DRAINAGE REPORT
FOR THE

REALIGNMENT & EXTENSION OF THE COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN

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 & EXTENSION OF THE COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
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 (MTO), for the realignment of the Cottam Sideroad Branch of the 7th Concession Drain. The proposed drainage works are required to facilitate the King's Highway No. 3 widening and associated culvert replacements. Council accepted the request under Section 78(1) of the Drainage Act for major improvements to a drainage works and on 14 August, 2023 appointed Dillon Consulting Limited to prepare a report.

Furthermore, the Municipality received a petition on 18 October 2023 from the MTO for the upstream northerly extension of the drain in order to facilitate a drainage outlet for the proposed new South Talbot Road realignment. The MTO has jurisdiction and is serving as an interim road authority to construct a new intersection between South Talbot Road and County Road No. 27 in its new location that is approximately 170 metres further north as a part of the highway widening project.

Watershed Description

The Cottam Sideroad Branch of the 7th Concession Drain consists of an open channel commencing just north of the north limit of the current South Talbot Road right-of-way. The drain flows south along the east limit of County Road 27 (Cottam Sideroad) crossing the highway and proceeding southerly to its outlet into the 7th Concession Drain. The upstream drainage area for the said works described herein is approximately 41.2 hectares (101.9 acres). This drainage area has been reduced by excluding the existing residential lands within the Village of Cottam. During the late 1990's, the drainage for the said area was redirected south and east to the Dornton Drain.

Roadside drainage along the east side of County Road No. 27, between South Talbot Road and County Road No. 34, will be redirected to the 8th Concession Drain as part of the future roadworks associated with the Highway 3 improvements. Historically, the watersheds for the Cottam Sideroad Branch of the 7th Concession Drain and the 8th Concession Drain have been interconnected across County Road No. 27 at South Talbot Road via an existing 1390 mm x 910 mm corrugated steel pipe culvert. 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 Cottam Sideroad Branch of the 7th Concession Drain follows:

- **July 1968 by William J. Setterington, P.Eng.:** The report recommended the repair and improvement of the drain including a drain cleanout and extension of a farm access culvert within Lot 9, Concession 7. This is the most current engineer's report on the said drain
- **1 March 1960 by Wm. D. Colby, B.Sc.:** The report recommended the repair and improvement of the drain including a drain cleanout.

Area Requiring Drainage / Sufficiency of Petition

The area requiring drainage encompasses lands within the west half of Lot 269, South Talbot Road Concession where the new South Talbot Road realignment will traverse the said lands. The Cottam Sideroad Branch of the 7th Concession Drain already provides legal outlet to the existing South Talbot Road, however with its proposed realignment further to the north, it will require an upstream extension of the drain to direct the road drainage to. In terms of sufficiency of the petition, we have determined the petition to be valid in accordance with Section 4(1)(c) of the Drainage Act, where the drainage works is required for a road and the petition has been signed by a person having jurisdiction over such road.

On-site Meeting

An on-site meeting was held on November 20, 2023 to discuss the proposed improvements to the Cottam Sideroad Branch of the 7th Concession Drain including the realignment of the drain further east of its existing location where it crosses the King's Highway No. 3 by-pass. To facilitate this drain realignment, the existing highway culvert will be removed and replaced with a new longer and larger culvert to encompass the highway widening. The proposed works also include a northerly extension of the drain upstream, as a covered drain tile, to be situated along the westerly side of property Roll No. 560-01002 to serve both the drainage needs of the future South Talbot Road alignment as well as the existing farm drainage tiles from the said property. A summary of the on-site meeting is provided within Schedule 'A' herein.

Survey

Our survey and examination of the Cottam Sideroad Branch of the 7th 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

(Drain Cleanout and Culvert Works)

To provide sufficient depth and improved design capacity to better serve the upstream lands and associated new drain crossings required for the King's Highway No. 3 widening and the proposed new northerly alignment of South Talbot Road, a drain realignment, extension, clean out and lowering of the existing drain is required. The improvements start at the drain's outlet into the 7th Concession Drain and continue to the northerly extents of the future South Talbot Road intersection with County Road No. 27. The drain spoils removed as part of the drain cleanout are to be cast upon the adjacent lands to the east side of the drain.

For Culvert No. 1, serving as the existing primary farm access to the south part of Lot 9, Concession 7 (Roll No. 490-01800), it consists of an 11 m long, 1200 mm diameter

corrugated steel pipe that requires cleaning to remove the accumulated sediment. The culvert presently has capacity to convey drainage flows from a 1 in 10 year storm event.

For Culvert No. 2, involving the relocation and replacement of an existing secondary farm access serving the north part of Lot 9, Concession 7 (Roll No. 490-01800), the culvert is designed to convey drainage flows from a 1 in 10 year storm event. The existing culvert was discovered to be perched by approximately 200 mm above the drain's design bottom and the new replacement culvert will be lowered. The proposed culvert is a new 18.0 m long, 1200 mm diameter aluminized corrugated steel pipe complete with sloping stone end treatment and providing a minimum 9.0 m driveable top width. The new access location will be approximately 70 metres further south in order to provide a safer distance away from the County Road No. 27 and Highway No. 3 intersection that is being reconstructed and improved to include left hand turning lanes.

For Culvert No. 3, involving a new larger culvert across King's Highway No. 3, it replaces the existing 33.5 m long, 3050 mm x 1520 mm concrete open footing structure to be situated approximately 27 metres east of its present location. The proposed culvert is a 52.0 m long, 3648 mm x 1910 mm precast concrete box culvert. Both ends of the culvert shall consist of cast-in-place concrete headwalls. The new highway culvert shall be embedded a minimum of 400 mm below the design's drain bottom and a 400 mm layer of river stone shall be placed within the bottom of the culvert for fish habitat considerations. The new culvert will accommodate the widening of the King's Highway No. 3 bypass.

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 effects of a longer culvert may have on the upstream high water level, and it was determined a larger and deeper culvert was required. The highway culvert is located within the upper portion of the Cottam Sideroad Branch of the 7th Concession Drain and the upstream portion 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 Cottam Sideroad Branch of the 7th Concession Drain being less than the flows expected during a 1 in 25 year storm event. The replacement of the culvert recommended would have a negligible increase in the 25 year storm water elevation and therefore no adverse impacts to the upstream or downstream lands served by the Cottam Sideroad Branch of the 7th Drain.

For Culvert No. 4, involving a new culvert across County Road No. 27, it replaces the existing 20.0 m long 1390 mm x 910 mm corrugated steel arch pipe (CSPA) culvert across County Road No. 27 interconnected with the 8th Concession Drain. The proposed culvert is a new 32.0 m long, 1200 mm diameter HDPE culvert having a similar capacity. The existing culvert has deteriorated beyond repair and the new culvert will continue to serve as a relief drain for both the Cottam Sideroad Branch of the 7th Concession Drain and the 8th Concession Drain being interconnected thereto.

<u>(Drain Realignment Station 0+572 to Station 0+858)</u>

For the upper portion of the existing Cottam Sideroad Branch of the 7th Concession Drain, we recommend the drain be realigned further to the east to permit the widening of the highway and intersection improvements with County Road No. 27. From Station 0+572 to Station 0+705, the bank slopes shall be constructed with a 4:1 fore slope and 2:1 back slope for the portion of the realigned drain alongside County Road No. 27.

From Station 0+705 to Station 0+858 where the drain will be situated inside the highway corridor, the new drain channel shall be constructed with bank slopes at 1.5:1 and be fully lined with R-50 riprap, minimum 350 mm thickness. The realigned drain channel will pick up drainage from the highway corridor as well as drainage from the existing South Talbot Road to the east of County Road No. 27.

(Drain Extension Station 0+000A to Station 0+182A)

Beyond the upstream realignment of the open portion of drain, we recommend the drain be extended northerly as a covered drain to the proposed new South Talbot Road intersection with County Road No. 27. The drain pipe is designed to convey drainage flows from a 1 in 10 year storm event.

The drain extension shall consist of 172 m long, 750 mm diameter HDPE pipe extending up to the north limit of South Talbot Road and picking up the surface and sub-surface drainage from the roadway and adjacent farmlands. As part of the drain extension, a 10 m long, 250 mm diameter HDPE stub pipe shall be provided to pick up existing tile drainage that is north of the new South Talbot Road and serving property Roll No. 560-01000. As part of the South Talbot Road construction along its alignment, a new header tile will be provided to intercept the existing farm tile drainage and be connected to the new municipal drain extension.

The existing farm tile drainage system that resides south of the new South Talbot Road is captured within existing header tiles that shall be connected to the new municipal drain extension near the southwest corner of the said farm property Roll No. 560-01002.

Allowances (Cottam Sideroad Branch Drain Extension)

In accordance with Sections 29 and 30 of the Drainage Act, we have determined that the landowner on the east side of the drain receive compensation for additional lands required to establish a new 6.0 m wide corridor to be centred over and along the drain's length from Station 0+000A to Station 0+182A and for damages to the said lands. Schedule 'B' herein, shows the distribution of these allowances in the total amount of $5,000.00 for the extension of the Cottam Sideroad Branch of the 7th Concession Drain.

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
	OPEN DRAIN WORKS	
1.	Excavation and levelling of excavated material, as follows:	
	a) Excavation of the drain bottom from Station 0+000 to Station 0+573, totalling approximately 573 linear meters of drain and approximately 200 m^3 of material. The work shall include levelling the drain spoils within the 9.0 m wide drain corridor on the east side of the drain.	$12,000.00
2.	Strip and remove vegetation and topsoil from the existing drain channel to be filled beyond Station 0+705 up to existing grade with clean native backfill including compaction in maximum 300 mm lifts.	$5,000.00

Item	Description	Amount
3.	Excavation and trucking of material, as follows	
	a) Excavate new open channel along proposed alignment from Station 0+573 to Station 0+705, approximately 132 lineal metres. Any excess soils not required to fill in the original drain alignment shall be hauled off-site under the management of the contractor for the highway improvements.	$40,000.00
	b) Excavate new open channel along proposed alignment from Station 0+705 to Station 0+747, approximately 42 lineal metres. Any excess soils not required to fill in the original drain alignment shall be hauled off-site under the management of the contractor for the highway improvements.	$13,500.00
	c) Excavate new open channel along proposed alignment from Station 0+799 to Station 0+858, approximately 59 lineal metres. Any excess soils not required to fill in the original drain alignment shall be hauled off-site under the management of the contractor for the highway improvements.	$19,000.00
4.	Hydroseeding of drain banks on new channel, as follows:	
	a) Supply and placement of fibre reinforced matrix hydraulic mulch seed on new drain banks from Station 0+573 to Station 0+705, approx. 1,200 m^2.	$10,000.00
5.	Stone erosion protection, as follows:	
	a) Supply and placement of R-50 riprap stone erosion protection 2 m wide on east drain bank around existing 375 mm tile outlet (Station 0+585), minimum 350 mm thickness, complete with filter fabric underlay, approx. 10 m^2.	$1,000.00
	b) Supply and placement of R-50 riprap stone erosion protection on west drain bank (Station 0+573 to Station 0+595), minimum 350 mm thickness, complete with filter fabric underlay, approx. 90 m^2.	$9,000.00
	c) Supply and placement of wired gabion basket mat protection on west drain bank including filling with R-10 riprap, (Station 0+615 to Station 0+705), 4.0 m wide, minimum 300 mm thickness, complete with filter fabric underlay, approx. 360 m^2.	$65,000.00
	d) Supply and placement of R-50 riprap stone erosion protection on full drain channel, (Station 0+705 to Station 0+747), minimum 350 mm thickness, complete with filter fabric underlay, approx. 330 m^2.	$33,000.00

Item	Description	Amount
	e) Supply and placement of R-50 riprap stone erosion protection of full drain channel, (Station 0+799 to Station 0+858), minimum 350 mm thickness, complete with filter fabric underlay, approx. 470 m^2.	$47,000.00
6.	Access Culvert removal, as follows;	
	a) Removal and disposal offsite of existing 24.0 m long 1200 mm diameter CSP culvert including end wall materials crossing existing South Talbot Road. Work to include restoration of all disturbed areas.	$10,000.00
	b) Removal and disposal offsite of 20.0 m long 1390 mm x 910 mm CSPA culvert including end wall materials crossing existing County Road No. 27. Work to include road restoration and traffic control.	$15,000.00
7.	New Culvert Work, as follows:	
	a) Culvert No. 1 (Roll No. 490-01800) – Clean and remove sediment from existing 11 m long, 1200 mm diameter CSP including levelling of sediment within working corridor.	$1,000.00
	b) Culvert No. 2 (Roll No. 490-01800) – Removal and disposal of existing 13.8 m long, 1200 mm diameter CSP, existing riprap sloping end wall materials and backfill off-site that are not suitable for native backfill. Supply and installation of a new 18.0 m long, 1200 mm diameter CSP aluminium type-II, 2.8 mm thick with 125mm x 25 mm corrugations. Clear stone bedding below the culvert pipe, minimum 150 mm thickness (approximately 20 tonnes), within driveway full Granular 'A' (crushed limestone) backfill material from the bottom of the pipe to the top of the driveway surface (approximately 230 tonnes) compacted, clean native or imported clean native backfill material beyond driveway compacted (approximately 20 m^3). Stone erosion protection (minimum 350 mm thickness) c/w filter cloth underlay to be provided for sloping end walls (approximately 90 m^2)	$35,000.00

