

**DRAINAGE REPORT
FOR THE**

**WALLACE FOX DRAIN
(KING'S HIGHWAY NO. 3 CULVERT
EXTENSION)**

**FORMER TOWNSHIP OF GOSFIELD SOUTH
TOWN OF KINGSVILLE**



FINAL REPORT
8 NOVEMBER 2023
TIM R. OLIVER, P. ENG.
FILE No. 21-3142

File No. 21-3142

Members of Council
Town of Kingsville
2021 Division Road North
Kingsville, Ontario
N9Y 2Y9

**Drainage Report for the
WALLACE FOX DRAIN
(KING'S HIGHWAY NO. 3 CULVERT EXTENSION)
Former Township of Gosfield South
Now In the Town of Kingsville**

Mayor and Members of Council:

Instructions

The Municipality received a request from the Ministry of Transportation Ontario on 10 July 2023, for the extension of the King's Highway No. 3 culvert over the Wallace Fox Drain. The proposed drainage works are required to facilitate the King's Highway No. 3 Widening on 10 July, 2023. Council accepted the request under Section 78(5) of the Drainage Act for minor improvements to a drainage works and on 14 August, 2023 appointed Dillon Consulting Limited to prepare a report.

Ontario Regulation 500/21

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

Watershed Description

The Wallace Fox Drain consists of an open drain commencing near the middle of the east half of Lot 6, Concession 3. It flows westerly for a distance of approximately 2985 meters, then turns southerly and then turns west where it outlets into the Division Road Drain. The upstream drainage area for the said highway culvert is approximately 45 hectares (101 acres). The surficial soils are predominately Parkhill Loam – Red Sand Spot Phase which is defined as having fair to poor natural drainage.

Drain History

The recent history of Engineers' reports for the Wallace Fox Drain follows:

- **14 September 1990 Lou Zarlenga, P.Eng.:** The report recommended the repair and improvement of the entire drain to re-establish the proper grade and reconstructing headwalls on two access culverts. This serves as the current report for the drain and is governed under the by-law.
- **5 May 1981 William J. Settingington, P.Eng.:** The report was prepared for re-alignment for the part of the Wallace Fox drain that intersects with the proposed Kings Highway No. 3. The report and accompanying drawings outline the drain



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realignment and abandoning of sections of the drain within the Kings Highway No. 3 Right of-Way.

Survey

Our survey and examination of the Wallace Fox Drain was carried out in September 2023. The survey comprised the recording of topographic data and examining the channel for available depth necessary to provide sufficient drainage.

Design Considerations

The size of the culvert extension is to match the existing culvert opening dimension, being 1830 mm span x 1220 mm rise concrete culvert using an 1830 mm span x 1220 mm rise concrete culvert supported on footings 32.3 m in length and embedded sufficiently so that the footings are not exposed above the design drain bottom. The upstream extension is a similar 1830 mm x 1220 mm culvert and is 8.8 m in length both to accommodate road widening and construction of the new east bound lanes for the King's Highway No. 3 by-pass. Both ends of the culvert shall consist of gabion basket headwalls. Beyond the headwalls, the disturbed drain channel section shall be lined with R-50 riprap, minimum 350 mm thickness for a minimum distance of 5 metres.

The MTO design criteria for rural arterial road culverts is to convey a 1 in 25 year event such that approximately 1 metre of freeboard is provided from the high water level to the edge of the travelled lane. This criterion was used to assess the affects the culvert extensions may have on the upstream high water level. The highway culvert is located near the head of the Wallace Fox Drain.

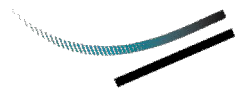
A Drainage, Hydrology/Hydraulics and Stormwater Management Report was completed by Dillon Consulting Limited (October 2023) to document the expected high water levels in the drain upstream in both an existing and proposed condition. The report identified that the existing culvert currently does not meet the MTO freeboard design criteria, and that the high water level is dependent on tailwater condition created by the limited capacity of the downstream Division Road Drain, and not the size of the culvert. To achieve MTO's freeboard design criteria, the road elevation would need to be raised, which MTO has expressed to not be economically feasible. Extension of the culvert was found to have a negligible increase in the 25 year storm water elevation upstream.

