DRAINAGE REPORT
FOR

NEW FARM ACCESS BRIDGE ON
PT. LOT 3, CONCESSION 6
OVER THE
BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN
(MEO BRIDGE)

TOWN OF TECUMSEH

DILLON CONSULTING

(FINAL-COUNCIL CONSIDERATION)
7 OCTOBER 2022
MARK D. HERNANDEZ, P.ENG.
FILE No. 22-4605
TECUMSEH FILE E09SO(96)CC5027

File No. 22-4605

Mayor and Council
The Corporation of the Town of Tecumseh
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Drainage Report for

NEW FARM ACCESS BRIDGE ON PT. LOT 3, CONCESSION 6 OVER THE BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN (MEO BRIDGE)

Town of Tecumseh

Mayor and Council:

Instructions

The Municipality received a request for a new farm access bridge serving part of Lot 3, Concession 6 (Roll No. 440-00800) over the Branch of the South Talbot and Holden Outlet Drain that was filed at the Municipal Office on the 19th April 2022. Council accepted the request under Section 78 of the Drainage Act and on 12th July 2022 appointed Dillon Consulting Limited to prepare a drainage report.

Watershed Description

The Branch of the South Talbot and Holden Outlet Drain consists of an open channel commencing at a high point at the line between Lots 4 & 5, Concession 6. The drain flows southerly along the easterly limit of Holden Road and outlets into the Merrick Creek Drain. The lands comprising the watershed are predominantly under intensive agricultural production with cash crops. There are several non-agricultural residential parcels in the watershed. The lands within the watershed are generally flat.

Drain History

The recent history of Engineers' reports for the Branch of the South Talbot and Holden Outlet Drain follows:

- **20 April 2015 by Mark D. Hernandez, P.Eng.:** The report recommended the repair and improvement of the southerly portion of the Branch of the South Talbot and Holden Outlet Drain. The report also recommended the replacement of an existing bridge.
- **21 October 2013 by Halliday P. Pearson, P.Eng.:** The report recommended the installation of a new 1630 mm x 1120 mm (equivalent to 1400 mm diameter) C.S.P.A. access culvert serving Roll No. 440-00901 in part of Lot 3, Concession 6 denoted herein as Bridge No. 6.

- **9 August 2010 by Bruce D. Crozier, P.Eng.:** The recommended work included the repair and improvement of the northerly portion of the Branch of the South Talbot and Holden Outlet Drain from the high point at the line between Lots 4 and 5 to the outlet into the Holden Outlet Drain. The report recommended a clean out and the replacement of an existing access culvert.
- **23 February 2009 by Bruce D. Crozier, P.Eng.:** The report recommended the installation of a new access culvert serving Roll No. 440-010 in part of Lot 4, Concession 6, denoted herein as Bridge No. 12. This is a secondary access assessed 100% to the property.
- **10 May 1979 by Maurice Armstrong, P.Eng.:** The recommended work included the repair and improvement of the entire Branch of the South Talbot and Holden Outlet Drain, complete with brushing, cleaning and lowering of two existing culverts.

On-Site Meeting

An on-site meeting was held on 3rd August 2022. A record of the meeting is provided in Schedule 'A', which is appended hereto.

Survey

Our survey and examination of the Branch of the South Talbot and Holden Outlet Drain was carried out in July 2022. The survey comprised the recording of topographic data and examining the channel for available depth necessary to provide sufficient drainage.

Design Considerations

The new access culvert is designed for an upstream drainage area of approximately 91.21 hectares (225.40 acres). The hydraulic capacity of the structure must meet the current Design Standards recommended by the Ministry of Agriculture, Food and Rural Affairs. The Design and Construction Guidelines suggest that a farm culvert must be designed to freely pass the runoff generated from a 2-year return period storm event. We have applied this criterion. We have also confirmed that the installation of this culvert will not result in adverse impacts to the level of service provided by the drain.

