

October 3, 2023

The Mayor and Council
Municipality of North Middlesex
229 Parkhill Main Street
Parkhill, ON
N0M 2K0

Gentlemen and Mesdames:

Re: Hutchinson-Eagleson Drain “A”

In accordance with your instructions, R. Dobbin Engineering has undertaken an examination of the Hutchinson-Eagleson Drain in the Municipality of North Middlesex.

Authorization under the Drainage Act

This Engineers Report that has been prepared under Section 78 of the Drainage Act as per a request from an affected Landowner.

Under Section 78 of the Drainage Act, Council may undertake and complete the maintenance or repair of any drainage works constructed under a bylaw passed under this Act or its predecessor. Section 78 is to be used where 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 Hutchinson-Eagleson Drain “A” outlets into the Canada Company Drain along the north lot line of Lot 2, Concession 28. It continues as an open channel generally

southeasterly for approximately 8,370m. Drain “A” serves as an outlet for Branches “B” through “L” as shown on the plan. Branches “B” and “C” are open channels and the remainder are tile drains.

The Hutchinson-Eagleson Drain was last improved under an Engineer’s Report dated May 7, 1973. Under this report Drain “A” was improved downstream of Hutchinson Road.

Under an Engineer’s Report dated April 28, 1961 the Hutchinson-Eagleson Drain “A” was improved along its length and Branches “B” through “L” were constructed.

On-Site Meeting

A site meeting was held on February 1, 2023.

The following were present at the meeting:

- Josh Warner (R. Dobbin Engineering)
- Joanne Sadler (Municipality of North Middlesex)
- John McLinchey (Landowner)
- Dale McLinchey (Landowner)
- Ron Smith (Tenant)
- Jerry Hendrikx (Landowner)
- Ron Masschelein (Landowner)
- Laurie-Ann Masschelein (Landowner)
- Marianne McMenamain (Landowner)
- Earl Bullock (Landowner)
- Garry Steeper (Landowner)
- Andy Roelands (Landowner)

The following is a brief summary of the meeting:

- General discussion of the Drainage Act and Landowners rights under the Drainage Act.
- Josh Warner stated that a standard culvert will provide an 8m access width. A standard culvert will be proposed to be assessed with a shared cost between the benefitting property and upstream properties as an outlet assessment. If a Landowner requests a wider access width, the additional cost beyond a standard access will be assessed to the requesting property.

- Original Request is for a new culvert on the property with Roll Number 70-114 (John and Dale McLinchey).
 - Landowner requested a 9m access width.
- The Landowner of the property with Roll Number 70-113 (Ron and Laurie-Ann Masschelein) requested an access on their property. They requested a 9m access width.
- With the notice, Landowners were given a plan with a preliminary drainage area. It was mentioned that should Landowners have any concerns with the drainage area as presented they should bring it up to the engineer. No Landowners expressed any concerns with the drainage area as presented.
- The culverts on the drain will be investigated and replaced as required. Any culverts not replaced will be specified for future replacement.
- No adverse soil conditions were noted at the site meeting.
- No requests outside of the Hutchinson-Eagleson Drain “A” were made.

Discussion

Following the site meeting, it was determined, in discussion with the Municipality, that updating the maintenance specifications, profile and schedules would be to the benefit of the drainage works.

The Landowner of the property with Roll Number 70-055 has drained the property outside of this watershed. At the Municipalities discretion a Section 65 or 76 report may be prepared to address this change. It will affect the maintenance provisions of the Prance and Roelands Drains.

Drain Classification

The Hutchinson-Eagleson Drain is currently classified as a class “F” drain. The Canada Company Drain North is currently classified as class “E” drain. These ratings are 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).

Approvals

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

Draft Report

A draft report, dated August 28, 2023 was sent to all the affected Landowners and a meeting was held on October 2, 2023 to go over the report and address any questions and concerns related to the draft report. The following were present at the meeting:

- Josh Warner (R. Dobbin Engineering)
- Joanne Sadler (Municipality of North Middlesex)
- Peter Wiersma (Landowner)
- Dale McLinchey (Landowner)
- Chris MacGregor (Landowner)
- Connie MacGregor (Landowner)
- Dale McLeod (Tenant)
- Ron Smith (Landowner)
- Jerry Hendrikx (Landowner)
- Garry Steeper (Landowner)
- Earl Bullock (Landowner)

The following is a brief summary of the meeting:

- General discussion of the Drainage Act.
- The Landowners of the property with Roll Number 70-084 requested that their culvert be replaced. They requested a 9m top width.
- Some discussions occurred regarding larger culverts for the roads then the accesses. Josh Warner explained that road culverts are designed to a higher standard to ensure that larger storm events do not overtop the road. If larger culverts were investigated the drain would need to be deepened or the accesses would need to be humped to allow sufficient cover over the culverts.

Following the meeting discussions occurred with Hugh Dietrich, who represents the property with Roll Number 70-127. He requested that the ditch be cleaned in his section of the property and the material be utilized to build a berm where the banks are low on the south side of the channel. It was decided that this would be best addressed through maintenance.

Existing Conditions

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

Culvert Number	Location	Existing Culvert Size	Condition	Recommendation
1	Unopened Road Allowance	2400mm dia. CSP	Good. Installed in 2023	Keep
2	Roll Number 70-120	2200mm dia. CSP	Okay. Some poor joints, minimal cover but relatively new culvert	Keep
3	Hutchinson Road	2500mm Wide Opening Concrete Box Culvert with Wing Walls	Poor. Cracks, footing undermined	Replace
4	Roll Number 70-114	Proposed New Culvert		
5	Roll Number 70-113	Proposed New Culvert		
6	Roll Number 70-105	2500mm Wide Opening Concrete Box Culvert	Okay. Footing Exposed and small cracks	Leave
7	Bullock Road	4900mm Wide Opening Concrete Box Culvert with Wing Walls	Poor. Crack, footing undermined and rebar exposed	Replace
8	Adare Drive	2800x2000 CSPA	Okay. Half full of water, some rust	Leave
9	Roll Number 70-084	2000mm dia. Boiler Shell	Okay. Very minimal cover	Replace
10	Roll Number 70-086	1200mm dia. Concrete Field Tile	Okay to Poor. Joints are separated and pipe is on inconsistent grade. Filter fabric is holding material from entering culvert	Leave, but Landowner to monitor
11	Grand Bend Road	2000x1700mm Concrete Box Culvert	Good	Leave

Culvert Number	Location	Existing Culvert Size	Condition	Recommendation
12	Roll Number 70-056	800mm dia. CSP	Okay. Rust below spring line, poor joint but no soil infiltration. Culvert is perched.	Leave
	Station 7+735 (Secondary Access)	825mm dia. Concrete Field Tile	Poor. Poor joints and broken in section	Remove

Design

The agricultural culverts shall be designed to provide outlet for a 1 in 5-year storm event. The municipal road culverts shall be designed to provide outlet for a 1 in 25-year storm event. The county road culverts shall be designed to provide outlet for a 1 in 100-year storm event.

Recommendations

It is therefore recommended that the following work be carried out:

1. New Culverts No. 4 & 5 shall be installed, Culverts No. 3, 7 & 9 shall be replaced, a Culvert at Station 7+735 shall be removed and future specifications shall be developed for the replacement of the remaining culverts along the length of the drainage works.
2. The specifications, profile and maintenance schedule for the Hutchinson-Eagleson Drain "A" shall be updated.

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 \$385,024, including engineering of the report, attending the Meeting to Consider the Report, attending the Court of Revision, and an estimate for tendering, contract administration and inspection. Appearances before appeal bodies have not been included in the cost estimate.

A plan has been prepared showing the location of the work and the approximate drainage area. A profile is included showing the depths and grades of the proposed work.

Assessment

As per Section 21 of the Drainage Act, the Engineer in their 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 will be 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 for road crossings and locating and working around utilities 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 road or public utility.

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

The estimated cost of the drainage works has been assessed in the following manner:

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. The road crossings, with the exception of the extra cost to locate and work around utilities, has been assessed with 100% of the estimated cost assessed as a special benefit assessment to the road authority. The utilities have been

assessed 100% of the estimated cost to work around that utility as a special benefit assessment to that utility. These items 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. The additional costs as a result of the utilities (such as a daylighting and surveying) that are not to be tendered separately have been assessed to the utility as a benefit assessment and shall be pro-rated with the remainder of the drainage works.

2. The installation/replacement of Culverts No. 4, 5 and 9 has been assessed based on the culvert length required to provide an 8m top width (standard culvert). This standard culvert has been assessed with 50% of the cost applied as benefit assessment to property and the remainder of the cost assessed as an outlet assessment on upstream lands and roads based on equivalent hectares. The additional cost to provide a wider access has been assessed to the requesting property as a benefit assessment. Based on the above, the culverts have been assessed with 54% of the cost applied as benefit assessment to the property and the remainder of the cost assessed as an outlet assessment on upstream lands and roads based on equivalent hectares.
3. The cost of removing the culvert at Station 7+735 has been assessed to the property as a special benefit assessment as it is a secondary access and is not eligible for grant.
4. The engineering for the access culverts not being replaced has been assessed with 50% of the cost applied as a benefit assessment to the property and the remainder of the cost assessed as an outlet assessment to upstream lands and roads based on equivalent hectares.
5. The maintenance schedule has been updated with 50% assessed as a benefit assessment and the remainder assessed as an outlet assessment to the upstream lands and roads based on equivalent hectares.

All final costs included in the cost estimate of this report, except as identified above, shall be pro-rated based on the Schedule of Assessment. Any additional costs shall be assessed in a manner as determined by the Engineer in accordance with the Drainage Act.

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 (\$12,140.00 per acre). Allowances for crop loss are based on \$2,000.00 per hectare for the first year and \$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 shall be from Haggmier Road, the Unopened Road Allowance via Greenway Road, Hutchinson Road, Bullock Road and Grand Bend Road. Access shall generally be restricted to a width of 6 metres.

Access for construction of the culverts shall be from the properties in which the culvert is being replaced or removed. Culvert No. 4 shall be through the property with Roll Number 70-114, Culvert No. 5 through the property with Roll Number 70-113, Culvert No. 9 through the property with Roll Number 70-084 and the removal of the culvert at Station 7+735 through the property with Roll Number 70-056. The location of the access shall generally be along laneways, fence lines or property lines.

The working area for the construction and future maintenance 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.

Access for culvert maintenance and channel repair on a single property shall be from the properties in which the culvert or channel is being repaired or maintained. If maintenance is being done on multiple properties access shall be gained from the nearest roadway and shall be along the length of the drainage works. 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. The working area for channel maintenance shall be restricted to a width of 10m from the side the excavation is taking place. The channel shall generally be excavated from the south side of the channel unless otherwise determined by the Drainage Superintendent. If, at the discretion of the Drainage Superintendent, there is erosion on the channel opposite the working area access may be gained along the channel and nearest culvert to maintain the bank.

Restrictions

No trees and shrubs shall be planted nor shall permanent structures be erected within 10m 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 Hutchinson-Eagleson Drain “A” shall be repaired and maintained as per the Schedule of Maintenance, specifications and drawings included in this report.

Properties that wish to have the excavated material trucked shall be assessed the cost of trucking less the cost of levelling. The cost of levelling shall form part of the drain maintenance cost. All of the trucking cost to create a berm on the property with Roll Number 70-127 shall be assessed to the property.

All the culverts, as included in the profile with rip rap end walls, shall be maintained and repaired in the following manner:

Culvert Number	Benefiting Lands	Road Authority	Upstream Based on Equivalent Hectares as Contained in the SofM
2, 6, 8, 10, 12	50%		50%
3, 7, 11		100%	
1	100% (Roll Number 70-124)		
4, 5, 9	54%		46%

If a Landowner requests an additional length of culvert beyond that required to have an 8m top width the extra cost shall be borne by the Landowner making the request including the future maintenance and repair. The location of the 8m top width shall be determined by the Drainage Superintendent and shall generally be in the primary access location and shall include any headwalls.

The cost of an asphalt surface across any of the culverts shall be assessed to the benefitting property.

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.

The Hutchinson-Eagleson Drain Branches “B” through “L” shall be maintained and repaired in accordance with the provisions contained in the 1961 Engineer’s Report.

Yours truly,



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



Hutchinson - Eagleson Drain "A"
Municipality of North Middlesex
October 3, 2023

ALLOWANCES

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

Conc.	Lot or part	Roll No.	Owner	Section 29 (\$) (R.O.W)	Section 30 (\$) Damages	Total (\$)
22	Lot 8	70-056	C. & K. Eagleson	-	1,360	1,360
23	W 1/2 Lot 6	70-084	C. & B. MacGregor	-	500	500
24	S 1/2 Lot 4 & Lot 5	70-095	E. & J. Bullock	-	50	50
25	SE 1/4 Lot 5 & E 1/2 Lot 6	70-107-01	Lagerwerf's Greenway Acres	-	50	50
26	Lot 3	70-115	P. & A. Wiersma	-	50	50
	NW 3/4 Lot 4	70-114	J & D Mclinchey Farms Ltd	-	390	390
	SW 1/4 Lot 4 & N 1/2 Lot 5	70-113	R. & L. Masschelein	-	1,180	1,180
27	Lot 3	70-120	W. Woodburn	-	50	50
TOTAL ALLOWANCES				-	3,630	3,630

Estimate of Cost

	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Pre-Construction Meeting	1	LS	300	300
Brushing and Tree Removal	1	LS	2,000	2,000
Culvert No. 3 (Hutchinson Road, Station 1+777)				
Traffic Control	1	LS	3,000	3,000
Daylight and Work Around Watermain	1	LS	1,000	1,000
Removal and Disposal of Existing Structure and Excavated Material	1	LS	4,000	4,000
Supply and Install 2700mmØ CSP c/w Bedding (3.5mm Thick)	18	m	3,100	55,800
Supply and Install Granular "B" Type II	400	tonne	30	12,000
Supply and Install Granular "M" (Crushed Dolomite Source)	50	m	40	2,000
Supply and Install Rip Rap End Walls	50	tonne	150	7,500
Extend Existing Tile	1	each	250	250
Restoration and Ditch Grading	1	LS	1,000	1,000
Culvert No. 4 (J & D McLinchey, Station 2+020)				
Supply and Install 2230x1700mmØ CSP c/w Bedding (3.5mm Thick)	15	m	1,700	25,500
Supply and Install Granular "B" Type II	140	tonne	30	4,200
Supply and Install 100% Crushed Granular "A"	25	tonne	35	875
Supply and Install Rip Rap at End Walls	30	tonne	150	4,500
Culvert No. 5 (R. & L. Masschelein, Station 2+530)				
Supply and Install 2230x1700mmØ CSP c/w Bedding (3.5mm Thick)	15	m	1,700	25,500
Supply and Install Granular "B" Type II	140	tonne	30	4,200
Supply and Install 100% Crushed Granular "A"	25	tonne	35	875
Supply and Install Rip Rap at End Walls	30	tonne	150	4,500
Culvert No. 7 (Bullock Road, Station 4+249)				
Traffic Control	1	LS	3,000	3,000
Daylight and Work Around Watermain	1	LS	1,000	1,000
Removal and Disposal of Existing Structure and Excavated Material	1	LS	4,000	4,000
Supply and Install 2400mmØ CSP c/w Bedding (3.5mm Thick)	21	m	2,800	58,800
Supply and Install Granular "B" Type II	400	tonne	30	12,000
Supply and Install Granular "M" (Crushed Dolomite Source)	50	m	40	2,000
Supply and Install Rip Rap End Walls	50	tonne	150	7,500
Restoration and Ditch Grading	1	LS	1,000	1,000
Culvert No. 9 (C. & B. MacGregor, Station 5+510)				
Removal and Disposal of Existing Structure and Excavated Material	1	LS	1,200	1,200
Supply and Install 1800mmØ CSP c/w Bedding (2.8mm Thick)	15	m	1,300	19,500
Supply and Install Granular "B" Type II	140	tonne	30	4,200
Supply and Install 100% Crushed Granular "A"	25	tonne	35	875
Supply and Install Rip Rap at End Walls	30	tonne	150	4,500
Remove existing Culvert and Excavated Material and Repair Channel (Station 7+735)	1	LS	1,600	1,600

