pipe in the trench until the installation has been successfully completed.

The Contractor shall lay the enclosure pipe to the lines, levels, and grades as shown in the accompanying drawings or as may be laid out and established by the Engineer prior to the time of construction. The Contractor shall be held responsible for said lines, levels and grades of the drain pipe and should the Engineer determine that the Contractor has not satisfactorily adhered to such lines, levels and grades, it may direct the Contractor to take up and re-lay any portion of the drain which does not conform to such lines, levels and grades.

Laser control must be provided to maintain drain line and grades, and the Contractor shall have a qualified Operator to set up and operate the equipment. In some instances, but only at the discretion of the Engineer, an approved system of batter boards may be utilized for this purpose; However, the cost of placing grade stakes and determining the cut information shall be provided by or paid for entirely by the Contractor.

The Contractor shall be responsible for the safe and proper handling of the pipe and shall inspect all pipes to ensure that no cracks, chips or defects exist in the pipe prior to placing the pipe in the sewer line. Should the Contractor permit damaged pipe or materials to be installed in the sewer, it shall be responsible for the removal and replacement of same at its own expense, should the Engineer require such removal and replacement.

If the drain pipe is laid in freezing weather, the Contractor shall take all the necessary precautions to prevent damage to the pipe or to any of the materials used in the construction of the work. In addition, the Contractor shall take care that no frozen ground or backfill is placed in the trench backfilling adjacent to the drain pipe.

All pipe and the various other materials used in the placing of said pipe shall be installed in strict compliance with the Manufacturer's recommendations.

VIII. STRUCTURE INSTALLATION

All materials for the ditch inlet catch basins and offset catch basin structures shall comply with Ontario Provincial Standard Specifications (O.P.S.S.) and Ontario Provincial Standard Drawings (O.P.S.D.) with respect to materials, qualities, and installation details. The structures shall be founded on a good, dry, firm, undisturbed earth base for its entire bottom surface area, or 20mm (3/4") clear stone bedding, if necessary. Corrections in depth of excavation caused by the Contractor excavating to an extent greater than that required for the structures shall be backfilled to the proper grade elevation by embedding the catch basin maintenance holes floor area with 20mm (3/4") clear stone granular bedding. A sump is to be provided in each structure which shall be a minimum of 450mm deep measured from the proposed invert of the covered drain or connection to the proposed concrete floor elevation of the structure. The structure shall be set to allow for connection of all of the inlet and outlet pipes and shall be installed as shown and detailed on the plans. The top elevation of the structure shall be installed to the elevations noted on the plans or as further directed by the Town Drainage Superintendent or the Consulting Engineer. All structure sections and adjustment units shall be joined together with standard gasket material, caulking, or grout as required by the manufacturer, or as set out in the applicable O.P.S.S. and O.P.S.D.

Where identified the Contractor shall provide and install 600mm square standard precast concrete offset catch basins with cast iron frame and grates, in accordance with O.P.S.D. 705.010 and O.P.S.D. 400.020 where shown on the plans.

At Station 1+374.7, the Contractor shall provide and install a 600mm x 1200mm Type B precast concrete ditch inlet catch basin together with galvanized steel honeycomb grate, in accordance with O.P.S.D. 705.040 and O.P.S.D. 403.010.

At Station 1+516.9, the Contractor shall provide and install a 600mm x 1200mm Type A precast concrete ditch inlet catch basin together with galvanized steel honeycomb grate, in accordance with O.P.S.D. 705.040 and O.P.S.D. 403.010.

All structures, where applicable, shall include a minimum of three (3) adjustment units in accordance with O.P.S.D. 704.011. All work shall be completed as shown and detailed on the plans.

The Contractor shall connect all covered drains and connections in the structures with the use of a mortar joint or standard rubber boot cast into the units by the Manufacturer. Said mortar joint shall be provided at the internal and exterior of the catch basin maintenance holes wall for the full circumference of the covered drain and be of a sufficient mass to produce a sealed joint, all

to be performed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer. Where possible, the Contractor shall employ a standard factory fitting or adapter to connect between the various pipes, tiles, and catch basin maintenance holes, otherwise, a mortar joint connection can be utilized.

IX. ENCLOSURE BACKFILL

Once the new enclosure pipe and appurtenances have been properly set in place, the Contractor shall completely backfill same with imported good, dry (clayey) local fill that is free of organics and debris, with the exception of the top 50mm (2”) of the backfill which shall be topsoil. The entire backfilling of the trench across the full width of the proposed driveway shall be backfilled and compacted with full depth granular material as outlined within the **“Typical Driveway Backfill Detail”** on Sheet 5 of the accompanying plans. The topsoil, to be provided shall be good, clean, dry, (black) organic material. All areas being backfilled with the exception of where the trench crosses the proposed driveways shall be totally compacted in place to a Minimum Standard Proctor Density of 96%. All of the backfill for the entire length and width of the trench across driveways and roadways shall be granular material M.T.O. Type “A” (crushed limestone) compacted in place to a Minimum Standard Proctor Density of 98%. The Contractor is required to provide whatever mechanical equipment necessary, such as jumping jack and/or plate tamper, in order to obtain the required compaction levels mentioned above. The placing of all backfill shall be done in a neat and workmanlike manner and conform to the **“Typical Enclosure Backfill Detail”** on Sheet 5 of the accompanying plans. All of which shall be completed to the full satisfaction of the Town Drainage Superintendent or Consulting Engineer.

X. CONSTRUCTING NEW SWALES

The Contractor shall provide all labour, material, and equipment, in order to construct the swales, to the lines, levels, and grades as is shown and detailed in the accompanying drawings. The centreline of the finished swale grade elevation and swale cross-section, at various locations along the length of the drain, are to be provided as shown and detailed in the design drawings. The Contractor shall be required to strictly adhere to this swale design unless otherwise directed and approved by the Consulting Engineer.

The swale shall generally be constructed with a V-section centered 1.00 metre west of the proposed enclosure pipe to ensure positive flow of the surface drainage into the top of all offset catch basins that act as outlets for the particular swale section. All materials excavated from the swale including all deleterious materials shall be hauled away and disposed of by the Contractor to a site to be obtained by it at its own expense.

XVI. SLOPED QUARRIED LIMESTONE END PROTECTION

Once the new road crossing pipe has been set in place, the Contractor shall install sloped quarried limestone end protection at the west end of the proposed road crossing culvert. The quarried limestone shall be provided as shown and detailed on the plans and shall be graded in size from a minimum of 100mm (4") to a maximum of 250mm (10"). The quarried limestone to be placed on the sloped ends of the road crossing or enclosure shall be underlain with a synthetic **non-woven** geotextile filter fabric. The sloped quarried limestone protection is to be rounded as shown on the plan details and shall also extend along the drain side slopes to a point directly in line with the ends of the culvert pipe. All work shall be completed to the full satisfaction of the Town Drainage Superintendent or the Consulting Engineer.

XI. UTILITIES

All pipe shall be laid in trenches in the general location shown on the accompanying drawings or as may be specifically directed and laid out by the Engineer at the time of construction. The trench shall be located to clear all existing utilities and structures above, on, or below the ground level. The Contractor will be responsible at all times for complete investigation to determine the location of all such utilities or structures known or unknown, and it shall indemnify and save harmless the Engineer and the Town for any responsibility, injury, or liability arising from any damage to such utilities or structures by the Contractor.