Allowances

In accordance with Sections 29 and 30 of the Drainage Act, we do not anticipate any agricultural lands being damaged or taken as a result of the proposed drainage works. Any damage to 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 during the site meeting and our examination and analysis of the survey data, we recommend that the Branch of the South Talbot and Holden Outlet Drain be repaired and improved as described below:

Item	Description	Amount
1.	Supply and place a new 19.0 m long, 1400 mm diameter aluminized corrugated steel pipe (CSP) culvert with 125 mm x 25 mm corrugations and 2.8 mm thickness including coupler and hardware (see Specifications). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.	$14,100.00
2.	Supply and placement of clear stone bedding materials, minimum 150 mm thickness (approximately 20 tonnes).	$1,650.00
3.	Supply and placement of compacted Granular 'B' backfill materials up to pipe springline (approximately 35 tonnes).	$1,450.00
4.	Supply and placement of clean native or imported clean native backfill material from springline of pipe culvert to the underside of Granular 'A' driveway material and outside of driveway portion to construct the 0.50 m wide native buffer strips (approximately 60 m^3). **Note: Where there is an insufficient amount of native fill materials for backfilling the culvert, the Contractor may elect to import additional fill materials or alternatively use Granular 'B' at his/her own expense.**	$1,100.00
5.	Supply and install Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 25 tonnes) providing a minimum 12.2 m (40 ft.) driveable top width.	$1,500.00
6.	Supply and placement of stone rip-rap minimum 300 mm thickness c/w filter cloth underlay for sloping end walls (approximately 30 m^2).	$2,800.00
7.	Temporary sediment and erosion control measures.	$850.00
SUB-TOTAL		$23,450.00
8.	Survey, report, assessment and final inspection	$7,000.00
9.	Expenses and incidentals	$500.00
10.	ERCA review fee and permit.	$500.00
TOTAL ESTIMATE (excluding Net HST)		$31,450.00

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 against the affected lands and roads as listed in Schedule 'C' under "Value of Special Benefit," "Value of Benefit" and "Value of Outlet." Since there is only one Special Benefit assessment, a separate schedule for Details of Special Benefit (Schedule 'D') is not required or included herein.

Assessment Rationale

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

1. Costs associated with the new farm access bridge have been assessed 100% to adjoining property Roll No. 440-00800 as listed under "Value of Special Benefit."

Utilities

It may become necessary to temporarily or permanently relocate utilities that may conflict with the construction recommended under this report. In accordance with Section 26 of the Drainage Act, we assess any relocation cost against the public utility having jurisdiction. Under Section 69 of the Drainage Act, the public utility is at liberty to do the work with its own forces, but if it should not exercise this option within a reasonable time, the Municipality will arrange to have this work completed and the costs will be charged to the appropriate public utility.

Future Maintenance

We recommend that future work of repair and maintenance on the new farm access bridge be carried out by the Municipality and assessed 50% against the lands on which the bridge is located and the remaining 50% assessed as "Outlet" assessment pro-rata against the lands and road that are located upstream of the affected bridge site in the same relative proportions as shown in Schedule 'E.' The outlet assessment is based on an arbitrary $10,000.00.

These provisions for maintenance are subject, of course, to any variations that may be made under the authority of the Drainage Act.

Drawings and Specifications

Attached to this report is "Schedule F," which contains specifications setting out the details of the recommended works, and "Schedule G," which represents the following drawings that are also attached to this report:

Page 1 of 2: Watershed Plan
Page 2 of 2: Bridge Details

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.

Respectfully submitted,

DILLON CONSULTING LIMITED

Mark D. Hernandez, P.Eng.

MDH:wlb

Meeting Minutes

Subject: South Talbot and Holden Outlet Drain New Access Bridge

Date: August 3, 2022

Location: Via Zoom

Our File: 22-4605

Distribution: Distribution

Attendees

Alessia Mussio	Town of Tecumseh
Mark Fishleigh	County of Essex
Ralph Meo	Landowner
Mark Hernandez	Dillon Consulting Ltd.