	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Environmental Considerations (including 2 Silt Fences)	1	LS	1,500	1,500
Extend Tile at Station 7+560 and 8 tonne of rip rap	1	LS	1,200	1,200
Miscellaneous/Contingency				<u>14,200</u>
Sub Total				\$297,075
Allowances				\$3,630
Engineering				\$35,760
Future Culvert Design				\$7,200
Engineering to Update SofM				\$3,000
Engineering to Update Profile				\$6,200
Daylighting and Surveying				\$3,000
Utilities				
Estimate for Tendering, Contract Administration and Inspection				\$22,000
ABCA Fee				<u>\$500</u>
Sub Total				\$378,365
Non-Recoverable HST (1.76%)				<u>\$6,659</u>
Total Estimate				\$385,024

SCHEDULE OF ASSESSMENT

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
<u>Agricultural Lands</u>								
21	Lot 7	1.21	70-044-10	H. Roellgen		-	244	244
	N 1/2 Lot 8	10.92	70-045	S. & C. Scott		-	2,200	2,200
	S 1/2 Lot 8 & N 1/2 Lot 9	30.34	70-046	H. Roellgen		147	5,196	5,343
	S 1/2 Lot 9	14.16	70-047	H. Roellgen		-	2,425	2,425
	Lot 10	16.18	70-048	H. Roellgen		-	2,934	2,934
22	S 1/2 Lot 6 & N 1/2 Lot 7	19.82	70-059	Marandy Farms Inc.		-	3,101	3,101
	S 1/2 Lot 7	20.23	70-058	A. Roelands		420	2,926	3,346
	Lot 8	34.40	70-056	C. & K. Eagleson	2,190	1,554	6,383	10,127
	Lot 9	18.21	70-056-10	Marandy Farms Inc.		-	2,721	2,721
	Lot 10	0.00	70-055	Deny's Farm Inc		-	-	-
23	Lot 5	4.04	70-083	S. & A. Steeper		-	709	709
	W 1/2 Lot 6	20.23	70-084	C. & B. MacGregor		20,644	3,525	24,169
	E 1/2 Lot 6	12.14	70-085-01	C. & B. MacGregor		-	2,130	2,130
	N 1/2 Lot 7	20.23	70-086	A. & B. Woodburn		748	3,123	3,871
	Pt. S 1/2 Lot 7	1.65	70-087	A. Woodburn		-	298	298
	S 1/2 Lot 7	16.15	70-087-01	B. Woodburn		289	2,893	3,182
	N 1/2 Lot 8	13.35	70-088	N. & L. Eagleson		-	2,413	2,413
	S 1/2 Lot 8	8.09	70-089	M. & M. Kazuk		-	1,462	1,462
24	S 1/2 Lot 4 & Lot 5	30.35	70-095	E. & J. Bullock		129	3,134	3,263
	Lot 6	32.37	70-094	E. & G. Bullock		561	2,853	3,414
25	N 1/2 Lot 4	10.11	70-104	Lagerwerf's Greenway Acres		-	1,006	1,006
	S 1/2 Lot 4 & N 1/2 Lot 5	40.47	70-105	R. Masschelein		902	3,950	4,852
	SW 1/4 Lot 5 & W 1/2 Lot 6	16.18	70-106	Dalgetta Farms Inc		569	1,611	2,180
	SE 1/4 Lot 5 & E 1/2 Lot 6	18.14	70-107-01	Lagerwerf's Greenway Acres		118	1,836	1,954
26	Lot 3	8.09	70-115	P. & A. Wiersma		89	384	473
	NW 3/4 Lot 4	30.35	70-114	J & D Mclinchey Farms Ltd		25,795	1,449	27,244
	SW 1/4 Lot 4 & N 1/2 Lot 5	28.32	70-113	R. & L. Masschelein		26,150	2,796	28,946
	S 1/2 Lot 5	8.09	70-112	J. & D. Mclinchey		-	392	392

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Special Benefit	Benefit	Outlet	Total
27	Lot 3	35.04	70-120	W. Woodburn		1,218	22	1,240
	Lot 4	24.28	70-118	D. & B. Mclinchey		-	30	30
28	Lot 1	4.04	70-126	New Venice Corp Ltd		120	-	120
	Lot 2	16.19	70-127	M. & L. Eagleson		239	-	239
N. B	Pt. Lot 45	2.83	70-124	Hope Family Pork Ltd.		-	2	2
					2,190	79,692	64,148	146,030
<u>Non-Agricultural Lands</u>								
22	Pt. N 1/2 Lot 7	1.42	70-057	T. & J. Scott		-	385	385
23	Pt. E 1/2 Lot 6	2.25	70-085	C. Lacey & E. Carter		-	602	602
24	Lot 7	5.48	70-093	Ausable Bayfield Conservation Authority		-	290	290
25	Pt E 1/2 Lot 6	2.09	70-107	M. McMenamin		-	210	210
27	Pt. Lot 3	0.57	70-119	D. Hodgins & J. Scott		-	3	3
					-	-	1,490	1,490
<u>Municipal Lands</u>								
Grand Bend Road		3.84		County of Middlesex		1,200	1,984	3,184
Unopened Road Allowance		1.20		Municipality of North-Middlesex		-	2	2
Hutchinson Road		1.21		Municipality of North-Middlesex	110,926	-	8	110,934
Bullock Road		1.82		Municipality of North-Middlesex	115,400	-	376	115,776
Adare Drive		4.86		Municipality of North-Middlesex		1,200	1,008	2,208
					226,326	2,400	3,378	232,104
<u>Utilities</u>								
Watermain				OCWA				
					2,400	3,000	-	5,400
					2,400	3,000	-	5,400
Total - Agricultural Lands					146,030			
Total - Non - Agricultural Lands					1,490			
Total - Municipal Lands					232,104			
Total - Utilities					5,400			
Total Assessment					\$385,024			

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

Conc.	Lot or Part	Affected Hect.	Roll Number	Owner	Assessment	Estimated Grant	Allowances	Estimated Net Assessmnet
Agricultural Lands								
21	Lot 7	1.21	70-044-10	H. Roellgen	244	81		163
	N 1/2 Lot 8	10.92	70-045	S. & C. Scott	2,200	733		1,467
	S 1/2 Lot 8 & N 1/2 Lot 9	30.34	70-046	H. Roellgen	5,343	1,781		3,562
	S 1/2 Lot 9	14.16	70-047	H. Roellgen	2,425	808		1,617
	Lot 10	16.18	70-048	H. Roellgen	2,934	978		1,956
22	S 1/2 Lot 6 & N 1/2 Lot 7	19.82	70-059	Marandy Farms Inc.	3,101	1,034		2,067
	S 1/2 Lot 7	20.23	70-058	A. Roelands	3,346	1,115		2,231
	Lot 8	34.40	70-056	C. & K. Eagleson	10,127	2,646	1,360	6,121
	Lot 9	18.21	70-056-10	Marandy Farms Inc.	2,721	907		1,814
	Lot 10	0.00	70-055	Deny's Farm Inc	-	-		-
23	Lot 5	4.04	70-083	S. & A. Steeper	709	236		473
	W 1/2 Lot 6	20.23	70-084	C. & B. MacGregor	24,169	8,056		16,113
	E 1/2 Lot 6	12.14	70-085-01	C. & B. MacGregor	2,130	710		1,420
	N 1/2 Lot 7	20.23	70-086	A. & B. Woodburn	3,871	1,290		2,581
	Pt. S 1/2 Lot 7	1.65	70-087	A. Woodburn	298	99		199
	S 1/2 Lot 7	16.15	70-087-01	B. Woodburn	3,182	1,061		2,121
	N 1/2 Lot 8	13.35	70-088	N. & L. Eagleson	2,413	804		1,609
	S 1/2 Lot 8	8.09	70-089	M. & M. Kazuk	1,462	487		975
24	S 1/2 Lot 4 & Lot 5	30.35	70-095	E. & J. Bullock	3,263	1,088	50	2,125
	Lot 6	32.37	70-094	E. & G. Bullock	3,414	1,138		2,276
25	N 1/2 Lot 4	10.11	70-104	Lagerwerf's Greenway Acres	1,006	335		671
	S 1/2 Lot 4 & N 1/2 Lot 5	40.47	70-105	R. Masschelein	4,852	1,617		3,235
	SW 1/4 Lot 5 & W 1/2 Lot 6	16.18	70-106	Dalgetta Farms Inc	2,180	727		1,453
	SE 1/4 Lot 5 & E 1/2 Lot 6	18.14	70-107-01	Lagerwerf's Greenway Acres	1,954	651	50	1,253

Conc.	Lot or Part	Affected Hect.	Roll Number	Owner	Assessment	Estimated Grant	Allowances	Estimated Net Assessment
26	Lot 3	8.09	70-115	P. & A. Wiersma	473	158	50	265
	NW 3/4 Lot 4	30.35	70-114	J & D Mclinchey Farms Ltd	27,244	9,081	390	17,773
	SW 1/4 Lot 4 & N 1/2 Lot 5	28.32	70-113	R. & L. Masschelein	28,946	9,649	1,180	18,117
	S 1/2 Lot 5	8.09	70-112	J. & D. Mclinchey	392	131		261
27	Lot 3	35.04	70-120	W. Woodburn	1,240	413	50	777
	Lot 4	24.28	70-118	D. & B. Mclinchey	30	10		20
28	Lot 1	4.04	70-126	New Venice Corp Ltd	120	40		80
	Lot 2	16.19	70-127	M. & L. Eagleson	239	80		159
N. B	Pt. Lot 45	2.83	70-124	Hope Family Pork Ltd.	2	1		1
Non-Agricultural Lands								
22	Pt. N 1/2 Lot 7	1.42	70-057	T. & J. Scott	385			385
23	Pt. E 1/2 Lot 6	2.25	70-085	C. Lacey & E. Carter	602			602
24	Lot 7	5.48	70-093	Ausable Bayfield Conservation Autho	290			290
25	Pt E 1/2 Lot 6	2.09	70-107	M. McMenamin	210			210
27	Pt. Lot 3	0.57	70-119	D. Hodgins & J. Scott	3			3
Municipal Lands								
	Grand Bend Road	3.84		County of Middlesex	3,184			3,184
	Unopened Road Allowance	1.20		Municipality of North-Middlesex	2			2
	Hutchinson Road	1.21		Municipality of North-Middlesex	110,934			110,934
	Bullock Road	1.82		Municipality of North-Middlesex	115,776			115,776
	Adare Drive	4.86		Municipality of North-Middlesex	2,208			2,208
Utilities								
	Watermain			OCWA	5,400			5,400
Total Assessment					\$385,024	\$47,945	\$3,130	\$333,949

SCHEDULE OF MAINTENANCE

To Maintain the Hutchinson-Egleson Drain Branch "A" from Station 0+000 to 8+366

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha.
<u>Agricultural Lands</u>								
21	Lot 7	1.21	70-044-10	H. Roellgen	-	28	28	0.42
	N 1/2 Lot 8	10.92	70-045	S. & C. Scott	-	250	250	3.82
	S 1/2 Lot 8 & N 1/2 Lot 9	30.34	70-046	H. Roellgen	160	591	751	9.03
	S 1/2 Lot 9	14.16	70-047	H. Roellgen	-	276	276	4.21
	Lot 10	16.18	70-048	H. Roellgen	-	334	334	5.10
22	S 1/2 Lot 6 & N 1/2 Lot 7	19.82	70-059	Marandy Farms Inc.	-	273	273	5.90
	S 1/2 Lot 7	20.23	70-058	A. Roelands	457	205	662	5.66
	Lot 8	34.40	70-056	C. & K. Eagleson	330	530	860	11.44
	Lot 9	18.21	70-056-10	Marandy Farms Inc.	-	279	279	4.78
	Lot 10	0.00	70-055	Deny's Farm Inc	-	-	-	0.00
23	Lot 5	4.04	70-083	S. & A. Steeper	-	41	41	1.41
	W 1/2 Lot 6	20.23	70-084	C. & B. MacGregor	290	179	469	7.08
	E 1/2 Lot 6	12.14	70-085-01	C. & B. MacGregor	-	123	123	4.25
	N 1/2 Lot 7	20.23	70-086	A. & B. Woodburn	161	180	341	6.23
	Pt. S 1/2 Lot 7	1.65	70-087	A. Woodburn	-	21	21	0.58
	S 1/2 Lot 7	16.15	70-087-01	B. Woodburn	314	176	490	5.65
	N 1/2 Lot 8	13.35	70-088	N. & L. Eagleson	-	169	169	4.67
	S 1/2 Lot 8	8.09	70-089	M. & M. Kazuk	-	102	102	2.83
24	S 1/2 Lot 4 & Lot 5	30.35	70-095	E. & J. Bullock	140	182	322	10.62
	Lot 6	32.37	70-094	E. & G. Bullock	610	178	788	9.63
25	N 1/2 Lot 4	10.11	70-104	Lagerwerf's Greenway Acres	-	29	29	3.54
	S 1/2 Lot 4 & N 1/2 Lot 5	40.47	70-105	R. Masschelein	328	116	444	13.88
	SW 1/4 Lot 5 & W 1/2 Lot 6	16.18	70-106	Dalgetta Farms Inc	618	62	680	5.66
	SE 1/4 Lot 5 & E 1/2 Lot 6	18.14	70-107-01	Lagerwerf's Greenway Acres	128	102	230	6.35
26	Lot 3	8.09	70-115	P. & A. Wiersma	97	16	113	2.83
	NW 3/4 Lot 4	30.35	70-114	J & D Mclinchey Farms Ltd	305	68	373	10.62
	SW 1/4 Lot 4 & N 1/2 Lot 5	28.32	70-113	R. & L. Masschelein	-	82	82	9.91
	S 1/2 Lot 5	8.09	70-112	J. & D. Mclinchey	-	24	24	2.83