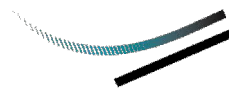
Allowances

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

Recommendations and Cost Estimate

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





Item	Description	Amount
<u>CULVERT WORKS</u>		
1.	Road Culvert Extension Work, as follows:	
	a) <u>Downstream Culvert Extension (King's Highway No. 3)</u> – Supply and installation of a new 32.3 m long open footing concrete culvert 1830 mm x 1220 mm connected to the existing culvert with flush end, complete with skewed outlet end, waterproofing membrane and protection board, including a 100 mm concrete mud slab, compacted Granular 'A' bedding (min. 300 mm thickness), compacted full Granular 'B' Type II backfill up to road subgrade, gabion basket headwall and R-50 riprap within the drain channel beyond fully lined for a minimum 5 m distance and minimum 350 mm thickness. Work to include fine grading, seeding and restoration of all disturbed areas. The work shall also include drain bottom cleanout and the flushing and cleaning of the existing 30.4m long culvert and the removal off-site of excess materials not suitable for culvert backfill.	\$280,000.00
	b) <u>Upstream Culvert Extension (King's Highway No. 3)</u> – Supply and installation of a new 8.8 m long open footing concrete culvert 1830 mm x 1220 mm connected to the existing culvert with skewed end, complete with skewed inlet end, waterproofing membrane and protection board, including a 100 mm concrete mud slab, compacted Granular 'A' bedding (min. 300 mm thickness), compacted full Granular 'B' Type II backfill up to road subgrade, gabion basket headwall and R-50 riprap within the drain channel beyond fully lined for a minimum 5 m distance and minimum 350 mm thickness. Work to include fine grading, seeding and restoration of all disturbed areas. The work shall also include drain bottom cleanout between the highway culvert and the north property limit of the highway and the removal off-site of excess materials not suitable for culvert backfill.	\$90,000.00
2.	Temporary silt control measures during construction.	\$5,000.00
SUB-TOTAL		\$375,000.00
3.	Report, Assessments and Final Inspection.	\$9,500.00
4.	Expenses and Incidentals.	\$500.00
TOTAL ESTIMATE – WALLACE FOX DRAIN (excluding Net HST)		\$385,000.00

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



We further recommend the King's Highway No. 3 culvert extension be incorporated as part of the Wallace Fox Drain.

Assessment of Costs

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

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

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

Assessment Rationale

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

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

1. As the culvert works are only required for the proposed highway widening, we have assessed 100% of the costs to the Ministry of Transportation Ontario in accordance with Section 26 of the Drainage Act as a non-proratable assessment.

Future Maintenance

After completion, the road culvert shall be maintained by the Ministry of Transportation Ontario for 100% of the costs, subject of course, to any variations that may be made under the authority of the Drainage Act.

Drawings and Specifications

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

Page 1 of 2 – Culvert Extension Plan

Page 2 of 2 – Culvert Extension Details

Construction Drawings and Specifications

The work included in this report will be performed under the provincial contract for the Widening of King's Highway No. 3 starting from 0.8 km west of Cameron Side Road and continuing easterly to 1.8 km west of County Road No. 31. Culvert drawings have been prepared for the construction complete with associated specifications which shall adhere to the

elevations, alignment, sizes, materials and location, and generally in compliance with this report.

Approvals

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

Agency Review

The Essex Region Conservation Authority (ERCA) has been previously notified and provided the opportunity to review the proposed drainage works outlined within a draft report dated October 30, 2023. An application for permit and associated fee payment is not required for provincial undertakings. The Town of Kingsville will subsequently give notice to ERCA and other prescribed persons of an upcoming meeting of Council that will consider and adopt the final report, at which time this meeting is an opportunity to provide input.

In 2021, a Fish and Fish Habitat Impact assessment was undertaken to identify the impacts of the approved improvements to fish and fish habitat within the Highway 3 Study Area. The assessment was completed in accordance with the requirements of the Interim 2020 *MTO/DFO/NDMNR Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings, Version 4* (Fisheries Protocol) and the guidance provided in MTO's (2020) *Interim Environmental Guide for Fish and Fish Habitat* (Fish Guide).

As per the direction received from Mr. Chris Evans, Environmental Planner MTO, all documentation (i.e., forms and templates) has been prepared so as to be in compliance with the Interim Fish Guide (April 2020). The *Fish and Fish Habitat Existing Conditions and Impact Assessment Report, Highway 3 Widening and Safety Enhancement Study* (GHD, July 2021) provides the impact analysis.