Notes

Item	Discussion	Action by
1.	Section 78 request for a new access bridge on Branch of South Talbot and Holden Outlet Drain	
2.	Landowner has provided information to Dillon regarding access needs	
3.	Dillon has completed the topographical survey	
4.	Dillon has started preparation of the report and anticipate it can be completed in a timely fashion	
5.	It was discussed that a PIC meeting would not be necessary due to the limited impact to other landowners. Other landowners are not responsible for the cost of the design and construction of the new culvert.	
6.	Due to the timing of the municipal elections, the Town will not be in a position to take the report to the Board until the New Year. This means construction may not occur until the spring of 2023.	
7.	The first board meeting is the Meeting to Consider the technical aspects of the report. The second meeting is the Court of Revision to discuss the assessment aspect of the report.	
8.	The landowner noted that they would like the remaining conditions cleared to be able to sever the land. The conditions included a reapportionment which will be completed by the Town and the Drainage Act process for establishing a new access to the property.	

Errors and/or Omissions

These minutes were prepared by _*Mark Hernandez*_ who should be notified of any errors and/or omissions.

"SCHEDULE C"
SCHEDULE OF ASSESSMENT
BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN
TOWN OF TECUMSEH

PRIVATELY-OWNED - AGRICULTURAL LANDS (NON-GRANTABLE)

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
440-00800	6	S. Pt. Lot 3	34.80	14.08	Raffaele & Gina Meo	$31,450.00	$0.00	$0.00	$31,450.00
Total on Privately-Owned - Agricultural Lands.....						$31,450.00	$0.00	$0.00	$31,450.00
TOTAL ASSESSMENT						**$31,450.00**	**$0.00**	**$0.00**	**$31,450.00**

	(Acres)	(Ha.)
Total Area:	**34.80**	**14.08**

"SCHEDULE E"
SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE
BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN (MEO BRIDGE)
TOWN OF TECUMSEH

MUNICIPAL LANDS:

Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Holden Road	7.00	2.83	Town of Tecumseh	$0.00	$0.00	$1,877.00	$1,877.00
Total on Municipal Lands				$0.00	$0.00	$1,877.00	$1,877.00

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
Severed Parcel	6	Pt. Lot 3	1.35	0.55	Raffaele & Gina Meo	$0.00	$0.00	$120.00	$120.00
440-00805	6	Pt. Lot 3 RP 12R7600 Pt. 1	0.62	0.25	Vincent J. & Antonietta Gyori	$0.00	$0.00	$91.00	$91.00
440-00901	6	N. Pt. Lot 3 RP 12R3516 Pt. 1	1.00	0.40	Julie-Christie Laudenbach & Leon J. Dufour	$0.00	$0.00	$106.00	$106.00
440-00950	6	Pt. Lot 3 RP 12R24063 Pt. 1	1.25	0.51	Gino Marchisio	$0.00	$0.00	$118.00	$118.00
440-01010	6	Pt. Lot 4 RP 12R22384 Pt. 1	1.81	0.73	Jessie J. & Catherine E. Robinet	$0.00	$0.00	$131.00	$131.00
440-01001	6	Pt. Lot 4 RP 12R6119 Pt. 1	1.00	0.40	James J. & Catherine M. Sykes	$0.00	$0.00	$106.00	$106.00
440-01005	6	Pt. Lot 4 RP 12R23835 Pt. 1	1.25	0.51	Anna Weinberg	$0.00	$0.00	$118.00	$118.00
440-01100	6	W. Pt. Lot 4	0.50	0.20	Daniel G. & Karen T. Lesperance	$0.00	$0.00	$80.00	$80.00
440-01101	6	Pt. Lots 4&5 RP 12R6847 Pt. 1	1.64	0.66	Scott & Joie Reyner	$0.00	$0.00	$126.00	$126.00
440-01200	6	Pt. Lot 5 RP 12R24842Pt. 1	1.26	0.51 *	Scott & Joie Reyner	$0.00	$0.00	$118.00	$118.00
440-01400	6	N. Pt. Lot 5 RP 12R21849 Pt. 1	0.56	0.23 *	Elaine J. Healey	$0.00	$0.00	$87.00	$87.00
Total on Privately-Owned - Non-Agricultural Lands						$0.00	$0.00	$1,201.00	$1,201.00

