DRAINAGE REPORT
FOR THE

REALIGNMENT OF THE 9TH CONCESSION DRAIN & KING'S HIGHWAY NO. 3 CULVERT EXTENSION

FORMER TOWNSHIP OF GOSFIELD NORTH

TOWN OF KINGSVILLE

DILLON CONSULTING

FINAL REPORT
10 JUNE 2024
TIM R. OLIVER, P. ENG.
FILE No. 21-3142

File No. 21-3142

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Drainage Report for the
REALIGNMENT OF THE 9TH CONCESSION DRAIN & KING'S HIGHWAY NO. 3 CULVERT EXTENSION
Former Township of Gosfield North
Now In the Town of Kingsville

Mayor and Members of Council:

Instructions

The Municipality received a request on 10 July 2023 from the Ministry of Transportation Ontario, for the downstream extension of the King's Highway No. 3 culvert over the 9th Concession Drain and for the realignment of the drain at the Road 9 West junction with the highway. The proposed drainage works are required to facilitate the King's Highway No. 3 widening. 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 9th Concession Drain consists of an open channel commencing at Lot 274, South Talbot Road Concession. It flows westerly along the north side of South Talbot Road for a distance of approximately 485 metres, then turns southerly crossing King's Highway No. 3 and then turns westerly following the south limit of the highway to Road 9 West. Joined by the Gilboe Relief Drain, the 9th Concession Drain continues to flow in a westerly direction for an approximate length of 2100 metres where it outlets into the West Townline Drain. The upstream drainage area beyond the highway culvert is approximately 82 hectares (202 acres). The surficial soils are predominately Brookston Clay which is defined as having poor natural drainage.

Drain History

The recent history of Engineers' reports for the 9th Concession Drain follows:

- **6 April 2018 by Gerard Rood, P.Eng.:** The report was prepared to recommend an access bridge replacement serving property on the west half of Lot 3, Concession 9.
- **21 May 1981 by William J. Setterington, P.Eng.:** The report was prepared to recommend a realignment of the drain across the lands used to build the King's

- Highway No. 3 by-pass with the new alignment that would follow along the southerly limit of the highway corridor and then to join back to upstream portion of drain crossing South Talbot Road with a reconfiguration and replacement of the South Talbot Road culvert.
- **5 February 1970 by William J. Setterington, P.Eng.:** The report was prepared to cleanout the upper portion of the drain starting from the confluence with the Barlow Drain in Lot 4, Concession 9 and proceeding upstream to the top end of the drain. This is the current governing report for future maintenance on the portion of drain located upstream and downstream of the highway.

Survey

Our survey and examination of the 9th Concession Drain was carried out in June 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 highway culvert downstream extension is to match the existing culvert opening dimension, being a 2440 mm span x 1520 mm rise concrete culvert supported on footings. It is to be connected to the existing culvert on a skewed alignment and is 36.5 m in length. The culvert extension is to accommodate the road widening and construction of the new east bound lanes for the King's Highway No. 3 by-pass. The downstream end 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 bridges 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 within the upper portion of the 9th Concession Drain and the upstream 485 metres of drain has less than a 1 in 25 year storm capacity.

A Drainage, Hydrology/Hydraulics and Stormwater Management Report was completed by Dillon Consulting Limited (August 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 meet the MTO freeboard design criteria, despite the limited capacity of the downstream 9th Concession Drain being less than the flows expected during a 1 in 25 year storm event. The extension of the culvert recommended would have a negligible increase in the 25 year storm water elevation and therefore no adverse impacts to the upstream lands served by the 9th Concession Drain.

With the proposed roadworks to disconnect Road 9 West from the highway and construct a cul-de-sac, a realignment of the 9th Concession Drain further west of the said road is required. The length of the realigned drain to wrap around the westerly side of the cul-de-sac is approximately 100 m long and shall be lined with R-50 riprap, minimum 350 mm thick. The existing portion of the 9th Concession Drain being replaced by the new realignment shall be filled in. Beyond Station 0+100 to Station 0+125, the 9th Concession Drain channel shall be reconstructed in association with the removal of the Road 9 West bridge crossing and to be fully lined with R-50 riprap minimum 350 mm thickness.

In conjunction with the Highway 3 culvert extension and the downstream realignment of the drain at Road 9 West, the cleanout of the drain is required to facilitate these works.

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 drainage works be repaired and improved as described below:

Item	Description	Amount
	DRAIN WORKS	
1.	Open Drain Realignment Work, as follows:	
	a) Excavate new open channel along proposed alignment, approximately 100 lineal metres, Station 0+000 to Station 0+100. Any excess soils required to be removed and hauled off-site will be shall be managed by the Contractor for the highway improvements.	$15,000.00
	b) Supply and placement of stone erosion protection R-50 riprap on drain banks and drain bottom, minimum 350 mm thickness, complete with filter fabric underlay, (approx. 900 m^2) Station 0+000 to Station 0+100.	$90,000.00
	c) Clearing and grubbing of existing drain to be filled in as well as the existing drain upstream from Station 0+125 to Station 0+242 and from Station 0+303 to Station 0+323.	$5,000.00
	d) Fill in the existing drain channel including clean native backfill and compaction.	$5,000.00
	e) Excavation of drain bottom cleanout from Station 0+125 to Station 0+242 and from Station 0+303 to Station 0+323 including disposal of drain spoils to be hauled off-site will be shall be managed by the Contractor for the highway improvements.	$10,000.00
	f) Remove existing 4270 mm x 1830 mm open footing concrete culvert and headwalls, 14 m long including disposal of debris off-site.	$30,000.00
	g) Reconstruct and reshape the existing open drain channel approximately 25 lineal metres, Station 0+100 to Station 0+125, fine grade and placement of stone erosion protection R-50 riprap on drain banks and drain bottom minimum 350 mm thickness, complete with filter fabric underlay, (approx. 200 m^2). The work to also include riprap placement on the inlet spillway for existing road ditch on the east side of Road 9 West into the drain.	$25,000.00