The Wallace Fox Drain was identified to support direct fish habitat and the culvert replacements and extensions are not likely to result in the death of fish or harmful alteration, disruption or destruction (HADD) of fish habitat.

Respectfully submitted,



DILLON CONSULTING LIMITED

Tim R. Oliver, P.Eng.

TRO:sjc



"SCHEDULE C"
SCHEDULE OF ASSESSMENT
WALLACE FOX DRAIN - KING'S HIGHWAY NO. 3 CULVERT EXTENSION
TOWN OF KINGSVILLE

SECTION 26 INCREASED COSTS - NON PRO-RATABLE

Description	Owner	Special Benefit	Benefit	Outlet	Total Assessment
King's Highway No. 3	Ministry of Transportation Ontario	\$385,000.00	\$0.00	\$0.00	\$385,000.00
Total Section 26 Increased Costs (Non Pro-ratable)		\$385,000.00	\$0.00	\$0.00	\$385,000.00
TOTAL ASSESSMENT		\$385,000.00	\$0.00	\$0.00	\$385,000.00

“SCHEDULE F”
DRAINAGE REPORT FOR THE
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TOWN OF KINGSVILLE

SPECIAL PROVISIONS - GENERAL

1.0 GENERAL SPECIFICATIONS

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

2.0 DESCRIPTION OF WORK

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

CULVERT WORKS

- Road Culvert Extension Work, as follows:
 - Downstream Culvert Extension (King’s Highway No. 3) – Supply and installation of a new 32.3 m long open footing concrete culvert 1830 mm x 1220 mm connected to the existing culvert with flush end, complete with skewed outlet end, waterproofing membrane and protection board, including a 100 mm concrete mud slab, compacted Granular ‘A’ bedding (min. 300 mm thickness), compacted full Granular ‘B’ Type II backfill up to road subgrade, gabion basket headwall and R-50 riprap within the drain channel beyond fully lined for a minimum 5 m distance and minimum 350 mm thickness. Work to include fine grading, seeding and restoration of all disturbed areas. The work shall also include drain bottom cleanout and the flushing and cleaning of the existing 30.4m long culvert and the removal off-site of excess materials not suitable for culvert backfill.
 - Upstream Culvert Extension (King’s Highway No. 3) – Supply and installation of a new 8.8 m long open footing concrete culvert 1830 mm x 1220 mm connected to the existing culvert with skewed end, complete with skewed inlet end, waterproofing membrane and protection board, including a 100 mm concrete mud slab, compacted Granular ‘A’ bedding (min. 300 mm thickness), compacted full Granular ‘B’ Type II backfill up to road subgrade, gabion basket headwall and R-50 riprap within the drain channel beyond fully lined for a minimum 5 m distance and minimum 350 mm thickness. Work to include fine grading, seeding and restoration of all disturbed areas. The work shall also include drain bottom cleanout between the highway culvert and the north property limit of the highway and the removal off-site of excess materials not suitable for culvert backfill.
- Temporary silt control measures during construction.

3.0 ACCESS TO THE WORK

Access to the drain shall be from the King's Highway No. 3 right-of-way. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. All grass areas disturbed shall be restored to original conditions at the Contractor's expense.

4.0 WORKING AREA

The working area for both construction and future maintenance purposes shall be restricted to the road right-of-way. **Any damages to lands and/or roads from the Contractor's work within the working areas for the new culvert site shall be rectified to pre-existing conditions at his/her expense.**

5.0 ROAD CULVERT EXTENSION CONSTRUCTION

5.1 Location

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

5.2 Materials

Materials shall be as follows:

<i>Downstream Culvert Extension</i>	<i>New 32.3 m long, 1830 mm x 1220 mm reinforced concrete open footing culvert per OPSS 1821 or CHBDC CAN/CSA S6-06 standards where applicable.</i>
<i>Upstream Culvert Extension</i>	<i>New 8.8 m long, 1830 mm x 1220 mm reinforced concrete open footing culvert per OPSS 1821 or CHBDC CAN/CSA S6-06 standards where applicable.</i>
<i>Culvert Bedding Below Culvert</i>	<i>Granular 'A' conforming to OPSS Division 10.</i>
<i>Culvert Backfill</i>	<i>Granular 'B' conforming to OPSS Division 10.</i>
<i>Erosion Stone</i>	<i>All stone to be used for erosion protection shall be R-50 clear quarried rock or OPSS 1004, minimum 350 mm thickness.</i>
<i>Filter Fabric</i>	<i>"Non-Woven" geotextile filter fabric with a minimum strength equal or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC, or approved equivalent.</i>

5.3 Culvert Installation

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

5.4 Gabion Basket End Protection

Gabion baskets shall be manufactured from galvanized steel wire mesh or PVC coated galvanized steel wire mesh as specified in the Contract Documents. When the type of mesh is not specified in the Contract Documents, the gabion baskets shall be manufactured from PVC coated galvanized steel wire mesh.