The Contractor shall protect all other services located in the vicinity of the proposed drainage works including any sanitary sewers and connections, watermains and connections, telephone and gas services, along with any private systems and services. Any damaged components shall be replaced by the Contractor, totally at its own expense and it shall fully restore the functionality of same.

The Contractor shall further contact or notify such Utility Company or Commission of its intention to carry out work in the area and cooperate with such Utility Company or Commission in the location, maintenance and preservation of all such utilities. The location of the pipes and appurtenances as shown on the drawings is approximate and may be changed by the Engineer if deemed advantageous for the progress of the work. The trenches are to be excavated where directed. If any part of the bottom of the trench is found to be unsound or in any way unsuitable to lay the pipe in the Town Drainage Superintendent's or the Engineer's opinion, it may direct that the location of said trench be changed if it is possible to avoid unsound soil by doing so.

XII. REMOVALS

The Contractor shall be required to cut any brush and denude the existing drain side slopes 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 enclosure sites. 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 driveway shall be hauled away and disposed of by the Contractor.

XIII. BENCHMARKS

Also, for use by the Contractor, we have established multiple Benchmarks near the proposed drainage works. The plans include details illustrating the work to be carried out. Benchmarks have been indicated and the Elevations have been shown and shall 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 accompanying profile. The profile also sets out the pipe size, materials, and other requirements relative to the installation of the enclosure structure. In all cases, the Contractor is to utilize the specified drain grade to set any new pipe installation. The Contractor shall ensure that it takes note of the direction of flow and sets all pipes to assure that all grades flow from upstream to downstream to match the direction of flow within the drain.

XIV. TOPSOIL, SEED AND MULCH

Once all of the enclosure backfilling has been satisfactorily completed, the Contractor shall adequately fine grade the topsoil and prepare for the seeding and mulching of the enclosure as well as the lawn area. The Contractor is to note that prior to fine grading the topsoil over the backfilled areas, positive drainage is to be provided off of these areas and into the swales, and the Contractor shall also be required to make minor changes where necessary to ensure same. The Contractor shall be required to restore all existing grassed areas and roadway boulevard areas damaged by the enclosure work, and shall provide topsoil and seed and mulch over all of these areas. 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, 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 will 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 Town Drainage Superintendent 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 Town Drainage Superintendent or Consulting Engineer.

XV. GENERAL CONSTRUCTION PROVISIONS

The Contractor is to note that several legal survey bars exist within the work area and it is to take whatever steps necessary to protect all of same. If any iron bars are damaged or removed by the Contractor, it shall arrange for an Ontario Land Surveyor licensed in the Province of Ontario to restore same, all at its cost.

The alignment of enclosure throughout shall be to the full satisfaction of the Town Drainage Superintendent. The whole of the work shall be done in a neat, thorough and workmanlike manner to the full satisfaction of the Town Drainage Superintendent.

The Contractor shall satisfy itself as to the exact location, nature and extent of any existing structure, utility or other object that it may encounter during the course of the work. The Contractor shall indemnify and save harmless, the Town and the Engineer for any damages which it may cause or sustain during the progress of the work. The Contractor shall not hold the Town of Kingsville, County of Essex or the Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.

All of the work required towards the installation and improvements of the enclosure shall be performed in a neat and workmanlike manner and the general site shall be restored to its' original condition, and all of same is to be performed to the full satisfaction of the Town Drainage Superintendent and the Consulting Engineer.

XVI. GENERAL CONDITIONS

a) The Town 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 Town of Kingsville 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 Town of Kingsville 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 Town 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 Town 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 Town. 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 for 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 Town 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 Town 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 shall be required to submit to the Town, a Certificate of Good Standing from the Workplace Safety and Insurance Board prior to the commencement of the work and the Contractor shall be required to submit to the Town, 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 Town of Kingsville 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 Town Clerk and the Consulting Engineer prior to the commencement of work.

l) Monthly progress orders for payment shall be furnished the Contractor by the Town 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 60 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 Town, 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 Town that there are no liens or claims against the work and that all of the requirements as per the Construction Act, 2018 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.

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APPENDIX "A"

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ESSEX REGION CONSERVATION AUTHORITY CORRESPONDENCE

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From: russell@peraltaengineering.com
Sent: Wednesday, September 23, 2020 10:03 AM
To: 'Ashley Gyori'
Cc: 'Tony Peralta'; 'kvegh@kingsville.ca'; 'dbroda@kingsville.ca'; 'william@peraltaengineering.com'
Subject: RE: Danube Drain Improvements - Town of Kingsville - D19-120
Attachments: 200923 - PRELIMINARY DESIGN - DANUBE DRAIN ENCLOSURE.pdf; 200909 DFO Letter - Danube Drain Enclosure.pdf

Good morning Ashley,

Further to our previous correspondence outlined below, we have been appointed by the Town of Kingsville, under Section 78 of the Drainage Act, to provide an Engineer's Report for the enclosure of the remaining open portion of the Danube Drain (approximately 240.0m) directly north of the existing road culvert across Peterson Road. In addition to the proposed enclosure, and per the request of the Town of Kingsville, we intend to replace the existing road crossing culvert. We have now completed our preliminary design for the above noted project. As a result, we wish to provide you with a copy of our preliminary drawings for your review.

The following is a summary of the project design details as it pertains to E.R.C.A. For more detailed information please refer to the attached preliminary drawings.

1. Further to the above, the existing 900mm CSP road crossing culvert was found to be in poor condition and has reached the end of its service life. As such, we have proposed the removal and replacement of this culvert with 28.4m of 750mm dia. 320kPa smoothwall plastic pipe. This culvert will be connected to the Ex. 1800mm dia. MH-1 and extend across Peterson Road to Station 1+204.1.
2. The proposed enclosure of the Danube Drain between Station 1+232.5 to Station 1+516.9 shall comprise of H.D.P.E. smoothwall plastic pipe and precast concrete structures (both inline and offset). The proposed enclosure has been sized to provide equivalent or better hydraulic capacities as compared to the existing upstream drainage systems. This will ensure that the proposed enclosure will have no adverse effects to the upstream watershed.
3. Furthermore, we will be grading the fill above the proposed enclosure to meet the elevations of both the greenhouse site, and the adjacent roadway. This will be done while still providing positive drainage to a series of offset and inline catch basins to contain and direct the overland flows.
4. As part of our investigations, we had submitted a request for review to the Department of Fisheries and Oceans (DFO); for the proposed works. Through various correspondence, DFO has provided their comments related to this project and provided the letter attached.

We trust that this information is satisfactory for your review. However, if you have any questions or require additional information, please feel free to contact us at your earliest opportunity as we intend on finalizing this report in the near future.