Item	Description	Amount
2.	Road Culvert Work, as follows:	
	a) Downstream Culvert Extension (King's Highway No. 3) – Supply and installation of a new 36.5 m long culvert 2440 mm x 1520 mm open bottom concrete box culvert with footings connected to the existing culvert with skewed end, complete with flush outlet end, waterproofing membrane and protection board, 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 the flushing and cleaning of the existing 25.6 m long culvert and the removal off-site of excess materials not suitable for culvert backfill.	$435,000.00
3.	Temporary silt control measures during construction.	$5,000.00
	SUB-TOTAL	**$620,000.00**
4.	Report, Assessments and Final Inspection.	$19,000.00
5.	Expenses and Incidentals.	$1,000.00
	TOTAL ESTIMATE – 9TH CONCESSION DRAIN (excluding Net HST)	**$640,000.00**

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

Assessment of Costs

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

i. Benefit (*advantages relating to the betterment of lands, roads, buildings, or other structures resulting from the improvement to the drain).*

ii. Outlet Liability *(part of cost required to provide outlet for lands and roads).*

iii. Special Benefit *(additional work or feature that may not affect function of the drain).*

We have assessed the estimated costs for the realignment of the 9th Concession Drain, extension of the King's Highway No. 3 culvert and associated cleanout of the drain against the affected roads as listed in Schedule 'C' under "Special Benefit." Details of the Special Benefit assessment listed are provided in the Assessment Rationale below.

Assessment Rationale

Special Benefit assessment shown in Schedule 'C' was derived as follows:

1. As the minor drain improvements are only required for the proposed highway widening project, 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. Since there are no special benefit assessments to other landowners, Schedule 'D' for the purposes of Special Benefit details has been omitted from this report.

Future Maintenance

After completion, the Highway 3 culvert and the open portion of drain from Station 0+000 to Station 0+323 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. Since there is no assessment of costs to the other landowners on the drain, Schedule 'E' for the purposes of future maintenance has been omitted from this report.

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 4 – Overall Plan
Page 2 of 4 – Drain Realignment Plan
Page 3 of 4 – Culvert Extension Detail
Page 4 of 4 – Profile & Cross Sections

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 Sideroad 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 be 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 Reviews

The Essex Region Conservation Authority (ERCA) has been previously notified and provided the opportunity to review the proposed drainage works set out within this report. 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.

Correspondence received from the Department of the Fisheries and Oceans (DFO) on January 31, 2023 (Letter of Advice approval) is included herein as Schedule 'A' of this report. Specifically, for the 9th Concession Drain, the measures to be implemented to avoid and mitigate the potential for prohibited effects to fish and fish habitat will not require an authorization under the *Fisheries Act* or permit under the *Species at Risk Act*.

Respectfully submitted,

DILLON CONSULTING LIMITED

Tim R. Oliver, P.Eng.
TRO:sjc

Fisheries and Oceans Canada | Pêches et Océans Canada

Ontario and Prairies 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

January 31, 2023

Our file *Notre référence*
22-HCAA-02305

Ontario Ministry of Transportation
ATTENTION: Michael Nadeau
659 Exeter Road
London, Ontario, N6E 1L3

Subject: Culvert Replacements and Drain Realignments, Three Class F Drains, Essex County – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Michael Nadeau:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on July 28, 2022. We understand that you propose the following:

- Realign an ~200m^2 (~102 linear meters) section of 9th Concession Road Drain resulting in ~275m^2 (~126 linear meters) of new drain.
- Remove the culvert under 9th Concession Road;
- Realign an ~200m^2 (~155 linear meters) section of Schiller Drain resulting in ~225m^2 (~209 linear meters) of new drain;
- Relocate and resize four Schiller Drain culverts;
- Realign an ~390m^2 (~191 linear meters) section of 4th Concession Road Drain resulting in ~360m^2 (~190 linear meters) of new drain;
- Relocate and resize two 4th Concession Road Drain culverts; and
- Perform one fish rescue per drain if the drain is not dry during construction.

Our review considered the following information:

- Request for review form submitted to DFO on July 28, 2022; and
- Email and telephone correspondence between Colby Nolan (DFO), Kelly Evertsen (GHD), Ian Dobrindt (GHD), Jordan Widmaier (GHD), and Chris Evans (MTO) from September 22, 2022 to December 15, 2022.