Gabion baskets shall be manufactured so that the sides, ends, lid, base, and diaphragms can be readily assembled into rectangular units.

Where the length of the gabion basket exceeds its horizontal width, the gabion basket shall be divided into equal cells by diaphragms. Cell length shall not exceed its horizontal width. Diaphragms shall be made of wire mesh and shall be secured in the proper position on the base section. Gabion baskets shall be manufactured with all components connected at the production facility with the exception of the gabion mat lid. Gabion baskets manufactured from galvanized wire mesh shall be assembled using either lacing wire or fasteners. Gabion baskets manufactured from PVC coated galvanized wire mesh shall be assembled using stainless steel ring fasteners. Fasteners shall be installed at a maximum spacing of 150 mm with at least one fastener per gabion mesh opening.

Gabion baskets shall be according to OPSS 1430.

Gabion stones shall be according to OPSS 1004 and as specified in the Contract Documents.

Excavation for gabions shall be according to OPSS 206.

Bedding and backfill shall be as specified in the Contract Documents.

Gabions shall be installed at the locations and to the line, grade, and dimensions specified in the Contract Documents.

Gabions shall be assembled according to the manufacturer's instructions and as specified in the Contract Documents.

Gabions shall be assembled so that wire ends do not project outside the units on any exposed surface.

Gabion stones shall be placed in a manner as not to damage the wire mesh or the PVC coating on the wire or cause deformation of the gabion. Gabion stones shall be placed to minimize the voids between the stones. When specified in the Contract Documents, the front face of exposed wall surfaces shall be hand placed gabion stone to ensure a uniform appearance.

Prior to securing the lids on the gabion basket, the gabion basket shall be slightly overfilled by 25 to 50 mm of gabion stone in order to allow for settlement of the stone within the units.

Internal connecting wires shall be installed according to the manufacturer's recommendations. When gabions are used as a channeling revetment, internal connecting wires are not necessary.

When the gabion has been filled, the gabion lid shall be bent over until all lid edges coincide with the front and side edges of the gabion and shall be secured to the front and sides by wire according to manufacturer's instructions and as specified in the Contract Documents.

Geotextile shall be placed uniformly, free of folds, tears or punctures and as specified in the Contract Documents. The geotextile shall be joined so that the material overlaps a minimum of 500 mm and shall be pinned together. Alternatively, the geotextile shall be joined to conform to the seam requirements of OPSS 1860. Geotextile shall be fixed to prevent movement during installation.

5.5 Erosion Protection

Erosion protection within the drain channel shall be constructed of quarry stone riprap (R50), as shown on the drawings and as specified hereto. The size of the riprap shall mostly vary between 150 mm and 250 mm in diameter. The riprap shall be sloped 1 vertical to 1.5 horizontal, with a filter fabric underlay and spanning across the entire width of the drain for a minimum 5.0 m distance beyond the end of the culvert. The minimum thickness requirement of the erosion stone layer is 350 mm with no portion of the filter fabric to be exposed.

5.6 Lateral Tile Drains

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

5.7 Seeding

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

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

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

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

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

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

5.8 Site Cleanup and Restoration

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

GENERAL SPECIFICATIONS

1.0 AGREEMENT AND GENERAL CONDITIONS

The part of the Specifications headed "Special Provisions" which is attached hereto forms part of this Specification and is to be read with it. Where there is any difference between the requirements of this General Specification and those of the Special Provisions, the Special Provisions shall govern.

Where the word "Drainage Superintendent" is used in this specification, it shall mean the person or persons appointed by the Council of the Municipality having jurisdiction to superintend the work.

Tenders will be received and contracts awarded only in the form of a lump sum contract for the completion of the whole work or of specified sections thereof. The Tenderer agrees to enter into a formal contract with the Municipality upon acceptance of the tender. The General Conditions of the contract and Form of Agreement shall be those of the Stipulated Price Contract CCDC2-Engineers, 1994 or the most recent revision of this document.