Conc.	Lot or Part	Affected Hect.	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha.
27	Lot 3	35.04	70-120	W. Woodburn	672	24	696	11.77
	Lot 4	24.28	70-118	D. & B. McInchey	-	33	33	8.50
28	Lot 1	4.04	70-126	New Venice Corp Ltd	130	-	130	0.71
	Lot 2	16.19	70-127	M. & L. Eagleson	260	-	260	5.38
N. B	Pt. Lot 45	2.83	70-124	Hope Family Pork Ltd.	-	2	2	0.99
					5,000	4,675	9,675	
<u>Non-Agricultural Lands</u>								
22	Pt. N 1/2 Lot 7	1.42	70-057	T. & J. Scott	-	27	27	0.75
23	Pt. E 1/2 Lot 6	2.25	70-085	C. Lacey & E. Carter	-	34	34	1.18
24	Lot 7	5.48	70-093	Ausable Bayfield Conservation Authori	-	24	24	0.96
25	Pt E 1/2 Lot 6	2.09	70-107	M. McMEnamin	-	6	6	0.73
27	Pt. Lot 3	0.57	70-119	D. Hodgins & J. Scott	-	2	2	0.30
					-	93	93	
<u>Municipal Lands</u>								
Grand Bend Road		3.84	County of Middlesex		-	140	140	3.84
Unopened Road Allowance		1.20	Municipality of North-Middlesex		-	2	2	0.84
Hutchinson Road		1.21	Municipality of North-Middlesex		-	5	5	0.85
Bullock Road		1.82	Municipality of North-Middlesex		-	22	22	1.27
Adare Drive		4.86	Municipality of North-Middlesex		-	63	63	3.40
					-	232	232	
Total - Agricultural Lands					9,675			
Total - Non - Agricultural Lands					93			
Total - Municipal Lands					232			
Total Assessment					\$10,000			

Hutchinson-Eagleson Drain "A"
Municipality of North Middlesex
October 3, 2023

SPECIFICATION OF WORK

1. Location

The Hutchinson-Eagleson Drain is located from Lot 2, Concession 28 to Lot 8, Concession 21 in The Municipality of North Middlesex.

2. Scope of Work

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

- Proposed Works
 - Three New Culvert Installations (Culvert No. 4, 5 and 9)
 - Two Road Culvert Replacements (Culvert No. 3 and 7)
 - Culvert Removal at Station 7+735

- Future Works
 - Future Channel Works
 - Culvert Replacements

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 Municipality of North Middlesex 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. 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. The Traffic Plan must be approved by the Municipality prior to the commencement of any road closures.

- 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 Road 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.

7. Access and Working Area

Access to the work site for construction and future maintenance shall be from Hagnier Road, the Unopened Road Allowance via Greenway Road, Hutchinson Road, Bullock Road and Grand Bend Road. Access shall generally be restricted to a width of 6 metres.

Access for construction of the culverts shall be from the properties in which the culvert is being replaced or removed. Culvert No. 4 shall be through the property with Roll Number 70-114, Culvert No. 5 through the property with Roll Number 70-113, Culvert No. 9 through the property with Roll Number 70-084 and the removal of the culvert at Station 7+735 through the property with Roll Number 70-056. The location of the access shall generally be along laneways, fence lines or property lines.

The working area for the construction and future maintenance 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.

Access for culvert maintenance and channel repair on a single property shall be from the properties in which the culvert or channel is being repaired or maintained. If maintenance is being done on multiple properties access shall be gained from the nearest roadway and shall be along the length of the drainage works. 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. The working area for channel maintenance shall be restricted to a width of 10m from the side the excavation is taking place. The channel shall generally be excavated from the south side of the channel unless otherwise determined by the Drainage Superintendent. If, at the discretion of the Drainage Superintendent, there is erosion on the channel opposite the working area access may be gained along the channel and nearest culvert to maintain the bank.

8. 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.

9. Removals

The culvert and excavated material shall be removed in their entirety and shall be disposed offsite at the expense of the Contractor.

Where the culvert is being removed and not replaced the Contractor shall be responsible for repairing the channel. This shall include resloping the banks to match the adjacent (minimum 1.5:1), levelling the excavated material in the field, installation of straw matting and seeding the side slopes.

10. Brushing and Tree Removal

All brush, trees, vegetation, stumps etc. in order to facilitate the excavation of the open channel and culvert construction, as determined by the Drainage Superintendent or Engineer, shall be removed at the discretion of the Drainage Superintendent or Engineer and shall be included as part of this item.

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. 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.

11. Excavation of Open Channel

For future maintenance of the drain the open channel shall be excavated and maintained to the depths and grades as per the profile and drawings as contained in this Engineers Report. 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. This shall include the removal of any rocks larger than 10cm in diameter and any debris/wood that could damage or plug farm equipment. Leveling shall occur when the material is dry enough to do so as determined by the Drainage Superintendent

or Engineer. 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. All material unfit for placing on farmlands shall be disposed of offsite by the Contractor.

Where determined by the Drainage Superintendent, the banks are unstable the banks shall be re-sloped to 2:1.

12. Berm on Property with Roll Number 70-127 (FUTURE MAINTENACE)

When the drain is cleaned on the property with Roll Number 70-127 all of the excavated material shall be trucked to construct a berm on the south side of the channel at the discretion at the Drainage Superintendent. The berm shall be constructed where the banks are low from approximately Station 0+315 to 0+465 in order to reduce overtopping under severe storm events. The berm shall have a 0.50m top and shall have a minimum of 2:1 side slopes. The top of berm elevation shall be consistent. With the estimated quantities of sediment currently in the channel the berm elevation may reach 180.50m. The cost of trucking of the excavated material shall be assessed to the property with Roll Number 70-127, as per the report.

13. Installation of 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) with a minimum wall thickness of 2.8mm. Corrugated Steel Pipe Arches and culverts under roadways shall have a minimum wall thickness of 3.5mm. 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) smooth wall pipe (320 kPa) shall be CSA Approved with bell and spigot joints.

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 or Engineer. The culverts shall be installed with the invert 10% (minimum 150mm) below the original channel bottom elevation unless otherwise shown in order to achieve the minimum cover. It is the Contractors responsibility to ensure that

the minimum cover is achieved when backfilling the culverts. The minimum cover for CSP under Highway Loading shall be 1/6 of the span, and shall be no less than 300mm.

All culverts may have concrete block or rip rap end walls. The access culverts shall be assessed, as per the report, to provide an 8m access width. If an owner requests a longer culvert than that required to achieve an 8m top width, please refer to the report.

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.

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 Granular "B" Type II. Where no vehicular traffic is proposed to cross the culvert, the culvert may be backfilled with select native material. The top 150mm shall be backfilled with compacted 100% crushed granular "A" material to finished grade. In sections where no vehicular traffic is proposed to cross the culvert, the top 150mm shall be topsoil and seeded as per the restoration specification. 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.

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 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 pipe shall be backfilled above the clear stone with Granular "B" Type II.

Asphalt Road: The sub-base shall consist of a minimum of 300mm of OPS 100% crushed 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.

Gravel Road: The top 200mm shall be OPS Granular "M", produced from 100% crushed dolomite, and shall be mechanically compacted to 100% modified standard proctor density.

The length of culverts specified in the profile are based on utilizing rip rap end walls. If concrete block end walls are proposed the culvert shall be decreased in length accordingly (a 10m culvert with concrete block end walls will provide an 8m top width).

If rip rap end walls are used, they shall consist of 150mm x 300mm 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 (Mirafi P150 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.

If concrete block end walls are 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. 600mm x 600mm x 2400mm concrete blocks will be paid at twice the unit price established per block, all others will be at a unit of 1. 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. 2400mm wide concrete blocks shall be used as the top block on arch and larger round pipes in order to span between the culvert top and the supporting block. 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. Erosion protection shall be placed on the banks next to the end walls. The erosion protection shall consist of 150mm x 300mm quarry stone over filter fabric (Mirafi P150 or approved equal). It shall extend 500mm upstream or downstream and from top of bank to top of bank at each end wall.

The blocks shall be placed over a layer of filter fabric (Mirafi P150 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.

14. Seeding/Restoration

All grass areas disturbed by construction, shall be restored with 100mm of screened topsoil and hand seeded. The timing of the seeding shall be approved by the Drainage Superintendent or Engineer.

If the hand seed or hydroseed has not germinated, at the discretion of the Engineer or Drainage Superintendent, prior to the one-year maintenance period, 100mm of screened topsoil shall be placed on all grass areas disturbed by the construction, and shall be

hydroseeded in accordance with the seed mixture, fertilizer and application rate as shown below.

Seed mixture, fertilizer and application rates are as follows:

- Canada Wild Rye (*Elymus Canadensis*), Virginia Wild Rye (*Elymus virginicus*), or Indian grass (*Sorghastrum nutans*)
- Fertilizer (300 kg/ha.) consisting of 8-32-16.
- Hydraulic mulch (2,999 kg/ha.) type “B” and water (52,700 litres/ha.) in accordance with OPSS 572 (hydroseed).

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

15. Subsurface Drainage

All existing subsurface drains encountered during construction in 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 and to the concrete tile. 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.

The tile at Station 7+560 (Landowner believed it was a 200mm dia. tile but the size shall be verified by Contractor) shall have 8 tonne of rip rap installed. The rip rap shall consist of 150mm x 300mm quarry stone or approved equal and shall extend from the toe of slope to the top of bank. The area to receive the rip rap shall be graded to a depth of 400mm below finished grade. Filter fabric (Mirafi P150 or approved equal) shall then be placed with any joints overlapped a minimum 600mm. The rip rap shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

16. Environmental Considerations

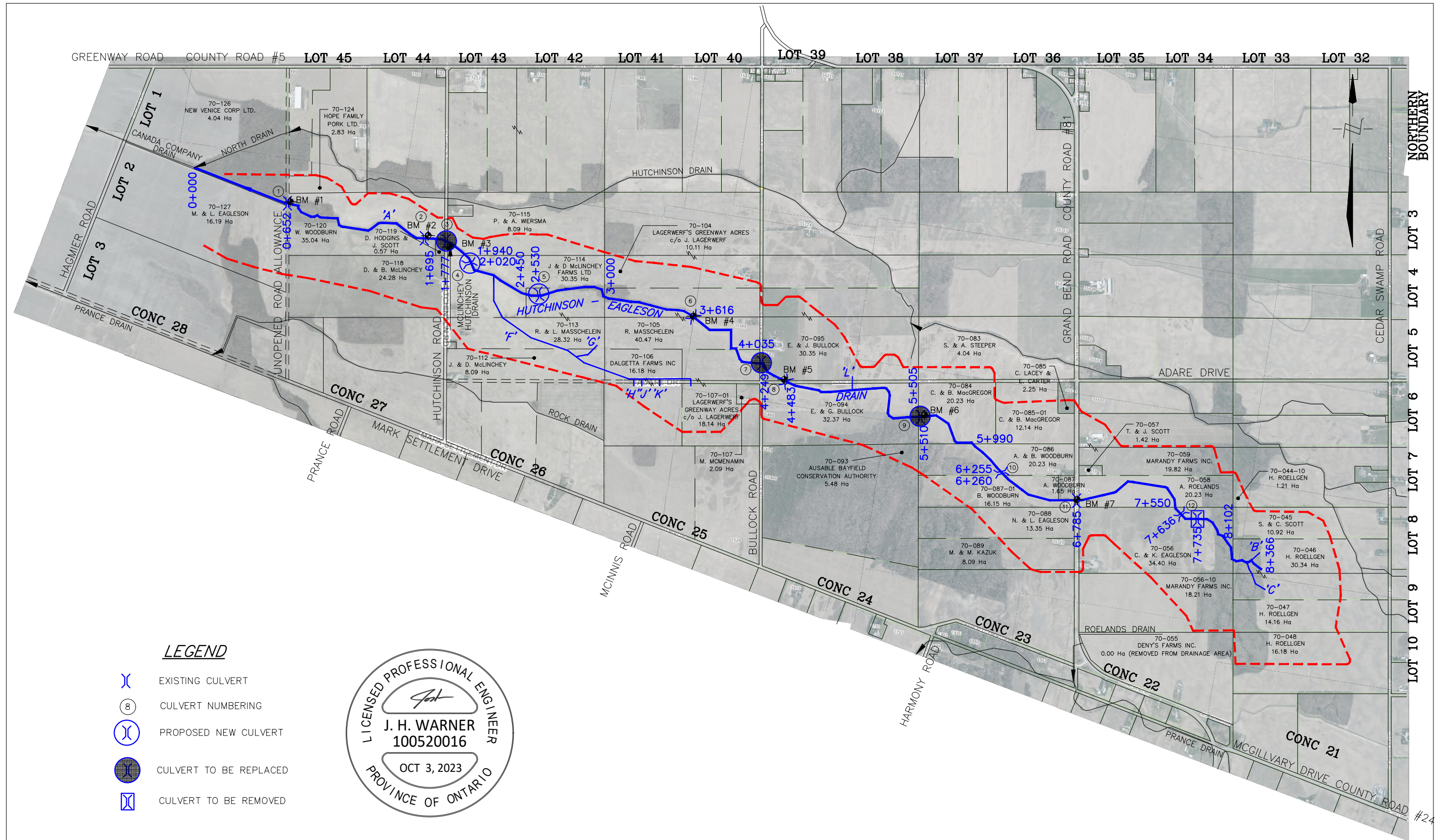
The Contractor shall take care to adhere to the following considerations.

- Operate machinery in a manner that minimizes disturbance to the banks of the watercourse.
- Erosion and sediment control measures must be installed prior to construction to prevent sediment from entering the water body.
- Material shall not be 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 577 and OPSD 219.110. The light duty silt fencing shall be removed once construction is complete.