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

Canada

- 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*; and
- 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 outcomes 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 outlined in your plan, in addition to the following listed below:

- Conduct work outside the spring timing windows (i.e. no in-water work between March 15 to July 15).
- Minimize duration of in-water work;
- Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Screen size requirements will be determined as per DFO's Freshwater Intake End-of-Pipe Screen Guideline (1995);
- Retain a qualified environmental professional to ensure appropriate protocols are applied and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding of the coffer dams occur;
- Install appropriate sediment erosion controls downstream of construction activities (e.g. silt curtain, straw-bale check dam, rock check dam etc.);
    - Conduct works during low or no flow;
    - Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation; and
    - Work in the dry.

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 permit under 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*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations*.

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).

Notify this office at least 10 days before starting any in-water works. Send your notification to Colby Nolan (Colby.Nolan@dfo-mpo.gc.ca) and the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. 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 Colby Nolan at our Burlington office at (289) 253-8302, or by email at Colby.Nolan@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Emily Morton

A/Senior Biologist

CC: Kelly Evertsen – GHD
Chris Evans – MTO
Ian Dobrindt – GHD
Colby Nolan – DFO

SCHEDULE C
SCHEDULE OF ASSESSMENT
9TH CONCESSION DRAIN
TOWN OF KINGSVILLE

ONTARIO LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
King's Highway No. 3	0.00	0.00	Ministry of Transportation Ontario	$640,000.00	$0.00	$0.00	$640,000.00
Total on Ontario Lands				$640,000.00	$0.00	$0.00	$640,000.00
TOTAL ASSESSMENT				**$640,000.00**	**$0.00**	**$0.00**	**$640,000.00**

"SCHEDULE F"
DRAINAGE REPORT FOR THE
REALIGNMENT OF THE 9TH CONCESSION DRAIN &
KING'S HIGHWAY NO. 3 CULVERT EXTENSION
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:

- Open Drain Realignment Work, as follows:
  - Excavate new open channel along proposed alignment, approximately 100 lineal metres, Station 0+000 to Station 0+100. Any excess soils required to be removed and hauled off-site will be shall be managed by the Contractor for the highway improvements.
  - Supply and placement of stone erosion protection R-50 riprap on drain banks and drain bottom, minimum 350 mm thickness, complete with filter fabric underlay, (approx. 900 m^2) Station 0+000 to Station 0+100.
  - Clearing and grubbing of existing drain to be filled in as well as the existing drain upstream from Station 0+125 to Station 0+242 and from Station 0+303 to Station 0+323.
  - Fill in the existing drain channel including clean native backfill and compaction.
  - Excavation of drain bottom cleanout from Station 0+125 to Station 0+242 and from Station 0+303 to Station 0+323 including disposal of drain spoils to be hauled off-site will be shall be managed by the Contractor for the highway improvements.
  - Remove existing 4270 mm x 1830 mm open footing concrete culvert and headwalls, 14 m long including disposal of debris off-site.
  - Reconstruct and reshape the existing open drain channel approximately 25 lineal metres, Station 0+100 to Station 0+125, fine grade and placement of stone erosion protection R-50 riprap on drain banks and drain bottom minimum 350 mm thickness, complete with filter fabric underlay, (approx. 200 m^2). The work to also include riprap placement on the inlet spillway for existing road ditch on the east side of Road 9 West into the drain.
- Road Culvert Work, as follows:
  - Downstream Culvert Extension (King's Highway No. 3) – Supply and installation of a new 36.5 m long culvert 2440 mm x 1520 mm open bottom concrete box culvert with footings connected to the existing culvert with skewed end, complete with flush outlet end, waterproofing membrane and protection board, 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 the flushing and cleaning of the existing 25.6 m long culvert 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 and Road 9 West 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 DRAIN RELOCATION

5.1 Topsoil

All topsoil within the proposed new drain location is to be stripped a minimum 200 mm deep and stockpiled in the working area, as described in Section 4.0.

5.2 New Drain Excavation

Excavation shall be carried out in accordance with the profile shown on the drawings for the drain relocation. In all cases, the Contractor shall use the benchmarks to establish the proposed grade.

All excavated sub-soil materials from the new drain realignment construction (Station 0+000 to Station 0+100), shall be used as backfill for the infilling of the old section of drain. All roadways and laneways disturbed by the trucking of excavated materials shall be restored to original conditions.

In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades. **THE CONTRACTOR SHALL NOT EXCAVATE DEEPER THAN THE GRADELINES SHOWN ON THE DRAWINGS.**

All excavation work shall be done in such a manner as to not harm any vegetation or trees, not identified in this report or by the Drainage Superintendent for clearing. Any damages to trees or vegetation caused by the Contractors work shall be rectified to the satisfaction of the Drainage Superintendent.

The Contractor shall exercise caution around existing tile inlets and shall confirm with the property owners that all tiles have been located and tile ends repaired as specified.

6.0 CLEARING & GRUBBING DRAIN PRIOR TO INFILLING

Prior to filling the existing drain, all brush and trees within the limits of the channel are to be cut and those roots and stumps within the channel and on the banks where the filling takes place shall be completely removed to a depth at least 1 metre below the level of the finished grade.