2.0 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Each tenderer must visit the site and review the plans and specifications before submitting his/her tender and must satisfy himself/herself as to the extent of the work and local conditions to be met during the construction. Claims made at any time after submission of his/her tender that there was any misunderstanding of the terms and conditions of the contract relating to site conditions, will not be allowed. The Contractor will be at liberty, before bidding to examine any data in the possession of the Municipality or of the Engineer.

The quantities shown or indicated on the drawings or in the report are estimates only and are for the sole purpose of indicating to the tenderers the general magnitude of the work. The tenderer is responsible for checking the quantities for accuracy prior to submitting his/her tender.

3.0 MAINTENANCE PERIOD

The successful Tenderer shall guarantee the work for a period of one (1) year from the date of acceptance thereof from deficiencies that, in the opinion of the Engineer, were caused by faulty workmanship or materials. The successful Tenderer shall, at his/her own expense, make good and repair deficiencies and every part thereof, all to the satisfaction of the Engineer. Should the successful Tenderer for any cause, fail to do so, then the Municipality may do so and employ such other person or persons as the Engineer may deem proper to make such repairs or do such work, and the whole costs, charges and expense so incurred may be deducted from any amount due to the Tenderer or may be collected otherwise by the Municipality from the Tenderer.

4.0 GENERAL CO-ORDINATION

The Contractor shall be responsible for the coordination between the working forces of other organizations and utility companies in connection with this work. The Contractor shall have no cause of action against the Municipality or the Engineer for delays based on the allegation that the site of the work was not made available to him by the Municipality or the Engineer by reason of the acts, omissions, misfeasance or non-feasance of other organizations or utility companies engaged in other work.

5.0 RESPONSIBILITY FOR DAMAGES TO UTILITIES

The Contractor shall note that overhead and underground utilities such as hydro, gas, telephone and water are not necessarily shown on the drawings. It is the Contractor's responsibility to contact utility companies for information regarding utilities, to exercise the necessary care in construction operations and to take other precautions to safeguard the utilities from damage.

All work on or adjacent to any utility, pipeline, railway, etc., is to be carried out in accordance with the requirements of the utility, pipeline, railway, or other, as the case may be, and its specifications for such work are to be followed as if they were part of this specification. The Contractor will be liable for any damage to utilities.

6.0 CONTRACTOR'S LIABILITY

The Contractor, his/her agents and all workmen or persons under his/her control including sub-contractors, shall use due care that no person or property is injured and that no rights are infringed in the prosecution of the work. The Contractor shall be solely responsible for all damages, by whomsoever claimable, in respect to any injury to persons or property of whatever description and in respect of any infringement of any right, privilege or easement whatever, occasioned in the carrying on of the work, or by any neglect on the Contractor's part.

The Contractor, shall indemnify and hold harmless the Municipality and the Engineer, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the contract.

7.0 PROPERTY BARS AND SURVEY MONUMENTS

The Contractor shall be responsible for marking and protecting all property bars and survey monuments during construction. All missing, disturbed or damaged property bars and survey monuments shall be replaced at the Contractor's expense, by an Ontario Land Surveyor.

8.0 MAINTENANCE OF FLOW

The Contractor shall, at his/her own cost and expense, permanently provide for and maintain the flow of all drains, ditches and water courses that may be encountered during the progress of the work.

9.0 ONTARIO PROVINCIAL STANDARDS

Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) shall apply and govern at all times unless otherwise amended or extended in these Specifications or on the Drawing. Access to the electronic version of the Ontario Provincial Standards is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web go to <http://www.mto.gov.on.ca/english/transrd/>. Under the title Technical Manuals is a link to the Ontario Provincial Standards. Users require Adobe Acrobat to view all pdf files.

10.0 APPROVALS, PERMITS AND NOTICES

The construction of the works and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced in this Contract. The Contractor shall obtain all approvals and permits and notify the affected authorities when carrying out work in the vicinity of any public utility, power, underground cables, railways, etc.