Item	Description	Amount
	c) Culvert No. 3 (King's Highway No. 3) - Supply and installation of a new 52.0 m long, 3648 mm x 1910 mm precast concrete box culvert, complete with waterproofing membrane and protection board, including a 100 mm concrete mud slab, compacted Granular 'A' bedding (min. 300mm thickness), compacted full Granular 'B' Type II backfill up to road subgrade with precast concrete headwalls and supply and placement of riverstone (D50 average size) in bottom of new culvert minimum 400 mm thickness. Work to include fine grading, seeding and restoration of all disturbed areas. The work shall also include removal off-site of all excess materials not suitable for bridge backfill.	$1,050,000.00
	d) Culvert No. 4 (County Road No. 27) –Supply and installation of a new 32.0 m long, 1200 mm diameter solid high-density polyethylene (HDPE) smooth interior wall, 320 kPa pipe (Duromaxx or approved equal) with water tight joints. Clear stone bedding below the culvert pipe, minimum 150 mm thickness (approximately 30 tonnes), within roadway full Granular 'A' (crushed limestone) backfill material from the bottom of the pipe to the bottom of road surface (approximately 300 tonnes) compacted, clean native or imported clean native backfill material beyond roadway compacted (approximately 70 m^3) and sloping stone erosion protection R-50 rip rap, minimum 350 mm thickness pipe end treatment, approximately 50 m^2.	$60,000.00
8.	Temporary silt control measures during construction.	$5,000.00
	TILE DRAIN WORKS	
9.	Supply and installation of a 172.0 m long 750 mm diameter HDPE pipe, 320 kPa, corrugated with smooth interior wall and bell and spigot joints, complete with Granular 'A' pipe bedding up to pipe spring line and native backfill except for crossing under South Talbot Road to be full Granular 'A' backfill compacted. Work to also include lateral tee connections for existing farm header tiles.	$190,000.00
10.	Supply and installation of a 10.0 m long 250 mm diameter HDPE pipe, 320 kPa, corrugated with smooth interior wall and bell and spigot couplers, complete with Granular 'A' pipe bedding up to pipe spring line.	$1,000.00

Item	Description	Amount
11.	Supply and installation of two (2) new 600 mm x 1200 mm precast concrete ditch inlet catch basins (OPSD 705.040) and grating (OPSD 403.01) complete with compacted Granular 'A' bedding (min. 150 thickness) and compacted full Granular 'B" Type-II backfill. Work to include supply and placement of R-50 riprap, minimum 350 mm thickness around perimeter of catch basin approximately (5 m^2).	$10,000.00
12.	Supply and installation of one (1) new 600 mm x 600 mm precast concrete catch basin CB (OPSD 705.010) and maintenance hole frame and cover (OPSD 401.010) complete with compacted Granular 'A' bedding (min. 150 thickness) and compacted full Granular 'B" Type-II backfill.	$2,500.00
	SUB-TOTAL	**$1,634,000.00**
13.	Allowances as per Sections 29 and 30 of the Drainage Act	$5,000.00
14.	Report, Assessments and Final Inspection	$29,000.00
15.	Expenses and Incidentals	$1,000.00
		$1,669,000.00

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 drain improvements and extension thereof the Cottam Sideroad Branch of the 7th Concession 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 new drain realignment, extension, new culvert works and cleanout are to facilitate the proposed highway 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 (Culverts No. 2 to 4)

Culvert No. 2 shall be maintained by the Town of Kingsville and future repair and maintenance costs assessed 100% to the owner of the access, Roll No. 490-01800, as a secondary access to said property.

For Culvert No. 3, it 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.

For Culvert No. 4, it shall be maintained by the County of Essex Road Department for 100% of the costs, subject of course, to any variations that may be made under the Authority of the Drainage Act.

Future Maintenance (Open Drain Portion from Station 0+000 to 0+705)

The open drain portion along the east side of County Road No. 27 from Station 0+000 to Station 0+705 shall be maintained by the Town of Kingsville. The future repair and maintenance costs shall be assessed to the lands and the roads for Benefit and Outlet assessments in the same relative proportions as listed in Schedule 'E-1' herein, subject of course to any variations that may be made under the authority of the Drainage Act. The assessment schedule is based on an arbitrary $10,000.00 of future maintenance costs for which actual costs would be prorated.

Future Maintenance (Open Drain Portion from Station 0+705 to 0+858)

The open drain portion existing within the King's Highway No. 3 corridor from Station 0+705 to Station 0+858 shall be maintained by the Ministry of Transportation Ontario (MTO). The future repair and maintenance costs shall be assessed 100% against the MTO, should the Town of Kingsville be required to complete the future maintenance works.

Future Maintenance (Tile Drain from Station 0+000A to Station 0+182A)

The tile drain portion along the east side of County Road No. 27 from Station 0+000A to Station 0+182A shall be maintained by the Town of Kingsville. The future repair and maintenance costs shall be assessed to the lands and roads for Benefit and Outlet assessments in the same relative proportions as listed in Schedule 'E-2' herein, subject of course, to any variations that may be made under the authority of the Drainage Act. The assessment schedule is based on an arbitrary $10,000.00 of future maintenance costs for which actual costs would be prorated.

Future Maintenance (Culvert No. 1 – Property Roll No. 490-01800)

The farm access culvert serving property Roll No. 490-01800 shall be maintained by the Town of Kingsville. The future repair and maintenance costs shall be shared with 50% assessed as a Special Benefit assessment to property Roll No. 490-01800 as the culvert serves as the primary access to the said property. The remaining 50% shall be assessed as an Outlet assessment to the lands and roads in the same relative proportions as listed in Schedule 'E-3' herein, subject of course, to any variations that may be made under the authority of the Drainage Act. The assessment schedule is based on an arbitrary $10,000.00 representing the 50% share of the Culvert No. 1 future maintenance costs for which actual costs would be prorated.

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 10 – Overall Plan

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Page 3 of 10 – Plan 2
Page 4 of 10 – Drain Enlargement Plan 1
Page 5 of 10 – Drain Enlargement Plan 2
Page 6 of 10 – Drain Extension Details
Page 7 of 10 – Profile 1 & Cross Sections
Page 8 of 10 – Profile 2 & Cross Sections
Page 9 of 10 – Culvert No. 2 Details
Page 10 of 10 – Typical 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 Sideroad and continuing easterly to 1.8 km west of County Road No. 31. Contract drawings for the roadworks including drain realignment, Culvert No. 3 (Hwy 3 crossing) and other associated road culverts under County Road No. 27 have been prepared 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 as outlined within this report. An application for permit has been made for the proposed undertakings associated with this municipal drain. 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/NDMNRF 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 compliant 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 Cottam Sideroad Branch of the 7th Concession Drain was identified to support direct fish habitat and the culvert replacement across Highway 3 and associated drain realignment

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:wlb

SCHEDULE 'A'

SUMMARY OF ON-SITE MEETING

November 20, 2023 @ 3:00 p.m.

Present:

Steve Merritt	Landowner
Rick Kendrick	Landowner
Kyle Saulnier	Ministry of Transportation Ontario
Carlo DiMambro	Green Infrastructure Partners Inc.
Mark Fishleigh	County of Essex Roads Dept.
Lu-Ann Marentette	Town of Kingsville
Clarke Campbell	Dillon Consulting Limited
Tim Oliver	Dillon Consulting Limited

Tim Oliver provided an overview of drainage improvements proposed to the Cottam Sideroad Branch of the 7th Concession Drain which involve a realignment at the Highway 3 crossing and new culvert, the relocation of an existing farm access culvert and an extension of the drain northerly to provide a drainage outlet for the future South Talbot Road realignment. The work also includes a replacement of the existing culvert across County Road No. 27 that interconnects the two drains (Cottam Sideroad Branch of 7th Concession Drain and 8th Concession Drain).

Steve Merritt mentioned there are some drainage concerns downstream on the 7th Concession Drain that should be tended to before improvements are made upstream as part of the highway project.

Lu-Ann Marentette replied that a previous request for maintenance of the 7th Concession Drain has been received for the downstream portion along County Road No. 27 and expects the drain will be cleaned out later this year which should help drainage flows.

Tim Oliver noted that the existing farm access culvert serving as a secondary access to the Merritt farm has an existing roadside vegetable stand business. During our survey of the drain, we discovered that this existing culvert is too high for the upstream portion of drain. For its proposed relocation being approximately 70 metres further downstream to facilitate the widening of County Road No. 27 and the associated turning lanes at the intersection with Highway 3, the drain will also require a minor deepening on the upstream end and a cleanout along its entire length downstream to its outlet into the 7th Concession Drain.

Steve Merritt mentioned that he also has the farm access culvert on the opposite (west) side of the road that will be relocated as well as part of same roadworks involving County Road No. 27. He noted the ditch on the west side of the road should not be conveying drainage from the Highway 3 improvements. In discussions with the highway project team, a new culvert across County Road No. 27 would bring the highway drainage into the Cottam Sideroad Branch of the 7th Concession Drain.

Tim Oliver explained that the upstream extension of the drain north of Highway 3 will involve a covered drain tile to interconnect existing farm tile drainage that is being redirected to the new drain extension as well as the drainage from the new South Talbot Road portion bisecting the Kendrick farm. The new drain extension will be situated along the westerly portion of the Kendrick farm. The size of tile will be 750 mm (30 inches) in diameter. A new private header tile will be placed along the northerly limit of the new South Talbot Road to intercept all the existing farm tile lateral runs and bring this drainage into the drain extension. The area drained by this tile is approximately 45 acres and we determined that a 250 mm (10 inches) in diameter tile would be of sufficient capacity and the new 30 inch pipe drain extension would have enough depth to receive this drainage. Tim also asked if tile plans were available for the Kendrick farm. The new header tile would need to be designed and installed by a licensed tile drainage contractor.

Rick Kendrick mentioned the entire 100 acre farm is systematically tiled with the middle third of the farm having tiles running north-south at 1 rod (16.5 feet) spacing, while the outside third portions of the farm has tiles at 2 rod (33 feet) spacing.

Carlo DiMambro mentioned that his company has a licensed tiler to complete the new header tile installation

Tim Oliver stated that the drainage report would be completed within the next 6 months to accommodate construction schedule starting this Summer 2024.

Meeting summary prepared by Tim Oliver, P. Eng.

"SCHEDULE B"

SCHEDULE OF ALLOWANCES

COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN

TOWN OF KINGSVILLE

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
560-01002	S.T.R.	PT LOT 269	Richard B. & Sharon M. Kendrick	$150.00	$4,850.00	$5,000.00
TOTAL ALLOWANCES				**$150.00**	**$4,850.00**	**$5,000.00**

"SCHEDULE C"
SCHEDULE OF ASSESSMENT

COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
TOWN OF KINGSVILLE

ONTARIO LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
King's Highway No. 3	11.00	4.45	Ministry of Transportation	$1,669,000.00	$0.00	$0.00	$1,669,000.00
Total on Ontario Lands.....				$1,669,000.00	$0.00	$0.00	$1,669,000.00
TOTAL ASSESSMENT				**$1,669,000.00**	**$0.00**	**$0.00**	**$1,669,000.00**

	(Acres)	(Ha.)
Total Area:	**11.00**	**4.45**

"SCHEDULE E-1"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (OPEN DRAIN PORTION STA. 0+000 TO STA. 0+705)

COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
TOWN OF KINGSVILLE

ONTARIO LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
King's Highway No. 3	11.00	4.45	Ministry of Transportation	$0.00	$880.00	$1,990.00	$2,870.00
Total on Ontario Lands				$0.00	$880.00	$1,990.00	$2,870.00

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 27	3.10	1.25	County of Essex	$0.00	$1,094.00	$588.00	$1,682.00
South Talbot Road	5.80	2.35	Town of Kingsville	$0.00	$289.00	$885.00	$1,174.00
Total on Municipal Lands				$0.00	$1,383.00	$1,473.00	$2,856.00

PRIVATELY-OWNED - AGRICULTURAL LANDS

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
490-01700	S.T.R.	Pt Lot 9	10.00	4.05	Donna J. & Steven J. Merritt	$0.00	$63.00	$176.00	$239.00
490-01800	S.T.R.	Pt Lots 9 & 10	20.00	8.09	Donna J. & Steven J. Merritt	$0.00	$1,027.00	$381.00	$1,408.00
560-01000	7	Pt Lot 269	45.00	18.21	Richard B. & Sharon M. Kendrick	$0.00	$560.00	$1,714.00	$2,274.00
560-01002	7	Pt Lot 269	7.00	2.83	Richard B. & Sharon M. Kendrick	$0.00	$87.00	$266.00	$353.00
Total on Privately-Owned - Agricultural Lands						$0.00	$1,737.00	$2,537.00	$4,274.00
TOTAL ASSESSMENT						**$0.00**	**$4,000.00**	**$6,000.00**	**$10,000.00**