Brush and trees removed from the existing drain are to be put into piles by the Contractor, in locations where they can be safely burned, and to be burned by the contractor after obtaining the necessary permits, as required. If, in the opinion of the Drainage Superintendent, any of the piles are too wet or green to be burned, he shall so advise the Contractor to haul away the unburned materials to an approved dump site or advise the Contractor to obtain an agreement in writing with the owners when to return to burn the materials. Prior to and during the course of burning operations the Contractor shall comply with the current guidelines prepared by the Air Quality Branch of the Ontario Ministry of Environment and shall ensure that the Environmental Protection Act is not violated.

The Contractor shall first consult with and obtain approval from the landowner, Drainage Superintendent and Town of Kingsville Fire Services prior to burning the brush removed from this specified area.

7.0 DRAIN INFILLING

Prior to the infilling of the open drain, the Contractor shall remove all vegetation and organic debris from the existing drain slopes. The native materials used to fill the drain shall be placed in maximum 300 mm loose lifts and compacted with vibratory compaction equipment capable of achieving 95% of the maximum standard proctor density or better. Furthermore, the Contractor shall confirm with the Drainage Superintendent that all existing lateral and main tile outlets have been found and marked prior to infilling the drain.

The Contractor shall complete the excavation of the new course of the drain from Station 0+000 to Station 0+100. First, the Contractor will be required to strip all topsoil between the new drain and the existing drain, and stockpile it along the east side of the existing drain.

The subsoil is to be excavated from the new course, and is to be placed along the west bank of existing drain or temporarily stockpiled. Where working space is restricted, backfill material may be placed directly in the old ditch as long as it is later spread or removed to ensure proper compaction practices. Once the excavation of the new channel has been completed, then the subsoil excavated from the new course of the drain is to be placed and spread in the old course of the drain in uniform full width layers of not more than 300 mm in depth.

Each layer shall be compacted to a Standard Proctor Dry Density of 95% by repetitive passes over the fill area with standard levelling equipment or compaction equipment if necessary. Then, the excess excavated subsoil is to be placed and graded in the area of the old ditch and the areas where topsoil was stripped on both sides of the old ditch. These areas are to be levelled and graded to provide a uniform contour and slope.

Once the backfilling and regrading of the area near the abandoned section of open drain has been completed, any excess topsoil stockpiled along the east side of the old course that is not required for the backfilling operation is to be levelled along the east side of the old drain. **Alternative methods or procedures for completing the earthworks may be proposed by the Contractor for approval of the engineer prior to construction. All work must be acceptable to the Drainage Superintendent in charge.**

8.0 STONE EROSION PROTECTION

Erosion protection, within the drain channel, shall be constructed of quarry stone rip-rap (R50) as shown on the drawings and as specified herein. The size of the rip-rap shall mostly vary between 150 mm and 250 diameter. The rip-rap shall be sloped 1 vertical to 1.5 horizontal, with filter fabric underlay spanning across the entire width of the drain for a minimum of 5 metres 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.

9.0 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 channelling 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.

10.0 ROAD CULVERT CONSTRUCTION

10.1 Location

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

10.2 Materials

Materials shall be as follows:

Downstream Culvert Extension	*New 36.5 m long, 2440 mm x 1520 mm reinforced concrete open footing culvert per OPSS 1821 or CHBDC CAN/CSA 56-06 standards where applicable*
Culvert Bedding	*Granular 'A' conforming to OPSS Division 10.*
Culvert Backfill	*Granular 'B' conforming to OPSS Division 10.*
Erosion Stone	*All stone to be used for erosion protection shall be R-50 clear quarried rock per OPSS 1004, minimum 350 mm thickness.*
Filter Fabric	*"Non-Woven" geotextile filter fabric with a minimum strength equal or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC, or approved equivalent.*

10.3 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.

10.4 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.

10.5 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.