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

DRAWING NAME:
 Hutchinson - Eagleson Drain "A" Plan

PROJECT No.
 2022-1474

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	OCT. 3, 2023	CS
DRAWN C. SAUNDERS	SCALE: 1:25,000 0 250 500 750m			

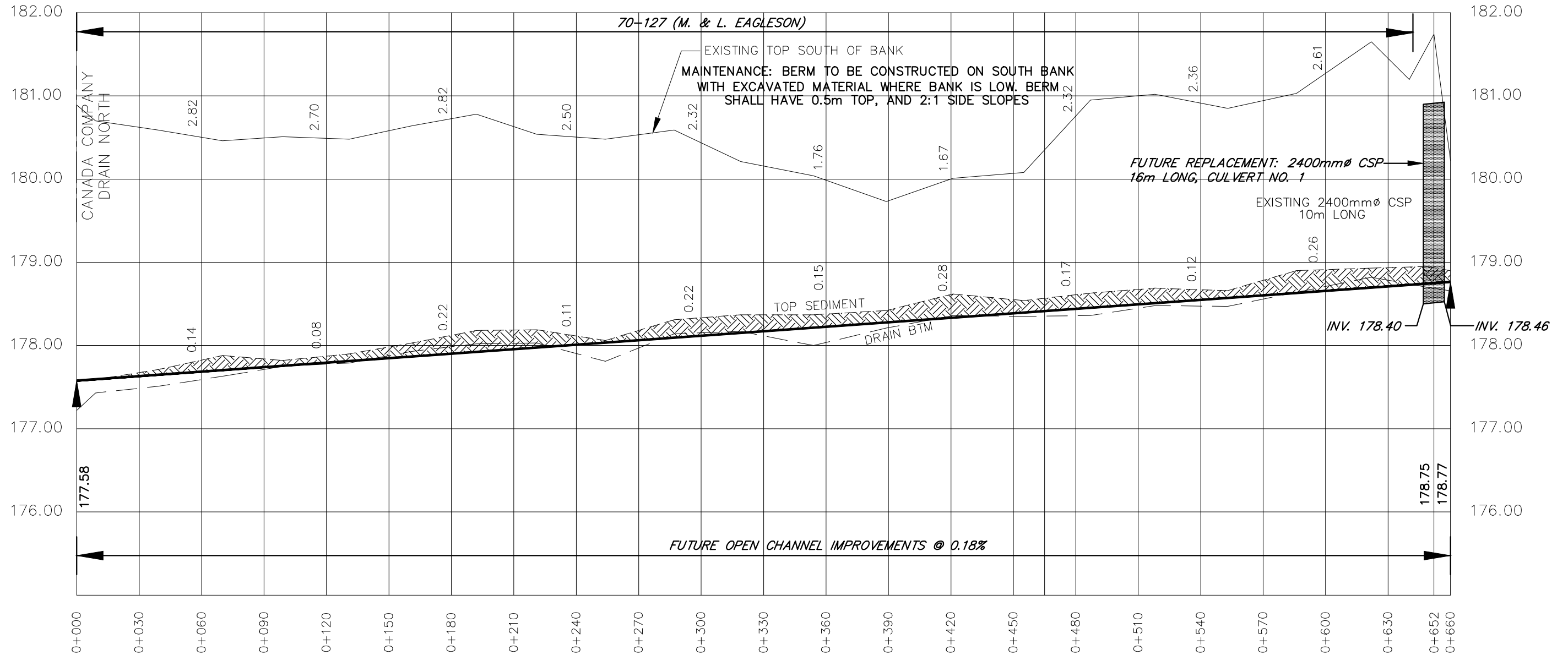
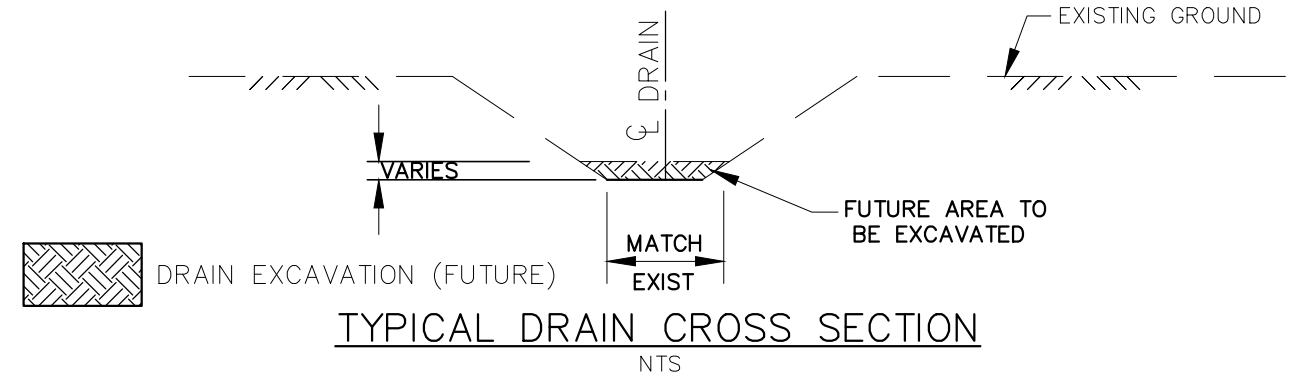
MUNICIPALITY of NORTH MIDDLESEX

HUTCHINSON - EAGLESON DRAIN "A"

PLAN

GENERAL NOTES

1. BENCHMARK No.1 ELEV. 179.83
TOP OF 250mmØ HDPE PIPE FROM SOUTH, STATION 0+661
2. UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.
2. LOWER NUMBERS ARE DEPTH OF FUTURE EXCAVATION



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 1

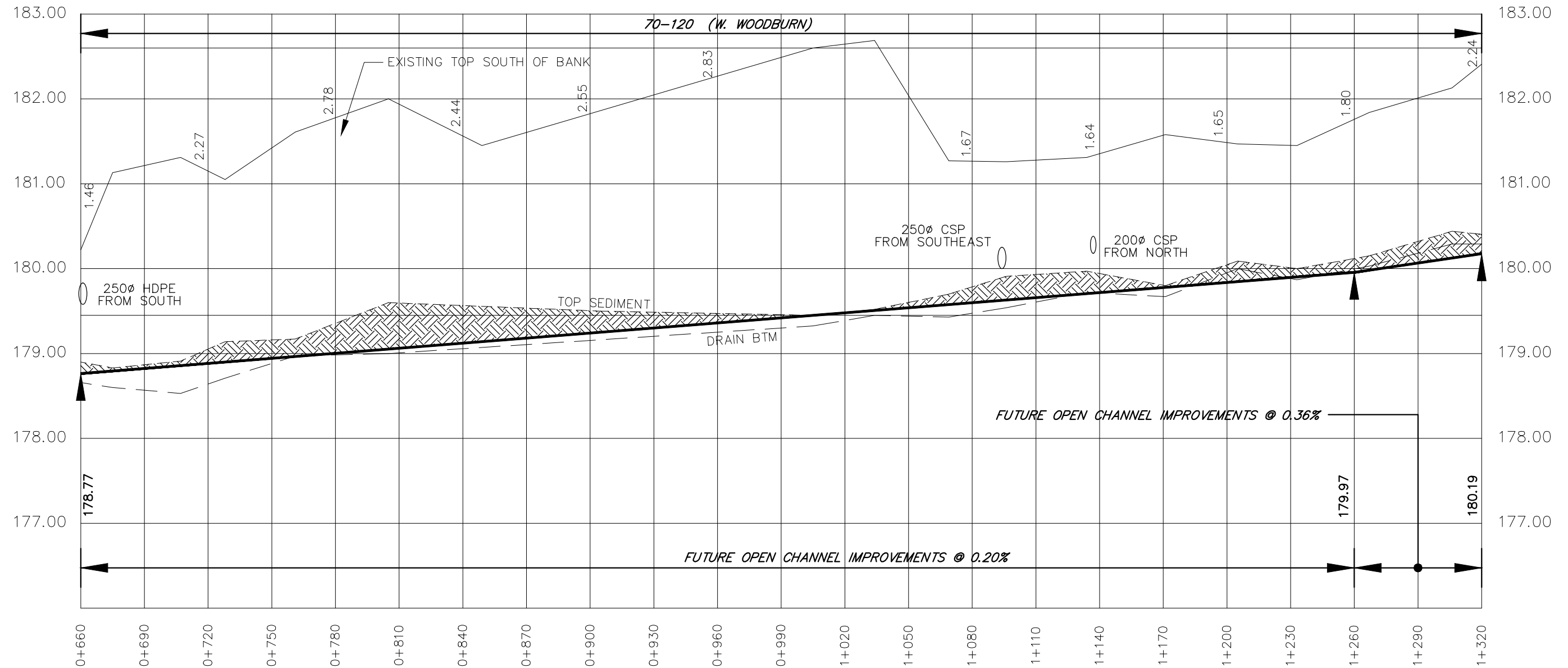
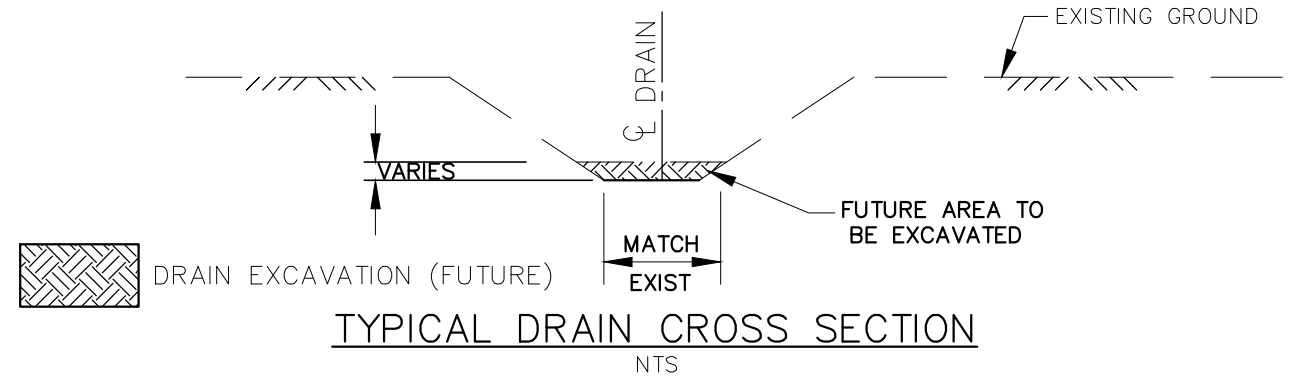
PROJECT No.
2022-1474

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN	SCALE: 1:2,000			
C. SAUNDERS	0 20 40 60m			

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

GENERAL NOTES

- BENCHMARK No.1 ELEV. 179.83
TOP OF 250mmØ HDPE PIPE FROM SOUTH, STATION 0+661
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 2

PROJECT No.
2022-1474

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J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

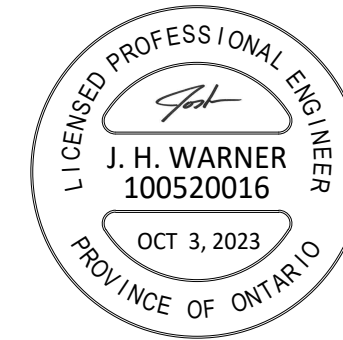
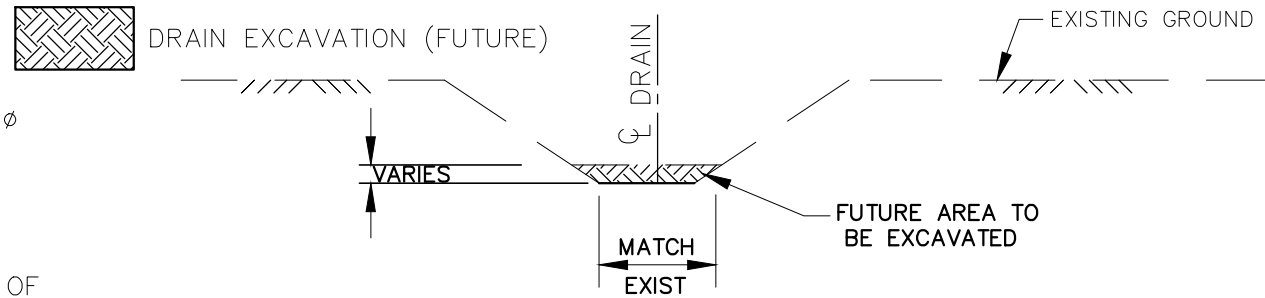
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MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

3
of 15

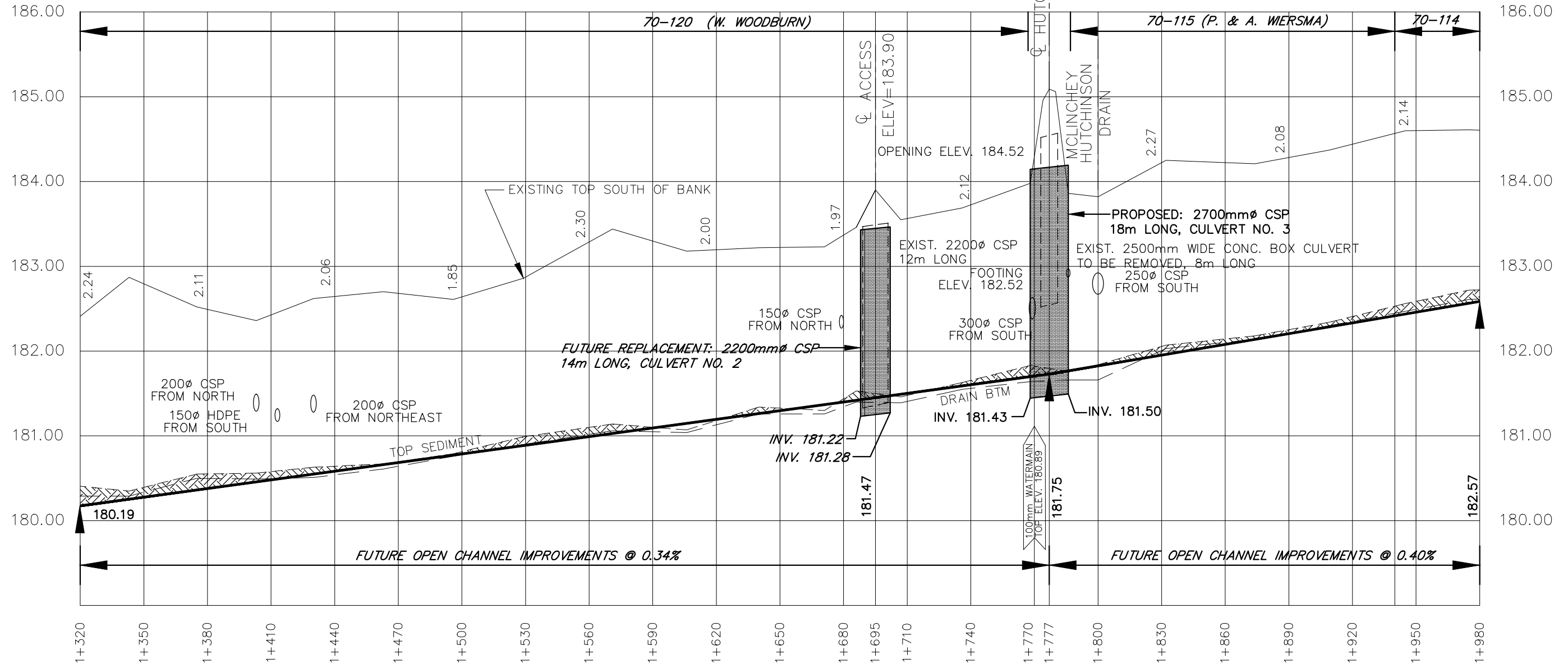
GENERAL NOTES

- BENCHMARK No.2 ELEV. 183.51
TOP OF EAST END OF EXISTING 2200mm ϕ CSP, STATION 1+695.
BENCHMARK No.3 ELEV. 184.20
TOP OF NAIL IN UTILITY POLE ON EAST SIDE OF HUTCHINSON ROAD.
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



