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May 18, 2022

The Mayor and Council
The Town of Tecumseh
917 Lesperance Road
Tecumseh, Ontario
N8N 1W9

Gentlemen and Mesdames:

Re: South Talbot Road Drain East and 12th Line Drain

In accordance with your instructions, we have undertaken an examination of the South Talbot Road Drain and 12th Line Drain in the Town of Tecumseh.

Authorization under the Drainage Act

This Engineer's Report has been prepared under Section 78 of the Drainage Act.

Section 78 of the Drainage Act states that, where, for the better use, maintenance or repair of any drainage works constructed under a bylaw passed under this Act, or of lands or roads, it is considered expedient to change the course of the drainage works, or to make a new outlet for the whole or any part of the drainage works, or to construct a tile drain under the bed of the whole or any part of the drainage works as ancillary thereto, or to construct, reconstruct or extend embankments, walls, dykes, dams, reservoirs, bridges, pumping stations, or other protective works as ancillary to the drainage works, or to otherwise improve, extend to an outlet or alter the drainage works or to cover the whole or any part of it, or to consolidate two or more drainage works, the Council whose duty it is to maintain and repair the drainage works or any part thereof may, without a petition required under Section 4 but on the report of an Engineer appointed by it, undertake and complete the drainage works as set forth in such report.

Background

The South Talbot Road Drain East outlets into the Malden Road East Drain at the southeast corner of the Malden Road and South Talbot Road intersection. It continues as an open channel southeasterly along the south side of South Talbot Road for 2,263m to the southwest corner of the South Talbot Road and Manning Road intersection. The 12th Line Drain outlets into the South Talbot Road Drain East at the southeast corner of the South Talbot Road and Concession Road 12 intersection. It continues as an open channel

southerly along the east side of Concession Road 12 for 1,543m to the northeast corner of the Concession Road 12 and County Road 8 intersection.

The South Talbot Road Drain East and the 12th Line Drain were both last improved under an Engineer's Report dated October 15, 1980. Under this report the 12th Line Drain was cleaned and the South Talbot Road Drain East was cleaned from its outlet to the 12th Line Drain. Also under this report, culverts now numbered Culvert No. 3 of the South Talbot Road Drain East and Culvert No. 2 of the 12th Line Drain, were lowered.

Drain Classification

The South Talbot Road Drain East and 12th Line Drain are both currently classified as a class "F" drain according to the Department of Fisheries and Oceans (DFO) classification as presented by the Ontario Ministry of Agriculture, Food and Rural Affairs' Agricultural Information Atlas.

Class "F" drains are intermittent or ephemeral (dry for more than two consecutive months).

The drain will require approval from the Essex Region Conservation Authority and the Department of Fisheries and Oceans. Construction cannot commence without necessary approvals.

On Site Meeting

An onsite meeting was held virtually on July 9th, 2021. The following were present:

- Josh Warner (Engineer, R. Dobbin Engineering)
- Sam Paglia (Drainage Superintendent, Town of Tecumseh)
- David Holek (Landowner)
- Rick Chapman (Landowner)
- Wayne Farough (Landowner)

The following is a brief summary of the onsite meeting:

- Landowners were made aware that R. Dobbin Engineering has been appointed under Section 78 of the Drainage Act to prepare a report for the installation of an access culvert in Pt. of Lot 2 and 3, Concession 12.
- It was stated that the existing maintenance schedule for the drain is out of date. The Landowners present agreed that updating the maintenance schedule for both drains, analyzing all the culverts along the length of the drainage works and replacing as required or providing provisions for future replacement would be to the benefit of the drain.

- The Landowner requesting the culvert requested a 20' top width and specified the location to be at the tree line on the property.
- Landowners were made aware that a Public Information Centre (PIC) will be held following the report completion for Landowners to voice their concerns and questions.
- Access culverts will be sized to a 1:5-year storm event and will typically have a length necessary to provide a 6m top width. Length requested or required beyond that will be assessed to the Landowner.
- Each property is permitted one access that will have cost sharing. Any costs associated with additional culverts will be at the cost of the individual Landowner.

Existing Conditions

Below is a summary of the condition of the existing culverts:

SOUTH TALBOT ROAD DRAIN EAST			
Location	Culvert Number	Condition	Recommendation
Roll Number 4410-000051	1	Good, Replaced in 2007	Leave
Concession Road 11	2	Poor – very little cover, small turning radius at east end and has been crushed, rust below spring line	Replace
Roll Number 4400-000012	3	Okay to Poor– rust below the spring line. No holes found	Leave, short term replacement
Roll Number 4400-000013	4	Okay	Leave
Concession Road 12	5	Okay	Leave
Roll Number 4400-000056	6	No Existing Culvert. Culvert is Proposed	Install New
Roll Number 4400-000056	7	Okay- rust and holes right at the west end, but remainder is in okay shape.	Leave
Roll Number 4400-000056-05	8	Poor to Fair – holes and rust	Replace

12th LINE DRAIN			
Location	Culvert Number	Condition	Recommendation
Roll Number 4400-000058-50	1	Okay to Poor-rust throughout but no holes found	Leave
Roll Number 4400-000059	2	Okay	Leave

Public Information Centre (PIC)

A public meeting was held virtually on April 22, 2022. Prior to this meeting all Landowners received the draft report. The following were present at the PIC:

- Josh Warner (Engineer, R. Dobbin Engineering)
- Sam Paglia (Drainage Superintendent, Town of Tecumseh)
- Alessia Mussio (Assistant Drainage Superintendent, Town of Tecumseh)
- Brian Hyland (Landowner)
- David Holek (Landowner)
- Ken Hebert (Landowner)
- Rick Chapman (Landowner)
- Wayne Farough (Landowner)

The following is a brief summary of the meeting:

- Brian Hyland expressed concerns with establishing the buffer strip as part of the drain and felt that it could be installed outside of the drainage act at a cheaper cost. Brian was going to reach out to OMAFRA, ERCA and others to investigate doing it outside of the report and would get back to Town staff and the engineer.

On May 18, 2022, the Town of Tecumseh said to proceed with the report with the inclusion of the buffer strips.

Design

The access culverts shall be designed to provide outlet for a 1 in 5-year storm event. The road culverts shall be designed to provide outlet for a 1 in 25-year storm event.

Recommendations

It is therefore recommended that, under this report, the following work be carried out:

1. A future grade line shall be established for the South Talbot Road Drain East (STRDE) and 12th Line Drain. A portion of the South Talbot Road Drain East shall be cleaned out to accommodate a proposed culvert as the area has filled in with sediment.
2. The culverts along the length of the drainage works shall be replaced as required and future specifications shall be developed for the remaining culverts.
3. A 1.5m wide buffer strip shall be established along the south side of the South Talbot Road Drain East and along the east side of the 12th Line Drain for the entire length of each drain.

Estimate of Cost

It is recommended that the work be carried out in accordance with the accompanying Specification of Work and Profile that forms part of this Report. There has been prepared an Estimate of Cost in the amount of \$154,554.00, including engineering of the report, attending the Meeting to Consider the Report, attending the Court of Revision and estimates for tendering, construction inspection, permitting and contract administration. Appearances before appeal bodies have not been included in the cost estimate.

Assessment

As per Section 21 of the Drainage Act, the Engineer in his report shall assess for benefit and outlet for each parcel of land and road liable for assessment.

Lands, roads, buildings, utilities, or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance, or repair of a drainage works may be assessed for benefit. (Section 22)

Lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek, or watercourse may be assessed for outlet. The assessment for outlet shall be based on the volume and rate of flow of the water artificially caused to flow into the drainage works from the lands and roads liable for such assessments. (Section 23)

The Engineer may assess for special benefit any lands for which special benefits have been provided by the drainage works. (Section 24)

A Schedule of Assessment for the lands and roads affected by the work and therefore liable for the cost thereof has been prepared as per the Drainage Act. Also, assessments may be made against any public utility or road authority, as per Section 26 of the Drainage Act, for any increased cost for the removal or relocation of any of its facilities and plant that may be necessitated by the construction or maintenance of the drainage works. Items to be assessed under Section 26 shall be tendered as a separate item in the contract documents with the actual cost plus a portion of the engineering (20% of the construction cost) being assessed to the public utility or road authority.

All additional costs to work around utilities not included in the estimate shall be tracked separately and the cost plus a portion of the engineering (20% of the construction cost) shall be borne by that utility.

The cost of any approvals, permits or any extra work, beyond that specified in this report that is required by any utility, conservation authority, government ministry or organization (federal or provincial), or road authority shall be assessed to that organization requiring the permit, approval, or extra work.

The proposed work has generally been assessed in the following manner, including all estimated fees, taxes and disbursements:

1. As per Section 26 of the Drainage Act the roads and utilities have been assessed the increased cost of the drainage works caused by the existence of the works of the public utility or road authority. The road crossings (Culvert No. 2 and 5) and traffic control on South Talbot Road have been assessed with 100% of the estimated cost/engineering being assessed as a special benefit assessment to the road authority. It is not anticipated that any utilities will conflict with the proposed drainage improvements. Any utilities that do conflict with the proposed improvements shall be assessed as per above. The replacement of Culvert No. 2 and the traffic control on South Talbot Road shall be tendered separately with the actual cost plus a portion of the engineering (20% of the construction cost) being assessed to the owner of the utility or road.
2. The engineering cost of Culvert No. 1 has been assessed with 80% of the cost applied as a benefit assessment to the owner of the abutting road (South Talbot Road), 10% applied as benefit assessment to the owner of the property, and the remainder of the cost has been assessed as outlet assessment to upstream lands and roads based on equivalent hectares.
3. The cost of Culvert No. 6 has been assessed with 100% of the cost applied as special benefit assessment to the requesting Landowner as it is a secondary access to the property.
4. The replacement/engineering cost for the remaining culverts (No. 3, 4, 7 & 8 on the STRDE and No. 1 & 2 on the 12th Line Drain) has been assessed with 45% of the cost applied as benefit assessment to the owner of the property, 10% applied as a benefit assessment to the owner of the abutting road (South Talbot Road and Concession Road 12) and the remainder to upstream lands and roads based on equivalent hectares.
5. The remainder of the open channel improvements have generally been assessed with 10% of the cost applied as a benefit assessment to the owner of the abutting road (South Talbot Road and Concession Road 12), 45% applied as benefit assessment to the owner of the property, and the remainder of the cost has been assessed as outlet assessment to upstream lands and roads based on equivalent hectares.

Allowances

Under Section 29 of the Drainage Act, the Engineer in his Report shall estimate and allow in money to the Owner of any land that it is necessary to use for the construction or improvement of a drainage works or for the disposal of material removed from drainage works. This shall be considered an allowance for right-of-way.

Under Section 30 of the Drainage Act, the Engineer shall determine the amount to be paid to persons entitled thereto for damage, if any, to ornamental trees, lawns, fences, land and crops occasioned by the disposal of material removed from a drainage works. This shall be considered an allowance for damages.

Allowances have been made, where appropriate, as per Section 29 of the Drainage Act for right-of-way and as per Section 30 of the Drainage Act for damages to lands and crops. Allowances for right of way are based on a land value of \$30,000.00 per hectare. Allowances for crop loss are based on \$2,000.00 per hectare for the first year, \$1,000.00 for the second year (\$3,000.00 per hectare total).

Access and Working Area

Access to the work site for construction and future maintenance of the South Talbot Road Drain East and 12th Line Drain shall be from South Talbot Road, Concession Road 11 and Concession Road 12, across the access culverts and along the drainage works. The working area for construction and maintenance shall be restricted to a width of 15m from the top of bank where the work is taking place. The excavation shall generally be done from the field side of the channel except across finished lawns. Across finished lawns, the excavation shall generally be done from the road side with the excavated material being trucked off site.

The working area at each culvert shall extend 10 metres from the bank on both sides and for 10 metres along the channel on either side of the culvert.

Restrictions

No trees and shrubs shall be planted nor shall permanent structures be erected within 15m of either side of the proposed drain without prior written permission of Council.

Attention is also drawn to Sections 80 and 82 of the Drainage Act, which refer to the removal of obstructions in a drain and damage caused to a drain.

Agricultural Grant

If available, it is recommended that application for subsidy be made for eligible agricultural properties. Any assessments against non-agricultural properties are shown separately in the Schedule of Assessment.

Maintenance

The open channel shall be maintained and repaired in the same relative portions as contained in the applicable Schedule of Maintenance. Maintenance shall be done in accordance with the enclosed specifications and profiles unless otherwise altered under provisions of the Drainage Act.

For future maintenance and repair of the open channel, the excavated material across finished lawns shall be trucked and disposed offsite by the Contractor. The cost of trucking across finished lawns less the equivalent cost of levelling, shall be assessed to the individual property. Agricultural properties that wish to have the excavated material trucked will be assessed the cost of trucking less the cost of levelling. The cost of levelling will form part of the drain maintenance cost.

The buffer strips are to extend 1.5 metres from the top of the bank on the south side of the channel on the South Talbot Road Drain East and the east side of the channel for the 12th Line Drain. If the buffer strip extends less than this due to encroaching cropping practices, the buffer strip shall be maintained with 100% of the cost assessed to the Landowner. Otherwise, the buffer strip shall be maintained and repaired in the same relative portions as contained in the applicable Schedule of Maintenance.