PRIVATELY-OWNED - AGRICULTURAL LANDS

Roll No.	Con.	Description	Area Affected (Acres)	(Ha.)	Owner	Special Benefit	Benefit	Outlet	Total Assessment
440-00800	6	S. Pt. Lot 3	34.80	14.08	Raffaele & Gina Meo	$0.00	$0.00	$1,867.00	$1,867.00
440-00910	6	Pt. Lot 3 RP 12R24159 Pt. 1	33.18	13.43	Charles A. & Helen J. Banwell	$0.00	$0.00	$1,781.00	$1,781.00
440-01000	6	Pt. Lot 4 RP 12R23835 Pt. 2	52.44	21.22	Joie Jobin & Scott Reyner	$0.00	$0.00	$2,814.00	$2,814.00
440-01220	6	Pt. W. ½ Lots 4 & 5	62.30	25.21 *	Scott & Joie Reyner	$0.00	$0.00	$334.00	$334.00
440-01300	6	S. Pt. Lot 5	23.44	9.49 *	Elaine J. Healey & Kathleen M. Tyrrell	$0.00	$0.00	$126.00	$126.00
Total on Privately-Owned - Agricultural Lands.....						$0.00	$0.00	$6,922.00	$6,922.00
TOTAL ASSESSMENT						**$0.00**	**$0.00**	**$10,000.00**	**$10,000.00**

	(Acres)	(Ha.)
Total Area:	**225.40**	**91.21**

* denotes lands assessed at reduced rate

”SCHEDULE F”

DRAINAGE REPORT FOR A

NEW FARM ACCESS BRIDGE ON PT. LOT 3, CONCESSION 6 BRANCH OF SOUTH TALBOT & HOLDEN OUTLET DRAIN

TOWN OF TECUMSEH

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:

- Supply and place a new 19.0 m long, 1400 mm diameter aluminized corrugated steel pipe (CSP) culvert with 125 mm x 25 mm corrugations and 2.8 mm thickness including coupler and hardware (see Specifications). The work is to include drain bottom cleanout in close proximity to the bridge, site cleanup and restoration within the working area.
- Supply and placement of clear stone bedding materials, minimum 150 mm thickness (approximately 20 tonnes).
- Supply and placement of compacted Granular 'B' backfill materials up to pipe springline (approximately 35 tonnes).
- Supply and placement of clean native or imported clean native backfill material from springline of pipe culvert to the underside of Granular 'A' driveway material and outside of driveway portion to construct the 0.50 m wide native buffer strips (approximately 60 m^3). Note: Where there is an insufficient amount of native fill materials for backfilling the culvert, the Contractor may elect to import additional fill materials or alternatively use Granular 'B' at his/her own expense.
- Supply and install Granular 'A' (crushed limestone) compacted driveway surface, minimum 200 mm thickness (approximately 25 tonnes) providing a minimum 12.2 m (40 ft.) driveable top width..
- Supply and placement of stone rip-rap minimum 300 mm thickness c/w filter cloth underlay for sloping end walls (approximately 30 m^2).
- Temporary sediment and erosion control measures.

3.0 ACCESS TO THE WORK

Access to the drain shall be from Holden Road. Through traffic must be maintained at all times along municipal roads with the required traffic control as per Section 13.0 in the General Specifications. All construction materials for the bridge are to be stored on the field side of the Branch of the South Talbot and Holden Outlet Drain. Any damage resulting from the Contractor's access to the bridge site shall be rectified to pre-existing conditions at his expense.