TYPICAL DRAIN CROSS SECTION

NTS



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 3

PROJECT No.
2022-1474

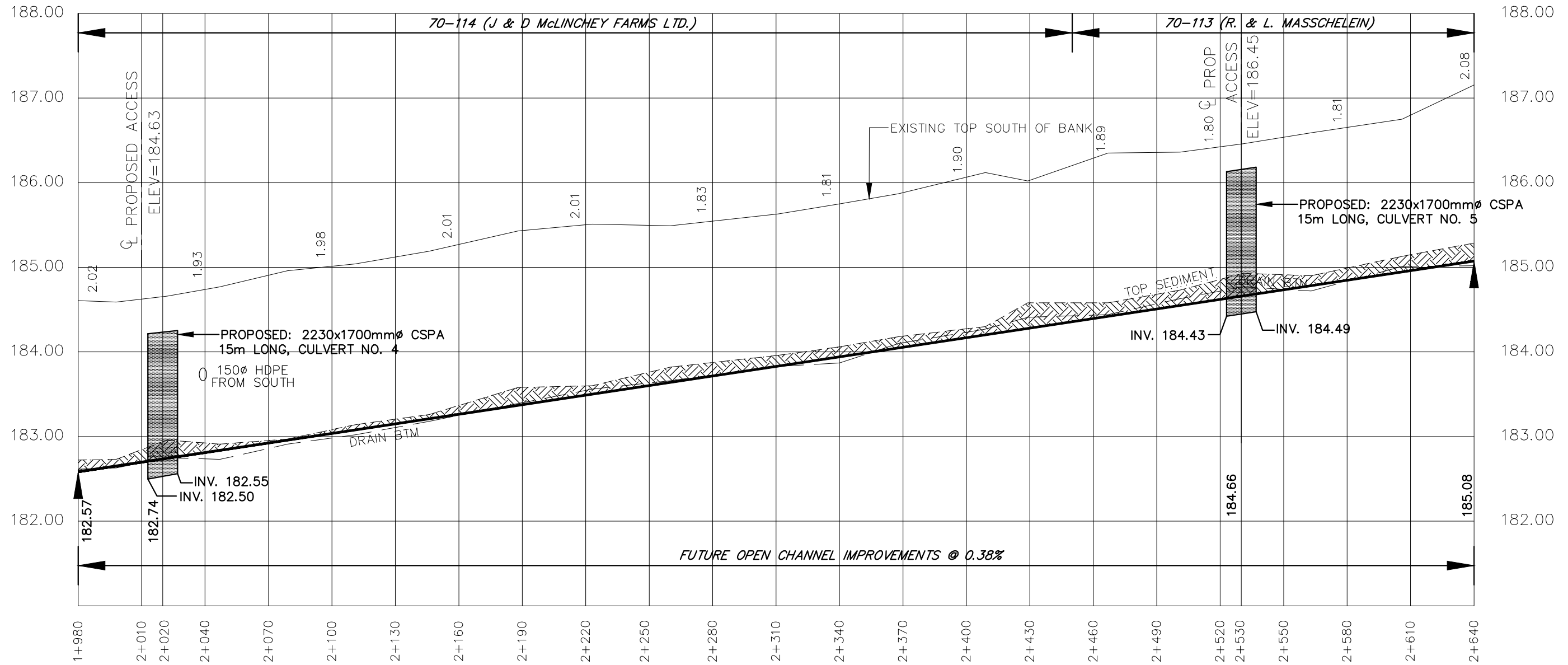
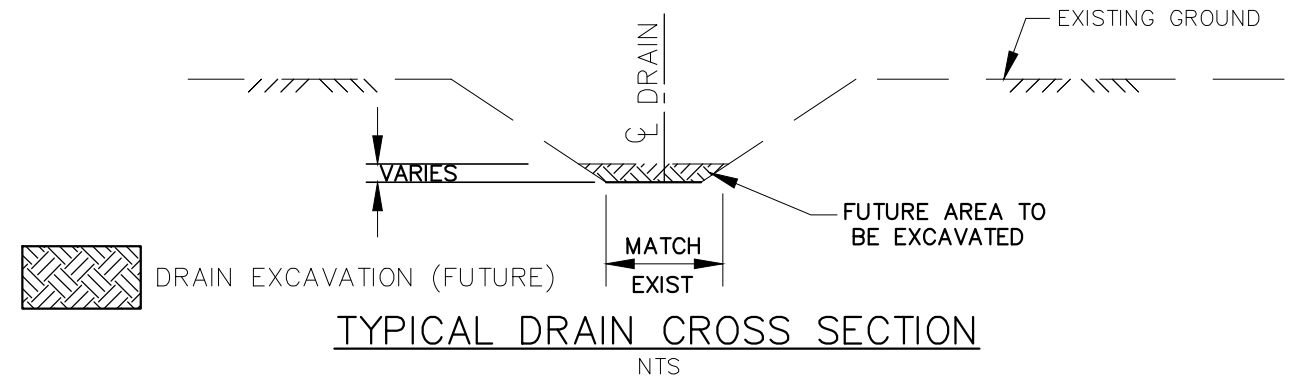
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

SCALE: 1:2,000
0 20 40 60m

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

GENERAL NOTES

- BENCHMARK No.3 ELEV. 184.20
TOP OF NAIL IN UTILITY POLE ON EAST SIDE OF HUTCHINSON ROAD.
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 4

PROJECT No.
2022-1474

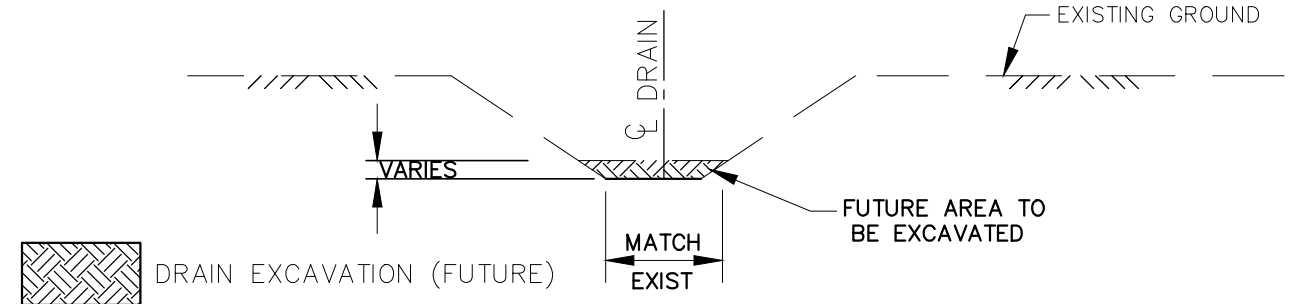
APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	OCT. 3, 2023	CS
DRAWN C. SAUNDERS	SCALE: 1:2,000			
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MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

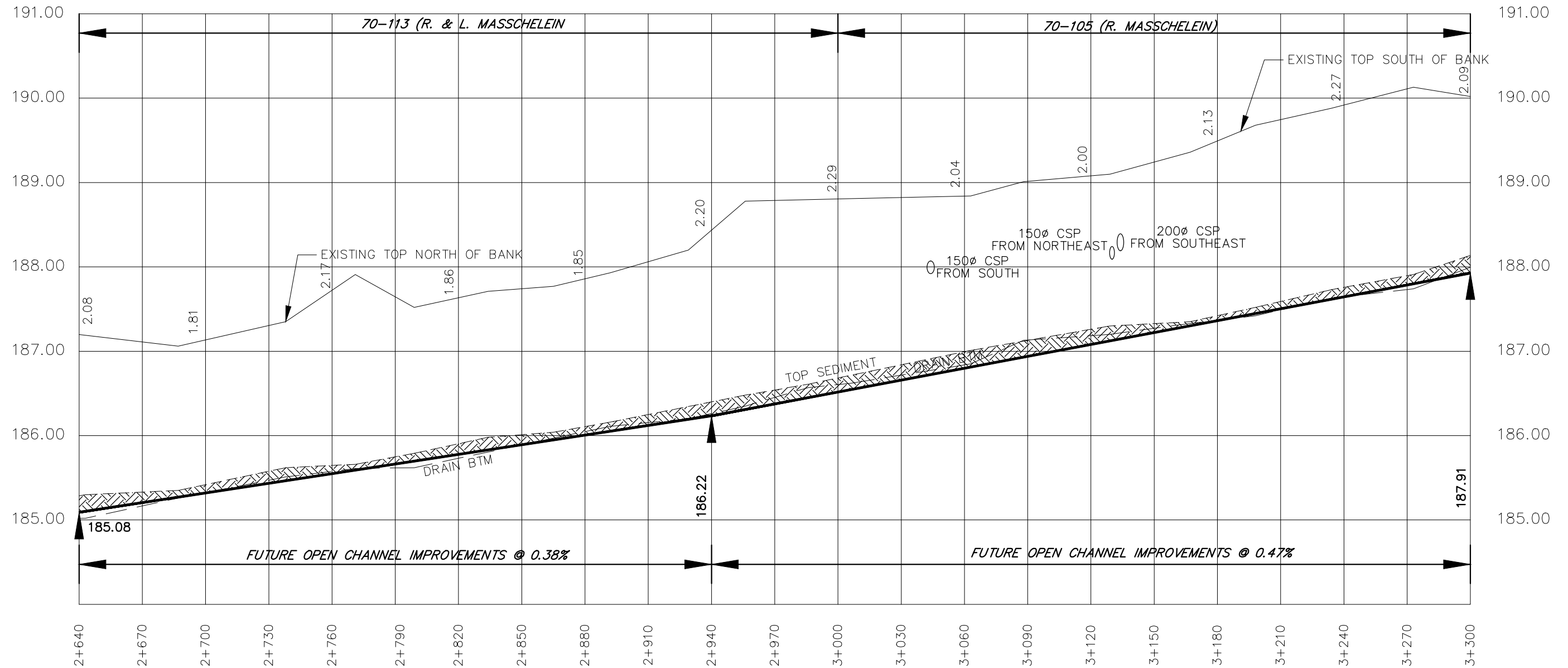
Last Updated: October 3, 2023

GENERAL NOTES

- BENCHMARK No.3 ELEV. 184.20
TOP OF NAIL IN UTILITY POLE ON EAST SIDE OF HUTCHINSON ROAD.
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



TYPICAL DRAIN CROSS SECTION
NTS



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 5

PROJECT No.
2022-1474

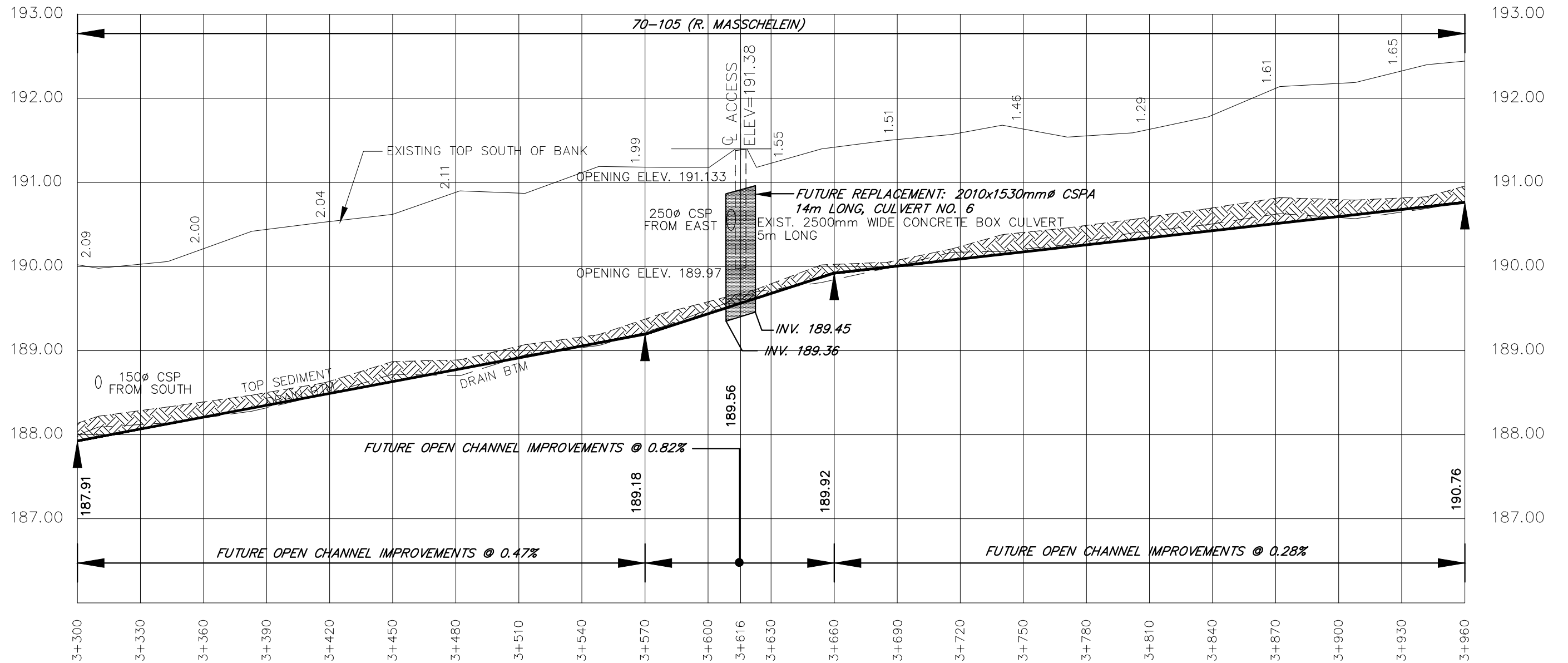
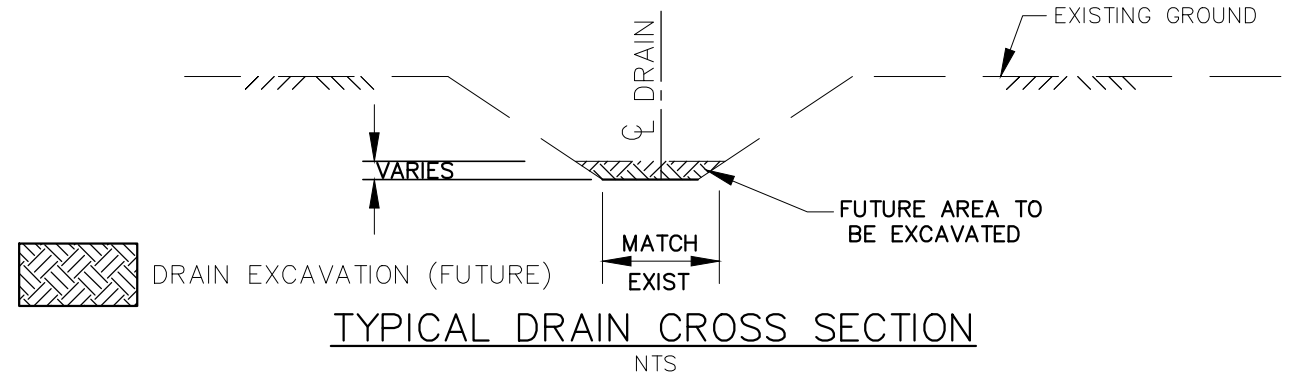
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