The culverts shall be maintained and repaired as follows, with outlet being assessed based on equivalent hectares as contained in the applicable Schedule of Maintenance:

SOUTH TALBOT ROAD DRAIN EAST			
Culvert Number	Benefitting Landowner	Road Authority	Outlet
1	10%	80% (South Talbot Road)	10%
2		100% (Concession Road 11)	
3, 4, 7 & 8	45%	10% (South Talbot Road)	45%
5		100% (Concession Road 12)	
6	100%		

12TH LINE DRAIN			
Culvert Number	Benefitting Landowner	Road Authority	Outlet
1 & 2	45%	10% (Concession Road 12)	45%

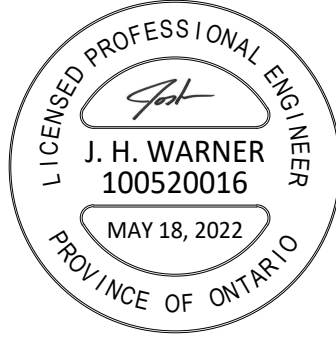
The cost of asphalt or concrete repair or replacement shall be borne by the benefitting Landowner.

Each property is allowed one access culvert for each municipal drain with any second culvert on the property maintained and repaired 100% by the owner.

Yours truly,



Josh Warner, P. Eng.
R. Dobbin Engineering Inc.



ALLOWANCES

Allowances have been made as per Sections 29 and 30 of the Drainage Act for right of way and for damages to lands and crops.

Conc.	Lot or part	Roll No.	Owner	Section 29	Section 30	Total
10	Pt. Lot 4	4410-000049	A. Deehan	370	50	420
11	Pt. Lot 2 & 3	4400-000014	W. & I. Farough	1,320	-	1,320
	Pt. Lot 3	4400-000013	S. Woodward	790	-	790
	Pt. Lot 3 & 4	4400-000012	C. Farough	3,760	50	3,810
12	Pt. Lot 2	4400-000056-05	K. Hebert	600	-	600
	Lot 1	4400-000059	B. & R. Hyland	2,800	-	2,800
	Pt. Lot 1 & 2	4400-000058-50	W. & M. Hyland	2,330	-	2,330
	Pt. Lot 2 & 3	4400-000056	R. & P. Chapman	5,060	2,160	7,220
TOTAL ALLOWANCES				\$17,030	\$2,260	\$19,290

Estimate of Cost

<u>Item (Supply and Install New)</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Total (\$)</u>
Pre-Construction Meeting	1	LS	400	400
Benchmark Loop	1	LS	400	400
Traffic Control on South Talbot Road (S. 26)	1	LS	1,500	1,500
Excavation of Open Channel	576	m	16	9,216
Level Excavated Material	576	m	7	4,032
Provisional: Re-Conncect Tile Drain Outlets	4	each	80	320
Culvert No.2 of South Talbot Road Drain East (Concession Road 11) (S. 26)				
Traffic Control on Concession Road 11	1.0	LS	1,200	1,200
Removal of existing structure	1.0	LS	1,400	1,400
Supply & Install 2230x1700mm dia. CSPA c/w Bedding and Backfill to 300mm Above top of Culvert	19.0	m	1,300	24,700
Place Backfill	1.0	LS	800	800
Provisional: Supply & install Granular 'B'	50.0	tonne	25	1,250
Supply & install Granular 'A'	50.0	tonne	30	1,500
Supply and Install HL4 Asphalt	8.0	tonne	200	1,600
Supply and Install HL3 Asphalt	8.0	tonne	250	2,000
Supply and Install Concrete Block Endwall	50.0	each	200	10,000
Re-Grade Ditch	1.0	LS	1,000	1,000
Restoration	1.0	LS	800	800
				46,250

<u>Item (Supply and Install New)</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Total (\$)</u>
Culvert No.6 of South Talbot Road Drain East (Roll No. 4400-000056)				
Supply & Install 1000mm dia. CSP c/w Bedding	12.0	m	800	9,600
Supply & Install Granular 'B'	60.0	tonne	25	1,500
Supply & Install Granular 'A'	20.0	tonne	30	600
Supply and Install Rip Rap End Walls	1.0	LS	2,500	2,500
				<u>14,200</u>
Culvert No.8 of South Talbot Road Drain East (Roll No. 4400-000056-05)				
Removal of existing structure	1.0	LS	600	600
Supply & install 750mm dia. HDPE c/w Bedding	12.0	m	700	8,400
Place Backfill	1.0	LS	800	800
Provisional: Supply Granular 'B'	30.0	tonne	25	750
Supply & Install Granular 'A'	20.0	tonne	30	600
Supply and Install Rip Rap End Walls	1.0	LS	2,500	2,500
				<u>13,650</u>
Buffer Strip	5090	m ²	1.50	7,635
Environmental Considerations	1.0	LS	300	300
Contingency				<u>5,000</u>
				<u>102,903</u>
				19,290
				23,030
				6,500
				500
				<u>152,223</u>
				2,331
				<u>\$ 154,554</u>

SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
Municipal Lands								
	South Talbot Road	2.21		Town of Tecumseh	1,800	6,231	441	8,472
	Concession Road 11	2.82		Town of Tecumseh	54,900	270	119	55,289
	Concession Road 12	3.12		Town of Tecumseh	1,350	1,367	1,145	3,862
				Total Municipal Lands	58,050	7,868	1,705	67,623
Non-Agricultural Lands								
10	Pt. Lot 2	0.73	4410-000053-02	P. & N. Gerard		-	15	15
	Pt. Lot 3	0.43	4410-000051	N. & R. McFarlane		-	9	9
	Pt. Lot 4	0.40	4410-000050	D. & E. Grosu		-	8	8
	Pt. Lot 4	0.40	4410-000049	A. Deehan		521	8	529
11	Pt. Lot 2	0.20	4400-000007-05	R. Gerard		-	4	4
	Pt. Lot 2	0.85	4400-000015-75	C. & J. Ellis		10	178	188
	Pt. Lot 2	0.41	4400-000015-50	T. Parent		5	86	91
	Pt. Lot 3	0.32	4400-000010	T. Farough		-	6	6
	Pt. Lot 3	4.00	4400-000013	S. Woodward		1,001	3,674	4,675
12	Pt. Lot 2	1.84	4400-000058	O. & R. Carpenter		16	2,277	2,293
	Pt. Lot 2	0.78	4400-000057-01	C. Andary		7	965	972
	Pt. Lot 2	0.39	4400-000057	D. Gerard		3	483	486
	Pt. Lot 2	1.21	4400-000056-05	K. Hebert		7,809	1,497	9,306
				Total Non-Agricultural Lands	-	9,372	9,210	18,582

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
Agricultural Lands (Eligible for Available Grants)								
10	Pt. Lot 2	0.00	4410-000055	S. Gerard		-	-	-
	Pt. Lot 2	3.25	4410-000052	C. Farough		-	43	43
	Pt. Lot 2 & 3	1.43	4410-000051-50	P. & P. Jobin		-	19	19
	Pt. Lot 3	0.93	4410-000046	R. & S. Clarkson		-	12	12
	Pt. Lot 3	8.39	4410-000047	R. & C. Lutzmann		-	112	112
	Pt. Lot 3 & 4	8.86	4410-000048	C. & B. Taiariol		-	118	118
11	E Pt. Lot 1	8.09	4400-000010	K. & J. Racicot		47	955	1,002
	Pt. Lot 1 & 2	20.29	4400-000016	D. & C. Davies		117	2,394	2,511
	Pt. Lot 2	18.98	4400-000015	1741057 Ontario Ltd.		31	866	897
	Pt. Lot 2	15.32	4400-000008	M. Gerard		1	208	209
	Pt. Lot 2	0.50	4400-000007-20	M. & D. Gerard		-	10	10
	Pt. Lot 2 & 3	10.22	4400-000009	C. Farough		8	292	300
	Pt. Lot 2 & 3	17.03	4400-000014	W. & I. Farough		1,141	584	1,725
	Pt. Lot 3	9.60	4400-000009-05	W. & L. Farough		7	274	281
	Pt. Lot 3	9.40	4400-000010-01	W. & I. Farough		7	268	275
	Pt. Lot 3 & 4	14.94	4400-000011	W. & L. Farough		12	426	438
	Pt. Lot 3 & 4	13.00	4400-000012	C. Farough		3,806	254	4,060
12	Lot 1	45.28	4400-000059	B. & R. Hyland		3,275	8,479	11,754
	Pt. Lot 1 & 2	33.04	4400-000058-50	W. & M. Hyland		2,766	9,739	12,505
	Pt. Lot 2 & 3	16.98	4400-000056	R. & P. Chapman	17,220	14,135	723	32,078
Total Agricultural Lands					17,220	25,353	25,776	68,349
Total Municipal Lands					67,623			
Total Non-Agricultural Lands					18,582			
Total Agricultural Lands					<u>68,349</u>			
Total Assessment					\$154,554			

ESTIMATED NET ASSESSMENT
Net assessment subject to OMAFRA ADIP Policy and actual construction costs.

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Total Assessment (\$)	Estimated Grant (\$)	Allowances (\$)	Estimated Net Assessment (\$)
Municipal Lands								
	South Talbot Road	2.21		Town of Tecumseh	8,472			8,472
	Concession Road 11	2.82		Town of Tecumseh	55,289			55,289
	Concession Road 12	3.12		Town of Tecumseh	3,862			3,862
Non-Agricultural Lands								
10	Pt. Lot 2	0.73	4410-000053-02	P. & N. Gerard	15			15
	Pt. Lot 3	0.43	4410-000051	N. & R. McFarlane	9			9
	Pt. Lot 4	0.40	4410-000050	D. & E. Grosu	8			8
	Pt. Lot 4	0.40	4410-000049	A. Deehan	529		420	109
11	Pt. Lot 2	0.20	4400-000007-05	R. Gerard	4			4
	Pt. Lot 2	0.85	4400-000015-75	C. & J. Ellis	188			188
	Pt. Lot 2	0.41	4400-000015-50	T. Parent	91			91
	Pt. Lot 3	0.32	4400-000010	T. Farough	6			6
	Pt. Lot 3	4.00	4400-000013	S. Woodward	4,675		790	3,885
12	Pt. Lot 2	1.84	4400-000058	O. & R. Carpenter	2,293			2,293
	Pt. Lot 2	0.78	4400-000057-01	C. Andary	972			972
	Pt. Lot 2	0.39	4400-000057	D. Gerard	486			486
	Pt. Lot 2	1.21	4400-000056-05	K. Hebert	9,306		600	8,706

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Total Assessment (\$)	Estimated Grant (\$)	Allowances (\$)	Estimated Net Assessment (\$)
Agricultural Lands (Eligible for Available Grants)								
10	Pt. Lot 2	0.00	4410-000055	S. Gerard	-	-		-
	Pt. Lot 2	3.25	4410-000052	C. Farough	43	14		29
	Pt. Lot 2 & 3	1.43	4410-000051-50	P. & P. Jobin	19	6		13
	Pt. Lot 3	0.93	4410-000046	R. & S. Clarkson	12	4		8
	Pt. Lot 3	8.39	4410-000047	R. & C. Lutzmann	112	37		75
	Pt. Lot 3 & 4	8.86	4410-000048	C. & B. Taiariol	118	39		79
11	E Pt. Lot 1	8.09	4400-000010	K. & J. Racicot	1,002	334		668
	Pt. Lot 1 & 2	20.29	4400-000016	D. & C. Davies	2,511	837		1,674
	Pt. Lot 2	18.98	4400-000015	1741057 Ontario Ltd.	897	299		598
	Pt. Lot 2	15.32	4400-000008	M. Gerard	209	70		139
	Pt. Lot 2	0.50	4400-000007-20	M. & D. Gerard	10	3		7
	Pt. Lot 2 & 3	10.22	4400-000009	C. Farough	300	100		200
	Pt. Lot 2 & 3	17.03	4400-000014	W. & I. Farough	1,725	575	1,320	(170)
	Pt. Lot 3	9.60	4400-000009-05	W. & L. Farough	281	94		187
	Pt. Lot 3	9.40	4400-000010-01	W. & I. Farough	275	92		183
	Pt. Lot 3 & 4	14.94	4400-000011	W. & L. Farough	438	146		292
	Pt. Lot 3 & 4	13.00	4400-000012	C. Farough	4,060	1,353	3,810	(1,103)
12	Lot 1	45.28	4400-000059	B. & R. Hyland	11,754	3,918	2,800	5,036
	Pt. Lot 1 & 2	33.04	4400-000058-50	W. & M. Hyland	12,505	4,168	2,330	6,007
	Pt. Lot 2 & 3	16.98	4400-000056	R. & P. Chapman	32,078	4,953	7,220	19,905
					154,554	17,042	19,290	118,222

SCHEDULE OF MAINTENANCE NO. 1

To maintain the South Talbot Road Drain East from Station 0+000 to 1+398

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Municipal Lands								
	South Talbot Road	2.21		Town of Tecumseh	6,188	712	6,900	2.10
	Concession Road 11	2.82		Town of Tecumseh	-	49	49	2.68
	Concession Road 12	3.12		Town of Tecumseh	-	1,311	1,311	2.96
Total Municipal Lands					6,188	2,072	8,260	
Non-Agricultural Lands								
10	Pt. Lot 2	0.73	4410-000053-02	P. & N. Gerard	-	6	6	0.33
	Pt. Lot 3	0.43	4410-000051	N. & R. McFarlane	-	4	4	0.19
	Pt. Lot 4	0.40	4410-000050	D. & E. Grosu	-	3	3	0.18
	Pt. Lot 4	0.40	4410-000049	A. Deehan	1,665	3	1,668	0.18
11	Pt. Lot 2	0.20	4400-000007-05	R. Gerard	-	2	2	0.09
	Pt. Lot 2	0.85	4400-000015-75	C. & J. Ellis	-	169	169	0.38
	Pt. Lot 2	0.41	4400-000015-50	T. Parent	-	82	82	0.18
	Pt. Lot 3	0.32	4400-000010	T. Farough	-	3	3	0.14
	Pt. Lot 3	4.00	4400-000013	S. Woodward	3,531	311	3,842	1.20
12	Pt. Lot 2	1.84	4400-000058	O. & R. Carpenter	-	367	367	0.83
	Pt. Lot 2	0.78	4400-000057-01	C. Andary	-	155	155	0.35
	Pt. Lot 2	0.39	4400-000057	D. Gerard	-	78	78	0.18
	Pt. Lot 2	1.21	4400-000056-05	K. Hebert	-	241	241	0.54
Total Non-Agricultural Lands					5,196	1,424	6,620	