	(Acres)	(Ha.)
Total Area:	**101.90**	**41.23**

"SCHEDULE E-2"

SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (TILE DRAIN PORTION STA. 0+000A TO STA. 0+182A)

COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN

TOWN OF KINGSVILLE

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
South Talbot Road	2.20	0.89	Town of Kingsville	$0.00	$2,500.00	$925.00	$3,425.00
Total on Municipal Lands				$0.00	$2,500.00	$925.00	$3,425.00

PRIVATELY-OWNED - AGRICULTURAL LANDS

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
560-01000	7	Pt Lot 269	45.00	18.21	Richard B. & Sharon M. Kendrick	$0.00	$2,000.00	$3,782.00	$5,782.00
560-01002	7	Pt Lot 269	7.00	2.83	Richard B. & Sharon M. Kendrick	$0.00	$500.00	$293.00	$793.00
Total on Privately-Owned - Agricultural Lands						$0.00	$2,500.00	$4,075.00	$6,575.00
TOTAL ASSESSMENT						**$0.00**	**$5,000.00**	**$5,000.00**	**$10,000.00**

	(Acres)	(Ha.)
Total Area:	**54.20**	**21.93**

"SCHEDULE E-3"

SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (CULVERT No. 1)

COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN

TOWN OF KINGSVILLE

ONTARIO LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
King's Highway No. 3	11.00	4.45	Ministry of Transportation	$0.00	$0.00	$3,425.00	$3,425.00
Total on Ontario Lands				$0.00	$0.00	$3,425.00	$3,425.00

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
County Road No. 27	3.10	1.25	County of Essex	$0.00	$0.00	$960.00	$960.00
South Talbot Road	5.80	2.35	Town of Kingsville	$0.00	$0.00	$1,445.00	$1,445.00
Total on Municipal Lands				$0.00	$0.00	$2,405.00	$2,405.00

PRIVATELY-OWNED - AGRICULTURAL LANDS

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
490-01700	S.T.R.	Pt Lot 9	10.00	4.05	Donna J. & Steven J. Merritt	$0.00	$0.00	$310.00	$310.00
490-01800	S.T.R.	Pt Lots 9 & 10	20.00	8.09	Donna J. & Steven J. Merritt	$0.00	$0.00	$625.00	$625.00
560-01000	7	Pt Lot 269	45.00	18.21	Richard B. & Sharon M. Kendrick	$0.00	$0.00	$2,800.00	$2,800.00
560-01002	7	Pt Lot 269	7.00	2.83	Richard B. & Sharon M. Kendrick	$0.00	$0.00	$435.00	$435.00
Total on Privately-Owned - Agricultural Lands						$0.00	$0.00	$4,170.00	$4,170.00
TOTAL ASSESSMENT						**$0.00**	**$0.00**	**$10,000.00**	**$10,000.00**

	(Acres)	(Ha.)
Total Area:	**101.90**	**41.23**

"SCHEDULE F"
DRAINAGE REPORT FOR THE
REALIGNMENT & EXTENSION OF THE
COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
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:

- Excavation and Leveling of excavated material, as follows:
  - Excavation of the drain bottom from Station 0+000 to Station 0+573, totalling approximately 573 linear meters of drain and approximately 200 m^3 of material. The work shall include levelling the drain spoils within the 9.0 m wide drain corridor on the east side of the drain.
- Strip and remove vegetation and topsoil from the existing drain channel to be filled beyond Station 0+705 up to existing grade with clean native backfill including compaction in maximum 300 mm lifts
- Excavation and trucking of material, as follows:
  - Excavate new open channel along proposed alignment from Station 0+573 to Station 0+705, approximately 132 lineal metres. Any excess soils not required to fill in the original drain alignment shall be hauled off-site under the management of the contractor for the highway improvements.
  - Excavate new open channel along proposed alignment from Station 0+705 to Station 0+747, approximately 42 lineal metres. Any excess soils not required to fill in the original drain alignment shall be hauled off-site under the management of the contractor for the highway improvements.
  - Excavate new open channel along proposed alignment from Station 0+799 to Station 0+858, approximately 59 lineal metres. Any excess soils not required to fill in the original drain alignment shall be hauled off-site under the management of the contractor for the highway improvements.
- Hydroseeding of drain banks on new channel, as follows:
  - Supply and placement of fibre reinforced matrix hydraulic mulch seed on new drain banks from Station 0+573 to Station 0+705, approx. 1,200 m^2.
- Stone erosion Protection, as follows:
  - Supply and placement of R-50 riprap stone erosion protection 2 m wide on east drain bank around existing 375 mm tile outlet (Station 0+585), minimum 350 mm thickness, complete with filter fabric underlay, approx. 10 m^2.

- Supply and placement of R-50 riprap stone erosion protection on west drain bank (Station 0+573 to Station 0+595), minimum 350 mm thickness, complete with filter fabric underlay, approx. 90 m^2.
- Supply and placement of wired gabion mat protection on west drain bank including filling with R-10 riprap, (Station 0+615 to Station 0+705), 4.0 m wide, minimum 300 mm thickness, complete with filter fabric underlay, approx. 360 m^2.
- Supply and placement of R-50 riprap stone erosion protection on full drain channel, (Station 0+705 to Station 0+747), minimum 350 mm thickness, complete with filter fabric underlay, approx. 330 m^2.
- Supply and placement of R-50 riprap stone erosion protection of full drain channel, (Station 0+799 to Station 0+858), minimum 350 mm thickness, complete with filter fabric underlay, approx. 470 m^2.

- Access Culvert removal, as follows;
  - Removal and disposal offsite of existing 24.0 m long 1200 mm diameter CSP culvert including end wall materials crossing existing South Talbot Road. Work to include restoration of all disturbed areas.
  - Removal and disposal offsite of 20.0 m long 1390 mm x 910 mm CSPA culvert including end wall materials crossing existing County Road No. 27. Work to include road restoration and traffic control.
- New Culvert Work, as follows:
  - Culvert No. 1 (Roll No. 490-01800) – Clean and remove sediment from existing 11 m long, 1200 mm diameter CSP including levelling of sediment within working corridor.
  - Culvert No. 2 (Roll No. 490-01800) – Removal and disposal of existing 13.8 m long, 1200 mm diameter CSP, existing riprap sloping end wall materials and backfill off-site that are not suitable for native backfill. Supply and installation of a new 18.0 m long, 1200 mm diameter CSP aluminium type-II, 2.8 mm thick with 125mm x 25 mm corrugations. Clear stone bedding below the culvert pipe, minimum 150 mm thickness (approximately 20 tonnes), within driveway full Granular 'A' (crushed limestone) backfill material from the bottom of the pipe to the top of the driveway surface (approximately 230 tonnes) compacted, clean native or imported clean native backfill material beyond driveway compacted (approximately 20 m^3). Stone erosion protection (minimum 350 mm thickness) c/w filter cloth underlay to be provided for sloping end walls (approximately 90 m^2)
  - Culvert No. 3 (King's Highway No. 3) - Supply and installation of a new 52.0 m long, 3648 mm x 1910 mm precast concrete box culvert, complete with waterproofing membrane and protection board, including a 100 mm concrete mud slab, compacted Granular 'A' bedding (min. 300mm thickness), compacted full Granular 'B' Type II backfill up to road subgrade with precast concrete headwalls and supply and placement of riverstone (D50 average size) in bottom of new culvert minimum 400 mm thickness. Work to include fine grading, seeding and restoration of all disturbed areas. The work shall also include removal off-site of all excess materials not suitable for bridge backfill.
  - Culvert No. 4 (County Road No. 27) –Supply and installation of a new 32.0 m long, 1200 mm diameter solid high-density polyethylene (HDPE) smooth interior

wall, 320 kPa pipe (Duromaxx or approved equal) with water tight joints. Clear stone bedding below the culvert pipe, minimum 150 mm thickness (approximately 30 tonnes), within roadway full Granular 'A' (crushed limestone) backfill material from the bottom of the pipe to the bottom of road surface (approximately 300 tonnes) compacted, clean native or imported clean native backfill material beyond roadway compacted (approximately 70 m^3) and sloping stone erosion protection R-50 rip rap, minimum 350 mm thickness pipe end treatment, approximately 50 m^2.

- Temporary silt control measures during construction.
- Supply and installation of a 172.0 m long 750 mm diameter HDPE pipe, 320 kPa, corrugated with smooth interior wall and bell and spigot joints, complete with Granular 'A' pipe bedding up to pipe spring line and native backfill except for crossing under South Talbot Road to be full Granular 'A' backfill compacted. Work to also include lateral tee connections for existing farm header tiles.
- Supply and installation of a 10.0 m long 250 mm diameter HDPE pipe, 320 kPa, corrugated with smooth interior wall and bell and spigot couplers, complete with Granular 'A' pipe bedding up to pipe spring line.
- Supply and installation of two (2) new 600 mm x 1200 mm precast concrete ditch inlet catch basins DICB (OPSD 705.040) and grating (OPSD 403.010) complete with compacted Granular 'A' bedding (min. 150 thickness) and compacted full Granular 'B" Type-II backfill. Work to include supply and placement of R-50 riprap, minimum 350 mm thickness around perimeter of catch basin approximately (5 m^2).
- Supply and installation of one (1) new 600 mm x 600 mm precast concrete catch basin CB (OPSD 705.010) and maintenance hole frame and cover (OPSD 401.010) complete with compacted Granular 'A' bedding (min. 150 thickness) and compacted full Granular 'B" Type-II backfill.

3.0 ACCESS TO THE WORK

Access to the drain shall be from the King's Highway No. 3 and County Road No. 27 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 CORRIDORS

For both the construction and future maintenance of the drain the Contractor shall restrict his/her equipment to the working corridors as specified in this Section. Any damage resulting from non-compliance with this Section shall be borne by the Contractor. The working corridor shall be as follows:

FROM STA.	TO STA.	PRIMARY (See Note 1)	SECONDARY (See Note 2)
0+000	0+705	9.0 m wide on the east side of the drain measured off top of east bank	County Road No. 27 right-of-way
0+705	0+858	King's Highway No. 3 right-of-way	N/A
		TILE DRAIN PORTION	

FROM STA.	TO STA.	PRIMARY (See Note 1)	SECONDARY (See Note 2)
0+000A	0+144A	6 m wide centered over drain tile on property Roll No. 560-01002	N/A
0+144A	0+172A	South Talbot Road right-of-way	N/A
0+172A	0+182A	6 m wide centered over drain tile on property Roll No. 560-01000	N/A

Note 1: *Primary working corridor* indicates the access corridor along the side of the drain where excavation is recommended (unless noted otherwise below and/or in the Specifications, as well as all purposes listed for Secondary Working Corridors).

Note 2: *Secondary working corridor* indicates the access corridor alongside the drain where construction equipment may travel for the purpose of trucking.

5.0 DRAIN REALIGNMENT

5.1 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 material from the new drain construction (Station 0+573 to Station 0+858), shall be used as backfill for the infilling of the old section of drain. Excess soils beyond that which is required for backfilling the abandoned original drain alignment shall be managed and stockpiled within the King's Highway No. 3 corridor or off-site as required. 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.**

Should over excavation of the drain bank occur, the Contractor will not be permitted to repair with native material packed into place by the excavator and reshaped. Should over excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

Prior to seeding of the drain, the stripped topsoil shall be placed on the drain banks at 50 mm depth.

Hydraulic Seeding of the newly shaped drain banks shall be completed immediately following drain construction and as specified in Section 7.0.

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.

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 DRAIN INFILLING

Prior to the infilling of the open drain portion to be abandoned within the Highway 3 corridor, 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.

7.0 HYDRAULIC SEEDING OF NEW DRAIN CHANNEL

The newly established drain banks and all existing grassed areas disturbed by construction shall be hydraulic mulch seeded as specified herein. 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.

The Contractor shall apply a fibre reinforced matrix (FRM) hydromulch engineered with pasteurized wood fibers and cross-linked with dispersible synthetic fibers and exclusive soil bonding agents for immediate and effective soil erosion control on newly constructed drain channels where the sideslopes are 2:1 (horizontal : vertical) such as the FlexGuard product by Fibremulch company or approved equal . The hydromulch should be non-toxic and 100% biodegradable with a minimal curing period and up to 12 months longevity. The hydromulch shall be applied at a minimum rate of 3,300 kg of dry product per 10,000 m^2. It shall be thoroughly mixed with water in a hydraulic seeder and mulcher at a rate of 20 kg of dry product to 225 litres of water. Refer to OPSS.PROV 804 for additional specifications.

Seeding and mulching shall be a one step process in which the seed and hydraulic mulch are applied simultaneously in a water slurry via the hydraulic seeder/mulcher. The materials shall be added to the supply tank while it is being loaded with water. The materials shall be thoroughly mixed into a homogeneous water slurry and shall be distributed uniform, cohesive mat over the prepared surface. The materials shall be measured by mass or by a mass-calibrated volume measurement, acceptable to the Drainage Superintendent.

