ENGINEERING REPORT

For

HAMILTON DRAIN 2025

Township of Huron-Kinloss

Bruce County

Date: April 1, 2025

File No.11-089

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS & PLANNERS

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Definitions:

“Act” means The Drainage Act R.S.O. 1990
“CSP” means corrugated steel pipe
“*Drainage Guide*” means *A Guide for Engineers working under the Drainage Act in Ontario,* (OMAFRA Publication 852, 2018)
“DFO” means Fisheries and Oceans Canada
“Drain” means Hamilton Drain 2025
“Grant” means provincial grant as per Section 85 of the Act
“Grant Policy” means OMAFA Agricultural Drainage Infrastructure Program Administrative Policies
“HDPE” means high-density polyethylene
“MECP” means Ministry of Environment, Conservation and Parks
“MNRF” means Ministry of Natural Resources and Forestry
“Municipal Drain” means a drainage works constructed under the Act
“Municipality” means Township of Huron-Kinloss
“OMAFA” means the Ontario Ministry of Agriculture, Food and Agribusiness
“Tribunal” or “Drainage Tribunal” means Agriculture, Food and Rural Affairs Appeal Tribunal
“ø” means diameter

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HAMILTON DRAIN 2025

TOWNSHIP OF HURON-KINLOSS

1 EXECUTIVE SUMMARY

This report is prepared pursuant to Section 78 and Section 4 of the Drainage Act R.S.O. 1990.

In 2011, the owner of Roll No. 001-00400 requested improvement of the Hamilton Drain in Lots 8 and 9, Concession 1, geographic Township of Huron, due to ditch bank instability concerns. Pursuant to Section 8 of the Act, on May 18, 2011, K. Smart Associates Limited was appointed by resolution of Council to prepare a Section 78 report on the Hamilton Drain.

In 2013, the Municipality received a Section 4 petition from the owners of Roll No. 001-00300 to secure an outlet for Lots 6 and 7, Concession 1 by means of a tile drain across Lot 8, connecting to the existing Hamilton Drain ditch. Pursuant to Section 8 of the Act, on July 17, 2013, K. Smart Associates Limited was appointed by resolution of Council to address the Section 4 petition by incorporating the necessary drainage works into the ongoing Section 78 report.

Based on our investigation and landowner meetings, this report recommends:

Hamilton Drain A

- Incorporate approximately 325m of the existing flow path downstream of the historic Hamilton Drain outlet.
- Construct a 100m long x 0.5m deep permanent sediment trap
- Complete approximately 1,280m of ditch cleanout and improvements
- Complete washout repairs and bank stabilization in four specific locations
- Incorporate an existing 1,800mmø field crossing

Hamilton Drain F

- Incorporate 200m of twinned 150mmø plastic tubing and catchbasin

Towle Branch

- Improved design grade and 531m of ditch cleanout for existing open drain

The estimated cost of this project is $192,000.

The watershed served is approximately 502 hectares (1,240 acres).

Assessment schedules are provided for construction and future maintenance of the drainage works.

- Schedule A shows the assessment of the total estimated cost
- Schedule B is for prorating future maintenance cost
- Schedule C is for levying the final cost of the Drain.
- Appendix A illustrates the calculation of the assessments outlined in Schedules A and B.

2 BACKGROUND

Pursuant to Section 8 of the Act, on May 16, 2011, K. Smart Associates Limited was appointed by resolution of Council to prepare a report under Section 78 for improvement of the Hamilton Drain to address landowners concerns related to bank instability, erosion and poor drainage on the existing drain in the south part of Lots 8, 9 and part of 10, Concession 1. In the summer of 2013, the Municipality also received a petition for a new tile outlet to serve the south part of Lots 6 and 7, Concession 1. On July 17, 2013, K. Smart Associates Limited was appointed by resolution of Council to address a Section 4 petition in the ongoing Section 78 report.

3 DRAINAGE HISTORY

The Hamilton Drain was first established through a 1966 report by E. H. Uderstadt, O.L.S. The 1966 report constructed Drains A, B, C, D and E. Drain A functioned as the main drain with an outlet into the natural watercourse in the north half of Lot 8, Concession 1, at a location 204m north of the half-concession line.

In 1979, following approval by Council and the Ministry of Natural Resources, a dam was constructed approximately 400m downstream of the Drain A outlet, on the natural watercourse in the north half of Lot 8, Concession 1, as part of a habitat enhancement project in association with Ducks Unlimited Canada.

Between 1981 and 1988, a series of *Drainage Act* proceedings transpired related to improving drainage for Lots 8, 9 and 10 in the south half of Concession 1, geographic Township of Huron. These proceedings included: two Preliminary Reports, a Section 4 report, multiple Tribunal appeals, an investigation report undertaken by the Tribunal and, ultimately a report by A. W. Clark, P. Eng., for the Hamilton Drainage Works Improvement, dated July 1988 and prepared in accordance with the Tribunal's direction. The 1988 report improved the profile for the downstream portion of Drain A and incorporated the Towle Branch into the Hamilton Drainage Works.

In 1988 a design modification was completed by Ducks Unlimited Canada to lower the sill of the outlet structure by approximately 750mm in accordance with Clark's 1988 report.

4 INVESTIGATION

4.1 On-Site Meeting (Section 78)

On September 22, 2011, the on-site meeting was held in accordance with Section 9(1) and 9(2) of the Act. Notice of the meeting was sent to the landowner most affected by the Section 78 improvement request (Tim Hackett, representing Roll No. 001-00400) and the Maitland Valley Conservation Authority (MVCA). The Drainage Superintendent (G. Collins), K. Smart staff (J. Kuntze, P. Eng.) and Mr. Hackett were present at the on-site meeting. T. Hackett's primary concern was bank erosion on the drain through his property. T. Hackett also noted his view that the downstream private dam was not low enough and it should be removed because it causes water to backup onto his land and it adversely affects the function of the Towle Branch. G. Collins noted ongoing beaver activity downstream of Drain A was a recurring drain maintenance issue.

On May 17, 2012, K. Smart staff held an additional on-site meeting with Bill Steele, owner of the downstream property (Roll No. 001-06500). The conversation with the B. Steele was centered around the existing dam/outlet structure downstream of Drain A of the Hamilton Drain. The B. Steele explained that the outlet structure was intended to be used with multiple stop logs to vary the water level in the constructed wetland upstream of the dam. B. Steele mentioned in the late 1980s, after initial construction, the bottom sill of the outlet structure was cut down, below the level of the lowest stop log, to lower the water level in the upstream ditch. B. Steele indicated his preference for the outlet structure sill to remain as-is to preserve what remained of the constructed wetland.

4.2 On-Site Meeting (Section 4)

On May 24, 2018, an on-site meeting for the Section 4 petition submitted by D. and L. Gibson, owners of Roll No. 001-00300, was held in accordance with Section 9(1) and 9(2) of the Act. Notice of the meeting was sent to affected landowners and the Maitland Valley Conservation Authority.

Attendees:

Landowners	
Darryl Gibson	Roll No. 001-00300
Tim Hackett Alan Emerson – consultant for Hackett	Roll No. 001-00400
Aaron Hackett	Roll No. 001-00400
Township of Huron-Kinloss	
Grant Collins	Drainage Superintendent
K. Smart Associates Limited	
John Kuntze, P. Eng.	
Joel Miller, P. Eng.	

K. Smart staff summarized the project process to date and reviewed the basis for the additional petition. Additional, generalized comments are listed below:

Darryl Gibson (Roll No. 001-00300)

D. Gibson indicated he bought the property from Mr. Irwin. The property is not systematically tiled, but does have some random tiling along low runs, which outlet to a private tile that Mr. Irwin installed 35 or 40 years ago. Mr. Irwin paid for installation of the private tile, which is approximately 200m long and it flows across Roll No. 001-00400, with an outlet into Drain A. D. Gibson believes the private tile is 200mm diameter plastic tubing. D. Gibson would like a catch basin installed at the Roll Nos. 001-00300/001-00400 property line. D. Gibson's tiles are currently not functioning because the private tile was recently blocked by the downstream landowner.

Tim Hackett for the E. Hackett Estate (Roll No. 001-00400)

T. Hackett believes the private tile on Hackett land is 100mm diameter plastic and estimates it was installed 20 years ago. noted there is no written agreement regarding access to the private tile. T. Hackett expressed concern about the lack of fence maintenance by Gibson along the shared property line, because the Hackett property is currently used as pasture.

John Kuntze, P. Eng.

J. Kuntze noted the route of the existing private tile would need to be surveyed to confirm sizing and also indicated a northerly option could also be investigated that would provide an outlet for the petitioning lands, without crossing the Hackett property. However, J. Kuntze noted the north option may not be feasible due to topography and/or cost.

4.3 Site Examinations and Survey Work

The route of Drain A was examined after the on-site meeting on May 17, 2012 and on multiple occasions between 2013 and 2025.

Topographic survey was completed in 2012 from the outlet of the Drain to Bruce Road 86. Additional GPS survey during subsequent years acquired details on existing cattle crossings, new tile outlets and various alternatives suggested by landowners.

In early October 2013, K. Smart coordinated a site review by staff from Parish Geomorphic (now Matrix Solutions, Inc.), a firm with expertise in fluvial geomorphology, watercourse restoration and bank stabilization.

4.4 Watershed Description

The perimeter watershed of the Drain was confirmed based on review of historic drain reports, the provincial SWOOP Digital Elevation Model (DEM), on-site

investigation, tile plans and topographic survey. The proposed watershed generally matches the Maitland Engineering Services Ltd. 1988 report.

Land use in the watershed is predominately agricultural with several roads. At the time of report writing, wetland features along the existing open ditch drains in Lots 8 and 9, Concession 1 are not classified as provincially significant wetlands.

5 AUTHORITY FOR REPORT

5.1 Section 78

Section 78 of the Drainage Act provides for the repair and improvement of an existing drain constructed under the Act through a new Engineer's report. The Hamilton Drainage Works Improvement 1988 was constructed under the Act, and it was determined from the on-site meeting and site examination that the Drain requires improvement. Therefore, this report is properly initiated under Section 78 of the Act.

5.2 Section 4

Section 4 of the Drainage Act provides for the construction of new drainage works for an area requiring drainage. As a result of discussion at the site meeting and on-site examination, the area requiring drainage was determined to be approximately 12.3 ha in the south part of Lots 7 and 8, Concession 1 which requires a legal outlet for subsurface tile drainage. The signatures on the petition represent the majority of owners, and greater than 60% of the hectarage in the area requiring drainage; thus, the petition is valid under Sections 4(1)(a) and 4(1)(b) of the Act.

6 DESIGN CONSIDERATIONS

6.1 Sufficient Outlet

Section 15 of the Act requires that the proposed work be continued downstream to a sufficient outlet. Section 1 of the Act defines sufficient outlet as "a point at which water can be discharged safely so that it will do no damage to lands or roads." For this project, the existing watercourse at Station -0+600 on Hamilton Drain A provides sufficient outlet and will allow the proposed works to function as intended.

Based on GPS survey of the Towle Branch, Drain A downstream of Bruce Road 86, adjacent agricultural lands and the Steele pond outlet structure, the present elevation of the existing pond outlet structure, as shown on the Drawings, is low enough for upstream drainage needs. Also, the survey confirmed the present elevation of the outlet structure weir is generally consistent with the recommendation of Clark's 1988 report and the modifications subsequently completed by Ducks Unlimited Canada.

6.2 Drain Capacity

The open ditch portion of the Drain is designed to provide adequate depth for existing tile outlets. The *Drainage Guide* notes open municipal drains serving agricultural or rural lands are typically designed for a 2-year storm.

The capacity of the existing tile drain being incorporated as Branch F was evaluated using the Drainage Coefficient Method outlined in the *Drainage Guide*. The drainage coefficient is a measure of the amount of runoff that a closed drain can remove from an upstream watershed in a 24-hour period. Based on our survey, site review and landowner discussions, Branch F (twinned 150mm diameter tubing) provides capacity for the 25mm (1") drainage coefficient.

The 1800mmø culvert that is to be incorporated near Station 0+960 on Drain A has capacity for the 5-year storm event.

6.3 Soil Conditions

Soil mapping for this area indicates that the soils bordering the open ditch are characterised as Brookston silt loam with poor drainage. To the west of the drain in Lots 9 and 10 Concession 1 the soils transition to Brandy sandy loam and Huron silt loam which provide imperfect and good drainage respectively. To the east in Lot 7, Concession 1, the route of Branch F is located on soils characterised as Perth silt loam, which provide imperfect drainage.

In consultation with Matrix Solutions Inc., it was determined that 3H:1V bank slopes, with vegetated cover, would provide a more stable cross-section on the portion of Drain A downstream of Station 0+0700 where notable washouts and bank erosion concerns were observed.

7 INFORMATION MEETING FOR SECTION 4 PETITION

On October 14, 2020, an information meeting related to the Section 4 petition for a tile drain outlet across Roll No. 001-00400 (designated Branch F in this report) was held at the Township office. Notice for the meeting was sent to landowners directly affected by the proposed work, affected agencies and the Municipality. At the meeting, the results of the investigation to-date were presented along with a summary of the proposed work and preliminary cost estimates and assessments.

Attendees:

Landowners	
Tim Hackett on behalf Alan Emerson – consultant for Hackett	Roll No. 001-00400
Darryl Gibson	Roll No. 001-00300
Township of Huron-Kinloss	
Grant Collins	Drainage Superintendent
Kelly Lush	Deputy Clerk
K. Smart Associates Limited	
John Kuntze, P. Eng.	Joel Miller, P. Eng.

Joel Miller, P. Eng.

Approximately 200m of new 300mm diameter tubing, with a catchbasin at the property line would provide capacity for the 38mm (1.5 inch) drainage coefficient. Survey of the existing concrete sill elevation at the dam on the Steele property determined the sill is low enough for the proposed tile drain for the Gibson property.

Darryl Gibson (001-00300)

D. Gibson did not express any concerns with the proposed design. He indicated his subsurface tiling still lacks a functional outlet.

Tim Hackett for the E. Hackett Estate (Roll No. 001-00400)

T. Hackett did not express any concerns with the proposed design. He noted the property would likely be sold in the near future and inquired when the report on the Section 4 petition would be filed. K. Smart indicated filing a stand-alone report for the Section 4 petition would require further discussion with the municipality.

8 OPTIONS INVESTIGATION

8.1 Landowner Meeting

Following the sale of *Roll No.* 001-00400 to a new owner in late 2020, an on-site discussion regarding the Section 78 appointment was held on March 25, 2021 with the new owner, Wen Sluys. The purpose of the meeting was to update W. Sluys on the project and confirm his drainage needs.

Attendees:

Landowners	
Darryl Gibson	Roll No. 001-00300
Wen Sluys	Roll No. 001-00400
Township of Huron-Kinloss	
Grant Collins	Drainage Superintendent
Tile Contractor	
Dan MacLennan	MacLennan Farm Drainage
K. Smart Associates Limited	
Joel Miller, P. Eng.	Thomas Jackson, P. Eng.

Generalized comments are listed below:

Wen Sluys (Roll No. 001-00400):

- He is systematically tiling the property and would like to enclose Drain A from Station 0+0300 to 0+984, depending on cost
- Said he would consider the realignment of Drain A to his east property line but is concerned about depth of cut through the high ground and the width of the resulting channel
- Mentioned the field crossing he recently installed across the drain for access

- Dan MacLennan, tile contractor for Mr. Sluys, noted the need for cleanout of Towle Branch for improved outlet of new headers. He also will leave a corridor vacant along each side of Drain A on Roll No. 001-00400, in case the ditch enclosure option is installed.

Darryl Gibson (Roll No. 001-00300)

- Mr. Gibson is also systematically tiling his property
- Would like to know the cost of enclosing Drain A across his farm
- Suggested he and Mr. Sluys will discuss options to obtain a functional outlet across Roll No. 001-00400 for existing and planned tiling on Roll No. 001-00300

Joel Miller, P. Eng.

- Noted that ditch enclosure, even with an overflow swale for major events, may not be feasible due to cost and/or constraints from MVCA, DFO, etc.
- Mentioned Drain A currently flows through the wooded area between Station 0+700 and 0+970, which is mapped by MNRF as a wetland feature.
- Indicated enclosure and re-alignment options would receive preliminary review, costing and agency input prior to a follow-up discussion with Mr. Sluys and Mr. Gibson.
- Explained large ditch enclosures are generally not eligible for OMAFRA grant, unless pre-approved due to erosion concerns.

8.2 Description of Options

Two (2) options for enclosing approximately 1,065m of Drain A across Roll Nos. 001-00300 and 001-00400 were investigated. Both options provided capacity for the 38mm (1.5”) drainage coefficient and included an overflow swale/ditch for major runoff events. Both options included a stilling basin at the pipe outlets for energy dissipation. Following initial correspondence with agency staff, site meetings were held with MVCA staff and DFO staff regarding ditch enclosure and also the baseline work scope (ditch cleanout and bank stabilization).

Full Enclosure: This option consisted of 1,065m of twin 825mmø pipes along the drain alignment from Station 0+240 to 1+306, with catch basins at the property lines.

Hybrid Enclosure: This option consisted of enclosing Drain A on Roll No. 001-00300, then turning north at Station 0+984 with a new ditch along the property line for approximately 510m, then turning west as twin 825mmø pipes with an overflow swale to an outlet near Station 0+240 on Drain A.

8.3 Outcome

Both options were presented to applicable environmental agencies. Ultimately, neither option was selected by the landowners requesting this analysis, due to high costs and permitting requirements.

9 ENVIRONMENTAL CONSIDERATIONS

9.1 Agency Notification

The Maitland Valley Conservation Authority was notified of both on-site meetings for the Section 78 and Section 4 appointment, held on September 22, 2011 and February 12, 2018, respectively.

Through the design process from 2020 to 2022, the engineer reviewed several different alternatives for erosion control and ditch enclosure, the following is a summary of the agency consultations and input.

9.2 Agency Responses

9.2.1 Maitland Valley Conservation Authority

The Maitland Valley Conservation Authority (MVCA) did not request an environmental appraisal under Section 6 of the Act.

On December 20, 2011, MVCA sent a letter in response to the first on-site meeting notice. The letter outlined MVCA's interest in maintaining the wooded resource lands as well as concerns about erosion due to the possible poor soil conditions.

In early 2021, K. Smart initiated discussions with MVCA regarding proposed ditch enclosure options. MVCA indicated their main concern was the unevaluated wetland on Drain A from Station 0+0700 and 0+970, especially the groundwater upwelling feature within the wetland that contributed high-quality base flow to Drain A during certain months of the year. MVCA also noted removal of the private dam on the Steele property would require engagement with the MNFR under the *Lakes and Rivers Improvement Act.*

9.2.2 DFO

A Request for Review was submitted to DFO along with a project description, photo log and drawing package. The response from DFO dated January 11, 2022 mentioned existing records of various fish species in the system and expressed concern with ditch enclosure impacts on fish and fish habitat.

On July 27, 2022, there was a site visit by Thomas Jackson (KSAL), Stuart Cambell (DFO) and Ken McCallum (Drainage Superintendent) to review ditch enclosure options. While walking the site it was noticed that Drain A was dry downstream of Station 0+850, where a natural spring was observed. DFO indicated enclosing the ditch downstream of Station 0+850 would require an authorization under the *Fisheries Act* from DFO, while enclosing upstream of the natural spring could be feasible without authorization.

DFO's current mapping indicates Drain A downstream of Bruce Road 86 is classified as a "Class C" drain, meaning no in-water work between March 15th and July 15th.

10 ADDITIONAL MEETINGS

10.1 Meeting Regarding Steele Pond

On April 23, 2024 an meeting was held at the Steele property to review preliminary drawings for the Hamilton Drain and discuss plans for a wetland rehabilitation project in conjunction with Ducks Unlimited Canada.

Attendees:

Landowners	
William, Pat and Owen Steele	Roll No. 001-06500
Township of Huron-Kinloss	
Ken MacCallum	Drainage Superintendent
Ducks Unlimited Canada	
Nick Krete, Sean Holmes, Andrew Riddell	
K. Smart Associates Limited	
Joel Miller, P. Eng., Thomas Jackson, P. Eng.	

Key discussions items were:

Bill and Owen Steele indicated the Ducks Unlimited rehabilitation project was tentatively scheduled for mid/late 2024. Ducks Unlimited staff indicated the project would likely include sediment removal from the wetland, plantings and replacement of the concrete outlet structure with a riprap spillway.

K. Smart staff noted:

- The upstream drain design was based on the present elevation of the outlet structure, shown as 354.68m on the preliminary drawings.
- A 100m long permanent sediment trap would be installed just upstream of the wetland, with cleanout on an as-needed basis by the Drainage Superintendent.
- The forthcoming drain report would extend the outlet of Drain A downstream through the wetland pond to the outlet structure, to facilitate removal of beaver dams or other obstructions that could impact upstream lands.

Regarding future maintenance responsibilities, those present agreed obstruction removal at the outlet structure would be undertaken by the Drainage Superintendent, on an as-needed basis, with the cost assessed per the maintenance schedule in the forthcoming report. Future repairs at the outlet structure, if required, would be undertaken by the Steele property in accordance with their agreement with Ducks Unlimited.

Following the meeting, the outlet structure and wetland site were reviewed by the meeting attendees, and K. Smart agreed to provide a benchmark near the outlet structure for use by the Ducks Unlimited contractor. After the 2024 rehabilitation

project was completed, K. Smart staff confirmed, via GPS survey, that the as-built elevation of the riprap spillway matched the design elevation of 354.68.

10.2 Information Meeting for Watershed

On January 16, 2025 an information meeting for the Section 78 and Section 4 appointment was held at Council Chambers in Ripley. Notice for the meeting was sent to all landowners in the watershed and MVCA.

Attendees:

Landowners	
Fred Hinz	Roll No. 001-06600
Glen Gibson	Roll No. 001-00200
Daryl Gibson	Roll Nos. 001-00300, 001-00400
Bill, Pat and Owen Steele	Roll No. 001-06500
Township of Huron-Kinloss	
Ken MacCallum	Drainage Superintendent
Kelly Lush	Deputy Clerk
Township of Ashfield-Colborne-Wawanosh	
George Guse	Drainage Superintendent
K. Smart Associates Limited	
Joel Miller, P. Eng.	Thomas Jackson, P. Eng.

K. Smart staff provided a summary of the project timeline to-date and an overview of the watershed area, proposed work and estimated cost of the project. Additional, generalized comments and discussion are summarized below.

Daryll Gibson (Roll Nos. 001-00400 & 001-00300)

- Mentioned a continuous bottom cleanout of Drain A is needed from around Station 0+300 to 0+600.
    - K. Smart agreed to include this work in the report.
- Inquired if all the cost for the options investigation was being assessed under this report.
    - K. Smart noted the options investigation for ditch enclosure was undertaken at the request of landowners, and that some environmental agency consultation - which was necessary in any case, was accomplished along the way. K. Smart noted the portion of the options investigation cost being assessed under this report was assigned to the landowners where enclosure options were explored.
- Asked about cost sharing for the proposed sediment trap at the south end of the Steele pond.
    - K. Smart explained 50% of the sediment trap cost was assessed as benefit to Roll No. 001-06500 and the remaining 50% was assessed to the upstream watershed.

Owen Steele (Roll No. 001-06500)

- Confirmed pond rehabilitation was completed in 2024 and attention was given to ensure the new riprap spillway, which replaced the previous outlet structure was constructed at the correct elevation.
- Noted the buried portion of the existing poured-in-place concrete outlet structure below 354.68 was left in place due to its size and the sill is visible.
    - K. Smart indicated this would not adversely affect Drain A's function.
- Suggested an optional access route was available, if needed, from Concession 2 Road to the Drain's outlet at pond.

G. Gibson (Roll No. 001-00200)

- Believes this portion of Drain A was last cleaned around 40 years ago.

Ken MacCallum (Drainage Superintendent)

- Mentioned beaver dams are a recurring maintenance task in Drain A
- Noted the proposed sediment trap will be much easier to clean out periodically with standard equipment, versus the larger equipment required for pond cleanout.

11 RECOMMENDED WORK

Major work items are described below. Further detail regarding construction items can be found in the Cost Estimate and the Drawings.

Hamilton Drain A

Steele (Roll No. 001-06500)

- Station -0+600 - incorporate riprap spillway, only for removal of obstructions above 254.68m.
- Station -0+600 to -0+275 – incorporate flow path through private pond for obstruction removal only.
- Station -0+275 to -0+175 – construct 100m long permanent sediment trap
- Station -0+175 to 0+000 – cleanout ditch and re-align Drain A at Towle Branch confluence with riprap bank protection.

Gibson (Roll No. 001-00400)

- Station 0+000 to 0+210 – ditch cleanout
- Station 0+210 to 0+600 – ditch cleanout and bank improvements
- Stations 0+300, 0+379, 0+561 – ditch straightening and washout repairs

Gibson (Roll No. 001-00300)

- Station 1+132 – riprap for erosion protection at bend on north bank

Hamilton Drain F

Gibson (Roll No. 001-00400)

- Station 0+000 to 0+200 - Incorporate twinned 150mmø plastic tubing and catchbasin

Towle Branch

Steele (Roll No. 001-06500), Hinz (Roll No. 001-06600), Gibson (Roll No. 001-00400)

- Station 0+000 to 0+531 – Cleanout existing open ditch per revised design grade

12 CONSTRUCTION CONSIDERATIONS

12.1 Construction Scheduling

Construction cannot commence until ten days after a bylaw to adopt this report is given third reading in accordance with the Act.

Restricted timing windows for this project, if any, are described in *Section 9 ENVIRONMENTAL CONSIDERATIONS.*

12.2 Design Changes During Construction

In general, design changes requested by landowners, agencies or other authorities after the bylaw is passed cannot be undertaken.