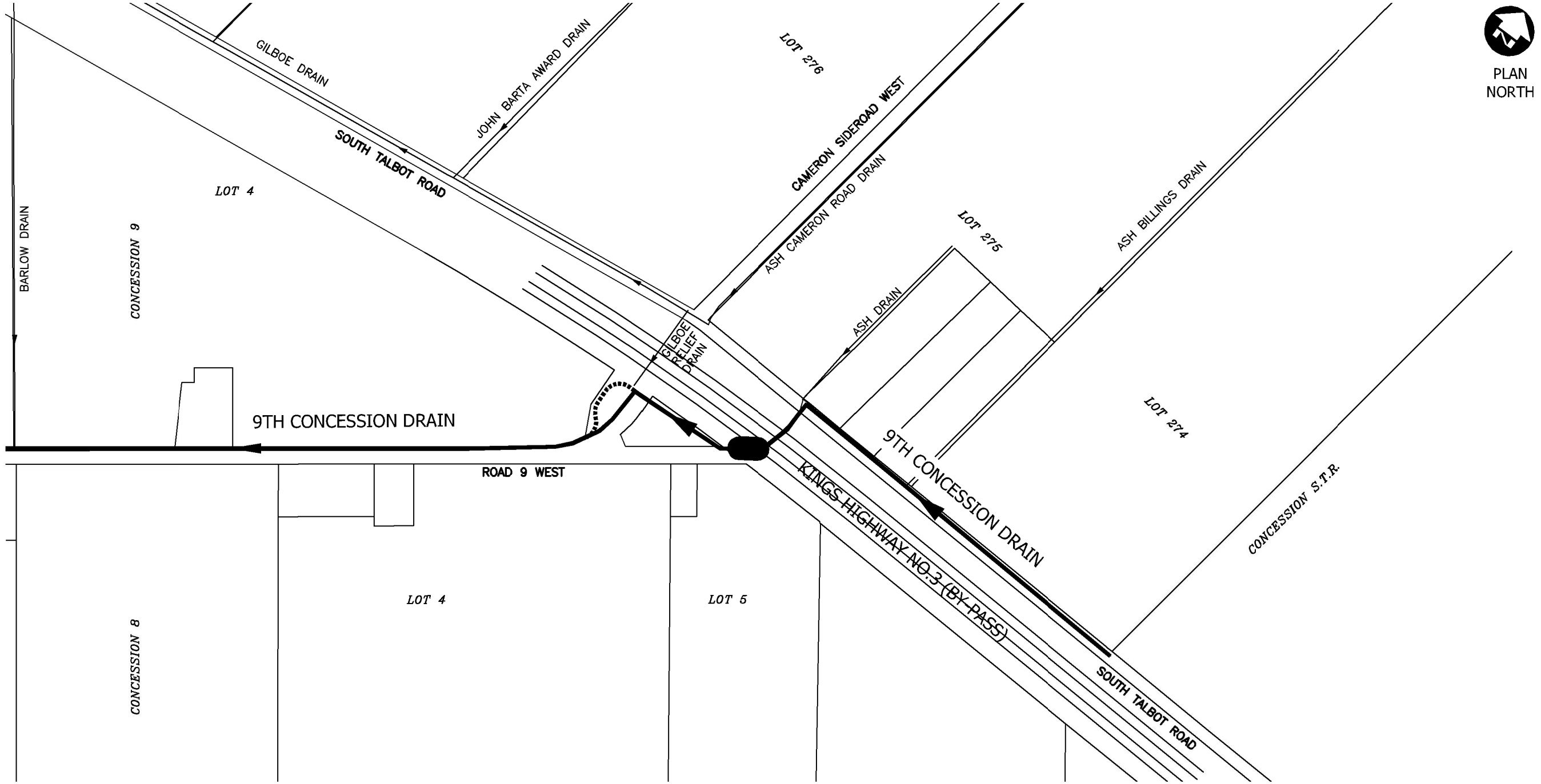
14.0 FINAL INSPECTION

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.



OVERALL PLAN
SCALE=1:5,000

LEGEND

- 9TH CONCESSION DRAIN
- 9TH CONCESSION DRAIN REALIGNMENT
- OTHER DRAINS
- CULVERT EXTENSION

LICENSED PROFESSIONAL ENGINEER
T. R. OLIVER
100046433
10/06/24
PROVINCE OF ONTARIO

'SCHEDULE G'