11.0 TRAFFIC CONTROL

The Contractor will be required to control vehicular and pedestrian traffic along roads at all times and shall, at his/her own expense, provide for placing and maintaining such barricades, signs, flags, lights and flag persons as may be required to ensure public safety. The Contractor will be solely responsible for controlling traffic and shall appoint a representative to maintain the signs and warning lights at night, on weekends and holidays and at all other times that work is not in progress. All traffic control during construction shall be strictly in accordance with the **Occupational Health and Safety Act** and the current version of the **Ontario Traffic Manuals**. Access to the electronic version of the **Ontario Traffic Manual** is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web go to <http://www.mto.gov.on.ca/english/transrd/>, click on "Library Catalogue," under the "Title," enter "Ontario Traffic Manual" as the search. Open the applicable "Manual(s)" by choosing the "Access

Key," once open look for the "Attachment," click the pdf file. Users require Adobe Acrobat to view all pdf files.

Contractors are reminded of the requirements of the Occupational Health and Safety Act pertaining to Traffic Protection Plans for workers and Traffic Control Plan for Public Safety.

12.0 SITE CLEANUP AND RESTORATION

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

13.0 UTILITY RELOCATION WORKS

In accordance with Section 26 of the Drainage Act, if utilities are encountered during the installation of the drainage works that conflict with the placement of the new culvert, the operating utility company shall relocate the utility at their own costs. The Contractor however will be responsible to co-ordinate these required relocations (if any) and their co-ordination work shall be considered incidental to the drainage works.