Section 84.1 of the Act and the associated regulation, O. Reg. 500/21, provides criteria and a process for amending this report if design changes are required during construction due to unforeseen circumstances and the design changes are approved by the Engineer. If design changes are made, this report must be amended after construction with the as-constructed drawings before passing the actual cost bylaw.

Additional work desired by the landowner(s) which is not part of the drainage works may be arranged with the Contractor provided the cost of the work is paid by the landowner(s), and the engineer reviews the additional work in advance. Such additional work is not part of the drainage works for future maintenance.

12.3 Alignment of Drains

All drains shall be constructed and maintained generally to the alignment, as noted on the plans and specified by the Special Provisions. In the absence of survey bars, existing fences and similar boundary features are assumed to represent property lines. Should landowners desire a more precise location for the drains in relation to their property line or if there is a dispute about the location of any property line, landowners may obtain a legal survey at their own cost before construction.

13 DRAWINGS AND SPECIFICATIONS

13.1 Drawings

The location of the drain, watershed boundary and the affected properties are shown on Drawing No. 1 and 2 included with this report. The numbers adjacent to the drain are station numbers which indicate in metres the distance along the drain from the outlet. The profiles, details and special provisions for the Drain are on Drawings 3 to 10.

13.2 Specifications

This report incorporates the General Conditions, Standard Specifications and Special Provisions listed in the Table of Contents, which govern the construction and maintenance of the Drain.

14 COST ESTIMATE

The estimated cost of this project includes allowances to owners, the construction cost, the engineering cost and other costs associated with the project.

14.1 Allowances

Sections 29 to 33 of the Drainage Act provides for allowances (compensation) to owners affected by drain construction. On this project, there are allowances made under Section 29, Section 30 and Section 31.

14.1.1 Section 29 – Right-of-Way

Section 29 provides for payment of an allowance to landowners for land to accommodate the Drain and access routes to the Drain for construction and maintenance purposes. Section 29 allowance rates are generally below full market value because there is no transfer of land ownership, drains are typically located along existing drainage features and closed drains in agricultural areas do not impede beneficial land use.

For the new portion of Drain A from -0+205 to -0+600, Section 29 allowances were computed based on a rate of $3,000/hectare for a 20m corridor along the Drain A flow route from -0+205 to -0+600.

For new Drain F, the Section 29 allowance was computed based on a rate of $6,000/hectare for a 10m corridor along the route of the tile drain.

No right-of-way allowance was paid under previous Hamilton Drain reports for the existing portion of Drain A on Roll No. 001-00300 from 0+984 to 1+306, so a Section 29 allowance was computed based on a rate of $15,000/hectare for a 20m corridor along the Drain A from 0+984 to 1+306.

Section 29 allowances are also provided for 4m wide access routes, shown on the Drawings, to be used for construction of the work under this report and for future maintenance.

14.1.2 Section 30 - Damages

Section 30 provides for payment of an allowance to landowners along the Drain for damages caused by the construction of the Drain. In agricultural areas, crop damages are computed using the methodology outlined in the *Drainage Guide*, published crop values, and declining productivity loss in the years following construction.

Section 30 allowances for wooded and agricultural lands was calculated using rates of $1,000/hectare and $2,000/hectare, respectively, applied over an average corridor width of 20m, for construction or cleanout along an open drain.

14.1.3 Section 31 – Existing Drains

Section 31 provides for payment of an allowance to the owner of works that will be incorporated into the Drain. For Drain A, the project will incorporate an existing access culvert ($5,000) on Roll No. 001-00400. For Drain F, the project will incorporate 200m of twinned 150mmø existing plastic tubing ($8,800) on Roll 001-00400 and a new catchbasin ($1,500) at the property line with Roll 001-00300.

14.1.4 Summary of Allowances

The table below summarizes the total allowance amounts provided:

Table 14.1-1 - Summary of Allowances

Roll No.	R.O.W. (S.29)	Damages (S.30)	Ex. Drain (S. 31)	Total
(001-06500)	2,600	1,100	-	3,700
(001-06600)		400		400
(001-00400)	1,800	4,200	13,800	19,800
(001-00300)	10,300	400	1,500	12,200
				36,100

In accordance with Section 62(3) of the Act, the allowances shown may be deducted from the final assessment levied. Payment to the owner would only be made when the allowance is greater than the final assessment. The allowances are a fixed amount and are not adjusted due to construction.

14.2 Construction Cost Estimate

The estimated cost for Labour, Equipment and Materials to construct the proposed Drain is outlined in detail in Estimated Costs Summary in *Table 14.6-1 - Estimated Cost Summary*.

The construction cost estimate is based on recent costs for comparable work. A contingency amount is included to cover additional work that may be required due to field conditions or minor alterations to the project.

The contract for the Drain will be awarded by public tender. If the contract price is more than 33% over the engineer's estimate, Section 59 of the Act requires a Council meeting with the petitioners to determine if the project should proceed.

14.3 Engineering Cost Estimate

Engineering costs include report preparation and attending Council meetings to consider the report and the Court of Revision. Report preparation includes site meetings, survey, design, assessments, report compilation and subconsultant services for site review and bank stability considerations.

Costs incurred for consultation with environmental agencies (MVCA and DFO) have been separately identified in Section 14.4 below for the purpose of OMAFA's tracking during the grant process.

Construction Phase Services typically includes: preparing tender documents and tender call, review of tenders, attending the pre-construction meeting, periodic construction inspection, payments, final inspection, post-construction follow-up, final cost analysis and preparation of the grant application.

The cost for report preparation is usually not altered at the conclusion of a project unless the report is referred back or the report is appealed to the Drainage Tribunal, which would result in additional costs. The amount shown for meetings (Report Consideration by Council and Court of Revision) is an estimate. The estimate shown for construction phase services assumes standard construction conditions and an efficient Contractor. The final cost for meetings and construction phase services will be based on the actual time spent. Engineering costs are summarized in *Table 14.6-1 - Estimated Cost Summary*.

14.4 Estimate of Section 73 Costs

Section 73(2) and 73(3) of the Act direct that the cost of services provided by municipal staff and the Council to carry out the Act process shall not form part of the final cost of the Drain. However, Section 73(1) outlines that the following costs incurred by the Municipality can be included in the cost of the Drain: "*cost of any application, reference or appeal and the cost of temporary financing."*

For this project, costs associated with agency consultations - correspondence, site meetings, the collection and preparation of photo logs and agency applications/ approvals and included in the Section 73 cost estimate.

Grant policy indicates that certain administrative costs required to carry out the required procedures under the Act can be included in the final drain cost. Section 73 costs are summarized in *Table 14.6-1 - Estimated Cost Summary*.

14.5 Harmonized Sales Tax

The Harmonized Sales Tax (HST) will apply to most costs on this project. The Municipality is eligible for a partial refund on HST paid, the net 1.76% HST (non-recoverable portion) is included in the cost estimates in this report.

14.6 Estimated Cost Summary

Table 14.6-1 - Estimated Cost Summary

DESCRIPTION			TOTAL
ALLOWANCES:			**$36,100**
CONSTRUCTION COST ESTIMATE			
Item	Stations	Description	Cost
i) Hamilton Drain A			
A1	-0+275 to -0+175	Construct 100m long permanent sediment trap	5,000
A2	-0+175 to -0+069	106m of ditch cleanout, includes levelling and seeding.	2,700
A3	-0+069	60m² of riprap placed on west bank at junction with Towle Branch	6,000
A4	-0+069 to -0+043	26m of ditch re-alignment, includes levelling and seeding.	3,900
A5	-0+043 to 0+210	253m of ditch cleanout, salvage spoil for upstream bank stabilization, seed banks and disturbed areas.	6,400
A6	0+210 to 0+600	390m of ditch cleanout and bank improvements with salvaged spoil, level and seed excess material.	13,700
A7	0+300	Repair washout per detail by: straightening 42m of ditch, reconstructing bank with 50m³ of on-site material and installing 71m² of erosion control matting	3,400
A8	0+379	Repair washout per detail by: straightening 38m of ditch, reconstructing banks with 200m³ of on-site material installing 66m² of erosion control matting	7,300
A9	0+379	Construct rock chute at surface run with 20m² riprap	2,000
A10	0+561	Repair washout per detail, by: straightening 25m of ditch, reconstructing bank with 25m³ of on-site material and 63m² of erosion control matting	2,300
A11	0+210 to 0+561	Hydroseed 1,650m² of reconstructed ditch banks where directed by engineer	3,300
A12	0+600 to 1+306	No ditch work required	-
-	0+958 to 0+967	Incorporate 9.4m of existing 1,800mmø CSP	-
A13	1+132	Install 5m² of rip-rap on the north bank	500
A14	-0+205 to -0+069	Unbilled maintenance for beaver trapping and obstruction removals	1,900
		Sub Total Part i)	**58,400**
ii) Hamilton Drain Branch F			
F1	0+000	5m² of riprap at each outlets (10m² total)	1,000
-	0+000 to 0+200	Incorporate twin existing 150mmø plastic pipes	-
-	0+200	Incorporate existing 450mmø plastic catchbasin	-
		Sub Total Part ii)	**1,000**
iii) Towle Branch			
T1	0+000 to 0+531	531m of ditch cleanout, level spoil, seed banks	4,200
		Sub Total Part iii)	**4,200**

	DESCRIPTION		TOTAL
iv) Contingencies (if required and approved by the engineer)			
C1	20m^2 riprap on geotextile where directed	2,000	
C2	Lump sum contingency allowance	6,900	
	Sub Total Part iv)	**8,900**	
	Net HST (1.76%) on Parts i) to iv)	1,240	
	TOTAL CONSTRUCTION COST ESTIMATE:		**$73,740**
ENGINEERING COSTS			
	Report Preparation	45,300	
	Consideration of Report Meeting	2,000	
	Court of Revision	2,000	
	Construction Phase Services	25,700	
	Net HST (1.76%)	1,260	
	TOTAL ENGINEERING COST ESTIMATE:		**$76,260**
	TOTAL SECTION 73 COST ESTIMATE:		**$5,900**
	TOTAL ESTIMATED COST:		**$192,000**

15 ASSESSMENTS

The Drainage Act requires that the total estimated cost be assessed to the affected lands and roads under the categories of Benefit (Section 22), Outlet Liability (Section 23), Injuring Liability (Section 23), Special Benefit (Section 24) and Increased Cost (Section 26). On this project assessment for Benefit, Special Benefit, Outlet Liability and Increased Cost (Special) Assessment are involved.

15.1 Calculation of Estimated Assessments

Appendix A in this report illustrates how the Drain is divided into sub-sections (intervals) and presents the estimated cost for each interval, as outlined in the *Drainage Guide*. For each interval, the first step in the assessment calculation is to determine the benefit assessment to the affected lands and roads, then special assessments to roads and utilities are determined, where applicable. After deducting the total benefit and special assessments from the interval cost, the balance of the cost is then assessed as outlet liability on a per hectare basis to all lands and roads in the watershed.

15.2 Benefit Assessments (Section 22)

Section 22 benefit assessments are listed in Schedule A – Schedule of Assessments and are shown on a per interval basis in Appendix A – Calculation of Assessments.

Section 22 benefits represent the estimated value provided to affected properties due to construction of the works. Typical benefit categories include: Direct Outlet (ability of a property to connect directly to the new drain), Improved Drainage (greater control of surface flow, reduced erosion and sedimentation, improved

efficiency, etc.), and Improved Outlet (where an existing municipal drain is upsized and/or lowered or otherwise redesigned to provide a higher level of service than the existing municipal drain. Refer to *Table 15.2-1 – Section 22 Benefit Assessments* for a summary of benefit assessments applicable to this project.

Table 15.2-1 – Section 22 Benefit Assessments

Roll No.	***Description***	***Drain A***	***Drain F***	***Towle Branch***	***TOTAL***
001-06500	*- Improved drainage along drain* *- Improved outlet* *- Improved sediment control*	1,600 2,500			4,100
001-06600	*- Improved drainage along drain*	600		1,000	1,600
001-00300	*- Improved drainage along drain* *- Improved outlet* *- Direct outlet*	5,000	 10,000		15,000
001-00400	*- Improved drainage along drain* *- Improved outlet* *- Bank stabilization*	9,000 1,000 27,200	1,500	2,100	40,800
001-00600	*- Improved outlet*	1,700		6,300	8,000
Unopened Rd (Lot 10/11)	*-For improved outlet*	1,500		1,500	3,000
County Rd 86	*-For improved outlet*	5,000			5,000
TOTAL		55,100	11,500	10,900	77,500

15.3 Outlet Liability Assessments (Section 23)

Section 23(3) of the Drainage Act states that outlet liability assessment is to be based on the volume and rate of flow of the water artificially caused to flow. Therefore, the lands and roads in the watershed are assessed on a per hectare basis, with adjustments made to recognize the different amount of runoff generated by different land uses, as outlined in the *Drainage Guide*. The basis for the adjustments is 1 hectare of cleared agricultural land contributing both surface and subsurface water to the Drain. Land uses with a different runoff rate are adjusted by the factors given in *Table 15.3-1 – Runoff Factors Table*.

Table 15.3-1 – Runoff Factors Table

Land Use	**Runoff factor**
Forest/swamp	0.5
Agricultural & unopened road r/w	1.0
Residential	1.5
Gravel Road	2.0
Paved Road	3.0

15.4 Special Benefit Assessments (Section 24)

Special Benefit assessments are for costs which are unrelated to the function of the drain. The following Special Benefit assessments apply to this project:

Roll No. 001-06500

- $3,600 for costs associated with on-line, private pond: site visits, survey of dam and outlet structure, meeting/correspondence/design coordination with the landowners and Ducks Unlimited Canada.

Roll No. 001-00300

- $3,200 for costs incurred to investigate Drain A enclosure requested by landowner: site visit, GPS survey, capacity calculations, drawings, cost estimate, and enclosure-related correspondence with agencies.

Roll No. 001-00400

- $4,800 for costs incurred to investigate Drain A enclosure requested by landowner: site visit, GPS survey, capacity calculations, drawings and cost estimates for alternative alignments, enclosure-related correspondence with agencies.

The special benefits listed above are non-proratable and are not eligible for grant under OMAFA's current Grant Policy.

15.5 Assessment Schedules

In the assessment schedules, each parcel of land assessed has been identified by the municipal assessment roll number at the time of the preparation of this report. The size of each parcel was established using current assessment roll information. If an "F" is shown in the first column, it denotes lands with current Farm Property Tax Class designation that may qualify for Grant. For convenience only, each parcel is also identified by the owner name(s) from the last revised assessment roll.

15.5.1 Schedule A- Schedule of Assessments

The estimated cost for the drainage works in this report is distributed among lands, roads and utilities, as shown in Schedule A, the Schedule of Assessments.

Section 22 Benefits and Section 23 Outlet assessments are proratable, and will be adjusted at the conclusion of the project using the actual drain cost and a pro rata application of the cost distribution shown in Schedule A.

15.5.2 Schedule B -Schedule of Assessments for Maintenance

In accordance with Section 74 of the Act, the Drain shall be maintained by the Municipality, and the cost of maintenance assessed to lands and roads upstream of the maintenance location, pro rata with the amounts in Schedule B. Schedule B $ amounts are listed for calculating share of future maintenance costs. Schedule B $ amounts will not be included in the actual cost levy for construction of this Drain.

Schedule B provides separate columns for each interval of the drain to identify upstream lands and roads. For any parcel, the future maintenance assessment will be computed by summing that parcel's share of the maintenance cost for all intervals upstream of the maintenance location.

The Municipality will confirm eligibility for the grant at the time the maintenance cost is levied.

15.5.3 Schedule C – Schedule for Actual Cost Bylaw

After the construction of the Drain is certified complete by the Engineer, the Municipality will determine the actual cost of the Drain. Non-proratable assessments identified in Schedule A will be updated using actual costs.

After deducting actual non-proratable assessments from the actual total drain cost, the remainder will be assessed pro rata using Schedule C.

Net assessments are determined by deducting allowance and grant amounts where applicable. Eligibility for grant will be confirmed by the Municipality at the time the actual cost is levied.

Actual assessments in Schedule C will be levied to the owner of the identified parcel at the time the Actual Cost Bylaw is passed.

16 GRANT

In accordance with the provisions of Section 85 of the Act, a grant not exceeding 1/3 (33-1/3%) may be available on the assessments against lands used for agricultural purposes. The current OMAFRA grant policy defines agricultural lands as privately owned parcels of land which have the Farm Property Class Tax Rate. Based on Municipal assessment roll information, parcels that have the Farm Property Tax Class are identified with an 'F' in the first column of the assessment schedules.

Section 88 of the Act provides for the Municipality to apply for this grant after the construction of the Drain is certified complete by the Engineer. The Municipality must confirm the Farm Property Tax Class on the assessed parcels at the time the grant application is completed and submitted to OMAFRA. OMAFRA has the authority to determine grant eligibility regardless of the designation herein.

17 PRIVACY OF LANDS

Although a right of way for the Municipality exists along the Drain and along access routes identified in this report for future maintenance, the land remains private property. Other landowners or the public may not enter or use the drain right of way. Persons authorized to enter the drain right of way to carry out duties under the Act include: Engineers, Contractors and the Drainage Superintendent and/or their assistants.

18 MAINTENANCE

Section 74 of the Act requires the Drain to be maintained by the Municipality with the cost of maintenance assessed to the upstream lands and roads pro rata with the assessments in Schedule B.

18.1 The Drain For Future Maintenance

The Hamilton Drain for the purpose of future maintenance will include all tile, catchbasins, ditches, as defined and constructed in accordance with the drawings and special provisions of this report.

Along Drain A, from Station -0+600 to -0+275, the flow route through the online pond is incorporated for the purpose of obstruction removal only. Future enhancement or rehabilitation projects may be undertaken by the landowner of the private pond, provided the expected water level identified in the drawings is maintained. The riprap spillway at -0+600 is incorporated, as shown on the drawings, for the purpose of obstruction removal under the drain maintenance program. Future structural repairs at the riprap spillway remain the responsibility of the landowner.

The Drain is also to include the existing wetland on Roll No. 001-06500 for obstruction removal.

18.2 General

All parties affected by the Drain, are encouraged to periodically inspect the Drain and report any visible or suspected problems to the Municipality. Any landowner making a new connection to the Drain shall notify the Drainage Superintendent before making the connection. If the Drainage Superintendent is not notified, the cost to remedy new connections that obstruct or otherwise damage the Drain will be the responsibility of the owner.

A right-of-way along the drain and access routes to the Drain exist for the Municipality to maintain the Drain. The right-of-way for the Drain, as described in this report shall remain free of obstructions. Costs to remove obstructions from the maintenance right-of-way will be assessed to the owner.

The cost of cleaning through road crossings shall be assessed to upstream lands and roads in accordance with Schedule B. The cost of replacing, repairing and/or maintaining any road culverts or crossings shall be assessed fully to the road authority.

18.3 Updating Future Maintenance Schedules

To ensure future maintenance assessments are equitable, the assessments provided in this report should be reapportioned under Section 65 when severances or amalgamations occur or when new lands are connected to the Drain or when a land-use change occurs that can be accommodated by the existing Drain. If a future land-use change will cause the drain capacity to be exceeded, a report under Section 4 or 78 may be required to provide increased capacity.

18.4 Culvert Maintenance

- The costs of cleaning through all culverts shall be assessed as drain maintenance to upstream lands and roads.
- Future repairs or replacement of the access culvert on Roll No. 001-00400 shall be assessed at 50% to the abutting landowner and 50% to the upstream watershed. If replaced, the new crossing will consist of a 12m length of 1800mm diameter CSP.
- Prior approval of the Municipality is required before a landowner installs a private culvert not constructed under this report.

19 BYLAW

This report including the drawings and specifications, assessment schedules and appendices, when adopted by bylaw in accordance with the Act, provides the basis for construction and maintenance of the Drain.

All of which is respectfully submitted,

K. SMART ASSOCIATES LTD.

Joel Miller, P. Eng.

HAMILTON DRAIN 2025
Township of Huron-Kinloss

Con	Lot	Roll No.	Owner	Total ha affected	DRAIN A Benefit Sec. 22	DRAIN A Benefit Sec. 24 (Non-Grantable)	DRAIN A Outlet	DRAIN A Total	TOWLE BRANCH Benefit Sec. 22	TOWLE BRANCH Outlet	TOWLE BRANCH Total	DRAIN F Benefit Sec. 22	DRAIN F Outlet	DRAIN F Total	Total Benefit Sec. 22	Total Outlet	Grand Total
			Lands														
Township of Huron-Kinloss																	
1	S1/2 4 & 5	001-00200	Gibson Ag Ltd.	5.0	0	0	1,071	1,071	0	0	0	0	0	0	0	1,071	1,071
1	S/12 4 & 5	001-00250	A. Thiessen	0.5	0	0	171	171	0	0	0	0	0	0	0	171	171
1	S1/2 6 & 7	001-00300	Gibson Ag Ltd.	14.5	5,000	3,200	5,736	13,936	0	0	0	10,000	4,975	14,975	15,000	10,711	28,911
1	S1/2 6	001-00310	T. Black	0.9	0	0	299	299	0	0	0	0	0	0	0	299	299
1	S1/2 8, 9, & 10	001-00400	Gibson Ag Ltd.	61.4	37,200	4,800	7,168	49,168	2,100	1,604	3,704	1,500	0	1,500	40,800	8,772	54,372
1	S1/2 9, & 10	001-00402	E. Van Osch	0.6	0	0	29	29	0	58	58	0	0	0	0	87	87
1	S1/2 11, 12, & 13	001-00600	P. Schilegel	34.0	1,700	0	1,089	2,789	6,300	2,153	8,453	0	0	0	8,000	3,242	11,242
1	N1/2 6, 7, & 8	001-06500	W. Steele	14.4	4,100	3,600	304	8,004	0	0	0	0	0	0	4,100	304	8,004
1	N1/2 9 & 10	001-06600	F. Hinz	10.0	600	0	165	765	1,000	147	1,147	0	0	0	1,600	312	1,912
Township of Ashfield-Colborne-Wawanosh																	
12	N1/2 6	012-01700	J. Wilkins	3.6	0	0	770	770	0	0	0	0	0	0	0	770	770
12	N1/2 6	012-01800	J. & S. Wilkins	3.3	0	0	707	707	0	0	0	0	0	0	0	707	707
13	S1/2 7	013-01600	S. Alton and S. Wright-Alton	1.1	0	0	236	236	0	0	0	0	0	0	0	236	236
13	N1/2 7	013-01700	W. Nyland	4.0	0	0	856	856	0	0	0	0	0	0	0	856	856
13	S1/2 6	013-01800	Gibson Ag Ltd.	36.8	0	0	7,705	7,705	0	0	0	0	0	0	0	7,705	7,705
13	N1/2 6	013-01900	Gibson Ag Ltd.	40.8	0	0	8,733	8,733	0	0	0	0	0	0	0	8,733	8,733
13	E1/2 5	013-02000	G. Gibson	38.2	0	0	7,748	7,748	0	0	0	0	0	0	0	7,748	7,748
13	E1/2 5	013-02001	F. & S. Bongertman	0.5	0	0	171	171	0	0	0	0	0	0	0	171	171
13	W1/2 5	013-02100	G. & C. Gibson	27.3	0	0	5,843	5,843	0	0	0	0	0	0	0	5,843	5,843
13	N1/2 4	013-02300	G. Gibson	10.3	0	0	1,862	1,862	0	0	0	0	0	0	0	1,862	1,862
14	S1/2 7	014-02300	W. Nyland, P Nylan-Van Broekhoven & J. Nyland	1.6	0	0	343	343	0	0	0	0	0	0	0	343	343
14	S1/2 6	014-02600	W. Nyland and P. Nylan-Van Broekhoven	20.5	0	0	4,280	4,280	0	0	0	0	0	0	0	4,280	4,280
14	E1/2 5	014-02800	C. Irwin	27.8	0	0	5,330	5,330	0	0	0	0	0	0	0	5,330	5,330
14	W1/2 5	014-03000	S., M. & S. Hadziavdic	1.1	0	0	364	364	0	0	0	0	0	0	0	364	364
14	W1/2 5	014-03001	Township of Ashfield-Colborne-Wawanosh	0.2	0	0	65	65	0	0	0	0	0	0	0	65	65
14	4 & W1/2 5	014-03100	JM Gibson Holdings	118.9	0	0	24,443	24,443	0	0	0	0	0	0	0	24,443	24,443
14	E1/2 3	014-03300	2450623 Ontario Ltd.	12.9	0	0	2,590	2,590	0	0	0	0	0	0	0	2,590	2,590
Total Assessments on Lands:				490.2	48,600	11,600	88,078	148,278	9,400	3,962	13,362	11,500	4,975	16,475	69,500	97,015	178,115
			Roads														
Township of Huron-Kinloss																	
Unopened Road Allowance			Township of Huron-Kinloss	2.2	1,500	0	71	1,571	1,500	142	1,642	0	0	0	3,000	213	3,213
Township of Ashfield-Colborne-Wawanosh																	
Lanesville Line			Township of A-C-W	1.8	0	0	1,156	1,156							0	1,156	1,156
Tower Line			Township of A-C-W	2.0	0	0	856	856							0	856	856
Zion Road			Township of A-C-W	0.9	0	0	580	580							0	580	580
County Road 86			Bruce County (Boundary Road Agreement)	5.3	5,000		2,909	7,909	0	171	171				5,000	3,080	8,080
Total Assessments on Roads:				12.2	6,500	0	5,572	12,072	1,500	313	1,813	0	0	0	8,000	5,885	13,885
TOTAL ASSESSMENTS HAMILTON DRAIN 2025				502.4	55,100	11,600	93,650	160,350	10,900	4,275	15,175	11,500	4,975	16,475	77,500	102,900	192,000

Notes:

1. Roll numbers are per the Municipality's last revised assessment roll, names included for convenience.
2. Lands noted with an "F" are classified as agricultural and according to current OMAFRA policy qualify for the 1/3 grant.
   Eligibility for the 1/3 grant will be confirmed at the time the final cost is levied.