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Agricultural Lands (Eligible for Available Grants)								
10	Pt. Lot 2	0.00	4410-000055	S. Gerard	-	-	-	0.00
	Pt. Lot 2	3.25	4410-000052	C. Farough	-	18	18	0.98
	Pt. Lot 2 & 3	1.43	4410-000051-50	P. & P. Jobin	-	8	8	0.43
	Pt. Lot 3	0.93	4410-000046	R. & S. Clarkson	-	5	5	0.28
	Pt. Lot 3	8.39	4410-000047	R. & C. Lutzmann	-	46	46	2.52
	Pt. Lot 3 & 4	8.86	4410-000048	C. & B. Taiariol	-	49	49	2.66
11	E Pt. Lot 1	8.09	4400-000010	K. & J. Racicot	-	1,074	1,074	2.43
	Pt. Lot 1 & 2	20.29	4400-000016	D. & C. Davies	-	2,695	2,695	6.09
	Pt. Lot 2	18.98	4400-000015	1741057 Ontario Ltd.	-	2,521	2,521	5.69
	Pt. Lot 2	15.32	4400-000008	M. Gerard	-	85	85	4.60
	Pt. Lot 2	0.50	4400-000007-20	M. & D. Gerard	-	4	4	0.23
	Pt. Lot 2 & 3	10.22	4400-000009	C. Farough	-	796	796	3.07
	Pt. Lot 2 & 3	17.03	4400-000014	W. & I. Farough	5,898	1,654	7,552	5.11
	Pt. Lot 3	9.60	4400-000009-05	W. & L. Farough	-	747	747	2.88
	Pt. Lot 3	9.40	4400-000010-01	W. & I. Farough	-	732	732	2.82
	Pt. Lot 3 & 4	14.94	4400-000011	W. & L. Farough	-	1,163	1,163	4.48
	Pt. Lot 3 & 4	13.00	4400-000012	C. Farough	16,753	96	16,849	5.20
12	Lot 1	45.28	4400-000059	B. & R. Hyland	-	6,014	6,014	13.58
	Pt. Lot 1 & 2	33.04	4400-000058-50	W. & M. Hyland	-	4,388	4,388	9.91
	Pt. Lot 2 & 3	16.98	4400-000056	R. & P. Chapman	-	2,255	2,255	5.09
Total Agricultural Lands					22,651	24,350	47,001	
Total Municipal Lands					8,260			
Total Non-Agricultural Lands					6,620			
Total Agricultural Lands					<u>47,001</u>			
Total Assessment					\$61,881			

SCHEDULE OF MAINTENANCE NO. 2
 To maintain the South Talbot Road Drain East from Station 1+398 to 2+263

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Municipal Lands								
	South Talbot Road	0.42		Town of Tecumseh	3,812	539	4,351	0.40
				Total Municipal Lands	3,812	539	4,351	
Non-Agricultural Lands								
12	Pt. Lot 2	1.84	4400-000058	O. & R. Carpenter	-	1,268	1,268	0.83
	Pt. Lot 2	0.78	4400-000057-01	C. Andary	-	537	537	0.35
	Pt. Lot 2	0.39	4400-000057	D. Gerard	-	269	269	0.18
	Pt. Lot 2	1.21	4400-000056-05	K. Hebert	2,668	834	3,502	0.54
				Total Non-Agricultural Lands	2,668	2,908	5,576	
Agricultural Lands (Eligible for Available Grants)								
12	Lot 1	9.00	4400-000059	B. & R. Hyland	-	4,134	4,134	2.70
	Pt. Lot 1 & 2	20.84	4400-000058-50	W. & M. Hyland	-	9,573	9,573	6.25
	Pt. Lot 2 & 3	14.98	4400-000056	R. & P. Chapman	14,485	-	14,485	4.49
				Total Agricultural Lands	14,485	13,707	28,192	
				Total Municipal Lands	4,351			
				Total Non-Agricultural Lands	5,576			
				Total Agricultural Lands	28,192			
				Total Assessment	\$38,119			

COMBINED SCHEDULE OF MAINTENANCE
 To maintain the South Talbot Road Drain East from Station 0+000 to 2+263

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Municipal Lands								
	South Talbot Road	2.21		Town of Tecumseh	10,000	1,251	11,251	2.10
	Concession Road 11	2.82		Town of Tecumseh	-	49	49	2.68
	Concession Road 12	3.12		Town of Tecumseh	-	1,311	1,311	2.96
				Total Municipal Lands	10,000	2,611	12,611	
Non-Agricultural Lands								
10	Pt. Lot 2	0.73	4410-000053-02	P. & N. Gerard	-	6	6	0.33
	Pt. Lot 3	0.43	4410-000051	N. & R. McFarlane	-	4	4	0.19
	Pt. Lot 4	0.40	4410-000050	D. & E. Grosu	-	3	3	0.18
	Pt. Lot 4	0.40	4410-000049	A. Deehan	1,665	3	1,668	0.18
11	Pt. Lot 2	0.20	4400-000007-05	R. Gerard	-	2	2	0.09
	Pt. Lot 2	0.85	4400-000015-75	C. & J. Ellis	-	169	169	0.38
	Pt. Lot 2	0.41	4400-000015-50	T. Parent	-	82	82	0.18
	Pt. Lot 3	0.32	4400-000010	T. Farough	-	3	3	0.14
	Pt. Lot 3	4.00	4400-000013	S. Woodward	3,531	311	3,842	1.20
12	Pt. Lot 2	1.84	4400-000058	O. & R. Carpenter	-	1,635	1,635	0.83
	Pt. Lot 2	0.78	4400-000057-01	C. Andary	-	692	692	0.35
	Pt. Lot 2	0.39	4400-000057	D. Gerard	-	347	347	0.18
	Pt. Lot 2	1.21	4400-000056-05	K. Hebert	2,668	1,075	3,743	0.54
				Total Non-Agricultural Lands	7,864	4,332	12,196	

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Agricultural Lands (Eligible for Available Grants)								
10	Pt. Lot 2	0.00	4410-000055	S. Gerard	-	-	-	0.00
	Pt. Lot 2	3.25	4410-000052	C. Farough	-	18	18	0.98
	Pt. Lot 2 & 3	1.43	4410-000051-50	P. & P. Jobin	-	8	8	0.43
	Pt. Lot 3	0.93	4410-000046	R. & S. Clarkson	-	5	5	0.28
	Pt. Lot 3	8.39	4410-000047	R. & C. Lutzmann	-	46	46	2.52
	Pt. Lot 3 & 4	8.86	4410-000048	C. & B. Taiariol	-	49	49	2.66
11	E Pt. Lot 1	8.09	4400-000010	K. & J. Racicot	-	1,074	1,074	2.43
	Pt. Lot 1 & 2	20.29	4400-000016	D. & C. Davies	-	2,695	2,695	6.09
	Pt. Lot 2	18.98	4400-000015	1741057 Ontario Ltd.	-	2,521	2,521	5.69
	Pt. Lot 2	15.32	4400-000008	M. Gerard	-	85	85	4.60
	Pt. Lot 2	0.50	4400-000007-20	M. & D. Gerard	-	4	4	0.23
	Pt. Lot 2 & 3	10.22	4400-000009	C. Farough	-	796	796	3.07
	Pt. Lot 2 & 3	17.03	4400-000014	W. & I. Farough	5,898	1,654	7,552	5.11
	Pt. Lot 3	9.60	4400-000009-05	W. & L. Farough	-	747	747	2.88
	Pt. Lot 3	9.40	4400-000010-01	W. & I. Farough	-	732	732	2.82
	Pt. Lot 3 & 4	14.94	4400-000011	W. & L. Farough	-	1,163	1,163	4.48
	Pt. Lot 3 & 4	13.00	4400-000012	C. Farough	16,753	96	16,849	5.20
12	Lot 1	45.28	4400-000059	B. & R. Hyland	-	10,148	10,148	13.58
	Pt. Lot 1 & 2	33.04	4400-000058-50	W. & M. Hyland	-	13,961	13,961	9.91
	Pt. Lot 2 & 3	16.98	4400-000056	R. & P. Chapman	14,485	2,255	16,740	5.09
Total Agricultural Lands					37,136	38,057	75,193	
Total Municipal Lands					12,611			
Total Non-Agricultural Lands					12,196			
Total Agricultural Lands					<u>75,193</u>			
Total Assessment					\$100,000			

SCHEDULE OF MAINTENANCE
 To Maintain the 12th Line Drain from Station 0+000 to 1+543

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Municipal Lands								
	Concession Road 12	3.12		Town of Tecumseh	1,000	381	1,381	2.96
				Total Municipal Lands	1,000	381	1,381	
Non-Agricultural Lands								
11	Pt. Lot 2	0.85	4400-000015-75	C. & J. Ellis	-	102	102	0.38
	Pt. Lot 2	0.41	4400-000015-50	T. Parent	-	49	49	0.18
				Total Non-Agricultural Lands	-	151	151	
Agricultural Lands (Eligible for Available Grants)								
11	E Pt. Lot 1	8.09	4400-000010	K. & J. Racicot	-	451	451	2.43
	Pt. Lot 1 & 2	20.29	4400-000016	D. & C. Davies	-	1,131	1,131	6.09
	Pt. Lot 2	1.20	4400-000015	1741057 Ontario Ltd.	-	67	67	0.36
12	Lot 1	36.28	4400-000059	B. & R. Hyland	1,817	2,022	3,839	10.88
	Pt. Lot 1 & 2	12.20	4400-000058-50	W. & M. Hyland	1,508	271	1,779	3.66
	Pt. Lot 2 & 3	2.00	4400-000056	R. & P. Chapman	1,175	26	1,201	0.60
				Total Agricultural Lands	4,500	3,968	8,468	
				Total Municipal Lands	1,381			
				Total Non-Agricultural Lands	151			
				Total Agricultural Lands	8,468			
				Total Assessment	\$10,000			

South Talbot Road Drain East and 12th Line Drain
Town of Tecumseh
May 18, 2022

SPECIFICATION OF WORK

1. Location

The South Talbot Road Drain East and 12th Line Drain exist in Lot 4, Concession 10, Lots 3 and 4, Concession 11 and Lots 1, 2 and 3, Concession 12 in the Town of Tecumseh.

2. Scope of Work

The work to be included in this specification includes, but is not limited to, the following:

- Culvert Replacements
- Open Channel Improvements

3. General

Each tenderer must inspect the site prior to submitting their tender and satisfy themselves by personal examination as to the local conditions that may be encountered during this project. The Contractor shall make allowance in their tender for any difficulties which they may encounter. Quantities or any information supplied by the Engineer is not guaranteed and is for reference only.

All work and materials shall be to the satisfaction of the Drainage Superintendent who may vary these specifications as to minor details but in no way decrease the proposed capacity of the drain.

The Contractor shall be responsible for the notification of all utilities prior to the start of construction.

Measurement for Payment Clauses have not been included in these specifications and will be part of the Construction document. If the Construction document has not identified Measurement for Payment Clauses, the Contractor must notify the Town of Tecumseh and request clarification 2 days prior to pricing the project.

4. Plans and Specifications

This Specification of Work shall take precedence over all plans and general conditions pertaining to the Contract. The Contractor shall provide all labour, equipment, and supervision necessary to complete the work as shown in the Plans and described in these

specifications. Any work not described in these specifications shall be completed according to the Ontario Provincial Standard Specifications and Standard Drawings.

5. Health and Safety

The Contractor at all times shall be responsible for health and safety on the worksite including ensuring that all employees wear suitable personal protective equipment including safety boots and hard hats.

When applicable the Contractor shall be responsible for traffic control as per the Ontario Traffic Manual Book 7 – Temporary Conditions (latest revision).

The Contractor shall be responsible to ensure that all procedures are followed under the Occupational Health and Safety Act to ensure that work sites are safe and that accidents are prevented. In the event of a serious or recurring problem, a notice of non-compliance will be issued. The Contractor will be responsible for reacting immediately to any deficiency and correcting any potential health and safety risk. Continuous disregard for any requirement of the Occupational Health and Safety Act could be cause for the issuance of a stop work order or even termination of the Contract.

The Contractor shall also ensure that only competent workers are employed onsite and that appropriate training and certification is supplied to all employees.

6. Workplace Safety and Insurance Board

The Contractor hereby certifies that all employees and officers working on the project are covered by benefits provided by the Contractor. The WSIB Clearance Certificate must be furnished prior to the execution of the Contract and updated every 90 days.

7. Pre-Construction Meeting

There is a requirement for a pre-construction meeting to be held prior to any construction taking place. The meeting shall be scheduled by the Contractor. The Landowners, Engineer, and the Town of Tecumseh shall be notified of the pre-construction meeting at least one week prior.

8. Traffic Control

Access and driveways to private properties shall not be obstructed longer than the minimum time necessary for the work and shall be reinstated as soon as possible all to the satisfaction of the Engineer. The Contractor shall schedule any obstruction of existing driveways with the owners at least two full working days in advance. Roads must be kept open to local traffic and all obstructions and diversions of traffic must be approved by the Engineer or Drainage Superintendent at least two (2) full working days in advance.