The hydraulic seeder/mulcher shall be equipped with mechanical agitation equipment capable of mixing the materials into a homogenous state until applied. The discharge pumps and gun nozzles shall be capable of applying the material uniformly. Grass seed shall be MTO roadside seed mixture meeting the requirements as follows:

Creeping Red Fescue	*52%*
Perennial Ryegrass	*35%*
Kentucky Bluegrass	*10%*
White Clover	*3%*

Bags shall bear the label of the supplier indicating the content by species, grade and mass. Seed shall be applied at a rate of 170 kg per 10,000 m². **The hydraulic 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.**

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 mm. The rip-rap shall be sloped 1 vertical to 1.5 horizontal, with filter fabric underlay spanning across the entire width of the drain.

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 MATS (STA. 0+615 TO STA. 0+705)

Gabion mats shall be manufactured from PVC or HDPE based polymer coated galvanized steel wire mesh. Gabion mats 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 mat exceeds its horizontal width, the gabion mat 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

mats shall be manufactured with all components connected at the production facility with the exception of the gabion mat lid. Gabion mats 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 mats shall be according to OPSS 1430 Tables 2, 4 & 5. Gabion stones shall be according to OPSS 1004 and as specified in the Contract Documents. Excavation for gabion mats shall be according to OPSS 206.

Gabions shall be installed at the locations and to the line, grade, and dimensions specified in the Contract Documents. As per Table 2, Mat Size 14 having a length of 30 m, 2 m width and 0.3 m depth is recommended for this application for two mats fastened together to form a 4 m wide gabion mat. 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 mat, the gabion mat 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.

10.0 TILE DRAIN CONSTRUCTION

10.1 Setting Out

The Engineer shall provide the Contractor in writing with benchmarks and points of reference. From these benchmarks and points of reference, the contractor will do his own setting out. The setting out by the Contractor shall include but shall not be limited to the preparation of grade sheets, the installation of centerline stakes, grade stakes, offsets, and sight rails. If, during the setting out, the contractor finds an error in the benchmarks or points of reference provided by the Engineer or is uncertain as to the interpretation of the information provided or the work intended, he shall notify the Engineer immediately for additional verification or clarification before proceeding with construction.

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work. The Contractor shall be responsible to ensure that the alignment selected results in a minimum depth of cover of 600 mm over the top of the drainage pipe to be installed. If, at any time during the progress of the works, an error shall appear or arise in the position, levels, dimensions or alignment of any part of the works, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer.

10.2 Profile

The drainage pipe shall be laid so that its invert shall be at the gradeline shown on the profile, which gradeline is governed by the benchmarks. The profile shows, for the convenience of the Contractors and others, the approximate depth of cut from the surface of the ground at 50 metre intervals, to the final invert of the drainage pipe in metres and decimals of a metre. Benchmarks, which have been established along the course of the drain, shall govern the final elevation of the drain. The locations and elevations of the benchmarks are shown on the drawings.

A variation in grade may be tolerated where the actual capacity of the drain exceeds the required capacity. The as-constructed invert of the drainage pipe shall not deviate from the specified gradeline more than 10% of the internal diameter of the drainage pipe. These deviations are allowable, provided they are gradual over a distance of not less than 10 m. No reverse grade shall be allowed.

10.3 Location of New Tile Drain

The new tile drain shall be installed as shown on the drawings attached hereto.

10.4Drainage Pipe Materials

10.4.1 HDPE Pipe

Tile Drain (Sta. 0+000A to Sta. 0+172A)	*New 750 mm (30") diameter solid (non-perforated) corrugated High Density Polyethylene (HDPE) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.* *Joined using (water tight) Ultra stab 75 gasketed "bell and spigot" coupler joining system.*
Tile Drain (Sta. 0+172A to Sta. 0+182A)	*New 250 mm (10") diameter solid (non-perforated) corrugated High Density Polyethylene (HDPE) smooth wall interior (Armtec Boss 2000 or approved equivalent) unless otherwise specified conforming to the following specifications: ASTM @3350, CSA B182.8-02 and OPSS 1840. The pipe is to provide a minimum pipe stiffness of 320 kPa.* *Joined using (water tight) Ultra stab 75 gasketed "bell and spigot" coupler joining system*
Pipe Bedding	*150 mm layer clear stone below pipe and Granular 'A' (crushed limestone) conforming to OPSS Division 10 up to pipe spring line compacted to minimum 98% S.P.D.*
Backfill Above Pipe Spring line (beyond roadways)	*Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substance compacted to minimum 95% S.P.D.*
Backfill Above Pipe Spring line (within roadways)	*Granular 'A'(crushed limestone) conforming to OPSS Division 10 up to pipe spring line compacted to minimum 98% S.P.D..*

Filter Fabric	*"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC or approved equivalent.*
Erosion Stone	*All stone to be used for erosion protection shall be 125 – 250 mm clear quarried rock or OPSS 1001, minimum 300 mm thickness.*

10.5 New Ditch Inlet Catch Basins at Station 0+144A & 0+172A (DICB)

The Contractor shall arrange for the supply and installation of concrete ditch inlet catch basins at the locations and elevations as shown on the drawings.

The Contractor shall install all precast structures plumb and true to line and grade. Precast bases shall be set to the specified grade, shall be level, and shall have uniform overall contact with the underlying soil.

All ditch inlet catch basins installed shall meet the dimensions and locations outlined in the drawings. Precast ditch inlet concrete catch basins shall conform to the requirements of Ontario Provincial Standard Specification (OPSS) 1351 and OSPD 705.04 (Type B). The floor elevation shall be at least 600 mm below the invert of the outlet pipe in the wall of the catch basin.

Pipe placed in the walls for inlet and outlet connections shall extend through the wall a sufficient distance to allow for connections. The pipes shall be trimmed flush with the inside wall and shall be securely sealed into place using concrete grout.

The ditch inlet catch basins shall be supplied with a galvanized steel honeycomb grating as per OPSD 403.01.

10.6 New Catch Basin at Station 0+182A (CB)

The Contractor shall arrange for the supply and installation of concrete catch basins at the locations and elevations as shown on the drawings.

The Contractor shall install all precast structures plumb and true to line and grade. Precast bases shall be set to the specified grade, shall be level, and shall have uniform overall contact with the underlying soil.

All catch basins installed shall meet the dimensions and locations outlined in the drawings. Precast concrete catch basins shall conform to the requirements of Ontario Provincial Standard Specification (OPSS) 1351 and OSPD 705.01. The floor elevation shall be at least 600 mm below the invert of the outlet pipe in the wall of the catch basin.

Pipe placed in the walls for inlet and outlet connections shall extend through the wall a sufficient distance to allow for connections. The pipes shall be trimmed flush with the inside wall and shall be securely sealed into place using concrete grout. The catch basin shall be supplied cast iron square frame & circular closed cover (Type A) as per OPSD 401.010.

11.0 CULVERT CONSTRUCTION

11.1 Location

The new culverts denoted as Culvert No. 1 to 4 herein shall be located and installed as shown on the drawings attached hereto.

11.2 Materials

Materials shall be as follows:

Culvert No. 2	*New 18.0 m long, 1200 mm diameter aluminized Type II corrugated steel pipe (CSP) culvert, 125x25 corrugations and 2.8 mm thickness with annular profile ends complete with wide style aluminized steel bolted couplers, 2.0 mm thickness.*

Culvert No. 3	*New 52.0 m long, 3648 mm x 1910 mm reinforced precast concrete box culvert per OPSS 1821 or CHBDC CAN/CSA S6-06 standards where applicable.*
Culvert No. 4	*New 32.0 m long, 1200 mm diameter steel rib reinforced polyethylene pipe, smooth interior wall profile DuroMaxx, as manufactured by Armtec Inc. complete with gasketed bell and spigot joints.*
Bedding below culvert pipes	*Granular 'A' conforming to OPSS Division 10 or 19 mm clearstone, minimum 150mm thickness.*
Bedding below box culverts	*Concrete mud matt minimum 100 mm thickness and Granular 'A' conforming to OPSS Division 10, minimum 300 mm thickness*
Culvert Backfill	*Granular 'A' 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.*

11.3 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.

11.4 Vertical Cast-in-Place End walls (Culvert No. 3)

The wingwalls shall be designed by the contractor and shall retain a Professional Engineer for which a Professional engineer's stamped shop drawings shall be submitted to the MTO for review and approval prior to construction.

11.5 Sloping stone End walls (Culvert No. 2 and Culvert No. 4)

Sloping stone end walls shall be constructed of quarry stone riprap (R-50), as shown on the drawings and as specified herein. The riprap shall be sloped 1 vertical to 1.5 horizontal, with filter fabric underlay and spanning across the entire drain. The minimum thickness requirement of the erosion stone layer is 350 mm with no portion of the filter fabric to be exposed.

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.

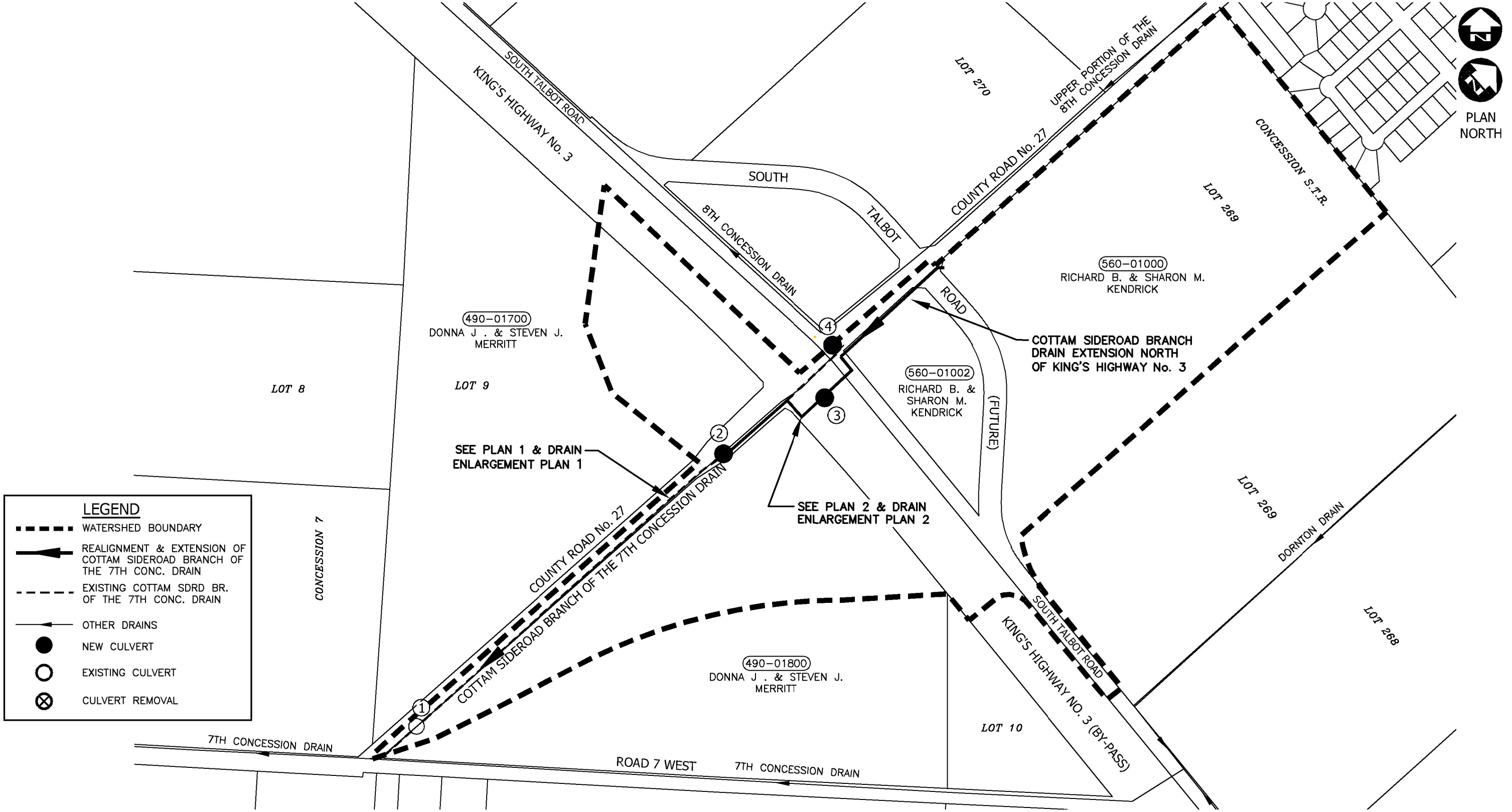
14.0 FINAL INSPECTION

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

'SCHEDULE G'

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

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DRAWN: MTB/WLB	CHECKED BY: TRO
DATE: June 10, 2024	
SCALE: AS SHOWN	