Regards,

Russell Leclair

N.J. Peralta Engineering Ltd.
45 Division Street North
Kingsville, ON N9Y 1E1
http://peraltaengineering.com/
P: 519.733.6587

F: 519.733.6588

From: Ashley Gyori <AGyori@erca.org>
Sent: Friday, June 26, 2020 12:53 PM
To: russell@peraltaengineering.com
Cc: Tony Peralta <tony@peraltaengineering.com>; kvegh@kingsville.ca; dbroda@kingsville.ca; kory@peraltaengineering.com
Subject: RE: Danube Drain Improvements - Town of Kingsville - D19-120

Hi Russell,

Thank you for your inquiry. We have reviewed the location of the proposed works and the information that you have provided below and have the following comments to provide.

A review of our floodplain mapping and files for the Danube 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.

Please note that this office reviews proposals in accordance with Section 28 of the Conservation Authorities Act and does not review proposals on behalf of other agencies. It is the proponent's responsibility to ensure that all municipal, provincial and federal authorizations have been obtained and that all applicable legislation has been adhered to.

With respect to Department of Fisheries and Oceans (DFO) concerns and comments, the proposed works 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 you have any questions, please do not hesitate to contact this office.

Kind regards,

Essex Region Conservation Authority
sustaining the place for life

ASHLEY GYORI
Regulations Analyst
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6
agyori@erca.org • essexregionconservation.ca

**NOTE: As per public health guidelines, our offices are closed to the public, but staff are working remotely to provide responses to inquiries and review applications as efficiently as possible. Your patience and understanding is greatly appreciated at this time. **

From: russell@peraltaengineering.com <russell@peraltaengineering.com>
Sent: Friday, June 19, 2020 11:57 AM
To: Ashley Gyori <AGyori@erca.org>
Cc: tony@peraltaengineering.com; kvegh@kingsville.ca; dbroda@kingsville.ca; Dan Jenner <DJenner@erca.org>; kory@peraltaengineering.com
Subject: Danube Drain Improvements - Town of Kingsville - D19-120

Good morning Ashley;

We have been appointed by the Town of Kingsville, under Section 78 of the Drainage Act, to provide an Engineer's Report for the enclosure of the remaining open portion of the Danube Drain (approximately 240.0m) directly north of the existing road culvert across Peterson Road. In addition to the proposed enclosure, and per the request of the Town of Kingsville, we intend to remove and replace the said existing road crossing culvert. The proposed works are located along and across Peterson Road, approximately 0.75 km north of Road 2 East, within the Town of Kingsville. The original request for the improvements of the Danube Drain were submitted by Mr. Paul Mastronardi on behalf of 617885 Ontario Limited/JEM Farms as part of their greenhouse development.

With regards to the proposed improvements, directly upstream there is presently an existing enclosure consisting of approximately 207.0m of H.D.P.E. Smoothwall pipe varying in size from 300mm dia - 500mm dia. The existing road crossing culvert consists of approximately 76.2m of 900mm diameter CSP pipe. The proposed improvements will tie into both the upstream enclosure and the proposed road crossing culvert replacement.

At this time, we would kindly request any comments or concerns from the ERCA. Attached is a map showing the general location of the proposed improvements.

As part of our investigations, we will be contracting a biological consultant to deal with all of the necessary environmental approvals through the Fisheries Act and the E.S.A.

Thank you for your time and attention to this matter. We look forward to your response.

Regards,

Russell Leclair, E.I.T.

N.J. Peralta Engineering Ltd.
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Kingsville, ON N9Y 1E1
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P: 519.733.6587
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DEPARTMENT OF FISHERIES AND OCEANS LETTER

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Fisheries and Oceans Canada | Pêches et Océans Canada

Ontario & Prairie Region
Fish and Fish Habitat
Protection Program
867 Lakeshore Road
Burlington, ON L7S 1A1

Région de l'Ontario et des Prairies
Programme de la protection
du poisson et de son habitat
867 Lakeshore Road
Burlington, ON L7S 1A1

September 8, 2020

Our file *Notre référence*

20-HCAA-01326

Corporation of the Town of Kingsville
ATTN: Ken Vegh
2021 Division Road North
Kingsville, Ontario
N9Y 2Y9

Subject: Municipal Drain Enclosure, Lane Drain, Kingsville – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Ken Vegh:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on June 24, 2020. We understand that you propose to:

- Enclose approx. 240 m^2 of an unrated drain.

Our review considered the following information:

- DFO Request for Review, Drain Map, and site photos received on June 24, 2020
- Email conversation between Steve Cho and Tony Peralta on September 4, 2020

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*;
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below in addition to the measures in your application:

- Work in dry or no flow conditions.
- Implement and maintain appropriate erosion and sediment control measures.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries Act* or the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, avoid prohibited effects on listed aquatic species at risk, any part of their critical habitat or the residences of their individuals, and prevent the introduction of non-indigenous species.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (http://www.dfo-mpo.gc.ca/pnw-ppe/CONTACT-eng.html).

Please notify this office at least 10 days before starting your project. A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Steve Cho at 905-336-6248 or by email at Steve.Cho@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Christopher Biberhofer
A/Senior Biologist

COPY:
Tony Peralta, N.J. Peralta Engineering Ltd. (tony@peraltaengineering.com)

APPENDIX "B"

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PLANS, PROFILES, SECTIONS & DETAILS

OF THE

DANUBE DRAIN IMPROVEMENTS

(For 617885 Ontario Limited (300-32600), Part of Lot 9, Concession 2 E.D.)

IN THE

TOWN OF KINGSVILLE (Geographic Township of Gosfield South)

IN THE

COUNTY OF ESSEX • ONTARIO

ANTONIO B. PERALTA, P.ENG.