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

No.	ISSUED FOR	DATE	BY
1	CLIENT REVIEW	JUNE 4/24	TRO

DESIGN: TRO	REVIEWED BY: MDH
DRAWN: SJC	CHECKED BY: TRO
DATE: June 10, 2024	
SCALE: AS SHOWN	

DILLON CONSULTING

PROJECT NO. 21-3142

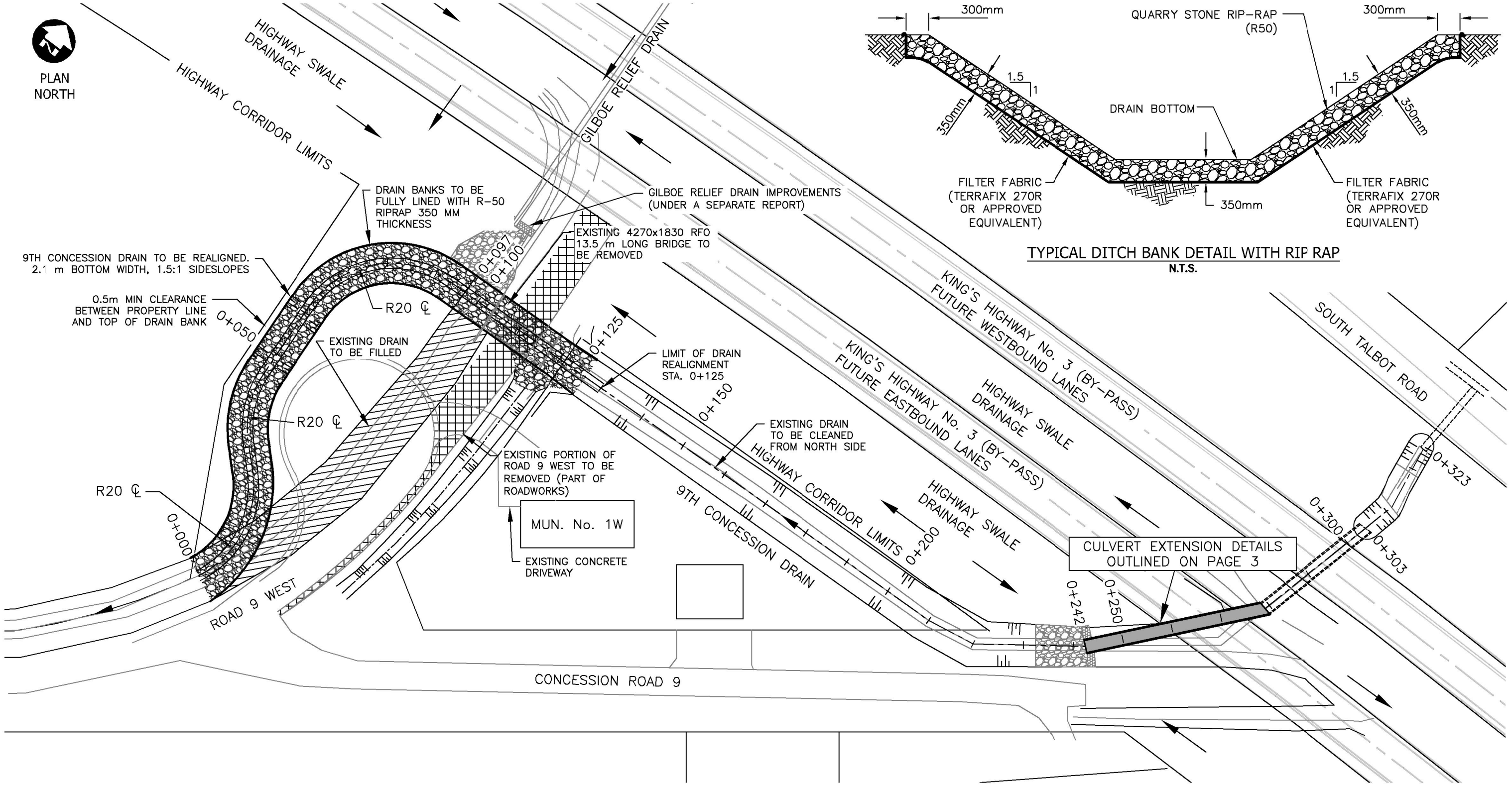
DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
9TH CONCESSION DRAIN
(King's Highway No. 3 Culvert Extension)
Town of Kingsville

SHEET TITLE: OVERALL PLAN

PAGE NO. 1 of 4

Jun 07, 2024 - 1:07pm C:\pw working directory\projects 2021\33tro\d0123854\213142-03-DRN-9th Concession Drain.dwg



TYPICAL DITCH BANK DETAIL WITH RIP RAP

N.T.S.

DRAIN REALIGNMENT PLAN

SCALE=1:750

'SCHEDULE G'

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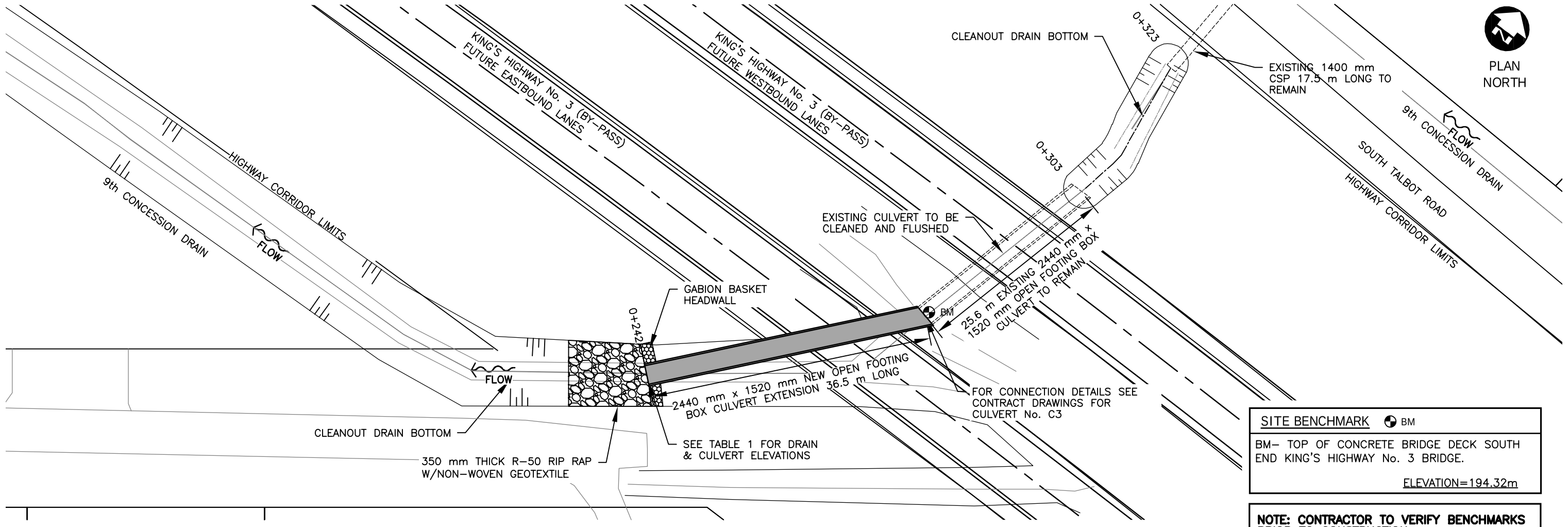
(King's Highway No. 3 Culvert Extension)
Town of Kingsville