- a) The Contractor shall supply, erect and maintain all detour signs and special signs necessary for detours to divert traffic from the area under construction as directed by the Drainage Superintendent or Engineer. All this work shall be at the Contractor's expense.
- b) The Contractor shall be responsible for supplying, erecting and maintaining all signs, supports, barricades, flashers, cones, etc. in the construction area and at the boundaries of the work as part of the above detours, all to the satisfaction of the Engineer or Drainage Superintendent. All this work shall be done by the Contractor at their own expense.
- c) The Contractor shall not be allowed to proceed with construction activities unless proper signage and flagmen are present. Flagging procedures, signage and detours shall conform to the recommendations of Book 7, Temporary Conditions, Ontario Traffic Manual, issued by the Ministry of Transportation. Conformance shall be enforced by the Ministry of Labour Inspector.

9. Access and Working Area

Access to the work site for construction and future maintenance of the South Talbot Road Drain East and 12th Line Drain shall be from South Talbot Road, Concession Road 11 and Concession Road 12, across the access culverts and along the drainage works. The working area for construction and maintenance shall be restricted to a width of 15m from the top of bank where the work is taking place. The excavation shall generally be done from the field side of the channel except across finished lawns. Across finished lawns, the excavation shall generally be done from the road side with the excavated material being trucked off site.

The working area at each culvert shall extend 10 metres from the bank on both sides and for 10 metres along the channel on either side of the culvert.

10. Benchmarks

The benchmarks are based on geodetic elevations. Elevations are available at the locations shown on the Plan and Profile drawings. Where these elevations are on existing structures to be replaced, they shall be transferred by the Contractor prior to the removal of the culvert.

The Contractor is required to complete a benchmark loop prior to construction to verify the benchmarks. If discrepancies exist the Contractor must notify the Drainage Superintendent and Engineer prior to completing any work.

11. Removals

The Contractor is required to notify the Landowner forty-eight (48) hours prior to the removal of an access culvert. The existing culverts shall be removed in their entirety from the open channel. The culvert, the concrete rubble and any deleterious material shall be disposed offsite at the expense of the Contractor. Suitable backfill shall be stockpiled adjacent to the site for reuse during installation of the proposed culvert. The existing rip rap, at the Discretion of the Drainage Superintendent or Engineer, can be re-used for end protection.

12. Brushing and Tree Removal

All brush, trees, woody vegetation, stumps etc. within the working area, the drain bottom and side slopes, and as determined by the Drainage Superintendent or Engineer shall be removed. This can be changed under the direction of the Drainage Superintendent or Engineer.

It is recommended that a mechanical grinder attached to an excavator be used for the removal of brush and trees. Any brush and trees too large to grind shall be close cut. The Contractor shall stockpile the trees and brush in a single pile on the property in which they were removed or dispose of the trees and brush offsite. If left on site, the Contractor is responsible for the burning of the trees and brush. The Contractor is responsible for obtaining all necessary permits for any disposal sites. Burning of the trees and brush is subject to local bylaws and guidelines of the Ministry of the Environment Conservation and Parks.

Certain trees may be left in place at the direction of the Drainage Superintendent or Engineer. Any trees to be salvaged shall be marked prior to construction.

For future maintenance it is recommended that appropriate spray be applied to the stumps, brush, and after-growth for two years following construction to maintain brush control.

13. Excavation of Open Channel

The open channel shall be excavated and maintained to the depths and grades as per the profile and drawings. The channel shall be excavated to the proper depth using a laser or similar approved device with a labourer onsite to ensure correctness of grade and to confirm location of tile ends.

The excavated material shall generally be cast on the side it is being excavated from, except across finished lawns where the excavated material shall be trucked. Excavated material shall be cast at least 1.5 metres clear of the bank. Excavated material shall not be placed in low runs or swales out letting surface water to the channel. The excavated

material shall be levelled to a maximum depth of 150mm and left in a condition suitable for cultivation. All high spots above grade shall be removed. The sediment shall be removed leaving a rounded bottom with the intent not to undercut the existing side slopes.

Where, determined by the Drainage Superintendent or Engineer, the banks are unstable due to the removal of the trees and brush, the banks shall be re-sloped to 2:1.

14. Installation of Access Culverts

The Contractor is required to notify the Landowner forty-eight (48) hours prior to the removal of a culvert.

The Contractor shall supply, install, and backfill aluminized corrugated steel pipe (CSP) or high-density polyethylene (HDPE) smooth wall pipe, as specified. CSP shall have a minimum wall thickness of 2.8mm in all cases. All corrugation profiles shall be of helical lock seam manufacture using 68 x 13mm corrugations for 1600mm dia. pipe and smaller and 125 x 25mm corrugations for 1800mm dia. pipe and larger. Pipe with 125 x 25mm corrugations shall be used if 68 x 13mm corrugations are not available. The high-density polyethylene (HDPE) pipe shall be CSA approved smooth wall pipe (320 kPa) with bell and spigot joints. Future culvert replacements shall be to these same specifications.

The culverts designated to be replaced in the future under this report shall be examined after any cleanout of the open channel as to its condition. If it is found to be in disrepair (i.e. there are holes corroded in the bottom or sides) it shall be replaced as per these specifications.

The culverts shall be installed generally in the same location or as approved by the Drainage Superintendent. The culverts shall be installed with the invert 10% (minimum 100mm) below the proposed channel bottom and as specified on the profile.

The access culvert lengths are based on using rip rap ends. If concrete block ends are to be utilized, the culverts shall be shortened proportionate to the sloped ends (1.5:1.0). The road culvert lengths are based on using concrete block end walls.

Any tile outlets extended as a result of a culvert shall be extended at the Landowner's expense. The pipes that shall be extended upstream or downstream of the proposed culvert shall be done with non-perforated HDPE agricultural tubing with a manufactured coupling, elbow and rodent grate.

All backfill shall be free from deleterious material. Any excess granular material shall be placed at the surface on the travel portion of the access culvert. All granular bedding and backfill material shall be mechanically compacted to 98% modified standard proctor density. All excavated backfill material above the spring line shall be mechanically

compacted to 95% modified standard proctor density using appropriate compaction equipment.

Access Culverts:

The bottom of the excavation shall be excavated to a minimum of 100mm below the proposed invert. The pipe shall be bedded with ¾" clear stone. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with ¾" clear stone and wrapped in filter fabric from the bottom of the excavation to the spring line of the pipe. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm so that the pipe is not displaced. The access culverts shall be backfilled from the spring line to within 150mm of finished grade with excavated material and/or Granular "B". Generally, Granular "B" shall be used within the access portion of the culvert and excavated material may be used outside of the access. If, at the discretion of the Drainage Superintendent or Engineer, the existing material on site is not sufficient for backfill, payment for imported fill shall be at the unit price specified in the Contract documents. This unit price shall include the trucking offsite of the unused excavated material. The top 150mm at the accesses shall be backfilled with compacted Granular "A" material to finished grade. If asphalt is proposed, the asphalt shall be HL4 and shall match the existing thickness. In these cases, the compacted Granular "A" shall occupy 150mm below the proposed asphalt.

For the access culverts rip rap end walls shall be used. They shall consist of 100mm x 250mm quarry stone or approved equal. The area to receive the rip rap shall be graded to a depth of 400mm below finished grade. Filter fabric (Terrafix 250R or approved equal) shall then be placed with any joints overlapped a minimum 600mm. The quarry stone shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance. For rip rap end walls, the clay material shall generally be used close to the end walls with gravel material being used for the center drive area.

Road Culverts:

The bottom of the excavation shall be excavated to a minimum of 100mm below the proposed invert. The pipe shall be bedded with ¾" clear stone. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with ¾" clear stone and wrapped in filter fabric from the bottom of the excavation to 300mm above the pipe. The bedding material shall not be native material. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm so that the pipe is not displaced. Within the road allowance, the pipe shall be backfilled above the clear stone with Granular "B" or suitable reused granular material at the discretion of the Drainage Superintendent or Engineer. Outside the road allowance, excavated material can be used. If, at the discretion of the Drainage Superintendent, the existing material on site is not sufficient for backfill, payment for imported fill shall be at the unit price specified in the Contract documents. The sub-base shall consist of a minimum of 300mm of OPS

Granular "A". The sub-base material shall not be native material. The asphalt shall be HL4 and HL3 at depths to match the existing thickness.

For the road culverts concrete block end walls shall be used. They shall consist of concrete blocks with dimensions of approx. 600mm x 600mm x 1200mm, 600mm x 600mm x 2400mm or 300mm x 600mm x 1200mm as required. Payment for 600mm x 600mm x 1200mm and 300mm x 600mm x 1200mm blocks shall be at the unit price in the contract documents while the 600mm x 600mm x 2400mm blocks shall be counted as two blocks. The blocks shall extend as determined by the Drainage Superintendent. For Culvert No. 2 the blocks shall extend parallel South Talbot Road on the east side of the culvert as shown on the drawings in order to increase the turning radius of the shoulder. The backfill behind the blocks shall consist of Granular "B" and shall be included in the unit price specified in the Contract documents.

The top of the culvert shall govern block elevation. The correct block shall be set with the top of the block equal to the top of the culvert. The blocks shall be set at each end of the culvert so that each row of blocks will be offset approx. 100mm from the row below. The bottom row shall consist of one block placed parallel to the culvert. The blocks shall be imbedded a minimum of 300mm into each bank and shall extend into the drain bottom to match the pipe invert or below.

The blocks shall be placed over a layer of filter fabric (Terrafix 270R or approved equal). The culvert shall be backfilled in conjunction with the placement of the blocks. The gaps between the culvert and the blocks shall be filled with concrete cinder blocks/bricks and mortar to give the end wall a finished appearance.

The future culvert replacements shall be to the following sizes, at a minimum, and may be replaced with an equivalent sized arch or round pipe or box culvert at the discretion of the Drainage Superintendent.

15. Culvert Maintenance

The Contractor shall be responsible for maintenance of the access culverts for a period of one year after their installation. This will include repairing any settlement areas, including on the travel surface with granular "A" and/or HL3 asphalt.

16. Subsurface Drainage

Landowners are required to mark field tile prior to construction.

All existing subsurface drains encountered during construction of the open channel shall be reconnected to the open channel unless otherwise noted on the drawings or as directed by the Drainage Superintendent.

A suitable length of equivalent sized PE agricultural tubing shall be used to connect the drain to the open channel. Manufactured fittings shall connect the PE tile to the existing drain. The connections shall be carefully backfilled to ensure there is adequate support under the pipe and large clumps of clay do not displace the tile.

Tile outlets larger than 150mm in diameter, or as determined by the Drainage Superintendent or Engineer at the time of construction, require erosion protection. The erosion protection made up of rip rap and filter fabric shall be installed on the embankment slope from 0.3m above the tile invert to the channel invert. The erosion protection shall be 0.5m wide. Rip rap shall be made up of 100mm to 250mm quarry stone or approved equal. The area to receive the rip rap shall first be graded to allow the placement of the rip below finished grade. After grading, a layer of filter fabric (Mirafi P270 or approved equal) is to be placed with any joints overlapped a minimum of 600mm. Rip rap shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

17. Buffer Strip

A grassed buffer strip shall be incorporated into the drainage works. The buffer strip shall extend 1.5 metres from the top of the bank on the south side of the South Talbot Road Drain East and on the east side of the 12th Line Drain. The seed mixture shall be as specified in the Seeding/Restoration specification. Where a buffer already exists no seed shall be placed.

18. Seeding/Restoration

The side slopes of the channel, road right of way, buffer strip, finished lawns, and all areas disturbed by construction, shall be topped with 100mm of topsoil and hydroseeded in the spring or fall following construction. The time of application shall be approved by the Drainage Superintendent or Engineer.

Hydraulic seed and mulch in accordance with OPSS 804. Seed mixture, fertilizer and application rates are as follows:

- Primary seed (85 kg/ha.) consisting of 50% red fescue, 40% perennial rye-grass and 5% white clover.
- Nurse crop consisting of Italian (annual) rye-grass at 25% of total weight.
- Fertilizer (300 kg/ha.) consisting of 8-32-16.
- Hydraulic mulch (2,999 kg/ha.) type “B” and water (52,700 litres/ha.).

The above mixture shall apply unless otherwise approved by the Drainage Superintendent or Engineer.

19. Environmental Considerations

The Contractor shall take care to adhere to the following considerations.

- Operate machinery in a manner that minimizes disturbance to the banks of the watercourse.
- The work shall be completed outside of the spring restricted activity timing window (March 15 to July 15)
- Erosion and sediment control measures must be installed prior to construction to prevent sediment from entering the water body.
- Material shall not be placed in areas regulated by the Conservation Authority or Ministry of Natural Resources.
- All granular and erosion control materials shall be stockpiled a minimum of 3.0m from the top of the bank or excavation. Material shall not be placed in surface water runs or open inlets that enter the channel.
- All activities, including maintenance procedures, shall be controlled to prevent the entry of petroleum products, debris, rubble, concrete, or other deleterious substances into the water. Vehicle and equipment refuelling and maintenance shall be conducted away from the channel, any surface water runs, or open inlets. All waste materials shall be stockpiled well back from the top of the bank and all surface water runs and open inlets that enter the drain.
- When possible, all construction within the open channel shall be carried out during periods of low flow or in dry conditions.
- The Contractor shall conduct regular inspections and maintain erosion and sediment control measures and structures during the course of construction.
- The Contractor shall repair erosion and sediment control measures and structures if damage occurs.
- The Contractor shall remove non-biodegradable erosion and sediment control materials once site is stabilized.
- Remove all construction materials from site upon project completion.

A light duty silt fencing shall be installed down-gradient of the work for the duration of construction.

The light duty silt fencing shall be supplied and installed in accordance with OPSS 805 and OPSD 219.110. The light duty silt fencing shall be removed once the disturbed area has been re-vegetated.