N. J. PERALTA ENGINEERING LTD.
45 DIVISION STREET NORTH
KINGSVILLE, ONTARIO
N9Y 1E1

TOWN OF KINGSVILLE
MAYOR: NELSON SANTOS
CLERK: JENNIFER ASTROLOGO
DRAINAGE SUPERINTENDENT: KEN VEGH

DATE: OCTOBER 1st, 2020

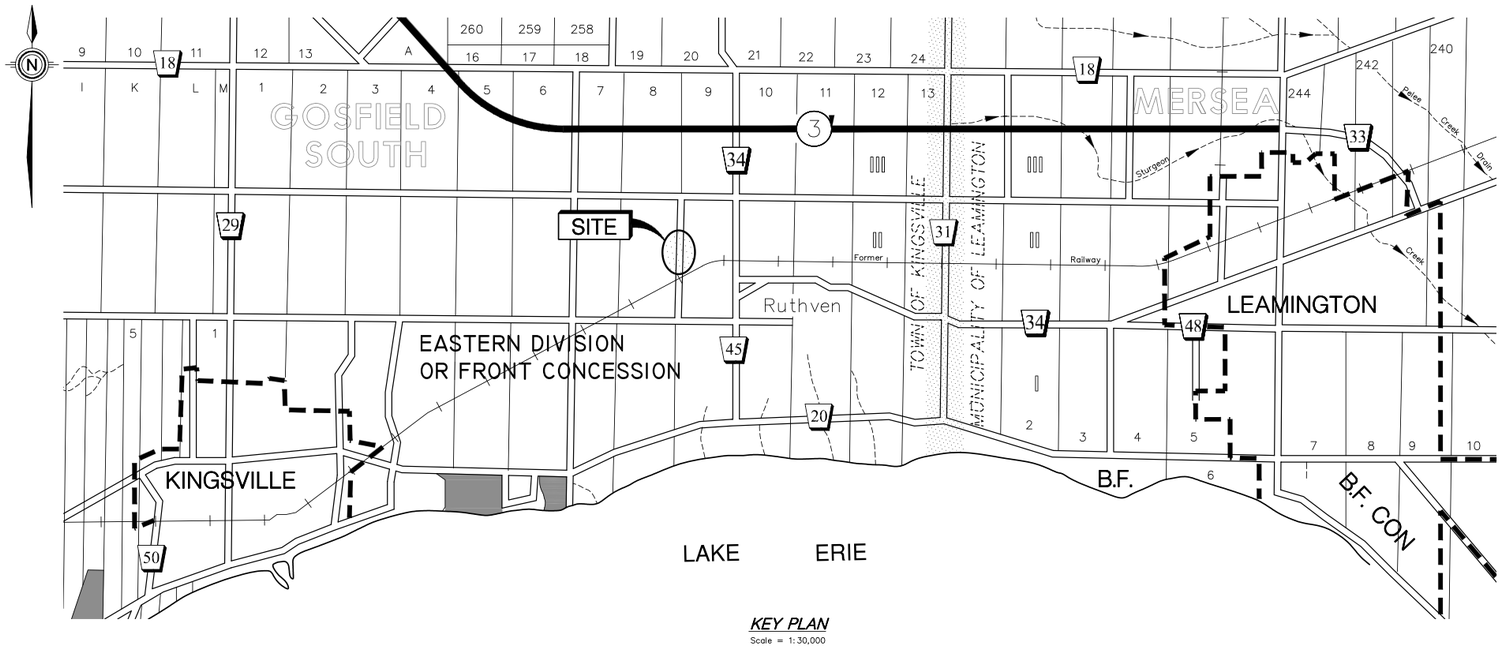
BENCHMARKS:

1. TOP OF WATER METER PIT LOCATED ON THE WEST SIDE OF PETERSON ROAD, ADJACENT TO THE WEST END OF THE PROPOSED ROAD CROSSING ENCLOSURE OF THE DANUBE DRAIN.

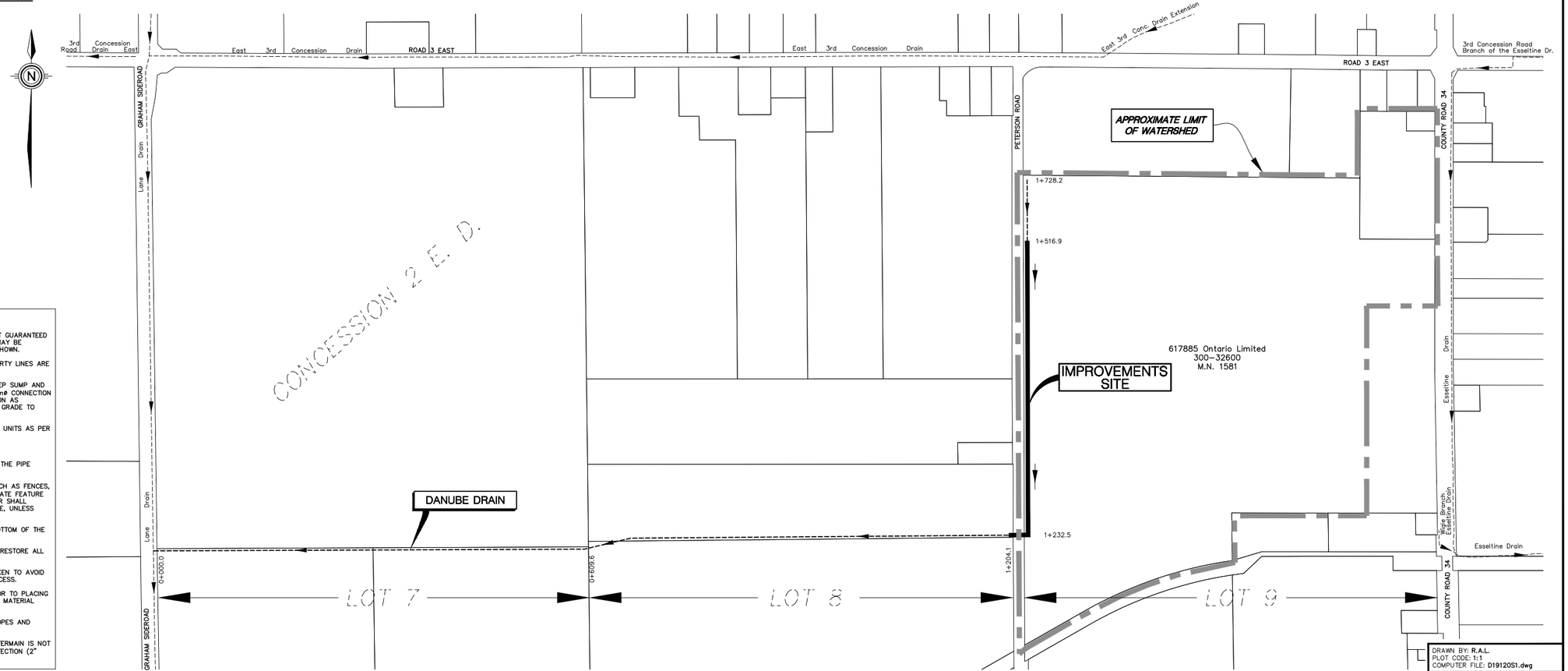
   ELEV. = 203.820m

2. TOP NUT OF EXISTING FIRE HYDRANT LOCATED ON THE WEST SIDE OF PETERSON ROAD, IN FRONT OF M.N. 2031.

   ELEV. = 205.740m



KEY PLAN
Scale = 1:30,000



WATERSHED PLAN
Scale = 1:1,500

THESE DRAWINGS HAVE BEEN REDUCED IN SIZE AND THE SCALE THEREFORE VARIES.
FULL SCALE DRAWINGS CAN BE VIEWED AT THE MUNICIPAL OFFICES IF REQUIRED.