SCALE: 1:2,000
0 20 40 60m

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

GENERAL NOTES

- BENCHMARK No.4 ELEV. 191.38
TOP OF CENTERLINE OF CONCRETE BOX
AT STATION 3+616.
- UPPER NUMBERS ARE DEPTH FROM TOP OF
BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 6

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2022-1474

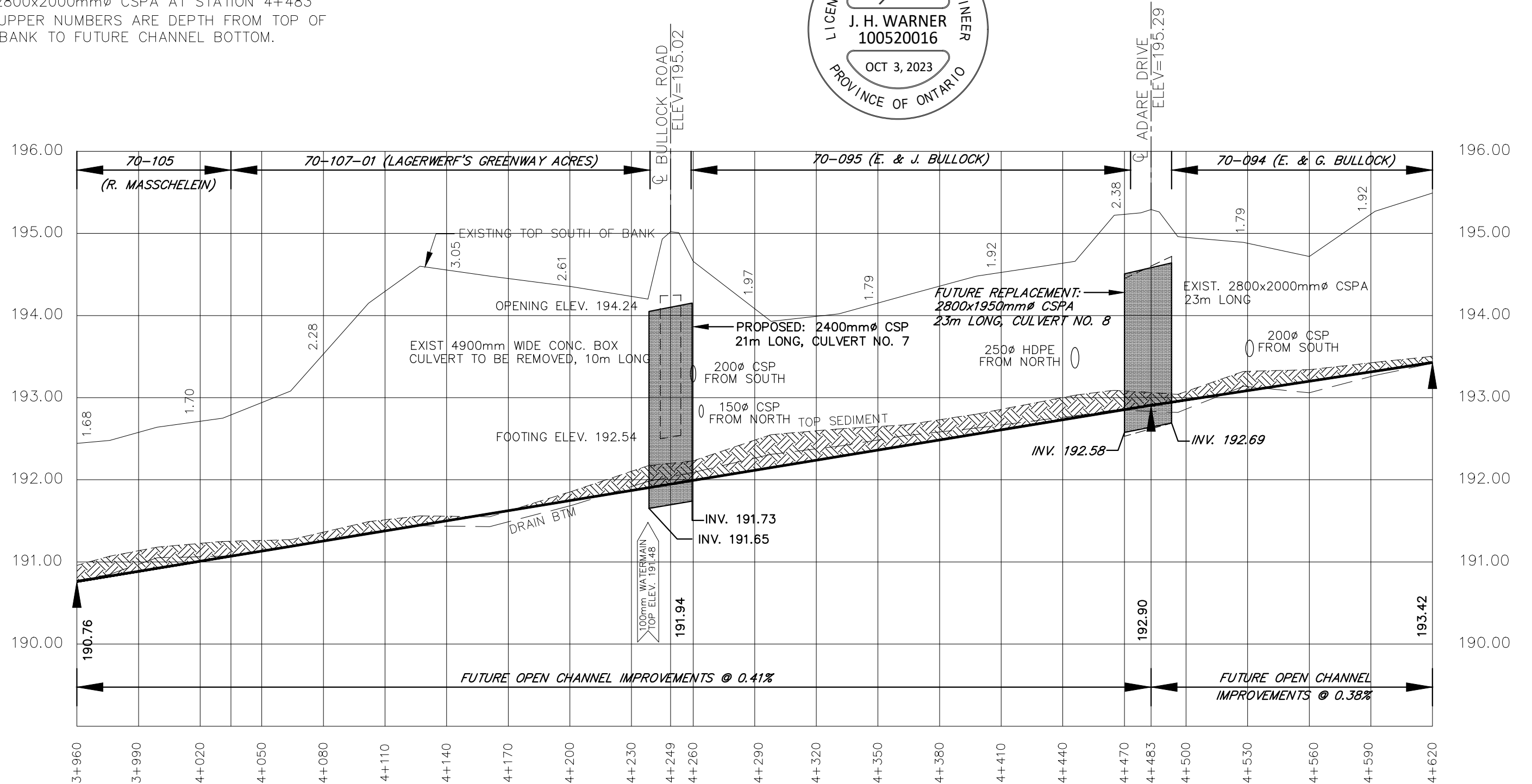
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

SCALE: 1:2,000
0 20 40 60m

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

GENERAL NOTES

- BENCHMARK No.5 ELEV. 194.45
TOP OF NORTHWEST END OF EXISTING
2800x2000mm ϕ CSPA AT STATION 4+483
- UPPER NUMBERS ARE DEPTH FROM TOP OF
BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 7

PROJECT No.
2022-1474

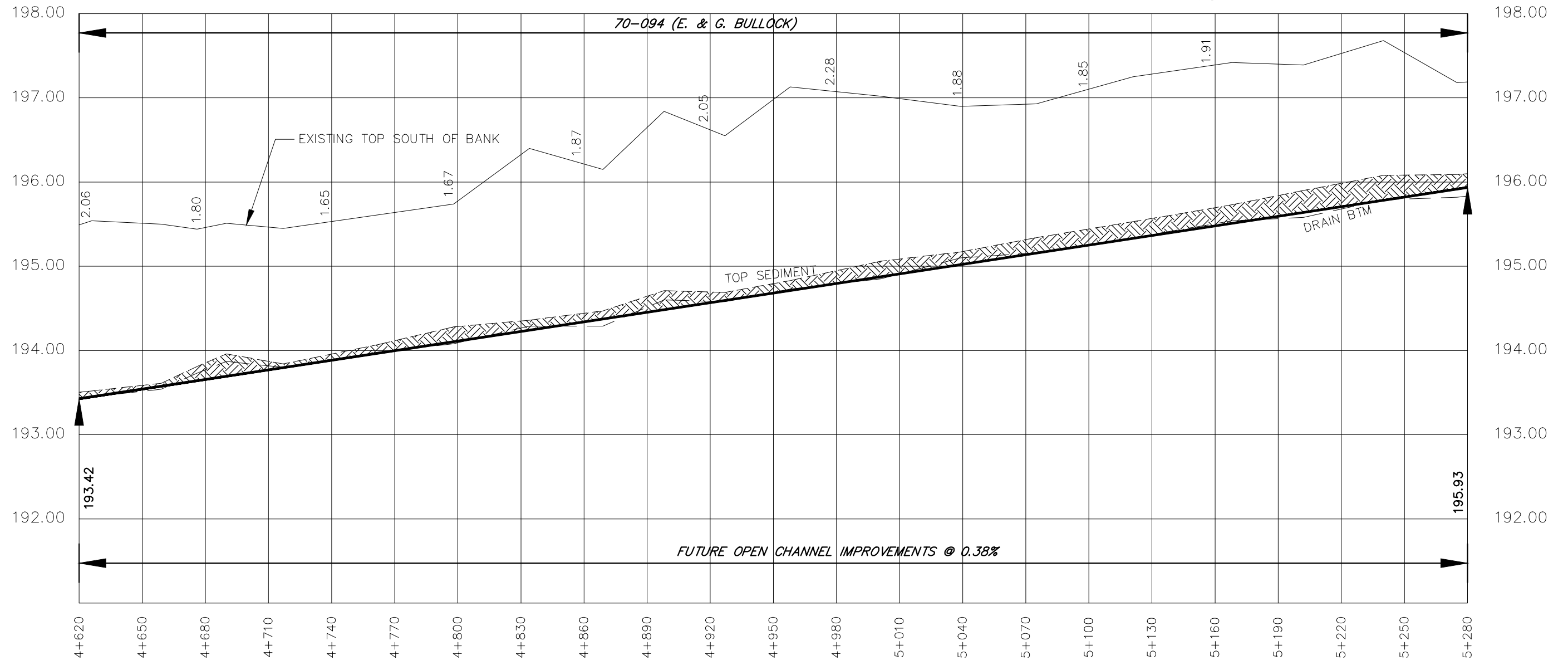
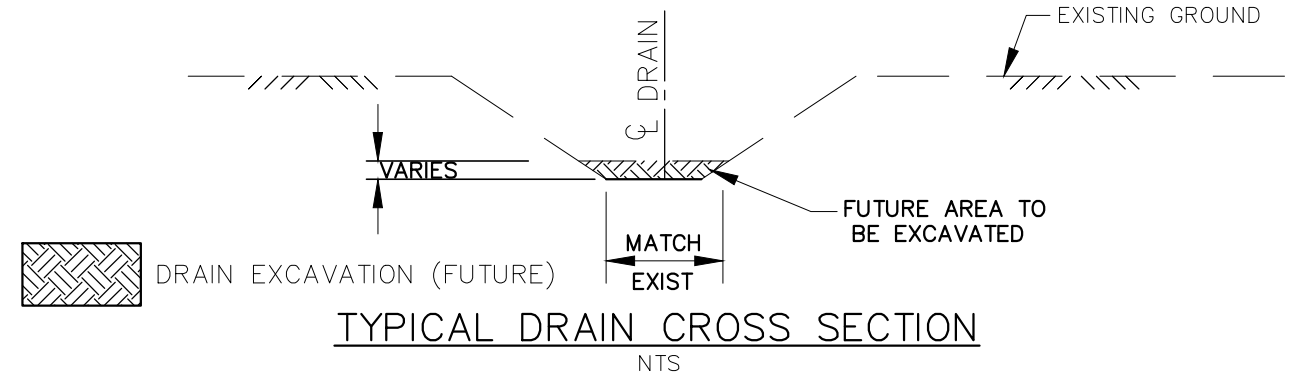
APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

SCALE: 1:2,000
0 20 40 60m

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

GENERAL NOTES

- BENCHMARK No.5 ELEV. 194.45
TOP OF NORTHWEST END OF EXISTING
2800x2000mmØ CSPA AT STATION 4+483
- UPPER NUMBERS ARE DEPTH FROM TOP OF
BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 8

PROJECT No.
2022-1474

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J. WARNER				
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B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

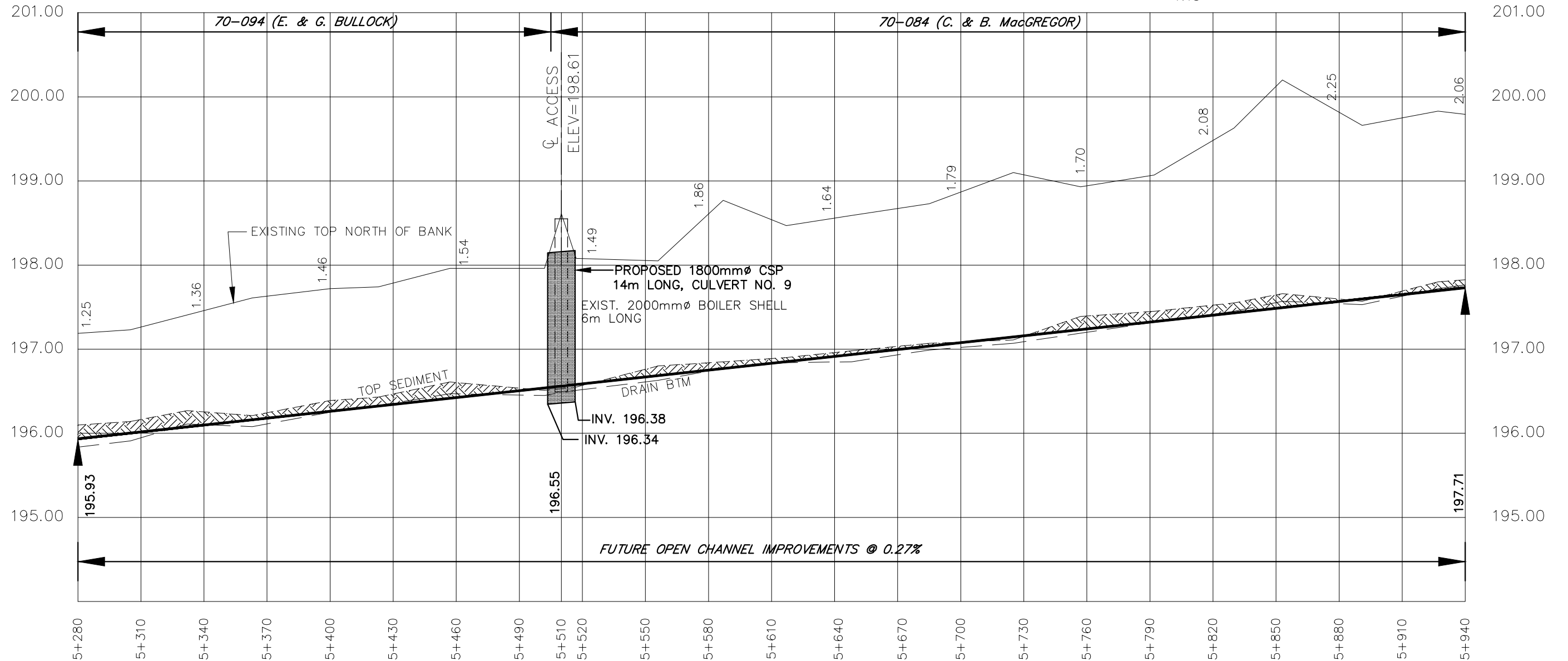
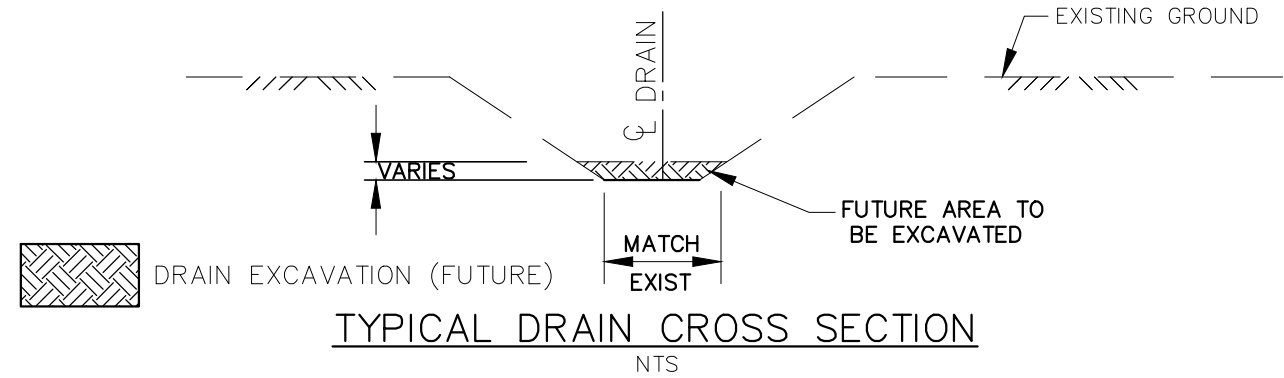
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MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