SHEET TITLE: DRAIN REALIGNMENT PLAN

PAGE NO. 2 of 4



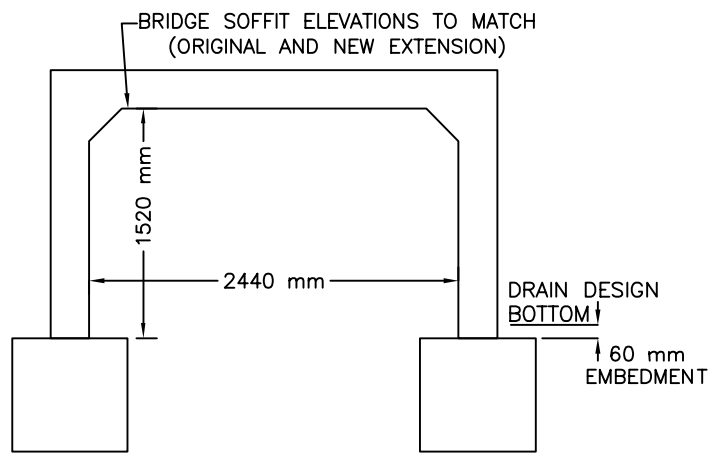
CULVERT EXTENSION DETAIL
SCALE=1:500

SITE BENCHMARK	BM
BM– TOP OF CONCRETE BRIDGE DECK SOUTH END KING'S HIGHWAY No. 3 BRIDGE.	ELEVATION=194.32m

NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.

TABLE 1 – CULVERT DESIGN INFORMATION (CULVERT No. C3)

DESCRIPTION	EXISTING CULVERT	DOWNSTREAM EXTENSION
TOP OF FOOTING ELEV. U/S SIDE(m)	192.56	192.56
TOP OF FOOTING ELEV. D/S SIDE(m)	192.56	192.54
DRAIN BOTTOM (m) (DESIGN) (AT U/S SIDE OF CULVERT)	192.64	192.62
DRAIN BOTTOM (m) (DESIGN) (AT D/S SIDE OF CULVERT)	192.62	192.60
MIN. CULVERT GRADE (%)	0.06	0.06
CULVERT TYPE	BOX CULVERT	BOX CULVERT
CULVERT MATERIAL	CONC. RFO	CONC. RFO
CULVERT LENGTH (m)	25.6	36.5
CULVERT SIZE (mm)	2440x1520	2440x1520
CULVERT ENDWALL TYPE	N/A	GABION BASKETS



DOWNSTREAM CULVERT EXTENSION CROSS SECTION
N.T.S.

LICENSED PROFESSIONAL ENGINEER
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10/06/24
PROVINCE OF ONTARIO

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TRO	MDH
DRAWN	CHECKED BY
SJC	TRO
DATE	June 10, 2024
SCALE	AS SHOWN

DILLON CONSULTING

'SCHEDULE G'

Drainage Report for the
9TH CONCESSION DRAIN
(King's Highway No. 3 Culvert Extension)
Town of Kingsville