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 ARE BASED ON THE TOWN OF KINGSVILLE GIS DATA.
3. ALL DRAINAGE STRUCTURES ARE TO BE AS SPECIFIED WITH 450mm DEEP SUMP AND CAST IRON FRAME AND GRATE (OPSD – 400.020) WITH MINIMUM 150mmø CONNECTION AT MINIMUM 2.0% SLOPE, UNLESS OTHERWISE NOTED. SET TOP ELEVATION AS PROVIDED AND WITH A MINIMUM 50mm BELOW ADJACENT GROUND AND GRADE TO SUIT.
4. ALL DRAINAGE STRUCTURES SHALL HAVE A MINIMUM OF 3 ADJUSTMENT UNITS AS PER OPSD 704.011.
5. ALL COVERED DRAINS TO HAVE MINIMUM 450mm OF COVER.
6. ENSURE THAT THERE IS A MINIMUM 0.50m VERTICAL SEPARATION WITH THE PIPE LENGTHS CENTERED OVER ANY WATERMAIN OR SANITARY SEWER.
7. CONTRACTOR IS RESPONSIBLE TO PROTECT ALL PRIVATE FEATURES (SUCH AS FENCES, GATES, SPRINKLERS, FLOWER BEDS, ETC.). IN THE EVENT THAT A PRIVATE FEATURE IS IN THE ALIGNMENT OF THE NEW DRAIN ENCLOSURE, THE CONTRACTOR SHALL REMOVE AND RE-INSTALL THE PRIVATE FEATURE TO ITS ORIGINAL STATE, UNLESS OTHERWISE NOTED.
8. THE ALIGNMENT OF THE NEW ENCLOSURE SHALL BE SET WITHIN THE BOTTOM OF THE EXISTING OPEN DRAIN.
9. ALL EXISTING ENCLOSURE PIPE SHALL BE REMOVED AND DISPOSED OF. RESTORE ALL EXISTING DRIVEWAYS WITH FULL GRANULAR BACKFILL.
10. CONTRACTOR SHALL ENSURE THAT PRECAUTIONARY MEASURES ARE TAKEN TO AVOID DAMAGE TO THE NEW ENCLOSURE THROUGHOUT THE INSTALLATION PROCESS.
11. ALL OPEN DRAIN BANKS SHALL BE FULLY BRUSHED AND GRUBBED PRIOR TO PLACING ANY BACKFILL MATERIAL; ALL BANKS SHALL BE FREE OF ANY ORGANIC MATERIAL PRIOR TO BACKFILLING.
12. TOPSOIL SHALL BE PLACED ON ALL NEWLY EXCAVATED SWALE SIDE SLOPES AND DISTURBED BOULEVARD AREAS THAT SHALL BE SEEDED AND MULCHED.
13. WHERE A MINIMUM OF 0.500m OF SEPARATION FROM THE EXISTING WATERMAIN IS NOT ACHIEVABLE, CONTRACTOR SHALL PLACE RIGID STYROFOAM FROST PROTECTION (2" FOR EVERY 300mm OF COVER).

DRAWN BY: R.A.L.
PLOT CODE: 1:1
COMPUTER FILE: D19120S1.dwg

FILE No.: D19-120
SHEET No.: 1 OF 5

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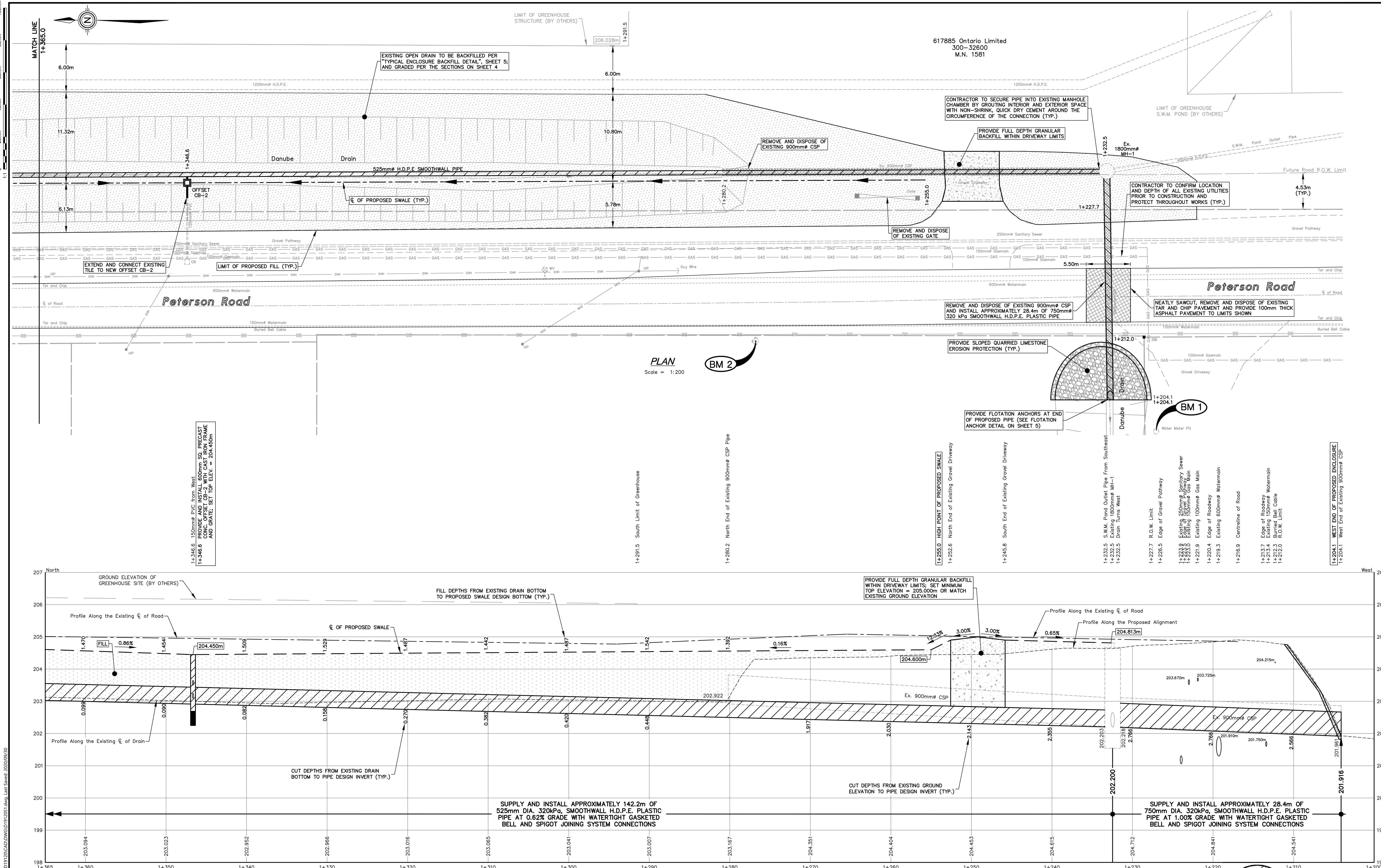
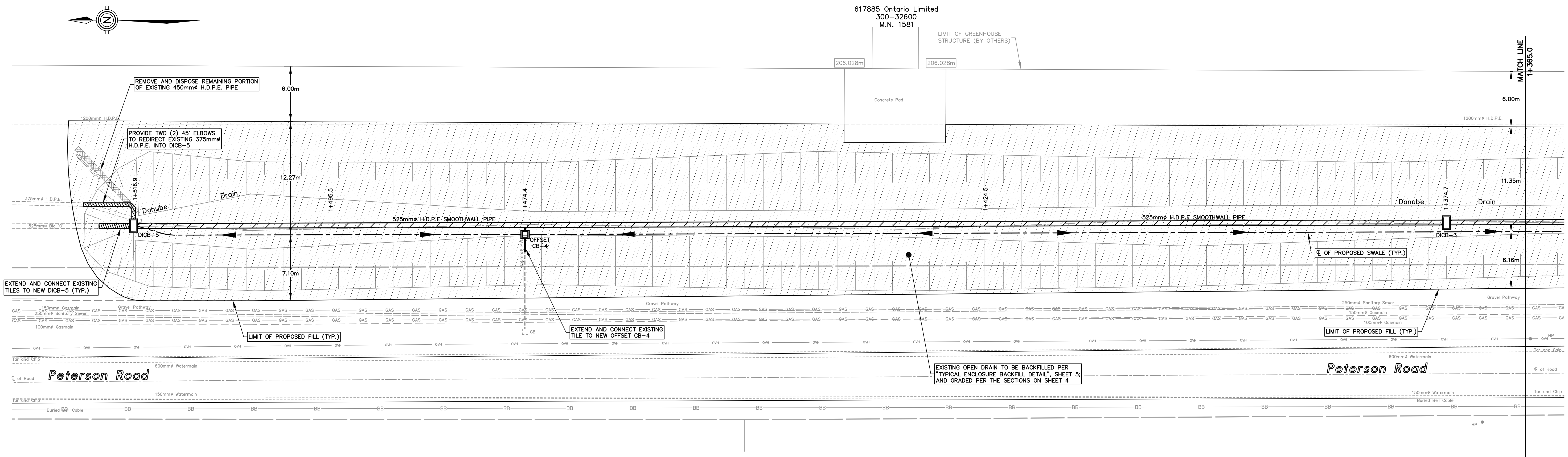