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GENERAL NOTES

- BENCHMARK No.6 ELEV. 198.55
TOP OF EAST END OF EXISTING 2000mmØ BOILER SHELL AT STATION 5+510.
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 9

PROJECT No.
2022-1474

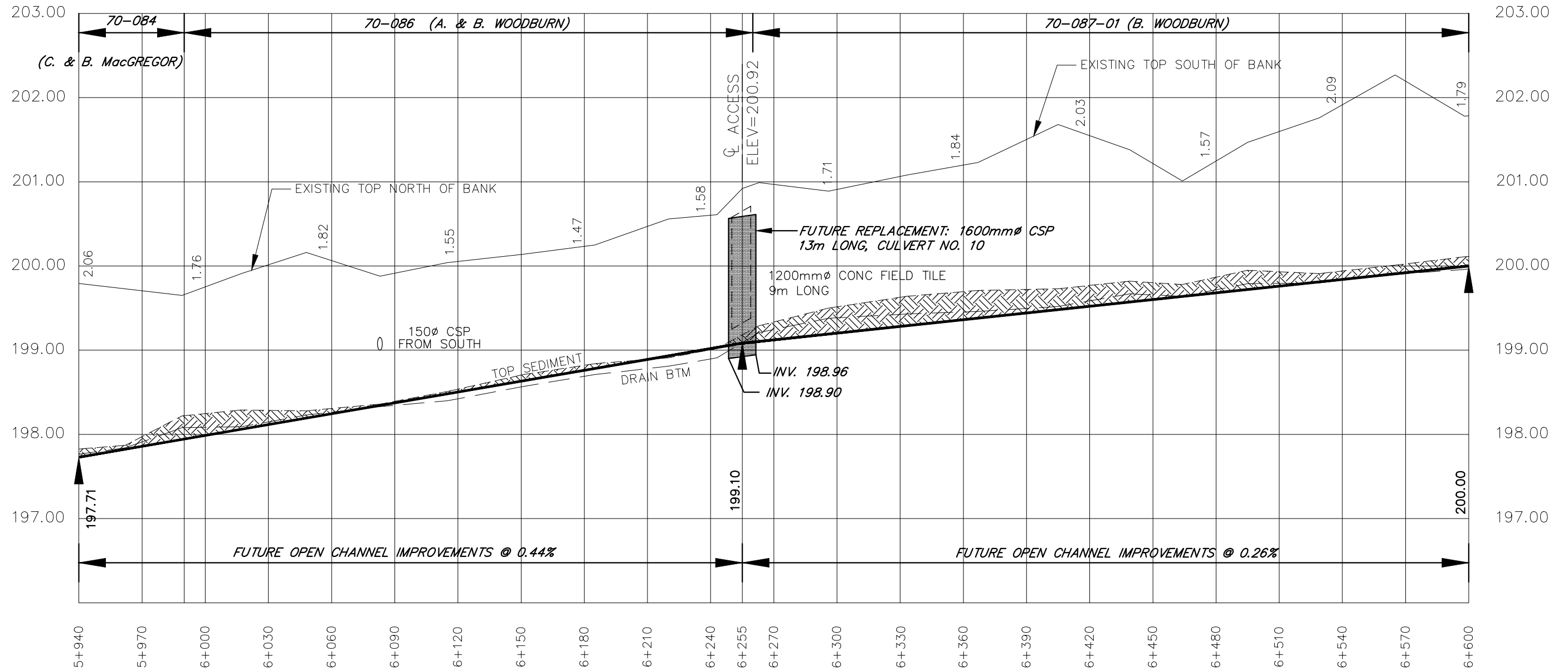
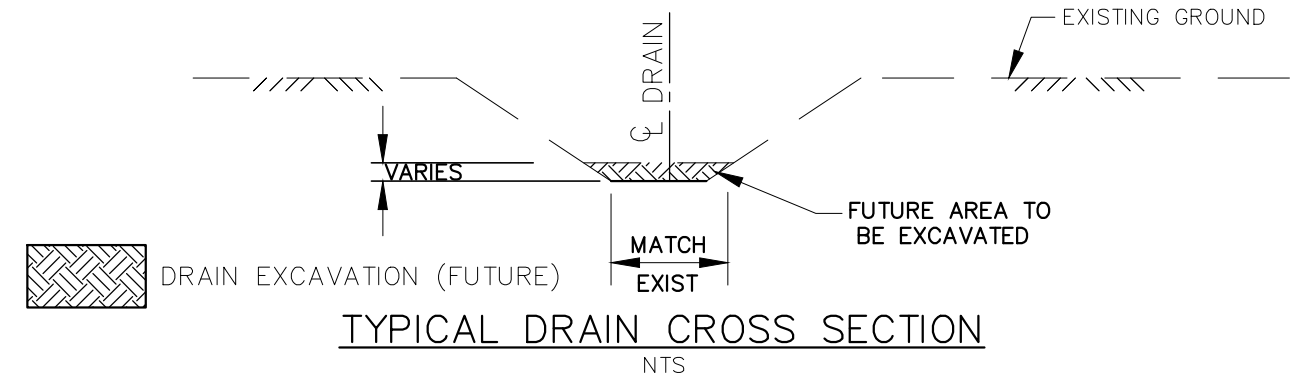
APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	OCT. 3, 2023	CS
DRAWN C. SAUNDERS	SCALE: 1:2,000 0 20 40 60m			

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

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of 15

GENERAL NOTES

- BENCHMARK No.6 ELEV. 198.55
TOP OF EAST END OF EXISTING 2000mm ϕ BOILER SHELL AT STATION 5+510.
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 10

PROJECT No.
2022-1474

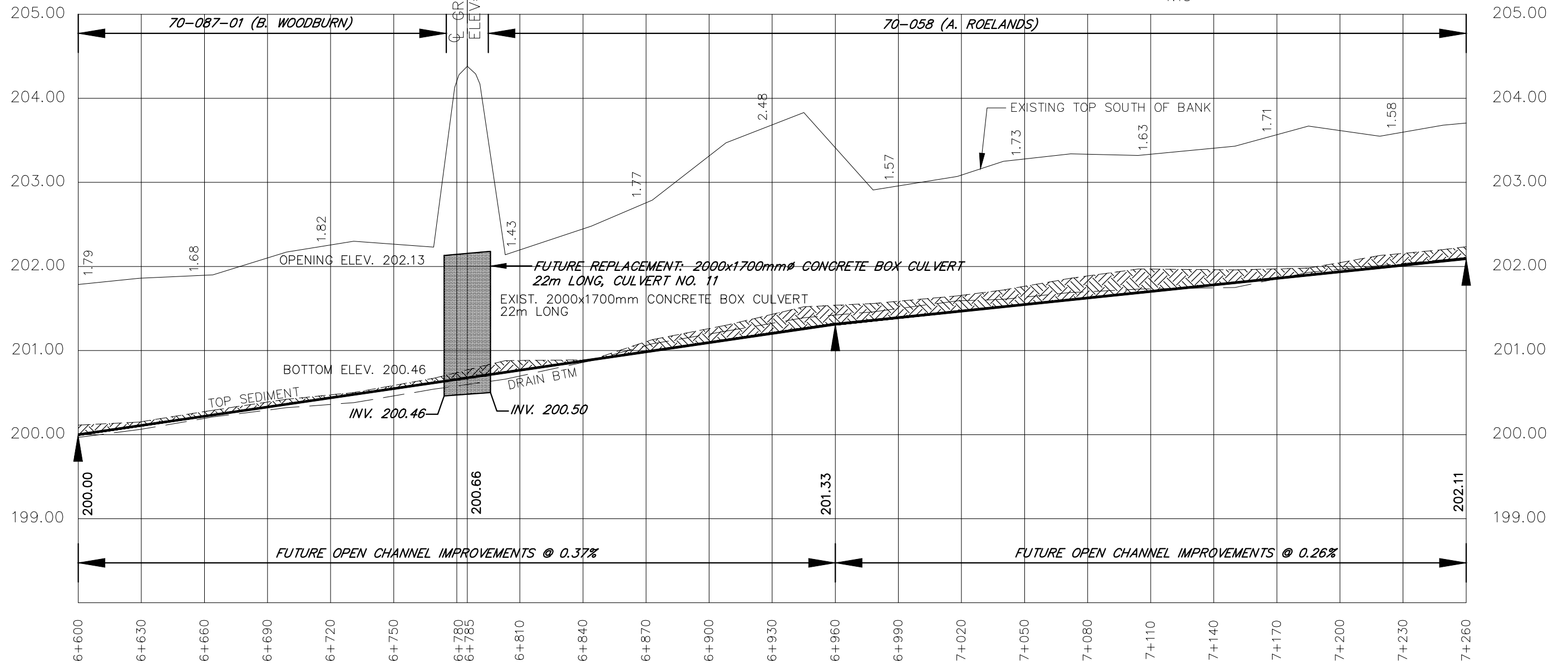
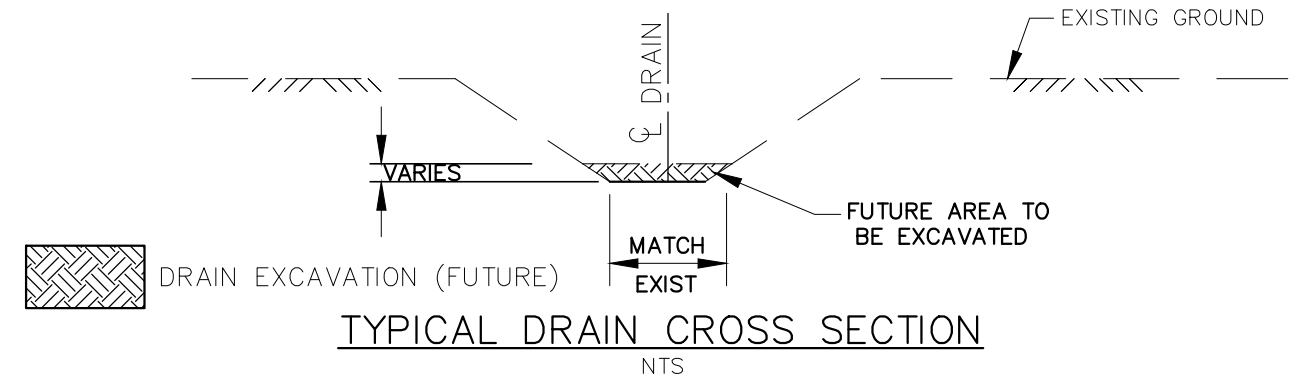
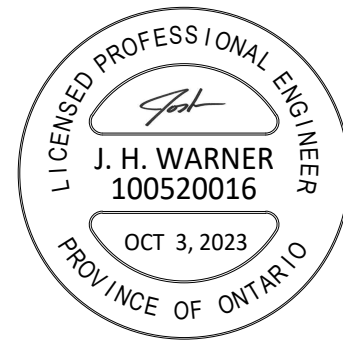
APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
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DRAWN C. SAUNDERS	SCALE: 1:2,000			

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

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of 15

GENERAL NOTES

1. BENCHMARK No.7 ELEV. 204.38
CENTERLINE OF GRANDBEND ROAD AT THE HUTCHINSON-EAGLESON DRAIN
2. UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 11

PROJECT No.
2022-1474

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

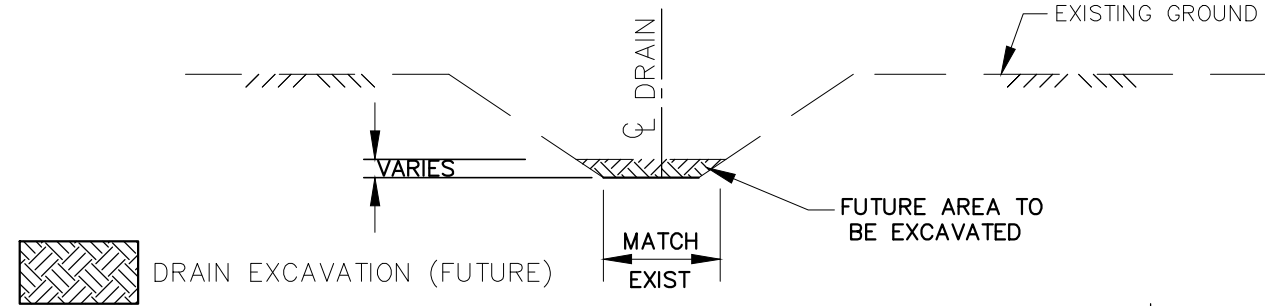
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MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

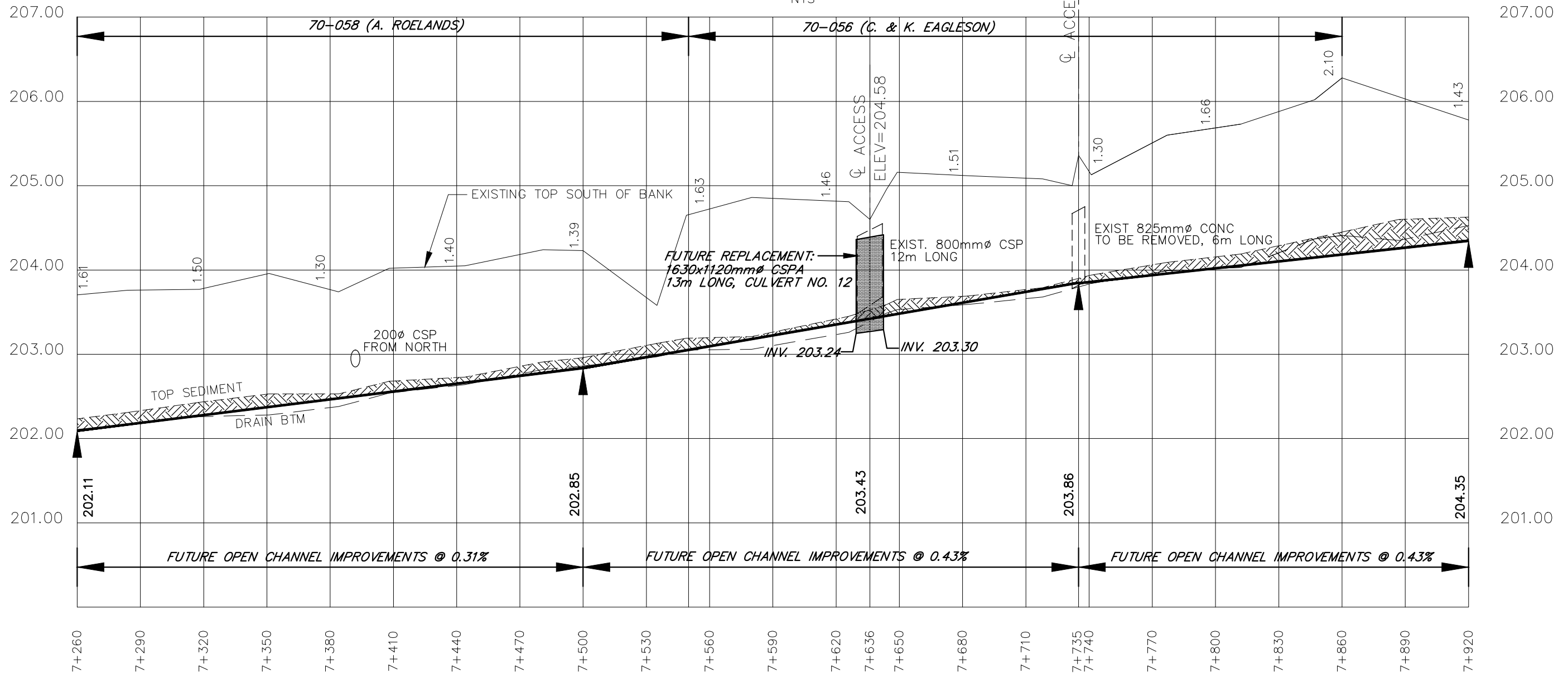
12
of 15

GENERAL NOTES

- BENCHMARK No.7 ELEV. 204.38
CENTERLINE OF GRANDBEND ROAD AT THE HUTCHINSON-EAGLESON DRAIN
- UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