4.0 WORKING CORRIDOR

The working area at the bridge site shall be restricted to a radius of 20.0 m from the proposed centre of the new culvert.

Any damages to lands and/or roads from the Contractor's work within the working area for the bridge site shall be rectified to pre-existing conditions at his/her expense.

5.0 BRIDGE CONSTRUCTION

5.1 Location of New Bridge

The new bridge structure shall be installed as shown on the drawing attached hereto.

5.2 Materials for New Bridge

Materials shall be as follows:

Culvert Pipe	*New 19.0 long, 1400 diameter aluminized Type II corrugated steel pipe (CSP) wall thickness of 2.8 mm and 125 mm x 25 mm corrugations with rerolled ends. New culvert shall be joined with annular aluminized corrugated wide bolt and angle couplers (minimum of 8 corrugation overlap and 2.8 mm wall thickness) and no single pipe less than 6.0 m in length. All pipes connected with couplers shall abut to each other with no more than a 25 mm gap between pipes prior to installation of the coupler and wrapped with filter fabric.*
Pipe Bedding Below Pipe	*20-25 mm clear stone conforming to OPSS Division 10.*
Backfill up to Pipe Springline	*Granular 'B' conforming to OPSS Division 10.*
Backfill Above Pipe Springline up to Driveway Surface Materials	*Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances. Alternatively, Granular 'A' or 'B' conforming to OPSS Division 10.*
Driveway Surface	*Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 200 mm thickness.*
Erosion Stone	*All stone to be used for erosion protection shall be 125 - 250 mm clear quarried rock or OPSS.Muni 1004, minimum 300 mm thickness.*
Buffer Strips	*Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances.*
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.*

5.3 Culvert Installation

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

5.4 Sloping Stone End Walls

End walls shall be constructed of quarry stone rip-rap, as specified herein. Each end wall shall extend from the invert of the new culvert to the top of the proposed lane. The end walls shall be sloped 1 vertical to 1.5 horizontal with a filter fabric underlay surrounding the pipe and spanning across the entire width of the drain and wrapping around the drain banks to align with the ends of the new pipe culvert. The minimum thickness requirement of the erosion stone layer is 300 mm with no portion of the filter fabric to be exposed to sunlight.

5.5 Granular 'A' Driveway

The Contractor shall construct the driveway with a maximum 3% cross-fall grade consisting of a minimum 200 mm thickness of compacted Granular 'A' (crushed limestone) surface. The minimum top width of the driveway shall be as shown on the drawings.

5.6 Lateral Tile Drains

One corrugated plastic tile drain needs to be relocated as shown on the drawings. Should the Contractor encounter any lateral tiles within the proposed culvert limits not shown on the attached drawings, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new culvert. **Tile drain outlets through the wall of the new culvert pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense.

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 SUBLETTING

The Contractor shall keep the work under his/her personal control, and shall not assign, transfer, or sublet any portion without first obtaining the written consent of the Municipality.

12.0 TIME OF COMPLETION

The Contractor shall complete all work on or before the date fixed at the time of tendering. The Contractor will be held liable for any damages or expenses occasioned by his/her failure to complete the work on time and for any expenses of inspection, superintending, re-tendering or re-surveying, due to their neglect or failure to carry out the work in a timely manner.

13.0 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.

14.0 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.