DILLON CONSULTING

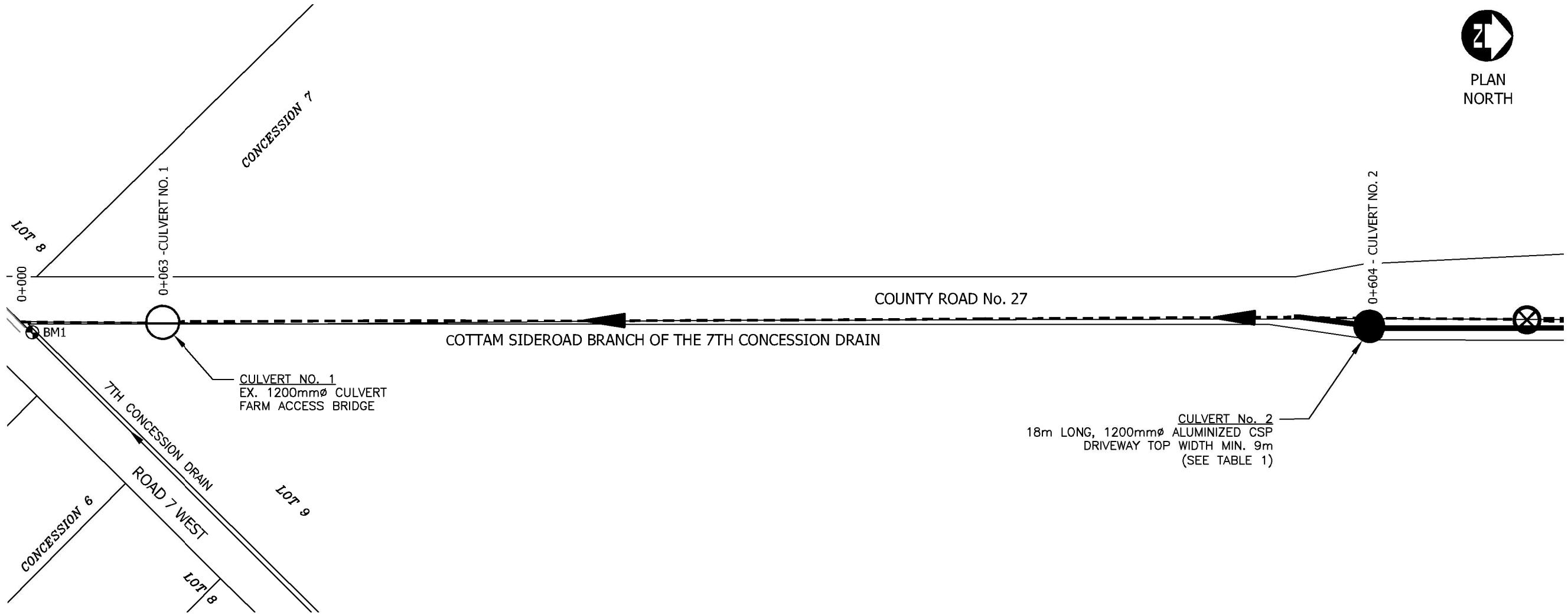
PROJECT NO. 21-3142

DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the Realignment and Extension of the
COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
Town of Kingsville

SHEET TITLE: OVERALL PLAN

PAGE NO. 1 of 10



PLAN 1
SCALE=1:2,000

LEGEND
- WATERSHED BOUNDARY
- REALIGNMENT & EXTENSION OF COTTAM SIDEROAD BRANCH OF THE 7TH CONC. DRAIN
- EXISTING COTTAM SDRD BR. OF THE 7TH CONC. DRAIN
- OTHER DRAINS
- NEW CULVERT
- EXISTING CULVERT
- CULVERT REMOVAL

TABLE 1 – CULVERT DESIGN INFORMATION

DESCRIPTION	CULVERT No. 2	CULVERT No. 3	CULVERT No. 4
CULVERT LOCATION	STA. 0+604 (℄)	STA. 0+773 (℄)	STA. 0+858 (E. END)
DRAIN BOTTOM DESIGN ELEVATION (m)	192.76(S) 192.77(N)	192.85(S) 192.88(N)	192.90(W) 192.90(E)
CULVERT INVERT ELEVATION (m) AT CULVERT ENDS	192.64(S) 192.65(N)	192.45(S) 192.48(N)	192.90(W) 192.90(E)
CULVERT SIZE	1200mmø	3648mm x 1910mm	1200mmø
CULVERT LENGTH (m)	18.0	52.0	32.0
CULVERT GRADE (%)	0.06	0.06	0.00
CULVERT TYPE	CSP ALUM. TYPE II	CONCRETE BOX	H.D.P.E
CULVERT THICKNESS (mm)	2.8	N/A	N/A
CULVERT CORRUGATIONS (mm)	125x25	N/A	N/A
TOP OF ROADWAY ELEV. (m)	194.70	195.30(EBL)	196.10
CULVERT ENDWALL TYPE	SLOPING STONE	CONCRETE	N/A

SITE BENCHMARKS ✪ BM

BM1–TOP OF EX. CONCRETE CULVERT NORTH END COUNTY ROAD NO. 27 OVER 7TH CONCESSION DRAIN.
ELEVATION=194.57m

BM2–TOP OF EX. KING'S HIGHWAY NO. 3 CONCRETE CULVERT SOUTH END.
ELEVATION=194.20m

NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.

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

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'SCHEDULE G'

Drainage Report for the Realignment and Extension of the
COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
Town of Kingsville

SHEET TITLE: PLAN 1
PAGE NO. 2 of 10

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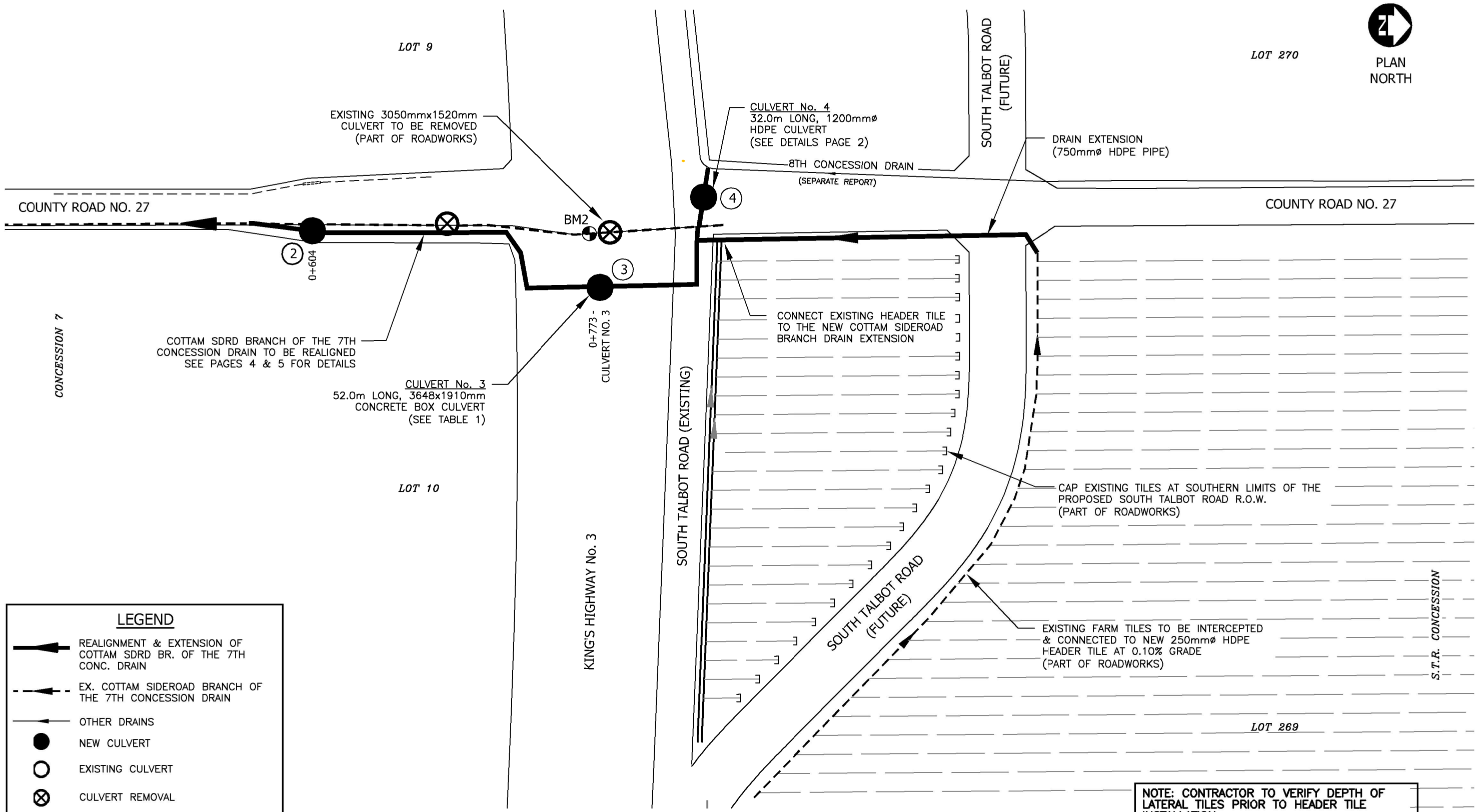

PLAN 2
SCALE=1:2,000

LEGEND

- REALIGNMENT & EXTENSION OF COTTAM SDRD BR. OF THE 7TH CONC. DRAIN
- EX. COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
- OTHER DRAINS
- NEW CULVERT
- EXISTING CULVERT
- CULVERT REMOVAL

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Town of Kingsville

SHEET TITLE: PLAN 2

PAGE NO. 3 of 10

Jun 07, 2024 - 1:19pm C:\pw working directory\projects 2021\33tro\d0122691\213142-03-DRN-COTTAM SDRD BRANCH.dwg

PLAN
NORTH

LOT 9
CONCESSION 7

NEW FARM ACCESS CULVERT
(PART OF ROADWORKS)

FUTURE ROAD CULVERT
(PART OF ROADWORKS)

0+572 0+585 0+595 0+604 0+613 0+655

STONE EROSION PROTECTION
WEST DRAIN BANK STA.
0+572 TO STA 0+705

DRAIN TO BE REALIGNED W/ 1m BOTTOM & 1.5:1 SIDE SLOPES
FROM STA. 0+572 TO STA. 0+595

TOPSOIL, FINE GRADE & HYDROSEED
NEW DRAIN CHANNEL FROM STA.
0+572 TO STA. 0+705

EXISTING DRAIN TO
BE FILLED IN

COUNTY ROAD NO. 27

FLOW

COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN

FLOW

SEE PAGE 5

FUTURE GRAVEL ENTRANCE TO LOT 9
(PART OF ROADWORKS)

STA. 0+585
EX. 375ø HDPE SURFACE DRAIN OUTLET
CUT BACK PIPE & PROVIDE STONE EROSION
PROTECTION ON EAST DRAIN BANK

CULVERT No. 2
SEE DETAILS PAGES 2 & 9

DRAIN TO BE REALIGNED W/ 1m BOTTOM &
4:1 FORE SLOPE & 2:1 BACK SLOPE FROM
STA. 0+613 TO STA. 0+705

LOT 9
CONCESSION 7

DRAIN ENLARGEMENT PLAN 1

SCALE=1:500

Jun 07, 2024 - 1:20pm C:\pw working directory\projects 2021\33tro\d0122691\213142-03-DRN-COTTAM SDRD BRANCH.dwg