Hamilton Drain 2025
Township of Huron-Kinloss

				DRAIN A				TOWLE BRANCH		DRAIN F	
				Interval 1		Interval 2					
				-0+600 to -0+069		-0+069 to -1+306		0+000 to 0+531		0+000 to 0+200	
Con	Lot	Roll No.	Owner	$	%	$	%	$	%	$	%
Township of Huron-Kinloss											
1	S1/2 4 & 5	001-00200	Gibson Ag Ltd.	162	0.80	909	0.90	0	0.00	0	0.00
1	S/12 4 & 5	001-00250	A. Thiessen	26	0.13	145	0.14	0	0.00	0	0.00
1	S1/2 6 & 7	001-00300	Gibson Ag Ltd.	866	4.27	7,370	7.30	0	0.00	9,975	93.01
1	S1/2 6	001-00310	T. Black	45	0.22	254	0.25	0	0.00	0	0.00
1	S1/2 8, 9, & 10	001-00400	Gibson Ag Ltd.	2,271	11.21	23,497	23.28	2,654	27.29	750	6.99
1	S1/2 9, & 10	001-00402	E. Van Osch	29	0.14	0	0.00	58	0.60	0	0.00
1	S1/2 11, 12, & 13	001-00600	P. Schilegel	1,939	9.57	0	0.00	5,303	54.53	0	0.00
1	N1/2 6, 7, & 8	001-06500	W. Steele	1,854	9.15	500	0.50	0	0.00	0	0.00
1	N1/2 9 & 10	001-06600	F. Hinz	465	2.30	0	0.00	647	6.65	0	0.00
Township of Ashfield-Colborne-Wawanosh											
12	N1/2 6	012-01700	J. Wilkins	116	0.57	654	0.65	0	0.00	0	0.00
12	N1/2 6	012-01800	J. & S. Wilkins	107	0.53	600	0.59	0	0.00	0	0.00
13	S1/2 7	013-01600	S. Alton and S. Wright-Alton	36	0.18	200	0.20	0	0.00	0	0.00
13	N1/2 7	013-01700	W. Nyland	129	0.64	727	0.72	0	0.00	0	0.00
13	S1/2 6	013-01800	Gibson Ag Ltd.	1,163	5.74	6,542	6.48	0	0.00	0	0.00
13	N1/2 6	013-01900	Gibson Ag Ltd.	1,319	6.51	7,414	7.34	0	0.00	0	0.00
13	E1/2 5	013-02000	G. Gibson	1,170	5.77	6,578	6.52	0	0.00	0	0.00
13	E1/2 5	013-02001	F. & S. Bongertman	26	0.13	145	0.14	0	0.00	0	0.00
13	W1/2 5	013-02100	G. & C. Gibson	882	4.35	4,961	4.91	0	0.00	0	0.00
13	N1/2 4	013-02300	G. Gibson	281	1.39	1,581	1.57	0	0.00	0	0.00
14	S1/2 7	014-02300	W. Nyland, P Nylan-Van Broekhoven & J. Nyland	52	0.26	291	0.29	0	0.00	0	0.00
14	S1/2 6	014-02600	W. Nyland and P. Nylan-Van Broekhoven	646	3.19	3,634	3.60	0	0.00	0	0.00
14	E1/2 5	014-02800	C. Irwin	805	3.97	4,525	4.48	0	0.00	0	0.00
14	W1/2 5	014-03000	S., M. & S. Hadziavdic	55	0.27	309	0.31	0	0.00	0	0.00
14	W1/2 5	014-03001	Township of Ashfield-Colborne-Wawanosh	10	0.05	55	0.05	0	0.00	0	0.00
14	4 & W1/2 5	014-03100	JM Gibson Holdings	3,691	18.22	20,752	20.56	0	0.00	0	0.00
14	E1/2 3	014-03300	2450623 Ontario Ltd.	391	1.93	2,199	2.18	0	0.00	0	0.00
Total Assessments on Lands:				18,536	91.49	93,842	92.96	8,662	89.07	10,725	100.00
Township of Huron-Kinloss											
Unopened Road Allowance				821	4.05	0	0.00	892	10.75	0	0.00
Township of Ashfield-Colborne-Wawanosh											
Lanesville Line				175	0.86	981	0.97	0	0.00	0	0.00
Tower Line				129	0.64	727	0.72	0	0.00	0	0.00
Zion Road				87	0.43	493	0.49	0	0.00	0	0.00
County Road 86			Bruce County (Boundary Road Agreement)	512	2.53	4,897	4.86	171	0.18	0	0.00
Total Assessments on Roads:				1,724	8.51	7,098	7.04	1,063	10.93	0	0.00
TOTAL ASSESSMENTS HAMILTON DRAIN 2025				20,260	100.00	100,940	100.00	9,725	100.00	10,725	100.00

Note:
Agricultural designation not included as grant eligibility has to be confirmed at the time of maintenance cost levy.

HAMILTON DRAIN 2025
Township of Huron-Kinloss

	Con	Lot	Roll No.	Owner	Ha. Affected	Estimated Gross Assessment	S. 24 Non-Grantable	Actual Gross Assessment	Est. Grant Eligible Portion	Estimated 1/3 Grant	Allowances	Estimated Net Assessment	Actual Net Assessment
				Lands									
	Township of Huron-Kinloss												
F	1	S1/2 4 & 5	001-00200	Gibson Ag Ltd.	5.00	1,071			1,071	357.00		714.00	
	1	S/12 4 & 5	001-00250	A. Thiessen	0.8	171						171.00	
F	1	S1/2 6 & 7	001-00300	Gibson Ag Ltd.	26.8	28,911	3,200		25,711	8,570.33	12,200	8,140.67	
	1	S1/2 6	001-00310	T. Black	1.4	299						299.00	
F	1	S1/2 8, 9, & 10	001-00400	Gibson Ag Ltd.	54.8	54,372	4,800		49,572	16,524.00	19,800	18,048.00	
	1	S1/2 9, & 10	001-00402	E. Van Osch	0.9	87						87.00	
F	1	S1/2 11, 12, & 13	001-00600	P. Schilegel	33.7	11,242			11,242	3,747.33		7,494.67	
F	1	N1/2 6, 7, & 8	001-06500	W. Steele	9.4	8,004	3,600		4,404	1,468.00	3,700	2,836.00	
F	1	N1/2 9 & 10	001-06600	F. Hinz	5.1	1,912			1,912	637.33	400	874.67	
	Township of Ashfield-Colborne-Wawanosh												
F	12	N1/2 6	012-01700	J. Wilkins	3.6	770			770	256.67		513.33	
F	12	N1/2 6	012-01800	J. & S. Wilkins	3.3	707			707	235.67		471.33	
F	13	S1/2 7	013-01600	S. Alton and S. Wright-Alton	1.1	236			236	78.67		157.33	
F	13	N1/2 7	013-01700	W. Nyland	4	856			856	285.33		570.67	
F	13	S1/2 6	013-01800	Gibson Ag Ltd.	36	7,705			7,705	2,568.33		5,136.67	
F	13	N1/2 6	013-01900	Gibson Ag Ltd.	40.8	8,733			8,733	2,911.00		5,822.00	
F	13	E1/2 5	013-02000	G. Gibson	36.2	7,748			7,748	2,582.67		5,165.33	
	13	E1/2 5	013-02001	F. & S. Bongertman	0.8	171						171.00	
F	13	W1/2 5	013-02100	G. & C. Gibson	27.3	5,843			5,843	1,947.67		3,895.33	
F	13	N1/2 4	013-02300	G. Gibson	8.7	1,862			1,862	620.67		1,241.33	
F	14	S1/2 7	014-02300	W. Nyland, P Nylan-Van Broekhoven & J. Nyland	1.6	343			343	114.33		228.67	
F	14	S1/2 6	014-02600	W. Nyland and P. Nylan-Van Broekhoven	20	4,280			4,280	1,426.67		2,853.33	
F	14	E1/2 5	014-02800	C. Irwin	24.9	5,330			5,330	1,776.67		3,553.33	
	14	W1/2 5	014-03000	S., M. & S. Hadziavdic	1.7	364						364.00	
	14	W1/2 5	014-03001	Township of Ashfield-Colborne-Wawanosh	0.3	65						65.00	
F	14	4 & W1/2 5	014-03100	JM Gibson Holdings	114.2	24,443			24,443	8,147.67		16,295.33	
F	14	E1/2 3	014-03300	2450623 Ontario Ltd.	12.1	2,590			2,590	863.33		1,726.67	
	Total Assessments on Lands:				474.5	178,115	11,600		165,358	55,119.34	36,100	86,895.66	
				Roads									
	Township of Huron-Kinloss												
	Unopened Road Allowance			Township of Huron-Kinloss	2.2	3,213						3,213.00	
	Township of Ashfield-Colborne-Wawanosh												
	Lanesville Line			Township of A-C-W	5.4	1,156						1,156.00	
	Tower Line			Township of A-C-W	4	856						856.00	
	Zion Road			Township of A-C-W	2.7	580						580.00	
	County Road 86			Bruce County (Boundary Road Agreement)	15.9	8,080						8,080.00	
	Total Assessments on Roads:				30.2	13,885	0					13,885.00	
	TOTAL ASSESSMENTS HAMILTON DRAIN 2025				504.7	192,000	11,600		165,358	55,119.34	36,100	100,780.66	

Notes:

1. Roll numbers are per the Municipality's last revised assessment roll, names included for convenience.
2. Lands noted with an "F" are classified as agricultural and according to current OMAFRA policy qualify for the 1/3 grant.
   Eligibility for the 1/3 grant will be confirmed at the time the final cost is levied.
3. Actual net assessment is levied to the owner of the parcel at the time the final cost is levied.

Hamilton Drain 2025
Township of Huron-Kinloss

			DRAIN A												TOWLE BRANCH			DRAIN F						
			-0+600 to -0+069 Interval 1				-0+069 to 1+306 Interval 2				Total				0+000 to 0+531			0+000 to 0+200						Grand Total
ESTIMATED COST	Allowances		3,200				19,600				22,800				1,300			12,000						36,100
	Construction		11,000				56,100				67,100				4,200			1,200						72,500
	Engineering		9,200				31,300				40,500				5,800			3,000						49,300
	Construction Supervision		3,100				19,400				22,500				3,200			0						25,700
	Section 73		900				4,300				5,200				500			200						5,900
	Net HST		410				1,840				2,250				175			75						2,500
	TOTAL		27,810				132,540				160,350				15,175			16,475						192,000
Roll No.	Owner	Total Ha Affected	Total ha Adjusted	Sec. 22 Benefit	Sec. 24 Spec. Ben.	Adj Ha	Outlet	Sec. 22 Benefit	Sec. 24 Spec. Ben.	Adj Ha	Outlet	Total S. 22 Benefit	Total S. 24 Spec. Ben.	Total Outlet	TOTAL	Benefit	Adj Ha	Outlet	Benefit	Adj Ha	Outlet	Total S. 22 Benefit	Total S. 24 Spec. Ben.	Total Outlets	TOTAL
	Lands																								
Township of Huron-Kinloss																									
001-00200	Gibson Ag Ltd.	5.0	5.0			5.0	162			5.0	909	0	0	1,071	1,071		0.0	0		0.0	0	0	0	1,071	1,071
001-00250	A. Thiessen	0.5	0.8			0.8	26			0.8	145	0	0	171	171		0.0	0		0.0	0	0	0	171	171
001-00300	Gibson Ag Ltd.	14.5	26.8			26.8	866	5,000	3,200	26.8	4,870	5,000	3,200	5,736	13,936		0.0	0	10,000	12.3	4,975	15,000	3,200	10,711	28,911
001-00310	T. Black	0.9	1.4			1.4	45			1.4	254	0	0	299	299		0.0	0		0.0	0	0	0	299	299
001-00400	Gibson Ag Ltd.	61.4	54.8	1,000		54.8	1,771	36,200	4,800	29.7	5,397	37,200	4,800	7,168	49,168	2,100	25.1	1,604	1,500	0.0	0	40,800	4,800	8,772	54,372
001-00402	E. Van Osch	0.6	0.9			0.9	29			0.0	0	0	0	29	29		0.9	58		0.0	0	0	0	87	87
001-00600	P. Schilegel	34.0	33.7	1,700		33.7	1,089			0.0	0	1,700	0	1,089	2,789	6,300	33.7	2,153		0.0	0	8,000	0	3,242	11,242
001-06500	W. Steele	14.4	9.4	3,100	3,600	9.4	304	1,000		0.0	0	4,100	3,600	304	8,004		0.0	0		0.0	0	4,100	3,600	304	8,004
001-06600	F. Hinz	10.0	5.1	600		5.1	165			0.0	0	600	0	165	765	1,000	2.3	147		0.0	0	1,600	0	312	1,912
Township of Ashfield-Colborne-Wawanosh																									
012-01700	J. Wilkins	3.6	3.6			3.6	116			3.6	654	0	0	770	770		0.0	0		0.0	0	0	0	770	770
012-01800	J. & S. Wilkins	3.3	3.3			3.3	107			3.3	600	0	0	707	707		0.0	0		0.0	0	0	0	707	707
013-01600	S. Alton and S. Wright-Alton	1.1	1.1			1.1	36			1.1	200	0	0	236	236		0.0	0		0.0	0	0	0	236	236
013-01700	W. Nyland	4.0	4.0			4.0	129			4.0	727	0	0	856	856		0.0	0		0.0	0	0	0	856	856
013-01800	Gibson Ag Ltd.	36.8	36.0			36.0	1,163			36.0	6,542	0	0	7,705	7,705		0.0	0		0.0	0	0	0	7,705	7,705
013-01900	Gibson Ag Ltd.	40.8	40.8			40.8	1,319			40.8	7,414	0	0	8,733	8,733		0.0	0		0.0	0	0	0	8,733	8,733
013-02000	G. Gibson	38.2	36.2			36.2	1,170			36.2	6,578	0	0	7,748	7,748		0.0	0		0.0	0	0	0	7,748	7,748
013-02001	F. & S. Bongertman	0.5	0.8			0.8	26			0.8	145	0	0	171	171		0.0	0		0.0	0	0	0	171	171
013-02100	G. & C. Gibson	27.3	27.3			27.3	882			27.3	4,961	0	0	5,843	5,843		0.0	0		0.0	0	0	0	5,843	5,843
013-02300	G. Gibson	10.3	8.7			8.7	281			8.7	1,581	0	0	1,862	1,862		0.0	0		0.0	0	0	0	1,862	1,862
014-02300	W. Nyland, P Nylan-Van Broekhoven & J. Nyland	1.6	1.6			1.6	52			1.6	291	0	0	343	343		0.0	0		0.0	0	0	0	343	343
014-02600	W. Nyland and P. Nylan-Van Broekhoven	20.5	20.0			20.0	646			20.0	3,634	0	0	4,280	4,280		0.0	0		0.0	0	0	0	4,280	4,280
014-02800	C. Irwin	27.8	24.9			24.9	805			24.9	4,525	0	0	5,330	5,330		0.0	0		0.0	0	0	0	5,330	5,330
014-03000	S., M. & S. Hadziavdic	1.1	1.7			1.7	55			1.7	309	0	0	364	364		0.0	0		0.0	0	0	0	364	364
014-03001	Township of Ashfield-Colborne-Wawanosh	0.2	0.3			0.3	10			0.3	55	0	0	65	65		0.0	0		0.0	0	0	0	65	65
014-03100	JM Gibson Holdings	118.9	114.2			114.2	3,691			114.2	20,752	0	0	24,443	24,443		0.0	0		0.0	0	0	0	24,443	24,443
014-03300	2450623 Ontario Ltd.	12.9	12.1			12.1	391			12.1	2,199	0	0	2,590	2,590		0.0	0		0.0	0	0	0	2,590	2,590
Sub-Total (Lands):		490.2	474.5	6,400	3,600	474.5	15,336	42,200	8,000	400.3	72,742	48,600	11,600	88,078	148,278	9,400	62.0	3,962	11,500	12.3	4,975	69,500	11,600	97,015	178,115
	Roads																								
Township of Huron-Kinloss																									
Unopened Road Allowance	Township of Huron-Kinloss	2.2	2.2	1,500		2.2	71			0.0	0	1,500	0	71	1,571	1,500	2.2	142		0.0	0	3,000		213	3,213
										0.0					0										
Township of Ashfield-Colborne-Wawanosh										0.0					0										
Lanesville Line	Township of A-C-W	1.8	5.4			5.4	175			5.4	981	0		1,156	1,156		0.0	0		0.0	0	0		1,156	1,156
Tower Line	Township of A-C-W	2.0	4.0			4.0	129			4.0	727	0		856	856		0.0	0		0.0	0	0		856	856
Zion Road	Township of A-C-W	0.9	2.7			2.7	87			2.7	493	0		580	580		0.0	0		0.0	0	0		580	580
										0.0															
County Road 86	Bruce County (Boundary Road Agreement)	5.3	15.9			15.9	512	5,000		13.2	2,397	5,000		2,909	7,909		2.7	171		0.0	0	5,000		3,080	8,080
Sub-Total (Roads);		12.2	30.2	1,500	-	30.2	974	5,000	-	25.3	4,598	6,500	0	5,572	12,072	1,500	4.9	313	0	0.0	0	8,000	-	5,885	13,885
TOTALS		502.4	504.7	7,900	3,600	504.7	16,310	47,200	8,000	425.6	77,340	55,100	11,600	93,650	160,350	10,900	66.9	4,275	11500	12.3	4,975	77,500	11,600	102,900	192,000

200 **GENERAL CONDITIONS**

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200 GENERAL CONDITIONS

200.1 SCOPE

The work to be done under this contract consists of supplying all labour, equipment and materials to construct the drainage work as outlined in the Instructions to Tenderers, the Form of Tender and Agreement, the Schedule of Tender Prices, the Drawings, the General Conditions, Special Provisions and the Standard Specifications.

200.2 ORDER OF PRECEDENCE

In case of any inconsistency or conflict between the drawings and specifications, the following order of precedence shall apply: Addenda, Form of Tender and Agreement, Schedule of Tender Prices, Special Provisions, Contract Drawings, Standard Specifications, General Conditions.

200.3 MUNICIPALITY

Municipality refers to a municipal corporation in the Province of Ontario. Where reference to Township, County, Region, Town, City or Owner appears it shall be deemed to be the same as the word Municipality. Where reference to owner appears in the specifications it is usually in reference to the owner of the property on which the drain is being constructed.

200.4 TENDERS AND CONTRACT SECURITY

Tenders are to be submitted for the complete works or a portion thereof, as instructed by the Municipality. The Schedule of Tender Prices must be completed and provided with the Contractor's tender.

A Tender Deposit in the form of a certified cheque, bank draft, bonding, or other security acceptable to the Municipality must accompany each tender as a guarantee of good faith. The Tender Deposit shall name the Municipality as the payee. Refer to the Instructions to Tenderers for additional Tender Deposit information and Contract Security requirements.

200.5 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Prior to the submission of the Tender, the Tenderer must examine the premises and site to compare them with the Drawings and Specifications in order to be satisfied with the existing conditions and the extent of the work to be done. If site examination requires entry onto privately owned lands, the Tenderer shall contact the Drainage Superintendent at least one week prior to the tender closing date to arrange site examination with the Drainage Superintendent.

The Tenderer must ensure that the meaning and intent of the drawings, estimated quantities and specifications is clearly understood before submission of the Tender. No allowances shall be made on behalf of the Contractor by reason of any error made in the preparation of the tender submission.

Any estimates of quantities shown or indicated on the drawings or elsewhere in the tender/contract document are provided for the convenience of the Tenderer. The Tenderer shall check the estimate of quantities for accuracy. Any use made of the estimated quantities by the Tenderer in calculating the tendered amounts is done at the Tenderer's risk.

200.6 COMMENCEMENT AND COMPLETION OF WORK

The work must commence immediately after the Tenderer is notified of the contract award or at a later date, where specified in the tender/contract document. If weather and ground conditions are unsuitable,

work may be started at a later date from either of the above two dates if such delay is approved by the Engineer.

Refer to Standard Specifications *400.2, 400.11, 400.20*, *400.21, 400.25* and *400.26* for notification requirements related to the *PRE-CONSTRUCTION MEETING, BENCHMARKS AND LAYOUT, WORKING IN ROAD ALLOWANCES, LANEWAYS AND ACCESS CROSSINGS, LIVESTOCK, AND STANDING CROPS*.

The work must proceed in such manner as to ensure its completion at the earliest possible date consistent with first class workmanship and within the time limit set out in the tender/contract document. Failure to commence or complete the work as set out in the tender/contract document may result in a forfeiture of all or part of the Contract Security if the Engineer determines that damages have been sustained by the Municipality or any landowner because of the non-commencement or non-completion of the contract as awarded and that the failure to meet the specified dates has been the fault of the Contractor.

200.7 NOTICE FOR RESUMPTION OF WORK

If the Contractor leaves the job site for a period of time after initiation of work, a minimum of 2 working days advance notice shall be given to the Engineer and the Municipality before returning to the job site to resume work. If any work is resumed without the advance notice, the Contractor shall be fully responsible for all such work undertaken prior to said notification and shall make good any works or materials judged to be inadequate.

200.8 PERMITS, NOTICES, LAWS AND RULES

The Contractor shall apply and pay for all necessary permits or licenses required for the execution of the work. This shall not include the obtaining of permanent easements or rights or servitude. The Contractor shall give all necessary notices and pay all fees required by the law and comply with all laws, ordinances, rules and regulations relating to the work and to the preservation of the public's health and safety and if the specifications and drawings are at variance therewith, any resulting additional expense incurred by the Contractor shall constitute an addition to the contract price.

200.9 HEALTH AND SAFETY

Contractor must comply with the *Occupational Health and Safety Act (OHSA)* and the associated *Regulations for Construction Projects*, including, but not limited to the requirements related to hazardous materials, physical agents and designated substances. Contractor must also follow any site-specific safety and training requirements of the Municipality, agencies, utility companies or other authorities.

Communication about site-specific hazards and safety requirements shall occur at the pre-construction meeting. If no pre-construction meeting is conducted, Contractor will communicate site-specific hazards and safety requirements before beginning work.

Contractor shall immediately report any workplace incidents, near misses, injuries and occupational illnesses to the Engineer.

200.10 LIMITATIONS OF OPERATIONS

Except for such work as may be required by the Engineer to maintain the works in a safe and satisfactory condition, the Contractor shall not carry out operations under the contract on Sundays or Statutory Holidays without permission in writing from the Engineer. The Engineer may direct in writing to the Contractor to cease or limit operations under the contract on any day or days if the operations are of such a nature, or if the work is so located, or if the traffic is of such a volume, that the Engineer deems it necessary or expedient to do so.

200.11 SUPERVISION

The Contractor shall provide constant supervision of the construction work and shall keep a competent foreman in charge at the site.

200.12 CHARACTER AND EMPLOYMENT OF WORKERS

The Contractor shall employ only orderly, competent and skillful workers to do the work and shall give preference to available qualified residents in the area of the contract. Whenever the Engineer informs the Contractor in writing that any workers are, in the opinion of the Engineer, disorderly, incompetent, or breaking the law, such workers shall be discharged from the job site and shall not again be employed on the job site without the written consent of the Engineer.

200.13 SUB-CONTRACTORS

If the Municipality so directs, the Contractor shall not sublet the whole or any part of this contract without the approval of the Engineer.

200.14 PAYMENT

Progress payments equal to the value of the work completed to date, less applicable holdbacks,will be made to the Contractor monthly or at the completion of the work. The Contractor may be required to provide a Proper Invoice for the progress payment amount. In accordance with the *Construction Act, R.S.O. 1990*, sixty (60) days after certification of substantial performance, the 10% Statutory Holdback will be released. Warranty Holdback of 3% of the contract value, unless specified otherwise in the tender/contract documents, may be reserved by the Municipality for one year after certification of substantial performance.

Holdbacks may be increased by the Municipality if, in the written opinion of the Engineer, particular conditions of the contract require such greater holdback.

After certification of substantial performance, the Warranty Holdback may be used by the Municipality to correct defects from faulty construction and/or materials, provided that notice shall first be given by the Engineer in writing to the Contractor stating that the Contractor has seven (7) days to remedy the defect in construction and/or materials.

Where alterations to the work are authorized by the Engineer, the Engineer's evaluation of payment for such changes shall consider the tendered price for similar work item(s). See Specification *400.8 – Alterations to Work*.

200.15 TERMINATION OF CONTRACT BY THE MUNICIPALITY

Termination of the contract by the Municipality may be considered if the Contractor:

1. should be adjudged bankrupt or make a general assignment for the benefit of creditors or if a receiver should be appointed on account of insolvency;
2. should refuse or fail to supply enough properly skilled workmen or proper materials after having received seven (7) days' notice in writing from the Engineer to supply such additional workmen or materials in order to commence or complete the works;
3. should fail to make prompt payment to sub-contractors or suppliers for labour or materials.
4. should persistently disregard laws, ordinances, or instructions from the Engineer, or otherwise be guilty of a substantial violation of the provisions of the contract;

then the Municipality, upon Certificate of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, give written notice to the Contractor to terminate the employment of the Contractor and take possession of the premises, and of all materials, tools and appliances thereon, and may finish the work by whatever method the Municipality may deem expedient,

but without undue delay or expense. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price will exceed the expense of finishing the work including compensation to the Engineer for additional services and including other damages of every name and nature, such excess shall be paid to the Contractor. If such expense will exceed such unpaid balance including the Contract Security, the Contractor shall pay the difference to the Municipality. The expense incurred by the Municipality, as herein provided, shall be certified by the Engineer. If the contract is terminated by the Municipality due to the Contractor's failure to properly commence the works, the Contractor shall forfeit the Contract Security and furthermore shall pay to the Municipality an amount to cover the increased costs, if any, associated with a new tender for the contract being terminated.