15.0 UTILITY RELOCATION WORKS

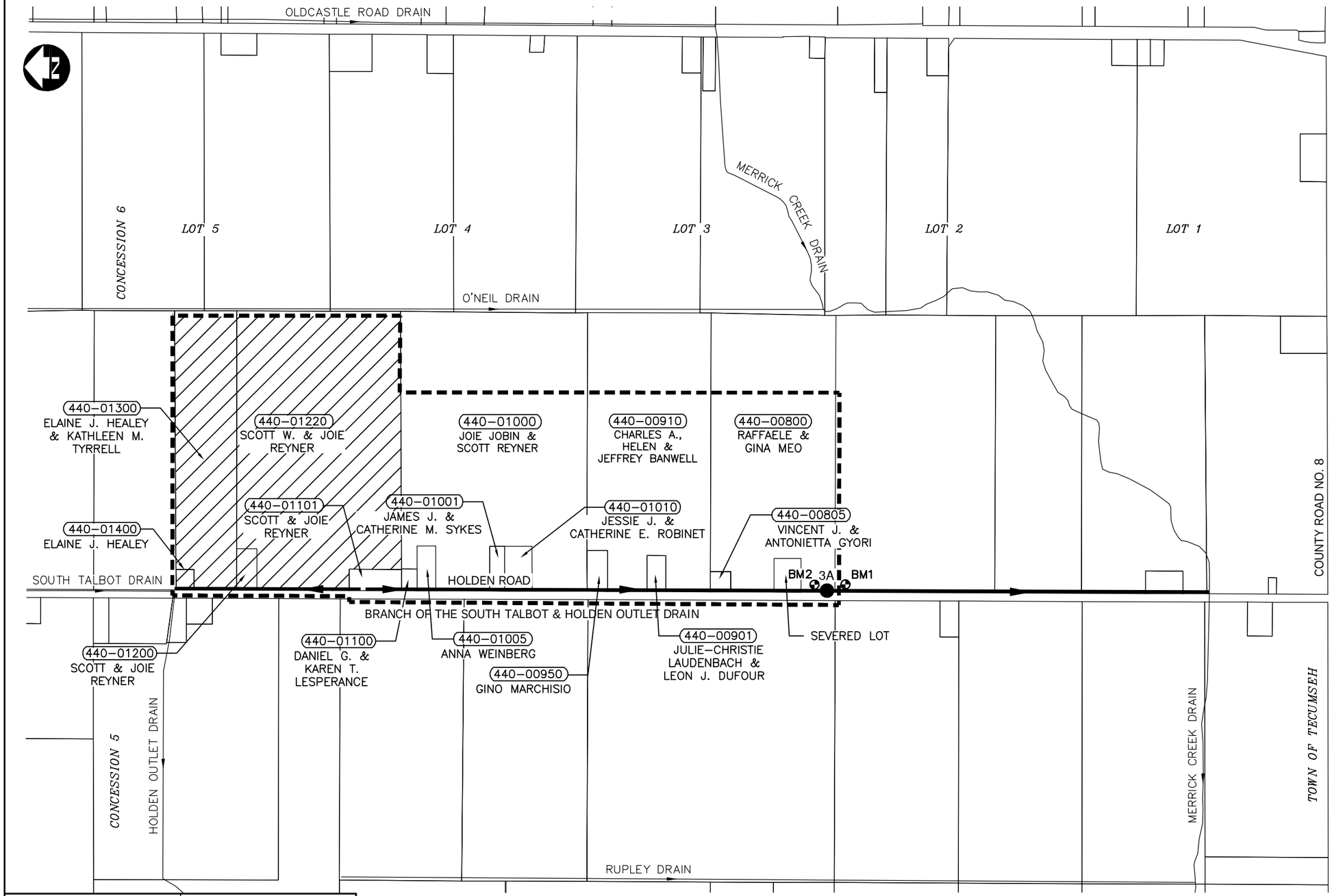
In accordance with Section 26 of the Drainage Act, if utilities are encountered during the installation of the drainage works that conflict with the placement of the new culvert, the operating utility company shall relocate the utility at their own costs. The Contractor however will be responsible to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

16.0 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.

17.0 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.