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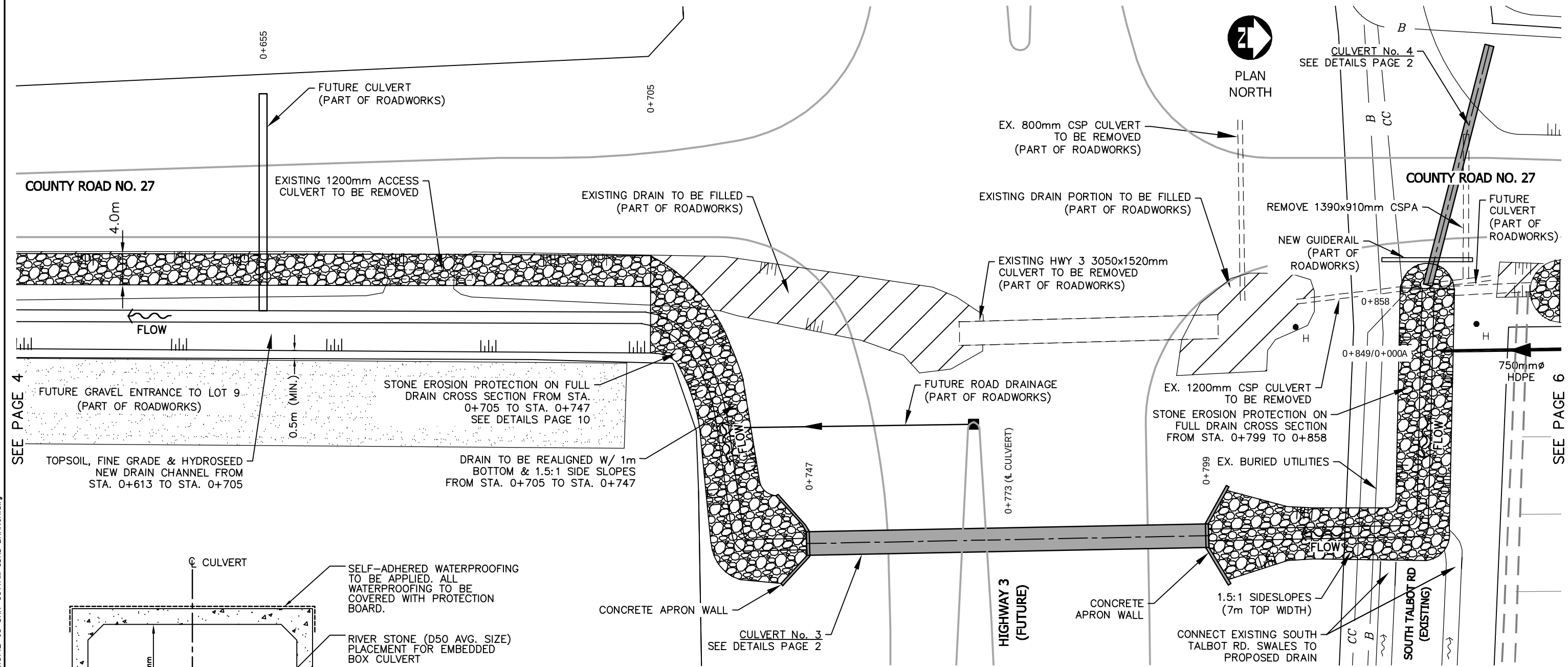
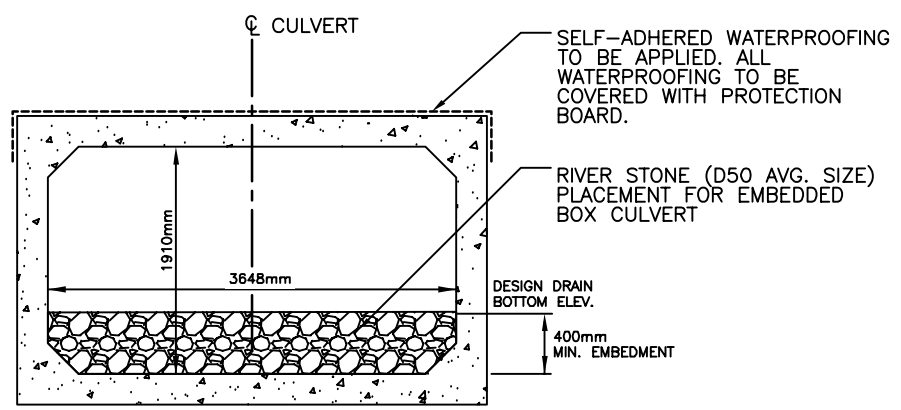
SHEET TITLE: DRAIN ENLARGEMENT PLAN 1

PAGE NO. 4 of 10



DRAIN ENLARGEMENT PLAN 2

SCALE=1:500



CULVERT NO. 3 SECTION

N.T.S.

UTILITIES (CC – GOSFIELD NORTH COMMUNICATIONS)
(B – BELL CANADA)

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THESE DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HERSELF/HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

'SCHEDULE G'

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Drainage Report for the Realignment and Extension of the
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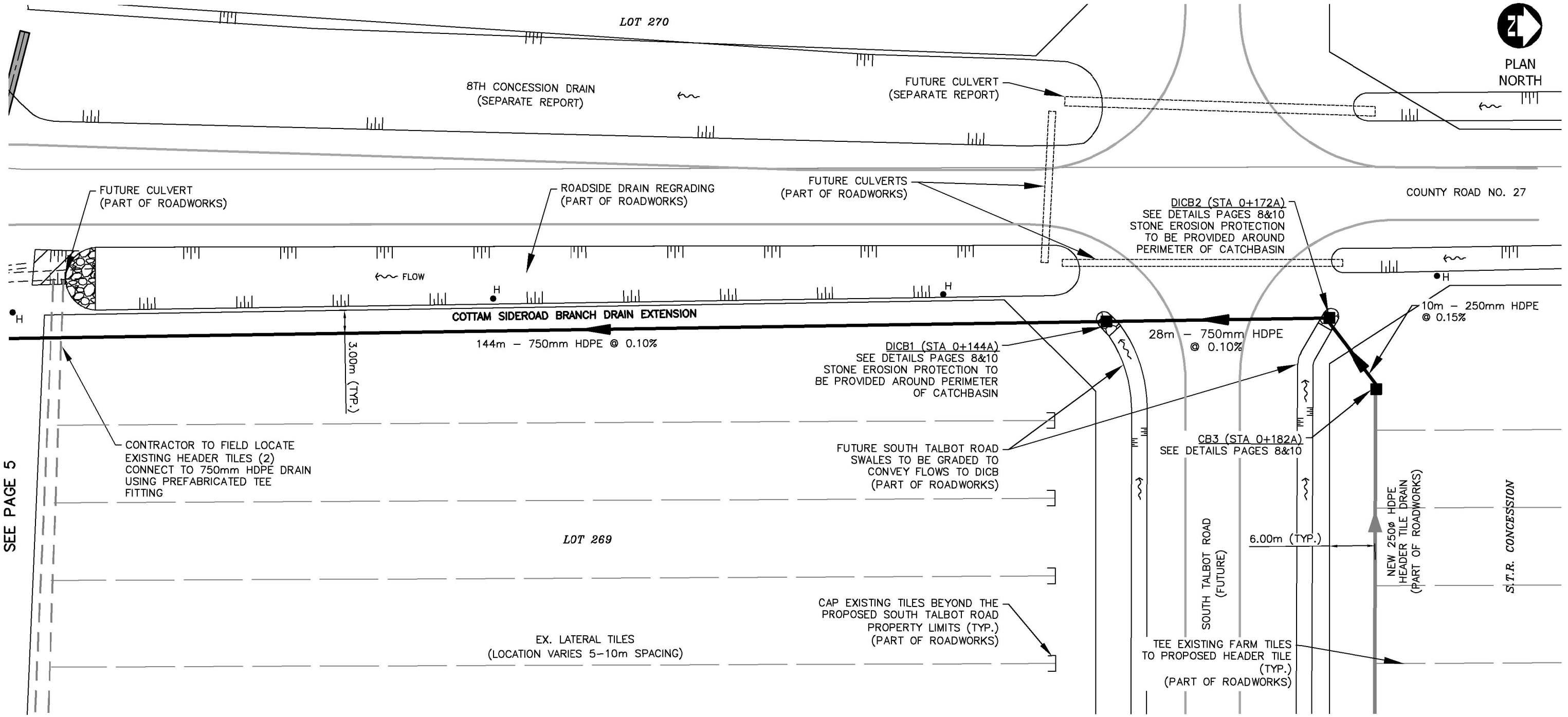
PROJECT NO. 21-3142

SHEET TITLE DRAIN ENLARGEMENT PLAN 2

PAGE NO. 5 of 10



DETAIL
SCALE=1:500

LEGEND
- PROPOSED PIPED DRAIN
- PROPOSED DICB/CB
- PROPOSED HEADER TILE

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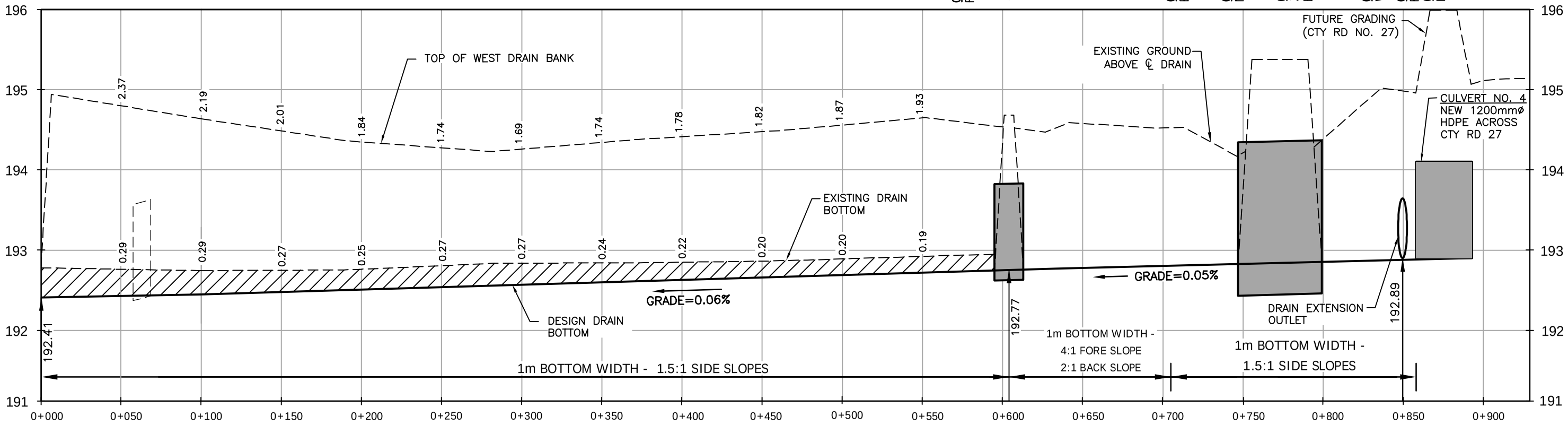
SHEET TITLE: DRAIN EXTENSION DETAILS

PAGE NO. 6 of 10



PROFILE 1 (Sta. 0+000 TO Sta 0+794)

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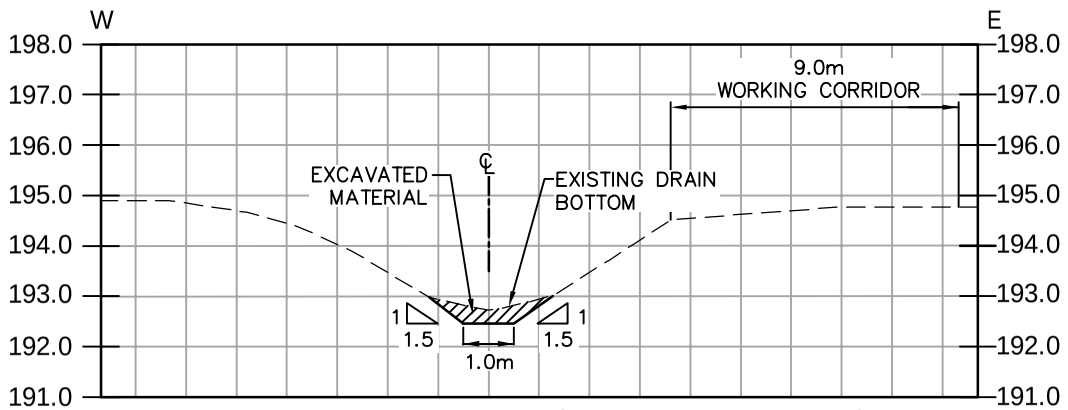
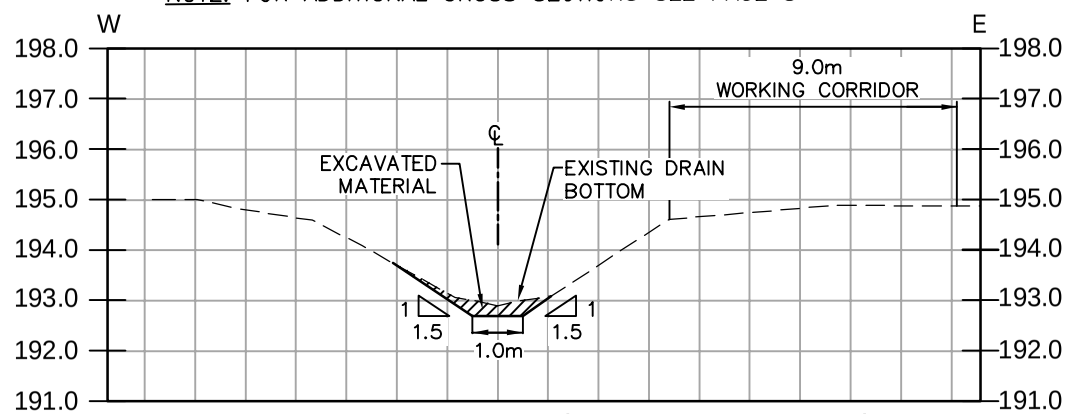
VERT.=1:50



CROSS SECTION 0+188 (LOOKING UPSTREAM)

SCALE–1:150

NOTE: FOR ADDITIONAL CROSS SECTIONS SEE PAGE 8



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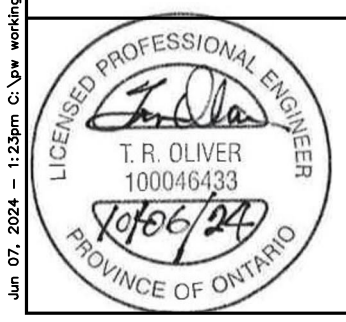
'SCHEDULE G'



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SHEET TITLE: PROFILE 1 & CROSS SECTIONS