- OWNER INDEX NUMBER**
1. 4410-000053-02 P. & N. GERARD 0.73 Ha
 2. 4410-000051 N. & R. McFARLANE 0.43 Ha
 3. 4410-000050 D. & E. GROSU 0.40 Ha
 4. 4410-000049 A. DEEHAN 0.40 Ha
 5. 4400-000007-05 R. GERARD 0.20 Ha
 6. 4400-000007-20 M. & D. GERARD 0.50 Ha
 7. 4400-000015-75 C. & J. ELLIS
 8. 4400-000015-50 T. PARENT 0.41 Ha
 9. 4400-000010 T. FAROUGH 0.32 Ha
 10. 4400-000013 S. WOODWARD 4.00 Ha

- LEGEND**
- DRAINAGE AREA
 - 12TH LINE AND SOUTH TALBOT ROAD DRAIN EAST
 - MUNICIPAL DRAIN
 - ⊗ PROPOSED CULVERT
 - ⊘ EXISTING CULVERT
 - CULVERT TO BE REPLACED
 - ⑦ CULVERT LOCATION



R Dobbin Engineering Inc.
 DRAWING NAME: 12th Line / South Talbot Road Drain East
 PROJECT No. 2021-1301

4218 Oil Heritage Road
 Petrolia Ontario, N0N 1R0
 Phone: (519) 882-0032 Fax: (519) 882-2233

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAY 18, 2022	CS
J. WARNER				
DRAWN				
C. SAUNDERS				

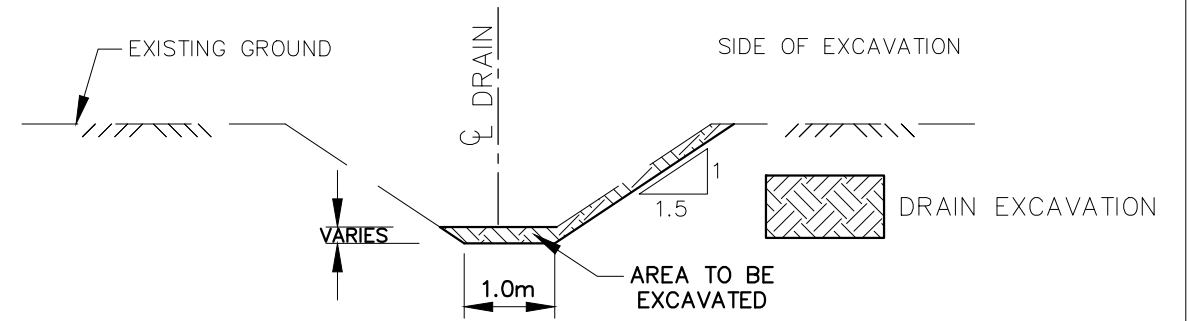
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TOWN of TECUMSEH
12th LINE / SOUTH TALBOT ROAD DRAIN EAST
PLAN

Last Updated: March 1, 2022

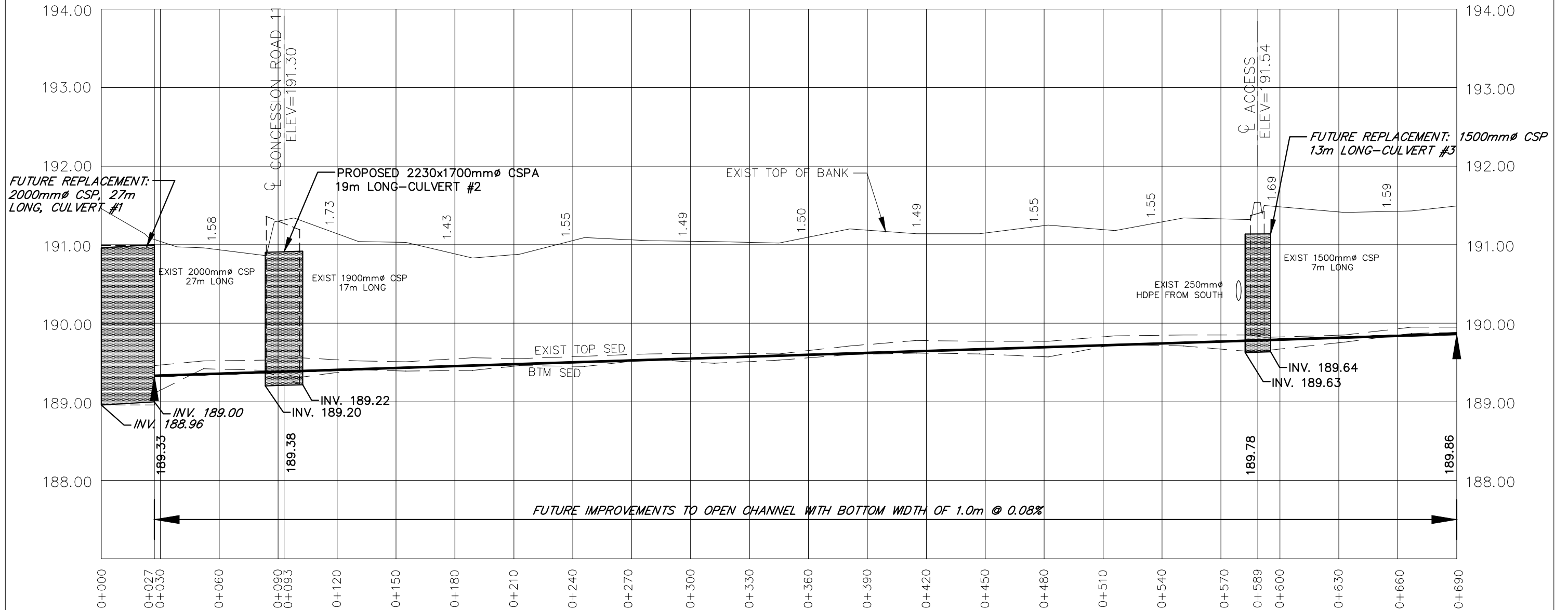
GENERAL NOTES

- BENCHMARK No.1 ELEV. 190.92
TOP OF EAST END OF EXISTING
2000mm ϕ CSP, STATION 0+027
BENCHMARK No.2 ELEV. 191.42
TOP OF EAST END OF EXISTING
1500mm ϕ CSP, STATION 0+589
- UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW
CHANNEL.



TYPICAL DRAIN CROSS SECTION

NTS



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
South Talbot Road Drain East Profile 1

PROJECT No.
2021-1301

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAY 18, 2022	JW
B. VAN RUITENBURG				
DRAWN				
J. WARNER				

SCALE: 1:2,000
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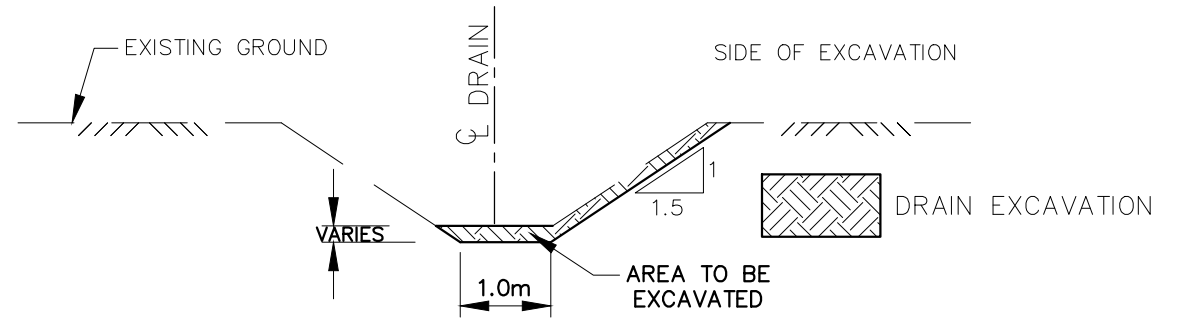
TOWN of TECUMSEH
SOUTH TALBOT ROAD DRAIN EAST
PROFILE

2
OF 10

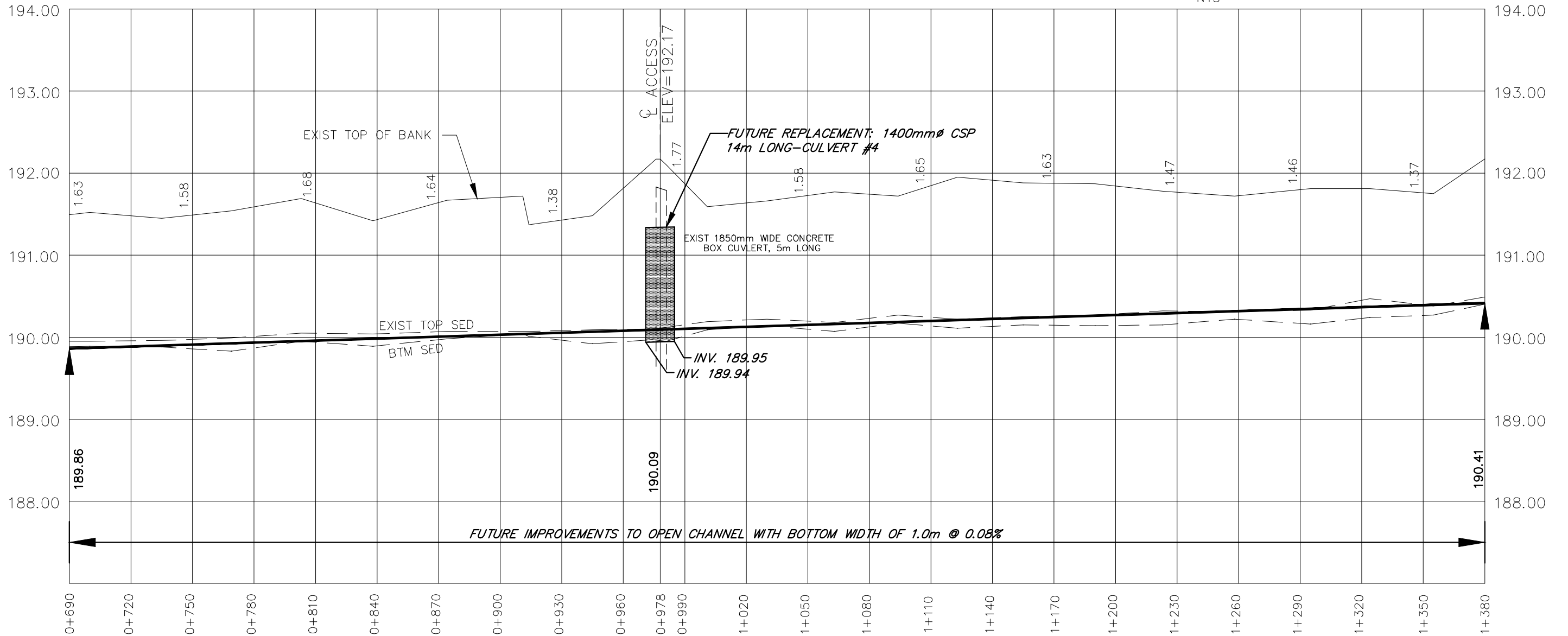
Last Updated: March 1, 2022

GENERAL NOTES

- BENCHMARK No.1 ELEV. 190.92
TOP OF EAST END OF EXISTING
2000mm ϕ CSP, STATION 0+027
BENCHMARK No.2 ELEV. 191.42
TOP OF EAST END OF EXISTING
1500mm ϕ CSP, STATION 0+589
- UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW
CHANNEL.



TYPICAL DRAIN CROSS SECTION



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
South Talbot Road Drain East Profile 2

PROJECT No.
2021-1301

APPROVED	J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED	B. VAN RUITENBURG	1	FINAL REPORT	MAY 18, 2022	JW
DRAWN	J. WARNER	SCALE: 1:2,000			

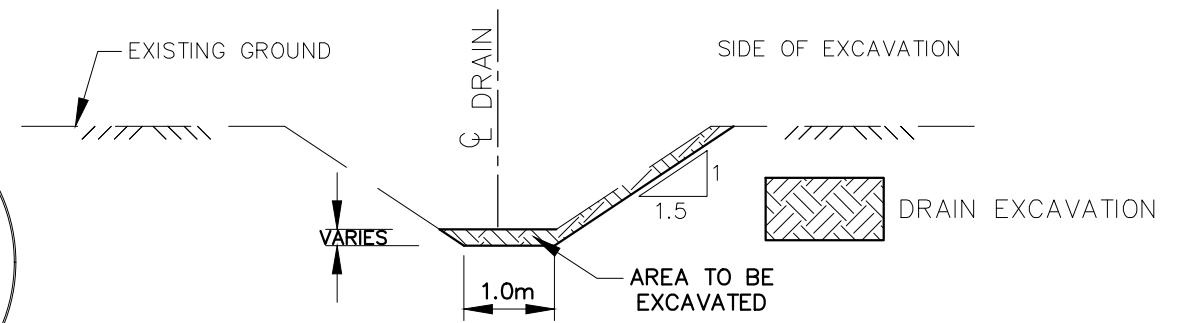
TOWN of TECUMSEH
SOUTH TALBOT ROAD DRAIN EAST
PROFILE