BENCHMARKS

BM1
TOP OF SIB ON EAST TOP OF BANK APPROX. 12 m SOUTH OF ℄ OF NEW BRIDGE.
ELEVATION=184.95m

BM2
TOP OF SIB ON EAST TOP OF BANK APPROX. 38 m NORTH OF ℄ OF NEW BRIDGE.
ELEVATION=185.02m

LEGEND

- BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN DRAINAGE AREA
- BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN
- OTHER DRAINS
- NEW BRIDGE
- BM LOCAL BENCHMARK
- LAND ASSESSED AT REDUCED RATE

WATERSHED PLAN

SCALE=1:10,000

LICENSED PROFESSIONAL ENGINEER
M. D. HERNANDEZ
100078099
Oct 7/22
PROVINCE OF ONTARIO

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
2	FINAL REPORT SUBMISSION	OCT. 7/22	MDH
1	CLIENT REVIEW	AUG. 26/22	MDH

DESIGN MDH	REVIEWED BY CDP
DRAWN WLB	CHECKED BY TRO
DATE October 7, 2022	
SCALE AS SHOWN	

DILLON CONSULTING

PROJECT NO. 22-4605

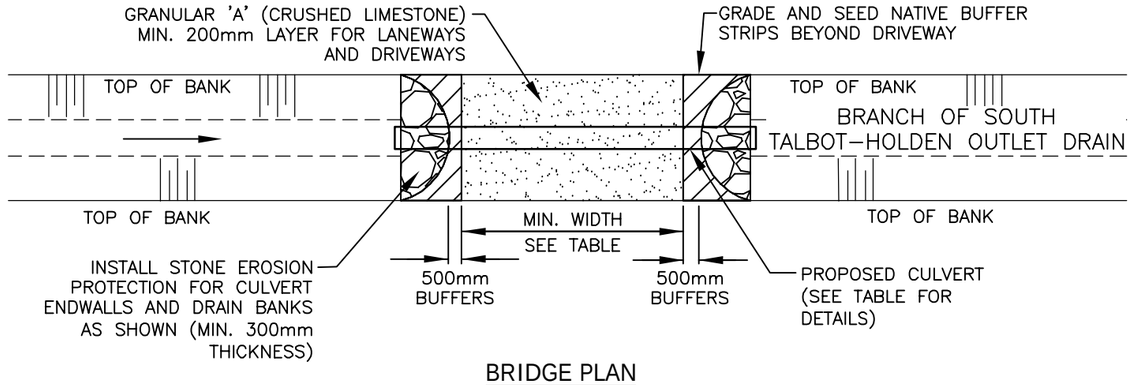
DRAWING SCALES BASED ON A 11" X 17" SHEET

'SCHEDULE G'

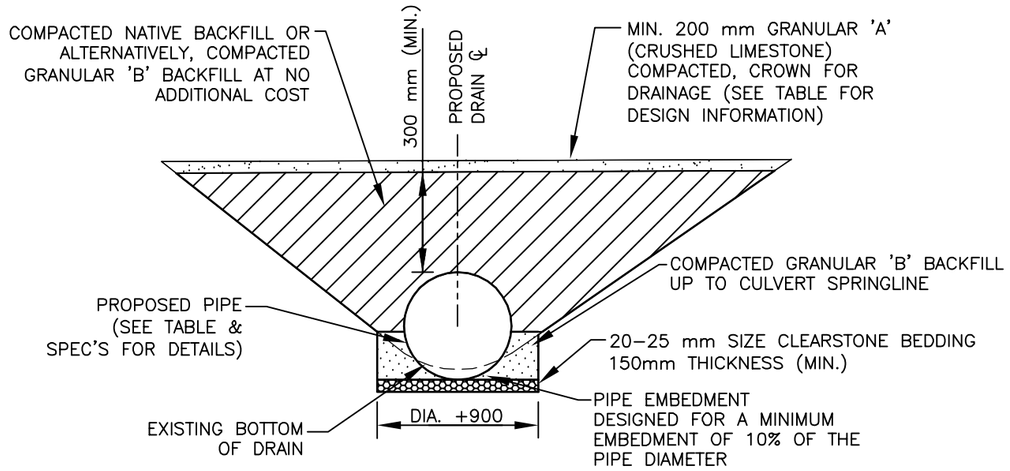
Drainage Report for the
BRANCH OF THE SOUTH TALBOT & HOLDEN OUTLET DRAIN (MEO BRIDGE)
Town of Tecumseh