PAGE NO. 7 of 10

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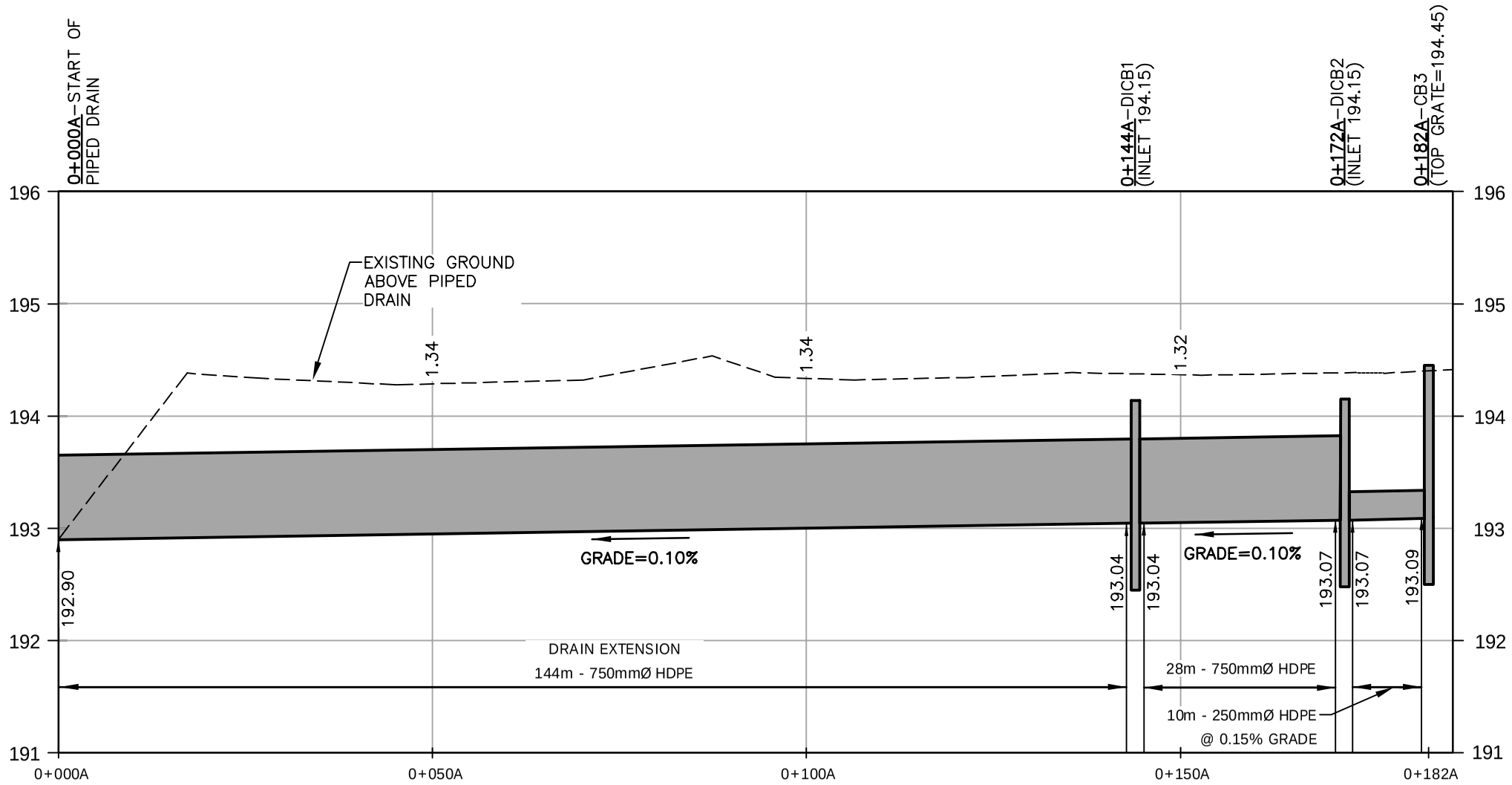

PROFILE 2 (Sta. 0+000A TO Sta 0+182A)

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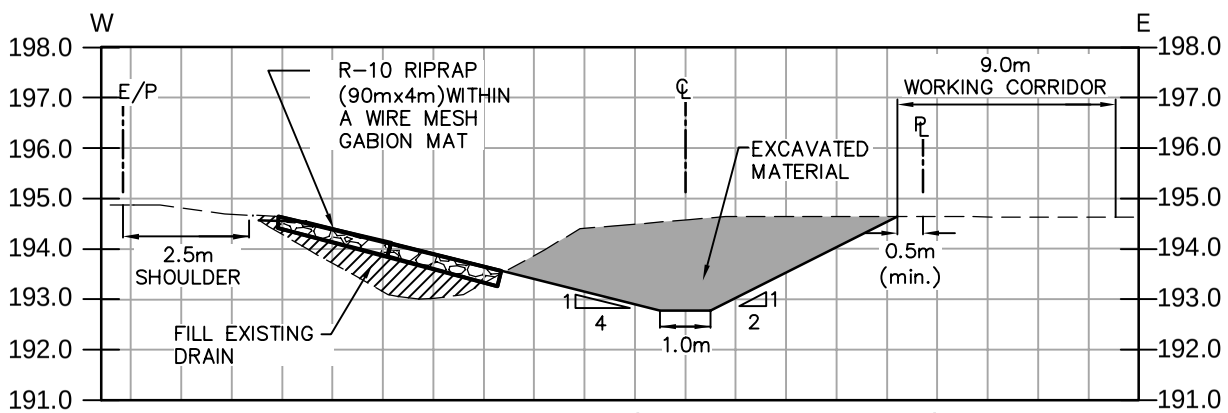

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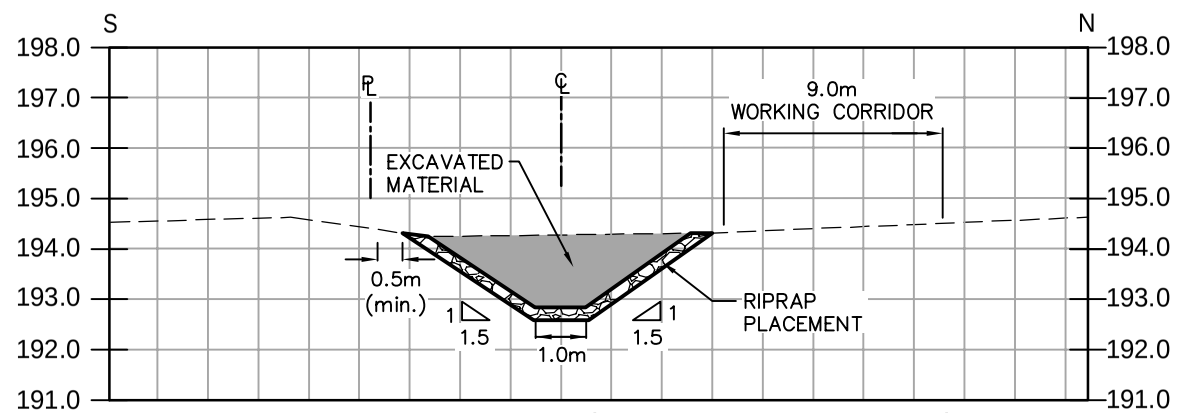

CROSS SECTION 0+718 (LOOKING DOWNSTREAM)

SCALE–1:150

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T. R. OLIVER
100046433
10/06/24
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DATE: June 10, 2024	
SCALE: AS SHOWN	

DILLON CONSULTING

PROJECT NO. 21-3142

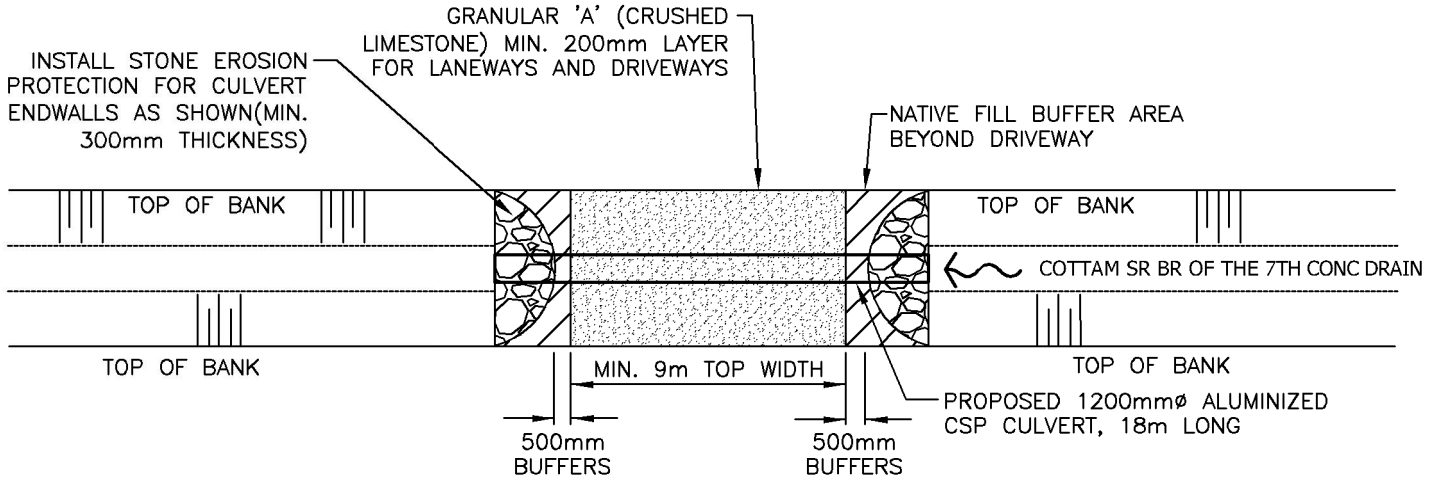
DRAWING SCALES BASED ON A 11" X 17" SHEET

Drainage Report for the Realignment and Extension of the
COTTAM SIDEROAD BRANCH OF THE 7TH CONCESSION DRAIN
Town of Kingsville

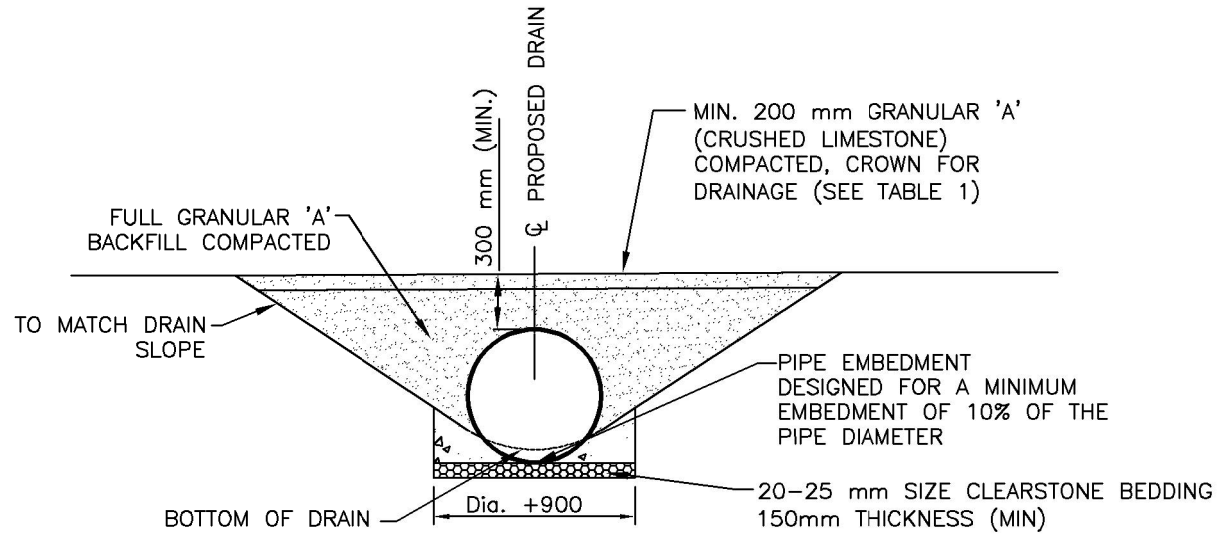
SHEET TITLE: PROFILE 2 & CROSS SECTIONS

PAGE NO. 8 of 10

Jun 07, 2024 – 1:23pm C:\pw working directory\projects 2021\33tro\d0122691\213142-03-DRN-COTTAM SDRD BRANCH.dwg



CULVERT No. 2 PLAN
N.T.S.