If any unpaid balance and the Contract Security do not equal the monies owed by the Contractor upon the termination of the contract, the Municipality may also charge such expenses against any money which is or may thereafter be due to the Contractor from the Municipality.

200.16 LIQUIDATED DAMAGES

It is agreed by the parties to the Contract that if all the work called for under the Contract is not finished or complete within the period of time as set forth in the tender/contract document, damage will be sustained by the Municipality. It is understood by the parties that it will be impracticable and extremely difficult to ascertain and determine the actual damage which the Municipality will sustain in the event of and by reason of such delay. The parties hereto agree that the Contractor will pay to the Municipality a sum as set out in the tender/contract documents for liquidated damages for each and every calendar day delay, including Saturdays, Sundays and Statutory Holidays, spent finishing the work in excess of the number of working days prescribed. It is agreed that the liquidated damages amount is an estimate of the actual damage to the Municipality which will accrue during the period in excess of the prescribed number of working days.

The Municipality may deduct any amount due under this section from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated damages payable under this section are in addition to and without prejudice to any other remedy, action or other alternative that may be available to the Municipality.

The Contractor shall not be assessed with liquidated damages for any delay caused by acts of nature, or of the Public Enemy, Acts of the Province or of any Foreign State, Fire, Flood, Epidemics, Quarantine Restrictions, Embargoes or any delays of Sub-Contractors due to such causes.

If the time available for the completion of the work is increased or decreased by reason of alterations or changes made under the provisions of the Contract, the number of working days shall be increased or decreased as determined by the Engineer.

If the tender/contract document does not show an amount for Liquidated Damages then Liquidated Damages do not apply for this contract.

200.17 CONTRACTOR'S LIABILITY

The Contractor and all workers, agents or any party under the Contractor's control, including Sub-Contractors, shall use due care that no person or property is injured and that no rights are infringed during the construction work outlined in the contract. The Contractor shall be solely responsible for all damages by whomsoever claimable in respect of any injury to persons or to lands, buildings, structures, fences, livestock, trees, crops, roadways, ditches, drains and watercourses, whether natural or artificial, or property of whatever description and in respect of any infringement of any right, privilege or easement wherever occasioned in the carrying on of the work or any part thereof, or by any neglect, misfeasance or non-feasance on the Contractor's part or on the part of any workers, agents or parties under the Contractor's control including Sub-Contractors, and shall bear the full cost thereof. The Contractor shall be fully responsible to make such temporary provisions as may be necessary to ensure the avoidance of any such damage, injury or infringement and to prevent the interruption of or danger or menace to the

traffic in any railway or any public or private road entrance or sidewalk and to secure to all persons and corporations the uninterrupted enjoyment of all their rights, in and during the performance of the work. The Contractor shall indemnify and save harmless the Municipality and the Engineer from and against all claims, demands, losses, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon, occasioned by, or attributed to any such damage, injury or infringement.

Wherever any work is of such an extent and nature that it must necessarily be confined to particular areas of a roadway, a working area, or private property, the Contractor shall use reasonable care not to damage or deface the remaining portions of the property, and if any damage is occasioned as a result of the Contractor's operations, it shall be rectified by and at the expense of the Contractor, to the satisfaction of the Engineer. Notwithstanding the indemnity provisions contained in this section, where in the opinion of the Engineer the Contractor has failed to rectify any damage, injury or infringement or has failed to adequately compensate any person for any damage, injury or infringement for which the Contractor is responsible under the contract, the Engineer, following notice in writing to the Contractor of an intention so to do, may withhold payment of any monies due the Contractor under this or any other contract until the Contractor has rectified such damage, injury or infringement or has paid adequate compensation for such damage, injury or infringement, provided however, that the Municipality will not withhold such monies where in the opinion of the Engineer there are reasonable grounds upon which the Contractor denies liability for such damage, injury or infringement and the Contractor has given the claimant a reasonable time in which to establish the validity of the claim, and provided further that the amount withheld under this section shall not exceed the amount of such claims against the Contractor.

Where the Contractor uses privately owned lands for material disposal, the Contractor shall comply with applicable laws and provide the Engineer with a release signed by or on behalf of the owner of each material disposal area used by the Contractor. If the said release is not obtained, then sufficient monies will be withheld from the Contractor except, however, where the owner's signature is withheld solely on the basis of damage, injury, or infringement it will be dealt with as provided elsewhere in this subsection.

Nothing herein contained shall be construed as in any way restricting or limiting the liability of the Contractor under the laws of the country, province or locality in which the work is being done. Neither the Certificate of Substantial Performance nor final payment thereunder, nor any provision in the Contract Document shall relieve the Contractor from this liability.

200.18 LIABILITY INSURANCE

The Contractor shall take out and keep in force until the end of the warranty period for the entire work, a comprehensive policy of public liability and property damage insurance providing insurance coverage of at least $3,000,000 for each and every accident, exclusive of interest and cost, against loss or damage resulting from bodily injury to or death of one or more persons and loss of or damage to property and such policy shall where, and as requested by the Municipality, name the Municipality and the Engineer as an additional insured thereunder and shall protect the Municipality against all claims for all damage or injury including death to any person or persons and for damage to any property of the Municipality or any other public or private property resulting from or arising out of any act or omission on part of the Contractor or any of his servants or agents during the execution of the Contract.

200.19 LOSSES DUE TO ACTS OF NATURE, ETC.

All damage, loss, expense and delay incurred or experienced by the Contractor in the prosecution of the work, by reason of unanticipated difficulties, bad weather, strikes, wars, acts of nature, or other mischances, shall be borne by the Contractor and shall not be the subject of a claim for additional compensation.

400 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS

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400 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS

400.1 ABBREVIATIONS

i) MTO means the Ministry of Transportation of Ontario
ii) ASTM means the American Society for Testing Materials
iii) CSA means the Canadian Standard Association
iv) OPSD means Ontario Provincial Standard Drawings
v) OPSS means Ontario Provincial Standard Specifications
vi) DFO means Fisheries and Oceans Canada
vii) MNRF means Ministry of Natural Resources and Forestry
viii) MECP means Ministry of Environment, Conservation and Parks

400.2 PRE-CONSTRUCTION MEETING

The Contractor shall arrange a pre-construction meeting with the Engineer, Municipality, and affected landowners prior to commencement of construction. The Contractor shall provide at least ten working days advance notice of the pre-construction meeting. Construction shall not commence less than five working days after the pre-construction meeting to allow time for layout and crop salvage.

If there is no pre-construction meeting or if a landowner is not present at the pre-construction meeting, prior to construction, the drain is to be walked by the Contractor and each landowner not present at the meeting to ensure that both agree with the work shown on the Drawings. Any difference of opinion shall be referred to the Engineer for decision. If the landowner is not contacted for such review, the Contractor shall advise the Engineer or the Municipality.

The cost to coordinate and attend the pre-construction meeting, including any follow-up meetings, is considered incidental and shall be included in the price of other tender items.

400.3 COLD WEATHER

When working in cold weather is approved by the Engineer, the Contractor shall provide suitable means for heating, protection of the work, and snow and ice removal. All work completed in cold weather conditions shall be to the satisfaction of the Engineer and any additional cost to remedy unsatisfactory work, or to protect the work, shall be borne by the Contactor. All backfilling shall occur as soon as possible to avoid backfilling with ground containing frozen particles. The Contractor will assume all responsibility for damages to any tile drains and for settlements or bank failure that may result from work in cold weather.

400.4 WORKING AREA

Unless otherwise specified on the Drawings, the working area is defined as follows:

- Where any part of the drain is on a road allowance, the road allowance shall be the working area.
- If any part of the drain is close to a property line, then the property line shall be one of the limits of the working area.
- For a closed drain, the working area shall not exceed 25 metres. A 10m x 10m working area exists around any catchbasin, junction box or access point.
- For an open drain, the working area shall be 17 metres wide on the side for leveling and 3 metres wide on the opposite side.
- A 10m wide working area shall exist for any overflow swale or grassed waterway.

400.5 PROPERTY BARS AND MONUMENTS

All property bars and monuments shall be protected. If a property bar or monument is shown on the Drawings with a note "***to be protected***", or similar, and is damaged by the Contractor, the damaged bar(s) shall be reinstated by an Ontario Land Surveyor at the Contractor's expense.

400.6 ACCESS

The Contractor shall have access to the drain by entering the working area directly from road allowances or along access routes shown on the Drawings. No other access routes shall be used unless first approved by the Engineer and the affected landowner. The Contractor shall notify each landowner prior to using the designated access routes. Standard Specifications *400.24 - FENCES, 400.25 - LIVESTOCK, and 400.26 - STANDING CROPS* also apply to access routes. The Contractor shall make good any damages caused by using the designated access routes. Costs to restore access routes to existing conditions shall be borne by the Contractor.

400.7 ACCESS TO PROPERTIES ADJOINING THE WORK

The Contractor shall provide at all times and at no additional cost, access to private properties adjoining the work, unless otherwise authorized by the Engineer. Where interruptions to access have been authorized by the Engineer, a minimum of 48 hours written notice shall be given by the Contractor to the affected landowners and such interruptions shall be arranged to minimize interference to those affected.

400.8 ALTERATIONS TO WORK

Design changes determined by the Engineer (alteration, additions, and deletions) shall be implemented by the Contractor without delay and shall in no way render the contract void.

In every such case, the contract amount shall be increased or decreased as required according to a fair evaluation of the work completed. Where such design changes involve additional work similar to items in the contract, the price for additional work shall be determined after consideration is given to the tendered price for similar items.

Additional work desired by the landowner(s), which is not part of the drainage works, may be arranged with the Contractor provided the cost of the work is paid by the landowner(s) and the Engineer reviews the additional work in advance. Such additional work is not part of the drainage works for future maintenance.

400.9 ERRORS AND UNUSUAL CONDITIONS

The Contractor shall notify the Engineer immediately of any *"errors or unusual conditions"* which may be found. Any attempt by the Contractor to correct an *"error"* without notice to the Engineer is at the Contractor's risk and expense. The Engineer shall determine necessary steps to correct errors or address unusual conditions. The contract amount shall be adjusted through a fair evaluation of documentation for the work added, deleted, or adjusted.

400.10 TESTS

The Engineer reserves the right to subject any materials to a competent testing laboratory for compliance with applicable Provincial and/or Municipal standards. If any materials supplied by the Contractor fail to meet the applicable standards, the Contractor shall bear full responsibility to remove all rejectable materials and replace with acceptable materials.

400.11 BENCHMARKS AND LAYOUT

The Engineer will layout the location of the proposed work unless otherwise provided in the Contract.

It is the Contractor's responsibility to confirm the location and elevation of benchmarks and layout stakes prior to construction and notify the Engineer immediately of any discrepancies.

The Contractor shall be liable for the cost of replacing any benchmarks or layout stakes destroyed during construction. The Contractor shall also be liable for the cost of additional layout if the Contractor's schedule delay requires replacement of original layout stakes.

400.12 INSPECTION OF UNDERGROUND WORK

The Contractor shall not cover up any work without providing the Engineer two working days notice and opportunity for carrying out an inspection.

If inspection does not occur as the work proceeds, inspection points shall be provided, with no additional payment, at the following locations: 50m intervals, tile connections, grade changes, junction boxes, fittings and pipe diameter/material transitions. If no inspection points are provided, the Engineer reserves the right to require the Contractor to expose the buried work for inspection purposes.

No additional payment will be made if the Engineer requires additional inspection points or exposure of covered work in other locations.

400.13 FINAL INSPECTION

Final inspection by the Engineer will occur after receiving written notice from the Contractor that work is complete. All the work included in the contract shall, at the time of final inspection, be completed to the dimensions and cross-sections shown on the Drawings.

Prior to issuing the certificate of substantial performance, a final inspection meeting may be held by the Engineer with landowners directly affected by the construction of the drain. The Contractor shall attend this meeting upon notice by the Engineer.

If there is no final inspection meeting with the Engineer, the Contractor shall obtain from each landowner a written statement indicating that the work has been performed to the landowner's satisfaction. If the Contractor is unable to obtain a written statement from the landowner, the Engineer will determine if further work is required prior to issuing the certificate of substantial performance.

The cost of attending the final inspection meeting and/or obtaining written statements from landowners, including any follow-up meetings, is considered incidental and shall be included in price of other tender items.

400.14 WARRANTY

There shall be a one-year warranty period on all completed work. The warranty period will commence on the date of the certificate of substantial performance.

When directed by the Engineer, the Contractor shall repair and make good any deficiencies in the work that may appear during the warranty period.

Before final acceptance by the Municipality and release of Warranty Holdback, the Contractor shall complete all work as directed by the Engineer, remove all debris and surplus materials, and leave the work neat and presentable.

400.15 PIPE MATERIALS

400.15.1 Concrete Drain Tile

Concrete drain tile shall conform to the requirements of the most recent ASTM C412 specifications for heavy duty extra quality concrete tile, unless a stronger concrete tile is required by the Special Provisions or Drawings. All tile furnished shall be subject to the approval of the Engineer.

The minimum nominal length of concrete drain tile shall be 1200mm.

All tile shall be of good quality, free from distortions and cracks and shall meet the standards specified. The ends shall be smooth and free from cracks. The Engineer reserves the right to reject unacceptable tiles. All rejected tiles are to be immediately removed from the site at the Contractor's expense.

400.15.2 Corrugated Plastic Tubing

Corrugated plastic tubing shall conform to the current version of the *Land Improvement Contractors of Ontario Standard Specification for Corrugated Plastic Drainage Tubing*.

Type of material (solid or perforated) and need for filter sock will be specified on the Drawings or in the description of the work in the Special Provisions. Filter sock, where specified, shall be a standard synthetic filter material as provided by a recognized plastic tubing manufacturer unless noted differently on the contract drawings or elsewhere in the contract document. The Contractor shall protect coils of plastic tubing from damage and deformation.

400.15.3 Smooth Wall Plastic Tubing

Smooth wall plastic tubing shall be dual-wall, high density polyethylene and conform to the requirements of the most recent ASTM 3390 specification for *"lined flexible corrugated polyethylene pipe"* for land drainage applications.

Type of material (solid or perforated) and need for filter sock will be specified on the Drawings or in the description of the work in the Special Provisions. Filter sock where specified shall be a standard synthetic filter material as provided by a recognized plastic tubing manufacturer unless noted differently on the contract drawings or elsewhere in the contract document. The Contractor shall protect coils of smooth wall plastic tubing from damage and deformation.

400.15.4 Corrugated Steel Pipe

Corrugated Steel Pipe (CSP) shall be according to OPSS.MUNI 1801 (CSA G401). Unless stated otherwise in the Special Provisions the pipe shall be:

- galvanized
- helical corrugation with lock seam and re-rolled annular ends
- 68mm x 13mm corrugation profile for diameters up to 1200mm
- 125mm x 25mm corrugation profile for diameters 1200mm and larger
- minimum wall thickness of 1.6mm for diameters up to 500mm
- minimum wall thickness of 2.0mm for diameters 600mm and larger
- joined using standard couplers matching the pipe diameter and material

Other coatings that may be specified include aluminized Type 2 or polymer. Polymer coating shall be a 254mm polymer film laminated to both sides of the pipe.

400.15.5 HDPE Pipe

Material indicated as "HDPE Pipe" or "Solid Plastic Pipe" shall be a high density polyethylene, dual-wall corrugated pipe with smooth inner wall, solid with no perforations, and minimum pipe stiffness at 320 kPa at 5% deflection certified to CSA B182.8, in accordance with OPSS.MUNI 1840.

When HDPE pipe is installed under a road right-of-way, private laneways or parking areas, the pipe joints shall be bell and spigot with rubber gaskets (CSA 182.8, Type 1) so that joints are watertight.

When HDPE pipe is specified for use on private lands, acceptable joints may be bell and spigot with rubber gaskets, or snap-on or split couplers (CSA 182.8, Type 3) so that joints are soil tight.

All fittings shall be injection molded HDPE.

400.15.6 Concrete Sewer Pipe

Concrete sewer pipe shall be in accordance with OPSS 1820.

Concrete sewer pipe shall be reinforced circular concrete pipe according to CSA A257.2 with joints and gaskets according to CSA A257.3.

Where specified, reinforced elliptical concrete sewer pipe, joints and gaskets shall be according to ASTM C 507M.

Classes shall be as shown on the Contract Drawings or as described in the Form of Tender.

Where concrete sewer pipe ***"seconds"*** are specified, the pipe should exhibit no damage or cracks on the barrel section and shall be capable of satisfying the crushing strength requirements of OPSS 1820. The pipe may contain cracks or chips in the bell or spigot which prevent the use of rubber gaskets but the joints must be protected with geotextile.

400.16 RIPRAP

All riprap is to be placed on a geotextile underlay, unless directed otherwise in the Drawings. Geotextile material shall be as specified in Specification *400.17 - GEOTEXTILE*, with the upstream edge of the geotextile keyed down 300mm below the bottom of riprap. The riprap is to be graded heavy angular stone (quarry stone is recommended) and shall meet gradation requirements for R-50 riprap per OPSS.MUNI 1004 Table 8 (averaging in size from 210mm to 305mm) and is to be placed at 300mm thickness, unless otherwise specified. Smaller particles may be included to fill voids. The finished top of riprap shall be at design cross-section, at design elevation or flush with existing ground.

400.17 GEOTEXTILE

Geotextile to be non-woven fabric that is rot proof, non-biodegradable, chemically resistant to acidic and alkaline soils and is dimensionally stable under different hydraulic conditions (Terrafix 360R or equal). Alternative geotextile materials shall be submitted to the Engineer prior to construction. The primary function of geotextile is to act as a highly permeable, non-clogging barrier between different materials. The Contractor shall follow the manufacturer's recommendations for cutting, installation and precautions necessary to avoid damage to the geotextile.

400.18 BACKFILL

Where sufficient clean on-site material is not available, the Contractor shall import material for backfill. Any imported material shall be approved by the Engineer in advance of supply & placement.
Imported material shall be free of deleterious material and shall satisfy the requirements of O. Reg. 406/19 for use in the location proposed. If requested by the Engineer, the Contractor shall provide test results at no additional cost to demonstrate conformance with project requirements. If non-conforming materials are rejected by the Engineer, they shall be removed at no additional cost.

If the work is being performed during winter months, frozen material shall not be used as backfill under roads or any other areas where settlement could negatively affect the surface above the work area.

400.19 NOTIFICATION OF ROAD AUTHORITIES, UTILITIES AND RAILROADS

The Contractor shall notify any Road Authority, Utility, or Railroad at least two working days in advance regarding work to be performed on their property or affecting their infrastructure. Where a Road Authority, Utility or Railroad has specific notification requirements, those requirements shall apply. The notice will be in writing and is exclusive of Saturdays, Sundays and Holidays. The Contractor is responsible to determine, understand and comply with the requirements of all authorities that may place restrictions upon the performance of the work, including without limitation, MTO, local utilities and railway authorities. In

submitting the tender, the Contractor represents that they have made all necessary inquiries to all authorities, as required, to carry out the proposed work.

400.20 WORKING IN ROAD ALLOWANCES

400.20.1 General

Work within public road allowances shall be done in accordance with the Ontario Traffic Manual Book 7, latest edition and the requirements of the Road Authority.

400.20.2 Maintenance of Traffic

Unless directed otherwise on the drawings or in the specifications, the Contractor shall keep roads open to traffic at all times. The Contractor shall provide suitable warning signs and/or flagging per OTM Book 7 requirements to the satisfaction of the Road Authority and the Engineer. Where specified in the Contract or when requested by the Engineer, the Contractor shall provide a Traffic Control Plan to the satisfaction of the Road Authority and the Engineer at no additional cost.

If road closure is required, the Contractor shall submit a Detour Plan for approval by the Road Authority and Engineer. The Contractor shall provide all signage for the detour route per OTM Book 7 and undertake all notifications required for the road closure in consultation with the Municipality.

400.20.3 Road Crossings

If no specific detail is provided for road crossings on the drawings or in the specifications the following shall apply:

General/Pre-Construction Phase

- A Road Authority will supply no labour, equipment, or materials for the construction of the road crossing.
- The Contractor shall not commence road crossing work until any required permits have been obtained.
- The Contractor shall notify the Road Authority, per the Road Authority's notification requirements, in advance of any construction in the road allowance. If the Road Authority has no notification requirements, at least 3 working days written notice shall be given.
- At least 2 working days prior to starting road crossing work, the Contractor shall confirm with the Municipality that EMS, OPP and Fire Department have been properly notified of any detours or road closures.

Construction Phase

- Exact location of the crossing shall be verified with the Road Authority and the Engineer.
- Pipe bedding shall be a minimum 150mm depth of Granular A, shaped for the pipe and compacted to 98% SPMDD.
- Pipe cover shall be Granular B, compacted to 98% SPMDD and extend 300mm above the top of the pipe.
- Trench shall be backfilled with acceptable native material for the base width of the road base. Trench backfill material shall be placed in lifts not exceeding 300mm in depth and shall be thoroughly compacted to 95% SPMDD. Trench backfill (subgrade) shall be inspected and approved by the Engineer prior to the placement of road base granular material.
- Road base granular material shall be placed in lifts not exceeding 300mm in depth and shall be compacted to 100% SPMDD. Unless otherwise specified, road base shall consist of minimum 450mm of Granular B and minimum 150mm of Granular A.
- Any surplus excavated material within the road allowance shall be disposed of per the Road Authority's requirements.
- The Contractor shall restore the road surface to the satisfaction of the Engineer and Road Authority requirements.

Warranty Phase

- The Contractor shall be responsible for correcting any backfill settlement during construction and during the warranty period. Upon approval of the Road Authority, surplus gravel shall be stockpiled near gravel road crossings to provide backfill for future trench settlement.

- If any road crossing is not left in a safe manner at the end of the working day, barricades and warning signs shall be erected to guarantee the safety of the travelling public per OTM Book 7 requirements.
- If the Engineer deems a road surface to have been damaged by the construction of a drain, either across or along the road, the Engineer may direct the Contractor to restore the road surface to existing or better condition, at no additional cost.
- All road crossings shall meet the final approval of the Road Authority at the end of the warranty period.

400.21 LANEWAYS AND ACCESS CROSSINGS

If no specific detail is provided for laneways and access crossings on the Drawings or in the Specifications the following shall apply:

General/Pre-Construction Phase

- The Contractor shall notify the landowner(s) at least 1 working day prior to impacting laneway access.

Construction Phase

- Pipe shall be on suitable, undisturbed, native material. If native material is deemed unsuitable by the Engineer, pipe shall be placed on 300mm depth of 19mm clear stone, wrapped in geotextile.
- Pipe bedding, cover and trench backfill shall be suitable native material placed in lifts not exceeding 300mm in depth and shall be thoroughly compacted to 95% SPMDD.
- Top 450mm of laneway backfill shall consist of minimum 300mm depth of Granular B and minimum 150mm depth of Granular A, compacted to 98% SPMDD, and shall be placed in lifts not exceeding 300mm in depth.
- Where pipe cover is minimal, laneway backfill may consist of minimum 300mm depth of Granular A, compacted to 98% SPMDD, subject to approval by the Engineer.
- Unless otherwise specified, the Contractor shall restore the laneway surface and dimensions to existing conditions, to the satisfaction of the Engineer.

Warranty Period Phase

- The Contractor shall be responsible for correcting any backfill settlement during construction and warranty period.

400.22 LOCATIONS OF EXISTING UTILITIES

The position of pole lines, conduits, watermains, sewers and other underground and overhead utilities are not necessarily shown on the Contract Drawings, and, where shown, the accuracy of the position of such utilities and structures is not guaranteed. Before starting work, the Contractor shall have all public and private utilities located.

Upon the request of the Utility owner or the Engineer, utilities shall be exposed to confirm there are no utility conflicts and adequate clearance is provided between existing utilities and the proposed work. In the case of utility conflict(s) or inadequate clearance(s), the Contractor shall notify the Engineer immediately. The Engineer may change the proposed design in accordance with Specification *400.8 - ALTERATIONS TO WORK*.

Unless otherwise provided in the tender, the cost of exposing utilities, including the use of hydrovac methods, shall be included in the price of other tender items. Additional payment will be allowed for relocation of utilities if conflicts are encountered.

The Contractor is responsible for protecting all located and exposed utilities from damage during construction. The Contractor shall assume liability for damage caused to all properly located utilities.

400.23 EXISTING CROSSING CLEANOUT

Where the Special Provisions require an existing crossing to be cleaned, the Contractor shall provide a bottom width and depth that provides capacity equivalent to the capacity of the channel on either side. Excavated materials shall be hauled away unless adjacent landowners give permission for leveling. Care shall be taken to ensure that existing abutments or any portion of the structure are not damaged or undercut. The method of removing the material is to be pre-approved by the Engineer.

400.24 FENCES

If the Contractor is responsible to remove and install fences, the following shall apply:

- All fences removed by a Contractor are to be re-erected in as good a condition as existing materials permit.
- All fences shall be properly stretched and fastened. Where directed by the Engineer, additional steel posts shall be placed to adequately support a fence upon re-erection.
- Where possible, the Contractor shall take down an existing fence at the nearest anchor post and roll the fence back rather than cutting the fence and attempting to patch it.
- Where fence materials are in such poor condition that re-erection is not possible, the Contractor shall replace the fence using equivalent materials. Such fence material shall be approved by the Engineer and the landowner. Where the Engineer approves new fence material, additional payment will be provided.