3
OF 10

Last Updated: March 1, 2022

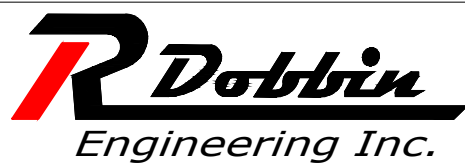
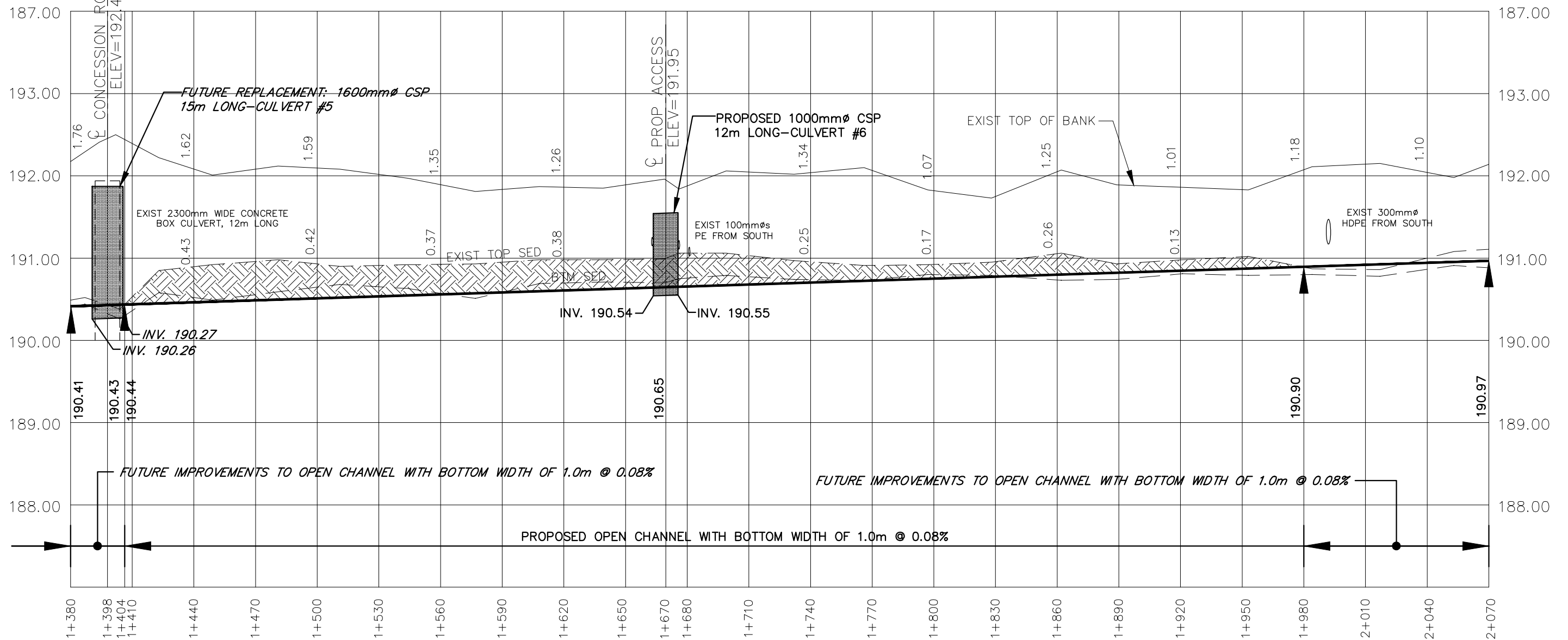
GENERAL NOTES

1. BENCHMARK No.3 ELEV. 192.76
TOP NAIL IN UTILITY POLE AT THE
SOUTHEAST CORNER OF THE
INTERSECTION OF SOUTH TALBOT
ROAD AND CONCESSION ROAD 12
BENCHMARK No.4 ELEV. 192.83
TOP SPINDLE OF FIRE HYDRANT
AT #12594 SOUTH TALBOT ROAD
2. UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW CHANNEL.
3. LOWER NUMBERS ARE DEPTH OF EXCAVATION.



TYPICAL DRAIN CROSS SECTION

NTS



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
South Talbot Road Drain East Profile 3

PROJECT No.
2021-1301

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAY 18, 2022	JW
B. VAN RUITENBURG				
DRAWN	SCALE: 1:2,000			
J. WARNER	0 20 40 60m			

TOWN of TECUMSEH

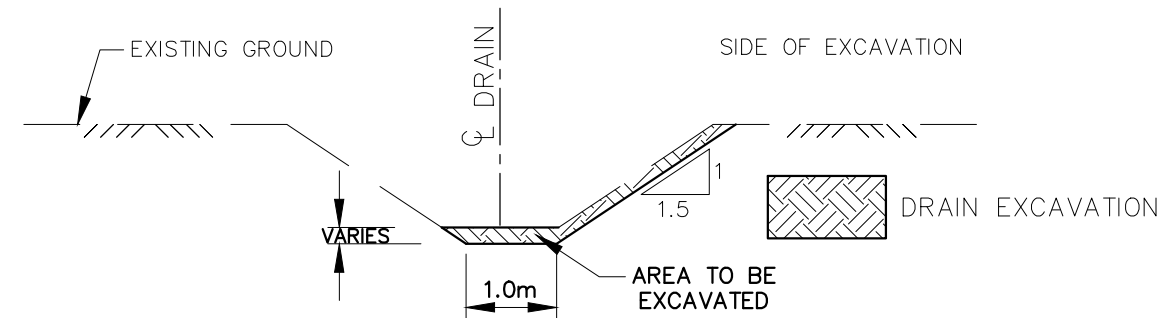
SOUTH TALBOT ROAD DRAIN EAST

PROFILE

4
OF 10

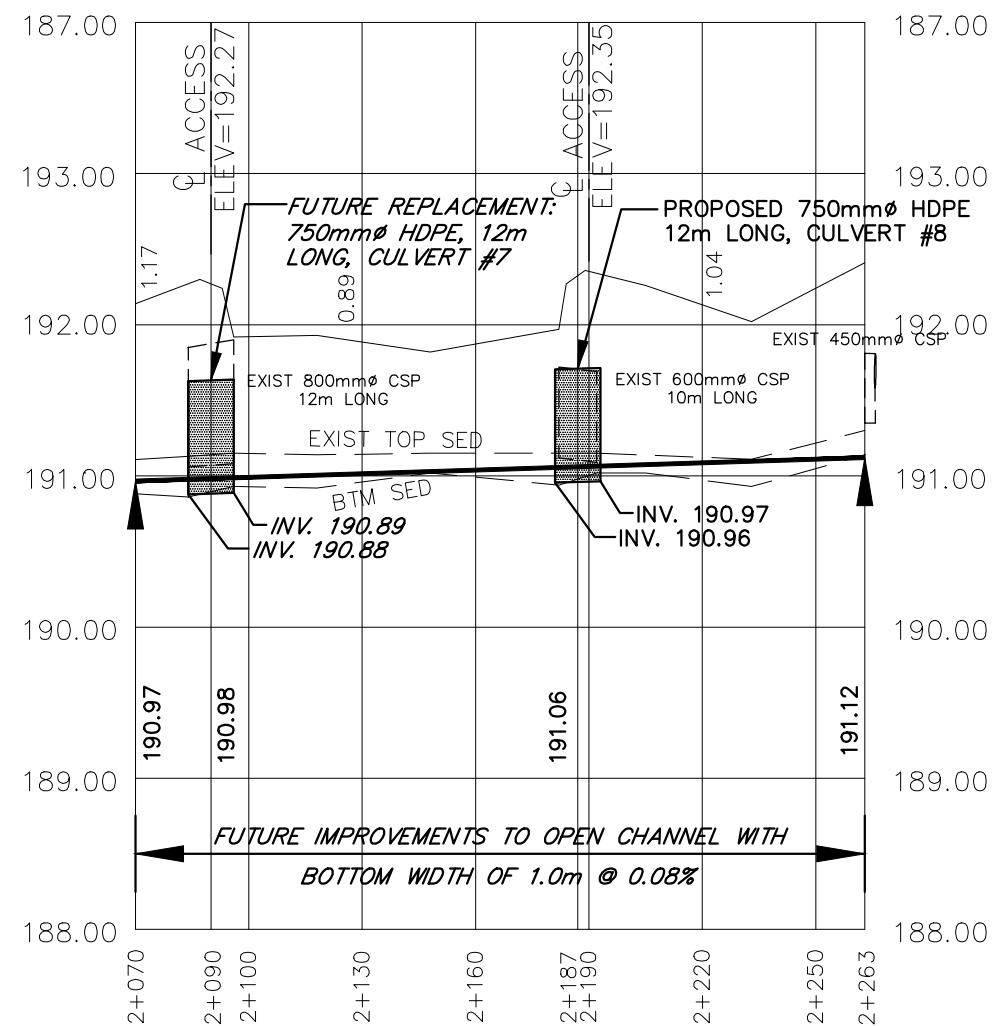
GENERAL NOTES

1. BENCHMARK No.5 ELEV. 191.85
TOP OF WEST END OF EXISTING
800mmØ CSP, STATION 2+090
2. UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW
CHANNEL.



TYPICAL DRAIN CROSS SECTION

NTS



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
South Talbot Road Drain East Profile 4

PROJECT No.
2021-1301

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	MAY 18, 2022	JW
DRAWN J. WARNER	SCALE: 1:2,000			
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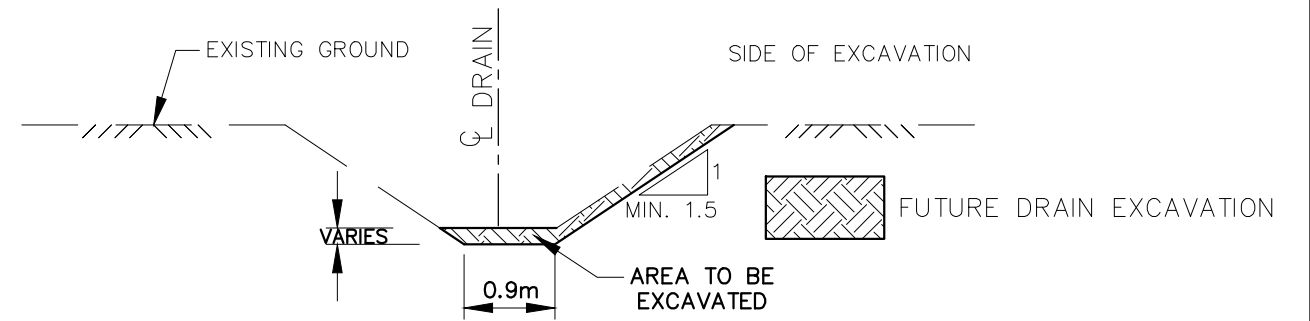
TOWN of TECUMSEH
SOUTH TALBOT ROAD DRAIN EAST
PROFILE

5
OF 10

Last Updated: March 1, 2022

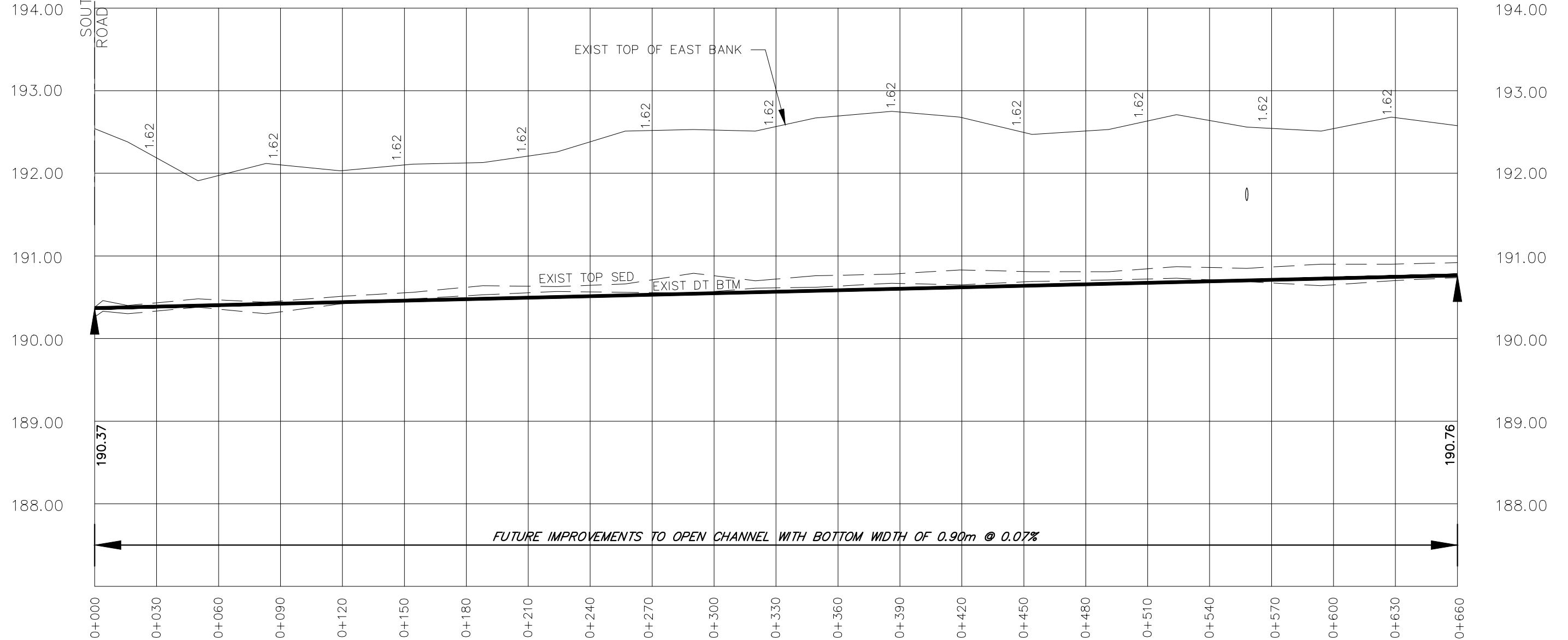
GENERAL NOTES

- BENCHMARK No.3 ELEV. 192.76
TOP NAIL IN UTILITY POLE AT THE
SOUTHEAST CORNER OF THE
INTERSECTION OF SOUTH TALBOT
ROAD AND CONCESSION ROAD 12
- BENCHMARK No.6 ELEV. 192.74
TOP OF CATCHBASIN AT ST. 1+240
WEST SIDE OF CONCESSION ROAD 12