MATCH LINE 1+365.0
617885 Ontario Limited
300-32600
M.N. 1581
LIMIT OF GREENHOUSE STRUCTURE (BY OTHERS)
206.028m
EXISTING OPEN DRAIN TO BE BACKFILLED PER "TYPICAL ENCLOSURE BACKFILL DETAIL", SHEET 5; AND GRADED PER THE SECTIONS ON SHEET 4
CONTRACTOR TO SECURE PIPE INTO EXISTING MANHOLE CHAMBER BY GROUTING INTERIOR AND EXTERIOR SPACE WITH NON-SHRINK, QUICK DRY CEMENT AROUND THE CIRCUMFERENCE OF THE CONNECTION (TYP.)
PROVIDE FULL DEPTH GRANULAR BACKFILL WITHIN DRIVEWAY LIMITS
LIMIT OF GREENHOUSE S.W.M. POND (BY OTHERS)
REMOVE AND DISPOSE OF EXISTING 900mmø CSP
Ex. 1800mmø MH-1
Danube Drain
525mmø H.D.P.E SMOOTHWALL PIPE
OFFSET CB-2
℄ OF PROPOSED SWALE (TYP.)
Future Road R.O.W. Limit
CONTRACTOR TO CONFIRM LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND PROTECT THROUGHOUT WORKS (TYP.)
4.53m (TYP.)
REMOVE AND DISPOSE OF EXISTING GATE
EXTEND AND CONNECT EXISTING TILE TO NEW OFFSET CB-2
LIMIT OF PROPOSED FILL (TYP.)
Peterson Road
REMOVE AND DISPOSE OF EXISTING 900mmø CSP AND INSTALL APPROXIMATELY 28.4m OF 750mmø 320 kPa SMOOTHWALL H.D.P.E. PLASTIC PIPE
NEATLY SAWCUT, REMOVE AND DISPOSE OF EXISTING TAR AND CHIP PAVEMENT AND PROVIDE 100mm THICK ASPHALT PAVEMENT TO LIMITS SHOWN
PROVIDE SLOPED QUARRIED LIMESTONE EROSION PROTECTION (TYP.)
PROVIDE FLOTATION ANCHORS AT END OF PROPOSED PIPE (SEE FLOTATION ANCHOR DETAIL ON SHEET 5)
BM 1
BM 2
PLAN
Scale = 1:200
1+346.6 150mmø PVC from West
1+346.6 PROVIDE AND INSTALL 600mm SQ. PRECAST CONC. OFFSET CB-2 WITH CAST IRON FRAME AND GRATE, SET TOP ELEV. = 204.450m
1+291.5 South Limit of Greenhouse
1+280.2 North End of Existing 900mmø CSP Pipe
1+255.0 HIGH POINT OF PROPOSED SWALE
1+252.6 North End of Existing Gravel Driveway
1+245.8 South End of Existing Gravel Driveway
1+232.5 S.W.M. Pond Outlet Pipe From Southeast
1+232.5 Existing 1800mmø MH-1
1+232.5 Drain Turns West
1+227.7 R.O.W. Limit
1+226.5 Edge of Gravel Pathway
1+221.9 Existing 100mmø Gas Main
1+220.4 Edge of Roadway
1+219.3 Existing 600mmø Watermain
1+216.9 Centreline of Road
1+213.7 Edge of Roadway
1+213.4 Existing 150mmø Watermain
1+212.3 Burried Bell Cable
1+212.0 R.O.W. Limit
1+204.1 WEST END OF PROPOSED ENCLOSURE
1+204.1 West End of Existing 900mmø CSP
GROUND ELEVATION OF GREENHOUSE SITE (BY OTHERS)
FILL DEPTHS FROM EXISTING DRAIN BOTTOM TO PROPOSED SWALE DESIGN BOTTOM (TYP.)
PROVIDE FULL DEPTH GRANULAR BACKFILL WITHIN DRIVEWAY LIMITS; SET MINIMUM TOP ELEVATION = 205.000m OR MATCH EXISTING GROUND ELEVATION
Profile Along the Existing ℄ of Road
Profile Along the Proposed Alignment
℄ OF PROPOSED SWALE
Profile Along the Existing ℄ of Drain
CUT DEPTHS FROM EXISTING DRAIN BOTTOM TO PIPE DESIGN INVERT (TYP.)
CUT DEPTHS FROM EXISTING GROUND ELEVATION TO PIPE DESIGN INVERT (TYP.)
SUPPLY AND INSTALL APPROXIMATELY 142.2m OF 525mm DIA. 320kPa, SMOOTHWALL H.D.P.E. PLASTIC PIPE AT 0.62% GRADE WITH WATERTIGHT GASKETED BELL AND SPIGOT JOINING SYSTEM CONNECTIONS
SUPPLY AND INSTALL APPROXIMATELY 28.4m OF 750mm DIA. 320kPa, SMOOTHWALL H.D.P.E. PLASTIC PIPE AT 1.00% GRADE WITH WATERTIGHT GASKETED BELL AND SPIGOT JOINING SYSTEM CONNECTIONS
PROFILE
Scale = 1:200 (Hor.)
Scale = 1:50 (Ver.)

THESE DRAWINGS HAVE BEEN REDUCED IN SIZE AND THE SCALE THEREFORE VARIES.
FULL SCALE DRAWINGS CAN BE VIEWED AT THE MUNICIPAL OFFICES IF REQUIRED.

LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2020-10-01
PROVINCE OF ONTARIO

DRAWN BY: R.A.L.
PLOT CODE: 1:1
COMPUTER FILE: D19120S1.dwg

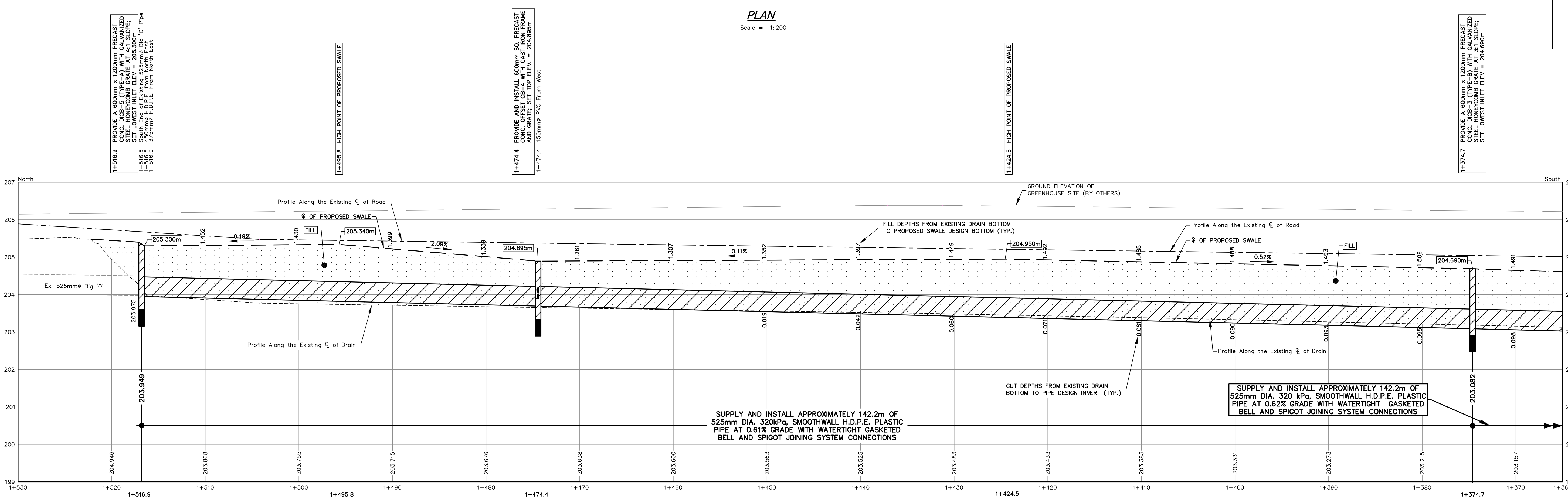
FILE No.:	SHEET No.:
D19-120	2 OF 5



617885 Ontario Limited
300-32600
M.N. 1581
LIMIT OF GREENHOUSE STRUCTURE (BY OTHERS)
MATCH LINE 1+365.0
REMOVE AND DISPOSE REMAINING PORTION OF EXISTING 450mmø H.D.P.E. PIPE
PROVIDE TWO (2) 45° ELBOWS TO REDIRECT EXISTING 375mmø H.D.P.E. INTO DICB-5
Concrete Pad
Danube Drain
525mmø H.D.P.E SMOOTHWALL PIPE
DICB-5
OFFSET CB-4
DICB-3
℄ OF PROPOSED SWALE (TYP.)
EXTEND AND CONNECT EXISTING TILES TO NEW DICB-5 (TYP.)
EXTEND AND CONNECT EXISTING TILE TO NEW OFFSET CB-4
LIMIT OF PROPOSED FILL (TYP.)
EXISTING OPEN DRAIN TO BE BACKFILLED PER "TYPICAL ENCLOSURE BACKFILL DETAIL", SHEET 5; AND GRADED PER THE SECTIONS ON SHEET 4
Peterson Road
6.00m
12.27m
7.10m
11.35m
6.16m
1+516.9
1+495.5
1+474.4
1+424.5
1+374.7

PLAN

Scale = 1:200



1+516.9 PROVIDE A 600mm x 1200mm PRECAST CONC. DICB-5 (TYPE-A) WITH GALVANIZED STEEL HONEYCOMB GRATE AT 4:1 SLOPE; SET LOWEST INLET ELEV = 205.300m
1+495.8 HIGH POINT OF PROPOSED SWALE
1+474.4 PROVIDE AND INSTALL 600mm SQ. PRECAST CONC. OFFSET CB-4 WITH CAST IRON FRAME AND GRATE; SET TOP ELEV. = 204.895m
1+474.4 150mmø PVC From West
1+424.5 HIGH POINT OF PROPOSED SWALE
1+374.7 PROVIDE A 600mm x 1200mm PRECAST CONC. DICB-3 (TYPE-B) WITH GALVANIZED STEEL HONEYCOMB GRATE AT 3:1 SLOPE; SET LOWEST INLET ELEV = 204.690m
North
South
Profile Along the Existing ℄ of Road
℄ OF PROPOSED SWALE
GROUND ELEVATION OF GREENHOUSE SITE (BY OTHERS)
FILL DEPTHS FROM EXISTING DRAIN BOTTOM TO PROPOSED SWALE DESIGN BOTTOM (TYP.)
FILL
205.300m
205.340m
204.895m
204.950m
204.690m
0.19%
2.09%
0.11%
0.52%
Ex. 525mmø Big 'O'
Profile Along the Existing ℄ of Drain
CUT DEPTHS FROM EXISTING DRAIN BOTTOM TO PIPE DESIGN INVERT (TYP.)
SUPPLY AND INSTALL APPROXIMATELY 142.2m OF 525mm DIA. 320kPa, SMOOTHWALL H.D.P.E. PLASTIC PIPE AT 0.61% GRADE WITH WATERTIGHT GASKETED BELL AND SPIGOT JOINING SYSTEM CONNECTIONS
SUPPLY AND INSTALL APPROXIMATELY 142.2m OF 525mm DIA. 320 kPa, SMOOTHWALL H.D.P.E. PLASTIC PIPE AT 0.62% GRADE WITH WATERTIGHT GASKETED BELL AND SPIGOT JOINING SYSTEM CONNECTIONS
203.949
203.082
1+530
1+520
1+516.9
1+510
1+500
1+495.8
1+490
1+480
1+474.4
1+470
1+460
1+450
1+440
1+430
1+424.5
1+420
1+410
1+400
1+390
1+380
1+374.7
1+370
1+365

PROFILE

Scale = 1:200 (Hor.)
Scale = 1:50 (Ver.)

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LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2020-10-01
PROVINCE OF ONTARIO