Any fences paralleling an open drain, that are not line fences, which hinder the proper working of the excavating machinery for drain construction or maintenance, shall be removed and rebuilt by the landowner at their own expense. If such parallel fences are line fences, they shall be removed and reinstalled by the Contractor.

No excavated or cleared material shall be placed against fences.

The installation of all fences shall be done to the satisfaction of the Engineer and the landowner.

400.25 LIVESTOCK

If any construction is within a fenced field containing livestock that are evident or have been made known to the Contractor, the Contractor shall notify the owner at least two working days in advance of accessing the field. Thereafter, the owner shall be responsible for the protection of the livestock in the field during construction and shall also be liable for any damage to or by the livestock.

The Contractor shall adequately re-erect all fences at the end of each working day, unless the owner provides written approval for the fences to remain open until construction is complete. No field containing livestock shall have a trench left open at the end of the working day, unless the trench has been adequately protected with fencing. Failure of the Contractor to comply with this paragraph shall render the Contractor liable for any damage to or by the livestock.

Where livestock may be encountered on any property the Contractor shall notify the Engineer to arrange for inspection of the work prior to backfilling.

400.26 STANDING CROPS

The Contractor shall not be held responsible for damages to standing crops within the working area and designated access routes for the drain. However, the Contractor shall notify the owner of upcoming work that will damage/destroy crops at least two working days prior to commencement of construction to allow the owner an opportunity to harvest or salvage the crop within the drain working area. If this advance notice is not given, the Contractor may be held liable for the loss of the standing crops if harvest could have reasonably been achieved by the owner if proper notice had been given by the Contractor.

400.27 CLEARING VEGETATION

400.27.1 General
The area for clearing, if not defined elsewhere, shall be 15m on each side of the drain.

400.27.2 Trees to Remain
Where it is feasible to work around existing trees that do not impede the function of the drainage works, the Contractor shall not remove any deciduous tree larger than 300mm and any coniferous tree larger than 200mm, unless authorized by the Engineer.

400.27.3 Incidental Clearing
Incidental clearing includes removal of trees, brush or other vegetation with an excavator during construction activities, and the cost is to be included in the price for the related construction activity.

400.27.4 Power Brushing
Power brushing includes removal of above-ground vegetation with a rotary brush cutter or other mechanical means. Stump and root removal is not required. Power brushed vegetation in a channel cross-section shall be removed and leveled in the working area. Excavated material may be placed and leveled on power brushed vegetation.

400.27.5 Close-Cut Clearing
Close-cut clearing includes removal of above-ground vegetation cut flush with the ground. Stump and root removal is not required.

400.27.6 Clearing And Grubbing
Clearing and grubbing includes removal of vegetation, including stumps and roots. Removal of earth from the grubbed area into the windrows or piles is to be minimized.

400.27.7 Disposal of Cleared Vegetation

400.27.7.1 In Bush Areas
Cleared vegetation is to be pushed into windrows or piles at the edge of the cleared area. Stumps and roots are to be piled first at the edge of the cleared area, followed by other vegetation (trunks, branches, etc.). Provisions for lateral drainage are required through all windrows. Windrows are not to block any laneways or trails. After removing cleared vegetation, the working area shall be leveled to the satisfaction of the Engineer.

400.27.7.2 In Field Areas
Cleared vegetation resulting from incidental clearing or power brushing may be hauled away, mulched in place or reduced to a size that permits cultivation using conventional equipment without causing undue hardship on farm machinery.

Cleared vegetation resulting from close-cut clearing or clearing and grubbing is to be hauled away to an approved location. Disposal sites may be in bush areas or other approved locations on the same farm. No excavated material shall be levelled over any logs, brush or rubbish of any kind.

400.27.8 Landowner Requested Salvage
A landowner may request that wood be separated from the windrows for the landowner's future use. This additional work would be eligible for extra payment, subject to the approval of the Engineer.

400.27.9 Clearing by Landowner
Wherever the Contract indicates that clearing may be undertaken by the landowner, work by the landowner shall be in accordance with the Clearing Vegetation requirements of this specification and must be completed so as not to cause delay for the Contractor. If the landowner does not complete clearing in accordance with these requirements, the Contractor will undertake the clearing at a price approved by the Engineer.

400.28 TOPSOIL

The Contractor shall strip, stockpile and salvage all existing topsoil within the disturbance limit of construction activities. The salvaged topsoil shall then be used to restore disturbed areas to the satisfaction of the Engineer. Disposal of excess topsoil shall be approved by the Engineer, and shall be disposed of at an approved disposal site.

Unless specified otherwise, the cost to remove, handle, haul, stockpile, salvage, dispose, supply and place topsoil, including all labour, material and equipment, shall be included in the price of other tender items.

400.29 BEDROCK REMOVAL

400.29.1 General

This section applies to bedrock and boulders that are greater than one-half cubic meter in size and that require blasting or hoe-ram removal. Bedrock or boulders that can be removed with an excavator bucket are not considered bedrock removal for the purposes of this section.

400.29.2 Blasting Requirements

All blasting shall be performed by a competent, qualified blaster in accordance with OPSS 120. Blasting mats are required. A pre-blast survey meeting the requirements of OPSS 120 must be completed for any structure within 200m of any blasting. The cost for pre-blast survey shall be included in the tender price for bedrock removal.

400.29.3 Typical Sections and Pay Limits

For tile drains and road culverts, bedrock shall be removed to 150mm below the proposed grade shown on the profile so that pipes are not in direct contact with bedrock. The width of bedrock removal shall be 1m minimum or the diameter of the pipe plus 600mm.

For open drains, bedrock removal shall match the proposed grade and bottom width shown on the Drawings. Side slopes shall be vertical or sloped outward. Side slopes shall be free of loose bedrock when excavation is completed.

Payment for the quantity of bedrock removed will be based on the typical sections described in these specifications and confirmed by field measurements. There will be no payment for overbreak.

400.29.4 Disposal of Bedrock

Excavated bedrock shall be piled at the edge of the working area at locations designated by the landowner. The cost to pile excavated bedrock shall be included in the tender price for bedrock removal. If the Special Provisions or the landowner require excavated bedrock to be hauled away, additional payment will be considered.

Where approved by the Engineer, excavated bedrock may be used in place of imported riprap in compliance with Specification *400.16 - RIPRAP*.

400.30 SURFACE RESTORATION

400.30.1 General

The Contractor shall be responsible for re-seeding as necessary for uniform catch during warranty period.

Areas that remain grassed after construction may not need to be seeded, unless directed otherwise by the Engineer.

400.30.2 Seeding
All disturbed ditch banks, berms and other grassed areas are to be seeded at the end of the day.

The following seed mixture shall be applied at 60kg/ha using a mechanical (cyclone) spreader:

- 35% Creeping Red Fescue
- 25% Birdsfoot Trefoil
- 25% Kentucky Bluegrass
- 10% Cover Crop (Oats, Rye, Barley, Wheat)
- 5% White Clover

Provide temporary cover for late fall planting by adding an additional 10 kg/ha of rye or winter wheat.

400.30.3 Hydroseeding
Where hydroseeding is specified, disturbed areas will be restored by the uniform application of a standard roadside mix, fertilizer, mulch and water at a rate of 2,000 kg/ha and be in accordance with OPSS 804.

400.30.4 Lawns
Unless specified otherwise, lawn areas shall be seeded with Canada No. 1 lawn grass mixture applied at 300 kg/ha using a mechanical (cyclone) spreader on 100mm of topsoil. Fertilizer shall be 5:20:20 or 10:10:10 applied at 300 kg/ha. Seed and fertilizer shall be applied together. Contractor shall arrange for watering with landowners.

400.30.5 Sod
Where sod is specified, sod is to be commercial grade turfgrass nursery sod, Kentucky Bluegrass placed on 150mm of topsoil. Fertilizer shall be 5-20-20 applied at 10kg/ha. Place sod in accordance with supplier instructions. The Contractor is responsible for saturating the sod with water on the day of sod placement. Subsequent watering is the responsibility of the landowner.

400.31 EROSION AND SEDIMENT CONTROL

400.31.1 General
The Contractor shall install sediment control features at the downstream limits of the project and at other locations as shown on the drawings or as directed by the Engineer.

Sediment control features shall be installed prior to any excavation taking place upstream of that location. The Contractor shall maintain all sediment control features throughout construction and the warranty period.

Sediment that accumulates during construction shall be removed and levelled as required by the Contractor.

400.31.2 Silt Fence
Silt fence shall be in accordance with OPSS 805.07.02.02 and OPSD 219.110 (light-duty).

400.31.3 Erosion Control Blankets
Erosion Control Blankets (ECB) shall be biodegradable and made of straw/coconut (Terrafix SC200, Nilex SC32 or equal) or coconut (Terrafix C200, Nilex C32 or equal) with photodegradable, double net construction. The blanket and the staples shall be supplied and installed as per OPSS 804.

Erosion control blankets shall be placed and stapled into position as per the manufacturer's installation instructions on slopes as directed by the Engineer. Blankets shall be installed in direct contact with the ground surface to form a uniform, cohesive mat over the seeded earth area. The blankets are to be single course with 150mm overlap between blankets and staggered joints. The Contractor shall ensure that the ECB is anchored to the soil and that tenting of the ECB does not occur.

On slopes, when the ECB cannot be extended 1m beyond the crest of the slope, the uppermost edge of the ECB shall be anchored in a 150mm wide by 150mm deep trench. The trench shall be backfilled with earth and compacted.

400.31.4 Flow Check Dams

400.31.4.1 Temporary Straw Bale Flow Check Dam

The straw bale flow check dam shall consist of a minimum of 3 bales. Each bale is to be embedded at least 75mm into the channel bottom and shall be anchored in place with two (2) - 1.2m wooden stakes, driven through the bale and 600mm below ground.

Accumulated sediments shall be excavated and levelled prior to demobilization from the site after initial construction and at the end of the warrant period. Straw bales are to be removed at the end of the warranty period.

400.31.4.2 Temporary Rock Flow Check Dam

The temporary rock flow check dam shall extend to the top of the banks so that dam overtopping does not cause bank erosion. Rock shall be embedded a minimum of 150mm into the ditch bottom and banks. No geotextile is required for temporary rock flow check dams.

Accumulated sediments shall be excavated and levelled prior to demobilization from the site after initial construction and at the end of the warranty period. Temporary rock flow check dams are to be removed at the end of the warranty period.

400.31.4.3 Permanent Rock Flow Check Dam

The requirements of temporary rock flow check dams shall apply except rock shall be placed on geotextile and the dam shall remain in place permanently.

400.31.5 Sediment Traps

400.31.5.1 General

The channel bottom shall be deepened in accordance with the dimensions provided in the Drawings or Special Provisions. If dimensions are not specified on the Drawings, the sediment trap shall be excavated within the channel cross-section at least 0.3m below the design grade.

The Contractor shall monitor the sediment trap during construction and cleanout accumulated sediments as required to maintain the function of the sediment trap.

If specified to be temporary, no sediment trap maintenance is required after construction is complete.

If specified to be permanent, the contractor shall cleanout the sediment trap at the conclusion of the warranty period, unless directed otherwise by the Engineer.

A permanent rock sediment trap shall include a permanent sediment trap and a rock flow check dam.

A temporary rock/straw sediment trap shall include a temporary sediment trap and a rock/straw flow check dam.

400.31.6 Turbidity Curtains

A turbidity curtain is required when there is permanent water level/flow and a sediment trap is not feasible.

Turbidity curtains shall be in accordance with OPSD 219.260, OPSS 805 and installed per manufacturer's instructions.

Turbidity curtains shall be sized and anchored to ensure the bottom edge of the curtain is continuously in contact with the waterbody bed so that sediment passage from the enclosed area is prevented. The curtain must be free of tears and capable of passing the base flow from the drainage works. Turbidity curtain locations shall be approved by the Engineer.

Turbidity curtains are to remain functional until work in the enclosed area is completed. Prior to relocating or removing turbidity curtains, accumulated sediment is to be removed from the drain and levelled. Where a turbidity curtain remains in place for more than two weeks it shall be inspected for damage or clogging and replaced, repaired, or cleaned as required. No additional payment shall be made for the replacement and maintenance of turbidity curtains during construction.

400.32 GRASSED WATERWAYS AND OVERFLOW SWALES

Grassed waterways and overflow swales typically follow low ground along the historic flow route. The cross-section shall be saucer shaped with a nominal 1m bottom width, 8:1 side slopes and 300mm depth, unless stated otherwise in the Special Provisions.

All grassed waterways are to be permanently vegetated. Grassed waterways shall be seeded with the seed mixture specified in Specification *400.30.2 – SURFACE RESTORATION - Seeding*.

Overflow swales in field areas which are not designated as grassed waterways shall not be seeded.

400.33 BUFFER STRIPS

Open drains shall include minimum 3m wide, permanently vegetated, buffer strips on each side of the drain, unless alternative dimensions are specified on the Drawings. Catchbasins shall include a minimum 1m vegetated buffer around the catchbasin, unless riprap is placed for sediment control.

400.34 POLLUTION

The Contractor shall keep their equipment in good repair. The Contractor or any landowner shall not spill or cause to flow any polluted material into the drain that is not acceptable to the MECP. The local MECP office and the Engineer shall be contacted if a polluted material enters the drain. The Contractor shall refill or repair equipment away from open water. If the Contractor causes a spill, the Contractor is responsible to clean-up the spill in accordance with MECP clean-up protocols.

400.35 SPECIES AT RISK

If a Contractor encounters a known Species at Risk designated by the MECP, MNRF or DFO, the Contractor shall notify the Engineer immediately and follow applicable authority's guidelines for work around the species.

400.36 SITE CLEANUP

The Contractor shall remove all surplus materials from the job site at the end of the project prior to demobilization. The Contractor shall locate the disposal site for all materials to be disposed of. Disposal of materials shall comply with applicable regulations. Unless specified otherwise, the cost to dispose of all surplus materials shall be included in the price of other tender items.

400.37 MAINTENANCE CORRIDOR

The maintenance corridor along the route of the drain, as defined in the report, Drawings, and Specification *400.4 - WORKING AREA and 400.6 - ACCESS*, shall be kept free of obstructions, ornamental vegetation and structures. When future maintenance is undertaken, the cost of removing such items from the corridor shall be assessed to the landowner.

410 **STANDARD SPECIFICATIONS**

FOR

OPEN DRAINS

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410 STANDARD SPECIFICATION FOR OPEN DRAINS

410.1 DESCRIPTION

Work under this item shall include the supply of labour, equipment and materials required for: channel excavation to the cross-section specified, leveling or disposal of all excavated material (spoil) as directed, reconstruction of all intercepted drains as required and any other items related to open drain construction as required by the Schedule of Tender Prices, Special Provisions or the Drawings.

410.2 MATERIALS

Refer to ***400 Standard Specifications for Drain Construction*** for any materials required for open drain construction.

410.3 CONSTRUCTION

410.3.1 Excavation

The bottom width and the side slopes of the ditch shall be as shown on the profile drawing. If the channel cross-section is not specified in the Special Provisions it shall be a 1m bottom width with 1.5m horizontal to 1m vertical (1.5:1) bank slope. At locations along the drain where the specified side slopes change there shall be a transitional length of not less than 5m between the varying side slopes. At locations along the drain where the specified bottom width changes there shall be a transitional length of not less than 5m. In all cases there shall be a smooth transition between changes in any part of the channel cross-section. Where the bottom width of the existing ditch matches the specified bottom width, ditch excavation shall be completed without disturbing existing banks.

410.3.2 Low Flow Channels

Unless specified otherwise in the Special Provisions, all intermittent open drains with a bottom width greater than 1.8m and a grade less than 0.07%, shall have a low flow channel. The bottom of the low flow channel shall be the grade shown on the profiles, and shall have a U-shaped cross-section with an average top width of 0.5m and a minimum depth of 0.3m. The low flow channel will not be seeded and may meander along the main channel bottom provided it remains at least 0.3m from the toe of the main channel bank slope.

410.3.3 Line

The drain shall be constructed according to the alignment shown on the drawings or shall follow the course of the existing ditch. All bends shall have a minimum inside radius of 2m. There shall be a smooth transition between changes in the channel alignment. The Contractor shall contact the Engineer before removing any bends or irregularities in an existing ditch.

410.3.4 Grade Control

The profile shows the grade line for the bottom of the ditch. Cuts may be shown on the profile from the existing top of bank and/or from the existing ditch bottom to the new ditch bottom. These cuts are shown for the convenience of the Contractor and are not recommended for quantity estimate or grade control. Accurate grade control must be maintained by the Contractor during ditch excavation. The ditch bottom elevation should be checked every 50 metres and compared to the elevation on the profile.

Benchmarks are identified on the Contract Drawings. The Engineer will confirm all benchmark elevations prior to construction.

410.3.5 Variation from Design Grade

A variation of greater than 25mm above the design grade line may require re-excavation. Excavation below design grade up to 150mm is recommended so that sediment accumulation during or following excavation will not place the ditch bottom above the design grade at completion. Under some circumstances the Engineer may direct that over excavation greater than 200mm will have to be backfilled. No additional payment will be made if backfilling is required to remedy over excavation.

410.3.6 Excavated Material

Excavated material (spoil) shall be deposited on either or both sides of the drain within the specified working area as directed in the Special Provisions. The Contractor shall verify the location for the spoil with each landowner before commencing work on their property. If not specified, spoil shall be placed on the low side of the ditch or opposite trees and fences. The spoil shall be placed a minimum 1m from the top of the bank. No excavated material shall be placed in tributary drains, depressions, or low areas such that water is trapped behind the spoil bank. Swales shall be provided through the leveled or piled spoil at approximately 60m intervals to prevent trapping water behind the spoil bank.

The excavated material shall be placed and leveled to a maximum depth of 250mm; unless otherwise instructed. If excavating more than 450mm topsoil shall be stripped, stockpiled separately and replaced over the leveled spoil, unless stated otherwise in the Special Provisions. The edge of the spoil bank furthest from the ditch shall be feathered down to existing ground. The edge of the spoil bank nearest the ditch shall have a maximum slope of 2:1. The material shall be leveled such that it may be cultivated with conventional equipment without causing undue hardship on farm machinery.

Wherever clearing is necessary prior to leveling, the Contractor shall remove all stumps and roots from the working area. No excavated material shall cover any logs, brush or rubbish of any kind. Large stones in the leveled spoil that are greater than 300mm in diameter shall be moved to the edge of the spoil bank nearest to the ditch but in general no closer than 1m to the top of bank.

Lateral channels that outlet into the drain shall be tapered over a distance of 10m to match the grade of drain excavation. No additional payment will be made for this work. Where the elevation difference between the lateral channel and the drain is greater than 450mm, a rock chute or similar bank protection approved by the Engineer shall be provided. Additional payment may be allowed for this work.

Where it is specified to straighten any bends or irregularities in the alignment of the ditch or to relocate any portion of an existing ditch, the excavation from the new cut shall be used for backfilling the original ditch. Regardless of the distance between the new ditch and old ditch, no additional payment will be allowed for backfilling the existing ditch.

The Contractor shall contact the Engineer if a landowner indicates in writing that spoil on the owner's property does not need to be leveled. The Engineer may release the Contractor from the obligation to level the spoil and the Engineer shall determine the credit to be applied to the Contractor's payment. No additional compensation is provided to the owner if the spoil is not leveled.

The Engineer may require the Contractor to obtain written statements from any or all of the landowners affected by the leveling of the spoil. Final determination on whether or not the leveling of spoil meets the specification shall be made by the Engineer.

410.3.7 Excavation at Existing Bridge and Culvert Sites

The Contractor shall excavate the drain to the specified depth under all bridges and to the full width of the structure unless specified otherwise in the Special Provisions. All necessary care and precautions shall be taken to protect permanent structures. Temporary bridges may be removed and left on the bank of the drain. In cases where the design grade line falls below the top of footings, the Contractor shall take care to not over-excavate below the grade line. The Contractor shall notify the Engineer if excavation of the channel exposes the footings of the bridge or culvert, so the Engineer can make an evaluation.

The Contractor shall clean through all pipe culverts to the grade line and width specified on the profile. The Contractor shall immediately contact the Engineer after a culvert cleanout if it is found that the culvert bottom is above the grade line or where the structural integrity of the culvert is questionable. Material resulting from cleanout through bridges or culverts shall be levelled on the adjacent private lands or hauled offsite at the expense of the bridge/culvert owner.

410.3.8 Bridges and Culverts

The size and material for any new ditch crossings shall be as outlined in the Special Provisions. For culvert installation instructions, refer to ***400 Standard Specifications for Construction of Drains***, the Drawings, and the Special Provisions.

If directed on the drawings that the existing crossing is to be salvaged for the owner, the Contractor shall carefully remove the existing crossing and place it beside the ditch or haul to a location as specified by the owner. If the existing crossing is not to be saved then the Contractor shall remove and dispose of the existing crossing. Disposal by burying on-site must be approved by the Engineer and the owner.

All new pipe crossings shall be installed at invert elevations as specified on the Drawings, typically a minimum of 50mm below design grade. If the ditch is over excavated greater than 200mm below design grade, the Contractor shall confirm with the Engineer the elevations for installation of the new crossing.

For backfill and surface restoration, refer to ***400 Standard Specifications for Construction of Drains***, the Drawings, and the Special Provisions.

Any crossings assembled on-site shall be assembled in accordance with the manufacturer's specifications. Installation of private crossings during construction must be approved by the Engineer.

410.3.9 Obstructions

All trees, brush, fallen timber and debris shall be removed from the ditch cross-section and as required for spreading of the spoil. The roots shall be left in the banks if no bank excavation is required as part of the new channel excavation. In wooded or heavily overgrown areas all cleared material may be pushed into piles or rows along the edge of the cleared path and away from leveled spoil. All dead trees along either side of the drain that may impede the performance of the drain if allowed to remain and fall into the ditch, shall be removed and put in piles, unless directed otherwise by the Engineer.

410.3.10 Tile Outlets

The location of all existing tile outlets may not be shown on the profile for the drain. The Contractor shall contact each owner and ensure that all tile outlets are marked prior to commencing excavation on the owner's property. If a marked tile outlet or the tile upstream is damaged due to construction, it shall be replaced at the Contractor's expense. Additional payment will be allowed for the repair or replacement of any unmarked tile outlets encountered during excavation. In all cases, if an existing tile outlet requires replacement the Contractor shall confirm the replacement tile outlet with the Engineer. Where riprap protection exists at any existing tile outlet such protection shall be removed and replaced as necessary to protect the outlet after reconstruction of the channel.

If any tile outlet becomes plugged as a result of construction, the Contractor shall remove the obstruction.

410.3.11 Completion

At the time of final inspection, all work in the contract shall have the full dimensions and cross-sections specified.

420 **STANDARD SPECIFICATIONS**

FOR

TILE DRAINS

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420 STANDARD SPECIFICATIONS FOR TILE DRAINS

420.1 GENERAL

Work under this specification will consist of supplying, hauling, laying and backfilling subsurface drainage pipe, in the location, depth and invert grade as shown on the Drawings or described in the Special Provisions. In this specification the word "tile" will apply to all described pipe materials. Diameters are in millimeters (mm), lengths in meters (m).

The work shall include the supplying of all labour, tools, equipment and materials required for the installation of the tile including the following associated tasks: excavation and backfilling of the trenches; trench dewatering; hauling, handling, placing and compaction of the excavated material for backfill; loading, hauling, handling and disposal of surplus excavated material; and stripping, handling and replacing of topsoil and sod.

All existing laterals crossed by the new drain alignment shall be reconnected in an approved manner. Either special manufactured connections shall be used or another method of sealing connections as approved by the Engineer.

The Contractor shall also supply and install catchbasins, junction boxes and other structures where directed by the Engineer. Refer to Specifications *420.3.8, 420.3.10, and 420.3.11* for specifics on tile connections and catchbasin/junction box details.

Except where complete removal of an existing pipe is required by new construction, existing pipes to be abandoned shall be sealed with a 300mm minimum length concrete or mortar plug to the satisfaction of the Engineer.

Sections 6 and 7 of the current version of the *Drainage Guide for Ontario*, OMAFRA Publication 29 shall provide a general guide to all methods and materials to be used in the construction of tile drains except where superseded by this Contract.

The licensing requirements of the *Agricultural Tile Drainage Installation Act, 1990* will not be applicable to this Contract unless specified otherwise by this Contract.

420.2 MATERIALS

Refer to ***400 Standard Specifications for Drain Construction*** for any materials required for tile drain construction.

420.3 CONSTRUCTION

420.3.1 Outlet

A tile drain outlet into a ditch or creek shall be protected using a 6m length of rigid pipe with a hinged grate for rodent protection. Maximum spacing between bars on the rodent grate shall be 50mm. Material for rigid pipe will be specified in the Special Provisions. If not otherwise specified, material shall be assumed to be plastic pipe as per Specification *400.15.5 – HDPE Pipe* (dual wall high density polyethylene). The joint between the rigid pipe and the tile drain shall be wrapped with filter fabric. All outlets will be protected with rock riprap to protect the bank cut and as a splash apron. In some locations riprap may also be required on the bank opposite the outlet. The quantity of riprap required will be specified in the Special Provisions. A marker stake as approved by the Engineer shall be placed at each tile outlet.

420.3.2 Alignment & Pre-Location of Existing Drains

The Engineer will designate the general location of the new drain. When the proposed drain is generally parallel to existing drains, the Contractor shall pre-locate the existing drains.