TYPICAL DRAIN CROSS SECTION
NTS



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 12

PROJECT No.
2022-1474

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	OCT. 3, 2023	CS
B. VAN RUITENBURG				
DRAWN				
C. SAUNDERS				

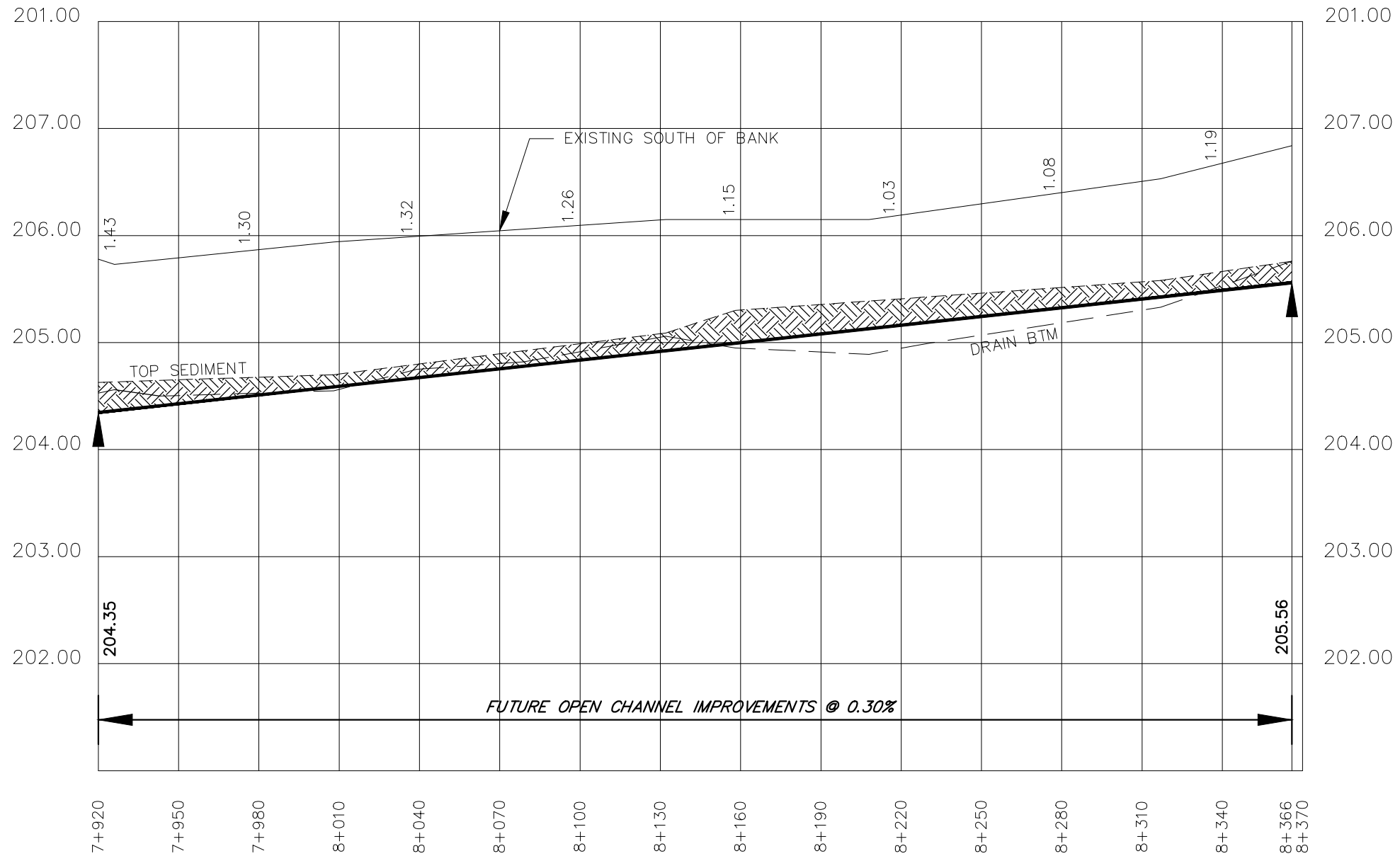
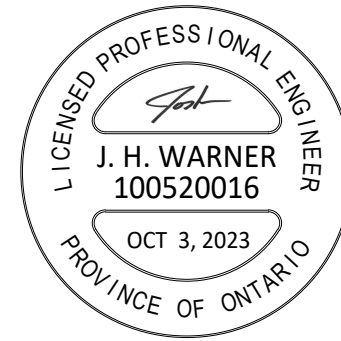
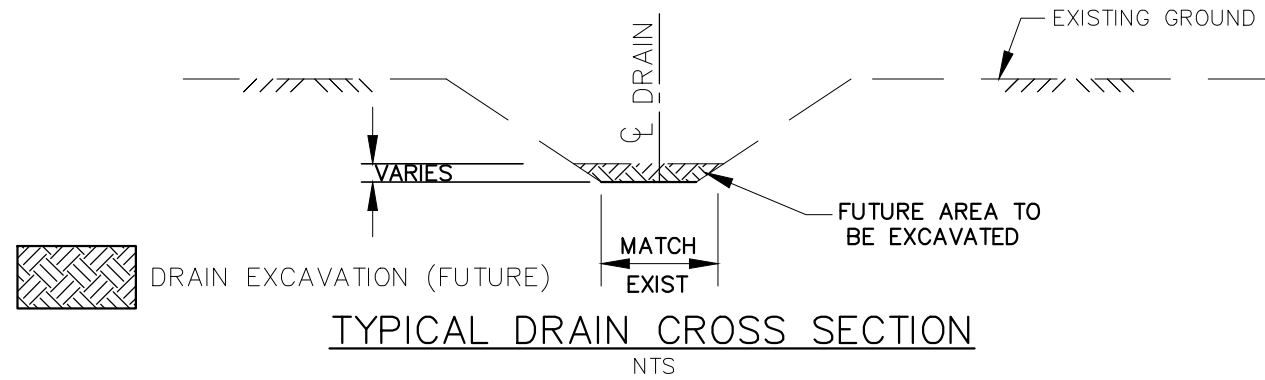
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MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

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of 15

GENERAL NOTES

1. BENCHMARK No.7 ELEV. 204.38
CENTERLINE OF GRANDBEND ROAD AT THE HUTCHINSON-EAGLESON DRAIN
2. UPPER NUMBERS ARE DEPTH FROM TOP OF BANK TO FUTURE CHANNEL BOTTOM.



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DRAWING NAME:
Hutchinson - Eagleson Drain "A" Profile 13

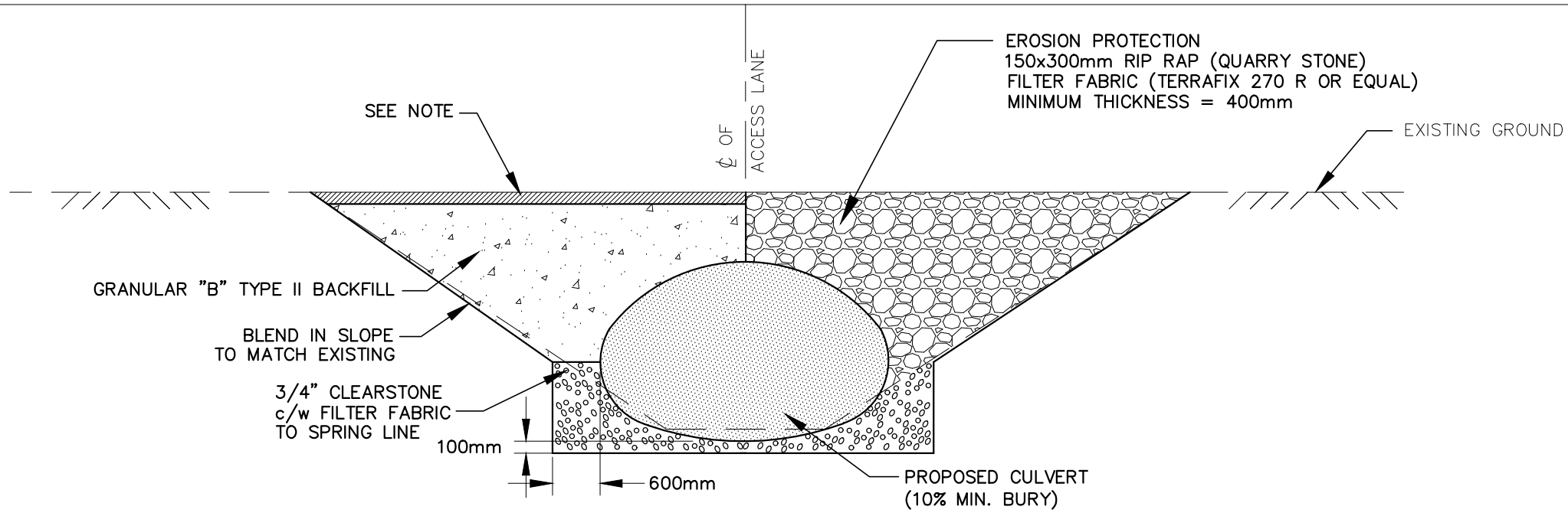
PROJECT No.
2022-1474

APPROVED J. WARNER	NO.	REVISIONS	DATE	BY
CHECKED B. VAN RUITENBURG	1	FINAL REPORT	OCT. 3, 2023	CS
DRAWN C. SAUNDERS	SCALE: 1:2,000 0 20 40 60m			

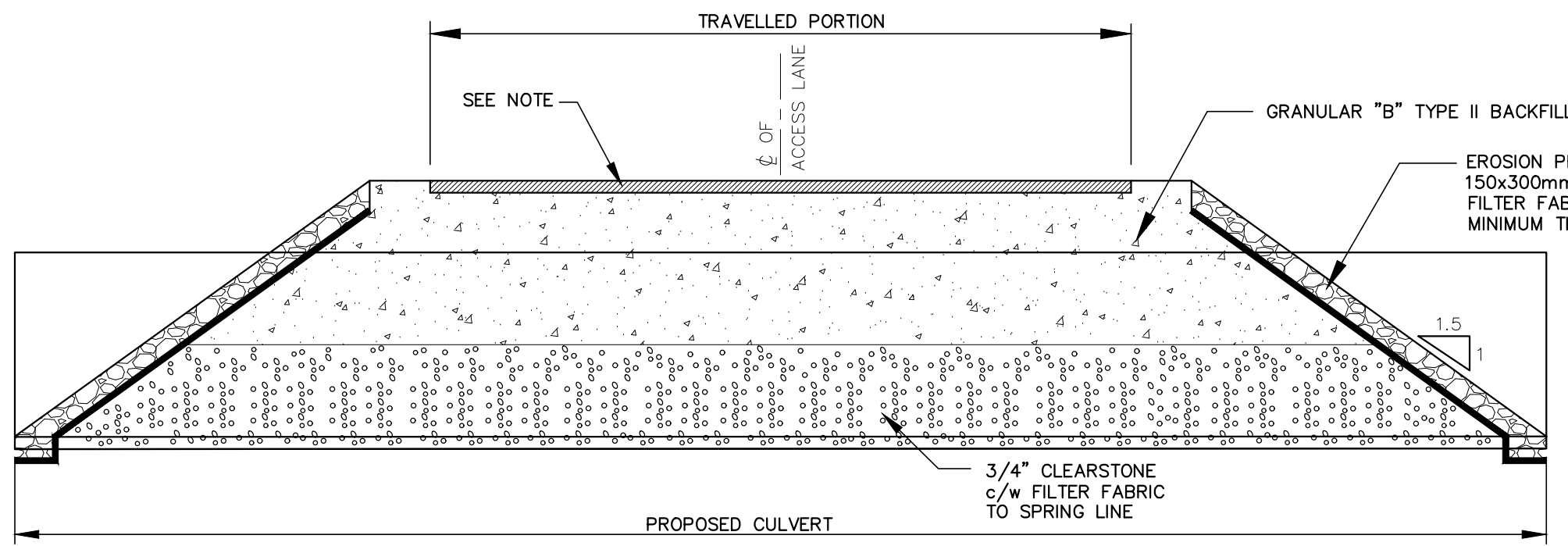
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HUTCHINSON - EAGLESON DRAIN "A"
PROFILE

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Last Updated: October 3, 2023

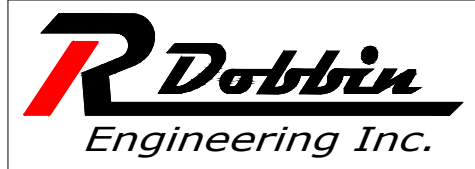


PROPOSED PIPE END SECTION



PROPOSED CROSS-SECTION

- NOTES:**
- ALL BACKFILL COMPACTED TO 95% MODIFIED PROCTOR DENSITY
 - CONTRACTOR SHALL ENSURE MINIMUM COVER IS MET PRIOR TO CROSSING
 - ASPHALT ROAD**
 - HL3 AND HL4 TO MATCH EXISTING THICKNESS
 - 300mm OF 100% CRUSHED GRAN "A" EXTENDING TO SHOULDER
 - GRAVEL ROAD**
 - 200mm OF OPS GRANULAR "M" (CRUSHED DOLOMITE SOURCE) TO MATCH EXISTING ROAD WIDTH
 - ACCESS CULVERT**
 - 150mm OF 100% CRUSHED GRANULAR "A"



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J. WARNER				
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B. VAN RUITENBURG				
DRAWN	SCALE 1:75			
J. WARNER	0 2m			

MUNICIPALITY of NORTH MIDDLESEX
HUTCHINSON - EAGLESON DRAIN
TYPICAL CULVERT DETAIL