TYPICAL DRAIN CROSS SECTION

NTS



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
12th Line Drain Profile 1

PROJECT No.
2021-1301

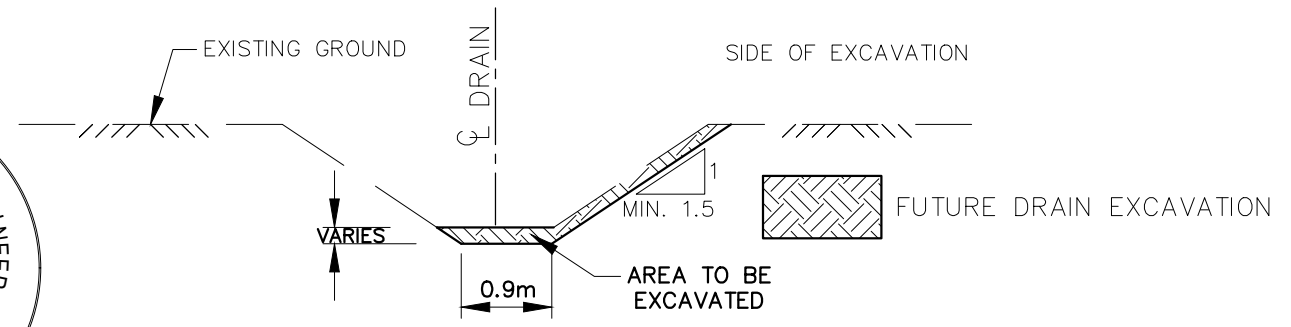
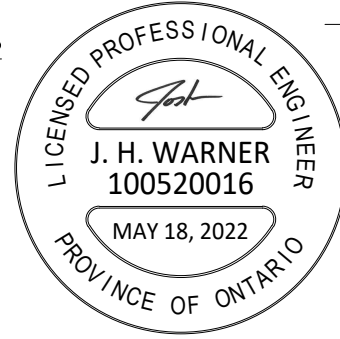
APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	MAY 18, 2022	CS
DRAWN C. SAUNDERS	SCALE: 1:2,000			

TOWN of TECUMSEH
12TH LINE DRAIN
PROFILE

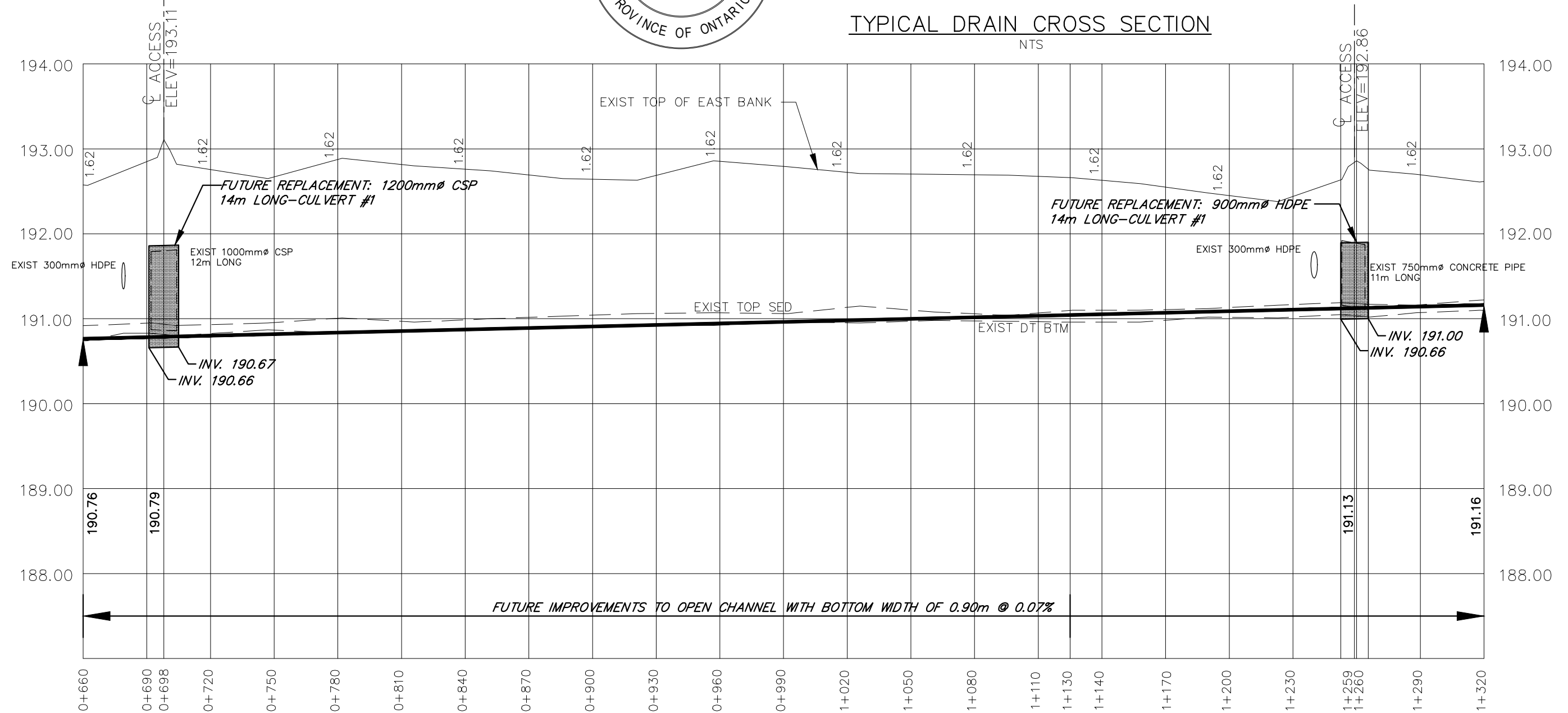
6
OF 10

GENERAL NOTES

- BENCHMARK No.1 ELEV. 192.76
TOP NAIL IN UTILITY POLE AT THE
SOUTHEAST CORNER OF THE
INTERSECTION OF SOUTH TALBOT
ROAD AND CONCESSION ROAD 12
- BENCHMARK No.2 ELEV. 192.74
TOP OF CATCHBASIN AT ST. 1+240
WEST SIDE OF CONCESSION ROAD 12



TYPICAL DRAIN CROSS SECTION
NTS



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
12th Line Drain Profile 2

PROJECT No.
2021-1301

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
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B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

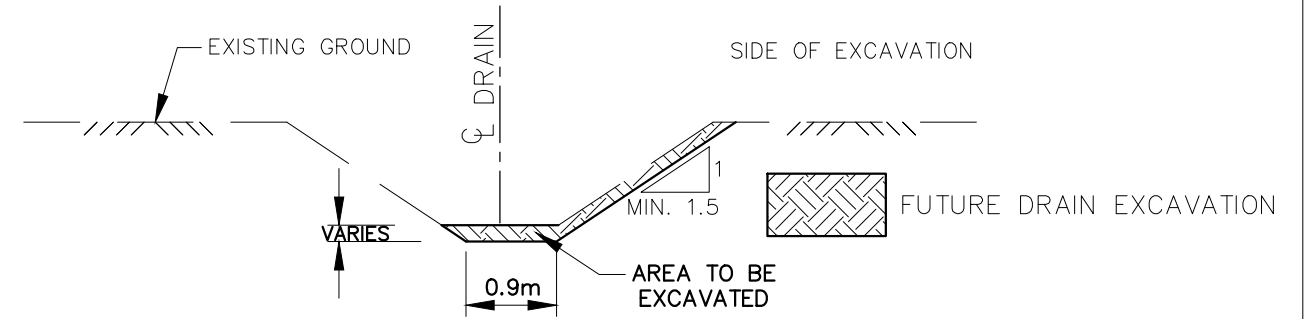
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TOWN of TECUMSEH
12TH LINE DRAIN
PROFILE

7
OF 10

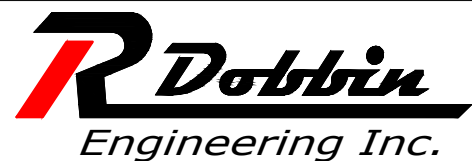
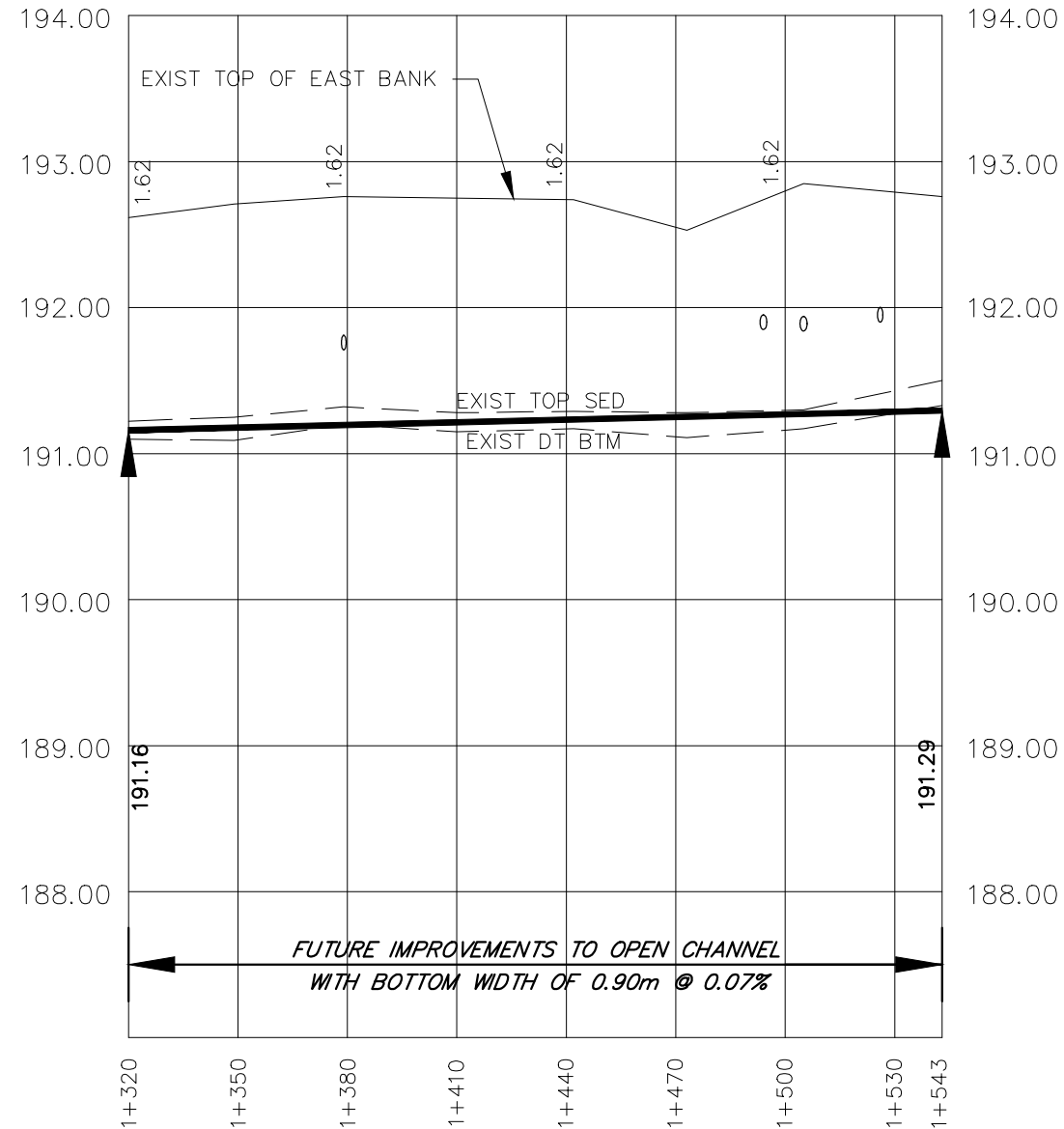
GENERAL NOTES

- BENCHMARK No.1 ELEV. 192.76
TOP NAIL IN UTILITY POLE AT THE
SOUTHEAST CORNER OF THE
INTERSECTION OF SOUTH TALBOT
ROAD AND CONCESSION ROAD 12
- BENCHMARK No.2 ELEV. 192.74
TOP OF CATCHBASIN AT ST. 1+240
WEST SIDE OF CONCESSION ROAD 12



TYPICAL DRAIN CROSS SECTION

NTS



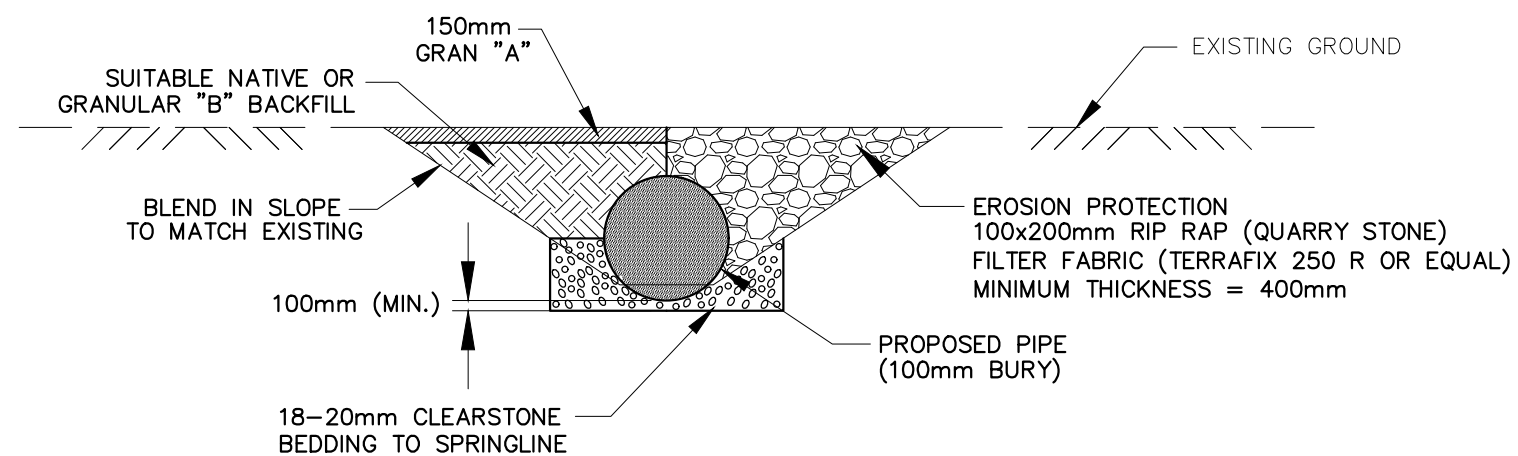
4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
12th Line Drain Profile 3