For pre-locates, cross trenches are to be dug along the entire length of the new drain route at 100m to 200m intervals (minimum), prior to construction, to confirm the alignment of the new drain. The frequency of pre-locating will depend on the alignment of the existing drains. More pre-locates will be necessary for a meandering drain route.

The Contractor shall exercise care to not disturb any existing tile drains which parallel the new drain and are intended to remain. The alignment of the new drain shall be offset approximately four to six metres from the existing drain to minimize disturbance of the existing drain. Where an existing tile is disturbed or damaged the Contractor shall perform the necessary correction or repair with no additional compensation.

NOTE: It is the Contractor's responsibility to ascertain the location of, and to contact the owners of all utility lines, pipes and cables in the vicinity of drain excavations. The Contractor shall be completely responsible for all damages incurred.

420.3.3 Grade Control

Tile drain is to be installed to the elevation and grade as shown on the profiles. Accurate grade control must be maintained by the Contractor at all times during tile installation. The tile invert elevation should be checked every 50m and compared to the elevation on the profile.

Benchmarks are identified on the Contract Drawings. The Engineer will confirm all benchmark elevations prior to construction.

420.3.4 Variation from Design Grade

No reverse grade will be allowed. A small variation in grade can be tolerated where the actual capacity of the drain exceeds the required capacity. The constructed grade should be such that the drain will provide the capacity required for the drainage area. Constructed grade should not deviate from design grade by more than 10% of the internal diameter for more than 25m. Grade corrections shall be made gradually over a distance not less than 10m.

420.3.5 Installation

420.3.5.1 General

For installation of closed drains by wheel trencher or excavator and corrugated plastic tubing by drainage plow, topsoil shall be stripped, stockpiled separately and replaced after the trench is backfilled. Topsoil stripping extents shall account for the width of the trench and include adequate space for subsoil stockpiles.

At each work stoppage, the exposed end of the tile shall be covered by a tight-fitting board or metal plate. No installed tile shall be left exposed overnight.

Any tile damaged or plugged during construction shall be replaced or repaired at the Contractor's expense.

Restoration requirements are provided in Specification *400.30 - Surface Restoration*.

420.3.5.2 Installation of Concrete Tile

The standard method for concrete tile installation is by wheel machine. Installation of concrete tile by backhoe/excavator is subject to the Engineer’s approval and shall meet the requirements at the end of this section.

Trench excavation shall begin at the outlet and proceed upstream. The location and grade shall be as shown on the Drawings but may be revised by the Engineer on site with no additional payment, except where the change requires increased depth of cut beyond the limitation of the wheel trencher in use at the time of the change.

Where the depth for the tile installation exceeds the depth capacity of the wheel trencher, the Contractor shall excavate a trench of sufficient depth so that the wheel trencher can install the tile at the correct depth and grade. The tender price shall include the cost of the additional excavation, material handling, backfilling and stripping and replacing topsoil over the trench.

The trench width measured at the top of the tile should be at least 150mm greater than the tile diameter. The bottom of the trench is to be cut accurately to grade and shaped so that 10% of the tile diameter is embedded in undisturbed soil. If the trench is overcut below the proposed grade, it is to be backfilled with 19mm clear crushed stone material to the correct grade.

The inside and ends of the tile are to be kept clean during installation. All soil and debris should be removed before the next tile is installed. All concrete tile joints and connections with other pipe materials are to be fully and tightly wrapped with a minimum 300mm width of geotextile drain wrap. A 150mm minimum overlap on top is also required. No additional payment will be made for joint wrapping.

On straight runs, ensure tile joints are aligned, joint wrap is flat and covers the joint evenly, and maximum space between tiles is 3mm. On curved runs, ensure tile joints are touching on one side with a maximum gap of 12mm (1/2”) on the opposite side. Where the maximum gap of 12mm cannot be achieved on a curved run, tiles shall be bevel cut or elbow fittings (maximum 45°) shall be used.

Additional Requirements for Excavator Installation

For installation of concrete tile by backhoe/excavator, concrete tile shall be installed on a minimum of 100mm of 19mm clear, crushed stone, shaped for 10% of the tile diameter. The cost to supply and place stone bedding shall be included in the tendered price for the concrete tile item.

420.3.5.3 Installation of Corrugated Plastic Tubing

Corrugated plastic tubing shall be installed by a drainage plow or wheel trencher unless an alternate method of construction is specified on the Drawings. For other installation methods, proper bedding and backfill is required to maintain the structural integrity of the plastic tubing so that surface and earth loads do not deflect the tubing by more than 20% of its nominal diameter.

For all installation methods:

- the plastic tubing should not be stretched by more than 7% of its normal length
- protect tubing from floating off grade when installing in saturated soil conditions
- directional changes can be made without fittings provided the centre-line radius of the bend is not less than five times the tubing diameter

Drainage plow equipment should construct a smooth bottomed opening in the soil and maintain the opening until the tubing is properly installed. The size of the opening in the soil should conform closely to the outside diameter of the tubing.

420.3.5.4 Installation of Concrete Sewer Pipe or Plastic Pipe

The Contractor shall shape the bottom of the trench to receive and support the pipe and bell over 10% of its diameter. In field and lawn areas, stone bedding is not required unless otherwise specified on the Drawings or directed by the Engineer.

420.3.6 Stony Conditions and Bedrock

The Contractor shall immediately contact the Engineer if stony conditions or bedrock is encountered such that installation by wheel trencher or drainage plow cannot continue. Upon approval of the Engineer, the Contractor shall continue with drain installation using excavator/backhoe methods, as described in Specification *420.3.5.2 - Installation of Concrete Tile.* If not already established in the Tender, additional payment may be approved by the Engineer in consultation with the Contractor. All reasonable effort by the Contractor shall be made to continue with the wheel trencher, or return to use of the wheel trencher after the stony area has been passed.

Stones greater than 300mm in diameter that are pulled to the surface during excavation shall be disposed of by the Contractor at an on-site location acceptable to the landowner. No additional payment for excavating or hauling these stones will be provided.

420.3.7 Unstable Subsoils

The Contractor shall immediately contact the Engineer if unstable subsoil conditions are encountered during tile installation. Upon approval of the Engineer, the tile shall be installed on a 300mm layer of 19mm clear crushed stone. In locations with non-cohesive, fine-grained soils, the Engineer may require the clear crushed stone to be wrapped in geotextile to prevent migration of fines into the clear stone. In exceptional circumstances (e.g. muck soils), the Engineer may require the Contractor to subexcavate unsuitable materials and backfill with clear stone, as required to support pipe bedding.

If not already established in the Tender, additional payment will be considered by the Engineer including: the cost to supply and place the additional stone, geotextile, and the increased cost for installation.

420.3.8 Tile Connections

All lateral drains encountered along the route of the new tile drain are to be connected to the new drain if the intercepted tile are clean and do not contain polluted water. The Contractor shall obtain direction from the Engineer for lateral drains that are full of sediment or contain polluted water.

All lateral drains are to be connected to the new tile using a pipe material and size that will provide the same flow capacity. Corrugated plastic tubing may be used for all tile connections, unless specified otherwise by the Engineer. Tubing may be solid or perforated. Filter sock is not required.

The Contractor is responsible for installation and backfilling in a manner that maintains the structural integrity of the connection. Manufactured fittings shall be used to ensure tight connections. Where an opening must be made in the new tile drain for a connection, the opening shall be cored, unless a field-cut connection is approved by the Engineer. Any gaps or voids around the connection shall be sealed with mortar, low-expanding spray foam, or geotextile. Lateral tubing shall not protrude more than 25mm beyond the inside wall of the new tile drain. The Contractor shall ensure that any material used to seal the connection does also not protrude beyond the inside wall of the new tile drain.

Tile connections will be paid in accordance with the Schedule of Tender Prices and shall include the cost for all fittings, tubing, stone, equipment and labour required.

420.3.9 Backfilling

All tile shall be blinded by the end of the day's work to protect and hold them in place against disturbance. After the tile is inspected, it shall be initially backfilled with a minimum cover of 300mm. For blinding and initial backfilling, use clean native soil with no organic matter. Initial backfill shall be tamped around the pipe by backhoe bucket or similar, if directed by the Engineer.

For completion of backfill, tile shall be backfilled with native material such that there is a minimum cover of 600mm. In addition, a sufficient mound must be placed over the trench to ensure that no depression occurs after settling along the trench.

420.3.10 Catchbasins

420.3.10.1 General

All catchbasins shall have minimum inside dimensions matching the dimensions shown on the Drawings. The Contractor is responsible for ordering catchbasins to match the inlet and outlet connections and top elevations required by the Special Provisions and the Drawings.

420.3.10.2 Materials

The requirements in this section apply strictly to catchbasins in non-travelled locations. Where catchbasins are proposed for travelled locations, refer to the Special Provisions and the Drawings for applicable OPSD information.

Precast, reinforced concrete catchbasins shall be manufactured by Coldstream Concrete or approved equal. The joints between precast catchbasin sections shall be protected with geotextile to prevent soil material from entering into the catchbasin. Joint protection using mortar or water tight barrier is also acceptable. Grates are to be birdcage grates as manufactured by Coldstream Concrete or approved equal, unless specified otherwise on the Drawings. All grates to be secured with corrosion resistant hardware.

HDPE catchbasins shall be as fabricated by ADS, Armtec, Hancor or approved equal. PVC catchbasins shall be Nyloplast as manufactured by ADS or approved equal. HDPE and PVC catchbasins shall be supplied with integral stubouts, fabricated by the manufacturer and sized according to the pipe connections shown on the Drawings. Grates for HDPE, steel or PVC catchbasins shall be in accordance with the Special Provisions and manufacturer recommendations.

Marker stakes as supplied by Coldstream Concrete or equal are to be placed beside each catchbasin, unless specified otherwise on the Drawings.

420.3.10.3 Installation

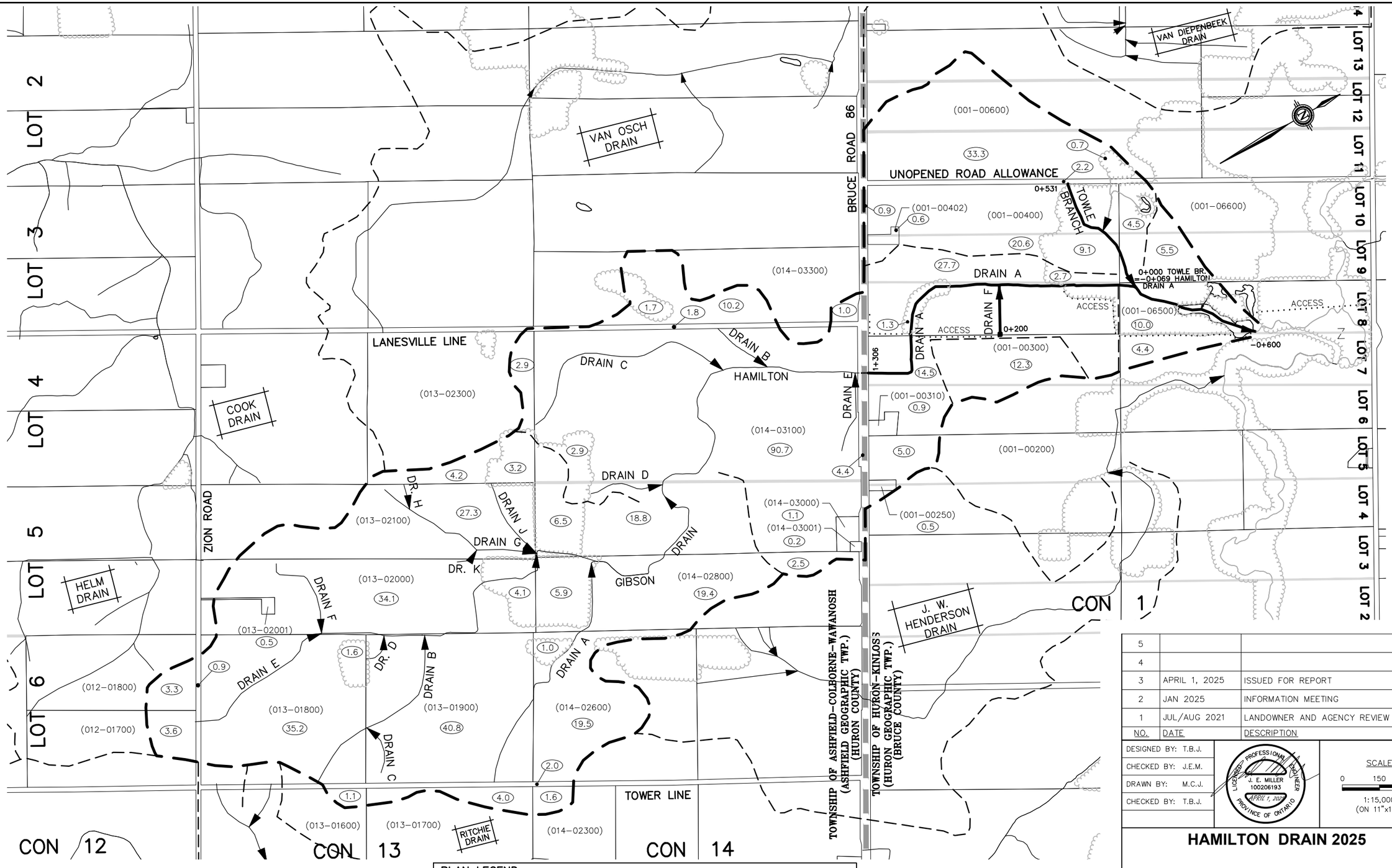
All tile or pipe connected to concrete catchbasins shall be mortared or secured in place so that no gaps remain at the connection. Mortar is to be applied on both the inside and outside wall surfaces.

Backfill around all new catchbasins is recommended to be 19mm clear crushed stone to avoid future settlements. The Contractor shall be responsible for backfilling all settlement areas around catchbasins during the contract warranty period. No additional payment will be provided for adding backfill to settlement areas around catchbasins.

All catchbasin sumps to be fully cleaned by the Contractor after completion of drain installation and backfilling.

420.3.11 Junction Boxes

Junction boxes shall be precast concrete to the same specification as above for catchbasins, except that the junction box shall have a solid concrete lid, unless specified otherwise on the Drawings. The lid shall be a minimum of 125mm thick with welded wire reinforcement and 2 lifting handles. Junction boxes shall have minimum cover of 450mm.



PLAN LEGEND

- SUB WATERSHED
- WATERSHED
- EXISTING DRAIN
- EXISTING DITCH OR WATERCOURSE
- PROPOSED WORK OR INCORPORATION
- (001-00400) – ROLL NUMBER
- DENOTES PROPERTY OWNERSHIP ON BOTH SIDES OF LOT LINE
- BUSH
- OPEN WATER
- ACCESS

NO.	DATE	DESCRIPTION
5		
4		
3	APRIL 1, 2025	ISSUED FOR REPORT
2	JAN 2025	INFORMATION MEETING
1	JUL/AUG 2021	LANDOWNER AND AGENCY REVIEW

DESIGNED BY: T.B.J.
CHECKED BY: J.E.M.
DRAWN BY: M.C.J.
CHECKED BY: T.B.J.

LICENSED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 150 300m
1:15,000
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON-KINLOSS

WATERSHED PLAN

APR 1, 2025

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
JOB NUMBER: 11-089
DRAWING: 1 OF 10

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UNOPENED ROAD ALLOWANCE

BRUCE ROAD 86

HB

(001–00400)

(001–06600)

(001–06500)

(001–00300)

TOWLE BRANCH

0+531

0+400

0+200

0+187

0+040

0+000

DRAIN A

DRAIN A 0+483
=DRAIN F 0+000

0+700

0+600

0+400

0+200

0+000

–0+069 DRAIN A
=0+000 TOWLE BRANCH

DRAIN A
STA. –0+275 TO –0+175
100mL x 0.5mD SEDIMENT TRAP

–0+200

–0+400

–0+600

DRAIN A –0+600
DOWNSTREAM LIMIT
OF DRAIN

STA. 0+561
WASHOUT

STA. 0+379
WASHOUT

STA. 0+300
WASHOUT

DRAIN F

0+200

0+984

0+800

HB

200mmø
(PRIVATE)

ACCESS

ACCESS

ACCESS

ACCESS

1+000

DRAIN A

1+306

1+200

1+132

1+344

DRAIN E

LOT 10

LOT 9

LOT 8

LOT 7

CON 1

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL BE INFORMED OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PLAN LEGEND

- SUB WATERSHED
- WATERSHED
- EXISTING DRAIN
- EXISTING DITCH OR WATERCOURSE
- PROPOSED WORK OR INCORPORATION
- (001–00400) – ROLL NUMBER
- DENOTES PROPERTY OWNERSHIP ON BOTH SIDES OF LOT LINE
- BUSH
- OPEN WATER
- ACCESS

NO.	DATE	DESCRIPTION
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CHECKED BY: T.B.J.

LICENSED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 50 100m
1:5,000
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON–KINLOSS

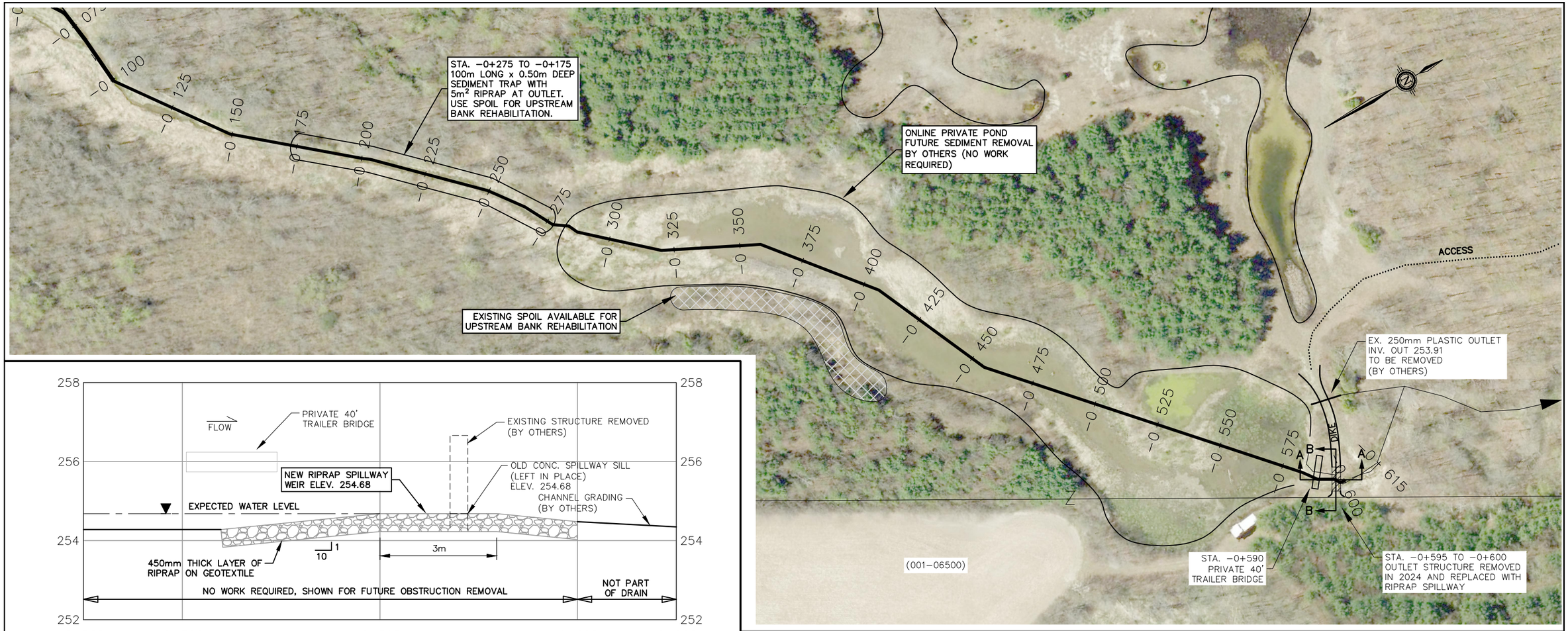
ENLARGEMENT PLAN

APR 1, 2025

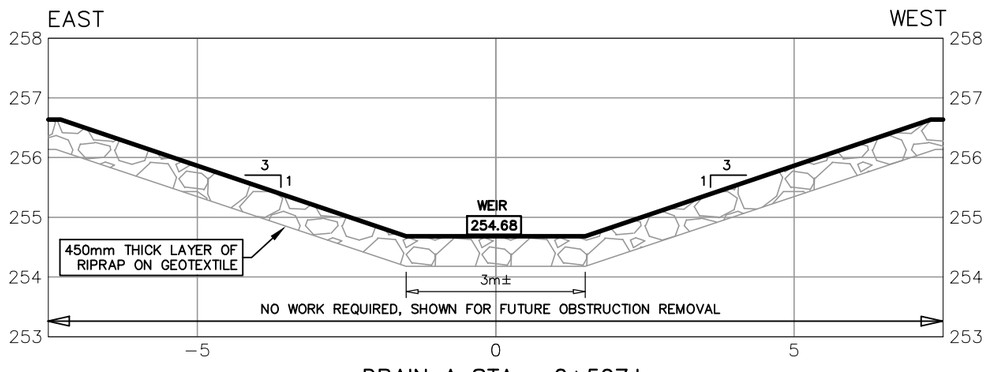
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
JOB NUMBER: 11–089
DRAWING: 2 OF 10

S:\2011\11–089\Drafting\WS 11–089.dwg 2. ENLARGEMENT PLAN 1–Apr–25 3:20:04 PM

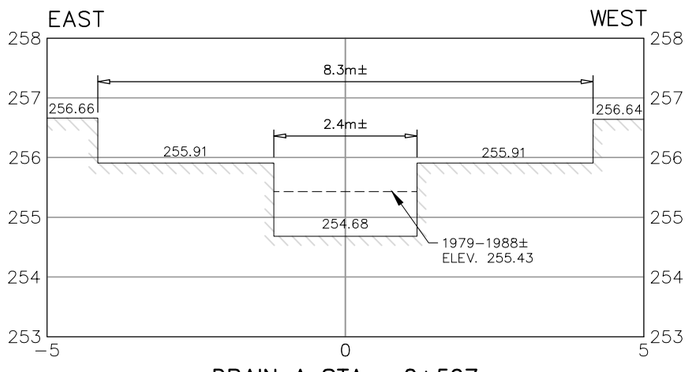


EXISTING PROFILE AT SPILLWAY (COMPLETED BY OTHERS)
(SECTION A: A)



DRAIN A STA. −0+597±
EXISTING RIPRAP SPILLWAY (COMPLETED BY OTHERS)
(SECTION B: B)

SCALE
0 2m
1 : 100 (HORIZ.)
0 2m
1 : 100 (VERT.)



DRAIN A STA. −0+597
PRE−2024 CONCRETE OUTLET STRUCTURE
(REMOVED ABOVE 254.68 BY OTHERS)

NOTES:

−0+600 TO −0+275	−NO WORK REQUIRED −W/L 254.68 −FUTURE OBSTRUCTION REMOVAL AS NEEDED AT RIPRAP SPILLWAY
−0+275 TO −0+175	−100m LONG x 0.50m DEEP SEDIMENT TRAP WITH 5m² RIPRAP AT OUTLET

DESIGNED BY:	T.B.J.
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CHECKED BY:	T.B.J.

LICENSED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 15 30m
1: 1,500 (PLAN)
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON−KINLOSS

DRAIN A DETAIL: STA. -0+600 TO -0+000

APR 1, 2025

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

REVISED:

JOB NUMBER: 11−089

DRAWING
3 OF 10

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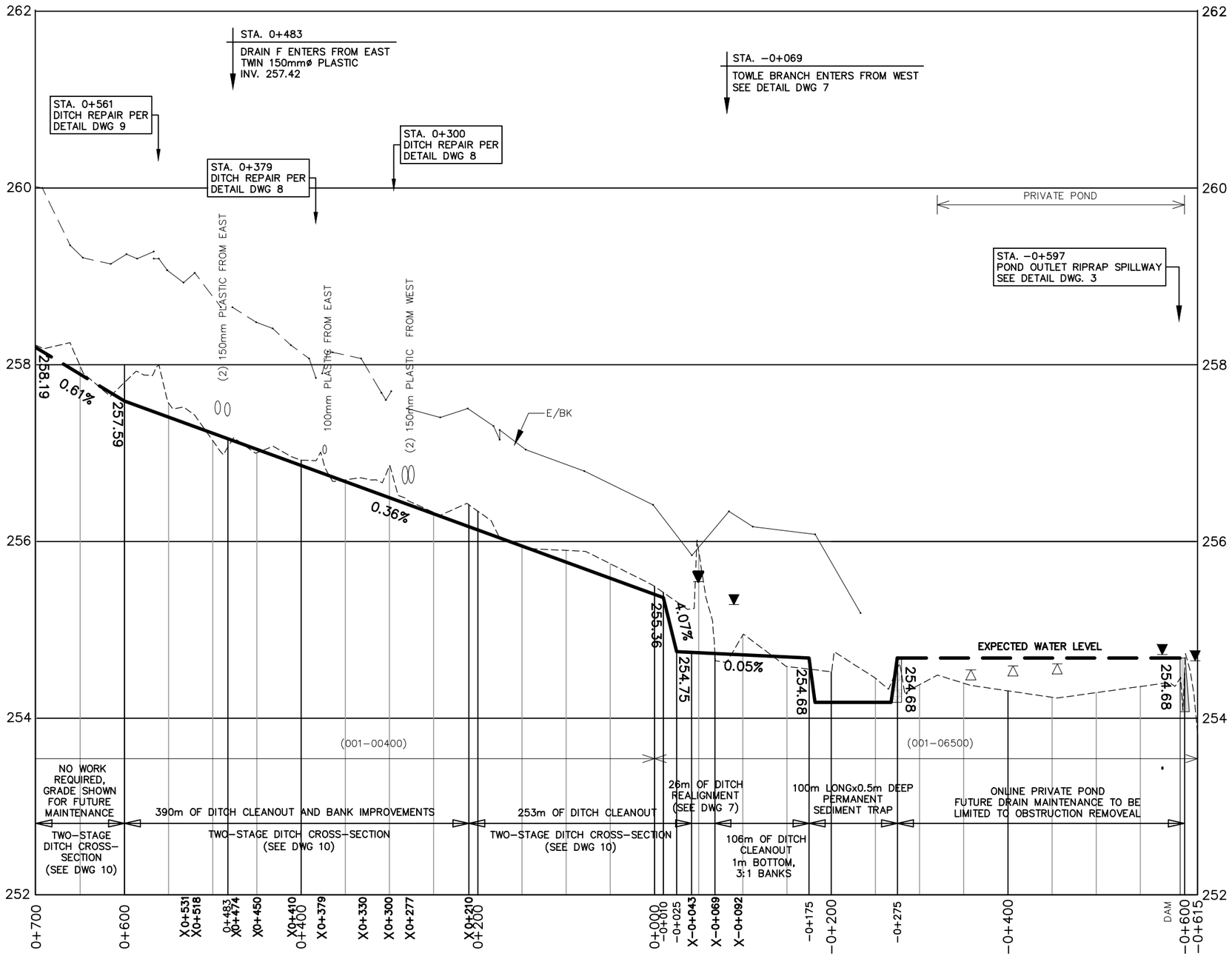

DRAIN A

CONSTRUCTION SPECIFICATIONS − SPECIFIC NOTES

(001−06500)

−0+600 TO −0+275	−NO WORK REQUIRED.
−0+275 TO −0+175	−CONSTRUCT 100m LONG BY 0.5m DEEP PERMANENT SEDIMENT TRAP. (SPOIL TO BE USED FOR BANK REHABILITATION. SEE DWG 8 & 9.) EXCESS SPOIL TO BE LEVELED & SEEDED
−0+175 TO −0+069	−106m OF DITCH CLEANOUT
−0+069 TO −0+043	−26m OF DITCH REALIGNMENT AND 60m^2 RIPRAP ON NORTH BANK.
−0+043 TO 0+000	−43m OF DITCH CLEANOUT.