PROJECT NO. 21-3142

SHEET TITLE CULVERT EXTENSION DETAIL

DRAWING SCALES BASED ON A 11" X 17" SHEET

PAGE NO. 3 of 4

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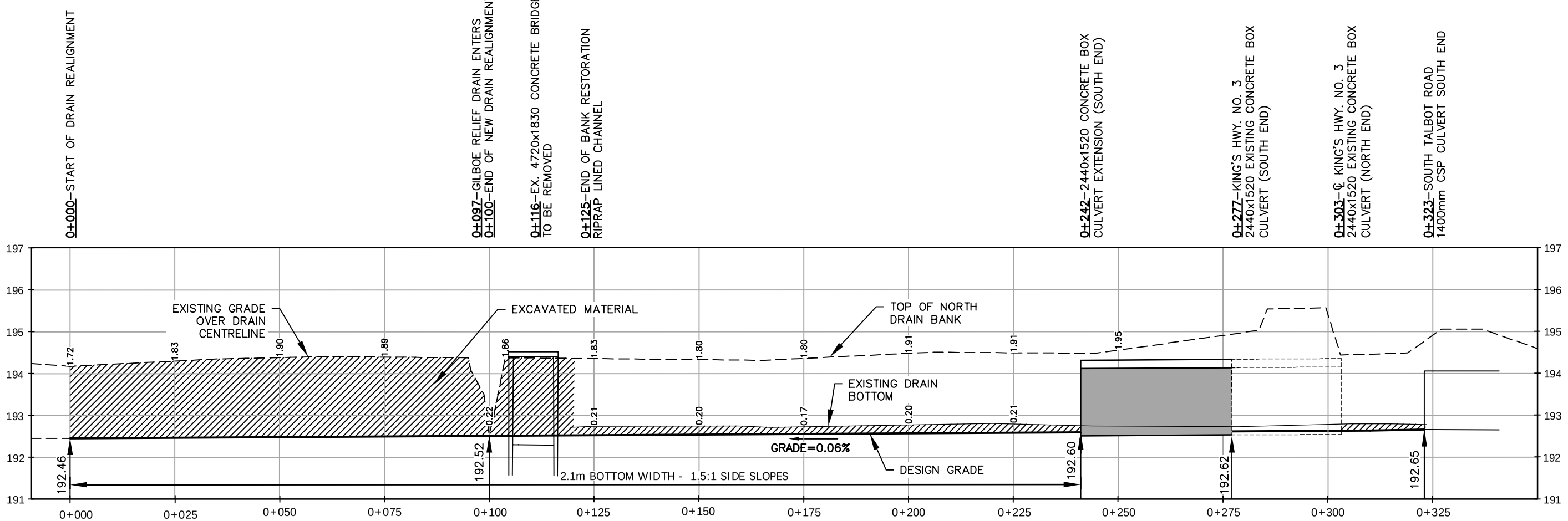
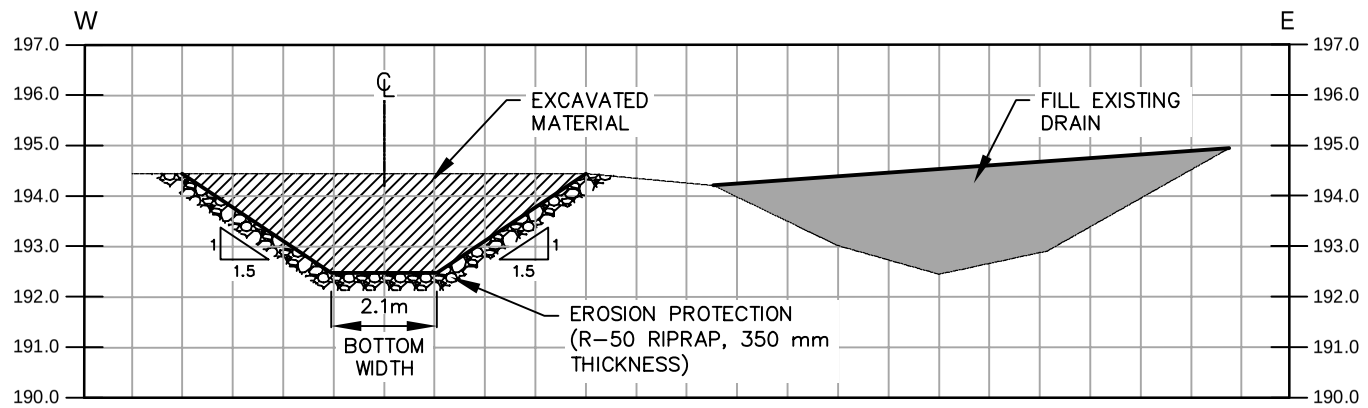


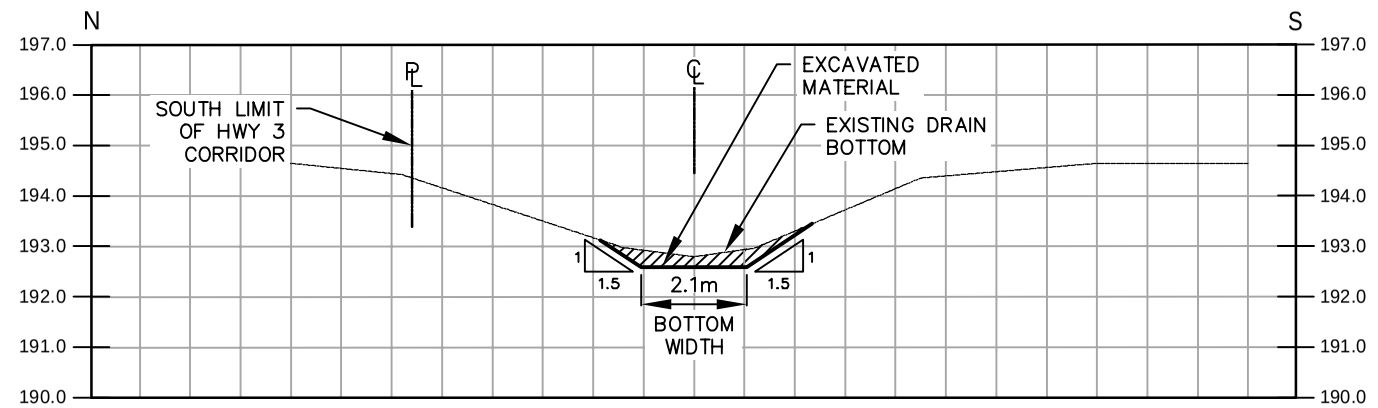
PROFILE

SCALE–HORIZ=1:1000
VERT.=1:100



CROSS SECTION 0+030 (LOOKING UPSTREAM)

SCALE–1:150



CROSS SECTION 0+210 (LOOKING UPSTREAM)

SCALE–1:150

'SCHEDULE G'

LICENSED PROFESSIONAL ENGINEER
T. R. OLIVER
100046433
10/06/24
PROVINCE OF ONTARIO

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DILLON CONSULTING

DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the
9TH CONCESSION DRAIN
(King's Highway No. 3 Culvert Extension)
Town of Kingsville

PROJECT NO. 21-3142

SHEET TITLE: PROFILE & CROSS SECTIONS

PAGE NO. 4 of 4

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