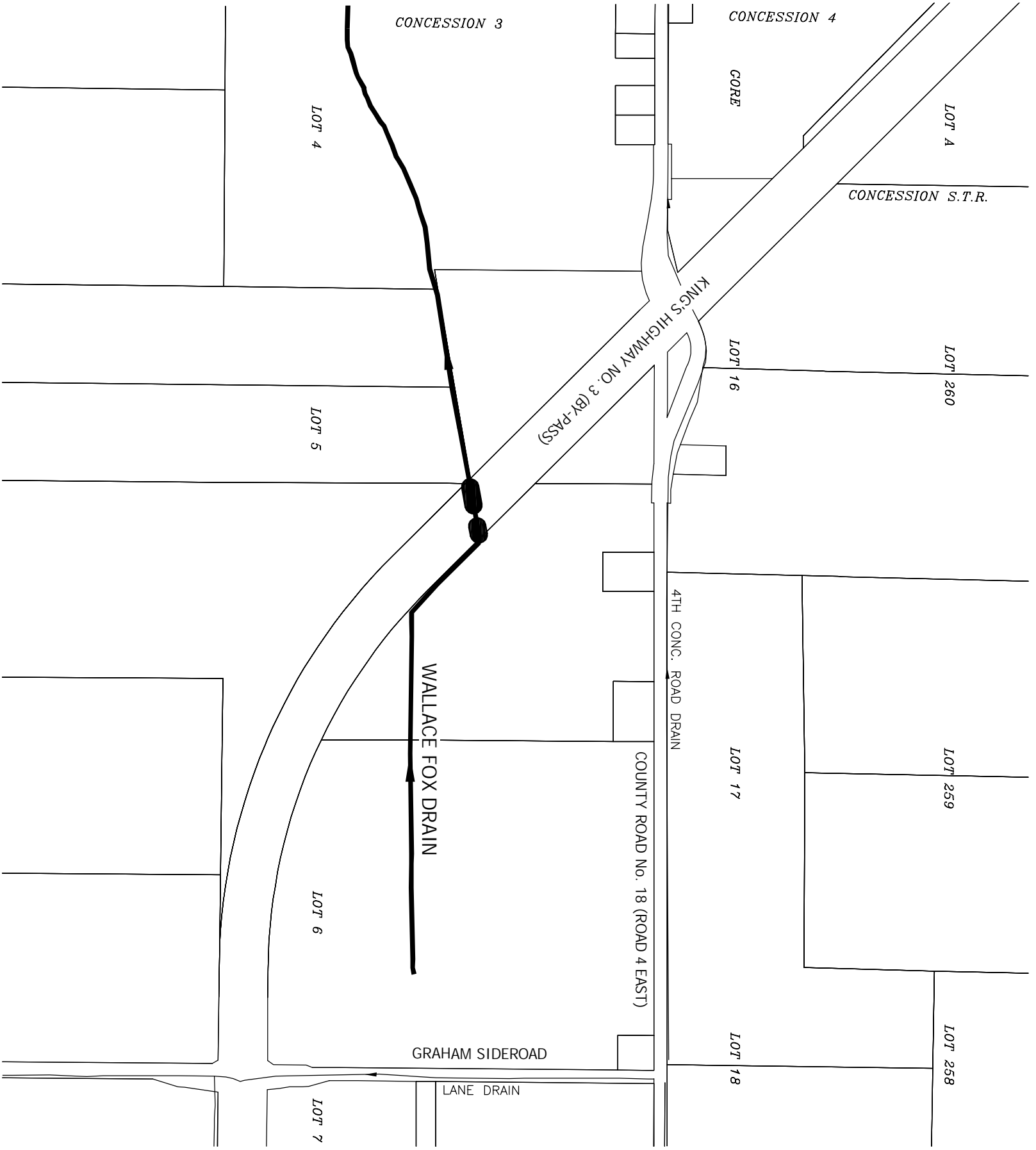
14.0 FINAL INSPECTION

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

Final inspection will be made by the Engineer within 20 days after the Drainage Superintendent has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

15.0 FISHERIES CONCERNS

Standard practices to be followed to minimize disruption to fish habitat include embedment of the culvert a minimum 10% below grade, constructing the work 'in the dry' and cutting only trees necessary to do the work (no clear-cutting). No in-water work is to occur during the timing window unless otherwise approved by the appropriate authorities.



PLAN
SCALE=1:7,500



PLAN
NORTH

Conditions of Use

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No.	ISSUED FOR	DATE	BY
1	CLIENT REVIEW	OCT. 30/23	TRO
2	FINAL REPORT SUBMISSION	NOV. 8/23	TRO