CROSS SECTION
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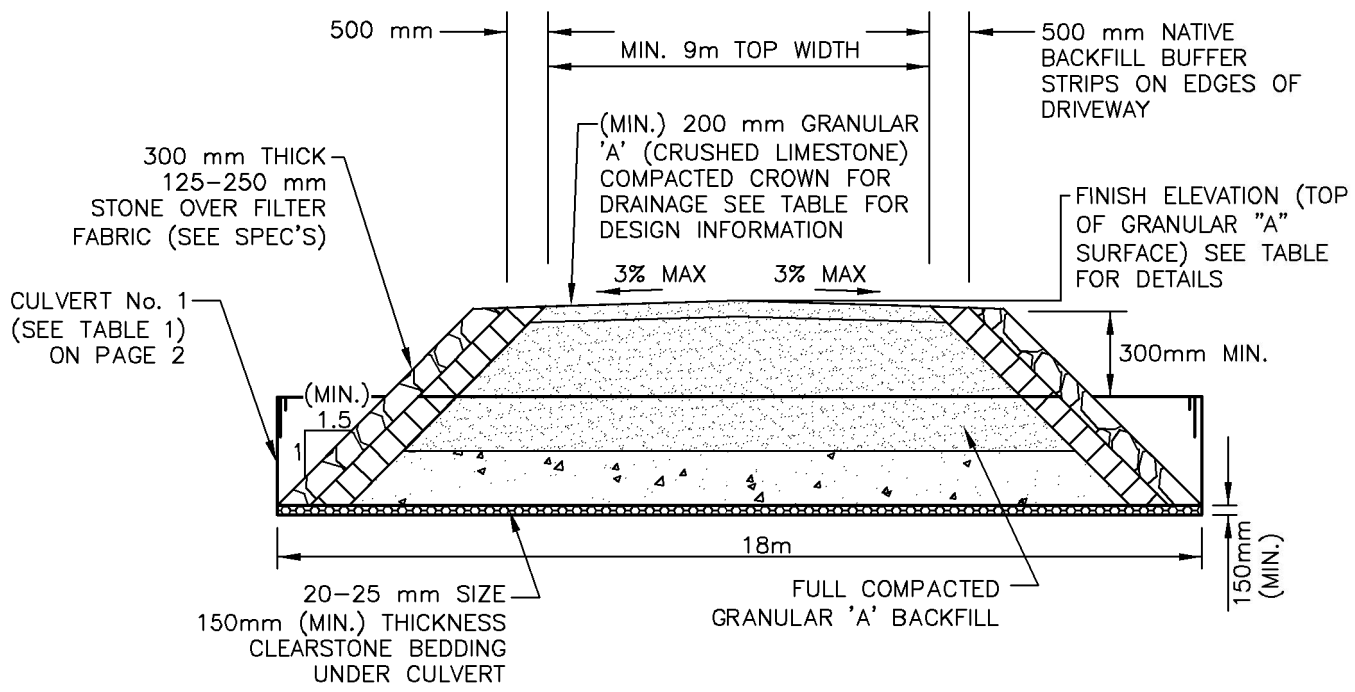

LONGITUDINAL SECTION
N.T.S.

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

Conditions of Use

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

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

DESIGN	REVIEWED BY
TRO	MDH
DRAWN	CHECKED BY
MTB/WLB	TRO

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'SCHEDULE G'

Drainage Report for the Realignment and Extension of the
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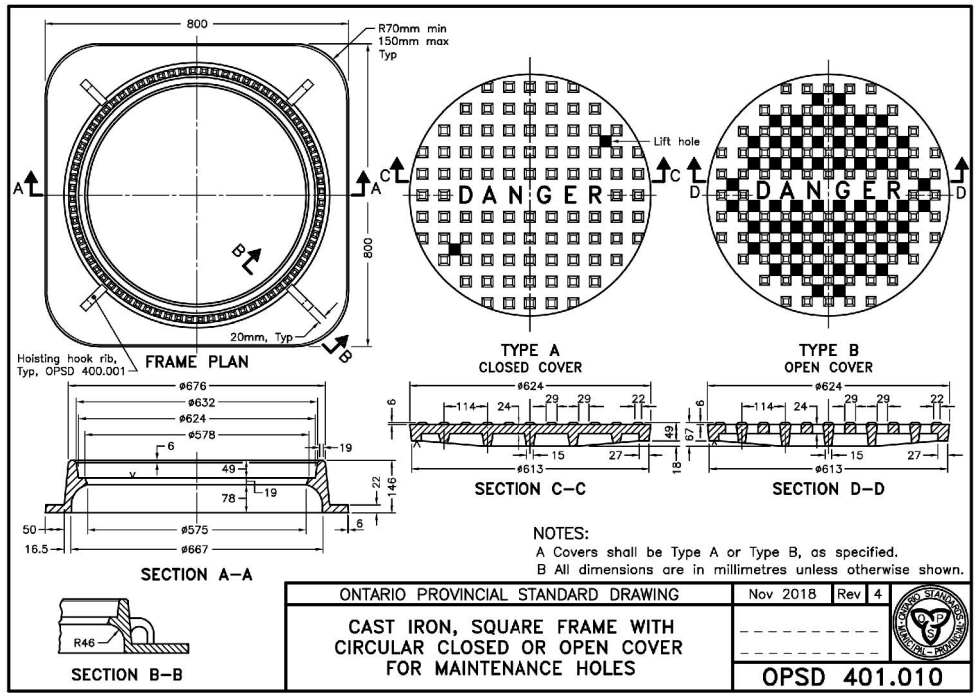
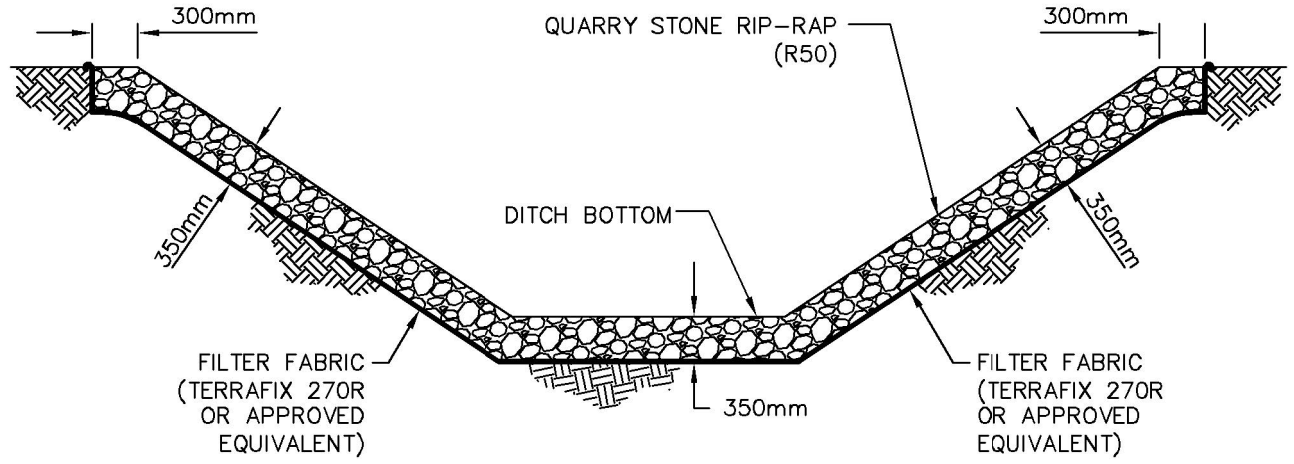
Town of Kingsville

SHEET TITLE: CULVERT No. 2 DETAILS

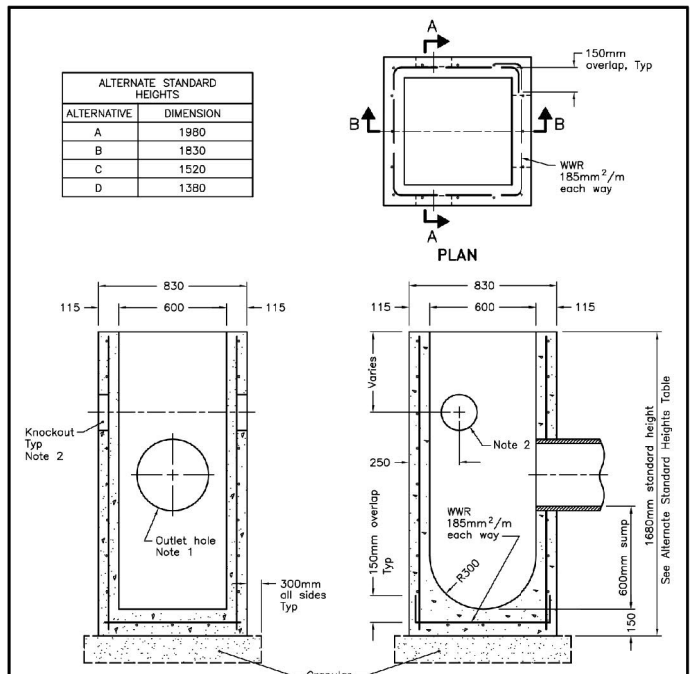


ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES		OPSD 401.010



TYPICAL DITCH BANK DETAIL WITH RIP RAP

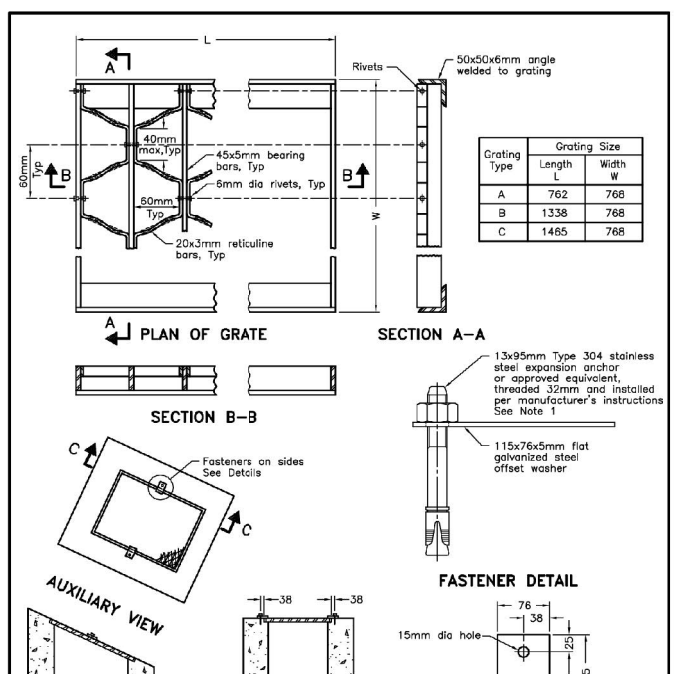
N.T.S.



ALTERNATE STANDARD HEIGHTS	
ALTERNATIVE	DIMENSION
A	1980
B	1830
C	1520
D	1380

NOTES:
1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
A Centre reinforcing in base slab and walls ±20mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

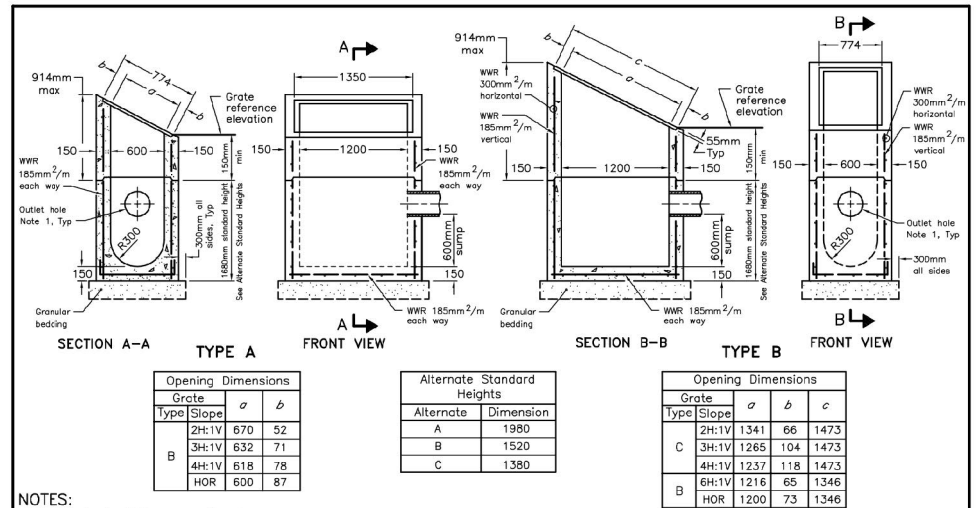
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN 600x600mm		OPSD 705.010



Grating Type	Grating Size	
	Length L	Width W
A	762	768
B	1338	768
C	1465	768

NOTES:
1 Equivalent (13x100mm Galvanized J–Bolt) cast–in–place anchor may be used.
A Fastener shall be inserted to maintain minimum concrete cover requirements.
B All steel components and rivets shall be galvanized.
C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev 3
GALVANIZED STEEL HONEYCOMB GRATING FOR DITCH INLETS		OPSD 403.010



Opening Dimensions				
Grate Type	Slope	a	b	
B	2H:1V	670	52	
	3H:1V	632	71	
	4H:1V	618	78	
	HOR	600	87	

Alternate Standard Heights	
Alternate	Dimension
A	1980
B	1520
C	1380

Opening Dimensions				
Grate Type	Slope	a	b	c
C	2H:1V	1341	66	1473
	3H:1V	1265	104	1473
	4H:1V	1237	118	1473
B	6H:1V	1216	65	1346
	HOR	1200	73	1346

NOTES:
1 Outlet hole size 525mm max diameter.
A Where inlet is placed across ditch and is accessible to vehicular traffic, grating slope shall be 6H:1V or flatter.
B Center reinforcing in wall and base slab ±25mm.
C Lap riser horizontal wires 300mm. Laps shall be placed at corners.
D Granular backfill shall be placed to a minimum thickness of 300mm all around the ditch inlet.
E Grating shall be according to OPSD 403.010.
F Pipe support shall be according to OPSD 708.020.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE DITCH INLETS 600 x 1200mm		OPSD 705.040

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'SCHEDULE G'

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SHEET TITLE: TYPICAL DETAILS

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