(010−04000)

−0+000 TO 0+210	−210m OF DITCH CLEANOUT.
0+210 TO 0+600	−390m OF DITCH IMPROVEMENT, INCLUDES BOTTOM CLEANOUT AND BANK WORK PER CROSS−SECTIONS ON DWG 10. HYDROSEED BANKS WHERE DIRECTED BY ENGINEER. HYDROSEEDING PAID SEPARATELY UNDER HYDROSEED ITEM
0+300	−WASHOUT REPAIR ON EAST BANK PER DETAIL DWG 8
0+379	−WASHOUT REPAIR ON EAST BANK PER DETAIL DWG 8
0+483	−10m^2 RIPRAP AT BRANCH F TILE OUTLETS PER DETAIL DWG 9
0+561	−WASHOUT REPAIR ON WEST BANK PER DETAIL DWG 9
0+600 TO 0+700	−NO WORK REQUIRED, UNLESS DIRECTED BY THE ENGINEER.

LEGEND

▼ −WATER LEVEL SURVEYED APRIL 23, 2024

△ −TOP OF SEDIMENT (SURVEYED MARCH 25, 2021)

X 0+300 −STATION W/ CROSS−SECTION

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CHECKED BY: J.E.M.
DRAWN BY: M.C.J.
CHECKED BY: T.B.J.

LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 50 100m
1:5000 (HORIZ.)
0 1m
1:50 (VERT.)
(ON 11"x17")

HAMILTON DRAIN 2025

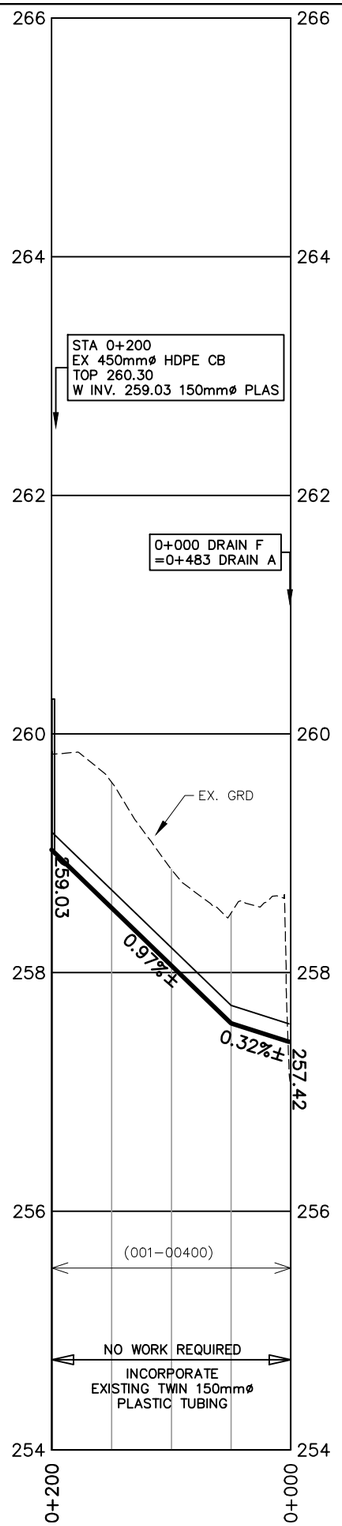
BRUCE COUNTY — TOWNSHIP OF HURON−KINLOSS

DRAIN A PROFILE

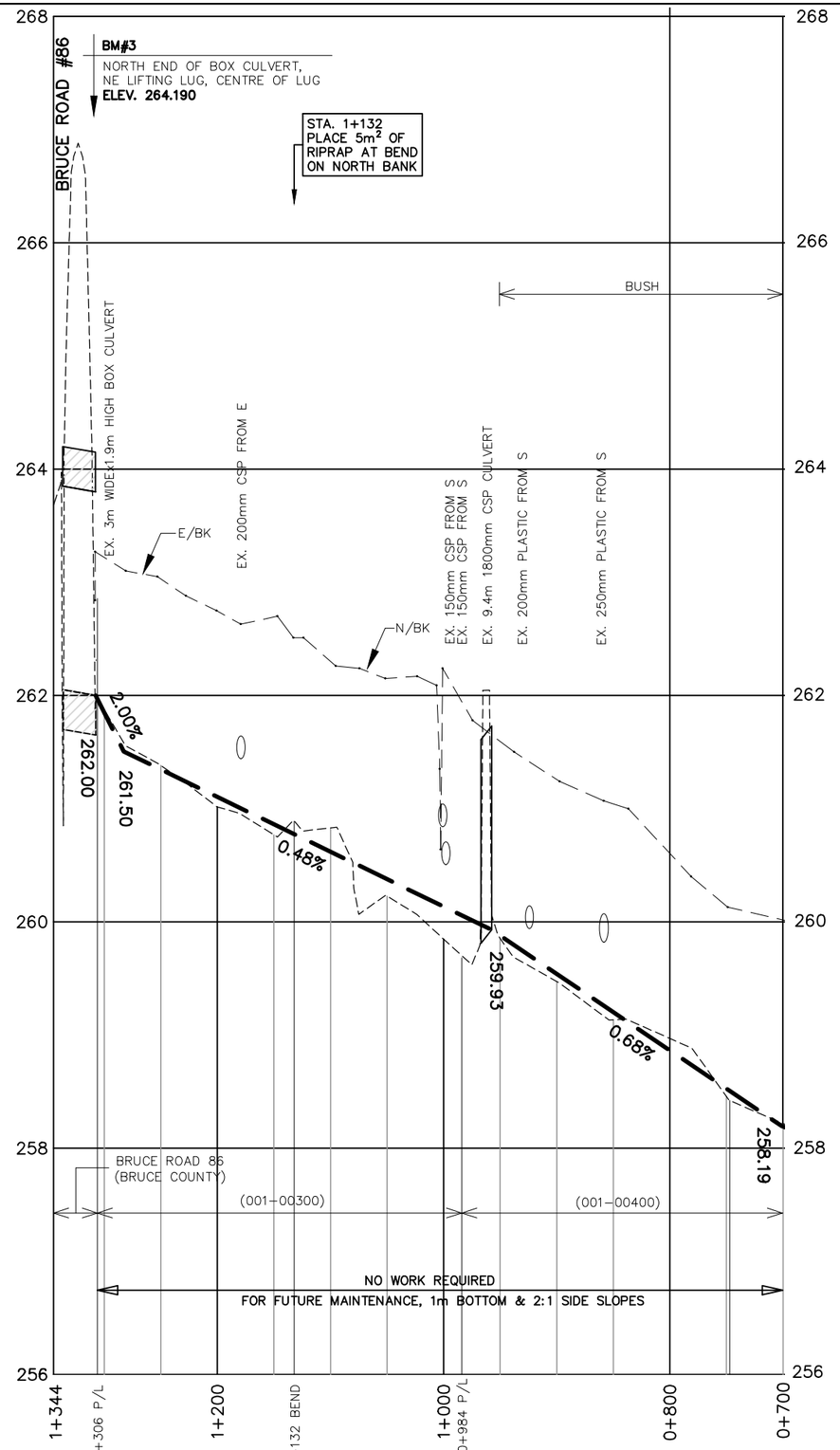
APR 1, 2025

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
JOB NUMBER: 11−089
DRAWING: 4 OF 10



DRAIN F



DRAIN A

CONSTRUCTION SPECIFICATIONS–SPECIFIC NOTES

DRAIN A

001–00400

0+700 TO 0+984	–NO WORK REQUIRED, UNLESS DIRECTED BY ENGINEER.
0+958 TO 0+967	–INCORPORATE 9.4m LONG 1800mmø CSP CULVERT.

001–00300

0+984 TO 1+306	–NO WORK REQUIRED, UNLESS DIRECTED BY ENGINEER.
1+132	–PLACE 5m² OF RIPRAP AT BEND ON NORTH BANK.

DRAIN F

001–00400

0+000 TO 0+200	–INCORPORATE EXISTING TWIN 150mmø PLASTIC TUBING.
0+200	–INCORPORATE EXISTING 450mmø PLAS. CATCHBASIN

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LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 50 100m
(SCALE 1 : 5000)
HORZ.
0 1m
(SCALE 1 : 50)
VERT.
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON–KINLOSS

DRAIN A AND DRAIN F PROFILES

APR 1, 2025

REVISED:

JOB NUMBER: 11–089

DRAWING 5 OF 10

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

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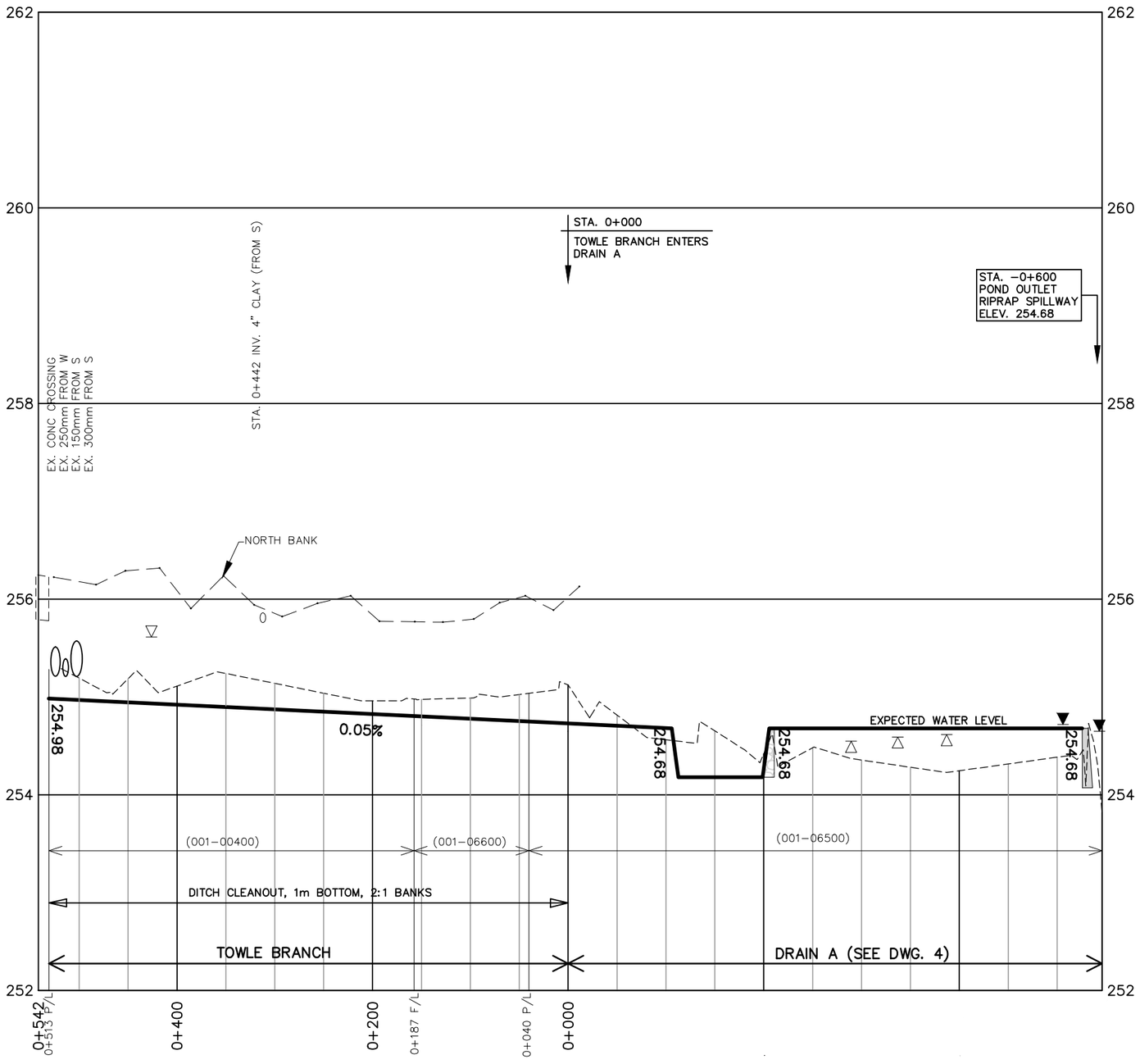

TOWLE BRANCH

CONSTRUCTION SPECIFICATIONS–SPECIFIC NOTES

001-06500
0+000 TO 0+040
- –CLEANOUT DITCH, 1m BOTTOM, 2:1 BANKS
- –WORKING AREA AND SPOIL LEVELING ALONG SOUTH BANK

001-06600
0+040 TO 0+187
- –CLEANOUT DITCH, 1m BOTTOM, 2:1 BANKS
- –WORKING AREA AND SPOIL LEVELING ALONG SOUTH BANK

001-00400
0+187 TO 0+531
- –CLEANOUT DITCH, 1m BOTTOM, 2:1 BANKS
- –WORKING AREA AND SPOIL LEVELING ALONG SOUTH BANK

LEGEND

▽ –WATER LEVEL SURVEYED JANUARY 28, 2014

▼ –WATER LEVEL SURVEYED APRIL 23, 2024

△ –TOP OF SEDIMENT (SURVEYED MARCH 25, 2021)

X 0+300 –STATION W/ CROSS-SECTION

NO.	DATE	DESCRIPTION
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CHECKED BY: T.B.J.

LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 50 100m
(SCALE 1 : 5000) HORZ.
0 1m
(SCALE 1 : 50) VERT.
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON-KINLOSS

TOWLE BRANCH PROFILE

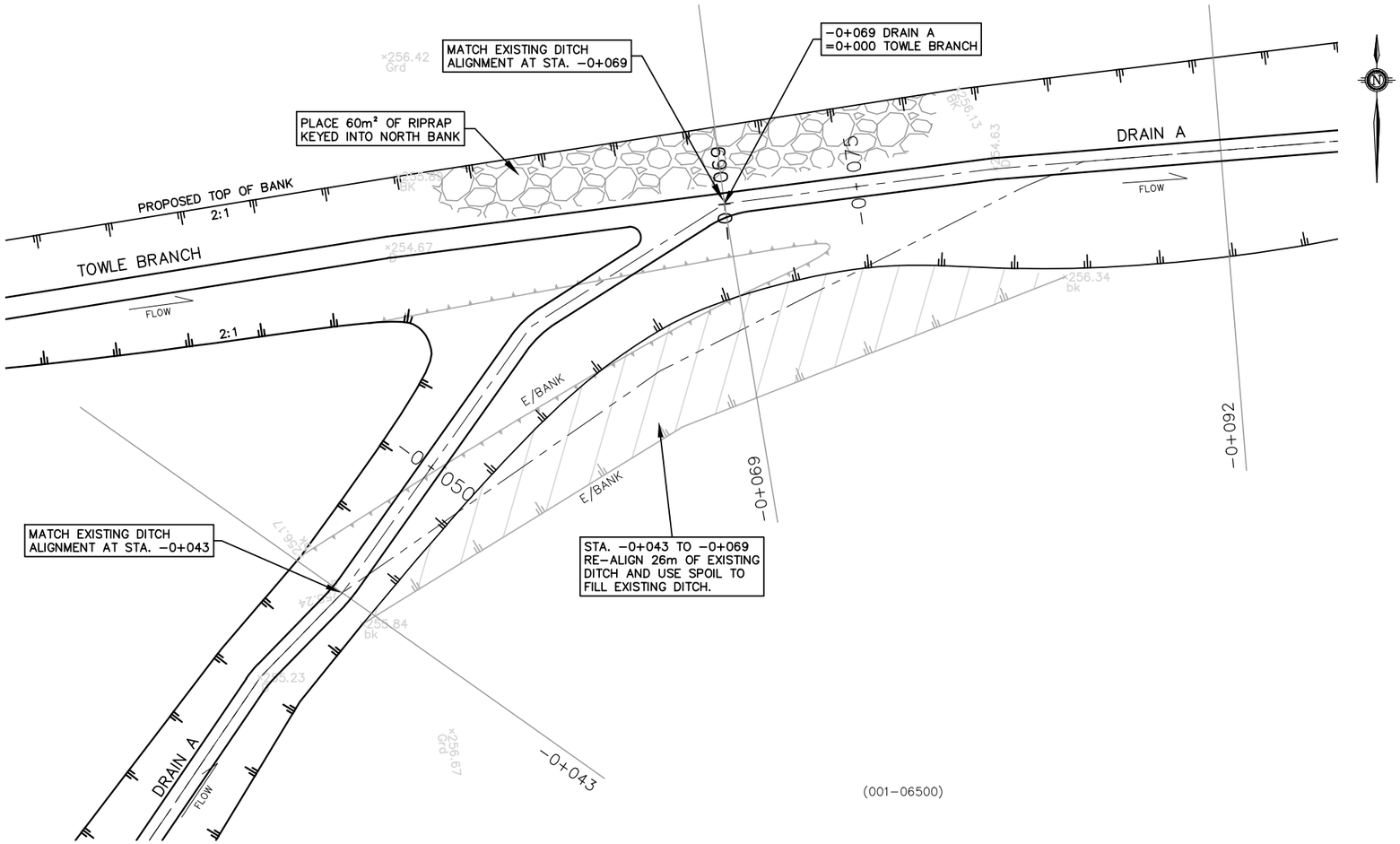
APR 1, 2025

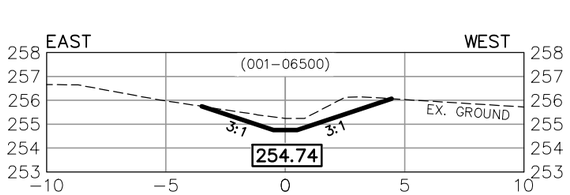
REVISED:

JOB NUMBER: **11-089**

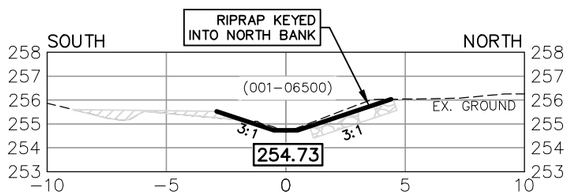
DRAWING 6 OF 10

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY





DRAIN A STA. −0+043



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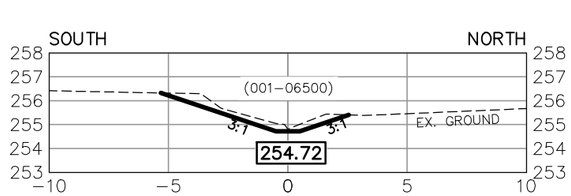

DRAIN A STA. −0+092

SCALE
0 2.5 5m
1 : 250 (HORIZ.)
0 5m
1 : 250 (VERT.)

CONSTRUCTION SPECIFICATIONS−SPECIFIC NOTES

001−06500
−0+069 TO −0+043
−RE−ALIGN 26m OF EXISTING DITCH WITH TWO STAGE CROSS SECTION AND USE SPOIL TO FILL IN EXISTING DITCH
−PLACE 60m² OF RIPRAP KEYED INTO NORTH BANK

NO.	DATE	DESCRIPTION
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LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 2.5 5m
1 : 250 (PLAN)
(ON 11"x17")

HAMILTON DRAIN 2025

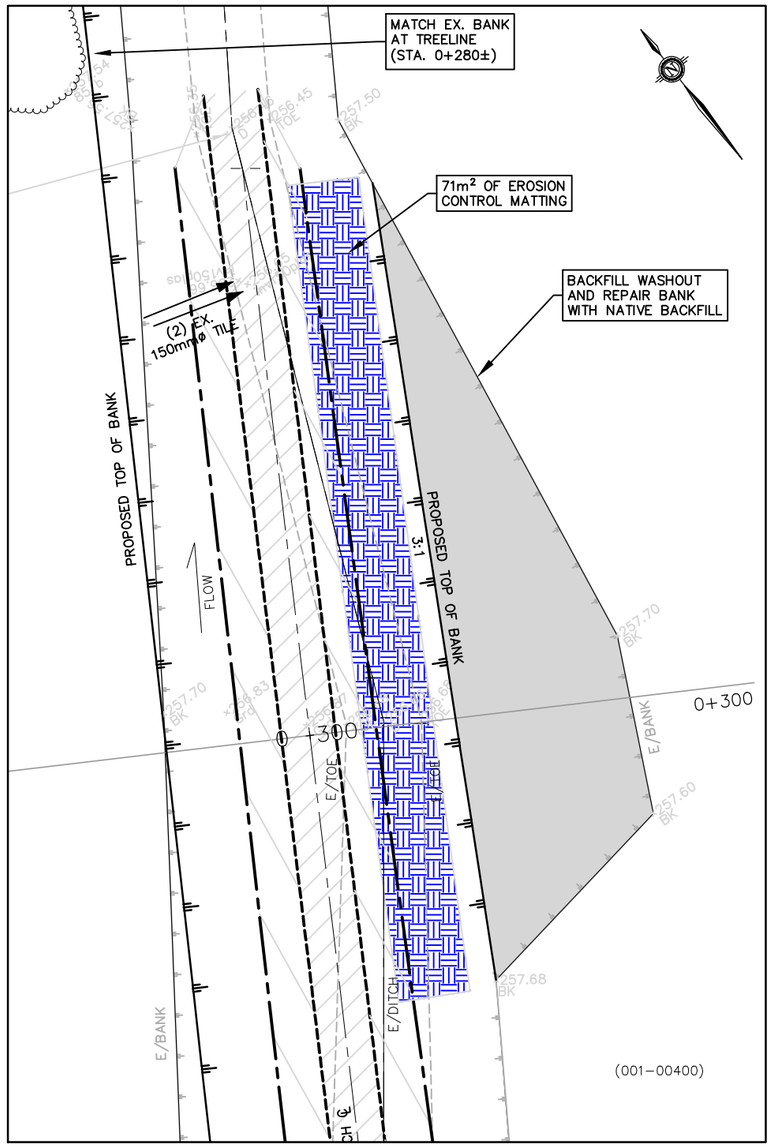
BRUCE COUNTY — TOWNSHIP OF HURON−KINLOSS

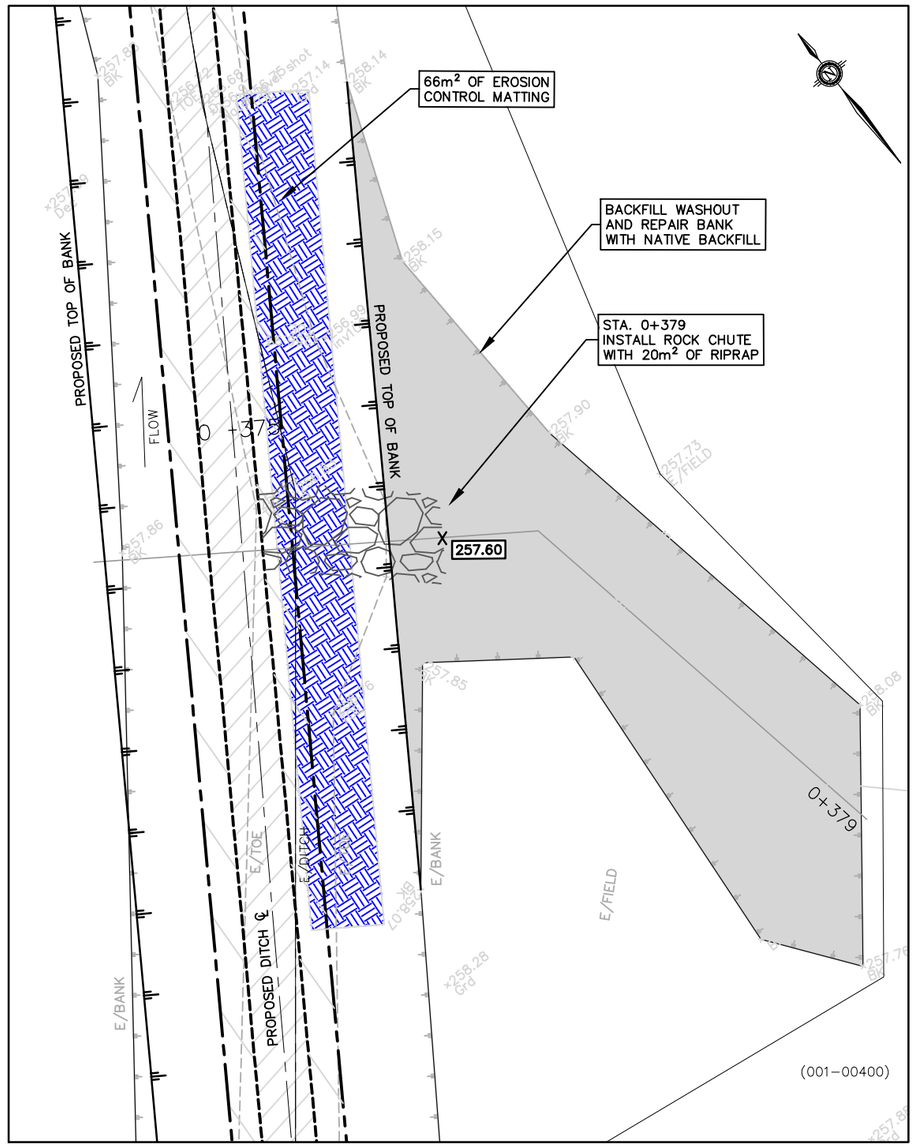
DETAIL AT TOWLE BRANCH JUNCTION

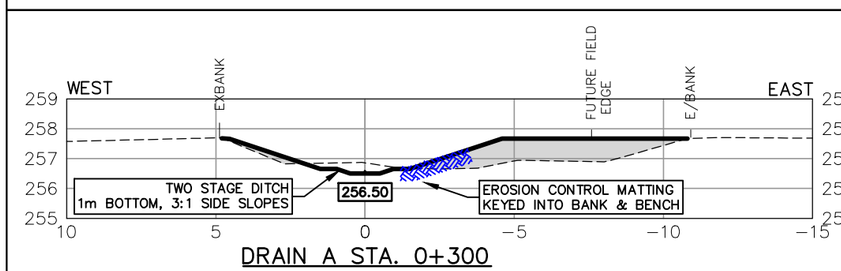
APR 1, 2025

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

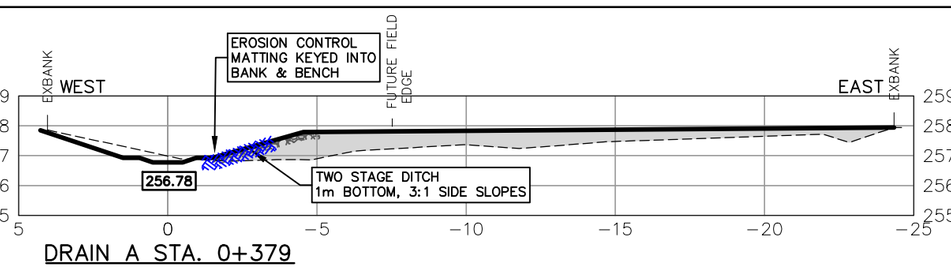
REVISED:
JOB NUMBER: 11−089
DRAWING: 7 OF 10







DRAIN A STA. 0+300



DRAIN A STA. 0+379

SCALE
0 2 4m
1 : 200 (HORIZ.)
0 4m
1 : 200 (VERT.)