DESIGN	REVIEWED BY
OEM	MDH
DRAWN: SJC	CHECKED BY: TRO
DATE: November 8, 2023	SCALE: AS SHOWN

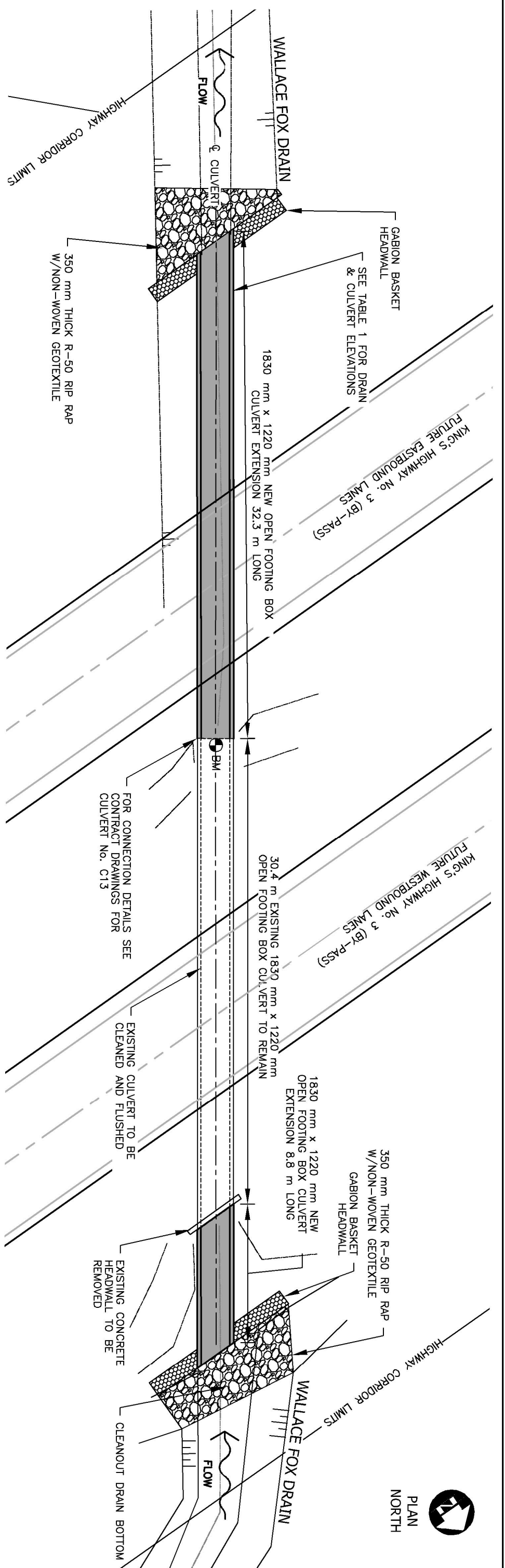
DILLON CONSULTING

PROJECT NO. 21-3142
DRAWING SCALES BASED ON A 11 X 17 SHEET

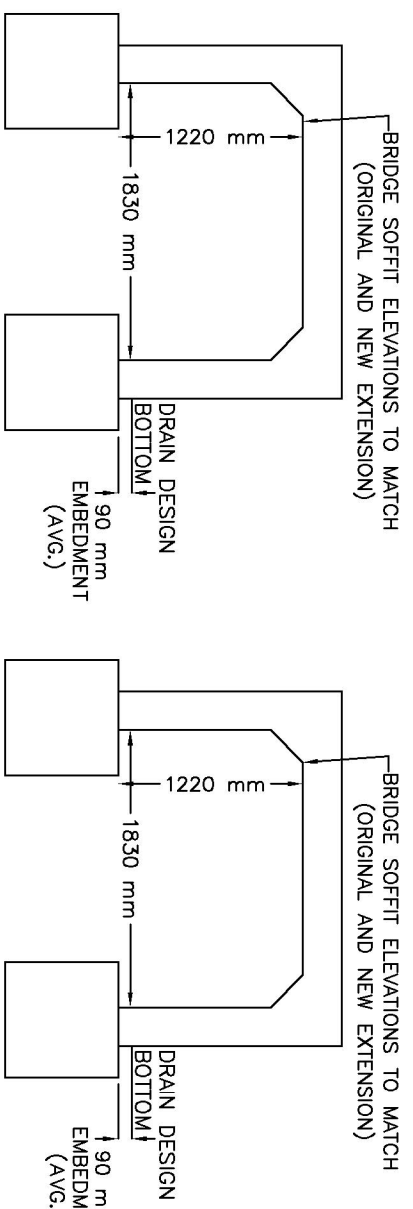
SCHEDULE G'
Drainage Report for the
WALLACE FOX DRAIN
(King's Highway No. 3 Culvert Extension)
Town of Kingsville

SHEET TITLE
CULVERT EXTENSION PLAN

PAGE NO. 1 OF 2



CULVERT EXTENSION DETAIL
SCALE=1:250



SITE BENCHMARK ● BM
BM - TOP OF SOUTH END OF EX. KING'S HIGHWAY No. 3 CULVERT AT THE CENTRELINE OF THE DRAIN
ELEVATION=199.84m

NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.

DESCRIPTION	EXISTING CULVERT	DOWNSTREAM EXTENSION	UPSTREAM EXTENSION
TOP OF FOOTING ELEV. U/S SIDE(m)	198.42	198.41	198.45
TOP OF FOOTING ELEV. D/S SIDE(m)	198.41	198.37	198.42
DRAIN BOTTOM (m) (DESIGN) (AT U/S SIDE OF CULVERT)	198.51	198.50	198.54
DRAIN BOTTOM (m) (DESIGN) (AT D/S SIDE OF CULVERT)	198.50	198.46	198.51
MIN. CULVERT GRADE (%)	0.12	0.12	0.12
CULVERT TYPE	BOX CULVERT	BOX CULVERT	BOX CULVERT
CULVERT MATERIAL	CONC. RFO	CONC. RFO	CONC. RFO
CULVERT LENGTH (m)	30.4	32.3	8.8
CULVERT SIZE (mm)	1830x1220	1830x1220	1830x1220
CULVERT ENDWALL TYPE	CONCRETE	GABION BASKETS	GABION BASKETS

DOWNSTREAM CULVERT EXTENSION
CROSS SECTION
N.T.S.

UPSTREAM CULVERT EXTENSION
CROSS SECTION
N.T.S.



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No.	ISSUED FOR	DATE	BY
1	CLIENT REVIEW	OCT. 30/23	TRO
2	FINAL REPORT SUBMISSION	NOV. 8/23	TRO

SCHEDULE G:

Drainage Report for the
WALLACE FOX DRAIN
(King's Highway No. 3 Culvert Extension)
Town of Kingsville

DESIGN: OEM
DRAWN: SIC
CHECKED BY: TRO
REVIEWED BY: MDH
DATE: November 8, 2023
SCALE: AS SHOWN

PROJECT NO: 21-3142
DRAWING SCALES BASED ON A 11" X 17" SHEET

SHEET TITLE: CULVERT EXTENSION DETAILS
PAGE NO: 2 OF 2