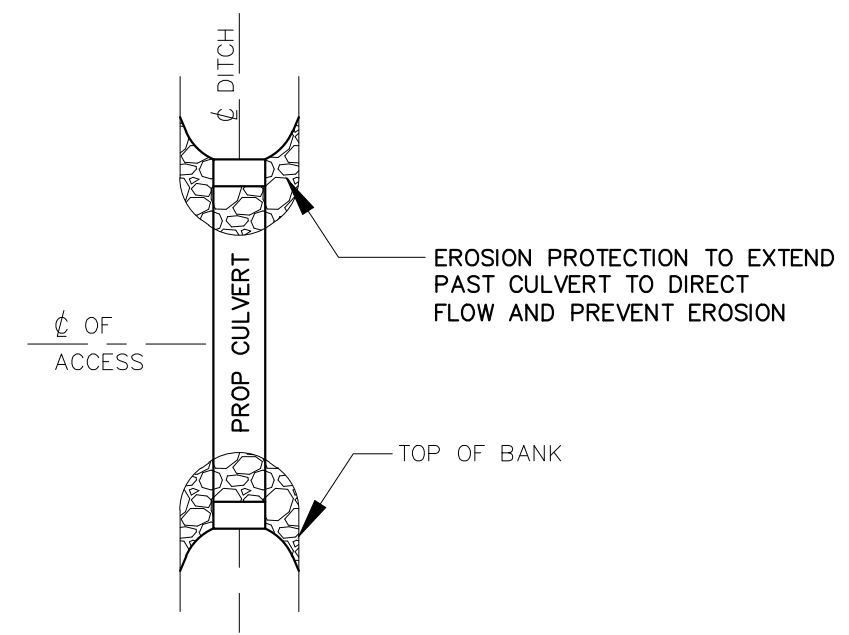
PROJECT No.
2021-1301

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAY 18, 2022	CS
B. VAN RUITENBURG				
DRAWN	SCALE: 1:2,000			
C. SAUNDERS	0 20 40 60m			

TOWN of TECUMSEH
12TH LINE DRAIN
PROFILE

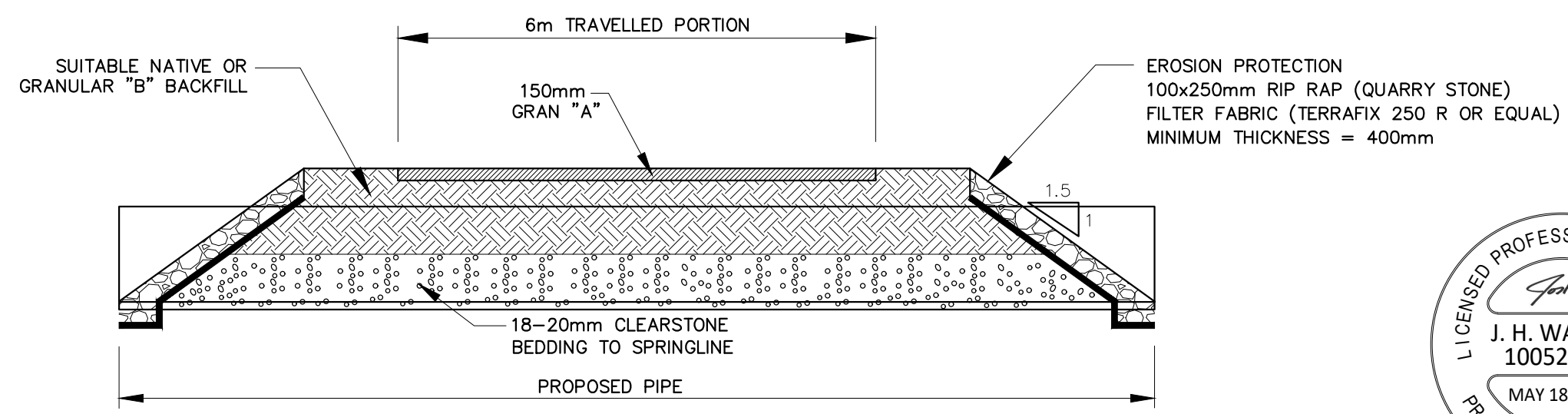


PROPOSED PIPE END SECTION



PROPOSED PLAN
TYPICAL CULVERT

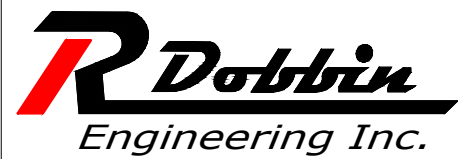
NTS



PROPOSED CROSS-SECTION



NOTE:
ALL GRANULARS COMPACTED
TO 98% MODIFIED PROCTOR DENSITY

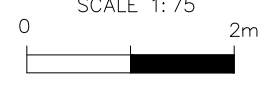


4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
South Talbot Road Drain East and
12th Line Drain Typical Access Culvert Detail

PROJECT No.
2021-1301

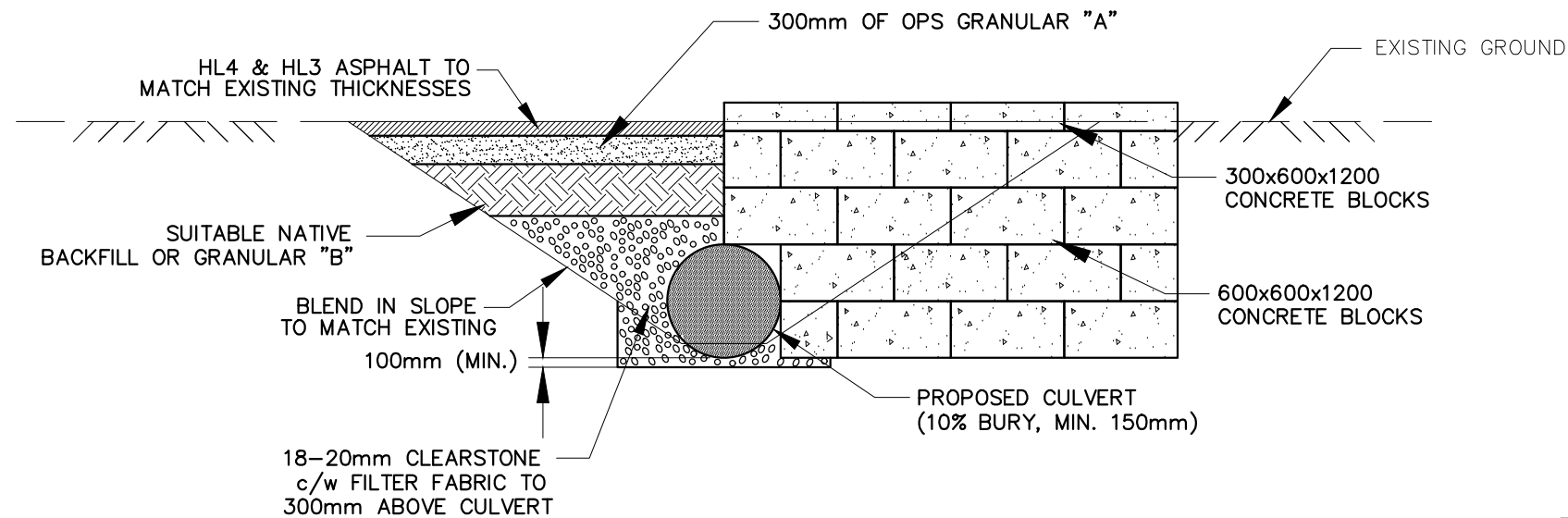
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	MAY 18, 2022	JW
DRAWN J. WARNER	SCALE 1:75			



TOWN of TECUMSEH
SOUTH TALBOT ROAD DRAIN EAST AND 12TH LINE DRAIN
TYPICAL ACCESS CULVERT DETAIL

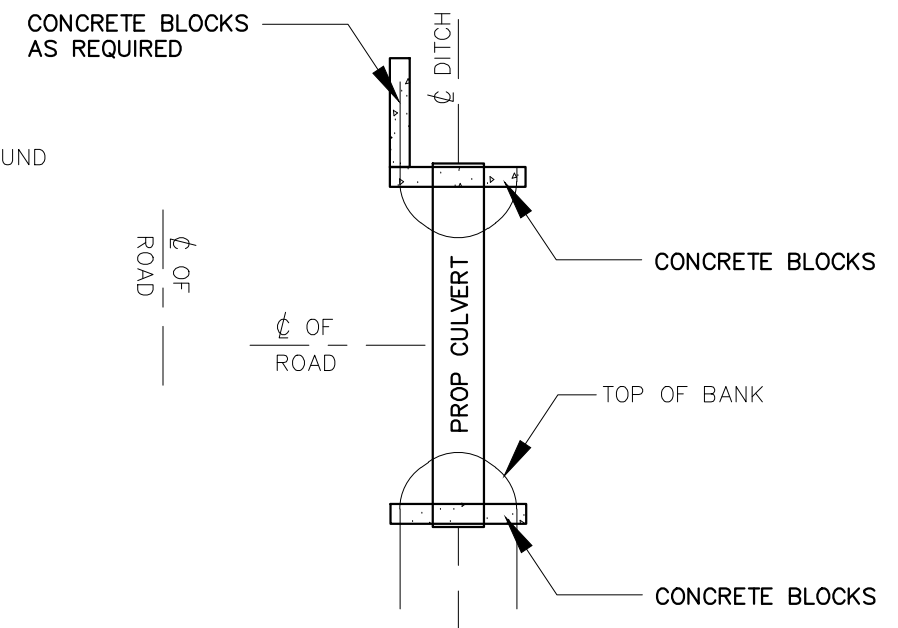
9
OF 10

Last Updated: March 1, 2022



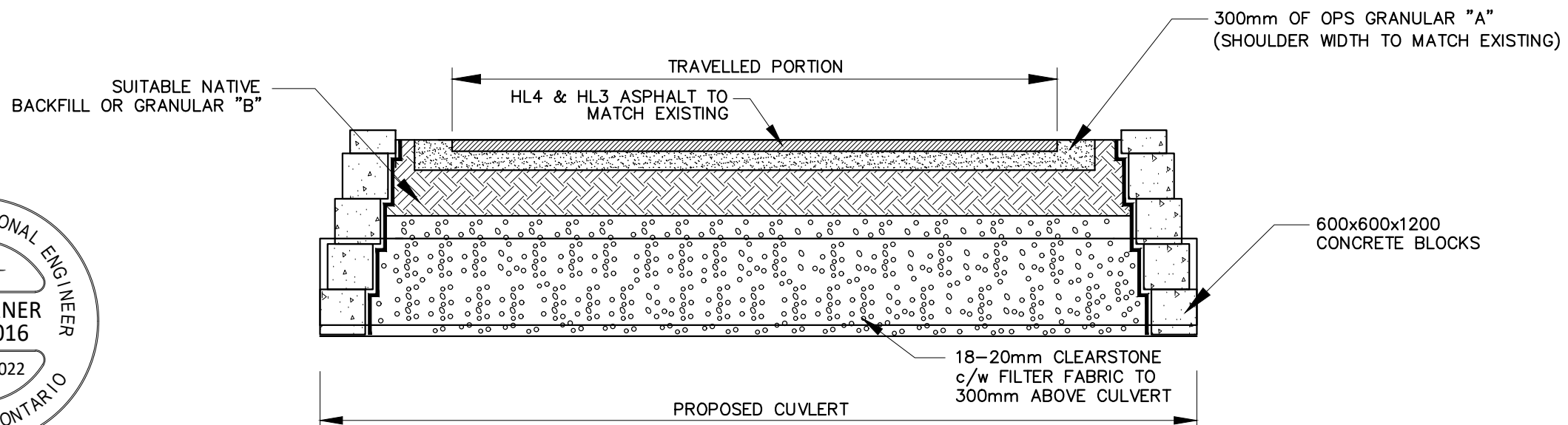
TYPICAL ASPHALT ROAD CUVLERT END SECTION

NTS



TYPICAL ROAD CUVLERT PLAN

NTS



TYPICAL ASPHALT ROAD CROSS-SECTION

NTS



NOTE:
ALL GRANULARS COMPACTED
TO 98% MODIFIED PROCTOR DENSITY



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
South Talbot Road Drain East Road Culvert Detail

PROJECT No.
2021-1301

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	MAY 18, 2022	JW
DRAWN J. WARNER				

TOWN of TECUMSEH
SOUTH TALBOT ROAD DRAIN EAST
TYPICAL ASPHALT ROAD CUVLERT DETAIL

10
OF 10

Last Updated: March 1, 2022