CONSTRUCTION SPECIFICATIONS–SPECIFIC NOTES

STA. 0+300
- –DITCH REPAIR, INCLUDING:
  - –48m OF CHANNEL STRAIGHTENING W/ TWO STAGE DITCH PER CROSS–SECTION (SEE DWG 10)
  - –REPAIR EAST BANK WITH 50m³ OF ON–SITE MATERIAL BACKFILL MATERIAL AND TOPSOIL TO BE SALVAGED FROM OTHER WORK AREAS ALONG THE DRAIN (SEE DWG 3)
  - –INSTALL 71m² OF EROSION CONTROL MATTING FROM MIDDLE OF EAST BENCH TO 2m UP BANK. INSTALL MATTING WITH MIN. 300mm LONG STAKES.
  - –HYDROSEED BOTH BANKS ALONG 48m OF DITCH, PAID SEPARATELY BY HYDROSEED ITEM

STA. 0+379
- –DITCH REPAIR, INCLUDING:
  - –38m OF CHANNEL STRAIGHTENING W/ TWO STAGE DITCH PER CROSS–SECTION (SEE DWG 10)
  - –REPAIR EAST BANK WITH 200m³ OF ON–SITE MATERIAL, BACKFILL MATERIAL AND TOPSOIL TO BE SALVAGED FROM OTHER WORK AREAS ALONG THE DRAIN (SEE DWG 3)
  - –INSTALL 66m² OF EROSION CONTROL MATTING FROM MIDDLE OF EAST BENCH TO 2m UP BANK. INSTALL MATTING WITH MIN. 300mm LONG STAKES.
  - –HYDROSEED BOTH BANKS ALONG 38m OF DITCH, PAID SEPARATELY BY HYDROSEED ITEM

STA. 0+379
- –INSTALL ROCK CHUTE WITH 20m² OF RIPRAP

LEGEND

- –PROPOSED WASHOUT BACKFILL AND BANK REPAIR
- –PROPOSED DITCH STRAIGHTENING
- –PROPOSED TOP OF DITCH
- –PROPOSED BANK TOE

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CHECKED BY:	T.B.J.

LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 2 4m
1 : 200 (PLAN)
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON–KINLOSS

DRAIN A REPAIR AT 0+300 & 0+379

APR 1, 2025

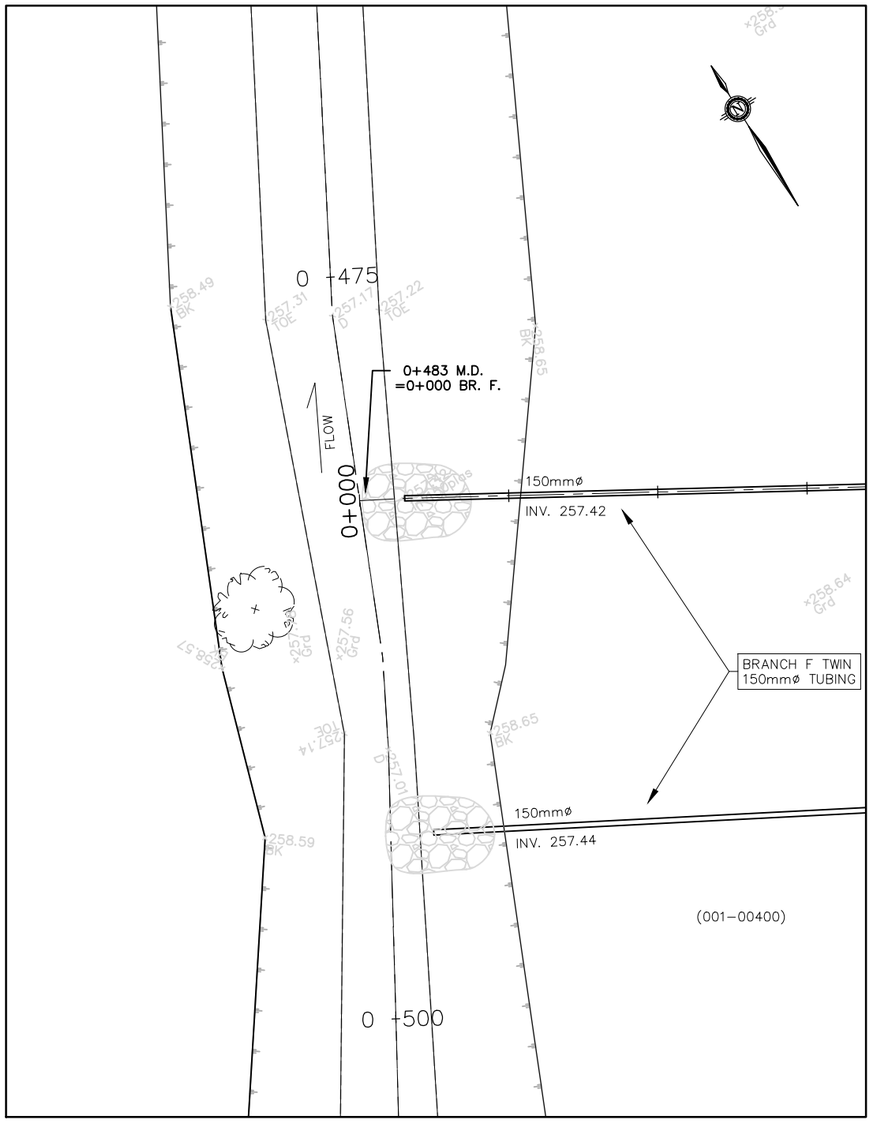
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

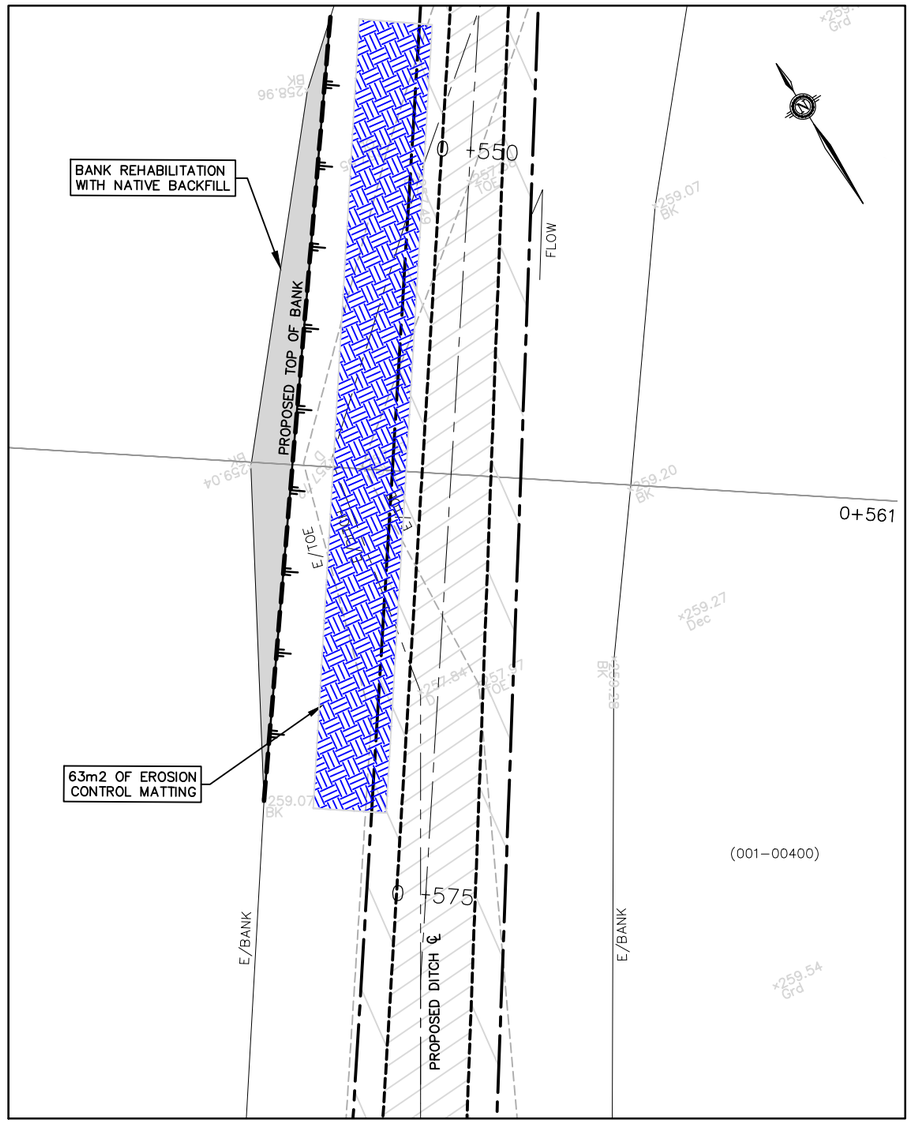
REVISED:

JOB NUMBER: 11–089

DRAWING: 8 OF 10

S:\2011\11–089\Drafting\PROFILE 11–089.dwg 8. BANK INSTABILITY 1–Apr–25 3:27:14 PM





CONSTRUCTION SPECIFICATIONS–SPECIFIC NOTES

001–00400

STA. 0+483 –MAINTAIN 2–STAGE DITCH, 10m² RIPRAP AT OUTLETS OF BRANCH F

STA. 0+561 –DITCH REPAIR, INCLUDING:
- –26m OF CHANNEL STRAIGHTENING W/ TWO STAGE DITCH PER DRAIN A TYPICAL CROSS–SECTION (SEE DWG 10)
- –REPAIR WEST BANK WITH 25m³ OF ON–SITE MATERIAL BACKFILL MATERIAL AND TOPSOIL TO BE SALVAGED FROM OTHER WORK AREAS ALONG THE DRAIN AND PLACED PER DETAIL.
- –INSTALL 63m² OF EROSION CONTROL MATTING FROM MIDDLE OF BENCH TO 2m UP WEST BANK. INSTALL MATTING WITH MIN. 300mm LONG STAKES.
- –HYDROSEED BOTH BANKS ALONG 26m OF DITCH, PAID SEPARATELY BY HYDROSEED ITEM
- –DITCH CLEAN OUT BETWEEN DITCH IMPROVEMENTS

LEGEND

- –PROPOSED WASHOUT BACKFILL AND BANK REPAIR
- –PROPOSED DITCH STRAIGHTENING
- –PROPOSED TOP OF DITCH
- –PROPOSED BANK TOE

NO.	DATE	DESCRIPTION
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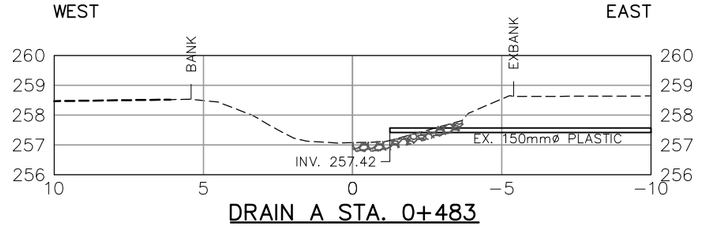
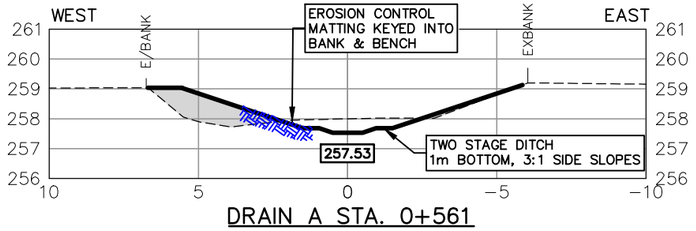


DRAIN A STA. 0+483



DRAIN A STA. 0+561

SCALE
0 2 4m
1 : 200 (HORIZ.)
0 4m
1 : 200 (VERT.)

DESIGNED BY: T.B.J.
CHECKED BY: J.E.M.
DRAWN BY: M.C.J.
CHECKED BY: T.B.J.

LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 2m 4m
1 : 200 (PLAN)
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON–KINLOSS

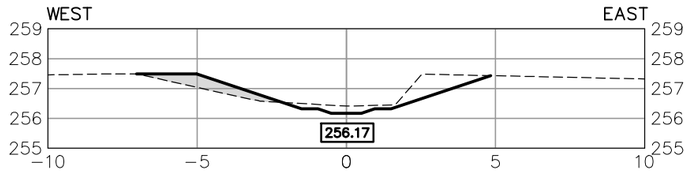
BRANCH F OUTLET AT 0+483
DRAIN A REPAIR AT 0+561

APR 1, 2025

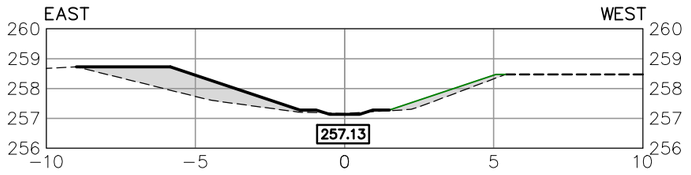
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
JOB NUMBER: 11–089
DRAWING: 9 OF 10

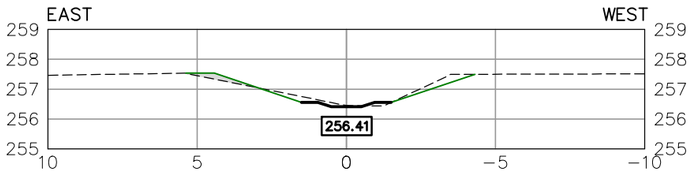
S:\2011\11–089\Drafting\PROFILE 11–089.dwg 9. BANK INSTABILITY 1–Apr–25 3:27:24 PM



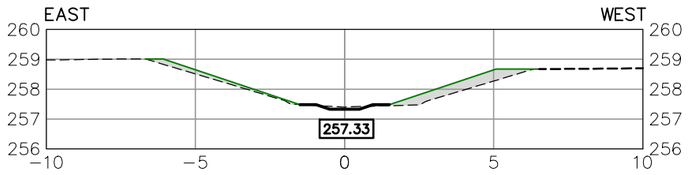
DRAIN A STA. 0+210



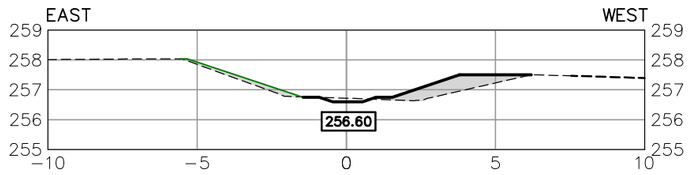
DRAIN A STA. 0+474



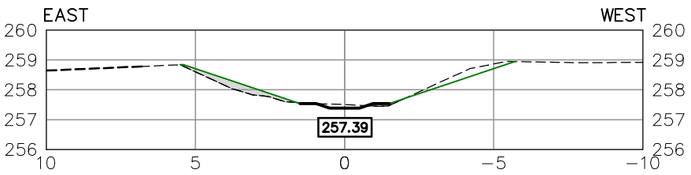
DRAIN A STA. 0+277



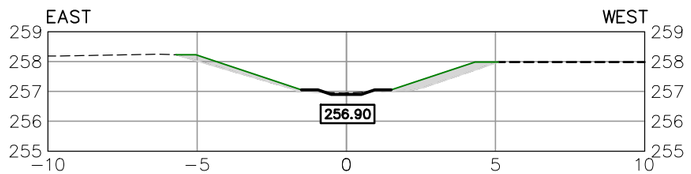
DRAIN A STA. 0+518



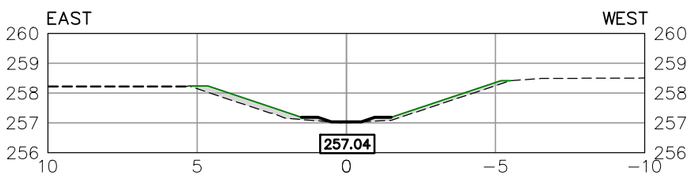
DRAIN A STA. 0+330



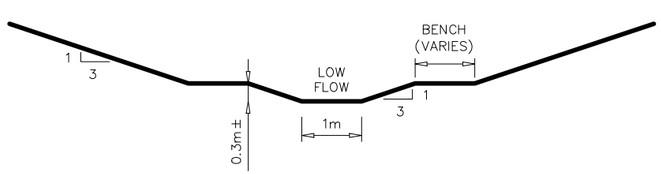
DRAIN A STA. 0+531



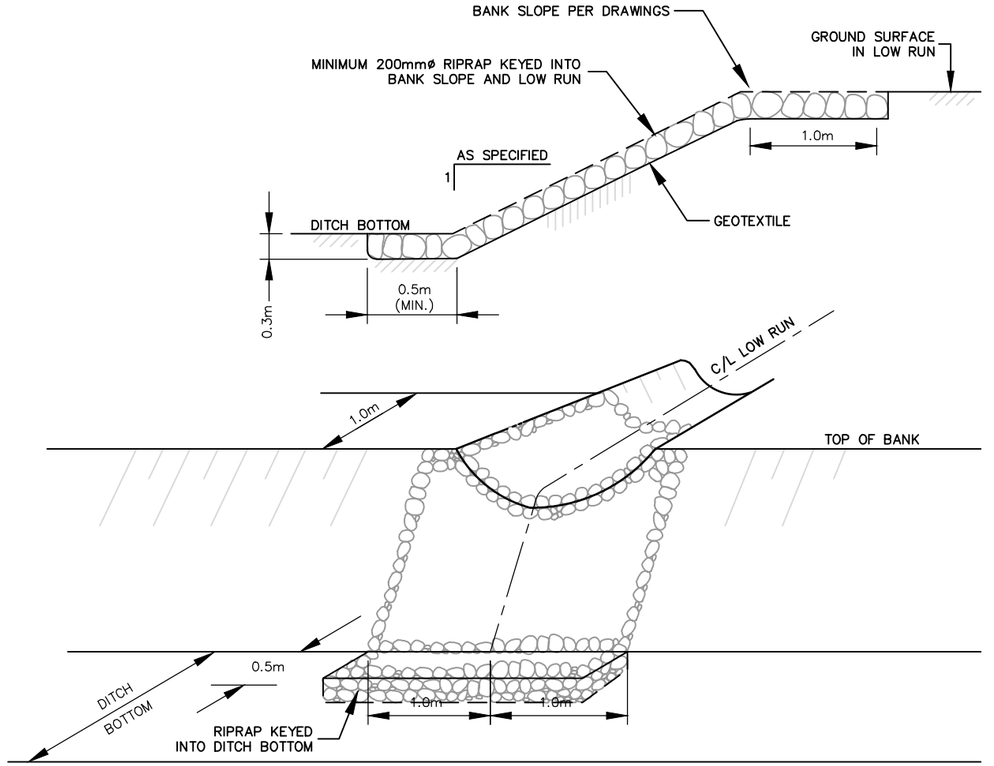
DRAIN A STA. 0+410



DRAIN A STA. 0+450



DRAIN A TYPICAL SECTION
(−0+043 TO 0+700)



ROCK CHUTE
NOT TO SCALE

SPECIAL PROVISIONS – GENERAL NOTES

1. WORKING AREA
FOR A CLOSED DRAIN UP TO 2m DEEP THE WORKING AREA SHALL BE A 10m WIDTH ON EITHER SIDE OF THE TRENCH OR ANY COMBINATION NOT EXCEEDING 20m. FOR CLOSED DRAINS DEEPER THAN 2m THE WORKING AREA SHALL BE INCREASED TO 30m. IF ANY PART OF THE DRAIN IS CLOSE TO A PROPERTY LINE THEN THE PROPERTY LINE SHALL BE ONE OF THE LIMITS OF THE WORK AREA. WHERE ANY PART OF THE DRAIN IS ON A ROAD ALLOWANCE, THE ROAD ALLOWANCE SHALL BE THE WORKING AREA. RESTRICTED OR INCREASED WORKING AREAS WILL BE DESCRIBED IN DETAIL IN THE SPECIFIC CONSTRUCTION NOTES.

2. ACCESS
ACCESS TO THE WORKING AREA SHALL BE FROM ROAD ALLOWANCES AND AS DESIGNATED ON THE DRAWINGS AND/OR SPECIFIC NOTES. NO OTHER ACCESS ROUTES SHALL BE USED UNLESS FIRST APPROVED BY THE ENGINEER AND THE AFFECTED LANDOWNER. SPECIFICATIONS RELATED TO CONSTRUCTION WILL APPLY TO THE ACCESS ROUTES. CONTRACTOR SHALL MAKE GOOD ANY DAMAGES CAUSED BY USING THE DESIGNATED ACCESS ROUTES. THE CONTRACTOR SHALL CONTACT EACH OWNER PRIOR COMMENCING CONSTRUCTION ON EACH PROPERTY.

3. PRE AND POST CONSTRUCTION MEETINGS
THE CONTRACTOR WILL BE REQUIRED TO ATTEND PRE-AND POST-CONSTRUCTION SITE MEETINGS WITH THE ENGINEER AND LANDOWNERS BEFORE STARTING AND AFTER FINISHING THE WORK.

LEGEND

—MAINTAIN EXISTING BANK
(NO EXCAVATION REQUIRED)

NO.	DATE	DESCRIPTION
5		
4		
3	APR 1, 2025	ISSUED FOR REPORT
2	JAN 2025	INFORMATION MEETING
1	JUL/AUG 2021	LANDOWNER AND AGENCY REVIEW

DESIGNED BY: T.B.J.
CHECKED BY: J.E.M.
DRAWN BY: M.C.J.
CHECKED BY: T.B.J.

LICENCED PROFESSIONAL ENGINEER
J. E. MILLER
100206193
APRIL 1, 2025
PROVINCE OF ONTARIO

SCALE
0 2 4m
1 : 200 (HORIZ.)
0 4m
1 : 200 (VERT.)
(ON 11"x17")

HAMILTON DRAIN 2025

BRUCE COUNTY — TOWNSHIP OF HURON-KINLOSS

DRAIN A IMPROVEMENT CROSS SECTIONS

APR 1, 2025

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

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JOB NUMBER: 11-089
DRAWING: 10 OF 10