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D19-120	3 OF 5

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FILE No.: D19-120

SHEET No.: 4 OF 5

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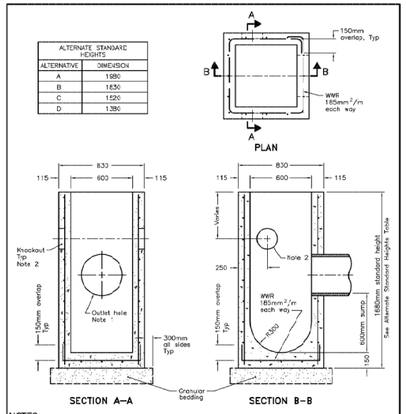
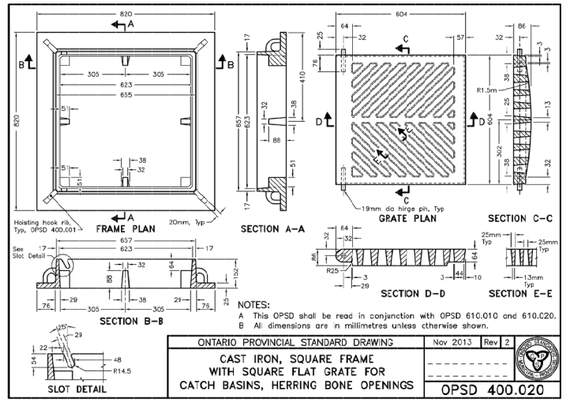
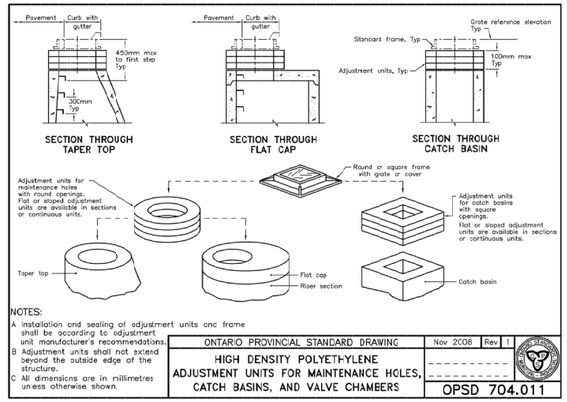
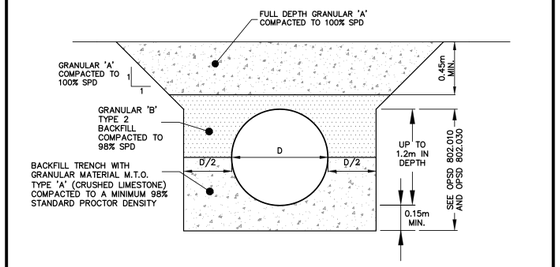
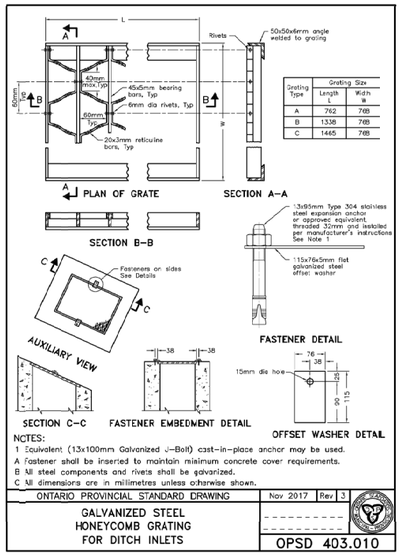


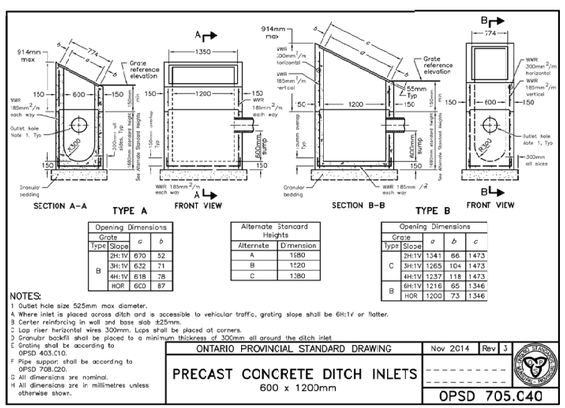


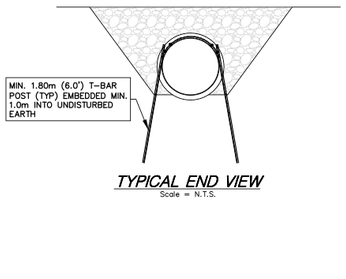




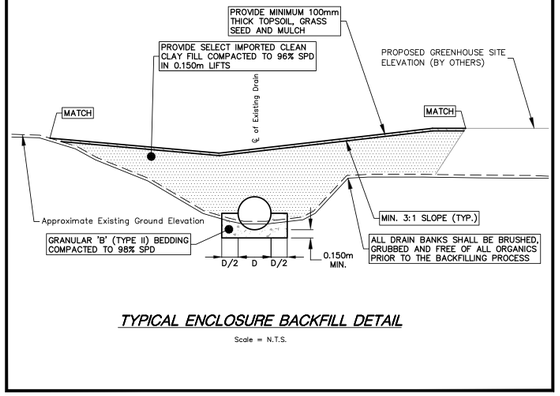
TYPICAL DRIVEWAY BACKFILL DETAIL
Scale = N.T.S.







FLOTATION ANCHOR DETAILS



TYPICAL ENCLOSURE BACKFILL DETAIL
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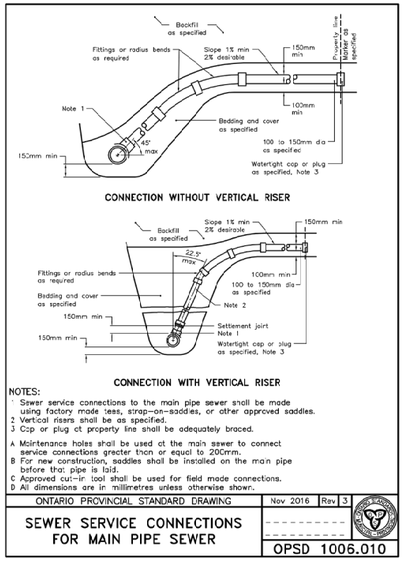

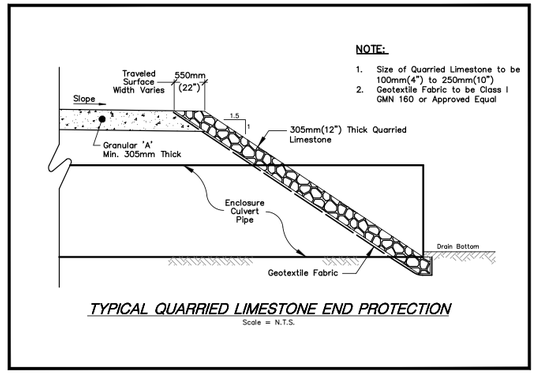

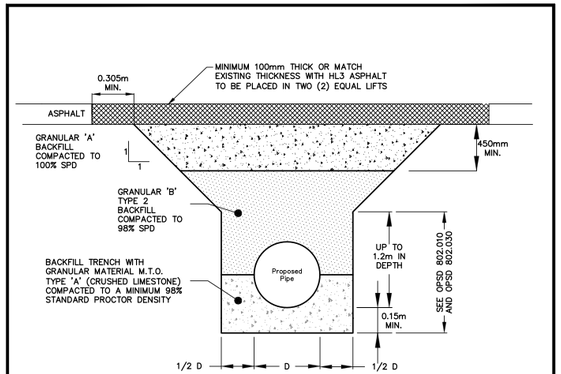

ROADWAY CROSSING BACKFILL DETAIL
Scale = N.T.S.

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LICENSED PROFESSIONAL ENGINEER
A. B. PERALTA
100138683
2020-10-20
PROVINCE OF ONTARIO

DRAWN BY: R.A.L.
PLOT CODE: 1:1
COMPUTER FILE: D19120S1.dwg
FILE No.: D19-120
SHEET No.: 5 OF 5

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