SHEET TITLE WATERSHED PLAN

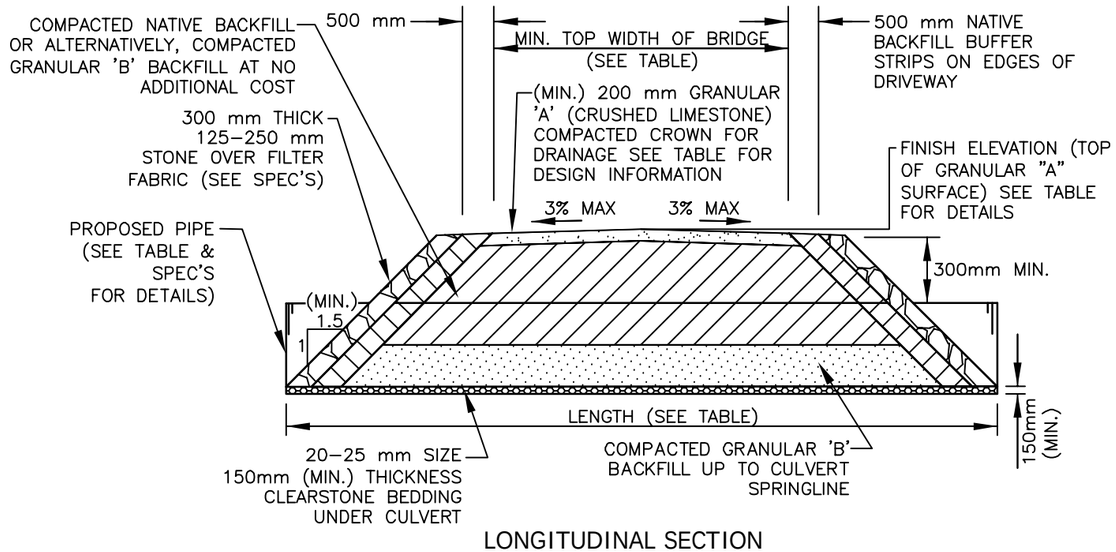
PAGE NO. 1 of 2



BRIDGE PLAN
SCALE=1:100



CROSS SECTION
SCALE=1:100



LONGITUDINAL SECTION
SCALE=1:100

TABLE 1 - ACCESS BRIDGE DESIGN INFORMATION

DESCRIPTION	BRIDGE No. 3A
PIPE INVERT ELEV. U/S SIDE(m)	183.40
PIPE INVERT ELEV. D/S SIDE(m)	183.38
TOP OF ℄ DRIVEWAY SURFACE ELEV. (m)	185.10
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	183.66
MIN. TOP WIDTH OF DRIVEWAY (m)	12.2
MIN. CULVERT GRADE (%)	0.10
CULVERT TYPE	C.S.P.
CULVERT MATERIAL	ALUM.
CULVERT LENGTH (m)	19.0
CULVERT THICKNESS (mm)	2.8
CULVERT CORRUGATIONS (mm)	125x25
PIPE SIZE (mm)	1400
CULVERT ENDWALL TYPE	SLOPING

LICENSED PROFESSIONAL ENGINEER
M. D. HERNANDEZ
100078099
Oct 7/22
PROVINCE OF ONTARIO

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DESIGN	REVIEWED BY
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DRAWN	CHECKED BY
WLB	TRO

DATE: October 7, 2022
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DILLON CONSULTING

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'SCHEDULE G'

Drainage Report for the
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Town of Tecumseh

SHEET TITLE: BRIDGE DETAILS
PAGE NO. 2 of 2

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